Tentative Agenda for the WAVERLY CITY COUNCIL MEETING to be held on November 14, 2023 at 6:00 PM. This meeting will be held at the Waverly City Office Building located at 14130 Lancashire Street, Waverly, Nebraska. A current Agenda shall be readily available for public inspection at the office of the City Clerk during normal business hours.

1. **Call to Order**
   - 1.a) Roll Call
   - 1.b) Pledge of Allegiance
   - 1.c) Acknowledgement of the "Open Meetings Act" poster that is posted by the south entrance.
   - 1.d) Adoption of Agenda
   - 1.e) Approval of the Consent Agenda Items*
     All items listed with an asterisk (*) are considered to be routine by the City Council and will be approved by one motion. There will be no separate discussion of these items unless a Council Member or a Citizen so requests, in which event the item will be removed from the Consent Agenda status and considered in its normal sequence on the Agenda.
   - 1.f) Proclamations and Presentations
2. **Public Hearings**
3. **Sheriff's Report**
4. **Public Comments**
5. **Approval of Minutes**
   - 5.a) *Minutes of the October 24, 2023 City Council Meeting
6. **Consideration of Claims and Financial Reports**
   - 6.a) Claims for payment
   - 6.b) Treasurer's Report and Budget & Expense Report
7. **Introduction of Resolutions**
   - 7.a) *Consideration of Resolution 23-27 authorizing temporary street closures for Waverly Fire/Rescue parade on Sunday, December 10, 2023.
8. **Introduction of Ordinances**
9. **Introduction of Business and Communications**
   - 9.a) *Consideration of Right of Way Request from ALLO for fiber optic cable placement in areas generally located in Anderson North Park and Bailie Ct.
   - 9.b) *Ratification and approval of the Waverly Fire/Rescue raffle fundraiser to be held on December 10, 2023 and the opening of a checking account on behalf of the City of Waverly associated therewith.
   - 9.c) Consideration of acceptance of the Water Distribution Study completed by Olsson.
   - 9.d) Mayor's appointment of Community Redevelopment Authority (CRA) members.
   - 9.e) *Consideration of approving the Fiscal Year 2022 Safe Streets and Roads for All (SS4A) Grant Agreement from U.S. Department of Transportation and authorize the mayor to sign all necessary documents.
   - 9.f) Consideration of approval of Plans and Specifications for the Eastbourne Street Water Main Improvements and to Release for Bid.
10. **Committee Reports**
    - 10.a) Human Services (Park & Recreation): Council Member Hummel
    - 10.b) Public Works (Utilities & Street): Council Member Jespersen

10.c) Public Health (Fire & Safety): Council Member Nielson
10.d) Fiscal and Economic Development: Council Member Pascoe
10.e) City Administrator Fisher

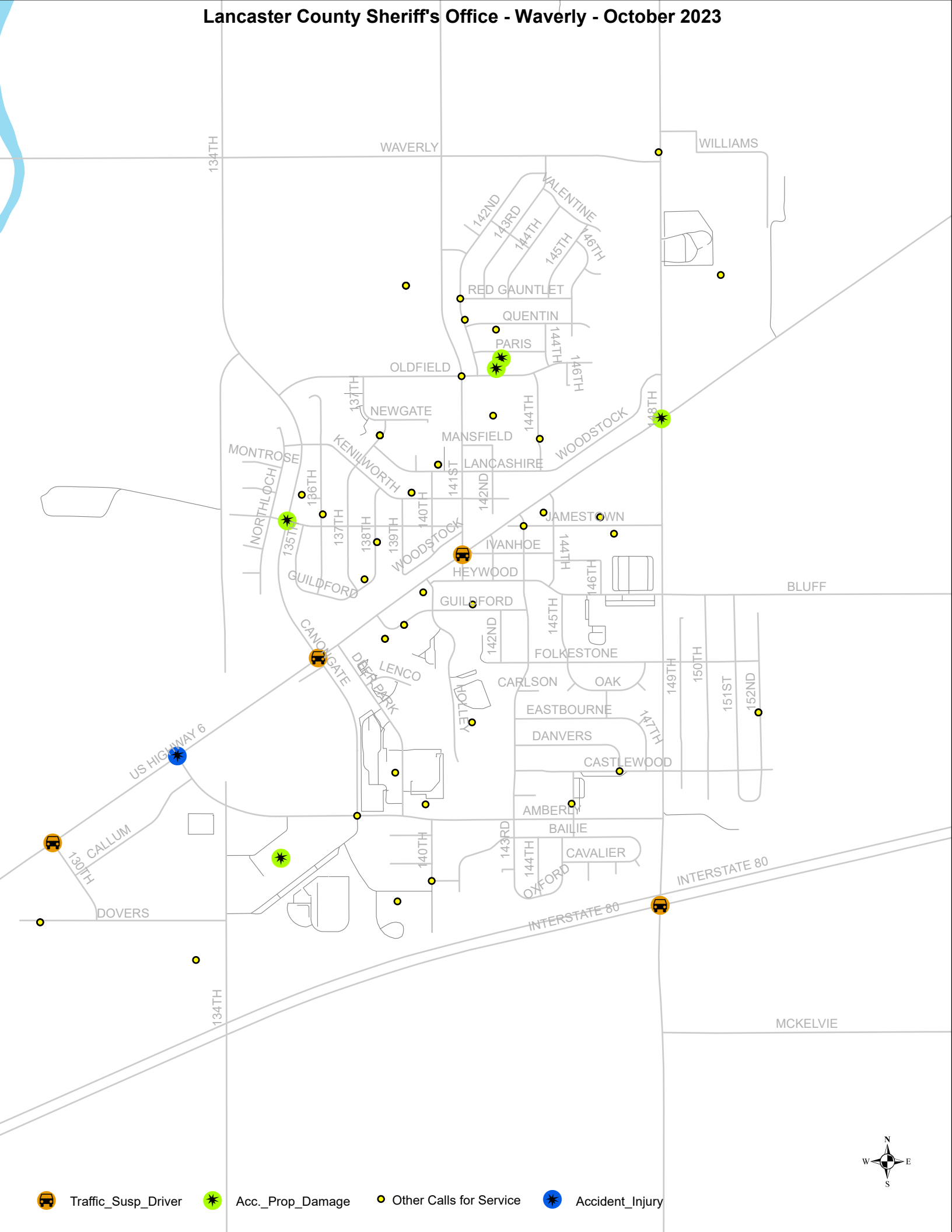
11. **Adjournment**

The Governing Body reserves the right to go into Executive Session at any time for the reasons outlined in State Statute 84-1410.

The following rules are established for audience members and participants at a Council meeting:

(1) Any person wishing to address the Council shall first state their name and address.
(2) Public comments are for non-agenda items only.
(3) Remarks shall be limited to five (5) minutes.

Lancaster County Sheriff's Office - Waverly - October 2023



Lancaster County Sheriff's Office - Waverly - October 2023

LOCATION	CASE	INC	INC_ABBR	DATE	TREC	DEPNAME
14251 PARIS ST	C3007805	3111	ACC PROP DMG	10/15/2023	1409	22178 BROWNELL
N 148TH ST & US HIGHWAY 6	C3007956	3111	ACC PROP DMG	10/20/2023	1653	22197 MCMANUS
14240 OLDFIELD ST	C3008045	3111	ACC PROP DMG	10/24/2023	755	22217 CALDWELL
13401 AMBERLY RD	C3008063	3111	ACC PROP DMG	10/24/2023	1836	22178 BROWNELL
CANONGATE RD & JAMESTOWN ST	C3008155	3111	ACC PROP DMG	10/27/2023	2141	22197 MCMANUS
US HIGHWAY 6 & AMBERLY RD	C3007479	3211	ACC INJURY	10/3/2023	818	22122 WICHT
10111 N 152ND ST	C3008050	4111	ALARM RESIDENTIAL	10/24/2023	1101	22217 CALDWELL
13351 DOVERS ST	C3007494	4222	ALARM COMMERCIAL	10/3/2023	1925	22178 BROWNELL
13901 GUILDFORD ST	C3008007	4222	ALARM COMMERCIAL	10/22/2023	2119	22178 BROWNELL
12851 DOVERS ST	C3008042	4444	ALARM FALSE	10/24/2023	425	22162 SCHNIEDER
9920 DEER PARK RD	C3008211	4444	ALARM FALSE	10/30/2023	513	22162 SCHNIEDER
14120 GUILDFORD ST	C3008012	5100	ASSAULT DOMESTIC	10/23/2023	34	22179 HICKS
13920 KENILWORTH ST	C3007468	9000	CHILD AB/NEG OTHER	10/2/2023	1622	22178 BROWNELL
14020 LANCASHIRE ST	C3007638	9500	CHILD AB/NEG PHYS	10/9/2023	1025	22172 BUCHHEISTER
11041 N 137TH ST	C3007866	11200	DEATH NATURAL	10/17/2023	1353	22122 WICHT
13401 AMBERLY RD	C3007465	12000	DISTURBANCE OTHER	10/2/2023	1523	22178 BROWNELL
13720 GUILDFORD ST	C3007470	12000	DISTURBANCE OTHER	10/2/2023	1723	22178 BROWNELL
N 140TH ST & DOVER ST	C3007517	12000	DISTURBANCE OTHER	10/4/2023	1539	22178 BROWNELL
13401 AMBERLY RD	C3007751	12000	DISTURBANCE OTHER	10/13/2023	1513	22172 BUCHHEISTER
10640 N 138TH ST	C3007777	12000	DISTURBANCE OTHER	10/14/2023	1218	22216 ANSHASI
10640 N 138TH ST	C3007933	12000	DISTURBANCE OTHER	10/19/2023	1725	22197 MCMANUS
14020 LANCASHIRE ST	C3008030	12000	DISTURBANCE OTHER	10/23/2023	1549	22178 BROWNELL
13401 AMBERLY RD	C3007486	23400	THEFT FROM BUILDING	10/3/2023	1327	22172 BUCHHEISTER
13401 AMBERLY RD	C3007665	23400	THEFT FROM BUILDING	10/10/2023	1632	22172 BUCHHEISTER
13401 AMBERLY RD	C3007666	23400	THEFT FROM BUILDING	10/10/2023	1632	22172 BUCHHEISTER
10720 N 136TH ST	C3007711	24000	MISC OTHER	10/12/2023	1247	22216 ANSHASI
14020 LANCASHIRE ST	C3007740	24000	MISC OTHER	10/13/2023	733	22122 WICHT
CANONGATE RD & US HIGHWAY 6	C3007755	24000	MISC OTHER	10/13/2023	1920	22215 SAWTELLE
9911 DEER PARK RD	C3007841	24000	MISC OTHER	10/16/2023	2054	22155 BUTTERS
N 141ST ST & US HIGHWAY 6	C3007655	27111	NARCOTICS POSSESS	10/10/2023	125	22162 SCHNIEDER
11200 N 148TH ST	C3007546	31222	OPS OTHER	10/5/2023	1619	22193 LAVENE
11661 N 141ST ST	C3007528	35222	SUSPICIOUS PERSON	10/4/2023	2257	22137 BRADY
13821 GUILDFORD ST	C3008054	35222	SUSPICIOUS PERSON	10/24/2023	1415	22155 BUTTERS
10380 HOLLEY DR	C3008060	35222	SUSPICIOUS PERSON	10/24/2023	1735	22178 BROWNELL
13901 GUILDFORD ST	C3007708	35333	SUSPICIOUS VEHICLE	10/12/2023	1202	22187 LATHROP
11120 N 141ST ST	C3008025	35333	SUSPICIOUS VEHICLE	10/23/2023	1442	22147 STURDY
13401 AMBERLY RD	C3008253	35666	THREAT MANAGEMENT	10/31/2023	1500	22172 BUCHHEISTER
I-80 & MM 413	C3007688	40222	SPEC SVC CHECK WELF	10/11/2023	1926	22197 MCMANUS
10111 N 152ND ST	C3007705	40222	SPEC SVC CHECK WELF	10/12/2023	1021	22122 WICHT
13920 KENILWORTH ST	C3007878	40222	SPEC SVC CHECK WELF	10/18/2023	110	22162 SCHNIEDER
N 141ST ST & OLDFIELD ST SWC	C3007501	40333	SPEC SVC OTHER	10/3/2023	2134	22178 BROWNELL
12575 N 148TH ST	C3008087	40333	SPEC SVC OTHER	10/25/2023	2145	22178 BROWNELL
13401 AMBERLY RD	C3007700	42000	CRIMINAL MISCHEIF	10/12/2023	848	22172 BUCHHEISTER
13401 AMBERLY RD	C3007700	42000	CRIMINAL MISCHEIF	10/12/2023	848	22172 BUCHHEISTER
13401 AMBERLY RD	C3007707	42000	CRIMINAL MISCHIEF	10/12/2023	1136	22172 BUCHHEISTER

10731 ASHBY CIR	C3007808	54111	PROP LOST/STOLEN	10/15/2023	1754	22178 BROWNELL
11041 N 137TH ST	C3007492	56000	MEDICAL EMERG OTHER	10/3/2023	1554	22178 BROWNELL
13401 AMBERLY RD	C3007511	56000	MEDICAL EMERG OTHER	10/4/2023	936	22172 BUCHHEISTER
9831 N 145TH ST	C3007514	56000	MEDICAL EMERG OTHER	10/4/2023	1508	22178 BROWNELL
12851 DOVERS ST	C3007531	56000	MEDICAL EMERG OTHER	10/5/2023	839	22122 WICHT
11041 N 137TH ST	C3007810	56000	MEDICAL EMERG OTHER	10/15/2023	1829	22178 BROWNELL
14621 JAMESTOWN ST	C3007877	56000	MEDICAL EMERG OTHER	10/17/2023	2358	22178 BROWNELL
11041 N 137TH ST	C3007944	56000	MEDICAL EMERG OTHER	10/19/2023	2307	22197 MCMANUS
14540 JAMESTOWN ST	C3007998	56000	MEDICAL EMERG OTHER	10/22/2023	1005	22137 BRADY
13801 AMBERLY RD	C3008031	56000	MEDICAL EMERG OTHER	10/23/2023	1614	22178 BROWNELL
14540 JAMESTOWN ST	C3008135	56000	MEDICAL EMERG OTHER	10/27/2023	1036	22217 CALDWELL
14341 HIGHWAY 6	C3008148	56000	MEDICAL EMERG OTHER	10/27/2023	1555	22197 MCMANUS
11520 N 142ND ST	C3007623	56466	MENTAL INVEST	10/8/2023	2139	22188 BONK
13941 HIGHWAY 6	C3008064	70111	WARRANT	10/24/2023	2022	22155 BUTTERS
N 143RD ST & JAMESTOWN ST	C3007490	82000	TRAFFIC PARK OTHER	10/3/2023	1435	22122 WICHT
10960 N 144TH ST	C3007716	82000	TRAFFIC PARK OTHER	10/12/2023	1523	22122 WICHT
N 142ND ST & RED GAUNTLET ST	C3007883	82000	TRAFFIC PARK OTHER	10/18/2023	959	22217 CALDWELL
14321 QUENTIN ST	C3007919	82000	TRAFFIC PARK OTHER	10/19/2023	630	22217 CALDWELL
CASTLEWOOD ST & DANVERS ST	C3008100	82000	TRAFFIC PARK OTHER	10/26/2023	1100	22217 CALDWELL
US HIGHWAY 6 & N 141ST ST	C3007523	94000	TRAFFIC OTHER	10/4/2023	1957	22178 BROWNELL
13401 AMBERLY RD	C3007667	94000	TRAFFIC OTHER	10/10/2023	1633	22172 BUCHHEISTER
AMBERLY RD & CANONGATE RD	C3007671	94000	TRAFFIC OTHER	10/10/2023	1934	22178 BROWNELL
13821 GUILDFORD ST	C3007689	94000	TRAFFIC OTHER	10/11/2023	1957	22197 MCMANUS
11661 N 141ST ST	C3007983	94000	TRAFFIC OTHER	10/21/2023	2108	22197 MCMANUS
11661 N 141ST ST	C3007984	94000	TRAFFIC OTHER	10/21/2023	2216	22197 MCMANUS
I-80 & MM 412	C3007611	94555	TRAFFIC SUSP DRIVER	10/8/2023	1402	22176 SARNES
CANONGATE RD & US HIGHWAY 6 ST	C3007622	94555	TRAFFIC SUSP DRIVER	10/8/2023	1923	22178 BROWNELL
I-80 & N 148TH ST	C3007735	94555	TRAFFIC SUSP DRIVER	10/13/2023	247	22205 CASTANEDA
N 141ST ST & US HIGHWAY 6 ST	C3007789	94555	TRAFFIC SUSP DRIVER	10/14/2023	2243	22205 CASTANEDA
N 130TH ST & US HIGHWAY 6	C3007940	94555	TRAFFIC SUSP DRIVER	10/19/2023	2116	22197 MCMANUS

MINUTES OF A WAVERLY CITY COUNCIL MEETING HELD ON OCTOBER 24, 2023

CALL TO ORDER
Mayor Bill Gerdes called the meeting to order at 6:00 p.m. and led those in attendance in reciting the Pledge of Allegiance. Gerdes acknowledged the Open Meetings Act Poster located on the south wall of the Council Chambers. Mayor Bill Gerdes and Council Members Abbey Pascoe, Dave Nielson, Aaron Hummel, and David Jespersen were in attendance. Other City Officials present were City Administrator Stephanie Fisher, Deputy City Attorney Sarah Meier, City Clerk Megan Frye, and Public Works Director Tracey Whyman. Others present were Don Busch, Courtney Morehead, Cole Stark, Fire Chief Jared Rains, Emergency Services Coordinator Robin Hoffman, Lancaster County Deputy Sheriff Jason Brownell, The Waverly News reporter Sam Crisler, and Jones Group representatives Brad Sloup and Mandy Craig. Notice of the Meeting and Agenda were given to the Mayor and all Members of the City Council prior to the Meeting. Notice of the Meeting was posted at Russ's Market Express, the US Post Office, the City Office, and the City website (citywaverly.com).

ADOPTION OF AGENDA
Council Member Pascoe moved to adopt the agenda as presented. Council Member Nielson seconded the motion.
The following Council Members voted "YEA": Pascoe, Nielson, Hummel, and Jespersen. The following Council Members voted "NAY": None. Motion carried. 4-0

CONSENT AGENDA
Minutes of the October 10, 2023 City Council Meeting.
Consideration of Resolution 23-24 regarding deposit of municipal funds for the 2023-2024 fiscal year.
Consideration of Resolution 23-25 authorizing the sale of municipal property.

Council Member Pascoe moved to approve the Consent Agenda as presented. Council Member Nielson seconded the motion.
The following Council Members voted "YEA": Nielson, Hummel, Jespersen, and Pascoe. The following Council Members voted "NAY": None. Motion carried. 4-0.

PROCLAMATIONS AND PRESENTATIONS
None.

PUBLIC HEARINGS
None.

SHERIFF'S REPORT
Deputy Brownell advised there is a huge influx of auto thefts during the winter months and advised of a recall of Honda and Kia vehicles due to theft risks.

PUBLIC COMMENTS
None.

APPROVAL OF MINUTES
Consent Agenda.

CONSIDERATION OF CLAIMS AND FINANCIAL REPORTS
Claims for Payment

Claims for Payment: October 11th-24th, 2023
Group A

Vendor	Description	Amount
ADP Fees	Payroll Fees	$ 197.20
ADP Payroll	Payroll	$ 33,658.16
Alpine Construction	Demolition of old pool	$ 2,438.60
Bauer Built	Ambulance & Truck 21 maintenance	$ 441.37
Blue Cross Blue Shield NE	Health Insurance	$ 13,086.29
Cubby's, Inc.	Fuel	$ 2,056.95
Dearborn National	Life & AD&D Insurance	$ 89.50
Delta Dental of Nebraska	Dental Insurance	$ 672.71
ESO Solutions	Firehouse Software	$ 2,720.90
Glasco UV LLC	UV lamps & quartz dome	$ 5,943.91
gWorks	FrontDesk Annual License Fee	$ 11,213.00
Harris Decals	Flag football super bowl signs	$ 66.50
Harrison Smith	Flag football referee	$ 920.00
Hawkins, Inc.	Supplies	$ 2,719.10
Hometown Leasing	FD Copier	$ 71.48
JEO Consulting, Group, Inc.	Water Main Construction Services, On-Call GIS, Firestation/City Hall Concept	$ 4,160.00
John Deere Financial	Bulk oil	$ 1,234.15
John Hancock USA	Retirement	$ 3,068.04
Kriha Fluid Power Co.	Hose assy w/fittings, coupler assembly	$ 436.93
Lancaster Co Sheriff Office	October 2023	$ 35,186.00
Landon Patel	Flag football referee	$ 920.00
LARM	2023-2024 Insurance, Water Dept. Building/Contents	$ 106,598.22
Lincoln Electric System	Electricity	$ 13,711.07
Logan Contractors Supply, Inc.	Crack sealant	$ 11,085.00
Menards-Lincoln North	Supplies	$ 34.86
Nadia Koval	Cleaning Service	$ 399.30
Nebraska Dept of Revenue	Lottery Tax	$ 12,733.00
Nebraska Dept of Environment & Energy	Water Operator License fee & course fee	$ 108.75
NE Public Health Environ. Lab	Lab fees	$ 1,052.00
NPZA	2023 NPZA Spring Workshop	$ 100.00
Quick Med Claims	September 2023 Billing-EMS	$ 371.68
Railroad Management CO.III,LLC	10" Water Pipeline Fee, 12" & 12.75" Sewer Pipeline Fee	$ 1,137.42
Range Landscaping	Aeration & spot over seed, repair low spot soccer field	$ 2,440.00
Ray Estes	Water class meal reimbursement	$ 71.94
Reece Bader	Flag football referee	$ 740.00
Rembolt Ludtke LLP	Legal Fees	$ 3,900.00
Ryan Murrell	Flag football referee	$ 890.00
S & L Trenching LLC	Water service leak- N 135 / Guildford	$ 3,170.00
Sunbelt Rentals, Inc.	Lift Rental	$ 253.75
Toys For Trucks	Remove/install top & slide 61	$ 345.00
Travelers - RMD	FD Workers Compensation Plan	$ 1,389.00
U.S. Postmaster	Stamps/Postage	$ 302.60
Union Bank & Trust Co.	HSA Accounts	$ 2,750.00

USA Blue Book	Supplies	$ 102.17
Verizon Wireless	Phone Service	$ 359.70
Windstream	Phone Service-Fire	$ 258.16
Windstream	Phone Service	$ 940.36
Woodstock Holdings LLC	Refund-Permit 22-035	$ 3,150.00
	Claims Group A Total	**$ 289,694.77**

Council Member Pascoe moved to approve Group A claims for payment in the amount of $289,694.77. Council Member Nielson seconded the motion.
The following Council Members voted "YEA" Hummel, Jespersen, Pascoe, and Nielson. The following Council Members voted "NAY": None. Motion carried. 4-0.

Keno and Sales Tax Reports
Keno and Sales Tax Reports provided for information.

INTRODUCTION OF RESOLUTIONS
Consideration of Resolution 23-23, an Interlocal Agreement with the City of Lincoln, NE on behalf of Lincoln-Lancaster County Health Department and the City of Waverly for the purpose of providing health regulation inspection and enforcement within the corporate limits of the City of Waverly and its extra-territorial jurisdiction (ETJ).
Council Member Hummel moved to approve Resolution 23-23, an Interlocal Agreement with the City of Lincoln, NE on behalf of Lincoln-Lancaster County Health Department and the City of Waverly for the purpose of providing health regulation inspection and enforcement within the corporate limits of the City of Waverly and its extra-territorial jurisdiction (ETJ). Council Member Pascoe seconded the motion.
The following Council Members voted "YEA" Jespersen, Pascoe, Nielson, and Hummel. The following Council Members voted "NAY": None. Motion carried. 4-0.

Consideration of Resolution 23-26 authorizing the temporary closing of Oldfield Street from Canongate Road to N 141st Street and Woodstock Street from N 144th Street to N 148th Street for the 2023 Hen Hustle Fun Run.
Council Member Hummel moved to approve Resolution 23-26 authorizing the temporary closing of Oldfield Street from Canongate Road to N 141st Street and Woodstock Street from N 144th Street to N 148th Street for the 2023 Hen Hustle Fun Run. Council Member Pascoe seconded the motion.
Courtney Moorhead stated the Community Fun Run brought in $1,600 the first year, $2,600 the second year, and hopefully will continue growing. Moorehead stated there are 29 deserving families needing funding in the district and it costs over $7,000 to feed those families throughout the year. The Wave donated the space, and local bakeries donated the prizes. There were 96 runners last year and we will have volunteers out helping assist with traffic control in safety gear.
The following Council Members voted "YEA" Pascoe, Nielson, Hummel, and Jespersen. The following Council Members voted "NAY": None. Motion carried. 4-0.

INTRODUCTION OF ORDINANCES
Consideration of the first reading of Ordinance 23-16, an ordinance to adopt the standards and regulations of Lincoln-Lancaster County Health Department regarding on-site wastewater treatment systems, solid waste, property transfers, and air pollution control, in order to meet the requirements for an interlocal agreement with the Lincoln-Lancaster County Health Department, for the purpose of providing health regulation inspection and enforcement within the corporate limits of the City of Waverly, NE and its extra-territorial jurisdiction (ETJ).
Council Member Pascoe moved to approve the first reading of Ordinance 23-16, an ordinance to adopt the standards and regulations of Lincoln-Lancaster County Health Department regarding on-site

wastewater treatment systems, solid waste, property transfers, and air pollution control, in order to meet the requirements for an interlocal agreement with the Lincoln-Lancaster County Health Department, for the purpose of providing health regulation inspection and enforcement within the corporate limits of the City of Waverly, NE and its extra-territorial jurisdiction (ETJ). Council Member Nielson seconded the motion.

Council Member Pascoe moved to suspend the rules and waive the requirement of three readings and move to third and final reading of Ordinance 23-16. Council Member Nielson seconded the motion. On motion to suspend the rules and waive the requirement for three readings of Ordinance 23-16, the following Council Members voted "YEA": Nielson, Hummel, Jespersen, and Pascoe. The following Council Members voted "NAY": None. Motion carried. 4-0.

Vote to pass on third and final reading of Ordinance 23-16, an ordinance to adopt the standards and regulations of Lincoln-Lancaster County Health Department regarding on-site wastewater treatment systems, solid waste, property transfers, and air pollution control, in order to meet the requirements for an interlocal agreement with the Lincoln-Lancaster County Health Department, for the purpose of providing health regulation inspection and enforcement within the corporate limits of the City of Waverly, NE and its extra-territorial jurisdiction (ETJ), the following Council Members voted "YEA": Hummel, Jespersen, Pascoe, and Nielson. The following Council Members voted "NAY": None. Motion carried. 4-0.

INTRODUCTION OF BUSINESS AND COMMUNICATIONS

Consideration of approving agent for the Fire Department property, life, and workman's compensation insurance policies and to authorize the mayor to execute all necessary documents on behalf of the City.

Council Member Pascoe moved to approve an agent for the Fire Department property, life, and workman's compensation insurance policies and to authorize the mayor to execute all necessary documents on behalf of the City. Council Member Nielson seconded the motion.

Jones Group Insurance/Financial Services representatives Mandy Craig and Brad Sloup went over in detail the presented policy on behalf of Waverly Fire/Rescue and advised of any noticeable changes and costs. Craig explained the Fire Pack is the Cadillac of what is available for Fire Department insurance coverage. Craig advised we did comparison sheet based on the summary provided and we are fairly close as far as limits and property values. Craig advised the current value on the Fire Department building was at $700,000 but we bumped it to $2.5 million. Craig shared the perks of the program including a homeowner's deductible reimbursement of up to $1,000 for volunteers, so when they are out on a call and their home or vehicle suffers a loss, Continental Group picks up the cost of their deductible. Another great perk we hope you never have to use is the line of duty reimbursement for line-of-duty death and there's a reimbursement to the department up to $10,000 to the surviving family. Also, an auto deductible reimbursement that takes care of volunteers' automobiles on the way to a call with deductibles up to $500 for hail or hitting a deer. There is an auto med pay for such instances as the parade or open house where there are kids climbing in apparatuses and someone falls, auto med pay is there to pick that up and I strongly recommend keep that on there. For fire apparatus, the NFPA changed the requirements, so if a piece of the vehicle is damaged and there are new compliance guidelines, we have to get you into fully compliant equipment.

Brad Sloup stated I like to work with the fire chiefs to determine values of aerials, tankers, squads, etc., and set that amount. I felt they were fairly close, but I always encourage you to take a look yearly and make adjustments if needed, as well as with the inventory and have an idea what assets are. City Administrator Fisher commented this is the same as the City where we have an annual review. Craig stated hopefully the vehicle market calms down because we are currently already 2-3 years out for a new

vehicle. Sloup provided an example of an engine totaled, and they received a check for $250,000 and the actual cost was $800,000.

Craig encouraged department members to take advantage of the free online training through Vector Solutions/Target Solutions online training portal and is included in the packet. It is cap c certified and approved in the State of Nebraska EMS training.

Craig advised the commandeered property claim has no deductible and up to $1 million claim. Current policy has rented and leased equipment but has a deductible. Personal property of others up to $100,000 with no deductible to cover the loss of personal property such as cell phone, hearing aids, glasses, etc.

Craig advised there are no changes to the workman's comp policy through Travelers and will keep it there but take of the policy on your behalf as an agent of record letter moving policy to current carrier.

City Administrator Fisher stated our current policy renewal date is November 1. Hoffman stated we made phone calls to other insurance providers, including LARM which was higher, and Public Risk Management, who doesn't have Fire Department coverage. Fire Department insurance coverage is a niche and is specialized. Council Member Jespersen asked if we need to do an RFP and Deputy City Attorney Sarah Meier stated that is not needed, only for construction. Jespersen requested the City put out to bid for fire department insurance next August or September.

Hummel pointed out a few necessary discrepancies and Craig pointed out how they are covered, in a different way that is written in the current policy. Council Members noted the new policy would be a cost savings for the City.

Emergency Services Coordinator stated I discovered the building was undervalued and met with the current carrier, going through accident with the ambulance. Customer service is lacking as well as coverage, including adjusters behind the scenes. Mayor Gerdes and Fire Chief Rains agreed customer service has not been good. Hoffman stated with this new policy, we will save money, receive good customer service, and I feel good about this.

Brad Sloup shared his background in Fire, EMS and law enforcement and stressed their commitment to providing exceptional customer service to clients 24/7. Sloup stated I will make sure things are handled and make an effort to come here and personally take a look at it. Craig added we are happy to handle your policy personally and advised of the Ashland office. Sloup stated this is about customer service.

Craig advised a cancer policy came by legislation, which is an optional coverage through Nebraska State Volunteer Firefighters Association. Craig stated I am the administrator of this program also and covers cancers known to have been caused by fire. Craig stated we haven't had anyone sign up but may be due to the fact it is not inexpensive. Sloup stated some departments might not be able to afford it. Craig stated the cancer policy is a nice recruitment perk and retention tool.

Pascoe asked for clarification on the $50,000 cyber policy coverage and remarked that won't begin to cover. Craig stated the Fire Department information in itself disappears and nothing is stored. Your biggest exposure is beneficiary forms and members information. Fisher stated the Fire Department is on the City network and firewalls through LARM and should overlap. Pascoe stated public sectors are the biggest target for cyber-attacks and we need to be covered.

The following Council Members voted "YEA": Jespersen, Pascoe, Nielson, and Hummel. The following Council Members voted "NAY": None. Motion carried. 4-0.

Discussion of Water Emergency status and update.
Public Works Director Tracey Whyman provided information on the pumping levels of all 7 wells for 2023 and the level of how close water levels get to the shut off level. Whyman went over the static levels when the wells are off, and advised those levels show how far you need to dig to hit water. Whyman stated current pumping and static water levels have reached where the wells were at in May and April. Whyman went over the daily use in gallons so far in 2023 and advised average usage hovered around 400,000 gallons per day until the beginning of watering season in March, when water usage increased by 60% more on some days, with the peak of 1.6 million gallons in June. Whyman stated after water restrictions were enforced, water usage peaked over the weekends as expected, with a few exceptions, but people have mostly been following the rules for the past 11 weeks. Current pumping levels are dropping off to around 400,000 gallons per day with the last two weeks from October 9-23 average of 484,000, with Saturday, October 21 peaking at 644,000 gallons. Whyman advised of a usage spike of 1.2 million gallons on October 2 when it was 95 degrees. Whyman stated water levels are starting to recover and let's hope they continue to do so over the winter, but we still need moisture.

Council Member Pascoe thanked Whyman for his efforts gathering data and giving presentations. Council Member Jespersen stated it looks like we would need significant precipitation to even come close to rebounding. City Administrator Fisher stated even though we've had less than two inches of rain in two months, we are actually still making gains. Council Member Hummel added the rainfall takes years to saturate down so when it rains, we hope people don't water as much. Hummel stated every time it rains, people think the aquifer filled up, but it doesn't work that fast. Council Member Nielson agreed.

Wyman stated we've been in a 4 year drought cycle for precipitation. Whyman recalled in 2016 when we had major rainfall and it rained every single day, Well 4 static level was at 6 feet and it didn't take long for the levels to come up so they CAN come up. Whyman stated I went to a water conference in Omaha and learned that Metropolitan Utilities District (MUD) is shutting half of their system down from 140 million gallons to 70 million gallons because the watering season is stopping in the Omaha Metro so that water is being reserved. Whyman stated the City of Lincoln is doing the same and just like Waverly, their flows have come down. Whyman stated the pivots aren't running anymore, which helps tremendously because there's a lot of pivots throughout eastern Nebraska pulling the same water we are. We are trending downward because everyone has stopped pumping so much compared to where we were in the middle of summer. Whyman said we still need the moisture and historically in the last three years, we are down. City Administrator Fisher added the static levels in other communities are also suffering the same as Waverly.

Whyman stated I talked to MUD about their Platte River Plant over by Gretna. They have 44 wells and I asked them if their static levels have dropped significantly, and they said they have dropped about 10 feet which is record levels since they build the plant 15 years ago—even with the well sitting right next to the Platte River and Elkhorn River. Whyman stated we've met with the City of Lincoln once and they were about two days away from having a Press Conference for water restrictions, but they canceled because it rained and the river flows came up a little bit. If you look at the Drought Monitor Map, most of eastern Nebraska is still in a drought and it gets even worse out by York—it's affecting us all.

Council Member Pascoe asked for a status update with the water study and the triggers and Mayor Gerdes advised we should have more information by November 7 so we can review and share and tentatively have information on the November 14 City Council meeting. Fisher agreed, stating at the last City Council meeting, we approved the hydrogeology work, and the hydrogeologists are looking at that and if everything comes back as they would expect, they should have something to us by November 7 so we can review and share, see if that's where we need to go. If there's hydrogeology information that needs to be looked at further, then we are going to have to come back at that point but it is our goal to have everything ready to present at the Council Meeting on November 14.

Council Member Hummel asked for the number of water violations and Gerdes answered 79. Fisher advised two notices today were from builders that installed sod and were watering to keep it from dying. Fisher stated the challenge is we are getting a lot of calls from builders and developers that it's part of their contract with the house to install sod to close on the house. They've waited a long time to install sod, but they need to close on the house. Fisher shared an instance where the bank advised the builder to install sod and the builder said it's going to die because we can't water it, and the bank said you must install sod, so they installed sod and it died. Gerdes advised we have to tell them they can install the sod but here's when you can water and they are at risk for getting their water disconnected if they water outside of the watering schedule. Pascoe asked if the sod installation of new homes is going to be part of the trigger conversation next meeting and Hummel asked if new hookups will also be included. Mayor Gerdes advised we first need to see what the triggers are. Fisher stated the triggers are in the Municipal Code 51.37 so we have an opportunity if we want to rewrite the whole 51.37 or review the triggers—each of which carry a separate consequence—and review each trigger and consequence. Mayor Gerdes advised they can give us the new triggers for the next meeting but then the ordinances will have to be changed if that's what the Council chooses.

Council Members discussed the current issue of new-build homes waiting on sod placement due to the water restrictions. Pascoe stated 51.37 does not have anything regarding new sod to close a house and there is unfortunately nothing we can do today, but this is a problem. Gerdes stated they were told beforehand and knew of the risks. Hummel stated if they get the building permit prior to water restrictions, then that should be built into this new regulation. Gerdes stated when the water emergency began, after that date they were told you can build a house, but you can't have a water tap until we get out of the water emergency. Some of them have chosen to go ahead and build a house. Now the house is built, and they want a water tap but they can't have a water tap but that was the builders choice. Pascoe asked why we have issued building permits since June 3 and Gerdes responded, there is no reason why we shouldn't. Gerdes stated they are gambling by hoping we come out of the water emergency before the house is done and they lost on the gamble. Jespersen advised even on losing on the gamble, this way the house is ready to sell the day after the emergency. Fisher stated the hard part is you have people who want to build a house in Waverly and have entered into a contract with the builder but are now sitting there without a house and I'll say it makes our job very difficult to be issuing building permits. Gerdes added it makes the job hard to answer all the phone calls, but it is what it is. Jespersen suggested the City could start gathering ideas and garner policies from like cities, such as Ashland, Raymond, Hickman and mentioned Bennett's policy regarding sod where they allow two weeks of watering for new build. Hummel stated that's what they are doing for this study and will share best practices.

Hummel asked for a status update on the proactive side of the water emergency and Whyman said we had one meeting with the City of Lincoln six weeks ago to share ideas. City of Lincoln Water Distribution & Production Superintendent Steve Owen mentioned—without engineering or anything—we would have to hook onto the distribution system on N 84th Street, in which we would have to run about seven miles of pipe. Pascoe mentioned the cost. Whyman stated that was only one meeting, but they did ask us several engineering detailed questions via email, which I have been replying to. Whyman stated another thing we are doing is having Olsson work on the trigger analysis that they've been in for about 5 weeks and the hydrogeologic study just started last week. That's about where we're at right now. Another idea that could be implemented is to do an additional study to find additional water closer to another well field. We are obviously going to need our wells running next year because we're not going to hook up to Lincoln next year and we won't have a new well field—we won't have any of these by next year.

Whyman stated we will hopefully have Well 7 back and running, which is under contract, so hopefully have that by June or July. Mayor Gerdes asked how deep Well 7 will be and Whyman estimated 185 feet to the bottom of the well but would have to double-check that number. Cole Stark questioned the urgency

to fix Well 7 since we have a water problem, not a delivery problem and it's pumping out of the same source. Hummel answered we have half our wells run one day and the other half the next day. There are some redundancies put in place and we've got a loop that goes around and some of that infrastructure stuff was put in place many, many years ago. Pascoe stated Well 7 was supposed to be done last year, but there were some delay issues. Hummel added we are not digging a new well, we are just replacing one we had. Whyman stated Well 7 was built in 1986 and in 2000 the 16-inch casing developed holes in it so it was sleeved with a 12-inch casing and in 2021 that 12-inch casing failed. When you reduce the casing size, you also reduce the flow that is pulled out of the well. Now, we are going to drill a new well, which is about 20 feet from the old well and it will have a new 16-inch diameter casing so it will probably be able to pump 550-600 gallons per minute. We're not really replacing anything but it's something that we already had. Whyman stated Well 6 is in that same situation—they were built at the same time—it's casing also built in the year 2000 and it was re-sleeved, and it has a 12-inch casing, and it was brought from 155 feet to 130 feet pumping level back in 2000 so Well 6 has a lot more water in it than it shows.

COMMITTEE REPORTS

Human Services (Park & Recreation) Council Member Hummel

Council Member Hummel reported the new assistant, Cade, has been busy hauling off tree limbs in Wayne Park and working on some of the final grading for the old pool, which has all been filled in so it's a nice level surface over there. All the soccer and flag football games are done for the year. Carrothers have been working on finishing up the punch list on the Aquatic Center. Lawson Field 1 bleachers should be delivered mid-November and hopefully installed this year, which are the replacements from the storm damage. They are starting to winterize the restrooms and things like that in the park and at Lawson, getting ready for the cold weather.

Public Works (Utilities & Streets) Council Member Jespersen

Council Member Jespersen reported the crew has finished painting curbs for No Parking zones. Took inventory and priced items in buildings for insurance coverage rates. Moved sludge off the sludge press area to the storage site at the WWTP. Worked on data for the City of Lincoln questions about the water system. They did some grade work N 134th Street and Williams Street. They changed out 8 older water meters in residences. Trimmed the ditch and holding pond at N 144th and Highway 6. Trimmed trees in the cemetery, mowed at the tree dump property and pushed up branches. One of the employees attended a one-day wastewater laboratory training class at Southeast Community College. They are working on snow removal equipment repair and prep this week. They had a couple electrical problems and rust on the F650 dump truck. Moved the rock salt pile to break up large chunks that have developed since last year. Worked on drought data, spreadsheets, and presentations and read through a 300 page Lower Platte NRD drought plan.

Public Health (Fire & Safety) Council Member Nielson

Council Member Nielson reported on October 16, they had a maintenance night and a mutual aid meeting. Last night, there was an SCBA training for the new SCBAs. The gear is more comfortable and there is less strain on their back and waist. Fire Chief Jared Rains added the SCBA training was to help get volunteers used to the new gear we are going to get. Rains stated December 10 is the Santa Express from 3-7pm at The Wave. There will be more information coming out soon about the addition of the parade this year. Rains advised we are still working on details and planning is in full swing and it should be a good time.

Fiscal and Economic Development Council Member Pascoe

Council Member Pascoe reported there is a golf cart decorating contest and parade at WIS this Sunday from 3-4pm. The WIS student council is raising money for new checkers/chess picnic tables at WIS.

City Administrator Fisher
City Administrator Fisher reported we had a meeting with DA Davidson who is the institution the City goes through to do all our recent lending. A representative from the Suburban Fire District, Emergency Services Coordinator Robin Hoffman, Council Member Nielson, and Mayor Gerdes were in attendance. We were coming up with ways to finance a new fire station and coming up with ideas how to we can accomplish that, so we will be sharing those in the future. Hoffman stated we will get it done so stay tuned.

Fisher reported the other day Mayor Gerdes, Zoning Administrator Mike Palm, Public Works Director Tracey Whyman and I had a virtual meeting with Tractor Supply working on easements for the west water and sewer extension and I feel like we had a pretty good meeting. We will continue working with other property owners down the line now that we feel pretty comfortable where we are going to have the west water and sewer extension.

Fisher reported we approved a bid for Well 7 and Olssons facilitated, now we have to approve the contract, and we have to give them the notice to proceed, and then a preconstruction meeting and that will be coming up soon. We discussed the hydrogeology work that Olsson's is doing and that also will be presented at the next Council meeting.

Fisher reported last night at the Planning Commission meeting, they approved a minor subdivision for Matt Warner. It is on the property where Wittrock Sandblasting was and then there's that next parcel—he's subdividing that next parcel, one piece off that's about 5.5 acres and the remaining is 15.5 acres. The 15.5 acres the City will maintain the ownership of the Wastewater Treatment Plant road so I feel comfortable with that situation so the City will always have an easement over that road. Matt Warner is doing a lot of things up there so there will be continued minor/major subdivisions going on up there.

Fisher reported we have received calls from the builders and developers asking about water. There is Halloween trick-or-treating all through town; the VFW from 5-7pm and then all through town. The Waverly Fire/Rescue and Kiwanis will be helping with traffic control. Two employees have completed advanced water training: Ray Estes is now a Grade 3 Water Operator and Chad Hartwick is now a Grade 4 Water Operator. All of our staff had a quarterly safety meeting last Thursday where we discussed workplace violence and harassment and also carbon monoxide awareness. We had several staff and Council Members that attended a virtual workshop for Planning & Zoning and that was very informative. They were supposed to have a section on TIF and that was cancelled, and they are supposed to send us a webinar to watch at a later date. There is a new business coming in at Amberly Crossing called The Mix in the space that was the dentist office. They will have energy smoothies, protein drinks, etc. and they have another in Ashland called The Blend. Council Member Hummel asked if there is an update on the CDA/CRA conversion and Mayor Gerdes advised it will be on the Council Agenda on November 14.

ADJOURNMENT
Council Member Nielson moved to adjourn at 7:44 p.m. Council Member Pascoe seconded the motion. The following Council Members voted "YEA": Pascoe, Nielson, Hummel, and Jespersen. The following Council Members voted "NAY": None. Motion carried. 4-0.

_____ _____

William D. Gerdes, Mayor Megan K. Frye, City Clerk / Deputy Treasurer

Claims for Payment: October 25th - November 14th, 2023

Group A			
Vendor	**Description**	**Amount**	**Date Paid**
Dylan & Rachel Andelt	Utility Deposit Refund	$ 100.00	
Melissa Araiza	Utility Deposit Refund	$ 100.00	
Josh & Shannon Hughes	Utility Deposit Refund	$ 100.00	
Jason & Andrea Kriger	Utility Deposit Refund	$ 100.00	
Josh & Jess Moser	Utility Deposit Refund	$ 100.00	
Andrew & Alison Neujahr	Utility Deposit Refund	$ 100.00	
Audrey Schutte	Utility Deposit Refund	$ 100.00	
September Stone	Utility Deposit Refund	$ 100.00	
ADP FEES	Payroll Fees	$ 121.21	11/10/2023
ADP PAYROLL	Payroll	$ 33,899.95	11/3/2023
ADP PAYROLL	Payroll	$ 33,815.19	11/17/2023
Andrew Toy	Meal reimbursement-water class	$ 17.10	
Barco Municipal Products Inc.	Street sign	$ 176.83	
Black Hills Energy	Natural gas	$ 149.80	
Brainard Heating & Air	Repair thermostat	$ 223.16	
CARQUEST AUTO PARTS	Oil filters, solenoid, parts cleaner, bulbs	$ 188.60	
COLONIAL LIFE	Insurance	$ 43.92	
Cornhusker International Truck	Dump truck	$ 157,187.00	
CUBBY'S, INC.	Fuel	$ 2,205.97	
DATAVIZION, LLC	VizionCare Complete, Microsoft 365, Aruba Foundation Care	$ 1,780.00	
DE Guns Firearms & Service	Lottery/Raffle Prizes	$ 2,179.97	
DEARBORN NATIONAL	Life & AD&D Insurance	$ 116.35	
EAKES OFFICE PLUS	FD copier contract billing	$ 36.18	
Fidelity Security Life Insuran	Vision Insurance	$ 139.72	
Frontier	Ruby Fieldmaster	$ 391.95	
HAMILTON EQUIPMENT CO.	Mower belt & cable	$ 363.39	
HORIZON BANK	Monthly ACH Fees	$ 10.00	11/15/2023
JOHN DEERE FINANCIAL	Tube & latch	$ 387.16	
JOHN HANCOCK USA	Retirement	$ 2,948.14	11/3/2023
JOHN HANCOCK USA	Retirement	$ 3,061.93	11/17/2023
Kevin LaPage	Install 5 HIM module brackets	$ 270.00	
LANCASTER CO SHERIFF OFFICE	November 2023	$ 35,186.00	
LINCOLN ELECTRIC SYSTEM	Electricity	$ 18,190.02	
MacQueen Emergency	Fire Truck Repair	$ 293.21	
MENARDS-LINCOLN NORTH	Ladders & antifreeze	$ 428.40	
MIDWEST LABORATORIES, INC	Lab fees	$ 54.77	
Mike Palm	Batteries reimbursement	$ 21.99	
NDEE-FISCAL SERVICES	Water Operator License Renewal	$ 115.00	
NEBRASKA DEPT REVENUE WASTE	Utility Sales Tax	$ 9,591.48	11/20/2023
NEBRASKA DEPT REVENUE WASTE	Waste Reduction & Recycling Fee	$ 25.08	11/15/2023
Nebraska Snow Equipment	Snow plow repair	$ 1,172.00	
NEDA	NEDA Annual Membership	$ 150.00	
NSG Logistics LLC	Ice control salt	$ 1,938.33	
OLSSON	Waverly Water Study Update	$ 940.75	
ONE CALL CONCEPTS, INC.	One-Call Service	$ 155.46	
PINNACLE BANK	Food for meeting, candy	$ 265.98	
PINNACLE BANK	Insurance deduct., street signs, railroad crossing kit, fire helmet cameras, medical devices	$ 4,616.54	
Production Creek Specialty Adv	Coed Softball Champ T-Shirts, employee clothing	$ 216.00	
QUIK DUMP REFUSE	Garbage Service	$ 531.52	
REMBOLT LUDTKE LLP	Zoning violation, legal fees	$ 3,740.00	
ROBIN L. HOFFMAN	License & raffle fees	$ 45.00	
ROBIN L. HOFFMAN	Wiper blades	$ 28.88	
Ryan Lawn and Tree	Sprinkler repairs	$ 2,807.00	
S & L TRENCHING LLC	Water repair 13621 Guildford	$ 1,950.00	
SANDRY FIRE SUPPLY	Gloves	$ 170.15	
SCHEMMER ASSOCIATES INC.	Quiet Zone Reaffirmation	$ 500.00	
SMALL ENGINE SPECIALISTS	Chain saw parts	$ 78.20	
S.E.Rural Fire Protection Dist	EMS Calls	$ 1,000.00	
THE VOICE NEWS	Advertising & Printing	$ 363.20	
U. S. POSTMASTER	Stamps/Postage	$ 264.00	
U.S.BANK EQUIPMENT FINANCE	Ricoh Copier	$ 143.95	
Visual Edge IT	Copies	$ 80.57	
WINDSTREAM	Phone Service-Fire	$ 261.50	11/15/2023
WINDSTREAM	Phone Service	$ 939.99	11/15/2023
	Claims Group A Total	**$ 326,778.49**	

William D. Gerdes, Mayor

Cheris Cadwell, City Treasurer/Deputy Clerk

REVENUE & EXPENSE REPORT

CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
10-00-4000	PROPERTY TAXES	4,902.95	4,902.95	776,949.00	772,046.05
10-00-4005	MOTOR VEHICLE TAX	15,245.04	15,245.04	85,000.00	69,754.96
10-00-4010	MOTOR VEHICLE PRO RATE	202.50	202.50	1,000.00	797.50
10-00-4015	PROPERTY TAX CREDIT	.00	.00	.00	.00
10-00-4018	STATE AID	.00	.00	.00	.00
10-00-4020	PROPERTY TAX CREDIT	.00	.00	.00	.00
10-00-4025	M.I.R.F.	.00	.00	.00	.00
10-00-4030	CARLINE	.00	.00	.00	.00
10-00-4032	LEASE REVENUE	500.00	500.00	6,000.00	5,500.00
10-00-4035	FRANCHISE TAX	101,590.30	101,590.30	450,000.00	348,409.70
10-00-4040	IN LIEU OF TAXES	.00	.00	3,000.00	3,000.00
10-00-4050	SALES TAX	.00	.00	.00	.00
10-00-4055	HOMESTEAD EXEMPTION	.00	.00	.00	.00
10-00-4060	INT EARNED ON LOCAL REVENUE	115.56	115.56	5,000.00	4,884.44
10-00-4065	FEES AND PERMITS	.00	.00	.00	.00
10-00-4070	CITY LICENSES	1,336.00	1,336.00	7,500.00	6,164.00
10-00-4071	CITY FINES	.00	.00	.00	.00
10-00-4075	DOG LICENSES	10.00	10.00	2,000.00	1,990.00
10-00-4080	DOG IMPOUNDMENT & BOARD	.00	.00	.00	.00
10-00-4090	OTHER LOCAL REVENUE RECEIPT	.00	.00	.00	.00
10-00-4091	QUIET ZONE	.00	.00	.00	.00
10-00-4095	LABOR & MATERIALS SOLD - GEN.	.00	.00	.00	.00
10-00-4100	EQUIPMENT SOLD	.00	.00	.00	.00
10-00-4105	GRANTS	.00	.00	.00	.00
10-00-4106	DEVELOPER: STREET TREES	.00	.00	.00	.00
10-00-4110	INSURANCE ADJUSTMENTS	.00	.00	.00	.00
10-00-4115	OPERATING CONTRIBUTIONS	.00	.00	.00	.00
10-00-4161	INTEREST-MMA	1,278.84	1,278.84	.00	1,278.84-
10-00-4210	TOWER RENT	3,303.37	3,303.37	41,000.00	37,696.63
10-00-4215	FARM RENT INCOME	5,347.50	5,347.50	27,500.00	22,152.50
10-00-4410	ADJUSTMENT	.00	.00	.00	.00
10-00-4415	AG LAND TAX CREDIT	.00	.00	.00	.00
10-90-4011	TRANSFER FROM CITY SALES TAX	.00	.00	.00	.00
10-90-4012	TRANSFER FROM STREET	.00	.00	.00	.00
10-90-4013	TRANSFER FROM POOL	.00	.00	.00	.00
10-90-4014	TRANSFER FROM PARK	.00	.00	.00	.00
10-90-4016	TRANSFER FROM FIRE/RESCUE	780.00	780.00	.00	780.00-
10-90-4020	TRANSFER FROM WATER	.00	.00	.00	.00
10-90-4021	TRANSFER FROM SEWER	.00	.00	.00	.00
10-90-4023	TRANSFER FROM DEBT SERVIC	.00	.00	.00	.00
10-90-4028	TRANSFER FROM CEMETARY	.00	.00	.00	.00
10-90-4029	TRANSFER FROM LOTTERY	.00	.00	.00	.00
10-90-4030	TRANSFER FROM TIF E	.00	.00	.00	.00
10-90-4031	TRANSFER FROM PAYROLL	.00	.00	.00	.00
10-90-4033	TRANSFER FROM TIF G	.00	.00	.00	.00
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	TOTAL REVENUE	134,612.06	134,612.06	1,404,949.00	1,270,336.94
10-00-5000	REGULAR SALARIES	11,117.26	11,117.26	101,361.00	90,243.74
10-00-5002	SALARIES OVERTIME	.00	.00	.00	.00
10-00-5005	SALARY OF MAYOR & COUNCIL	.00	.00	30,000.00	30,000.00

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
10-00-5006	SALARIES PART TIME/TEMP	.00	.00	5,000.00	5,000.00
10-00-5009	SOCIAL SECURITY	843.99	843.99	10,001.00	9,157.01
10-00-5015	HEALTH INSURANCE	3,339.82	3,339.82	21,000.00	17,660.18
10-00-5019	WORKER'S COMP INSURANCE	1,144.38	1,144.38	1,500.00	355.62
10-00-5020	EMPLOYMENT EXPENSES	482.76	482.76	7,000.00	6,517.24
10-00-5025	UNEMPLOYMENT COMPENSATION	6.84	6.84	2,000.00	1,993.16
10-00-5030	RETIREMENT	611.44	611.44	5,616.00	5,004.56
10-00-5035	CLOTHING	.00	.00	1,500.00	1,500.00
10-00-5040	COUNTY TREAS. & OTHER FEES	228.60	228.60	2,000.00	1,771.40
10-00-5045	CUSTODIAL SERVICE	399.30	399.30	5,000.00	4,600.70
10-00-5050	LEGAL SERVICES	3,900.00	3,900.00	50,000.00	46,100.00
10-00-5055	CONTRACT OR SECURED SERVICE	35,186.00	35,186.00	423,000.00	387,814.00
10-00-5060	OTHER PROF. & TECH SERVICE	19,623.82	19,623.82	90,000.00	70,376.18
10-00-5065	NATURAL GAS	43.37	43.37	2,000.00	1,956.63
10-00-5070	ELECTRICITY	356.76	356.76	3,500.00	3,143.24
10-00-5075	GARBAGE SERVICE	19.28	19.28	500.00	480.72
10-00-5080	RENTALS OR LEASES	.00	.00	500.00	500.00
10-00-5085	POSTAGE	.00	.00	3,000.00	3,000.00
10-00-5090	TELEPHONE	499.35	499.35	7,000.00	6,500.65
10-00-5095	ADVERTISING AND PRINTING	310.86	310.86	5,000.00	4,689.14
10-00-5100	SUPPLIES	64.48	64.48	10,000.00	9,935.52
10-00-5102	OPERATING SUPPLIES	.00	.00	.00	.00
10-00-5105	CONCESSIONS	.00	.00	.00	.00
10-00-5110	FURNITURE AND EQUIPMENT	.00	.00	3,000.00	3,000.00
10-00-5115	LICENSE FEES	.00	.00	5,000.00	5,000.00
10-00-5120	SCHOOL, DUES AND SEMINARS	2,007.25	2,007.25	32,000.00	29,992.75
10-00-5125	SALES TAX	.00	.00	.00	.00
10-00-5130	DOG BOARD AND DISPOSAL	.00	.00	.00	.00
10-00-5135	PROPERTY INSURANCE	13,066.79	13,066.79	16,000.00	2,933.21
10-00-5140	TRAVEL OR MILEAGE	.00	.00	4,000.00	4,000.00
10-00-5145	REPAIR & MAINT. SERVICES	.00	.00	7,000.00	7,000.00
10-00-5149	REFUNDS	.00	.00	.00	.00
10-00-5150	OTHER MISC. OBJECTS	.00	.00	4,000.00	4,000.00
10-00-5155	QUIET ZONE	.00	.00	.00	.00
10-00-5160	DRY DAM	.00	.00	10,000.00	10,000.00
10-00-5170	WATERSHED	.00	.00	.00	.00
10-00-5175	CAPITAL IMPROVEMENTS	.00	.00	.00	.00
10-10-5100	SUPPLIES	.00	.00	.00	.00
10-10-5102	OPERATING SUPPLIES	.00	.00	.00	.00
10-10-5110	FURNITURE AND EQUIPMENT	.00	.00	.00	.00
10-10-5120	SCHOOL, DUES AND SEMINARS	.00	.00	.00	.00
10-10-5140	TRAVEL OR MILEAGE	.00	.00	.00	.00
10-10-5145	REPAIR & MAINT. SERVICES	.00	.00	.00	.00
10-10-5150	OTHER MISC. OBJECTS	.00	.00	.00	.00
10-30-5006	SUB OR TEMP SALARIES	.00	.00	.00	.00
10-30-5009	SOCIAL SECURITY	.00	.00	.00	.00
10-40-5000	REGULAR SALARIES	.00	.00	.00	.00
10-40-5001	PARTTIME SALARIES	.00	.00	.00	.00
10-40-5002	SALARIES PART TIME/TEMP	.00	.00	.00	.00
10-40-5009	SOCIAL SECURITY	.00	.00	.00	.00
10-40-5015	HEALTH INSURANCE	.00	.00	.00	.00

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
10-40-5030	RETIREMENT	.00	.00	.00	.00
10-40-5090	TELEPHONE	.00	.00	.00	.00
10-40-5100	SUPPLIES	.00	.00	.00	.00
10-40-5200	DEPOSIT REFUND	.00	.00	.00	.00
10-50-5000	REGULAR SALARIES	.00	.00	.00	.00
10-50-5009	SOCIAL SECURITY	.00	.00	.00	.00
10-60-5006	SUB OR TEMP SALARIES	.00	.00	.00	.00
10-60-5009	SOCIAL SECURITY	.00	.00	.00	.00
10-90-5011	TRANSFER TO CITY SALES TX	.00	.00	.00	.00
10-90-5012	TRANSFER TO STREET	285,000.00	285,000.00	285,000.00	.00
10-90-5013	TRANSFER TO POOL	.00	.00	.00	.00
10-90-5014	TRANSFER TO PARK	.00	.00	.00	.00
10-90-5016	TRANSFER TO FIRE/RESCUE	153,750.00	153,750.00	153,750.00	.00
10-90-5018	TRANSFER TO FD EQUIPMENT FUND	.00	.00	.00	.00
10-90-5019	TRANSFER TO BUILDING	125,000.00	125,000.00	125,000.00	.00
10-90-5020	TRANSFER TO WATER	.00	.00	.00	.00
10-90-5021	TRANSFER TO SEWER	.00	.00	.00	.00
10-90-5023	TRANSFER TO DEBT SERVICE	.00	.00	.00	.00
10-90-5028	TRANSFER TO CEMETERY	41,000.00	41,000.00	41,000.00	.00
10-90-5029	TRANSFER TO LOTTERY	.00	.00	.00	.00
	TOTAL EXPENSES	698,002.35	698,002.35	1,472,228.00	774,225.65
	GENERAL TOTAL	563,390.29-	563,390.29-	67,279.00-	496,111.29

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
11-00-4052	CITY SALES TAX	76,502.92	76,502.92	570,000.00	493,497.08
11-00-4053	AQUATIC CENTER SALES TAX	.00	.00	.00	.00
11-00-4135	REIMBURSEMENT	.00	.00	.00	.00
11-00-4161	INTEREST-MMA	2,156.72	2,156.72	10,000.00	7,843.28
11-00-4163	INTEREST-CD'S HORIZON	.00	.00	.00	.00
11-90-4010	TRANSFER FROM GENERAL	.00	.00	.00	.00
11-90-4014	TRANSFER FROM PARK	.00	.00	.00	.00
11-90-4033	TRANSFER FROM TIF G	.00	.00	.00	.00
	TOTAL REVENUE	78,659.64	78,659.64	580,000.00	501,340.36
11-00-5174	COMMUNITY IMPROVEMENT	.00	.00	.00	.00
11-00-5175	CAPITAL OUTLAY	.00	.00	762,000.00	762,000.00
11-00-5302	BOND PAYMENTS	.00	.00	.00	.00
11-90-5010	TRANSFER TO GENERAL	.00	.00	.00	.00
11-90-5012	TRANSFER TO STREET	.00	.00	.00	.00
11-90-5014	TRANSFER TO PARK	.00	.00	.00	.00
11-90-5021	TRANSFER TO SEWER	.00	.00	.00	.00
11-90-5033	TRANSFER TO TIF G	.00	.00	.00	.00
	TOTAL EXPENSES	.00	.00	762,000.00	762,000.00
	CITY SALES TAX TOTAL	78,659.64	78,659.64	182,000.00-	260,659.64-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
12-00-4005	MOTOR VEHICLE FEES	9,884.81	9,884.81	25,000.00	15,115.19
12-00-4090	OTHER LOCAL REV RECEIPTS	.00	.00	.00	.00
12-00-4095	LABOR & MATERIALS SOLD-STREETS	.00	.00	.00	.00
12-00-4100	EQUIPMENT SOLD	.00	.00	.00	.00
12-00-4105	GRANTS	.00	.00	236,000.00	236,000.00
12-00-4110	INSURANCE ADJUSTMENTS	.00	.00	.00	.00
12-00-4120	HIGHWAY ALLOCATION	47,944.32	47,944.32	581,001.00	533,056.68
12-00-4125	INCENTIVE PAYMENTS	.00	.00	.00	.00
12-00-4130	SALE BONDS - STREETS	.00	.00	2,000,000.00	2,000,000.00
12-00-4135	REINBURSEMENT/PROJECT FINANCED	.00	.00	.00	.00
12-00-4161	INTEREST-MMA	3,262.72	3,262.72	.00	3,262.72-
12-00-4220	SCRAP SALES	.00	.00	.00	.00
12-00-4405	INFRASTRUCTURE FEE	325.00	325.00	.00	325.00-
12-90-4010	TRANSFER FROM GENERAL	285,000.00	285,000.00	285,000.00	.00
12-90-4011	TRANSFER FROM SALES TAX	.00	.00	.00	.00
12-90-4012	TRANSFER FROM STREET	.00	.00	.00	.00
12-90-4013	TRANSFER FROM POOL	.00	.00	.00	.00
12-90-4014	TRANSFER FROM PARK	.00	.00	.00	.00
12-90-4016	TRANSFER FROM FIRE/RESCUE	.00	.00	.00	.00
12-90-4020	TRANSFER FROM WATER	.00	.00	.00	.00
12-90-4021	TRANSFER FROM SEWER	.00	.00	.00	.00
12-90-4023	TRANSFER FROM DEBT SERVIC	.00	.00	.00	.00
12-90-4028	TRANSFER FROM CEMETARY	.00	.00	.00	.00
12-90-4029	TRANSFER FROM LOTTERY	.00	.00	.00	.00
12-90-4030	TRANSFER FROM TIF	.00	.00	.00	.00
	TOTAL REVENUE	346,416.85	346,416.85	3,127,001.00	2,780,584.15
12-00-5000	REGULAR SALARIES	17,365.23	17,365.23	170,000.00	152,634.77
12-00-5002	SALARIES OVERTIME	387.20	387.20	3,729.00	3,341.80
12-00-5006	SUB OR TEMP SALARIES	1,100.82	1,100.82	12,000.00	10,899.18
12-00-5009	SOCIAL SECURITY	1,403.06	1,403.06	11,975.00	10,571.94
12-00-5015	HEALTH INSURANCE	10,212.68	10,212.68	80,000.00	69,787.32
12-00-5019	WORKER'S COMP INSURANCE	4,241.16	4,241.16	6,000.00	1,758.84
12-00-5030	RETIREMENT	705.49	705.49	7,345.00	6,639.51
12-00-5035	CLOTHING	.00	.00	1,250.00	1,250.00
12-00-5045	CUSTODIAL SERVICES	.00	.00	.00	.00
12-00-5060	PROF&TECH SERVICE/SPECIAL FEES	200.00	200.00	301,000.00	300,800.00
12-00-5065	NATURAL GAS	83.27	83.27	5,000.00	4,916.73
12-00-5070	ELECTRICITY	6,241.73	6,241.73	78,000.00	71,758.27
12-00-5073	GAS AND OIL	2,064.55	2,064.55	14,000.00	11,935.45
12-00-5075	GARBAGE SERVICE	96.39	96.39	1,500.00	1,403.61
12-00-5076	RECYCLING SERVICE	.00	.00	.00	.00
12-00-5080	RENTALS OR LEASES	3,505.75	3,505.75	7,000.00	3,494.25
12-00-5090	TELEPHONE	76.19	76.19	.00	76.19-
12-00-5095	ADVERTISING AND PRINTING	10.50	10.50	1,000.00	989.50
12-00-5100	SUPPLIES-OFFICE/SHOP	217.85	217.85	7,000.00	6,782.15
12-00-5102	SUPPLIES-STREETS	11,085.00	11,085.00	68,000.00	56,915.00
12-00-5120	FURNITURE AND EQUIPMENT	35,326.28	35,326.28	165,500.00	130,173.72
12-00-5121	SCHOOL,DUES, & SEMINARS	.00	.00	.00	.00
12-00-5135	PROPERTY INSURANCE	17,174.44	17,174.44	18,000.00	825.56

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
12-00-5141	SERVICE FEES	.00	.00	.00	.00
12-00-5144	REPAIR & MAINT.SERVICE-BLDG	10.00	10.00	7,500.00	7,490.00
12-00-5145	REPAIR & MAINT. STREETS	.00	.00	85,000.00	85,000.00
12-00-5146	EQUIPMENT MAINTENANCE	436.93	436.93	30,000.00	29,563.07
12-00-5147	VEHICLE MAINTENANCE	200.94	200.94	10,000.00	9,799.06
12-00-5150	OTHER MICS. OBJECTS	.00	.00	.00	.00
12-00-5165	TRAFFIC CONTROL	.00	.00	8,000.00	8,000.00
12-00-5170	STREET CONTRACTS	.00	.00	4,500.00	4,500.00
12-00-5175	CAPITAL IMPROVEMENT-REAL PRPTY	.00	.00	2,000,000.00	2,000,000.00
12-90-5012	TRANSFER TO STREET	.00	.00	.00	.00
12-90-5013	TRANSFER TO POOL	.00	.00	.00	.00
12-90-5014	TRANSFER TO PARK	.00	.00	.00	.00
12-90-5016	TRANSFER TO FIRE/RESCUE	.00	.00	.00	.00
12-90-5020	TRANSFER TO WATER	.00	.00	.00	.00
12-90-5021	TRANSFER TO SEWER	.00	.00	.00	.00
12-90-5023	TRANSFER TO DEBT SERVICE	.00	.00	.00	.00
12-90-5028	TRANSFER TO CEMETERY	.00	.00	.00	.00
12-90-5029	TRANSFER TO LOTTERY	.00	.00	.00	.00
	TOTAL EXPENSES	112,145.46	112,145.46	3,103,299.00	2,991,153.54
	STREET TOTAL	234,271.39	234,271.39	23,702.00	210,569.39-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
13-00-4052	CITY SALES TAX	38,251.40	38,251.40	300,000.00	261,748.60
13-00-4085	CONCESSIONS	.00	.00	.00	.00
13-00-4090	OTHER LOCAL REV RECEIPTS	3,809.00	3,809.00	.00	3,809.00-
13-00-4105	GRANTS	.00	.00	.00	.00
13-00-4130	SALE BONDS - POOL	.00	.00	1,400,000.00	1,400,000.00
13-00-4131	AQUA CENTER BOND PROCEEDS	.00	.00	.00	.00
13-00-4132	2022 MUN IMP BOND PROCEED	.00	.00	.00	.00
13-00-4140	POOL RECEIPTS	.00	.00	60,000.00	60,000.00
13-00-4155	GIFT OR DONATIONS	.00	.00	.00	.00
13-00-4161	INTEREST-MMA	1,955.12	1,955.12	.00	1,955.12-
13-00-4162	INTEREST-NE CLASS	3,018.63	3,018.63	.00	3,018.63-
13-00-4167	INTEREST FSB	6.20	6.20	.00	6.20-
13-00-4185	CONCESSION RECEIPTS	.00	.00	20,000.00	20,000.00
13-90-4010	TRANSFER FROM GENERAL	.00	.00	.00	.00
13-90-4012	TRANSFER FROM STREET	.00	.00	.00	.00
13-90-4014	TRANSFER FROM PARK	.00	.00	.00	.00
13-90-4016	TRANSFER FROM FIRE/RESCUE	.00	.00	.00	.00
13-90-4020	TRANSFER FROM WATER	.00	.00	.00	.00
13-90-4021	TRANSFER FROM SEWER	.00	.00	.00	.00
13-90-4023	TRANSFER FROM DEBT SERVIC	.00	.00	.00	.00
13-90-4028	TRANSFER FROM CEMETARY	.00	.00	.00	.00
13-90-4029	TRANSFER FROM LOTTERY	.00	.00	.00	.00
	TOTAL REVENUE	47,040.35	47,040.35	1,780,000.00	1,732,959.65
13-00-5000	REGULAR SALARIES	3,160.90	3,160.90	32,205.00	29,044.10
13-00-5002	SALARIES PART TIME/TEMP	.00	.00	.00	.00
13-00-5006	SUB OR TEMP SALARIES	59.54	59.54	80,000.00	79,940.46
13-00-5009	SOCIAL SECURITY	245.24	245.24	5,650.00	5,404.76
13-00-5015	HEALTH INSURANCE	854.97	854.97	8,400.00	7,545.03
13-00-5019	WORKER'S COMP INSURANCE	60.02	60.02	600.00	539.98
13-00-5030	RETIREMENT	156.06	156.06	1,582.00	1,425.94
13-00-5035	CLOTHING	.00	.00	4,000.00	4,000.00
13-00-5045	CUSTODIAL SERVICE	.00	.00	.00	.00
13-00-5050	LEGAL SERVICES	.00	.00	.00	.00
13-00-5055	CONTRACTED OR SECURED SERVICES	.00	.00	2,000.00	2,000.00
13-00-5060	OTHER PROF. & TECH SERVICE	.00	.00	4,000.00	4,000.00
13-00-5065	NATURAL GAS	.00	.00	2,000.00	2,000.00
13-00-5070	ELECTRICITY	791.69	791.69	28,000.00	27,208.31
13-00-5075	GARBAGE SERVICE	18.36	18.36	500.00	481.64
13-00-5080	RENTALS OR LEASES	.00	.00	.00	.00
13-00-5090	TELEPHONE	47.02	47.02	1,000.00	952.98
13-00-5095	ADVERTISING AND PRINTING	15.12	15.12	500.00	484.88
13-00-5100	SUPPLIES	.00	.00	25,000.00	25,000.00
13-00-5102	OPERATION SUPPLIES	459.80	459.80	5,000.00	4,540.20
13-00-5105	CONCESSIONS	.00	.00	10,000.00	10,000.00
13-00-5110	FURNITURE AND EQUIPMENT	.00	.00	3,000.00	3,000.00
13-00-5120	SCHOOLS, DUES, & SEMINARS	.00	.00	3,000.00	3,000.00
13-00-5135	PROPERTY INSURANCE	17,316.76	17,316.76	14,000.00	3,316.76-
13-00-5140	TRAVEL OR MILEAGE	.00	.00	.00	.00
13-00-5141	SERVICE FEES	.00	.00	800.00	800.00

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
13-00-5145	REPAIR & MAINT. SERVICES	.00	.00	2,000.00	2,000.00
13-00-5149	REFUNDS	.00	.00	.00	.00
13-00-5150	OTHER MISC. OBJECTS	.00	.00	.00	.00
13-00-5175	CAPITAL IMPROVEMENT-REAL PRPTY	4,188.60	4,188.60	68,000.00	63,811.40
13-00-5176	NEW POOL SUPPLIES	.00	.00	.00	.00
13-00-5333	2021 GO AQUATIC CTN PRINCIPAL	.00	.00	220,000.00	220,000.00
13-00-5334	2021 GO AQUATIC CTR INTEREST	.00	.00	34,982.50	34,982.50
13-00-5351	2022 AQUA IMPR BOND PRINC	.00	.00	1,400,000.00	1,400,000.00
13-00-5352	2022 AQUA IMPROV INTEREST	.00	.00	99,000.00	99,000.00
13-90-5012	TRANSFER TO STREET	.00	.00	.00	.00
13-90-5014	TRANSFER TO PARK	.00	.00	.00	.00
13-90-5016	TRANSFER TO FIRE/RESCUE	.00	.00	.00	.00
13-90-5020	TRANSFER TO WATER	.00	.00	.00	.00
13-90-5021	TRANSFER TO SEWER	.00	.00	.00	.00
13-90-5023	TRANSFER TO DEBT SERVICE	.00	.00	.00	.00
13-90-5028	TRANSFER TO CEMETERY	.00	.00	.00	.00
13-90-5029	TRANSFER TO LOTTERY	.00	.00	.00	.00
	TOTAL EXPENSES	27,374.08	27,374.08	2,055,219.50	2,027,845.42
	POOL TOTAL	19,666.27	19,666.27	275,219.50-	294,885.77-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
14-00-4065	FEES & PERMITS	.00	.00	.00	.00
14-00-4090	OTHER LOCAL REV RECEIPTS	9.79	9.79	.00	9.79-
14-00-4105	GRANTS	.00	.00	.00	.00
14-00-4110	INSURANCE ADJUSTMENTS	.00	.00	.00	.00
14-00-4139	YOUTH FLAG FOOTBAL	.00	.00	5,000.00	5,000.00
14-00-4140	FALL SOCCER RECEIPTS	.00	.00	5,000.00	5,000.00
14-00-4142	SPRING SOCCER RECEIPTS	.00	.00	10,000.00	10,000.00
14-00-4145	BALL RECEIPTS	.00	.00	15,000.00	15,000.00
14-00-4146	BALL FIELD RENTAL	.00	.00	12,000.00	12,000.00
14-00-4147	ADULT SPORTS RECEIPTS	.00	.00	1,000.00	1,000.00
14-00-4155	PARK DONATIONS	1,362.15	1,362.15	20,000.00	18,637.85
14-00-4161	INTEREST-MMA	428.96	428.96	.00	428.96-
14-00-4162	INTEREST-NE CLASS	1,035.53	1,035.53	.00	1,035.53-
14-00-4165	INTEREST EARNED	.00	.00	.00	.00
14-00-4166	INTEREST	.19	.19	.00	.19-
14-00-4405	INFRASTRUCTURE FEE	750.00	750.00	8,000.00	7,250.00
14-00-4420	ADVERTISING REVENUE	.00	.00	3,000.00	3,000.00
14-90-4010	TRANSFER FROM GENERAL	.00	.00	.00	.00
14-90-4011	TRANSFER FROM CITY SALES TAX	.00	.00	.00	.00
14-90-4012	TRANSFER FROM STREET	.00	.00	.00	.00
14-90-4013	TRANSFER FROM POOL	.00	.00	.00	.00
14-90-4014	TRANSFER FROM PARK	.00	.00	.00	.00
14-90-4016	TRANSFER FROM FIRE/RESCUE	.00	.00	.00	.00
14-90-4020	TRANSFER FROM WATER	.00	.00	.00	.00
14-90-4021	TRANSFER FROM SEWER	.00	.00	.00	.00
14-90-4023	TRANSFER FROM DEBT SERVIC	.00	.00	.00	.00
14-90-4028	TRANSFER FROM CEMETARY	.00	.00	.00	.00
14-90-4029	TRANSFER FROM LOTTERY	260,000.00	260,000.00	.00	260,000.00-
	TOTAL REVENUE	263,586.62	263,586.62	79,000.00	184,586.62-
14-00-5000	REGULAR SALARIES	11,135.93	11,135.93	127,690.00	116,554.07
14-00-5002	OVERTIME SALARIES	.00	.00	.00	.00
14-00-5006	SUB OR TEMP SALARIES	986.32	986.32	36,000.00	35,013.68
14-00-5009	SOCIAL SECURITY	925.51	925.51	12,939.00	12,013.49
14-00-5015	HEALTH INSURANCE	2,329.82	2,329.82	43,000.00	40,670.18
14-00-5019	WORKER'S COMP INSURANCE	2,877.78	2,877.78	3,500.00	622.22
14-00-5030	RETIREMENT	449.62	449.62	5,085.00	4,635.38
14-00-5035	CLOTHING	.00	.00	1,250.00	1,250.00
14-00-5045	CUSTODIAL SERVICE	.00	.00	.00	.00
14-00-5055	CONTRACTED OR SECURED SERVICES	4,640.00	4,640.00	16,500.00	11,860.00
14-00-5060	OTHER PROF. & TECH SERVICE	.00	.00	27,000.00	27,000.00
14-00-5070	ELECTRICITY	958.34	958.34	15,000.00	14,041.66
14-00-5073	GAS AND OIL	387.89	387.89	7,000.00	6,612.11
14-00-5075	GARBAGE SERVICE	223.99	223.99	3,000.00	2,776.01
14-00-5080	RENTAL & LEASES	.00	.00	.00	.00
14-00-5090	PHONE	76.19	76.19	1,000.00	923.81
14-00-5095	ADVERTISING & PRINTING	.00	.00	3,000.00	3,000.00
14-00-5100	SUPPLIES	696.27	696.27	28,000.00	27,303.73
14-00-5102	OPERATION SUPPLIES	2,309.43	2,309.43	13,500.00	11,190.57
14-00-5110	FURNITURE AND EQUIPMENT	.00	.00	20,200.00	20,200.00

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
14-00-5120	SCHOOLS, DUES AND SEMINARS	.00	.00	1,000.00	1,000.00
14-00-5130	TREES AND PLANTINGS	.00	.00	16,000.00	16,000.00
14-00-5135	PROPERTY INSURANCE	20,539.99	20,539.99	25,000.00	4,460.01
14-00-5140	TRAVEL OR MILEAGE	.00	.00	500.00	500.00
14-00-5145	REPAIR & MAINT. SERVICES	18,935.22	18,935.22	59,000.00	40,064.78
14-00-5146	EQUIPMENT MAINTENANCE	151.98	151.98	3,500.00	3,348.02
14-00-5147	VEHICLE MAINTENANCE	197.95	197.95	1,000.00	802.05
14-00-5149	REFUNDS	.00	.00	1,000.00	1,000.00
14-00-5150	OTHER MISC. OBJECTS	.00	.00	.00	.00
14-00-5160	DONATION EXPENSES	.00	.00	1,000.00	1,000.00
14-00-5175	CAPITAL IMPROVEMENT-REAL PRPTY	.00	.00	70,000.00	70,000.00
14-90-5011	TRANSFER TO CITY SALES TAX	.00	.00	.00	.00
14-90-5012	TRANSFER TO STREET	.00	.00	.00	.00
14-90-5013	TRANSFER TO POOL	.00	.00	.00	.00
14-90-5016	TRANSFER TO FIRE/RESCUE	.00	.00	.00	.00
14-90-5020	TRANSFER TO WATER	.00	.00	.00	.00
14-90-5021	TRANSFER TO SEWER	.00	.00	.00	.00
14-90-5023	TRANSFER TO DEBT SERVICE	.00	.00	.00	.00
14-90-5028	TRANSFER TO CEMETERY	.00	.00	.00	.00
14-90-5029	TRANSFER TO LOTTERY	.00	.00	.00	.00
	TOTAL EXPENSES	67,822.23	67,822.23	541,664.00	473,841.77
	PARK TOTAL	195,764.39	195,764.39	462,664.00-	658,428.39-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
15-00-4161	INTEREST-MMA	2,597.97	2,597.97	.00	2,597.97-
15-00-4199	ARPA PROCEEDS	.00	.00	.00	.00
	TOTAL REVENUE	2,597.97	2,597.97	.00	2,597.97-
15-00-5141	ARPA EXPENSES	.00	.00	721,225.00	721,225.00
	TOTAL EXPENSES	.00	.00	721,225.00	721,225.00
	ARPA TOTAL	2,597.97	2,597.97	721,225.00-	723,822.97-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
16-00-4090	OTHER LOCAL REV RECEIPTS	.00	.00	.00	.00
16-00-4091	COVID-19 CARE FUNDS	.00	.00	.00	.00
16-00-4100	EQUIPMENT SOLD	.00	.00	.00	.00
16-00-4105	GRANTS	.00	.00	.00	.00
16-00-4110	INSURANCE ADJUSTMENTS	.00	.00	.00	.00
16-00-4135	REIMBURSEMENT-MAT'LS/SERVICES	.00	.00	.00	.00
16-00-4155	GIFTS OR DONATIONS	.00	.00	.00	.00
16-00-4160	RURAL FIRE DEPARTMENT	11,937.50	11,937.50	153,750.00	141,812.50
16-00-4161	INTEREST-MMA	488.33	488.33	.00	488.33-
16-00-4165	INTEREST/FIRE-RESCUE	.00	.00	.00	.00
16-90-4010	TRANSFER FROM GENERAL	153,750.00	153,750.00	153,750.00	.00
16-90-4012	TRANSFER FROM STREET	.00	.00	.00	.00
16-90-4013	TRANSFER FROM POOL	.00	.00	.00	.00
16-90-4014	TRANSFER FROM PARK	.00	.00	.00	.00
16-90-4018	TRANSFER FROM FIRE EQUIPMENT	.00	.00	.00	.00
16-90-4020	TRANSFER FROM WATER	.00	.00	.00	.00
16-90-4021	TRANSFER FROM SEWER	.00	.00	.00	.00
16-90-4023	TRANSFER FROM DEBT SERVIC	.00	.00	.00	.00
16-90-4028	TRANSFER FROM CEMETARY	.00	.00	.00	.00
16-90-4029	TRANSFER FROM LOTTERY	.00	.00	.00	.00
	TOTAL REVENUE	166,175.83	166,175.83	307,500.00	141,324.17
16-00-5003	OFFICER REIMBURSEMENT	.00	.00	10,800.00	10,800.00
16-00-5017	LIFE INSURANCE	.00	.00	3,500.00	3,500.00
16-00-5019	WORKER'S COMP INSURANCE	1,389.00	1,389.00	5,000.00	3,611.00
16-00-5045	CUSTODIAL SERVICE	.00	.00	.00	.00
16-00-5050	LEGAL SERVICES	.00	.00	.00	.00
16-00-5055	CONTRACTED OR SECURED SERVICES	250.00	250.00	57,400.00	57,150.00
16-00-5056	ENARSIS ADMIN	.00	.00	20,000.00	20,000.00
16-00-5060	OTHER PROF.& TECH SERVICE	2,792.38	2,792.38	11,000.00	8,207.62
16-00-5065	NATURAL GAS	52.15	52.15	6,000.00	5,947.85
16-00-5070	ELECTRICITY	350.46	350.46	3,500.00	3,149.54
16-00-5073	GAS & OIL	448.95	448.95	8,000.00	7,551.05
16-00-5075	GARBAGE SERVICE	19.28	19.28	300.00	280.72
16-00-5080	RENTALS OR LEASES	.00	.00	.00	.00
16-00-5085	POSTAGE	.00	.00	.00	.00
16-00-5090	TELEPHONE	373.43	373.43	4,000.00	3,626.57
16-00-5095	ADVERTISING AND PRINTING	812.99	812.99	1,000.00	187.01
16-00-5100	SUPPLIES	135.74	135.74	8,000.00	7,864.26
16-00-5101	FIRE OPERATION SUPPLIES	.00	.00	20,000.00	20,000.00
16-00-5102	MEDICAL SUPPLIES	199.88	199.88	15,000.00	14,800.12
16-00-5103	FD BUNKER GEAR	100.00	100.00	5,500.00	5,400.00
16-00-5110	FURNITURE AND EQUIPMENT	.00	.00	.00	.00
16-00-5112	COMMUNICATION GEAR	.00	.00	10,000.00	10,000.00
16-00-5115	LICENSE FEES	.00	.00	500.00	500.00
16-00-5120	SCHOOL, DUES AND SEMINARS	.00	.00	20,000.00	20,000.00
16-00-5135	PROPERTY INSURANCE	.00	.00	25,000.00	25,000.00
16-00-5140	TRAVEL OR MILEAGE	.00	.00	3,500.00	3,500.00
16-00-5141	SERVICE FEES	.00	.00	.00	.00
16-00-5142	VEHICLE MILEAGE REIMBURSE	.00	.00	20,000.00	20,000.00

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
16-00-5145	BUILDING REPAIR & MAINTENANCE	207.64	207.64	30,000.00	29,792.36
16-00-5146	EQUIPMENT-REPAIR & MAINTENANCE	.00	.00	12,500.00	12,500.00
16-00-5147	VEHICLE REPAIR & MAINTENANCE	786.37	786.37	10,000.00	9,213.63
16-00-5148	COMMUNICATION REPAIR	.00	.00	2,500.00	2,500.00
16-00-5149	REFUNDS	.00	.00	.00	.00
16-00-5150	OTHER MISC. OBJECTS	.00	.00	3,000.00	3,000.00
16-00-5180	INNOCULATIONS	.00	.00	.00	.00
16-00-5225	DONATION FUND-EXPENSES	.00	.00	.00	.00
16-00-5230	VOID!! USE FUND 18 ACCTS	.00	.00	.00	.00
16-00-5231	FEH: FIRE SERVICE CALLS	.00	.00	.00	.00
16-00-5555	UNIFORMS	.00	.00	2,500.00	2,500.00
16-90-5010	TRANSFER TO GENERAL	780.00	780.00	.00	780.00-
16-90-5011	TRANSFER TO SALES TAX	.00	.00	.00	.00
16-90-5012	TRANSFER TO STREET	.00	.00	.00	.00
16-90-5013	TRANSFER TO POOL	.00	.00	.00	.00
16-90-5014	TRANSFER TO PARK	.00	.00	.00	.00
16-90-5017	TRANSFER TO FIRE DONATION	.00	.00	.00	.00
16-90-5018	TRANSFER TO FIRE EQUIPMENT	.00	.00	.00	.00
16-90-5020	TRANSFER TO WATER	.00	.00	.00	.00
16-90-5021	TRANSFER TO SEWER	.00	.00	.00	.00
16-90-5023	TRANSFER TO DEBT SERVICE	.00	.00	.00	.00
16-90-5028	TRANSFER TO CEMETERY	.00	.00	.00	.00
16-90-5029	TRANSFER TO LOTTERY	.00	.00	.00	.00
	TOTAL EXPENSES	8,698.27	8,698.27	318,500.00	309,801.73
	FIRE DEPARTMENT TOTAL	157,477.56	157,477.56	11,000.00-	168,477.56-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
17-00-4065	BURN PERMITS	40.00	40.00	500.00	460.00
17-00-4105	GRANTS	.00	.00	.00	.00
17-00-4155	GIFTS OR DONATIONS	1,759.00	1,759.00	8,000.00	6,241.00
17-00-4162	INTEREST-NE CLASS	171.17	171.17	.00	171.17-
17-00-4165	INTEREST FIRE DONATION	.00	.00	.00	.00
17-00-4166	INTEREST	1.63	1.63	.00	1.63-
17-90-4016	TRANSFER FROM FIRE/RESCUE	.00	.00	.00	.00
17-90-4018	TRANSFER FROM FIRE EQUIP	.00	.00	.00	.00
	TOTAL REVENUE	1,971.80	1,971.80	8,500.00	6,528.20
17-00-5035	CLOTHING ALLOWANCE	.00	.00	2,500.00	2,500.00
17-00-5100	SUPPLIES	1,366.05	1,366.05	3,500.00	2,133.95
17-00-5150	OTHER MISC EXPENSES	.00	.00	.00	.00
17-00-5175	CAPITAL EQUIPMENT	.00	.00	37,000.00	37,000.00
17-90-5016	TRANSFER TO FIRE/RESCUE	.00	.00	.00	.00
17-90-5018	TRANSFERS TO FIRE EQUIPMENT	.00	.00	.00	.00
	TOTAL EXPENSES	1,366.05	1,366.05	43,000.00	41,633.95
	FIRE DONATION TOTAL	605.75	605.75	34,500.00-	35,105.75-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
18-00-4090	OTHER LOCAL REV RECEIPTS	.00	.00	.00	.00
18-00-4091	COVID-19 Care funds	.00	.00	.00	.00
18-00-4105	GRANTS	.00	.00	.00	.00
18-00-4135	REIMBURSEMENT	.00	.00	.00	.00
18-00-4150	FEH: FIRE SERVICE CALLS	.00	.00	5,000.00	5,000.00
18-00-4151	EMS: RESCUE SERVICE CALLS	2,649.67	2,649.67	50,000.00	47,350.33
18-00-4160	RURAL FIRE DEPARTMENT	.00	.00	.00	.00
18-00-4161	INTEREST-MMA	44.86	44.86	.00	44.86-
18-00-4162	INTEREST-NE CLASS	1,448.08	1,448.08	.00	1,448.08-
18-00-4165	INTEREST - FIRE EQUIPMENT	.00	.00	.00	.00
18-00-4166	INTEREST	9.47	9.47	.00	9.47-
18-90-4016	TRANSFER FROM FIRE	.00	.00	.00	.00
18-90-4029	TRANSFER FROM KENO	.00	.00	.00	.00
	TOTAL REVENUE	4,152.08	4,152.08	55,000.00	50,847.92
18-00-5055	CONTRACT/SECURED SERVICES	.00	.00	.00	.00
18-00-5060	OTHER PROF/TECH SERVICE	.00	.00	.00	.00
18-00-5100	SUPPLIES	.00	.00	120,000.00	120,000.00
18-00-5103	FD BUNKER GEAR	.00	.00	77,000.00	77,000.00
18-00-5110	FURNITURE & EQUIPMENT	697.01	697.01	180,000.00	179,302.99
18-00-5147	VEHICLE MAINT	.00	.00	.00	.00
18-00-5149	REFUNDS	.00	.00	.00	.00
18-00-5175	CAPITAL EQUIPMENT	.00	.00	.00	.00
18-00-5230	VOID!! USE STANDARD ACCTS	.00	.00	.00	.00
18-00-5231	FEH - FEES	.00	.00	2,000.00	2,000.00
18-00-5232	EMS - FEES	371.68	371.68	15,000.00	14,628.32
18-90-5016	TRANSFER TO FD OPERATIONS	.00	.00	.00	.00
18-90-5017	TRANSFER TO DONATIONS	.00	.00	.00	.00
	TOTAL EXPENSES	1,068.69	1,068.69	394,000.00	392,931.31
	FIRE EQUIPMENT TOTAL	3,083.39	3,083.39	339,000.00-	342,083.39-

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
19-00-4065	FEES & PERMITS	6,395.30	6,395.30	60,000.00	53,604.70
19-00-4090	OTHER LOCAL REV RECEIPTS	.00	.00	.00	.00
19-00-4106	DEVELOPER:STREET TREES	.00	.00	.00	.00
19-00-4161	INTEREST-MMA	694.05	694.05	.00	694.05-
19-00-4200	PERMIT DEPOSITS	1,000.00	1,000.00	10,000.00	9,000.00
19-00-4205	DEVELOPER CONTRIBUTIONS	.00	.00	80,000.00	80,000.00
19-00-4405	INFRASTRUCTURE FEE	1,250.00	1,250.00	50,000.00	48,750.00
19-90-4010	TRANSFER FROM GENERAL	125,000.00	125,000.00	125,000.00	.00
	TOTAL REVENUE	134,339.35	134,339.35	325,000.00	190,660.65
19-00-5000	SALARIES - REGULAR	10,678.32	10,678.32	96,921.00	86,242.68
19-00-5001	SALARIES - PART TIME	.00	.00	20,000.00	20,000.00
19-00-5002	SALARIES - OVERTIME	.00	.00	.00	.00
19-00-5009	SS/MED - CITY SHARE	813.63	813.63	8,944.00	8,130.37
19-00-5015	HEALTH INSURANCE	3,186.84	3,186.84	21,052.00	17,865.16
19-00-5030	RETIREMENT	587.31	587.31	4,884.00	4,296.69
19-00-5035	CLOTHING	.00	.00	250.00	250.00
19-00-5060	OTHER PROF & TECH SERVICE	.00	.00	50,000.00	50,000.00
19-00-5073	GAS & OIL	78.54	78.54	1,000.00	921.46
19-00-5090	TELEPHONE	96.31	96.31	1,500.00	1,403.69
19-00-5095	ADVERTISING AND PRINTING	18.49	18.49	500.00	481.51
19-00-5100	SUPPLIES	.00	.00	500.00	500.00
19-00-5110	FURNITURE & EQUIPMENT	.00	.00	.00	.00
19-00-5120	SCHOOL, DUES & SEMINARS	100.00	100.00	3,000.00	2,900.00
19-00-5135	INSURANCE	693.77	693.77	1,000.00	306.23
19-00-5140	TRAVEL & MILEAGE	.00	.00	1,000.00	1,000.00
19-00-5145	REPAIR & MAINT SERVICES	.00	.00	.00	.00
19-00-5146	EQUIPMENT MAINT	.00	.00	.00	.00
19-00-5147	VEHICLE MAINT	.00	.00	500.00	500.00
19-00-5150	OTHER MISC.OBJECTS	.00	.00	.00	.00
19-00-5151	OTHER-STREET TREES	.00	.00	25,000.00	25,000.00
19-00-5201	DEPOSITS REFUNDED	3,150.00	3,150.00	35,000.00	31,850.00
19-00-5205	CONSULTANTS	.00	.00	80,000.00	80,000.00
	TOTAL EXPENSES	19,403.21	19,403.21	351,051.00	331,647.79
	BUILDING & ZONING TOTAL	114,936.14	114,936.14	26,051.00-	140,987.14-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
20-00-4050	SALES TAX	1,468.07	1,468.07	15,000.00	13,531.93
20-00-4071	CITY FINES	.00	.00	.00	.00
20-00-4090	OTHER LOCAL REV RECEIPTS	40.00	40.00	.00	40.00-
20-00-4095	LABOR & MATERIALS SOLD - WATER	112.40	112.40	20,000.00	19,887.60
20-00-4105	GRANTS	.00	.00	.00	.00
20-00-4110	INSURANCE ADJUSTMENTS	.00	.00	.00	.00
20-00-4130	SALE OF BONDS - WATER	.00	.00	1,800,000.00	1,800,000.00
20-00-4161	INTEREST-MMA	5,971.16	5,971.16	.00	5,971.16-
20-00-4165	INTEREST/WATER	.00	.00	.00	.00
20-00-4175	CONTRIBUTION INCOME	.00	.00	.00	.00
20-00-4200	INSURANCE PROCEEDS	.00	.00	.00	.00
20-00-4220	SCRAP SALES	.00	.00	.00	.00
20-00-4300	UTILITY SERVICE CHARGE-WATER	70,168.33	70,168.33	650,000.00	579,831.67
20-00-4305	SALE OF WATER	35.46	35.46	.00	35.46-
20-00-4400	DEPOSITS RECEIVED	.00	.00	.00	.00
20-00-4405	INFRASTRUCTURE FEE	75.00	75.00	.00	75.00-
20-90-4012	TRANSFER FROM STREET	.00	.00	.00	.00
20-90-4013	TRANSFER FROM POOL	.00	.00	.00	.00
20-90-4014	TRANSFER FROM PARK	.00	.00	.00	.00
20-90-4016	TRANSFER FROM FIRE/RESCUE	.00	.00	.00	.00
20-90-4021	TRANSFER FROM SEWER	.00	.00	.00	.00
20-90-4023	TRANSFER FROM DEBT SERVIC	.00	.00	.00	.00
20-90-4028	TRANSFER FROM CEMETARY	.00	.00	.00	.00
20-90-4029	TRANSFER FROM LOTTERY	.00	.00	.00	.00
	TOTAL REVENUE	77,870.42	77,870.42	2,485,000.00	2,407,129.58
20-00-5000	REGULAR SALARIES	19,378.65	19,378.65	177,410.00	158,031.35
20-00-5002	OVERTIME SALARIES	484.43	484.43	6,328.00	5,843.57
20-00-5006	SUB OR TEMP SALARIES	564.43	564.43	.00	564.43-
20-00-5009	SOCIAL SECURITY	1,540.27	1,540.27	14,012.00	12,471.73
20-00-5015	HEALTH INSURANCE	8,334.75	8,334.75	56,000.00	47,665.25
20-00-5019	WORKER'S COMP INSURANCE	1,608.73	1,608.73	1,500.00	108.73-
20-00-5030	RETIREMENT	1,075.96	1,075.96	10,170.00	9,094.04
20-00-5035	CLOTHING	.00	.00	500.00	500.00
20-00-5050	LABORATORY SERVICES	.00	.00	.00	.00
20-00-5055	CONTRACTED OR SECURED SERVICES	.00	.00	3,000.00	3,000.00
20-00-5056	GRANT EXPENDITURES	.00	.00	.00	.00
20-00-5060	OTHER PROF. & TECH SERVICE	200.00	200.00	180,000.00	179,800.00
20-00-5061	SPECIAL PROF & TECH SERVICES	.00	.00	.00	.00
20-00-5065	SPECIAL PROF & TECH SERVICES	.00	.00	.00	.00
20-00-5070	ELECTRICITY	2,805.72	2,805.72	40,000.00	37,194.28
20-00-5073	GAS AND OIL	316.46	316.46	3,000.00	2,683.54
20-00-5080	RENTALS OR LEASES	379.14	379.14	1,000.00	620.86
20-00-5085	POSTAGE	151.30	151.30	3,500.00	3,348.70
20-00-5090	TELEPHONE	152.38	152.38	2,000.00	1,847.62
20-00-5095	ADVERTISING AND PRINTING	91.64	91.64	2,000.00	1,908.36
20-00-5100	SUPPLIES	8,869.88	8,869.88	50,000.00	41,130.12
20-00-5102	OPERATION SUPPLIES	.00	.00	.00	.00
20-00-5110	FURNITURE AND EQUIPMENT	.00	.00	12,000.00	12,000.00
20-00-5120	SCHOOL, DUES AND SEMINARS	108.75	108.75	3,000.00	2,891.25

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
20-00-5125	SALES TAX-WATER	1,053.10	1,053.10	12,000.00	10,946.90
20-00-5135	PROPERTY INSURANCE	11,311.39	11,311.39	13,000.00	1,688.61
20-00-5140	TRAVEL OR MILEAGE	.00	.00	1,000.00	1,000.00
20-00-5141	SERVICE FEES	.00	.00	400.00	400.00
20-00-5144	REPAIR & MAIN. - BLDG	.00	.00	5,000.00	5,000.00
20-00-5145	REPAIR & MAINT. SERVICES	4,650.49	4,650.49	35,000.00	30,349.51
20-00-5146	EQUIPMENT MAINTENANCE	.00	.00	140,000.00	140,000.00
20-00-5147	VEHICLE MAINTENANCE	.00	.00	1,000.00	1,000.00
20-00-5150	OTHER MISC. OBJECTS	.00	.00	.00	.00
20-00-5175	CAPITAL IMPROVEMENT-REAL PRPTY	6,100.00	6,100.00	2,315,000.00	2,308,900.00
20-00-5180	2021 NDEE PRINCIPAL PAYMENT	.00	.00	.00	.00
20-00-5181	NDEE INTEREST PAYMENT	.00	.00	.00	.00
20-00-5182	2021 GO WATER PRINCIPAL	.00	.00	120,000.00	120,000.00
20-00-5183	2021 GO WATER INTEREST	.00	.00	16,212.50	16,212.50
20-00-5201	REFUNDS	.00	.00	.00	.00
20-00-5210	METER AND READOUT PURCHASE	.00	.00	140,000.00	140,000.00
20-00-5220	DEPRECIATION EXPENSE	.00	.00	.00	.00
20-00-5235	LABORATORY SERVICES	1,052.00	1,052.00	5,000.00	3,948.00
20-00-5304	BOND NOTES	.00	.00	.00	.00
20-00-5305	INTEREST EXPENSE	.00	.00	.00	.00
20-00-5382	2021 GO WTR REF PRINCIPAL	.00	.00	.00	.00
20-00-5383	2021 GO WTR REF INTEREST	.00	.00	.00	.00
20-00-5400	DEPOSITS REFUNDED	.00	.00	.00	.00
20-90-5012	TRANSFER TO STREET	.00	.00	.00	.00
20-90-5013	TRANSFER TO POOL	.00	.00	.00	.00
20-90-5014	TRANSFER TO PARK	.00	.00	.00	.00
20-90-5016	TRANSFER TO FIRE/RESCUE	.00	.00	.00	.00
20-90-5021	TRANSFER TO SEWER	.00	.00	.00	.00
20-90-5023	TRANSFER TO DEBT SERVICE	.00	.00	.00	.00
20-90-5028	TRANSFER TO CEMETERY	.00	.00	.00	.00
20-90-5029	TRANSFER TO LOTTERY	.00	.00	.00	.00
	TOTAL EXPENSES	70,229.47	70,229.47	3,369,032.50	3,298,803.03
	WATER TOTAL	7,640.95	7,640.95	884,032.50-	891,673.45-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
21-00-4050	SALES TAX	8,774.03	8,774.03	80,000.00	71,225.97
21-00-4090	OTHER LOCAL REV RECEIPTS	.00	.00	.00	.00
21-00-4095	LABOR & MATERIALS SOLD - SEWER	.00	.00	.00	.00
21-00-4105	GRANTS	.00	.00	.00	.00
21-00-4110	INSURANCE ADJUSTMENTS	.00	.00	.00	.00
21-00-4130	SALE OF BONDS - SEWER	.00	.00	.00	.00
21-00-4161	INTEREST-MMA	8,961.19	8,961.19	.00	8,961.19-
21-00-4163	INTEREST-CD'S HORIZON	296.34	296.34	.00	296.34-
21-00-4164	INTEREST-CD'S FSB	.00	.00	.00	.00
21-00-4175	CONTRIBUTION INCOME	.00	.00	.00	.00
21-00-4180	INTEREST INCOME	.00	.00	.00	.00
21-00-4220	SCRAP SALES	.00	.00	.00	.00
21-00-4300	UTILITY SERVICE CHARGE-SEWER	126,016.65	126,016.65	1,100,000.00	973,983.35
21-00-4405	INFRASTRUCTURE FEE	100.00	100.00	.00	100.00-
21-90-4011	TRANSFER FROM SALES TAX	.00	.00	.00	.00
21-90-4012	TRANSFER FROM STREET	.00	.00	.00	.00
21-90-4013	TRANSFER FROM POOL	.00	.00	.00	.00
21-90-4014	TRANSFER FROM PARK	.00	.00	.00	.00
21-90-4016	TRANSFER FROM FIRE/RESCUE	.00	.00	.00	.00
21-90-4020	TRANSFER FROM WATER	.00	.00	.00	.00
21-90-4023	TRANSFER FROM DEBT SERVIC	.00	.00	.00	.00
21-90-4028	TRANSFER FROM CEMETARY	.00	.00	.00	.00
21-90-4029	TRANSFER FROM LOTTERY	.00	.00	.00	.00
	TOTAL REVENUE	144,148.21	144,148.21	1,180,000.00	1,035,851.79
21-00-5000	REGULAR SALARIES	13,561.92	13,561.92	144,000.00	130,438.08
21-00-5002	OVERTIME SALARIES	774.97	774.97	4,859.00	4,084.03
21-00-5006	SUB OR TEMP SALARIES	653.81	653.81	2,571.00	1,917.19
21-00-5009	SOCIAL SECURITY	1,140.73	1,140.73	10,283.00	9,142.27
21-00-5015	HEALTH INSURANCE	4,693.11	4,693.11	38,000.00	33,306.89
21-00-5019	WORKER'S COMP INSURANCE	782.93	782.93	1,000.00	217.07
21-00-5030	RETIREMENT	775.45	775.45	7,289.00	6,513.55
21-00-5035	CLOTHING	14.99	14.99	250.00	235.01
21-00-5045	CUSTODIAL SERVICE	.00	.00	.00	.00
21-00-5050	LABORATORY SERVICES	1,219.96	1,219.96	6,000.00	4,780.04
21-00-5060	OTHER PROF. & TECH SERVICE	200.00	200.00	1,000.00	800.00
21-00-5065	NATURAL GAS	.00	.00	5,000.00	5,000.00
21-00-5070	ELECTRICITY	6,959.38	6,959.38	85,000.00	78,040.62
21-00-5073	GAS AND OIL	214.65	214.65	5,000.00	4,785.35
21-00-5075	GARBAGE SERVICE	154.22	154.22	2,000.00	1,845.78
21-00-5080	RENTALS OR LEASES	758.28	758.28	1,000.00	241.72
21-00-5085	POSTAGE	151.30	151.30	3,500.00	3,348.70
21-00-5090	TELEPHONE	237.35	237.35	3,000.00	2,762.65
21-00-5095	ADVERTISING AND PRINTING	.00	.00	1,000.00	1,000.00
21-00-5100	SUPPLIES	2,845.26	2,845.26	25,000.00	22,154.74
21-00-5102	OPERATION SUPPLIES	.00	.00	.00	.00
21-00-5110	FURNITURE AND EQUIPMENT	8,875.15	8,875.15	535,500.00	526,624.85
21-00-5120	SCHOOL, DUES AND SEMINARS	95.00	95.00	1,500.00	1,405.00
21-00-5125	SALES TAX-SEWER	8,609.43	8,609.43	95,000.00	86,390.57
21-00-5135	PROPERTY INSURANCE	15,168.80	15,168.80	15,000.00	168.80-

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
21-00-5140	TRAVEL OR MILEAGE	71.94	71.94	500.00	428.06
21-00-5141	SERVICE FEES	.00	.00	800.00	800.00
21-00-5145	REPAIR & MAINT. SEWER	80.49	80.49	5,000.00	4,919.51
21-00-5146	EQUIPMENT MAINTENANCE	118.40	118.40	20,000.00	19,881.60
21-00-5147	VEHICLE MAINTENANCE	.00	.00	500.00	500.00
21-00-5150	OTHER MISC. OBJECTS	.00	.00	.00	.00
21-00-5151	ADJUSTMENTS	.00	.00	.00	.00
21-00-5152	REPAIR & MAIN - WWTP	.00	.00	.00	.00
21-00-5175	CAPITOL IMPROVEMENTS-SEWER	.00	.00	2,000,000.00	2,000,000.00
21-00-5180	AMORTIZATION EXPENSE	.00	.00	.00	.00
21-00-5220	DEPRECIATION EXPENSE	.00	.00	.00	.00
21-00-5300	DISPOSITION OF EQUIPMENT	.00	.00	.00	.00
21-00-5301	BOND REFINANCE EXPENSES	.00	.00	.00	.00
21-00-5306	PRINCIPAL-2016 COM. UT.REV.REF	.00	.00	.00	.00
21-00-5307	INTEREST-2016 COM.UT.REV.REF.	.00	.00	.00	.00
21-00-5326	2021 CURRB PRINCIPAL	.00	.00	305,000.00	305,000.00
21-00-5327	2021 CURRB INTEREST	.00	.00	20,830.00	20,830.00
21-00-5333	2020 CURR PRINCIPAL	.00	.00	210,000.00	210,000.00
21-00-5334	2020 CURR INTEREST	.00	.00	20,392.50	20,392.50
21-00-5337	PRIN: HOLD 2018 C.U.R. BOND	.00	.00	.00	.00
21-00-5338	INT: 2018 C.U.R. BAN	.00	.00	.00	.00
21-90-5011	TRANSFER TO GENERAL	.00	.00	.00	.00
21-90-5012	TRANSFER TO STREET	.00	.00	.00	.00
21-90-5013	TRANSFER TO POOL	.00	.00	.00	.00
21-90-5014	TRANSFER TO PARK	.00	.00	.00	.00
21-90-5016	TRANSFER TO FIRE/RESCUE	.00	.00	.00	.00
21-90-5020	TRANSFER TO WATER	.00	.00	.00	.00
21-90-5023	TRANSFER TO DEBT SERVICE	.00	.00	.00	.00
21-90-5028	TRANSFER TO CEMETERY	.00	.00	.00	.00
21-90-5029	TRANSFER TO LOTTERY	.00	.00	.00	.00
	TOTAL EXPENSES	68,157.52	68,157.52	3,575,774.50	3,507,616.98
	SEWER TOTAL	75,990.69	75,990.69	2,395,774.50-	2,471,765.19-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
22-00-4105	GRANTS	.00	.00	.00	.00
22-00-4130	CDBG GRANT PROCEEDS	.00	.00	540,000.00	540,000.00
22-00-4180	INTEREST INCOME	.00	.00	.00	.00
22-00-4310	TIF REVENUE	.00	.00	.00	.00
	TOTAL REVENUE	.00	.00	540,000.00	540,000.00
22-00-5050	LEGAL SERVICES	.00	.00	.00	.00
22-00-5100	TIF NOTE DISBURSEMENTS	.00	.00	.00	.00
22-00-5101	DRAW DOWNS	.00	.00	540,000.00	540,000.00
22-00-5102	OPERATION SUPPLIES	.00	.00	.00	.00
22-00-5215	TIF NOTE PAYMENTSD	.00	.00	.00	.00
	TOTAL EXPENSES	.00	.00	540,000.00	540,000.00
	CDBG FUND TOTAL	.00	.00	.00	.00

