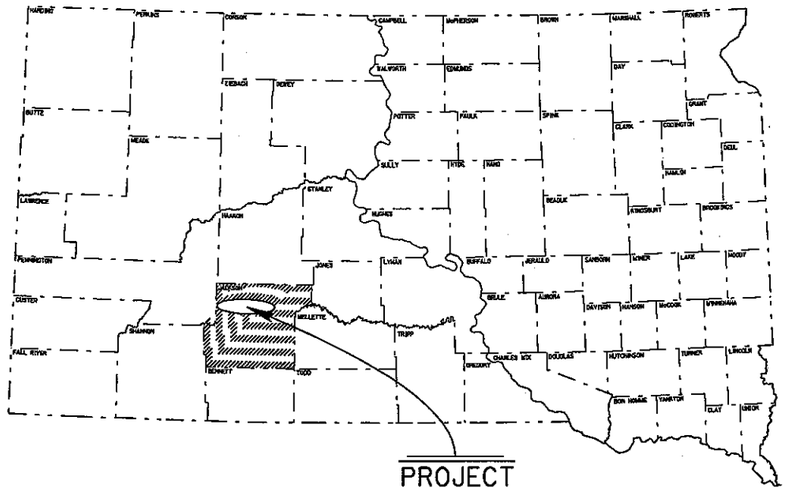
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	090E - 391	1	10

Plotting Date: 15-MAR-2011



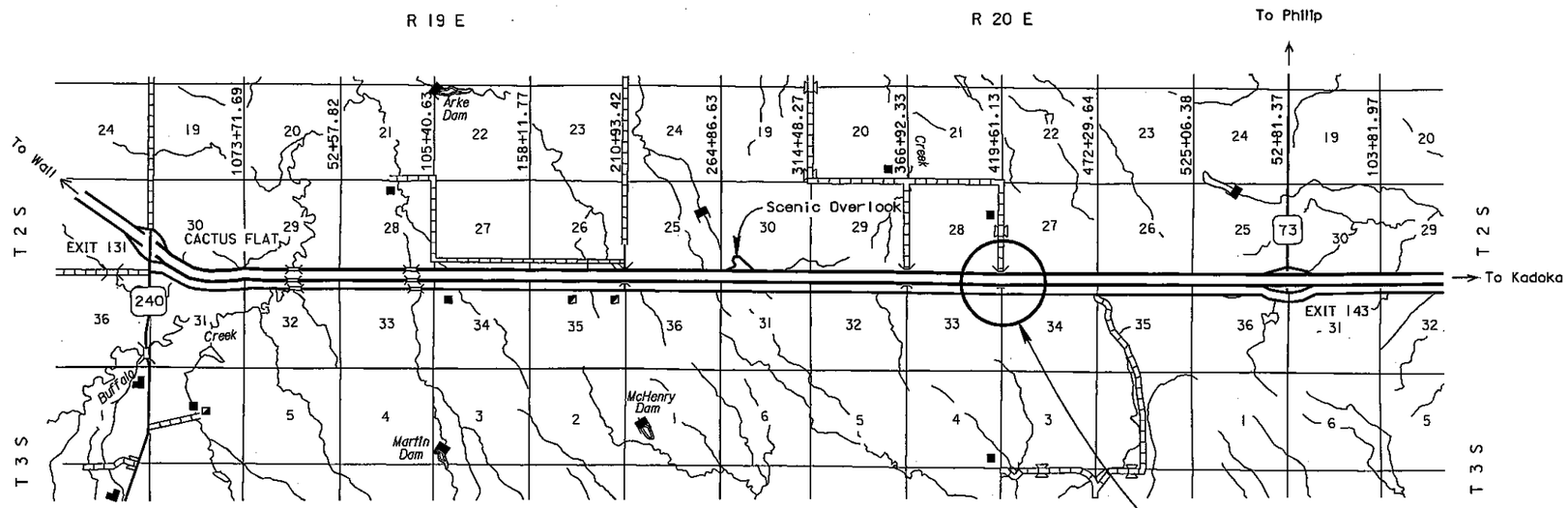
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT 090E – 391
INTERSTATE 90 EBL
JACKSON COUNTY

BOX CULVERT APRON REPAIR

PCN I21F

INDEX OF SHEETS



STORM WATER PERMIT

None Required

ESTIMATE OF QUANTITIES

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
250E0010	Incidental Work	Lump Sum	LS
420E0200	Structure Excavation, Box Culvert	21	CuYd
421E0200	Box Culvert Undercut	33	CuYd
460E0120	Class A45 Concrete, Box Culvert	21.2	CuYd
480E0100	Reinforcing Steel	1,645	Lb
634E0100	Traffic Control	585	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2004 Edition and Required Provisions, Supplemental Specifications and/or Special Provisions as included in the Proposal.

SEQUENCE OF OPERATIONS

The Contractor shall submit their proposed sequence of operations for the Engineer's approval at least one week prior to the preconstruction meeting.

The Contractor may perform work only during daylight hours unless additional hours are approved by the Engineer. The Contractor shall maintain traffic through the project at all times.

The roadway through the structure shall be closed to traffic during the repair of the box culvert apron. The closure shall be placed as per the details in the plans. The Contractor shall mark the locations of all the signs and the Engineer will approve these locations prior to installation. The quantity of signs required in constructing the traffic closure is included in the estimate of quantities.

Once work that inconveniences traffic has commenced on the project, it shall be pursued in the near continuous, expeditious manner to its completion. Any work that restricts the motorist from traveling through the box culvert will be considered to be an inconvenience to traffic. The contractor will have 10 working days to complete the project. Time required for the concrete to obtain the design compressive strength will not be included in the 10 day working day period. For each working day after the initial 10 day working period, that the construction status results in an inconvenience to traffic, the Contractor will be assessed $450 Liquidated Damages. This provision applies up to the Contract Completion Date, as extended. After the completion date, Liquidated Damages will be assessed in accordance with Section 8.7 of the Standard Specifications.

