DESIGN DATA						
Traffic (North Bound)		Averag	je Daily			
Current 2022	Pass: 16165	Truc	ks: 725	Total: 16890		
Forecast 2042	Pass: 17785	Truc	ks: 800	Total: 18585		
Traffic (South Bound)	Average Daily					
Current 2022	Pass: 17035	Trucks: 690		Total: 17725		
Forecast 2042	Pass: 18740	Truc	ks: 760	Total: 19500		
Clear Zone Distance:	Zone Distance: 18' @ 4:1 Design		Design Speed	: 40		
Minimum Sight Dist. fo	r Stopping: N/A		Bridges: HL-9	03		
Limited Access Control						
Pavement Design Life	20 (years)					
Design Accumulated O	ne-way flexible ESA	Ls: 3,7	'52,115			

NORTH DAKOTA

DEPARTMENT OF TRANSPORTATION

NH-CPU-4-083(142)198

Ward County US 83, South of US 2

Structure Replacement, Surfacing, Signal, and Incidentals





STATE COUNTY MAP

DESIGNER

DESIGNER

DESIGNER

Charlie Petersen, EIT

Mary Boechler, PE Nikki Olson, PE

Paul Deutsch, PE Araceli Gonzalez, El



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	GOVERNING SPECIFICATIONS			NS	Da [.] Dep	te Publis by the partment	hed and A North Dak of Transp	dopted ota portation	
		Standard Spec	ifications		ļ	7/	1/2024		
		Supplemental Sp	pecifications		L	Ν	ONE		
	<u>PROJEC</u> N	<u>)T NUMBER \ DE</u> H-CPU-4-083(14)	<u>SCRIPTION</u> 2)198	<u>NET</u> 0	<u>MILE</u> .109	<u>=s (</u>	<u>3ROSS N</u> 0.10	<u>/IILES</u> 9	
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ND E OFFI	DEPARTN ICE OF F	VENT OF TRANS PROJECT DEVEL	SPORTATION OPMENT			REG	DATE	13/25 /)EES
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NOTES

107-P01	MAINTAINING TRAFFIC – UNEVEN SHOULDER: The following procedure is only
	intended for areas that are not protected by a barrier.

If, at the end of the work-day, drop-offs greater than 2 inches and less than 18 inches or slopes steeper than 4:1 exist between the edge of a traffic lane and the outside edge of the proposed roadway, perform one of the following actions:

- Construct a traversable wedge in the area of the drop-off or steep slope; or
- Close the lane adjacent to the drop-off or steep slope and provide 24-hour flagging or pilot car operations.

When constructing a wedge, construct a wedge composed of aggregate or earthen materials with a 4:1 or flatter slope along the entire length of the area. Compact materials using Type C compaction, as specified in 203.04 G.4, "Compaction Control Type C".

Install stackable vertical panels that meet the requirements of Section 704.03 H, "Stackable Vertical Panels", along the edge of the driving lane closest to the wedge.

The Engineer will measure stackable vertical panels as specified in Section 704.05, "Method of Measurement" and will pay for panels as specified in Section 704.06, "Basis of Payment".

The Engineer will not measure material used to construct the wedge. Include the cost of materials, equipment, labor, and incidentals required for this operation in the price bid for aggregate pay items.

If a 4:1 or flatter wedge is not installed, provide 24 hour flagging or pilot car operations and associated traffic control at no additional cost to the Department.

The requirements of Section 704.04 O. "Traffic Control for Uneven Pavement" apply to drop-offs created by milling or the placement of hot mix asphalt.

- 202-P01 REMOVAL OF TEMPORARY BYPASS: The temporary bypass for this project consists of the temporary US 2 off ramp and temporary pavement surfaces created in existing median island locations. Include removal of embankment, all temporary asphalt and aggregate surfacing, pipe conduit, and regrading associated with the temporary ramp and other temporary driving surfaces in the price bid for "Removal of Temporary Bypass."
- 202-P02 REMOVAL OF PAVEMENT: Include removal of existing median concrete, bituminous pavement, and all underlying aggregate base material in the price bid for "Removal of Pavement."
- 203-010 SHRINKAGE: 25 percent additional volume is included for shrinkage in earth embankment.

203-385 AVERAGE HAUL: No average haul has been computed for this project.

- 203-P01 COMMON EXCAVATION: Plan quant payment for common excavation item
- 430-P01 COMMERCIAL GRADE HOT MIX AS Asphalt only for temporary asphalt. In coat, and prime coat in the price bid for
- 704-100 TRAFFIC CONTROL SUPERVISOR:
- 704-200 STATE FURNISHED MEDIAN BARR barriers. Pick up and return to the Wi Williston District office at 701-774-270

If returning barriers with connection control the connecting components with the E available at the return location. Provid necessary to stack barriers. The board

Include all costs associated with medi Furnished Median Barrier".

- 704-510 OBLITERATION OF PAVEMENT MA designated for obliteration is allowed. specified in Section 704.04 N, "Obliter using removable, non-reflective prefor as the pavement surface and that ove side.
- 704-P01 ATTENUATION DEVICE TYPE B: Ins feet wide.

Before installing devices, provide the stating that the devices meet NCHRP a copy of an eligibility letter from FHW

Use devices rated for the MPH design

Install devices according to the manuf

Liquid filled attenuators may not be de the months of January, February, and the 15th of March.

If liquid filled attenuation devices are of of March or in any portion of the mont November, include calcium magnesiu acetate in the liquid filled barrier solution chemicals with water as recommended

	STATE	PROJECT NO.		SECTION NO.	SHEET NO.			
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tity IS.	ity will be used as the measurement for s.							
SPI Iclu or	PHALT: Use Commercial Grade Hot Mix clude the cost for related asphalt cement, tack or "Commercial Grade Hot Mix Asphalt".							
Ρ	rovide	e a Traffic Control S	Supervisor.					
IE Illis 00	IER: Obtain (25) 2.5' x 10' concrete lliston District yard at US 2 RP 12. Contact the 00 to facilitate the exchanges.							
on En de ds	omponents, coordinate the delivery location for Engineer. Some 4 inch x 4 inch boards are le any additional 4 inch x 4 inch boards ds will become property of the Department.							
iar	n barr	iers in the contract	unit price f	or "Sta	te			
Rł C rat rm erla	RKINGS: Masking of pavement markings Choose to remove or mask marking as ration of Pavement Markings". Mask markings rmed tape that is approximately the same color erlaps the marking a minimum of 1 inch on each							
sta	ll liqu	id filled attenuatior	n devices th	at are	2.5			
Er R VA	Engineer with a Certificate of Compliance Report 350, MASH 2009, or MASH 2016, and /A.							
nat	nation used in the item description.							
fac	cturer	's specifications.						
ep I D	loyed)ecerr	in any portion of ber, nor before	LO PROF	ESSIO,	NAT.			
de ths im ior	ploye of Aj aceta n. Mix by the	d after the 15th oril, October or ate or potassium the anti-icing e anti-icing	AF BOI DE AMPE- DATE O NORTH	RY ANN ICHLER 283470 02/13/202	ENGINEER			

chemical manufacturer to protect the barrier from freezing to a temperature of 0°F. Contact the Engineer and the NDDOT Environmental and Transportation Services Division in the case of a spill leaving the roadway. Dispose of the mixture inside the device as specified in Section 107.17, "Removed Material".

Provide a full replacement set of attenuators available to the project. If the replacement devices are installed, have a set of replacement devices available to the project within 3 calendar days.

Immediately replace any damaged pieces. The Department will reimburse the Contractor for damaged pieces based on the material invoice price plus 10 percent. All other costs associated with installing and maintaining replacement pieces will be at no additional cost to the Department.

704-P02 TRAFFIC CONTROL: The traffic control devices list has been developed using the layouts shown in the plans and the following layouts shown on Standard Drawings. The traffic control devices will comply with the following Standard Drawings:

> D-704-15, Type C Half Road Closure on a Multi-Lane High Speed Highway D-704-20, Type G Terminal Sign Layout D-704-21, Type I Detour Sign Layout D-704-23, Type P Stationary Lane Closure on a Divided Highway D-704-24, Type R Shoulder Work

704-P03 TRAFFIC CONTROL PHASING: Phase work as follows. See Section 100 for additional details.

> Phase 1a/1b – Utilize lane closures to remove concrete and curb and gutter of identified median island locations. Place temporary hot mix asphalt surfacing to create a temporary driving surface in those locations. Install embankment, pipe, and surfacing related to temporary ramp.

> Phase 2 – Install and activate temporary signals. Reduce traffic to one lane in the NB and SB directions. Shift traffic to the west side of the existing roadway section at the designated work area. Remove existing hot mix asphalt surfacing and aggregate base course within the work area on the east side of the existing roadway as well as remaining median concrete and curb and gutter. Remove the three existing signal standards and associated items. Establish a temporary stream diversion. Install temporary shoring and conduct excavation to replace structure at least 122 LF from outlet end of proposed RCB. Backfill and restore east side to proposed conditions for asphalt surfacing. Also provide additional asphalt surfacing in designated median island areas to create temporary driving surfaces.

> Phase 3 – Shift traffic to the east side of the existing roadway section at the designated work area and utilize the temporary ramp. Remove existing hot mix asphalt surfacing and aggregate base course on the west side of the existing roadway as well as median concrete and curb and gutter and a portion of the existing ramp. Install temporary shoring and conduct excavation to replace structure up to proposed structure installed in phase 2. Backfill and restore west side to proposed

NOTES

704-P04

		STATE	PROJECT N	0.	NO.	NO.	
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conditions for as Install proposed signals.	phalt surfacing. Remo curb and gutter and co	ove tem oncrete	porary shoring ar e median paving a	nd stream di Is able. Res	version et traffi	C	
Phase 4a/4b – A closures as nece pavement. Remo	ctivate traffic signals a essary to install the rer ove embankment, pipe	and shi maining e, and s	ft traffic to origina g curb and gutter a surfacing related t	l locations. l and median o temporary	Jtilize la concre ramp.	ane te	
TEMPORARY T shown in the plat supplementary tr drums. Prior to ir proper signal coo	RAFFIC SIGNALS: Pr ns. Before the portable raffic control devices in nstallation, sync and tr ordination between de	rovide t e traffic ncludin roubles vices.	emporary traffic s signals are active g but not limited to hoot temporary tr	ignals at loc ated, place o signs and affic signals	ations delinea to ensi	ator ure	
Clearance interv	als are provided to as	sist wit	<u>h adequate sig</u> nal	l timing:			
Phase 2	US 83 Southbound	US	2 Off Ramp				
Yellow	1.9 seconds	1.8	3 seconds				
Red	4.1 seconds	5.6	6 seconds				
Phase 3							
Yellow	1.9 seconds	1.8	seconds				
unit. Include all la and remove the t	abor and equipment n temporary traffic signa ROL SIGNS: Cover e	ecessa al in the xisting	ary to furnish, insta price bid for "Ter signs as necessa	all, maintain nporary Tra ry to provide	, reloca ffic Sigi e work	ite, nal".	
zone clarity in all remove covering	hases. Include all co in the price bid for "T	osts for raffic C	material, and lab control Signs".	or to cover a	and		
TRAFFIC CONT delineator in acc flexible delineato	ROL SIGNS: Mount the ordance with standarc or in the price bid for "	ne W16 I drawi Fraffic (6-7ap-18 traffic co ng D-704-13. Incl Control Signs".	ntrol sign or ude all costs	n a flexi s for the	ble e	
REMOVE & RESET DELINEATORS: Remove and reset existing flexible delineators and object markers as shown in the plans. Replace flexible delineators, object markers, supports, and mounting hardware that are damaged during removing, resetting, or stockpiling at no additional cost to the							
to existing sign s costs for labor, n resetting delinea "Remove & Rese	supports as shown in the set existing supports as shown in the naterials, and equipment tors and object marke set Delineators".	he plar ent nec rs in th	essary for e price bid for	PROF BOJ BOJ BOJ BOJ BOJ BOJ BOJ BOJ BOJ BOJ	ESSIO	A.P.LENGINE	
PAVEMENT MA agree, plan quar payment for pave	RKING: If the Enginee ntity will be used as the ement marking items.	er and (e meas	Contractor surement for	DATE O NORTH	02/13/202 DAKOT	5 FP A	

SECTION SHEET

- 704-P05
- 704-P06
- 754-P01
- 762-050

<u>NOTES</u>

- 772-P01 EXISTING EQUIPMENT INSPECTION: Inspect all traffic signal system equipment to be salvaged/reset for damage prior to removal. Contact the City of Minot Traffic Division and the Project Engineer prior to removal of any damaged equipment to document damaged equipment. Include all costs for labor, materials, and equipment necessary for the existing equipment inspection in the bid price for "Revise Traffic Signal System".
- 772-P02 REVISE TRAFFIC SIGNAL SYSTEM: Include in the bid price for "Revise Traffic Signal System" all materials, labor, and equipment necessary for the intersection of US 83 & US 2/US 52 South Ramps traffic signal system to be fully operational as shown in the plans upon construction completion. This includes, but is not limited to, the salvaging and resetting of traffic signal standards, mast arms, signal heads, emergency vehicle pre-emption (EVP) system, video detection system, ancillary hardware, cables, wiring, and appurtenances as well as furnishing and installing conduit, pull boxes, and incidental concrete to reset a fully operational traffic signal system.

Remove the following as shown in the plans:

- 1. Existing traffic signal pull boxes.
- 2. Existing traffic signal pole foundations.
- 3. Existing traffic signal pipe conduit within limits of excavation. At limits of excavation, abandon existing conduit in place.

Salvage and protect the following traffic signal system equipment to be reset as shown in the plans:

- 1. Existing traffic signal equipment.
- 2. Existing video detection equipment.
- 3. Existing emergency vehicle pre-emption (EVP) equipment.

Temporarily relocate all existing equipment salvaged for reset to manage other construction activities.

Take care not to damage any existing equipment to be reset. Replace at contractor's expense any equipment that was functioning prior to construction, that does not function at construction completion. Replace damaged equipment with the same manufacturer and model as the existing equipment, to the extent possible if it is still available to be reproduced. Replace full cable if existing cables are damaged.

Construct new traffic signal foundations per drilled shaft foundations special provision. Furnish and install pull boxes and rigid conduit for traffic signal cables as shown in the plans. New conduit runs must not exceed the length of existing conduit runs in order to maintain existing cable slack. Connect new conduit to existing conduit. Re-pull all existing salvaged traffic signal system cables through new conduit and existing conduit as shown in the plans.

Reset traffic signals on new traffic signal foundations as shown in the plans. Reattach and reinstall all traffic signal system equipment as shown in the plans.

772-P03 REMOVE CONCRETE FOUNDATIO traffic signal foundations that are nea remove concrete foundations as spec Include all costs for labor, materials, a disposing of existing traffic signal four for "Revise Traffic Signal System".

772-P04 HAZARDOUS MATERIALS: Prior to a North Dakota Certified lab to verify if material is present as defined by the quality. If hazardous materials are de public from all debris. Collect all sand method that is approved by the EPA. containment, and any other costs ass EPA and North Dakota Department o in the bid prices for "Paint Signal Star

772-P05 PAINT SIGNAL STANDARD and PA method when re-painting traffic signa

Sandblast Traffic Signal:

- 1. Temporarily detach all existing eq arms, including mounting hardwar
- Remove oil and grease from affect oil or grease by solvent cleaning a Painting Council Surface Preparat methods.
- 3. Use SSPC SP-10 Near-White Met defined as a near-white metal blas magnification is free of all oil, grea corrosion products, and other fore limited to no more than 5% of each
- 4. Completely remove all visible rust traffic signal standard and mast an
- 5. Use steel grit angular carbon stee approved equal for the sandblastin
- Perform sandblasting. Protect all p debris. Collect all sandblasting ma is approved by the EPA. Contain a paint/debris if it contains harmful o lead paint, which includes protecting traveling public from these hazard
- 7. Before the primer is applied, coordinate inspection the Project Engineer to ensure that the traffic signa standard and mast arm are free of all visible paint, and contaminants. Prepare the traffic signal standa mast arm according to Near-White Metal Blasting Specifications and to the satisfaction of the Project

25	STATE	PROJECT NC	D.	SECTION NO.	SHEET NO.		
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NS arly cifie and nda	NS: Remove and dispose of existing concrete rly fully exposed during excavation. Otherwise, sified in NDDOT Standard Specifications. and equipment necessary for removing and ndations as shown in the plans in the bid price						
any any Noi etec dbla Inc soci of Ei nda	any work on painted signal components, use a any lead paint, PCB paint, or other hazardous North Dakota Department of Environmental tected, protect all pedestrians and the traveling blasting material and removed paint/debris in a Include all work pertaining to the testing, sociated with meeting requirements from the f Environmental Quality Hazardous Waste Rules ndard" and "Paint Signal Standard MA".						
INT als.	NT SIGNAL STANDARD MA: Use the following Is.						
uip re, a cted acco tion	uipment from traffic signal standards and mast re, as necessary to re-paint traffic signals. sted surfaces before blast cleaning. Remove the according to SSPC SP-1 (Steel Structures tion Specification-1) and with EPA approved						
tal st c ase eign ch u t an	tal Blast Cleaning. This method of cleaning is st cleaned surface that when viewed without ase, dirt, mill scale, rust, coating, oxides, sign matter except for random staining which is th unit area.						
rm. el, o ng l ped ater and	rm. I, or 40/60 coal slag abrasive media, or ng materials. pedestrians and the traveling public from all aterial and removed paint/debris in a method that						
che ing dous dina at th of all affic	micals pedes s cont ate ins ne trat l visib s signa	s or existing strians and the aminates. spection with ffic signal le paint, rust, al standard and	DATE 03	ESS/01 AUL HTSCH 27951 3/31/2025	TENGINEER		

NORTHDAKO

<u>NOTES</u>

- 772-P01 EXISTING EQUIPMENT INSPECTION: Inspect all traffic signal system equipment to be salvaged/reset for damage prior to removal. Contact the City of Minot Traffic Division and the Project Engineer prior to removal of any damaged equipment to document damaged equipment. Include all costs for labor, materials, and equipment necessary for the existing equipment inspection in the bid price for "Revise Traffic Signal System".
- 772-P02 REVISE TRAFFIC SIGNAL SYSTEM: Include in the bid price for "Revise Traffic Signal System" all materials, labor, and equipment necessary for the intersection of US 83 & US 2/US 52 South Ramps traffic signal system to be fully operational as shown in the plans upon construction completion. This includes, but is not limited to, the salvaging and resetting of traffic signal standards, mast arms, signal heads, emergency vehicle pre-emption (EVP) system, video detection system, ancillary hardware, cables, wiring, and appurtenances as well as furnishing and installing conduit, pull boxes, and incidental concrete to reset a fully operational traffic signal system.

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- 772-P03 REMOVE CONCRETE FOUNDATION traffic signal foundations that are near remove concrete foundations as spec Include all costs for labor, materials, a disposing of existing traffic signal four for "Revise Traffic Signal System".
- 772-P04 HAZARDOUS MATERIALS: Prior to a North Dakota Certified lab to verify if a material is present as defined by the N quality. If hazardous materials are det public from all debris. Collect all sand method that is approved by the EPA. containment, and any other costs ass EPA and North Dakota Department of in the bid prices for "Paint Signal Stan
- 772-P05 PAINT SIGNAL STANDARD and PAI method when re-painting traffic signal

Sandblast Traffic Signal:

- 1. Temporarily detach all existing equarms, including mounting hardwar
- Use Steel Structures Painting Cou White Metal Blast Cleaning," SSP0 of cleaning is defined as a sandbla metallic color. Ensure the surface corrosion products, oxides, paint, s 100% of every square inch.
- 3. Completely remove all rust and pa standard and mast arm.
- 4. Use steel grit angular carbon steel
- 5. Perform sandblasting. Protect all p debris. Collect all sandblasting ma is approved by the EPA. Contain a contains harmful chemicals or exis pedestrians and the traveling public
- 6. Before the primer is applied, coord ensure that the traffic signal stands free of all paint, rust, and contamin signal standard and mast arm accord Blasting Specifications and to the Project Engineer. Re-blast or clear DEVPREP 88 cleaner if needed. Of Project Engineer to determine whit used.

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	ND	NH-CPU-4-083	(142)198	6	3		
NS rly :ifie and nda	: Rem fully e d in N equij itions	nove and dispose exposed during ex IDDOT Standard oment necessary as shown in the p	of existing c cavation. Of Specification for removing lans in the b	concrete therwis ns. g and pid pric	e e, e		
any Nor tec bla Inc oci f Er nda	iny work on painted signal components, use a any lead paint, PCB paint, or other hazardous North Dakota Department of Environmental ected, protect all pedestrians and the traveling plasting material and removed paint/debris in a include all work pertaining to the testing, ociated with meeting requirements from the Environmental Quality Hazardous Waste Rules dard" and "Paint Signal Standard MA".						
NT Is.	SIGN	IAL STANDARD I	MA: Use the	e follow	ing		
uip inc C-S aste is f sta	uipment from traffic signal standards and mast e, as necessary to re-paint traffic signals. ncil Surface Preparation Specification "No. 5 C-SP5 for a totally clean surface. This method asted cleaned surface with a fray-white uniform is free of all oil, grease, dirt, mill scale, rust, stains, streaks, or any other contaminant across						
aint	by W	hite Metal Blasting	g the traffic	signal			
I fo bed iter and stin ic f dina ard	for the sandblasting materials. bedestrians and the traveling public from all terial and removed paint/debris in a method that and clean up the existing paint/debris if it sting lead paint, which includes protecting ic from these hazardous contaminates. linate inspection with the Project Engineer to ard and mast arm is						
nan ord sat n th Coc ch	its. Pr ling to isfact ne pol ordina metho	epare the traffic White Metal ion of the le with Devoe te with the od shall be	PROFI PROFI DEU DEU PE	AUL HTSCH 27961 2/11/2025	ENGINEER		

Engineer. Re-blast or clean the pole with Devoe DEVPREP 88, CHLOR*RID, or approved equal cleaner, if needed. Coordinate with the Project Engineer to determine which method shall be used.

Paint Traffic Signal:

- 1. Remove and replace all post-mount plugs before painting.
- 2. Mask all areas as desired by the Project Engineer.
- 3. Prime bare metal with PPG HBE-400 Primer and HBE-403 Catalyst. Apply two top coats of Devthane 379UVA manufactured by Devoe High-Performance Coatings, and one coat of clear coat as recommended by the top coat manufacturer. Alternatively, apply primer/base coat of PPG Amerlock 2 High-Build Epoxy, then Top coat PPG PSX 700 Polysiloxane, or approved equals, as necessary to achieve desired color, finish, and durability.
- 4. Apply all coatings according to the manufacturer's recommended film thickness. Follow the manufacturer's directions for use for application of all materials.
- 5. Remove all masking.

Include all costs for labor, materials, and equipment necessary to sandblast and paint traffic signal standards and mast arms in the bid prices for "for "Paint Signal Standard" and "Paint Signal Standard MA".

- 772-P06 SIGNAL COMPONENT COLOR PAINT / FINISH: Provide traffic signal system components painted / finished in accordance with the following:
 - Transformer base black
 - Pole black
 - Mast arm black
 - Signal head mounting hardware black
 - Backplate black
 - Signal housing black

The black color is 17038 of the AMS-STD No. 595.

- 772-P07 RELOCATE MA SIGNAL HEAD: Include all costs for labor, materials, and equipment necessary for relocating misaligned signal heads in the bid price for "Revise Traffic Signal System".
- 772-P08 SALVAGE AND RE-PULL CABLE: Salvage and re-pull all existing cables, conductors, wiring, and incidental equipment through new conduit and existing conduit as shown in the plans to provide a fully operational traffic signal system, including video detection and EVP. Existing conduit size of 3 inches at the intercept shown in the plans is based on the most recent as-builts. Include all costs for labor, materials, and equipment necessary for salvaging and re-pulling cable in the bid price for "Revise Traffic Signal System".

772-P09 REVISE CONTROLLER: Coordinate potentially the manufacturer, as nece emergency vehicle pre-emption, vide and programming to match existing se properly. Include all costs for labor, m fully operational traffic signal system System".

NOTES

772-P10 VIDEO DETECTION SYSTEM: Salva cables, wiring, mounting hardware, a as shown in the plans. Ensure existin zones, programming of detection zon setups are reinstated as recommended Minot Traffic Division, and potentially support to accommodate modification the reliability of operation with the Cit labor, materials, and equipment neces detection system, including technical Signal System".

- 772-P11 EMERGENCY VEHICLE PRE-EMPT the EVP units, cables, wiring, mounting reset as shown in the plans. Ensure e programming, and all other incidental the manufacturer. Notify the fire chief EVP systems are tested and operable range of the system. Verify the reliab all costs for labor, materials, and equ EVP system in the bid price for "Revis
- 772-P12 TRAFFIC SIGNAL PULL BOX: Provid high-density polymer concrete compo exposure, weathering, chemicals, and standard drawing D-770-3 for details. boxes. No splicing is allowed in pull b steel hex bolts and nuts and be stam all costs for labor, materials, and equi traffic signal pull boxes in the bid price

Revised 3/31/25	STATE	PROJECT NO.	SECTION NO.	SHEET NO.	
	ND	NH-CPU-4-083(142)198	6	4	
ER: Coordinate wit cturer, as necessa e-emption, video d natch existing setti osts for labor, mate signal system in t	h the ary for etectiongs. N erials, he bio	City of Minot Traffic Division, technical support and set per on, traffic signal timing, coord /erify that all controller setting and equipment necessary for price for "Revise Traffic Sign	and rmaner ination, s work settinç al	ıt ' ja	
SYSTEM: Salvage ng hardware, and o . Ensure existing c of detection zones, as recommended l and potentially the ate modifications the cion with the City of equipment necessa uding technical sup	and p other able c and a by the man hroug f Minc ary for oport,	protect the video detection can video detection equipment to connections, camera aim, dete all other incidental video detect e manufacturer. Coordinate wi ufacturer, as necessary for te hout the duration of the project of Traffic Division. Include all of resetting a fully operational w in the bid price for "Revise Tr	meras, be rese ection tion th City chnical ct. Verit costs fo rideo raffic	ət of fy ır	
LE PRE-EMPTION (EVP) EQUIPMENT: Salvage and protect wiring, mounting hardware, and other EVP equipment to be blans. Ensure existing cable connections, EVP aim, other incidental EVP setups are reinstated as recommended by fy the fire chief Kelli Kronschnabel (701-857-4740) when the ed and operable. The City of Minot is responsible for setting the derify the reliability of operation with the City of Minot. Include erials, and equipment necessary for resetting a fully operational price for "Revise Traffic Signal System".					
L BOX: Provide pull boxes that are made of a lightweight, oncrete composite, UL listed and are resistant to sunlight chemicals, and unaffected by freeze-thaw cycles to -50 F. See 0-3 for details. Duct seal all conduits entering and exiting pull lowed in pull boxes. Provide box covers that are stainless s and be stamped with standard logo "Traffic Signal". Include erials, and equipment necessary for furnishing and installing in the bid price for "Revise Traffic Signal System".					
		20 PROFI	ESS/ON	NI-EL	

DATE 03/31/2025

VORTH DAKOTP

NOTES

Paint Traffic Signal:

- 1. Remove and replace all post-mount plugs before painting.
- 2. Mask all areas as desired by the Project Engineer.
- 3. Prime bare metal with PPG HBE-400 Primer and HBE-403 Catalyst.
- 4. Apply two top coats of Devthane 379UVA manufactured by Devoe High-Performance Coatings, and one coat of clear coat as recommended by the top coat manufacturer.
- 5. Apply all coatings according to the manufacturer's recommended film thickness. Follow the manufacturer's directions for use for application of all materials.
- 6. Remove all masking.