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
23-00-4000	COUNTY PROPERTY TAX	5,841.67	5,841.67	925,703.00	919,861.33
23-00-4005	COUNTY MOTOR VEHICLE FEE	.00	.00	.00	.00
23-00-4010	COUNTY MOTOR VEHICLE PRO RATE	241.28	241.28	1,000.00	758.72
23-00-4015	PROPERTY TAX CREDIT	.00	.00	.00	.00
23-00-4020	PROPERTY TAX CREDIT	.00	.00	.00	.00
23-00-4023	TRANSFER FROM CO. BOND	.00	.00	.00	.00
23-00-4030	CO. CARLINE	.00	.00	.00	.00
23-00-4037	COUNTY SPECIAL ASSESSMENTS	.00	.00	40,500.00	40,500.00
23-00-4040	COUNTY IN LIEU OF TAX	.00	.00	3,000.00	3,000.00
23-00-4055	COUNTY HOMESTEAD EXEMPTION	.00	.00	.00	.00
23-00-4090	OTHER LOCAL REV RECEIPTS	.00	.00	.00	.00
23-00-4130	COUNTY BOND PROCEEDS	.00	.00	.00	.00
23-00-4162	INTEREST-NE CLASS	1,506.39	1,506.39	.00	1,506.39-
23-00-4165	INT EARNED ON CO. BOND	.00	.00	.00	.00
23-00-4166	INT EARNED ON CO. DEBT FUND	.00	.00	.00	.00
23-00-4167	INTEREST FSB	17.69	17.69	.00	17.69-
23-00-4170	INT EARNED ON BOND NOTE	.00	.00	.00	.00
23-00-4415	AG LAND TAX CREDIT	.00	.00	.00	.00
23-90-4010	TRANSER FROM GENERAL	.00	.00	.00	.00
23-90-4012	TRANSFER FROM STREET	.00	.00	.00	.00
23-90-4013	TRANSFER FROM POOL	.00	.00	.00	.00
23-90-4014	TRANSFER FROM PARK	.00	.00	.00	.00
23-90-4016	TRANSFER FROM FIRE/RESCUE	.00	.00	.00	.00
23-90-4020	TRANSFER FROM WATER	.00	.00	.00	.00
23-90-4021	TRANSFER FROM SEWER	.00	.00	.00	.00
23-90-4023	TRANSFER FROM CO. BOND	.00	.00	.00	.00
23-90-4028	TRANSFER FROM CEMETARY	.00	.00	.00	.00
23-90-4029	TRANSFER FROM LOTTERY	.00	.00	.00	.00
23-90-4033	TRANSFER FROM TIF G	.00	.00	.00	.00
23-90-4035	TRANSFER FROM TIF ADMIN W/H	.00	.00	.00	.00
	TOTAL REVENUE	7,607.03	7,607.03	970,203.00	962,595.97
23-00-5102	OPERATION SUPPLIES	.00	.00	.00	.00
23-00-5141	SERVICE FEES	22.00	22.00	.00	22.00-
23-00-5316	2007 IMPROVEMENTS	.00	.00	.00	.00
23-00-5325	PRINCIPAL-2016 GO REFG BONDS	.00	.00	.00	.00
23-00-5326	INTEREST-2016 REFG BONDS	.00	.00	.00	.00
23-00-5337	2016 GOVP BOND PRINCIPAL	.00	.00	35,000.00	35,000.00
23-00-5338	2016 GOVP INTEREST	.00	.00	1,995.00	1,995.00
23-00-5339	2020 HAFP BOND PRINCIPAL	.00	.00	55,000.00	55,000.00
23-00-5340	2020 HAFP BOND INTEREST	.00	.00	2,936.25	2,936.25
23-00-5345	CAPITAL OUTLAY-LAWSON PARK	.00	.00	.00	.00
23-00-5347	23-00-5348 PRINCIPAL	.00	.00	130,000.00	130,000.00
23-00-5348	2019 GOVP INTEREST	.00	.00	40,982.50	40,982.50
23-00-5349	2020 GOVP PRINCIPAL	.00	.00	155,000.00	155,000.00
23-00-5350	2020 GOVP BOND INTEREST	.00	.00	24,880.00	24,880.00
23-00-5353	NEW BOND - REFINANCING	.00	.00	.00	.00
23-00-5380	2021 GO SWR PRINCIPAL	.00	.00	225,000.00	225,000.00
23-00-5381	2021 GO SWR INTEREST	.00	.00	12,695.00	12,695.00
23-00-5400	2016 HWY ALLOC PRINCIPAL	.00	.00	80,000.00	80,000.00

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
23-00-5440	2016 HWY ALLOC INTEREST	.00	.00	1,980.00	1,980.00
23-00-5450	2016 BAN	.00	.00	.00	.00
23-00-5455	INTEREST - 2016 BAN	.00	.00	.00	.00
23-00-5460	2016B BAN INTEREST	.00	.00	.00	.00
23-00-5470	PRIN 2016 BAN	.00	.00	.00	.00
23-00-5480	2016 VARIOUS PURPOSE	.00	.00	.00	.00
23-00-5490	INTEREST - 2018 BAN	.00	.00	.00	.00
23-90-5012	TRANSFER TO STREET	.00	.00	.00	.00
23-90-5013	TRANSFER TO POOL	.00	.00	.00	.00
23-90-5014	TRANSFER TO PARK	.00	.00	.00	.00
23-90-5016	TRANSFER TO FIRE/RESCUE	.00	.00	.00	.00
23-90-5020	TRANSFER TO WATER	.00	.00	.00	.00
23-90-5021	TRANSFER TO SEWER	.00	.00	.00	.00
23-90-5028	TRANSFER TO CEMETERY	.00	.00	.00	.00
23-90-5029	TRANSFER TO LOTTERY	.00	.00	.00	.00
23-90-5035	TRANSFER TO TIF ADMIN FUNDS	.00	.00	.00	.00
	TOTAL EXPENSES	22.00	22.00	765,468.75	765,446.75
	DEBT SERVICE TOTAL	7,585.03	7,585.03	204,734.25	197,149.22

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
24-00-4180	INTEREST INCOME	11.78	11.78	.00	11.78-
24-00-4310	TIF REVENUES	.00	.00	120,000.00	120,000.00
	TOTAL REVENUE	11.78	11.78	120,000.00	119,988.22
24-00-5102	OPERATION SUPPLIES	.00	.00	.00	.00
24-00-5150	REAL ESTATE TAX REFUND	.00	.00	.00	.00
24-00-5214	TIF COUNTY REIMBURSEMENT	.00	.00	.00	.00
24-00-5215	TIF NOTE PAYMENTS	.00	.00	120,000.00	120,000.00
24-90-5025	TRANSFER TO TIF B	.00	.00	.00	.00
24-90-5033	TRANSFER TO TIF G	.00	.00	.00	.00
24-90-5035	TRANSFER TO ADMIN W/H	.00	.00	.00	.00
	TOTAL EXPENSES	.00	.00	120,000.00	120,000.00
	TIF H: TSC DISTR CENTER TOTAL	11.78	11.78	.00	11.78-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
25-00-4180	INTEREST INCOME	.01	.01	.00	.01-
25-00-4310	TIF REVENUES	.00	.00	37,000.00	37,000.00
25-90-4024	TRANSFER FROM TIF A	.00	.00	.00	.00
	TOTAL REVENUE	.01	.01	37,000.00	36,999.99
25-00-5150	REAL ESTATE TAX REFUND	.00	.00	.00	.00
25-00-5214	TIF COUNTY REIMBURSEMENT	.00	.00	.00	.00
25-00-5215	TIF NOTE PAYMENTS	.00	.00	37,000.00	37,000.00
25-90-5035	TRANSFER TO ADMIN W/H	.00	.00	.00	.00
	TOTAL EXPENSES	.00	.00	37,000.00	37,000.00
	TIF I: TSC RETAIL STORE TOTAL	.01	.01	.00	.01-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
26-00-4180	INTEREST INCOME	.00	.00	.00	.00
26-00-4310	TIF REVENUE	.00	.00	.00	.00
26-90-4035	TRANS FROM TIF ADMIN	.00	.00	.00	.00
	TOTAL REVENUE	.00	.00	.00	.00
26-00-5102	OPERATION SUPPLIES	.00	.00	.00	.00
26-00-5215	TIF NOTE PAYMENT	.00	.00	.00	.00
26-90-5035	TRANSFER TO TIF ADMIN FUNDS	.00	.00	.00	.00
	TOTAL EXPENSES	.00	.00	.00	.00
	TIF C: MBA POULTRY A TOTAL	.00	.00	.00	.00

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
27-00-4180	INTEREST INCOME	.00	.00	.00	.00
27-00-4310	TIF REVENUE	.00	.00	.00	.00
27-90-4035	TRANS FROM TIF ADMIN	.00	.00	.00	.00
	TOTAL REVENUE	.00	.00	.00	.00
27-00-5102	OPERATION SUPPLIES	.00	.00	.00	.00
27-00-5215	TIF NOTE PAYMENTS	.00	.00	.00	.00
27-90-5035	TRANSFER TO TIF ADMIN	.00	.00	.00	.00
	TOTAL EXPENSES	.00	.00	.00	.00
	TIF D: MBA POULTRY B TOTAL	.00	.00	.00	.00

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
28-00-4090	OTHER LOCAL REV RECEIPTS	.00	.00	.00	.00
28-00-4105	GRANTS	.00	.00	.00	.00
28-00-4110	INSURANCE ADJUSTMENTS	.00	.00	.00	.00
28-00-4155	GIFTS OR DONATIONS	.00	.00	.00	.00
28-00-4161	INTEREST-MMA	76.44	76.44	.00	76.44-
28-00-4164	INTEREST-CD'S FSB	.00	.00	.00	.00
28-00-4167	INTEREST FSB	19.77	19.77	.00	19.77-
28-00-4180	INTEREST/CEMETERY FUNDS	.00	.00	.00	.00
28-00-4185	CEMETERY RECEIPTS	3,160.00	3,160.00	5,000.00	1,840.00
28-90-4010	TRANSFER FROM GENERAL	41,000.00	41,000.00	.00	41,000.00-
28-90-4011	TRANSFER FROM SALES TAX	.00	.00	.00	.00
28-90-4012	TRANSFER FROM STREET	.00	.00	.00	.00
28-90-4013	TRANSFER FROM POOL	.00	.00	.00	.00
28-90-4014	TRANSFER FROM PARK	.00	.00	.00	.00
28-90-4016	TRANSFER FROM FIRE/RESCUE	.00	.00	.00	.00
28-90-4020	TRANSFER FROM WATER	.00	.00	.00	.00
28-90-4021	TRANSFER FROM SEWER	.00	.00	.00	.00
28-90-4023	TRANSFER FROM DEBT SERVIC	.00	.00	.00	.00
28-90-4028	TRANSFER IN - CEMETERY	.00	.00	.00	.00
28-90-4029	TRANSFER FROM LOTTERY	.00	.00	.00	.00
	TOTAL REVENUE	44,256.21	44,256.21	5,000.00	39,256.21-
28-00-5000	REGULAR SALARIES	3,039.53	3,039.53	40,000.00	36,960.47
28-00-5002	OVERTIME SALARY	.00	.00	.00	.00
28-00-5006	SUB AND TEMP SALARIES	574.58	574.58	2,712.00	2,137.42
28-00-5009	SOCIAL SECURITY	272.98	272.98	2,486.00	2,213.02
28-00-5015	HEALTH INSURANCE	2,247.45	2,247.45	19,000.00	16,752.55
28-00-5030	RETIREMENT	167.17	167.17	1,695.00	1,527.83
28-00-5070	ELECTRICTY	.00	.00	500.00	500.00
28-00-5073	GAS AND OIL	155.23	155.23	1,000.00	844.77
28-00-5080	RENTALS & LEASES	.00	.00	1,000.00	1,000.00
28-00-5100	SUPPLIES	.00	.00	2,000.00	2,000.00
28-00-5102	OPERATION SUPPLIES	.00	.00	.00	.00
28-00-5110	FURNITURE AND EQUIPMENT	.00	.00	.00	.00
28-00-5135	PROPERTY INSURANCE	611.28	611.28	500.00	111.28-
28-00-5141	SERVICE FEES	.00	.00	.00	.00
28-00-5145	REPAIR AND MAINTENANCE	2,525.00	2,525.00	3,000.00	475.00
28-00-5146	EQUIPMENT MAINTENANCE	.00	.00	500.00	500.00
28-00-5150	OTHER MISC OBJECTS	.00	.00	.00	.00
28-00-5175	CAPITAL IMPROVEMENT-REAL PRPTY	.00	.00	.00	.00
28-90-5012	TRANSFER TO STREET	.00	.00	.00	.00
28-90-5013	TRANSFER TO POOL	.00	.00	.00	.00
28-90-5014	TRANSFER TO PARK	.00	.00	.00	.00
28-90-5016	TRANSFER TO FIRE/RESCUE	.00	.00	.00	.00
28-90-5020	TRANSFER TO WATER	.00	.00	.00	.00
28-90-5021	TRANSFER TO SEWER	.00	.00	.00	.00
28-90-5023	TRANSFER TO DEBT SERVICE	.00	.00	.00	.00
28-90-5028	TRANSFER OUT - CEMETERY	.00	.00	.00	.00
28-90-5029	TRANSFER TO LOTTERY	.00	.00	.00	.00

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
	TOTAL EXPENSES	9,593.22	9,593.22	74,393.00	64,799.78
	CEMETERY TOTAL	34,662.99	34,662.99	69,393.00-	104,055.99-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
29-00-4090	OTHER LOCAL REV RECEIPTS	.00	.00	.00	.00
29-00-4130	Bond Proceeds	.00	.00	.00	.00
29-00-4162	INTEREST-NE CLASS	707.99	707.99	.00	707.99-
29-00-4165	INTEREST CD PINNACLE	.00	.00	1,000.00	1,000.00
29-00-4166	INTEREST	79.14	79.14	.00	79.14-
29-00-4167	INTEREST FSB	133.83	133.83	.00	133.83-
29-00-4193	KENO OPERATING RECEIPTS	60,353.00	60,353.00	1,000,000.00	939,647.00
29-00-4195	KENO - CITY COMMISIONS	12,292.71	12,292.71	200,000.00	187,707.29
29-00-4200	MISC INCOME	.00	.00	5,000.00	5,000.00
29-90-4012	TRANSFER FROM STREET	.00	.00	.00	.00
29-90-4013	TRANSFER FROM POOL	.00	.00	.00	.00
29-90-4014	TRANSFER FROM PARK	.00	.00	.00	.00
29-90-4016	TRANSFER FROM FIRE/RESCUE	.00	.00	.00	.00
29-90-4020	TRANSFER FROM WATER	.00	.00	.00	.00
29-90-4021	TRANSFER FROM SEWER	.00	.00	.00	.00
29-90-4023	TRANSFER FROM DEBT SERVIC	.00	.00	.00	.00
29-90-4028	TRANSFER FROM CEMETARY	.00	.00	.00	.00
29-90-4029	TRANSFER FROM LOTTERY	.00	.00	.00	.00
	TOTAL REVENUE	73,566.67	73,566.67	1,206,000.00	1,132,433.33
29-00-5010	Transfers to General	.00	.00	.00	.00
29-00-5040	CO TREASURER & OTHER FEES	.00	.00	.00	.00
29-00-5050	ATTORNEY FEES	.00	.00	.00	.00
29-00-5060	AUDIT FEES	.00	.00	10,000.00	10,000.00
29-00-5102	OPERATION SUPPLIES	.00	.00	.00	.00
29-00-5115	LICENSE FEES	.00	.00	.00	.00
29-00-5141	SERVICE FEES	.00	.00	400.00	400.00
29-00-5175	CAPITAL OUTLAY	.00	.00	.00	.00
29-00-5195	STATE TAX	12,733.00	12,733.00	70,000.00	57,267.00
29-00-5200	KENO EXPENSES-OPERATING ACCT	59,467.79	59,467.79	1,200,000.00	1,140,532.21
29-00-5205	PRIZE FUND	.00	.00	75,000.00	75,000.00
29-00-5333	2020 COP PRINCIPAL PAYMNT	.00	.00	95,000.00	95,000.00
29-00-5334	2020 COP INTEREST PAYMNT	.00	.00	7,255.00	7,255.00
29-90-5010	TRANSFER TO GENERAL	.00	.00	.00	.00
29-90-5012	TRANSFER TO STREET	.00	.00	.00	.00
29-90-5013	TRANSFER TO POOL	.00	.00	.00	.00
29-90-5014	TRANSFER TO PARK	260,000.00	260,000.00	260,000.00	.00
29-90-5016	TRANSFER TO FIRE/RESCUE	.00	.00	.00	.00
29-90-5020	TRANSFER TO WATER	.00	.00	.00	.00
29-90-5021	TRANSFER TO SEWER	.00	.00	.00	.00
29-90-5023	TRANSFER TO DEBT SERVICE	.00	.00	.00	.00
29-90-5028	TRANSFER TO CEMETERY	.00	.00	.00	.00
29-90-5029	TRANSFER TO LOTTERY	.00	.00	.00	.00
	TOTAL EXPENSES	332,200.79	332,200.79	1,717,655.00	1,385,454.21
	LOTTERY TOTAL	258,634.12-	258,634.12-	511,655.00-	253,020.88-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
30-00-4130	TIF NOTE PROCEEDS	.00	.00	.00	.00
30-00-4180	INTEREST INCOME	1.74	1.74	.00	1.74-
30-00-4310	TIF REVENUE	.00	.00	85,000.00	85,000.00
30-90-4035	TRANSFER FROM TIF ADMIN	.00	.00	.00	.00
	TOTAL REVENUE	1.74	1.74	85,000.00	84,998.26
30-00-5040	COUNTY TREASURER & OTHER FEES	.00	.00	.00	.00
30-00-5050	LEGAL SERVICES	.00	.00	.00	.00
30-00-5100	TIF NOTE DISBURSEMENTS	.00	.00	.00	.00
30-00-5102	OPERATION SUPPLIES	.00	.00	.00	.00
30-00-5215	TIF NOTE PAYMENTS	.00	.00	85,000.00	85,000.00
30-90-5010	TRANSFER TO GENERAL FUND	.00	.00	.00	.00
30-90-5012	TRANSFER TO STREET	.00	.00	.00	.00
	TOTAL EXPENSES	.00	.00	85,000.00	85,000.00
	TIF E: WATTS ELECTRIC TOTAL	1.74	1.74	.00	1.74-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
31-00-5215	TIF NOTE PAYMENTS	.00	.00	.00	.00
31-90-5010	TRANSFER TO GENERAL	.00	.00	.00	.00
	TOTAL EXPENSES	.00	.00	.00	.00
	PAYROLL TOTAL	.00	.00	.00	.00

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
32-00-4130	TIF F NOTE PROCEEDS	.00	.00	.00	.00
32-00-4180	INTEREST INCOME	2.47	2.47	.00	2.47-
32-00-4310	TIF F REVENUE	.00	.00	54,000.00	54,000.00
	TOTAL REVENUE	2.47	2.47	54,000.00	53,997.53
32-00-5012	TRANSFER TO STREETS	.00	.00	.00	.00
32-00-5050	LEGAL SERVICES	.00	.00	.00	.00
32-00-5100	TIF F NOTE DISBURSEMENT	.00	.00	.00	.00
32-00-5102	OPERATION SUPPLIES	.00	.00	.00	.00
32-00-5215	TIF F NOTE PAYMENTS	.00	.00	54,000.00	54,000.00
	TOTAL EXPENSES	.00	.00	54,000.00	54,000.00
	TIF F: KAMTERTER TOTAL	2.47	2.47	.00	2.47-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
33-00-4130	TIF G NOTE PROCEEDS	.00	.00	.00	.00
33-00-4162	INTEREST-NE CLASS	3,920.23	3,920.23	.00	3,920.23-
33-00-4180	INTEREST INCOME- TIF G	20.56	20.56	.00	20.56-
33-00-4310	TIF G REVENUE	632.63	632.63	170,000.00	169,367.37
33-90-4011	TRANSFER FROM SALES TAX	.00	.00	.00	.00
33-90-4024	TRANSFER FROM TIF H	.00	.00	.00	.00
	TOTAL REVENUE	4,573.42	4,573.42	170,000.00	165,426.58
33-00-5050	LEGAL SERVICES-TIF G	.00	.00	.00	.00
33-00-5100	TIF G NOTE DISBURSEMENT	.00	.00	5,000,000.00	5,000,000.00
33-00-5102	OPERATION SUPPLIES- TIF G	.00	.00	.00	.00
33-00-5141	SERVICE FEES	.00	.00	.00	.00
33-00-5215	TIF G NOTE PAYMENTS	.00	.00	11,000.00	11,000.00
33-00-5343	PRINCIPAL-TIF G	.00	.00	.00	.00
33-00-5344	INTEREST-TIF G	.00	.00	.00	.00
33-90-5023	TRANSFER OUT	.00	.00	.00	.00
	TOTAL EXPENSES	.00	.00	5,011,000.00	5,011,000.00
	TIF G; BUCKET B AREA TOTAL	4,573.42	4,573.42	4,841,000.00-	4,845,573.42-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
34-00-4130	TIF J NOTE PROCEEDS	.00	.00	.00	.00
34-00-4180	INTEREST INCOME - TIF J	.07	.07	.00	.07-
34-00-4310	TIF J REVENUE	3,479.43	3,479.43	12,000.00	8,520.57
	TOTAL REVENUE	3,479.50	3,479.50	12,000.00	8,520.50
34-00-5050	LEGAL SERVICES - TIF J	.00	.00	.00	.00
34-00-5100	TIF J - NOTE DISBURSEMENT	.00	.00	.00	.00
34-00-5102	OPERATIONAL SUPPLIES - TIF J	.00	.00	.00	.00
34-00-5215	TIF J NOTE PAYMENTS	.00	.00	12,000.00	12,000.00
34-00-5343	PRINCIPAL - TIF J	.00	.00	.00	.00
34-00-5344	INTEREST - TIF J	.00	.00	.00	.00
34-90-5023	TRANSFER OUT	.00	.00	.00	.00
	TOTAL EXPENSES	.00	.00	12,000.00	12,000.00
	TIF J: VACEK ENTERPRISES TOTA	3,479.50	3,479.50	.00	3,479.50-

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
35-00-4162	INTEREST-NE CLASS	689.88	689.88	.00	689.88-
35-00-4180	INTEREST INCOME ADMIN W/H	.00	.00	500.00	500.00
35-00-4310	ADMIN W/H REVENUE	.00	.00	.00	.00
35-00-4400	TRANSFERS IN	.00	.00	.00	.00
35-90-4023	TRANSFER FR TIF C MBA POULTRY	.00	.00	.00	.00
35-90-4026	TRANSFER FR TIF C MBA POULTRY	.00	.00	.00	.00
35-90-4027	TRANSFER FROM TIF D	.00	.00	.00	.00
	TOTAL REVENUE	689.88	689.88	500.00	189.88-
35-00-5050	LEGAL SERVICES-ADMIN W/H FUNDS	.00	.00	2,000.00	2,000.00
35-00-5060	OTHER PROF & TECH SERVICE	.00	.00	.00	.00
35-00-5141	SERVICE FEES	.00	.00	.00	.00
35-00-5175	CAPITAL IMPROVEMENTS	.00	.00	.00	.00
35-90-5023	TRANSFER TO DEBT SERVICE	.00	.00	.00	.00
35-90-5026	TRANS TO TIF C MBA POULTRY	.00	.00	.00	.00
35-90-5027	TRANSFER TO TIF D MBA POULTRY	.00	.00	.00	.00
35-90-5030	TRANSFER TO TIF E WATTS ELEC	.00	.00	.00	.00
	TOTAL EXPENSES	.00	.00	2,000.00	2,000.00
	TIF ADMIN W/H FUNDS TOTAL	689.88	689.88	1,500.00-	2,189.88-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
36-00-4180	INTEREST EARNED	.44	.44	.00	.44-
36-00-4310	TIF REVENUE	.00	.00	40,000.00	40,000.00
	TOTAL REVENUE	.44	.44	40,000.00	39,999.56
36-00-5215	TIF K Note Payments	.00	.00	40,000.00	40,000.00
	TOTAL EXPENSES	.00	.00	40,000.00	40,000.00
	TIF K: WOODSTOCK LLC TOTAL	.44	.44	.00	.44-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
37-00-4090	OTHER LOCAL REV RECEIPTS	.00	.00	.00	.00
37-00-4130	BOND PROCEEDS	.00	.00	.00	.00
37-00-4180	INTERST INCOME	.37	.37	.00	.37-
37-00-4310	TIF REVENUES	.00	.00	10,000.00	10,000.00
	TOTAL REVENUE	.37	.37	10,000.00	9,999.63
37-00-5100	NOTE DISBURSEMENTS	.00	.00	.00	.00
37-00-5102	OPERATION SUPPLIES	.00	.00	.00	.00
37-00-5215	TIF NOTE PAYABLE	.00	.00	10,000.00	10,000.00
37-00-5343	PRINCIPAL	.00	.00	.00	.00
37-00-5344	INTEREST	.00	.00	.00	.00
	TOTAL EXPENSES	.00	.00	10,000.00	10,000.00
	TIF L NW ELECTRIC TOTAL	.37	.37	.00	.37-

REVENUE & EXPENSE REPORT
CALENDAR 10/2023, FISCAL 1/2024

PCT OF FISCAL YTD 8.3%

ACCOUNT NUMBER	ACCOUNT TITLE	MTD BALANCE	YTD BALANCE	BUDGET	DIFFERENCE
	Report Total	119,677.36	119,677.36	0,593,857.25-	0,713,534.61-

TREASURER'S REPORT

CALENDAR 10/2023, FISCAL 1/2024

ACCT	TITLE	LAST REPORT ON HAND	DISBURSED	RECEIVED	CHANGE IN LIABILITY	BALANCE
10	GENERAL	1,004,842.79	698,002.35	134,612.06	5,963.53	447,416.03
11	CITY SALES TAX	3,071,079.22	.00	78,659.64	.00	3,149,738.86
12	STREET	711,300.42	112,145.46	346,416.85	11,972.60	957,544.41
13	POOL	1,228,066.99	27,374.08	47,040.35	1,523.11	1,249,256.37
14	PARK	234,055.01	67,822.23	263,586.62	4,618.27	434,437.67
15	ARPA	738,167.90	.00	2,597.97	.00	740,765.87
16	FIRE DEPARTMENT	.00	8,698.27	166,175.83	.00	157,477.56
17	FIRE DONATION	42,734.32	1,366.05	1,971.80	.00	43,340.07
18	FIRE EQUIPMENT	361,879.78	1,068.69	4,152.08	.00	364,963.17
19	BUILDING & ZONING	112,277.79	19,403.21	134,339.35	5,722.60	232,936.53
20	WATER	1,738,923.00	70,229.47	77,870.42	12,082.36	1,758,646.31
21	SEWER	4,928,411.56	68,157.52	144,148.21	7,982.48	5,012,384.73
22	CDBG FUND	.00	.00	.00	.00	.00
23	DEBT SERVICE	329,566.73	22.00	7,607.03	.00	337,151.76
24	TIF H: TSC DISTR CENTE	89,584.41	.00	11.78	.00	89,596.19
25	TIF I: TSC RETAIL STOR	40.36	.00	.01	.00	40.37
26	TIF C: MBA POULTRY A	.00	.00	.00	.00	.00
27	TIF D: MBA POULTRY B	.00	.00	.00	.00	.00
28	CEMETERY	83,900.51	9,593.22	44,256.21	2,532.17	121,095.67
29	LOTTERY	877,772.59	332,200.79	73,566.67	.00	619,138.47
30	TIF E: WATTS ELECTRIC	19,872.35	.00	1.74	.00	19,874.09
31	PAYROLL	.00	.00	.00	.00	.00
32	TIF F: KAMTERTER	28,228.66	.00	2.47	.00	28,231.13
33	TIF G; BUCKET B AREA	832,476.76	.00	4,573.42	.00	837,050.18
34	TIF J: VACEK ENTERPRIS	3,479.76	.00	3,479.50	.00	6,959.26
35	TIF ADMIN W/H FUNDS	145,370.26	.00	689.88	.00	146,060.14
36	TIF K: WOODSTOCK LLC	9,953.94	.00	.44	.00	9,954.38
37	TIF L NW ELECTRIC	8,409.34	.00	.37	.00	8,409.71
	Report Total	16,600,394.45	1,416,083.34	1,535,760.70	52,397.12	16,772,468.93

TRIAL BALANCE

CALENDAR 10/2023, FISCAL 1/2024

ACCOUNT NUMBER	ACCOUNT TITLE	PTD BAL.	YTD BAL.
10-00-1000	CASH IN BANK - GENERAL	43,955.60-	62,426.87
10-00-1007	CASH IN BANK - MMA	513,471.16-	364,638.67
10-00-1010	CASH AT COUNTY TREASURER	.00	20,350.49
11-00-1000	CASH IN BANK - CITY SALES TAX	.00	.00
11-00-1007	CASH IN BANK - MMA	78,659.64	614,950.85
11-00-1035	CD #19645 SALES TAX	.00	1,784,788.01
11-00-1036	CD #738 SALES TAX	.00	750,000.00
12-00-1000	CASH IN BANK - STREET	42,018.73-	27,238.66
12-00-1007	CASH IN BANK - MMA	288,262.72	930,305.75
13-00-1000	CASH IN BANK - POOL	74,601.97-	52,594.09
13-00-1007	CASH IN BANK - MMA	96,955.12	557,469.29
13-00-1016	CASH IN BANK-NE CLASS	3,018.63	639,030.59
13-00-1030	CASH IN BANK-AQUATIC CENTER	4,182.40-	162.40
14-00-1000	CASH IN BANK - PARK	28,917.98	50,188.94
14-00-1002	PARK & REC FUND	.00	.00
14-00-1003	PARK & REC SCHOLARSHIP ACCT	.19	901.63
14-00-1007	CASH IN BANK - MMA	89,571.04-	122,311.57
14-00-1016	CASH IN BANK-NE CLASS	261,035.53	261,035.53
15-00-1000	CASH IN BANK - ARPA	.00	.00
15-00-1007	CASH IN BANK - MMA	2,597.97	740,765.87
16-00-1000	CASH IN BANK - FIRE DEPT.	18,239.23	18,239.23
16-00-1007	CASH IN BANK - MMA	139,238.33	139,238.33
17-00-1000	CASH IN BANK - BURN PERMIT CC	.00	.00
17-00-1012	CASH IN BANK-FIRE DONATION	434.58	7,104.58
17-00-1016	CASH IN BANK - NE CLASS	171.17	36,235.49
18-00-1000	CASH IN BANK - FIRE EQUIP FUND	.00	.00
18-00-1001	CASH IN BANK-FIREEQUIP HORIZON	1,590.45	45,621.64
18-00-1007	CASH IN BANK - MMA	44.86	12,789.95
18-00-1016	CASH IN BANK - NE CLASS	1,448.08	306,551.58
18-00-1030	CD# 19609 FIRE EQUIP	.00	.00
19-00-1000	CASH IN BANK-BUILDING & ZONING	34,964.69	35,041.00
19-00-1007	CASH IN BANK - MMA	85,694.05	197,895.53
20-00-1000	CASH IN BANK - WATER	86,247.85-	56,074.48
20-00-1007	CASH IN BANK - MMA	105,971.16	1,702,571.83
21-00-1000	CASH IN BANK - SEWER	120,284.36-	55,124.03
21-00-1004	2010 BOND RESERVE	.00	.00
21-00-1007	CASH IN BANK - MMA	203,961.19	2,555,124.61
21-00-1009	2012 BOND RESERVE	.00	.00
21-00-1030	CD# 19666 SEWER FUND	296.34	28,296.15
21-00-1031	CD #4048 SEWER FSB	.00	353,810.83
21-00-1033	CD #19643 SEWER HORIZON	.00	510,089.68
21-00-1034	CD #19644 SEWER HORIZON	.00	509,939.43
21-00-1037	CD #19739 SEWER HORIZON	.00	1,000,000.00
22-00-1000	CASH IN BANK- CBDG FUNDS	.00	.00
23-00-1000	CASH IN BANK - COUNTY BOND	.00	.00
23-00-1003	CASH IN BANK-COUNTY BOND MM	18,921.36-	2,513.94
23-00-1008	COP TRUST RESERVE	.00	.00
23-00-1010	CASH AT COUNTY TREASURER	.00	6,082.95
23-00-1016	CASH IN BANK - NE CLASS	26,506.39	328,554.87

TRIAL BALANCE
CALENDAR 10/2023, FISCAL 1/2024

ACCOUNT NUMBER	ACCOUNT TITLE	PTD BAL.	YTD BAL.
24-00-1000	CASH IN BANK - TIF H	.00	.00
24-00-1017	CASH IN BANK-NOTE H TSC DISTR	11.78	89,596.19
25-00-1000	CASH IN BANK- TIF I	.00	.00
25-00-1018	CASH IN BANK-NOTE I TSC RETAIL	.01	40.37
26-00-1000	CASH IN BANK - TIF C	.00	.00
26-00-1010	CASH AT COUNTY TREASURER	.00	.00
26-00-1019	CASH IN BANK-NOTE C MBA POUL A	.00	.00
27-00-1000	CASH IN BANK - TIF D	.00	.00
27-00-1010	CASH AT COUNTY TREASURER	.00	.00
27-00-1020	CASH IN BANK-NOTE D MBA POUL B	.00	.00
28-00-1000	CASH IN BANK - CEMETERY	16,098.95	21,584.47
28-00-1007	CASH IN BANK - MMA	21,076.44	21,795.69
28-00-1011	CASH IN BANK-ROSEHILL MMA	19.77	11,406.78
28-00-1031	CD #3133 CEMETERY FSB	.00	66,308.73
29-00-1000	CASH IN BANK - KENO	.00	.00
29-00-1005	CASH IN BANK-LOTTERY PRIZE MMA	133.83	77,230.62
29-00-1006	CERTIFICATE OF DEPOSIT	.00	.00
29-00-1013	CASH IN BANK-KENO OPERAT ACCT	896.65	50,536.63
29-00-1014	CASH IN BANK-FIXED KENO ACCT	372.59-	35,967.52
29-00-1016	CASH IN BANK - NE CLASS	259,292.01-	108,061.44
29-00-1030	CD #0065 KENO PINNACLE	.00	347,342.26
30-00-1000	CASH IN BANK - TIF E	.00	.00
30-00-1021	CASH IN BANK-NOTE E WATTS ELEC	1.74	19,874.09
31-00-1000	CASH IN BANK - PAYROLL	.00	.00
32-00-1000	CASH IN BANK - TIF F	.00	.00
32-00-1022	CASH IN BANK-NOTE F KAMKERTER	2.47	28,231.13
33-00-1000	CASH IN BANK - TIF G	.00	.00
33-00-1010	CASH AT COUNTY TREASURER	.00	632.63
33-00-1016	CASH IN BANK - NE CLASS	3,920.23	829,889.06
33-00-1023	CASH IN BANK-NOTE G BUCKET B	653.19	6,528.49
34-00-1000	CASH IN BANK - TIF J	.00	.00
34-00-1010	CASH AT COUNTY TREASURER-TIF J	.00	3,479.43
34-00-1024	CASH IN BANK-NOTE J VASEK ENT	3,479.50	3,479.83
35-00-1000	CASH ACCOUNT - ADMIN W/H	.00	.00
35-00-1016	CASH IN BANK - NE CLASS	689.88	146,043.81
35-00-1025	CASH IN BANK-ADMIN W/H FUNDS	.00	16.33
36-00-1026	CASH IN BANK-TIF K WOODSTOCK	.44	9,954.38
37-00-1028	CASH IN BANK-NOTE L NW ELECTR	.37	8,409.71
		==========	==========
	PROOF	172,074.48	16,772,468.93
		==========	==========

RESOLUTION 23-27

RESOLUTION AUTHORIZING THE TEMPORARY CLOSING OF OLDFIELD STREET FROM N 137TH TO CANONGATE ROAD; CANONGATE ROAD FROM OLDFIELD STREET TO KENILWORTH STREET; KENILWORTH STREET FROM CANONGATE ROAD TO N 142ND STREET; N 142ND STREET FROM KENILWORTH STREET TO LANCASHIRE STREET; LANCASHIRE STREET FROM N 142ND STREET TO WOODSTOCK STREET; AND WOODSTOCK STREET FROM LANCASHIRE TO N 148TH STREET FROM 5:30 P.M. TO 7:00 P.M. ON SUNDAY, DECEMBER 10, 2023

WHEREAS, Waverly Fire and Rescue has requested approval to hold a parade for the 2023 Santa Express and Tree Lighting event on December 10, 2023; and

WHEREAS, they have requested the temporary closing of Oldfield Street from N 137th Street to Canongate Road; Canongate Road from Oldfield Street to Kenilworth Street; Kenilworth Street from Canongate Road to N 142nd Street; N 142nd Street from Kenilworth Street to Lancashire Street; Lancashire Street from N 142nd Street to Woodstock Street; and Woodstock Street from Lancashire Street to N 148th Street from 5:30 p.m. to 7:00 p.m. on Sunday, December 10, 2023; and

WHEREAS, the City of Waverly has agreed to provide the necessary signage barricades to prohibit vehicular traffic from 5:30 p.m. to 7:00 p.m. at the outlined locations with the understanding that the volunteers of the Waverly Fire and Rescue Department will install the barricades by 5:30 p.m. and remove the barricades by 7:00 p.m. on Sunday, December 10, 2023.

NOW THEREFORE, BE IT RESOLVED BY THE MAYOR AND CITY COUNCIL OF WAVERLY, NEBRASKA that barricades be provided and placed by 5:30 p.m. on December 10, 2023 to prohibit vehicular traffic except emergency vehicles on Oldfield Street from N 137th Street to Canongate Road; Canongate Road from Oldfield Street to Kenilworth Street; Kenilworth Street from Canongate Road to N 142nd Street; N 142nd Street from Kenilworth Street to Lancashire Street; Lancashire Street from N 142nd Street to Woodstock Street; and Woodstock Street from Lancashire Street to N 148th Street after 5:30 p.m. on December 10, 2023 until 7:00 p.m. on December 10, 2023.

PASSED AND APPROVED THIS 14TH DAY OF NOVEMBER, 2023.

_____
William D. Gerdes
Mayor

ATTEST:

_____
Megan K. Frye
City Clerk/Deputy Treasurer

(Seal)

Lawson Park Waverly, NE
Red Gauntlet St
Millard Lumber Inc
Quentin St
Paris St
N 141st St
Oldfield St
WFR Traffic
Oldfield St
Canongate Rd
The Mulberry at Waverly
Waverly Community Foundation
Jaycee Park
Woodstock Blvd
WFR Traffic
Kenilworth St
Lancashire St
Valmont Gearbox
I-80 ALT
N 148th St
Tomorrow's Veterinary Care
Waverly
Jamestown St
Jamestown St

BE APART OF
WAVERLY FIRE RESCUE'S

CHRISTMAS PARADE

Sunday, December 10th
Approximately 5:30pm start time

To register a float or vehicle for the parade,
contact Jared Rains at (402) 440-9309
or scan the QR code/use this link
https://forms.gle/vuj7dyUFhV7sS6yd9

REQUEST TO PLACE BURIED COMMUNICATIONS FACILITIES
ON PUBLIC RIGHT-OF-WAY WITHIN CORPORATE LIMITS
of the CITY of WAVERLY, NEBRASKA

ALLO Communications LLC ("ALLO") respectfully requests permission to place fiber optic cable communications facilities in public right-of-way to serve households, businesses, and governmental entities throughout the City of Waverly, Nebraska.

The proposed communications facilities will be routed to avoid existing utilities or other obstructions as good engineering practices require in each situation, as detailed in the two plan sets labeled as Bailie Ct and Anderson Park Additional Build submitted to the City for approval. The communications facilities will be bored in the right-of-way at a minimum depth of thirty-six (36) inches.

ALLO and its contractors will cooperate with City officials and keep them fully informed of all underground facility construction or maintenance work required in public right-of-way.

ALLO proposes to place and maintain the aforesaid communications facilities in public right-of-way at its own risk and expense. After any such work, at its own risk and expense ALLO or its contractors will restore road surfaces and other areas along the route disturbed by installation procedures to their original condition.

Please direct any questions to:

Al Schroeder, P.E.
Director of OSP Engineering
330 5 21st Street
Lincoln, NE 68510

If you approve, please sign below, and return this form via email to al.schroeder@allofiber.com or return a signed copy to the address listed above.

We hereby grant to ALLO Communications LLC permission to place and maintain fiber optic communications facilities throughout the City of Waverly according to the procedure and conditions **described in this document.**

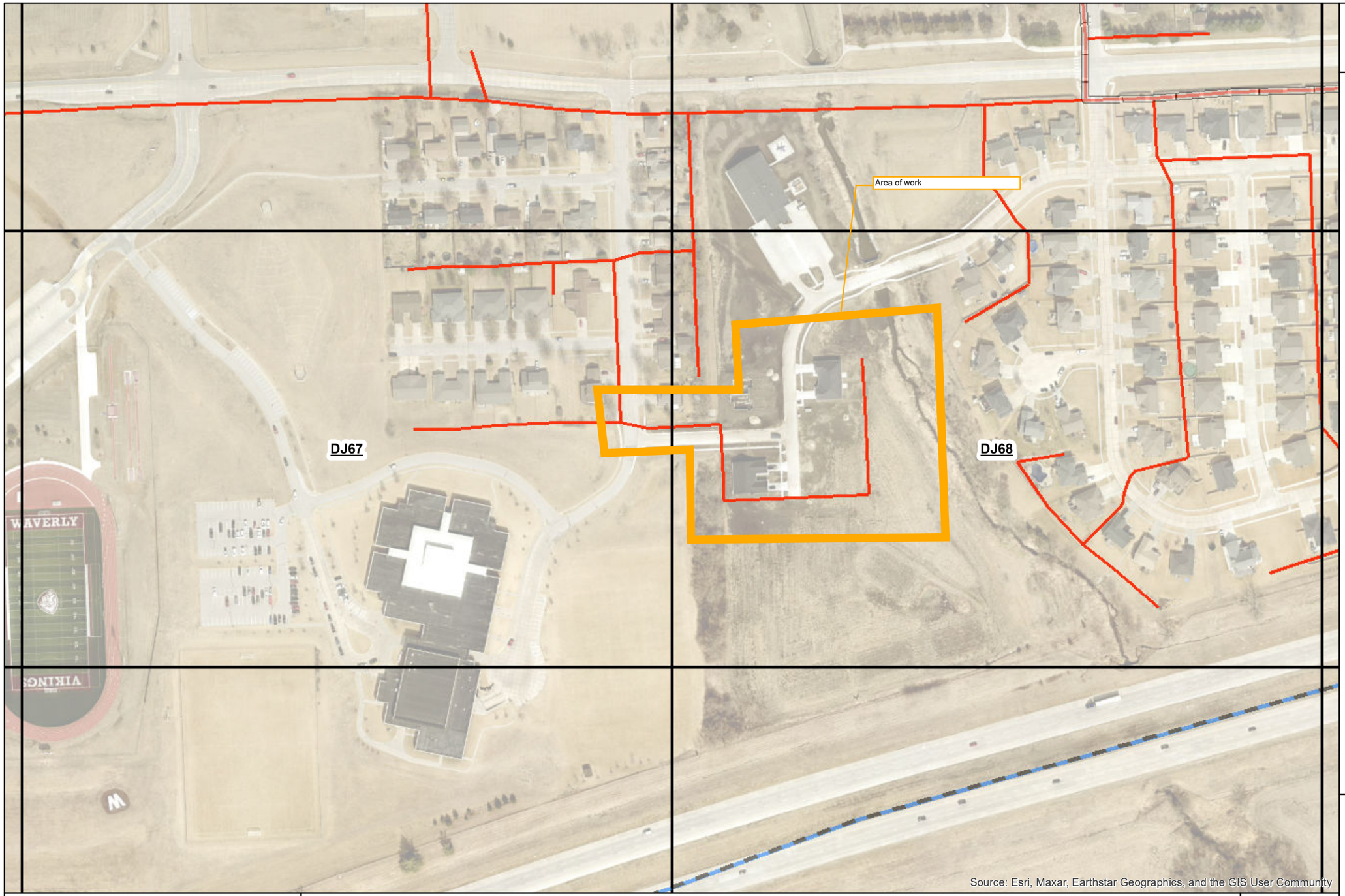
Signature:_____

Date:

_____
Name and Title

Person to be contacted prior to construction by ALLO Communications LLC or Contractor is:

_____ at _____
Name Area Code and Number



Bailie Court Waverly

DCR:

PERMIT:	
LEGEND	Date: 10/23/2023

PON

ROUTE

Underground

Note: "For clarity and simplicity, Sheets with no conduit (edges particularly) are not shown"

Allo FIBER

ne1call.com Nebraska811 Know what's below. Call before you dig.

Notes:

Revisions:

N

1 in = 206 ft

ROW CONSTRUCTION PROJECT NOTES

1. The City shall be notified a minimum of forty eight (48) hours in advance of initial project construction.

2. The contractor shall adhere to the current City standard specifications, approved special provisions, City standard plans, right-of-way construction procedures manual.

3. The locations of all aerial and underground utility facilities may not be indicated on the project plans. The contractor is required to contact the One Call 811 notification center (dial 811) forty-eight (48) hours prior to working in the city right of way and any public or private land. No excavation will be permitted in the area of the underground utilities until all facilities have been located and identified to the satisfaction of all parties. The contractor shall be responsible for protection of all underground and aerial utilities and infrastructure.

4. Whenever underground facilities are in close proximity to the proposed pathway location or whenever the vertical location of the underground facility is unknown, the permittee shall use special measures to determine the locations of such underground facilities.

   a. If the permittee is conducting the excavation by digging from the surface, when in a close proximity to the underground facilities, the permittee shall use hand digging, hydro excavating, air excavating, or any other techniques that are approved by the City to locate such facility.
   b. If the permittee is conducting the excavation by tunneling or boring, the permittee shall determine the vertical location of the underground facility by potholing or any other method approved by the City.

5. Project plans shall dimension new facilities being installed. Measurements shall be taken from existing adjacent visible structures (curbs, poles, cabinets, manholes, inlets, fire hydrants, etc.) clearly identifying location of such facility. The contractor shall verify dimensions taken from city files.

6. Unless specified on the plan sets, the depth of installed facilities in city row shall be at a minimum as follows.

   a. Thirty (30) inches in soil, if rock present and is an issue twenty-four (24) inches can be used.

   b. Forty-two (42) inches below a projected slope from the flow line of a ditch at a three (3) horizontal and one (1) vertical slope.

   c. Forty-eight (48) inches under a roadway measured from the surface of said roadway to the top of the installation.

   d. Forty-eight (48) inches under a storm water or creek channel design bottom of pipe, and

   e. Maintain a minimum of twenty-four (24) inches of vertical and horizontal spacing from existing utilities.

   f. Be located as far from the existing or proposed curb line as possible to avoid potential future conflicts.

7. All potholes in sidewalk panels will be filled unless directed by City inspector. If colored, textured or patterned concrete is existing, replacement patches, and panels panels will be replaced to match as practicable. Owner may be required to put money into escrow to cover all repairs prior to starting work.

8. All non-street surface materials that are disturbed by excavation and backfilling operations shall be replaced and restored.

9. City street surface materials disturbed shall be backfilled, tamped and repaved by approved paving contractor to be paid by Allo.

10. All Conduit, vaults and Pedestals shall be located in the public ROW and in public utility easements.

11. All Aerial shown on attached planset will be permitted separately by Pole Owners. All pole permits submitted to pole owners will follow NESC codes.

12. If sidewalk, wheel chair ramps or any portion of the pedestrian facilities are removed or closed, a pedestrian detour shall be established and maintained during the time of the closure and the entire pedestrian facility shall be restored within seventy-two (72) hours, unless the contractor provides a hard surface alternate route approved by the city.

13. All pedestrian detours and any reconstruction of pedestrian facilities shall meet current Americans with Disability Act (ADA) standards and specifications.

14. All pedestrian detours shall be part of an approved Traffic Control Plan (TCP).

15. All holes made in city pavements for the purpose of performing vacuum excavations to locate underground utilities shall be restored to their original condition with the reinstated core flush with and in the original orientation as the existing surface matching existing pavement surface appearance.

16. When the contractor is not actively working, all equipment, fencing, debris, etc, shall not be placed within the triangular area required for sight distance of vehicles exiting or entering an adjacent property or intersection.

17. All excavations shall be adequately fenced and covered when contractor is not present or project site left unattended.

18. No lane closures allowed on arterial streets during AM and PM peak hours unless approved by City Traffic and Right of Way Construction section(s) staff.

19. All work zone traffic control, including pedestrian control measures, shall be in compliance with the MUTCD, ADA, and the City Standard Specifications.

20. The contractor shall notify all affected owners of adjacent properties a minimum of forty-eight (48) hours prior to beginning of construction and provide updates to the affected owners when construction phases change that affect the areas of work associated with the permit.

21. The contractor shall maintain a set of "as built" plans on site with dimensioning. These plans shall be presented upon request to any city representative.

22. A current city right of way construction permit and city approved plan set shall be maintained on each work site by the contractor. The contractor shall present such permit and plan set upon request to any city representative.

23. Any field adjustments to installation of facilities, which vary from the plans that have been submitted and approved during the permit application process, shall comply with the following:

   a. The contractor must stop work immediately and contact the facility owner.

   b. The facility owner's representative shall contact the city's construction inspector and provide him with the details

of the proposed changes.

   c. The City inspector will make a determination on how to proceed. This determination may range from approval over the phone or via email to delaying the project until plans can be updated and appropriate review can be conducted.

Special Notes

1. All conduit shall be bored unless specified otherwise.
2. Contractors shall notify land owner prior to work on all private developments.
3. A reminder to the reader. the drawings are scaled, thus dimension is available at all locations.
4. The contractor shall bypass all MST pedestals with distribution conduit where installed parallel to MST conduit. Similarly, bypass the T18 "Flowerpot" with MST conduit where installed parallel to future drop conduit.

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N

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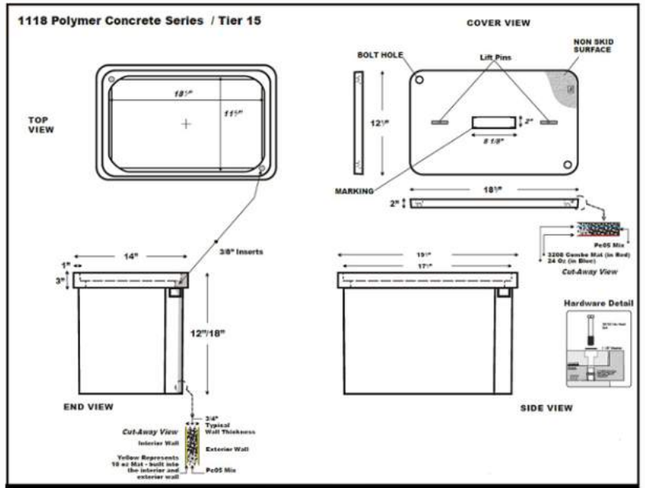


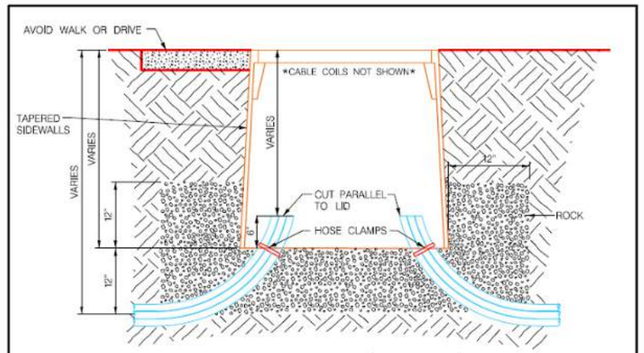
DESCRIPTION	NORMAL SIZE W x L x D	LOAD RATING	ANSI TIER	PART NUMBER
Box & Cover Assembly	12" x 18" x 18"	60lbS	15	1118

ALLO PULL BOX

NOTES:

T18

1. ALLO PULL BOX SHALL HAVE 2 PIECE COVER
2. ALLO PULL BOX SHALL BE LABELED "FIBER OPTICS"



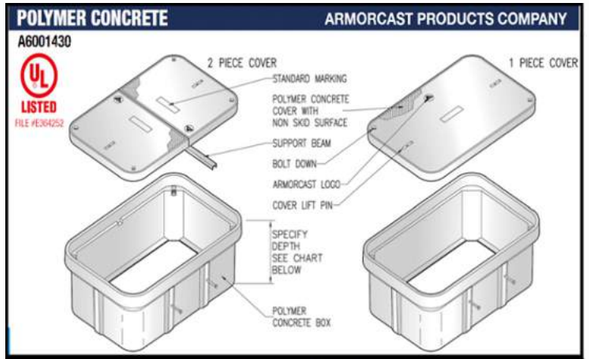
ALLO PULL BOX INSTALLATION

NOTES:

1. AT ALL CABLE PULLING LOCATIONS, COIL 60' OF EACH FIBER CABLE (MST TAILS EXCLUDED)

POLYMER CONCRETE — ARMORCAST PRODUCTS COMPANY

A6001430



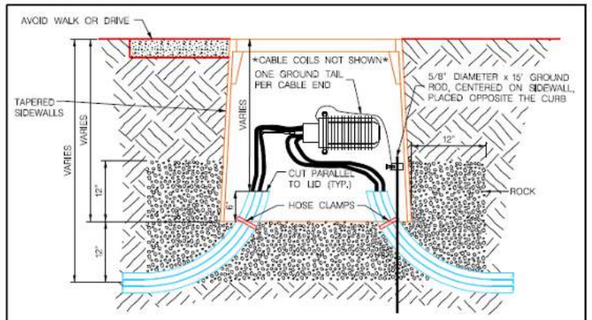
DESCRIPTION	NORMAL SIZE W x L x D	LOAD RATING	ANSI TIER	PART NUMBER
Box & Cover Assembly	30" x 48" x 36"	20K	15	A6001430TAPCX36

ALLO SPLICE VAULT AND CITY T48 PULL BOX

NOTES:

T48

1. ALLO SPLICE VAULT SHALL HAVE 1 PIECE COVER
2. CITY T48 PULL BOX SHALL HAVE 2 PIECE COVER
3. ALLO SPLICE VAULT SHALL BE LABELED "FIBER OPTICS"
4. CITY T48 PULL BOX SHALL BE LABELED "FIBER"



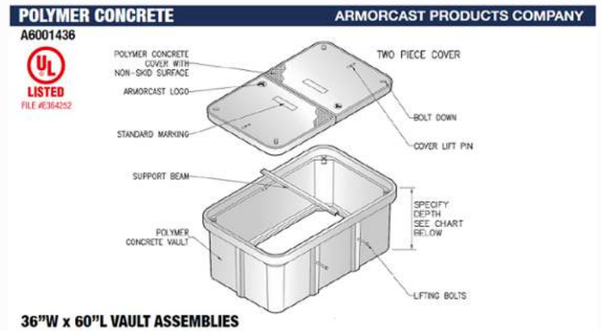
ALLO SPLICE VAULT INSTALLATION

NOTES:

1. AT ALL SPLICE VAULTS, COIL 75' OF EACH FIBER CABLE TAIL AND 50' OF EACH MST TAIL.

POLYMER CONCRETE — ARMORCAST PRODUCTS COMPANY

A6001436



36"W x 60"L VAULT ASSEMBLIES

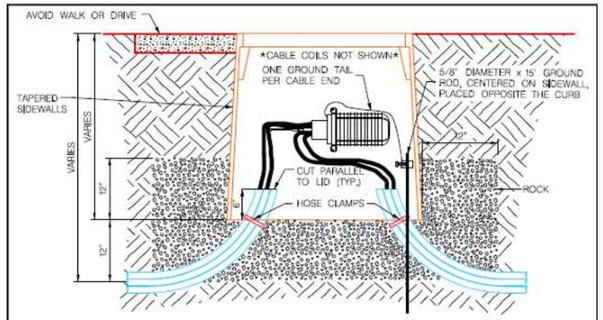
DESCRIPTION	NORMAL SIZE W x L x D	LOAD RATING	ANSI TIER	PART NUMBER
Box & Cover Assembly	36" x 60" x 36"	20K	15	A6001436TAPCX36

ALLO MAINTENANCE VAULT

NOTES:

T60

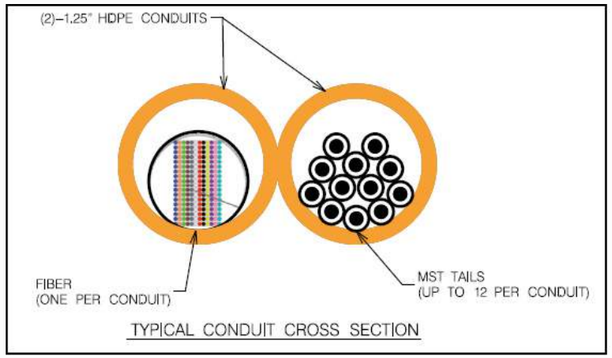
1. ALLO MAINTENANCE VAULT SHALL HAVE 2 PIECE COVER
2. ALLO MAINTENANCE VAULT SHALL BE LABELED "FIBER OPTICS"



ALLO MAINTENANCE VAULT INSTALLATION

NOTES:

1. AT ALL MAINTENANCE VAULTS, COIL 75' OF EACH FIBER CABLE (MST TAILS EXCLUDED).



TYPICAL CONDUIT CROSS SECTION

Typicals

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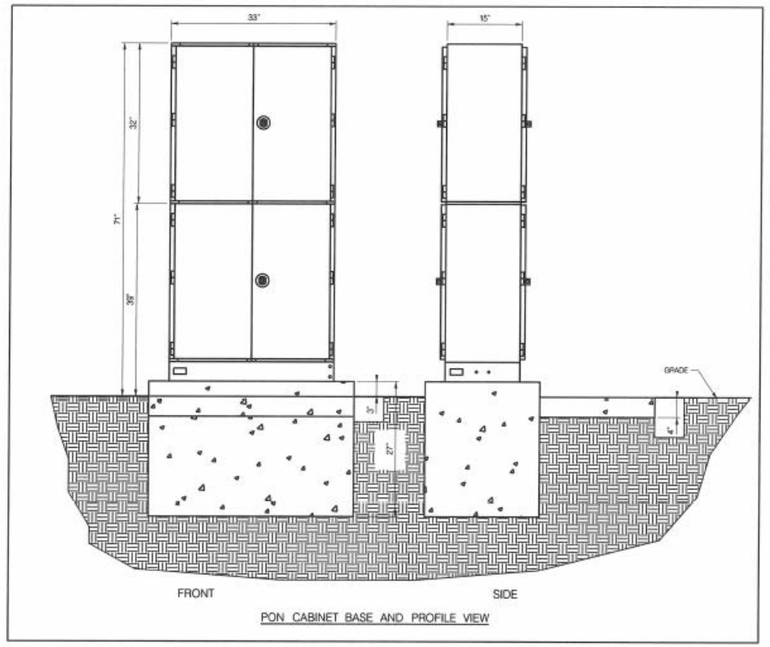
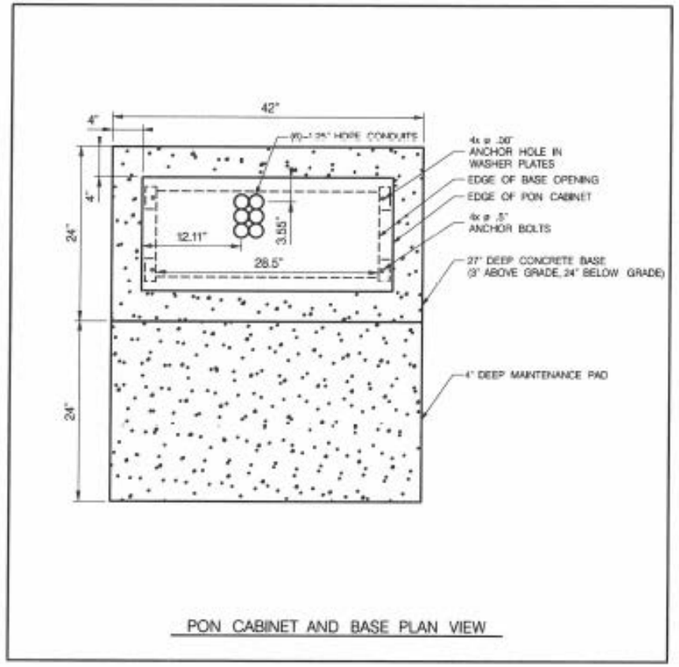


PON CABINET BASE AND PROFILE VIEW



PON CABINET AND BASE PLAN VIEW

Typicals

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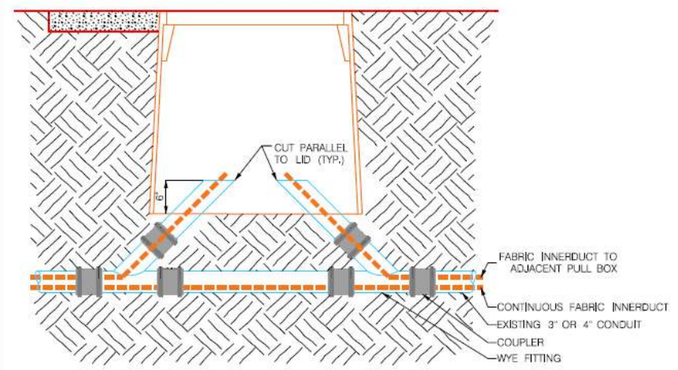
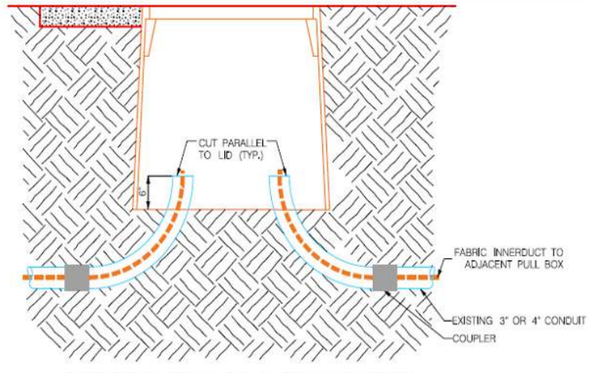
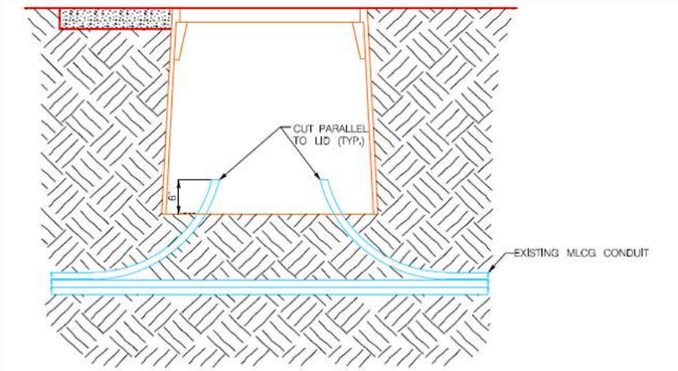
Typicals



CAPTURE 3" OR 4" CONDUIT WITH EXISTING FIBER DETAIL



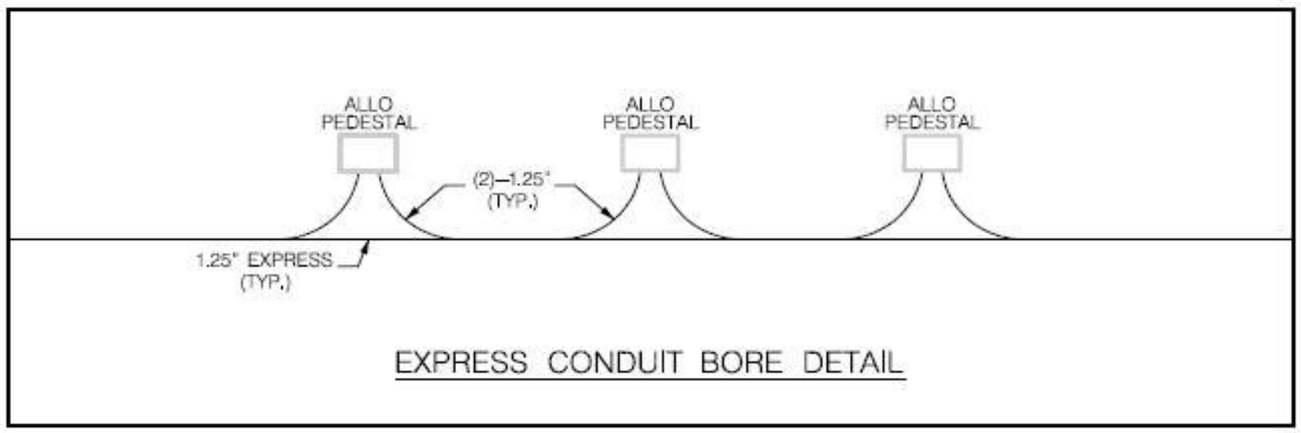
CAPTURE EMPTY 3" OR 4" CONDUIT DETAIL



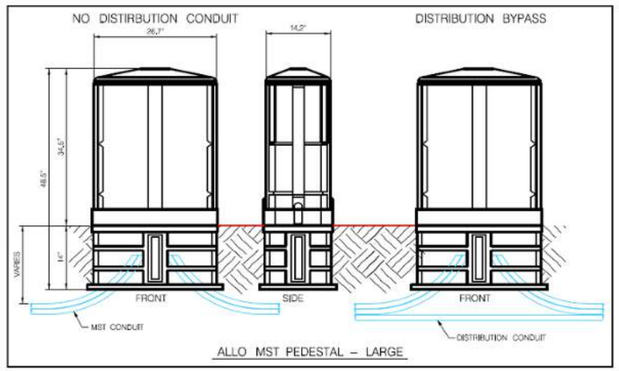
CAPTURE MLCG DETAIL

Typicals here represent various sweeps of conduit.
Follow City standards for bedding.
MLCG stands for Main Line Conduit Group, any bundle of conduit placed in the ground together.

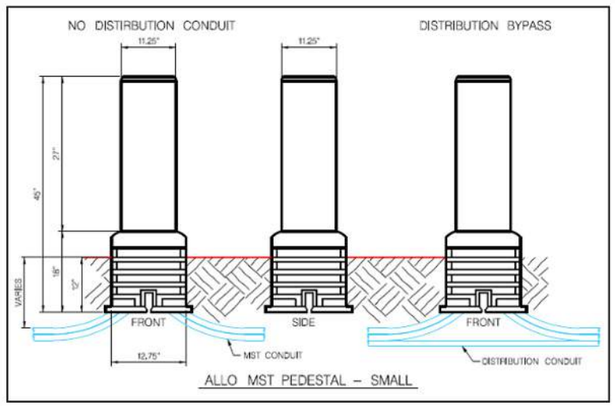
Express Conduit are detailed by midspan call outs.
48f - 288f, 1 - 1.25" per cable Should be expressed to T36, T48, T60 boxes bypassing pedestals.
432f - 864, 1 - 2.0" per cable Should be expressed to T36, T48, T60 boxes bypassing pedestals.



EXPRESS CONDUIT BORE DETAIL



ALLO MST PEDESTAL – LARGE



ALLO MST PEDESTAL – SMALL

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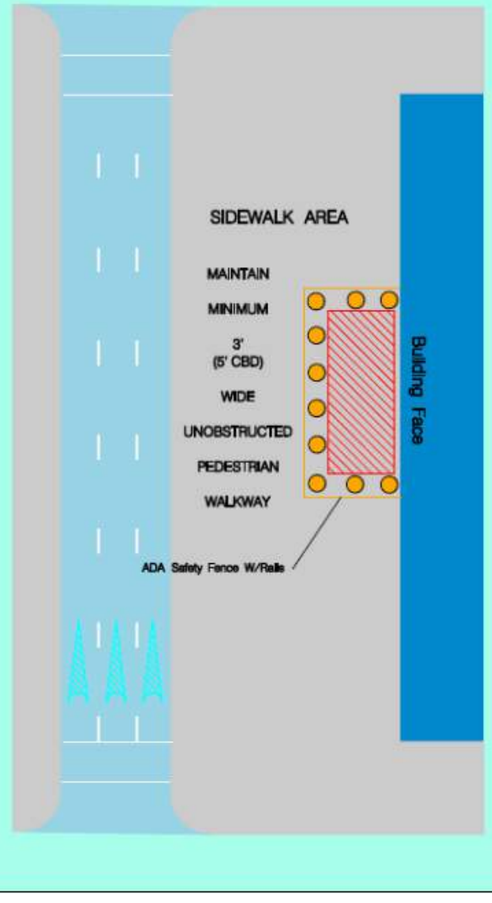
12

WORK IN THE PEDESTRIAN AREAS

Maintain a clear and unobstructed pedestrian walkway around the work zone, or post warning signs for closures at adjoining intersections.

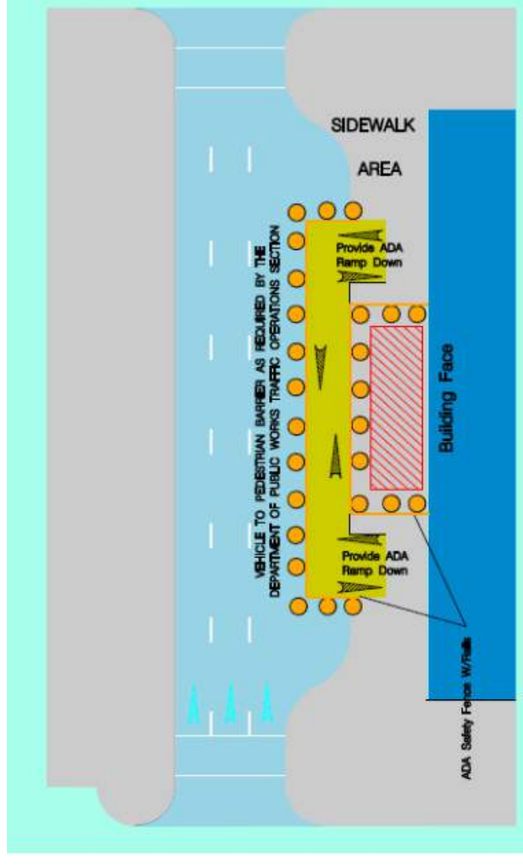


13

WORK IN THE PEDESTRIAN AREAS

PEDESTRIAN DETOUR IN CENTRAL BUSINESS DISTRICT(CBD)

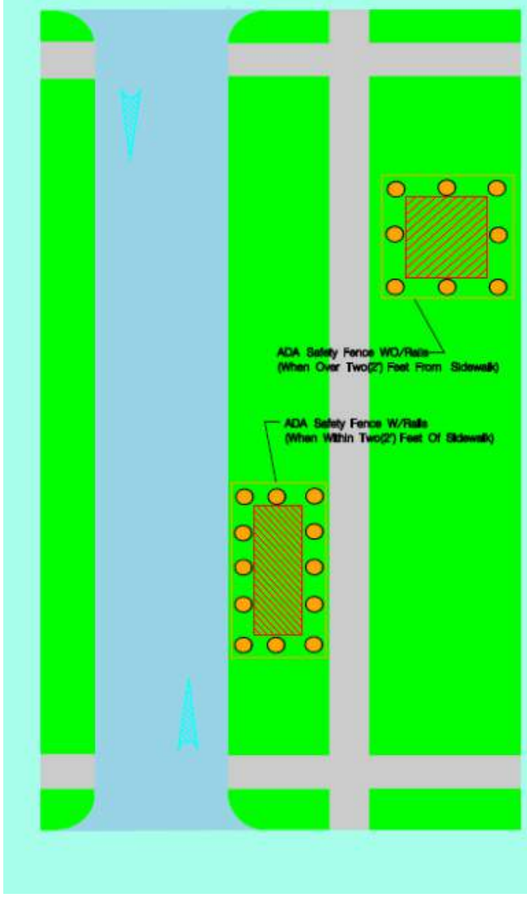
Maintain a minimum of 5' unobstructed pedestrian walkway around the work zone using constructed walkway or protected area as designated by the Department of Public Works Traffic Operations Section.



14

WORK IN THE PEDESTRIAN AREAS

Protection of Excavations & Hazards not in roadways or sidewalks



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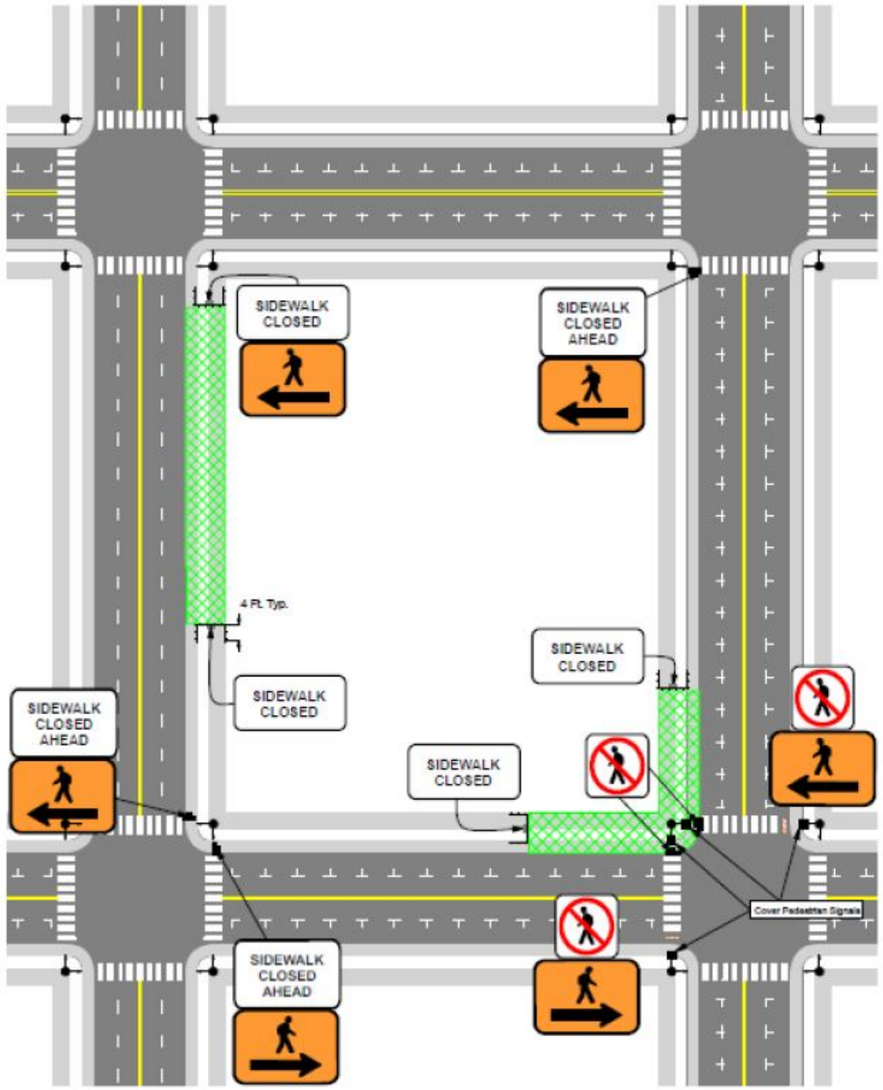
N

Sidewalk Closure

See Page A9 for A, B, C, L Distances

1) This plan shows the pedestrian traffic control measures only. Additional traffic control measures may be required to manage vehicular traffic.



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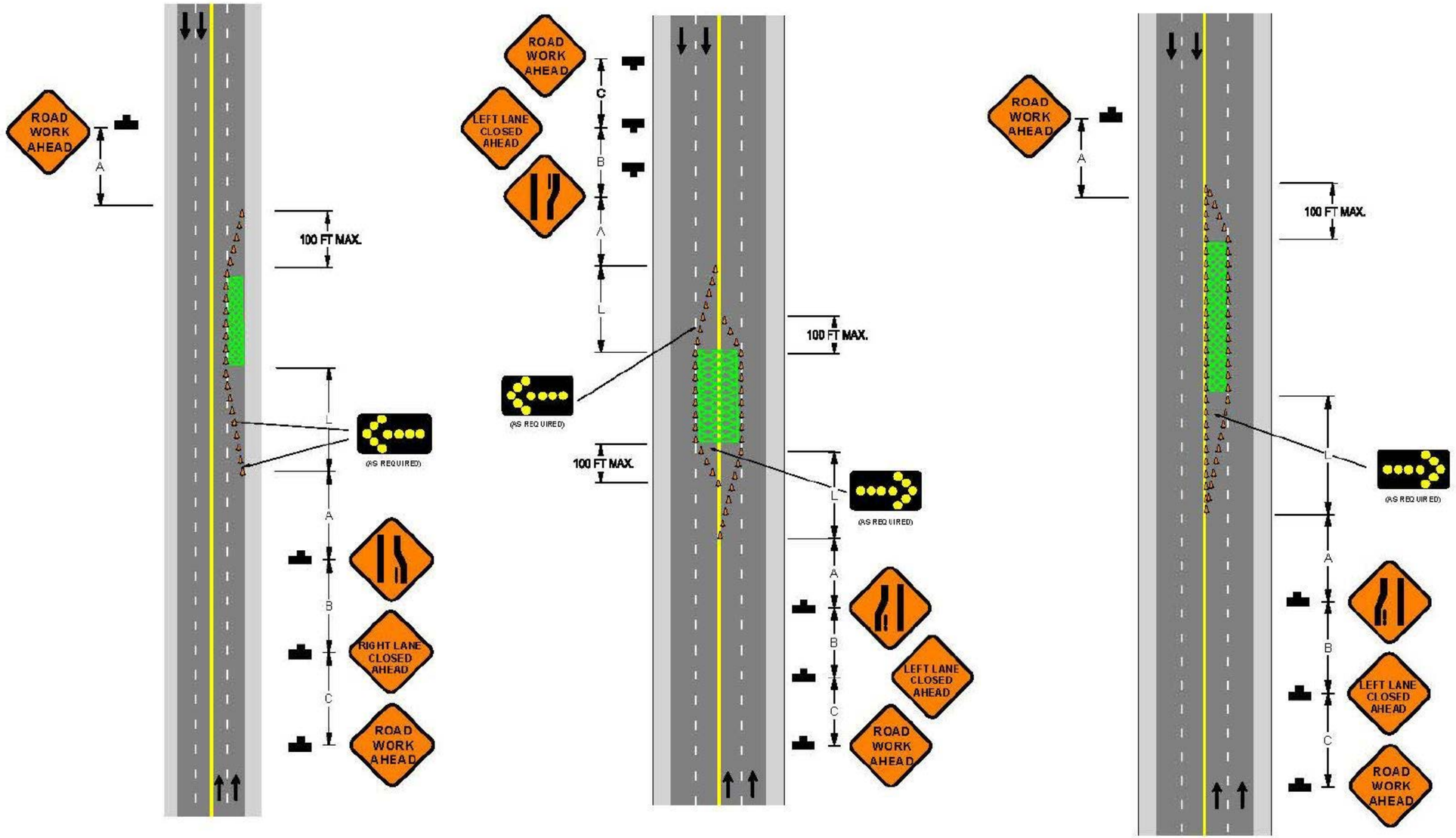
Through Lane Closures on Higher Volume Streets (Collectors, Arterials Etc..)

See Page A9 for A, B, C, L Distances



Legend

- ARROW PANEL
- CHANNELIZING DEVICE
- DIRECTION OF TRAVEL
- SIGN STAND
- WORK AREA

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Through Lane Closures on Higher Volume Streets within Intersections (Collectors, Arterials Etc..)

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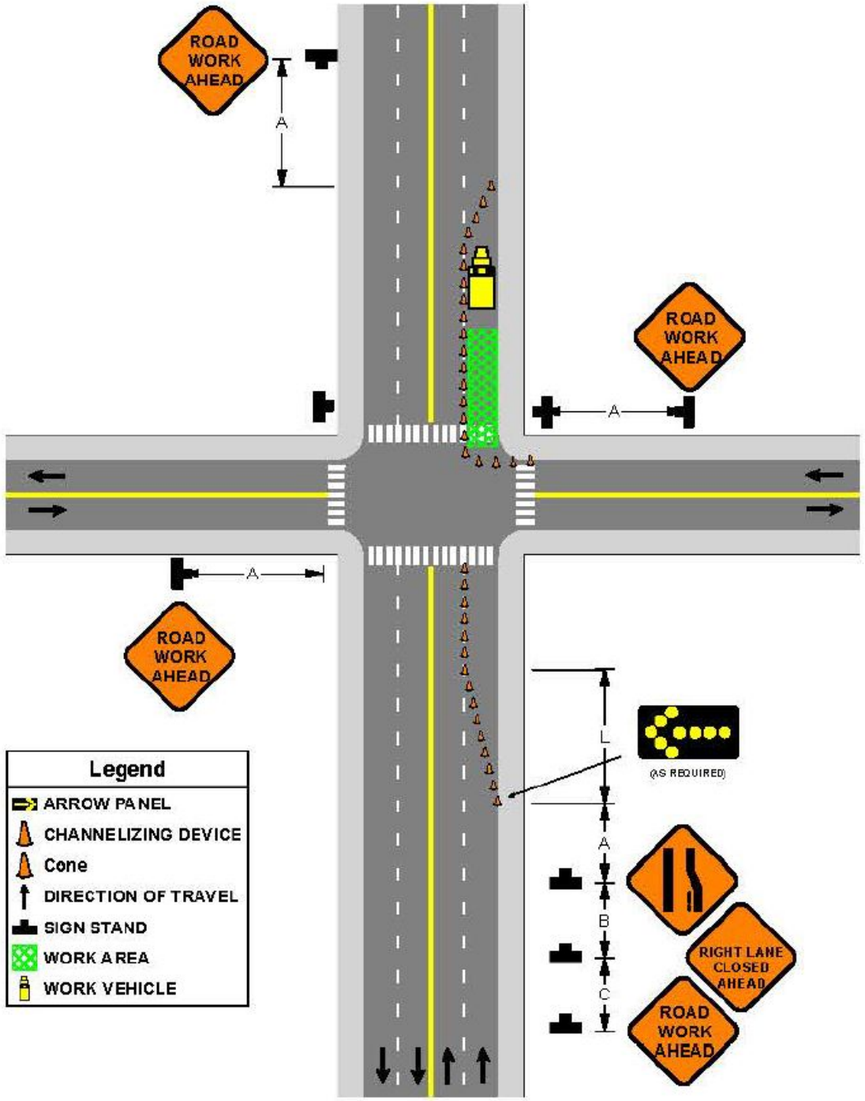

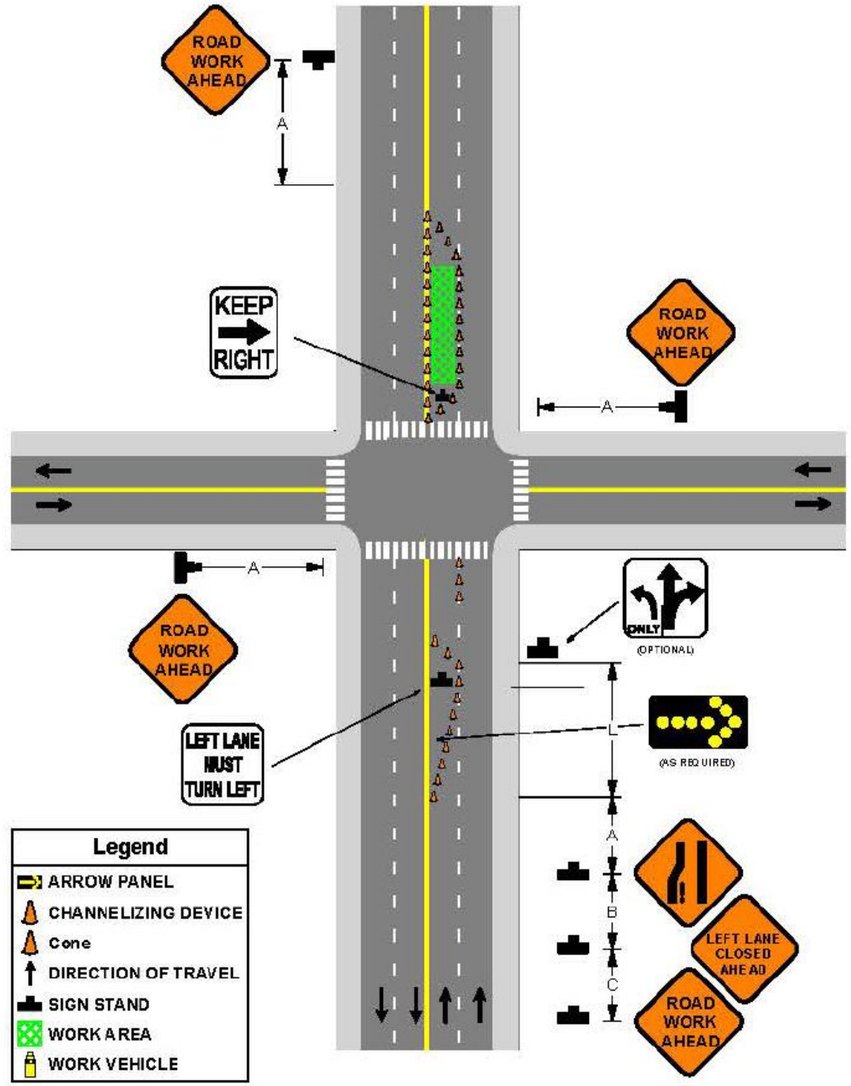

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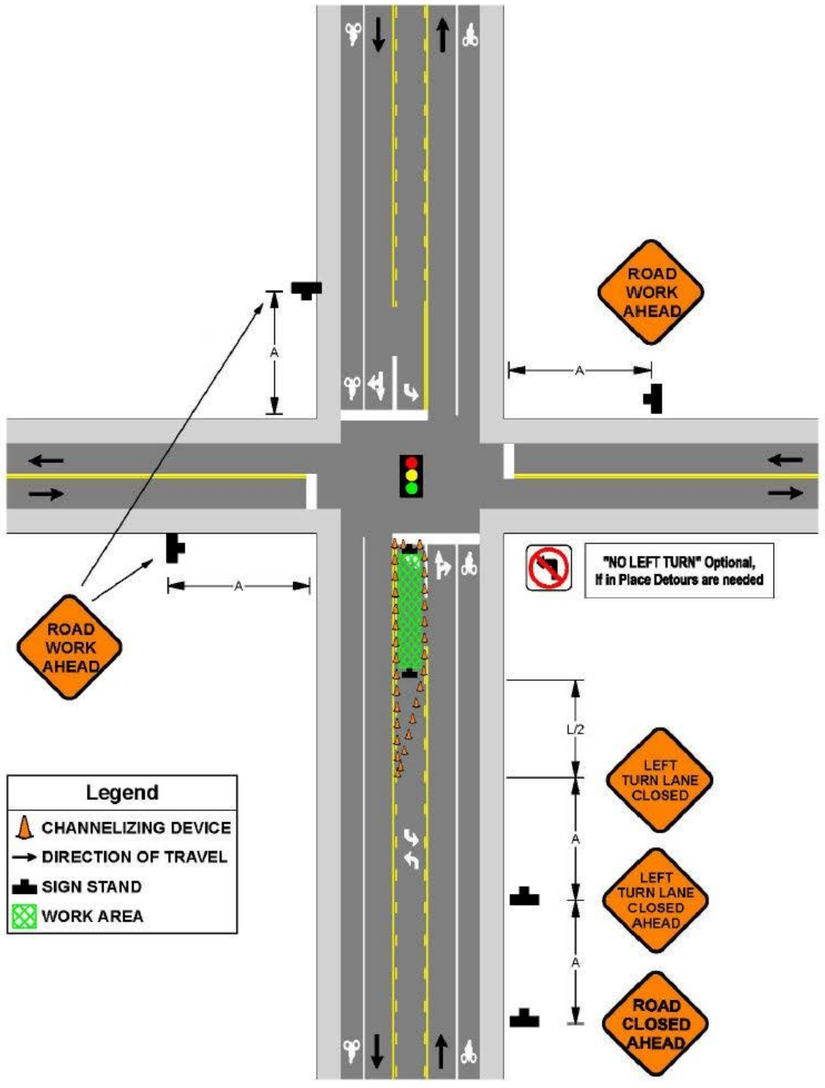
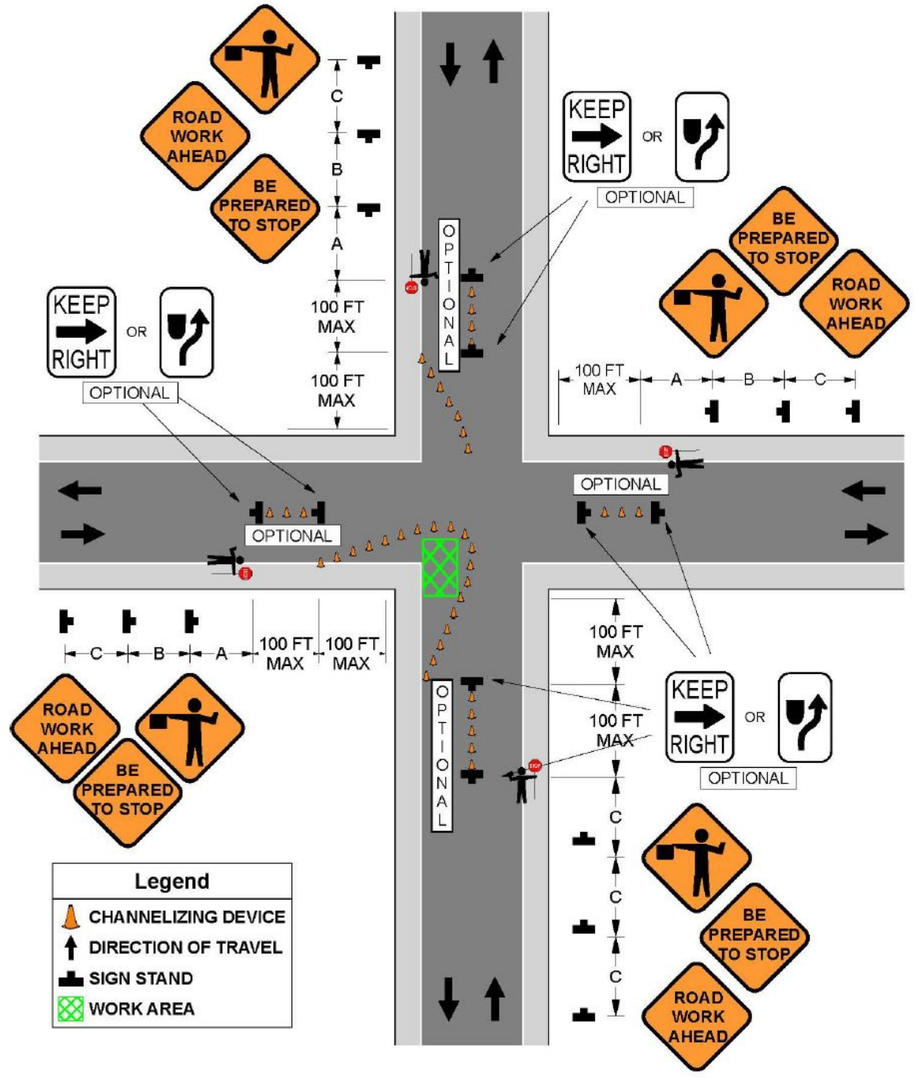
Left/Right Turn Lane Closures on Higher Volume Streets
(I.E. Collectors, Arterials, etc.) Within Signalized Intersections
(Contact Traffic Signal Staff)



Closures on Lower Volume Streets for Workzones within Intersections



See Page A9 for A, B, C, L Distances

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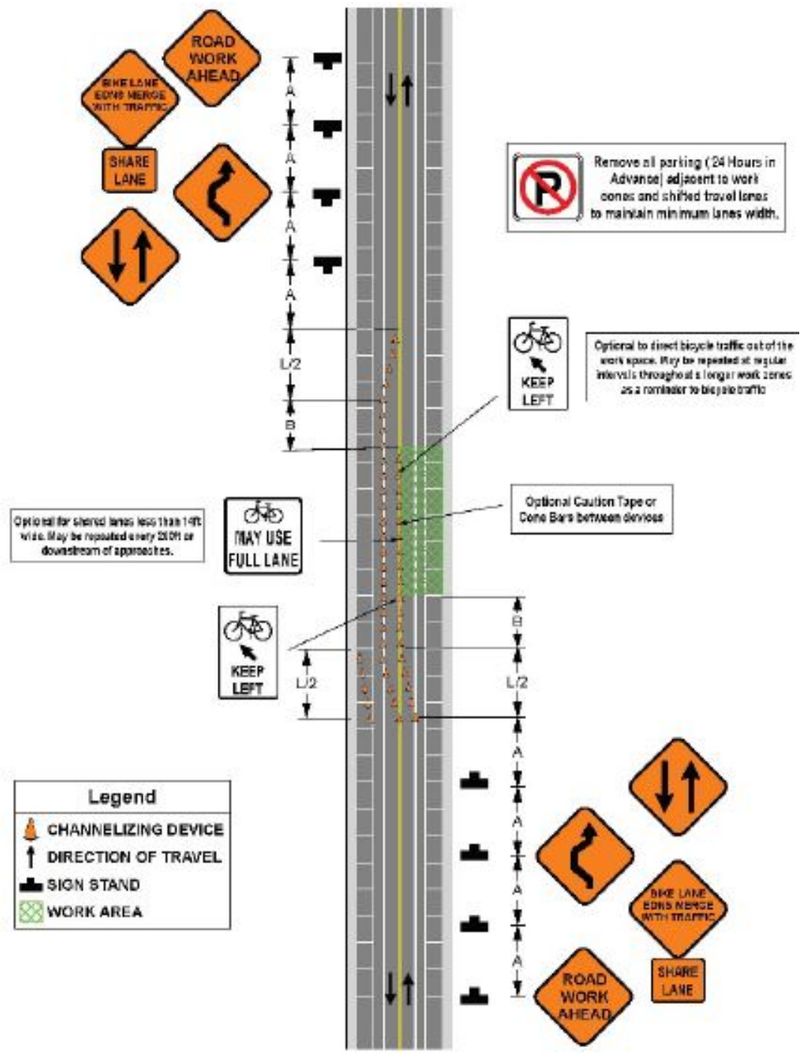
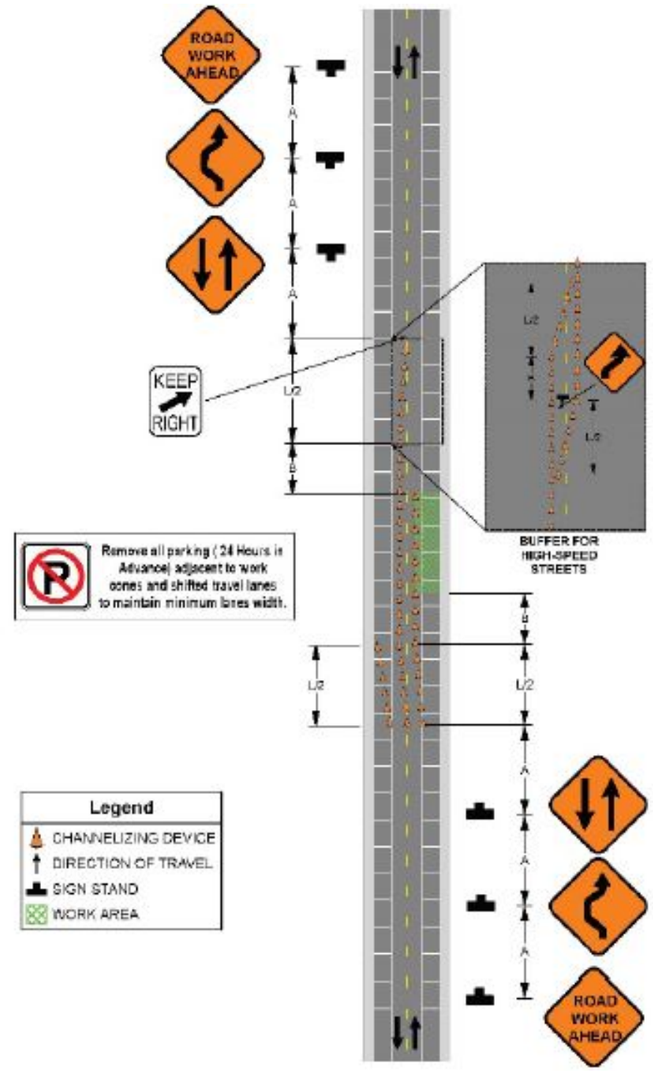
Lane Closures on Lower Volume Streets for Workzones along Corridors with Bike Lanes and On-Street Parking

See Page A9 for A, B, C, L Distances





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Partial street Closures on Lower Volume Streets

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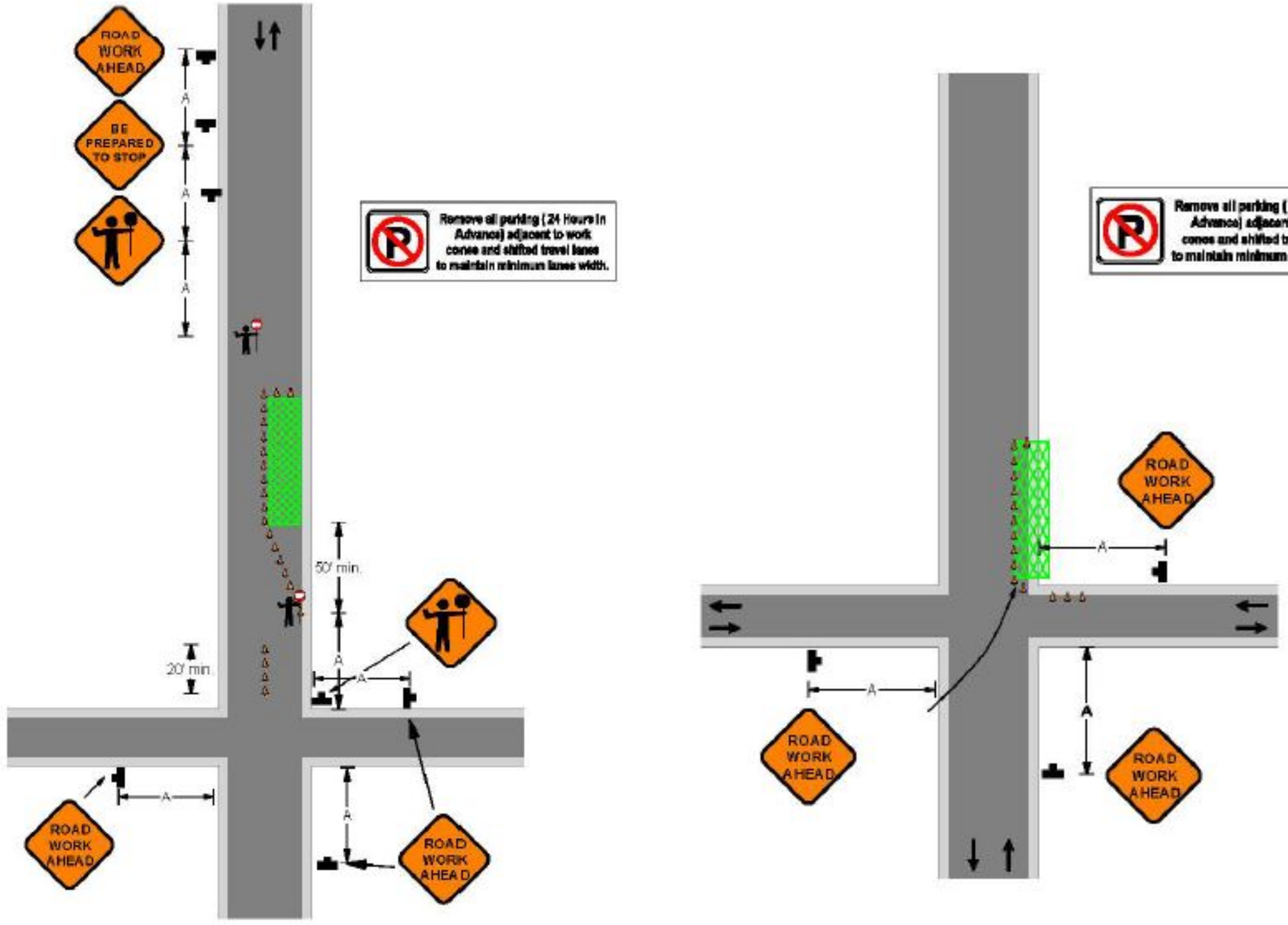

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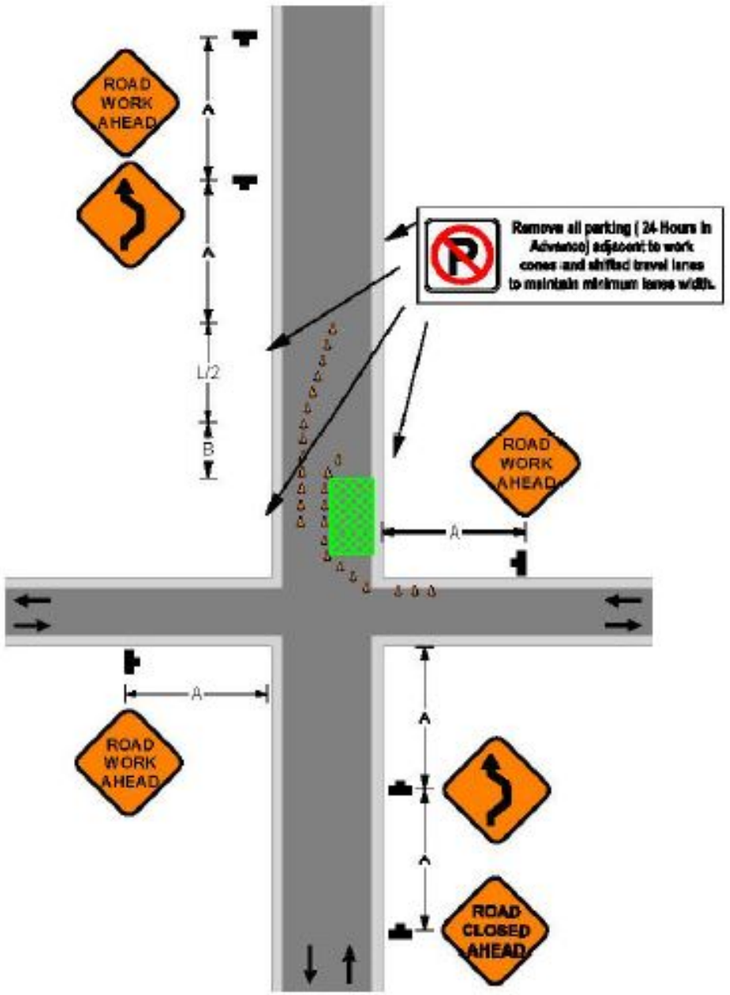
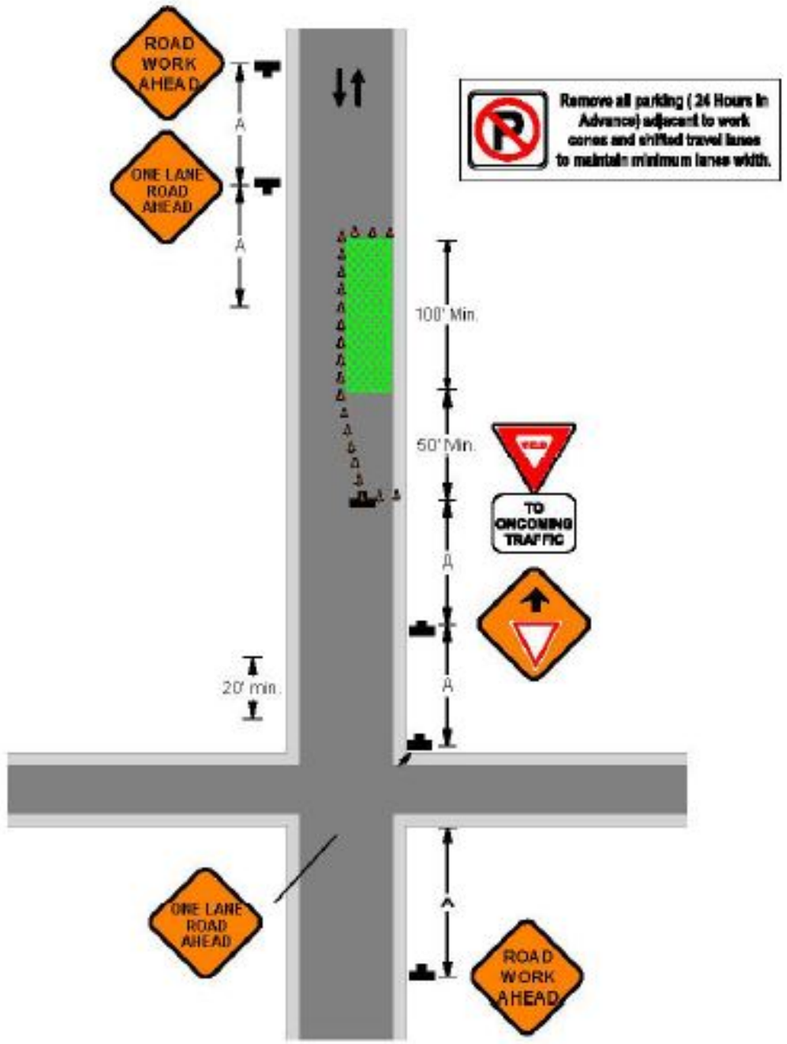
Partial street Closures on Lower Volume Streets





See Page A9 for A, B, C, L Distances

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Road Type	Distance Between Signs**		
	A	B	C
Urban (low speed)*	100 feet	100 feet	100 feet
Urban (high speed)*	350 feet	350 feet	350 feet
Rural	500 feet	500 feet	500 feet
Expressway / Freeway	1,000 feet	1,500 feet	2,640 feet

Type of Taper	Taper Length (L)
Merging Taper	At least L
Shifting Taper	At least 0.5 L
Shoulder Taper	At least .33 L
One-Lane, Two Way Traffic Taper	100 Ft. (30m) Maximum
Downstream Taper	100 Ft. (30m) per Lane

Speed (S)	Taper Length (L) in feet
40 mph or less	$L = \frac{WS^2}{60}$
45 mph or more	$L = WS$

Where: L = taper length in feet
W = width of offset in feet
S = posted speed limit, or off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

Lane Width	Speed in MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH
10 Ft.	Merging Taper	105'	150'	205'	270'	450'	500'	550'	600'	650'
11 Ft.	Merging Taper	115'	165'	225'	294'	495'	550'	605'	660'	715'
12 Ft.	Merging Taper	125'	180'	245'	320'	540'	600'	660'	720'	780'

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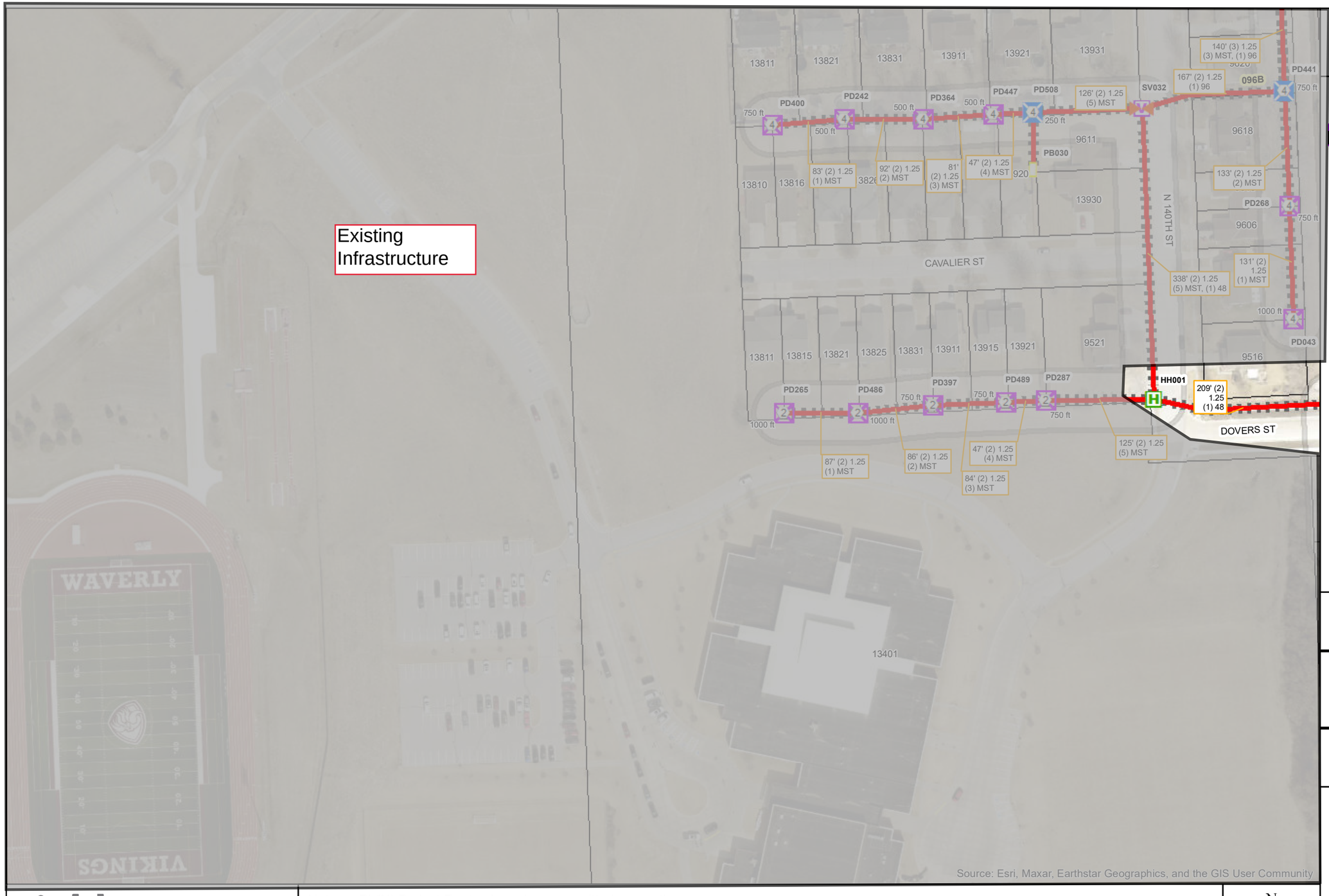
Existing Infrastructure



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

PON: WAV-01-001

DCR:

PERMIT:

LEGEND Date: 10/23/2023

PON

FIBEREQUIPMENT

- MST 4
- MST 2

SPLICECLOSURE

- Underground

STRUCTURE

- Large PED
- Small PED
- T18
- T36 Vault
- T48 Vault

ROUTE

Placement Type

- UG Bore

Future MDU Drop

- Future MDU Drop
- Conduit
- MST Runs

DI66	DI67	DI68
DJ66	DJ67	DJ68
DK66	DK67	DK68

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Notes: PLCS Project Routes have been permitted seperatly

Revisions:

N

1 in = 113 ft

PON: WAV-01-001

DCR:

PERMIT:

LEGEND Date: 10/23/2023

PON

FIBEREQUIPMENT

MST 4

MST 2

SPLICECLOSURE

Underground

STRUCTURE

Large PED

Small PED

T48 Vault

ROUTE

Placement Type

UG Bore

Future MDU Drop

Future MDU Drop

Conduit

MST Runs

Existing Infrastructure

DI67	DI68	DI69
DJ67	DJ68	DJ69
DK67	DK68	DK69

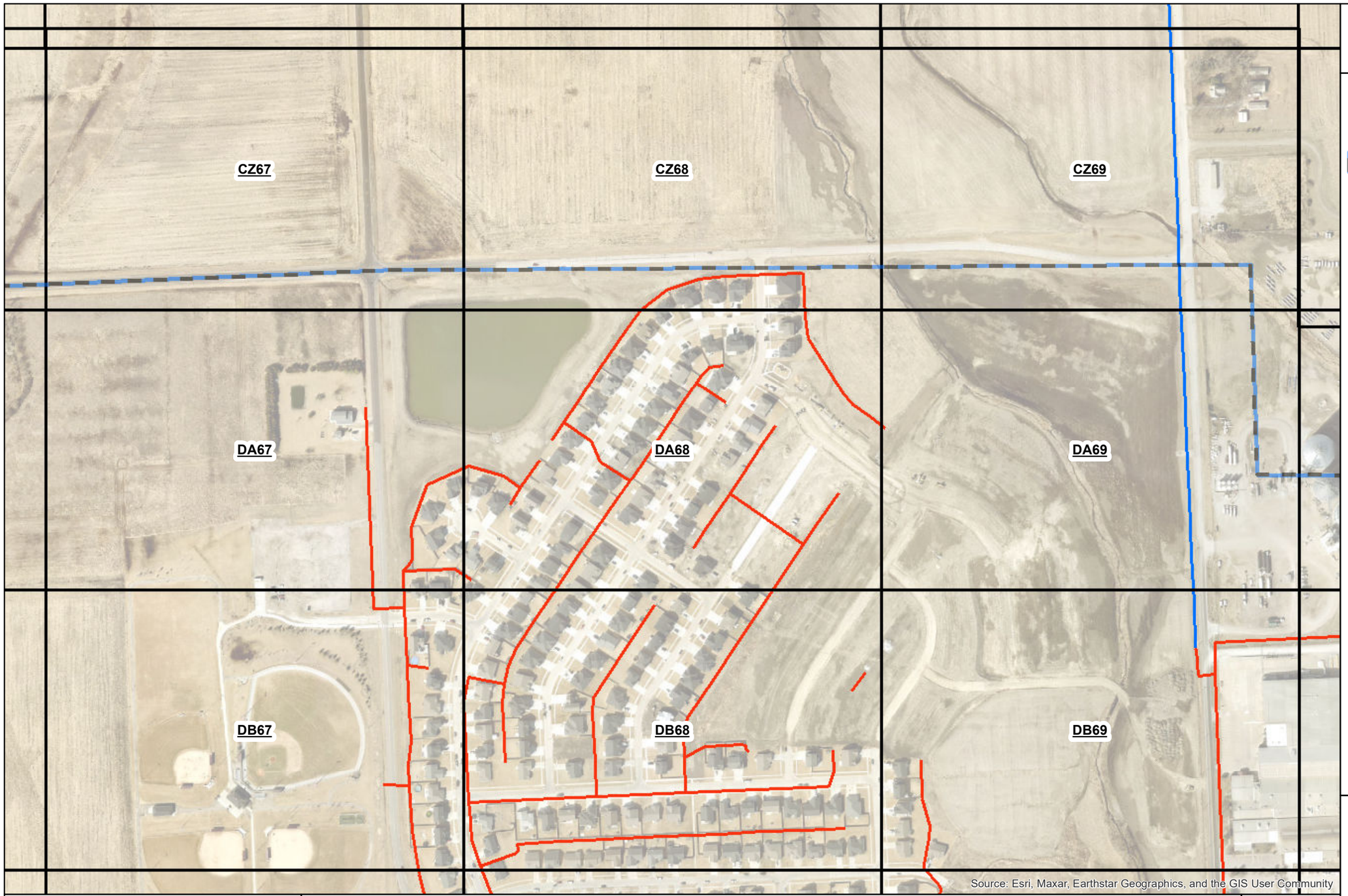
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Notes: PLCS Project Routes have been permitted seperatly

Revisions:

N

1 in = 113 ft



PON: WAV-01-002

DCR:

PERMIT:

LEGEND Date: 10/20/2023

PON

ROUTE

Underground

Note: "For clarity and simplicity, Sheets with no conduit (edges particularly) are not shown"

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Notes:

Revisions: 10/27/23: Modified structure placement on page DA68

N

1 in = 320 ft

PON: WAV-01-002

DCR:

PERMIT:

LEGEND Date: 10/20/2023

PON

FIBEREQUIPMENT

MST 4

MST 2

SPLICECLOSURE

Underground

STRUCTURE

Small PED

T36 Vault

T48 Vault

ROUTE

Placement Type

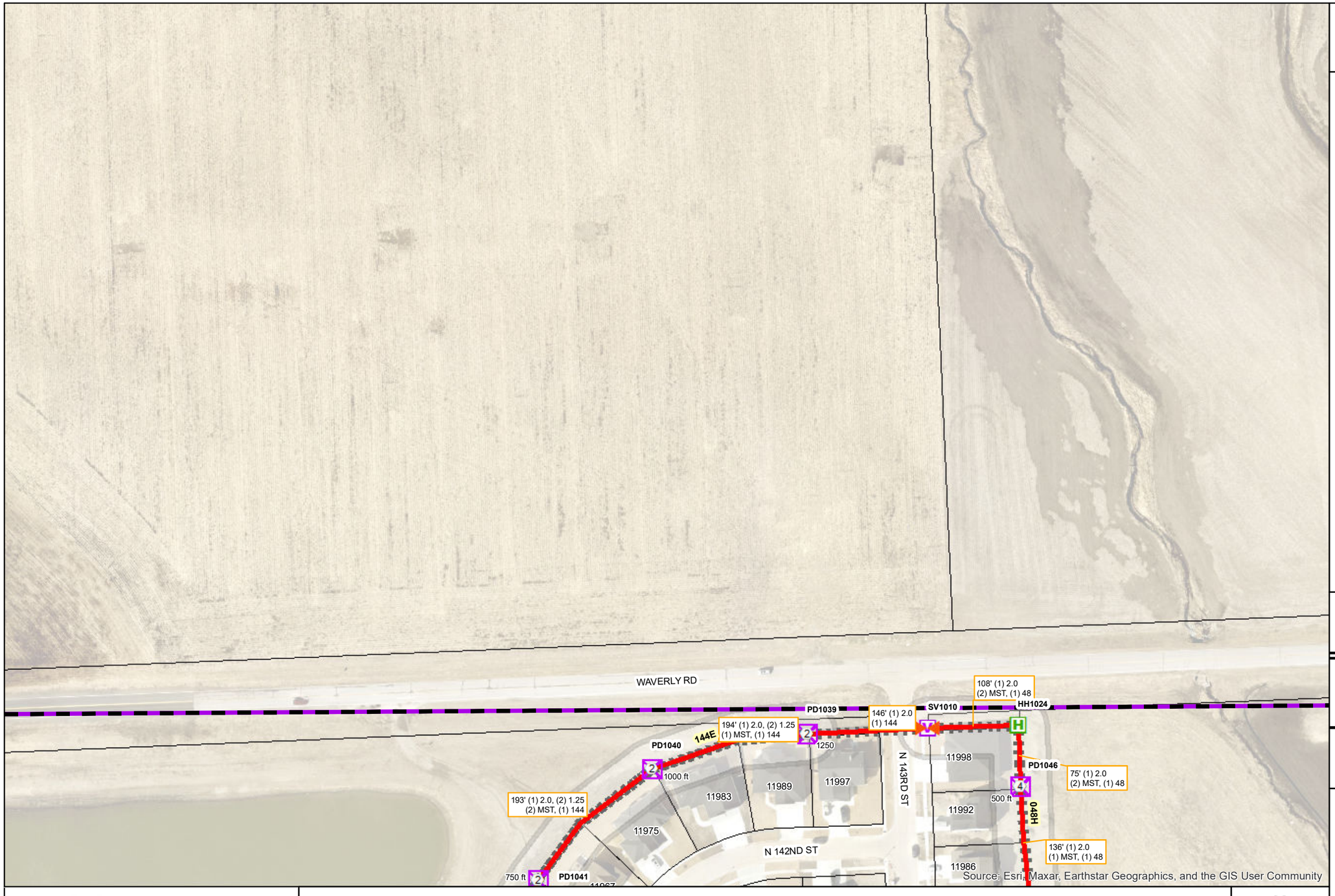
UG Bore

Future MDU Drop

Future MDU Drop

Conduit

MST Runs



AV173	AV174	AV175
CZ67	CZ68	CZ69
DA67	DA68	DA69

Notes: PLCS Project Routes have been permitted seperatly

Revisions:

N

1 in = 118 ft

PON: WAV-01-002

DCR:

PERMIT:

LEGEND Date: 10/27/2023

PON

FIBEREQUIPMENT

- MST 6
- MST 4
- MST 2

SPLICECLOSURE

- Underground

STRUCTURE

- Large PED
- Small PED
- T36 Vault
- T48 Vault

ROUTE

Placement Type

- UG Bore

Future MDU Drop

- Future MDU Drop
- Conduit
- MST Runs

CZ67	CZ68	CZ69
DA67	DA68	DA69
DB67	DB68	DB69

Built Previously with Waverly PON 02.

