CITY OF ELKO
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EXHIBIT 16 - TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

CITY OF ELKO

ARPA - ELKO MOUNTAIN BOOSTER PUMP &

WATERLINE PROJECT

TECHNICAL SPECIFICATIONS

SECTION 01010 - SUMMARY OF WORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Summary
B. Work Scope
C. Definitions
D. Contradictions
E. Contractor's Responsibilities
F. Owner's Responsibilities

1.02 SUMMARY

This section includes the project scope of work with definitions, contradictions, and contractor's responsibilities as they apply to the Project Work and these Technical Specifications.

1.03 WORK SCOPE

The project scope of work includes the mobilization of materials, equipment and labor to the job site, the construction of the work is generally described below and more particularly shown on the Project Construction Drawings and described in the Project Specifications. The project work is generally described as follows:

1. The Contractor shall complete the "Project Work", as described in the Project Scope of Work, in accordance with the project plans and specifications. The Contract work includes the following:

   A. The Mobilization of all equipment, labor, tools, and materials to and from the project site.

   B. Place temporary facilities at the Project Site as required to perform the work. Temporary facilities may include temporary bathroom facilities, mobile office facilities, an equipment lay-down area, scaffolding and/or other temporary improvements or equipment to complete the work.

   C. Coordinate with the Elko Water Department Staff, the City Public Works Department Staff, and the local utility companies to locate all existing buried pipe, valves, pipe fittings and buried utilities within the limits of the project work. The Contractor shall be aware that there are existing buried sewer, water, electric power, telephone, natural gas and fiber optic lines located within the project work area, including the tank access road, Powder House Road and State Route 227 Lamoille Highway right-of-way. The Contractor shall be aware of this and locate and protect these improvements during the construction.

   D. The Contract work will require a construction "Stormwater Pollution Prevention Plan (SWPPP) utilizing the template available on-line at the NDEP-Bureau of

Water Pollution Control Website. The SWPPP shall be prepared by the Contractor and submitted to the Nevada Division of Environmental Protection Bureau of Water Pollution Control (NDEP-Bureau of Water Pollution Control) with a mandatory $200.00 permit fee. The mandatory "Construction Stormwater Permits" are required when the Project Construction is determined to disturb "One (1) Acre, or more, of Land Surface Area, or is a part of a larger project that "will ultimately disturb More than One (1.0) Acre of Land Surface Area within the State of Nevada. The required Stormwater Discharge Permit shall be acquired by the Project Contractor through the NDEP-Bureau of Water Pollution Control upon Contract Award and prior to commencing work on the Project. The NDEP-Bureau of Water Pollution Control website includes a template form to fill out and submit for the required permit along with an inspection template form and includes Stormwater Pollution Control "Best Management Practices (BMP's) for controls.

E. The work includes the Bid Items shown and described in the Bid Proposal Form. The Contractor shall take the time and effort to become thoroughly familiar with the work required to successfully complete this project.

F. The Contractor shall provide construction traffic control in accordance with Nevada Department of Transportation (NDOT) requirements when working in the NDOT right-of-way and the City of Elko's traffic control and specification requirements when working on the construction work in City of Elko street right-of-way. All new water lines constructed as a part of this project will be located in a City of Elko right-of-way, City Property, and/or a utility easement.

G. Globally construction consists of mass grading of the existing 5400 zone tanks site in preparation for the placement of a new pump house. Such a facility will encompass a pre-designed/pre-approved/pre-assembled fully equipped booster pump station (BPS).

H. The City of Elko will be performing a 10-inch hot tap, of the existing 10-inch tank primary outlet. The contractor will be responsible to provide all connection saddles with flange fittings, mechanical joint adapters, thrust block and all appurtenances to make a secure connection.

I. The installation of a new 10-inch diameter water transmission pipe will then be constructed and connected to the proposed BPS. It will be the responsibility of the Contractor (CTR) to have the proposed BPS onsite and fully dimensioned, prior to placing slab penetrations within the pump house and pouring of the concrete slab floor. Proposed Slab Penetrations: 10-inch BPS Supply, 10-inch BPS Discharge, BPS Drain, Two (2) 2-Inch Floor Drains. All drain lines shall be routed to one continuous 2-inch drain and discharged into existing tank discharge channel as shown on the project plans.

J. The new water transmission line extending from the BPS will terminate at an existing 18-inch flanged tee located in Powder House Road. Connection will occur with a 10-inch x 18-inch concentric reducer.

K. The Contractor shall provide, install and construct all pipe connections, bends, tees, crosses, valves, air release & vacuum valve assemblies, air release valve

assemblies, valve boxes, pressure reducing valve assemblies, manholes and accessory items required to complete the work as shown on the Project Construction Drawings and as specified in the project technical specifications.

L. The Contractor shall provide and place pipe bedding material, backfill and compact all pipe backfill material.

M. The Contractor shall take all appropriate safety measures to protect the workmen on site, City of Elko workmen on-site, and the general public traveling along Powder House Road, Elko Mountain Way, and SR 227 during the entire time of construction including weekends. The Contractor shall have and maintain a Safety Plan meeting all OSHA, State of Nevada and City of Elko requirements.

N. The Contractor's on-site work hours shall be coordinated and approved through the City of Elko Water Department and the City of Elko Public Works and Streets Department.

O. The Contractor shall provide his, or her, own source of electric power to power all temporary lighting facilities, water pipe placement equipment, and workmen's power tools.

P. Final cleanup and "punch list" work: The Contractor shall clean the project site and leave the site clean and free of all garbage created during the Contractor's work activities.

Q. Land disturbance reclamation and grass seeding. Following final site cleanup the Contractor shall spread the original ground topsoil evenly over all disturbed areas before applying the specified grass seed mix over the areas to be reclaimed and revegetated. This work is described in Section 02485 – Seeding and Revegetation of Disturbed Areas of the Project Specifications and is included as a bid item in the bid proposal form.

R. State of Nevada and City of Elko requirements. The Contractor's personnel shall carry OSHA training proof of certification cards when on the jobsite. The Contractor shall submit a copy of each worker's OSHA certifications to the City of Elko and the Engineer. All Contractor personnel on-site shall have current OSHA 10 and/or 30 hour Construction Industry Safety Training and Certification as required by the City of Elko, the State of Nevada, and the Nevada Department of Transportation in order to commence work on the project.

S. The Contractor shall attend the mandatory pre-bid meeting held on-site prior to bidding the project and shall be fully informed of the scope of work to be completed by the Contractor on this project.

2. The City of Elko Water Department Staff and the City of Elko Public Works & Street Department shall provide the following:

A. Provide access to the work site for the Contractor.

B. Provide the labor and equipment to tap the existing 18-inch diameter ductile iron water pipe at the 5400 zone (ST-01) tank site. The contractor shall provide and install the specified tapping sleeve and tapping valve required to connect to the existing 18 - inch diameter ductile iron water transmission pipe at ST-01.

1.04 CONTRACT TIME

The Contractor shall supply the materials, manpower and equipment resources to complete the project work within the specified contract time. The Contractor shall begin work no later than the date set forth in the Notice to Proceed and the work shall be completed within the following time frame:

A. The Contractor shall complete all work as stated above within **One Hundred Twenty (120) Calendar Days** from the project commencement date, as agreed to in the Construction Contract and as stated in the Notice to Proceed issued by the City of Elko.

B. The Contractor shall provide the Owner with a complete construction schedule prior to commencing work. If contract work falls behind schedule, or progresses ahead of schedule, by more than Seven (7) calendar days, the Contractor shall provide the Owner with an updated revised construction schedule.

1.05 LIQUIDATED DAMAGES

If the Contractor refuses or fails to complete the project work within the specified time, including authorized time extensions, there shall be deducted from the moneys due the Contractor, not as a penalty, but as liquidated damages, the sum of **One Thousand Dollars ($1,000.00) for each calendar day** subsequent to the time specified and until the work is completed and accepted.

1.06 DEFINITIONS

A. The following definitions apply to these Technical Specifications:

1. "Owner" is defined as an authorized representative of City of Elko.

2. "Engineer" is defined as a representative appointed and authorized by the City of Elko. The Engineer of Record is Aaron K. Martinez – PE, PLS a registered Professional Engineer and Professional Land Surveyor in the State of Nevada. Under his supervision, are designated site representatives whom are NAQTC certified inspectors during the construction process.

3. "Quality Assurance Team" is defined as the individuals working under the direction of Engineer to perform the site quality assurance tasks for the Owner. Such

inspectors shall be NAQTC certified and all Materials laboratory services shall be AASTO Accredited laboratories.

4. The "Contractor" is defined as the party executing the construction contract agreement, with the Owner, to satisfactorily complete the specified work.

5. "Specifications" is defined as this document that contains the technical specifications for the work prepared by the Engineer, for the City of Elko.

6. The City's current adopted "*Standard Specifications*" shall refer to the "*Standard Specifications for Public Works Construction, 2016 Edition" (Revision No. 7 for Water Works Construction and Revision No. 8 for Grading and Other Construction)*, as sponsored and distributed by the Washoe County Regional Transportation Commission and as adopted by the City of Elko and the Nevada Division of Environmental Protection – Bureau of Safe Drinking Water. These documents shall be referred to as the Project *"Standard Specifications".*

7. In addition, all waterworks construction shall comply with the requirements of **Nevada Administrative Code Chapter NAC 445A "Water Controls"**. All material and workmanship standards shall comply with the contents of these standards.

8. "Modifications" are defined as changes made to the Project Specifications and/or the Project Construction Drawings that are approved by the Owner, Engineer, and Contractor in writing after the Specifications and the Project Drawings have been finalized.

9. "Record Documents" are defined as the documents prepared and certified by the Engineer, or Land Surveyor, documenting the progress, location, type and quantity of materials placed to complete the Work.

10. The "Project" is defined as the work required to complete all construction activities required for the **ARPA - ELKO MOUNTAIN BOOSTER PUMP & WATERLINE PROJECT.**

11. "Products" is defined as new water pipe, sewer pipe, valves, pipe fittings, valve boxes, concrete thrust blocks, manholes, material, machines, components, equipment, fixtures, and systems forming the Work. This does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work.

12. "Work" is defined as the entire completed construction, or the various separately identifiable parts thereof, required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor, and furnishing and incorporating materials and equipment into the construction, all as required within the Contract Documents;

13. "Contract Documents" are defined as the Plans and Specifications, Addenda (which pertain to the Contract Documents), Contractor's Bid (including documentation accompanying the Bid and any post-Bid documentation submitted prior to the

Notice of Award) when attached as an exhibit to the Agreement, the Bonds, these General Conditions, the Supplementary Conditions, the Technical Specifications, the Drawings, and the signed Contract Form together with all Modifications issued after the execution of the Agreement.

1.07 CONTRADICTIONS

A. Should any contradiction, either implied or real, exist between the Specifications and the Drawings, the Contractor shall:

1. Notify the Owner and Engineer.

2. Stop all work that concerns the contradiction until the contradiction is remedied or clarified by the Engineer.

B. The decision of the Engineer is final.

1.08 CONTRACTOR'S RESPONSIBILITIES

A. The Contractor shall:

1. Visit the site of the proposed work and fully acquaint himself, or herself, with the conditions relating to construction, labor, and equipment so that he may fully understand the facilities, difficulties, and restriction attending the execution of the work under the contract. Bidders shall thoroughly examine and be familiar with the drawings and specifications. The failure of any bidder to receive or examine any form, instrument, addendum or other document or to visit the site and acquaint himself with conditions there existing shall in no way relieve any obligations with respect to his proposal or to the contract.

2. **Project Superintendent.** The Contractor shall provide one (1) project superintendent for the duration of the project. The Contractor shall provide and submit a resume of the project superintendent along with the project schedule. The superintendent's resume shall be an accurate description of the project superintendent's education, experience and training. The resume shall focus primarily on the superintendent's work experience over the past five (5) years. Upon approval of the project superintendent, the Contractor shall not reassign the project superintendent without being assessed a **liquidated damage of $250.00** per day until the approved superintendent is returned to the jobsite, or until the Contractor and Owner agree on an equally qualified and acceptable superintendent.

3. Maintain Nevada Workman's Compensation Insurance, General Liability Insurance, and other insurances, as required in the City of Elko Contract Documents, and provide evidence of insurance to the Owner.

4. Be responsible for making his own measurements and installing his work to fit the conditions encountered.

5. Before proceeding with the work, examine all Project Plans & Specifications and

report to the Engineer any apparent discrepancies or interferences. The Engineer shall have the privilege of making minor alterations to the Project Plans. All alterations shall be issued under a covering work order signed by the Owner prior to the start of alteration if the alteration will affect the terms of Contract.

6. Before commencing work the Contractor shall provide the following plans and training certifications for review:
   a. Project Safety Plan/Program
   b. MSDS Sheets for all materials and chemicals to be used on the jobsite.
   c. OSHA certifications and training cards for all construction personnel to work on the jobsite.
   d. Manufacturer's Training Certificates for specialized work.
   e. A detailed construction schedule, as specified.
   f. Prepare a Stormwater Pollution Prevention Plan and apply for and acquire a Construction Stormwater General Permit through the NDEP-Bureau of Water Pollution Control.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 BASIS OF PAYMENT

The basis of payment for the construction work shall be at the unit price or lump sum amount established within the Contractors Bid Proposal and as specified in the Contract Special Provisions for each separate bid item. No additional payment shall be made for incidental items required by the Contractor to complete the project scope of work.

END OF SECTION

SECTION 01025
MEASUREMENT AND PAYMENT

PART I GENERAL

1.01 SECTION INCLUDES

A. Schedule of Values
B. Application for Payment
C. As-Built Drawings
D. Payment for extra and force account work.

1.02 SCHEDULE OF VALUES

A. Approval of Schedule: Submit for approval a preliminary schedule of values, in duplicate, for all of the Work. The Contractor's preliminary schedule of values shall be organized and show all work in accordance with the Project Bid Proposal Form included within the City's Contract Documents. Submit preliminary schedule of values within seven (7) calendar days after date established in Notice to Proceed.

B. Format: Utilize a format similar to the Contract Bid Proposal Form and/or Table of Contents of the Project Specifications. Identify each line item with number and title of the major specification section. Identify site mobilization, bonds and insurance not limited to but including Bid Bond, Performance Bond, and Payment Bond. Include with each line item, a direct proportional amount of CONTRACTOR'S overhead and profit.

C. Revisions: With each Application for Payment revise schedule to list approved Change Orders.

D. Payment to the Contractor shall not exceed that amount shown in the Contractor's bid proposal price for the work specified. Where specific bid items are not given for specified work, the Contractor shall include that specified work in other bid items and no additional payment shall be made for the subject work required to make the project complete.

E. Payment for each category of work shall be in accordance with PART 4 BASIS OF PAYMENT described in the related work section of these technical specifications.

1.03 APPLICATION FOR PAYMENT

A. Required Copies: Submit one (1) electronic copy of each application for payment to the Engineer.

B. Execute certification by signature of authorized officer.

C. Use data from approved Schedule of Values.

D. Stored Materials: When payment for materials stores is permitted in the Supplementary Conditions, submit a separate schedule for Materials Stored showing line item, description, previous value received, value incorporated into the

Work and present value.

E. Change Orders: List each authorized Change Order as an extension on continuation sheet, listing Change Order number and dollar amount as for an original item of work.

F. Partial Payment: Prepare partial payment requests on a monthly basis in accordance with Subsection 100.51 PARTIAL PAYMENTS of the General Conditions ("City's Standard Specifications, 2016

G. Edition Revisions No. 7 and No. 8).

H. Final Payment: Prepare Application for final Payment as require in Subsection 100.52 FINAL ESTIMATE AND PA MENT of the General Conditions.

I. Submit an updated construction schedule with each Application for Payment if the previous schedule should accelerate or fall behind schedule by more than 5-days.

J. Submit application for payment to the Owner's representative on site (Engineer) on or before the last day of each month.

K. Application for payment shall be by lump sum or by unit prices in accordance with the unit costs and lump sum unit prices bid by the Contractor.

1.04 AS BUILT DRAWINGS

A. The Contractor shall maintain a 36-inch by 24-inch scale copy of the plans on site at all times to "redline" and record all project changes and locations of utilities underground utilities that are encountered during the construction. The Contractor shall provide the "redline" drawings to the Engineer and the Owner at the end of construction to be incorporated into the Project As-Built Drawings prepared by the Engineer.

1.05 PAYMENT FOR EXTRA AND FORCE ACCOUNT WORK

A. Extra work shall be prosecuted in accordance with Subsection 100.24. CHANGE ORDERS and Subsection 100.25 EXTRA WORK of the "*Standard Specifications for Public Works Construction, 2016 Edition (Revisions No. 7 and No. 8)*", as adopted by the City of Elko. Extra work, performed in accordance with the subsection titled Extra Work of Section 4, will be paid for at the Contract prices or agreed prices specified in the change order or supplemental agreement authorizing such extra work. When the change order or supplemental agreement authorizing the extra work requires that it be done by force account, such force account shall be measured and paid for based on expended labor, equipment, and materials plus a reasonable allowance for overhead and profit.

B. Miscellaneous: No additional allowance will be made for general superintendence, the use of small tools, or other costs for which no specific bid item is herein provided. The Contractor shall include all equipment, labor and materials in his bid proposal to complete the work described and specified.

C. Comparison of Records: The Contractor and the Engineer shall compare

records of the cost of force account work at the end of each day. Agreement shall be indicated by signature of the Contractor and Engineer or their duly authorized representatives.

D. Statements: No payment will be made for work performed on a force account basis until the Contractor has furnished the Engineer with duplicate itemized statements for the cost of such force account work detailed as follows:

1. Name, classification, date, daily hours, total hours, rate and extension for each laborer and foreman.
2. Designation, dates, daily hours, total hours, rental rate, and extension for each unit for machinery and equipment.
3. Quantities of materials, prices, and extensions.
4. Transportation of materials.
5. Cost of property damage, liability and workmen's compensation insurance premiums, unemployment insurance contributions, and social security tax.

E. Statements shall be accompanied and supported by receipted invoice for all materials used and transportation charges. However, if materials used on the force account are not specifically purchased for such work but are taken from the Contractor's stock, then in lieu of the invoices the Contractor shall furnish an affidavit certifying that such materials were taken from his stock, that the quantity claimed was actually used, and that the price and transportation claimed represent the actual cost to the Contractor.

