ADDENDUM NUMBER FOUR (4)

Date: July 2, 2014

Project: Socorro County Detention Center
1001 Grefco Road
Socorro, New Mexico
Studio SW Project Number: 1344

From: Studio Southwest Architects, Inc.
2101 Mountain Road NW
Albuquerque, New Mexico 87104
843-9639
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To: Prospective Bidders

This Addendum forms a part of the Contract Documents and modifies the original Bidding Documents dated June 16, 2014 as noted below. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of (7) pages plus (28) additional pages for the Project Manual, including (2) blank pages, (9) supplemental drawings and (1) new sheet.

1. CHANGES TO BIDDING REQUIREMENTS:
   1.1 DOCUMENT 001113 –ADVERTISEMENT FOR BIDS, Article 1.2, Paragraph A, Subparagraph 1: CHANGE the bid date to “July 22, 2014.” The bid time and location remain the same.

2. CHANGES TO PROJECT MANUAL:
   2.1 SECTION 042200 –UNIT MASONRY:
      A. Article 2.1, Paragraph B: ADD the following to the end of the paragraph: “… at exterior exposed locations. CMU at concealed locations may be standard finish, gray color.”
      B. Article 3.1: CHANGE Paragraph B to read: “B. All exposed exterior masonry shall be colored with scoria aggregate. Refer to architectural drawings for finish. Masonry not exposed to view may be standard finish, gray color.”
   2.2 SECTION 042731 –REINFORCED UNIT MASONRY, Article 3.04: DELETE Paragraph D regarding joint reinforcement.
2.3 SECTION 072000 – INSULATION: REPLACE with attached Section 072100 – Thermal Insulation.

2.4 SECTION 260923 – LIGHTING CONTROL DEVICES:
   A. Reference paragraph 2.1-A: ADD “Nexlight” as an approved manufacturer.
   B. Reference paragraph 2.2-A: ADD “Nexlight” as an approved manufacturer.
   C. Reference paragraph 2.3-A: ADD “Nexlight” as an approved manufacturer.
   D. Reference paragraph 2.4-A: ADD “Nexlight” as an approved manufacturer.

2.5 SECTION 260943 - NETWORK LIGHTING CONTROLS: Reference paragraph 2.1-A: ADD “Nexlight” as an approved manufacturer.

2.6 SECTION 280510 – MAINTENANCE, SERVICE AND WARRANTY FOR ELECTRONIC SECURITY, Article 2.1, Paragraph A:
   A. Subparagraph 1, CHANGE “two (5) years” to read “five (5).”
   B. Subparagraph 3, CHANGE “two (5) years” to read “five (5).”

2.7 SECTION 221300 – LIFT STATION MATERIAL: ADD this section. (Note: This is provided for information purposes. There is an allowance in Section 012100 for the lift station work.)

2.8 SECTION 331000 – WATER UTILITIES: REPLACE with the attached revised section.

3. CHANGES TO DRAWINGS:

3.1 SHEET AS-101 – OVERALL SITE PLAN:
   A. SITE PLAN – CONCEPT A1/AS-101: CHANGE the notes “MASONRY SCREEN WALL 7'-4” HIGH” to read “MASONRY SCREEN WALL 4'-4” HIGH, SEE DETAIL B5/AS-101.”
   B. DETAIL B5/AS-101, CLARIFICATION: Split face CMU is only required on one side of the screen wall.

3.2 SHEET C-200 – UTILITY PLAN:
   A. ADD bollards associated with the fire hydrant located at the west end of the site as shown on Supplemental Drawing Sketch SKC-01.
   B. ADD information associated with the lift station configuration as shown on Supplemental Sketch SKC-02. (Note: This is provided for information purposes. There is an allowance in Section 012100 for the lift station work.)
   C. ADD the gas line and notes requiring further coordination with the local gas company and ADD notes pertaining to the existing lines and potholing as necessary as shown on Supplemental Sketch SKC-03.

3.3 SHEET C-301 – CIVIL DETAIL SHEET: ADD this new sheet to show details associated with the lift station. A stamped version of this sheet is on file at the architect’s and engineer’s offices. (Note: This is provided for information purposes. There is an allowance in Section 012100 for the lift station work.)
3.4 SHEET S-102 – FOUNDATION AND FRAMING PLANS, Design clarification: The grating width of the cell walkways is 4'-0".

3.5 SHEET S-301 – FOUNDATION SECTIONS AND DETAILS, Turndown Slab Section C1/S-301: REMOVE CMU wall callout. Refer to Sheet S-101, the Wall Schedule on Sheet S-601, and specification section 04 22 00 for reinforcing/grouting requirements.

3.6 SHEET S-302 – FOUNDATION SECTIONS AND DETAILS, Int Column at Thickened Slab C1/S-302; REVISE column embed plate as follows: PL 1/2"x5"x1'-0" W/ 4- 1/2" DIA x 6" EMBED EXP AHR.

3.7 SHEET S-303 – FOUNDATION AND FRAMING SECTIONS AND DETAILS:
A. Typical Interior Column A3/S-303: REVISE column base plate as follows: PL 3/4"x12"x1'-0" W/4 – 3/4" DIA x 9" EMBED F1554 AHR BOLTS W/ STD WASHER AND DBL NUTS.
B. Typical Exterior Column C1/S-303: REVISE column base plate as follows: PL 3/4"x16"x1'-4" W/4 – 3/4" DIA x 9" EMBED F1554 AHR BOLTS W/ STD WASHER AND DBL NUTS.

3.8 SHEET S-304 – FRAMING SECTIONS AND DETAILS:
A. REVISE Steel Column at CMU Wall B3/S-304 as shown on attached Sketch SKS-01.
B. REVISE Framing Section B2/S-304 as shown on attached Sketch SKS-02.
C. REVISE Framing Section C2/S-304 as shown on attached Sketch SKS-03.
D. ADD Typical Canopy Section A1/S-304 as shown on attached Sketch SKS-04.
E. ADD Canopy Detail B1/S-304 as shown on attached Sketch SKS-05.

3.9 SHEET S-601 – SCHEDULES: REVISE CMU lintel schedule as shown on attached Sketch SKS-06.

3.10 SHEET A-201 – EXTERIOR ELEVATIONS, Legend: ADD the following to the CMU VENEER note: “SPLIT FACE ON EXTERIOR FACES. PROVIDE STANDARD FACE WHERE DEVICES OR STRUCTURES ATTACH TO THE CMU.”

3.11 SHEET A-202 – EXTERIOR ELEVATIONS, Legend: ADD the following to the CMU VENEER note: “SPLIT FACE ON EXTERIOR FACES. PROVIDE STANDARD FACE WHERE DEVICES OR STRUCTURES ATTACH TO THE CMU.”

3.12 SHEET A-205 – ALTERNATES 1, 2, AND 3, Elevation C1/A-205 – North Elevation – Entry: DELETE the reference to Detail A3/A-205 and the note that reads “SPLIT FACE MASONRY WALL.”

3.13 SHEET A-602 – ALUMINUM STOREFRONT ELEVATIONS AND DETAILS:
A. Aluminum Window Elevations A2: ADD note to read: “REFER TO SECTION 088000 FOR GLAZING TYPES.”
B. Detail B3 – Sill Detail @ Main Entry: ADD note to read: “SEE A1/A-315 FOR INSULATION AND FRAMING AT SPANDREL.”

3.14 SHEET A-702 – MEZZANINE FINISH PLAN: NOTE that the schedule on the left side of the sheet is the ROOM FINISH SCHEDULE.

