
ADDENDUM NO. 1

The following general questions have been received and the responses are as follows:

Q1. *What is the contract value estimate?*

The anticipated bonding capacity is \$1,000,000.00 for the Base bid award and \$2,000,000.00 for the Base and Optional bid awards.

Q2. *Will the District be providing survey control and staking?*

The District will not be providing survey control and staking. Contractor shall be responsible for establishing local project controls and maintaining staking sufficient for execution of the work.

Q3. *Can Bid Item No. 040.0 (and Bid Item No. 040.1 in the Optional Reach Extension bid) be separated into individual line items for the sales tax and the use tax?*

Additional bid line items will not be provided for separate itemization of taxes. As stated in the acknowledgement check boxes at the bottom of the bid forms, the District has no tax exemptions on this Work, and all applicable taxes need to be included in the bid price. The District will not add an additional tax calculation onto invoice payments. If the tax value is not already incorporated into a specific bid item, the value of the tax to be reimbursed should be included in the bid line item number designated for "Sales and Use Tax". This lump sum value can be invoiced in percent complete installments aligned with the otherwise unitemized tax value.

Q4. *Is there a separate line item for clearing and grubbing?*

The intent is to minimize vegetative disturbance to the minimum required to execute the work. A separate line item unit price for clearing and grubbing will not be added to the bid forms. Clearing and grubbing costs are to be included in Bid Item No 110.0 (and Bid Item No. 110.1 in the Optional Reach Extension bid) for "Access Improvement" and Bid Item No. 120.0 (and Bid Item No. 120.1 in the Optional Reach Extension bid) for "Staging Site Improvements".

Q5. *Is there a separate line item for rock excavation?*

A separate Bid Line Item 215.0 (and Bid Item No. 215.1 in the Optional Reach Extension bid) will be added via Addendum 1 for inclusion of a nominal allowance for excavation of rock, should it be encountered when trenching.

The following attached changes are incorporated into requirements for the Project No. 33-SBC-1001 Contract Documents by this Addendum:

1. Section 00 41 00 – Bid Form,
Bid Form Page 4 (Base Bid form) and Bid Form Page 5 (Optional Bid form) for addition of bid line items for rock excavation.
2. Section 31 23 00 – Excavation and Fill,
Replaced “Gravel Base” with “Gravel Backfill” material, adjusted “Crushed Surfacing” gradation, added “Riprap” material, added “Quarry Spalls” material, adjusted “Common Borrow” material, defined “Rock Excavation”, adjusted “Waste Material Disposal” execution, adjusted “Pipe Zone Bedding” execution, and adjusted “Control of Water” execution.
3. Section 33 11 00 – Water Utility Distribution Piping,
Added approved alternative pipe products, added alternative pipe size requirements, and added maximum pipe deflection criteria.
4. Drawings
 - a. Drawing G-001: Revised Drawing Index table.
 - b. Drawing G-002: Revised material hatching key.
 - c. Drawing G-006: Revised Table Headings to clarify that coordinates are in local project ground distances.
 - d. Drawing CG102: Slight revision to pipeline start point to eliminate centerline offset at from existing canal centerline.
 - e. Drawing CG105: Revised inlet and outlet of undershot culvert.
 - f. Drawing CG301: Revised trench backfill material to utilize “Gravel Backfill”.
 - g. Drawing CG302: New sheet clarifying CDF backfill for thrust blocking and typical trench backfill material for alternative pipe material.
 - h. Drawing CG401: Added coordinate points for box culvert orientation.
 - i. Drawing CG402: Revised notes and streambed material gradation based Washington Department of Fish & Wildlife permit review comments.
 - j. Drawing CG410: Clarified need for restoring adjacent landowner fence on KRD property where access required for undershot culvert inlet replacement.
 - k. Drawing CG440: Revised typical delivery box turnout partial plan.
 - l. Drawing CG501: Removed typical details unused in Robinson Siphon to Milepost 10.4.
 - m. Drawing RI805: Reprint of reference drawing for missing record drawing image.
 - n. Drawing RI810: Reprint of reference drawing for missing USFS drawing image.
 - o. Drawing RI811: Reprint of reference drawing for missing USFS drawing image.

KITTITAS RECLAMATION DISTRICT

Dated this 24th day
of August, 2020

By: _____
David Allison

Title: _____
Engineer

SECTION 31 23 00 – EXCAVATION AND FILL

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Ballast Rock
- B. Gravel Drain
- C. Gravel ~~Base~~Backfill
- D. Crushed Surfacing
- ~~E.~~ Riprap
- ~~F.~~ Quarry Spalls
- ~~E.G.~~ Select Borrow
- ~~F.H.~~ Common Borrow
- ~~G.I.~~ Controlled Density Fill
- ~~H.J.~~ Excavation
- ~~K.~~ Rock Excavation
- ~~H.L.~~ Bedding
- ~~J.M.~~ Backfill
- ~~K.N.~~ Compaction
- ~~L.O.~~ Control of Water

1.02 RELATED SECTIONS

The provisions and intent of the Contract, including the General Conditions and Specific Requirements, apply to this work as if specified in this section. Work related to this section is described in:

- A. Section 01 33 00 – Submittal Procedures
- B. Section 01 43 00 – Quality Assurance
- C. Section 01 50 00 – Temporary Facilities and Controls
- D. Section 07 26 16 – Below Grade Vapor Barriers
- E. Section 31 50 00 – Excavation Support and Protection

1.03 REFERENCES

- A. General: Publications listed below form a part of this Specification to the extent indicated by references thereto.
- B. Washington State Department of Transportation (WSDOT)
 - 1. WSDOTStandard Specifications for Road, Bridge, and Municipal Construction, 2018 (referred herein as the WSDOT Standard Specifications)
 - 2. WSDOTMaterials Manual, 2018
- C. American Association of State Highway and Transportation Officials (AASHTO)
 - 1. AASHTO T 180Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop; American Association of State Highway and Transportation Officials; 2001 (2004).
- D. Standard Specifications for Transportation Materials and Methods of Sampling and Testing, 25th Edition.
- E. ASTM International (ASTM):
 - 1. ASTM C136Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
 - 2. ASTM D422Standard Test Method for Particle-Size Analysis of Soils
 - 3. ASTM D698Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)); 2007.
 - 4. ASTM D1556Standard Test Method for Density and Unit Weight of Soil and Unit Weight in Place by the Sand-Cone Method
 - 5. ASTM D1557Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN m/m³)); 2007.
 - 6. ASTM D2167Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
 - 7. ASTM D2487Standard Classification of Soils for Engineering Purposes.
 - 8. ASTM D3017Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

- 9. ASTM D4318 Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- 10. ASTM D6938 Standard Test Methods for In-Place and Water Content of Soil and Soil-Aggregate by nuclear Methods (Shallow Depth).
- F. Occupational Safety and Health Administration (OSHA)
 - 9. OSHA.....Part 1926, Subpart P, "Excavations", most recent edition

1.04 QUALITY ASSURANCE

Conduct tests and submit test reports in accordance with the requirements of Section 01 33 00 and Section 01 45 00.

1.05 JOB CONDITIONS

- A. Existing Utilities: The Contractor shall locate existing utilities in the area of the work. These utilities shall be adequately protected from damage during construction of this project as approved by the District Representative.
- B. The Contractor shall utilize the services of a surveyor licensed in the State of Washington to oversee all surveying, alignment and positioning work on the Project. The surveyor shall extend vertical and horizontal control to the project, set temporary surveying control, establish primary work lines, and spot check as-built locations of exposed project elements. The choice of surveyor shall be subject to the approval of the District and the Contractor shall submit qualifications for approval. The surveyor shall have a minimum of five years of documented experience in land surveying.
- C. Protect bench marks, survey control points, existing structures, fences, other features to remain from excavating equipment and vehicular traffic.
- D. Do not commence with excavation operations until temporary erosion and sedimentation control measures are in place.
- E. Provide dust alleviation and control measures continuously during the course of work; as approved by the District.

1.06 PROTECTION

- A. Use all means necessary to protect all items outside of the limits of work shown in the contract drawings. In the event of damage, immediately make all repairs and requirements necessary to the approval of the District Representative and at no additional cost to the District.
- B. Utilities: Use all means necessary to protect existing utilities. Contact the District Representative before disconnecting any utility. All utilities serving adjacent facilities shall remain active unless disconnection is approved by the District Representative.

- C. Traffic: Contractor shall coordinate all their equipment and employee traffic with the District Representative. Inform the District Representative a minimum 48 hours prior to any revision in traffic flow. Contractor is responsible for coordinating any traffic revisions to State, County, or City roadways with the respective agency. Barricades, signs, and other temporary traffic control zone measures shall be in compliance with the Manual of Uniform Traffic Control Devices (MUTCD).
- D. Hazards: Provide lighted barricades around all hazardous areas including but not limited to excavations, trenches, and stored materials or debris left over night.
- E. Erosion and Sediment Control: Contractor shall take all necessary precautions to prevent silt laden runoff from leaving the site. Silt fencing, ditch lining, straw bales, detention ponds, catch basin/inlet inserts, and other erosion control and reduction measures may be necessary to provide satisfactory erosion control in accordance with Section 01 50 00. No additional payment will be made for erosion control measures.
- F. Cover stockpiles if weather conditions necessitate.

1.07 SUBMITTALS

- A. Certifications: Submit sieve analysis and suppliers certification of compliance for each imported material. Submit sieve analysis for on-site materials to be incorporated into the work.
- B. Materials Sources: Submit name of imported materials source.
- C. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.
- D. Compaction Density Test Reports.
- E. Waste Material Disposal: Submit location of all disposal sites to be used and provide copies of permits and approvals for such disposal sites.

PART 2 – PRODUCTS

2.01 BALLAST ROCK

Ballast rock shall be 2 1/2 inch minus crushed or naturally occurring granular material conform with the requirements of the WSDOT Standard Specifications 9-03.9(2) "Permeable Ballast".

2.02 GRAVEL DRAIN

Gravel backfill for drains shall conform with the requirements of the WSDOT Standard Specifications 9-03.12(4) "Gravel Backfill for Drains".

2.03 GRAVEL BASEBACKFILL

Gravel ~~base-Backfill~~ material shall be crushed or naturally angular material conforming with the requirements of the WSDOT Standard Specifications ~~9-03.10-12(3)~~ for "Aggregate for Gravel Base~~Gravel Backfill for Pipe Zone Bedding~~".

2.04 CRUSHED SURFACING

Crushed surfacing material, also referred to as Crushed Surfacing ~~Top-Base~~ Course (~~CSTCCSBC~~), shall be ~~3/4~~1 inch minus crushed material conforming with the requirements of the WSDOT Standard Specifications 9-03.9(3) for "Crushed Surfacing" under the table heading "Top Course and Keystone~~Base Course~~".

2.05 RIP RAP

Riprap shall be hard, sound, and durable broken and/or processed rock conforming with the requirements for Class A (18-inch minus) material of the WSDOT Standard Specifications 9-13.4(2) "Grading Requirements of Rock for Erosion and Scour Protection".

2.06 QUARRY SPALLS

Quarry Spalls shall be granular material conforming with the requirements of the WSDOT Standard Specifications 9-13.1(5) "Quarry Spalls".

~~2.05~~2.07 SELECT BORROW

- A. Select Borrow shall consist of granular aggregate or nongranular soil material, either naturally occurring or processed, free of refuse, organic materials, roots over 1/2 inch in diameter, and rocks over 4 inches in diameter. Grading and quality shall conform with the requirements of the WSDOT Standard Specifications 9-03.14(2) "Select Borrow".
- B. Material shall be obtained from required excavations or other Contractor furnished sources and shall be approved by the District Representative prior to placement.

~~2.06~~2.08 COMMON BORROW

- A. Common Borrow shall consist of granular aggregate or nongranular soil material, either naturally occurring or processed, free of refuse, organic materials, roots over 1/2 inch in diameter, and rocks over 6 inches in diameter.
- B. Material shall conform to ~~soil plasticity Option 1 of~~ the WSDOT Standard Specifications ~~9-03.14(3)~~15 "Common Borrow~~Native Material for Trench Backfill~~".
- C. Material shall be obtained from required excavations or other Contractor furnished sources and shall be approved by the District Representative prior to placement.

~~2.07~~2.09 CONTROLLED DENSITY FILL (CDF)

Controlled Density Fill (CDF) shall be a self-compacting, cementitious, flowable material requiring no subsequent vibration or tamping to achieve consolidation. CDF shall be

designed to have a minimum 28-day strength of 50 psi and a maximum 28-day strength not to exceed 300 psi with an approximate slump of 3 to 10 inches.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Identify required lines, levels, contours and datum locations.
- B. Locate, identify, and protect utilities that remain and protect from damage.
- C. Protect and maintain erosion and sedimentation controls during excavation operations.

3.02 SCARIFICATION AND COMPACTION

Following the site stripping and any required grubbing and/or over excavation, uniformly moisture-conditioned to be between zero (0) percent and five (5) percent above the optimum moisture content, and compacted to at least 90 percent of the maximum dry density.

3.03 TRENCH EXCAVATION

- A. This section is applicable to excavations required for the placement of all underground drain collection pipes, turnout pipes, and undershot culverts.
- B. The trench shall be excavated to permit placement of the pipe, or culvert to the alignment and grade shown on the contract drawings. Excavation depth shall include an allowance for the required bedding. Trench bottom shall be cleaned of all loosened soil and rocks. Shape and dimension of the trench shall allow a minimum trench width as specified on the plans. If, without written authorization, the pipe trench is excavated below the required depth, it shall be backfilled at the Contractor's expense with bedding material specified as Gravel Base-Backfill in Paragraph 2.03 in this Section.
- C. Material obtained from pipeline excavation and meeting the backfill requirements specified in Paragraph ~~2.082-05~~ of this Section may be used for non-classified material trench backfill. Material not meeting specified material requirements shall be disposed of by the Contractor in an approved ~~off-site~~ disposal location.
- D. Contractor shall provide shoring, signs, and barricades, etc., in accordance with OSHA Standards and Section ~~34-01~~ 50 00.

3.04 STRUCTURAL EXCAVATION

- A. Structural excavations include excavations required for steel reinforced walls, inlet and outlet transition structures, foundations, manholes, and catch basins.
- B. Slabs and footings shall bear on a minimum of one (1) foot of structural fill consisting material specified as Gravel Base-Backfill in Paragraph 2.03 of this Section compacted to 95% maximum dry density.

- C. The bottom of excavations shall be within + 0.10 feet of the elevations shown on the contract drawings. The bottom of all structural excavations shall be cleaned to remove all rocks over three (3) inches in diameter and loosened soil.
1. All excavations shall be carried to the depth indicated on the contract drawings and/or approved by the District Representative. Should the Contractor, through their own negligence or other fault, excavate below the designated elevations, they shall replace such over excavation with approved materials and methods at their own expense.
 2. The District Representative shall be notified as soon as excavations for footings or foundations are made, in order that inspections can be made prior to building forms and pouring concrete.
 3. Excess cuts under existing adjacent footings shall be filled with concrete.
 4. All excavations must be clean, dry, free from loose earth or other materials, and firm with an unyielding surface at time of placing concrete. Remove excess excavated materials from site.

3.05 UNCLASSIFIED EXCAVATION

- A. Unclassified excavations include excavations required for roadway cuts, paving and grading, site contouring, and other excavation not classified as Trench Excavation as defined in Paragraph 3.03 of this Section or Structural Excavation as defined in Paragraph 3.04 of this Section.
- B. The Contractor shall remove all material to sufficient elevation to allow proper placement and compaction of any necessary fill and surfacing to meet the elevations shown on the contract drawings or as required for removal of unsuitable material as directed by the District Representative.

3.06 ROCK EXCAVATION

- A. Rock excavation will be determined in accordance with WSDOT Standard Specifications 7-09.3(7)B "Rock Excavation".
- B. Rock excavation quantity when required will be measured in accordance with WSDOT Standard Specifications 7-09.4 "Measurement".

~~3.06~~3.07 WASTE MATERIAL DISPOSAL

- A. Concrete, large rock, organic material, and other excavated material not suitable for or included in fills and backfills can be disposed of onsite by the Contractor by spreading, uncompacted, over the properly backfilled and compacted pipeline trench alignment. shall be disposed of by the Contractor in an approved off-site disposal location.
1. Concrete disposed of onsite shall be broken into a size not greater than 24-inch square and be free of steel reinforcing and embeds.

A-2. Organic material disposed of onsite shall be chipped and spread in accordance with WSDOT Standard Specifications 2-01.2(3) "Disposal Method No. 3 – Chipping".

- B. The Contractor shall make his own arrangements for disposal of surplus material not meeting the requirements for onsite disposal and shall protect the District from any and all damages arising there from. All costs for such disposal shall be considered to be incidental to the Contract and no additional compensation will be made.
- C. The Contractor shall provide the District Representative with the location of all disposal sites to be used, and also provide copies of the permits and approvals for such disposal sites.

3.073.08 PIPE ZONE BEDDING

- A. The word pipeline shall include all underground drain collection pipes, turnout pipes, and undershot culverts.
- B. Trenches shall not be backfilled until the District Representative or his designee has determined that installation and testing requirements have been met. Pipe bedding shall be brought up evenly on both sides of the pipe to avoid lateral displacement of the pipe and damage to the joints.
- C. All pipelines shall be bedded with material specified as Gravel Base-Backfill in Paragraph 2.03 in this Section. Minimum thickness of the compacted bedding layer under the pipeline shall be six (6) inches. Compaction shall be to at least 90 percent of maximum dry density.
- D. After the pipeline is in place on the bedding, bedding materials shall be placed uniformly along each side of the pipe in 6-inch thick, loose depth layers, and compacting each layer to at least 90 percent of maximum dry density, up to six (6) inches of springline as shown on drawings. This is referred to as the Haunch Zone. The remainder of the pipe zone is to be backfilled with Select Borrow in Paragraph in this Section. This is until the pipeline is covered by at least six (6) inches ~~of material for rigid pipe and at least twelve (12) inches of material for flexible pipe.~~

3.083.09 TRENCH BACKFILL

- A. Trenches shall be backfilled as soon after the pipe laying as possible. The remaining portion of the trench (trench backfill) shall be backfilled in layers not exceeding one (1) foot thick loose depths and compacted to at least 90 percent maximum dry density. Backfill above the pipe zone shall be accomplished in such a manner that the pipe is not damaged or disturbed.
- B. Where undershot culverts and turnouts cross under the access roadway, the trench backfill material shall be compacted to at least 95 percent of maximum dry density.

- C. Where pipeline installation adjacent to structures or other pipelines and utilities restricted compaction of the standard pipe zone envelope (trench width and bedding material coverage), Controlled Density Fill (CDF) shall be used in lieu of the standard pipe bedding material.

3.093.10 STRUCTURAL BACKFILL

- A. All backfill within a horizontal distance of 2 feet from concrete structures such as footings, manholes, vaults, etc. is defined as structural fill.
- B. Structural fill material shall be material specified as Gravel Base-Backfill in Paragraph 2.03 of this Section placed and compacted in 8-inch maximum thickness layers, loose measure, to at least 95 percent of maximum dry density.
- C. Where backfill is to be placed against both sides of concrete walls, the backfill shall be brought up evenly on both sides of the wall.
- D. Backfill shall not be placed against just one side of concrete walls until the concrete has developed sufficient strength to resist the loading imposed by the backfill. Any abutting concrete walls shall also have attained sufficient strength. In any case, the backfill placement shall not begin prior to 7 days after concrete placing and shall not exceed the following schedule:

Age of Concrete	Backfill Depth
7 days	2/3 wall height
28 days	full wall height

- E. Perform compaction within two (2) feet of walls with hand operated vibratory compactors.

3.403.11 COMPACTED FILL

- A. All fill not otherwise classified shall be compacted fill. Material for fill shall be uniformly moisture-conditioned to between zero (0) percent and five (5) percent above the optimum moisture content and shall be placed in 8-inch maximum layers loose depth, and shall be compacted to at least 90 percent of maximum dry density.
- B. Compacted fill shall be placed to the shapes and elevations shown on the contract drawings, sloped to drain, and without noticeable irregularities.

3.443.12 COMPACTION

- A. Compaction to the density required shall be by means of an appropriately sized static, vibratory or impact type compactor suited to the soil and physical restrictions of the area to be compacted. Although the Contractor is responsible for the selection of the method of compaction, selection of an inappropriate method shall not relieve the Contractor of the responsibility to achieve the specified result.

- B. Jetting, sluicing, or water settling will not be permitted.

3.123.13 COMPACTION CONTROL TESTS:

Laboratory and field tests shall be performed by the Contractor as follows:

- A. Compaction control density shall be the maximum density at optimum moisture content as determined by ASTM D1557, Standard Methods for Moisture-Density Relationships of Soil and Soil Aggregates, Methods A, B, C or D as applicable.
- B. Field tests to determine in-place compliance with required densities as specified, shall be performed in accordance with ASTM D1556, D2167, or D6938.

3.133.14 CONTROL OF WATER

- A. The Contractor shall furnish, install, and operate all necessary machinery, appliances, and equipment to control water in excavations during construction and shall control the water so as not to cause injury to public or private property or to cause a nuisance or menace to the public.
- B. The Contractor shall at all times have on hand sufficient pumping equipment and machinery in good working condition for all ordinary emergencies, including power outage and shall have available at all times competent workers for the operation of pumping equipment.

Discharge water may be routed ~~to the underdrain collection system, once installed,~~ or back in-to the remaining downstream canal system. Adequate sheeting, sand bagging, cut-off wall, or other damming shall be provided to prevent flow of discharged water back upstream into the excavation.
- C. The control of groundwater shall be such that softening of the bottom of excavations shall be prevented.
- D. Water control systems shall be designed and operated so as to prevent removal of the natural soils.
- E. Where soil has been softened or eroded by flooding or placement during unfavorable weather, remove all damaged areas and recompact as specified for fill and compaction.
- F. Control of water in the pipeline trench shall be considered as incidental to the construction and all costs thereof shall be included in the Total Bid Price.

END OF SECTION

SECTION 33 11 00 – WATER UTILITY DISTRIBUTION PIPING

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Perforated Corrugated High Density Polyethylene (HDPE) pipe and fittings for drainage.
- B. Polyvinyl Chloride Irrigation Pipe (PIP) pipe and fittings for irrigation turnouts.
- C. Steel Reinforced Polyethylene (SRPE) pipe and fittings for mainline canal piping 48-inch diameter and larger.
- D. Alternative requirements for substitution of SRPE with profile wall high-density polyethylene (HDPE) pipe and fittings for mainline canal supply lines less than 48-inch diameter.

1.02 RELATED WORK SPECIFIED ELSEWHERE

The provisions and intent of the Contract, including the General Conditions and Specific Requirements, apply to this work as if specified in this section. Work related to this section is described in:

- A. Section 01 33 00 – Submittal Procedures
- B. Section 01 45 00 – Quality Control
- C. Section 01 60 00 – Product Requirements
- D. Section 31 23 00 – Excavation and Fill
- E. Section 33 05 26 – Utility Line Signs, Markers, and Flags
- F. Section 33 12 16 – Utility Valves and Gates

1.03 REFERENCES

- A. ASTM International (ASTM):
 - 1. D1784 Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
 - 2. D2241 Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)
 - 3. D2321 Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

4. D3212Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
5. D3350Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
6. F477Specification for Elastomeric Seals (Gasket) for Joining Plastic Pipe
7. F1417Standard Practice for Installation Acceptance of Plastic Non-pressure Sewer Lines Using Low-Pressure Air.
8. F2562Standard Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage

1.04 ALTERNATE MATERIALS

- A. The contract drawings have been prepared based on use of specific pipe materials and details developed accordingly; but it is not intended to preclude use of alternate materials subject to contract requirements and approval by the District Representative. Any request for alternate pipe materials is to comply with Section 01 33 00.
- B. Alternatives to SRPE pipe and fittings for mainline canal piping 48-inch diameter and greater may be used if the alternate pipe is approved by the District Representative. The alternate material pipe characteristics shall meet or exceed the following technical criteria in addition to other Contract requirements:
 1. Pressure rating of all pipe, fittings, and associated gaskets or other jointing methodology shall meet or exceed laboratory tests to 10.8 psi (25 feet hydraulic head) when tested in accordance with ASTM D3212.
 2. HS-20 loading with 1'-6" minimum soil cover and 25'-0" maximum soil cover.
 - 2-3. Approved SRPE pipe product is Duromaxx brand pipe by Contech. Alternative pipe materials that have been approved include Spirolite (Class 160) by Plasson USA, and Santitie HP (triple Wall) by ADS.
- C. Redesign for Alternative Piping
 1. The Contract pipe alignment, appurtenances, valves, and other features are to be retained in the redesign. Variations from the contract drawings are to be clearly identified. No reduction in pipe size is allowed.
 2. Typical unrestrained fittings to be bell and spigot type unless otherwise noted.

