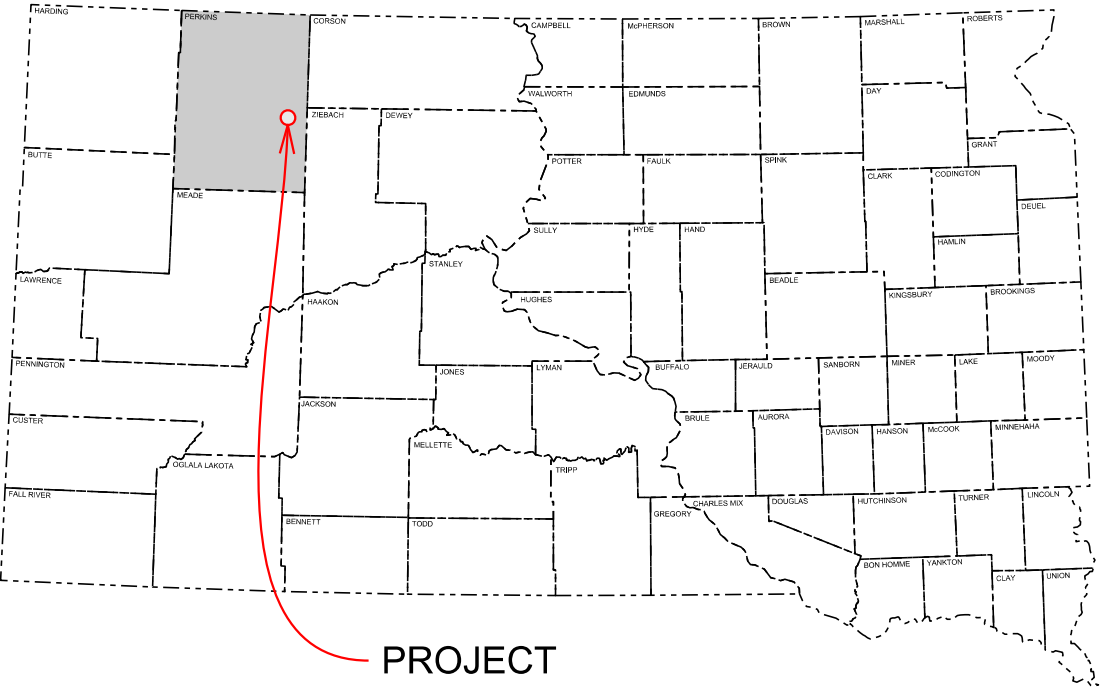


Plot Scale - 1:200

Plotted From - TRRC14610



PROJECT

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED
PROJECT 073-472
SD HWY 73
PERKINS COUNTY
Bump Repair
PCN i62d

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Plotting Date: 04/21/2021

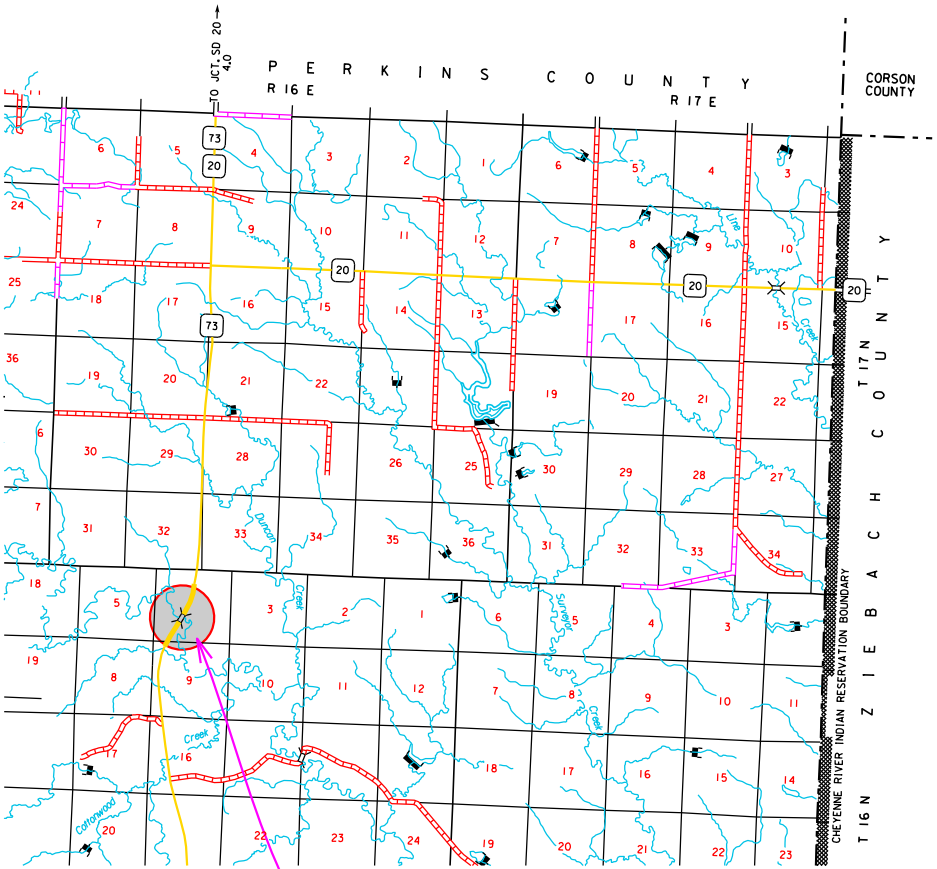
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SD HWY 73
STR. NO. 53-282-397
DESIGN DESIGNATION

| | |
|-------------|--------|
| AADT (2020) | 415 |
| AADT (2040) | 524 |
| DHV | 83 |
| D | 50 % |
| DHV T% | 15.9 % |
| AADT T% | 35 % |
| V | 65 mph |

STORM WATER PERMIT
None Required



SD HWY 73
STR.NO. 53-383-397
MRM 202.78



ESTIMATE OF QUANTITIES

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|-----------------|---|----------|------|
| 009E0010 | Mobilization | Lump Sum | LS |
| 110E0300 | Remove Concrete Curb and/or Gutter | 12 | Ft |
| 110E0730 | Remove Beam Guardrail | 625.0 | Ft |
| 110E7700 | Remove Drop Inlet Frame and Grate Assembly for Reset | 1 | Each |
| 120E0600 | Contractor Furnished Borrow Excavation | 113 | CuYd |
| 230E0100 | Remove and Replace Topsoil | Lump Sum | LS |
| 260E1010 | Base Course | 26.0 | Ton |
| 320E1200 | Asphalt Concrete Composite | 174.0 | Ton |
| 332E0010 | Cold Milling Asphalt Concrete | 1,373 | SqYd |
| 410E2600 | Membrane Sealant Expansion Joint | 33.8 | Ft |
| 460E0300 | Breakout Structural Concrete | 2.4 | CuYd |
| 480E0200 | Epoxy Coated Reinforcing Steel | 90 | Lb |
| 480E0504 | No. 4 Rebar Splice | 4 | Each |
| 550E0011 | Concrete Bridge Deck Overlay | 15 | CuYd |
| 550E0100 | Concrete Removal Type 1A | 79.2 | SqYd |
| 550E0500 | Finishing and Curing | 85.8 | SqYd |
| 630E0500 | Type 1 MGS | 425.0 | Ft |
| 630E1501 | Type 1 Retrofit Guardrail Transition | 4 | Each |
| 630E2017 | MGS MASH Flared End Terminal | 4 | Each |
| 632E2220 | Guardrail Delineator | 18 | Each |
| 633E1220 | High Build Waterborne Pavement Marking Paint, 4" White | 494 | Ft |
| 633E1222 | High Build Waterborne Pavement Marking Paint, 4" Yellow | 65 | Ft |
| 634E0010 | Flagging | 80.0 | Hour |
| 634E0110 | Traffic Control Signs | 364.0 | SqFt |
| 634E0120 | Traffic Control, Miscellaneous | Lump Sum | LS |
| 634E0275 | Type 3 Barricade | 1 | Each |
| 634E0600 | 4" Temporary Pavement Marking Tape Type I | 144 | Ft |
| 634E0640 | Temporary Pavement Marking | 2,860 | Ft |
| 650E4360 | Type D46 Concrete Curb and Gutter | 12 | Ft |
| 670E7000 | Reset Drop Inlet Frame and Grate Assembly | 1 | Each |
| 734E0010 | Erosion Control | Lump Sum | LS |
| 734E0154 | 12" Diameter Erosion Control Wattle | 120 | Ft |

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

ENVIRONMENTAL COMMITMENTS

The SDDOT is committed to protecting the environment and uses Environmental Commitments as a communication tool for the Engineer and Contractor to ensure that attention is given to avoid, minimize, and/or mitigate an environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency with permitting authority can delay a project if identified environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. During construction, the Project Engineer will verify that the Contractor has met Environmental Commitment requirements. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office.

Additional guidance on SDDOT's Environmental Commitments can be accessed through the Environmental Procedures Manual found at: <https://dot.sd.gov/media/documents/EnvironmentalProceduresManual.pdf>

For questions regarding change orders in the field that may have an effect on an Environmental Commitment, the Project Engineer will contact the Environmental Engineer at 605-773-3180 or 605-773-4336 to determine whether an environmental analysis and/or resource agency coordination is necessary.

Once construction is complete, the Project Engineer will review all environmental commitments for the project and document their completion.

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

The Whooping Crane is a spring and fall migratory bird in South Dakota that is about 5 feet tall and typically stops on wetlands, rivers, and agricultural lands along their migration route. An adult Whooping Crane is white with a red crown and a long, dark, pointed bill. Immature Whooping Cranes are cinnamon brown. While in flight, their long necks are kept straight and their long dark legs trail behind. Adult Whooping Cranes' black wing tips are visible during flight.

Action Taken/Required:

Harassment or other measures to cause the Whooping Crane to leave the site is a violation of the Endangered Species Act. If a Whooping Crane is sighted roosting in the vicinity of the project, borrow pits, or staging areas associated with the project, cease construction activities in the affected area until the Whooping Crane departs and immediately contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

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COMMITMENT C: WATER SOURCE

The Contractor will not withdraw water with equipment previously used outside the State of South Dakota or previously used in aquatic invasive species (AIS) positive waters within South Dakota without prior approval from the SDDOT Environmental Office. To prevent and control the introduction and spread of invasive species into the project vicinity, all equipment will be power washed with hot water (≥140 °F) and completely dried for a minimum of 7 days prior to subsequent use. South Dakota administrative rule 41:10:04:02 forbids the possession and transport of AIS; therefore, all attached dirt, mud, debris and vegetation must be removed and all compartments and tanks capable of holding standing water must be drained. This includes, but is not limited to, all equipment, pumps, lines, hoses and holding tanks.

Action Taken/Required:

The Contractor will obtain the necessary permits from the regulatory agencies such as the South Dakota Department of Environment and Natural Resources (DENR) and the United States Army Corps of Engineers (USACE) prior to water extraction activities.

Additional information and mapping of water sources impacted by Aquatic Invasive Species in South Dakota can be accessed at: <http://sdleastwanted.com/maps/default.aspx>

[South Dakota Administrative Rule 41:10:04 Aquatic Invasive Species: https://sdlegislature.gov/rules/DisplayRule.aspx?Rule=41:10:04](https://sdlegislature.gov/rules/DisplayRule.aspx?Rule=41:10:04)

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site.

COMMITMENT H: WASTE DISPOSAL SITE

The Contractor will furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

Construction and/or demolition debris may not be disposed of within the Public ROW.

The waste disposal site(s) will be managed and reclaimed in accordance with the following from the General Permit for Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Environment and Natural Resources.

The waste disposal site(s) will not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Environmental Office and the Project Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements will apply:

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials will be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris will consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW will be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor will control the access to waste disposal sites not within the Public ROW with fences, gates, and placement of a sign or signs at the entrance to the site stating “No Dumping Allowed”.
2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.

Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) will be incidental to the various contract items.

COMMITMENT I: HISTORICAL PRESERVATION OFFICE
CLEARANCES

State Historical Preservation Office (SHPO or THPO) concurrence has not been obtained for this project.

Action Taken/Required:

All earth disturbing activities require a cultural resource review prior to scheduling the pre-construction meeting. This work includes, but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

The Contractor will arrange and pay for a record search and when necessary, a cultural resource survey. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review if the site was previously surveyed; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor will provide ARC with the following: a topographical map or aerial view of which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor will submit the cultural resources survey report to SDDOT Environmental Office, 700 East Broadway Avenue, Pierre, SD 57501-2586. SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

In the event of an inadvertent discovery of human remains, funerary objects, or if evidence of cultural resources is identified during project construction activities, then such activities will immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office to determine an appropriate course of action.

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UTILITIES

The Contractor will contact the involved utility companies through South Dakota One Call (1-800-781-7474) prior to starting work. It will be the responsibility of the Contractor to coordinate work with the utility owners to avoid damage to existing facilities.

If utilities are identified near the improvement area through the SD One Call Process as required by South Dakota Codified Law 49-7A and Administrative Rule Article 20:25, the Contractor will contact the Project Engineer to determine modifications that will be necessary to avoid utility impacts.

SURFACING THICKNESS DIMENSIONS

At those locations where material must be placed to achieve a required elevation, the depth/quantity may be varied to achieve the required elevation.

COLD MILLING ASPHALT CONCRETE

Cold milling asphalt will be done according to the typical section. In areas where maintenance patches have raised and/or widened the road, additional asphalt concrete will be milled to provide a uniform typical section from centerline to the edge of the finished shoulder. These areas also include farm, residential, field entrances and intersecting roads. Milling will be daylighted to the outside edge of the roadway. Any additional costs associated with this additional cold milling will be incidental to the contract unit price per square yard for COLD MILLING ASPHALT CONCRETE.

Cold milling asphalt is estimated to produce 216 tons of cold milled asphalt concrete material.

The excess asphalt concrete material will be become the property of the Contractor for disposal and may not be reused on the project.

WATER FOR COMPACTION

The cost of water for compaction of the granular material will be incidental to the various other contract items. Six percent plus or minus moisture will be required at the time of compaction unless otherwise directed by the Engineer.

Water for compaction of earth embankments will be applied at the rate of 10 gallons per cubic yard of Contractor Furnished Borrow Excavation. The cost of the water will be incidental to the contract unit price per cubic yard for CONTRACTOR FURNISHED BORROW EXCAVATION.

CONTRACTOR FURNISHED BORROW EXCAVATION

The Contractor will provide a suitable site for Contractor furnished borrow excavation material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site. The borrow material will be approved by the Engineer. The plans quantity for “Contractor Furnished Borrow Excavation” as shown in the Estimate of Quantities will be the basis of payment for this item.

Restoration of the Contractor furnished borrow excavation site will be the responsibility of the Contractor.

FLUSH SEAL

Application of flush seal will be completed within 10 working days following completion of the asphalt concrete surfacing.

Application of flush seal may be eliminated by the Engineer. If the paved surface remains tight, the Engineer will notify the Contractor as soon as possible that the flush seal is unnecessary.

SAND FOR FLUSH SEAL

The sand application will be placed 11' wide in each lane, leaving 12" on center line and 6" on each edge line free of sand (Rate of 8 lbs/sqyd).

TABLE OF SURFACING QUANTITIES

| | Remove Concrete Curb & Gutter | Remove Drop Inlet Frame & Grate Assembly for Reset | Cold Mill Asphalt Concrete | Asphalt Concrete Composite | Type D46 Concrete Curb & Gutter | Reset Drop Inlet Frame & Grate Assembly |
|--------------|-------------------------------|--|----------------------------|----------------------------|---------------------------------|---|
| Location | Ft | Each | SqYd | Ton | Ft | Each |
| Begin Bridge | 12 | 1 | 721 | 91 | 12 | 1 |
| End Bridge | | | 652 | 83 | | |
| TOTALS: | 12 | 1 | 1373 | 174 | 12 | 1 |

TABLE OF GUARDRAIL

| Location | L/R | Remove Beam Guardrail | Type 1 Retrofit Guardrail Transition | Type 1 MGS | MGS Mash Flared End | Guardrail Delineation | Contractor Furnished Borrow Excavation | Base Course |
|--------------|-----|-----------------------|--------------------------------------|------------|---------------------|-----------------------|--|-------------|
| | | Ft | Each | Ft | Each | Each | CuYd | Ton |
| Begin Bridge | R | 181.25 | 1 | 150 | 1 | 5 | 63 | 12 |
| | L | 131.25 | 1 | 62.5 | 1 | 4 | | |
| End Bridge | R | 131.25 | 1 | 62.5 | 1 | 4 | 70 | 14 |
| | L | 181.25 | 1 | 150 | 1 | 5 | | |
| TOTALS: | | 625 | 4 | 425 | 4 | 18 | 133 | 26 |

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REMOVE AND REPLACE TOPSOIL

Topsoil will also be salvaged and stockpiled prior to constructing the guardrail embankment area(s). Limits of this work, depth of salvage, and stockpile location will be directed by the Engineer. Following completion of construction, topsoil will be spread evenly over the disturbed areas.

All costs associated with removing and replacing the topsoil along areas to be resurfaced will be incidental to the contract lump sum price for “Remove and Replace Topsoil”.

EROSION CONTROL

The estimated area requiring erosion control is 4,200 square feet. All costs for the erosion control work for furnishing, placing, and maintaining erosion control including equipment, labor, mycorrhizal inoculum, seeding, fertilizing, and fiber mulching will be incidental to the contract lump sum price for “Erosion Control”.

The limits of erosion control work will be determined by the Engineer during construction.

Mycorrhizal Inoculum

Mycorrhizal inoculum will consist of mycorrhizal fungi spores and mycorrhizal fungi-infected root fragments in a solid carrier. The carrier may include organic materials, calcinated clay, or other materials consistent with application and good plant growth. The supplier will provide certification of the fungal species claimed and the live propagule count. The inoculum will include the following fungal species:

- 25% *Glomus intraradices*
- 25% *Glomus aggregatum or deserticola*
- 25% *Glomus mosseae*
- 25% *Glomus etunicatum*

All seed will be inoculated by the seed supplier with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. All costs of inoculating the seed will be incidental to the contract lump sum price for Erosion Control.

The mycorrhizal inoculum will be as shown below or an approved equal:

| Product | Manufacturer |
|----------------------------|--|
| MycoApply | Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 www.mycorrhizae.com |
| AM 120 Multi Species Blend | Reforestation Technologies Int. Gilroy, CA Phone: 1-800-784-4769 www.reforest.com |

Fertilizing

The Contractor will apply an all-natural slow release fertilizer prior to seeding or placing sod. The all-natural fertilizer will have a minimum guaranteed analysis of 4-4-4 and be USDA Certified BioBased. It should provide a minimum of 4% (N) nitrogen with a minimum water insoluble nitrogen (WIN) fraction of 2.07%, a minimum of 4% (P2O5) available phosphate, a minimum of 4% (K2O) soluble potash, and a maximum carbon to nitrogen ratio (C:N ratio) of 5:1. The all-natural fertilizer will be free of weed-seed and pathogens accomplished through thermophilic composting, and not mechanical or chemical sterilization, to assure presence of beneficial soil microbiology. The fertilizer will have a near neutral pH, a low salt index, a low biological oxygen demand, contain organic humic and fulvic acids, and have high aerobic organism counts. The fertilizer will also be stable, free of bad odors, and be unattractive as a food source for animals. It should also be in a granular form that is easily spread.

The fertilizer will be applied at a rate of 1,500 pounds per acre in accordance with the manufacturer’s recommended method of application.

The all-natural slow release fertilizer will be as shown below or an approved equal:

| Product | Manufacturer |
|---------------|--|
| Sustane | Sustane Corporate Headquarters Cannon Falls, Minnesota Phone: 1-800-352-9245 www.sustane.com |
| Perfect Blend | Perfect Blend, LLC Bellevue, WA Phone: 1-866-456-8890 www.perfect-blend.com |

Permanent Seeding

The areas to be seeded consist of all newly graded areas within the project limits except for the top of roadways and temporary easements under cultivation,

Type F Permanent Seed Mixture will consist of the following:

| Grass Species | Variety | Pure Live Seed (PLS) (Pounds/Acre) |
|--|---|------------------------------------|
| Western Wheatgrass | Arriba, Flintlock, Rodan, Rosana, Walsh | 7 |
| Green Needlegrass | Lodorm, AC Mallard Ecovar | 4 |
| Sideoats Grama | Butte, Pierre | 3 |
| Blue Grama | Bad River | 2 |
| Oats or Spring Wheat: April through May; Winter Wheat: August through November | | 10 |
| Total: | | 26 |

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Fiber Mulching

Fiber mulch will be applied in a separate operation following permanent seeding.

The Contractor will allow the fiber mulch to cure a minimum of 18 hours prior to watering or any storm event to ensure proper cohesion between the soil and fiber particles.

The fiber mulch provided will be from the approved product list. The approved product list for fiber mulch may be viewed at the following internet site:

<http://apps.sd.gov/HC60ApprovedProducts/main.aspx>

EROSION CONTROL WATTLE

Erosion control wattles for restraining the flow of runoff and sediment will be installed at locations noted in the table and at locations determined by the Engineer during construction. Refer to Standard Plate 734.06 for details.

The Contractor will provide certification that the erosion control wattles do not contain noxious weed seeds.

Erosion control wattles will remain on the project to decompose.

The erosion control wattle provided will be from the approved product list. The approved product list for erosion control wattle may be viewed at the following internet site:

<http://apps.sd.gov/HC60ApprovedProducts/main.aspx>

TABLE OF EROSION CONTROL WATTLE

| Station | L/R | Diameter (Inch) | Location | Quantity (Ft) |
|---------|-----|-----------------|----------------------|---------------|
| 14+52 | R | 12 | ditch bottom | 30 |
| 15+62 | L | 12 | ditch bottom | 30 |
| | | | Additional Quantity: | 60 |
| | | | Total: | 120 |

SEQUENCE OF OPERATIONS

- 1. Set up Traffic Control.
- 2. Remove guardrail and curb & gutter for bridge work.
- 3. Complete bridge work and curb & gutter.
- 4. Complete cold mill asphalt.
- 5. Complete asphalt surfacing.
- 6. Complete guardrail.
- 7. Complete erosion control.
- 8. Complete pavement markings.
- 9. Remove traffic control.

Contractor requests to deviate from the sequence of operations will be submitted in writing to the Engineer for review. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department’s intent for traffic control and sequencing of the work. An alternate sequence will be submitted for review a minimum of one week prior to potential implementation.

GENERAL TRAFFIC CONTROL

Existing guide, route, informational logo, regulatory, and warning signs will be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging, and resetting of existing traffic control devices, including delineation, will be the responsibility of the Contractor. Cost for this work will be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost will be replaced by the Contractor at no cost to the State.

All temporary traffic control sign locations will be set in the field by the Contractor and verified by the Engineer prior to installation.

All construction operations will be conducted in the general direction of traffic movement.

If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD, whichever is more stringent will be used, as determined by the Engineer.

Unless otherwise stated in these plans, work will not be allowed during hours of darkness.

Fixed location signing placed more than 4 calendar days prior to the start of construction will be covered or laid down until the time of construction. The covers must be approved by the Engineer prior to installation. The cost of materials, labor, and equipment necessary to complete this work will be incidental to other contract items. No separate payment will be made.

All fixed location signs, sign posts, and breakaway bases will be removed within 7 calendar days following pavement marking.

All haul trucks will be equipped with an additional flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights will be incidental to the various related contract items.

At no time will a vertical drop-off of greater than 3 inches be left overnight adjacent to the traveled way. The Contractor will utilize embankment material to ensure a 3-inch vertical drop-off is not exceeded. The slope of the embankment material will not be steeper than a 4:1 within 30 feet of the traveled way.

Traffic will be maintained on the driving lanes. Use of the shoulder as a driving lane will not be permitted. Any damage to the shoulder due to rerouted traffic or Contractor’s equipment will be repaired at no expense to the Department.

TEMPORARY PAVEMENT MARKING

Temporary flexible vertical markers (tabs) will be required on the top lift of asphalt concrete surfacing.

Covers on the tabs will be sufficiently secured to prevent traffic from dislodging the cover and when removed, the covers will be properly disposed of. The Contractor will remove and properly dispose of the tabs after permanent pavement marking is applied. Method of removal will be nondestructive to the road surface and will be accomplished within one week of completion of the permanent pavement marking.

Any temporary flexible vertical markers (tabs) with covers removed before the flush seal will be replaced prior to application of the flush seal. Full reflectivity of all temporary flexible vertical markers (tabs) is required at all times. The Contractor will be required to replace any missing or non-reflective tabs at no additional cost to the State.

Three applications of temporary pavement marking are included in the estimate of quantities for completion of the milling, the final asphalt concrete lift, and uncovering the temporary flexible vertical markers (tabs) after application of the flush seal, and after the fog seal.

If the flush seal is eliminated, the application of the temporary pavement marking on top of the flush seal will be eliminated. No adjustment in the contract unit price for “Temporary Pavement Marking” will be made because of a variation in quantities.

In the absence of a signed lane closure or pilot car operation, FLAGGER (W20-7) symbol signs and flaggers, or a shadow vehicle with rotating yellow lights or strobe lights will be positioned on the shoulder in advance of workers for both directions of traffic during the installation and removal of the temporary flexible vertical markers (tabs). The traffic control device used will be moved intermittently to provide proper warning of the work operation. A ROAD WORK AHEAD (W20-1) sign, a WORKER (W21-1) symbol sign or a BE PREPARED TO STOP (W3-4) sign will be mounted on the rear of the shadow vehicle. The method of traffic control used by the Contractor for this work must be approved by the Engineer.

Temporary pavement marking for stop lines will consist of 4” Temporary Pavement Marking Tape Type I. Placement of each 24” white stop line will be accomplished by placing six pieces of 4” x 12’ tape adjacent to one another. Each workspace requires two stop lines which is an equivalent of approximately 144’ of 4” tape (1 workspaces at 144’ = 144’). Temporary pavement marking on centerline will consist of temporary flexible vertical markers (tabs) or temporary raised pavement markers and will be used as depicted on standard plate 634.25 when the stop condition must remain in place during nighttime hours, 9:00 pm to 6:00 am (Estimate 1 workspaces remaining during nighttime hours x 2,200’ per workspace = 2,200’).