MAINTENANCE OF TRAFFIC

Removing, relocating, covering, salvaging and resetting of existing traffic control devices, including delineation, shall be the responsibility of the Contractor. Cost for this work shall be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

Storage of vehicles and equipment shall be outside the clear zone and as near as possible to the right-of-way line. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work.

Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage to the vegetation, surfacing, embankment, delineators and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

All breakaway sign supports shall comply with FHWA NCHRP 350 or MASH crash-worthy requirements. The Contractor shall provide post installation details at the preconstruction meeting for all breakaway sign support assemblies.

The Contractor shall furnish, install and maintain Truck Crossing signs. The exact number and location will be determined on construction. Payment for additional signs will be based on the contract unit price per unit for Traffic Control.

The Truck Crossing signs shall be displayed at all times when haul vehicles are hauling material. When the truck haul condition no longer exists, and also during nighttime hours, the signs shall be covered or removed from view. Hinged signs may be used.

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

Traffic control drums, Type II barricades, cones, and/or tubular markers shall be used as needed to safely delineate traffic during construction per standard plates. These items will not be measured in the field. The cost to furnish, install, maintain, and remove these items shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

Traffic Control units, as shown in the Estimate of Quantities, are estimates. The Contractor's operation may require adjustments in quantities, either more or less. Payment will be for those signs actually ordered by the Engineer and used.

The bottom of signs on portable or temporary supports shall be less than seven feet above the pavement in urban areas and one foot above the pavement in rural areas. Portable sign supports may be used as long as the duration is less than 3 days. If the duration is more than 3 days the signs shall meet the minimum mounting heights of 5 foot for rural areas and 7 foot for urban areas.

HISTORICAL PRESERVATION OFFICE CLEARANCES

To obtain State Historical Preservation Office (SHPO) clearance, a cultural resources survey may need to be conducted by a qualified archaeologist. In lieu of a cultural resources survey, the Contractor could request a records search from Jim Donohue, State Archaeological Research Center (SARC). Provide SARC 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 no artifacts have been found on the site. The Contractor shall arrange and pay for the cultural resource survey and/or records search.

If any earth disturbing activities occur within the current geographical or historic boundaries of any South Dakota reservation, the Contractor shall obtain Tribal Historical Preservation Office (THPO) clearance. If no THPO exists, the required SHPO clearance shall suffice, with documentation of Tribal contact efforts provided to SHPO.

To facilitate SHPO or THPO responses, the Contractor should submit a records search or cultural resources survey report to the DOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3268). Allow 30 days from the date this information is submitted to the Environmental Engineer for SHPO/THPO approval. The Contractor is responsible for obtaining all required permits and clearances for staging areas, borrow sites, waste disposal sites, and all material processing sites. The Contractor shall provide the required permits and clearances to the Engineer at the preconstruction meeting.

WASTE DISPOSAL SITE

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

Construction/demolition debris may not be disposed of within the State ROW.

The waste disposal site(s) shall be managed and reclaimed in accordance with the following from the General Permit for Highway, Road, and Railway 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 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/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/demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the State 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 State 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.

SIGN TABULATION

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2A	36" x 18"	END ROAD WORK	3	17	51
R11-2	48" x 30"	ROAD CLOSED	2	27	54
R11-4	60" x 30"	ROAD CLOSED TO THRU TRAFFIC	1	30	30
W8-6	48" x 48"	TRUCK CROSSING	2	34	68
W20-1	48" x 48"	ROAD WORK #### FT. OR AHEAD	3	34	102
*****	*****	TYPE III BARRICADE - 8 FT. DOUBLE SIDED	5	56	280
				TOTAL UNITS	**585**

BOX CULVERT UNDERCUT

The existing material below box culvert aprons shall be removed and undercut to a depth of 1.0 ft. Backfill and compaction requirements shall conform to Section 421 of the Standard Specifications.

All costs for removing, disposal, replacing and compacting the undercut material shall be incidental to the contract unit price per cuyd for “Box Culvert Undercut”.

