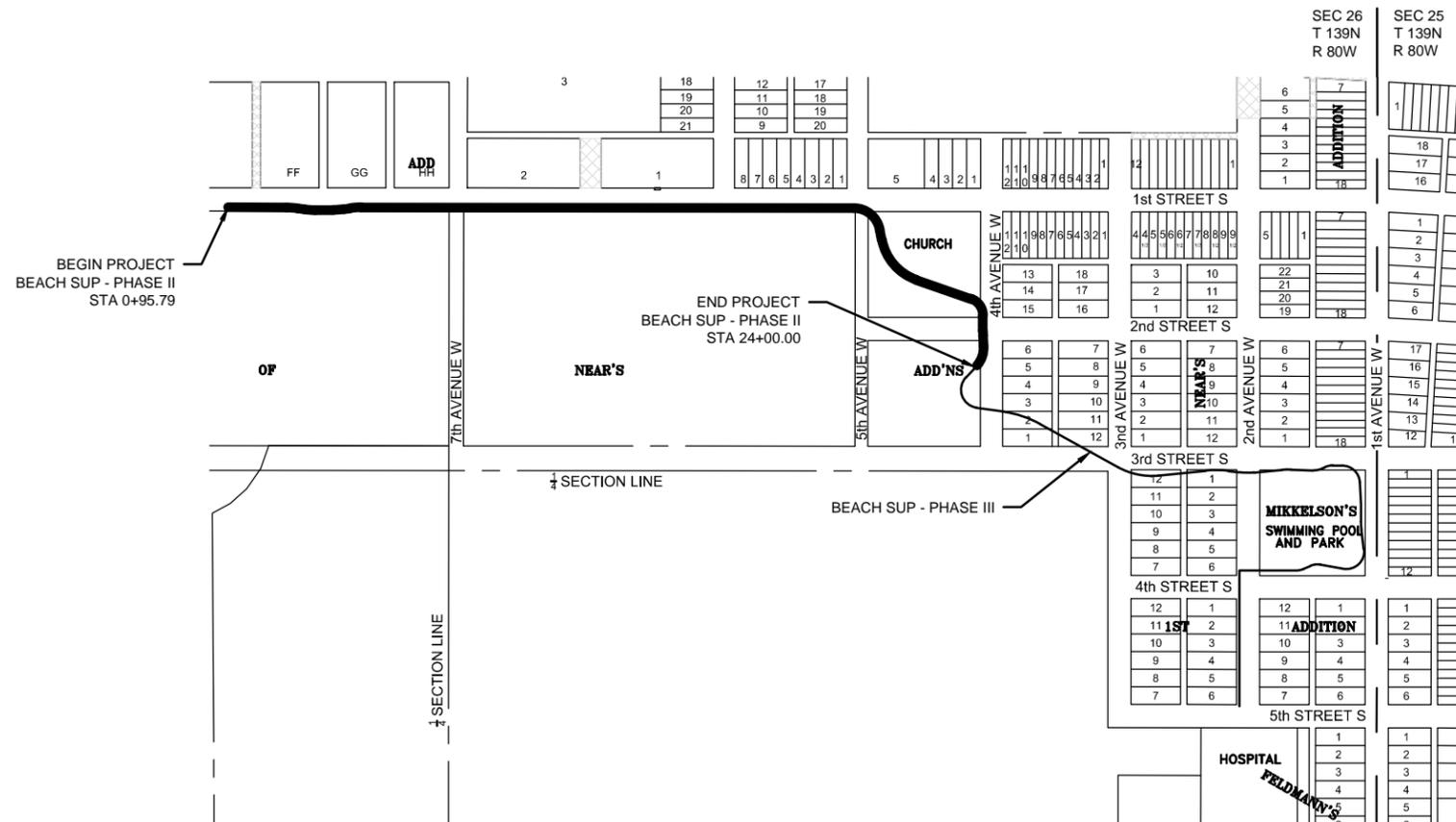


BEACH SHARED USE PATH (SUP) - PHASE II

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	Beach SUP - Phase II	1	1

Beach, North Dakota
 1st Street S to 4th Avenue W
 Grading, Bituminous Pavement, PCC Pavement
 Curb & Gutter, Signing, Marking & Incidentals

GOVERNING SPECIFICATIONS:
 2014 Standard Specifications adopted by the North Dakota Department of Transportation and the Supplemental Specifications effective on the date the project is advertised.



PROJECT	NET MILES	GROSS MILES
BEACH SUP - PHASE II	0.436	0.436

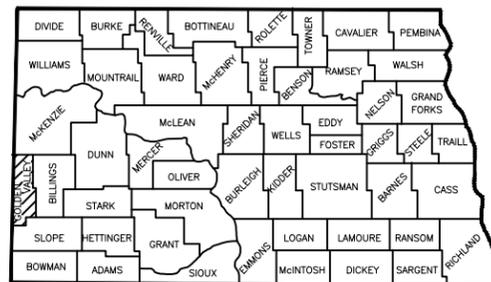


DESIGNERS

Andrew Werder, PE

AJ Welder, EI

Cameron Bencini, EI



STATE OF NORTH DAKOTA

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF NORTH DAKOTA.

Andrew Werder, PE

ANDREW WERDER, PE
 ENGINEER
 BISMARCK, NORTH DAKOTA

DATE: 01-30-2015

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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List of Standard Drawings

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D-101-1	NDDOT ABBREVIATIONS
D-101-2	NDDOT ABBREVIATIONS
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D-260-1	EROSION AND SILTATION CONTROLS - SILT FENCE
D-261-1	EROSION CONTROL FIBER ROLL PLACEMENT DETAILS
D-704-7,8	BREAKAWAY SYSTEM FOR CONSTRUCTION ZONE SIGNS
D-704-13	BARRICADE AND CHANNELIZING DEVICE DETAILS
D-704-50	PORTABLE SIGN SUPPORT ASSEMBLY
D-708-6	EROSION AND SILTATION CONTROLS MEDIAN OR DITCH INLET PROTECTION
D-748-1	CURB & GUTTER AND VALLEY GUTTER
D-750-2	SIDEWALK
D-750-3	CURB RAMP DETAILS
D-754-23	PERFORATED TUBE ASSEMBLY DETAILS
D-754-24	MOUNTING DETAILS PERFORATED TUBE
D-754-24A	MOUNTING DETAILS PERFORATED TUBE
D-754-25	MOUNTING DETAILS PERFORATED TUBE
D-754-28	SIGN PUNCHING, STRINGER, AND SUPPORT LOCATION DETAILS REGULATORY, WARNING, AND GUIDE SIGNS
D-754-46	BIKE ROUTE SIGNS PUNCHING, STRINGER, AND SUPPORT LOCATION DETAILS
D-762-1	PAVEMENT MARKING MESSAGE DETAILS

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BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
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DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113
DATE 01/30/2015		

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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EXISTING	PROPOSED		EXISTING	PROPOSED	
		FIRE HYDRANT			UNDERGROUND ELECTRIC
		GATE VALVE			UNDERGROUND TELEPHONE
		CURB STOP			GAS LINE
		BEND			UNDERGROUND FIBER OPTIC
		TEE			UNDERGROUND CABLE TV
		CROSS			OVERHEAD ELECTRIC POWERLINE
		REDUCER			CURB & GUTTER (CONCRETE)
		SANITARY MANHOLE			EDGE OF ASPHALT SURFACE
		CURB INLET			WOODEN FENCE
		CATCH BASIN (BEEHIVE)			BARBED WIRE FENCE
		STORM MANHOLE			WATER MAIN
		FLARED END SECTION			SANITARY SEWER MAIN
		POWER POLE			CULVERTS / STORM SEWER
		STREET LIGHT			RETAINING WALL
		ELECTRICAL JUNCTION BOX			WETLANDS
		TELEPHONE PEDESTAL			GRADING LIMITS
		SIGN POST			PROPERTY LINE
		GUY WIRE & ANCHOR			EASEMENT
		TREE / SHRUB			CONSTRUCTION EASEMENT
		DRAINAGE DIRECTION			RIGHT OF WAY
		CONCRETE			CONTROL POINT
		ASPHALT			PROPERTY PIN - FOUND/SET
		GRAVEL			MULTIPLE TREE REMOVALS
		CONTOURS			FIBER ROLL
		GUY POLE			ASPHALT REMOVAL
		TV PEDESTAL			SILT FENCE
		SPRINKLER HEAD			CONCRETE REMOVAL
		ROCK			SINGLE TREE REMOVAL
					GRAVEL REMOVAL

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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
		LEGEND
DRWN. BY AJW	CHKD BY ADW	PROJECT NO. 1614113
		DATE 01/30/2015

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	6	1

100-P01 TESTING: The Contractor shall provide an approved independent testing laboratory, which shall be responsible for the proctor's and subgrade density tests, and aggregate tests, concrete test, grout tests, and asphalt tests at the Contractor's expense. The Engineer shall select all test locations. The Contractor shall provide the Engineer the original test results no later than 24 hours after the test was performed. All testing shall be incidental to the bid item being tested. For concrete paving the first truck shall be tested each day a concrete pour occurs.

Testing frequencies shall be determined by the Field Sampling and Testing Manual.

107-P01 HAUL ROAD RESTRICTIONS: Before submitting a proposal, contact the appropriate State, County, Township, or City officials to determine if there are any roadways that will be designated as "no haul routes".

107-P02 STAGING AREA: Contractor shall coordinate location of staging area(s) with the City of Beach.

201-P01 CLEARING & GRUBBING: Field engineer shall mark all trees and shrubs to be removed. Cost to remove all trees, shrubs, stumps, signs and aggregate surfacing shall be included in the bid item, "Clearing & Grubbing."

202-P02 REMOVAL OF CURB & GUTTER: All curb and gutter shall be sawcut at the nearest joint. All costs associated with sawcutting the curb and gutter shall be included in the bid item, "Removal of Curb & Gutter".

202-P02 REMOVAL OF BITUMINOUS SURFACING-FULL DEPTH: All costs associated with sawcutting the bituminous surfacing shall be included in the bid item, "Removal of Bituminous Surfacing-Full Depth".

203-P01 COMMON EXCAVATION TYPE C: Payment for "Common Excavation Type C" shall be contract quantity.

203-P02 TOPSOIL: Payment for topsoil shall be contract quantity. All material and labor costs associated with this item shall be included in the cubic yard bid price for "Topsoil".

All stripped topsoil shall be stockpiled along the trail. Any topsoil stockpile location(s) shall be located as directed by the Engineer.

203-P03 COMPACTION AND DENSITY CONTROL: Compact material as specified in Section 203.04 E.2.b, "ND T-99".

230-P01 SUBGRADE PREPARATION-TYPE C-12IN : In addition to moisture and density testing requirements specified in Section 230; the Contractor shall proof roll the prepared subgrade in the presence of the Engineer prior to placing of aggregate base. Proof roll shall be conducted using a tandem truck with an approximate gross weight of 45,000 lbs. A failing test will be indicated by yielding and rutting of 1 inch or greater or by significant deformation of subgrade.

430-P01 SEEDING CLASS I: Areas to receive Class I seeding shall be all disturbed areas along the proposed trail.

430-P01 COMMERCIAL GRADE HOT MIX ASPHALT: The Commercial Grade Hot Mix Asphalt must meet the requirements specified for Superpave FAA 40 or Superpave FAA 41.

750-P01 CONCRETE SIDEWALK: Contractor shall not receive deduction for any concrete that fails to meet the specified depth. Contractor shall remove and replace all areas that do not meet the specified depth.

Contraction / dummy joints shall be constructed at 8-foot intervals with a single 1/8" wide saw cut. Longitudinal contraction joints are not required. Expansion / isolation joints shall be sealed with cold applied joint sealant.

754-P01 RESET SIGN SUPPORT: Tourist sign shall be reset at a minimum distance of 3' from the edge of the proposed trail to the edge of the reset sign.

762-P01 PVMT MK PAINTED 12 IN LINE: Contractor shall use yellow paint to paint the top and face of the curb between the "No Parking" sign and the end of the curb. No glass beads are required.

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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
		CONSTRUCTION NOTES
DRWN BY AJW	CHWD BY ADW	PROJECT NO. 1614113
		DATE 01/30/2015
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	8	1

BEACH SUP - PHASE II				
FROM 563' WEST OF 7TH AVENUE W TO 4TH AVENUE W				
ESTIMATED TOTAL LENGTH = 2,300 LF (0.436 Miles)				
SPEC	CODE	ITEM	UNIT	QUANTITY - BASE BID
103	0100	Contract Bond	L SUM	1
201	0330	Clearing & Grubbing	L SUM	1
202	0112	Removal of Concrete	SY	671
202	0130	Removal of Curb & Gutter	LF	40
202	0135	Removal of Bituminous Surfacing	SY	65
203	0103	Common Excavation - Type C	CY	219
203	0109	Topsoil	CY	530
203	0140	Borrow-Excavation	CY	362
216	0100	Water	MGAL	35
230	0320	Subgrade Preparation Type C-12IN	STA	23.00
251	0100	Seeding Class I	ACRE	1.2
253	0201	Hydraulic Mulch	ACRE	1.2
260	0100	Silt Fence Unsupported	LF	850
261	0112	Fiber Rolls 12IN	LF	60
302	0356	Aggregate Surface Course Cl 13	TON	39
702	0100	Mobilization	L SUM	1
704	0100	Flagging	MHR	50
704	1000	Traffic Control Signs	UNIT	220
704	1060	Delineator Drums	EA	12
704	1067	Tubular Markers	EA	16
748	0140	Curb & Gutter- Type I	LF	90
750	2115	Detectable Warning Panels	SF	40
754	0110	Flat Sheet for Signs - Type XI Refl Sheeting	SF	31.1
754	0112	Flat Sheet for Signs - Type IV Refl Sheeting	SF	10.8
754	0206	Steel Galv Posts - Telescoping Perforated Tube	LF	165.7
754	0593	Reset Sign Support	EA	1
762	1212	PVMT MK Painted 12 IN Line	LF	106

BEACH SUP - PHASE II				
ALT A				
HMA TRAIL				
SPEC	CODE	ITEM	UNIT	QUANTITY - ALT A
302	120	Aggregate Base Course CL 5	TON	752
430	500	Commercial Grade Hot Mix Asphalt	TON	499
430	5828	PG-58-28 Asphalt Cement	TON	34.8
750	115	Sidewalk Concrete 4IN	SY	39

BEACH SUP - PHASE II				
ALT B				
CONCRETE TRAIL				
SPEC	CODE	ITEM	UNIT	QUANTITY - ALT B
302	120	Aggregate Base Course CL 5	TON	656
430	500	Commercial Grade Hot Mix Asphalt	TON	10
430	5828	PG-58-28 Asphalt Cement	TON	0.7
750	115	Sidewalk Concrete 4IN	SY	2530

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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
 ESTIMATED QUANTITIES		
DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113
DATE 01/30/2015		

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ND	BEACH SUP - PHASE II	10	1

BASIS OF ESTIMATE

WATER

10 GALLONS PER CY FOR COMMON EXCAVATION/BORROW
20 GALLONS PER TON FOR AGGREGATE BASE COURSE
15 "M" GALLONS FOR DUST CONTROL

COMMON EXCAVATION

30% WAS USED IN THE CALCULATIONS FOR SHRINKAGE

AGGREGATE BASE COURSE

1.875 TON PER CUBIC YARD OF CL. 5 AGGREGATE BASE COURSE

COMMERCIAL GRADE HOT MIX ASPHALT

2.0 TON PER CUBIC YARD OF HOT BITUMINOUS PAVEMENT

PG 58-28 ASPHALT CEMENT

7.0% PG 58-28 ASPHALT CEMENT PER TON OF HOT MIX ASPHALT

EARTHWORK

EXISTING TOPSOIL DEPTH WAS ASSUMED TO BE 4 INCHES
30% WAS USED IN THE CALCULATIONS FOR SHRINKAGE OF COMMON EXCAVATION TO BE USED AS FILL

FILL VOL. = 447 CY (CV = COMPACTED VOL.)
CUT VOL. (COMMON EXCAVATION TYPE C) = 219 CY (EV = IN-PLACE VOL.)
UNCOMPACTED FILL REQUIRED = 447 CY * (1.30) = 581 CY (CV)
BORROW EXCAVATION = 581 CY (EV) - 219 CY (EV) = 362 CY (EV)

SEEDING AND MULCHING

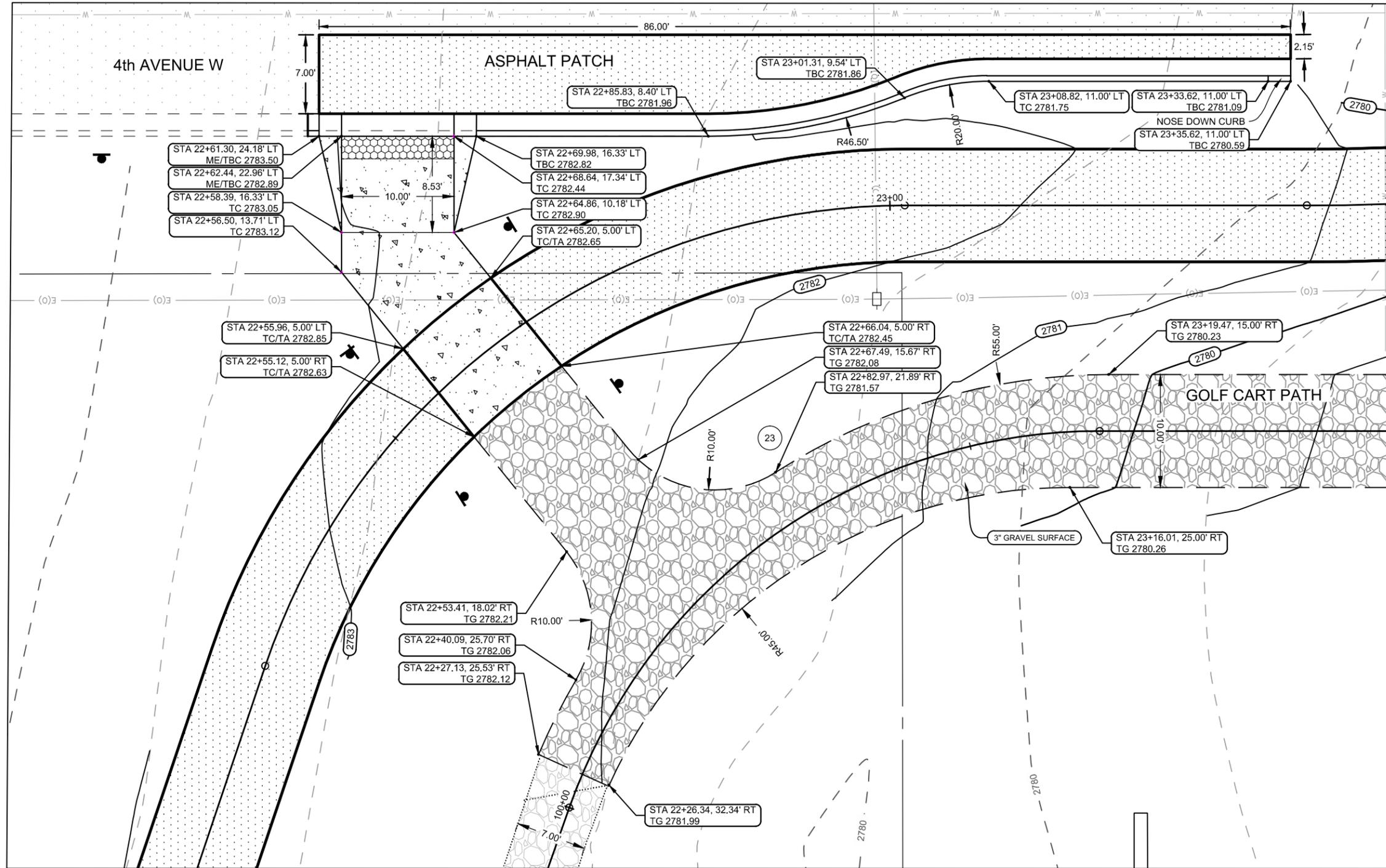
AREAS TO RECEIVE CLASS I SEEDING SHALL BE ALL DISTURBED AREAS ADJACENT TO THE PROPOSED TRAIL.
HYDRAULIC MULCH SHALL BE APPLIED TO ALL SEEDED AREAS.