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TABLE OF TRAFFIC CONTROL DEVICES

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

| SIGN CODE | SIGN DESCRIPTION | CONVENTIONAL ROAD | | | |
|--------------|--|---|-----------|------------------|------|
| | | NUMBER | SIGN SIZE | SQFT PER SIGN | SQFT |
| R1-1 | STOP | 2 | 30" | 5.2 | 10.4 |
| W1-4 | REVERSE CURVE (L or R) | 1 | 48" x 48" | 16.0 | 16.0 |
| W3-1 | STOP AHEAD (symbol) | 2 | 48" x 48" | 16.0 | 32.0 |
| W8-1 | BUMP | 4 | 48" x 48" | 16.0 | 64.0 |
| W8-7 | LOOSE GRAVEL | 2 | 48" x 48" | 16.0 | 32.0 |
| W8-11 | UNEVEN LANES | 2 | 48" x 48" | 16.0 | 32.0 |
| W13-1P | ADVISORY SPEED (plaque) | 2 | 30" x 30" | 6.3 | 12.6 |
| W16-2P | ____ FEET (supplemental distance plaque) | 2 | 30" x 24" | 5.0 | 10.0 |
| W20-1 | ROAD WORK AHEAD | 2 | 48" x 48" | 16.0 | 32.0 |
| W20-4 | ONE LANE ROAD AHEAD | 2 | 48" x 48" | 16.0 | 32.0 |
| W20-7 | FLAGGER (symbol) | 2 | 48" x 48" | 16.0 | 32.0 |
| W21-2 | FRESH OIL | 2 | 48" x 48" | 16.0 | 32.0 |
| G20-2 | END ROAD WORK | 2 | 36" x 18" | 4.5 | 9.0 |
| | | CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT | | | |
| | | 346.0 | | | |

PAVEMENT MARKING PAINT

| | | | |
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All materials will be applied as per the manufacturer’s recommendations.

The application of permanent pavement marking will begin no sooner than 7 calendar days following completion of the fog or flush seal. Application of permanent pavement marking will be completed within 14 calendar days following completion of the final surfacing.

HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

All materials will be applied as per manufacturer’s recommendations.

This material will consist of a durable high build, low VOC, fast drying, waterborne traffic paint with a 100% acrylic polymer (Arkema DT-400, Dow HD-21A, or equivalent). The Contractor will provide certification that the material is one of the following products or an equivalent as approved by the Operations Traffic Engineer:

- Diamond Vogel's Waterborne High Build Polymer Marking Paint
- Ennis-Flint’s High Build Polymer Marking Paint

No further testing of this material will be required. Reflective media will consist of glass beads.

High Build Waterborne Pavement Marking Paint applied after October 15 must be formulated as cold-weather waterborne paint. Cold weather waterborne paint will meet the requirements of Section 980.1 B.

RATES OF MATERIALS FOR HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

- Solid 4” line = 27.8 Gals/Mile
- Dashed 4” line = 7.6 Gal/Mile
- Glass Beads = 8 Lbs/Gal.

All cost for materials, labor and equipment necessary to furnish and install the pavement markings will be incidental to the contract unit price for the respective High Build Waterborne Pavement Marking Paint items.

TABLE OF PAVEMENT MARKING

| Location | Temporary Pavement Marking Ft | Pavement Marking Tape, Type 1 Ft | High Build Waterborne Pavement Marking Paint (White) Ft | High Build Waterborne Pavement Marking Paint (Yellow) Ft |
|--------------|--|---|--|---|
| Begin Bridge | 1460 | 72 | 294 | 40 |
| End Bridge | 1400 | 72 | 200 | 25 |
| TOTALS: | 2860 | 144 | 494 | 65 |

1:200
Plot Scale -

Plotted From - TRRC1610

SURFACING SECTIONS

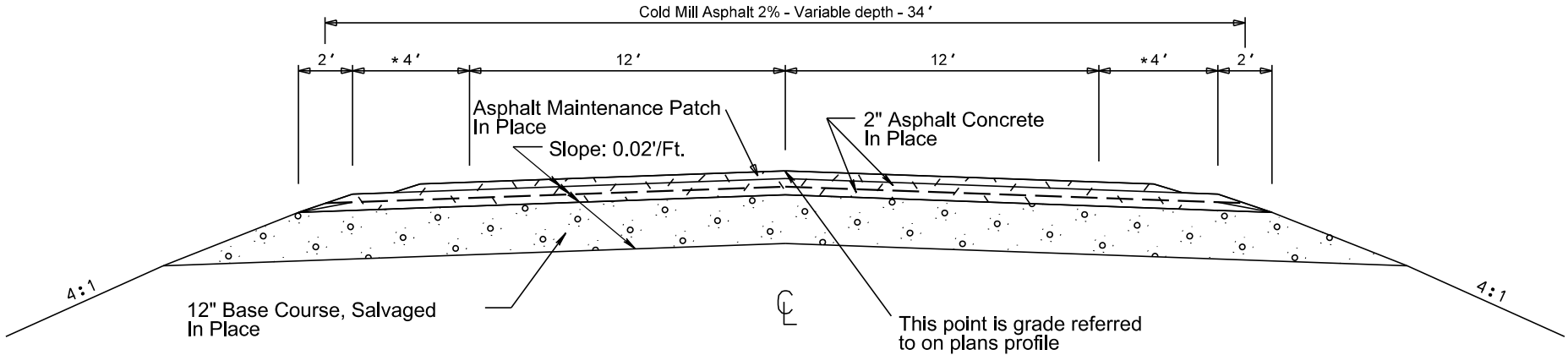
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|-----------------------------|---------|-------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
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Plotting Date: 04/21/2021

In Place Surfacing MAINLINE

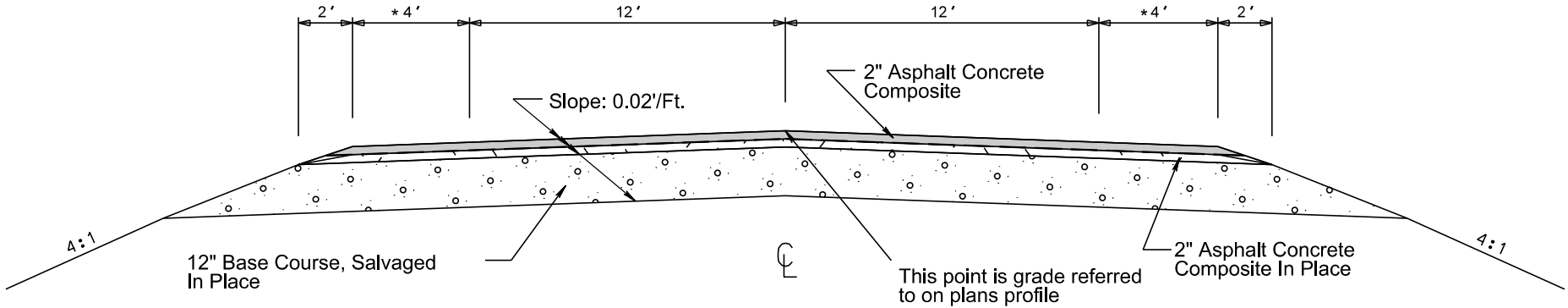
Sta. 12+32 to Sta. 14+16.55
Sta. 15+99.44 to Sta. 17+81

* At the ends of shoulder-widening for
Guardrail, the shoulder will transition
from 4' to 2' at the following locations:
12+63.54 to 12+31.60 L
12+84.42 to 12+55.04 R
17+30.70 to 17+60.70 L
17+50.71 to 17+80.71 R



Resurfacing MAINLINE

Sta. 12+32 to Sta. 14+16.55
Sta. 15+99.44 to Sta. 17+81



HORIZONTAL ALIGNMENT DATA

MAINLINE

| Type | Station | | | Northing | Easting |
|------|----------|------------|---------------|------------|-------------|
| POB | 12+83.74 | | | 569880.934 | 1409871.521 |
| | | TL= 133.85 | N 31°35'37" E | | |
| PI | 14+17.59 | | | 569994.942 | 1409941.642 |
| | | TL= 178.00 | N 31°44'25" E | | |
| PI | 15+95.58 | | | 570146.318 | 1410035.281 |
| | | TL= 84.59 | N 32°04'36" E | | |
| PI | 16+80.18 | | | 570217.998 | 1410080.205 |
| | | TL= 44.17 | N 31°45'28" E | | |
| POE | 17+24.35 | | | 570255.555 | 1410103.453 |

CONTROL DATA

| HORIZONTAL AND VERTICAL CONTROL POINTS | | | | | | |
|--|----------|---------|--------------------------------|------------|-------------|-----------|
| POINT | STATION | OFFSET | DESCRIPTION | NORTHING | EASTING | ELEVATION |
| CP9 | 14+46.43 | 16.97 R | BNCHMK Brass in top of SE Wall | 570010.545 | 1409971.243 | 2441.28 |
| 2137 | 14+46.43 | 16.97 R | | 570010.545 | 1409971.243 | 2441.28 |

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. North Zone

1:200
Plot Scale -

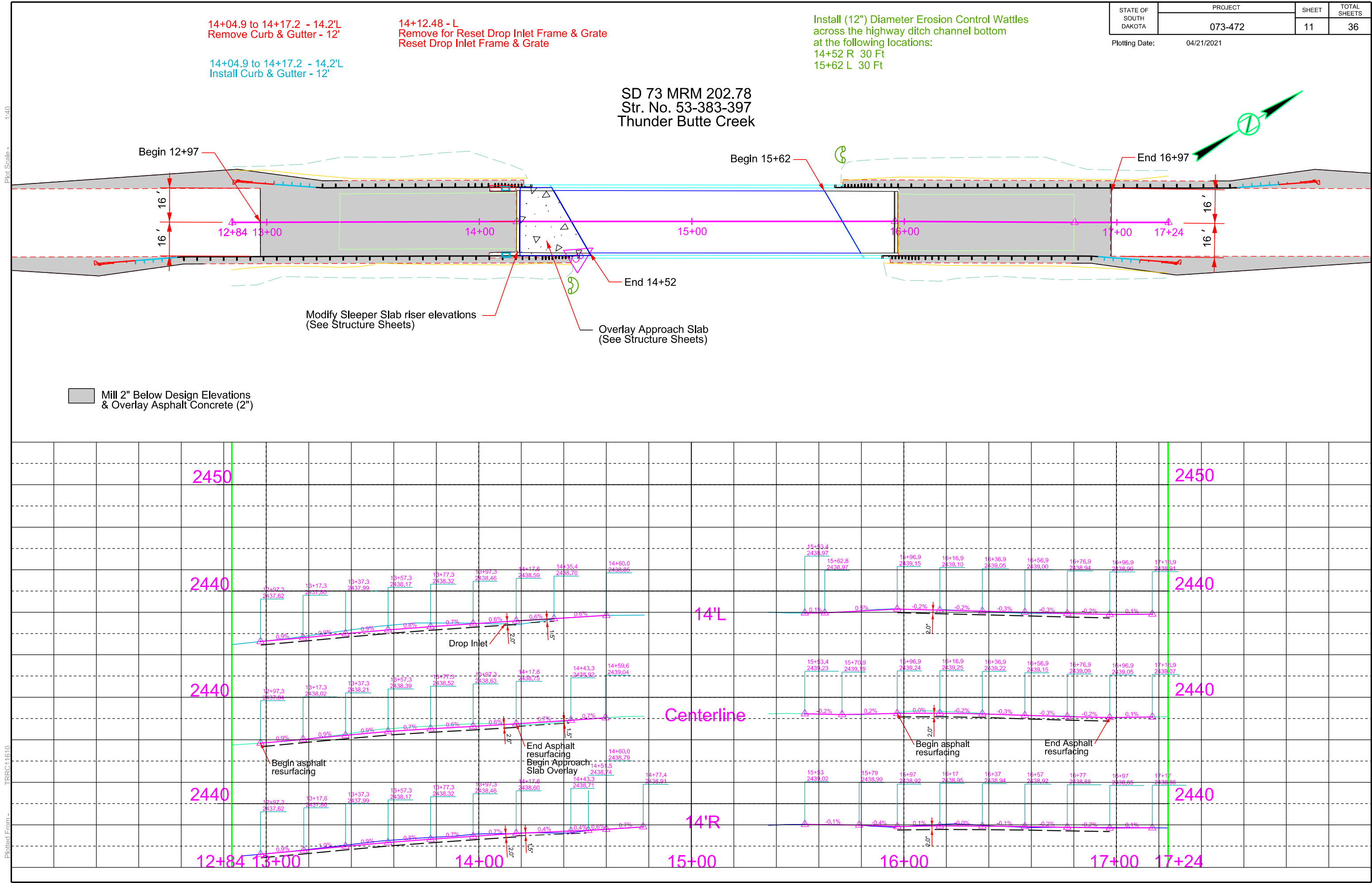
Plotted From -
TRR014610

LEGEND

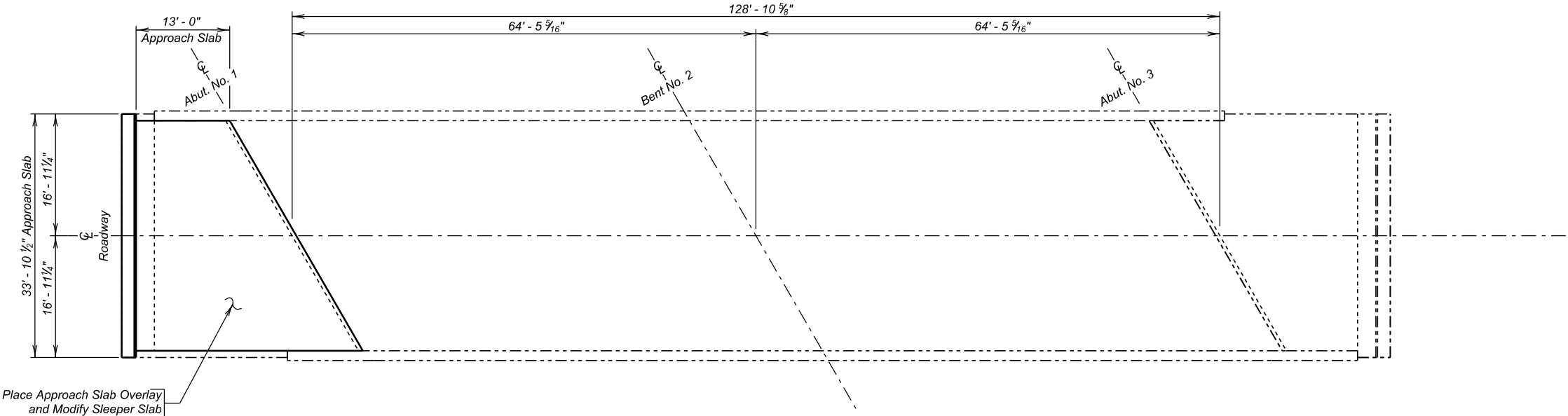
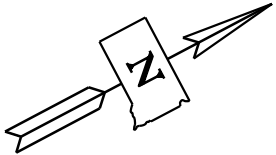
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
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Plotting Date: 04/21/2021

| | | | | | | | |
|---|--|-------------------------------|--|--|--|------------------------------------|--|
| Anchor | | Mailbox | | Subsurface Utility Exploration Test Hole | | State and National Line | |
| Antenna | | Manhole Electric | | Telephone Fiber Optics | | County Line | |
| Approach | | Manhole Gas | | Telephone Junction Box | | Section Line | |
| Assumed Corner | | Manhole Miscellaneous | | Telephone Pole | | Quarter Line | |
| Azimuth Marker | | Manhole Sanitary Sewer | | Television Cable Jct Box | | Sixteenth Line | |
| BBQ Grill/ Fireplace | | Manhole Storm Sewer | | Television Tower | | Property Line | |
| Bearing Tree | | Manhole Telephone | | Test Wells/Bore Holes | | Construction Line | |
| Bench Mark | | Manhole Water | | Traffic Sign Double Face | | ROW Line | |
| Box Culvert | | Merry-Go-Round | | Traffic Sign One Post | | New ROW Line | |
| Bridge | | Microwave Radio Tower | | Traffic Sign Two Post | | Cut and Fill Limits | |
| Brush/Hedge | | Miscellaneous Line | | Traffic Signal | | Control of Access | |
| Buildings | | Miscellaneous Property Corner | | Trash Barrel | | New Control of Access | |
| Bulk Tank | | Miscellaneous Post | | Tree Belt | | Proposed ROW | |
| Cattle Guard | | Overhang Or Encroachment | | Tree Coniferous | | (After Property Disposal) | |
| Cemetery | | Overhead Utility Line | | Tree Deciduous | | | |
| Centerline | | Parking Meter | | Tree Stumps | | Drainage Arrow | |
| Cistern | | Pedestrian Push Button Pole | | Triangulation Station | | | |
| Clothes Line | | Pipe With End Section | | Underground Electric Line | | Remove Concrete Pavement | |
| Concrete Symbol | | Pipe With Headwall | | Underground Gas Line | | Remove Concrete Driveway Pavement | |
| Control Point | | Pipe Without End Section | | Underground High Pressure Gas Line | | Remove Asphalt Concrete Pavement | |
| Creek Edge | | Playground Slide | | Underground Sanitary Sewer | | Remove Concrete Sidewalk | |
| Curb/Gutter | | Playground Swing | | Underground Storm Sewer | | Remove Concrete Median Pavement | |
| Curb | | Power And Light Pole | | Underground Tank | | Remove Concrete Curb and/or Gutter | |
| Dam Grade/Dike/Levee | | Power And Telephone Pole | | Underground Telephone Line | | | |
| Deck Edge | | Power Meter | | Underground Television Cable | | Detectable Warning | |
| Ditch Block | | Power Pole | | Underground Water Line | | Pedestrian Push Button Pole | |
| Doorway Threshold | | Power Pole And Transformer | | Water Fountain | | and 30" x 48" Clear Space | |
| Drainage Profile | | Power Tower Structure | | Water Hydrant | | with 1.5% slope | |
| Drop Inlet | | Propane Tank | | Water Meter | | | |
| Edge Of Asphalt | | Property Pipe | | Water Tower | | | |
| Edge Of Concrete | | Property Pipe With Cap | | Water Valve | | | |
| Edge Of Gravel | | Property Stone | | Water Well | | | |
| Edge Of Other | | Public Telephone | | Weir Rock | | | |
| Edge Of Shoulder | | Railroad Crossing Signal | | Windmill | | | |
| Electric Transformer/Power Junction Box | | Railroad Milepost Marker | | Wingwall | | | |
| Fence Barbwire | | Railroad Profile | | Witness Corner | | | |
| Fence Chainlink | | Railroad ROW Marker | | | | | |
| Fence Electric | | Railroad Signs | | | | | |
| Fence Miscellaneous | | Railroad Switch | | | | | |
| Fence Rock | | Railroad Track | | | | | |
| Fence Snow | | Railroad Trestle | | | | | |
| Fence Wood | | Rebar | | | | | |
| Fence Woven | | Rebar With Cap | | | | | |
| Fire Hydrant | | Reference Mark | | | | | |
| Flag Pole | | Retaining Wall | | | | | |
| Flower Bed | | Riprap | | | | | |
| Gas Valve Or Meter | | River Edge | | | | | |
| Gas Pump Island | | Rock And Wire Baskets | | | | | |
| Grain Bin | | Rockpiles | | | | | |
| Guardrail | | Satellite Dish | | | | | |
| Gutter | | Septic Tank | | | | | |
| Guy Pole | | Shrub Tree | | | | | |
| Haystack | | Sidewalk | | | | | |
| Highway ROW Marker | | Sign Face | | | | | |
| Interstate Close Gate | | Sign Post | | | | | |
| Iron Pin | | Slough Or Marsh | | | | | |
| Irrigation Ditch | | Spring | | | | | |
| Lake Edge | | Stream Gauge | | | | | |
| Lawn Sprinkler | | Street Marker | | | | | |



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| STATE OF | PROJECT | SHEET NO. | TOTAL SHEETS |
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INDEX OF BRIDGE SHEETS -

- Sheet No. 1 - Layout for Upgrading
- Sheet No. 2 - Estimate of Structure Quantities and Notes
- Sheet No. 3 - Notes (Continued)
- Sheet No. 4 - Approach Slab Details
- Sheet No. 5 - Approach Slab Joint Details
- Sheet No. 6 thru 7 - Original Construction Plans

ALTERNATE A
LAYOUT FOR UPGRADING
FOR
128' - 10⁵/₈" PRESTRESSED GIRDER BRIDGE
32' - 0" ROADWAY 30° RHF SKEW
OVER THUNDER BUTTE CREEK SEC. 4-T16N-R16E
STR. NO. 53-383-397

PERKINS COUNTY
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2020

| | | | |
|--------------------------------|-----------------------------|--|--|
| DESIGNED BY BWS PERKI62D | DRAWN BY BWS I62DSA01 | | <i>Steve A. Johnson</i> BRIDGE ENGINEER |
|--------------------------------|-----------------------------|--|--|

ESTIMATE OF STRUCTURE QUANTITIES

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|-----------------|----------------------------------|----------|------|
| 410E2600 | Membrane Sealant Expansion Joint | 33.8 | Ft |
| 460E0300 | Breakout Structural Concrete | 2.4 | CuYd |
| 480E0200 | Epoxy Coated Reinforcing Steel | 90 | Lb |
| 480E0504 | No. 4 Rebar Splice | 4 | Each |
| 550E0011 | Concrete Bridge Deck Overlay | 14.9 | CuYd |
| 550E0100 | Concrete Removal Type 1A | 79.2 | SqYd |
| 550E0500 | Finishing and Curing | 85.8 | SqYd |

SPECIFICATIONS FOR BRIDGE

- Design Specifications: AASHTO LRFD Bridge Design Specifications, 2014 Edition with 2015 and 2016 interims.
- Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and required provisions, supplemental specifications, and special provisions as included in the proposal.

DETAILS AND DIMENSIONS OF EXISTING BRIDGE

All details and dimensions of the existing bridge, contained in these plans, are based on the original construction plans and shop plans. It is the Contractor's responsibility to inspect and verify the actual field conditions and any necessary as-built dimensions affecting the satisfactory completion of the work required for this project.

SCOPE OF BRIDGE WORK AND SEQUENCE OF OPERATIONS

All work on this structure shall be accomplished with the traffic control shown elsewhere in the plans.

- Remove existing approach slab concrete, sleeper slab riser, strip seal, and steel extrusion for the first phase of construction.
- Accomplish all Concrete Removal Type 1A to the satisfaction of the Engineer for the first phase of construction.
- Place new Concrete Bridge Deck Overlay to the elevations shown in the surfacing plans on the approach slab for the first phase of construction.
- Install new membrane sealant expansion joint on approach slab for the first phase of construction.
- Switch traffic and repeat steps 1 through 4 for second phase of construction.

GENERAL CONSTRUCTION - BRIDGE

- All mild reinforcing steel shall conform to ASTM A615, Grade 60.
- Use 2" clear cover on all reinforcing steel except as shown otherwise.

- Request for construction joints or resteel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of reinforcing steel.
- Surfaces of fresh concrete at construction joints shall be rough floated sufficiently to consolidate the surface. All construction joints shall be cleaned of surface laitance, curing compounds and other foreign materials prior to placing fresh concrete against the joint.
- The type of vibratory screed shall be approved by the Engineer.

CONCRETE BREAKOUT

- The existing sleeper slab riser and approach slab shall be broken out to the limits shown on the plans. Breakout limits shall be defined with a 3/4" deep sawcut (unless specified otherwise in these plans), where practical, as approved by the Engineer. Reinforcing steel that is exposed and is scheduled for use in the new construction shall be cleaned and straightened to the satisfaction of the Engineer. Care shall be taken not to damage the existing reinforcing steel that is to be reused in the new construction during concrete breakout. Any reinforcing steel that is damaged during concrete breakout shall be replaced or repaired, as approved by the Engineer, by the Contractor at no cost to the Department.
- All broken out concrete, discarded reinforcing bars and expansion devices shall be disposed of by the Contractor. Any disposal of discarded material shall be in accordance with the Environmental Commitments.
- The contract unit price per cubic yard for "Breakout Structural Concrete" shall include breaking out concrete, cleaning, straightening existing reinforcing steel, removal of the existing armored device, and disposal of all broken out material.

- The existing reinforcing steel in the sleeper slab riser and approach slab is epoxy coated. Reinforcing steel that is exposed and is scheduled for use in the new construction shall be cleaned of all adhering concrete and rust (if present) with a wire brush and straightened to the satisfaction of the Engineer. Any reinforcing steel that is damaged during concrete breakout shall be replaced or repaired, as approved by the Engineer, by the Contractor at no cost to the Department. After all concrete removal and rebar straightening, the Contractor shall visually inspect the epoxy coating on the salvaged reinforcing steel with the Engineer and repair all areas of damaged epoxy coating as approved by the Engineer. The damaged coating areas shall be repaired with a touch up coating material supplied by an epoxy coating manufacturer who supplies coating material for new epoxy coated reinforcing steel. This coating shall be inert in concrete and compatible with the existing coating on the reinforcing steel. The coating shall be allowed to cure for 24 hours or as per the manufacturer's recommendations, whichever is more stringent, before concrete can be placed. These bars shall be clean and free from all surface contaminants before coating. The cost of cleaning and placing the epoxy touch up coating to the existing reinforcing steel shall be incidental to the various bid items.

CONCRETE BRIDGE DECK OVERLAY

- The preparation for resurfacing consists of Concrete Removal Type 1A on the approach slab. Such removal will be in conformance with these plans and Section 550 of the Construction Specifications. Extreme care will be taken during the Concrete Removal 1A to assure that the existing reinforcing steel is not damaged. In the event that reinforcing steel damage inadvertently occurs, the Bridge Construction Engineer will be immediately notified. Any damaged reinforcing steel will be repaired by the Contractor, as approved by the Engineer, at no additional cost to the Department.
- A minimum thickness of 1.5" of Concrete Bridge Deck Overlay will be maintained on the approach slab.
- Concrete for the overlay will be an approved A40 Concrete Mix Design mixed and proportioned in accordance with Section 460 of the construction specifications with the following modifications.
 - The course aggregate gradation will be in accordance with Section 820 of the Construction Specifications and size #3 will be substituted in lieu of sizes #1 and #15.
 - This mix will meet the requirement for use in a bridge deck as shown below Table 1 in Section 460 of the Construction Specifications.