Include all costs for labor, materials, and equipment necessary to sandblast and paint traffic signal standards and mast arms in the bid prices for "for "Paint Signal Standard" and "Paint Signal Standard MA".

- 772-P06 SIGNAL COMPONENT COLOR PAINT / FINISH: Provide traffic signal system components painted / finished in accordance with the following:
 - Transformer base black
 - Pole black
 - Mast arm black
 - Signal head mounting hardware black
 - Backplate black
 - Signal housing black

The black color is 17038 of the AMS-STD No. 595.

- 772-P07 RELOCATE MA SIGNAL HEAD: Include all costs for labor, materials, and equipment necessary for relocating misaligned signal heads in the bid price for "Revise Traffic Signal System".
- 772-P08 SALVAGE AND RE-PULL CABLE: Salvage and re-pull all existing cables, conductors, wiring, and incidental equipment through new conduit and existing conduit as shown in the plans to provide a fully operational traffic signal system, including video detection and EVP. Existing conduit size of 3 inches at the intercept shown in the plans is based on the most recent as-builts. Include all costs for labor, materials, and equipment necessary for salvaging and re-pulling cable in the bid price for "Revise Traffic Signal System".
- 772-P09 REVISE CONTROLLER: Coordinate with the City of Minot Traffic Division, and potentially the manufacturer, as necessary for technical support and set permanent emergency vehicle pre-emption, video detection, traffic signal timing, coordination, and programming to match existing settings. Verify that all controller settings work properly. Include all costs for labor, materials, and equipment necessary for setting a fully operational traffic signal system in the bid price for "Revise Traffic Signal System".

- 772-P10 VIDEO DETECTION SYSTEM: Salvage and protect the video detection cameras, Signal System".
- reset as shown in the plans. Ensure existing cable connections, EVP aim, EVP system in the bid price for "Revise Traffic Signal System".
- 772-P12 TRAFFIC SIGNAL PULL BOX: Provide pull boxes that are made of a lightweight,
 - traffic signal pull boxes in the bid price for "Revise Traffic Signal System".

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-CPU-4-083(142)198	6	4

cables, wiring, mounting hardware, and other video detection equipment to be reset as shown in the plans. Ensure existing cable connections, camera aim, detection zones, programming of detection zones, and all other incidental video detection setups are reinstated as recommended by the manufacturer. Coordinate with City of Minot Traffic Division, and potentially the manufacturer, as necessary for technical support to accommodate modifications throughout the duration of the project. Verify the reliability of operation with the City of Minot Traffic Division. Include all costs for labor, materials, and equipment necessary for resetting a fully operational video detection system, including technical support, in the bid price for "Revise Traffic

772-P11 EMERGENCY VEHICLE PRE-EMPTION (EVP) EQUIPMENT: Salvage and protect the EVP units, cables, wiring, mounting hardware, and other EVP equipment to be

> programming, and all other incidental EVP setups are reinstated as recommended by the manufacturer. Notify the fire chief Kelli Kronschnabel (701-857-4740) when the EVP systems are tested and operable. The City of Minot is responsible for setting the range of the system. Verify the reliability of operation with the City of Minot. Include all costs for labor, materials, and equipment necessary for resetting a fully operational

> high-density polymer concrete composite, UL listed and are resistant to sunlight exposure, weathering, chemicals, and unaffected by freeze-thaw cycles to -50 F. See standard drawing D-770-3 for details. Duct seal all conduits entering and exiting pull boxes. No splicing is allowed in pull boxes. Provide box covers that are stainless steel hex bolts and nuts and be stamped with standard logo "Traffic Signal". Include all costs for labor, materials, and equipment necessary for furnishing and installing



ENVIRONMENTAL NOTES

ENVIRONMENTAL NOTES (EN): The North Dakota Department of Transportation and the Federal Highway Administration have made environmental commitments to secure approval of this project. The following environmental notes are requirements to comply with these commitments:

<u>EN-1</u> AQUATIC NUISANCE SPECIES (ANS): Equipment that was last used outside of North Dakota or within a Class I infested waterbody (identified on the North Dakota Game and Fish Department (NDGFD) website) requires an inspection by NDGFD. Notify the NDGFD at least 10 business days prior to pumps, watercraft, or any equipment entering a public water to allow the NDGFD sufficient time to inspect any and all such equipment for ANS. Contact the NDGFD ANS Coordinator, Ben Holen by e-mail - bholen@nd.gov for equipment inspections. Supply one of the following to the engineer as proof of compliance prior to work taking place in the water: (1) the NDGFD inspection report, (2) documented NDGFD correspondence (email or signed letter).

<u>EN-2</u> <u>TEMPORARY WETLAND IMPACT</u>: Temporary impact areas within wetlands and or other waters are incorporated into the plans for this project. Remove temporary fill placed and sedimentation in wetlands or other waters. Restore these wetlands to preconstruction contours.



Estimated Quantities

SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline: Funding A	100% City: Funding B
103	0100	CONTRACT BOND	L SUM	1	
202	0105	REMOVAL OF STRUCTURE	L SUM	1	
202	0130	REMOVAL OF CURB & GUTTER	LF	1524	
202	0136	REMOVAL OF PAVEMENT	TON	3470	
202	0170	REMOVAL OF CULVERTS-ALL TYPES & SIZES	LF	32	
202	0230	REMOVAL OF INLETS	EA	1	
202	0350	REMOVAL OF TEMPORARY BYPASS	EA	1	
203	0101	COMMON EXCAVATION-TYPE A	CY	10801	
203	0109	TOPSOIL	CY	716	
203	0113	COMMON EXCAVATION-WASTE	CY	3297	
203	0140	BORROW-EXCAVATION	CY	1212	
210	0050	BOX CULVERT EXCAVATION	EA	1	
210	0210	FOUNDATION FILL	CY	2008	
210	0250	BOX CULVERT FOUNDATION AGGREGATE	CY	246	
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1	
216	0100	WATER	M GAL	170	
251	0200	SEEDING CLASS II	ACRE	1.07	
251	2000		ACRE	1.04	
253	0201		ACRE	2.11	
255	0102		SY	2/3	
256	0201		ION	1405.5	
260	0200			635	
260	0201			635	
201	0112			620	
201	0113	REMOVE FIBER ROLLS 12IN		20	
202	0100			100	
202	0101			100	
302 401	0120	AGGREGATE BASE COURSE CL 5	CAL	4040 285 8	
401	0050		GAL	200.0	
401	0000	BLOTTER MATERIAL CL 11		21.5	
/30	0045			1113	
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT	TON	430	
430	1000		FA	12	
430	5821	PG 58V-34 ASPHALT CEMENT	TON	66.8	
550	3005	CONCRETE MEDIAN PAVEMENT	SY	521	
606	1010	10FT X 10FT PRECAST RCB CUI VERT	IF	228	
606	5010	10FT X 10FT PRECAST RCB END SECTION	EA	2	
702	0100	MOBILIZATION	LSUM	- 1	
704	0100	FLAGGING	MHR	96	
704	1000	TRAFFIC CONTROL SIGNS	UNIT	3492	
704	1038	ATTENUATION DEVICE-TYPE B-40	EA	2	
704	1052	TYPE III BARRICADE	EA	17	
704	1060	DELINEATOR DRUMS	EA	242	
704	1067	TUBULAR MARKERS	EA	43	
704	1087	SEQUENCING ARROW PANEL-TYPE C	EA	2	
704	1500	OBLITERATION OF PAVEMENT MARKING	SF	5627	

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-CPU-4-083(142)198	8	1
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		5627	

Estimated Quantities

SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline: Funding A	100% City: Funding B
704	3511	STATE FURNISHED MEDIAN BARRIER	LF	250	
708	1540	INLET PROTECTION-SPECIAL	EA	1	
708	1541	REMOVE INLET PROTECTION-SPECIAL	EA	1	
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	4265	
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	1125	
714	4100	PIPE CONDUIT 18IN	LF	100	
714	4101	PIPE CONDUIT 18IN-STORM DRAIN	LF	36	
722	3510	INLET-TYPE 2	EA	1	
748	0140	CURB & GUTTER-TYPE I	LF	1632	
754	0162	REMOVE & RESET DELINEATORS	EA	13	
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	164	
754	0592	RESET SIGN PANEL	EA	10	
754	0806	OBJECT MARKERS - TYPE III (BACK TO BACK)	EA	2	
762	0110	EPOXY PVMT MK 4IN LINE-GROOVED	LF	4725	
762	0132	EPOXY PVMT MK 8IN LINE-GROOVED	LF	1665	
762	0135	EPOXY PVMT MK 24IN LINE-GROOVED	LF	72	
762	0136	EPOXY PVMT MK MESSAGE-GROOVED	SF	128	
762	0420	SHORT TERM 4IN LINE-TYPE R	LF	18364	
762	0426	SHORT TERM 24IN LINE-TYPE R	LF	52	
762	1140	PVMT MK PAINTED CURB TOP & FACE	LF	1580	
764	0145	W-BEAM GUARDRAIL END TERMINAL	EA	1	
764	2081	REMOVE END TREATMENT & TRANSITION	EA	1	
772	2810	TEMPORARY TRAFFIC SIGNALS	EA	2	
772	2904	REVISE TRAFFIC SIGNAL SYSTEM	EA	1	
772	8000	PAINT SIGNAL STANDARD	EA		3
772	8001	PAINT SIGNAL STANDARD MA	EA		3
900	1000	TEMPORARY STREAM DIVERSION	EA	1	
930	8230	SHORING	EA	1	

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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3	10484+	06	-	16	64						
3	10484+	58	-	16							
	Total		otal	128							
MK P/	1K PAINTED CURB TOP & FACE										
STA	End ST	A		LF	Subtotal						
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MATERIALS BASIS OF ESTIMATE

Removal of Pavement: Includes removal of median concrete, exst bit pvmt, underlying aggr base material

2 Ton/CY for concrete and asphalt materials 1.875 Ton/CY for aggregate

Water: 10 Gal/CY for Embankment 20 Gal/Ton for Aggregates 25 M Gal/Mile for Dust Palliative

Riprap Grade II: 1.5 tons/CY

Aggregate Base Course CL 5: 1.875 Ton/CY

Commercial Grade Hot Mix Asphalt: 2 Ton/CY

Superpave FAA 45: 2 Ton/CY

Asphalt Cement: 6% of Asphalt

Tack Coat: 0.05 Gal/SY

Prime Coat: 0.35 Gal/SY

762	2-0132 EPO	XY PVMT MK	GROOVED	- 8IN	
Туре	Location	Start STA	End STA	LF	Subtotal
Channel Line	NB	10473+94	10475+80	186	
	SB	10483+84	10487+54	370	687
	NB	10484+06	10485+37	131	
Gore Perimeter	SB	10476+93	10478+93	409	015
	NB	10478+48	10480+64	436	045
Gore 45 Degree	SB	10476+93	10478+93	78	400
@ 15'	NB	10478+48	10480+64	55	133
				Total	1665

762-0135 EPOXY PVMT MK GROOVED - 24IN										
Туре	Location	Start STA	End STA	LF	Subtotal					
Stop Bar	Off Ramp	10480+75	10480+99	24						
·	NB .	10480+88	10480+88	24	72					
	NB	10481+54	10481+54	24						
				Total	72					

			STATE	TE PROJECT NO.				SECTION NO.	SHEET NO.	
			ND	1	NH-CPU-4	1-083(1	42)198		10	1
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762-0136 EI	POXY PVMT	MK MESS	AGE -	MESSA	GE					
Туре	Location	Start STA		SF	Subtotal					
Left Turn	NB	10473+94		16						
Arrow	NB	10474+46	'	16	64					
	SB	104/8+41		16						
	SB	10478+93		16						
Right Turn		10470+09		16						
Arrow		10479+01		16	64					
	NB	10484+00		16						
		10404130	ר ^י	Total	128					
			L		120					
762-1140		AINTED CU	RB TC	P & FA	CE					
Location	Start STA	End STA		LF	Subtotal					
S Median	10476+94	10480+97	/	805						
Off Ramp	10480+57	10480+75	5	77	1500					
On Ramp	10480+64	10482+66	5 4	444	1580					
N Median	10481+42	10482+65	5 2	254						
		ļ	-	Total	1580					
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			ND		NH-CPU-4	4-083(1	42)198	10	1
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762-0136 EF	POXY PVMT	MK MESS	AGE -	MESSA	GE				
Iype	Location	5tart 51A		5F 16	Subtotal				
	NB	10473+94		16					
Arrow	SB	10474+40 10478+41	'	16	64				
	SB	10478+93		16					
Right Turn	NB	10478+59		16					
	NB	10479+01		16					
Anow	NB	10484+06		16	64				
	NB	10484+58		16					
			1	Total	128				
[1			
762-1140	RB TC	P & FA		1					
Location	Start SIA				Subtotal	-			
S iviedian	10476+94	10480+97	[] {	805					
Опкатр	10480+57	10480+75	2	//	1580				
Unkamp	10480+64	10482+66) 4	444					
IN IVIEDIAN	10481+42	10482+65)	Z54 Total	4500	-			
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		Ва	sis of	Estimate	e				131
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762	2-0110 EPO	XY PVMT MK	GROOVED	- 4IN	
Туре	Location	Start STA	End STA	LF	Subtotal
White Edge	NB	10477+53	10482+63	532	
Line	SB	10478+24	10480+57	257	
	Off Ramp	10480+42	10480+76	103	1620
	NB	10480+64	10484+44	381	1020
	SB	10481+12	10483+84	273	
	On Ramp	10483+04	10483+84	84	
Yellow Edge	NB+SB	10476+94	10480+88	784	
Line	On Ramp	10480+64	10482+82	244	2274
	Off Ramp	10480+91	10481+12	75	
	NB	10481+54	10485+93	440	2274
	SB	10481+54	10487+34	581	
	Off Ramp	19+48	21+04	150	
White CL	NB	10467+50	10480+88	335	
Skip	SB	10475+29	10480+76	137	821
	NB	10481+54	10485+93	110	521
	SB	10481+54	10491+09	239	
				Total	4725

	Temporary Asphalt										
Begin Station	End	Length	Cross-Sectional (See Typical Sec	Area ctions)	302 0120 Aggregate Base	430 0500 Commercial Grade					
Deginetation	Station 10479+30 (RT) 10480+98 (LT)		Aggregate Base	HMA	Course CL 5	Hot Mix Asphalt					
		(LF)	(SF)	(SF)	(TON)	(TON) 26					
10478+00 (RT)	10479+30 (RT)	130	7.77	2.59	71	26					
10480+02 (LT)	10480+98 (LT)	96	5.6051	1.87	27	10					
10480+62 (RT)	10481+95 (RT)	133	6.86	2.29	64	23					
10480+93 (LT)	10481+75 (LT)	82	50.38	31.73	116	32					
10480+95 (LT)	10482+57 (LT)	162	9.82	35.28	881	264					
10481+38 (CTR)	10482+67 (CTR)	129	12.23	4.08	109	39					
10481+95 (RT)	10482+68 (RT)	73	20.45	6.82	99	36					
				TOTAL	1367	430					

				Pe	rmanent Asphalt				
Begin Station	End Station	Length	302 0120 Aggregate Base Course CL 5	4010060 Prime Coat @ 0.35 Gal/SY	4010160 Blotter Material Cl 44 @ 15 lbs/SY	4010050 Tack Coat @ 0.05 Gal/SY (2nd Lift)	4010050 Tack Coat @ 0.05 Gal/SY (3rd Lift)	430 0045 Superpave FAA 45 @ 2 TON/CY	4 P(Asph
		(LF)	(TON)	(GAL)	(TON)	(GAL)	(GAL)	(TON)	
10479+20 (LT)	10481+75 (LT)	255	1060	461.7	9.9	66.0	66	517	
10479+20 (LT)	10481+07 (LT)	187	426	153.7	3.3	22	22	155	
10479+29 (RT)	10481+95 (RT)	266	970	383.7	8.3	54.9	54.9	441	
. ,		TOTAL	2456	999.1	21.5	142.9	142.9	1113	

Permanent Medians						
Begin Station	End Station	Length	302 0120 Aggregate Base	550 3005 Concrete Median		
		(LF)	(TON)	(SY)		
10476+94 (RT)	10479+30 (RT)	236	220	97		
10479+30 (RT)	10480+99 (RT)	169	242	129		
10480+57 (LT)	10480+76 (RT)	19	59	31		
10480+64 (RT)	10482+66 (RT)	202	307	158		
10481+40 (CTR)	10481+78 (CTR)	39	55	29		
10481+78 (CTR)	10482+65 (CTR)	87	140	77		
		TOTAL	1023	521		

HMA Cored Samples							
	A B		С				
Specification Section	Distance (FT)/1000	Lanes	Joints	Lifts	Sublots (AxBxC)	Quantity (1 per mile)	Unit
430.04 I.2.b(2). "Pavement Density Cores"	576 / 1000 = 1	4	N/A	3	12	N/A	EA
				TOTAL	12	0	EA

STATE	PROJECT NO.		SECTION NO.	SHEET NO.
ND	NH-CPU-4-083(1	42)198	10	2
30 5821				
3 58V-34 alt Cem∉	ent			
0.0%				
(TON) 31.0				
9.3				
<u>26.5</u> 66.8				
		DROF	ESS/0	v.
			×	
Basis of I	Estimate		CHLER	15
		PEA PEA	28347	NE
ucture Pr	anlacement	DATE C	2/12/202	5/-0/
282 Cor	th of US 2	NORTL	DAKOT	M
5 05, 500			~~~~	·

Earthwork Summary					
Location	Common Excavation - Type A (Pay Item)	Embankment Volume*	Borrow- Excavation (Pay Item)	Common Excavation - Waste (Pay Item)	Topsoil** (Pay Item)
	CY	CY	CY	CY	CY
Mainline US 83					716
Channel					
Phase 2: Sta 26+75 to Sta 29+1	5,544	3,246	-	2,298	-
Phase 3: Sta 25+14 to Sta 26+7	5,208	4,209	-	999	-
Temporary Ramp					
Sta 10+53.52 to Sta 14+65.15	49	1,261	1,212	-	-
Totals=	10,801	8,716	1,212	3,297	716

*Additional 25% volume included for shrinkage **Assumed 6 inch depth for topsoil areas

	STATE	PROJECT NO.		SECTION NO.	SHEET NO.
	ND	NH-CPU-4-083(1	42)198	11	1
			PROF	ESSIO	
					AL
E	arthwork	Summary	BOE	CHLER	NG
			Elerype	2834PC	and z
<u> </u>			DATE C	2/12/202	5/~v/
Str	ucture Re	epiacement	NODT		\mathbf{A}
U	S 83, Sou	th of US 2	~~~/h	DAKU	/



	STATE			SECTION	SHEET
			12)108	<u>№</u> .	NO. 1
	ND	NH-CF0-4-003(1	42/190	20	1
			-05	ESSIE	
			PRUI		$ _{\mathcal{A}}$
Flota	ation Silt (Curtain Detail	MAF	RY ANN	1E
			BOE BOE	CHLER	GI
			UN UN	20341	THE E
Str	ucture Re	eplacement	DATE C	2/12/202/ /	5/ ~ /
U	S 83, Sou	th of US 2	NORTH	DAKOT	A



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-CPU-4-083(142)198	20	2

ion Control Blanket (ECB)							
ре	Unit Total Quantity						
am	No	Quantity	Type 1	Type 2	Type 3	Type 4	
ch)		(SY)	(ŜY)	(ŜY)	(ŜY)	(ŜY)	
5	1	16		16			
(SYs)				16			

TRAVERSABLE END SECTION						
IA	x	Y	Surface area to be protected	ECB		
n	Ft	Ft	SF	SY		
8	7.7	18.8	140.3	16		
ote: Quantities based on 4:1 slope.						



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-CPU-4-083(142)198	20	3
	Inlet Protection Device		
<u>s:</u>			
tightly ce at le	against drain opening and cover entire g ast 2 inches past the grate toward the str	rate. reet.	
egmer	its at longer openings.		
evice s	o that water cannot flow behind it.		
arial th	at falls into the inlet during maintenance	or	
evice.		01	
·SY)			
,			
		FSC	
	DPROF	13310	A
	MAR	ANN ANN	E
	BOE	CHLER	chez
		20017	
	Mar C		
		DAKO	ン
	Inlet Protection Devi	ce	
	Structure Replaceme	ent	
	US 83, South of US	2	



	STATE	PROJECT NO.		SECTION NO.	SHEET NO.					
	ND	NH-CPU-4-083(14	42)198	30	1					
	4:1									
	sified Bas	3e								
	- Varies -									
		4:1								
			PROF	<u>ESS/0</u>	Kar					
5	sting ⊤ypi	cal Sections	MAF	Y ANN	(E)					
			IS BOE	CHLER	GI					
			Der A	mn Doe	cher					
r	ucture Re	eplacement	DATE C)2/12/202 /	5/ ~ /					
	S 83, Sou	th of US 2	NORTH	DAKOT						



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-CPU-4-083(142)198	30	2
, r		4:1		
	– 7.0" S	uperpave FAA 45		
C	synthet	ic Material Type G		
J.	gregate	Base Course Class 5		
	— 7.0" — 7.0" Geosynth and Gut	4:1 Ceo Ceo Ceo 15.0" Aggregate Base Course Class 5 Superpave FAA 45 netic Material Type G ter Type 1 (Sec A)		
		Note: See Section 90 fo	r variable	widths



STATE	PROJECT NO.		SECTION NO	SHEET NO.
ND	NH-CPU-4-083(14	42)198	30	3
Asphalt	4.1			
emporary Typical \$	Pavement Section	PROF BOE BOE DATE O	ESS/0, RY ANN CCHLER 28347 MM Doc 02/12/202	ARL ENGINEER
ucture Re	eplacement	Non-		N
5 83, Sou	th of US 2	- vr l H	DAKU	~



STATE	PROJECT NO.	SECTIO	N SH	EET O.
ND	NH-CPU-4-083(142)198	40		1
DE BID IT	EM	QTY	UNIT	
0 REMC 10476 10480 10480	VAL OF CURB & GUTTER +94 to 10480+98 +64 to 10482+66 +65 to 10480+75 +40 to 10482+65	814 444 34 232	LF LF LF	-
6 REMC 10479	VAL OF PAVEMENT +20 to 10481+95			
BITUM AGGR	IINOUS EGATE	1284 1532	TON TON	
10476 CONC AGGR	+94 to 10480+98 RETE EGATE	46 247	TON TON	
10480 CONC AGGR	+56 to 10480+76 RETE EGATE	7 31	TON TON	
10480 CONC AGGR	+63 to 10482+66 RETE EGATE	36 166	TON TON	
10481 CONC AGGR	+39 to 10482+66 RETE EGATE	22 99	TON TON	

Begin Station / Location	Begin Offset	End Station / Location	End Offset		Pipe Installation (Pay Item)	1	Allowable Material	Required Diameter	Steel Pipe Coatings	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness	Geosythe Material Type G
				In	Bid Item	LF		In	Туре	-	In	SY
	SCL	US83										
1A		10480+72	68' Rt	18	Pipe Conduit - Storm Drain	36	Reinforced Concrete Pipe - Class III (barrel length = 36 LF)	18				
F	R TEM	IP RAMP					· · · · ·					
							Reinforced Concrete Pipe - Class III (barrel length = 100 LF)	18				
10,50	2511+	12.27	201 04	10	Dine Conduit	100	Corrugated Steel Pipe	18	Z, A, P	2	0.064	1
12+52	25 LI	13+37	29 RI	10	Pipe Conduit	100	Spiral Rib Steel Pipe	18	Z, A, P	3/4, 1	0.064	1 -
							Polypropylene Pipe (AASHTO M330, Type S)	18				1
							· · · · · · · · · · · · · · · · · · ·			· ·		

<u>Corrugations:</u> 2 = 2-2/3"x1/2"

<u>Coatings:</u> Z = Zinc A = Aluminum P = Polymeric (over Zinc or Aluminum)

<u>Spiral Ribs:</u> 3/4 = 3/4"x3/4"@7-1/2" 1= 3/4"x1"@11-1/2"

(*) End sections are measu FES = Flared End Section TES = Traversable End Sec

Stru US 83, South of US 2

	s	TATE		PROJEC	CT NO.			SECTION NO.	SHEET NO.
	١	١D	1	NH-CPU-4-0	83(1	42)198		51	1
ne al G	tic	В	(*) End Se egin	ections End	_ Ap B	plicable ackfill			
			EA	EA					
				TES	St D-	andard 714-27			
			-	-	St D-	andard 714 - 26			
as on Se	urec	d and p	baid for s	eparately for p	oipe e>	tensions.			
ļ	Allov	vable	Pipe Lis	t		REGISTERED	ROF MAR BOE PE	ESS/0) EY ANN CCHLER 28347 MM Doc 2/12/202	WAL ENGINEER
tr	uctu	ure Re	eplacem	ent					×/
J	S 83	3, Soi	th of US	52			RTH	DAKO	ン



