REQUEST FOR PROPOSALS (RFP)
FLATHEAD INDIAN RESERVATION, MONTANA

KING PUMP STATION PROJECT

CONFEDERATED SALISH AND KOOTENAI TRIBES
DIVISION OF ENGINEERING AND WATER RESOURCES

The cover form shall be submitted with a service provider's response to this RFP. Failure to submit the cover form is grounds to disqualify a submittal.

COMPANY INFORMATION:

COMPANY NAME	
MAILING ADDRESS	
CITY/STATE/ZIP	
TELEPHONE	
INDIAN PREFERENCE	

SUBMITTAL SIGNATURE:

I have read and understand the requirements for CSKT DIVISION OF ENGINEERING AND WATER RESOURCES REQUEST FOR PROPOSALS **King Pump Station Project** and agree to provide the required services in accordance with the RFP and its contents.	
Submitted by (Printed Name):	
Title:	
Signature:	

INSTRUCTIONS TO OFFERORS

It is the responsibility of each offeror to:

Follow the format required in the RFP when preparing your response. Provide point-by-point responses to all sections in a clear and concise manner.

Provide complete answers/descriptions. Read and answer **all** questions and requirements. Don't assume Confederated Salish and Kootenai Tribes (CSKT) or evaluator/evaluation committee will know what your company capabilities are or what items/services you can provide, even if you have previously contracted with CSKT. The proposals are evaluated based solely on the information and materials provided in your response.

Use the forms provided, i.e., cover page, cost proposal, etc.

Submit your response on time. Note all the dates and times listed in the Schedule of Events, and be sure to submit all required items on time. Late proposal responses are not accepted.

List of RFP Attachments:

- Draft Contract
- King Pump Station Plan set, dated December 2025
- Technical Specifications

The following items MUST be included in the response for the proposal to be considered responsive. Failure to include any of these items may result in a nonresponsive determination or point deductions.

- Signed RFP cover sheet
- Signed Cost proposal form
- RFP Response Form, including point-by-point responses to the offeror qualifications and information requirements
- Indian Preference Certification, if applicable
- CSKT Debarment Form
- Complete Bid bond Form (10%)
- Signed Addendum Acknowledgement Form

SCHEDULE OF EVENTS

RFP Issuance Date……2/23/2026
Pre-Bid Meeting……..3/12/2026
Questions from proposer due……..3/25/2026
Responses and/or Addendum due from CSKT……..4/6/2026
Proposal Due Date……..4/15/2026
Intended Date for Contractor Selection……..5/1/2026

SECTION 1: PROJECT OVERVIEW AND INSTRUCTIONS

SOLICITATION NOTICE

Notice is given that the CSKT Natural Resources Department has released this Request for Proposals and will be accepting proposals until **2:30 PM Mountain Time, April 15, 2026**, from qualified Contractors to provide services, equipment, and labor for the King Pump Station Project on the Flathead Indian Reservation. The project will construct a new pumping facility and appurtenances with a vertical turbine pump and screened intake for a private water rights holder along the newly constructed banks of a restored Jocko River channel, and the buried pipeline and underground power to connect to existing utilities.

CSKT intends to award a Small Project Agreement (Attachment) to the selected Contractor to complete the Work. Offerors shall familiarize themselves with the contract requirements as part of the bidding process. The CSKT project manager will be the responsible contracting officer representative for all contract-related matters.

Contractors receiving contract awards shall be responsible, in total, for all work of any subcontractors. All subcontractors, if any, must be identified and their experience **must** be included in the proposal. The Contractor shall be responsible to CSKT for the acts and omissions of: a) all subcontractors, or agents and of persons directly or indirectly employed by such subcontractors, and b) for the acts and omissions of persons employed directly by the Contractor. Further, nothing contained within this document or any contract documents created as a result of any contract awards developed from this RFP shall create any contractual relationships between any subcontractor and CSKT.

PROJECT OVERVIEW

The CSKT are implementing a large-scale restoration project on the Bison Range Reach of the Jocko River located upstream from Sčilíp (formerly Dixon), Montana in Sanders County as displayed in Figure 1. As part of the restoration project, an existing pump station that provides irrigation water to a private water rights holder will need to be relocated to a new location along the restored river channel. The existing pump station will be removed/abandoned as part of a separate contract and is not included as part of this project. The new pump station is specifically located in the SW/4 of Section 21, Township 18 North, Range 21 West, P.M.M., Montana as shown on Figure 1. The new pump station will consist of a precast concrete vault, vertical turbine pump, screened intake, and piping appurtenances. From the new irrigation pump station approximately 540 lineal feet of 10-inch diameter plastic irrigation pipe will need to be installed and connected to the existing irrigation pipe. A new underground 3-phase power service will need to be installed with the buried irrigation pipeline and connected to the existing overhead power line to provide power to the pump station. A new security fence will be installed around the pump station.

A more complete description of the services sought for this project is provided in Section 3 Scope of Work and the Contract documents (Attachment). This RFP and associated items can be found on the CSKT Water Compact website at https://www.csktwatercompact.com/documents-and-links/.

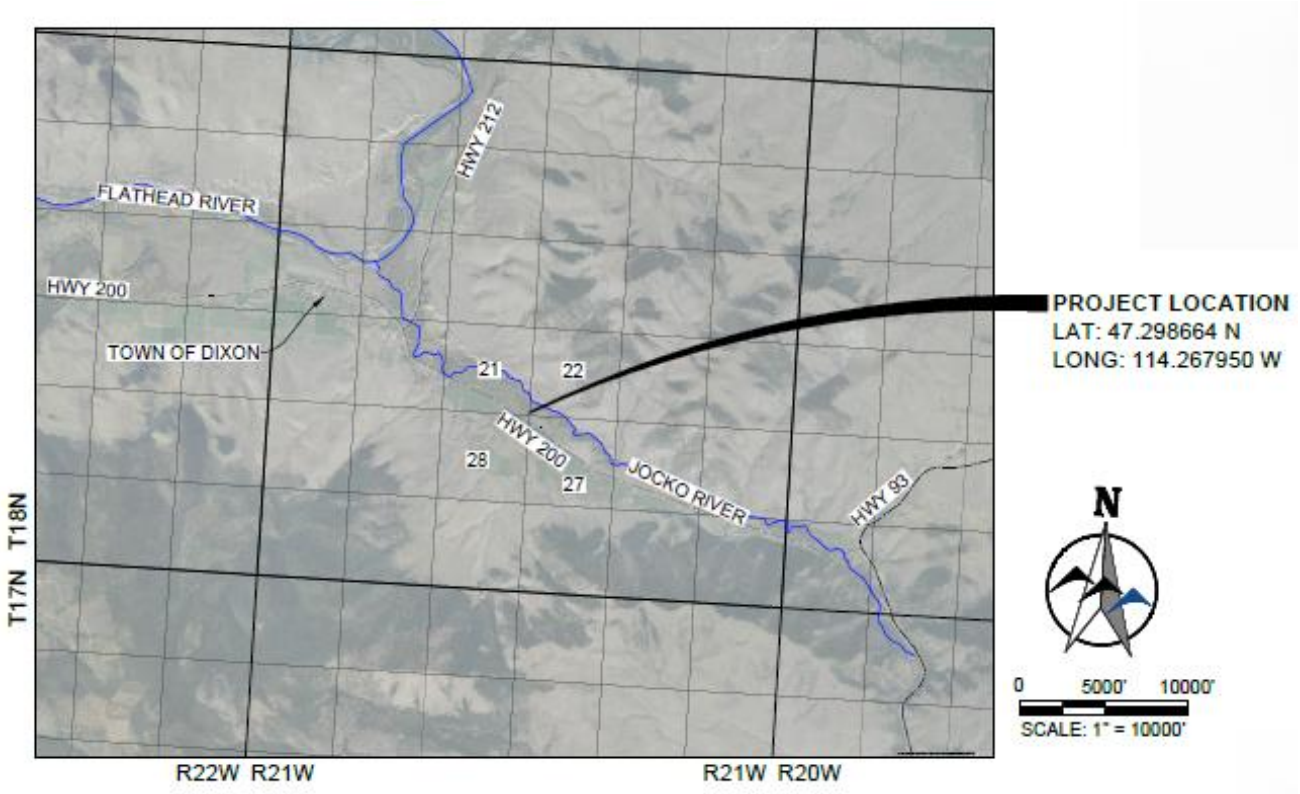


Figure 1. Overview of King Pump Station Project location

SINGLE POINT OF CONTACT

From the date this Request for Proposals (RFP) is issued until an offeror(s) is selected and the selection is announced, all contact regarding the project shall be directed to:

Tabitha Espinoza, Restoration Program Manager
NRD Division of Engineering and Water Resources
(406) 675-2700 Ext. 7238
Tabitha.Espinoza@cskt.org

SUBMITTING A PROPOSAL

Offerors failing to comply with the RFP instructions may be subject to point deductions. CSKT may also choose to not evaluate, may deem nonresponsive, and/or may disqualify from further consideration any proposals that do not follow this RFP format, are difficult to understand, are difficult to read, or are missing any requested information.

Number of Copies and Due Date. Offerors must submit one electronic PDF copy of the complete package as described here via email to Tabitha.Espinoza@cskt.org. **Electronic copies of the Proposals must be received on April 15, 2026, prior to 2:30 p.m.,** local time. Proposals received after this time will not be accepted for consideration. Facsimile submissions are not acceptable.

PRE-BID TOUR

The pre-bid tour is not mandatory but strongly encouraged. **The pre-bid tour is at 1 pm on March 12, 2026 at the CSKT Division of Engineering and Water Resources office** at the Kicking Horse complex south of

Ronan, MT. Address: 33091 Mollman Pass Trail, Charlo, MT 59824. A brief field visit to the project site will follow.

INDIAN PREFERENCE

This is an Indian Preference RFP. Tribal Contractors who wish to receive Indian Preference must obtain certification by CSKT Indian Preference Office as a legitimate Indian-owned business prior to submission of a response to this RFP. In order to claim Indian Preference, proof of Indian Preference Certification must be included with the response in the form of a copy of the certificate issued by the Indian Preference Office. Be advised, evidence of membership or affiliation with a tribe does not constitute Indian Preference certification. The selection of the successful Offeror and award of this Project will be per the provisions of the CSKT Indian Preference Ordinance 101A. It is the sole responsibility of the Offeror to obtain and provide proof of Indian Preference certification from the Indian Preference Office. For more information on Indian Preference certification, contact Melinda Charlo at (406) 675-2700 extension 1045.

Selected Contractor must comply with the Indian Preference Ordinance and Regulations, which can be found here: https://cskt.org/indian-preference-office/.

ACKNOWLEDGEMENT OF ADDENDA

Addenda to this RFP and answers to questions from potential respondents will be posted in accordance with the schedule of events at the following link https://www.csktwatercompact.com/documents-and-links/. It is the responsibility of the Contractor to ensure they have received and understand any and all addenda issued.

A completed 'Addendum Acknowledgement' form is attached and must be included with all Contractor solicitation responses.

10% BID BOND

Offerors shall attach an electronic copy of their bid bond for their proposal to be responsive. Submission of the bid bond, along with a certified and effectively dated copy of the power of attorney, shall be completed and signed by all required parties. Submittal of a bid bond less than 10% of the total estimated contract amount for base period, shall result in the bid being deemed non-responsive. Failure to submit a Bid Bond from a Surety Company shall result in rejection of the offer.

CONSTRUCTION WAGE REQUIREMENTS

The Indian Self Determination and Education Assistance Act, Pub. L. 93-638, 25 USC 5301, et seq., as amended, and its implementing regulations, including but not limited to, those set forth in 25 CFR Part 1000, Subpart K, as may be amended, shall apply to construction programs and projects included in this Agreement. Contractors and subcontractors must comply with applicable Tribal laws, Federal laws, program statutes and regulations. Wage determinations can be found at: Wage Determinations | SAM.gov.

Davis-Bacon Prevailing Wages: Davis-Bacon Prevailing Wages must be paid to construction personnel by the Successful Offeror and to all Subcontractors.

PRE-CONTRACTUAL EXPENSES

Respondents are responsible for all costs incurred prior to issuance of a fully executed contract. All material submitted regarding this RFP will become the property of the CSKT and will only be returned to the respondent at the CSKT's discretion.

SECTION 2: EVALUATION PROCESS

OFFEROR QUALIFICATIONS

Offeror's proposal must indicate at least 3 years of relevant past experience, providing examples of at least 2 projects of similar services, size and scope to the type proposed in this RFP. Offeror shall provide the name and qualifications of the resident (onsite) superintendent and all key personnel involved in any aspects of the contract.

EVALUATION OF PROPOSALS

All proposals will initially be classified as either "responsive" or "nonresponsive." Proposals may be found nonresponsive at any time during the procurement process if any of the required information is not provided; the submitted price is found to be excessive or inadequate as measured by criteria stated in the RFP; or the proposal does not address the specific scope of work items described and required in the RFP. If a proposal is found to be nonresponsive, it will not be considered further.

Selection and award will be based on the offeror's proposal and other items outlined in this RFP. Submitted responses may not include references to information located elsewhere, such as Internet websites or libraries, unless specifically requested. Information or materials presented by offerors outside the formal response period and process, or subsequent discussion/negotiation, or best and final offer, if requested, will not be considered, will have no bearing on any award, and may result in the offeror being disqualified from further consideration.

An evaluation committee will evaluate responsive proposals and recommend whether to award contract(s) to the highest scoring offeror, or, if necessary, to seek discussion/negotiation or a best and final offer in order to determine the highest scoring offeror.

EVALUATION CRITERIA

CSKT will offer a contract to the offeror with the best value bid to the CSKT, based on several factors outlined here. All responsive proposals will be evaluated based on a combination of offeror's references, relevant experience, method of providing services, Indian Preference score, and cost outlined in its proposal.

Bidder's submittals will be evaluated and scored by CSKT as follows:

1. Contractor experience constructing projects of similar type and scale.
2. Total cost submitted on the cost proposal form.
3. Contractor's key personnel demonstrate adequate experience, skills, and training to successfully complete the Work.
4. Indian preference certification.
5. Contractor references confirm successful and timely completion of past projects with similar scope and scale.

CSKT'S RIGHT TO INVESTIGATE AND REJECT

CSKT may make such investigations as deemed necessary to determine the ability of the offeror to provide the supplies and/or perform the services specified. CSKT reserves the right to accept, reject, or negotiate any proposal if the evidence submitted by, or investigation of, the offeror fails to satisfy CSKT that the offeror is properly qualified to carry out the obligations of the contract. This includes CSKT's ability to reject the proposal based on negative references, including poor efficiency or experience with operator skills or

in previous project performance. Qualified personnel listed for specific tasks will be expected to perform as such.

CSKT expressly reserves the right to:

1. Reject all responses and re-advertise the Request for Proposals, with or without amended requirements
2. Base the scoring on compliance with this document, Indian Preference, responder experience and other factors
3. Reject any response in whole or in part if it is found in the public interest to do so
4. Waive informalities and irregularities in a response

Furthermore, CSKT reserves the right to withdraw this Request for Proposals at any time.

SUBMITTALS

Upon notice of selection, the bidder must provide the following documents immediately. If the bidder fails to provide required documents within 10 business days after the notice of contingent award, CSKT retains the right to begin negotiations with the next best offeror.

- Current W-9 Form
- Proof of current worker's compensation insurance or proof of valid exemption*
- Proof of current general liability (or commercial) and automobile insurance*
- Indian Preference Compliance Plan, if applicable
- Performance Bond*
- Payment Bond*
- Final schedule, as approved by Owner

*Review draft contract in Attachments for specific information regarding bond and insurance requirements

SECTION 3: SCOPE OF WORK

This Scope of Work (SOW) and attached plan sheets describe the construction activities that will occur to construct a new pump station, pipeline, power supply, and security fence along a rehabilitated portion of the Jocko River.

WORK LOCATIONS

An overview of the project location is shown on Sheet 6 on the construction plans. Owner's consultant will provide an electronic file of the project design that the Contractor can utilize to georeference and stake the project location, if desired.

SITE ACCESS AND EQUIPMENT

Minimizing damage to the floodplain is a high priority, especially within existing wetlands, which will be flagged for no entry unless Work is required and permitted in a wetland per the design. All efforts will be made to minimize driving on the site and pre-determined access routes and staging areas are defined on Sheet 1.1. Construction specifications are outlined on Sheet 1.1 and will be adhered to throughout construction. All equipment will be weed-seed-free when brought onsite and not driven through any weedy areas subsequently. Equipment will be inspected for weed-seed prior to accessing the site, at the discretion of the Owner or Consultant.

CONSTRUCTION MILESTONES

The contract times and milestone dates identified in the contract are listed here. The ideal timeframe for project construction is July to August. Any delays caused by Contractor(s) may be grounds for termination of a contract and/or assessment of liquidated damages. Key dates include the following:

- Substantial completion on or before August 28, 2026
- Project complete and ready for final payment on or before September 28, 2026

*These dates cannot change without the express written approval by the CSKT.

BID ITEMS. Pump station components are broken out by bid items, which correspond to the cost proposal form. It is the Contractor's responsibility to understand and propose proper sequencing for the various tasks.

BID ITEM 1: MOBILIZATION/PREP WORK Preparatory work and operations performed by the Contractor, including but not limited to those necessary for the movement of personnel, equipment, supplies, and incidentals to the project site, temporary offices, utilities, buildings, and other facilities necessary for all work on the project. Mobilization costs for subcontracted work/personnel. All costs of the work not specifically designated for payment under other Bid Items and all project-specific overhead.

Contractor will provide all labor, tools, equipment, and incidentals necessary to complete the Work as specified.

Measurement for Mobilization/Prep Work will be made as a percentage completed of the lump sum.

BID ITEM 2: PUMP STATION This item covers the furnishing and installation of the concrete structure, piping and fittings from the structures to the inlet screen, vertical turbine pump and control panel, and all

other components as shown in the details included in the Drawings. Pre-cast structures will be allowed as approved by the Engineer.

Work required: Work required under this section shall include but not be limited to the following:

- Excavation, backfill, and compaction.
- Furnishing and installing bedding material.
- Furnishing and installing forms, reinforcing steel, concrete, block outs, steps, etc., necessary to construct the structure either onsite or at a pre-cast facility.
- Furnishing and installing manhole lid.
- Furnishing and installing all fittings, valves, and supports in the structure and fittings outside the structure necessary to connect to irrigation piping.
- Coating exposed metals.
- Connecting system piping to the structure and valves for the inlet piping.
- Furnishing and installing steel piping and fittings from the pump to where the pipe transitions from above ground to underground.
- Furnishing and installing steel piping and fittings from the vault structure to the connection with the steel intake screen.
- Furnishing and installing all above ground bends, flow meter, pressure gauge, above ground valves, pipe supports, and fittings.
- Furnishing and installing (1) vertical turbine pump, control panel, appurtenances, electrical connections, pump start-up, and training with the Owner and private landowner.
- Furnishing and installing low-level shut-off float.
- All labor, tools, equipment, materials, and incidentals necessary to complete work as specified.

Measurement for Pump Station will be made as a percentage completed of the lump sum.

BID ITEM 3: SCREEN INLET AND HYDROBURST SYSTEM This item covers the furnishing and installation of the Johnson Screens, or approved equal, and the Johnson Screens Hydrobust system, or approved equal.

Work required: Work required under this section shall include but not be limited to the following:

- Furnishing and installing Johnson Screens.
- Furnishing and installing Johnson Screens Hydroburst system.
- Furnishing and installing stainless steel bots to attach screen to concrete pad.
- All startup, testing, and operator training for the Hydroburst system.
- All labor, tools, equipment, materials, and incidentals necessary to complete work as specified.

Measurement for Screen Inlet and Hydroburst System will be made as a percentage completed of the lump sum.

BID ITEM 4: CONCRETE SLAB This item covers the furnishing and installation of the concrete pad for the intake screen as indicated on the Drawings and in the Contract Documents.

Work required: Work required under this section shall include but not be limited to the following:

- Submittal of concrete and reinforcing steel to the Engineer for approval.

- Furnishing and installing forms, reinforcing steel, concrete, block outs, etc. necessary to construct concrete splash pads where necessary.
- All labor, tools, equipment, materials, and incidentals necessary to complete work as specified.

Measurement for Concrete Slab will be made as a percentage completed of the lump sum.

BID ITEM 5: IRRIGATION PIPE This item covers the furnishing and installation of irrigation piping from the start of the buried pipe section at the irrigation pump station to where the pipe connects to the existing irrigation pipe in the sizes, types, and classes as indicated on the Drawings and in the Contract Documents.

Work required: Work required under this section shall include but not be limited to the following:

- Providing submittals to the Engineer for approval.
- Trench Excavation, backfill, and compaction.
- Furnishing and installing pipe with gaskets, lubricants, etc.
- Furnishing and installing all bends and fittings.
- Furnishing and installing pipe bedding.
- Furnishing and installing detectable warning tape.
- Furnishing and installing all air valves and pup out ports.
- Installing thrust and anchor blocking.
- Testing, including pressure and leakage testing.
- All labor, tools, equipment, materials, and incidentals necessary to complete work as specified.

Measurement for Irrigation Pipe will be made on an installed and approved lineal foot basis.

BID ITEM 6: POWER SERVICE This item covers the coordination and installation of a new power supply lines from the local utility to the irrigation pump and hydroburst system, as indicated on the drawings and in these Contract Documents.

Work required: Work required under this section shall include but not be limited to the following:

- Coordination and obtaining necessary permits from the local utility for the new power supply lines.
- Paying for the installation of the new power supply line and appurtenances to the irrigation vertical turbine pump and hydroburst system.
- All labor, tools, equipment, materials, and incidentals necessary to complete work as specified.

Measurement for Power Service will be made as a percentage completed of the lump sum.

BID ITEM 7: SECURITY FENCE This item covers installation of security fence and gate around the pumps station as indicated on the Drawings and in the Contract Documents.

Work required: Work required under this section shall include but not be limited to the following:

- Furnishing and installing fence materials.
- Furnishing and installing gate.
- All labor, tools, equipment, materials, and incidentals necessary to complete work as specified.

Measurement for Security Fence will be made on an installed and approved lineal foot basis.

BID ITEM 8: SITE RESTORATION This item covers seeding and fertilizing, with approved mixtures, all areas that the Contractor disturbs, which may include but is not limited to access road, spoil areas, equipment areas, materials storage areas, and any other areas disturbed by the work.

Work required: Work required under this section shall include but not be limited to the following:

- Submittal of seed and fertilizer mixtures to the Engineer for approval.
- Strip, salvage, and stockpile existing sod, as applicable. Salvaged sod can be replaced after proper backfill and compaction on disturbed areas to reduce the need for new topsoil and seeding.
- Seed bed preparation. Ensure a minimum of 6-inches of topsoil is placed in the areas that will be seeded. If inadequate topsoil quantities are available from the stripped topsoil volume, the Contractor is responsible for sourcing additional topsoil and providing a submittal to the Engineer for review.
- Seeding, fertilizing and mulching the disturbed areas.
- Protection of the seeded areas and reseeding as required during the maintenance period.
- All labor, tools, equipment, materials, and incidentals necessary to complete work as specified

Measurement for Site Restoration will be made as a percentage completed of the lump sum.

GENERAL DUTIES AND RESPONSIBILITIES

The Work described in this RFP will be completed adjacent to and concurrent with a larger construction project for the restoration and realignment of the Jocko River. It is the responsibility of the Contractor to safely share access and haul routes, and promptly communicate access-related issues with the Owner, as needed. Contractor must stay on developed access routes, and respect fences and gated closures throughout the duration of the project. Any impacts to Tribal lands caused by the Contractor must be rectified by the Contractor at the expense of the Contractor as soon as reasonably possible to the satisfaction of the Owner.

The King Pump Station and Jocko River Rehabilitation projects are authorized together with all the required permits, consultations and NEPA documentation. Work under this RFP will comply with all permits and consultation requirements. Key requirements are included here, but other applicable requirements will be communicated by the Owner, as needed. The Owner shall prepare a permit binder for the Contractor with all relevant permits prior to construction, which shall remain onsite for the duration of construction. Relevant CSKT staff, the consultant and the contractor will have a pre-construction meeting to discuss environmental protection requirements among other construction-related details.

All equipment, vehicles and tools to be used for the project will be pressure washed or appropriately cleaned prior to arrival onsite to reduce the risk of transporting noxious or invasive species. The Owner reserves the right to inspect all equipment prior to entry into the work area. Noxious weeds are present in the project area and care must be taken when demobilizing from the project area to prevent the spread of weeds.

All equipment shall be free of leaks or other mechanical deficiencies that may lead to a release of petroleum or other deleterious products.

The Contractor shall define an equipment refueling area that precludes potential release of petroleum products and shall maintain spill containment equipment onsite that meets the requirements of the Owner.

Protection of Tribal Resources is of the upmost importance. At all times the Contractor shall work to minimize damage to soils, plants, wildlife, and cultural sites on the Reservation. Vehicles and equipment shall only be operated in approved access zones and on established roads or routes. Damage caused by unauthorized access or disturbance shall be repaired by the Contractor, at no cost and to the satisfaction of the CSKT.

Conservation Measures for Grizzly Bears

Due to the potential presence of Grizzly Bear in the Action Area, the following actions and precautions must be adhered to when working within any construction or staging site to minimize disturbance and attracting bears to the Work site. Avoiding potential conflicts with Grizzly Bears is vital to the persistence of the species; therefore, the following precautions need to be followed at the Work site:

- Anyone working in grizzly bear habitat (i.e., Contractors, partners, and tribal employees) will be briefed on bear-country safety, including use of bear spray and measures to avoid providing attractants and minimizing potential for conflicts and disturbance to bears.
- All workers will be equipped with and carry bear spray.
- Promptly clean up any project related spills, litter, garbage, debris, etc.
- Store all food, food related items, petroleum products, antifreeze, garbage, and personal hygiene products inside a closed, hard-sided vehicle or commercially manufactured IGBC Certified bear resistant container.
- Remove garbage from project sites daily and dispose of it in accordance with applicable regulations. Anyone working in grizzly bear habitat (i.e., Contractors, partners, and Tribal employees) will comply with applicable attractant storage orders (https://igbconline.org/be-bear-aware/food-storage/). If no specific rule exists for the area, a review and adaptation of the available food storage orders will be considered adequate.
- Activities will adhere to all grizzly bear-related requirements in Tribal Forest Management Plans and Resource Management Plans, Terms and Conditions in past and future consultations, and other management plans. This includes consistency with any Forest-specific bear safety plans.
- Between April 1 and June 1, all activities will avoid high-quality spring habitats wherever feasible. If not feasible to avoid these areas, projects in quality spring habitats during the spring season will be completed in 5 or fewer days. These areas are defined as snow-free forested and open habitats that afford fresh green-up of grasses, roots, and bulbs, as well as foraging opportunities for small rodents, and may include riparian areas, meadows, open grassy parklands, and avalanche chutes.
- Camping for project-related activities will occur at developed campgrounds or if at dispersed sites, will consist of ≤20 individuals for up to 5 days per campsite.
- Grizzly bear sightings and/or incidents will be reported to the CSKT Wildlife Management office within 48 hours.
- Notify the CSKT Wildlife Management Program of any animal carcasses found in the area.
- Remove garbage from the project site daily and dispose of it in accordance with all applicable regulations.

Cultural Mitigation Measures

- A CSKT TPD monitor will be present during all ground disturbance activities to inspect for unexpected archaeological resources that may be uncovered. The Contractor shall contact the CSKT TPD two weeks prior to any ground disturbing activities to arrange for TPD staff to be present during this phase of construction.
- Any archaeological or historical artifacts discovered during construction shall be left intact and undisturbed, all Work in the area shall cease immediately, and the CSKT TPD (406.675.2700 ext. 1075) shall be notified immediately pursuant to 36 CFR 800.13. Commencement of operations shall be allowed upon notification by the CSKT TPD.
- If during construction operations, any human remains, funerary objects, sacred objects, or objects of cultural patrimony, as defined in the Native American Graves Protection and Repatriation Act (P.L. 101-601; Stat. 3048; 25 U.S.C. 3001), are discovered, the Contractor shall cease operations in the immediate area of discovery, protect the remains and objects, and shall immediately notify the CSKT TPD (406.675.2700 ext. 1075) of the discovery by telephone with written confirmation. The Contractor shall continue to protect the immediate area of the discovery until notified by the CSKT Tribal Preservation Department that operations may continue.

Ground Disturbance Mitigation Measures

- Water shall be applied, as needed, to control dust during all phases of construction.
- The Contractor shall adhere to all applicable tribal, state, and federal regulations when obtaining construction water.

Other Mitigation Measures

- In compliance with Executive Order 13112, the Contractor shall implement noxious weed control.
- In compliance with Executive Order 13112, the Contractor shall inspect all earth-moving and hauling equipment. All equipment shall be cleaned of visible dirt or plant parts prior to entering the construction site to prevent the introduction of noxious weed seed.
- In compliance with Executive Order 13112, the Contractor shall inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site.
- In compliance with the Migratory Bird Treaty Act (MBTA), if trees or shrubs must be removed, the Contractor shall remove all trees and shrubs during the non-breeding season (generally August 15 - April 15).
- In compliance with the MBTA, if trees or shrubs must be removed during the nesting season (generally April 15 – August 15), the Contractor shall arrange for a qualified biologist to survey impacted areas prior to initiating the project.

SECTION 4: RFP RESPONSE FORM

(USE ADDITIONAL SHEETS AS NECESSARY)

OFFEROR QUALIFICATIONS/INFORMATIONAL REQUIREMENTS

In order to determine the capabilities of an offeror to perform the services specified in Section 3, the offeror must respond to the following regarding its ability to meet contract requirements.

NOTE: Each item below must be completely addressed. Offerors taking exception to any requirements listed in this section may be found nonresponsive or be subject to point deductions.

1. **Proposal Documents**. In addition to this form, offeror must provide:

a. Signed copy of the RFP Cover Sheet,

b. Completed cost proposal form (Section 5),

c. Signed CSKT Debarment Form,

d. Complete Bid bond Form (10%),

e. Indian Preference Certification, if applicable, and

f. Signed Addendum Acknowledgement Form

2. **References**. Offeror shall provide a minimum of two, but no more than four, references for the type of services proposed in this RFP. The offeror shall provide the following details for each reference:

a. The customer's name,

b. The project name and location where the supplies and/or services were provided,

c. Contact person(s), customer's telephone number, and

d. A description of the project type, and dates the services were provided.

These references may be contacted to verify offeror's ability to perform the contract. CSKT reserves the right to use any information or additional references deemed necessary to establish the ability of the offeror to perform the conditions of the contract. Negative references may be grounds for proposal disqualification.

3. **Resumes/Company Profile**. Offeror shall provide:

a. A narrative describing how long the company submitting the proposal has been in the business of providing supplies and/or services similar to those requested in this RFP and under what company name, and

b. Resumes must be provided for all key personnel who will be involved with any aspects of the contracted Work, which detail qualifications, relevant work experience, years of experience, education, skills, etc.. Key personnel must include at least a resident superintendent.

4. **Experience/Project Examples**. Offeror shall provide a complete description of at least 2 relevant past projects, to include:

a. Project name and location,

b. Work performed (photographs of proven work is encouraged if possible), and

c. Size and duration of project.