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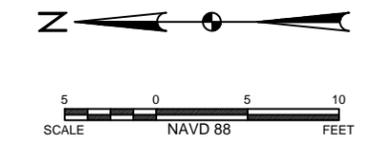
Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
		BASIS OF ESTIMATE
DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113
		DATE 01/30/2015

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	20	1



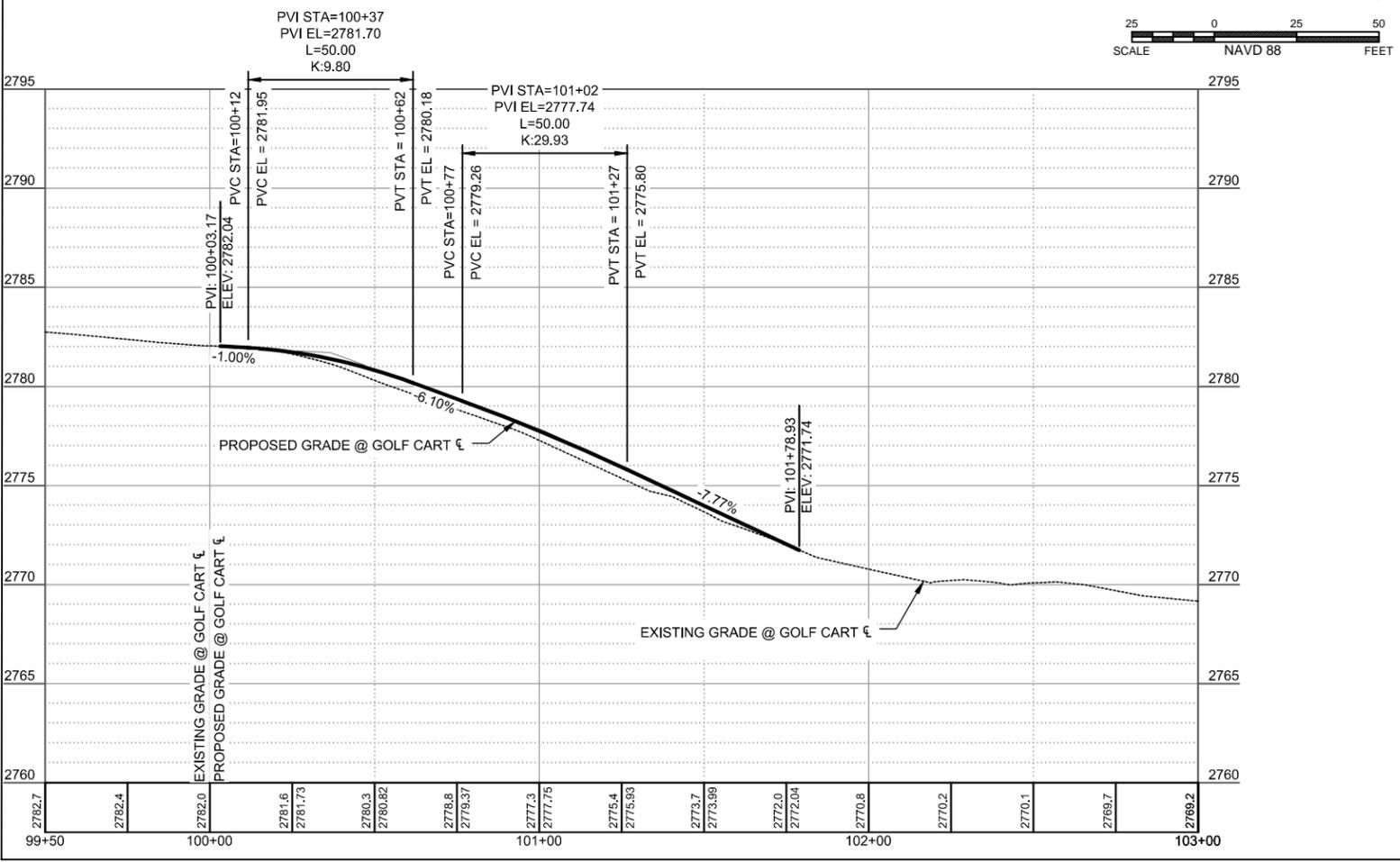
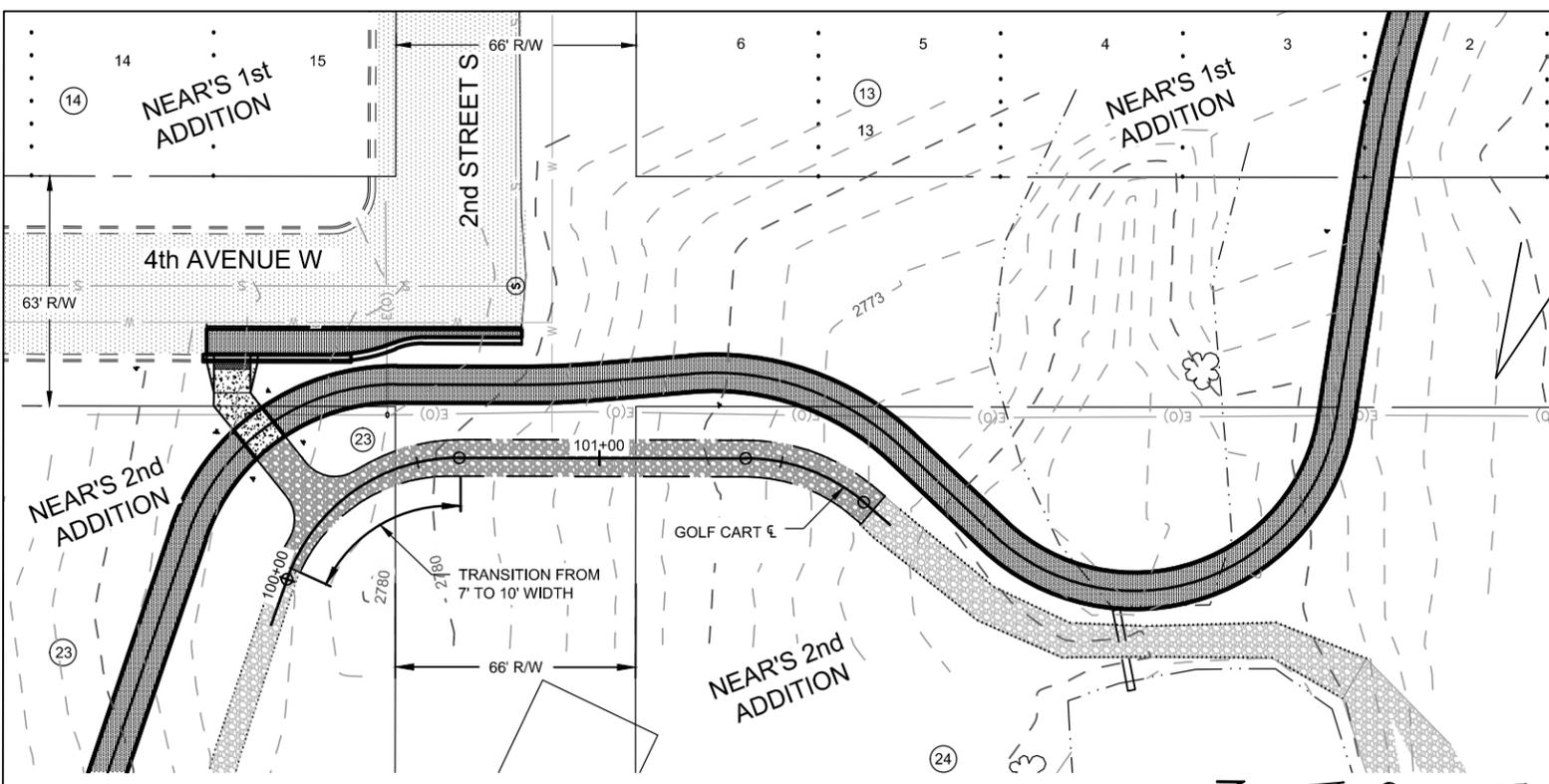
GOLF CART CROSSING AND 4TH AVENUE ACCESS RAMP



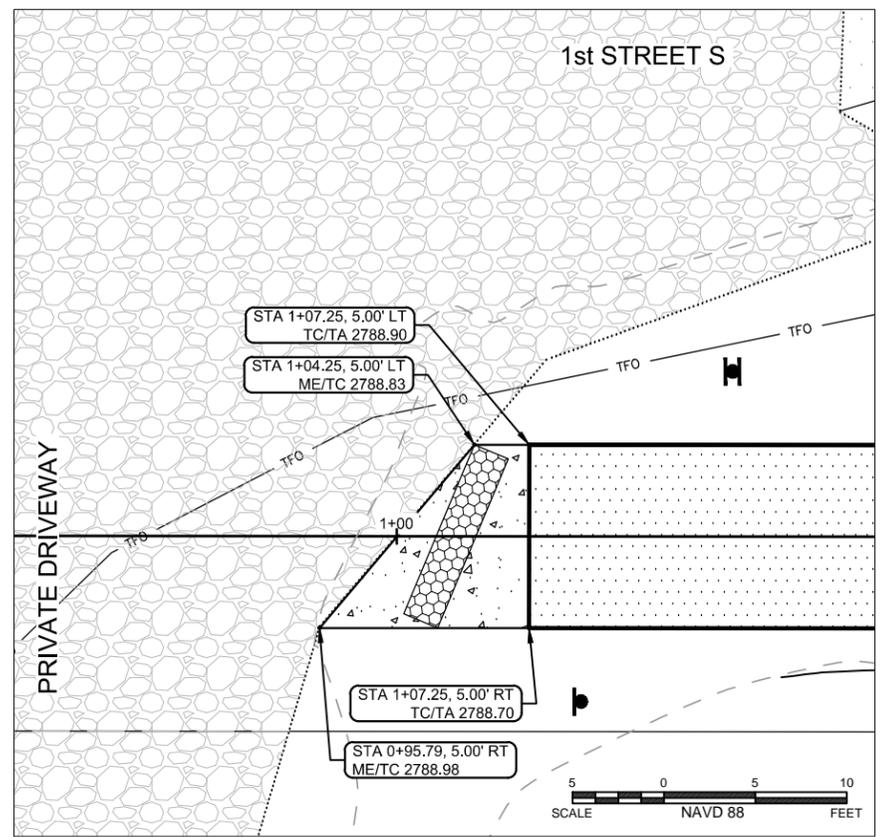
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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
		GENERAL DETAILS
DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113
DATE 01/30/2015		

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ND	BEACH SUP - PHASE II	20	2



GOLF CART PATH PLAN AND PROFILE

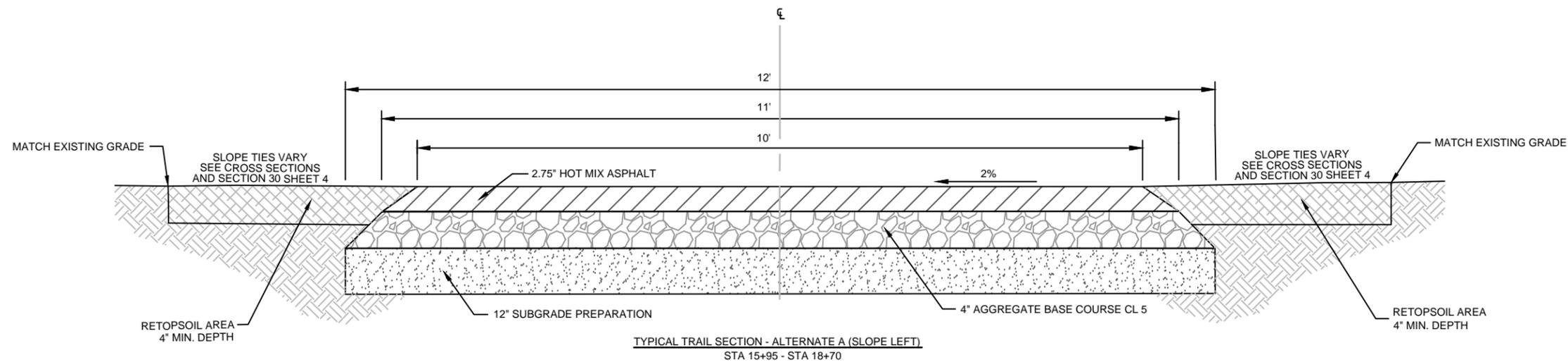
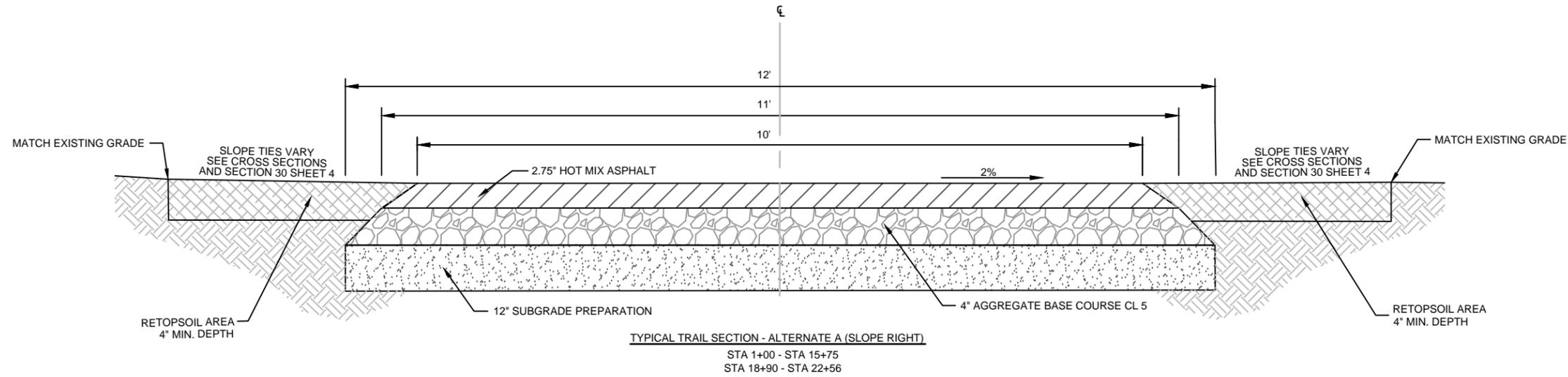
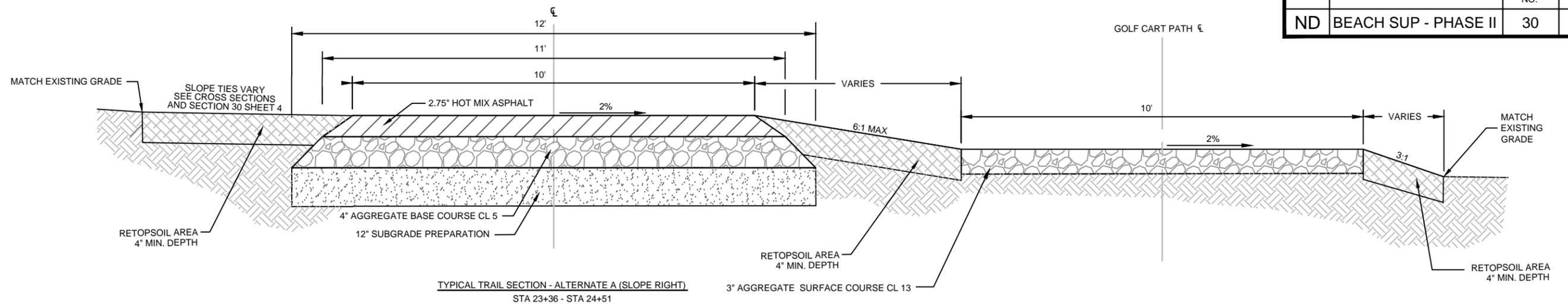


CURB RAMP AT STA 1+00

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BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
KLJ GENERAL DETAILS		
DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113
DATE 01/30/2015		

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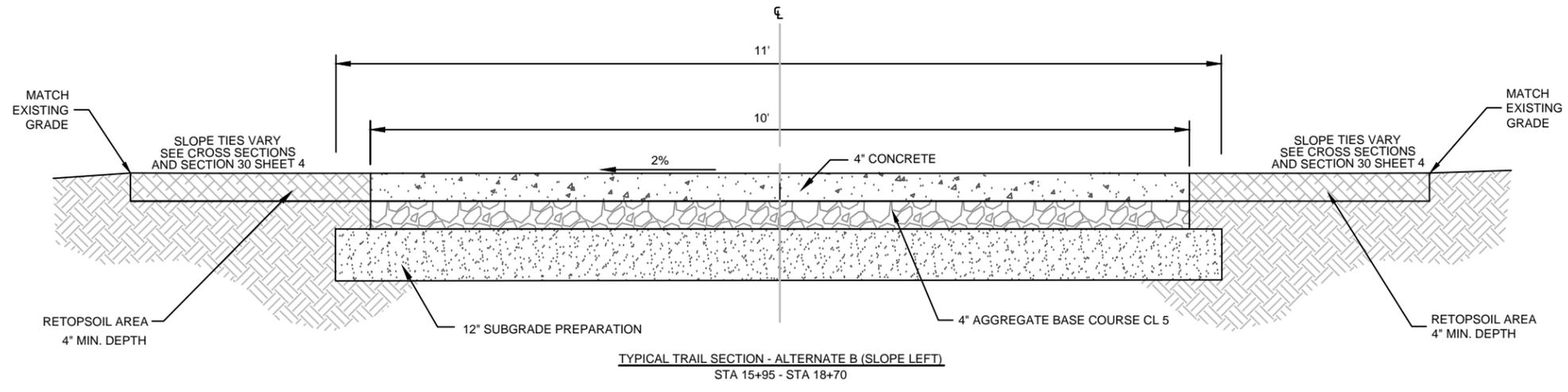
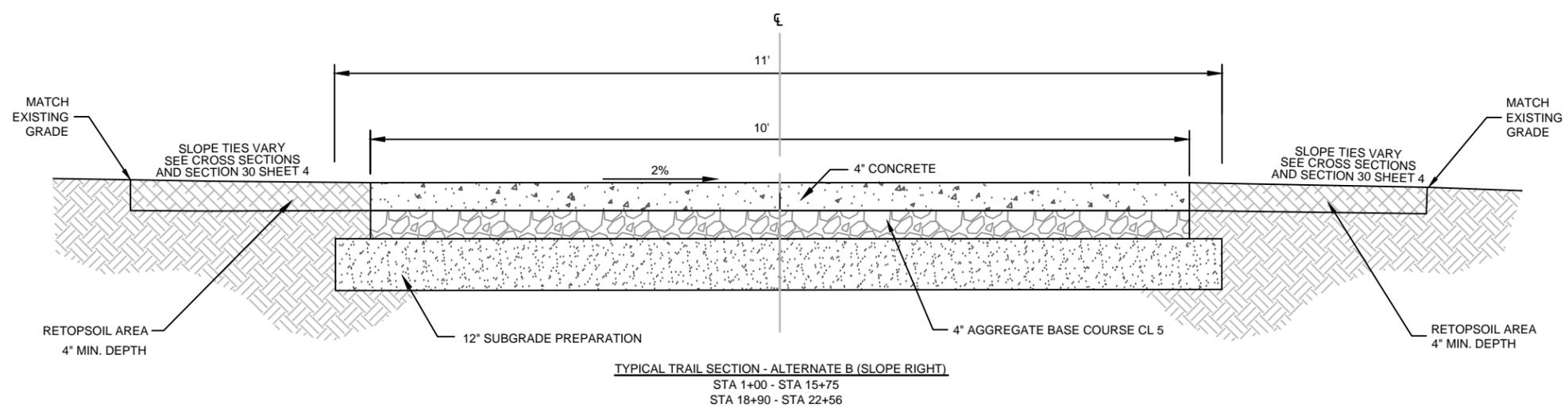
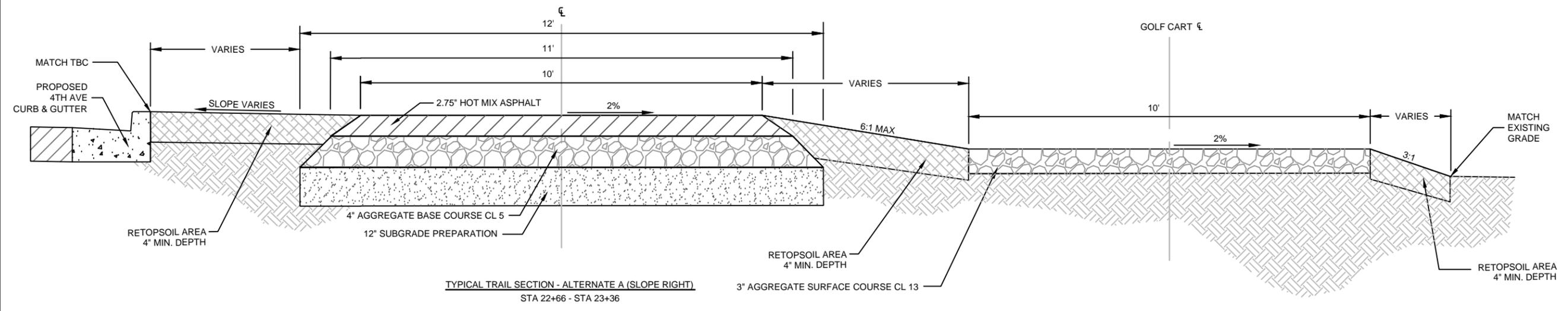


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BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
KLJ TYPICAL SECTIONS		
DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113
DATE 01/30/2015		

