

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED
PROJECT 212-471
US HIGHWAY 212
BUTTE COUNTY

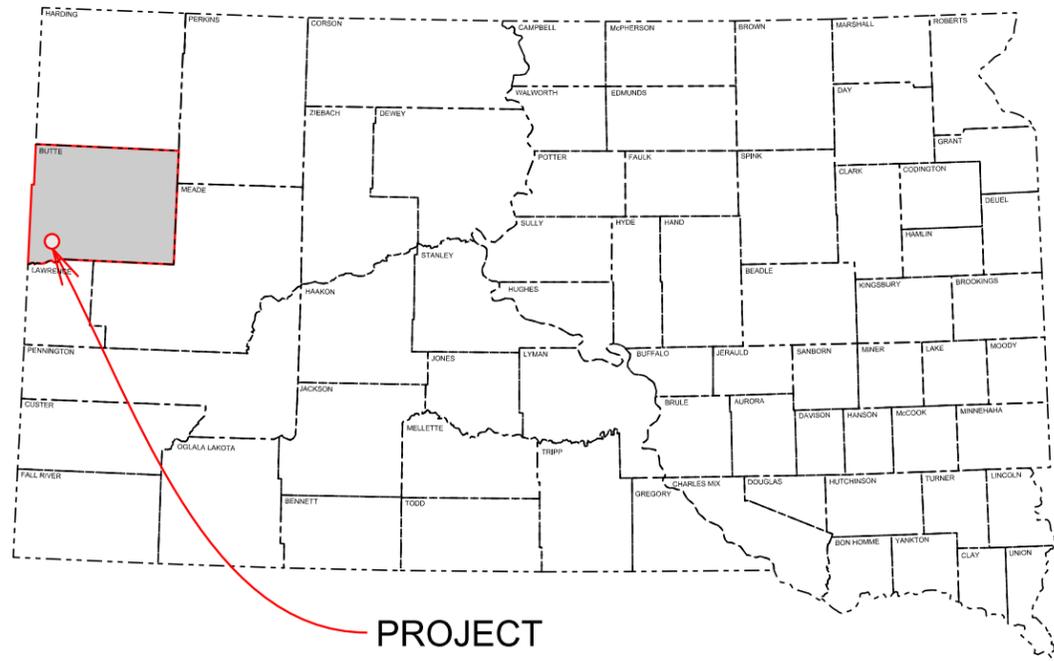
DRAINAGE REPAIR
PCN i49k

| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
|-----------------------|---------|-------|--------------|
| | 212-471 | 1 | 21 |

Plotting Date: 05/18/2016

INDEX OF SHEETS

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- 2-5 Estimate With General Notes & Tables
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PROJECT

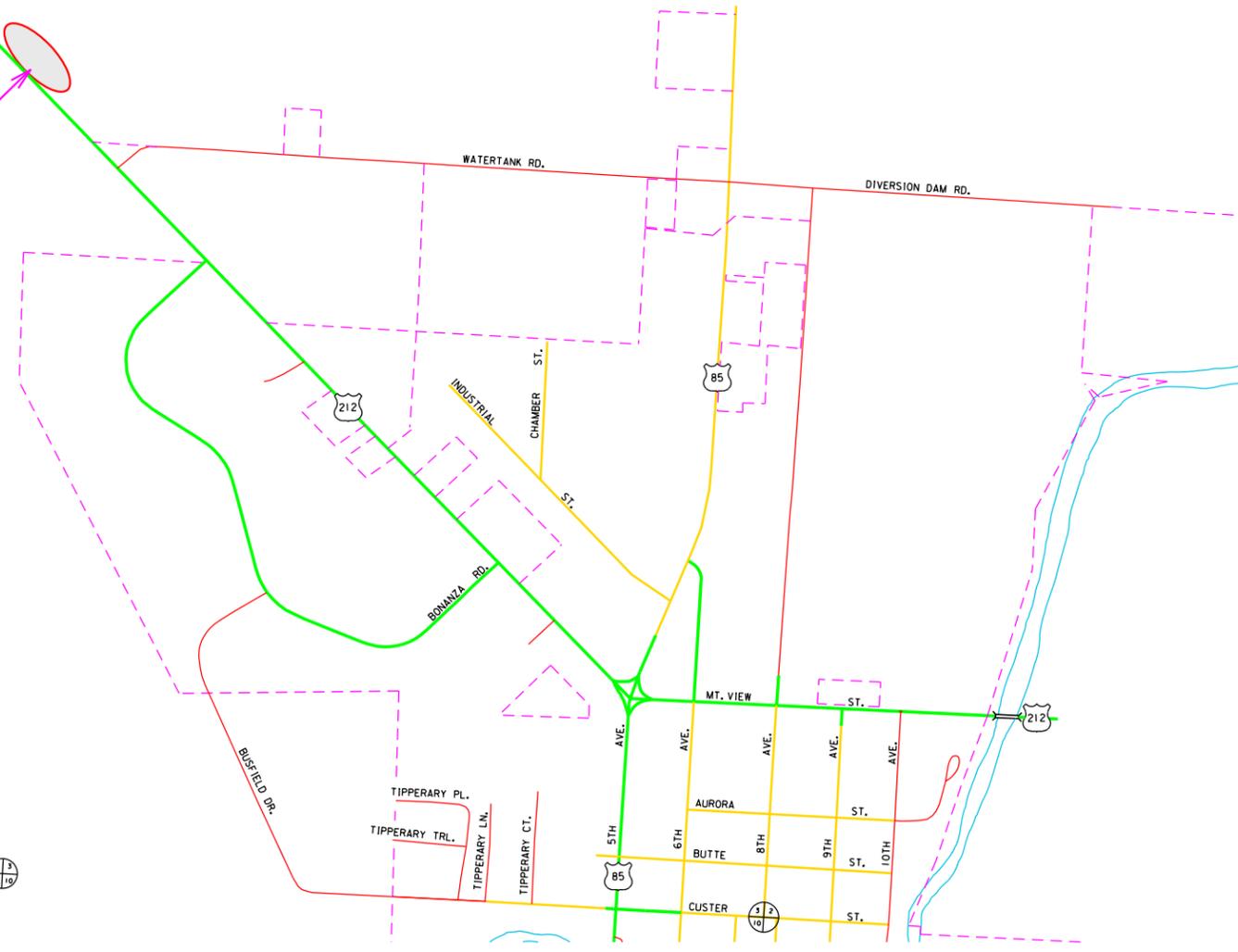
PROJECT 212-471
MRM 12.0 +0.36

DESIGN DESIGNATION

| | |
|------------|--------|
| ADT (2015) | 3984 |
| ADT (2035) | 4486 |
| DHV | 700 |
| D | 50 % |
| T DHV | 8.1 % |
| T ADT | 17.7 % |
| V | 45 MPH |

STORM WATER PERMIT

None Required



BELLE FOURCHE

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

| | | | |
|-----------------------------|---------|-------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | 212-471 | 2 | 21 |

ESTIMATE OF QUANTITIES

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|-----------------|-------------------------------------|----------|------|
| 009E0010 | Mobilization | Lump Sum | LS |
| 120E4100 | Reprofiling Ditch | 2.8 | Sta |
| 230E0020 | Contractor Furnished Topsoil | 70 | CuYd |
| 230E0100 | Remove and Replace Topsoil | Lump Sum | LS |
| 260E3010 | Gravel Surfacing | 52.0 | Ton |
| 450E4759 | 18" CMP 16 Gauge, Furnish | 172 | Ft |
| 450E4760 | 18" CMP, Install | 172 | Ft |
| 450E5406 | 18" CMP Safety End, Furnish | 4 | Each |
| 450E5407 | 18" CMP Safety End, Install | 4 | Each |
| 450E8900 | Cleanout Pipe Culvert | 1 | Each |
| 634E0110 | Traffic Control Signs | 74.0 | SqFt |
| 634E0120 | Traffic Control, Miscellaneous | Lump Sum | LS |
| 634E0420 | Type C Advance Warning Arrow Board | 1 | Each |
| 720E1015 | Bank and Channel Protection Gabion | 41.5 | CuYd |
| 734E0010 | Erosion Control | Lump Sum | LS |
| 734E0154 | 12" Diameter Erosion Control Wattle | 100 | 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

An Environmental Commitment is a measure that SDDOT commits to implement in order to avoid, minimize, and/or mitigate a real or potential environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency mentioned below with permitting authority can influence a project if perceived 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. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office. The environmental commitments associated with this project are as follows:

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 shall 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) shall 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) shall 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 Project Engineer.

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

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the Public ROW through the use of 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) shall be incidental to the various contract items.

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require review of cultural resources impacts. 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 shall arrange and pay for a cultural resource survey and/or records search. 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; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor shall provide ARC with the following: a topographical map or aerial view on 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 shall submit the records search or cultural resources survey report and if the location of the site is within the current geographical or historic boundaries of any South Dakota reservation to SDDOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). 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.

If evidence for cultural resources is uncovered during project construction activities, then such activities shall cease and the Project Engineer shall be immediately notified. The Project Engineer will contact the SDDOT Environmental Engineer in order to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

UTILITIES

Utilities are not planned to be affected on this project. 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 shall contact the Project Engineer to determine modifications that will be necessary to avoid utility impacts.

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

GRAVEL SURFACING

Included in the estimate of quantities is 26 ton of gravel surfacing per approach applied depth of 3" to the disturbed area.

CORRUGATED METAL PIPE

Corrugated metal pipes shall have 2 2/3-inch X 1/2-inch corrugations for 42-inch and smaller round pipe and 48-inch and smaller arch pipe unless otherwise stated in the plans. Corrugated metal pipes shall have 3-inch X 1-inch or 5-inch X 1-inch corrugations for 48-inch and larger round pipe and 54-inch and larger arch pipe unless otherwise stated in the plans.

The gauge of the corrugated metal ends shall match the thickest gauge of corrugated metal pipe it is connected to.

PIPE FOR APPROACHES

Class II reinforced concrete pipe, high density polyethylene pipe, corrugated polypropylene pipe, or steel reinforced polyethylene pipe may be substituted for corrugated metal pipe at approaches at no additional cost to the State.

If corrugated metal pipes are provided, the pipes shall be as specified in the CORRUGATED METAL PIPE note.

If high density polyethylene pipe, corrugated polypropylene pipe, or steel reinforced polyethylene pipe are provided, then the end sections shall be metal, be compatible, and conform to the type of end section as shown in the plans.

TABLE OF PIPE

| Station | | Corrugated Metal Circular | |
|---------|---|---------------------------|-----------------------|
| | | 18" 16 Ga (Ft) | Safety End 18" (Each) |
| 650+77 | L | 94 | 2 |
| 652+30 | L | 78 | 2 |
| Totals: | | 172 | 4 |

REMOVE AND REPLACE TOPSOIL

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

The estimated amount of topsoil to be removed and replaced is 70 CuYd.

All costs associated with removing and replacing the topsoil in areas to be reprofiled shall be incidental to the contract lump sum price for "Remove and Replace Topsoil".

REPROFILING DITCH

The Contractor shall reprofile the ditch to restore drainage into/out of the approach pipes, between the concrete gutter, the approach pipe and existing to the mainline cross pipe to ensure positive drainage. The work will require removing sedimentation along with placing the removed material where areas need material to fill in erosion. Placement and location of the cleanout material shall be approved by the Engineer.

All cost associated with reshaping the existing ditch including labor, excavation, placing material, equipment, and incidentals shall be paid for at the contract unit price per station for "Reprofiling Ditch". Payment will be plans quantity and no field measurement will be required.