F. The additional payment, based on the percentages specified above, shall constitute full compensation for all items of expense not specifically provided for the force account work. The total payment made as provided above shall constitute full compensation for such work.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01045 - MOBILIZATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Summary
B. General
C. Basis of Payment

1.02 SUMMARY

This section describes the scope of work for mobilization and demobilization including requirements for temporary works such as construction signing, construction barricading, temporary construction fencing, and necessary permits. The basis of payment for mobilization is described within this section.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 GENERAL

A. Upon receipt of the Notice to Proceed, the Contractor shall furnish, mobilize and install such temporary works, materials, equipment and construction plants as are necessary for the successful completion of the Work. The Contractor shall also operate and maintain such temporary works, equipment and construction plants throughout the period of construction. All applicable temporary works, such as sanitation facilities and security fencing, shall fully comply with the rules and regulations of the government agency having jurisdiction. Clearing, grading, earthwork and construction of access roads necessary for the temporary works, if any, shall be included as mobilization. The Contractor shall obtain all required environmental permits, Air Quality Permits, Storm Water Discharge Permits, well driller's permits, and all other permits necessary to mobilize the Contractor's equipment to the work site and complete the Work, as specified.

B. The Contractor shall provide temporary office facilities, if needed, to properly coordinate the work on-site with the contractor's work force, including subcontractors.

C. The Contractor shall be responsible for temporary electric power to the worksite, if required by the Contractor, to complete the work as specified. The contractor shall provide portable electric generators, air compressors, welders, power tools, hand tools as well as any other equipment required to complete the work.

D. For historic preservation of the site the Contractor shall refer to NRS 383.121 - Historic Preservation and NRS 383.170 - Procedure upon discovery of Indian burial sites; permissible excavation.

E. The Contractor shall be knowledgeable and comply with all applicable provisions of Nevada Administrative Code Chapter NAC 445A - Water Controls.

F. The cost required to secure insurance, bonds, and other related project overhead may be included, by the Contractor, in the amount bid for Mobilization.

G. The Contractor shall maintain traffic signing and traffic control to protect the traveling public and the Contractor's workers from conflicts with vehicular traffic and pedestrians. The Contractor shall be responsible for traffic control and shall include the costs for traffic control in this work, unless a separate bid item is provided for Traffic Control in the Bid Proposal Form.

3.02 BASIS OF PAYMENT

A. Partial payments for mobilization and demobilization will be made in accordance with the following schedule:

1. The Owner shall pay the Contractor up to fifty percent (50%) of the amount bid for Mobilization/Demobilization when the Contractor has completed at least twenty-five percent (25%) of the original contract work amount.

2. The Owner shall pay the Contractor up to seventy-five percent (75%) of the amount bid for Mobilization/Demobilization when the Contractor has completed seventy-five percent (75%) of the original contract work amount.

3. The Owner may retain up to twenty-five percent (25%) of the amount bid for Mobilization/Demobilization until all cleanup work has been completed on the project work site. At that time payment shall be made for the total amount bid for Mobilization/Demobilization, less the amount held for retention by the owner.

4. The total sum for all mobilization payments shall not exceed the original contract bid amount for Mobilization, regardless of the fact that the Contractor may have, for any reason, shut down his work on the Project or moved equipment away from the Project Site and back again.

END OF SECTION

SECTION 01090 - REFERENCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Summary
B. Codes and Regulations
C. Schedule of References

1.02 SUMMARY

This section of the Project Specifications states and establishes applicable codes, regulations and standards expected for materials and workmanship. A list of applicable references are shown. For additional reference material refer to Section 01010 – Summary of Work, Section 01300 – Submittals, Section 1400 – Quality Control, Section 1600 – Materials and Equipment, Section 02207 – Aggregate Materials, Section 02221 – Trenching, Backfilling, and Compaction, Section 02513 – Plantmix Bituminous Pavement, Section 02576 – Bituminous Pavement Prime, Tack and Seal Coats, Section 02623 – Pipe, Valves and Fittings, Section 02630 – Sanitary Sewer Pipe and Storm Sewer Pipe, Section 03300 – Cast In Place Concrete and Section 03400 – Precast Concrete.

1.03 CODES AND REGULATIONS

A. The work shall conform to applicable federal, state, county, and local regulations.

B. The following publications current at the date of Contract Documents, unless specified otherwise, are a part of this specification, except where modified or replaced by local codes or ordinances having jurisdiction, in which case such local codes or ordinances shall govern:

1. Occupational Safety and Health Administration, General Industry and Health Standards -OSHA Publication 2206.

2. Occupational Safety and Health Administration, Construction Industry Standards, Code of Federal Regulations (CFR) Title 29, Part 1926.

3. Occupational Safety and Health Administration, General Industry Standards, Code of Federal Regulations (CFR) Title 29, Part 1910.

4. The City of Elko Written Plan/Program for Work Safety. The contractor shall be required to have a written plan that meets or exceeds local, state and federal OSHA program requirements prior to issuance of the written Notice to Proceed with contract work.

5. 40 CFR 117 – Determination of Reportable Quantities of Hazardous Substances.

6. 40 CFR 122 – EPA Administered Permit Program: The National Pollutant Discharge Elimination System.

7. 40 CFR 261-268 – Federal Standards for Determination, Storage, Handling, Licensing, and Disposal of Hazardous Materials by Generators & Transporters.

8. NSF 61 – Drinking Water Components, Health Effects.

9. SSPC - Steel Structures Painting Council standards for steel surface preparation and coating.

10. SSPC-SP 13/NACE 6 – Surface Preparation of Concrete

11. SSPC Guide 6I(CON) – Guide for containing debris generated during paint removal operations.

12. SSPC Guide 7I(DIS) – Guide for the disposal of Lead-Contaminated Surface Preparation Debris.

13. SSPC-PA Guide 3 – A guide to safety in paint application.

14. U.S. Department of Transportation.

15. Clean Water Act - Nevada Division of Environmental Protection.

16. Environmental Assessment and the Plan of Operations at the site, if applicable.

17. *Standard Specifications for Public Works Construction, 2016 Edition (with Revisions No. 7 and No. 8)*, as adopted by the NDEP-Bureau of Safe Drinking Water and the City of Elko, Nevada. The "*Standard Specifications*" for this project shall refer to these documents.

18. Nevada Administrative Code Chapter NAC 445A "*Water Controls* and all state and federal requirements for public water systems shall be complied with.

19. Standard Specifications for Road and Bridge Construction as published by the Nevada Department of Transportation (*Current Adopted Edition)* for construction within the NDOT SR 227 right-of-way.

20. Manual on Uniform Traffic Control Devices as adopted by the Nevada Department of Transportation and the Federal Highway Administration.

21. The International Building Code (IBC), 2018 Edition, as enacted by the International Conference of Building Officials and as adopted by the City of Elko, Nevada, as the City's Building Code

22. The International Plumbing Code (IBC), 2018 Edition, as enacted by the International Conference of Building Officials and as adopted by the City of Elko, Nevada, as the City's Plumbing Code

23. The National Electric Code (NFPA-70), the current edition adopted

1.04 SCHEDULE OF REFERENCES

A. For products of workmanship specified by association, trade, or Federal Standards, all shall comply with the requirements of the standard, except when more rigid requirements are specified or are required by applicable codes. Conform to reference standard that is current at the date of Contract Documents. As a minimum the following reference standards shall be used for this project:

AASHTO American Association of State Highway and Transportation Officials
444 North Capitol Street, N.W.
Washington, DC 20001
www.aashto.org

AISC American Institute of Steel Construction
400 N. Michigan Avenue
Eighth Floor
Chicago IL 60611
www.aisc.org

ANSI American National Standards Institute
1430 Broadway
New York, N 10018
www.ansi.org

ASTM American Society for Testing and Materials
1916 Race Street
Philadelphia, PA 19103
www.astm.org

ASME American Society of Mechanical Engineers
Three Park Avenue
New York, New York 10016-
5990 www.asme.org

ASCE American Society of Civil Engineers
1801 Alexander Bell Drive
Reston, VA 20191
www.asce.org

AWWA American Water Works Association
6666 West Quincy Avenue Denver,
CO 80235
www.awwa.org

ACI American Concrete Institute
Box 9094
Farmington Hills, MI 48333
www.aci-int.org

CRSI Concrete Reinforcing Steel
Institute 933 North Plum Grove

Road Schaumburg, Il, 60195
www.crsi.org

NDOT — Nevada Department of Transportation 1263 S. Stewart Street
Carson City, NV 89712
www.nevadadot.com

IBC — International Building Code – International Code Council, Inc.
4051 West Flossmoor Road
Country Club Hills, IL 60478-5795
Phone No. 800-214-4321

NDEP-BSDW — Nevada Division of Environmental Protection
Bureau of Safe Drinking Water
901 S. Stewart Street, Suite 4001
Carson City, NV 89701-5249
www.ndep.nv.gov

NDEP-BWPC — Nevada Division of Environmental Protection Bureau of Water Pollution Control
901 S. Stewart Street, Suite 4001
Carson City, Nevada 89701-5249
www.ndep.nv.gov

NDPH — Nevada Department of Public Health
505 E. King Street
Carson City, NV 89701
www.health2k.state.nv.us

NSF — National Sanitation Foundation
Box 130140
Ann Arbor, MI 48113-0140
www.nsf.org

OSHA — Occupational Safety and Health Act
1301 N. Green Valley Parkway, Ste. 200
Henderson, NV 89704
www.osha.gov

SSPC — Steel Structures Painting Council
40 24th Street, Ste. 600
Pittsburgh, PA 15213

"Standard Specifications" – The *Standard Specifications for Public Works Construction, 2016 Edition (Revisions No. 7 for Water Works Construction and Revision No. 8 for other construction),* as distributed by the Washoe County RTC, the Cities and Counties of Northern Nevada, and as adopted by the NDEP-Bureau of Safe Drinking Water and the City of Elko for public works construction.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01300 - SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Summary

B. Technical Data

C. Progress Schedules

D. As-Built Documentation

E. Trenching, Confined Space Entry & Safety Plan/Program

F. Contractor's Superintendent Resume

G. MSDS Sheets for all Chemicals, Solvents, Curing Agents, and Chemicals

H. Contractor Worker OSHA 10 hour / 30-hour Certifications

I. Basis of Payment

1.02 SUMMARY

This section addresses the procedures for presenting and submitting materials and equipment technical data submittals for approval, construction schedules, progress payment submittals, requests for information and as-built documentation.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 TECHNICAL DATA

A. The Contractor shall submit a complete construction schedule to the Engineer and the City of Elko prior to commencing work either prior to, or at the time of the Preconstruction Meeting. The preconstruction schedule shall be in a bar chart or CPM format and shall show all critical work items/tasks.

B. The Contractor shall submit a schedule of submittals with his, or her, initial project schedule. The schedule of submittals shall list all the products that the contractor will be submitting for approval. All major equipment items including construction schedule, PVC water pipe, pipe fittings; valves; valve boxes; concrete mix design (for pipe thrust blocks); pipe bedding material; gravel drain rock, combination air and vacuum valves, pressure reducing valves, concrete manholes, gravel base material, plantmix bituminous pavement, CMU block type, door, window, air

louvers, all objects with color options, electrical equipment, jobsite safety plan/program, and other work related items requiring purchasing. Specific environmental permits-when required. All construction materials shall be included in the schedule of submittals.

C. Engineering data covering all equipment and fabricated materials to be furnished under this contract shall be submitted to the Engineer for review. The data shall include shop drawings and descriptive information in sufficient detail to show the kind, size, arrangement, and operation of component material and devices: the external connections, anchorages, and supports required; performance characteristics; and dimensions needed for installations and correlation with other materials and equipment. Data submitted shall include drawings showing essential details of any changes proposed by Contractor.

D. No work shall be performed in connection with the fabrication or manufacture of material and equipment, nor shall any accessory or appurtenance be purchased until the drawings and data have been reviewed and approved by the Engineer and the Owner, except at the Contractor's own risk and responsibility.

E. Submit electronic copies of each submittal, drawing, and necessary data to the Owner and Engineer. Each drawing or data sheet shall be clearly marked with the name of the project, the Contractor's name, and references to applicable specification paragraphs and drawing sheets. When catalog pages are submitted, the applicable items shall be identified. The Engineer shall return an electronic copy of the submittal to the Contractor with redlined corrections, or marked approved or disapproved.

F. When the drawings and data are returned marked RETURNED FOR CORRECTIONS, the corrections shall be made as noted thereon and as instructed by the Engineer and an electronic copy shall be resubmitted.

G. Unless otherwise directed by the Engineer, when drawings and data are returned marked EXCEPTIONS NOTED, the changes shall be made as noted thereon and a new electronic copy shall be furnished to the Engineer.

H. When the drawings and data are returned marked NO EXCEPTIONS NOTED, the Contractor may order the materials as shown.

I. The Engineer's review of drawings and data submitted by the Contractor shall cover only general conformity to the Drawings and Specifications, external connections, and dimensions, which affect the layout. The Engineer's review of drawings and data returned mark NO EXCEPTIONS NOTED or EXCEPTIONS NOTED does not indicate a thorough review of all dimensions, quantities, and details of the material, equipment, devices, or items shown and does not relieve the Contractor from any responsibility for errors or deviations from the contract requirements.

J. All drawings and data, after final processing by the Engineer, shall become a part of the Contract Documents and the Work shown or described thereby shall be performed in conformity therewith unless otherwise authorized by the Owner or the Engineer.

3.02 PROGRESS SCHEDULES

A. Procedure:

1. Within fourteen (14) days after the Notice of Award and prior to the issuance of the Notice to Proceed and the start of construction the Contractor shall submit a complete construction schedule in either a bar chart or critical path method (CPM) format to the Engineer and Owner for review and approval.

2. Upon Owner's review, revise and resubmit schedule to comply with Owner's review comments.

3. If the Contractor deviates from the Approved Construction Schedule he, or she, shall revise and update the Construction Schedule and resubmit it to the Engineer and the Owner for review and approval.

B. Show complete sequence of construction by activity, with dates for beginning and dates of completion of each element of construction.

C. Provide subcontractors activity schedules.

D. Provide separate schedule of submittal dates for shop drawings, product data, and samples, including Owner furnished products, and dates that reviewed submittals shall be required from the Owner and Engineer. Indicate delivery data for products.

E. Schedules shall be in a form that is acceptable to the Owner.

F. The Contractor shall distribute copies of approved schedules to the project file, Subcontractors, suppliers, and the Engineer.

G. The Contractor shall instruct recipient to promptly report in writing all problems anticipated by projections indicated in schedules.

H. In the event that (weather delays, construction delays, material delivery delays, owner delays, etc.) the Contractor falls to five (5) days behind schedule, or more, a new progress schedule shall be submitted, as stated above.

3.03 AS BUILT DOCUMENTATION

A. The Contractor shall be responsible for maintaining accurate as-built information showing any project changes. As-built documentation shall be kept on the job site. When detailed as-built information is required by the Owner. The Contractor shall accurately survey, by a surveyor, the locations and elevations, and where applicable, the type, thickness and geometry of any and all underground piping systems, ditches, breaks in fill or cut slopes, general grading, change in fill material type and any other aspect of the work required deemed critical to the Project.

B. All As-Built Surveying will be provided by A.M. Engineering.

C. Submittal: Completed as-built documentation will be submitted prior to project acceptance in the following manner:

1. Submit one (1) digital copy to the Engineer.
2. Submit one (1) hard copy to the Engineer.
3. Submit one (1) hard copy to the City of Elko.

D. Any discrepancies between the locations as installed shall be corrected at the Contractors expense. Written approval from the Owner for these corrections shall be required prior to the project acceptance.

3.04 TRENCHING, CONFINED SPACE ENTRY AND JOBSITE SAFETY PLAN

A. The Contractor shall submit a Jobsite Safety Plan/Program which meets, or exceeds, all OSHA Standards as well as all state and local safety requirements.

1. The Contractor's Jobsite Safety Plan/Program shall be submitted within ten (10) days after Notice of Award.

2. The Contractor's Jobsite Safety Plan/Program must meet all local, state and federal OSHA requirements for construction industry safety.

3. The Contractor's plan shall be submitted to the Owner and Engineer for review only. The Contractor shall be solely responsible for the safety of the workers on the work site.

4. The Contractors Jobsite Safety Plan shall address all OSHA requirements for Trenching & Excavating, Confined Space Entry, and Jobsite General Safety to protect workmen and the general public.

3.05 CONTRACTORS SUPERINTENDENT RESUME

A. The Contractor shall submit a resume of work experience for the project Superintendent to be in charge of the work performance.

B. The proposed project superintendent shall remain on the project from the commencement of work through project completion and final acceptance by the Owner. See the project superintendent requirements in Section 01010 – SUMMARY OF WORK.

3.06 MSDS SHEETS FOR CHEMICALS ON THE PROJECT

A. The Contractor shall keep on-site a complete list on-site and MSDS information specific to all chemicals, solvents, concrete curing agents, crack sealants, epoxies, sealants and chemical grout materials to be on site. MSDS information shall be submitted for all OSHA regulated chemicals and agents to be on the jobsite at any time during construction.

3.07 OSHA 10 HOUR 30 HOUR CERTIFICATION OF WORKERS

A. State of Nevada and City of Elko requirements. The Contractor's personnel shall carry OSHA training proof of certification cards when on the jobsite. The Contractor shall submit a copy of the each worker's OSHA certification prior to commencement of construction. All Contractor personnel on-site shall have current OSHA 10

Hour & 30 Hour Construction Industry Safety Training and Certification as required by state law in order to be present and work on the project.

3.08 BASIS OF PAYMENT

A. The material and equipment technical submittal approval process is considered a part of the work and shall be included in the unit price or lump sum bid prices provided by the Contractor in the Contractor's Bid Proposal amount.

B. The progress schedules are considered part of work required for this project, and no separate payment will be made.

C. As-built documentation, as described in the general conditions and in the special provisions, for the project shall be provided by the contractor prior to final payment for work on this project. No separate payment shall be made for this submittal.

D. A complete Safety Plan/Program addressing Trenching & Excavating, Confined Space Entry and General Construction Site Safety is considered part of the work required for this project, and no separate payment will be made.

END OF SECTION

SECTION 01400 - QUALITY CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Related Sections
B. Summary
C. References
D. Quality Control
E. Quality Assurance
F. Field Inspection, Sampling, and Testing
G. Manufacturer's Samples
H. Inspection and Testing Laboratory Services
I. Basis of Payment

1.02 SUMMARY

This section includes the definitions of quality control and quality assurance. The section includes the Contractor's responsibilities for quality control testing of the work as well as the Owner's responsibilities for quality control testing and inspection of the work.

1.03 REFERENCES

A. Quality control measures shall conform to the referenced *Standard Specifications* as adopted by the City of Elko and the NDEP-BSDW for each portion of the work unless specifically detailed otherwise in the project construction plans and work specifications.

B. Should the specified reference standards conflict with Contract Documents, the Contract Documents shall prevail. The Contractor shall request clarification from the Engineer before proceeding.

C. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any referenced documents, or standards.

D. All work shall meet the minimum requirements set forth in the Project "*Standard Specifications"*..

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 QUALITY CONTROL

A. Definition: Inspection and testing of the project construction materials and work performed prior to the next material course being placed as part of the Work. Performed by the Contractor, Manufacturer, or facility retained by the Contractor or Manufacturer.

B. Results of quality control tests are subject to verification by the Engineer. Should a discrepancy between the quality control results and the Engineer's results occur the Engineer's results and conclusions shall prevail.

C. Quality control results are not a basis of acceptance of Work. Results of inspection and testing on in-place material approved by the Engineer or performed by the Owner's quality assurance team shall prevail.

D. The Contractor shall be responsible for monitoring quality control over suppliers, manufacturers, products, services, site conditions and workmanship to produce Work of specified quality.

E. The Contractor shall comply fully with manufacturers' requirements and specifications. Should manufacturers' material requirements conflict with the Contract Documents, request clarification from the Engineer before proceeding with the Work.

F. The Contractor shall comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes or specified requirements indicate higher standards or more precise workmanship.

G. Perform all work by persons qualified to produce workmanship of specified quality.

3.02 QUALITY ASSURANCE

A. Definition: Inspection, sampling, and testing performed by qualified Quality Assurance personnel hired by the Owner.

3.03 INSPECTION, SAMPLING, AND TESTING

A. Maintain access at all times for the Quality Assurance Team to perform inspection, sampling, and testing. At no time deny quality assurance personnel, Engineer, or Owner access to any Work area, fabrication area, staging area, or any other area associated with Work.

B. Make allowance for the quality assurance testing to be performed and divert equipment elsewhere during the required quality assurance testing.

C. There is no provision for claims of delays due to quality assurance inspection, testing, or sampling. Should Contractor feel that delays are being incurred due to quality assurance inspection, testing, sampling, or other activities, notify the Engineer and owner in writing documenting in detail the date, time, and quality assurance activity of each occurrence. Should Engineer determine that excessive time is being spent at quality assurance activities causing delay to Work, corrective action will be taken.

D. If any Work should be covered up without prior approval or consent of the Engineer, it must, if required by the Engineer, be uncovered for examination. After the uncovered Work has been observed and authorization given by the Engineer, the Work shall be recovered in accordance with the Specifications. The cost of uncovering and recovering the Work and any consequential costs shall be born entirely by the Contractor regardless of the condition of the Work uncovered. If the Work is found to be deficient, the Contractor shall expose all Work that was covered prior to approval, correct any Work that is deficient, and proceed according to the Specifications. The cost of uncovering deficient Work, correcting deficient Work and any consequential costs shall be entirely the responsibility of the Contractor.

E. All Work performed by the Contractor shall meet the approval of the Owner and the Engineer. The method and manner of doing the Work will be under the control of the Contractor.

F. Frequency of Testing: The specified testing frequencies can be found in the following sections:

1. Section 02207-Aggregate Materials
2. Section 02220-Subgrade Preparation, Grading, Fill and Embankment
3. Section 02221-Trenching, Backfilling and Compaction
4. Section 02270-Geotextile Fabric
5. Section 02513-Plantmix Bituminous Pavement
6. Section 02576-Bituminous Pavement Prime, Tack and Seal Coats
7. Section 02623-Pipe, Valves and Fittings
8. Section 02630-Sanitary Sewer Pipe and Storm Drain Pipe
9. Section 03210-Reinforcing Steel
10. Section 03300-Cast in Place Concrete
11. Section 03400-Precast Concrete

Testing frequencies not specifically stated within these sections shall be in accordance with the standard frequencies stated within the City's adopted "*Standard Specifications for Public Works Construction, 2016 Edition (Revisions No. 7 and No. 8)*", Subsection 336-INSPECTION AND TESTING.

3.04 MANUFACTURER'S SAMPLES

A. The manufacturer shall sample and perform quality control testing at the frequencies specified in the City of Elko's adopted *Standard Specifications for Public Works Construction, 2016 Edition (Revisions No. 7 and No. 8)*. Water pipe, sewer pipe, precast concrete manholes and catch basins shall be tested and certified by the manufacturer to meet all material specification requirements prior to delivery to the jobsite.

3.05 INSPECTION AND TESTING LABORATORY SERVICES

A. The Owner will appoint, employ, and pay for services of a materials testing laboratory to perform inspection and testing

B. The materials testing laboratory will perform inspections, tests and other services under the supervision and control of the Engineer or his designated representative while work is in progress.

C. The Contractor shall cooperate with the materials testing laboratory; furnish samples of materials, design mixes, equipment, tools, storage, and assistance as required.

The Contractor will also:

1. Notify the Engineer and materials testing laboratory twenty-four (24) hours prior to expected time for operations requiring services.

2. Make arrangements with materials testing laboratory and pay for additional samples and tests required for Contractor's use.

D. The laboratory firm will submit to the Engineer two (2) copies of reports indicating observations and results of tests and indicating compliance or noncompliance with Contract Documents.

E. The Owner's inspections will not relieve the Contractor of responsibility for the acceptability of the finished work or portions thereof.

F. Retesting required due to non-conformance to specified requirements of the Technical Specifications shall be performed by the same materials testing laboratory on instructions by the Engineer. The costs of retesting shall be paid by the Contractor including added costs incurred when retesting requires the testing agency to work extra hours or overtime.

G. NAQTC Certification is required.

H. AASHTO Accredited laboratory is required.

3.06 BASIS OF PAYMENT

A. e basis of payment for work described in this section shall be at the unit price or lump sum amount established within the Contractors Bid Proposal and as specified in the Contract Special Provisions for each separate bid item. No additional payment shall be made for incidental items required by the Contractor to provide for quality control.

END OF SECTION

SECTION 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Summary
B. Access
C. Power
D. Construction Water
E. Fugitive Dust Control
F. Surface Water Control
G. Work Limits
H. Traffic Control/Road Use
I. Basis of Payment

1.02 SUMMARY

This section describes the responsibilities of the Contractor to provide temporary construction facilities for access, power, construction water, dewatering facilities, and temporary controls for fugitive dust and storm water pollution prevention within the construction limits of this project. In addition, this section includes the Contractor's responsibilities for traffic control for public safety and the safety of workmen for the duration of the project.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 ACCESS

A. Access to the site shall be provided by the Owner. The Contractor shall not construct any staging areas, temporary facilities, haul roads, or access roads without the approval of the Owner. Prior to construction the Contractor shall meet with the Engineer and the Owner to coordinate the placement of temporary access facilities as well as traffic control measures to be implemented by the Contractor. All staging areas for materials storage and fabrication shall be approved by the Owner prior to the commencement of work. The use of property not owned by or available to the City will require the Contractor to obtain written permission from the property owner.

B. Where work is required within the Nevada Department of Transportation (NDOT) right of way the Contractor shall comply with all NDOT requirements for work within NDOT right-of-way and all NDOT utility permit requirements.

C. Work within the Union Pacific Railroad Right of Way must be permitted through the Union Pacific Railroad Permits Office in Omaha, Nebraska and shall comply with all current UPRR permit requirements.

D. Contract work located within designated wetlands and within the limits of the Humboldt River channel and flood plain shall comply with all federal (US Corps of Engineers and USEPA) permit requirements and all state agency (NDEP-Bureau of Water Pollution Control) permit requirements.

E. The Contractor shall be required to obtain a state storm water general permit from the Nevada Division of Environmental Protection – Bureau of Water Pollution Control prior to commencing work on the project. See 3.05 Surface Water Control in these specifications below.

F. The Contractor shall install silt fence, fiber rolls, and riprap erosion protection at all critical locations along the length of the project to prevent construction site pollution of the storm water leaving the construction site during storm events.

G. Rock riprap vehicle track out prevention measures shall be constructed at designated accesses to the jobsite.

H. Prior to completion of construction the Contractor shall return the construction site condition to a neat, clean condition – equal to the condition of the site prior to construction. The Contractor shall be aware that retention will not be released until the final site condition meets the Owner's approval.

I. Reseeding of disturbed areas located within the construction limits will be a part of the Contractor's work. Seeding of disturbed areas within the construction limits to reestablish native grass vegetation will be completed by the Contractor following final cleanup of the site and the spreading of the original ground topsoil. See Note No. 18 on Plan Sheet C-2 for grass seeding requirements. The addition of a soil fertilizer will be required in areas where there is little topsoil. The Contractor will be required to reestablish grass vegetation within the limits of all Project Disturbed areas.

3.02 POWER

A. Contractor shall provide his own temporary power needs. The Contractor shall be responsible for providing all equipment and materials to access power in accordance with local electric codes and the latest adopted edition of the National Electric Code (NEC). This work site does not have utility power available to the Contractor.

3.03 CONSTRUCTION WATER

A. Construction water for this project shall be made available by the City of Elko Water and Sewer Department near the Project Work Site. Typically, recycled water (treated effluent) can be made available to the contractor for dust suppression where it is available. The Contractor shall make application for temporary water with the Water Reclamation Facility (WRF) Staff where treated effluent is available. The Contractor shall acquire a city permit and provide a standpipe with "air gap" or a reduced pressure principal backflow prevention device for all hydrants used for dispensing construction water. During summer months, from June 15 through September 15 of each year, the City of Elko mandates the use of treated effluent for construction water for dust suppression and soil moisturization and compaction. During this time frame municipal potable water is not available for the above uses.

A fire hydrant and recycled water fill pipe will be made available near the jobsite for construction water. Treated effluent is not economically available at this Jobsite so the City of Elko and the Contractor shall use municipal water supply for dust suppression on this project.

B. The Contractor shall make application and pay all appropriate fees for Elko City municipal (potable) water when work requires human contact with construction water. Municipal water will be necessary for certain contract work such as for concrete curing and pressure washing of concrete surfaces to remove debris and corrosion. The Contractor shall be responsible for hauling potable water from a designated loading station to the jobsite in accordance with the Elko City Water Code.

C. Water required by the contractor for dust control on haul roads, moisture conditioning of borrow material to be placed as fill, and for maintaining in place fill soils shall be obtained by the Contractor. Water will be made available, as close to the project site as possible, by the City of Elko. The Contractor shall be informed that municipal drinking water may be in short supply and not available for construction water for this project. The Contractor shall properly identify all construction water trucks and inform all workmen and the general public when reclaimed wastewater is used as construction water. The Owner will make treated wastewater available at no charge to the Contractor. The Contractor shall supply all water trucks with proper licenses to operate on city streets, pumps, and tanks necessary to provide an adequate supply of water to fulfill the conditions of this contract.

D. The reuse of reclaimed wastewater in Nevada is regulated by the Nevada Division of Environmental Protection Bureau of Water Pollution Control. The Contractor shall be aware of the state regulations governing the use of reclaimed wastewater for construction water and the contractor shall be responsible for compliance with state and local regulations.

3.04 FUGITIVE DUST CONTROL

A. During the performance of the Work defined by these Specifications or any operations appurtenant thereto, whether on right-of-way provided by the Owner or elsewhere, the Contractor shall:

1. Furnish all labor, equipment, materials, and means required to perform proper and efficient measures to reduce the dust nuisance.

2. Prevent dust, which has originated from the Work from damaging land, vegetation, and dwellings or causing a nuisance to persons.

3. Control dust to a degree acceptable to the appropriate State and Federal Agencies, and to the Owner.

3.05 SURFACE WATER CONTROL

A. The contractor shall, at all times, protect the project work from damage created by stormwater, construction water, and construction debris. The Contractor shall be solely responsible for protecting the project work from damage due to stormwater.

B. Install ditches and/or channels and construct facilities (sediment basins) to control surface water resulting from precipitation and domestic sources.

C. Install silt fences downgradient from all earthwork operations to prevent silt and soil from being transported off-site during storm events. Comply with the City of Elko's Construction Site Best Management Practices Handbook; the State of Nevada Bureau of Water Quality Planning's – Stormwater Quality Control Best Management Practices Standards available on the Bureau of Water Quality Planning's website and the Nevada Department of Transportation's Stormwater Best Management Standards when working in NDOT right-of-way. These standards are all available on-line at the agency websites.

D. Provide temporary erosion protection for prepared construction area surfaces, or other potential erosion areas, or as directed by the Engineer, until all such portions of the Work have been accepted by the Owner.

E. If precipitation or runoff damage occurs prior to acceptance of the Owner, repair the damaged Work in accordance to these Specifications at the Contractors own expense.

F. All temporary and final design storm water run-on control ditches and/or channels shall be installed prior to site grading in accordance with the Clean Water Act.

G. Contractor's responsibility to inform residents to prevent damage to work by outdoor water use and runoff. Also responsible to collect damages from residents.

H. The Contractor shall be aware of the NDEP and City of Elko requirements for any stormwater discharges. The Contractor shall submit a Storm Water Pollution Prevention Plan in accordance with City, State and Federal NPDES requirements. The Contractor shall comply with Subsection 100.49 PERMITS AND LICENSES of the *Standard Specifications for Public Works Construction, 2016 Edition (Revision No. 8 dated 10 1 2018),* as sponsored by the Regional Transportation Commission of Washoe County and cities and counties of northern Nevada and as adopted by the City of Elko as the City's "*Standard Specifications".*

I. The Contractor shall institute the use of sediment control measures that incorporates the following into the work:
   1. Silt fences.
   2. Fiber rolls.
   3. Gravel Stormwater Retention Berms.
   4. Riprap erosion protection measures.
   5. Vehicle tracking control at entrances and exits to the construction areas (Type 2 base).
   6. Concrete truck washout basins.
   7. Sediment control basins.

8. Storm drainage protection (where applicable).

J. When the project work includes grading and earthwork, the Contractor shall provide an erosion control plan to be approved by the Owner and Nevada State regulatory agencies within seven (7) days after the Notice of Award and prior to commencement of construction.

3.06 WORK LIMITS

A. Confine apparatus, equipment, the storage of Materials and the operation of workmen to the limits indicated by law, ordinances, permits, or as directed by the Owner. The Contractor shall hold the Owner harmless and shall be solely responsible for damage to private or public property resulting from the Contractor's own work.

B. The Contractor shall confine materials storage and work limits to only those areas provided by the WRF staff for work and storage and the areas shown on the project drawings.

C. Avoid unreasonably encumbering the premises with materials or equipment.

D. Do not block roads except as provided in the traffic control plan.

E. Avoid interfering with the Owners operations.

F. Do not present a hazard to the Owner's personnel and equipment or to the public.

G. Use existing roads whenever possible.

H. Minimize construction of new roads.

I. Keep the site neat, tidy and free of waste materials or rubbish. The Contractor shall conduct daily trash pickups and shall keep all construction related debris including plastics, papers, and other garbage out of the WRF clarifiers, the equalization basin, and the lined Emergency Storage Pond.

J. Store and dispense fuel, lubricating oils, and chemicals in such a manner as to prevent or contain spills and prevent said materials from reaching local streams or groundwater according to Nevada Division of Environmental Protection or other regulatory requirements.

K. Dispose of waste in accordance with State and Local regulations.

L. Keep Material Safety Data Sheets (MSDS) on file at the site for all hazardous materials. The Contractor shall submit copies of all MSDS sheets to the Owner and the Engineer.

M. Comply with all Nevada Department of Transportation (NDOT) permit requirements and City of Elko requirements for work within agency right-of-ways.

3.07 TRAFFIC CONTROL ROAD USE

A. The Contractor shall be responsible for traffic control to protect the workmen on site and the general public from danger and accident resulting from the Contractor's equipment. The Contractor shall prepare a complete Traffic Control Plan to be submitted and approved by the Engineer, the City of Elko, and the Nevada Department of Transportation (where applicable). The Contractor's Construction Traffic Control Plan shall be prepared in accordance with the current issue of the Manual on Uniform Traffic Control Devices, in particular, in accordance with PART VI - STANDARDS AND GUIDES FOR TRAFFIC CONTROLS FOR STREET AND HIGHWA CONSTRUCTION. The Contractor will be responsible for providing construction signs, barricades, traffic control cones, and flagmen during the prosecution of work in order to protect the general public as well as the Contractor's own workmen. The Contractor shall provide Traffic Control in accordance with the latest edition of the Manual on Uniform Traffic Control Devices as adopted by the City of Elko, Nevada and the Nevada Department of Transportation. The person responsible for construction signing must have current flagger certification in the State of Nevada.

B. Any public or private roads that become damaged as a result of the Contractor's hauling operations or construction equipment shall be repaired at the Contractor's expense.

C. Contractor's personnel will park personal vehicles in an on-site or off-site area as agreed to by the Owner and Contractor. The Contractor's personnel will park their vehicles in a safe manner as to not obstruct traffic or vision along any public or private roads.

D. The Owner or Engineer may stop work if signing is not approved or is unsafe. Contractor shall receive no compensation for such stoppage.

E. The Contractor shall allow the owner access to the construction work site in order to perform daily work duties.

PART 4 BASIS OF PAYMENT

4.01 BASIS OF PAYMENT

There will be no direct payment for contractor costs associated with construction facilities and temporary controls - including possible utility extensions to contractor facilities, construction water for dust control, diversion of surface runoff, and safety of workmen on the project. Costs for these work items shall be included in the Contractor’s itemized bid proposal price for related bid items.

END OF SECTION

SECTION 01600 - MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Summary
B. Transportation and Handling
C. Storage and Protection
D. Product Options
E. Substitutions
F. Basis of Payment

1.02 SUMMARY

This section addresses requirements for the transportation, handling, storage, and protection of materials and equipment. Also presented are procedures for submittal of product options and request for substitutions.

PART 2 PRODUCTS

2.01 MATERIALS

A. All water pipe materials, backfill, gravel base, concrete and pavement shall meet the material specifications specifically called out on the approved Project Plans.

B. All materials that are not specifically described in the special provisions and materials specifications sections described in these Project Specifications shall be as described in the adopted "*Standard Specifications for Public Works Construction, 2016 Edition (Revision No.7 and No. 8)"* which shall be referenced as the City of Elko's "*Standard Specifications*" in these contract documents.

PART 3 EXECUTION

3.01 TRANSPORTATION AND HANDLING

The Contractor and his subcontractors shall:

A. Transport and handle all products and materials in accordance with manufacturer's specifications. The Contractor shall be responsible for any and all damage to project materials in transport to the job site and/or stored on the job site. Any and all damaged materials shall be replaced by the contractor and shall not be installed on the Project.

B. Promptly inspect shipments to assure that products comply with requirements, material quantities are correct, and products are undamaged.

C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

D. Coordinate delivery of all pipe, fittings, pipe gaskets and bolt packs to the jobsite just prior to construction and installation.

3.02 STORAGE AND PROTECTION

A. Store and protect products in accordance with manufacturer's specifications, with seals and labels intact and legible. Store sensitive products in weather tight, climate controlled enclosures.