3. Restrained fittings are to be flanged unless otherwise noted.
4. The complete design drawings, specifications, design calculations, product information, and supporting data are to be submitted for District review.

1.05 ALTERNATE PIPE SIZES

- A. The contractor may submit alternative pipe sizes to replace the 48, 54" and 60" pipes as shown on the drawings. Contractor must demonstrate that any alternative pipe sizes satisfies the minimum flow of 138 cfs with the following criteria:
1. Calculations be based on pipe flowing full condition with no additional flow due to any surcharge.
 2. Slope of pipes to be 0.0005 foot-per-foot (1 foot drop per 2,000 foot run)
 3. A Mannings coefficient of no less than 0.012 must be used. This is to represent a nominal interior surface roughness coefficient assumption over the life of the pipe.
 4. Pipe backfill conditions must meet or exceed that shown on the plans with Gravel Backfill to extend to at least six (6) inches of the highest common trench pipe springline.

1.051.06 SUBMITTALS

- A. Alternative Material to SRPE Pipe: Submit Variance Request at time of bid containing material tests and calculations demonstrating compliance with Paragraph 1.04 above.
- B. Manufacturer's data for the following:
1. Polyvinyl Chloride Irrigation Pipe (PIP): Submit for approval, manufacturer's literature, specifications, and installation instructions for pipe and fittings for irrigation turnouts.
 2. Steel Reinforced Polyethylene (SRPE): Submit for approval, manufacturer's literature, specifications, and installation instructions for pipe and fittings for mainline canal piping 48-inch diameter and larger.
- C. Shop Drawings:
1. Shop drawings showing dimensions and details of pipe joint fittings, fitting specials, valves and appurtenances.
 2. Detailed layout, spacers, adapters, connectors, fittings and pipe supports not indicated in the Contract Documents.
 3. Fittings and specials details such as elbows, wyes, tees, outlets, connections, or other specials where shown on the contract drawings. All

fittings and specials shall be properly reinforced to withstand the internal pressure, both circumferential and longitudinal, and the external loading conditions shown in the Contract Documents.

- D. Testing Plan: Include standard procedures to be followed for Low-pressure air testing with a list of all equipment to be utilized. Provide corrective actions to be undertaken if tests come back negative.

4.061.07 QUALITY ASSURANCE

- A. The contract drawings indicate the extent and general arrangement of the piping systems. The Contractor shall be responsible for the coordination and proper relation of his work to the buildings and structures and to the work of all trades. The Contractor shall familiarize himself with all details of the work and working conditions, verify all dimensions in the field, and advise the District Representative of any discrepancy before performing any work.
- B. The pipe manufacturer shall test all pipe and fittings as required by these specifications and the reference standards. The pipe manufacturer shall submit to the District two copies of all test results including a written certification that material to be delivered is represented by the samples tested and that such delivered materials meet or exceed specified requirements. No pipe shall be delivered until test results and certifications are in the hands of the District.
- C. The District shall have free access to all testing records pertaining to material to be delivered to the job site. The District may elect to be present at any or all material testing operations.
- D. The basis of acceptance shall be manufacturer's certificate of compliance, accompanied by two copies of pressure test results of the pipe or fittings involved.

4.071.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle pipe, fittings and accessories on site under provisions of Section 01 60 00.
- B. Handle pipe accessories so as to ensure delivery in a sound and undamaged condition.
 - 1. Pipe shall be handled in a manner that will prevent damage to the pipe. Damaged pipe shall be rejected, and the Contractor shall immediately place damaged pipe apart from the undamaged and shall remove the damaged pipe from the site within 24 hours.
 - 2. Ropes, fabric or rubber protected slings and straps shall be used when handling pipes. Chains, cables or hooks inserted into the pipe ends shall not be used. Two slings spread apart shall be used for lifting each length of pipe.
 - 3. On nested loads, unload each pipe size independently.

- C. Pipes shall be stored on level ground, preferably turf or sand, free of sharp objects, which could damage the pipe. Stacking of the pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature conditions. Where necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such width as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.
- D. Pipe shall be stored on clean level ground to prevent undue scratching or gouging. The handling of the pipe shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects.
 - 1. The interior of all pipe surface shall be free of cuts, gouges, or scratches.
 - 2. For PVC Irrigation Pipe, the maximum allowable depth of cuts, scratches or gouges on the exterior of the pipe is 5 percent of wall thickness.
- E. Dirt or other foreign material shall be prevented from entering the pipe during handling or storage. Thoroughly clean interior of pipe and accessories before placing pipe. Keep the pipe clean during the placing operations by plugging or other method approved by the District Representative.
- F. Before installation, inspect each piece of pipe and each fitting for defects. Material found to be defective before or after placement shall be replaced with sound material meeting the specified requirements, and without additional cost to the District.
- G. Rubber gaskets: Store loose gaskets in a cool dark place until just prior to time of installation.
- H. Provide proper blocking and storage practices to protect bell and spigot pipe and fittings from deformation of the pipe bells.

PART 2 – PRODUCTS

2.01 GENERAL

All pipe shall be clearly marked with manufacturer's name, type, class, and thickness applicable. Lettering shall be legible and permanent under normal conditions of handling and storage.

2.02 PIPES

- A. Perforated Corrugated High Density Polyethylene (HDPE) Underdrain Pipe:
 - 1. Pipe and fittings (up to 10 inch nominal diameter) shall conform to WSDOT 9-05.2(7) "Perforated Corrugated Polyethylene Underdrain Pipe (Up to 10 inch)".
 - 2. Pipe and fittings (12 inch nominal diameter and larger) shall conform to WSDOT 9-05.2(8) "Perforated Corrugated Polyethylene Underdrain Pipe (12-inch Through 60-inch Diameter Maximum), Couplings, and Fittings".

3. Unless otherwise noted, perforation pattern shall be AASHTO Class I for use in combined storm/underdrain systems.
- B. Polyvinyl Chloride (PVC) Irrigation Pipe:
1. PVC pipe and fittings shall conform to ASTM D2241 for diameters from 6 inches to 27 inches.
 2. All pipe shall be made from quality PVC resin, compounded to provide physical and mechanical properties that equal or exceed cell class 12454 as defined in ASTM D1784
 3. All pipes shall be suitable for use as pressure conduits and shall have a Dimension Ratio (DR) of 41 unless indicated otherwise.
 4. Rubber gaskets shall be factory installed and conform to ASTM F477.
- C. Steel Reinforced Polyethylene (SRPE) Mainline Canal Pipe
1. SRPE shall be manufactured in accordance with the applicable requirements of ASTM F2562.
 2. Virgin high density polyethylene stress-rated resins will be used to manufacture SRPE pipe and complimentary fabricated fittings. Resins will conform to the minimum requirements of cell classification 345464C as defined and described in the latest version of ASTM D3350.
 3. Pipe lengths shall be joined on site using coupling bands, bell & spigots, or welded couplers especially designed for SRPE pipe. Joints shall be gasketed, bell and spigot joints where both the bell and spigot are reinforced with steel that is fully encased in stress-rated high density polyethylene (meeting the requirements set forth in the above Material Properties paragraph) and that have been laboratory tested to 10.8 psi in accordance with ASTM D3212.
 4. The SRPE system shall be designed for a minimum HS-20/HS-25 final live loading conditions with the minimum pipe stiffness in accordance with ASTM F2562. The SRPE system shall meet HS-20/HS-25 loading requirements with a minimum cover of 18-inches.
 5. Elastomeric gaskets shall comply with the requirements specified in ASTM F477.

2.03 LUBRICANT

The lubricant used for the assembly of gasketed joints shall have no detrimental effect on the gasket or on the pipe.

2.04 BEDDING AND BACKFILL MATERIAL

Bedding and backfill materials shall be in accordance with Section 31 23 00.

2.05 MARKING TAPE OR TRACER WIRE

Furnish marking tape or tracer wire in accordance with Section 33 05 26.

2.06 FITTINGS

All fabricated fittings and couplings supplied by manufacturer shall be constructed to ensure no loss of structural integrity or joint tightness at welded seems and joints. Only those fittings supplied by or recommended by the manufacturer shall be used.

2.07 VALVES AND GATES

Valves and gates shall be in accordance with Section 33 12 16.

PART 3 – EXECUTION

3.01 FIELD MEASUREMENT

Make necessary measurements in the field to assure precise fit of items in accordance with the approved design.

3.02 INSTALLATION

- A. All pipe, fittings, and couplings shall be installed in accordance with ASTM D2321 unless otherwise directed by the manufacturer, the contract drawings, these specifications, and with the best commercial trade practice.
- B. Any special tools required for laying, jointing, cutting, etc., shall be supplied and properly used.
- C. All pipe shall be thoroughly cleaned before laying and shall be kept clean until accepted in the completed work
- D. Bell and spigot pipe shall be laid with the bell-ends pointing in the direction of laying. Pipe shall be graded in straight lines taking care to avoid the formation of any dips or low points. All joints shall be made in strict conformance with the manufacturer's recommendations.
- E. Open Trench Installation
 - 1. Under no circumstances shall the pipe or accessories be dropped into the trench.
 - 2. Pipe shall be laid to the lines and grade shown on the contract drawings with bedding and backfill in conformance with Section 31 23 00.
 - 3. The full length of each section of pipe and fittings shall rest solidly on the pipe bed, with recessed excavation to accommodate bells, joints and couplings. Anchors and supports shall be provided where necessary and where indicated on the contract drawings for fastening work into place.
 - 4. The Contractor shall establish line and grade and transfer it into the trench where they shall be carried by means of laser level or taut grade line supported on firmly set batter boards at intervals of not more than

thirty (30) feet. Not less than three (3) batter boards shall be in use at one time. Grades shall be constantly checked and in the event that batter boards do not line up, the work shall be immediately stopped and the cause remedied before proceeding with the work. Any other procedure shall have the written approval of the District.

5. Good alignment shall be preserved during installation. Deflection of the pipe shall occur only at those places on design drawings, as required for control of thermal expansion and contraction, and as approved by the District Representative. Fittings, in addition to those shown on the contract drawings, shall be used only if necessary or required by the District Representative.
6. When moveable trench bracing such as trench boxes, moveable sheeting, shoring or plates are used to support the sides of the trench, care shall be taken in placing and moving the boxes or supporting bracing to prevent movement of the pipe, or disturbance of the pipe bedding and the backfill. Trench boxes, moveable sheeting, shoring or plates shall not be allowed to extend below top of the pipe. As trench boxes, moveable sheeting, shoring or plates are moved, pipe bedding shall be placed to fill any voids created and the backfill shall be recompact to provide uniform side support for the pipe.

3.03 FIELD QUALITY CONTROL

- A. Upon completion of the work in this section, remove all rubbish, trash and debris resulting from construction operations. Structures and pipes should be free from sediment and debris at the end of construction. Provide all necessary facilities for the inspection and clearing and dispose of waste, including water.
- B. Perform field inspection and testing in accordance with Section 01 45 00. Inspect the pipe for defects before installation and joining. Defective, damaged, or unsound pipe will be rejected.
- C. Pipe cleaning and pressure testing of piping systems shall be conducted in accordance with ASTM F1417.
- D. Pipe deflection shall not exceed a maximum of five-percent (5%).
- D-E. Each valve shall be tested by closing each in turn and relieving the pressure beyond. This test of the valve will be acceptable if there is no immediate loss of pressure on the gauge when the pressure comes against the valve being checked. The Contractor shall verify that the pressure differential across the valve does not exceed the rated working pressure of the valve. Should any defects in design, materials, or workmanship appear during these tests, the Contractor shall correct such defects with the least possible delay and to the satisfaction of the District.

END OF SECTION

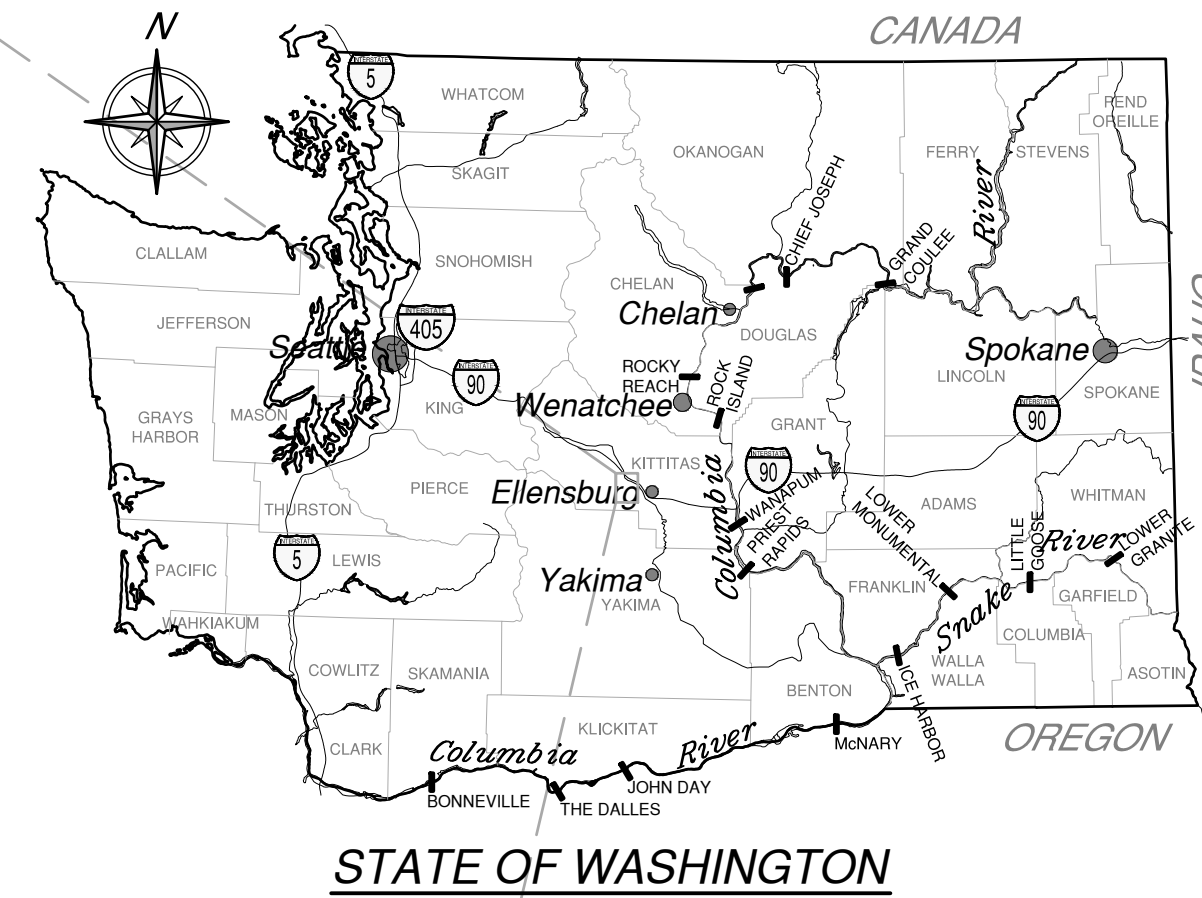
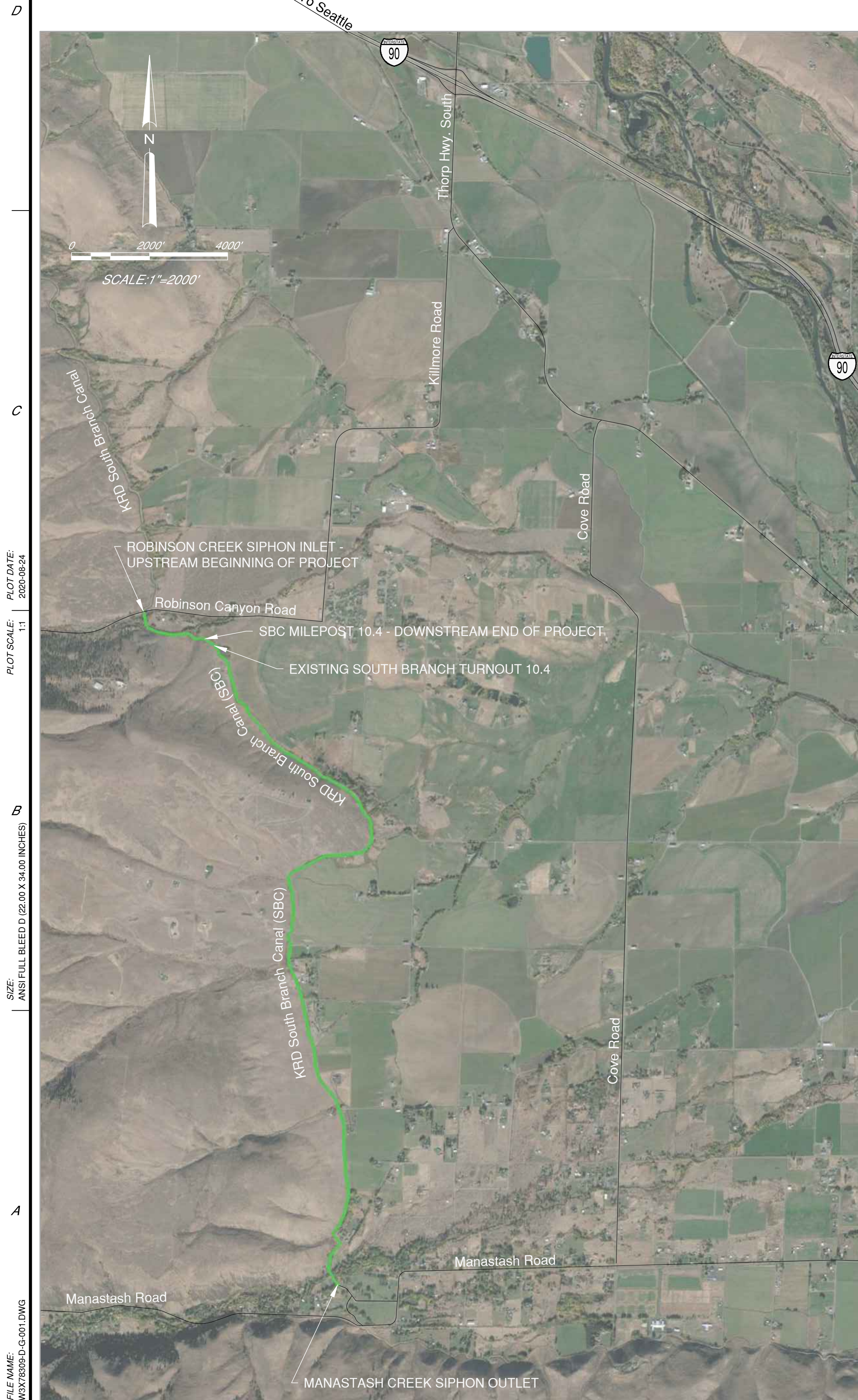


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SOUTH BRANCH CANAL IMPROVEMENTS

WATER CONSERVATION AND OPERATIONAL IMPROVEMENTS

ROBINSON CREEK SIPHON (MP 10.0) TO SOUTH BRANCH CANAL MILEPOST 10.4



DRAWING SET INDEX			
NO.	DRAWING	SHEET TITLE	SHEET SUBTITLE
01	G-001	COVER SHEET	LOCATION MAP AND INDEX
02	G-002	GENERAL	ABBREVIATIONS
03	G-003	GENERAL	NOTES AND SPECIFICATIONS
04	G-004	GENERAL	SURVEY CONTROL POINTS
05	G-005	GENERAL ALIGNMENTS	PROJECT ALIGNMENT MAP
06	G-006	GENERAL ALIGNMENTS	EXISTING AND PROPOSED
07	CG001	GRADING SITE PLAN	KEY MAP
08	CG101	PLAN AND PROFILE	ROBINSON CREEK SIPHON
09	CG102	PLAN AND PROFILE	STA P10+00 TO STA P13+00
10	CG103	PLAN AND PROFILE	STA P13+00 TO STA P18+00
11	CG104	PLAN AND PROFILE	STA P18+00 TO STA P22+50
12	CG105	PLAN AND PROFILE	STA P22+50 TO STA P26+50
13	CG106	PLAN AND PROFILE	STA P26+50 TO STA P28+30
14	CG301	SECTION	TYPICAL ACCESS ROAD AND PIPELINE TRENCHING
15	CG302	SECTION	CDF BACKFILL
16	CG310	CROSS SECTIONS	STA P10+50 TO STA P16+50
17	CG311	CROSS SECTIONS	STA P16+50 TO STA P22+00
18	CG312	CROSS SECTIONS	STA P22+50 TO STA P29+50
19	CG401	ROBINSON CULVERT CROSSING	PLAN VIEW
20	CG402	ROBINSON CULVERT CROSSING	PROFILE AND SECTION
21	CG403	ROBINSON CULVERT CROSSING	CHANNEL PROFILE
22	CG410	UNDERSHOT CULVERT	TYPICAL PLAN AND SECTIONS
23	CG430	CANAL CONTROL STRUCTURE	PRECAST PLAN AND SECTIONS
24	CG431	CANAL CONTROL STRUCTURE	DETAILS
25	CG440	TYPICAL DELIVERY BOX TURNOUT	PLAN AND SECTIONS
26	CG450	PIPELINE TRANSITION TO CANAL	PLAN AND SECTIONS
27	CG501	MISCELLANEOUS	DETAIL
28	CG502	MISCELLANEOUS	DETAIL
29	RI801	RECORD DRAWING 5.1-A-9 (23421)	SOUTH BRANCH CANAL LOCATION MAP
30	RI802	RECORD DRAWINGS 3.2-G-29 (23423)	PROFILE AND SECTION STA 300+00 TO STA 527+96.0
31	RI803	RECORD DRAWING 3.2-G-30 (23424)	PROFILE AND SECTION STA 527+96 TO STA 756+00
32	RI804	RECORD DRAWING 33-D-382 (23435)	ROBINSON CREEK SIPHON
33	RI805	RECORD DRAWING 33-D-324 (23183)	CONCRETE PIPE CULVERTS
34	RI810	USFS STANDARD PLAN HM000028	GATE BARRIER - RAIL TYPE
35	RI811	USFS STANDARD PLAN HM000028	GATE BARRIER - RAIL TYPE DETAILS



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DRAWN BY: RILEY A. HOLLAND
 CHECKED BY: JOHN M. ETULAIN
 APPROVED BY: DAVID L. ALISON
 CONTRACT / PROJECT NO.: 10376509
 FILE NUMBER: 10376509-01-001
 DATE: 2/20/05

DESIGNED BY: JOHN M. ETULAIN

Conserving water, promoting local agriculture, and enhancing the environment . . .