TABLE OF REPROFILING DITCH

| Station | to | Station | L/R | Quantity (Sta) |
|---------|----|---------|-----|----------------|
| 649+00 | | 650+24 | L | 1.24 |
| 651+25 | | 651+86 | L | 0.61 |
| 652+70 | | 653+61 | L | 0.91 |
| Total: | | | | 2.76 |

CLEAN OUT PIPE CULVERT

The mainline 24" RCP at Sta. 649+60 shall be cleaned such that the bottom of the pipe is visible throughout its length to re-establish the flow line.

It is the responsibility of the Contractor to visit the site to determine the method and extent of culvert cleaning work required.

Wattles shall be used to catch any pipe cleanout material from leaving the projects limits. Placement of the wattles shall be as directed by the Engineer.

Cleaning method shall be approved by the Engineer. The culvert shall be cleaned to the satisfaction of the Engineer. The Contractor shall be responsible for repairing any damage caused by the cleaning process. These repairs, if required, shall be the responsibility of the Contractor.

All sediment and debris removed from the culvert shall be disposed of as waste. The Contractor shall shape the area of the culvert ends to restore ditch flow. All costs associated with cleaning out the existing culvert, the removal of debris and shaping of the outlet shall be incidental to the contract unit price per each for "Cleanout Pipe Culvert".

TABLE OF BANK AND CHANNEL PROTECTION GABIONS

| Station | L/R | Bank and Channel Protection Gabion (CuYd) |
|------------------|-----|-------------------------------------------|
| 649+00 to 650+29 | L | 21.5 |
| 651+25 to 651+96 | L | 12.0 |
| 652+53 to 653+01 | L | 8.0 |
| Totals: | | 41.5 |

CONTRACTOR FURNISHED TOPSOIL

It is anticipated that a larger volume of topsoil will be needed for the reprofiled ditch area than can be salvaged from the existing grade. The Contractor will be required to furnish and place 2 inches of topsoil on the reprofiled ditch area and areas as determined by the Engineer during construction.

Contractor furnished topsoil shall be free from clay lumps, stones, coarse gravel, or similar objects larger than 1/2 inch in diameter. Brush, stumps, roots, wood, objectionable weeds, litter, or any other material which may be harmful to plant growth will not be allowed. Organic material shall be decomposed.

All costs to furnish and place the Contractor furnished topsoil shall be incidental to the contract unit price per cubic yard for "Contractor Furnished Topsoil".

EROSION CONTROL

The estimated area requiring erosion control is 11,327 square feet (0.26 acres). All costs for the erosion control work for furnishing, placing, and maintaining erosion control including equipment, labor, seeding, fertilizing, and fiber mulching shall 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 shall 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 shall provide certification of the fungal species claimed and the live propagule count. The inoculum shall include the following fungal species:

- Glomus intraradices* 25%
- Glomus aggregatu* 25%
- Glomus mosseae* 25%
- Glomus etunicatum* 25%

All seed shall 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 shall be incidental to the contract lump sum price for "Erosion Control".

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

| | |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>Product</u> | <u>Manufacturer</u> |
| MycoApply | Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 http://www.mycorrhizae.com/ |

EROSION CONTROL (Cont.)

Fertilizing

The Contractor shall apply an all-natural slow release fertilizer prior to seeding or placing sod. The all-natural fertilizer shall have a minimum guaranteed analysis of 4-6-4 and be USDA Certified BioBased. It should provide a minimum of 4% (N) nitrogen with a minimum water insoluble nitrogen (WIN) fraction of 3.2%, a minimum of 6% (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 shall 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 shall 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 shall 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 shall 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 shall be as shown below or an approved equal:

| | |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>Product</u> | <u>Manufacturer</u> |
| Sustane | Sustane Corporate Headquarters Cannon Falls, Minnesota Phone: 1-800-352-9245 http://www.sustane.com/ |

Permanent Seeding

Type F Permanent Seed Mixture shall consist of the following:

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

EROSION CONTROL (Cont.)

Fiber Mulching

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

An additional 2% by weight of tackifier shall be added to the fiber mulch product selected from the approved product list. If the product selected has guar gum tackifier included, then the additional 2% of tackifier shall be guar gum. If the product selected has synthetic tackifier included, then the additional 2% of tackifier shall be synthetic.

Fiber mulch shall be applied at the rate of 3,000 pounds per acre.

The Contractor shall 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.

All costs for the additional tackifier added to the fiber mulch including labor, equipment, and materials shall be incidental to the contract lump sum price for "Erosion Control".

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

<http://sddot.com/business/certification/products/Default.aspx>

Table of Fiber Mulching
(For Information Only)

| Station | to | Station | L/R | Quantity (Lb) |
|---------|----|---------|-----|-------------------|
| 649+51 | | 650+57 | L | 243 |
| 650+98 | | 652+09 | L | 268 |
| 652+47 | | 653+04 | L | 150 |
| Total: | | | | 661 |

EROSION CONTROL WATTLE

Erosion control wattles for restraining the flow of runoff and sediment shall 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 shall provide certification that the erosion control wattles do not contain noxious weed seeds.

Erosion control wattles shall remain on the project to decompose.

An additional quantity of 12" Diameter Erosion Control Wattles has been added to the Estimate of Quantities for temporary erosion and sediment control in highway ditch channels and as an alternative to low flow or high flow silt fence at the pipe cleanout area adjacent to the highway.

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

<http://sddot.com/business/certification/products/Default.aspx>

TABLE OF EROSION CONTROL WATTLE

| Station | L/R | Diameter (Inch) | Location | Quantity (Ft) |
|---------|-----|--------------------|----------------------|------------------|
| 649+60 | L | 12 | Pipe Inlet | 20 |
| 650+98 | L | 12 | Pipe Inlet | 20 |
| 652+62 | L | 12 | Pipe Inlet | 20 |
| | | | Additional Quantity: | 40 |
| | | | Total: | 100 |

TRAFFIC CONTROL – GENERAL NOTES

Pipe installation shall be done one approach at a time and be backfilled and gravel surfaced to roadway elevation before opening the approach.

At the end of each day's work all traffic, control devices shall be pulled off the roadway and taken down and traffic shall be opened to two lanes. Applicable signing shall remain in place, i.e. "Road Work Ahead" etc.

Requests to deviate from the sequence of operations shall 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 shall be submitted for review a minimum of one week prior to potential implementation.

Unless otherwise stated in these plans, no work will be allowed during hours of darkness.

Existing guide, route, informational logo, regulatory, warning signs and delineation shall be temporarily reset and maintained during construction as directed by the Engineer. Removing, relocating, salvaging and resetting of the above items shall be the responsibility of the Contractor.

All non-applicable existing signing and temporary traffic control devices shall be covered or removed during periods of inactivity. Periods of inactivity shall be defined as no work taking place for a period of more than 48 hours. The cost of removing or covering non-applicable signs and temporary traffic control devices shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

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

All construction operations shall 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 shall be used, as determined by the Engineer.

Temporary Flexible Vertical Markers (Tabs) shall be used for lane closure tapers or lane shift tapers and shall be installed at 5' spacing. Tabs used for tapers and shifts will not be measured for payment. All costs associated to furnish, install, maintain (including replacement as required by the Engineer at no added cost to the Department), and remove all markers will be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

TABLE OF TRAFFIC CONTROL DEVICES

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

| SIGN CODE | SIGN DESCRIPTION | CONVENTIONAL ROAD | | | |
|---------------------------------------------------------|----------------------------------|-------------------|-----------|------------------|-----------|
| | | NUMBER | SIGN SIZE | SQFT PER SIGN | SQFT |
| W4-2 | LEFT or RIGHT LANE ENDS (symbol) | 1 | 48" x 48" | 16 | 16 |
| W20-1 | ROAD WORK AHEAD | 2 | 48" x 48" | 16 | 32 |
| W20-5 | LEFT or RIGHT LANE CLOSED AHEAD | 1 | 48" x 48" | 16 | 16 |
| G20-2 | END ROAD WORK | 2 | 36" x 18" | 5 | 10 |
| CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT | | | | | 74 |

HORIZONTAL ALIGNMENT DATA

| | | | |
|-----------------------------|---------|-------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | 212-471 | 6 | 21 |

MAINLINE

| Type | Station | | | Northing | Easting |
|------|-----------|------------|---------------|------------|------------|
| POB | 648+66.96 | | | 337365.757 | 962290.849 |
| | | TL= 575.03 | S 43°44'20" E | | |
| POE | 654+41.99 | | | 336950.299 | 962688.409 |

LEGEND

| | | | |
|-----------------------|---------|-------|--------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
| | 212-471 | 7 | 21 |

Plotting Date: 05/18/2016

Plot Scale - 1:200

Plotted From - Irrc11610

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

File - ...legend.dgn

Reprofile Ditch at the following locations:
 649+00 L to 650+24 L
 651+25 L to 651+86 L
 652+70 L to 653+61 L

650+77 - 65.5'L
 Install 18" - 94' CMP
 & 2 Safety Ends

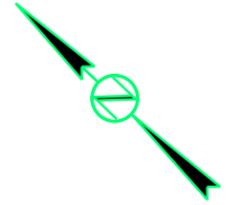
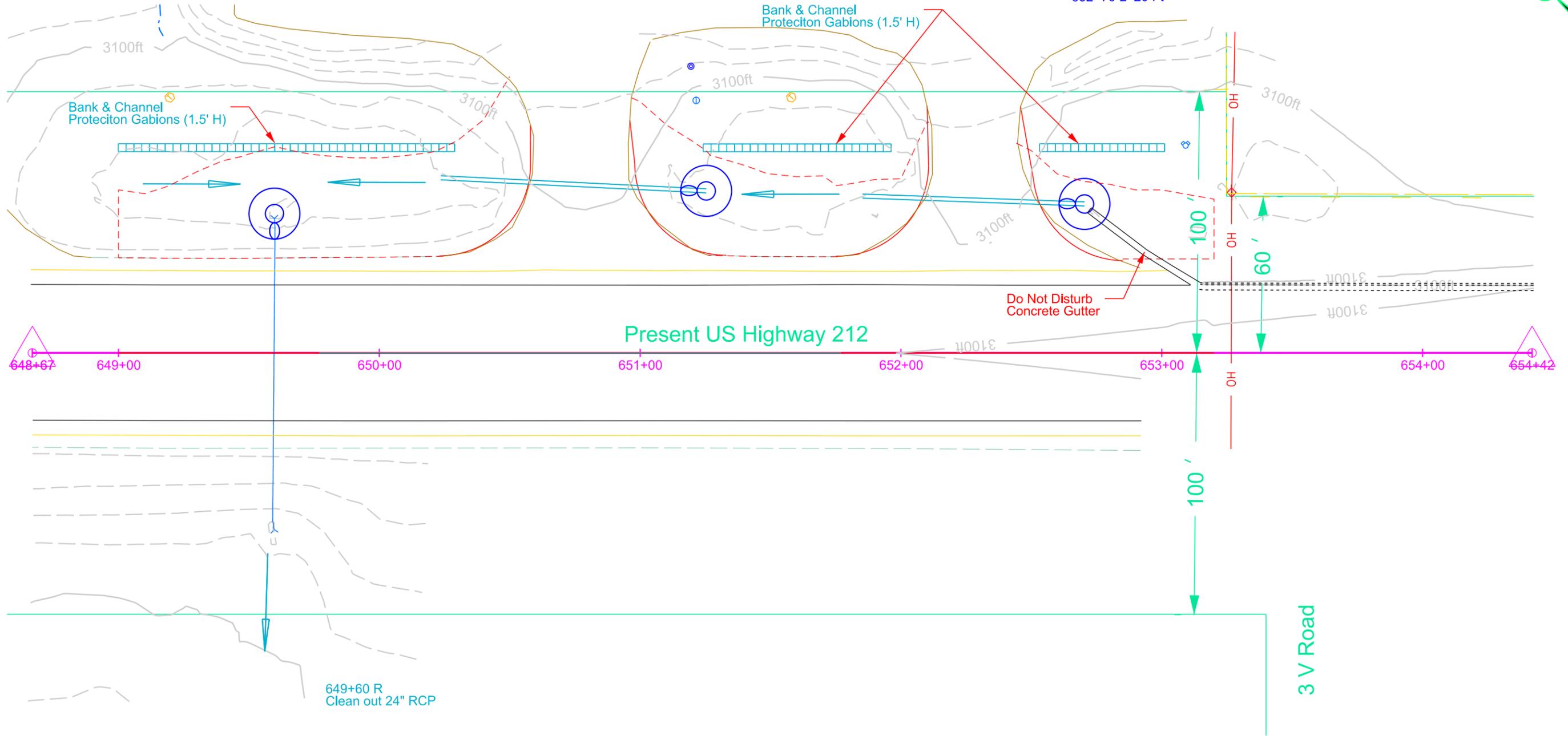
652+30 - 57.5'L
 Install 18" - 78' CMP
 & 2 Safety Ends

| STATE OF SOUTH DAKOTA | PROJECT | SHEET | TOTAL SHEETS |
|-----------------------|---------|-------|--------------|
| | 212-471 | 8 | 21 |