STATE	PROJECT NO.		SECTION NO.	SHEET NO.
ND	NH-CPU-4-083(1	42)198	60	1
DE BID IT	EM		QTY L	INIT
0 REMO	VAL OF CULVERTS-ALL TY	PES & SIZES		
Sta 10	480+71- 30' Rt to Sta 10480+	-72 - 63' Rt	32	LF
30 REMC 10480	VAL OF INLETS +71-30' Rt		1	EA
01 PIPE (Sta 10	CONDUIT 18IN-STORM DRA 480+71- 30' Rt to Sta 10480+	IN -72 - 67' Rt	36	LF
0 INLET	-TYPE 2			
10480	+71-30' Rt		1	EA
0 TEMP Chann	ORARY STREAM DIVERSIO el	N	1	EA
	Grate Elevation = 1720.56			
)	- Invert Elevation = 1716.00	181	N Pipe Cond	duit
	Base Elevation = $1/15.75$			
		Inlet Data:		
	1A	Inlet No.	1A Inlet - Ty	ne 2
		Grate Style	L	
	COD	Sta. (SCL_083) Grate Elev	10480+7	1-30' Rt
	Pipe	Base Elev. Invert Elev.	1715.75	
	<u>1</u>	H' Dist.	4.81	
		- D OF	ESSIO	
		(1) Phi		A
US	83	MAF	RY ANN	E
Plan &	Profile	S PE	28347	NIS
	a la comort	DATE C	mn Doe)2/12/202	25
		NOPTI	UDAV OT	
5 83, Sol	ith of US 2	11	UANU	/



	STATE	PROJECT NO.		SECTION NO.	SHEET NO.
	ND	NH-CPU-4-083(14	42)198	60	2
	DE BID ITE	EM		QTY U	INIT
	50 REMO	VAL OF TEMPORARY BYPA	SS		
	Tempo	rary Ramp		1	EA
	00 PIPE C Sta 12-	ONDUIT 18IN +52 - 25' Lt to Sta 13+37 - 29'	Rt	100	LF
			ROF	ESSIO	
	Tompere	n Pomo	L. Y.		A
		y namp Profile		CHLER	NG
			PE	28347	NE
r	ucture Re	eplacement	DATE O	2/12/202	25/-0/
	S 83, Sou	th of US 2	NORTH	DAKOT	A
	,				

								Wetla	and Imp	oact Ta	ble				
								USF	WS				1	Wetland M	it
					Wetla	and Impacts A	cre(s)	Ease Imp Acr	ement acts re(s)	Miti	gation Red	quired	11990 Ba	ank	
Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands ¹	Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Temp.	Perm.	EO 11990	USACE	USFWS	Location	Acre(s)	
1a	Sec.35, T155N, R83W	Riverine	Manipulated	Yes	-	-	-	-	-	N	N	-	-	-	
1c	Sec.35, T155N, R83W	Riverine	Manipulated	Yes	0.005	0.002	-	-	-	Y	N	-	Anderson Bank	0.002	
1d	Sec.36, T155N, R83W	Riverine	Manipulated	Yes	0.016	0.015	-	-	-	Y	N	-	Anderson Bank	0.015	
1f	Sec.36, T155N, R83W	Riverine	Manipulated	Yes	0.016	0.004	-	-	-	Y	N	-	Anderson Bank	0.004	
2	Sec.36, T155N, R83W	Ditch	Created	Yes	0.007	0.007	-	-	-	N	N	-	-	-	
3	Sec.36, T155N, R83W	Slope	Created	Yes	0.004	0.011	-	-	-	N	N	-	-	-	
					0.048	0.039	0.000	0.000	0.000					0.021	Γ

						Other W	aters Im	pact Tabl	e					
					Othe	er Waters							Other	' Wa
							In	pacts to O	ther Waters	;			Miti	gatio
						Acres		Permane (ad	nt Impact ² cre)		Linear Feet			
Number	Location	Туре	Feature	USACE Jurisdictional ¹	Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Perm Loss	No Loss	Temp.	Perm. (Fill/Drain)	Perm. (Cut)	EO 11990	U
OW 1b	Sec.35, T155N, R83W	Stream/River	Natural	Yes	0.005	0.006	0.000	0.003	0.003	25.000	22.000	0.000	Ν	
OW 1e	Sec.36, T155N, R83W	Stream/River	Natural	Yes	0.014	0.027	0.000	0.000	0.027	56.000	65.000	0.000	Ν	
	•			Totals	0.019	0.033	0.000	0.003	0.030	81.00	87.000	0.000		

¹ A wetland Jurisdictional Determination was issued by the USACE on 9/6/2023; NWO-2016-01355-BIS. ² Riprap in a stream not considered a permanent loss.

Wetlands

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US

		STATE			PR	DJECT NO.			SECTION NO.	SHEI NO	ET).
		ND		NH-CF	<u>-</u> ں	4-083(142)198		75	1	
M	itig	jation									
						Onsite)				
	N	litigat	ion					C	onstruct	ed	
	L	.ocati	on;	A	-)	Cons	tructed		Size		
		Ratio	0	Acre	s)	3	ite #		Acre(s)		
		-									
				0.00	0			L	0.000		
	-				1						
/a ₊:.	ter	Mitig	ation	1							
cic	חכ	ĸequ	irea								
U	SA	CE	us	FWS							
	Ν			N							
	N			N							
		I			1						
							/		<u> </u>		
ls	Miti	igation	and E	Invironm	ental		n P S	RUF	LJJ/0,	K)	、 、
		0						M۵	Y ANN	1/1	2
							SIL	BOI	ECHLER		<u>[</u>]
St	Structure Replacement						BAR	PEA	-28347 MM Doe	chlor	
							CC DA	TE C	02/12/202	5/7	6/
U	58	ss, Sou	tn of l	JS 2			No	RTI	UDAK OT	A	/
								11	IUANU	/	

Imp	oact Sur	mmary Tab	ble
Permane Impact Sun	ent nmary	Temporary additional	Impacts and information
Wetland Type	Total Acre(s)	Water Type	Total Acre(s)
Natural/JD (Fill/Drain)	0.000	Temporary Wetland JD	0.048
Natural/Non- JD (Fill/Drain)	0.000	Non-JD Wetland Temporary	0.000
Artificial/JD (Fill/Drain)	0.039		
Artificial /Non-JD (Fill/Drain)	0.000	Permanent OW	0.033 acre/ 87 LF
Total	0.039	Temporary OW	0.019 acre/ 81 LF
JD Natural (Cut)	0.000	Permanent OW-d	0.000
JD Artificial (Cut)	0.000	Temporary OW-d	0.000
Non-JD Natural (Cut)	0.000		
Non-JD Artificial (Cut)	0.000		
Total	0.000		

Mitigation Summary Table										
	Location	Onsite Acre(s)	11990 Bank Acre(s)	USACE/11990 Bank Acre(s)	USFWS Bank Acre(s)					
USACE Only		-		-						
EO 11990 Only	Anderson Bank	-	0.021							
USACE/11990		-		-						
USFWS		\ge		\searrow	-					
	Total	0.000	0.021	0.000	0.000					

Wetlands M

US

	STATE	PROJECT NO.		SECTION NO.	SHEET NO.
	ND	NH-CPU-4-083(142)198	75	2
/i+i	igation a	nd Environmental	PROF	ESS/0,	N)
111	iyalion a			-	Tr.
				ECHLER	NG
	ture Rer	blacement	PE	-28347	h
			DATE (02/12/202	5/-0/
5 8	33, South	n of US 2	NOPTI	UNAVOT	\mathbf{A}
			-11	IUANU	/



STATE	PROJECT NO.		SECTION NO.	SHEET NO.
ND	NH-CPU-4-083(1-	42)198	75	3
ading Tie	Line - Fill			
ading Tie	Line - Cut			
tland De	Line - Transition			
nporary	Wetland Impacts			
manent	(Fill/Drain) Wetland Impact	S		
manent nporary ((Cut) Wetland Impacts Other Water Impacts			
manent	(Fill/Drain) Other Water Imp	pacts		
			\sim	
		PROF	ESSIO	\sim
Wetla	ands		× · · · · ·	Ar l
		MAR BOF	er ann Chler)Z
		Elary PE.	283470	chlar
		DATE C)2/12/202	5/F)
ucture Re	eplacement	Non-	1	\mathbf{A}
5 83, Sou	uth of US 2		1 DAKU)	



STATE	PROJECT NO.		SECT NO	ION	SHE N(ET D.
ND	NH-CPU-4-083(1	42)198	76	3		1
DE BID IT	EM		QTY	U	NIT	
0 TEMF	ORARY COVER CROP					
10479	+01 to 10483+04		1.04	AC	RES	
1 HYDF						
10479	+01 to 10483+04		1.04	AC	RES	
0 SILT	ENCE SUPPORTED			_	_	
10479	+02 to 10480+54 - Lt		210	L	F	
10479	+10 to 10480+89 - Rt		205	L	_F	
10481	+30 to 10482+20 - Rt		120	L	.F	
10481	+63 to 10481+57 - Lt		100	L	.⊦	
1 REMO	VE SILT FENCE SUPPORTE	D				
10479	+02 to 10480+54 - Lt		210	L	.F -	
10475	1+10 to 10480+89 - Kt		205	L	-1.	
1040	+30 to 10482+20 - rti		120	L		
	+03 10 10401+37 - LL		100	L	.г	
2 FIBE	ROLL 12IN		20			
1040	+20 - Lt		20	L	.⊢	
3 REMO	DVE FIBER ROLL 12IN					
10481	+20 - Lt		20	L	.F	
0 FLOT	ATION SILT CURTAIN					
10481	+37 to 10481+67 - Rt		100	L	F	
1 REMO	OVE FLOTATION SILT CURTA	AIN				
10481	+37 to 10481+67 - Rt		100	L	F	
0 INLET	PROTECTION-SPECIAL					
10480)+71 - Rt		1	E	A	
1 REMO	NVF INI FT PROTECTION-SP	FCIAI				
10480)+71- Rt		1	E	A	
ndina Tie	Line - Fill					
duling Tir						
aung ne - alaa Tid						
	Mineated Existing					
W Line						
lvert Inie						
Fence	Supported					
tation S	lt Curtain					
mporary	Cover Crop & Hydraulic Mu	ılch				
		DOF	ESS	No.	_	
		Phu		~	V_>	
Sedimen	t and Erosion Control	/~~/ war	~		11	n
			(Y AP 	NN N		3
		S BUE	-UNLE ົາຊ ະ ທ	.K 157		<u>S</u>
		9 Arran A	m	Soe	chb	<u> </u>
		DATE C)2/12/	202	:5/-	ชั/
ucture R	eplacement	1 Ava		/.	/ \\ /	/
S 83, So	uth of US 2	VORTH	DAY	(0)	/	



STATE	PROJECT NO.		SECTION NO.	SHEET NO.
ND	NH-CPU-4-083(1	42)198	77	1
DE BID IT	ΈM		QTY	UNIT
0 SEED	ING CLASS II		4.07 4	0050
10479	+0110 10483+04		1.07 A	CRE5
)1 HYDR	AULIC MULCH			
10479	+01to 10483+04		1.07 A	CRES
10480	+72 - Rt		16	SY
10481	+05 to 10481+49 - Rt		124	SY
10481	+41 to 10481+78 - Rt		133	SY
10470			0.7	
10479	+00 10 10479+09 - Ll		0.7	
10400	- 34 to 10401 - 34 - 1 tt		234.0	
2 FIBER	ROLL 12IN			
10479	+01to 10480+34 - Rt		140	LF
10479	+03 to 10479+61-Lt		75	LF
10480	+03 to 10480+53 - Lt		60	LF
10481	+05 to 10481+41- Lt		60	LF
10481	+31to 10482+17 - Rt		105	LF
10481	+57 to 10481+63 - Lt		100	LF
10481	+61 to 10481+78 - Rt		60	LF
5 GEOS	SYNTHETIC MATERIAL TYP	PE RR		
10479	+80 to 10479+89 - Lt		7	SY
10480	+34 to 10481+34 - Rt		188	SY
ading Tie	Line - Fill			
ading Tie	Line - Cut			
ading Tie	Line - Transition			
etland De	lineated Existing			
w Line				
er Rolls	12IN			
eding Cla	ass II & Hydraulic Mulch			
B Type 2	2			
thetic Ma	terial Type RR typical unde	er all riprap		
		DOF	ESSIA	
		Pho		NA
Seaiment	and Erosion Control	/~~/		/m/
				1ZI
		S BOE		1
		A A	MA DA	chhe
		DATE	2/12/20	25/-0/
ucture Re	eplacement			<u> </u>
S 83, Sou	uth of US 2	WORTH	DAKO	15

	PRELI	MINARY SURVE	EY COORDIN		D CURVE DATA	<u>US 83 S</u>	South of US Hw	v <u>y 2 - Structur</u>	al Plate F	Pipe Replacemer	<u>nt</u>	-	STATE	PRO	лест NO. -083(142)	98	SECTION SHEET NO.
			1		CURV			03	FUBLIC								
PNT	STATION	NORTHING	EASTING		ARC DE	FINITION		CORNER	IRN	NORTHING	EASTING	PNT	NORTHING	EASTING MONUMENT D	ELEV ESCRIPTION	STATION	OFFSET
US 83 (SCL_US8	3)								T-´	55-N R-83-W							
Rec Sec Cor/Begi	in 10446+04.29	437,520.94	1,774,635.82					NE Cor Sec 35	11-L	442,807.70	1,774,685.92	GPS 83-1	440,847.81	1,774,539.91	1,714.41	10479+30	127' Lt
Rec 1/4 Cor	10472+45.55	440,162.08	1,774,660.81					E 1/4 Cor Sec 35	11 - M	440,162.08	1,774,660.81		#5 Rebar w/ gre	een plastic cap sta	mped "ULTEIG	SURVEY CC	NTROL"
Station Equation	US 83 (SCL_US83) at Offramp from US 2 / US	6 52 (EX_SWR)					SW Cor Sec 36	11 - N	437,520.94	1,774,635.82	GPS 83-2	441,003.59	1,774,915.69	1,711.65	10480+89	247' Rt
US 83	10480+75.29	440,991.78	1,774,668.69										#5 Rebar w/ gre	een plastic cap sta	mped "ULTEIG	SURVEY CO	NTROL"
Offramp from US 2 / US 52	23+98.75	440,991.78	1,774,668.69														
Station Equation	US 83 (SCL_US83) at Onramp to US 2 / US 52	2 (EX_SER)														
US 83	10482+23.49	441,139.97	1,774,670.09														
Onramp to US 2 / US 52	30+00.00	441,139.97	1,774,670.09														
Rec Sec Cor/End	10498+91.29	442,807.70	1,774,685.92														
													RE	FERENC	E MARKE	ERS	
												R Mkr #	Northing	Easting	Station	Offset	Alignment
Offramp from US	2 / US 52 (EX_SWF	٦)										198	438,356.08	1,774,700.26	10454+40	57' Rt	SCL_US83
Begin	6+00.00	441,684.51	1,773,046.76		Curve C_SWR1												
PC	6+63.01	441,667.00	1,773,107.28	PI	= 11+30.01												
PIC SWR1	11+30.01	441,537.19	1,773,555.88	Delta	= 18°30'59" (Rt)												
PT	15+88.88	441,271,63	1.773.940.03	Da	= 02°00'00"		Curve C SWR2										
PC	19+89.17	441.044.00	1.774.269.32	R	= 2.864.93	PI	= 20+75.54										
PLC_SWR2	20+75 54	440,994,89	1,774,340,36	т	= 467.00	Delta	= 34°06'42" (1 t)										
PT	21+56 77	440 994 07	1 774 426 72	1	= 925 87	Da	= 20°21'11"										
Station Equation	Offramp from US 2	2/US 52 (EX_SWR) at US 8	33 (SCL_US83)			B	= 281.51										
Offramp from Equation	d 23+08 75	440.991.78	1 774 668 69			т	= 86 37										
US 2 / US 52 LI	10490+75 20	440,991.78	1,774,668,60				- 167.60										
05 65	10480+75.29	440,991.78	1,774,000.09			L	= 167.60										
												_					
Onramp to US 2 /	US 52 (EX_SER)																
Station Equation	Onramp to US 2 / L	JS 52 (EX_SER) at US 83 (\$	SCL_US83)														and the state of the
Onramp to US 2 / US 52 Be	gin 30+00.00	441,139.97	1,774,670.09									All coor	rdinates and mea	surements		FES	SIONA
US 83	10482+23.49	441,139.97	1,774,670.09									on this	document derived	l from finition		PRU	- (m)
End	40+00.00	441,500.88	1,775,602.69											inituon.	4	NATI-	IANIEL E
								Assumed Co	ordinates				IALIZING BENCH	I MARK OPUS)	ME	1 SA	NUVIG Z
NOTES: Sheet 1 of US 83 Alignm Offramp from	1 tent based on R/W Plat t US 2 / US 52 based of	s 0083_183_1953_04_09 and 00 n Design Plans NHU-4-002(140)	083_197_2003_12_16 146, PCN 23190			Date Survey	r Completed 09/20/23	All coordinate County groun They are deri reference fra Combination	es on this sheet d coordinates. ved from the N/ me; North Dako Factor (cf) = <u>0.9</u>	are <u>Ward</u> AD83(<u>2011)</u> ta <u>North</u> Zone 9998530		X NAVE X GEO GEO	ID12B]	ac Git	LS. DATE O	-27505 22/12/2025 -5 1 DAKOTA
2/11/2025	5:39:55 PM N	IATHAN.SANDVIG G:\2022\22.1	2802\40083198.142\Survey\0	81CD_001.dgn		1										and the second s	Address of Additional Additi



STATE		SECTION NO.	SHEET NO.			
ND	NH-	82	1			
Northing	Easting	Station	Offset (ft)	Chai	n Elev	ation
40614.40	1774670.32	10476+97.94	5.2	SCL_U	S83 172	2.08
40614.48	1774678.18	10476+98.09	13.1	SCL_U	S83 172	2.06
				OUL	ESSIA	
				PKU		NA
Survev Da	ata Lavout			/) V V V V V V	/m/
	Layour		14		CHIFR	131
			Sin	PE*	28347	Z
			Jula	ry A	mn Boe	cher
	onlacomont		1ª	DATE O	2/12/202	25/ ~^ /
acture Re	epiacement			VODE	1	A
S 83, Sou	uth of US 2			~n lH	DAKU	~

US 83, South of US 2



STATE	PROJECT NO.					SECTION NO.		EET IO.
ND	NH		82		2			
Northing	Easting	Station	Offset (ft)	Chai	n	Eleva	ation	
40845.81	1774676.89	10479+29.40	9.6	SCL U	S83	1719	9.87	
41010.33	1774675.97	10480+93.91	7.1	SCL U	S83	1721	1.76	
41013.44	1774666.51	10480+96.92	-2.4	SCL_U	S83	1721	1.83	
41012.00	1774665.45	10480+95.48	-3.4	SCL_U	S83	1721	1.76	
41004.87	1774663.07	10480+88.33	-5.7	SCL_U	S83	1721	1.63	
40974.83	1774662.96	10480+58.29	-5.6	SCL_U	S83	172	1.02	
40964.44	1774663.46	10480+47.90	-5.0	SCL_U	S83	1720	0.89	
40912.48	1774668.59	10479+95.99	0.7	SCL_U	S83	1720).46	
40903.27	1774669.07	10479+86.79	1.2	SCL_U	S83	1720).37	
40836.48	1774669.36	10479+20.00	2.1	SCL_U	S83	1719	9.98	
41010.30	1774670.72	10480+93.83	1.9	SCL_U	S83	1722	2.08	
41004.83	1774675.07	10480+88.40	6.3	SCL_U	S83	1721	I.64	
40836.97	1774618.10	10479+20.00	-49.1	SCL_U	S83	1719	9.00	
40865.15	1774617.31	10479+48.18	-50.2	SCL_U	S83	1719	9.00	
40910.19	1774611.60	10479+93.16	-56.3	SCL_U	S83	1718	3.91	
40968.38	1774569.71	10480+50.95	-98.8	SCL_U	S83	1718	3.34	
41010.69	1774570.11	10480+93.26	-98.8	SCL_U	S83	1719	9.37	
41010.69	1774586.78	10480+93.42	-82.1	SCL_U	S83	1719	9.51	
41012.81	1774607.28	10480+95.73	-61.6	SCL_U	S83	1719	9.94	
41015.65	1774619.05	10480+98.69	-49.9	SCL_U	S83	1720).52	
41025.08	1774626.75	10481+08.19	-42.2	SCL_U	S83	1721	1.04	
41022.76	1774720.70	10481+06.76	51.7	SCL_U	S83	1720).74	
40845.42	1774717.65	10479+29.40	50.3	SCL_U	S83	1718	3.96	
40902.84	1774571.07	10479+85.43	-96.8	SCL_U	S83	1706	6.94	
40900.76	1774537.20	10479+83.02	-130.6	SCL_U	S83	1703	8.89	
40974.47	1774764.96	10480+58.90	96.4	SCL_U	S83	1705	5.75	
41025.37	1774616.71	10481+08.39	-52.3	SCL_U	S83	1720).32	
40987.90	1774599.07	10480+70.75	-69.6	SCL_U	S83	1719	9.91	
40994.34	1774601.03	10480+77.20	-67.7	SCL_U	S83	1719	9.98	
40994.00	1774624.96	10480+77.10	-43.7	SCL_U	S83	1720	0.67	
40990.94	1774627.92	10480+74.06	-40.8	SCL_U	S83	1720	0.64	
40974.79	1774627.59	10480+57.91	-40.9	SCL_U	S83	1720	0.36	
40972.34	1774622.95	10480+55.41	-45.5	SCL_U	S83	1720).24	
40990.84	1774600.98	10480+73.70	-67.7	SCL_U	S83	1720).35	
40991.00	1774624.92	10480+74.10	-43.8	SCL_U	S83	1720	0.99	
40974.85	1774624.59	10480+57.94	-43.9	SCL_U	S83	1720	0.69	
40981.47	1774697.48	10480+65.25	28.9	SCL_U	S83	1720	0.58	
40981.44	1774700.73	10480+65.26	32.1	SCL_U	S83	1720	0.67	
40981.42	1774703.98	10480+65.26	35.4	SCL_U	S83	1720).38	I

Survey Data Layout

Structure Replacement

US 83, South of US 2





STATE		SECTION NO.		SH N	EET IO.					
ND	NH	8	82		3					
Northing	Easting	Station	Offset (ft)	Chai	n	Eleva	ation			
41086.42	1774704.83	10481+70.27	35.2	SCL U	S83	1722	2.79			
41111.13	1774707.54	10481+95.00	37.7	SCL U	S83	1723	3.35			
41170.91	1774739.38	10482+55.08	69.0	SCL U	S83	1723	3.69			
41177.36	1774745.62	10482+61.59	75.2	SCL U	S83	1723	3.47			
41183.05	1774741.82	10482+67.25	71.3	SCL_U	S83	1723	3.85			
41169.66	1774707.77	10482+53.53	37.4	SCL_U	S83	1725	5.22			
41156.78	1774698.90	10482+40.57	28.6	SCL U	S83	1724	1.96			
41111.21	1774698.53	10481+95.00	28.7	SCL U	S83	1723	3.72			
41156.63	1774712.90	10482+40.55	42.6	SCL_U	S83	1724	1.98			
41056.81	1774862.14	10481+42.15	192.8	SCL_U	S83	1693	3.72			
41085.43	1774827.83	10481+70.45	158.2	SCL_U	S83	1706	6.87			
41179.79	1774743.10	10482+64.00	72.6	SCL_U	S83	1724	1.07			
41058.97	1774670.90	10481+42.50	1.6	SCL_U	S83	1722	2.82			
41064.64	1774672.74	10481+48.19	3.4	SCL_U	S83	1722	2.90			
41080.22	1774675.27	10481+63.79	5.7	SCL_U	S83	1723	3.23			
41111.43	1774675.55	10481+95.00	5.7	SCL_U	S83	1724	1.06			
41177.14	1774676.12	10482+60.71	5.7	SCL_U	S83	1725	5.97			
41177.24	1774664.12	10482+60.70	-6.3	SCL_U	S83	172	5.81			
41091.55	1774663.37	10481+75.00	-6.3	SCL_U	S83	1723	3.42			
41060.24	1774663.10	10481+43.69	- 6.2	SCL_U	S83	1722	2.71			
41060.20	1774667.10	10481+43.69	-2.2	SCL_U	S83	1723	3.21			
41177.19	1774670.12	10482+60.71	-0.3	SCL_U	S83	1726	5.31			
41062.29	1774722.25	10481+46.31	52.9	SCL_U	S83	1721	1.77			
41110.89	1774733.01	10481+95.00	63.2	SCL_U	S83	1722	2.29	1		
41091.88	1774627.91	10481+75.00	-41.7	SCL_U	S83	1722	2.47	1		
41076.93	1774628.04	10481+60.05	-41.5	SCL_U	S83	1722	2.10			
41080.68	1774623.28	10481+63.75	-46.3	SCL_U	S83	172	1.72	I		

Survey Data Layout

Structure Replacement

US 83, South of US 2





	STATE	PROJECT NO.		N	SHEET NO.
	ND	NH-CPU-4-083(142)198	90		1
DE	BID IT	QTY	U	NIT	
20	AGGR				
	Tempo	rary Median			
	10478	+00 to 10479+30	71	Т	ON
	10480	+02 to 10480+98	27	Т	ON
	Tempo	rarv Pavement			
	10480	+93 to 10481+75	116 T		ON
	Tempo	rary Ramp			
	10480	+95 to 10482+57	881	Т	ON
	Tempo	rary Median			
	10481	+38 to 10482+67	109	T	ON
	10481	+95 to 10482+68	99	Ť	ON
חו	COM				
0	10478		26	т	
	10470	$+00\ 10\ 1047\ 9+30$	20	т Т	
	10400	+02 to 10480+96	20	т Т	
	10460	+931010401+75	32	- T	
	10480	+90 to 10462+07	204	1' T	
	10481		39		
	10481	+95 to 10482+68	36	I	UN


STATE	PROJECT NO.	SECTIOI NO.	N	SHEET NO.
ND	NH-CPU-4-083(142)198	90		2
DE BID IT	EM	QTY	٩U	NIT
20 AGGR	EGATE BASE COURSE CL 5			
Mainliı 10479	ne +29 to 10481+95	970	тс	NC
Tempo 10480	orary Median +62 to 10481+95	64	тс	ON
5 SUPE	RPAVE FAA 45			
Mainliı 10479	те +29 to 10481+95	441	тс	 DN
о соми	IERCIAL GRADE HOT MIX ASPHALT			
Tempo 10480	orary +62 to 10481+95	23	тс	 DN
0 GEOS	YNTHETIC MATERIAL TYPE G			
Mainlii 10479	те +29 to 10481+95	1402	S	Y