ALTERNATE A
ESTIMATE OF STRUCTURE QUANTITIES AND NOTES
FOR

128' - 10⁵/₈" PRESTRESSED GIRDER BRIDGE

STR. NO. 53-383-397

DECEMBER 2020


2 OF 7

| | | |
|--------------------------------|-------------------------------|-------------------------------------|
| DESIGNED BY BWS PERK162D | DRAFTED BY BWS I62DSA02 | Steve A. Johnson BRIDGE ENGINEER |
|--------------------------------|-------------------------------|-------------------------------------|

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| STATE OF | PROJECT | SHEET NO. | TOTAL SHEETS |
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4. The Concrete overlay will be placed, finished, and cured in accordance with Section 550 of the Construction Specifications except as noted below.
- a. Section 550.3 B.2 and 550.3 B.3 will be waived.
- b. Section 550.3 B.4, Placing and Finishing Equipment will be modified to include any equipment capable to screed the concrete overlay accurately as approved by the Bridge Construction Engineer. The Contractor will vibrate all concrete prior to the screed/finish machine.
- c. Prior to the placement of the Concrete Bridge Deck Overlay the approach slab will be completely and continuously wetted for a minimum of 3 hours. Immediately prior to concrete placement any visible free or ponded water on the deck surface will be removed from the deck surface using a broom or oil free compressed air. **No grout is to be used for this overlay.**
- d. The Concrete Bridge Deck Overlay will be cured in accordance to 460.3 M.2.a or 460.3 M.2.b for a minimum of 7 days.
5. Reinforcing steel will be placed in the sleeper and approach slab according to the plans. The sleeper and approach slab will be filled with concrete during the placement of Concrete Bridge Deck Overlay. The use of a spud vibrator maybe required to prevent voids in this location.
6. No traffic will be allowed to operate on the scarified portion of the approach slab. If it appears that the entire Concrete Bridge Deck Overlay cannot be completed prior to winter, the Type 1A removal will not be done until work resumes in the spring. In the event that scarification has been started and due to unforeseen circumstances it becomes impossible to complete the placement of the overlay on the entire surface of the structure prior to winter, the Office of Bridge Design will be notified. Recommendations for handling winter traffic will then be made. These recommendations may include, but are not limited to, filling extra depth removal areas with Class A45 Concrete, placing an asphalt overlay on the uncompleted area so that the entire roadway width may be opened to traffic, removal of the asphalt overlay when work is resumed and scarifying an additional 1/4" of depth on the approach slab. The cost of this work, including asphalt overlay, scarification, Class A45 Concrete, extra concrete, and all other items incidental to this work, will be at the expense of the Contractor.
7. It will be necessary for the Contractor to shape the surface of the Concrete Bridge Deck Overlay within one foot of the curb as detailed in the plans to ensure that water drains off the ends of the approach slab.
8. Concrete Bridge Deck Overlay will be measured to the nearest cubic yard of concrete placed. Deductions will not be made for material wasted in the finishing operations and removed to form longitudinal joints, unless the waste becomes excessive. Concrete wasted or rejected for other causes will not be included for payment.
9. Concrete Bridge Deck Overlay will be paid for at the contract unit price per cubic yard. Payment will be full compensation for labor, equipment, materials including elastic joint sealer, and all incidental work required to furnish and place this material.

ALTERNATE A
NOTES (CONTINUED)
FOR
128' - 10⁵/₈" PRESTRESSED GIRDER BRIDGE
STR. NO. 53-383-397
DECEMBER 2020

| | | | |
|--------------------------------|----------|--|-----------------|
| DESIGNED BY BWS PERK162D | I62DSA01 | DRAFTED BY BWS  | BRIDGE ENGINEER |
|--------------------------------|----------|--|-----------------|

| STATE OF | PROJECT | SHEET NO. | TOTAL SHEETS |
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REINFORCING SCHEDULE

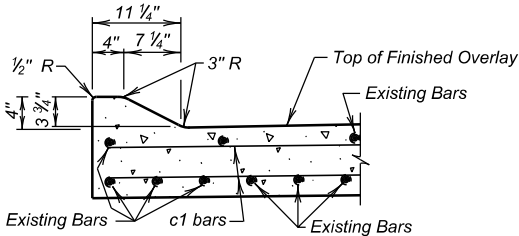
| Mk. | No. | Size | Length | Type | Bending Details |
|---------|-----|------|--------|----------|-----------------|
| PHASE 1 | | | | | |
| Ø | c1 | 4 | 4 | 16' - 9" | Str. |
| PHASE 2 | | | | | |
| Ø | c1 | 4 | 4 | 16' - 9" | Str. |

Note -
All Dimensions are out to out of bars.
All Bars to be Epoxy Coated.
Ø Splice (Mechanically Spliced)

ESTIMATED QUANTITIES

| ITEM | UNIT | PHASE 1 | PHASE 2 |
|--------------------------------|---------|----------|----------|
| | | QUANTITY | QUANTITY |
| ★ Concrete Bridge Deck Overlay | Cu. Yd. | 6.7 | 8.2 |
| ★ Concrete Removal Type 1A | Sq. Yd. | 33.9 | 45.3 |
| Finishing and Curing | Sq. Yd. | 34.7 | 51.1 |
| Breakout Structural Concrete | Cu. Yd. | 1.3 | 1.1 |
| No. 4 Rebar Splice | Each | 4 | — |
| Epoxy Coated Reinforcing Steel | Lbs. | 45 | 45 |
| | | | |
| | | | |

★ See surfacing plans for overlay elevations.



SEC. D - D

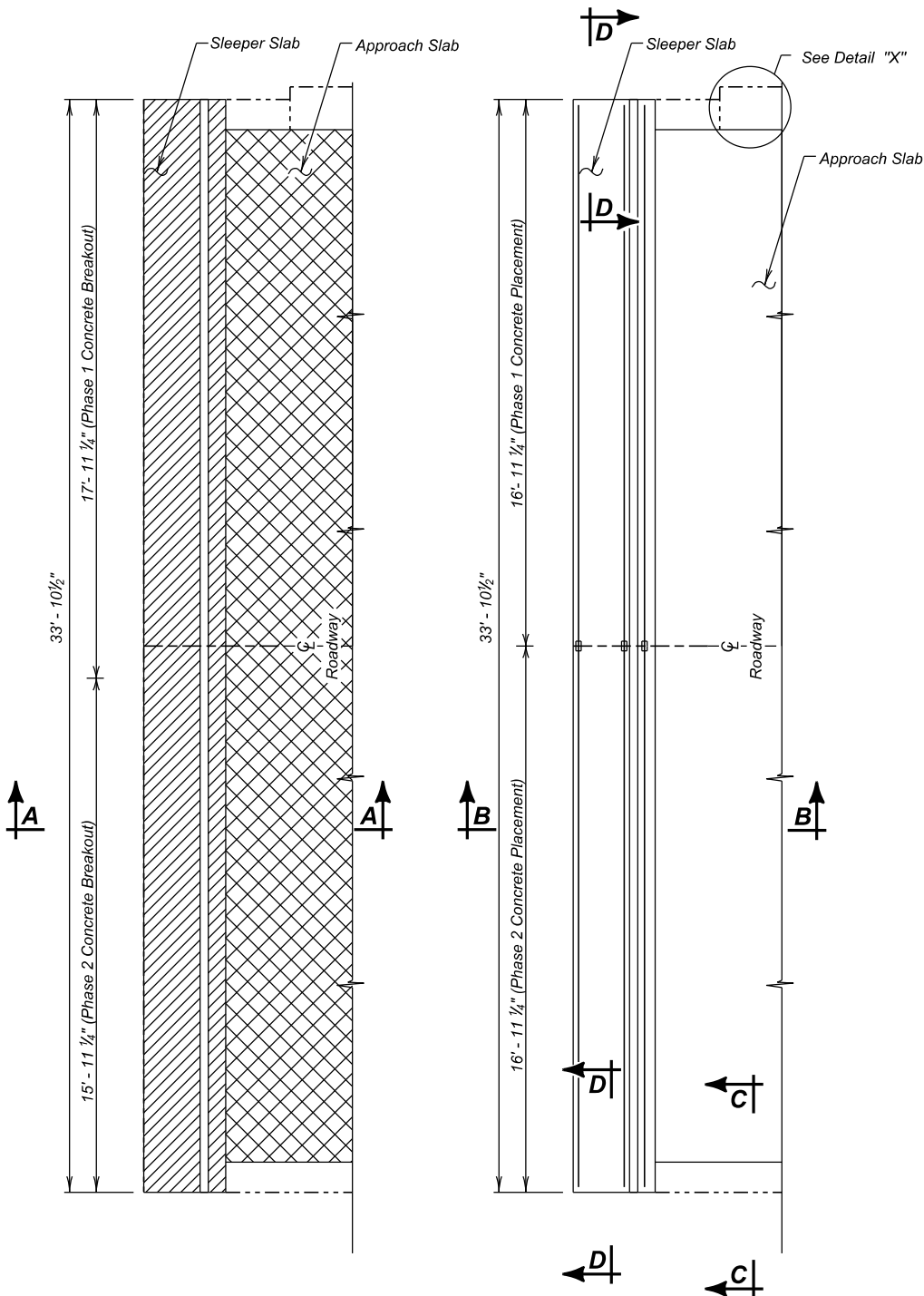
Dimensions are approximate.
Hand Finish to Match Adjacent Curb Dimensions

ALTERNATE A APPROACH SLAB DETAILS

FOR
128' - 10⁵/₈" PRESTRESSED GIRDER BRIDGE
32' - 0" ROADWAY
OVER THUNDER BUTTE CREEK
STR. NO. 53-383-397

PERKINS COUNTY
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2020

| | | | |
|--------------------------------|-----------------------------|--|--|
| DESIGNED BY BWS PERK162D | DRAWN BY BWS 162DSA01 | | <i>Steve A. Johnson</i> BRIDGE ENGINEER |
|--------------------------------|-----------------------------|--|--|



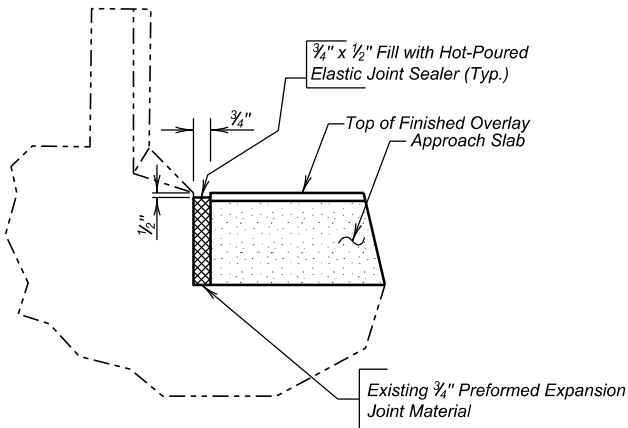
PLAN VIEW

(Showing Breakout Area)

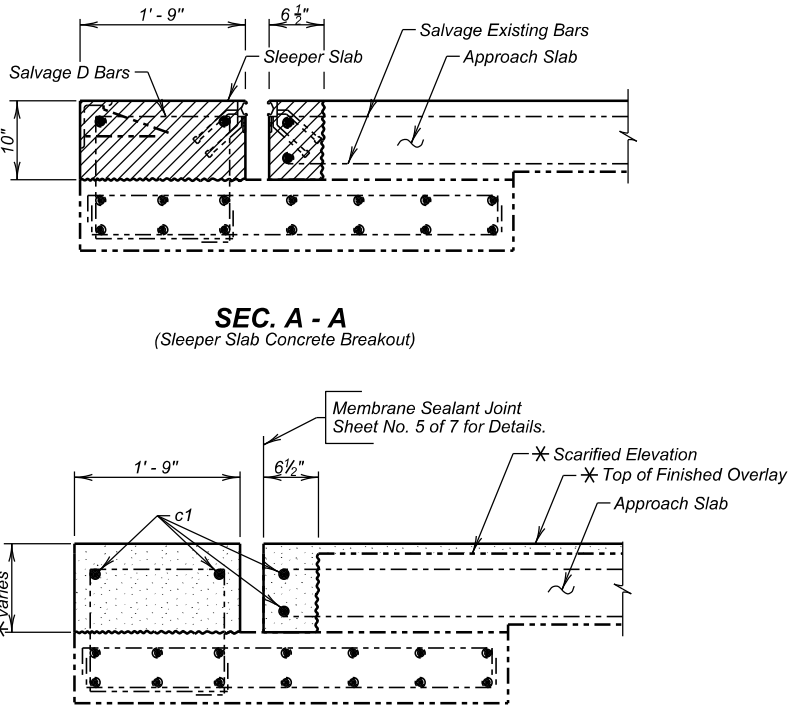
- Concrete Breakout Area
- Concrete Removal Type 1A Area

PLAN VIEW

(Showing New Concrete)



SECTION F - F



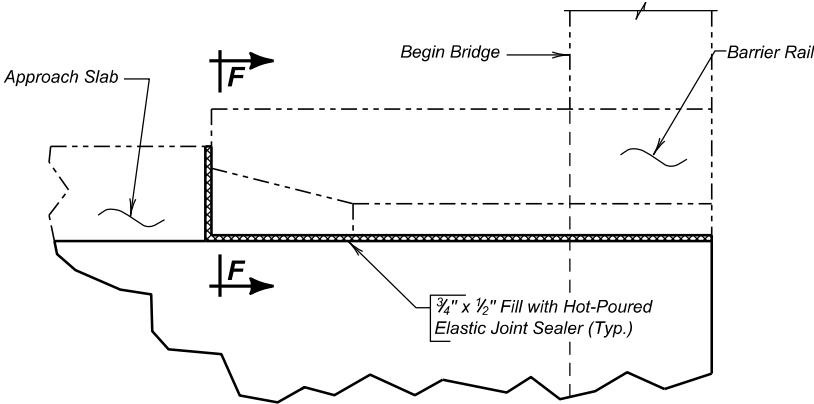
SEC. A - A

(Sleeper Slab Concrete Breakout)

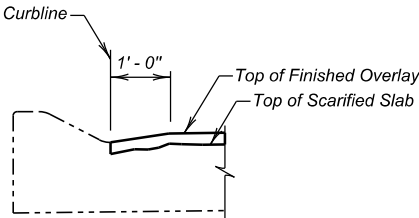
SEC. B - B

(Sleeper Slab)

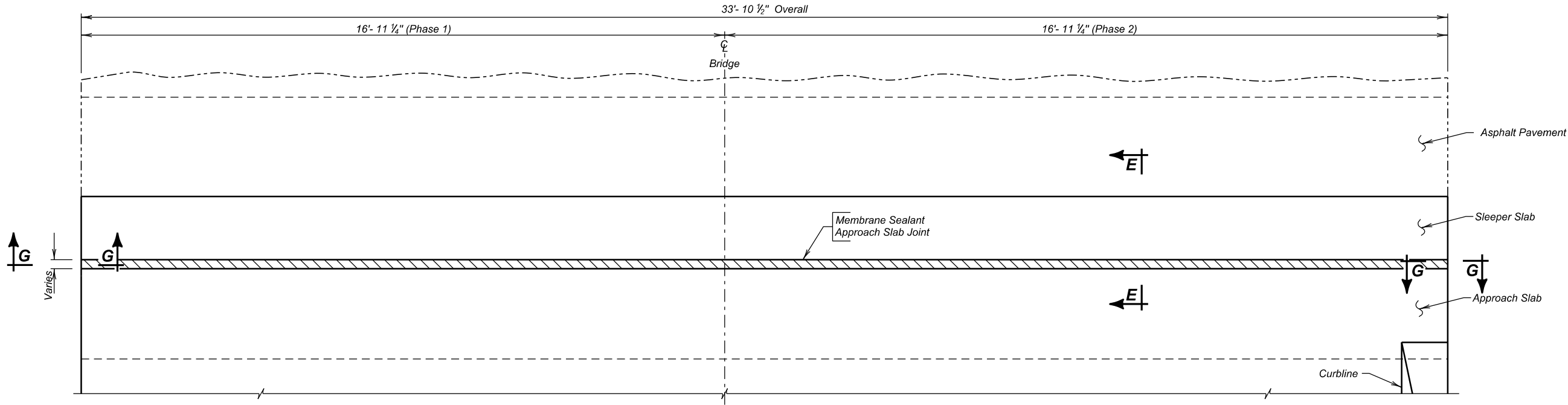
★ Actual dimension will vary due to settlement of sleeper slab and approach crown
See Surfacing Plans for Approach and Sleeper Elevations



DETAIL "X"



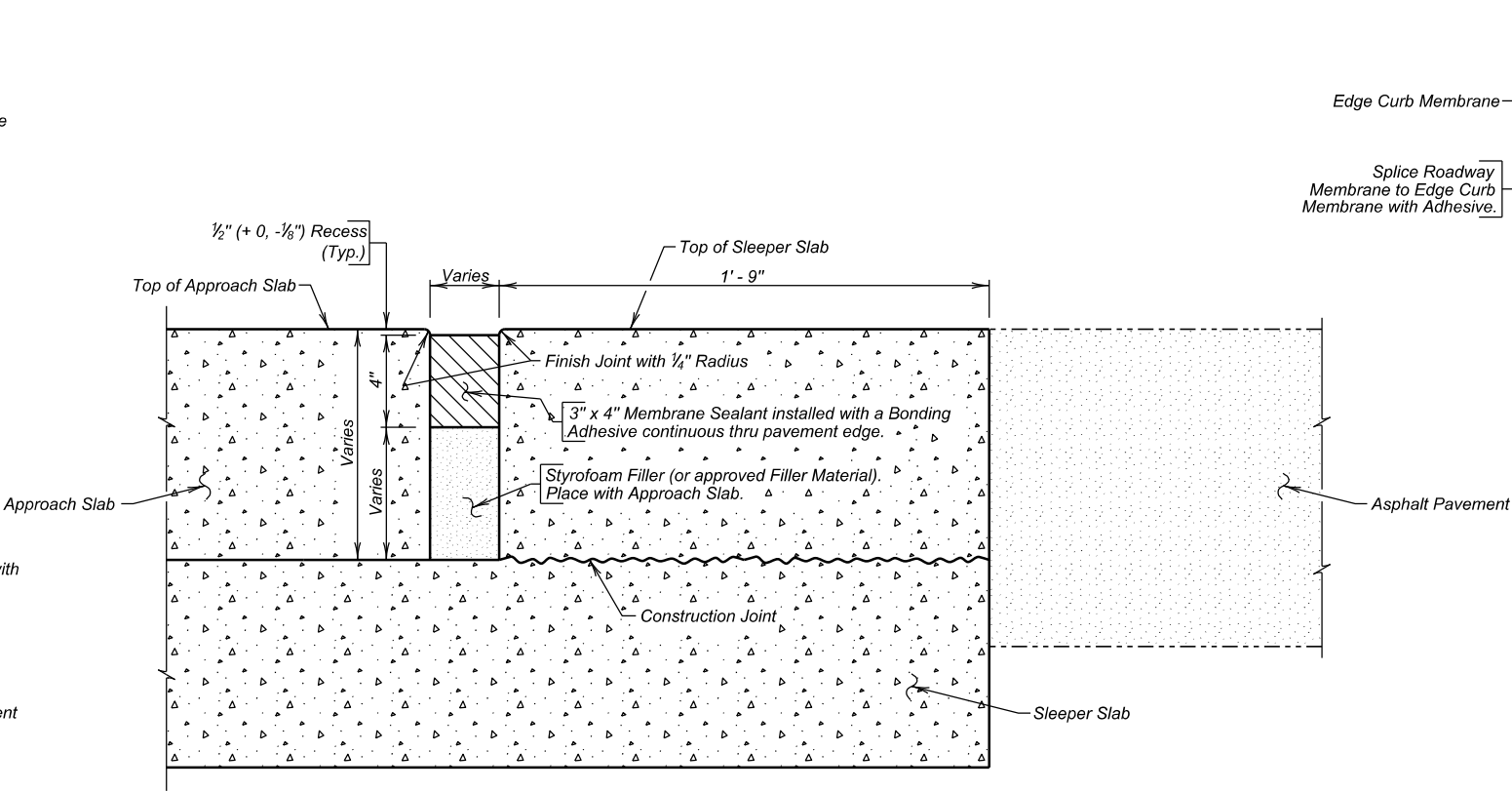
SEC. C - C



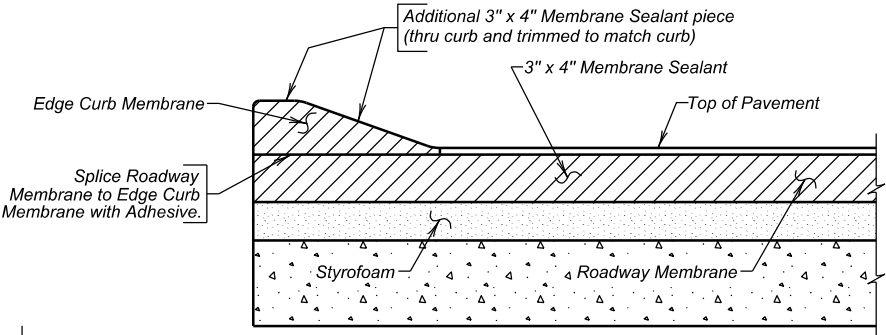
PLAN

GENERAL NOTES

- The membrane sealant shall be on the approved product list for Membrane Sealant Expansion Joints.
- The manufacturer shall supply the membrane sealant in packaging that precompresses the membrane sealant. The precompressed dimension shall be as recommended by the sealant manufacturer to provide a water tight seal throughout a joint movement range of + 25% (minimum) from the specified joint opening dimension. In no case shall the precompressed dimension exceed 75% of the joint opening width. The foam sealant shall be slowly self expanding to permit workers ample time to install the membrane sealant before the membrane sealant exceeds the joint opening width.
- The membrane sealant shall be supplied in pieces 5 feet in length or longer. The foam sealant shall be ultra-violet and ozone resistant.
- The bonding adhesive used to attach the membrane sealant to the adjacent concrete shall be approved by the membrane sealant manufacturer.
- Adhesive used to join adjacent pieces of the membrane sealant shall be as recommended by the manufacturer.
- If styrofoam filler material is used in the construction, it shall be closed cell and water-tight as approved by the Engineer.
- The minimum ambient air temperature at the time of joint installation and adhesive curing shall be 40° F.
- A technical representative of the membrane sealant manufacturer shall be present at the jobsite during installation. The technical representative shall be knowledgeable in the correct procedures for the preparation and installation of the joint material to insure the contractor installs the joint to the manufacturers recommendations.
- Concrete surfaces that will be in contact with the membrane sealant shall be thoroughly cleaned by abrasive blasting to remove all laitance and contaminants (such as oil, curing compounds, etc.) from the concrete surface. At a minimum two passes of abrasive blasting with the nozzle held at an angle to within 1 to 2 inches of the concrete surface will be required. Cleaning of the concrete surfaces with solvents, wire brushing, or grinding shall not be permitted.
- After abrasive blasting, but immediately prior to membrane joint installation, the entire joint contact surface shall be air blasted. The air compressor used for joint cleaning shall be equipped with trap devices capable of providing moisture-free and oil-free air at a recommended pressure of 90 psi. To obtain complete bonding with the adhesive, the adjacent concrete surfaces must be dry and clean. The contact surfaces for the joint shall be visually inspected by the Engineer immediately prior to joint installation to verify the surface is dry and clean.
- Individual spliced sections shall be installed as per the manufacturers' recommendations. The membrane joint sealant manufacturer shall submit a detailed installation procedure to the Engineer at least 5 days prior to joint installation for his review.
- Traffic shall not be allowed on the joint for a minimum of 3 hours unless otherwise directed by the Engineer.
- Use plywood or other material to protect concrete adjacent to the joint from spalling before any equipment is moved across the joint. Any spall areas will be repaired at the Contractor's expense by breaking out and replacing adjacent concrete, as approved by the Engineer.
- The Membrane Sealant Expansion Joint will be measured in feet to the nearest one-tenth foot, complete in place. Measurement will be made of the overall horizontal length. The Membrane Sealant Expansion Joint will be paid for at the contract unit price per foot complete in place. Payment for this item shall be full compensation for furnishing all the required materials in place, including labor, equipment and incidentals necessary to complete the work in accordance with the plans and the foregoing specifications.



