Montana Fish, Wildlife & Parks

SPECIFICATIONS FOR WORK
SPECIAL PROVISIONS

Contents:

1. PROJECT DESCRIPTION

The Project involves construction work associated with:

Kettle Replacement
Miles City Fish Hatchery
Fish, Wildlife & Parks (FWP) project # 7119101
Located in Custer County, MT

The project generally includes demolition of the existing intake, drain and fish removal structure hereafter referred to as a kettle as well as replacing that Kettle with a new modern version as described on these plans. To include all site work, concrete, plumbing and railing to make a complete functioning system.

2. PROJECT RELATED CONTACTS

Project contacts are designated as follows:

Owner:	Montana FWP 1420 E. Sixth Ave. PO Box 200701 Helena, MT 59620-0701
FWP Project Representative:	Kenneth Phillips, P.E. FWP Project Manager 1522 9th Avenue Helena, MT 59620 406-841-4006 (wk) 406-431-4031 (cell) 406-841-4004 (fax)

3. SITE INSPECTION

All Bidders should satisfy themselves as to the construction conditions by personal examination of the site described in this document. Bidders are encouraged to make any investigations necessary to assess the nature of the construction and the difficulties to be encountered, see General Conditions, Article 3.

4. SOILS INFORMATION

Limited Geotechnical investigation work has been completed for this Project. It is the responsibility of the Bidders to review and interpret all investigations, findings, and reports made part of this contract prior to bid preparation, see General Conditions, Article 3. Three types of soils will be encountered; 6” of road mix with 6” of pit run on roadway sections, a silty clay in the general dike area and a fat clay liner on the edge of the pond as well as some cobble armoring.

5. PROJECT REPRESENTATIVE, INSPECTIONS, AND TESTING

Before work commences the Project Representative will schedule a Preconstruction Conference . The required Attendees are: Engineer, Contractor, sub contractors, and the Regional Fish, Wildlife and Parks representative when possible.

Agenda:

1. Execution of Owner-Contractor Agreement.
2. Submission of executed bonds and insurance certificates.
3. Distribution of Contract Documents.
4. Submission of list of Subcontractors, list of products, Schedule of Values, and progress schedule.
5. Designation of personnel representing the parties in Contract, and the Engineer.
6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders and Contract closeout procedures.
7. Scheduling.

The Contractor's work will be periodically tested and observed to insure compliance with the Contract Documents. Complete payment will not be made until the Contractor has demonstrated that the work is complete and has been performed as required. If the Project Representative detects a discrepancy between the work and the requirements of the Contract Documents at any time, up to and including final inspection, such work will not be completely paid for until the Contractor has corrected the deficiency, see General Conditions, Article 9.

The Project Representative will periodically monitor the construction of work to determine if the work is being performed in accordance with the contract requirements. The Project Representative does not have the authority or means to control the Contractor's methods of construction. It is, therefore, the Contractor's responsibility to utilize all methods, equipment, personnel, and other means necessary to assure that the work is installed in compliance with the Drawings and Specifications, and laws and regulations applicable to the work. Any discrepancies noted shall be brought to the Contractor's attention, who shall immediately correct the discrepancy. Failure of the Project Representative to detect a discrepancy will not relieve the Contractor of his ultimate responsibility to perform the work as required, see General Conditions, Article 3.

The Contractor shall inspect the work as it is being performed. Any deviation from the Contract requirements shall be immediately corrected. Prior to any scheduled observation by the Project Representative, the Contractor shall again inspect the work and certify to the Project Representative that he has inspected the work and it meets the requirements of the Contract Documents. The Project Representative may require uncovering of work to verify the work was installed according to the contract documents, see General Conditions, Article 12.

The work will be subject to review by the Project Representative. The results of all such

observations, and all contract administration, shall be directed to the Contractor only through the Project Representative.

5.1 Services Required by the Contractor. The Contractor shall provide the following services:

a. Any field surveys to establish locations, elevations, and alignments as stipulated on the Contract Documents. FWP reserves the right to set preliminary construction staking for the project. The Contractor is responsible to notify FWP for any construction staking discrepancies.

b. Preparation and certification of all required shop drawings and submittals as described in the General Conditions, Article 3.

c. All testing requiring the services of a laboratory to determine compliance with the Contract Documents shall be performed by an independent commercial testing laboratory acceptable to the Project Representative. The laboratory shall be staffed with experienced technicians properly equipped, and fully qualified to perform the tests in accordance with the specified standards.

d. Preparation and submittal of a construction schedule, including submittals, see General Conditions, Article 3. The schedule shall be updated as required, as defined in the Contract Documents.

e. All Quality Control testing as required by the Contractor's internal policies.

f. All Quality Assurance testing and/or re-testing as stated in the Contract Documents, see General Conditions, Article 13.