KITTTAS RECLAMATION DISTRICT
 ELLENSBURG, WASHINGTON
 SOUTH BRANCH CANAL IMPROVEMENTS
 ROBINSON SIPHON TO MANASTASH CREEK SIPHON
SOUTH BRANCH IMPROVEMENTS
 ROBINSON SIPHON (MILEPOST 10.0) TO SOUTH BRANCH CANAL MILEPOST 10.4

REV NO	REV NO	REV NO	REV NO
		08-24-2020	08-11-2020
	1	JOHN M. ETULAIN	
	0		

UPDATED DRAWING INDEX FOR DRAWING C3302
 ISSUED FOR BIDDING

CONSULTANT PRODUCED BY

X ACCEPTANCE
 KRD ADMINISTRATOR TITLE

ELLENSBURG, WA 2019-10
 LOCATION DATE

COVER SHEET

LOCATION MAP AND INDEX

G-001
 SHEET 01 OF 35

FILE NAME: W:\2005\33-SBC\G-001.DWG
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 PLOT SCALE: 1" = 100'
 PLOT DATE: 2/20/2005
 C
 D

FILE NAME: W:\2020\G-002.DWG
 SIZE: ANSI FULL BLEED D (22.00 X 34.00 INCHES)
 PLOT SCALE: 1" = 10'-0"
 PLOT DATE: 2020-08-24

ABBREVIATIONS

A,AMPS	AMPERES
ABT	ABOUT
ABV FF	ABOVE FINISH FLOOR
ACP	ASBESTOS CEMENT PIPE
ADA	AMERICANS WITH DISABILITIES ACT
ALUM	ALUMINUM
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APPROX	APPROXIMATELY
AR	AIR RELEASE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AUX	AUXILIARY
@	AT
BE	BOTH ENDS
BETW	BETWEEN
BLDG	BUILDING
BO	BLOW OFF
BOT	BOTTOM
BRG	BEARING
C	CHANNEL STEEL, CONDUIT
CDF	CONTROLLED DENSITY FILL
CJ	CONSTRUCTION JOINT
CL	CENTERLINE
CLR	CLEAR
CMP	CORRUGATED METAL PIPE
CO	COUNTY, CLEANOUT
COL'S	COLUMNS
CONC	CONCRETE
CONN	CONNECTION
CONT	CONTROL, CONTINUED, CONTINUOUS
CPEP	CORRUGATED POLYETHYLENE PIPE
CPP	CORRUGATED PLASTIC PIPE
CRES	CORROSION RESISTANT STEEL (STAINLESS STEEL)
Ø	DIAMETER, PHASE
DI	DUCTILE IRON
DIA	DIAMETER
DET	DETAIL
DIFF	DIFFERENTIAL
DWG	DRAWING
E	EAST, EASTING, ELECTRICAL (UNDERGROUND)
EA	EACH
EF	EACH FACE
ELECT	ELECTRICAL
EL, ELEV	ELEVATION
EMBED	EMBEDMENT
EMER	EMERGENCY
EOG	EDGE OF GRAVEL
EQ	EQUAL
EW	EACH WAY
EXIST/EX	EXISTING
FB	FLAT BAR
FF	FAR FACE
FFE	FINISHED FLOOR ELEVATION
FIG	FIGURE
FLNG, FLG	FLANGE
FM	FORCE MAIN
FT	FEET
FTG	FOOTING
G	GROUND, GAS
GA	GAGE, GAUGE
GALV	GALVANIZED
GRT'G	GRATING
GV	GATE VALVE
GW	GROUND WATER
H	HIGH
HDPE	HIGH DENSITY POLYETHYLENE
HEX	HEXAGONAL
HORIZ	HORIZONTAL
HP	HORSEPOWER, HIGH POINT
HSS	HOLLOW STRUCTURAL SECTION
HT	HEIGHT
HTR	HEATER
HVAC	HEATING, VENTILATION, AND AIR CONDITIONING
ID	INSIDE DIAMETER
IE (INV EL)	INVERT ELEVATION
INFO	INFORMATION
INST	INSTRUMENT
JB	JUNCTION BOX
KSI	THOUSAND POUNDS PER SQUARE INCH
KV	KILOVOLT

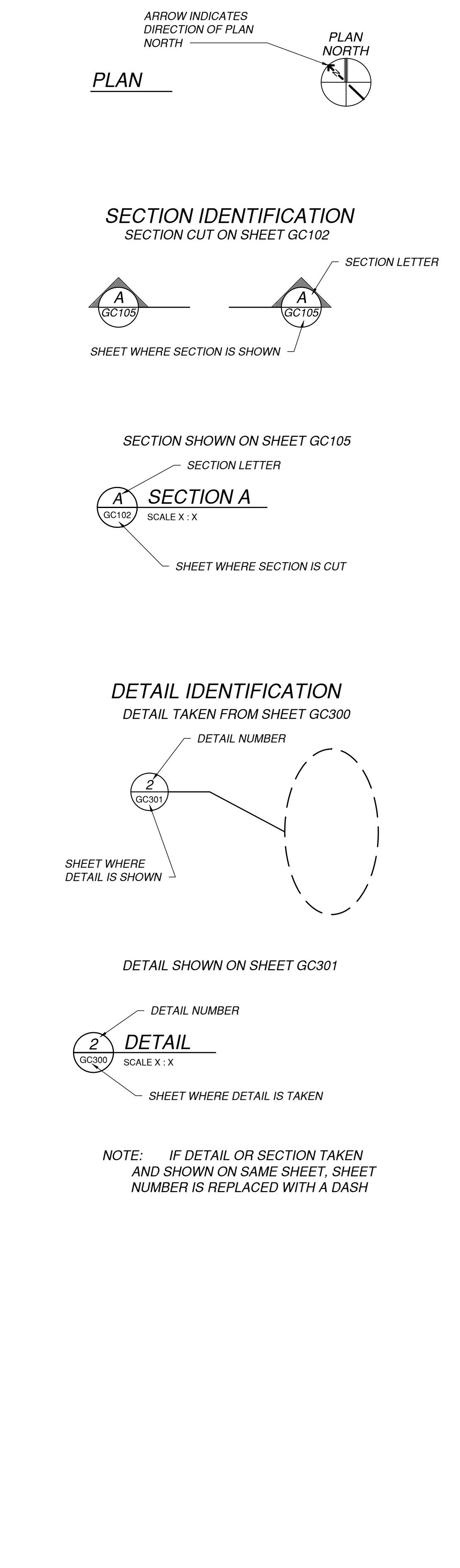
ABBREVIATIONS (CONTINUED)

KVA	KILOVOLT AMPERE
KW	KILOWATT
L	ANGLE STEEL, LENGTH, LINE
LF	LINEAR FOOT
LG	LONG
LOC	LOCATION
LOC'D	LOCATED
LP	LOW POINT
LT	LIGHT, LEFT
LTG	LIGHTING
MAX	MAXIMUM
MC	MISCELLANEOUS CHANNEL
MECH	MECHANICAL
MH	MANHOLE
MFG	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MON	MONOLITH
MP, M.P.	MILE POST
MS	MOTOR STARTER
MTD	MACHINE SCREW
MTG	MOUNTED
MTZ	MOTORIZED
N	NORTH, NORTHING
NEC	NATIONAL ELECTRIC CODE
NF	NEAR FACE, NEAR FLANGE
NIC	NOT IN CONTRACT
NMC	NON METALLIC CONDUIT
NMHW	NORMAL MAXIMUM HIGH WATER
NO, #	NUMBER
NOM	NOMINAL
NP	NAME PLATE
NTP	AMERICAN NATIONAL STANDARD TAPER PIPE THREAD
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTER DIAMETER
OHP	OVERHEAD POWER
OHT	OVERHEAD TELEPHONE
OHWM	ORDINARY HIGH WATER MARK
OPER	OPERATION
OPNG	OPENING
OPP HAND	OPPOSITE HAND
P	POLE, POWER
PA	POLLUTION ABATEMENT
PB	PULLBOX
PC	POINT OF CURVATURE
PE	POLYETHYLENE
PERF	PERFORATED
PG	PLATE GIRDER
PH	PHASE
PI	POINT OF INTERSECTION
PIV	POST-INDICATOR VALVE
PL	PLATE
PLCS	PLACES
PNL	PANEL
PNT	COORDINATE POINT
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENCY
PUD	PUBLIC UTILITY DISTRICT
PVC	POLYVINYL CHLORIDE CONDUIT OR PIPE, POLYVINYL CHLORIDE, POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT
PVT	POINT OF VERTICAL TANGENCY
PW	POTABLE WATER
R, RAD	RADIUS
RB	RIGHT BANK
RCP	REINFORCED CONCRETE PIPE
RED	REDUCER
REC, RECEPT	RECEPTACLE
REF	REFERENCE
REL	RELAY
REM	REMOTE
REQ'D	REQUIRED
RGS	RIGID GALVANIZED STEEL
RJ	RESTRAINED JOINT
RW, R/W	RIGHT OF WAY
RT	RIGHT
S	S-SHAPE STEEL, SOUTH
SCH	SCHEDULE
SD	STORM DRAIN
SE	SOUTH EAST
SECT	SECTION
SF	SQUARE FEET
SHT	SHEET
SIM	SIMILAR

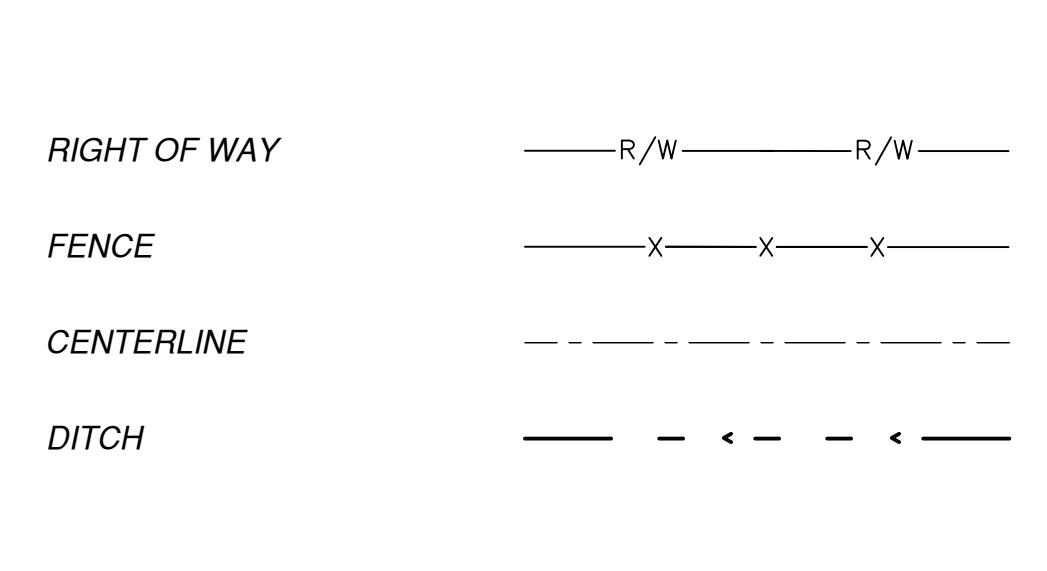
ABBREVIATIONS (CONTINUED)

SPA	SPACES, SPACING
SPEC	SPECIFICATION
SS	STAINLESS STEEL (CRES)
STA	SANITARY SEWER STATION
STD	STANDARD
STIFF	STIFFENER
STL	STEEL
STR	STRUCTURAL
SYMM	SYMMETRICAL
T&B	TOP AND BOTTOM
TB	THRUST BLOCK
TBE	THREADED BOTH ENDS
THD'D	THREADED
THRU	THROUGH
TOC	TOP OF CONCRETE, TOP OF CURB
TOB	TOP OF BANK
TOG	TOP OF GRATING
TOS	TOP OF STEEL
TS	TUBE SECTION
TYP	TYPICAL
UG	UNDERGROUND
UGP	UNDERGROUND POWER
UGD	UNDERGROUND DATE/TELEPHONE
UHMWPE	ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE
UNC	UNIFIED NATIONAL COARSE
UNO	UNLESS NOTED OTHERWISE
V	VOLTS
VC	VERTICAL CURVE
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
W	W-SHAPE STEEL, WIRE, WIDE WATER, WEST
W/	WITH
WG	WIRE GAUGE
WM	WATER METER
WP	WEATHERPROOF, WORK POINT
WSDOT	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
WT	WT STEEL SHAPE
XFMR	TRANSFORMER
XMTR	TRANSMITTER
XS PIPE	EXTRA STRONG PIPE (SCHEDULE 80 PIPE)

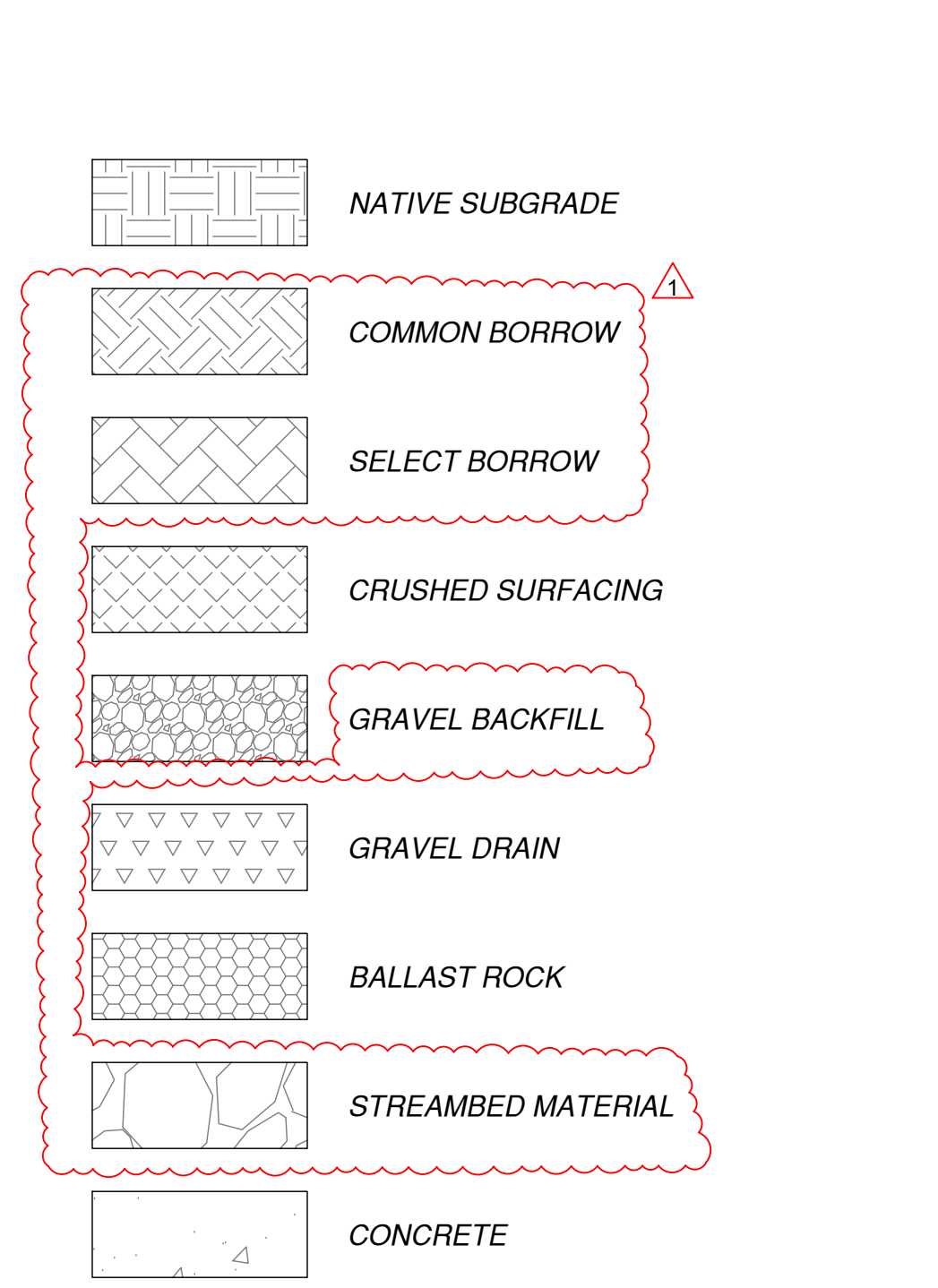
SHEET SYMBOLS



LINE TYPES



HATCH



Kittitas Reclamation District

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DRAWN BY: R. HOLLAND
CHECKED BY: J. M. ETULAIN
APPROVED BY: D. L. ALISON
CONTRACT / PROJECT NO.: 1037859
DATE: 08-11-2020
FILE NUMBER: 1037859-01-002

DESIGNED BY: J. M. ETULAIN

KITTITAS RECLAMATION DISTRICT
ELLENSBURG, WASHINGTON
SOUTH BRANCH CANAL IMPROVEMENTS
ROBINSON SIPHON TO MANASTASH CREEK SIPHON
SOUTH BRANCH IMPROVEMENTS
ROBINSON SIPHON (MILEPOST 10.0) TO
SOUTH BRANCH CANAL MILEPOST 10.4

Conserving water, promoting local agriculture, and enhancing the environment . . .

REV NO	REV NO	REV NO	REV NO

ADJUSTED MATERIAL HATCHING KEY
ISSUED FOR BIDDING

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X ACCEPTANCE
KRD ADMINISTRATOR TITLE

ELLENSBURG, WA 2020-08
LOCATION DATE

GENERAL
ABBREVIATIONS

G-002
SHEET OF 35

D

C

B

A

SOUTH BRANCH IMPROVEMENTS EXISTING CANAL ALIGNMENT

Table with 7 columns: ID NO., DISTANCE (GRID), RADIUS (GRID), BEARING, START GRID COORDINATE (PROJECT DATUM), END GRID COORDINATE (PROJECT DATUM), CURVE Δ. Rows include L1 through L10.

SOUTH BRANCH IMPROVEMENTS PROPOSED PIPE ALIGNMENT

Table with 7 columns: ID NO., DISTANCE (GRID), RADIUS (GRID), BEARING, START GRID COORDINATE (PROJECT DATUM), END GRID COORDINATE (PROJECT DATUM), CURVE Δ. Rows include L11 through L18.

SOUTH BRANCH IMPROVEMENTS ACCESS ROAD ALIGNMENT

Table with 7 columns: ID NO., DISTANCE (GRID), RADIUS (GRID), BEARING, START GRID COORDINATE (PROJECT DATUM), END GRID COORDINATE (PROJECT DATUM), CURVE Δ. Rows include L19 through L30.

- NOTES: 1. THIS INFORMATION IS IN LOCAL PROJECT GROUND DISTANCES. SEE NOTE C-4 ON SHEET G-003 FOR INFORMATION ON CONVERTING TO HARN WASHINGTON STATE PLANE, SOUTH ZONE, US SURVEY FOOT.



Jacobs logo and contact information: 1100 127th Ave NE, Suite 500, Bellevue, WA 98004. Includes drawing, checked, approved, and contract/project details.

Professional Engineer seal for John M. Etulain, State of Washington, License No. 31933. Text: 'Conserving water, promoting local agriculture, and enhancing the environment... SOUTH BRANCH IMPROVEMENTS ROBINSON SIPHON TO MANASTASH CREEK SIPHON'.

Revision table with columns: REV NO., REV DATE, DESCRIPTION. Shows revision 1 dated 08-21-2020 by R. A. HOLLAND.

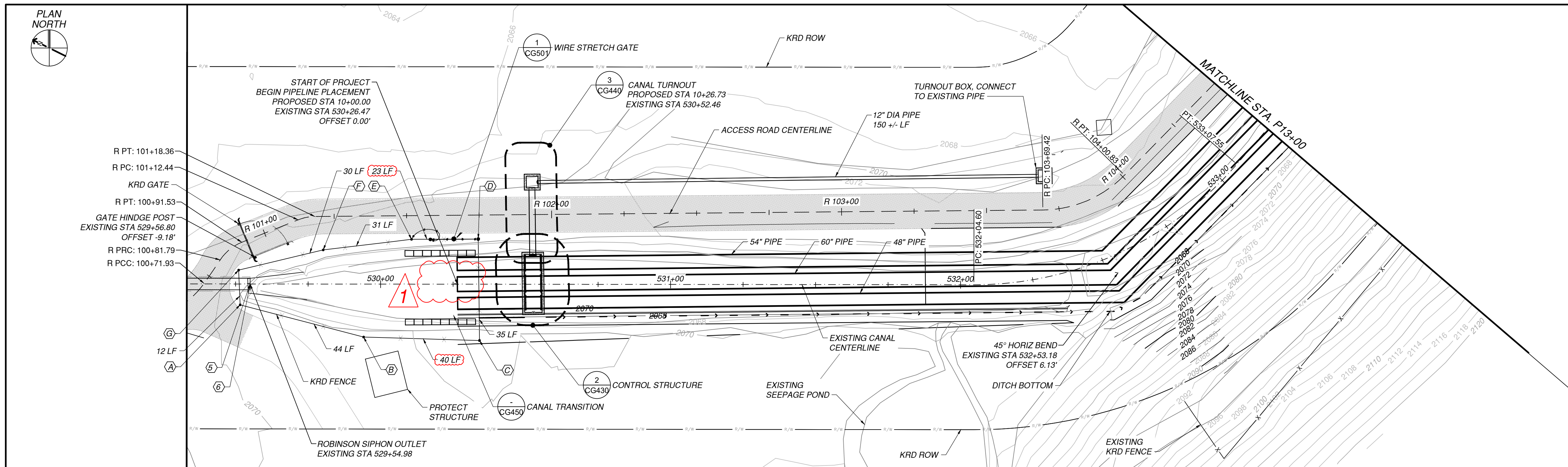
CONSULTANT PRODUCED BY section with signature line, ACCEPTANCE stamp, and LOCATION: ELLENSBURG, WA, DATE: 2020-08.

GENERAL ALIGNMENTS EXISTING AND PROPOSED

PLOT DATE: 2020-08-23
PLOT SCALE: 1" = 200'

SIZE: ANSI FULL BLEED D (22.00 X 34.00 INCHES)

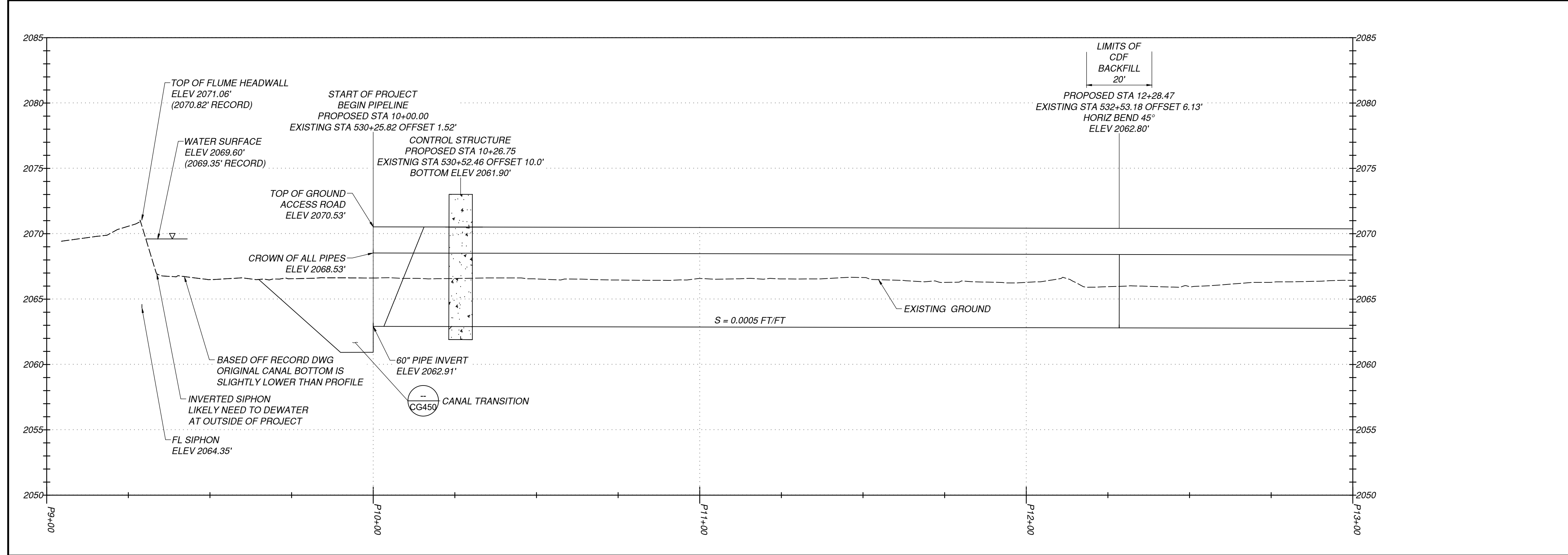
FILE NAME: W:\PROJECTS\G-006.DWG



PARTIAL PLAN
 STA. P10+00 TO STA. P13+00
 SCALE: 1"=20'

FENCE POST LOCATION		
NAME	EXISTING STATION	OFFSET
A	529+51.56	7.21
B	529+94.15	18.27
C	530+31.13	19.33
D	530+30.65	-15.66
E	530+10.65	-15.47
F	529+80.19	-11.77
G	529+51.02	-4.78

EXISTING STRUCTURE SURVEY POINTS		
NUMBER	DESCRIPTION	ELEVATION
5	FL SIPHON	2064.35'
6	FLUME	2071.06'



PARTIAL PROFILE
 STA. P10+00 TO STA. P13+00
 HORIZONTAL SCALE: 1"=20'
 VERTICAL SCALE: 1"=5'

NOTE:
 1. CDF BACKFILL TO PROVIDE THRUST BLOCKING AND BE CENTERED ON BEND. SEE CG302 FOR CDF BACKFILL INFORMATION.

SHEET SIZE: ANSI FULL BLEED D (22.00 X 34.00 INCHES) PLOT SCALE: 1"=10' PLOT DATE: 2020-08-23
 FILE NAME: CG102.DWG



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DRAWN BY: RILEY A. HOLLAND
 CHECKED BY: JOHN M. ETULAIN
 APPROVED BY: DAVID L. ALISON
 CONTRACT / PROJECT NO.: 1937829
 DATE: 08/11/2020
 FILE NUMBER: W927829.DWG102

Conserving water, promoting local agriculture, and enhancing the environment...