SECTION 5: COST PROPOSAL FORM

Quantities: The number of quantities are estimates only and will be the basis for evaluation of bids. Payment will be made in an amount equal to the total of all extended prices for actual Work completed. The extended price is determined by multiplying the unit price times the actual quantity of that Work item completed. Actual quantities installed will be determined by the Engineer, and approved by the Owner.

BID ITEM	DESCRIPTION	UNITS	QUANTITY	UNIT PRICE	EXTENDED PRICE
1	Mobilization/Prep. Work	LUMP SUM	1		
2	Pump Station	LUMP SUM	1		
3	Screen Inlet and Hydroburst System	LUMP SUM	1		
4	Concrete Slab	LUMP SUM	1		
5	Irrigation Pipe	LINEAR FEET	540		
6	Power Service	LUMP SUM	1		
7	Security Fence	LINEAR FEET	112		
8	Site Restoration	LUMP SUM	1		
Total of all extended prices for Estimated Quantities of Work					

Total Bid Price (in words): _____
_____

Offeror:
Company Name _____
Address _____
_____
Telephone _____
Date _____
Contact Name _____
Signature _____
By signing the above, I certify that I am authorized by the Company named above to respond to this request.

SECTION 6: OTHER FORMS

Addendum Acknowledgement Form

Offeror acknowledges receipt of the following addenda which are attached to the SOQ:

Addendum No._____ Date _____

Addendum No._____ Date _____

Addendum No._____ Date _____

Addendum No._____ Date _____

Addendum No._____ Date _____

Failure to acknowledge receipt of all addenda may cause the proposal to be considered non-responsive and omitted from consideration.

BID BOND FOR CS&KT CONTRACTS

PRINCIPAL (Legal name and business address)	DATE BOND EXECUTED (Must not be later than bid opening date)
	TYPE OF ORGANIZATION ("X" one) [ ] Individual [ ] Partnership [ ] Joint Venture [ ] Corporation
	STATE OF INCORPORATION

SURETY(IES) (Name and business address)	
PENAL SUM OF BOND	BID IDENTIFICATION

PERCENT OF BID PRICE *	AMOUNT NOT TO EXCEED				BID DATE	SOLICITATION/SPECIFICATIONS
	MILLIONS	THOUSANDS	HUNDREDS	CENTS	FOR [X] Construction [ ] Supplies [ ] Services	

OBLIGATION:
We, the Principal and Surety(ies), are firmly bound to THE CONFEDERATED SALISH AND KOOTENAI TRIBES (hereinafter called the Tribes) in the above penal sum. For payment of the penal sum, we bind ourselves, our hires, executors, administrators, and successors, jointly and severally. However, where the Sureties are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us. For all other purposes, each Surety binds itself, jointly and severally with the Principal, for the payment of the sum shown opposite the name of the Surety. If no limit of liability is indicated, the limit of liability is the full amount of the penal sum.

CONDITIONS:
The Principal has submitted the bid identified above.

THEREFORE:
The above obligation is void if the Principal - (a) upon acceptance by the Tribes of the bid identified above, within the period specified therein for acceptance (sixty (60) days if no period is specified), executed the further contractual documents and gives the bond(s) required by the terms of the bid as accepted within the time specified (ten (10) days if no period is specified) after receipt of the forms by the Principal, or (b) in the event of failure to execute such further contractual documents and give such bonds, pays the Tribes for any costs of procuring the work which exceeds the amount of the bid.

Each Surety executing this instrument agrees that its obligation is not impaired by any extension(s) of time for acceptance of the bid that the Principal may grant to the Tribes. Notice to surety(ies) of extension(s) are waived. However, waiver of the notice applies only to extensions aggregating not more than sixty (60) calendar days in addition to the period originally allowed for acceptance of the bid.

WITNESS:
The Principal and Surety(ies) executed this bid bond and affixed their seals on the above date.

PRINCIPAL

SIGNATURE(S)	1. (Seal)	2. (Seal)	3. (Seal)	CORPORATE SEAL
NAME(S) & TITLE(S) (typed)	1.	2.	3.	

* Not less than 10 percent of the bid price. (A bid guarantee is required with any bid in excess of $25,000. The bid guarantee shall be in the amount of 10 percent of the total amount of the bid or $3,000,000, whichever is less.)

CORPORATE SURETY(IES)					
	NAME & ADDRESS		STATE OF INC.	LIABILITY LIMIT	CORPORATE
A	SIGNATURE(S)				SEAL
	NAME(S) & TITLE(S) (Typed)				

CORPORATE SURETY(IES)					
	NAME & ADDRESS		STATE OF INC.	LIABILITY LIMIT	CORPORATE
B	SIGNATURE(S)				SEAL
	NAME(S) & TITLE(S) (Typed)				

CORPORATE SURETY(IES)					
	NAME & ADDRESS		STATE OF INC.	LIABILITY LIMIT	CORPORATE
C	SIGNATURE(S)				SEAL
	NAME(S) & TITLE(S) (Typed)				

INSTRUCTIONS

1. This form is authorized for use when a bid guarantee is required. Any deviation from this form will require the written approval of the Tribes.

2. Insert the full legal name and business address of the Principal in the space designated "Principal" on the face of the form. An authorized person shall sign the bond. Any person signing in a representative capacity (e.g., an attorney-in-fact) must furnish evidence of authority if that representative is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved.

3. The bond may express penal sum as a percentage of the bid price. In these cases, the bond may state a maximum dollar limitation (e.g., 20% of the bid price but the amount not to exceed _____ dollars).

4. (a) Where more than one corporate surety is involved, their names and addresses shall appear in the spaces (A, B, etc.) headed "CORPORATE SURETY(IES)." In the space designated "SURETY(IES)" on the face of the form, insert only the letter identification of the sureties.
(b) The use of individual Sureties will not be acceptable to the Tribes.

5. Corporations executing the bond shall affix their corporate seals.

6. Type the name and title of each person signing this bond in the space provided.

7. In its application to negotiated contracts, the terms "bid" and "bidder" shall include "proposal" and "offeror."

DEBARMENT AND SUSPENSION CERTIFICATION

1. All persons or firms, including sub-consultants, must complete this certification and certify, under penalty of perjury, that, except as noted below, he/she or any person associated therewith in the capacity of owner, partner, director, officer, or manager:

    a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any federal department or agency;

    b. Have not, within the three (3) year period preceding this certification, been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state, or local) transaction or contract under a public transaction, violation of Federal or state antitrust statutes, or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

    c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (federal, state, or local) with Commission of any of the offenses listed in subparagraph (1)(b) of this certification; and

    d. Have not, within the three (3) year period preceding this certification, had one or more public transactions (Federal, state, and local) terminated for cause or default.

2. If such persons or firms later become aware of any information contradicting the statements of paragraph (1), they will promptly provide that information to CSKT.

If there are any exceptions to this certification, note the exceptions in the following space and attach a detailed explanation to this document.

Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted above, indicate below to whom it applies, initiating agency, and dates of actions.

NOTE HERE

_____
Name of Firm

_____
Signature

_____
Date

List of RFP Attachments:

- Draft Contract
- King Pump Station Plan set, dated December 2025
- Technical Specifications

CONTRACT FOR CONSTRUCTION OF A SMALL PROJECT

This Agreement entered into on the **_____,** ("Effective Date") is by and between **the Confederated Salish and Kootenai Tribes-NRD, Division of Engineering and Water Resources** ("Owner") and **[name of contracting entity]** ("Contractor").

Owner and Contractor hereby agree as follows:

ARTICLE 1 - THE WORK

1.01 Work

A. Work includes all labor, materials, equipment, services, and documentation necessary to construct the Project defined herein. The Work may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

B. The Contractor shall complete all Work as specified or indicated in the Contract Documents. The Project is generally described as follows:

1. **King Pump Station Project** will construct a new pumping facility and appurtenances with a vertical turbine pump and screened intake for a private water rights holder along the newly constructed banks of a restored Jocko River channel, and the buried pipeline and underground power to connect to existing utilities.

2. The Site of the Work areas are described in greater detail in the Contract Documents but generally located **in the SW/4 of Section 21, Township 18 North, Range 21 West, in Sanders County, MT.**

ARTICLE 2 - CONTRACT DOCUMENTS

2.01 Intent of Contract Documents

A. It is the intent of the Contract Documents to describe a functionally complete project. The Contract Documents do not indicate or describe all of the Work required to complete the Project. Additional details required for the correct installation of selected products are to be provided by the Contractor and coordinated with the Owner and Engineer. This Contract supersedes prior negotiations, representations, and agreements, whether written or oral. The Contract Documents are complementary; what is required by one part of the Contract Documents is as binding as if required by other parts of the Contract Documents.

B. During the performance of the Work and until final payment, Contractor and Owner shall submit all matters in question concerning the requirements of the Contract Documents, or relating to the acceptability of the Work under the Contract Documents to the Engineer. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.

C. Engineer will render a written clarification, interpretation, or decision on the issue submitted, or initiate a modification to the Contract Documents.

D. Contractor, and its subcontractors and suppliers, shall not have or acquire any title to or ownership rights to any of the Drawings, Specifications, or other documents (including copies or electronic media editions) prepared by Engineer or its consultants.

2.02 Contract Documents Defined

A. The Contract Documents consist of the following documents:

1. This Contract.
2. Construction Specifications and Design Drawings (Attachment A).
3. The following which may be delivered or issued before or after the Effective Date of the Contract:

a. CSKT Performance Bond form

b. CSKT Payment Bond form

c. CSKT Debarment Form

d. CSKT Invoice Certification and Request for Payment Form

e. W-9 form

f. Work Change Directives form

g. Change Orders form

h. Field Orders form

i. Proof of current worker's compensation insurance or proof of valid exemption

j. Proof of current general liability (or commercial) and automobile insurance

ARTICLE 3 - ENGINEER

3.01 Engineer

A. The Engineer for this Project is **WWC Engineering.**

ARTICLE 4 - CONTRACT TIMES

4.01 Contract Times

A. The Work will be substantially completed on or before **August 18, 2026** and completed and ready for final payment on or before **September 28, 2026**.

4.02 Liquidated Damages

A. Contractor and Owner recognize that time is of the essence in the performance of the Contract, and that Owner will incur damages if Contractor does not complete the Work according to the requirements of Paragraph 4.01. Because such damages for delay would be difficult and costly to determine, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty) Contractor shall pay Owner $1,000.00 for each day that expires after the Contract Time for substantial completion.

4.03 Delays in Contractor's Progress

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to

an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor or their subcontractors or suppliers.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times.

D. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor or Contractor's subcontractors or suppliers.

4.04 Milestones

A. Parts of the Work must be substantially completed on or before the following Milestone(s):

1. Milestone 1 [All work to allow for the pump station to safety and efficiently pump water by August 18, 2026]

ARTICLE 5 - CONTRACT PRICE

5.01 Payment

A. Owner shall pay Contractor in accordance with the Contract Documents at the following unit prices for each unit of Work completed:

Item No.	Description	Unit	Estimated Quantity	Unit Price	Extended Price
1	Mobilization/Prep. Work	LS	1		
2	Pump Station	LS	1		
3	Screen Inlet and Hydroburst System	LS	1		
4	Concrete Slab	LS	1		
5	Irrigation Pipe	LF	540		
6	Power Service	LS	1		
7	Security Fence	LF	112		
8	Site Restoration	LS	1		
Total of all extended prices for Estimated Quantities of Work					**$**

Payment will be made in an amount equal to the total of all extended prices for actual Work completed. The extended price is determined by multiplying the unit price times the actual quantity of that Work item completed. Actual quantities installed will be determined by the Engineer.

ARTICLE 6 - BONDS, INSURANCE, AND OTHER REQUIRED DOCUMENTS

6.01 Bonds

A. Before starting Work, Contractor shall furnish a performance bond and a payment bond from surety companies that are duly licensed or authorized to issue bonds in the required amounts in the jurisdiction in which the Project is located. Each bond shall be in an amount equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until the completion of the correction period specified in Paragraph 7.12 but, in any case, not less than one year after the date when final payment becomes due.

6.02 Insurance

A. Before this Agreement is signed, Contractor shall furnish evidence of insurance from companies that are duly licensed or authorized in the jurisdiction in which the Project is located with a minimum AM Best rating of A-VII or better. Contractor shall provide insurance in accordance with the following:

1. Contractor shall provide coverage for not less than the following amounts, or greater where required by Laws and Regulations:

a. Workers' Compensation:

State:		Statutory
Employer's Liability:		
Bodily Injury, each Accident	$	500,000.00
Bodily Injury By Disease, each Employee	$	500,000.00
Bodily Injury/Disease Aggregate	$	2,000,000.00

b. Commercial General Liability:

General Aggregate	$	2,000,000.00
Products - Completed Operations Aggregate	$	2,000,000.00
Personal and Advertising Injury	$	2,000,000.00
Each Occurrence (Bodily Injury and Property Damage)	$	2,000,000.00

c. Automobile Liability herein:

Combined Single Limit of:	$	2,000,000.00

B. All insurance policies required to be purchased and maintained will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the insured and additional insured.

C. Automobile liability insurance provided by Contractor shall provide coverage against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.

D. Contractor's commercial general liability policy shall be written on a 1996 or later ISO commercial general liability occurrence form and include the following coverages and endorsements:

1. Products and completed operations coverage maintained for three years after final payment;
2. Blanket contractual liability coverage to the extent permitted by law;
3. Broad form property damage coverage; and
4. Severability of interest; underground, explosion, and collapse coverage; personal injury coverage.

E. The Contractor's policies shall include and list Owner and Engineer and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each as additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis.

1. Additional insured endorsements will include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.
2. Contractor shall provide ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent for design professional additional insureds.

F. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 15.

6.03 Other Documentation Required

A. Within ten (10) business days of notice of contingent award, Contractor shall provide the following, necessary for CSKT contract administration:

- Proof of Insurance
- Workman's Compensation
- Completed W-9 form

B. Once received in complete form, CSKT review and approval is necessary in order to issue a DocuSign link for contract execution. Owner may issue a Notice to Proceed after proper approval. Owner will return one fully executed counterpart of the Agreement as an electronic copy of the Contract Documents.

ARTICLE 7 - CONTRACTOR'S RESPONSIBILITIES

7.01 Supervision and Superintendence

A. Contractor shall supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the

Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, safety, and procedures of construction.

B. Contractor shall assign a competent resident superintendent who is to be present at all times during the execution of the Work. This resident superintendent shall not be replaced without written notice to and approval by the Owner and Engineer except under extraordinary circumstances.

C. Contractor shall at all times maintain good discipline and order at the Site.

D. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday.

7.02 Other Work at the Site

A. In addition to and apart from the Work of the Contractor, other work may occur at or adjacent to the Site. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.

7.03 Services, Materials, and Equipment

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work shall be new, of good quality and shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable supplier, except as otherwise may be provided in the Contract Documents.

7.04 Subcontractors and Suppliers

A. Contractor may retain subcontractors and suppliers for the performance of parts of the Work. Such subcontractors and suppliers must be acceptable to Owner.

7.05 Quality Management

A. Contractor is fully responsible for the managing quality to ensure Work is completed in accordance with the Contract Documents.

7.06 Licenses, Fees and Permits

A. Contractor shall pay all license fees and royalties and assume all costs incident to performing the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others.

B. Contractor shall obtain and pay for all construction permits and licenses unless otherwise provided in the Contract Documents.

7.07 Laws and Regulations; Taxes/Fees

A. Contractor shall give all notices required by and shall comply with all local, state, tribal and federal Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages if Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations.

C. Contractor shall pay all applicable sales, consumer, use, and other similar taxes or fees Contractor is required to pay in accordance with Laws and Regulations.

7.08 Record Documents

A. Contractor shall maintain one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved shop drawings in a safe place at the Site. Contractor shall annotate them to show changes made during construction. Contractor shall deliver these record documents to Engineer upon completion of the Work.

7.09 Safety and Protection

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work.

B. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. All persons on the Site or who may be affected by the Work;

2. All the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. Other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and underground facilities not designated for removal, relocation, or replacement in the course of construction.

C. All damage, injury, or loss to any property caused, directly or indirectly, in whole or in part, by Contractor, or anyone for whose acts the Contractor may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Contract Documents or to the acts or omissions of Owner or Engineer and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor).

D. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

E. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor shall act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any

significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.10 Shop Drawings, Samples, and Other Submittals

A. Contractor shall review and coordinate the shop drawing and samples with the requirements of the Work and the Contract Documents and shall verify all related field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information.

B. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.

C. With each submittal, Contractor shall give Engineer specific written notice, in a communication separate from the submittal, of any variations that the shop drawing or sample may have from the requirements of the Contract Documents.

D. Engineer will provide timely review of shop drawings and samples.

E. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs.

F. Engineer's review and approval of a separate item does not indicate approval of the assembly in which the item functions.

G. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of shop drawings and submit, as required, new samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

H. Shop drawings are not Contract Documents.

7.11 Warranties and Guarantees

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.

7.12 Correction Period

A. If within one year after the date of substantial completion, any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly and without cost to Owner, correct such defective Work.

7.13 Indemnification

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against

all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any subcontractor, any supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts they may be liable.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.01 Owner's Responsibilities

A. Except as otherwise provided in the Contract Documents, Owner shall issue all communications to Contractor through Engineer.

B. Owner shall make payments to Contractor as provided in this Contract.

C. Owner shall provide Site and easements required to construct the Project.

D. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, unless stated elsewhere in the Contract Documents, Owner shall have sole authority and responsibility for such coordination.

E. The Owner shall be responsible for performing inspections and tests required by applicable codes.

F. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

G. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.

H. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 Engineer's Status

A. Engineer will be Owner's representative during construction. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in this Contract.

B. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any subcontractor, any supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

C. Engineer will make visits to the Site at intervals appropriate to the various stages of construction. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work.

D. Engineer has the authority to reject Work if Contractor fails to perform Work in accordance with the Contract Documents.

E. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work.

F. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

ARTICLE 10 - CHANGES IN THE WORK

10.01 Authority to Change the Work

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work.

10.02 Change Orders

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. Changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. Changes in the Work which are: (a) ordered by Owner or (b) agreed to by the parties or (c) resulting from the Engineer's decision, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and

3. Changes in the Contract Price or Contract Times or other changes which embody the substance of any final binding results under Article 12.

B. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 11 - DIFFERING SUBSURFACE OR PHYSICAL CONDITIONS

11.01 Differing Conditions Process

A. If Contractor believes that any subsurface or physical condition including but not limited to utilities or other underground facilities that are uncovered or revealed at the Site either differs materially from that shown or indicated in the Contract Documents or is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Contract Documents then

Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. After receipt of written notice, Engineer will promptly:

1. Review the subsurface or physical condition in question;
2. Determine necessity for Owner obtaining additional exploration or tests with respect to the condition;
3. Determine whether the condition falls within the differing site condition as stated herein;
4. Obtain any pertinent cost or schedule information from Contractor;
5. Prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and
6. Advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

ARTICLE 12 - CLAIMS AND DISPUTE RESOLUTION

12.01 Claims Process

A. The party submitting a claim shall deliver it directly to the other party to the Contract and the Engineer promptly (but in no event later than 10 days) after the start of the event giving rise thereto.

B. The party receiving a claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the claim through the exchange of information and direct negotiations. All actions taken on a claim shall be stated in writing and submitted to the other party.

C. If efforts to resolve a claim are not successful, the party receiving the claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the claim within 45 days, the claim is deemed denied.

D. If the dispute is not resolved to the satisfaction of the parties, Owner or Contractor shall give written notice to the other party of the intent to submit the dispute to the Tribal Court of the Confederated Salish and Kootenai Tribes.

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION OF DEFECTIVE WORK

13.01 Tests and Inspections

A. Owner and Engineer will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access.

B. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

C. If any Work that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense.

13.02 Defective Work

A. Contractor shall ensure that the Work is not defective.

B. Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. The Contractor shall promptly correct all such defective Work.

E. When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. If the Work is defective or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated.

ARTICLE 14 - PAYMENTS TO CONTRACTOR

14.01 Progress Payments

A. The Contractor shall prepare a schedule of values that will serve as the basis for progress payments. The schedule of values will be in a form of application for payment acceptable to Engineer. The unit price breakdown submitted with the bid will be used for unit price work. Break lump sum items into units that will allow for measurement of Work in progress.

14.02 Applications for Payments:

A. Contractor shall submit an application for payment using **CSKT Invoice Certification Form**, no more frequently than monthly, to Engineer. Applications for payment will be prepared and signed by Contractor. Contractor shall provide supporting documentation required by the Contract Documents. Payment will be paid for Work completed as of the date of the application for payment.

B. Beginning with the second application for payment, each application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work

have been applied on account to discharge Contractor's legitimate obligations associated with prior applications for payment.

14.03 Retainage

A. Not used.

14.04 Review of Applications

A. Within 10 days after receipt of each application for payment, the Engineer will either indicate in writing a recommendation for payment and present the application for payment to Owner or return the application for payment to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. The Contractor will make the necessary corrections and resubmit the application for payment.

B. Engineer will recommend reductions in payment (set-offs) which, in the opinion of the Engineer, are necessary to protect Owner from loss because the Work is defective and requires correction or replacement.

C. The Owner is entitled to impose set-offs against payment based on any claims that have been made against Owner on account of Contractor's conduct in the performance of the Work, incurred costs, losses, or damages on account of Contractor's conduct in the performance of the Work, or liquidated damages that have accrued as a result of Contractor's failure to complete the Work.

14.05 Contractor's Warranty of Title

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

14.06 Substantial Completion

A. The Contractor shall notify Owner and Engineer in writing that the Work is substantially complete and request the Engineer issue a certificate of substantial completion when Contractor considers the Work ready for its intended use. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Engineer will make an inspection of the Work with the Owner and Contractor to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor and Owner in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete or upon resolution of all reasons for non-issuance of a certificate identified in 14.06.B, Engineer will deliver to Owner a certificate of substantial completion which shall fix the date of substantial completion and include a punch list of items to be completed or corrected before final payment.

14.07 Final Inspection

A. Upon written notice from Contractor that the entire Work is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.08 Final Payment

A. Contractor may make application for final payment after Contractor has satisfactorily completed all Work defined in the Contract, including providing all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents and other documents.

B. The final application for payment shall be accompanied (except as previously delivered) by:

1. All documentation called for in the Contract Documents;

2. Consent of the surety to final payment;

3. Satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any liens or other title defects, or will so pass upon final payment;

4. A list of all disputes that Contractor believes are unsettled; and

5. Complete and legally effective releases or waivers (satisfactory to Owner) of all lien rights arising out of the Work, and of liens filed in connection with the Work.

C. The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

14.09 Waiver of Claims

A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 Owner May Suspend Work

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 60 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension.

15.02 Owner May Terminate for Cause

A. Contractor's failure to perform the Work in accordance with the Contract Documents or other failure to comply with a material term of the Contract Documents will constitute a default by Contractor and justify termination for cause.

B. If Contractor defaults in its obligations, then after giving Contractor and any surety ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:

1. Declare Contractor to be in default, and give Contractor and any surety notice that the Contract is terminated; and

2. Enforce the rights available to Owner under any applicable performance bond.

C. Owner may not proceed with termination of the Contract under Paragraph 15.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

D. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

E. In the case of a termination for cause, if the cost to complete the Work, including related claims, costs, losses, and damages, exceeds the unpaid contract balance, Contractor shall pay the difference to Owner.

15.03 Owner May Terminate for Convenience

A. Upon seven days written notice to Contractor, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for, without duplication of any items:

1. Completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. Expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. Other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

15.04 Contractor May Stop Work or Terminate

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner, and provided Owner does not remedy such suspension or failure within that time, either stop the Work until payment is received, or terminate the Contract and recover payment from the Owner.

ARTICLE 16 - CONTRACTOR'S REPRESENTATIONS

16.01 Contractor Representations

A. Contractor makes the following representations when entering into this Contract:

1. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.

2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

3. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

4. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on:

    a. The cost, progress, and performance of the Work;

    b. The means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and

    c. Contractor's safety precautions and programs.

5. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

6. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

7. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

8. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

9. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that, without exception, all prices in the Contract are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 17 - MISCELLANEOUS

17.01 Cumulative Remedies

A. The duties and obligations imposed by this Contract and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.02 Limitation of Damages

A. Neither Owner, Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

17.03 No Waiver

A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

17.04 Survival of Obligations

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 Contractor's Certifications

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract.

17.06 Controlling Law

A. This Contract is to be governed by the law laws of the Confederated Salish and Kootenai Tribes to the extent not superseded or pre-empted by federal law. In the event of legal action, the parties agree and covenant that the exclusive forum to hear such cause or enforce such obligation shall be the Tribal Court of the Confederated Salish and Kootenai Tribes. Nothing in this agreement shall be interpreted as waiving the sovereign immunity of the Confederated Salish and Kootenai Tribes.

17.07 Assignment of Contract

A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

17.08 Successors and Assigns

A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

17.09 Performance of Work by the Contractor

A. The Contractor shall perform on the site, and with its own organization, work equivalent to at least **60 percent** of the total amount of work to be performed under the contract.

B. This percentage may be reduced by a supplemental agreement to this contract if, during performing the work, the Contractor requests a reduction and the Owner determines that the reduction would be to the advantage of the Tribes.

17.10 Audit and Records

A. The Contractor, upon written request of the Tribes, shall make available financial records pertinent to its performance of this Agreement for the purposes of financial audit.

B. The Contractor agrees that the Tribes or any of its duly authorized representatives shall, until the expiration of three years after final payment under this Agreement, have access to and the right to examine any of the Contractor's records related to this Agreement.

17.11 Officials Not to Benefit

A. No member of or delegate to Congress, Tribal Council member, or resident commissioner, shall be admitted to any share or part of this contract, or to any benefit arising from it. However, this clause does not apply to this contract to the extent that this contract is made with a corporation for the corporation's general benefit.

17.12 Construction Wage Rate Requirements

A. The Indian Self Determination and Education Assistance Act, Pub. L. 93-638, 25 USC 5301, et seq., as amended, and its implementing regulations, including but not limited to, those set forth in 25 CFR Part 1000, Subpart K, as may be amended, shall apply to construction programs and projects included in this Agreement. Contractors and subcontractors must comply with applicable Tribal laws, Federal laws, program statutes and regulations.

17.13 Notices

All notices required or permitted under this Agreement shall be signed and in writing, and shall be delivered to the party to be notified in person or by depositing the same in the United States mail, certified, to the appropriate following address:

Owner - Confederated Salish & Kootenai Tribes	**Contractor –**
Attn: NRD-DEWR Tabitha Espinoza	**Attn:**
PO Box 278	Address
Pablo, MT 59855	City State Zip

IN WITNESS WHEREOF, Owner and Contractor have executed this Agreement on the date first written above.

CONTRACTOR:

_____ _____
Contractor Date

_____
Name, Title
Email

CONFEDERATED SALISH AND KOOTENAI TRIBES:

_____ _____
Department Head Date

_____ _____
Director Date

_____ _____
Executive Officer Date

_____ _____
Tribal Council Chair Date

ATTACHMENT A

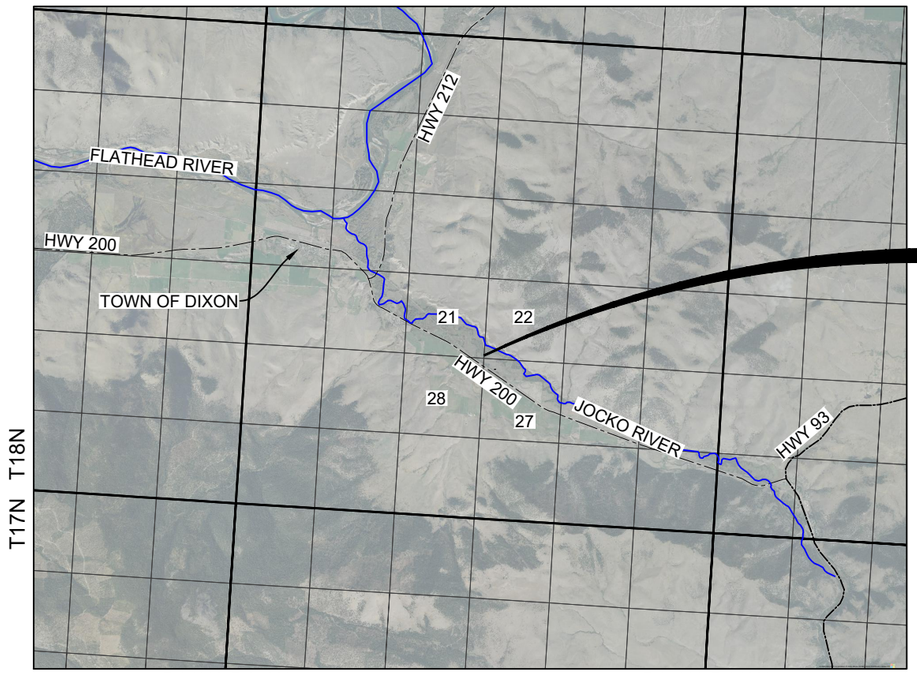
Insert:

- Scope of Project (copy what was issued in the RFP)
- Construction Specs & Design Drawings (copy what was issued in the RFP)
- Project Schedule/Milestones (if any)

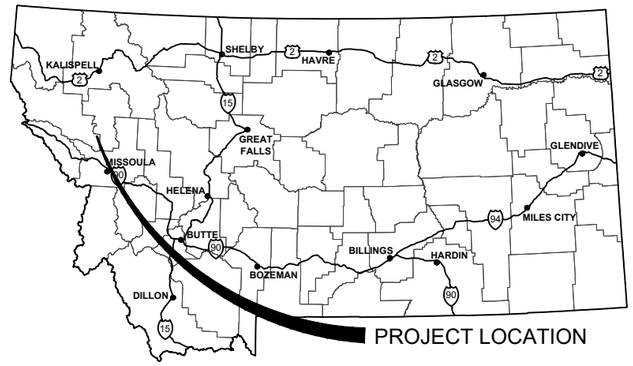
CONSTRUCTION DRAWINGS

CONFEDERATED SALISH AND KOOTENAI TRIBES
KING PUMP STATION

Sheet List Table	
Sheet Number	*Sheet Title*
1	COVER
2	GENERAL NOTES
3	STRUCTURAL NOTES
4	QUANTITIES
5	EXISTING CONDITIONS
6	OVERALL SITE PLAN
7	PIPELINE PLAN & PROFILE
8	PUMP STATION PLAN AND PROFILE
9	PUMP STATION LAYOUT
10	PUMP STATION GRADING PLAN
11	VAULT LAYOUT
12	DETAILS 1
13	FENCE DETAILS 1
14	FENCE DETAILS 2



LOCATION MAP



SANDERS COUNTY, MT

PROJECT LOCATION
LAT: 47.298664 N
LONG: 114.267950 W

N

0 5000' 10000'
SCALE: 1" = 10000'

MONTANA
DARYL DREW PEARSON
No. 62631ES
12/19/25
LICENSED PROF ENGINEER-LAND SURVEYOR

Know what's below. Call before you dig.