SEC. E - E



SEC. G - G

ALTERNATE A
APPROACH SLAB JOINT DETAILS
FOR

128' - 10 5/8" PRESTRESSED GIRDER BRIDGE
32' - 0" ROADWAY 30° RHF SKEW
OVER THUNDER BUTTE CREEK SEC. 4-T16N-R16E
STR. NO. 53-383-397

PERKINS COUNTY
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2020

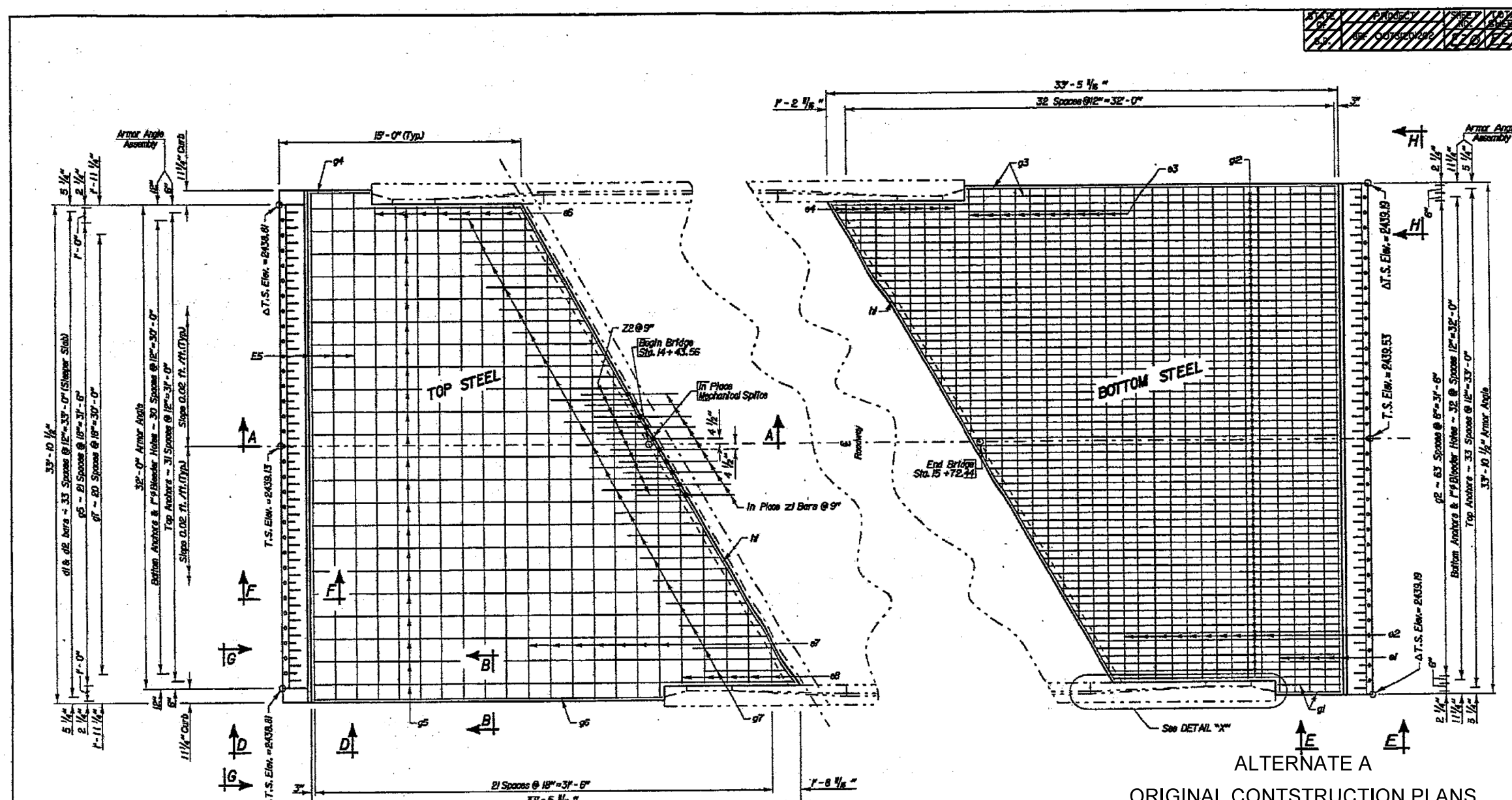
ESTIMATED QUANTITIES

| ITEM | UNIT | PHASE 1 | PHASE 2 |
|----------------------------------|------|----------|----------|
| | | QUANTITY | QUANTITY |
| Membrane Sealant Expansion Joint | Ft. | 16.9 | 16.9 |

DESIGNED BY
BWS
PERK162D

DRAWN BY
BWS
162DSA01

Steve A. Johnson
BRIDGE ENGINEER



PLAN

ORIGINAL CONSTRUCTION PLANS

DETAILS APPROACH SLAB ADJACENT TO BRIDGE
FOR

128' - 10 5/8" PRESTR. CONC. BRIDGE

32' - 0" ROADWAY 30° RHF SKEW
STA. 14+43.56 TO 15+72.44 SEC. 4-T16N-R16E
OVER THUNDER BUTTE CREEK BR# 0073(20)202
STR. NO. 53-383-397 HS 25-44
(& ALT.)

PERKINS COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 2004 14 OF 24

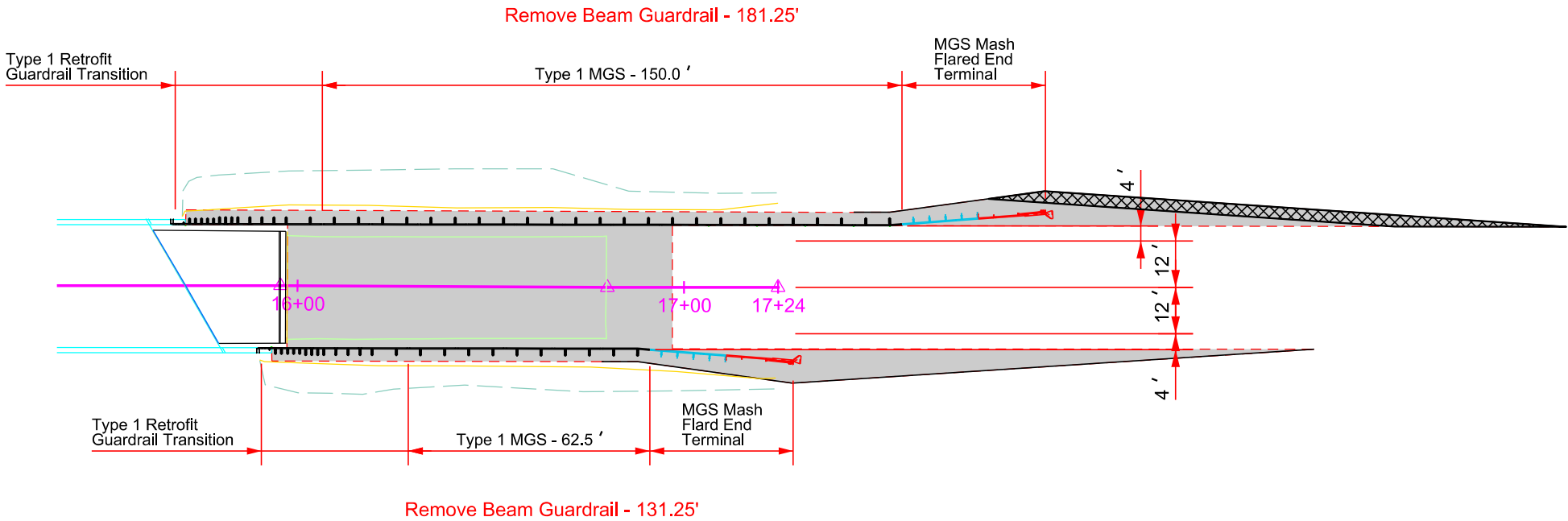
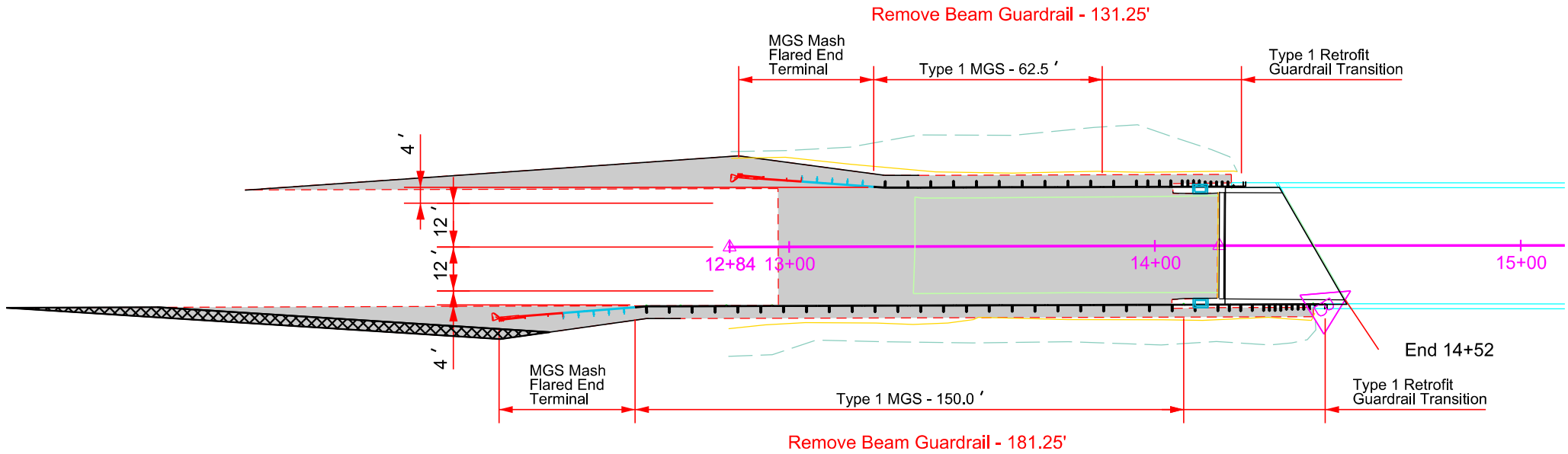
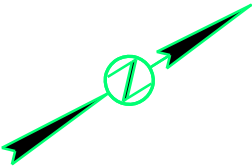
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|---------------------------------|---------------------------|---------------------|---|
| DESIGNED BY AV/DM PERKINS | DRAWN BY BK S134KAR | CHECKED BY AV/DM | APPROVED J.L.C.C. BRIDGE ENGINEER |
|---------------------------------|---------------------------|---------------------|---|

GUARDRAIL LAYOUT

| | | | |
|-----------------------------|---------|-------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | 073-472 | 19 | 36 |

Plotting Date: 04/21/2021

SD 73 MRM 202.78
Str. No. 53-383-397
Thunder Butte Creek

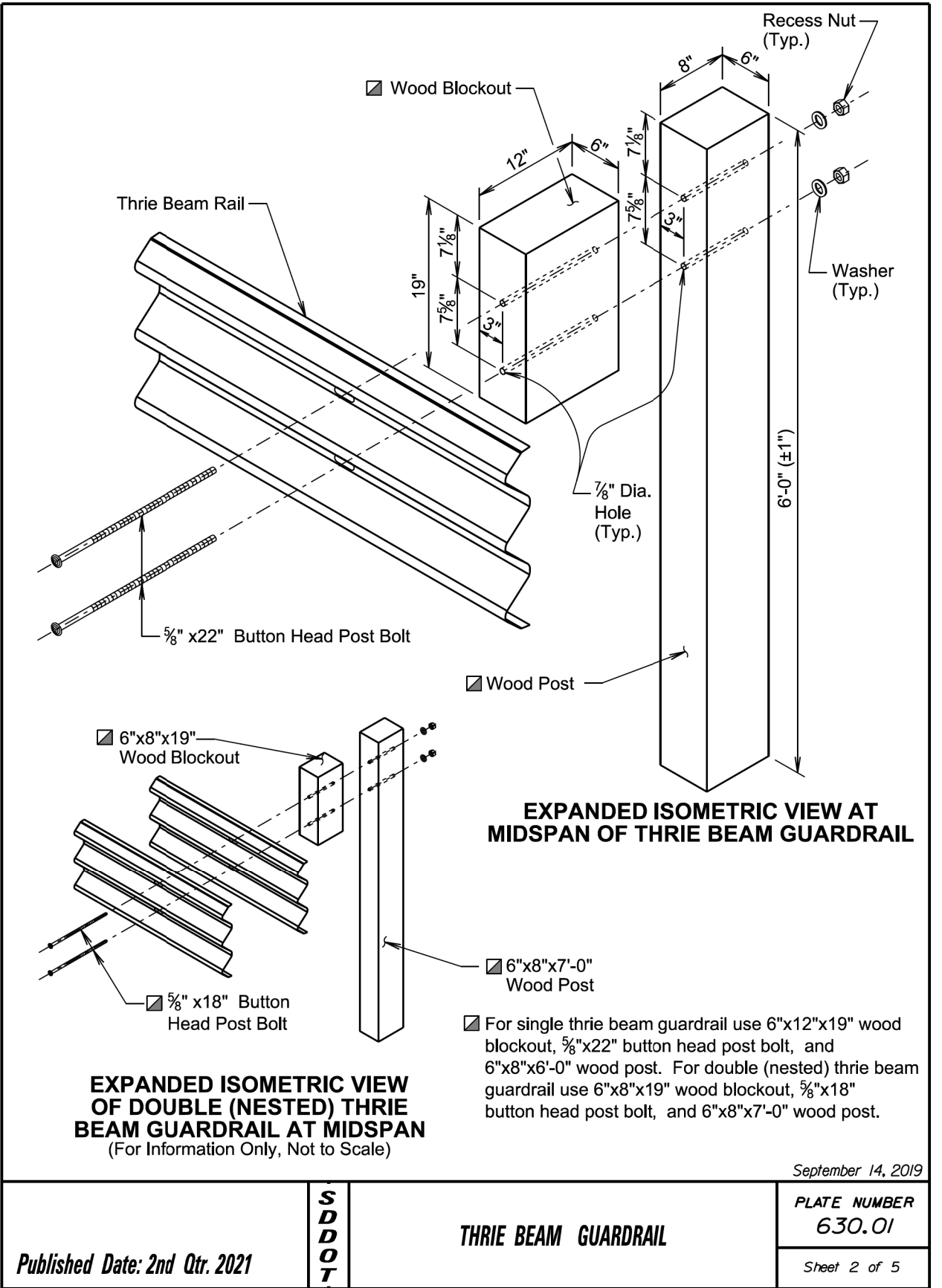
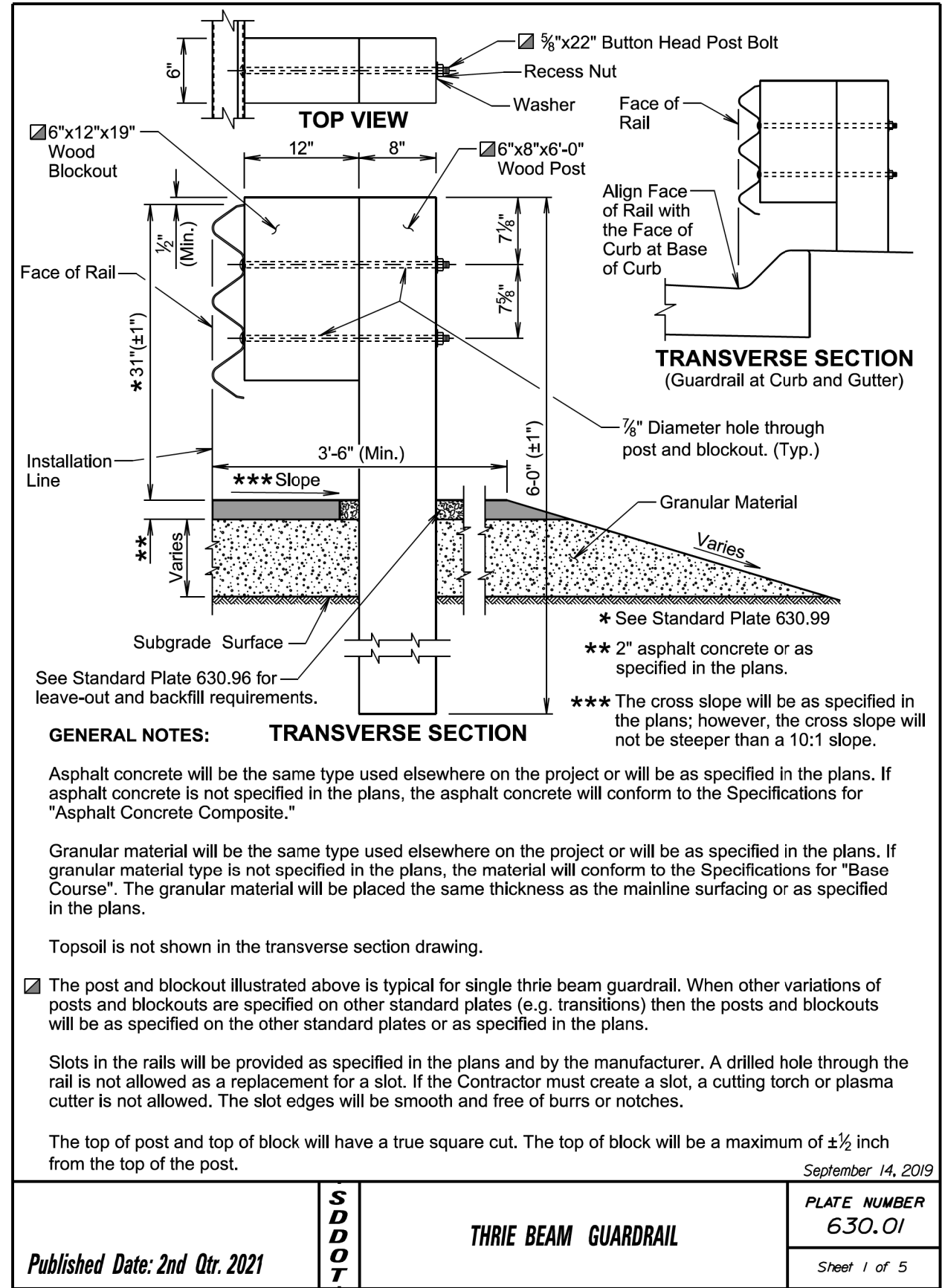


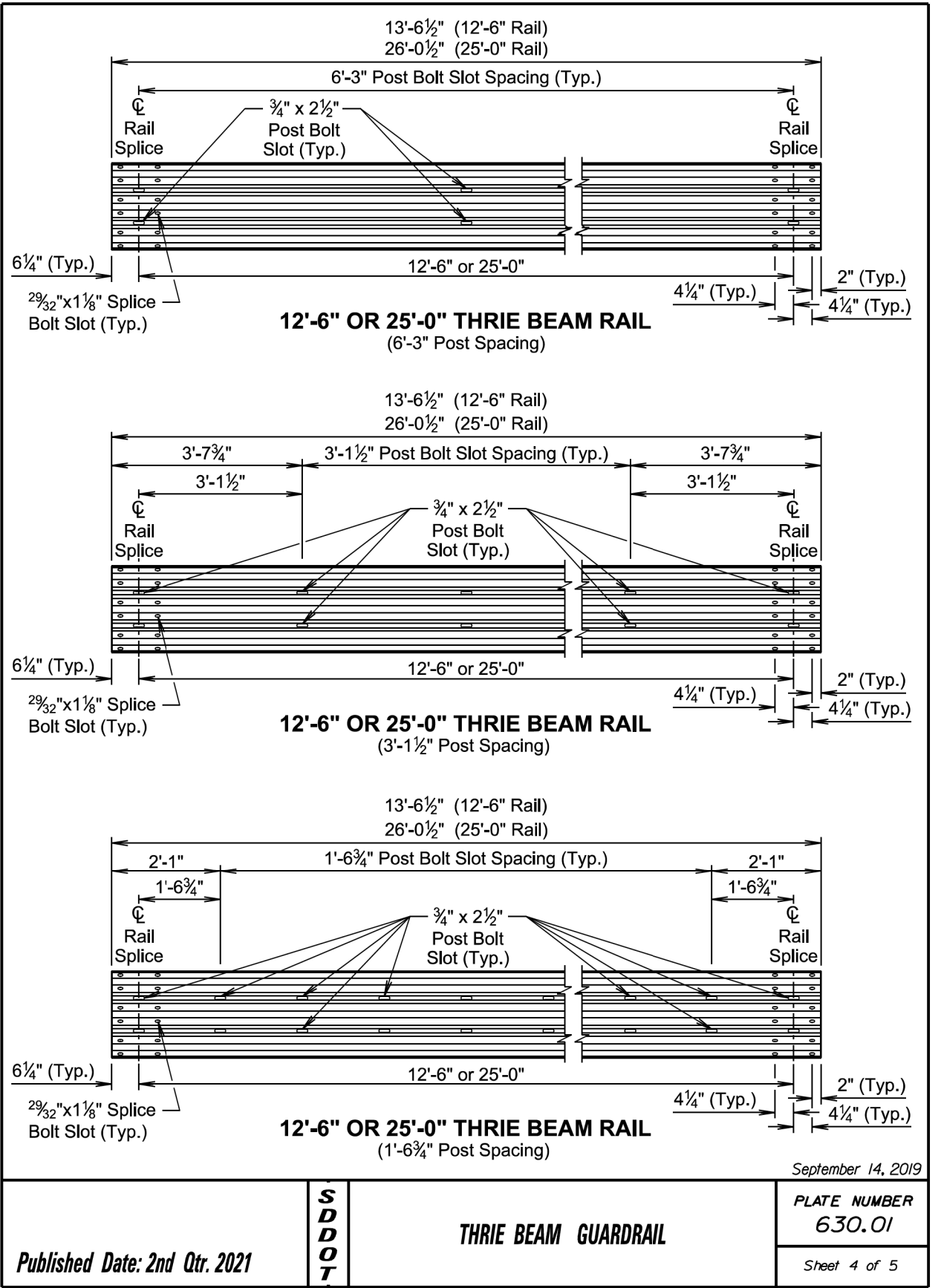
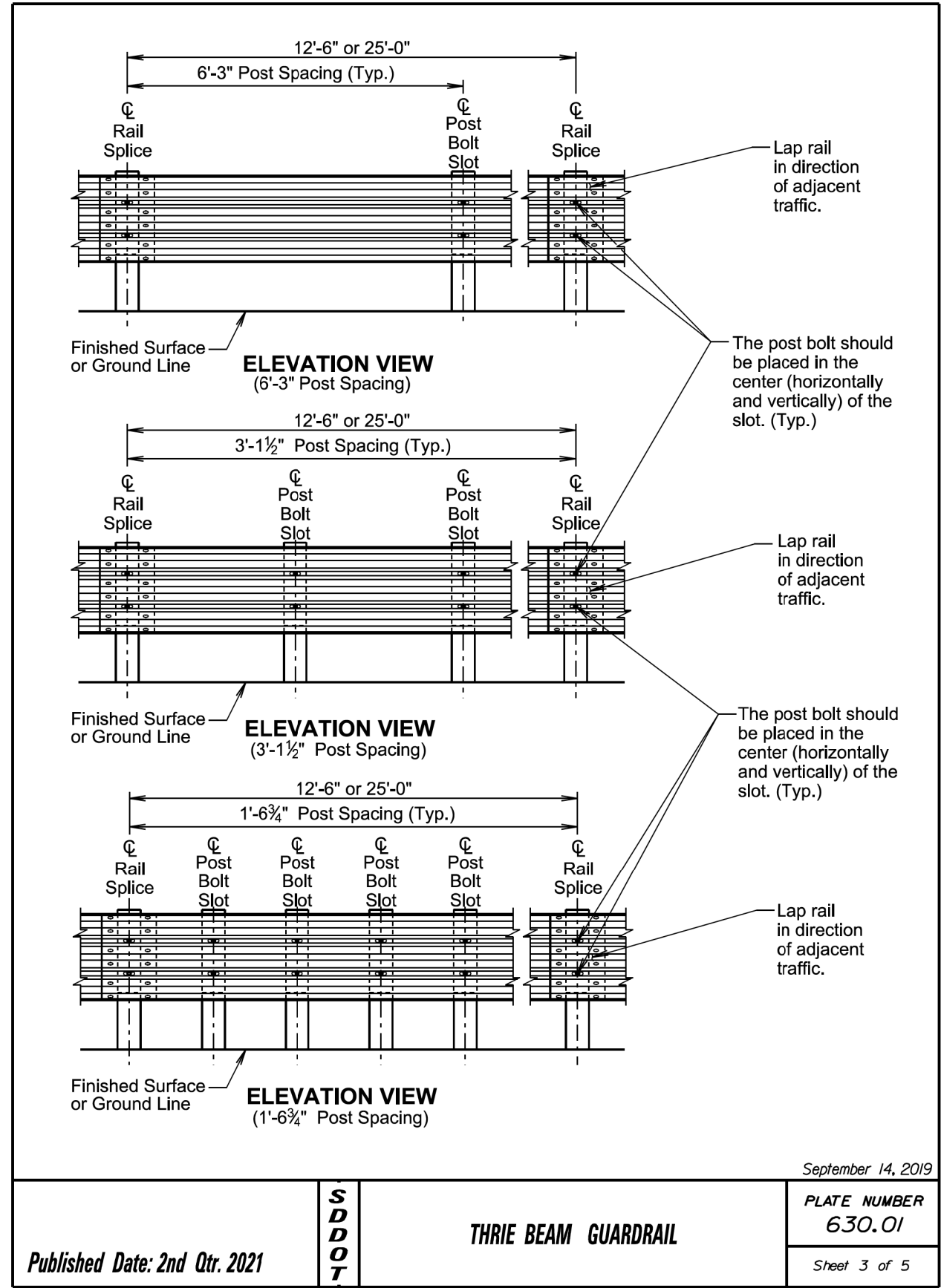
- 2" Asphalt Concrete Composite
- Contractor Furnished Borrow Excavation

Plot Scale - 1:40

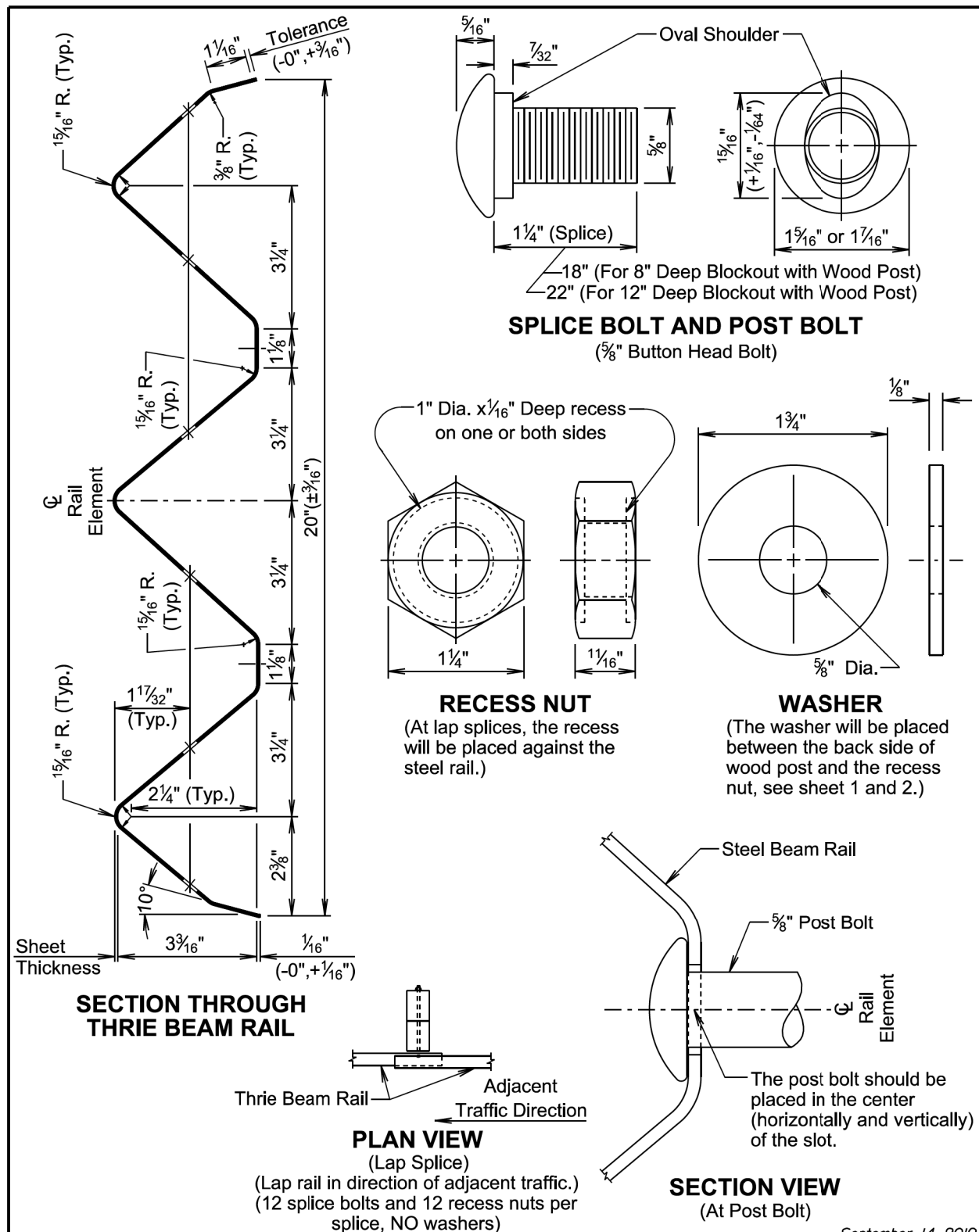
Plotted From - TRR014610

File - ...lgr1620.dgn





Plotting Date: 04/21/2021



| TYPE AND DETAILS OF MGS | | | | | | |
|-------------------------|---|------------------|----------------------|--------------|------------------|-----------------|
| Type of MGS | W Beam Rail Single or Double (Nested) | Blockout Size | Blockout Material | Post Size | Post Material | Post Spacing |
| 1 | Single | 6"x12"x14" | Wood | 6"x8"x6'-0" | Wood | 6'-3" |
| 1C | Single | 6"x12"x14" | Wood | 6"x8"x7'-6" | Wood | 6'-3" |
| 2 | Single | 6"x12"x14" | Wood | 6"x8"x6'-0" | Wood | 3'-1½" |
| 3 | Single | 6"x12"x14" | Wood | 6"x8"x6'-0" | Wood | 1'-6¾" |
| 4 | Double | 6"x12"x14" | Wood | 6"x8"x6'-0" | Wood | 6'-3" |

| STANDARD PLATE REFERENCE | |
|--------------------------|-----------------------|
| Type of MGS | See Standard Plate(s) |
| 1 | 630.20, 630.22 |
| 1C | 630.20, 630.25 |
| 2 | 630.20 |
| 3 | 630.20 |
| 4 | 630.20 |

GENERAL NOTES:

Asphalt concrete will be the same type used elsewhere on the project or will be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete will conform to the Specifications for "Asphalt Concrete Composite".