KITTITAS RECLAMATION DISTRICT
 ELLENSBURG, WASHINGTON
 SOUTH BRANCH CANAL IMPROVEMENTS
 ROBINSON SIPHON TO MANASTASH CREEK SIPHON
SOUTH BRANCH IMPROVEMENTS
 ROBINSON SIPHON (MILEPOST 10.0) TO SOUTH BRANCH CANAL MILEPOST 10.4

REV NO	DESCRIPTION	DATE
1	REVISED TO ADJUST BEGINNING OF PROPOSED ALIGNMENT - EXTEND FENCE TO ACCOUNT FOR REPOSITIONING	08-21-2020
0	ISSUED FOR BIDDING	08-11-2020

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X ACCEPTANCE
 KRD ADMINISTRATOR TITLE

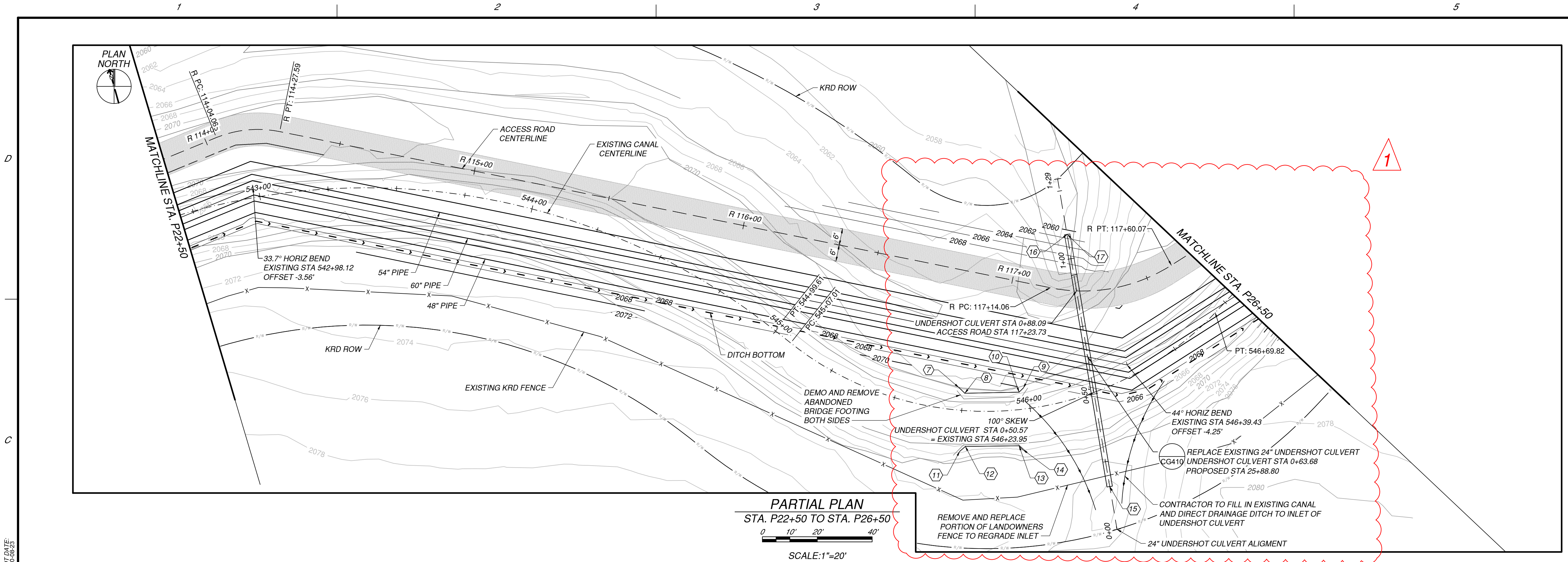
ELLENSBURG, WA 2020-08
 LOCATION DATE

PLAN AND PROFILE

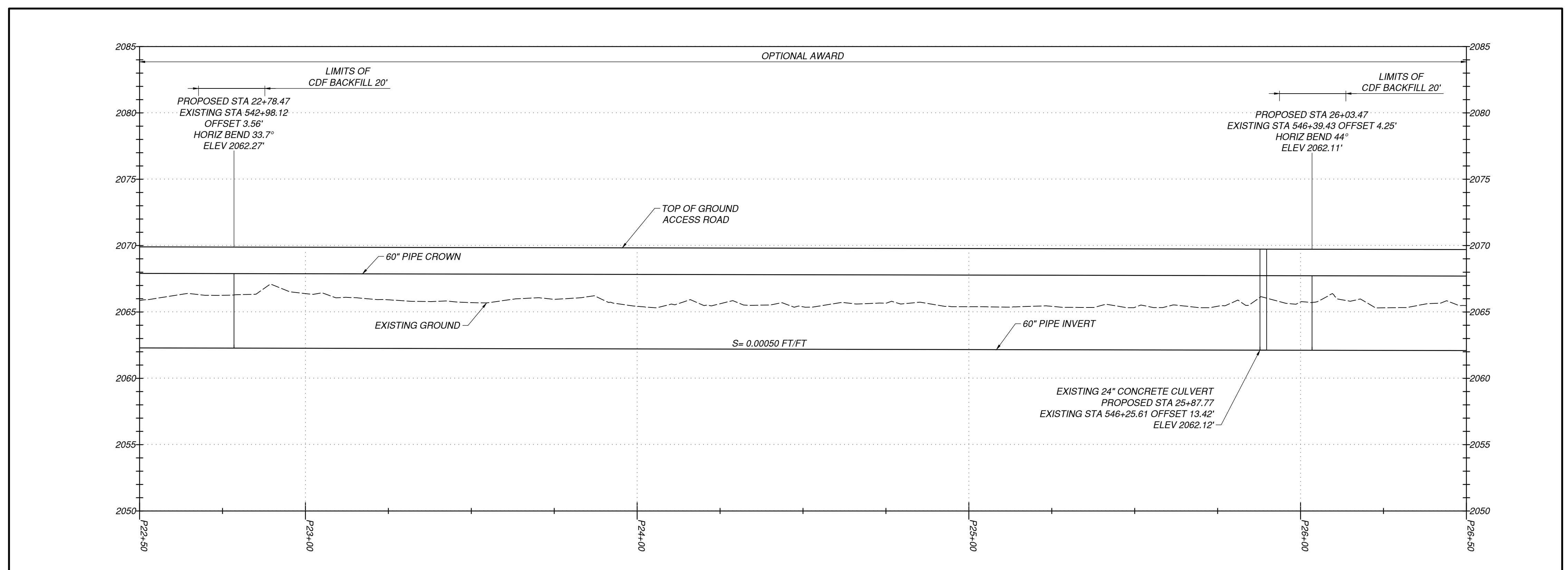
STA P10+00
 TO STA P13+00

CG102
 SHEET 09 OF 35

SOLICITATION NO.: 33-SBC-1004



PARTIAL PLAN
 STA. P22+50 TO STA. P26+50
 SCALE: 1"=20'



PARTIAL PROFILE
 STA. P22+50 TO STA. P26+50
 HORIZONTAL SCALE: 1"=20'
 VERTICAL SCALE: 1"=5'

STRUCTURE SURVEY POINTS		
NUMBER	DESCRIPTION	ELEVATION
7	NEW CL 8 CONC	2069.80'
8	CL 8 CONC	2071.15'
9	CL 8 CONC	2070.08'
10	CL 8 CONC	2071.16'
11	CL 8 CONC	2069.90'
12	CL 8 CONC	2071.14'
13	CL 8 CONC	2071.16'
14	CL 8 CONC	2070.28'
15	IE 24" CONC	2064.98'
16	FL	2057.74'
17	TOP 24" CONC	2058.98'

NOTE:
 1. CDF BACKFILL TO PROVIDE THRUST BLOCKING AND BE CENTERED ON BEND. SEE CG302 FOR CDF BACKFILL INFORMATION.

FILE NAME: CG105.DWG
 SHEET SIZE: ANSI FULL BLEED D (22.00 X 34.00 INCHES)
 PLOT SCALE: 1"=11'
 PLOT DATE: 2020-08-23



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DRAWN BY: RYLY A. HOLLAND
 CHECKED BY: JOHN M. ETULAIN
 APPROVED BY: DAVID L. ALLISON
 CONTRACT / PROJECT NO.: 1937859
 DATE: 08/11/2020
 FILE NUMBER: W9278209.DWG105
 DESIGNED BY: JOHN M. ETULAIN

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KITTITAS RECLAMATION DISTRICT
 ELLENSBURG, WASHINGTON
 SOUTH BRANCH CANAL IMPROVEMENTS
 ROBINSON SIPHON TO MANASTASH CREEK SIPHON
SOUTH BRANCH IMPROVEMENTS
 ROBINSON SIPHON (MILEPOST 10.0) TO SOUTH BRANCH CANAL MILEPOST 10.4

REV NO	REV NO	REV NO	REV NO	REV NO
			08-21-2020	08-11-2020
			RYLY A. HOLLAND	RYLY A. HOLLAND
			1	0
			REVISED TO IMPROVE GRADE AT INLET AND OUTLET OF UNDERSHOT CULVERT	ISSUED FOR BIDDING

CONSULTANT PRODUCED BY

X ACCEPTANCE KRD ADMINISTRATOR TITLE

ELLENSBURG, WA 2020-08
 LOCATION DATE

PLAN AND PROFILE

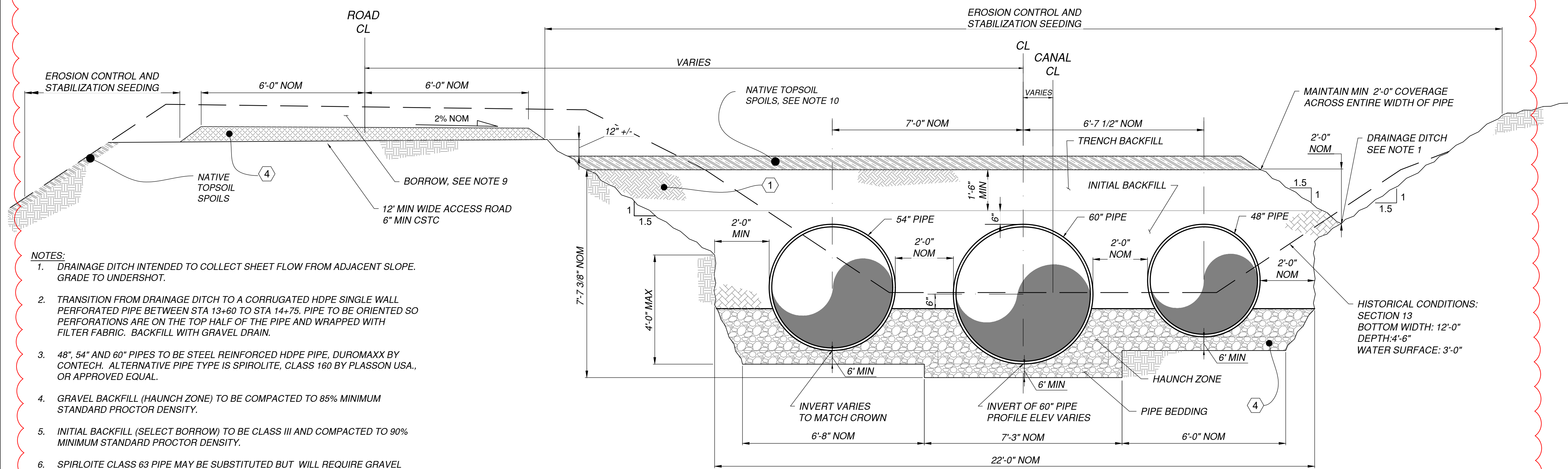
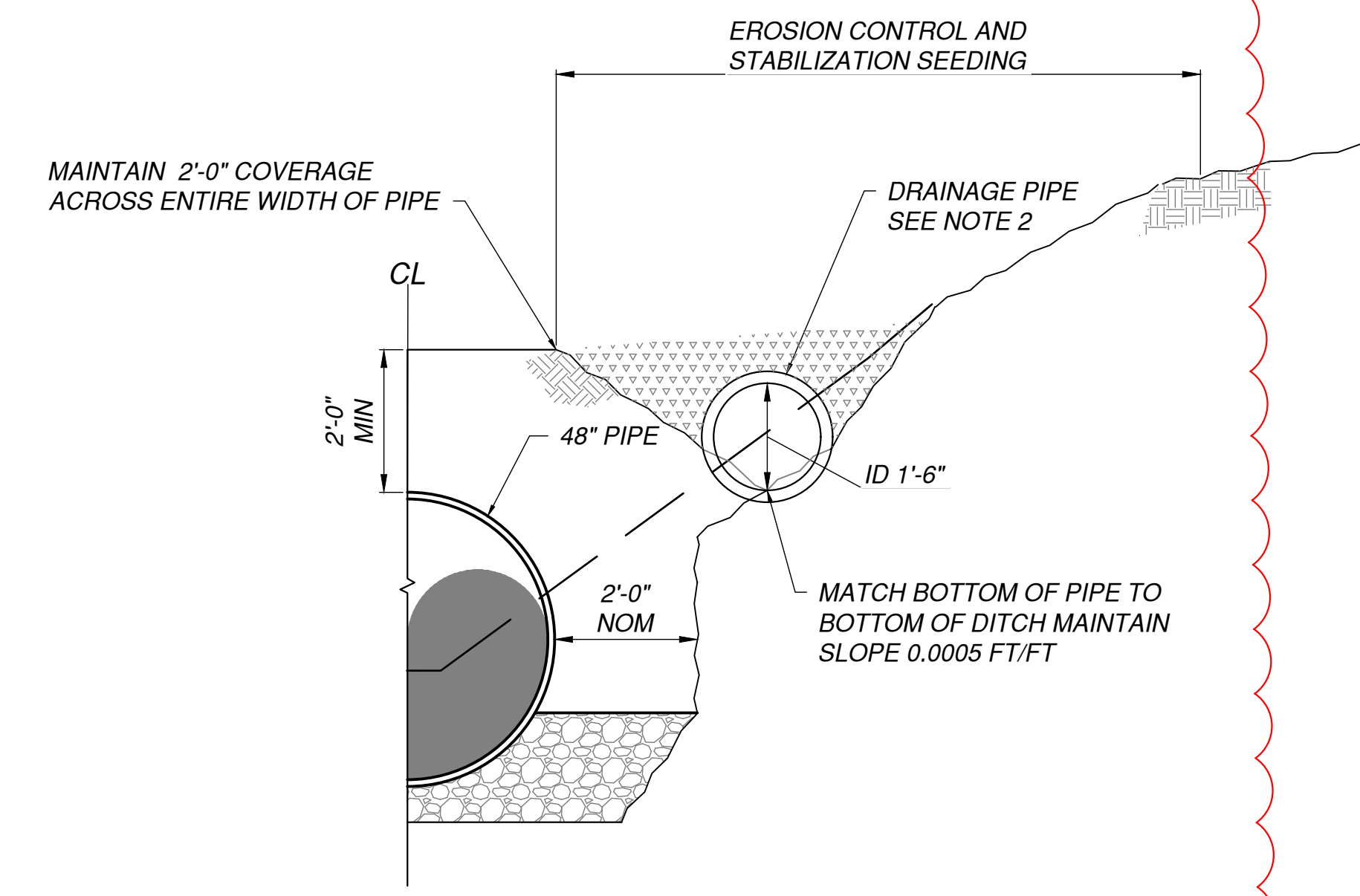
STA P22+50
 TO STA P26+50

CG105
 SHEET 12 OF 35

SOLICITATION NO.: 33-SBC-1004

KEYNOTE AND GRAPHICAL PATTERN OR SYMBOL LEGEND

NO.	GRAPHIC	NAME	DESCRIPTION
—	[Pattern]	NATIVE SUBGRADE	EXISTING UNDISTURBED AND/OR UNCLASSIFIED EARTHEN SOIL, ROCK, OR EXISTING GROUND SURFACING.
①	[Pattern]	COMMON BORROW	MULTIPLE AND/OR UNCLASSIFIED MATERIAL PLACED TO GRADES SHOWN. CONFORMING WITH WSDOT STANDARD SPECIFICATION SECTION 9-03.14(3) COMMON BORROW.
②	[Pattern]	SELECT BORROW	MULTIPLE AND/OR UNCLASSIFIED MATERIAL PLACED TO GRADES SHOWN. CONFORMING WITH WSDOT STANDARD SPECIFICATION SECTION 9-03.14(2) SELECT BORROW.
③	[Pattern]	CRUSHED SURFACING	CRUSHED SURFACING BASE COURSE (CSBC) MEETING REQUIREMENTS OF WSDOT STANDARD SPECIFICATION SECTION 9-03.9(3) FOR TOP COURSE.
④	[Pattern]	GRAVEL BACKFILL	CRUSHED OR NATURAL ANGULAR MATERIAL MEETING REQUIREMENTS OF WSDOT STANDARD SPECIFICATION SECTION 9-03.12(3) GRAVEL BACKFILL FOR PIPE ZONE BEDDING.
⑤	[Pattern]	CONCRETE	PORTLAND CEMENT CONCRETE - SEE RELATED TYPICAL DETAILS FOR SPECIFIC MIX AND ANY RELATED REINFORCING REQUIREMENTS.
⑥	[Pattern]	GRAVEL DRAIN	GRAVEL BACKFILL FOR DRAINS CONFORMING WITH WSDOT STANDARD SPECIFICATION SECTION 9-03.12(4) GRAVEL BACKFILL FOR DRAIN.
⑦	[Pattern]	STABILIZING FABRIC	MECHANICALLY STABILIZING GEOTEXTILE FABRIC, TENSAR TX7 TRIAX® GEOGRID OR EQUIVALENT.



- NOTES:**
- DRAINAGE DITCH INTENDED TO COLLECT SHEET FLOW FROM ADJACENT SLOPE. GRADE TO UNDERSHOT.
 - TRANSITION FROM DRAINAGE DITCH TO A CORRUGATED HDPE SINGLE WALL PERFORATED PIPE BETWEEN STA 13+60 TO STA 14+75. PIPE TO BE ORIENTED SO PERFORATIONS ARE ON THE TOP HALF OF THE PIPE AND WRAPPED WITH FILTER FABRIC. BACKFILL WITH GRAVEL DRAIN.
 - 48", 54" AND 60" PIPES TO BE STEEL REINFORCED HDPE PIPE, DUROMAXX BY CONTECH. ALTERNATIVE PIPE TYPE IS SPIROLITE, CLASS 160 BY PLASSON USA., OR APPROVED EQUAL.
 - GRAVEL BACKFILL (HAUNCH ZONE) TO BE COMPACTED TO 85% MINIMUM STANDARD PROCTOR DENSITY.
 - INITIAL BACKFILL (SELECT BORROW) TO BE CLASS III AND COMPACTED TO 90% MINIMUM STANDARD PROCTOR DENSITY.
 - SPIROLITE CLASS 63 PIPE MAY BE SUBSTITUTED BUT WILL REQUIRE GRAVEL BACKFILL COMPACTED TO 90% UP TO 12" ABOVE PIPE SPRING LINE.
 - PIPE JOINTS TO BE GASKETED BELL AND SPIGOT WITH MIN 10.8 PSI RATING IN ACCORDANCE WITH ASTM D3212.
 - CROWN OF ALL PIPES MEET SAME ELEVATION.
 - ACCESS ROAD TO BE CUT AND GRADED TO PROVIDE COMMON BORROW USED AS TRENCH BACKFILL.
 - PLACE 6" OF FILL MATERIAL ABOVE TRENCH BACKFILL FOR SLOPE STABILITY AND SITE RESTORATION. SEE G-003 FOR GRASS SEEDING REQUIREMENTS. FILL MATERIALS TO BE A COMBINATION OF TOP SOIL, MULCH, USABLE MATERIAL FROM CLEARING AND GRUBBING AND NATIVE SOIL.

(A) PIPE PLACEMENT TYPICAL SECTION
 SCALE: 1/2" = 1'-0"

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DESIGNED BY: JOHN M. ETULAIN
 CHECKED BY: JOHN M. ETULAIN
 APPROVED BY: DAVID L. ALISON
 CONTRACT / PROJECT NO.: 10376509
 DATE: 08-11-2020
 FILE NUMBER: W9278209-D-CG301

Kittitas Reclamation District

Conserving water, promoting local agriculture, and enhancing the environment. . . .

KITTITAS RECLAMATION DISTRICT
 ELLENSBURG, WASHINGTON
 SOUTH BRANCH CANAL IMPROVEMENTS
 ROBINSON SIPHON TO MANASTASH CREEK SIPHON

SOUTH BRANCH IMPROVEMENTS
 ROBINSON SIPHON (MILEPOST 10.0) TO SOUTH BRANCH CANAL MILEPOST 10.4

REV NO	REV BY	REV DATE	DESCRIPTION
1	JOHN ETULAIN	08-21-2020	REVISED TRENCH BACKFILL MATERIALS
0		08-11-2020	ISSUED FOR BIDDING