PLOT SCALE - 10261.671614:1.000000

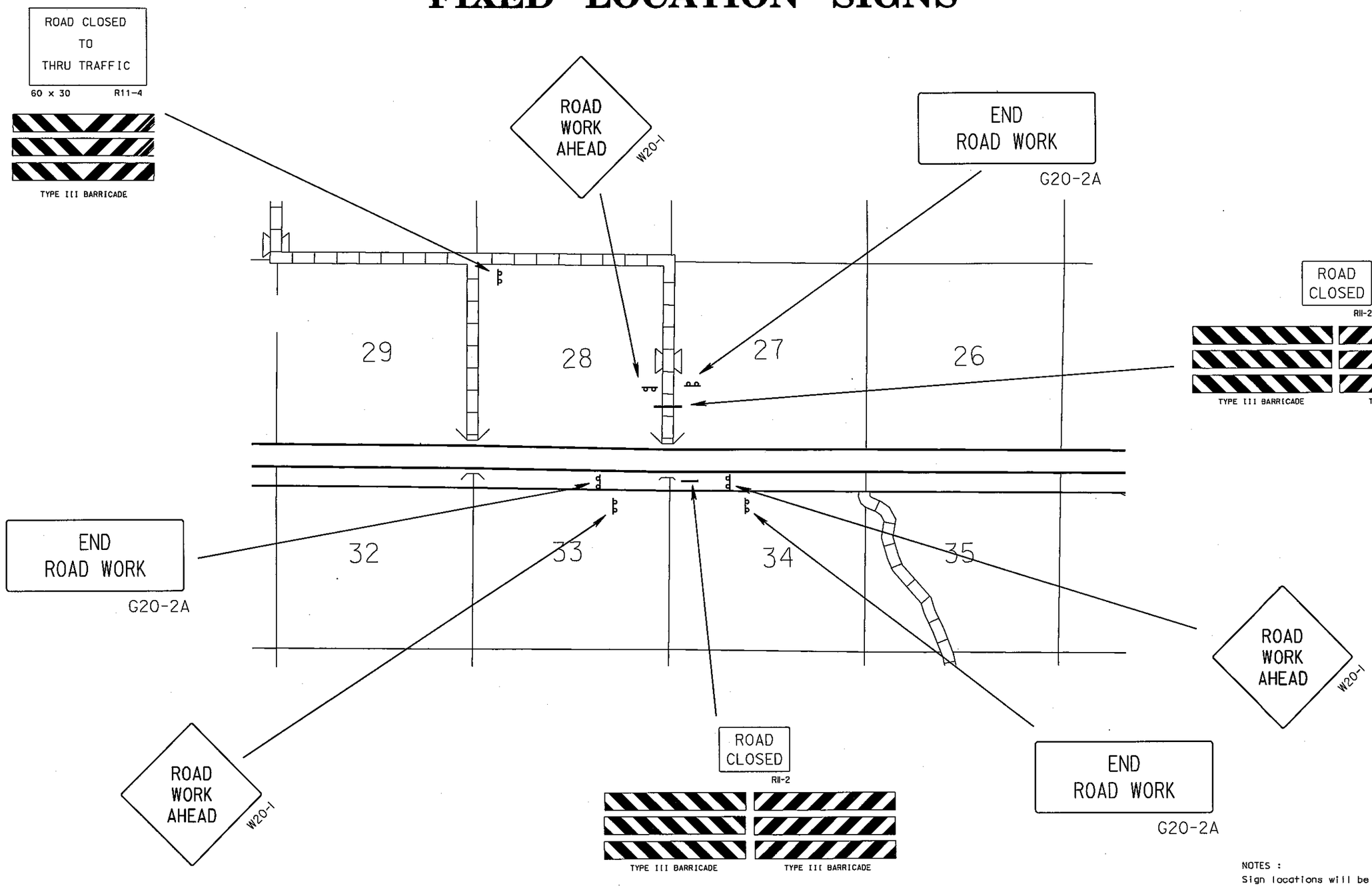
PLOTTED FROM - TRWINT20

FILE - N:\DESIGN\2011 DESIGNS\JACK121F\DESIGN\JACK 121F_LAYOUT MAPS.DGN PLOT NAME - JACK 121F_LAYOUT MAPS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	090E - 391	4	10

Plotting Date: 15-MAR-2011

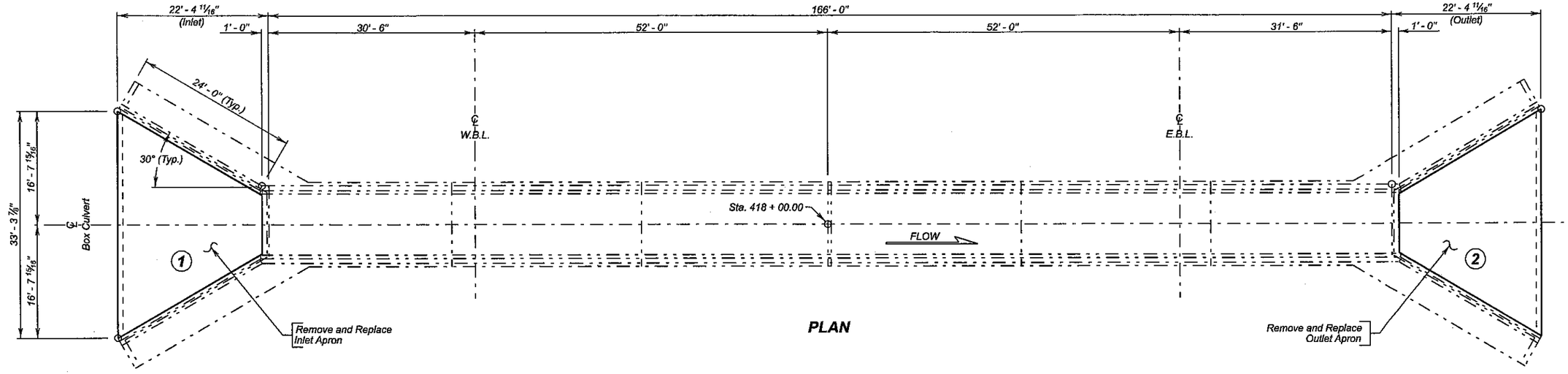
FIXED LOCATION SIGNS



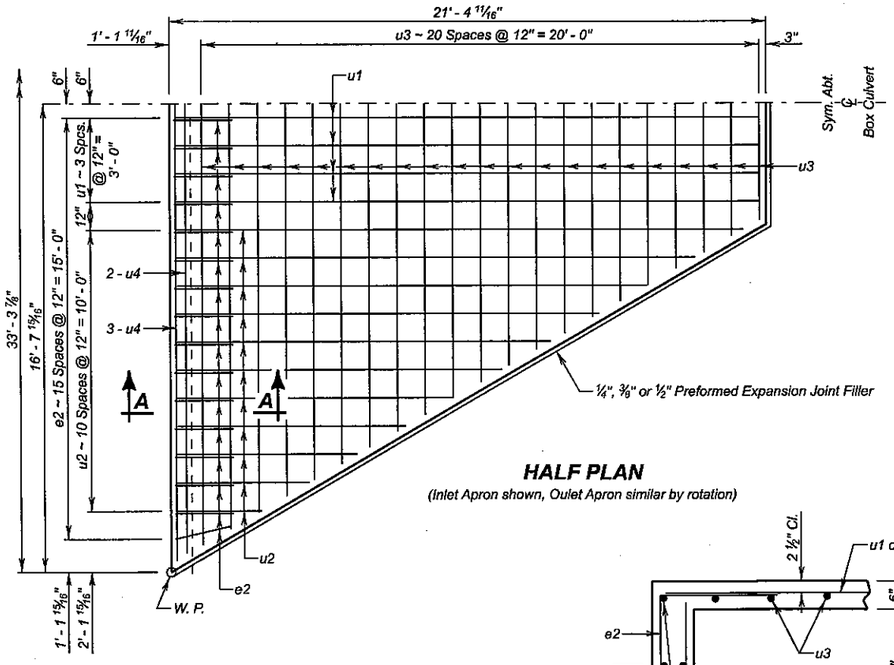
NOTES :
Sign locations will be verified in the field by the Engineer prior to installation

The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	090E - 391	5	10

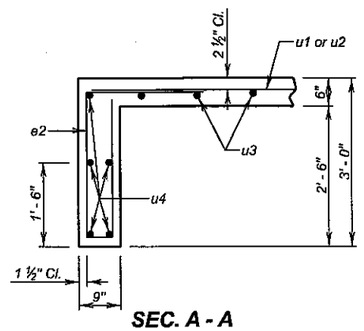


PLAN



HALF PLAN

(Inlet Apron shown, Oulet Apron similar by rotation)



SEC. A - A

SPECIFICATIONS

Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2004 Edition and required Provisions, Supplemental Specifications and/or Special Provisions as included in the Proposal.