Granular material will be the same type used elsewhere on the project or will be as specified in the plans. If granular material type is not specified in the plans, the material will conform to the Specifications for "Base Course". The granular material will be placed the same thickness as the mainline surfacing or as specified in the plans.

Topsoil is not shown in the transverse section drawing on sheet 2 of 6.

All W beam rail will be Type 1 and Class A (12 Ga.) unless specified otherwise in the plans.

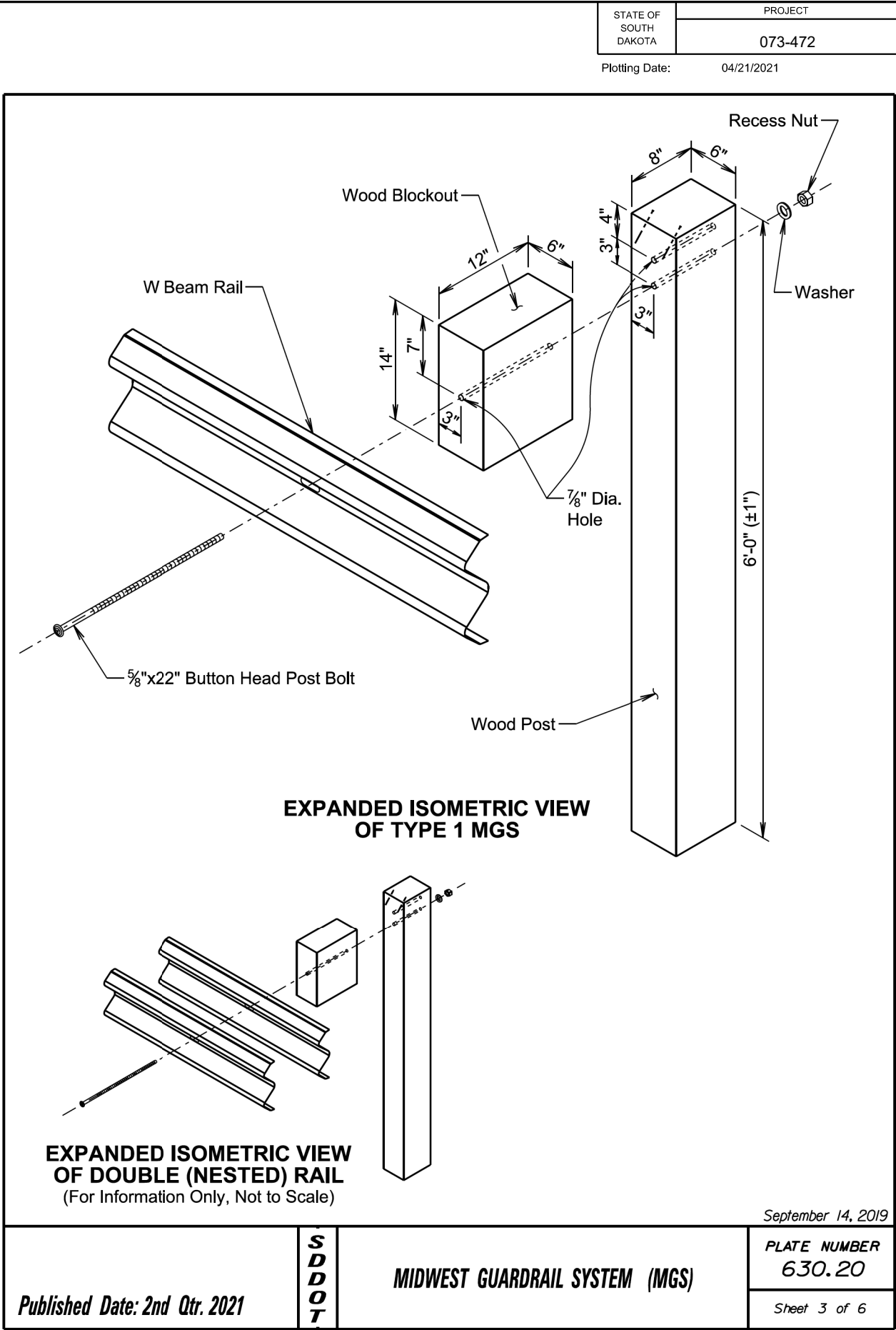
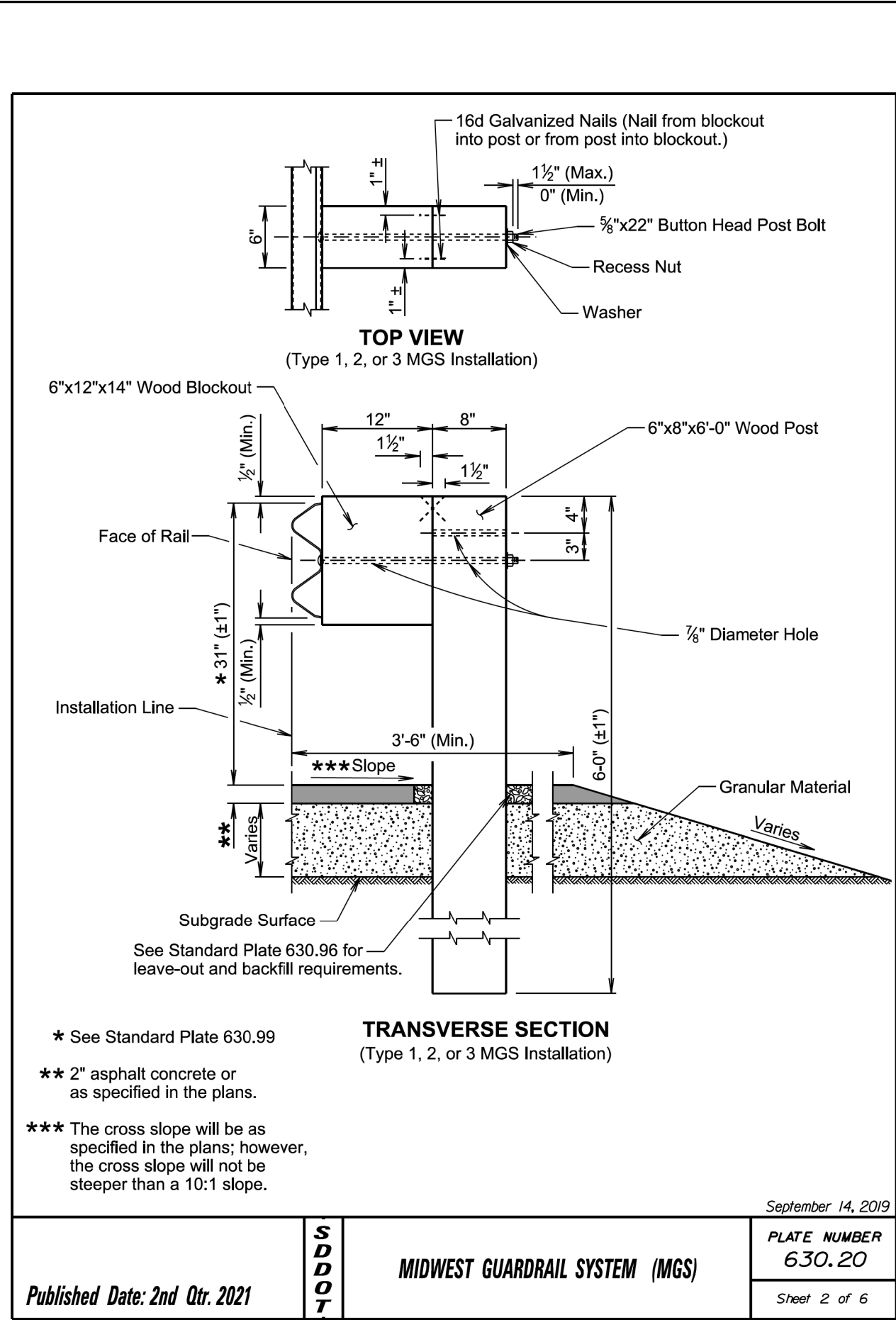
W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used will be compatible with the total length of rail per site as shown in the plans.

Slots in the rails will be provided as specified in the plans and by the manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot edges will be smooth and free of burrs or notches.

All costs for constructing the MGS including labor, equipment, and materials including all posts, blockouts, steel beam rail, and hardware will be incidental to the contract unit price per foot for the respective MGS contract item.

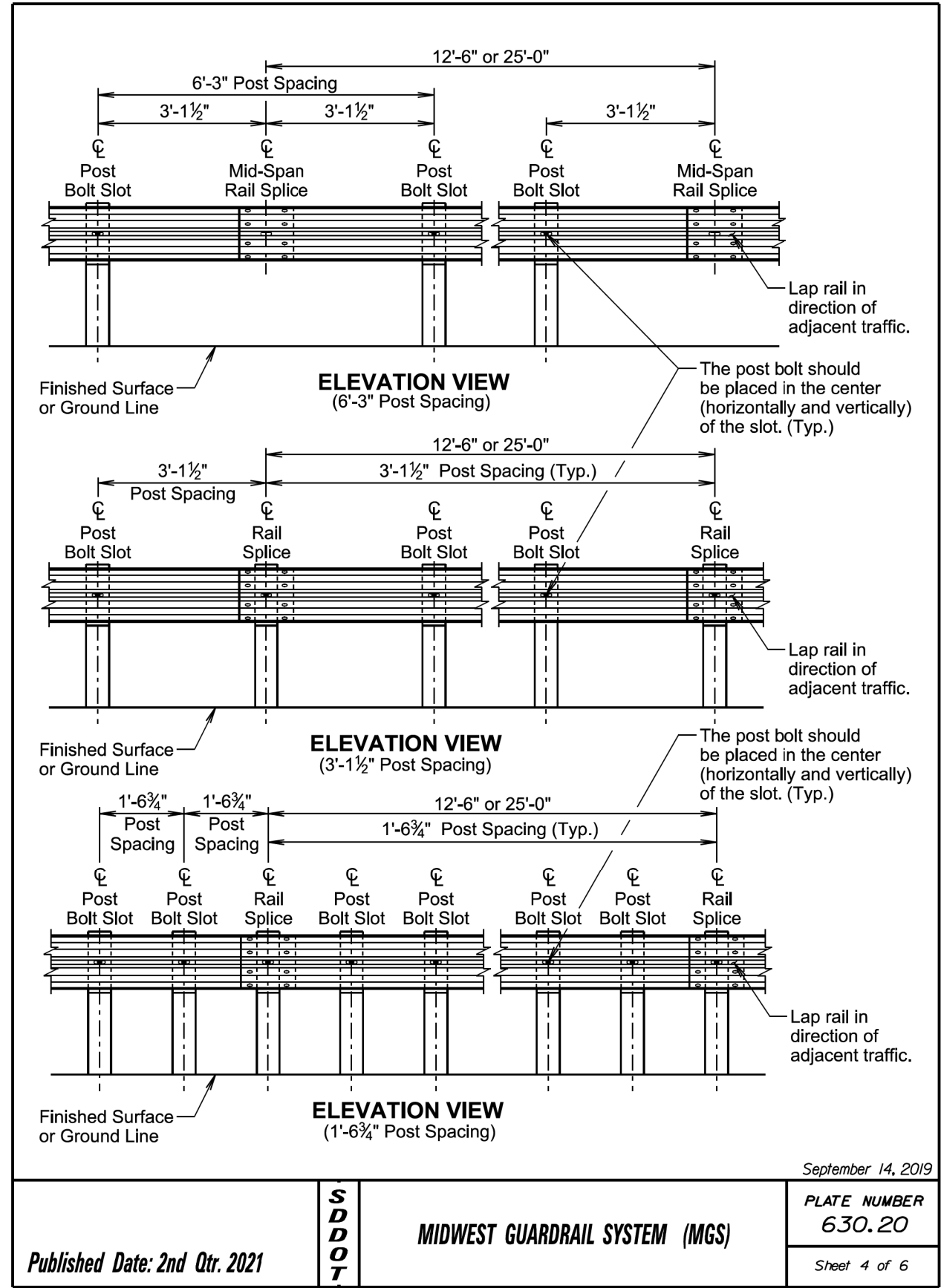
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|-------------------------------|-----------------------|----------------------|------------------------|
| Published Date: 2nd Qtr. 2021 | S D D O T | THRIE BEAM GUARDRAIL | PLATE NUMBER 630.01 |
| | | | Sheet 5 of 5 |

| | | | |
|-------------------------------|-----------------------|--------------------------------|------------------------|
| Published Date: 2nd Qtr. 2021 | S D D O T | MIDWEST GUARDRAIL SYSTEM (MGS) | PLATE NUMBER 630.20 |
| | | | Sheet 1 of 6 |



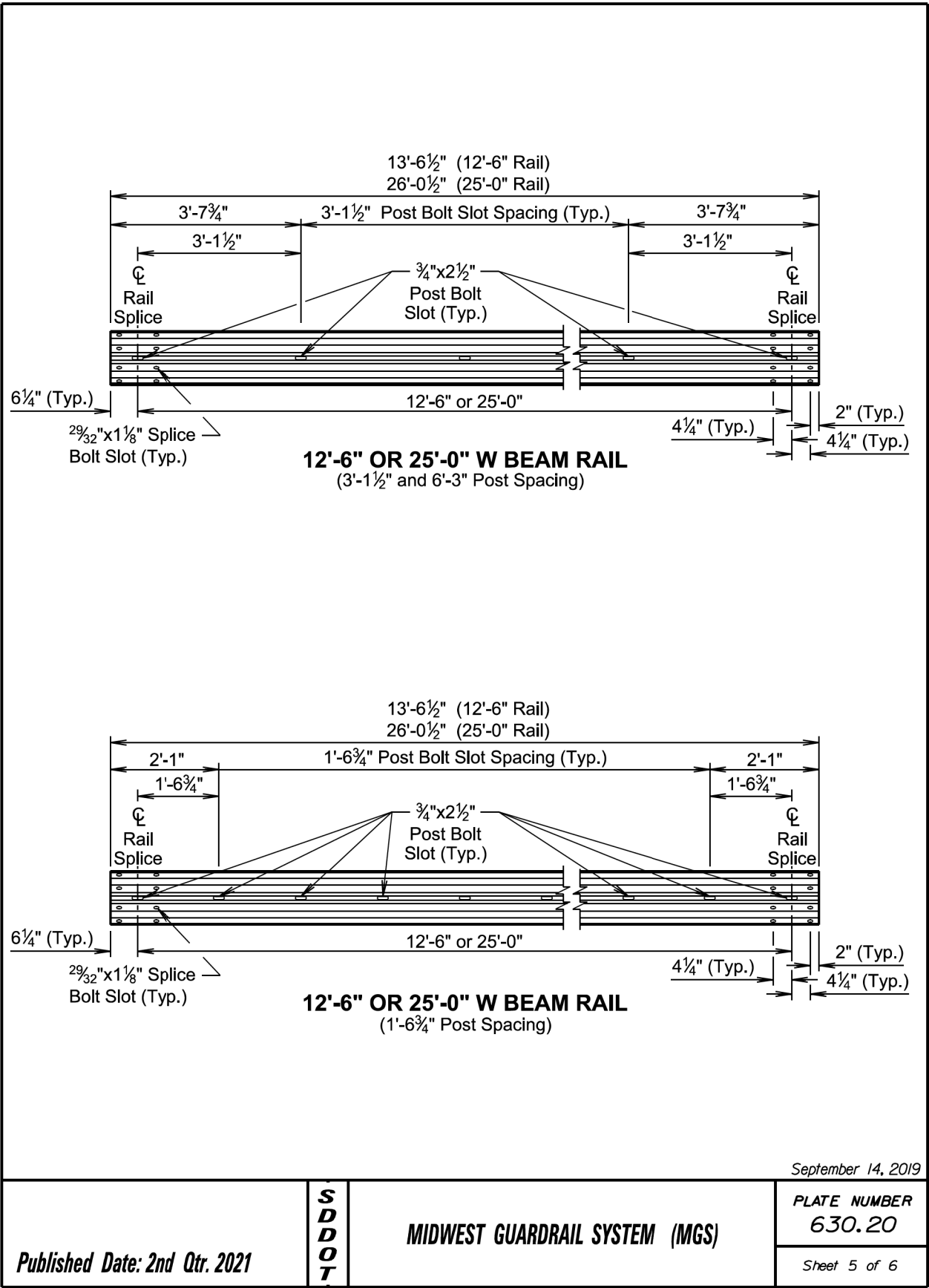
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Plotted From - TRRC-14610

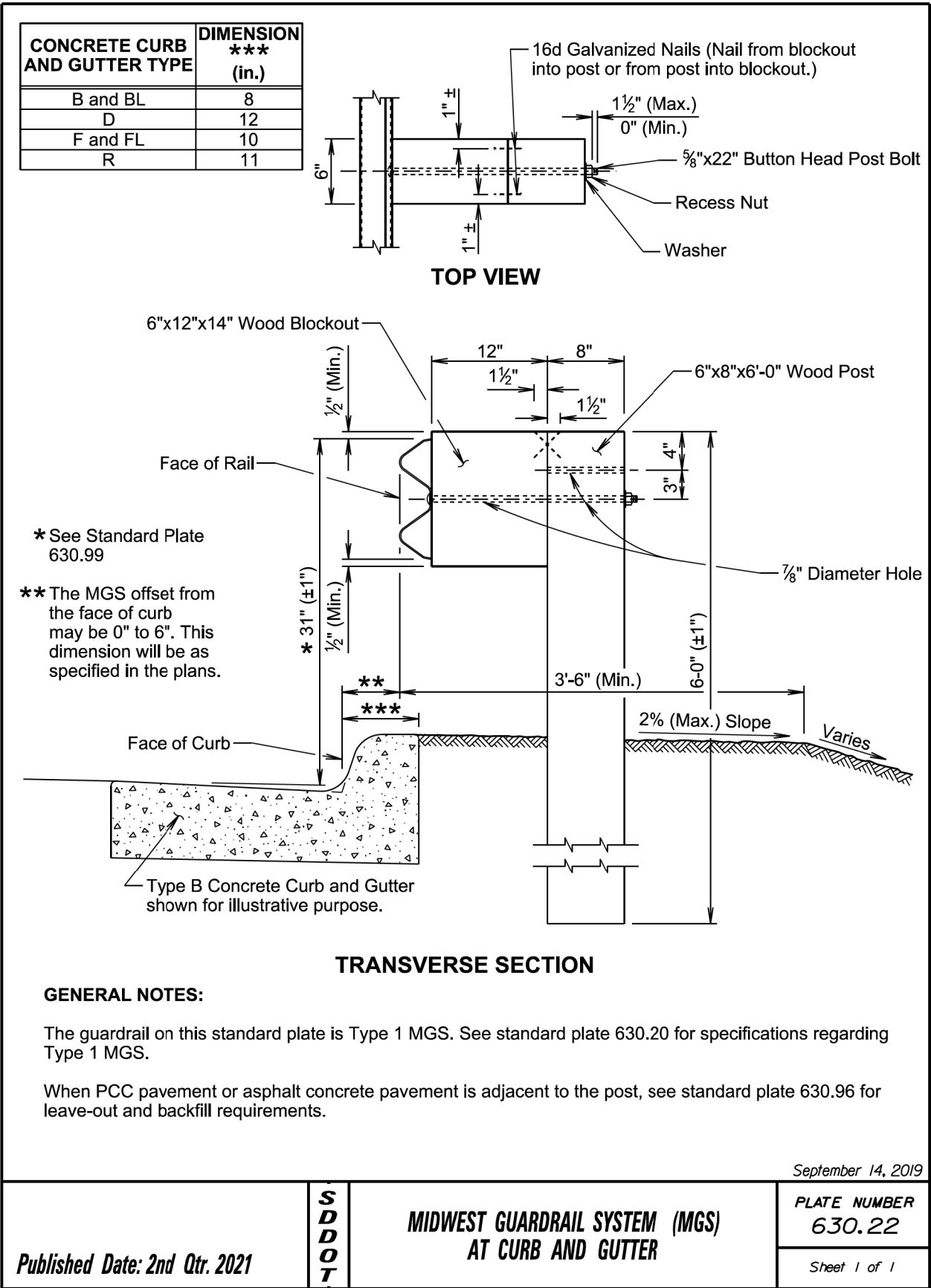
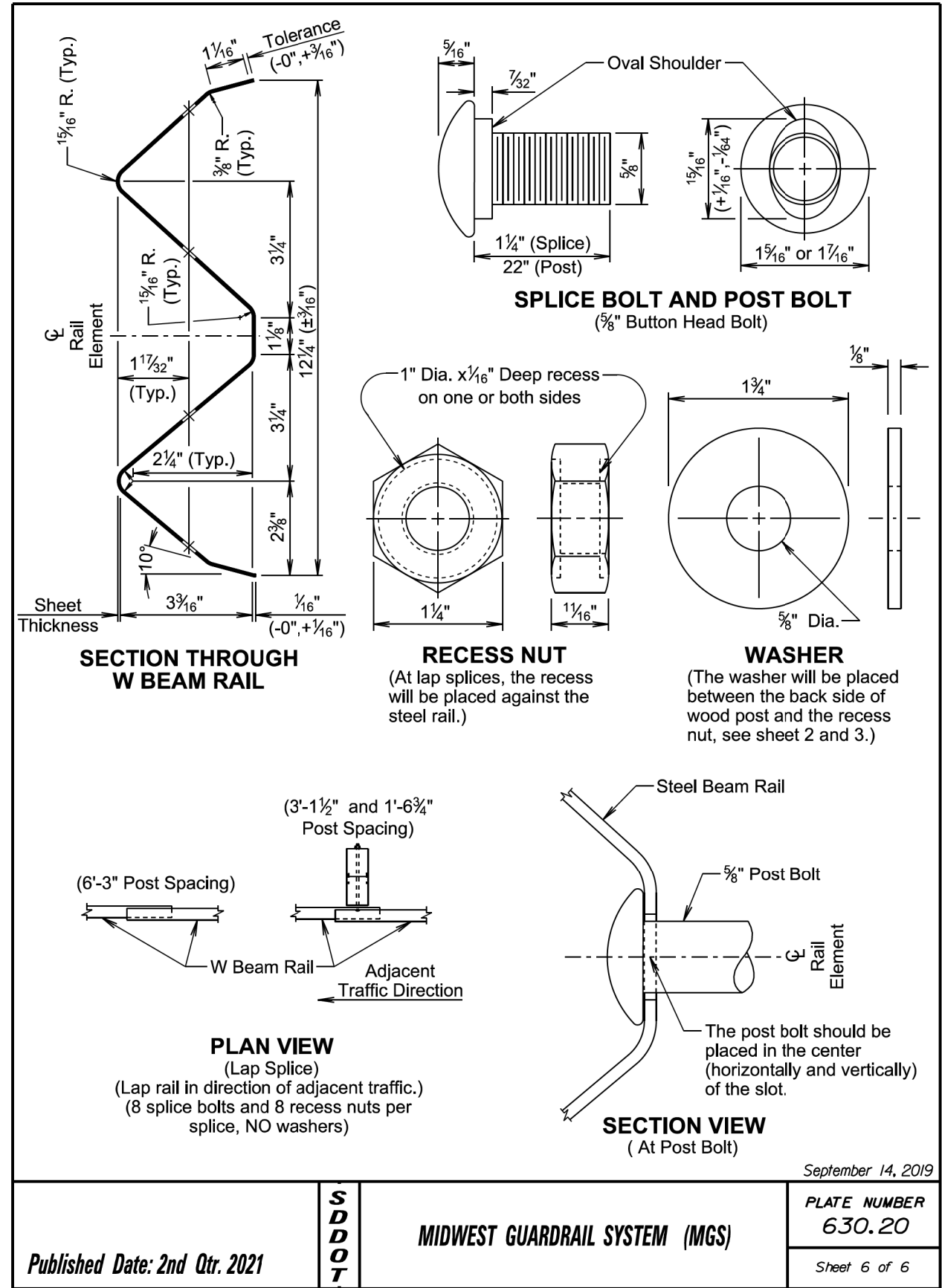