CONSULTANT PRODUCED BY

X ACCEPTANCE
 KRD ADMINISTRATOR TITLE

ELLENSBURG, WA 2020-08
 LOCATION DATE

SECTION
 TYPICAL ACCESS ROAD AND PIPELINE TRENCHING

CG301
 SHEET 14 OF 35

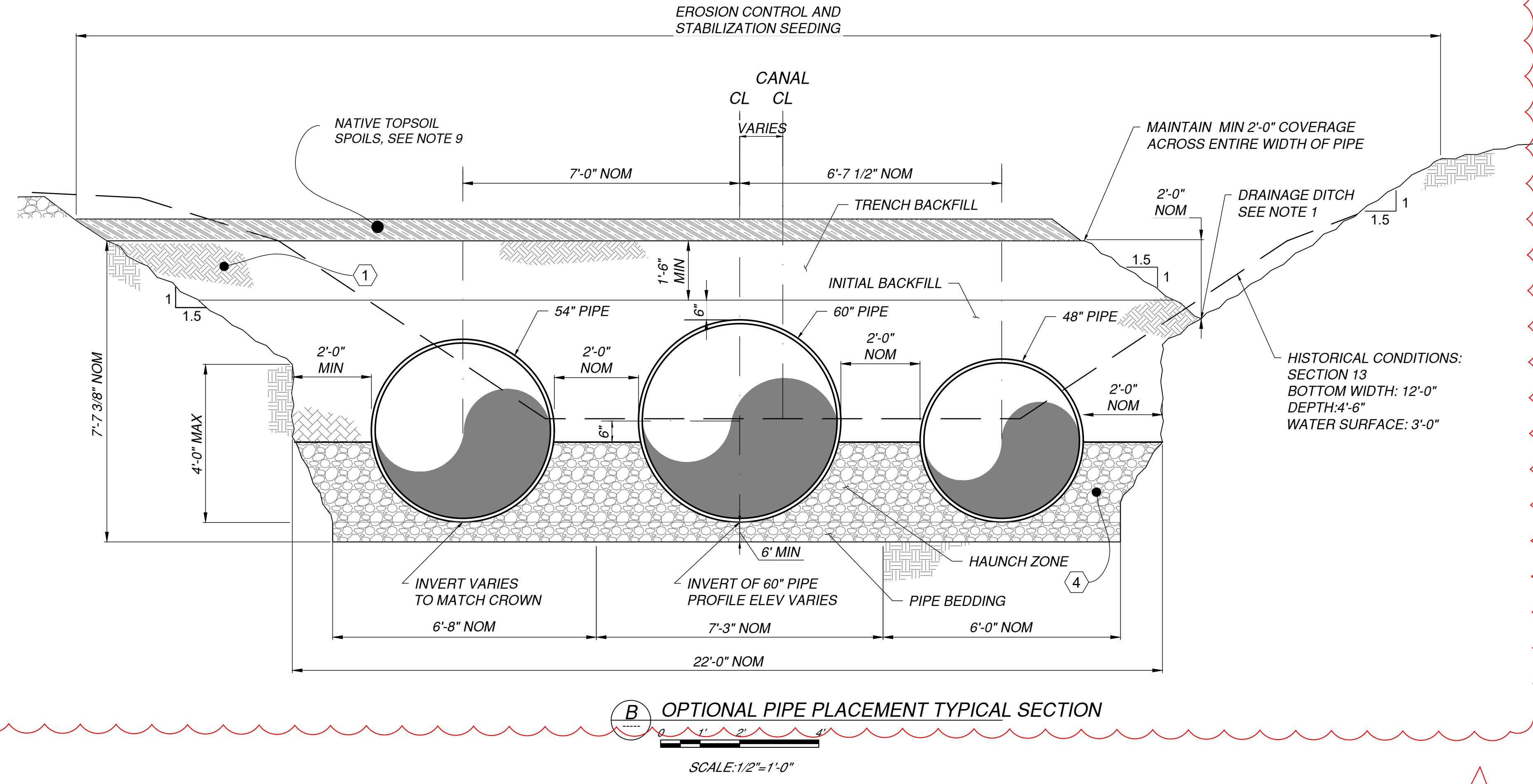
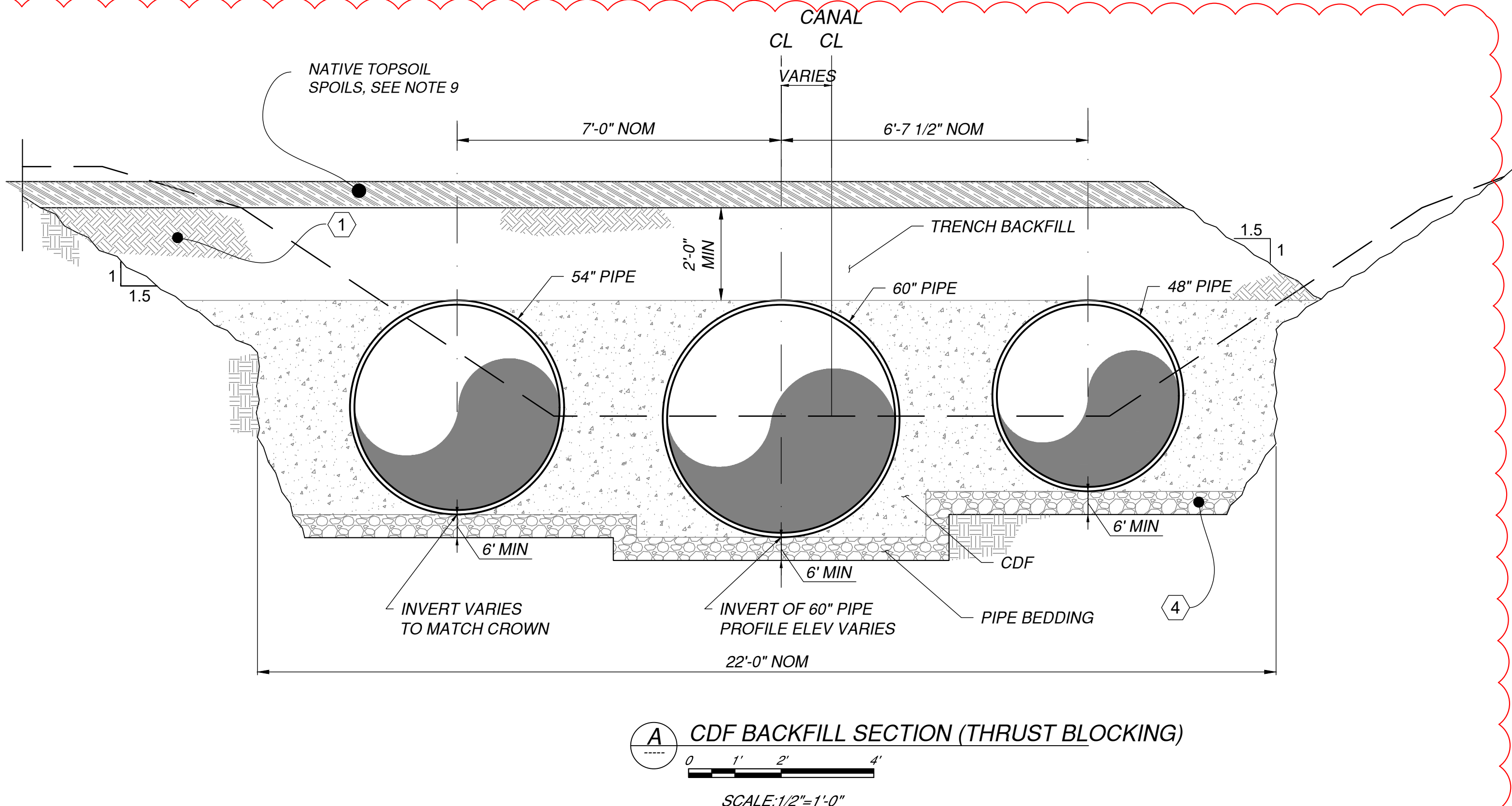
SHEET SIZE: ANSI FULL BLEED D (22.00 X 34.00 INCHES)
 PLOT SCALE: 1" = 11'
 PLOT DATE: 2020-08-23
 FILE NAME: CG301-DWG



KEYNOTE AND GRAPHICAL PATTERN OR SYMBOL LEGEND

NO.	GRAPHIC	NAME	DESCRIPTION
-		NATIVE SUBGRADE	EXISTING UNDISTURBED AND/OR UNCLASSIFIED EARTHEN SOIL, ROCK, OR EXISTING GROUND SURFACING.
①		COMMON BORROW	MULTIPLE AND/OR UNCLASSIFIED MATERIAL PLACED TO GRADES SHOWN. CONFORMING WITH WSDOT STANDARD SPECIFICATION SECTION 9-03.14(3) COMMON BORROW.
②		SELECT BORROW	MULTIPLE AND/OR UNCLASSIFIED MATERIAL PLACED TO GRADES SHOWN. CONFORMING WITH WSDOT STANDARD SPECIFICATION SECTION 9-03.14(2) SELECT BORROW.
③		CRUSHED SURFACING	CRUSHED SURFACING BASE COURSE (CSBC) MEETING REQUIREMENTS OF WSDOT STANDARD SPECIFICATION SECTION 9-03.9(3) FOR TOP COURSE.
④		GRAVEL BACKFILL	CRUSHED OR NATURAL ANGULAR MATERIAL MEETING REQUIREMENTS OF WSDOT STANDARD SPECIFICATION SECTION 9-03.12(3) GRAVEL BACKFILL FOR PIPE ZONE BEDDING.
⑤		CONCRETE	PORTLAND CEMENT CONCRETE - SEE RELATED TYPICAL DETAILS FOR SPECIFIC MIX AND ANY RELATED REINFORCING REQUIREMENTS.
⑥		GRAVEL DRAIN	GRAVEL BACKFILL FOR DRAINS CONFORMING WITH WSDOT STANDARD SPECIFICATION SECTION 9-03.12(4) GRAVEL BACKFILL FOR DRAIN.
⑦		STABILIZING FABRIC	MECHANICALLY STABILIZING GEOTEXTILE FABRIC, TENSAR TX7 TRIAX® GEOGRID OR EQUIVALENT.

- NOTES:**
- 48", 54" AND 60" PIPES TO BE STEEL REINFORCED HDPE PIPE, DUROMAXX BY CONTECH. ALTERNATIVE PIPE TO BE SPIROLITE, CLASS 160 BY PLASSON USA., OR APPROVED EQUAL.
 - GRAVEL BASE (HAUNCH ZONE) TO BE COMPACTED TO 85% MINIMUM STANDARD PROCTOR DENSITY.
 - INITIAL BACKFILL (SELECT BORROW) TO BE CLASS III AND COMPACTED TO 90% MINIMUM STANDARD PROCTOR DENSITY.
 - SPIRLOITE CLASS 63 PIPE MAY BE SUBSTITUTED BUT WILL REQUIRE GRAVEL BACKFILL COMPACTED TO 90% UP TO 12" ABOVE PIPE SPRING LINE.
 - PIPE JOINTS TO BE GASKETED BELL AND SPIGOT WITH MIN 10.8 PSI RATING IN ACCORDANCE WITH ASTM D3212.
 - INVERT OF ALL PIPES MEET SAME ELEVATION.
 - AT PIPE BENDS, PIPES TO BE BACKFILLED UP TO SPRINGLINE WITH CDF AS INDICATED ON DRAWING AND PROFILES. CONTRACTOR TO USE TIE DOWN ANCHORS OR OTHER MECHANISM TO GUARD AGAINST FLOTATION OF PIPE DURING INSTALLATION OF CDF.
 - CONTROLLED DENSITY FILL (CDF) SHALL BE IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATION 2-09.3 (1)E.
 - PLACE 6" OF FILL MATERIAL ABOVE TRENCH BACKFILL FOR SLOPE STABILITY AND SITE RESTORATION. SEE G-003 FOR GRASS SEEDING REQUIREMENTS. FILL MATERIALS TO BE A COMBINATION OF TOP SOIL, MULCH, USABLE MATERIAL FROM CLEARING AND GRUBBING AND NATIVE SOIL.



Kittitas Reclamation District

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DRAWN BY: JOHN M. ETULAIN
CHECKED BY: RILEY A. HOLLAND
APPROVED BY: DAVID L. ALLISON
CONTRACT / PROJECT NO.: 10378509
DATE: 08-11-2020
FILE NUMBER: WSA78509-D-CG302

DESIGNED BY: JOHN M. ETULAIN

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KITTTITAS RECLAMATION DISTRICT
ELLENSBURG, WASHINGTON
SOUTH BRANCH CANAL IMPROVEMENTS
ROBINSON SIPHON TO MANASTASH CREEK SIPHON

SOUTH BRANCH IMPROVEMENTS
ROBINSON SIPHON (MILEPOST 10.0) TO SOUTH BRANCH TURNOUT 10.4 (MILEPOST 10.4)

REV NO	REV NO	REV NO	REV NO	REV NO	REV NO
					0

ISSUED FOR BIDDING

CONSULTANT PRODUCED BY

X ACCEPTANCE BY ADMINISTRATOR TITLE

ELLENSBURG, WA LOCATION 2020-08 DATE

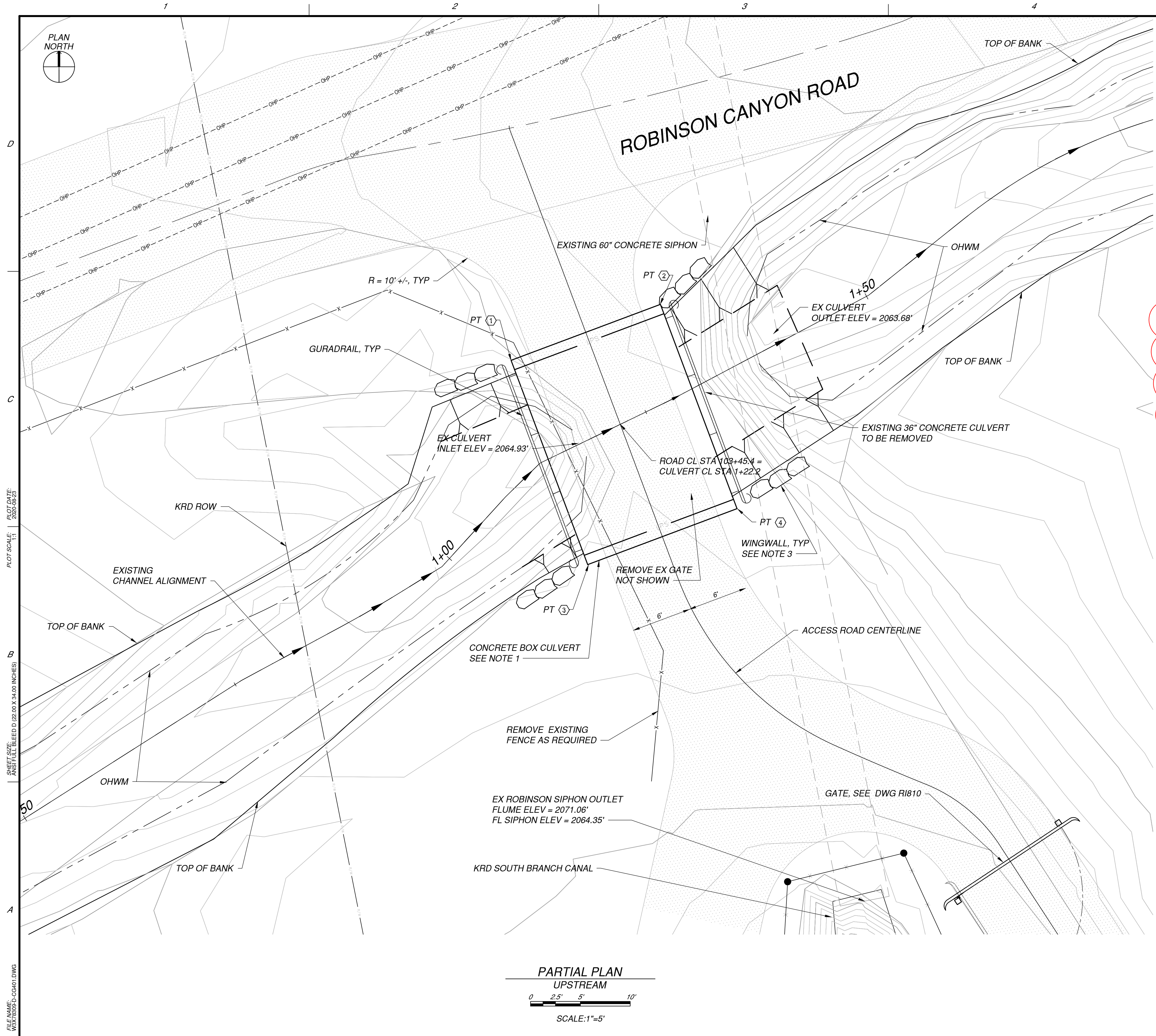
SECTION

CDF BACKFILL

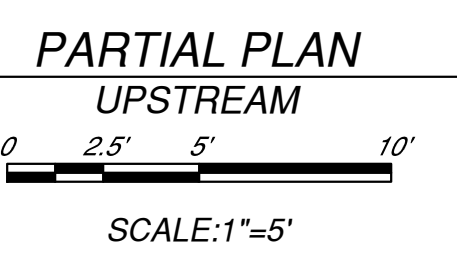
CG302
SHEET 15 OF 35

SOLICITATION NO.: 33-SBC-1004

PLOT SCALE: 1" = 10'-0" DATE: 08-11-2020 SHEET SIZE: ANSI FULL BLEED D (22.00 X 34.00 INCHES) FILE NAME: CG302.DWG



FILE NAME: \\WV\3333\3333\CG401.DWG
 SHEET SIZE: ANSI (FULL BLEED) 0 (22.00 X 34.00 INCHES)
 PLOT SCALE: 1"=5'
 PLOT DATE: 2020/02/23



NOTES:

1. INSTALL BOX CULVERT, BOX CULVERT TO BE FOUR SIDED, PRECAST CONCRETE CULVERT WITH 20 FOOT SPAN AND 8 FOOT HEIGHT. WIDTH TO BE 16'.
2. CULVERT TO BE H20S RATED WITH TOP LID TO ACT AS DRIVING SURFACE.
3. PROVIDE WINGWALLS USING 2-MAN AND 3-MAN SIZED ROCK AT 6:1 BATTER (APPROXIMATELY 8 CUBIC YARD).
4. CONTRACTOR TO SET ASIDE REMOVED VEGETATION FROM REGRADING OF CHANNEL AND REPLANT AFTER GRADING.
5. SEE DRAWING CG402 FOR CONCRETE BOX CULVERT DIMENSIONS AND CHANNEL REGRADE PROFILE.
6. SEE DRAWING CG403 FOR CHANNEL PROFILE.
7. PROVIDE LOW FLOW CHANNEL THROUGH REGRADED CHANNEL AREA.
8. SEE WDFW 2013 WATER CROSSING DESIGN GUIDELINES FOR ADDITIONAL INFORMATION.

FINAL BOX CULVERT LOCATION TO BE DETERMINED BY SITE CONDITIONS AND FINAL PERMIT COORDINATION.

POINT NUMBER	NORTHING	EASTING
①	17613428.71	21591732.96
②	17613434.28	21591747.82
③	17613408.20	21591740.65
④	17613413.82	21591755.63



Kittitas Reclamation District

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DRAWN BY: JOHN M. ETULAIN
 CHECKED BY: RILEY A. HOLLAND
 APPROVED BY: DAVID L. ALISON
 CONTRACT / PROJECT NO.: 1937659
 DATE: FILE NUMBER: 1937659.D-CG401
 DESIGNED BY: JOHN M. ETULAIN

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 KITTITAS RECLAMATION DISTRICT
 ELLENSBURG, WASHINGTON
 SOUTH BRANCH CANAL IMPROVEMENTS
 ROBINSON SIPHON TO MANASTASH CREEK SIPHON
SOUTH BRANCH IMPROVEMENTS
 ROBINSON SIPHON (MILEPOST 10.0) TO SOUTH BRANCH CANAL MILEPOST 10.4

REV NO	0	COORDINATE TABLE FILLED IN	ISSUED FOR BID
REV NO	1	08-21-2020	JOHN ETULAIN
REV NO	0	08-11-2020	JOHN ETULAIN

CONSULTANT PRODUCED BY: _____
 ACCEPTANCE: _____
 KRD ADMINISTRATOR TITLE: _____
 ELLENSBURG, WA LOCATION: _____ DATE: 2020-08

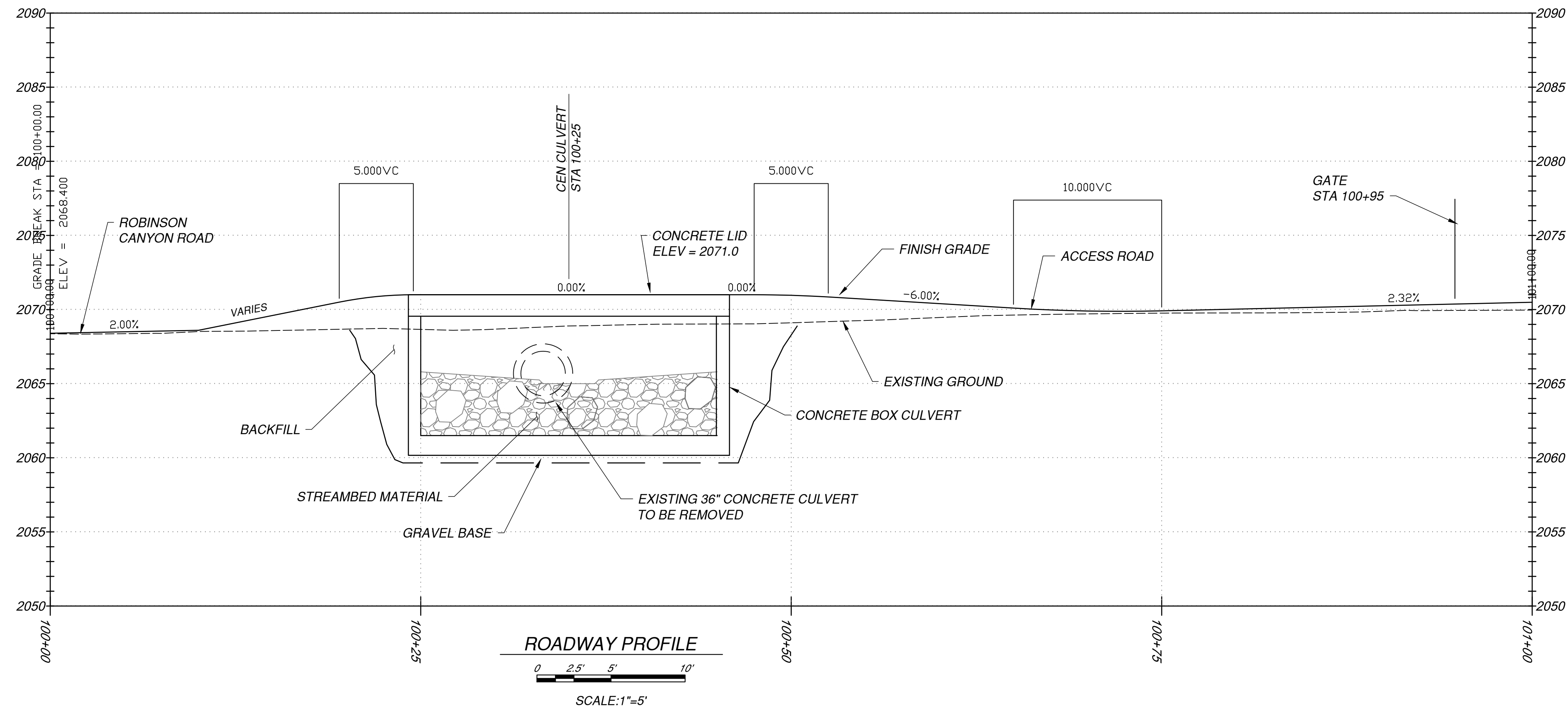
ROBINSON
CULVERT
CROSSING

PLAN VIEW

CG401

SHEET 19 OF 35

SOLICITATION NO.: 33-SBC-1004



NOTES:

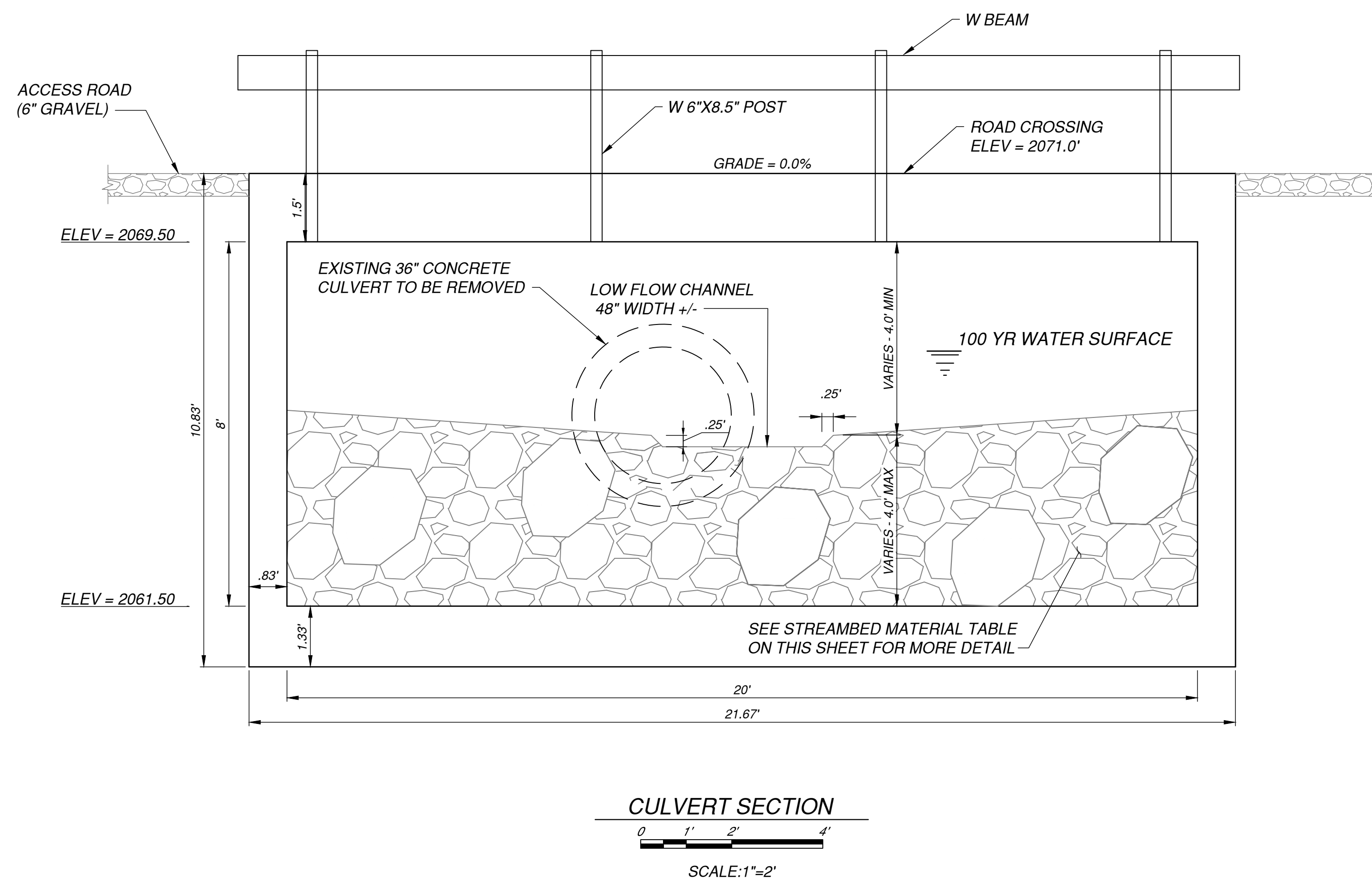
1. PROVIDE 6" GRAVEL BASE UNDER PRECAST CONCRETE BOX CULVERT.
2. BACKFILL TO BE NATIVE MATERIAL, FREE OF 3" ROCKS OR GREATER, COMPACTED TO 95%.
3. PRECAST CULVERT WALL AND SLAB DIMENSIONS ARE APPROXIMATE, TO BE DETERMINED BY MANUFACTURER.
4. FINAL ACCESS ROADWAY PROFILE TO BE BASED ON MANUFACTURER LID DIMENSION AND ORIENTATION OF BOX CULVERT PER SITE CONDITIONS AND FINAL PERMIT COORDINATION. COORDINATE WITH ENGINEER FOR FINAL PROFILE.
5. SEE CG403 FOR STREAMBED MATERIAL PROFILE AND GRADE.