Plotting Date: 05/18/2016

Install Bank & Channel Protection Gabions (1.5' H) at the following locations:
 649+00 - 77' L to 650+29 - 77' L (21.5 CuYd)
 651+25 - 77' L to 651+96 - 77' L (12 CuYd)
 652+53 - 77' L to 653+01 - 77' L (8 CuYd)

Install 12" Diameter Erosion Control Wattles around pipe inlets at the following locations:
 649+60 L 20 Ft
 651+25 L 20 Ft
 652+70 L 20 Ft

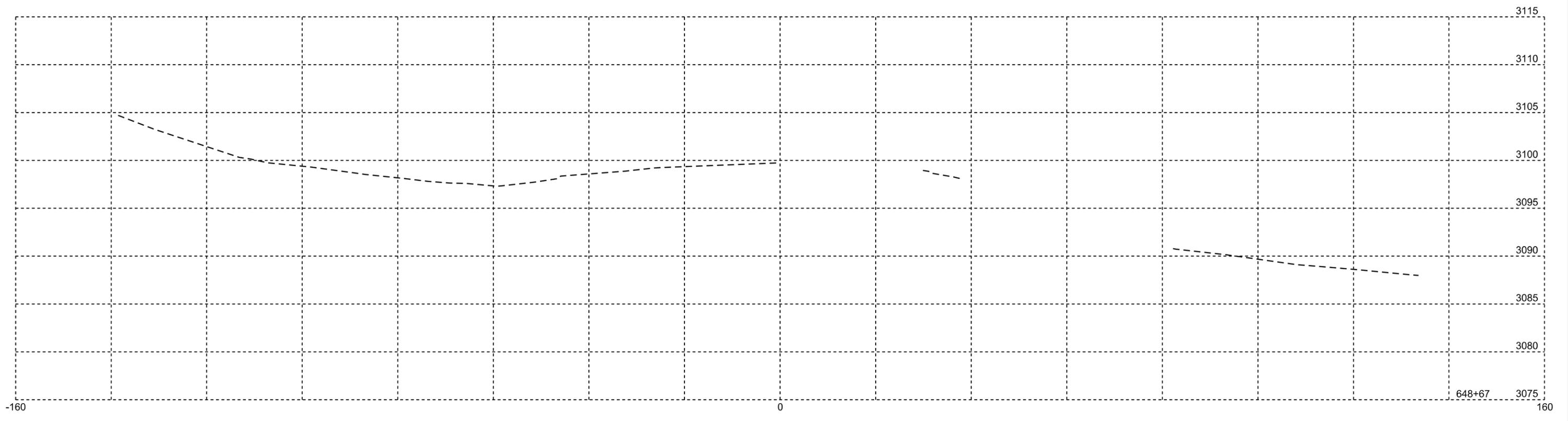
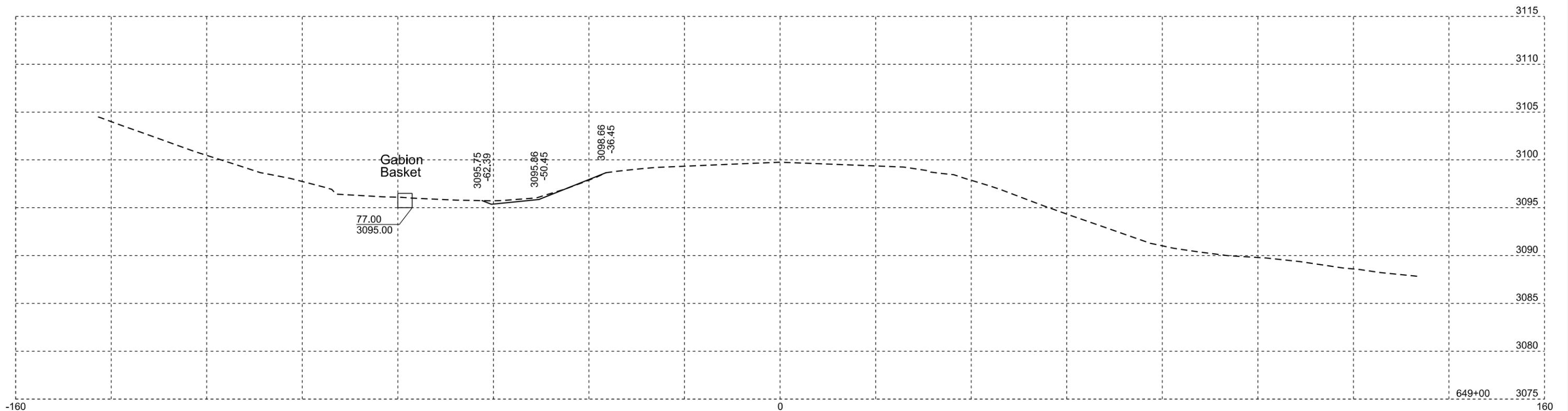


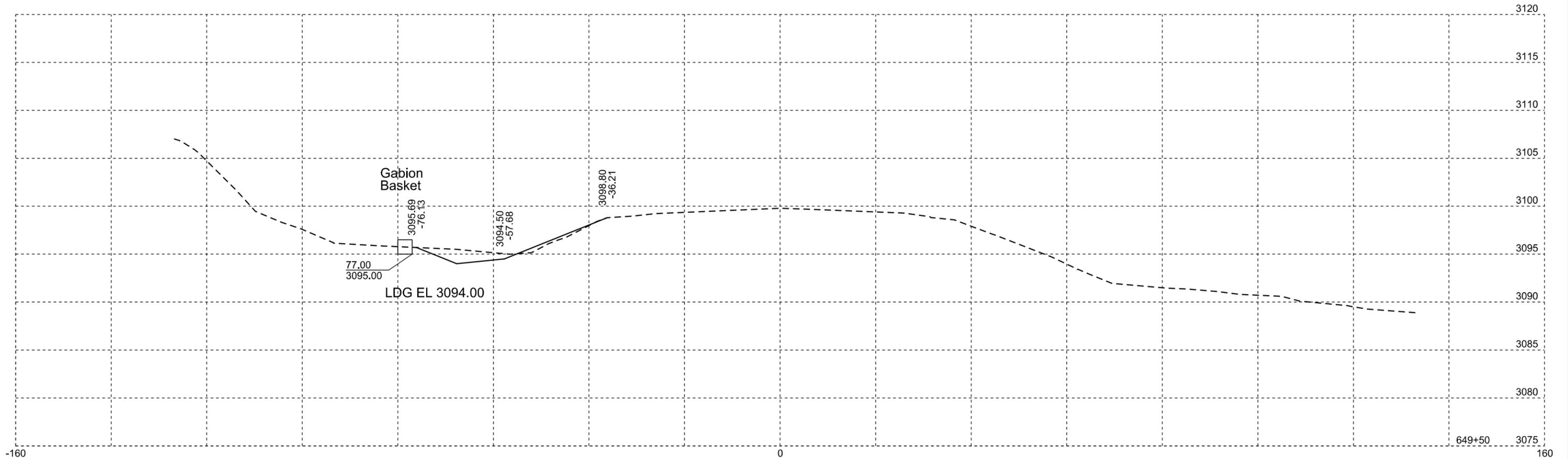
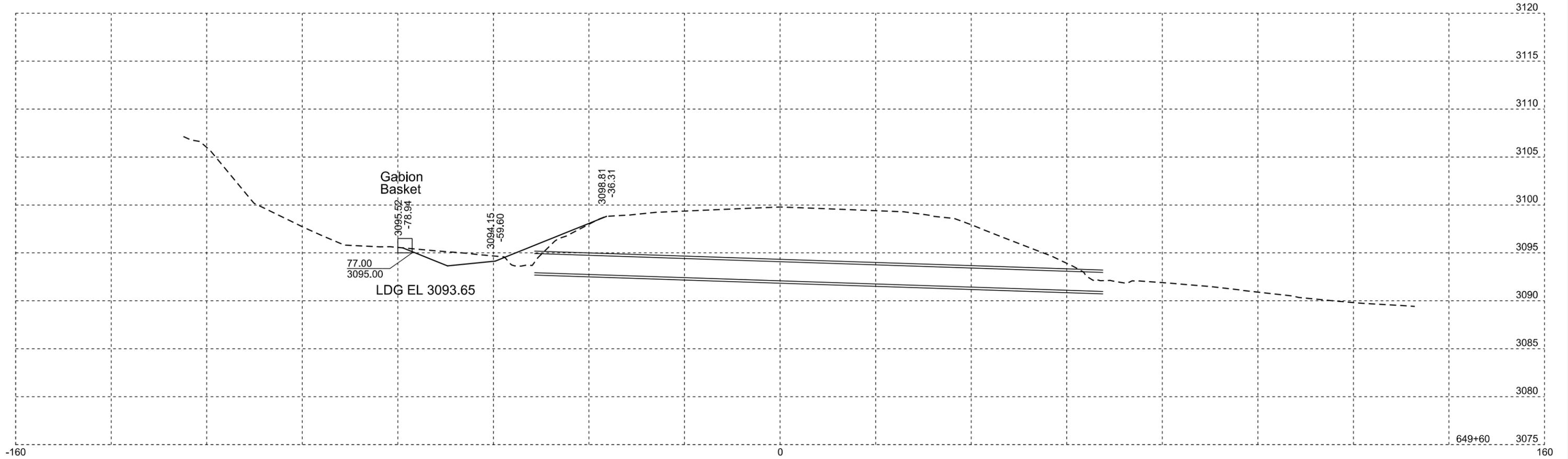
Plot Scale - 1"=40'