Built with LES in Joint Trench

Existing PED

Notes:

Revisions: 10/27/23: Moved HH1022 to northeast corner of 11926 N 142nd St

N

1 in = 113 ft

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

PON: WAV-01-002

DCR:

PERMIT:

LEGEND Date: 10/20/2023

PON

FIBEREQUIPMENT

- MST 6
- MST 4
- MST 2

SPLICECLOSURE

- Underground

STRUCTURE

- Large PED
- Small PED
- T36 Vault
- T48 Vault

ROUTE

Placement Type

- UG Bore
- Conduit
- MST Runs

DA67	DA68	DA69
DB67	DB68	DB69
DC67	DC68	DC69

Existing PEDs

Notes: Greyed out area Previously built with Waverly PON 02 and with LES in Joint Trench.

Revisions:

N

1 in = 118 ft

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Waverly Water Study

Council Meeting - November 14, 2023

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Overview

- Population Projections
- Water Demands
- Water Quality
- Existing Facilities
- Recommended Projects/Improvements

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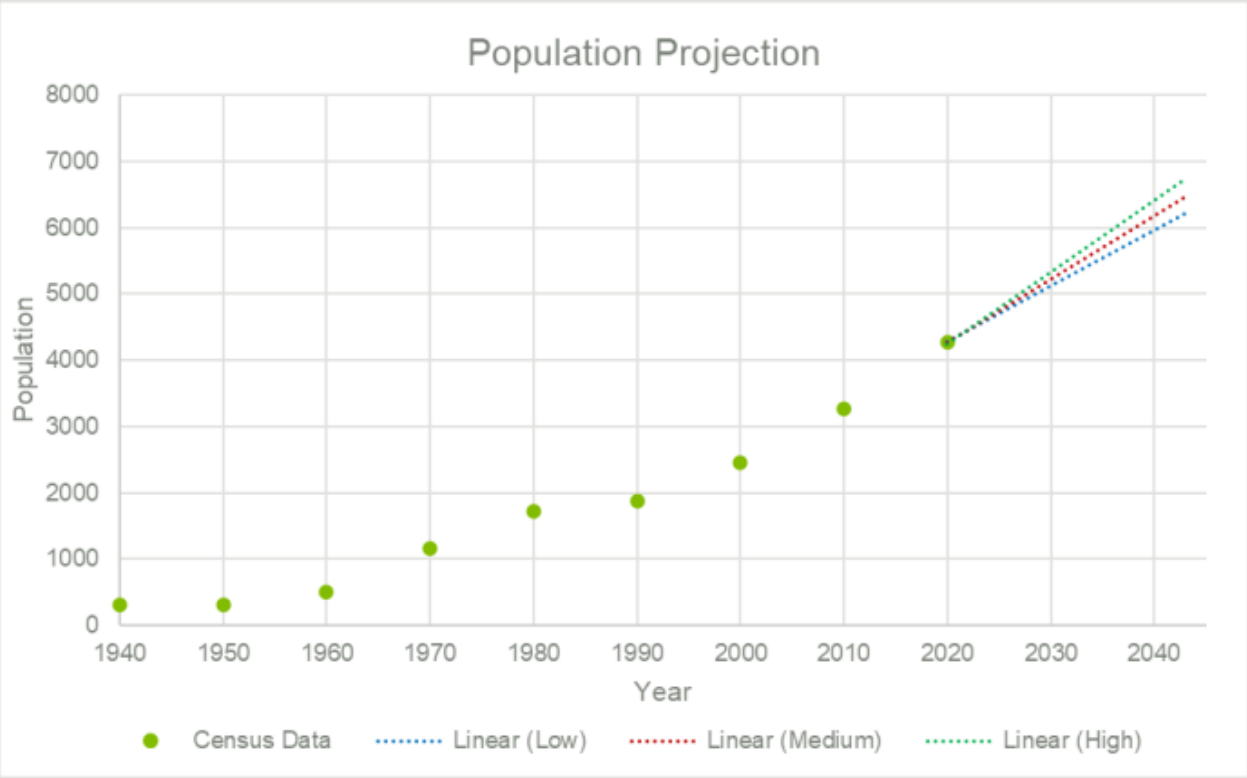
Population Projections



- Current: 4,532 people
- Projected 2043: 6,734 people
- Growth rate based on 2023 Comprehensive Plan
  - 2.5% growth - conservative high estimate

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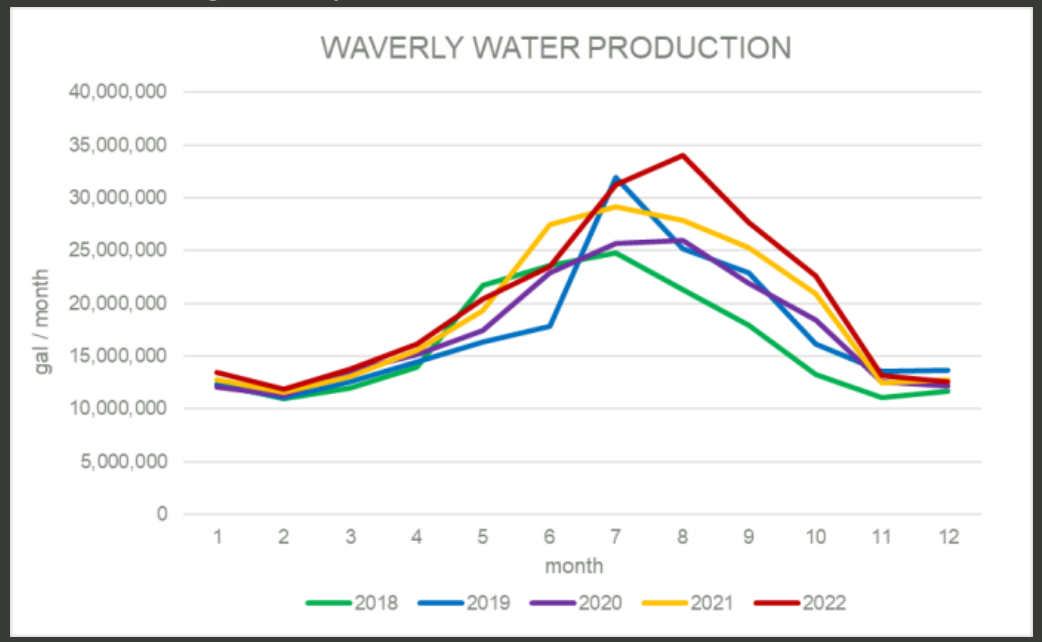
Water Demands

- Average water use: 591,000 gpd and 138 gpcd
- Peak use in summer months
- Peak hour use in mornings and evenings (tied to lawn irrigation)



	2023	2033	2043
Population	4,532	5,667	6,734
Per Capita Demand (gpcd)	138	138	138
Avg. Daily Demand (gpd)	591,265	784,802	932,537
Avg. Daily Demand (gpm)	411	545	648
Peak Day/Avg. Day Ratio	1.85	1.85	1.85
Peak Hour/Peak Day Ratio	2.02	2.02	2.02
Peak Day Demand (gpm)	761	1,010	1,201
Peak Hour Demand (gpm)	1,538	2,041	2,425
Residential Fire Flow			
Residential Fire Demand (gpm)	1,500	1,500	1,500
Fire Flow + Average Day Demand (gpm)	1,911	2,045	2,148
Commercial Fire Flow			
Commercial Fire Demands (gpm)	3,500	3,500	3,500
Fire Flow + Average Day Demand (gpm)	3,911	4,045	4,148

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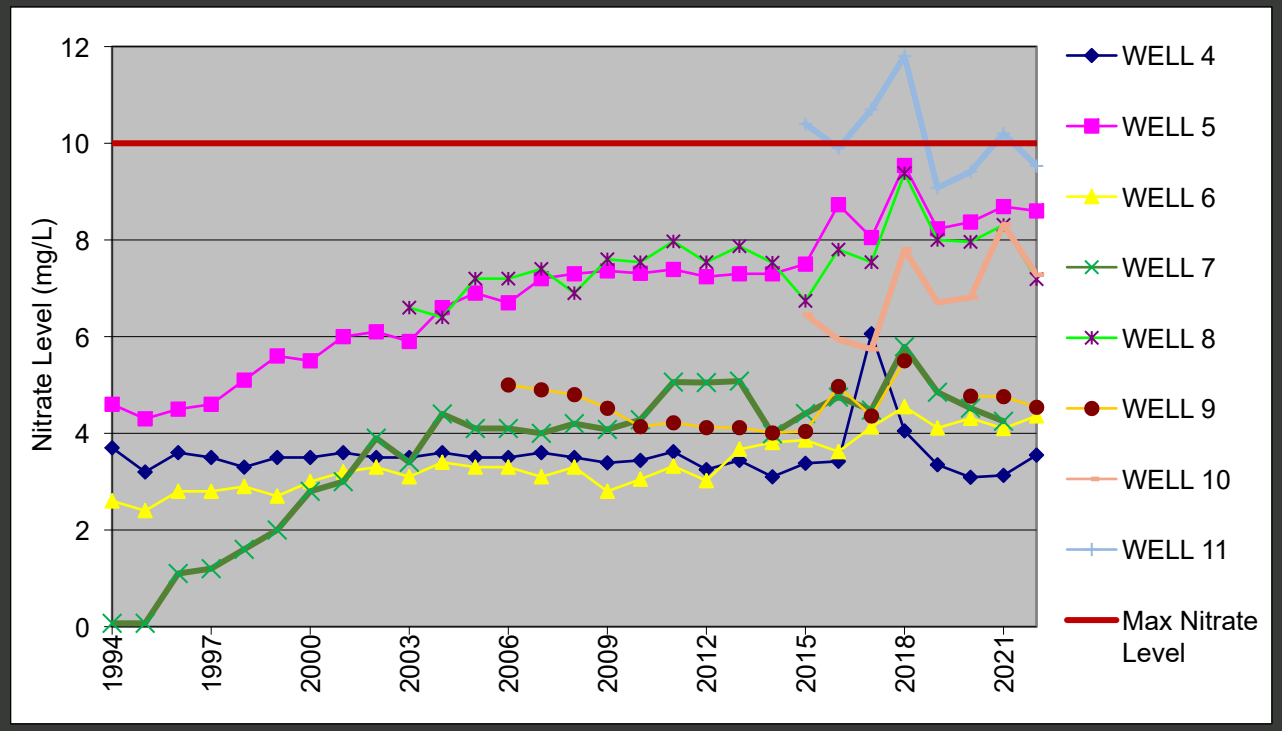
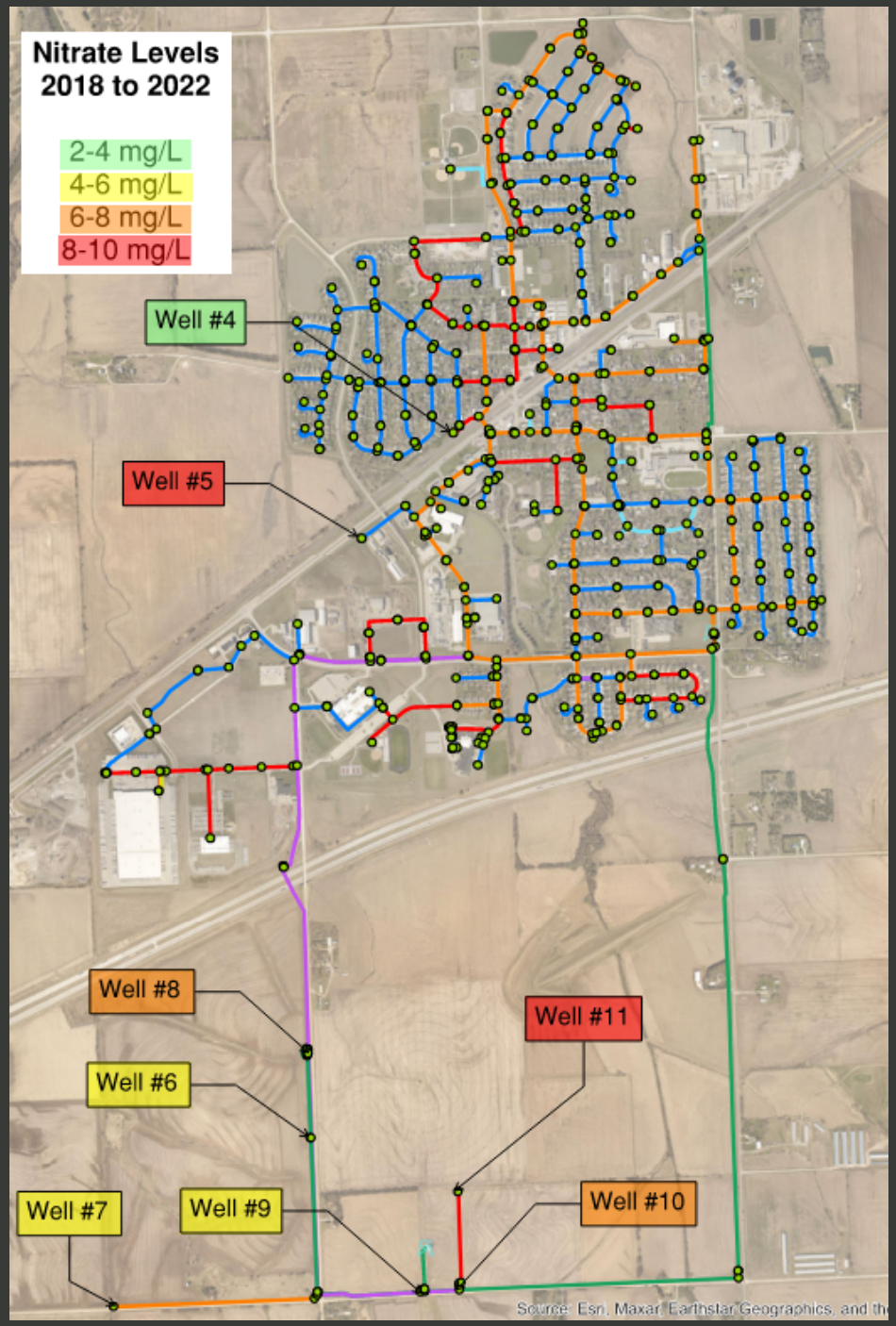
Water Quality

- No current water quality issues, but nitrates increasing
- Nitrate solutions
  - Blending existing wells
  - New water source (LWS or new wells)

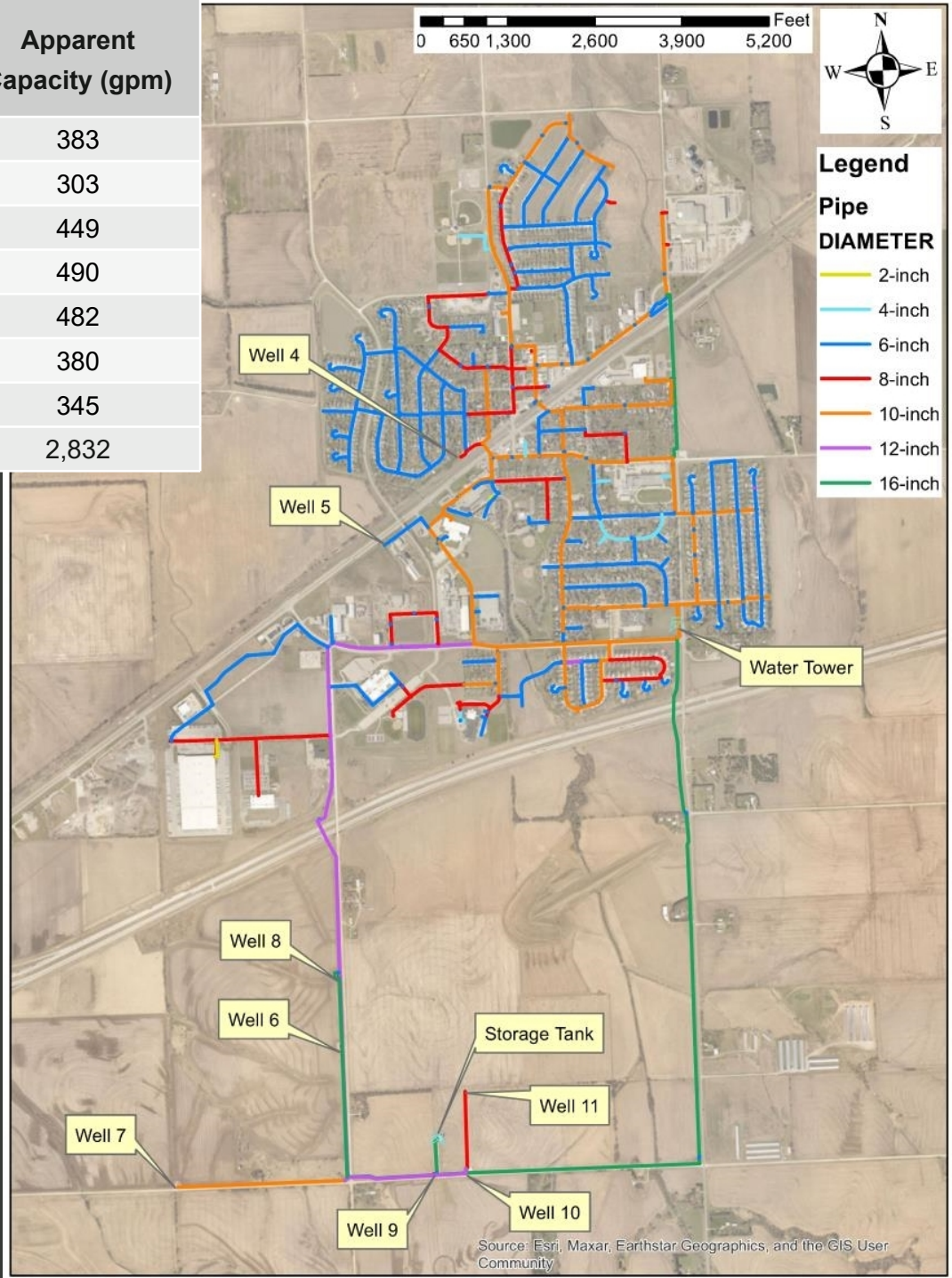




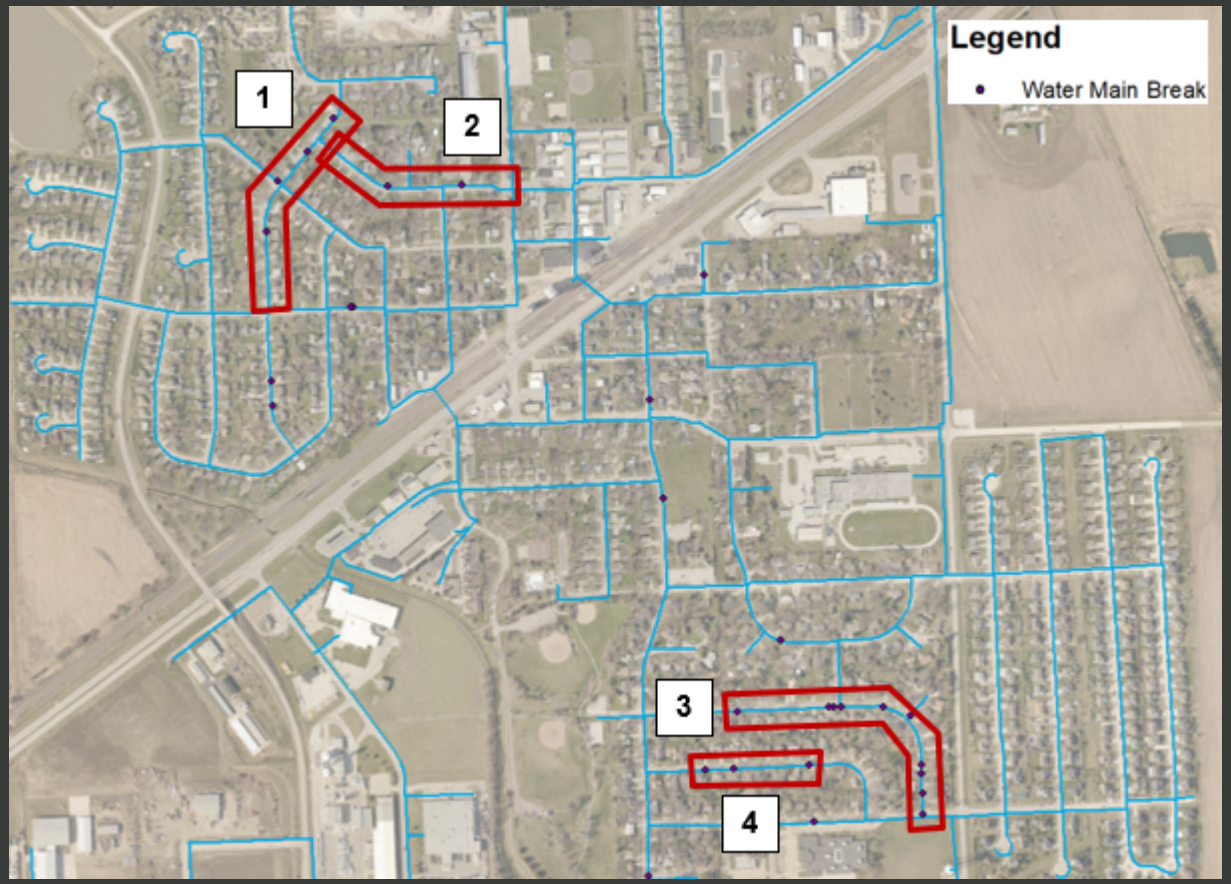
Existing Facilities

- Two storage tanks: 1M gal total
  - Sufficiently sized to meet requirements
- Total well capacity: 2,832 gpm
  - Peak hour demand: 1,538 gpm → sufficient well pump capacity to meet demands plus storage to supplement peaks
- Half wells run each day, ideally for maximum 12-15 hours to minimize wear or overheating
- City moving from odd/even schedule to balance capacity across well field

Well #	Backup Power Connection Available (Y/N)	Apparent Capacity (gpm)
4	N	383
5	N	303
6	Y	449
8	Y	490
9	Y	482
10	Y	380
11	Y	345
Total Capacity		2,832



Replacement due to Main Breaks



- Areas with concentrated main breaks - 1998 to present
    1. N 137th St from Newgate St to Jamestown St
    2. Lancashire St from N 137th St to N 141st St (designed)
    3. Eastbourne St/N 147th St (designed)
    4. Danvers St

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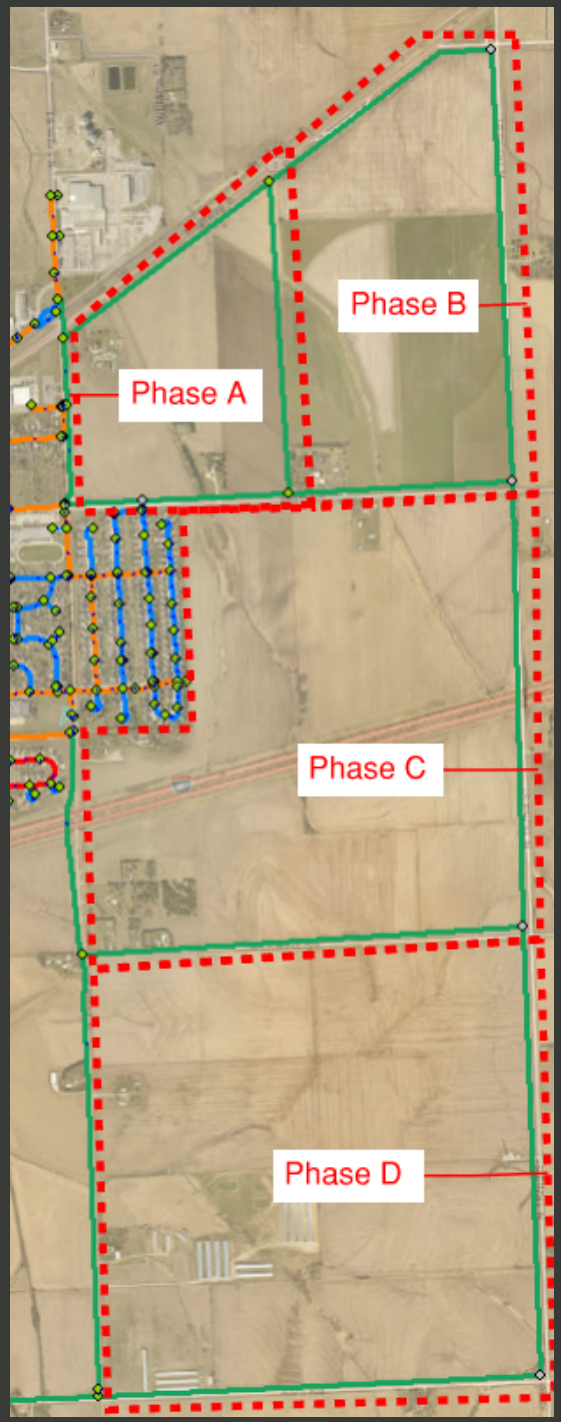
Future Growth

- New development planned east of Waverly in the next 15-20 years
  - Proposed 16-inch loop around area (phased)
  - Conservatively expect 15,000 population increase from full buildout – 1,438 gpm
  - Average demands can be met but may need additional wells or storage to meet peak demands
- Future industry/commercial development to be evaluated on a case-by-case basis to ensure adequate pressures and water supply to facility



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Recommended Improvements

- 1 – Replace 4-inch main on Oak Ln with 6-inch to meet fire flow requirements
- 2 – Create looped connection to Northloch St to improve fire flow
- 3 – 16-inch loop for future development
- 4 – Create looped connection from Well #5 to Energy Way to provide redundancy for well
- 5-8 – Replacing water mains in areas with numerous main breaks

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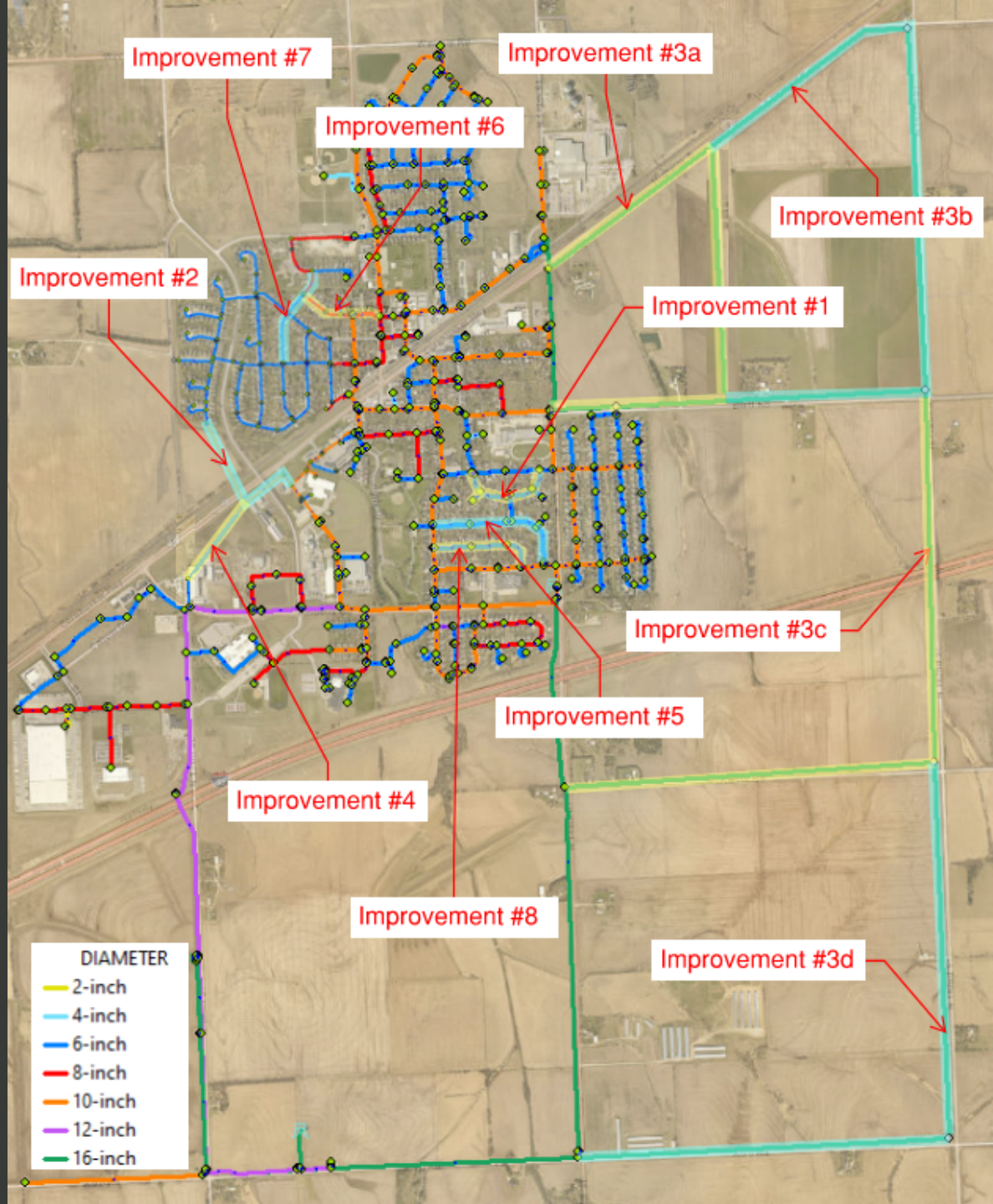
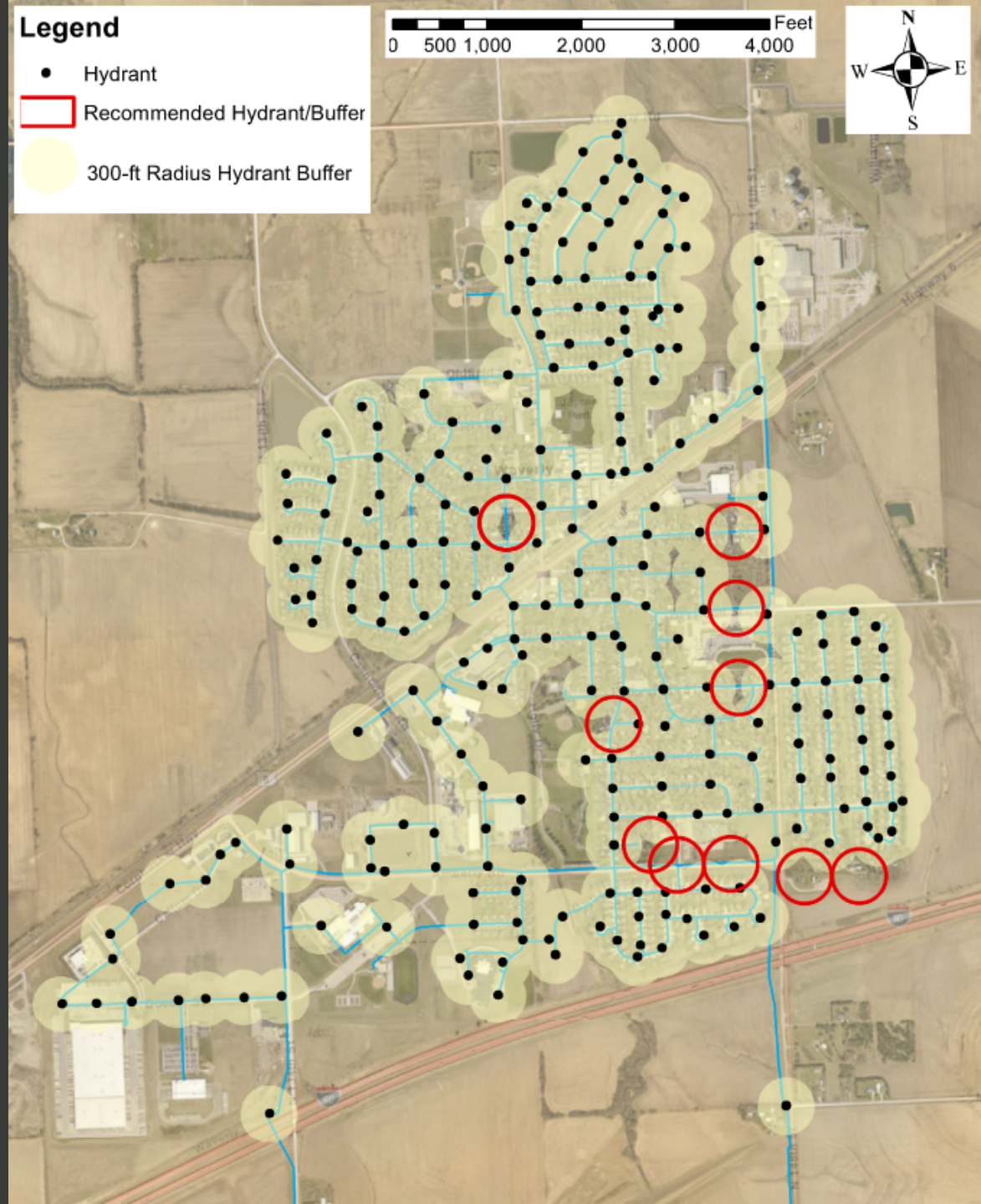


Recommended Improvements

- 9 – Installing hydrants in 8 key locations to meet recommended coverage
- 10 – Replace old metal water mains – 29% of system
  - Higher likelihood of failure; replace over ~20 years
- 11 – Nitrate/Well Siting/LWS Feasibility Study
  - Locate a new well or look into blending or alternate source
- 12 – Blending system design & construction
- 13 – New Well



Improvement Costs and Priority

No.	Description	Quantity	Estimated Cost	Timeframe
1	Oak Ln Water Main Upsize	1,525 LF 6" Main	$ 203,000	0-3 Years
2	Looped Connection to Northloch St	2,160 LF 10" Main	$ 715,000	0-5 Years
3a	Future 16" Loop around East Development Area - Northwest	9,500 LF 16" Main	$ 2,356,000	0-10 Years
3b	Future 16" Loop around East Development Area - Northeast	10,900 LF 16" Main	$ 2,704,000	As needed to support growth
3c	Future 16" Loop around East Development Area - Central	10,500 LF 16" Main	$ 2,604,000	As needed to support growth
3d	Future 16" Loop around East Development Area - South	10,500 LF 16" Main	$ 2,604,000	As needed to support growth
4	Construct Water Main between N 134th St and Well #5	2,000 LF 6" Main	$ 186,000	0-5 Years
5	Eastbourne St Main Replacement	2,335 LF 6" Main	$ 311,000	0-2 Years
6	Lancashire St Main Replacement	1,185 LF 8" and 230 LF 6" Main	$ 242,000	0-2 Years
7	N 137th St Main Replacement	370 LF 8" and 1,050 LF 6" Main	$ 206,000	0-5 Years
8	Danvers St Main Replacement	1,480 LF 6" Main	$ 197,000	0-5 Years
9	Install New Hydrants to Improve Coverage	8 Hydrants	$ 56,000	0-3 Years
10	Replace Old Metal Water Mains (Over 20 Years)	158,615 LF, various sizes	$ 24,687,000	0-20 Years
11	Nitrate/Well Study/LWS Feasibility	Engineering Study	$ 11,000	0-3 Years
12	Blending Vault	Vault Design & Construction	$ 17,000	5-10 Years
13	New Well	1 Well (Design & Construction)	$ 700,000	0-10 Years
		TOTAL COST OF RECOMMENDED IMPROVEMENTS	$48,169,991	

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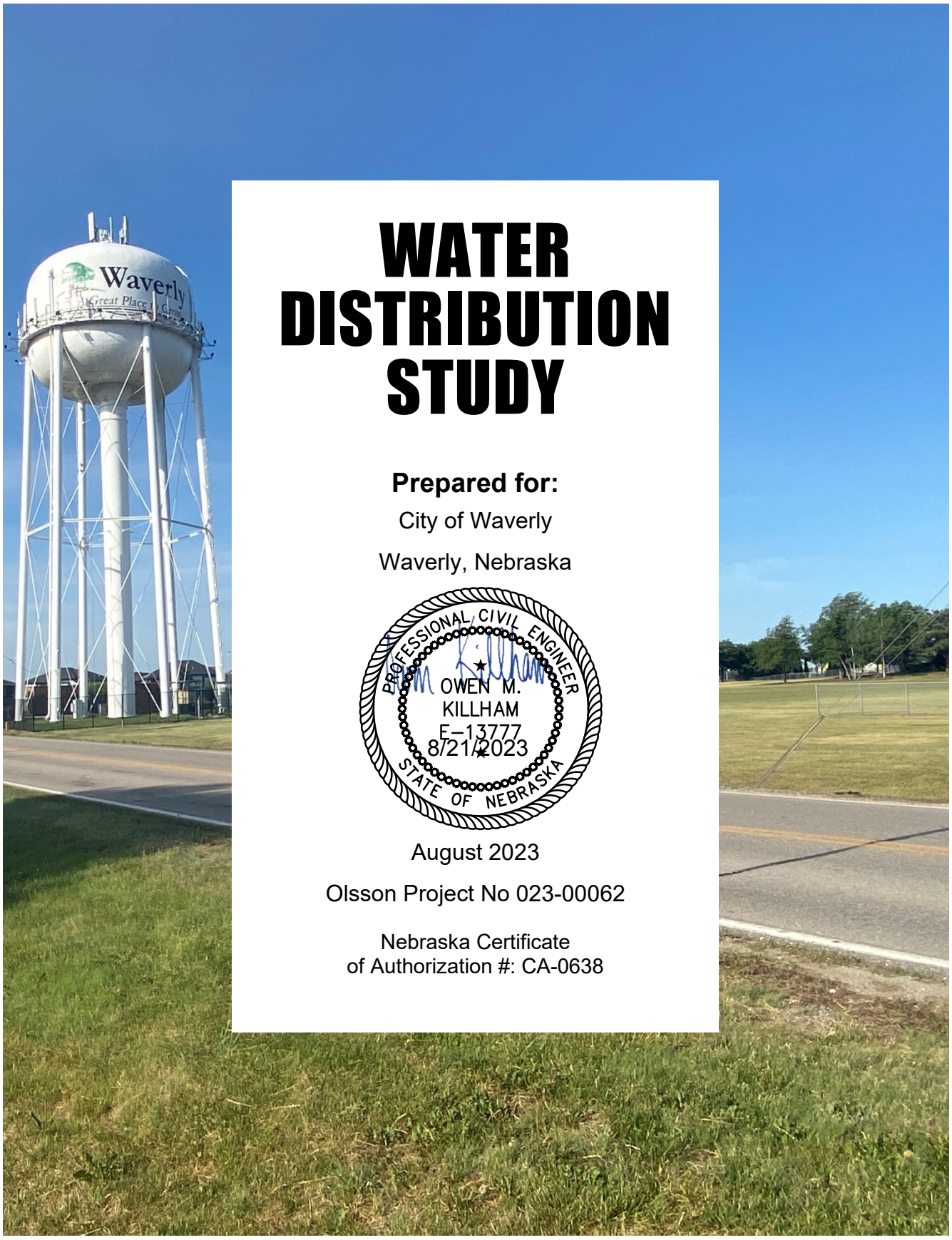

WATER DISTRIBUTION STUDY

Prepared for:

City of Waverly

Waverly, Nebraska

PROFESSIONAL CIVIL ENGINEER
OWEN M. KILLHAM
E-13777
8/21/2023
STATE OF NEBRASKA

August 2023

Olsson Project No 023-00062

Nebraska Certificate
of Authorization #: CA-0638

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ABBREVIATIONS

µg/L ..... micrograms per liter
AWWA ..... American Water Works Association
$CACO_3$ ..... calcium carbonate
CDBG ..... Community Development Block Grant
cfu ..... colony forming unit
CIP ..... cast iron pipe
DBCP 1,2-Dibromo-3-chloropropane
DIP ..... ductile iron pipe
DWSRF ..... Drinking Water State Revolving Fund
EA ..... each
EDA ..... Economic Development Administration
EPA ..... Environmental Protection Agency
FEMA ..... Federal Emergency Management Agency
fps ..... feet per second
gal ..... gallons
GIS ..... geograpical information system
gpcd ..... gallons per capita per day
gpd ..... gallons per day
gpm ..... gallons per minute
HFPO-DA ..... Hexafluoropropylene oxide-dimer acid
ISO ..... Insurance Services Office
IUP ..... Intended Use Plan
JEO ..... Johnson Erickson O'Brien
kW ..... kilowatt
LF ..... linear feet
LWS ..... Lincoln Water System
MCL ..... Maximum Contaminant Level
MCLG ..... Maximum Contaminant Level Goal
MFL ..... million fibres per liter
MGD ..... million gallons per day
mg/L ..... milligrams per liter
MHI ..... Median Household Income
NDEE ..... Nebraska Department of Energy and Environment

NDEQ ..... Nebraska Department of Environmental Quality
NDNR ..... Nebraska Department of Natural Resources
NE ..... Nebraska
NeDED ..... Nebraska Department of Economic Development
O&M ..... Operation & Maintenance
LF ..... linear feet
pCi/L ..... picocuries per liter
ppt ..... parts per trillion
psi ..... pounds per square inch
PFAS ..... polyfluoroalkyl substances
PFBS ..... perfluorobutane sulfonate
PFNA ..... perfluorononanoic acid
PFAS ..... perfluorooctanoic acid
PFHxS ..... perfluorohexane sulfonate
PFOS ..... perfluorooctane sulfonate
PVC ..... polyvinyl chloride
RDD ..... Rural Development Division
RL ..... reporting limit
ROW ..... right-of-way
RWD ..... Rural Water District
SRF ..... State Revolving Fund
TBD ..... to be determined
TC ..... total coliform
TCDD 2,3,7,8-Tetrachlorodibenzo-p-dioxin
TDS ..... total dissolved solids
THM ..... Trihalomethane
US ..... United States
USDA ..... United States Department of Agriculture
USGS ..... United States Geological Survey
WTP ..... Water Treatment Plant
WWAC ..... Water Wastewater Advisory Committee

SUMMARY

FINDINGS:

1. The current population of Waverly is 4,532 people and is expected to be 6,734 by 2043 based on the high growth rate from Waverly's 2023 Comprehensive Plan.
2. The average quantity of water distributed by the City of Waverly is approximately 591,265 gpd based on historical pump records. This equates to an average daily use of 411 gpm and 138 gpcd.
3. Waverly's wells have a firm pumping capacity of 2,342 gpm. There are generators with the ability to provide backup power to three wells, which results in a backed up firm pumping capacity of 725 gpm.
4. There are currently no water quality problems with Waverly's water supply. However, nitrate levels in approximately half the wells are over 5 mg/L, trending upwards, and warrant the need to begin searching for a well site and planning a new well to ensure adequate supply is available during peak water usage.
5. During a drought condition, when the aquifers are not recharged via precipitation, the wells are known to operate close to the top of their screen.
6. The existing storage tanks and supply wells with backup power are capable of providing sufficient capacity for one day's worth of water consumption under peak demands. It is also able to provide average water consumption during a 2-hour residential or 3-hour commercial fire flow event. This is true for the present and projected 2043 water system demands.
7. The distribution system has pressures ranging from 60 to 76 psi within City Limits, which is within the Ten States Standards recommended pressures of 60 to 80 psi. Future demands are not expected to create issues with maintaining adequate pressures. Some portions of the transmission main operate at 40 psi +/-, but this has not been a cause for concern since there are no water services or fire protection provided in these locations.
8. Waverly's residential fire flow demand is 1,500 gpm while retaining a residual pressure of 20 psi. The distribution system able to meet these requirements in the majority of the system. Some areas, such as 4-inch mains and cul-de-sacs around the outskirts of town are slightly deficient in their ability to provide this fire flow capacity.

RECOMMENDATIONS:

1. The City should improve water system components to serve the existing and projected population to satisfy pressure and fire flow requirements. This can be done by upsizing crucial mains from 4 inches to 6 inches or larger, constructing loops to better facilitate flow, and proactively replacing mains with a higher tendency of failure due to material and age.
2. The City should adopt a new schedule for operating their wells to more evenly spread out the impact on the underlying aquifer. This is especially significant in periods of drought, as the City experienced in Spring/Summer of 2023.
3. It is recommended that the City proceed with the suggested improvements #1-2, #4-9, and #11 within the next five years as funding allows. These improvements include upsizing water mains and constructing loops to meet fire flow requirements, adding additional hydrants to provide hydrant coverage to lacking areas, replacing old CIP mains with a history of main breaks, and a well siting study as a first step to replacing a well that may need to be taken out of service.
4. Additional recommendations were provided to be ideally completed within the next ten to twenty years or as needed to support growth. These include large water main loops east of town where future development is planned, replacing all old metal mains, and constructing a new well as needed.

1. INTRODUCTION

The City of Waverly is a community experiencing major growth. There has been a considerable increase in population from the 1960s through the present. The expansion of industry and proximity to the City of Lincoln is expected to increase the population in Waverly significantly over the next several years. To plan for future residential and industrial development within the community, the water distribution system must also be improved to handle increased stress on the system with the increased water demand associated with the population growth. Maintaining adequate water pressure and quality and managing an aging distribution system are key factors in providing an ample supply of quality water to residents of Waverly.

1.1 Purpose

The purpose of this report is to review and identify potential system deficiencies and water quality issues for the City of Waverly's water supply and distribution systems. This report summarizes the present water system and forecasts future growth and its anticipated impact on the water system. By evaluating these conditions, the existing distribution system can be evaluated to determine how it performs under present and future conditions. The evaluation allows suggestions for recommended improvements and related financial planning.

1.2 Scope

The scope of this study is to evaluate the City's water system based on an agreement dated January 11, 2023. The key objectives of that agreement are as follows:

1. Review available documents from the City regarding existing infrastructure maps, water use records, maintenance records, previous studies, and annual operating budget.
2. Review historical population trends and develop population projection for the next 20 years, based on the current Comprehensive Plan.
3. Project future water use, including average and peak daily demands.
4. Review of existing water infrastructure for physical condition, capacity, and quality – including supply, distribution, and storage components.
5. Recommend improvements based on the evaluation of existing system and projected needs.
6. Prioritize the recommended improvements and determine a potential timeline for implementation of recommended alternatives.
7. Develop preliminary design criteria and opinions of probable total cost for recommended improvements.
8. Prepare pre-application requirements for the WWAC including preliminary review of direct and indirect environmental impacts of selected design alternative.

9. Provide a cost-effective analysis and rank the recommended improvement alternatives based on project costs, 20-year present worth, and anticipated environmental impacts.
10. Evaluate the financial requirements of the alternatives, including the financial history of operation from the previous three years.
11. Review of amortization schedule on existing indebtedness.
12. Develop a projected fee schedule based on the opinions of cost.
13. Review funding options and financial alternatives.

To assist in the system evaluation, a hydraulic model will be created of the water system in InfoWater. The model will include supply, distribution, and storage components of the existing water system. The model will be used to evaluate the system robustness including pressures and fire flow capabilities for the present and future demand scenarios.

2. BACKGROUND

The existing water distribution system consists of a variety of pipes differing in age, size, and material. A majority of the system is PVC installed after 1990, though there is a notable amount of CIP water mains installed prior to 1990. Pipe sizes range from 2-inch to 16-inch. Water storage consists of two 500,000-gallon reservoirs, described in further detail later in this report.

The system's supply currently consists of seven active wells, as outlined in Table 1. Well #7 was taken out of service in 2021 due to a damaged well casing. The well and well house were damaged beyond repair in February 2023, and is anticipated to be replaced with a new submersible well with valve vault in 2023/early 2024.

Table 1. Waverly Wells and Status

Well	Year Constructed	Status
#1	-	Inactive since 1982
#2	-	Inactive since 2003
#3	-	Inactive since 1982
#4	1982	In service
#5	1985	In service
#6	1986	In service
#7	1986	Inactive since 2021
#8	2001	In service
#9	2006	In service
#10	2014	In service
#11	2014	In service

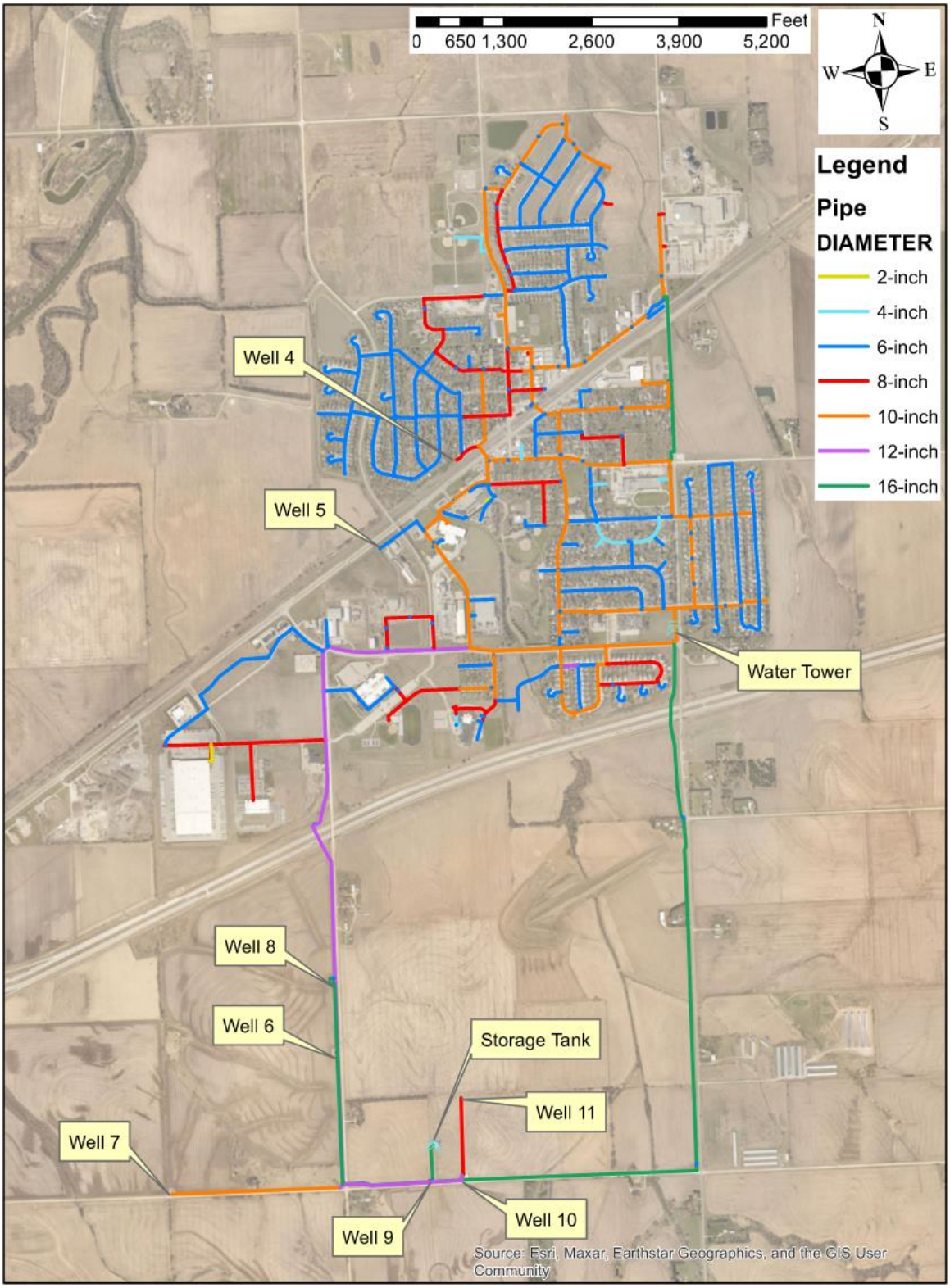

Figure 1. Map of Water System

3. POPULATION PROJECTIONS

Table 2 shows the historic population trends for the City of Waverly. The population numbers are based on US Census data and information obtained from the Nebraska Department of Economic Development.

Historic records can be used to determine existing system needs and improvements, but future system demands must also be considered to prepare the system for future growth in Waverly. Population growth was relatively flat in Waverly in the 1980s but has increased significantly since 1990. With the proximity to Lincoln and development of industry, continued population growth is expected. The 2023 Comprehensive Plan, currently under development by Hanna Keelan Associates, projected growth using a low (1.8%), medium (2.2%), and high (2.5%) annual growth rate. The projected population growth data is summarized in Table 2, and shown graphically in Figure 2.

Table 2. Historical Population

Year	Population	Percent Change Over Previous Year (%)	Annual Percent Change (%)
1940	306	--	--
1950	310	+1.3	+0.13
1960	511	+64.8	+6.48
1970	1,152	+125.4	+12.54
1980	1,726	+49.8	+4.98
1990	1,869	+8.3	+0.83
2000	2,448	+31.0	+3.10
2010	3,277	+33.9	+3.39
2020	4,279	+30.6	+3.06
2023*	4,532	+5.9	+1.97
2033 Low*	5,371	+18	+1.8
2033 Medium*	5,520	+22	+2.2
2033 High*	5,667	+25	+2.5
2043 Low*	6,211	+18	+1.8
2043 Medium*	6,478	+22	+2.2
2043 High*	6,734	+25	+2.5

* Estimated from previous data and various methods of estimated growth

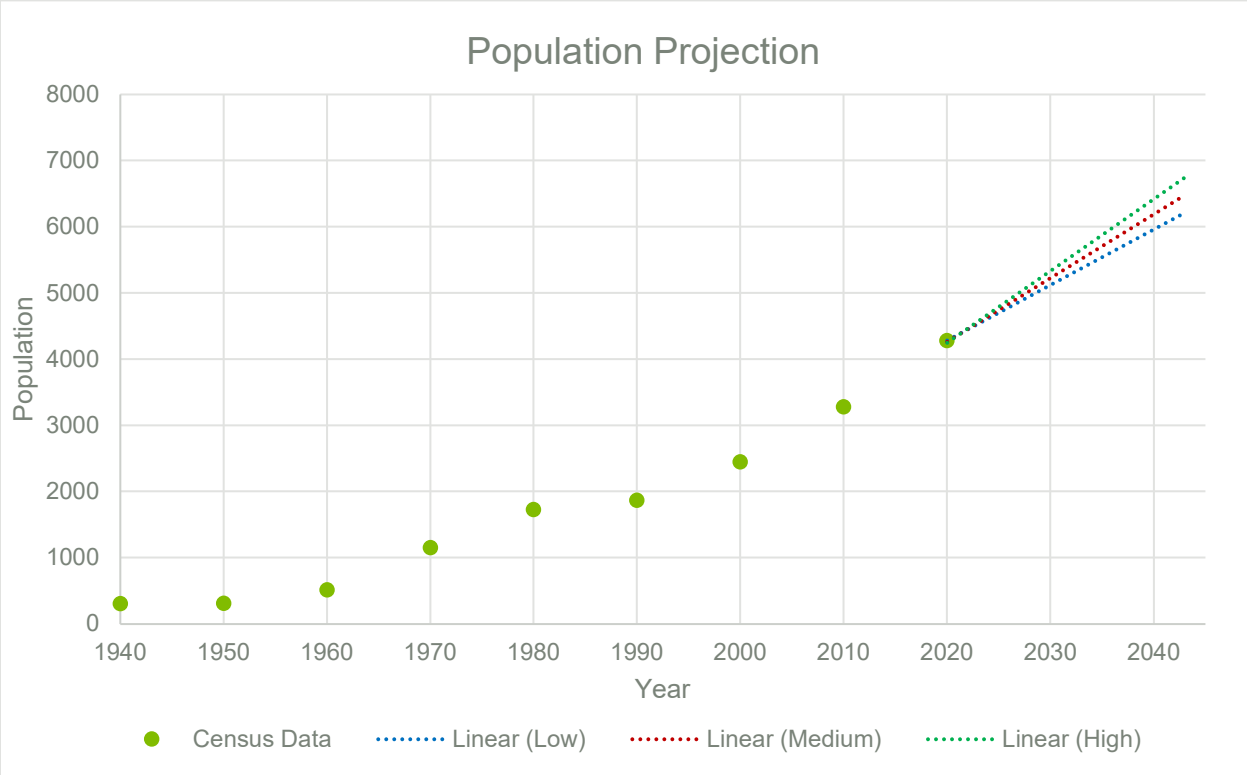

Figure 2. Population Projections for Waverly, NE

The high growth rate results in a projected 2043 population of 6,734 people. This population estimate provides the most conservative number and will be used as the 2043 population for the purposes of this report to analyze and recommend future distribution system improvements.

4. WATER REQUIREMENTS

4.1 Average Daily Demands

Water usage data was provided by the City in the form of well pumping records. Water usage data was analyzed from 2018 to 2022 to calculate the average per capita water usage, as shown in Table 3. The population for each year was determined using interpolation between 2010 and 2020 Census data points. The per capita water use was determined by dividing the water demand (in gpd) by the population. Based on these calculations, the per capita water demand in Waverly is 138 gpcd, and the average day demand is 591,265 gpd. For comparison, the per capita water demand in the 2005 Olsson water study was 141 gpcd.

Table 3. Water Use Summary, 2018-2022

Year	Population	Water Pumped (gal)	Average Water Demand (gpd)	Per Capita Use (gpcd)
2018	4,079	194,504,331	532,889	131
2019	4,179	208,022,655	569,925	136
2020*	4,279	208,961,017	570,932	133
2021	4,363	227,928,394	624,461	143
2022	4,448	240,212,814	658,117	148
		Average	**591,265**	**138**

**Calculation based on a leap year with 366 days.*

As indicated in Table 3, water use significantly increased in 2021 and 2022 due to the population growth experienced over the past twenty years. This is in line with the projections provided in the 2005 report, which predicted an average day demand of approximately 648,000 gpd in 2025.

Figure 3 shows the water pumped from wells per month graphically, based on Waverly's pump records from 2018 to 2022. The water use has been generally increasing each year, in conjunction with the growing population. One changing trend is the duration of the peak flow season. Typically, peak season is assumed to be May through August due to lawn irrigation. However, recently the peak has begun to gradually rise earlier in the year and extend further into the fall, increasing the per capita water usage in 2021 and 2022. A likely explanation for this is the increased irrigation associated with new homes where lawns need to be established.

Periods of drought, as experienced in 2022 and 2023, cause significant strain on the water system and the underlying aquifer. Increased pumping from the groundwater wells has dropped the aquifer levels that supply Waverly with water to dangerously low levels. Due to the lack of precipitation, the groundwater has not been able to recharge sufficiently to keep up with demand.

On June 27, 2023, the City declared a water emergency to help reduce water use, after voluntary water restrictions to curb demand were not observed. The water emergency required that the community irrigate every other day, with no irrigation on Mondays.

The City of Waverly website (citywaverly.com) indicates that between June 2023 and July 2023, average water usage dropped from just over 1.1 MGD to approximately 0.6 MGD, a decrease of 44%. Water usage was back up to pre-emergency conditions in late July when average demands exceeded 1 MGD on a few days in the last week of the month. In response to the spike in water usage, the City instituted more water restrictions on August 5, 2023, limiting irrigation to one day a week, with half of the residents being allowed to water on Saturdays and half on Sundays. Watering was prohibited completely from 10:00 AM to 4:00 PM.

Water demands decreased throughout early August, dropping to levels experienced earlier in the summer. The City observed that when water usage dropped to the 700,000 gpd range, adequate pumping levels were able to be maintained at the wells. The City is currently reevaluating their ordinance to determine the best triggers for water watches and warnings to encourage residents to conserve water.

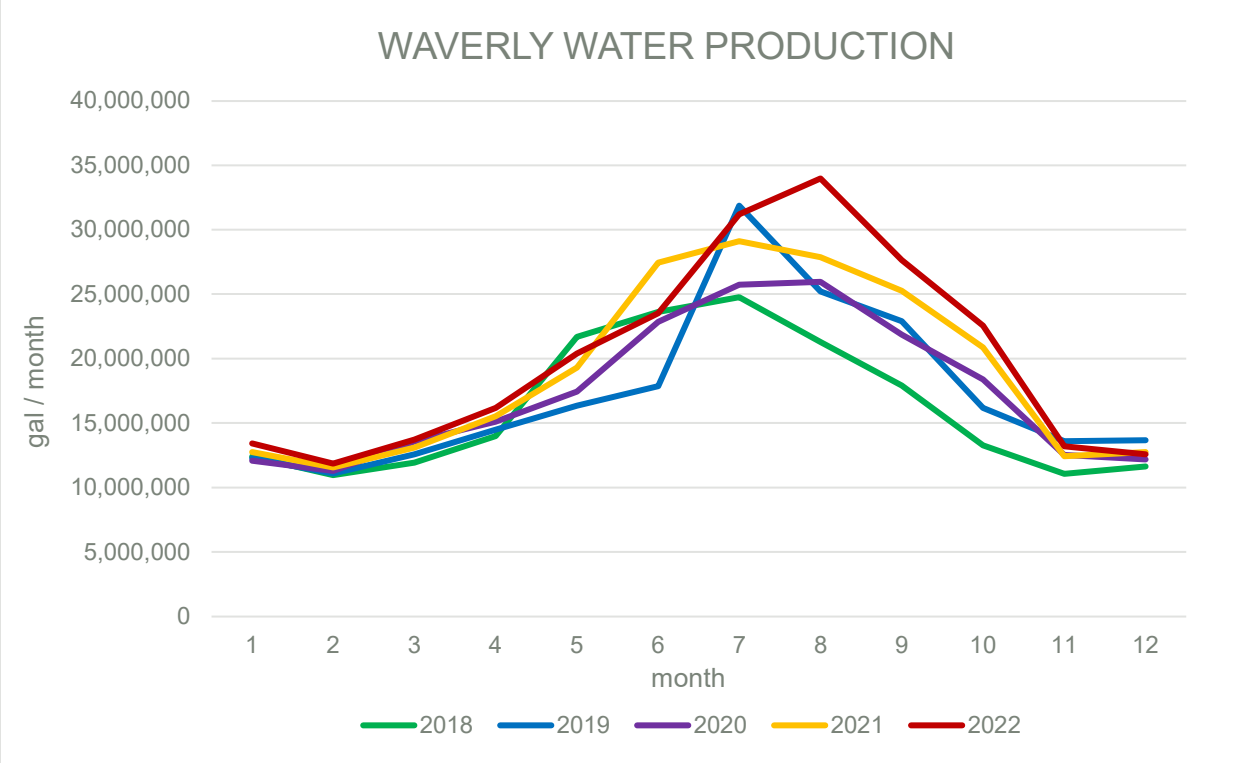

Figure 3. Monthly Well Production Trends

Water usage data was also provided for the top 5 water users in the system, as shown in Table 4. All these users have multiple water connections linked to their accounts. The water use rate is based on an assumed constant use over 24 hours.

Table 4. Water Consumption for Top 5 Users

	Yearly Average Use (gal)	Daily Average Use (gpd)*	Water Use (gpm)
User 1	31,762,927	86,962	60.4
User 2	21,958,241	60,118	41.7
User 3	1,956,200	5,356	3.7
User 4	1,877,200	5,139	3.6
User 5	1,559,400	4,269	3.0
TOTAL	**59,113,968**	**161,845**	**112.4**

**Daily average based on a 365.25-day year since water consumption was provided for four years.*

In addition to average daily demands, peak day, fire flow, and future demands must also be considered to determine necessary water storage and wellfield capacity.

4.2 Peak Daily Demands

Peak daily demands occur during the summer months (June-September) and are primarily due to lawn irrigation. From well pumping records analyzed from 2018 to 2022, the peak water consumption for Waverly was 1,096,119 gpd, or 761 gpm, which occurred in August 2022. The ratio of peak day to average day demand factor was determined to be 1.85.

By comparison, the peak to average day ratio in the 2002 study was 1.70. This increase in peak day factor is likely linked to the higher water use during the peak season associated with the establishment of more new lawns in conjunction with the construction of new homes.

4.3 Peak Hourly Demands

Peak demands on a water supply system occur for short periods of time, normally one to four hours in duration. This condition generally occurs before and after working hours when people start watering lawns and gardens during the summer and use more water within the house when cooking, showering, or washing dishes. These short periods of high demand, referred to as peak hourly demands, impose critical demands on various elements of the water system. The combination of well pumping and flow from storage must supply these high demand rates. The distribution mains must be adequate to deliver the water throughout the entire system without excessive loss in pressure.

Various publications (Clark, 1971) indicate peak hour demands based on population, housing density, and a variety of other factors. In general, small communities are affected more by peak demands than larger communities, and thus have larger factors. The following equation can be used to determine the peak hourly demand. The 2020 Census indicated 1,487 total housing units in Waverly.

$$Q_{peak\ hour} = (3.34 * \#\ of\ Dwelling\ Units) + (2.02 * Q_{peak\ day})$$

$$Q_{peak\ hour} = (3.34 * 1{,}487) + (2.02 * 1{,}096{,}119\ gpd) = 2{,}219{,}127\ gpd$$

Based on the calculations above, the ratio of peak hour to peak daily demands is 2.02. This is the same as the peak hour factor of 2.02 calculated in the 2005 study.

4.4 Fire Flow

The standards for grading a municipality's fire defense and physical conditions are based on criteria outlined by the ISO of Nebraska. Per Ten States Standards a water system must be "designed to maintain a minimum pressure of 20 psi at ground level at all points in the distribution under all conditions of flow" (2012). The recommended fire flow capacity depends on the size, construction type, occupancy, and exposure of buildings within an area. A fire flow of 1,000 to 1,500 gpm is generally recommended for residential areas, depending on the spacing of structures. For instance, for 1- and 2-family dwellings not exceeding two stories in height, spaced up to ten feet apart, ISO recommends 1,500 gpm fire flow.

The ISO determines fire-stream requirements throughout the distribution system's service area. Waverly's most recent ISO report was done in 2018. However, the hydrant flow data summary that lists needed and available fire flows at various locations could not be located for this report. Instead, fire flow assumptions were carried over from the hydrant flow data summary from 2000 and Waverly's 2005 water study. A copy of this ISO hydrant flow table can be found in Appendix A. The hydrant flow data summary from 2000 listed a maximum of 1,500 gpm at a residential hydrant and 3,500 gpm for a commercial area. These fire flows were used to evaluate the storage and fire flow supply requirements for residential and commercial areas in Waverly.

The assumed duration of a fire flow event increases as fire flow demands increase. The AWWA Manual of Water Supply Practices M32 sets varying required durations to sustain fire flows depending on the needed fire flow, as outlined in Table 5. For the purposes of this report, a 2-hour duration was used for residential fire flows (1,500 gpm) and 3 hours for the commercial fire flow (3,500 gpm).

Table 5. Required Duration of Fire Flow (AWWA M32)

Fire Flow (gpm)	Required Duration of Flow (hours)
< 2,500	2
3,000 – 3,500	3
4,000 – 12,000	4

4.5 Future Demands

As determined previously, the average daily demand was approximately 591,265 gpd with a peak to average demand ratio of 1.85. Assuming the high population projections discussed in Section 3, Table 6 summarizes estimated present and future demands placed on the system including fire demands. These demand rates serve as the basis for recommending improvements to the major components of the system which will serve the City's water demands until the year 2043.

Table 6. Future Water Demands and Residential & Commercial Fire Flow

	2023	2033	2043
Population	4,532	5,667	6,734
Per Capita Demand (gpd)	138	138	138
Avg. Daily Demand (gpd)	591,265	784,802	932,537
Avg. Daily Demand (gpm)	411	545	648
Peak Day/Avg. Day Ratio	1.85	1.85	1.85
Peak Hour/Peak Day Ratio	2.02	2.02	2.02
Peak Day Demand (gpm)	761	1,010	1,201
Peak Hour Demand (gpm)	1,538	2,041	2,425
Residential Fire Flow			
Residential Fire Demand (gpm)	1,500	1,500	1,500
Fire Flow + Average Day Demand (gpm)	1,911	2,045	2,148
Commercial Fire Flow			
Commercial Fire Demands (gpm)	3,500	3,500	3,500
Fire Flow + Average Day Demand (gpm)	3,911	4,045	4,148

5. WATER QUALITY

Demands for water cannot be satisfied by quantity alone; the quality must also be satisfactory for its intended use. The prime consideration for supplying good quality water is to protect public health. Pollution of public water supply and the consequent danger to health has been traced to many sources. These include leakages from human activities, agricultural chemicals, leaking fuel tanks, breaking transmission mains, floods of contaminated water, and the relaxation of vigilance in the purification of a public water supply system.

Waverly presently does not have a full water treatment facility, but they do inject drinking water with chlorine and fluoride, as well as polyphosphate for corrosion control. Water from the wells south of I-80 are routed to Well #10 for this treatment to be applied. It is individually added at Wells #4 and #5.

5.1 Regulatory Requirements

The Safe Drinking Water Act requires the EPA to enforce regulations for a number of drinking water contaminants. These contaminants fall within six broad contaminant groups:

- Microorganisms
- Disinfectants
- Disinfection byproducts
- Inorganic chemicals
- Organic chemicals
- Radionuclides

Table 7 outlines the EPA limits of regulated contaminants. The presence of substances in excess of the limits for human health constitutes grounds for rejection of the water supply. Water supplies containing substances in excess of aesthetic limitations may be suitable from a health standpoint, but unacceptable due to odors, discoloration, or taste; rendered economically or aesthetically inferior; or are toxic to fish or plants.

Table 7. Drinking Water Standard Contaminant Limits

Contaminant	EPA Approved Limit Level (mg/L, unless otherwise noted)
Microorganisms	
TC (including fecal coliforms and E. coli)	Maximum 5% of samples may be TC-positive
Disinfection Byproducts	
Bromate	0.01
Chlorite	1.0
Haloacetic acids	0.06
Total Trihalomethanes	0.08
Disinfectants (Maximum Residual Disinfectant Levels)	
Chloramines (as Cl2)	4.0
Chlorine (as Cl2)	4.0
Chlorine dioxide (as ClO2)	0.8
Inorganic Chemicals	
Antimony	0.006
Arsenic	0.01
Asbestos	7 MFL
Barium	2
Beryllium	0.004
Cadmium	0.005
Chromium	0.1
Copper	1.3
Cyanide	0.2
Fluoride	4.0
Lead	0.015
Mercury	0.002
Nitrate	10
Nitrite	1
Selenium	0.05
Thallium	0.002

Organic Chemicals	
Alachlor	0.002
Atrazine	0.003
Benzene	0.005
Benzo(a)pyrene (PAHs)	0.0002
Carbofuran	0.04
Carbon tetrachloride	0.005
Chlordane	0.002
Chlorobenzene	0.1
2,4-D (2,4-Dichlorophenoxyacetic acid)	0.07
Dalapon	0.2
1,2-Dibromo-3-chloropropane (DBCP)	0.0002
o-Dichlorobenzene	0.6
p-Dichlorobenzene	0.075
1,2-Dichloroethane	0.005
1,1-Dichloroethylene	0.007
cis-1,2-Dichloroethylene	0.07
trans-1,2-Dichloroethylene	0.1
Dichloromethane	0.005
1,2-Dichloropropane	0.005
Di(2-ethylhexyl) adipate	0.4
Di(2-ethylhexyl) phthalate	0.006
Dinoseb	0.007
Dioxin (2,3,7,8-TCDD)	0.00000003
Diquat	0.02
Endothall	0.1
Endrin	0.002
Ethylbenzene	0.7
Ethylene dibromide	0.00005
Glyphosate	0.7
Heptachlor	0.0004
Heptachlor epoxide	0.0002
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
Lindane	0.0002
Methoxychlor	0.04
Oxamyl (Vydate)	0.2
Pentachlorophenol	0.001
Picloram	0.5
Simazine	0.004
Styrene	0.1
Tetrachloroethylene	0.005

Organic Chemicals, continued	
Toluene	1
Toxaphene	0.003
2,4,5-TP (Silvex)	0.05
1,2,4-Trichlorobenzene	0.07
1,1,1-Trichloroethane	0.2
1,1,2-Trichloroethane	0.005
Trichloroethylene	0.005
Vinyl chloride	0.002
Xylenes (total)	10
Radionuclides	
Alpha particles	15 pCi/L
Beta particles and photon emitters	4 millirems/year
Radium 226 and Radium 228	5 pCi/L
Uranium	30 µg/L

5.2 Nitrates

The City provided nitrate levels, recorded annually, at each well since 1994. Figure 4 shows these levels graphically. The EPA MCL for nitrates is 10 mg/L. As depicted in this graph, all the wells remain under the MCL, with the exception of Well #11, which spiked above 10 mg/L three times between 2015 and 2018, and once in 2021. Continued monitoring is recommended, especially for Wells #5, #8, #10, and #11 if they continue to trend close to 10 mg/L.

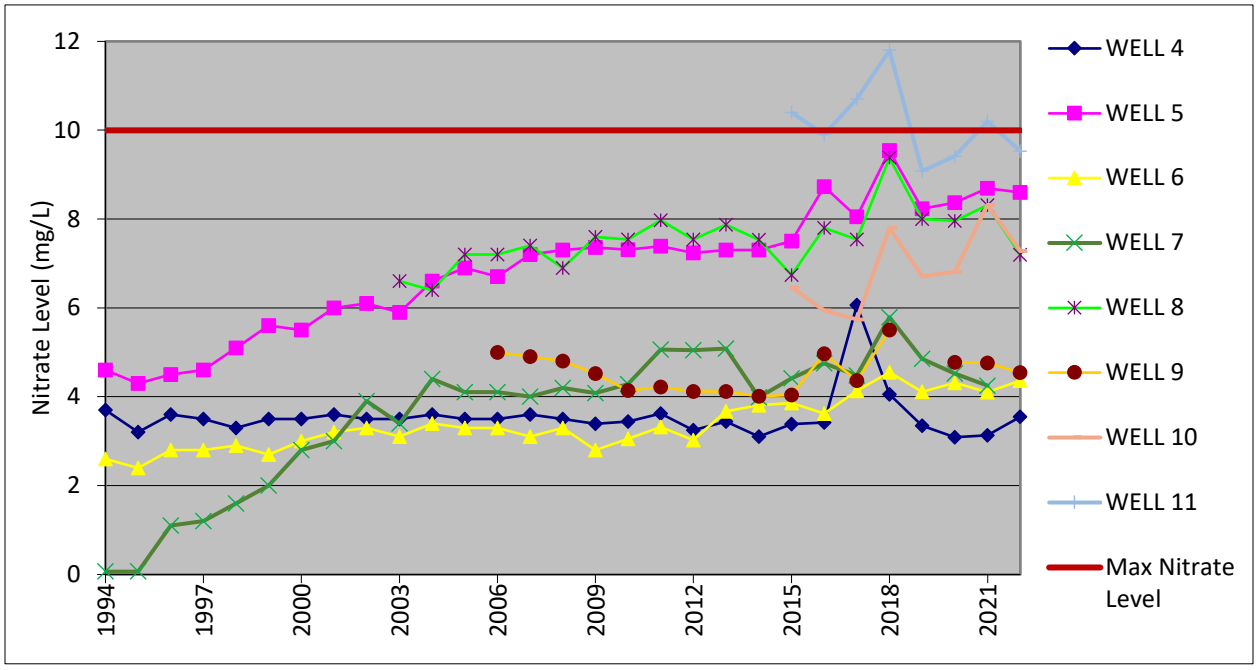

Figure 4. Well Nitrate Levels

Figure 5 shows a map of Waverly's supply wells with the labels color-coded to indicate the location of the higher nitrate wells. The southwestern-most cluster of Wells #6, #7, and #9 show the lowest nitrate concentrations in the system, indicating that this area would potentially be a candidate for an additional municipal well. Additionally, this area is outside the FEMA flood zone, so it is anticipated to have minimal environmental risk from flooding.

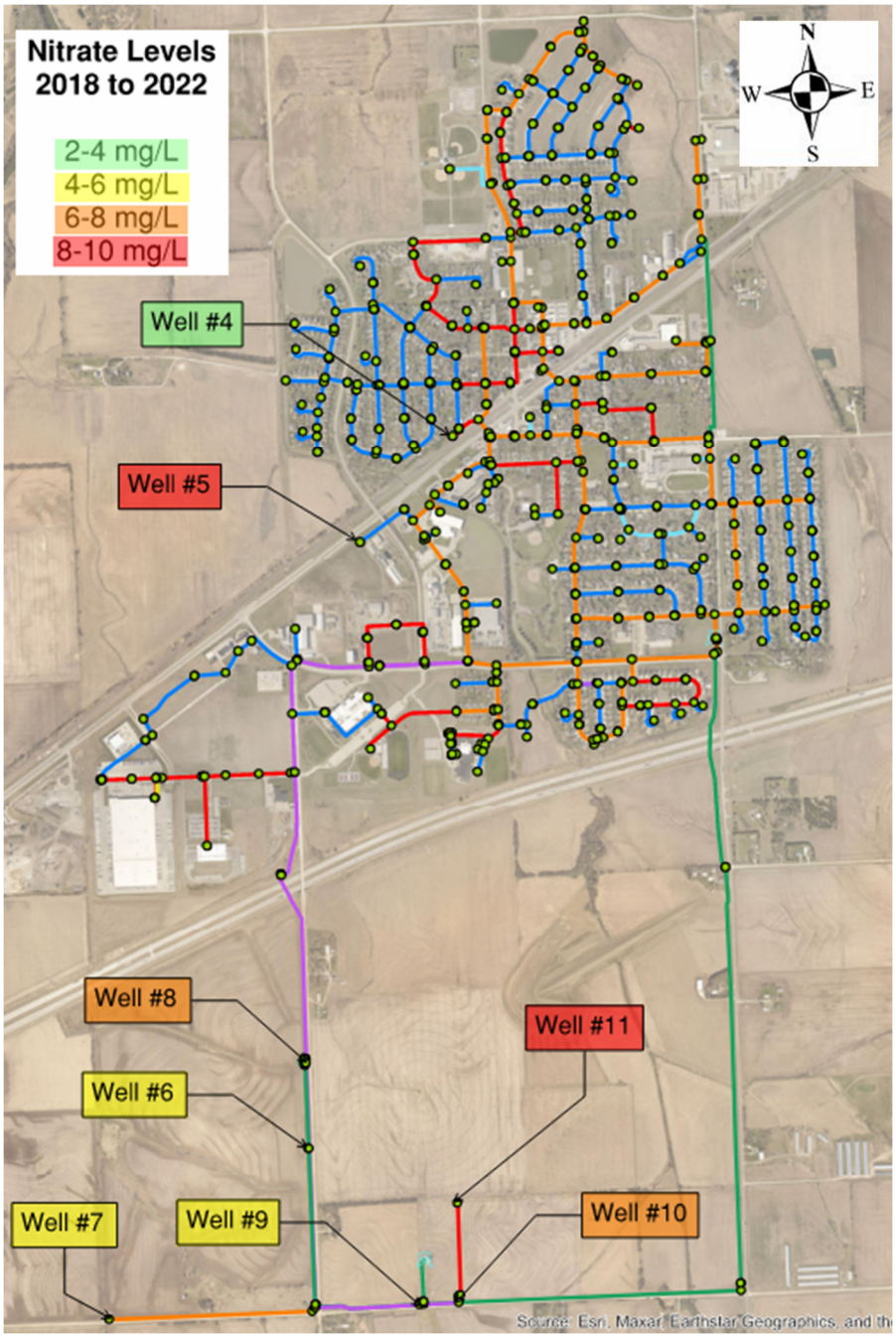

Figure 5. Map of Wells with Symbolized Nitrate Levels

5.2.1 Possible Solutions to Address High Nitrates

Although half of Waverly's wells are seeing nitrate levels below half the nitrate MCL (3 to 5 mg/L), the other half of wells range from 7 to 9 mg/L and could potentially spike above the 10-mg/L limit. With the nitrate levels trending upwards, especially the ones that are already above 7 mg/L, it is recommended that the City start looking into solutions now, such as another water source and/or blending.

There are several different solutions that could be considered to lower the nitrate levels in the water system or provide additional water in the case that some wells needed to be shut off due to nitrates. Preliminary discussions for several options are provided below, but detailed analysis and cost estimating for these options is outside the scope of this study.

Waverly should also refer to the recommendations in their 2022 Drinking Water Protection Management Plan prepared by JEO to minimize further nitrate contamination in the groundwater, especially in critical source areas.

Blending

The first potential solution to addressing the nitrates issue is to blend water from two or more water sources and convey the blended water into the water system. If the right combination of wells was blended, one or more of the City's wells could potentially remain in service even if they surpass the 10 mg/L nitrate limit.

The primary constraint is that two or more wells must be running simultaneously into a blending vault to implement this option, and these well nitrate levels will be combined with a weighted average. Due to their location within town, it may not be feasible to blend Wells #4 and #5 at the same blending vault as the other wells.

The effects of blending may be estimated by using the following equation:

$$C_{blend} = \frac{Q_1 C_1 + Q_2 C_2}{Q_1 + Q_2}$$

Where:

C_{blend}: Contaminant concentration in blended water
Q_1: Flow rate of first source
Q_2: Flow rate of second source
C_1: Contaminant concentration of first source
C_2: Contaminant concentration of second source

Overall, the blended average of nitrate levels in the wells is 6.2 mg/L. This shows that although some wells are getting close to the 10 mg/L limit, there is still some room for lower nitrate wells

to bring the average down. Depending on the rotational schedule of wells, the blended nitrate level is expected to be anywhere between 5 and 7 mg/L. The following calculation shows the blended nitrate level of Wells #6 and #11, which respectively have one of the lowest and one of the highest nitrate levels.

$$C_{blend} = \frac{(449 * 4.36) + (345 * 9.53)}{449 + 345} = 6.61\ mg/L\ nitrates$$

Should this option be selected, more detailed analysis and testing would be performed to validate the effects of blending the two water sources.

Construction of a New Well

The first step would be a well siting hydrogeological study to identify locations with adequate quality and quantity to be utilized for a municipal well site. After potential sites were identified, a well driller would be hired to dig a test hole at the site to verify the aquifer capacity. If a suitable water bearing formation was found, a test well would be constructed to determine the optimum pumping rate and verify water quality is suitable for a municipal water well. After the completion of a successful test hole/well at the site, the City could proceed with the design and construction of a new well.

As previously depicted in Figure 5, the land near Wells #6, #7, and #9 are shown to have the lowest nitrates in the vicinity of the water system, so some preliminary water quality sampling and investigation of well capacity in the vicinity could be done prior to constructing a full test hole/well.

Purchase Water from LWS

A third option for securing a reliable water source is to connect to and purchase water from LWS. The City has held an early feasibility discussion with LWS, but more investigation is needed to determine feasibility and logistics. Connection would include the construction of a new transmission main, and backflow preventers would be required to prevent water from Waverly from entering Lincoln's system.

A benefit to connecting to Lincoln's water system is that some of all of Waverly's water would be guaranteed from Lincoln and the City would not be responsible for O&M on more wells. However, Waverly would still need to maintain their existing water infrastructure. This connection would drop O&M costs on the City's water infrastructure by reducing the need for well pump operation since LWS would be responsible for any maintenance on their supply and source. A downside is that Waverly would lose control of water rates and would be dependent any changes to LWS water rates in the future. To pursue this option, a feasibility study would be needed to compare costs and determine water chemistry blending.

Treatment Facility

The final option for improving water quality in the system is a WTP for nitrates. This would likely be the most expensive option to construct and maintain, so would only be recommended if all well nitrate levels begin to spike above 7 mg/L. 7 mg/L is the baseline nitrate level that NDEE begins to require elevated testing frequency and indicate that the current wells may soon spike and no longer be viable water sources.

Several different treatment technologies exist such as reverse osmosis and ion exchange. If this route is taken, a nitrate removal study would be recommended to evaluate the best system and costs for Waverly.

5.3 Quality Sampling

A 13 Parameter quality test was conducted on Wells #4 through #9 in January 2008. Table 8 presents the results of the water quality sampling data. It can be seen that no chemical constituents exceeded the maximum levels set by the EPA. TDS is approaching the 500 mg/L limit and primarily contributes to taste problems with the water. Testing has not been conducted since 2008, and thus no 13 Parameter sample data is available for Well #10 or #11, which were constructed after 2008.

Table 8. 13 Parameter Water Quality Sampling Results

Chemical Constituent	Maximum Level Limit	Well #4	Well #5	Well #6	Well #7	Well #8	Well #9
pH	6.5–- 8.5	7.03	7.03	7	7.15	7	6.94
Sulfate (mg/L)	250	86	53	40	100	39	46
Chloride (mg/L)	250	19.8	8.34	5.97	8.31	6.17	5.57
Iron (µg/L)	300	<RL	<RL	79.8	<RL	<RL	<RL
Total Hardness (as CaCO3) (mg/L)		330	230	240	310	230	240
Total Dissolved Solids (mg/L)	500	490	402	369	492	376	421
Total Alkalinity (as CaCO3) (mg/L)		308	248	276	304	274	268
Calcium (mg/L)		98.9	67.7	69.5	88.7	64.7	68.7
Sodium (mg/L)		47.9	46.9	44.4	51.3	50.8	44.8
Total Coliform (cfu/10)	< 5% positive	0	0	0	0	0	0
E. Coli (cfu/10)		0	0	0	0	0	0
Nitrate + Nitrite (as N) (mg/L)	10	3.6	7.1	3.1	3.9	7	4.5
Fluoride (mg/L)	2.0	0.47	0.38	0.36	0.37	0.33	0.37
Manganese (µg/L)	50	49.3	17.4	<RL	<RL	<RL	<RL

Based on these 13 Parameter test results, all the constituents were below stated maximum level limits, however not all constituents have set limits. Although there is no regulatory limit for water hardness in Nebraska, the US Department of Interior and Water Quality Association state that any water with hardness of 180 mg/L as $CaCO_3$ is “very hard.” The measured hardness in Waverly’s wells ranges from 230 to 330 mg/L as $CaCO_3$. Hard water has not been shown to have any adverse health impacts, but it can cause mineral buildup on plumbing fixtures and interfere with cleaning tasks by causing soap and detergent to be less effective. The City operators noted that they are not seeing any problems from the hard water, and most residents have their own water softeners.

There is also no regulated limit for alkalinity, and there are no known detrimental health effects. However, it is notable that values above 150 mg/L may contribute to scaling, which is when there is a high level of minerals, and a substance begins to build up in pipes. Alkalinity and hardness are related due to both forming from calcium carbonate.

Sampling results for various other contaminants has been provided for wells in the Waverly water system between 2017 and 2023. Overall, the sample results were lower than EPA maximum contaminant levels. A test from April 2022 on Wells #10 and #11 recorded levels of 0.720 µg/L each for both bromodichloromethane and bromoform. Another test in August 2022 recorded a THM level of 1.10 µg/L and a bromoform level of 1.77 µg/L. These contaminants are both part of the Total Trihalomethane contaminant group which is regulated to have an MCL of 80 µg/L. However, both THM and bromoform have goal MCLs of 0.

Over time, Well #4 has been tested for selenium, which has a MCL of 50 µg/L. In 2017, the result was 86 µg/L. However, since then the selenium concentration has lowered to the mid-30s, with the most recent test in 2022 reading 27 µg/L. It is recommended to continue monitoring this well for selenium to ensure the level remains below 50 µg/L.

5.4 Anticipated EPA Emerging Contaminant Changes

In March 2023, the EPA issued a plan for proposed action for six PFAS contaminants. Currently, they are just proposing health-based, non-enforceable MCLGs, though enforceable MCLs may be expected eventually. The proposed rule would require public water systems to monitor these PFAS levels and notify public and reduce levels if necessary. The earliest this rule could be in place is 2026.

The proposed limits for PFAS contaminants are shown in Table 9. The Hazard Index limit is based on the evaluation of potential health risks from chemical mixtures and can be found through a calculation using health-based water concentrations for each of those four compounds.

Table 9. EPA's Proposed Action for PFAS Drinking Water Regulations

Compound	Proposed MCLG	Proposed MCL (enforceable level)
PFOA	0 ppt	4.0 ppt
PFOS	0 ppt	4.0 ppt
PFNA	1.0 (unitless) Hazard Index	1.0 (unitless) Hazard Index
PFHxS		
PFBS		
HFPO-DA (GenX)		

Another expected change is with regard to manganese. Currently, manganese is a secondary drinking water regulation, meaning that the Secondary MCL is a non-enforceable recommendation. However, it is anticipated that this will be changed to an MCL of 50 µg/L. Based on a 2020 study by DHHS, it is also possible that there will be a warning level of 30 µg/L at which communities may be asked to notify residents. With the manganese levels in Well #4 at 49 µg/L, it is recommended to get updated tests and consider a blending solution to reduce overall manganese in the water system as needed.

6. EXISTING WATER SYSTEM FACILITIES

The City of Waverly has a GIS map of the water system created by JEO. This map is available online, and the files making up the water system components were also provided for this study.

6.1 Wells and Pumps

Waverly's water distribution consists of seven active wells and one inactive well (Well #7). A project to replace Well #7 is in progress. The well locations were previously shown in Figure 1. The wells are currently run every other day to reduce wear on the pumps, with odd-numbered wells one day and even-numbered the next.

While no WTP is in place, chlorine, fluoride, and polyphosphate are added to treat the water from the wells. Polyphosphate is added for corrosion control. The wellhouse at Well #10 has chemical feed rooms, and all the water from wells south of I-80 (Wells #6 through #11) are routed there for treatment. Treatment is individually applied at Wells #4 and #5.

All of Waverly's wells pump directly into the system and fill a 500,000-gallon storage tank and 500,000-gallon water tower. The water pressure in the system is a result of the water level in the elevated water tower and storage tank.

The wells and pumps are inspected and serviced as necessary each year. Sargent Well Inspections from 2022 and 2023 were provided and are included in Appendix B of this report. At this time, no repairs or replacements were recommended for any active wells. The motors are serviced as needed during well inspections. Well #6 was relined in 2000 due to holes forming in the casing. In 2020, the pumps were replaced for Wells #6 through #8. Wells #4, #5, and #6 were all installed in the 1980s, thus having a higher potential for failure in the future. A cost estimate will be provided so the City can plan for replacing one if needed. The City plans to soon pull Wells #4, #5, and #9 for routine maintenance, cleaning, and inspection.

6.1.1 Pump Capacity

Table 10 outlines the well capacities found in state well registrations. Apparent present capacities and average pump efficiencies, as determined from the 2022 Sargent Well inspections, are also summarized in Table 10. Based on these numbers, the wells are pumping 96% of the registered capacity. The apparent capacities and efficiencies are lower than designed due to pump repair and replacement or wear over time. Sargent noted that no modifications were recommended at this time to the pumps. The apparent total capacity of the active wells is 2,832 gpm. The firm pumping capacity, defined as the available capacity if the highest producing well (Well #8) is out of service, is 2,342 gpm.

It is noted that these numbers will change, and the pumping capacity will increase once Well #7 is replaced.

Table 10. Active Well Capacities

Well #	Backup Power Connection Available (Y/N)	Registered Capacity (gpm)	Apparent Capacity (gpm)	Average Pump Efficiency (%)
4	N	400	383	76
5	N	300	303	62
6	Y	500	449	81
8	Y	500	490	82
9	Y	500	482	76
10	Y	400	380	73
11	Y	350	345	68

6.1.2 Backup Capability and Redundancy

The City has a 150 kW diesel generator from 2014 near Wells #10 and #11 which is able to power both wells at the same time, if needed. There is also a diesel generator from 1986 on a trailer that can power one well (either Well #6, #8, or #9). Wells #4 and #5 do not have transfer switches installed, therefore backup power is not available at those sites. In the case of total power loss, this means that three wells could continue to run. Assuming the generators would power the highest capacity well (Well #8) and can power both Wells #10 and #11, this results in an available pumping capacity of 1,215 gpm for wells with backup power.

Five of the seven active wells are located south of the City Limits, and provide 2,146 gpm, or 76% of the current total pumping capacity. A looped transmission main ranging from 12 to 16 inches transfers the water from the wells and one storage tank to the other storage tank and the remainder of the distribution system. This loop was installed per the recommendation in the previous 2005 water study to add redundancy. If there were a rupture or line break anywhere along this main, water could still flow through the other side of the main loop and minimize disruption of service.

6.1.3 Aquifer Levels

Wells #4 and #5 within town are located in the shallow alluvial unconsolidated Lower Salt Creek aquifer. The remaining wells south of I-80 are in the Dakota bedrock aquifer. All wells pump at approximately the same elevation above sea level, but Wells #4 and #5 are shallower below grade.

The City monitors the static water level at each well when it is not pumping. The water level below grade while pumping is also recorded. These levels are shown in Table 11. Each well also has a maximum pumping level, which acts as a trigger to shut the wells off to avoid excessive drawdown of the aquifer or issues with the pump.

Annual trends show that the aquifer level typically lowers throughout the high demand summer season when peak water demand in Waverly coincides with peak irrigation. Aquifer levels

recover in the spring due to snowmelt and rain and lower water use over the previous winter. Since 2019, all the wells have had a downward trend in seasonal aquifer levels. Most significantly, Wells #4 and #5 have not seen the typical springtime recovery as of May 2023. It should be noted that 2023 was an exceptionally dry spring/summer with one of the worst drought conditions in recent history.

As shown in Table 11, Wells #4, #5, #9, and #11 are all within 5 feet of the minimum pumping level, which is concerning, especially Well #5 which is 1 foot above the level. As the water level approaches the minimum pumping level, it is not harmful to the pump but should be a warning level that the well is in danger of getting shut off if water levels continue to decline. The minimum pumping level is based on information from the well vendors on when the well would need to be shut off. The well may be in danger of malfunctioning if the water level is not above this point.

Table 11. Aquifer Levels During Well Pumping (May 2023)

	Static Level (ft)	Pumping Water Level (ft)	Min Pumping Level (ft)	Water Level Over Shutoff (ft)
Well #4	22	44	48	4
Well #5	20	46	47	1
Well #6	79	129	155	26
Well #8	72	128	138	10
Well #9	105	147	150	3
Well #10	86	120	142	22
Well #11	98	135	140	5

Since Well #7 has been inactive, there has been increased strain on the odd-numbered wells, which have a pump capacity of approximately 600 gpm less than the even-numbered wells. This is backed up by the most critical aquifer levels being seen in these three odd-numbered wells. A proposed pumping schedule to more evenly spread out well pumping across the aquifer is outlined in Section 10.1.2.

If the pumping water levels continue to drop to unsafe levels, it may be necessary to use VFDs (where available) to lower the pump speed. This could result in longer pump run times but would overall reduce the strain on the aquifer and prevent the well from having to be turned off completely.

Another potential solution to low aquifer levels during pumping is imposing water restrictions on Waverly, as outlined in the City ordinances. Currently, a pumping water level of 5 ft or less over the shutoff is allowable grounds for a water emergency which would impose enforceable restrictions. Some level of water restrictions is recommended if the new pump schedule does not help or if the drought continues to allow the aquifer to lower throughout the summer.

In June of 2023, a Water Emergency was declared, imposing mandatory watering restrictions for all residents. After this was put in place, water use decreased, and aquifer levels slightly rose. However, it is unknown whether this trend can be fully attributed to the Water Emergency since there was a significant amount of rainfall around this time as well, around 7 inches. Olsson is assisting the City in updating the trigger criteria for the different levels of water restrictions. This effort will be in a memo separate from this study but will aim to protect and regulate several aspects of the system such as daily demand, aquifer water levels, and pumping ability.

Low aquifer levels could potentially cause the wells to shut off and be unable to serve the City demands. However, this can also have environmental effects. Consequences of depleted aquifer levels include lower lake or stream levels, which can negatively impact riparian plants and animals in the area (EPA, 2023). In areas of heavy withdrawal, it is possible for land subsidence or sinkhole formation to occur. It is important to conserve water or have additional/alternate water sources to maintain adequate water supply to the City and minimize potential environmental impacts to excessive aquifer drawdown.

6.2 Distribution System

According to the GIS database, Waverly has approximately 161,809 linear feet of water main, or 30.6 miles. Table 12 summarizes the length and percent of pipe in the system for each material. The known installation dates of water main range from 1964 to present, although approximately half of the installation dates are unknown. A majority of the pipe installed prior to 1990 is CIP, but almost exclusively PVC pipe has been installed after that point. The City has expressed a desire to eventually phase out all old CIP water mains, replacing them with PVC.

Table 12. Pipe Material Summary

Pipe Material	Length of Pipe (ft)	Length of Pipe (mi)	Percent of Total Length (%)
PVC	103,803	19.7	64
CIP	2,815	0.5	27
DIP	43,357	8.2	2
Unknown	11,834	2.2	7
Totals	161,809	30.6	100

City water operators did not report any pressure deficiencies in the water system. In general, deficiencies in available capacity may result from older water mains or undersized piping. The condition of the piping and suggested improvements is discussed later in further detail.

The current distribution system ranges in pipes sizes 2 to 16 inches. Ten States Standards indicate that where fire protection is provided, water mains should be a minimum of 6 inches in diameter. The approximate pipe totals in the system are shown in Table 13. The majority of the water main is between 6 to 10 inches. Only 2.39% of the system is 4 inches or smaller.

Table 13. Pipe Length Totals

Pipe Size (in)	Length of Pipe (ft)	Length of Pipe (mi)	Percent of Total Length (%)
2	367	0.07	0.23
3	414	0.08	0.26
4	3,068	0.58	1.90
6	62,994	11.93	38.93
8	21,438	4.06	13.25
10	41,035	7.77	25.36
12	12,211	2.31	7.55
16	19,552	3.70	12.08
Unknown	728	0.14	0.45
Totals	161,809	30.65	100.00

6.3 Hydrant Coverage

The Waverly GIS system indicates that there are over 250 hydrants providing fire protection throughout the distribution system. The City indicated that some of the hydrants south of town along N 134th St and N 148th St are painted black to indicate that they are not in service, and the corresponding valves are closed.

Hydrant coverage is an important factor in the ability to provide fire protection. Generally, Ten States Standards recommends fire hydrant spacing to range from 350 to 600 feet, depending on the area being served. To verify existing hydrant coverage in Waverly, 300-foot radius buffer circles were drawn around each hydrant in the system map, as shown in Figure 6. Some areas that are lacking coverage are classified as parks and open space per Waverly's land use map, and thus would not require the same hydrant coverage. Industrial areas are also assumed to have their own interior fire protection systems.

Based on these assumptions, a majority of the residential areas are adequately covered. However, the following areas were noted as lacking hydrant coverage, listed in below:

1. Along N 140th St between Jamestown St and Kenilworth St

2. Along Jamestown St between N 144th St and N 148th St
3. Along Heywood St between N 146th St and N 148th St
4. Along Folkestone St between Oak Lanes
5. Along N 143rd St at Carlson Ct
6. Along Amberly Rd at N 145th St
7. Along Amberly Rd between N 145th St and N 148th St
8. At the east end of Bradford Ct
9. Along road just east of Amberly Rd and N 148th St
    a. This area is outside City limits, and there is not an existing water main providing service to these houses. Therefore, no improvement is recommended for this area currently.

Adding hydrants should ideally be done in conjunction with water main replacement projects to minimize disruption to the water system.

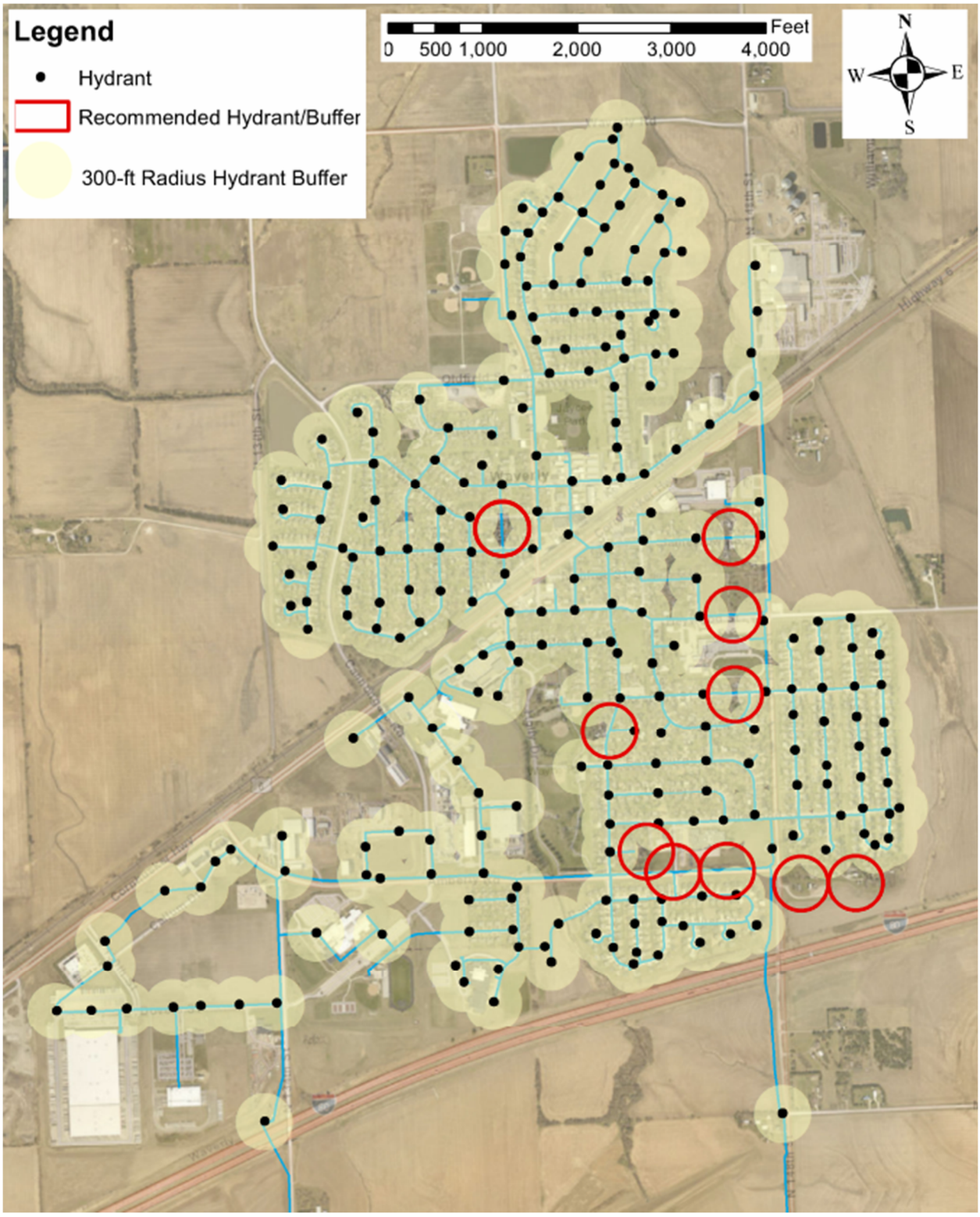

Figure 6. Hydrant Coverage Map

6.4 Water Storage Facilities

Water storage provides increased reliability for equalizing peak demands and for fire protection and emergencies during power outages. The required storage is a function of system demands, supply, and fire protection. The distribution system pressure is regulated by the water level in the two storage tanks. The wells are programmed to turn on and off based upon the level in the tanks. System pressures at the base of the storage tanks fluctuate depending on the system demands. Normal operating pressures throughout the distribution system range from 45 to 73 psi.