STREAMBED MATERIAL TABLE:

PERCENTAGES ARE BY WEIGHT OF TOTAL MIX. PIECE SHAPE SHALL BE ANGULAR OR SUBANGULAR (NOT ROUNDED) FOR ITEMS 1 AND 2.

FOR MATERIAL GRADATION, SEE STANDARD SPECIFICATIONS FOR ROAD BRIDGE, AND MUNICIPAL CONSTRUCTION 2016, AVAILABLE AT www.wsdot.wa.gov/Publications/Manuals/M41-10.htm.

- ① 20% TWO-MAN ROCK PER WA DOT 9-03.11(3)
- ② 20% ONE-MAN ROCK PER WA DOT 9-03.11(3)
- ③ 40% 12-INCH COBBLES PER WA DOT 9-03.11(2)
- ④ 20% STREAMBED SEDIMENT PER WA DOT 9-03.11(1)



1

SHEET SIZE: ANSI FULL BLEED D (22.00 X 34.00 INCHES) | PLOT SCALE: 1"=11' | FILE NAME: CG402-CG401.DWG

Kittitas Reclamation District

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DRAWN BY: JOHN M. ETULAIN
 CHECKED BY: RILEY A. HOLLAND
 APPROVED BY: DAVID L. ALLISON
 CONTRACT / PROJECT NO.: 1937859
 DATE: 08/11/2020
 FILE NUMBER: W827809-D-CG401

JOHN M. ETULAIN
REGISTERED PROFESSIONAL ENGINEER
STATE OF WASHINGTON
31203

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KITTITAS RECLAMATION DISTRICT
ELLENSBURG, WASHINGTON
SOUTH BRANCH CANAL IMPROVEMENTS
ROBINSON SIPHON TO MANASTASH CREEK SIPHON

SOUTH BRANCH IMPROVEMENTS
ROBINSON SIPHON (MILEPOST 10.0) TO SOUTH BRANCH CANAL MILEPOST 10.4

REV NO	REV	DATE	REVISIONS
1	08-21-2020	JOHN ETULAIN	REVISED NOTES AND STREAMBED GRADATION
0	08-11-2020	JOHN ETULAIN	ISSUED FOR BID

CONSULTANT PRODUCED BY

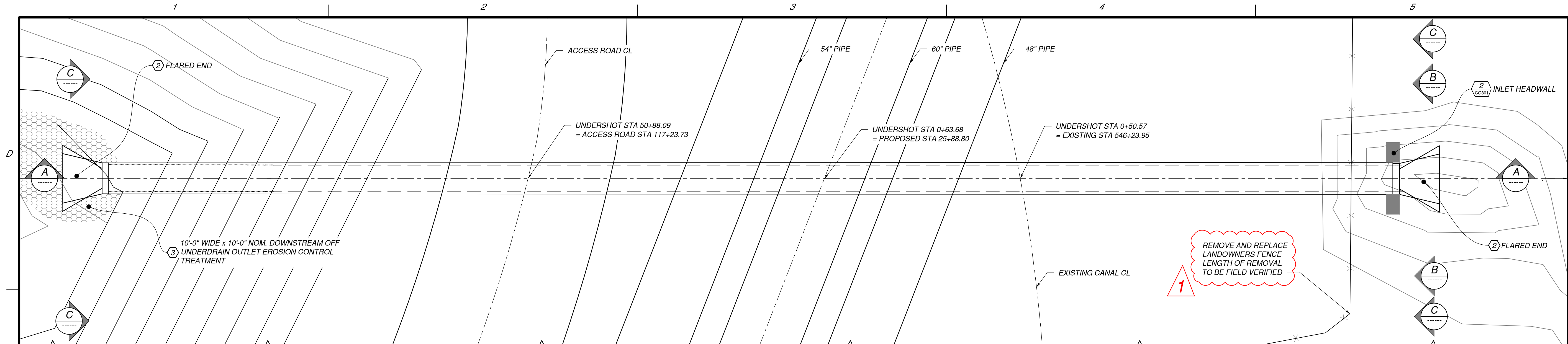
X ACCEPTANCE
KRD ADMINISTRATOR TITLE

ELLENSBURG, WA 2020-08
LOCATION DATE

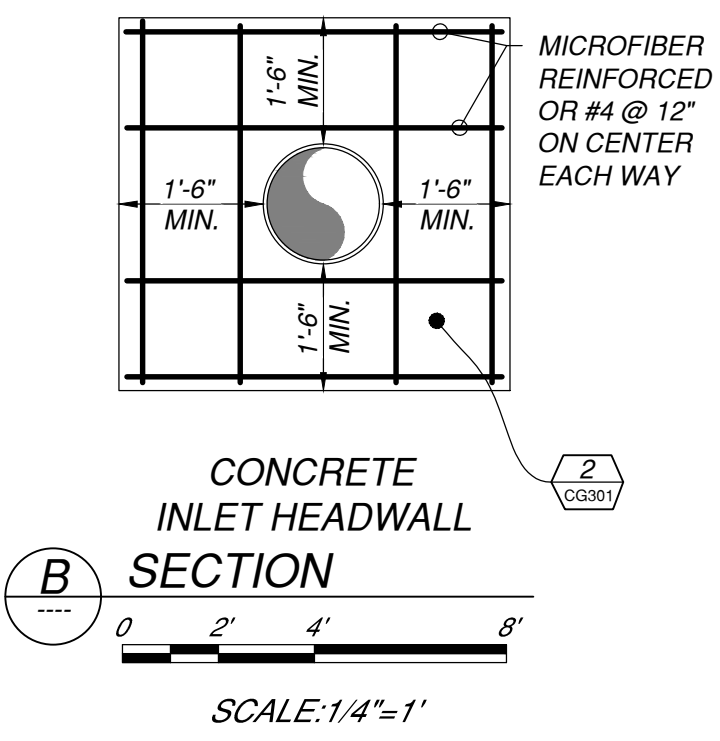
ROBINSON CULVERT CROSSING
PROFILE AND SECTION

CG402
SHEET 20 OF 35

SOLICITATION NO.: 33-SBC-1004

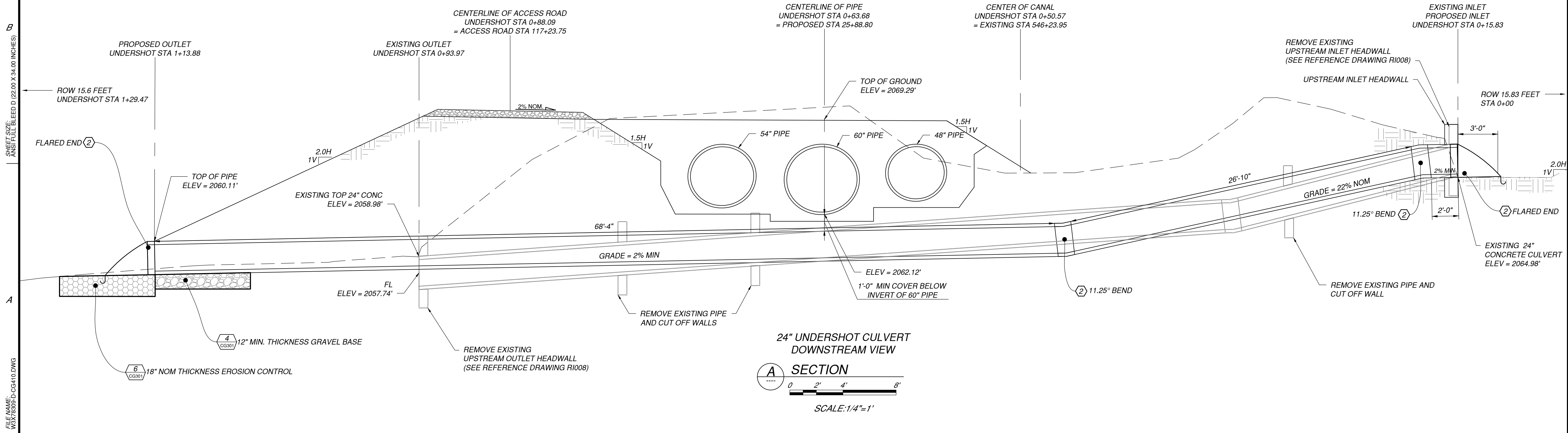
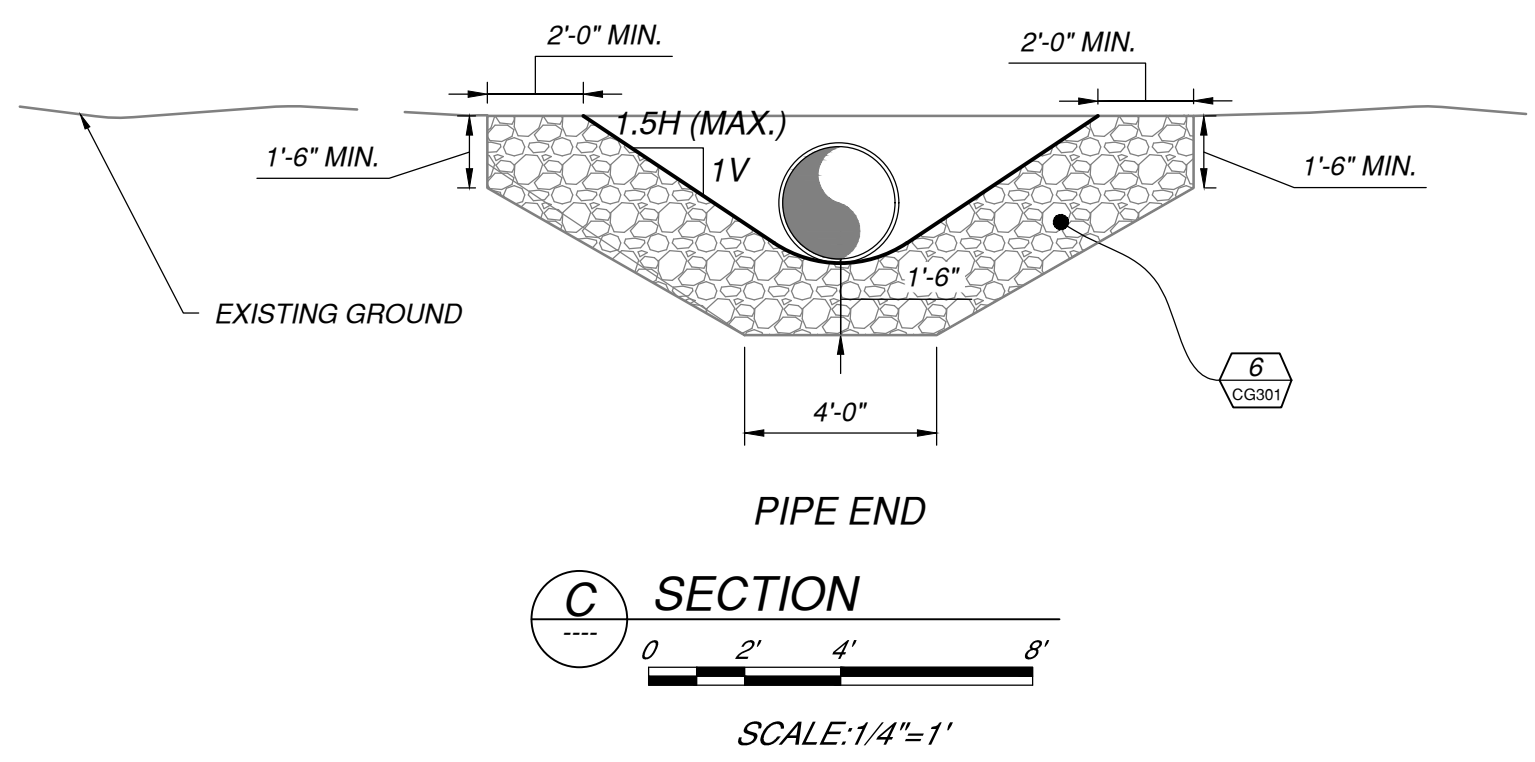


UNDERDRAIN TO UNDERSHOT CONNECTION
4 PARTIAL PLAN
 SCALE: 1/4"=1'



GENERAL KEYNOTE SYMBOL LEGEND

NO.	NAME	DESCRIPTION
①	11.25° BEND	11.25-DEGREE DUAL WALL SOIL TIGHT FABRICATED BEND, 24-INCH DIAMETER CORRUGATED POLYETHYLENE DUAL WALL CONVEYANCE PIPE. ADS PART NUMBERS 2491AN85B OR EQUAL.
②	FLARED END	24-INCH FLARED END FOR ATTACHMENT TO CORRUGATED POLYETHYLENE DUAL WALL CONVEYANCE PIPE OUTLET. ADS PART NUMBERS 2410NP OR EQUAL.



PLOT SCALE: 1/4"=1'
 SHEET SIZE: ANSI FULL BLEED D (22.00 X 34.00 INCHES)
 FILE NAME: W:\S\2020\CG410.DWG

Kittitas Reclamation District

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 (425) 453-5000 / www.jacobs.com

DESIGNED BY: JOHN M. ETULAIN
 CHECKED BY: REILLY A. HOLLAND
 APPROVED BY: WYLLI L. ALLISON
 CONTRACT PROJECT NO.: WAK7890
 FILE NUMBER: W3278909-D-CG410
 DATE: 2020-03

STATE OF WASHINGTON
 PROFESSIONAL ENGINEER
 WYLLI L. ALLISON
 LICENSE NO. 36828

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KITTITAS RECLAMATION DISTRICT
 ELLENSBURG, WASHINGTON
 SOUTH BRANCH CANAL IMPROVEMENTS
 ROBINSON SIPHON TO MANASTASH CREEK SIPHON
SOUTH BRANCH IMPROVEMENTS
 ROBINSON SIPHON (MILEPOST 10.0) TO SOUTH BRANCH MILEPOST 10.4

REVNO	DESCRIPTION	DATE
1	CLARIFICATION OF FENCE REMOVAL AND REPLACEMENT FOR ACCESSING INLET OF UNDERSHOT CULVERT.	08-11-2020
0	ISSUED FOR BIDDING	08-11-2020

CONSULTANT PRODUCED BY

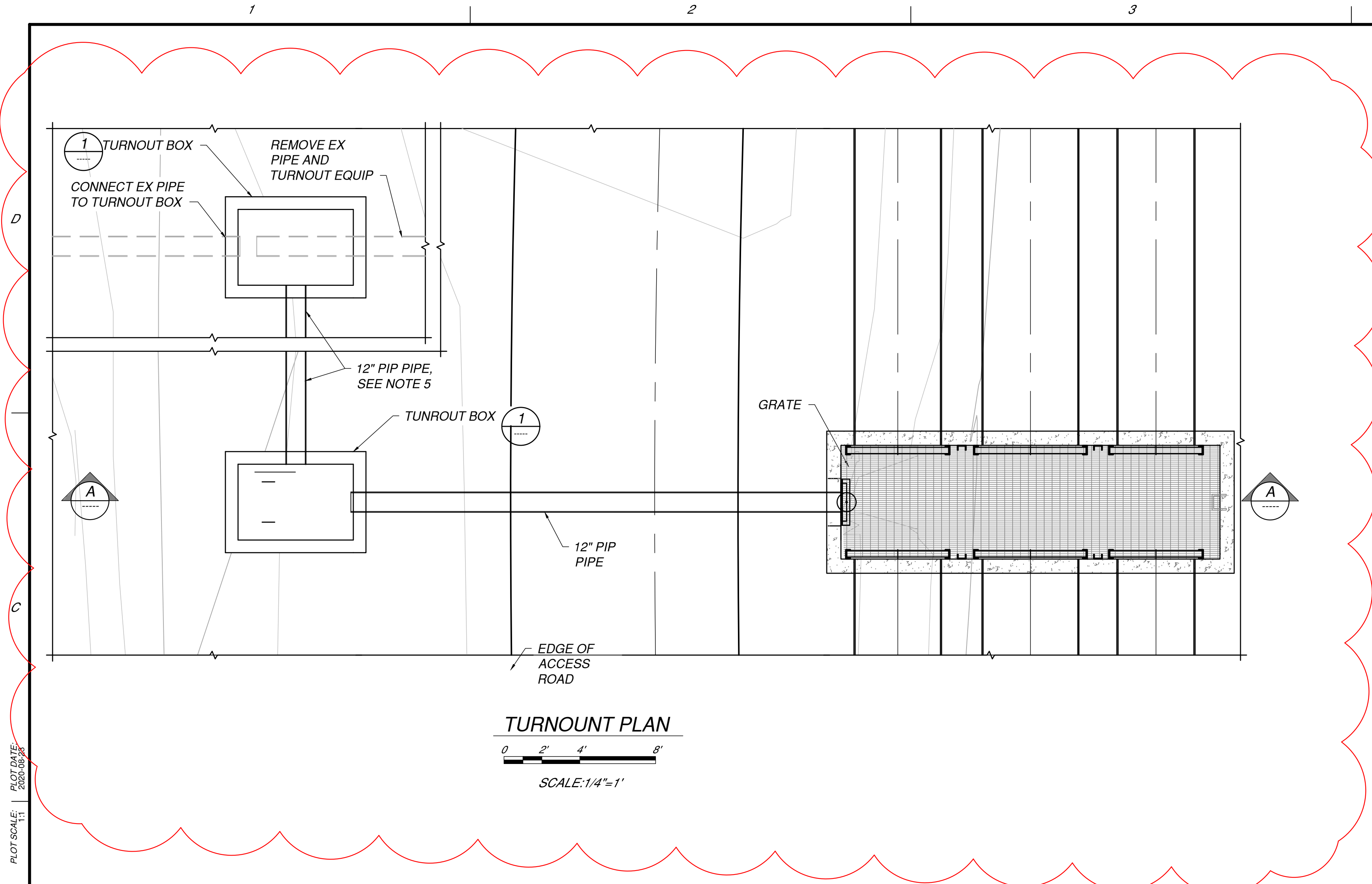
X ACCEPTANCE FOR ADMINISTRATION TITLE

ELLENSBURG, WA 2020-08
 LOCATION DATE

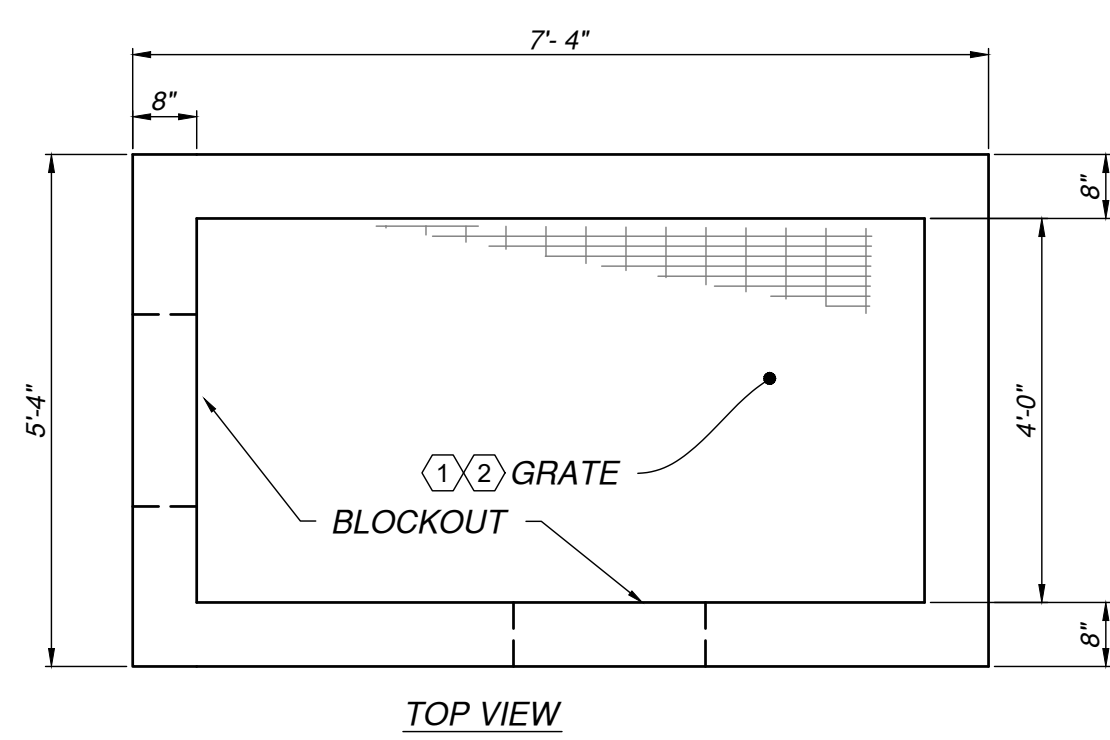
UNDERSHOT CULVERT
 TYPICAL PLAN AND SECTIONS

CG410
 SHEET 22 OF 34

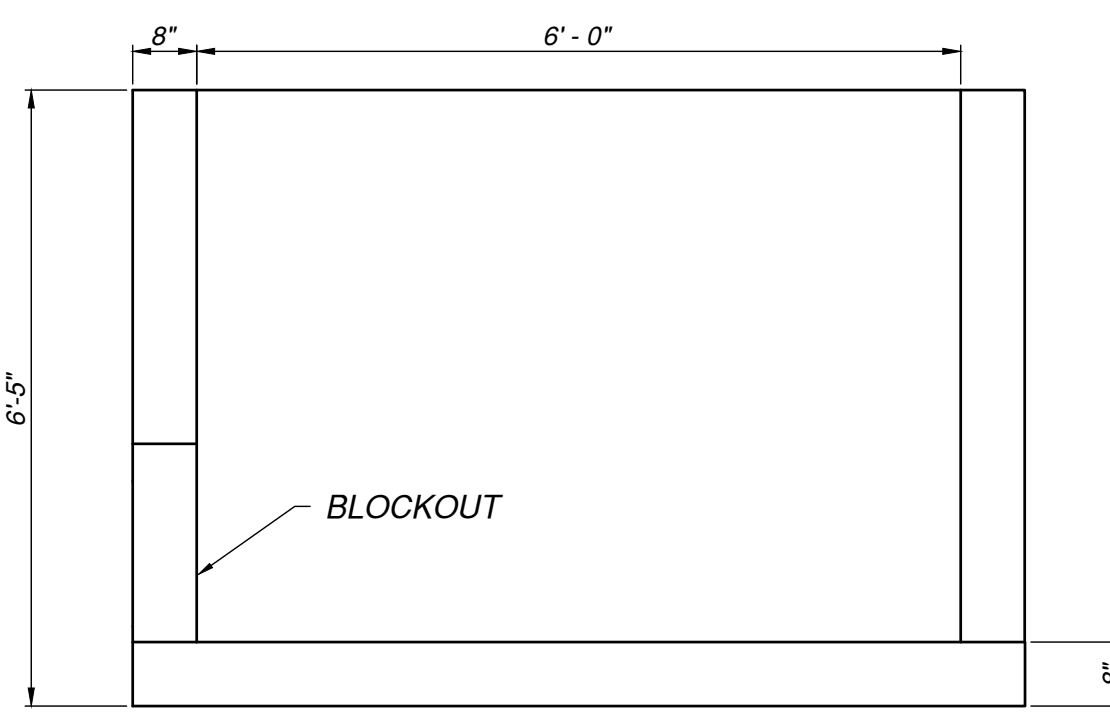
SOLICITATION NO.: 33-SBC-1004



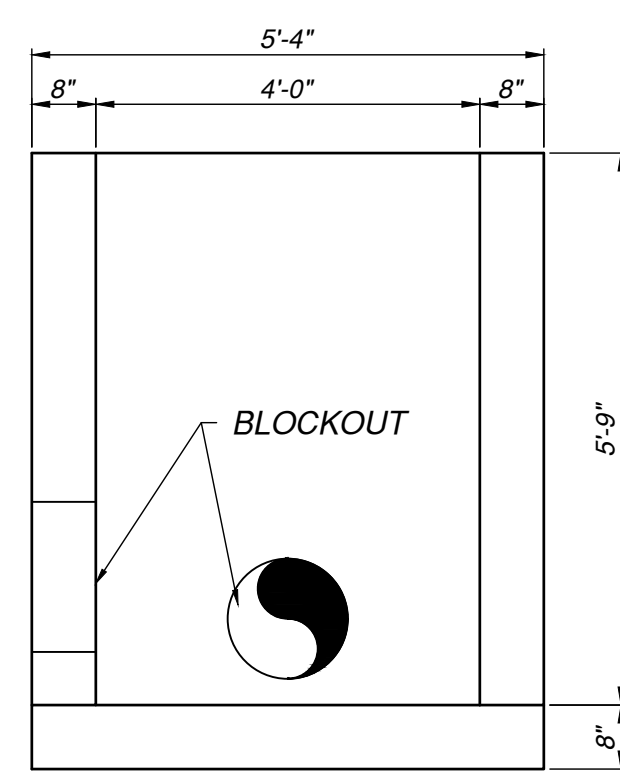
TURNOUT PLAN
 0 2' 4' 8'
 SCALE: 1/4" = 1'