:	STATE	PROJECT NO.		SECTIO NO.	N	SHEET NO.
	ND	NH-CPU-4-083(1	42)198	90		3
		, v	,			
ЭЕ	BID IT	EM		QTY	UNI	г
20		EGATE BASE COURSE CL	5			
	10479 [.]	+20 to 10481+75		1060	TON	1
	Ramp	+20 to 10/81+07		126		ı
	10475	-2010 10401-07		420	101	N
	Media	n Islands				
	10479	+30 to 10480+99		242	TON	1
	10481	+39 to 10481+78		59 55		N 1
	107 00	-37 10 10400+70		55	TOP	N
5	SUPE	RPAVE FAA 45				
	Mainlir			E 4 7		
	10479	+201010461+75		517	TOP	N
	Ramp					
	10479	+20 to 10481+07		155	TON	1
15	CONC	RETE MEDIAN PAVING				
	10479	+30 to 10480+99		129	SY	
	10480	+57 to 10480+76		31	SY	
	10481 [.]	+40 to 10481+78		29	SY	
0	CEOS		EC			
0	Mainlir		20			_
	10479	+20 to 10481+75		2282	SY	
0	CURB	& GUTTER -TYPE I		0.1.1		
	10479	+30 to 10480+99		344		
	10480	+55 to 10480+77		89		
	10781	+38 to 10481+78		82	LF	
			ROF	ESS	01	<
Ρ	avina	Layout	(1) Y !!			$\langle \rangle$
	Dhor	2	MAF	RY ANI	1)	E
	Phas	se s	S BOE	CHLEF	2	GI
			PEA PEA	2834	rech	E
			DATE C	2/12/2	025/	1-5/
uci	ture Re	eplacement	Ara			
58	3, Sou	th of US 2	- PORTH	DAK	oir	/
			~ ~		~	



Ş	STATE	PROJECT NO.	SECTIC NO.	N	SHEET NO.	
	ND	NH-CPU-4-083(142)198	90		4	
DE	BID IT	EM	QTY	1U	NIT	
20	AGGR	EGATE BASE COURSE CL 5				
	Media	n Islands		_		
	10476 [.]	+94 to 10479+30	220	Т	NC	
	10480	+64 to 10482+66	307	Т	NC	
	10481	+78 to 10482+65	140	Т	NC	
)5	CONC	RETE MEDIAN PAVING				
	10476 [.]	+94 to 10479+30	97	S	SY	
	10480	+64 to 10482+66	158	S	SY	
	10481 [.]	+78 to 10482+65	77	S	SY	
_						
0	CURB	& GUTTER -TYPE I				
	10476	+94 to 10479+30	477	L	_F	
	10480	+62 to 10482+68	456	L	.F	
	10481 [.]	+78 to 10482+67	184	L	F	

Paving Layout Phase 4 Structure Replacement US 83, South of US 2

SIGN NUMBER	SIGN SIZE	DESCRIPTION		AI RE BY P	NOU QUIF HAS	NT RED E NO.				
			1/4a	1/4k	2	3	REQUIRED	AMOUNT	TOTAL	
E5-1-48	48"x48"	EXIT GORE						35		
G20-1-60	60"x24"	ROAD WORK NEXT MILES	_					28		
520-10-60	60"x24"	NO WORK IN PROGRESS (Sign and installation only)	-	4	4	4	-	18	104	
320-2-40	36"x18"	PILOT CAR FOLLOW/ME (Mounted to back of pilot car)	4	4	4	4	4	18	104	
G20-4b-36	36"x30"	WAIT FOR PILOT CAR						18		
G20-50a-72	72"x36"	ROAD WORK NEXT MILES RT & LT ARROWS						43		
620-52a-72	72"x24"	ROAD WORK NEXT MILES RT or LT ARROW	4	4	4	5	5	36	180	
320-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE \$80 WHEN WORKERS PRESENT	3	3	3	4	4	59	236	
/11-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)						11		
11-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)			30	15	30	10	300	
11-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)						10		
13-1-24	24"x12"	NORTH (Mounted on route marker post)			26	11	26	7	182	
13-2-24	24"x12"	EAST (Mounted on route marker post)			4	4	4	7	28	
13-3-24	24"x12"	SOUTH (Mounted on route marker post)						7		
13-4-24	24"x12"	WEST (Mounted on route marker post)	_					7		
14-8-24	24"x12"	DETOUR (Mounted on route marker post)			26	11	26	7	182	
14-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT			6	6	6	15	90	
14-10-48	48"X18"	DETOUR (INSIDE ARROW) RIGHT or LEFT (mounted on barricade)	_		1		1	7		
11J-1-21	21 X 15"			-	-		-	1		
10-1-30 16-1-91	21"v1E"		-	-	22	21	22	9 7	46	
16-1-30	21 XI3 30"v21"		-	-	22	41	22	<u>،</u>	154	
16-2-24	24"x24"		-	-	Δ	4	4	14	50	
16-3-21	21"x15"	DIRECTIONAL ARROW UP (Mounted on route marker post)	-	-	4	4	4	7	2	
//6-3-30	30"x21"	DIRECTIONAL ARROW UP (Mounted on route marker post)	-	-	1	1	1	15		
1 1 30	30"x30"	STOP		-	2	2	2	17	34	
1-1-48	48"x48"	STOP			-		-	32		
1-2-48	48"x48"	YIELD	-			1	1	19	19	
1-2-60	60"x60"	YIELD						29		
1-3P	18"x6"	ALL WAY (Plaque)			4	4	4	10	40	
2-1-36	36"x48"	SPEED LIMIT (Portable only)	5	6	5	6	6	30	180	
2-1-48	48"x60"	SPEED LIMIT						39		
R2-1aP-24	24"x18"	MINIMUM FEE \$80 (Mounted on Speed Limit post)	3	4	3	4	4	10	4	
3-1-24	24"x24"	NO RIGHT TURN			1	1	1	14	14	
3-2-48	48"x48"	NO LEFT TURN						35		
3-5-30	30"X36"	LEFT or RIGHT TURN ONLY			1	1	1	18	18	
R3-7-36	36"x36"	RIGHT LANE MUST TURN RIGHT			3	5	5	11	5	
R4-1-4 8	48"x60"	DO NOT PASS						39		
R4-7-24	24"x30"	KEEP RIGHT SIGN						6		
84-7-48	48"x60"	KEEP RIGHT						39		
R5-1-30	30"x30"	DO NOT ENTER			1	1	1	17	17	
85-1-48	48"x48"	DO NOT ENTER						35		
R6-1-54	54"x18"	ONE WAY RIGHT or LEFT (Mounted on STOP or DO NOT ENTER post)						14		
<u> 1/-1-12</u>	12"x18"				•		-	11		
(10-6-24	24"X36"	STOP HERE ON RED	_		2	2	2	16	32	
11 20 49	40 X30	STREET CLOSED (Mounted on barricade)			1	1		12	14	
11 20 60	40 X30	BOAD CLOSED (Mounted on barricade)					-	12		
211-30-60	60"v30"	STREET CLOSED						15		
211-4a-60	60"x30"	STREET CLOSEDMILES ATLEAD ECCAE TRAIT IS ONET (Mild of barricade)	_	-				15		
V1-3-48	48"x48"	REVERSE TURN RIGHT or LEFT	-	-	-			35		
V1-4-48	48"x48"	REVERSE CURVE RIGHT or LEFT	1	1	4	7	7	35	24	
V1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT	1	<u> </u>	-			35		
V1-6-48	48"x24"	ONE DIRECTION LARGE ARROW			1	2	2	26	5:	
V3-1-48	48"x48"	STOP AHEAD						35		
V3-3-48	48"x48"	SIGNAL AHEAD						35		
V3-4-48	48"x48"	BE PREPARED TO STOP	2	2	2	2	2	35	70	
V3-5-48	48"x48"	SPEED REDUCTION AHEAD	3	4	3	4	4	35	140	
V4-2-48	48"x48"	LANE ENDS RIGHT or LEFT	2	2	2	2	2	35	70	
V5-1-48	48"x48"	ROAD NARROWS						35		
V5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE						35		
V5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW	_	_				35		
V6-3-48	48"x48"		_				_	35		
v8-1-48	48"x48"			<u> </u>	-			35		
V8-3-48	48"x48"	PAVEMENT ENDS	_	-				35		
vo-/-48	48"x48"		_	-	-			35		
vo-11-48	48"X48"		-	-	<u> </u>		-	35		
VO-12-48	48 X48		_	-	-		-	35		
VO-1/-40	40 X48		-	-	-			30		
V8-51 10	40 X40			-	-			35		
VO-04-40	40 X48			-	-			30		
V8-56-40	40 840		-	-	-			35		
V0-30-40	40 X48			-	-			35		
V12_1_/P	40 X40 48"v/9"		-	-	1	2	2	10	•	
V12-1-40	40 840	MPH ADVISORY SPEED PLACIE (Mounted on warning sign post)	1	1	1	2	2	13		
V13-4P	36"v26"		1	1	1	1		20	20	
V14-3-64	64"y48"	NO PASSING ZONE	+ •	<u> </u>	-		-	28	20	
V16-2P-30	30"x24"	FEET PLAQUE (Mounted on warning sign post)		-	-			10		
V16-7n-18	18"x12"	LEFT or RIGHT DIAGONAL ARROW (Mounted on delineator drum)	-	-	1	1	1	2		
				-			· ·	-		

									STA	TE		PRO.	SECTION NO.	SHEET NO.	
									N	D	NH-	CPU-4	-083(142)198	100	1
SIGN NUMBER	SIGN SIZE	DESCRIPTION				F BY 1/4a1/	AMOU REQUI PHAS	INT RED SE NC	A RE	TOTAL MOUNT QUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL			
V20-2-48 V20-3-48	48"x48" 48"x48"	DETOUR AHEAD or FT or MILE ROAD or STREET CLOSED AHEAD or FT or MIL	E				3	2		3	35 35	105 105			
V20-4-48	48"x48"	ONE LANE ROAD AHEAD or FT orMILE	r FT o	· MILI	=	4	1 4	-		4	35	140			
V20-7-48	48"x48"	FLAGGER	- <u>-</u> 0		-	2	22	2		2	35	70			
V20-52P-54	54"x18"	NEXT MILES (Mounted on warning sign post)				2	2 2	2		2	5 12	10			
V21-1-48 V21-2-48	48"x48" 48"x48"	WORKERS FRESH OIL					_	-	_		35 35				
V21-3-48 V21-5-48	48"x48" 48"x48"						1			1	35 35	35			
V21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED									35				
V21-50-48 V21-6-48	48"x48" 48"x48"	SURVEY CREW	or_MILE								35				
V21-50-48 V21-51-48	48"x48" 48"x48"	BRIDGE PAINTING AHEAD or FT MATERIAL ON ROADWAY					-				35 35				
V21-52-48	48"x48" 48"x48"	PAVEMENT BREAKS									35 35				
V22-8-48	48"x48"	FRESH OIL LOOSE ROCK									35				
V24-1-48	48"x48"	DOUBLE REVERSE CURVE									35				
							_	-							
							_	-							
SPECIAL SIG	GNS														
VZ 1	24x8	WB 28th Ave					3	3		3	2	6			
VZ 3	66x9	West 28th Ave					1	1		1	5	5			
VZ 4	66x9	East 28th Ave					1	1		1	5	5			
							_	-					NOTE.		
							_						If additional signs	are	
PEC & COD								-					required, units wi calculated using t	ll be he formula	
704-1000		TRAFFIC CONTROL SIGNS				тот	AL UI	ITS				3492	from Section III-1	8.06 of the	
													Design Manual. http://www.dot.nd	.gov/	
SPEC &		DESCRIPTION	UNIT		Q BY	UANTITY PHASE N	10.		то					-	
704-0100	FLAGGIN	G	MHR	1/4a	1/4b	2	3		QUA	96					
704-1036	ATTENUA	TION DEVICE-TYPE B-30	EA	10	10		-								
704-1038 704-1045	ATTENUA	ATION DEVICE-TYPE B-40 ATION DEVICE-TYPE B-75	EA EA			2	2			2					
704 - 1048 704 - 1050	PORTABL TYPE I BA	LE RUMBLE STRIPS	EACH										205	ESSIO	/
704-1052		BARRICADES	EACH	9	4	9	17			17			DPR0.		$\langle A \rangle$
704-1060	TRAFFIC	CONES	EACH	56	107	242	220			242					1m
704-1067 704-1070	DELINEA	R MARKERS TOR	EACH			39	43		-	43				RY ANN	1Z
704-1072	FLEXIBLE		EACH										2 hrand	MEZNOC	haz
704-1080	VERTICA	L PANELS - BACK TO BACK	EACH										L Internet	20347	
704-1085	SEQUEN	CING ARROW PANEL - TYPE A CING ARROW PANEL - TYPE B	EACH EACH				-		-					02/12/202	5/ ~> ′/
704-1087	SEQUENO OBLITER	CING ARROW PANEL - TYPE C	EACH	2 15	2 732	2 1988	2 2892			2 5627			Ala		
704-3501	PORTABL		LF	13	, 52								VORT	1 DAKO]	ア
704-3510 704-3511	STATE FU	JRNISHED MED BARRIER - STATE FURNISHED	EACH			250	210			250					
762-0200 762-0420	RAISED F	PAVEMENT MARKERS	EACH LF	2194	1479	7166	7525			18364		٦	Fraffic Control Device	s List	
762-0426	SHORT T		LF			28	24			52					
772-2810	TEMPOR	ARY TRAFFIC SIGNALS	EA			2	2			2			Structure Replacem	ent	
													US 83, South of US	o ∠	

							STATE			PRO	JECT NO.	SECTION NO.	SHEET NO.			
									ľ	ND		NH-	CPU-4	-083(142)198	100	1
SIGN	SIGN						AM	OUNT		тота	۹L	UNITS	UNITS			
NUMBER	SIZE	DESCRIPTION				E	REQ BY PH	IASE	NO.	AMOU REQUIF	INT RED	PER AMOUNT	SUB TOTAL			
W20-2-48	48"x48"	DETOUR AHEAD or FT or MILE				1/4a	1/4b	3 2	3 2	3		35	105			
W20-3-48 W20-4-48	48"x48"	ROAD or STREET CLOSED AHEAD or FT or _ MIL	E					3 2	2	3		35 35	105			
W20-5-48	48"x48"	RIGHT or CENTER or LEFT LANE CLOSED AHEAD or	rFTo	r_MILE	=	4	4	4 4	4	4		35	140			
W20-7-48 W20-8-18	48"x48" 18"x18"	FLAGGER STOP - SLOW PADDLE Back to Back				2	2	2 2	2	2		35 5	70 10			
W20-52P-54	54"x12"	NEXT MILES (Mounted on warning sign post)										12				
W21-1-48	48"x48" 48"x48"	FRESH OIL										35				
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or FT or MILE					1			1		35	35			
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED										35				
W21-5b-48 W21-6-48	48"x48" 48"x48"	RIGHT or LEFT SHOULDER CLOSED AHEAD or FT SURVEY CREW	or _ MILE	-			_	_		-		35 35				
W21-50-48	48"x48"	BRIDGE PAINTING AHEAD or FT										35				
W21-51-48 W21-52-48	48"x48" 48"x48"	PAVEMENT BREAKS										35				
W21-53-48	48"x48"											35				
W24-1-48	48"x48"	DOUBLE REVERSE CURVE										35				
								_								
SPECIAL SIG	INS]		
WZ 1	24x8	WB 28th Ave						3	3	3		2	6			
WZ 2 WZ 3	24x8 66x9	EB 28th Ave West 28th Ave						4 4 1 ·	4 1	4		2 5	8			
WZ 4	66x9	East 28th Ave						1	1	1		5	5			
								_	-							
								_	-	_						
														NOTE:		
														If additional signs	are Lbe	
SPEC & COD	E													calculated using t	he formula	
704-1000		TRAFFIC CONTROL SIGNS				тс	TAL	UNIT	s				3492	from Section III-1	3.06 of the	
											_			http://www.dot.nd	.gov/	
SPEC &		DESCRIPTION	UNIT		Q BY	UANTIT PHASE	Y NO.			TOTAL						
704-0100		IC	MUD	1/4a	1/4b	2	3	2		QUANTIN	r e					
704-1036	ATTENU	ATION DEVICE-TYPE B-30	EA	10	10	32				9	-					
704-1038	ATTENUA	ATION DEVICE-TYPE B-40 ATION DEVICE-TYPE B-75	EA FA			2		2	_		2					
704-1048	PORTABI	LE RUMBLE STRIPS	EACH								1				FSC	
704-1050 704-1052	TYPE I B	ARRICADES BARRICADES	EACH	9	4	9	1	7		1	7			PRUT	LJJ/0/	\sim
704-1060	DELINEA		EACH	56	107	242	22	26		243	2			<u> </u>		4
704-1065 704-1067	TUBULA	R MARKERS	EACH			39	4	13	-	4:	3			/ ST MA	RY ANN	1E
704-1070			EACH											BO	ECHLER	19
704-1072	STACKA	BLE VERTICAL PANELS	EACH											FlarypE	283470	naz
704-1081 704-1085	VERTICA	L PANELS - BACK TO BACK CING ARROW PANEL - TYPE A	EACH								_			Lun /		/m/
704-1086	SEQUEN	CING ARROW PANEL - TYPE B	EACH												02/12/202	5/ ~0 /
704-1087	OBLITER	CING ARROW PANEL - TYPE C	SF	2 15	2 732	2 1988	289	2	_	562	2			No		
704-3501	PORTAB		LF											VORT	1 DAKO)	ン
704-3510	STATE F	URNISHED MEDIAN BARRIER	EACH			250	21	0		25	0					
762-0200	RAISED F	PAVEMENT MARKERS	EACH	210/	1470	7166	752	5		1836	4	1	٦	Fraffic Control Device	s List	
762-0426	SHORT T	ERM 24IN LINE-TYPE R	LF	2104	473	28	2	24		5	2					
762-0430 772-2810	SHORT T	ERM 4IN LINE - TYPE NR ARY TRAFFIC SIGNALS	LF EA			2		2		:	2			Structure Device	ont	
											1	1		Siruciure Replacem	ent	
												1				
												1		US 83, South of US	52	



STATE	PROJECT NO.		SECTION NO.	SHEET NO.
ND	NH-CPU-4-083(14	42)198	100	2
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/aries	4:1			
	4:1			
k Zone Tr Typic ructure Re	raffic Control cals eplacement	PROF BOE BOE PEA DATE O	ESS/0, RY ANN CCHLER 28347 28347 22/12/202	APLENGINEER
S 83, Sou	th of US 2	WORTH	DAKOT	r/





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2/11/2025 12:08:33 PM mary boechler G:\2022\22.12802\40083198.142\Design\Sheets\100WZ_006_Phase1a_ConSign.dgn







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STATE				PROJEC	T NO.			SECTION NO.	SHEET NO.
ND		NH	-CPL	J-4-0	83(1	42)198	100	25
							AREA: 1.3 Sq.F	rt.	
1	24	4 in							
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₽	B 2	28 TH	AVE		ч т				
	4			 					
2		20	2						
		Lette	er locati	ions an	e pane	el ed	ge to lower left	corner	
				20	4 2	-	B 2000		
				20	-,2				
							AREA: 4.125 So	q.⊢t.	
	64	3 in							
	00	5 111					 		
ct	28	24	h	Δ					
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	5	3.3					6.4		
		Lette	er locati	ions ar	e pane	el ed	ge to lower left	corner	
				LENGTH	SIZ	E	SERIES		
				53.3	6/4.	5	D 2000		
							DOF	ESSIA	
							(DPMU)		NA
Sign D	Details					/	S MAR	RY ANN)E
							BOE	CHLER	GIN
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ucture R	enlace	ment				\backslash	🛩 🗸 date o	2/12/202	25/~~)
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																			STA	TE		PROJECT NO.		SECTION NO.	SHEET NO.
																			N.	D.	NH	I-CPU-4-083(14	12)198	110	1
Station / RP	Sign No.	Assembly No.	Flat S For S IV SF	heet igns XI SF	Sign S 1st LF	Support 2nd LF	Length 3rd LF	4th LF	Vert Clear- ance FT	Support Size	Max Post Len LF	Sleeve 1st LF	Length 2nd LF	3rd LF	4th LF	Sleeve Size	Anchor / EA	Anchor LF	Anchor Size	Rese Sigr Pane EA	et Res n Sig el Supp E/	set gn port Break-Awa A EA	ay Comment	s	
Mainline	Alignme	nt																							
10480+24 Lt	R1-2	4			13.4				7.0	2 x 2 12 ga	13.6						1	4	2.25 x 2.25 12 ga	n 1					
10480+73 Lt	R10-6	9			9.7				7.0	2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga	1 1					
10480+74 Lt	W12-1	19			10.2				7.0	2.25 x 2.25 12 ga	11.6						1	4	2.5 x 2.5 12 ga	1			Reset attac	hed deline	ator.
10481+14 Lt	R5-1a	33			12.3				7.0	2.5 x 2.5 12 ga	14.8						1	4	3 x 3 7 ga	1					
10481+40 Lt	R3-1	17			12.9	13.2			7.0	2.5 x 2.5 10 ga	13.9						2	4	3 x 3 7 ga	1		2			
10481+70 Lt	W1-8	10			10.0				6.0	2.25 x 2.25 12 ga	10.6						1	4	2.5 x 2.5 12 ga	1					
10482+07 Lt	W1-8	10			10.0				6.0	2.25 x 2.25 12 ga	10.6						1	4	2.5 x 2.5 12 ga	1					
10482+09 Rt	W1-8	10			9.2				6.0	2.25 x 2.25 12 ga	10.6						1	4	2.5 x 2.5 12 ga	1					
10482+26 Rt	W1-8	10			9.2				6.0	2.25 x 2.25 12 ga	10.6						1	4	2.5 x 2.5 12 ga	1					
10482+44 Rt	W1-8	10			9.2				6.0	2.25 x 2.25 12 ga	10.6						1	4	2.5 x 2.5 12 ga	1					
Sub Total			0.0	0.0		Total	119.3										Total	44.0		10	(0 2			
Grand Total			0.0	0.0		Total	119.3										Total	44	0	10	(0 2			,



2/11/25 1:42:32PM Page 1 of 1

Sign Summary Perforated Tube

Minot Structure Replacement





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STATE	PROJECT NO.		SECTION NO.	NO.
ND	NH-CPU-4-083(142)198	110	3
\langle				
\times				
\nearrow				
	Sta 10482+53 - 421' Lt Remain in Place			
] +06 - 384' Lt				
n in Place				
	×	TA		
	Ę	·D		
		nOF	ESSIA	
Permaner	nt Sianina	(DPRO)		NA
	- · · · · · · · · · · · · · · · · · · ·)E
		DE PF	-27961	G
		UN CON		
ructure R4	eplacement	DATE O	2/12/202	5/ ~ >/
		NOPTI	UDAVOT	A
S 83, Sou	ith of US 2		IUANU	/
















STATE	PROJECT NO.	SECTION NO	SHEET NO.
ND	NH-CPU-4-083(142)198	150	4
2 2 	Sta 10480+80 - 1' Rt Elev 1721.98' Right Slip Lane 2' -	Approach	Roadway
is: eset all com eset the EVI eset the vide kisting signa are masked	arm lengths are approximated. Field verify. ponents of the Traffic Signal System to provide a f P system to provide a functional system. eo detection system to provide a functional system al heads #6 and #7 are programmable signal heads from the northbound right turn lane to on ramp).	(directional here) (directional here) FESS/0, PAUL	em. eads
andards (& Head Locations	EUTSCH F-27961	NGIN

Structure Replacement

US 83, South of US 2



Conduit Run				Existing Cable Runs to be Re-Pulled (estimated based on asbuilts)			
Conduit Run #	Location	Length (FT)	Size (IN)	Qty	Туре	Title	
				3	No. 12 AWG 7 Conductor Cable	Signal Control Cable	
	Signal Controller		_	3	No. 16 AWG 3 Conductor Cable	Video Detector Cable	
1	to Conduit	31	Existing	3	Low Loss Coaxial Cable	Coax for Video Detection	
	Intercept		Ŭ	3	Emergency Vehicle Detector Cable	Emergency Vehicle Detector Cable	
				3	No. 12 AWG 2 Conductor Cable	Emergency Vehicle Indicator Lamp	
				3	No. 12 AWG 7 Conductor Cable	Signal Control Cable	
	Construit Internet		New	3	No. 16 AWG 3 Conductor Cable	Video Detector Cable	
2	to Pullbox T1	133	New	3	Low Loss Coaxial Cable	Coax for Video Detection	
			Ŭ	3	Emergency Vehicle Detector Cable	Emergency Vehicle Detector Cable	
				3	No. 12 AWG 2 Conductor Cable	Emergency Vehicle Indicator Lamp	
				1	No. 12 AWG 7 Conductor Cable	Signal Control Cable	
	Pu ll box T1to Signal SW	6	Now	1	No. 16 AWG 3 Conductor Cable	Video Detector Cable	
3			2.5"	1	Low Loss Coaxial Cable	Coax for Video Detection	
			210	1	Emergency Vehicle Detector Cable	Emergency Vehicle Detector Cable	
				1	No. 12 AWG 2 Conductor Cable	Emergency Vehicle Indicator Lamp	
				1	No. 12 AWG 7 Conductor Cable	Signal Control Cable	
	Dullbox T1 to		Now	1	No. 16 AWG 3 Conductor Cable	Video Detector Cable	
4	Signal SE	52	2.5"	1	Low Loss Coaxial Cable	Coax for Video Detection	
	0.9.00.01			1	Emergency Vehicle Detector Cable	Emergency Vehicle Detector Cable	
				1	No. 12 AWG 2 Conductor Cable	Emergency Vehicle Indicator Lamp	
				1	No. 12 AWG 7 Conductor Cable	Signal Control Cable	
	Dullbox T1 to		Now	1	No. 16 AWG 3 Conductor Cable	Video Detector Cable	
5	Pullbox T2	91	2.5"	1	Low Loss Coaxial Cable	Coax for Video Detection	
				1	Emergency Vehicle Detector Cable	Emergency Vehicle Detector Cable	
				1	No. 12 AWG 2 Conductor Cable	Emergency Vehicle Indicator Lamp	
				1	No. 12 AWG 7 Conductor Cable	Signal Control Cable	
	Bullbox T2 to		Now	1	No. 16 AWG 3 Conductor Cable	Video Detector Cable	
6	Signal NE	53	2.5"	1	Low Loss Coaxial Cable	Coax for Video Detection	
				1	Emergency Vehicle Detector Cable	Emergency Vehicle Detector Cable	
				1	No. 12 AWG 2 Conductor Cable	Emergency Vehicle Indicator Lamp	

Note:

Salvage, protect, and re-pull traffic signal wiring through new conduit. Existing traffic signal conduit runs and cable runs are based on asbuilts and survey. Field verify. New conduit runs must not exceed the length of the existing conduit runs in order to maintain existing cable slack.