Plotted From - Irrc11610

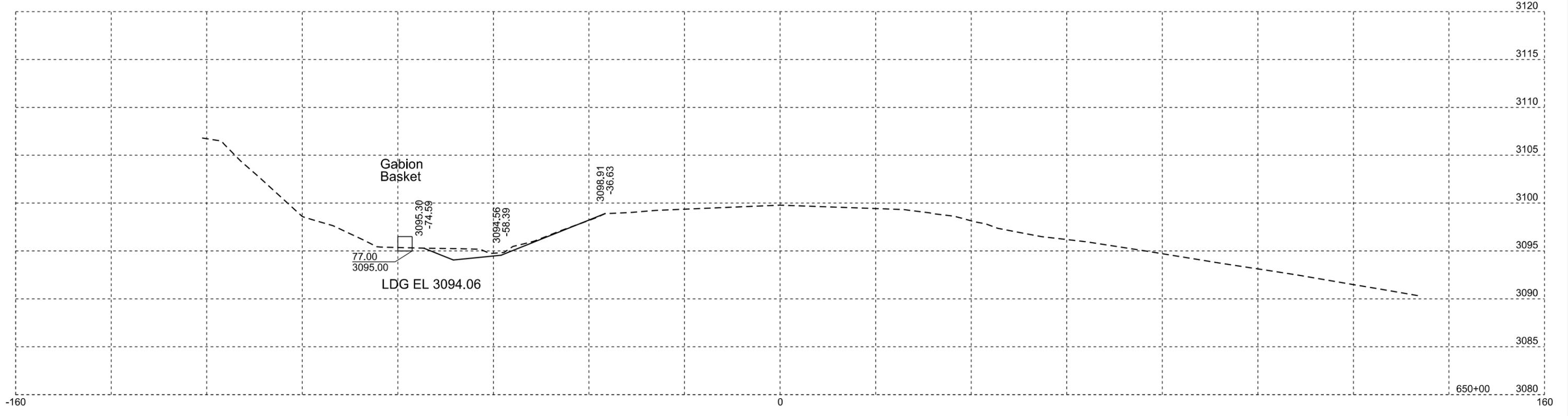
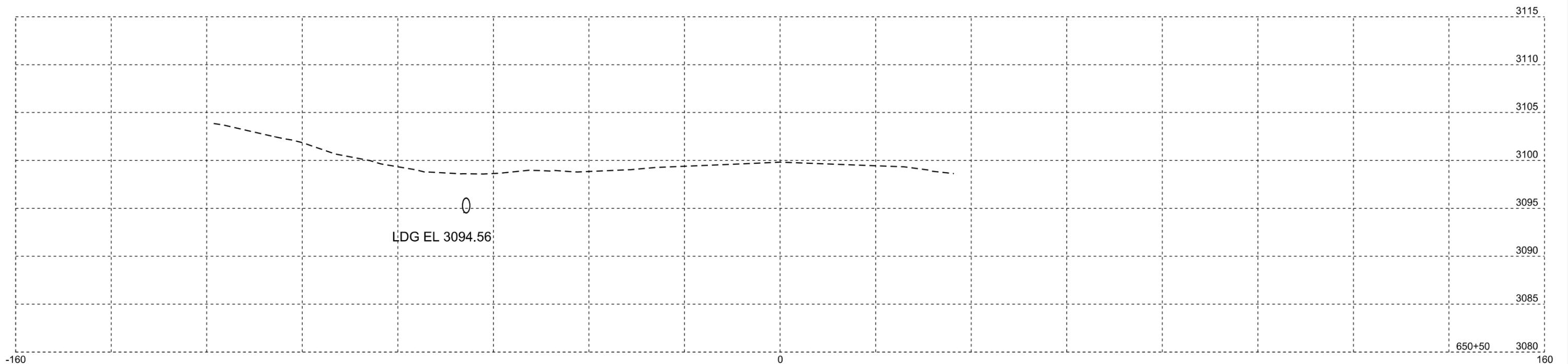
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|-----------------------------|---------|--------------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
| | 212-471 | 10 | 21 |

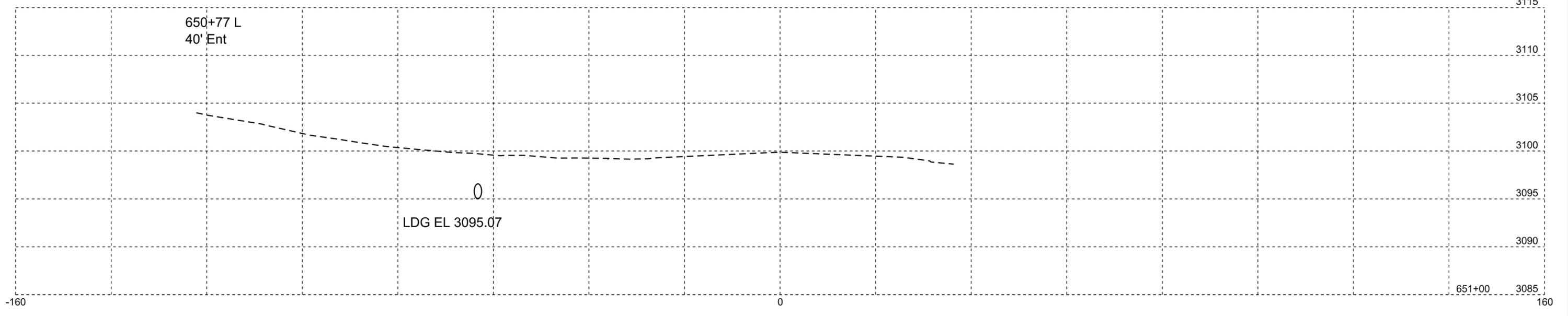
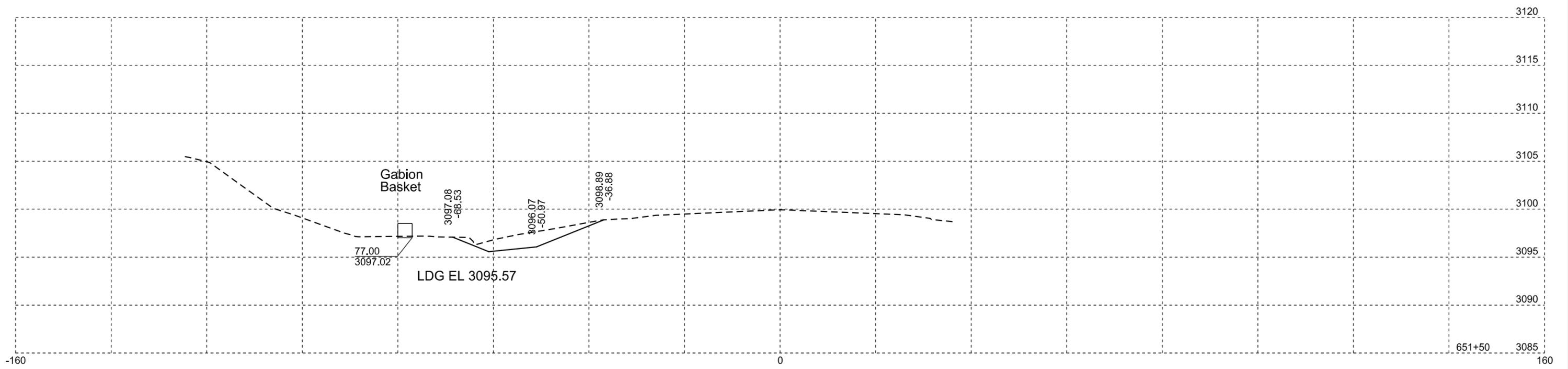




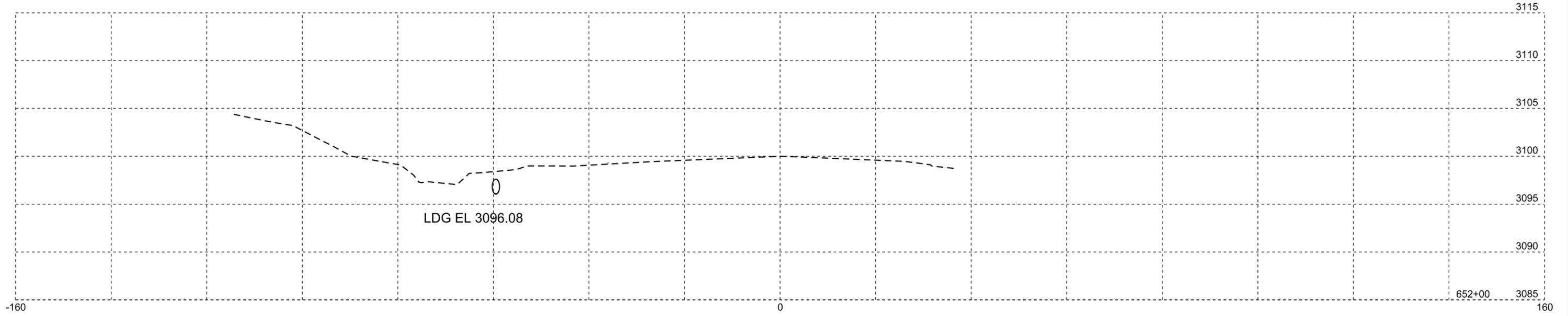
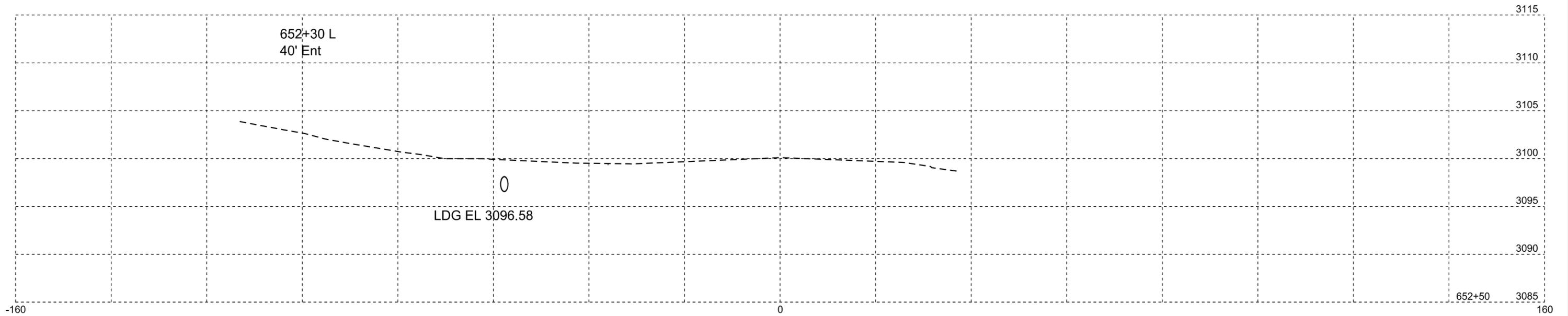
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| | 212-471 | 12 | 21 |



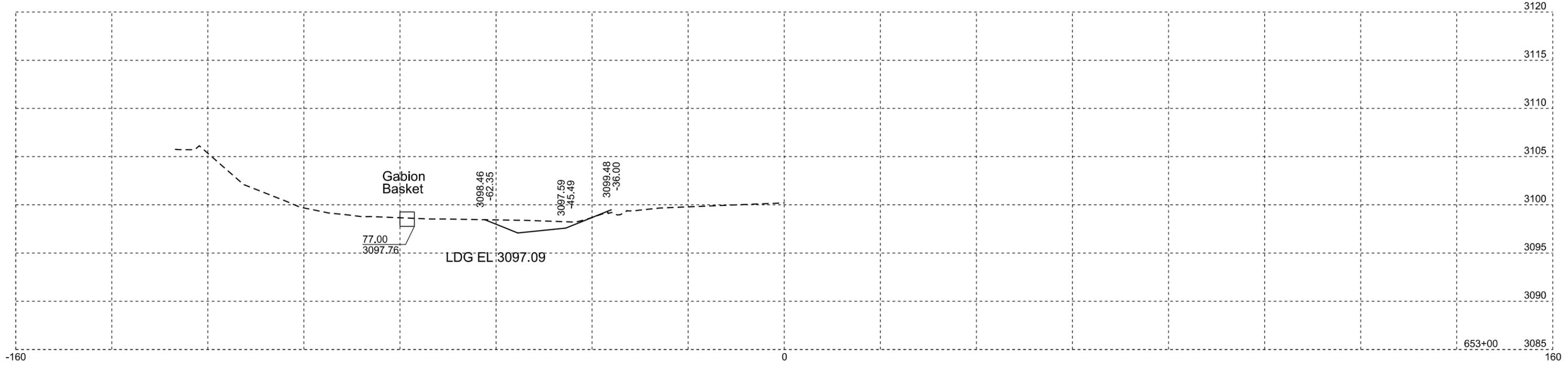
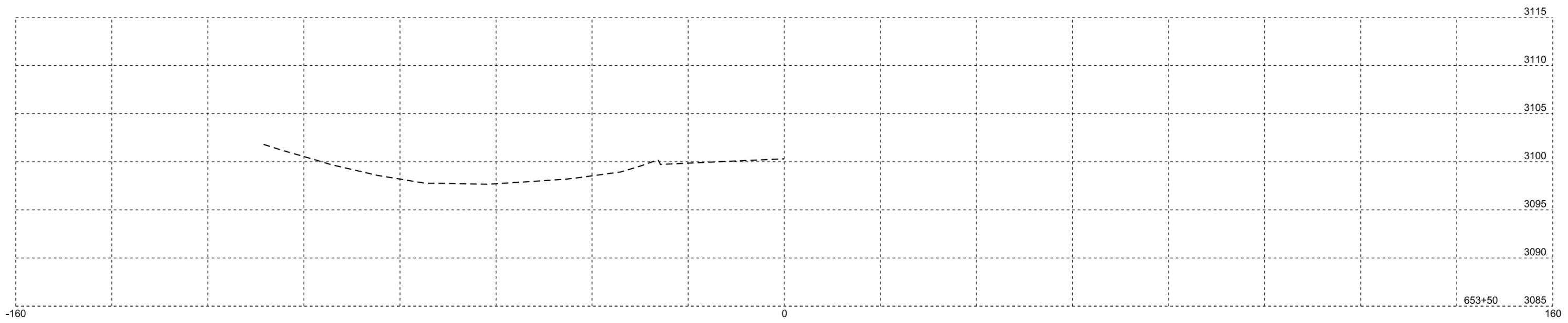
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| | 212-471 | 13 | 21 |