5.2 Services Provided by the Owner. The Owner shall provide the following services at no cost to the Contractor except as required for retests as defined in the Contract Documents.

a. The Project Representative may check compaction of backfill and surfacing courses using laboratory testing submittal information supplied by the Contractor. These tests are to determine if compaction requirements are being fulfilled in accordance with the Contract Documents. It is ultimately the responsibility of the Contractor to insure that this level of compaction is constant and met in all locations.

b. Any additional Quality Assurance testing deemed appropriate by the Owner, at the Owner's expense.

6. ENGINEERING INTERPRETATIONS

Timely Engineering decisions on construction activities or results have an important bearing on the Contractor's schedule. When engineering interpretation affects a plan design or specifications change, it should be realized that more than 24 hours may be

required to gain the necessary Owner participation in the decision process including time for formal work directive, or change order preparation as required.

7. REJECTED WORK

Any defective work or nonconforming materials or equipment that may be discovered at any time prior to the expiration of the warranty period, shall be removed and replaced with work or materials conforming to the provisions of the Contract Documents, see General Conditions, Article 12. Failure on the part of the Project Representative to condemn or reject bad or inferior work, or to note nonconforming materials or equipment on the Contractors submittals, shall not be construed to imply acceptance of such work. The Owner shall reserve and retain all its rights and remedies at law against the Contractor and its Surety for correction of any and all latent defects discovered after the guarantee period (MCA 27-2-208).

Only the Project Representative will have the authority to reject work which does not conform to the Contract Documents.

8. UTILITIES

The exact locations of existing utilities that may conflict with the work are not precisely known. It shall be the Contractor's responsibility to contact the owners of the respective utilities and arrange for field location services. **One Call Locators, 1-800-424-5555**

The Contract Documents may show utility locations based on limited field observation and information provided to the Project Representative by others. **The Project Representative cannot guarantee their accuracy.** The Contractor shall immediately notify the Project Representative of any discrepancies with utility locations as shown on the Contract Drawings and/or their bury depths that may in any way affect the intent of construction as scoped in these specifications.

There will be no separate payment for exploratory excavation required to locate underground utilities.

8.1 Notification. The Contractor shall contact, in writing, all public and private utility companies that may have utilities encountered during excavation. The notification includes the following information:

a. The nature of the work that the Contractor will be performing.
b. The time, date and location that the Contractor will be performing work that may conflict with the utility.
c. The nature of work that the utility will be required to perform such as moving a power pole, supporting a pole or underground cable, etc.
d. Requests for field location and identification of utilities.

A copy of the letter of notification shall be provided to the Project

Representative. During the course of construction, the Contractor shall keep the utility companies notified of any change in schedule, or nature of work that differs from the original notification.

8.2 Identification. All utilities that may conflict with the work shall be the Contractor's responsibility to locate before any excavation is performed. Field markings provided by the utility companies shall be preserved by the Contractor until actual excavation commences. All utility locations on the Drawings should be considered approximate and should be verified in the field by the Contractor. The Contractor shall also be responsible for locating all utilities that are not located on the Drawings.

Utilities are depicted on the Contract Documents in accordance with their achieved "Quality Levels," as defined in the American Society of Civil Engineer's Document, ASCE 38, "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data." Reliance upon these data for risk management purposes during bidding does not relieve the Contractor, or Utility Owner from following all applicable utility damage prevention statutes, policies, and/or procedures during construction. It is important that the Contractor investigates and understands the scope of work between the project Owner and Engineer regarding scope of limits of the utility investigations leading to these utility depictions. Definitions of Quality Levels are described as follows:

a. "QUALITY LEVEL A" – (QLA): LOCATING THROUGH EXCAVATION. QLA data are highly accurate and are obtained by surveying an exposed utility. As such, both horizontal and vertical data are recorded. Survey accuracies are typically set at 15mm (1/2-inch) vertically, and to project survey standards horizontally (typically the same as for topography features), although these survey accuracies and precisions are generally left to the owner to specify in a scope of work. In addition to the applicable standard of care and any other additional standards imposed by commercial indemnity clauses, the accuracy of these location data is also typically guaranteed. Other data typically characterized include material type, surface elevation, utility size/capacity, outside dimensions, and configurations, soil type, and utility condition.

b. "QUALITY LEVEL B" – (QLB): DESIGNATING. QLB information is obtained through the application of appropriate surface geophysical methods to identify the existence and approximate horizontal location of utilities (a utility's "designation") within the project limits, followed by survey, mapping, and professional review of that designation. Underground utilities are identified by interpretation of received signals generated either actively or passively, and through correlating these received signals with visible objects (QLC) and record data

(QLD) to determine function. Designated utilities that can't be identified are labeled as "unknowns." Although approximate has no accuracy associated with it, generally the locations are within inches rather than feet. The more utility congested the area or the deeper the utilities, the less likely it is that the designations will achieve that accuracy. These designations are then surveyed to project accuracies and precisions, typically third-order accuracy similar to other topography features. Note that surveying existing one-call marks does not lead to QLB data, since the genesis of the marks was not under the direct responsible charge of the professional certifying the QLB depictions, and one-call generally does not address unknown utilities, privately owned utilities, utilities without records, abandoned utilities, and so on. Nor does the professional have knowledge of the field technician's qualifications, training, and level of effort.