3.15 SHEET E-101 – ELECTRICAL SITE PLAN: Reference Site Plan, Extend 6” PVC for primary cable 90’ south parallel to Dicapert Entrance Road. East-West routing and distance shown on Addenda #3 shall remain the same. Primary conduit shall be Schedule 80 PVC in lieu of Schedule 40 PVC.

3.16 SHEET E-300 – ELECTRICAL DETAILS: Reference Detail 4, Note secondary conduits shall be schedule 80 PVC.

3.17 SHEET E-510 – ELECTRICAL LIGHTING SCHEDULES:

A. Reference the “Interior Light Fixture Schedule”: ADD the following as approved equal light fixtures. All substitutions listed are subject to further review for compliance with the drawings and specifications.

<table>
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<th>Light Fixtures</th>
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<th>A1/A-315 Part Number</th>
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<tr>
<td>AT1</td>
<td>JUNO</td>
<td>R551SC-T8WH</td>
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<td>AKTFLGR20-WH</td>
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<td>AS1</td>
<td>LUMINAIRE</td>
<td>SPC1212-2CR-21W-HP-4000K-120-OP-XXX</td>
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<td>DL1</td>
<td>OMEGA</td>
<td>OM6LED-39-120-R6LED</td>
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<td>SV16-L-W-WL</td>
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<td>FP1</td>
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<td>CS1-A-REG-W-4-A</td>
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<td>WB1</td>
<td>SPAULDING</td>
<td>TRP-30L4K-053-X-1-PS</td>
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</table>
B. Reference the “Exterior Light Fixture Schedule”. ADD the following as approved equal light fixtures. All substitutions listed are subject to further review for compliance with the drawings and specifications.

OA1  KIM LIGHTING 1SA-WP9L2E35-120L-4K-VOLT-WH with a
SPAU LDING  SSA-30-60-B-AX-WH Pole
GARDCO  ECF-1-2-105LA-4870-NW-UNV-WP
OA2  KIM LIGHTING 1SA-WP9L3E35-120L-4K-VOLT-WH with a
SPAU LDING  SSA-30-60-B-AX-WH Pole
GARDCO  ECF-1-3-105LA-4870-NW-UNV-WP
OB1  KIM LIGHTING GEM1-18L4KUV-WH
GARDCO  BRM830-42-CWL-NW-360-UNV-WP
OG1  BEACON CDT-24NB-55-4K-OPTICS-UNV-MOUNT-FV-WHT
STONCO  GP1-24W-L-U-XXX-WH
OG2  BEACON CDT-24NB-55-4K-5X3-UNV-MOUNT-FV-WHT
STONCO  GP2-04-U-WH-030-4K-XXX
OG3  BEACON CDT-24NB-55-4K-6X6-UNV-MOUNT-FV-WHT
STONCO  GP2-04-U-WH-030-4K-XXX
OG4  BEACON CDT-24NB-55-4K-OPTICS-UNV-MOUNT-FV-WHT
STONCO  GP2-04-U-WH-030-4K-XXX

4. QUESTIONS

4.1 Questions from Precision Masonry (6-27-14)

1. Detail C1/S-301 denotes joint reinforcement at 16” OC and reinforced cells to be grouted. Specification section 042200 3.4.A denotes “Grout all cells solid”. Specification section 042731 3.04.D. denotes joint reinforcement to be installed 8 inches on center.

Response: Refer to Addendum No. 4 for revisions and clarifications.

4.2 Questions from HD Supply (6-27-14)

1. Will Domestic Material be required for this project?

Response: There are no “Buy American” requirements.
2. Plan sheet C-200: Does Note #3, which states “ALL/SERVICE LINES SHALL BE RESTRAINED THE ENTIRE DISTANCE FROM FITTING TO THE CAP”, indicate that ALL lines shown on sheet C-200 should be fully restrained?

**Response:** Only the service lines (both domestic and the 6" fire sprinkler line) need to be fully restrained. The restrained length for the internal fire line loop that serves the remaining fire hydrants shall adhere to the restraining joint table noted on Sheet C-200.

### 4.3 Questions from Garvin Construction (6-27-14)

1. What are the locations from grid lines for the 3" pipe mezzanine columns?

**Response:** Refer to Addendum No. 4.

2. What size are the HSS posts at the central control room, between the window panels? These are the posts that field weld to base and cap embed plates.

**Response:** Refer to Addendum No. 3.

### 4.4 Questions from Flintco (6-27-14)

1. The insulation specification includes a rigid insulation for “roof and wall panels where indicated on drawings”. The drawings show batt insulation at all locations. Also, the spec indicates “unfaced” batt insulation. Do you really want exposed unfaced insulation in the building? Please clarify.

**Response:** Refer to Addendum No. 4 for specification revisions. Note that the metal building specification includes the metal building insulation. We will clarify the requirement for CMU core insulation in a future addendum.

2. Please send all of your pdf’s un-secured, creating unnecessary work/time.

**Response:** That was our intention for Addendum No. 3, but we had a technical problem with some of the drawing files.

### 4.5 Questions from Precision Masonry (6-27-14)

Specifications Section 042200 denotes CMU color to match #210 Dusty Mesa, include Integral water repellent where exposed to weather and shall be split faced scored unless noted otherwise on the drawings. Masonry not exposed to view may be smooth finished.

1. C5 AS-501 denotes ground face 8” masonry running bond on lettered side. To our knowledge CMU is not available split faced scored on one side and ground face on the other side. Is it acceptable to provide ground face one die and standard smooth finish on the opposite side for the monument sign? Because it is called out as running bond, the ground face side is not to be scored, right?

**Response:** See Addendum No. 4 for revisions and clarifications.
2. Refuse enclosure calls for split face finish on the exterior. Is it to be scored split face? If so, one vertical score in the center?
   **Response:** See Addendum No. 4 for revisions and clarifications.

3. What finish is intended for the 7’-4” high masonry screen walls shown on AS-101?
   **Response:** See Addendum No. 4 for revisions and clarifications.

4. What finish is intended for the exposed eight inch masonry applied on the East, North and South exterior of the building?
   **Response:** See Addendum No. 4 for revisions and clarifications.

5. Are the Alternate Three split face units to include a score? If so, one vertical score centered?
   **Response:** See Addendum No. 4 for revisions and clarifications.

6. Can the CMU located on the exterior walls covered by EIFS or metal panels be smooth natural grey without IWR?
   **Response:** See Addendum No. 4 for revisions and clarifications.

7. Is it the intent for the interior CMU to get block filler and paint where exposed?
   **Response:** Refer to the Room Finish Schedule on Sheet A-702 and the paint systems specified in Section 099000.

**End of Addendum**
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Board insulation at cavity wall construction and Unit Masonry Core Inserts.
B. Batt insulation in exterior wall and interior wall and ceiling (acoustic) construction.
C. Batt insulation for filling perimeter window and door shim spaces.

1.02 RELATED REQUIREMENTS
A. Section 072400 - Exterior Insulation and Finish Systems: Board insulation on exterior side of walls, finished with weatherproof coating.
B. Section 078400 - Firestopping: Insulation as part of fire-rated through-penetration assemblies.
C. Section 133419 - Metal Building Systems: Insulation specified as part of the metal building package.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
C. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.
D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.05 FIELD CONDITIONS
A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 APPLICATIONS
A. Insulation Inside Masonry Cavity Walls: Extruded polystyrene board.
B. Insulation in Metal Framed Walls (Exterior): Batt insulation with integral vapor retarder.
C. Insulation in Metal Framed Walls (interior): Acoustic Batt insulation with no vapor retarder.
D. Insulation Above Lay-In Acoustical Ceilings: Acoustical batt insulation with no vapor retarder.

