



34

Creek

# **ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS**

## **ESTIMATE OF QUANTITIES – PCN i4at**

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E6000	Remove 3 Cable Guardrail for Reset	362	Ft
120E0100	Unclassified Excavation, Digouts	15	CuYd
260E1050	Base Course, Salvaged Asphalt Mix	28.0	Ton
320E1200	Asphalt Concrete Composite	84.7	Ton
332E0010	Cold Milling Asphalt Concrete	568	SqYd
629E0200	Reset 3 Cable Guardrail	362	Ft
633E1400	Pavement Marking Paint, 4" White	20	Ft
633E1405	Pavement Marking Paint, 4" Yellow	20	Ft
634E0010	Flagging	20.0	Hour
634E0110	Traffic Control Signs	613.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Board	3	Each

### ESTIMATE OF QUANTITIES – PCN i4d1

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
320E1200	Asphalt Concrete Composite	767.8	Ton
633E1300	Pavement Marking Paint, White	35	Gal
633E1305	Pavement Marking Paint, Yellow	35	Gal
634E0010	Flagging	20.0	Hour
634E0110	Traffic Control Signs	106.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0640	Temporary Pavement Marking	5,187	Ft

#### **SPECIFICATIONS**

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

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:

## 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 pit, or staging site associated with the project, cease construction activities in the affected area until the Whooping Crane departs and contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

#### **COMMITMENT E: STORM WATER**

#### 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.

## **ESTIMATE OF QUANTITIES – PCN i4au**

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0740	Remove 3 Cable Guardrail Anchor Assembly	1	Each
110E6000	Remove 3 Cable Guardrail for Reset	122	Ft
320E1200	Asphalt Concrete Composite	22.5	Ton
332E0010	Cold Milling Asphalt Concrete	133	SqYd
629E0200	Reset 3 Cable Guardrail	122	Ft
629E0300	3 Cable Guardrail Slip Base Anchor Assembly	1	Each
632E2520	Type 2 Object Marker	1	Each
633E1400	Pavement Marking Paint, 4" White	50	Ft
633E1405	Pavement Marking Paint, 4" Yellow	50	Ft
634E0010	Flagging	20.0	Hour
634E0110	Traffic Control Signs	253.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Board	1	Each

STATE OF	PROJECT	SHEET	TOTAL SHEETS
DAKOTA	014A-451, 090VV-451		
DAROTA	& 090E-451	2	20

#### **ENVIRONMENTAL COMMITMENTS**

# COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND

Construction activities constitute less than 1 acre of disturbance.

# **ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS**

#### 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:

Construction and/or demolition debris consisting of concrete, asphalt 1. 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.

#### COMMITMENT R: FIRE PREVENTION IN THE BLACK HILLS AREA

Protection Boundary.

#### Action Taken/Required:

STATE OF	PROJECT	SHEET	TOTAL SHEETS
DAKOTA	014A-451, 090W-451 & 090E-451	3	20

This project is located within the confines of the Black Hills Forest Fire

The Contractor shall adhere to the "Special Provision for Fire Plan".

#### **PROJECT COORDINATION**

The Contractor shall coordinate work at I90 MRM 27.07 to 27.06 with the Region Foam Jacking project. The asphalt work at this location shall be completed after the Region Foam Jacking at this location.

The Contractor shall coordinate work at I90 Exit 23 with the Partial Interchange Lighting project IM 0901(182)23, contractor Muth Electric..

The Contractor shall coordinate work on US 14A with the Region Rout & Seal project P 0041(145), contractor Roadway Services, Inc. The asphalt work at this location shall be completed after the Region Crack Sealing at this location, .

#### UTILITIES

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.

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.

#### SIGNS AND DELINEATION

The Contractor will be required to remove and reinstall delineator posts, signs, etc., as necessary for construction of this project. Reinstallation shall be as directed by the Engineer. Cost of performing this work shall be incidental to other contract items. Separate measurement and payment will not be made. Any delineators, signs, etc. damaged and/or lost through removal and/or storage shall be replaced by the Contractor at no cost to the State.

#### SURFACING THICKNESS DIMENSIONS

Plans tonnage shall be applied even though the thickness may vary from that shown in the plans. At those locations where material must be placed to achieve a required elevation, plans tonnage may be varied to achieve the required elevation.