B. Store all mechanical equipment, valves, valve boxes, gaskets, bolt packs and delicate materials at the Contractor’s warehouse or in a covered and secure building structure until the materials are to be installed at the job site.

C. For exterior storage of fabricated products, place on stable supports, above the ground.

D. Cover products subject to deterioration from ultraviolet light or weather with impervious sheet covering.

E. Provide ventilation to avoid condensation.

F. Store loose granular materials on solid flat surfaces in a well-drained area.

G. Prohibit mixing with foreign matter.

H. Arrange storage of products to permit access for inspection.

I. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

J. Water pipe and fittings, valves, pipe gaskets, paint, epoxy grout, protective coating materials, water stop, geomembrane, geotextile fabric, silicone sealants, and elastomeric joint sealer shall be stored in an indoor area with controlled temperature and away from adverse weather effects. Store as per the manufacturer’s specifications and at controlled temperature.

3.03 PRODUCT OPTIONS

A. Products specified by Reference Standards or by Description Only: 1) Any product meeting those standards or description.

B. Products Specified by Naming One of More Manufacturers: 1) Products of manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a provision for Substitutions: 1) Submit a request for substitution for any manufacturer not named.

3.04 STAGING OF MATERIALS

A. The Contractor shall be responsible for staging, unloading and assembling pipeline materials for this project at locations along the pipeline route. This project includes the construction of 10-inch diameter PVC C900 water pipe (formerly PVC C905 PVC water pipe) and pipeline fittings as shown on the Project Construction Drawings. The Contractor shall be responsible for coordinating work with the City of Elko, the Nevada Department of Transportation (SR227 Lamoille Highway right-of-way) and the private property owners affected by the project work.

B. Work shall be staged at the project site by the general contractor.

3.05 SUBSTITUTIONS

A. All requests for substitutions shall be provided in writing to the Owner at least fourteen (14) calendar days prior to the execution of work.

B. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.

C. Substitution Submittal Procedure:

1. Submit one (1) electronic copy of Request for Substitution 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.

3. The Engineer shall notify the Contractor, in writing, of decision to accept or reject request.

3.06 BASIS OF PAYMENT

A. The basis of payment for materials and equipment shall be in accordance with the Contractors Base Bid Proposal Amount and Unit Prices Bid for the Work. No additional payment shall be made for materials and equipment specified.

END OF SECTION

SECTION 02207 - AGGREGATE MATERIALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Summary
B. References
C. Aggregate Materials
D. Source Quality Control
E. Stockpiling
F. Borrow Area Cleanup
G. Placement
H. Basis of Payment

1.02 SUMMARY

This section includes ASTM reference methods along with required products and execution of aggregate materials, source quality control, and stockpiling. The Contractor shall supply and install the aggregate materials including pipe bedding material, pipe backfill material, drain rock material, and Type 2, Class B, Aggregate Base Material for this Project. The Contractor shall execute the placement, installation and compaction of these aggregate materials, as specified.

1.03 REFERENCES

A. ASTM D 75 – Sampling of Aggregate Materials

B. ASTM C 88 – Soundness Test of Aggregates

C. ASTM C 127 – Specific Gravity & Absorption of Course Aggregate

D. ASTM C 128 – Specific Gravity & Absorption of Fine Aggregate

E. ASTM C 136 - Test Method for Sieve Analysis of Fine and Coarse Aggregate.

F. ASTM D 422 - Test Method for Particle Size Analysis of Soils.

G. ASTM D 1140 – Material in Soils Finer than No. 200 Sieve.

H. ASTM D 1556 - Test Method for Density of Soil-In-Place by the Sand Cone Method.

I. ASTM D 1557 - Test Method for Moisture Density Relations of Soils and Soil Aggregate Mixtures Using 10-lb (4.54-kg) Rammer and 10-inch (457-mm) drop.

J. ASTM D 2922 – Density of Soil In-Place by the Nuclear Gage Method.

K. ASTM D 4318 – Liquid Limit, Plastic Limit, Plasticity Index of Soils.

L. Sampling and Testing of aggregate materials shall be in accordance with the applicable test methods stated within Subsection 336.02 SAMPLING AND TESTING and Subsection 336.03 TESTING REQUIREMENTS of the *Standard Specifications for Public Works Construction, 2016 Edition (Revision No. 8)*, the City of Elko's "Standard Specifications". The referenced test methods shall be applied for the testing of Aggregate Materials, Soil Materials, Concrete, and Asphalt Materials.

M. The *Standard Specifications for Public Works Construction, 2016 Edition (Revision No. 8 dated 10/ 1/2018)* published by the Washoe County RTC and the Cities and Counties of Northern Nevada and as adopted by the City of Elko shall be referenced as the project " *Standard Specifications"*.

PART 2 PRODUCTS

2.01 AGGREGATE MATERIALS

The requirements for aggregate for base course material that is not specifically defined in this Section shall meet the minimum requirements described in Subsection 200.01-AGGREGATES FOR BASE COURSES of the *Standard Specifications for Public Works Construction, 2016 Edition (Revision No. 8).*

A. **Type 2, Class B, Aggregate Base**:

On-site or off-site material to be used Type 2, Class B, Aggregate Base shall conform to the requirements of Subsection 200.01.03 of the "Standard Specifications". Type 2, Class B, Aggregate Base material shall conform to the following gradational specifications

U.S. Standard Sieve Size	**Percent Passing by Dry Weight**
1-inch	100
3/4-inch	90-100
No. 4	35-65
No. 10	25-53
No. 16	15-40
No. 40	12-28
No. 200	2-10

Percentage by Dry Weight Passing No. 200 Sieve	Plasticity Index Maximum
0. 1 to 3.0	15
3.1 to 4.0	12
4.1 to 5.0	9
5.1 to 8.0	6
8.1 to 11.0	4
11. 1 to 15.0	3

Compliance with this section shall be determined by Test Method ASTM C117 – Material Finer than No. 200 Sieve and Test Method ASTM D4318 – Liquid Limit, Plastic Limit and Plastic Index.

The Type 2, Class B aggregate base shall also meet the following requirement by the test method stated:

Test	Test Method	Requirements
Sieve Analysis	ASTM C136 & C117	As shown above
Sampling Aggregate	ASTM D420	
Fractured Faces	Nev.T230	35 Percent Minimum
Plasticity Index	ASTM D4318	As shown above
Liquid Limit	ASTM D4318	35 Maximum
Resistance (R) Value	ASTM D2844	70 Minimum
Percentage of Wear (500 Rev.)	ASTM C131	45 Percent Maximum

B. Pit Run Subbase Material.

Pit Run Subbase Material shall be placed at the locations shown and to the compacted depths indicated on the Project Construction Plans. Pit Run Subbase shall be an aggregate material meeting the minimum requirements described in Subsection 200.01.08 Pit Run Subbase of the "*Standard Specifications for Public Works Construction, 2016 Edition (Revision No. 8)* as adopted by the City of Elko as the City's "Standard Specifications". Pit Run Subbase material may be washed, or unwashed, but shall be free of any organic impurities, clay material, or any unstable substances. Pit Run Subbase material shall meet the following gradation and aggregate test requirements:

U.S. Standard Sieve Size	Percent Passing b y Dry Weight
4-inch	100
2-inch	60-100
No. 4	30-60
No. 100	5-20
No. 200	3-12

Test	Test Method	Requirements
Sampling Aggregate	ASTM D75	-
Sieve Analysis	ASTM C 136 and C 117	See above
Liquid Limit	ASTM D4318 (1)	40 Maximum

Plastic Index	ASTM D4318 (1)	12 Maximum
Resistance (R) Value	ASTM D2844	30 Minimum

1. Use Dry Method

C. Aggregates for Pipe Bedding and Backfill Material shall meet the requirements stated in Subsection 200.03-AGGREGATES FOR BEDDING AND BACKFILL of the *Standard Specifications for Public Works Construction, 2016 Edition (Revision No. 8).*

D. Pipe Bedding Material. Aggregate Material for pipe bedding to be placed below and above the pipe, as shown on the Project Drawings, must meet the specifications for Class A Graded Backfill Material, or Type 2, Class B, Aggregate Base Material, as described in Subsection 200.03 BEDDING AND BACKFILL of the City's "*Standard Specifications for Public Works Construction, 2016 Edition (Revision No. 8)"*. The Contractor shall provide certified test results for all sources of aggregate materials, to the Engineer, for approval prior to stockpiling any aggregate material on the job site.

E. Drain Backfill (Rock) Material. Drain backfill material for placement at the locations shown on the Project Construction Plans shall be clean, evenly graded aggregate material from 1-inch diameter to 3/8-inch diameter in size. Drain backfill material shall meet the specification requirements for CLASS C BACKFILL MATERIAL (MODIFIED) as described in SECTION 200.03.04 of the City of Elko's "*Standard Specifications*". Provide and Place drain backfill material in the combination air and vacuum valve manhole and air release valve manhole, as shown.

F. Riprap Material. Riprap for erosion protection in "V-Type" earthen ditches and for erosion protection around culvert pipe end sections shall meet the requirements of Subsection 200.07 RIPRAP. Riprap grading shall be as described on the plans. Grading requirements are given in Subsection 200.07.04 LOOSE RIPRAP GRADING AND QUALITY REQUIREMENTS BY SIZE of the "*Standard Specifications for Public Works Construction, 2016 Edition (Revisions No. 7 and No. 8)*" adopted by the City of Elko.

G. Unless otherwise shown, riprap grading shall meet the requirements for Class 150 Riprap for Type 1 Drainage Ditch construction and Class 300/400 Riprap for Type 2 Drainage Ditch construction. See SUBSECTION 200.07.05 – RIPRAP BEDDING, GRADING AND QUALIT REQUIREMENTS of the City's adopted *Standard Specifications* for material specifications. Riprap depth shall be to the minimum dimensions shown on the project plans.

H. Geotextile Fabric. See Section 02340 NONWOVEN GEOTEXTILE for geotextile fabric requirements

I. The Contractor shall make arrangements with the City of Elko and/or the private property owners along the reuse pipeline route for stockpiling aggregate material and pipe backfill material on site.

J. There is property available on the City of Elko property located near the beginning

of the project for the stockpiling of aggregate materials and pipe bedding material. The Contractor must make proper arrangements with the City of Elko to store materials in City of Elko roadway right-of-way. Storage of materials on site shall be done in a manner to not create any roadway hazard, or danger, to workmen or the general public.

K. The storage of pipe bedding and backfill material will be allowed at locations along the 40-foot wide water line pipeline/sanitary sewer easement. Storage of materials shall be coordinated with the affected property owners.

2.02 SOURCE QUALITY CONTROL

A. Inspection and testing will be performed under the provisions of Section 01400 Quality Control.

B. Tests and analysis of Aggregate Materials in accordance with ASTM D136 and ASTM D422.

C. The Owner will retrieve samples of the Aggregate Materials during production. Laboratory sieve analyses will be conducted on the samples in accordance with ASTM D136 or ASTM D422 by the Owner's representative at a frequency determined by the Engineer. The results of the analyses will be provided to the screening/crushing Contractor within twenty-four (24) hours so that operations can be adjusted, if necessary. Samples will be retrieved from the conveyor belt prior to placement in the stockpile.

D. If tests indicate materials do not meet specified requirements, change material source or screening operation. Reject material may be re-screened and retested at no cost to the Owner.

E. Aggregate Materials already placed and found not to meet these Specifications shall be removed and replaced with suitable Aggregate Materials at no cost to the Owner.

F. Materials – The quality and size of all materials shall conform to the requirements of Subsection 200.01 AGGREGATES FOR BASE COURSES of the City's "*Standard Specifications for Public Works Construction, 2016 Edition (Revision No. 8)*".

PART 3 EXECUTION

1.01 STOCKPILING

A. If stockpiling is performed, materials shall be stockpiled at locations designated by the Owner. Stockpile sufficient material to meet project schedule and requirements. Separate different materials to prevent mixing. Direct surface water away from stockpiles to prevent erosion or deterioration of material and control sediment and erosion.

B. Leave unused stockpile material in a neat, compact stockpile.

C. Prevent contamination of materials with native subgrade soils and other stockpiled materials.

1.02 BORROW AREA CLEANUP

A. Leave all soil borrow areas in a clean and neat condition. Grade site surface to prevent free standing surface water. Grade slopes to a maximum slope of 3-Horizontal to1-vertical (3:1 slope).

1.03 PLACEMENT

A. All Aggregate Base Materials, including Type 2, Class B, Aggregate Base, Pit Run Sub-base material, pipe bedding material, and pipe backfill shall be placed by, moisturizing, compacting and grading the material to the lines and grades shown on the Project Drawings.

B. Where the required compacted thickness for Aggregate Base Material is less than 8-inches, Aggregate Materials may be placed in one compacted lift - if it can be demonstrated that the Contractor's compaction equipment can achieve the specified compaction requirements. If the Contractor cannot achieve the required compaction then the lift thickness must be reduced and compaction requirements must be achieved.

C. Aggregate Base Material shall be compacted to a minimum of 95 maximum dry density, as determined by test method ASTM D1557. Aggregate Base Material shall be placed and compacted at optimum moisture content (· 1.0%).

D. Pipe Bedding and Aggregate Backfill Material shall be compacted to a minimum of 90 maximum dry density, as determined by test method ASTM D1557. Aggregate Backfill Material shall be placed and compacted at optimum moisture content (· 1.0 %).

E. Placement of Aggregate Materials must be in accordance with Section 308 – AGGREGATE BASE COURSES of the City's "*Standard Specifications for Public Works Construction, 2016 Edition (Revision No. 8)"*.

PART 4 BASIS OF PAYMENT

4.01 BASIS OF PAYMENT

A. Payment for Aggregate Materials, including Type 2, Class B, Aggregate Base, Pit Run Subbase Aggregate Material, and Pipe Bedding Material shall be in accordance with the Contractor's unit price bid proposal for each category of aggregate material. Where bid items are specific to the type of aggregate material provided and placed the Contractor shall be paid in accordance with his unit price bid. Pipe bedding and backfill material shall be included in the Contractor's unit price for pipe, fittings, and valves. The Contractor shall include all materials, labor, and equipment in his bid proposal amount for work associated with aggregate materials. There will be no additional payment to the Contractor for work specified in this section of the specifications.END OF SECTION

SECTION 02220 - STRIPPING, SUBGRADE PREPARATION, GRADING, FILL AND EMBANKMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

B. Summary
C. References
D. Fill Materials
E. Verification
F. Clearing & Stripping
G. Preparation
H. Fill Placement
I. Tolerances
J. Field Quality Control
K. Protection of Finished Work
L. Basis of Payment

1.02 SUMMARY

This section includes construction methods and materials for ground preparation, placement, and compaction of fill material for embankment. Test methods have been referenced for laboratory and field testing of fill material.

1.03 REFERENCES

A. ASTM D 136 - Method for Sieve Analysis of Fine and Coarse Aggregate.

B. ASTM D 422 - Test Method for Particle-Size Analysis of Soils.

C. ASTM D 1140 – Amount of Materials in Soils Finer than No. 200 Sieve.

D. ASTM D 1556 - Test Method for Density of Soil In-Place by the Sand-Cone Method.

E. ASTM D 1557 - Test Method for Moisture-Density Relations of Soils and Soil Aggregate Mixtures Using 10-lb (4.54-kg) Rammer and 18-in. (457-mm) Drop.

F. ASTM D 2167 - Test Method for Density and Unit Weight of Soil In-Place by the Rubber Balloon Method.

G. ASTM D 2216 - Test Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures.

H. ASTM D 2844 – Test Method for determining Soil Resistance Value (R Value).

I. ASTM D 2922 - Test Methods for Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth).

J. ASTM D 3017 - Test Method for Water Content of Soil and Rock In-Place by Nuclear Methods (Shallow Depth).

K. ASTM D 4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

L. ASTM D 4643 - Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method.

PART 2 PRODUCTS

2.01 FILL MATERIALS

The Contractor shall provide, place and compact fill material in accordance with SECTION 304 -UNCLASSIFIED FILL of the City's *Standard Specifications for Public Works Construction, 2016 Edition (Revision No. 8)*.

A. Aggregate Base: Aggregate base shall be provided as specified in Section 02207 Aggregate Materials of these specifications and in accordance with SUBSECTION 200.01 AGGREGATES FOR BASE COURSES and SUBSECTON 308 AGGREGATE BASE COURSES the City's adopted "*Standard Specifications*".

2.02 ACCESSORIES

Not Used

PART 3 EXECUTION

3.01 VERIFICATION

A. Verify that lines and grades of fill limits and slopes have been established as required.

3.02 CLEARING AND STRIPPING

A. Clearing and Stripping shall be done in accordance with the requirements stated with SECTION 300-CLEARING AND GRUBBING of the City's adopted "*Standard Specifications for Public Works Construction, 2016 Edition (Revisions No. 7 and No. 8)".*

B. Clearing and Stripping shall consist of removing all natural and artificial objectionable materials including vegetation, topsoil, plant roots, and organic soil material from areas to receive fill material.

C. The surface of the ground above all buried pipelines and culverts shall be cleared and stripped before commencing excavation and backfill operations.

D. Topsoil material shall be stockpiled on-site and upon the completion of construction the topsoil material shall be spread on all disturbed areas including excavation source areas, buried pipeline disturbances and areas to be landscaped.

E. Seeding and establishment of natural vegetation for erosion protection shall be completed on all disturbed areas in a manner as specified and as shown on the Project Construction Drawings and in Section 02282 – Revegetation and Erosion Control. Grass seed mix shall be broadcast and harrowed over all disturbed areas on in the spread topsoil to establish vegetation to prevent ground surface erosion.

3.03 SUBGRADE SOIL PREPARATION

A. Remove existing improvements including bituminous pavement, concrete pavement, curbs, gutters, sidewalks, valley gutters, cross drains, driveways and other removals in accordance with SECTION 301 REMOVAL OF E ISTING IMPROVEMENTS of the City's adopted "*Standard Specifications for Public Works Construction, 2016 Edition (Revision No. 8)"*.

B. Prepare the subgrade soil according to SECTION 302 – SUBGRADE PREPARATION of the City's "*Standard Specifications for Public Works Construction, 2016 Edition (Revision No. 8)"*.

C. After rough grading has been completed scarify, moisturize, and compact the top 6-inches of subgrade soil to a minimum of 90% compaction measured in accordance with test method ASTM D1557.

D. The Contractor shall not place fill soil upon the subgrade soil until Subgrade Preparation has been completed and has been tested and approved by the Engineer.