A 500,000-gallon elevated water storage tower, installed in 1975, is located on the northwest corner of Amberly Rd and N 148th Street. The high-water level is 140 feet above grade, with an operating range of 40 feet. This tower is shown in Figure 7.

Figure 7. 500,000-Gallon Elevated Water Tower

The second storage facility is a 500,000-gallon prestressed concrete water tank, which was installed in 2014. It is located northeast of Alvo Rd and N 134th St, just north of Well #9. The high-water level is 40 feet above the base elevation. This storage tank is shown in Figure 8.

Figure 8. 500,000-Gallon Alvo Rd Water Tank

General maintenance has been performed periodically on the tanks. The elevated water tower was last drained and repainted (interior and exterior) five years ago and is due for an inspection in 2023. The Alvo Rd ground storage tank was last inspected in 2020. Overall, this inspection found the water storage tank to be in very good condition with a small amount of sediment accumulating on the tank floor. The continued periodic inspection of both the interior and exterior of the storage facilities is recommended.

6.5 General Information

AWWA has suggested minimum design standards for distribution piping that the City should continue to follow when expanding the system and making improvements.

Standards for distribution pipe sizing include:

- Smallest pipe size: 6-inch
- Smallest pipe size on dead end: 8-inch
- Smallest pipes in high-value district: 8-inch
- Smallest pipes on principal streets in central district: 12-inch

Standards for valve placement include:

- Largest spacing on long branches: 800 feet
- Largest spacing in high-value district: 500 feet

Standards for hydrants include:

- All hydrants should be provided with auxiliary valve
- Minimum pipe size for hydrant branch: 6-inch
- Spacing in congested areas: 300 feet
- Spacing in light residential areas: 600 feet
- Suggested locations for hydrants include:
    - All intersections
    - The middle of long blocks
    - At end of dead-end streets

7. SYSTEM DEFICIENCIES

The analysis of the existing system and the establishment of estimated demands permit a determination of the present deficiencies and the development of a plan for potential improvements. An adequate supply of quality water must be backed up with adequate storage and distribution systems to provide good service to all areas of the City for the present and future years.

7.1 Storage

Ten States Standards recommends that a water system have adequate storage to provide the following conditions:

- A full day at peak demand.
- Average daily demand plus the capacity required for a fire flow event.

Waverly has two 500,000-gallon storage facilities; therefore, both combined should store enough water to handle the two demand conditions outlined above for the entire City.

The required storage capacity may be decreased if there is a source with backup power to supplement peak demands of the system. Table 14 summarizes the pumping capacity for wells with backup power connections and which ones would be powered in the case of power loss. In a situation where one well out of Wells #6 through #9 can be connected to the City's portable generator, Well #8 would be prioritized due to having the highest capacity. Wells #10 and #11 are wired such that the portable generator can power both of them simultaneously in the event of a power outage. In a power outage, the total capacity of wells on backup power is 1,215 gpm. The firm capacity of wells on backup power, calculated by removing the largest capacity well (Well #8) from the calculations, is 725 gpm.

Table 14. Summary of Wells With Backup Power

Wells With Generator Connections	Pumping Capacity (gpm)
Well #6	449
Well #8	**490**
Well #9	482
Well #10	**380**
Well #11	**345**
Pumping Capacity for Wells on Backup Power	
Apparent Pumping Capacity (gpm)*	1,215
Firm Pumping Capacity (gpm)	725

** Apparent pumping capacity is the sum of Wells #8, #10 and #11 that could be powered with generators in case of emergency*

7.1.1 Peak Day Storage Analysis

The first way to determine needed storage is ensuring that a full day's worth of peak demands could be provided by the wells with backup power and available storage. Table 15 outlines the water balance for a full day of peak demands at both the present 2023 condition and estimated 2043 future demands. The calculations show a surplus of available storage for both the present and future conditions. If the population and demand increase as forecasted in this study, the current water storage capacity of 1,000,000 gallons will be adequate for the projected 2043 population.

Table 15. Peak Day Storage Analysis

2023 Storage Analysis	
Peak Daily Demand	761 gpm
Firm Pumping Capacity for Wells with Backup Power	725 gpm
Water Balance	-36 gpm
Remaining Quantity Required for One Day	51,840 gal
Available Storage	1,000,000 gal
Net Water Balance after One Day	+948,160 gal
2043 Storage Analysis	
Peak Daily Demand	1,201 gpm
Firm Pumping Capacity for Wells with Backup Power	725 gpm
Water Balance	-476 gpm
Remaining Quantity Required for One Day	685,440 gal
Available Storage	1,000,000 gal
Net Water Balance after One Day	+314,560 gal

7.1.2 Fire Flow Plus Average Day Storage Analysis

The second storage analysis performed is calculating water consumption during fire flow conditions. Table 16 indicates the surplus and deficiency in supply and storage resulting from residential fire demand plus average day demands under firm pumping capacity of wells with backup power. In this report, a 2-hour residential fire flow duration was assumed per AWWA standards. As indicated in this table, there is a surplus of 857,680 gallons after a 2-hour residential fire flow event at average day conditions. Combining the flows provided by the existing water storage and firm pumping capacity conditions, the existing system can provide for average day demand plus 1,500-gpm fire demand in residential areas through 2043.

Table 16. Average Demands Plus Residential Fire Demands

2-Hour Fire Event	2023	2033	2043
Residential Fire Demand (gpm)	1,500	1,500	1,500
Average Day Demand (gpm)	411	545	648
Total Demand (gpm)	1,911	2,045	2,148
Firm Pumping Capacity for Wells with Backup Power (gpm)	725	725	725
Water Balance (gpm)	- 1,186	- 1,320	- 1,423
Water Balance After 2 Hours (gal)	- 142,320	- 158,400	- 170,760
Available Storage (gal)	1,000,000	1,000,000	1,000,000
Net 2-Hour Balance (gal)	+857,680	+841,600	+829,240

*Positive indicates a surplus, Negative (-) indicates a deficiency

Large commercial buildings have higher fire flow requirements. Table 17 outlines the surplus and deficiency in supply and storage resulting from commercial fire flow demand of 3,500 gpm plus average day demands under firm pumping capacity of wells with backup power. Per AWWA standards, a 3-hour fire flow duration was assumed for this condition. In the event of a fire in a commercial area, the distribution system would have a surplus of 426,520 gallons after the 3-hour fire flow event at average day conditions. This table shows that Waverly will continue to meet this 3,500-gpm fire flow capacity using their existing storage tanks and backed up wells firm pumping capacity through 2043.

Table 17. Average Demands Plus Commercial Fire Demands

3-Hour Fire Event	2023	2033	2043
Commercial Fire Demand (gpm)	3,500	3,500	3,500
Average Day Demand (gpm)	411	545	648
Total Demand (gpm)	3,911	4,045	4,148
Firm Pumping Capacity for Wells with Backup Power (gpm)	725	725	725
Water Balance (gpm)	- 3,186	- 3,320	- 3,423
Water Balance After 3 Hours (gal)	- 573,480	- 597,600	- 616,140

Available Storage (gal)	1,000,000	1,000,000	1,000,000
Net 3-Hour Balance (gal)	+426,520	+402,400	+383,860

*Positive indicates a surplus, Negative (-) indicates a deficiency

7.1.3 Water Turnover

The EPA recommends a 3-to-5-day complete water turnover in storage facilities as a starting point for maintaining water quality. This prevents excessive water age, which can lead to poor water quality entering the system. Using the 1,000,000-gallon storage capacity and the average daily demand for both present and 2043 conditions results in a storage turnover of 1.1 to 1.7 days. Thus, the anticipated turnover rate is considerably lower than the general recommendation.

7.2 Wells

It was noted previously that the City has two diesel generators that can provide backup power to three wells. Out of the seven active wells, five have the capability to be hooked onto backup power. Based on the calculations in the previous section, there is enough capacity using the existing generators to power wells and available storage to meet peak flow and average demand plus fire flow. Thus, an additional generator is not needed at this time to provide backup power to wells. However, if Waverly began to near exceeding storage requirements, a generator would be a cheaper alternative to provide additional water versus constructing a new storage facility or additional wells.

Ideally, Waverly's wells should be run no more than 12 hours a day to prevent excessive wear on the pumps. Since Waverly runs half their wells each day, the total pump capacity can be divided in half, equaling approximately 1,400 gpm. This assumes that both days have roughly equivalent pump capacities. Currently, the wells are programmed to run with the even numbered wells running one day and odd numbered wells the next. It is recommended that Waverly develop a well schedule that will run wells of an approximately equal capacity each day to minimize excessive wear on pumps that run on a lower-capacity day.

Table 18 outlines the present and future water use as compared to the pump capacity assuming that only half of the wells run each day. As shown in the table, there is a surplus water supply in the present and future condition. This shows that Waverly has sufficient well capacity to alternate wells every other day and run them for a maximum of 12 hours on an average day. Assuming the current pump capacity remains constant, a new well will be needed when Waverly's average daily demand reaches 700 gpm. Based on the population projections from this report, this will not happen until after 2043. These calculations do only account for average demand, but the peak day water use has been accounted for through the storage calculations showing that there is enough water stored to provide a peak day's worth of water.

Table 18. Water Use at 12-Hour Pump Schedule

	2023	2043
Average Water Use (gpm)	411	648
Water Use X 2 (gpm)	822	1,296
Half of Pump Capacity (gpm)	1,400	1,400
Water Balance (gpm)	+578	+104

7.3 Fire Flow

Olsson conducted fire flow testing with the City on February 6, 2023 throughout the distribution system. The purpose for such testing is to determine areas of the system which are unable to supply adequate water to handle fire demand and identify areas which lack sufficient pressures for normal water consumption.

The results were also used to calibrate the InfoWater model to ensure the model acted in a similar manner as the existing distribution system. The locations and results of the fire flows conducted are listed in Section 8.3 in Figure 10 and Table 19.

Even if water storage and supply can provide for demands in the event of a fire, distribution system deficiencies limit the ability to deliver the necessary flow to fight a fire in some areas of town. Per Ten States Standards, a desired range of system pressures is between 60 psi and 80 psi throughout fluctuating system demands, with a minimum working pressure of 40 psi. Under fire flow demand conditions, as the system must provide a minimum of 20 psi. During the flow tests performed by Olsson and the City, the lowest pressure recording was 42 psi, which is above the required minimum. Refer to Section 9.5 for additional discussion of the system fire flow capabilities.

7.4 Distribution System

Ten States Standards recommend that where fire protection is provided, water mains should be a minimum of 6 inches in diameter. Currently, approximately 3,850 LF, or 2.4%, of the system is comprised of mains less than 6-inches in diameter. The existing 4-inch pipe should be replaced with 6-inch pipe in areas where fire protection is provided to meet AWWA standards.

Water system maintenance records have been reviewed based on the main breaks recorded from 1998 to present in the GIS database. A history of breaks in a concentrated area can warrant replacement in areas of the water distribution system. Areas of high concentration of historical main break locations are shown in Figure 9. These three locations are outlined in red and are located along water mains on:

1. N 137th St from Newgate St to Jamestown St
2. Lancashire St from N 137th St to N 141st St

3. Eastbourne St/N 147th St
4. Danvers St

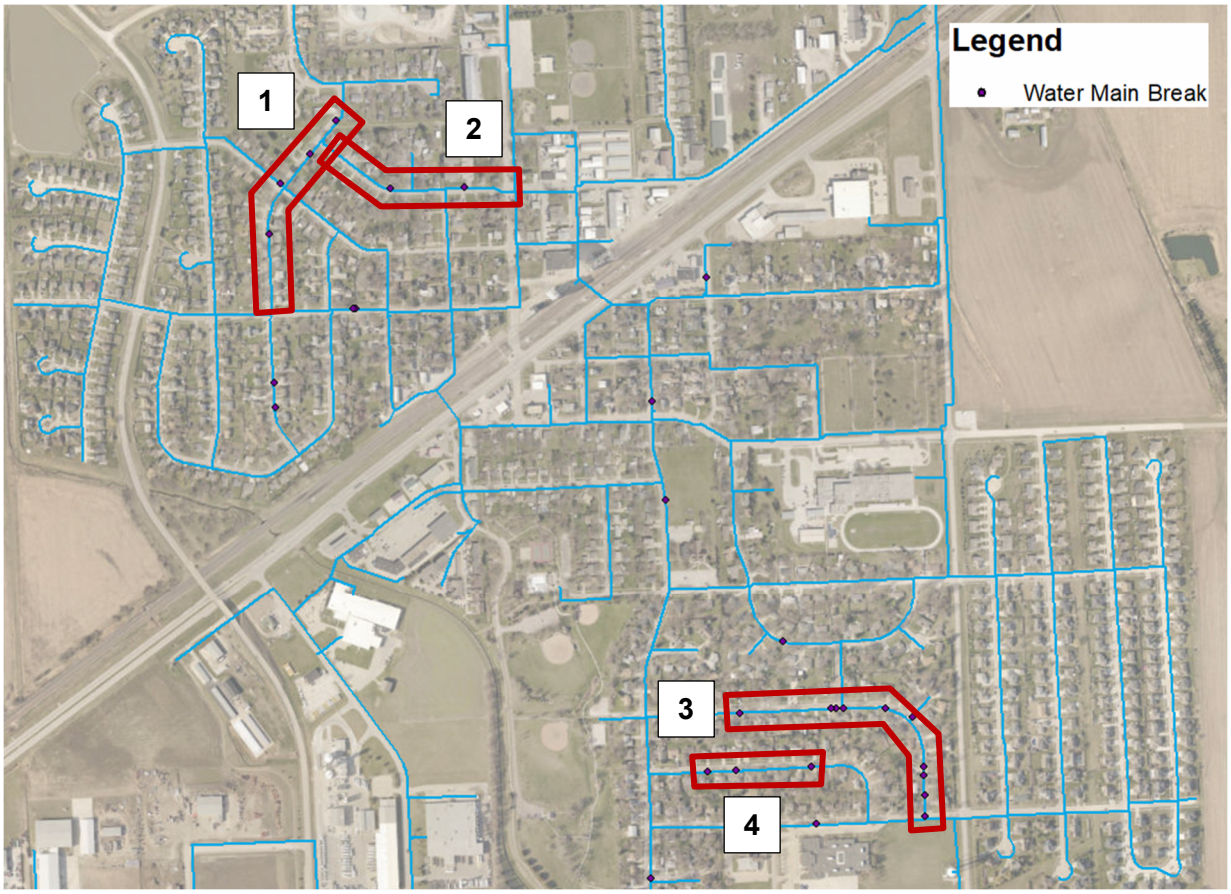

Figure 9. Main Break Locations

The project along Eastbourne St (#3) has been designed and is planned to be constructed in the 2023/2024 budget year. The project along Lancashire St (#2) has been designed, but the construction has not yet been scheduled.

The main breaks along N 137th St (#1) and Danvers St (#4) have occurred sporadically over the past 20 years. These are both CIP material and were built in the 1960s. There does not seem to be a worsening problem in this area, but the City has expressed interest in eventually phasing out all the old metal mains and replacing with PVC. Due to the history of main breaks, these two areas would be good places to start, especially if additional main breaks occur here in the future.

8. WATER MODEL HYDRAULIC ANALYSIS

A hydraulic model of the Waverly's water distribution system was created to evaluate the existing water mains to ensure appropriate capacity, pressures, velocities, and fire flow capabilities throughout the City. The InfoWater model creates a computerized representation of the water distribution system, which enables a hydraulic modeler to analyze the system and determine the water system's ability to provide adequate pressures and fire protection. Where potential deficiencies are identified, the hydraulic model may be used to recommend improvements.

System deficiencies are generally indicated by inadequate system pressures. The desired range of system pressures is between 60 psi and 80 psi, with a minimum working pressure of 40 psi. During fire flow conditions, the water system must provide a minimum system pressure of 20 psi.

For distribution facilities, pipe segments are generally considered potentially deficient, or the most-limiting segments, if they are predicted to have velocities greater than 5 fps or head loss greater than 10 ft/1000 ft. Velocities in pipe segments are acceptable up to 10 fps. However, as velocities increase, pipe head losses increase exponentially and problems with the water system performance under emergency conditions increase. The important objectives are to identify potentially vulnerable portions of the system, investigate the results of the system performance under emergency scenarios, and identify alternatives to improve reliability.

8.1 Model Development

Waverly's water system was input into InfoWater, a hydraulic modeling software by Autodesk. Existing hydrant and water main location and water main sizes were determined using the Waverly GIS system as a reference. Elevations within the water model nodes were derived from USGS Raster Data. The water tower and storage tower elevations were obtained from City record drawings.

No minor head losses anticipated from fittings, water meters, backflow preventers, or other items were introduced into the water model.

A Hazen-Williams coefficient of friction (C-factor) of 100 was assumed for the existing water mains, as recommended by Nebraska Title 123. This value was confirmed through model calibration efforts and adjusted as necessary to match most closely what was observed in flow testing. The extent to which pipes and valves are corroded in Waverly's distribution system is unknown, but generally a lower C-factor is associated with a greater degree of internal corrosion. Different areas of the water system likely represent different degrees of corrosion due to age and material of the pipes.

8.2 Water Demands

The 2023 average water use was found to be 411 gpm, as outlined in Section 4. The water use from the top 5 users is 112 gpm. The top 5 water user demands are applied at nodes representing their location in the water system, while the remaining 298 gpm was distributed evenly throughout the water model. There are 672 nodes throughout the system. Dividing the 298 gpm over those nodes results in a demand of 0.44 gpm at each node.

The model was also run with scenarios for peak daily demand and peak hourly demand. Peak daily demand is 761 gpm, as previously determined. The peak hour demand is 1,538 gpm. For both of these scenarios, 112 gpm was subtracted to account for specific demands applied near the top users (assumed constant over 24 hours), and the remaining demand was divided between the 672 nodes in the model.

8.3 Model Calibration

After the initial development of the hydraulic model, it must be calibrated to field conditions. This is achieved by conducting field hydrant flow testing and making adjustments within the hydraulic model until it most closely matches the conditions observed during flow testing. Flow testing field data was collected by Olsson with City water employees on February 6, 2023.

Hydrant flow testing consists of the following steps:

- Pairs of hydrants were identified throughout the water system for flow testing.
- Approximately 10% of the system's hydrants were tested.
- At each test location, one hydrant is identified as the "flow" hydrant, and one as the "residual" hydrant. It was attempted to sample two hydrants on the same water main line.
- A pressure gauge is installed on the fully opened residual hydrant. The pressure at that hydrant is recorded.
- The flow hydrant is opened fully, and the pressure of the water leaving the hydrant is recorded using a pitot gauge.
- The pressure drop at the residual hydrant is recorded.

After the flow testing is complete, results are entered into a spreadsheet to document the results for use in calibrating the model. The pressure recorded from the flow hydrant (in psi) is converted to a flow rate (in gpm) using the following equation:

$$Q = 29.83 * CD^2\sqrt{P}$$

Where:
Q = Hydrant Flow (gpm)
C = Opening Coefficient (unitless), ranges from 0.7 to 0.9 depending on the shape of opening
D = Hydrant Opening Diameter (inches)

P = Pitot Tube Pressure (psi)

After computing the flows from the hydrants at each flow test, the static and residual pressures from each test are compared against those in the model. Where the model static pressures differ from what was recorded in the field, node elevations are adjusted until the static pressures most closely replicate what was observed in the field to within 2 psi.

To calibrate to flow conditions, the calculated flow from each flow hydrant is input into its corresponding node in the model, and the residual pressure in the model is observed. To calibrate the model to field conditions, the roughness values in the nearby water mains are adjusted up and down until the model results most closely match the field results within 7 psi. The full calibration table is included in Table 19, and the flow test locations are shown in Figure 10.

As indicated in Table 19, the model was able to be calibrated to field conditions in nearly all locations. Test 18 was calibrated well to static conditions, but the residual pressure in the model was slightly higher than the allowable range. This is not a major concern and is likely due to the distance between the flow and residual hydrants for this test.

Table 19. Model Calibration Results

Test No.	Location of Flow Hydrant	Location of Residual Hydrant	Field Static Pressure (psi)	Model Static Pressure (psi)	Δ (psi)	Calculated Flow (gpm)	Field Residual Pressure (psi)	Model Residual Pressure (psi)	Δ (psi)
1	Alvo Rd & N 134th St, F-221	Alvo Road, F-222	45	45	0	538	42	44	2
2	Dovers St, F-213	Dovers St, F-214	65	67	2	1,007	55	56	1
3	Dovers St & Bailie Ct, F-255	Bailie Ct, F-161	63	64	1	993	58	58	0
4	Amberly Rd & Canongate Rd, F-199	Amberly Road, F-200	70	70	0	1,061	65	68	3
5	Deer Park Rd, F-189	Deer Park Rd & Amberly Rd, F-188	66	68	2	715	62	66	4
6	Bailie St, F-166	Bailie St & N 145th St, F-165	54	55	1	839	50	52	2
7	Castlewood & N 152nd St, F-155	N 152nd St, F-154	61	62	1	650	54	59	5
8	Eastbourne St & 143rd St, F-116	Eastbourne St, F-117	58	59	1	505	53	57	4
9	Guildford Rd, F-98	Guildford Rd & N 140th St, F-97	70	71	1	1,061	64	68	4
10	Heywood St & N 141st St, F-90	Heywood St & N 142nd St, F-89	68	70	2	1,061	66	70	3
11	N 150th St, F-136	N 150th St & Bluff Rd, F-135	63	65	2	993	55	54	1
12	Jamestown St, F-79	Jamestown St & N 148th St, F-78	67	69	2	875	62	66	4
13	Jamestown St & N 141st St, F-45	Jamestown St & N 139th St, F-42	69	69	0	949	65	66	1
14	N 135th Street, F-20	N 135th Street, F-19	70	72	2	787	52	58	6
15	Northloch St & Lucia Ct, F-4	Northloch St & Montrose Ct, F-2	69	69	0	750	49	56	7
16	Oldfield St, F-55	Oldfield St & N 142nd St, F-56	66	68	2	839	60	63	3
17	Quentin St, F-231	Quentin St & N 146th St, F-232	68	70	2	839	58	58	0

Test No.	Location of Flow Hydrant	Location of Residual Hydrant	Field Static Pressure (psi)	Model Static Pressure (psi)	Δ (psi)	Calculated Flow (gpm)	Field Residual Pressure (psi)	Model Residual Pressure (psi)	Δ (psi)
18	N 148th St, F-76	N 148th St, F-74	71	73	2	888	60	69	9
19	N 142nd St & Red Gauntlet, F-225	N 143rd St & Red Gauntlet, F-226	69	69	0	888	59	62	3
20	N 143rd St & N 142nd St, F-252	N 142nd St, F-251	69	71	2	993	55	61	6
21	Lancashire St, F-40	Lancashire St & N 137th St, F-31	70	72	2	825	65	68	3
22	Lancashire St & N 143rd St, F-50	Lancashire St & N 142nd St, F-49	68	70	2	1,186	65	64	1

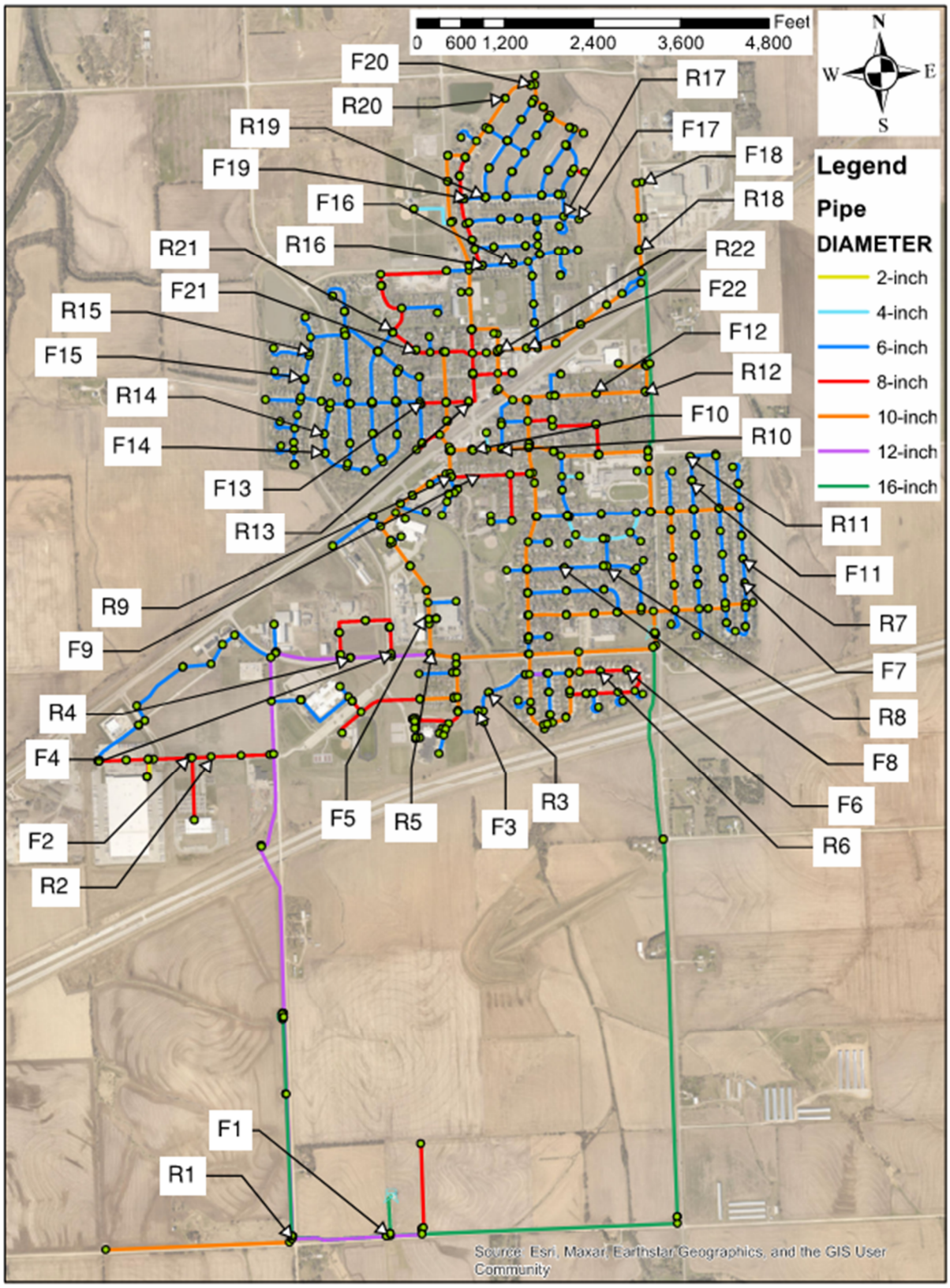

Figure 10. Flow Testing Map

8.4 System Pressures and Velocities

The calibrated hydraulic model was used to simulate operation of the water system and identify potential deficiencies in its ability to provide adequate pressures. Ten States Standards indicate that a water system should provide working pressures ideally between 60 and 80 psi, with a minimum pressure of 40 psi. The model indicated system pressures throughout the City limits ranging from 60 to 76 psi at average demand conditions. South of the City, on the transmission main from the wellfield, the pressure drops to as low as 35 psi in the very southeast, which can be attributed to the increase in elevation moving south. Since this portion of the water main is primarily for transmission and not distribution, and the transmission main is not being used to provide fire protection, this portion of the system operating at pressures nearing the 35-psi minimum is not cause for concern.

The model was used to generate a contour map of the system pressures, in psi, throughout the water system, as shown in Figure 11. The hydraulic model shows that pressures drop by about 1 to 4 psi from present average day conditions to peak hour conditions, depending on the location within the water system.

Future water demands were also modeled in the hydraulic model. The projected 2043 average daily demand is slightly lower than the 2023 peak daily demand, which the system is able to handle with minimal pressure drops (1 to 4 psi). The scenario that would put the most stress on the system is the 2043 peak hour demand of 2,313 gpm. Subtracting the top user water usage that is applied on specific nodes, this results in 3.44 gpm at the remaining nodes. When the model was run at these conditions, the pressures within the water system ranged from 60 to 70 psi. Although this is a drop from pressures at the average demand, it is still within the recommended 60 to 80 psi and these conditions will only occur at the peak hours. Note that there is the potential for new industrial development in the water system, which is not accounted for in these calculations. These calculations should be revisited once an estimated water usage is known for potential future industrial users in the water system.

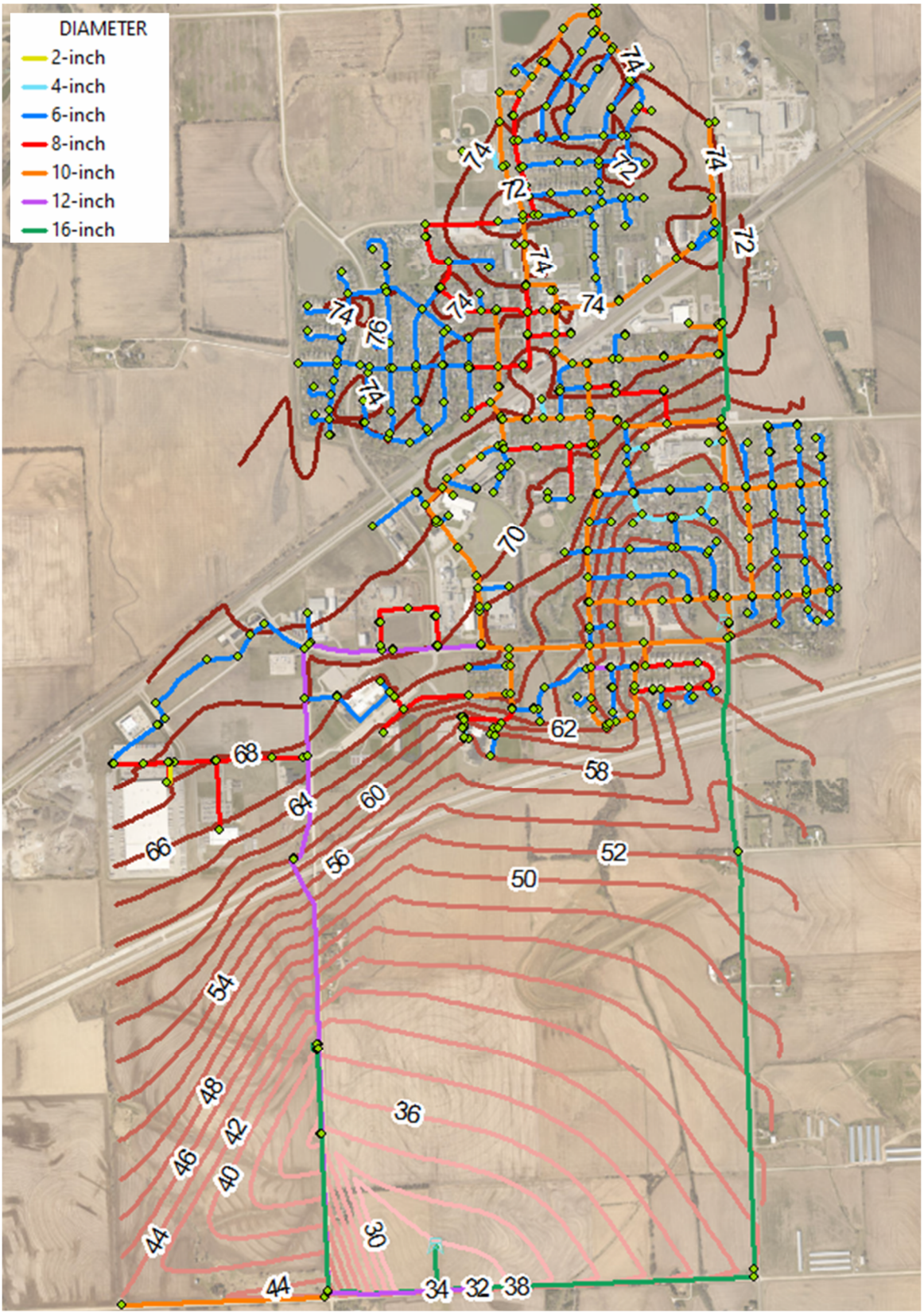

Figure 11. System Pressures at Average Day Demand

For all three demand scenarios, the velocity in pipes did not exceed 5 fps, and thus was determined to be acceptable. Figure 12 shows the velocity of water in pipes under the 2023 peak hour demand. As can be seen in the figure, the highest velocities are near the water tower. Velocities are lower moving to the north and to the outskirts of the water system.

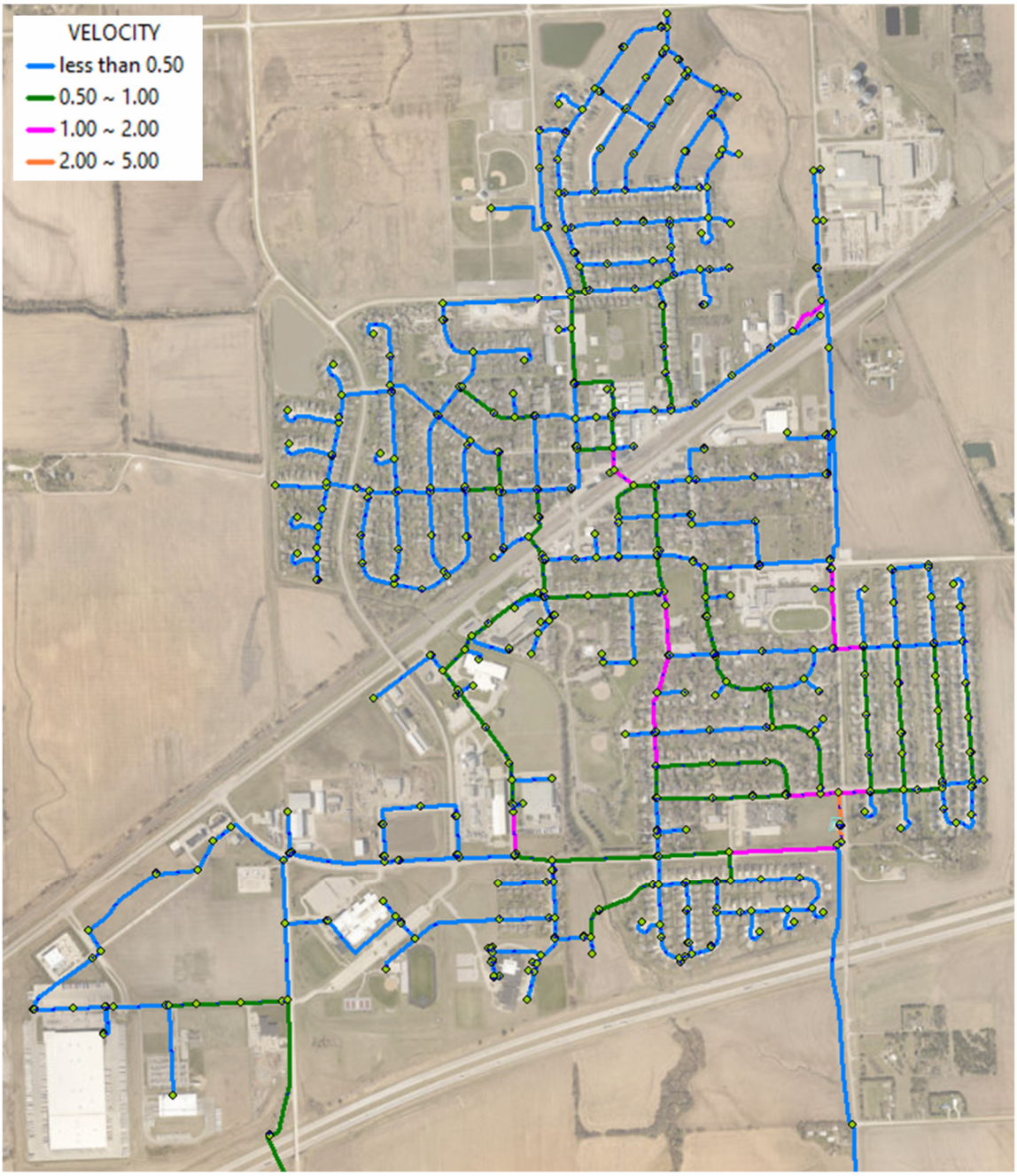

Figure 12. Pipe Velocity (in fps) at Peak Hour Demand

8.5 Fire Flow Simulation

The hydraulic model was next used to identify deficiencies in the system's fire protection capabilities. A distribution system should be capable of providing the needed fire flow (previously determined to be 1,500 gpm in residential locations and 3,500 gpm in commercial areas) while maintaining a residual pressure of 20 psi.

A fire flow analysis was performed within the hydraulic model to identify potential deficiencies in the water distribution system using the Fire Flow Scenario in InfoWater. The fire flow analysis utilizes the hydraulic model to gradually increase demands on the water system until the pressure drops to 20 psi. The demand that corresponds to a residual pressure of 20 psi is indicated to be the available fire flow at that location, in gpm. Where the available fire flow is lower than the needed fire flow identified earlier in this report, it is indicative of a potential deficiency in the water system.

To address potential system deficiencies, the model is used to simulate water improvements and their effect on addressing those deficiencies. Potential improvements can be projects such as upsizing water mains, looping water mains to eliminate dead ends in the system, or other projects listed in this section. Waverly's water distribution system generally meets Ten States Standards for minimum 6-inch diameter water mains where fire protection is provided. There is only one area where there is a 4-inch loop, along Oak Lane, which results in fire flow capabilities less than 1,500 gpm in this area. The remaining areas of pipe with smaller than 6-inch diameter are all dead ends or services to buildings and are not significantly hindering the transport of water for fire flow.

After simulating fire flows throughout the water system in the model, locations where potential deficiencies are located were identified. A contour map of the available fire flow, in gpm, is provided in Figure 13. This map shows that most of the system can provide the residential demand of at least 1,500 gpm while maintaining a residual pressure of 20 psi. The commercial areas of Waverly, primarily along Highway 6 as outlined on their land use map, were cross referenced with the fire flow map. It was found that these commercial areas are able to supply a minimum of 3,500 gpm for fire flow. The future land use map can be found in Appendix C.

Where the contours show that available fire flow is less than required, improvements are identified to address them. The hydraulic model shows that fire flow capabilities are lowest on the northwest outskirts of town and at various other dead ends such as cul-de-sacs or lines running to building services. These areas of lower fire flows along dead-end service lines are to be expected, and no recommendations are provided for these cases. Available fire flow is also lacking though the 4-inch main along Oak Ln, Recommended improvements to increase fire flow capability are outlined in Section 10.2.

In areas that are lacking the 1,500-gpm fire flow capability, it is recommended that the firefighters take caution. If they use pumps on the trucks to pull more water than is readily available, they should monitor the system pressures, and lower the output flow if it is nearing 20 psi.

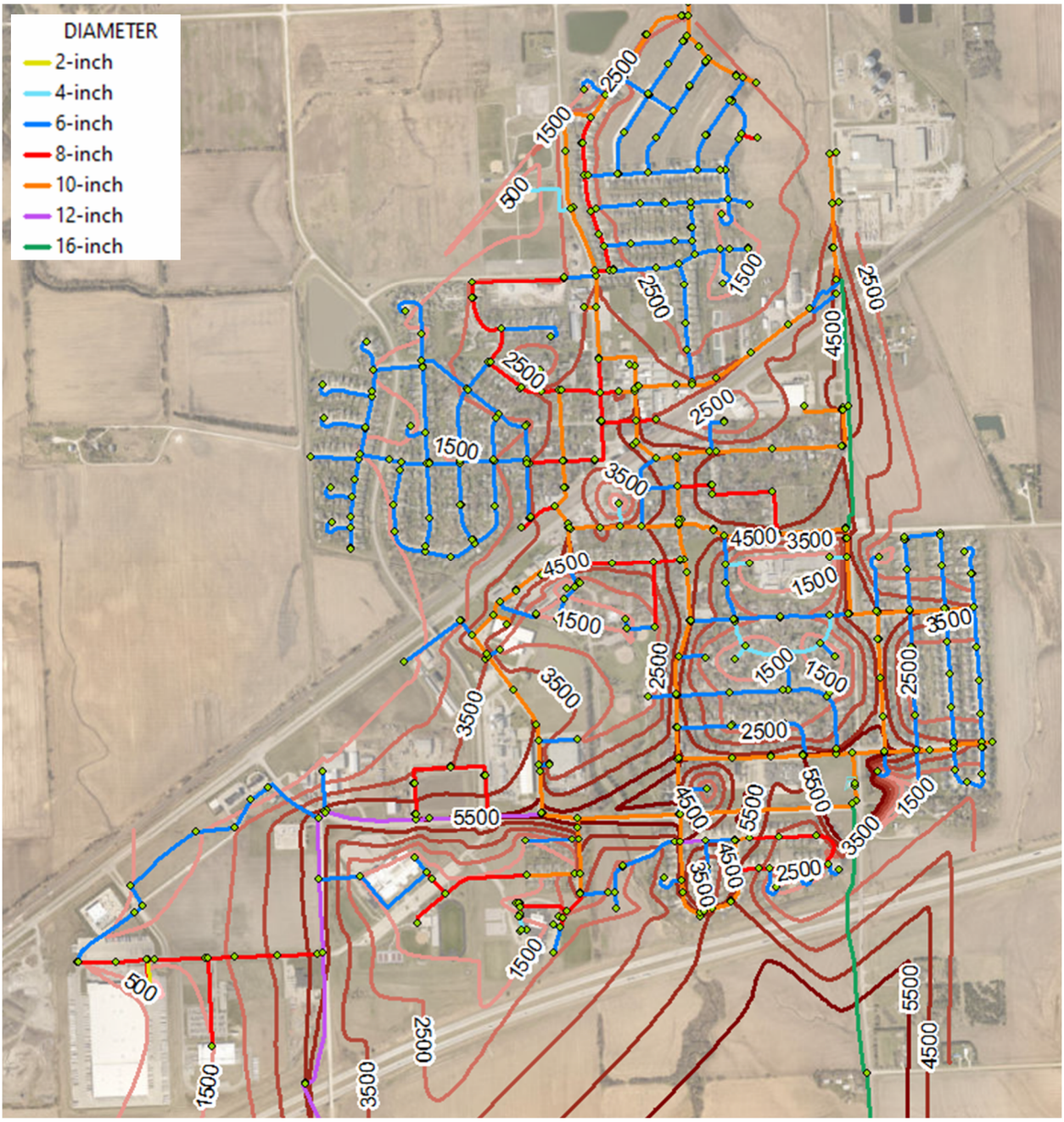

Figure 13. Fire Flow Capabilities

9. FUTURE GROWTH

Although future population growth has already been explored in Section 3 through projections provided in Waverly's Comprehensive Plan, it is also necessary to identify growth areas as the land outside of the water system to ensure that they will be able to be served with water when constructed. The Comprehensive Plan, prepared by Hanna Keelan Associates, determined what areas of town may be developed in the future and what type of land use is expected. This future land use map can be found in Appendix C.

9.1 Development East of Waverly

The City is presently in the process of completing a new Comprehensive Plan and has provided the current land use map that determines what areas of town may be developed in the future and what type of land use might be expected. This map is shown in Figure 14. The future land use map shows planned areas of Urban Density Residential, Multi-Family Residential, and Commercial east of N 148th St and west of N 162nd St. The City confirmed that these areas are still being planned for development, likely starting with residential south of Highway 6 and North of I-80 within the next 15 to 20 years.

Figure 14 also shows a proposed water main loop consisting of approximately 41,500 linear feet to serve these areas of new development. The loop was assumed to be near the roadways within right-of-way to prevent the need for property acquisition or easements for their construction. Benefits of the looped layout include providing redundancy, preventing dead ends, and maintaining pressure. Depending on the timeline for developing this area, different portions of the loop would likely be constructed in phases. In order to match the 16-inch transmission main and maximize capacity, these future water main loops are proposed to be 16 inches, installed in open right-of-way.

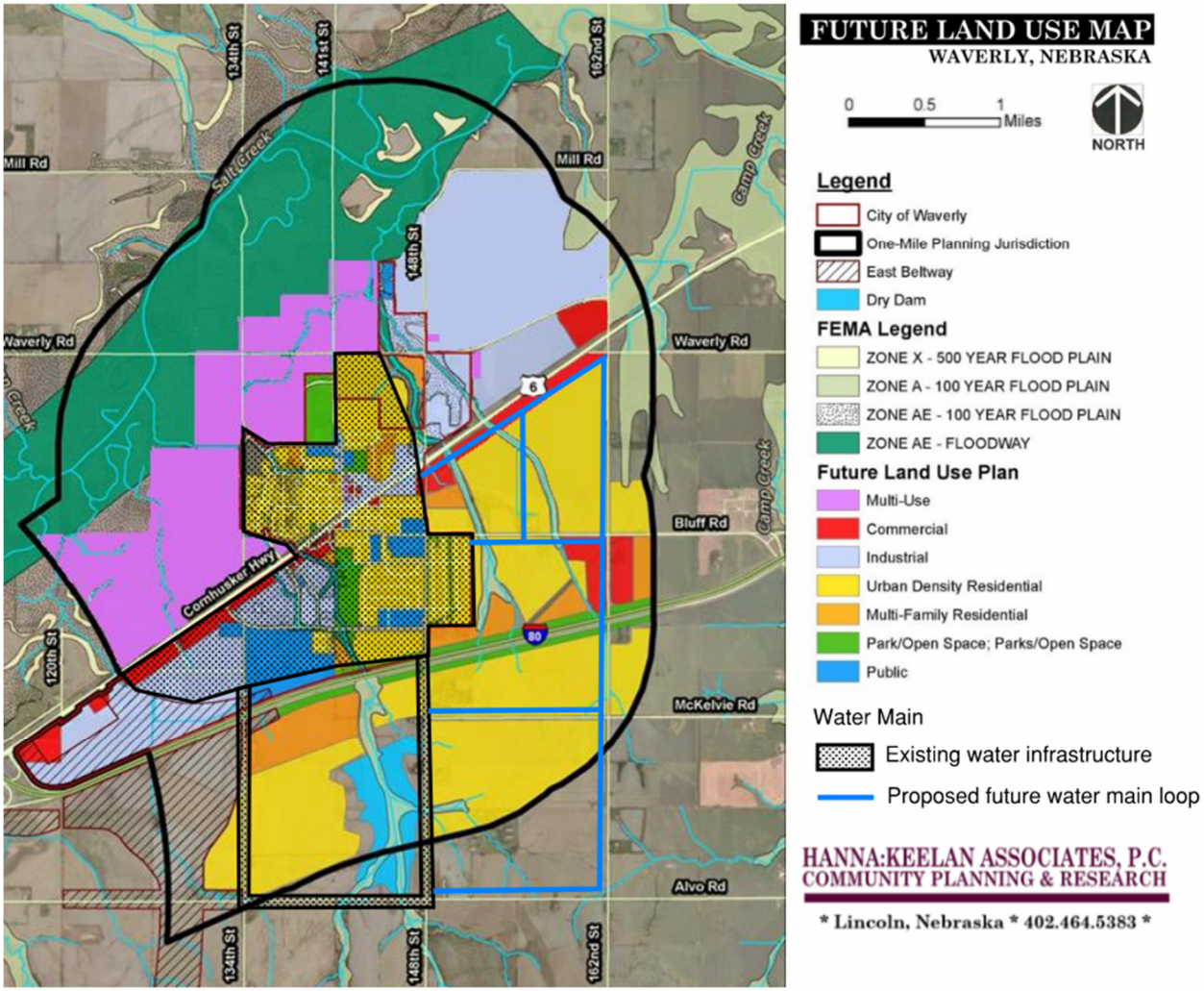

Figure 14. Future Land Use Map with Proposed Water Main Loops

9.1.1 Future Loop Demand

Population density is used to estimate population growth in the future growth areas. The proposed future loops cover approximately 1,500 acres of potential development. Several methods of population density for residential areas were considered, as outlined in Table 20.

Table 20. Residential Population Density by Different Estimation Methods

	Residential Density (people/acre)
2005 Water Study	8.28
2013 Comprehensive Plan	11.27
National Planning Standard	10

The National Planning Standard density was used for this report, resulting in an expected 15,000-person population increase from this new development area, which is primarily residential. It is noted that this population increase is considerably higher than the growth rates

defined in Section 3. This method of estimation is used as a preliminary conservative assumption. The future population will likely be much lower due to parks and other types of developments besides only residential houses in this area. Additionally, this development will likely take longer than 20 years to be fully complete and populated.

If the calculated 138 gpcd was applied over this future water loop, this would result in an additional average demand of 2,070,000 gpd, or 1,438 gpm. The current pumping capacity would be able to provide this additional average demand, but a new well or additional storage may be necessary to meet peak demands. However, no specific recommendations will be made at this time due to the exact developments and timeline not being planned yet.

9.1.2 Future Loop Pressure and Fire Flow

With expected demands applied, pressures in this proposed loop are similar to the pressures around the present distribution main within town, as shown in Figure 15. Pressures north of I-80 range from 50 to 75 psi. Pressures south of I-80 range from 36 to 55 psi. Further study and modeling are recommended prior to planning the portion of this loop south of I-80 to ensure the development has adequate pressure. It is likely that a booster pump station will be needed in this southern area in order to provide pressures within 60 to 80 psi.

Due to the large-diameter main, fire flow in this loop is more than sufficient, ranging from 3,000 to 5,500 gpm in the model, as shown in Figure 16. While the hydraulic model is shown to provide fire protection for the loop in this area, it is recommended that the pressures and fire protection capabilities be further modeled when exact water mains are designed for the site.

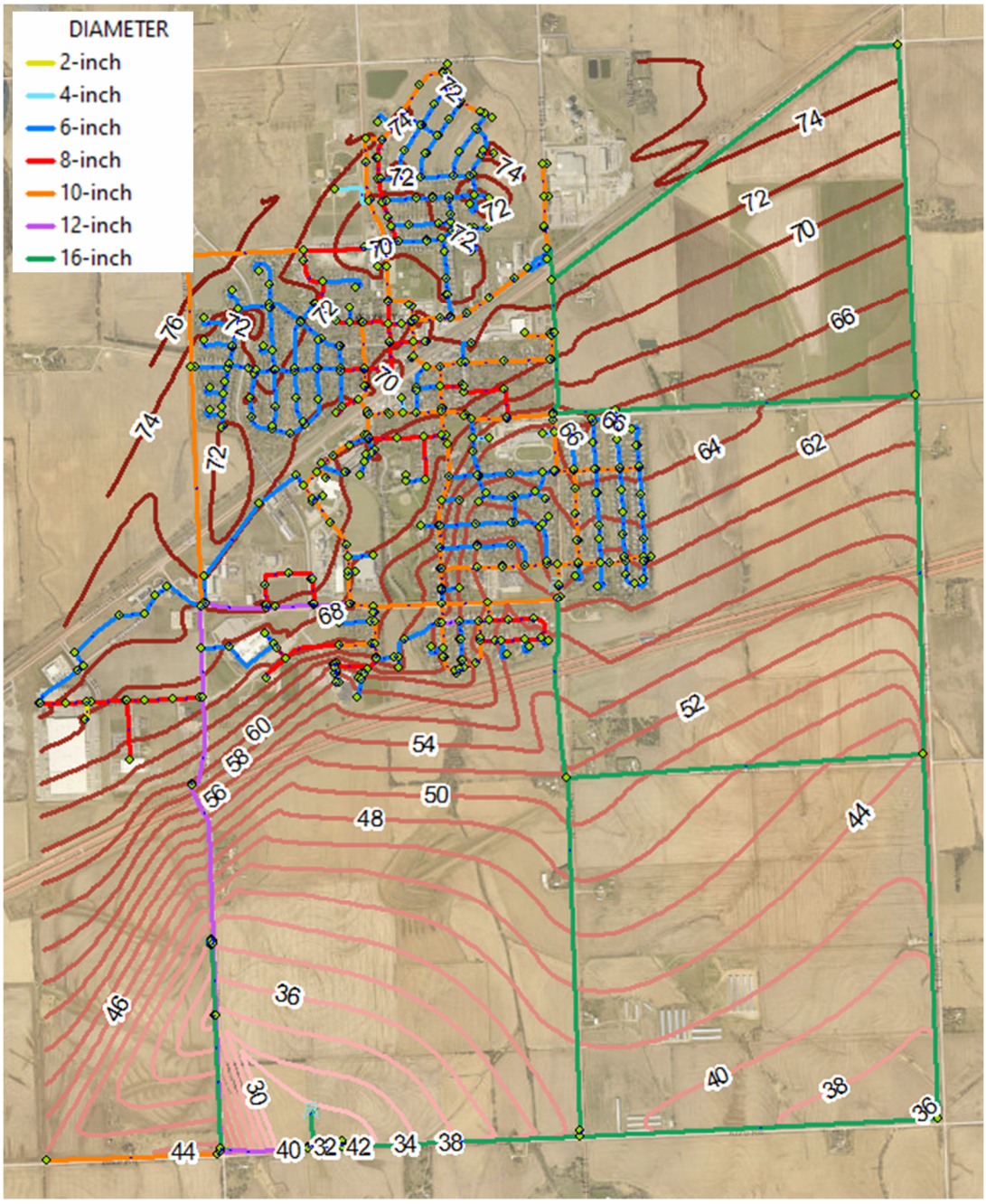

Figure 15. Pressures Around Proposed 16-inch Loop

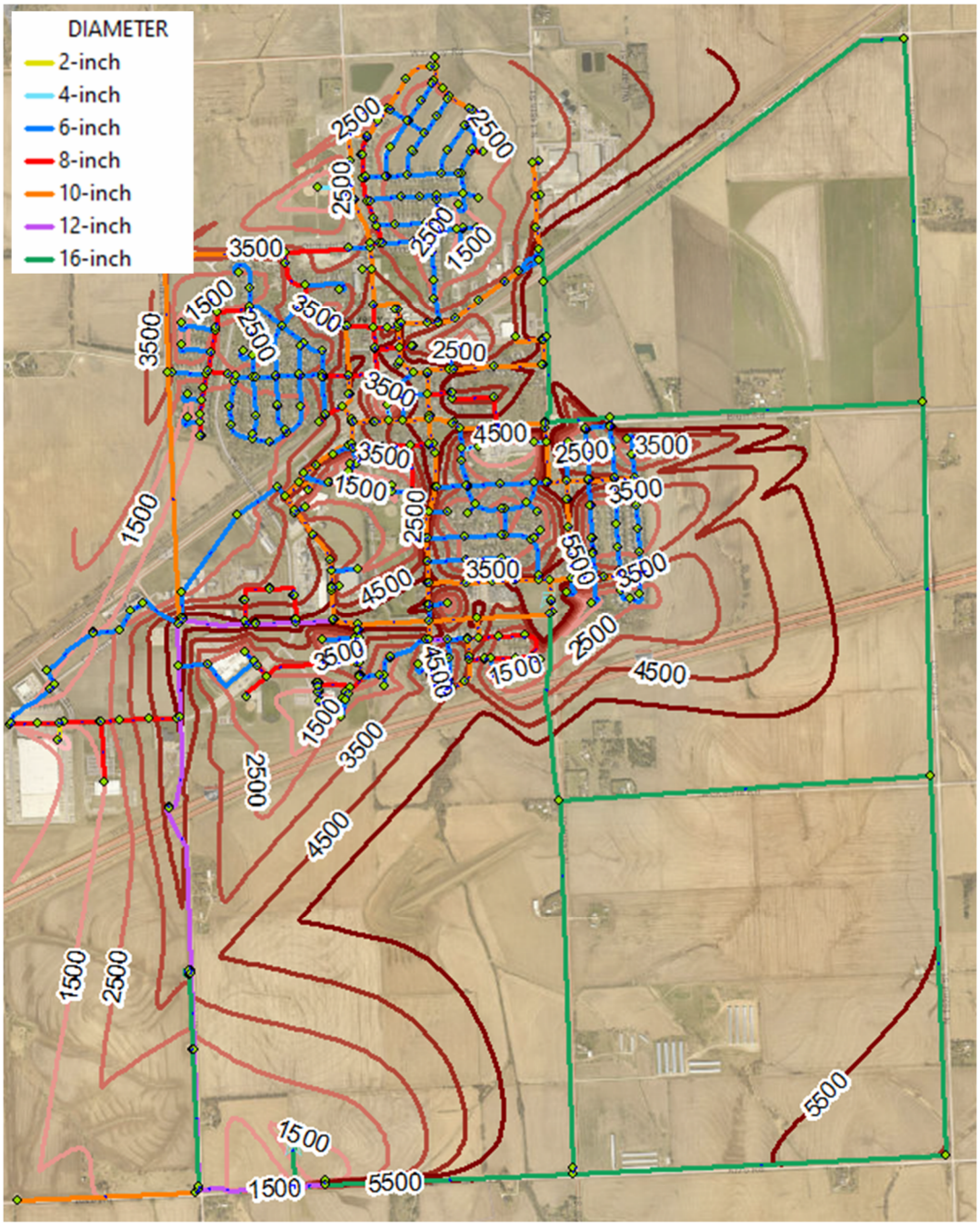

Figure 16. Available Fire Flow Around Proposed 16-inch Loop

9.1.3 Future Loop Phasing

This water main loop is very large and will likely be constructed in phases as land development is planned and constructed. This proposed phasing, as shown in Figure 17, will be used to break down the cost, to be further detailed in Section 11. Recently, the land in the northwestern portion of this loop (Phase A) has been purchased, and residential development is expected within the next 10 years.

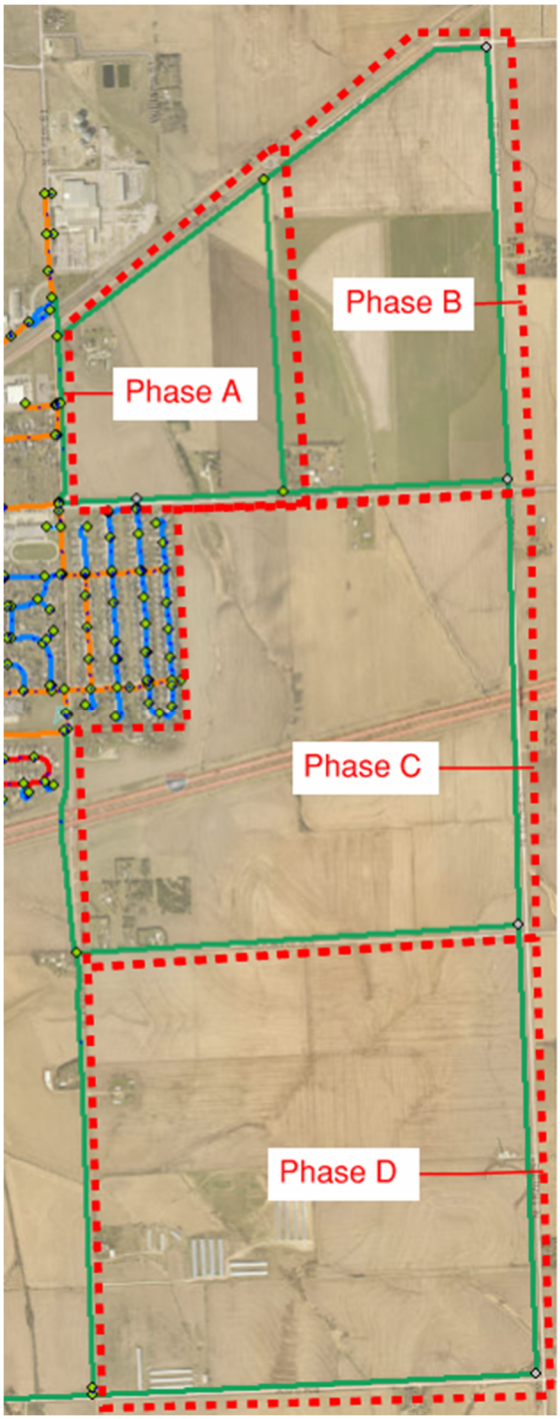

Figure 17. Future Loop Phasing

9.2 Potential Water Main Extensions and Cost

The City mentioned a couple areas on the outskirts of City limits that have expressed interest in a water main extension and connecting onto Waverly's system. These landowners are currently getting water from private wells.

The first potential extension is approximately 7,500 LF of water main north along 148th St to Mill Rd and the buildings north of the wastewater treatment plant. The City said there are about 8 buildings that could be connected to water. The model finds a pressure of approximately 75 psi on the line, which is good. For a 6-inch water main, fire flow at the furthest north point is only 350 gpm. Due to the spacing between buildings being more than 30 feet apart, there would be a 500-gpm fire flow requirement in this area. If this extension is upsized to 8 inches, then it can provide 700 gpm at the most remote point, which is adequate. The estimated cost for this 7,500-LF extension of 8-inch water main is approximately $930,000.

The second potential extension is southwest along Highway 6 to 120th St, which is approximately 3,500 LF of water main. The pressure at the end of this extension is about 70 psi, which is good. For an 8-inch main, the fire flow at the end is approximately 850 gpm. Upsizing this to 10 inches results in a fire flow of 1,200 gpm. The closet buildings in this area are about 30 feet apart, which will result in an ISO fire flow requirement of 750 gpm. Therefore, an 8-inch main would likely be adequate, unless additional fire protection is desired. The estimated cost for an 8-inch water main extension is approximately $434,000.

It is noted that these water mains were approximately drawn in the model based on preliminary discussions with the City. Additional modeling may be required once the water main and expected demands are configured to confirm adequate pressures and fire flows.

10. RECOMMENDED IMPROVEMENTS

10.1 General Improvements

Much of the existing water main in Waverly is adequately sized at 6 inches or larger. Water mains 4 inches or smaller compose only 2.4% of the system. Most of these are dead ends serving only one property and should not be a priority to upsize.

Looping dead ends or branched runs would be beneficial in increasing flow and pressures to deficient areas of the City. However, the majority of dead ends currently occur in cul-de-sacs or in providing service to one property, which would make looping an infeasible solution. As the City continues to grow, a main that encompasses the City boundaries is recommended for to accommodate future water users.

When specific new developments or water main extensions are planned, it is recommended to model the system to ensure that adequate pressures and fire flow can be provided to the new areas. A Master Services Agreement can be created upon request for Olsson to provide these on-call services for modeling updates for specific future projects utilizing the model of Waverly's water system.

Analysis of the water system shows that the current wells provide a sufficient quantity of water to regularly meet present and future demands. Thus, a new well is not recommended at this time to supplement water quantity. If a new well was to be planned for, it would be recommended to look around the southwest area of the existing wellfield near Wells #6 and #7 due to the lowest nitrate concentrations in that area. A separate well study would be recommended at that point to explore and further refine a site for a test hole.

10.1.1 Old Metal Water Mains

It was requested by the City to evaluate the cost to eventually replace all old metal water mains, which comprise approximately 29% of the system (plus 7% unknown material). Table 21 shows a summary of the length of pipe that is a different size of DIP, CIP, or unknown pipe material. The unknown pipe material is included due to the likelihood that it is unknown because the plans are older and thus more likely to be a metal material. Standard costs are assumed for the design, construction, and associated fees for the various sizes of pipe. All costs are rounded to the nearest $1,000. To replace all water mains assumed to be metal would result in an estimated cost of $24.7 million. Replacing all non-PVC water mains at once is not feasible, and it is more practical to replace the mains in areas known to be deficient and then in a scheduled replacement plan to slowly make progress over time.

Table 21. Summary of DIP, CIP, and Unknown Material Water Mains

Pipe Diameter (in)	Length (LF)	Cost per LF	Cost to Replace
Unknown*	88,192	$ 133	$ 11,730,000
2	367	$ 44	$ 16,000
3	414	$ 67	$ 28,000
4	2,364	$ 89	$ 210,000
6	27,082	$ 133	$ 3,602,000
8	6,323	$ 178	$ 1,125,000
10	23,516	$ 222	$ 5,221,000
12	10,356	$ 266	$ 2,755,000
TOTAL	**158,615**	**-**	**$ 24,687,000**

**When the pipe size was unknown, it was assumed to be the construction cost of 6-inch pipe due to that being the most common occurrence in the system.*

One method of planning for the replacement of all older, metallic mains is to budget for their replacement over a 20-year period. Based upon the total in the previous table, this will result in a cost of $1,234,350 per year for the next 20 years.

10.1.2 Recommended Pump Schedule

The current wells are scheduled to run even-numbered wells one day, odds the next. The pump capacity of even-numbered wells is approximately 600 gpm higher than odd-numbered wells. Consequently, this is likely adding increased strain on the aquifer level near the odd-numbered wells. This is reflected in Wells #5, #9, and #11 all having critical pumping water levels within 5 feet of the intake in May 2023.

A new recommended setup of pumps to alternate daily is shown in the table below. This arrangement was chosen to better equalize the production capacity across all wells. This also geographically spreads out the wells in a different way which could potentially help aquifer levels. Pumping and static water levels are recommended to be monitored after this shift to confirm if there is a positive impact on the aquifer levels. This exercise should be revisited once Well #7 is constructed and the optimum pumping rate for that site is verified.

Table 22. Recommended Pump Schedule

	Day 1	Day 2
	Well #5	Well #4
	Well #6	Well #8
	Well #10	Well #9
	Well #11	--
Total Capacity	1,477 gpm	1,355 gpm

10.2 System Improvements

The following improvements to the distribution system will help facilitate better flow throughout the system, improve pressures and fire flow capability, meet minimum sizing recommendations, and plan for future growth and development around Waverly. Figure 18 shows a map of the locations for all improvements.

Improvement 1

Upsize approximately 1,525 LF of 4-inch water main to 6 inches along Oak Lane and W Oak Lane Circle. Based on the modeled fire flow, this segment is currently not able to meet the 1,500-gpm residential requirements. Upsizing this line to 6 inches improves the fire flow to meet 1,500 gpm as well as satisfying Ten States Standards recommendations for mains providing fire protection. Additionally, this area of water main has had two main breaks within the past year, and replacing it would reduce the risk of this happening again and affecting the customers served off this line.

It is noted that the City does not have the original drawings for this segment of water main that was constructed in the 1960s. It is believed that it is part 4-inch and part 6-inch. The 4-inch segments that restrict the flow and the age would both contribute to reasons that this main should be replaced.

Improvement 2

Currently, almost all of Northloch Street and the cul-de-sacs to the west are under the 1,500-gpm residential fire flow requirements. Adding another connection point to the water system and looping this development to the water system would improve fire flow along Northloch St and the cul-de-sacs to the west. This would include installing approximately 1,300 LF of 10-inch pipe from the existing 6-inch main along Northloch St going south to Energy Way and Well #5. Approximately 450 LF of that pipe would be bored with casing under US Highway 6 and the railroad. In addition, approximately 860 LF of 6-inch water main along Energy Way and Deer Park Rd would need to be upsized to 10 inches.

After this improvement, all of Northloch St will meet the 1,500-gpm fire flow capability. The western ends of the cul-de-sacs can only provide roughly 1,100 to 1,400 gpm, but they are within 500 feet of another hydrant that could provide additional flow if needed.

Improvement 3

As part of planning for future growth, a 16-inch main is recommended to loop around the proposed development area east of town. This would be the first step to provide adequate facilities for the new development areas. As part of the proposed water main along Bluff Rd for this loop, a 100-LF connection south into the 6-inch main along N 151st St is recommended in

order to improve flow in that area. This water main loop is recommended to be installed in four phases as development is planned. This improvement is further expanded on in Section 9.1.

Improvement 4

It is recommended that the 6-inch main from Well #5 along Energy Way is looped to connect to the 6-inch main at N 134th St. The City mentioned that this connection is being planned but is dependent on some future development layouts in this area. The two connection points are approximately 1,400 LF apart, and 2,000 LF of 6-inch pipe will be assumed for the length of water main to allow for installing around future developments.

This improvement will help towards the general goal of looping water mains to improve pressures and flow throughout the system. This location by a well is also beneficial to provide a redundant connection, so that the well could continue supplying water if there was an issue with the one water main along Energy Way which presently connects the well to the distribution system.

Improvement 5

Although the water main replacement project along Eastbourne St and N 147th St has already been designed, it has not been constructed and therefore will be included in the cost estimate in this water study. This project consists of approximately 2,335 LF of 6-inch pipe. There has been a history of many main breaks in this area, which necessitates this project.

Improvement 6

The water main replacement along Lancashire St from N 141st St to N 137th St has been designed. A cost estimate for construction is included in this study. This replacement includes approximately 1,185 LF of 8-inch water main and 230 LF of 6-inch pipe.

Improvement 7

As outlined in Section 7.4, the water main along N 137th St has had a history of main breaks and is recommended to be replaced. It is 8-inch CIP between Newgate St and Lancashire St and 6-inch CIP between Lancashire St and Jamestown St. Both were installed in the late 1960s. It is recommended to replace this 370 LF of 8-inch pipe and 1,050 LF of 6-inch main.

Improvement 8

As outlined in Section 7.4, the 6-inch water main along Danvers St has a history of water main breaks and is recommended to be replaced. The installation date is unknown and likely around the 1960s. The material is cast iron, which the City would prefer to replace. It is recommended that the entire 1,480 LF of water main along Danvers St from N 143rd St to Castlewood St is replaced in order to upgrade this area all at once.

Improvement 9

As discussed in Section 6.3, several areas throughout Waverly are lacking sufficient hydrant coverage. In order to improve the coverage, eight hydrants are recommended in the locations previously described. When possible, it is recommended that these projects be completed in conjunction with main replacements or other projects rather than installing them individually on existing water mains. This would minimize disruption to the overall water system and likely bring cost savings.

Improvement 10

Approximately 29% of Waverly's water system is comprised of old metal CIP and DIP mains. The City has expressed interest in replacing these over time. Improvement 10 consists of a 20-year plan to do so.

Improvement 11

Due to the trending upwards nitrate levels, it is recommended to take the first steps towards looking for a new well or other water source. A nitrate/well study is recommended to start planning for new well(s) to replace high nitrate wells.

This study could also investigate the logistics and preliminary costs of purchasing water from Lincoln if the City is interested in that as an alternate to a new well as an additional water source. This would include a review of water chemistry to confirm blending is possible.

Improvement 12

Instead of or in conjunction with an additional water source, it is recommended that Waverly look into a blending solution to lower the overall system nitrate levels. This would involve calculations to set up a well schedule configuration that combines water from high- and low-nitrate wells.

This would also include the construction of a blending vault near the treatment application points. The blending vault would be a small structure that includes a static mixer, pipes and valves, and a downstream sampling station.

Improvement 13

Due to the aging Wells #4, #5, and #6, the City has expressed interest in the associated costs for replacing these wells rather than rehabilitating them. In the case of Wells #4 and #6, due low nitrates in this area, the best option may be drilling a new well adjacent to the existing well.

High nitrates in the vicinity of Well #5 may necessitate a nitrate/well study (Improvement 11) to ensure a reliable water supply. Improvement 13 includes the associated costs for design and construction of a new well and pump.

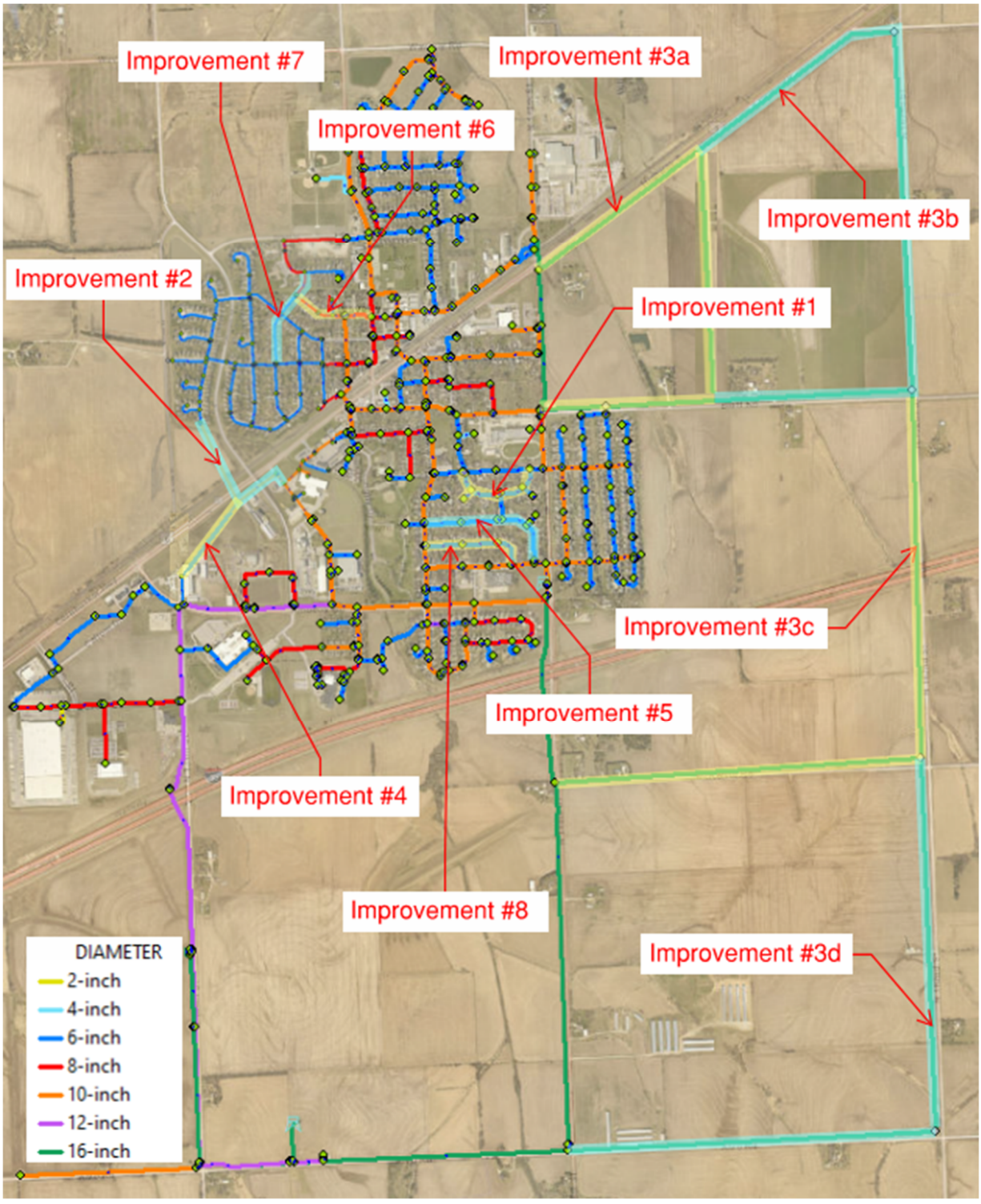

Figure 18. Distribution System Improvements Map

10.3 System Improvement Priority Ranking and Timeline

The proposed projects are prioritized to aid the City in budgeting and planning for their construction. Table 23 outlines the recommended improvements and provides a timeline for each project. It is noted that several improvements are indicated as needed to support growth, and the timeline for those is dependent on planned development in Waverly.

Table 23. Recommended Improvements Priority and Timeframes

Improvement No.	Description	Prioritization Timeframe
1	Oak Ln Water Main Upsize (4” to 6”)	0-3 Years
2	Looped Connection to Northloch St	0-5 Years
3a	Future 16" Loop around East Development Area - Northwest	0-10 Years
3b	Future 16" Loop around East Development Area - Northeast	As needed to support growth
3c	Future 16" Loop around East Development Area - Central	As needed to support growth
3d	Future 16" Loop around East Development Area - South	As needed to support growth
4	Construct Water Main between N 134th St and Well #5/Energy Way	0-5 Years
5	Eastbourne St Main Replacement (6” Pipe)	0-2 Years
6	Lancashire St Main Replacement (8” and 6” Pipe)	0-2 Years
7	N 137th St Main Replacement (8” and 6” Pipe)	0-5 Years
8	Danvers St Main Replacement (6” Pipe)	0-5 Years
9	Install 8 New Hydrants to Improve Coverage	0-3 Years
10	Replace Old Metal Water Mains (Done Over 20 Years)	0-20 Years
11	Nitrate/Well Siting Study/LWS Feasibility	0-3 Years
12	Blending Vault	5-10 Years
13	New Well	0-10 Years

11. OPINION OF COST

An opinion of project cost for each of the proposed improvements is presented in Table 25. The opinions of cost assume that all work is competitively bid and performed by registered contractors with complete plans and specifications. All costs are estimated using 2023 pricing. The rate of inflation in construction costs is difficult to forecast, so opinions of cost for improvements that are not completed in the near future will require updating at that time. A more detailed analysis of cost will also likely be performed when a project is designed.

Estimates of cost were compiled using data from RS Means Estimating Guide, tabulations from recently bid projects, and pricing from vendors. The budget cost estimates assume that the projects are designed by a Professional Engineer, and that the work is performed by a licensed contractor with complete plans and specifications, approved by NDEE.

For proposed water distribution system improvement projects, a budget cost per inch-diameter of water main was used to estimate the potential cost for each project, which will include hydrants, valves, disinfection and testing, pavement removal and replacement, service line installation, and other miscellaneous items associated with the construction of new water mains. Budget cost per inch-diameter of water mains were derived from the LWS Master Plan. These unit costs were used as a basis and compared to RS Means Estimating Guide, recently bid projects, and information provided by vendors and suppliers. It was determined that the unit prices for the water mains in open ROW were accurate to recent costs. However, a 40% contingency was added to the LWS unit prices for water mains in congested areas in order to account for the project and market variability in alignment with recently bid projects in similar communities.

In preparing the opinion of cost for piping improvement projects, it has been assumed that new water mains will be located in open right-of-way since they are primarily planned to run along existing roads, and they will not require the removal/replacement of any pavement or sidewalks. This includes Improvements #2, #3, and #4. The water mains that are being upsized are assumed to be constructed in a congested area. This includes Improvements #1, #5, #6, #7, #8 and #10.

Standard budget costs for each of these are outlined in Table 24. These unit costs include material and construction cost as well as assuming a 20% contingency to account for engineering, legal, and administrative costs.

Table 24. Budget Costs for Water Main Projects

Water Main in Open ROW	
Main Size (in)	Construction Cost per LF
6	$93
8	$124
10	$155
12	$186
16	$248
Water Main in Congested Areas	
Main Size (in)	Construction Cost per LF
6	$186
8	$249
10	$311
12	$372
16	$497

Budget cost estimates for the recommended projects are included in Table 25. Costs are rounded to the nearest thousand dollars. A total of 13 recommended projects are provided, ranging from new water main loops, to main replacements, to new wells. The costs for each assume that the projects are completed individually as their own project, though it is likely that cost savings would be experienced if two or more projects are combined into a single larger project.

The estimate for a new well as Improvement 13 includes design of a well, test hole and soil analysis, drilling of a well, casing, screen, gravel pack, well development and testing, wellhouse, and electrical and pipe connection to the new well. If it was decided to re-drill Well #4 or #6 adjacent to the existing well, this cost would likely be slightly lower, although there would still be some cost associated with abandoning the existing well.

Table 25. Opinion of Cost for Recommended Improvements

No.	Description	Quantity	Estimated Cost	Timeframe	Annual Cost, 20-yr Loan @ 7%
1	Oak Ln Water Main Upsize	1,525 LF 6" Main	$ 203,000	0-3 Years	$ 26,808
2	Looped Connection to Northloch St	2,160 LF 10" Main	$ 715,000	0-5 Years	$ 67,491
3a	Future 16" Loop around East Development Area - Northwest	9,500 LF 16" Main	$ 2,356,000	0-10 Years	$ 222,390
3b	Future 16" Loop around East Development Area - Northeast	10,900 LF 16" Main	$ 2,704,000	As needed to support growth	$ 255,238
3c	Future 16" Loop around East Development Area - Central	10,500 LF 16" Main	$ 2,604,000	As needed to support growth	$ 245,799
3d	Future 16" Loop around East Development Area - South	10,500 LF 16" Main	$ 2,604,000	As needed to support growth	$ 245,799
4	Construct Water Main between N 134th St and Well #5	2,000 LF 6" Main	$ 186,000	0-5 Years	$ 17,557
5	Eastbourne St Main Replacement	2,335 LF 6" Main	$ 311,000	0-2 Years	$ 41,061
6	Lancashire St Main Replacement	1,185 LF 8" and 230 LF 6" Main	$ 242,000	0-2 Years	$ 31,999
7	N 137th St Main Replacement	370 LF 8" and 1,050 LF 6" Main	$ 206,000	0-5 Years	$ 27,185
8	Danvers St Main Replacement	1,480 LF 6" Main	$ 197,000	0-5 Years	$ 26,052
9	Install New Hydrants to Improve Coverage	8 Hydrants	$ 56,000	0-3 Years	$ 5,286
10	Replace Old Metal Water Mains (Over 20 Years)	158,615 LF, various sizes	$ 24,687,000	0-20 Years	$ 1,729,750*
11	Nitrate/Well Study/LWS Feasibility	Engineering Study	$ 11,000	0-3 Years	$ 1,038
12	Blending Vault	Vault Design & Construction	$ 17,000	5-10 Years	$ 1,605
13	New Well	1 Well (Design & Construction)	$ 700,000	0-10 Years	$66,075
TOTAL COST OF RECOMMENDED IMPROVEMENTS			$48,169,991		$ 3,011,134

**This is not a 20-year loan cost. It is the total estimated cost of this improvement divided over 20 years, since the City is considering budgeting 4% of these replacements each year.*

12. OPERATING BUDGET & WATER RATES

The current water rates for Waverly are provided in Table 26. There is a base service charge for each different size of meter, and a volume fee is charged for the amount of water used. There are presently 1,648 water service connections to the system. Table 27 summarizes the total number of each size of meter/service in Waverly. It is estimated that there are around 70 to 90 non-residential meters in the system.

Table 26. Current Water Rates

Metered Connections Service Charge	
5/8-inch Meter	$16.75/month
3/4-inch Meter	$16.87/month
1-inch Meter	$17.19/month
Volume Fees (per 1,000 gallons)	
First 10,000	$1.88
Next 10,000	$2.41
Above 20,000	$2.99

Table 27. Water Service Summary

Meter Size	Number of Services
5/8”	656
1”	933
1.5”	18
2”	32
4”	9
TOTAL	**1,648**

In 2022, Waverly sold approximately 220,961,831 gallons of water. This can be compared to the total amount of water pumped in 2022, which was 240,212,814 gallons. This equates to a water loss of 8%. Water loss can be due to leaks in the system or unbilled water such as water used for City buildings. Overall, this amount of water loss is not a cause for concern in this system.

Financial information on the City’s water fund was provided for the 2021-22 and 2022-23 fiscal years. A summary of expenses and revenue for each of these fiscal years is provided in Table 28.

Table 28. City Financial Summary

Category	2021-22 Budget	2022-23 Budget
Employee Pay & Benefits	$141,600	$189,500
Worker's Comp Ins	$500	$1,000
Clothing	$250	$500
Contracted or Secured Services	$2,000	$3,000
Professional & Technical Services	$1,000	$40,000
Electricity	$37,000	$37,000
Fuel & Oil	$3,000	$3,000
Rentals & Leases	$1,000	$1,000
Postage	$3,500	$3,500
Telephone	$1,800	$2,000
Advertising & Printing	$1,000	$1,000
Supplies	$40,000	$50,000
Furniture & Equipment	$80,000	$170,000
School, Dues, Seminars	$3,000	$3,000
Sales Tax for Water	$50,000	$15,000
Property Insurance	$8,300	$9,000
Travel & Mileage	$1,000	$1,000
Repair & Maintenance-Buildings	$0	$0
Repair & Maintenance-Water System	$35,000	$35,000
Repair & Maintenance-Equipment	$7,000	$15,000
Vehicle Maintenance	$1,000	$1,000
Capital Improvement	$520,000	$1,550,000
NDEQ Loan Payments / 2021 Water Bond	$142,673	$137,093
Meter & Readout Purchase	$110,000	$180,000
Laboratory Services	$5,000	$5,000
TOTAL COSTS	**$1,195,623**	**$2,452,593**
Revenue from Water Rates	$852,868	TBD
NET COSTS INCURRED	**$342,755**	**TBD**

Work and improvements recommended in this report would fall under the following categories: Professional & Technical Services, Repair & Maintenance, Capital Improvement, and Loan/Bond Payments. The total amount budgeted in these categories was $705,673 and $1,777,093 in the respective 2021-22 and 2022-23 budget years.

13. FUNDING OPTIONS

Several potential options are available to the City to fund this project, including: bonds, assistance from funding agencies/programs, and loans. The following is an overview of some of the various options available to the City.

- Revenue Bonds
    - These are tax-exempt bonds in which the debt service is paid by a dedicated revenue source, such as revenue from the sale of water to consumers, property, or sales tax.

- General Obligation Bonds
    - General obligation bonds are backed by the full faith and credit of the taxing authority. Utility revenues can be used to pay the annual debt service, and/or a tax can be levied on properties within the City. These are considered to be more secure than revenue bonds. As with revenue bonds, voter approval is often required prior to issuance.

- WWAC
    - To assist communities seeking funding for water projects, Nebraska established the WWAC in 1997. WWAC is an advisory panel for municipalities, counties, and RWDs that are seeking public financing from DWSRF or USDA.
    - Communities seeking funds must go through the WWAC, which consists of representatives from NDEE and USDA. The process for submitting to the WWAC includes a pre-application and a completed facility plan or preliminary engineering report. The pre-application and other associated guidance can be found at http://deq.ne.gov.
    - The WWAC reviews submittals monthly to determine actions taken. If the project is selected for funding, and the community meets the eligibility requirements, the WWAC will recommend one or a combination of funding sources. It should be noted that receiving funds is highly competitive, and the City may not qualify for funding from all agencies.
    - The various funding sources under WWAC are described further, below:
        - SRF Loan Program: SRF loans are administered by the NDEE through the DWSRF. The City's eligibility to qualify for a State or Federal SRF loan is dependent upon the SRF IUP. This process, which repeats each year, consists of individual communities submitting their project needs to the State, which then ranks the projects based upon several criteria.

Should the City choose to move forward with one of these options, they should get onto the IUP for funding consideration.

- It is noted that Waverly's MHI is on the high end of what NDEE considers to be possibly eligible for loan forgiveness, so SRF with loan forgiveness may be challenging to obtain. Until at least 2026, a lot of NDEE's money that could typically be given out as an SRF cash loan is otherwise tied up in assisting with FEMA projects.
- It is noted that any funding from DWSRF prioritizes projects that are necessary to maintain public health, such as to prevent high levels of nitrates or copper.
- DWSRF would be unable to fund any project that has a primary purpose to support future growth or fire protection. A project could be funded if it is deemed necessary to maintain the current customer base such as replacing a well or installing a new well to lower the system blended nitrate level.

▪ USDA Rural Development Program: The Water and Waste Disposal program of USDA's RDD provides funding through direct loans or grants and guaranteed loans to develop and/or upgrade rural water distribution and wastewater facilities.

- USDA typically funds projects for communities less than 500 people, so Waverly would likely not be eligible for this funding.

- Community Development Block Grant
  - CDBG is a highly competitive program administered by NeDED. To be eligible for a CDBG grant, a community must have a maximum population of less than 50,000 and a minimum of 51% of low to moderate income families.
  - Applications are accepted throughout any given year. CDGB provides matching grants for water or wastewater to a maximum of $350,000. The City's match would range from 25 to 75%, with the amount ultimately determined by the program.

- NDNR Water Sustainability Fund
  - The Nebraska Water Sustainability Fund provides financial assistance to programs, projects, or activities that increase aquifer recharge, mitigate threats to drinking water or provide increased water productivity and enhance quality.
  - Projects related to a study and new well may be especially qualified for this funding.

  - Applications are filed between March 16th and 31st each year. More information can be found on their website: https://nrc.nebraska.gov/water-sustainability-fund-0

- US EDA Funding
  - The EDA is a bureau of the Department of Commerce that helps financially support infrastructure projects through its public works program. There are many different funding opportunities that can be found on their website: https://www.eda.gov/funding/funding-opportunities
  - Funding is prioritized for projects that create jobs, especially high-skill and high-wage jobs. EDA does not participate in projects related to infrastructure for new residential developments.
  - EDA determines eligibility for funding based on the county in which the community is located. Currently, Lancaster County is not eligible for funding due to low unemployment rate and high MHI.

- Direct Loans and Grants
  - Public entities such as municipalities, counties, special purpose districts, Indian Tribes, and corporations operated on a not-for-profit basis may apply for loans or grants to develop drinking water and waste disposal systems, including solid waste disposal and storm drainage. To apply, communities must have a population of 10,000 or less, be unable to obtain sufficient credit from commercial sources at reasonable rates and terms, and have a MHI below the non-metropolitan MHI for the State of Nebraska.
  - Loans may be made at one of three interest rates: the poverty rate, intermediate rate, and market rate. The rate of the loan depends upon the need to meet applicable health or sanitary standards, and the MHI of the community. Once the loan rate is established, it remains fixed for the life of the loan maximum term, of which is up to 40 years. Normal term for treatment projects is 20 years. Funding preference is given to low-income communities, communities with fewer than 5,500 residents, restoring deteriorating water supplies, improving, enlarging, or modifying a water facility or an inadequate waste facility or merging small water facilities.
  - The RDD considers reasonable user rates to be $40 to $45 per month per household for 5,000 gallons used. Currently, for 5,000 gallons used, residential users in Waverly pay $26.59 per month. Loan amounts are based upon the reasonable rate amount multiplied by the number of user households. If repayment of loans increase monthly residential rates beyond this reasonable

amount, RDD grant monies will be sought to maintain reasonable rates. If monthly rates are below what is considered a reasonable rate, they will need to be increased as necessary for a loan to be secured.

- Grants are made in combination with direct loans or with funding from other sources. Grants may be up to 75% of eligible project costs, but are limited to the amount necessary to enable the residents to be charged reasonable user rates. The MHI of the service area must be below that of the non-metropolitan MHI for the State as well as generally below the national poverty rate, or 80% of the State poverty rate figure. Grants can only be made for projects which address health or safety issues.

- Guaranteed Loans
  - This method is most often used when communities with populations of 10,000 or less identify a private lender interested in financing a project, but will only do so if risk can be reduced. Loan guarantees are 90% of the total loan amount. Interest rates are negotiated between the lender and borrower, and may either be fixed or variable, but must be in-line with rates customarily charged to borrowers in similar circumstances.

- Public-Private Partnerships
  - In addition to traditional funding methods, there are several forms of public-private partnerships that can be used to fund water projects.

- Lease-Purchase Agreement
  - This is a contract in which a private entity funds the project, and the City makes scheduled lease payments until the lease is paid in full.

- Leverage Fund Loans through NDEE
  - The possibility of leverage funds through NDEE has been discussed. NDEE has the opportunity to use bond proceeds to offer a community a lower interest rate than a private loan. NDEE would also likely be able to offer a longer loan term (up to 30 years) than a private loan.
  - Since this funding is from the state, it would have the same requirements as SRF loans such as Davis-Bacon, American Iron and Steel Acts, and Minority-Owned Business Enterprises. These requirements can typically cause a contractor to have higher bids due to the extra work associated with these requirements.
    - If this route is considered for funding, it is recommended to have a bid alternate: one with SRF requirements, and the other with no restrictions

and the City obtaining a private loan. Then, the cost savings between the bid prices and the loan interest rates can be compared.

- Leverage funds would also have the same restrictions as DWSRF such as not being allowed to fund projects that primarily support future growth or fire protection.
- This funding option would be dependent on if NDEE can gather interest from more communities than just Waverly. Discussions are currently paused until information on federal earmark funds is released September 2023, as that may affect some other communities' interest.

14. CONCLUSIONS AND RECOMMENDATIONS

It is recommended that Waverly improve their water supply and distribution system by constructing projects that ensure there is sufficient quantity of quality water. With unpredictable and increasing nitrate levels in some wells, it is recommended that Waverly proceed with a nitrate and well siting study and planning to construct a new well.

Additionally, system modifications should be made to ensure adequate pressures and fire flow capabilities throughout the distribution system. This is recommended to be done by upsizing pipes, creating new loops, or replacing old metal water mains in the locations noted in this report.

Additional recommendations were provided with longer timelines to support continued growth and proactively replace old metal mains with a higher likelihood of breaks and other maintenance issues. The mains installed to support future growth should be constructed in anticipation of new residential/commercial developments.

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APPENDIX A
ISO HYDRANT FLOW TABLE - 2000

INSURANCE SERVICES OFFICE, INC.

07-88

HYDRANT FLOW DATA SUMMARY

City WAVERLY STATE NE 68462 Witnessed by Insurance Services Office, Inc. Date July 24, 2000

TEST NO.	TYPE DIST.*	TEST LOCATION	SERVICE	FLOW - GPM INDIVIDUAL HYDRANTS			TOTAL	PRESSURE PSI STATIC	PRESSURE PSI RESID.	FLOW AT 20 PSI NEEDED **	FLOW AT 20 PSI AVAIL.	REMARKS
1	Comm	WOODSTOCK & 142 ST	Main	2120			2120	72	60	3000	4700	
2	Res	JAMESTOWN & 138 ST	"	1120			1120	70	14	1000	1100	
3	Comm	WOODSTOCK & E. OF 144 ST	"	670	670		1340	71	42	2500	1800	
4	Comm	HEYWOOD AND 148 ST	"	2430			2430	68	46	3500	3700	
5	Res	FOLKSTONE & OAK LANE	"	670	670		1340	60	48	1500	2600	
6	Comm	CASTLEWOOD & DANVERS	"	2120			2120	54	48	2000	5400	
7	Comm	GUILDFORD & 142 ST	"	1970			1970	67	42	2250	2800	
8	Comm	DEER PARK RD 3 S. OF ENERGYWAY	"	2260			2260	70	56	1750	4500	
9	Comm	AMBERLY ROAD @ SCHOOL (EAST)	"	1800			1800	72	36	-	2200	

THE ABOVE LISTED NEEDED FIRE FLOWS ARE FOR PROPERTY INSURANCE PREMIUM CALCULATIONS ONLY AND ARE *NOT* INTENDED TO PREDICT THE MAXIMUM AMOUNT OF WATER REQUIRED FOR A LARGE SCALE FIRE CONDITION. THE AVAILABLE FLOWS ONLY INDICATE THE CONDITIONS THAT EXISTED AT THE TIME AND AT THE LOCATION WHERE TESTS WERE WITNESSED.

*Comm = Commercial; Res = Residential.

Needed is the rate of flow for a specific duration for a full credit condition. Needed Fire Flows greater than 3,500 gpm are **not considered in determining the classification of the city when using the Fire Suppression Rating Schedule.

APPENDIX B
SARGENT WELL INSPECTIONS – 2022 & 2023

2022 Well Inspections

PO Box 367
846 S 13th St.
Geneva, NE 68361

SARGENT Drilling

Toll Free: 888-496-3902
Phone: 402-759-3902
Fax: 402-759-4960

June 10, 2022

City of Waverly
P.O. Box 427
Waverly, NE 68462

RE: 2022 Well and pump results

Attention: Honorable Board Members

On May 25, 2022 Sargent Drilling performed well and pump tests in your community and this letter is a summary of the results:

Well #4: The average pump efficiency is 76%, this is excellent. The well is producing 17 gallons of water per foot of drawdown. This is the same as the last test. The flow meter registers 10% high. The electric motor was serviced and the packing was greased.

Well #5: The average pump efficiency is 62%, this is excellent. The well is producing 13 gallons of water per foot of drawdown. This is slightly down from last test. The flow meter registers 2% low.

Well #6: The average pump efficiency is 81%, this is excellent. The well is producing 10 gallons of water per foot of drawdown. This is down slightly from last test. The flow meter registers 3% high. The electric motor was serviced and the packing was greased.

Well #8: The average pump efficiency is 82%, this is excellent. The well is producing 10 gallons of water per foot of drawdown. This is the same as last test. The flow meter registers 3% low. The electric motor was serviced and the packing was greased.

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846 S 13th St.
Geneva, NE 68361

SARGENT Drilling

Toll Free: 888-496-3902
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Fax: 402-759-4960

Well #9: The average pump efficiency is 76%, this is excellent. The well is producing 11 gallons of water per foot of drawdown. This is the same as last test. The flow meter registers 7% high. The electric motor was serviced and the packing was greased.

Well #10: The average pump efficiency is 73%, this is excellent. The well is producing 13 gallons of water per foot of drawdown. This is up slightly from last test. The flow meter registers 1% high. The electric motor was serviced and the packing was greased.

Well #11: The average pump efficiency is 68%, this is excellent. The well is producing 10 gallons of water per foot of drawdown. This is the same as last test. The flow meter registers 3% high.

Sargent Drilling appreciates the opportunity to be of service to the City of Waverly.

If you have any questions feel free to contact the office at (402) 759-3902.

Thank You,

Ivan Mumm,
Technician

Sargent Drilling

INDUSTRIAL ENGINEERING

COMPLETE MUNICIPAL AND INDUSTRIAL
WELL AND PUMP SERVICE

Box 367
846 S 13th St

Geneva, NE.
68361

Phone 402-759-3902
Fax 402-759-4960

SARGENT PUMP TEST

DATE: 5-25-2022 OWNER: City of Waverly OPERATOR: Andrew

CITY: Waverly STATE: NE WELL #: 4 WELL ID#:

GPS N-LATITUDE: 40 - 54 - 53.8 W-LONGITUDE: 96 - 31 - 57

MOTOR MFG: U S Motors HP: 40 FRAME: MOTOR EFFICIENCY: 89.5 %

PUMP MFG: Goulds SETTING: 50 Ft. 6 X 1 1/2 BOWL: 5 Stage 10WAHC

STATIC W. L.(Ft.): 14.3 DESIGN SP (GPM/Ft. DD): 0 SHUT OFF (PSI): 121

CONDITION	TEST #1	TEST #2	TEST #3
Pump RPM	1789	1789	1788
Pumping Pressure (PSI)	95	85	75
Pump Loss (Ft.)	2.89	3.51	4.08
Pumping Level (Ft.)	34.9	37.3	39.9
TDH (Ft.)	257.24	237.16	217.23
GPM: Meter	384	428	457
GPM: Test Equipment	345	383	415
Water HP	22.41	22.94	22.77
SP Capacity (GPM/Ft.)	16.7	16.7	16.2
KW	23.86	24.91	25.64
Input HP	31.98	33.39	34.37
Pump HP	28.63	29.89	30.76
Wire To Water (%)	70.1	68.7	66.2
Bowl Efficiency (%)	80.2	78.5	75.7
Pump Efficiency (%)	78.3	76.7	74

Sargent Drilling

INDUSTRIAL ENGINEERING

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WELL AND PUMP SERVICE

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Geneva, NE.
68361

Phone 402-759-3902
Fax 402-759-4960

SARGENT PUMP TEST

DATE: 5-25-2022 OWNER: City of Waverly OPERATOR: Andrew

CITY: Waverly STATE: NE WELL #: 5 WELL ID#:

GPS N-LATITUDE: 40 - 54 - 40.6 W-LONGITUDE: 96 - 32 - 12.9

MOTOR MFG: Franklin HP: 25 FRAME: MOTOR EFFICIENCY: 83 %

PUMP MFG: Grundfos SETTING: 52 Ft. 4 X Sub BOWL: 7 Stage 300S250

STATIC W. L.(Ft.): 15.9 DESIGN SP (GPM/Ft. DD): 0 SHUT OFF (PSI):

CONDITION	TEST #1	TEST #2	TEST #3
Pump RPM	3450	3450	3450
Pumping Pressure (PSI)	80	70	60
Pump Loss (Ft.)	7.7	8.53	9.35
Pumping Level (Ft.)	37.3	39.3	41
TDH (Ft.)	229.8	209.53	188.95
GPM: Meter	279	296	312
GPM: Test Equipment	287	303	318
Water HP	16.65	16.03	15.17
SP Capacity (GPM/Ft.)	13.4	12.9	12.7
KW	22.89	22.76	22.69
Input HP	30.68	30.51	30.42
Pump HP	25.47	25.32	25.24
Wire To Water (%)	54.3	52.5	49.9
Pump Efficiency (%)	65.4	63.3	60.1

Sargent Drilling

INDUSTRIAL ENGINEERING

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Box 367
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Geneva, NE.
68361

Phone 402-759-3902
Fax 402-759-4960

SARGENT PUMP TEST

DATE: 5-25-2022 OWNER: City of Waverly OPERATOR: Andrew

CITY: Waverly STATE: NE WELL #: 6 WELL ID#:

GPS N-LATITUDE: 40 - 53 - 27.1 W-LONGITUDE: 96 - 32 - 24.8

MOTOR MFG: U S Motors HP: 50 FRAME: MOTOR EFFICIENCY: 89.5 %

PUMP MFG: Sargent Pipe Co. SETTING: 130 Ft. 6 X 1 1/2 BOWL: 6 Stage 10SC

STATIC W. L.(Ft.): 75 DESIGN SP (GPM/Ft. DD): 0 SHUT OFF (PSI): 115

CONDITION	TEST #1	TEST #2	TEST #3
Pump RPM	1787	1788	1788
Pumping Pressure (PSI)	90	80	70
Pump Loss (Ft.)	8.61	11.72	13.78
Pumping Level (Ft.)	110.9	118	122.6
TDH (Ft.)	327.41	314.52	298.08
GPM: Meter	360	460	500
GPM: Test Equipment	380	449	490
Water HP	31.42	35.66	36.88
SP Capacity (GPM/Ft.)	10.6	10.4	10.3
KW	33.68	35.82	37.18
Input HP	45.15	48.02	49.84
Pump HP	40.41	42.97	44.61
Wire To Water (%)	69.6	74.3	74
Bowl Efficiency (%)	81.2	86.4	86
Pump Efficiency (%)	77.8	83	82.7

Sargent Drilling

INDUSTRIAL ENGINEERING

COMPLETE MUNICIPAL AND INDUSTRIAL
WELL AND PUMP SERVICE

Box 367
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Geneva, NE.
68361

Phone 402-759-3902
Fax 402-759-4960

SARGENT PUMP TEST

DATE: 5-25-2022 OWNER: City of Waverly OPERATOR: Andrew

CITY: Waverly STATE: NE WELL #: 8 WELL ID#:

GPS N-LATITUDE: 40 - 53 - 37.5 W-LONGITUDE: 96 - 30 - 25.02

MOTOR MFG: U S Motors HP: 50 FRAME: MOTOR EFFICIENCY: 89.5 %

PUMP MFG: Sargent Pipe Co. SETTING: 140 Ft. 6 X 1 1/2 BOWL: 6 Stage 10SC

STATIC W. L.(Ft.): 68.3 DESIGN SP (GPM/Ft. DD): 0 SHUT OFF (PSI): 131

CONDITION	TEST #1	TEST #2	TEST #3
Pump RPM	1789	1789	1788
Pumping Pressure (PSI)	90	80	70
Pump Loss (Ft.)	12.49	14.81	17.79
Pumping Level (Ft.)	112.9	118	122.3
TDH (Ft.)	333.29	317.61	301.79
GPM: Meter	430	480	520
GPM: Test Equipment	447	490	541
Water HP	37.62	39.3	41.23
SP Capacity (GPM/Ft.)	10	9.9	10
KW	38.51	39.78	40.7
Input HP	51.62	53.32	54.56
Pump HP	46.2	47.73	48.83
Wire To Water (%)	72.9	73.7	75.6
Bowl Efficiency (%)	84.8	85.6	87.7
Pump Efficiency (%)	81.4	82.3	84.4

Sargent Drilling

INDUSTRIAL ENGINEERING

COMPLETE MUNICIPAL AND INDUSTRIAL
WELL AND PUMP SERVICE

Box 367
846 S 13th St

Geneva, NE.
68361

Phone 402-759-3902
Fax 402-759-4960

SARGENT PUMP TEST

DATE: 5-26-2022 OWNER: City of Waverly OPERATOR: Andrew

CITY: Waverly STATE: NE WELL #: 9 WELL ID#:

GPS N-LATITUDE: 40 - 53 - 7.6 W-LONGITUDE: 96 - 32 - 7.0

MOTOR MFG: U S Motors HP: 60 FRAME: MOTOR EFFICIENCY: 90 %

PUMP MFG: Sargent Pipe Co. SETTING: 150 Ft. 8 X 1 1/2 BOWL: 6 Stage 10SC

STATIC W. L.(Ft.): 97 DESIGN SP (GPM/Ft. DD): 0 SHUT OFF (PSI): 111

CONDITION	TEST #1	TEST #2	TEST #3
Pump RPM	1784	1786	1785
Pumping Pressure (PSI)	80	70	60
Pump Loss (Ft.)	2.26	2.78	3.29
Pumping Level (Ft.)	134.3	139.6	143.9
TDH (Ft.)	321.36	304.08	285.79
GPM: Meter	470	520	565
GPM: Test Equipment	431	482	528
Water HP	34.98	37.01	38.11
SP Capacity (GPM/Ft.)	11.6	11.3	11.3
KW	38.48	40.13	41.07
Input HP	51.58	53.79	55.05
Pump HP	46.42	48.41	49.55
Wire To Water (%)	67.8	68.8	69.2
Bowl Efficiency (%)	78.7	79.7	80.1
Pump Efficiency (%)	75.4	76.5	76.9

Sargent Drilling

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Box 367
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Geneva, NE.
68361

Phone 402-759-3902
Fax 402-759-4960

SARGENT PUMP TEST

DATE: 5-25-2022 OWNER: City of Waveryly OPERATOR: Andrew

CITY: Waverly STATE: NE WELL #: 10 WELL ID#:

GPS N-LATITUDE: 40 - 53 - 7.8 W-LONGITUDE: 96 - 32 - 1.3

MOTOR MFG: U S Motors HP: 30 FRAME: MOTOR EFFICIENCY: 88.5 %

PUMP MFG: Goulds SETTING: 140 Ft. 8 X 1 1/2 BOWL: 5 Stage 9RCLC

STATIC W. L.(Ft.): 80.3 DESIGN SP (GPM/Ft. DD): 0 SHUT OFF (PSI): 90

CONDITION	TEST #1	TEST #2	TEST #3
Pump RPM	1778	1775	1774
Pumping Pressure (PSI)	50	40	30
Pump Loss (Ft.)	1.42	1.67	2.06
Pumping Level (Ft.)	107	111.3	115
TDH (Ft.)	223.92	205.37	186.36
GPM: Meter	350	385	431
GPM: Test Equipment	348	380	425
Water HP	19.68	19.71	20
SP Capacity (GPM/Ft.)	13	12.3	12.2
KW	21.53	22.28	22.68
Input HP	28.86	29.87	30.4
Pump HP	25.54	26.43	26.91
Wire To Water (%)	68.2	66	65.8
Bowl Efficiency (%)	82.9	80	79.7
Pump Efficiency (%)	77.1	74.6	74.3

Sargent Drilling

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WELL AND PUMP SERVICE

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68361

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Fax 402-759-4960

SARGENT PUMP TEST

DATE: 5-25-2022 OWNER: City of Waverly OPERATOR: Andrew

CITY: Waverly STATE: NE WELL #: 11 WELL ID#:

GPS N-LATITUDE: 40 - 53 - 19.5 W-LONGITUDE: 96 - 32 - 1.4

MOTOR MFG: Franklin HP: 25 FRAME: N/A MOTOR EFFICIENCY: 83 %

PUMP MFG: Grundfos SETTING: 137 Ft. 4 X Sub BOWL: 4 Stage 385S250-4

STATIC W. L.(Ft.): 94.2 DESIGN SP (GPM/Ft. DD): 0 SHUT OFF (PSI):

CONDITION	TEST #1	TEST #2	TEST #3
Pump RPM	3450	3450	3450
Pumping Pressure (PSI)	45	35	25
Pump Loss (Ft.)	16.86	23.18	28.45
Pumping Level (Ft.)	123.6	128.6	133
TDH (Ft.)	244.41	232.63	219.2
GPM: Meter	317	350	384
GPM: Test Equipment	291	345	385
Water HP	17.96	20.27	21.31
SP Capacity (GPM/Ft.)	9.9	10	9.9
KW	25.48	26.16	26.48
Input HP	34.16	35.07	35.5
Pump HP	28.35	29.11	29.46
Wire To Water (%)	52.6	57.8	60
Pump Efficiency (%)	63.4	69.6	72.3

2023 Well Inspections

RECEIVED
6-28-23

PO Box 367
846 S 13th St.
Geneva, NE 68361

SARGENT Drilling

Toll Free: 888-496-3902
Phone: 402-759-3902
Fax: 402-759-4960

June 13, 2023

City of Waverly
P.O. Box 427
Waverly, NE 68462

RE: 2023 Well and pump results

Attention: Honorable Board Members

On May 30, 2023 Sargent Drilling performed well and pump tests in your community and this letter is a summary of the results:

Well #4: The average pump efficiency is 75%, this is excellent. The well is producing 16 gallons of water per foot of drawdown. This is slightly up from the last test. The flow meter registers 13% high. The electric motor was serviced and the packing was greased.