#### SHOULDER WORK

Vegetation and accumulated material on or adjacent to the existing roadway edge shall be removed to the satisfaction of the Engineer prior to asphalt concrete resurfacing. Any remaining windrow of accumulated material shall be spread evenly on the inslope adjacent to the asphalt shoulder, to the satisfaction of the Engineer.

Shoulder work shall be incidental to other contract items. Separate measurement and payment will not be made.

#### SAFETY EDGE - PCN i4d1

A Safety Edge shall be constructed with the Asphalt Concrete Composite on US Hwy 14A.

A Safety Edge shall be constructed along the outside edge of the Asphalt Concrete Leveling Lift by creating a sloped edge profile with a 30° slope. The safety edge must be constructed as an integral operation in the paving process and in accordance with the details provided in these plans.

The longitudinal safety edge system must be approved by the Engineer.

The asphalt concrete pavement safety edge device shall be attached to the paving machine as recommended by the supplier. The device shall use a spring loaded shoe that constrains the asphalt head, thus increasing the density of the extruded profile. The shoe shall be capable of applying variable pressure to ensure some compaction of the edge during the paving operation. Currently there is a least two manufactures producing equipment that can create a Safety Edge (see list below). An approved equal may be permitted by the Engineer.

Transtech Systems, Inc. 1594 State Street Schenectady, NY 12304 Phone: 1-800-724-6306 or 1-518-370-5558 www.transtechsys.com

Advant-Edge Paving Equipment LLC 1197 Hillside Avenue, Suite B47 Niskayuria, NY 12309 Phone: 1-518-280-6090 www.advantedgepaving.com

The use of a single plate strike-off method to construct the safety edge will not be allowed.

Short sections of hand work may be allowed by the Engineer when necessary for paving thru transitions, intersecting roads, and entrances.

Additional information about the safety edge is detailed in the FHWA brochure titled "The Safety Edge" (FHWA Publication Number FHWA-SA-10-034).

No separate measurement or payment will be made; all work associated with furnishing and constructing the safety edge shall be incidental to the various asphalt concrete bid items on the project.

#### **EXCAVATION OF UNSTABLE MATERIAL**

Included in the Estimate of Quantities are 15 cubic vards of Unclassified Excavation, Digouts for necessary removal of unstable material.

Backfill shall be 7" of Base Course, Salvaged Asphalt Mix and 3" Asphalt Concrete Composite paid for at the contract unit price per ton.

#### **BASE COURSE, SALVAGED ASPHALT MIX**

Base Course, Salvaged Asphalt Mix shall be obtained from the milled material produced on this project.

Compaction of the Base Course, Salvaged Asphalt Mix shall be to the satisfaction of the Engineer.

At the time of compaction the material shall have approximately 4% moisture uniformly blended throughout the depth of material. The percent moisture may be adjusted by the Engineer. The estimated quantity of Water for Granular Material is 450 Gal. No separate payment will be made for the Water for Granular Material and all costs associated shall be incidental to the contract unit price per ton of "Base Course, Salvaged Asphalt Mix".

Base Course, Salvaged Asphalt Mix shall be used for backfill of Unclassified Excavation Digouts.

The Base Course, Salvaged Asphalt Mix material shall be crushed to meet the requirements of Section 884 prior to use.

Engineer.

The contract unit price per ton for Base Course, Salvaged Asphalt Mix shall include loading, placing, and compacting the cold milled material.

#### **COLD MILLING ASPHALT CONCRETE**

Loose material resulting from the cold milling shall be immediately picked up, and stockpiled for use as Base Course, Salvaged Asphalt Mix.

The Los Angeles Abrasion Loss value on the aggregate used for the in place asphalt concrete could not be determined.

Included in the Estimate of Quantities is 3" of Cold Milling Asphalt Concrete and as necessary at the limits of the project so that the top of the new asphalt surfacing can match existing surface elevations. The milling depths might vary due to irregularities in the surface to obtain smoothness.

Cold milling asphalt is estimated to produce 47 tons of salvaged asphalt concrete. An estimated 28 tons of Base Course, Salvaged Asphalt Mix will be used as Base Course, Salvaged Asphalt Mix. The remainder of salvaged asphalt concrete will become the property of the Contractor.

