



ADDENDUM NO. 02

To: Prospective Bidders & Plan Holders

From: Craig A. Johnson, P.E.
Crist Engineers, Inc.

Date: May 5, 2023

Project: Wastewater System Improvements
Kansas Street Parallel Force Main - Phase 1 and 2
Pine Bluff, Arkansas

Bid Date: May 9, 2023

Bid Time: 10:00 AM

Location: City Clerk's Office
200 East 8th Avenue, Room 202
Pine Bluff, Arkansas 71601

The BIDDER shall properly acknowledge Addendum No. 02 as required in Article 3 of Document 004100 on the Bid Form as confirmation that the BIDDER has examined the following Addenda and the related changes to the Contract Documents. Lack of proper acknowledgement on the Bid Form may deem a bid non-responsive.

The Contract Documents dated April 12, 2023, are hereby amended as follows:





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IMPORTANT REMINDERS:

The bid opening for this project is 10:00 AM on May 9, 2023.

Please reference Section 002113 - Instructions to Bidders, provided in the contract documents for information required for the bid submission.

CLARIFICATIONS:

1. Clarification No. 7 – Addendum No. 1
 - A. Delete in its entirety.
2. Contractor Questions
 - A. A list of all contractor questions received to date is attached to this addendum as supplemental information for contractors use.

TABLE OF CONTENTS – ADDENDUM NO. 1:

1. Division 09 - Painting
 - A. Add Division 09 – Painting and specification 099100 – Painting.

BID DOCUMENTS:

1. Section 004100 – Bid Form – Addendum No. 1
 - A. Delete Bid Form Page 4 – Addendum No. 1 and Replace with Bid Form Page 4 – Addendum No. 2, attached hereto.
 - B. Delete Bid Form Page 5 – Addendum No. 1 and Replace with Bid Form Page 5 – Addendum No. 2, attached hereto.
 - C. Delete Bid Form Page 6 – Addendum No. 1 and Replace with Bid Form Page 6 – Addendum No. 2, attached hereto.
 - D. Add Bid Form Page 12 – Addendum No. 2, attached hereto.

SPECIFICATIONS:

1. Specification 010250 – Measurement and Payment – Addendum No. 1
 - A. Paragraph 1.3.R.: Delete in its entirety.
2. Specification 099100 – Painting
 - A. Add specification 099100 – Painting, attached hereto.



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3. Specification 331216 – Wastewater Valves

A. Paragraph 2.4.I: Modify as follows:

- i. Worm gear actuators shall be provided on all valves six inches and larger. Actuators shall be enclosed in a cast iron housing, with outboard seals to protect the bearings and other internal components. The actuator shaft and gear quadrant shall be supported on permanently lubricated bronze bearings. **For all buried MJ plug valves, the worm gear actuators shall be rotated in the 90 degree position for the valve to actuate on a horizontal plane.**

B. Paragraph 2.4.: Add the following:

- i. **L. All plug valves up to 36" in size shall be full port. All plug valves 42" in size and greater shall be minimum 80% port.**

C. Paragraph 2.8.B.: Modify as follows:

- i. Valves shall have ~~bronze~~ **316 stainless steel** seat ring and ~~bronze~~ **316 stainless steel** seat on disc.

D. Paragraph 2.8.J.: Modify as follows:

- i. Swing check valves shall comply with AWWA C508 and shall be ~~as~~ manufactured by Mueller, Clow (McWane), **Dezurik**, or approved equal.

4. Specification 333400 – Sewage Force Main Pipe and Fittings - Addendum No. 1

A. Paragraph 2.2.A.: Modify as follows:

- i. PVC pipe shall conform to the requirements of AWWA ~~C905~~ **C900 and shall be as indicated on the Bid Form** ~~for 200 psi working pressure (DR21).~~ The outside diameter shall be equivalent to cast iron pipe.

5. Specification 355333 – Underwater Pipeline Construction – Addendum No. 1

A. Paragraph 2.7.E.: Modify as follows:

- i. Connections (Mat to Mat) – Connectors shall be provided **on two adjacent mats connected on a platform above the water surface. Connecting adjacent mats in a subaqueous condition is not required** ~~to connect adjacent mats.~~ All connectors that are metallic shall be made of 316-grade stainless steel. Connections from mat to mat shall be by stainless steel cable or stainless-steel banding. Connectors shall be provided by the mat manufacturer.



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DRAWINGS:

1. Drawing G1-03 - General Notes & Legend:
 - A. Add the following paragraph to the Bathymetric Survey Notes:
 - i. **Our approach is to coordinate closely with construction activities to mobilize bathymetric efforts as expeditiously as possible and process data review. The Engineer is afforded 48 hours at most and will expedite as much as possible.**
2. Drawing CZ2-07 – Details V:
 - A. Add new Drawing Sheet CZ2-07 to Addendum No. 2 – Details V, attached hereto.

END ADDENDUM NO. 02

ARTICLE 5 – BASIS OF BID

- 5.01 Bidder will refer to Section 010250 Measurement and Payments prior to preparing the bid schedule.
- 5.02 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

BID SCHEDULE – BASE BID – PHASE 1 & 2 42" DUCTILE IRON & PVC PIPE Kansas Street Parallel Force Main: Phase 1 - Lake Langhofer Subaqueous Crossing & Phase 2 – Levee Crossing, Kansas Street Pump Station Yard Piping and Tie-ins with existing Force Main City of Pine Bluff, Arkansas					
Item No.	Description	Units	QTY	Unit Price	Item Total
1-1	42" Ductile Iron Pipe, Epoxy Lined, Class 150, Raw Sewage Force Main, Restrained, Lake Langhofer Subaqueous Crossing	LF	630	\$	\$
1-2	42" Ductile Iron Pipe, Epoxy Lined, Class 350 Ball Joint, Sewage Force Main, Restrained, Lake Langhofer Subaqueous Crossing	LF	235	\$	\$
1-3	42" Ductile Iron Pipe, Epoxy Lined, Class 150, Raw Sewage Force Main, Restrained, Non-Roadway	LF	235	\$	\$
1-4 Addendum No. 02	42" MJ DI 45° Bend, Restrained	EA	1	\$	\$
1-5	42" MJ DI 22.5° Bend, Restrained	EA	6	\$	\$
1-6 Addendum No. 02	42" MJ DI 11.25° Bend, Restrained	EA	3	\$	\$
1-7	42" MJ Plug, Restrained	EA	2	\$	\$
1-8	Bathymetric Surveying	LS	1	\$	\$