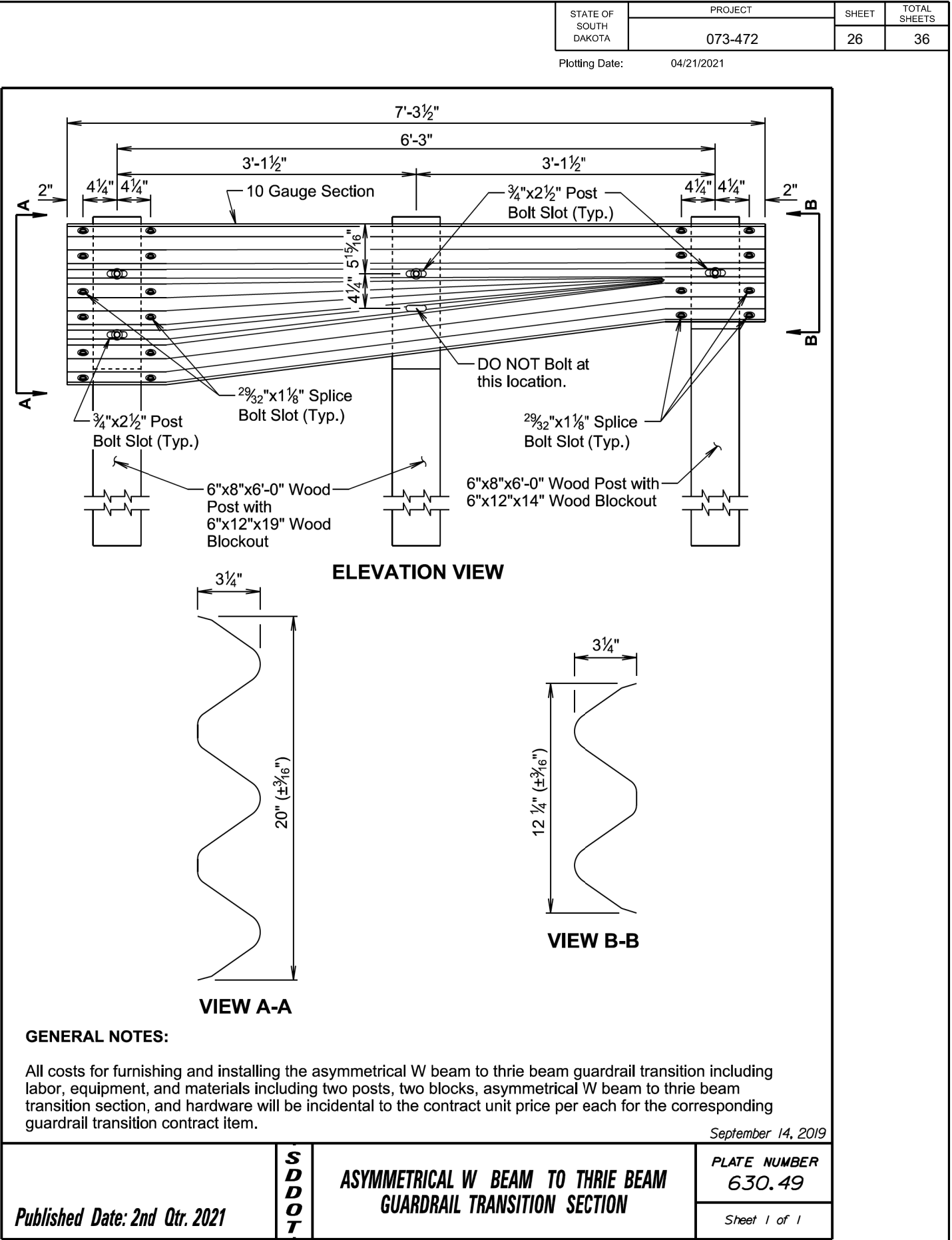
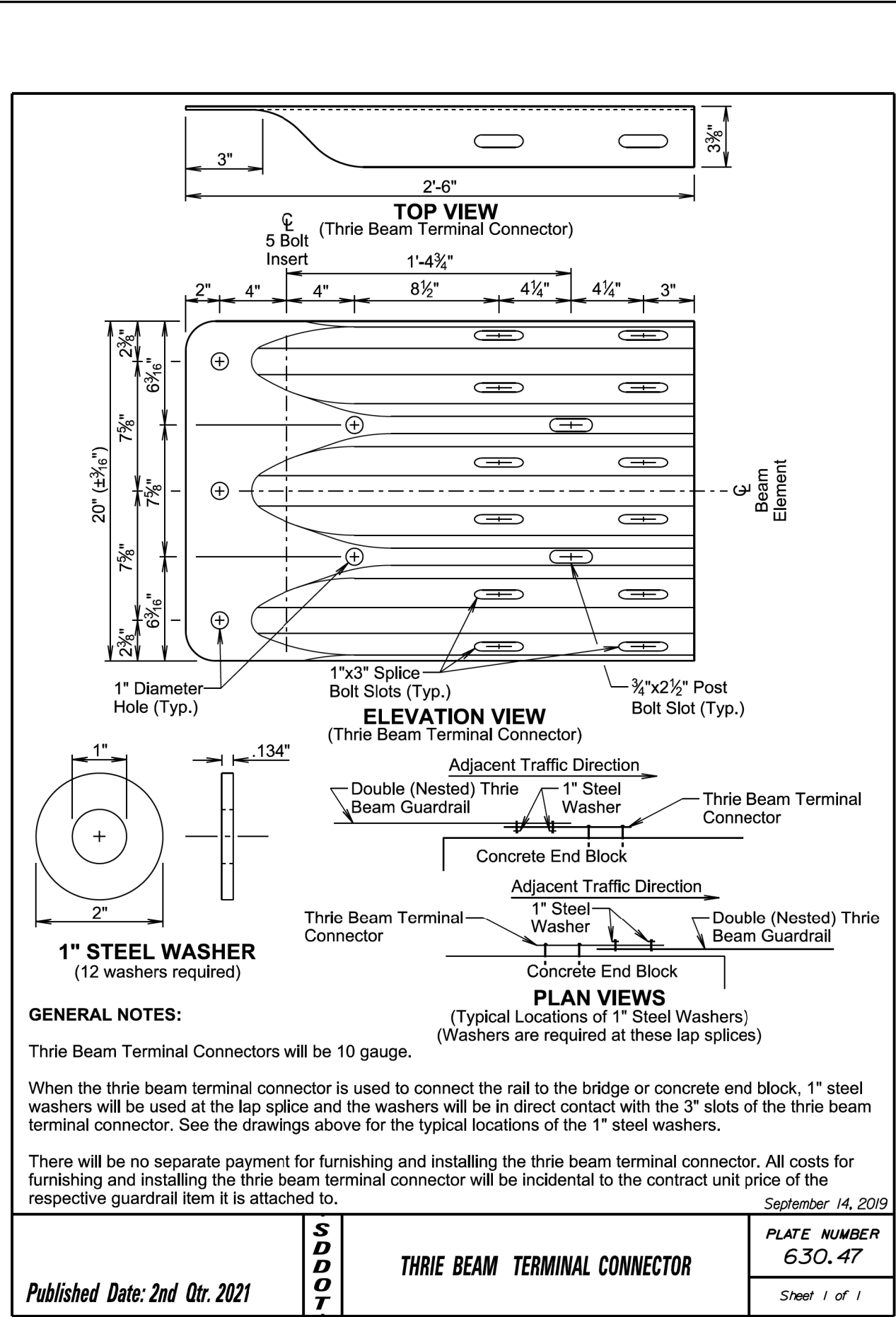
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|-----------------------------|---------|-------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | 073-472 | 24 | 36 |

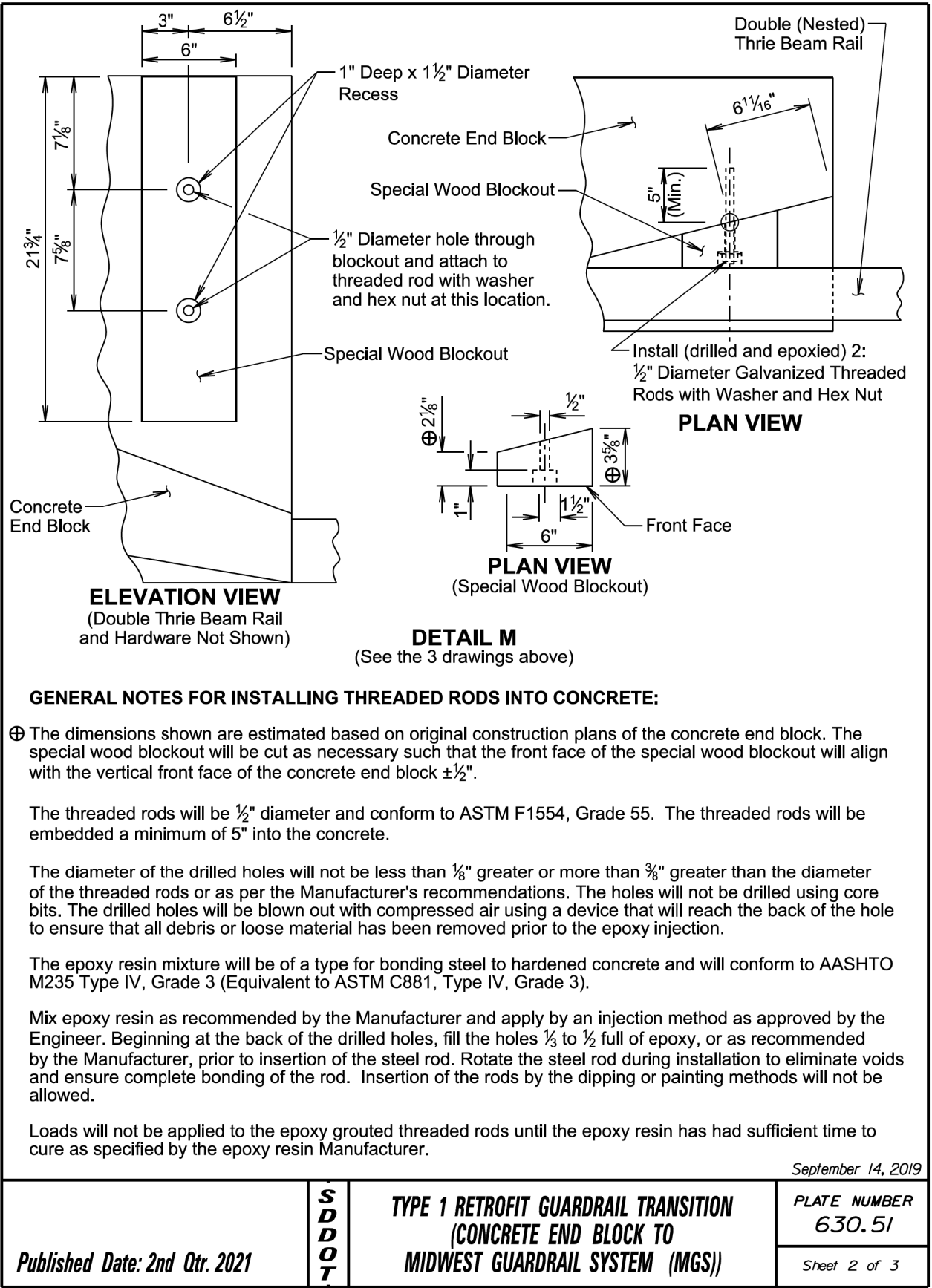
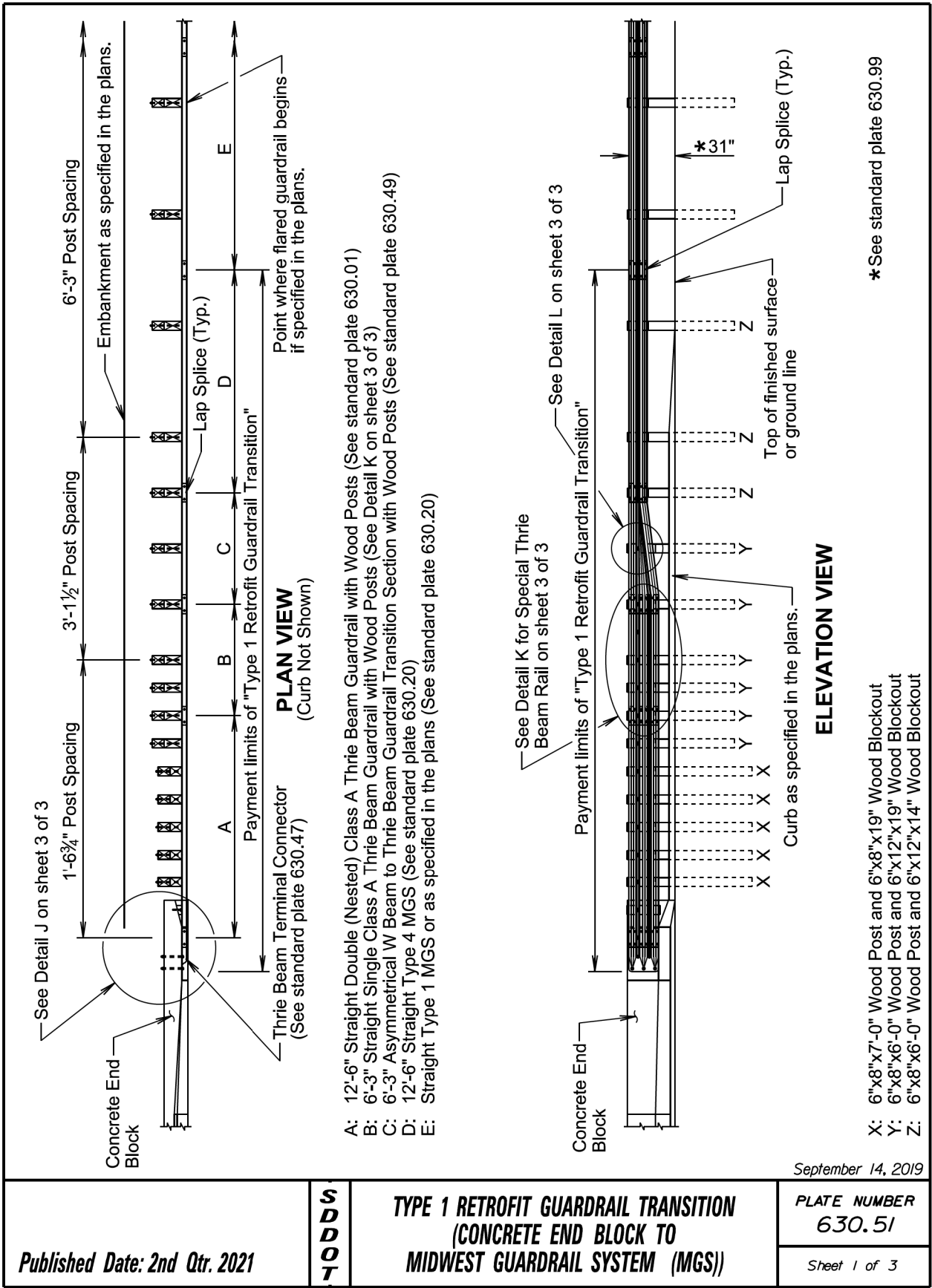
Plotting Date: 04/21/2021



File - ...1624 StdPlate.dgn

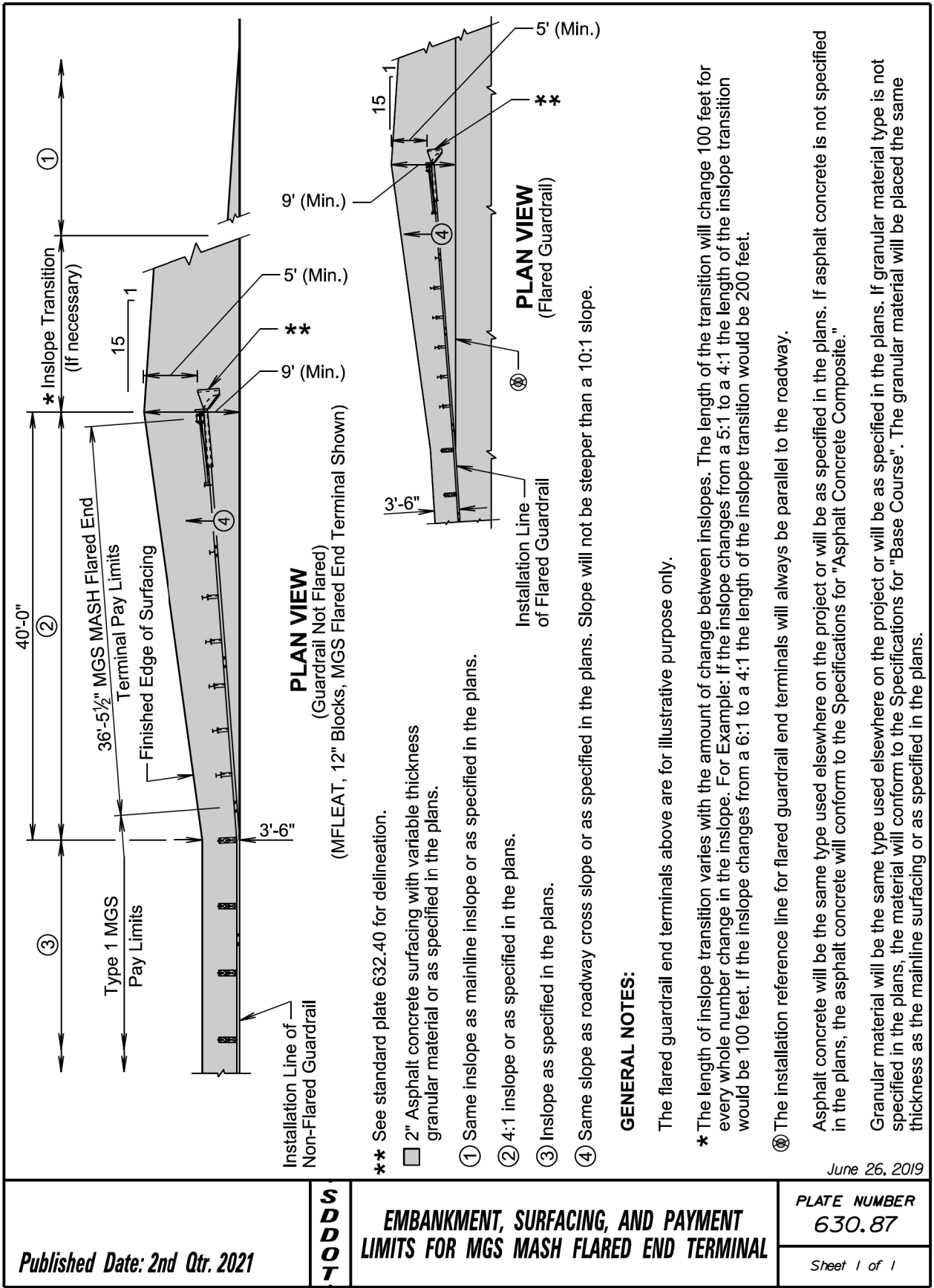
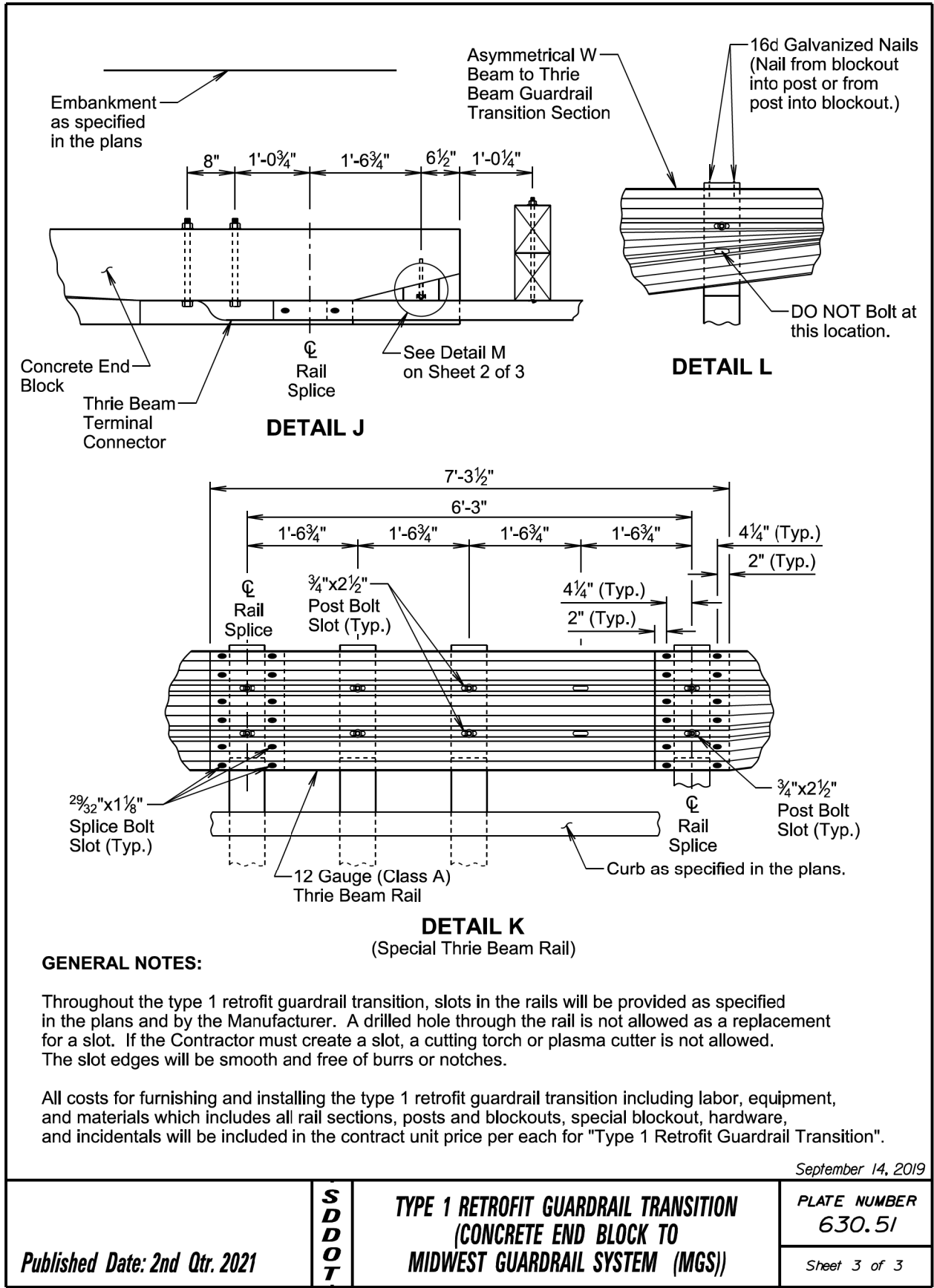


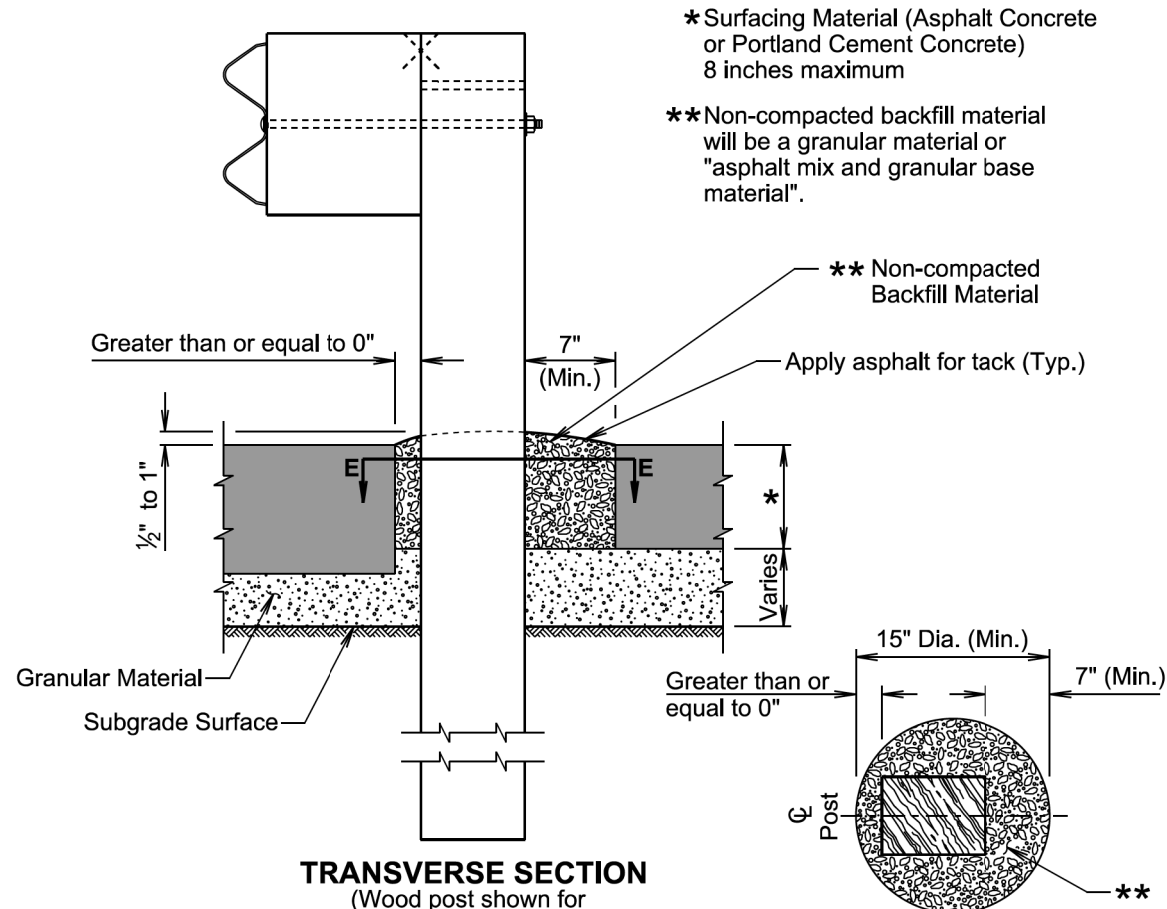




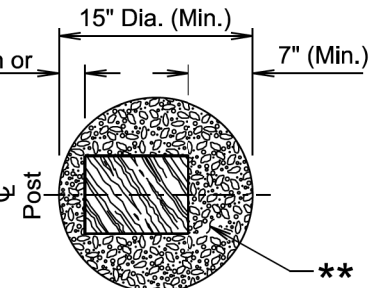
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
|-----------------------------|---------|-------|-----------------|
| | 073-472 | 28 | 36 |

Plotting Date: 04/21/2021

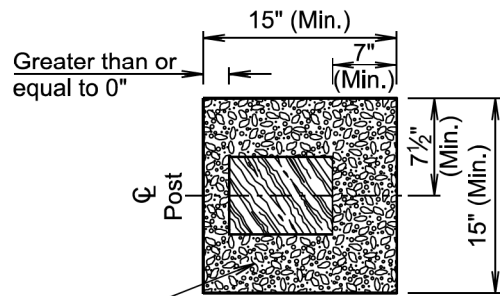




TRANSVERSE SECTION
(Wood post shown for illustrative purpose only)



SECTION E-E
(Round option for leave-out and backfill limits)
(Wood post shown for illustrative purpose only)



SECTION E-E
(Square option for leave-out and backfill limits)
(Wood post shown for illustrative purpose only)

GENERAL NOTES:

The leave-out limits may be increased to accommodate construction equipment and tolerances.