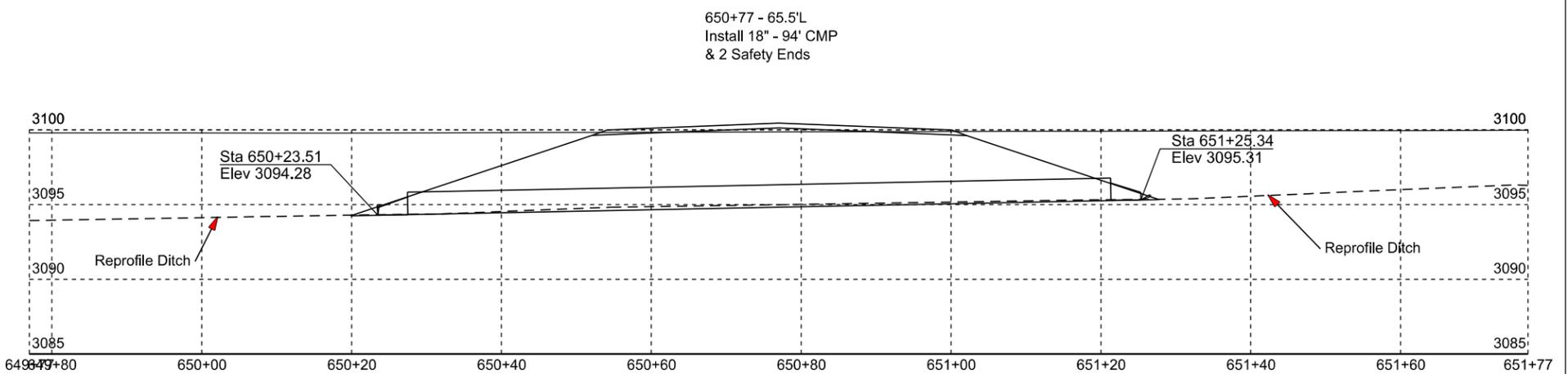
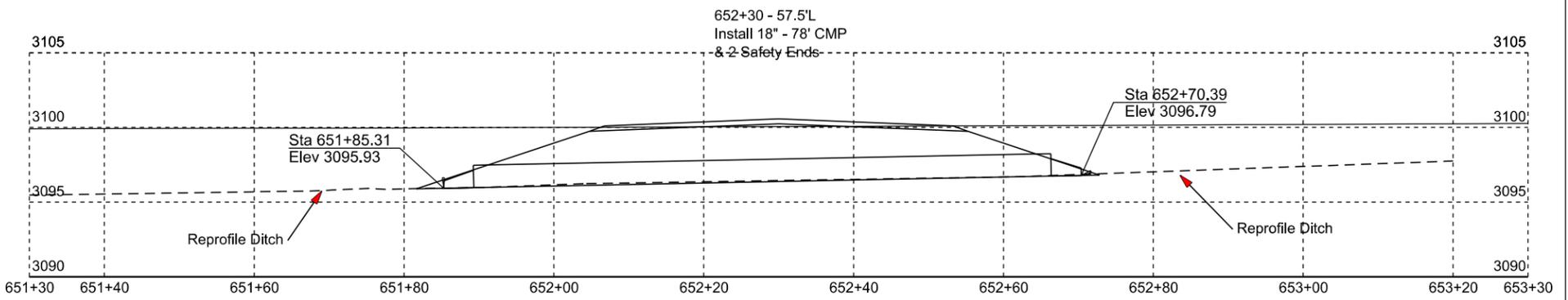


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|-----------------------------|---------|--------------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
| | 212-471 | 14 | 21 |



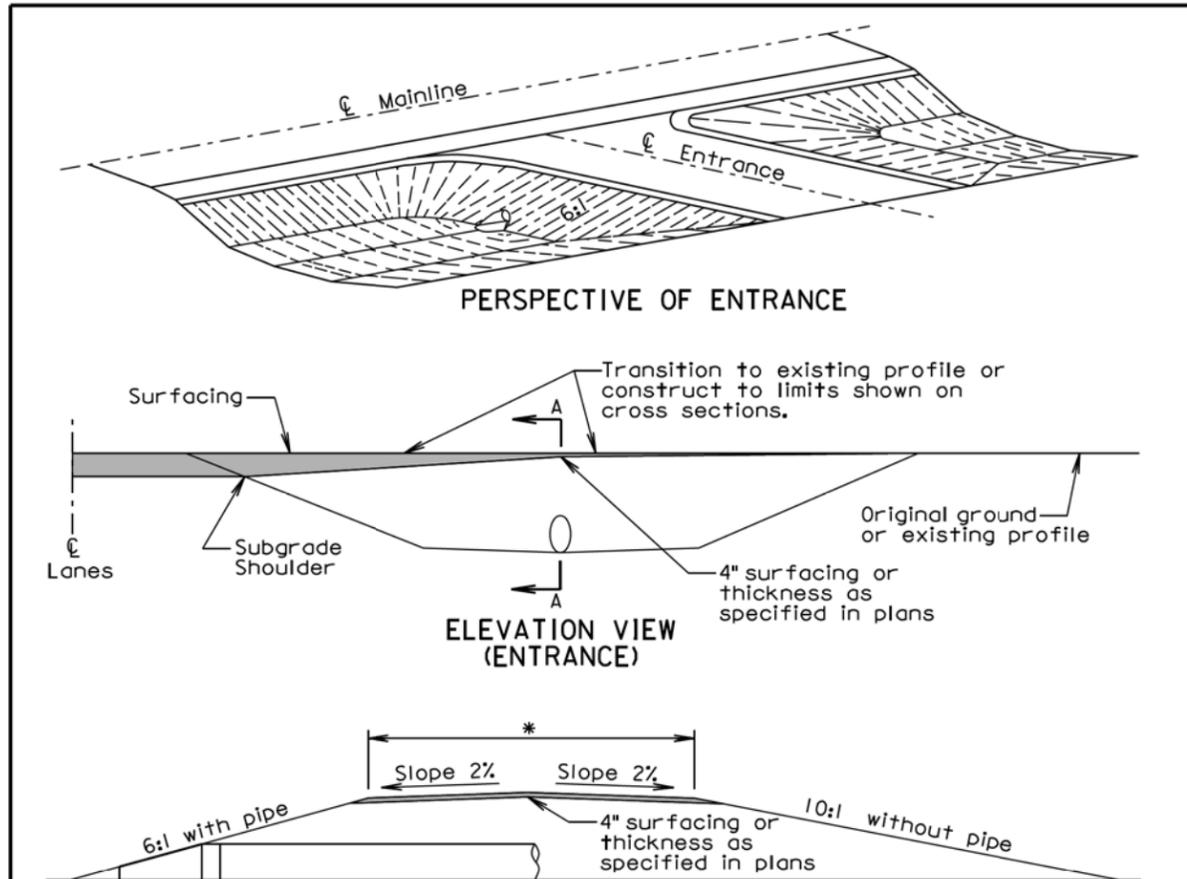
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|-----------------------------|---------|--------------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
| | 212-471 | 15 | 21 |





Plotting Date: 05/18/2016

| | | | |
|-----------------------------|---------|--------------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
| | 212-471 | 16 | 21 |



*The finished surfacing width is stated elsewhere in the plans. The subgrade width is 4' wider than the finished surfacing width unless stated otherwise in the plans.

GENERAL NOTES:

The ditch section shown above in the perspective and elevation view is only for illustrative purposes.

A 6:1 inslope shall be constructed for an entrance when a pipe is required. A 10:1 inslope shall be constructed when a pipe is not required.

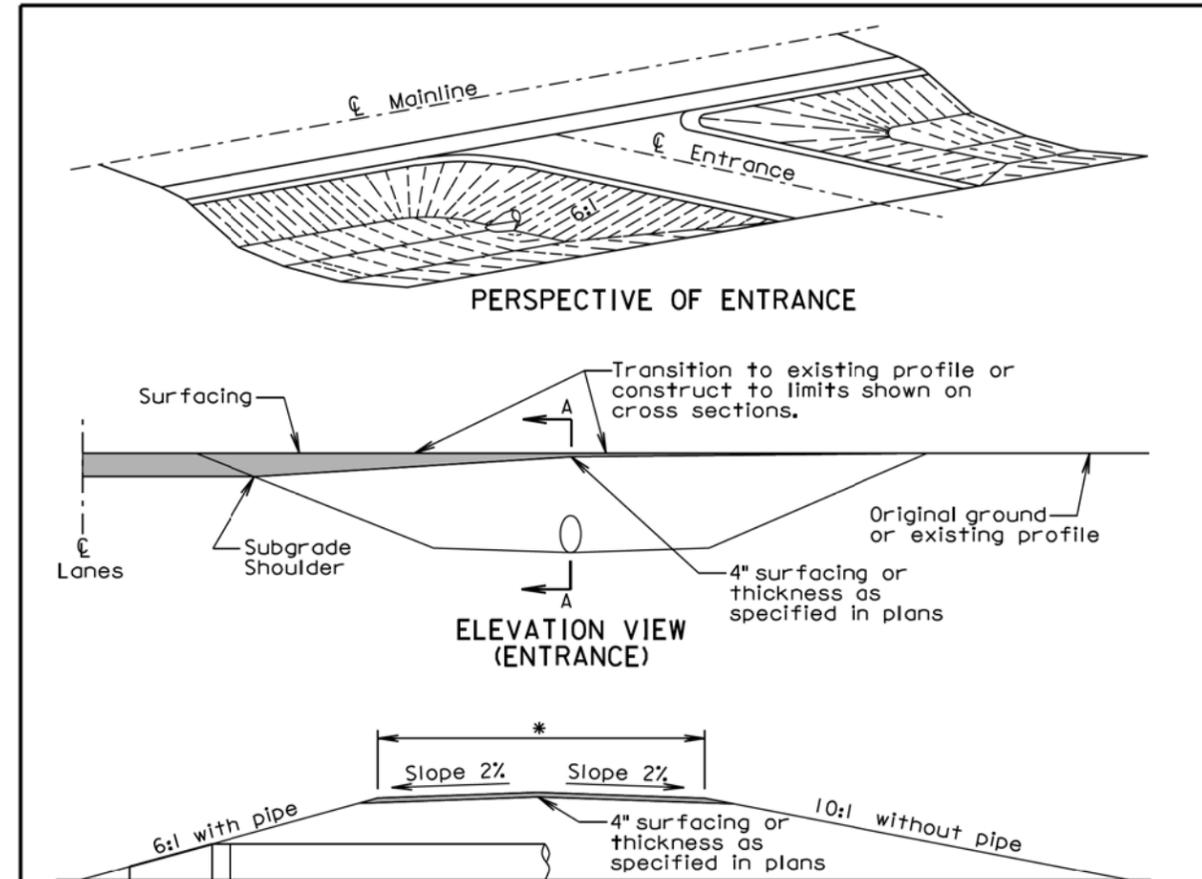
Pipe lengths shall be adjusted if necessary during construction to obtain the 6:1 slopes. For grading projects, the pipe lengths are estimated typically using a 4" thickness of surfacing directly over the subgrade above the pipe.