2.02 FOAM BOARD INSULATION MATERIALS
A. Extruded Polystyrene (XPS) Board Insulation: ASTM C578, Type VI; extruded polystyrene board with either natural skin or cut cell surfaces; with the following characteristics:
   1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
   2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
   3. Board Size: 48 x 96 inch (1220 x 2440 mm).
   4. Board Thickness: 2 inches (50 mm) maximum.
6. Thermal Resistance: R-value of 4.6 per 1 inch (25.4 mm) at 75 degrees F (24 degrees C) mean temperature.
8. Board Density: 1.80 lb/cu ft (29 kg/cu m).
9. Water Absorption: 0.3 percent by volume, maximum.

B. Manufacturers:
2. Owens Corning Corp; Foamular 400: www.owenscorning.com.

2.03 CONCRETE BLOCK CORE INSULATION
A. Provide concrete blocks with molded core insulation already installed at Block Producers plant, for use in all exterior unit masonry walls.
1. Inserts shall be properly installed in accordance with manufacturer's specification to allow blocks to be handled or saw cut without danger of insert dislodging.
2. Inserts are to be installed whether the cells are to be grouted or not.
B. Block Core Insulation Inserts: ASTM C 578 Type X, expanded polystyrene molded inserts, minimum density 1.3 lb/cu ft.
C. Manufacturer: Provide products equal to or better than the following:
1. "Korfil Block Insulation"; Concrete Block Insulating Systems Inc. West Brookfield, MA.
2. Substitutions: See Section 016000 - Product Requirements.

2.04 BATT INSULATION MATERIALS
A. Glass Fiber Batt Insulation (Thermal): Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
5. Thickness: 6 inch (152 mm).
7. Manufacturers:
8. Substitutions: See Section 016000 - Product Requirements.
B. Glass Fiber Batt Insulation (Acoustic): Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
3. Combustibility: Non-combustible, when tested in accordance with ASTM E136.
5. Thickness: 3-1/2 inch (89 mm).
7. Sound Transmission Class (STC): 50.
8. Manufacturers:
2.05 ACCESSORIES
A. Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inch (50 mm) wide.
B. Tape joints of rigid insulation in accordance with roofing and insulation manufacturers' instructions.
C. Insulation Fasteners: Impaling clip of galvanized steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.
D. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT CAVITY WALLS
A. Install boards to fit snugly between wall ties.
B. Install boards horizontally on walls.
   1. Place boards to maximize adhesive contact.
   2. Install in running bond pattern.
   3. Butt edges and ends tightly to adjacent boards and to protrusions.
C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 BATT INSTALLATION
A. Install insulation in accordance with manufacturer's instructions.
B. Install in exterior wall and ceiling spaces without gaps or voids. Do not compress insulation.
C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
E. Install with factory applied vapor retarder membrane facing warm side of building spaces. Lap ends and side flanges of membrane over framing members.
F. Retain insulation batts in place with spindle fasteners at 12 inches (300 mm) on center.
G. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.
H. Tape seal tears or cuts in vapor retarder.
I. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane. Tape seal in place.
J. Coordinate extent of work of this section with that of work specified in Section 133419.
K. Do not allow insulation to become wet.
   1. Remove and replace any batt insulation that has gotten wet with new, dry insulation.

3.04 PROTECTION
A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION
SECTION 221300 – LIFT STATION MATERIAL

PAR1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

A. Contractor shall furnish all labor, materials, equipment and incidentals required to provide a sewage pump lift station with a system capacity of 100 gpm at 22 tdh with necessary accessories listed herein. The basis of design will by Flygt submersible pumps with Flygt control panel as specified herein.

1.3 SUBMITTALS

A. Product Data: The submittal data for the pumps shall include, but is not limited to: design piping system calculations with system curves stamped by a NM Professional Engineer, pipe sizing, pump curves, wet well layout drawings, and complete description of control panel, with wiring diagrams, sequence data, instrumentation, alarms, and copy of certificate of one million dollar minimum liability insurance.

B. Shop Drawings: Show location, details, layout of wet well with listing of material, operational hardware and accessories. Indicate materials, dimensions, sizes, weights of equipment. Include plans, elevations, sections and other required installations and operational clearances, minimum depths and details of anchorage and attachment and bracing.

C. Wiring Diagrams: Power and control wiring. Differentiate between manufacturer-installed and field installed wiring, floats, sensors and between components provided by manufacturer and those provided by others.

D. Product Certificates: Signed by manufacturers certifying that products furnished comply with requirements.

E. Qualification Data: For firms and persons specified in “Quality Assurance” Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, name and address of architects and owners, and other information specified.

F. Pre-Approval Requirements: Pre-submittal data as listed from paragraphs 1.3.A through 1.3.E, to include certified AutoCAD 2000., Mechanical desktop, 3-D
drawing, with electrical wiring diagrams for the entire wet well. Data to be submitted no later than 15 days prior to bid date for engineer consideration. No exceptions.

G. Field Test Reports: Provide an on site pump test start up report for compliance with performance requirements.

PART 2 – PRODUCTS

2.1 OPERATING CONDITIONS & SYSTEM REQUIREMENTS

A. Contactor shall furnish and install two Flygt pumps, Model NP3085.181MT with 463 impeller code.

B. The equipment will include pumps, bases, check valves, plug valves, stainless steel guild rails, stainless steel guide rail brackets, float hangers, lift station cover, trash basket, portable hoist, Flygt Control Panel and Flygt Floats all for contractor assembly in a concrete as shown on the plans.

C. The lift station shall be preassembled in Fiberglass basin. 60” in diameter by 100” depth with attached valve box. Piping shall be schedule 80 PVC. Guiders, chains and hardware shall be stainless steel. Pump bases shall be constructed per manufacture’s recommendations. Top cover will have access for wet well and separate access for the valve vault portion.

2.2 PUMP CONSTRUCTION

A. Furnish and install 2 submersible grinder Flygt wastewater pump(s). Each pump shall be equipped with an _2.4_ HP submersible electric motor, connected for operation on _460_ volts, _3_ phase, _60_ hertz, _60_ wire service, with _30_ feet of submersible cable (SUBCAB) suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval. The pump(s) shall be automatically and firmly connected to the discharge connection, guided by no less than two guide bars extending from the top of the station to the discharge connection. There shall be no need for personnel to enter the wet-well. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact. **Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable.** No portion of the pump shall bear directly on the sump floor. Each pump shall be fitted with _20_ feet of stainless steel lifting chain. The working load of the lifting system shall be _50%_ greater than the pump unit weight.
B. **PUMP CONSTRUCTION** Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. The lifting handle shall be of stainless steel. All exposed nuts or bolts shall be AISI type 316 stainless steel construction. All metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump. Sealing design shall incorporate **metal-to-metal contact** between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile or optional Viton rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit. Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

C. **COOLING SYSTEM** Motors are sufficiently cooled by the surrounding environment or pumped media. A water jacket is not required.

D. **CABLE ENTRY SEAL** The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of a single cylindrical elastomer grommet, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the body containing a strain relief function, separate from the function of sealing the cable. The assembly shall provide ease of changing the cable when necessary using the same entry seal. The cable entry junction chamber and motor shall be separated by a stator lead sealing gland or terminal board, which shall isolate the interior from foreign material gaining access through the pump top. Epoxies, silicones, or other secondary sealing systems shall not be considered acceptable.