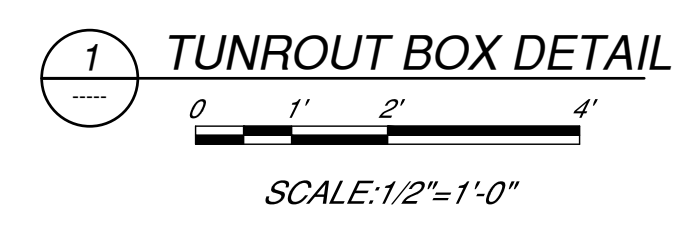
TOP VIEW



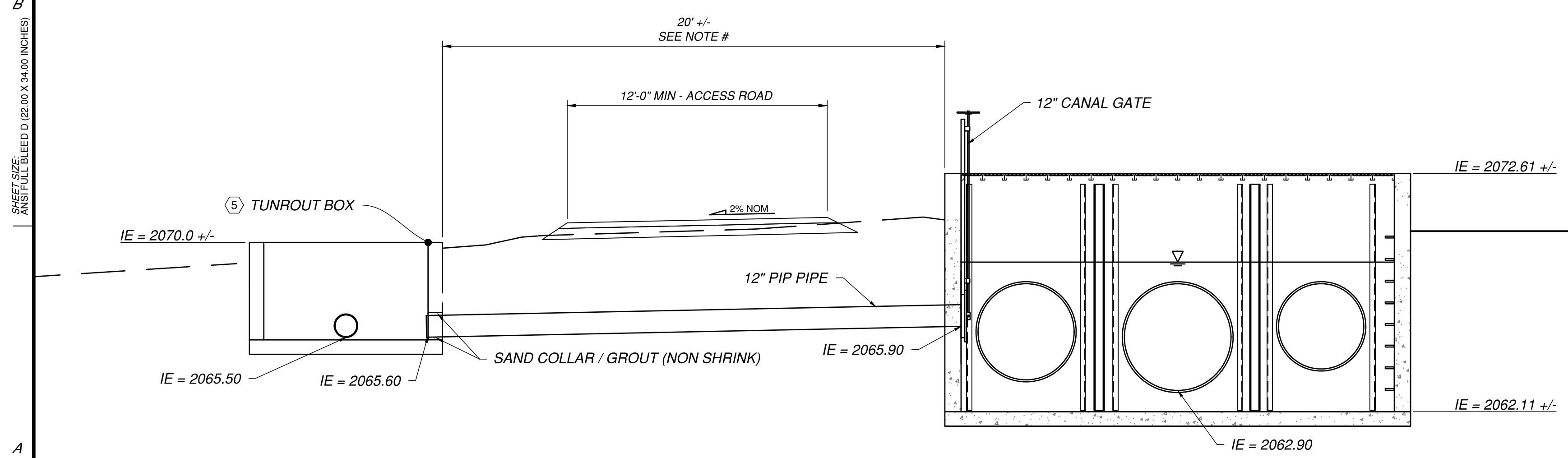
SIDE VIEW



FRONT VIEW



TUNROUT BOX DETAIL
 0 1' 2' 4'
 SCALE: 1/2" = 1'-0"



SECTION
 0 2' 4' 8'
 SCALE: 1/4" = 1'

NOTES:

1. PROVIDE GRATE CONSTRUCTED OF BAR GRATING ON TOP OF TURNOUT BOX.
2. PROVIDE SUPPORTS FOR BAR GRATING AND FASTEN TO TURNOUT BOX.
3. CANAL GATE TO BE C-10 BY WATERMAN, OR APPROVED EQUAL.
4. SEE GC003 FOR CONCRETE AND MINIMUM REINFORCEMENT REQUIREMENTS.
5. PIPE LENGTH AND TURNOUT LOCATIONS ARE APPROXIMATE, CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING TURNOUT PIPE AND COORDINATE WITH ENGINEER TO VERIFY DESIGN.

FILE NAME: \\WV\GISD\C440.DWG
 SHEET SIZE: ANSI FULL BLEED D (22.00 X 34.00 INCHES)
 PLOT SCALE: 1/4" = 1'
 PLOT DATE: 2020/08/28

Kittitas Reclamation District

JACOBS
 1100 12TH AVE. N.E. SUITE 300
 BELLEVUE, WA 98004
 (425) 453-5000 / www.jacobs.com

DRAWN BY: JOHN M. ETULAIN
 CHECKED BY: RYLY A. HOLLAND
 APPROVED BY: DAVID L. ALLISON
 CONTRACT / PROJECT NO.: WSR7539
 DATE: 2020/04
 FILE NUMBER: WSR7539.D-CG440

DESIGNED BY: JOHN M. ETULAIN

Conserving water, promoting local agriculture, and enhancing the environment . . .

KITTITAS RECLAMATION DISTRICT
 ELLENSBURG, WASHINGTON
 SOUTH BRANCH CANAL IMPROVEMENTS
 ROBINSON SIPHON TO MANASTASH CREEK SIPHON
SOUTH BRANCH IMPROVEMENTS
 ROBINSON SIPHON (MILEPOST 10.0) TO SOUTH BRANCH CANAL MILEPOST 10.4

REV NO	REV NO	REV NO	REV NO	REV NO	REV NO
				08-21-2020	08-11-2020
			1	JOHN ETULAIN	REVISOR
			0		ISSUED FOR BIDDING
					REVISED TURNOUT DETAIL

CONSULTANT PRODUCED BY

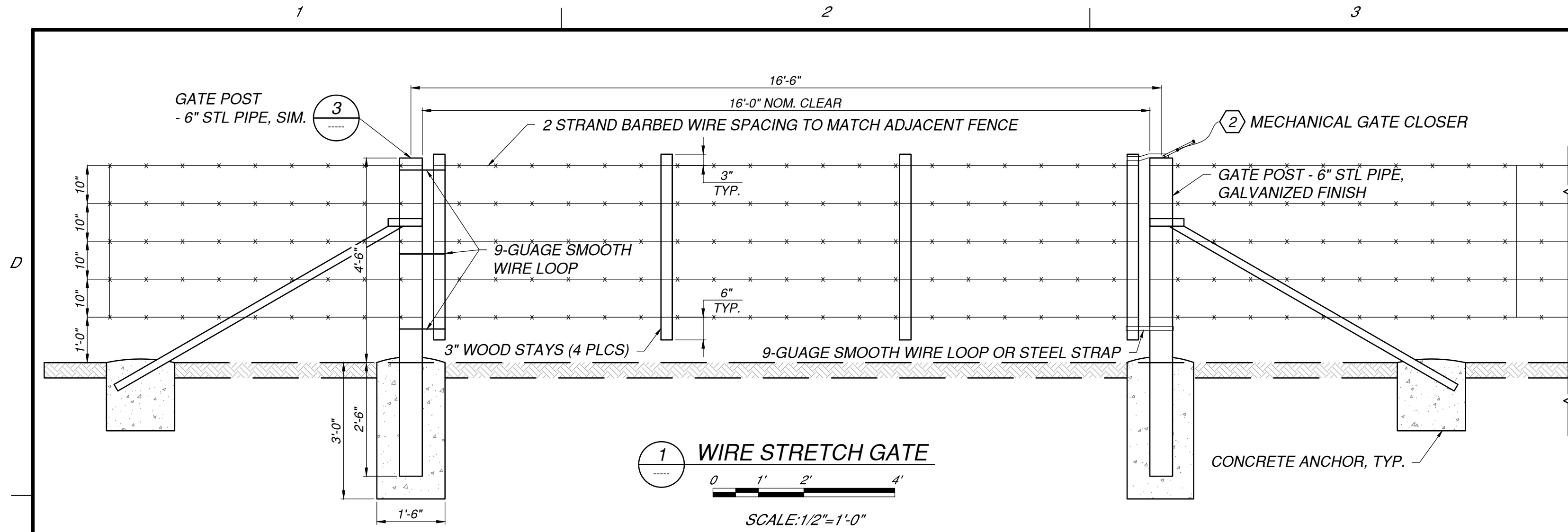
X ACCEPTANCE
 KRD ADMINISTRATOR TITLE

ELLENSBURG, WA 2020-08
 LOCATION DATE

TYPICAL DELIVERY BOX TURNOUT

PLAN AND SECTIONS

CG440
 SHEET 25 OF 35



- NOTES:**
- 6" O.D. STEEL ANCHOR POSTS TO BE FILLED WITH CONCRETE AND PAINTED OSHA YELLOW.
 - MECHANICAL GATE CLOSER TO BE SPEECO GATE CLOSER, OR APPROVED EQUAL.
 - SLATS TO BE 2"x3"x1/4" ANGLE IRON, OR APPROVED EQUAL. COPE FLANGE OF HORIZONTAL 2" LEG AT ENDS OF SLAT TO PROVIDE FLAT CONNECTION SURFACE. VERTICALLY STAGGER SLATS FOR CLEARANCE ON CENTER POST AND FASTEN VIA 3" FLANGE BY EITHER BOLTING THROUGH POST (GATE POSTS) OR USING U-BOLTS (END POSTS).

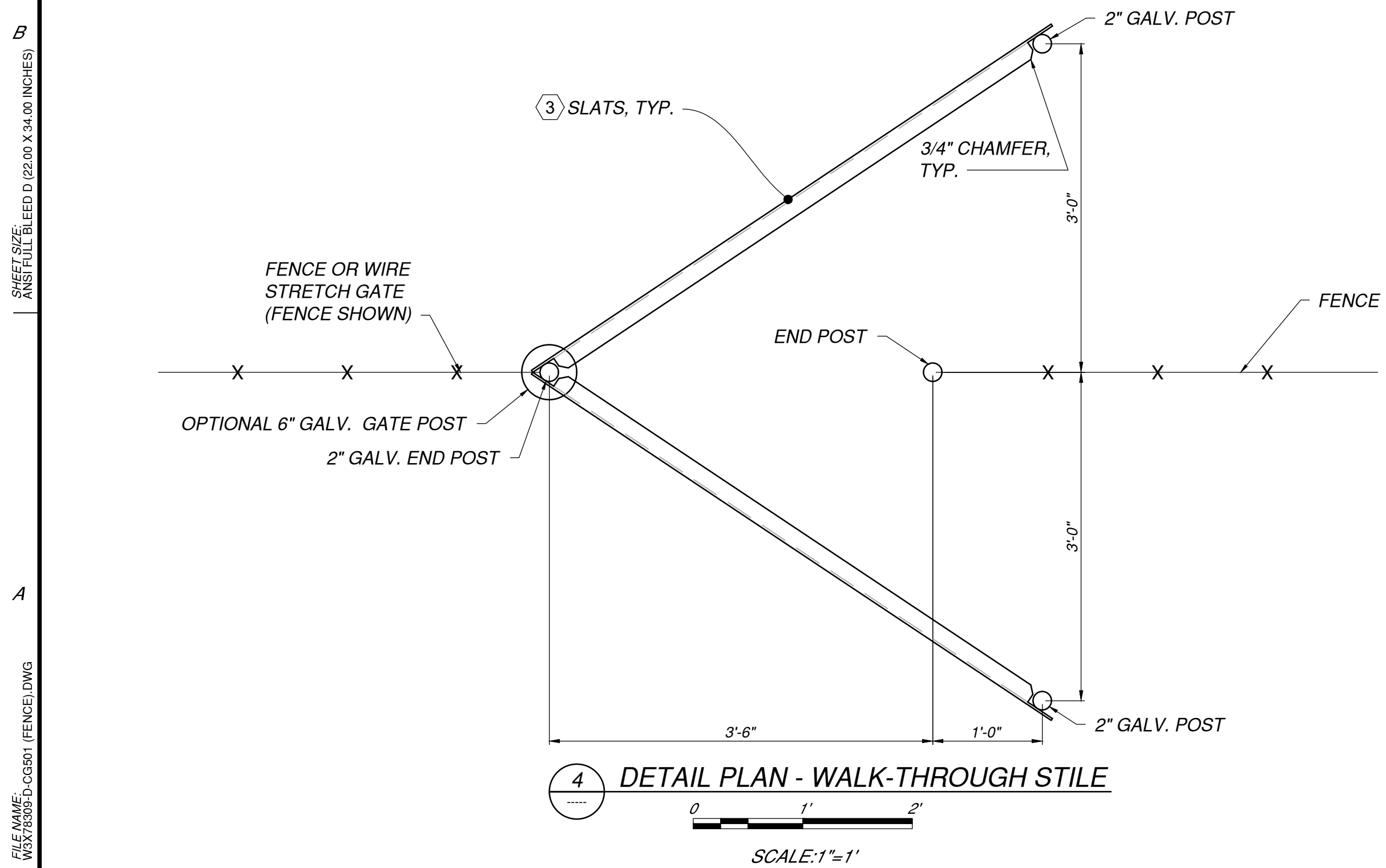
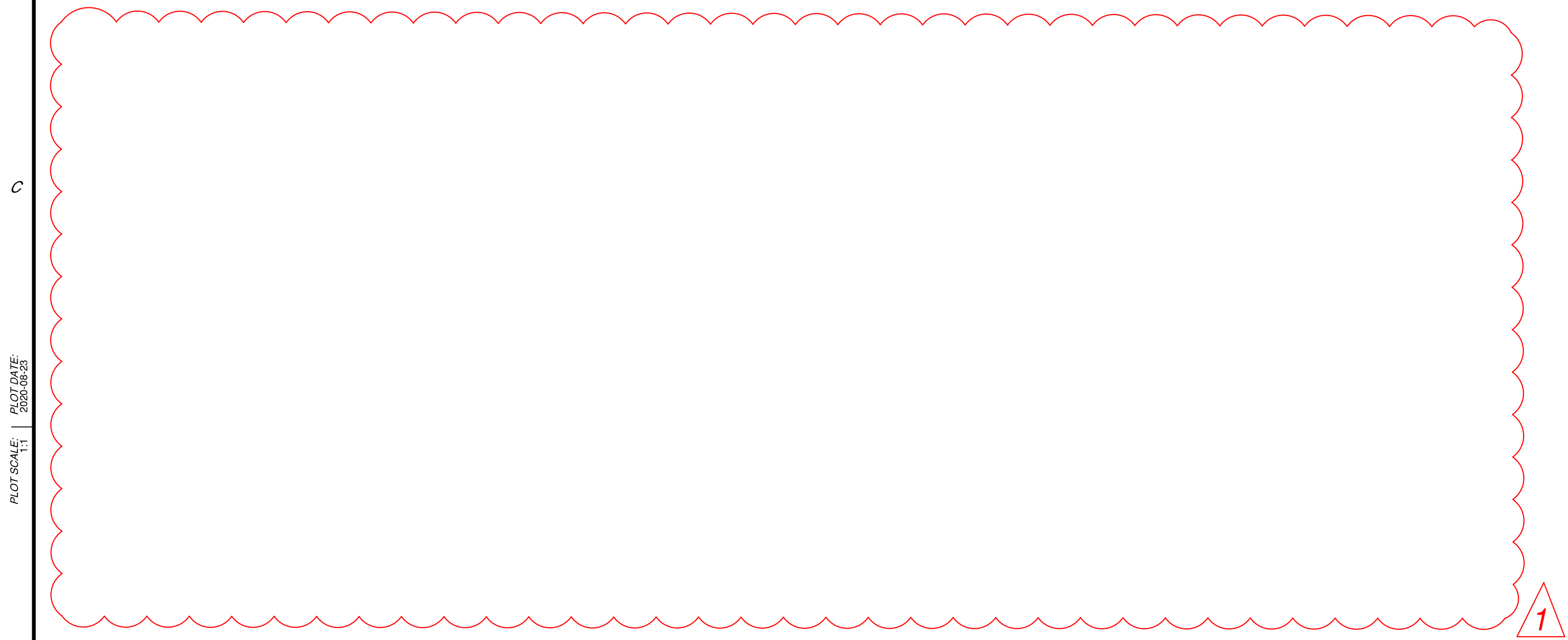
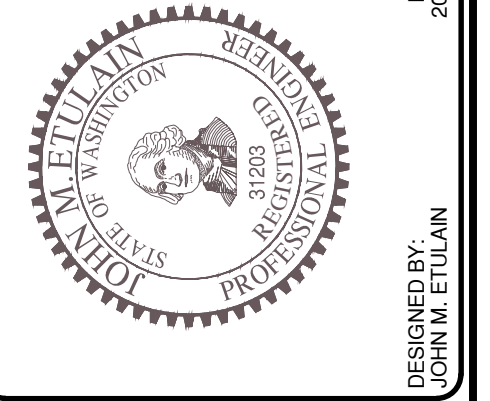
Kittitas Reclamation District

JACOBS
 1100 112TH AVE. NE, SUITE 500
 BELLEVUE, WA 98004
 (425) 452-5000 / www.jacobs.com

DRAWN BY: RILEY A. HOLLAND
 CHECKED BY: JOHN M. ETULAIN
 APPROVED BY: WYD L. ALLISON
 CONTRACT PROJECT NO.: WAX7890
 FILE NUMBER: W3278909-D-CG501

DATE: 2020-03

DESIGNED BY: JOHN M. ETULAIN



Conserving water, promoting local agriculture, and enhancing the environment . . .

KITTITAS RECLAMATION DISTRICT
 ELLENSBURG, WASHINGTON
 SOUTH BRANCH CANAL IMPROVEMENTS
 ROBINSON SIPHON TO MANASTASH CREEK SIPHON

SOUTH BRANCH IMPROVEMENTS
 ROBINSON SIPHON (MILEPOST 10.0) TO SOUTH BRANCH CANAL MILEPOST 10.4

REV/NO	0	ISSUED FOR BIDDING
REV/NO	1	TYPICAL SAFETY LINE ANCHOR NOT USED IN CONTRACT AND REMOVED
REV/NO	08-21-2020	RILEY A. HOLLAND
REV/NO	08-11-2020	RILEY A. HOLLAND

CONSULTANT PRODUCED BY _____

X ACCEPTANCE FOR ADMINISTRATION TITLE

ELLENSBURG, WA 2020-08
 LOCATION DATE

MISCELLANEOUS

DETAIL

D

C

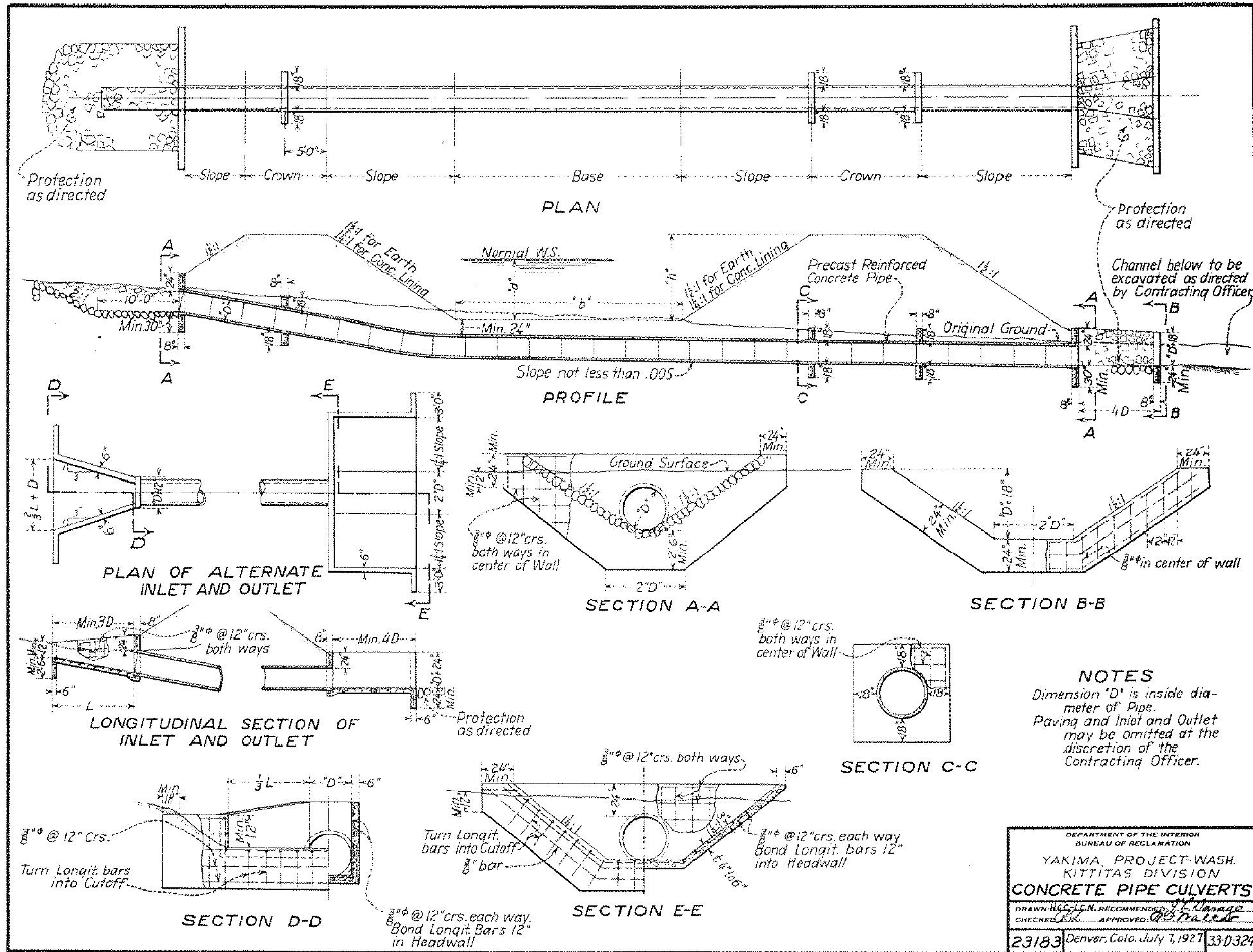
B

A

PLOT SCALE: 1/2" = 1'-0"

SIZE: ANS I FULL BLEED B (11.00 X 17.00 INCHES)

FILE NAME: W33-D-324-DRWS.DWG



SPECIFICATIONS NO. 479

DRAWING NO. 23

Jacobs

1100 177th Ave. NE, Suite 500
Bellevue, WA 98004
(425) 453-5000 / www.jacobs.com

DRAWN BY: _____
CHECKED BY: _____
APPROVED BY: _____

CONTRACT / PROJECT NO.: W33D324
DATE: 08-11-2020
FILE NUMBER: W33D324-DRWS

RESPONSIBLE ENGINEER: JOHN M. ETLAW

Conserving water, promoting local agriculture, and enhancing the environment...