GENERAL NOTES

1. Design Material Strengths: Concrete fc = 4500 p.s.i.
   Reinforcing Steel fy = 60000 p.s.i.
2. All concrete shall be Class A45 conforming to Section 460.
3. All reinforcing steel shall conform to ASTM A615 Grade 60.
4. All exposed edges shall be chamfered ¾ inch.
5. Use 1 inch clear cover on all reinforcing steel EXCEPT as shown.
6. Circled numbers in the PLAN view are section I.D. Numbers (see SDDOT Materials Manual).
7. Cost of Preformed Expansion Joint Filler used in apron construction shall be incidental to the other contract items.
8. All costs for removing and disposing of the existing aprons, in accordance with the WASTE DISPOSAL SITE notes found elsewhere in the plans, shall be included in the Lump Sum Price for Incidental Work.

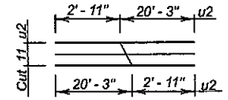
DIMENSION OF EXISTING BOX CULVERT

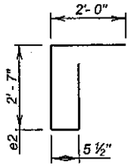
All details and dimensions of Existing Box Culvert, contained in these plans, are provided as information only. It is the Contractor's responsibility to inspect and verify the actual field conditions and any necessary dimensions affecting the satisfactory completion of the work required for this project. Original construction plans can be obtained from the Office of Bridge Design.

REINFORCING SCHEDULE

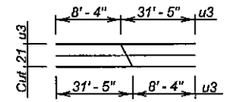
(For Two Aprons)

Mk.	No.	Size	Length	Type	Bending Details
e2	64	4	7' - 3"	S12	
u1	16	4	20' - 11"	Str.	
⌀ u2	22	4	23' - 2"	Str.	
⌀ u3	21	4	39' - 9"	Str.	
u4	10	4	32' - 0"	Str.	





Type S12



NOTES:
All dimensions are out to out of bars.
⌀ See cutting diagram.

ESTIMATED QUANTITIES

ITEM	Class A45 Concrete Box Culvert	Reinforcing Steel	Structure Excavation Box Culvert	Incidental Work
UNIT	Cu. Yd.	Lb.	Cu. Yd.	Lump Sum
1 - Inlet & 1 - Outlet Apron	21.2	1645	21.2	L.S.

APRON REPAIR
FOR
SPECIAL 10' x 10' BOX CULVERT
CATTLE PASS — 0° SKEW
STA. 418 + 00.00 — SEC. 28/33-T2S-R20E
STR. NO. 36-209-110 — 090E-391

JACKSON COUNTY
S. D. DEPT. OF TRANSPORTATION
FEBRUARY 2011 — (1) OF (1)

PLANS BY:
OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

DESIGNED BY	DRAWN BY	CHECKED BY	
SJ/DU	MG/GW	SJ/DU	Kevin N. Goeden
JACKI2IF	I2IFWA0I		BRIDGE ENGINEER

FED. ROAD DIST. NO.	STATE		FISCAL YEAR	SHEET NO.	TOTAL
5	S.D.			96	

6 of 10

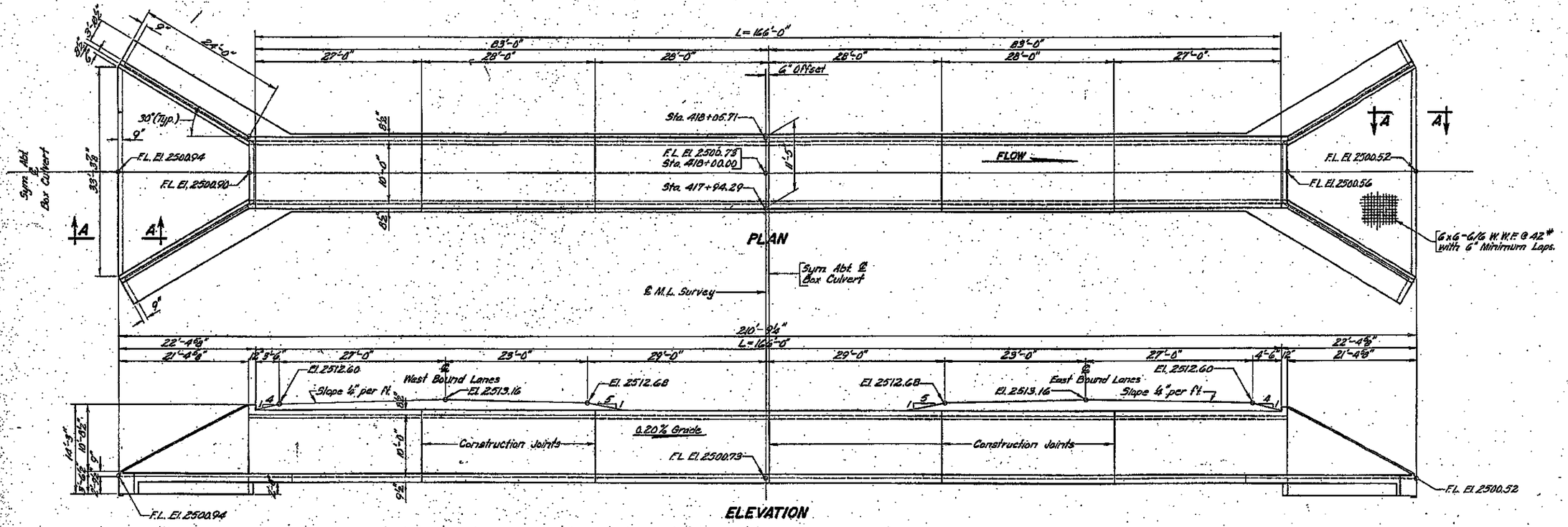
090E-391

INDEX OF CULVERT SHEETS—

No. 1 – General Drawing, Apron Details and Quantities
No. 2 – Inlet, Outlet and Barrel Section Details
No. 3 – Insert and Eyebolt Details (11-4-65)