STATE OF	PROJECT	SHEET	TOTAL SHEETS
DAKOTA	014A-451, 090VV-451		
DAROTA	& 090E-451	4	20

Included in the Estimate of Quantities are 28 tons of Base Course, Salvaged Asphalt Mix for backfill of Unclassified Excavation Digouts. Compaction of the Base Course, Salvaged shall be to the satisfaction of the

#### ASPHALT CONCRETE COMPOSITE – PCN i4at & i4au, WESTBOUND 190 & RAMPS

Included in the Estimate of Quantities is 3" of Asphalt Concrete Composite for areas of Cold Milling Asphalt Concrete on I90 ramps and shoulders.

#### ASPHALT CONCRETE COMPOSITE - PCN i4d1, US HWY 14A

Included in the Estimate of Quantities is 1" lift of Asphalt Concrete Composite on US 14A.

Mineral aggregate shall be furnished by the Contractor. Mineral Aggregate for Asphalt Concrete Composite shall conform to the requirement of Class E, Type 2 except the gradation shall be as follows:

Passing 3/8" sieve	100%
Passing No. 4 sieve	75-95%
Passing No. 8 sieve	45-65%
Passing No. 16 sieve	28-48%
Passing No. 40 sieve	14-30%
Passing No. 200 sieve	4.0-10.0%

The mineral aggregate retained on the No.4 sieve shall contain at least seventy percent by dry weight of crushed pieces having two or more surfaces produced by crushing.

The portion of mineral aggregate passing the No.4 sieve shall be manufactured solely from material retained on a <sup>3</sup>/<sub>4</sub> inch sieve except that up to thirty percent of the total mineral aggregate may be natural sand or filler necessary to meet gradation. Sand or filler shall be added to the cold feed by separate adjustable methods, which provides a constant and uniform flow.

All other requirements for Asphalt Concrete Class E shall apply.

#### **REMOVE 3 CABLE GUARDRAIL FOR RESET**

The 3 cable guardrail shall be removed for reset starting from the 3 cable anchor nearest the repair location.

#### TABLE OF QUANTITIES – PCN i4at

Location		Median/ Outside Shoulder	Length	Width	Cold Milling Asphalt Concrete	Asphalt Concrete Composite	Unclassified Excavation, Digouts	Base Course, Salvaged Asphalt Mix	Remove 3 Cable Guardrail for Reset	Reset 3 Cable Guardrail	Pavement Marking Paint, 4" White	Pavement Marking Paint, 4" Yellow
MRM to	MRM		Ft	Ft	SqYd	Ton	CuYd	Ton	Ft	Ft	Ft	Ft
WB 23.31	WB 23.45	М	740	4	452	65.9						
		Adjacent to										
Exit 23 WE	3 off ramp	PCCP	20	24	53	9.0					20	20
WB 27.06	WB 27.07	0	60	8	63	9.8	15	28	362	362		
		TOTALS:			568	84.7	15	28	362	362	20	20

#### TABLE OF QUANTITIES – PCN i4au

	Median/ Outside			Cold Milling Asphalt	Asphalt Concrete	Remove 3 Cable Guardrail Anchor	Remove 3 Cable Guardrail	Reset 3 Cable	3 Cable Guardrail Slip Base Anchor	Type 2 Object	Pavement Marking Paint, 4"	Pavement Marking Paint, 4"
Location	Shoulder	Length	Width	Concrete	Composite	Assembly	for Reset	Guardrail	Assembly	Marker	White	Yellow
		Ft	Ft	SqYd	Ton	CuYd	Ton	Ft	Ft		Ft	Ft
	Adjacent to											
Exit 23 EB on ramp	PCCP	50	24	133	22.5	1	122	122	1	1	50	50
	TOTALS:			133	22.5	1	122	122	1	1	50	50