Well #5: The average pump efficiency is 64%, this is excellent. The well is producing 13 gallons of water per foot of drawdown. This is the same as the last test. The flow meter registers 3% low.

Well #6: The average pump efficiency is 75%, this is excellent. The well is producing 10 gallons of water per foot of drawdown. This is the same as the last test. The flow meter registers 4% high. The electric motor was serviced and the packing was greased.

Well #8: The average pump efficiency is 82%, this is excellent. The well is producing 10 gallons of water per foot of drawdown. This is the same as last test. The flow meter registers 6% low. The electric motor was serviced and the packing was greased.

PO Box 367
846 S 13th St.
Geneva, NE 68361

SARGENT Drilling

Toll Free: 888-496-3902
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Fax: 402-759-4960

Well #9: The average pump efficiency is 68%, this is excellent. The well is producing 10 gallons of water per foot of drawdown. This is lightly down from the last test. The flow meter registers 20% high. The electric motor was serviced and the packing was greased.

Well #10: The average pump efficiency is 75%, this is excellent. The well is producing 12 gallons of water per foot of drawdown. This is down slightly from the last test. The flow meter registers 2% high. The electric motor was serviced and the packing was greased.

Well #11: The average pump efficiency is 80%, this is excellent. The well is producing 10 gallons of water per foot of drawdown. This is the same as the last test. The flow meter registers 1% high.

Sargent Drilling appreciates the opportunity to be of service to the City of Waverly.

If you have any questions feel free to contact the office at (402) 759-3902.

Thank You,

Ivan Mumm,
Technician

IM/jk

Enclosures

Sargent Drilling

INDUSTRIAL ENGINEERING

COMPLETE MUNICIPAL AND INDUSTRIAL
WELL AND PUMP SERVICE

Box 627
West Hwy 2

Geneva, NE.
68822

Phone (308)872-5125
Fax (308)872-6912

SARGENT PUMP TEST

DATE: 5-30-2023 OWNER: City of Waverly OPERATER: Andrew

CITY: Waverly STATE: NE WELL #: 4 WELL ID#:

GPS N-LATITUDE: 40 - 54 - 53.8 W-LONGITUDE: 96 - 31 - 57

MOTOR MFG: U S Motors HP: 40 FRAME: MOTOR EFFICIENCY: 89.5 %

PUMP MFG: Goulds SETTING: 50 Ft. 6 X 1 1/2 BOWL: 5 Stage 10WAHC

STATIC W. L.(Ft.): 20.3 DESIGN SP (GPM/Ft. DD): 0 SHUT OFF (PSI): 118.6

CONDITION	TEST #1	TEST #2	TEST #3
Pump RPM	1786	1787	1787
Pumping Pressure (PSI)	95	85	75
Pump Loss (Ft.)	2.5	3.18	3.74
Pumping Level (Ft.)	40	43	45.9
TDH (Ft.)	261.95	242.53	222.89
GPM: Meter	380	414	452
GPM: Test Equipment	319	363	396
Water HP	21.1	22.23	22.29
SP Capacity (GPM/Ft.)	16.2	16	15.5
KW	22.97	24.38	25.31
Input HP	30.79	32.68	33.93
Pump HP	27.56	29.25	30.37
Wire To Water (%)	68.5	68	65.7
Bowl Efficiency (%)	78.5	77.8	75.1
Pump Efficiency (%)	76.6	76	73.4

Sargent Drilling

INDUSTRIAL ENGINEERING

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Geneva, NE.
68822

Phone (308)872-5125
Fax (308)872-6912

SARGENT PUMP TEST

DATE: 5-30-2023 OWNER: City of Waverly OPERATER: Andrew

CITY: Waverly STATE: NE WELL #: 5 WELL ID#:

GPS N-LATITUDE: 40 - 54 - 40.6 W-LONGITUDE: 96 - 32 - 12.9

MOTOR MFG: Franklin HP: 25 FRAME: N/A MOTOR EFFICIENCY: 83 %

PUMP MFG: Grundfos SETTING: 52 Ft. 4 X Sub BOWL: 7 Stage 300-S-250

STATIC W. L.(Ft.): 20.9 DESIGN SP (GPM/Ft. DD): 0 SHUT OFF (PSI):

CONDITION	TEST #1	TEST #2	TEST #3
Pump RPM	3450	3450	3450
Pumping Pressure (PSI)	80	70	60
Pump Loss (Ft.)	7.6	8.43	9.29
Pumping Level (Ft.)	43	45	46.6
TDH (Ft.)	235.4	215.13	194.49
GPM: Meter	277	294	309
GPM: Test Equipment	285	301	317
Water HP	16.94	16.35	15.57
SP Capacity (GPM/Ft.)	12.9	12.5	12.3
KW	22.76	22.71	22.63
Input HP	30.51	30.44	30.34
Pump HP	25.32	25.27	25.18
Wire To Water (%)	55.5	53.7	51.3
Pump Efficiency (%)	66.9	64.7	61.8

Sargent Drilling

INDUSTRIAL ENGINEERING

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West Hwy 2

Geneva, NE.
68822

Phone (308)872-5125
Fax (308)872-6912

SARGENT PUMP TEST

DATE: 5-30-2023 OWNER: City of Waverly OPERATER: Andrew

CITY: Waverly STATE: NE WELL #: 6 WELL ID#:

GPS N-LATITUDE: 40 - 53 - 27.1 W-LONGITUDE: 96 - 32 - 24.8

MOTOR MFG: U S Motors HP: 50 FRAME: MOTOR EFFICIENCY: 89.5 %

PUMP MFG: Sargent Pipe Co. SETTING: 130 Ft. 6 X 1 1/2 BOWL: 6 Stage 10SC

STATIC W. L.(Ft.): 80 DESIGN SP (GPM/Ft. DD): 0 SHUT OFF (PSI): 114

CONDITION	TEST #1	TEST #2	TEST #3
Pump RPM	1785	1785	1785
Pumping Pressure (PSI)	90	80	70
Pump Loss (Ft.)	6.48	10.45	12.66
Pumping Level (Ft.)	113.6	122.3	127.3
TDH (Ft.)	327.98	317.55	301.66
GPM: Meter	350	425	480
GPM: Test Equipment	326	422	468
Water HP	27	33.84	35.65
SP Capacity (GPM/Ft.)	9.7	10	9.9
KW	33.81	35.72	37.11
Input HP	45.32	47.88	49.75
Pump HP	40.56	42.85	44.52
Wire To Water (%)	59.6	70.7	71.7
Bowl Efficiency (%)	69.5	82.2	83.3
Pump Efficiency (%)	66.6	79	80.1

Sargent Drilling

INDUSTRIAL ENGINEERING

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WELL AND PUMP SERVICE

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West Hwy 2

Geneva, NE.
68822

Phone (308)872-5125
Fax (308)872-6912

SARGENT PUMP TEST

DATE: 5-30-2023 OWNER: City of Waverly OPERATER: Andrew

CITY: Waverly STATE: NE WELL #: 8 WELL ID#:

GPS N-LATITUDE: 40 - 53 - 37.5 W-LONGITUDE: 96 - 30 - 25.02

MOTOR MFG: U S Motors HP: 50 FRAME: MOTOR EFFICIENCY: 89.5 %

PUMP MFG: Sargent Pipe Co. SETTING: 140 Ft. 6 X 1 1/2 BOWL: 6 Stage 10SC

STATIC W. L.(Ft.): 72.3 DESIGN SP (GPM/Ft. DD): 0 SHUT OFF (PSI): 129.20

CONDITION	TEST #1	TEST #2	TEST #3
Pump RPM	1787	1786	1787
Pumping Pressure (PSI)	90	80	70
Pump Loss (Ft.)	12.08	14.92	16.83
Pumping Level (Ft.)	115	121.3	126
TDH (Ft.)	334.98	321.02	304.53
GPM: Meter	410	460	510
GPM: Test Equipment	439	492	525
Water HP	37.14	39.88	40.37
SP Capacity (GPM/Ft.)	10.3	10	9.8
KW	37.95	39.61	40.62
Input HP	50.87	53.1	54.45
Pump HP	45.53	47.52	48.73
Wire To Water (%)	73	75.1	74.1
Bowl Efficiency (%)	85	87.3	86.1
Pump Efficiency (%)	81.6	83.9	82.8

Sargent Drilling

INDUSTRIAL ENGINEERING

COMPLETE MUNICIPAL AND INDUSTRIAL
WELL AND PUMP SERVICE

Box 627
West Hwy 2

Geneva, NE.
68822

Phone (308)872-5125
Fax (308)872-6912

SARGENT PUMP TEST

DATE: 5-31-2023 OWNER: City of Waverly OPERATER: Andrew

CITY: Waverly STATE: NE WELL #: 9 WELL ID#:

GPS N-LATITUDE: 40 - 53 - 7.6 W-LONGITUDE: 96 - 32 - 7

MOTOR MFG: U S Motors HP: 60 FRAME: MOTOR EFFICIENCY: 90 %

PUMP MFG: Sargent Pipe Co. SETTING: 150 Ft. 8 X 1 1/2 BOWL: 6 Stage 10SC

STATIC W. L.(Ft.): 103.3 DESIGN SP (GPM/Ft. DD): 0 SHUT OFF (PSI): 109

CONDITION	TEST #1	TEST #2	TEST #3
Pump RPM	1784	1786	1785
Pumping Pressure (PSI)	80	70	60
Pump Loss (Ft.)	1.46	1.99	3.04
Pumping Level (Ft.)	139.9	145	149
TDH (Ft.)	326.16	308.69	290.64
GPM: Meter	460	520	570
GPM: Test Equipment	341	403	506
Water HP	28.09	31.41	37.14
SP Capacity (GPM/Ft.)	9.3	9.7	11.1
KW	37.11	39.65	40.74
Input HP	49.75	53.15	54.61
Pump HP	44.77	47.84	49.15
Wire To Water (%)	56.5	59.1	68
Bowl Efficiency (%)	65.6	68.5	78.7
Pump Efficiency (%)	62.7	65.7	75.6

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68822

Phone (308)872-5125
Fax (308)872-6912

SARGENT PUMP TEST

DATE: 5-31-2023 OWNER: City of Waverly OPERATER: Andrew

CITY: Waverly STATE: NE WELL #: 10 WELL ID#:

GPS N-LATITUDE: 40 - 53 - 7.8 W-LONGITUDE: 96 - 32 - 1.3

MOTOR MFG: U S Motors HP: 30 FRAME: MOTOR EFFICIENCY: 88.5 %

PUMP MFG: Goulds SETTING: 140 Ft. 8 X 1 1/2 BOWL: 5 Stage 9RCLC

STATIC W. L.(Ft.): 86 DESIGN SP (GPM/Ft. DD): 0 SHUT OFF (PSI): 87

CONDITION	TEST #1	TEST #2	TEST #3
Pump RPM	1777	1775	1775
Pumping Pressure (PSI)	50	40	30
Pump Loss (Ft.)	1.21	1.56	2.03
Pumping Level (Ft.)	111.9	116.3	120.6
TDH (Ft.)	228.61	210.26	191.93
GPM: Meter	326	377	427
GPM: Test Equipment	319	366	422
Water HP	18.42	19.43	20.45
SP Capacity (GPM/Ft.)	12.3	12.1	12.2
KW	20.92	22.04	22.82
Input HP	28.04	29.54	30.59
Pump HP	24.82	26.15	27.07
Wire To Water (%)	65.7	65.8	66.9
Bowl Efficiency (%)	80	79.8	80.9
Pump Efficiency (%)	74.2	74.3	75.5

Sargent Drilling

INDUSTRIAL ENGINEERING

COMPLETE MUNICIPAL AND INDUSTRIAL
WELL AND PUMP SERVICE

Box 627
West Hwy 2

Geneva, NE.
68822

Phone (308)872-5125
Fax (308)872-6912

SARGENT PUMP TEST

DATE: 5-31-2023 OWNER: City of Waverly OPERATER: Andrew

CITY: Waverly STATE: NE WELL #: 11 WELL ID#:

GPS N-LATITUDE: 40 - 53 - 19.5 W-LONGITUDE: 96 - 32 - 1.4

MOTOR MFG: Franklin HP: 25 FRAME: N/A MOTOR EFFICIENCY: 83 %

PUMP MFG: Grundfos SETTING: 134 Ft. 4 X Sub BOWL: 4 Stage 385-S-250-4

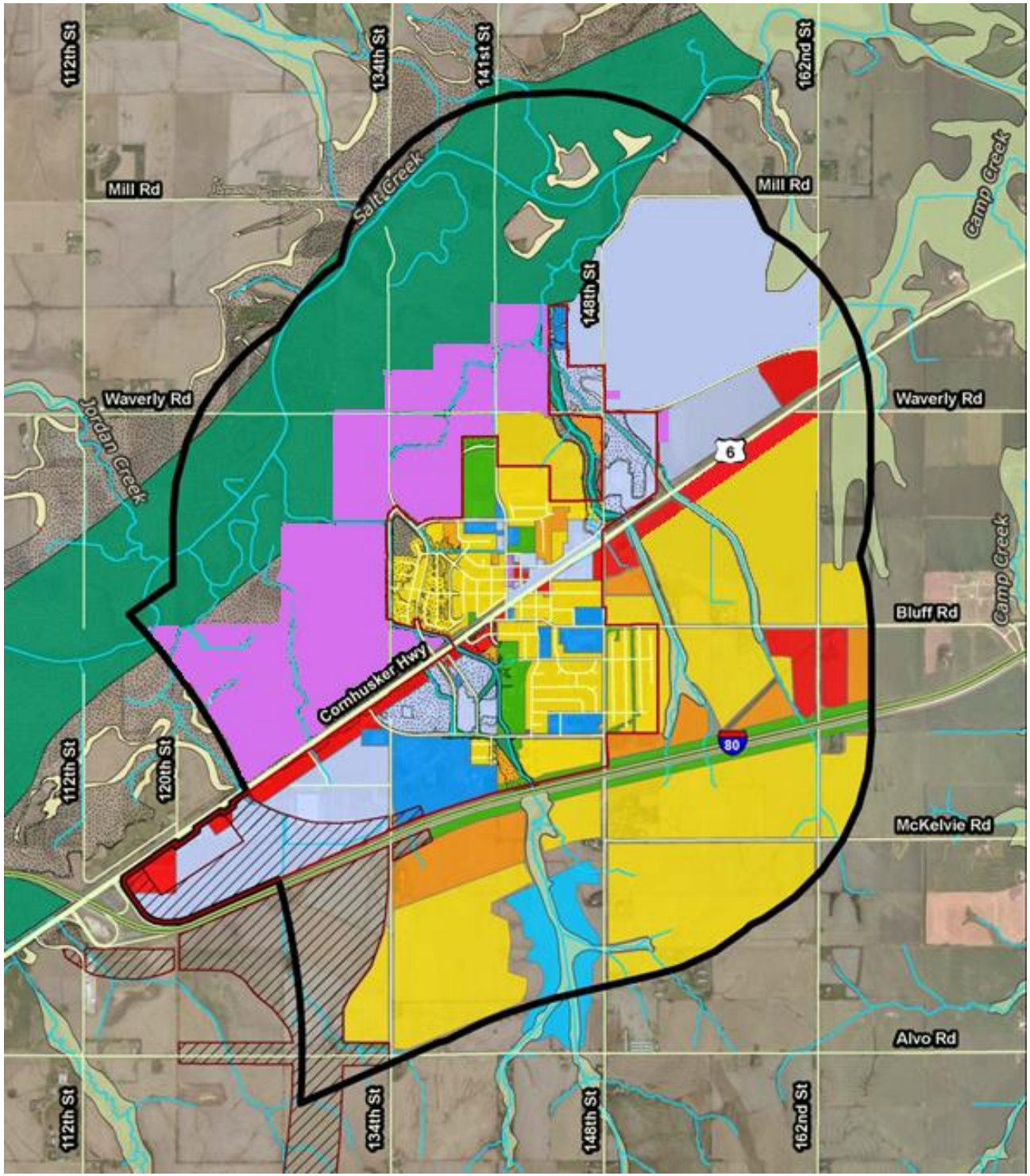
STATIC W. L.(Ft.): 99.3 DESIGN SP (GPM/Ft. DD): 0 SHUT OFF (PSI):

CONDITION	TEST #1	TEST #2	TEST #3
Pump RPM	3450	3450	3450
Pumping Pressure (PSI)	45	35	40
Pump Loss (Ft.)	18.17	22.37	19.3
Pumping Level (Ft.)	127.9	134	131.9
TDH (Ft.)	250.02	237.22	243.6
GPM: Meter	307	345	313
GPM: Test Equipment	306	342	316
Water HP	19.32	20.49	19.44
SP Capacity (GPM/Ft.)	10.7	9.9	9.7
KW	21.61	22.54	21.74
Input HP	28.97	30.21	29.14
Pump HP	24.04	25.08	24.19
Wire To Water (%)	66.7	67.8	66.7
Pump Efficiency (%)	80.4	81.7	80.4

APPENDIX C
FUTURE LAND USE MAP - 2023

FUTURE LAND USE MAP

WAVERLY, NEBRASKA



NORTH

Legend

- City of Waverly
- One-Mile Planning Jurisdiction
- East Beltway
- Dry Dam

FEMA Legend

- ZONE X - 500 YEAR FLOOD PLAIN
- ZONE A - 100 YEAR FLOOD PLAIN
- ZONE AE - 100 YEAR FLOOD PLAIN
- ZONE AE - FLOODWAY

Future Land Use Plan

- Multi-Use
- Commercial
- Industrial
- Urban Density Residential
- Multi-Family Residential
- Park/Open Space; Parks/Open Space
- Public

HANNA:KEELAN ASSOCIATES, P.C.
COMMUNITY PLANNING & RESEARCH

* Lincoln, Nebraska * 402.464.5383 *

WAVERLY WATER DISTRIBUTION STUDY

City of Waverly, Nebraska

August 2023

Olsson Project No. 023-00062

Megan Frye

From: Stephanie Fisher
Sent: Wednesday, November 1, 2023 10:18 AM
To: Megan Frye
Cc: Bill Gerdes; Abbey Pascoe
Subject: FW: CRA members

Megan,

The below group will be appointed as CRA Members at the next Council Meeting. Please make the necessary changes to the CRA Group on Sparq and create an email group, also. Let me know if you need anything else. Thanks!

From: Bill Gerdes <billg@citywaverly.com>
Sent: Wednesday, November 1, 2023 9:42 AM
To: Stephanie Fisher <cityadministrator@citywaverly.com>
Subject: CRA members

Greg Dunlap – 5 years
Rusty Wellman -- 4
Ryan Meston – 3
Missi Pishna – 2
Cole Stark -- 1

Ryan Meston
Greg Dunlap
Missi Pishna
Cole Stark
Rusty Wellman

William 'Bill" Gerdes
Mayor
Waverly, NE 68462
402-416-7952 Cell

Waverly
A Great Place to Grow

ATTENTION ELECTED OFFICIALS: A "Reply to All" on this e-mail could lead to violations of the Nebraska Open Meetings Act.

1. Award No. 693JJ32440056

2. Effective Date
See No. 17 Below

3. Assistance Listings No.
20.939

4. Award To
City of Waverly, Nebraska
14130 Lancashire Street
Waverly, NE 68462

Unique Entity Id.: XFJNS8M2WFG5
TIN No.: 47-0492180

5. Sponsoring Office
U.S. Department of Transportation
Federal Highway Administration
Office of Safety
1200 New Jersey Avenue, SE
HSSA-1, Mail Drop E71-117
Washington, DC 20590

6. Period of Performance
Effective Date of Award – May 1, 2025

7. Total Amount

Federal Share:	$236,000
Recipient Share:	$59,000
Other Federal Funds:	$0
Other Funds:	$0
Total:	$295,000

8. Type of Agreement
Grant

9. Authority
Section 24112 of the Infrastructure Investment and Jobs Act (Pub. L. 117–58, November 15, 2021; also referred to as the "Bipartisan Infrastructure Law" or "BIL")

10. Procurement Request No. HSSP230226PR

11. Federal Funds Obligated
$236,000

12. Submit Payment Requests To
See article 20.

13. Payment Office
See article 20.

14. Accounting and Appropriations Data

15X0173E50.0000.055SR10500.5592000000.25305.61006600

15. Description of Project
Vehicular and Pedestrian Connectivity Study for Waverly, Nebraska.

RECIPIENT
16. Signature of Person Authorized to Sign

_____
Signature Date
Name: William D. Gerdes
Title: Mayor

FEDERAL HIGHWAY ADMINISTRATION
17. Signature of Agreement Officer

_____
Signature Date
Name: Kyle Griggs
Title: Agreement Officer

U.S. DEPARTMENT OF TRANSPORTATION

GRANT AGREEMENT UNDER THE
FISCAL YEAR 2022 SAFE STREETS AND ROADS FOR ALL GRANT PROGRAM

This agreement is between the [United States Department of Transportation (the "**USDOT**")] [Federal Highway Administration (the "FHWA") and the City of Waverly, Nebraska (the "**Recipient**").

This agreement reflects the selection of the Recipient to receive a Safe Streets and Roads for All ("SS4A") Grant for the Vehicular and Pedestrian Connectivity Study for Waverly, Nebraska.

The parties therefore agree to the following:

ARTICLE 1
GENERAL TERMS AND CONDITIONS

1.1 General Terms and Conditions.

(a) In this agreement, "**General Terms and Conditions**" means the content of the document titled "General Terms and Conditions Under the Fiscal Year 2022 Safe Streets and Roads for All Grant Program," dated February 8, 2023, which is available at https://www.transportation.gov/grants/ss4a/grant-agreements. Articles 7–30 are in the General Terms and Conditions. The General Terms and Conditions are part of this agreement.

(b) The Recipient states that it has knowledge of the General Terms and Conditions. Recipient also states that it is required to comply with all applicable Federal laws and regulations including, but not limited to, the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (2 CFR part 200); National Environmental Policy Act (NEPA) (42 U.S.C. § 4321 et seq.); and Build America, Buy America Act (BIL, div. G §§ 70901-27).

(c) The Recipient acknowledges that the General Terms and Conditions impose obligations on the Recipient and that the Recipient's non-compliance with the General Terms and Conditions may result in remedial action, termination of the SS4A Grant, disallowing costs incurred for the Project, requiring the Recipient to refund to the [FHWA] [USDOT] the SS4A Grant, and reporting the non-compliance in the Federal-government-wide integrity and performance system.

ARTICLE 2
APPLICATION, PROJECT, AND AWARD

2.1 Application.

Application Title: Vehicular and Pedestrian Connectivity Study for Waverly, Nebraska

Application Date: September 13, 2022

2.2 Award Amount.

SS4A Grant Amount: $236,000

2.3 Award Dates.

Period of Performance End Date: See Section 6 on Page 1

2.4 Budget Period

Budget Period End Date: See Section 6 on Page 1

2.5 Action Plan Grant or Implementation Grant Designation.

Designation: Action Plan

2.6 Federal Award Identification Number. The Federal Award Identification Number is listed on page 1, line 1.

ARTICLE 3
SUMMARY PROJECT INFORMATION

3.1 Summary of Project's Statement of Work.

Access and safety from one part of the city to the other, as well as to the schools, recreation areas and commercial center need improvement. Planning will focus on increasing pedestrian safety through proper management of pedestrian and vehicular traffic. This will be accomplished by assessing the need for a pedestrian viaduct over the railroad tracks and highway, adding sidewalks in heavily trafficked areas near schools and improved intersections at desired locations in the city.

3.2 Project's Estimated Schedule.

ACTION PLAN SCHEDULE

Milestone	Schedule Date
Planned Draft Action Plan Completion Date:	10-01-2024
Planned Action Plan Completion Date:	01-01-2025
Planned Action Plan Adoption Date:	03-01-2025
Planned SS4A Final Report Date:	05-01-2025

3.3 Project's Estimated Costs.

(a) Eligible Project Costs

Eligible Project Costs	
SS4A Grant Amount:	$236,000
Other Federal Funds:	$0
State Funds:	$0
Local Funds:	$59,000
In-Kind Match:	$0
Other Funds:	$0
Total Eligible Project Cost:	$295,000

(b) Supplemental Estimated Budget

Cost Element	Federal Share	Non-Federal Share	Total Budget Amount
Direct Labor	$0.00	$0.00	$0.00
Fringe Benefits	$0.00	$0.00	$0.00
Travel	$0.00	$0.00	$0.00
Equipment	$0.00	$0.00	$0.00
Supplies	$0.00	$0.00	$0.00
Contractual/Consultant	$236,000	$59,000	$295,000
Other	$0.00	$0.00	$0.00
Indirect Costs	$0.00	$0.00	$0.00
Total Budget	**$236,000**	**$59,000**	**$295,000**

ARTICLE 4
RECIPIENT INFORMATION

4.1 Recipient's Unique Entity Identifier.

XFJNS8M2WFG5

4.2 Recipient Contact(s).

Stephanie Fisher
City Administrator
City of Waverly, Nebraska
PO Box 427
402-786-2312
cityadministrator@citywaverly.com

4.3 Recipient Key Personnel.

Name	Title or Position
Stephanie Fisher	City Administrator
Tracey Whyman	Public Works Director

4.4 USDOT Project Contact(s).

Christie Dawson
Safe Streets and Roads for All Program Manager
Federal Highway Administration
Office of Safety
HSSA-1, Mail Stop: E71-117
1200 New Jersey Avenue, S.E.
Washington, DC 20590
(202) 366-9265
christie.dawson@dot.gov

and

Ashley Cucchiarelli
Agreement Officer (AO)
Federal Highway Administration
Office of Acquisition and Grants Management
HCFA-33, Mail Stop E62-310
1200 New Jersey Avenue, S.E.
Washington, DC 20590
(720) 963-3589
ashley.cucchiarelli@dot.gov

and

Ashley Cucchiarelli
Agreement Specialist (AS)
Office of Acquisition and Grants Management
HCFA-33, Mail Stop E62-204
1200 New Jersey Avenue, S.E.
Washington, DC 20590
(720) 963-3589
ashley.cucchiarelli@dot.gov

and

Division Administrator
Agreement Officer's Representative (AOR)
Nebraska Division Office
100 Centennial Mall North Lincoln, NE 68508
United States
Nebraska.FHWA@dot.gov

Alison Koch
Nebraska Division Office Point of Contact
Transportation Specialist
100 Centennial Mall North Lincoln, NE 68508
402-742-8467
alison.koch@dot.gov

ARTICLE 5
USDOT ADMINISTRATIVE INFORMATION

5.1 Office for Subaward and Contract Authorization.

USDOT Office for Subaward and Contract Authorization: FHWA Office of Acquisition and Grants Management

SUBAWARDS AND CONTRACTS APPROVAL

Note: See 2 CFR § 200.331, Subrecipient and contractor determinations, for definitions of subrecipient (who is awarded a subaward) versus contractor (who is awarded a contract).

Note: Recipients with a procurement system deemed approved and accepted by the Government or by the AO are exempt from the requirements of this clause. See 2 CFR 200.317 through 200.327.

Note: This clause is only applicable to Action Plan Grants.

Unless described in the application and funded in the approved award, the Recipient must obtain prior written approval from the AO for the subaward, transfer, or contracting out of any work under this award above the Simplified Acquisition Threshold. This provision does not apply to the acquisition of supplies, material, equipment, or general support services. Approval of each subaward or contract is contingent upon the Recipient's submittal of a written fair and reasonable price determination, and approval by the AO for each proposed contractor/sub-recipient. Consent to enter into subawards or contracts will be issued through written notification from the AO or a formal amendment to the Agreement.

The following subawards and contracts are currently approved under the Agreement by the AO. This list does not include supplies, material, equipment, or general support services which are exempt from the pre-approval requirements of this clause.

(Fill in at award or by amendment)

5.2 Reimbursement Requests

(a) The Recipient may request reimbursement of costs incurred in the performance of this agreement if those costs do not exceed the funds available under section 2.2 and are allowable under the applicable cost provisions of 2 C.F.R. Part 200, Subpart E. The Recipient shall not request reimbursement more frequently than monthly.

(b) The Recipient shall use the DELPHI eInvoicing System to submit requests for reimbursement to the payment office. When requesting reimbursement of costs incurred or credit for cost share incurred, the Recipient shall electronically submit supporting cost detail with the SF 271 (Outlay Report and Request for Reimbursement for Construction Programs) to clearly document all costs incurred.

(c) The Recipient's supporting cost detail shall include a detailed breakout of all costs incurred, including direct labor, indirect costs, other direct costs, travel, etc., and the Recipient shall identify the Federal share and the Recipient's share of costs. If the Recipient does not provide sufficient detail in a request for reimbursement, the AO may withhold processing that request until the Recipient provides sufficient detail.

(d) The USDOT shall not reimburse costs unless the Agreement Officer's Representative (the "**AOR**") reviews and approves the costs to ensure that progress on this agreement is sufficient to substantiate payment.

(e) The USDOT may waive the requirement that the Recipient use the DELPHI eInvoicing System. The Recipient may obtain waiver request forms on the DELPHI eInvoicing website (http://www.dot.gov/cfo/delphi-einvoicing-system.html) or by contacting the AO. A Recipient who seeks a waiver shall explain why they are unable to use or access the Internet to register and enter payment requests and send a waiver request to

Director of the Office of Financial Management
US Department of Transportation,
Office of Financial Management B-30, Room W93-431
1200 New Jersey Avenue SE
Washington DC 20590-0001

or

DOTElectronicInvoicing@dot.gov.

If the USDOT grants the Recipient a waiver, the Recipient shall submit SF 271s directly to:

DOT/FAA
P.O. Box 268865
Oklahoma City, OK 73125-8865
Attn: Agreement Specialist

(f) The requirements set forth in these terms and conditions supersede previous financial invoicing requirements for Recipients.

ARTICLE 6
SPECIAL GRANT TERMS

6.1 SS4A funds must be expended within five years after the grant agreement is executed and DOT obligates the funds, which is the budget period end date in section 10.3 of the Terms and Conditions and section [wherever the date it is in this agreement].

6.2 The Recipient acknowledges that the Action Plan will be made publicly available, and the Recipient agrees that it will publish the final Action Plan on a publicly available website.

6.3 The Recipient demonstrates compliance with civil rights obligations and nondiscrimination laws, including Titles VI of the Civil Rights Act of 1964, the Americans with Disabilities Act (ADA), and Section 504 of the Rehabilitation Act, and accompanying regulations. Recipients of Federal transportation funding will also be required to comply fully with regulations and guidance for the ADA, Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, and all other civil rights requirements.

6.4 There are no other special grant requirements for this award.

ATTACHMENT A
PERFORMANCE MEASUREMENT INFORMATION

Study Area: The study area will be the City of Waverly city limits.

Baseline Measurement Date: January 15, 2024

Baseline Report Date: March 15, 2024

Table 1: Performance Measure Table

Measure	Category and Description	Measurement Frequency
Equity	Percent of Funds to Underserved Communities: Funds will be used to identify areas that are lacking in sidewalks near schools, provide safe pedestrian route over the railroad/highway and improving safety at intersections.	05-01-2025
Costs	Project Costs: Problem areas will be identified through evaluation of data gathered and public engagement. Estimated costs for each project will be determined and ranked according to their cost-benefit and overall improvement to community safety. Educational materials will be created and shared throughout schools, organizations, and media outlets.	05-01-2025
Lessons Learned and Recommendations	Lessons Learned and Recommendations from the completed Action Plan will be used to help evaluate future traffic safety engineering projects within the City of Waverly.	05-01-2025

ATTACHMENT B
CHANGES FROM APPLICATION

Scope: There are no changes to the Scope of the City of Waverly Action Plan.

Schedule: There are no changes to the Schedule of the City of Waverly Action Plan.

Budget: There are no changes to the Budget of the City of Waverly Action Plan.

The table below provides a summary comparison of the project budget.

	Application		**Section 3.3**	
Fund Source	$	%	$	%
Previously Incurred Costs (Non-Eligible Project Costs)				
Federal Funds				
Non-Federal Funds				
Total Previously Incurred Costs				
Future Eligible Project Costs				
SS4AFunds				
Other Federal Funds				
Non-Federal Funds				
Total Future Eligible Project Costs				
Total Project Costs				

ATTACHMENT C
RACIAL EQUITY AND BARRIERS TO OPPORTUNITY

1. Efforts to Improve Racial Equity and Reduce Barriers to Opportunity.

The Recipient states that rows marked with "X" in the following table are accurate:

	A racial equity impact analysis has been completed for the Project. *(Identify a report on that analysis or, if no report was produced, describe the analysis and its results in the supporting narrative below.)*
	The Recipient or a project partner has adopted an equity and inclusion program/plan or has otherwise instituted equity-focused policies related to project procurement, material sourcing, construction, inspection, hiring, or other activities designed to ensure racial equity in the overall delivery and implementation of the Project. *(Identify the relevant programs, plans, or policies in the supporting narrative below.)*
X	The Project includes physical-barrier-mitigating land bridges, caps, lids, linear parks, and multimodal mobility investments that either redress past barriers to opportunity or that proactively create new connections and opportunities for underserved communities that are underserved by transportation. *(Identify the relevant investments in the supporting narrative below.)*
X	The Project includes new or improved walking, biking, and rolling access for individuals with disabilities, especially access that reverses the disproportional impacts of crashes on people of color and mitigates neighborhood bifurcation. *(Identify the new or improved access in the supporting narrative below.)*
	The Project includes new or improved freight access to underserved communities to increase access to goods and job opportunities for those underserved communities. *(Identify the new or improved access in the supporting narrative below.)*
	The Recipient has taken other actions related to the Project to improve racial equity and reduce barriers to opportunity, as described in the supporting narrative below.
	The Recipient has not yet taken actions related to the Project to improve racial equity and reduce barriers to opportunity but, before beginning construction of the project, will take relevant actions described in the supporting narrative below
	The Recipient has not taken actions related to the Project to improve racial equity and reduce barriers to opportunity and will not take those actions under this award.

2. Supporting Narrative.

The Vehicular and Pedestrian Connectivity Study for Waverly Action Plan Project includes analyzing a multi-modal bridge connecting underserved communities over the existing railroad tracks. This will provide numerous citizens access to work, school, commerce, green space, and more throughout The City of Waverly.

The Vehicular and Pedestrian Connectively Study for Waverly Action Plan Project includes analyzing new multi-modal trails within The City of Waverly that will meet all American with Disabilities Act (ADA) standards and requirements and that will provide access throughout the community for individuals with disabilities. Crash data will be analyzed in order to identify target intersections, roadways, or pedestrian areas to focus improvements on.

NEBRASKA

Good Life. Great Resources.

DEPT. OF ENVIRONMENT AND ENERGY

Jim Pillen, Governor

October 25, 2023

NDEE PERMIT No. W-133-2023

Stephanie Fisher, Administrator
City of Waverly
P.O. Box 427
Waverly, NE 68462

Re: Public Water – Waverly – W-133-2023 – **Plans and Specifications** – Eastbourne Street Water Main Improvements (JEO Project No. 201085.00)

Dear Ms. Fisher:

Documents describing the above-referenced project have been reviewed and are hereby approved with respect to features of sanitary significance. This approval does not supersede any other NRD, local, state, or federal requirements. In accordance with Title 179 NAC 7-003, a construction permit is hereby granted. This permit is valid for a period of two years from the date of issuance.

This approval is subject to any stipulations listed below. Written approval must be obtained from this Department before proceeding with any major changes from the project documents as approved. One set of the submitted documents is being made a part of this Department's records.

No project that is considered major construction shall be placed into service prior to a final inspection and approval by the Department. The only exception to this requirement is interior tank coating and water distribution main projects. The Department may allow these projects to be placed into service when requested by the owner and/or the engineer. The request to place into service must be accompanied with a certification of project completion by the engineer and copies of satisfactory bacteriological testing results for the project. The Department may be issuing administrative penalties, as authorized in Neb. Rev. Stat. § 71-5304.01, to any system that violates this regulation.

Sincerely,

Cyril Martinmaas

Cyril Martinmaas, P.E., Engineering Section Supervisor
Permitting & Engineering Division
Nebraska Department of Environment and Energy

CJM:SJJ:CNW

xc: Tim Adams, P.E., JEO(ec)
Tracey Whyman, City of Waverly (ec)
Greg Brekel, NDEE (ec)

XXXX In accordance with Title 179 NAC 7-005.01, documentation of the contract or actual cost of the project shall be provided to this Department for the purpose of determining the final fee amount. Payment of the final fee amount shall be made to this Department.

XXXX In accordance with Title 179 NAC 7-003.02, record drawings must be submitted to the Department. PDF (Portable Document Format) copies are preferred.

XXXX Discharge of chlorinated water from disinfection procedure must follow Best Management Practices (BMPs) for meeting surface water quality standards under the National Pollutant Discharge Elimination System (NPDES). For assistance, contact the NPDES Compliance Section at 402/471-1367.

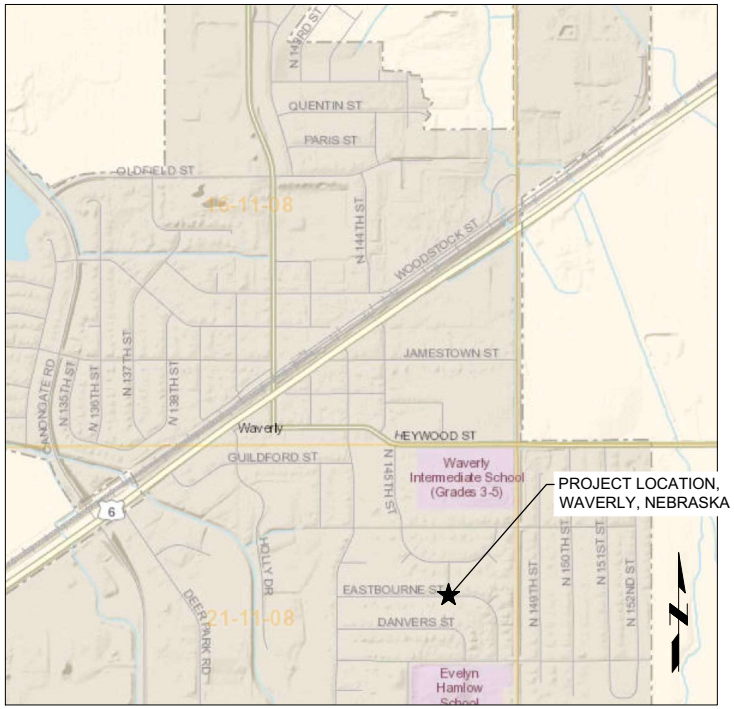
Department of Environment and Energy
P.O. Box 98922
Lincoln, Nebraska 68509-8922

Jim Macy, Director
OFFICE 402-471-2186 FAX 402-471-2909
ndee.moreinfo@nebraska.gov

2020
WATER MAIN IMPROVEMENTS EASTBOURNE ST./N 147TH ST.; N 143RD ST. TO CASTLEWOOD ST. WAVERLY, NEBRASKA

INDEX OF SHEETS:

SHEET NO:	SHEET NAME:
C0.1	COVER SHEET
C0.2	SYMBOLS
C0.3	HORIZONTAL ALIGNMENT & CONTROL
C1.0 - C1.1	EXISTING SITE PLAN
PP1.1 - PP2.1	PLAN AND PROFILE SHEETS
D1.1 - D1.2	STANDARD DETAILS



LOCATION MAP

Drinking Water Project
NEBRASKA
Good Life. Great Resources.
DEPT. OF ENVIRONMENT AND ENERGY
APPROVED
Gail Martinmaas PE

NDEE Project No. W-133-2023
October 25, 2023

I, TIMOTHY J. ADAMS, AM THE COORDINATING PROFESSIONAL ON THE 2020 WATER MAIN IMPROVEMENTS EASTBOURNE ST./N 147TH ST.; N 143RD ST. TO CASTLEWOOD ST. PROJECT.

TIMOTHY J. ADAMS
E-15149
11/24/2020
PROFESSIONAL CIVIL ENGINEER
STATE OF NEBRASKA

811 Know what's below. Call before you dig.

NOTE:
NEITHER THE OWNER (CLIENT) NOR JEO CONSULTING GROUP, INC. ASSUMES ANY RESPONSIBILITY FOR UTILITY LOCATIONS BEING ACCURATELY SHOWN OR NOT SHOWN ON THE PLANS. A REQUEST FOR UTILITY LOCATES WAS MADE FOR THIS LOCATION AS PER THE ONE-CALL NOTIFICATION SYSTEM ACT.
(DATE: 8/4/2020 TICKET NO.: 202130110).
(DATE: 8/4/2020 TICKET NO.: 202130111).
(DATE: 8/4/2020 TICKET NO.: 202130112).
(DATE: 8/4/2020 TICKET NO.: 202130113).
(DATE: 8/4/2020 TICKET NO.: 202130114).
(DATE: 8/4/2020 TICKET NO.: 202130115).
(DATE: 8/4/2020 TICKET NO.: 202130116).

UTILITIES SHOWN ARE FROM FIELD MARKINGS PROVIDED IN THE FIELD BY THE UTILITY PROVIDERS.

THE EXACT LOCATION AND/OR SIZE OF UNDERGROUND FEATURES MAY NOT BE ACCURATELY, COMPLETELY AND RELIABLY DEPICTED. FIELD VERIFICATION OF UTILITIES MAY BE REQUIRED. CONTRACTOR(S) SHALL NOTIFY THE RESPECTIVE UTILITY COMPANIES BEFORE COMMENCING ANY WORK.

JEO CONSULTING GROUP 1-800-723-0987

2020
WATER MAIN IMPROVEMENTS
EASTBOURNE ST./N 147TH ST.;
N 143RD ST. TO CASTLEWOOD ST.
WAVERLY, NEBRASKA

COVER SHEET

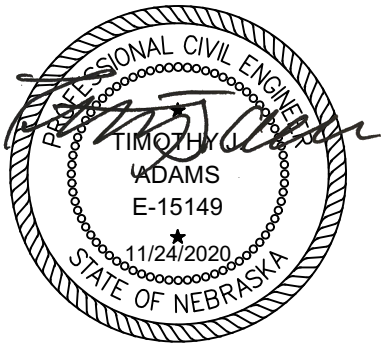
PROJECT NO.	201085.00
DATE	11/24/2020
DRAWN BY	ADP
FILE NAME	S-201085_3.dwg
FIELD BOOK	FB LINCOLN #2
FIELD CREW	EF, NH
SURVEY FILE NO.	SV-201085
PLAN IN HAND INITIALS / DATE	TJA 8/31/2020
70 PERCENT REVIEW INITIALS / DATE	RSP 10/16/2020
95 PERCENT REVIEW INITIALS / DATE	RSP 11/09/2020
REVISIONS	

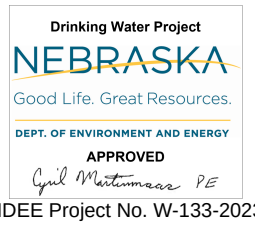
C0.1

PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS
FOR
2020 WATER MAIN IMPROVEMENTS
EASTBOURNE ST./N 147TH ST.; N 143RD ST. TO CASTLEWOOD ST.
FOR
WAVERLY, NEBRASKA

OWNER CONTACT Tracey Whyman, Director of Public Works
City of Waverly
14130 Lancashire St
PO Box 427
Waverly, NE 68462
Phone: 402.786.2312
Email: traceyw@citywaverly.com

COORDINATING PROFESSIONAL Timothy J. Adams, PE
JEO Consulting Group, Inc.
2700 Fletcher Ave
Lincoln, NE 68504-1113
Office: 402.474.8767
Mobile: 402.710.0527
Email: tadams@jeo.com





NDEE Project No. W-133-2023
October 25, 2023

PLANS AVAILABLE **jeo.com/bidding**

OR

JEO Consulting Group, Inc.
2700 Fletcher Ave
Lincoln, NE 68504-1113

Phone: 402.474.8740
Email: srosenau@jeo.com

JEO PROJECT NO. 201085.00

PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS
FOR
2020 WATER MAIN IMPROVEMENTS
EASTBOURNE ST./N 147TH ST.; N 143RD ST. TO CASTLEWOOD ST.
FOR
WAVERLY, NEBRASKA

ADDENDUM NO. 1 **October 12, 2023**

TO: PLANS, SPECIFICATIONS AND BIDDING DOCUMENTS FOR THE 2020 WATER MAIN IMPROVEMENTS, EASTBOURNE ST./N 147TH ST.; N 143RD ST. TO CASTLEWOOD ST. (JEO PROJECT NO. 201085.00).

NOTICE:

THIS ADDENDUM IS ISSUED BY ENGINEER TO ALL KNOWN INDIVIDUALS, FIRMS OR CORPORATIONS WHO HAVE OBTAINED OR RECEIVED BIDDING DOCUMENTS AND CONTRACT DOCUMENTS FOR ABOVE LISTED PROJECT.

THIS ADDENDUM IS HEREBY MADE A PART OF THE BIDDING DOCUMENTS OR CONTRACT DOCUMENTS, AS APPROPRIATE. BIDDERS ARE REQUIRED TO ACKNOWLEDGE RECEIPT OF THIS ADDENDUM IN APPROPRIATE SPACE ON THE BID FORM.

CHANGES TO PROJECT SPECIFICATIONS:

1. Refer to Section “Contents” in front of Specifications.

   Amend the addresses for both “Coordinating Professional” and “Plans Available” to read as follows:

   ‘2000 Q St, Ste 500
   Lincoln, NE 68503’

   For specifications issued after October 13, 2023, this change has already been made for you.

2. Refer to Section “Contents” in front of Specifications.

   Amend the contact information for “Plans Available” to read as follows:

   ‘Contact: Autum Filipi
   Phone: 402.742.7220
   Email: afilipi@jeo.com’

   For specifications issued after October 13, 2023, this change has already been made for you.

3. Refer to Section 00 21 00 – Instructions to Bidders.

   Amend Paragraph 15.02 Bid submittal address by striking out the following text: “Hope Staten, Clerk” and inserting the following text: “Megan Frye, Clerk”

4. Refer to Section 00 41 00 – Bid Form.

   The Bid submittal address shall be amended by striking out the following text: “Hope Staten, Clerk” and inserting the following text: “Megan Frye, Clerk”

5. Refer to Section 00 52 00 – Agreement.

   Delete Paragraph 4.02 in its entirety and insert the following in its place:

   ‘4.02 Contract Times: Dates

   A. The start date for the Work will be **10 days after Notice to Proceed** and the Work will be substantially completed on or before **August 1, 2024**, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before **September 1, 2024**.’

6. Refer to Section 00 55 00 – Notice to Proceed.

   Bidders should note that all revised completion and milestone dates noted in this addendum will also be updated in the Notice to Proceed prior to providing the contract documents to the successful bidder for execution.

7. Refer to Section 01 10 00 – Special Provisions.

   Delete paragraph 1.08.C in its entirety and insert the following in its place:

   ‘C. The Group A bid item “Seeding, Fertilizer, and Mulch’ shall include furnishing and installing all components, including labor and materials, necessary to reseed all vegetated areas disturbed by the Contractor during construction of the project. This bid item shall include, but is not limited to, fine grading, seed, fertilizer, mulch, and watering as necessary to establish vegetation. Quantities will not be measured, and it will be paid as a Lump Sum.’

8. Refer to Section 01 10 00 – Special Provisions.

   Delete paragraph 1.17 in its entirety and insert the following in its place:

   ‘**1.17 CONSTRUCTION PROGRESS MEETINGS**

   A. Weekly progress meeting will be held on site during the construction period to review and confirm the work plan for the next week. The day of the week for the meeting will be determined at the preconstruction meeting. Attendance by the Contractor or Contractor’s authorized representative is mandatory.

   B. Monthly progress review meetings will be held during the construction period at a time and date set by the Owner through the Engineer. Location will be

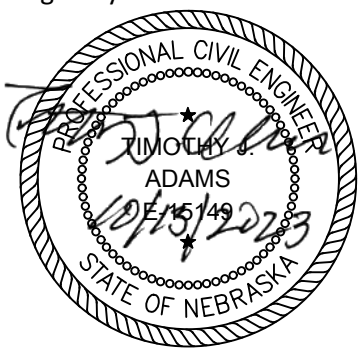
determined at the preconstruction meeting. Attendance by the Contractor or Contractor's authorized representative is mandatory.'

CLARIFICATIONS:

1. The City of Waverly intends to provide water for construction at no cost to the Contractor. In the event that the City of Waverly is not able to provide water, a change order will be negotiated to purchase and haul water from another source.

In order to bid the project, the contract documents must be issued directly by JEO Consulting Group, Inc. or QuestCDN to the bidder. All bidders must be on the plan holders list at the time of the letting.

All other requirements of the Plans, Specifications and Contract Documents remain in effect. This addendum shall be attached to and made a part of the Plans, Specifications and Contract Documents and receipt shall be acknowledged by the Bidder on the Proposal submitted.



END OF ADDENDUM NUMBER 1

Timothy J. Adams, PE
October 12, 2023

JEO CONSULTING GROUP INC
JEO ARCHITECTURE INC

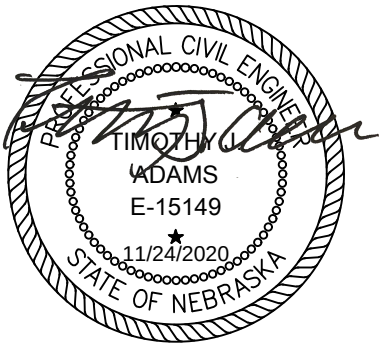
PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS
FOR
2020 WATER MAIN IMPROVEMENTS
EASTBOURNE ST./N 147TH ST.; N 143RD ST. TO CASTLEWOOD ST.
FOR
WAVERLY, NEBRASKA

Engineering
Architecture
Surveying
Planning
Funding

PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS
FOR
2020 WATER MAIN IMPROVEMENTS
EASTBOURNE ST./N 147TH ST.; N 143RD ST. TO CASTLEWOOD ST.
FOR
WAVERLY, NEBRASKA

OWNER CONTACT Tracey Whyman, Director of Public Works
City of Waverly
14130 Lancashire St
PO Box 427
Waverly, NE 68462
Phone: 402.786.2312
Email: traceyw@citywaverly.com

COORDINATING PROFESSIONAL Timothy J. Adams, PE
JEO Consulting Group, Inc.
2700 Fletcher Ave
Lincoln, NE 68504-1113
Office: 402.474.8767
Mobile: 402.710.0527
Email: tadams@jeo.com



PLANS AVAILABLE **jeo.com/bidding**

OR

JEO Consulting Group, Inc.
2700 Fletcher Ave
Lincoln, NE 68504-1113

Phone: 402.474.8740
Email: srosenau@jeo.com

JEO PROJECT NO. 201085.00

CONTENTS

DIVISION 00:

00 10 00 – Invitation to Bid
00 21 00 – Instructions to Bidders
00 41 00 – Bid Form
00 43 00 – Bid Bond
00 52 00 – Agreement
00 55 00 – Notice to Proceed
00 61 00 – Performance Bond
00 61 50 – Payment Bond
00 70 00 – General Conditions
00 73 00 – Supplementary Conditions

DIVISION 01:

01 10 00 – Special Provisions
01 20 00 – Price and Payment Procedures
01 22 00 – Unit Prices
01 30 00 – Administrative Requirements
01 40 00 – Quality Requirements
01 50 00 – Temporary Facilities and Controls
01 55 00 – Traffic Control and Barricading
01 60 00 – Product Requirements
01 70 00 – Execution Requirements
01 71 13 – Mobilization and Demobilization
01 77 00 – Project Closeout

DIVISION 03:

03 30 00 – Cast-in-Place Concrete

DIVISION 31:

31 23 19 – Dewatering
31 23 23 – Fill and Backfill
31 23 33 – Trenching for Utilities
31 25 00 – Erosion Control

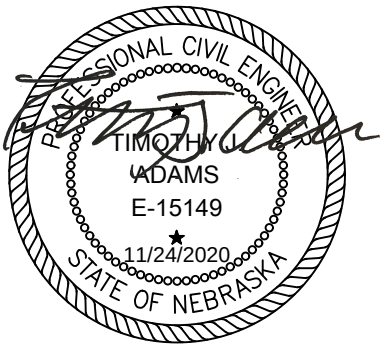
DIVISION 32:

32 92 19 – Seeding

DIVISION 33:

33 11 16 – Water Distribution
33 12 16 – Buried Water and Sewer Main Valves
33 13 00 – Disinfection of Water Distribution System

2020 WATER MAIN IMPROVEMENTS
EASTBOURNE ST./N 147TH ST.; N 143RD ST. TO CASTLEWOOD ST.
FOR
WAVERLY, NEBRASKA
JEO PROJECT NO. 201085.00



The following Specification Sections have been prepared by myself or under my direct supervision:

Section No.	Title
Division 00 – All Sections Included	Bidding and Contracting Requirements
Division 01 – All Sections Included	General Requirements
Division 02 – All Sections Included	Existing Conditions
Division 03 – All Sections Included	Concrete
Division 31 – All Sections Included	Earthwork
Division 32 – All Sections Included	Exterior Improvements
Division 33 – All Sections Included	Utilities

SECTION 00 10 00

INVITATION TO BID

INVITATION TO BID

Sealed Proposals for the construction of "***2020 Water Main Improvements, Eastbourne St./N 147th St.; N 143rd St. to Castlewood St. for the City of Waverly, Nebraska***," JEO Project No. **201085.00**, QuestCDN No. **7428778**, will be received by the City Clerk at ***14130 Lancashire St, Waverly NE 68462***, until _____ on the _____ day of _____ **20**_____, and thereafter will be read aloud.

The work is generally described as follows: ***Water main replacement including the installation of approximately 2,300 linear feet of 8" PVC water main including fittings, valves, hydrants and water services.***

Opinion of Probable Cost $455,000

Proposals will be taken for said construction work listed above by unit prices, as an aggregate bid for the entire project.

All Proposals for said construction work must be made on blanks furnished by the Engineer and must be accompanied by Bid Security of not less than 5% of the amount bid. Bid Security to be made payable to the Treasurer of the City of Waverly as liquidated damages in case the bid is accepted and the bidder neglects or refuses, to enter into contract and furnish bond in accordance herewith.

Copies of the contract documents are on file with the City of Waverly for examination by bidders. Complete digital project bidding documents are available at JEO's website at jeo.com for $**20.00**. An optional paper set of project documents is available for a non-refundable price of $**75.00** per set. Please send your check payable to JEO Consulting Group, Inc. at **2700 Fletcher Ave, Lincoln, NE 68504. If you have any questions, contact us at 402.474.8740**. In order to bid the project, the contract documents must be issued directly by JEO Consulting Group, Inc. or QuestCDN to the bidder.

The Owner reserves the right to waive informalities and irregularities and to make awards on bids which furnish the materials and construction that will, in their opinion serve the best interests of the Owner, and also reserves the right to reject any and/or all bids.

CITY OF WAVERLY, NEBRASKA
Mike Werner, Mayor

ATTEST: Hope Staten, Clerk

PUBLISHED: Waverly News
1st Publication Date
2nd Publication Date
3rd Publication Date

SECTION 00 21 00

INSTRUCTION TO BIDDERS

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ARTICLE 1 – DEFINED TERMS

1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. *Issuing Office* – The office from which the Bidding Documents are to be issued.

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

2.01 Complete sets of the Bidding Documents may be obtained from the Issuing Office in the number and format stated in the advertisement or invitation to bid.

2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

2.04 **In order to bid the project, the contract documents must be issued directly to the Bidder from JEO Consulting Group, Inc. or QuestCDN. The Bid shall be submitted by the same firm that were issued the contract documents.**

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

3.01 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and within **5** days of Owner's request, Bidder shall submit (a) written evidence establishing its qualifications such as financial data, previous experience, and present commitments, and (b) **such other data as may be requested** ~~the following additional information~~:

A. [Evidence of Bidder's authority to do business in the state where the Project is located.]

~~B. [Bidder's state or other contractor license number, if applicable.]~~

~~C. [Subcontractor and Supplier qualification information; coordinate with provisions of Article 12 of these Instructions, "Subcontractors, Suppliers, and Others."]~~

~~D. [Other required information regarding qualifications]~~

3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.

3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

3.04 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

ARTICLE 4 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

4.01 *Site and Other Areas*

A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any

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additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

4.02 *Existing Site Conditions*

A. Subsurface and Physical Conditions; Hazardous Environmental Conditions

1. The Supplementary Conditions identify:

a. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site.

b. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

c. reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.

d. Technical Data contained in such reports and drawings.

2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

~~4. Geotechnical Baseline Report: The Bidding Documents contain a Geotechnical Baseline Report (GBR). The GBR describes certain select subsurface conditions that are anticipated to be encountered by Contractor during construction in specified locations ("Baseline Conditions"). The GBR is a Contract Document.~~

~~The Baseline Conditions in the GBR are intended to reduce uncertainty and the degree of contingency in submitted Bids. However, Bidders cannot rely solely on the Baseline Conditions. Bids should be based on a comprehensive approach that includes an independent review and analysis of the GBR, all other Contract Documents, Technical Data, other available information, and observable surface conditions. Not all potential subsurface conditions are baselined.~~

~~Nothing in the GBR is intended to relieve Bidders of the responsibility to make their own determinations regarding construction costs, bidding strategies, and Bid prices, nor of the responsibility to select and be responsible for the means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs incident thereto.~~

B. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site are set forth in the Contract Documents and are based upon information and data

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furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

C. Adequacy of Data: Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 5.03, 5.04, and 5.05 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 5.06 of the General Conditions.

4.03 *Site Visit and Testing by Bidders*

A. Bidder shall conduct the ~~required~~ **highly recommended** Site visit during normal working hours, and shall not disturb any ongoing operations at the Site.

B. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.

C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.

D. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.

E. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

4.04 *Owner's Safety Program*

A. Site visits and work at the Site may be governed by an Owner safety program. As the General Conditions indicate, if an Owner safety program exists, it will be noted in the Supplementary Conditions.

4.05 *Other Work at the Site*

A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

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ARTICLE 5 – BIDDER'S REPRESENTATIONS

5.01 It is the responsibility of each Bidder before submitting a Bid to:

A. examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;

B. **highly recommended to** visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;

C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work;

D. carefully study all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings;

E. consider the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs;

F. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;

G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;

H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;

I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work; and

J. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 6 – PRE-BID CONFERENCE

6.01 Not applicable.

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ARTICLE 7 – INTERPRETATIONS AND ADDENDA

7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all parties recorded as having received the Bidding Documents. Questions received less than seven days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

7.02 Addenda may be issued to clarify, correct, supplement, or change the Bidding Documents.

ARTICLE 8 – BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of **5** percent of Bidder's maximum Bid price (determined by ~~adding~~ the base bid ~~and all alternates~~) and in the form of a certified check, bank money order, or a Bid bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.

8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract Documents, furnished the required contract security, and met the other conditions of the **award** ~~Notice of Award~~, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the **award** ~~Notice of Award~~, Owner may consider Bidder to be in default, annul the **award** ~~Notice of Award~~, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults.

8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within seven days after the Bid opening.

ARTICLE 9 – CONTRACT TIMES

9.01 The number of days within which, or the dates by which, the Work is to be substantially completed and ready for final payment are set forth in the Agreement.

ARTICLE 10 – LIQUIDATED DAMAGES

10.01 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 11 – SUBSTITUTE AND "OR-EQUAL" ITEMS

11.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, and those "or-equal" or substitute or materials and equipment subsequently approved by Engineer prior to the submittal of Bids and identified by Addendum. No item of material or equipment will be considered by Engineer as an "or-equal" or

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substitute unless written request for approval has been submitted by Bidder and has been received by Engineer at least 15 days prior to the date for receipt of Bids. Each such request shall comply with the requirements of Paragraphs 7.04 and 7.05 of the General Conditions. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. If Engineer approves any such proposed item, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner.

11.02 All prices that Bidder sets forth in its Bid shall be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of "or-equal" or substitution requests are made at Bidder's sole risk.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

12.01 A Bidder shall be prepared to retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of the Work if required by the Bidding Documents (most commonly in the Specifications) to do so. If a prospective Bidder objects to retaining any such Subcontractor, Supplier, or other individual or entity, and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.

12.02 Subsequent to the submittal of the Bid, Owner may not require the Successful Bidder or Contractor to retain any Subcontractor, Supplier, or other individual or entity against which Contractor has reasonable objection.

12.03 **If required by the bid documents** the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of the Subcontractors or Suppliers proposed for the following portions of the Work **for which such identification is required**.

12.04 If requested by Owner, such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, or other individual or entity. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the **award** ~~Notice of Award~~ is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder shall submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

12.05 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, or other individuals or entities. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the **award** ~~giving of the Notice of Award~~ will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.06 of the General Conditions.

ARTICLE 13 – PREPARATION OF BID

13.01 The Bid Form is included with the Bidding Documents.

A. All blanks on the Bid Form shall be completed in ink **or by typewriter** and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid

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Form. A Bid price shall be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.

B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."

13.02 A Bid by a corporation shall be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation shall be shown.

13.03 A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.

13.04 A Bid by an individual shall show the Bidder's name and official address.

13.05 A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.

13.06 All names shall be **typed or** printed in ink below the signatures.

13.07 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.

13.08 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.

13.09 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 14 – BASIS OF BID

14.01 *Lump Sum*

A. Bidders shall submit a Bid on a lump sum basis as set forth in the Bid Form.

14.02 *Unit Price*

A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.

B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity" (which Owner or its representative has set forth in the Bid Form) for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.

C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

~~14.03 *Allowances*~~

~~A. For cash allowances the Bid price shall include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash~~

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~~allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.~~

~~14.04 *Price Plus Time Bids*~~

~~A. The Owner will consider the time of Substantial Completion commitment made by the Bidder in the comparison of Bids.~~

~~B. Bidder shall designate the number of days required to achieve Substantial Completion of the Work and enter that number in the Bid Form as the total number of calendar days to substantially complete the Work.~~

~~C. The total number of calendar days for Substantial Completion designated by Bidder shall be less than or equal to a maximum of [____], but not less than the minimum of [____]. If Bidder purports to designate a time for Substantial Completion that is less than the allowed minimum, or greater than the allowed maximum, Owner will reject the Bid as nonresponsive.~~

~~D. The Agreement as executed will contain the Substantial Completion time designated in Successful Bidder's Bid, and the Contractor will be assessed liquidated damages at the rate stated in the Agreement for failure to attain Substantial Completion within that time.~~

~~E. [Bidder shall also designate the time in which it will achieve Milestones, and achieve readiness for final payment. Such time commitments shall be consistent with the "Time of Substantial Completion" to which Bidder commits. The Agreement as executed will contain, as binding Contract Times, Successful Bidder's time commitments regarding Milestones, as applicable, and readiness for final payment.]~~

ARTICLE 15 – SUBMITTAL OF BID

15.01 With each copy of the Bidding Documents, a Bidder is furnished one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 7 of the Bid Form.

15.02 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed to:

City of Waverly
Attn: Hope Staten, Clerk
14130 Lancashire St
PO Box 427
Waverly NE 68462

15.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

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ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

16.01 A Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

16.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 16.01 and submit a new Bid prior to the date and time for the opening of Bids.

16.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

ARTICLE 17 – OPENING OF BIDS

17.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible. If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, then the Owner will reject the Bid as nonresponsive; provided that Owner also reserves the right to waive all minor informalities not involving price, time, or changes in the Work.

19.02 If Owner awards the contract for the Work, such award shall be to the responsible Bidder submitting the lowest responsive Bid.

19.03 Evaluation of Bids

A. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the **award** ~~Notice of Award~~. **Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive all informalities and to negotiate contract terms with the Successful Bidder.**

B. In the comparison of Bids, alternates will be **considered as described in Section 01 10 00 – Special Provisions.** ~~applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner shall announce to all bidders~~

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~~a "Base Bid plus alternates" budget after receiving all Bids, but prior to opening them. For comparison purposes alternates will be accepted, following the order of priority established in the Bid Form, until doing so would cause the budget to be exceeded. After determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these Instructions, the award may be made to said Successful Bidder on its base Bid and any combination of its additive alternate Bids for which Owner determines funds will be available at the time of award.~~

~~C. Bid prices will be compared after adjusting for differences in time of Substantial Completion (total number of calendar days to substantially complete the Work) designated by Bidders. The adjusting amount will be determined at the rate set forth in the Agreement for liquidated damages for failing to achieve Substantial Completion, or such other amount that Owner has designated in the Bid Form.~~

~~1. The method for calculating the lowest bid for comparison will be the summation of the Bid price shown in the Bid Form plus the product of the Bidder-specified time of Substantial Completion (in calendar days) times the rate for liquidated damages **[or other Owner-designated daily rate]** (in dollars per day).~~

~~2. This procedure is only used to determine the lowest bid for comparison and contractor selection purposes. The Contract Price for compensation and payment purposes remains the Bid price shown in the Bid Form.~~

19.04 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.

19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 20 – BONDS AND INSURANCE

20.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the Agreement (executed by Successful Bidder) to Owner, it shall be accompanied by required bonds and insurance documentation.

ARTICLE 21 – SIGNING OF AGREEMENT

21.01 **Following award,** ~~When~~ **the** Owner issues ~~a Notice of Award to~~ the Successful Bidder~~, it shall be accompanied by~~ the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder shall execute and deliver the required number of counterparts of the Agreement (and any bonds and insurance documentation required to be delivered by the Contract Documents) to Owner. Within ten days thereafter, Owner shall deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies**, if requested,** of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

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ARTICLE 22 – SALES AND USE TAXES

22.01 **Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.**

Items in Group A are taxable for sales and use tax only on Materials and Equipment to be incorporated into the project. Items in Group B are not taxable for Materials and Equipment.

Sales tax for Group A shall only be shown separately on Materials and Equipment to be incorporated into the project by bidders operating under Option 1 with the Nebraska Department of Revenue. Bidders operating under Options 2 or 3 do not show sales tax separately on Group A.

Upon award, and at the request of the Owner the successful bidders shall provide a breakdown of Group A as follows:

Materials (cost-less tax paid on materials)
Subcontractor costs
Contractor's Labor (as defined by the Nebraska Department of Revenue for Sales and Use Tax Purposes)

ARTICLE 23 – CONTRACTS TO BE ASSIGNED

23.01 Refer to the Supplementary Conditions for additional information, if required.

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BEGINNING
OF
BID DOCUMENTS

BID FORM

PROJECT IDENTIFICATION:

PROJECT NAME: **2020 Water Main Improvements, Eastbourne St./N 147th St.; N 143rd St. to Castlewood St.**

JEO PROJECT NO.: **201085.00**

NAME OF BIDDER **DATE**

THIS BID IS SUBMITTED TO:

City of Waverly
Attn: Hope Staten, Clerk
14130 Lancashire St
PO Box 427
Waverly NE 68462

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ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

City of Waverly
Attn: Hope Staten, Clerk
14130 Lancashire St
PO Box 427
Waverly NE 68462

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER'S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

Addendum No.	**Addendum, Date**

B. Bidder ~~has~~ **is highly recommended to have** visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

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E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.

I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.

J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;

B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and

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4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the e execution of the Contract.

ARTICLE 5 – BASIS OF BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

Item No.	Description	Quantity	Unit	Unit Price	Total
GROUP A – Install/Build Water Main					
1	Mobilization	1	LS		
2	Bonding and Insurance	1	LS		
3	6" PVC Water Main, DR 18	323	LF		
4	6" PVC Water Main, DR 18, RJ, Directionally Bored	1,955	LF		
5	10" Gate Valve and Box, MJ	3	EA		
6	6" Gate Valve and Box, MJ	9	EA		
7	10" x 6" x 10" Tee, MJ	2	EA		
8	6" x 6" x 6" Tee, FL	7	EA		
9	6" 90° Bend, MJ	2	EA		
10	6" 45° Bend, MJ	2	EA		
11	6" 22.5° Bend, MJ	6	EA		
12	Connect to Existing Water Main	3	EA		
13	6" x 1" Saddle	48	EA		
14	1" Corporation Stop	48	EA		
15	1" Curb Stop and Box	48	EA		
16	Connect to Existing Water Service	48	EA		
17	Bore Water Service Line	628	LF		
18	1" PE Water Service (SDR 7)	1,024	LF		

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Item No.	Description	Quantity	Unit	Unit Price	Total
19	Remove Concrete Sidewalk	2,250	SF		
20	4" Concrete Sidewalk	2,250	SF		
21	Remove Pavement	600	SY		
22	7" Concrete Pavement	600	SY		
23	Remove Driveway	100	SY		
24	6" Concrete Driveway	100	SY		
25	Water Main Removals and Abandonments	1	LS		
26	Seeding, Fertilizer, and Mulch	1	LS		
27	Traffic Control	1	LS		
SUBTOTAL GROUP A					
SALES TAX FOR MATERIALS & EQUIPMENT ON GROUP A @ 7.0% (SHOWN SEPARATELY BY OPTION 1 CONTRACTORS ONLY)					
TOTAL GROUP A					

GROUP B – Install/Build Fire Hydrants					
1	6" Fire Hydrant Assembly	6	EA		
TOTAL GROUP B					

TOTAL GROUPS A & B	

Bidder acknowledges that (1) each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and (2) estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

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ARTICLE 6 – TIME OF COMPLETION

6.01 Bidder agrees that the start date for the work will be 10 days after Notice to Proceed and will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

7.01 The following documents are submitted with and made a condition of this Bid:

A. Required Bid security;

B. Experience Record.

ARTICLE 8 – DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

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ARTICLE 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

_____

By:
[Signature] _____

[Printed name] _____

Attest:
[Signature] _____

[Printed name] _____

Title: _____

Submittal Date: _____

Address for giving notices:

_____

_____

_____

Telephone Number: _____

Fax Number: _____

Contact Name and e-mail address: _____

_____

Bidder's License No.: _____
(where applicable)

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EXPERIENCE RECORD

PREVIOUS EXPERIENCE (Include Projects completed within last 5 years)

Project Name	Owner's Contact Person	Design Engineer	Contract Date	Type of Work	Status	Cost of Work
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				

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BID BOND

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER *(Name and Address)*:

SURETY *(Name, and Address of Principal Place of Business)*:

OWNER:

City of Waverly, Nebraska
14130 Lancashire St, PO Box 427
Waverly, NE 68462

BID

Bid Due Date:

Description: **2020 Water Main Improvements, Eastbourne St./N 147th St.; N 143rd St. to Castlewood St. Waverly, Nebraska; JEO Project No. 201085.00**

BOND

Bond Number:

Date:

Penal sum _____ $ _____

(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

BIDDER	**SURETY**
_____ (Seal)	_____ (Seal)
Bidder's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	By: _____
Signature	Signature (Attach Power of Attorney)
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	Attest: _____
Signature	Signature
Title	Title

Note: Addresses are to be used for giving any required notice.
Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.

3. This obligation shall be null and void if:

3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or

3.2 All Bids are rejected by Owner, or

3.3 Owner fails to ~~issue a Notice of Award~~ **award** to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue ~~Notice of Award~~ **award** agreed to in writing by Owner and Bidder, provided that the total time for issuing ~~Notice of Award~~ **award** including extensions shall not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after the Bid due date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

END
OF
BID DOCUMENTS

250.00

AGREEMENT
BETWEEN OWNER AND CONTRACTOR
FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

THIS AGREEMENT is by and between **City of Waverly, Nebraska** ("Owner") and

("Contractor").

Owner and Contractor hereby agree as follows:

ARTICLE 1 – WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: **Water main replacement including the installation of approximately 2,300 linear feet of 8" PVC water main including fittings, valves, hydrants and water services.**

ARTICLE 2 – THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: **2020 Water Main Improvements, Eastbourne St./N 147th St.; N 143rd St. to Castlewood St.; Waverly, Nebraska; JEO Project No. 201085.00.**

ARTICLE 3 – ENGINEER

3.01 The Project has been designed by JEO Consulting Group, Inc.

3.02 The Owner has retained JEO Consulting Group, Inc. ("Engineer") to act as Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

4.01 *Time of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Contract Times: Days*

A. The start date for the Work will be **10 days after Notice to Proceed** and the Work will be substantially completed within **150** calendar days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **180** calendar days after the date when the Contract Times commence to run.

4.03 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the

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delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. Substantial Completion: Contractor shall pay Owner $**500.00** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.
2. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner $**250.00** for each day that expires after such time until the Work is completed and ready for final payment.
3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.

ARTICLE 5 – CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents the amounts that follow, subject to adjustment under the Contract:

~~A. For all Work other than Unit Price Work, a lump sum of: $_____.~~

~~All specific cash allowances are included in the above price in accordance with Paragraph 13.02 of the General Conditions.~~

B. For all Unit Price Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item):

Item No.	Description	Quantity	Unit	Unit Price	Total
GROUP A – Install/Build Water Main					
1	Mobilization	1	LS		
2	Bonding and Insurance	1	LS		
3	6" PVC Water Main, DR 18	323	LF		
4	6" PVC Water Main, DR 18, RJ, Directionally Bored	1,955	LF		
5	10" Gate Valve and Box, MJ	3	EA		
6	6" Gate Valve and Box, MJ	9	EA		
7	10" x 6" x 10" Tee, MJ	2	EA		
8	6" x 6" x 6" Tee, FL	7	EA		

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Item No.	Description	Quantity	Unit	Unit Price	Total
9	6" 90° Bend, MJ	2	EA		
10	6" 45° Bend, MJ	2	EA		
11	6" 22.5° Bend, MJ	6	EA		
12	Connect to Existing Water Main	3	EA		
13	6" x 1" Saddle	48	EA		
14	1" Corporation Stop	48	EA		
15	1" Curb Stop and Box	48	EA		
16	Connect to Existing Water Service	48	EA		
17	Bore Water Service Line	628	LF		
18	1" PE Water Service (SDR 7)	1,024	LF		
19	Remove Concrete Sidewalk	2,250	SF		
20	4" Concrete Sidewalk	2,250	SF		
21	Remove Pavement	600	SY		
22	7" Concrete Pavement	600	SY		
23	Remove Driveway	100	SY		
24	6" Concrete Driveway	100	SY		
25	Water Main Removals and Abandonments	1	LS		
26	Seeding, Fertilizer, and Mulch	1	LS		
27	Traffic Control	1	LS		
SUBTOTAL GROUP A					
SALES TAX FOR MATERIALS & EQUIPMENT ON GROUP A @ 7.0% (SHOWN SEPARATELY BY OPTION 1 CONTRACTORS ONLY)					
TOTAL GROUP A					

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Item No.	Description	Quantity	Unit	Unit Price	Total
GROUP B – Install/Build Fire Hydrants					
1	6" Fire Hydrant Assembly	6	EA		
TOTAL GROUP B					

TOTAL GROUPS A & B	

C. Total of Lump Sum Amount and Unit Price Work (subject to final Unit Price adjustment) $_____.

~~D. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.~~

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the **second Tuesday** of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract

a. 90 percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and

b. 90 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 100 percent of the Work completed, less such amounts set off by

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Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 125 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment, and final payment will be subject to Paragraph 6.03.A.

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work in accordance with Paragraph 15.06 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

ARTICLE 7 – INTEREST

7.01 All amounts not paid when due shall bear interest at the rate of 12 percent per annum.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

8.01 In order to induce Owner to enter into this Contract, Contractor makes the following representations:

A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.

B. Contractor has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

E. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (3) Contractor's safety precautions and programs.

F. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

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H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

J. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

A. The Contract Documents consist of the following:

1. This Agreement (pages 1 to 8, inclusive).
2. Performance bond (pages 1 to 2, inclusive).
3. Payment bond (pages 1 to 2, inclusive).
4. ~~Other bonds.~~
   a. ~~_____ (pages _____ to _____, inclusive).~~
5. General Conditions (pages 1 to 65, inclusive).
6. Supplementary Conditions (pages 1 to 10, inclusive).
7. Specifications as listed in the table of contents of the Project Manual.
8. Drawings (not attached but incorporated by reference) consisting of 12 sheets with each sheet bearing the following general title: 2020 Water Main Improvements Eastbourne St./N 147th St.; N 143rd St. to Castlewood St. Waverly, Nebraska.
9. Addenda (numbers _____ to _____, inclusive).
10. Exhibits to this Agreement (enumerated as follows):
    a. Contractor's Bid (pages _____ to _____, inclusive).
11. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
    a. Notice to Proceed.
    b. Work Change Directives.
    c. Change Orders.
    d. Field Orders.
12. **Equipment Assessment Certification.**

B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 9.

D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

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ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 *Assignment of Contract*

A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 *Successors and Assigns*

A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 *Severability*

A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 *Contractor's Certifications*

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

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10.06 *Other Provisions*

A. Owner stipulates that if the General Conditions that are made a part of this Contract are based on EJCDC® C-700, Standard General Conditions for the Construction Contract, published by the Engineers Joint Contract Documents Committee®, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

B. **If Owner is a public entity in the State the Project is located, then Contractor shall register with and use the E-Verify Program, or an equivalent federal program designated by the United States Department of Homeland Security or other federal agency authorized to verify the work eligibility status of a newly hired employee pursuant to the Immigration Reform and Control Act of 1986, to determine the work eligibility status of new employees physically performing services within the State of the Project is located. Contractor shall require the same of each subcontractor.**

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on _____ (which is the Effective Date of the Contract).

OWNER: **City of Waverly, Nebraska**	CONTRACTOR:
_____	_____ *(sign)*
By: **Mike Werner**	By: _____ *(print)*
Title: **Mayor**	Title: _____
	(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)
Address for giving notices:	Address for giving notices:
14130 Lancashire St	_____
PO Box 427	_____
Waverly, NE 68462	_____
	License No.: _____ *(where applicable)*

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EQUIPMENT ASSESSMENT CERTIFICATION

BY REQUIREMENT OF NEBRASKA STATE STATUTE 77-1323, THE FOLLOWING INFORMATION MUST BE FURNISHED BY ALL CONTRACTORS AND SUBCONTRACTORS UTILIZING ANY EQUIPMENT ON ANY AND ALL PUBLIC IMPROVEMENT CONTRACTS.

I certify to the best of my knowledge and belief, all the information on this form is correct. All equipment to be used on JEO Project No. **201085.00**, except that acquired since the assessment date, has been assessed for taxation for the current year in _____ County.

Name of Company _____

Authorized Official _____
(Print Name)

_____
(Signature)

Title _____

Date _____

NOTICE TO PROCEED

Owner:	**City of Waverly, Nebraska**	Owner's Contract No.:	
Contractor:		Contractor's Project No.:	
Engineer:	**JEO Consulting Group, Inc.**	Engineer's Project No.:	**201085.00**
Project:	**2020 Water Main Improvements, Eastbourne St./N 147th St.; N 143rd St. to Castlewood St.**	Contract Name:	**2020 Water Main Improvements, Eastbourne St./N 147th St.; N 143rd St. to Castlewood St.**
		Effective Date of Contract:	

TO CONTRACTOR:

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on **, 20** .

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work shall be done at the Site prior to such date. In accordance with the Agreement, the number of calendar days to achieve Substantial Completion is **150**, and the number of calendar days to achieve readiness for final payment is **180**.

Before starting any Work at the Site, Contractor must comply with the following:
[Note any access limitations, security procedures, or other restrictions]

Owner**:** **City of Waverly, Nebraska**

_____
Authorized Signature

By: **Mike Werner**

Title: **Mayor**

Date Issued:

Copy: Engineer

PERFORMANCE BOND

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER:

City of Waverly, Nebraska
14130 Lancashire St, PO Box 427
Waverly, NE 68462

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description: **2020 Water Main Improvements, Eastbourne St./N 147th St.; N 143rd St. to Castlewood St.**
Waverly, Nebraska; JEO Project No. 201085.00

BOND

Bond Number:

Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:

Amount:

Modifications to this Bond Form: ☐ None ☐ See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL	**SURETY**
_____ *(seal)*	_____ *(seal)*
Contractor's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	**By:** _____
Signature	Signature *(attach power of attorney)*
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	**Attest:** _____
Signature	Signature
_____	_____
Title	Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

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1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after:

3.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

3.3 The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

7.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

7.2 additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Definitions

14.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

14.2 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

14.3 Contractor Default: Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

14.5 Contract Documents: All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

16. Modifications to this Bond are as follows:

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PAYMENT BOND

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER:

City of Waverly, Nebraska
14130 Lancashire St, PO Box 427
Waverly, NE 68462

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description: **2020 Water Main Improvements, Eastbourne St./N 147th St.; N 143rd St. to Castlewood St.**
Waverly, Nebraska; JEO Project No. 201085.00

BOND

Bond Number:

Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:

Amount:

Modifications to this Bond Form: ☐ None ☐ See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL	**SURETY**
_____ *(seal)*	_____ *(seal)*
Contractor's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	**By:** _____
Signature	Signature *(attach power of attorney)*
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	**Attest:** _____
Signature	Signature
_____	_____
Title	Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

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1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.

4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.

5. The Surety's obligations to a Claimant under this Bond shall arise after the following:

   5.1 Claimants who do not have a direct contract with the Contractor,
      5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
      5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).
   5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).

6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.

7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

   7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
   7.2 Pay or arrange for payment of any undisputed amounts.
   7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. **Definitions**

   16.1 **Claim:** A written statement by the Claimant including at a minimum:
      1. The name of the Claimant;
      2. The name of the person for whom the labor was done, or materials or equipment furnished;
      3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
      4. A brief description of the labor, materials, or equipment furnished;
      5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
      6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
      7. The total amount of previous payments received by the Claimant; and
      8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.
   16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
   16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.
   16.4 **Owner Default**: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
   16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

18. Modifications to this Bond are as follows:

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SECTION 00 70 00

GENERAL CONDITIONS

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

EJCDC®
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

Issued and Published Jointly by

ACEC
AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.

3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

5. *Bidder*—An individual or entity that submits a Bid to Owner.

6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.

7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.

8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.

10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer

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has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. ("CERCLA"); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. ("RCRA"); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.

13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.

14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .

15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.

17. *Cost of the Work*—See Paragraph 13.01 for definition.

18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.

19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.

20. *Engineer*—The individual or entity named as such in the Agreement.

21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.

22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.

23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

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24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.

26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.

27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.

28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.

32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.

33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.

34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.

35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

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37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.

38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.

40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.

42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.

43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.

44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.

45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

46. *Unit Price Work*—Work to be paid for on the basis of unit prices.

47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

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48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 *Terminology*

A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives*:

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. *Day*:

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*:

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

a. does not conform to the Contract Documents; or

b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).

E. *Furnish, Install, Perform, Provide*:

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

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3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.

C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;

2. a preliminary Schedule of Submittals; and

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3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

2.06 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.

B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.

C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or

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computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.

C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.

D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.

E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 *Reference Standards*

A. Standards Specifications, Codes, Laws and Regulations

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*:

1. *Contractor's Verification of Figures and Field Measurements*: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict,

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error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents*: If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*:

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:

a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.

B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

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3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or

2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

4.03 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

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2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.

B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;

2. abnormal weather conditions;

3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and

4. acts of war or terrorism.

D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.

E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.

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G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*:

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part

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by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

B. *Removal of Debris During Performance of the Work*: During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading of Structures*: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;

2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and

3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

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5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor*: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or

2. is of such a nature as to require a change in the Drawings or Specifications; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Possible Price and Times Adjustments*:

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;

b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

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c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:

a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or

b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or

c. Contractor failed to give the written notice as required by Paragraph 5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 *Underground Facilities*

A. *Contractor's Responsibilities*: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;

c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and

d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after

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becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

C. *Engineer's Review*: Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. *Owner's Statement to Contractor Regarding Underground Facility*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.

E. *Possible Price and Times Adjustments*:

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

    a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;

    b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;

    c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and

    d. Contractor gave the notice required in Paragraph 5.05.B.

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

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5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and

2. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

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F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.

H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.H shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

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ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.

B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.

D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.

E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 *Insurance—General Provisions*

A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is

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maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.

H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.

I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.

J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

A. *Workers' Compensation*: Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.

2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).

3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

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4. Foreign voluntary worker compensation (if applicable).

B. *Commercial General Liability—Claims Covered*: Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:

1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.

2. claims for damages insured by reasonably available personal injury liability coverage.

3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

C. *Commercial General Liability—Form and Content*: Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage:

a. Such insurance shall be maintained for three years after final payment.

b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.

2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.

3. Broad form property damage coverage.

4. Severability of interest.

5. Underground, explosion, and collapse coverage.

6. Personal injury coverage.

7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.

8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

D. *Automobile liability*: Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.

E. *Umbrella or excess liability*: Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.

F. *Contractor's pollution liability insurance*: Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result

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of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.

H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.

I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:

1. include at least the specific coverages provided in this Article.

2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.

3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.

4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.

5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.

J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

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6.04 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

6.05 *Property Insurance*

A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."

2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.

3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).

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5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).

6. extend to cover damage or loss to insured property while in transit.

7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.

8. allow for the waiver of the insurer's subrogation rights, as set forth below.

9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.

10. not include a co-insurance clause.

11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.

12. include performance/hot testing and start-up.

13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.

B. *Notice of Cancellation or Change*: All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.

C. *Deductibles*: The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.

D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.

E. *Additional Insurance*: If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.

F. *Insurance of Other Property*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

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6.06 *Waiver of Rights*

A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.

D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the

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policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and

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guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.04 *"Or Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.

1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;

3) it has a proven record of performance and availability of responsive service; and

4) it is not objectionable to Owner.

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.

C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

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D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.

E. *Treatment as a Substitution Request*: If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 *Substitutes*

A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.

1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.

2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

a. shall certify that the proposed substitute item will:

1) perform adequately the functions and achieve the results called for by the general design,

2) be similar in substance to that specified, and

3) be suited to the same use as that specified.

b. will state:

1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,

2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.

c. will identify:

1) all variations of the proposed substitute item from that specified, and

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2) available engineering, sales, maintenance, repair, and replacement services.

d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.

C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.

F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.

B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.

C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.

D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

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E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.

F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.

G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.

J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.

K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.

L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.

N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

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O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor

2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

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7.09 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.10 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.12 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. all persons on the Site or who may be affected by the Work;

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2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

7.14 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or

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exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements*:

1. Before submitting a Shop Drawing or Sample, Contractor shall have:

a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

B. *Submittal Procedures for Shop Drawings and Samples*: Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

1. *Shop Drawings*:

a. Contractor shall submit the number of copies required in the Specifications.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to

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provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples*:

   a. Contractor shall submit the number of Samples required in the Specifications.

   b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Other Submittals*: Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.

D. *Engineer's Review*:

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.

3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.

5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.

6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

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8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

E. *Resubmittal Procedures*:

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal;

6. the issuance of a notice of acceptability by Engineer;

7. any inspection, test, or approval by others; or

8. any correction of defective Work by Owner.

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D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.

B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.

B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop

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Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.

C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

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8.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. an itemization of the specific matters to be covered by such authority and responsibility; and

3. the extent of such authority and responsibilities.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.

C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.

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D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

9.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.

B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.

C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

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9.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.

B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during

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or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.

B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.

C. Engineer's authority as to Change Orders is set forth in Article 11.

D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.07 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

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B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.

1. *Change Orders*:

a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.

b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.

2. *Work Change Directives*: A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an

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adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *Owner-Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.

B. An adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on

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the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.

B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under

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the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures*: Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.

2. *Engineer's Action*: Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

3. *Binding Decision*: Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

B. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and

4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

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B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12 – CLAIMS

12.01 *Claims*

A. *Claims Process*: The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and

3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.

D. *Mediation*:

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.

2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim

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submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable

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thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

    a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

    b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

    c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

    d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

    e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

    f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes

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other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded*: The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*: When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

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B. *Cash Allowances*: Contractor agrees that:

1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

13.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.

E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;

2. there is no corresponding adjustment with respect to any other item of Work; and

3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

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ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

14.02 *Tests, Inspections, and Approvals*

A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to

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cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects*: Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

A. Engineer has the authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

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B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will

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include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *Applications for Payments*:

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications*:

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

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a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or

b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

a. to supervise, direct, or control the Work, or

b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:

a. the Work is defective, requiring correction or replacement;

b. the Contract Price has been reduced by Change Orders;

c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

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e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*:

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*:

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:

a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Contractor has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. the Work is defective, requiring correction or replacement;

g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

h. the Contract Price has been reduced by Change Orders;

i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;

j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;

k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

l. there are other items entitling Owner to a set off against the amount recommended.

2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount

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remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

15.03 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

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E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.

2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*:

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of

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inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents;

   b. consent of the surety, if any, to final payment;

   c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

   d. a list of all disputes that Contractor believes are unsettled; and

   e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Application and Acceptance*:

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

D. *Payment Becomes Due*: Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,

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including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. correct the defective repairs to the Site or such other adjacent areas;

2. correct such defective Work;

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

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E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);

2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;

3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or

4. Contractor's repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and

2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses,

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and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for

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expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this Article:

1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and

2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.

B. *Final Resolution of Disputes*: For any dispute subject to resolution under this Article, Owner or Contractor may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or

2. agree with the other party to submit the dispute to another dispute resolution process; or

3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18 – MISCELLANEOUS

18.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 *Computation of Times*

A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

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18.04 *Limitation of Damages*

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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SECTION 00 73 00

SUPPLEMENTARY CONDITIONS

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Supplementary Conditions

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC® C-700 (2013 Edition). All provisions that are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC-1.01 Defined Terms

SC 1.01.A.49 Add the following new Paragraph after Paragraph 1.01.A.48:

Abnormal Weather Conditions – Conditions of extreme or unusual weather for a given region, elevation, or season as determined by Engineer. Extreme or unusual weather that is typical for a given region, elevation, or season should not be considered Abnormal Weather Conditions.

ARTICLE 2 – PRELIMINARY MATTERS

SC-2.01 Delivery of Bonds and Evidence of Insurance

SC-2.01.C Add the following language at the end of part 2.01.C:

Owner and Engineer shall be listed as additional insureds on all certificates of insurance required under SC-6.03.

SC-2.02 Copies of Documents

SC 2.02.A Amend the first sentence of Paragraph 2.02.A. to read as follows:

Owner shall furnish to Contractor one paper copy of the fully executed agreement if the agreement is not signed electronically, or else the Contractor shall be furnished one copy in electronic portable document format (PDF) of the fully executed agreement. Additional printed copies will be furnished upon request at the cost of reproduction.

SC-2.04 Preconstruction Conference; Designation of Authorized Representatives

SC 2.04.B Amend the last sentence of Paragraph 2.04.B. to read as follows:

Such individuals shall the authority to transmit and receive information, and act as the point of contact on behalf of each respective party.

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SC-2.06 Electronic Transmittals

SC 2.06 Add a new paragraph immediately after Paragraph 2.06.C:

D. The electronic transmittal protocol shall be the following:

1. Documents shall be transferred between Owner, Engineer and Contractor through the designated authorized representative, as determined at the preconstruction conference.

2. If a web based, or other cloud based document transfer service is to be utilized for the Project, the Owner, Engineer and Contractor shall jointly determine the representatives for each party that may have access and specific authorizations within the document transfer service. If either party desires to make modifications to their representatives, and authorities of such, written notice shall be provided to all parties. The specifications shall designate which party is responsible for the cost of said service, if required.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

SC-4.03 Reference Points

SC-4.03.A Delete paragraph 4.03A in its entirety and insert the following in its place:

Engineer shall provide engineering surveys to establish reference points and the general layout of the work, which in Engineer's judgment are necessary to enable Contractor to proceed with the work. Contractor shall give Engineer at least 72 hours' notice prior to needing staking.

Engineer will set stakes for <u>engineer will set stakes for the water main alignment at 100-foot intervals and all fittings, valves, and hydrants. Staking shall be limited to two trips</u>.

Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points, construction stakes and property monuments, and shall make no changes or relocations without the prior written approval of the Owner.

Contractor shall report to Engineer whenever any reference point, construction stakes, or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the payment to Engineer to replace or relocate such reference points, construction stakes, or property monuments. Such payment shall be paid prior to the Contractor's final estimate or shall be deducted from the same.

All improvements shall be installed as staked by the Engineer. The locations as shown on the plans should be considered approximate.

SC-4.05 Delays in Contractor's Progress

SC 4.05.C.2 Amend Paragraph 4.05.C.2 by striking out the following text: "abnormal weather conditions;" and inserting the following text:

Abnormal Weather Conditions;

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ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

SC-5.03 Subsurface and Physical Conditions

SC 5.03 Delete Paragraphs 5.03.A and 5.03.B in their entirety and insert the following:

A. No reports of explorations or tests of subsurface conditions at or adjacent to the Site, or drawings of physical conditions relating to existing surface or subsurface structures at the Site, are known to Owner.

SC-5.06 Hazardous Environmental Conditions

SC 5.06 Delete Paragraphs 5.06.A and 5.06.B in their entirety and insert the following:

A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.

B. Not Used.

ARTICLE 6 – BONDS AND INSURANCE

SC-6.02 Insurance—General Provisions

SC 6.02.D Delete paragraph 6.02.D in its entirety and insert the following in its place:

[Deleted]

SC 6.02.E Delete paragraph 6.02.E in its entirety and insert the following in its place:

[Deleted]

SC-6.03 Contractor's Liability Insurance

SC 6.03 Add the following new paragraph immediately after Paragraph 6.03.J:

K. The limits of liability for the insurance required by Paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation, and related coverages under Paragraphs 6.03.A.1 and A.2 of the General Conditions:

State:	Statutory
Federal, if applicable (e.g., Longshoreman's):	Statutory
Employer's Liability:	
Bodily injury, each accident	$ 500,000
Bodily injury by disease, each employee	$ 500,000
Bodily injury/disease aggregate	$ 500,000
Foreign voluntary worker compensation	Statutory

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2. Contractor's Commercial General Liability under Paragraphs 6.03.B and 6.03.C of the General Conditions:

General Aggregate	$ 2,000,000
Products - Completed Operations Aggregate	$ 1,000,000
Personal and Advertising Injury	$ 1,000,000
Each Occurrence (Bodily Injury and Property Damage)	$ 1,000,000
Fire Damage (Any One Fire) OR Damage to Rented Premises	$ 50,000
Medical Expenses (Any One Person)	$ 5,000

3. Automobile Liability under Paragraph 6.03.D. of the General Conditions:

Bodily Injury:	
Each person	$ 500,000
Each accident	$ 1,000,000
Property Damage:	
Each accident	$ 1,000,000
[or]	
Combined Single Limit of	$ 1,000,000

4. Excess or Umbrella Liability:

Per Occurrence	$ 2,000,000
General Aggregate	$ 2,000,000

5. Contractor's Pollution Liability:

Each Occurrence	$ 1,000,000
General Aggregate	$ 2,000,000

☒ If box is checked, Contractor is not required to provide Contractor's Pollution Liability insurance under this Contract

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6. Additional Insureds: In addition to Owner and Engineer, include as additional insureds the following:

None, unless listed here.

SC 6.03.J Delete paragraph 6.03.J in its entirety and insert the following in its place:

[Deleted]

SC-6.05 Property Insurance

SC-6.05.A Delete paragraph 6.05.A in its entirety and insert the following in its place:

A. Builder's Risk: Owner shall not be responsible for purchasing and maintaining any property insurance to protect the interests of Contractor, subcontractors, or others in the Work. Unless otherwise agreed in writing between Owner and Contractor, and until final completion of the Work and acceptance of the Work in accordance with paragraph 15.03 of the General Conditions, all risk of loss with no right of recovery against the Owner, Engineer, Engineer's consultants (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) will be borne by Contractor, subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage, each may purchase it and maintain it at the purchaser's own expense.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

SC-7.02 Labor; Working Hours

SC-7.02.B. Delete Paragraph 7.02 B. in its entirety, and insert the following:

B. In the absence of any Laws or Regulations to the contrary, Contractor may perform the Work on holidays, during any or all hours of the day, and on any or all days of the week, at Contractor's sole discretion.

SC-7.04 "Or Equals"

SC 7.04.A.1 Amend the last sentence of Paragraph a.3 by striking out "and;" and adding a period at the end of Paragraph a.3.

SC 7.04.A.1 Delete paragraph 7.04.A.1.a.4 in its entirety and insert the following in its place:

[Deleted]

SC-7.05 Substitutes

SC 7.05.B Amend the second to last sentence of Paragraph B by striking out "a Field Order or".

SC-7.06 Concerning Subcontractors, Suppliers, and Others

SC 7.06.H Delete paragraph 7.06.H in its entirety and insert the following in its place:

[Deleted]

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SC-7.17 Contractor's General Warranty and Guarantee

SC-7.17.C.3. Amend Paragraph 7.17.C.3 to the following:

3. The issuance of a certificate of Substantial Completion by Engineer, Owner or any payment related thereto by Owner;

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

SC-10.03 Project Representative

SC-10.03 Add the following new paragraph immediately after Paragraph 10.03.A:

B. The Resident Project Representative (RPR) will be Engineer's representative at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions. RPR responsibilities may include and are not limited to the following; per the agreement between the Owner and Engineer.

1. General: RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of Contractor. RPR shall generally communicate with Owner only with the knowledge of and under the direction of Engineer.

2. Schedules: Review the progress schedule, schedule of Shop Drawing and Sample submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.

3. Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings, and prepare and circulate copies of minutes thereof.

4. Liaison:

   a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.

   b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.

   c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.

5. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.

6. Shop Drawings and Samples:

   a. Record date of receipt of Samples and Contractor-approved Shop Drawings.

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b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.

c. Advise Engineer and Contractor of the commencement of any portion of the Work requiring a Shop Drawing or Sample submittal for which RPR believes that the submittal has not been approved by Engineer.

7. Modifications: Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, if any, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.

8. Review of Work and Rejection of Defective Work:

   a. Conduct on-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.

   b. Report to Engineer whenever RPR believes that any part of Contractor's work in progress is defective, will not produce a completed Project that conforms generally to the Contract Documents, or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.

9. Inspections, Tests, and System Start-ups:

   a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.

   b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.

10. Records:

    a. Prepare a daily report or keep a diary or log book, recording Contractor's hours on the Site, Subcontractors present at the Site, weather conditions, data relative to questions of Change Orders, Field Orders, Work Change Directives, or changed conditions, Site visitors, deliveries of equipment or materials, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to Engineer.

    b. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.

    c. Maintain records for use in preparing Project documentation.

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11. Reports:

    a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the Progress Schedule and schedule of Shop Drawing and Sample submittals.

    b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.

    c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, force majeure or delay events, damage to property by fire or other causes, or the discovery of any Constituent of Concern or Hazardous Environmental Condition.

12. Payment Requests: Review applications for payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the Schedule of Values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.

13. Certificates, Operation and Maintenance Manuals: During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Contract Documents to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.

14. Completion:

    a. Participate in Engineer's visits to the Site to determine Substantial Completion, assist in the determination of Substantial Completion and the preparation of a punch list of items to be completed or corrected.

    b. Participate in Engineer's final visit to the Site to determine completion of the Work, in the company of Owner and Contractor, and prepare a final punch list of items to be completed and deficiencies to be remedied.

    c. Observe whether all items on the final list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the notice of acceptability of the work.

C. The RPR shall not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).

2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.

3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.

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4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor's work.

5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.

6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.

7. Accept Shop Drawing or Sample submittals from anyone other than Contractor.

8. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

SC-11.07 Execution of Change Orders

SC 11.07.B Delete paragraph 11.07.B in its entirety and insert the following in its place:

[Deleted]

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

SC-13.03 Unit Price Work

SC 13.03.E Delete Paragraph 13.03.E in its entirety and insert the following in its place:

E. The unit price of an item of Unit Price Work shall be subject to reevaluation and adjustment under the following conditions:

1. if the extended price of a particular item of Unit Price Work amounts to 15 percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than 15 percent from the estimated quantity of such item indicated in the Agreement; and

2. if there is no corresponding adjustment with respect to any other item of Work; and

3. if Contractor believes that Contractor has incurred additional expense as a result thereof, Contractor may submit a Change Proposal, or if Owner believes that the quantity variation entitles Owner to an adjustment in the unit price, Owner may make a Claim, seeking an adjustment in the Contract Price.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

SC-15.01 Progress Payments

SC 15.01.B Amend paragraph 15.01.B.1 by striking out the following text: "At least 20 days before the date established in the agreement for each progress payment" and insert "At least

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10 days before the date established in the agreement for consideration of each progress payment."

SC 15.01.D.1 Amend the first sentence of paragraph 15.01.D by striking out the following text: "ten" and replacing it with "30".

SC-15.03 Substantial Completion

SC 15.03.A Delete the last sentence of Paragraph 15.03.A in its entirety.

SC-15.06 Final Payment

SC 15.06.A.2 Amend paragraph 15.06.A2.e: to read as follows:

e. if requested by Owner, complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

ARTICLE 18 - MISCELLANEOUS

SC-18.08 Add the following new paragraphs after Paragraph 18.08:

SC 18.09 Add the following after Article 18.09 with the title "Environmental Requirements":

When constructing a Project involving trenching and/or other related earth excavations, Contractor shall comply with the following environmental conditions:

A. Wetlands – When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert wetlands.

B. Floodplains – When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert 100-year floodplain areas (Standard Flood Hazard Area) delineated on the latest Federal Emergency Management Agency Floodplain Maps, or other appropriate maps, e.g., alluvial soils on NRCS Soil Survey Maps.

C. Historic Preservation – Any excavation by Contractor that uncovers an historical or archaeological artifact or human remains shall be immediately reported to Owner and a representative of Agency. Construction shall be temporarily halted pending the notification process and further directions issued by Agency after consultation with the State Historic Preservation Officer (SHPO).

D. Endangered Species – Contractor shall comply with the Endangered Species Act, which provides for the protection of endangered and/or threatened species and critical habitat. Should any evidence of the presence of endangered and/or threatened species or their critical habitat be brought to the attention of Contractor, Contractor will immediately report this evidence to Owner and a representative of Agency. Construction shall be temporarily halted pending the notification process and further directions issued by Agency after consultation with the U.S. Fish and Wildlife Service.

E. Mitigation Measures – The following environmental mitigation measures are required on this Project: None.

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SECTION 01 10 00

SPECIAL PROVISIONS

PART 1 - GENERAL

These Special Provisions amend or supplement the following Specifications and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Special Provisions will have the meanings indicated in the Specifications and Contract Documents. Additional terms used in these Special Provisions have the meanings indicated below, which are applicable to both the singular and plural thereof.

1.01 PROJECT CONTACT

A. Owner's Primary Contact:

1. Name: Tracey Whyman, Public Works Director
2. Address: PO Box 427, 14130 Lancashire Street, Waverly, NE 68462
3. Phone Number: 402.786.2312
4. Email: traceyw@citywaverly.com

B. Engineer's Primary Contact:

1. Name: Tim Adams, PE
2. Address: 2700 Fletcher Avenue, Lincoln, NE 68504
3. Phone Number: 402.474.8767
4. Cell Number: 402.710.0527
5. Email: tadams@jeo.com

C. Engineer's Secondary Contact:

1. Name: Merrett Lane, EI
2. Address: 2700 Fletcher Avenue, Lincoln, NE 68504
3. Phone Number: 402.435.3080; 1472
4. Cell Number: 402.658.1044
5. Email: mlane@jeo.com

1.02 CONTRACT DESCRIPTION

A. One Contract for construction of Base Bid Group A and Base Bid Group B.

1.03 CONTRACT DRAWINGS AND SPECIFICATIONS

A. The Drawings, Specifications, Proposal, Special Provisions and all supplementary documents are intended to describe the complete work and are essential parts of the Contract. All requirements occurring in any of them are binding.

B. In cases where there is a discrepancy in the contract documents.

1. Written dimensions take precedence over scaled dimensions on Drawings.
2. Larger scale Drawings take precedence over smaller scale Drawings.
3. Section 01 10 00, Special Provisions, take precedence over the Drawings.
4. Section 01 10 00, Special Provisions, take precedence over other Specification Sections.

C. Any Specification Section that is referenced by another Specification Section and is not included in the project specifications shall not apply to this project. See table of contents for complete listing.

D. At least one copy of all Drawings and Specifications shall be maintained by Contractor at the project site and these shall be accessible at all times to Owner and Engineer.

1.04 REPORTS

A. Refer to Section 00 73 00 - Supplementary Conditions, paragraphs SC-5.03 and SC-5.06.

1.05 PERMITS

A. Nebraska DHHS: A permit is being processed by the Nebraska Department of Health and Human Services. A copy of the permit will be presented to the successful bidder, when the approval has been issued. Contractor will construct the proposed improvements in strict compliance to the instructions and provisions of the permit.

1.06 CODE COMPLIANCE

A. All proposed work shall comply with the National Plumbing Code, National Electrical Code, International Building Code and all applicable state and local codes.

1.07 MEASUREMENTS AND PAYMENTS

A. Water Main: Horizontal stationing along the centerline of water main alignments is based upon level line measurement and is used for measurement and payment. Actual pipe length is determined by the vertical slope or curve on which the pipe is installed.

1. No deductions shall be made for length through fittings or valves.
2. No additional payment shall be made for variations in actual pipe length due to installation on vertical slopes or curves.

1.08 BID ITEM DESCRIPTIONS

A. The Group A bid item “Water Main Removals and Abandonments” shall include all components, including labor and materials, necessary for completing removal and abandonment of existing water mains, services, valves, and hydrants. This bid item shall include, but is not limited to, excavation, removal, disposal or salvage, ductile iron fittings and mechanical joint restraint devices, backfill material, backfilling, and site grading. Quantities will not be measured, and it will be paid as a Lump Sum.

B. The Group A bid item “Traffic Control” shall include furnishing and maintaining all traffic control devices, barricades, signs, lights, and other safeguards for the duration of the project. This bid item shall include, but is not limited to, setup, maintenance, and removal of all traffic control devices for the duration of the project. Quantities will not be measured, and it will be paid as a Lump Sum.

C. The Group A bid item “Seeding, Fertilizer, and Mulch” shall include furnishing and installing all components, including labor and materials, necessary to reseed all vegetated areas disturbed by the Contractor during construction of the project. This bid item shall include, but is not limited to fine grading, seed, fertilizer, and mulch. Quantities will not be measured, and it will be paid as a Lump Sum.

1.09 INCIDENTAL AND SUBSIDIARY ITEMS OF WORK

A. Any items or materials called for on the Drawings or in these Specifications that are not measured and paid for directly shall be considered incidental and subsidiary to other items of work for which direct payment is made.

B. Temporary Hydrants, Valves, and Fittings: Any temporary hydrants, valves, or fittings installed by the Contractor in order to complete the project as shown on the Drawings shall be considered incidental to other items of work for which direct payment is made.

C. Fire Hydrant Adjustments: Additional ductile iron fittings installed on the hydrant lead to achieve the bury depth shown in the Drawings shall be considered incidental and subsidiary to fire hydrant assemblies, for which direct payment is made. The use of fire hydrant extensions will not be allowed.

D. Ductile Iron Solid Sleeves: Ductile iron solid sleeves installed to transition between pipe materials and at other locations determined by the Contractor's sequence of work shall be considered incidental and subsidiary to PVC water main for which direct payment is made.

E. Mechanical Joint Restraint Devices for Ductile Iron Fittings: All ductile iron fittings shall be installed with mechanical joint restraint devices. Mechanical joint restraint devices will not be paid for directly and shall be considered incidental and subsidiary to ductile iron fittings, for which direct payment is made.

F. Mechanical Joint Restraint Devices for Gate Valves: All gate valves shall be installed with mechanical joint restraint devices. Mechanical joint restraint devices will not be paid for directly and shall be considered incidental and subsidiary to gate valves, for which direct payment is made.

G. Service Line Fittings: Tees, bends, and other fittings 2" and smaller required to install PE service lines will not be paid for directly and shall be considered incidental and subsidiary to other items of work for which direct payment is made.

H. Bedding Material for Gate Valves and Ductile Iron Fittings. All gate valves and ductile iron fittings shall be installed with granular bedding material as described in these Specifications. This bedding material will not be paid for directly and shall be considered incidental and subsidiary to other items of work for which direct payment is made.

I. Curb and Gutter: Installation of concrete curb and gutter shall not be paid for directly and shall be considered incidental and subsidiary to the bid item Concrete Pavement for which direct payment is made.

J. Curb Ramps: The installation of curb ramps, including detectable warning panels, shall not be paid for directly and shall be considered incidental and subsidiary to concrete sidewalk for which direct payment is made.

K. Saw Cutting for Removals: Saw cutting of existing concrete, asphalt, etc. to be removed shall be considered incidental and subsidiary to the other items of work for which direct payment is made.

L. Subgrade Preparation: All concrete pavement, alleys, driveways, and sidewalks shall include subgrade preparation. Subgrade preparation will not be paid for directly and shall be considered incidental and subsidiary to other items of work for which direct payment is made.

M. Concrete Pavement Jointing: Sawing of new concrete pavement for jointing will not be paid for directly and shall be considered incidental and subsidiary to other items of work for which direct payment is made.

N. Concrete Sidewalk Jointing: Hand tooling of new concrete sidewalk for jointing will not be paid for directly and shall be considered incidental and subsidiary to concrete sidewalk for which direct payment is made.

O. Grading Adjacent to Sidewalk: At the proposed sidewalk locations, the Contractor will be required to grade the adjacent area to match the sidewalk grade. The Contractor should anticipate an area a minimum of 6 feet wide. This work will not be measured and paid for directly and shall be considered incidental and subsidiary to concrete sidewalk for which direct payment is made.

P. Temporary Shoring: Temporary shoring of excavations shall be considered incidental and subsidiary to the other items of work for which direct payment is made. Damages due to improper shoring shall be repaired at the expense of the Contractor.

Q. Exploratory Excavation: Exploratory excavation necessary to determine the location and elevation of existing public and private utilities prior to installation of PVC water main shall be considered incidental and subsidiary to other items of work for which direct payment is made.

R. Lawn Irrigation System Repair: The Contractor shall be responsible for repairing/replacing any lawn irrigation system components that are damaged by construction activities. This work will not be measured and paid for directly and shall be considered incidental and subsidiary to other items of work for which direct payment is made.

S. Mailboxes: Removal, relocation, and resetting of mailboxes will not be paid for directly and shall be considered incidental and subsidiary to other items of work for which direct payment is made.

T. Power: All power for lighting, construction use, operation of Contractor's equipment, and for any other use by the Contractor, shall be provided by the Contractor at his sole cost and expense and shall be considered incidental and subsidiary to other items of work for which direct payment is made.

U. Water for Construction: All labor and materials necessary for acquiring, storing, and use of water in order to complete the work shall be considered incidental and subsidiary to other items of work for which direct payment is made.