E. **MOTOR** The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of bolts, pins or other fastening devices requiring penetration of the stator housing is not acceptable. The motor shall be designed for continuous duty handling pumped media of 40°C (104°F) and capable of no less than 30 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of cast aluminum. Thermal switches set to open at 125°C (260°F) shall be embedded in the stator end coils to monitor the temperature of each phase winding. These thermal switches shall be used in conjunction with and
supplemental to external motor overload protection and shall be connected to the
control panel. The junction chamber containing the terminal board, shall be
hermetically sealed from the motor by an elastomer compression seal. Connection
between the cable conductors and stator leads shall be made with threaded
compression type binding posts permanently affixed to a terminal board. The
motor and the pump shall be produced by the same manufacturer. The combined
service factor (combined effect of voltage, frequency and specific gravity) shall
be a minimum of 1.15. The motor shall have a voltage tolerance of plus or minus
10%. The motor shall be designed for operation up to 40°C (104°F) ambient and
with a temperature rise not to exceed 80°C. A performance chart shall be provided
upon request showing curves for torque, current, power factor, input/output kW
and efficiency. This chart shall also include data on starting and no-load
characteristics. The power cable shall be sized according to the NEC and ICEA
standards and shall be of sufficient length to reach the junction box without the
need of any splices. The outer jacket of the cable shall be oil resistant chlorinated
polyethylene rubber. The motor and cable shall be capable of continuous
submergence underwater without loss of watertight integrity to a depth of 65 feet
or greater. The motor horsepower shall be adequate so that the pump is non-
overloading throughout the entire pump performance curve from shut-off through
run-out.

F. **BEARINGS** The pump shaft shall rotate on two bearings. Motor bearings shall
be permanently grease lubricated. The upper bearing shall be a single deep groove
ball bearing. The lower bearing shall be a two row angular contact bearing to
compensate for axial thrust and radial forces. **Single row lower bearings are not
acceptable.**

G. **MECHANICAL SEAL** Each pump shall be provided with a tandem mechanical
shaft seal system consisting of two totally independent seal assemblies. The seals
shall operate in a lubricant reservoir that hydro-dynamically lubricates the lapped
seal faces at a constant rate. The lower, primary seal unit, located between the
pump and the lubricant chamber, shall contain one stationary and one positively
driven rotating, corrosion resistant tungsten-carbide ring. The upper, secondary
seal unit, located between the lubricant chamber and the motor housing, shall
contain one stationary and one positively driven rotating, corrosion resistant
tungsten-carbide seal ring. Each seal interface shall be held in contact by its own
spring system. The seals shall require neither maintenance nor adjustment nor
depend on direction of rotation for sealing. The position of both mechanical
seals shall depend on the shaft. Mounting of the lower mechanical seal on the
impeller hub will not be acceptable. For special applications, other seal face
materials shall be available. **The following seal types shall not be considered
acceptable or equal to the dual independent seal specified:** shaft seals without
positively driven rotating members, or conventional double mechanical seals
containing either a common single or double spring acting between the upper and
lower seal faces. No system requiring a pressure differential to offset pressure and
to effect sealing shall be used. Each pump shall be provided with a lubricant
chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and to provide lubricant expansion capacity. The drain and inspection plug, with positive anti-leak seal shall be easily accessible from the outside. The seal system shall not rely upon the pumped media for lubrication. **The motor shall be able to operate dry without damage while pumping under load.** Seal lubricant shall be FDA Approved, nontoxic.

H. **PUMP SHAFT** Pump and motor shaft shall be the same unit. The pump shaft is an extension of the motor shaft. Couplings shall not be acceptable. The pump shaft shall be stainless steel – ASTM A479 S43100-T. If a shaft material of lower quality than stainless steel – ASTM A479 S43100-T is used, a shaft sleeve of stainless steel – ASTM A479 S43100-T is used to protect the shaft material. However, shaft sleeves only protect the shaft around the lower mechanical seal. No protection is provided for in the oil housing and above. Therefore, the use of stainless steel sleeves will not be considered equal to stainless steel shafts.

I. **IMPELLER** The impeller shall be of (ASTM A-48, Class 35B gray iron or ASTM A-532 (Alloy III A) 25% chrome cast iron) dynamically balanced, semi-open, multi-vane, back swept, screw-shaped, non-clog design. The impeller leading edges shall be mechanically self-cleaned automatically upon each rotation as they pass across a spiral groove located on the volute suction. The screw-shaped leading edges of the gray iron impeller shall be hardened to Rc 45 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater. The impeller to volute clearance shall be readily adjustable by the means of a single trim screw. The impellers shall be locked to the shaft, held by an impeller bolt and shall be coated with alkyd resin primer.

J. **VOLUTE / SUCTION COVER (for N-pumps)** The pump volute shall be a single piece gray cast iron, ASTM A-48, Class 35B, non-concentric design with smooth passages of sufficient size to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified. The volute shall have a replaceable suction cover insert ring in which are cast spiral-shaped, sharp-edged groove(s). The spiral groove(s) shall provide trash release pathways and sharp edge(s) across which each impeller vane leading edge shall cross during rotation so to remain unobstructed. The insert ring shall be cast of (ASTM A-48, Class 35B gray iron or ASTM A-532 (Alloy III A) 25% chrome cast iron) and provide effective sealing between the multi-vane semi-open impeller and the volute housing.

K. **PROTECTION** All stators shall incorporate thermal switches in series to monitor the temperature of each phase winding. The thermal switches shall open at 125°C (260°F), stop the motor and activate an alarm. A leakage sensor shall be available as an option to detect water in the stator chamber. The Float Leakage Sensor (FLS) is a small float switch used to detect the presence of water in the
when activated, the FLS will stop the motor and send an alarm both local and/or remote. **Use of Voltage Sensitive Solid State Sensors and Trip Temperature Above 125°C (260°F) Shall Not Be Allowed.** The thermal switches and FLS shall be connected to a Mini CAS (Control and Status) monitoring unit. The Mini CAS shall be designed to be mounted in any control panel.

### 2.3 FLYGT ACCESSORIES

**A. 4” Pump Bases, Mix Flush Valve.** The mix flush valve keeps the wet well stirred and holds down orders. There will be no exception to this component. SS rail assemble with ss upper guide rail brackets. SS pump lifting chain. 4” Dezurik plug valve with lever operator, 4” Flygt ball check, Aluminum trash basket with standoff rails and ss lifting chain. SS portable hoist with SS cable and wench.

### 2.3 FLYGT SYSTEM CONSTRUCTION

**A. Control Panel** The contractor shall furnish and install a pump control system designed to operate sewage pumps in a sewage lift station as described herein. The utility power supply at the lift/pump station shall be 460 volts, 3 phase, 4 wire. The duplex submersible pump motors shall be rated at 2.4 HP 10 FLA’s each and shall be equipped with an internal thermal switch for high temperature protection and probes to detect the presence of moisture inside the motor housing.

B. The control system shall be designed to operate two submersible pumps based on wet well level monitored by float type level sensors. Four normally open float level sensors shall be required for automatic operation of the duplex pump station. The control panel shall be designed for the float level sensors to operate on 24 VAC to provide the following functions; stop pumps, start lead pump, start lag pump, and high level alarm. The panel shall require electromechanical and solid state components for interface with wet well level sensors, built-in pump sensors, and to meet control requirements.

C. This specification describes the Flygt Float series of pump control systems.

D. Electrical equipment, materials and workmanship shall comply with all applicable codes, safety and fire law regulations at the location of the work and shall conform to applicable codes and standards of the organizations listed below.