B.M. No. 47 - El. 2507.74
Rebar & Gds.
200' Lt. Sta. 411+00

B.M. No. 48 - El. 2514.12
Rebar & Gds.
200' Lt. Sta. 421+00

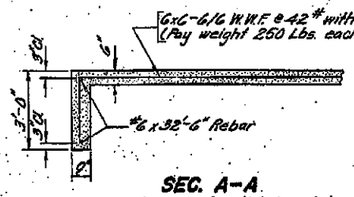


SPECIFICATION NOTE—

Use South Dakota Standard Specifications for Roads and Bridges, 1963 Edition, approved as Standard September 21, 1964, and Required Provisions, Supplemental Specifications and/or Special Provisions as included in the Proposal.

GENERAL NOTES—

1. All exposed edges shall be chamfered 1".
2. Design Specifications: A.A.S.H.O. Specifications for Highway Bridges, 1961 with Interim Specifications for 1961, 1962, and 1963.
3. Design Loading: H S 20-44 A.A.S.H.O. and the Alternate Loading as designated in P.P.M. 20-6, Section 4c.
4. All Reinforcing Steel shall conform to A.S.T.M. Specifications A305 and A15, Intermediate Grade.
5. Unit Stresses: Concrete f_c = 1600 p.s.i.
   Reinforcing Steel f_s = 20,000 p.s.i.
6. See NOTES on Sheet No. 2



SEC. A-A
(Inlet and Outlet Apron)
NOTE: Apron shall NOT be built monolithic with Box Culvert.

ESTIMATED QUANTITIES

ITEM	Cl. "A" Conc. Cu. Yds.	Reinf. Steel Lbs.	Excavation – Cu. Yds. Struct.	Excavation – Cu. Yds. Δ Unclass.
1-Inlet and 1-Outlet	49.5	5715	24	
Barrel Sections-L = 166'-0"	208.4	43,240	60	
2-Aprons (Inlet and Outlet)	21.0	695	21	
Totals	278.9	49,650	105	Δ X,100

Δ See Grading Plans for Unclassified Excavation.

ORIGINAL CONSTRUCTION PLANS

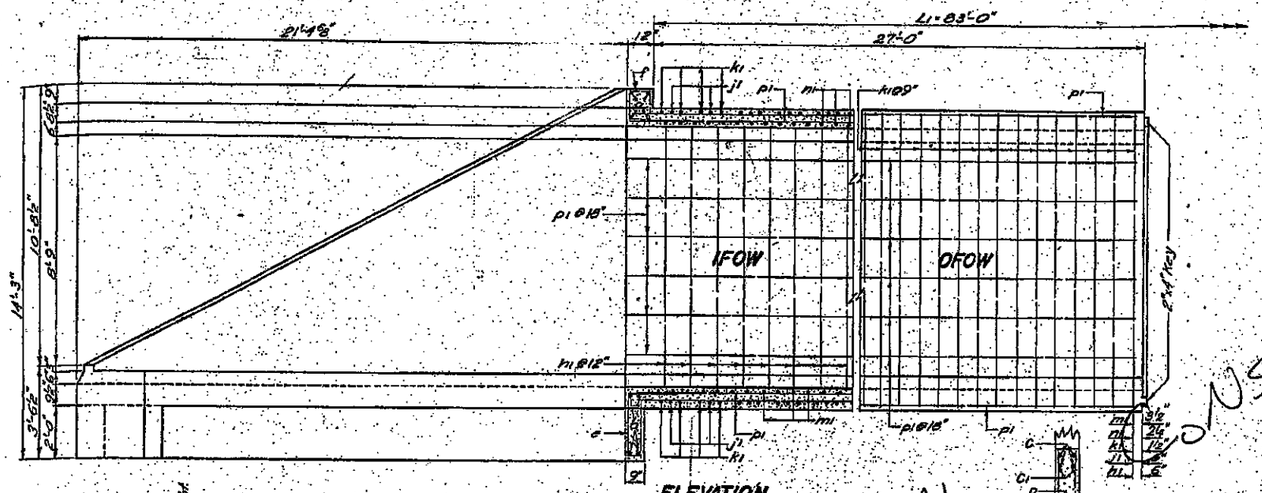
GENERAL DRAWING, APRON DETAILS, AND QUANTITIES
FOR
SPECIAL 10'X10' BOX CULVERT
0° SKEW

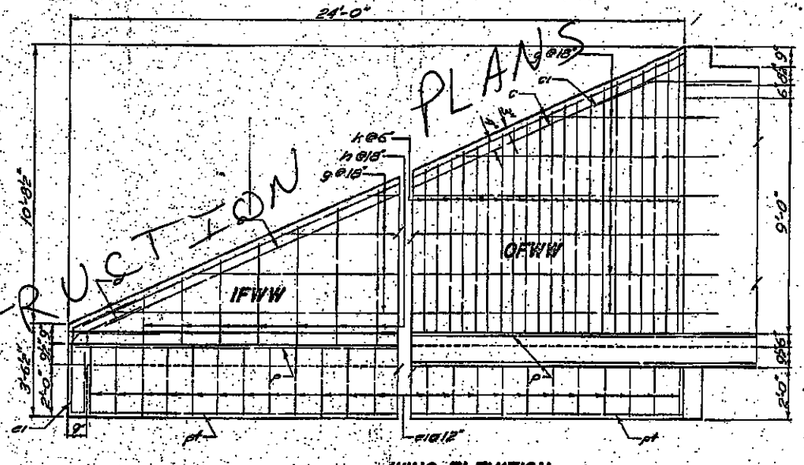
CATTLE PASS — SEC. 28/33-T2S-R20E
STA. 418+00.00 — 190-3(14)134
JACKSON COUNTY
SOUTH DAKOTA — HS20-44 (8 ALT.)
DEPARTMENT OF HIGHWAYS
JUNE 1965 — (1) OF (3)