V. Dewatering: All labor and materials necessary for pumping and dewatering in order to complete the work shall be considered incidental and subsidiary to other items of work for which direct payment is made.

W. Trash Pickup: The Contractor shall be responsible for coordinating and allowing access for trash pickup for residents in the area affected by construction. This work will not be measured and paid for directly and shall be considered incidental and subsidiary to other items of work for which direct payment is made.

X. Mail Delivery: The Contractor shall be responsible for coordinating and allowing access for mail delivery for residents in the area affected by construction. This work will not be measured and paid for directly and shall be considered incidental and subsidiary to other items of work for which direct payment is made.

Y. Temporary Facilities: Temporary facilities are not required and, if provided at the Contractor's discretion, shall be considered incidental and subsidiary to other items of work for which direct payment is made.

1.10 PROJECT CONDITIONS

A. Existing Utilities:

1. There are utilities in the vicinity of the proposed work.
2. Contractor shall notify the respective utility company(s) and/or One-Call notification center before commencing work.
3. Neither the Owner nor the Engineer assumes any responsibility for utility locations being accurately shown, or not shown on the Drawings.
4. Any reference to utilities in the Drawings is approximate. The Contractor shall verify the location of any existing utilities within the vicinity of the proposed work.
5. The Contractor shall provide notification of intent to begin construction in advance to allow utility company(s) sufficient time to locate or relocate their utilities.
6. Once the location of the utility has been staked, located or marked, it shall be the Contractor's responsibility to protect these stakes/markings. Any costs for restaking or remarking shall be at the expense of the Contractor.
7. The Contractor shall avoid damaging any existing utility(s). Any costs for protecting utility(s) or repair of any damage to existing utilities caused by the Contractor, sub-Contractors, suppliers or agents shall be the responsibility of the Contractor.
8. The Contractor shall coordinate utility relocation or reconstruction with the appropriate utility company.

B. Sanitary Sewer Services:

1. Existing sanitary sewer service locations shown in the Drawings are approximate based on the best available data.
2. The Contractor shall be responsible for exploratory excavation necessary to determine the location and elevation of existing sanitary sewer services prior to installation of PVC water main.
3. The Contractor shall be responsible for any additional locating or televising of sanitary sewer services, if desired, after the Owner has marked the sanitary sewer service locations.

C. Documentation of Existing Conditions:

1. The Contractor shall record video of the extents of the project site prior to any construction activities in order to document existing conditions.
2. The Contractor shall provide the video to Owner in digital format on a DVD or removeable media device.

D. Maintain Continuous Water Service:

1. Whenever possible, the Contractor shall schedule and conduct all work in a sequence, which will provide continuous operation of the water system. The Contractor's schedule of planned operations shall outline compliance with this requirement.

2. When it is necessary to temporarily interrupt water service to any user:
    a. The Contractor shall limit shutdown to 4 hours maximum time.
    b. The Contractor shall make arrangement with Owner at least 48 hours in advance of any shutdown.
    c. The Contractor shall get approval of any shutdown from Owner at least 48 hours in advance of the shutdown.
    d. The Contractor shall give notification to any effected user at least 48 hours in advance of the shutdown. Such notification shall be closely coordinated with Owner.
3. The Contractor shall assume that interruptions to water service due to water main or water service connections may be required to take place outside of normal business hours.

E. Lawn Irrigation Systems:
1. There may be underground lawn irrigation systems in the project area. It is the responsibility of the Contractor to notify Owner of any irrigation systems in the project area of the construction activities that will affect the irrigation systems.
2. The Contractor shall conduct construction activities in a manner that will mitigate damage to the irrigation systems.
3. The Contractor shall be responsible for repairing/replacing any lawn irrigation system components that are damaged by construction activities. This work will not be measured and paid for directly and shall be considered incidental and subsidiary to other items of work for which direct payment is made.

1.11 CONCRETE PAVEMENT, SIDEWALKS, AND DRIVEWAYS

A. The bid items for the removal of existing pavement, sidewalk, and driveways include additional quantities beyond those shown in the Drawings.

B. The bid items for the installation of concrete pavement, sidewalk, and driveways include additional quantities beyond those shown in the Drawings.

C. The use of these additional quantities shall be at direction of the Owner or Engineer. Adjustments to the bid quantities will be processed at the established unit price.

1.12 SUBMITTALS

A. Refer to Section 01 30 00 – Administrative Requirements.

B. All submittals shall be submitted to the Engineer in digital pdf format.

C. Engineer will review and issue approvals digitally.

D. Refer to Section 01 30 00 – Administrative Requirements, paragraph 3.05.B, references to printing and distribution shall be replaced with digital distribution in a pdf or other approved format. A field office is not required on this project.

1.13 RECORD DRAWINGS

A. The Contractor shall provide two copies of the record drawings/as-builts clearly marking the field adjustments, additions/deletions to the Drawings, and locations of all buried piping/infrastructure and critical elevations of same.

B. Record drawings shall include detailed drawings of connections to existing water main. All dimensions shall be field measured to the middle of fittings and valves. Once connection is complete, the drawings shall be presented to the Engineer.

1.14 RIGHT-OF-WAY

A. The project shall be constructed within right-of-way and property owned by the Owner, as shown on the Drawings.

B. The Contractor shall confine all operations to areas within the right-of-way and property owned by the Owner, as shown on the Drawings.

C. Areas outside of the right-of-way and existing property owned by the Owner, as shown on the Drawings, are not to be disturbed.

D. The Contractor shall exercise all reasonable care in any activities that are conducted in the areas of right of way and limited easements, to minimize damages to the property. The Contractor's attention is specifically called to any buildings, trees, fences, drainage structures and other miscellaneous appurtenances to the property.

E. The Contractor shall be solely and completely responsible for any damages caused by Contractor, sub-Contractors, suppliers or agents to any areas outside of the right-of-way and existing property owned by the Owner, as shown on the Drawings.

F. The Contractor shall be solely responsible for obtaining and shall pay all costs in connection with any additional work area, storage site, access to the site, or temporary right-of-way, which may be required for proper completion of the work.

G. The Contractor is responsible for obtaining a site for storage of materials and equipment.

1.15 SITE ADMINISTRATION

A. The Contractor shall be responsible for all areas of the site used by him and by all sub-Contractors in the performance of the work.

B. The Contractor shall exert full control over the actions of all employees and other persons with respect to the use and preservation of the property and existing facilities, except such controls as may be specifically reserved to the Owner.

C. The Contractor has the right to exclude from the site all persons who have no purpose related to the work or its inspection, and may require all persons on the site, except the Owner, to observe the same regulations as he requires of his employees.

D. The Contractor may use the area within the limited easements, right-of-way and property owned by Owner, as shown on the Drawings, for storage and staging, but must not interfere with normal operations of the Owner, without prior written approval from the Owner.

1.16 MAILBOXES

A. Mailboxes which conflict with construction activities shall be removed by the Contractor and set in a temporary location designated by the Owner.

B. Mailboxes which are ornamental in nature or, in the estimation of the Owner, cannot be relocated shall be delivered to the Owner and a temporary mailbox shall be provided by the Contractor.

C. At the completion of construction, the Contractor shall reset all mailboxes as nearly as possible to their original locations and in conformance with Postal Regulations.

D. Mailboxes that are damaged during relocation or as a result of relocation or construction activities shall be replaced at the expense of the Contractor.

1.17 MONTHLY PROGRESS MEETINGS

A. Monthly progress review meetings will be held during the construction period at a time and date set by the Owner through the Engineer.

B. Location will be determined at the preconstruction meeting. Attendance by the Contractor or Contractor's authorized representative is mandatory.

1.18 HISTORICAL AND ARCHAEOLOGICAL

A. If, during the course of construction, evidence of deposits of historical or archaeological interest is found, the Contractor shall cease operations affecting the find and shall notify the Owner.

B. No further disturbance of the deposits shall ensue until Contractor has been notified by the Owner that the Contractor may proceed. Compensation to the Contractor, if any, for lost time or changes in construction resulting from the find shall be determined in accordance with changed or extra work provisions of the Contract Documents.

1.19 DEWATERING

A. Work to be performed may require pumping and dewatering to complete the work as shown on the Drawings. Such pumping and dewatering shall be the obligation of the Contractor.

B. The Contractor will be responsible for design, construction, electrical service and materials, operation, maintenance and permitting of any dewatering system necessary for the successful construction and completion of the project.

C. The Contractor shall conduct such investigation as is necessary to satisfy themselves of the groundwater conditions that will be encountered during construction.

1.20 PROJECT PHASING PLAN

A. In order to minimize disruptions, it is required that the Contractor progress with the construction of the water main following the phasing plan outlined below. The Contractor shall review these guidelines prior to construction and confirm the ability to meet the phasing plan.

1. Phase 1:
    a. Construct the 6-inch water main from STA 1+00 to STA 12+15 including the water main connection at STA 1+00.
    b. Complete pressure testing and disinfection of water main using fire hydrant assembly at STA 12+15.
    c. Following approval from DHHS and Engineer, construct water services between STA 1+00 and STA 12+15 and connect users.
    d. Construct the water main connections at STA 12+09.
2. Phase 2:
    a. Construct the 6-inch water main from STA 12+15 to STA 21+84 and STA 30+00 to STA 31+83.
    b. Complete pressure testing and disinfection of water main using temporary hydrant and blow-off at STA 21+84 and fire hydrant assembly at STA 31+83.
    c. Following approval from DHHS and Engineer:

(1) Construct water services between STA 12+15 and STA 21+84 and connect users.

(2) Construct water services between STA 30+00 and STA 31+83 and connect users

d. Construct water main connections at STA 31+84 and complete remaining abandonments of existing 6-inch water main, valves, and hydrants.

B. The Contractor may submit an alternate project phasing plan for Owner approval a minimum of 30 days prior to the mobilization of any equipment or materials.

1.21 SUBSTANTIAL COMPLETION

A. Refer to the General Conditions.

B. Substantial Completion requires the following components to be complete and operational:

1. Installation and backfilling of pipe, fittings, valves, hydrants, and appurtenances is complete.
   a. Pressure testing is complete.
   b. Compacted density testing of backfill is complete.
   c. Bacteriological testing is complete.
   d. Tracer wire testing is complete.
   e. All fire hydrants, valves and curb stops are operational with a wrench.
2. All water main connections and service line connections are complete.
3. Existing water main has been abandoned and removals are complete.
4. Earthwork is complete, with the exception of fine grading and seeding.
5. Installation of all pavement, sidewalk, and aggregate surfacing is complete.

PART 2 - PRODUCTS

2.01 WATER MAIN AND APPURTENANCES

A. Ductile Iron Fittings:

1. Ductile iron fittings shall meet the requirements of AWWA C153/111 or C110/153 and shall be cement lined.
2. All ductile iron fittings shall be mechanical joint with a minimum pressure rating of 250 PSI.
3. All buried ductile iron fittings shall be polywrapped.
4. All buried ductile iron fittings shall be bedded from 6 inches below the fitting to the top of the fitting with 3/4-inch crusher run bedding material.
5. Approved Manufacturers:
   a. Tyler
   b. Star
   c. Sigma

B. PVC Water Main:

1. Trenched: AWWA C900 PVC Pipe, DR 18
2. Directionally Bored: AWWA C900 PVC Pipe, Restrained Joint, DR 18

C. Gate Valves:

1. All buried gate valves shall be installed with mechanical joint restraint devices.
2. All buried gate valves shall be polywrapped and shall be bedded from 6 inches below the valve to the top of the valve with 3/4-inch crusher run bedding material.
3. All valve boxes for buried gate valves shall be furnished with Valve Box Adaptor II as manufactured by Adaptor, Inc. or equal.
4. All gate valves shall be provided by the same manufacturer.
5. Approved Manufacturers:
    a. American Flow Control
    b. Mueller

D. Fire Hydrant:

1. All fire hydrants shall be provided by the same by the same manufacturer.
2. Approved Manufacturers:
    a. American Flow Control
    b. Mueller

E. Water Services:

1. Water Service Material: PE Pipe, SRD7 IPS
2. Connection Stiffeners:
    a. Connection stiffeners shall be installed in the PE pipe at all connections to fittings.
    b. Connection stiffeners shall be made of solid tubular stainless steel.
3. Saddles: Ford FS202 or AY McDonald with a stainless-steel double bolt band.
4. Corporation Stops: Ford or Mueller taper thread inlet with a swivel eighth bend and pack joint outlet suitable for service line material.
5. Curb Stops: Ford or AY McDonald taper thread inlet with a swivel eighth bend and pack joint outlet suitable for service line material.
6. Curb Stop Box: Minneapolis style with a plug style lid, with the word “WATER” cast on the lid. A 60-inch stationary rod shall be included with each curb stop.

F. Tracer Wire:

1. Strength:
    a. Direct Bury: 450-pound minimum break load
    b. Directional Bore: 1,150-pound minimum break load
2. Placement:
    a. Install one tracer wires with all trenched water main
    b. Install two tracer wires will all directionally bored water main.
    c. Install one tracer wire will all trenched or directionally bored water services.

2.02 CONCRETE AND REINFORCING

A. Reinforcing Steel: Shall be ASTM A 615 Grade 60.

B. Concrete:

1. The use of Class C fly ash is disallowed.
2. Compressive strength when tested in accordance with ASTM C39 at 28 days: Minimum 4,000 psi.
    a. Thrust Blocks and Thrust Collars
    b. Streets, Alleys, Driveways, and Sidewalks
3. Percent Air Content: 6.0% - 8.5%
4. Maximum Slump: 4”
5. Concrete mix shall have a minimum of 30% coarse aggregate.

2.03 SEEDING

A. Seed Mixture for Urban Areas: Super Turf II (United Seeds, Inc.), Preferred Turf (Miller Seeds, Inc.), or seed of the following composition. Seeding rate shall be 10 lbs/1,000 square feet, drill seeded:

	Percent of Mix
Firecracker LS Turf Tall Fescue	24.50
Monet Turf Type Tall Fescue	24.50
Spyder LS Turf Tall Fescue	24.50
Talladega Turf Tall Fescue	24.50

2.04 AGGREGATE SURFACING

A. Crushed Rock Surface Course:

1. Crushed rock for surfacing shall consist of clean, hard particles of crushed limestone, quartzite, or dolomite.
2. The crushed rock aggregates for surfacing shall have a Los Angeles Abrasion loss percentage of not more than 45.
3. Crushed rock for surfacing shall have a percent loss of not more than 30 at the end of 16 cycles of the freezing and thawing test.
4. Rock shall meet NDOT 3/4-inch Crushed Rock for Surfacing gradations.

2.05 CURB RAMPS

A. All curb ramps shall have detectable warning panels as part of the ramp which comply with the detectable warnings on walking surfaces section of the Americans with Disabilities Act. Approved types are:

1. Armor Tile Cast-In-Place System.
2. ADA Solutions, Inc.

B. The use of replaceable detectable warning panels is not allowed.

PART 3 - EXECUTION

3.01 WATER MAIN DIRECTIONAL BORING INSTALLATION

A. Pipe rollers shall be used to support pipe during pulling operations.

B. Installation Tolerances:

1. Horizontally: ± 2.0 feet from the alignment shown on the Drawings.

2. Vertically: ± 1.0 foot from the profile shown on the Drawings. Maintain the minimum depth specified in the contract documents.

3. Greater deviation or interference with other identified facilities may be cause for rejection.

C. Deviation from Line and Grade:

1. The Contractor shall not deviate from the line and grade shown on the Drawings without approval from the Owner and Engineer.

2. Installations deviating from the specified tolerances that cannot be adjusted to conform to the specified tolerances may be rejected by the Owner.

3. If non-conforming installation is not rejected, The contractor shall provide all additional fittings or appurtenances needed to accommodate horizontal or vertical misalignment, at the expense of the Contractor.

D. Disposal of Boring Mud:

1. The Contractor shall take the necessary precautions to keep boring mud off of the streets during directional boring activities.

2. The Contractor shall remove and dispose of all boring mud collected in open excavations prior to backfilling activities.

3.02 ACCESS REQUIREMENTS

A. The Contractor shall provide notice to property owners and authorities:

1. The Contractor shall notify owners of adjacent property and utilities when proceeding with the work that may affect them.

2. When it is necessary to temporarily deny access by owners or tenants to their property, or when any utility service connection must be interrupted, The Contractor shall give notices sufficiently in advance to enable the affected persons to provide for their needs.

3. Notices shall conform to any applicable local ordinance and, whether delivered orally or in writing, will include information concerning the interruption and instructions on how to limit their inconvenience.

4. Utilities and other concerned agencies shall be contacted at least 48 hours prior to cutting or closing streets or other traffic areas or excavating near underground utilities or pole lines.

5. The Contractor shall regularly advise the local law enforcement, fire and rescue authorities of the project status and coordinate with them in a manner to maximize access to property in the construction area in event of an emergency.

B. The Contractor to maintain access for the residents of the area located within the area of the project, as much as possible.

C. The Contractor shall keep driveways and entrances serving adjacent properties clear and available to the property owner or occupant at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site that obstructs access to property.

D. The Contractor shall at all times maintain public access to the neighboring buildings in the project area.

E. The Contractor shall provide temporary approaches and crossings of streets and sidewalks during construction operations. The temporary approaches and crossings shall be maintained by Contractor in good condition during construction operations.

F. The Contractor to arrange site and premises to allow work by others and the Owner.

G. The Contractor to limit shutdowns of utility services to 4 hours at a time and arrange with Owner 48 hours in advance of any shutdowns.

H. The Contractor shall take all precautions not to damage buildings, utilities, sidewalks, drives, trees and property that are to remain in place during and after construction activities. Contractor shall be responsible for any damage and repair at the expense of the Contractor.

I. The Contractor shall provide their own fencing to maintain security of the site during construction. The entire site shall be secured at all times to deter entry to the site and prevent injuries to non-construction personnel.

3.03 VERIFY UTILITY LOCATION

A. The Contractor shall verify depth and location of existing utilities prior to any excavation.

B. The Contractor shall pothole existing utilities to confirm depth and location prior to directional boring activities.

C. The Contractor shall verify that the existing utilities are of the size and type shown in the Drawings prior to providing any connecting materials.

3.04 UNFAVORABLE CONSTRUCTION CONDITIONS

A. During unfavorable weather, wet ground or other unsuitable construction conditions, the Contractor shall confine operations to work, which will not be affected adversely by such conditions.

B. No portion of the work shall be constructed under conditions, which would adversely affect the quality or efficiency thereof, unless special means or precautions are taken by The Contractor to perform the work in a proper and satisfactory manner.

3.05 TOPSOIL AND SUBSOIL

A. The Contractor shall remove the upper 6 inches of topsoil from the area of trench excavation and store it on site. After the trench has been backfilled, the Contractor shall replace the stored topsoil on top of the backfill to provide a suitable seed bed for the area above the trench excavation.

B. Topsoil containing crop residue shall be collected separately and reapplied to agricultural ground to proposed finish grades.

3.06 CONCRETE PAVING TIE IN

A. New concrete paving will be tied to existing concrete paving with no. 4 x 18 inch tie bars at 48 inch center to center where condition of existing concrete paving or concrete base allows.

3.07 CURB RAMPS

A. The Contractor shall notify the Engineer prior to installation of sidewalk curb ramps in order to allow for inspection of the forms.

3.08 BARRICADES, LIGHTS AND TRAFFIC CONTROL

A. All open trenches and other excavations shall have suitable barricades, signs, lights and other safeguards to provide adequate protection to the public.

B. Obstructions such as material piles and equipment shall be provided with similar warning barricades, signs, lights and other safeguards.

C. The Contractor shall maintain traffic and shall provide and maintain traffic control devices in accordance with the contract documents.

D. The Contractor's traffic control devices shall be in accordance with and shall be placed as required in the current edition of the Manual on Uniform Traffic Control Devices for Streets & Highways.

E. The Contractor shall provide all necessary devices for traffic control during construction. Barricades, signs, lights and other safeguards shall be placed and maintained by Contractor during construction activities.

3.09 REMOVALS

A. The Contractor shall use care in removing concrete, asphalt and other permanent surfacing. Additional removals required due to the negligence of the Contractor will be at the expense of the Contractor.

B. Water Main Removals and Abandonments:

1. Existing water mains shall be abandoned using ductile iron fittings with mechanical joint restraint devices.

2. Existing valves shall be abandoned in place and all valve boxes shall be removed to a depth of 3 feet below grade.

3. Fire hydrants shall be removed and salvaged to the Owner

3.10 DISPOSAL OF REMOVALS

A. All disposal of any material that is removed shall be done in strict compliance with all applicable state, federal and local laws and rules and regulations.

B. The Contractor shall be responsible for the disposal of any miscellaneous items at the Contractor’s own disposal site at the expense of the Contractor.

C. Excess excavated material that is not suitable for reuse in the project shall be disposed of at the Contractor’s own disposal site and at the expense of the Contractor.

D. Boring mud removed from excavations shall be disposed of by the Contractor at the Contractor’s own disposal site at the expense of the Contractor.

E. All concrete removals shall be disposed of by the Contractor at the Contractor’s own disposal site at the expense of the Contractor.

F. All asphalt removals shall be disposed of by the Contractor at the Contractor’s own disposal site at the expense of the Contractor.

G. All trees and stumps removed shall be disposed of by Contractor at Contractor’s own disposal site at the expense of the Contractor.

H. Items, if any, that are to be salvaged to the Owner and items that are to be salvaged and re-installed are listed in the Drawings.

3.11 CONSTRUCTION STAKING

A. Refer to Section 00 73 00 - Supplementary Conditions, Paragraph SC-4.03.A.

3.12 SOILS TESTING

A. All concrete paving, sidewalks, curb ramps, etc. shall include subgrade preparation. The Contractor shall include cost of subgrade preparation with the appropriate related bid item.

B. Trench: The Owner reserves the right arrange and pay for all trench testing that meets the required densities. Any re-tests shall be paid for by the Contractor. Soil compaction shall meet the following requirements:

1. Trench Backfill in Critical Areas (roadways, driveways, alleys, under pavement): 98% of maximum standard proctor density, with moisture content at optimum (-) 2% to (+) 4%.
2. Trench Backfill 5 feet or more from Critical Areas: 92% of maximum standard proctor density with moisture content at optimum (-) 2% to (+) 4%.

C. General Fill: Owner shall arrange and pay for all testing of general fill that meets the required densities. Any re-tests shall be paid for by the Contractor. Soil compaction shall meet the following requirements:

1. General Fill: 95% of maximum standard proctor density, with moisture content at optimum (-) 2% to (+) 4%.
2. Top 12” of fill in lawn and cultivated fields: 90% of maximum standard proctor density, with moisture content at optimum (-) 2% to (+) 4%.

3.13 CONCRETE TESTING

A. Concrete Testing: The Owner reserves the right arrange and pay for all concrete testing that meets the required strength.

1. All concrete delivered to the project site shall be accompanied with documentation regarding the concrete mix, quantity of total concrete, water, aggregate, cement, air, and additives. This information shall be submitted to the the Owner and the Engineer for records.
2. At a minimum, an independent testing agency employed by the Owner will collect Compressive Strength Test Samples in accordance with ASTM C39 procedures.
    a. For each test, mold and cure 3 concrete test cylinders. At least one set of cylinders shall be taken for each day concrete placement takes place.
    b. The Owner may elect to collect one additional cylinder for a break prior to 7 days or during cold weather concreting, cured on job site under same conditions as the concrete it represents.
3. All costs for retesting shall be at the expense of the Contractor. The Owner shall deduct the costs for these tests from the project agreement price through a formal change order.

3.14 WATER QUALITY TESTING

A. Refer to Section 33 13 00 – Disinfection of Water Distribution System

B. The Contractor shall arrange and pay for all bacteriological testing needed to meet regulatory requirements.

C. The laboratory shall be a state regulatory agency laboratory or a state certified testing laboratory.

D. After all above requirements are met, reviewed, and approved by the Owner and Engineer, the Owner will request an inspection from the Nebraska Department of Health and Human Services (DHHS) of the system. Upon approval from the Owner and DHHS, the Contractor shall coordinate with the Owner and Engineer for placing the new system into service and connecting water services.

3.15 WATER FOR CONSTRUCTION

A. The Contractor shall make arrangements to obtain water from the Owner, as necessary for construction of the work.

B. The Contractor shall furnish all hose, hose adapters, backflow protection devices, meters and fittings necessary, and shall provide transportation and distribution of the water.

C. The Contractor shall exercise care in drawing water from the water system and shall not draw water at a rate, when combined with municipal uses, that will reduce the water system storage level below 75% of the maximum.

D. If water is required to provide the proper moisture content for compaction, the transportation and distribution of water shall be considered incidental and subsidiary to other items of work for which direct payment is made.

3.16 OPERATION OF WATER SYSTEM VALVE AND WATER MAIN CONNECTIONS

A. No valve or other control on the existing water system shall be operated for any purpose by Contractor without prior permission of Owner.

B. Connections to existing water mains will be coordinated with Owner.

3.17 CLEANUP

A. The Contractor shall return all areas disturbed by construction of the project to the original grade or to the finish grade as shown on Drawings and shall restore the site to the condition before the work began.

B. The Contractor shall keep the cleanup of the project current with the construction.

C. During construction, areas to be maintained for traffic shall be kept clear of all hazardous materials, including but not limited to construction debris, dust, and mud.

D. The cleaning and sweeping of the streets in the construction area shall be completed prior to the completion of the project.

E. The Contractor shall clean streets in project area whenever mud, dirt or debris is tracked onto to the streets as a result of the activities of Contractor, sub-Contractors, suppliers or agents.

F. The project cleanup shall be conducted to the satisfaction of Owner and Engineer and shall be completed prior to final acceptance of the project.

END OF SECTION

SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in contract price and contract time.

C. Change procedures.

D. Correlation of Contractor submittals based on changes.

E. Procedures for preparation and submittal of application for final payment.

1.02 SCHEDULE OF VALUES

A. Submit a printed schedule for projects or items bid as a lump sum.

B. Revise schedule to list approved change orders with each application for payment.

1.03 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the agreement or arranged at preconstruction meeting.

B. Present required information in typewritten form.

C. Form: Provided by Engineer.

D. Execute Contractor's certification by signature of authorized officer.

E. Use data from approved schedule of values. Provide dollar value in each column for each line item for portion of work performed and for stored products.

F. List each authorized change order as a separate line item, listing change order number and dollar amount as for an original item of work.

G. Submit 4 copies of each application for payment to Engineer for review.

H. Include the following with the application:

1. Transmittal letter as specified for submittals in Section 01 30 00 - Administrative Requirements.

2. Construction progress schedule, revised and current as specified in Section 01 30 00 - Administrative Requirements.

3. Affidavits and invoices attesting to on and off-site stored materials.

I. When Engineer requires substantiating information, submit data justifying dollar amounts in question. Provide 1 copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.04 MODIFICATION PROCEDURES

A. Submit name of the individual authorized to receive change documents and who shall be responsible for informing others in Contractor's or subcontractor's employ of changes to the work.

B. Engineer shall advise of minor changes in the work not involving an adjustment to contract price or contract time as authorized by the conditions of the contract by issuing supplemental instructions on letter.

C. Work Directive Change: Engineer may issue a document, signed by Owner, instructing Contractor to proceed with a change in the work for subsequent inclusion in a change order.

1. The document shall describe changes in the work and shall designate method of determining any change in contract price or contract time.

2. Promptly execute the change in work.

D. Notice of Change: Engineer may issue a document which includes a detailed description of a proposed change with supplementary or revised drawings and specifications and a change in contract time for executing the change. Contractor shall prepare and submit an estimated price quotation within 7 days.

E. Contractor may propose a change by submitting a request for change to Engineer, describing the proposed change and its full effect on the work, with a statement describing the reason for the change and the effect on the contract price and contract time with full documentation.

F. Computation of Change in Contract Amount:

1. For change requested by Engineer for work falling under a fixed price contract, the amount shall be based on Contractor's price quotation.

2. For change requested by Contractor, the amount shall be based on Contractor's request for a change order as approved by Engineer.

3. For predetermined unit prices and quantities, the amount shall be based on the fixed unit prices.

G. Substantiation of Costs: Provide full information required for evaluation.

1. On request, provide the following data:

a. Quantities of products, labor and equipment.

b. Taxes, insurance and bonds.

c. Overhead and profit.

d. Justification for any change in contract time.

e. Credit for deletions from contract, similarly documented.

2. Support each claim for additional costs with additional information:

a. Origin and date of claim.

b. Dates and times work was performed and by whom.

c. Time records and wage rates paid.

d. Invoices and receipts for products, equipment and subcontracts, similarly documented.

H. Execution of Change Orders: Engineer shall issue change orders for signatures of parties as provided in the conditions of the contract.

I. After execution of change order, promptly revise schedule of values and application for payment forms to record each authorized change order as a separate line item and adjust the contract price.

J. Promptly revise progress schedules to reflect any change in contract time, revise sub-schedules to adjust times for other items of work affected by the change and resubmit.

K. Promptly enter changes in project record documents.

1.05 APPLICATION FOR FINAL PAYMENT

A. Prepare application for final payment as specified for progress payments, identifying total adjusted contract price, previous payments and sum remaining due.

B. Application for final payment shall not be considered until the following have been accomplished:

1. All closeout procedures specified in Section 01 77 00 - Project Closeout.

2. Walk through with Engineer and Owner.

3. All punch list items completed.

4. Acceptance signed. Full execution of the substantial completion, if not already executed.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 22 00

UNIT PRICES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Measurement and payment criteria applicable to work performed under a unit price payment method or lump sum.

B. Defect assessment and nonpayment for rejected work.

1.02 COSTS INCLUDED

A. Unit prices and lump sum prices included on the bid form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the work; and overhead and profit.

B. Where a following technical specification attached to this contract document identifies a measurement and payment on a unit price basis or other method and no item is specifically listed on the bid form, such work shall be considered incidental to the contract. Full compensation shall be considered paid in listed bid items and no separate payment shall be made for incidental items of work including items not specifically identified as bid items.

1.03 UNIT QUANTITIES SPECIFIED

A. Quantities indicated in the bid form are for bidding and contract purposes only. Quantities and measurements of actual work shall determine the payment amount.

1.04 MEASUREMENT OF QUANTITIES

A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.

B. Take all measurements and compute quantities. Measurements and quantities shall be verified by Engineer.

C. Assist by providing necessary equipment, workers and survey personnel as required.

D. Measurement Devices:

1. Weigh Scales: Inspected, tested and certified by the applicable state weights and measures department within the past year.

2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.

3. Metering Devices: Inspected, tested and certified by the applicable state department within the past year.

E. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes shall be measured by handbook weights to the nearest pound. Welded assemblies shall be measured by handbook or scale weight.

F. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness to the nearest cubic yard.

G. Measurement by Area: Measured by square dimension using mean length and width or radius measured to the nearest square foot or square yard.

H. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord measured to the nearest foot.

I. Lump Sum: For each described item. Includes materials, equipment, labor, products and incidentals to provide for a complete and functional system as described in the specifications.

J. Established Quantity (EQ): Plan quantity not field measured.

1.05 PAYMENT

A. Payment for work governed by unit prices shall be made on the basis of the actual measurements and quantities of work which is incorporated in or made necessary by the work and accepted by Engineer, multiplied by the unit sum/price.

B. Payment shall not be made for any of the following:

1. Products wasted or disposed of in a manner that is not acceptable.
2. Products determined as unacceptable before or after placement.
3. Products not completely unloaded from the transporting vehicle.
4. Products placed beyond the lines and levels of the required work.
5. Products remaining on hand after completion of the work.
6. Loading, hauling and disposing of rejected products.

1.06 DEFECT ASSESSMENT

A. Replace work, or portions of the work, not conforming to specified requirements.

B. If, in the opinion of Engineer, it is not practical to remove and replace the work, Engineer shall direct one of the following remedies:

1. The defective work may remain, but the unit sum/price shall be adjusted to a new sum/price at the discretion of Engineer and accepted by Owner.
2. The defective work shall be partially repaired as per the instructions of Engineer; and the unit sum/price shall be adjusted to a new sum/price at the discretion of Engineer and accepted by Owner.

C. The individual specification sections may modify these options or may identify a specific formula or percentage sum/price reduction.

D. The authority of Engineer to assess the defect and identify payment adjustment is final.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Preconstruction meeting.

B. Progress meetings.

C. Construction progress schedule.

D. Submittal procedures.

E. Submittal schedule.

F. Shop drawings.

G. Project data.

H. Samples.

I. Engineers Action.

J. Manufacturer's instructions.

1.02 PROJECT COORDINATION

A. Project Engineer: JEO Consulting Group, Inc.

B. Cooperate with Owner and Engineer to determine the availability of staging areas for field offices, storage of materials, parking of equipment, etc.

C. During construction, coordinate use of site and facilities through Owner and Engineer.

D. Comply with Engineer's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings and recommendations; and resolution of ambiguities and conflicts.

E. Comply with instructions of Owner and Engineer for use of temporary utilities and construction facilities.

F. Coordinate field engineering and layout work under instructions of the project Engineer.

G. Make the following types of submittals to Engineer:

1. Requests for interpretation.
2. Requests for substitution.
3. Shop drawings, product data and samples.
4. Test and inspection reports.
5. Design data.
6. Manufacturer's instructions and field reports.
7. Applications for payment and change order requests.

8. Progress schedules.

9. Coordination drawings.

10. Closeout submittals.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 PRECONSTRUCTION MEETING

A. Engineer shall schedule a meeting after the contract documents are executed.

B. Attendance Required:

1. Owner.

2. Engineer.

3. Contractor.

4. Subcontractors.

5. Utilities.

C. Agenda:

1. Designation of project representatives for Owner, Engineer and Contractor.

2. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, change orders and contract closeout procedures.

3. Project scheduling.

4. Scheduling activities of subcontractors.

5. Review scope of project and project specific items.

6. Review other miscellaneous items as needed.

D. Record minutes and distribute copies after meeting to participants.

3.02 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the work with a maximum of monthly intervals.

B. Engineer shall make arrangements for meetings, prepare agenda with copies for participants and preside at meetings.

C. Attendance Required: Job superintendent, major subcontractors and suppliers, Owner and Engineer, as appropriate to agenda topics for each meeting.

D. Agenda:

1. Review minutes of previous meetings.

2. Review of work progress.

3. Field observations, problems and decisions.

4. Identification of problems which impede planned progress.

5. Review of submittals schedule and status of submittals.

6. Review of off-site fabrication and delivery schedules.

7. Maintenance of progress schedule.

8. Corrective measures to regain projected schedules.

9. Planned progress during succeeding work period.

10. Coordination of projected progress.

11. Maintenance of quality and work standards.

12. Effect of proposed changes on progress schedule and coordination.

13. Other business relating to work.

E. Engineer shall record minutes and distribute copies within 2 days after meeting to participants, with 1 copy each to Owner, Contractor, participants and those affected by decisions made.

3.03 CONSTRUCTION PROGRESS SCHEDULE

A. Within 10 days after the effective date of the agreement, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.

1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each application for payment.

3.04 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.

2. Coordinate transmittal of different types of submittals for related elements of the work so processing will not be delayed by the need to review submittals concurrently for coordination.

a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

3. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.

a. Allow 2 weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Engineer shall promptly advise Contractor when a submittal being processed must be delayed for coordination.

b. If an intermediate submittal is necessary, process the same as the initial submittal.

c. Allow 2 weeks for reprocessing each submittal.

d. No extension of contract time shall be authorized because of failure to transmit submittals to Engineer sufficiently in advance of the work to permit processing.

B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

1. Provide a space to record Contractor's review and approval markings and the action taken.

2. Include the following information on the label for processing and recording action taken.

a. Project name.

b. Date.

c. Name and address of Engineer.

d. Name and address of Contractor.

e. Name and address of subcontractor.

f. Name and address of supplier.

g. Name of manufacturer.

h. Number and title of appropriate specification section.

i. Drawing number and detail references, as appropriate.

C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Engineer using a transmittal form. Submittals received from sources other than Contractor shall be returned without action.

D. Copies Required: If submitting hard copies, submit 6 copies for review unless otherwise noted in the Special Provisions. If submitted via electronic submittal, only 1 copy is required.

3.05 SUBMITTAL SCHEDULE

A. After development and acceptance of Contractor's construction schedule, prepare a complete schedule of submittals. Submit the schedule within 10 days of the date required for establishment of Contractor's construction schedule.

1. Coordinate submittal schedule with the list of subcontracts, schedule of values and the list of products, as well as Contractor's construction schedule.

2. Prepare the schedule in chronological order; include submittals required during the first 10 days of construction. Provide the following information:

   a. Scheduled date for the first submittal.

   b. Related section number.

   c. Submittal category.

   d. Name of subcontractor.

   e. Description of the part of the work covered.

   f. Scheduled date for resubmittal.

   g. Scheduled date Engineer's final release or approval.

B. Distribution: Following response to initial submittal, print and distribute copies to Engineer, Owner, subcontractors and other parties required to comply with submittal dates indicated. Post copies in the project meeting room and field office.

   1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the work and are no longer involved in construction activities.

C. Schedule Updating: Revise the schedule after each meeting or activity where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

3.06 SHOP DRAWINGS

A. Submit newly prepared information drawn to accurate scale. Highlight, circle or otherwise indicate deviations from the contract documents. Do not reproduce contract documents or copy standard information as the basis of shop drawings. Standard information prepared without specific reference to the project is not considered shop drawings.

B. Shop drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:

   1. Dimensions.

   2. Identification of products and materials included.

   3. Compliance with specified standards.

   4. Notation of coordination requirements.

   5. Notation of dimensions established by field measurement.

   6. Sheet Size: Except for templates, patterns and similar full-size drawings, submit shop drawings on sheets formatted at least 8 1/2 inches x 11 inches but no larger than 24 inches x 36 inches. Electronic submittal is preferred.

7. If submitting hard copies, submit 6 Black Line Prints: For review unless otherwise noted in the Special Provisions.

8. One of the prints returned shall be marked up and maintained as a "record document".

9. Do not use shop drawings without an appropriate final stamp indicating action taken in connection with construction.

C. Coordination drawings are a special type of shop drawings that show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or function as intended.

1. Preparation of coordination drawings may include components previously shown in detail on shop drawings or product data.

2. Submit coordination drawings for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space.

3.07 PRODUCT DATA

A. Collect product data into a single submittal for each element of construction or system. Product data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where product data must be specially prepared because standard printed data is not suitable for use, submit as "shop drawings".

1. Mark each copy to show applicable choices and options. Where printed product data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:

a. Manufacturer's printed recommendations.

b. Compliance with recognized trade association standards.

c. Compliance with recognized testing agency standards.

d. Application of testing agency labels and seals.

e. Notation of dimensions verified by field measurement.

f. Notation of coordination requirements.

2. Do not submit product data until compliance with requirements of the contract documents has been confirmed.

3. Submittals: If submitting via hard copies submit 4 copies of each required submittal; submit 4 hard copies where required for maintenance manuals. Engineer shall retain one and shall return the other marked with action taken and corrections or modifications required.

a. Unless noncompliance with contract document provisions is observed, the submittal may serve as the final submittal.

4. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators and others required for performance of construction activities. Show distribution on transmittal forms.

   a. Do not proceed with installation until an applicable copy of product data applicable is in the installer's possession.

   b. Do not permit use of unmarked copies of product data in connection with construction.

3.08 SAMPLES

A. Submit full-size, fully fabricated samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.

1. Mount, display, or package samples in the manner specified to facilitate review of qualities indicated. Prepare samples to match Engineer's sample. Include the following:

   a. Generic description of the sample.

   b. Sample source.

   c. Product name or name of manufacturer.

   d. Compliance with recognized standards.

   e. Availability and delivery time.

2. Submit samples for review of kind, color, pattern and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.

   a. Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 3) that show approximate limits of the variations.

   b. Refer to other specification sections for requirements for samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation and similar construction characteristics.

3. Preliminary Submittals: Where samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.

   a. Preliminary submittals shall be reviewed and returned with Engineer's mark indicating selection and other action.

4. Submittals: Except for samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 4 sets; 1 shall be returned marked with the action taken.

5. Maintain sets of samples, as returned, at the project site for quality comparisons throughout the course of construction.

   a. Unless noncompliance with contract document provisions is observed, the submittal may serve as the final submittal.

   b. Sample sets may be used to obtain final acceptance of the construction associated with each set.

B. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers and others as required for performance of the work. Show distribution on transmittal forms.

1. Field samples specified in individual sections are special types of samples. Field samples are full-size examples erected on-site to illustrate finishes, coatings or finish materials and to establish the standard by which the work will be judged.

   a. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

C. Compliance with specified characteristics is Contractor's responsibility.

3.09 ENGINEER'S ACTION

A. Review required submittals with reasonable promptness and in accordance with schedule, only for general conformance to design concept of project and compliance with information given in plans and specifications. Review shall not extend to means, methods, sequences, techniques, procedures of construction, safety precautions or programs incidental thereof. Review of a separate item as such shall not indicate approval of assembly in which item functions.

B. Affix stamp and initials or signature and indicate requirements for resubmittal or review of submittal. Engineer's action on submittal is classified as follows:

1. No Exceptions Taken: Submittal has been reviewed and appears to be in conformance with design concept of project and plans and specifications.

2. Make Corrections Noted: Submittal has been reviewed and appears to be in conformance with design concept of project and plans and specifications, except as noted by Engineer.

3. Amend and Resubmit: Submittal has been reviewed and appears not to be in conformance with design concept of project and plans and specifications. Contractor shall make corrections as required by Engineer and resubmit for review.

4. Rejected - See Remarks: Submittal has not been reviewed because submittal is otherwise substantially contrary to design concept of project and plans and specifications. Contractor shall revise submittal to correct defects and resubmit for review.

5. No action taken.

C. Return submittals to Contractor.

D. Engineer's review of submittals shall not relieve Contractor from responsibility for any deviations from plans and specifications unless Contractor has, in writing, called Engineer's attention to such deviation at time of submission, and Engineer has given written concurrence pursuant to plans and specifications to specific deviations; nor shall any concurrence by Engineer relieve Contractor from responsibility for errors or omissions in submittals.

E. Installation, manufacture or fabrication of items prior to final approval is at Contractor's own risk.

3.10 MANUFACTURER'S INSTRUCTIONS

A. When required in individual specification section, submit manufacturer's printed instructions for delivery, storage, assembly, installation, start-up, adjusting and operation in quantities specified for product data.

END OF SECTION

Submittals Transmittal Form

TRANSMITTAL NO. | _____
DATE | _____
PROJECT | _____
JEO PROJECT NO. | _____
LOCATION | _____

CONTRACTOR | _____
ADDRESS | _____
CITY, STATE, ZIP | _____
PHONE | _____

☐ **1st Submittal** ☐ **Resubmittal [Previous Submittal No. _____, Date _____]**

Contractor shall fill in columns 1 through 5 for each submittal item. List each drawing, data item, or sample separately.

1. Spec Section & Paragraph No.	2. Item Description	3. Manufacturer or Supplier	4. Drawing or Detail No. *(if appropriate)*	5. Sample Only *(mark X)*	6. Coordinating Professional Action *(ref. A-E below)*

These/this item(s) have been checked for compliance with specification requirements and space limitations and will meet these conditions.

Submitted by (CONTRACTOR): _____ _____

Signature Printed Name and Title

SPACE BELOW FOR JEO USE ONLY

Review is for general compliance with contract documents. No responsibility is assumed for correctness of dimensions or details.

The above data has been reviewed in accordance with the provisions of the project specifications and is returned with action designated above in accordance with the following legend *(circle one of the following)*:

A	B	C	D	E
NO EXCEPTIONS TAKEN	MAKE CORRECTIONS NOTED	AMEND AND RESUBMIT	REJECTED (SEE REMARKS)	NO ACTION TAKEN (SEE REMARKS)

Remarks: _____

_____

_____

Reviewed by (COORDINATING PROFESSIONAL): _____ _____

Signature Date

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Submittals - qualifications and reports.

B. References and standards.

C. Testing and inspection agencies.

D. Control of installation.

E. Tolerances.

F. Testing and inspection.

G. Manufacturers field service.

H. Defect assessment.

1.02 SUBMITTALS - QUALIFICATIONS AND REPORTS

A. Testing Agency Qualifications:

1. Prior to start of work, submit testing agency name, address and telephone number, and names of full time registered Engineer and responsible officer.

2. Submit copy of report of testing agency laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

B. Design Data: Submit for Engineer's knowledge as contract administrator or Owner for the limited purpose of assessing conformance with the design concept expressed in the contract documents.

C. Test Reports: After each test/inspection, promptly submit 2 copies of report to Engineer.

1. Include:

a. Date issued.

b. Project title and number.

c. Name of inspector.

d. Date and time of sampling or inspection.

e. Identification of product and specification section.

f. Location in the project.

g. Type of test/inspection.

h. Date of test/inspection.

i. Results of test/inspection.

j. Conformance with contract documents.

k. When requested by Engineer, provide interpretation of results.

2. Test reports are submitted for Engineer's knowledge as contract administrator for the limited purpose of assessing conformance with the design concept expressed in the contract documents and for Owner's information.

D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Engineer in quantities specified for product data.

1. Indicate that material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits and certifications as appropriate.

2. Certificates may be recent or previous test results on material or product but must be acceptable to Engineer.

E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting and finishing for Owner's information. Indicate special procedures, perimeter conditions requiring special attention and special environmental criteria required for application or installation.

F. Manufacturer's Field Reports: Submit reports for Engineer's benefit as contract administrator and for Owner's information.

1. Submit report in duplicate within 15 days of observation to Engineer for information.

2. Submit information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

G. Erection Drawings: Submit drawings for Engineer's benefit as contract administrator and for Owner's information.

1. Submit for information and for the limited purpose of assessing conformance with the information given and the design concept expressed in the contract documents.

2. Data indicating inappropriate or unacceptable work may be subject to action by Engineer or Owner.

1.03 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the project manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard of date of issue current on date of contract documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning and progress of the specific work until project acceptance.

E. Should specified reference standards conflict with contract documents, request clarification from Engineer before proceeding.

F. Neither the contractual relationships nor the duties or responsibilities of the parties in contract or those of Engineer shall be altered from the contract documents by mention inference or otherwise in any reference document.

G. Should plans conflict with specifications or other contract documents, request clarification from Engineer before proceeding.

1.04 TESTING AND INSPECTION AGENCIES

A. As indicated in the Section 01 10 00 - Special Provisions or individual specification sections, Owner or Contractor shall employ and pay for services of an independent testing agency to perform specified testing.

B. Employment of an independent testing agency in no way relieves Contractor of obligation to perform work in accordance with requirements of contract documents.

C. Owner Employed Agency:

1. Owner shall employ a certified testing agency to test concrete for air content, slump and make cylinders for and perform compressive strength testing. Test frequency as indicated in Section 32 13 13 – Portland Cement Concrete or Section 03 30 00 – Cast in Place Concrete, as applicable.

2. Owner shall employ a certified testing agency to test the asphalt for uniformity of the mix and conformity to the mix design. Owner shall employ a certified testing agency to collect and test asphalt core samples.

3. Owner shall employ a certified testing agency for trench, fill and subgrade sampling and testing, and as noted in individual specification sections

4. All costs (including testing and other evaluations) related to the determination of defective work shall be the responsibility of the Contractor, if said work is found to be defective.

5. Retesting of failed tests and testing to identify a failed area shall be paid for by Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions and workmanship to produce work of specified quality.

B. Comply with manufacturer's instructions, including each step in sequence.

C. Should manufacturer's instructions conflict with contract documents, request clarification from Engineer before proceeding.

D. Comply with specified standards as minimum quality for the work, except where more stringent tolerances, codes and specified requirements indicate higher standards or more precise workmanship.

E. Work shall be performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion and disfigurement.

H. The Contractor shall be responsible for the protection, care, and upkeep of the work, all associated storage sites, and other areas used to execute the contract.

1. The Contractor shall take every precaution against injury or damage to the work due to the weather or from any other cause.

2. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to the work due to any cause before final acceptance at no additional cost.

3.02 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable work. Do not permit tolerances to accumulate.

B. Comply with manufacturer's tolerances. Should manufacturer's tolerances conflict with contract documents, request clarification from Engineer before proceeding.

C. Adjust products to appropriate dimensions, position before securing products in place.

3.03 TESTING AND INSPECTION

A. See individual specification sections for testing required.

B. Testing Agency Duties:

1. Test samples of materials and mixes submitted by Contractor.

2. Provide qualified personnel at site. Cooperate with Engineer and Contractor in performance of services.

3. Perform specified sampling and testing of materials, products and mixes in accordance with specified standards.

4. Ascertain compliance of materials, products and mixes with requirements of contract documents.

5. Promptly notify Engineer and Contractor of observed irregularities or nonconformance of work or products.

6. Perform additional tests and inspections required by Engineer.

7. Attend preconstruction meetings and progress meetings.

8. Submit reports of all tests/inspections specified.

C. Limits on Testing/Inspection Agency Authority:

1. Agency may not release, revoke, alter or enlarge on requirements of contract documents.

2. Agency may not approve or accept any portion of the work.

3. Agency may not assume any duties of Contractor.

4. Agency has no authority to stop the work.

D. Contractor's Responsibilities:

1. Deliver to agency at designated location adequate samples of materials proposed to be used which require testing, along with proposed mix designs.

2. Cooperate with testing agency personnel and provide access to the work.

3. Provide incidental labor and facilities.

a. To provide access to work to be tested/inspected.

b. To obtain and handle samples at the site or at source of products to be tested/inspected.

c. To facilitate tests/inspections.

d. To provide storage and curing of test samples.

4. Notify Engineer and testing agency 48 hours prior to expected time for operations requiring testing/inspection services.

E. Retesting required because of nonconformance to specified requirements shall be performed by the same agency on instructions by Engineer. Payment for retesting shall be paid for by the Contractor.

3.04 MANUFACTURER'S FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions; conditions of surfaces and installation; quality of workmanship; start-up of equipment; test, adjust and balance of equipment as applicable; and to initiate instructions when necessary.

B. Submit qualifications of observer to Engineer 30 days in advance of required observations.

1. Observer subject to approval of Engineer.

2. Observer subject to approval of Owner.

C. Report to Engineer observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.

3.05 DEFECT ASSESSMENT

A. Replace work or portions of the work not conforming to specified requirements.

B. If, in the opinion of Engineer, it is not practical to remove and replace the work, Engineer shall direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Temporary utilities.

B. Temporary sanitary facilities.

C. Barriers.

D. Fencing.

E. Security.

F. Vehicular access and parking.

G. Waste removal facilities and services.

H. Project identification.

I. Removal of utilities, facilities and controls.

1.02 TEMPORARY UTILITIES

A. Provide and pay for all electrical power, lighting, water, heating and cooling and ventilation required for construction purposes.

B. Existing facilities may be used subject to the Owner’s approval.

C. New permanent facilities may not be used.

1.03 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Use of existing facilities is not permitted unless approved by Owner.

C. New permanent facilities may not be used during construction operations.

D. Maintain daily in clean and sanitary condition.

E. At end of construction, return facilities to same or better condition as originally found.

1.04 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas to allow for Owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way.

C. Provide protection for plants designated to remain. Replace damaged plants.

D. Protect nonowned vehicular traffic, stored materials, site and structures from damage.

1.05 FENCING

A. Construction: See Section 01 10 00 - Special Provisions.

1.06 SECURITY

A. Provide security and facilities to protect work, existing facilities and Owner's operations from unauthorized entry, vandalism or theft.

1.07 VEHICULAR ACCESS AND PARKING

A. Coordinate access and haul routes with governing authorities and Owner.

B. Provide and maintain access to fire hydrants, free of obstructions.

C. Provide means of removing mud from vehicle wheels before entering public right-of-way.

D. Designated, existing on-site roads may be used for construction traffic.

E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

F. Existing parking areas may be used for construction parking subject to Owner’s approval.

G. Do not allow vehicle parking on existing pavement without Owner’s approval.

1.08 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Dispose of waste off-site periodically.

C. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.09 PROJECT IDENTIFICATION

A. Provide project identification sign of design and construction if indicated in the drawings or Section 01 10 00 - Special Provisions.

B. Erect on site at location indicated.

C. No other signs are allowed without Owner's permission, except those required by law.

1.10 REMOVAL OF UTILITIES, FACILITIES AND CONTROLS

A. Remove temporary utilities, equipment, facilities and materials prior to recommendation of acceptance inspection.

B. Remove underground installations to a minimum depth of 3 feet. Grade site as indicated.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 55 00

TRAFFIC CONTROL AND BARRICADING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This section describes various materials, equipment and procedures involved in traffic control and barricading during construction.

1.02 REFERENCES

A. Manual on Uniform Traffic Control Devices – MUTCD.

B. National Cooperative Highway Research Program.

C. Report 350 – NCHRP Report 350.

D. ASTM D 4956 – Standard Specification for Retroreflective Sheeting for Traffic Control.

E. State Standard Specifications, latest revision.

1.03 RESPONSIBILITIES

A. Contractor and the contracting authority have certain responsibilities whether public traffic is allowed or is prohibited during construction.

B. Contractor shall furnish, erect, operate, maintain, move and remove all traffic control and barricading devices required by the contract documents.

C. All traffic control and barricading shall be in accordance with the current edition of the MUTCD (Manual on Uniform Traffic Control Devices) and latest revisions.

1.04 TRAFFIC CONTROL DEVICES

A. All Category I traffic control and barricading devices used on projects shall meet National Cooperative Highway Research Program (NCHRP) Report 350. Category I devices are defined as low mass, single-piece traffic cones, tubular markers, single-piece drums and delineators. No lights or signs may be attached to these devices in order for them to meet the Category I limitations. Category I devices shall be self-certified by the vendor. It shall be the responsibility of the vendor of the device to determine if the device meets the evaluation criteria of NCHRP Report 350.

B. All Category II traffic control devices purchased for use on projects shall meet NCHRP Report 350. Category II devices are defined as vertical panels, Type II and Type III barricades; moveable skid mounted sign stands and barrels with reflected signs or lights attached. Type III barricades with attached signs used on all projects shall meet NCHRP Report 350. A list of approved Category II traffic control devices is found on the world wide web at the following URL:

http://safety.fhwa.dot.gov/fourthlevel/hardware/wzd.htm.

1.05 MONITORING

A. Contractor shall provide 24 hour per day continuous monitoring of traffic control and barricading devices.

B. Assistance to motorists and involvement with obstructions shall continue until they are no longer an impediment to traffic and further assistance can be provided safely by others.

C. When a vehicle or anything else is obstructing a travel lane or shoulder intended to be clear, the operator shall assist the motorist or remove the obstruction promptly and safely. If further assistance is needed, it is to be summoned.

D. The operator shall keep a report of any events that restrict the normal traffic flow during complex operations.

E. A copy of this report shall be provided to Engineer daily.

F. Contractor shall perform the following quality control work associated with monitoring and documenting traffic control and barricading conditions daily as the project is constructed:

1. Review all traffic control operations and maintain a project traffic control daily diary, which shall be submitted to Engineer and shall become a part of the contracting authority's project records. The diary shall include:

   a. All reviews of traffic control devices and operations.

   b. Approved changes to traffic control.

   c. Incidentals affecting the efficiency and safety of traffic.

   d. Coordinate all traffic control operations, including those of subcontractors and suppliers.

1.06 SIGNS

A. Signs shall utilize retro reflective sheeting. Reflective sheeting shall meet the requirements of ASTM D 4956, including supplementary requirements, except when modified in the contract documents or this specification.

B. Reflective sheeting shall be uniform in color and reflectivity. In a single sign or traffic control device, variations in color or reflectivity noticeable at a distance of 50 feet or more, under daytime or nighttime lighting conditions, shall be cause for rejection of the sign.

C. Signs for traffic control and construction zones in duration for 4 calendar days or more shall be mounted on fixed posts.

D. Signs for traffic control and construction zones in duration for less than 4 calendar days may be mounted on moveable skids or fixed posts.

E. Fixed, post-mounted signs shall have the sign sheeting applied to rigid wood or metal and shall be mounted at a height of at least 7 feet, measured from the bottom of the sign to the near edge of the pavement. A secondary sign on the same post may be mounted 1 foot lower than specified above. Post-mounted signs shall have a clear distance 2 feet behind a curb or beyond the edge of the shoulder.

F. Moveable skid mounted signs shall use flexible roll-up sheeting or other skid mounted sign systems that meet NCHRP 350 requirements. Moveable skid mounted signs shall be mounted at a height of at least 1 foot above the roadway.

G. Mounting devices shall not be so substantial as to be a hazard to vehicles.

1. Wood sign supports are allowed.

2. U-shaped rail steel posts not exceeding 3.0 pounds per foot are allowed.

3. Dual-post and triple-post configurations using these sign supports are acceptable provided that no more than 2 posts occupy any 8-foot wide path. Bracing of these posts shall not be permitted. Posts exceeding these requirements shall have breakaway features approved by Engineer.

H. Signs shall be in a condition so they are effective for the intended purposes when viewed from a vehicle. For nighttime installations, the reflectance shall be adequate so that the message is clearly readable. Signs shall be maintained in a near vertical position.

1.07 CHANNELIZING DEVICES

A. Channelizing devices shall utilize reflective sheeting.

1.08 BARRICADES

A. Type II barricades shall be used for all pavement surfaces on interstate and multilane roadways, which include travel lanes, intersections, ramps, acceleration and deceleration lanes, crossovers and shoulders.

B. At locations other than on interstate and multilane divided roadways, Type II barricades may be used. Type II barricades shall have a minimum length of rail of 2 feet.

C. When Type II barricades are furnished as one of the options for channelizing devices in lieu of vertical panels, cones or drums, a 2 foot minimum length barricade may be used.

D. Type III barricades shall be used where specifically required. They shall have a minimum length of rail of 4 feet. When used as a shoulder barricade, the minimum barricade is acceptable. Unless otherwise shown in the contract documents, other Type III barricades shall have a minimum effective length of rail of 8 feet, including locations where the barricades are staggered to permit construction or local traffic. Barricades of the minimum length may be used, side by side and rigidly fastened together by bolting or other approved methods, to make this effective length.

E. When traffic is permitted in each direction around a Type III barricade, the Type III barricade used shall have fully reflectorized faces on both sides of the rails.

F. Barricades shall be erected in essentially a horizontal position perpendicular to the direction of approaching traffic. When placed on the traveled way or shoulder, they shall be ballasted with sandbags placed so as not to cover any striped rail.

1.09 CONES, VERTICAL PANELS, DRUMS AND TUBULAR MARKERS

A. Cones, vertical panels, drums and tubular markers shall meet the current requirements of the MUTCD, latest revision.

B. When used to separate two-way traffic, temporary no passing lines shall be separated by approximately 16 inches with the marker to be installed between these lines.

C. Tubular markers shall be between 28 inches and 34 inches in height with a diameter facing traffic at least 2 inches in width. Tubular markers shall be completely faced with reflectorized white and orange sheeting. The white reflectorized sheeting shall be in 2 bands 4 inches wide with 6 inches between bands. The top band shall be no more than 2 inches from the top of the tubular marker.

1.10 FLAGGERS

A. Flaggers shall be trained about safe flagging operations that comply with Department of Roads or Transportation Flaggers Handbook, Part VI of the MUTCD and the standard specifications prior to flagging operations. Training of flaggers shall include the following:

1. Issue and review the current Flaggers Handbook.
2. Presentation of the current professional flagging video.
3. Issue flagger training card, which shall include the following:
    a. Employee name.
    b. Date of training.
    c. Name of instructor.
    d. Expiration date of December 31 of the year following the training date.
    e. Flaggers shall carry their flagger training card at all times and show it upon request.
4. Contractor shall maintain a list of flaggers trained and the date of the training.

B. Training shall not be required for short time, emergency or relief assignment of employees to flagging operations.

C. Except in an emergency, flaggers shall use signs as specified in the current edition of the MUTCD, Part VI, except the signs shall be as least 24 inches wide. The sign shall be mounted on a staff with a clear distance of 6 feet above the road surface.

D. To be visible to traffic while flagging, flaggers shall wear a soft cap or a hard hat and a vest, shirt or jacket. The colors of these articles of dress shall be orange or strong yellow-green or fluorescent versions of these colors. Combinations of these colors are acceptable.

1.11 LIMITATIONS

A. All traffic control and barricading devices subject to movement by wind shall be anchored by sandbags.

B. When a two-way road is open to public traffic during contract work, one-way traffic shall not be controlled through the work area by means of a carry through flag or other token, except during equipment failure or emergency. When voice or signal communication between flaggers at control points is difficult or not effective because of distance, sight or noise, other means shall be used. These may be two-way radios, pilot cars or traffic signals. When the normal work area exceeds 1/4 mile on projects, pilot

cars shall be used; however, where necessary for short durations, the distance may be extended to 1/2 mile for better sight distance or to clear intersections or other safety considerations with approval of Engineer, provided a two-way radio is used for communication between flaggers.

C. During nonworking hours, traffic control and barricading devices intended for working hours only shall be removed, covered or turned down. When traffic control devices are no longer needed, they shall be removed.

D. During daylight hours, workers exposed to traffic in or adjacent to traffic lanes should wear a vest, shirt or jacket equal to that required for flaggers.

E. At night, workers shall wear clothing that is similar in color to that required for flaggers and is retro reflective to be highly visible to drivers. The retro reflective clothing shall be designed to identify clearly the wearer as a person and shall be visible through the full ranges of body actions.

F. Engineer may require traffic control and barricading devices to be recleaned by washing. The device shall be washed with a brush and water and with detergent or solvent as necessary. Washing shall include a supplemental or auxiliary sign, if any, the entire target area or sign face, all reflectors, and faces of warning lights which are part of that device.

G. Entry to and exit from work areas shall be in the direction of public traffic and shall not cross open traffic lanes at other than designated locations. During hours of darkness, Contractor shall operate equipment in the traffic control zone facing in the direction of traffic flow unless otherwise specified in the traffic control plan. Darkness shall include the period from sunset to sunrise and other times when conditions such as fog, snow, sleet or rain provide insufficient lighting to clearly identify persons and vehicles on the highway at a distance of 500 feet ahead.

H. Unless otherwise stated in the traffic control plan, Contractor shall provide for a minimum of 2 miles between traffic control zones on rural roadways. Minimum distances between traffic control zones on urban roadways shall be at the direction of Engineer.

1.12 METHOD OF MEASUREMENT

A. When the contract documents include a pay item for traffic control and barricading, Engineer shall measure for payment the following items:

1. Traffic Control/Barricading: This item shall be the lump sum for traffic control and barricading for the project.

1.13 BASIS OF PAYMENT

A. When the following item is required for traffic control and barricading, there shall be items included in the contract documents with payment as follows:

1. Traffic Control/Barricading: When there is a contract item for traffic control, Contractor shall be paid either the lump sum contract price or at the contract unit prices. This payment shall be full compensation for erecting, maintaining, moving and removing all traffic control devices required by the contract

documents, including warning lights and for furnishing all materials, labor and equipment.

B. If traffic control and barricading is not a bid item it shall be incidental to other items on the project.

C. All traffic control and barricading devices furnished by Contractor shall remain Contractor's property at the completion of the work and shall be removed from the site when no longer needed.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Transportation, handling, storage and protection.

C. Product option requirements.

D. Substitution limitations and procedures.

E. Spare parts and maintenance materials.

1.02 SUBMITTALS

A. Proposed Products List: Submit list of major products proposed for use with name of manufacturer, trade name and model number of each product.

1. Submit within 10 days of the effective date of the agreement.

2. For products specified only by reference standards, list applicable reference standards.

B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options and other data. Supplement manufacturer's standard data to provide information specific to this project.

C. Shop Drawing Submittals: Prepared specifically for this project; marked up drawings will not be acceptable.

D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures and patterns.

E. Indicate utility and electrical characteristics, utility connection requirements and location of utility outlets for service for functional equipment and appliances.

PART 2 - PRODUCTS

2.01 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the contract documents.

B. Existing materials and equipment indicated to be removed, but not to be reused, relocated, reinstalled, delivered to Owner, or otherwise indicated as to remain the property of Owner, become the property of Contractor and shall be removed from project site.

2.02 NEW PRODUCTS

A. Provide interchangeable components of the same manufacturer for components being replaced.

2.03 PRODUCT OPTIONS

A. Products specified by reference standards or by description only. Use any product meeting those standards or description.

B. Products specified by naming one or more manufacturers. Use a product of one of the manufacturers named and meeting specifications; no options or substitutions allowed.

C. Products specified by naming one or more manufacturers with a provision for substitutions. Submit a request for substitution for any manufacturer not named.

2.04 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Provide spare parts, maintenance and extra products of types and in quantities specified in individual specification sections.

B. Deliver to project site; obtain receipt prior to final payment.

PART 3 - EXECUTION

3.01 SUBSTITUTION PROCEDURES

A. No substitutions will be considered prior to receipt of bids unless written request for approval has been received by Engineer at least 10 days prior to the date for receipt of bids. Substitution requests shall be submitted by the bidder or supplier.

B. After an award of a contract, if Contractor chooses to make a substitution for items specified and that are available, Contractor shall identify an amount to be deducted from the bid price. Cost of substitution review shall be reimbursed to Owner and Engineer as per Article 7, Section 7.05.D, of the Standard General Conditions of the Construction Contract.

C. Document each request with complete data substantiating compliance of proposed substitution with contract documents.

D. A request for substitution constitutes a representation that the submitter:

1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.

2. Will provide the same warranty for the substitution as for the specified product.

3. Will coordinate installation and make changes to other work which may be required for the work to be complete with no additional cost to Owner.

4. Waives claims for additional costs or time extension which may subsequently become apparent.

5. Will reimburse Owner and Engineer for review or redesign services associated with reapproval by authorities/consultants.

E. Substitutions will not be considered when they are indicated or implied on shop drawings or product data submittals without separate written request or when acceptance will require revision to the contract documents.

F. Substitution Submittal Procedure:

1. Submit to Engineer 3 copies of Form 01 60 00 Material/Equipment Substitution Request Form Prior to Letting or Form 01 60 00-A Material/Equipment Substitution Request Form After Execution of Contract, whichever is applicable, for consideration. Limit each request to one proposed substitution.

2. Submit shop drawings, product data and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.

3. Engineer shall notify Contractor in writing of decision to accept or reject request.

3.02 CONTRACTOR SUBSTITUTIONS FOR APPROVED MAJOR EQUIPMENT

A. Bidder shall indicate all proposed substitutions by listing in writing the substitute equipment or supplier and the addition or deduction to the base bid lump sum price for the proposed substitute item.

B. Contractor may propose only one substitution for each item. No further substitutions will be considered.

C. No proposed substitution for an item of approved major equipment shall be considered unless, in the opinion of Engineer or Owner, it conforms to the requirements of the contract drawings and specifications in all major respects, except for make, manufacturer or other minor details.

D. Proposed Contractor substitutions shall be deemed as equal if the substitute is the same or better quality than the product or equipment specified under the base bid in terms of its function, performance, reliability, quality and general configuration.

E. Required substitution data shall include:

1. Product Identification:

a. Manufacturer's name.

b. Telephone number and representative contact name.

c. Specification section or drawing reference number of originally specified product.

2. Manufacturer's literature clearly marked to show compliance of proposed product with contract documents.

3. Itemized comparison of original and proposed product addressing product characteristics including, but not limited to:

a. Size.

b. Composition or materials of construction.

c. Weight.

d. Electrical or mechanical requirements.

4. Product Experience:

a. Location of past projects utilizing product.

b. Name and telephone number of persons associated with referenced projects concerning proposed product.

c. Available field data and reports associated with proposed product.

5. Data relating to changes in construction schedule.

6. Data relating to changes in cost.

7. Samples:

a. At request of Engineer.

b. Full size if requested by Engineer.

c. Engineer not responsible for loss or damage to samples.

8. Data and drawing information shall be specifically prepared for this project. Sales catalog cuts or marked up drawings from previous projects are not acceptable.

F. The design and preparation of these drawings and specifications are based on products and equipment specified under base bid. Bidder or Contractor shall be responsible for any and all changes necessary to accommodate the substitute items, including the costs for:

1. Redesign.

2. Revision of construction documents.

3. Additional construction administration.

3.03 TRANSPORTATION AND HANDLING

A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

B. Transport and handle products in accordance with manufacturer's instructions.

C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct and products are undamaged.

E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement or damage.

F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturer's instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weather tight, climate-controlled enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.

G. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

H. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

I. Prevent contact with material that may cause corrosion, discoloration or staining.

J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement or damage.

K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

ENGINEER USE ONLY

Date Received _____

MATERIAL/EQUIPMENT SUBSTITUTION REQUEST FORM PRIOR TO LETTING

This form to be submitted with supporting data.

Project Description/Title _____ JEO Project No. _____

Date of Letting _____ Date of Submittal _____

Reference Specification and Section _____

Name of Bidder Submitting Substitution Request _____

Reason for Substitution Request _____

_____

Is specified material or equipment available? ☐ Yes ☐ No

Has bidder procured plans and specifications from JEO Consulting Group, Inc.? ☐ Yes ☐ No

Has bidder reviewed instructions to bidders, general conditions and supplemental conditions regarding procedures for substitute or "or-equal" materials and equipment? ☐ Yes ☐ No

The contract, if awarded, will be on the basis of materials and equipment specified or described in the bidding documents, or those substitute or "or-equal" materials and equipment approved by Engineer and identified by addendum. The materials and equipment described in the bidding documents establish a standard of required type, function and quality to be met by any proposed substitute or "or-equal" item. No item of material or equipment shall be considered by Engineer as a substitute or "or-equal" unless written request for approval has been submitted by bidder and has been received by Engineer (submittal time and requirements as specified) prior to the date for receipt of bids. Each such request shall conform to requirements of the general conditions, supplemental conditions and instructions to bidders. The burden of proof of the merit of the proposed item is upon bidder. Engineer's decision of approval or disapproval of a proposed item shall be final. If Engineer approves any proposed item, such approval shall be set forth in an addendum issued to all prospective bidders. Bidders shall not rely upon approvals made in any other manner.

APPROVED: ☐ Yes ☐ No

REVIEWER: _____ DATE: _____

Signature

ENGINEER USE ONLY

Date Received _____

MATERIAL/EQUIPMENT SUBSTITUTION REQUEST FORM AFTER EXECUTION OF CONTRACT

This form to be submitted with Contractor's supporting data.

Project Description/Title _____ JEO Project No. _____

Date of Letting _____ Date of Submittal _____

Reference Specification and Section _____

Contractor Submitting Substitution Request _____

Reason for Substitution Request _____

_____

Is specified material or equipment available? ☐ Yes ☐ No

Has Contractor reviewed general conditions, supplemental conditions and other specified material/equipment submittal requirements regarding procedures for substitute or "equivalent" materials and equipment? ☐ Yes ☐ No

What cost savings will be experienced by Owner with this substitution? $_____

Contractor agrees to reimburse Owner for Engineer's review of substitution request if specified equipment is available? ☐ Yes ☐ No

Substitution requests will not be considered that are submitted by subcontractors or suppliers. The contract was awarded on the basis of materials and equipment specified or described in the contract documents, or those substitute or "or-equal" materials and equipment approved by Engineer and identified by addendum. The materials and equipment described in the contract documents establish a standard of required type, function and quality to be met by any proposed substitute or "or-equal" item. No item of material or equipment shall be considered by Engineer as a substitute or "or-equal" unless written request for approval has been submitted by Contractor and has been received by Engineer (submittal time and requirements as specified). Each such request shall conform to requirements of the general and supplemental conditions and any other material/equipment submittal requirements. The burden of proof of the merit of the proposed item is upon Contractor. Engineer's decision of approval or disapproval of a proposed item shall be final. If Engineer approves any proposed item, such approval shall be set forth in written notification to Contractor. Contractor shall not rely upon approvals made in any other manner.

APPROVED: ☐ Yes ☐ No

REVIEWER: _____ DATE: _____

Signature

SECTION 01 70 00

EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation and general installation procedures.

B. Preinstallation meetings.

C. Surveying for laying out the work.

D. Cleaning and protection.

E. Starting of systems and equipment.

F. Demonstration and instruction of Owner's personnel.

1.02 PROJECT CONDITIONS

A. Grade site to drain. Maintain excavations free of water. Provide, operate and maintain pumping equipment.

B. Protect site from ponding or running water. Provide barriers as required to protect site from soil erosion.

C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity and to prevent accumulation of dust, fumes, vapors or gases.

D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent airborne dust from dispersing into atmosphere.

E. Erosion and Sediment Control: Plan and execute construction by methods to control surface drainage from cuts and fills and from borrow and waste disposal areas. Prevent erosion and sedimentation.

1. Minimize amount of bare soil exposed at one time.

2. Provide temporary measures such as berms, dikes, bale checks, silt fence, etc. to prevent erosion.

3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.

4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

5. Contractor is responsible to furnish and install any and all the measures necessary to control erosion, whether it is a pay item or not.

F. Noise Control: Provide methods, means and facilities to minimize noise produced by construction operations.

G. Pollution Control: Provide methods, means and facilities to prevent contamination of soil, water and atmosphere from discharge of noxious, toxic substances and pollutants produced by construction operations.

H. Pest Control: Provide methods, means and facilities to prevent pest and insects from damaging work.

I. Rodent Control: Provide methods, means and facilities to prevent rodents from accessing or invading premises.

1.04 COORDINATION

A. Coordinate scheduling, submittals and work of the various sections of the project manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies about proposed construction and coordinate with their requirements.

C. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to and placing in service such equipment.

D. Coordinate space requirements, supports and installation of mechanical and electrical work which are indicated diagrammatically in the drawings. Follow routing shown for pipes, ducts and conduit as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance and for repairs.

E. Coordinate completion and cleanup of work of separate sections.

PART 2 - PRODUCTS

2.01 NOT USED

PART 3 - EXECUTION

3.01 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Engineer of any discrepancies discovered.

C. Control datum for survey may be indicated in the drawings.

D. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

E. Promptly report to Engineer the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

F. Utilize recognized engineering survey practices.

G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:

1. Site improvements, including pavements; stakes for grading, fill and topsoil placement; and utility locations, slopes and invert elevations.

2. Grid or axis for structures.

H. Periodically verify layouts by same means.

I. Maintain a complete and accurate log of control and survey work as it progresses.

3.02 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces and other closed or remote spaces prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris and rubbish from site periodically and dispose off-site.

3.03 PROTECTION OF INSTALLED WORK

A. Protect installed work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

C. Prohibit traffic from landscaped areas.

D. Limiting Exposure: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging or otherwise deleterious exposure during the construction period, no matter what the cause. Where applicable, such exposures include, but are not limited to, the following:

1. Excessive static or dynamic loading.
2. Excessively high or low temperatures.
3. Excessively high or low humidity.
4. Water or ice.
5. Heavy traffic.
6. Soiling, staining and corrosion.
7. Unusual wear or other misuse.
8. Excessive weathering.
9. Unprotected storage.
10. Improper shipping or handling.
11. Theft.
12. Vandalism.

3.04 STARTING SYSTEMS

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify Engineer and Owner 7 days prior to start-up of each item.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence and for conditions that may cause damage.

D. Verify tests, meter readings and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify that wiring and support components for equipment are complete and tested.

F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturer's instructions.

G. When specified in individual specification sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start-up and to supervise placing equipment or system in operation.

H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.05 DEMONSTRATION AND INSTRUCTION

A. Demonstrate operation and maintenance of products to Owner's personnel prior to date of final inspection.

B. Demonstrate start-up, operation, control, adjustment, troubleshooting, servicing, maintenance and shutdown of each item of equipment.

C. Provide a qualified manufacturer's representative who is knowledgeable about the project to perform demonstration and instruction of Owner's personnel.

D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

3.06 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.07 FINAL CLEANING

A. Execute final cleaning after items have been completed but before making final application for payment.

1. Clean areas to be occupied by Owner prior to final completion and/or before Owner's occupancy.

B. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned, as recommended by the manufacturer of the equipment and/or fixtures.

C. Clean filters, if reusable, or provide new for operating equipment.

D. Clean site, sweep paved areas and rake clean landscaped surfaces.

E. Remove waste and surplus materials, rubbish and construction facilities from the site.

3.08 MAINTENANCE SERVICE

A. Furnish service and maintenance of components indicated in specification sections during the warranty period.

B. Examine system components at a frequency consistent with reliable operation. Clean, adjust and lubricate as required.

C. Include systematic examination, adjustment and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

D. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of Owner.

END OF SECTION

SECTION 01 71 13

MOBILIZATION AND DEMOBILIZATION

PART 1 - GENERAL

1.01 SCOPE

A. The work shall consist of the mobilization and demobilization of Contractor's forces and equipment necessary for performing the work required under the contract.

B. This work shall not include mobilization and demobilization for specific items of work for which payment is provided elsewhere in the contract.

C. Mobilization shall not be considered as work in fulfilling the contract requirement for commencement of work.

D. The work shall consist of providing all required contract bonding and insurance required under the contract.

1.02 UNIT PRICES - MEASUREMENT AND PAYMENT

A. No measurement will be made.

B. Mobilization: A lump sum amount that includes all items described in this section. The costs for insurance and bonds may be included in Mobilization if a separate bid item for insurance and bonds is not provided.

1. The partial payment for any Mobilization item will be limited to an amount not to exceed 10 percent (10%) of the total amount bid, including mobilization, for the group in which the Mobilization occurs. In the event the lump sum bid for "Mobilization" exceeds 10 percent (10%) of the total group amount; the difference (remainder) will not be paid until Owner has accepted the Project.

2. Subject to the limitations stated in Paragraph 1 of this subsection, when the contract documents provide a separate bid item for Mobilization, progress payments for mobilization shall be made as follows:

a. When 5 percent (5%) of the original contract sum for the contract or a specific Group has been earned, excluding Mobilization, the first 25 percent (25%) of the contract or that Group's Mobilization amount will be paid, subject to the limitations stated in Paragraph 1 of this subsection.

b. When 10 percent (10%) of the original contract sum for the contract or a specific Group has been earned, excluding Mobilization, the second 25 percent 25% (bringing the total payments to 50%) of the contract or that Group's Mobilization amount will be paid, subject to the limitations stated in Paragraph 1 of this subsection.

c. When 50 percent (50%) of the original contract sum for the contractor or a specific Group has been earned, excluding Mobilization, the second 50 percent 50% (bringing the total payments to 100%) of the contract or

that Group's Mobilization amount will be paid, subject to the limitations stated in Paragraph 1 of this subsection.

d. Upon completion of all work on the project required by the contract, and acceptance by Owner, full payment will be made for mobilization, including any amount not paid as a progress payment.

3. When "Mobilization" is not shown as a separate pay item in the bid form, the work described in this section shall be considered incidental and subsidiary to all other items of work within the contract for which direct payment is made and no separate payments will be made for Mobilization.

C. Insurance and Bonds: A lump sum amount that includes the costs of Contract Bond(s) and all insurance premiums.

1. Payment for any Insurance and Bonds bid item will be allowed following contract execution and Owner will pay up to 100 percent (100%) of the bid item for that Group's Insurance and Bonds amount.

2. When "Insurance and Bonds" is not shown as a separate pay item, it shall be included in the "Mobilization" bid item. If neither "Insurance and Bonds" or "Mobilization" are shown as separate bid items, the work described in this section shall be considered subsidiary to other pay items in the contract.

1.03 EQUIPMENT AND MATERIALS

A. Mobilization shall include all activities and costs for transportation of personnel, equipment and operating supplies to the site; establishment of offices, buildings and other necessary facilities for Contractor's operations at the site; and premiums paid for performance and payment bonds, including coinsurance and reinsurance agreements as applicable.

B. Demobilization shall include all activities and costs for transportation of personnel, equipment and supplies not included in the contract from the site, including the disassembly, removal and site cleanup of offices, buildings and other facilities assembled on the site for this contract. No separate payment will be made for demobilization.

C. This work includes mobilization and demobilization required by the contract at the time of award. If additional mobilization and demobilization activities and costs are required during the performance of the contract as a result of changed, deleted or added items of work for which Contractor is entitled to an adjustment in contract price, compensation for such costs shall be included in the price adjustment for the item or items or work changed or added.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 77 00

PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of contract, including general and supplementary conditions and other specification sections, apply to this section.

1.02 SUMMARY

A. This section specifies administrative and procedural requirements for project closeout including, but not limited to:

1. Inspection procedures.
2. Project record document submittal.
3. Operation and maintenance manual submittal.
4. Submittal of warranties.
5. Final cleaning.

B. Closeout requirements for specific construction activities are included in the appropriate sections.

1.03 PRIOR TO FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting the substantial completion, complete the following.

1. If 100 percent of project completion has not been achieved, include a list of incomplete items, the value of incomplete construction and reasons the work is not complete.
2. Inform Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
4. Obtain and submit releases enabling Owner unrestricted use of the work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
5. Submit extra stock as specified in individual specification sections.
6. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

B. Inspection Procedures: On receipt of a request for inspection, Engineer shall either proceed with inspection or advise Contractor of unfilled requirements. Engineer shall advise Contractor of construction that must be completed or corrected before the substantial completion will be issued.

1. Engineer shall repeat inspection when requested and assured that the work has been completed.

2. Results of the completed inspection shall form the basis of requirements for final acceptance.

1.04 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for substantial completion and final payment, complete the following. List exceptions in the request.

1. Submit record drawings, maintenance manuals, property survey and similar final record information.

2. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

3. Submit an updated final statement, accounting for final additional changes to the contract sum.

4. Submit a certified copy of Engineer's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance and the list has been endorsed and dated by Engineer.

5. Submit consent of surety with the application for final payment, if requested by the Owner.

6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

7. Submit an affidavit stating that, to the best of Contractor's knowledge, asbestos was not used in the manufacture and fabrication of products and materials used in conjunction with the project.

8. Submit signed and completed punch list documents to Engineer.

B. Reinspection Procedure: Engineer shall reinspect the work upon receipt of notice that the work, including inspection list items from earlier inspections, has been completed, except items where completion has been delayed because of circumstances acceptable to Engineer.

1. Upon completion of reinspection, Engineer shall prepare the substantial completion, or advise Contractor of work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance of the project.

1.05 RECORD DOCUMENT SUBMITTALS

A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; and provide access to record documents for Engineer's reference during normal working hours.

B. Record Drawings: Maintain a clean, undamaged set of blue or black line white prints of contract drawings and shop drawings. Mark the set to show the actual installation where the installation varies substantially from the work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where

shop drawings are used, record a cross-reference at the corresponding location on the contract drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the work.
2. Mark new information and/or design changes that were not shown on contract drawings or shop drawings.
3. Note related change order numbers where applicable.
4. Organize record drawing sheets into manageable sets; bind with durable paper cover sheets; and print suitable titles, dates and other identification on the cover of each set.

C. Record Specifications: Maintain 1 complete copy of the project manual, including addenda, and 1 copy of other written construction documents, such as change orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual work performed in comparison with the text of the specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and product data.

1. Upon completion of the work, submit record specifications to Engineer for Owner's records.

D. Record Product Data: Maintain 1 copy of each product data submittal. Mark these documents to show significant variations in actual work performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the work which cannot otherwise be readily discerned later by direct observation. Note related change orders and markup of record drawings and specifications.

1. Upon completion of markup, submit complete set of record product data to Engineer for Owner's records.

E. Extra Stock Submitted: Immediately prior to the date or dates of substantial completion, Contractor shall meet at the site with Engineer and Owner's personnel to transmit extra stock to Owner for storage purposes. Comply with delivery of Owner's storage area.

F. Miscellaneous Record Submittals: Refer to other specification sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the work. Immediately prior to the date or dates of substantial completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to Engineer for Owner's records.

1.06 OPERATION AND MAINTENANCE MANUAL SUBMITTAL

A. Maintenance Manuals: Organize operating and maintenance data into 3 sets of manageable size. Bind properly indexed data in individual heavy-duty, 3-inch, 3-ring

vinyl-covered binders complete with tab sections and table of contents, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:

1. Emergency instructions.
2. Spare parts list.
3. Copies of warranties.
4. Wiring diagrams.
5. Recommend “turn around” cycles.
6. Inspection procedures.
7. Shop drawings and product data.
8. Equipment cards for all equipment furnished on project.
9. List of subcontractors and material suppliers.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

1. Provide copies to Engineer and Owner.

B. Notify Engineer when work is considered ready for final/partial inspection.

C. Submit written certification that contract documents have been reviewed, work has been inspected and that work is complete in accordance with contract documents and ready for Engineer’s review.

D. Owner shall occupy all of the site or facilities as indicated in the plans or as directed by Owner and Engineer.

E. Correct items of work listed in executed punch list documents and comply with requirements for access to Owner occupied areas.

F. Notify Engineer and Owner when work is considered 100 percent complete.

G. Complete items of work determined by Engineer’s final inspection.

H. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet Owner’s personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer’s representatives. Include a detailed review of the following items:

1. Maintenance manuals.
2. Record documents.
3. Spare parts and materials.
4. Tools.

5. Identification systems.

6. Control sequences.

7. Hazards.

8. Cleaning.

9. Warranties and bonds.

10. Maintenance agreements and similar continuing commitments.

11. Equipment cards.

12. Lubricants and fuels.

I. As part of instruction for operating equipment, demonstrate the following procedures:

1. Start-up.

2. Shutdown.

3. Emergency operations.

4. Noise and vibration adjustments.

5. Safety procedures.

6. Economy and efficiency adjustments.

7. Effective energy utilization.

3.02 FINAL CLEANING

A. General: General cleaning during construction is required by the general conditions and included in Section 01 50 00 - Temporary Facilities.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

1. Complete the following cleaning operations before requesting inspection for substantial completion.

a. Remove labels that are not permanent labels.

b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.

c. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean.

d. Clean the site, including landscape development areas, of rubbish, liter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth, even-textured surface.

C. Removal of Protection: Remove temporary protection and facilities installed for protection of the work during construction.

D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

1. Wipe surfaces of mechanical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition.

2. Wipe surfaces of electrical equipment. Clean light fixtures and lamps.

3. Where extra materials of value remaining after completion of associated work have become Owner's property, arrange for disposition of these materials as directed by Engineer/Owner.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Concrete formwork

B. Floors and slabs on grade

C. Concrete foundation walls

D. Elevated concrete slabs

E. Concrete reinforcement

F. Joint devices associated with concrete work

G. Miscellaneous concrete elements, including equipment pads, light pole bases, thrust blocks and manholes

H. Concrete curing

1.02 REFERENCES

A. ACI 211.1 – Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete

B. ACI 301 – Specifications for Structural Concrete for Buildings

C. ACI 302.1R – Guide for Concrete Floor and Slab Construction

D. ACI 304R – Guide for Measuring, Mixing, Transporting, and Placing Concrete

E. ACI 305R – Hot Weather Concreting

F. ACI 306R – Cold Weather Concreting

G. ACI 309R – 05 Guide to Consolidation of Concrete

H. ACI 315 – Standard Practice for Detailing Reinforced Concrete Structures

I. ACI 351 – Grouting Between Foundations and Bases for Support of Equipment and Machinery

J. ASTM C 33 – Standard Specification for Concrete Aggregates

K. ASTM C 39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

L. ASTM C 94 – Standard Specification for Ready-Mixed Concrete

M. ASTM C 143 – Standard Test Method for Slump of Hydraulic-Cement Concrete

N. ASTM C 150 – Specification for Portland Cement

O. ASTM C 171 – Standard Specification for Sheet Materials for Curing Concrete

P. ASTM C 173 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

Q. ASTM A 185 – Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete (Withdrawn 2013)

R. ASTM C 260 – Standard Specification for Air-Entraining Admixtures for Concrete

S. ASTM C 309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

T. ASTM C 311 – Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland - Cement Concrete

U. ASTM C 494 – Standard Specification for Chemical Admixtures for Concrete

V. ASTM A 497 – Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete (Withdrawn 2013)

W. ASTM A 615 – Standard Specification for Deformed and Carbon-Steel Bars for Concrete Reinforcement

X. ASTM C 618 –- Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

Y. ASTM C 920 – Standard Specification for Elastomeric Joint Sealants

Z. ASTM C 1017 – Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete

AA. ASTM C 1074 – Standard Practice for Estimating Concrete Strength by the Maturity Method

BB. ASTM C 1077 – Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation

CC. ASTM C 1116 – Standard Specification for Fiber-Reinforced Concrete

DD. ASTM D 3405 – Standard Specification for Joint Sealants, Hot-Applied for Concrete and Asphalt Pavements (Withdrawn 2002)

EE. ASTM E 329 – Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

FF. ASTM E 548 – Standard Guide for General Criteria Used for Evaluating Laboratory Competence

GG. ASTM E 1643 – Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs

HH. AASHTO M 33 – Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)

II. AASHTO M 182 – Standard Specification for Burlap Cloth Made from Jute or Kenaf and Cotton Mats

JJ. State Standard Specifications for Highway Construction, Latest Addition, including all current supplemental specifications

KK. NSF 61 – Drinking Water System Components - Health Effects

1.03 UNIT PRICES

A. Concrete - Slab on Grade or Vertical in Forms or Miscellaneous Locations:

1. Includes formwork, reinforcement, concrete, placement accessories, consolidating and leveling, troweling and curing.

2. Method of measurement and pay unit by the cubic yard, square yard, as shown on the Bid Form, or as described in the Special Provisions Section 01 10 00.

3. Components and accessories are subsidiary items to placing concrete.

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's data on manufactured material and products indicated.

B. Design Mixes:

1. Submit the proposed mix design for each class of concrete to Engineer and testing firm for review prior to commencement of concrete operations.

2. Specify amounts of mix water to be withheld for later addition at project site, if any.

3. Provide the source, type, name, and amount of each admixture in the design mix.

C. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:

1. Cementitious materials and aggregates.

2. Steel reinforcement and reinforcement accessories.

3. Admixtures.

D. Mock Up Panels:

1. Contractor may be required to construct and erect a mock up panel for architectural surfaces, finishes, colors or other treatments.

E. Shop Drawings - Steel Reinforcement: Details of fabrication, bending and placement prepared according to ACI 315.

1. Included material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement and supports of concrete reinforcement.

2. Include special reinforcement required for openings through concrete structures.

F. Project Record Documents: Accurately record locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed concrete work similar in material, design and extent to that indicated for this project and whose work has resulted in construction with a record of successful in-service performance.

B. Concrete Supplier's Qualifications: Firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

1. Concrete Supplier's must be certified according to the National Ready Mixed Concrete Association Certification of Ready Mixed Concrete Production Facilities.

C. Testing Agency Qualifications: Independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct testing indicated, as documented according to ASTM E 548.

1. Personnel conducting tests shall be qualified as ACI concrete field testing technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

D. Obtain each type or class of cementitious material of the same brand from the same source, aggregate from same source and each admixture from same source.

PART 2 - PRODUCTS

2.01 FORMWORK

A. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.

1. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true and smooth concrete surfaces. Furnish in largest practical sizes to minimize number of joints.

a. Plywood, metal or other approved panel materials.

b. Use of aluminum forms is prohibited.

2. Rough-Formed Finished Concrete: Plywood, lumber, metal or other approved material. Provide dressed lumber on at least 2 edges and 1 side for tight fit. Use of aluminum forms is prohibited.

3. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber reinforced plastic, paper or fiber tubes that will produce surfaces that meet specified formwork surface class. Use of aluminum forms is prohibited. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

4. Chamfer Strips: Wood, metal, PVC or rubber strips 3/4 inch by 3/4 inch minimum.

5. Form Coating: Commercially formulated release agent that will not bond, stain or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

    a. For steel forms, formulate form-release agent with rust inhibitor.

6. Form Ties: Cone snap type that will leave no metal within 1 1/2 inches of concrete surface. Form ties with a waterstop shall be used for any structure that its intended purpose is to hold a liquid (i.e. water, wastewater, swimming pools, etc.).

2.02 REINFORCEMENT

A. Reinforcing Steel:

1. ASTM A 615 Grade 60

    a. New, deformed billet-steel bars.

    b. Unfinished.

B. Plain-Steel Welded Wire reinforcement:

1. ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.

    a. Rolled sheets are not permitted.

C. Deformed-Steel Welded Wire Reinforcement:

1. ASTM A 497, flat sheet

    a. Rolled sheets are not permitted.

D. Dowel Bars:

1. ASTM A 615 Grade 60.

    a. New, smooth round steel bars.

    b. Coated with organic coating AASHTO M 254, corrosion resistant coated dowel bars.

2. Cut bars true to length with ends square and free of burrs.

E. Reinforcement Accessories:

1. Tie Wire: Annealed, minimum 16 gauge.

2. Chairs, Bar Supports, Bolsters, Spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place shall comply with CRSI's "Manual of Standard Practice’.

3. Chairs, Bar Supports, Bolsters, Spacers, and other devices for spacing: Sized and shaped for adequate support of reinforcement during concrete placement.

2.03 CONCRETE MATERIALS

A. Concrete Materials:

1. Concrete shall consist of aggregate, portland cement, water, approved air-entraining and other admixtures and pozzolans.

B. Cement:

1. Type I, Type II, Type I/II and Type III Portland cement shall conform to the requirements in ASTM C 150 with the following additional requirements:

   a. Portland cement shall not contain more than 0.60 percent equivalent alkali.

   b. Processing additions may be used in the manufacture of the cement, provided such materials have been shown to meet the requirements of ASTM C 465 and the total amount does not exceed 1 percent of the weight of Portland cement clinker.

2. Interground and Blended Cement shall conform to the requirements in ASTM C 595 with the following additional requirements:

   a. Interground/Blended cement Type IP

      (i) Type IP(25) shall be composed of Class F fly ash or Class N pozzolan replacement shall be 25%+/-2%

      (ii) Type IP(20) shall be composed of Class F fly ash or Class N pozzolan replacement shall be 20%+/-2%

   b. Interground/Blended cement Type IT

      (i) For SCMs, slag cement and limestone, the maximum replacement by weight shall be 40%. The manufacturer has a production tolerance of +2% from the proposed replacement.

      (ii) For slag cement, the maximum replacement shall be 20% or less when incorporated into the final Interground/Blended cement.

      (iii) For limestone cement, the replacement range shall be from 5.1% to 10.0% when incorporated into the final Interground/Blended cement.

C. Normal weight Fine and Coarse Mix Aggregate:

1. Mineral aggregates shall be crushed rock, broken stone, gravel, sand-gravel, coarse sand, fine sand, or a mixture of these materials composed of clean, hard, durable, and uncoated particles.

2. Shall meet the requirements in ASTM C 33.

3. Aggregates shall be free from injurious quantities of dust, soft or flaky particles, loams, alkali, organic matter, paper, wood, or other deleterious matter as determined by Engineer.

4. Free of materials with deleterious reactivity to alkali in cement.

D. Fly Ash: Shall meet the requirements in Class F; ASTM C 618 and ASTM C 311.

1. The use of Class C Fly ash is not acceptable in any concrete on this project.

E. Water:

1. Shall meet the requirements in ASTM C 94 and potable.

2. Water shall be free from objectionable quantities of oil, acid, alkali, salt, organic matter, or other deleterious materials.

2.04 ADMIXTURES

A. Contractor shall report the source, type, name, and amount of each admixture.

B. Air-Entrainment Admixture:

1. Shall meet the requirements in ASTM C 260;

2. For concrete that requires shrinkage reducing admixture, ensure that the air entrainment admixture that meets the shrinkage reducing admixture's manufacturer's requirements is utilized.

C. Plasticizing and Retarding Admixture: Shall meet the requirements in ASTM C 1017.

D. Other Chemical Admixtures:

1. Refer to approved products list in the applicable State or Local Standard Specifications or as specified in Section 01 10 00 - Special Provisions.

2. Admixtures shall meet the requirements in ASTM C 494.

3. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of concrete.

4. Admixture shall not contain more than 1 percent of chlorides calculated as calcium chloride.

2.05 CONCRETE ACCESSORIES

A. Vapor Retarder: 10 mil thick nonwoven, polyester-reinforced, polyethylene coated sheet, type recommended for below grade application.

B. Water Stops:

1. Corps of Engineers (COE) CRD-C 572 and ASTM Standards

2. PVC type

3. Factory fabricated corners, intersections and directional changes.

4. Profile: Flat, ribbed with center bulb.

5. Size: 4", unless specified differently on the Plans or Special Provisions.

6. Pre-approved Manufacturers:

a. Greenstreak

b. Progress Unlimited, Inc.

c. Westec Barrier Technologies

d. Williams Products, Inc.

e. Approved Equivalent

C. Joint Filler: Preformed, non-extruding, bituminous type, AASHTO M 33.

D. Joint Sealer: Asphaltic, hot poured, ASTM D 3405.

1. Application: Use for joints in vehicular traffic areas.

E. Joint Sealer: Polyurethane, self-leveling; ASTM C 920, Class 25, (Uses - T, I, M and A), Type S - single component.

1. Color: Gray.

2. Applications: Use for joints in pedestrian walkways.

2.06 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz/sq yd dry.

C. Moisture-Retaining Cover: ASTM C 171; clear polyethylene or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

F. Liquid Membrane-Forming Compounds for Curing Concrete: White pigmented, AASHTO M 148, Type 2.

2.07 CONCRETE MIX DESIGN

A. Specific mix design criteria for project components as stated in Section 01 10 00 – Special Provisions.

B. For trial mixtures method, employ independent testing agency acceptable to Engineer for preparing and reporting proposed mix designs.

C. Admixtures: Add acceptable admixtures as recommended in ACI 211 and at rates recommended by manufacturer.

1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizers) in concrete, as required, for placement and workability.

2. Use water-reducing and retarding admixture when required by high temperatures, low humidity or other adverse placement conditions.

D. Non-Shrink Grout:

1. 6 sack grout, with the following quantities:

a. Cement: Type I, 2.87 cubic feet

b. Sand: Masonry sand, 17.97 cubic feet

c. 6% entrained air

d. Water: 4.54 cubic feet

e. POZZ 900 oz./100 admixture, 12 per mix

f. Water-Cementitious Ratio: 0.502 at SSD aggregate moisture

g. Unit Weight: 140.20 lbs./cf

E. Maximum Water-Cementitious Materials Ratio: As specified by the applicable State or Local Standard Specifications or as specified in Section 01 10 00 - Special Provisions.

F. Air Content: As specified by the applicable State or Local Standard Specifications or as specified in Section 01 10 00 - Special Provisions.

2.08 MIXING

A. Ready-Mixed Concrete: Measure, batch, mix and deliver concrete according to ASTM C 94 and ASTM C 1116 and furnish batch ticket information.

1. When air temperature is between 85 and 90 degrees F, reduce mixing and delivery time from 1 1/2 hours to 75 minutes. When air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify lines, levels and dimensions before proceeding with work of this section.

B. Verify compacted subgrade is acceptable and ready to support footings, slabs and any other imposed loads.

3.02 PREPARATION

A. Notify Engineer a minimum of 48 hours prior to commencement of concreting operations.

B. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured.

1. Set edge forms, bulkheads and intermediate screed strips for slabs to achieve required alignment, elevation and slope in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

2. Chamfer exterior corners and edges of permanently exposed concrete.

3. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt and other debris just before placing concrete.

4. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

5. Verify that forms are clean and free of rust before applying release agent. Coat contact surfaces of forms with form-releasing agent, according to manufacturer's directions, before placing reinforcement.

6. Use of excavated earth back form shall not be permitted unless approved by Engineer. All structural walls shall be formed with form panels.

C. Removing and Reusing Forms:

1. Fabricate and assemble formwork to permit easy stripping and dismantling without damage to concrete. Forms shall be easily removed without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood inserts for forming keyways, reglets, recesses and the like for easy removal.

2. Formwork for sides of beams, walls, columns and similar parts of the work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 degrees F for 24 hours after placing concrete, provided concrete is hard enough to prevent damage by form removal operations, concrete has adequate strength to maintain structural integrity of the work and curing and protection operations are maintained.

3. Leave formwork for beam soffits, joists, slabs and other structural elements that support weight of concrete in place until concrete has achieved at least 70 percent of 28-day design compressive strength.

4. Clean and repair surfaces of forms to be reused in the work. Split, frayed, delaminated or otherwise damaged form-facing material is not acceptable for exposed surfaces. Apply new form-release agent.

5. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms on exposed concrete surfaces unless approved by Engineer.

D. Embedded Items:

1. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions and directions furnished with items to be embedded.

a. Install anchor bolts, accurately located, to elevations required.

E. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

F. Vapor Retarder Under Interior Slabs on Grade:

1. Place, protect and repair vapor-retarder sheets according to ASTM E 1643 and manufacturer's instructions.

3.03 REINFORCEMENT

A. Delivery, Storage and Handling

1. Deliver, store and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

B. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale and accurately position, support and secure in place to achieve not less than minimum concrete coverage required for protection.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

C. Accurately position, support and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Tying Reinforcement:

1. Tie reinforcing bars securely in place at all points where bars cross other reinforcing bars.

2. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practical length on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least 1 mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Splice laps with tie wire.

F. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely and will not interfere with concrete placement.

G. Welding on reinforcing steel is prohibited unless specifically authorized by Engineer.

3.04 JOINT PLACEMENT

A. Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired at locations indicated or as approved by Engineer.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.

2. Form with preformed galvanized steel, plastic keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1 1/2 inches into concrete.

3. Locate joints for beams, slabs, joists and girders in the middle third of span. Offset joints in girders a minimum distance of twice the beam width from beam-girder intersection.

4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, girders and at top of footings or floor slabs.

5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners and in concealed locations where possible.

6. Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade. Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least 1/4 of concrete thickness as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate tool marks on concrete surfaces.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8 inch wide joints into concrete when cutting action will not tear, abrade or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams and other locations as indicated.

1. Extend joint filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.

2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants are indicated.

3. Install joint-filler strips in lengths as long as practical. Where more than one length is required, lace or clip sections together.

E. Dowel Joints: Install dowel sleeves and dowels or dowel bar and support assemblies at joints where indicated. Use dowel sleeves or lubricate or asphalt-coat 1/2 of dowel length to prevent concrete bonding to 1 side of joint.

F. Water Stops:

1. Flexible Water Stops: Install in construction joints as indicated to form a continuous diaphragm. Install in longest lengths practical. Support and protect exposed water stops during progress of work. Field fabricate joints in water stops according to manufacturer's instructions.

3.05 PLACING CONCRETE

A. Follow recommendations of ACI 306R when concreting during cold weather.

B. Follow recommendations of ACI 305R when concreting during hot weather.

C. Before placing concrete, verify that installation of formwork, reinforcement and embedded items are complete and required inspections have been performed.

D. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas a minimum of 6 inches and seal watertight.

E. Install joint devices in accordance with manufacturer's instructions.

F. Ensure reinforcement, embedded parts and forms are not disturbed during concrete placement.

G. Do not add water to concrete during delivery, at project site or during placement unless approved by Engineer.

H. Deposit concrete continuously or in layers at such thickness that no concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation. Concrete free fall distance shall not exceed 5 feet. This includes free fall in a discharge pipe. Chutes and tremie pipes may be used for conveying concrete to the forms when authorized by Engineer.

I. Deposit concrete in forms in horizontal layers no deeper than 18 inches and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic to avoid cold joints.

1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.

2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layers and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration as necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate.

J. Deposit and consolidate concrete for floors and slabs in continuous operation, within limits of construction joints, until placement of panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.

2. Maintain reinforcement in position on chairs during concrete placement.

3. Screed slab surfaces with a straightedge and strike off to correct elevations.

4. Slope surfaces uniformly to drains where required.

5. Begin initial floating using bull floats or darbies to form a uniform and open-texture surface plane, free of humps or hollows, before excess moisture or bleedwater appears on surface. Do not further disturb slab surfaces before starting finishing operations.

K. Pumping Concrete:

1. Pump concrete into forms in a continuous stream and free of air pockets. Eject concrete in the pipeline in such a manner that there will be no contamination or segregation of the concrete.

2. Use pump discharge pipes designed to maintain a positive pressure head on the concrete. Free fall distance shall not exceed 5 feet at discharge.

3. Perform air test, slump tests and fabrication of concrete test cylinders at the final discharge point.

L. Cold-Weather Placement: Comply with ACI 306.1 and as follows:

1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions or low temperatures.

2. When air temperature has fallen to or is expected to fall below 40 degrees F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 degrees F and not more than 80 degrees F at point of placement.

3. Do not use frozen materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

4. Do not use calcium chloride, salt or materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.

M. Hot-Weather Placement: Comply with ACI 305R and as follows when hot weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 degrees F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.

3. Fog-spray forms, steel reinforcement and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots or dry areas.

N. Screed floors level, maintaining surface flatness of maximum 1/4 inch in 10 feet.

3.06 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.

B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.

C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:

1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive not more than 24 hours after form removal.

2. Grout Cleaned Finish: Wet areas to be cleaned and apply grout mixture by brush or spray; scrub immediately to remove excess grout. After drying, rub vigorously with clean burlap and keep moist for 36 hours.

3. Cork Floated Finish: Immediately after form removal, apply grout with trowel or firm rubber float, compress grout with low-speed grinder and apply final texture with cork float.

D. Concrete Floors and Slabs: Finish to requirements of ACI 302.1R and as follows:

1. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Straighten, cut down high spots and fill low spots. Repeat float passes and straightening until surface is left with a uniform, smooth, granular texture.

    a. Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up membrane roofing or sand-bed terrazzo.

2. Trowel Finish: After applying float finish, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue troweling passes and straighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

    a. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic, or quarry tile set over a cleavage membrane, paint or another thin-film finish coating system.

    b. Finish and measure surface so gap at any point between concrete surface and an unleveled freestanding 10-foot long straightedge, resting on 2 high spots and placed anywhere on the surface, does not exceed 1/4 inch.

3. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thick-set or thin-set method.

    a. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with fine broom.

4. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps and elsewhere as indicated.

    a. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Engineer before application.

5. Burlap Drag Finish: Apply a burlap drag finish to paving, parking areas and elsewhere as indicated.

a. Immediately after float finishing, texture by dragging a wet burlap, carpet or canvas belt over full width of surface in longitudinal direction.

b. Suspend drag from mandrel or similar device to ensure uniform texture.

c. Rinse or wash drags as necessary to obtain uniform texture.

d. Replace drags which cannot be cleaned.

3.07 CURING AND PROTECTION

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold weather protection and with recommendation in ACI 305R for hot weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry or windy conditions cause moisture loss approaching 0.2 lb/sq ft per hour before and during finishing operations.

1. If the rate of evaporation approaches 0.2 lb/sq ft per hour, Contractor must notify Engineer regarding the additional actions that will be taken to prevent plastic shrinkage cracking.

2. Obtain rate of evaporation from applicable State or local Standard Specification.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing by one or a combination of methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than 7 days with the following materials:

a. Water.

b. Continuous water-fog spray.

c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining Cover Curing: Cover concrete surfaces and sides with moisture-retaining cover for curing concrete, placed in widest practical width, lapped at least 12 inches and sealed with waterproof tape or adhesive. Cure for not less than 7 days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.

b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.

c. Cure concrete surfaces to receive floor covering with either a moisture-retaining cover or a manufacturer recommended curing compound for use with floor coverings.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Repeat process 24 hours later and apply second coat. Maintain continuity of coating and repair damage during curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings and other surfaces, by one of the methods listed above in formed surfaces.

3.08 JOINT FILLING

A. Prepare, clean and install joint filler according to manufacturer's directions.

B. Remove dirt, debris, saw cuttings, curing compounds and sealers from joints; leave contact faces of joint clean and dry.

C. Install semi-rigid epoxy joint filler depth in saw-cut joints and at least 2 inches into deep-formed joints. Overfill joint and trim joint filler flush with lip of joint after hardening.

3.09 FIELD QUALITY CONTROL

A. An independent testing agency employed by Owner shall perform field quality control tests as specified in Section 01 40 00 - Quality Requirements.

1. Contractor shall provide free access to concrete operations at project site and cooperate with testing agency.

2. Contractor shall submit proposed mix design of each class of concrete to Engineer and testing agency for review prior to commencement of concrete operations.

3. Results of testing shall be furnished in a timely manner to Owner, Engineer and Contractor, in writing.

4. Field testing and laboratory testing of concrete will be performed by testing agency employed by Owner to determine conformance with specified requirements.

5. Strength Testing:

a. Compressive Strength Test Samples: ASTM C 39. For each test, mold and cure 3 concrete test cylinders. A set of 3 test cylinders shall be collected for every 100 cubic yard or fractional part thereof for each class of concrete placed in a day. At least one set of cylinders is required for each day concrete placement takes place.

(i) One additional cylinder may be required for a break prior to 7 days.

(ii) Take 1 additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

b. Maturity Method for Estimating Strength: ASTM C 1074. The Contractor may elect to utilize the maturity curve method to determine concrete strength. The Contractor must notify the Engineer in writing and submit a Plan with any changes applicable with State or local standard specifications.

6. Perform 1 slump test for each set of test cylinders taken.

a. If the concrete mixture is excessively wet causing segregation, excessive bleeding, or any other undesirable condition, the concrete shall be rejected.

b. If the slump is outside the allowable limits specified in Section 01 10 00 - Special Provisions, the load of concrete shall be rejected.

7. Perform 1 air content test for each set of test cylinders taken.

a. If the air content is less than the minimum specified, only one addition of air-entraining admixtures is allowed.

b. If the air content is then outside the allowable limits specified in Section 01 10 00 - Special Provisions, the load of concrete shall be rejected.

B. The independent testing agency employed by Owner will maintain records of placed concrete items and Contractor shall assists testing agency as necessary to accomplish the completion of this record keeping. Records will include; type of test samples taken, all test results, date and location of sample collected, concrete test cylinder number, quantity of concrete placed and slump, air content, air temperature test results.

C. Additional Tests: The testing agency employed by Owner shall make additional tests of concrete, as directed by Engineer, when test results indicate that slump, air entrainment, compressive strengths or other requirements have not been met.

1. The cost for this additional testing will be paid for by Contractor.
2. If any additional testing is required to isolate failures, this shall be considered retests and shall be paid for by Contractor.

3.10 DEFECTIVE CONCRETE

A. All materials which Engineer determines to be damaged, defective, or otherwise unsuitable for use will be rejected and shall be removed and replaced at Contractor's expense.

B. Contractor will be required to take corrective measures for high spots or low areas by removal and replacement, or by grinding with a machine equipped with multiple diamond blades with spacers to the required profile. If grinding is used, utilize methods which do not break the cement and aggregate bond. Engineer will determine whether defective concrete will be repaired, or if it will be rejected and removed and replaced. Contractor shall submit the proposed corrective action plan and receive Engineer AND

Owner approval prior to performing corrective measures. The approved corrective measure will be done at Contractor's expense.