FOR BIDDING

PREPARED FOR:
CONFEDERATED SALISH AND KOOTENAI TRIBES
P.O. BOX 1722
WHITEFISH, MT 59937
(406) 862-4927

PREPARED BY:
WWC ENGINEERING
1275 MAPLE STREET, SUITE F
HELENA, MT 59601
(406) 443-3962
www.wwcengineering.com

NO.

PROJECT NO. 2024138

NO.	REVISION	BY	DATE

DESIGNED BY: JDF
DRAWN BY: JDF
CHECKED BY: DDP
DATE: 12/19/2025

DRAWING NO.
1

GENERAL CONSTRUCTION NOTES

1. UNLESS SPECIFICALLY SHOWN ON THE DRAWINGS, ALL WORK SHALL CONFORM TO MPWSS, LATEST EDITION AND THESE PLANS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS REQUIRED AND CONSTRUCTION TESTING FOR CONSTRUCTION ACTIVITIES.
3. THE CONTRACTOR SHALL RESTORE ALL ROADWAY TO EQUAL OR BETTER CONDITION THAN EXISTED PRIOR TO CONSTRUCTION, AS DETERMINED BY THE OWNER AND THE ENGINEER.
4. THE LOCATION, DEPTH AND SIZE OF EXISTING UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE. THE CONTRACTOR SHALL FIELD VERIFY THE EXISTENCE, LOCATION, DEPTH, SIZE, LINE AND GRADE OF EXISTING UTILITY CONNECTIONS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING FACILITIES DUE TO FAILURE TO LOCATE OR PROVIDE PROPER PROTECTION WHEN LOCATION IS KNOWN.
5. THE CONTRACTOR SHALL SUPPLY ALL NECESSARY FITTINGS, COUPLINGS AND SPOOL PIECES FOR CONNECTING NEW UTILITIES TO EXISTING UTILITIES. THESE PLANS MAY NOT SHOW ALL REQUIRED COMPONENTS FOR MAKING THE CONNECTIONS.
6. ALL BACKFILL FOR UTILITY TRENCHES SHALL BE TYPE “A,” UTILIZING TYPE 1 BEDDING, UNLESS DIRECTED OTHERWISE BY ENGINEER. SPECIFIED BEDDING SHALL BE FROM 4” BENEATH THE PIPE TO 6” ABOVE THE TOP OF PIPE (SEE MPWSS STANDARD DRAWING 02221-1). THE COST OF THIS ADDITIONAL BEDDING SHALL BE INCLUDED IN THE UNIT PRICE BID.
7. PIPE BEDDING (TYPE 1) AND TRENCH BACKFILL (TYPE B) SHALL BE IN ACCORDANCE WITH MPW STANDARD SPECIFICATION 02221, STANDARD DRAWING 02221-1.
8. THE CONTRACTOR IS RESPONSIBLE FOR CONTROLLING DUST AND EROSION DURING CONSTRUCTION AT CONTRACTOR'S EXPENSE. EROSION SHALL BE CONTROLLED IN ACCORDANCE WITH MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY REGULATIONS.
9. ALL PROFILES REPRESENT EXISTING GROUND (DASHED LINE) AND FINISHED GRADE (SOLID LINE) ALONG THE ALIGNMENTS INDICATED ON THE PLANS. ELEVATIONS ARE FINISHED GROUND ELEVATIONS.
10. ALL DISTURBED AREAS SHALL BE SEEDED BY THE CONTRACTOR USING A SEED MIX APPROVED BY THE OWNER OR THE LOCAL USDA OFFICE.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF UTILITY (POWER) INSTALLATION WITH LOCAL UTILITY COMPANIES.
12. THE CONTRACTOR SHALL NOTIFY ONE CALL @ 1-800-424-5555 FOR ONSITE UTILITY LOCATION. ALL EXISTING UTILITIES SHALL BE MARKED BEFORE DIGGING.
13. THE CONTRACTOR SHALL MAINTAIN SERVICE OF ALL EXISTING UTILITIES. IF SAID SERVICE IS DAMAGED, THE CONTRACTOR SHALL IMMEDIATELY REPAIR THE DAMAGE AT THE CONTRACTOR’S EXPENSE.
14. THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF 48 HOURS PRIOR TO BEGINNING ANY WORK.
15. ALL UTILITY CONDUITS FOR IRRIGATION, ELECTRICAL, GAS, PHONE, CATV, ETC. SHALL BE BURIED A MINIMUM 24” FROM FINISHED GRADE WITH TYPE A BACKFILL, UTILIZING TYPE 1 BEDDING, UNLESS DIRECTED OTHERWISE BY ENGINEER.
16. PROJECT WILL FALL UNDER GENERAL SWPPP FOR THE RIVER RESTORATION PROJECT. NO SEPARATE SWPPP PERMIT AND EROSION MEASURES ARE NECESSARY FOR THIS PROJECT.
17. QUANTITIES SHOWN IN THESE PLANS ARE FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING ACTUAL QUANTITIES.

DRAWING NOTATION

A / 10 — INDICATES CROSS SECTION LOCATION. "A" REFERS TO THE CROSS SECTION DESIGNATION. "10" REFERS TO THE SHEET NUMBER WHERE THE SECTION IS CUT OR SHOWN.

1 / 12 — INDICATES DETAIL LOCATION. "1" REFERS TO THE DETAIL DESIGNATION. "12" REFERS TO THE SHEET NUMBER WHERE THE DETAIL IS INDICATED OR SHOWN.

ABRREVIATIONS

ACI	AMERICAN CONCRETE INSTITUTE	HWY	HIGHWAY
BAR	REBAR	INV	INVERT ELEVATION
BMP	BEST MANAGEMENT PRACTICES	LF	LINEAR FEET
BOT	BOTTOM	MH	MANHOLE
BVC	BEGIN VERTICAL CURVE	MJ	MECHANICAL JOINT
CFS	CUBIC FEET PER SECOND	O.C.	ON CENTER
CL	CENTERLINE	O.C.E.F.	ON CENTER EACH FACE
CMP	CORRUGATED METAL PIPE	OHP	OVERHEAD POWER
CONC	CONCRETE OR CONCENTRIC	PI	POINT OF INTERSECTION
CP	CONTROL POINT	POT	POINT ON TANGENT
CSP	CORRUGATED STEEL PIPE	PS	PIPE SUPPORT
CTR	CENTER	PT	POINT, POINT OF TANGENCY
CU FT	CUBIC FEET	PVC	POLYVINYL CHLORIDE
CULV	CULVERT	PWR	POWER
DI	DUCTILE IRON OR DRAIN INLET	RCP	REINFORCED CONCRETE PIPE
DIA	DIAMETER	R/W OR ROW	RIGHT OF WAY
EA	EACH	SAN	SANITARY
E.F.	EACH FACE	SST	STAINLESS STEEL
EL, ELEV	ELEVATION	STA	STATION
EOP	EDGE OF PAVEMENT	TBC	TOP BACK OF CURB
EVC	END VERTICAL CURVE	TYP	TYPICAL
FT	FOOT OR FEET	UG	UNDERGROUND
GPM	GALLONS PER MINUTE	WTR	WATER
HP	HORSEPOWER		

BLOCK LEGEND

EXISTING	PROPOSED	
		SANITARY SEWER MANHOLE
		SANITARY SEWER CLEANOUT
		SANITARY SEWER CAP
		SANITARY SEWER METER VAULT
		SANITARY SEWER LIFT STATION
		SANITARY SEWER FM (TEE)
		SANITARY SEWER FM (11.25°)
		SANITARY SEWER FM (22.5°)
		SANITARY SEWER FM (45°)
		SANITARY SEWER FM (90°)
		SANITARY SEWER FM (CROSS)
		SANITARY SEWER FM FLANGE
		SANITARY SEWER FM VALVE
		SANITARY SEWER FM REDUCER
		SANITARY SEWER FM BF PREV.
		STORMWATER AREA INLET
		STORMWATER COMBO INLET
		STORMWATER FLARED END
		STORMWATER MANHOLE
		STORMWATER PUMP STATION
		STORM SEWER HEAD WALL
		WATER FITTING BEND 11.25°
		WATER FITTING BEND 22.5°
		WATER FITTING BEND 45°
		WATER FITTING BEND 90°
		WATER FITTING CAP
		WATER FITTING CROSS
		WATER FITTING FLANGE
		WATER FITTING TEE
		WATER FITTING VALVE
		WATER VENT
		WATER MANHOLE
		WATER REDUCER
		WATER MARKER
		FIRE HYDRANT
		WATER CURB STOP
		WATER METER
		WATER VAULT
		WATER BOOSTER STATION
		WATER WELL
		WATER MONITORING WELL
		WATER TEST STATION
		CABLE TELEVISION MARKER
		CABLE TELEVISION PULL BOX
		CABLE TELEVISION PEDESTAL
		CABLE TELEVISION VAULT
		POWER GUY ANCHOR
		POWER GUY POLE
		POWER MANHOLE
		POWER MARKER
		ELECTRIC POWER METER
		POWER POLE
		POWER TRANSFORMER
		POWER VAULT
		STREET LIGHT
		IRRIGATION PULL BOX
		IRRIGATION SPRINKLER HEAD
		IRRIGATION VALVE
		IRRIGATION VAULT
		FIBER OPTIC MANHOLE
		FIBER OPTIC MARKER
		FIBER OPTIC PULL BOX
		FIBER OPTIC PEDESTAL
		FIBER OPTIC VAULT
		NATURAL GAS MARKER
		NATURAL GAS METER
		NATURAL GAS VALVE
		TELEPHONE MANHOLE
		TELEPHONE MARKER
		TELEPHONE PULL BOX
		TELEPHONE PEDESTAL
		TELEPHONE VAULT
		TREE (DECIDUOUS)
		TREE (CONIFER)
		ADA RAMP
		SIGN
		BOLLARD
		MILEPOST
		CATTLE GUARD
		BORE LOCATION
		PROP CORNER ALUMINUM CAP
		PROP CORNER BRASS CAP
		PROP CORNER CHISELED X
		HIGHWAY ROW MONUMENT
		PROP CORNER IRON PIPE
		PROP CORNER LEAD & TACK
		PROP CORNER REBAR
		PROP CORNER STONE
		CONTROL POINT
		PROP CORNER PLASTIC CAP

LINE STYLE LEGEND

EXISTING	PROPOSED	
		MAJOR CONTOUR
		MINOR CONTOUR
OHT	OHT	OVERHEAD TELEPHONE
OHP	OHP	OVERHEAD POWER
NG	NG	NATURAL GAS
IR	IR	IRRIGATION LINE
FO	FO	FIBER OPTIC
FM	FM	FORCEMAIN
O	O	FENCE [CHAIN]
X	X	FENCE [BARBED]
[ ]	[ ]	FENCE [PRIVACY]
F	F	FIRE LINE
OHTV	OHTV	OVERHEAD TV
RW	RW	RAW WATER
SS	SS	SEWER
ST	ST	STORM
UGP	UGP	UNDERGROUND POWER
UGT	UGT	UNDERGROUND TELEPHONE
UGTV	UGTV	UNDERGROUND TV
W	W	WATER

FOR BIDDING

NO.	REVISION	BY	DATE

PROJECT NO. 2024138

PREPARED BY
WWC ENGINEERING
1275 MAPLE STREET, SUITE F
HELENA, MT 59601
(406) 443-3962
www.wwcengineering.com

CONFEDERATED SALISH AND KOOTENAI TRIBES
KING PUMP STATION

GENERAL NOTES

SANDERS COUNTY, MT

DESIGNED BY: JDF
DRAWN BY: JDF
CHECKED BY: DDP
DATE: 12/19/2025

SHEET 2

GENERAL STRUCTURAL NOTES

1. GENERAL REQUIREMENTS

1.1. GOVERNING CODE: DESIGN AND CONSTRUCTION OF THIS PROJECT IS GOVERNED BY THE "INTERNATIONAL BUILDING CODE (IBC)", 2021 EDITION, HEREAFTER REFERRED TO AS THE IBC.

1.2. REFERENCE STANDARDS: REFER TO CHAPTER 35 OF THE IBC. WHERE OTHER STANDARDS ARE NOTED IN THE DRAWINGS, USE THE LATEST EDITION OF THE STANDARD UNLESS A SPECIFIC DATE IS INDICATED. REFERENCE TO A SPECIFIC SECTION IN A CODE DOES NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE ENTIRE STANDARDS.

1.3. PROJECT SPECIFICATIONS: REFER TO PROJECT SPECIFICATIONS ISSUED AS PART OF THE CONTRACT DOCUMENTS FOR ADDITIONAL INFORMATION. INFORMATION PRESENTED IN THESE GENERAL STRUCTURAL NOTES IS PROVIDED TO HIGHLIGHT KEY STRUCTURAL ASPECTS OF THE PROJECT AND FOR THE EASE OF REVIEW BY THE CONTRACTOR. INFORMATION PRESENTED IN THESE GENERAL STRUCTURAL NOTES MAY BE REDUNDANT TO INFORMATION PROVIDING IN THE PROJECT SPECIFICATIONS.

1.4. DISCREPANCIES: IN CASE OF DISCREPANCIES BETWEEN THE GENERAL NOTES, SPECIFICATIONS PLAN/DETAILS OR REFERENCE STANDARDS, THE ENGINEER SHALL DETERMINE WHICH SHALL GOVERN. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

1.5. COORDINATION: THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING DETAILS AND ACCURACY OF THE WORK; FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS; FOR SELECTING FABRICATION PROCESSES; FOR TECHNIQUES OF ASSEMBLY; AND FOR PERFORMING WORK IN A SAFE AND SECURE MANNER.

1.6. MEANS, METHODS, AND SAFETY REQUIREMENTS: THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND ALL JOB RELATED SAFETY STANDARDS SUCH AS OSHA AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS AND METHODS RELATED TO INTERMEDIATE STRUCTURAL CONDITIONS.

1.7. TEMPORARY SHORING, BRACING: THE CONTRACTOR IS RESPONSIBLE FOR THE STRENGTH AND STABILITY OF THE STRUCTURE DURING CONSTRUCTION AND SHALL PROVIDE TEMPORARY SHORING, BRACING AND OTHER ELEMENTS REQUIRED TO MAINTAIN STABILITY UNTIL THE STRUCTURE IS COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE FAMILIAR WITH THE WORK REQUIRED IN THE CONSTRUCTION DOCUMENTS AND THE REQUIREMENTS FOR EXECUTING IT PROPERLY.

1.8. ADJACENT UTILITIES: THE CONTRACTOR SHALL DETERMINE THE LOCATION OF ALL ADJACENT UNDERGROUND UTILITIES PRIOR TO EARTHWORK, FOUNDATIONS, SHORING, AND EXCAVATION. ANY UTILITY INFORMATION SHOWN ON THE DRAWINGS AND DETAILS IS APPROXIMATE AND NOT NECESSARILY COMPLETE.

2. DESIGN CRITERIA

LOAD TYPE	LOAD
HYDROSTATIC	WATER ELEVATION AT FULL RIVER HEIGHT.
SOIL PRESSURE	REFER TO "SOILS AND FOUNDATIONS" STRUCTURAL NOTES.
SNOW	NOT CONSIDERED FOR DESIGN.
GROUND SURCHARGE	250 PSF SURCHAGE LOAD FACTORED AS LIVE LOAD IN DESIGN.
SEISMIC	NOT CONSIDERED FOR DESIGN.
WIND	NOT CONSIDERED FOR DESIGN.

3. SPECIAL INSPECTION AND TESTING

3.1. SOILS: PERIODIC INSPECTION OF FILL MATERIALS, SUBGRADE PREPARATION AND COMPACTION. INSPECTIONS SHALL OCCUR PRIOR TO PLACEMENT OF FOUNDATION AND/OR SLAB MATERIALS.

3.2. CONCRETE: PERIODIC INSPECTION OF REINFORCEMENT AND OTHER EMBEDDED ITEMS BEFORE CONCRETE IS PLACED. FULL TIME INSPECTION DURING PLACEMENT OF CONCRETE INCLUDING THE TAKING OF TEST SPECIMENS, SLUMP AND AIR CONTENT MEASUREMENT. INSPECTION AND TESTING SHALL BE LIMITED TO STRUCTURAL REINFORCED CONCRETE WITH TESTING FREQUENCY IN ACCORDANCE WITH THE PROJECT TECHNICAL SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TESTING COSTS.

3.3. STEEL: PERIODIC INSPECTION OF EMBEDDED ITEMS PRIOR TO PLACEMENT OF CONCRETE.

4. SOILS AND FOUNDATIONS

4.1. DESIGN SOIL VALUES:

ALLOWABLE SOIL BEARING PRESSURE	2,500	PSF	(ASSUMED)
SOIL FRICTION ANGLE	25	DEGREES	(ASSUMED)
SOIL UNIT WEIGHT	120	PCF	(ASSUMED)
ACTIVE LATERAL PRESSURE COEFFICIENT	0.39	(COULOMB)	
PASSIVE LATERAL PRESSURE COEFFICIENT	2.56	(COULOMB)	
COEFFICIENT OF SLIDING FRICTION	0.50		

4.1. FOUNDATIONS AND FOOTINGS: FOUNDATIONS SHALL BE PLACED ON COMPETENT NATIVE SOIL OR COMPACTED STRUCTURAL FILL AS REQUIRED BY THE DRAWINGS. AVOID EXCESSIVE WETTING OR DRYING OF THE FOUNDATION EXCAVATIONS DURING CONSTRUCTION.

4.2. SLABS-ON-GRADE: SLABS-ON-GRADE SHALL BE PLACED ON COMPETENT NATIVE SOIL OR COMPACTED STRUCTURAL FILL AS REQUIRED BY THE DRAWINGS.

4.3. WALLS AND RETAINING WALLS: BACKFILL ON WALLS WITH FILL ON BOTH SIDES SHALL BE COMPACTED IN EQUAL LIFTS EACH SIDE OF WALL. WALLS BACKFILLED FROM ONE SIDE ONLY SHALL HAVE ALL SUPPORTING SLABS, PERMANENT FRAMING OR TEMPORARY BRACING IN PLACE PRIOR TO PLACEMENT OF BACKFILL. NO BACKFILLING SHALL BE DONE AGAINST FOUNDATION AND RETAINING WALL UNTIL CONCRETE HAS ATTAINED AT LEAST 75% OF ITS DESIGN STRENGTH. DO NOT USE HEAVY CONSTRUCTION EQUIPMENT ADJACENT TO FOUNDATION AND RETAINING WALLS.

5. STRUCTURAL STEEL

5.1. REFERENCE STANDARDS:

ANSI/AISC 303-16 - CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS & BRIDGES.
ANSI/AISC 360-16 - SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS.
AWS D1.1-15 - STRUCTURAL WELDING CODE - STEEL.
RCSC 2014 - SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS.

5.1. MATERIALS:

STRUCTURAL STEEL WIDE FLANGE (W), TEE (WT) SHAPES	ASTM A992	Fy = 50 KSI
STRUCTURAL STEEL BARS AND PLATES (PL)	ASTM A36	Fy = 36 KSI
STEEL CHANNEL (C) AND ANGLE (L) SHAPES	ASTM A36	Fy = 36 KSI
STRUCTURAL STEEL PIPE	ASTM A53, GR. B	Fy = 35 KSI
HIGH-STRENGTH BOLTS	ASTM A325/F1852 TYPE 1, PLAIN	
ANCHOR RODS (ANCHOR BOLTS)	ASTM F1554 GR. 55	Fy = 55 KSI
DEFORMED BAR ANCHORS (DBA)	ASTM A1064	Fy = 70 KSI
MILD THREADED RODS	ASTM A36	Fy = 36 KSI
HEAVY HEX NUTS	ASTM A563, GR. A, GALVANIZED	
WASHERS (FLAT OR BEVELED)	ASTM F436, GALVANIZED	

5.2. WELDING: ALL WELDING SHALL CONFORM TO AWS D1.1 AND SHALL BE PERFORMED BY WELDERS QUALIFIED BY THE APPROPRIATE AWS TEST FOR THE WELDING PERFORMED. WELDING SHALL BE PERFORMED USING E70 OR E71T, 70 KSI STRENGTH ELECTRODES APPROPRIATE FOR THE PROCESS SELECTED.

5.3. PROTECTIVE COATING: ALL SURFACES OF SUBMERGED AND EXPOSED STEEL SURFACES SHALL HAVE A HOT-DIP ZINC COATING IN ACCORDANCE WITH ASTM A123.

6. CAST-IN-PLACE CONCRETE

6.1. REFERENCE STANDARDS:

ACI 301-20 - SPECIFICATIONS FOR STRUCTURAL CONCRETE.
ACI 305R-10 - SPECIFICATIONS FOR HOT WEATHER CONCRETING.
ACI 306R-10 - SPECIFICATIONS FOR COLD WEATHER CONCRETING.
ACI 318-19 - BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE.
ACI 117-10 - SPECIFICATIONS FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS.

6.2. CONCRETE MIX DESIGN REQUIREMENTS:

USE	STENGTH, f'c (PSI)	TEST AGE (DAYS)	NOMINAL MAXIMUM AGGREGATE (IN.)	EXPOSURE CLASS	MAX W/C RATIO	AIR CONTENT
ALL USES EXCEPT AS NOTED	4,500	28	1	F2	0.45	6.5 WITH TOLERANCE (+/- 1.5%)

7. CONCRETE REINFORCEMENT

7.1. REFERENCE STANDARDS:

ACI 301-20 - SPECIFICATIONS FOR STRUCTURAL CONCRETE, SECTION 3 - REINFORCEMENT AND REINFORCEMENT SUPPORTS.
ACI SP-66-04 - ACI DETAILING MANUAL.
CRSI MSP-09, 28TH EDITION - MANUAL OF STANDARD PRACTICE.
ANSI/AWS D1.4-18 - STRUCTURAL WELDING CODE-REINFORCING STEEL.
IBC CHAPTER 19 - CONCRETE
ACI 318-19 - BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE.
ACI 117-10 - SPECIFICATIONS FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS.
MPWS SECTION 03210 - REINFORCING STEEL.

7.2. MATERIALS:

REINFORCING BARS	ASTM A615	GRADE 60 DEFORMED BARS
WELDABLE REINFORCING BARS	ASTM A706	GRADE 60 DEFORMED BARS
BAR SUPPORTS	CRSI MSP-09	CHAPTER 3 - BAR SUPPORTS
TIE WIRE	16 GAGE OR HEAVIER, BLACK ANNEALED.	

7.3. CONCRETE COVER: CONFORM TO THE FOLLOWING COVER REQUIREMENTS UNLESS NOTED OTHERWISE IN THE DRAWINGS.

CONCRETE CAST AGAINST EARTH	3"
CONCRETE EXPOSED TO EARTH OR WEATHER	2"

7.3. SPLICES: CONFORM TO ACI 301. REFER TO STANDARD LAP SPLICE DETAILS PROVIDED WITH THESE PLANS.

7.4. FIELD BENDING: ALL BENT REINFORCING BARS SHALL BE SHOP FABRICATED ONLY. RE-BENDING OR WELDING OF REINFORCEMENT SHALL NOT BE PERMITTED UNLESS AUTHORIZED BY ENGINEER.

7. MISCELLANEOUS

A. EQUIPMENT INSTALLATION: ALL OPENINGS SHOWN SHALL BE VERIFIED, AND ALL STRUCTURAL DIMENSIONS AND DETAILS PERTAINING TO EQUIPMENT INSTALLATION SHALL BE COORDINATED BY THE CONTRACTOR WITH THE ACTUAL EQUIPMENT FURNISHED. EQUIPMENT SUPPORTS, ANCHORAGES AND OPENINGS NOT SHOWN ON THE STRUCTURAL DRAWINGS, BUT REQUIRED BY OTHER CONTRACT DRAWINGS, SHALL BE PROVIDED PRIOR TO PLACING CONCRETE.

B. POST-INSTALLED ANCHORS: ADHESIVE ANCHORS SHALL ONLY BE USED WHERE SPECIFICALLY SHOWN IN THE DETAILS OR ALLOWED BY THE ENGINEER. ALL POST INSTALLED ANCHORS SHALL HAVE A CURRENT ICC-EVALUATION SERVICE REPORT. ANCHORS SHALL BE INSTALLED IN STRICT ACCORDANCE TO ICC-ESR AND MANUFACTURERS INSTRUCTIONS.

FOR BIDDING

NO.	REVISION	BY	DATE

PROJECT NO. 2024138

PREPARED BY
WWC ENGINEERING
1275 MAPLE STREET, SUITE F
HELENA, MT 59601
(406) 443-3962
www.wwcengineering.com

CONFEDERATED SALISH AND KOOTENAI TRIBES
KING PUMP STATION
SANDERS COUNTY, MT

STRUCTURAL NOTES

DESIGNED BY: JDF
DRAWN BY: JDF
CHECKED BY: DDP
DATE: 12/19/2025

SHEET
3

PUMP STATION QUANTITIES

ITEM	QUANTITY	UNIT	
COMPACTED FILL	30	CUYD	
REINFORCED CONCRETE (VAULT)	13	CUYD	PRECAST
REINFORCED CONCRETE (INTAKE SCREEN SLAB)	0.6	CUYD	CAST-IN-PLACE
REINFORCED CONCRETE (HYDROBURST SYSTEM SLAB)	0.9	CUYD	CAST-IN-PLACE
6" SCH 40 STEEL INTAKE PIPE	8	LF	
12" SCH 40 STEEL INTAKE PIPE	38	LF	
JOHNSON SCREENS INLET SCREEN AND HYDROBURST SYSTEM	1	EA	OR APPROVED EQUAL
GOULDS 100 HP VIT 13CLC VERTICAL TURBINE IRRIGATION PUMP	1	EA	OR APPROVED EQUAL
SECURITY FENCE	112	LF	

PIPELINE QUANTITIES

ITEM	QUANTITY	UNIT	
NEW 3-PHASE UNDERGROUND POWER SERVICE	510	LF	
10" SCH. 40 STEEL PIPE	22	LF	
10" SCH 40 22.5° STEEL ELBOW	1	EA	
10" PIP (CLASS 160) PIPE	540	LF	
10" 22.5° PIP ELBOW	2	EA	
10" 45° PIP ELBOW	4	EA	
FLOW METER	1	EA	
STEEL PIPE DRAIN	1	EA	
PRESSURE GAUGE	1	EA	
10" BUTTERFLY VALVE	1	EA	
NELSON ACV200 AIR VALVE	1	EA	OR APPROVED EQUAL
PUMP OUT PORT ASSEMBLY	1	EA	

NOTES:
1. QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY. CONTRACTOR TO VERIFY ALL QUANTITIES FOR BIDDING PURPOSES.

FOR BIDDING

NO.	REVISION	BY	DATE

PROJECT NO. 2024138

PREPARED BY
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CONFEDERATED SALISH AND KOOTENAI TRIBES
KING PUMP STATION
QUANTITIES
SANDERS COUNTY, MT

DESIGNED BY: JDF
DRAWN BY: JDF
CHECKED BY: DDP
DATE: 12/19/2025

SHEET
4

K:\Helena\RIVER DESIGN GROUP INC\2024138 King Pump House Engineering\05CAD\Sheets\Civil\24138-PLAN-EXST.dwg EXISTING CONDITIONS 2/18/2026 8:42:24 AM

EXISTING PUMP STATION (TO BE REMOVED)

EXISTING OVERHEAD POWER (TO BE ABANDONED)

FLATHEADHEAD INDIAN RESERVATION

ACCESS ROAD

JOCKO RIVER

USA IN TRUST FOR CSKT

EXISTING 10" PVC IRRIGATION PIPELINE (TO BE ABANDONED)

END EXISTING PIPELINE AND OVERHEAD POWER REMOVAL

SITE ACCESS

DANIEL COLE

GERALD HAMEL

DANIEL COLE

FLATHEADHEAD INDIAN RESERVATION

BNSF RAILROAD

HWY 200

ACCESS ROAD

SITE ACCESS

APPROXIMATE ALIGNMENT OF EXISTING 10" PVC IRRIGATION PIPELINE

APPROXIMATE END OF EXISTING 10" PVC IRRIGATION PIPELINE

KING RANCH INC

KING RANCH INC

KINGS LN

DANIEL COLE

DANIEL COLE

APPROXIMATE ALIGNMENT OF EXISTING 10" PVC IRRIGATION PIPELINE

KING RANCH INC

KING RANCH INC

MARGARET KING

FLATHEADHEAD INDIAN RESERVATION

2925 2900 2875 2850 2825 2800 2775 2750 2725 2700

2600 2625 2650

2650 2650 2675

2700

2725

2750 2775

NOTES:
1. PROPERTY LINES SHOWN HEREON WERE OBTAINED FROM THE MONTANA CADASTRAL GIS DATABASE AND DO NOT REPRESENT A BOUNDARY SURVEY.
2. CONTOUR INTERVAL = 5 FEET.
3. ACCESS ROAD ESTABLISHED AS PART OF RIVER RESTORATION PROJECT.

N

0 250' 500'

SCALE: 1" = 500'

FOR BIDDING

NO.	REVISION	BY	DATE

PROJECT NO. 2024138

PREPARED BY
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1275 MAPLE STREET, SUITE F
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CONFEDERATED SALISH AND KOOTENAI TRIBES

KING PUMP STATION

EXISTING CONDITIONS

SANDERS COUNTY, MT

DESIGNED BY: JDF
DRAWN BY: JDF
CHECKED BY: DDP
DATE: 12/19/2025

SHEET 5

K:\Helena\RIVER DESIGN GROUP INC\2024138 King Pump House Engineering\05CAD\Sheets\Civil\24138-PLAN-SITE.dwg OVERALL SITE PLAN 2/18/2026 8:41:48 AM

PROPOSED JOCKO RIVER RE-ALIGNMENT

PROPOSED PUMP STATION
REFER TO SHEET 9

EXISTING IRRIGATION PIPELINE

CONTRACTOR
STAGING AREA

EXISTING OVERHEAD POWER

PROPOSED NEW 10" Ø PVC PIPELINE
REFER TO SHEET 7

INSTALL APPROX. 513 LF OF 3-PHASE UNDERGROUND
POWER TO PROPOSED PUMP STATION.

FLATHEADHEAD INDIAN RESERVATION

SITE ACCESS

BNSF RAILROAD

HWY 200

ACCESS ROAD
(SEE NOTE 2)

USA IN TRUST FOR CSKT

DANIEL COLE

FLATHEADHEAD INDIAN RESERVATION

EXISTING OVERHEAD POWER

EXISTING 10" PVC
PIPELINE (TO REMAIN)

ACCESS ROAD
TO EXISTING
HIGHWAY
APPROACH

NOTES:
1. PROPERTY LINES SHOWN HEREON WERE OBTAINED FROM THE MONTANA CADASTRAL GIS DATABASE AND DO NOT REPRESENT A BOUNDARY SURVEY.
2. CONTRACTOR SHALL ACCESS THE SITE USING THE SAME ROUTE FOR THE DURATION OF CONSTRUCTION TO MINIMIZE IMPACTS. AVOID TREES AND HEAVY VEGETATION WITH PROPOSED ACCESS ROAD. ACCESS ROAD SHOWN, WITH EXCEPTION OF PORTION NEEDED TO ACCESS PUMP STATION SITE WILL BE ESTABLISHED AND RECLAIMED BY THE RIVER RESTORATION CONTRACTOR. CONTRACTOR IS RESPONSIBLE FOR RECLAIMING AND SEEDING ACCESS ROAD AND ALL DISTURBED AREAS TO PRE-CONSTRUCTION CONDITIONS FOR AREAS NOT DISTURBED BY THE RIVER RESTORATION PROJECT.