1-9	Articulating Concrete Mats and Accessories	EA	147	\$	\$
1-10	Muck Removal (20 FT Wide x 3 FT Deep) for entire length of lake crossing.	CY	1,860	\$	\$
1-11	Bank Stabilization Mats, Silt Fencing, Etc.	Lump Sum	1	\$	\$
1-12	Shoreline Restoration	Lump Sum	1	\$	\$
1-13	Pipeline Crossing Sign Removal	Each	2	\$	\$
1-14	Pipeline Crossing Sign Installation	Each	4	\$	\$
1-15	Gravel Surface Repair	CY	12	\$	\$
1-16	Bonds and Insurance	LUMP SUM		\$	\$
1-17	Mobilization & Demobilization	LUMP SUM		\$	\$
1-18	Clearing & Grubbing	LUMP SUM		\$	\$
~~1-19~~ Addendum No. 02	~~Route Clearing~~	~~LUMP SUM~~		\$	\$
1-20	Seeding, Mulching, Final Cleanup	LUMP SUM		\$	\$
1-21	Storm Water Permit & S.W.P.P.P.	LUMP SUM		\$	\$
1-22	Maintenance of Traffic	LUMP SUM		\$	\$
1-23	Excavation and Trench Safety System	LUMP SUM		\$	\$
1-24	Miscellaneous & Incidental Work	LUMP SUM		\$	\$
SUB-TOTAL BASE BID FOR ITEMS 1-1 THRU 1-24 (ALL PHASE 1 WORK) (TO BE USED FOR THE DEDUCTIVE ALTERNATE CALCULATIONS)					\$

2-1 Addendum No. 02	42" PVC Pipe, DR 25, Class 165, Raw Sewage Force Main, Restrained, Non-Roadway	LF	1,450	\$	\$
2-2	42" MJ 45° WYE, Restrained	EA	1	\$	\$
2-3	42" MJ TEE, Restrained	EA	3	\$	\$
2-4	42" MJ SLEEVE, Restrained	EA	4	\$	\$
2-5	42" x 36" MJ TEE, Restrained	EA	2	\$	\$
2-6	42" Plug Valve, buried, manual operator.	EA	4	\$	\$
2-7	42" MJ 45° BEND, Restrained	EA	3	\$	\$
2-8	42" MJ 22.5° BEND, Restrained	EA	7	\$	\$
2-9	42" MJ 11.25° BEND, Restrained	EA	2	\$	\$
2-10	42" x 24" MJ Reducer, Restrained	EA	1	\$	\$
2-11	54" HDPE Encasement (Gas Line X-ing's)	LF	50	\$	\$
2-12	36" PVC Pipe, DR21, Class 200, Raw Sewage Force Main, Restrained, Non-Roadway	LF	50	\$	\$
2-13	36" MJ 45° BEND, Restrained	EA	4	\$	\$
2-14	36" Plug Valve, buried, manual operator	EA	1	\$	\$
2-15	24" PVC Pipe, DR21, CL200, Non-Restrained, Non-Roadway	LF	450	\$	\$
2-16	24" MJ 45° Wye, Restrained	EA	1	\$	\$
2-17	24" MJ Plug Valve, buried, manual operator	EA	3	\$	\$
2-18	24" MJ Sleeve, Restrained	EA	4	\$	\$
2-19	24" MJ 45° Bend, Restrained	EA	3	\$	\$

ARTICLE 10 – SCHEDULE OF MAJOR SUBCONTRACTORS

<u>Schedule of Major Subcontractors</u>	
Trade	Company Name & Address

SECTION 099000

PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. The work of this Section includes the coating of all interior and exterior surfaces specified or shown on the Drawings.
- B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, the Engineer will select from standard colors and finishes available.
- C. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.
- D. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1.2 REFERENCES

- A. ASTM D16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.
- B. ASTM D3359 - Method for Measuring Adhesion by Tape Test.
- C. NACE (National Association of Corrosion Engineers) - Industrial Maintenance Painting.
- D. NPCA (National Paint and Coating Association) - Guide to U.S. Government Paint Specifications.
- E. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.
- F. Paint manufacturer's printed instructions.

1.3 DEFINITIONS

- A. DFT - dry film thickness
- B. mil(s) - a unit of measure equal to a thousandth of an inch (0.0254) mm.
- C. VOC(s) - volatile organic compound(s)

1.4 INTERPRETATION

- A. The Engineer's decision shall be final in the interpretation and/or conflict between any of the referenced Specifications and Standards contained herein.

1.5 SUBMITTALS

- A. Procedures for Submittals: Section 013300.
- B. Provide a list of materials to be used under this Section. Submit the list before the materials are delivered to the job site. Cross reference the list to the painting schedule specified herein.
- C. Product Data: Manufacturer=s descriptive data fully describing each product to include solids by volume. Include manufacturer=s recommendations for mixing, thinning and curing.
- D. Submit to the Engineer three (3) sets of the paint manufacturer=s standard color charts reflecting the full range of colors for the particular paint product and formulation being considered. The Submittal shall be delivered to the Engineer at least 30 days prior to the scheduled delivery of the paint products. The Owner will select the paint colors for each element to be coated from the manufacturer=s standard paint charts.
- E. Qualification Data: For Applicator.
- F. Coordinate work so as to allow sufficient time for paint to be delivered to the job site.

1.6 QUALITY ASSURANCE

- A. General: Use quality assurance procedures and practices to monitor all phases of surface preparation, application and inspection throughout the duration of the project. Procedures or practices not specifically defined herein may be utilized provided they meet recognized and accepted professional standards.
- B. Surface Preparation: Surface preparation will be based upon comparison with: "Pictorial Surface Preparation Standards for Painting Steel Surfaces" SSPC-VIS 1-89 and ASTM Designation D2200, "Standard Methods of Evaluating Degree of Rusting on Painted Steel Surfaces" SSPC-VIS 2 and ASTM Designation D610; "Visual Standard for Surfaces of New Steel Airblast Cleaned with Sand Abrasive".
- C. Application: No coating shall be applied: When the surrounding air temperature or the temperature of the surface to be coated or painted is below the minimum surface temperature for the products specified herein; or in rain, snow, fog or mist; when the temperature is less than 5 degrees F above the dew point; when the air temperature is expected to drop below 35 degrees F within six hours after application of coating. Dew point shall be measured by use of an instrument such as a Sling Psychrometer in conjunction with U.S. Department of Commerce Weather Bureau Psychrometric Tables. If the above conditions are forecast, coating or painting shall be completed in time to permit the film sufficient drying time prior to damage by atmospheric conditions.
- D. Thickness and Holiday Checking (Steel Surfaces): Thickness of coatings shall be checked with a non-destructive, magnetic-type thickness gauge. Use as instrument such as a Tooke Gauge if a destructive tester is deemed necessary. The integrity of coated surfaces shall be checked with an approved inspection device. Non-destructive holidays shall not exceed 672 volts nor shall destructive holiday detectors exceed the voltage recommended by the manufacturer of the coating system. For thickness between 10 and 20 mils, use a non-sudsing type wetting agent, such as Kodak Photo-Flow. Failures shall be marked, repaired in accordance with the manufacturer's printed recommendations and retested. No pinholes or other irregularities will be permitted in the final coating.

- E. Inspection Devices: The Contractor shall furnish, until final acceptance of coating and painting, inspection devices in good working condition for detection of holidays and measurement of dry film thickness (dft) of coating. The Contractor shall also furnish U.S. Department of Commerce, National Bureau of Standards certified thickness calibration plates to test accuracy of dft gauges and certified instrumentation to test accuracy of holiday detector. Dry film thickness gauges and holiday detectors shall be made available for the Engineer's use at all times until final acceptance of application. Holiday detection devices shall be operated in the presence of the Engineer.
- F. Warranty Inspection: Warranty inspection shall be conducted during the eleventh month following completion of all coating and painting work. All defective work shall be repaired in accordance with this specification and to the satisfaction of the Engineer/Owner.