1. Institute of Electrical and Electronic Engineers. (IEEE)
3. National Electrical Manufacturers Association (NEMA)
4. American National Standards Institute. (ANSI)
5. Underwriters Laboratories. (UL-508 or 913 for intrinsically safe)

E. All equipment and materials shall be new and shall bear the manufacturers name and trade name. In cases where the standard has been established for the particular material, the material shall be so labeled. The equipment to be furnished shall essentially be the standard product of a manufacturer regularly engaged in the production of the required type of equipment for this type of work and shall be the manufacturers latest approved design. Equipment and material shall be suitably delivered and stored and shall be readily accessible for inspection. All items subject to moisture damage shall be stored in dry spaces. All material and equipment shall be protected against dirt, dust, water and chemical or mechanical injury, vandalism and theft.

F. The described equipment shall be housed in a single NEMA 3R enclosure fabricated from:

14 gauge galvanized steel with a baked ANSI gray finish inside and out over zinc phosphatized surface

G. Enclosure shall be padlockable. Fiberglass enclosure shall also be gasketed. Enclosure sizing shall be the responsibility of the system panel manufacturer.

H. The hinged inner door shall be provided fabricated from 5052-H32.080 marine alloy aluminum. The hinged inner door shall contain cut-outs for all circuit breaker toggles. Control switches and indicators shall be labeled and mounted to the hinged inner door to keep operators from entering the live electrical compartment. A warning sign stating “DANGER -- Disconnect all sources of power before opening door” shall be installed on the inner door. It shall be completely removable for ease of service and shall be held closed by at least (2) hand operated 1/4 turn fasteners.

I. The following items shall be mounted on the inner door:
   1. Lead pump selector switch to manually select or automatically alternate the lead pump.
   2. Hand-Off-Automatic rocker/toggle switch to select the operating mode for each pump.

J. The panel shall have 24 volt control circuitry for the float sensor in the wet well with relay logic control system. Relays shall be of the square base plug in type with integral LED indicator lights. All relays shall have a transparent polycarbonate dust cover to protect the contact surfaces from airborne dust and other contaminants. All relays shall have DPDT or 4PDT contacts, as required. Relays shall be rated for continuous duty operation.
K. Relay contacts shall be rated for 10 amps at 300VAC. Relay sockets shall have screw terminals with self-lifting clamps and terminal identification numbers located at each connection on the relay socket.

L. Provide a solid state lightning arrester connected to the incoming supply power at the main line lugs or power distribution block. The lightning arrester shall be designed to protect control equipment from damage due to lightning strikes on the incoming power supply line.

M. A phase monitor relay shall be installed to monitor the incoming three phase power supply. The voltage level shall be adjustable and a LED indicator shall glow to indicate that the incoming power supply conditions are acceptable. The phase monitor relay shall be used to disconnect all motor starter coil power when the following conditions exist: Low voltage, Voltage unbalance, Phase loss, and Incorrect phase sequence. The phase monitor relay shall automatically reset when the fault condition has been corrected. The phase monitor relay shall be protected with an input fuse on each incoming power supply phase.

N. Each pump motor shall be provided with a NEMA rated full voltage non-reversing across-the-line magnetic motor starter. Starters shall provide single phase protection and be equipped with Class 10 or 20 bimetallic ambient compensated overload heaters. The adjustable overload heaters shall be sized according to the motor nameplate data. The motor starter coil shall be rated 120 volts. The motor starter shall be inoperative whenever the overload heaters are removed or have tripped. A overload reset push button shall be provided on the inner door for each motor starter.

O. Miscellaneous required equipment in the panel:

a. A GFI receptacle shall be provided to protect against ground fault leakage and shock. The unit shall have a retractable ground pin and polarized blades for two (2) or three (3) wire receptacles. The unit shall require a reset after any ground fault interruption.

b. A heating system shall be provided to maintain the internal temperature 2 - 3 degrees F above ambient temperature to prevent condensation inside the duplex control panel. A thermostat shall not be required.

c. A solid state duplex alternator shall be provided to alternate pump starting sequence at the end of each cycle. The duplex alternator shall be rated 120VAC.

d. The panel shall have a lead pump selector switch mounted on the inner door to manually select or automatically alternate the lead pump.
e. A non-resettable elapse time meter shall be mounted on the inner/outer door to record the accumulated running time for each pump. The elapse time meter shall be rated (select one) 24 aC.

f. A lag pump time delay (1 - 60 second) relay shall be included to prevent simultaneous starting of both pumps after a power failure.

g. The panel shall have lights mounted on the inner door to indicate the ON or RUN operation of each pump.

h. The panel shall have indicating lights mounted on the inner door to indicate the operation of each float level sensor.

i. The panel shall have a indicating light mounted on the inner door to indicate high level alarm. Manual reset is accomplished by pressing the high level or common reset button located on the inner door after the high level condition has been removed.

j. The panel shall have a indicating light mounted on the inner door to indicate low level alarm. Manual reset is accomplished by pressing the low level or common reset button located on the inner door after the water level has increased above the stop pumps level sensor.

P. The panel shall have indicating lights mounted on the inner door to indicate motor over-temperature for each pump. Automatic reset is accomplished by allowing the motor to cool and self reset. Manual reset is accomplished by pressing the appropriate motor over-temperature reset button located on the inner door. Control power to the motor starter coil shall be disconnected when a over-temperature condition is detected.

Q. The panel shall have indicating lights mounted on the inner door connected to moisture detection relays mounted on the back panel to indicate seal failure alarm for each pump. This circuit can only be reset by removing the water from the motor outer housing. Manual reset is accomplished by pressing the appropriate seal failure reset button located on the inner door after removing the water/moisture. The pump shall be allowed to continue operating when seal failure has been detected.

R. The panel shall have indicating lights mounted on the inner door connected to seal minder relays (ABS) mounted on the back panel to indicate seal failure alarm for each pump. This circuit can only be reset by removing the water from the motor outer housing. Manual reset is accomplished by pressing the appropriate seal failure reset button located on the inner door after removing the water/moisture. The pump shall be allowed to continue operating when seal failure has been detected.

S. The panel shall have indicating lights and reset buttons mounted on the inner door connected to a 24 VAC Control And Status module (Flygt Mini-CAS II) mounted on the back panel to indicate seal failure and over-temperature alarm for each pump. Manual reset is accomplished by pressing the appropriate Mini-CAS reset
button located on the inner door. The pump shall not be allowed to continue operating when a seal failure or over-temperature has been detected.

T. The panel shall have a red/amber alarm beacon mounted on top of the panel. The alarm beacon shall be rated 120 VAC, 40/60W, and shall illuminate/flash for the following condition(s): high level alarm. The panel shall have a audible alarm mounted on the side of the panel. A silence push button shall be mounted on the inner door. The audible alarm shall be rated 120 VAC, 90db at 2 feet (min.), and shall sound for the following condition(s); high level alarm.

U. The terminal strip shall be mounted on a 45° angle using rail offset brackets to angle up bottom side of terminals from back panel to ease field wiring connections. Rail offset brackets shall be zinc bichromate plated steel. All wiring within the control system enclosure should be installed in wiring duct and terminated at the terminal blocks.

2.4 EXPERIENCE The pump vendor shall have a minimum of 10,000 heavy-duty submersible wastewater pumps installed and operating for no less than 5 years in the New Mexico.

2.5 WARRANTY AND START UP

A. The lift station equipment provided shall be warranted in writing against defects in materials or workmanship under normal use and service for a period of one year after date of original operation but not more than 18 months from date of shipment from the Company's factory when installed and used in accordance with good standard practice.