N

0 50' 100'
SCALE: 1" = 100'

FOR BIDDING

NO.	REVISION	BY	DATE

PROJECT NO. 2024138

PREPARED BY
WWC ENGINEERING
1275 MAPLE STREET, SUITE F
HELENA, MT 59601
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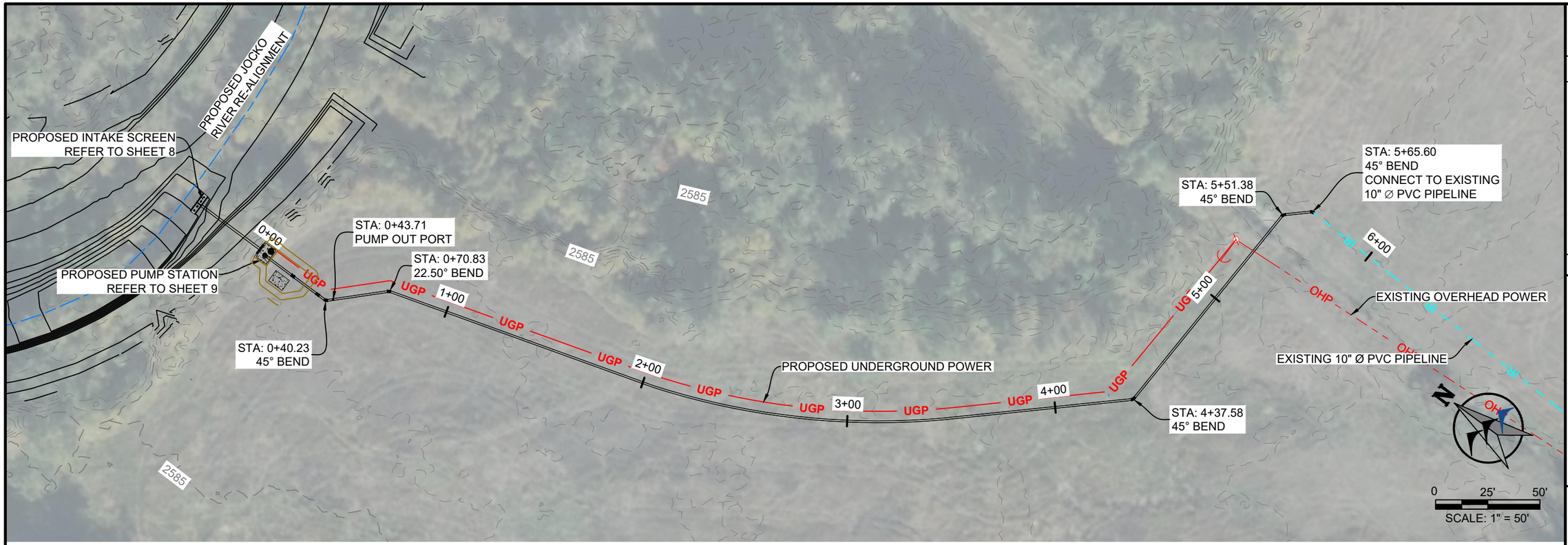
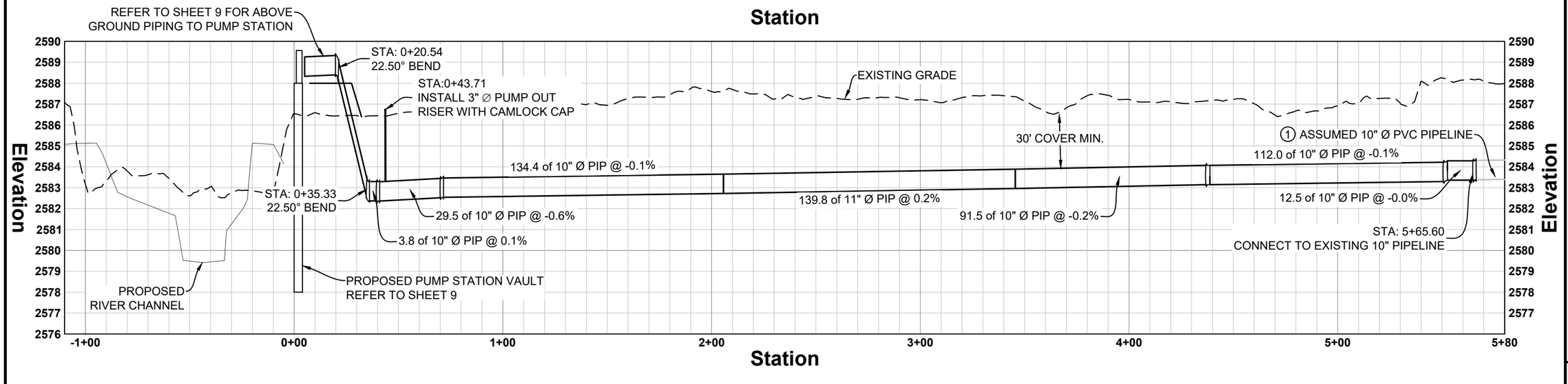
CONFEDERATED SALISH AND KOOTENAI TRIBES
KING PUMP STATION
OVERALL SITE PLAN
SANDERS COUNTY, MT

DESIGNED BY: JDF
DRAWN BY: JDF
CHECKED BY: DDP
DATE: 12/19/2025

SHEET
6



Profile View of Irrigation Pipeline



NOTES:
1. CONTRACTOR TO FIELD VERIFY LOCATION, TYPE, CONDITION AND DEPTH OF EXISTING IRRIGATION MAIN TO TIE TO AND PROVIDE ADEQUATE FITTINGS AND THRUST BLOCKS.
2. ALL ELEVATIONS ARE TO TOP OF PIPE UNLESS OTHERWISE NOTED.

FOR BIDDING

NO.	REVISION	BY	DATE

PROJECT NO. 2024138

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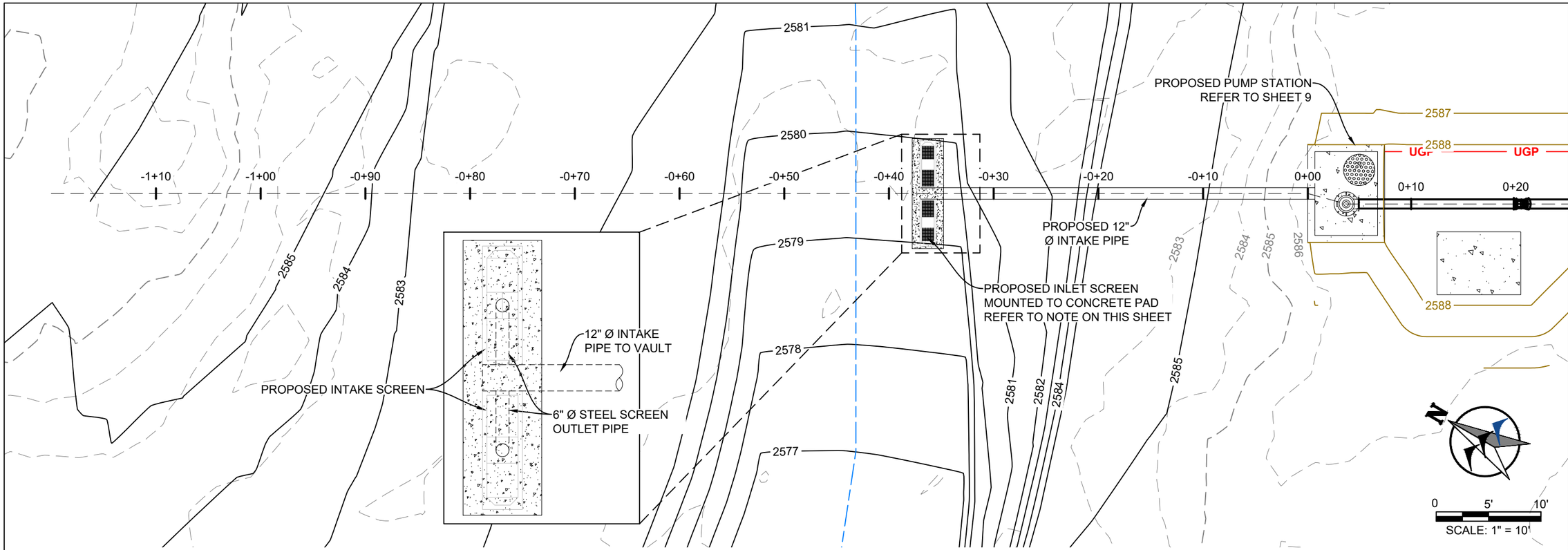
CONFEDERATED SALISH AND KOOTENAI TRIBES
KING PUMP STATION

PIPELINE PLAN & PROFILE

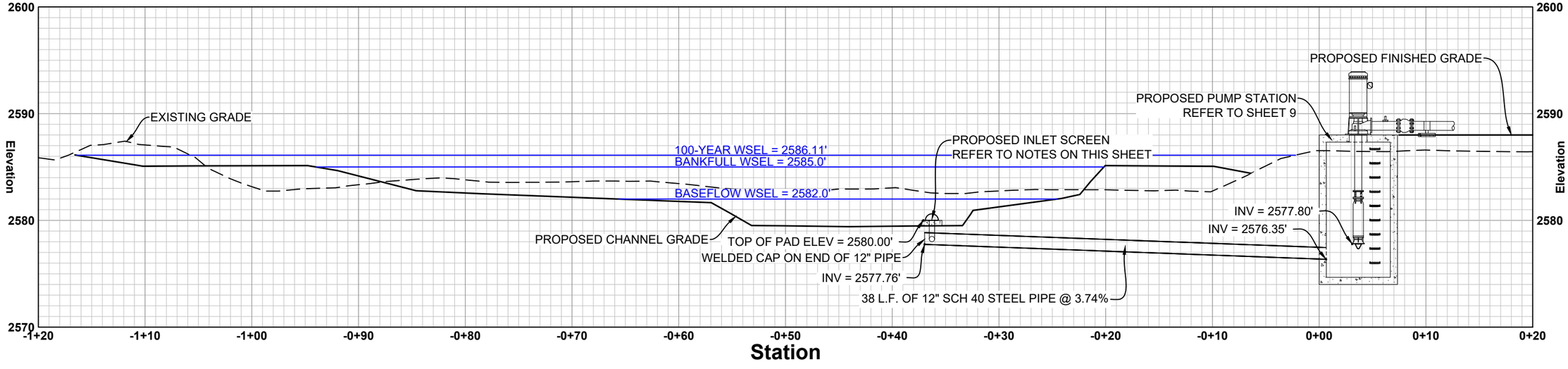
SANDERS COUNTY, MT

DESIGNED BY: JDF
DRAWN BY: JDF
CHECKED BY: DDP
DATE: 12/19/2025

SHEET
7



Profile View of Irrigation Pipeline



NOTES:
1. INTAKE SCREEN SHALL BE A JOHNSON SCREENS LOW PROFILE HALF T14 HIGH CAPACITY INTAKE SCREEN OR APPROVED EQUAL.
2. 6" SCREEN OUTLET PIPES SHALL BE WELDED TO 12" INTAKE PIPE AT A PERPENDICULAR ANGLE.
3. SCREEN SHALL BE 304 STAINLESS STEEL WITH 0.0625" MAX SLOT SIZE, MIN FLOW RATE, 1000 GPM AT MINIMUM WATER SURFACE ELEVATION OF JOCKO RIVER, MAXIMUM APPROACH VELOCITY 0.160 FT/SEC, MAX HEAD LOSS 1.17 FT THROUGH INTAKE ASSEMBLY.
4. SCREEN SHALL BE BOLTED TO CONCRETE PAD WITH STAINLESS STEEL BOLTS AND INCLUDE JOHNSON SCREENS HYDROBURST SYSTEM TO PREVENT CLOGGING.

FOR BIDDING

NO.	REVISION	BY	DATE
1	INTAKE SCREEN UPDATES	JDF	12/18/2025

PROJECT NO. 2024138

PREPARED BY
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CONFEDERATED SALISH AND KOOTENAI TRIBES
KING PUMP STATION

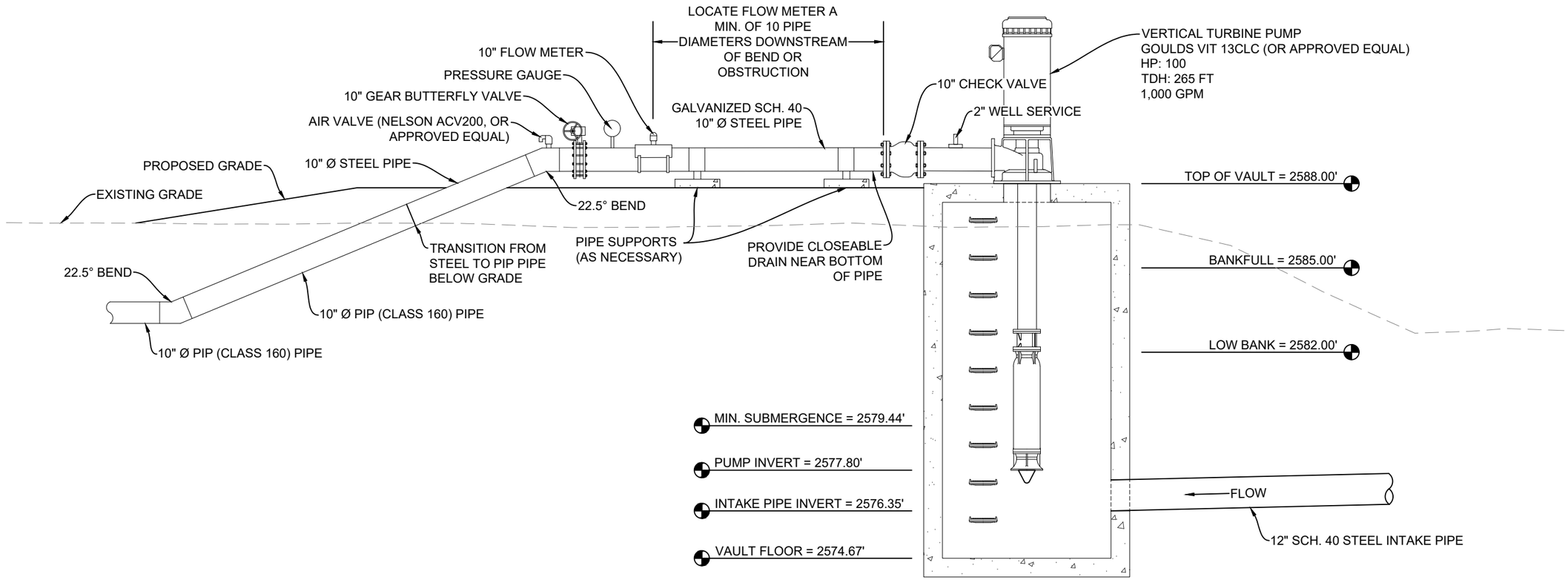
PUMP STATION PLAN AND PROFILE

SANDERS COUNTY, MT

DESIGNED BY: JDF
DRAWN BY: JDF
CHECKED BY: DDP
DATE: 12/19/2025

SHEET
8

NOTES:
1. ALL FITTINGS AND PIPING SHALL BE GALVANIZED STEEL UNLESS OTHERWISE NOTED.
2. PRESSURE GAUGE TO BE LIQUID FILLED (GLYCERIN) CORROSION PROOF, 1/4" STEM WITH 0-100 PSI READING.
3. INSTALL LOW LEVEL FLOAT OR OTHER APPROVED MECHANISM TO AUTOMATICALLY SHUT OFF PUMP. WATER LEVEL FOR PUMP SHUTOFF SHALL BE COORDINATED WITH PUMP MANUFACTURER.
4. DIAMETER OF OPENING SHALL BE DETERMINED BY PUMP SUPPLIER AND VERIFIED WITH THE ENGINEER.
5. BOTTOM OF VAULT AND BOTTOM OF SCREEN ELEVATION MAY NEED TO BE LOWERED IF CHOSEN VERTICAL TURBINE PUMP REQUIRES ADDITIONAL SUBMERGENCE. VERIFY WITH ENGINEER BEFORE ORDERING VAULT.



0 2' 4'
SCALE: 1" = 4'

FOR BIDDING

NO.	REVISION	BY	DATE

PROJECT NO. 2024138

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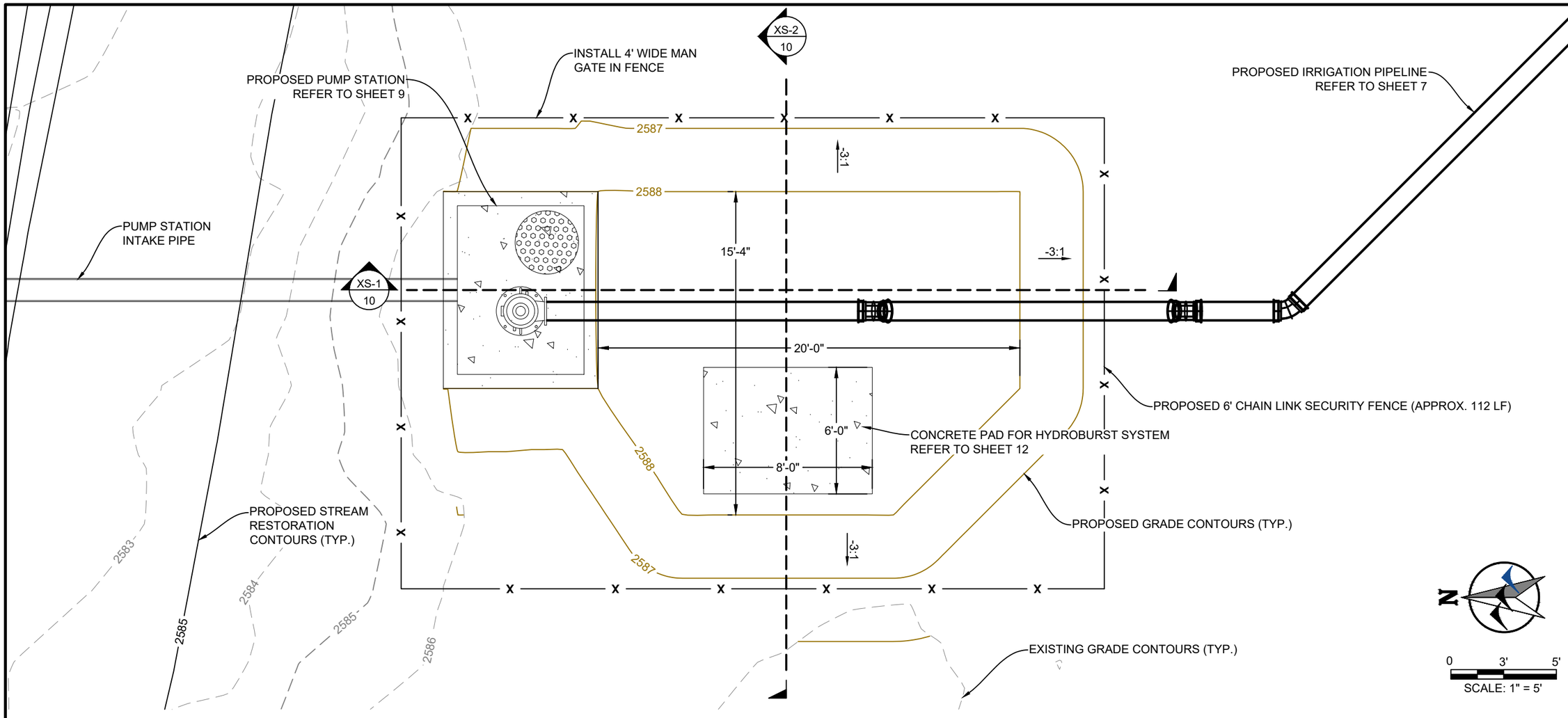
CONFEDERATED SALISH AND KOOTENAI TRIBES
KING PUMP STATION

PUMP STATION LAYOUT

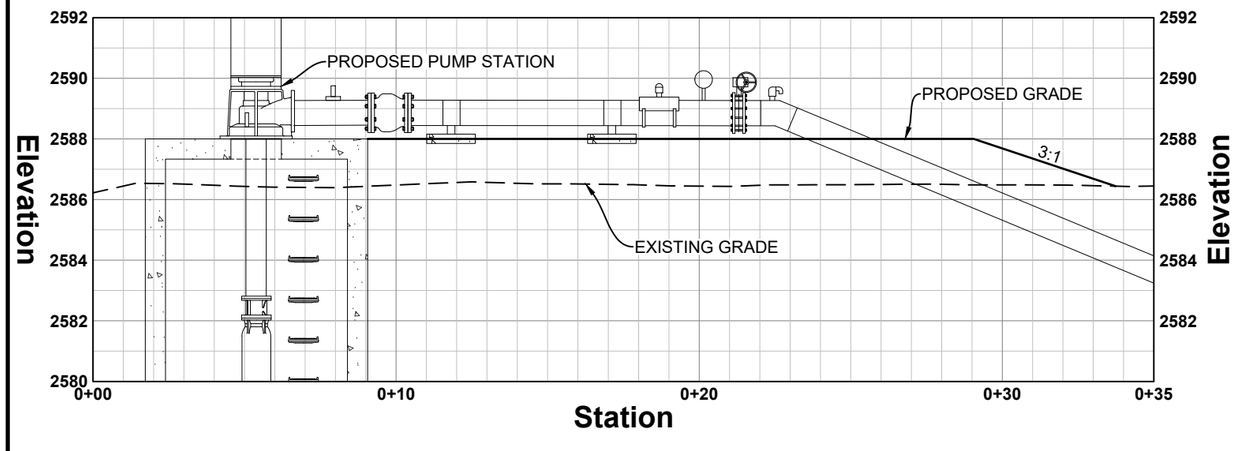
SANDERS COUNTY, MT

DESIGNED BY: JDF
DRAWN BY: JDF
CHECKED BY: DDP
DATE: 12/19/2025

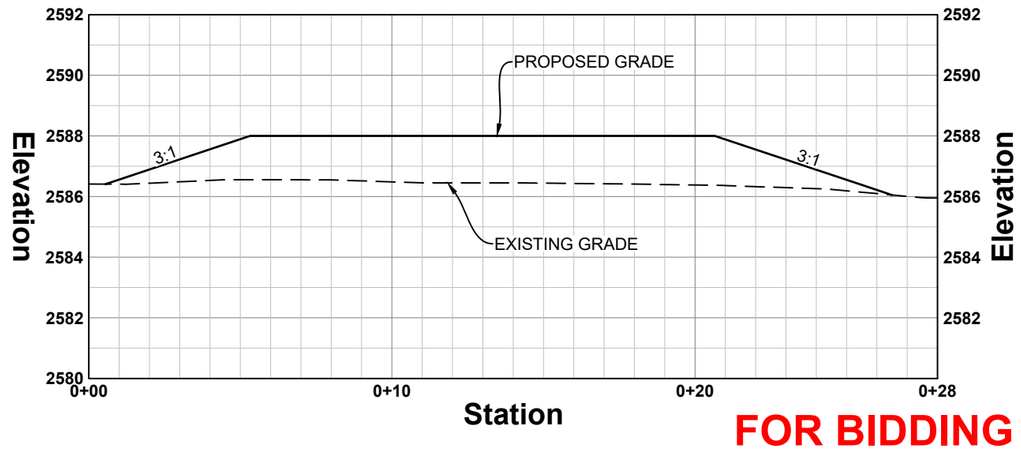
SHEET
9



Profile View of XS-1



Profile View of XS-2



FOR BIDDING

NO.	REVISION	BY	DATE

PROJECT NO. 2024138

PREPARED BY
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HELENA, MT 59601
(406) 443-3962
www.wwcengineering.com

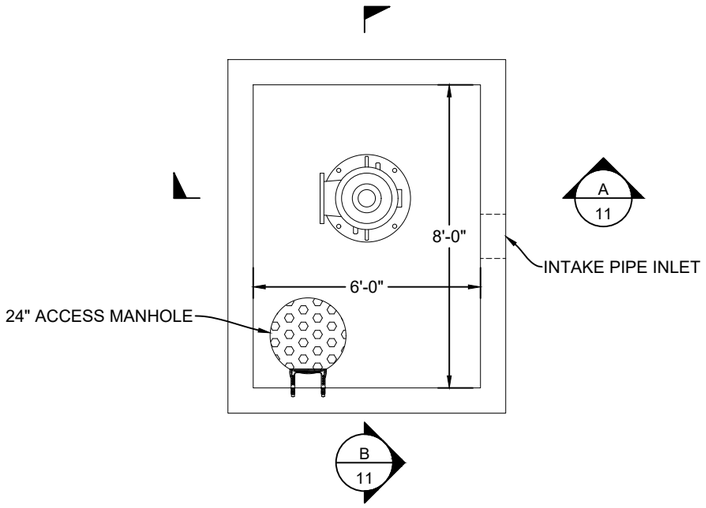
CONFEDERATED SALISH AND KOOTENAI TRIBES
KING PUMP STATION

PUMP STATION GRADING PLAN

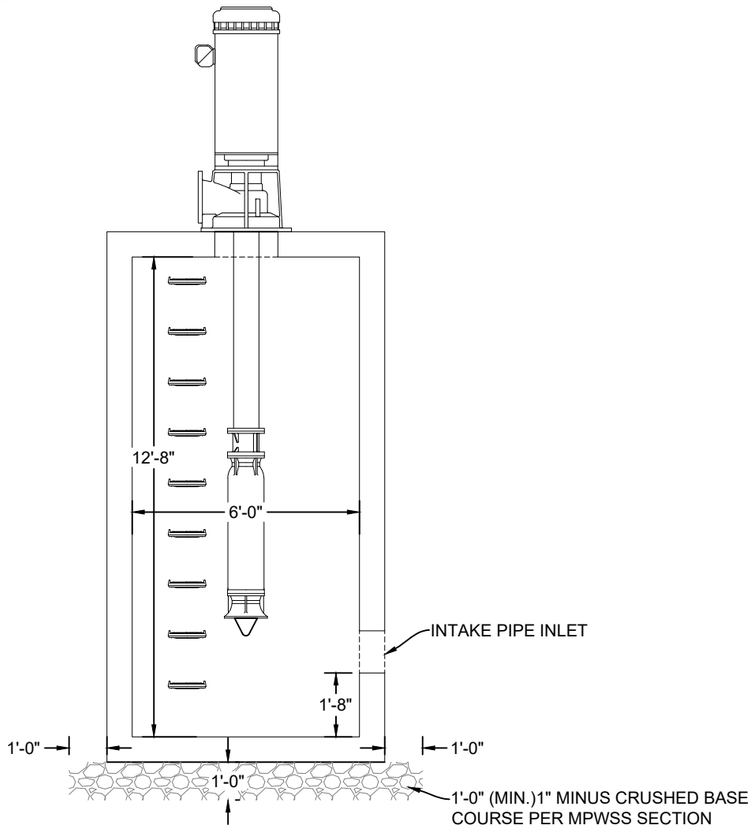
SANDERS COUNTY, MT

DESIGNED BY: JDF
DRAWN BY: JDF
CHECKED BY: DDP
DATE: 12/19/2025

SHEET
10

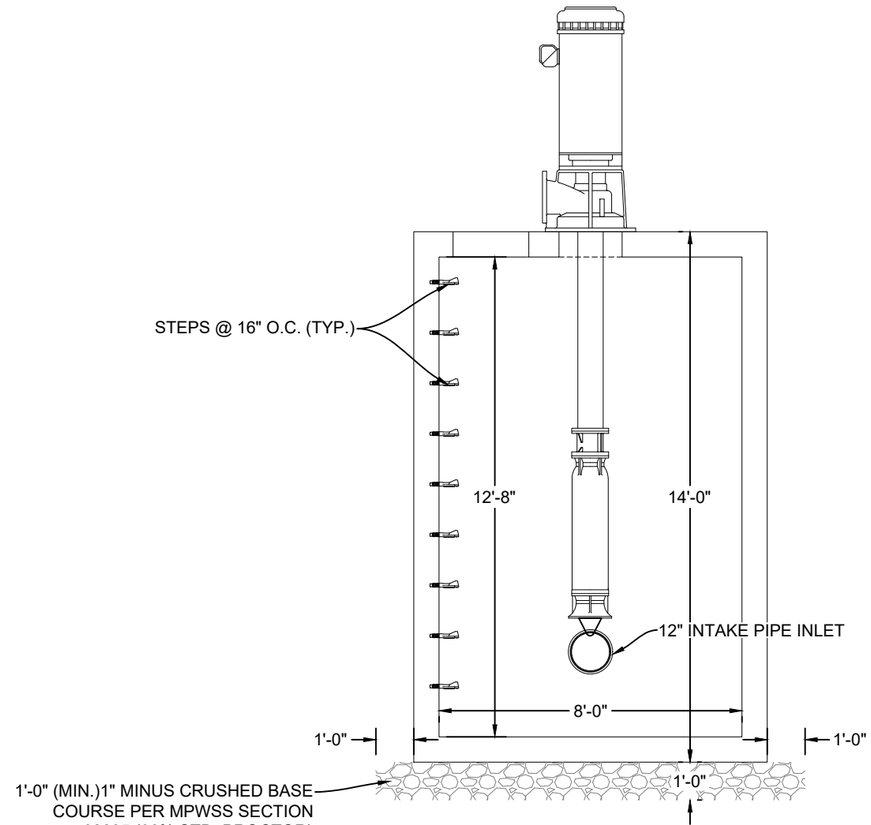


1 / 11 PUMP STATION VAULT PLAN VIEW
SCALE: 1"=4'



2 / 11 PUMP STATION VAULT SECTION VIEW A
SCALE: 1"=4'

NOTES:
1. ALL PIPE BLOCK OUTS SHALL BE SIZED APPROPRIATELY TO HAVE A FLEXIBLE PIPE TO MANHOLE CONNECTOR INSTALLED TO ENSURE A WATERTIGHT SEAL.
2. PRECAST MANUFACTURER TO DETERMINE WALL THICKNESS AND REBAR CONFIGURATION FOR VAULT.
3. VAULT TO BE COVERED WITH A BITUMINOUS COATING TO REPEL WATER AND ALL JOINTS SHALL BE SEALED WITH 12" BUTYL ADHESIVE WRAP MATERIAL.
4. BASE SHALL BE CAST MONOLITHICALLY WITH BOTTOM WALL SECTION.