STATE OF	PROJECT	SHEET	TOTAL SHEETS
DAKOTA	014A-451, 090W-451 & 090E-451	5	20

#### **PAVEMENT MARKING RATES OF APPLICATION**

#### TABLE OF QUANTITIES – PCN i4d1

				Asphalt	Temporary
				Concrete	Pavement
Location		Length	Width	Composite	Marking
MRM to	MRM	Ft	Ft	Ton	Ft
23.932	23.953	110	24	16.3	110
24.279	24.302	120	24	17.8	120
24.573	24.589	110	24	16.3	110
24.794	24.808	140	24	20.7	140
24.844	24.95	582	24	86.1	582
25.139	25.189	264	24	39.1	264
25.254	25.272	94	24	13.9	94
25.304	25.332	158	24	23.4	158
25.389	25.494	560	24	82.9	560
25.769	25.805	193	24	28.6	193
26.178	26.0205	140	24	20.7	140
26.457	26.486	155	24	22.9	155
26.614	26.632	97	24	14.4	97
26.782	26.874	480	24	71	480
27.276	27.295	100	24	14.8	100
27.495	27.522	140	24	20.7	140
27.705	27.754	260	24	38.5	260
27.988	28.04	425	24	62.9	425
28.035	28.079	254	24	37.6	254
28.186	28.217	160	24	23.7	160
28.217	28.256	200	24	29.6	200
28.416	28.439	120	24	17.8	120
28.806	28.827	105	24	15.5	105
29.045	29.085	220	24	32.6	220
	TOTAL:	5187		767.8	5187

Approximate paint application rates shall be as follows:

Two Lane Roadway (Rates for one line)
Dashed Yellow Centerline Rate = 4.6 Gals./Pass-Mile
Solid Yellow Centerline Rate = 16.9 Gals./Pass-Mile
Solid White Edgeline Rate = 16.9 Gals./Pass-Mile
Glass Beads = 8 Lbs./Gal.

Centerline striping (yellow) - 33.8 gallons per mile. \*

Rate above is an average. The actual gallons used will vary depending upon the number of no passing zones.



#### TWO LANE ROADWAY

STATE OF	PROJECT	SHEET	TOTAL SHEETS
DAKOTA	& 090E-451	6	20

#### **TRAFFIC CONTROL – GENERAL NOTES**

- 1. Unless otherwise stated in these plans, no work will be allowed during hours of darkness.
- 2. 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.
- 3. Vehicles working in traffic or alongside traffic shall be equipped with a flashing amber light visible from all directions. 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.
- 4. All construction operations shall be conducted in the general direction of traffic movement.
- 5. 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.
- 6. 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.
- 7. Construction related traffic shall not cross interstate traffic. Construction traffic shall only enter and exit the interstate by the use of existing interchanges.
- 8. Guardrail must be installed prior to restoring traffic to their respective lanes on I90 westbound at MRM 27.06.
- 9. I-90 traffic shall not be stopped at any time.
- 10. All transitions shall be paved/milled for a smooth ride as approved by the Engineer.

#### MAINTENANCE CROSSOVER TRUCK CROSSING

At the discretion of the Engineer, the use of maintenance crossovers will be allowed when the following criteria are met:

- The passing lanes in both directions are closed and signed as per the "Maintenance Crossover Truck Crossing Detail" traffic control sheet.
- Flaggers shall be used to prevent thru traffic from entering the passing lanes used by the turning trucks.
- A maintenance crossover shall not be used if it is within one mile of an existing interchange.
- Traffic shall not be subject to unnecessary weaving when construction operations occupy the driving lane. A minimum of one mile shall always be maintained from the end of an active construction work zone (in the driving lane) to the beginning of the lane taper (in the passing lane) for the truck maintenance crossover.
- All maintenance crossover use is subject to approval by the Engineer and will not be allowed if deemed unsafe for the physical conditions and traffic.
- All damage to the maintenance crossovers shall be repaired after mainline paving is completed. Payment for the required repairs will be made under the appropriate contract items.

#### **TABLE OF TRAFFIC CONTROL DEVICES - PCN i4at**

#### ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

		EX	PRESSWAY	INTERSTA	ſE
SIGN CODE	SIGN DESCRIPTION	NUM BER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-2	YIELD	1	60" x 60"	25	25
R2-1	SPEED LIMIT	1	36" x 48"	12	12
W3-2	YIELD AHEAD (symbol)	1	48" x 48"	16	16
W3-4	BE PREPARED TO STOP	1	48" x 48"	16	16
W4-1	MERGE (symbol)	2	48" x 48"	16	32
W4-2	LEFT or RIGHT LANE ENDS (symbol)	8	48" x 48"	16	128
W5-4	RAMPNARROWS	1	48" x 48"	16	16
W20-1	ROAD WORK AHEAD	5	48" x 48"	16	80
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	8	48" x 48"	16	128
W20-7	FLAGGER (symbol)	5	48" x 48"	16	80
G20-2	END ROAD WORK	9	48" x 24"	8	72
-	EXIT w / arrow	1	36" x 32"	8	8
		EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT 61			613