1.7 QUALIFICATIONS

- A. The Contractor shall employ the services of an experienced and properly equipped Painting Subcontractor to conduct the painting and coating as detailed on the Drawings and specified herein.
- B. The Painting Subcontractor shall have three (3) years practical experience and successful history in the application of specified products to surfaces in water treatment, wastewater treatment, or industrial facilities.
- C. The Painting Subcontractor shall be a knowledgeable and experienced professional, fully aware of the methods and regulatory requirements of coating removal and application.
- D. Upon request, the Painting Subcontractor shall substantiate their qualifications by furnishing a list of references and job completions.
- E. The Painting Subcontractor shall be subject to approval by the Owner and/or Engineer.

1.8 DELIVERY AND STORAGE

- A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
 - 1. Product name or title of material.
 - 2. Product description (generic classification or binder type).
 - 3. Manufacturer's stock number and date of manufacture.
 - 4. Contents by volume, for pigment and vehicle constituents.
 - 5. Thinning instructions.
 - 6. Application instructions.
 - 7. Color name and number.
 - 8. VOC content.
- B. Materials shall not be used until the Engineer has inspected contents and obtained data from information on containers or label. Materials exceeding storage life recommended by the manufacturer shall be rejected.
- C. All coatings and paints shall be stored in enclosed structures at temperatures between 35-deg F and 100-deg F to protect them from weather and excessive heat or cold. Flammable coatings or paint must be stored to conform with City, County, State and Federal safety codes for flammable coating or paint materials. At all times coatings and paints shall be protected from freezing.

1.9 SAFETY AND HEALTH REQUIREMENTS

- A. General: The Contractor shall perform all work in accordance with applicable local, state, and federal laws and regulations, and material manufacturer's instructions and recommendations pertaining to the methods, materials, or activities in the work. Some of these regulations are included in the following groups:
1. Occupational Safety and Health Act and derived regulations.
 2. Clean Air Act and derived regulations, both federal and state.
- B. The items listed below are intended to call the Contractor's attention to some of the frequently necessary compliance activities. The Contractor is solely responsible for compliance with applicable regulations including, but not limited to, the areas identified in this Specification. The Contractor shall provide and require the use of personal protective equipment for persons working on or about the project.
1. Head and Face Protection and Respiratory Devices: Equipment shall include protective helmets which shall be worn by all persons while in the vicinity of the work. In addition, workers engaged in or near the work during sandblasting shall wear appropriate eye and face protection devices and air purifying, half mask or mouthpiece respirators with appropriate filters.
 2. Ventilation: Where ventilation is used to control hazardous exposure, all equipment shall be explosion-proof. Ventilation shall reduce the concentration of air contaminants to the degree a hazard does not exist. Air circulation and exhausting of solvent vapors shall be continued until coatings have fully cured.
 3. Sound Levels: Whenever the occupational noise exposure exceeds maximum allowable sound levels, the Contractor shall provide and require the use of approved ear protective devices.
 4. Illumination: Adequate illumination shall be provided while work is in progress, including explosion-proof lights and electrical equipment. Whenever required by the Engineer, the Contractor shall provide additional illumination and necessary supports to cover all areas to be inspected. The level of illumination for inspection purposes shall be determined by the Engineer.
 5. Temporary Ladders and Scaffolding: All temporary ladders and scaffolding shall conform to applicable safety requirements. They shall be erected where requested by the Engineer to facilitate inspection and be moved by the Contractor to locations requested by the Engineer.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Materials specified are those that have been evaluated for the specific service. Products are listed to establish a standard of quality. Equivalent materials of other manufacturers may be substituted on written approval of the Engineer in accordance with Section 016000. Acceptable manufacturer:
1. Tnemec Company, Inc.
 2. Sherwin Williams
 3. Induron

- B. Requests for substitution shall include manufacturer's literature for each product giving name, product number, generic type, descriptive information, solids by volume, recommended dft and certified laboratory test reports showing results to equal the performance criteria of the products specified herein. In addition, a list of five projects shall be submitted in which each product has been used and rendered satisfactory service. The listed projects shall be in the States of Texas, Oklahoma, Louisiana, or Arkansas. Submit manufacturer's certified test reports shall be showing that the substitute products equal or exceed the performance of the specified products.
 - 1. No request for substitution shall be considered that would decrease film thickness or offer a change in the generic type of coating specified.
- C. Products for each specified function and system shall be of a single manufacturer.

2.2 PAINT MATERIALS, GENERAL

- A. Paints and coatings shall be new, first-quality products of a single manufacturer.
- B. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- C. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
 - 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
- D. Any product applied without prior approval by the Engineer, if deemed necessary by the Engineer, will be completely removed to base material by scraping, sandblasting, or other suitable means; and the coating reestablished with approved and sanctioned products as approved by the Engineer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application.
 - 1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
 - 2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify Engineer about anticipated problems when using the materials specified over substrates primed by others.

3.2 GENERAL

- A. All surface preparation, coating and painting shall conform to applicable standards of the Steel Structures Painting Council and the manufacturer's printed instructions. Material applied to the surface prior to the approval of the Engineer shall be removed and re-applied to the satisfaction of the Engineer at the expense of the Contractor.
- B. All work shall be performed by skilled craftsmen qualified to perform the required work in a manner comparable with the best standards of practice. Continuity of personnel shall be coordinated with the Engineer.
- C. Dust, dirt, oil, grease or any foreign matter that will affect the adhesion or durability of the finish must be removed by washing with clean rags dipped in an approved cleaning solvent and wiped dry with clean rags.
- D. Coating and painting systems include surface preparation, prime coating and finish coatings. Unless otherwise approved by the Engineer, prime coating shall be field applied. Where prime coatings are shop applied, the Contractor shall instruct suppliers to provide the prime coat compatible with the finish coat specified. Any off-site work which does not conform to this specification that is damaged during transportation, construction or installation shall be thoroughly cleaned and touched-up in the field as directed by the Engineer. The Contractor shall use repair procedures which insure the complete protection of all adjacent primer. The specified repair method and equipment may include wire brushing, hand or power tool cleaning, or dry-air blast cleaning. In order to prevent injury to surrounding painted areas, blast cleaning may require use of lower air pressure, smaller nozzle and abrasive particle sizes, or shorter blast nozzle distance from surface shielding and masking. If damage is too extensive or uneconomical to touch-up, then the item shall be re-cleaned and coated as directed by the Engineer.
- E. The Contractor's coating and painting equipment shall be designed for application of materials specified and shall be maintained in first class working condition. Compressors shall have suitable traps and filters to remove water and oils from the air.
- F. Application of the first coat shall follow immediately after surface preparation and cleaning and before rust bloom occurs. Any cleaned areas not receiving first coat within this period shall be re-cleaned prior to application of first coat.
- G. Prior to assembly, all surfaces made inaccessible after assembly shall be prepared as specified herein and shall receive the coating or paint system specified.