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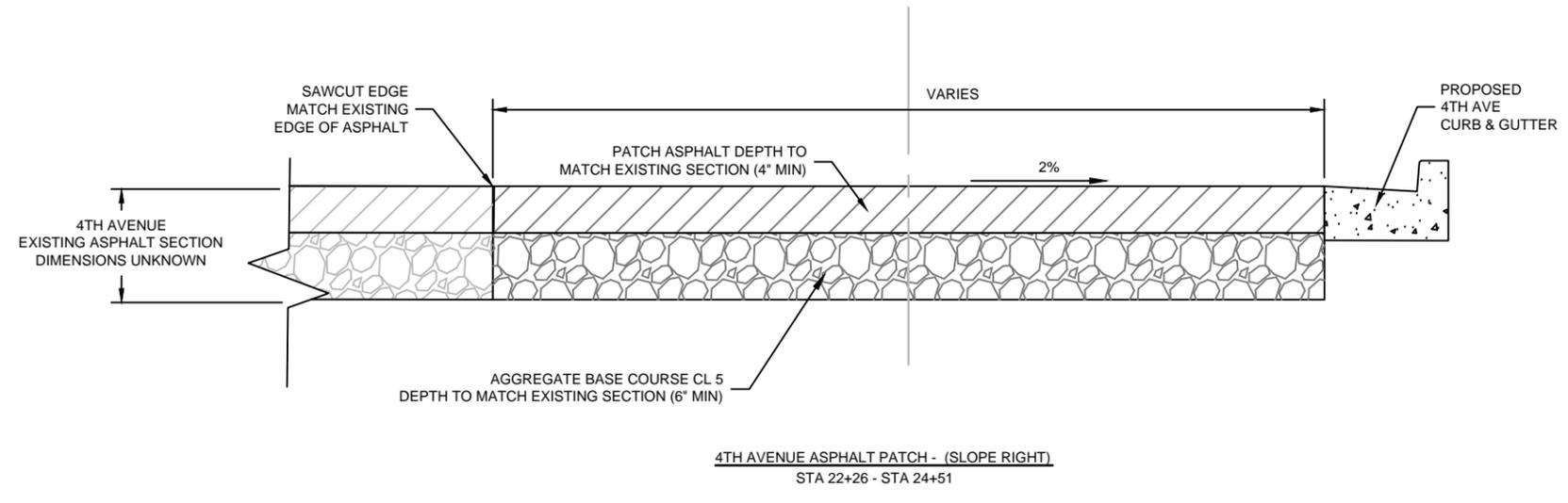
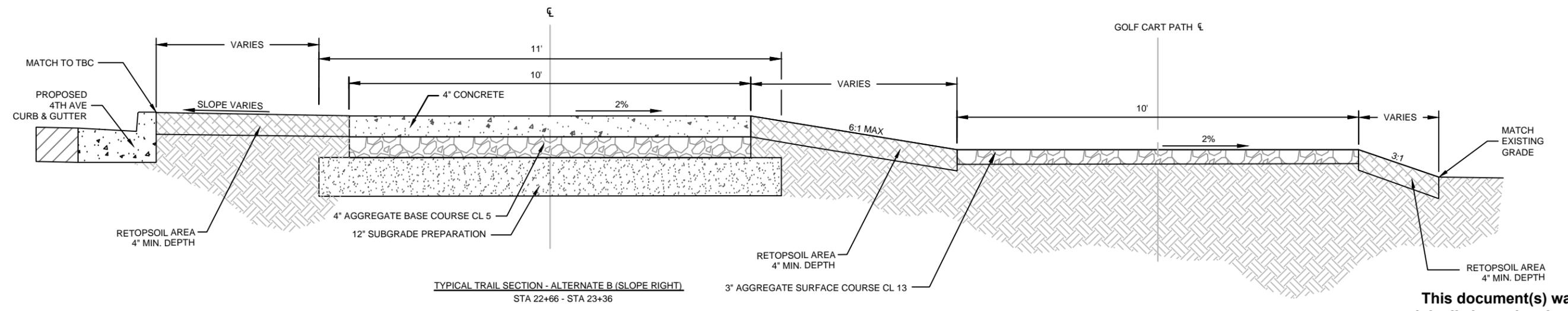
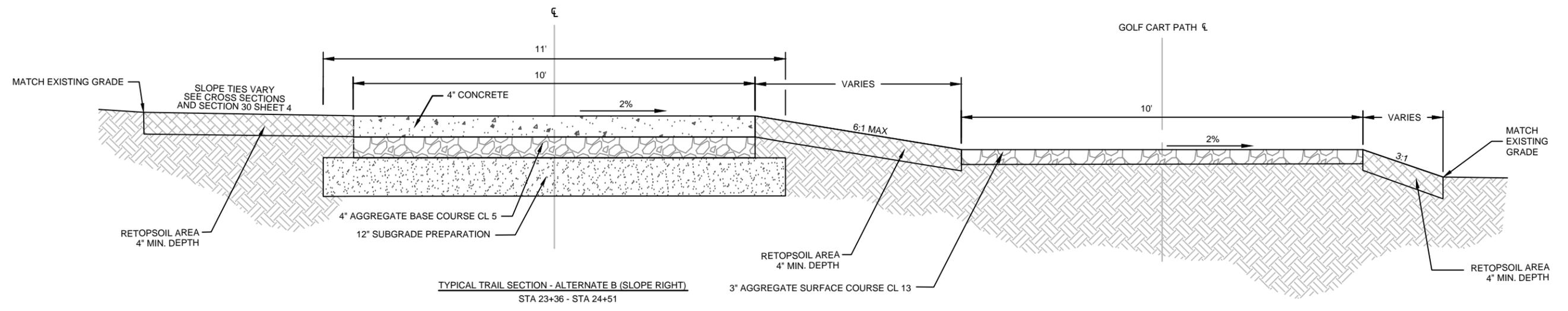
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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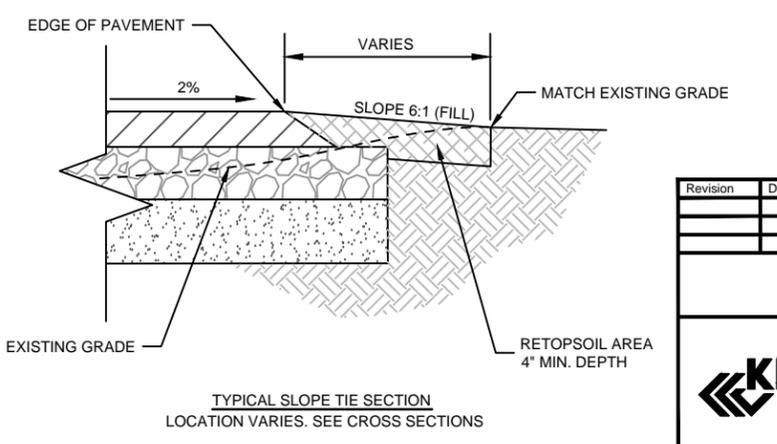
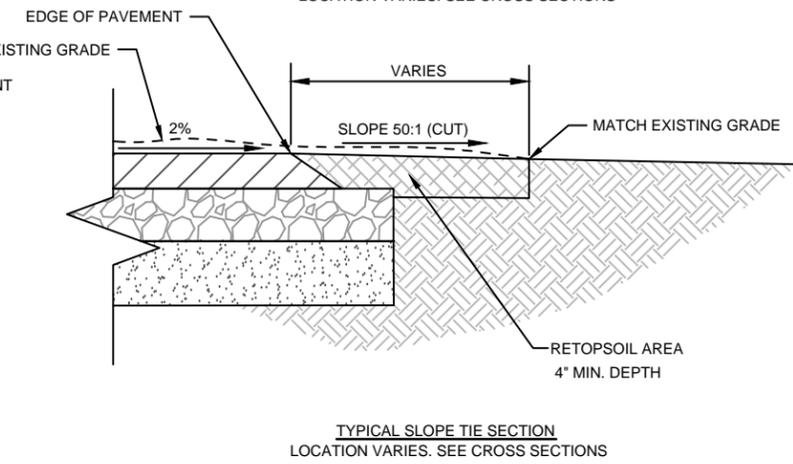
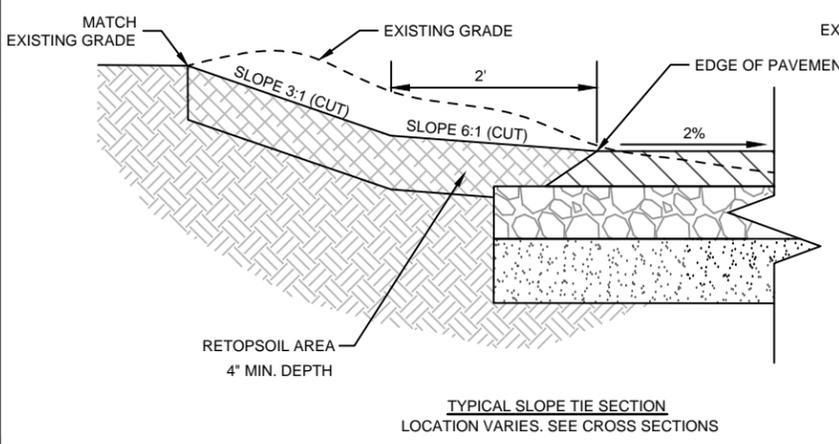
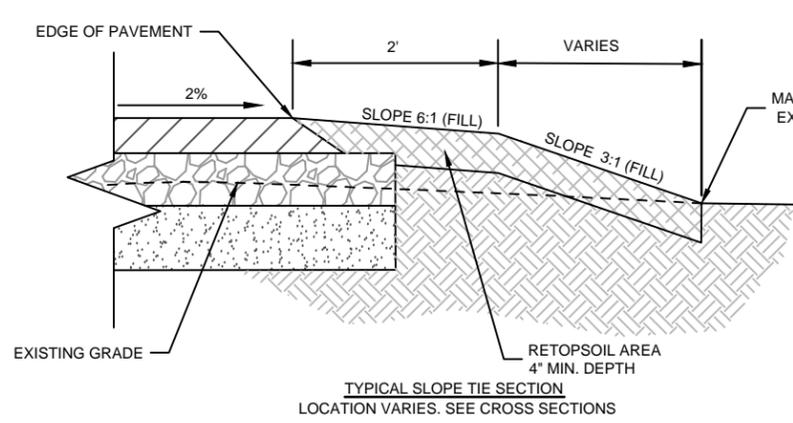
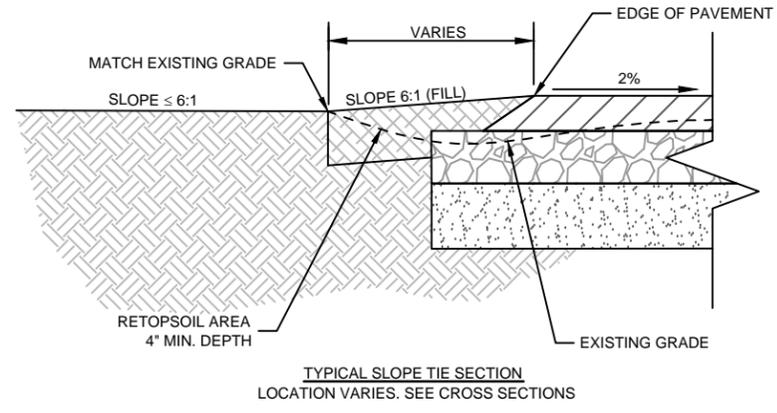
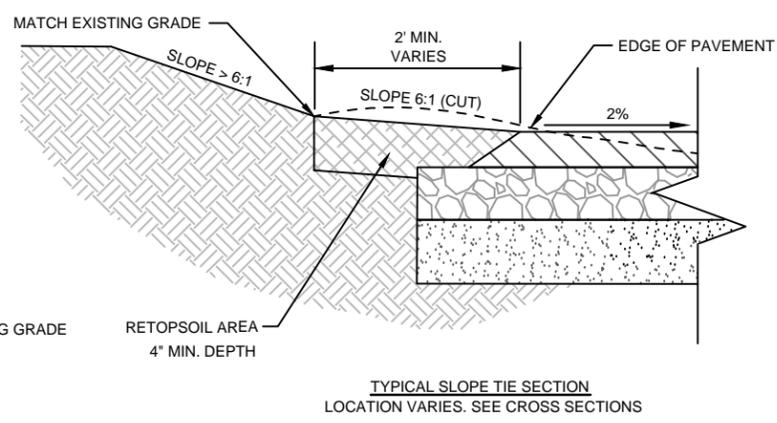
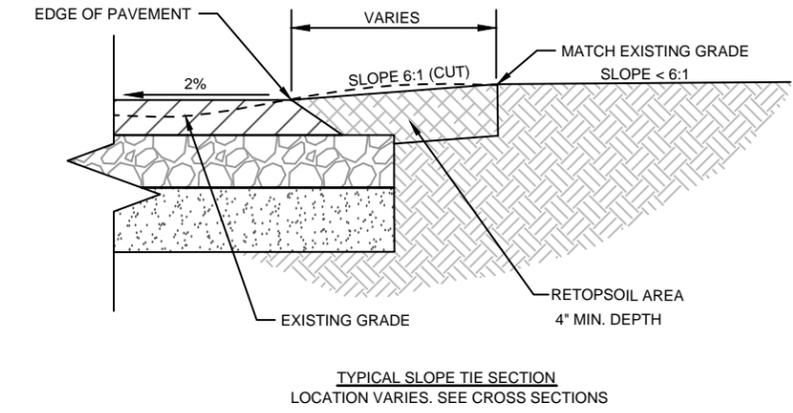
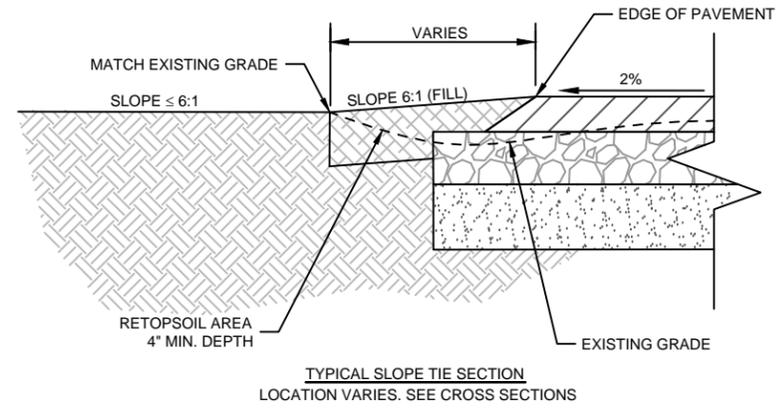
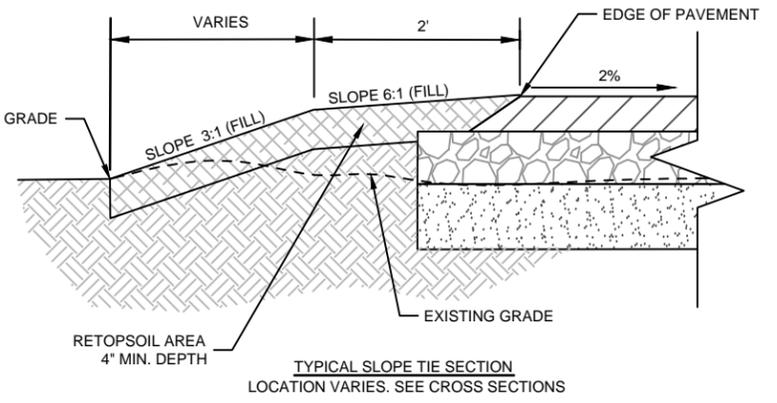
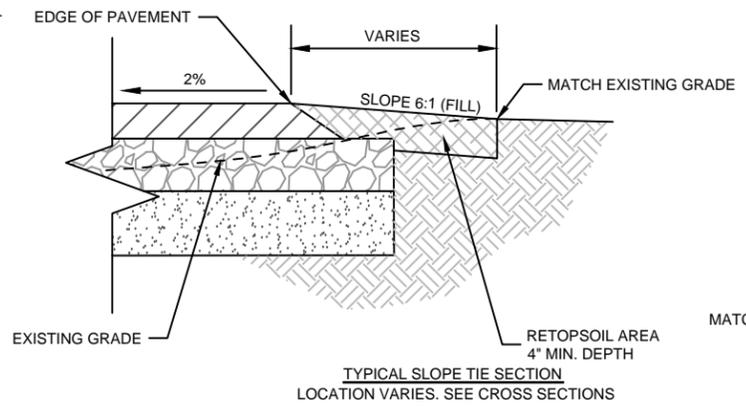
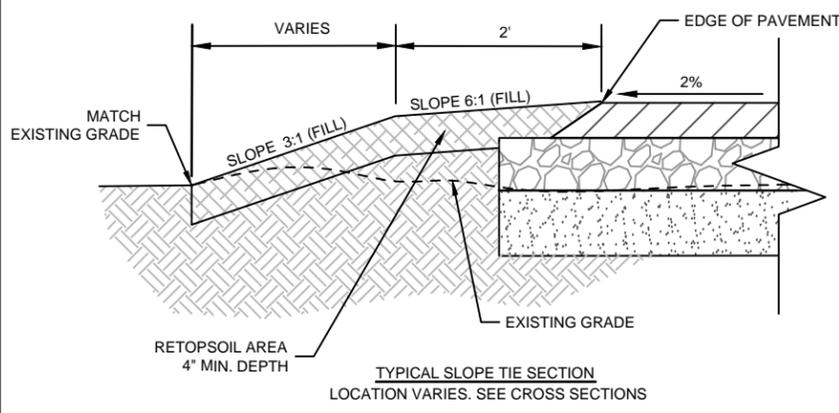
Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
KLJ TYPICAL SECTIONS		
DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113
DATE 01/30/2015		

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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
KLJ TYPICAL SECTIONS		
DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113
DATE 01/30/2015		

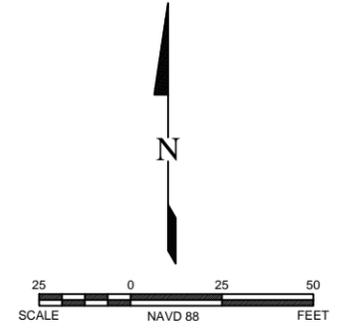
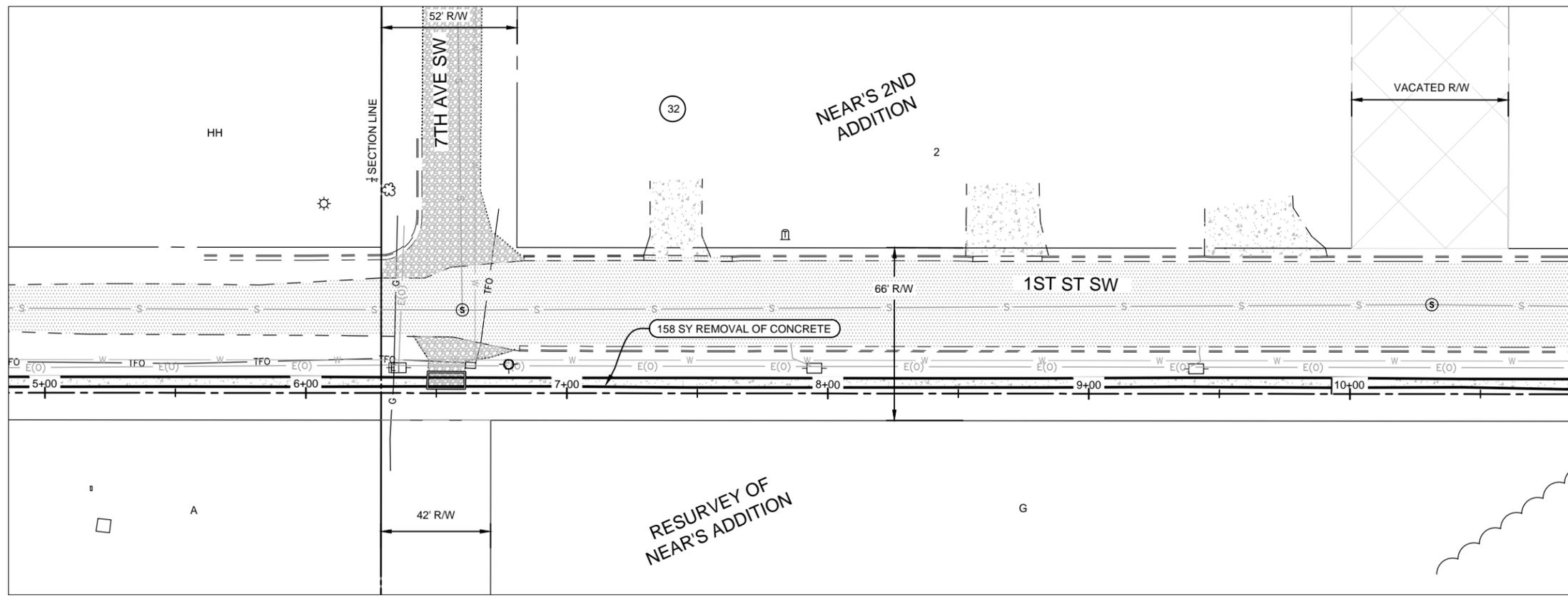
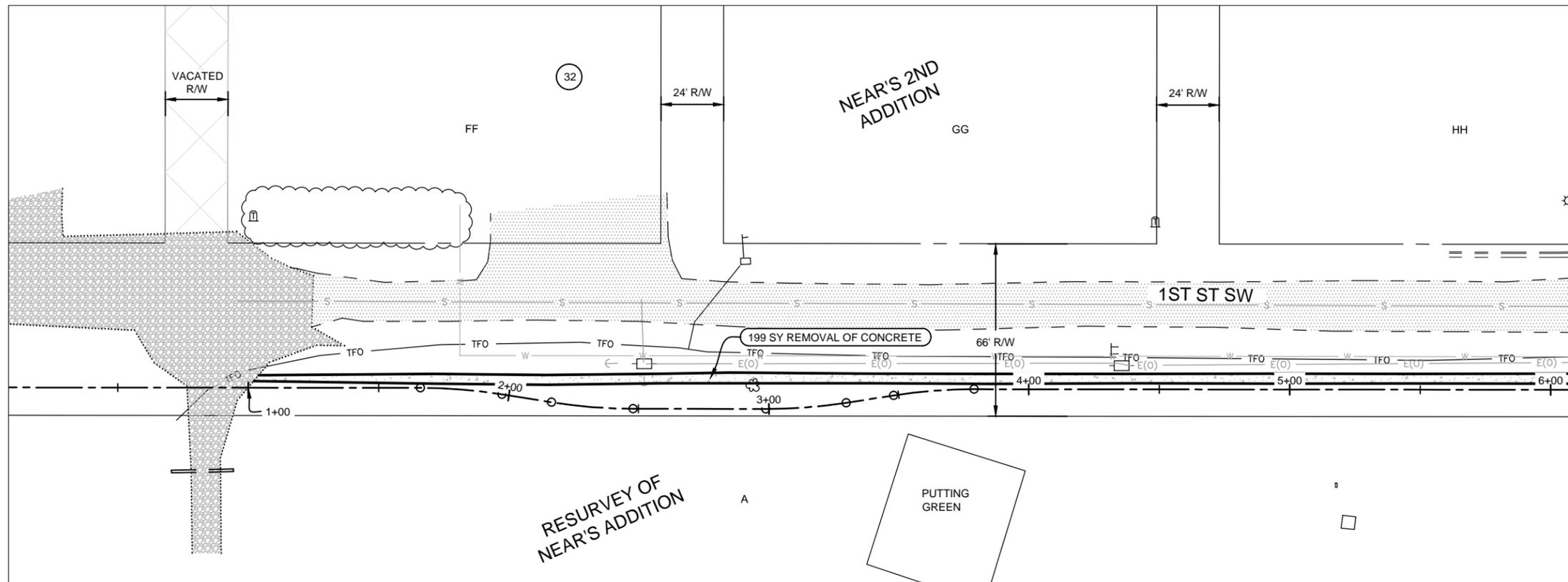


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BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
KLJ TYPICAL SECTIONS		
DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113
		DATE 01/30/2015
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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REMOVAL OF CONCRETE
 STA 1+03 TO STA 6+00 = 199 SY
 STA 6+00 TO STA 10+00 = 158 SY
 TOTAL = 357 SY

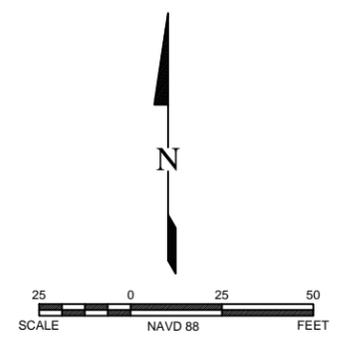
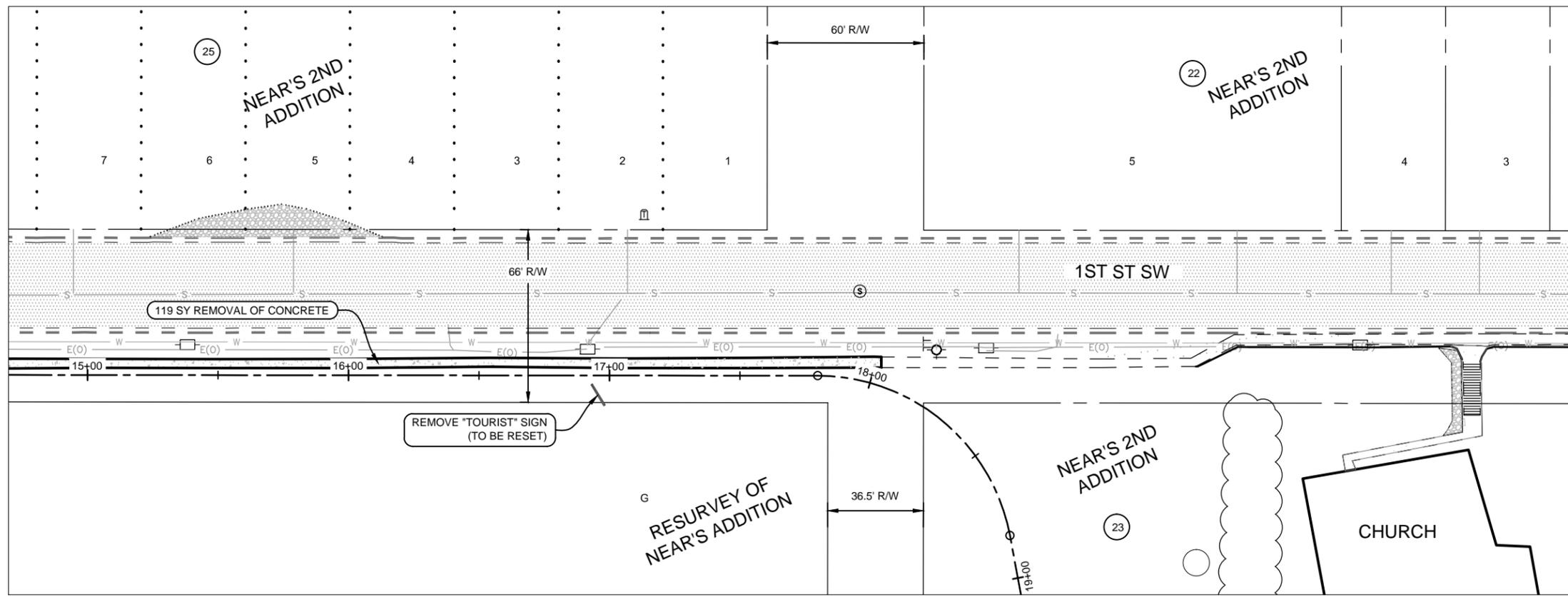
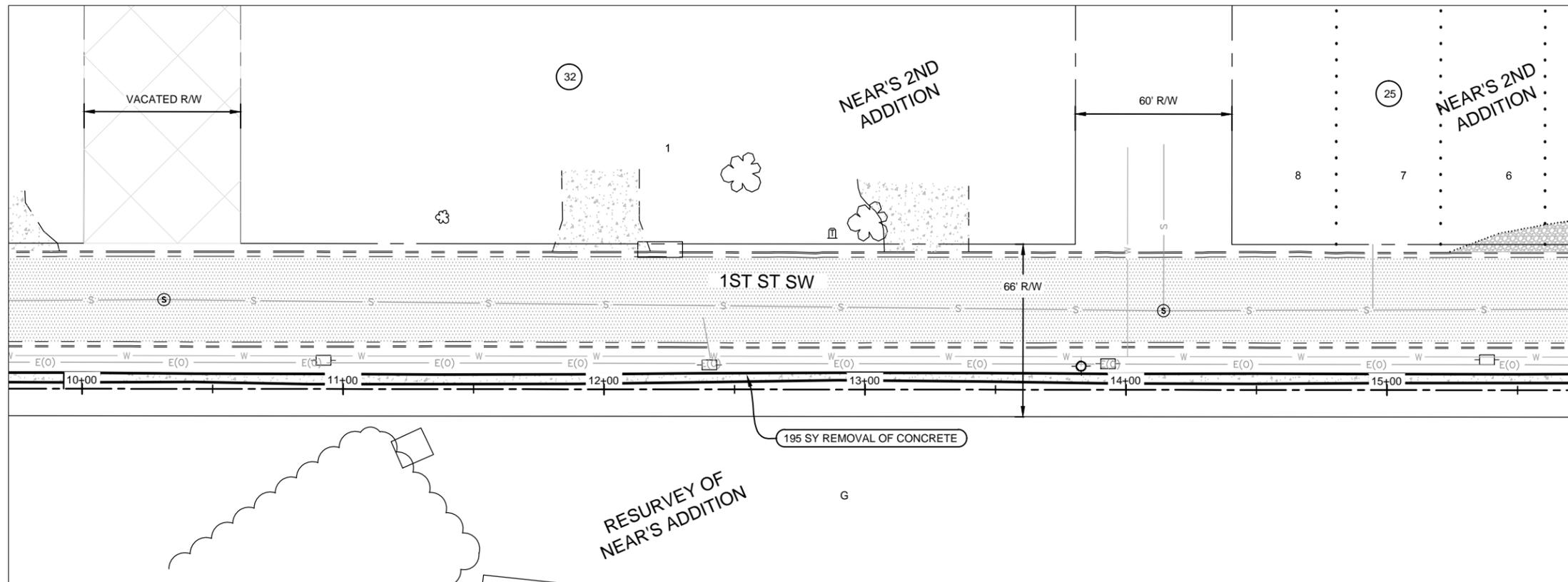