C. Contractor will be required to take corrective measures for any cracking of concrete no matter what the cause. The corrective measures may include routing and sealing the cracks or removal and replacement. Engineer will determine whether defective concrete will be repaired, or if it will be rejected and removed and replaced. Contractor shall submit the proposed corrective action plan and receive Engineer AND Owner approval prior to performing corrective measures. The approved corrective measures will be done at Contractor's expense.

D. Joints: Contractor will be required to take corrective measures for any joints that in the opinion of Engineer are not constructed per the plans and specifications. Contractor shall submit the proposed corrective action plan and receive Engineer AND Owner approval prior to performing corrective measures. The approved corrective measures will be done at Contractor's expense.

E. Contractor will be required to take corrective measures for any concrete containing excessive honeycombing, spalling, fractures, chips and concrete that does not conform to required lines, details, dimensions, tolerances, specified requirements or other defects at no additional cost to Owner. The corrective measures may include repairing concrete or removal and replacement of concrete. Engineer will determine whether defective concrete will be repaired, or if it will be rejected and removed and replaced. Contractor shall submit the proposed corrective action plan and receive Engineer AND Owner approval prior to performing corrective measures. The approved corrective measures will be done at Contractor's expense.

F. Contractor must protect the concrete from damage due to rain, premature drying, excessive hot or cold temperatures, foot traffic and vehicular traffic. Failure to properly protect concrete may constitute cause for repairing or for removal and replacement of defective concrete. Engineer will determine whether defective concrete shall be repaired, or if it shall be rejected and removed and replaced. Contractor shall submit the proposed corrective action plan to address the defective concrete and receive Engineer AND Owner approval prior to performing corrective measures. The approved corrective measures will be done at Contractor's expense.

G. The cost of any additional testing performed as a result of repairing or removal and replacement of defective concrete shall be borne by Contractor when defective concrete is identified.

3.11 TOLERANCES

A. Maximum Variation of Surface Flatness: 1/8 inch in 10 feet.

B. Maximum Variation from True Position: 1/4 inch.

C. All concrete shall meet or exceed the strength requirement of the specifications.

1. If concrete does not meet the minimum strength requirement, the Contractor may elect to further evaluate the use of the concrete in place. Evaluation shall be performed by the Engineer of record, at the Contractor's expense. .

2. Concrete not approved by the Engineer shall be rejected and shall be removed and replaced at Contractor's expense.

D. All concrete shall meet or exceed the minimum thickness as per the plans and specifications.

1. If concrete does not meet the minimum thickness requirement, the Contractor may elect to further evaluate the use of the concrete in place. Evaluation shall be performed by the Engineer of record, at the Contractor's expense.

2. Concrete not approved by the Engineer shall be rejected and shall be removed and replaced at Contractor's expense.

END OF SECTION

SECTION 31 23 19

DEWATERING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Excavation dewatering

1.02 REFERENCES

A. ASTM D 422 – Standard Test Method for Particle Size-Analysis of Soils (Withdrawn 2016)

B. ASTM D 698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))

C. ASTM D 1556 – Standard Test Method for Density and Unit Weight of Soil in place by the Sand-Cone Method

D. ASTM D 1587 – Standard Practice for Thin-Walled Tube Sampling of Fine-Grained Soils for Geotechnical Purposes

E. ASTM D 2216 – Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

F. ASTM D 2488 – Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)

G. ASTM D 4220 – Standard Practices for Preserving and Transporting Soil Samples

H. ASTM D 4318 – Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils

I. ASTM D 6938 – Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

1.03 SCOPE OF WORK:

A. The work in this Section includes site dewatering necessary to lower and control groundwater level and hydrostatic pressure, and controlling the site drainage and surface water flows, to allow construction to be performed.

1. It is required that the groundwater level be lowered and maintained at the level necessary to provide a substantially dry and stable grade to allow subsequent operations to be performed.
2. The Contractor shall install all such dewatering equipment as may be necessary, throughout the duration of the project, to maintain the groundwater level, as required.
3. Contractor is responsible for controlling discharge rate and the dewatering system’s effect on the groundwater level.
4. The Contractor shall intercept and divert site drainage and surface water flows away from excavations and trenches; using dikes, ditches, pipes, sumps, pumps or other means.
5. The Contractor shall remove standing water from trench or excavation with sumps, pumps and piping or other means.

B. It shall be Contractor's responsibility to select materials, methods, and equipment, and design a dewatering system which will:

1. Provide a substantially dry and stable grade to allow subsequent operations to be performed.
2. Effectively reduce the hydrostatic pressure and lower the groundwater level, as required.
3. Not result in damage to adjacent properties, buildings, structures, utilities, private and public water wells, or other work, as a result of settlement, standing water or other groundwater-related effects.

C. Dewatering operations shall be adequate to assure the integrity of the finished project.

D. The responsibility for conducting the dewatering operation in a manner, which will protect adjacent structures and facilities, rests solely with Contractor.
1. The cost of repairing any damage and/or the restoration or replacement of adjacent structures and facilities that are damaged as a result of the dewatering operations shall be the sole responsibility of Contractor.

E. The Contractor shall be solely responsible for the design, installation, operation, maintenance, monitoring, and removal of the dewatering system.

1.04 POWER

A. All power necessary for dewatering, intercepting and diverting the site drainage and surface water flows away from the excavation, and removing standing water from trench or excavation with a sump and pump shall be provided by Contractor at his sole cost and expense and shall be considered incidental and subsidiary to other items of work for which direct payment is made. No separate payment will be made for this power.

1.05 MEASUREMENT AND PAYMENT (INCIDENTAL)

A. Unless otherwise stated in Section 01 10 00 - Special Provisions, measurement and separate payment for dewatering will not be made.

B. Dewatering, including intercepting and diverting site drainage and surface water flows away from excavations and trenches, and removing standing water from trench or excavation with a sump and pump shall be considered incidental and subsidiary to other items of work for which direct payment is made.

1.06 REGULATORY REQUIREMENTS

A. The Contractor shall be responsible for submitting the applications and securing all permits necessary to complete the requirements of this Section.
1. Owner will support Contractor’s efforts in securing the required permits, as necessary.
2. To support Contractor’s efforts in securing required permits, if required by regulatory authority, Owner will sign the permit application documents that have been prepared by Contractor and reviewed and approved by Owner.
    a. Contractor shall prepare necessary documents, required by regulatory authority to be signed by Owner, and shall provide Owner a minimum of 5 (five) working days for Owner to review and approve documents.
3. Contractor shall provide a copy of all permits that are secured to Owner through Engineer.

4. A copy of all necessary permits shall be maintained by Contractor at the work site at all times during the performance of the work.

B. The Contractor shall comply with requirements of applicable regulatory authorities for the dewatering system, including but not limited to the construction of the dewatering system and the control and discharge of groundwater from dewatering operations.

C. The Contractor shall coordinate dewatering activities with Owner, other Contractors, Sub-contractors and regulatory authorities.

D. The Contractor shall comply with the site-specific requirements included in any permits, including the possible modification of the dewatering system or adjustment of the dewatering operation, if the discharge exceeds limits imposed by a regulatory permit.

1. Obtain regulatory authority's specific discharge requirements prior to commencement of dewatering.
2. The Contractor will be responsible for the costs of flow measurement, sampling, analysis and reporting, required by a regulatory permit.

E. Where applicable, Contractor shall provide a pollution prevention plan and implement any Best Management Practices needed to achieve necessary results.

1.07 SUBMITTALS

A. Prior to commencement of construction, if dewatering to lower the groundwater level is to be performed, submit the detailed dewatering plan for Owner's and Engineer's record. Review and approval of the dewatering plan by Owner and/or Engineer is not required. The detailed dewatering plan shall, at a minimum, include:

1. Complete description of equipment and instrumentation Contractor plans to utilize in dewatering, with the installation, operation, maintenance and monitoring procedures.
2. Dewatering system design, complete with design calculations and shop drawings demonstrating the adequacy of the proposed system and equipment.
3. Arrangement, location and depths of the components of the dewatering system.
4. Estimated pumping rates for dewatering system.
5. Estimated duration of dewatering operations.
6. Method of disposal of groundwater pumped from dewatering system.
7. Method of water quality monitoring, if required by regulatory authority.
8. Method of flow measurement, if required by regulatory authority.
9. Method for monitoring the groundwater level at the construction site.
10. If applicable, the name of subcontractor(s) responsible for dewatering and their contact information.
11. Source of power for dewatering.
12. Description and location of standby equipment and standby power supply.
13. Description of the process to decommission the dewatering system, including the criteria for determining the schedule for ending dewatering system operation.

B. Submit copies of the special permits required for performing the work of this Section.

PART 2 - PRODUCTS

2.01 EQUIPMENT

A. Contractor shall furnish, install and remove all equipment and materials necessary for dewatering, control of site drainage and surface water flows and removing standing water from excavations or trenches.

B. Equipment and materials may include, but is not limited to, sump pumps, single or multiple stage well point systems, eductor and ejector type systems, deep wells, well pumps, berms, dikes, ditches, sumps, temporary pipelines, treatment systems or any combinations thereof.

C. Contractor shall provide adequate standby equipment and competent personnel; available at all times, to insure continuous and efficient dewatering operations are maintained.

D. Contractor shall furnish and install equipment, as necessary, to comply with flow measurement and water quality monitoring requirements of regulatory authorities or permit requirements.

PART 3 - EXECUTION

3.01 GENERAL

A. The Contractor shall furnish, install, and operate pumps, pipes, appliances, and equipment as necessary to maintain the groundwater level as required within the excavation limits, control site drainage and surface water flows, and remove standing water from excavations and trenches.

1. Dewatering system shall be designed, installed, operated and maintained to lower and control the groundwater level to permit excavation, construction and placement of backfill materials to be performed under substantially dry and stable soil conditions.
2. Contractor shall maintain the required groundwater level, until the construction is completed, backfilled and operational.
3. Dewatering shall at all times be conducted in a manner that preserves the undisturbed bearing capacity of subgrade soils.
4. Contractor shall prevent flotation by maintaining a positive and continuous removal of groundwater and control of surface water. Contractor is responsible and liable for all damages that may result from failure to adequately keep excavations and trenches dewatered.
5. Contractor shall locate dewatering facilities where they will not interfere with existing or proposed utilities or structures, or the work to be performed by others.
6. Contractor shall use sand-pack or provide other means to prevent pumping of fine sands or silts from the subsurface.

B. Observation and Operational Control

1. Adequate observation and operational control and routine inspections shall be provided by Contractor at all times to ensure proper operation and compliance with any permits or water quality requirements.

2. Temporary diversions, sumps, channels and flow outlets shall be inspected regularly by Contractor for erosion and accumulated sediment, and repairs and maintenance shall be done, as needed, in a timely manner.
    a. Sediment shall be disposed of in accordance with all applicable laws and regulations.
3. Adequate observation and operational control shall be maintained by Contractor at all times to ensure that the stability of excavated grade and slopes is not adversely affected by dewatering.
4. Adequate observation and operational control shall be maintained by Contractor to ensure that erosion is controlled and that flooding or damage to the excavation, adjacent structures or facilities, and downstream property does not occur.
5. Contractor shall monitor dewatering system to ensure that subsurface soil, sand or fine-sized soil particles are not being removed by the dewatering operation.

C. Dispose of groundwater in a suitable manner.
1. Contractor shall NOT drain groundwater into work built or under construction.
2. Wherever possible, groundwater shall be discharged into a nearby, existing storm sewer or drainage system.
3. Contractor shall obtain all permits required for discharge of groundwater from authorities having jurisdiction.
    a. Any groundwater discharged shall comply with applicable permit requirements.
    b. Methods of groundwater discharge, conveying, and transmission to off-site locations shall meet with the approval of the authorities having jurisdiction.
    c. Treat any groundwater collected by dewatering operations prior to discharge, as required by authorities having jurisdiction.
        (i) Remove solids from groundwater treatment facilities and perform other maintenance of groundwater treatment facilities as necessary to maintain their efficiency.
    d. Discharge groundwater as required by permits and in manner that will not cause erosion or flooding, or otherwise damage existing facilities, facilities under construction or adjacent property.

D. Contractor shall control site drainage and surface water flows at all times and shall remove standing water from trench or excavation.
1. Intercept and divert site drainage and surface water flows away from excavations and trenches, drain standing water to sumps and pump or drain away by gravity to keep the excavation free from standing water.
2. Any water discharged shall comply with regulatory authority requirements and applicable permit conditions.

E. Contractor shall provide any temporary piping necessary to convey dewatering discharge to an acceptable drainage structure with the capacity to convey said discharge.

1. Any temporary piping, necessary to complete the project, shall be provided by Contractor.

F. Contractor shall modify any dewatering procedures, which cause or threaten to cause damage to new or existing facilities, to prevent further damage.

1. The Contractor is responsible for determining the extent of any modifications that are to be made, and shall implement these modifications at no additional cost to the Owner.

G. The dewatering system shall be placed into operation, prior to beginning excavating and shall be operated continuously 24 hours a day, 7 days a week until construction that is subject to effects of groundwater is complete and backfill materials have been placed.

1. Provide back-up equipment as necessary for replacement and for unanticipated emergencies.

2. If the dewatering system fails to operate properly, shuts down or pumping is suspended before scheduled and the groundwater rises above the level required, the groundwater level will need to be lowered to the level required, prior to continuing any construction, including excavation or backfilling.

a. If the excavation or backfill is prematurely subjected to an increase in groundwater level, additional soil testing, as determined necessary by Engineer, will be performed, to verify soils stability and suitability.

b. The additional testing shall be conducted prior to continuing construction and may include compaction test, moisture content test and other soil testing to determine the soil condition.

c. If the soil stability or soil condition is determined to be unacceptable by Engineer, Contractor shall take such corrective action as is necessary to provide acceptable soil conditions, at Contractor's sole cost and expense.

d. The cost of any additional soil testing required as a result of a premature increase in groundwater level shall be borne solely by Contractor.

H. Contractor shall establish, observe, and record reference points to detect any settlement of structures adjacent to areas of proposed dewatering.

1. Take and record elevation measurements not less than once per week and report results to Owner through Engineer weekly during the entire dewatering system operation.

2. Upon completion of dewatering, take weekly measurements for a period of 4 weeks and report results to Owner through Engineer weekly.

3. Notify Owner through Engineer and take immediate remedial action, if movement of the existing structure occurs during the performance of the work.

4. Modify dewatering procedures that cause, or threaten to cause any movement or damage to new or existing facilities, to prevent further movement or damage.

3.02 OPERATIONAL RECORDS

A. Contractor shall submit to Owner, through Engineer, copies of records of:

1. Discharge volume on a periodic basis, as required by regulatory authority.
2. Water quality test results on a periodic basis, as required by regulatory authority.
3. Submit records of elevation readings taken on existing structure in the area that may be affected by dewatering operations, monthly.

3.03 UNSTABLE SOIL CONDITIONS

A. If during or after any excavation, Contractor observes sufficient soil instability present to prevent the proper installation of pipe bedding, pipelines, foundation material, subgrade preparation, structure, backfill and compaction, then Contractor shall call for inspection of conditions by the Engineer.

3.04 RESTORATION

A. Allow groundwater to return to its static level in such a manner as to maintain the undisturbed state of the natural foundation soils, prevent disturbance of compacted backfill and prevent flotation or movement of structures or pipelines.

B. Provide materials, equipment and labor necessary to remove all temporary dewatering system components and equipment prior to contract closeout.

C. All dewatering wells and well points shall be decommissioned in strict compliance with applicable regulatory requirements.

D. Restore to conditions equivalent to those existing prior to start of work, including repair of any settlement related damage.

END OF SECTION

SECTION 31 23 23

FILL AND BACKFILL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Filling, backfilling and compacting for building volume below grade, footings, slabs-on-grade, paving, site structures and utilities all within the building envelope, and pile caps.

B. Filling holes, pits and excavations generated as a result of removal operation.

C. Backfilling around and outside of structures.

1.02 REFERENCES

A. AASHTO T 180 – Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop; American Association of State Highway and Transportation Officials.

B. ASTM C 136 – Standard Test Method for Sieve Analysis of Fine Coarse Aggregates.

C. ASTM D 698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb/ft3 (600 kN-m/m3)).

D. ASTM D 1556 – Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.

E. ASTM D 1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3).

F. ASTM D 2167 – Standard Test Method for Density and Unit Weight of Soil in Place by Rubber Balloon Method.

G. ASTM D 2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

H. ASTM D 6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

I. ASTM D 4318 – Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

J. State Standard Specifications for Highway Construction, latest edition, including all current supplemental specifications.

1.03 UNIT PRICES

A. Fill and backfill is considered subsidiary to the work included in the project.

1.04 SUBMITTALS

A. Samples: 60-pound sample of each type of fill. Submit airtight containers to testing laboratory.

B. Materials Sources: Submit name of imported materials source.

C. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.

D. Compaction density test reports.

1.05 PROJECT CONDITIONS

A. Provide sufficient quantities of fill to meet project schedule and requirements. When necessary, store materials on-site in advance of need.

B. When fill materials need to be stored on-site, locate stockpiles where designated.

1. Separate differing materials with dividers or stockpile separately to prevent intermixing.

2. Prevent contamination.

3. Protect stockpiles from erosion and deterioration of materials.

C. Verify that survey benchmarks and intended elevations for work are as indicated.

PART 2 - PRODUCTS

2.01 FILL MATERIALS

A. Fill Materials: All recommendations in the geotechnical report shall be followed. In the absence of a geotechnical report, the fill materials shall meet the criteria stated in this section.

B. Non-structural Fill: Subsoil excavated on-site.

1. Material should not contain an appreciable amount of roots, rock, or debris, and should not contain any foreign material with a dimension greater than 3 inches.

2. ASTM C 2487 classification: GW, GP, GM, GC, SC, SW, SP, SM, ML, CL-ML or CL.

3. Liquid limit: Less than 45.

4. Maximum plasticity index: 20.

5. See Geotechnical Report for additional information, if available.

C. Structural Fill: Subsoil excavated on-site.

1. Low volume change cohesive soils, free of organic matter, rocks or foreign material.

2. ASTM D 2487 classification: CL, ML, or CL-ML.

3. Liquid limit: Less than 45.

4. Maximum plasticity index: 20.

5. See Geotechnical Report for additional information, if available.

D. Flowable Fill:

1. A mixture of cement, fly ash, fine sand, water and air having a consistency which will flow under a very low head.

2. Approximate quantities, per cubic yard:

a. Cement (Type II): 50 Lbs.

b. Fly ash: 200 Lbs.

c. Fine Sand: 2,700 Lbs.

d. Water: 420 Lbs.

e. Air Content: 10 percent

3. Compressive Strength: 85 to 175 psi.

E. Topsoil: Topsoil excavated on-site.

1. Unclassified.

2. Free of roots, rocks, subsoil, debris, large weeds and foreign matter.

I. Water: Water required for fill and backfill is Contractor's responsibility. The cost of furnishing water will not be a direct pay item but is to be included in other items for which payment is made, unless stated otherwise.

2.02 SOURCE QUALITY CONTROL

A. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.

B. If tests indicate materials do not meet specified requirements, change material and retest.

C. Provide materials of each type from same source throughout the work.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Identify required lines, levels, contours and datum locations.

B. Verify subdrainage, dampproofing or waterproofing installation has been inspected.

C. Verify structural ability of unsupported walls to support imposed loads by the fill.

3.02 PREPARATION

A. Scarify and proof roll subgrade surface to a depth of 6 inches to identify soft spots.

B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with specified fill.

C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.03 FILLING AND BACKFILLING

A. Fill to contours and elevations indicated using unfrozen materials.

B. Employ a placement method that does not disturb or damage other work.

C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

D. Maintain optimum moisture content of fill materials to attain required compaction density.

E. Fill and Backfill: Place and compact materials in equal, continuous layers not exceeding 6 inches compacted depth (as recommended in geotechnical report or Section 01 10 00 – Special Provisions).

F. Slope grade away from building minimum 2 percent or as shown on the plans. Make gradual grade changes. Blend slope into level areas.

G. Correct areas that are over-excavated.

1. Load-Bearing Foundation Surfaces: Use structural fill, flush to required elevation, compacted as per the geotechnical report.

2. Other Areas: Use non-structural fill, flush to required elevation, compacted as per the geotechnical report.

H. Compaction density(s) shall be as recommended in the geotechnical report or Section 01 10 00 – Special Provisions.

I. Reshape and recompact areas subjected to vehicular traffic.

3.04 TOLERANCES

A. Top Surface of Fill: Plus or minus 0.08 foot from required elevations.

3.05 FIELD QUALITY CONTROL

A. Compaction density testing shall be performed on compacted fill in accordance with ASTM D 1556, ASTM D 2167, or ASTM D 6938.

B. Results shall be evaluated in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 "standard proctor", ASTM D 1557 "modified proctor" or AASHTO T 180.

C. If tests indicate work does not meet specified requirements, remove work, replace and retest.

D. Frequency of Tests:

1. Test randomly.

2. Under Paving, Slabs-on-Grade and Similar Construction: A minimum of 1 test for each lift of 0 to 2 feet in depth per 100’ x 100’ area or as determined by Engineer.

E. Proof roll compacted fill at surfaces that will be under slabs-on-grade, pavers and paving.

3.06 CLEANUP

A. Remove unused stockpiled materials; leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

B. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

END OF SECTION

SECTION 31 23 33

TRENCHING FOR UTILITIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Excavation, backfilling and compacting for utilities.

1.02 REFERENCES

A. AASHTO T 180 - Standard Specification for Moisture - Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop; American Association of State Highway and Transportation Officials.

B. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine Coarse Aggregates.

C. ASTM D 698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

D. ASTM D 1556 – Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.

E. ASTM D 1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

F. ASTM D 2167 – Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

G. ASTM D 2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

H. ASTM D 6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

I. ASTM D 4318 – Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

J. State Standard Specifications for Highway Construction, latest edition, including all current supplemental specifications.

1.03 METHOD OF PAYMENT

A. Excavation, trenching, backfilling, moisture condition and compaction are subsidiary items that are not measured for payment and for which no direct payment shall be made. Contractor must include the cost of performing this work in a related item that is identified in the plans and specifications which is measured for payment and for which direct payment is made.

1. Includes excavating to required elevations. The loading, hauling and disposal of surplus material at a site of the contractor's choice is considered subsidiary.

B. Unsuitable Materials:

1. Includes excavating materials which are determined by Engineer to be unsuitable as subgrade for pipe and/or structures, loading and removal of

unsuitable material to a site of the contractor's choice, and furnish and backfill with materials specified by Engineer.

2. Method of Measurement and Pay Unit: By the cubic yard (measured in place).

1.04 SUBMITTALS

A. Samples: 60 pound sample of each type of fill. Submit in airtight containers to testing laboratory.

B. Materials Sources: Submit name of imported materials source.

C. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.

D. Compaction density test reports.

1.05 PROJECT CONDITIONS

A. Provide sufficient quantities of fill to meet project schedule and requirements. When necessary, store materials on-site in advance of need.

B. When fill materials need to be stored on-site, locate stockpiles where designated. See Engineer.

1. Separate differing materials with dividers or stockpile separately to prevent intermixing.

2. Prevent contamination.

3. Protect stockpiles from erosion and deterioration of materials.

C. Verify that survey benchmarks and intended elevations for the work are as indicated. Notify Engineer immediately if a discrepancy is identified.

D. Protect plants, lawns, rock outcroppings, trees, amenities and other features to remain.

E. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, curbs, utility pedestals and amenities from excavating equipment and vehicular traffic.

F. Provide exploratory excavation to determine exact location of existing underground structures or utilities.

PART 2 - PRODUCTS

2.01 FILL MATERIALS

A. See Section 31 23 23 – Fill and Backfill for material specifications.

B. Refer to the Drawing, Section 01 10 00 – Special Provision, and/or geotechnical report for specific bedding material requirements.

2.02 SOURCE QUALITY CONTROL

A. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.

B. If tests indicate materials do not meet specified requirements, change material and retest.

C. Provide materials of each type from same source throughout the work.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Identify required lines, levels, contours and datum locations.

3.02 TRENCHING

A. Notify Engineer of unexpected subsurface conditions and discontinue affected work in areas until notified to resume work.

B. Slope banks of excavation deeper than 3 feet to angle of repose or less until shored.

1. Install shoring to protect pavements and structures or where backsloping is impractical.

2. Pile excavated material beyond edge of trench to prevent slides and cave-in.

C. Stockpile topsoil material for placement in areas disturbed by construction.

D. Do not interfere with 45 degree bearing splay of foundations.

E. Cut trenches wide enough to allow inspection of installed utilities.

F. Bottom width of trench not less than 8 inches nor more than 12 inches on each side of pipe, or as indicated on the Plans.

G. Hand trim excavations. Remove loose material.

H. Remove large stones and other hard matter which could damage piping or impede consistent backfilling or compaction.

I. Remove lumped subsoil, boulders and rock.

J. Remove excavated material that is unsuitable for reuse from site.

K. Stockpile excavated material to be reused in area designated on-site.

L. Remove excess excavated material from site.

3.03 PREPARATION FOR UTILITY PLACEMENT

A. Cut out soft areas of subgrade not capable of compaction in place. Backfill with specified fill.

B. Compact subgrade to density equal to or greater than requirements for subsequent fill material. See Geotechnical Report.

C. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.

D. Provide uniform bearing for each pipe section.

1. Round bottom of trench to allow at least 1/4 of the circumference to rest firmly on undisturbed earth.

2. Excavate holes for pipe bells.

E. Verify that trace wire has been installed and is unbroken or damaged.

3.04 BEDDING AND BACKFILLING

A. Backfill to contours and elevations indicated using unfrozen materials.

B. Employ a placement method that does not disturb or damage other work.

C. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

D. Adjust and maintain optimum moisture content of fill and backfill materials to attain required compaction density.

E. Fill: Place and compact materials in equal, continuous layers.

F. Place bedding material as indicated on the drawings.

G. Manually backfill under pipe haunches and around bells.

1. Fill in uniform layer on each side of pipe to prevent displacement.

2. Use handheld pneumatic or mechanical compacting equipment.

3. Use manual methods until backfill is a minimum of 12 inches above top of pipe, or as indicated on the Plans.

4. Use caution to prevent damage to trace wire.

H. Leave shoring in place where required to protect structures or pavement.

1. Cut off top of piling a minimum of 36 inches below subgrade elevation.

I. Correct areas that are over-excavated.

1. Thrust Bearing Surfaces: Fill with concrete.

2. Other Areas: Use specified fill, flush to required elevation, compacted as per the geotechnical report.

J. Reshape and recompact areas subjected to vehicular traffic.

K. Slope grade away from building and structures minimum 2 percent unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

3.05 TOLERANCES

A. Top Surface of Backfill: Plus or minus 0.08 feet from required elevations.

3.06 FIELD QUALITY CONTROL

A. Compaction density testing shall be performed on compacted fill in accordance with ASTM D 1556, ASTM D 2167, or ASTM D 6938.

B. Results shall be evaluated in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 "standard proctor", ASTM D 1557 "modified proctor" or AASHTO T 180.

C. If tests indicate work does not meet specified requirements, remove work, replace and retest.

D. Frequency of Tests:

1. Under Paving, Slabs-on-Grade and Similar Construction:

a. 1 test per 150 linear feet of main line or as determined by Engineer. Test at random depths.

b. 1 test of each service line or as determined by Engineer.

2. Nonpaved Area:

a. 1 test per 300 linear feet of main line or as determined by Engineer. Test at random depths.

b. 1 test of each service line or as determined by Engineer.

E. Proof roll compacted fill at surfaces that will be under slabs-on-grade, pavers and paving.

3.07 CLEANUP

A. Remove unused stockpiled materials; leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

SECTION 31 25 00

EROSION CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Storm water pollution prevention plans – SWPPP.

B. Permits.

C. Erosion control blanket.

D. Silt fence.

E. Straw wattle.

F. Inlet filters.

1.02 UNIT PRICES

A. SWPPP or Storm Water Management Plans, construction of erosion control facilities, maintenance, permit compliance responsibilities, erosion control materials, and installation, payment by lump sum, as shown on the Bid Form, and/or refer to Section 01 10 00 - Special Provisions.

B. Permit Compliance – No separate payment, incidental to project cost.

C. Erosion control blankets (all types):

1. Method of Measurement and Pay Unit: By the square yard per type or as shown on the Bid Form.

2. Includes matting, filter fabric, staples, placement, delivery, installation and maintenance.

D. Silt fence (all types):

1. Method of Measurement and Pay Unit: By the lineal foot per type or as shown on the Bid Form.

2. Includes fence, posts, trenching and backfilling, installation and maintenance.

E. Straw wattles:

1. Method of Measurement and Pay Unit: By the lineal foot per size or as shown on the Bid Form

2. Includes material and installation.

F. Inlet filters:

1. Method of Measurement and Pay Unit: Included in the cost of the inlet, by each or as shown on the Bid Form

2. Includes material, installation, maintenance, and disposal.

1.03 REFERENCES

A. Erosion Control Technology Council.

B. National Pollutant Discharge Elimination System (NPDES) General NPDES Permit Number NER110000.

C. State Standard Specifications, latest revision.

1.04 PERMITS

A. NPDES: The Owner is responsible for submitting the Notice of Intent (NOI) to the permitting authority for this project. Once the project is provided a permit number and the proper forms are received, copies will be provided to the Contractor.

1. Under this permit the Contractor will be responsible for:

a. Filling out and obtaining signatures on the Start Form. This must be turned in prior to work beginning on the project.

b. Installation and removal as called for on plans and in these specifications.

c. Maintain the site according to the permit requirements. Erosion control features will be cleaned when they have been 50 percent filled.

d. Completing a daily record for erosion control measures installed and condition of those installed previously.

e. Maintaining a record of rainfall events and the effects on the erosion control measures.

f. Maintain a record of events when the erosion control measures failed and what corrective measures were taken.

g. Filling out and obtaining signatures on the End form. This must be turned in at the completion of work on the project.

h. Allowing for the inspection of the site by others including; Regulatory Authority, Engineer, Owner or other designated representatives.

i. Providing a copy of all documents to Engineer and Owner at completion of project.

PART 2 - PRODUCTS

2.01 EROSION CONTROL BLANKET

A. The erosion control blanket shall be placed as per the manufacturer's recommendations and the plans. The erosion control blanket shall be placed after the area is seeded and before the area is mulched.

B. Wire staples shall be used for anchoring the erosion control blanket. The staple pattern shall be per the manufacturers recommendations.

C. The seed shall comply with the applicable portions of Section 01 10 00 – Special Provisions and Section 32 92 19 - Seeding. The seed mixture shall be of the types and applied at the rate shown in the special provisions.

D. The fertilizer shall comply with the applicable portion of Section 32 92 19 - Seeding. The fertilizer shall be of the types and applied at the rate shown in the special provisions.

E. All erosion control mats shall be of type specified in the plans.

2.02 SILT FENCE

A. The silt fence material shall be of the type specified in the plans.

B. The stakes shall be as shown in the plans, or as follows:

1. The pins that are required shall be 11 gauge (0.120 inch) steel wire with a 1 inch or larger throat with at least 6-inch legs.

2. Silt fence stakes shall be 5.5 foot studded, steel "T" fence posts.

a. Used posts are acceptable.

C. Stakes for low profile silt fence shall be wood, 1 1/2 inches x 1 1/2 inches x 36 inches.

2.03 STRAW WATTLE

A. The straw wattles (or sediment logs) shall be of the type, size and length specified in the plans.

B. The stakes shall be as shown in the plans.

1. Wood stakes shall be 1-1/8" x 1-1/8" x 30" for 9" and 12" straw wattle.

2. Wood stakes shall be 1-1/8" x 1-1/8" x 48" for 20" straw wattle.

2.04 INLET FILTERS

A. The inlet filters shall be of the type and size as shown on the plans.

PART 3 - EXECUTION

3.01 SWPPP OR STORM WATER MANAGEMENT PLAN

A. These facilities shall be constructed as shown on the plans. The time frame for construction is set forth in Section 01 10 00 – Specials Provisions or as directed by the Engineer. The SWPPP shall be maintained throughout the duration of the project and until the Engineer has deemed the SWPPP may be closed, transferred to another party or as stated in Section 01 10 00 – Special Provisions.

3.02 EROSION CONTROL BLANKETS

A. This work shall be performed as soon as possible after finish grading operations have been completed or as directed.

B. No restrictive seeding time periods shall apply to this work.

C. Contractor shall tamp and shape fill earth to the finish grade as needed to repair erosion to the grades and conditions shown in the plans.

1. If additional fill dirt is required, it will not be paid for as extra work and must be provided and placed at no additional cost.

D. Contractor shall perform all work in the areas to be protected so that the land surface is graded smooth and free of all debris, including roots and stones larger than 1 inch in their largest dimensions.

1. All lumps of soil shall be pulverized, raked out or removed.

2. Vegetation shall be removed from these areas, except for the desirable native vegetation that has been designated by Engineer to remain undisturbed.

3. The soil in the areas to be protected by the soil retention blanket shall be loosened to a depth of not less than 1 inch by discing, harrowing, raking or other approved methods.

E. Contractor shall obtain Engineer's approval of all soil preparation work, fertilizer and seed.

F. Contractor shall place the erosion control blankets immediately following fertilizing and seeding.

1. The blanket shall be laid out flat, parallel to the surface runoff flow direction, and secured as shown in the plans for each specific type of erosion control.

2. Care shall be exercised in placing the blanket so as not to disturb previously seeded areas.

3.03 SILT FENCE

A. The silt fence shall be installed and in good working condition prior to any grading operations taking place.

1. Contractor shall excavate a trench to the depth, width and length shown in the plans.

B. Contractor shall place the silt fence in the trench and pin it as shown in the plans.

1. If the silt fence is installed with mechanical methods, installing pins is not required.

C. Contractor shall backfill the trench, compact the soil and attach the fabric to the posts as shown in the plans.

1. All silt fence splice joints shall be overlapped a minimum of 16 inches (400 mm).

D. Contractor shall remove and dispose of silt that accumulates near the silt fence during construction and at completion of the project. Each time silt is removed, the fence shall be repaired to a good working condition.

E. Contractor shall maintain the silt fence in good working condition at all times.

3.04 STRAW WATTLES

A. Contractor shall place straw wattles immediately after finish grading is complete in areas where straw wattles are to be constructed or as directed.

B. Contractor shall install straw wattles as per the plans.

C. The remainder of the area shall be prepared and the entire area shall be fertilized and seeded in accordance with Standard Specifications or Section 32 92 19 – Seeding.

D. Contractor shall then place the erosion control blanket and staple it as shown in the plans.

1. If the filter fabric is attached to the erosion control blanket, then the seed shall

be broadcast over the blanket and then the blanket shall be soil filled.

E. The limits of the completed straw wattles shall extend up the fore slope and back slope of the swale or channel to effectively contain the runoff and prevent erosion and washout at the edges of the installation.

F. All straw wattles shall be held securely in place.

G. In shale, the 2 reinforcing steel stakes in each barrier shall be wired together to prevent the barrier from floating off the stakes.

H. All stakes shall be driven into the ground a minimum of 16 inches.

I. Contractor shall remove and dispose of silt that accumulates adjacent to the straw wattle.

3.05 INLET FILTERS

A. Contractor shall install inlet filters immediately after the construction of the inlet structure.

B. Contractor shall remove and dispose of silt that accumulates in the inlet filter. If the inlet filter becomes damaged, the Contractor shall replace the inlet filter, the cost of such shall be incidental.

3.06 EROSION CONTROL REMOVAL

A. Contractor shall remove inlet filters, silt fence, straw wattles including stakes and posts, after vegetation has been fully established and as otherwise directed by Engineer (not to exceed 1 year).

B. Contractor to obtain permission from Engineer prior to the removal of any erosion control materials.

3.07 SWPPP FACILITY REMOVAL

A. Contractor may be required to remove facilities that were constructed as part of a SWPPP, such as detention or sedimentation basins, accumulated silt, drainage piping, riprap, etc. Refer to Section 01 10 00 – Special Provisions or the Bid Form.

B. Contractor to obtain permission from the Engineer prior to the removal of any SWPPP Facilities.

C. Contractor may be required to seed the removal areas. Refer to Section 01 10 00 – Special Provisions or the Bid Form.

END OF SECTION

SECTION 32 92 19

SEEDING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Preparation of seedbed.

B. Placing topsoil.

C. Seeding, mulching and fertilizer.

D. Hydroseeding.

E. Maintenance.

1.02 SUBMITTALS

A. Submit from an established seed dealer or grower the certified "blue tag" for each container of seed. This tag will show percentage by weight, percentage of purity, germination and weed seed for each grass, legume and cereal crop stating botanical and common name of each species as specified.

1.03 REGULATORY REQUIREMENTS

A. Comply with regulatory agencies for seed and fertilizer.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable. Deliver seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging and location of packaging.

B. Deliver fertilizer in waterproof bags showing weight, chemical analysis and name of manufacturer.

1.05 MAINTENANCE

A. Maintain seeded areas immediately after placement until grass/seed mix is well established and exhibits a vigorous growing condition.

B. Fill washouts and areas of erosion with topsoil. Contractor is responsible for any and all erosion control measures necessary for the establishment of the specified seed material.

C. Maintain erosion control.

1.06 UNIT PRICE - MEASUREMENT AND PAYMENT

A. The work of seeding shall be a per acre, lump sum or as shown on the Bid Form for surfaces seeded in accordance with these specifications. The quantity of completed and accepted work measured as provided herein shall be paid for at the contract price for the item "seeding". This price shall be full compensation for furnishing and applying fertilizer; furnishing and sowing seed; furnishing and applying mulch materials; preparation of the seedbed; and for all materials, labor, equipment, tools and incidentals necessary to complete the work.

PART 2 - PRODUCTS

2.01 FERTILIZER

A. Fertilizer shall be a standard commercial inorganic product containing nitrogen, available phosphoric acid and soluble potash in a recognized plant food form. This fertilizer shall be either suspendable or soluble in water.

B. All fertilizer shall comply with the provisions of the State and Local Regulations, with subsequent amendments or revisions thereto. Under these regulations, each brand and grade of commercial fertilizer must be registered. Each container of commercial fertilizer shall have placed on or affixed to the container, in written or printed form, the new weight and the following additional information:

1. The name and address of the person guaranteeing the fertilizing.
2. The brand and grade.
3. The guaranteed analysis showing the minimum percentage of plant food claimed in the following order and form:
    a. Total nitrogen - percent.
    b. Available phosphoric acid (P_2O_5) - percent.
    c. Soluble potash (K_2O) - percent.
    d. If distributed in bulk, a written or printed statement of the weight and preceding information shall accompany delivery and be supplied to Engineer.

C. Any grade or mixture of grades of nitrogen and phosphoric acid fertilizer may be used providing the proportions of the minimum rate of application per acre in accordance with the specifications or as directed by Engineer are met.

D. Fertilizer shall be furnished and delivered in standard bags or bulk.

E. Rate of application of commercial inorganic fertilizer shall be 200 pounds/acre of 18-46-0, recommended by seed supplier or shown in Section 01 10 00 – Special Provisions.

2.02 SEED MIXTURE

A. All seeds shall comply with applicable state and federal seed laws.

B. The seed shall comply with the specified requirements and shall be applied at the rate shown. All seeds shall be certified blue tag. A certified blue tag and analysis tag shall be on every bag.

C. See Section 01 10 00 – Special Provisions for seed mixture.

2.03 WATER

A. Clean, fresh and free of substances or matter which could inhibit vigorous growth of grass.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that the prepared soil base is ready to receive the work of this section.

B. Contractor shall notify Engineer at least 48 hours in advance of the intended time to begin work and shall not proceed with such work until permission to do so has been granted by Engineer.

3.02 PREPARATION

A. Prepare subgrade and topsoil in accordance with Section 31 22 00 – Grading.

B. Remove foreign materials, plants, roots, stones and debris from site. Do not bury foreign material.

C. Remove contaminated soil.

D. The finish grading must be approved by Engineer before seeding operations begin.

3.03 FERTILIZING

A. Apply fertilizer at the rate specified.

B. Apply after smooth raking of topsoil and prior to roller compaction.

C. Do not apply fertilizer at the same time or with the same machine as will be used to apply seed.

D. Mix thoroughly into upper 2 inches of topsoil.

E. Lightly water to aid the dissipation of fertilizer, if required.

3.04 SEEDING

A. The seedbed shall be prepared by loosening the soil to a depth of not less than 2 inches by discing, harrowing, raking or by other approved means. Several discings, harrowings or similar means may be required to provide a satisfactory seedbed. Discing, harrowing and raking shall be longitudinal on all slopes.

B. Existing weed stubble and small weeds shall be cut and partially incorporated into the soil during the seedbed preparation work. All other growth of vegetation that will interfere with seeding operations shall be removed. Extreme care shall be exercised to avoid injury to trees and shrubs that have not been designated by Engineer to be removed.

C. For seeding, approved mechanical power-drawn drills shall be used. Mechanical power-drawn drills shall have depth bands set to maintain a planting depth of 1/2 to 1 inch.

D. Apply seed at the rate specified evenly in 2 intersecting directions. Rake in lightly.

E. Planting Season: Seeding operations shall be performed only during the periods March 1 to June 30 and August 1 to December 1.

F. Do not sow immediately following rain, when ground is too dry or frozen, or during windy periods.

G. Apply water with fine spray immediately after each area has been sown.

3.05 HYDROSEEDING

A. Apply seeded slurry with a hydraulic seeder, only when specifically stated in the Section 01 10 00 – Special Provisions, evenly in 2 intersecting directions at a rate of 1,500 pounds of mulch/acre.

3.06 MULCHING

A. This work shall consist of placing a mulch on areas seeded. The mulch shall be loose enough to allow sunlight to penetrate and air to slowly circulate, but thick enough to shade the ground, reduce rate of water evaporation and prevent or reduce water or wind erosion.

B. Mulch shall be either dry cured native hay or threshed grain straw. Hay or straw shall be free from seeds of noxious weeds and relatively free from seeds of all other weeds.

C. The mulch shall be applied at the rate of 2 tons per acre.

D. Mulch shall be immediately applied after sowing the seed unless otherwise directed by Engineer. The mulch shall be applied with a mulch blowing machine or other approved methods.

E. Immediately following the spreading of the mulch, the material shall be anchored to the soil by a V-type wheel land packer, a soil erosion mulch tiller or other suitable equipment which will secure the mulch firmly to form a soil-binding mulch.

F. Apply water with a fine spray immediately after each area has been mulched.

3.07 RESEEDING

A. Prior to the expiration of the 1-year warranty, Contractor will be required to reseed any area that has not established a vigorous growth of specified seed mixture. Engineer to determine which areas are to be reseeded.

END OF SECTION

SECTION 33 11 16
WATER DISTRIBUTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Pipe and fittings for potable water mains, including domestic waterlines and fire waterlines.

B. Fire hydrant

C. Flush hydrant

D. Hydrostatic testing.

E. Disinfection.

F. Thrust restraints.

G. Water main boring.

H. Casing for water main.

I. Service lines.

1.02 REFERENCES

A. ANSI/AWWA C 104 – Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.

B. ANSI/AWWA C 105 – Polyethylene Encasement for Ductile-Iron Pipe Systems.

C. ANSI/AWWA C 110 – Ductile-Iron and Gray-Iron Fittings.

D. ANSI/AWWA C 111 – Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

E. ANSI/AWWA C 115 – Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.

F. ANSI/AWWA C 116 – Protective Fusion-Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings.

G. ANSI/AWWA C 150 – Thickness Design of Ductile-Iron Pipe.

H. ANSI/AWWA C 151 – Ductile-Iron Pipe, Centrifugally Cast.

I. ANSI/AWWA C 153 – Ductile-Iron Compact Fittings.

J. ANSI/AWWA C 502 – Dry Barrel Fire Hydrants.

K. ANSI/AWWA C 550 – Protective Interior Coatings for Valves and Hydrants.

L. ANSI/AWWA C 600 – Installation of Ductile Iron Water Mains and Their Appurtenances.

M. ANSI/AWWA C 605 – Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings.

N. ANSI/AWWA C 651 – Disinfecting Water Mains.

O. ANSI/AWWA C 655 – Field Dechlorination

P. ANSI/AWWA C 800 – Underground Service Line Valves and Fittings.

Q. ANSI/AWWA C 900 – Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 12 In. (100 mm Through 300 mm), for Water Transmission and Distribution.

R. ANSI/AWWA C 901 – Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13 mm) 3 In. Through (76 mm) for Water Service.

S. ANSI/AWWA C 905 – Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 In. through 48 In. (350 mm through 1,200 mm).

T. ANSI/AWWA C 906 – Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 65 In. (100 mm Through 1,650 mm), for Waterworks.

U. ANSI/AWWA C 907 – Injection-Molded Polyvinyl Chloride (PVC) Pressure Fittings, 4 In. Through 12 In. (100 mm Through 300 mm), for Water, Wastewater, and Reclaimed Water Service.

V. ANSI/AWWA C 909 – Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe, 4 In. through 24 In. (100 mm through 600 mm) for Water, Wastewater, and Reclaimed Water Service.

W. ASTM A 53 – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless.

X. ASTM B 88 – Standard Specification for Seamless Copper Water Tube.

Y. ASTM A 139 – Standard Specification for Electric-Fusion (Arc) - Welded Steel Pipe (NPS 4 and Over).

Z. ASTM F 477 – Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

AA. ASTM D 698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).

BB. ASTM D 1556 – Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.

CC. ASTM D 1557 – Standard Test Methods for Laboratory Compaction of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).

DD. ASTM D 1784 – Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.

EE. ASTM D 2167 – Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

FF. ASTM D 6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

GG. ASTM D 3139 – Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.

HH. AASHTO T 180 – Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

II. Recommended Standards for Water Works, latest edition (aka 10 States Standards) by Great Lakes-Upper Mississippi River Board of State Public Health and Environmental Managers

1.03 UNIT PRICES

A. Pipe:

1. Method of Measurement
   a. Measure along centerline of pipe to the nearest foot.
   b. No deduction for length of fittings or valves
2. Pay Unit: By the linear foot (LF) for each respective size and type of pipe.

3. Includes excavation, hand trimming excavation, pipe, tracer wire and test stations, bolts, concrete thrust restraints, placement, assembly, bedding, backfilling and compaction of backfill, testing and incidentals thereto.

a. Testing includes:

(i) Hydrostatic testing

(ii) Compacted density testing of backfill.

(iii) Concrete Compressive Strength testing

(iv) Bacteriological / E-Coli testing

(v) Tracer wire testing

B. Fittings:

1. Method of Measurement and Pay Unit: By the unit (Each) for each respective size and type of fitting.

2. Includes excavation, hand trimming excavation, fitting, gland, gasket, polyethylene encasement, eye bolts, concrete thrust restraints, thrust restraint rods if specified, placement, assembly, bedding, backfilling and compaction of backfill, testing and incidentals thereto.

C. Mechanical Joint Restraint Devices:

1. Method of Measurement and Pay Unit: By the unit (Each) for each respective size and type of Mechanical Joint Restraint Device.

2. Includes furnishing the device (gland with restraint wedges), placement, assembly, testing and incidentals thereto.

D. Fire Hydrant Assembly:

1. Method of Measurement and Pay Unit: By the unit (Each) for each respective size and type of fire hydrant.

a. Includes fire hydrant, excavation, hand trimming excavation, bedding, fire hydrant lead pipe (up to 8 feet) from the fitting in the trunk line to the auxiliary valve, auxiliary gate valve and valve box with valve box adapter and concrete valve box collar, pipe from the auxiliary valve to the foot of the fire hydrant, gravel drain, bolts, concrete thrust restraints, thrust restraint rods, mechanical joint restraint devices, concrete base, backfilling and compaction of backfill, testing and incidentals thereto.

2. Fire hydrant lead pipe from the fitting in the trunk line to the auxiliary valve that is in excess of 8 feet in length will be measured and paid for as pipe.

E. Flush Hydrant Assembly:

1. Method of Measurement and Pay Unit: By the unit (Each) for each respective size and type of flush hydrant.

a. Includes flush hydrant, excavation, hand trimming excavation, bedding, flush hydrant lead pipe (up to 8 feet of lead pipe) from the connecting fitting, valve or curb stop to the foot of the flush hydrant, base elbow, gravel drain, concrete thrust restraints, backfilling and compaction of backfill, testing and incidentals thereto.

2. Flush hydrant lead pipe from the connecting fitting, valve or curb stop to the base elbow that is in excess of 8 feet in length will be measured and paid for as pipe.

F. Corporation Stop and Saddle:

1. Method of Measurement and Pay Unit: By the unit (Each) for each respective size and type of corporation stop and saddle.
2. Includes excavation, hand trimming excavation, tapping water main, corporation stop with saddle, backfilling, compaction, testing and incidentals thereto.

G. Curb Stop and Box:

1. Method of Measurement and Pay Unit: By the unit (Each) for each respective size of curb stop.
2. Includes excavation, hand trimming excavation, connections to water service lines, curb stop, curb stop box, stationary rod, backfilling, compaction, testing and incidentals thereto.

H. Polyethylene Encasement:

1. Polyethylene encasement of ductile or gray iron pipe, fitting, fire and flush hydrant is considered to be subsidiary to and included in the cost of the ductile iron, gray iron or other item for which payment is made.

I. Dry Boring and Jacking of Casing Pipe:

1. Method of Measurement: Measured along centerline of casing pipe, within the extents of the casing pipe shown in the Drawings. The length of the casing pipe considered for payment shall not be greater than the length shown in the Drawings, unless the length of the casing pipe is increased at the direction of Engineer.
2. Pay Unit: By the linear foot (LF) for each respective size and type of casing pipe bored and jacked, within the limits shown in the Drawings or directed by Engineer.
3. Includes excavation of jacking pits, dry bore hole for casing pipe, removal of bored materials, jacking equipment, casing pipe and installation, casing chocks, installation of carrier pipe in casing pipe, casing end seals, backfilling and compaction of backfill, connection to pipe, testing and incidentals thereto.
4. Carrier Pipe: Installed within casing pipe, shall be measured and paid for separately.

J. Dry Boring Without Casing Pipe:

1. Method of Measurement: Measured along centerline of Dry Bore, within the extents of the dry bore shown in the Drawings. The length of the dry bore considered for payment shall not be greater than the length shown in the Drawings, unless the length of the dry bore is increased at the direction of Engineer.
2. Pay Unit: By the linear foot (LF) for each respective size of pipe installed by dry boring.
3. Includes excavation of boring pits, dry bore hole for pipe, removal of bored material, jacking equipment, installation of carrier pipe in bore hole, backfilling and compaction of backfill, connection to pipe, testing and incidentals thereto.
4. Carrier Pipe: Installed within dry bore, shall be measured and paid for separately.

K. Directional Boring Carrier Pipe:

1. Method of Measurement: Measured along centerline of directional boring, within the extents of the directional boring shown in the Drawings. The length of the directional boring considered for payment shall not be greater than the length shown in the Drawings, unless the length of the directional boring is increased at the direction of Engineer.
2. Pay Unit: By the linear foot (LF) for each respective size of pipe installed by directional boring.
3. Includes excavation, directional bore hole for pipe, tracer wire and test stations, jacking equipment, carrier pipe and installation of carrier pipe, backfilling and compaction of backfill, connection to pipe, testing and incidentals thereto.
4. Carrier pipe will not be measured and paid for separately, but will be considered a subsidiary item included in the directional boring pay item.

L. Dewatering of Trench:

1. Dewatering, including intercepting and diverting site drainage and surface water flows away from excavations and trenches, and removing standing water from trench or excavation with a sump and pump shall be considered incidental and subsidiary to other items of work for which direct payment is made
   a. Includes providing all permits required for the dewatering and paying all permit costs, pump, piping, wells and/or well points, dewatering equipment, assembly and disassembly, backfilling and compaction of backfill, energy cost and incidentals thereto.
2. Method of Measurement: (INCIDENTAL)
   a. Unless otherwise specified in Section 01 10 00 – Special Provisions, measurement and separate payment for dewatering will not be made.

M. Connection to Existing Water Main (Dry or Cut-in):

1. Method of Measurement and Pay Unit: By the unit (Each).
2. Includes excavation, hand trimming excavation, bedding, bolts, concrete thrust restraints, backfilling and compaction of backfill, couplings, bolts, sleeves, adapters and incidentals thereto.
3. Washing, cleaning and disinfection of all units prior to installation shall be considered to be a subsidiary to and included in the cost of the item for which payment is made.
4. Mechanical joint fitting(s) at the connection shall be measured and paid for as a separate item (Each).

N. Connection to Existing Water Main (Pressure or Wet Tap):

1. Method of Measurement and Pay Unit: By the unit (Each).
2. Includes excavation, hand trimming excavation, bedding, bolts, concrete thrust restraints, tapping main, backfilling and compaction of backfill, couplings, sleeves, adaptors, and incidental work and materials.
3. Washing, cleaning and disinfection of all units prior to installation shall be considered to be a subsidiary to and included in the cost of the item for which payment is made.

4. Tapping tee and attached valve with appurtenances shall be paid for as a separate item (Each).

O. Connection to Existing Water Service:

1. Method of Measurement and Pay Unit: By the unit (Each).
2. Includes excavation, hand trimming excavation, bedding, backfilling and compaction of backfill, fittings, and adapters to connect new service line or curb stop to existing service line or existing curb stop and incidental work and materials thereto.
3. Washing, cleaning and disinfection of all units prior to installation shall be considered to be a subsidiary to and included in the cost of the item for which payment is made.

P. Abandon Existing Water Main:

1. Method of Measurement and Pay Unit: By the unit (Each).
2. Includes excavation, hand trimming excavation, capping or plugging existing main, concrete, thrust blocking, backfilling and compaction of backfill, adapters, fittings, couplings, sleeves, gaskets and incidentals thereto.
3. Mechanical joint ductile iron - gray iron fitting shall be paid for as a separate item (Each).

Q. Abandon Existing Water Service:

1. Method of Measurement and Pay Unit: By the unit (Each).
2. Includes excavation, hand trimming excavation, capping or plugging existing main, thrust blocking, backfilling and compaction of backfill, adapters, fittings, couplings, sleeves, gaskets and incidentals thereto.

R. Tracer Wire, Tracer Wire Terminal Access Box, Marker Post and Appurtenances:

1. Tracer wire, tracer wire test stations, tracer wire terminal access boxes, marker posts with test station, mounting stakes, decals and installation and testing are considered to be subsidiary items to and included in the cost of items for which payment is made.

S. Thrust Restraint Rods and Concrete Thrust Restraints:

1. Thrust restraint rods and eye bolts and concrete thrust restraints are considered to be subsidiary items included in the cost of items for which payment is made.

T. Flexible Couplings:

1. Considered to be a subsidiary item included in the cost of items for which payment is made.

U. Pipe Material Adapters:

1. Adapters for transition from one type of material to another are considered a subsidiary item included in the cost of items for which payment is made.

V. Pipe Pressure Testing, Flushing, Cleaning and Disinfection:

1. Considered to be subsidiary items included in the cost of items for which payment is made.

W. Bacteriological / E-Coli Testing:

1. Considered to be a subsidiary item included in the cost of items for which payment is made.

1.04 SUBMITTALS

A. Product Data: Provide data on pipe materials, pipe fittings, hydrants, service line materials and accessories and appurtenances.

B. Concrete: Provide concrete design mix data.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

D. Manufacturer's Installation Instructions: Provide special procedures required to install products.

E. Project Record Documents:

1. Record the location of water main, fittings, and connections and thrust restraints.
    a. Provide Engineer with a minimum of 3 distance ties from the pipe fittings and connections to permanent topographical feature (trees, buildings, fire hydrants, etc.).
    b. Provide Engineer with GPS Coordinates, if required, see Section 01 10 00 – Special Provisions.
    c. Provide Engineer with measure distance to service taps from center curb stop.
    d. For directional bore, submit to Engineer the plot of the actual horizontal and vertical alignment of the pilot bore at intervals not to exceed 30 feet.
2. Identify, describe and record the discovery of variations in subsoil conditions, and provide copy of record to Engineer.
3. Identify, describe and record the discovery of uncharted utilities, and provide copy of record to Engineer.
4. Testing:
    a. See Section 01 40 00 – Quality Requirements for general requirements for field inspection and testing.
    b. See Section 31 23 33 – Trenching for Utilities for compaction testing.
    c. See Section 33 13 00 – Disinfection of Water Distribution System for testing.
    d. Hydrostatic Test of Water Main; provide copy of Test Records to Engineer
    e. Tracer Wire Continuity Test; provide copy of Test Records to Engineer
    f. Backfill Compaction Test; provide copy of Test Records to Engineer, see Section 01 10 00 – Special Provisions.
    g. Concrete Strength Test Records; provide copy of Test Records to Engineer, see Section 01 10 00 – Special Provisions.

F. Submit the following as appropriate for each hydrant provided:

1. Outline and installation drawings for equipment and fixtures furnished.
2. Equipment performance data and operating characteristics.
3. Manufacturer’s data for hydrants and accessories.
    a. Supply catalog data, including illustrations and a parts list that identifies the materials used for various parts.
    b. The information shall be in sufficient detail to serve as a guide in the assembly and disassembly of the hydrant and for ordering repair parts.

4. Manufacturer’s catalog data marked to indicate materials being furnished as standard equipment, fixtures, specialties and accessories.

G. Submit the following for restrained joint ductile iron pipe:

1. Restrained joint style and detailed designs by the pipe manufacturer, including detailed laying schedules.

1.05 QUALITY ASSURANCE

A. All products are required to meet applicable AWWA requirements, NSF 61 and the requirements of the Safe Drinking Water Act.

B. Marking:

1. Pipe: Nominal pipe size, material code designation, standard dimension ratio, pressure rating, manufacturer's name or mark, National Sanitation Foundation seal and appropriate ASTM designation numbers marked on pipe.

2. Fittings: Manufacturer's name or mark and pressure rating marked on body.

3. Fire Hydrant: Manufacturer's name or mark, main valve opening and year of manufacture marked on Hydrant.

C. Bacteriological water quality sampling and testing in accordance with AWWA C600 or C605 and AWWA C651 and in compliance with the rules and regulations of the authority having jurisdiction for potable water system piping.

1. Bacteriological and/or E-Coli testing water quality analysis shall be performed by a laboratory approved by the authority having jurisdiction for potable water system piping.

1.06 REGULATORY REQUIREMENTS

A. Conform to all applicable local, state and federal code for materials and installation of the work of this section. Perform work in accordance with standards of authorities having jurisdiction for potable water system piping. Includes materials, installation, testing and disinfection.

1.07 PROJECT CONDITIONS

A. Verify that survey control points for alignment and elevation are as shown in the Drawings.

B. Research public utility records and verify location of existing utilities.

1. Contact utility locating service for project area.

2. Comply with applicable “ONE CALL” requirements.

C. Provide exploratory excavation to determine exact location of existing underground structures or utilities. Notify Engineer immediately if a discrepancy or conflict is identified.

D. Protect plants, lawns, trees, and other amenities and features; which are to remain, as shown in the Drawings or specified in Section 01 10 00 – Special Provisions, from damage by equipment, vehicular traffic and other construction related activities.

E. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, curbs, utility pedestals and lines and amenities that are to remain from damage by excavating equipment, vehicular traffic and other construction related activities.

F. Verify that water service piping can be installed as shown in the Drawings and to reference standards.

G. Coordinate the connection of water piping to existing water main, water service line and/or other water facilities as shown in the Drawings.

1.08 DELIVERY, STORAGE AND HANDLING

A. Preparation for Transport:

1. Ensure that fittings, hydrants and specialties are dry and internally protected against rust and corrosion.
2. Protect glands, gaskets, threaded ends and flange faces.
3. Set fittings, hydrants and specialties in best position for handling.
4. Do not telescope small diameter pipe inside larger diameter pipe.

B. During Storage:

1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
2. Protect from weather:
   a. Protect stored pipe, fittings, hydrants and specialties from moisture and dirt.
   b. Pipe end covers may be required, see Section 01 10 00 – Special Provisions.
   c. Store indoors and maintain temperature higher than ambient dew point temperature, where possible.
   d. When outdoor storage is necessary, support materials off the ground or pavement.
3. Protect PVC pipe from prolonged (more than 1 month) exposure to sunlight.
4. Support flexible pipe to prevent sagging and bending.

C. Handling:

1. Use sling to lift pipe, fittings, hydrants and specialties where size requires handling by crane or other equipment.
   a. Rig pipe, fittings, hydrants and specialties to avoid damage.
2. Protect pipe, fittings, hydrants and specialties from moisture and dirt during handling.
3. Deliver pipe, fittings, hydrants and specialties to trench in sound, undamaged condition.

1.09 SEQUENCING/SCHEDULING

A. Attend preconstruction meeting.

B. Submit plan for construction sequence prior to commencing work.

C. Coordinate the connection of water piping to existing water main, water service line and/or other water system facilities, as shown in the Drawings, with Owner and Engineer.

1. Give Owner and Engineer a minimum 24-hours notice before connection to existing main or other water system facilities.
2. Keep disruption of service to less than 4 hours.

D. Give Engineer, Owner and permitting authority a minimum 48-hours notice prior to commencing any boring activity.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS/PRODUCTS

A. All products furnished shall meet all applicable AWWA requirements and NSF 61 requirements.

B. See Section 01 10 00 – Special Provisions for specific product brand requirements.

2.02 WATER PIPE

A. Ductile Iron Pipe (DIP):

1. Conform to ANSI/AWWA C151.
2. Diameter: As shown in the Drawings.
3. Thickness/Rating:
   a. 3" – 12": Pressure Class 350, minimum.
   b. 14" – 48": Pressure Class 250, minimum.
4. Joints: ANSI/AWWA C111, rubber gasket, push-on or mechanical joint.
   a. Restrained Joint DIP:
      (i) Flexible type.
      (ii) Boltless, lock ring type.
      (iii) Restraining gaskets are not approved.
      (iv) Fittings: Ductile iron molded or formed to suit pipe size and joint design.
5. Exterior Coating: Asphaltic, 1 mil thickness, per ANSI/AWWA C104.
6. Interior Coating: Standard cement lining with seal coat, per ANSI/AWWA C104.
7. Buried DIP shall be encased in Polyethylene per ANSI/AWWA C105.

B. Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVOC) Pipe:

1. General:
   a. AWWA C900, 4 inch through 12 inch; AWWA C905, 14 inch through 36 inch, AWWA C909, 4 inch through 24 inch.
   b. DR or Pressure Class as shown on the Bid form and/or specified in Section 01 10 00 – Special Provisions.
   c. Color: Blue
   d. Same outside diameter as ductile iron pipe.
2. Joints:
   a. Conform to AWWA C900 or AWWA C905 or AWWA C909 as applicable to pipe.
   b. Elastomeric gasketed push-on joints.
   c. Solvent cement welded joints are not approved.

C. Restrained Joint PVC Pipe:

1. General:
   a. AWWA C900, for 4 inch through 12 inch.

b. Restrained joint pipe shall be furnished in 4", 6", 8", 10", 12" sizes in DR or Pressure Class as shown on the Bid form, and/or specified in Section 01 10 00 – Special Provisions.

c. The restrained joint pipe system shall meet all short and long term pressure test requirements of AWWA C900.

d. Pipe joints shall be designed for use at or above the pressure class of the pipe with which they are utilized.

2. Materials:

a. The products represented by this specification are made from un-plasticized PVC compounds having a minimum cell classification of 12454 as defined in ASTM D 1784.

b. Gasket shall be elastomeric sealing gaskets meeting the requirements of ASTM F 477.

c. Pipe joints shall be designed for use at or above the pressure class of the pipe with which they are utilized.

d. Joints shall be designed to meet the zero leakage test requirements of ASTM D 3139.

3. Certifications:

a. The products represented by this specification shall additionally conform to NSF 61 Drinking Water System – Health Effects.

4. Dimensions & Color

a. Nominal outside diameters and wall thicknesses of this restrained joint pipe conforming to the requirements of AWWA C900 (Cast Iron pipe OD).

b. Pipe shall be furnished in standard lengths of 20 feet.

c. Color: Blue.

5. Workmanship

a. Pipe and couplings (as applicable) shall be homogeneous throughout and free from voids, cracks, inclusions and other defects and shall be as uniform as commercially practicable in color, density and other physical characteristics.

6. Marking

a. Pipe and couplings (as applicable) are legibly and permanently marked in ink with critical information including nominal size, material type, dimension ratio, pressure class, applicable standards, manufacturer's name or trademark, production record code and seal (mark) of testing agency verifying the suitability of the pipe material for potable water systems.

D. High Density Polyethylene (HDPE) Pipe:

1. General

a. AWWA C906: PE 3408 or PE 4710.

b. DR as shown on the Bid Form and/or specified in Section 01 10 00 – Special Provisions.

c. Manufactured with color striping to identify their application. Blue for Water purposes.

d. Same outside diameter size as ductile iron.

e. Furnish manufacturer's inspection certificates.

f. Polyethylene pipe may be joined together by butt fusion using approved heat-fusion joining machine.

2. Polyethylene pipe may be joined to other materials with fittings with the same or greater pressure rating by means of:

a. Flanged adapters:

(i) Fitted with back-up rings that are pressure rated equal to or greater than the mating pipe.

(ii) The back-up ring bore shall be chamfered or radiused to provide clearance to the flange adapter radius.

b. Mechanical Joint Adapters

(i) Mechanical couplings designed for joining polyethylene pipe to another material and AWWA C111 joints.

(ii) A stainless steel stiffener shall be installed in the bore of the polyethylene pipe when an OD compression mechanical coupling is used and when connecting plain end PE pipe to a mechanical joint pipe, fitting or appurtenance.

c. External clamp and tie rod restraint shall be installed where PE pipe is connected to the socket of a mechanical joint pipe, fitting or appurtenance except where a Mechanical Joint Adapter is used.

2.03 FITTINGS

A. Conform to ANSI/AWWA C110 or ANSI/AWWA C153

B. Diameter: 2 inch through 64 inch as shown in the Drawings.

C. Material: Ductile Iron

D. Mechanical Joints: Conform to ANSI/AWWA C111.

E. Gaskets: Conform to ANSI/AWWA C111.

F. Exterior Coating: Asphaltic, 1 mil thickness.

G. Interior Coating: Standard cement lining ANSI/AWWA C104 with seal coat.

H. Working Pressure: 350 psi.

I. Buried fittings shall be encased in Polyethylene per ANSI/AWWA C105.

2.04 SPECIAL FITTINGS

A. Ductile Iron Couplings/Flexible Couplings:

1. Ductile iron body.

2. Finish: Epoxy coated per AWWA C213 or equal.

3. Gaskets: Synthetic rubber, Buna-N or equal.

4. Working Pressure: 150 psi, minimum.

B. Mechanical Joint Restraint Devices:

1. Sizes: 3 inch through 48 inch.

2. Specifically designed to be installed on PVC or Ductile Iron pipe.
3. Restraint devices shall consist of multiple gripping wedges incorporated into a follower gland.
    a. Gland shall meet applicable requirements of ANSI/AWWA C110.
    b. Wedges shall impart increasing resistance against the pipe as internal pressure increases.
    c. Actuate the gripping wedges with torque limiting twist off nuts.
4. Gland body, wedges and wedge actuating components: Ductile iron
5. Working Pressure:
    a. Minimum safety factor: 2:1
    b. 3 -16 inch: 350 psi, min.
    c. 18-48 inch: 250 psi, min.

C. Bolt-Through Mechanical Joint Adapter:
1. Adapter shall be a bolt-through positive restraint mechanism that connects valves and/or AWWA C110 fittings together at a linear distance not to exceed three (3) inches and without attachment to pipe.
2. Material: Ductile iron
3. Gaskets: Conform to ANSI/AWWA C111.
4. Exterior Coating: Asphaltic, 1 mil thickness.
5. Interior Coating:
    a. 3-12 inch: Standard cement lining conforming to ANSI/AWWA C104 with seal coat.
    b. 14-36 inch: NSF 61, 7-mil. fusion bonded epoxy conforming to AWWA C116 and C550.
6. Working Pressure:
    a. 3 -24 inch: 350 psi, min.
    b. 30-36 inch: 250 psi, min.

D. Pressure/Wet Tap Tapping Sleeves:
1. 2-section construction.
    a. Stainless Steel
    b. Ductile/Gray Iron
2. Gaskets: Rubber, Buna-N or equal.
3. Flanged outlet for tapping valve, ANSI B16.1, Class 125.
4. Pressure Rated: 200 psi.

E. Tapping Valve:
1. Resilient seat, non-rising stem gate valves - AWWA C509.
2. Materials for tapping valves in potable water service shall comply with the requirements of the Safe Drinking Water Act and shall be certified as suitable for contact with drinking water by an accredited certification organization in accordance with ANSI/NSF Standard 61.
3. Exposed Bolts and Nuts: Stainless steel.

4. Joints for Tapping Valves.
    a. Valve end connecting Valve to tapping sleeve: Flanged, ANSI B16.1, Class 125
    b. Valve end connecting Valve to branch pipe: Mechanical Joint.
5. Actuator: 2-inch operating nut.

F. Encased in Polyethylene per ANSI/AWWA C105

2.05 POLYETHYLENE ENCASEMENT FOR IRON PIPE AND FITTINGS

A. Shall meet ANSI/AWWA C105 standards.

B. Flat sheet, split tube or tube.

C. 8 mil (0.20 mm) thickness.

2.06 PIPE LUBRICANT

A. NSF Standard #61 certified for potable water pipe.

B. Non-toxic and non-corrosive. Shall not support bacterial growth.

C. No residue after assembly and flushing of main and appurtenances according to AWWA procedures.

2.07 TRACER WIRE

A. General
1. Wire Size: Minimum size shall be 12 AWG or as shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
2. Jacket color shall meet the APWA color code standard for identification of buried utilities, blue for potable water.
3. Jacket/ coating type shall be High Density Polyethylene (HDPE) or High Molecular Weight Polyethylene (HMWPE) rated for direct burial. Nylon is not allowed.

B. Placement:
1. The tracer wire shall be placed in the same orientation as installed pipe.
2. The tracer wire shall be placed as shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
3. When connecting to an existing main, begin tracer wire system at the connection to the existing main.
    a. If test station is not installed adjacent to the connection to the existing main, install a five foot long by 1/2" diameter or larger copper clad or solid copper ground rod in the trench, next to the connection.
    b. Connect tracer wire to ground rod with corrosion-resistant brass, stainless steel or copper alloy clamp. Steel rebar is not acceptable.

C. Wire Type:
1. Open trench/direct bury: Wire type shall be Solid Copper or Solid Copper Clad Steel (CCS) or as shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
2. Pipe bursting and directional boring: Wire type shall be Solid Copper Clad Steel (CCS) or as shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
3. Stranded wire not required, but may be used at Contractor's option.

D. Connectors (splice):

1. Shall be Copperhead SnakeBite connector, 3M DBR connector or approved equal and shall be rated for direct bury for the protection of wire from moisture and corrosion.
2. Connector shall be sized appropriate to the number and size of wires connected.

E. Terminal Access Boxes and Marker Posts.

1. General:
    a. Access boxes and/or test stations shall be installed to bring the tracer wire to level for ease of testing.
2. Flush Mount Terminal Access Box:
    a. Tracer wire terminal access box shall be located directly in front of fire hydrant auxiliary valves and water main valve boxes, as shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
    b. Tracer wire shall be terminated at each end in a flush mount terminal access box.
    c. Terminal access box shall have a cast iron lid that can be locked and opened with a standard pentagon head key wrench.
    d. Riser base: 12” minimum depth, PVC or approved equivalent.
    e. Terminal access box shall be installed in a concrete pad, set to finish grade, as shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
    f. Tracer wires shall be attached to integral stainless steel screws.
    g. Terminals shall be readily accessible once the lid is removed for use of a locator.
    h. Extend tracer wire up inside the terminal access box, leaving minimum of 3 feet of tracer wire inside the terminal access box.
3. Water line marker post with tracer wire test station:
    a. Marker post and test station shall be located when shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
    b. Six (6) foot minimum length.
    c. Shall be designed to bend and rebound when struck by a vehicle.
    d. Shall be triangular shape or approved equal.
    e. Color shall meet the APWA color code standard for identification of buried utilities, blue for potable water.
    f. Shall have decals stating “Warning, Buried Water” or similar.
    g. Shall have minimum of two corrosion resistant internal terminals, brass or stainless steel.
    h. Shall have removable top cap to access internal terminals.
    i. Installation of tracer wire in marker post and test station:
        (i) Bury the bottom 18 inches of the marker post and test station, with anchor barbs flared out.

(ii) Run the tracer wire up through the marker post and test station, leaving a minimum of 3 feet of tracer wire slack inside the marker post and test station.

(iii) Each tracer wire shall be attached to an internal corrosion resistant terminal.

(iv) Label the screws with a permanent marker to indicate the direction of the main and tracer wire from the marker post and test station. IE; “Tracer Line North”, “Tracer Line South”, Etc.

2.08 HYDRANTS

A. Fire Hydrants:

1. ANSI/AWWA C502 for dry-barrel fire hydrants.
2. Type of Shutoff: Compression.
3. Type of Construction: Break flange or break bolt.
4. Main Valve Opening: 5 1/4 inches.
5. Nozzle Arrangement and Size: 3 nozzles - two 2 1/2 inch nozzles and one 4 1/2 inch pumper nozzle.
6. Nozzle Threads: National standard hose threads.
7. Type of Inlet Connection: Mechanical Joint.
8. Size of Inlet Connection: 6 inch.
9. Depth of bury: Distance from ground line to top of connection pipe shall be 5-½ feet minimum, or otherwise as shown in the Drawings.
10. Direction of Opening: Counterclockwise.
11. Packing: Conventional or O-ring.
12. Size and Shape of Operating Nut: 1 1/2 inch, standard pentagon.
13. Working Pressure: 150 psi.
14. Color: Red, or as indicated in Section 01 10 00 – Special Provisions.
15. Thrust Restraint: Mechanical restraints and concrete thrust block, as shown in the Drawings.
    a. Mechanical joint restraint devices shall be installed on the branch of the connecting tee, each side of the auxiliary valve and each side of any fittings.

B. Flush Hydrants:

1. Style: Above ground, non-freezing, self-draining.
2. Barrel: 2 inch diameter with traffic break-away coupling, horizontal inlet
3. Depth of bury: Distance from ground line to top of connection pipe shall be 5-½ feet minimum, or otherwise as shown in the Drawings.
4. Nozzle(s): arrangement and size:
    a. Nozzle thread: National Standard Hose Threads.
    b. 1 nozzle – 2-½ inch.
    c. Horizontal discharge.
    d. Iron nozzle cap and chain.

5. Operating Parts:
    a. Hydrant shall include a lockable cover to prevent unauthorized use.
    b. Non-turning operating rod.
    c. Operating nut: Slotted corporation style
    d. Direction of opening: Counterclockwise.
    e. Internal working parts shall be bronze, brass, aluminum or approved equivalent.
    f. Internal working part shall be serviceable from above grade with no digging.
6. Coating: AWWA C502
    a. Color: Red, or as indicated in Section 01 10 00 – Special Provisions.
7. Thrust Restraint: Mechanical Restraint and Concrete Thrust Block, as shown in the Drawings.

2.09 NUTS AND BOLTS, EYE BOLTS AND THREADED ROD THRUST RESTRAINTS

A. Nuts and Bolts: Ductile iron, corten or stainless steel.

B. Eye Bolts: 3/4 inch diameter, corten.

C. Threaded Rod: 3/4 inch diameter; stainless steel or corten.

D. Wrapped with polyethylene encasement AWWA C105.

2.10 CONCRETE THRUST BLOCKS

A. As shown in the Drawings.

B. Concrete Mix Design: Compressive strength when tested in accordance with ASTM C 39 at 28 Days: Minimum 3,500 psi.

2.11 WATER SERVICE LINE MATERIALS

A. Conform to the requirements of ANSI/AWWA C800 Underground Service Line Valves and Fittings.

B. Copper Tubing: Type K, ASTM B 88.
    1. Flared joint or pack joint fittings.
    2. Size: As shown in the Drawings.

C. Polyethylene (PE) plastic pipe (SIDR):
    1. ASTM D 2239 and AWWA C901
    2. Thickness: SIDR 7.
    3. Minimum Pressure Rating: 200 psi.
    4. Outer Diameter: Iron Pipe Size.
    5. Size: As shown in the Drawings.
    6. Install with insert stiffeners.

D. Service Saddles:
    1. Brass, bronze, stainless or ductile iron body for use with water pipe.
    2. Wide band stainless, bronze, brass straps.
    3. O-ring seal.
    4. AWWA taper threaded outlet.

5. Minimum Working Pressure: 150 psi.
6. Size: As shown in the Drawings.

E. Corporation Stops:
1. Brass or bronze body for use with copper or PE service pipe.
2. AWWA taper threaded inlet.
3. Minimum Working Pressure: 150 psi.
4. Size: As shown in the Drawings.

F. Curb Stops:
1. Brass or bronze body without drain; ball valve type for use with copper or polyethylene service pipe.
2. Inlet and outlet connection as shown in the Drawings for copper or polyethylene service pipe.
3. Grip joint or pack joint; (See Section 01 10 00 – Special Provisions).
4. Minimum Working Pressure: 150 psi.
5. Size: As shown in the Drawings.

G. Curb Boxes:
1. Extendable type with cast iron base and lid:
2. Steel pipe upper section.
3. Minimum Inside Diameter: 1 1/2 inches.
4. Base Pattern: Minneapolis or Arch; (See Section 01 10 00 – Special Provisions).
5. Lid Pattern: Plug style with pentagon bolt.
6. Rod Type: 42-inch stationary rod.
7. Length: As shown in the Drawings.

H. Couplings:
1. Brass for flared connections for copper service pipe.
2. Compression type for PE service pipe.
3. Minimum Working Pressure: 150 psi.
4. Size: As shown in the Drawings.

2.12 CASING PIPE

A. Steel Pipe:
1. General: Uncoated, smooth wall welded steel pipe; ASTM A 53, Type E or Type S, Grade B black steel; or ASTM A 139, Grade B black steel. Minimum yield strength 35,000 psi.
2. Minimum Wall Thickness: See Drawings and Section 01 10 00 – Special Provisions

B. Casing Chocks:
1. General: Provide casing chocks for carrier pipe 4 inches or greater in diameter.
2. High Density Polyethylene, Stainless Steel body or equal
3. Shall have runners that extend beyond the bell, mechanical joint, or restrainer of the carrier pipe.
4. Shall be designed to grip tightly to the carrier pipe

C. Casing End Seals: Minimum 1/8" thick synthetic rubber end seals with mechanical stainless steel bands or equal:

1. After insertion of the carrier pipe into the casing, the ends of the casing shall be closed by installing wrap-around end seals or equal.
2. Place the end seal around the carrier pipe and casing; then compress the adhesive strips to form a seal.
3. Stainless steel banding installed and mechanically tightened per manufacturer's recommendation.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that trench cut and excavation base are ready to receive work and excavations, dimensions and elevations are as shown in the Drawings.

B. Verify that building service connection and municipal utility water main size, location and invert elevation are as indicated.

C. Verify depth and location of other buried utilities and structures in the area.

3.02 TRENCHING

A. Hand trim excavation for accurate placement of pipe, hydrant, fitting and specialties to elevations shown.

B. Form and place concrete for pipe thrust restraints at each change in pipe direction. Place concrete to permit full access to pipe and pipe accessories. See Drawings for square footage of thrust restraint based on pipe diameter.

C. Place and compact embedment materials for bedding, haunching and initial backfill according to manufacturer's recommendations.

D. Backfill around sides and to top of pipe with cover fill, tamp in place and compact; then complete backfilling and compaction.

E. Protect pipe from damage and displacement while backfilling and compacting.

3.03 PIPE AND FITTING INSTALLATION

A. Install pipe and appurtenances in accordance with manufacturer's recommendations and AWWA C 600 (Ductile Iron) on AWWA C605 (PVC), including but not limited to proper handling and storage, installation, tapping and testing of pipe.

B. Handling Pipe and Appurtenances:

1. Protect pipe, fittings, hydrants and specialties during handling to prevent damage and to prevent entrance of dirt, debris and moisture.
2. Deliver to trench in sound, undamaged condition.
3. Use web slings. End hooks not allowed.

C. Inspect for Defects:

1. Tap DIP pipe with light hammer to detect cracks.
2. Replace defective, damaged or unsound pipe and appurtenances.

D. Protection of Pipe Interior:

1. Clean pipe interior of foreign material before lowering into trench.
2. Keep clean at all times.

3. Securely close open pipe ends and fittings with watertight plugs during nonworking periods including:
    a. When pipe laying is not in progress.
    b. Nights.
    c. Weekends.

E. Cutting Pipe:
1. Use methods recommended by manufacturer.
2. Cut pipe in neat, workmanlike manner without damage to interior lining or exterior coating.
3. Use approved mechanical cutter.
4. Grind smooth and bevel cut ends.

F. Joining Pipe:
1. Use minimum amount of gasket lubricant necessary to allow safe and efficient assembly of pipes and fittings.
2. Use methods recommended by manufacturer to assemble pipes and fittings.

G. Pipe Deflections:
1. Allowed only with permission of Engineer or if shown in the Drawings.
2. Do not exceed manufacturer's recommendations for type and size of pipe and joint being used.
3. Utilize fittings (bends) or shorter lengths of pipe where necessary to achieve desired alignment.

H. Pipe Gradient:
1. Lay pipe to slope gradient shown in the Drawings.

I. Separation Between Water Mains and Sewer Mains:
1. Maintain minimum of 10 feet horizontal separation of water mains from storm sewer and sanitary sewer mains and manholes.
2. Maintain minimum of 18 inches vertical separation where sewer and water mains cross.
    a. Center 1 full length (approximately 20 feet) of water main pipe at sewer line crossing.
    b. Correct any misalignment and/or loosened joints of sewer line prior to backfilling.
    c. Carefully compact backfill beneath sewer line to prevent misalignment.
    d. Repair any damage to sewer line at no cost to Owner. Use Engineer approved method of repair.

J. Polyethylene Encasement:
1. Wrap ductile iron and cast iron pipe, fittings, specialties, and hydrants with polyethylene encasement per ANSI/AWWA C 105.
2. Repair damaged areas of polyethylene encasements with an adhesive PVC, 10 mil minimum thick tape or equal.

K. Tracer Wire, Tracer Wire Terminal Access Box and Marker Posts with Test station:

1. Place tracer wire in trench adjacent to the water main, as shown in the Drawings.
2. Terminate tracer wire in a tracer wire terminal access box or marker posts with test station.
3. Minimum bury of tracer wire from water main to terminal access box or marker post: 36 inches.
4. Boring with Casing Pipe, Dry Boring and Directional Boring:
    a. Attach tracer wire to carrier pipe as required.
    b. Install a terminal access box or marker post with test station at each end of the boring or casing pipe.
5. Test tracer wire to insure continuity.
6. Maximum length between tracer wire terminal access boxes or marker posts: As shown in the Drawings or specified in Section 01 10 00 – Special Provisions.

L. Marker Post with Test Station and Decals:
1. Furnish and install marker posts with test station, as shown in the Drawings or specified in Section 01 10 00 – Special Provisions.
2. Maximum spacing as specified in Section 01 10 00 – Special Provisions or as shown in the Drawings.
3. See Drawings or Section 01 10 00 – Special Provisions for special wording (If Required)
4. Place decal on each marker post.

M. Depth of Cover:
1. Minimum Depth of Cover: 5.5 feet unless shown otherwise in the Drawings or stated on the Plans. (Depth of cover is measured from top of pipe to finish grade elevation.)

3.04 HYDRANT INSTALLATION

A. Set hydrant on concrete pad that is placed on undisturbed soil or other solid bearing approved by Engineer.

B. Fire Hydrants:
1. Set hydrant at location and grade shown in the Drawings.
2. Set plumb.
3. Keep interior clean at all times.
4. Locate pumper nozzle perpendicular to and facing roadway unless directed otherwise.
5. Set hydrant "bury line" at finish grade.
6. Set hydrant on 18 inch square by 4 inch thick concrete foundation.
7. Provide a drainage pit 36 inches square by 24 inches deep filled with washed gravel. Encase elbow of hydrant in gravel to 6 inches above drain opening. Do not connect drain opening to sewer.
    a. Gravel shall be a locally available material composed of ¾" or smaller well graded road gravel, free of organic matter, fine sand, loam, clay or other particles that would restrict water flow through the gravel. Crushed concrete materials are not an acceptable substitute.

8. Tie auxiliary gate valve to tee with thrust rods.
9. Position auxiliary valve a minimum of 18 inches from hydrant.
10. Wrap hydrant barrel above gravel pack, up to finish grade, with polyethylene encasement ANSI/AWWA C105.
11. Place a temporary cover over the hydrant until placed in service.

C. Flush Hydrants:

1. Set hydrant at location and grade shown in the Drawings.
2. Set plumb.
3. Keep interior clean at all times.
4. Set hydrant "bury line" at finish grade.
5. Set hydrant on 18 inch square by 4 inch thick concrete foundation.
6. Provide a drainage pit 36 inches square by 24 inches deep filled with washed gravel. Encase elbow of hydrant in gravel to 6 inches above drain opening. Do not connect drain opening to sewer.
    a. Gravel shall be a locally available material composed of ¾" or 1" graded gravel free of organic matter, sand, loam, clay or other particles that would restrict water flow through the gravel. Crushed concrete materials are not an acceptable substitute.
7. Position auxiliary valve a minimum of 18 inches from hydrant.
8. Wrap hydrant barrel above gravel pack, up to finish grade, with polyethylene encasement ANSI/AWWA C105.

3.05 RESTRAINED JOINT PIPE INSTALLATION

A. Restrained Joint Ductile Iron Pipe:

1. Provide restrained joint ductile iron pipe as shown in the Drawings. Include detailed laying schedule.
2. Field cutting of restrained joint pipe not allowed.
    a. Exceptions: Locations that utilize a "field cut" restrained joint end kit as provided and recommended by pipe manufacturer and shown in the Drawings.
3. Protect restraining mechanisms, tie rods, clamps or other components of dissimilar metal against corrosion by hand application of a suitable coating or by encasement of entire assembly with polyethylene film in accordance with ANSI/AWWA C105.

B. Concrete Thrust Blocks:

1. Place concrete thrust blocks at bends, tees and dead ends against undisturbed soil.
2. Location and Size: As shown in the Drawings.

3.06 BORING WITH CASING PIPE

A. Location: As shown in the Drawings and indicated in any special permit.

B. Refer to permit:

1. Boring under federal and state highways shall be done in strict compliance with all conditions of the permit, including but not limited to:

a. State Department of Roads or Transportation policy for utility crossings of highways and primary road systems.

b. Any other local standards that apply in the project area.

2. Boring under railroad tracks shall be shall be done in strict compliance with all conditions of the railroad permit.

3. Refer to permit provided by governmental (County or Municipal) agency. Boring shall be done in strict compliance with all conditions of the permit.

C. Encase water mains and service lines that cross roadways from toe of fill slope to toe of fill slope or as shown in the Drawings.

D. Pits for boring, tunneling or jacking not permitted closer to roadway than toe of fill slope or toe of foreslope in rural areas or 2 feet back of curb in urban sections or as shown in the Drawings.

E. Installation of casing and pipe accomplished by boring, tunneling or jacking methods.

1. Use of water under pressure (jetting) or puddling not permitted.

2. Water used to lubricate cutter and pipe, with Engineer approval, considered as dry boring.

F. Boring or tunneling operation, including location of bore pit, shall be conducted in a manner which is not detrimental to the roadway being crossed.

G. Take prompt remedial action when excessive voids or oversized bored holes are produced by filling the bore with concrete or pressurized grout and beginning a new bore hole. Obtain approval of Engineer prior to abandoning a completed bored or tunneled hole unless safety is an immediate concern.

H. Bore hole diameter for casing pipe shall not to exceed the casing pipe diameter by more than 1 1/2 inches for casing pipe having inside diameter of 12 inches or less.

I. Bore hole diameter for casing pipe shall not to exceed the casing pipe diameter by more than 2 inches for casing pipe having inside diameter of greater than 12 inches.

J. Install water main 4 inches or greater in diameter through casing pipe using casing chocks strapped to the pipe and large enough to provide clearance between casing and pipe couplings.

1. Follow manufacturer's recommendations, minimum.

2. Spacing of Chocks:

a. Maximum 10-foot centers for ductile iron pipe.

b. Maximum 6-foot centers for PVC pipe.

K. Leave space between carrier pipe and casing open.

L. Seal annular space at end of casing with synthetic rubber end seal with stainless bands.

M. Backfill bore pit:

1. See Section 31 23 33 – Trenching for Utilities.

2. Backfill over-excavated areas around the casing with compacted clean aggregate or rock.

3. Backfill Compaction Density for Bore Pit: Per the geotechnical report or at least 95 percent of maximum dry density, Standard Proctor, if geotechnical report unavailable.

3.07 DRY BORING

A. Location: As shown in the Drawings.

B. Use of water under pressure (jetting) or puddling not permitted.

C. Water used to lubricate cutter, with Engineer approval, considered as dry boring.

D. Hole diameter for water main not to exceed outside diameter of bell or coupling plus 2 inches for pipe having inside diameter of 4 inches or less.

E. Hole diameter for water main not to exceed outside diameter of bell or coupling plus 4 inches for pipe having inside diameter of more than 4 inches.

F. Where unstable soil conditions exist, conduct boring operation in a manner which is not detrimental to adjacent features or structures.

G. Take prompt remedial action when excessive voids or oversize bored hole is produced or when abandoning a bored hole. Obtain approval of Engineer prior to taking action.

H. Pressure grout all voids or abandoned holes caused by boring or jacking.

I. Backfill bore pit:

1. See Section 31 23 33 – Trenching for Utilities.
2. Backfill over-excavated areas with compacted clean aggregate or rock.
3. Backfill Compaction Density for Bore Pit: Per the Geotechnical Report or at least 95 percent of maximum dry density, Standard Proctor, if Geotechnical Report is unavailable.

3.08 DIRECTIONAL BORING

A. Location: As shown in the Drawings.

B. Examination of Site:

1. Verify horizontal and vertical alignment.
2. Review geotechnical report.
3. Verify depth and location of sewer lines and other utilities.
4. Notify Engineer immediately of any observations affecting the work.

C. Diameter of bore hole only large enough to properly install water pipe without causing excessive stress on pipe.

D. Do not exceed maximum bending radius of pipe as given by manufacturer.

3.09 HYDROSTATIC TEST

A. General:

1. Hydrostatic testing of water main(s) shall be conducted prior to disinfection and bacteriological testing of the water main(s).
2. Perform Hydrostatic Pressure Testing of piping and appurtenances in accordance with AWWA C 600 or C 605.
    a. Test against closed hydrant, with hydrant auxiliary valve open.
    b. Test perfo rmed simultaneously with initial disinfection and flushing.

B. Preparation:

1. Slowly fill pipeline with clean potable water.
2. Water used for filling may be supplied from a direct connection to the existing water distribution system, where only unidirectional flow into the new pipeline is

possible, or alternate method approved by the Engineer unless additional measures are required in the Special Provisions.

3. Expel air from system. Extreme care must be taken to ensure that all air is expelled from the pipeline before testing. This may require several cycles of pressurizing and bleeding the trapped air, prior to beginning the test.

   a. Open air valve(s) to release air and close air valves prior to testing.

   b. Install corporation stops at high points, as necessary, and open to release air. Close corporation stops, prior to beginning the test.

      (i) Owner's option after testing completed and accepted: Remove corporation stop and install plug, or leave corporation stop in place and cap.

   c. The pipeline should stand full of water for at least 24 hours prior to conducting the hydrostatic test, to allow air to escape.

C. Test:

1. Test Pressure: 150 psi or as directed by Engineer.

   a. The pressure applied at the test site shall be the pressure necessary to create the specified test pressure at the lowest point along the section of the pipeline being tested. The pressure applied at the test site shall be determined based on the specified test pressure, and the relative elevation of the lowest point along the section of pipeline being tested and the elevation of the test gage.

   b. Test pressure shall not be less than 1.25 times the working pressure at highest point of test section. (Working pressure is the anticipated maximum sustained operating pressure.)

   c. Test pressure shall not be less than 1.50 times the working pressure at lowest point of test section. (Working pressure is the anticipated maximum sustained operating pressure.)

   d. Test pressure shall not exceed 1.5 times the pressure rating of the pipe (as specified by the manufacturer).

   e. Test pressure shall not exceed the rated working pressure of the valves, fittings and appurtenances, or the thrust restraint design pressure.

   f. The pipeline shall be allowed to stabilize at the test pressure before conducting the hydrostatic test.

2. Minimum Test Period: 2 hours.

3. Testing Allowance:

   a. Testing allowance is the maximum quantity of makeup water that is added into the section of the pipeline undergoing hydrostatic testing, in order to maintain pressure within +/- 5 psi of specified test pressure throughout the test period.

   b. No pipe installation will be accepted, if the quantity of makeup water is greater than that determined by the following formula.

      (i) $Q = LD \times \sqrt{P}$ divided by 148,000 where

      Q = Quantity of makeup water, in gallons per hour

L = Length of pipe section being tested, in feet

D = Nominal diameter of the pipe, in inches

P = Average test pressure during the hydrostatic test, in pounds per square inch (gauge)

$\sqrt{P}$ means the square root of P

D. Replace damaged or defective pipe, fittings, hydrants, appurtenances or joints that are discovered during or following the test.

E. Completion of Hydrostatic Test:

1. If the quantity of makeup water is less than the testing allowance, as stated above, the Hydrostatic Test for the section of the pipeline being tested passes.
2. If the quantity of makeup water is greater than the testing allowance, as stated above, the Hydrostatic Test for the section of the pipeline being tested fails.
    a. Locate and repair all leaks.
    b. Repeat Hydrostatic Test, until satisfactory results are obtained.

3.10 CLEANING AND FLUSHING OF PIPING AND APPURTENANCES

A. Cleaning:

1. Prior to assembly and installation, thoroughly clean interior of each piece of pipe, hydrant and fitting.
2. Keep interior clean at all times.
3. If dirt enters the pipe, it shall be removed and the interior of the pipe washed with a 1 percent, minimum, free chlorine residual water.
    a. If in the opinion of the Owner and Engineer, the pipe cannot be thoroughly cleaned using flushing operations, the interior of the pipe shall be cleaned using mechanical means (i.e. foam pig) along with a chlorine solution.
4. If the installed pipe is flooded during construction, the floodwater shall be drained and the exposed piping shall be filled with a 25 mg/L, minimum, free chlorine residual water and held for a minimum of 24 hours. The chlorinated water shall be drained or flushed and regular flushing and disinfection practices outlined in these Specifications shall be resumed through the course of construction.

B. Final Filling and Flushing:

1. The Owner will provide sufficient volume of potable water from the active distribution system for the minimum required filling and flushing activities required by these Specifications at no additional cost to the Contractor.
    a. Refer to Section 01 10 00 – Special Provisions for any costs to the Contractor for additional water.
2. Obtain approval of Owner and Engineer prior to discharging flushed water into storm sewer or natural waterway.
3. Use flushing methods that prevent damage to private and public property.
4. Hydrants may be used for flushing.

5. Minimum Flushing Velocity: 3.0 feet per second (fps) unless otherwise approved by the Engineer. The following table outlines the minimum flows required for various pipe sizes to achieve the minimum velocity.

Pipe Size	Flow @ 3.0 fps. Velocity
(inches)	(gal/min)
4	120
6	260
8	470
10	730
12	1,060
16	1,880

6. Flush a minimum of 5 times the volume of the applicable water main.

3.11 DISINFECTION

A. Refer to Section 33 13 00 – Disinfection of Water Distribution System.

3.12 CHLORINATED WATER DISCHARGE

A. Refer to Section 33 13 00 – Disinfection of Water Distribution System.

3.13 BACTERIOLOGICAL and/or E-COLI TESTING

A. Refer to Section 33 13 00 – Disinfection of Water Distribution System.

3.14 CONNECTION TO EXISTING WATER MAIN

A. General:

1. Location: As shown in the Drawings.
2. Coordinate connection location with Owner and Engineer.
3. Coordinate time and date for connection with Owner and Engineer.
4. Obtain permission from Owner prior to operating controls and/or valves.
5. All salvaged valves and fittings to be salvaged and delivered to Owner.
6. Minimize shutoff time of existing water distribution system.
7. Disinfect new fittings and piping prior to installation.

B. Water mains and appurtenances shall be completely installed, flushed, disinfected and satisfactory bacteriological samples received prior to permanent connections made to the active distribution system.

C. Connections Equal to or Less Than 20 Feet in Length: New pipe, fittings and valves shall be spray or swab disinfected with a 1 percent, minimum, free chlorine solution immediately before being installed.

D. Connections Greater Than 20 Feet in Length: New pipe, fittings and valves shall be setup, disinfected, and bacteriological samples taken prior to the connection being connected to the active distribution system.

3.15 SERVICE LINES

A. General:

1. Extend new service line from corporation stop on water main to new or existing curb stop or as shown in the Drawings or details.

B. Service Taps:

1. Made in conformance with AWWA C600 or AWWA C605 at location shown in the Drawings.
2. Use service line saddle.
3. Locate 45 degrees to top of pipe.
4. Follow manufacturer's recommendations.
5. Inspected by Owner's representative prior to backfilling.

C. Service Line:

1. Depth of Cover: Minimum 5.5 feet or as specified in Section 01 10 00 – Special Provisions or as shown in the Drawings.
2. Minimum 2-foot separation between structures open to weather and service line (i.e. storm sewer pipe).
3. Deviations in Depth of Cover and/or Minimum Separation: Notify Engineer immediately of any deviation in depth or alignment. Make changes as directed by Engineer.

D. Curb Stops and Boxes:

1. Install at locations shown in the Drawings.
2. Follow manufacturer's recommendations.

E. Leakage:

1. Locate and repair all visible leaks.
2. Replace damaged and defective pipe, fittings, valves or joints.

F. Maintenance of Service to Customers:

1. Keep disruption of service at maximum of 1 hour.
2. Provide temporary connection if necessary.
3. Do not abandon, disconnect or discontinue an existing water service for greater than one hour, until customer is connected to temporary or permanent service line.
4. Provide Owner and Engineer with service connection schedule.
5. Notify service customer 24 hours in advance of making connection to curb stop.

G. Connection of New Water Service Inside of House or Building:

1. Contractor to coordinate this connection with the Owner and property owner.
2. Connection of new service line to existing plumbing inside of the house or building will be done by a Licensed Plumber.

3.16 FIELD QUALITY CONTROL

A. If tests indicate work does not meet specified requirements, remove defective materials/work and replace and retest; and/or take necessary remedial action and retest, all at no cost to Owner.

B. See Geotechnical Report.

C. Compaction density testing shall be performed on compacted fill in accordance with ASTM D 1556, ASTM D 2167, or ASTM D 6938.

1. Results shall be evaluated in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 "standard proctor", ASTM D 1557 "modified proctor" or AASHTO T 180.

2. Frequency of Backfill Compaction Tests:

a. Under Paving, Slabs-on-Grade and Similar Construction:

(i) 2 tests per 150 linear feet of main line, test lower portion and test upper portion of trench or as determined by Engineer.

(ii) 1 test of each service line or as determined by Engineer

b. Nonpaved Area:

(i) 2 tests per 300 linear feet of main line, test lower portion and test upper portion of trench or as determined by Engineer.

(ii) 1 test of each service line or as determined by Engineer.

D. Perform hydrostatic test at Contractor's expense.

1. If tests indicate work does not meet specified requirements, remove defective materials/work and replace and retest; and/or take necessary remedial action and retest, all at no cost to Owner.

E. Perform bacteriological and/or E-Coli test at Contractor's expense.

1. See Section 33 13 00 – Disinfection of Water Distribution System.

2. If tests indicate work does not meet specified requirements, remove defective materials/work and replace and retest; and/or take necessary remedial action and retest, all at no cost to Owner.

F. Tracer Wire Test:

1. If tracer wire installed, Contractor shall perform a continuity test on all tracer wire prior to the acceptance of the water system. This test may be performed by either hiring an acceptable underground utility locating firm to physically locate the tracer wire in the presence of a representative of Owner or via low voltage circuit completed with the use of a suitable voltage source and meter to ensure continuity of the tracer wire.

2. In the event that continuity cannot be demonstrated or difficulties with the locating or continuity test arise, the cause shall be isolated and corrected. Thereafter, the section in which the defective test occurred shall be retested as a unit and continuity of that section confirmed.

END OF SECTION

SECTION 33 12 16

BURIED WATER AND SEWER MAIN VALVES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Valves.

B. Air release valves.

C. Disinfection.

D. Thrust restraints.

1.02 REFERENCES

A. ANSI/AWWA C 104 – Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.

B. ANSI/AWWA C 105 – Polyethylene Encasement for Ductile-Iron Pipe Systems.

C. ANSI/AWWA C 110 – Ductile-Iron and Gray-Iron Fittings.

D. ANSI/AWWA C 111 – Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

E. ANSI/AWWA C 504 – Rubber-Seated Butterfly Valves.

F. AWWA C 508 – Swing-Check Valves for Waterworks Service, 2 inch through 24 inch (50-mm Through 600-mm) NPS.

G. ANSI/AWWA C 509 – Resilient-Seated Gate Valves for Water Supply Service.

H. ANSI/AWWA C 512 – Air-Release, Air/Vacuum, and Combination Air Valves for Waterworks Service.

I. ANSI/AWWA C 517 – Resilient-Seated Cast-Iron Eccentric Plug Valves

J. ANSI/AWWA C 550 – Protective Interior Coatings for Valves and Hydrants.

K. ANSI/AWWA C 600 – Installation of Ductile-Iron Water Mains and Their Appurtenances.

L. ANSI/AWWA C 605 – Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings.

M. ANSI/AWWA C 651 – Disinfecting Water Mains.

N. ASTM D 698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3))

O. ASTM D 1556 – Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method

P. ASTM D 1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3))

Q. ASTM D 2167 – Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method

R. ASTM D 6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

S. AASHTO T 180 – Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop

T. Recommended Standards for Water Works, latest edition (aka 10 States Standards) by Great Lakes-Upper Mississippi River Board of State Public Health and Environmental Managers

1.03 UNIT PRICES

A. Valves with Valve Boxes:

1. Method of Measurement and Pay Unit: By the unit (Each) for each respective size and type of valve shown on the bid form.

2. Includes excavation, hand trimming excavation, valve, bedding, thrust restraints, concrete for base and thrust restraints, backfilling and compaction of backfill, valve box, valve box adapter, concrete valve box collar, testing and incidentals thereto.

B. Air-Release, Vacuum and Combination Valves:

1. Method of Measurement and Pay Unit: By the unit (Each) for each respective size and type of air valve.

2. Water Air Valve: Includes excavation, hand trimming excavation, bedding, backfilling and compaction of backfill, connection to pipe, air valve, supply valve and air valve structure or manhole, assembly, testing and incidentals thereto, as shown in the Drawings.

3. Sewer Air Valve: Includes excavation, hand trimming excavation, bedding, backfilling and compaction of backfill, connection to pipe, air valve, inlet and outlet shut off valves, coupling, hose, air valve structure or manhole, assembly, testing and incidentals thereto, as shown in the Drawings.

C. Polyethylene Encasement:

1. Polyethylene encasement of ductile iron valves is considered to be a subsidiary item included in the cost of items for which payment is made.

D. Tracer Wire, Marker Post and Appurtenances:

1. Tracer wire, pedestals, maker posts, mounting stakes, decals and installation and testing are considered to be subsidiary items to and included in the cost of items for which payment is made.

E. Reinforced Concrete Valve Box Collar, as shown in the Drawings:

1. Considered to be a subsidiary item included in the cost of valve for which payment is made.

F. Valve Box Adaptor:

1. Considered to be a subsidiary item included in the cost of valve for which payment is made.

G. Disinfection:

1. Considered to be a subsidiary item included in the cost of valve for which payment is made.

H. Testing and Cleaning:

1. Considered to be a subsidiary item included in the cost of the item for which payment is made.

I. Bacteriological and/or E-Coli Testing:

1. Considered to be a subsidiary item included in the cost of valve for which payment is made.

J. Dewatering:

1. Considered to be a subsidiary item included in the cost of valve for which payment is made.

K. Bedding:

1. Considered to be a subsidiary item included in the cost of the item for which payment is made.

1.04 SUBMITTALS

A. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

B. Submit the following as appropriate for each valve and air valve provided:

1. Outline and installation drawings for equipment and fixtures furnished.
2. Equipment performance data and operating characteristics.
3. Manufacturer's data for valve, air valves and accessories.
   a. Supply catalog data, including illustrations and a parts list that identifies the materials used for various parts.
   b. The information shall be in sufficient detail to serve as a guide in the assembly and disassembly of the valve and for ordering repair parts.
4. Manufacturer's catalog data marked to indicate materials being furnished are a standard equipment, fixtures, specialties and accessories.

C. Project Record Documents:

1. Record the location of valves.
   a. Provide Engineer with a minimum of 3 distance ties from the valve to permanent topographical feature (trees, buildings, fire hydrants, etc.).
   b. Provide Engineer with GPS Coordinates, if required, see Section 01 10 00 – Special Provisions.
2. Identify, describe and record the discovery of variations in subsoil conditions, and provide copy of record to Engineer.
3. Identify, describe and record the discovery of uncharted utilities, and provide copy of record to Engineer.
4. Backfill Compaction Test; provide copy of Test Records to Engineer

1.05 QUALITY ASSURANCE

A. All products are required to meet applicable AWWA requirements, ANSI/NSF 61 and the requirements of the Safe Drinking Water Act.

B. Marking: Manufacturer's name or mark, size and pressure class/rating marked on valve body/cover.

1.06 REGULATORY REQUIREMENTS

A. Conform to all applicable local, state and federal code for materials and installation of the work of this section. Perform work in accordance with standards of authorities having jurisdiction over system piping and appurtenances. Includes materials, installation, testing and disinfection, if applicable

B. If installed in a potable water system, bacteriological water quality sampling and testing in accordance with AWWA C 600 or C 605 and AWWA C 651 and in compliance with the rules and regulations of the authority having jurisdiction for potable water system piping.

1. Bacteriological water quality analysis shall be performed by a state approved laboratory.

C. If installed in a wastewater system, conform to all applicable state, federal and local codes of authorities having jurisdiction for wastewater piping. Includes materials, installation and testing.

1.07 PROJECT CONDITIONS

A. Verify that survey control points for alignment and elevation are as indicated in the Drawings.

B. Research public utility records and verify location of existing utilities.

1. Contact utility locating service for project area.

2. Comply with applicable “ONE CALL” requirements.

C. Provide exploratory excavation to determine exact location of existing underground structures or utilities. Notify Engineer immediately if a discrepancy or conflict is identified.

D. Protect plants, lawns, trees, and other amenities and features; which are to remain, as shown in the Drawings, from damage by equipment, vehicular traffic and other construction related activities.

E. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, curbs, utility pedestals and lines and amenities that are to remain from damage by excavating equipment, vehicular traffic and other construction related activities.

F. Verify that valve can be installed as shown in the Drawings and to reference standards.

G. Coordinate with the installation of piping and/or other facilities as shown in the Drawings.

1.08 DELIVERY, STORAGE AND HANDLING

A. Preparation for Storage:

1. Ensure that valves are dry and internally protected against rust and corrosion.

2. Protect actuator and end joints.

3. Set valves in best position for handling.

4. Set valves closed to prevent rattling.

B. During Storage:

1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.

2. Protect from weather:

a. Protect stored valves and accessories from moisture and dirt.

b. Store indoors and maintain temperature higher than ambient dew point temperature, where possible.

c. When outdoor storage is necessary, support valve off the ground or pavement in watertight enclosures.

C. Handling:

1. Use sling to lift valves where size requires handling by crane or other equipment. End hooks not allowed

a. Rig valves to avoid damage to exposed valve parts.

b. Do not use actuator or stem as lifting or rigging points.

2. Deliver to trench in sound, clean and undamaged condition.
3. Protect valves and appurtenances from moisture and dirt during handling.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS/PRODUCTS

A. All products installed in a potable water system shall meet NSF 61 requirements.

B. All valves and accessories shall meet all applicable AWWA requirements.

2.02 VALVES

A. Gate Valves:

1. Meeting requirements of ANSI/AWWA C509.
2. All valves by same manufacturer.
3. Resilient-seated type
4. Nonrising stem
5. Body: Cast Iron or Ductile Iron meeting ASTM A126 standards.
6. Nuts and Bolts: Type 304 stainless steel meeting ASTM A240 standards.
7. Valve Ends: Mechanical joint meeting ANSI/AWWA C110 and C111.
8. Actuator:
   a. Manually driven 2-inch square nut for buried service.
   b. Valve shall open by turning the operator counter clockwise.
9. Coating: ANSI/AWWA C550 epoxy coating; inside and outside of body, bonnet and stuffing box.
10. Pressure Rating: 200 psi for 3 through 12 inch, 150 psi for 16 through 30 inch.

B. Butterfly Valves:

1. Meeting requirements of ANSI/AWWA C504, sized for bi-directional water service.
2. All valves by same manufacturer.
3. Body: Cast Iron meeting ASTM A126 standards or Ductile Iron meeting ASTM A536 standards.
4. Valve Ends: Mechanical joint meeting ANSI/AWWA C110 and C111.
5. Disc:
   a. Cast Iron meeting ASTM A126 standards or Ductile Iron meeting ASTM A536 standards, with a 316 stainless steel edge.
   b. Discs shall be secured to the shaft by stainless steel pins, which extend through the full diameter of the shaft to withstand the specified line pressure up to valve rating and the torque required to operate the valve.
   c. Disc stops located in the flow stream are not allowed.
6. Seats: Synthetic rubber compound, mechanically retained to the body.
7. Nuts and Bolts: Type 304 stainless steel meeting ASTM A240 standards.
8. Stem: Type 304 stainless steel meeting ASTM A240 standards, turned, ground, and polished.

9. Stem Seals: standard self-adjusting "V" type packing. Packing material shall be suitable for use in high temperature air piping. "O" ring and "U" cup packing is not allowed.

10. Operator:

    a. Manually driven encased worm gear with 2-inch square nut for buried service.

    b. Valve shall open by turning the operator counter clockwise.

11. Coating: ANSI/AWWA C550 epoxy coating; inside and outside of body.

12. Pressure Rating Class: 150 psi, minimum (Class 150B).

C. Plug Valves:

1. Meeting requirements of ANSI/AWWA C517.

2. All valves by same manufacturer.

3. Body:

    a. Cast Iron meeting ASTM A126 standards or Ductile Iron meeting ASTM A536 standards.

    b. Port Size of not less than 100 % of pipe area.