3.3 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
 1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.

1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
1. Provide barrier coats over incompatible primers or remove and reprime.
 2. Cementitious Materials: Prepare concrete, concrete unit masonry, and cement surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
 - a. Use abrasive blast-cleaning methods if recommended by paint manufacturer.
 - b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces if moisture content exceeds that permitted in manufacturer's written instructions.
 - c. Prepare concrete floors to be coated by shotblasting all surfaces to create a surface profile similar to medium grit sandpaper in accordance with NACE No. 6 - SSPC-SP13.
 2. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 - b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
 - c. If transparent finish is required, backprime with spar varnish.
 - d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on back side.
 - e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.
 4. Ferrous Metals: Clean un-galvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.
 - a. Blast steel surfaces clean as recommended by paint system manufacturer and according to SSPC-SP6.
 - b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
 - c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.
 5. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods. Abrasive blast clean to obtain a 1.5 to 2.0 mil surface profile.

- D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
 3. Use only thinners approved by paint manufacturer and only within recommended limits.
- E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.4 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.
 2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 3. Provide finish coats that are compatible with primers used.
 4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, convactor covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
 5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
 7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
 8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
 9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
 10. Sand lightly between each succeeding enamel or varnish coat.
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
 2. Omit primer over metal surfaces that have been shop primed and touch-up painted.
 3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.
- C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
 2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
 3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
- D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.
- E. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.
- F. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with and after backrolling lay down with a short nap roller in order to obtain a uniform finish with all pores filled.
- G. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Re-coat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
- H. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.
- I. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.5 CLEAN UP

- A. Upon completion of the work, all staging, scaffolding and containers, waste blast abrasive, or other painting debris shall be removed from the site. Coating or paint spots or oil stains upon adjacent surfaces shall be removed and the job site cleaned. All damage to surfaces resulting from the work of this section shall be cleaned, repaired, or refinished to the satisfaction of the Engineer at no cost to the Owner.

3.6 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by the Engineer.
- B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.

1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.7 VAPOR REMOVAL

- A. All solvent vapors shall be completely removed by suction-type exhaust fans and blowers before placing tank or system in operating service.

3.8 DISINFECTION

- A. Disinfection may be required for interior surfaces of tanks or systems containing potable water. Coordinate painting with disinfection requirements.

3.9 PAINTING SCHEDULE

- A. Exceptions:

1. Metal Building: The structural framing system, walls, frames, and incidentals associated with the metal building shall be hot-dipped galvanized.

- B. General Requirement - The number of coats called for in this schedule shall be considered minimum. If additional coats are required for complete coverage and uniform appearance, they shall be applied. Colors will be selected by the Owner. The system numbering may not be sequential or inclusive of all numbers from the first to last system or schedule numbers. Coating systems specified for potable water contact shall meet NSF standards even if the information presented here is to the contrary.

PAINTING SCHEDULE

Item No.	Surfaces / Items	Coating (Tnemec Product Numbers)	Thickness
1.	<u>Steel - Exterior Exposure</u>		
	Type of Structure:	Doors, Door Frames, Bollards, Miscellaneous Steel, Etc.	
	Surface Preparation:	SSPC-SP6 Commercial Blast Cleaning	
	First Coat:	Series N69 Hi-Build Epoxoline II	4.0 - 6.0 mils
	Second Coat:	Series 1074 Endura-Shield II	3.0 - 5.0 mils
	Total Dry Film Thickness		9.0 - 11.0 mils
2.	<u>Steel - Interior Exposure</u>		
	Type of Structure:	Doors, Door Frames, Equipment, Miscellaneous Steel, Etc.	
	Surface Preparation:	SSPC-SP6 Commercial Blast Cleaning	
	First Coat:	Series N69 Hi-Build Epoxoline II	4.0 - 6.0 mils
	Second Coat:	Series N69 Hi-Build Epoxoline II	4.0 - 6.0 mils
	Total Dry Film Thickness		10.0 - 12.0 mils
3.	<u>Ductile Iron and Non-Ferrous Metals - Exterior Exposure</u>		
	Type of Structure:	D.I.P. Pipes, Fittings, Valves, Etc.	
	Surface Preparation:	SSPC-SP1 Solvent Cleaning and Abrasive Blast Clean	
	First Coat:	Series N69 Hi-Build Epoxoline II	4.0 - 6.0 mils
	Second Coat:	Series N69 Hi-Build Epoxoline II	3.0 - 5.0 mils
	Total Dry Film Thickness		7.0 - 11.0 mils
4.	<u>Ductile Iron and Non-Ferrous Metals - Interior Exposure</u>		
	Type of Structure:	D.I.P. Pipes, Fittings, Valves, Etc.	
	Surface Preparation:	SSPC-SP1 Solvent Cleaning and Abrasive Blast Clean	
	First Coat:	Series N69 Hi-Build Epoxoline II	4.0 - 6.0 mils
	Second Coat:	Series N69 Hi-Build Epoxoline II	4.0 - 6.0 mils
	Total Dry Film Thickness		8.0 - 12.0 mils
5.	<u>Concrete - Interior Exposure</u>		
	Type of Structure:	Pads, Pedestals, Etc.	

Surface Preparation: Surface shall be clean, dry and in sound condition. Abrasive blast clean in accordance with SSPC-SP13 to remove all laitance, hardeners, curing compounds, sealers and other contaminants and to obtain a uniform surface profile. Fill all bugholes, voids and cracks.

Filler:	Series 215 Surfacing Epoxy	As Required
First Coat:	Series N69 Hi-Build Epoxoline II	6.0 - 8.0 mils
Second Coat:	Series N69 Hi-Build Epoxoline II	6.0 - 8.0 mils
Total Dry Film Thickness		14.0 - 16.0 mils

6. Masonry Block Walls - Interior Exposure

Surface Preparation:	Surface must be clean, dry and free of oil, grease and other contaminants.	
First Coat:	Series 130 Envirofill	65 ft ² per gal.
Second Coat:	Series N69 Hi-Build Epoxoline II	4.0 - 6.0 mils
Third Coat:	Series N69 Hi-Build Epoxoline II	4.0 - 6.0 mils
Total Dry Film Thickness		8.0 - 12.0 mils

7. Concrete Floors - Interior Exposure

Location:	All concrete floors.	
Surface Preparation:	Surface must be clean, dry, and free of oil and grease. Surface must be cured 28 days.	
First Coat:	Series 624 Phylon	300-400 ft ² per gal
Second Coat:	Series 624 Phylon	500-600 ft ² per gal