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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
Sta 1+03 to Sta 10+00 EXISTING CONDITIONS & REMOVALS		
DRWN. BY AJW	CHKD BY ADW	PROJECT NO. 1614113
DATE 01/30/2015		

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	40	2

REMOVAL OF CONCRETE
 STA 10+00 TO STA 15+00 = 195 SY
 STA 15+00 TO STA 17+29 = 119 SY
 TOTAL = 314 SY



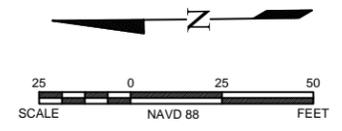
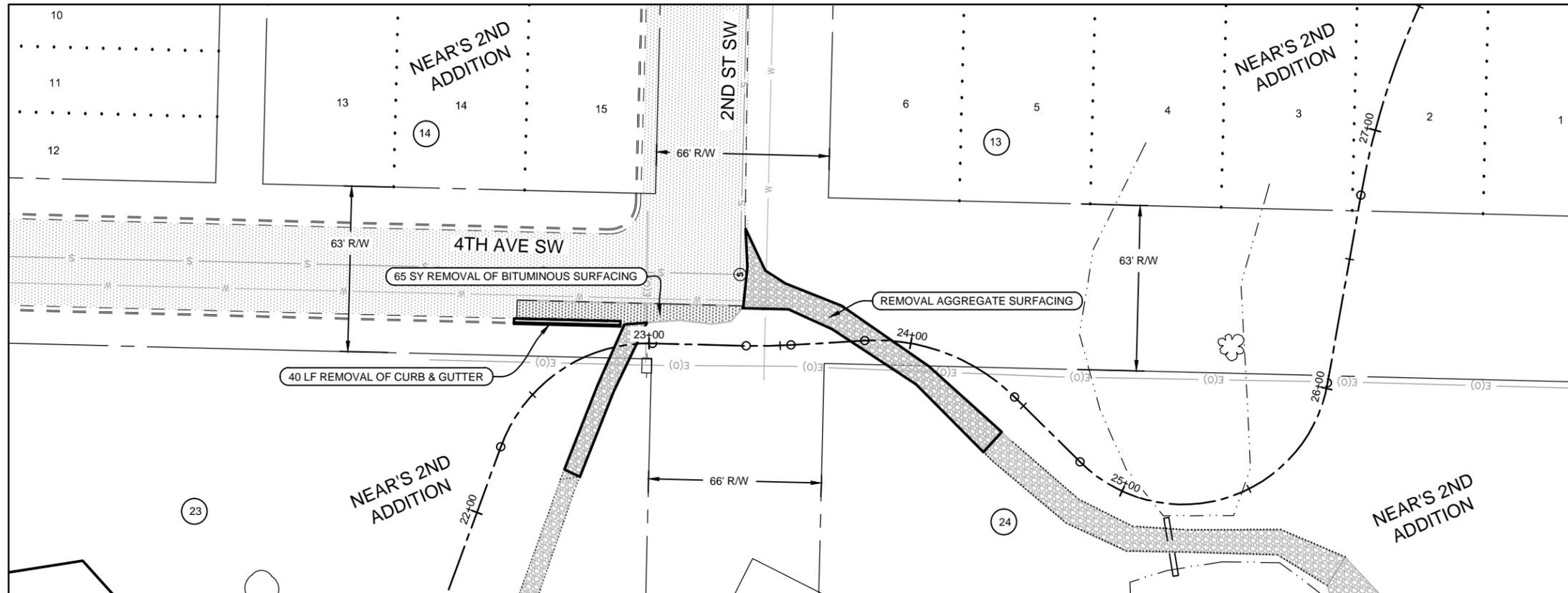
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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
Sta 10+00 to Sta 18+02 EXISTING CONDITIONS & REMOVALS		
DRWN. BY AJW	CHKD BY ADW	PROJECT NO. 1614113
DATE 01/30/2015		

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	40	3

REMOVAL OF CURB & GUTTER
 STA 22+60 TO STA 22+90 = 40 LF

REMOVAL OF BITUMINOUS SURFACING
 STA 22+62 TO STA 23+36 = 65 SY



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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
		Sta 22+27 to Sta 24+51 EXISTING CONDITIONS & REMOVALS
DRWN. BY	CHKD BY	PROJECT NO.
AJW	ADW	1614113
		DATE
		01/30/2015
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	60	1

BASE BID

SUBGRADE PREPARATION TYPE-C (12IN)
STA 1+00 TO STA 5+50 = 4.50 STA

DETECTABLE WARNING PANEL
STA 1+04 = 20 SF

ALTERNATE - A

AGGREGATE BASE COURSE CL 5
STA 1+00 TO STA 1+07 = 2 TON
STA 1+07 TO STA 5+50 = 141 TON
TOTAL = 143 TON

COMMERCIAL GRADE HOT MIX ASPHALT
STA 1+07 TO STA 5+50 = 95 TON

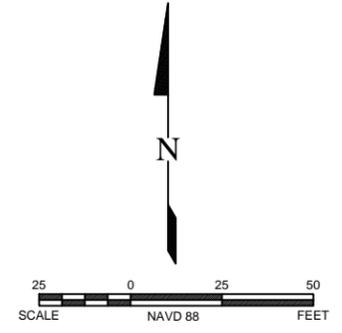
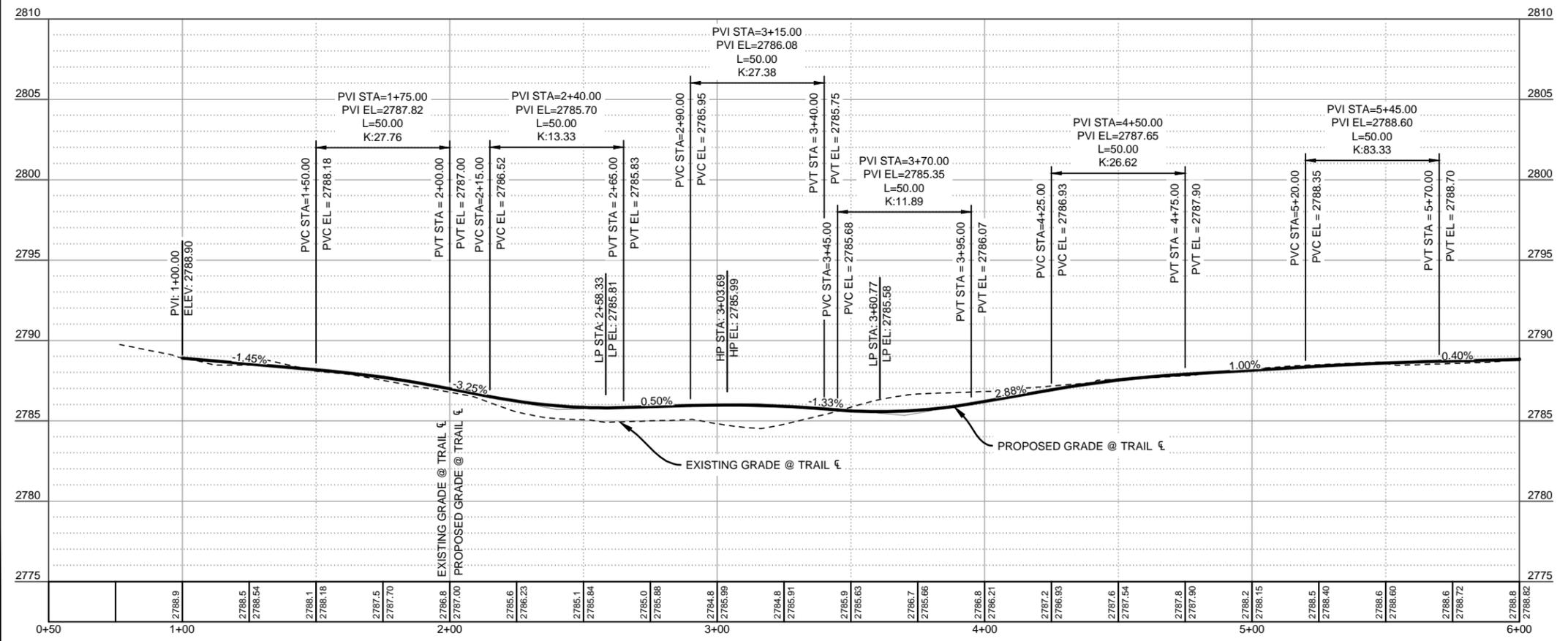
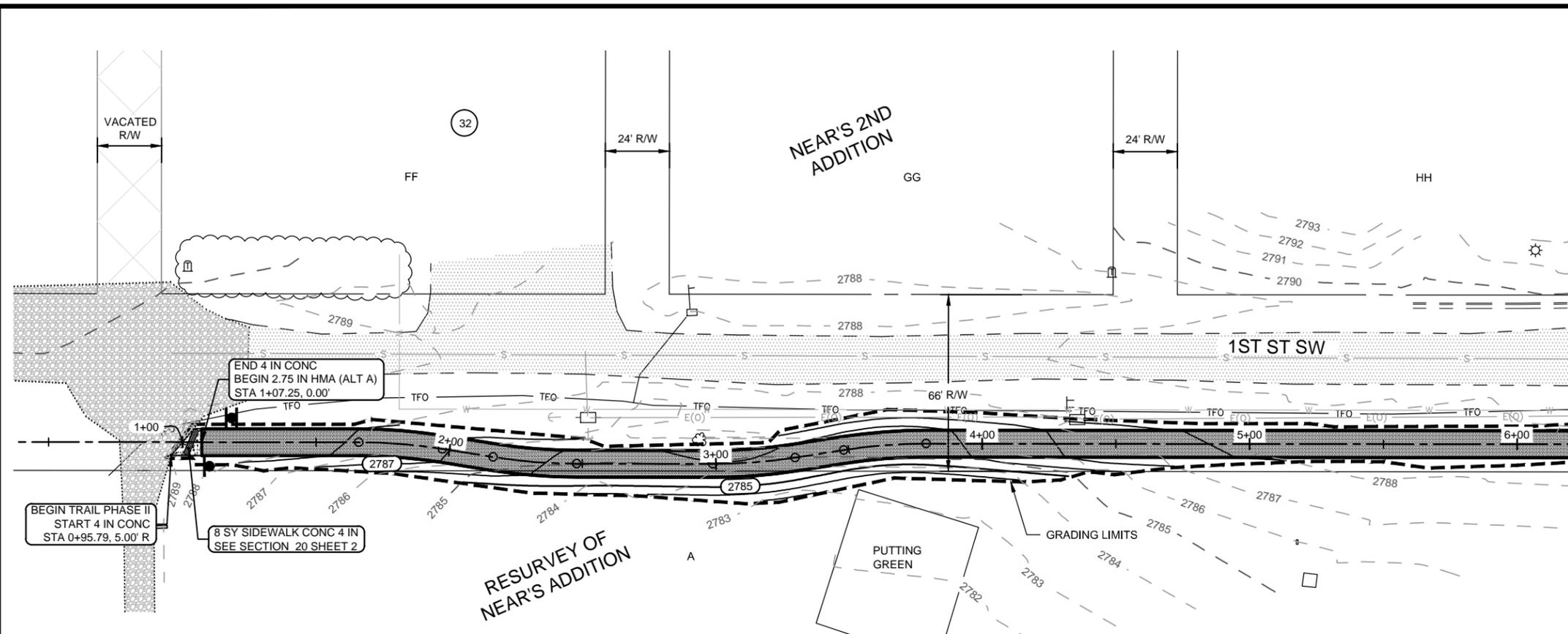
PG-58-28 ASPHALT CEMENT
STA 1+07 TO STA 5+50 = 6.6 TON

SIDEWALK CONCRETE 4 IN
STA 1+00 TO STA 1+07 = 8 SY

ALTERNATE - B

AGGREGATE BASE COURSE CL 5
STA 1+00 TO STA 1+07 = 2 TON
STA 1+07 TO STA 5+50 = 123 TON
TOTAL = 125 TON

SIDEWALK CONCRETE 4 IN
STA 1+00 TO STA 1+07 = 8 SY
STA 1+07 TO STA 5+50 = 492 SY
TOTAL = 500 SY



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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
Sta 1+00 to Sta 5+50 PLAN & PROFILE		
	DRWN BY AJW	CHKD BY ADW
	PROJECT NO. 1614113	DATE 01/30/2015
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	60	2

BASE BID

SUBGRADE PREPARATION TYPE-C (12IN)
STA 5+50 TO STA 10+50 = 5.00 STA

ALTERNATE - A

AGGREGATE BASE COURSE CL 5
STA 5+50 TO STA 10+50 = 160 TON

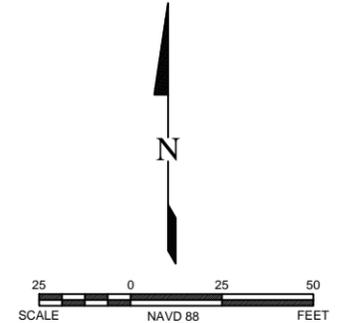
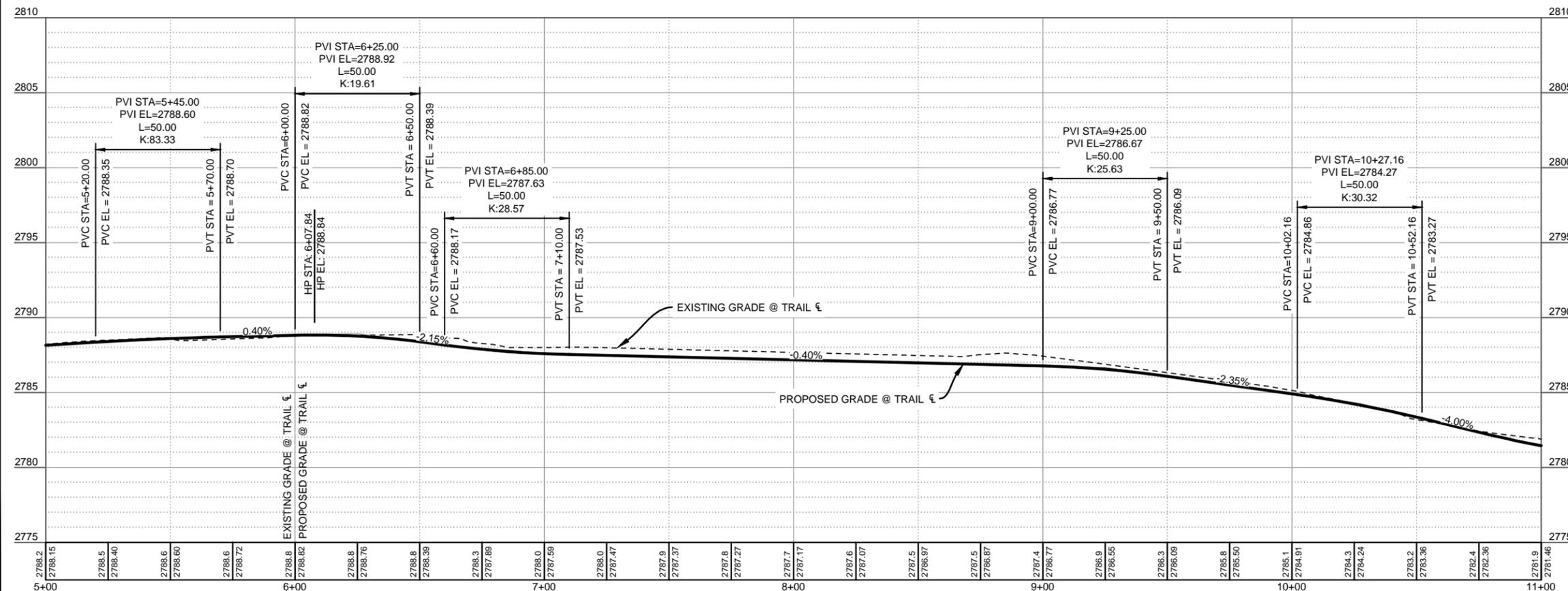
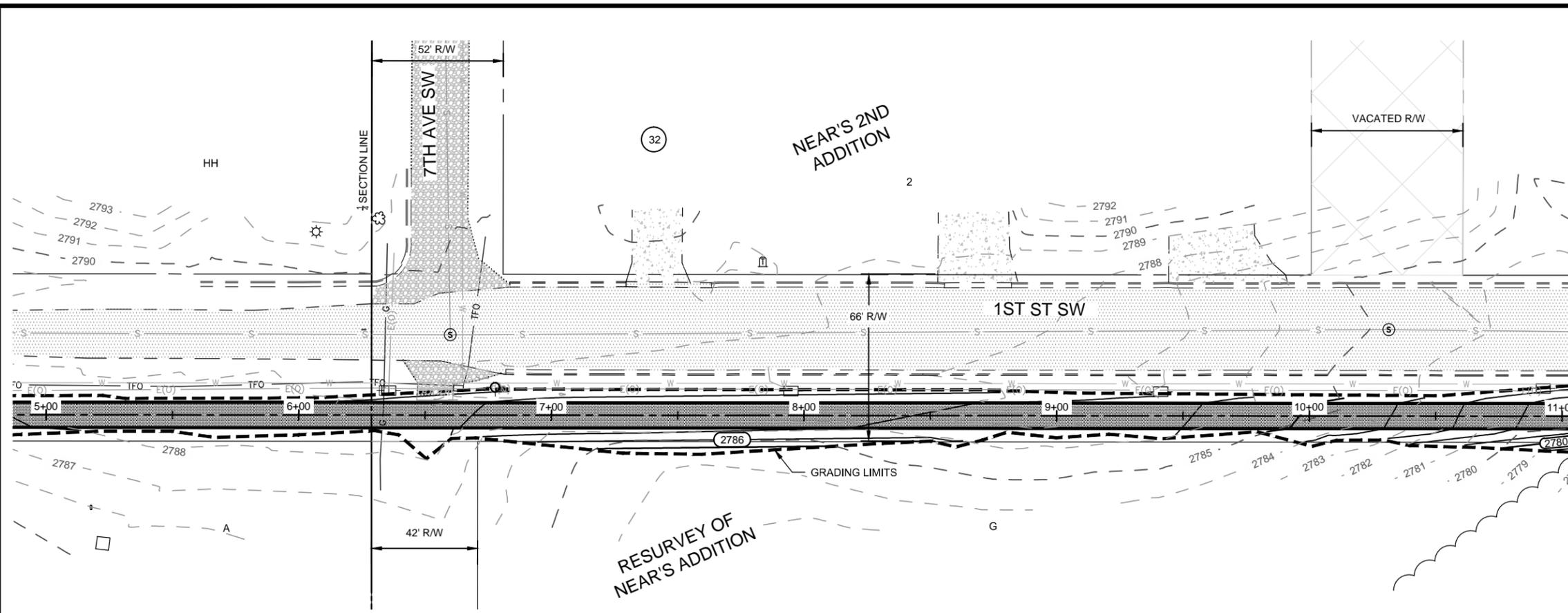
COMMERCIAL GRADE HOT MIX ASPHALT
STA 5+50 TO STA 10+50 = 107 TON

PG-58-28 ASPHALT CEMENT
STA 5+50 TO STA 10+50 = 7.5 TON

ALTERNATE - B

AGGREGATE BASE COURSE CL 5
STA 5+50 TO STA 10+50 = 139 TON

SIDEWALK CONCRETE 4 IN
STA 5+50 TO STA 10+50 = 556 SY

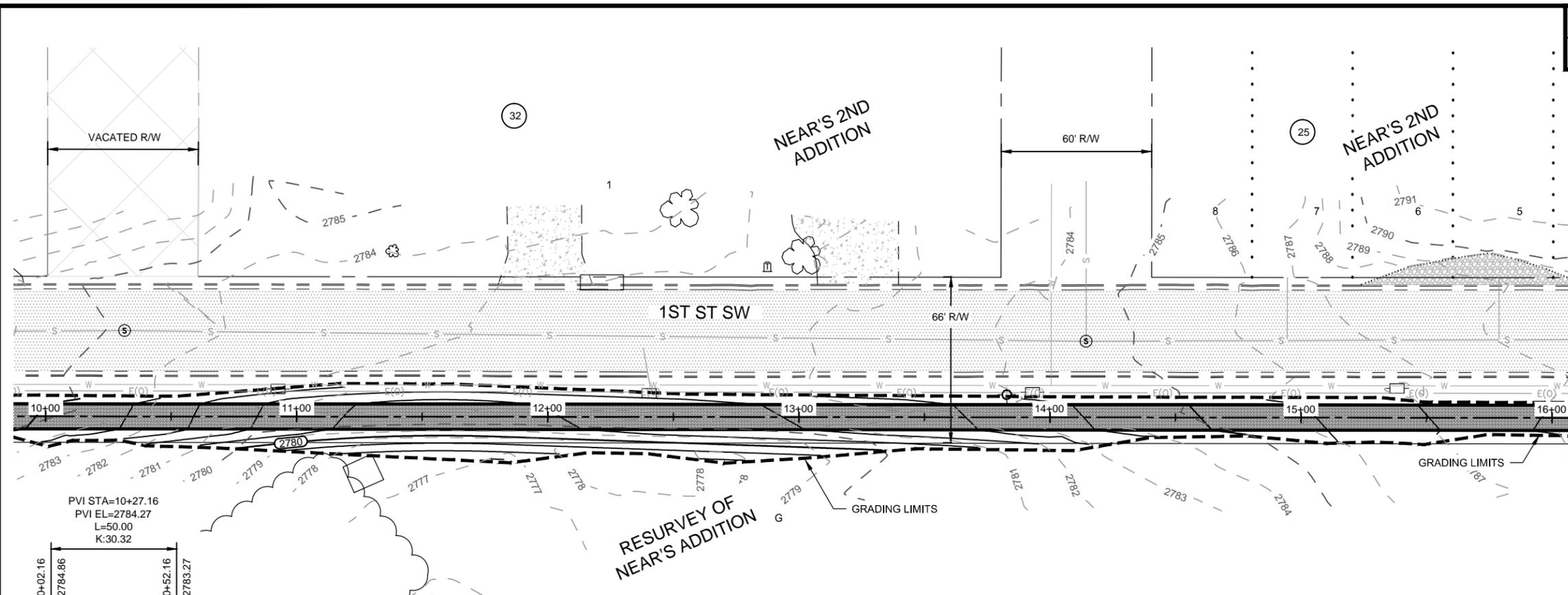


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Revision	Date	Description

BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA			
Sta 5+50 to Sta 10+50 PLAN & PROFILE			
DRWN. BY AJW	CHKD BY ADW	PROJECT NO. 1614113	DATE 01/30/2015