3 / 11 PUMP STATION VAULT SECTION VIEW B
SCALE: 1"=4'

0 2' 4'
SCALE: 1" = 4'

FOR BIDDING

NO.	REVISION	BY	DATE

PROJECT NO. 2024138

PREPARED BY
WWC ENGINEERING
1275 MAPLE STREET, SUITE F
HELENA, MT 59601
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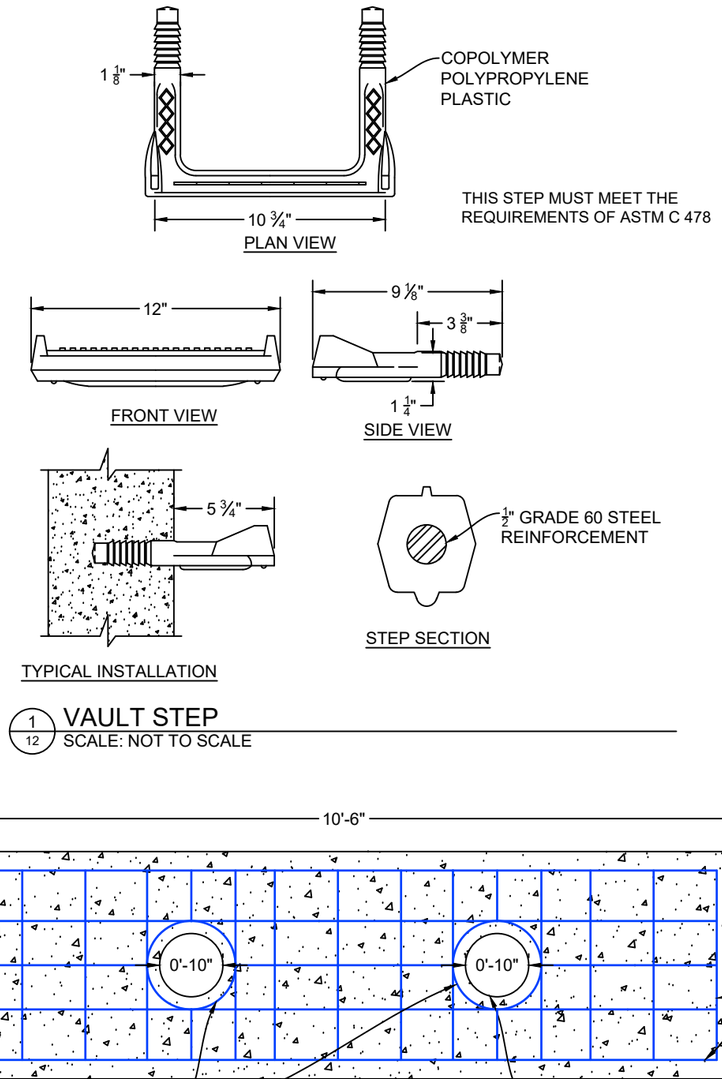
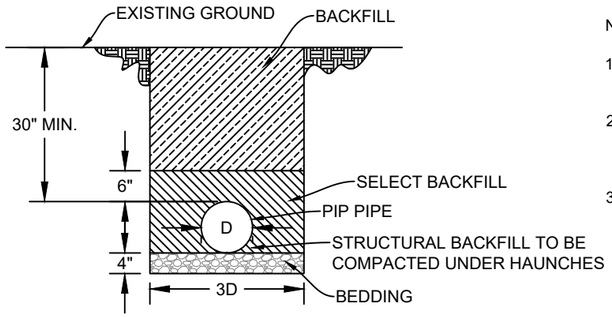
CONFEDERATED SALISH AND KOOTENAI TRIBES
KING PUMP STATION
VAULT LAYOUT
SANDERS COUNTY, MT

DESIGNED BY: JDF
DRAWN BY: JDF
CHECKED BY: DDP
DATE: 12/19/2025

SHEET
11



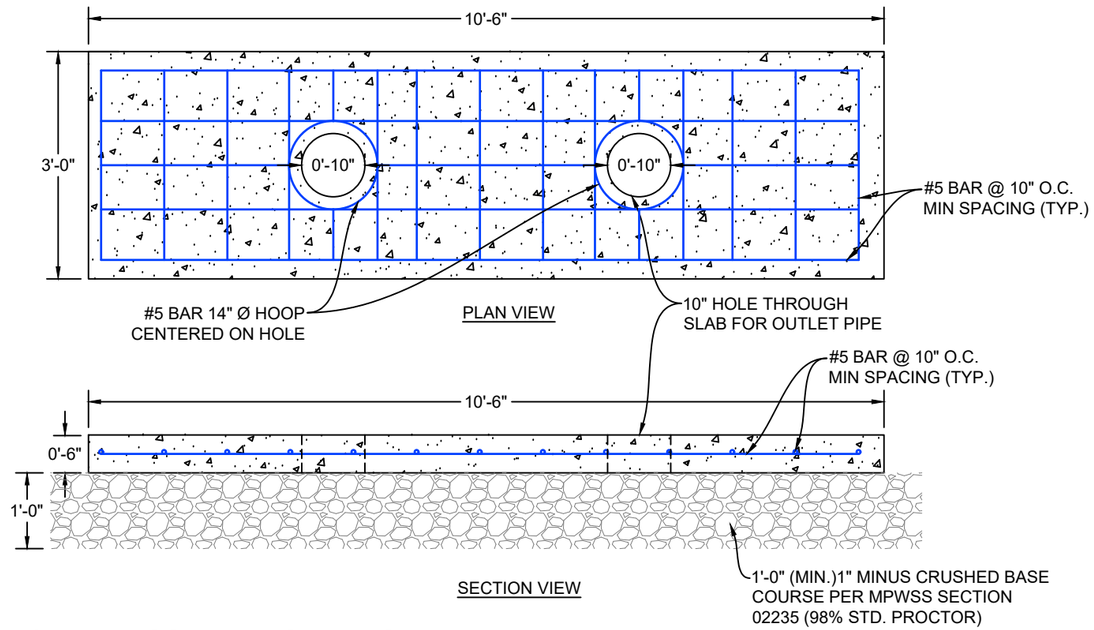
1/12 VAULT STEP
SCALE: NOT TO SCALE



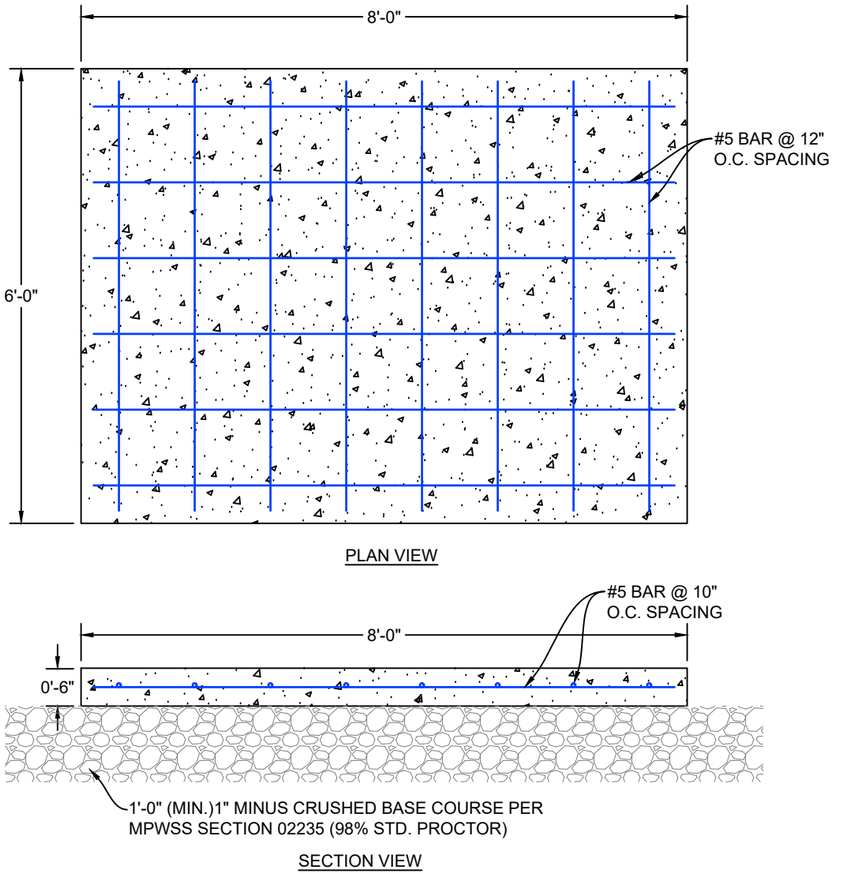
NOTES:

1. BACKFILL SHALL BE FREE FROM MATERIAL LARGER THAN 2 INCHES.
2. SELECT BACKFILL SHALL CONSIST OF SOIL OR GRANULAR MATERIAL THAT IS FREE FROM ROCKS GREATER THAN 1/2 INCH IN DIAMETER.
3. BEDDING SHALL BE USED ON NATIVE MATERIAL CONTAINING MATERIAL LARGER THAN 1/2 INCH. BEDDING MAY BE EITHER GRANULAR MATERIAL CONFORMING TO ASTM C-33 GRADATION 7 OR 8, OR BACKFILL MATERIAL.

2/12 PIPE BEDDING
SCALE: 1"=2'



3/12 INLET SCREEN MOUNTING PAD
SCALE: 1"=2'



4/12 HYDROBURST SYSTEM MOUNTING PAD
SCALE: 1"=2'

FOR BIDDING

NO.	REVISION	BY	DATE
1	INTAKE SCREEN UPDATES	JDF	12/18/2025

PROJECT NO. 2024138

PREPARED BY
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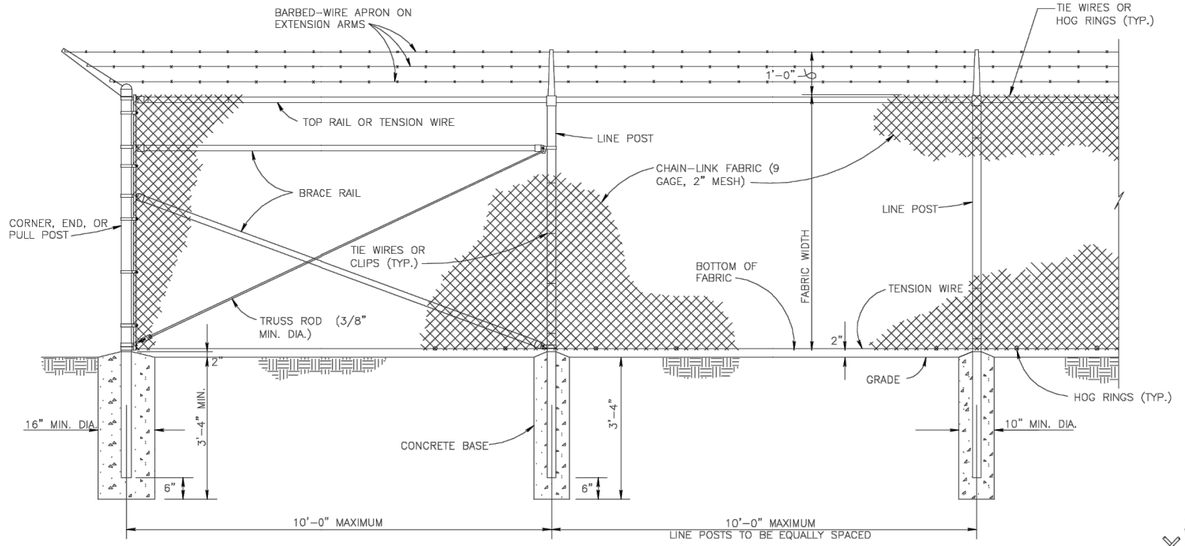
CONFEDERATED SALISH AND KOOTENAI TRIBES
KING PUMP STATION

DETAILS 1

SANDERS COUNTY, MT

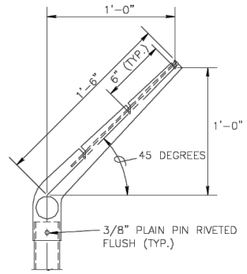
DESIGNED BY: JDF
DRAWN BY: JDF
CHECKED BY: DDP
DATE: 12/19/2025

SHEET 12

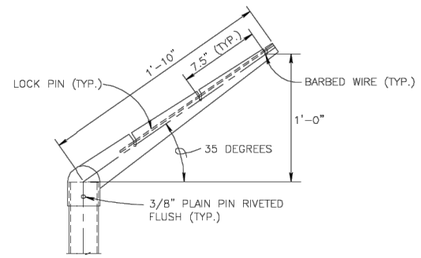


CHAIN-LINK SECURITY FENCE DETAIL

NO SCALE



LINE POST



CORNER POST

EXTENSION ARM DETAILS

NO SCALE

STEEL POST SCHEDULE			
USE AND SECTION	MINIMUM OUTSIDE DIMENSIONS (NOMINAL)		
	FABRIC LESS THAN 72"	FABRIC 72" TO 96"	FABRIC OVER 96"
CORNER, END & PULL POSTS			
TUBULAR – ROUND	2.375" O.D.	2.875" O.D.	4.00" O.D.
TUBULAR – SQUARE	2.00" SQ.	2.50" SQ.	3.00" SQ.
C-SECTION (ROLL-FORMED)	3.50" X 3.50"	3.50" X 3.50"	
LINE POSTS			
TUBULAR – ROUND	1.90" O.D.	2.375" O.D.	2.875" O.D.
H-SECTION	2.25" X 1.70"	2.25" X 1.70"	2.25" X 70"
C-SECTION (ROLL-FORMED)	1.875" X 1.625"	2.25" X 1.70"	
TOP, BOTTOM & BRACE RAILS			
TUBULAR – ROUND	1.66" O.D.		
TUBULAR – SQUARE	1.50" O.D.		
H-SECTION	1.625" X 1.50"		
C-SECTION (ROLL-FORMED)	1.625" X 1.25"		

NOTES:

1. DETAILS SHOWN ARE TO CLARIFY REQUIREMENTS AND ARE NOT INTENDED TO LIMIT OTHER TYPES OF FENCE SECTIONS AND METHODS OF INSTALLATION.

2. WIRE TIES, RAILS, POSTS, AND BRACES SHALL BE CONSTRUCTED ON THE SECURE SIDE OF THE FENCE ALIGNMENT. CHAIN-LINK FABRIC SHALL BE PLACED ON THE OPPOSITE SIDE OF THE SECURE AREA.

3. UNLESS SPECIFICALLY SHOWN OR SPECIFIED, ALL FE6 FENCE SHALL HAVE AN APRON EXTENDED OUTWARD FROM THE AREA BEING PROTECTED.

4. C-SECTION POSTS SHALL BE INSTALLED SO THAT THE VOID INSIDE THE POST IS COMPLETELY FILLED WITH CONCRETE UP TO THE TOP OF THE FOUNDATION.

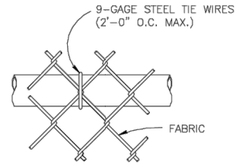
FENCE LEGEND:

TYPE FE5 – CHAIN-LINK FENCE WITHOUT BARBED-WIRE APRON
TYPE FE6 – CHAIN-LINK FENCE W/BARBED-WIRE ON SINGLE OUTRIGGER
TYPE FE7 – CHAIN-LINK FENCE W/BARBED WIRE ON DOUBLE OUTRIGGER
TYPE FE8 – CHAIN-LINK FENCE W/BARBED-WIRE AND BARBED-TAPE ON DOUBLE OUTRIGGER
TR – FENCE WITH TOP RAIL AND TENSION WIRE AT BOTTOM
TBR – FENCE WITH TOP AND BOTTOM RAILS
TWB – TENSION WIRE TOP AND BOTTOM
TWBR – FENCE WITH TOP TENSION WIRE AND BOTTOM RAIL
FINAL NUMBER IS FABRIC WIDTH IN INCHES.

EXAMPLES

FE6-TR-72 – CHAIN-LINK SECURITY FENCE WITH BARBED-WIRE ON SINGLE OUTRIGGER, TOP RAIL, AND 72 INCH FABRIC WIDTH.

FE5-TWB-48 – CHAIN-LINK SECURITY FENCE WITH NO APRON, TOP AND BOTTOM TENSION WIRE, AND 48 INCH FABRIC WIDTH.



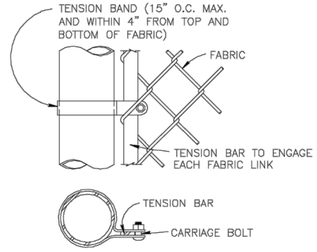
TOP OR BRACE RAIL ATTACHMENT

TRUSS ROD AND BAND

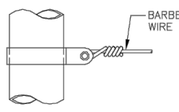
ROUND POST

H-BEAM

BRACE RAIL CLAMP DETAILS



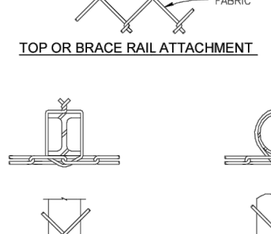
END OR GATE POST DETAIL



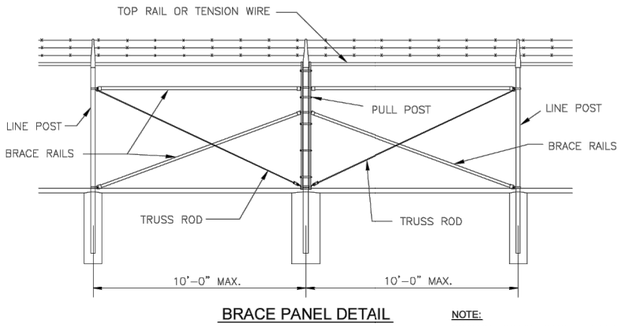
TENSION BAND DETAIL

FASTENING DETAILS

NO SCALE



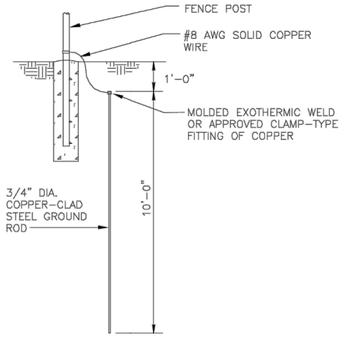
LINE POST ATTACHMENTS



BRACE PANEL DETAIL

NO SCALE

NOTE:
PROVIDE BRACE PANEL WHENEVER STRAIGHT RUNS EXCEED 500 FEET.



GROUNDING DETAIL

NO SCALE

$$ - THINK VALUE ENGINEERING - $$

Revisions

Symbol	Descriptions	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

Designed by: X
Drawn by: X
Checked by: X
Reviewed by: X
Submitted by:
Chief: X Section

STANDARD DETAILS FOR CHAIN-LINK SECURITY FENCES AND FARM STYLE FENCES

FE6 CHAIN-LINK SECURITY FENCE DETAILS

Plot Scale Ratio: 1:1
Design File: FE6FENCE
Date: 02/01/02
Sheet reference number: 03
Spec. No.: DACA 45
Contract No.: DACA 45
Drawing Code: STD 87-90-03

FOR BIDDING

NO.	REVISION	BY	DATE

PROJECT NO. 2024138

PREPARED BY
WWC ENGINEERING
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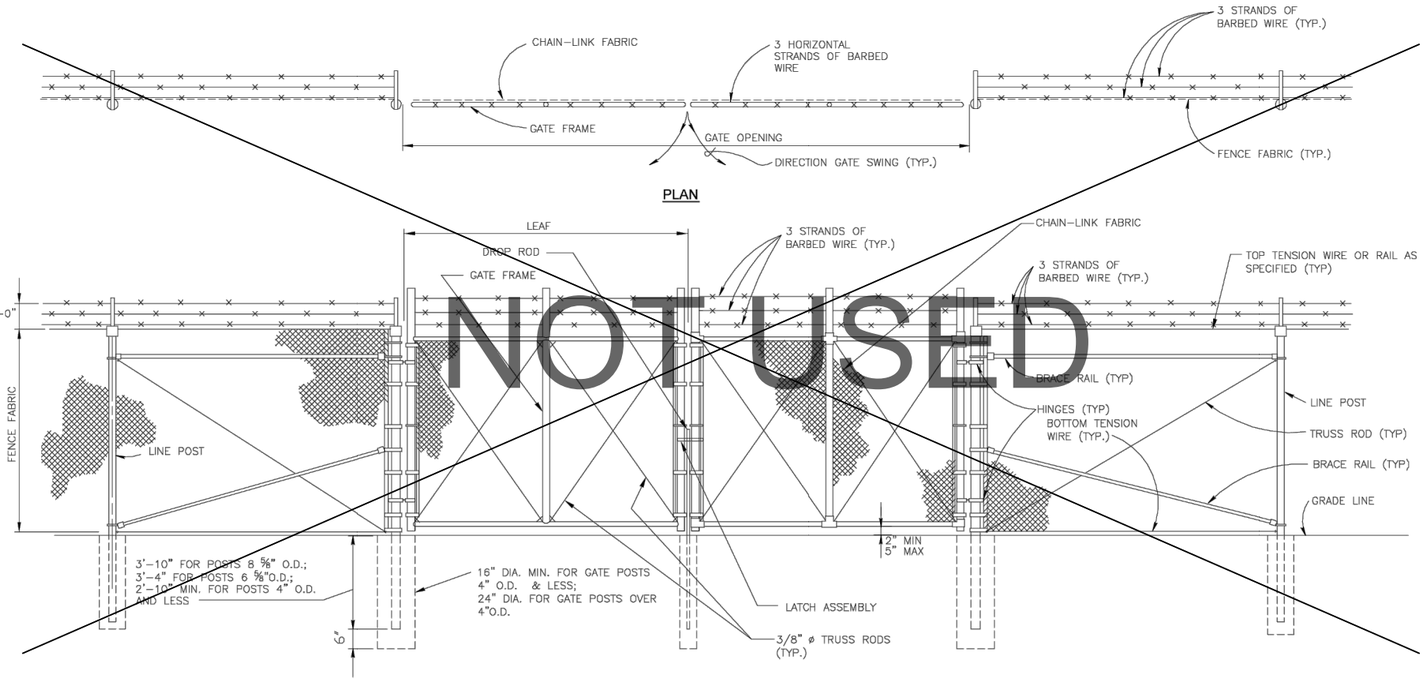
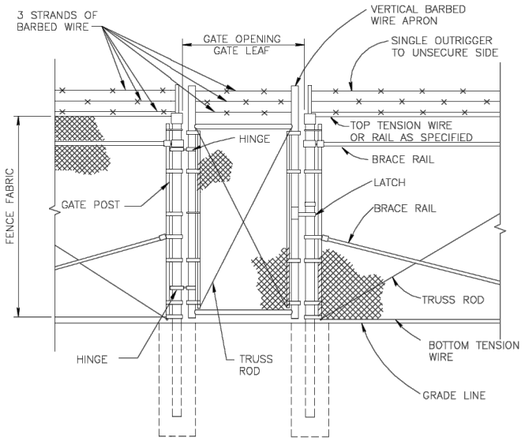
CONFEDERATED SALISH AND KOOTENAI TRIBES
KING PUMP STATION
FENCE DETAILS 1
SANDERS COUNTY, MT

DESIGNED BY: JDF
DRAWN BY: JDF
CHECKED BY: DDP
DATE: 12/19/2025

SHEET 13



ELEVATION
DOUBLE SWING GATE (TYPE FE-6 FENCE)



PERSONNEL GATE
TYPE FE-6 FENCE

NOTES:

1. DETAILS SHOWN ARE TO CLARIFY REQUIREMENTS AND ARE NOT INTENDED TO LIMIT OTHER TYPE OF FENCE SECTIONS AND METHODS OF INSTALLATION.

2. SWING GATES SHALL BE CONSTRUCTED WITH DROP RODS, PADLOCKS, LATCH ASSEMBLY AND GATE KEEPERS EXCEPT AS NOTED.

3. ALL GATE FRAMES SHALL BE A MINIMUM 1.90" NOMINAL (ROUND) OR 2.00" NOMINAL (SQUARE). GATE FRAMES SHALL BE OF WELDED CONSTRUCTION OR SHALL BE ASSEMBLED USING HEAVY FITTINGS. AT CONTRACTOR'S OPTION A WELDED HORIZONTAL BRACE MAY BE USED IN LIEU OF TRUSS RODS TO BRACE ALL WELDED GATE FRAMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER RIGID CONSTRUCTION OF ALL GATES SUPPLIED.

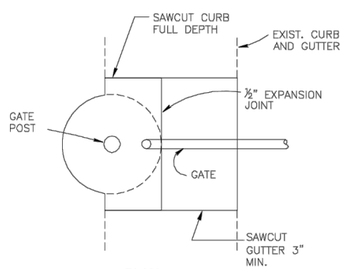
4. GATES SHALL BE DESIGNATED AS FOLLOWS:

FENCE TYPE – FE5, FE6, ETC.
FENCE HEIGHT – INCHES
TYPE OPENING – SO (SINGLE)
– DO (DOUBLE)
HINGE – RA (STANDARD)
– HO (OFFSET)
OPENING – FEET (CLEAR OPENING BETWEEN GATE POSTS)

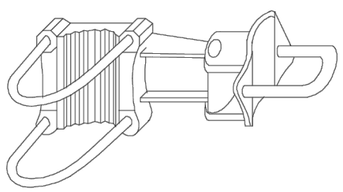
EXAMPLES: FE6–84–DO–RA–24
FE5–48–SO–HO–6

GATE POST SCHEDULE

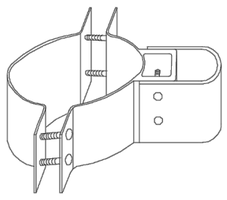
GATE LEAF WIDTH (NOMINAL)	OUTSIDE DIMENSION (NOMINAL)
6' OR LESS	2.875" OD 2.5" SQ
MORE THAN 6' TO 13'	4.0" OD
MORE THAN 13' TO 18'	6.625" OD
MORE THAN 18'	8.625" OD



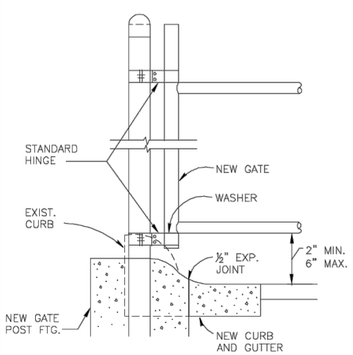
PLAN



OFFSET HINGE

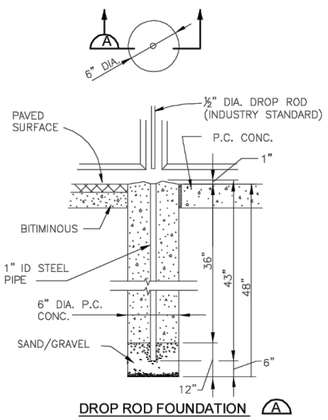


STANDARD HINGE

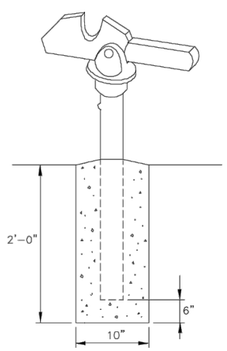


SECTION

GATE POST DETAIL
AT CURB AND GUTTER
NO SCALE

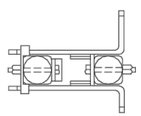


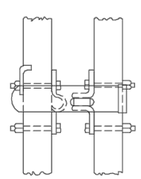
DROP ROD FOUNDATION (A)



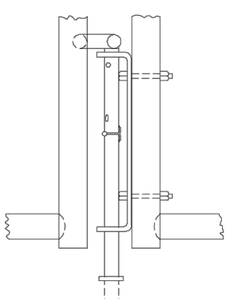
GATE KEEPER
(TO HOLD GATE OPEN)

SWING GATE DETAILS
NO SCALE





LATCH ASSEMBLY



DROP ROD ASSEMBLY

$$ - THINK VALUE ENGINEERING - $$

Revisions

Symbol	Descriptions	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

Designed by: X
Drawn by: X
Checked by: X
Reviewed by: X
Submitted by:
Chief: X Section

BASE NAME — BASE LOCATION
STANDARD DETAILS FOR CHAIN-LINK SECURITY FENCES AND FARM STYLE FENCES

FE6 CHAIN-LINK SECURITY FENCE GATE DETAILS

Plot Scale Ratio: 1:1
Design File: FE6GATE.DGN
Date: 02/01/02
Spec. No.: DACA 45
Drawing Code: STD 872-90-08
Contract No.: DACA 45
Sheet reference number: 08

NOT USED

FOR BIDDING

NO.	REVISION	BY	DATE

PROJECT NO. 2024138

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CONFEDERATED SALISH AND KOOTENAI TRIBES
KING PUMP STATION
FENCE DETAILS 2
SANDERS COUNTY, MT

DESIGNED BY: JDF
DRAWN BY: JDF
CHECKED BY: DDP
DATE: 12/19/2025

SHEET
14

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The Contractor shall furnish concrete formwork, bracing, shoring, and supports for cast- in-place concrete and shall design and construct falsework, all in accordance with the Contract Documents.

1.02 RELATED DOCUMENTS

A. Section 03 21 00 - Reinforcement Steel

B. Section 03 30 00 - Cast-in-place Concrete

1.03 CONTRACTOR SUBMITTALS

A. Furnish submittals in accordance with Section 01 33 00 – Submittal Procedures.

1.04 QUALITY ASSURANCE

A. Tolerances: The variation from required lines or grade shall not exceed 1/4-inch in 10-feet, non-cumulative, and there shall be no offsets or visible waviness in the finished surface. Other tolerances shall be within the tolerances of ACI 117 – Standard Tolerances for Concrete Construction and Materials.

PART 2 - PRODUCTS

2.01 GENERAL

A. Except as otherwise expressly accepted by the COR, lumber brought on the Site for use as forms, shoring, or bracing shall be new material. Forms shall be smooth surface forms and shall be of the following materials:

Walls	Steel, fiberglass, or plywood panel
Columns	Steel, plywood or fiberglass
Roof and floor	Plywood
All other Work	Steel panels, fiberglass, plywood or tongue and groove lumber

2.02 FORM AND FALSEWORK MATERIALS

A. Materials for concrete forms, formwork, and falsework shall conform to the following requirements:

1. Lumber shall be Douglas Fir or Southern Yellow Pine, construction grade or better, in conformance with U.S. Product Standard PS 20 – American Softwood Lumber Standard.

2. Plywood for concrete formwork shall be new, waterproof, synthetic resin bonded, exterior type Douglas Fir or Southern Yellow Pine plywood manufactured especially for concrete formwork, shall conform to the

requirements of PS 1-09 (B-B) – Construction and Industrial Plywood, for Concrete Forms, Class I, and shall be edge sealed.

3. Form materials shall be metal, wood, plywood, or other material that will not adversely affect the concrete and will facilitate placement of concrete to the shape, form, line, and grade indicated. Metal forms shall accomplish such results. Wood forms for finished walls and surfaces to be painted shall be Medium Density Overlaid plywood, MDO Ext. Grade.
4. Steel leave in place forms shall not be used.

B. Unless otherwise indicated, exterior corners in concrete members shall be provided with ¾ -inch chamfers or be tooled to ½-inch radius. Re-entrant corners in concrete members shall not have fillets unless otherwise indicated.