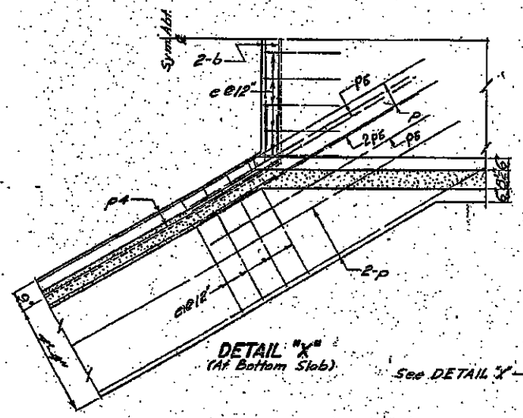
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	I.C.	H.A.	BRIDGE ENGINEER

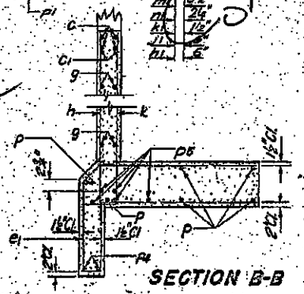
FED. ROAD DIST. NO.	STATE		FISCAL YEAR	PROJ. NO.	TOTAL
8	S.D.			97	

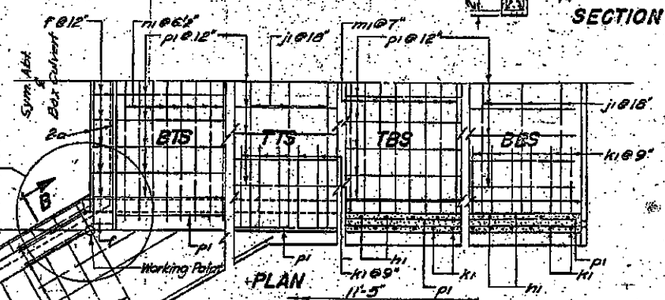
090E-391

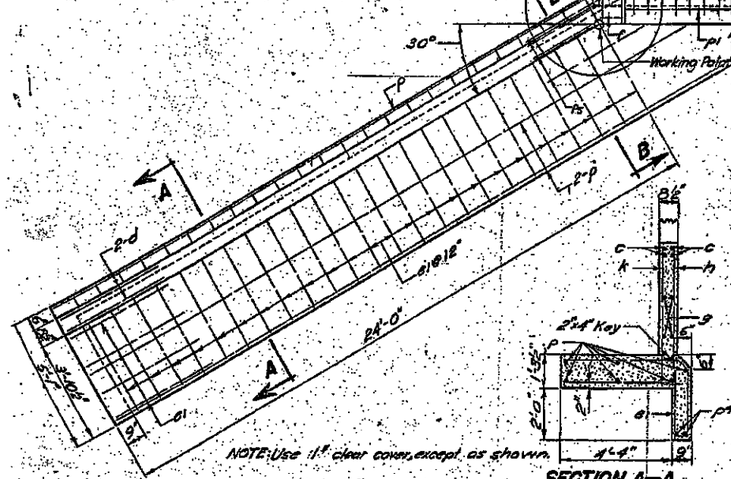


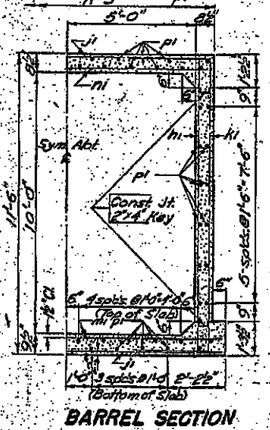








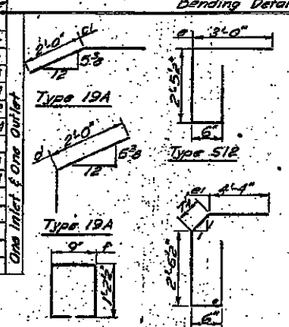




REINFORCING SCHEDULE

MK	No.	Size	Length	Type
a	8	6	11'-0"	Str.
b	8	6	2'-0"	Str.
c	16	5	26'-0"	Str.
c1	8	9	7'-0"	19A
d	16	5	5'-0"	19A
e	20	5	6'-3"	512
e1	112	5	10'-3"	512A
f	24	4	3'-9"	56
g	24	4	31'-0"	19A
h	30	4	22'-9"	17A
k	90	5	15'-3"	17A
*p	24	4	32'-0"	Str.
*p1	8	4	26'-0"	Str.
p6	20	6	10'-0"	Str.

Bending Details



MK	No.	Size	Length	Type
h1	332	4	11'-5"	17A
j1	224	5	10'-0"	Str.
k1	452	7	15'-0"	17
m1	284	7	12'-0"	Str.
n1	908	7	11'-0"	Str.
p1	420	4	27'-9"	Str.

*Bend in field as necessary to fit
Note: All Dimensions are out to out of bars.

LEGEND FOR PLACING RE-STEEL

- OFWW = Outside Face of Wing Wall.
- IFWW = Inside Face of Wing Wall.
- OFOW = Outside Face of Wall.
- IFOW = Inside Face of Wall.
- TTS = Top of Top Slab.
- BTS = Bottom of Top Slab.
- TBS = Top of Bottom Slab.
- BBS = Bottom of Bottom Slab.

ESTIMATED QUANTITIES

ITEM	Cl. 'A' Conc. Cu. Yds.	Re-Steel Lbs.	Struct. Exc. Cu. Yds.
1-Inlet & 1-Outlet	49.5	5713	24
Barrel Sections -L-166'-0"	203.4	43,240	60
Totals	252.9	48,955	84

Rev-Aurora Co. I 90-7(8)295 Sta. 177+48.00 6-3-65 by O.C.