The transition area between the mainline inslope and the approach inslope for entrances shall be rounded to eliminate an abrupt transition.

The turning radii shall be 35' for intersecting roads and entrances unless stated otherwise in the plans.

September 6, 2013

| | | | |
|-------------------------------|-----------------------|----------------------------------|------------------------|
| Published Date: 2nd Qtr. 2016 | S D D O T | INTERSECTING ROADS AND ENTRANCES | PLATE NUMBER 120.01 |
| | | | Sheet 1 of 2 |



*The finished surfacing width is stated elsewhere in the plans. The subgrade width is 4' wider than the finished surfacing width unless stated otherwise in the plans.

GENERAL NOTES:

The ditch section shown above in the perspective and elevation view is only for illustrative purposes.

A 6:1 inslope shall be constructed for an entrance when a pipe is required. A 10:1 inslope shall be constructed when a pipe is not required.

Pipe lengths shall be adjusted if necessary during construction to obtain the 6:1 slopes. For grading projects, the pipe lengths are estimated typically using a 4" thickness of surfacing directly over the subgrade above the pipe.

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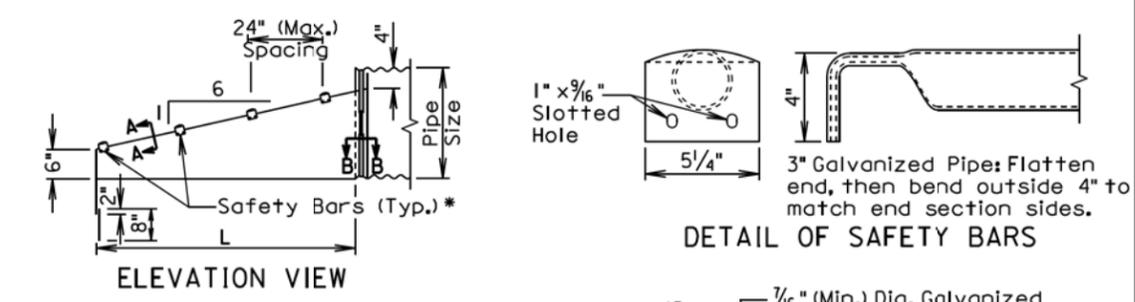
September 6, 2013

| | | | |
|-------------------------------|-----------------------|----------------------------------|------------------------|
| Published Date: 2nd Qtr. 2016 | S D D O T | INTERSECTING ROADS AND ENTRANCES | PLATE NUMBER 120.01 |
| | | | Sheet 1 of 2 |

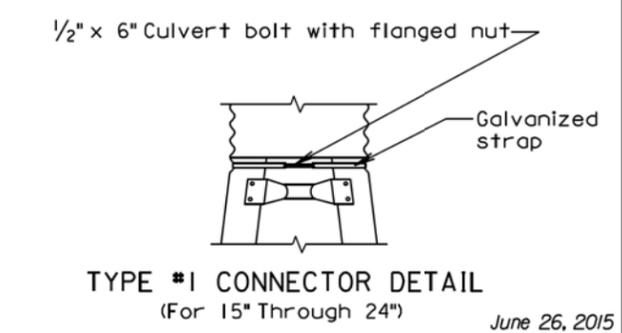
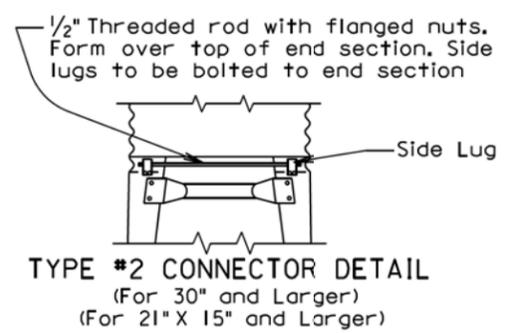
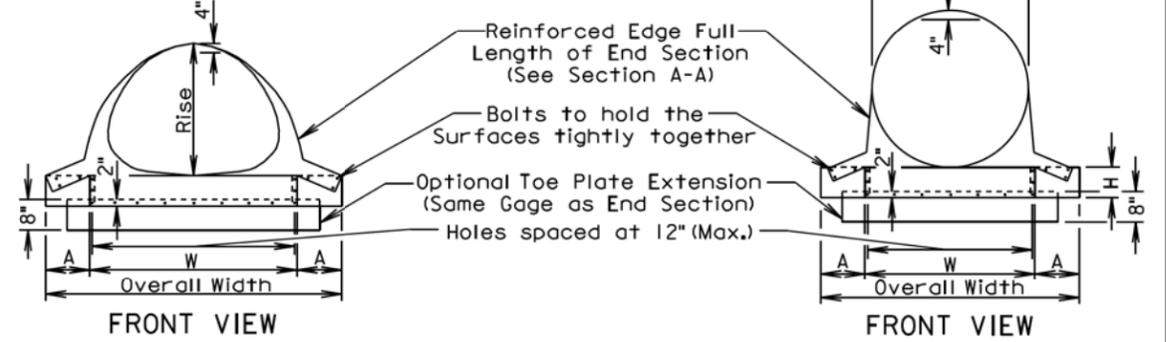
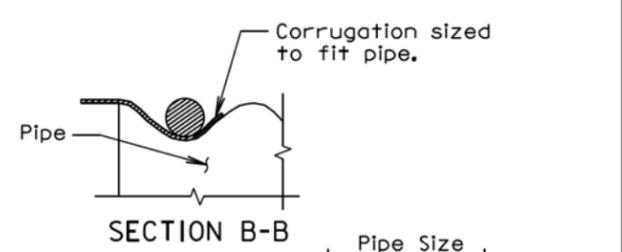
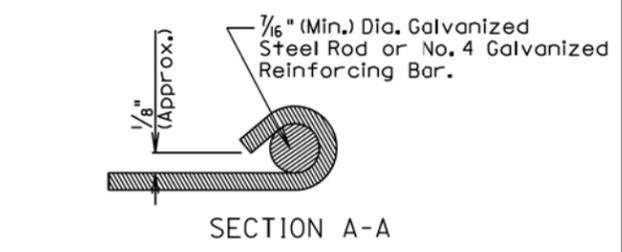
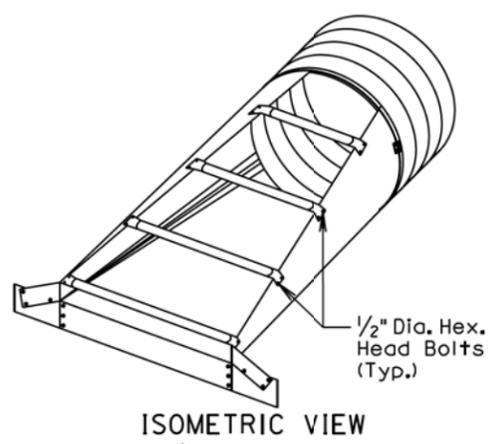
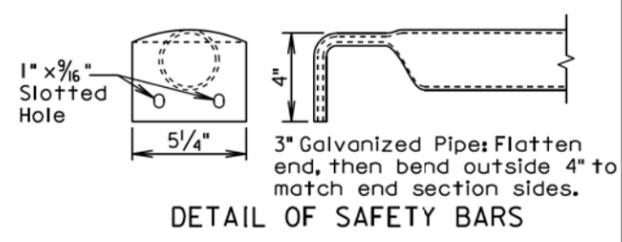
Plot Scale - 1:200

Plotted From - Irrc11610

File - ...StdPlatePg1.dgn



*Number of bars required will vary depending on the length of the end section.



June 26, 2015

| | | |
|----------------------------------|-------------------------------|-------------------------------|
| S D D O T | C. M. P. SAFETY ENDS | PLATE NUMBER 450.38 |
| | Published Date: 2nd Qtr. 2016 | Sheet 1 of 2 |

| Equv. Dia. (Inch) | (Inches) | | Min. Thick. Inch | Dimensions (Inches) | | | Overall Width | L Dimensions | | |
|-------------------|----------|------|------------------|---------------------|----|----|---------------|--------------|---------------|-----|
| | Span | Rise | | A | H | W | | Slope | Length (Inch) | |
| 18 | 21 | 15 | .064 | 16 | 8 | 6 | 27 | 43 | 6:1 | 30 |
| 21 | 24 | 18 | .064 | 16 | 8 | 6 | 30 | 46 | 6:1 | 48 |
| 24 | 28 | 20 | .064 | 16 | 8 | 6 | 34 | 50 | 6:1 | 60 |
| 30 | 35 | 24 | .079 | 14 | 12 | 9 | 41 | 65 | 6:1 | 84 |
| 36 | 42 | 29 | .109 | 12 | 12 | 9 | 48 | 72 | 6:1 | 114 |
| 42 | 49 | 33 | .109 | 12 | 16 | 12 | 55 | 87 | 6:1 | 138 |
| 48 | 57 | 38 | .109 | 12 | 16 | 12 | 63 | 95 | 6:1 | 168 |
| 54 | 64 | 43 | .109 | 12 | 16 | 12 | 70 | 102 | 6:1 | 198 |
| 60 | 71 | 47 | .109 | 12 | 16 | 12 | 77 | 109 | 6:1 | 222 |
| 72 | 83 | 57 | .109 | 12 | 16 | 12 | 89 | 121 | 6:1 | 282 |

| Pipe Dia. (Inch) | Min. Thick. Inch | Dimensions (Inches) | | | L Dimensions | | | |
|------------------|------------------|---------------------|----|----|--------------|---------------|-------|---------------|
| | | Gage | A | H | W | Overall Width | Slope | Length (Inch) |
| 15 | .064 | 16 | 8 | 6 | 21 | 37 | 6:1 | 30 |
| 18 | .064 | 16 | 8 | 6 | 24 | 40 | 6:1 | 48 |
| 21 | .064 | 16 | 8 | 6 | 27 | 43 | 6:1 | 66 |
| 24 | .064 | 16 | 8 | 6 | 30 | 46 | 6:1 | 84 |
| 30 | .109 | 12 | 12 | 9 | 36 | 60 | 6:1 | 120 |
| 36 | .109 | 12 | 12 | 9 | 42 | 66 | 6:1 | 156 |
| 42 | .109 | 12 | 16 | 12 | 48 | 80 | 6:1 | 192 |
| 48 | .109 | 12 | 16 | 12 | 54 | 86 | 6:1 | 228 |
| 54 | .109 | 12 | 16 | 12 | 60 | 92 | 6:1 | 264 |
| 60 | .109 | 12 | 16 | 12 | 66 | 98 | 6:1 | 300 |

GENERAL NOTES:

Safety ends shall be fabricated from galvanized steel conforming to the requirements of the Specifications.

Safety bars shall be fabricated from steel schedule 40 pipe in conformance with ASTM A53, grade B or HSS 3.5X.216 in conformance with ASTM A500, grade B.