E. All subgrade soil to receive compacted fill material shall be scarified to a minimum depth of 6-inches, moisturized to within 1.0% of optimum moisture content, and compacted to a minimum of 90% of maximum dry soil density in accordance with Test Method ASTM D 1557.

3.04 FILL PLACEMENT

The Contractor shall provide and place fill soil in accordance with the requirements of SECTION 304 – UNCLASSIFIED FILL of the City's "*Standard Specifications for Public Works Construction, 2016 Edition (Revision No. 8)"*. These specifications include:

A. Do not place frozen soil material as fill.

B. Do not place fill soil on frozen ground until the ground has thawed and Subgrade Preparation has been performed.

C. Fill soil materials shall be obtained from on-site cut material or off-site locations as designated by the Owner, or Engineer. When the Contractor proposes to import fill soil materials from areas other than those designated by the Engineer, the Contractor shall give the Owner and Engineer notice of at least five (5) working days prior to placement of the imported material. This will enable the Owner's representative to sample and test the material. Imported material must be tested for compliance with the specifications and the test results must be approved by the Engineer prior to the material being delivered to the site.

D. Placement of fill soil shall be made only in areas approved by the Engineer. Fill soil material shall be placed to the lines and grades shown on the project drawings and according to the project specifications.

E. Fill placement shall be temporarily stopped due to inclement weather conditions at the direction of the Engineer. Under marginal weather conditions, the Contractor may place fill, provided the fill when tested, meets the requirements of the project specifications. Weather shall be determined to be unacceptable for fill placement when fill soils are frozen, or the ground surface to receive fill material is frozen, or when extremely wet weather exists and fill soils are determined to be in excess of 1 over optimum water content and determined to be unsuitable for proper compaction.

F. The distribution of materials shall be such that the fill is free from lenses, pockets, streaks, or layers of material differing substantially in texture or gradation from the surrounding material. The combined borrow excavation and fill placement operation shall be such that the materials, when compacted in the fill, will be blended sufficiently to provide the best practicable distribution of the material, subject to the approval of the Engineer.

G. If, in the opinion of the Engineer, the surface of the prepared foundation or the surface of any layer of the fill is too dry or too smooth to bond properly with the layer of material to be placed thereon, it shall be moistened and/or worked with discs, motor graders with rippers, or other equipment to provide a satisfactory bonding surface before the next layer of fill material is placed. If, in the opinion of the Engineer, the surface of the prepared foundation or the rolled surface of any layer of the fill in-place is too wet for proper compaction of the layer of fill material to be placed thereon, it shall be removed and allowed to dry or shall be worked with discs, motor graders, or other equipment to reduce the moisture content to the required amount, and then compacted before the next layer of fill material is placed.

H. The Contractor shall conduct his hauling operations in a safe manner, and providing flagmen, if necessary, to stop traffic at public road crossings, or other traffic areas. Any public or private roads that become damaged as-a-result of the Contractor's hauling operations shall be repaired at the Contractor's expense.

I. The Contractor shall place fill only after subgrades below fills have been adequately compacted and approved by the Engineer. Should any of the Work be covered before it has been approved, the Contractor shall uncover all such Work at no cost to the Owner. After the Work has been examined, tested and approved by the Engineer, the Contractor shall make all repairs and replacements necessary to restore the Work to the Contract Specifications at no additional cost to the Owner.

J. All fill materials shall be moisture-conditioned prior to applying soil compaction effort. Moisture-conditioning may be performed to fill material either in the borrow area or at the fill site or in both areas as directed by the Engineer.

K. During compaction operations, the borrow and reworked in-place materials

requiring moisture conditioning shall be maintained within the range of moisture content required to achieve, with the equipment being used, adequate compaction to the specified density. The moisture content of the fill material prior to, and during, compaction shall be uniform throughout the material.

L. When material is too dry for proper compaction and/or is below the minimum moisture content specified, the Contractor shall spray water on the fill and work the moisture into the fill by disking or scarifying, or other approved means until a uniform distribution of moisture is obtained. Material that is too wet for proper compaction and/or is above the maximum moisture content specified, shall be removed from the fill or the material may be spread, disced, and scarified and permitted to dry until the moisture content is reduced to an amount suitable for obtaining the specified degree of compaction. The Contractor shall not mix underlying fill materials with fill materials being "moisture conditioned".

M. The relative compaction of fill materials shall be tested in-place to check compliance to the Specifications.

N. The Engineer shall continuously evaluate the Contractor's equipment and methods. If such equipment or methods are found unsatisfactory for the intended use, the Engineer shall require the Contractor to replace the unsatisfactory equipment with other types or adjust methods until proper compaction is achieved.

O. The Contractor shall maintain and protect all fill soil in a condition satisfactory to the Engineer at all times until the final completion and acceptance of the Work. Any approved fill material which becomes unsuitable for any reason whatsoever, after being placed in the fill, and before final acceptance of the Work, shall be removed and replaced by the Contractor in a manner satisfactory to the Engineer at no cost to the Owner.

P. The Contractor shall route construction equipment and take all actions necessary to prevent material of one type from being deposited inadvertently, either by dumping or through travel of equipment, in or on material of another type. Such improperly deposited material shall be removed from the fill areas, as directed by the Engineer. If in-place material becomes contaminated, it shall also be removed. All removed material shall be wasted in locations designated by the Engineer. Removal of all such material shall be at no cost to the Owner.

Q. If prior placed, tested, and accepted in-place fills become loosened, softened, or disturbed by construction equipment traffic during dry or wet weather, these materials shall be moisture-conditioned or dried, as previously described, and recompacted. If weather or soil conditions prevent soils from being properly compacted, the unsuitable soils shall be removed and replaced with properly compacted fill. Such replacement and/or re-compaction and testing shall be at no cost to the Owner.

R. Structural Fill:

1. Structural Fill shall include all backfill around the cast in-place concrete, roadway embankment fills, and any other road fill soil.

2. It is the intent of the design to use excavated material from the construction area and locations shown on the Drawings for Fill.

3. Structural Fill soil shall be conditioned to a moisture content which allows compaction to the required density and that results in a stable non-yielding surface.

4. Structural Fill materials shall be placed in 8-inch maximum loose lifts and compacted to a minimum of ninety-five percent (95%) of maximum dry density in accordance with test method ASTM D1557.

5. Structural Fill material shall be placed as fill soil beneath all concrete slabs, footings and foundations that are to receive soil fill material.

3.05 TOLERANCES

A. Slopes shall be at the same grades as those shown on the Project Plans.

B. Finished grades shown on the Project Plans, or Drawings, are given in feet and tenths or hundredths of feet and shall slope uniformly between given spot and contour elevations. All grades shall provide for natural runoff of water without low spots or pockets.

C. Fill materials shall be placed within a tolerance of plus or minus 0.05 feet, unless otherwise approved by the Engineer.

D. Minimum grades and slopes shown on the Project Drawings provide drainage control and shall be maintained.

E. Correction of over-excavation and fill and embankment past the tolerances identified above shall be to the Contractor's account, at no expense to the Owner.

3.06 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under Special Provision Section 01400 – Quality Control. Project inspection and testing shall comply with the requirements of SECTION 336 – INSPECTION AND TESTING of the City's *"Standard Specifications for Public Works Construction, 2016 Edition (Revision No. 8)"*.

B. In-place density testing will be performed in accordance with the following test methods:
   1. ASTM D 1556, ASTM D 1557, and ASTM D 2167; or,
   2. ASTM D 2922 and ASTM D 3017.

C. Laboratory compaction testing to determine the soil's maximum dry density will be performed in accordance with ASTM D1557.

D. If tests indicate Work does not meet specified requirements, perform remedial action as described below.

1. Compaction below specified minimum:

a. Apply additional effort, or scarify, moisture condition, and recompact and retest.

2. Moisture content outside of specified limits during compaction:

a. Moisture content below specified minimum:

(1) Scarify the depth of the lift, moisture condition, mix to achieve uniform moisture content, compact, and retest. Application of moisture to the top of a compacted lift will not be allowed to increase the moisture content without the prior approval of the Engineer and on a case-by-case basis.

b. Moisture content above specified maximum:

(1) Scarify the depth of the lift, allow to air dry, mix to achieve uniform moisture content, compact, and retest or remove the wet material. Mixing of dry material to lower the moisture content will not be allowed without the prior approval of the Engineer and on a case-by-case basis.

3. Moisture content outside of specified limits after compaction approved and prior to covering:

a. Determine depth of material outside of specified limits and correct as specified above.

4. Material not in accordance with the material specification requirements:

a. Remove material in its entirety as determined by the Engineer.

E. Frequency of Tests:

1. Testing requirements are as defined in Orange book, Standard Specifications.

2. Tests may be conducted more frequently at the direction of the Engineer or the Engineer's representative. More frequent testing shall be performed, where indicated by the following guidelines:

   a. Areas where special compaction equipment or methods are used.

   b. Areas where the height of fill rises quickly versus the quantity of fill placed.

   c. Areas where compaction control is particularly important such as around appurtenant structures.

   d. Areas where doubtful construction procedures are being used.

   e. Areas where the required compaction may not have been achieved based upon visual observations.

   f. Areas where unacceptable material may have been placed.

3.07 PROTECTION OF FINISHED WORK

A. Protect finished Work and Work-in-Progress under provisions of Section 01500.

PART 4 BASIS OF PAYMENT

4.01 BASIS OF PAYMENT

Payment for clearing, striping, subgrade preparation, fill material, and compacted embankment shall be made to the Contractor per lump sum, per square foot, or by the cubic yard of excavation removed and/or compacted embankment placed to the lines and grades shown on the Project Drawings. The payment method shall be as shown in the Contract Bid Proposal Form. Measurement of quantities for payment shall be made in the field and will be based on the original base survey conducted following clearing and stripping operations. Payment shall be made in accordance with the Contractor's bid proposal unit price for subgrade preparation, compacted embankment and site excavation. The Contractor shall include all materials, labor, and equipment required to complete the construction of Compacted Embankment in his, or her, base bid proposal. No additional payment will be made to the Contractor for work described under this section of the Project Specifications.

END OF SECTION

SECTION 02221 - TRENCHING, BACKFILLING AND COMPACTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Summary
B. Bedding and Backfill Materials
C. Execution of Work
D. Trench Excavation
E. Bedding Material
F. Backfill Material
G. Backfill Compaction
H. Basis of Payment

1.02 SUMMARY

This section includes the requirements and specifications for trenching, backfilling, and compacting the excavations for concrete footings, underground structures, pump wet wells, thrust blocks, manholes, precast concrete underground structures, and underground utilities including municipal water pipe, sanitary sewer pipe, treated effluent pipelines, underground electrical conduits, gas, telephone, irrigation piping, and other underground utility installations.

PART 2 PRODUCTS

2.01 BEDDING AND BACKFILL MATERIALS

Materials for pipe bedding and backfill shall meet the following material specifications. General requirements for bedding and backfill materials for pipelines and buried structures shall be in accordance with *Subsection 200.03 AGREGATES FOR BEDDING AND BACKFILL* of the "*Standard Specifications for Public Works Construction, 2016 Edition (Revisions No. 7 and No.8) as* adopted by the City of Elko as the City's "*Standard Specifications"*.

Materials provided by the Contractor under this section of the project specifications shall meet the following specifications:

A. Backfill Material

1. Trench backfill shall consist of granular native soil material meeting the requirements of SUBSECTION 200.03.06 Class E Backfill of the "Standard Specifications" and the following material gradation requirements:

US Standard Sieve Size	Percent Passing
4 - inch	100
1-inch	70- 100
No. 40	10-50
No. 200	0-35

Backfill Test Requirements:

Test	Test Method	Requirements
Sampling Aggregate	ASTM D420	-
Sieve Analysis	ASTM C136 and C117	Shown Above
Liquid Limit	ASTM D4318 (Dry Method)	40 Maximum
Plasticity Index	ASTM D4318 (Dry Method)	12 Maximum

2. Backfill Material shall be placed in accordance with and as shown on the project drawings.

B. Pipe Bedding Material

1. Pipe Bedding Material shall be a graded granular material. Pipe Bedding Material shall be provided by the Contractor and shall be in accordance with SUBSECTION 200.03.02 Class A Backfill of the City's "Standard Specifications". Pipe Bedding Material shall meet the following gradation specification:

U.S. Standard Sieve Size	Percent by Passing Passing Sieve
3/8 - inch	100
No. 4	90- 100
No. 50	10-40
No. 100	3-20
No. 200	0- 15

Pipe Bedding Material Test Requirements:

Test	Test Method	Requirements
Sampling Aggregate	ASTM D420	-
Sieve Analysis	ASTM C136 and C117	Shown Above
Plasticity Index	ASTM D4318 (Dry Method)	See Table I (Below)
Percentage of Wear (500 Rev.)	ASTM C131	37 Percent Maximum

Table 1 – Plasticity Limit Requirements for Pipe Bedding:

Percentage by Weight Passing No. 200 Sieve (ASTM C117)	Plasticity Index Maximum (ASTM D4318 Dry Method)
0.1 to 3.0	15
3.1 to 4.0	12
4.1 to 5.0	9
5.1 to 8.0	6
8.1 to 11.0	4
11.1 to 15.0	3

2. Pipe Bedding Material shall be placed as shown on the project drawings and shall extend below and above all pipe, culverts, and other underground conduits as depicted on the Typical Trench Sections and Typical Plan Details of the Project Construction Drawings.

3. Type 2, Class B, Aggregate Base may be used as pipe bedding material and select backfill material when approved by the project engineer. Type 2, Class B, Aggregate Base shall meet the material specifications described within SUBSECTION 200.01.03 CRUSHED AGGREGATE BASE of the "*Standard Specifications for Public Works Construction, 2016 Edition (Revision No. 8)"* adopted by the City of Elko.

PART 3 EXECUTION

3.01 EXECUTION OF WORK

The Contractor shall execute the work described under this section in the following manner:

A. Work not specifically specified within this written specification shall be executed in accordance with SECTION 305 - TRENCH EXCAVATION AND BACKFILL of the City's "*Standard Specifications for Public Works Construction, 2016 Edition (Revisions No. 7 and No. 8")*.

B. All lines and grades shall be as shown on the Project Drawings and shall be verified by the Contractor in the field.

C. Contractor is responsible for the protection of existing site improvements and existing site utilities, and if any damage occurs, the cost to repair or replace improvements shall be the Contractor's expense.

D. The Contractor shall be solely responsible for the protection of workmen during the execution of work described under this section. The Contractor shall maintain trenches in accordance with the applicable OSHA regulations for trenching and excavating. The Contractor shall properly shore excavations if soil conditions require shoring for the protection of workmen as well as work quality. Shoring shall be in accordance with SUBSECTION 305.06 - SHORING of the City's "*Standard Specifications for Public Works Construction, 2016 Edition (Revision No. 7 and No. 8)"*.

E. Pipe Bedding Material shall be compacted to a minimum of 90 of maximum dry density in accordance with test method ASTM D1557 – unless otherwise shown on the Project Drawings. Backfill Material shall be compacted to a minimum of ninety percent (90%) maximum dry density in accordance with test method ASTM D1557.

3.02 TRENCH EXCAVATION

A. The Contractor shall properly notify/call "USA CALL BEFORE YOU DIG" to have all utilities located prior to commencing any excavation activities on the Project site. The contractor shall be responsible for protecting all site utilities during construction. The Contractor shall be solely responsible for maintaining the Jobsite in a "safe condition" for the protection of the Contractor's workmen and the Public.

B. The Elko WRF is not serviced by "USA CALL BEFORE YOU DIG". The Contractor shall be responsible for locating existing plant utilities from the as-built drawings available on site. The Contractor shall provide a spotter and use metal detectors to locate buried plant utilities.

C. The work covered under this section shall include but is not limited to the excavating and backfilling of concrete footings, pump wet wells, underground structures, manholes, valve boxes, catch basins, culverts, storm drain pipe, water pipe, sewer pipe, effluent pipe, underground conduits, and underground utility pipe.

D. All excavating and backfilling shall be complete prior to the placement of aggregate base, concrete (curb, gutter, and sidewalk), masonry wall, and plantmix bituminous pavement.

E. The Contractor shall maintain proper drainage to prevent trenches and excavations from being flooded during periods of rain. The Contractor shall remove all standing water in excavations prior to backfilling.

F. The trench width shall be in accordance with the Project Construction Drawings. If the trench width is greater than specified on the Project Construction Drawings, then the Contractor shall provide additional pipe bedding material and backfill material to complete work at no cost to the Owner.

3.03 BEDDING MATERIAL

A. Pipe Bedding Material shall be the aggregate material supporting, around, and extending from a certain distance below to a distance above buried pipe. The dimensions for the placement of Pipe Bedding Material shall be as shown on the Typical Utility Trench Sections shown in the Project Construction Drawings.

B. This material shall be compacted beneath the haunches of the pipe with mechanical or hand operated equipment.

C. Damage that occurs to buried pipe, cast-in-place concrete, manholes, or conduit during the Contractor's backfilling operations shall be repaired or replaced at the Contractor's own expense.

3.04 BACKIFILL MATERIAL

A. Trench backfill material shall be the soil material placed in the trench from the top of the bedding material to the top of the trench.

B. Bedding material and backfill material shall NOT be placed against or upon cast-in-place concrete for a period of 5 days following the concrete pour, and the Contractor shall NOT densify backfill for a period of 7 days, unless approved by the Engineer.

C. All rocks 4-inches and greater in size shall be removed from backfill material.

D. Voids created by the removal of rocks and other interfering objects shall be backfilled and compacted with a suitable material to not less than 90 percent relative compaction beneath roadways or around structural areas and 85 percent in non-structural areas crossing native ground where vehicles and other structures are not located. Compaction shall be determined in accordance with test method ASTM D1557, or as specified by the Engineer. This work will be at the expense of the Contractor.

3.05 BACKIFILL COMPACTION

A. The Contractor shall place and compact backfill in accordance with SUBSECTION 305.09 - BACKFILL AND DENSIFICATION of the City's "*Standard Specifications for Public Works Construction, 2016 Edition (Revision No. 8)*".

B. Mechanically compacted backfill shall comply with SUBSECTION 305.10 MECHANICALL COMPACTED BACKFILL of the City's "*Standard Specifications for Public Works Construction, 2016 Edition (Revision No. 8)*".

C. Backfill material shall be placed in compacted lifts not to exceed 8-inches when hand-directed tampers are used for compaction.

D. Each layer or lift of backfill shall be placed in horizontal layers to the thicknesses stated above, as to best use the compaction equipment.

E. Each loose soil lift shall be evenly spread, moistened (dried if necessary), and then densified to minimum of ninety percent (90%) maximum dry density beneath roadways, parking lots, concrete sidewalks and other structural areas unless otherwise specified.