INLET, OUTLET & BARREL SECTION DETAILS
FOR
SPECIAL 10'X10' BOX CULVERT
0° SKEW

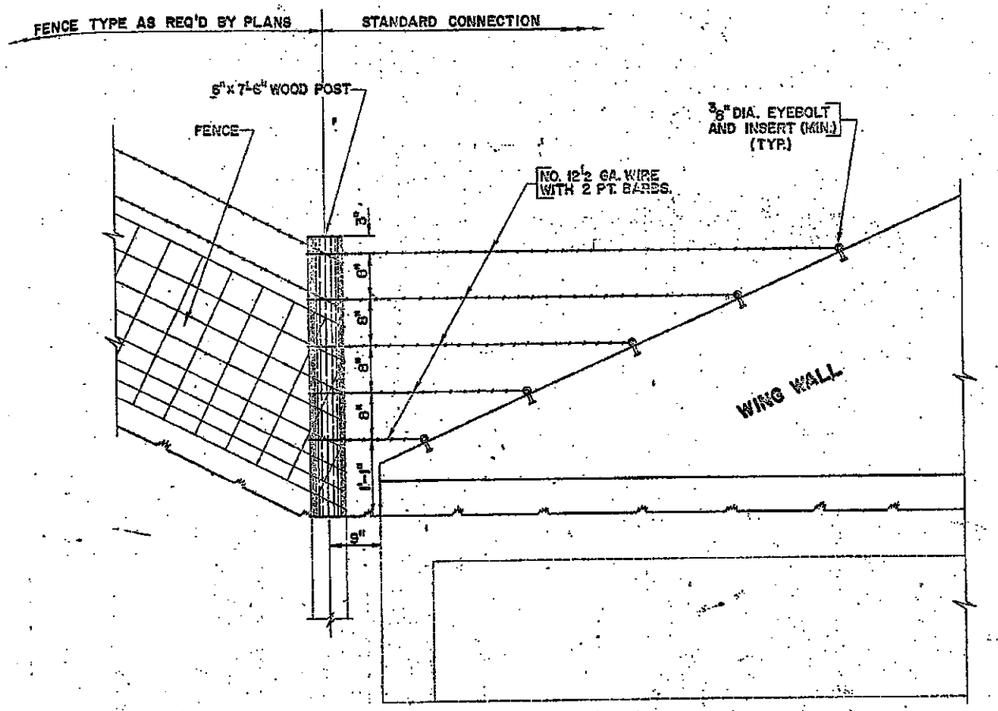
CATTLE PASS
STA. 418+00.00

SEC. 28/33-T2S-R20E
I 90-3(14)134
JACKSON COUNTY
SOUTH DAKOTA HS20-44
DEPARTMENT OF HIGHWAYS (B ALT.)
JUNE 1965 (2) OF (3)

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	G.L.S.	J.L.H.	R.A. Lehrer, BRIDGE ENGINEER

FED. ROAD DIST. NO.	STATE		FISCAL YEAR	SHEET NO.	TOTAL
5	S.D.			9?	

090E-391

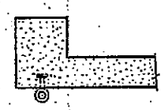


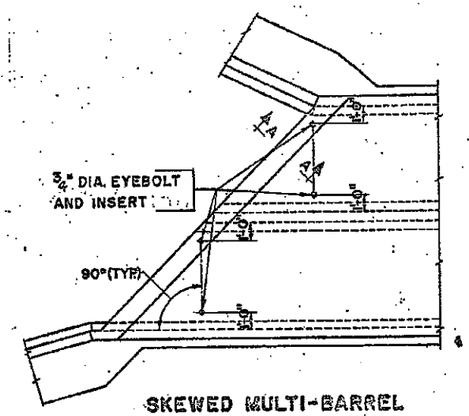
DETAIL FOR TYING FENCE TO WING WALLS

NOTES—

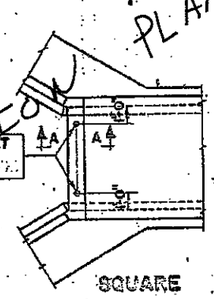
1. COST OF FURNISHING AND INSTALLING INSERTS AND EYEBOLTS SHALL BE ABSORBED BY THE STRUCTURE CONTRACTOR IN THE UNIT PRICE BID FOR CLASS "A" CONCRETE.
2. EYEBOLTS SHALL BE GALVANIZED ACCORDING TO AASHO DESIGNATION: M-30. INSERTS OF CORROSION RESISTANT MATERIAL NEED NOT BE GALVANIZED.

ORIGINAL CONSTRUCTION PLANS

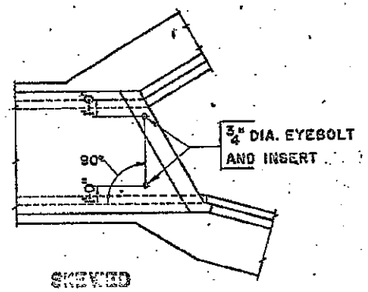




SKEWED MULTI-BARREL



SQUARE



SKEWED

INSERT LOCATIONS

INSERT AND EYEBOLT DETAILS
FOR
SPECIAL 10'X10' BOX CULVERT
0° SKEW

CATTLE PASS — SEC. 28/33-T2S-R20E
STA. 418+00.00 — I 90-3(14)134
JACKSON COUNTY
SOUTH DAKOTA
DEPARTMENT OF HIGHWAYS
JUNE 1965 (3) OF (3)

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
			BRIDGE ENGINEER

Rev. 11-4-65

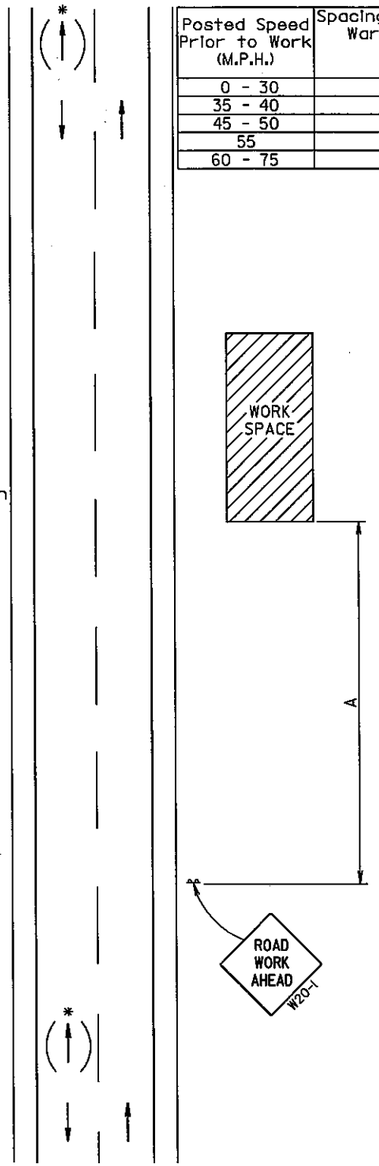
The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