4. Valve Ends: Mechanical joint meeting ANSI/AWWA C110 and C111.

5. Nuts and Bolts: Type 304 stainless steel meeting ASTM A240 standards.

6. Operator:

    a. Manually driven encased worm gear with 2-inch square nut for buried service.

    b. Valve shall open by turning the operator counter clockwise.

7. Coating: ANSI/AWWA C550 epoxy coating; outside of body.

8. Minimum Design Pressure Rating:

    a. 175 psi for valves 12” and smaller.

    b. 150 psi for valves 14” and larger

D. Buried valves shall be encased in Polyethylene per ANSI/AWWA C105.

2.03 VALVE BOXES:

A. Cast iron base, center and top sections; screw type adjustment.

B. Base: Standard or oval as required for valve.

C. Top Section: Drop lid marked "WATER" for water mains or “SEWER” for sewer force main.

2.04 VALVE BOX ADAPTER:

A. The valve box adapter shall permanently align the valve with the valve box assembly preventing shifting and settling of the valve box assembly.

B. The valve box adapter shall center the valve box over the operating nut.

C. The valve box adapter shall be polyester powder coated steel or rubber to provide corrosion protection.

D. The adapter shall be available in various sizes designed to accurately align a valve box assembly.

E. The adapter shall be manufactured to fit the various valve manufacturers’ products.

2.05 COMBINATION AIR VALVES – WATER

A. The Drinking Water Combination Air Valve shall perform the functions of both Air Release and Air/Vacuum Valves and furnished as a single body or dual body type, and be designed for operation in a drinking water system.

1. Valves shall be manufactured and tested in accordance with American Water Works Association (AWWA) Standard C512 certified to NSF/ANSI 61 Drinking Water System Components – Health Effects.

2. The valve shall be an automatic float operated valve designed to exhaust large quantities of air during the filling of a piping system and close upon liquid entry, without spilling.

3. The valve shall open during or if a negative pressure occurs. The valve shall also release accumulated air from a piping system while the system is in operation and under pressure.

4. All valves installed shall include an inflow preventer to prevent the introduction of contaminated water through air valve outlet. The inflow preventer shall allow the admittance and exhausting of air while preventing contaminated water from entering during normal operational conditions. The inflow preventer shall be flow tested by an independent third party to certify performance.

B. The valve body and cover shall be constructed of cast iron, ductile iron or polyethylene.

1. Cast or ductile iron valve interiors and exteriors shall be coated with an NSF/ANSI 61 certified fusion bonded epoxy in accordance with AWWA C550.

C. Valves 3 inch and smaller shall be threaded with NPT inlets and outlets. Larger valves shall be provided with flanged ends.

1. The valve shall be mounted on a vertical riser with ball, plug, or gate isolation valve prior to the inlet as shown on the Drawings.

D. Resilient seats shall be replaceable and provide drip tight shut off to the full valve pressure rating.

E. The float and guide shaft shall be constructed of stainless steel or equal.

1. Floats shall be unconditionally guaranteed against failure, including pressure surges.

F. Pressure Rating: Working pressures up to 250 psig.

G. Polyethylene Encasement: AWWA C105, if buried.

H. Includes fittings, couplings and incidentals thereto.

2.06 COMBINATION AIR VALVES - SEWER

A. The Sewage Combination Air Valve shall perform the functions of both Air Release and Air/Vacuum Valves and furnished as a single body type, and be designed for operation in a sewage system. Dual body types shall only be permitted if shown in the Drawings and/or included in Section 01 10 00 – Special Provisions.

1. Valves shall be manufactured and tested in accordance with American Water Works Association (AWWA) Standard C512 certified to NSF/ANSI 61 Drinking Water System Components – Health Effects.

2. The valve shall be an automatic float operated valve designed to exhaust large quantities of air during the filling of a piping system and close upon liquid entry, without spilling.

3. The valve shall open during or if a negative pressure occurs. The valve shall also release accumulated air from a piping system while the system is in operation and under pressure.

B. The valve body and cover shall be constructed of cast iron, ductile iron or polyethylene.

C. Valves 3 inch and smaller shall be threaded with NPT inlets and outlets. Larger valves shall be provided with flanged ends.

1. The valve shall be mounted on a vertical riser with ball, plug, or gate isolation valve prior to the inlet as shown on the Drawings.

D. Resilient seats shall be replaceable and provide drip tight shut off to the full valve pressure rating.

E. The float and guide shaft shall be constructed of stainless steel or equal.

1. Floats shall be unconditionally guaranteed against failure, including pressure surges.

F. The body shall have 2" NPT cleanout and 1" NPT drain connection for manual drainage outlet on the side of the body.

G. Inlet and blow off valves, quick disconnect couplings and minimum 5' hose for flushing shall be provided.

H. Pressure Rating: Working pressures up to 250 psig.

I. Polyethylene Encasement: AWWA C105, if buried.

J. Includes fittings, couplings and incidentals thereto.

2.07 TRACER WIRE

A. Wire: No. 12 AWG solid copper conductor with type THHN insulation or No. 12 AWG copper clad steel conductor with HDPE jacket.

B. Splices: Splicing shall be made with 3M DB type direct bury wire splice kits, sized appropriate to the number and size of wires connected.

C. Incidentals: Terminal box, pedestal box or duplex box - see detail sheet and Section 01 1000 - Special Provisions.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that trench cut and excavation base are ready to receive work and that the location and elevation is as indicated.

B. Verify that water main size, location and invert are as indicated.

C. Verify depth and location of other buried utilities and structures in the area.

3.02 TRENCHING

A. Hand trim excavation for accurate placement of valves to elevations indicated.

B. Backfill around sides and to the top of valve body and tamp in place; and then backfill around sides and to the top of valve box in layers and compact to meet backfill compaction requirement.

C. Protect valve and appurtenances from damage and displacement while backfilling and compacting.

3.03 VALVE INSTALLATION

A. General:

1. Location: As shown in the Drawings.
2. Inspect valve for defects before completing installation.
3. Prior to assembly and installation, thoroughly clean interior of each valve.
4. Keep interior clean at all times.
5. Set valves on solid bearing.

B. Center and plumb valve box over valve:

1. Install valve box adapter.
2. Set box cover flush with finished grade.

C. Install valve and appurtenances in accordance with manufacturer's recommendations and AWWA C 600 (Ductile Iron) on AWWA C 605 (PVC).

D. Handling Pipe Valves and Appurtenances:

1. Use sling to lift valves where size requires handling by crane or other equipment.
   a. Rig valves to avoid damage to exposed valve parts.
   b. Do not use actuator or stem as lifting or rigging points.
2. Deliver to trench in sound, undamaged condition.
3. Use web slings. End hooks not allowed.

3.04 JOINING TO PIPE

A. Use methods recommended by manufacturer.

B. Use minimum amount of gasket lubricant necessary to allow safe and efficient assembly.

3.05 JOINT DEFLECTIONS

A. Do not exceed manufacturer's recommendations for type and size of valve and joint being used.

3.06 POLYETHYLENE ENCASEMENT

A. Wrap buried ductile iron valves and actuators with polyethylene encasement per ANSI/AWWA C 105.

B. Repair damaged areas of polyethylene encasements.

3.07 TRACER WIRE

A. Place tracer wire in trench adjacent to valve.

B. Terminate trace wire in terminal access boxes and/or pedestals as noted in the Specifications and shown in the Drawings.

3.08 DEPTH OF COVER

A. Minimum Depth of Cover: 5.5 feet unless noted otherwise in the Drawings. (Depth of cover is measured from top of pipe to finish grade elevation.)

3.09 PROTECTION OF VALVE INTERIOR

A. Clean valve interior of foreign material before lowering into trench.

B. Keep clean at all times.

C. Securely close open ends with watertight plugs during nonworking periods including:

1. When pipe laying is not in progress.
2. Nights.
3. Weekends.

3.10 DISINFECTION:

A. See Section 33 13 00 – Disinfection of Water Distribution System.

3.11 RESTRAINT

A. Restrained Joints:

1. Provide restrained joint fittings where indicated in the Drawings.

B. Thrust Restraint:

1. Mechanical Restraint:
   a. Threaded Rod: 3/4 inch diameter; stainless steel or corten.
   b. Nuts: Ductile iron, corten or stainless steel.
   c. Eye Bolts: 3/4 inch diameter, corten.
2. Concrete Thrust Block.

C. Protect restraining devices, threaded rods, clamps or other components of dissimilar metal against corrosion by hand application of a suitable coating or by encasement of entire assembly with polyethylene film in accordance with ANSI/AWWA C 105/A 21.5.

3.12 FIELD QUALITY CONTROL

A. General: If a test indicates that work does not meet specified requirements, remove defective materials/work and replace and retest; and/or take necessary remedial action and retest, all at no cost to Owner.

B. Compaction density testing shall be performed on compacted fill in accordance with ASTM D 1556, ASTM D 2167, or ASTM D 6938.

1. Results shall be evaluated in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 "standard proctor", ASTM D 1557 "modified proctor" or AASHTO T 180.
2. If tests indicate work does not meet specified requirements, remove defective materials/work and replace and retest; and/or take necessary remedial action and retest, all at no cost to Owner.

C. Perform hydrostatic test at Contractor's expense.

1. If tests indicate work does not meet specified requirements, remove defective materials/work and replace and retest; and/or take necessary remedial action and retest, all at no cost to Owner.

D. Perform disinfection and bacteriological and/or E-Coli tests at Contractor's expense.

1. See Section 33 13 00 – Disinfection of Water Distribution System.
2. If tests indicate work does not meet specified requirements, remove defective materials/work and replace and retest; and/or take necessary remedial action and retest, all at no cost to Owner.

END OF SECTION

SECTION 33 13 00

DISINFECTION OF WATER DISTRIBUTION SYSTEM

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Disinfection of waterline.

B. Testing and reporting.

1.02 REFERENCES

A. AWWA B300 – Hypochlorites.

B. AWWA B301 – Liquid Chlorine.

C. AWWA C651 – Disinfecting Water Mains.

D. Standard Methods for the Examination of Water and Wastewater (AWWA/WEF/APHA)

1.03 UNIT PRICES - MEASUREMENT AND PAYMENT

A. Disinfection of Potable Waterlines:

1. Separate payment for disinfection of potable waterlines and water wells will not be made. Disinfection is considered subsidiary to the work indicated in the project.

B. Bacteriological Testing of Potable Waterlines:

1. Separate payment for bacteriological testing of potable waterlines and water wells will not be made. Biological testing is considered subsidiary to the work included in the project.

1.04 SUBMITTALS

A. Disinfection Report, Record:

1. Type and form of disinfectant used.
2. Date and time of disinfectant injection start and time of completion.
3. Test locations.
4. Initial and 24-hour disinfectant residuals (quantity in treated water) in ppm for each outlet tested.
5. Date and time of flushing start and completion.
6. Disinfectant residual after flushing in ppm for each outlet tested.

B. Bacteriological Report, Record:

1. Date issued, project name, and testing laboratory name, address and telephone number.
2. Time and date of water sample collection.
3. Name of person collecting samples.
4. Test locations.
5. Initial and 24-hour disinfectant residuals in ppm for each outlet tested.
6. Test results for each outlet tested.
7. Certification that water conforms, or failed to conform, to bacterial standards of State Regulatory Agency.

8. Bacteriologist's signature and authority.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with AWWA C 651.

B. Disinfection: Company with minimum of 3 years documented experience in disinfecting potable water systems.

C. Testing Firm: State Regulatory Agency laboratory or company specializing in testing potable water systems, certified and approved by the State Regulatory Agency for microbiological testing.

1.06 REGULATORY REQUIREMENTS

A. Conform to applicable State Regulatory Agency code or regulation for performing the work of this section.

B. Provide certificate of compliance from authority having jurisdiction, indicating approval of water system.

PART 2 - PRODUCTS

2.01 DISINFECTION CHEMICAL

A. ANSI/AWWA B300 – Hypochlorites:

1. Sodium hypochlorite solution.
2. Calcium hypochlorite granules.
3. Calcium hypochlorite tablets.

B. ANSI/AWWA B301 – Liquid Chlorine.

2.02 FOOD GRADE ADHESIVES

A. Permatex Form-A-Gasket No. 2.

B. Permatex clear RTV silicone adhesive sealant.

C. Approved equal.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that piping systems or water well has been cleaned, inspected and pressure tested.

B. Schedule disinfecting activity to coordinate with start-up, testing, adjusting and balancing, and demonstration procedures, including related systems.

3.02 GENERAL

A. Disinfection in accordance with ANSI/AWWA C651, latest edition.

B. Potable water shall be used from the existing distribution system or another source approved by the Engineer for disinfection, flushing and testing activities.

C. Filling and Flushing: Refer to Part 3 of Section 33 11 16 – Water Distribution. Eliminate air pockets and remove particulates from pipe to be disinfected and tested.

3.03 DISINFECTION

A. Continuous-Feed Method:

1. Preparation:

a. Flush line following procedures outlined in Part 3 of Section 33 11 16 – Water Distribution to eliminate air pockets and remove particulates.

2. Application of Chlorine Solution:

a. Fill line with potable water and chlorine solution at constant and measured rate at a tap, with corporation stop, within 10 feet downstream from beginning (upstream side) of the new main.

b. Constantly apply chlorine solution using one of the following methods:

(1) Liquid chlorine solution-feed, vacuum-operated chlorinator and booster pump.

(2) Liquid hypochlorite metered, chemical feed pump.

c. Direct-feed chlorinators which operate solely from gas pressure in chlorine cylinder are not allowed.

d. Chlorine solutions must have a minimum of 1% chlorine concentration prepared with sodium hypochlorite or calcium hypochlorite.

e. Pace the water and chlorine solution flow rates so water entering the new line will not have less than 25 mg/L available chlorine.

f. The amount of chlorine required for each 100 feet of pipe shall be as outlined in the following table.

Chlorine Solution Required to
Produce an Initial 25 mg/L Concentration
(per 100 feet of pipe)

Pipe Diameter	100% Chlorine	1% Chlorine Solution
(Inches)	(lbs)	(gal)
4	0.013	0.16
6	0.030	0.36
8	0.054	0.65
10	0.085	1.02
12	0.120	1.44
16	0.217	2.60

g. Chlorine application shall not cease until the entire main is filled with chlorinated water.

B. Slug Method:

1. Preparation:

a. Flush line following procedures outlined in Part 3 of Section 33 11 16 – Water Distribution to eliminate air pockets and remove particulates.

2. Application of Chlorine Solution:

a. Fill line with potable water and chlorine solution at constant and measured rate at a tap, with corporation stop, within 10 feet downstream from beginning (upstream side) of the new main.

b. Constantly apply chlorine solution using the methods outlined for the Continuous Feed Method.

c. Pace the water and chlorine solution flow rates so water entering the new line will not have less than 100 mg/L available chlorine.

d. Chlorine shall be applied consistently to develop a solid slug of chlorinated water that will, as it moves through the main, expose all interior surfaces to approximately 100 mg/L concentration for 3 hours, minimum.

e. The free chlorine concentration shall be measured at regular intervals, as the slug moves through the main, to provide consistent loading of the target chlorine concentration.

f. If at any time the chlorine concentration drops below 75 mg/L, the flow shall be stopped and chlorination equipment shall be relocated to the head of the slug to restore the concentration of chlorine to a minimum of 100 mg/L.

g. As the slug passes past fittings, hydrants, branches of the water main, etc.., related valves and hydrants shall be operated to disinfect those locations.

C. Tablet/Granular Method:

1. General:

a. Need written permission of Engineer.

b. Do not use on solvent-welded plastic or screwed-joint steel pipe.

c. Use only if pipe and appurtenances have been kept clean and dry during construction.

d. Use with calcium hypochlorite granules or tablets to give average chlorine does of 25 mg/L.

2. Placing Calcium Hypochlorite Granules (HTH):

a. Place at upstream end of first section of pipe and each branch main.

b. Place at 500-foot intervals thereafter.

c. The quantity of granules to be applied at each location shall be as outlined in the following table.

HTH Granules

(65% Available Chlorine by Weight)

Pipe Diameter (Inches)	(ounces)	(grams)
4	1.7	48
6	3.8	108
8	6.7	190
10	10.5	298
12	15.1	428
14 and larger	D^2 x 15.1	D^2 x 428

D = Inside pipe diameter in feet

3. Placing Calcium Hypochlorite Tablets (HTH):

   a. Place 5-gram tablet(s) in the upstream end of each section of pipe.

   b. At least one tablet shall be placed in each fire hydrant or flush hydrant lead pipe.

   c. The quantity of tablets to be placed at each location shall be as outlined in the following table.

Number of 5 gram HTH Tablets
(65% Available Chlorine by Weight)

	Pipe Size									
Length of Pipe	4"	6"	8"	10"	12"	16"	20"	24"	30"	36"
13'	1	1	1	2	3	4	7	9	15	21
18'	1	1	2	3	4	6	9	13	20	28
20'	1	1	2	3	4	7	10	14	22	32
30'	1	2	3	4	6	10	15	21	33	47
40'	1	2	4	5	7	13	20	28	44	63

(Number of 5g tablets per pipe section = 0.0012 d^2 L rounded up, where d = Inside diameter of pipe in inches and L = length in feet.)

   d. Attach tablets to inside, top of pipe of each length of pipe with NSF/ANSI 61 approved adhesive.

4. Filling Pipe:

   a. Slowly fill pipe to ensure tablets do not come loose from pipe.

   b. Keep the filling velocity to no greater than 1 foot per second. Refer to the following table as reference.

Pipe Size (Inches)	Flow (gpm) < 1 Ft/Sec. Velocity
4	< 40
6	< 85
8	< 155
10	< 245
12	< 350
14	< 480
16	< 625

   c. Ensure that air pockets are eliminated.

D. Retention Time:

   1. Maintain the chlorinated water in the piping for at least 24 hours.

2. If water temperature is less than 41 degrees F, allow treated water to stand for at least 48 hours.

3. Maintain minimum 10 mg/L free residual chlorine concentration during entire retention time.

E. Post-Disinfection Flushing:

1. Refer to Section 33 11 16 – Water Distribution.

2. Ascertain that heavily chlorinated water has been removed from waterline.

3. Chlorine concentration should be no higher than that generally maintained in the system or less than 1 mg/L.

3.04 CHLORINATED WATER DISCHARGE

A. Refer to ANSI/AWWA C655 – Field Dechlorination.

B. Contractor shall discharge/dispose of the chlorinated water resulting from the disinfection of the water improvements in an appropriate manner and in strict compliance with local, state and federal requirements for discharges to any storm drain, surface water, ditch or other waterway.

C. Do not discharge 'super-chlorinated' (concentration of 4 mg/L or higher) water directly to any storm sewer drain system, surface water or other waterway without permission of the Owner.

1. Super-chlorinated water may only be discharged after dechlorination by aeration, retention, dissipation, or chemical treatment using a portable dechlorinator to "no measurable chlorine" content.

2. Removal of any residual chlorine must be completed before any discharge into an environmentally sensitive area or surface water

D. If the discharge is to a ditch, at a minimum, all regulatory requirements and the following stipulations shall be complied with.

1. The water in the ditch(es) shall not have measurable residual chlorine within 1,000 feet of the point of discharge or at the point of entry into an environmentally sensitive area, surface water or other waterway, whichever distance is less.

2. Discharges shall not be toxic to vegetation or aquatic life in the ditch.

3.05 BACTERIOLOGICAL TESTS

A. Sample Collection Methods:

1. After final flushing and before new waterline is placed in service, fill line with potable water.

2. Install corporation stop on waterline with copper tube gooseneck assembly.

3. Bacteriological samples shall be analyzed for the presence of coliform bacteria.

a. Samples shall be tested in accordance with Standard Methods for the Examination of Water and Wastewater.

b. A passing sample is defined as results showing absence (zero presence) of coliform bacteria.

4. Contractor shall conduct bacteriological sample collection and testing in conformance with one of the following options:

a. Collect 2 consecutive sets of samples at least 16 hours apart

b. At the conclusion of flushing, allow the main to sit without water use for a minimum of 16 hours. After the minimum of 16 hours, two sets of samples shall be collected a minimum of 15 minutes apart while the sample taps are left running.

B. Location of Samples:

1. 1 set at end of each test section.
2. 1 set for every 1,200 feet.
3. 1 set at the end of each branch.
4. Others as directed by Engineer, as specified in Section 01 10 00 – Special Provisions or shown in the Drawings.

C. Sample Collection:

1. Collect samples in sterile bottles treated with sodium thiosulfate.
2. Do not take samples from hoses or fire hydrant.

D. Submit water samples to state regulatory agency laboratory or certified testing laboratory for bacteriological analysis.

E. Bacteriological Test Failure:

1. Repeat flushing and disinfection procedures.
2. Use continuous-feed method for disinfection.
3. Repeat bacteriological sampling and testing.

END OF SECTION

THIS PAGE CONCLUDES

THE

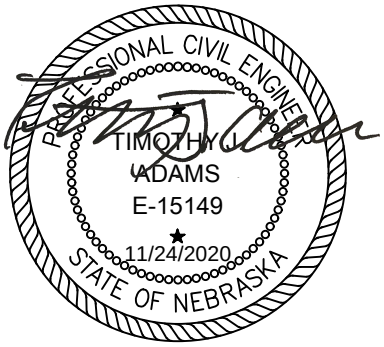
SPECIFICATIONS

FOR THE

2020 WATER MAIN IMPROVEMENTS
EASTBOURNE ST./N 147TH ST.; N 143RD ST. TO CASTLEWOOD ST.

FOR

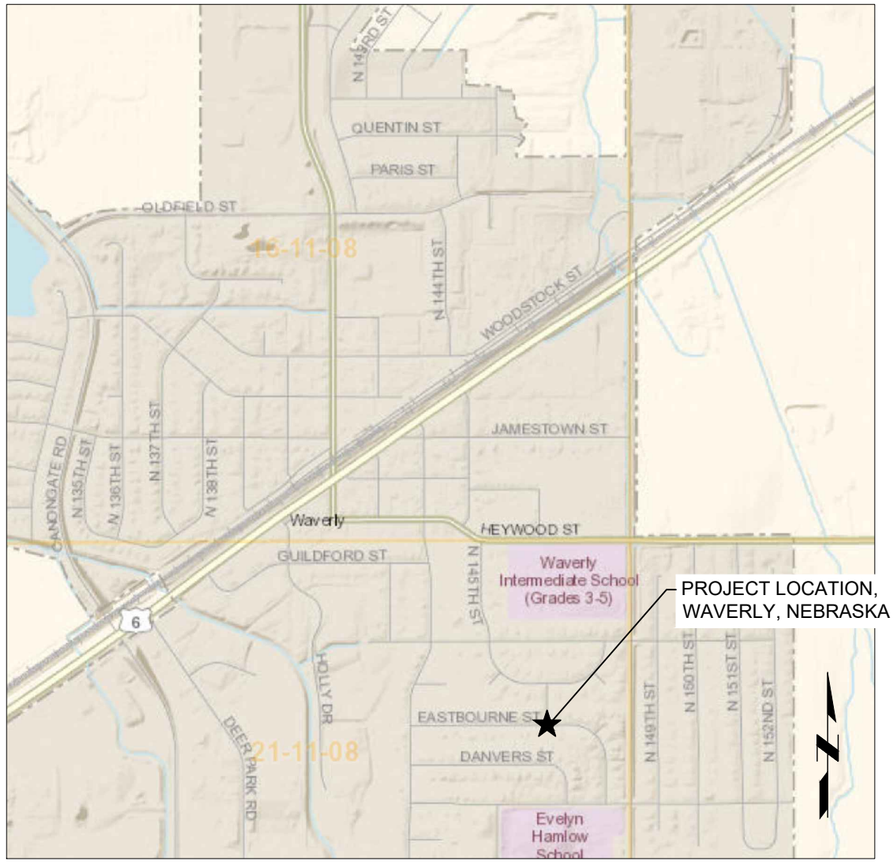
WAVERLY, NEBRASKA



2020
WATER MAIN IMPROVEMENTS
EASTBOURNE ST./N 147TH ST.;
N 143RD ST. TO CASTLEWOOD ST.
WAVERLY, NEBRASKA

INDEX OF SHEETS:

SHEET NO:	SHEET NAME:
C0.1	COVER SHEET
C0.2	SYMBOLS
C0.3	HORIZONTAL ALIGNMENT & CONTROL
C1.0 - C1.1	EXISTING SITE PLAN
PP1.1 - PP2.1	PLAN AND PROFILE SHEETS
D1.1 - D1.2	STANDARD DETAILS



LOCATION MAP

I, TIMOTHY J. ADAMS, AM THE COORDINATING PROFESSIONAL ON THE 2020 WATER MAIN IMPROVEMENTS EASTBOURNE ST./N 147TH ST.; N 143RD ST. TO CASTLEWOOD ST. PROJECT.

PROFESSIONAL CIVIL ENGINEER
TIMOTHY J. ADAMS
E-15149
11/24/2020
STATE OF NEBRASKA

NOTE:
NEITHER THE OWNER (CLIENT) NOR JEO CONSULTING GROUP, INC. ASSUMES ANY RESPONSIBILITY FOR UTILITY LOCATIONS BEING ACCURATELY SHOWN OR NOT SHOWN ON THE PLANS. A REQUEST FOR UTILITY LOCATES WAS MADE FOR THIS LOCATION AS PER THE ONE-CALL NOTIFICATION SYSTEM ACT.
(DATE: 8/4/2020 TICKET NO.: 202130110).
(DATE: 8/4/2020 TICKET NO.: 202130111).
(DATE: 8/4/2020 TICKET NO.: 202130112).
(DATE: 8/4/2020 TICKET NO.: 202130113).
(DATE: 8/4/2020 TICKET NO.: 202130114).
(DATE: 8/4/2020 TICKET NO.: 202130115).
(DATE: 8/4/2020 TICKET NO.: 202130116).

UTILITIES SHOWN ARE FROM FIELD MARKINGS PROVIDED IN THE FIELD BY THE UTILITY PROVIDERS.

THE EXACT LOCATION AND/OR SIZE OF UNDERGROUND FEATURES MAY NOT BE ACCURATELY, COMPLETELY AND RELIABLY DEPICTED. FIELD VERIFICATION OF UTILITIES MAY BE REQUIRED. CONTRACTOR(S) SHALL NOTIFY THE RESPECTIVE UTILITY COMPANIES BEFORE COMMENCING ANY WORK.

811 Know what's below. Call before you dig.

PROJECT NO.	201085.00
DATE	11/24/2020
DRAWN BY	ADP
FILE NAME	S-201085_3.dwg
FIELD BOOK	FB LINCOLN #2
FIELD CREW	EF, NH
SURVEY FILE NO.	SV-201085
PLAN IN HAND INITIALS / DATE	TJA 8/31/2020
70 PERCENT REVIEW INITIALS / DATE	RSP 10/16/2020
95 PERCENT REVIEW INITIALS / DATE	RSP 11/09/2020
REVISIONS	

\\jeo.local\dav\Projects\Lincoln\2020\085.00 - Waverly Water and Sewer Improvements\7 Design\2 Drawings\Full Eastbourne to N 147th Street Water Main\S-201085_3.dwg on 11/24/2020 10:47 AM

LINESTYLES

ITEM	SYMBOL
BREAK LINE	
CABLE TELEVISION	TV
CENTERLINE OF ROAD	
CONTOUR MINOR (EX)	1202
CONTOUR MAJOR (EX)	1200
CONTOUR MINOR (EX SCREENED)	1202
CONTOUR MAJOR (EX SCREENED)	1200
CONTOUR MINOR (PR)	1202
CONTOUR MAJOR (PR)	1200
LIMITS OF CONSTRUCTION	LOC
CULVERT	
ELECTRIC (OVERHEAD)	OHE
ELECTRIC (UNDERGROUND)	UGE
FENCE (WOODEN)	
FENCE (WIRE OR UNKNOWN)	
FENCE (CHAINLINK)	
FENCE (SECURITY)	
FIBER OPTIC LINE	FO
FLOWLINE (BREAKLINE)	
GAS LINE	G
GUARDRAIL	
PROPERTY BOUNDARY	
PROPERTY LOT LINES (PR)	
RIGHT-OF-WAY LINE	ROW
RAILROAD RIGHT-OF-WAY	RR ROW
RAILROAD TRACKS	
RETAINING WALL	
SANITARY SEWER (EXIST)	8" SAN
SANITARY SEWER (PROP)	8" SAN
SAN SEWER FORCE MAIN (EX)	8" FM
SAN SEWER FORCE MAIN (PR)	6" FM
STORM SEWER (EXIST)	12"ST (OFFSET TO PIPE SIZE)
STORM SEWER (PROP)	12" ST (OFFSET TO PIPE SIZE)
TELEPHONE LINE (UGND)	UGT
TELEPHONE LINE (OVERHEAD)	OT
TERRACE	
CROPLINE	
TRAVELED WAY	
WATER (EXIST)	6" W
WATER (PROP)	6" W
FIRE SERVICE	6" F

SWPPP

ITEM	SYMBOL
SILT FENCE	SF
INLET PROTECTION	
STRAW WATTLE CHECK	
STRAW BALE CHECK	
FLOW ARROW (PLAN)	
AREA INLET FILTER PROTECTION	
RIP RAP	
SEEDING	
MATTING	

PAVING FEATURES

ITEM	SYMBOL
EXISTING PAVEMENT JOINT	
TRANSVERSE JOINT	
LONGITUDINAL JOINT	
EXPANSION/KEYED JOINT	
PAVEMENT MARKING	
PAVEMENT REBAR	
HANDICAP SYMBOL	

UTILITIES

ITEM	SYMBOL
STORM SEWER	
CURB INLET	
GRATE INLET	
CATCH BASIN	D
STORM SEWER MANHOLE	D
SANITARY	
CLEANOUT	C
SEPTIC TANK	S
SANITARY MANHOLE	
POWER, ELECTRICAL, LIGHT, AND TRAFFIC	
AIR CONDITIONING UNIT	A
ANTENNA	
ANCHOR POLE/POST	
GUY POLE	
GUY WIRE ANCHOR	
ELECTRICAL HIGHLINE TOWER (METAL OR CONCRETE)	
POWER POLE (EXISTING)	
POWER POLE (PROPOSED)	
POWER (ELEC) PEDESTAL	P
POWER (ELEC) PULL BOX OR MANHOLE	P
POWER (ELEC) METER	
LIGHT POLE	
TRAFFIC SIGNAL	
TRAFFIC SIGNAL BOX	SB
TELEVISION PEDESTAL	TV
TELEVISION MANHOLE	TV
WATER	
WATER MANHOLE	W
WATER VALVE	
WATER SHUT OFF OR CURB STOP	
WELL	
WATER METER	W
WATER METER PIT	WP
YARD HYDRANT	
WATER ELEVATION	
WATER TOWER	
FIRE HYDRANT (EXISTING)	
FIRE HYDRANT (PROPOSED)	
FIRE HYDRANT IN PROFILE	
WATER FITTINGS	
11- 1/4°	
22- 1/2°	
45°	
90°	
CROSS	
PLUG	
REDUCER	
TEE	
GAS	
GAS METER	G
GAS MANHOLE	G
GAS FILL PIPE	
GAS PUMP	
GAS VALVE	
GAS VENT	V
TELEPHONE	
FIBER OPTICS PULL BOX	FO
TELEPHONE POLE	
TELEPHONE PULL BOX OR MANHOLE	T
TELEPHONE PEDESTAL	T
MANHOLE (NON-SPECIFIC)	
UNDERGRND STORAGE TANK	UST
VALVE (NON-SPECIFIC)	

VEGETATION

ITEM	SYMBOL
BUSH	
CONIFEROUS TREE	
DECIDUOUS TREE	
MARSH/WETLAND	
TREE MASS LINE	
TREE STUMP	

SITE & SIGNAGE

ITEM	SYMBOL
SIGN	
BARRICADE	
ROAD SIGNS	
COUNTY ROAD	0
INTERSTATE HIGHWAY	0
STATE HIGHWAY	0
U.S. HIGHWAY	0
MILE MARKER POST	M
RIGHT OF WAY MARKER	R
RAILROAD CROSSING SIGNAL	
RAILROAD SWITCH	
FLAG POLE	
MAILBOX	
PROPANE TANK	
SATELLITE TV DISH	
WINDMILL	

CONTROL & ELEVATION

ITEM	SYMBOL
BENCHMARK	BM
CONTROL POINT (NON-PROPERTY)	
MONUMENT FOUND (PROPERTY)	
MONUMENT SET	
TEMPORARY POINT	
TEST BORING	
POINT ELEVATION (EXISTING)	× 0.00
POINT ELEVATION (PROPOSED)	1000.00 TC / 1100.00 TC
GRID TICK	

MISC FEATURES

ITEM	SYMBOL
CENTER PIVOT	
CEMETERY	
GRAVE	
CHURCH	
CAVE	
CISTERN	
LATRINE	
OIL WELL	
GUARD POST	

PAVEMENT SYMBOLS AND HATCH

ITEM	SYMBOL	HATCH
ASPHALT PAVEMENT (EX.)		
CONCRETE PAVEMENT (EX.)		
GRAVEL (EX.)		
BRICK PAVEMENT (EX.)		
ASPHALT PAVEMENT (PR.)		
CONCRETE PAVEMENT (PR.)		
GRAVEL (PR.)		
BRICK PAVEMENT (PR.)		

GENERAL

ITEM	SYMBOL
PLAN REVISION	1
NORTH ARROW	
GRAPHIC SCALE	GRAPHIC SCALE 0 10 20 40 UNIT OF MEASURE IS FEET

ARCHITECTURAL MATERIALS

ITEM	SYMBOL	ITEM	SYMBOL	ITEM	SYMBOL
UNDISTURBED EARTH		CONCRETE BLOCK		LVL - GLU-LAM	
EARTH		METAL		GYPSUM BOARD (DBL LINE OMITTED AT SMALL SCALE)	
GRANULAR FILL		WOOD, FINISH		INSULATION, BATT	
SAND MORTAR, PLASTER		WOOD, FRAMING		GLASS - ELEVATION	
CONCRETE		WOOD, FRAMING INTERRUPTED MEMBER		INSULATION, RIGID	
BRICK		PLYWOOD			

ARCHITECTURAL SYMBOLS

ITEM	SYMBOL	ITEM	SYMBOL
DATUM POINT		REFERENCED NOTE	4
EXISTING COLUMN LINE	A	ELEVATION	XXX'-XX"
REFERENCED DEMOLITION NOTE	22	BUILDING SECTION	1 A101 / 1 A101
REFERENCED PHOTOGRAPH TAG	07	WALL SECTION	1 A101
COLUMN REFERENCE GRID LINES	B	DETAIL	X XX-X
ROOM NAME & NO.	OFFICE 101	INTERIOR ELEVATION(S)	1 A101 / 1 A101
DOOR NO.	101	ENLARGED DETAIL	1 A101
WINDOW NO.	2	REVISION	3
WALL TYPE	X		
EQUIPMENT OR FIXTURE	TA-01		

JEO CONSULTING GROUP
1-800-723-0557

2020
WATER MAIN IMPROVEMENTS
EASTBOURNE ST./N 147TH ST.;
N 143RD ST. TO CASTLEWOOD ST.
WAVERLY, NEBRASKA

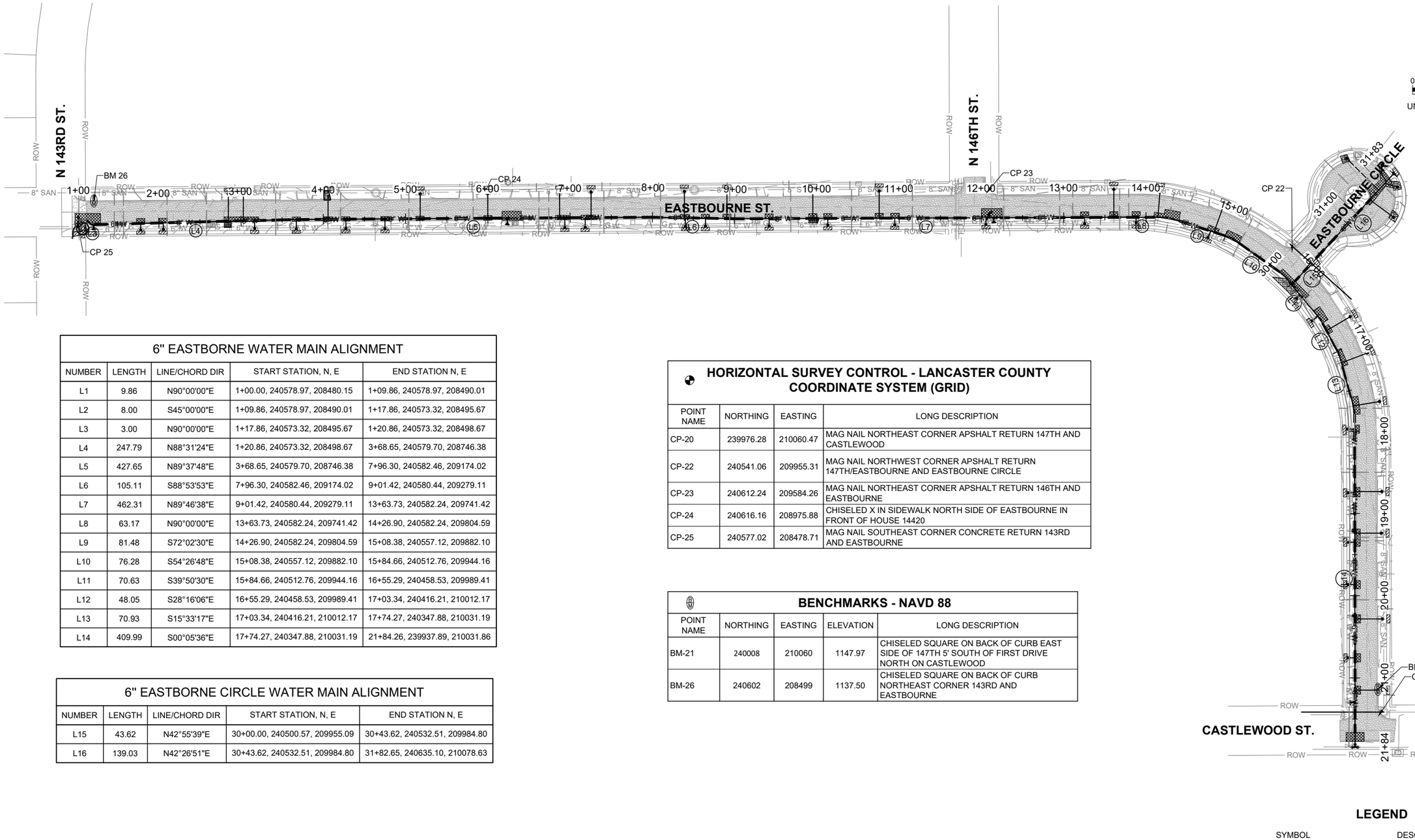
SYMBOLS

PROFESSIONAL CIVIL ENGINEER
TIMOTHY J. ADAMS
E-15149
11/24/2020
STATE OF NEBRASKA

PROJECT NO. 201085.00
DATE 11/24/2020
DRAWN BY ADP
FILE NAME S-201085_3.dwg
FIELD BOOK FB LINCOLN #2
FIELD CREW EF, NH
SURVEY FILE NO. SV-201085
PLAN IN HAND INITIALS TJA DATE 8/31/2020
70 PERCENT REVIEW INITIALS RSP DATE 10/16/2020
95 PERCENT REVIEW INITIALS RSP DATE 11/09/2020
REVISIONS

C0.2

I:\jeo-local\Users\PA\pwdrf\Engineering\201085.00 - Waverly Water and Sewer Improvements\7 Design\2 Drawings\#S1 eastbourne to N 147th Street Water Main\S-201085_3.dwg on 11/24/2020 7:07 AM



GRAPHIC SCALE

0 30 60 120

UNIT OF MEASURE IS FEET

6" EASTBORNE WATER MAIN ALIGNMENT				
NUMBER	LENGTH	LINE/CHORD DIR	START STATION, N, E	END STATION N, E
L1	9.86	N90°00'00"E	1+00.00, 240578.97, 208480.15	1+09.86, 240578.97, 208490.01
L2	8.00	S45°00'00"E	1+09.86, 240578.97, 208490.01	1+17.86, 240573.32, 208495.67
L3	3.00	N90°00'00"E	1+17.86, 240573.32, 208495.67	1+20.86, 240573.32, 208498.67
L4	247.79	N88°31'24"E	1+20.86, 240573.32, 208498.67	3+68.65, 240579.70, 208746.38
L5	427.65	N89°37'48"E	3+68.65, 240579.70, 208746.38	7+96.30, 240582.46, 209174.02
L6	105.11	S88°53'53"E	7+96.30, 240582.46, 209174.02	9+01.42, 240580.44, 209279.11
L7	462.31	N89°46'38"E	9+01.42, 240580.44, 209279.11	13+63.73, 240582.24, 209741.42
L8	63.17	N90°00'00"E	13+63.73, 240582.24, 209741.42	14+26.90, 240582.24, 209804.59
L9	81.48	S72°02'30"E	14+26.90, 240582.24, 209804.59	15+08.38, 240557.12, 209882.10
L10	76.28	S54°26'48"E	15+08.38, 240557.12, 209882.10	15+84.66, 240512.76, 209944.16
L11	70.63	S39°50'30"E	15+84.66, 240512.76, 209944.16	16+55.29, 240458.53, 209989.41
L12	48.05	S28°16'06"E	16+55.29, 240458.53, 209989.41	17+03.34, 240416.21, 210012.17
L13	70.93	S15°33'17"E	17+03.34, 240416.21, 210012.17	17+74.27, 240347.88, 210031.19
L14	409.99	S00°05'36"E	17+74.27, 240347.88, 210031.19	21+84.26, 239937.89, 210031.86

6" EASTBORNE CIRCLE WATER MAIN ALIGNMENT				
NUMBER	LENGTH	LINE/CHORD DIR	START STATION, N, E	END STATION N, E
L15	43.62	N42°55'39"E	30+00.00, 240500.57, 209955.09	30+43.62, 240532.51, 209984.80
L16	139.03	N42°26'51"E	30+43.62, 240532.51, 209984.80	31+82.65, 240635.10, 210078.63

HORIZONTAL SURVEY CONTROL - LANCASTER COUNTY COORDINATE SYSTEM (GRID)

POINT NAME	NORTHING	EASTING	LONG DESCRIPTION
CP-20	239976.28	210060.47	MAG NAIL NORTHEAST CORNER APSHALT RETURN 147TH AND CASTLEWOOD
CP-22	240541.06	209955.31	MAG NAIL NORTHWEST CORNER APSHALT RETURN 147TH/EASTBOURNE AND EASTBOURNE CIRCLE
CP-23	240612.24	209584.26	MAG NAIL NORTHEAST CORNER APSHALT RETURN 146TH AND EASTBOURNE
CP-24	240616.16	208975.88	CHISELED X IN SIDEWALK NORTH SIDE OF EASTBOURNE IN FRONT OF HOUSE 14420
CP-25	240577.02	208478.71	MAG NAIL SOUTHEAST CORNER CONCRETE RETURN 143RD AND EASTBOURNE

BENCHMARKS - NAVD 88

POINT NAME	NORTHING	EASTING	ELEVATION	LONG DESCRIPTION
BM-21	240008	210060	1147.97	CHISELED SQUARE ON BACK OF CURB EAST SIDE OF 147TH 5' SOUTH OF FIRST DRIVE NORTH ON CASTLEWOOD
BM-26	240602	208499	1137.50	CHISELED SQUARE ON BACK OF CURB NORTHEAST CORNER 143RD AND EASTBOURNE

LEGEND

SYMBOL	DESCRIPTION
0+00 1+00	BASELINE ALIGNMENT (DESIGN)
C1	BASELINE ALIGNMENT CURVE TAG LABEL
L1	BASELINE ALIGNMENT LINE TAG LABEL
	BASELINE ALIGNMENT PI POINT
	POINT OF CURVATURE OR TANGENCY

JEO CONSULTING GROUP
1-800-723-6867

2020
WATER MAIN IMPROVEMENTS
EASTBOURNE ST./N 147TH ST.;
N 143RD ST. TO CASTLEWOOD ST.
WAVERLY, NEBRASKA

HORIZONTAL ALIGNMENT & CONTROL

PROFESSIONAL CIVIL ENGINEER
TIMOTHY J. ADAMS
E-15149
11/24/2020
STATE OF NEBRASKA

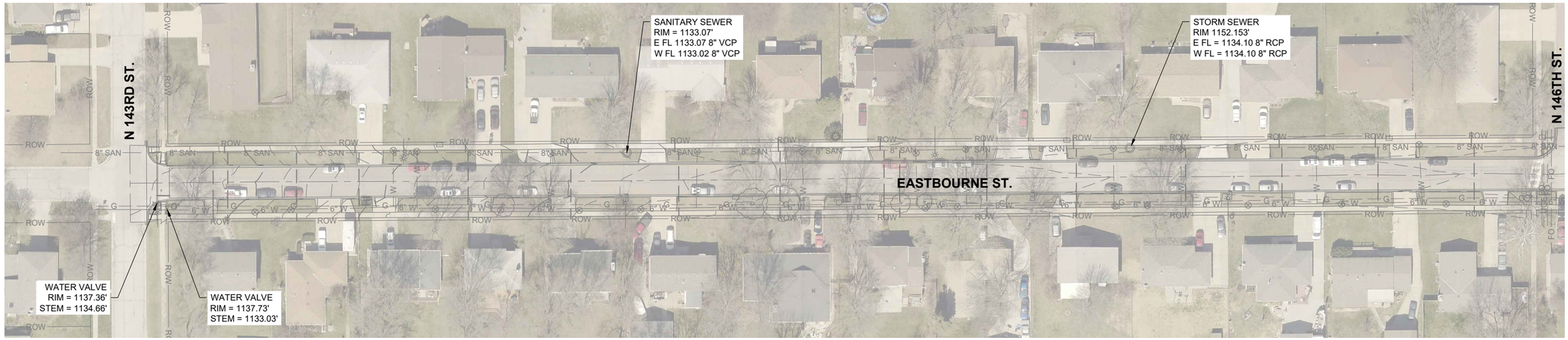
PROJECT NO.	201085.00
DATE	11/24/2020
DRAWN BY	ADP
FILE NAME	S-201085_3.dwg
FIELD BOOK	FB LINCOLN #2
FIELD CREW	EF, NH
SURVEY FILE NO.	SV-201085
PLAN IN HAND INITIALS	TJA
PLAN IN HAND DATE	8/31/2020
70 PERCENT REVIEW INITIALS	RSP
70 PERCENT REVIEW DATE	10/16/2020
95 PERCENT REVIEW INITIALS	RSP
95 PERCENT REVIEW DATE	11/09/2020
REVISIONS	

C0.3

GRAPHIC SCALE

0 20 40 80

UNIT OF MEASURE IS FEET



JEO CONSULTING GROUP
1-800-723-6967

2020
WATER MAIN IMPROVEMENTS
EASTBOURNE ST./N 147TH ST.;
N 143RD ST. TO CASTLEWOOD ST.
WAVERLY, NEBRASKA

EXISTING SITE PLAN

PROFESSIONAL CIVIL ENGINEER
TIMOTHY J. ADAMS
E-15149
11/24/2020
STATE OF NEBRASKA

PROJECT NO.	201085.00
DATE	11/24/2020
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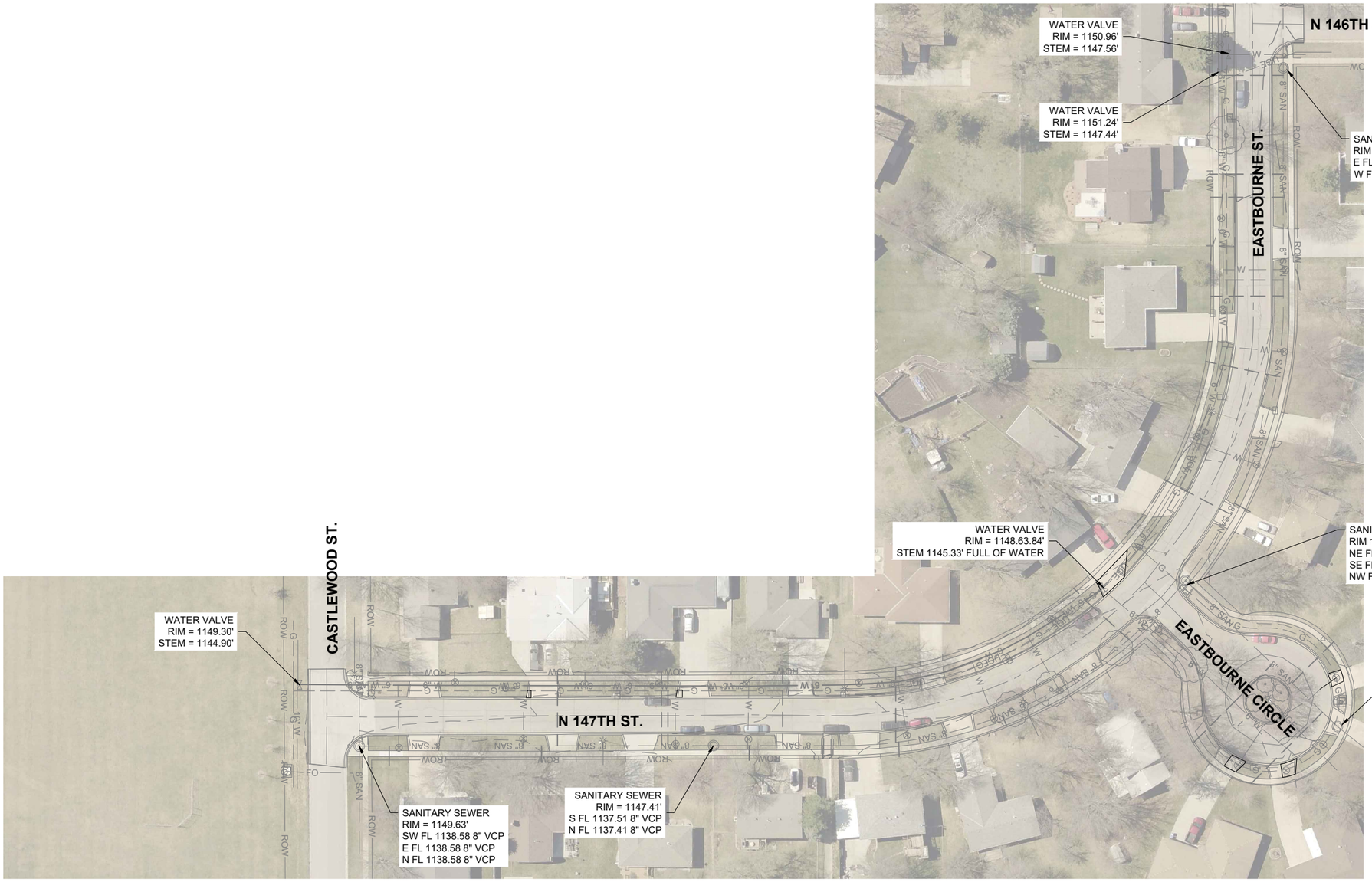
REVISIONS	

C1.0



GRAPHIC SCALE

0 20 40 80

UNIT OF MEASURE IS FEET

JEO CONSULTING GROUP
1-800-723-6967

2020
WATER MAIN IMPROVEMENTS
EASTBOURNE ST./N 147TH ST.;
N 143RD ST. TO CASTLEWOOD ST.
WAVERLY, NEBRASKA

EXISTING SITE PLAN

PROFESSIONAL CIVIL ENGINEER
TIMOTHY J. ADAMS
E-15149
11/24/2020
STATE OF NEBRASKA

PROJECT NO.	201085.00
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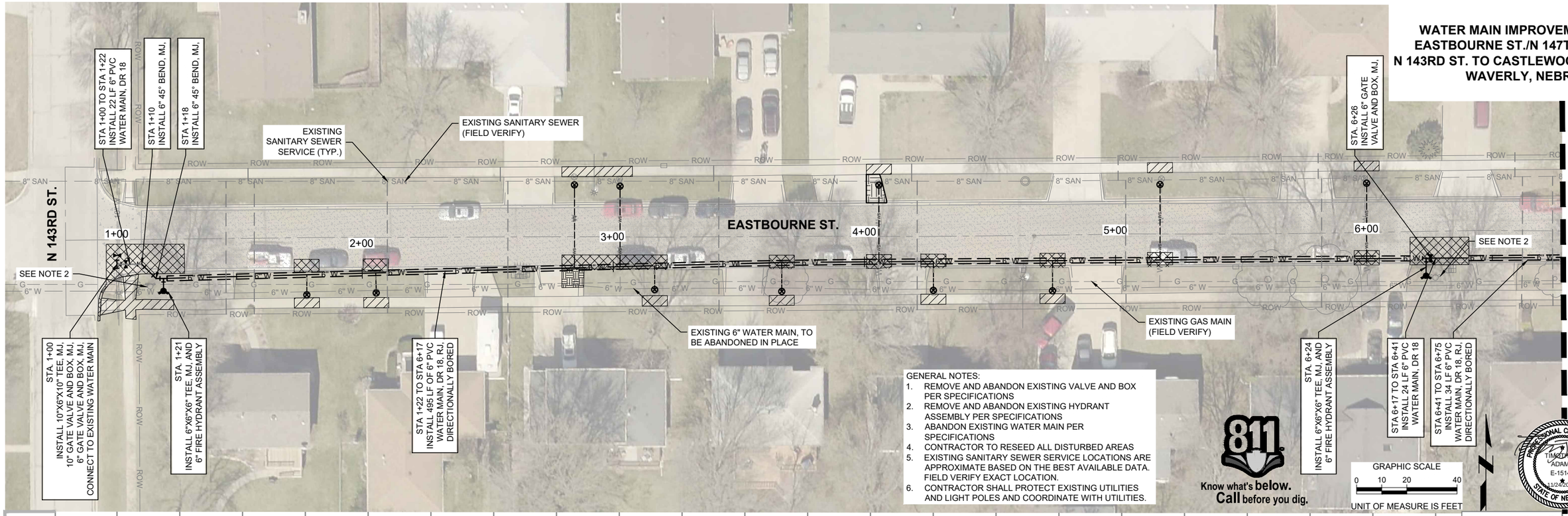
95 PERCENT REVIEW DATE	11/09/2020
REVISIONS	

C1.1

2020
WATER MAIN IMPROVEMENTS
EASTBOURNE ST./N 147TH ST.; N 143RD ST. TO CASTLEWOOD ST.
WAVERLY, NEBRASKA



GENERAL NOTES:
1. REMOVE AND ABANDON EXISTING VALVE AND BOX PER SPECIFICATIONS
2. REMOVE AND ABANDON EXISTING HYDRANT ASSEMBLY PER SPECIFICATIONS
3. ABANDON EXISTING WATER MAIN PER SPECIFICATIONS
4. CONTRACTOR TO RESEED ALL DISTURBED AREAS
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6. CONTRACTOR SHALL PROTECT EXISTING UTILITIES AND LIGHT POLES AND COORDINATE WITH UTILITIES.

811 Know what's **below.** **Call** before you dig.

GRAPHIC SCALE
0 10 20 40
UNIT OF MEASURE IS FEET

PROFESSIONAL CIVIL ENGINEER
TIMOTHY J. ADAMS
E-15149
11/24/2020
STATE OF NEBRASKA

HORIZ.= 0 10 20
VERT.= 0 2.5 5

PAVEMENT/SIDEWALK REMOVAL AND REPLACEMENT

DESCRIPTION	STATION	SIDE	REMOVE	INSTALL	THICKNESS
CONCRETE PAVEMENT	1+10	CL	45 SY	45 SY	7"
CONCRETE SIDEWALK	1+10	RT	191 SF	191 SF	4"
CONCRETE PAVEMENT	1+78	LT	6 SY	6 SY	7"
CONCRETE SIDEWALK	1+78	RT	40 SF	40 SF	4"
CONCRETE PAVEMENT	2+05	LT	6 SY	6 SY	7"
CONCRETE SIDEWALK	2+05	RT	40 SF	40 SF	4"
CONCRETE DRIVEWAY	2+84	CL	7 SY	7 SY	6"
CONCRETE PAVEMENT	3+00	CL	26 SY	26 SY	7"
CONCRETE SIDEWALK	3+00	LT	64 SF	64 SF	4"
CONCRETE SIDEWALK	3+16	RT	40 SF	40 SF	4"
CONCRETE PAVEMENT	3+67	CL	6 SY	6 SY	7"
CONCRETE SIDEWALK	3+67	RT	40 SF	40 SF	4"

PAVEMENT/SIDEWALK REMOVAL AND REPLACEMENT

DESCRIPTION	STATION	SIDE	REMOVE	INSTALL	THICKNESS
CONCRETE PAVEMENT	4+06	CL	6 SY	6 SY	7"
CONCRETE SIDEWALK	4+06	LT	40 SF	40 SF	4"
CONCRETE DRIVEWAY	4+06	LT	9 SY	9 SY	6"
CONCRETE PAVEMENT	4+27	CL	6 SY	6 SY	7"
CONCRETE SIDEWALK	4+27	RT	40 SF	40 SF	4"
CONCRETE PAVEMENT	4+75	CL	6 SY	6 SY	7"
CONCRETE SIDEWALK	4+75	RT	40 SF	40 SF	4"
CONCRETE PAVEMENT	5+18	CL	6 SY	6 SY	7"
CONCRETE SIDEWALK	5+18	LT	40 SF	40 SF	4"
CONCRETE PAVEMENT	6+00	CL	6 SY	6 SY	7"
CONCRETE SIDEWALK	6+00	LT	40 SF	40 SF	4"
CONCRETE PAVEMENT	6+26	CL	29 SY	29 SY	7"

WATER SERVICES

STATION	SIDE	SERVICE SIZE	SERVICE LENGTH	BORE LENGTH
1+78	RT	1"	8 LF	-
2+05	RT	1"	8 LF	-
2+85	LT	1"	33 LF	25 LF
3+03	LT	1"	32 LF	25 LF
3+16	RT	1"	10 LF	-
3+67	RT	1"	12 LF	-
4+06	LT	1"	31 LF	24 LF
4+27	RT	1"	12 LF	-
4+75	RT	1"	12 LF	-
5+18	LT	1"	30 LF	24 LF
6+00	LT	1"	30 LF	24 LF

WATER SERVICE NOTES:
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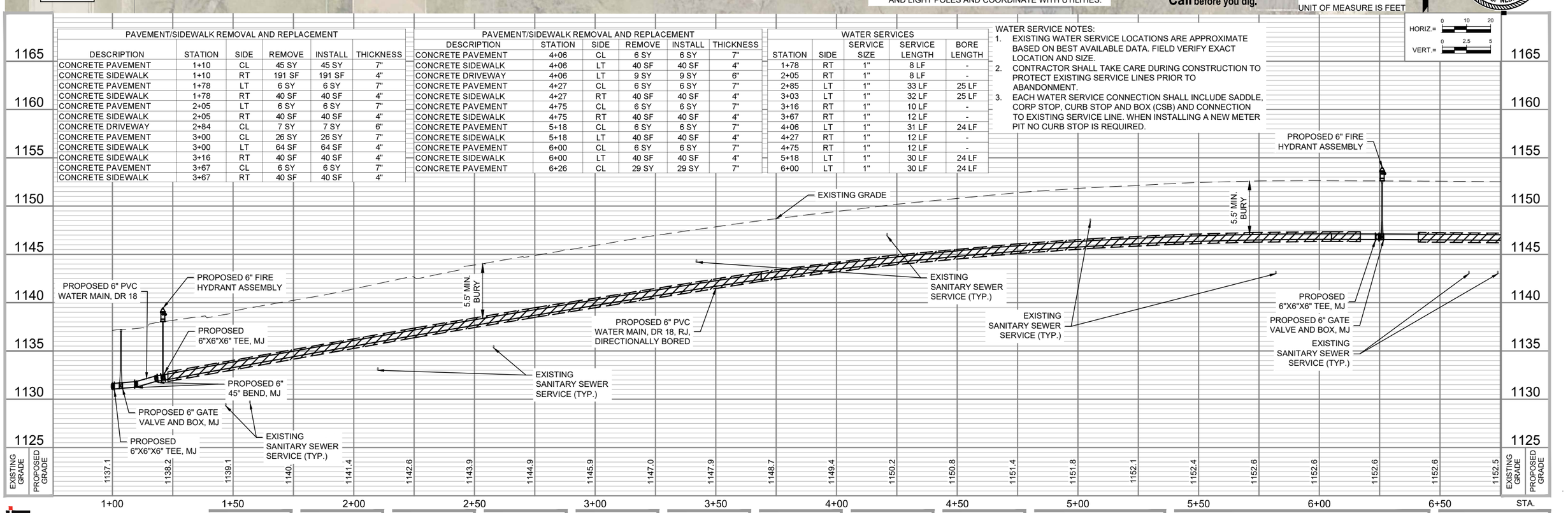
2. CONTRACTOR SHALL TAKE CARE DURING CONSTRUCTION TO PROTECT EXISTING SERVICE LINES PRIOR TO ABANDONMENT.
3. EACH WATER SERVICE CONNECTION SHALL INCLUDE SADDLE, CORP STOP, CURB STOP AND BOX (CSB) AND CONNECTION TO EXISTING SERVICE LINE. WHEN INSTALLING A NEW METER PIT NO CURB STOP IS REQUIRED.



REVISION	REVISION	FIELD BOOK	FIELD CREW	REVIEW BY	REVIEW DATE	DRAWN BY	DATE	PROJECT NO.	FILE NAME
		FB LINCOLN #2	EF, NH	RSP	11/09/2020	ADP	11/24/2020	201085.00	S-201085_3.dwg

JEO CONSULTING GROUP

PLAN AND PROFILE

PP1.1

2020
WATER MAIN IMPROVEMENTS
EASTBOURNE ST./N 147TH ST.; N 143RD ST. TO CASTLEWOOD ST.
WAVERLY, NEBRASKA

GENERAL NOTES:
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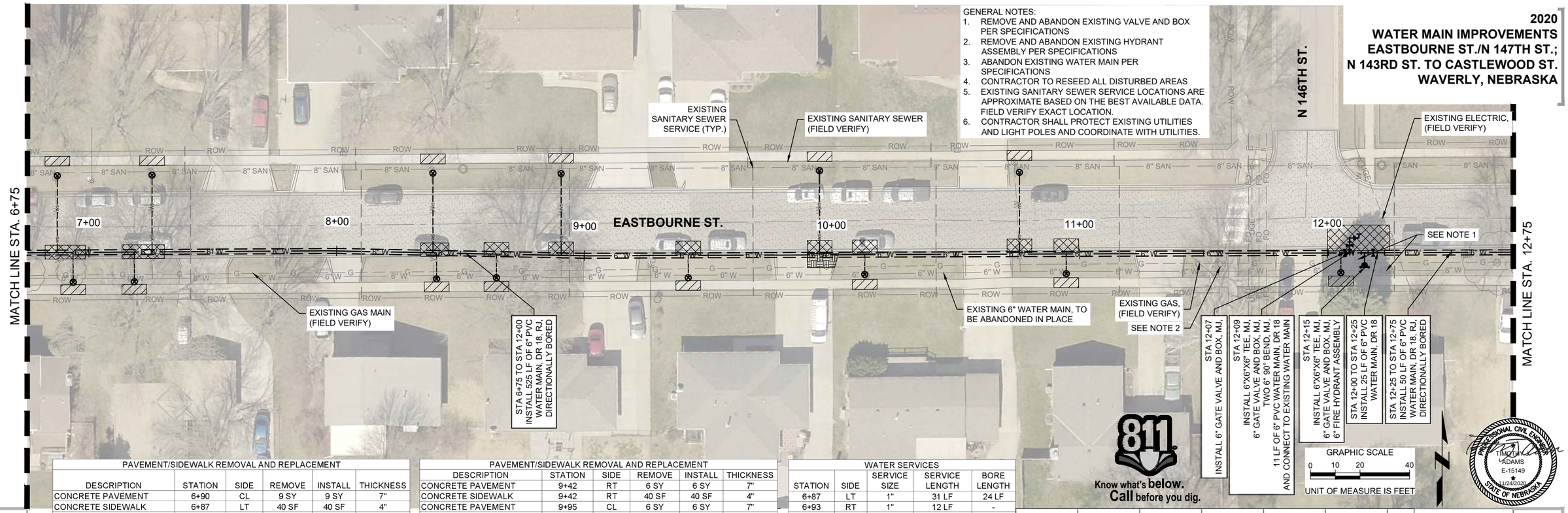

811 Know what's below. Call before you dig.

GRAPHIC SCALE
0 10 20 40
UNIT OF MEASURE IS FEET

PROFESSIONAL CIVIL ENGINEER — TIMOTHY J. ADAMS — E-15149 — 11/24/2020 — STATE OF NEBRASKA

HORIZ.= 0 10 20
VERT.= 0 2.5 5

PAVEMENT/SIDEWALK REMOVAL AND REPLACEMENT

DESCRIPTION	STATION	SIDE	REMOVE	INSTALL	THICKNESS
CONCRETE PAVEMENT	6+90	CL	9 SY	9 SY	7"
CONCRETE SIDEWALK	6+87	LT	40 SF	40 SF	4"
CONCRETE SIDEWALK	6+93	RT	40 SF	40 SF	4"
CONCRETE PAVEMENT	7+23	CL	10 SY	10 SY	7"
CONCRETE SIDEWALK	7+18	RT	40 SF	40 SF	4"
CONCRETE SIDEWALK	7+26	LT	40 SF	40 SF	4"
CONCRETE PAVEMENT	8+39	CL	7 SY	7 SY	7"
CONCRETE SIDEWALK	8+39	LT	40 SF	40 SF	4"
CONCRETE SIDEWALK	8+40	RT	40 SF	40 SF	4"
CONCRETE PAVEMENT	8+65	RT	6 SY	6 SY	7"
CONCRETE SIDEWALK	8+65	RT	40 SF	40 SF	4"
CONCRETE PAVEMENT	8+91	LT	6 SY	6 SY	7"
CONCRETE SIDEWALK	8+91	LT	40 SF	40 SF	4"

PAVEMENT/SIDEWALK REMOVAL AND REPLACEMENT

DESCRIPTION	STATION	SIDE	REMOVE	INSTALL	THICKNESS
CONCRETE PAVEMENT	9+42	RT	6 SY	6 SY	7"
CONCRETE SIDEWALK	9+42	RT	40 SF	40 SF	4"
CONCRETE PAVEMENT	9+95	CL	6 SY	6 SY	7"
CONCRETE DRIVEWAY	9+95	RT	8 SY	8 SY	6"
CONCRETE SIDEWALK	9+95	LT	40 SF	40 SF	4"
CONCRETE PAVEMENT	10+13	RT	6 SY	6 SY	7"
CONCRETE SIDEWALK	10+13	RT	40 SF	40 SF	4"
CONCRETE PAVEMENT	10+76	LT	6 SY	6 SY	7"
CONCRETE SIDEWALK	10+76	LT	40 SF	40 SF	4"
CONCRETE PAVEMENT	10+95	RT	6 SY	6 SY	7"
CONCRETE SIDEWALK	10+95	RT	40 SF	40 SF	4"
CONCRETE SIDEWALK	12+05	RT	40 SF	40 SF	4"
CONCRETE PAVEMENT	12+12	LT	29 SY	29 SY	7"

WATER SERVICES

STATION	SIDE	SERVICE SIZE	SERVICE LENGTH	BORE LENGTH
6+87	LT	1"	31 LF	24 LF
6+93	RT	1"	12 LF	-
7+18	RT	1"	12 LF	-
7+26	LT	1"	31 LF	24 LF
8+39	LT	1"	32 LF	25 LF
8+40	RT	1"	11 LF	-
8+65	RT	1"	10 LF	-
8+91	LT	1"	33 LF	25 LF
9+42	RT	1"	9 LF	-
9+95	LT	1"	34 LF	25 LF
10+13	RT	1"	8 LF	-
10+76	LT	1"	33 LF	25 LF
10+95	RT	1"	8 LF	-
12+05	RT	1"	8 LF	-

WATER SERVICE NOTES:
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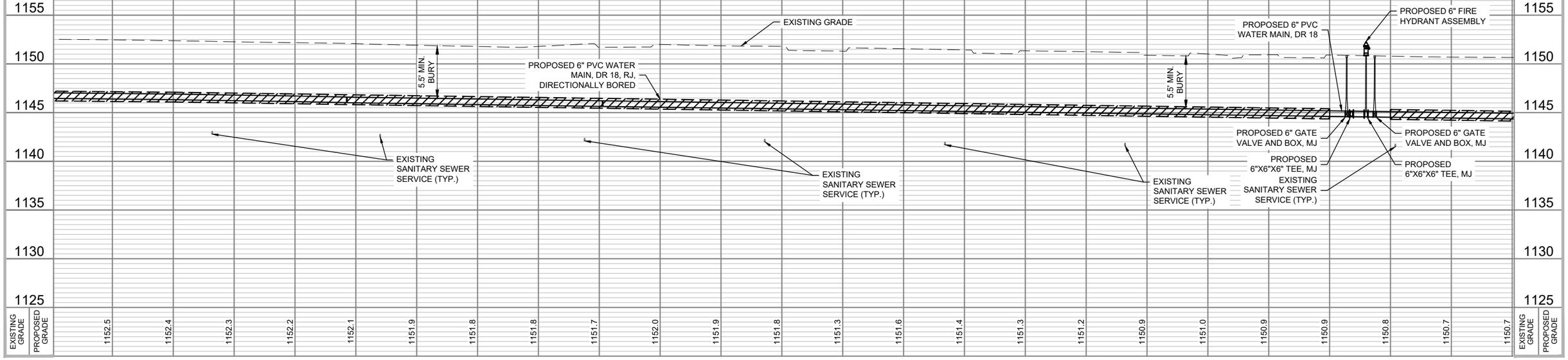

JEO CONSULTING GROUP

REVISION	REVISION	FIELD BOOK	FIELD CREW	REVIEW BY	REVIEW DATE	DRAWN BY	DATE	PROJECT NO.	FILE NAME
		FB LINCOLN #2	EF, NH	RSP	11/09/2020	ADP	11/24/2020	201085.00	S-201085_3.dwg

PLAN AND PROFILE

PP1.2

2020
WATER MAIN IMPROVEMENTS
EASTBOURNE ST./N 147TH ST.;
N 143RD ST. TO CASTLEWOOD ST.
WAVERLY, NEBRASKA

GENERAL NOTES:
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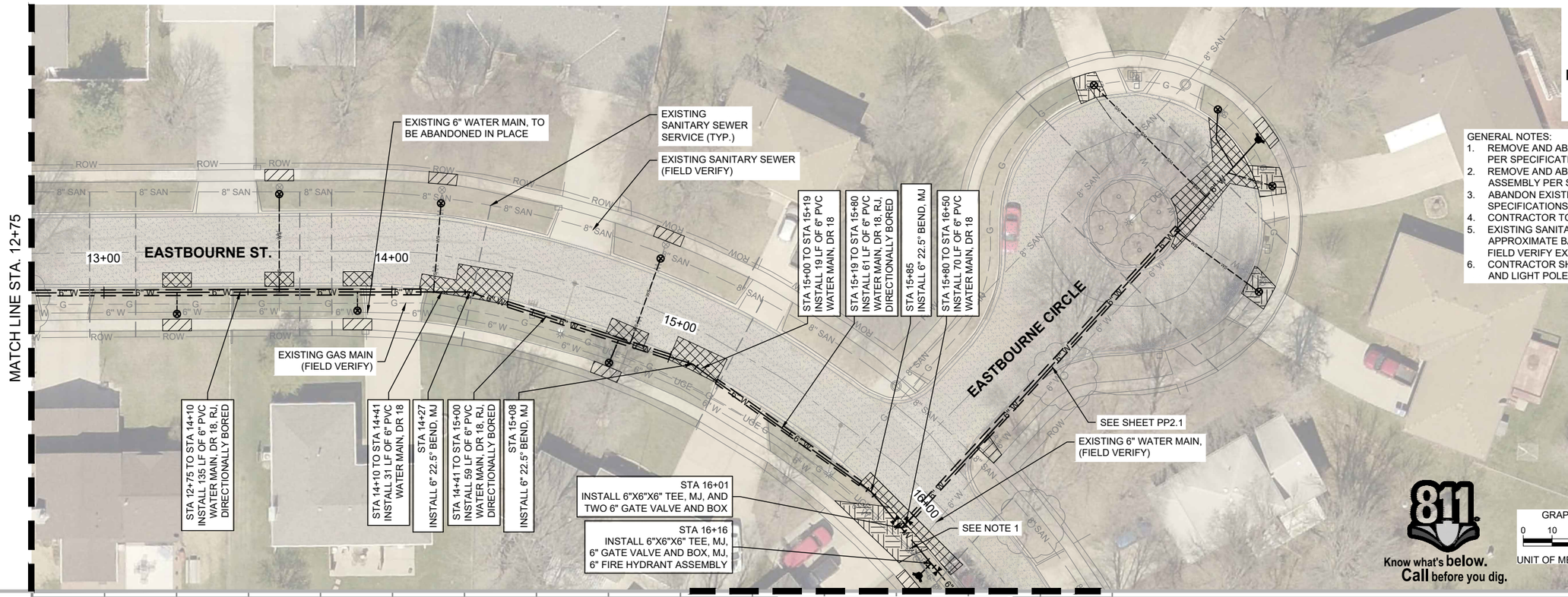

Know what's below. Call before you dig.

GRAPHIC SCALE
0 10 20 40
UNIT OF MEASURE IS FEET

HORIZ.= 0 10 20
VERT.= 0 2.5 5

PAVEMENT/SIDEWALK REMOVAL AND REPLACEMENT

DESCRIPTION	STATION	SIDE	REMOVE	INSTALL	THICKNESS
CONCRETE PAVEMENT	13+25	LT	6 SY	6 SY	7"
CONCRETE SIDEWALK	13+25	RT	40 SF	40 SF	4"
CONCRETE PAVEMENT	13+61	LT	6 SY	6 SY	7"
CONCRETE SIDEWALK	13+61	LT	40 SF	40 SF	4"
CONCRETE PAVEMENT	13+88	LT	6 SY	6 SY	7"
CONCRETE SIDEWALK	13+88	RT	40 SF	40 SF	4"
CONCRETE SIDEWALK	14+15	LT	40 SF	40 SF	4"
CONCRETE PAVEMENT	14+26	CL	31 SY	31 SY	7"
CONCRETE SIDEWALK	14+81	RT	40 SF	40 SF	4"
CONCRETE PAVEMENT	14+83	CL	9 SY	8 SY	7"
CONCRETE SIDEWALK	14+85	LT	40 SF	40 SF	4"
CONCRETE PAVEMENT	15+08	CL	18 SY	18 SY	7"
CONCRETE PAVEMENT	16+00	CL	23 SY	23 SY	7"
CONCRETE DRIVEWAY	16+00	RT	32 SY	32 SY	6"
CONCRETE SIDEWALK	16+17	RT	40 SF	40 SF	4"

WATER SERVICES

STATION	SIDE	SERVICE SIZE	SERVICE LENGTH	BORE LENGTH
13+25	RT	1"	8 LF	-
13+61	LT	1"	34 LF	25 LF
13+88	RT	1"	7 LF	-
14+15	LT	1"	31 LF	25 LF
14+81	RT	1"	9 LF	-
14+85	LT	1"	32 LF	25 LF

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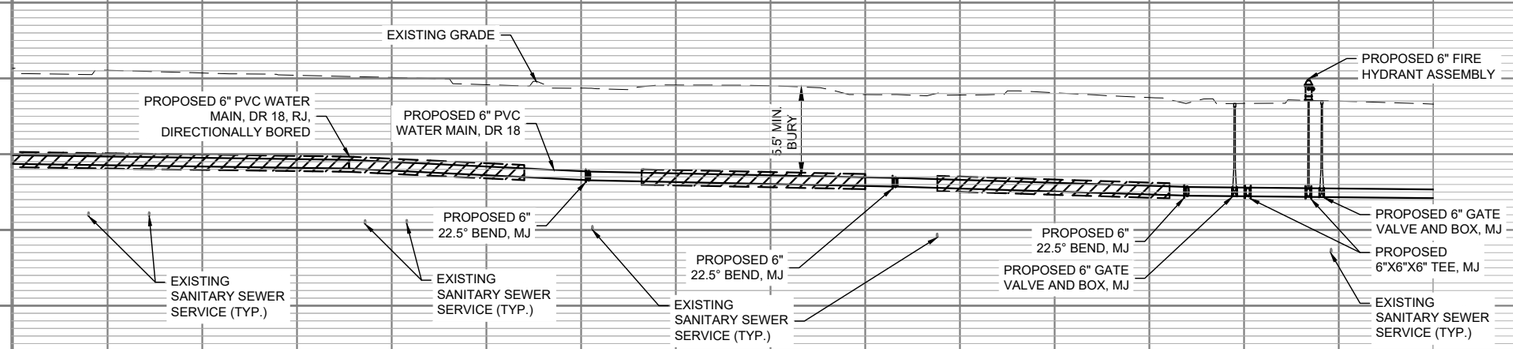

	13+00	13+50	14+00	14+50	15+00	15+50	16+00	16+50	STA.
EXISTING GRADE	1150.5	1150.2	1149.6	1149.6	1149.5	1148.9	1149.0	1148.3	1148.3
PROPOSED GRADE	1150.4	1150.1	1149.4	1149.6	1149.5	1148.9	1148.7	1148.5	1148.3

REVISION	REVISION	FIELD BOOK	FIELD CREW	REVIEW BY	REVIEW DATE	DRAWN BY	DATE	PROJECT NO.	FILE NAME
		FB LINCOLN #2	EF, NH	RSP	11/09/2020	ADP	11/24/2020	201085.00	S-201085_3.dwg

JEO CONSULTING GROUP

PLAN AND PROFILE

PP1.3

2020
WATER MAIN IMPROVEMENTS
EASTBOURNE ST./N 147TH ST.; N 143RD ST. TO CASTLEWOOD ST.
WAVERLY, NEBRASKA

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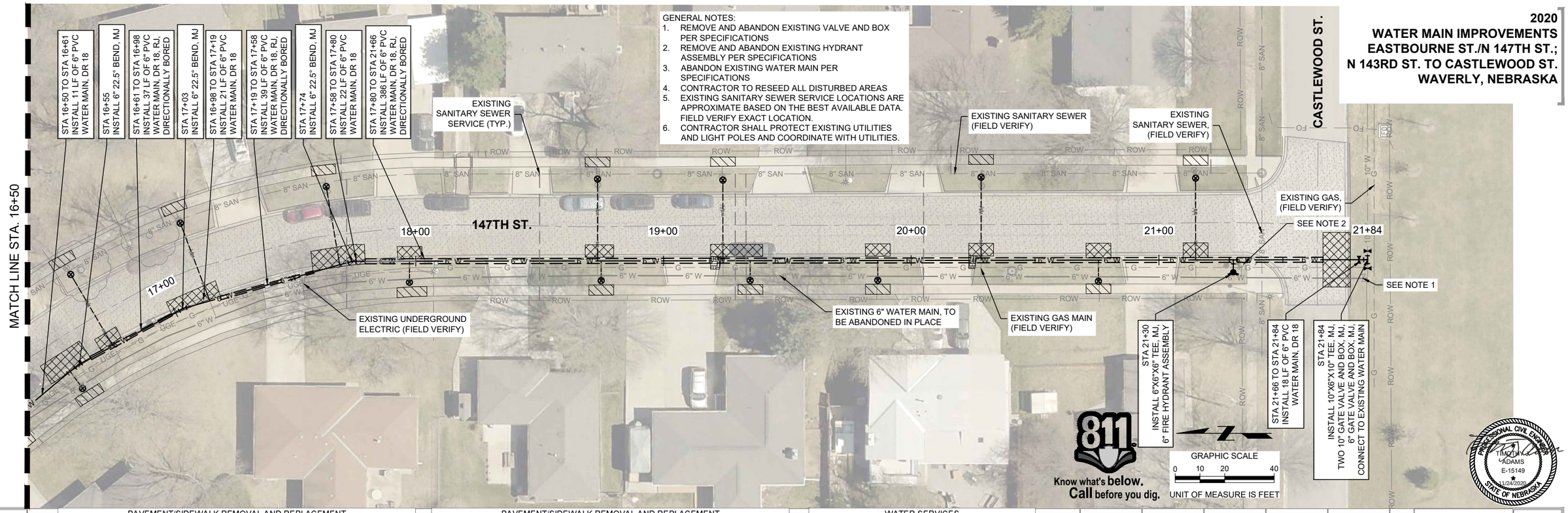


PAVEMENT/SIDEWALK REMOVAL AND REPLACEMENT

DESCRIPTION	STATION	SIDE	REMOVE	INSTALL	THICKNESS
CONCRETE SIDEWALK	16+51	RT	40 SF	40 SF	4"
CONCRETE PAVEMENT	16+55	LT	18 SY	18 SY	7"
CONCRETE PAVEMENT	16+71	LT	6 SY	6 SY	7"
CONCRETE SIDEWALK	16+71	LT	40 SF	40 SF	4"
CONCRETE PAVEMENT	17+10	CL	12 SY	12 SY	7"
CONCRETE SIDEWALK	17+15	LT	40 SF	40 SF	4"
CONCRETE SIDEWALK	17+69	LT	40 SF	40 SF	4"
CONCRETE PAVEMENT	17+74	CL	19 SY	19 SY	7"
CONCRETE PAVEMENT	17+97	LT	6 SY	6 SY	7"
CONCRETE SIDEWALK	17+97	RT	40 SF	40 SF	4"
CONCRETE PAVEMENT	18+73	LT	7 SY	7 SY	7"
CONCRETE SIDEWALK	18+73	LT	40 SF	40 SF	4"
CONCRETE SIDEWALK	18+75	RT	40 SF	40 SF	4"

PAVEMENT/SIDEWALK REMOVAL AND REPLACEMENT

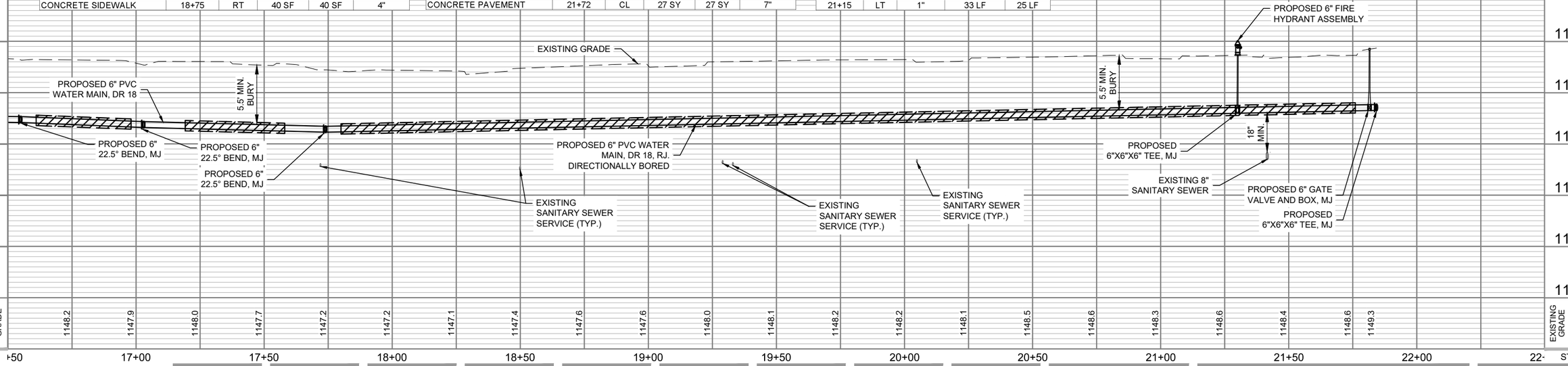
DESCRIPTION	STATION	SIDE	REMOVE	INSTALL	THICKNESS
CONCRETE DRIVEWAY	19+21	CL	3 SY	3 SY	6"
CONCRETE SIDEWALK	19+24	LT	40 SF	40 SF	4"
CONCRETE PAVEMENT	19+30	LT	12 SY	12 SY	7"
CONCRETE SIDEWALK	19+35	RT	40 SF	40 SF	4"
CONCRETE PAVEMENT	19+87	LT	6 SY	6 SY	7"
CONCRETE SIDEWALK	19+87	RT	40 SF	40 SF	4"
CONCRETE DRIVEWAY	20+24	CL	2 SY	2 SY	6"
CONCRETE PAVEMENT	20+28	LT	6 SY	6 SY	7"
CONCRETE SIDEWALK	20+28	LT	40 SF	40 SF	4"
CONCRETE PAVEMENT	20+76	LT	7 SY	7 SY	7"
CONCRETE SIDEWALK	20+76	RT	40 SF	40 SF	4"
CONCRETE PAVEMENT	21+15	LT	7 SY	7 SY	7"
CONCRETE SIDEWALK	21+15	LT	40 SF	40 SF	4"
CONCRETE PAVEMENT	21+72	CL	27 SY	27 SY	7"

WATER SERVICES

STATION	SIDE	SERVICE SIZE	SERVICE LENGTH	BORE LENGTH
16+51	RT	1"	9 LF	-
16+71	LT	1"	34 LF	25 LF
17+15	LT	1"	34 LF	25 LF
17+69	LT	1"	32 LF	25 LF
17+97	RT	1"	9 LF	-
18+73	LT	1"	33 LF	25 LF
18+75	RT	1"	8 LF	-
19+24	LT	1"	33 LF	25 LF
19+35	RT	1"	8 LF	-
19+87	RT	1"	8 LF	-
20+28	LT	1"	34 LF	25 LF
20+76	RT	1"	9 LF	-
21+15	LT	1"	33 LF	25 LF

WATER SERVICE NOTES:
1. EXISTING WATER SERVICE LOCATIONS ARE APPROXIMATE BASED ON BEST AVAILABLE DATA. FIELD VERIFY EXACT LOCATION AND SIZE.
2. CONTRACTOR SHALL TAKE CARE DURING CONSTRUCTION TO PROTECT EXISTING SERVICE LINES PRIOR TO ABANDONMENT.
3. EACH WATER SERVICE CONNECTION SHALL INCLUDE SADDLE, CORP STOP, CURB STOP AND BOX (CSB) AND CONNECTION TO EXISTING SERVICE LINE. WHEN INSTALLING A NEW METER PIT NO CURB STOP IS REQUIRED.

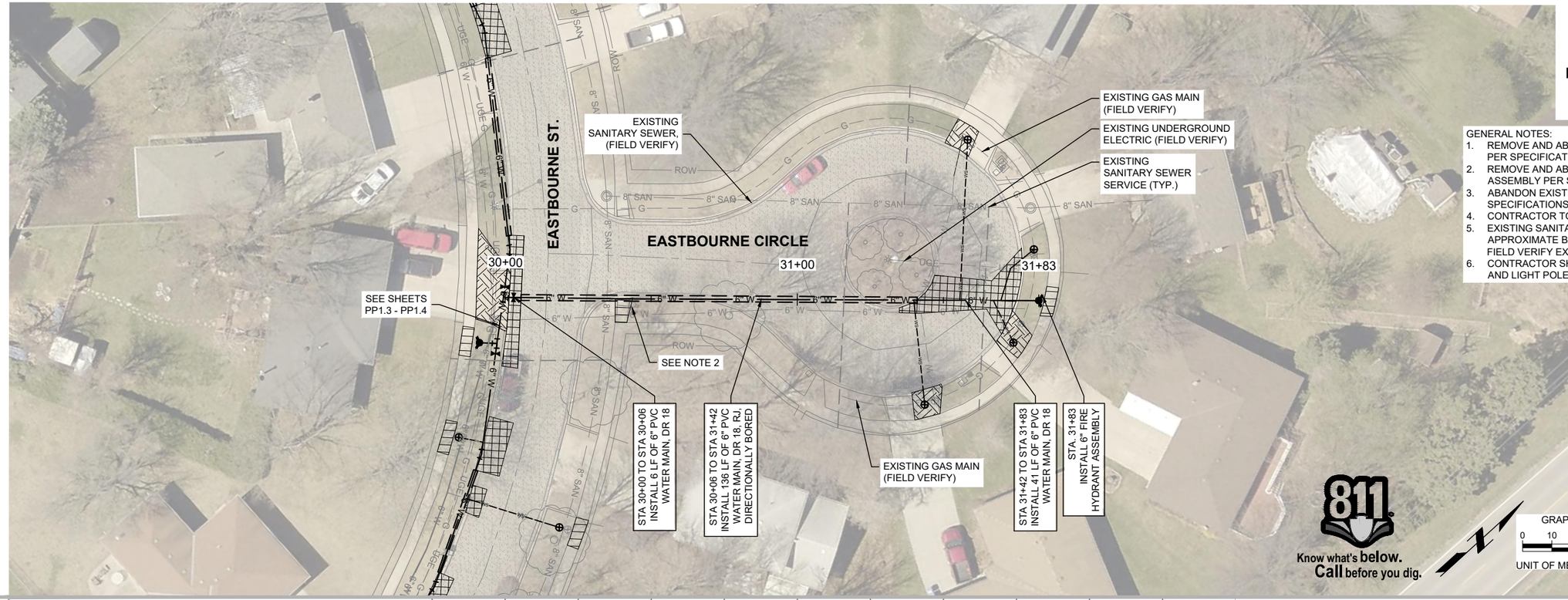
HORIZ.= 0 10 20
VERT.= 0 2.5 5



JEO CONSULTING GROUP	REVISION	REVISION	FIELD BOOK	FIELD CREW	REVIEW BY	REVIEW DATE	DRAWN BY	DATE	PROJECT NO.	FILE NAME	PLAN AND PROFILE	PP1.4
			FB LINCOLN #2	EF, NH	RSP	11/09/2020	ADP	11/24/2020	201085.00	S-201085_3.dwg		

2020
WATER MAIN IMPROVEMENTS
EASTBOURNE ST./N 147TH ST.;
N 143RD ST. TO CASTLEWOOD ST.
WAVERLY, NEBRASKA

GENERAL NOTES:
1. REMOVE AND ABANDON EXISTING VALVE AND BOX PER SPECIFICATIONS
2. REMOVE AND ABANDON EXISTING HYDRANT ASSEMBLY PER SPECIFICATIONS
3. ABANDON EXISTING WATER MAIN PER SPECIFICATIONS
4. CONTRACTOR TO RESEED ALL DISTURBED AREAS
5. EXISTING SANITARY SEWER SERVICE LOCATIONS ARE APPROXIMATE BASED ON THE BEST AVAILABLE DATA. FIELD VERIFY EXACT LOCATION.
6. CONTRACTOR SHALL PROTECT EXISTING UTILITIES AND LIGHT POLES AND COORDINATE WITH UTILITIES.



Know what's **below.** **Call** before you dig.

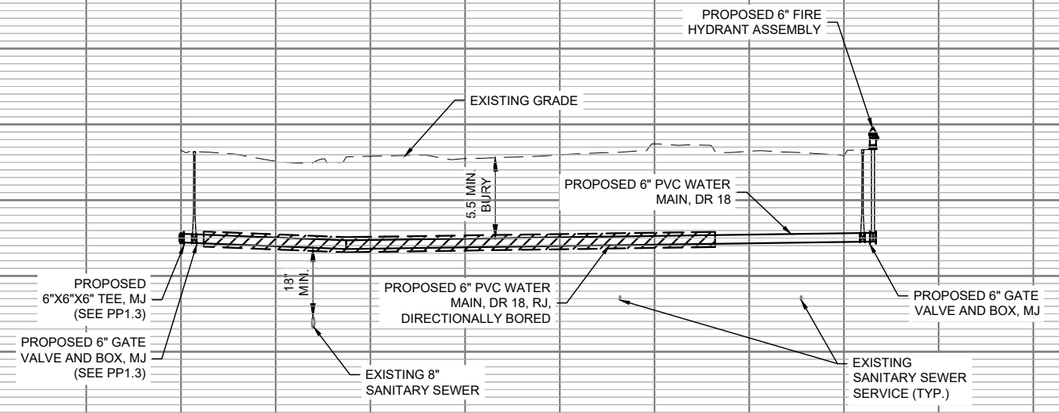
GRAPHIC SCALE
0 10 20 40
UNIT OF MEASURE IS FEET

PROFESSIONAL CIVIL ENGINEER
TIMOTHY J. ADAMS
E-15149
11/24/2020
STATE OF NEBRASKA

PAVEMENT/SIDEWALK REMOVAL AND REPLACEMENT

DESCRIPTION	STATION	SIDE	REMOVE	INSTALL	THICKNESS
CONCRETE SIDEWALK	30+41	RT	41 SF	41 SF	4"
CONCRETE DRIVEWAY	31+40	RT	11 SY	11 SY	6"
CONCRETE PAVEMENT	31+50	CL	52 SY	52 SY	7"
CONCRETE DRIVEWAY	31+56	LT	9 SY	9 SY	6"
CONCRETE DRIVEWAY	31+67	RT	11 SY	11 SY	6"
CONCRETE SIDEWALK	31+83	CL	40 SF	40 SF	4"

HORIZ.= 0 10 20
VERT.= 0 2.5 5



WATER SERVICES

STATION	SIDE	SERVICE SIZE	SERVICE LENGTH	BORE LENGTH
31+40	RT	1"	36 LF	31 LF
31+67	RT	1"	16 LF	10 LF
31+56	LT	1"	55 LF	50 LF
31+70	LT	1"	22 LF	17 LF

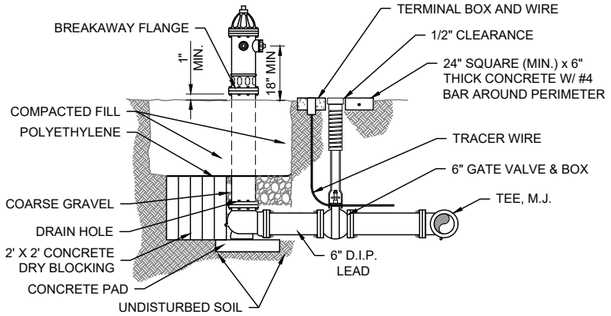
WATER SERVICE NOTES:
1. EXISTING WATER SERVICE LOCATIONS ARE APPROXIMATE BASED ON BEST AVAILABLE DATA. FIELD VERIFY EXACT LOCATION AND SIZE.
2. CONTRACTOR SHALL TAKE CARE DURING CONSTRUCTION TO PROTECT EXISTING SERVICE LINES PRIOR TO ABANDONMENT.
3. EACH WATER SERVICE CONNECTION SHALL INCLUDE SADDLE, CORP STOP, CURB STOP AND BOX (CSB) AND CONNECTION TO EXISTING SERVICE LINE. WHEN INSTALLING A NEW METER PIT NO CURB STOP IS REQUIRED.

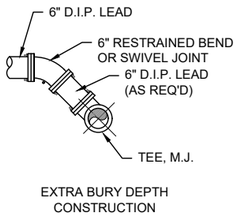
	1165	1160	1155	1150	1145	1140	1135	1130	1125
EXISTING GRADE	1148.3	1147.6	1147.9	1147.7	1148.0	1148.7	1148.2	1147.9	1148.3
PROPOSED GRADE									
STA.	30+00	30+50	31+00	31+50	32+00	32+50			

JEO CONSULTING GROUP

REVISION	REVISION	FIELD BOOK	FIELD CREW	REVIEW BY	REVIEW DATE	DRAWN BY	DATE	PROJECT NO.	FILE NAME
		FB LINCOLN #2	EF, NH	RSP	11/09/2020	ADP	11/24/2020	201085.00	S-201085_3.dwg

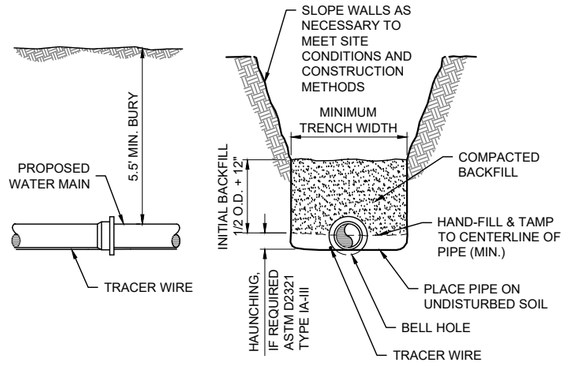
PLAN AND PROFILE **PP2.1**





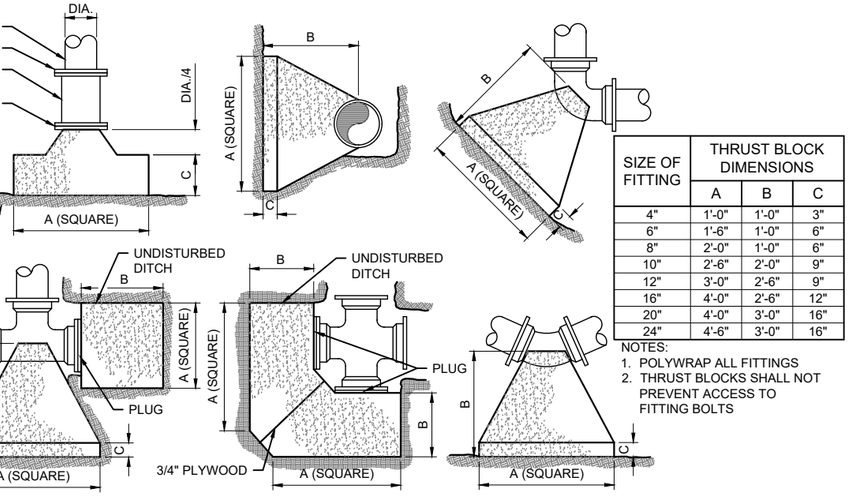
NOTES:
1. HYDRANT ASSEMBLY TO INCLUDE MECHANICAL JOINT RESTRAINT DEVICE OR ANCHOR COUPLING, PIPING AND GATE VALVE.
2. ALL FITTINGS TO BE MECHANICAL JOINT, WITH MECHANICAL JOINT RESTRAINT DEVICES OR ANCHOR COUPLINGS

1 FIRE HYDRANT ASSEMBLY
SCALE: N.T.S.



PIPE SIZE	MIN. TRENCH WIDTH
4"	18"
6"	18"
8"	24"
10"	26"
12"	30"
15"	30"
16"	32"
18"	32"

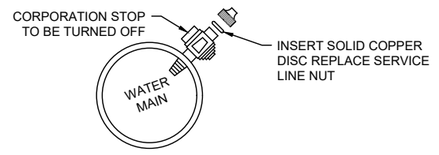
2 WATER MAIN TRENCH
SCALE: N.T.S.



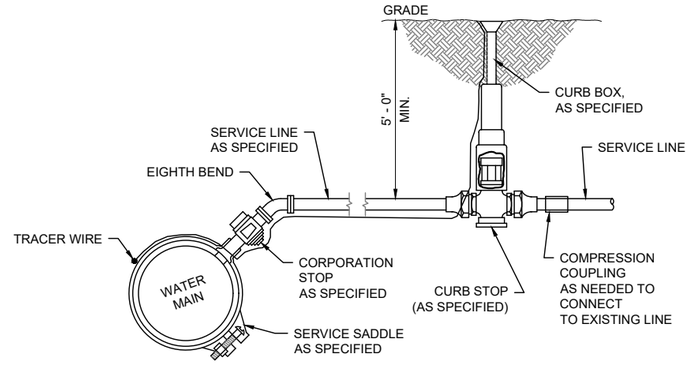
SIZE OF FITTING	THRUST BLOCK DIMENSIONS		
	A	B	C
4"	1'-0"	1'-0"	3"
6"	1'-6"	1'-0"	6"
8"	2'-0"	1'-0"	6"
10"	2'-6"	2'-0"	9"
12"	3'-0"	2'-6"	9"
16"	4'-0"	2'-6"	12"
20"	4'-0"	3'-0"	16"
24"	4'-6"	3'-0"	16"

NOTES:
1. POLYWRAP ALL FITTINGS
2. THRUST BLOCKS SHALL NOT PREVENT ACCESS TO FITTING BOLTS

3 CONCRETE THRUST BLOCK
SCALE: N.T.S.



TYPICAL ABANDONMENT OF EXISTING CORPORATION STOP



4 WATER SERVICE INSTALLATION
SCALE: N.T.S.

JEO CONSULTING GROUP
1-800-723-6867

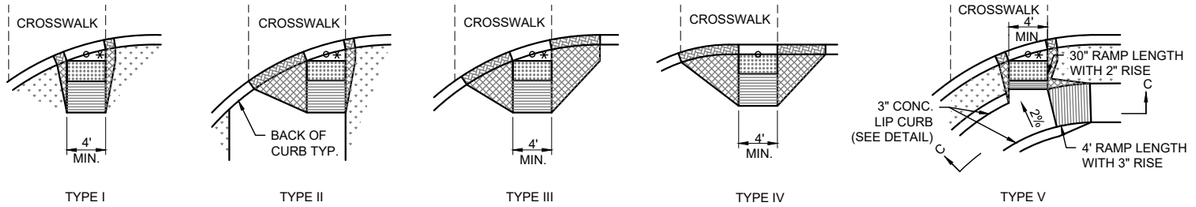
2020
WATER MAIN IMPROVEMENTS
EASTBOURNE ST./N 147TH ST.;
N 143RD ST. TO CASTLEWOOD ST.
WAVERLY, NEBRASKA

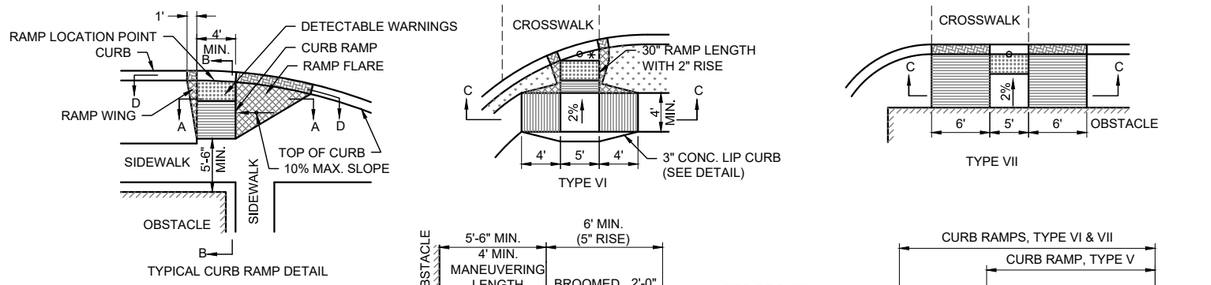
STANDARD DETAILS

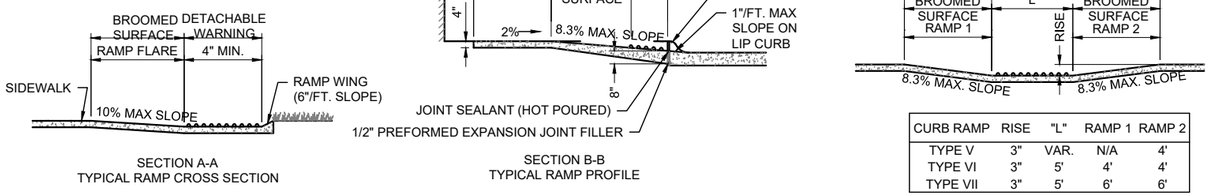
PROFESSIONAL CIVIL ENGINEER
TIMOTHY J ADAMS
E-15149
11/24/2020
STATE OF NEBRASKA

PROJECT NO.	201085.00
DATE	11/24/2020
DRAWN BY	ADP
FILE NAME	S-201085_3.dwg
FIELD BOOK	FB LINCOLN #2
FIELD CREW	EF, NH
SURVEY FILE NO.	SV-201085
PLAN IN HAND INITIALS	TJA
PLAN IN HAND DATE	8/31/2020
70 PERCENT REVIEW INITIALS	RSP
70 PERCENT REVIEW DATE	10/16/2020
95 PERCENT REVIEW INITIALS	RSP
95 PERCENT REVIEW DATE	11/09/2020
REVISIONS	

D1.1

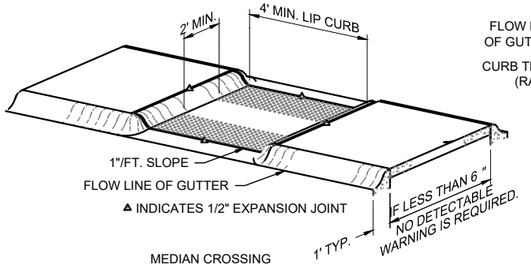


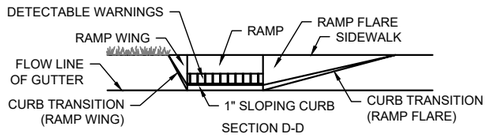




CURB RAMP	RISE	"L"	RAMP 1	RAMP 2
TYPE V	3"	VAR.	N/A	4'
TYPE VI	3"	5'	4'	4'
TYPE VII	3"	5'	6'	6'

SECTION C-C
TYPICAL RAMP CROSS SECTION





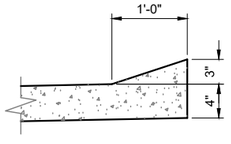
LEGEND

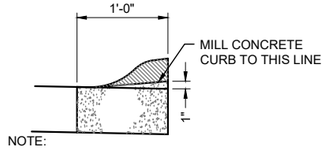
- DETECTABLE WARNINGS
- BROOMED CURB RAMPS
- BROOMED RAMP WINGS & FLARES
- MILLED CONCRETE
- GRASS OR NON-WALKING SURFACE
- CURB TRANSITION

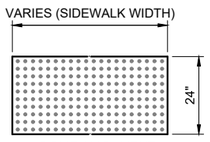
NOTES:

1. THE NORMAL GUTTER LINE PROFILE SHALL BE MAINTAINED THROUGH THE AREA OF THE CURB RAMP.
2. THE SURFACE OF ALL CURB RAMPS SHALL BE BROOMED PERPENDICULAR TO THE SLOPE OF THE CURB RAMP. ALL FLARES AND WINGS SHALL BE BROOMED PERPENDICULAR TO SLOPE.
3. CARE SHALL BE TAKEN TO ASSURE A UNIFORM GRADE ON THE CURB RAMP, FREE OF SAGS AND SHORT GRADE CHANGES.
4. THE RAMP FLARES SHALL BE CONSTRUCTED WITH A 10 ANGLES TO THE SLOPE OF THE CURB RAMP, TYPES II, III & IV.
5. THE SLOPE OF SIDEWALKS APPROACHING CURB RAMPS (OR THEIR FLARES) SHALL BE FLAT ENOUGH TO PROVIDE RECOVERY AREAS FOR WHEELCHAIRS ENTERING OR EXITING THE RAMPS.
6. THE WORK OF CONSTRUCTING THESE RAMPS SHALL BE MEASURED AND PAID FOR AS A PART OF THE WORK FOR "CONCRETE SIDEWALKS", "CONCRETE MEDIAN SURFACING" OR "CONCRETE BIKEWAY".THE WORK OF MODIFICATION OF NEW OR EXISTING CURB WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE CONSIDERED SUBSIDIARY TO OTHER ITEMS OF WORK FOR WHICH DIRECT * PAYMENT IS MADE.
7. DETECTABLE WARNING PANEL:
   SHALL BE FROM THE APPROVED PRODUCT LIST.
   SHALL BE A CONTRASTING COLOR TO THE SURROUNDING SURFACING.
   SHALL EXTEND THE FULL WIDTH OF THE 1" SLOPING CURB.

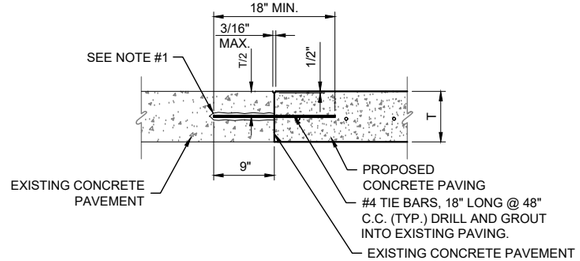
INDICATES 2% SLOPE TOWARDS STREET





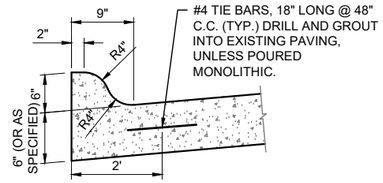


6 CURB RAMP DETAILS
SCALE: N.T.S.

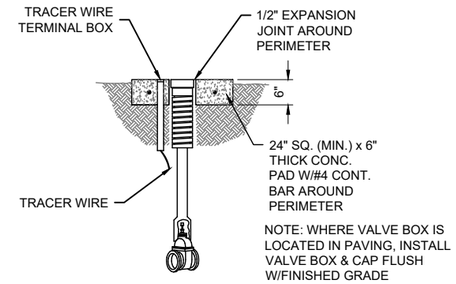


NOTES:
1. DRILL HOLE DIA. 1/8" LARGER THAN TIE BAR.
2. NO BAR WILL BE CLOSER THAN 6 INCHES TO ANY LONGITUDINAL JOINT (CENTERLINE OR LANELINE).

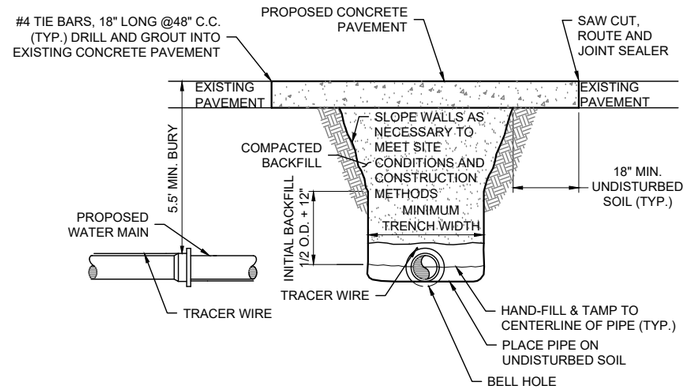
6 PAVING TIE-IN DETAIL
SCALE: 1"=1'-0"



7 CURB DETAIL
SCALE: 1"=1'-0"



8 GATE VALVE & BOX
SCALE: N.T.S.



PIPE SIZE	MIN. TRENCH WIDTH
4"	18"
6"	18"
8"	24"
10"	26"
12"	30"
15"	30"
16"	32"
18"	32"

9 WATER MAIN TRENCH - CONCRETE PAVEMENT
SCALE: N.T.S.

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2020
WATER MAIN IMPROVEMENTS
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D1.2