PART 4 BASIS OF PAYMENT

4.01 BASIS OF PAYMENT

The basis of payment for the work described under this section shall be in accordance with the Contractor's lump sum or unit price bid for buried concrete footings, manholes, pump wet wells, buried pipe fittings and buried pipe but not limited to, underground storm drain pipe, culverts, water pipe, sanitary sewer pipe, effluent pipe, electrical conduit, underground telephone, and other underground pipe installations. No separate bid item shall be provided for pipe bedding and backfill material. The Contractor shall be responsible for including pipe bedding and backfill in the cost of associated work items. END OF SECTION

SECTION 02485 – SEEDING REVEGETATION OF DISTURBED AREAS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Summary
B. References
C. Summary
D. Submittals
E. General Products
F. Piping Materials
G. Piping Installation
H. Basis of Payment

1.02 RELATED SECTIONS

A. Section 01010 – Summary of Work
B. Section 01025 – Measurement and Payment
C. Section 01090 – Referenced Standards
D. Section 01300 – Submittals
E. Section 01600 – Materials and Equipment
F. Section 02220 – Stripping, Subgrade Preparation, Grading, Fill and Embankment
G. Section 02221 – Trenching, Backfilling and Compacting
H. Section 02623 – Pipe, Valves, Fittings & Accessories
I. Section 02630 – Sanitary and Storm Sewer Pipe

1.03 REFERENCES

A. American Water Works Association Standards (AWWA)
B. American National Standards Institute (ANSI)
C. American Society of Testing and Materials (ASTM)
D. American Association of State Highway and Transportation Officials (AASHTO)
E. American Society of Mechanical Engineers (ASME)
F. The "*Standard Specifications for Public Works Construction, 2016 Edition (Revisions No. 7 and No. 8)*" – as adopted by the City of Elko as the City's referenced "*Standard Specifications*".

1.04 SECTION SUMMARY

A. This section includes the requirements for the reseeding and reestablishment of native grasses for soil cover, erosion protection and the reseeding of the site to restore the ground cover to the work site's preconstruction conditions.

1.05 SUBMITTALS

A. The Contractor shall submit a revegetation plan that describes the removal of the topsoil and the stockpiling, respreading, and seeding of the topsoil following the installation of the 10-inch diameter water transmission pipeline. The revegetation plan shall include the addition of fertilizer to the topsoil, the broadcasting of native grass seed mix, and the Contractor's efforts required to reestablish the preconstruction native grasses on the disturbed soil surfaces following construction of the new 10-inch diameter municipal waterline.

PART 2 PRODUCTS

2.01 GENERAL

A. The Contractor shall be responsible for clearing and stockpiling the topsoil from all construction areas to be disturbed by the installation of pipe and the regrading of the project site.

B. After project cleanup and final grading the Contractor shall spread the stockpiled topsoil material over the disturbed land area prior to the addition of fertilizer and the seeding of the disturbed areas.

C. Add 11-48-0 commercial grass fertilizer in the amount recommended to provide proper nutrient composition of the soil to support native grass growth.

D. The Contractor shall reseed all disturbed areas by either the "drill seeding" method or the "hand/mechanical broadcast seeding method" followed by lightly harrowing the native grass seed mix into the topsoil.

E. Where slopes are steeper than 3 to 1 (3-horizontal to 1-vertical) the slopes shall be seeded by the "hydro-seeding" method.

2.02 NATIVE GRASS SEED REQUIREMENTS

A. Upon the completion of site cleanup, the completion of finish grading and the placement of the stockpiled topsoil the Contractor shall reseed the disturbed site ground surfaces.

B. If the Owner (City of Elko) does not have an approved or required seed mix for the project the Contractor shall provide and establish the following seed mix: Crested Wheat Grass - 5.0 lbs/acre; Blue Bunch Wheat Grass - 2.0 lbs/acre; Indian Rice Grass - 2.0 lbs/acre; and Basin Wildrye - 4.0 lbs/acre for a total mixed seed mass of 13 lbs/acre.

C. Fertilizer shall be added, as required, to facilitate the reestablishment of healthy native grass on all soil surfaces disturbed by the project work activities. 11-48-0 commercial fertilizer is recommended at a mass of 10 lbs/acre where no specific fertilizer brand and type is required by the owner.

PART 3 EXECUTION

3.01 ESTABLISHMENT OF NATIVE GRASS COVER

A. The Contractor shall be responsible for reestablishing native grass ground cover over the ground surface area to a level, or condition, of at least the preconstruction level, or condition.

B. Those areas where the native grass seed mix doesn't take or doesn't grow native grasses will be seeded again by the Contractor until native grass cover is established over the ground surface.

C. Mulch may be required upon completion of the seeding and fertilizing operations to deter ground surface erosion during the establishment of vegetation and will serve to conserve moisture and reduce surface compaction.

PART 4 BASIS OF PAYMENT

4.01 BASIS OF PAYMENT

A. BASIS OF PA MENT

The basis of payment for the work described under this section shall be in accordance with the Contractor's unit price, or lump sum bid amount, shown in the Contractors Bid Proposal for seeding and revegetation of disturbed areas and related work activities. All materials, labor, and equipment required to do this work shall be included in the contractor's unit price per acre, or lump sum price, bid for this work and related work items. No additional payment shall be made for incidental items required by the Contractor to complete the project scope of work.

END OF SECTION

SECTION 02623 - PIPE, VALVES, FITTINGS AND ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Related Sections
B. Standard Specifications
C. Pipe Fittings
D. Accessories
E. Fabrication
F. Finishing
G. Valves
H. Flow Meters
I. Combination Air and Vacuum Valves
J. Installation
K. Pipe Connections
L. Valve Installation
M. Hydrostatic Tests

1.02 RELATED SECTIONS

A. Section 01010 – Summary of Work
B. Section 01025 – Measurement and Payment
C. Section 01090 – Referenced Standards
D. Section 01300 – Submittals
E. Section 01600 – Materials and Equipment
F. Section 02221 – Trenching, Backfilling and Compacting

1.03 STANDARD SPECIFICATIONS

A. The Project "*Standard Specifications*" for water pipe, valves, pipe fittings, and water piping accessories shall be as described in paragraph **1.06 DEFINITIONS** of **SECTION 01010 SUMMARY OF WORK** and paragraph **1.04 SCHEDULE OF REFERENCES** of **SECTION 010 0 REFERENCES** of these project specifications.

PART 2 PRODUCTS

2.01 PIPE AND PIPE FITTINGS

A. PVC water pipe installed as a part of the Project shall be of the diameter shown on the Construction Plans. All water pipe shall meet the minimum requirements of current Standards ANSI/AWWA C900, DR 18 (235 psi), as shown on the project plans. All PVC water pipe shall meet, or exceed, the minimum requirements stated in current Standard ANSI/AWWA C900 for water pipe 4-inches in diameter to 12-inches in diameter. All water pressure pipe greater than 12-inches in diameter shall meet, or exceed, the minimum requirements provided in current Standard ANSI/AWWA C900 (previous standard ANSI/AWWA C905). All water pipe fittings shall be Ductile Iron – Cement Mortar lined, (or epoxy lined and coated) meeting current Standards ANSI/AWWA C110/A21.10, ANSI/AWWA C104/A21.4, and ANSI/AWWA Standard C150/A21.50 in accordance with the latest adopted

standard revision. All water pipe and fittings shall be ANSI/NSF 61/372 certified for contact with potable drinking water. Flanged coupling adaptors shall be provided for attachment to all tees and pipe fittings as shown on the Project Plans. See the Project Plans for locations and additional installation requirements for all water pipe and fittings.

B. Water pipe installed inside steel casing pipe beneath highway and roadway crossings shall be US Pipe TR-Flex, or American DIP Co. "Flex Ring", restrained joint water pipe with cement mortar lining and stainless steel carrier pipe supports located on each side of the pipe bell and at the middle of each pipe "joint" or pipe section, as shown and described in the Project Plans and Plan Detail Sheets.

C. The Contractor may be allowed to provide and install "Eagle Loc900" pressure rated ANSI/AWWA C900, DR14 (305 PSI Rated) restrained joint PVC water pipe inside steel casing beneath roadway and highway crossings when approved by the City of Elko Water Department and when approved by the permitting agency. The permitting agency shall be the Nevada Department of Transportation for all state highway crossings. PVC restrained joint pipe shall only be approved when the specified ductile iron carrier pipe is not available for delivery to the job site and PVC pipe is approved by the Owner and all permitting agencies.

D. All nuts, bolts and backup rings for PVC pressure water pipe and ductile iron pipe fittings shall be Type 304 or Type 316 Stainless Steel meeting the minimum requirements of ASTM A 276 Condition A. Nuts, bolts and backup rings shall be of the same stainless steel material type.

E. All water pipe for this project shall be new. No used pipe shall be provided for this project.

F. All exposed water pipe shall be Class 50 Ductile Iron water pipe meeting current standards ANSI/AWWA C150/A21.50; C151/A21.51; and C115/A21.15. Project Construction Drawings. All specialty pipe fittings and/or steel water pipe fittings shall be as detailed and specified on the Project Construction Drawings.

G. Steel pipe and fittings. Steel tees, bends, reducers, pipe spools and other pipe fittings shall be manufactured from standard weight steel pipe of the type and dimensions shown on the construction plans. Type 304, Type 304L and Type 316 stainless steel pipe and fittings shall be installed at the locations indicated on the Project Construction Drawings. All pipe flanges shall meet or exceed the requirements of standard ASME B16.5 for steel pipe and fittings 24-inches in diameter, or smaller. Pipe flanges for steel pipe and fittings 26-inch diameter and larger shall meet or exceed standard ASME B16.47. Flanges for steel pipe and fittings shall be class 150 unless otherwise shown on the construction drawings.

H. All steel pipe shown on the Project Construction Drawings shall be manufactured meeting standards ASME/ANSI B36.10 and ASME/ANSI B36.19 for standard weight steel pipe.

I. PVC communication (SCADA) conduit to be installed as a part of the Project shall be Schedule 40 PVC pipe with solvent weld joints. PVC communication conduit shall be installed only where indicated on the project construction drawings and shall be of the size shown on the Project Construction Drawings.

J. All buried ductile iron water pipe and fittings with soil backfill shall be wrapped with polyethylene encasement in accordance with current Standard ANSI/AWWA C105. Polyethylene encasement shall be 8.0 mil thickness and shall be secured to the ductile iron pipe with polyethylene tape (10.0 mil min. thickness).

2.02 VALVE AND FITTING ACCESSORIES

A. The Contractor shall provide all pipe unions, flanged coupling adaptors, gaskets, and pipe transition couplings required to connect PVC pressure pipe to ductile iron pipe fittings, as shown on the Project Construction Drawings.

B. Pipe flange gaskets shall be made of EDPM (ethylene-propylene diene) with an operating temperature range of -20 F to 200 F.

C. Pipe transition couplings and pipe repair couplings shall be of the type indicated on the Project Construction Drawings. Flexible couplings for connecting existing water pipe to new water pipe shall be ROMAC Armor Link flexible stainless steel couplings.

D. Fusion bonded epoxy coatings for pipe and fittings shall be factory applied and shall meet or exceed standard ANSI/AWWA C116/A21.16 Protective Fusion Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings. All Ductile iron fittings, pipe spools, and valves on this project shall be fusion bonded epoxy coated on all inside and outside surfaces.

E. All gate valves shown on the Project Construction Drawings shall be Mueller A-2361 Resilient Wedge flanged gate valves for water service meeting standard ANSI/AWWA C509. All gate valves shall be provided with factory applied fusion bonded epoxy coatings on the exterior and interior surfaces of the valve.

F. Plug Valves shall be installed where shown on the Project Construction Drawings. Plug valves shall be in accordance with Standard AWWA C517 and shall be DEZURICK full port eccentric plug valves.

G. All nuts and bolts for flanged fittings, valves, pipe spools, and pipe flanges shall be Type 304 Stainless Steel, or Type 316 Stainless Steel, meeting standard ASTM A 276, Condition A requirements, or equal.

H. All nuts, bolts and backup rings for flanges shall be Type 304 or Type 316 Stainless Steel meeting the requirements of ASTM A 276 Condition A. Nuts, bolts and backup rings shall be of the same steel material type.

I. Valve boxes for all buried valves shall be Tyler Model 6855 564-A two (2) piece adjustable cast iron valve boxes with cast iron covers. Valve boxes shall be of sufficient length to properly fit a pipe burial depth of 4-feet of soil cover.

J. Flanges for connection to valves or for connections between PVC water pipe, ductile iron pipe and steel pipe shall conform to ASME/ANSI B16.5 or ASME/ANSI B16.47. Flanges shall be flat-faced and attached with gaskets and bolts.

K. Flange gaskets shall be full-faced, 1/8" or 1/16" thick, and of the material specified above.

L. Combination air (and vacuum) valves for this project shall be Valmatic Model No. 201C.2 (single body) or Series 100/22 (Dual Body) combination air and vacuum valves for potable water service certified to NSF/ANSI 61 Drinking Water System Components – Health Effects approved. Insect screens and 2-inch diameter pipe shall be Type 304, or Type 316, stainless steel of the configuration shown on the Project Construction Drawings. Install air (and vacuum) valves at the locations shown on the Project Construction Plans.

M. Air Release Valves (without vacuum valve) shall be Valmatic Model No. 48AS stainless steel wastewater air release valves for severe duty applications. Install an air release valves at the locations and pipeline stations shown on the Project Plans.

2.03 FABRICATION

A. All water pipe fittings, pipe spools, and bends on this project shall be ductile iron, or gray cast iron, with flanged connections meeting the requirements of standard ANSI/AWWA C110/A21.10 with the coatings specified above.

B. Water pipe tees and fittings shall conform to the standards shown above in subsection **2.01 PIPE AND PIPE FITTINGS** and shall be installed to the lines and grades shown on the Project Drawings. Water pipe tees and fittings shall be either flanged, or mechanical joint, as shown on the project plans shall be fabricated in accordance with current adopted Standard ANSI/AWWA C110/A21.10 "Ductile Iron and Gray Iron Fittings".

C. HDPE pipe bends and fittings shall be either butt-heat-fusion welded or flanged and shall be of equal DR rating (rated working pressure) as the reuse pipeline specified rating. All pipe bends and fittings shall be manufactured with PE 4710 resin material and shall be molded, unless approved otherwise.

D. All steel pipe to be welded in the field such as steel pipe casing shall have beveled ends for field welding.

E. All flanged steel pipe spools and fittings shall meet the requirements specified. The dimensions of all fabricated flanged steel pipe tees, bends, reducers and other fittings shall meet the requirements of standard ANSI/ASME B16.50 for pipe diameters -inch through 24-inch diameter and standard ANSI/ASME B16.47 for pipe 26-inches through 60-inch diameter. All fabricated steel pipe flanges shall be 150-lb in strict accordance with standard ANSI/AMSE B16.10. Ductile iron cement mortar line pipe spools and pipe fittings meeting all applicable ANSI/AWWA specification requirements shall also meet requirements, as shown on the project plans.

2.04 FINISHING

A. Coatings for ductile iron and gray cast iron fittings, bends, pipe spools and valves shall be fusion bonded epoxy factory applied and shall meet or exceed standard ANSI/AWWA C116/A21.16 Protective Fusion Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings. All Ductile iron fittings, pipe spools, and valves on this project shall be fusion bonded epoxy coated on all inside and outside surfaces.

B. Steel pipe surfaces for above ground steel pipe shall also be coated in accordance with Standard *ANSI/AWWA C218-16 Liquid Coating for Above Ground Steel Water Pipelines and Fittings,* or Standard ANSI/AWWA C222-18 Polyurethane Coatings for the Interior and Exterior of Steel Water Pipe and Fittings. If joints are field welded, all pipe coatings shall be held back 6-inches from ends and coated and wrapped after welding.

C. All buried ductile iron, cast iron and steel pipe shall be polyethylene encased in accordance with current Standard AWWA C105 Polyethylene Encasement for Ductile-Iron Pipe Systems. Polyethylene encasement shall be 8.0 mil thickness unless otherwise shown on the Project Plans.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install according to the pipe and pipe fitting manufacturer's recommendations.

B. Install all piping and fittings to the grades and elevations as shown on the Project Construction Drawings.

C. Buried pipe bedding material shall be provided and shall be of the type and the gradation requirements shown on the Project Construction Drawings. Pipe bedding material shall be compacted to a minimum compaction of 90 maximum dry density in accordance with test method ASTM D 1557.

D. Buried pipe backfill material shall be native soil material placed and compacted above the pipe bedding material to the ground finish grade surface. Pipe backfill material shall be compacted to 90 maximum dry density in accordance with test method ASTM D 1557.

E. Take all precautions necessary to prevent damage to pipe during placement and backfilling. The Contractor shall take all precautions to ensure that the pipe is not damaged during the installation process.

F. Care shall be taken in bolting flanged joints that there is no restraint on the opposite end of the piece which would prevent pressure from being evenly and uniformly applied upon the gasket. Bolts shall be gradually tightened at a uniform rate of gasket compression around the entire flange.

G. Care shall be taken when installing the Ductile Iron (and PVC) main pipe through steel casing pipe. Any repair required from installation shall be at the Contractor's expense. Steel, Ductile Iron, PVC and Polyethylene Pressure Pipe (Standard ANSI/AWWA C906 PE Pressure Pipe) shall be installed in accordance with the manufacturer's recommendations and at the locations shown on the Project Drawings.

H. Use Type 304 and Type 316 Stainless steel pipe, fittings, and flange bolts & nuts where indicated on the Project Construction Drawings. Type 304 and Type 316 stainless steel pipe and fittings shall meet material standard ASTM A 276 Condition A.

I. Install a 10-gauge rubber coated copper location (trace) wire on all water mains and private water lines, as shown on the City of Elko Water Department's Standard Trench Section Detail. The Contractor shall also be aware that all non-metal pipe installed in Nevada Department of Transportation (NDOT) right-of-way requires installation of a coated copper location wire taped to the top of the non-metal pipe.

J. Install 1-1/2-inch diameter schedule 40 PVC communication conduit with solvent weld joints shall be installed inside the bore casing for the new 10-inch diameter water pipe crossing beneath SR227 Lamoille Highway.

3.02 PIPE CONNECTIONS

A. See the Project Plans and Project Detail Sheets for the pipe connection details.

B. Provide and submit fabrication drawings for all piping materials for this project in accordance with the requirements stated in Section 01300 – Submittals.

C. The ends of all stub pipes shall be capped with a ductile iron end cap, or blind flange as shown in the Project Plans and Detail Sheets.

D. All PVC, ductile iron, cast iron, or steel pipe connections shall be flanged, mechanical joint, or bell and spigot as detailed in the project plans.