2.03 FORM TIES

A. Form ties shall be provided with a plastic cone or other suitable means for forming a conical hole to ensure that the form tie may be broken off back of the face of the concrete. The maximum diameter of removable cones for rod ties or other removable form tie fasteners having a circular cross-section shall not exceed 1½ inches; and all such fasteners shall be such as to leave holes of regular shape for reaming. Form ties for water- retaining structures shall have integral waterstops that tightly fit the form tie so that they cannot be moved from mid-point of the tie. Form ties shall be **Hex Head Snap Ties by Meadow Burke; Snap Ties by Dayton Superior;** or equal.

B. Removable taper ties may be used when approved by the COR. A preformed neoprene or polyurethane tapered plug sized to seat at the center of the wall shall be inserted in the hole left by the removal of the taper tie. Use **Taper Ties by Meadow Burke, Taper Ties by Dayton Superior,** or equal.

PART 3 - EXECUTION

3.01 GENERAL

A. Forms to confine the concrete and shape it to the required lines shall be used wherever necessary. The Contractor shall assume full responsibility for the adequate design of forms, and any forms that are unsafe or inadequate in any respect shall promptly be removed from the Work and replaced. Provide worker protection from protruding reinforcement bars in accordance with applicable safety codes. A sufficient number of forms of each kind shall be available to permit the required rate of progress to be maintained. The design and inspection of concrete forms, falsework, and shoring shall comply with applicable local, state, and Federal regulations. Plumb and string lines shall be installed before concrete placement and shall be maintained during placement. Such lines shall be used by Contractor's personnel and by the COR and shall be in sufficient number and properly installed. During concrete placement, the Contractor shall continually monitor plumb and string line form positions and immediately correct deficiencies.

B. Concrete forms shall conform to the shape, lines, and dimensions of members required, and shall be substantial, free from surface defects, and sufficiently tight to prevent leakage. Forms shall be properly braced or tied together to maintain

their position and shape under a load of freshly placed concrete. If adequate foundation for shores cannot be secured, trussed supports shall be provided.

C. Forms shall not be removed earlier than specified unless approved otherwise by the COR.

3.02 FORM DESIGN

A. Forms shall be true in every respect to the required shape and size, shall conform to the established alignment and grade, and shall be of sufficient strength and rigidity to maintain their position and shape under the loads and operations incident to placing and vibrating the concrete. Suitable and effective means shall be provided on forms for holding adjacent edges and ends of panels and sections tightly together and in accurate alignment so as to prevent the formation of ridges, fins, offsets, or similar surface defects in the finished concrete. Plywood, ⅝-inch and greater in thickness, may be fastened directly to studding if the studs are spaced close enough to prevent visible deflection marks in the concrete.

B. Forms shall be tight so as to prevent the loss of water, cement, and fines during placing and vibrating of the concrete. Specifically, the bottom of wall forms that rest on concrete footings or slabs shall be provided with a gasket to prevent loss of fines and paste during placement and vibration of concrete. Such gasket may be a 1- to 1½-inch-diameter polyethylene rod held in position to the underside of the wall form. Adequate clean-out holes shall be provided at the bottom of each lift of forms. The size, number, and location of such clean-outs shall be as acceptable to the COR. Whenever concrete cannot be placed from the top of a wall form in a manner that meets the requirements of the Contract Documents, form windows shall be provided in the size and spacing needed to allow placement of concrete to the requirements of Section 03 30 00 – Cast-in-Place Concrete. The size, number, and location of such form windows shall be as acceptable to the COR.

3.03 CONSTRUCTION

A. Vertical Surfaces: Vertical surfaces of concrete members shall be formed, except where placement of the concrete against the ground is indicated. Not less than 1-inch of concrete shall be added to the indicated thickness of a concrete member where concrete is permitted to be placed against trimmed ground in lieu of forms. Permission to do this on other concrete members will be granted only for members of comparatively limited height and where the character of the ground is such that it can be trimmed to the required lines and will stand securely without caving or sloughing until the concrete has been placed.

B. Construction Joints: Concrete construction joints will not be permitted at locations other than those indicated, except as may be acceptable to the COR. When a second lift is placed on hardened concrete, special precautions shall be taken in the way of the number, location, and tightening of ties at the top of the old lift and bottom of the new to prevent any unsatisfactory effect whatsoever on the concrete. Pipe stubs and anchor bolts shall be set in the forms where required.

C. Form Ties:

1. Embedded Ties: Holes left by the removal of form tie cones shall be reamed with suitable toothed reamers so as to leave the surface of the holes clean and rough before being filled with mortar. Wire ties for holding forms will not be permitted. No form-tying device or part thereof, other than metal, shall be left

embedded in the concrete. Ties shall not be removed in such manner as to leave a hole extending through the interior of the concrete members. The use of snap-ties that cause spalling of the concrete upon form stripping or tie removal will not be permitted. If steel panel forms are used, rubber grommets shall be provided where the ties pass through the form in order to prevent loss of cement paste. Where metal rods extending through the concrete are used to support or to strengthen forms, the rods shall remain embedded and shall terminate not less than 1 inch back from the formed face or faces of the concrete.

2. Removable Ties: Where taper ties are approved for use, the larger end of the taper tie shall be on the wet side of walls in water retaining structures. After the taper tie is removed, the hole shall be thoroughly cleaned and roughened for bond. A precast neoprene or polyurethane tapered plug shall be located at the wall centerline. The hole shall be completely filled with non-shrink grout for water bearing and below-grade walls. The hole shall be completely filled with non-shrink or regular cement grout for above-grade walls that are dry on both sides. Exposed faces of walls shall have the outer 2 inches of the exposed face filled with a cement grout that shall match the color and texture of the surrounding wall surface.

3.04 REUSE OF FORMS

A. Forms may be reused only if in good condition and only if acceptable to the COR. Light sanding between uses will be required wherever necessary to obtain uniform surface texture on exposed concrete surfaces. Exposed concrete surfaces are defined as surfaces, which are permanently exposed to view. In the case of forms for the inside wall surfaces of hydraulic/water retaining structures, unused tie rod holes in forms shall be covered with metal caps or shall be filled by other methods acceptable to the COR.

3.05 REMOVAL OF FORMS

A. Careful procedures for the removal of forms shall be strictly followed, and this Work shall be done with care so as to avoid injury to the concrete. No heavy loading on green concrete will be permitted. In the case of slabs on grade and walls, forms shall remain in place until test cylinders attain a minimum compressive strength of 75 percent of the 28-day strength in Section 03 30 00 unless approved in writing by the COR. Forms and bracing for vertical walls of water holding structures shall remain in place at least 36 hours after the concrete has been placed. If forms are removed prior to the completion of the curing periods specified in 03 30 00, the Contractor shall determine means and methods to continue curing operations for the durations specified herein. Forms for parts of the Work not specifically mentioned herein shall remain in place for periods of time as recommended in ACI 347 – Guide to Formwork for Concrete.

3.06 MAINTENANCE OF FORMS

A. Forms shall be maintained in good condition, particularly as to size, shape, strength, rigidity, tightness, and smoothness of surface. Before concrete is placed, the forms shall be thoroughly cleaned. The form surfaces shall be treated with a nonstaining mineral oil or other lubricant acceptable to the COR. Any excess lubricant shall be satisfactorily removed before placing the concrete. Where field oiling of forms is required, the Contractor shall perform the oiling at least 2 weeks

in advance of their use and reapply oil as necessary. Care shall be exercised to keep oil off the surfaces of steel reinforcement and other metal items to be embedded in concrete.

3.07 FALSEWORK

A. The Contractor shall be responsible for the design, engineering, construction, maintenance, and safety of falsework, including staging, walkways, forms, ladders, and similar appurtenances, which shall equal or exceed the applicable requirements of the provisions of the OSHA Safety and Health Standards for Construction and the requirements herein. Design of falsework shall be signed and sealed by a professional engineer registered in the state of Montana.

B. Falsework shall be designed and constructed to provide the necessary rigidity and to support the loads. Falsework for the support of a superstructure shall be designed to support the loads that would be imposed if the entire superstructure were placed at one time.

C. Falsework shall be placed upon a solid footing, safe against undermining, and be protected from softening. When the falsework is supported on timber piles, the maximum calculated pile loading shall not exceed 20 tons. When falsework is supported on any portion of the structure, which is already constructed, the load imposed by the falsework shall be spread, distributed, and braced in such a way as to avoid any possibility of damage to the structure.

END OF SECTION 03 10 00

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PART 1 - GENERAL

1.01 SECTION INCUDES

A. The Contractor shall provide reinforcement steel and appurtenant work, complete and in place, in accordance with the Contract Documents.

1.02 RELATED DOCUMENTS

A. Section 03 10 00 - Concrete Formwork

B. Section 03 30 00 - Cast-in-place Concrete

C. Section 03 62 00 - Grout

1.03 CONTRACTOR SUBMITTALS

A. Furnish submittals in accordance with Section 01 33 00 – Submittal Procedures

B. RSN 03 21 00-01 Reinforcing Steel Shop Drawings:

1. Shop bending diagrams, placing lists, and drawings of reinforcement steel prior to fabrication. The shop bending diagrams shall show the actual lengths of bars to the nearest inch measured to the intersection of the extensions (tangents for bars of circular cross section) of the outside surface. Include bar placement diagrams that clearly indicate the dimensions of each bar splice. Shop drawings shall contain the total tonnage of rebar detailed per sheet.

2. Details of the concrete reinforcement steel and concrete inserts shall be submitted no later than 14 days receipt by the Contractor of the Notice to Proceed. Said details of reinforcement steel for fabrication and erection shall conform to ACI 315 – Details and Detailing of Concrete Reinforcement and the requirements herein.

C. RSN 03 21 00-02 Reinforcing Steel Couplers

1. Where mechanical couplers are required or permitted to be used to splice reinforcement steel, the Contractor shall submit manufacturer's literature which contains instructions and recommendations for installation for each type of coupler used; certified test reports that verify the load capacity of each type and size of coupler used; and Shop Drawings that show the location of each coupler with details of how they are to be installed in the formwork.

2. Welder qualifications and procedure qualifications shall be as specified in AWS D1.4.

1.04 QUALITY ASSURANCE

A. If requested by the COR, the Contractor shall furnish samples from each heat of reinforcement steel in a quantity adequate for testing. Costs of initial tests will be paid by the Contracting Officer. Costs of additional tests if material fails initial tests shall be the Contractor’s responsibility.

B. If requested by the COR, the Contractor shall furnish samples of each type of welded splice in a quantity and of dimensions adequate for testing. At the

discretion of the COR, radiographic testing of direct butt-welded splices will be performed. The Contractor shall provide assistance necessary to facilitate testing. The Contractor shall repair any weld that fails to meet AWS D1.4.

PART 2 - PRODUCTS

2.01 REINFORCEMENT STEEL

A. Reinforcement steel for cast-in-place reinforced concrete construction shall conform to the following requirements:

1. Bar and spiral reinforcement shall conform to ASTM A 615 – Deformed and Plain Carbon – Steel Bars, for Grade 60 reinforcement unless otherwise indicated.

2. Bar and spiral reinforcement that is welded shall conform to ASTM A 706 – Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement, for Grade 60 reinforcement unless otherwise indicated. In addition, the carbon equivalent in reinforcing that is welded shall not exceed 0.55 percent.

3. Welded wire fabric reinforcement shall conform to ASTM A 1064 – Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete, and the details indicated. Welded wire fabric with longitudinal wire of W4 size wire and smaller shall be in flat sheets or in rolls with a core diameter of not less than 10- inches. Welded wire fabric with longitudinal wires larger than W4 size shall be in flat sheets only.

B. Accessories:

1. Accessories shall include necessary chairs, slab bolsters, concrete blocks, tie wires, dips, supports, spacers, and other devices to position reinforcement during concrete placement. Bar supports shall meet the requirements of the Concrete Reinforcing Steel Institute (CRSI) Manual of Standard Practice, including special requirements for supporting epoxy-coated reinforcing bars. Wire bar supports shall be CRSI Class 1 for maximum protection with a 1/8-inch minimum thickness of plastic coating that extends at least 1/2-inch from the concrete surface. Plastic shall be gray in color.

2. Concrete blocks (dobies) used to support and position reinforcement steel shall have the same or higher compressive strength as required for the concrete in which they are located. Wire ties shall be embedded in concrete block bar supports.

C. Epoxy coating for reinforcing and accessories shall conform to ASTM A 775 – Epoxy – Coated Reinforcing Steel Bars. Bars shall not receive epoxy coating, unless otherwise noted in the Contract Drawings.

2.02 MECHANICAL COUPLERS

A. Mechanical couplers shall be provided where indicated and where approved by the COR. The couplers shall develop a tensile strength that exceeds 125 percent of the yield strength of the reinforcement bars being spliced at each splice.

B. Where the type of coupler used is composed of more than one component, components required for a complete splice shall be provided. This shall apply to mechanical splices, including those splices intended for future connections.

C. The reinforcement steel and coupler used shall be compatible for obtaining the required strength of the connection. Straight threaded type couplers shall require the use of the next larger size reinforcing bar or shall be used with reinforcing bars with specially forged ends which provide upset threads which do not decrease the basic cross section of the bar.

D. Couplers shall be **Lenton Form Saver by Pentair**, **Dowel Bar Splicer System by Dayton Superior**, or equal.

2.03 WELDED SPLICES

A. Welded splices shall be provided where indicated and where approved by the COR. Welded splices of reinforcement steel shall develop a tensile strength that exceeds 125 percent of the yield strength of the reinforcement bars that are connected.

B. Materials required to conform the welded splices to AWS D1.4 shall be provided.

2.04 EPOXY GROUT

A. Epoxy for grouting reinforcing bars shall be specifically formulated for such application, for the moisture condition, application temperature, and orientation of the hole to be filled. Epoxy grout shall meet Section 03 62 00 –Grout.

PART 3 - EXECUTION

3.01 GENERAL

A. Reinforcement steel, welded wire fabric, couplers, and other appurtenances shall be fabricated, and placed in accordance with the Building Code and the supplementary requirements herein.

3.02 FABRICATION

A. General:

1. Reinforcement steel shall be accurately formed to the dimensions and shapes indicated, and the fabricating details shall be prepared in accordance with ACI 315 and ACI 318 – Building Code Requirements for Structural Concrete, except as modified by the Drawings. Bars shall be bent cold. Bars shall be bent per ACI 318.

2. The Contractor shall fabricate reinforcement bars for structures in accordance with bending diagrams, placing lists, and placing drawings.

B. Fabricating Tolerances: Bars used for concrete reinforcement shall satisfy the following fabricating tolerances:

1. Sheared length: plus and minus 1-inch

2. Depth of truss bars: plus zero, minus 1/2-inch

3. Stirrups, ties, and spirals: plus and minus 1/2-inch

4. Other bends: plus and minus 1-inch

3.03 PLACING

A. Reinforcement steel shall be accurately positioned as indicated and shall be supported and wired together to prevent displacement, using annealed iron wire

ties or suitable clips at intersections. Reinforcement steel shall be supported by concrete, plastic or metal support spacers, or metal hangers that are strong and rigid enough to prevent any displacement of the reinforcement steel. Where concrete is to be placed on the ground, supporting concrete blocks (or dobies) shall be used in sufficient numbers to support the bars without settlement, but in no case shall such support be continuous. Concrete blocks used to support reinforcement steel shall be tied to the steel with wire ties that are embedded in the blocks. For concrete over formwork, the Contractor shall provide concrete, metal, plastic, or other acceptable bar chairs and spacers.

B. Limitations on the use of bar support materials shall be as follows.

   1. Concrete Dobies

      a. Permitted at any location except where architectural finish is required. Compressive strength of the dobies shall be equal to the compressive strength of the structural concrete.

   2. Wire Bar Supports: permitted only at slabs over dry areas, interior dry wall surfaces, and exterior wall surfaces.

   3. Plastic Bar Supports: permitted at every location except on grade.

C. Tie wires shall be bent away from the forms in order to provide the required concrete coverage.

D. Bars additional to those indicated that may be found necessary or desirable by the Contractor for the purpose of securing reinforcement in position, shall be provided by the Contractor at its own expense.

E. Unless otherwise indicated, reinforcement placing tolerances shall be within the limits in Section 7.5 of ACI 318 except where in conflict with the Building Code.

F. Bars may be moved as necessary to avoid interference with other reinforcement steel, conduits, or embedded items. If bars are moved more than one bar diameter or enough to exceed the above tolerances, the resulting arrangement of bars shall be as reviewed and accepted by the COR. Cutting of reinforcement shall be prohibited unless written permission is issued by the COR.

G. Welded wire fabric reinforcement placed over horizontal forms shall be supported on slab bolsters. Slab bolsters shall be spaced not more than 30-inches on centers, shall extend continuously across the entire width of the reinforcement mat, and shall support the reinforcement mat in the plane indicated.

H. Welded wire fabric placed over the ground shall be supported on wired concrete blocks (dobies) spaced not more than 3-feet on centers in any direction. The construction practice of placing welded wire fabric on the ground and hooking into place in the freshly placed concrete shall not be used.

I. Epoxy-coated reinforcing bars shall be stored, transported, and placed in such a manner as to avoid chipping of the epoxy coating. Non-abrasive slings made of nylon and similar materials shall be used. Specially coated bar supports shall be used. Chips or cracks in the epoxy coating shall be repaired with a compatible epoxy repair material prior to placing concrete.

J. Accessories supporting reinforcing bars shall be spaced such that there is no deflection of the accessory from the weight of the supported bars. When used to

space the reinforcing bars from wall forms, the forms and bars shall be located so that there is no deflection of the accessory when the forms are tightened into position.

3.04 SPACING OF BARS

A. The clear distance between parallel bars (except in columns and between multiple layers of bars in beams) shall be not less than the nominal diameter of the bars, nor less than 1- 1/3 times the maximum size of the coarse aggregate, nor less than one-inch.

B. Where reinforcement in beams or girders is placed in 2 or more layers, the clear distance between layers shall be not less than one-inch.

C. In columns, the clear distance between longitudinal bars shall be not less than 1-1/2 times the bar diameter, nor less than 1-1/2 times the maximum size of the coarse aggregate, nor less than 1-1/2 inches.

D. The clear distance between bars shall also apply to the distance between a contact splice and adjacent splices or bars.

3.05 SPLICING

A. General:

1. Reinforcement bar splices shall only be used at locations indicated. When it is necessary to splice reinforcement at points other than where indicated, the character of the splice shall be as reviewed and accepted by the COR.

2. Unless otherwise indicated, dowels shall match the size and spacing of the spliced bar.

B. Splices of Reinforcement:

1. The length of lap for reinforcement bars, unless otherwise indicated, shall be in accordance with ACI 318, Section 12.15.1 for a Class B splice and plan set.

2. Laps of welded wire fabric shall be in accordance with ACI 318. Adjoining sheets shall be securely tied together with No. 14 tie wire, one tie for each 2 running feet. Wires shall be staggered and tied in such a manner that they cannot slip.

3. Splices in column spiral reinforcement, when necessary, shall be made by welding or by a lap of 1½ turns.

C. Bending or Straightening: Reinforcement shall not be straightened or rebent in a manner which will injure the material. Bars shall be bent or straight as indicated. Do not use bends different from the bends indicated. Bars shall be bent cold, unless otherwise permitted by the COR. No bars partially embedded in concrete shall be field-bent except as indicated or specifically permitted by the COR.

D. Couplers that are located at a joint face shall be a type that can be set either flush or recessed from the face as indicated. The couplers shall be sealed during concrete placement to completely eliminate concrete or cement paste from entering. Couplers intended for future connections shall be recessed a minimum of 1/2-inch from the concrete surface. After the concrete is placed, the coupler shall be plugged with plastic plugs which have an O-ring seal and the recess filled with

sealant to prevent any contact with water or other corrosive materials. Threaded couplers shall be plugged.

1. Unless indicated otherwise, mechanical coupler spacing and capacity shall match the spacing and capacity of the reinforcing indicated for the adjacent section.

3.06 CLEANING AND PROTECTION

A. Reinforcement steel shall always be protected from conditions conducive to corrosion until concrete is placed around it.

B. The surfaces of reinforcement steel and other metalwork to be in contact with concrete shall be thoroughly cleaned of dirt, grease, loose scale and rust, grout, mortar, concrete, and other foreign substances immediately before the concrete is placed. Where there is delay in depositing concrete, reinforcement shall be re-inspected and, if necessary, re- cleaned.

3.07 EMBEDMENT OF DRILLED REINFORCING STEEL DOWELS

A. Hole Preparation:

1. The hole diameter shall be as recommended by the epoxy manufacturer but shall be no larger than 1/4-inch greater than the diameter of the outer surface of the reinforcing bar deformations.

2. The depth of the hole shall be as recommended by the epoxy manufacturer to fully develop the bar but shall not be less than 12 bar diameters, unless indicated otherwise.

3. The hole shall be drilled by methods that do not interfere with the proper bonding of epoxy.

4. Existing reinforcing steel in the vicinity of proposed holes shall be located prior to drilling. The location of holes shall be adjusted to avoid drilling through or nicking any existing reinforcing bars.

5. The hole shall be blown clean with clean, dry compressed air to remove dust and loose particles.

B. Embedment:

1. Epoxy shall be injected into the hole through a tube placed to the bottom of the hole. The tube shall be withdrawn as epoxy is placed but kept immersed to prevent formation of air pockets. The hole shall be filled to a depth that ensures excess material will be expelled from the hole during dowel placement.

2. Dowels shall be twisted during insertion into the partially filled hole so as to guarantee full wetting of the bar surface with epoxy. The bar shall be inserted slowly enough to avoid developing air pockets.

END OF SECTION 03 21 00

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The Contractor shall provide cast-in-place concrete in accordance with the Contract Documents.

B. The following types of concrete are covered in this Section:

1. Structural Concrete:

a. For use on the concrete pads for the screen and hydroburst system.

1.02 RELATED DOCUMENTS

A. Section 03 21 00 – Reinforcement Steel

1.03 CONTRACTOR SUBMITTALS

A. Furnish submittals in accordance with Section 01 33 00 – Submittal Procedures.

B. RSN 03 30 00-01 Concrete Mix Designs:

1. Prior to beginning the work and within 30 days of the Notice to Proceed, submit preliminary concrete mix designs which shall show the proportions and gradations of materials proposed for each class and type of concrete. Mix designs shall be checked through trial batch and laboratory testing by an independent testing laboratory acceptable to the COR. Costs related to trial batch and related laboratory testing shall be the Contractor's responsibility as part of the work. The Contractor shall test a minimum of two (2) mix designs for each class of concrete. All admixtures planned for use in the Work shall be included in the mix designs.

C. RSN 03 30 00-02 Concrete Delivery Tickets:

1. Where ready-mix concrete is used, the Contractor shall furnish delivery tickets at the time of delivery of each load of concrete. Each ticket shall show the state-certified equipment used for measuring and the total quantities, by weight, of cement, sand, each class of aggregate, admixtures, the amount of water in the aggregate added at the batching plant, and the amount allowed to be added at the Site for the specific design mix. In addition, each ticket shall state the mix number, total yield in cubic yards, and the time of day, to the nearest minute, corresponding to the times when the batch was dispatched, when it left the plant, when it arrived at the Site, when unloading began, and when unloading was finished. The COR will have the option to inspect the ready mix batch plant and concrete trucks.

D. RSN 03 30 00-03 Concrete Constituents Test Data

1. Material test data relating to the cement, aggregate, and admixtures shall be less than 6 months old. Furnish the following submittals in accordance with ACI 301 – Structural Concrete:

a. Mill tests for cement.

b. Admixture certification. Chloride ion content shall be included.

c. Aggregate reactivity per ASTM 1260 and gradation test results and certification.

d. Materials and methods for curing.

1.04 QUALITY CONTROL

A. Codes and Standards: The codes and standards referred to in this section are declared to be part of this specification as if fully set forth herein. In addition, the following ACI Standards are incorporated in their entirety, unless specifically required otherwise:

1. ACI Standard 301, "Specifications for Structural Concrete," American Concrete Institute, current edition.

2. ACI Standard 318, "Building Code Requirements for Structural Concrete", American Concrete Institute, current edition.

3. Concrete Reinforcing Steel Institute, "Manual of Standard Practice".

4. International Building Code of I.C.B.O.

B. Employ, at the Contractor's expense, a testing laboratory acceptable to the COR to perform material evaluation tests and/or perform the mix design prior to placing any concrete, and all acceptance testing during the onsite placement of the concrete. Retesting or additional testing of concrete or materials failing to meet the requirements of these specifications must be done by the Contractor at no additional cost to the CO.

1.05 TESTING

A. All concrete quality assurance testing must be performed by an ACI Grade I certified testing technician. Unless otherwise specified, the COR shall be responsible for all quality assurance testing during the on-site placement of the concrete.

1. Materials

a. The COR or their representative must have access to the ready-mix production facility for sampling constituent materials during production to assure the materials meet these specifications and represent those stated on the approved mix design.

2. Standard Slump Tests

a. The COR shall, during each day's placement, check the consistency of the concrete by slump test. A slump test will also be made each time that strength specimens are made. Slump tests are performed meeting ASTM C143 "Method of Test for the Slump of Portland Cement Concrete".

3. Air Content Tests

a. The COR shall during each strength test, check the air content by either the "Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method" (ASTM C231), "Method of Test for Air Content of Freshly Mixed Concrete by the Volumetric Method" (ASTM C173) or "Method of Test for Unit Weight, Yield and Air Content (Gravimetric) of Concrete" (ASTM C138).

4. Compressive Strength Tests.

   a. A minimum of three specimens, 6-inch (150 mm) diameter or four 4 inch (100 mm) diameter, shall be made and tested for every concrete placement. Mold and test 1 set of test cylinders for every 50 cubic yards of concrete or fraction thereof placed each day or once per class of concrete supplied per day. On a given project, if the total volume of concrete is such that frequency of testing required above would generate less than 5 strength tests for a given class of concrete, make tests from at least 5 randomly selected batches or from each batch if fewer than 5 batches are used. Cure these cylinders under laboratory conditions except that additional test cylinders cured entirely under field conditions may be required by the COR to check the adequacy of curing and protection of the concrete.

   b. Take samples for strength tests in accordance with ASTM C172, entitled "Standard Practice for Sampling Freshly Mixed Concrete".

   c. Mold test cylinders and laboratory-cure in accordance with ASTM C31. Test cylinders in accordance with ASTM C39, entitled " "Method of Test for Compressive Strength of Cylindrical Concrete Specimens", ASTM C39, using an independent testing laboratory, as approved by the COR.

   d. Each set of cylinders cast per placement, test 1 for information strength at 7 days and test the remaining cylinders for acceptance strength at 28 days. To meet this specification, average strength of 28-day cylinders from the same sample is classified at the compressive strength test result. Strength level of an individual class of concrete is considered satisfactory if both of the following requirements are met:

      (1) The average of all sets of 3 consecutive tests equal or exceed the specified strength.

      (2) No individual strength test (average of 28-day cylinders) falls below specified strength by more than 500 psi (3400 kPa).

   e. Cure field cylinders under field conditions meeting the provisions of "Field Curing" of the Standard Practice for "Making and Curing Concrete Test Specimens in the Field" (ASTM C31).

   f. Mold field cured test cylinders at the same time and from the same samples as laboratory cured test cylinders. Improve procedures for protecting and curing concrete when strength of field cured cylinders at the test age designated for measuring specified strength is less than 85% of that of companion laboratory cured cylinders. When laboratory cured cylinder strengths are appreciably higher than the specified strength, field cured cylinder strengths need not exceed the specified strength by more than 500 psi (3400 kPa) even though the 85% criterion is met.

   g. The strengths of any specimens cured on the job are to indicate the adequacy of protection and curing of the concrete and may be used to determine when the forms may be stripped, shoring removed, or the structure placed in service. When the strengths of the job cured specimens are below those specified above, the Contractor must improve the procedures for protecting and curing the concrete. The strengths of any

field cured specimens should never be used solely for concrete acceptance purposes.

h. When concrete fails to meet the requirements above or when tests of field cured cylinders indicate deficiencies in protection and curing, the CO's representative may order tests on the hardened concrete in accordance with ACI-301 for that portion of the structure where the questionable concrete has been placed. In the event the core tests also indicate that the structure is unsatisfactory, make all modifications as directed by the COR to make the structure sound. If the core tests indicate the concrete is satisfactory, all cost of testing shall be paid by CO.

5. Temperature

   a. Performed each time a set of compressive strength test specimens is made.

6. Testing Reports

   a. In addition to the reports provided to the Owner and COR, the Contractor shall ensure that the concrete producer is provided copies of all reports of tests performed on concrete samples taken to determine compliance with the specification requirements. Reports shall be provided on a timely basis.

PART 2 - PRODUCTS

2.01 CLASSIFICATION

A. Concrete is classified as set forth by aggregates size referenced in ASTM C33, sizes 4 and 467 for Class C concrete and 56, 57, and 6 for Class M concrete. Place the specified class of concrete for each structure element as specified.

1. Use M-4500 (f'c=4,500 psi) concrete for curb and gutter, sidewalks, driveways, approaches, curb turn fillets and valley gutters and structural concrete. The maximum allowable water cement (w/c) for this concrete is 0.45. Use this concrete classification for the concrete slabs for this project.

2. Use M-3000 (f'c=3,000 psi) concrete for manholes, storm drain inlets and miscellaneous or C-3000 Concrete Construction class. The maximum allowable w/c for this concrete is 0.50.

B. If concrete strength or durability requirements established by design exceed the above strength classifications, the COR may specify additional concrete classifications to meet those requirements.

2.02 CONCRETE MATERIALS

A. Materials for concrete shall conform to the following requirements:

1. Cementitious Material: Cementitious material consists of Portland cement meeting ASTM C150 Type I, II, III, or V, with or without the addition of cementitious or pozzolanic mineral admixtures meeting, ASTM C618 or ASTM C989, and ASTM C1240, or blended hydraulic cement meeting ASTM C595 Type 1P, 1S, or 1L, or hydraulic cement meeting ASTM C1157 Type GU, MS, HS, or HE. Unless otherwise specified, assure cementitious material meets ASTM C 150 Type I, Type II, or Type IL. Assure cementitious material used in concrete is the same brand and type and from the same plant of manufacture as the

cementitious material used in the concrete represented by the submitted field test date or used in the trial mixtures.

2. Water for mixing and curing shall be potable, clean, and free from objectionable quantities of silty organic matter, alkali, salts, and other impurities. The water shall be considered potable, for the purposes of this Section only, if it meets ASTM C 1602
3. – Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete. Agricultural water with high total dissolved solids (greater than 1000 mg/l TDS) shall not be used.
4. Aggregates: Assure aggregates meet ASTM C33. When a single size or a combination of two or more sizes of coarse aggregates are used, assure the final gradation meets the grading requirements of ASTM C33 or provide an optimized combined aggregate gradation plan. Obtain concrete aggregates from the same source and use the same size ranges as the aggregates used in the concrete represented by submitted historical data or used in trial mixtures.
5. Ready-mix concrete shall conform to the requirements of ASTM C 94 – Ready-Mixed Concrete and all application standard from the National Ready Mixed Concrete Association (NRMCA).
6. Tenting: Tenting is allowed for creation of heated spaces to avoid cold temperature problems associated with concrete curing.
7. Admixtures: Use admixtures meeting the following requirements:
    a. Air entraining, admixtures ASTM C260
    b. Chemical admixtures ASTM C494
    c. Chemical admixtures for use in producing, flowing concrete ASTM C1017
    d. Calcium Chloride ASTM D98
    e. Use admixtures in the concrete that are the same as those used in the concrete represented by submitted field test data or in trial mixtures.
8. Change of materials
    a. When brand, type, size, or source of cementitious materials, aggregates, water, ice or admixtures are requested to be changed, submit new field data or data from new trial mixtures or furnish evidence that indicates that the change will not adversely affect the relevant properties of the concrete for acceptance before using the concrete.
9. Fly ash
    a. Fly ash shall be substituted for cement, 20% by weight for the higher strength mix.
    b. For other concrete, fly ash may be substituted for not more than 15%, by weight, of cement in structural concrete and not more than 30% by weight for site work concrete.
    c. Fly ash shall conform to ASTM C618 and shall not have loss-on-ignition greater than 3%.
    d. The water/cement ratio shall be calculated based on cement plus fly ash.