c. "QUALITY LEVEL C" – (QLC): SURFACE VISIBLE FEATURE SURVEY. QLC builds upon the QLD information by adding an independent detailed topography site survey for surface-visible appurtenances of subsurface utilities including but not limited to fire hydrants, valves, risers, and manholes. Professional judgment is used to correlate the QLD data to the surveyed features, thus increasing the reliability of both utility location and existence. It is a function of the professional to determine when records and features do not agree and resolve discrepancies. This may be accomplished by depiction of a utility line at quality level D, effectively bypassing or disregarding (but still depicting) a surveyed structure of unknown origin. Additional resolution may result from consultation with utility owners.

d. "QUALITY LEVEL D" – (QLD): EXISTING RECORDS RESEARCH. QLD is the most basic level of information. Information is obtained from the review and documentation of existing utility records, verbal accounts, and/or one-call markings (to determine the existence of major active utilities and their approximate locations).

8.3 Removal or Relocation of Utilities. All electric power, street lighting, gas, telephone, and television utilities that require relocation will be the responsibility of the utility owner. A request for extending the specified contract time will be considered if utility owners cause delays.

8.4 Public Utilities. Water, sewer, storm drainage, and other utilities owned and operated by the public entities shall, unless otherwise specifically requested by the utility owner, be removed, relocated, supported or adjusted as required by the Contractor at the Contractor's expense. All such work shall be in accordance with these Contract Documents, or the Owner's Standard Specifications or written instructions when the work involved is not covered by these Specifications.

8.5 Other Utilities. Utilities owned and operated by private individuals, railroads, school districts, associations, or other entities not covered in these Special Provisions shall, unless otherwise specifically requested by the utility owner, be removed, relocated, supported or adjusted as required by the Contractor at the Contractor's expense. All work shall be in accordance with the utility owner's directions, or by methods recognized as being the standard of the industry when directions are not given by the owner of the utility.

8.6 Damage to Utilities and Private Property. The Contractor shall protect all utilities and private property and shall be solely responsible for any damage resulting from his construction activities. The Contractor shall hold the Owner and Project Representative harmless from all actions resulting from his failure to properly protect utilities and private property. All damage to utilities shall be repaired at the Contractor's expense to the full satisfaction of the owner of the damaged utility or property. The Contractor shall provide the Owner with a letter from the owner of the damaged utility or property stating that it has been repaired to the utility owner's full satisfaction.

8.7 Structures. The Contractor shall exercise every precaution to prevent damage to existing buildings or structures in the vicinity of his work. In the event of such damages, he shall repair them to the satisfaction of the owner of the damaged structure at no cost to the Owner.

8.8 Overhead Utilities. The Contractor shall use extreme caution to avoid a conflict, contact, or damage to overhead utilities, such as power lines, streetlights, telephone lines, television lines, poles, or other appurtenances during the course of construction of this project.

8.9 Buried Gas Lines. The Contractor shall provide some means of overhead support for buried gas lines exposed during trenching to prevent rupture in case of trench caving.

8.10 Pavement Removal. Where trench excavation or structure excavation requires the removal of curb and gutter, concrete sidewalks, or asphalt or concrete pavement, the pavement or concrete shall be cut in a straight line parallel to the edge of the excavation by use of a spade-bitted air hammer, concrete saw, colter wheel, or similar approved equipment to obtain a straight, square clean break. Pavement cuts shall be 2 feet wider than the actual trench opening.

8.11 Survey Markers and Monuments. The Contractor shall use every care and precaution to protect and not disturb any survey marker or monuments, such as those that might be located at lot or block corners, property pins, intersection of street monuments or addition line demarcation. Such protection includes markings with flagged high lath and close supervision. No monuments shall be disturbed without prior approval of the Project

Representative. Any survey marker or monument disturbed by the Contractor during the construction of the project shall be replaced at no cost to the Owner by a licensed land surveyor.

8.12 Temporary Utilities. The Contractor shall provide all temporary electrical, lighting, telephone, heating, cooling, ventilating, water, sanitary, fire protection, and other utilities and services necessary for the performance of the work. All fees, charges, and other costs associated therewith shall be paid for by the Contractor.

9. CONSTRUCTION SAFETY

The Contractor shall be solely and completely responsible for conditions of the jobsite, including safety of all persons (including employees and subcontractors) and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall conform to U.S. Department of Labor (OSHA), and all other applicable federal, state, county, and local laws, ordinances, codes, and regulations. Where any of these are in conflict, the more stringent requirement shall be followed. The Contractor's failure to thoroughly familiarize himself with the aforementioned safety provisions shall not relieve them from compliance with the obligations and penalties set forth therein, see General Conditions, Article 10.