Slotted holes for safety bar attachment shall be provided for all end sections.

Attachment to circular pipes 15" through 24" diameter shall be made with Type #1 straps. All other sizes shall be attached with Type #2 rods and lugs.

When stated in the plans, optional toe plate extension shall be punched and bolted to end section apron lip with 3/8" diameter galvanized bolts. Steel for toe plate extension shall be same gauge as end section. Dimensions shall be overall width less 6" by 8" high.

Installation shall be performed in accordance with the Specifications.

Cost of all work and materials required for fabrication and installation of safety ends shall be incidental to the bid items for the various sizes of safety ends.

June 26, 2015

| | | |
|----------------------------------|-------------------------------|-------------------------------|
| S D D O T | C. M. P. SAFETY ENDS | PLATE NUMBER 450.38 |
| | Published Date: 2nd Qtr. 2016 | Sheet 2 of 2 |

Plot Scale - 1:200

Plotted From - irrc11610

File - ...StdPlatePg2.dgn

| Posted Speed Prior to Work (M.P.H.) | Spacing of Advance Warning Signs (Feet) (A) | Taper Length (Feet) (L) | Spacing of Channelizing Devices (Feet) (G) |
|-------------------------------------|---------------------------------------------|-------------------------|--------------------------------------------|
| 0 - 30 | 200 | 180 | 25 |
| 35 - 40 | 350 | 320 | 25 |
| 45 - 50 | 500 | 600 | 50 * |
| 55 | 750 | 660 | 50 * |
| 60 - 65 | 1000 | 780 | 50 * |

* Spacing is 40' for 42" cones.

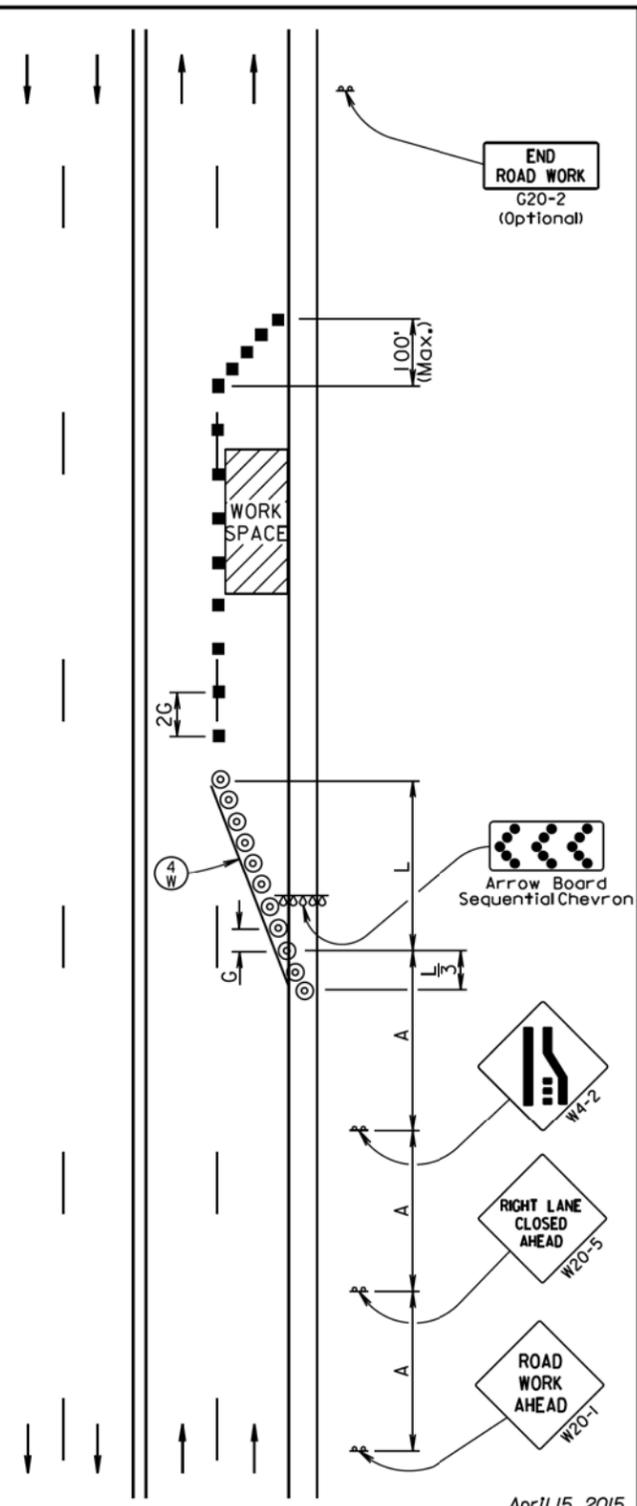
- ⊙ Reflectorized Drum
- Channelizing Device
- ④ 4" White Temporary Pavement Marking

The channelizing devices shall be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

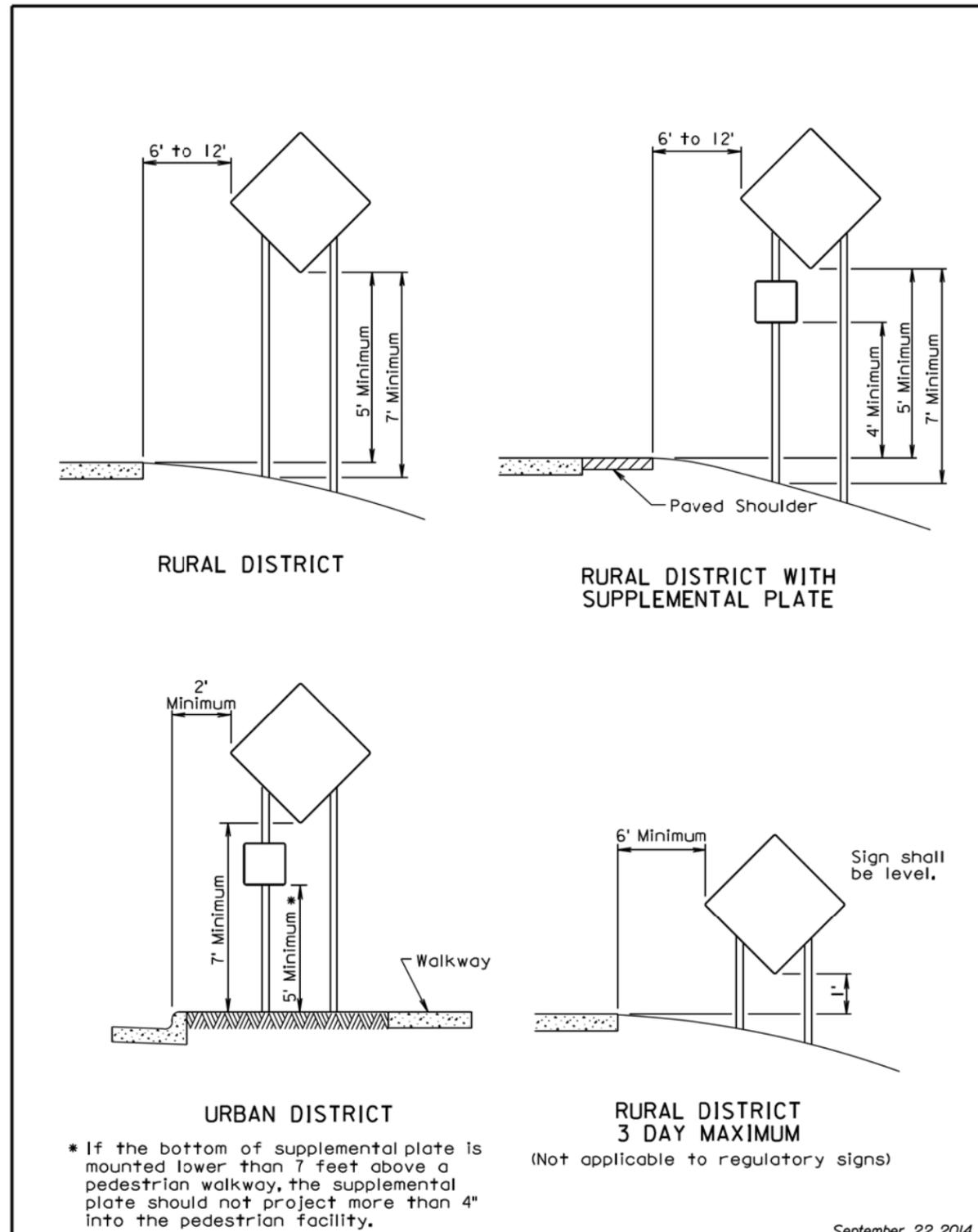
Temporary pavement markings shall be used if traffic control must remain overnight.

The length of A and L may be adjusted to fit field conditions.



April 15, 2015

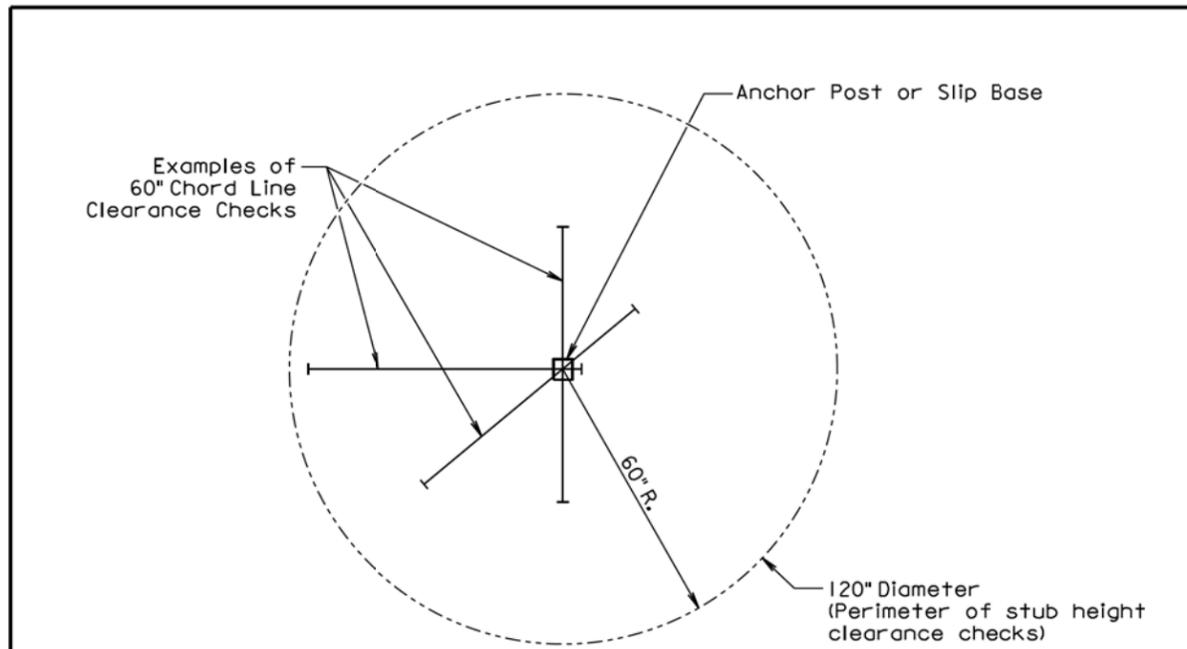
| | | |
|----------------------------------|-----------------------------------------------------------------------------------|-------------------------------|
| S D D O T | GUIDES FOR TRAFFIC CONTROL DEVICES 4-LANE UNDIVIDED, RIGHT LANE CLOSED | PLATE NUMBER 634.47 |
| | Published Date: 2nd Qtr. 2016 | Sheet 1 of 1 |