B. Performance and Design Requirements

1. Assure the cementitious material content is adequate to meet the specified requirements for strength, water-cement ratio and finishing requirements. For concrete exposed to freezing and thawing or concrete exposed to deicers, assure a maximum water-cement ratio of 0.45.
2. Furnish concrete at the point of delivery having a slump of 4 inches (max) (100 mm) determined by ASTM C143. Meet slump tolerances in ACI 117. When a plasticizing admixture is used meeting ASTM C1017 or when a Type F or G high range water reducing admixture meeting ASTM C494 is approved to increase the concrete slump, assure the concrete has a slump of 2 to 4 inches (50-100mm) before the admixture is added and a maximum slump of 8 inches (200 mm) at the point of delivery after the admixture is added.
3. Assure the nominal maximum size of coarse aggregate does not exceed three fourths of the minimum clear spacing between reinforcing bars, one-fifth of the narrowest dimension between sided of forms or one-third of the thickness of slabs or toppings.
4. Concrete exposed to cycles of freezing and thawing or in the presence of deicers must be air entrained. Montana is considered a "severe" exposure state. Measure air content under ASTM C 138, C 173 or C231. Unless otherwise specified, ASTM C231 shall be used. Table 2.1 lists the required air contents for various nominal maximum size aggregates.

Table 2.1 Total Air Content* of Concrete for Various Sizes of Coarse Aggregate

Nominal Maximum Size of aggregate in.	Total air content, percent
	Severe exposure
Less than 3/8	9
3/8	7.5
1/2	7
3/4	6
l	6
1-1/2	5.5
2	5
3	4.5
6	4

* Measure in accordance with ASTM C 138, C 173, or C 231.
Air content tolerance is plus 2 percent (+2%) to minus 1 percent (-1%).

a. When admixtures are specified in the Contract documents for particular parts of the work, use types specified. Use of calcium chloride or other admixtures containing chloride ions is subject to the limitations in Table 2.2 Chloride Ion Concentration. When approved, use calcium chloride in solution form only, when introduced into the mixture.

(1) Assure the maximum water-soluble chloride ion concentrations in hardened concrete at ages from 28 to 42 days attributed to the ingredients including water, aggregates, cementitious materials, and admixtures do not exceed the limits of Table 2.2. Use tests to determine water soluble chloride ion content meeting AASHTO T260. The type of member described in Table 2.2 applies to the work as indicated in the Contract Documents.

Table 2.2 Maximum Allowable Chloride Ion Content

Type of Member	Maximum water-soluble chloride (CI) Content in concrete, percent by weight of cement
Prestressed concrete	0.06
Reinforced concrete exposed to chloride in service	0.15
Reinforced concrete that will be dry or protected from moisture in service	1.00
Other reinforced concrete construction	.30

b. When the air temperature has fallen to or is expected to fall below 40oF (4oC) during the protection period, deliver concrete in accordance with minimum temperatures identified in ASTM C94. The protection period is defined as the time required to prevent concrete from being affected by exposure to cold weather.

c. Furnish the compressive strength and the water-cement or water cementitious, material ratio of concrete for each portion of the work as specified in the Contract documents.

(1) If cementitious or pozzolanic mineral admixtures meeting, ASTM C618 or ASTM C989, or ASTM C1240 are used, the cement portion of the water-cement ratio must be the total weight of cementitious material.

(2) The combined weight of fly ash and other pozzolans, slag cement, silica fume meeting applicable ASTM standards, cannot exceed limits in ACI 318-14, Table 26.4.2.2 (b). The fly ash and pozzolan present in an ASTM Type IP cement meeting ASTM C595 must be included in the calculated percentage.

ACI Table 26.4.2.2(b) – Limits on Cementitious materials for concrete assigned to Exposure Class F3

Cementitious Materials	Maximum Percent of Total Cementitious Materials by Mass
Fly ash or other pozzolans conforming to ASTM C618	25
Slag cement conforming to ASTM C989	50
Silica fume conforming to ASTM C1240	10
Total of fly ash or other pozzolans and silica fume	35
Total of fly ash or other pozzolans, slag cement, and silica fume	50

(3) Strength requirements are based on the 28-day compressive strength determined on 6" x 12" (150mm x 300mm) (average of two specimens), or 4" x 8" (100mm x 200mm) (average of three specimens) cylindrical specimens made and tested under ASTM C31 and C39 respectively.

2.03 PROPORTIONING AND DESIGN OF MIXES

A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to the COR for preparing and reporting proposed mix designs.

B. Submit written reports of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until design mixes have been reviewed and approved.

PART 3 - EXECUTION

3.01 CONCRETE MIXES

A. Job-Site Mixing: Mix materials for concrete in appropriate drum type batch match mixer. For mixers of 1 cu. yd., or small capacity, continue mixing at least 1-½ minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released. For mixers of capacity larger than one cu. yd., increase minimum 1-½ minutes of mixing time by 2.5 minutes for each additional cu. yd., or fraction thereof. Aggregates or bags of cement containing lumps or crusts shall not be used.

B. Provide batch ticket in compliance with ASTM C94 for each batch discharged and used in work.

C. When air temperature is between 85ºF (30ºC) and 90ºF (32ºC), reduce mixing and delivery time from 1-½ hours to 75 minutes, and when air temperature is above 90¤F (32ºC), reduce mixing and delivery time to 60 minutes, unless a hot weather concreting plan has been approved.

D. The mix may be designed for delayed set time to allow for long haul or other project conditions. Information pertaining to the delayed set admixture needs to be included on the Batch Ticket. Include with the mix design submittal information on the delayed set provisions of the design and specific time to final placement requirements.

3.02 MIXING

A. Thoroughly mix concrete to assure a uniform distribution of the materials throughout the mass. Mix concrete only in quantities required for immediate use and place it within the time limits specified. Waste all concrete which initial set has begun. Retempering of concrete is prohibited. Mix concrete in an approved truck mixer meeting the requirements of ASTM C94 herein.

1. WATER:

   a. Do not exceed the approved w/c ratio.

   b. The addition of water is allowed only one time and a minimum of 30 revolutions at mixing speed are required before discharge of concrete.

   c. Do not add water if part of the batch has been discharged as a W/C ratio cannot be determined.

   d. Do not add water if the slump is within specified range.

2. ADMIXTURE

   a. Do not exceed manufacturer’s recommended dosage rates unless otherwise approved in the mix design stage.

   b. Only admixtures included in the approved mix design may be dosed on-site.

   c. A minimum of 30 revolutions at mixing speed are required before discharging of concrete.

   d. Do not add admixtures if any concrete has been discharged from the mixer other than the minimal amount for initial testing.

   e. When measured plastic air content or slump exceeds the upper test limit and there is time available within the discharge time limit specified, rotate the load at agitation speed and re-test the air content and/or slump.

   f. Do not use additives to reduce the air content and/or slump.

B. The capacity of the plant and the transportation equipment must ensure delivery at a rate that will permit proper handling, placement and finishing at the point of delivery. Maintain the concrete delivery rate to provide for the continuous operation of placing, handling, and finishing concrete as is practical. Maintain the interval between delivery of loads so that layers or lifts of concrete in place do not

harden before succeeding layers or lifts are placed. In general, no lift or layer of concrete can remain exposed for more than 20 minutes before being covered by fresh concrete.

C. The volume of mixed concrete in the mixing drum shall not exceed the manufacturer's rating, on the capacity plate.

D. A recording water metering device is always required at the primary point of the batching operation.

E. Do not add water to concrete in transit. Water may be introduced into the mixer at the job site, one time only, under direction of the COR, if the specified water-cement ratio is not exceeded. Water must be added in accordance with ASTM C94, Assure the drum revolves continuously after the introduction of the cement and water until the concrete is discharged.

F. Begin mixing immediately after introduction of the cement and water and continue for at least 70 revolutions of the drum at mixing speed. This minimum revolution count will be waived when the concrete is produced at a central mixing plant. Not more than 100 drum revolutions can exceed 6 revolutions per minute. All other revolutions must be at agitating speed of not less than 2 or more than 6 revolutions per minute.

G. Provide a revolution counter on each truck that registers the number of revolutions of the drum.

H. Mount the counter so it can be easily read by both the operator and the COR.

3.03 PREPARATION OF SURFACES FOR CONCRETING

A. General: Earth surfaces shall be thoroughly wetted by sprinkling prior to the placing of any concrete, and these surfaces shall be kept moist by frequent sprinkling for a 12-hour period within 24 hours of the concrete placement. The surface shall be free from standing water, mud, and debris at the time of placing concrete. Concrete shall not be placed upon any surface that has not been approved by the COR in writing.

B. Placing Interruptions: When placing of concrete is to be interrupted long enough for the concrete to take a set, the working face shall be given a shape by the use of forms or other means that will secure proper union with subsequent work; provided that construction joints shall be made only where acceptable to the COR.

C. Embedded Items: No concrete shall be placed until formwork, installation of parts to be embedded, reinforcement steel, and preparation of surfaces involved in the placing have been completed and accepted by the COR in writing at least 4 hours before placement of concrete. Surfaces of forms and embedded items that have become encrusted with dried grout from previous usage shall be cleaned before the surrounding or adjacent concrete is placed. Any concrete placed without written approval from the COR shall be removed by the Contractor at their own expense.

1. Inserts or other embedded items shall conform to the requirements herein.

2. Reinforcement, anchor bolts, sleeves, inserts, and similar items shall be set and secured in the forms at locations indicated on the Drawings or shown by Shop Drawings and shall be acceptable to the COR before any concrete is placed. Accuracy of placement is the responsibility of the Contractor.

D. Casting New Concrete against Old: Where concrete is to be cast against old concrete (defined as any concrete which is greater than 60 days old), the surface of the old concrete shall be thoroughly cleaned and roughened by hydroblasting or sandblasting to expose aggregate. The joint surface shall be coated with an epoxy bonding agent unless determined otherwise by the COR.

1. No concrete shall be placed in any structure until water entering the space to be filled with concrete has been properly cut off or has been diverted by pipes or other means, and carried out of the forms, clear of the work. No concrete shall be deposited underwater nor shall the Contractor allow still water to rise on any concrete until the concrete has attained its initial set. Water shall not be permitted to flow over the surface of any concrete in such manner and at such velocity as will injure the surface finish of the concrete. Pumping or other necessary dewatering operations for removing ground water, if required, shall be subject to review by the COR.

E. Corrosion Protection: Pipe, conduit, dowels, and other ferrous items required to be embedded in concrete construction shall be so positioned and supported prior to placement of concrete that there will be a minimum of 2-inches clearance between said items and any part of the concrete reinforcement. Securing such items in position by wiring or welding them to the reinforcement will not be permitted.

1. Openings for pipes, inserts for pipe hangers and brackets, and anchors shall, where practicable, be provided during the placing of concrete.

2. Anchor bolts shall be accurately set and shall be maintained in position by templates while embedded in concrete.

F. Cleaning: The surfaces of metalwork to be in contact with concrete shall be thoroughly cleaned of dirt, grease, loose scale and rust, grout, mortar, and other foreign substances immediately before the concrete is placed.

3.04 PLACING

A. Thoroughly consolidate concrete into its final position. Assure it is thoroughly consolidated around fittings and embedded items. Assure all reinforcement and embedded items are accurately placed as shown on the plans and are clean and free from coatings of dried mortar, detrimental rust, scale, oil or foreign matter.

3.05 CONSOLIDATING

A. As concrete is placed in the forms or in excavations, it shall be thoroughly settled and compacted throughout the entire depth of the layer which is being consolidated into a dense, homogeneous mass, filling all corners and angles, thoroughly embedding the reinforcement, eliminating rock pockets, and bringing only a slight excess of water to the exposed surface of concrete. Vibrators shall be Group 3 per ACI 309 – Consolidation of Concrete, high speed power vibrators (8000 to 12,000 rpm) of an immersion type in sufficient number and with at least one standby unit as required. Group 2 vibrators may be used only at specific locations when accepted by the COR.

B. Care shall be used in placing concrete around waterstops. The concrete shall be carefully worked by rodding and vibrating to make sure that air and rock pockets have been eliminated. Where flat-strip type waterstops are placed horizontally, the concrete shall be worked under the waterstops by hand, making sure that air

and rock pockets have been eliminated. Concrete surrounding the waterstops shall be given additional vibration over and above that used for adjacent concrete placement to assure complete embedment of the waterstops in the concrete.

C. Concrete in walls shall be internally vibrated and at the same time rammed, stirred, or worked with suitable appliances, tamping bars, shovels, or forked tools until it completely fills the forms or excavations and closes snugly against each surface. Subsequent layers of concrete shall not be placed until the layers previously placed have been worked thoroughly. Vibrators shall be provided in sufficient numbers, with standby units as required, to accomplish the required results within 15 minutes after concrete of the prescribed consistency is placed in the forms. The vibrating head shall not contact the surfaces of the forms. Care shall be taken not to vibrate concrete excessively or to work it in any manner that causes segregation of its constituents. If the COR believes that proper consolidation is not being achieved, the Contractor shall provide additional training and instruction to personnel operating the vibrators or assign this duty to more experienced personnel.

3.06 CURING

A. Protect freshly placed concrete from freezing, high temperature, large temperature differentials, premature drying, excessive moisture, and moisture loss for a period of time necessary to develop the desired concrete properties.

B. Thoroughly cure concrete surfaces by covering as soon as possible with canvas, plastic sheets with sealed joints, burlap and sand or other satisfactory materials and keep concrete moist. If the concrete surfaces are not covered, keep them moist by flushing or sprinkling. Continue curing for at least 7 days after placing the concrete. Concrete surfaces placed against forms may be cured by leaving the forms in place for at least 7 days, when approved.

C. Protect concrete against freezing or other conditions detrimental to strength development meeting the applicable requirements of this specification.

D. To aid finishing, side forms on ornamental work, curbs and sidewalks, railing and parapets may be removed after 12 hours, not to exceed 48 hours, depending on weather conditions. Continue moist curing during the concrete finishing operation.

E. Untreated forms and existing concrete must be kept continuously wet for at least 1 hour before any concrete is placed. Keep wet until covered with concrete except that adequately treated forms must be thoroughly washed with a water spray immediately before placing the concrete.

F. The curing of concrete, by either water curing or membrane curing, must be as follows unless otherwise approved by the COR.

1. Water Curing

    a. Keep all concrete top surfaces continuously moist after finishing, with a fine water spray, until the concrete has set. Cover the moist concrete with water or an approved curing covering.

    b. Cure concrete deck slabs and concrete floors for at least 7 days. Cure by placing burlap, cotton mats or other absorptive material as close behind the finishing operation as possible without marring the finished surface. Keep the absorptive material continuously moist for the full time it is used.

The absorptive material may be kept in place for the entire curing period, or it may be removed as soon as practical and the entire surface covered with approximately 1-1/2 inches (38.1 mm) of sand, kept continuously moist for the entire curing period.

c. Remove forms and repair surface irregularities without interfering with any of the curing requirements. As soon as the vertical forms have been removed and the surface irregularities repaired, cover the concrete with absorptive material, kept continuously wet for the balance of the curing period.

2. Impervious Membrane Curing

a. Assure membrane curing compounds are delivered to the job in the manufacturer’s original container, clearly labeled to show the name of the manufacturer and the contents. The clear curing compound must be sufficiently transparent and free from permanent color that would change the color of the natural concrete. Use clear compound containing a fugitive dye having color sufficient to render the film visible on the concrete for at least 4 hours after application. The concrete surface must maintain its natural color after curing.

b. Use a compound ready for use as shipped by the manufacturer. Dilute following the manufacturer's recommendations. Use curing compound only with written approval. Sampling will not be required if manufacturer's certification is available. Apply the curing compound under pressure with a spray nozzle to cover the entire exposed surface thoroughly and completely with a uniform film not exceeding manufacturer's specifications. Maintain the required pressure in the spray machine to force the material to leave the nozzle in a fine mist. Keep all concrete surfaces moist with a fine water spray or with wetted burlap until the sealing compound is applied. Keep the curing compound application close to the finishers of the top surface of concrete at all times. Seal the concrete immediately after the finishing operations have been completed, to the satisfaction of the COR.

c. If it is necessary to allow workers or equipment on the surface before the 7-day curing period is completed, protect the concrete from damage and maintain the curing environment.

d. Keep concrete, which has not completed its curing period, continuously moist during the stripping and surface repair operations. Remove all surface irregularities, repair all depressions, voids, or holes, including those formed by trapped air, to the satisfaction of the COR. Immediately apply the curing compound before the surface has had an opportunity to dry out. Keep concrete, from which forms have been stripped, continuously moist until surface repair and finishing are completed, and the impervious membrane curing has been applied.

3.07 WEATHER AND NIGHT LIMITATIONS

A. General

1. Stop concreting operations when darkness prevents obtaining the specified placing and finishing work. Night operations may be conducted with written approval and when approved artificial lighting is provided.

2. Cold weather concreting is governed by ACI 306.1 unless otherwise specified herein. Cold weather exists when the ambient air temperature has fallen or is expected to fall below 40ºF during the protections and curing period. The protection and curing period is defined as the time required to prevent concrete from being affected by exposure to cold weather.
3. When cold weather conditions are expected, all concreting operations will be suspended unless authorized by the COR. Contractor may receive authorization from concrete placement in cold weather by submitting a cold weather concreting plan for review and approval. The plan shall include detailed procedures to protect the fresh concrete from freezing during placement and maintaining the concrete surface temperature at a minimum of 55ºF during the curing period.
4. Assume all risk of placing concrete in cold weather. Placing concrete during cold weather does not relieve the Contractor of the responsibility for obtaining the specified results. Remove and replace all concrete injured by frost at Contractor expense.
5. Before any concrete is placed, remove all ice, snow, and frost completely from the formwork receiving the concrete. The subgrade must be frost free and above freezing before any concrete can be placed. Increase the temperature of formwork, reinforcement, subgrade, and base gravel to a minimum of 35˚F (2˚C).
6. Concrete shall be mixed, placed, and maintained according to Table (306-R10 5.1) 3.1.
7. Protection of Concrete
    a. Unless otherwise approved, Maintain the surface temperature of the concrete in place between 55˚ F and 75˚ F for a minimum of 7 days using approved heating devices or enclosures during the protection and cure period. The minimum 7-day protection and cure period is intended only to protect the concrete from the effects of cold. A longer protection period may be needed for the concrete to gain additional strength to support the loads it will experience when in service. Contractor may, bearing all expenses, field cure concrete test cylinders with the in-place concrete and discontinue protection and curing when the field test cylinders reach 3500 psi. Contractor shall monitor the concrete temperature daily throughout the protection and cure period and make adjustments as needed to maintain the temperature between 55˚ F and 75˚ F. Forms shall be kept in place for the duration of the protection and cure period. When the protection and cure period has ended reduce the heat gradually, so the concrete surface temperature does not decrease faster than 15˚ per hour until the concrete temperature is the same as the outside temperature. Modifications may be allowed if approved by COR and in conformance with ACI 306.1.
    b. A Contractor may, at their expense, determine the in-place strength of the concrete using appropriate test methods and discontinue protection when those test methods indicate the concrete has reached 3500 psi.

3.08 PROTECTION

A. The Contractor shall protect concrete against injury until final acceptance. Repairs due to damage made by the Contractor shall be as directed by the COR.

B. Fresh concrete shall be protected from damage due to rain, hail, sleet, or snow. The Contractor shall provide such protection while the concrete is still plastic and whenever precipitation is imminent or occurring.

3.09 TREATMENT OF SURFACE DEFECTS

A. As soon as forms are removed, exposed surfaces shall be carefully examined and any irregularities shall be immediately rubbed or ground in a satisfactory manner in order to secure a smooth, uniform, and continuous surface. Plastering or coating of surfaces to be smoothed will not be permitted. No repairs shall be made until after inspection by the COR. In no case will extensive patching of honeycombed concrete be permitted. Voids 1/4" and greater in any dimension within 3" from a water bearing surface shall be repaired by the Contractor at their own expense. Concrete containing minor voids, holes, honeycombing, or similar depression defects shall be repaired as indicated below. Concrete containing extensive voids, holes, honeycombing, or similar depression defects shall be completely removed and replaced per the direction of the COR. Repairs and replacements shall be performed promptly.

B. Defective surfaces to be repaired shall be cut back from true-line a minimum depth of ½-inch over the entire area. Feathered edges will not be permitted. Where chipping or cutting tools are not required in order to deepen the area properly, the surface shall be prepared for bonding by the removal of laitance and soft material, plus not less than $^{1}/_{32}$-inch depth of the surface film from hard portions by means of an efficient sandblast. After cutting and sandblasting, the surface shall be wetted sufficiently in advance of shooting with shotcrete or with cement mortar so that while the repair material is being applied, the surfaces underneath will remain moist but not so wet as to overcome the suction upon which a good bond depends. The material used for repair shall consist of a mixture of one sack of cement to 3 cubic feet of sand. For exposed walls, the cement shall contain such a proportion of Atlas white Portland cement as is required to make the color of the patch match the color of the surrounding concrete.

C. Holes left by tie-rod cones shall be reamed with suitable toothed reamers so as to leave the surfaces of the holes clean and rough. Holes then shall be repaired in an approved manner with dry-packed cement grout. Holes left by form-tying devices having a rectangular cross section and other imperfections having a depth greater than their least surface dimension shall not be reamed but shall be repaired in an approved manner with dry-packed cement grout.

D. Repairs shall be built up and shaped in such a manner that the completed Work will conform to the requirements of this Section, as applicable, using approved methods which will not disturb the bond, or cause sagging, or cause horizontal fractures. Surfaces of repairs shall receive the same kind and amount of curing treatment as required for the concrete in the repaired section.

3.10 CARE AND REPAIR OF CONCRETE

A. The Contractor shall protect concrete against injury or damage from excessive heat, lack of moisture, overstress, or any other cause until final acceptance. Particular care shall be taken to prevent the drying of concrete and to avoid

roughening or otherwise damaging the surface. Any concrete found to be damaged, or which may have been originally defective, or which becomes defective at any time prior to the final acceptance of the completed Work, or which departs from the established line or grade, or which, for any other reason, does not conform to the requirements of the Contract Documents, shall be satisfactorily repaired or removed and replaced with acceptable concrete at the COR's discretion.

B. Cracks identified by the COR shall be repaired at no additional cost to the Owner. Depending upon the crack width, repair techniques may involve routing and filling with sealant conforming to the requirements of Paragraph 2.4 or may require chemical grouting or epoxy injection. The COR shall determine the method of repairing cracks.

END OF SECTION 03 30 00

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The Contractor shall provide precast and prestressed concrete elements in accordance with the Contract Documents.

B. The following types of precast concrete are covered in this Section:

1. Precast vault

1.02 RELATED DOCUMENTS

A. Section 01 33 00 – Submittal Procedures

B. Section 03 10 00 – Concrete Formwork

C. Section 03 21 00 – Reinforcement Steel

D. Section 03 30 00 – Cast-in-place Concrete

1.03 CONTRACTOR SUBMITTALS

A. Furnish submittals in accordance with Section 01 33 00 – Submittal Procedures.

B. RSN 03 41 00-01 Concrete Mix Designs:

1. Prior to beginning the work and within 30 days of the Notice to Proceed, submit preliminary concrete mix designs which shall show the proportions and gradations of materials proposed for each concrete mixture in accordance with Section 03 30 00 Cast-in-place Concrete.

C. RSN 03 41 00-02 Shop Drawings:

1. Furnish drawings sealed by a licensed Professional Engineer showing the type of concrete to be placed, predicted camber, the finish requirements, fabrication details, reinforcement, connection details, dimensions, openings, and unit layout and relationship to adjacent members.

2. Design calculations for all concrete structures, sealed by a licensed Professional Engineer.

1.04 QUALITY ASSURANCE

A. Evaluation and Acceptance of Concrete:

1. The Precaster shall sample, test, and report the following tests:

a. The compressive strength of concrete will be according to AASHTO T23 and AASHTO T22.

b. Make at least one set release strength test cylinders according to AASHTO T

c. 23 in addition to those required to determine the 28-day compressive strength. Cure the release strength test cylinders with the concrete member they represent.

d. Sample and test for air content in accordance with AASHTO T 152 or AASHTO T 196.

e. Precaster shall conduct production testing and monitor testing reports and records to ensure consistency with data and compliance with Project requirements. Testing is subject to observation by Owner's Representative.

B. Fabrication Tolerances:

1. Fabricate precast concrete foundation units straight and true size and shape with exposed edges and corners precise and true so each finished unit complies with the following dimension tolerances as well as position tolerances for cast in items:

a. Length shall not vary by more than ¾ inch.

b. Height/Width shall not vary from that shown in the design by more than ¼ inch.

c. Local smoothness shall be no more than ¼inch in 10 ft for any surface.

d. Position of inserts for structural connections shall not vary from that shown in the shop drawings by more than ½ inch.

e. Placement of non-prestressed reinforcement shall comply with Section 03 21 00 Reinforcement Steel.

C. Defective Work: Precast concrete units that do not comply with requirements, including strength, manufacturing tolerances, and finishes, are unacceptable. Replace with precast concrete units that comply with requirements.

PART 2 - PRODUCTS

2.01 CONCRETE MATERIALS

A. Concrete: See Section 03 30 00 Cast-in-place Concrete except as specified here.

1. Portland Cement: Conform to AASHTO M85

2.02 REINFORCING MATERIALS

A. See Section 03 21 00 - Reinforcement Steel.

2.03 GROUT MATERIALS

A. Sand-Cement Grout: Portland cement, ASTM C 150, Type I, and clean, natural sand, ASTM C 144. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration. Water-soluble chloride ion content less than 0.06 percent by weight of cement when tested according to ASTM C 1218.

B. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, of consistency suitable for application. Acceptable materials:

1. MASTERFLOW 928 GROUT, manufactured by Chemrex.

2. CRYSTEX GROUT, manufactured by L&M Construction Chemicals, Inc.

3. CRYSTEX GROUT, manufactured by L&M Construction Chemicals, Inc.
4. SURE-GRIP HIGH PERFORMANCE GROUT manufactured by Dayton Superior.

2.04 MORTAR MATERIALS

A. Mortar: Premixed cementitious system made up of:

1. Natural aggregate, 3/8" maximum size, that meets the requirements specified in ASTM C 33 except for grading. Accomplish grading by blending sieve sizes to obtain the optimum density.
2. Metallic aggregate free from nonferrous material, soluble alkaline compounds, and visible rust.
3. Water reducers, workability agents, air-entraining agents, and catalysts.
4. Blend the materials to minimize bleeding, increase workability, resist exposure to freeze-thaw cycles and deicing salts, and prevent shrinkage within and at the perimeter of the patch, keyway, or other area to be filled.

B. Ensure that the minimum compressive strength of the mortar, as tested by ASTM C 109 for a 3" slump, is:

24-hour.....5,000 psi

7-day.....8,500 psi

28-day ..... 10,000 psi

C. Provide certification from the manufacturer that the product is compatible for work that is 3" or more in depth and more than 3" in width; and where the mixing, placing, and curing temperatures may range from 5^{O} C to 30^{O} C (40^{O} F to 85^{O} F).

D. Submit products proposed for use to the CO for approval and accompany them with the manufacturer's submittals substantiating all requirements in this section, including (1) graphs or charts showing the time, temperature, humidity, and curing requirements to achieve mortar strengths equal to the adjacent concrete; and (2) complete recommendations for storage, mixing, application, and curing procedures.

E. As specified as mortar on the contract plans, the following products meet the above requirements:

1. MASTEREMACO T430, manufactured by BASF.
2. RAPID SET DOT REPAIR MIX manufactured by CTS Cement Manufacturing Co.
3. SURE-GRIP HIGH PERFORMANCE GROUT (when extended with pea gravel) manufactured by Dayton Superior.

PART 3 - EXECUTION

3.01 FABRICATION

A. Concrete. Construct prestressed concrete according to Section 03 30 00 - Cast-in-place Concrete. Construct reinforcing steel according to Section 03 21 00 - Reinforcement Steel.

3.02 FINISHES

A. Finish precast foundation units in accordance with paragraph 3.10 of Section 03 30 00 - Cast-in-place Concrete. The top surface (bearing surface) shall be given a U3 Finish.

3.03 STORING AND TRANSPORTING

A. Do not ship concrete members until concrete cylinder tests, manufactured of the same concrete and cured under the same conditions as the members; indicate that the concrete in each member has attained the minimum required design strength and is at least 7 days old.

B. Before transporting concrete members, provide written certification from a professional engineer that the members were fabricated and visually inspected according to the contract and meet minimum quality requirements.

C. Store, and transport precast in the upright position with the points of support and directions of the reactions, with respect to the member, approximately the same as when the member is in its final position. Prevent cracking or damage during hoisting, handling, and storing of the precast units. Replace units damaged by improper handling or storing.

3.04 ERECTING AND PLACEMENT OF PRECAST FOUNDATION MEMBERS

A. Erect members without damage to structural capacity, shape, or finish. Replace or repair damaged members.

B. Erect members level and plumb without exceeding the following allowable tolerances:

1. Plan Location from Design Datum: Plus or Minus 1/2 in. (±13 mm).
2. Top Elevation from Nominal Top Elevation: Plus or Minus 3/8 in. (±6 mm).
3. Plumb in any 10 ft (3 m) of Element Height: 1/4 in. (6 mm).
4. Maximum Jog in Alignment of Matching Edges: 1/4 in. (6 mm).

3.05 ERECTING AND PLACEMENT OF PRECAST MEMBERS

A. Advise the CO a minimum of 48 hours before any field grout or mortar is to be placed.

B. Use high-pressure water blasting to remove all debris and loosened paste in the keyways immediately prior to placing mortar.

C. Maintain air and concrete keyway temperatures between 45 °F and 85 °F before placing mortar. Maintain the temperature within these limits until mortar placement and application of curing method is completed. Require air and concrete temperatures for grout placement to be the same as required for mortar.

D. Thoroughly saturate the areas to be grouted with water and remove all free-standing water just prior to grout placement.

E. Strike off exposed grout surfaces flush with the same surface texture finish as the surrounding concrete as soon as the grout has set sufficiently.