KITTITAS RECLAMATION DISTRICT
KITTITAS VALLEY
ELLENSBURG, WASHINGTON

SOUTH BRANCH CANAL IMPROVEMENTS
ROBINSON SIPHON TO MANASTASH CREEK SIPHON

SOUTH BRANCH IMPROVEMENTS
ROBINSON SIPHON (MILEPOST 10.0) TO SOUTH BRANCH TURNOUT 10.4 (MILEPOST 10.4)

REV. NO.	REV. DATE	REV. DESCRIPTION
0	08-11-2020	ISSUED FOR BIDDING

CONSULTANT PRODUCED BY

X ACCEPTANCE (FOR ADMINISTRATOR TITLE)

ELLENSBURG, WA 2020-08
LOCATION DATE

RECORD DRAWING
33-D-324 (23183)

CONCRETE PIPE CULVERTS

R1805
SHEET 33 OF 35

SOLICITATION NO.: 33-SBC-1004

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

YAKIMA, PROJECT-WASH.
KITTITAS DIVISION

CONCRETE PIPE CULVERTS

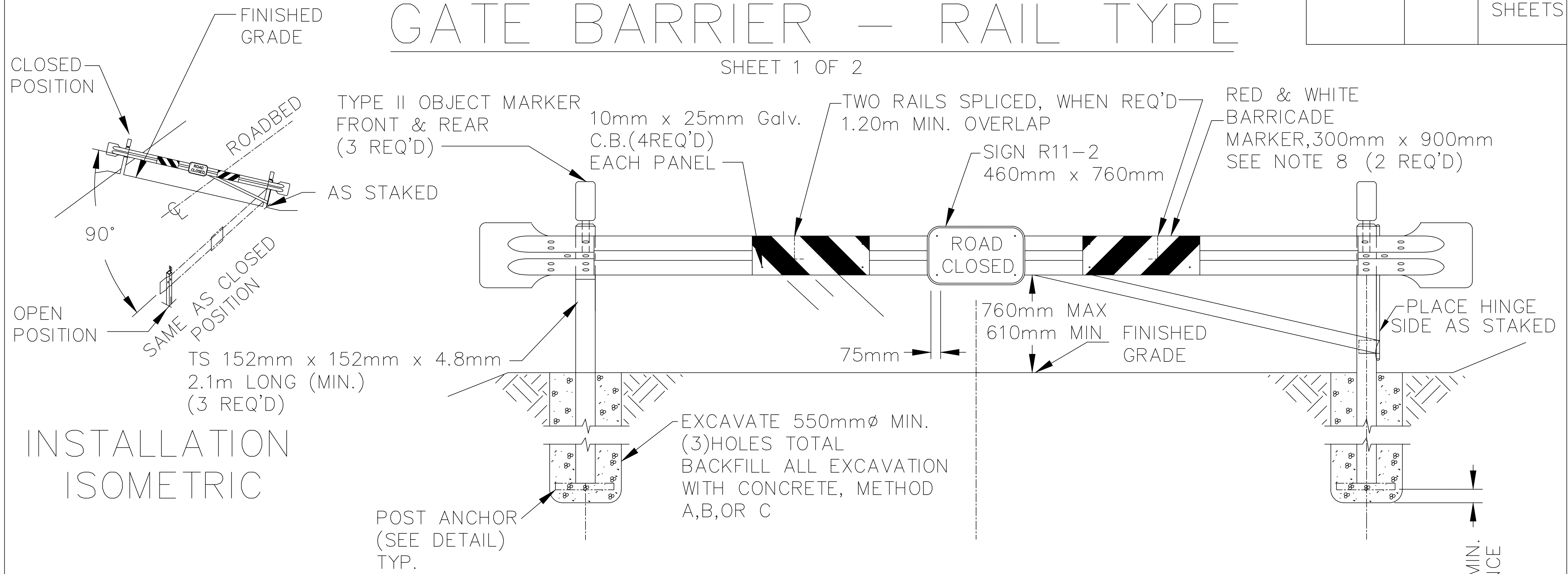
DRAWN: H.C. CLON... RECOMMENDED: J.L. ...
CHECKED: J.K. ... APPROVED: J.L. ...

23183 Denver, Colo. July 7, 1927 33-D-324

PROJECT	SHEET	TOTAL SHEETS

GATE BARRIER — RAIL TYPE

SHEET 1 OF 2



INSTALLATION ISOMETRIC

ELEVATION VIEW

NOTES:

1. ALL STEEL COMPONENTS EXCEPT GUARDRAIL, END SECTIONS, PIPE & BOLTS PER A.S.T.M. DESIGNATION A36.
2. ALL WELDS 5mm EXCEPT AS SHOWN. WELDING TO BE PER STRUCTURAL WELDING CODE—AWS D1.1
3. GATE SECTION TO BE "ECONO-BEAM" GUARDRAIL AS MANUFACTURED BY ARMCO STEEL FABRICATORS OR EQUAL. END SECTIONS TO BE OF LIKE MATERIAL & CROSS SECTION USED FOR GATE SECTION.
4. TYPE II OBJECT MARKERS & R11-2 SIGN TO BE PER M.U.T.C.D. STANDARDS & CURRENT REVISIONS.
5. PEEN ALL BOLT ENDS TO PREVENT REMOVAL. BOLTS ON BRACE MUST BE CAPABLE OF BEING LOOSENED FOR ADJUSTING GATE.
6. FIELD VERIFY GROUND ELEVATIONS BEFORE CUTTING POSTS FOR LENGTH. ENTIRE STRUCTURE TO BE SHOP FABRICATED EXCEPT

7. ENTIRE STRUCTURE EXCEPT SIGN & OBJECT MARKER TO BE THOROUGHLY CLEANED OF RUST, SLAG, & OTHER FOREIGN MATTER & PRIMED WITH ONE COAT OF WHITE MACHINE PAINT IN ACCORDANCE WITH SECTION 708.
8. BARRICADE MARKER PANELS TO BE ALUMINUM OVERLAIN WITH "3M" REFLECTIVE SHEETING, WIDE ANGLE, FLAT-TOP, PRESSURE SENSITIVE, NO. 3280, IMPERIAL WHITE, TO WHICH TRANSPARENT "STOP SIGN RED", SPRAYING TO PRODUCE STRIPING. EQUAL PRODUCTS & PROCESSES MAY BE APPROVED.
9. LUBRICATE HINGE ASSEMBLY FULL LENGTH WITH MULTIPURPOSE MARINE A-LUBE OR EQUAL.

HM000028
1-22-97

FOR INFORMATION ONLY

FILE NAME: W3X78309-D-R1810.DWG
 SIZE: ANSI FULL BLEED D (22.00 X 34.00 INCHES)
 PLOT SCALE: 1:1
 PLOT DATE: 2020-08-23

JACOBS
 1100 112TH AVE. N.E. SUITE 600
 BELLEVUE, WA 98004
 (425) 453-3000 / www.jacobs.com

DRAWN BY: _____
 CHECKED BY: _____
 APPROVED BY: _____
 CONTRACT / PROJECT NO.: W3X78309
 DATE: 2020-08
 FILE NUMBER: W3X78309-D-R1810

FOR INFORMATION ONLY

DESIGNED BY: JOHN M. ETULAIN

Conserving water, promoting local agriculture, and enhancing the environment . . .

KITTITAS RECLAMATION DISTRICT
 ELLENSBURG, WASHINGTON
 SOUTH BRANCH CANAL IMPROVEMENTS
 ROBINSON SIPHON TO MANASTASH CREEK SIPHON

SOUTH BRANCH IMPROVEMENTS
 ROBINSON SIPHON (MILEPOST 10.0) TO SOUTH BRANCH CANAL MILEPOST 10.4

REVNO	REVNO	REVNO	REVNO	REVNO

CONSULTANT PRODUCED BY _____

X ACCEPTANCE
 WSD ADMINISTRATOR TITLE _____

ELLENSBURG, WA 2020-08
 LOCATION DATE

USFS STANDARD PLAN HM000028

GATE BARRIER - RAIL TYPE

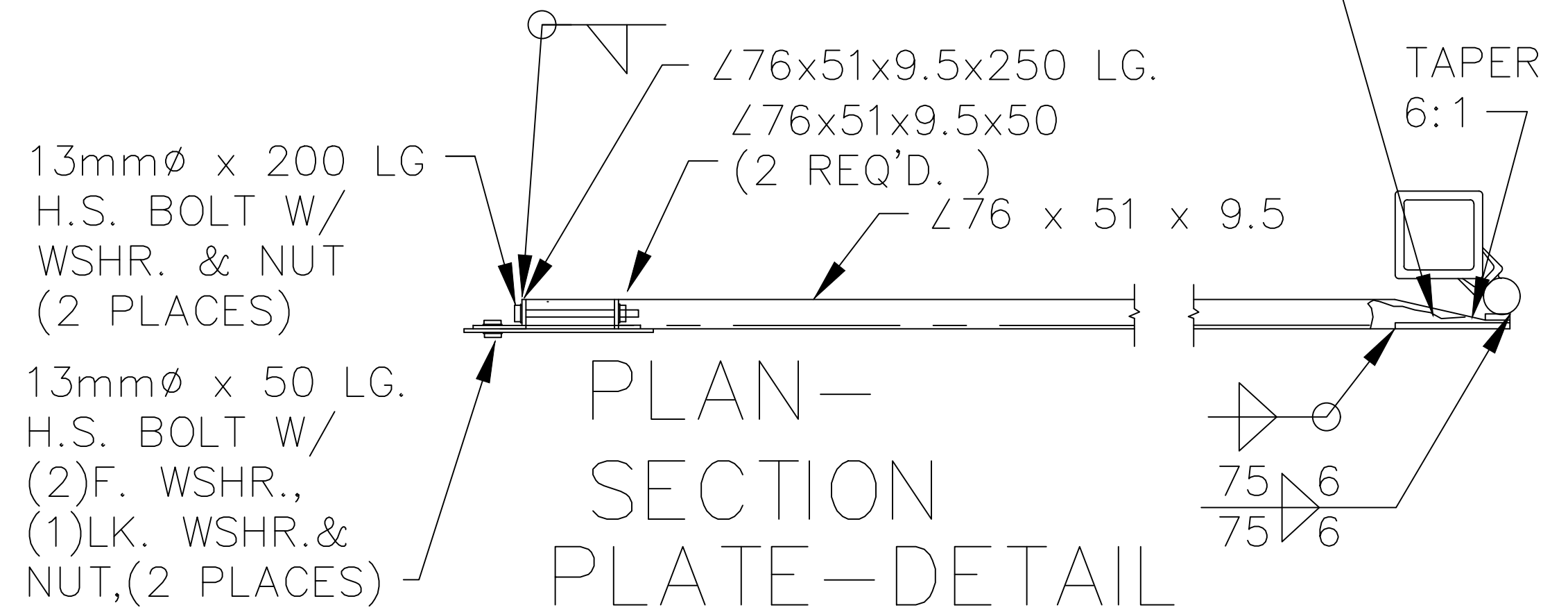
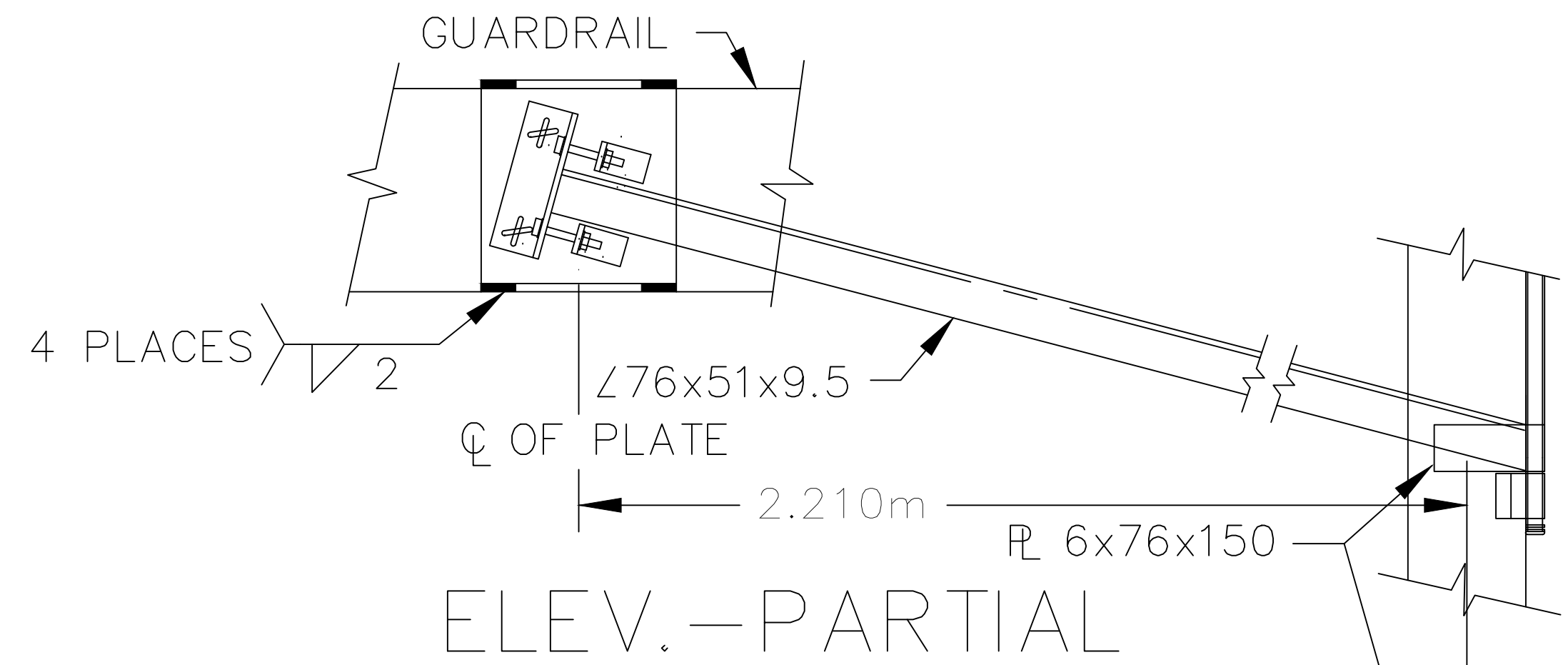
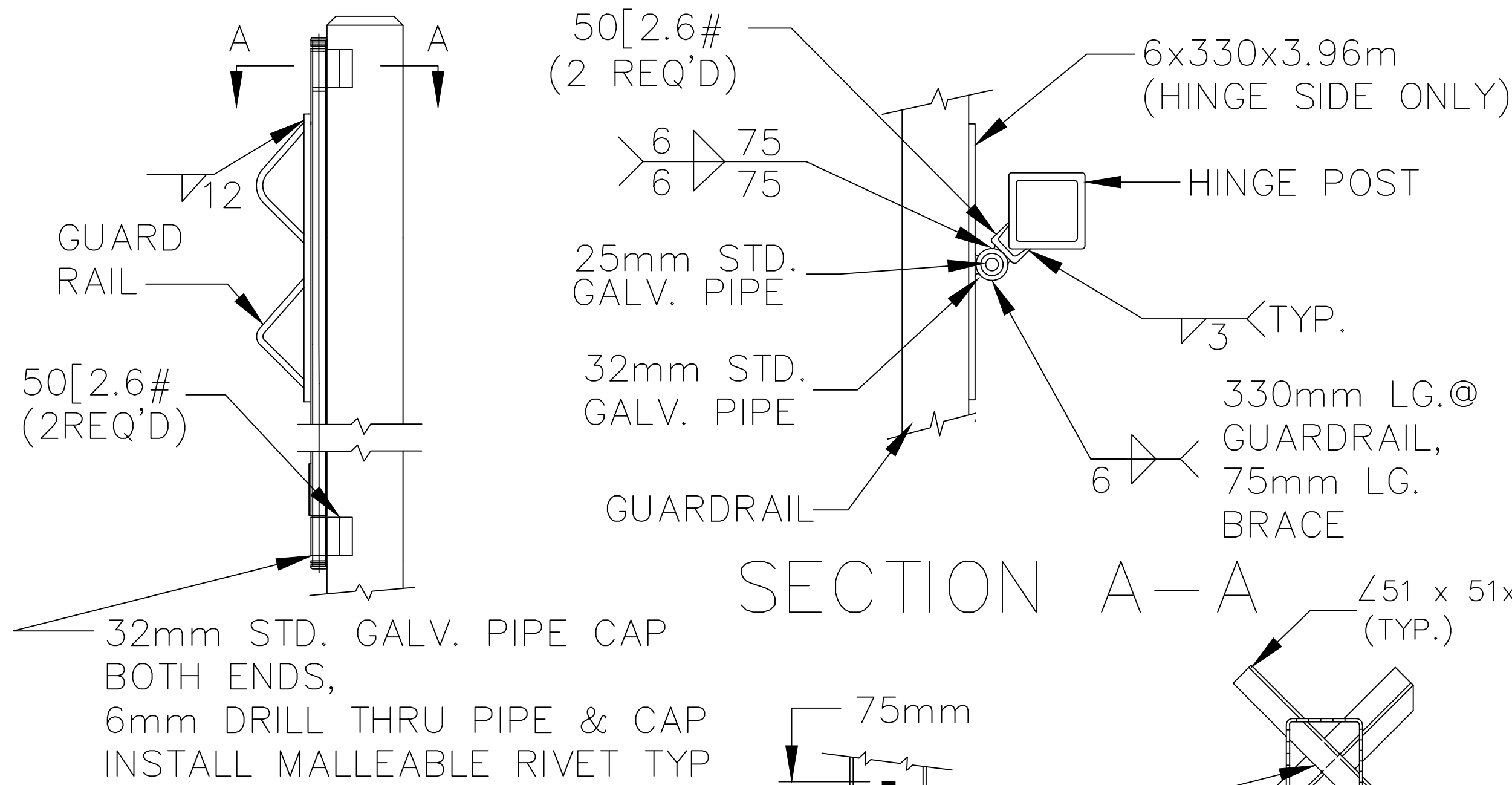
R1810
 SHEET 34 OF 35

GATE BARRIER - RAIL TYPE

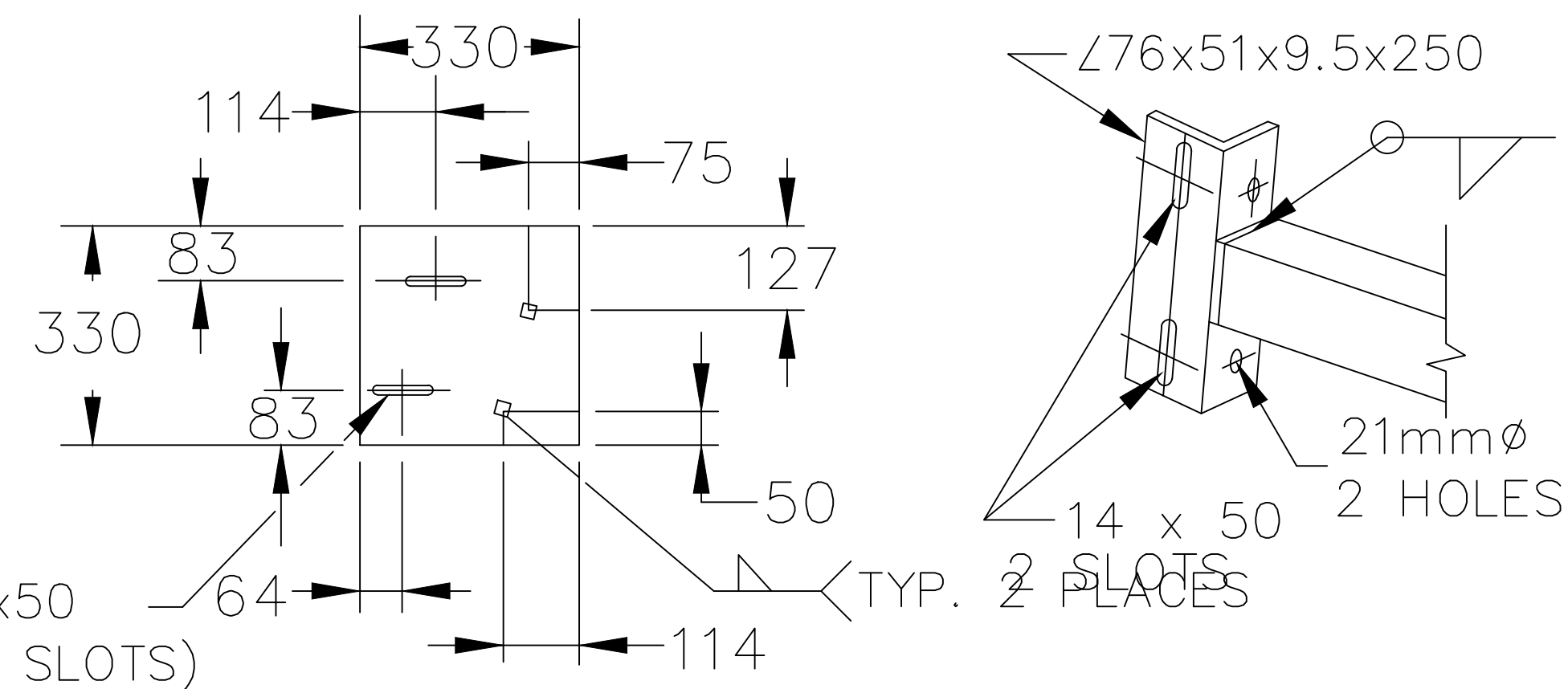
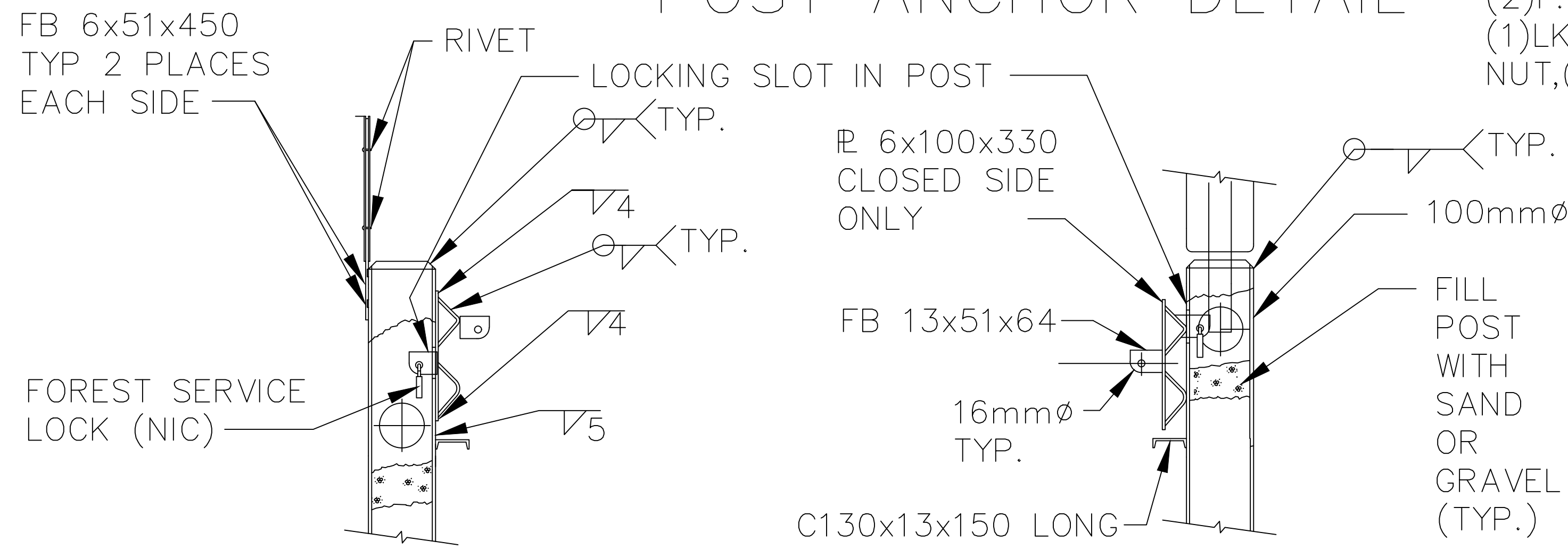
SHEET 2 OF 2

PROJECT	SHEET	TOTAL SHEETS

HINGE DETAIL



POST ANCHOR DETAIL



CLOSED POSITION LOCKING POST & GATE

OPEN POSITION LOCKING POST & GATE

ADJUSTABLE BRACE DETAILS

NOTE: ALL DIMENSIONS ARE mm UNLESS OTHERWISE NOTED.

HM000029
1-22-97

FOR INFORMATION ONLY

Kittitas Reclamation District

JACOBS
1100 112TH AVE. N.E. SUITE 600
BELLEVUE, WA 98004
(425) 453-3000 / www.jacobs.com

DESIGNED BY: JOHN M. ETULAIN
DRAWN BY: WBY28309
CHECKED BY: WBY28309
APPROVED BY: WBY28309
CONTRACT / PROJECT NO.: WBY28309
DATE: 2020-09-23

FOR INFORMATION ONLY

Conserving water, promoting local agriculture, and enhancing the environment...

KITTITAS RECLAMATION DISTRICT
ELLENSBURG, WASHINGTON
SOUTH BRANCH CANAL IMPROVEMENTS
ROBINSON SIPHON TO MANASTASH CREEK SIPHON

SOUTH BRANCH IMPROVEMENTS
ROBINSON SIPHON (MILEPOST 10.0) TO SOUTH BRANCH CANAL MILEPOST 10.4

REVNO	REVNO	REVNO	REVNO	REVNO

CONSULTANT PRODUCED BY

X ACCEPTANCE FOR ADMINISTRATION TITLE

ELLENSBURG, WA LOCATION
2020-09 DATE

USFS STANDARD PLAN HM000028

GATE BARRIER - RAIL TYPE DETAILS

R1811
SHEET 35 OF 35

SOLICITATION NO.: 33-SBC-1004

FILE NAME: WBY28309-D-R1811.DWG
SIZE: ANSI FULL BLEED D (22.00 X 34.00 INCHES)
PLOT SCALE: 1:1
PLOT DATE: 2020-09-23