10. CONSTRUCTION LIMITS AND AREAS OF DISTURBANCE

10.1 Construction Limits. Where construction easements or property lines, are not specifically called out on the Contract Documents, limit the construction disturbance to ten (10) feet, when measured from the edge of the slope stake grading, or to the adjacent property line, whichever is less. Disturbance and equipment access beyond this limit is not allowed without the written approval of both the Project Representative and the Owner of the affected property. If so approved, disturbance beyond construction limits shall meet all requirements imposed by the landowner; this includes existing roads used and/or improved as well as the construction of new access roads. Special construction, reclamation, or post-construction reclamation or other closure provisions required by the landowner on access roads beyond the construction limits shall be performed by the Contractor at no additional cost to the Owner.

10.2 Areas of Disturbances. Approved areas of disturbance are those areas disturbed by construction activities within the construction limits and along designated or approved access routes. Such areas may require reclamation and revegetation operations, including grading to the original contours, top soiling with salvaged or imported topsoil, seeding, fertilizing, and mulching as specified herein. Other areas that are disturbed by the Contractor's activities outside of the limits noted above will be considered as site damage or unapproved areas of disturbance, see General

Conditions, Articles 3 and 10. This includes areas selected by the Contractor outside the defined construction limits for mobilization, offices, equipment, or material storage.

11. DECONTAMINATE CONSTRUCTION EQUIPMENT

Power wash all construction equipment that have been operated off of paved or gravel roadways entering the project site to prevent the spread of noxious weeds and aquatic invasive species. This applies to all FWP projects, whether or not individual construction permits specifically address cleaning of equipment.

12. TREE PROTECTION AND PRESERVATION

The Contractor and the Owner shall individually inspect all trees within the project construction limits prior to construction. The Owner shall determine which trees are to be removed and which trees are to be preserved. Construction of the grading, utilities and various roadway facilities must not significantly damage the trees root system or hinder it's chances for survival. Reasonable variations from the Contract Documents, as directed by the Project Representative, may be employed to ensure the survival of trees.

13. CONSTRUCTION SURVEYS

The Contractor will be responsible for all layout and construction staking utilizing the Project Representative's existing control and coordinate data for the project. Dimensions and elevations indicated in layout of work shall be verified by the Contractor. Discrepancies between Drawings, Specifications, and existing conditions shall be referred to the Project Representative for adjustment before work is performed. The Project Representative may set location and grade stakes prior to construction; however, it is ultimately the responsibility of the Contractor to check and verify all construction staking for the project.

Existing survey control (horizontal and vertical) has been set for use in the design and ultimately the construction of these improvements. A listing of the coordinates and vertical elevation for each of these control points may be included in the project drawings.

The Contractor will be responsible for preserving and protecting the survey control until proper referencing by the Contractor has been completed. Any survey control obliterated, removed, or otherwise lost during construction will be replaced at the Contractor's expense.

Contractor shall be aware of property pins and survey monuments. Damage to these pins will require replacement of such by a registered land surveyor at no cost to the owner.

The Contractor shall provide construction staking from the Contractor's layouts and the control points. Contractor's construction staking includes at a minimum:

1. Location and grade stakes for drainage features and retaining walls.

Original field notes, computations and other records taken by the Contractor for the purpose of quantity and progress surveys shall be furnished promptly to the Project Representative and shall be used to the extent necessary in determining the proper amount of payment due to the Contractor.

14. MATERIAL SOURCES AND CONSTRUCTION WATER

The Contractor shall be responsible for locating all necessary material sources, including aggregates, earthen borrow and water necessary to complete the work. The Contractor shall be responsible for meeting all transportation and environmental regulations as well as paying any royalties. The Contractor shall provide the Project Representative with written approvals of landowners from whom materials are to be obtained, prior to approval.

The Contractor may use materials from any source, providing the materials have been tested through representative samples and will meet the Specifications.

Water for compaction efforts shall be supplied by the Contractor.

15. MATERIALS SALVAGE AND DISPOSAL

Notify the Owner for any material salvaged from the project site not identified in the Contract Documents. The Owner reserves the right to maintain salvaged material at the project site, compensate the Contractor for relocation of salvaged material, or agreed compensation to Owner for material salvaged by the Contractor.

Haul and waste all waste material to a legal site and obey all state, county, and local disposal restrictions and regulations.

16. STORED MATERIALS

Contractor shall use an approved storage area for materials. Materials and/or equipment purchased by the Contractor may be compensated on a monthly basis. For compensation, provide the Project Representative invoices for said materials, shop drawings and/or submittals for approval, and applicable insurance coverage, see General Conditions, Article 9.

17. STAGING AND STOCKPILING AREA

Contractor shall use staging and stockpiling sites for to facilitate the project as approved by

the Owner. Contract Documents do show approved staging and stockpiling locations. Notify Owner within 24 hours for approval of staging and stockpiling sites not shown on the Contract Drawings.