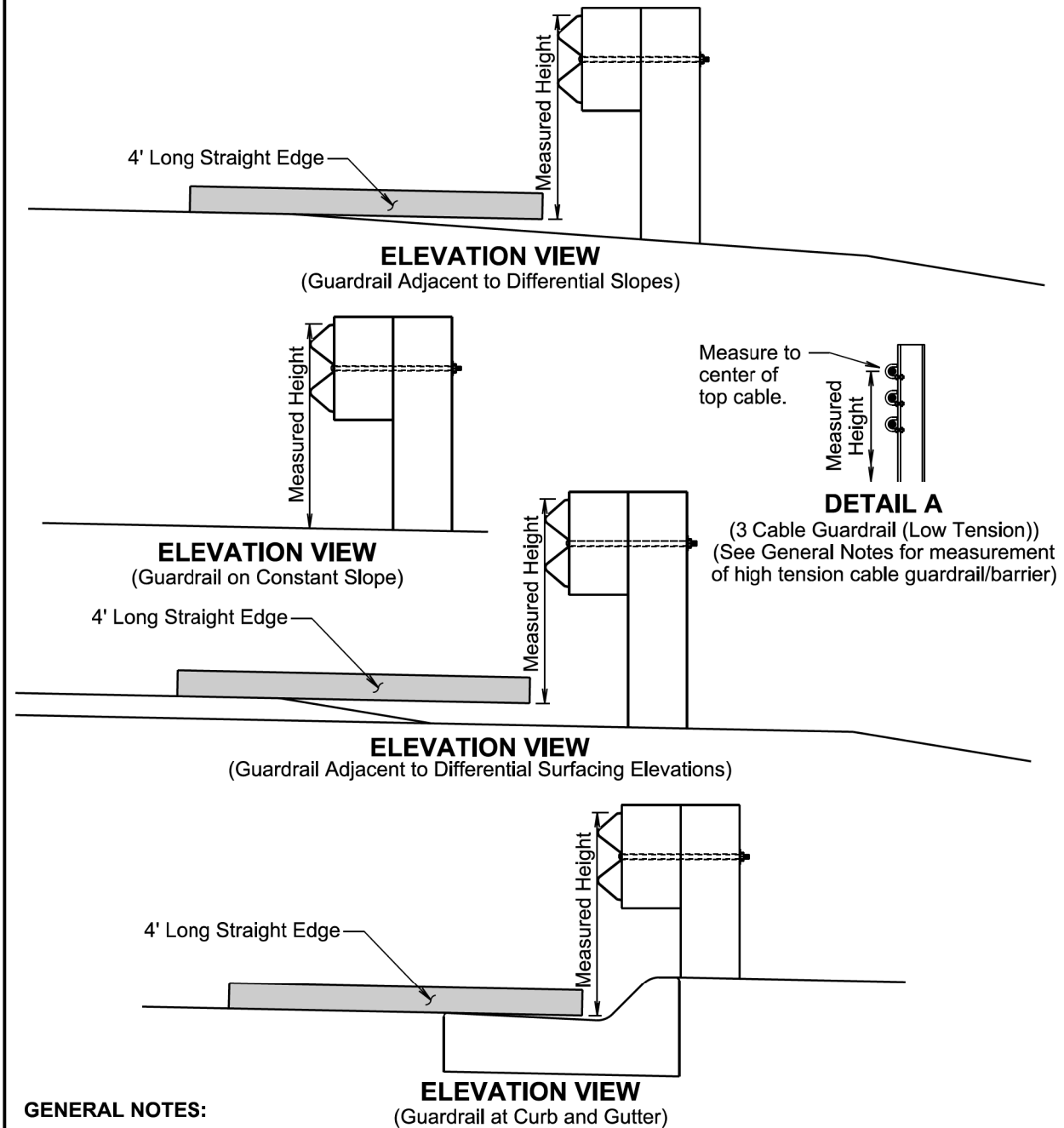
The backfill material will be mounded 1/2 inch to 1 inch above the top of the adjacent surfacing as illustrated above.

Asphalt for tack will be applied to the surface of the backfill material at the rate of 0.15 to 0.20 gallons per square yard.

All costs for constructing the leave-out including labor, equipment, and materials which includes the backfill material and tack coat will be incidental to the contract unit price for the respective guardrail contract item.

September 14, 2019

| | | | |
|-------------------------------|-----------------------|--|------------------------|
| Published Date: 2nd Qtr. 2021 | S D D O T | GUARDRAIL POST INSTALLED IN ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE | PLATE NUMBER 630.96 |
| | | | Sheet 1 of 1 |



ELEVATION VIEW
(Guardrail Adjacent to Differential Slopes)

ELEVATION VIEW
(Guardrail on Constant Slope)

ELEVATION VIEW
(Guardrail Adjacent to Differential Surfacing Elevations)

ELEVATION VIEW
(Guardrail at Curb and Gutter)

DETAIL A
(3 Cable Guardrail (Low Tension))
(See General Notes for measurement of high tension cable guardrail/barrier)

GENERAL NOTES:

The W Beam guardrail shown is for illustrative purpose. The guardrail height for all types of guardrail systems except for high tension cable guardrail/barrier will be measured in accordance with this standard plate.

When measuring height of 3 cable guardrail (low tension) the height will be measured to the center of the top cable. See Detail A.

The height of high tension cable guardrail/barrier will be measured in accordance with the Manufacturer's installation instructions.

September 14, 2019

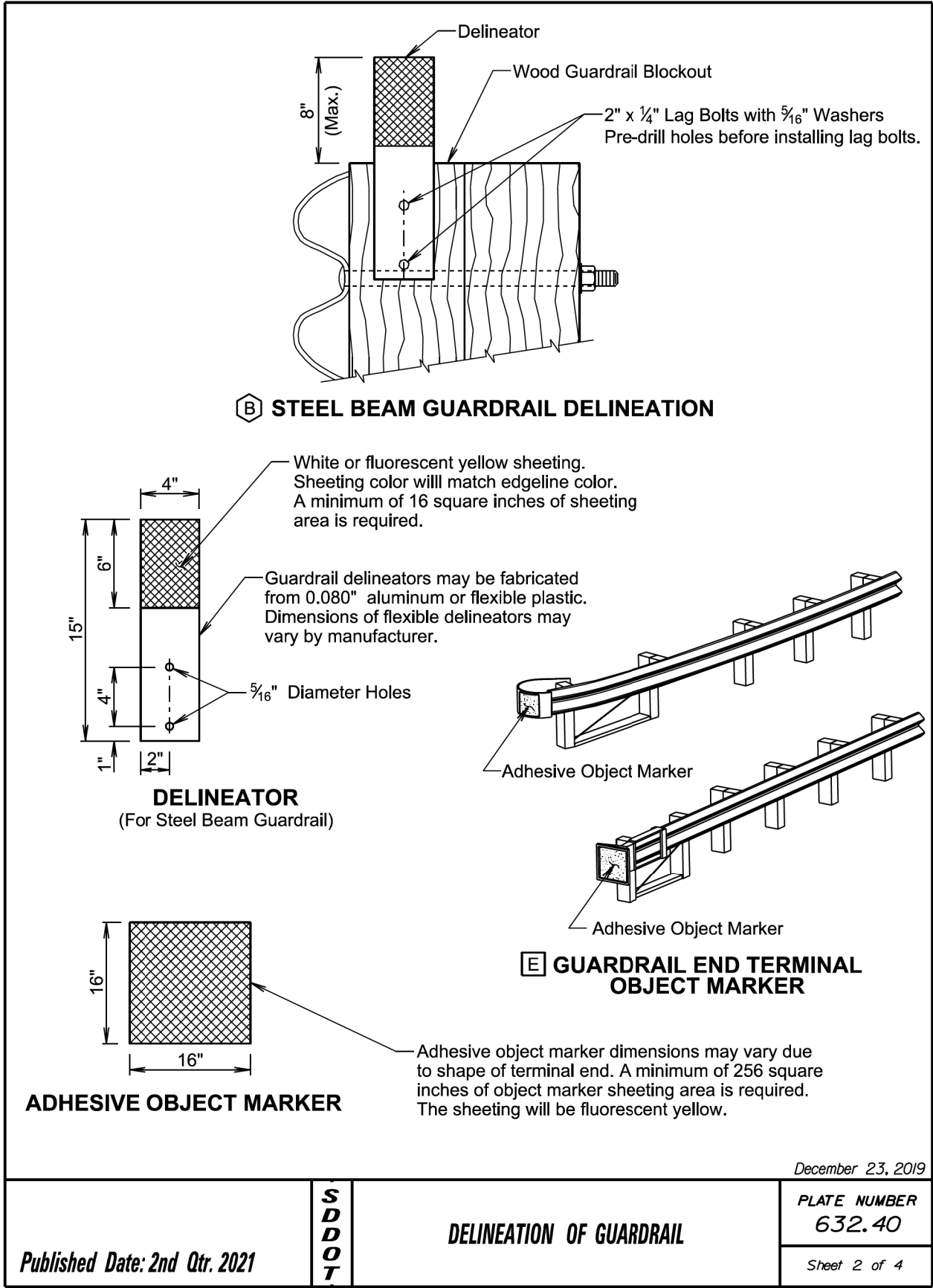
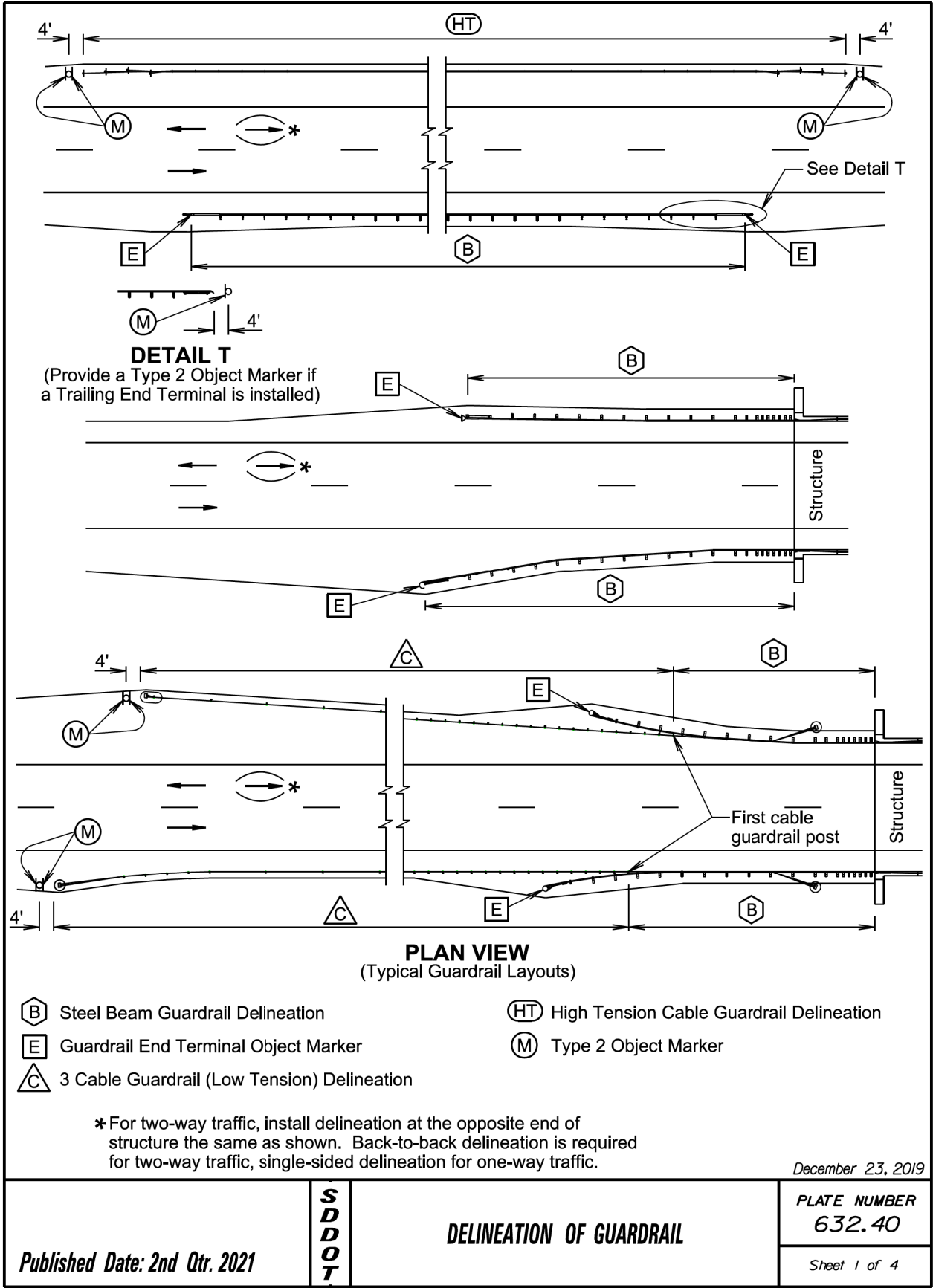
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| Published Date: 2nd Qtr. 2021 | S D D O T | MEASURING GUARDRAIL HEIGHT | PLATE NUMBER 630.99 |
| | | | Sheet 1 of 1 |

Plot Scale - 1:200

Plotted From - TRRC11610

| | | | |
|-----------------------------|---------|-------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | 073-472 | 30 | 36 |

Plotting Date: 04/21/2021



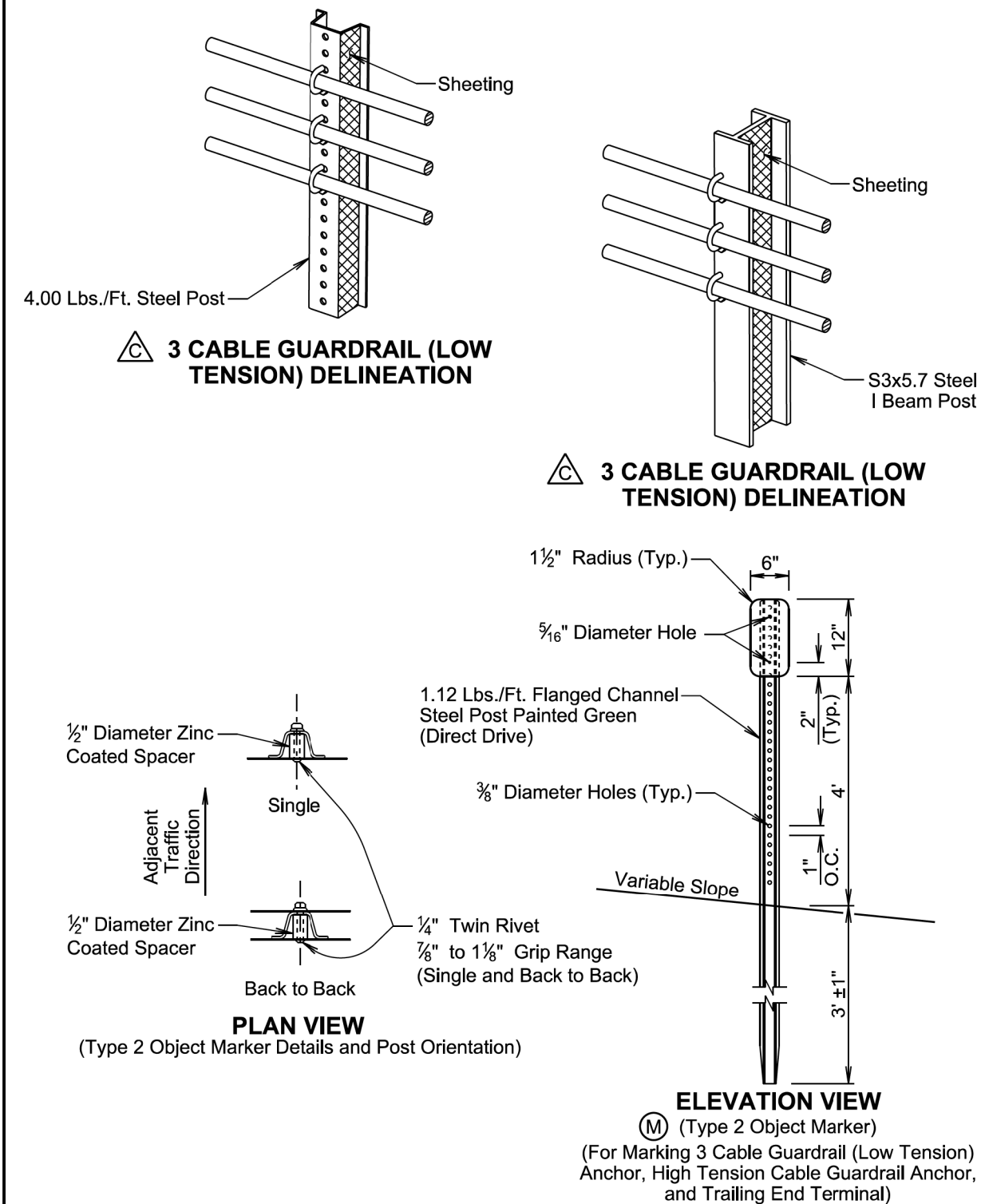
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1:200
Plot Scale -

Plotted From -
TRRC-1610

| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
|-----------------------------|---------|-------|-----------------|
| | 073-472 | 31 | 36 |

Plotting Date: 04/21/2021



December 23, 2019

| | | | |
|--------------------------------------|----------------------------------|---------------------------------|------------------------|
| <i>Published Date: 2nd Qtr. 2021</i> | S D D O T | DELINEATION OF GUARDRAIL | PLATE NUMBER 632.40 |
| | | | Sheet 3 of 4 |

GENERAL NOTES:

The delineation of high tension cable guardrail will be reflective sheeting placed back to back on every other post cap or cable spacer. The sheeting will be type XI in conformance with ASTM D4956. The color of the reflective sheeting shall be the same as the nearest pavement marking.

The delineators for steel beam guardrail and sheeting on 3 cable guardrail (low tension) posts will be covered with a minimum of 16 square inches of reflective sheeting. The reflective sheeting will be type XI in conformance with ASTM D4956. Along two-way roadways the sheeting will be on both sides of the delineators and guardrail posts and will be white in color. For one-way roadways the sheeting will only be required on the side facing traffic and the color will be the same as the nearest pavement marking, yellow on the left side of the roadway and white on the right side.

When steel beam guardrail is attached to a bridge the first delineator will be attached to the post nearest the bridge.

At bridges with guardrail less than 200 feet in length, a minimum of 4 delineators will be placed in addition to the end terminal yellow object marker. The spacing between the delineators will be approximately one third of the length of the guardrail.

At bridges with guardrail 200 feet and greater in length, including bridges that have steel beam guardrail transitioning to 3 cable guardrail (low tension), the delineators will be placed at a spacing of approximately 50 feet. Delineation will extend throughout the length of the guardrail system.

Steel beam guardrail that is not attached to a bridge and is less than 200 feet in length, a minimum of 4 delineators will be placed in addition to the end terminal yellow object markers. The spacing between the delineators will be approximately one third of the length of the guardrail.

Steel beam guardrail that is not attached to a bridge and is 200 feet and greater in length, including steel beam guardrail transitioning to 3 cable guardrail (low tension), the delineators will be placed at a spacing of approximately 50 feet. Delineation will extend throughout the length of the guardrail system.

All costs for furnishing and installing single or back to back guardrail delineation on 3 cable guardrail and steel beam guardrail will be included in the contract unit price per each for "Guardrail Delineator".

All costs for furnishing and installing the reflective sheeting on the cable spacers or post caps for the high tension cable guardrail will be incidental to the respective high tension cable guardrail contract item.

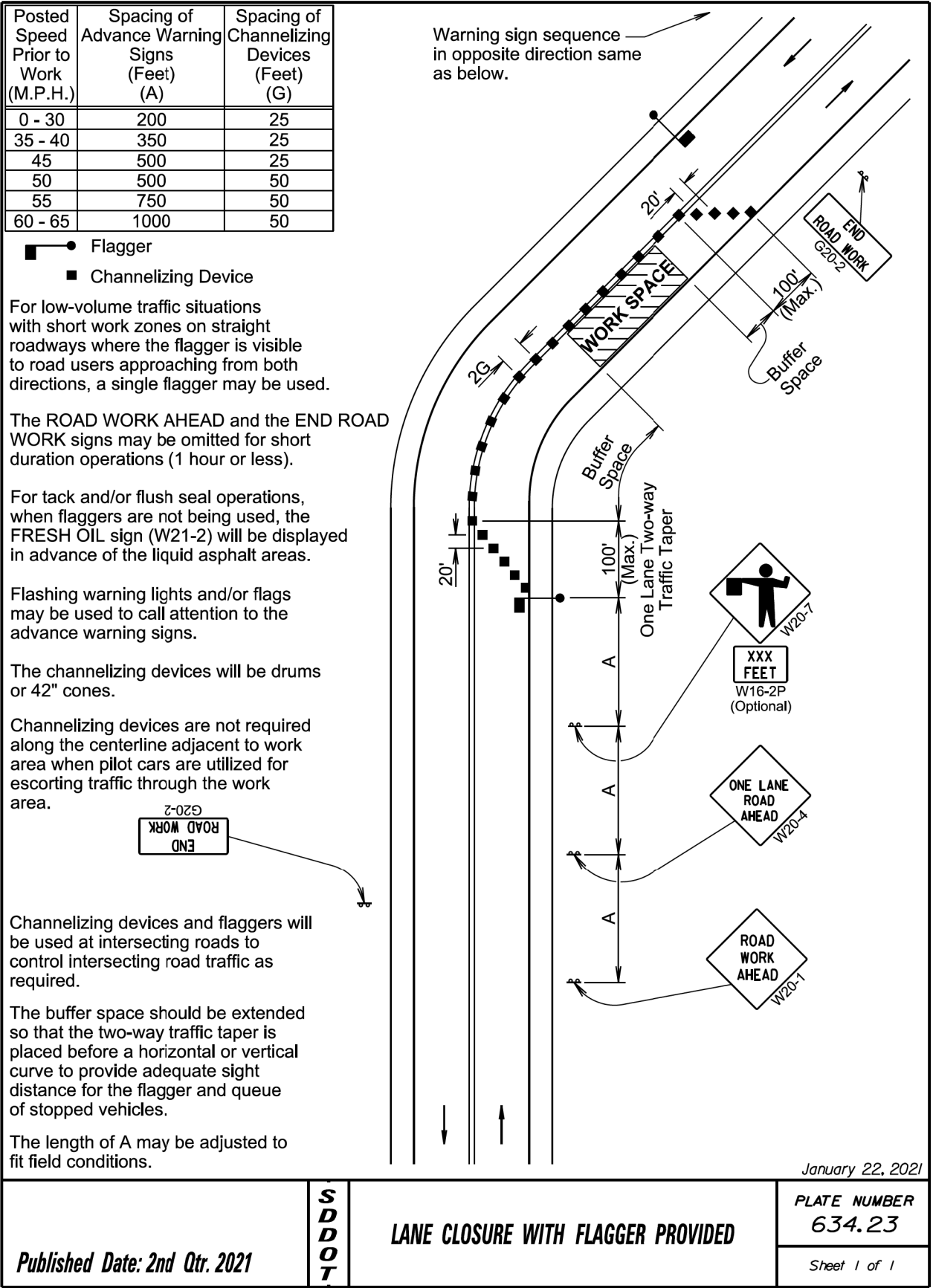
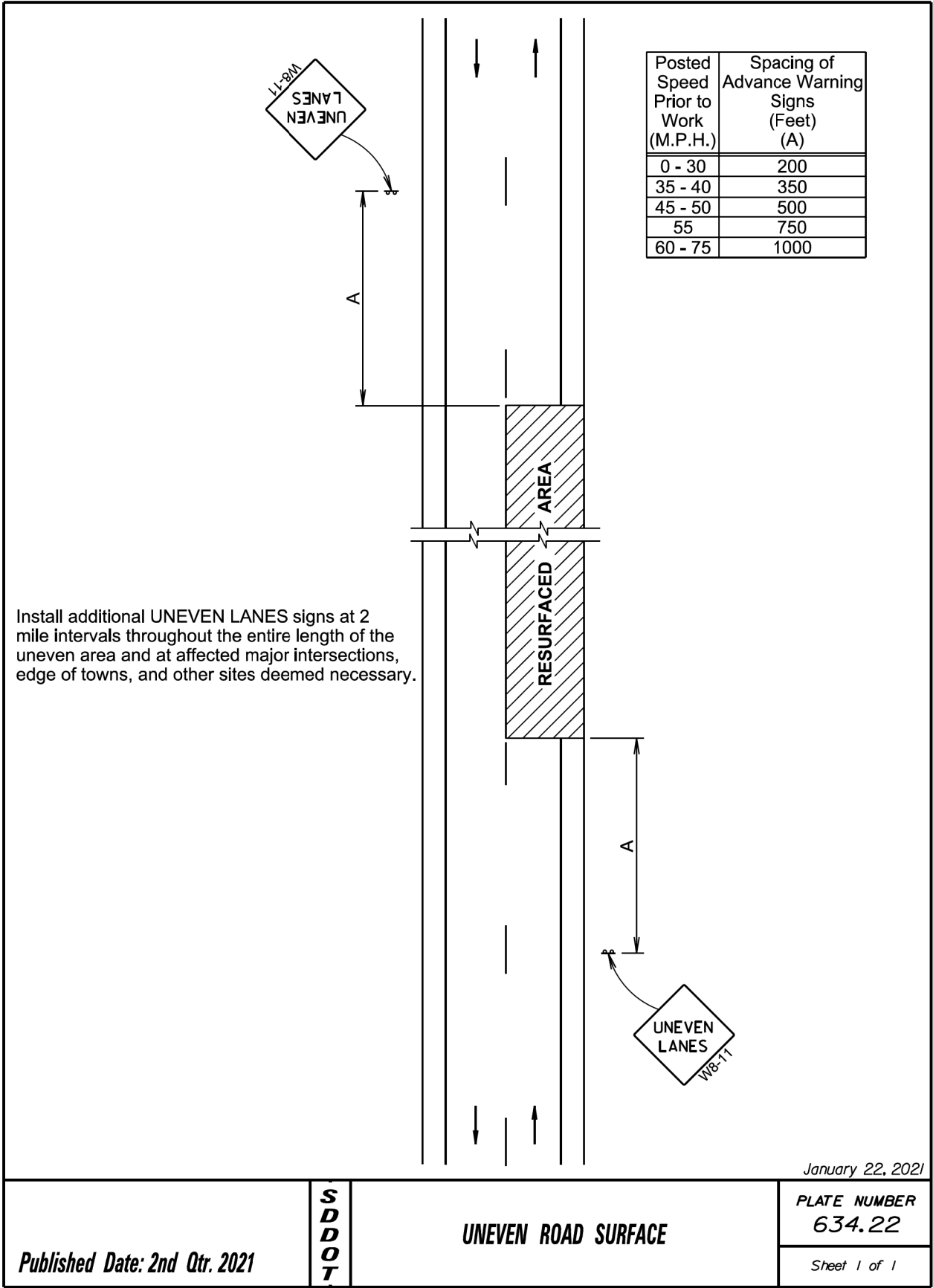
An adhesive object marker will be placed on the end of the W beam guardrail or MGS end terminal. The adhesive object marker dimensions may vary due to the shape of the terminal end. A minimum of 256 square inches of object marker reflective sheeting area is required. The reflective sheeting will be fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the adhesive object marker will be incidental to various contract items.