#### TABLE OF TRAFFIC CONTROL DEVICES - PCN i4au

		EXPRESSWAY / INTERSTATE				
SIGN CODE	SIGN DESCRIPTION	NUM BER	SIGN SIZE	SQFT PER SIGN	SQFT	
R1-2	YIELD	1	60" x 60"	25	25	
R2-1	SPEED LIMIT	1	36" x 48"	12	12	
W3-2	YIELD AHEAD (symbol)	1	48" x 48"	16	16	
W3-4	BE PREPARED TO STOP	1	48" x 48"	16	16	
W4-1	MERGE (symbol)	2	48" x 48"	16	32	
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16	32	
W5-4	RAMPNARROWS	1	48" x 48"	16	16	
W20-1	ROAD WORK AHEAD	3	48" x 48"	16	48	
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16	32	
W20-7	FLAGGER (symbol)	1	48" x 48"	16	16	
G20-2	END ROAD WORK	1	48" x 24"	8	8	
		EXPRES	SWAY / INTE CONTROL SI	RSTATE GNS SQFT	253	

#### TABLE OF TRAFFIC CONTROL DEVICES - PCN i4d1

			CONVENTIO	NAL ROAD	
SIGN CODE	SIGN DESCRIPTION	NUM BER	SIGN SIZE	SQFT PER SIGN	SQFT
W3-4	BE PREPARED TO STOP	2	48" x 48"	16	32
W20-1	ROAD WORK AHEAD	2	48" x 48"	16	32
W20-7	FLAGGER (symbol)	2	48" x 48"	16	32
G20-2	END ROAD WORK	2	36" x 18"	5	10
		CON TRAFFIC	VENTIONAL Control Si	ROAD GNS SQFT	106

STATE OF	PROJECT	SHEET	TOTAL SHEETS
DAKOTA	014A-451, 090VV-451		
5/	& 090E-451	7	20

#### ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

#### ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

# EXISTING TYPICAL SURFACING SECTIONS



STATE OF	PROJECT	SHEET	TOTAL
SOUTH DAKOTA	014A-451, 090W-451 & 090E-451	8	20
Plotting Date:	05/04/2016		



# **TRAFFIC CONTROL**

RAMP ENTRANCE AND EXIT SIGNING DETAILS



STATE OF	PROJECT	SHEET	TOTAL
SOUTH	014A-451, 090W-451		ONLETO
DAKUTA	& 090E-451	10	20
Plotting Date:	05/04/2016		



THE WARNING LIGHT SHALL BE A SHIELDED TYPE B, IN ACCORDANCE WITH THE MUTCO

## MAINTENANCE CROSSOVER TRUCK CROSSING DETAIL



	STATE OF	PROJECT	SHEET	TOTAL
	SOUTH	014A-451, 090W-451		SHEETS
	BAROTA	& 090E-451	11	20
	Plotting Date:	05/04/2016		
mile minim	im to work	zone in driving long		
	and to work	zono in driving luile.		

0ne

#### GENERAL NOTES:

Either flanged channel steel posts or S3x5.7 steel I beam posts shall be used, but post type shall be consistent thoughout the project. The S3x5.7 Steel I Beam post shall be used for the end posts.

All costs associated with furnishing and constructing the 3 cable guardrail anchor assembly including the concrete anchor, cable anchor bracket, compensating device, steel turnbuckle cable assembly, and necessary hardware shall be incidental to the contract unit price per each for "3 Cable Guardrail Anchor Assembly".

All costs associated with furnishing and constructing the 3 cable guardrail including posts, cable, cable splices, and hardware shall be incidental to the contract unit price per foot for "3 Cable Guardrail".

The following table and criteria shall apply to the arrangement of the Spring Cable End Assemblies (Compensation Devices) and Turnbuckle Cable End Assemblies:

LENGTH OF CABLE RUN	CRITERIA FOR ARRANGEMENT OF THE SPRING CABLE END ASSEMBLIES (COMPENSATION DEVICES) AND TURNBUCKLE CABLE END ASSEMBLIES
Less than 500'	Use turnbuckle on the approaching traffic end and compensating device on the other end of each individual cable, except in the W Beam to 3 Cable Transition where all compensating devices shall be provided at the bridge ends.
Greater than 500' to 1000'	Use compensating device on each end of each individual cable.
Greater than 1000'	Start new run by interlacing at last parallel post as shown on sheet 2 of 6.