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	60	3



BASE BID
 SUBGRADE PREPARATION TYPE-C (12IN)
 STA 10+50 TO STA 15+50 = 5.00 STA

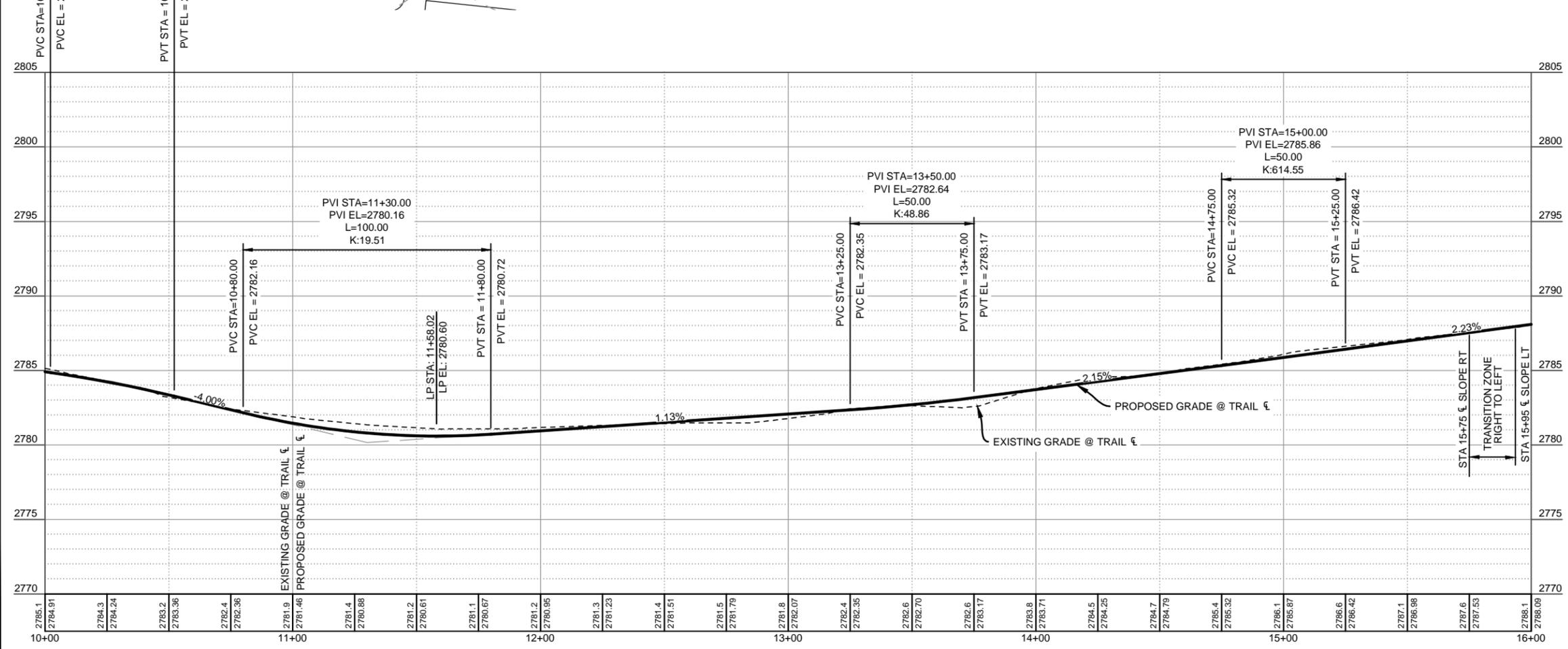
ALTERNATE - A
 AGGREGATE BASE COURSE CL 5
 STA 10+50 TO STA 15+50 = 107 TON

COMMERCIAL GRADE HOT MIX ASPHALT
 STA 10+50 TO STA 15+50 = 107 TON

PG-58-28 ASPHALT CEMENT
 STA 10+50 TO STA 15+50 = 7.5 TON

ALTERNATE - B
 AGGREGATE BASE COURSE CL 5
 STA 10+50 TO STA 15+50 = 139 TON

SIDEWALK CONCRETE 4 IN
 STA 10+50 TO STA 15+50 = 556 SY



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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
Sta 10+50 to Sta 15+50 PLAN & PROFILE		
DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113
DATE 01/30/2015		

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	60	4

BASE BID
 SUBGRADE PREPARATION TYPE-C (12IN)
 STA 15+50 TO STA 19+00 = 3.50 STA

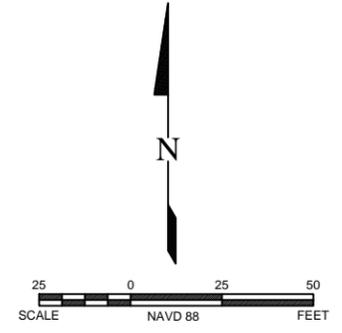
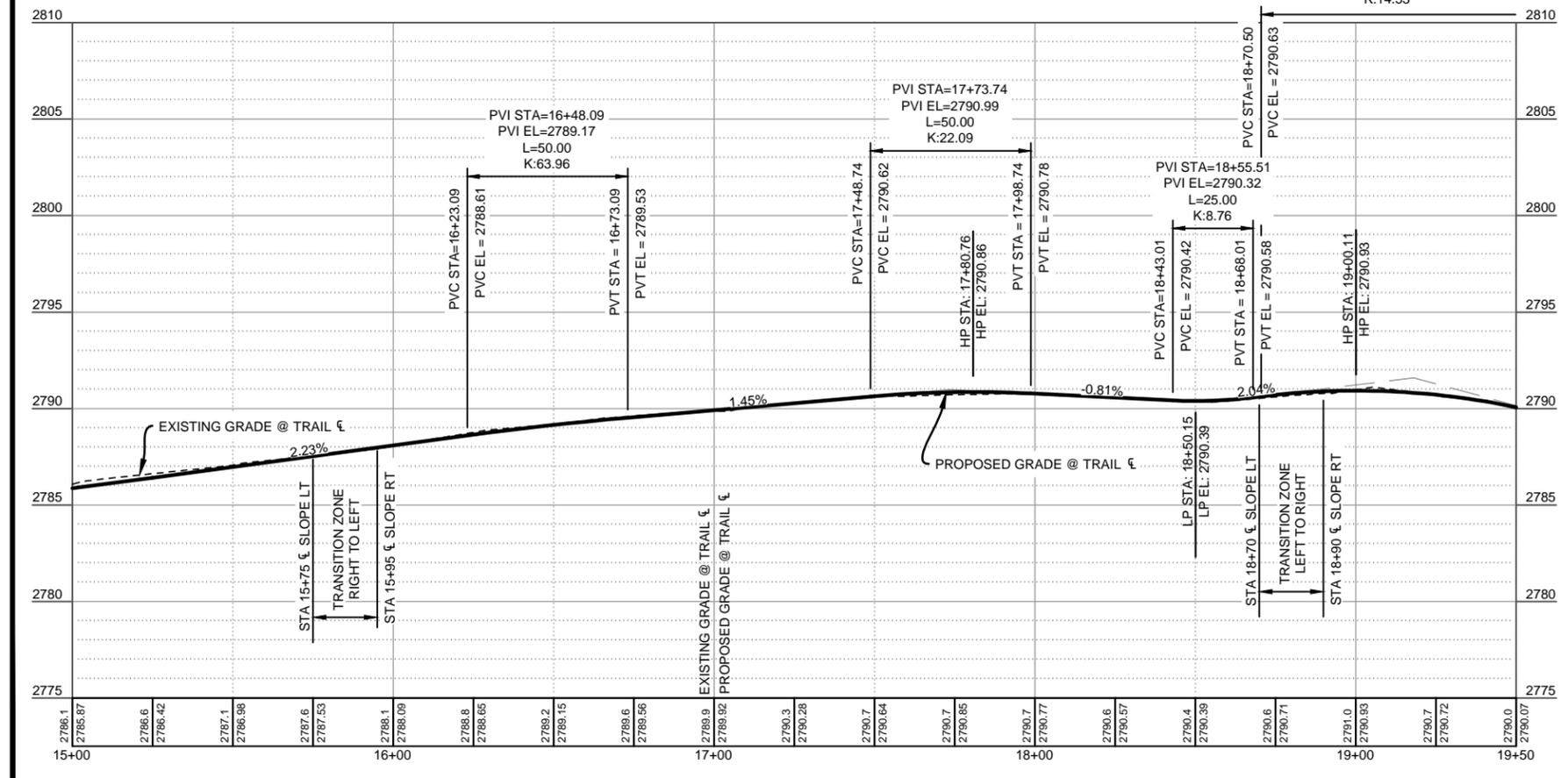
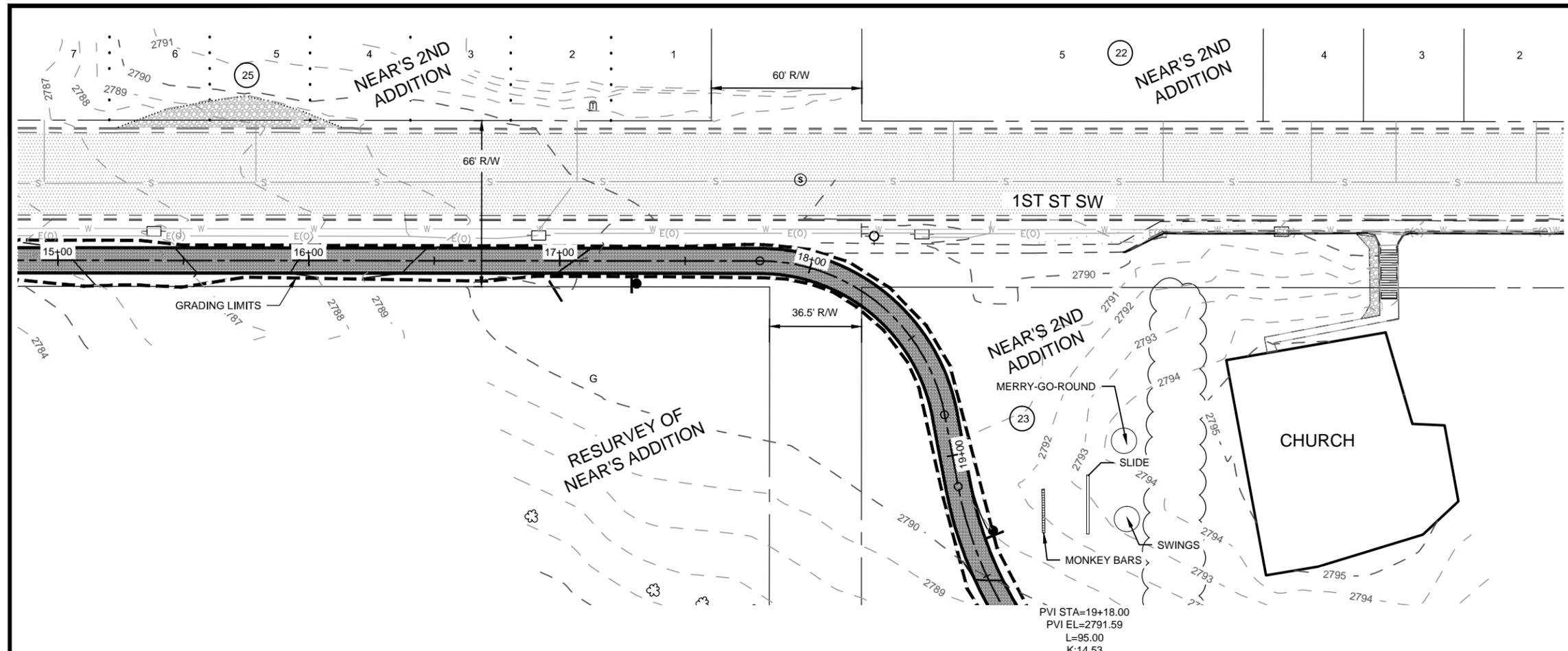
ALTERNATE - A
 AGGREGATE BASE COURSE CL 5
 STA 15+50 TO STA 19+00 = 112 TON

COMMERCIAL GRADE HOT MIX ASPHALT
 STA 15+50 TO STA 19+00 = 75 TON

PG-58-28 ASPHALT CEMENT
 STA 15+50 TO STA 19+00 = 5.2 TON

ALTERNATE - B
 AGGREGATE BASE COURSE CL 5
 STA 15+50 TO STA 19+00 = 97 TON

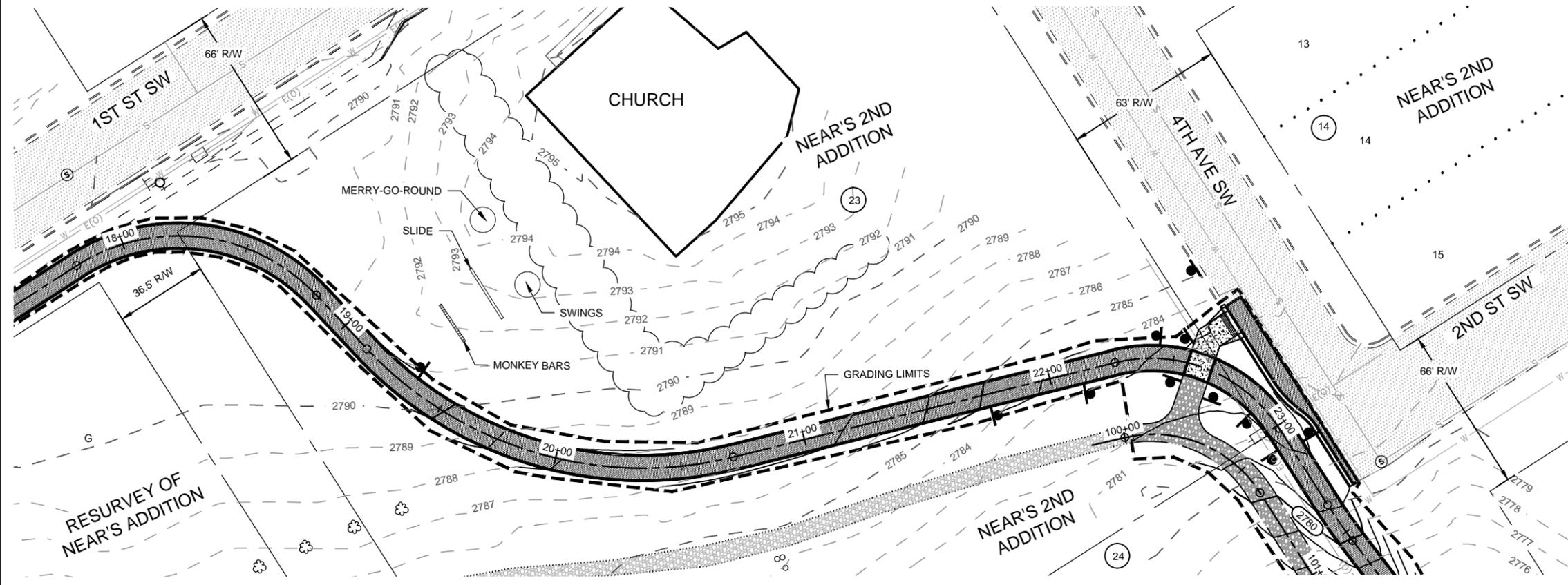
SIDEWALK CONCRETE 4 IN
 STA 15+50 TO STA 19+00 = 389 SY



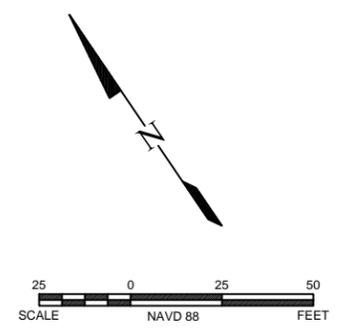
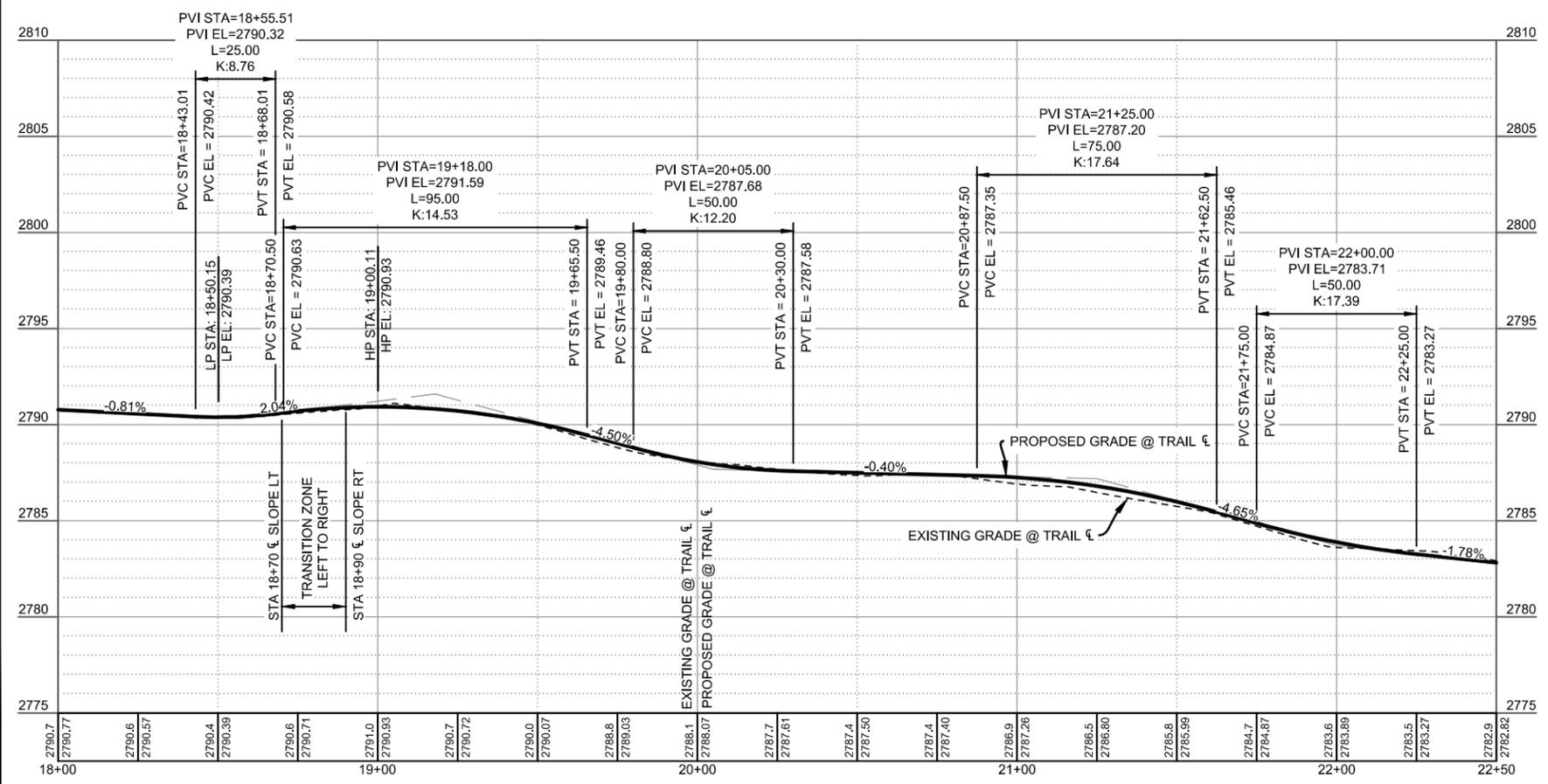
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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
 Sta 15+50 to Sta 19+00 PLAN & PROFILE		
DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113
DATE 01/30/2015		

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	60	5



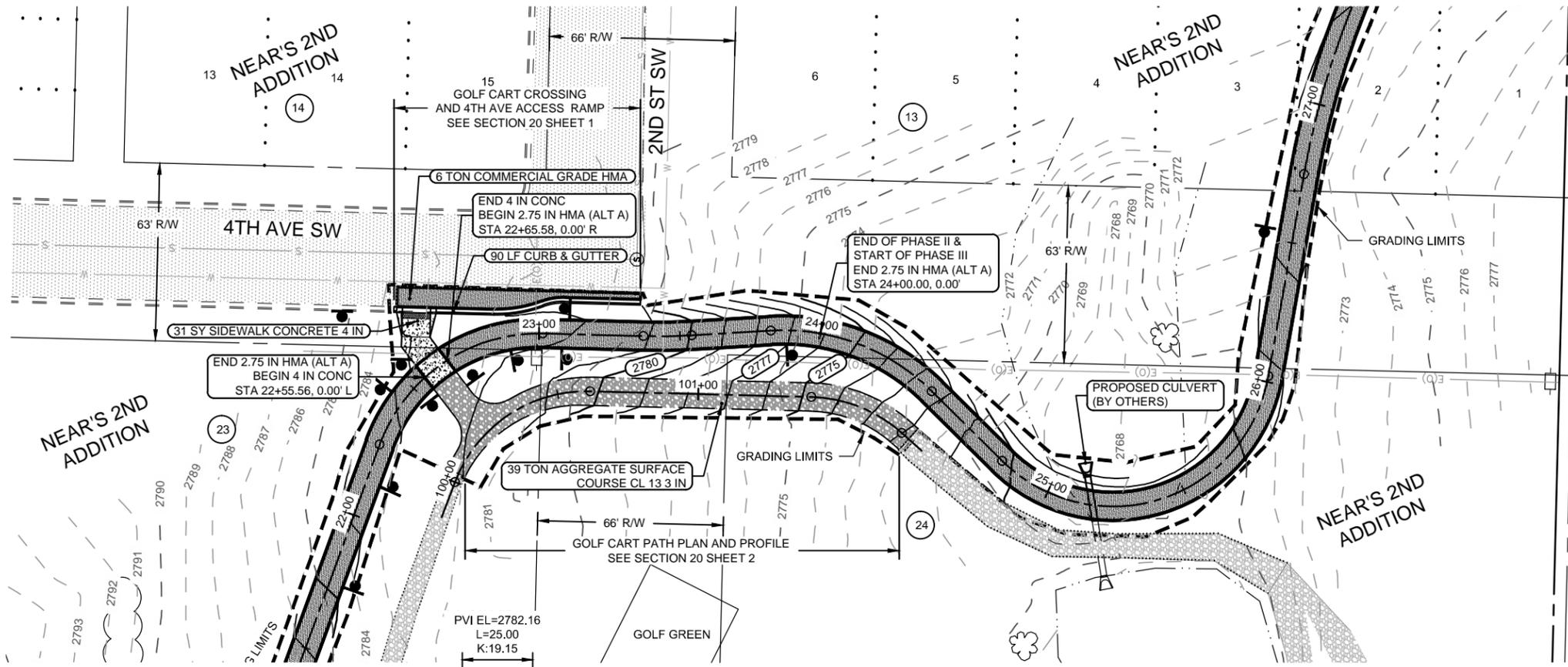
- BASE BID**
 SUBGRADE PREPARATION TYPE-C (12IN)
 STA 19+00 TO STA 22+00 = 3.00
- ALTERNATE - A**
 AGGREGATE BASE COURSE CL 5
 STA 19+00 TO STA 22+00 = 96 TON
- COMMERCIAL GRADE HOT MIX ASPHALT
 STA 19+00 TO STA 22+00 = 64 TON
- PG-58-28 ASPHALT CEMENT
 STA 19+00 TO STA 22+00 = 4.5 TON
- ALTERNATE - B**
 AGGREGATE BASE COURSE CL 5
 STA 19+00 TO STA 22+00 = 83 TON
- SIDEWALK CONCRETE 4 IN
 STA 19+00 TO STA 22+00 = 333 SY



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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
Sta 19+00 to Sta 22+00 PLAN & PROFILE		
	DRWN BY AJW	CHKD BY ADW
PROJECT NO. 1614113	DATE 01/30/2015	

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	60	6



- BASE BID**
- SUBGRADE PREPARATION TYPE-C (12IN)
STA 22+00 TO STA 24+00 = 2.00 STA
 - AGGREGATE SURFACE COURSE CL 13
STA 22+26 TO STA 24+51 = 39 TON
 - CURB & GUTTER - TYPE 1
STA 22+61 LT TO STA 23+26 LT = 90 LF
 - DETECTABLE WARNING PANEL
STA 22+61 LT = 20 SF