18. SECURITY

The Contractor shall provide all security measures necessary to assure the protection of equipment, materials in storage, completed work, and the project in general.

19. CLEANUP

Cleanup for each item of work shall be fully completed and accepted before the item is considered final. If the Contractor fails to perform cleanup within a timely manner the Owner reserves the right to withhold final payment.

Review these Contract Documents for additional Final Cleanup specifications for specific measures, associated with Contractor responsibilities and final payment.

20. ACCESS DURING CONSTRUCTION

Provide emergency access as well as hatchery worker access at all times within the project throughout the construction period.

21. CONSTRUCTION TRAFFIC CONTROL

The Contractor is responsible for providing safe construction and work zones within the project limits by implementing the rules, regulations, and practices of the Manual on Uniform Traffic Control Devices, current edition.

22. SANITARY FACILITIES

Provide on-site toilet facilities for employees of Contractor and Sub-Contractors and maintain in a sanitary condition. The toilet shall be staked out so to prevent wind damage. The toilet must be located on the roadway and not in the pond bottom.

23. CONTRACT CLOSEOUT

The Contractor's Superintendent shall maintain at the project site, a "Record Set of Drawings" showing field changes, as-built elevations, unusual conditions encountered during construction, and such other data as required to provide the Owner with an accurate "as constructed" set of record drawings. The Contractor shall furnish the "Record Set" to the Project Representative following the Final Inspection of the Project.

The Contractor's final payment will not be processed until the "Record Set" of drawings are received and approved by the Project Representative.

24. MEASUREMENT AND PAYMENT

Review these Contract Documents for additional Measurement and Payment specifications for definitions. Quantities are listed on the Bid Proposal for Payment Items. Additional material quantities, volumes, and measurements may be shown on the Contract Document drawings and/or specifications.

Unit Price quantities and measurements shown on the Bid Proposal are for bidding and contract purpose only. Quantities and measurements supplied, completed for the project, and verified by the Project Representative shall determine payment. Each unit price will be deemed to include an amount considered by the Contractor to be adequate to cover Contractor's overhead and profit for each bid item.

The Owner or Contractor may make a Claim for an adjustment in Contract Unit Price if the quantity of any item of Unit Price Work performed by the Contractor differs materially and/or significantly (increase or decrease by 50%) from the estimated quantity indicated on the Bid Proposal.

Lump sum bid item quantities will not be measured. Payment for these lump sum bid proposal items will be paid in full amount listed on the Bid Proposal when accepted by the Project Representative, unless specified otherwise.

1. Mobilization/Demobilization shall include all costs for general conditions, all transportation costs for equipment and job trailers to arrive/depart site. Any temporary offsite storage costs, demurrage, job cleanup and temporary facilities that the contractor needs to complete the work. Payment will be 65% of the lump sum bid for mobilization and 35% for demobilization.

2. Kettle demolition – The complete demolition of the existing kettle including but not limited to: removal of all metal grating and railing, concrete steps, concrete walls, sluice gates, cutting and removing portions of piping. Everything required to be removed for the installation of the new kettle.

3. Kettle Construction – The complete furnishing of labor and materials to construct a complete assembly of the new kettle as shown on plans including but not limited to: necessary excavation and embankment, concrete, piping, railing, walkways and sluice gates.

APPLICATIONS FOR PAYMENT

A. Submit 1 copy of each application on Department Fish, Wildlife and Parks Form 101.

B. Content and Format: Utilize Schedule of Values on proposal form for listing items in Application for Payment.

C. Payment Period: 30 days.

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TECHNICAL SPECIFICATIONS

INDEX TO
TECHNICAL SPECIFICATIONS
Miles City Fish Kettle Replacement

FWP# 7113104

TECHNICAL SPECIFICATIONS

SECTION 02112

REMOVAL OF EXISTING
STRUCTURES

All applicable portions of this specification section in the MPWSS shall apply with the following additions, deletions and/or modifications.

PART 1 GENERAL

1.1 DESCRIPTION

Change to Read:

A. The work consists of the removal and disposal of existing concrete walleye kettle & basin as well as associated piping, hand railing, gang planks, walkway footings as designated on the project drawings.

PART 3 EXECUTION

3.1 GENERAL

Add the following:

D. Remove all gate assemblies, railing, piping and other appurtenances attached to the concrete. Remove the concrete kettle and basin including foundation, sidewalk and steps as shown in the project drawings or as directed by the Engineer. Carefully excavate as not to disturb the native soil and minimize disturbance to the clay liner. Grade area in anticipation of erecting new concrete structure.

Dispose all removed concrete and reinforcement off the project site and obey all state, county, and local disposal restrictions and regulations. All removed metal sluice gates assemblies, railing, and gangways become property of the Owner. These are to be salvaged and stockpiled in the designated staging area.