Tra Condu

	STATE	PROJECT NO.		SECTION NO.	SHEET NO.
	ND	NH-CPU-4-083(1	42)198	150	5
			DOF	ESSIO	
Tr	affic Sigr	nal System	(J) Pri-		
onc	luit & Cab	ble Schedules	DF	'AUL UTSCH	E
			PE/	2/961	GN
			DATE O	2/11/2024	5/ 5 /
Str	ucture Re	eplacement	No		
U	S 83, Sou	th of US 2	VORTH	DAKO	/

SPEC	CODE	ITEM DESCRIPTION	QUANTITY	UNIT
772	0020	CONCRETE FOUNDATION - TRAFFIC SIGNALS	3	EA
772	0100	PULLBOX	2	EA
772	0260	2.5IN DIAMETER RIGID CONDUIT	202	LF
772	0270	3IN DIAMETER RIGID CONDUIT	133	LF
772	2990	REVISE CONTROLLER	1	EA
772	3021	RELOCATE MA SIGNAL HEAD	2	EA
772	3160	REMOVE CONCRETE PULL BOX	2	EA
772	3165	REMOVE CONCRETE FOUNDATIONS	4	EA
772	-	REMOVE/ABANDON CONDUIT (A)	1	LS
772	-	SALVAGE TRAFFIC SIGNAL AND EQUIPMENT FOR RESET (B)	3	EA
772	-	SALVAGE EMERGENCY VEHICLE PRE-EMPTION UNIT FOR RESET (C)	3	EA
772	-	SALVAGE VIDEO DETECTION CAMERA FOR RESET (D)	3	EA
772	-	SALVAGE AND RE-PULL CABLE (E)	1	LS
772	2904	REVISE TRAFFIC SIGNAL SYSTEM	1	EA

(A) Includes removal of traffic signal pipe conduit within limits of excavation and abandonment of traffic signal conduit beyond limits of excavation.

(B) Includes traffic signal base, pole, mast arm, heads, cables, wiring, mounting hardware, and all other traffic signal equipment.

(C) Includes emergency vehicle pre-emption (EVP) detector, light, cables, wiring, mounting hardware, and all other EVP equipment. (D) Includes video detection camera, cables, wiring, mounting hardware, and all other video detection equipment.

(E) Salvage and re-pull all existing cables, conductors, wiring, and incidental equipment through new conduit and existing conduit as shown in the plans to provide a fully operational traffic signal system, including video detection and EVP.

Items shown are for informational purposes. Provide all labor, materials, and equipment required for traffic signal system to be fully operational as shown in the plans. Include items in the corresponding bid price for "REVISE TRAFFIC SIGNAL SYSTEM."

Traffic Signal Standard Foundation Table (Use for Single Mast Arms Only)						
D	escription	Footing Depth, "D" 24" & 30" Diameters (ft)	Footing Depth, "D" 36" & 42" Diameters (ft)			
<u>Type IV</u>	Signal Standard					
0' - 25'	Signal Mast Arm	11, 11	11, 11			
26'-30'	Signal Mast Arm	12, 12	12, 12			
31'-35'	Signal Mast Arm	12, 12	12, 12			
36'-39'	Signal Mast Arm	13, 13	13, 13			
40' - 45'	Signal Mast Arm	16, 15	15, 15			

Note: Existing mast arm lengths are approximated at 8', 25', and 38'. Field verify mast arm lengths to ensure proper design depths & diameters are constructed.

Traffic Signal System Signal Quantities & Foundation Schedule

772 - 8 772

	STAT	E PROJECT NO.	SECTION NO.	SHEET NO.
	NE	NH-CPU-4-083(142)198	150	6
		TRAFFIC SIGNAL QUANTITIES		
SPEC	CODE	BID ITEM	QTY	UNIT
772	2904	REVISE TRAFFIC SIGNAL SYSTEM	1	EA
772	8000	PAINT SIGNAL STANDARD	3	EA
772	8001	PAINT SIGNAL STANDARD MA	3	EA

Structure Replacement







	5 CODL	HEM DESCRIPTION	UNIT	QUANTIT	HYDRAULIC DATA:				
202 210 210 210 256 606 606 709 709 900 930	0105 0050 0210 0250 0405 0201 1010 5010 0100 0155 1000 8235	REMOVAL OF STRUCTURE BOX CULVERT EXCAVATION FOUNDATION FILL BOX CULVERT FOUNDATION AGGREGATE FOUNDATION PREPARATION-BOX CULVERT RIPRAP GRADE II 10FT X 10FT PRECAST RCB CULVERT 10FT X 10FT PRECAST RCB END SECTION GEOSYNTHETIC MATERIAL TYPE G GEOSYNTHETIC MATERIAL TYPE RR TEMPORARY STREAM DIVERSION SHORING	L SUM EA CY EA TONS LF EA SY SY EA EA	1 1 2008 246 1 1162 228 2 581 930 1 1	Drainage Area Stream Gradient Design Frequency Design Discharge Design Headwater Stage Design Tailwater Stage Velocity Through Culvert 100-Year Frequency Discharge 100-Year Frequency Headwater Overtopping Stage Overtopping Discharge	14.30 0.0043 50 1035.0 1711.89 1700.11 19.41 1234.0 1713.48 1719.65 1642.1	sq mi ft/ft yr cfs ft ft fps cfs ft ft ft cfs	REGISTERED	MARY AN BOECHLE AMPE-2834 DATE NORTH DAX

STATE		PROJECT NO. SECTION SHEE NO. NO.						
ND		NH-CI	PU-4-083(142)198	3	170	1		
	€ Bo	x Culvert -	10'-0" 10'-0" 10'-0" 10'-0" 10'-0" 10'-0"					
The second secon								
			SPECIAL PR	OVISIO	DNS			
		SSP 2	MIGRATORY	BIRD TR	EATY AC	Г		
		SP299(24) TEMPORARY	WATER	DIVERSIO	DN		
			STANDARD [DRAWI	VGS			
		D-714-22						
			HL-93 DESIG	N LOA	DING			
			CRE	EK				
CLEAR SPAN 10' CLEAR HEIGHT 10' MAXIMUM FILL 17' STATION: 10480+50 PRECAST SINGLE BOX CULVERT LAYO						YOUT		
GINEEP		ND DEPA BRIDGE	RTMENT OF TRANS DIVISION / Thouman	PORTAT Jasoi 02/13	ION n Thorer 8/25	ison		
		DRAWING NO.			83-19	8.488-1		

- SCOPE OF WORK: Work at this site consists of removing an existing structure and building a new single barrel 10' x 10' x 228' precast concrete box culvert. The new precast culvert will have parallel wingwalls at the inlet and flared wingwalls at the outlet. The outlet structure will include a riprap basin.
- 202 REMOVAL OF STRUCTURE: The existing structure is a single 11.5' diameter x 234' long structural steel plate pipe. Include all work required to remove the existing SPP, concrete headwalls, and outlet concrete basin in the contract unit price for "Removal of Structure".

100

- 210 ORDINARY BACKFILL: Compact material as specified in Section 203.04 G.2.a, "ND T 180."
- 606 JOINTS: Provide joints in accordance with Section 606.E.3, with the exception that a 12" minimum width waterproof membrane is allowable around the exterior surfaces of the box culvert walls and roof.
- 606 PRECAST BOX CULVERT DESIGN: Design the box culvert and box culvert end sections in accordance with the AASHTO LRFD Bridge Design Specifications, 9th Edition. Design for HL-93 live load and a fill height of 17 ft over the box culvert.

Load rate the box culvert in accordance with both the NDDOT Load Rating Manual and the AASHTO Manual for Bridge Evaluation, 2018 Edition, incorporating the latest Interim Revisions. Provide a box culvert design to achieve a rating factor greater than or equal to 1.0 for the design, legal, and permit trucks at the specified fill height.

Include with the work drawing submittals a Load Rating Report sealed by a ND registered PE, and an AASHTOWare BrR Model of the structure in XML format.

606 PRECAST SECTION: Tie the precast barrel and precast end sections together with 1"Ø tie bolts as shown on Standard Drawing D-714-22. A lock nut or lock washer may be provided in lieu of tack welding as shown in the standard drawings. Place ties in the exterior walls of each precast segment. Use two ties per exterior wall joint, located at the one-third points of the wall's clear height.

Do not cast lifting holes through the roof, walls, or floor of the precast barrel or precast end sections. Provide precast barrel and precast end sections that incorporate cast-inplace anchors into the sections that are designed for lifting and handling the precast sections. Provide anchors that are part of a lifting system that has been designed for the anticipated loading that will result from lifting, moving, transporting, and setting the precast units. Galvanize all components of the lifting system that will remain part of the precast structure.

Payment for the Precast RCB End Section includes both the sloped end section on the inlet end and the flared end section on the outlet end. The payment also covers the apron, cutoff wall, parapet, and wingwalls.

NOTES

Connect the sloped end section to the bac centers through the last sloped end section ³/₄" diameter reinforcing bars. Additionally end section to accommodate ³/₄" diameter Install the bars according to the manufact strength adhesive specifically intended for Section 806.02.

For the flared end section, attach the april both the last barrel section and the apron connecting the apron to the box and wing section using tie bolts, steel-bolted plates corner surface is smooth. Cast holes at 3 apron and into the cutoff wall to receive 3 last barrel section at 2'-0" centers for 3/4" of Cast parapet against the section. Install to recommendations, with a high strength a anchorage, in accordance with Section 8

Include all labor, equipment, and materia section bid items.

930 SHORING: Design and provide shoring a complete the structure replacement.

Provide a shoring plan design completed in accordance with Section 105.08, "Wor the Engineer at least 21 calendar days be shoring.

Construct any necessary shoring as desc there are changes to the shoring, notify the plan design to the Engineer. Submit the to incorporating any changes into the sho

Include all costs to design, construct, ma price bid for "Shoring". Such payment is equipment, labor, and incidentals to com

23 U.S.C. 407 NDDOT Reserves All Objections

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.		
	ND	NH-CPU-4-083(142)198	170	2		
arre on y, er r ctui or o	rrel sections using tie bolts. Cast holes at 3'-0" on segment and into the cutoff wall to receive y, cast holes at 2'-0 centers in the first sloped r reinforcing bars for attaching the parapet. turer's recommendations, utilizing a high- or concrete anchorage, in accordance with					
ron J. gw 3'- 3'4" dia the idh	to the Provid alls. r othe 0" cer diame amete bars bars bars bars	e last barrel section and the v de a welded tie type system for Connect the wingwalls to the er approved methods so the in hters through the flared end s eter reinforcing bars. Cast hole r reinforcing bars to attach the according to the manufacture specifically intended for cond	vingwal or last ba nside ection les in th e parap er's crete	lls to rrel ne pet.		
al c	osts f	or the precast culvert and pre	ecast er	nd		
as necessary during the traffic control phasing to I by a licensed Engineer and submit the design				ig to gn		
efo	ore sta	arting construction of any nec	essary	11 10		
cril he re orii	cribed in the shoring plan design submittal. If he engineer and resubmit the revised shoring revised shoring plan design at least 7 days prior pring.					
fu	ll com	pensation for furnishing all me work as specified.	aterial,			
		AND PROF AND PROF BO DATE NOPTH	ESS/0 RY ANN ECHIER 28347 D2/13/202	APLENGINEER 55 A		



1. Extend the geosynthetic, bedding material and box culvert foundation aggregate material below the box culvert to the end of the apron. 2. Provide bedding and backfill for the box culvert wingwalls as specified by the supplier of the precast components.



STATE		PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-C	CPU-4-083(142)198	170	3
	8	30'-0"	-	
	10-20-09 11-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	20:1		
		SPECIAL PROVISIO	DNS	
10NA	SP 389(24) STRUCTURAL AND C EXCAVATION FOUND	HANNEL ATION	
IN Rpechar 2025		PRECAST BOX CULVE STATION: 10480+ EXCAVATION & BACKFIL	ACEMEN RT 50 L DETA	T
	DRAWING NO.		83-198	3.488-3

Extru

extruded

?	This is a special text character used in the labeling	C Gdrl	cable guardrail	Culv	culvert	FOS
	of existing features. It indicates a feature that has	Calc	calculate	C&G	curb & gutter	Fed
	an unknown characteristic, potentially based on:	CIP	cast iron pipe	CI	curb inlet	FP
		СВ	catch basin	CR	curb ramp	Fn
Abn	abandoned	CRS	cationic rapid setting	С	cut	Fn P
Abut	abutment	C Gd	cattle quard			FO
Adi	adjusted	C To C	center to center	Dd Ld	dead load	FD
Agar	aggregate	CL or C	centerline	Defl	deflection	F.
Ahd	ahead	Ch	chain	Defm	deformed	FAA
ARV	air release valve	Chnlk	chain-link	DInt	delineate	FH
Alian	alignment	Ch Blk	channel block	DIntr	delineator	FI
Al	alley	Ch Ch	channel change	Depr	depression	Elrd
Alt	alternate	Chk	check	Desc	description	FES
Alum	aluminum	Chsld	chiseled	Det	detail	F Bon
	Americans with Disabilities Act	Cir	circle	DWP	detectable warning panel	FA
&	and	CI	class	Dtr	detour	FI
Appr	annroach	Cint	clean-out	Dia or ø	diameter	Eta
Approx	approximate	Cir	clear	Dia or ø	direction	FM
	approximate	Cl&ar	clearing & grubbing	Diet	distance	End
ACF	aspestos cement pipe	Clayi		DISL	disturbed material	Edp
Aspii	asphalt compat	Coml				Full
AC		Compr		DB	ditch grade	Flac
Assinu	assumed	Compr	compression	DG	ditch grade	Fiwy Est
<u>w</u>	dl attenuation	CADD	computer alded drarting & design	DDI	double	
Atten		Conc		Dn	down	FF
AIR	automatic traffic recorder	CECB	concrete erosion control blanket	Dwg	drawing	
Ave	Avenue	Cond	conductor	Dr	drive	FFP
Avg	average	Const	construction	Drwy	driveway	FLS
ADT	average daily trattic	Cont	continuous	DI	aropiniet	Furn
		CSB	continuous split barrel sample	D	ary density	
		Contr	contraction			
DI		Contr	contractor			
BK	back	CP	control point	_		
BF	backface	Coord	coordinate	Ea	each	
Balc	balcony	Cor	corner	Esmt	easement	
B Wire	barbed wire	Corr	corrected	E	East	
Barr	barricade	CAES	corrugated aluminum end section	EB	Eastbound	
Btry	battery	CAP	corrugated aluminum pipe	Elast	elastomeric	
BI	beehive inlet	CMES	corrugated metal end section	EL	electric locker	
Beg	begin	CMP	corrugated metal pipe	E Mtr	electric meter	
BG	below grade	CPVCP	corrugated poly-vinyl chloride pipe	Elec	electric/al	
BM	bench mark	CSES	corrugated steel end section	EDM	electronic distance meter	
Bkwy	bikeway	CSFES	corrugated steel flared end section	Elev or El	elevation	
Bit	bituminous	CSP	corrugated steel pipe	Ellipt	elliptical	
Blk	block	CSTES	corrugated steel traversable end section	Emb	embankment	
BH	bore hole	Co	County	Emuls	emulsion/emulsified	
Bot	bottom	Crse	course	ES	end section	
Blvd	Boulevard	Ct	Court	Engr	engineer	
Bndry	boundary	Xarm	cross arm	ESS	environmental sensor station	
Brkwy	breakaway	Xbuck	cross buck	Eq	equal	
Br	bridge	Xsec	cross sections	Evgr	evergreen	
Bldg	building	Xing	crossing	Exc	excavation	
Bus.	business	Xrd	crossroad	Exst	existing	
BV	butterfly valve	Crn	crown	Exp	expansion	
Вур	bypass			Expy	Expressway	
				E	external of curve	

	factor of safety
	Federal
	feed point
	fence
	fence post
	fiber optic
	field drive
	fill
	fine aggregate angularity
	fire hydrant
	flange
	flared
	flared end section
n	flashing beacon
	flight auger sample
	flow line
	footing
	force main
	found
	foundation
	fractional
/	freeway
	front
	front face
sp	fuel dispenser
	fuel filler pipes
	fuel leak sensor
l .	furnish/ed

DEPART	NORTH DAKOTA MENT OF TRANSPORTATION 07-01-14 REVISIONS	RK J. HOR
DATE	CHANGE	K GISTER
04-23-18 09-20-18 12-18-20 08-16-22	General Revisions General Revisions General Revisions General Revisions	PROFESSIONAL PE-4683 TO FUGINEER OF TH DAY 08/16/22

Galv Gar Gs L G Reg GMV G Mtr GSV GVP GV GV GV GV Gv Gv Grd Grnd GWM Gdrl Gtr	galvanized garage gas line gas line regulator gas main valve gas meter gas service valve gas vent pipe gate valve gauge government graded/grade ground ground water monitor guardrail gutter	Ln Lg Lat Lt Lens Lvl Lvlng Lht Ltg Liq Ll Lcc Long. Lp LD Lum
H Plg	H piling	N 41-
Hawi Ht	height	MD ML
Hel	helical	MH
HDPE	high density polyethylene	Mkd
HP	high pressure	Mka
HPS	high pressure sodium	MA
HTCG	high tension cable guardrail	Matl
Hwy Hor	highway	Max
HBP	hot bituminous pavement	Meas
HMA	hot mix asphalt	Mdn
Hyd	hydrant	MD
Ph	hydrogen ion content	MC
		MOS
ld	identification	MP
Incl	inclinometer tube	Min
	iniet manhole inside diameter	Misc
Inst	instrument	Mnd
Intchg	interchange	Mtbl
Intmdt	intermediate	Mtd
Intsch	intersection	Mtg
IP	iron pipe	
Jt	joint	
Jct	junction	Neop
		N
		NE
		NW
		NB
		No. or #

Lg	large
Lat	latitude
Lt	left
Lens	lenses
Lvl	level
Lvlng	leveling
Lht	light
LP	light pole
Ltg	lighting
Liq	liquid
LL	liquid limit
Loc	location
Long.	longitude
Lp	loop
LD	loop detector
Lum	luminaire
Mb ML Mkd Mkr Mkg MA Matl Max MC Meas Mdn MD MC MGS MM MD MC MGS MM MP Min Misc Mon Mtbl Mtd Mtg Mk	mailbox main line manhole marked marker marking mast arm material maximum meander corner measure median drain median drain median drain medium curing Midwest Guardrail System mile marker mile post minimum miscellaneous monument mound mountable mounted mounting muck
Neop	neoprene
Ntwk	network
N	North
NE	North East
NW	North West
NB	Northbound

number

lane

Obsc Ocpd Ocpy O/s	obscure(d) occupied occupy offset	Qty Qtr
003	on center	Rador
c	one dimensional consolidation	RR
00	organic content	Riwy
Oria	original	Red
		RC
	outside diameter	Rec
<u>ОН</u>	overbead	Rev
	overnead	ROY
		RPCC
	pad mounted transformer	Ricc
		Rei R Mkr
r y Dotd	pages	DM
Dr	painted	RP
n i Dol	pan	Rofl
	paner nark	RCB
חפח	park nassing sight distance	RCES
Pymt	passing signi distance	RCEES
Ped	pedestal	RCP
Ped	pedestrian	RCPS
	pedestrian pushbutton post	RCTES
Pen	penetration	Reinf
Perf	perforated	Res
Per	perimeter	Res
Perm	permanent	Ret
PI	nineline	Rev
PI	place	Rt
P&P	place plan & profile	R/W
	plastic limit	Riv
PlorP	plate	Rd
Pt	point	Rdbd
PF	polvethylene	Rdwy
PVC	polyvinyl chloride	RWIS
PCC	Portland Cement concrete	Rk
PP	power pole	Rt
Preempt	preemption	
Prefab	prefabricated	
Prfmd or I	Pref preformed	
Prep	preperation	
Press.	pressure	
PRV	pressure relief valve	
Prestr	prestressed	
Pvt	private	
PD	private drive	
Prod.	, production/produce	
Prog	programmed	
Prop.	property	
Prop Ln	property line	
Ppsd	proposed	
PB	 pull box	

	quantity quarter
r R	radius
	railroad
	raisod
	rapid curing
	record
	recycle
	recycled asphalt pavement
;	recycled portland cement concrete
	reference
	reference marker
	reference monument
	reference point
	reinforced concrete box
	reinforced concrete end section
s	reinforced concrete flared end section
-	reinforced concrete pipe
5	reinforced concrete pipe sewer
S	reinforced concrete traversable end section
	reinforcement
	reservation
	residence
	retaining
	reverse
	right of way
	river
	road
	road bed
	roadway
	roadway weather information system
	rock
	route

DEPART	NORTH DAKOTA MENT OF TRANSPORTATION	\bigcirc
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08-03-15 04-23-18 12-18-20 08-16-22	General Revisions General Revisions General Revisions General Revisions	PROFESSIONAL PE-4683 TOPTHDAY 08/16/22

Salv	salvage(d)	Tel	telephone
San	sanitary sewer line	Tel B	Telephone Booth
Sec	section	Tel P	telephone pole
SL	section line	Τv	television
Sep	separation	Temp	temperature
Sea	sequence	Temp	temporary
Serv	service	TBM	temporary bench mark
Sht	sheet	Т	thinwall tube sample
Shtna	sheeting	' Te	tonsoil
Shidr	shoulder	Traf	traffic
Sw or Sdw	sidewalk	TSCB	traffic signal control box
SW 01 50W	sight distance	Tr	trail
SD		Transf	transformer
SIN	signal	Trans	transition
Sig	signal		
Sgi	single		transmission tower
SRCP	slotted reinforced concrete pipe	TES	traversable end section
SC	slow curing	Trans	transverse
SS	slow setting	Trtd	treated
Sm	small	Trmt	treatment
S	South	Qc	triaxial compression
SE	South East	TERO	tribal employment rights ordinance
SW	South West	ТрІ	triple
SB	Southbound	Тур	typical
Sp	spaces		
Spcl	special		
SA	special assembly	Qu	unconfined compressive strength
SP	special provisions	Ugrnd	underground
G	specific gravity	Util	utility
Spk	spike		
SB	split barrel sample		
SH	sprinkler head	VG	vallev gutter
SV	sprinkler valve	Vap	vapor
Sq	square	Vert	vertical
Stk	stake	VCP	vitrified clay pipe
Std	standard	Vol	volume
N	standard penetration test	VSFS	vehicle speed feedback sign
Std Specs	standard specifications		
Stm I	steam line	Wkwy	walkway
SEC	steel encased concrete	W	water content
SMA	stone matrix asphalt	WGV	water gate valve
SSD	stonoing sight distance	WI	water line
SD	storm drain		water main
St	stroot	\\\\\\\	water main valvo
SDD	structural plate pipe	VVIVI V	water motor
	structural plate pipe		water service velve
SFFA Str	structural plate pipe al ch	VV3V	
Suba	subdivision		water wen
Suba	subdivision	vvrng	wearing
Sub	subgrade	VVIIVI	weign in motion
Sub Prep	subgrade preperation	VV	west
Ss	subsoll	WB	westbound
SS	supplement specification	VVrng	wiring
Supp	supplemental	VV/	with
Surf	surfacing	W/o	without
Surv	survey	WC	witness corner
Sym	symmetrical		

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MEASUREMENTS

ас	acres
А	ampere
Bd Ft	board feet
Cd	candela
cm	centimeter
С	coulomb
CF	cubic feet
m3	cubic meter
m3/s	cubic meters per second
CY	cubic vard
CY/mi	cubic vards per mile
D or Deg	degree
F	Fahrenheit
F	farad
ft	feet/foot
Gal	gallon
G	giga
Ha	hectare
н	henry
Hz	hertz
hr	hour(s)
in	inch
1	ioule
ĸ	kelvin
	kilo newton
kPa	kilo pascal
kra	kilogram
kg/m2	kilogram par cubic motor
kg/115	kilomotor
	Kinometer
	KIP(S)
	litro
L	lumon
LIII	lump sum
	nux man hour
	mannour
	mega
m m/a	meter
m/s	meters per second
mi	millitar
mL	millimeter
mm mm/br	millimeter
mmyni D	ninimeters per nour
	nano
IN De	newton
Pa IL	pascal
u	pounds
sec	seconds
5	siemens
SF km2	square leet
KIIIZ	square kilometer
mz sv	square meter
5Y Ch- V I	square yara
Sta Yd	station yards
SI	Systems International

Т	tesla
T/mi	tons per mile
V	volt
W	watt
Wb	weber

SURVEY DESCRIPTIONS SOI		
SURVE Az Bs Brg BP Cap BS BC CS Eq E FS FB Fs Geod GIS GPS HI IM I Pn LS LSIT L LC LB Mer M NGS NS Obsn Off Loc OP Cap PK P Cap PC PC PC PC PT PC PC PT PC PC PT PT PC PC PT PC PT PC PC PT PT PC PC PT PC PT PC PC PT PC PC PT PC PC PT PC PC PT PC PC PT PC PC PT PC PC PT PC PC PT PC PC PT PC PC PT PC PC PT PC PT PC PC PT PC PC PT PC PC PT PC PC PT PC PC PT PC PC PC PT PC PC PT PC PC PC PT PC PC PT PC PC PC PT PC PC PT PC PC PT PC PC PC PT PC PC PC PT PC PC PC PT PC PC PC PT PC PC PC PT PC PC PC PC PC PC PC PC PC PC PC PC PC	Y DESCRIPTIONS azimuth backsight bearing blue plastic cap both sides brass cap curve to spiral equation external of curve far side field book foresight geodetic Geographical Information System height of instrument iron pin Land Surveyor (licensed) Land Surveyor (licensed) Land Surveyor In Training length of curve long chord level book meridian mid ordinate of curve National Geodetic Survey near side observation office location orange plastic cap pink plastic cap point of neverse curvature point of neverse curvature point of tangent random traverse point range red plastic cap spiral to curve spiral to curve spiral to tangent random traverse point tangent (semi) tangent (semi) tangent (semi) tangent (semi) tangent curve World Geodetic Survey Vertical curve World Geodetic System yellow plastic cap	SOL CI CI F CI HV CI Lm Co S C Gr CS FS Gr Lig CI Lig SI Lm Rk Sd Sdy C Sdy C Sdy C Sdy C Sdy C Sdy I Si CI Si CI Si Lm
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D-101-4