- ALTERNATE - A**
- AGGREGATE BASE COURSE CL 5
STA 22+00 TO STA 22+56 = 18 TON
STA 22+56 TO STA 22+66 = 8 TON
STA 22+62 TO STA 23+36 = 12 TON
STA 22+66 TO STA 24+00 = 43 TON
TOTAL = 81 TON
 - COMMERCIAL GRADE HOT MIX ASPHALT
STA 22+00 TO STA 22+56 = 12 TON
STA 22+62 TO STA 23+36 = 10 TON
STA 22+66 TO STA 24+00 = 29 TON
TOTAL = 51 TON
 - PG-58-28 ASPHALT CEMENT
STA 22+00 TO STA 22+56 = 0.8 TON
STA 22+62 TO STA 23+36 = 0.7 TON
STA 22+66 TO STA 24+00 = 2.0 TON
TOTAL = 3.5 TON

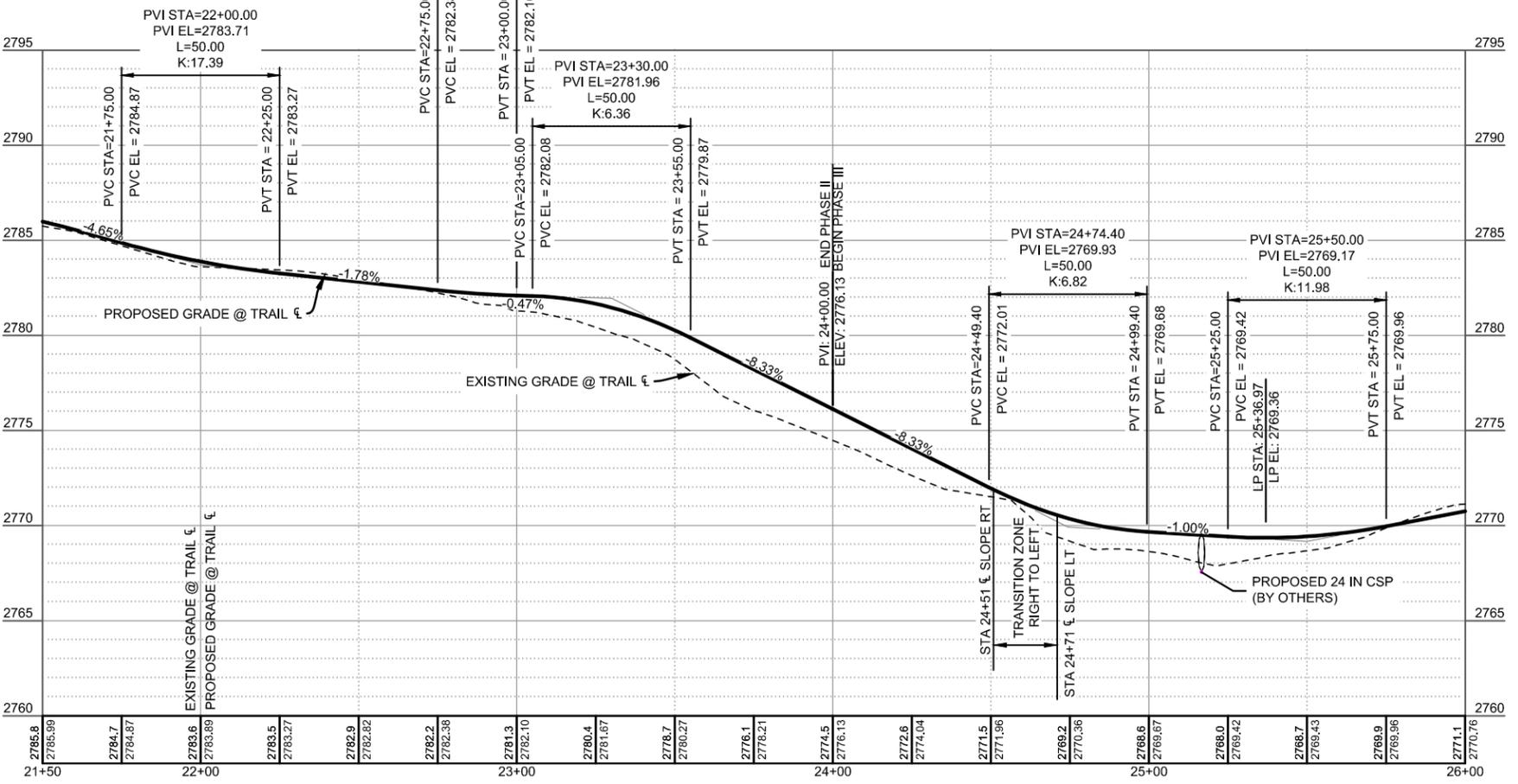
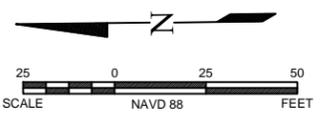
- SIDWALK CONCRETE 4IN
STA 22+56 TO STA 22+66 = 31 SY

- ALTERNATE - B**
- AGGREGATE BASE COURSE CL 5
STA 22+00 TO STA 22+56 = 16 TON
STA 22+56 TO STA 22+66 = 8 TON
STA 22+62 TO STA 23+36 = 12 TON
STA 22+66 TO STA 24+00 = 37 TON
TOTAL = 73 TON

- COMMERCIAL GRADE HOT MIX ASPHALT
STA 22+62 TO STA 23+36 = 10 TON

- PG-58-28 ASPHALT CEMENT
STA 22+62 TO STA 23+36 = 0.7 TON

- SIDWALK CONCRETE 4 IN
STA 22+00 TO STA 22+56 = 16 SY
STA 22+56 TO STA 22+66 = 31 SY
STA 22+66 TO STA 24+00 = 149 SY
TOTAL = 196 SY



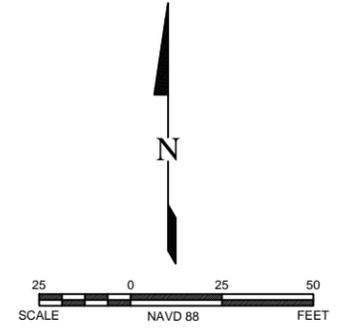
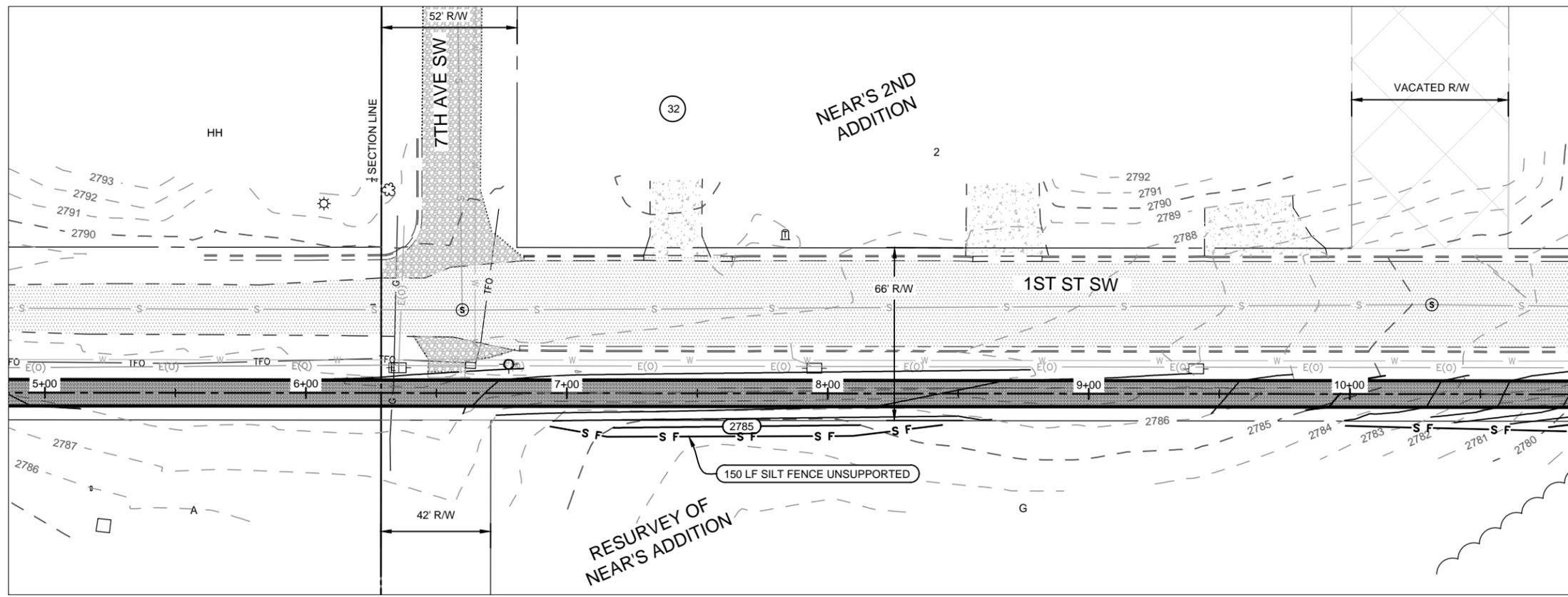
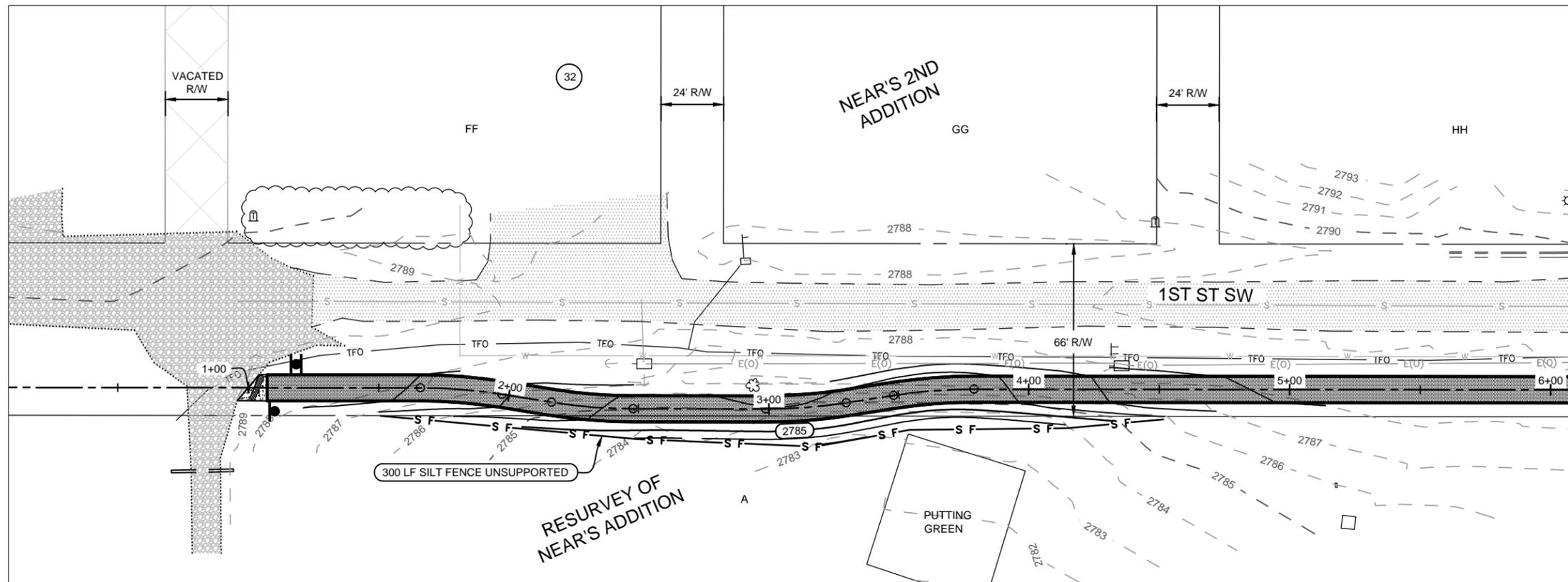
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Revision	Date	Description

BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA			
Sta 22+00 to Sta 24+00 PLAN & PROFILE			
DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113	DATE 01/30/2015

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	76	1

SILT FENCE UNSUPPORTED
 STA 1+51 TO STA 4+51 = 300 LF
 STA 6+94 TO STA 8+44 = 150 LF
 TOTAL = 450 LF

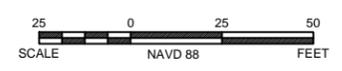
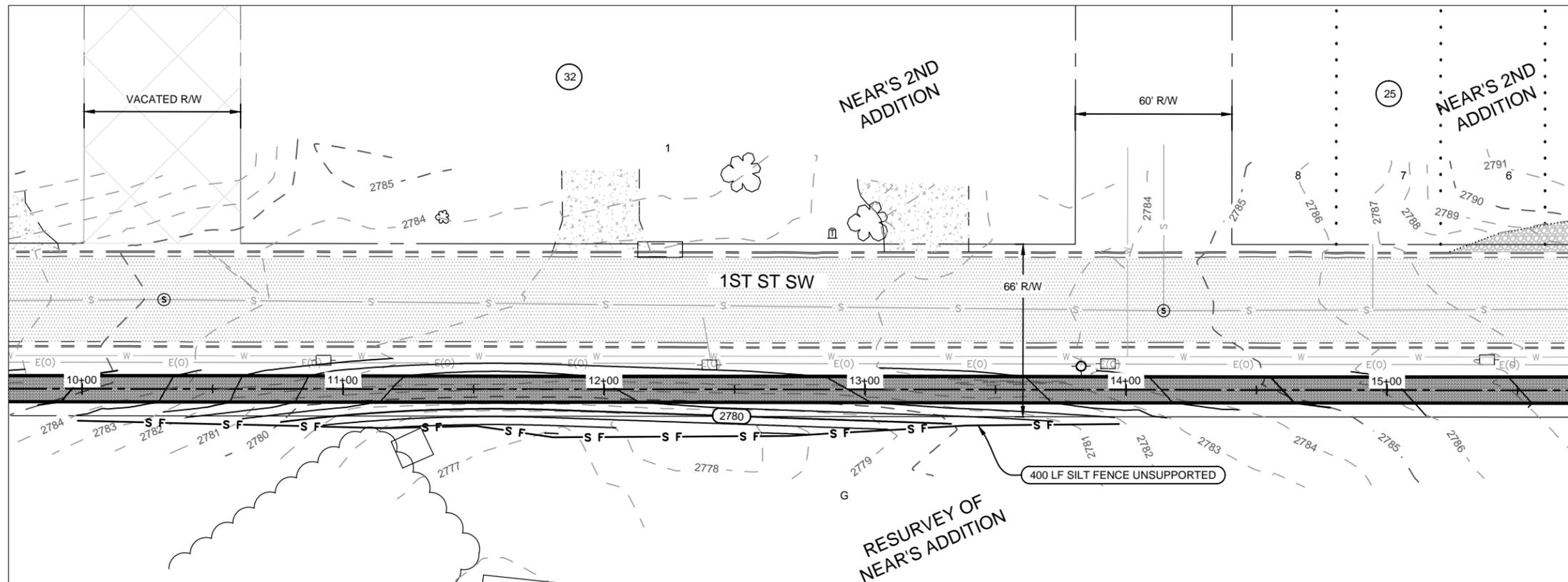


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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
Sta 1+51 to Sta 8+44 PRELIMINARY EROSION CONTROL		
DRWN. BY AJW	CHKD BY ADW	PROJECT NO. 1614113
DATE 01/30/2015		

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	76	2

SILT FENCE UNSUPPORTED
STA 9+98 TO STA 13+98 = 400 LF



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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
		Sta 9+98 to Sta 13+98 PRELIMINARY EROSION CONTROL
DRWN. BY AJW	CHKD BY ADW	PROJECT NO. 1614113
		DATE 01/30/2015

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	81	1

HORIZONTAL ALIGNMENT				
PNT	STATION	NORTHING	EASTING	BEARING
BEACH TRAIL PHASE II				
BP	0+00.00	42,779.42	48,957.54	S89° 56' 34.08" E
PC	1+73.04	42,779.25	49,130.58	
PI	1+88.76	42,779.23	49,146.29	S80° 57' 28.16" E
PT	2+04.41	42,776.76	49,161.81	
PC	2+23.60	42,773.74	49,180.77	
PI	2+39.31	42,771.27	49,196.29	
PT	2+54.96	42,771.26	49,212.00	S89° 56' 34.08" E
PC	3+05.87	42,771.21	49,262.91	
PI	3+21.36	42,771.19	49,278.40	N81° 11' 58.97" E
PT	3+36.79	42,773.56	49,293.70	
PC	3+55.17	42,776.38	49,311.87	
PI	3+70.66	42,778.74	49,327.18	S89° 56' 34.08" E
PT	3+86.09	42,778.73	49,342.67	
PC	17+09.08	42,777.41	50,665.66	
PI	18+04.08	42,777.31	50,760.66	
PT	18+58.30	42,682.31	50,760.56	S00° 03' 25.92" W
PC	18+62.72	42,677.90	50,760.56	
PI	19+18.46	42,622.15	50,760.50	S73° 11' 07.58" E
PT	19+58.60	42,606.03	50,813.86	
PC	20+62.57	42,575.95	50,913.39	
PI	20+71.10	42,573.48	50,921.55	S71° 13' 48.90" E
PT	20+79.63	42,570.74	50,929.63	
PC	22+26.59	42,523.45	51,068.78	
PI	22+69.68	42,509.59	51,109.58	S00° 08' 14.98" W
PT	23+01.33	42,466.50	51,109.48	
PC	23+37.08	42,430.75	51,109.39	
PI	23+45.65	42,422.18	51,109.37	
PT	23+54.21	42,413.63	51,110.08	S04° 46' 19.06" E
PI	23+82.37	42,385.57	51,112.42	
EP	24+15.81	42,352.25	51,115.21	

HORIZONTAL ALIGNMENT				
PNT	STATION	NORTHING	EASTING	BEARING
CART PATH				
BP	99+86.72	42,500.89	51,043.63	S70° 28' 27.03" E
PC	100+00.00	42,496.46	51,056.15	
PI	100+35.41	42,484.62	51,089.52	S00° 08' 14.98" W
PT	100+61.62	42,449.21	51,089.43	
PC	101+40.21	42,370.61	51,089.24	
PI	101+58.61	42,352.22	51,089.20	
PT	101+75.47	42,338.24	51,077.25	S40° 32' 00.82" W
EP	101+84.93	42,331.05	51,071.09	

ALIGNMENT CURVE DATA				
ARC DEFINITION (BEACH TRAIL PHASE II)				
	C1	C2	C3	C4
PI STA	1+81.72	2+32.27	3+14.32	3+63.62
DELTA	8° 59' 05.93"	8° 59' 05.93"	8° 51' 26.95"	8° 51' 26.95"
DA	28° 38' 52.40"	28° 38' 52.40"	28° 38' 52.40"	28° 38' 52.40"
R	200.00	200.00	200.00	200.00
T	15.71	15.71	15.49	15.49
L	31.36	31.36	30.92	30.92
LC	31.33	31.33	30.89	30.89
	C5	C6	C7	C8
PI STA	18+41.90	20+00.14	22+69.68	23+45.65
DELTA	79° 15' 36.56"	60° 32' 51.38"	71° 22' 03.88"	4° 54' 34.03"
DA	76° 23' 39.74"	38° 11' 49.87"	95° 29' 34.68"	28° 38' 52.40"
R	75.00	150.00	60.00	200.00
T	62.11	87.56	43.09	8.57
L	103.75	158.51	74.74	17.14
LC	95.67	151.24	70.00	17.13
	C9			
PI STA	23+45.65			
DELTA	4° 54' 34.03"			
DA	28° 38' 52.40"			
R	200.00			
T	8.57			
L	17.14			
LC	17.13			

ALIGNMENT CURVE DATA				
ARC DEFINITION (CART PATH)				
	C10	C11		
PI STA	100+35.41	101+58.61		
DELTA	70° 36' 42.01"	40° 23' 45.85"		
DA	114° 35' 29.62"	114° 35' 29.62"		
R	50.00	50.00		
T	35.41	18.39		
L	61.62	35.25		
LC	57.79	34.53		

SURVEY CONTROL POINTS				
PNT	NORTHING	EASTING	ELEV	DESCRIPTION
1	49999.999	49999.999	2814.957	GPS CP1 2
2	46973.434	51843.865	2830.751	GPS F.HYD
14	52666.552	54883.911	2726.4	CSEC 13 FND1.5
27	50025.816	52144.253	2766.619	SPCR BALD REBAR TRACK COR
31	46973.433	51843.865	2830.754	GPS F.HYD
32	50025.87	52244.271	2770.663	NWSEC 24-140-106 REBAR
33	50028.39	54882.835	2743.808	NQCOR 24-140-106 LS AC
34	44747.89	49591.889	2815.921	SQCOR 23-140-106
35	44742.613	54875.409	2785.168	SQCOR 24-140-106 REBAR
50	45510.398	54525.836	2789.917	PCR
51	45510.105	54225.589	2797.055	PCR
52	45190.077	54225.261	2789.466	PCR
53	45190.355	54525.424	2801.776	PCR
100	48150.45	51539.38	2826.559	RWMC
101	48566.455	52338.639	2791.186	RWMC
102	48568.864	52369.183	2790.073	RWMC
103	48734.637	52368.994	2777.669	RWMC
104	48986.016	53141.975	2752.789	RWMC
105	49075.191	53742.464	2748.463	RWMC
106	48148.984	52139.105	2801.583	RWMC
107	47702.47	51538.815	2821.019	RWMC
108	48150.109	51539.6	2826.601	RWMC
109	48755.923	52141.413	2788.723	RWMC
110	49028.242	51141.61	2826.449	PCR 5/8 REBAR
200	45435.39	60170.567	2748.118	CP END RWY 30
201	48321.378	57119.389	2755.752	CP END RWY 12

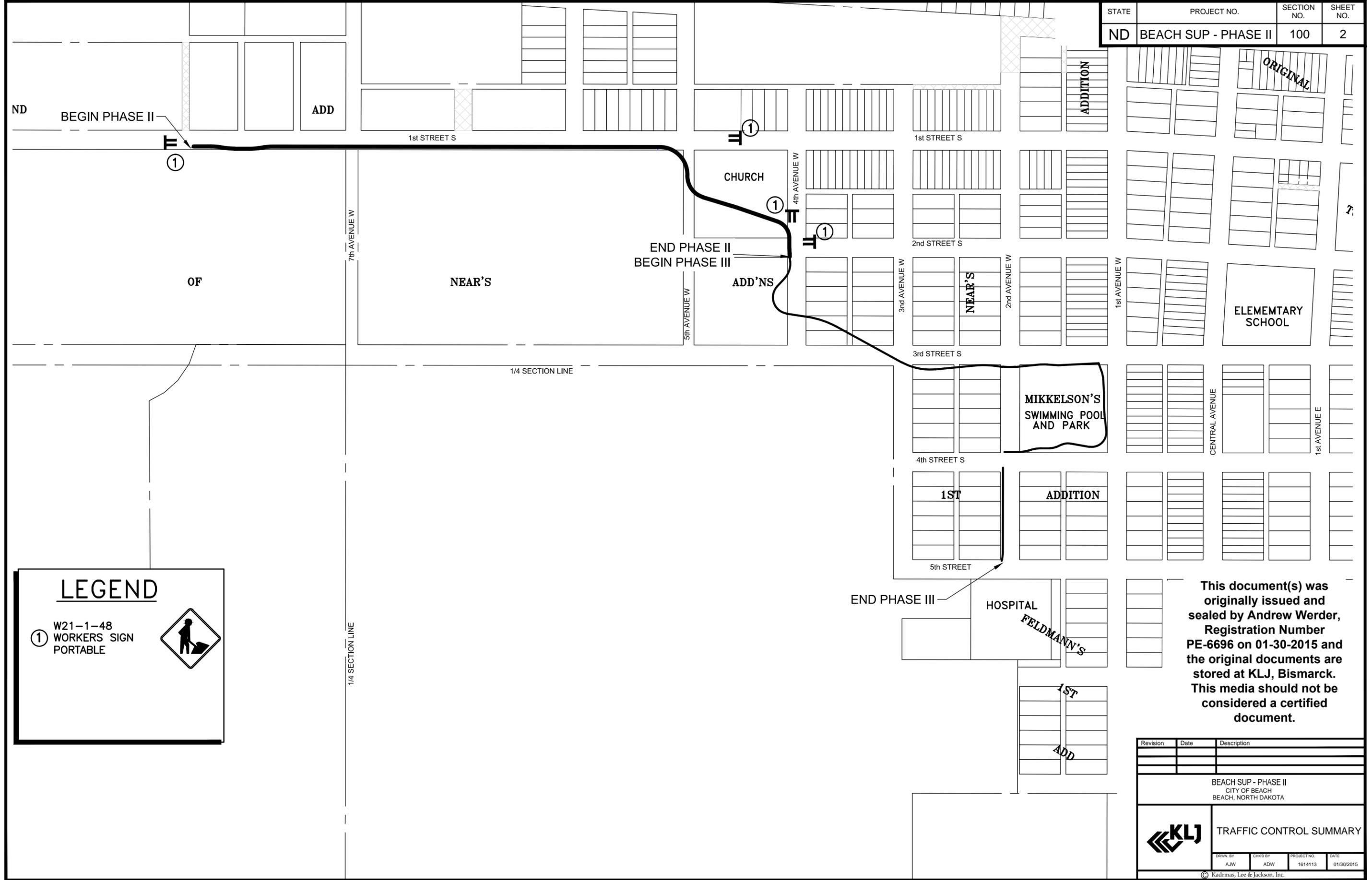
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BASIS OF SURVEY

ALL CONTOURS, ELEVATIONS AND COORDINATES FOR THE PROJECT ARE BASED ON NAD 1983 STATE PLANE COORDINATE SYSTEM, NORTH DAKOTA SOUTH 3302 ZONE (1996 ADJUSTMENT), INTERNATIONAL FEET, AND NAVD-88.

Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
		ALIGNMENT TABLE
DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113
		DATE 01/30/2015

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	100	2



LEGEND

① W21-1-48 WORKERS SIGN PORTABLE

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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
		TRAFFIC CONTROL SUMMARY
DRWN. BY AJW	CHKD BY ADW	PROJECT NO. 1614113
		DATE 01/30/2015

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	BEACH SUP - PHASE II	110	1

Sta/RP	Sign No.	Assembly No.	Flat Sheet For Signs		Sign Support Length				Support Size	Max Post Len	Sleeve Length				Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
			IV SF	XI SF	1st LF	2nd LF	3rd LF	4th LF		LF	1st LF	2nd LF	3rd LF	4th LF								
1+10 Rt	R5-3	14		4.0	8.0				2 x 2 12 ga	13.0						1	4	2.25 x 2.25 12 ga				
1+18 Lt	D11-1		7.0		8.0				2 x 2 12 ga	14.7						1	4	2.25 x 2.25 12 ga			SA A, Mount with M4-14-12, M4-6-12	
17+31 Rt	W1-2R	102		2.3	7.8				2 x 2 12 ga	17.8						1	4	2.25 x 2.25 12 ga				
19+34 Lt	W1-2L	102		2.3	7.8				2 x 2 12 ga	17.8						1	4	2.25 x 2.25 12 ga				
21+77 Rt	W1-2R	102		2.3	7.8				2 x 2 12 ga	17.8						1	4	2.25 x 2.25 12 ga				
22+14 Rt	W1111	102		2.3	7.8				2 x 2 12 ga	17.8						1	4	2.25 x 2.25 12 ga				
22+43 Lt	R5-3	14		4.0	8.0				2 x 2 12 ga	13.0						1	4	2.25 x 2.25 12 ga				
22+50 Rt	D11-1	103	3.8		8.3				2 x 2 12 ga	14.8						1	4	2.25 x 2.25 12 ga			Mount with M6-4-12	
22+51 Lt	R7-11	7		1.5	7.4				2 x 2 12 ga	25.5						1	4	2.25 x 2.25 12 ga				
22+53 Lt	R1-1	100		1.9	7.5				2 x 2 12 ga	21.4						1	4	2.25 x 2.25 12 ga				
22+71 Rt	R1-1	100		1.9	7.5				2 x 2 12 ga	21.4						1	4	2.25 x 2.25 12 ga				
22+91 Rt	R5-3	14		4.0	8.0				2 x 2 12 ga	13.0						1	4	2.25 x 2.25 12 ga				
23+09 Lt	W1111	102		2.3	7.8				2 x 2 12 ga	17.8						1	4	2.25 x 2.25 12 ga				
23+10 Rt	W7-5	102		2.3	7.8				2 x 2 12 ga	17.8						1	4	2.25 x 2.25 12 ga				
Sub Total			10.8	31.1	Total 109.7											Total 56			0	0	0	
Grand Total			10.8	31.1	Total 109.7											Total 56			0	0	0	

Basis of Estimate
Sign Support Lengths

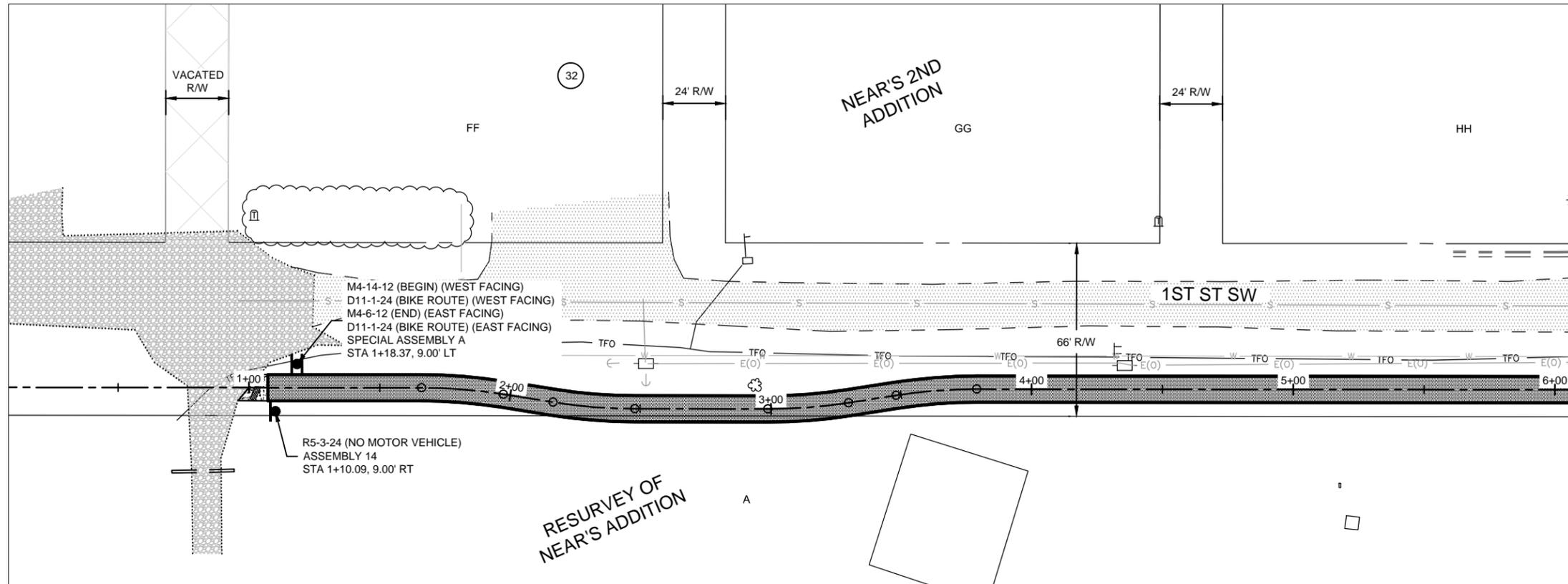
The sign support lengths have been calculated using the following vertical clearances:

Areas where parking and/or pedestrian movement will occur - 84"
Bike route - 60"

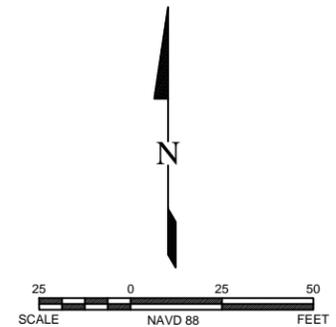
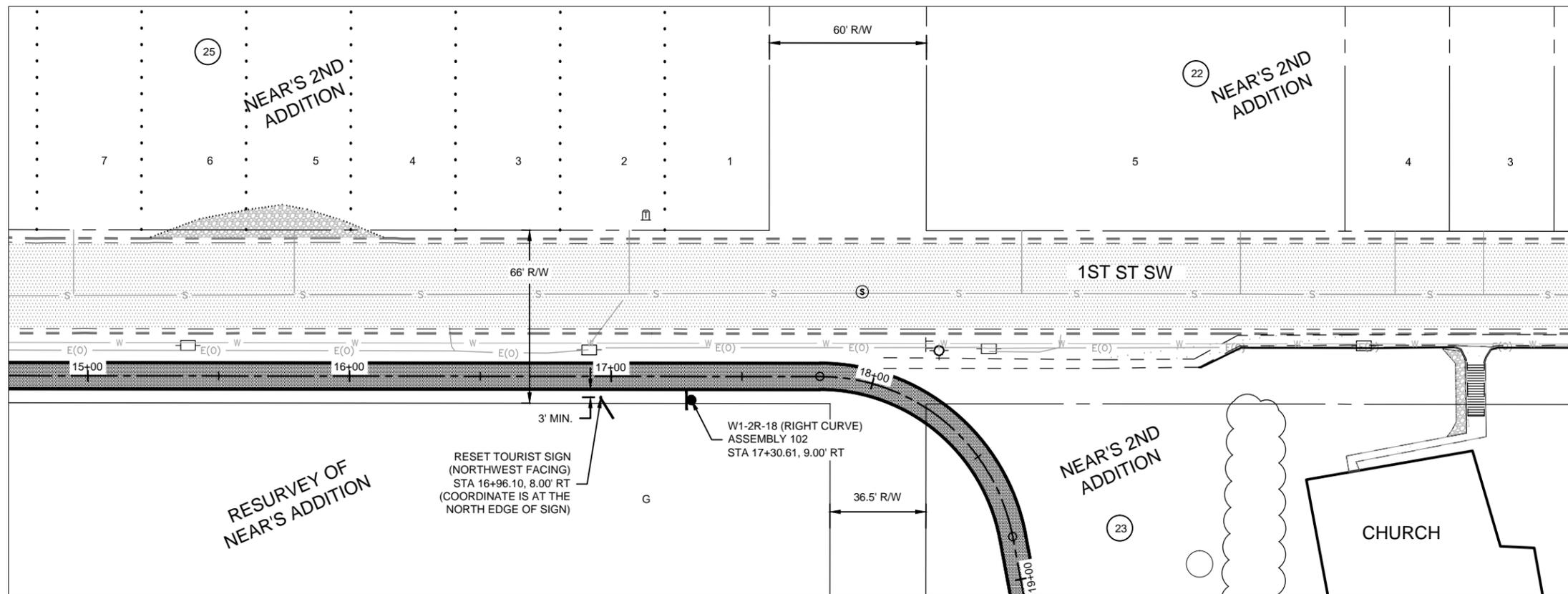
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Sign Summary Perforated Tube

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	110	2

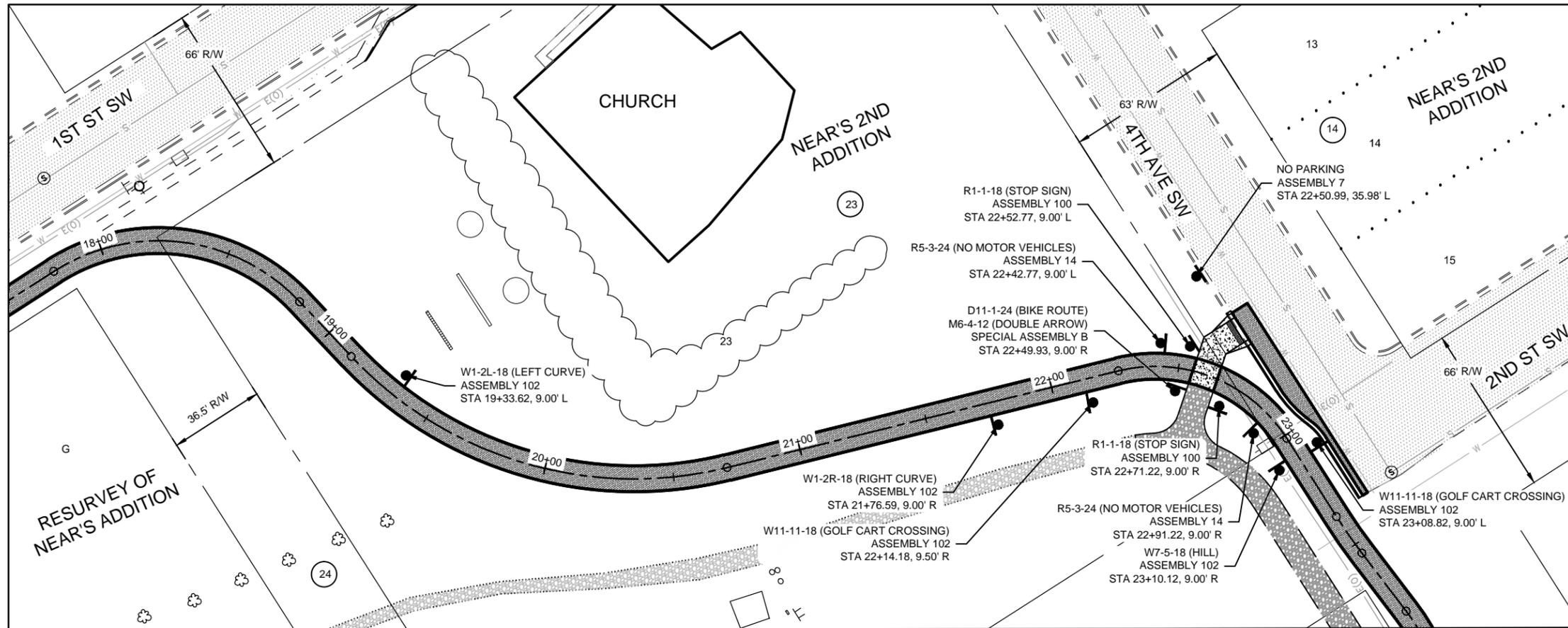


- 18"  D11-1-24 (BIKE ROUTE)
-  M4-14-12 (BEGIN)
-  M4-6-12 (END)
- 24"  R5-3-24 (NO MOTOR VEHICLES)
- 9"  M6-4-12
-  W1-2R-18 (RIGHT CURVE)



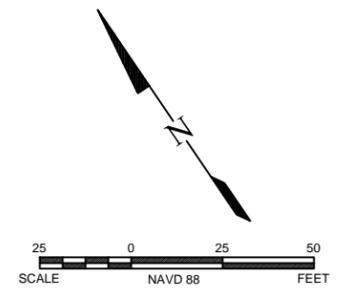
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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
Sta 1+00 to Sta 19+00 SIGN PLAN		
DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113
DATE 01/30/2015		© Kadrmas, Lee & Jackson, Inc.



-  R5-3-24
(NO MOTOR VEHICLES)
-  D11-1-24
(BIKE ROUTE)
-  M6-4-12
(DOUBLE ARROW)
-  W1-2R-18
(RIGHT CURVE)
-  W1-2L-18
(LEFT CURVE)
-  W7-5-18 (HILL)
-  W11-11-18
(GOLF CART CROSSING)
-  W16-7PL-24
(LEFT DIAGONAL ARROW)
-  NO PARKING
HERE TO CORNER
-  STOP

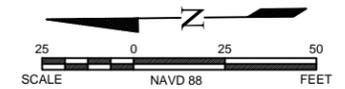
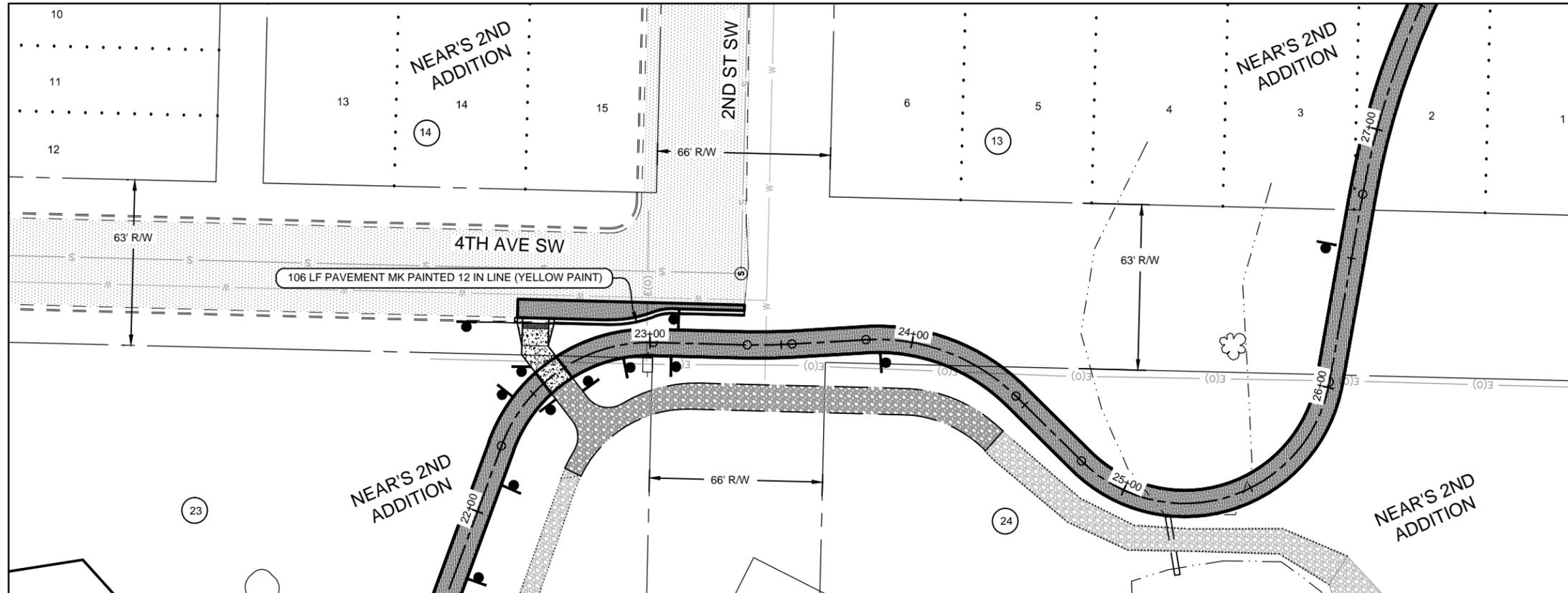
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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
Sta 19+00 to Sta 24+00 SIGN PLAN		
DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113
DATE 01/30/2015		