8. Wood - Interior and Exterior Exposure

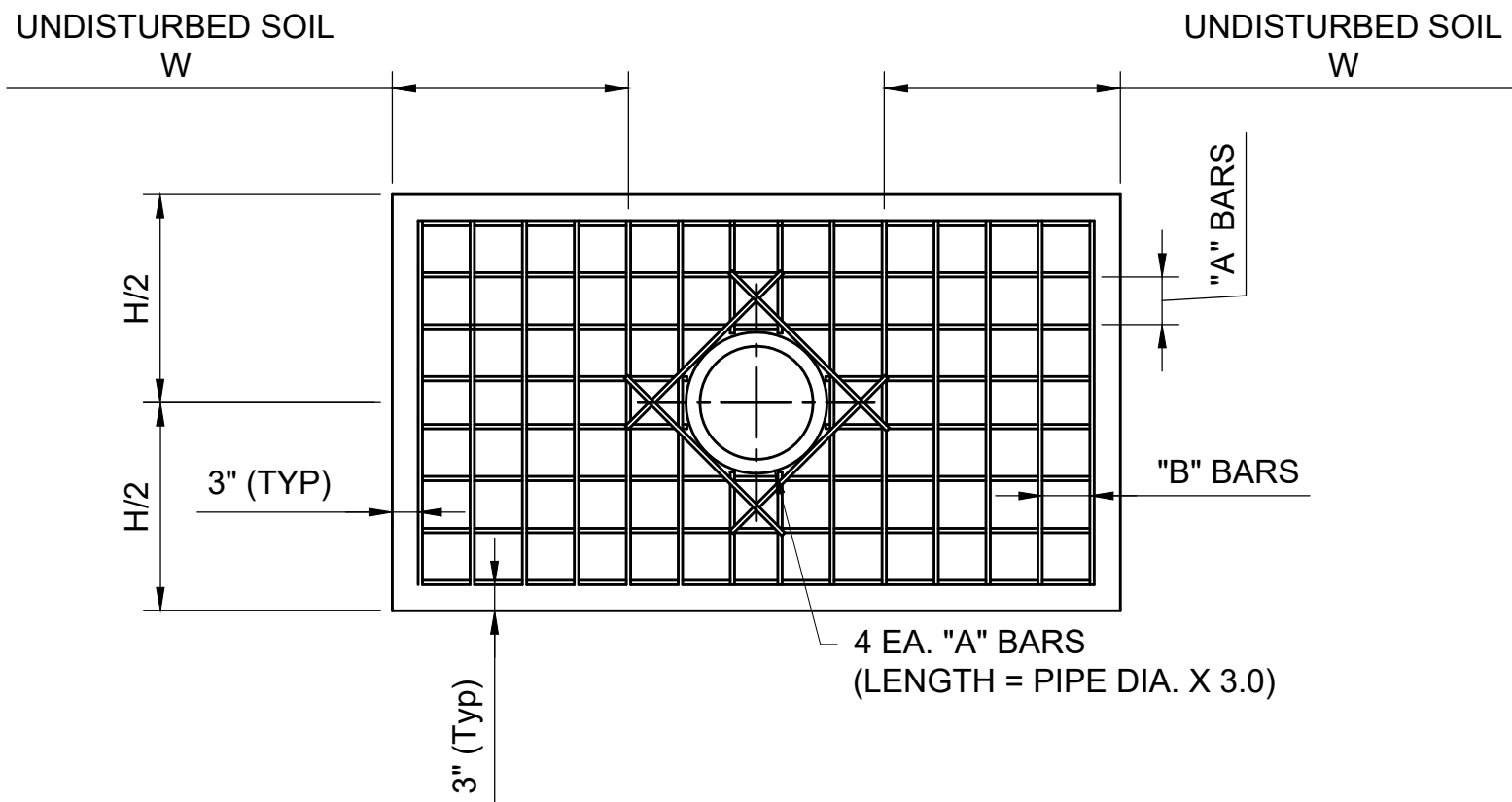
Surface Preparation:	Surface shall be clean and dry.	
First Coat:	Series V10 White	2.5 - 3.5 mils
Second Coat:	Series 1029 Enduratone	2.0 - 3.0 mils
Third Coat:	Series 1029 Enduratone	2.0 - 3.0 mils
Total Dry Film Thickness		6.5 - 9.5 mils

3.10 COLOR SCHEME

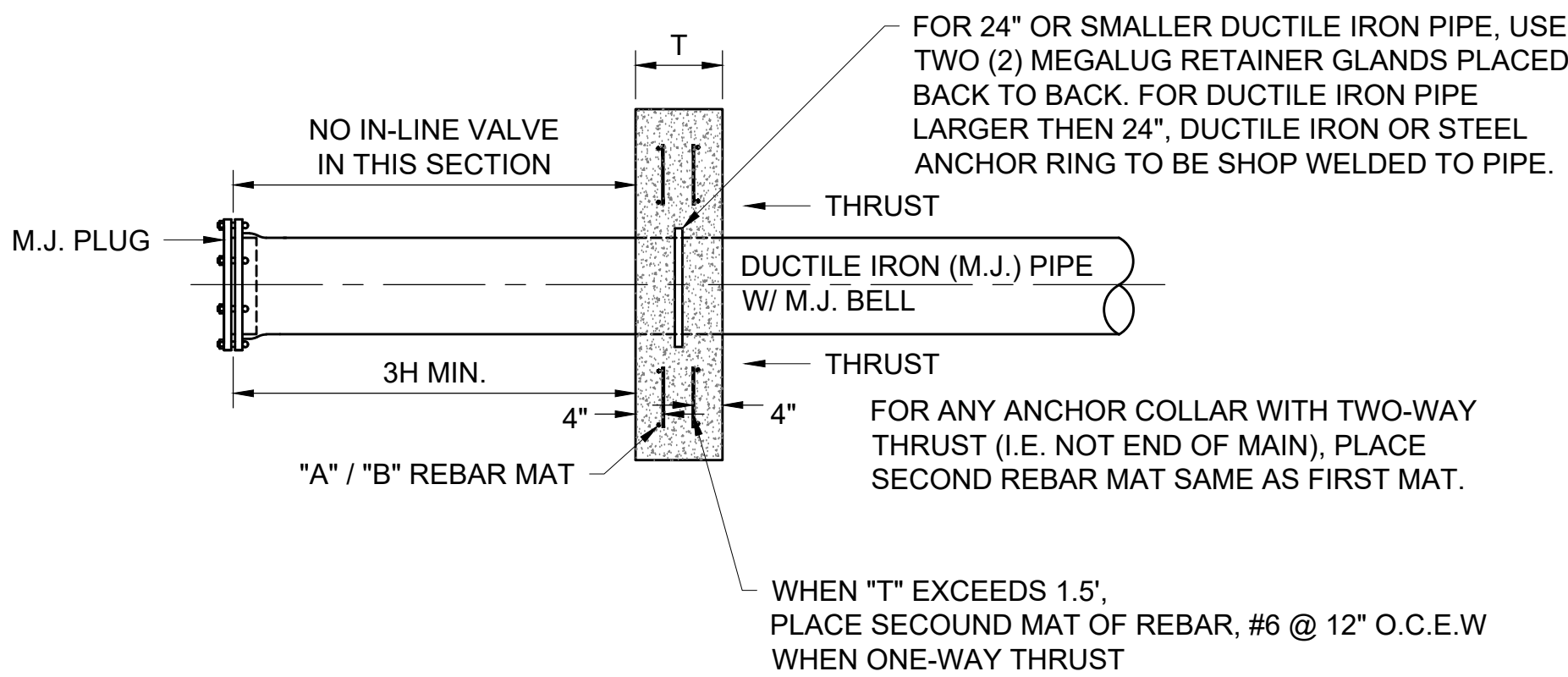
- A. The Owner shall select colors for the project. The Contractor shall submit a chart of the manufacturer's available colors to the Engineer thirty (30) days prior to coating.