SOIL TYPES

	clay
	clay fill
vy	clay heavy
'n	clay loam
	coal slack
•	coarse gravel
	coarse sand
	fine sand
	gravel
Co	lignite coal
51	lignite slack
	loam
	rock
	sand
Cl	sandy clay
Cl Lm	sandy clay loam
FI	sandy fill
Lm	sandy loam
	scoria
	shale
	silt clay
Lm	silty clay loam
n	silty loam

DEPART	NORTH DAKOTA MENT OF TRANSPORTATION 07-01-14 REVISIONS	LIRK J. HOAN
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12-18-20	Sheet Added - Continued from D-101-3	PROFESSIONAL PE-4683 TOPTH DAY 12 18 2020

NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

702COM ACCENT AGASSIZ WU AGC ALL PL ALL SEAS WU AMOCO PI AMRDA HESS AT&T **B** PAW BAKER ELEC **BASIN ELEC** BEK TEL **BELLE PL** BLM BNSF BOEING **BRNS RWD BURK-DIV ELEC** BURL WU CABLE ONE CABLE SERV CAP ELEC CASS CO ELEC CASS RWU CAV ELEC CBLCOM CENEX PL CENT PL WATER DIST CENT PWR ELEC CENTURYLINK COE CONS TEL CONT RES CPR DOE DAK CARR DAK CENT TEL DAK RWD DGC DICKEY R NET DICKEY RWU DICKEY TEL DNRR DOME PL DVELEC DVMW ENBRDG ENVENTIS EQUINOR FALK MNG FHWA G FKS-TRL WD **GETTY TRD & TRAN GLDN W ELEC** GRGS CO TEL GTR RAMSEY WD

702 Communications Accent Communications Agassiz Water Users Incorporated Assiociated General Contractors of America Alliance Pipeline All Seasons Water Users Association Amoco Pipeline Company Amerada Hess Corporation AT&T Corporation Bear Paw Energy Incorporated Baker Electric Basin Electric Cooperative Incorporated Bek Communications Cooperative Belle Fourche Pipeline Company Bureau of Land Management Burlington Northern Santa Fe Railway Boeina Barnes Rural Water District Burke-Divide Electric Cooperative Burleigh Water Users Cable One Cable Services Capital Electric Cooperative Incorporat Cass County Electric Cooperative Cass Rural Water Users Incorporated Cavalier Rural Electric Cooperative Cablecom Of Fargo Cenex Pipeline Central Pipe Line Water District **Central Power Electric Cooperative** CenturvLink Corps of Engineers Consolidated Telephone Continental Resource Inc Canadian Pacific Railway Department Of Energy Dakota Carrier Network Dakota Central Telephone Dakota Rural Water District Dakota Gasification Company Dickey Rural Networks Dickey Rural Water Users Association Dickey Telephone Dakota Northern Railroad Dome Pipeline Company Dakota Valley Electric Cooperative Dakota, Missouri Vallev & Western Enbridge Pipelines Incorporated Enventis Telephone Equinor Pipeline Falkirk Mining Company Federal Highway Administration Grand Forks-traill Water District Getty Trading & Transportation Golden West Electric Cooperative Griggs County Telephone Greater Ramsey Water District

GT PLNS NAT GAS HALS TEL IDEA1 INT-COMM TEL KANEB PL KEM ELEC KOCH GATH SYS LKHD PL LNGDN RWU LWR YELL R ELEC MCKNZ CON MCKNZ ELEC MCKNZ WRD MCLEOD MCLN ELEC MCLN-SHRDN R WAT MDU MIDCO MIDSTATE TEL MINOT CABLE MINOT TEL MISS VALL COMM MISS W W S MNKOTA PWR MOR-GRAN-SOU ELEC MOUNT-WILLIELEC MRE LBTY TEL MUNICIPAL MUNICIPAL N CENT ELEC N VALL W DIST ND PKS & REC ND TEL NDDOT NDSU SOIL SCI DEPT NEMONT TEL NODAK R ELEC NOON FRMS TEL NPR NSP NTH PRAIR RW NTHN BRDR PL NTHN PLNS ELEC NTHWSTRN REF NW COMM NWRWD ONEOK OSHA OTTR TL PWR PAAP PLEM POLAR COM **PVT ELEC** QWEST **R&T W SUPPLY**

Great Plains Natural Gas Company Halstad Telephone Company Idea1 Inter-Community Telephone Company Kaneb Pipeline Company Kem Electric Cooperative Incorporated Koch Gathering Systems Incorporated Lakehead Pipeline Company Langdon Rural Water Users Incorporated Lower Yellowstone Rural Electric McKenzie Consolidated Telcom McKenzie Electric Cooperative McKenzie County Water Resource District McLeod USA McLean Electric Cooperative McLean-Sheridan Rural Water Montana-dakota Utilities **MidContinent Communications** Midstate Telephone Company Minot Cable Television Minot Telephone Company **Missouri Valley Communications** Missouri West Water System Minnkota Power Mor-gran-sou Electric Cooperative Mountrail-williams Electric Cooperative Moore & Liberty Telephone City Water And Sewer City Of '.....' North Central Electric Cooperative North Valley Water District North Dakota Parks And Recreation North Dakota Telephone Company North Dakota Department of Transportation NDSU Soil Science Department Nemont Telephone Nodak Rural Electric Cooperative Noonan Farmers Telephone Company Northern Plains Railroad Northern States Power Northern Prairie Rural Water Association Northern Border Pipeline Northern Plains Electric Cooperative Incorporated Northwestern Refinery Company Northwest Communication Cooperation Northwest Rural Water District Oneok gas Occupational Safety and Health Administration Otter Tail Power Company Plains All American Pipeline Prairielands Energy Marketing Polar Communications Private Electric Qwest Communications R & T Water Supply Association

RED RIV COMM **RESVTN TEL** ROBRTS TEL **R-RIDER ELEC** RRVW S CENT REG WD SEWU SCOTT CABLE SHERDN ELEC SHEYN VLY ELEC SKYTECH SLOPE ELEC SOURIS RIV TELCOM ST WAT COMM STATE LN WATER STER ENG STUT RWU SW PL PRJ ТМС TCI TESORO HGH PLNS PL TRI-CNTY WU TRL CO RWU UNTD TEL UPPR SOUR WUA **US SPRINT USAF MSL CABLE** USFWS USW COMM VRNDRY ELEC W RIV TEL WAPA WAWSA WFB WILLI RWA WILSTN BAS PL WLSH RWD WOLVRTN TEL XLENER YSVR

D-101-10

Red River Rural Communications Reservation Telephone **Roberts Company Telephone** Roughrider Electric Cooperative Red River Valley & Western Railroad South Central Regional Water District South East Water Users Incorporated Scott Cable Television Dickinson Sheridan Electric Cooperative Sheyenne Valley Electric Cooperative Skyland Technologies Incorporated Slope Electric Cooperative Incorporated Souris River Telecommunications State Water Commission State Line Water Cooperative Sterling Energy Stutsman Rural Water Users Southwest Pipeline Project **Turtle Mountain Communications** TCI of North Dakota Tesoro High Plains Pipeline Tri-County Water Users Incorporated Traill County Rural Water Users United Telephone Upper Souris Water Users Association U.S. Sprint U.S.A.F. Missile Cable US Fish and Wildlife Service U.S. West Communications Verendrye Electric Cooperative West River Telephone Incorporated Western Area Power Administration Western Area Water Supply Authority W. E. B. Water Development Association Williams Rural Water Association Williston Basin Interstate Pipeline Company Walsh Water Rural Water District Wolverton Telephone Xcel Energy Yellowstone Valley Railroad

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LINE STYLES

Existing Top	oography		Existing 3-Cable w Posts	Existing l	Jtilities
Void — Void — Void — V	Existing Ground Void	<u></u>	Site Boundary	——————————————————————————————————————	Existing Electrical
++	Existing Cemetary Boundary		Existing Berm, Dike, Pit, or Earth Dam	F0	Existing Fiber Optic Line
	Existing Box Culvert Bridge		Existing Ditch Block	F0	Existing TV Fiber Optic
	Existing Concrete Surface		Existing Tree Boundary	G	Existing Gas Pipe
	Existing Drainage Structure		Existing Brush or Shrub Boundary	ОН	Existing Overhead Utility Line
	Existing Gravel Surface		Existing Retaining Wall	P	Existing Power
	Existing Riprap		Existing Planter or Wall	PL	Existing Fuel Pipeline
	Existing Dirt Surface	۰ ـ ـ ۱ ـ ۱ ـ ۱ ـ ۱ ـ ۱ ـ ۱ ـ ۱ ـ ۱ ـ ۱	Existing W-Beam Guardrail with Posts	PL	Existing Undefined Above Ground Pipe Line
	Existing Asphalt Surface	•	Existing Railroad Switch	SAN:	Existing Sanitary Sewer
	Existing Tie Point Line	<u>, , , , , , , , , , , , , , , , , , , </u>	Gravel Pit - Borrow Area	SAN FM	Existing Sanitary Force Main
	Existing Railroad Centerline		Existing Wet Area-Vegetation Break	SD	Existing Storm Drain
	Existing Guardrail Cable		Existing High Tension Cable Guardrail	SD FM	Existing Storm Drain Force Main
·• ••	Existing Guardrail Metal	F-+FFFFFFFFFF	Existing High Tension Cable Guardrail with Posts		Existing Culvert
	Existing Edge of Water			T	Existing Telephone Line
xx	Existing Fence	Proposed T	opography	Tv	Existing TV Line
++++++	Existing Railroad	·	3-Cable w Posts	W	Existing Water or Steam Line
	Existing Field Line	~ ~ ~ ~	Flow		Existing Under Drain
~ ~ ~ ~ -	Exst Flow	xxx	Fence		Existing Slotted Drain
	Existing Curb	—— REMOVE —— REMOVE —	Remove Line		Existing Conduit
	Existing Valley Gutter	<u> </u>	Wall		Existing Conductor
	Existing Driveway Gutter		Retaining Wall (Plan View)		Existing Down Guy Wire Down Guy
	Existing Curb and Gutter	<u> </u>	W-Beam w Posts		Existing Underground Vault or Lift Station
	Existing Mountable Curb and Gutter	····	High Tension Cable Guardrail with Posts		

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Proposed Utilities



Traffic Utilities

C	onductor
———— Fi	iber Optic
E	xisting Loop Detector
•• E	xisting Double Micro Loop Detector
•• M	icro Loop Detector Double
• E:	xisting Micro Loop Detector
• M	icro Loop Detector
si	ignal Head with Mast Arm
▼ E	xisting Signal Head with Mast Arm
Sign Struct	rures

Existing Overhead Sign Structure

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— Existing Overhead Sign Structure Cantilever

Overhead Sign Structure Cantilever

DEPARTI	NORTH DAKOTA MENT OF TRANSPORTATION	OK J. HOR
	REVISIONS	LAN SISTER A
DATE	CHANGE	TI AS TIS VA
09-23-16 12-18-20	Added and Revised Items, Organized by Functional Groups General Revisions	PROFESSIONAL PE-4683 TO STIGINEER TH DAX 12 18 2020

LINE STYLES

Right Of	f Way	Cross Sections	and Typicals	Strip	bing		Erosion Control	
	Easement		Existing Ground		Centerline Pavement Marking		Limits of Co	onst Transition Line
	Existing Easement		Existing Topsoil (Cross Section View)		Barrier with Centerline Pavement Marking		····· Bale Check	(
	Right of Way	void — void — void — v	Existing Ground Void (Not Surveyed)		Barrier Pavement Marking		····· Rock Check	k
	Existing Right of Way		Existing Concrete		Stripe 4 IN Dotted Extension White	s	— s — Floating Sil ^t	t Curtain
	Existing Right of Way Railroad		Existing Aggregate (Cross Section View)		Stripe 8 IN Dotted Extension White	SF	— SF — Silt Fence	
	Existing Right of Way Not State Owned		Existing Curb and Gutter (Cross Section View)		Stripe 8 IN Lane Drop	· · · _	— — Excavation	Limits
·	Existing Government Lot Line		Existing Asphalt (Cross Section View)			<u></u>	Fiber Rolls	
	Existing Adjacent Block Lines		Existing Reinforcement Rebar	Pavemei	nt Joints			
	Existing Adjacent Lot Lines	Geotec	hnical		Doweled Joint		Environmental	
	Existing Adjacent Property Line	D D	Geotextile Fabric Type D	+++++++++++++++++++++++++++++++++++++++	Tie Bar 30 Inch 4 Foot Center to Center	<u>*_*_</u> *_*	Wetland Mi	itigation
	Existing Adjacent Subdivision Lines	Geo Geo -	Geogrid	++++++++++++++++++++++++++++++++++++++	Tie Bar 18 Inch 3 Foot Center to Center		Existing We	etland Easement USFWS
	Sight Distance Triangle Line	R R	Geotextile Fabric Type R	+++++++++++++++++++++++++++++++++++++++	Tie Bar at Random Spacing	<u></u>	Existing We	etland Jurisdictional
	Dimension Leader	R R	Geotextile Fabric Type R1				Existing We	ətland
		RR RR	Geotextile Fabric Type RR	Bridge	Details		Tree Row	
Boundary	Control	s s	Geotextile Fabric Type S		Small Hidden Object			
	Existing City Corporate Limits or Reservation Boundary		Subgrade Reinforcement		Large Hidden Object			
	Existing State or International Line		Failure Line		Phantom Object			
	Existing Township	Count	tours		Existing Conditions Object			
	Existing County		Depression Contours		Centerline Main			
	Existing Section Line		Supplemental Contour		Centerline Secondary	DEPARTA	NORTH DAKOTA MENT OF TRANSPORTATION	JRK J. HO
	Existing Quarter Section Line	Prot	file	· · · · ·	Excavation Limits	DATE 09-23-16	REVISIONS CHANGE Added and Revised Items,	KINE J H
	Existing Sixteenth Section Line		Subgrade, Subcut or Ditch Grade		Proposed Ground	12-18-20	Organized by Functional Groups General Revisions	PROFESSION PE-4683
	Existing Centerline		Topsoil Profile		Sheet Piling			OPTH DA
	Tangent Line							12 18 202

	Limits of Const Transition Line
	Bale Check
	Rock Check
s s	Floating Silt Curtain
SF SF	Silt Fence
, ,	Excavation Limits
· · · · · · · · · · · ·	Fiber Rolls

DEPARTI	NORTH DAKOTA MENT OF TRANSPORTATION 07-01-14 REVISIONS	JURK J. HOAR
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			 North Arrow (Half Scale) 	۵	Existing Bush or Shrub	CSB	Continuous
		٨	Alignment Data Point	\rightarrow	Existing Large Evergreen Tree	FA	Flight Auge
			Alignment Monument	×	Existing Small Evergreen Tree	SB	Split Barrel
		×	Spot Elevation	R	Existing Large Tree	F	Thinwall Tu
		×	Existing Miscellaneous Spot	¢	Existing Small Tree	Z	Standard P
		♠	Existing Access Control Arrow	۵	Existing Tree Trunk	Incl	Inclinomete
		۲	Existing Benchmark				Excavation
		۲	Reset USGS Marker		Cairn or Stone Circle	•	Existing Gr
		0	Iron Monument Found	×	Existing Artifact		
		۲	Iron Pin R/W Monument	Э	Existing Satellite Dish		
		•	Property Corner	V*	Existing Weather Station		
		•	Iron Pin Reference Monument	\bowtie	Existing Windmill or Tower		
(0)	٦	٥	Right of Way Marker (Exst, Ppsd, Reset)		Reinforced Pavement		
		x	Existing Federal Reference Corner				
•	•	\oplus	Existing Section Corner (Full, Quarter, Sixteenth, Meander)				
		\oplus	Existing Witness Corner				
۵	۵	۵	Existing Control Point (CP, GPS-RTK, TRI)				
		۵	Existing Traverse PI Aerial Panel				
			Existing Reference Marker Point NGS				
		Δ	Existing EFB Misc				

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D-101-30

us Split Barrel Sample

ger Sample

el Sample

Tube Sample

Penetration Test

eter Tube

on Unit

Ground Water Well Bore Hole

DEPART	NORTH DAKOTA MENT OF TRANSPORTATION 07-01-14 REVISIONS	HRK J. HORA
DATE	CHANGE	N/Ze - JOVA
12-18-20	General Revisions	PROFESSIONAL PE-4683 TO FTH DAY 12 18 2020

					•	Flexible Delineator		ļ::
						Flexible Delineator Type A (Exst, Ppsd)	þ	þ
						Flexible Delineator Type B (Exst, Ppsd)	þ	þ
						Flexible Delineator Type C (Exst, Ppsd)	þ	ŀ
				0	0	Flexible Delineator Type D (Exst, Ppsd)		K
				0	0	Flexible Delineator Type E (Exst, Ppsd)		k
		⊢	F	\vdash	F	Delineator Type A (Exst, Ppsd, Diamond Grade-Reset)		ľ
		⊩	⊩	⊩	⊬	Delineator Type B (Exst, Ppsd, Diamond Grade-Reset)		
		₩	#-	₩-		Delineator Type C (Exst, Ppsd, Diamond Grade)	Go	_
		0	0	0		Delineator Type D (Exst, Ppsd, Diamond Grade)	Θ•	_
		0	0	0		Delineator Type E (Exst, Ppsd, Diamond Grade)	0	-
			I	\square	\mathbb{I}	Barricade (Type I, Type II, Type III)		
(•)	\Leftrightarrow	← •	\rightarrow	000	Ţ	Arrow Panel (Caution Mode, Double Direction, Left Directional, Right Directional, Sequencing, Truck Mounted)		
					\bigtriangleup	Attenuation Device		
						Truck Mounted Attenuator		
					•	Delineator Drums		-
					<u>م</u>	Flagger		
					►	Tubular Marker		
					A	Traffic Cone		
					ΤΤ	Back to Back Vertical Panel Sign		

D-101-31

	Þ	Highway Sign	(Exst, Ppsd)
	þ	Mile Post Type	e A (Exst-Ppsd-Reset)
		Mile Post Type	e B (Exst, Ppsd)
		Mile Post Type	e C (Exst, Ppsd)
	k	Object Marker	Type I (Exst, Ppsd)
	k	Object Marker	Type II (Exst, Ppsd)
	K	Object Marker	Type III (Exst, Ppsd)
	o	Existing Refer	ence Marker
	G	Road Closure	Gate 18 Ft (Exst, Ppsd)
Э-		Road Closure	Gate 28 Ft (Exst, Ppsd)
		——————————————————————————————————————	Gate 40 Ft (Exst, Ppsd)
		Existing Railro	ad Battery Box
	×	Existing RR P	rofile Spot
	Ť	Existing Railro	ad Crossbuck
	×	Existing Railro	ad Frog
		Existing Mailb	ox (Private, Federal)
ſ	DEPART	NORTH DAKOTA	
þ		07-01-14	RKJ. HOR
┢	DATE	CHANGE	- KEGISTERA
	12-18-20	General Revisions	PROFESSIONAL PE-4683
			TO ENGINEER AT

12 18 2020

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-Ò-	Existing Luminaire	(\Box)	\bigcirc
	Luminaire LED	\bigcirc	\bigcirc
$-\diamondsuit$	Existing Light Standard Luminaire	\mathcal{R}	\bigcirc
$-\dot{\bigcirc}$	Relocate Light Standard	$\langle \mathbf{x} \rangle$	\bigcirc
-	Light Standard Light LED Luminaire	R	\bigcirc
-0	Light Standard 35 Watt High Pressure Sodium Vapor Luminaire		\bigoplus
$- \bigcirc$	Light Standard 50 Watt High Pressure Sodium Vapor Luminaire	$\langle \mathbf{x} \rangle$	()
\rightarrow	Light Standard 70 Watt High Pressure Sodium Vapor Luminaire		
\rightarrow	Light Standard 100 Watt High Pressure Sodium Vapor Luminaire	\bigcirc	\bigcirc
$- \mathbf{O}$	Light Standard 150 Watt High Pressure Sodium Vapor Luminaire	\bigcirc	\Box
	Light Standard 200 Watt High Pressure Sodium Vapor Luminaire	\square	\square
	Light Standard 250 Watt High Pressure Sodium Vapor Luminaire	¢	\subset
-	Light Standard 310 Watt High Pressure Sodium Vapor Luminaire	0	٠
$-\diamondsuit$	Light Standard 400 Watt High Pressure Sodium Vapor Luminaire	00	0–0
-	Light Standard 700 Watt High Pressure Sodium Vapor Luminaire		
-	Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire	00	0 0
+	Emergency Vehicle Detector	\bigcirc	\bigcirc
	Video Detection Camera		
		\bigcirc	

High Mast Light Standard 3 Luminaire (Exst, Ppsd)		0	
High Mast Light Standard 4 Luminaire (Exst, Ppsd)	\otimes	\otimes	\otimes
High Mast Light Standard 5 Luminaire (Exst, Ppsd)	\otimes	\otimes	
High Mast Light Standard 6 Luminaire (Exst, Ppsd)		Å.	A
High Mast Light Standard 7 Luminaire (Exst, Ppsd)	Ð	•	Ð
High Mast Light Standard 8 Luminaire (Exst, Ppsd)		O	
High Mast Light Standard 9 Luminaire (Exst, Ppsd)		0	•
High Mast Light Standard 10 Luminaire (Exst, Ppsd)			0
Overhead Sign Structure Load Center (Exst, Ppsd)			0
Traffic Signal Controller (Exst, Ppsd)			o
Pad Mounted Traffic Signal Controller (Exst, Ppsd)	•	•	•
Flashing Beacon (Exst, Ppsd)			
Concrete Foundation (Exst, Ppsd)			
Pipe Mounted Flasher (Exst, Ppsd)			
Pad Mounted Feed Point (Exst, Ppsd)			
Pipe Mounted Feed Point with Pad (Exst, Ppsd)			
Pole Mounted Feed Point (Exst, Ppsd)			
Junction Box (Exst, Ppsd)			
Existing Pedestrian Head with Number			
Existing Signal Head			
Pole Mounted Head			
Existing Lighting Standard Pole			

D-101-32

Existing Traffic Signal Standard

Pull Box (Exst-Ppsd-Undefined)

Intelligent Transportation Pull Box (Exst, Ppsd)

Transformer (Exst, Ppsd)

Power Pole (Exst-Ppsd-with Transformer)

Wood Pole (Exst, Ppsd)

Pedestrian Push Button Post (Exst, Ppsd)

Existing Pole

Existing Telephone Pole

Existing Post

Connection Conductor (Ground, Neutral, Phase 1, Phase 2)

DEPART	NORTH DAKOTA IENT OF TRANSPORTATION	X J HO
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	(_)	(<u>)</u>)	()	Existing Manhole (Electrical, Gas, Telephone)	Cap or S E	Stub xst Gas, Exst S	Sanitary, Exst S	torm Drain, Pp	sd Storm Drain	, Exst Water		
		()	(ම)	Water Manhole (Exst, Exst with Valve)	c	D	þ	C	ī			
	(_)	0	(ම්)	Sanitary Sewer Manhole (Exst, Ppsd, Exst with Valve)	Existing E	Pedestal Electrical, Telep	hone, Fiber Op	otic Telephone,	TV, Fiber Optic	: TV, Undefined	1	
	(_)	0	۲	Sanitary Force Main Manhole (Exst, Ppsd, Exst with Valve)	۵	۵	D	Ω	D	â		
\bigcirc	0	()		Storm Drain Manhole (Exst, Ppsd, Exst with Inlet, Ppsd with Inlet)	Existing G	Pipe Vent as, Fuel, Sanit	ary, Storm Drai	n, Water, Unde	fined			
		()	(Ô)	Force Main Storm Drain Manhole (Exst, Exst with Valve)	ſ	ſ	ſ	ſ	ſ	٦		
	0	Ø	()	Manhole (Ppsd, Ppsd 48 Inch, Exst Undefined)	Valve E	xst Gas, Exst V	Vater, Ppsd Wa	ater, Exst Unde	fined			
			Ø	Existing Water Appurtenance	8	8	θ					
		Ø	in i	Sprinkler Head (Exst, Ppsd)	Pump S	anitary, Storm	Drain, Exst Wa	ter				
		q	۲	Fire Hydrant (Exst, Ppsd)	ø	ø	ø					
		<u>C</u>	۵	Cleanout (Exst Sanitary, Underdrain)	Corruga	ted Metal End	Section (18, 24	, 30, 36, 42, 48	, 54, 60 Inch)			
		([])	OID	Existing Catch Basin Inlet (Round, Square)	D	\triangleleft	\triangleleft	\Box				
		([])	DID	Existing Curb Inlet (Round, Square)	Reinford	ed Concrete E	nd Section (18,	, 24, 30, 36, 42,	48, 54, 60 Inc	h)		
			DID	Existing Slotted Reinforced Concrete Pipe	Д	А		\triangleleft	K			
	ο	0	0	Catch Basin (Riser 30 Inch, Beehive, Type A)								
		0		Inlet Mountable Curb (Type A, Type B)	+	Existing	Utility Marker					
		0		Inlet Saddle Base (Type 1, Type 2)		Existing	Meter					
	0	0	0	Inlet Special (Catch Basin, Type 1, Type A)	•	Existing	Fuel Dispense	rs				
0	ο			Inlet (Tee, Type 1, Type 2, Type 2 Double)	۲	Existing	Fuel Filler Pipe	95				
			٩	Median Drain	٥	Existing	Fuel Leak Sen	sors				[
0	l			Headwall (Exst, Ppsd, Ppsd Single with Vegitation Barrier, Ppsd Double with Vegitation Barrier)								DEPARTM

DE	PARTI	NORTH DAKOTA MENT OF TRANSPORTATION 07-01-14 REVISIONS	HRK J. HOAA
DA 12-1	TE8-20	CHANGE General Revisions Sheet added - Continued from D-101-32	PROFESSIONAL PE-4683 TOPTH DAY 12 18 2020

Cross Section Legend









04/22/24

ATTENUATION DEVICE



Construction Detail

Fill Ghait							
	I	Module Weights (LBS)					
	200 400 700 1400 2100						
Distance from top edge	8½"	5"	4"	3"	0"		



				Туре в А	ttenuation	1 Device					
					Da	ash Numb	ber				
Number	75	70	65	60	55	50	45	40	35	30	25
					Modul	e Weights	s (LBS)				
B1	2100										
B2	2100										
B3	2100	2100	2100	2100	2100	2100	2100	2100	2100		
B4	2100	2100	2100	2100	2100	2100	2100	2100	2100		
B5	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
B6	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
B7	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
B8	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
B9	700	700	700	700	700	700	700	700	700	700	700
B10	700	700	700	700	700	700	700	700	700	700	700
B11	700	700	700	700	700	700	700	700	700	700	700
B12	700	700	700	700	700	700	700	700	700	700	700
B13	700	700	700	700	700	700	700	700	700	700	700
B14	400	400	400	400	400	400	400	400	400	400	400
B15	400	400	400	400	400	400	400	400	400	400	400
B16	200	200	200	200	200	200	200	200	200	200	200
Length (L)	34.2'	30.7'	30.7'	30.7'	30.7'	30.7'	30.7'	30.7'	30.7'	27.2'	27.2'
Module Weights (LBS)		Replacement Module									
2100	1	1	1	1	1	1	1	1	1		
1400	1	1	1	1	1	1	1	1	1	1	1
700	2	2	2	2	2	2	2	2	2	2	2
400	1	1	1	1	1	1	1	1	1	1	1
200	2	2	2	1	1	1	1	1	1	1	1

Notes:

1 Materials

A) Use modules manufactured from frangible polyethylene material which shatters upon impact.
 B) Fill modules with class 43 aggregate meeting NDDOT Standard Specifications aggregate requirements. Use fill with a unit weight of at least 100 pounds per cubic foot. Use fill with a moisture content of 2% or less when left over winter.