PART 4 MEASUREMENT AND PAYMENT

Change to Read:

4.2 Concrete Removal

A. The removal of the concrete structures, all appurtenances as well as cutting of existing service and drain will be paid lump sum under kettle demolition.

END OF SECTION 02112

SECTION 02230

STREET EXCAVATION, BACKFILL AND COMPACTION

REFERENCE IS MADE TO THE MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS WITH THE FOLLOWING CHANGES.

PART 1: GENERAL

1.3 DENSITY CONTROL TESTING

C. Material Submittals

1. Engineer will provide gradation test results to contractor for his use to obtain compaction.

PART 3: EXECUTION

3.1 EXECUTION

B. Stockpile the respective road mix, clay liner, and general fill material in separate stockpiles for later re use. Avoid mixing the material as little as possible. If contractor contaminates the road mix or clay liner, he will provide replacement material at no additional costs to the owner.

PART 4: MEASUREMENT AND PAYMENT

A. EXCAVATION ABOVE SUBGRADE

4. Payment is lump sum and is paid under Kettle Construction bid items.

B. SUBEXCAVATION/REPLACEMENT BELOW SUBGRADE

2. Payment is lump sum and is paid under either Kettle Construction bid items.

C. EMBANKMENT IN PLACE

3. Payment is lump sum and is paid under either Kettle Construction bid items.

END OF SECTION

SECTION 03100

CONCRETE FORMWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Formwork for cast-in place concrete, with shoring, bracing and anchorage.

B. Form accessories.

C. Form stripping.

1.2 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

A. Section 03300 - Cast-In-Place Concrete: Supply of concrete accessories for placement by this section.

1.3 RELATED SECTIONS

A. Section 03200 - Concrete Reinforcement.

B. Section 03300 - Cast-in-Place Concrete.

1.4 REFERENCES

A. ACI 301 - Structural Concrete for Buildings.

B. ACI 318 - Building Code Requirements for Reinforced Concrete.

C. ACI 347 - Recommended Practice for Concrete Formwork.

D. PS 1 - Construction and Industrial Plywood.

1.5 DESIGN REQUIREMENTS

A. Construct formwork, shoring and bracing to conform to design and code requirements; resultant concrete to conform to required shape, line and dimension.

1.6 REGULATORY REQUIREMENTS

Conform to applicable code for fabrication, erection and removal of formwork.

PART 2 PRODUCTS

2.1 WOOD FORM MATERIALS

A. Form Materials: At the discretion of the Contractor.

2.2 FORMWORK ACCESSORIES

A. Form Release Agent: Colorless mineral oil which will not stain concrete, or absorb moisture.

B. Nails, Spikes, Lag Bolts, Through Bolts, and Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.2 EARTH FORMS

A. Earth forms are not permitted unless provided for in project plan.

3.3 ERECTION - FORMWORK

A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301.

B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to over stressing by construction loads.

C. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping.

D. Align joints and make watertight. Keep form joints to a minimum.

3.4 APPLICATION - FORM RELEASE AGENT

A. Apply form release agent on formwork in accordance with manufacturer's recommendations.

B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.

C. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated with form release agent prior to placement of concrete.

3.5 FORMWORK TOLERANCES

A. Construct formwork to maintain tolerances required by Section 03300 - Cast-in-Place Concrete.

3.4 FIELD QUALITY CONTROL

A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with design, and that supports, fastenings, wedges, ties, and items are secure.

B. Notify Engineer 72 hours prior to concrete placement for inspection of formwork and rebar reinforcement installation.

3.5 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.

B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Reinforcing steel, and accessories for cast-in-place concrete.

1.2 RELATED SECTIONS

A. Section 03100 - Concrete Formwork.

B. Section 03300 - Cast-in-Place Concrete.

1.3 REFERENCES

A. CRSI - Concrete Reinforcing Steel Institute - Manual of Practice.

B. CRSI 63 - Recommended Practice For Placing Reinforcing Bars.

C. CRSI 65 - Recommended Practice For Placing Bar Supports, Specifications and Nomenclature.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with CRSI 63, 65 and Manual of Practice.

1.5 COORDINATION

A. Coordinate work under provisions of Section 01039.

PART 2 PRODUCTS

2.1 REINFORCEMENT

A. Reinforcing Steel: ASTM A 615 or ASTM A 617/A 617M, Grade 40. Place as shown on the plans.

2.2 ACCESSORY MATERIALS

A. Tie Wire: Minimum 16 gage annealed type.

B. Saddles: Use actual saddles intended for reinforcement bars not blocks, rocks or other non fabricated items.

2.3 FABRICATION

A. Fabricate concrete reinforcing in accordance with CRSI Manual of Practice.

B. Locate reinforcing splices not indicated on drawings, at point of minimum stress, according to ACI 301. Review location of splices with Engineer.