END OF SECTION

ANCHOR COLLAR SCHEDULE						
PIPE SIZE	MINIMUM DIMENSIONS			THRUST COLLAR	REINFORCING BARS	
	W	H	T		"A" BARS	"B" BARS
6"	1.5'	2.0'	1.0'	M.L. RETAINER GLAND	#6 @ 6"	#6 @ 6"
8"	1.5'	2.5'	1.0'	M.L. RETAINER GLAND	#6 @ 6"	#6 @ 6"
12"	2.0'	4.0'	1.5'	M.L. RETAINER GLAND	#6 @ 6"	#6 @ 6"
16"	3.0'	4.5'	1.5'	M.L. RETAINER GLAND	#6 @ 6"	#6 @ 6"
20"	3.5'	5.0'	2.0'	M.L. RETAINER GLAND	#6 @ 6"	#6 @ 6"
24"	4.5'	5.5'	2.0'	M.L. RETAINER GLAND	#7 @ 6"	#7 @ 10"
30"	6.5'	6.0'	2.5'	4.5" X 1.0" WELD-ON	#8 @ 6"	#8 @ 10"
36"	7.5'	7.0'	2.5'	4.7" X 1.0" WELD-ON	#8 @ 6"	#8 @ 10"
42"	8.5'	8.0'	3.0'	5.0" X 1.25 WELD-ON	#8 @ 6"	#8 @ 10"



ANCHOR COLLAR (ELEVATION)

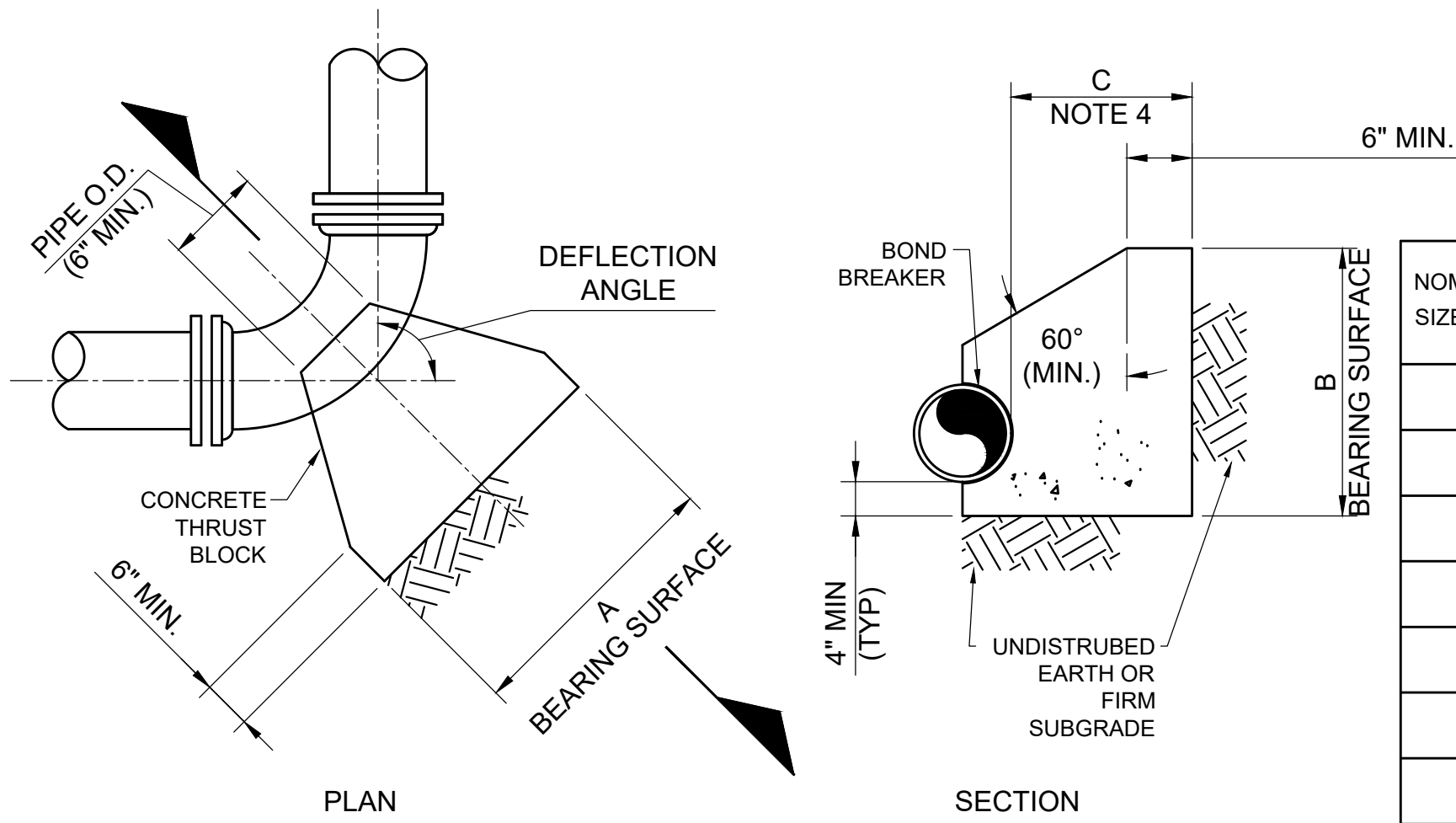
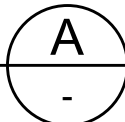


DUCTILE IRON PIPE (TOP)