E. Steel pipe fitting fabrication shall be electrically arc welded in the factory by the manufacturer and coated with an approved epoxy coating system. Shop drawings shall be provided for all fabricated materials.

3.03 VALVE INSTALLATION

A. Butterfly valves, gate valves, plug valves, drain valves and combination air and vacuum valves shall be installed in accordance with the manufacturer's approved installation procedures.

3.04 HYDROSTATIC AND AIR TESTS

A. All municipal or private water mains providing potable water for consumptive use shall be properly disinfected in accordance with current adopted *Standard AN SI/AWWA C651-14 Disinfection of Water Mains* and pressure tested for leaks prior to placing the water mains into service.

B. The Contractor shall hydrostatically pressure test all water pipe, reuse pipe, or sewer force main pipe installed as a part of the Project. All new gravity sewer pipe (PVC SDR 35 pipe) installed for gravity sanitary sewer service shall be air tested.

C. Hydrostatic pressure tests for sewer pipe shall be in accordance with Subsection 336.03.07.03.01 of the City of Elko's adopted "*Standard Specifications*".

D. Air Pressure Tests for sanitary sewer pipe shall be in accordance with Subsection 336.03.07.04 Air Pressure Tests of the City of Elko's adopted " *Standard Specifications".*

E. Water, sewer and reuse pressure pipe shall be pressure tested in accordance with Subsection 336.03.08 Pressure Line-Pressure and Leakage Tests of the City of Elko's adopted " *Standard Specifications".*

1. Testing may be conducted on the full system, or in sections between isolation valves. The test section size is determined by test equipment capability. If the pressurizing or pumping equipment is too small, it may not be possible to complete the test within allowable testing time limits. If so, higher capacity test equipment, or a smaller test section may be necessary.

2. The temperature of the test medium and the pipe test section should be the same and should be at ambient temperature. Before applying test pressure, allow time for the test medium and the pipe test section to equalize. At temperatures above 100▪ F (38▪ C), test pressure must be reduced.

3. Pipe system pressure testing is performed to discover unacceptable faults in a piping system, pressure testing may cause such faults to fail by leaking or rupturing.

4. Test equipment should be examined before pressure is applied to insure that it is tightly connected. All low pressure filling lines and other items not subject to the test pressure should be disconnected or isolated.

5. Take suitable precautions to eliminate hazards to personnel near lines being tested. Keep personnel a safe distance away from the test section during testing.

F. References:

1. The following reference publications provide pressure testing information: ASME B31.1 Power Piping, Section 137, Pressure Tests; PPI TR-31, Underground Installation of Polyethylene Piping, Section 7. System

Testing; and ASTM F1417, Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air.

2. The manufacturer should be consulted before using pressure testing procedures other than those presented herein. Other pressure testing procedures may or may not be applicable depending upon piping products and/or piping applications.

G. Test pressure:

1. For private and municipal water pipe serving fire hydrants for fire protection the water pipe, pipe installation, and pressure test shall meet the minimum requirements specified in current Standard NFPA 24 – Standard for the Installation of Private Fire Service Mains and Their Appurtenances. Water transmission pipe and water main pipe test pressure shall be 200- psi for a minimum time of two (2) hours. The pressure shall not drop by more than 5-psi during the time frame of the pressure test.

2. Water Test pressure may be limited by valves, or other lower pressure rated components. Such components may not withstand the required test pressure. They should be either removed, or isolated from the test section to avoid possible damage, or failure to these devices. Isolated equipment should be vented.

3. For pressure piping systems the maximum allowable test pressure is 1.5 times the system design operating pressure at the lowest point in the section under test, provided that the test pressure limiting components or devices have been isolated or removed from the test section.

4. The hydrostatic pressure test shall not exceed the pressure rating of the water pipe, reuse pipe, or sanitary sewer force main pipe to be pressure tested.

5. The test pressure shall not exceed the thrust-restraint design pressure.

6. If a lower pressure rated device or component cannot be removed or isolated, then the test pressure is limited to the pressure rating of that device.

7. For non-pressure, low pressure, or gravity flow (intermittent pressure) systems, consult the manufacturer for information regarding maximum allowable test pressure.

H. General procedures:

1. Piping system pressure testing using hydrostatic procedures is recommended. The testing medium shall be clean water from the City of Elko's water distribution system. The test section should be completely filled with liquid. Take care to bleed off any trapped air. While the test section is filling, venting t high points may be necessary to purge air

pockets. Venting may be provided by loosening flanges, or by using equipment vents. Re-tighten any loosened flanges before applying test pressure.

2. Monitored make-up water test:

   a. The test procedure consists of initial expansion, and test phases. During the initial expansion phase, the test section is pressurized to the test pressure, and enough make-up liquid is added each hour for three (3) hours to return to test pressure.

   b. The test phase follows immediately, and may be one (1), two (2), or three (3) hours. At the end of the test time, the test section is returned to test pressure by adding a measured amount of liquid. If the amount of make-up liquid added does not exceed Table 1 values, leakage is not indicated.

3. Non-monitored make-up water test:

   a. The test procedure consists of initial expansion, and test phases. For the initial expansion phase, make-up water is added as required to maintain the test pressure for three (3) hours. For the test phase, the test pressure is reduced by 10 psi. If the pressure remains steady (within 5 of the target value) for an hour, no leakage is indicated.

PART 4 BASIS OF PAYMENT

4.01 BASIS OF PAYMENT

The basis of payment for work described under this section shall be in accordance with the Contractor's lump sum or unit price bid for water transmission main, water pipe, reuse pipe, sewer pipe, sewer force main pipe and/or casing pipe placed by boring & jacking methods. The Contractor shall include all related labor, equipment, and materials required to construct this work as specified and as shown on the Project Construction Drawings in the bid proposal price. All pipe fittings, valves, installation requirements, pipe bedding, pipe backfill, and hydrostatic & pressure tests shall be included in the Contractor’s bid price for each category of pipe. No additional payment shall be made, by the Owner, to complete the work as specified.

END OF SECTION

SECTION 03200 - CONCRETE STEEL REINFORCEMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Related Sections

B. Summary

C. Submittals

D. Materials

E. Construction Methods

F. Protection of Steel

G. Basis of Payment

1.02 RELATED SECTIONS

A. Section 01010 – Summary of Work

B. Section 01025 – Measurement and Payment

C. Section 01090 – References

D. Section 01300 - Submittals

E. Section 01600 - Material and Equipment

F. Section 02623 – Pipe, Valves, Fittings and Accessories

G. Section 03300 - Cast-In-Place Concrete

H. Section 03400 – Precast Concrete

I. Section 04200 - Unit Masonry

1.03 SUMMARY

The work covered under this section of the specifications includes the material requirements, construction methods, and the basis of payment for reinforcing steel used in the construction of concrete structures and masonry structures. This section describes the specification requirements and submittal information required for concrete and masonry reinforcing steel. This section shall also apply to reinforcing steel for pre-cast concrete supplied for this project. The Contractor, or his/her subcontractor, shall provide and install all reinforcing steel for the project.

1.04 SUBMITTALS

A. The Contractor shall provide mill certificates for each grade and type of reinforcing steel to the Engineer, for review and approval, prior to the placement of reinforcing steel on the Project.

B. The reinforcing steel grade and tensile strength shall be included in each submittal.

C. Submittals for reinforcing steel shall be provided to the Engineer, for review and approval, in accordance with Section 01300 - Submittals of these specifications.

PART 2 PRODUCTS

2.01 MATERIALS

Bar steel reinforcement for use in the construction of concrete and masonry structures shall be deformed steel bars meeting the following requirements:

Material	**Test Method**	**Requirements**
Deformed Billet-Steel Bars for Concrete Reinforcement	ASTM A615	Grade 40, Grade 60
Axel-Steel Deformed Bars for Concrete Reinforcement	ASTM A617	Grade 40, Grade 60
Spiral Reinforcement	ASTM A615	Grade 60

A. Reinforcing steel for cast-in-place concrete construction shall be deformed bars of the grade and type shown on the Project Plans.

B. Reinforcing steel for building footings, pipe thrust blocks, concrete encasement, driveway aprons and approach slabs shall be clean, free of all rust and deleterious material and shall be of the size and dimensions shown on the Project Construction Plans.

C. Reinforcing Steel exposed to extreme corrosive environments such as chemical containment, untreated wastewater, sodium hypochlorite, hydrochloric acids or strong bases shall be epoxy coated for the protection of the reinforcing steel from corrosion. The epoxy coating shall consist of a factory applied fusion bonded epoxy powder coating that is applied by a CRSI certified epoxy coating company. The coating shall be green in color. Epoxy coated rebar shall be installed where shown and detailed on the Project Construction Drawings and Plan Details.

D. Chairs and tie wire for supporting reinforcing steel shall be made of material that is compatible and intended for use supporting epoxy coated reinforcing steel. Bar supports shall be of dielectric material or coated with dielectric material. Tie wire for epoxy coated reinforcing steel shall be coated with a dielectric material in a manner to protect the epoxy coating on the reinforcing steel and protect the steel and coating from damage. See the Project Plan Details in the Construction Drawings for additional details of construction.

E. Epoxy powder shall meet the minimum requirements of standard AASHTO M284. Factory applied epoxy coating shall be a minimum of 6-mil cured thickness (dry film thickness).

F. Welded Steel Wire Fabric Reinforcement shall conform to the requirements of standard ASTM A 185.

G. Deformed bars for cast-in-place concrete reinforcement shall be free from rust, dirt, oil and grease. The Contractor shall cover reinforcing steel for storage on the jobsite.

H. Reinforcing steel for cast in place structures as well as all roadway structures shall meet the requirements set forth in SECTION 206 -REINFORCING STEEL of the City's current adopted "*Standard Specifications for Public Works Construction*', unless otherwise specified or shown on the Project Construction Drawings. Reinforcing steel for concrete structures shall be free of rust, dirt and all other deleterious substances that may affect the steel strength and concrete to steel bond strength.

I. Epoxy Coated reinforcing steel shall comply with SECTION 505 REINFORCING STEEL, Subsection 505.02.03 – "Specifications for Coating Reinforcing Steel" of the latest edition of the Nevada Department of Transportation's *Standard Specifications for Road and Bridge Construction".*

PART 3 EXECUTION

3.01 CONSTRUCTION METHODS

A. Concrete steel reinforcement shall be supplied and placed in accordance with SECTION 326 – REINFORCING AND STRUCTURAL STEEL of the City's Adopted "*Standard Specifications for Public Works Construction".*

B. Reinforcing steel shall be cold bent to the shape and dimensions shown on the Project Drawings. All bends shall be made in accordance with the ACI Manual of Standard Practice for Detailing Reinforced Concrete Structures.

C. All bar reinforcement shall be accurately placed in the positions shown on the Project Construction Drawings and shall be firmly held in place during the placement and setting of the concrete. When the spacing of the reinforcing steel exceeds one foot in either direction, all intersections of the steel shall be tied. When the spacing of the bars is one foot or less in both directions alternate intersections shall be tied, unless shown otherwise on the Project Plans.

D. The distances from the vertical and horizontal forms shall be maintained by means of stays, ties, hangers, blocks, or other approved supports. Metal chairs that are in contact with the exterior surface of the concrete shall be fabricated of either galvanized steel, or have the steel tips plastic coated to at least 3/4-inch into the concrete or be of stainless steel conforming to the requirements of ASTM A493 Type 430. Blocks used for holding reinforcing bars shall be precast mortar blocks of approved shape and dimensions and shall have a compressive strength of not less than the compressive strength of the concrete specified.

E. The use of pebbles, broken concrete, stone, brick, metal pipe, and wooden blocks for holding reinforcing bars **into place shall not be permitted**.

F. If mesh reinforcement is shipped in rolls it shall be straightened into flat sheets before being placed.

G. All steel reinforcement shall be furnished in the lengths indicated on the Project Plans. Splicing of bars, except where shown on the Project Plans, will not be permitted without the approval of the Engineer. All splices shall be in accordance with the latest edition of ACI Standard 318. **Welding of reinforcing steel shall not be permitted on this project**.

H. Splices in reinforcing steel bars shall be made in accordance with SUBSECTION 326.02.06 – SPLICES of the City of Elko's current adopted " *Standard Specifications for Public Works Construction"*.

I. Placement of structural steel shall comply with SUBSECTION 326.03 – STRUCTURAL STEEL of the City's current adopted " *Standard Specifications for Public Works Construction (Revisions No. 7 and No. 8)"*.

3.02 PROTECTION OF STEEL

A. The Contractor shall protect reinforcing steel and all reinforcing steel protective coatings from damage at all times on the jobsite. Epoxy coated reinforcing steel shall be stored above the ground or on padded covers. Epoxy coated reinforcing steel shall be handled by equipment, or systems, with padded contact areas that won't damage the protective epoxy coating material.

B. When stored on the jobsite, or placed in the work, reinforcing steel shall be kept free from dirt, detrimental scale, paint, oil, grease, or other foreign substances. Reinforcing steel shall not be stored on the ground, but shall be stored in areas free of moisture, dirt and other conditions that may cause the steel to rust or deteriorate.

PART 4 BASIS OF PAYMENT

4.01 BASIS OF PAYMENT

Payment for the work covered under this section shall be included in the Contractor's unit price for related concrete work. The Contractor shall include all labor, equipment, and materials required to complete the work described in this Section and the work shown on the Project Construction Drawings in his bid proposal amount for the related reinforced concrete structures. There shall be no specific bid item for concrete steel reinforcement other than as a part of the concrete work to be completed on this project.

END OF SECTION

SECTION 03300 - CAST IN PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Related Sections
B. Summary
C. Submittals
D. Materials
E. Construction Methods
F. Basis of Payment

1.02 RELATED SECTIONS

A. Section 01010 – Summary of Work
B. Section 01025 – Measurement and Payment
C. Section 01090 – Referenced Standards
D. Section 01300 – Submittals
E. Section 01400 - Quality Control
F. Section 01600 - Materials and Equipment
G. Section 02207 - Aggregate Materials
H. Section 02623 – Pipe, Valves, Fittings and Accessories
I. Section 02528 - Concrete Curb, Gutter, and Sidewalk
J. Section 03210 - Reinforcing Steel
K. Section 03240 – Fibrous Reinforcement for Cast-In-Place Concrete
L. Section 03253 – Concrete Waterstops
M. Section 03600 – Grout
N. Section 04220 - Concrete Unit Masonry

1.03 SUMMARY

The work covered under this section of the specifications includes the materials requirements, construction methods, and basis of payment for cast-in-place concrete. This includes reinforced concrete ramps, driveway aprons, reinforced concrete foundations, floors, slabs, sidewalk, gutters, curbs, concrete thrust blocks and reinforced concrete pipe encasement constructed as a part of the Project. This section also describes the submittal requirements for concrete mix designs to be submitted, by the Contractor, to the Engineer for approval.

1.04 SUBMITTALS

A. The contractor shall submit concrete mix designs to the Engineer for review and approval at least fourteen (14) calendar days prior to concrete placement.

B. The concrete mix shall be designed in accordance with standard ACI 301 by an approved independent testing laboratory.

C. Concrete mix designs shall be provided in accordance with SUBSECTION 337.01 – MI DESIGN and SUBSECTION 337.10 – GENERAL STRUCTURAL USE PORTLAND CEMENT CONCRETE of the City of Elko's current adopted "*Standard Specifications*

for Public Works Construction".

PART 2 PRODUCTS

2.01 MATERIALS

A. All cement found in cast-in-place concrete provided on the jobsite, by the Contractor, shall meet the requirements specified in SUBSECTION 202.01 - CEMENT of the City's current adopted "*Standard Specifications for Public Works Construction"*.

B. Portland Cement shall be as specified in Subsection 202.01.03 - PORTLAND CEMENTS of the City of Elko's current adopted *Standard Specifications for Public Works Construction (Revision No. 7 and No. 8)"*. This specification covers Type II, Type III and Type V, low alkali Portland cements. Type II, Type III and Type V, low alkali Portland cements shall conform to ASTM C150, including the 0.60 percent limitation on total alkalis expressed as (Na2O and 0.658 K2O) as determined in accordance with ASTM C114.

C. Portland cement used in concrete exposed to sulfates shall be Type V cement.

D. All ready-mix concrete provided on this project for concrete curb & gutter, sidewalk and buried thrust blocks shall be constructed of Type 1-P blended hydraulic cement conforming to standard ASTM C595, or Type II and Type V low alkali cement conforming to standard ASTM C150. All concrete shall have a minimum 28-day compressive strength of 4,000 psi.

E. Concrete exposed to freeze-thaw environments shall be air entrained and shall meet the following requirements:

Minimum 28-day compressive strength:	4,000 PSI
Minimum number of sacks of cement (per CY):	6.5
Air content of freshly mixed concrete:	6.5 percent +/- 1.5%
Maximum slump of freshly mixed concrete:	4-inches
Maximum water / cement ratio of concrete:	0.45

F. Ready-mixed concrete shall conform to the requirements of standard ASTM C94 -Standard Specifications for Ready-Mixed Concrete.

G. Concrete aggregates shall meet the specification requirements stated in SUBSECTION 200.05 - AGGREGATES FOR GENERAL STRUCTURAL USE PORTLAND CEMENT CONCRETE of the City of Elko's current adopted "*Standard Specifications for Public Works Construction"*. Concrete aggregates shall conform to the quality requirements of standard ASTM C33 for normal weight aggregate and standard ASTM C330 for lightweight aggregate.

H. Many concrete aggregates in the Elko area, both fine and coarse aggregate, have been found to be chemically reactive with the alkali found in Portland cement. Alkali- silica reactivity shall be determined through aggregate testing in accordance with test method ASTM C 33 and the Appendix, as specified. Accelerated mortar bar screening techniques for determination of potential alkali-silica reactivity include ASTM C 33, Appendix Test Method 1260 or Test Method AASHTO T 303 (accepted by the City of Elko Engineering Department). Potential for alkali-silica reactivity found in concrete

aggregates used in all concrete mix designs shall be properly mitigated using acceptable methods before consideration of the aggregate and associated mix design for use on this project.

I. Coarse aggregate for concrete shall conform to Subsection 200.05.03 -COARSE AGGREGATES of the City's current adopted " *Standard Specifications"*. Coarse concrete aggregate shall be graded in accordance with the gradation specified for No. 67 concrete aggregate (3/4" to No. 4). See Table 200.05.03-1 and Table 200.05.03-II for gradation and quality control requirements for coarse aggregates.

J. Fine aggregate shall meet the materials specifications and gradation requirements of SUBSECTION 200.05.04 - FINE AGGREGATE of the City's current adopted *Standard Specifications"*. Refer to Tables 200.05.04-1 and 200.05.04-2 of the City's adopted "*Standard Specifications*" for concrete fine aggregate gradation and material quality requirements.