PART 3 EXECUTION

3.1 PLACEMENT

A. Place, support and secure reinforcement against displacement. Do not deviate from required position.

B. Maintain concrete cover around reinforcing as follows:

Item	Coverage
Footings and Concrete Formed	2 inches
Against Earth	3 inches

3.2 FIELD QUALITY CONTROL

A. Field inspection shall be performed by the Engineer.

B. Notify Engineer 72 hours prior to placement of concrete inform for form work and rebar inspection.

END OF SECTION

SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Control, expansion and contraction joint devices associated with concrete work.

1.2 RELATED SECTIONS

A. Section 03100 - Concrete Formwork: Formwork and accessories.

B. Section 03200 - Concrete Reinforcement: Reinforcement

1.3 MEASUREMENT AND PAYMENT

A. Concrete:

1. Basis of Measurement: Per Work Item.
2. Basis of Payment: Payment includes grading, formwork, fiber and steel reinforcement, concrete, placement accessories, consolidating and leveling, troweling, finishing, curing, drain rock and filter fabric. See section 01025 Measurement and Payment.

1.4 REFERENCES

A ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.

B. ACI 305R - Hot Weather Concreting.

C. ACI 306R - Cold Weather Concreting.

D. ACI 308 - Standard Practice for Curing Concrete.

E. ANSI/ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

F. ASTM C33 - Concrete Aggregates.

G. ASTM C94 - Ready-Mixed Concrete.

H. ASTM C150 - Portland Cement.

I. ASTM C260 - Air Entraining Admixtures for Concrete.

J ASTM C494 - Chemicals Admixtures for Concrete.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

A. Cement: ASTM C150, Type IA or II - Air Entraining - Portland type.

B. Fine and Coarse Aggregates: ASTM C33.

C. Water: Clean and not detrimental to concrete. Per ASTM C94

2.2 ADMIXTURES

A. Air Entrainment: ASTM C260.

2.4 CONCRETE MIX

A. Mix and deliver concrete in accordance with ASTM C94, Alternative No. 3.

B. Select proportions for normal weight concrete in accordance with ACI 301 Method 3.

C. Provide concrete to the following criteria:

Unit	Measurement
Concrete Classification	M-4000
Aggregate Size (maximum)	3/4 inch
Air Entrained	3 - 6 percent
Slump (maximum)	3 - 4 inches

D. Use accelerating admixtures in cold weather only when approved by Engineer. Use of admixtures will not relax cold weather placement requirements.

E. Use set retarding admixtures during hot weather only when approved by Engineer.

F. Add air entraining agent to normal weight concrete mix for work exposed to exterior.

G. Use of calcium chloride as an admixture is prohibited!

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that reinforcement and other items to be cast into concrete are accurately placed, positioned securely.

B. Verify requirements for concrete cover over reinforcement.

3.2 PREPARATION

A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

3.3 PLACING CONCRETE

A. Place concrete in accordance with ACI 301.

B. Notify Engineer minimum 72 hours prior to commencement of operations. The forms and steel reinforcement shall be inspected by the Engineer before concrete may be placed.

C. Ensure reinforcement, embedded parts, formed expansion and contraction joints, are not disturbed during concrete placement.

D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

E. The contractor shall not allow cold joints to occur within continuous sections of concrete.

F. Tolerance:
   1. Horizontal alignments on all work shall be such that the concrete serves the function intended and presents a clean, even, regular appearance. Lines intended to be straight shall be within a tolerance of plus or minus 2 inches in 100 feet.
   2. Elevation shall be plus or minus .05 feet of staked elevation.

3.5 CURING AND PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Concrete placed during cold weather shall be protected in accordance with ACI 306R - Cold Weather Concreting.

3.6 FIELD QUALITY CONTROL

A. Testing will be performed by the Contractor. There should be a slump test with every truck load and cylinders cast and air pot testing for the first truck of the day.

B. Contact engineer 72 hours prior to placement of concrete in forms.

C. Provide free access to Work and cooperate with testing firm.

D. Submit proposed mix design of concrete to the Engineer for review 72 hours prior to commencement of Work.

E. Tests of cement and aggregates may be performed at the Engineers direction to ensure conformance with specified requirements.

3.7 PATCHING

A. Allow Engineer to inspect concrete surfaces immediately upon removal of forms.

B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.

C. Patch imperfections as directed.

3.8 DEFECTIVE CONCRETE

A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

B. The repair or replacement of defective concrete will be determined by the Engineer.

C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Engineer for each individual area.

END OF SECTION

SECTION 05500

METAL FABRICATIONS

1.1 GENERAL

A. Submittals: In addition to Product Data, submit the following:

1. Shop Drawings detailing fabrication and erection.
2. Templates for anchor bolts.

1.2 PRODUCTS

A. General: Provide materials with smooth, flat surfaces without blemishes.

B. Ferrous Metals: As follows:

1. Steel Plates, Shapes and Bars: ASTM A 36/A 36M
2. Steel Tubing: Cold-formed steel tubing complying with ASTM A 500
3. Steel Pipe: ASTM A 53, standard weight (Schedule 40), unless otherwise indicated.
4. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either ASMT A 47 (ASMT A 47M) malleable iron or ASMT A 27/A 27M cast steel. Provide bolts, washers and shims as needed, hot-dip galvanized per ASTM A 153/A 153M.
5. Safety Chain – Safety Chains shall be galvanized welded steel, proof coil chain tested in accordance with ASTM A 467/A 467M, Class CS. Safety chains shall be straight link style, 3/16” diameter, minimum 12 links per foot and with bolt type snap hooks on each end.