The signs illustrated shall be used where there are distracting situations; such as: vehicles parked on shoulder, vehicles accessing the work site via the highway, and equipment traveling on or crossing the roadway to perform work operations.

The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.

* If the work space is on a divided highway, an advance warning sign should also be placed on the left side of the directional roadway.

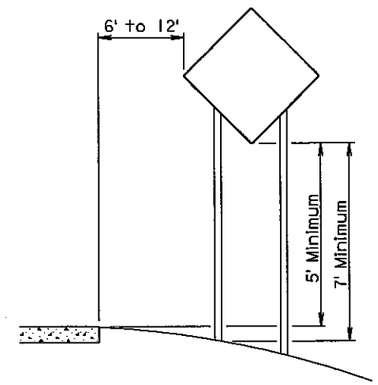
For short term, short duration, or mobile operations, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.



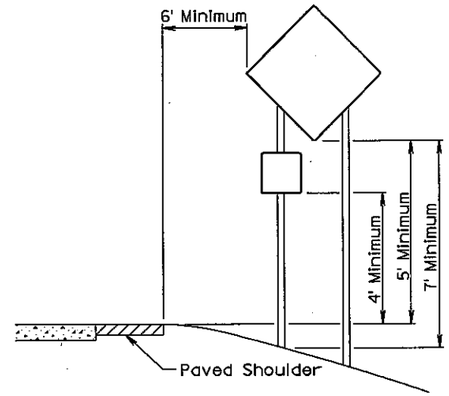
Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 75	1000

July 1, 2005

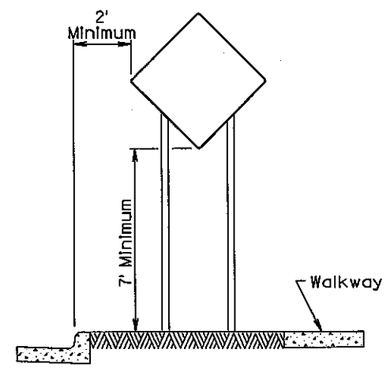
Published Date: 1st Qtr. 2011	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES WORK BEYOND THE SHOULDER	PLATE NUMBER 634.01 Sheet 1 of 1



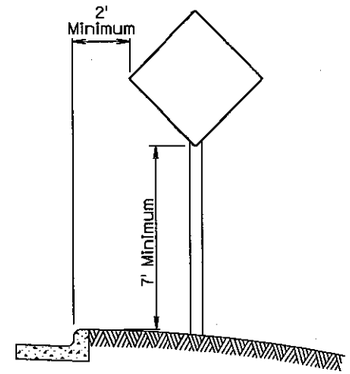
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE



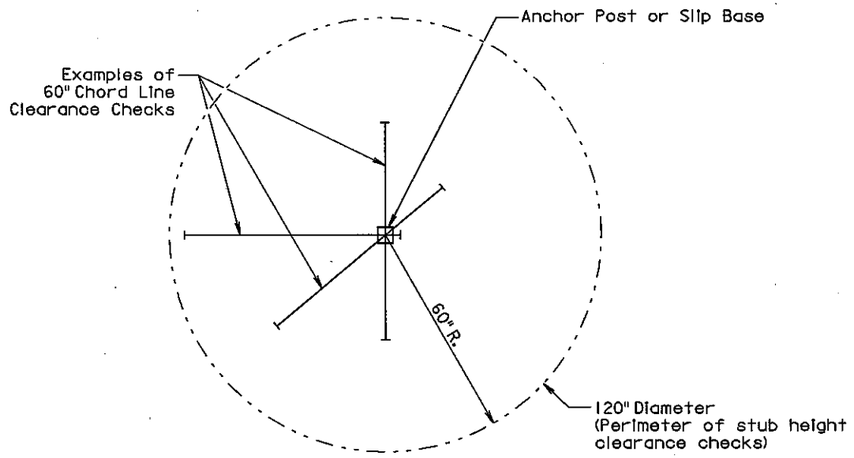
URBAN DISTRICT



URBAN DISTRICT

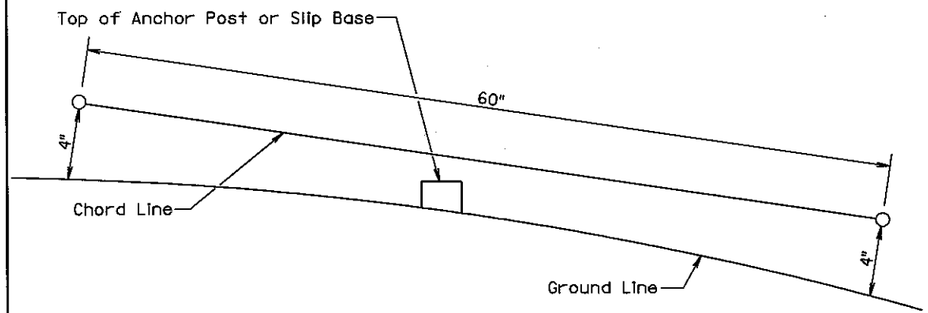
December 23, 2003

Published Date: 1st Qtr. 2011	SDDOT	BREAKAWAY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85 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

Published Date: 1st Qtr. 2011	SDDOT	**BREAKAWAY SUPPORT STUB CLEARANCE**	*PLATE NUMBER* 634.99
			Sheet 1 of 1