B. Start up shall consist of a full lift station witnessed test with a written report back to the Engineer.

C. On maintenance visit on the 12 month anniversary after start up shall be performed at the manufacturer’s cost with a written report of findings and maintenance performed.
PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. All work and materials in this Section shall be performed in accordance with the Contract Drawings and the New Mexico Standard Specifications for Public Works Construction, Latest Edition, including all updates, and all applicable laws, codes, and regulations.

B. Generally include but not be limited to furnishing all necessary material, labor, and equipment to construct the following:

1. Pipes and appurtenances for potable water.

1.2 REFERENCES

A. AWWA:

1. C110: Gray iron and ductile iron fittings 3" through 48" for water and other liquids.
5. C900: Polyvinyl chloride (PVC) pressure pipe 4" through 12" for water.
6. C905: Polyvinyl chloride (PVC) pressure pipe 14" through 36" for water.

B. ASTM:

2. A536: Ductile iron castings.
4. D1598: Test for time-of-failure of plastic pipe under long-term hydrostatic pressure.
5. D1599: Test for short-term rupture strength of plastic pipe, tubing and fittings.
6. D1784: Polyvinyl chloride (PVC) compound and chlorinated polyvinyl chloride (PVC) compounds, rigid.
7. D1785: Polyvinyl chloride (PVC) plastic pipe, Schedules 40, 80 and 120.
10. D2241: Polyvinyl chloride (PVC) plastic pipe (SDR-DO).
11. D3139: Joints for plastic pressure pipes using flexible elastomeric seals.
12. E8: Tension testing for metallic materials.

1.3 SUBMITTALS

A. Submittals per Section 01 33 00.
B. Product Requirement: Section 01 60 00.
C. Manufacturer's installation recommendations.

1.4 GENERAL REQUIREMENTS

A. Pipes, fittings and materials to be new, of highest quality and shall be in first class condition when installed.
B. Pipe, fittings and appurtenances of the same type and made by the same manufacturer.
C. Provide labor, equipment and materials for pipe field testing.
D. Contact and coordination with utility's owner is the full responsibility of the Contractor.

1.5 HANDLING AND STORAGE OF PIPE AND APPURTENANCES

A. Pipe, valves, hydrants, and other appurtenances shall, unless otherwise directed, be unloaded, hauled and laid as follows:

1. Pipe and appurtenances shall be lifted by hoists with broad well padded contact surfaces, or rolled on skidways in such a manner to avoid shock.
2. Under no circumstances shall pipe or appurtenances be dropped.
3. Pipe must not be rolled or skidded against pipe already on the ground.

B. The Contractor shall be responsible for the safe storage of material furnished by or to him and accepted by him, and intended for the work, until it has been incorporated in the completed project.
C. Installation:

1. In distributing material at the site of the work, each piece shall be unloaded opposite or near the place where it is to be laid in the trench.
2. Pipe shall be handled in a manner that only a minimum amount of damage to the pipe exterior will result. Damaged piping shall be repaired in a manner satisfactory to the Engineer or replaced.
3. The interior of all pipe, fittings, and other appurtenances shall be kept free from dirt and foreign matter at all times.

1.6 QUALITY ASSURANCE

A. Ductile Iron:

1. Tests:
   b. ASTM E23: Impact Test.
2. Marking: cast on each pipe length:
   a. Weight, class, nominal thickness and casting period.
   b. Manufacturer's name, year of production and the letters "DI" or the words "Ductile Iron."

B. PVC Pipe and Fittings:

1. Tests: ASTM D3034
2. Marking: indelible, in each pipe:
   a. Diameter and cell classification.
   b. Manufacturer's name, ASTM, SDR or Schedule and date of production.
   c. Service designation.
   d. NSF approved.
3. Rubber rings: marked with the manufacturer's identification, size, year of production and classes of pipe in which they are to be used.

C. Valves:

1. Valves shall be built and equipped for the type of operation shown on the Plans or as directed by the Engineer.
2. All valves shall be of standard makes approved by the Engineer and shall have the name, monogram, or initials of the manufacturer cast thereon.
3. Dielectric gaskets or unions will be used when dissimilar metals are connected to each other.
2.1 MATERIALS AND FABRICATION

D. Ductile Iron:

1. Pipe:
   a. ANSI A21.51 (AWWA C151).
   b. ASTM A536, Grade 60-42-10.
   c. Ductile iron pipe shall meet ANSI/AWWA A21.51/C151 specifications:

2. Fittings:
   a. Ductile iron, ANSI A21.10 (AWWA C111).
   b. ASTM A536, Grade 80-60-03 or 70-50-05.
   c. Hydrostatic test: Rated at minimum 150psi.

3. Threaded connections: ANSI B2.1 NPT.

4. Joints:
   a. Mechanical: 350 psi working pressure.
   b. Flange: DI; ANSI A21.14 or B16.1, 125 lb.
   c. Gaskets: ASTM D1330, Grade I.
   d. Push-on gaskets: neoprene or other synthetic rubber, D412 and D395. Natural rubber not acceptable.
   e. Lubricant: Heavy vegetable soap solution suitable for potable water use.

5. Flanged adapters:
   c. Bolts: Steel with heavy hex nuts, ASTM A576.
   d. Gaskets: Fastite neoprene.

E. Polyvinyl Chloride (PVC):

1. Pipe and fittings:
   a. AWWA C900:
      (1) All Sizes: SDR18 or as scheduled.
      (2) Pressure Class: 200 psi or as scheduled.

2. Joints:
   a. Gasket bell end: ASTM D3139 for plastic pressure pipes using elastomeric seals.
   c. Solvent-Cement: Manufacturer's standard; use only where specifically scheduled, shown on Drawings or approved by Engineer.
F. Service Lines:

1. High Density Polyethylene:
   a. ASTM D2239, SDR-9, iron pipe size; or:
   b. ASTM D2737, SDR-7, copper pipe size.
   c. Contractor's option unless otherwise scheduled.


3. Joints:
   a. Compression fittings.
   b. Compatible with heavy duty copper service fittings.

2.2 APPURTENANCES

G. Fire Hydrants:

1. Latest revision of AWWA C-502.
3. 1-1/2" Pentagon bronze operating nut equipped with elastomer weather seal between the top casting and the operating nut.
4. Sealed oil reservoir will inmate a system of Ford lubrication of the thrust collar area each time the hydrant is operated.
5. Two 2.5" and one 4.5" nozzles with National Standard fire hose threads mechanically connected into the barrel, O-ring sealed with National Standard nozzle caps.
6. Steel safety stem coupling with stainless steel fasteners and two-piece breakaway safety flange.
7. Centerline of hose nozzle will be a minimum of 18" above ground line.
8. 5-1/4" diameter main valve opening.
9. Upper valve plate shall be all bronze.
10. All internal surfaces of the shoe, the lower valve plate and cap nut shall be coated with a factory-applied, two-part, thermosetting epoxy coating with a minimum thickness of 4 mils.
11. The bronze valve seat shall be threaded into a bronze drain ring or shoe bushing; the drain channel shall be all bronze.
12. The hydrant shall have two drain outlets above the lower flange of the hydrant shoe assembly.
13. 200 psi working pressure, and be certified as such by the manufacturer.
14. Lower barrel to shoe connection will have a minimum of six bolts made of stainless steel.
15. All hydrants furnished will have a standard 10-year warranty certified by the manufacturer.
16. Painted chrome yellow.
H. One Manufacturer’s hydrant wrench supplied with each hydrant installed.