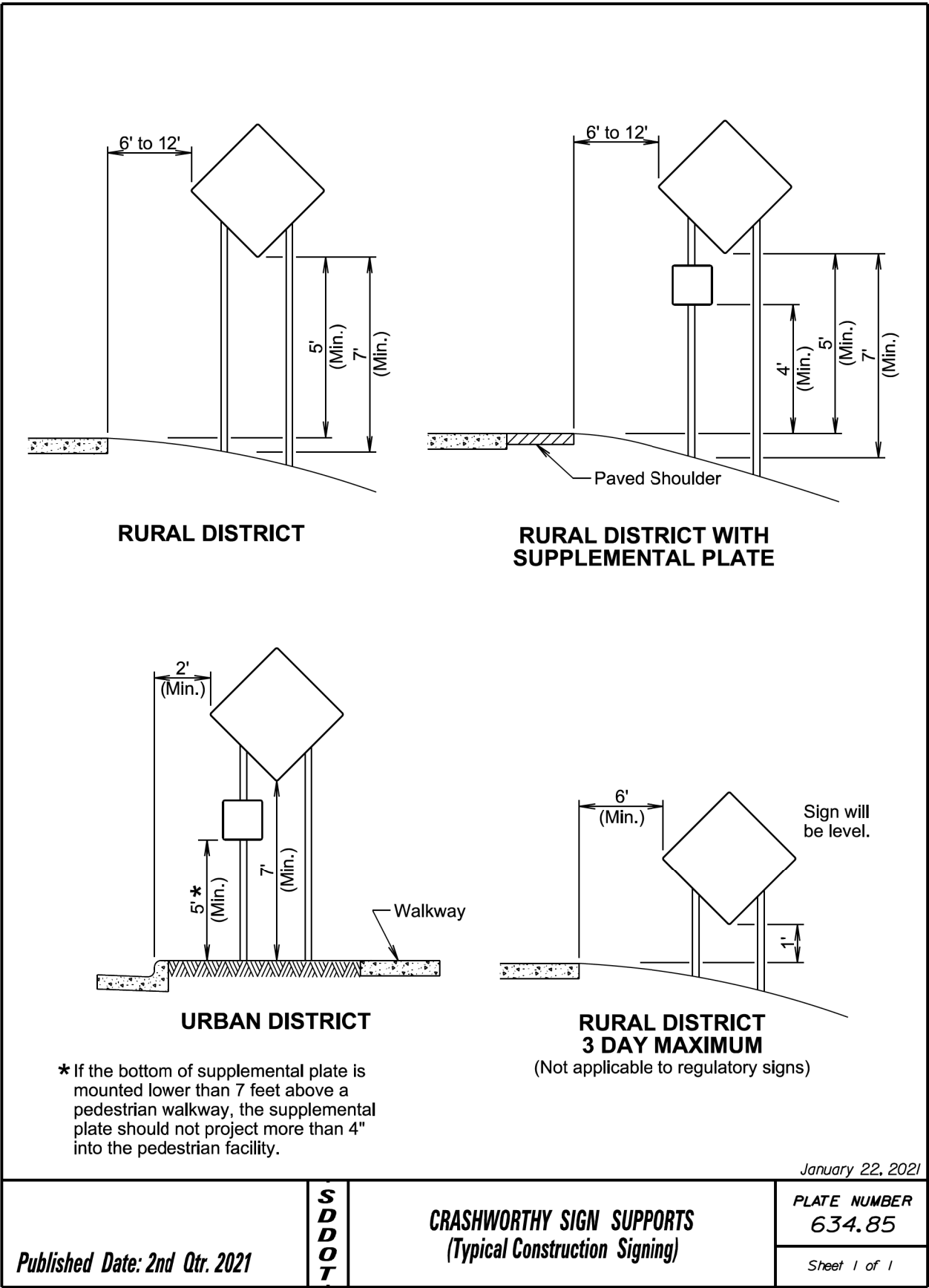
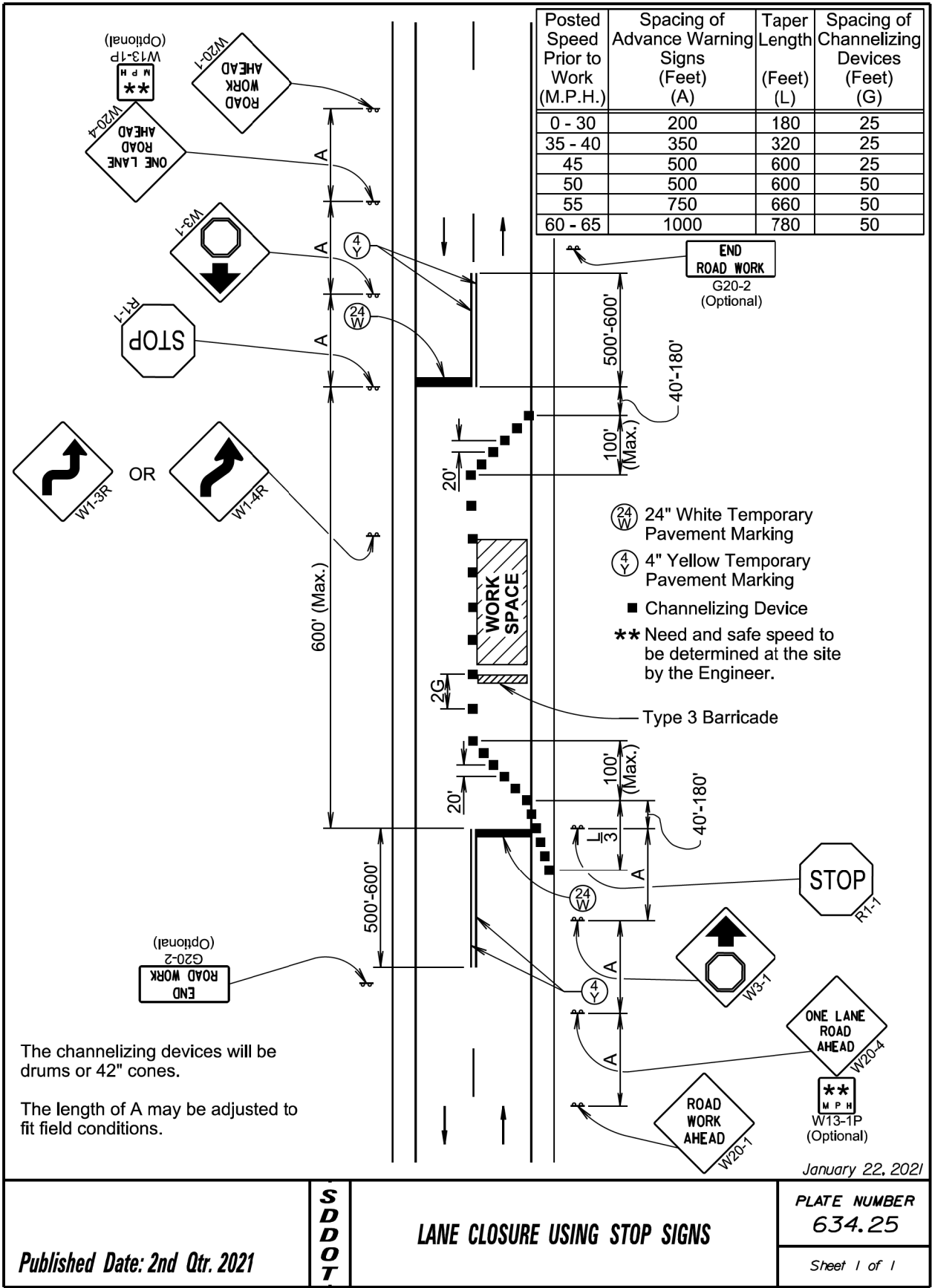
A type 2 object marker will be placed adjacent to the 3 cable guardrail (low tension) anchor, high tension cable guardrail anchor, and trailing end terminal at the location noted on sheet 1 of this standard plate. The type 2 object marker (6" x 12") will have fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the type 2 object marker including the steel post, 6" x 12" reflective panel, and hardware will be included in the contract unit price per each for "Type 2 Object Marker" for single-sided and "Type 2 Object Marker Back to Back" for back to back type 2 object markers.

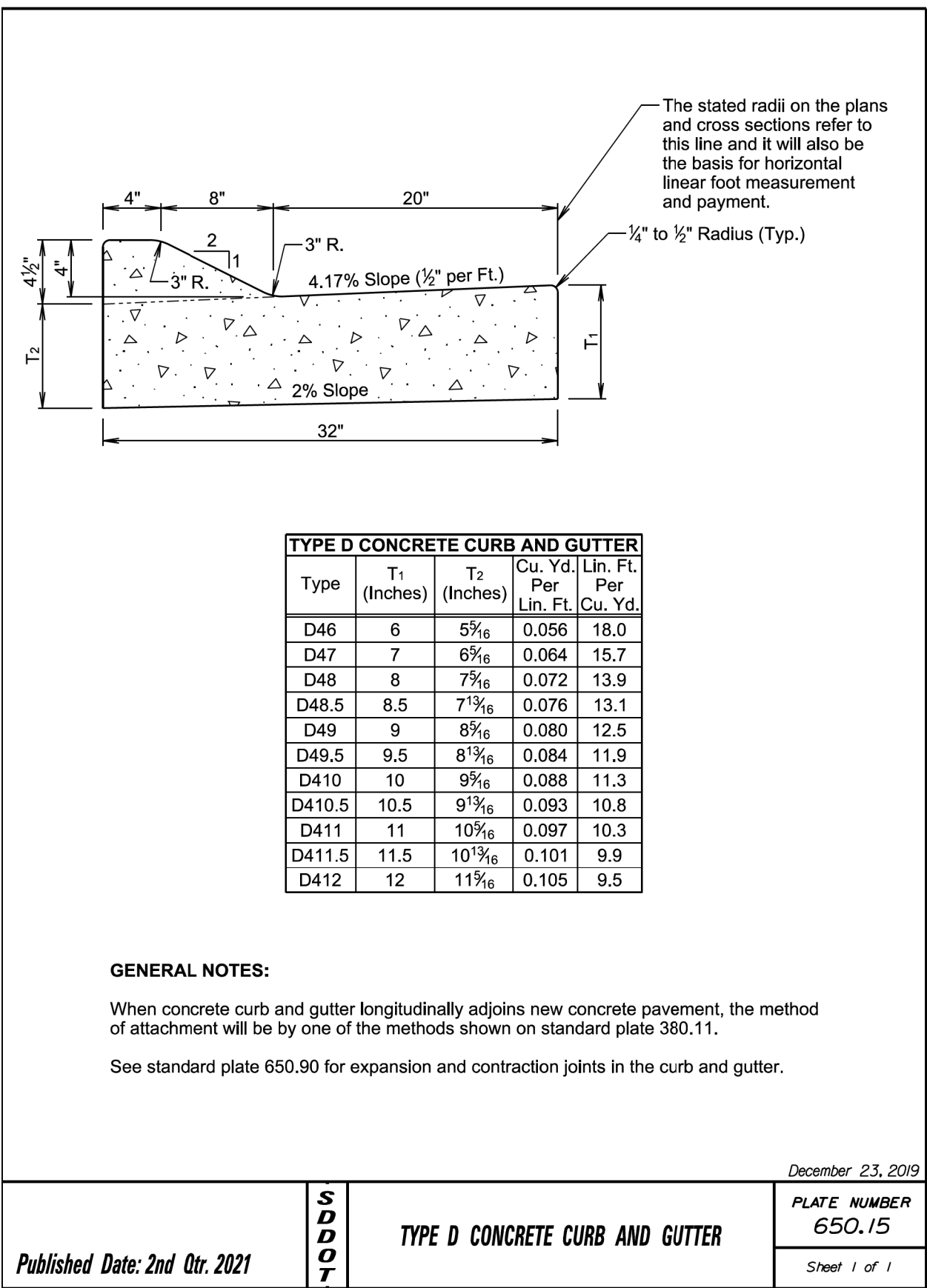
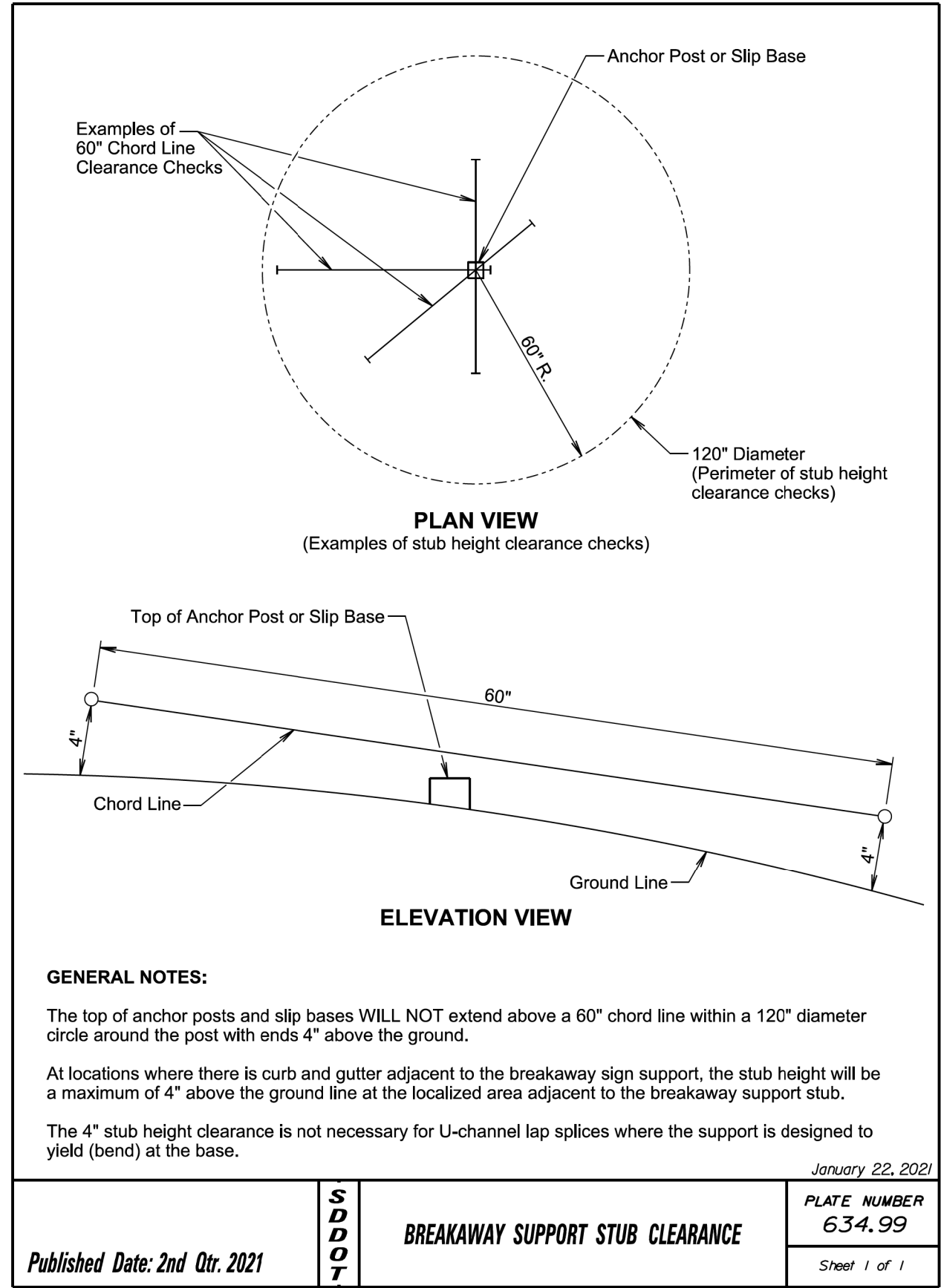
December 23, 2019

| | | | |
|--------------------------------------|----------------------------------|---------------------------------|------------------------|
| <i>Published Date: 2nd Qtr. 2021</i> | S D D O T | DELINEATION OF GUARDRAIL | PLATE NUMBER 632.40 |
| | | | Sheet 4 of 4 |

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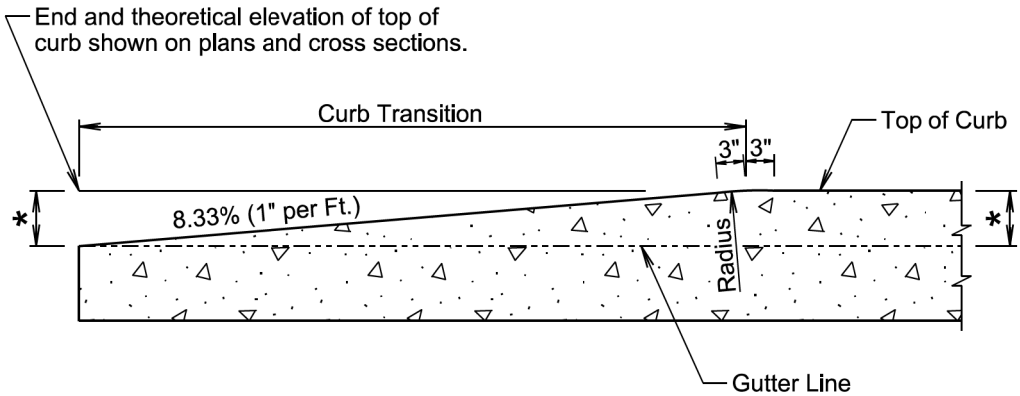






| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
|-----------------------------|---------|-------|-----------------|
| | 073-472 | 35 | 36 |

Plotting Date: 04/21/2021

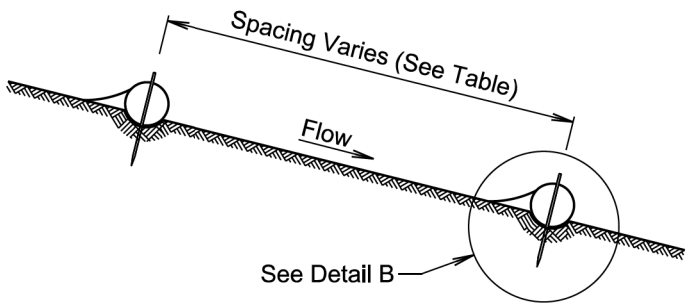


* Height of Curb

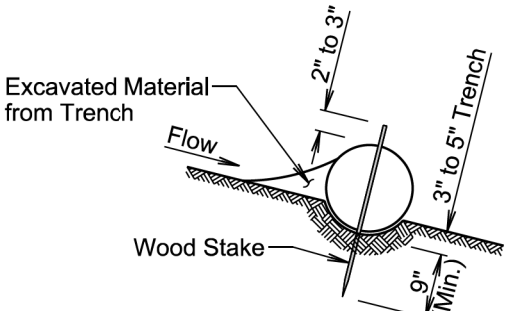
LONGITUDINAL SECTION
(Concrete Curb Taper)

December 23, 2019

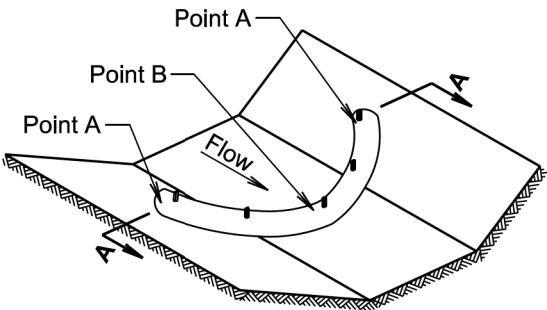
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| Published Date: 2nd Qtr. 2021 | S D D O T | CONCRETE CURB TAPER | PLATE NUMBER 650.35 |
| | | | Sheet 1 of 1 |



ELEVATION VIEW
(Cut or Fill Slope Installation)

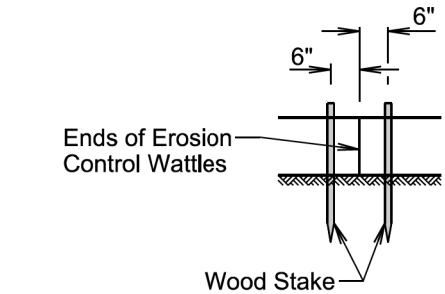


DETAIL B
(Typical of All Installations)

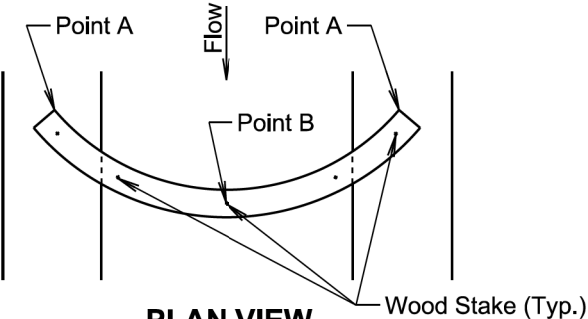


ISOMETRIC VIEW
(Ditch Installation)

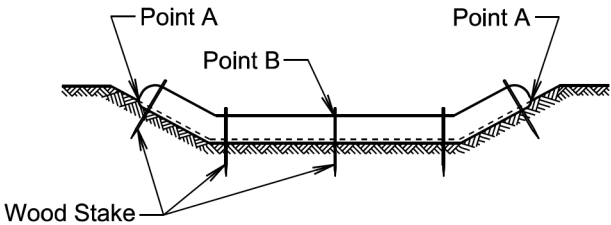
| DITCH INSTALLATION | |
|--------------------|---------------|
| Grade | Spacing (Ft.) |
| 2% | 150 |
| 3% | 100 |
| 4% | 75 |
| 5% | 50 |



DETAIL C
(See General Notes)



PLAN VIEW
(Ditch Installation)



SECTION A-A

February 14, 2020

| | | | |
|-------------------------------|-----------------------|------------------------|------------------------|
| Published Date: 2nd Qtr. 2021 | S D D O T | EROSION CONTROL WATTLE | PLATE NUMBER 734.06 |
| | | | Sheet 1 of 2 |

| | | | |
|-----------------------------|---------|-------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | 073-472 | 36 | 36 |

Plotting Date: 04/21/2021

GENERAL NOTES:

At cut or fill slope installations, wattles will be installed along the contour and perpendicular to the water flow.

At ditch installations, point A must be higher than point B to ensure that water flows over the wattle and not around the ends.

The Contractor will dig a 3" to 5" trench, install the wattle tightly in the trench so that daylight can not be seen under the wattle, and then compact the soil excavated from the trench against the wattle on the uphill side. See Detail B.

The stakes will be 1"x2" or 2"x2" wood stakes, however, other types of stakes such as rebar may be used only if approved by the Engineer. The stakes will be placed 6" from the ends of the wattles and the spacing of the stakes along the wattles will be 3' to 4'.

Where installing running lengths of wattles, the Contractor will butt the second wattle tightly against the first and will not overlap the ends. See Detail C.

The Contractor and Engineer will inspect the erosion control wattles in accordance with the storm water permit. The Contractor will remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

Sediment removal, disposal, or necessary shaping will be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping will be incidental to the contract unit price per cubic yard for "Remove Sediment".

All costs for furnishing and installing the erosion control wattles including labor, equipment, and materials will be incidental to the contract unit price per foot for the corresponding erosion control wattle contract item.

All costs for removing the erosion control wattle from the project including labor, equipment, and materials will be incidental to the contract unit price per foot for "Remove Erosion Control Wattle".

February 14, 2020

| | | | |
|--------------------------------------|----------------------------------|-------------------------------|--------------------------------------|
| <i>Published Date: 2nd Qtr. 2021</i> | S D D O T | EROSION CONTROL WATTLE | <i>PLATE NUMBER</i> 734.06 |
| | | | <i>Sheet 2 of 2</i> |