2. Modules

- Modules
 Provide modules in two sizes containing volumes of either 2, 4, 7, 14, or 21 cubic feet minimum.
 A) Provide three components for 2, 4, or 7 cubic foot module containers:
 1) A 14 C.F., yellow outer container.
 2) A black lid securely locking over the top lip of the container.
 3) A variable cone-shaped supporting insert capable of supporting 200, 400, or 700 pounds of sand mass to allow for three sizes of modules. Place cone inserts inside the 14 cubic foot container. B) Provide two components for the 14 cubic foot module container:
- 1) A 14 C.F., yellow outer container. 2) A black lid securely locking over the top lip of the container.
- C) Provide two components for the 21 cubic foot module container:
 1) A 36" height X 36" width yellow outer container.
- 2) A black lid which locks securely over the top of the container.
- For temporary installations use Energite or Fitch attenuation barrels manufactured by Energy Absorption Systems of Chicago, IL, TrafFix barrels manufactured by TrafFix Devices, Inc. of San Clemente, CA, or approved equal modules. As an option, place attenuation devices on 3¹/₂" maximum thickness pallets to facilitate maintenance.
- 4. For permanent installations use Barrel Attenuation Device consisting of one-piece outer sand container modules with separate detachable lid. Energite attenuation barrels manufactured by Energy Absorption Systems of Chicago, IL, TrafFix barrels manufactured by TrafFix Devices, Inc. of San Clemente, CA, or approved equal meet these requirements.
- 5. The Typical Module Construction Detail and Type B Layout are based on the Energite Crash Cushion manufactured by Energy Absorption. Provide any required layouts and details from other sand filled attenuation module manufacturers which differ from those shown here.



BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

Perforated Tube



- 4. In concrete sidewalk, use same anchor without wings.

	Tele	escopine	g Perfo	rated Tu	ube	
Number of Posts	Post Size In.	Wall Thick- ness Gauge	Sleeve Size in.	Wall Thick- ness Gauge	Slip Base	Anchor Size without Slip Base in.
1	2	12			No	21⁄4
1	21⁄4	12			No	21/2
1	21⁄2	12			(A)	3
1	2½	10			Yes	
1	21⁄4	12	2	12	Yes	
1	2 ½	12	21⁄4	12	Yes	
2	2	12			No	21⁄4
2	21⁄4	12			No	21/2
2	21⁄2	12			Yes	
2	2 ½	12			Yes	
2	21⁄4	10	2	12	Yes	
2	2 ½	12	21⁄4	12	Yes	
3 & 4	21/2	12			Yes	
3&4	2 ½	10			Yes	
3&4	21/2	12	21⁄4	12	Yes	
3 & 4	21/4	12	2	12	Yes	
3 & 4	2½	10	2 ³ / ₁₆	10	Yes	

(A) Use breakaway base when support is placed in weak soils. Engineer determines if soils are weak.

(B) For additional wind load, insert the $2\frac{3}{16}$ "x10 ga. into $2\frac{1}{2}$ "x10 ga.



Top Post Receiver Plate - ASTM A572 grade 50 Angle Receiver - 2¹/₂"x2¹/₂"x%" ASTM A36 structural angle



Bottom Soil Stub Tube - 3"x3"x7 gauge ASTM A500 grade B tube Stabilizing Wing - 7 gauge H.R.P.O. ASTM A1011 Plate - ASTM A572 grade 50



Bolt Retainer for Base Connection Bolt Retainer- 1/32" Reprocessed Teflon

D-704-7

1. Torque slip base bolts as specified by manufacturer.

2. Use anchor with 43.9 KSI yield strength and 59.3 KSI tensile strength.

Provide 4" vertical clearance for anchor or breakaway base. Measure the 4"x60" measurement above and below post location and back and ahead of post.

5. Provide more than 7' between the first and fourth posts of a four post sign.

	Properties of Telescoping Perforated Tube							
Tube Size in	Wall Thickness in	U.S. Standard Gauge	Weight per Foot Ibs	Moment of Inertia in.4	Cross Sec. Area in. ²	Section Modulus in. ³		
1½ x 1½	0.105	12	1.702	0.129	0.380	0.172		
2 x 2	0.105	12	2.416	0.372	0.590	0.372		
2¼ x 2¼	0.105	12	2.773	0.561	0.695	0.499		
2¾ ₁₆ x 2¾ ₁₆	0.135	10	3.432	0.605	0.841	0.590		
$2\frac{1}{2} \times 2\frac{1}{2}$	0.105	12	3.141	0.804	0.803	0.643		
$2\frac{1}{2} \times 2\frac{1}{2}$	0.135	10	4.006	0.979	1.010	0.785		

Top Post Receiver Data Table						
Square Post Sizes (B)	А	В	С	D	Е	F
2¾16"x10 ga.	1%4"	2½"	3½32"	²⁵ ⁄ ₃₂ "	1 ³³ ⁄64"	1%"
2½"x10 ga.	1%32"	2½"	3 ⁵ ⁄ ₁₆ "	5%"	1 ²¹ / ₃₂ "	1¾"

DEPART	NORTH DAKOTA MENT OF TRANSPORTATION	
	2-28-14	1140
	REVISIONS	at J. HOR
DATE	CHANGE	TH CISIFOL A
9-27-17 10-03-19 8-01-24	Updated to active voice New Design Engr PE Stamp Electronic Stamp/Signature	PROFESSIONAL PE-4683 TO PTH DAY 08/01/24

BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

U-Channel Post



17.125

Retainer Strap Detail



Breakaway U-Channel Splice Detail Alternate B (2.5 and 3 lb/ft) Install a maximum of 3 posts within 7'.

Alternate A Steps of Installation:

- a) Drive anchor unit to within 12" of ground level.
 b) Establish proper assembly by lining up bottom hole of retainer strap with 6th hole from the top of the anchor unit.
 c) Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.
 d) Rotate strap 90° to left.
- a) Drive anchor unit to 4" above ground.b) Rotate strap to vertical position.
- a) Place 5/6"x2" bolt, lock washer and nut in bottom of sign post to facilitate alignment of sign post with proper hole in anchor unit.
 b) Alternately tighten two connector bolts.
- 4. Complete assembly by tightening $\frac{5}{16}$ "x2" bolt (this fastens sign post to retainer strap).
- 5. Properly nest base post, strap, and sign post. Proper nesting occurs when all flat surfaces of the base post, strap, and sign post at the bolts have full contact across the entire width.

D-704-8



DEPARTI	NORTH DAKOTA MENT OF TRANSPORTATION 2-28-14 REVISIONS CHANGE	HRK J. HORA
9-27-17 10-03-19 8-01-24	Updated to active voice New Design Engr PE Stamp Electronic Stamp/Signature	PROFESSIONAL PE-4683 TO FIGINEER OFTH DAY 08/01/24

DocuSign Envelope ID: B6D1C72A-6E5E-4E5C-A02F-4D3D1C582775







CONSTRUCTION SIGN DETAILS REGULATORY SIGNS





Legend: black (non-refl) Background: white



Legend: black (non-refl) Background: white



R11-4a-60 Legend: black (non-refl) Background: white



R11-2a-48 Legend: black (non-refl) Background: white

D-704-10

DEPART	NORTH DAKOTA MENT OF TRANSPORTATION	
	8-13-13	AKJ. HON
	REVISIONS	ALL ALE TEN A
DATE	CHANGE	A GIT FRAMA
8-17-17 10-03-19 8-01-24	Revised sign number New Design Engineer PE Stamp Electronic Stamp/Signature	PROFESSIONAL PE-4683 TO TH DAY 08/01/24



D-704-11

WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

* DISTANCE MESSAGES





ARROW DETAILS

DEPARTME	NORTH DAKOTA ENT OF TRANSPORTATION	
	8-13-13	AKJ. HON
	REVISIONS	
DATE	CHANGE	A GIT FRANA
8-17-17 tu 5-31-18 F 10-03-19 N 8-01-24 E	Jpdated sign number Revised sign and arrow detalls Jew Design Engineer PE Stamp Electronic Stamp/Signature	PROFESSIONAL PE-4683 TOPTH DAYO 08/01/24

SHOULDER CLOSURE TAPERS



(when shoulder is 8' or wider)



D-704-12





NOTES:

1. Sign Supports: Galvanize or paint supports. Minimum post sizes are 2.5 lb/ft u-channel or 2" x 2" x 12 gauge steel perforated tube, except where noted. When installing signs on u-channel, minimum post size for assemblies containing a secondary sign is 3.0 lb/ft. Post sizes based on a wind speed of 55 MPH

D-704-14

Place signs over 50 square feet on $2\frac{1}{2}$ " x $2\frac{1}{2}$ " perforated tube supports as a minimum.

Do not attach guy wires to sign supports. Attach wind beams behind sign panels when used with u-posts.

- 2. Sign Panels: Provide sign panels made of 0.100" aluminum, $\frac{1}{2}$ " plywood, or other approved material, except where noted. Punch all holes round for 3/8" bolts.
- 3 Alternate Messages: Install and remove alternate message signs on reflectorized plate (without borders) as required. (i.e. "Left" and "Right" message on lane closure sign)
- Route Marker Auxiliary Signs: Provide route marker auxiliary signs, such as the cardinal direction and directional arrows, with a background and legend that match the route marker they are used with:

Interstate - white legend on blue background Interstate Business Loop - white legend on green background US and State - black legend on white background County - yellow legend on blue background

5. Vertical Clearance: Install signs with a vertical clearance of 5'-0" (see TYPICAL SECTION.) In areas where parking or pedestrian movements are likely or the view of the sign may be obstructed, install signs with a vertical clearance of 7'-0" from the top of the curb or from the near edge of the driving lane in absence of a curb

The vertical clearance to secondary signs is 1'-0" less than the vertical clearance stated above.

Provide a minimum clearance of 7'-0" from the ground at the post for signs with an area exceeding 50 square feet.

6. Portable Signs: Provide portable signs that meet the vertical clearance stated above when it is necessary to place signs within the pavement surface.

Use of low-mounting height (minimum 12" vertical clearance) portable signs for 5 days or less, is allowed as long as the view of the sign is not obstructed. Time delays caused by unforseen circumstances, such as equipment breakdown, rain, subgrade failures, etc., will not accrue towards the 5 day period. Use of R9-8 through R9-11a series, W1-6 through W1-8 series, M4-10, and E5-1 is allowed for longer than 5 days.

Restrict signs mounted on portable sign supports shown in the LOW-MOUNTING HEIGHT and HIGH-MOUNTING HEIGHT details to a maximum surface area of 16 square feet.

MINIMUM BALLAST (For each side of sign support base)

Sign Panel Mounting Height (ft)	Number of 25 lb sandbags for 4' x 4' sign panel
1'	6
5'	8
7'	10

Note: The number of sandbags are based on a wind speed of 55 MPH. Place sandbags at or near the ends of sklds.

	DEPART	NORTH DAKOTA MENT OF TRANSPORTATION	\bigcirc
		10-4-13	ALJ. HON
		REVISIONS	1 Provent
ge	DATE	CHANGE	IN COLFERENCE
e uge ibe	11-14-13 9-27-17 11-01-19 8-01-24	Revised Note 6 Updated to active voice Revised 60%24* sign detail Electronic Stamp/Signature	PROFESSIONAL PE-4683 70 7H DAY 08/01/24





ADVANCE WARNING SIGN SPACING					
Road Type		Distance Between Si Min. (ft)			
	А	В			
Jrban - Low Speed (30 mph or less)	150	150			
Jrban - Low Speed (over 30 to 40 mph)	280	280	1		
Jrban - High Speed (over 40 mph to 50 mph)	360	360			
Rural - High Speed (over 50 mph to 65 mph)	720	720			
Jrban Expressway and Freeway 55 mph to 60 mph)	850	1350	2		
Rural Expressway and Freeway 70 mph to 75 mph)	1000	1500	2		
nterstate/4-Lane Divided Maintenance and Surveying)	750	1000	1		





D-704-23

- L = Minimum length of taper, S x W for freeways, expressways, and all other roads with speeds of 45 mph or greater, or W x S² /60 for urban, residential, and other streets with speeds of 40 mph or less.
- Place Sequencing Arrow Panels at the beginning of taper. Where shoulder width does not provide sufficient room, move panel closer to the work area and place on roadway surface.
- Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 MPH,
- vehicles or at the edge of the parking area so they are visible to oncoming traffic. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.

		KEY						
		Ħ	Type III barri	cade		Work an	ea	
		F	Sign		000	Sequen	cing arrov	w panel
		۲	Delineator D	rum		Tubular	Markers	
			ADVANCE W	ARNING S	SIGN SP	ACING		
			Road Type			Distance Between Signs Min. (ft)		
						A	В	С
Urban -	Urban - Low Speed (30 mph or less)				150	150	150	
Urban -	- Low :	Speed	(over 30 to 40 m	nph)		280	280	280
Urban -	- High	Speed	(over 40 mph to	50 mph)		360	360	360
Rural -	- High	Speed	(over 50 mph to	65 mph)		720	720	720
Urban (55 mp	Urban Expressway and Freeway (55 mph to 60 mph)				850	1350	2200	
Rural E (70 mp	Rural Expressway and Freeway (70 mph to 75 mph)			1000	1500	2640		
Intersta (Mainte	Interstate/4-Lane Divided (Maintenance and Surveying)			750	1000	1500		
	NODT		τA					
DEPARTM	MENT C	F TRAN	SPORTATION		/			
	9	-27-13			10th	J. H	02	
	RE	VISIONS	3		11	CISTER		x
DATE		CH	ANGE	NV.	1 hts	ST-4	4 M	1
08-17-17 11-01-19	Remov update Revise	ved spee ed notes ed sign n	d limit signs, & & sign numbers umbers & note		PRC	FESSIC	NAL	
12-08-21 11-29-22	Added Remov	dded Dollars At Work sign emoved Dollars At Work						
					Z/A		a la	·/
				GINEE				
			ATH DAK					
					11/29/22			


(PAVEMENT MARKING)



		Caution Mode
DEPART	NORTH DAKOTA MENT OF TRANSPORTATION 9-27-13	This document was originally
	REVISIONS	issued and sealed by
DATE	CHANGE	Kirk J Hoff
6-18-14 9-27-17 1-08-19	Removed shadow vehicle 2 on two lane roadways Updated to active voice Changed Standard Heading	Registration Number PE- 4683, on 11/08/19 and the original document is stored at the North Dakota Department of Transportation



D-704-50

Maximum 250 pound weight of assembly.

Use a 14" wheel and tire.

Use no automotive and equipment axle assemblies for trailer-mounted sign supports.

Other NCHRP 350 or MASH crash tested assemblies are acceptable.

DEPART	NORTH DAKOTA MENT OF TRANSPORTATION 11-23-10 REVISIONS	JURK J. HORA
DATE	CHANGE	TI CEGIOILANNIA
12/02/2020	Updated Note to active voice.	PROFESSIONAL PE-4683 TOPTH DAY 12 02 2020



FLARED END SECTION								
TERMINAL DIMENSIONS								
DIA	А	В	С	D	Е	U		
12	0'-4''	2'-0"	4'-07⁄8"	6'-0%"	2'-0"	2"		
15	0'-6''	2'-3"	3'-10"	6'-1"	2'-6"	2¼"		
18	0'-9''	2'-3"	3'-10"	6'-1"	3'-0"	21⁄2"		
21	0'-9"	3'-0"	3'-1"	6'-1"	3'-6"	2¾"		
24	0'-9½"	3'-71⁄2"	2'-6"	6'-1½"	4'-0"	3"		
27	0'-10½"	4'-0"	2'-1½"	6'-1½"	4'-6"	3¼"		
30	1'-0"	4'-6"	1'-7¾"	6'-1¾"	5'-0"	31⁄2"		
36	1'-3"	5'-3"	2'-9"	8'-0"	6'-0"	4"		
42	1'-9"	5'-3"	2'-9"	8'-0"	6'-6"	41⁄2"		
48	2'-0"	6'-0"	2'-0"	8'-0"	7'-0"	5"		
54	2'-3"	5'-5"	2'-9¼"	8'-2¼"	7'-6"	5½"		
60	2'-11"	5'-0"	3'-3"	8'-3"	8'-0"	5"		
66	2'-6"	6'-0"	2'-3"	8'-3"	8'-6"	5½"		
72	3'-0"	6'-6"	1'-9"	8'-3"	9'-0"	6"		
78	3'-0"	7'-6"	1'-9"	9'-3"	9'-6"	6½"		
84	3'-0"	7'-6½"	1'-9"	9'-3½"	10'-0''	6½"		
90	3'-5"	7' - 3½"	2'-0"	9'-31/5"	11'-0"	61/2"		

PERSPECTIVE



SIDE VIEW

END VIEW

REINFORCED CONCRETE PIPE - FLARED END SECTION Reinforcement to be equivalent to Class III RCP

TRAVERSABLE END SECTION								
DIA	В	С	D	E	R	s		
15"	4'	9"	4'-9"	1'-7½"	3"	6		
18"	5'-9"	9"	6'-6"	1'-11"	3"	6		
24"	6'	1'	7'	2'-6"	3"	4		
30"	7'-6"	1'	8'-6"	3'-1"	3½"	4		
36"	7'-3"	15"	8'-6"	3'-8"	3"	4		

All Classifications of Round Concrete Pipe



PERSPECTIVE





TOP VIEW

TOP VIEW

REINFORCED CONCRETE PIPE - TRAVERSABLE END SECTION Reinforcement to be equivalent to Class III RCP





U



Internal Dia of pipe in inches	Cross-Sectional Water Area	Weight per lin. foot of pipe Std. Wall	Joint J Groove End Min/Max	Joint K Tongue End Min	Minimum Wall Thickness (T)
Dia	Sq. ft.	Lbs.	In,	In.	In.
12	0.79	92	1 ⁵ /8-2 ³ /8	3⁄4	2
15	1.23	127	1¾-2¾	7∕8	2¼
18	1.77	168	1¾ -2 ⅔	1	2 ½
21	2.40	214	17/8-31/8	11/8	2¾
24	3.14	265	2¾-3¾	11/8	3
27	3.98	322	2¾ - 4	1¼	3¼
30	4.91	384	3¼-4¼	1¼	31⁄2
33	5.94	452	3¼-4¼	1½	3¾
36	7.07	524	3¼-4¼	1½	4
42	9.62	685	3¾ - 4¾	1¾	4½
48	12.57	685	3 ⁵ / ₈ -4 ³ / ₄	17⁄8	5
54	15.90	1070	4½ - 5¼	2	5½
60	19.63	1296	4½-5½	2¼	6
66	23.76	1542	5 - 6	25⁄8	6½
72	28.27	1810	5 ⁵ ⁄8 - 6¾	21%	7
78	33.18	2098	6¼-7¼	21/8	71/2
84	38.48	2410	5 ⁵ /8-7 ³ /4	3¾	8
90	44.18	2793	6¾-8½	31/8	81/2
96	50.27	3092	7-8¼	31/2	9
102	56.75	3466	7-8¼	31/2	9½
108	63.62	3864	71⁄4-81⁄2	3¾	10

CIRCULAR PIPE

END VIEW

JOINTS FOR REINFORCED CONCRETE PIPE

D-714-1



of Transportation

ROUND CORRUGATED STEEL PIPE CULVERTS AND END SECTIONS



D-714-4

_								
			SECT	ION DI	ONS	APPROX.	BODY	
	THORNEOD			11			DATE	DIFOF
	IN	IN	IN	IN	IN	IN	RATE	PIECE
	0.064 - 0.079	7	8	6	26	30	21/2:1	1
	0.064 - 0.109	8	10	6	31	36	2 ½:1	1
	0.064 - 0.109	10	13	6	41	48	21/2:1	1
	0.064 - 0.109	12	16	8	51	60	21/2:1	1 or 2
	0.064 - 0.109	14	19	9	60	72	2½:1	2
	0.064 - 0.138	16	22	11	69	84	21/2:1	2
	0.064 - 0.168	18	27	12	78	90	2¼:1	2
	0.064 - 0.168	18	30	12	84	102	2:1	2
	0.064 - 0.168	18	33	12	87	114	1¾:1	3
	0.064 - 0.168	18	36	12	87	120	1½:1	3
	0.064 - 0.168	18	39	12	87	126	1½:1	3
	0.064 - 0.168	18	42	12	87	132	1¼:1	3
	0.064 - 0.168	18	45	12	87	138	1%:1	3

* These sizes have 0.109" sides and 0.138" center panels.

* * Pipe diameter is equal to dimension "D" of end section.

Manufacturers tolerances of above dimensions will be allowed.

Splices to be the lap riveted type.

Multiple panel bodies shall have lap seams which are to be tightly joined with %" dia. galv. bolts or rivets. Nuts to be torqued to 25 foot-lbs ±.

- Pipes and connecting bands shall conform to applicable sections of NDDOT Standard Specifications and to AASHTO M-36.
- 2. Top edge of all end sections to have rolled edges for reinforcement (see Section A-A). The reinforced edges are to be supplemented with 2" x 2" x ¼" galv. angle for 60" through 72" dia. and 2½" x 2½" x ¼" galv. angle for 78" and 84" dia.. Angles to be attached by galv. %" dia. bolts and nuts. Angles are to extend from pipe to the corner wing bend.
- Elongated pipes shall be factory preformed so that the vertical diameter shall be 5% greater and the horizontal diameter 5% less than a circular pipe.
- Coupling bands shall be two-piece for pipes larger than 36" as shown in Section C-C & D-D details. For pipes 36" and smaller, a one-piece band is acceptable.
- 5. $\frac{1}{2}$ " x 8" bolts may be used as a substitute for the $\frac{1}{2}$ " x 6" bolts shown in the details.
- Coupling bands wider than 14" may be used if a minimum of four ½" bolts with maximum spacing of 5¹/₂" are used for the connection.
- 7. Length of spot welds shall be minimum $\frac{1}{2}$ ".

5⁄16"
 — 0.109" thic galy, steel

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION					
	08-16-13				
	REVISIONS				
DATE	CHANGE				
01-07-14 02-27-14 09-18-19 09-23-22	End Section Plan View 3" x 1" Comgation Detail Added Perspective View Detail Galvanized Thickness Table				



DocuSign

TRAVERSABLE END SECTIONS FOR CORRUGATED STEEL PIPE CULVERTS



 TR

 Pipe

 Dia.

 (in.)

 15

 18

 24

 30

 Equiv.
 (inche

 Dia.
 Span

 (in.)
 Span

 18
 21

 21
 24

 24
 28

D-714-11

RAVERSABLE END SECTIONS FOR CIRCULAR PIPES									
Min. Thick. Dimensions (inches) L Dimensions							;		
in.	Gauge	А	Н	w	Overall Width	Slope	Length (in.)	Slope	Length (in.)
.064	16	8	6	21	37	4:1	20	6:1	30
.064	16	8	6	24	40	4:1	32	6:1	48
.064	16	8	6	30	46	4:1	56	6:1	84
109	12	12	9	36	60	4:1	80	6:1	120

RAVERSABLE END SECTIONS FOR ARCHED PIPES										
es) Min. Thick. Dimensions (inches) L Dimensions								;		
Rise	in.	Gauge	А	Н	W	Overall Width	Slope	Length (in.)	Slope	Length (in.)
15	.064	16	8	6	27	43	4:1	20	6:1	30
18	.064	16	8	6	30	46	4:1	32	6:1	48
20	.064	16	8	6	34	50	4:1	40	6:1	60

- 1. See Standard Drawing D-714-04 for end section to pipe details.
- 2. Use a $\frac{1}{2}$ " diameter rod or strap type connection for 15", 18", and 24" diameter end sections to attach to corrugated steel pipe.
- Use a ⁵/₈" diameter rod type connection for 30" diameter round end sections to attach to corrugated steel pipe.
- 4. Use a $\frac{1}{2}"$ diameter rod type connection for all sizes of arched pipe end sections to attach to corrugated steel pipe.
- Use the same gauge material for the toe plate extension as the end section. Use a dimension with a width 6" less than the overall width.
- 6. For centerline crossings, use end sections with a dimension "W" of 36" or less where a single culvert is required to convey the flow and a dimension "W" of 30" or less where multiple culverts are required to convey the flow.
- 7. For approach crossings, use end sections with a dimension "W" of 24" or less where a single culvert is required to convey the flow and a dimension "W" of 21" where multiple culverts are required to convey the flow.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
7-23-09	O KA
REVISIONS	NUNET
DATE CHANGE	A STER
8-6-21 Notes 2-7, Lables	PROFESSIONAL PE-4684 CONTRACTOR PE-4684 CONTRACTOR PE-4684 CONTRACTOR PE-4684

CONCRETE PIPE, CATTLE PASS, OR PRECAST CONCRETE BOX CULVERT TIES



D-714-22

- 1. The pipe size listed is the inside diameter of round pipe or the equivalent diameter of pipe arch.
- 2. Insert pipe ties from the inside of the pipes and grout into place for Cattle Pass and Jacked and Bored pipes. Jacked and bored pipes with a diameter of 24" or less do not require pipe ties.
- 3. Nuts and washers are not required on Jacked and Bored pipes or pipes with a 24" diameter or less. Insert and grout tie bars into place where nuts and washers are not used.
- 4. Do not use pipe ties to pull the pipe or RCB sections tight. The ties are only for holding sections together.
- 5. Use only tie bolt assemblies that have been hot dip galvanized in accordance with ASTM A 153.
- 6. Holes in pipes to accommodate tie bolts will be precast. Tapered holes are permitted. Use holes that have a diameter $\frac{1}{4}$ " larger than the diameter of the thread. In precast RCB's, use holes that contain cast-in bolt sleeves with an inside diameter of $1\frac{1}{4}$ ".
- 7. Include the cost of precasting the required holes and furnishing and installing the tie bolts in the price bid for the appropriate conduit or RCB pay item.
- 8. Tie all centerline and approach RCP culvert joints. Tie all joints including the end sections of all free ends of storm drain systems. Free ends are defined as any storm drain end which does not terminate at an inlet or manhole. Outfall culverts with end sections which drain adjacent ditches are examples of free ends.
- 9. Place joint wrap prior to installing ties. Firmly secure the wrap around the full perimeter. For concrete pipes, use Type S2 geotextile fabric and overlap the joint by 12" in both directions. For box culverts, use a waterproof membrane that meets ASTM C990. Provide a membrane that is a minimum of 12" wide and center it at the joint. Provide a minimum overlap of 2.5" at the seams.
- Use tie bolts that conform to ASTM A 36. Use heavy hex nuts that conform to ASTM A 563. Use washers that conform to ASTM F 436, Type 1. Use welded pipe sleeves and cast-in bolt sleeves that conform to ASTM A 53, Grade B.
- 11. Provide lock washers or burr threads of concrete box ties after installation and tightening to prevent nut rotation.
- 12. Tie RCB's as noted in the plans.