I. Resilient Wedge Gate Valves:

1. Size as shown on Drawings.
2. Mueller, Clow, Waterous, American Darling, Resilient Wedge Gate Valves or Engineer approved equivalent.
3. Valves shall conform to AWWA C-509 and comply with its latest revisions.
4. The wedge shall be cast iron, fully encapsulated in molded rubber including the guides. The bronze stem nut must be rigidly enclosed in the wedge to maintain alignment.
5. The stem shall have two O-rings above and one O-ring below the collar. Stem seats must be replaceable with the valve under pressure.
6. The stem material shall be stainless steel (AISI420) or Engineer-approved equivalent.
7. The waterway shall be full size to allow for tapping use; no cavities or depressions are permitted in the seat area.
8. Valve body and bonnet shall be electrostatically applied, fusion bonded and epoxy coated, both inside and out, by the valve manufacturer. The coating shall meet the requirements of AWWA C-550. Coating to be applied only at the valve manufacturer's facilities.
9. The bonnet bolts shall not be exposed to the environment or, alternatively, be in 316 stainless steel.
10. O-ring style seals shall be used as gaskets on the bonnet and on the stuffing box.
11. All valves must be tested by hydrostatic pressure equal to the requirements in the AWWA C-509 specifications prior to shipment from the manufacturer.
12. 2-inch AWWA operating nut for valves in below-ground service; handwheel for above-ground service.
13. Mechanical joint ends for pipe or as shown on drawings.

J. Swing Check Valves:

1. 3" and smaller: bronze, swing disc, screwed ends.
2. 4" and larger: iron body, bronze trim, swing disc, renewable disc and seat, outside weight and lever for exposed service, flanged ends.

K. Air Pressure and Vacuum Relief Valves:

1. Cast iron body, cover and baffle; stainless steel trim and float.
2. Sized for up to 800 gpm; 0 - 250 psi.
3. Seat: Buna-N.
4. 3" and smaller: NPT threaded outlet.
5. 4" and larger: Plain outlet with steel protector hood.
6. Val-Matic, Crispin or Engineer-approved equivalent.

L. Backflow Preventer:

5. Minimum working pressure: 250 psi.
7. Breco Model 6 (Hersey-Sparling) or Engineer-approved equivalent.

M. Valve Boxes:

1. Cast iron, adjustable extension, traffic type.
2. Minimum thickness of metal at any point: 3/16".
3. Removable cast iron cover.
4. For valves on washwater and irrigation system only: Class 200 PVC pipe.
5. All valve boxes for plug valves shall be designed for integral installation of the required valve position indicator.
7. Cover marked "Water".

N. Tapping Sleeves:

1. Minimum working pressure 250 psi.
2. Mechanical joint type.
3. Sizes as shown on Drawings.
4. Mueller Type H-615 with two end gasket sets that allow to fit all classes of cast iron pipe or Engineer-approved equivalent.

O. Tapping Crosses:

1. Minimum working pressure 250 psi.
2. Mechanical joint type.
3. Sizes as shown on Drawings.
4. Mueller Type H-715 with two end gaskets sets that allow to fit all classes of cast-in pipe or Engineer-approved equivalent.
P. Tapping Valves:
   1. Minimum working pressure 250 psi.
   2. Size as shown on the Drawings.
   3. Mueller Type H-667 mechanical joint on outlet side and flange end on opposite side; attach to tapping drilling machine, or Engineer-approved equivalent.
   4. AWWA C500.

Q. Inserting Valves:
   1. Sizes as shown on Drawings.
   2. Minimum working pressure 250 psi.
   3. Comply with Part 2.02C.
   4. Mueller Type H-800 for cast iron pipe or Engineer-approved equivalent.

R. Gauges:
   1. All gauges shall be 3” in diameter.
   2. Each gauge shall be installed with block and bleed valves, and with a snubber and dielectric coupling.

S. Tracer Wire:
   1. Conductor shall be solid or stranded copper per ASTM B-1, B-3, or B-8.
   2. Insulation of conductor shall be yellow, high molecular weight polyethylene (HMWPE).
   3. The temperature rating of the tracer wire shall be 75 degrees Celsius, dry and wet. The voltage rating shall be 600 Volts.
   4. Tracer wire shall be installed on all gas/propane and water lines.

T. Sentry Posts:
   1. Metal posts.
   2. Water pipeline warning sign.
PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Trenching, Backfilling and Compacting: Section 31.00.00
2. Pipe Cutting:
   a. Pipe cutting measurement taken at site.
   b. Cutting of pipe or inserting valves, fittings, or closure pieces shall be done in a neat and workman like manner without damage to the pipe.
3. Direction of Bells:
   a. Unless otherwise directed, pipe shall be laid with bell ends facing the direction in which work is progressing.
   b. Pipe laid on an appreciable slope shall be laid with bell ends facing uphill.
4. Pipe Plugs: At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other means approved by the Engineer.
5. Pipe Cleanliness:
   a. Clean all pipe, fittings and appurtenances before use.
   b. Foreign materials or objects shall be prevented from entering the pipe while it is placed in the trench.
6. Temporarily support, adequately protect and maintain all underground and surface utility structures, drains, sewers, and other obstructions encountered in the progress of work.

B. Pipe Alignment and Grade

1. All pipe shall be laid and maintained to the required lines and grades; with fittings, valves, and hydrants at the required locations, with joints centered and spigots home; and with all valve and hydrant stems plumb.
2. Deviations:
   a. Wherever existing utility structures or branch connections leading to main sewers or to main drains, or other conduits, ducts, pipes or structures present obstructions to the grade and alignment of the pipe, they shall be permanently supported, removed, relocated, or reconstructed by the Contractor through cooperation with the owner of the utility, structure or obstruction involved.
   b. No deviation shall be made from the required line or grade except with the written consent of the Engineer.
   c. The Contractor shall make all necessary explorations to determine the location of existing pipes, valves, or other
underground structures. The Owner and Engineer shall furnish all available information; however, such information cannot be guaranteed as accurate.

3. Depth of Bury:
   a. Depth of bury shall be as shown in the Plans.
   b. Minimum depth of bury of 3'-0" as measured from the established road grade or the surface of the permanent improvement to the top of the barrels of the pipe. When crossing the arroyo and/or drainage swales, depth of bury shall be 4'-0".

C. Pipe Laying:

1. Proper implements, tools, and facilities shall be provided and used for the safe and convenient performance of the work.
2. All pipe fittings, valves and hydrants shall be lowered carefully into the trench by means of a derrick, ropes, or other suitable tools or equipment, in such a manner as to prevent damage to water main materials and protective coatings and linings.
3. Under no circumstances shall water main materials be dropped into trench.
4. Trench shall be dewatered prior to installation of pipe.

D. Jointing and Assembling:

1. Joints shall be installed in accordance with manufacturer’s written Installation and Operation Manual and approved submittals.
2. Lubricants: Vegetable soap solution suitable for use on potable water systems.
3. Precaution must be taken to prevent entrance of soil and other contaminants.
4. Use mechanical or push-on for exterior locations.
5. All lumps, blisters, burrs or excess coating shall be removed from the socket and plain ends of each pipe, and the outside of the plain end and the inside of the bell shall be wiped leaned and dry and be free from dirt, sand, grit, or any other foreign materials.

E. Clean all lines by repeated flushings after installation.

F. Disinfection: Refer to New Mexico Standard Specifications for Public Works Construction section 801.

G. Pipe Sleeves:

1. For all pipes passing through concrete or masonry.
2. Install where practical before concrete is placed.
3. Sleeve seal: watertight, modular sealing element when sleeve is placed in slabs with one side against soil.