All Compensating Devices shall be attached to the cable anchor bracket when one end of the run is attached to a bridge.

Compensating Devices must have a spring rate of 450  $\pm$  50 pounds per inch and shall have a total available travel of 6 inches minimum.

The cable shall be retensioned after the initial 2 week pretension period in accordance with the following table:

	CABLE TENSIONING SPECIFICATIONS													
Temperature Range (Degree F)	-20 to -11	-10 to -1	0 †0 9	10 to 19	20 †o 29	30 †o 39	40 †o 49	50 †o 59	60 †o 69	70 †0 79	80 †o 89	90 †o 99	100 †o 109	110 †o 120
Spring Compression (Inch)	41/4	4	3¾	31/2	31⁄4	3	2¾	21/2	21/4	2	1 3⁄4	11/2	11/4	I

POST SPACING FOR HOP	RIZONTAL CURVES
Roadway & Curvature	Maximum Post Spacing (Ft)
I° and Less	16'
Greater than 1° to 8°	12'
Greater than 8° to 13°	8'
Greater than 13°	NOT ALLOWED

December 16, 2015

S PLATE NUMBER D D D O T **3 CABLE GUARDRAIL** 629.01 (LOW TENSION) Published Date: 2nd Qtr. 2016 Sheet I of 6



..\StdPlatePa1.de





1.200

Plotted From - trrc





Scale - 1:2

Plotted From - trrc116

					-		
	STATE OF SOUTH	PROJECT 014A-451. 090W-451		SHEET	TOTAL SHEETS		
	DAKOTA	&	090E-451	101	14	20	
	Plotting Date:	05/04	4/2016				
	VT VIEW	END POST CAP teel in accordance with ASTM A499, Grade 60.	nance with ASTM A563 Grade DH.	ity dark green enamel.			
%" Dia.	AL TERNATE	NNEL STEEL POST BLE GUARDRAIL 1 be produced from high strength s <sup>-</sup>	rmance with ASTM A709, Grade 36. th ASTM A307, Nut shall be in conforr rdance with ASTM F2329.	plate shall be a baked on high quali unfinished.			\StdPlatePq3.don
//e	ANCHOR PLATE	FLANGED CHAI GENERAL NOTES: FOR 3 CAE Flanged channel steel posts shall	Anchor plates shall be in confor Bolt shall be in conformance wit Bolt shall be galvanized in accor	R Finish for the post and anchor Alternate anchor plate may be			File -
		PLATE	NUMBER				
CABLE GUARDRAIL			62	9.0/			
(LOW TENSION)		Sheet	6 of 6				
•		Sileer	0 01 0				





1.200

- Plotted From - trrc116

...\StdPlatePq4.dgr









# Dotted From trro11610

			PROJECT		ΤΟΤΔΙ		
	STATE OF SOUTH	0144-4	451, 090W-451	SHEET	SHEETS		
	DAKOTA	8	090E-451	17	20		
Plotting Date: 05/04/2016							
				1			
-Wood award	rail block	out					
~ 2	" x 1/4" loc	bolts					
- w	/ith % " w	ashers					
P							
ir ir	nstalling	lag bolt	S.				
$\langle         \rangle$							
′-{-{-}-}- <b>∤</b> - <b>{ ₽</b> ₩₩							
		N					
NUNAL DEL	INEATIU	N.					
	- 1-						
er or very high at sheeting, St	gh heeting						
geline color.	A minimum	ı					
of sheeting	area is						
ay be fabrica	ted						
flexible plas	tic.						
defined for S ind	JY						
	1						
		-					
-Adhesive Obj	ect Mark	ter 1					
			J		ŕ		
(e		Ψ.					
<b>5</b>					i		
Adhariya Object Marker							
← Adhesive Ubject Marker							
E GUA	RDRAIL	TERMIN	NAL END				
OBJECT MARKER							
oblact media	diment						
nape of termin	nal end. A	ns may Minimur	n of				
e inches of o	bject mo	rker sh	eeting				
nt yellow super or very high intensity.							
			-				
			June 26, 201 /				
			PLATE NUMBER				
N UF GUAKDKAI	002.70						
			Sheet 2 of 4				
				,			





Published Date: 2nd Qtr. 2016	SDDOT	DELINEATION
-------------------------------	-------	-------------