 	DEPARTN DATE	NORTH DAKOTA MENT OF TRANSPORTATION 3-18-14 REVISIONS CHANGE	New PROFESSION
↓	7-21-15 6-6-17 8-11-21 01-17-25	Note 8 Notes 2-11 Table, Title, Labels Notes 2-12 Table, Label Notes 9-13 Table, Labels Section A-A, End View	PE - 5048 DATE 01/17/25



D-714-26

1) This drawing applies to new/replaced mainline and paved intersection roadway pipes only (including ramps). It does not include pipes in approaches.

2) Embankment may be either borrow Excavation or Common Excavation - Type A

DEPARTM	NORTH DAKOTA MENT OF TRANSPORTATION 7-26-13 REVISIONS CHANGE	MATTHEW C
10-15-13 1-21-15 9-18-15 5-27-20	Label Formatting Nomendature Title Rewording Replaced R1 Fabric with Geogrid Changed bedding depth	KURLE PE-8777 DATE DATE DATE DATE DATE DATE DATE DATE

PIPE INSTALLATION DETAIL FOR LONGITUDINAL MAINLINE PIPE OR PIPE NOT UNDER THE ROADWAY



D-714-27

Pay Items
1) Pipe* 2) Removal of Pipe (if required)

*Included in Pipe Pay Item

- 1) Pipe
- 2) Trench excavation
- 3) Aggregate base course CI 3 or CI 54) Embankment

NOTES: 1) This drawing does not apply to pipes in approaches.
2) It is the contactor's option to select Detail A or B.
3) Embankment may be either Borrow Excavation or Common Excavation - Type A

Bedding and Haunch (A)						
Pipes Not Under Roadway = 0.5 O.D. + 0.5 Feet						
Pipes Under the Roadway = 0.5 O.D. + 0.5 Feet						
Backfill Cover (B)						
Concrete Pipe = 0.5 O.D.						
Metal and Plastic = 0.5 O.D. + 1 Foot						

Backfill Material (C) Top of Pipe 4 Feet or Less Below the Top of Proposed Subgrade = Aggregate Base Course Cl3 or Cl 5 Top of Pipe Greater than 4 Feet Below the Top of Proposed Subgrade = Common Excavation - Type A Pipe Not Under Roadway = Common Excavation - Type B

DEPARTI	NORTH DAKOTA MENT OF TRANSPORTATION	OFESSIO
	7-26-13	RKUTEOUN
	REVISIONS	
DATE	CHANGE	
10-15-13 1-21-15 12-10-15 5-27-20	Label Formatting Nomenclature Added Plastic Pipe Changed bedding depth and updated table	NURLE PE-8777 DATE DATE DATE DOS/27/20 TH DAKO DOCUSION





D-748-1

- 1. Use Curb and Gutter Type 1 (Sec. A & B). Use section "A" with (-) pavement slopes and section "B" with (+) pavement slopes.
- 2. Contraction Joints: Tool the Curb & Gutter 2" as shown on the contraction joint details.
- 3. Isolation Joints: Use ³/₄" expansion joint material for isolation joints. Form the backer rod and joint sealant opening with a pre-cut piece of wood or other material approved by the engineer. Dowel supports are not required on the second pour at a cold joint. Install plastic or metal caps and greased dowels in the cold joint for the second pour.
- 4. Joint Spacing: For hot mix asphalt pavements use a 10' max joint spacing for the curb and gutter with panels on each side of the inlets. For concrete pavements match the joint spacing for the curb and gutter to the pavement joint on PCC Pavements (approximately 15' spacing.)
- 5. Joint sealing: For contraction joint, use joint sealant that conforms to section 826.02B. Use sealant for expansion joints specified in note 3 above. Tool and install sealant in accordance with the manufacturer's recommendations.
- Curb & Gutter-Pavement Interface: For hot mix asphalt pavement use gutter depth shown. For PCC pavements, either match gutter depth to adjacent pavement depth or construct gutter depth shown.
- Tie curb and gutter to abutting PCC pavement with No. 4 bars, 2'-0" in length, spaced at 3'-9" centers for 15' joint spacing (maximum spacing of 4' centers).
- 8. On street returns and other locations where new curb and gutter ends and does not abut existing curb and gutter, taper the last two (2) feet of the curb from 6" in height to 0". Install a 1/2" premolded full depth isolation joint (the same shape as the curb and gutter just ahead of the taper) with an 18" plain round bar across the joint.
- 9. Valley Gutter Joints: Form, saw, or score ¹/₈" min. to ³/₈" max. width contraction joints (a minimum 2" depth) at approx 10' intervals. Seal the joints with hot poured elastic type joint sealer (Section 826.02A.2 of the Standard Specifications.) Include all costs for the joint and sealant in the price bid for Valley Gutter.
- 10. Reinforcing at Inlets: Use #4 deformed reinforcing bars without splices. Include all costs for reinforcing bars at inlets (even inlets located on radii) in the price bid for "Curb & Gutter Type 1" or "Curb & Gutter Mountable Type 1." Extend reinforcement to the second joint (with rebar placed through the first joint) in cases where the 3' minimum panel length can't be obtained.

DEPART	NORTH DAKOTA IENT OF TRANSPORTATION	
	8-7-2013	at J. HON
	REVISIONS	CISTER
DATE	CHANGE	Vine J' KANA
10-17-17 08-27-19 10-30-24	Updated to active volce. New Design Engr PE Stamp. Revised bar size & notes.	PROFESSIONAL PE-4683 TOPTH DAYO 10/30/24

PERFORATED TUBE ASSEMBLY DETAILS

Notes:

- 1. Curbed Roadways: Use a 3' clearance from face of the curb except where right of way or sidewalk width is limited; Use a minimum 2' clearance. Increase the horizontal clearance if required to maintain a minimum sidewalk clear width of 4' from the sign support, not including any attached curb.
- 2. Minimum vertical clearance: Provide at least 5' measured from the bottom of the sign to the edge of the driving lane or auxiliary lane at the side of the road in rural districts. Provide at least 7' clearance to the bottom of the sign, where parking or pedestrian movements occur.
- Install signs on expressways a minimum height of 7'.
- Install adopt-a-highway signs on Freeways at least 7' above the edge of the driving lane.
- Maximum vertical clearance is 6" greater than the minimum vertical clearance.
- 3. Offset signs: Use a vertical clearance of 5' above the edge of the driving lane for signs placed 30 feet or more from the edge of the traveled way.
- 4. Provide a horizontal clearance from edge of shared use path to edge of sign of 3', except where width is limited. Provide a minimum clearance of 2'.







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erforated Tubes							
Inertia In ⁴	Cross Sect. Area In. ²	Section Modulud In. ³					
.129	0.380	0.172					
.372	0.590	0.372					
).561	0.695	0.499					
.605	0.841	0.590					
.804	0.803	0.643					
.979	1.010	0.783					

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Updated notes to active voice & corrected max height of base.		Pogistra	tion		
New Design Engineer PE Stamp		Registra	uon		
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	Telescoping Perforated Tube							
Number of Posts	Post Size In.	Wall Thick- ness Gauge	Sleeve Size In.	Wall Thick- ness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thickness Guage	
1	2	12			No	21⁄4	12	
1	21⁄4	12			No	21⁄2	12	
1	21⁄2	12			(B)	3(C)	7	
1	21⁄2	10			Yes		7	
1	21⁄4	12	2	12	Yes		7	
1	21⁄2	12	21⁄4	12	Yes		7	
2	21⁄2	10			Yes		7	
2	21⁄4	12	2	12	Yes		7	
2	21⁄2	12	21⁄4	12	Yes		7	
3 & 4	21⁄2	12			Yes		7	
3 & 4	21⁄2	10			Yes		7	
3 & 4	21⁄2	12	21⁄4	12	Yes		7	
3 & 4	21⁄4	12	2	12	Yes		7	
3 & 4	21/2	10	2 ³ ⁄ ₁₆	10	Yes		7	

(C) - 3" anchor unit

Notes:

D-754-24A

- 4" Vertical clearance of anchor or breakaway base. The $4"\ x\ 60"$ measurement is above and below post location and also back and ahead of post. 1.
- 2. Use anchor unit of the same size and specification as the post.
- 3. Provide a minimum 8' distance between the first and fourth post on four post signs.
- Use the breakaway base system on standard D-754-24 or the breakaway coupling system manufactured from material meeting the requirements of ASTM A325 fasteners with the special requirements specified by DENT BREAKAWAY IND., INC. which meets the test requirements of NCHRP Report 350. 4.

(B) - $2\frac{1}{2}$ " 12 gauge posts do not need breakaway bases unless support is placed in boggy, wet, or loose soil areas.

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The $2\frac{3}{6}$ " size 10 gauge is shown as 2.19" size on the The $2\frac{1}{2}$ " size is shown as 2.51" size on the plan

D-754-25

Note:

- 1. Horizontal stringers Use perforated tubes or $1^3\!4'' \, x \, ^3\!\!/_6''$ thick, 1.08 lbs./ft aluminum or 3.16 lbs./ft steel z bar stringers.
- 2. Use minimum outside diameter ${}^{15}_{16}$ " $\pm {}^{1}_{16}$ " and 10 gauge thick metal washers on sign face.
- 3. Place No Parking signs with directional arrows at a 30 to 45 degree angle with the line of traffic flow. Turning the support to the correct angle for No Parking signs requiring the above angles is allowed. If the No Parking sign is placed with another sign that requires placement at a 90 degree angle with the line of traffic flow, use the detailed angle strap to mount the No Parking sign. Use flat washers and lock washers with all nylon washers.
- 4. Punching the sign backing and placing the bolt through the sign, the stringer and the post is allowed in lieu of using the bent bolt to attach the post to the stringer.
- 4" vertical clearance of anchor or breakaway base. The 4" x 60" measurement is above and below post location and also back and ahead of post.

	Telescoping Perforated Tube						
Number of Posts	Post Size In.	Wall Thick- ness Gauge	Sleeve Size In.	Wall Thick- ness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thick- ness Gauge
1	2	12			No	2¼	12
1	2¼	12			No	21/2	12
1	2½	12			(B)	3(C)	7
1	21/2	10			Yes		7
1	2¼	12	21/2(D)	12	Yes		7
1	21/2	12	2¼	12	Yes		7
2	21/2	10			Yes		7
2	2¼	12	21/2(D)	12	Yes		7
2	21/2	12	2¼	12	Yes		7
3 & 4	21/2	12			Yes		7
3 & 4	21/2	10			Yes		7
3 & 4	21/2	12	2¼	12	Yes		7
3 & 4	2¼	12	21/2(D)	12	Yes		7
3 & 4	21/2	10	2 ³ / ₁₆	10	Yes		7

(B) - When placing $2\frac{1}{2}$ ", 12 gauge posts in standard soils without breakaway bases, provide a shim as specified by the manufacturer. Provide breakaway base when placing the support in weak soils. Engineer will determine if soils are weak. Weak soils are classified as boggy, wet, or loose soil areas. (C) - 3" anchor unit (D) - $2\frac{1}{2}$ " x 12 ga. x 18" minimum length external sleeve required.

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ž		7-8-14 8-30-18 8-30-19	7-8-14 Revised Note 3. 8-30-18 Updated notes to active voice	Registration Number			
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS REGULATORY, WARNING AND GUIDE SIGNS



Assembly No. 1







Assembly No. 2















Assembly No. 5

D-754-26

Notes:

- 1. Use 0.100 inch minimum thickness sign backing material.
- 2. Use $1\frac{1}{2}$ " x $1\frac{1}{2}$ " perforated square tube stringers.
- 3. Punch holes round for %" bolt.



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		or transportation

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS REGULATORY, WARNING AND GUIDE SIGNS















Assembly No. 8













D-754-27

Notes:

- 1. Use 0.100 inch minimum thickness sign backing material.
- 2. Use $1\frac{1}{2}$ " x $1\frac{1}{2}$ " perforated square tube stringers.
- 3. Punch holes round for %" bolt.





Assembly No. 10



3 Posts

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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS REGULATORY, WARNING AND GUIDE SIGNS Sign supports 10' -0--0-Sign support Sign -Sign Support 志 supports <u>-</u><u>o</u>--0-<u>-</u><u>o</u>-60" 0 <u>_0</u> -0-20" 1 Post $\perp \perp _$ ₫. <u>_</u>_ Assembly No. 13 ____O <u>-</u>0-<u>-</u> ē -0--0-11 - 24" 12" 12 1 Post 2 Posts 3 Posts Assembly No. 12 - Sign supports łOł -0 ō ō 11 - 15" — 15" — 🗕 - Sign support — Sign support supports 30 11 †O† ____. -0--Ō-<u>-</u> -0--0-

Assembly No. 15

- 15"

-1 Post 6" ไ

2 Posts







Assembly No. 16







D-754-28



Assembly No. 14



3 Posts

Notes:

- 1. Use 0.100 inch minimum thickness sign backing material.
- 2. Use $1\frac{1}{2}$ " x $1\frac{1}{2}$ " perforated square tube stringers.
- 3. Punch holes round for %" bolt.

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D-754-29

Notes:

- 1. Use 0.100 inch minimum thickness sign backing material.
- 2. Use 1½" x 1½" perforated square tube stringers.
- 3. Punch holes round for %" bolt.

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D-754-32









D-762-2

NOTE:

(A) Normal width white edge line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph,

Use 4 or 6 inch wide pavement marking for all other roadways with speed limits \leq 40 mph.

Normal width yellow edge line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph, (B)

Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40 mph.

- (C)
- (D) (E)
- Assume "varies" equals 790' for purpose of estimate. Place pavement marking from beginning of taper to the 12" line. Beginning of physical gore to theoretical gore. If the distace is less than 350' extend the 12" channel line to the theoretical gore, otherwise use 195'. Use 195' for estimating purposes. Not required for gravel surface crossroad approaches. 4' minimum, 15' maximum from nearest edge of intersection traveled way.
- (F) (G) (H)
- traveled way. Extend dotted line until it touches the edgeline. (**I**)

-6" vellow edge line — 6" white edge line

BASIS OF ESTIMATE		
LOCATION	ITEM	
	12" White channel Ine	580 LF
Right or Left Side	24" White stop line	60 LF
Exit Ramp	6" White dotted line	148 LF
TAPERED	6" White edge Ine	1115 LF
	6" Yellow edge line	1075 LF
	12" White channel line	390 LF
Entrance Ramp	6" White dotted line	258 LF
TAPERED	6" White edge Ine	1270 LF
	6" Yellow edge line	1075 LF
	12" White channel line	396 LF
	24" White stop line	60 LF
Right or Left Side	6" White dotted line (C)	258 LF
PARALLEL	6" White edge line	1115 LF
	6" Yellow edge line	1075 LF
	12" White channel line	388 LF
Entrance Ramp	6" White dotted line	283 LF
PARALLEL	6" White edge Ine	1275 LF
	6" Yellow edge line	1075 LF
	6" White Iane line, 10' line, 30' skip	2640 LF/M
(Both Roadways)	6" White edge ine	10,560 LF/M
(Sour roodways)	6" Yellow edge line	10,560 LF/M
Cross Road	6" White edge line 6" Dbl yellow barrier line (4" between)	2000 LF 2000 LF





D-762-4

- 1. Continue edge lines through private drives and field drives. Break edge lines for intersections.
- For section lines, county roads, and street approaches, stripe the radii and edge lines of the paved surface within the right of way except where curb and gutter is present.
- Normal width line 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph,
- 3. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits < 40 mph.

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_	10-17-17 08-27-19 11-22-23 07-09-24	Updated to active voice. New Design Engineer PE Stamp, Revised pavement marking widths. Modified Note 1.	PROFESSIONAL PE-4683 07/09/24 70 70 70 70 70 70 70 70 70 70 70 70 70



D-762-11

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8-27-19	New Design Engineer PE Stamp.	01/17/24
11-22-23	Revised pavement marking widths	1210 0171
1-17-24	Revised wide pvmt marking width.	GINEED
		HTH DAK



NOTES:

 Place reflector plates at the first post and spaced at 25' centers on guardrail less than 250' in length and at 50' centers for guardrail over 250' in length. Use reflector the same color as the pavement marking adjacent to that reflector unless noted otherwise on the plans.

D-764-1

- Dispose of excess earth from excavations for guard posts as directed by the engineer. Replace bituminous material where guardrail is installed after mat is placed. Include cost of excavation and replacing of bituminous material in the price bid for other items.
- Place Object Marker within the vertical edges of the Impact Plate. Use type XI retroreflective sheeting meeting the requirements of Section 894.02.E of the standard specifications. Apply sheeting to 0.100 Aluminum sheeting meeting the requirements Section 894.01.A. Attach the Object Marker to the Impact Head Plate with non-rust rivets or some other non-rust attachment device. Slope stripes downward toward the roadway side.
- 4. Guardrail installation height tolerance = 1/4", + 1".
- 5. Standard W-Beam rail post bolt slot spacing is 6'-3". Post bolt slot spacing of 3'-1 $\ensuremath{12^{\prime\prime}}$ is acceptable.

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10-25-19 Updated notes to active voice and added Note 5. 12-02-20 Updated clipped head to optional	PROFESSIONAL PE-4683 TOPTH DAY 12 02 2020



ITEM #	QTY	BILL OF MATERIALS
F3000	1	IMPACT HEAD
F1303	1	W-BEAM GUARDRAIL END SECTION, 12 GA
G1203	2	W-BEAM GUARDRAIL, 12 GA
HP1A	1	FIRST POST ASSEMBLY TOP
HP1B	1	FIRST POST ASSEMBLY BOTTOM
HP2A	1	SECOND POST ASSEMBLY TOP
HP2B	1	SECOND POST ASSEMBLY BOTTOM
P671	5	WOOD CRT POST
P675	5	TIMBER BLOCKOUT OR RECYCLED EQUIVALENT
E750	1	BEARING PLATE
S760	1	CABLE ANCHOR BOX
E770	1	BCT CABLE ANCHOR ASSEMBLY
S785	1	GROUND STRUT HINGED POST
HARDWARE		HARDWARE
B140404	2	¼" Dia x 4" HEX BOLT
WO14	4	¼" WASHER
N014	2	¼" HEX NUT
B580122	17	%" Dia x 1¼" SPLICE BOLT
B581802	4	% Dia x 10" H.G.R. BOLT (POSTS 3 THRU 6)
B580904A	1	%" Dia x 9" HEX BOLT GR 5
W050	5	%" WASHER
N050	22	%" Dia H.G.R. NUT
B340854A	1	¾" Dia x 8½" HEX BOLT GR A449
NO30	1	¾" Dia HEX NUT
N100	2	1" ANCHOR CABLE HEX NUT
W100	2	1" ANCHOR CABLE WASHER
SB58A	8	CABLE ANCHOR BOX SHOULDER BOLT
N055A	8	½" A325 STRUCTURAL NUT
W050A	16	11/16" OD x 9/16" ID A325 STR. WASHER



D-770-1

NOTES:

LIGHT & SIGNAL STANDARD FOUNDATIONS: See plans for conduit size, number of bends and correct position for each foundation. When conduit does not continue beyond the foundation, conduit with a 105° bend and bushings on both ends may be substituted for the 90° bends shown. See plans for correct size & location of foundations. The grade and exact location shall be established by the Engineer in the field. All reinforcing shall be Grade 60. Tie bars shall have a minimum of a 12" lap. Reinforcing may be omitted for Type I, II, V, VI & VII signal standard foundations if the anchor bolts extend to within 3" to 6" above the bottom of the foundation. A minimum of 6 anchor bolts shall be used for cantilevered structures.

CONTROLLER CABINET FOUNDATION PAD MOUNT FOUNDATION: See plans for the number of 90° bends per foundation and correct positioning. The foundation for Pad Mounted Controller Cabinet shall be of sufficient size so that there is a minimum of 3" of clearance from the outside edge of cabinet to the outside edge of the foundation on any side. The contractor shall ensure a water-tight seal between the controler cabinet and the foundation by caulking, except for V-aroove.

WORKING AREA SLAB: The materials and preparation of this slab shall be as approved by the Engineer in the field.

TRANSFORMER & FEED POINT CABINET FOUNDATION PAD MOUNTED: The foundation shall have a wood float finish. All conduits shown shall be installed. Conduit that is not used at this time shall be plugged with an expandable plua.

FEED POINT CABINET FOUNDATION PAD MOUNTED: The foundation shall have a wood float finish. All conduits shown shall be installed. Conduit that is not used at this time shall be plugged with an expandable plug.

LIGHT & SIGNAL FOUNDATION TABLE		
FOOTING DEPTH	LONGITUDINAL	
(ft)	REINFORCING	
≤ 12	8 - #5	
13 - 1 4	8 - #6	
15 - 1 6	8 - #7	
17 - 19	8 - #8	

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11-01-24	Updated PVC pull box, trenching.	PROFESSIONAL PE-4683 12/06/24 ZONGINEERAT









Transformer Base: In lieu of transformer base use alternate signal standard base.

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Com	Combination Signal and Light Standard			
Signal Standard Type	Luminaire Mounting height (ft)	Install Light Standard Extension and Luminaire	Luminaire Mast Arm	
A	30	yes	single	
В	30	(A)	single	
С	40	yes	single	
D	40	(A)	single	
E	30	yes	twin	
F	30	(A)	twin	
G	40	yes	twin	
H	40	(A)	twin	
	50	yes	single	
J	50	yes	twin	

(A) Install the light standard extension for these signal standards at a later date under a separate contract.

lotes:	
ight standard xtension:	Mast arm is 6 ft. unless otherwise noted on the plans. Use light standard extension galvanized in accordance with ASTM A 123.
uminaire:	Use internal ballast - constant wattage 120 x 240 voltage luminaires. See layout sheets for type of luminaire, wattage, and I.E.S. distribution.
ignal head:	See Traffic Signal Layout for correct mounting position, number, size, and arrangement of lenses. Place mast arm mounted signal heads with a clearance between 17 ft. and 19 ft. from the \bigcirc of the roadway to the bottom of signal heads.
lulti-sided poles:	Provide a means, other than friction, that will not allow the mast arm to be rotated by wind forces. Fabricate the pole so the mast arm is rotatable. This feature to be as approved by the Engineer.

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11			North Dakota Department		
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TRAFFIC SIGNAL HEAD MOUNTING Type IV or combination signal standard 4½" two way slip fitter R Pedestrian countdown timer Ŷ (A) See plans for the appropriate orientation and type of pedestrian signal head to use. G G Pole clamp with two Pole clamp with two horizontal hubs ø horizontal hubs Ø Г Pole clamp with two horizontal hubs Pole clamp with two horizontal hubs Pole clamp with two horizontal hubs N Type II Type IV Type V Pedestal Mounted - Pedestrian (A) Post Mounted - Vehicular Post Mounted - Vehicular Post Mounted - Pedestrian (A) Post Mounted - Pedestrian (A) Light Standard Mounted Pedestrian Signal Head (A) Pedestrian head 5" backplate Signal standard Min. %" band 2" elevator stainless steel plumbizer 4½" three way <u>ج</u> slip fitter Signal and or 0 2" standard pipe pedestrian head Direction of travel - Face of curb 1/4" set screw Side View ЬD R Mast Arm Signal Mid-Span Mounted and Head Bracket Mast Arm Rigid Mounted Ŷ Plan Layout Signal Heads (typical) G Note: Place signal heads behind the face of the curb. 25 Pole clamp with three horizontal hubs R – 5" backplate " backplate (R)Mast arm Mast arm G ĀVē Ŕ ()Pole clamp with <≁two horizontal hubs G |(G)(G-G = \searrow Type VII

Post Mounted - Vehicular Post Mounted - Pedestrian (A)

Isometric View

Front View

End Mounted and Mast Arm Rigid Mounted Signal Heads

Front View

Isometric View

D-772-4



Post Mounted - Vehicular Post Mounted - Pedestrian (A)

Notes:	
Reinforcing Plates:	Install reinforcing plates where mounting hardware attaches to signal heads when using polycarbonate signal heads. Where a plumbizer is used, place reinforcing plates on each side of the plumbizer.
Clearance:	Place the bottom of post or pedestal mounted vehicular signal heads a minimum of 10 ft. and pedestrian signal heads a minimum of 8 ft. above the ground line or sidewalk.
Signal Heads:	See traffic signal layout for correct mounting position, numbers, size, and arrangement of lenses.
Pole Clamps:	A pole plate with suitable banding material, as approved by the Engineer, is allowed in place of pole clamps. Where traffic signal heads and pedestrian signal heads are mounted one above the other, one pole clamp assembly is allowed.
Paint:	Paint signal housing yellow and backplates dull black. Paint pole clamps and signal head mounting hardware the same color as the signal standard shaft.
	When pedestrian heads are light standard mounted, paint the lower 12 ft. the same color as the other traffic signal standards.
Mounting Details:	All signal heads shown viewed from direction of travel.

All signal heads shown viewed from direction of travel.

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DATE	DATE CHANGE		Kirk J Hoff.	
7-8-14 10-17-17 8-28-19	Added reinforcing plate note Updated to active voice. New Design Engineer PE Stamp.	PE Kirk Registra PE ON 8/28/19 document North Dako of Trar		4683, and the original s stored at the ta Department hsportation