C. Aluminum Products:

1. Handrailing shall be in accordance with ASTM B429 1&1/2” diameter aluminum posts and rails, schedule 40 with 0.145” nominal wall thickness.
2. Stair nosing shall be 2 component systems comparable to Balco DXH 330, or approved equal. Material shall meet ASTM B221.

D. Fasteners: Provide Type 304 or 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, where built into exterior walls. Select fasteners for type, grade and class required.

E. Fabrication, General: Use connections that maintain structural value of joined pieces. Shear and punch metals cleanly and accurately. Remove burrs.

1. Weld corners and seams continuously. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. Obtain fusion without undercut or overlap. Remove welding flux immediately. Finish exposed welds smooth and blended.
2. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes.
3. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.

F. Loose Bearing and Leveling Plates: Provide for steel items bearing on masonry or concrete. Drill plates to receive anchor bolts.

1. Galvanize plates and angles.

G. Metal walking grates: Fabricate to sizes indicated and for attachment to kettle. Anchor on angle iron using holddown clamps.

1. Metal prefabricated gratings: Shall be McNichols® Quality Bar Grating SGSS Series, stainless steel, bar grating locked by swaging., 1&1/4”X1/8”, or approved equal.

H. Miscellaneous Framing and Supports: Provide steel framing and supports that are not a part of structural-steel framework as necessary to complete the Work. Fabricate from structural steel of welded construction. Cut, drill and tap units to receive hardware, hangers and similar items.

1. Where indicated to be cast into concrete or built into masonry, equip with integrally welded anchors at 24 inches (600 mm) o.c.

I. Miscellaneous Steel Trim: Fabricate units with continuously welded joints and smooth exposed edges. Miter corners and use concealed splices where possible. Provide cutouts, fittings and anchorages; coordinate assembly and installation with other work.

J. Finish metal fabrications after assembly. Comply with NAAMM’s “Metal Finishes Manual for Architectural and Metal Products” for recommendations for applying and designating finishes. Shop prime ferrous-metal items not indicated to be galvanized.

1. Hot-dip galvanize items indicated to be galvanized to comply with ASTM A 153 or ASTM 153M as applicable.
2. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 3, “Power Tool Cleaning.”

1.3 EXECUTION

A. Installation, General: Provide anchorage devices and fasteners for securing metal fabrications to in-place construction. Perform cutting, drilling and fitting required for installing metal fabrications. Set metal fabrications accurately in location, with edges and surfaces level, plumb and true.

1. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
2. Fit exposed connections accurately together. Weld connections, unless otherwise indicated. Do not weld or abrade galvanized surfaces.

B. Set bearing and leveling plates on cleaned surfaces using wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts and pack with nonshrink, nonmetallic grout.

C. Galvanized Surfaces: Clean field welds, bolted connections and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION

SECTION 15100- BASIC MATERIALS AND METHODS

PART 1 GENERAL

1.1 SECTION INCLUDES

1.2. Pipe and Pipe Fittings

1.3. Pipe and Equipment Identification.

1.2 Pipe and Pipe Fittings

A. Existing supply piping to the existing kettle is PVC that takes off from a "Steel Pipe. New service piping will be 8" schedule 80 PVC. The 10" drain piping is anticipated to be PVC back until its connection with the existing main drain line which is denoted as asbestos/cement piping. If asbestos piping is encountered owner will bring in qualified firm to cut and prep pipe to receive new mechanical flange.

B. Sluice Gates – Armtech 20-10C 12" for the concrete wall and 8" for the aluminum wall. Gates shall have rising stem actuators.

C. Gate valves- 4" gate valve to be Watts Series GV Bronze Gate Valves or approved equal. 8" gate valves to be Williams Valve Corporation Cast Steel Gate Valve, Class 150 – API Trim 8 –RF OS&Y or approved equal

D. Flexible Connection – Metraflex model SLP 4 & SLP 8" or approved equal

E. Valve wrap – All buried or partially buried valves shall be wrapped with All purpose Petrolatum Tape as manufactured by Denso or approved equal.

1.3 Pipe and Equipment Identification

A. All piping and fittings shall be delivered with factory labels installed and left intact until installation. Labels will be submitted with O&M manual.

1.4 Submittals

The following Submittals should be provided within 14 days after the Contract Agreement is fully executed.

a. Manufacturers cut sheets for sluice gate, gate valves, PVC piping and fittings, hardware and gaskets

End of Section