K. Expansion joint material for use in concrete walls, curb & gutter, and sidewalk shall be premolded strips of durable, resilient material meeting the following standards:

Preformed Expansion Joint Filler (Bituminous Type) - ASTM D994.
Non-extruding and Resilient Filler (Bituminous Type) - ASTM D1751.
Preformed Sponge Rubber and Cork Expansion Joint Fillers - ASTM D1752.

L. Evaporation reducers and curing agents shall be applied to all flat work in NDOT Right-of-Ways immediately after initial finishing. Curing materials shall conform to the requirements of NDOT Specification 702.03.01 and shall be applied as per the manufacturer's instructions and all NDOT District 3 requirements.

M. Chemical admixtures for Portland Cement Concrete placed within the City of Elko roadway right-of-ways shall comply with SUBSECTION 202.02.01 – ADMIXTURES of the City's current adopted " *Standard Specifications for Public Works Construction".*

PART 3 EXECUTION

3.01 CONSTRUCTION METHODS

A. Type 2, Class B, Aggregate Base material and high performance non-woven geotextile fabric shall be placed at locations that require a separation fabric to prevent contamination of the gravel base material.

B. When the subgrade is dry earth, it shall be thoroughly dampened with water to ensure that no moisture will be absorbed by the earth from the fresh concrete.

C. The Engineer, or Owner's representative, will be on site to test the fresh concrete slump, entrained air content, unit weight, and to sample concrete for cured strength. The Contractor shall provide the Engineer and Owner with access to the fresh concrete for such tests.

D. The Contractor and/or the concrete supplier shall be solely responsible for defective

concrete. Concrete exceeding the specified slump shall be immediately rejected from the project site.

E. Concrete forms shall be constructed of suitable material, size, type, shape, quality, and strength to insure construction as designed and shall conform to the requirements of standard ACI 347 - Recommended Practice for Concrete Forming.

F. Concrete forms shall conform to Subsection 311.04 - FORMS of the City's current adopted *Standard Specifications for Public Works Construction*.

G. Concrete reinforcing steel shall be placed accurately, to the dimensions and clearances shown on the Project Plans and shall be held firmly in place using form ties.

H. Reinforcing steel shall be furnished and placed as shown on the Project Plans and in accordance with the requirements described within SECTION 03210 - REINFORCING STEEL of the City's current adopted "*Standard Specifications for Public Works Construction (Revision No. 7 and No. 8)"*.

I. Concrete shall not be placed on frozen ground, nor shall concrete be mixed and placed when the atmospheric temperature is below 35-degrees Fahrenheit, unless adequate means have been provided to heat the aggregates and water, satisfactory provisions have been made to protect the curing concrete, and approval has been granted by the Project Design Engineer.

J. All ready-mix concrete shall be effectively protected from freezing or frost for a period of at least seven (7) days following placement. The contractor shall protect the concrete from freezing using concrete blankets, mechanical heaters, or other approved methods when placing and curing concrete in cold weather at no expense to the Owner.

K. The Contractor shall use proper safety precautions when heating confined areas for curing concrete. The Contractor shall be responsible for protecting the work as well as the safety of the workmen and the general public when electric or gas heaters are used by the Contractor to provide heat in order to cure concrete.

L. Pumping of concrete will be allowed when placement requires pumping. All specified concrete strength and durability properties shall be maintained when concrete is placed with a concrete pump. Concrete aggregate shall remain mixed and shall not be allowed to segregate during ready-mix concrete placement.

M. Construction joints shall be constructed at the locations shown on the Project Plans and shall conform to SUBSECTION 311.10.07 - CONSTRUCTION JOINTS of the City's current adopted ""*Standard Specifications"*

N. Placement of concrete in the field shall be in accordance with SUBSECTION 311.10 HANDLING AND PLACING CONCRETE of the City's current adopted "*Standard Specifications"*

PART 4 BASIS OF PAYMENT

4.01 BASIS OF PAYMENT

The basis of payment for cast-in-place concrete shall be in accordance with the Contractor's lump sum, or unit price, bid for the work described. Concrete curb & gutter shall be paid in accordance with the Contractor's unit price bid for concrete curb and gutter. Concrete sidewalk shall be paid per square foot of concrete sidewalk installed as a part of the Project. Concrete thrust blocks for water pipe and reuse pipe shall be paid per each installed, or as a part of a fitting assembly installed as a part of the project as described in the Bid Proposal Form. Concrete encasement shall be paid for by the cubic yard of concrete placed as concrete encasement. The Contractor shall include all labor, equipment, and materials required to construct this work as specified and as shown on the Project Drawings in the Contractor's bid proposal price to do the work. No additional payment shall be made, by the Owner, to complete the work as specified.

END OF SECTION

SECTION 03400 - PRECAST CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Summary
B. Submittals
C. Materials
D. Construction Methods
E. Basis of Payment

1.02 SUMMARY

The work covered under this section of the specifications includes the materials requirements, construction methods, and basis of payment for precast concrete for sanitary sewer manholes, storm drain manholes, vaults, catch basins, drop inlets, junction boxes and related pre-cast concrete structures. This section also includes the submittal requirements for any substitutions to be submitted, by the Contractor, to the Engineer for approval. The City's current adopted "*Standard Specifications for Public Works Construction, 2016 Edition (Revisions No. 7 and No. 8)*, shall be referred to as the City's current adopted "*Standard Specifications*".

1.03 SUBMITTALS

A. The Contractor shall provide technical submittals for all pre-cast concrete to be installed on the jobsite prior to ordering the materials and at least fourteen (14) calendar days prior to the scheduled delivery date.

B. The Contractor shall submit substitution requests to the Engineer for review and approval at least fourteen (14) calendar days prior to installation.

C. Submittal information should be complete and should include load ratings, test results and must include accessories including grates, frames, covers, security hatches and interior and exterior coatings, if specified by the Engineer.

D. Submit all submittals in accordance with Section 01300 - Submittals of the Project Specifications.

E. Pre-cast concrete shall be formed and constructed in accordance with SECTION 311 – CONCRETE STRUCTURES AND MASONRY CONSTRUCTION of the City's current adopted "*Standard Specifications for Public Works Construction (Revision No. 7 and No. 8)*".

PART 2 PRODUCTS

2.01 MATERIALS

A. Concrete for pre-cast concrete structures shall meet the requirements for Portland Cement Concrete as described in Subsection 202.01 – Portland Cement Concrete of the City of Elko's current adopted "*Standard Specifications*".

B. The Owner shall provide all the materials as stated in this specification and as shown on the drawings.

C. Precast concrete manhole bases, manhole shaft extensions, manhole cones and grade rings shall be manufactured in accordance with current standard ASTM C 478.

D. Precast concrete utility vault structures shall be constructed in accordance with Standard ASTM C858-19 – *"Standard Specification for Underground Concrete Utility Structures".* Concrete utility vaults, valve vaults, and PRV/PSV vault stations shall be traffic rated (where shown on the plans) and shall be manufactured in accordance with Standard ASTM C858-19. Precast concrete vaults shall be as manufactured by Jensen Precast Company, Oldcastle Precast Company, or other approved precast manufacturer.

E. Precast concrete septic tanks shall be manufactured and tested for compliance in accordance with current standard ASTM C1227-22 – *"Standard Specification for Concrete Septic Tanks"*. Concrete septic tanks shall be as manufactured by Jensen Precast Co., Oldcastle Precast, or an approved equal precast concrete structures manufacturer. Precast concrete septic tanks shall be traffic rated as designated and as indicated on the Project Construction Drawings.

F. This section shall include all pre-cast concrete construction for concrete pipe, manholes, precast concrete boxes and precast concrete drop inlets to be provided by the Contractor. Precast concrete drop inlets and catch basins shall be as manufactured by Jensen Precast, Old Castle Precast, or approved equal.

G. The Contractor shall properly store and protect from damage all materials from the time the materials are delivered to the jobsite from the manufacturer.

H. The Contractor shall install all pre-cast concrete to the elevations shown and in accordance with the project drawings.

PART 3 EXECUTION

3.01 CONSTRUCTION METHODS

A. All work shall be as shown on the project drawings and as described in these specifications. Granular aggregate base material shall be placed and compacted beneath all precast concrete structures as shown on the project drawings.

B. A minimum of 6-inches of Type 2, Class B, Aggregate Base shall be placed and compacted beneath all concrete, and pre-cast concrete structures unless otherwise

shown on the Project Construction Drawings.

C. A minimum of 8-inches of compacted Type 2, Class B, Aggregate Base material or compacted Class A sand bedding material shall be placed beneath precast concrete septic tanks, oil water separators, grease interceptors and storm water treatment tanks.

D. All granular base and sand bedding material placed beneath precast concrete structures shall be compacted to a minimum of 95% maximum dry density, as measured in accordance with test method ASTM D 1557.

E. Pre-cast concrete shall be formed and placed in accordance with SECTION 311 – CONCRETE STRUCTURES AND MASONRY CONSTRUCTION of the City's current adopted "*Standard Specifications for Public Works Construction (Revision No. 7 and No. 8)*".

PART 4 BASIS OF PAYMENT

4.01 BASIS OF PAYMENT

The basis of payment for work described under this section shall be in accordance with the Contractor's lump sum or unit price bid for pre-cast concrete items. The Contractor shall include all related labor, equipment, and materials required to construct the work described in this Section, as specified. No additional payment shall be made, by the Owner, to the Contractor to complete the work as specified in these work specifications or as shown on Project Construction Drawings.

END OF SECTION

SECTION 04000 – BOOSTER PUMP STATION

PART 1 GENERAL

1.04 SECTION INCLUDES

A. Summary
B. Submittals
C. Materials
D. Construction Methods
E. Basis of Payment

1.05 SUMMARY

The work covered under this section of the specifications includes the materials requirements, construction methods, and basis of payment for a preassembled Booster Pump Station (BPS)

1.06 SUBMITTALS

A. The Contractor shall provide technical submittals for all components prior to executing a purchase order.

B. The Contractor shall submit substitution requests to the Engineer for review and approval at least fourteen (14) calendar days prior to installation.

C. Submittal information should be complete and should include all design point thresholds verified by Pump Supplier.

D. Submit all submittals in accordance with Section 01300 - Submittals of the Project Specifications.

PART 2 PRODUCTS

2.02 MATERIALS

A. The Owner shall provide all the materials as stated in this specification and as shown on the drawings.

B. The Contractor shall properly store and protect from damage all materials from the time the materials are delivered to the jobsite from the manufacturer.

C. The Contractor shall install all pre-cast concrete to the elevations shown and in accordance with the project drawings.

D. All materials must be **NSF-61 compliant.**

DESIGN DETAILS

Design Point:	Jockey	1	2				
Design Flow Rate - GPM:	60	508	1000	Voltage:	480	Electrical Loads	AMPS
Intake Pressure - PSI:				Phase:	3	DISCONNECT	600
Station Pressure - PSI:		156	156	Hertz:	60	NEC FLA	360
Discharge Pressure - PSI:		156	156				

PUMP AND MOTOR DETAILS

SEQUENCE: JOCKEY/JOCKEY STANDBY/LEAD/LAG/HIGH FLOW

FUNCTION	QTY	HP	PUMP PERFORMANCE	RPM	TYPE / BRAND	MOTOR ENCLOSURE
MAIN/DUTY	2	40	255 GPM @ 361' TDH	3600	END-SUCTION CENTRIFUGAL	ODP
					CORNELL	
JOCKEY	2	10	60 GPM @ 361' TDH	3600	VMS (VERTICAL MULTI-STAGE)	ODP
					XYLEM-GOULDS	
HIGH FLOW	1	150	1000 GPM @ 361' TDH	3600	END-SUCTION CENTRIFUGAL	ODP
					CORNELL	

SPECIAL MOTOR DESIGN/ADDITIONS

Premium Efficiency Motors

SYSTEM OVERVIEW

SYSTEM TYPE:	FLOODED SUCTION
INTAKE SOURCE:	POTABLE
DISCHARGE USE:	POTABLE - NFS RATED/HUMAN CONSUMPTION-W/HIGH FLOW
PUMP STATION ENCLOSURE:	IN CONTRACT
PUMP STATION FLOW METER :	BADGER MAG METER
SPARE HIGH FLOW PUMP	BID ALTERNATE No. 1
SKID BASE SIZE (INCHES):	96X120

MUST INCLUDE: CERTIFIED START-UP, CALIBRATION, TRAINING & ELECTRICAL COMPONENT WARRANTY EXTENSION TO 3 YEARS*

TECHNICIAN FOR A MAXIMUM OF 6 HOURS ON SITE FOR START-UP AND CALIBRATION OF PUMP STATION & OPERATOR TRAINING

CERTIFIED START UP EXTENDS WARRANTY OF ALL COMPONENTS INSIDE ELECTRICAL CONTROL PANEL (when provided) TO A TOTAL OF 3* YEARS

- UL QCZJ Certified pumping system
- For factory tested system and/or components only.
- The pump station shall include all pumps described above, as well as all necessary valves and piping (See details below).
- Variable frequency control panel for the pump station shall be prewired and pretested.
- PLC and HMI Touchscreen with programming written specific to the project will be provided
- **Control Panel is NEMA 12 manufactured for INDOOR operation.**

WARRANTY

[IN ADDITIONAL TO THE CITY OF ELKO STANDARD WARRANTY]

TELEPHONE TECHNICAL SUPPORT: Free-of-charge

Warrant that its products and systems will be free from defects in material and workmanship for a period of twelve [12] months from the date of placing the equipment in operation or fifteen [15] months from the date of completion of manufacture of the equipment, whichever shall occur first.

When notified by Purchaser of a defect which conforms to this Warranty BPS Supplier shall, at its sole discretion, correct the defect by performing a suitable repair to the Equipment or by providing a replacement part.

** Three year electronic warranty extension offered with certified start-up*

ALTERATIONS - OTHER

1	GENERATOR AND AUTOMATIC TRANSFER SWITCH WILL BE PROVIDED BY THE GENERAL CONTRACTOR AND THIS PROJECT

CONTROL SYSTEM DETAILS

● CONTROLLER:	**IDEC PLC6e-PLUS**
● HMI:	**IDEC 10.4'' COLOR TOUCH SCREEN**
● ENVIRONMENTAL DESIGN:	NEMA 12 cabinet manufactured for INDOOR operation
● MOTOR STARTING PRIMARY:	VFD - ALL MOTORS
● MOTOR STARTING OTHER:	VFD - ALL MOTORS HIGH FLOW
● VFD MODEL:	ABB ACQ580
● PANEL COOLING:	FORCED AIR
● CONTROL SYSTEM MODEL NUMBER:	MMC2X040V-483-DPP-HF150VDPP-2XJ10VDPP-U3A-TE-PLC6E-HG10C-UPS-VZW-AWWA
● CONTROL PANEL MODEL NUMBER:	5600 ZONE-VFD PANEL [REV:DEFAULT]
● CONTROL PANEL SIZE:	H= 90'' W+D= 7224'' FEET= 4'' TOTAL HEIGHT= 94''
● SPECIFIED KAIC:	

- VOLTAGE MONITOR
- UPS BACKUP
- WIRELESS CAPABLE - Modem provided - The General Contractor, through the SCADA Professional shall ensure connection to City of Elko Water Department
- UL Listed and Labeled (UL 508A)
- Ethernet Capable for Internet Access
- Clock Start Relay; 24vac (or 120vac)
- System Fault Logger
- VFD Sleep By Flow; Wake By Pressure
- Adjust VFD Sleep Settings on HMI
- Single Motor Controller
- Single Main + Jockey Controller
- Multi-Motor Controller with Alternation
- EMAIL Alarm Capability
- Hand/Off/Auto Selector
- Manual VFD Speed Control - Dial (Potentiometer)
- Labeled Field Terminal Wiring Strip
- Main-Line Slow Fill Routine
- HMI Password Protection
- PID Set-Point Trimming via Level/Intake
- Trend Data logging with upload to USB

MECHANICAL DETAILS

PIPE COMPOSITION:

STEEL A53	ASTM A53 GROUP B STEEL PIPE

BASE COMPOSITION:

GALVANIZED	ASTM A36 STEEL PLATE - BREAK PRESS FOLDED - HOT DIP GALVANIZED

GENERAL DETAILS:

● PUMP CHECK VALVE(S)	WAFER - Valmatic 1400A Silent
● PUMP ISOLATION VALVES(S)	NSF - LUG STYLE BFV
● STATION ISOLATION VALVES(S)	NSF - LUG STYLE BFV
● PRESSURE CLASS:	AWWA D [175 PSI]
● PRESSURE RELIEF VALVE	3" ClaVal 50-13

COATING DETAILS:

Pipe Interior:	AWWA/NSF 61 DARK BLUE 7-2540
Pipe Exterior:	AWWA/NSF 61 DARK BLUE 7-2540
Skid Base:	GALVANIZED
Enclosure:	N/A

SENSORS

● Suction Pressure Gauge	1	NSF: 2.5" Bourdon Tube, SS Case Liquid Filled	PSI =	0-100
● Discharge Pressure Gauge	1	NSF: 2.5" Bourdon Tube, SS Case Liquid Filled	PSI =	0-200
● Suction Pressure Transmitter	1	NSF: IFM Programmable w/Display	PSI =	NSF: -14.5 ~ 145 (IFM)
● Discharge Pressure Transmitter	1	NSF: IFM Programmable w/Display	PSI =	NSF: -14.5 ~ 362 (IFM)
● High Pressure Switch	1			

OTHER

● Intake Screen Supply Valve	NO
● 3/4" Air Release Valve	6

- All bare carbon steel coated with Polyester TGIC baked on powder coating
- Hose bib connection (where applicable)
- Sample Tap for Potable Systems (where applicable)
- Manifold drains (where applicable)

3.02 CONSTRUCTION METHODS

A. All work shall be as shown on the project drawings and as described in these specifications.

B. Pump skid to be fully assembled and operational, meeting the design point thresholds as provided.

C. Each pump is expected to alternate operation, in a lead / lag scenario.

D. Through Bid items 8, 9, 10, 27 & 28, the BPS is expected to be fully operational and connected with appropriate appurtenances.

PART 4 BASIS OF PAYMENT

4.01 BASIS OF PAYMENT

The basis of payment for work described under this section shall be in accordance with the Contractor's lump sum price. The Contractor shall include all related labor, equipment, and materials required to construct the work described in this Section, as specified. No additional payment shall be made, by the Owner, to the Contractor to complete the work as specified in these work specifications or as shown on Project Construction Drawings.

END OF SECTION

These plans & specifications were prepared for continuity and in coordination with a connecting City of Elko Water Transmission mainline Project, "Hospital 2nd Source Project." See plans by Ferron Konakis, P.E.