H. Buried pipe anchorage:

1. Anchors, joint harness or other acceptable means of preventing pipe movement whether indicated or not required for:
   a. Unlugged bell and spigot or all unflanged tees.
   b. Y branches.
   c. Bends deflecting 22 ½ degrees or more.
   d. Plugs and caps.
   e. Fittings in fills or unstable ground.
   f. Above grade or exposed structure.

2. Restrained joints shall be installed within the vicinity of the arroyo and/or drainage swales.

I. Valves: Installed as shown on Drawings with valve boxes and joint restraint.

J. Fire hydrants: As indicated on Drawings with concrete blocking.

3.2 FIELD QUALITY CONTROL

A. All pipes and fittings tested in the presence of and to the satisfaction of the Engineer. AWWA C600 and C605 should be followed for proper pipe installation procedures and hydrostatic testing methods.

B. Test Conditions (PVC):

2. Perform test at 150 psi for one hour per 1,000 linear foot of pipe or 2 hours minimum

C. Testing Equipment:

1. Pressure gauge used to perform pressure test shall be a digital type gauge with the ability to display testing pressure to one hundredth (1/100) of a psi. The pressure gauge shall be rated for at least the required testing pressure.
2. All equipment for use in supplying water for the testing procedure shall be for potable water use only. A suitable amount of chlorine should be added to the storage device in order to disinfect such device. Prior notice will be given to engineer of method used for supplying water for testing.
3. When existing water mains are used to supply test water, they should be protected from backflow contamination by temporarily
installing a double check-valve assembly between the test and supply main, or by other means approved by the Engineer.

4. All testing equipment are subject to and shall be disinfected per New Mexico Standard specifications for Public Works Construction Section 801 prior to any test. All equipment must pass a bacteriological test prior to being placed in service.

D. Procedure (PVC):

1. Disconnect fixtures, equipment and accessories that may be damaged by test pressure.
2. Plug ends as required.
3. Water shall be applied by means of a pump connected to the pipe in a satisfactory manner.
4. All air shall be expelled from the pipe prior to pressure testing.
5. No installation will be accepted unless the leakage is less than the number of gallons per hour as determined by the formula in New Mexico Standard specifications for Public Works Construction Section 801:

6. Leakage shall be defined as the quantity of water that must be supplied into the pipe section being tested to maintain a pressure within 5 psi of the specified leakage-test pressure after the pipe has been filled with water and the air in the pipeline has been expelled.
7. All joints showing visible leaks shall be properly repaired. Any cracked or defective pipes, fittings, valves, or hydrants discovered in consequence of this pressure test shall be removed and replaced by the Contractor with sound material, and the test repeated.
8. Retest repaired joints, pipes and fittings until system is tight and results are satisfactory to the Engineer.
9. Pipe testing and preparation for use should strictly follow AWWA C605 Section. 7: Preparation for use.
10. Ductile Iron pipe hydrostatic pipe testing shall be done in accordance with section C600: Installation of Ductile-Iron Water Mains and Their Appurtenances. Previously described procedures for hydrostatic testing is for Polyvinyl Chloride (PVC) pipe only.

3.3 PIPE SCHEDULE

A. PVC Pipe:

1. Pipe sizes 4” or less, ASTM 2241, PVC 1120, SDR-21 pressure class 200 psi.
2. Pipe sizes 4” through 12”, AWWA C900, SDR 14 18, pressure class 200 Or Engineer acceptable alternate:

B. Ductile Iron Pipe: Pipe sizes 3” through 12”, pressure class 350 psi.
C. End connections to be push-on joints unless otherwise indicated on the Drawings.

D. Repair and/or replacement of existing water lines damaged during construction: Material generally to match existing or at least quality required by this section.

E. Provide sizes as shown on the Drawings.

3.04 VALVE SCHEDULE

A. Resilient wedge gate valves: as shown on the Drawings.

B. Provide sizes as shown on the Drawings and as provided for in the Bid Schedule.

END OF SECTION - 331000
5. INSTALL 4" 1/2" FIRE HYDRANT WITH 6" GATE VALVE PER NMAPWA STANDARD DETAIL 2340.

14. INSTALL BOLLARD PER DETAIL THIS SHEET.
UTILITY KEYED NOTES

15. GAS SERVICE LINE PROVIDED BY LOCAL GAS COMPANY, COORDINATION WITH LOCAL GAS UTILITY COMPANY AND OWNER IS REQUIRED FOR NEW GAS SERVICE LINE. SEE MECHANICAL PLANS FOR CONTINUATION.

CONTRACTOR SHALL POTHOLE EXISTING TELEPHONE AND GAS LINE AND ENSURE LOCATION AND DEPTH OF BURY ADHERES TO UTILITY REQUIREMENTS. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY WITH ANY DISCREPANCIES.
2 - #5 CONT IN BOND BEAM

CEILING SEE ARCH

2 - #5 WELDABLE REINF TO MATCH AND LAP 2 - #5 FULL HEIGHT

PL 1/2"x7"x0'-7"

L4x4x3/8 BRACE @ 6'-0" OC MAX

PL 1/4"x8"x0'-8" W/ 2-3/4" HAS @ 6" OC TYP

2 - #5 CONT IN BOND BEAM

2 - #5 WELDABLE REINF TO MATCH AND LAP 2 - #5 FULL HEIGHT TYP

PL 1/2"x7"x0'-7"

PJP

3/16 TYP

SCALE: 3/4" = 1'-0"

STEEL COLUMN AT CMU WALL

B3

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MTL BLDG PURLIN BY OTHERS
METAL DECK BY OTHERS

MTL BLDG SIDING
BY OTHERS

MTL BLDG GIRT
BY OTHERS
DESIGN GIRT FOR AN ADDITIONAL
200 PLF SEISMIC LOAD AND
DEFLECTION LIMITATION OF L/600.

MTL BLDG FRAME BY
OTHERS

SCALE: 3/4" = 1'-0"

FRAMING SECTION
MTL BLDG PURLIN BY OTHERS
DESIGN FOR ADDL 1000# SEISMIC LOAD IN ANY DIRECTION

MTL BLDG SIDING BY OTHERS

MTL BLDG FRAME BY OTHERS

L4x4x1/4 DIA BRACE @ EA PURLIN- 5'-0" OC MAX

2 - 3/4" DIA THRU BOLTS @ EA BRACE

1/8 TYP @ EA STUD

CONT L4x4x1/4

FRAMING SECTION

SCALE: 3/4" = 1'-0"
NOTE: COORDINATE INFORMATION WITH ARCHITECTURAL DETAIL C1/A-321.

A1 TYPICAL CANOPY SECTION
SCALE: 3/4" = 1'-0"
**CONN @ METAL BLDG GIRT**

- **3/8" THRU BOLTS @ 16" OC**
- **HSS1 1/2x1 1/2x3/16 x 0'-8" SPACER**

**CONN @ STUD WALL**

- **3/8" THRU BOLTS @ 16" OC**
- **HSS4x4x1/4X0'-8" SPACER**
- **CONT PL 1/4"x6"**
- **TYP @ EA STUD 1/8**

**CONN @ CMU WALL**

- **3/8" THRU BOLTS @ 16" OC**

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**CANOPY DETAIL**

**B1**

**SCALE: 3/4" = 1'-0"**
<table>
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<th>OPENING WIDTH</th>
<th>WIDTH</th>
<th>DEPTH</th>
<th>LINTEL REINFORCING</th>
<th>SILL</th>
<th>JAMB WIDTH</th>
<th>JAMB REINF PER CELL</th>
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<td>16''</td>
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<td>2 - #5</td>
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<td>2 - #5</td>
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<td>2 - #5</td>
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<tr>
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