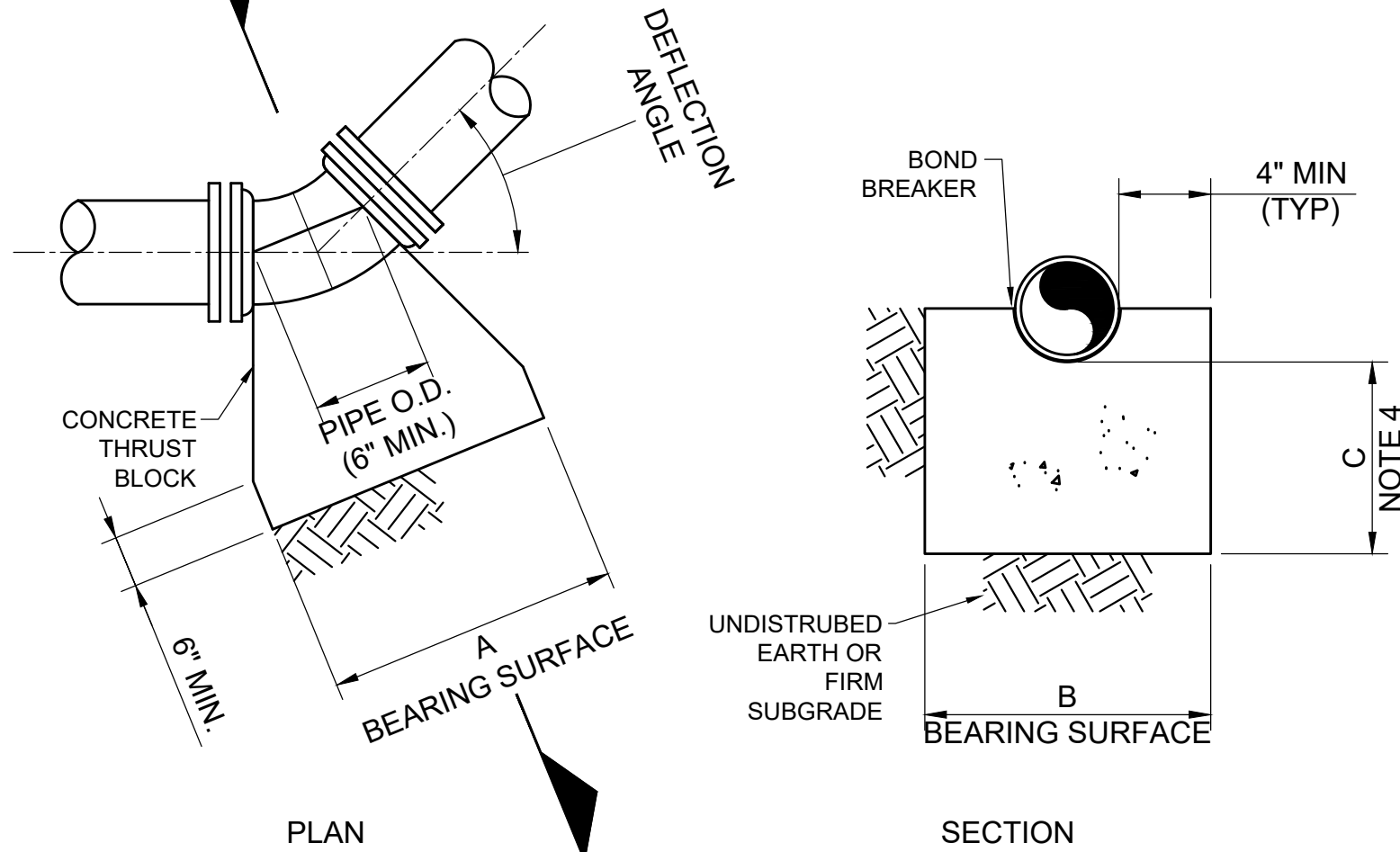
ANCHOR COLLAR DETAIL

DETAIL

VPSCALE



DETAIL FOR HORIZONTAL BENDS



PLAN

SECTION

DETAIL FOR LOWER VERTICAL BENDS

NOMINAL PIPE SIZE (INCHES)	OUTSIDE DIAMETER (INCHES)	REQUIRED BEARING AREA (SQ. FT.)							
		DEAD END	90° BEND	60° BEND	45° BEND	30° BEND	22.50° BEND	11.25° BEND	
1	1.32	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
2	2.38	0.5	0.1	0.5	0.4	0.3	0.3	0.3	
3	3.96	1.4	2.0	1.4	1.1	0.7	0.5	0.3	
4	4.80	2.0	2.9	2.0	1.6	1.1	0.8	0.4	
6	6.90	4	6	4	3	2.2	1.6	0.8	
8	9.05	7	10	7	6	4	3	1.4	
10	11.10	11	15	11	8	6	4	2.1	
12	13.20	15	22	15	12	8	6	3	
14	15.30	21	29	21	16	11	8	4	
16	17.40	27	38	27	20	14	10	5	
18	19.50	34	48	34	26	17	13	7	
20	21.60	41	58	41	32	21	16	8	
24	25.80	59	83	59	45	30	23	12	
30	32.00	90	128	90	69	47	35	18	
36	38.30	130	183	130	99	67	51	25	
42	44.50	170	240	170	130	90	65	30	

HORIZONTAL AND LOWER VERTICAL BENDS

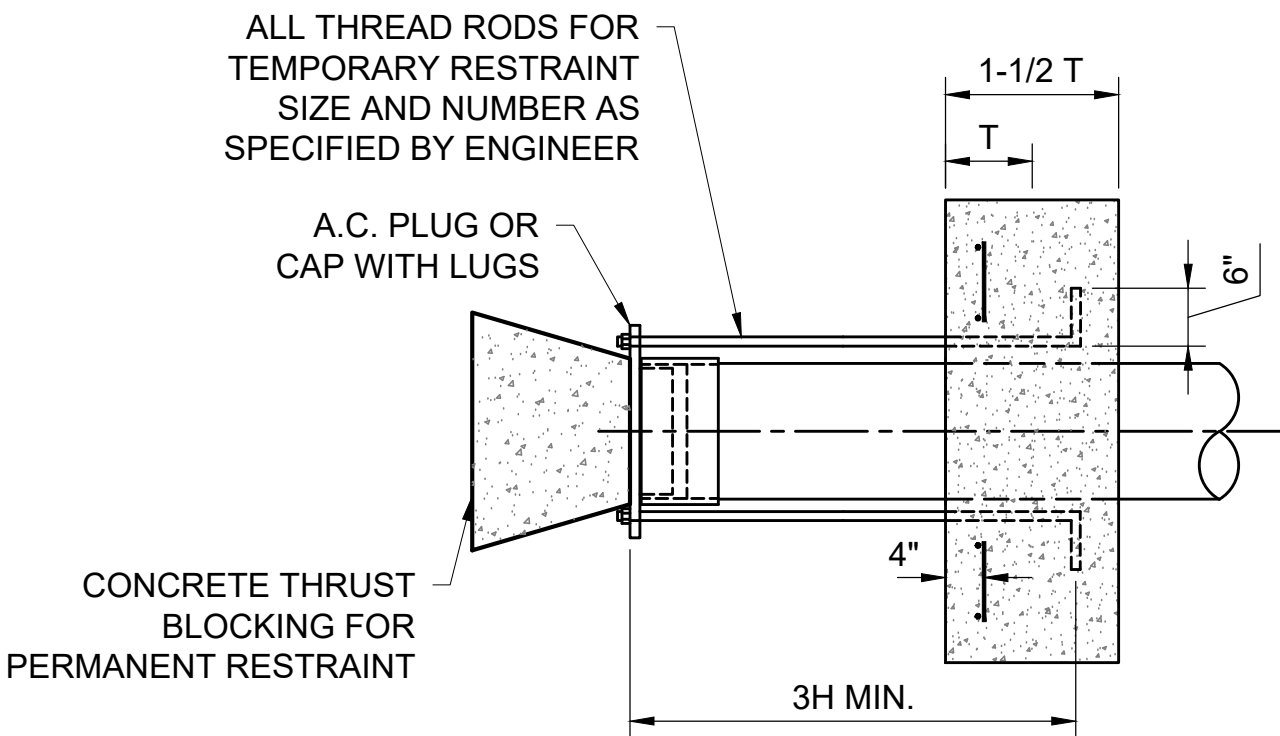
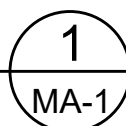
NOTES:

- TEST PRESSURE + 1.5 X NORMAL WORKING PRESSURE OR 150 PSI MAXIMUM.
- MINIMUM ALLOWABLE SOIL BEARING PRESSURE = 2000 PSF.
- BEARING AREA = S X B.
- C SHALL BE GREATER THAN A/2 AND B/2.
- THRUST BLOCKING SHALL BE CLASS "A" CONCRETE.