F. Cure the exposed surface as specified in Section 03 30 00 - Cast-in-place Concrete. When artificial means are used to control the curing temperature of the mortar or

grout, as during hot or cold weather, the CO will approve the method in advance. Use combustion heaters only if fully vented outside their enclosure. Store all dry mortar materials and mixing and placing equipment such that their temperature is above freezing. Warm mixing water to provide mortar or grout at desired temperature but ensure that it is at 85 °F or less when mixed with the dry materials. Use ice as part of the mixing water provided it is completely melted prior to the introduction of the water to the dry materials.

G. Ensure that patching mortar and grout are the same color as the parent concrete.

END OF SECTION 03 41 00

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PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The Contractor shall provide grout, complete and in place, in accordance with the Contract Documents.

B. Epoxy for grouting reinforcing bars shall be specifically formulated for such application, for the moisture condition, application temperature, and orientation of the hole to be filled.

C. Types of grout

1. Cement Grout
2. Non-Shrink Grout - Class I (cement-based)
3. Non-Shrink Grout - Class II (cement-based)
4. Non-Shrink Epoxy Grout
5. Epoxy Anchor Grout for Adhesive Anchors
6. Topping Grout and Concrete/Grout Fill

1.02 RELATED DOCUMENTS:

A. Section 03 21 00 - Reinforcement Steel

B. Section 31 68 20 - Drilled Anchors

1.03 SUBMITTALS

A. Furnish submittals in accordance with Section 01 33 00 –Submittal Procedures.

1. RSN 03 62 00-01: Grout Lab Test Reports

a. Certified testing lab reports for tests herein indicated.

1.1 QUALITY ASSURANCE

B. Field Tests

1. Compression test specimens will be taken from the first placement of each type of grout, and at intervals thereafter selected by the COR. The specimens will be made by the COR or its representative.
2. Compression tests and fabrication of specimens for cement grout and cement based non-shrink grout will be performed in accordance with ASTM C 1107 - Packaged Dry, Hydraulic-Cement Grout (Non-shrink), at intervals during construction selected by the COR. A set of 3 specimens will be made for testing at 7 Days, 28 Days, and each additional time period as appropriate.
3. Compression tests and fabrication of specimens for topping grout and concrete/grout fill will be performed in accordance with Section 03 30 00 - Cast-in-Place Concrete, at intervals during construction selected by the COR.

4. Compression tests and fabrication of specimens for epoxy grouts will be performed in accordance with ASTM C 579 - Test Methods for Compressive Strength of Chemical-Resistant Mortars and Monolithic Surfacing and Polymer Concretes, Method B, at intervals during construction selected by the COR. A set of 3 specimens will be made for testing at 7 days and each earlier time period as appropriate.
5. The cost of laboratory tests on grout will be paid by Contractor including test results showing the grout to be defective. Contractor shall pay for the tests, removal and replacement of Defective Work, and re-testing, all as part of the work.
6. The Contractor shall assist the COR in obtaining specimens for testing and shall furnish materials necessary for fabricating the test specimens.

A. Construction Tolerances: Construction tolerances shall be as indicated in Section 03 30 00 unless indicated otherwise.

1.04 GENERAL WARANTY

A. Furnish one-year warranty for work provided under this section.

B. Manufacturer's warranty shall not contain a disclaimer limiting responsibility to the purchase price of products or materials.

PART 2 - PRODUCTS

2.01 APPLICATION

A. Unless indicated otherwise, grouts shall be provided as listed below, whether or not indicated on drawings:

Application	Type of Grout
Anchor bolts and reinforcing steel required to be set in grout that is not in high temperature or high fire risk areas.	Epoxy Anchor Grout
Filling blockout spaces for embedded items such as railing posts, gate guide frames, etc.	Non-Shrink - Class I (Class II where placement time exceeds 20 min.)
Under precast concrete elements	Non-Shrink - Class II
Toppings and concrete/grout fill less than 3-inches thick	Topping Grout
Toppings and concrete/grout fill greater than 3-inches thick	Structural Concrete per 03 30 00
Surface repairs	Cement Grout
Repair of holes and defects in concrete members which are not water bearing and not in contact with soil or other fill material	Non-Shrink - Class I

Application	Type of Grout
Repair of holes and defects in concrete members which are water bearing or in contact with soil or other fill materials	Non-Shrink - Class II
Any application not listed above, where grout is indicated	Non-Shrink Class I, unless specifically indicated otherwise

2.02 CEMENT GROUT

A. Cement grout shall be composed of one part cement, 3 parts sand, and the minimum amount of water necessary to obtain the desired consistency. Where needed to match the color of adjacent concrete, white Portland cement shall be blended with regular cement as needed. The minimum compressive strength at 28 Days shall be 4000 psi.

B. Cement grout materials shall be as indicated in Section 03 30 00 – Cast-In Place Concrete.

2.03 NON-SHRINK GROUTS (CEMENT BASED)

A. General

B. Cement-based non-shrink grout shall be a prepackaged, inorganic, fluid, non-gas liberating, non-metallic, cement type grout requiring only the addition of water. Cement from kilns burning metal-rich hazardous waste fuel shall not be used.

1. Manufacturer's instructions shall be printed on each bag or other container in which the materials are packaged. The specific formulation for each class of non-shrink grout shall be as recommended by the manufacturer for the particular application.
2. Grout shall not contain chlorides or additives that may contribute to corrosion.
3. Grout shall be formulated to be used at any consistency from fluid to plastic.
4. Cement-based non-shrink grout shall have the following minimum properties when tested at a fluid consistency, at 28 Days:
    a. Minimum tensile splitting strength of 500 psi per ASTM C 496 - Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens.
    b. Minimum flexural strength of 1000 psi per ASTM C 580 - Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes.
    c. Minimum bond strength (concrete to grout) of 1900 psi per modified ASTM C 882 - Standard Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear.
    d. Grout shall be certified for use in a marine environment.
    e. Grout shall be certified for use in freeze/thaw environments

C. Class I Non-Shrink Grout

1. Class I non-shrink grout shall have a minimum 28 Day compressive strength of 5000 psi when mixed at a fluid consistency.
2. Class I non-shrink grout shall meet the requirements of ASTM C 1107, Grade B or C, when mixed to fluid, flowable, and plastic consistencies.
3. Grout shall have a maximum early age height change of 4.0 percent expansion and shall have no shrinkage (0.0 percent) in accordance with ASTM C 827 – Test Method for Early Volume Change of Cementitious Mixtures. The grout when tested shall not bleed or segregate at maximum allowed water.
4. Grout shall have no shrinkage (0.0 percent) and a maximum of 0.3 percent expansion in the hardened state when tested in accordance with ASTM C 1090 - Test Method for Measuring Changes in Height of Cylindrical Specimens from Hydraulic-Cement Grout.
5. Furnish certification that the non-shrink property of grout is not based on gas production or gypsum expansion.
6. Class I Non-Shrink Grout shall be Five Star Grout by Five Star Products, **Sikagrout 212 by Sika Corporation, Premier by L&M Construction Chemicals**; **High-Flow Grout by Euclid Chemical Company, CG 200 PC by Hilti**, or equal.

D. Class II Non-Shrink Grout

1. Class II non-shrink grout shall be a high precision, fluid, extended working time, grout. The minimum 28-day compressive strength shall be 7500 psi, when mixed at a fluid consistency.
2. Grout shall have a maximum early age height change of 4.0 percent expansion and shall have no shrinkage (0.0 percent) in accordance with ASTM C 827.
3. Grout shall have no shrinkage (0.0 percent) and a maximum of 0.3 percent expansion in the hardened state when tested in accordance with ASTM C 1090.
4. Class II non-shrink grout shall have an extended working time of 30 minutes minimum when mixed to a fluid consistency as defined in ASTM C 827 at temperature extremes of 45 to 90 degrees F in accordance with ASTM C 1107.
5. Class II non-shrink grout shall meet the requirements of ASTM C 1107, Grade B or C when tested using the amount of water needed to achieve fluid consistency per ASTM C 939.
6. The grout when tested shall not bleed or segregate at maximum allowed water content.
7. Provide certification that its non-shrink property is not based on gas production or gypsum expansion.
8. Class II non-shrink grout shall be **Masterflow 928 by MBT/Degussa Building Systems**, **Five Star Fluid Grout 100 by Five Star Products**, **Crystex by L&M Construction Chemicals**, or equal.

2.04 NON-SHRINK EPOXY GROUT

A. Non-shrink epoxy grout shall be a flowable, non-shrink, 100 percent solids system. The epoxy grout system shall have 3 components: resin, hardener, and specially blended aggregate, each premeasured and prepackaged. The resin component shall not contain any non-reactive diluents. Resins containing butyl glycidyl ether

(BGE) or other highly volatile and hazardous reactive diluents are not acceptable. Variation of component ratios is not permitted unless specifically recommended by the manufacturer. Manufacturer's instructions shall be printed on each container in which the materials are packaged.

B. Epoxy grout shall have a maximum early age height change of 4.0 percent expansion and shall have no shrinkage (0.0 percent) in accordance with ASTM C 827, (modified for epoxy grouts by using an indicator ball with a specific gravity between 0.9 and 1.1).

C. Epoxy grout shall have a negligible (less than 0.0006 in/in) length change after hardening, and a coefficient of thermal expansion less than 0.00003 in/in F when tested according to ASTM C 531 - Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing.

D. The epoxy grout shall develop a minimum compressive strength of 9000 psi in 24 hours and 13,000 psi in seven days when tested in accordance with ASTM C 579, method B.

E. The mixed epoxy grout shall have a minimum working life of 90 to 120 minutes at 70 degrees F.

F. The effective bearing area shall be a minimum of 95 percent EBA in accordance with ASTM C 1339 – Standard Test Method for Flowability and Bearing Area of Chemical- Resistant Polymer Machinery Grouts, for bearing area and flow.

G. The chemical formulation of the epoxy grout shall be recommended by the manufacturer for the particular application. Do not reduce aggregate loading or add solvents to increase flowability.

H. Non-shrink epoxy grout shall have the following minimum properties when tested at 7 Days:

1. Minimum bond strength to concrete of 3000 psi per ASTM C 882 modified.
2. Minimum bond strength to steel of 1700 psi per ASTM C 882 modified.
3. Minimum flexural strength of 2500 psi per ASTM C 580.

I. Minimum tensile strength of 2000 psi per ASTM C 307 -- Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacings.

J. Non-shrink epoxy grout shall be **Five Star DP Epoxy Grout by Five Star Products Inc.**, **Masterflow 648 CP Plus by MBT/ Degussa Building Systems**, **Sikadur 42 Grout Pak by Sika Corporation**, or equal.

2.05 EPOXY ANCHOR GROUT

A. Epoxy anchor grout shall conform to ASTM C 881 - Epoxy-Resin-Base Bonding Systems for Concrete, Type IV, Class C, Grade 3 with the exception of gel time.

B. Heat deflection temperature per ASTM D 648 -- Test Method for Deflection Temperature of Plastics Under Flexural Load shall be a minimum 120 degrees F.

C. Manufacturer shall certify that the epoxy anchor grout will maintain 90 percent of its strength up to a temperature of 125 degrees F.

D. Grout shall come in a 2 chambered cartridge with a metering system that provides the proper ratio of hardener and resin. The grout shall also come with a static mixer nozzle to thoroughly mix the hardener and resin together.

E. Epoxy anchor grout shall be capable of being used in submersed applications once cured.

F. Compressive strength per ASTM D 695 - Test Method for Compressive Properties of Rigid Plastics shall be 10,000 psi minimum.

G. If the average working or operating temperature will be over 100 degrees F or in a high fire risk area, use cement based non-shrink grout and oversized holes.

H. Overhead anchors and anchors in fire-resistive construction shall be cast-in anchors.

I. Embedment of adhesive anchors/rebar shall be deep enough to develop the anchor/rebar. Embedment shall not exceed 67 percent of the member depth.

J. Epoxy anchor grout shall be **Epcon C6 by ITW Ramset/Red Head**; **Power-Fast Epoxy Injection Gel by Powers Fasteners**; **HIT-RE 500 V3 by Hilti**, **Sikadur AnchorFix-4 by Sika Corporation**, or equal.

2.06 TOPPING GROUT AND CONCRETE/GROUT FILL

A. Where fill is thicker than 3-inches, structural concrete as indicated in Section 03 30 00 - Cast-in-Place Concrete, may be used when accepted by the COR.

B. Grout for topping of slabs and concrete/grout fill for built-up surfaces of tank, channel, and basin bottoms shall be composed of cement, fine aggregate, coarse aggregate, water, and admixtures proportioned and mixed as indicated. Materials and procedures indicated for normal concrete in Section 03 30 00- Cast-in-Place Concrete, shall apply unless indicated otherwise.

C. Topping grout and concrete/grout fill shall contain a minimum of 564 pounds of cement per cubic yard with a maximum water cement ratio of 0.45.

D. Coarse aggregate shall be graded as follows:

U.S. STANDARD SIEVE SIZE	PERCENT BY WEIGHT PASSING
1/2 in	100
3/8 in	90-100
No. 4	20-55
No. 8	5-30
No. 16	0-10
No. 30	0

E. Final mix design shall be as determined by trial mix design as indicated in Section 03 30 00 except that drying shrinkage tests are not required.

F. Topping grout and concrete grout/fill shall contain air-entraining agent per Section 03 30 00.

G. Strength: Minimum compressive strength of topping grout and concrete/grout fill at 28 Days shall be 4000 psi.

2.07 CURING MATERIALS

A. Curing materials shall be in accordance with Section 03 30 00 and as recommended by the manufacturer of prepackaged grouts.

2.08 CONSISTENCY

A. The consistency of grouts shall be that necessary to completely fill the space to be grouted for the particular application. Dry pack consistency is defined such that the grout is plastic and moldable but will not flow. Where "dry pack" is called for in the Contract Documents, it shall mean a grout of that consistency; the type of grout to be used shall be as indicated herein for the particular application.

B. The slump for topping grout and concrete/grout fill shall be adjusted to match placement and finishing conditions but shall not exceed 4-inches.

2.09 MEASUREMENT OF INGREDIENTS

A. Measurements for cement grout shall be made accurately by volume using containers. Shovel measurements shall not be allowed.

B. Prepackaged grouts shall have ingredients measured by means recommended by the manufacturer.

PART 3 - EXECUTION

3.01 DELIVERY, STORAGE AND HANDLING

A. Grout shall be stored in accordance with manufacturer's recommendations.

3.02 GENERAL

A. Contractor shall arrange for the manufacturer of prepackaged grouts to provide on-Site technical assistance within 72 hours of request, as part of the work.

B. Grout shall not be placed until base concrete or masonry has attained its design strength, unless authorized otherwise by the COR.

C. When cementitious grouts are used on concrete surfaces, the concrete surface shall be saturated with water for 24 hours prior to placement. Upon completion of the saturation period, excess water shall be removed with clean, oil free compressed air prior to grouting. Concrete substrate shall not be wet prior to placement of epoxy grouts.

D. Surface preparation, curing, and protection of cement grout shall be in accordance with Section 03 30 00. The finish of the grout surface shall match that of the adjacent concrete unless otherwise indicated.

E. Surfaces that will be in contact with grout shall be free of dirt, loose rust, oil, wax, grease, curing compounds, laitance, loose concrete, and other deleterious materials.

F. Shade the work from sunlight for at least 24 hours before and 48 hours after grouting.

G. Contact the grout manufacturer's representative for assistance on hot and cold weather grouting techniques and precautions if applicable.

3.03 GROUTING PROCEDURES

A. General: Mixing, surface preparation, handling, placing, consolidation, curing, and other means of execution for prepackaged grouts shall be done according to the instructions and recommendations of the manufacturer.

B. Structural, equipment, tank, and piping support bases shall be grouted, unless indicated otherwise.

1. The original concrete shall be blocked out or finished off a sufficient distance below the plate to provide for a minimum one-inch thickness of grout or other thickness if indicated.

2. After the base plate has been set in position at the proper elevation by steel wedges or double nuts on the anchor bolts, the space between the bottom of the plate and the original pour of concrete shall be filled with non-shrink-type grout through a headbox of appropriate size. The mixture shall be of a fluid consistency and poured continuously into the space between the plate and the base concrete. Forms for grout shall be tight against retaining surfaces, and joints shall be sealed as recommended by the grout manufacturer to be liquid-tight. Forms shall be coated as recommended by the grout manufacturer for easy form release. Where this method of placement is not practical or where required by the COR, alternate grouting methods shall be submitted for acceptance by the COR.

3. Concrete equipment pads for equipment bases that will be epoxy-grouted shall be sized so that, when the equipment base is fully grouted, the epoxy grout is stopped not less than 4-inches from the edge of the pad.

C. Drilled Anchors and Reinforcing Bars

1. General

a. Drilled anchors and reinforcing bars shall be installed in strict accordance with the manufacturer's instructions. Holes shall be roughened with a brush on a power drill and cleaned. Drilled anchors shall not be installed until the concrete has reached the required 28 Day compressive strength. Anchors shall not be loaded until the grout has reached its indicated strength in accordance with the manufacturer's instructions.

b. The Contractor shall identify position of reinforcing steel and other embedded items prior to drilling holes. Care shall be exercised in coring and drilling to avoid damaging existing reinforcing or embedded items. Notify the COR if reinforcing steel or other embedded items are encountered during drilling. Take precautions as necessary to avoid damaging prestressing tendons, electrical and communications conduit, and piping.

2. Epoxy Adhesive Anchors

    a. Grout shall be proportioned and mixed with automatic equipment.

    b. Unless otherwise indicated, embedment shall be sufficient to develop the ultimate tensile strength of the anchor or reinforcing bar per the manufacturer's ICBO/ES report but shall not be less than 8 rod diameters for threaded rod or 12 bar diameters for reinforcing or smooth bars.

    c. Holes shall be dry.

3. Cement Based Non-Shrink Grout

    a. In places of high temperatures or fire hazard, anchor bolts shall be grouted in using cement based non-shrink grout, Class I.

    b. Unless otherwise indicated, embedment shall be sufficient to develop the ultimate tensile strength of the anchor or reinforcing bar per the manufacturer's ICBO/ES report but shall not be less than 16 rod diameters for threaded rod or 24 bar diameters for reinforcing or smooth bars.

    c. When the bolt diameter is one-inch or less, the hole diameter shall be a minimum of 2-inches. When the bolt diameter is greater than one-inch, the hole diameter shall be at least twice the bolt diameter.

    d. Drilled holes shall be saturated with water for not less than 24 hours before installation of anchor/rod/rebar.

    e. The non-shrink grout shall be placed in the holes in a non-sag (trowelable) consistency. The grout shall be placed in the holes before the anchor and then the anchor inserted and vibrated to ensure proper coverage.

D. Topping Grout and Concrete/Grout Fill

1. Mechanical, electrical, and finish work shall be completed prior to placement of topping or concrete/grout fill. To ensure bonding to the base slab, the base slab shall be given an exposed aggregate finish. Alternatively, where accepted by the COR, the base slab shall be given a roughened textured surface by a close-spaced rake while the surface is green. After curing, high-pressure washing shall expose the aggregates and produce not less than a 3/16-inch amplitude roughness. Jackhammers or chipping hammers shall not be used.

2. The minimum thickness of grout topping and concrete/grout fill shall be one-inch. Where the finished surface of concrete/grout fill is to form an intersecting angle of less than 45 degrees with the concrete surface it is to be placed against, a key shall be formed in the concrete surface at the intersection point. The key shall be a minimum of 3-1/2 inches wide by 1-1/2 inches deep.

3. The base slab shall be thoroughly cleaned and wetted to saturated surface dry (SSD) condition per the International Concrete Repair Institute (ICRI) -- Technical Guide for Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays, prior to placing topping and fill. No topping concrete shall be placed until the slab is completely free from standing pools or ponds of water. A thin coat of neat cement grout shall be broomed into the surface of the slab just before topping or fill placement. The neat cement grout shall not be allowed to dry before topping placement. If it does dry, it must be immediately removed using wet stiff brooms and reapplied. The

topping and fill shall be compacted by rolling or thorough tamping, brought to established grade, and floated. Grouted fill for tank and basin bottoms where scraping mechanisms are to be installed shall be screeded by blades attached to the revolving mechanism of the equipment in accordance with the procedures outlined by the equipment manufacturer after the grout is brought to the established grade. Coat surface with evaporation retardant as needed to prevent plastic shrinkage cracks.

4. Topping grout placed on sloping slabs shall proceed uniformly from the bottom of the slab to the top, for the full width of the placement.
5. The surface shall be tested with a straight edge to detect high and low spots which shall be immediately eliminated. When the topping or fill has hardened sufficiently, it shall be steel troweled to a smooth surface free from pinholes and other imperfections. An approved type of mechanical trowel may be used as an assist in this operation, but the last pass over the surface shall be by hand-troweling. During finishing, no water, dry cement, or mixture of dry cement and sand shall be applied to the surface.
6. As soon as topping or fill finishing is completed, coat surface with curing compound. The tank shall be filled with sufficient water to cover the entire floor for 14 days, where required by the COR.

3.04 CONSOLIDATION

A. Grout shall be placed in such a manner, for the consistency necessary for each application, to ensure that the space to be grouted is completely filled.

3.05 CURING

A. Cement based grouts shall be cured per Section 03 30 00 and per the manufacturer's recommendations.

END OF SECTION 03 62 00

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. This section of the specifications covers the furnishing and installation of the Johnson Intake Screens and appurtenances as shown on the drawings and specified herein.

B. The following items are a part of this section and shall be furnished by one manufacturer to ensure a properly designed and integrated intake system.

1. Two (2) Half Johnson Intake Screen assembly(s) of all-welded continuous slot Vee-Wire® construction.

2. Johnson Hydroburst® System for air flushing of screen surface for debris removal. (Section 4)

1.02 QUALITY ASSURANCE:

A. The entire intake screen system shall be furnished by a single manufacturer who shall comply with the following:

1. The equipment manufacturer must maintain an ongoing quality assurance program, including ISO-9000 certification.

2. The single manufacturer supplying this equipment must be able to furnish proof of over (100) installations and (20) years of manufacturing equipment of similar technology.

3. The equipment manufacturer must manufacture their own screen for the intake assembly. Manufactures that have to source screen from an outside source will not be considered

4. All stainless or Z-Alloy intake screens shall be certified NSF/ANSI Standard 61 (NSF-61) for drinking water system components.

1.03 SUBSTITUTIONS:

A. Manufacturers other than that which is specified and/or not meeting EVERY provision of the specification shall be required to submit a complete and detailed PRE-QUALIFICATION PACKAGE to the engineer at least (15) days prior to the bid. Any PRE-QUALIFICATION PACKAGE must contain as a minimum:

1. Detailed layout drawings

2. Supporting flow distribution data via a CFD (Computational Fluid Dynamics) analysis.

3. Weld certifications

4. Evidence of a recognized ongoing quality assurance program.

5. Detailed component specifications and catalog cuts as required.

6. Detailed list of ALL VARIATIONS required from the original design, referencing appropriate sections of the specifications and locations on the drawings.

7. Full installation reference list of at least (50) customers that includes similar proposed equipment.
8. NSF 61 Model Number

B. Manufacturers qualifying will be recognized by addendum a minimum of (5) days prior to the bid. Contractors shall include all costs associated with any redesign required with their bid.

C. Manufacturers not meeting this specification in EVERY WAY or are not PRE-QUALIFIED and approved by the engineer as outlined above will not be considered for use in this project.

PART 2 - PRODUCTS

2.01 GENERAL

A. All system components and equipment utilized in the intake screen system, including the system described in Section 1.01 shall be furnished as a complete integrated system by one manufacturer; Johnson Screen, New Brighton, MN.

2.02 CAPACITY

A. The intake assembly capacity shall be 500 GPM at a maximum through-slot velocity, as a result of water withdrawal, of 0.5 feet per second. The corresponding average through-slot velocity shall be 80% - 90% of the maximum velocity. Pressure drop through the entire intake, which includes all the components of the intake assembly - screen, modifiers, outlet pipe, etc. shall be approximately 0.5063 psi at the designed flow. The hydraulic design of this system is based on this maximum headloss – screens that exceed this headloss are not acceptable. The manufacturer's clean screen assembly headloss must be stated in the bid documents.

B. The total intake assembly capacity of 1,000 GPM shall be handled by Two (2), Johnson Screens Half Model T14-HC intake tee screen assembly(s).

C. Evidence of the intake assembly capacity and flow distribution shall be proven by a Computational Fluid Dynamic (CFD) analysis, supplied by the manufacturer. The CFD Analysis Method must be verified by calculations supported by previously completed physical flow distribution tests.

2.03 STRENGTH

A. The intake assembly shall be designed to a maximum 4.33 psi (0.3 bar) negative pump pressure or differential headloss.

B. Design stress used for determining strength of the assembly shall be no more than 80% of the published yield strength of the material used. Strength calculations verifying compliance with these criteria shall be provided upon request.

2.04 CONSTRUCTION

A. The intake screen surface wire shall be Johnson Screens Vee-Wire® number 69.

B. The surface wire, support beam and stiffener structure shall be an all-welded matrix designed to provide the specific strength with minimal interference with the through screen flow pattern.

C. End plates and tee body shall be a minimum of 0.105 inches thick. All structural butt welds shall be full penetration fillet welds and shall be the thickness of the thinner component.

D. The intake shall have a maximum outside diameter of 12.50 inches and a maximum overall length of 48.44 inches.

E. Screens for the intakes assembly to be fabricated by the intake manufacture. Intakes constructed with screens fabricated and procured by a third-party manufacturer are not acceptable.

2.05 SLOT OPENING SIZE

A. The screen slot size shall be 0.0625 inches. The open area for this slot opening shall be 46.82%.

1. Slot size shall be controlled and continuously monitored during manufacture.

2. For slot openings of 0.040" through 0.100" the mean slot size shall be within +/- 0.002" with a standard deviation no greater than 0.002" throughout the assembly.

3. For slot openings greater than 0.100" the mean slot size shall be within +/- 0.003" with a standard deviation no greater than 0.003" throughout the entire assembly.

2.06 MATERIALS

A. The main outlet flange shall mate with a 6-inch flange with a flange pattern equal to AWWA C-207, Table 2, Class D.

B. The air connection shall be 1-inch NPS ANSI Flange.

C. The intake screen material shall be manufactured of 304 Stainless Steel or Z-Alloy material.

D. If material is Z-Alloy, any alternate copper-based materials must demonstrate a minimum of five (5) years experience showing successful zebra mussel protection. Lack of demonstrated experience or coatings of any kind shall not be acceptable.

PART 3 - SCREEN SUBMITTALS

3.01 SCREEN SUBMITTALS

A. The intake screen manufacturer shall submit:

1. Drawing(s) showing screen diameter, screen length, assembly length, interface dimensions for outlet and air backwash dimensions, materials of construction and assembly weight.

2. WPS/PQR

3. Evidence of a recognized ongoing quality assurance program

4. Provide supporting flow distribution data where calculations are supported by previously completed physical flow distribution tests. This includes a CFD Analysis of the flow distribution of the screen at the design flow.

5. NSF 61 Model Number

PART 4 - HYDROBURST® AIR BACKWASH SYSTEM

4.01 GENERAL

A. The intake screen supplier shall provide, as part of the overall intake screen system, an air backwash system designed to remove debris from the screen surface by delivering a suitable volume of compressed air to the inside of the screen body. The exiting air shall scour the screen surface to maintain adequate design flow and through slot velocity characteristics.

4.02 PRODUCTS

A. The Hydroburst air backwash system shall consist of an integrated system of compressor, receiver tank, valves and control panel. Hydroburst must operate without causing any flow interruption. All components shall be tank mounted and arrive on site ready to operate. Any system provided requiring field assembly and not ready to operate shall not be acceptable. System dimensions shall be approximately 45" X 75" X 62" Tall during operation.

1. The compressor shall be a oilless reciprocating compressor and shall be sized to recover from each backwash in 15 minutes.
    a. 3/60/480V, Electric Motor / Pump
    b. 5.7 HP Drive Moter Protection IP 54
    c. 14.4 CFM@160 psi
    d. Variable Speed Drive
    e. Direct Drive
    f. 100% Duty Cycle
    g. Sound Enclosure – 66 dBA
2. The receiver shall be a custom 60-gallon receiver, ASME coded for 200 psig, sized for the system piping and to displace THREE SCREEN VOLUMES OF AIR AT THE SCREEN IN 3-5 SECONDS during a backwash to provide suitable debris removal and cleaning. The receiver shall have a max OD of 16 inches and height of 21 inches
3. The receiver shall be equipped with a 4 ½ inch isolated pressure gauge, safety valve and automatic zero loss drain valve.
4. The system shall include two Jomar ball valves rated at 200 psi with standard NPT connections. There shall be one valve per screen and shall be sized to match the tank flange and the backwash piping.
    a. A1000 Full Port 3 Piece 4-Bolt direct mount
    b. Body / Shaft / Ball – Stainless Steel
    c. Spring-Return Pneumatic Actuator
    d. Single Solenoid Control valve with Manual Override
    e. Visual Position Indicator with Limit Switches

B. Automatic Operation:

1. The above Jomar valve(s) shall be provided with a pneumatic actuator with direct mounted solenoid valves, position indicator and position switches.
2. The system shall include a suitably sized air receiver interconnected and charged by the main receiver to allow valve operation.
3. A NEMA 4 control panel shall be included that will contain as a minimum, the control power transformer and a relay logic to perform the specified control functions.
4. The controls shall allow timed automatic or manual initiated air cleaning cycles. A cycle consists of cleaning all intake system screens.
5. The control system included shall allow a full week duration of programmed Hydroburst cycles.
6. All operator/indicators will be 22 mm in size. All indicators will be LED type
7. Control Panel, NEMA 4 Enclosure with:
    a. Intertek Labeled for UL508a assembly
    b. Lockable Disconnect w/Type J Fusing
    c. 7-Day Programmable Timer
    d. System On-Off Selector Switch
    e. Cycle Start Push Button
    f. Event Mode Selector Switch
    g. Digital pressure controller with readout
    h. System Power On Pilot Light
    i. Low Air Pressure Alarm Pilot Light
    j. Adequate Air Pressure Pilot Light
    k. Cycle in progress Pilot Light
    l. Relays
    m. Auxiliary Contacts
    n. Compression Type Terminal Blocks capable of 1 #10 wire or 2, #12 wires.
    o. Isolated SCADA / PLC Output Contacts (Yellow in color)
        1) Cycle Start – Option for remote signal to initiate an air burst cycle
        2) Valve Open
        3) Valve Closed
        4) Adequate Air
        5) Low Air Pressure
        6) Compressor Active
        7) Compressor General Fault

C. Interconnecting piping between the intake screen assembly and the Hydroburst System is by others. All interconnecting wiring to automated valving and power connections is done by others.

4.03 SUBMITTALS AND MANUALS

A. Included in the intake screen submittals shall be all associated Hydroburst equipment catalog information, system sizing criteria and drawings. All dimensional and operational information will be provided. All interconnecting wiring and piping information will be included.

B. An electronic version of the O&M will be provided.

4.04 COMMISSIONING & TRAINING

A. Manufacture shall provide a field service representative for one trip consisting of 1.5 days. The first day will be dedicated to commissioning the Hydroburst unit and the following half day will be for operator training.

END OF SECTION 328113