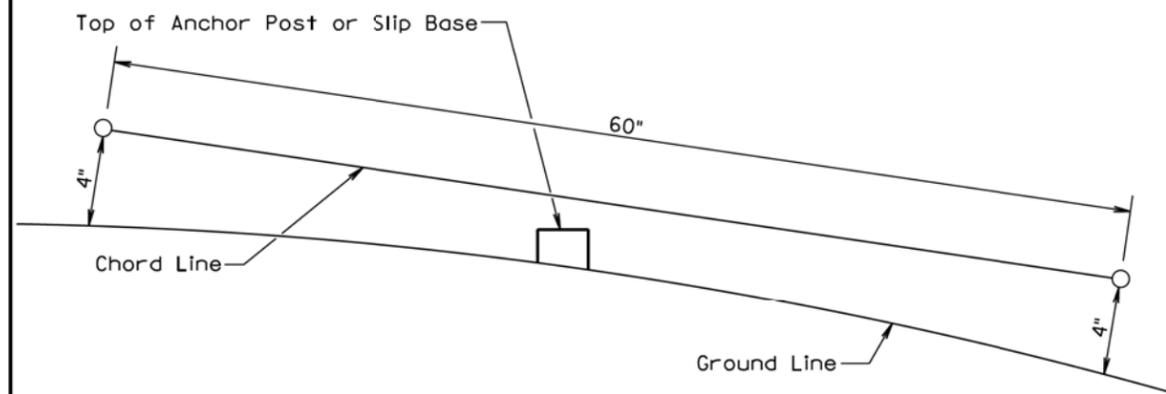
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

September 22, 2014

| | | |
|----------------------------------|---------------------------------------------------------------------|-------------------------------|
| S D D O T | CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing) | PLATE NUMBER 634.85 |
| | Published Date: 2nd Qtr. 2016 | Sheet 1 of 1 |



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

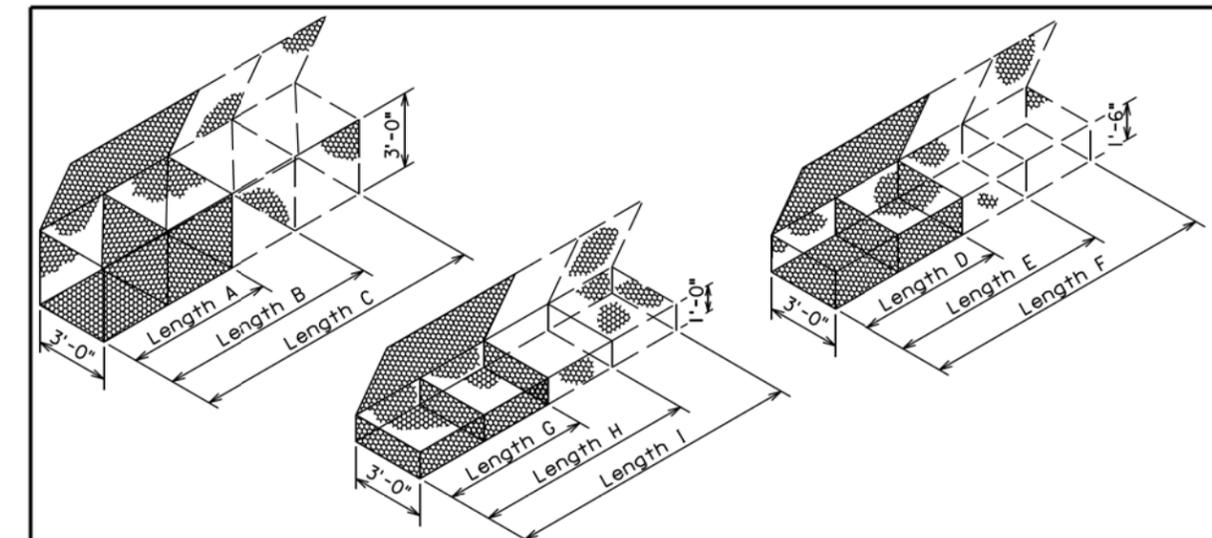
GENERAL NOTES:

The top of anchor posts and slip bases SHALL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.
 At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.
 The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

July 1, 2005

| | | |
|----------------------------------|-----------------------------------------|-------------------------------|
| S D D O T | BREAKAWAY SUPPORT STUB CLEARANCE | PLATE NUMBER 634.99 |
| | | Sheet 1 of 1 |

Published Date: 2nd Qtr. 2016



GABION DETAILS
STANDARD SIZES

| SIZE | LENGTH | WIDTH | HEIGHT | NUMBER OF CELLS | CAPACITY, Cu. Yd. |
|------|--------|-------|--------|-----------------|-------------------|
| A | 6'-0" | 3'-0" | 3'-0" | 2 | 2.0 |
| B | 9'-0" | 3'-0" | 3'-0" | 3 | 3.0 |
| C | 12'-0" | 3'-0" | 3'-0" | 4 | 4.0 |
| D | 6'-0" | 3'-0" | 1'-6" | 2 | 1.0 |
| E | 9'-0" | 3'-0" | 1'-6" | 3 | 1.5 |
| F | 12'-0" | 3'-0" | 1'-6" | 4 | 2.0 |
| G | 6'-0" | 3'-0" | 1'-0" | 2 | 0.7 |
| H | 9'-0" | 3'-0" | 1'-0" | 3 | 1.0 |
| I | 12'-0" | 3'-0" | 1'-0" | 4 | 1.3 |

Above Dimensions subject to mill tolerances.

GENERAL NOTES:

Lacing and internal connecting wire shall be 0.0866 inch diameter steel wire ASTM A641 Class 3 soft temper measured after galvanizing and for PVC coated gabions shall be 0.0866 inch diameter steel wire measured after galvanizing but before PVC coating.

The lacing procedure is as follows:

1. Cut a length of lacing wire approximately 1 1/2 times the distance to be laced but not exceeding 5 feet.
2. Secure the wire terminal at the corner by looping and twisting.
3. Proceed lacing with alternating single and double loops at a spacing not to exceed 6 inches.
4. Securely fasten the other lacing wire terminal.

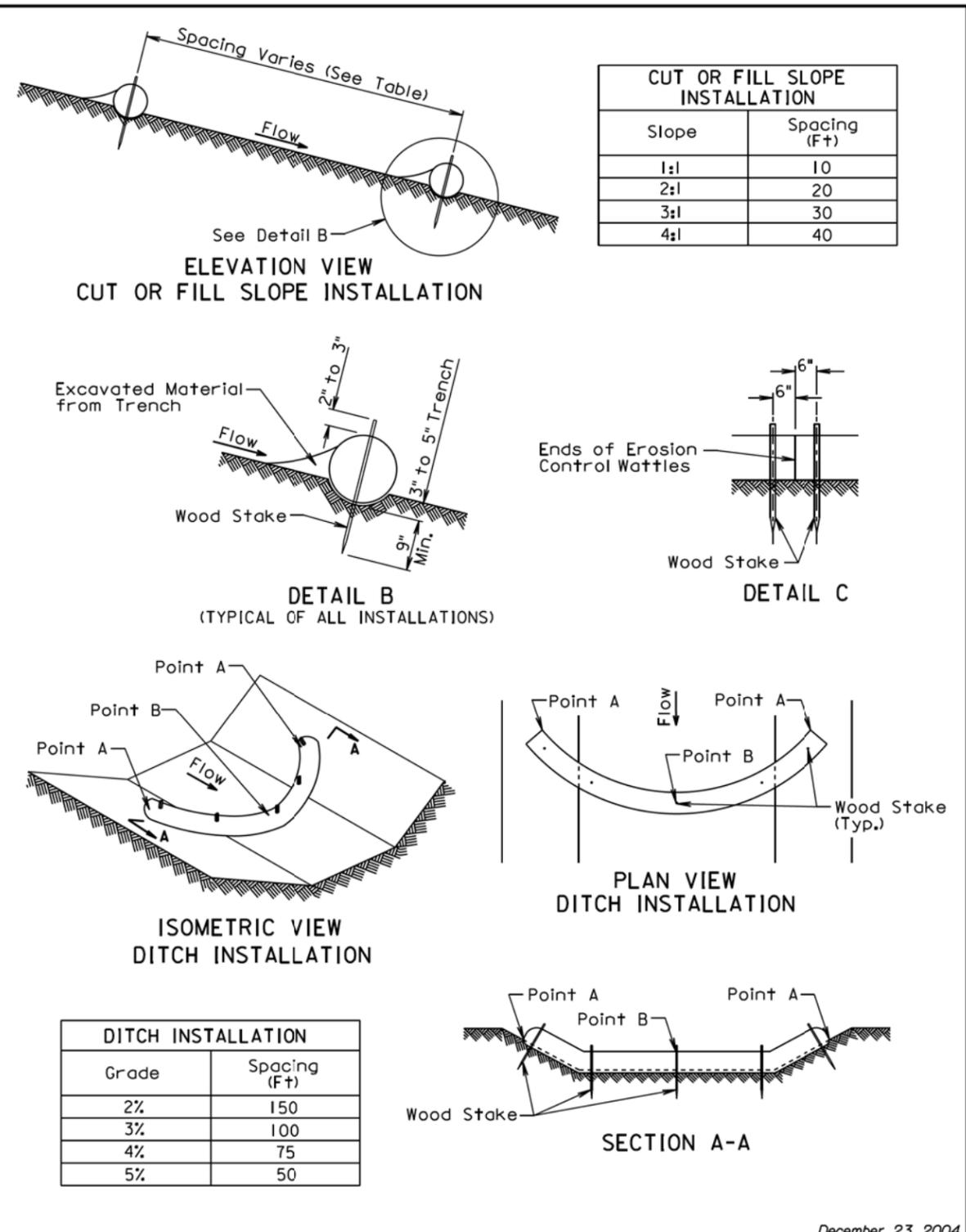
Wire lacing or interlocking type fasteners shall be used for gabion assembly and final construction of gabion structures. Interlocking fasteners for galvanized gabions shall be high tensile 0.120 inch diameter galvanized steel wire measured after galvanizing. The galvanizing shall conform to ASTM A641-92 Class 3 coating. Fasteners shall also be in accordance with ASTM A764, Class II, Type III.

Interlocking fasteners for PVC coated gabions shall be high tensile 0.120 inch diameter stainless steel wire conforming to ASTM A313, Type 302, Class I. The spacing of the interlocking fasteners during all phases of assembly and construction shall not exceed 6 inches. All fasteners shall be placed where the mesh weaves around the selvage wire at the vertical and horizontal joints.

June 26, 2001

| | | |
|----------------------------------|--------------------------------------------|-------------------------------|
| S D D O T | BANK AND CHANNEL PROTECTION GABIONS | PLATE NUMBER 720.01 |
| | | Sheet 1 of 1 |

Published Date: 2nd Qtr. 2016



December 23, 2004

| | | |
|----------------------------------------------------------|-------------------------------|------------------------|
| S D D O T | EROSION CONTROL WATTLE | PLATE NUMBER 734.06 |
| | | Sheet 1 of 2 |

Published Date: 2nd Qtr. 2016

GENERAL NOTES:

At cut or fill slope installations, wattles shall 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 shall 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 shall 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 shall be placed 6" from the ends of the wattles and the spacing of the stakes along the wattles shall be 3' to 4'.

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

The Contractor and Engineer shall inspect the erosion control wattles once every week and within 24 hours after every rainfall event greater than 1/2". The Contractor shall remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

Sediment removal, disposal, or necessary shaping shall be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping shall 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 shall be incidental to the contract unit price per foot for the corresponding erosion control wattle bid item.

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

December 23, 2004

| | | |
|----------------------------------------------------------|-------------------------------|------------------------|
| S D D O T | EROSION CONTROL WATTLE | PLATE NUMBER 734.06 |
| | | Sheet 2 of 2 |

Published Date: 2nd Qtr. 2016

Plot Scale - 1:200

Plotted From - Irrc11610

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