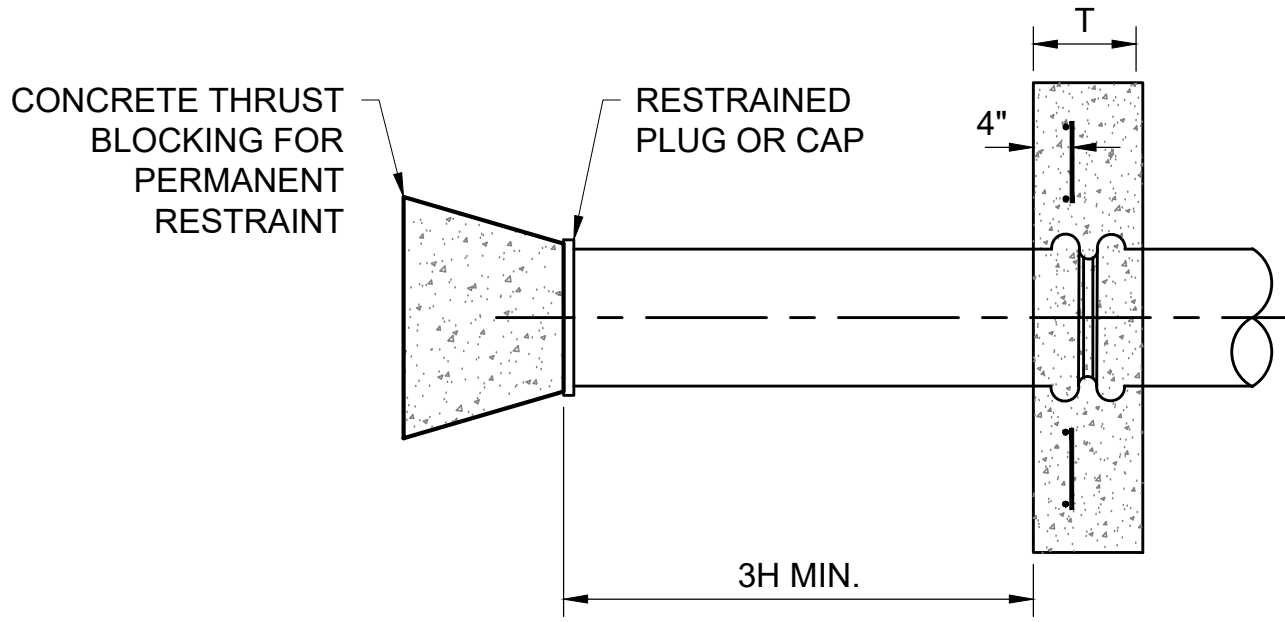
THRUST BLOCKING

DETAIL

N.T.S.

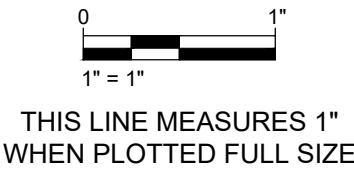


ASBESTOS CEMENT PIPE ANCHOR COLLAR



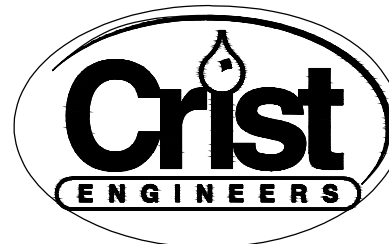
CONCRETE PIPE - PRECAST KEY

1	5/5/23	MPA	CAJ	ADDED BY ADDENDUM NO. 02	
REV. NO.	DATE	DRWN	CHKD	REMARKS	



THIS LINE MEASURES 1" WHEN PLOTTED FULL SIZE

DESIGNED:	JPK
DRAFTED:	KEG
CHECKED:	CAJ
DATE:	APR 2023



CRIST ENGINEERS, INC.
CONSULTING ENGINEERS

205 EXECUTIVE COURT
LITTLE ROCK, ARKANSAS 72205
TELEPHONE: (501) 664-1552
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WWW.CRISTENGINEERS.COM

PINE BLUFF, ARKANSAS
PINE BLUFF WASTEWATER UTILITY
KANSAS STREET PARALLEL FORCE MAIN

PHASE 2
DETAILS V

JOB NO.

2155

SHEET NO.

CZ2-07

**Pine Bluff Wastewater Utility
Kansas Street Parallel Force Main
Phase 1 and 2**

CONTRACTOR QUESTIONS RECEIVED TO DATE:

1. Detail B/CZ1-01; The detail calls out 6" min. "B Stone Ballast", is this the correct stone call-out, as it appears to not exist? "D" and "C" ballast stone are common. **B-Stone is correct.**
<https://gmqrock.com/construction-material/>
2. Detail B/CZ1-01; Note 2 calls out to dredge 2' ft. min. The bid form calls out 3' depth, Bid Item 1-10. Please clarify the depth Contractor's are to bid. **3 ft as indicated in Bid Form and Measurement and Payment spec. Some areas will not require 3 ft and some areas might require more than 3 ft, as determined by the Engineer during removal.**
3. Bid Form; Bid Item 1-12 Shoreline Restoration, what does this item consist of? Drawing C1-02, references "Restore Shoreline as required by USACE", we do not know what those requirements are to date without the permit be issued. **USACE Letter of permission will state Best Management Practices are to be used. Erosion control mats and silt fencing should be included in Bid as shown on the lake crossing plan and profile. Restore Shoreline to pre-construction conditions.**
4. Bidder's Checklist; The "List of Proposed Subcontractors" to be submitted, do you have a specific form to be used, which includes specific information requested? **This has been addressed in Addendum No. 02.**
5. Bid Form; What is the difference between "Clearing and Grubbing" and "Route Clearing" on the bid form, which both have a lump Sum of 1? **Addressed in Addendum No. 02.**
6. Bid Form; Bid Items 1-4 to 1-6, the quantity of fittings is more than shown on Drawing C1-02 between Ph1 limits. Where are all the fittings to be installed, not shown on the drawings? **Addressed in Addendum No. 02.**
7. There are several bathometric surveys called at specific phases of the phases 1 portion of the work that limit means and methods. Is there concern that if all of the excavation is opened up at once that the excavation will silt back in before the line is laid, backfilled, and concrete mats installed? **Addressed in Addendum No. 02.**
8. Specification 010250 – Addendum No. 1; The addendum 1 010250-5 para. R. Granular bedding Material indicates it will be paid for by the ton at unit price established. I cannot find the unit price bid (pipelines) item in new proposal. Please advise. **Addressed in Addendum No. 02.**