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	120	1

PAVEMENT MK PAINTED 12 IN LINE
 STA 22+52 TO STA 23+36 = 106 LF

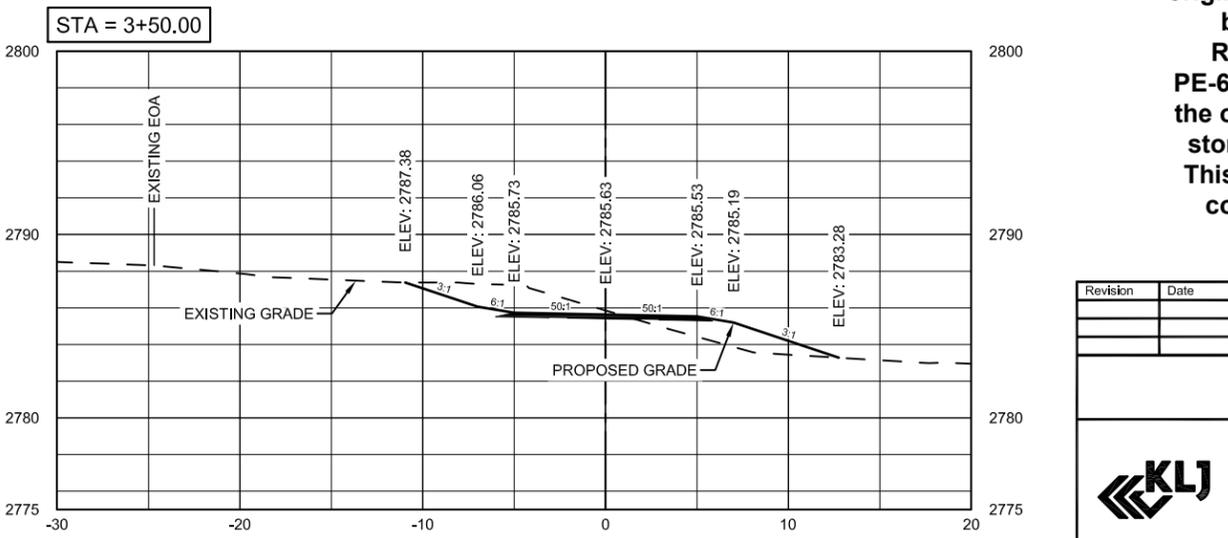
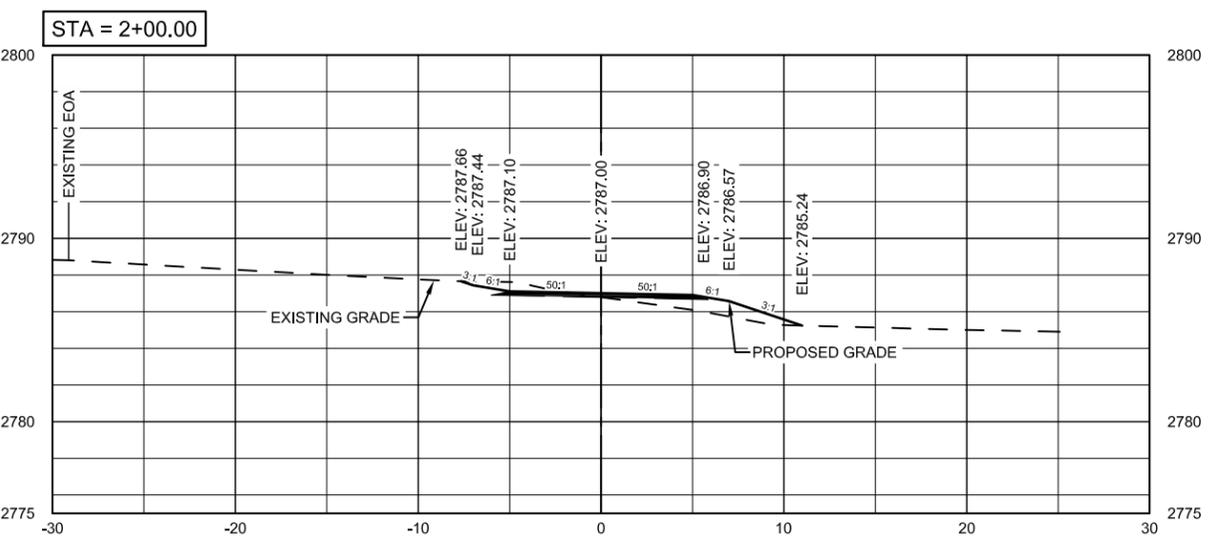
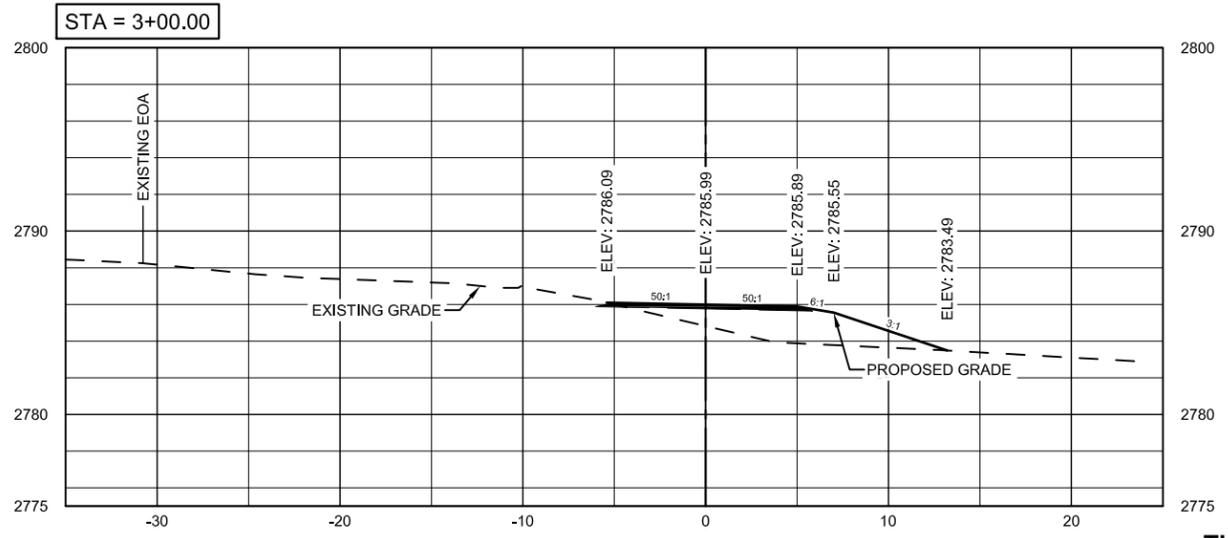
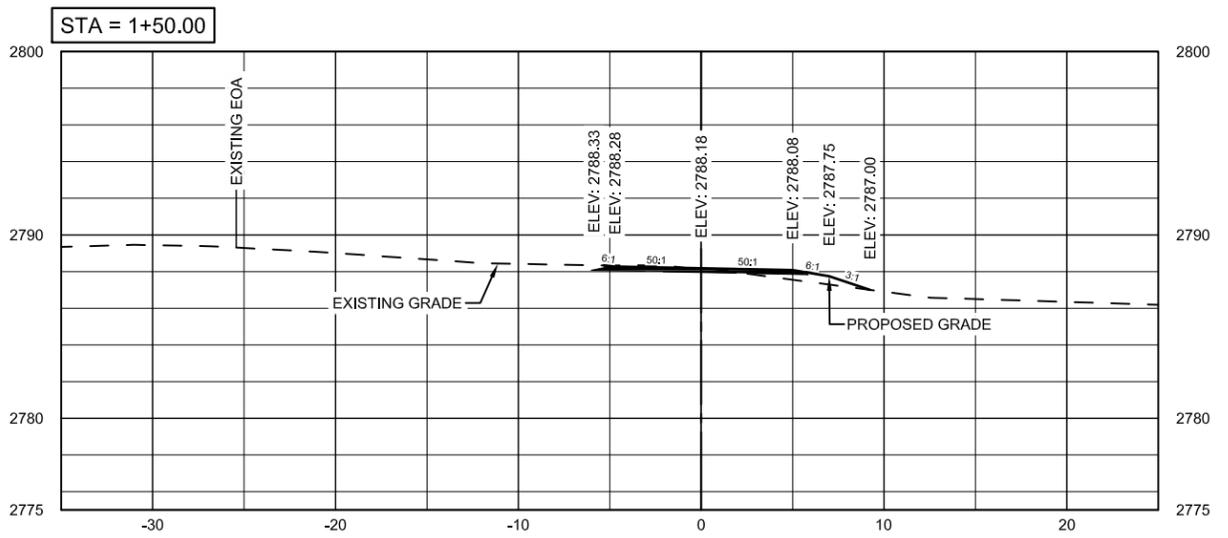
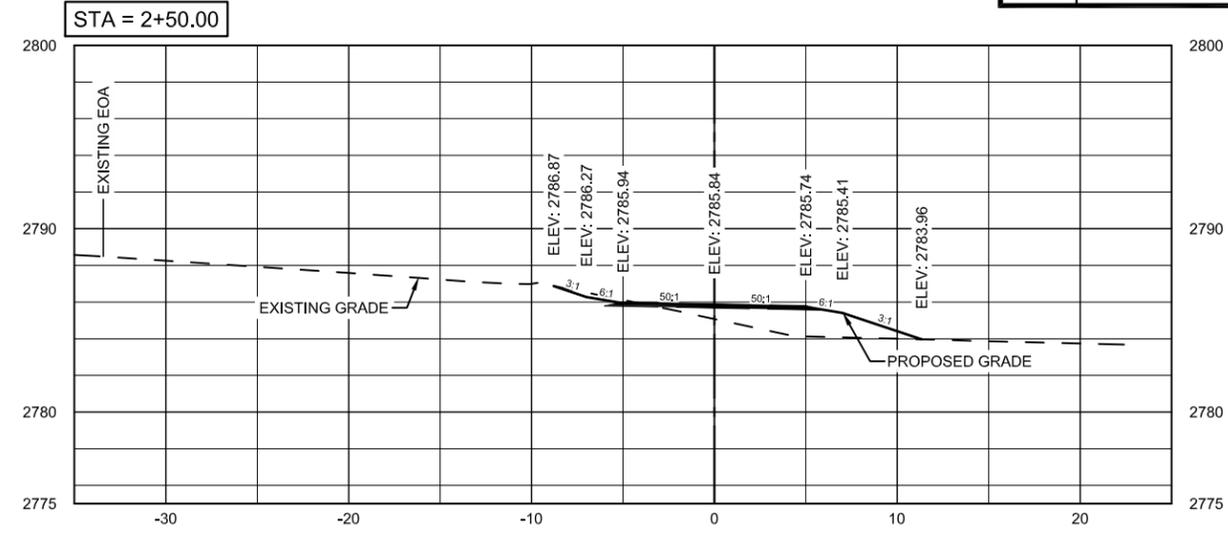
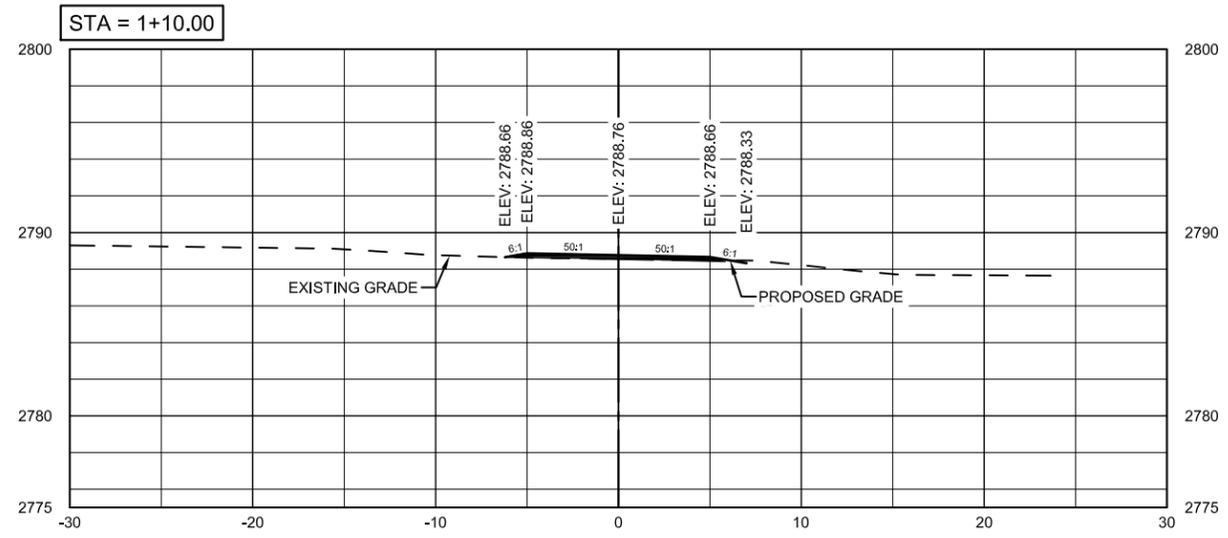


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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
		Sta 64+50 to Sta 74+70 STRIPING
DRWN. BY AJW	CHKD BY ADW	PROJECT NO. 1614113
		DATE 01/30/2015

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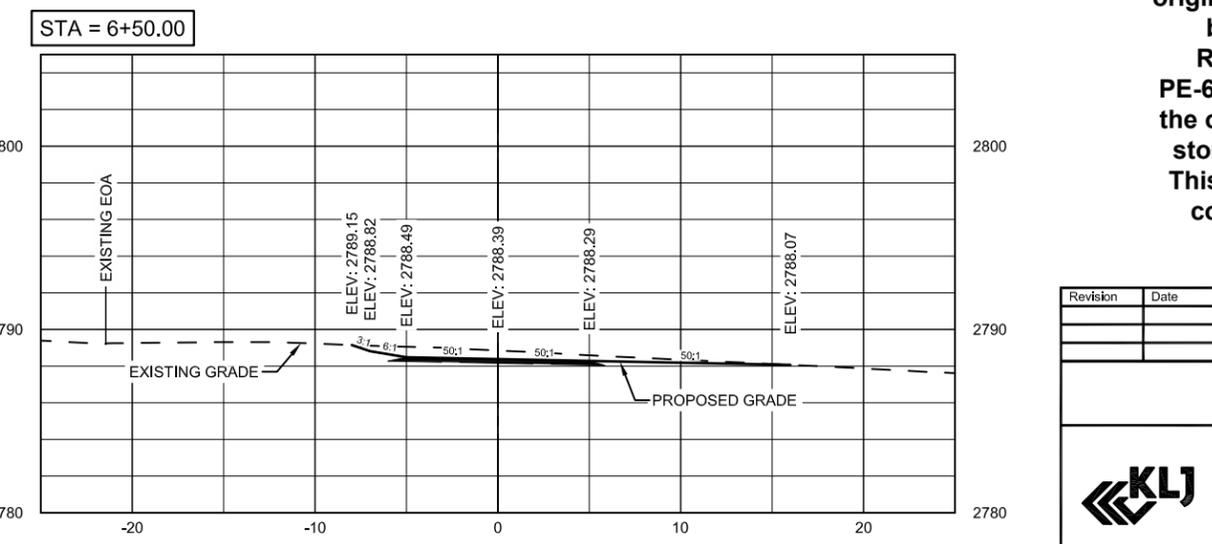
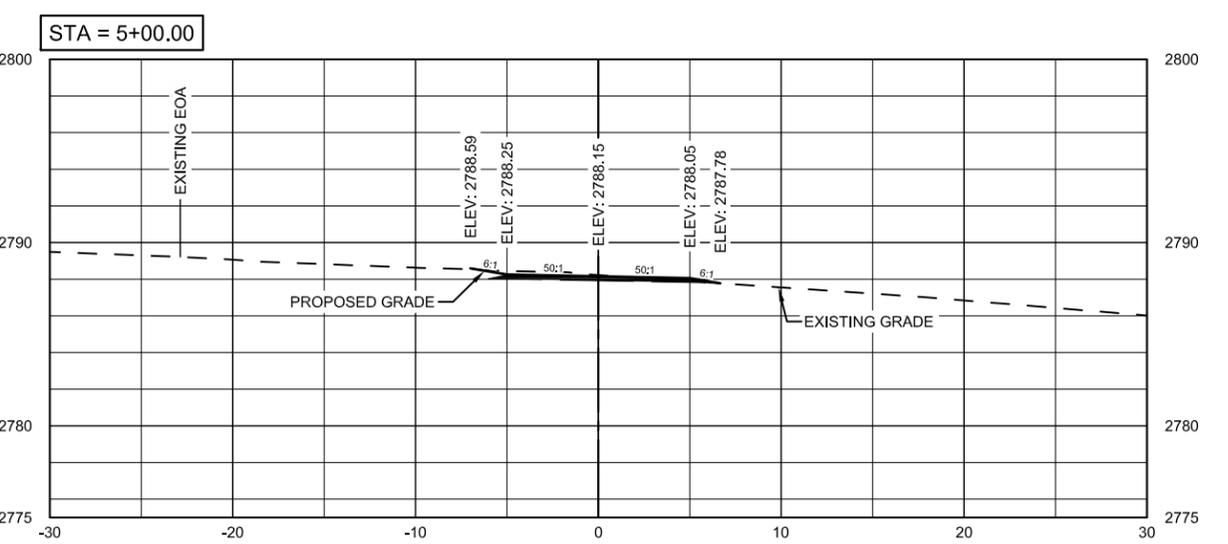
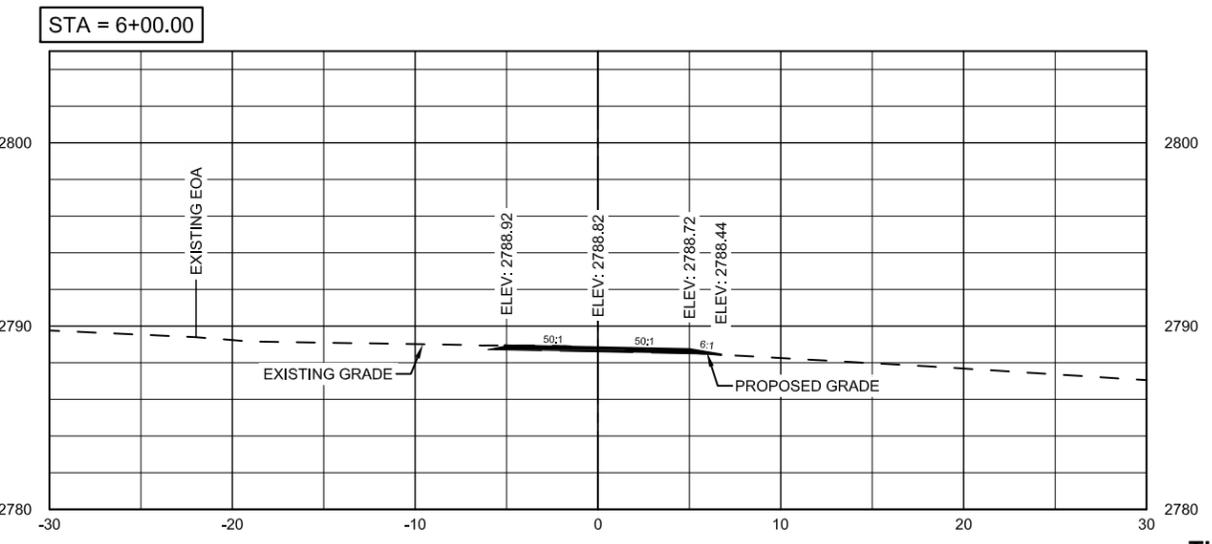
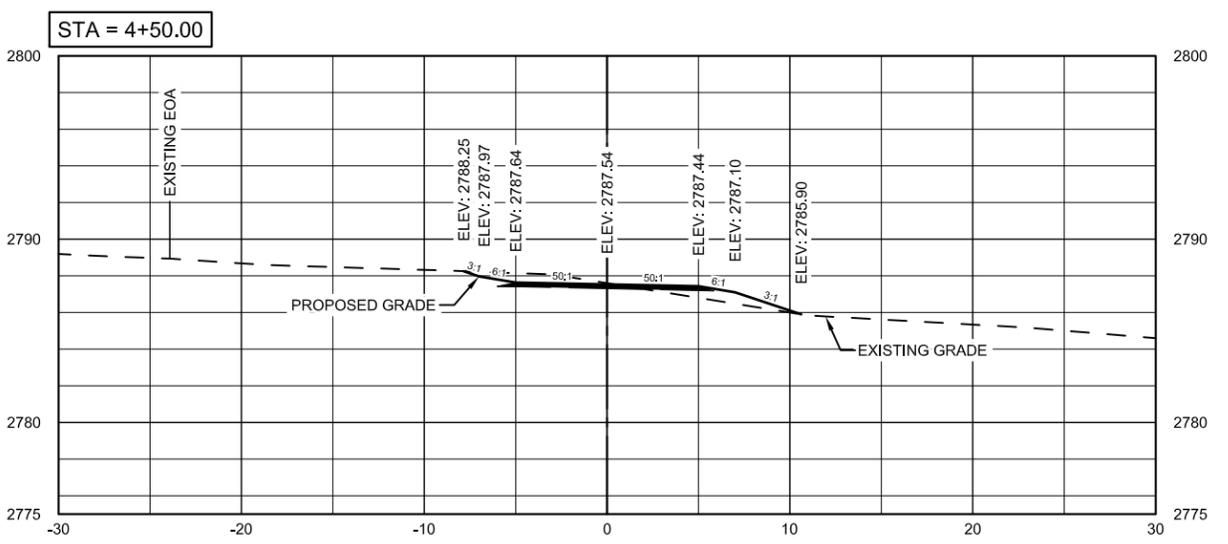
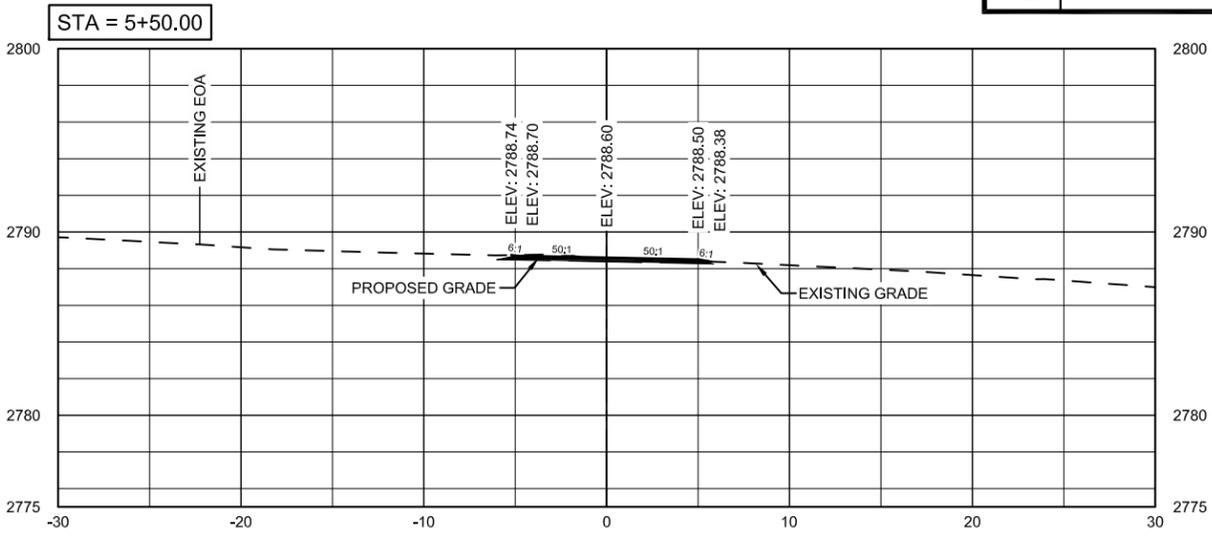
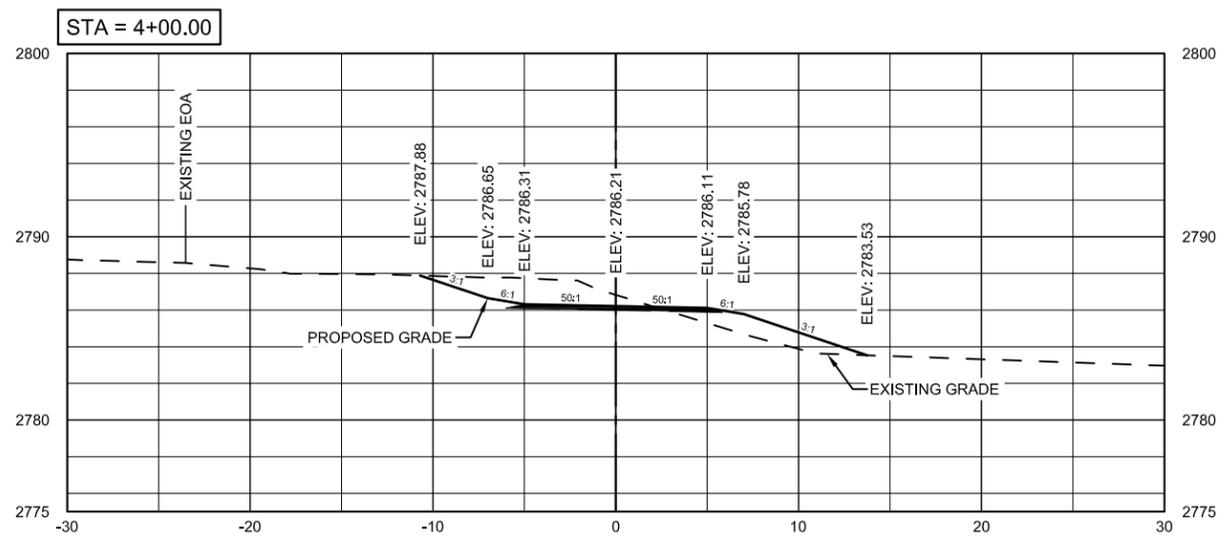
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	200	1



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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
KLJ		
CROSS SECTIONS STA 01+10 - STA 03+50		
DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113
DATE 01/30/2015		
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	200	2



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Revision	Date	Description

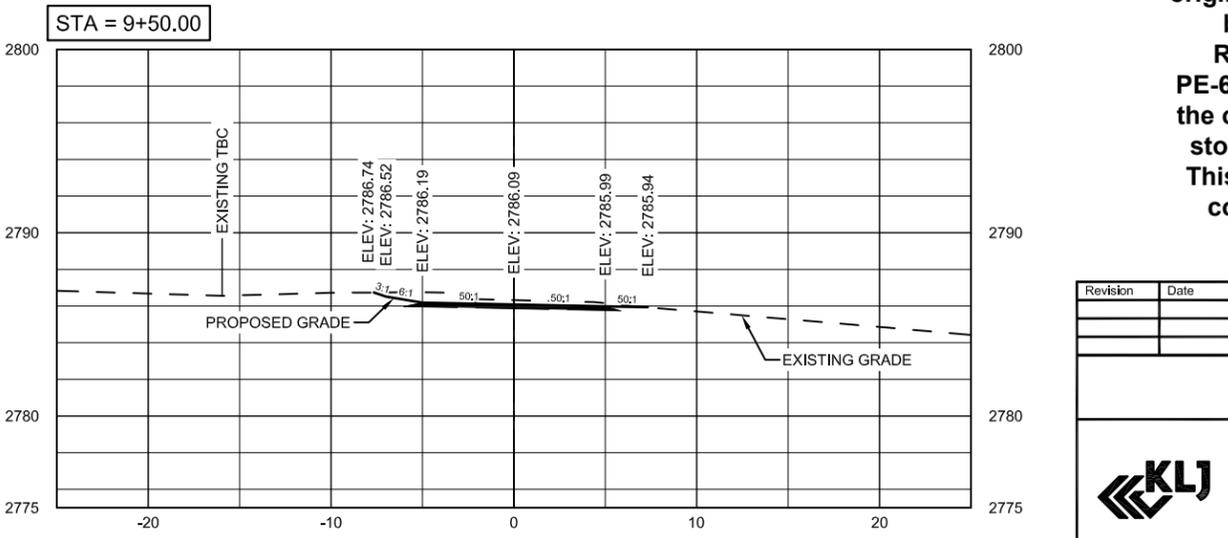
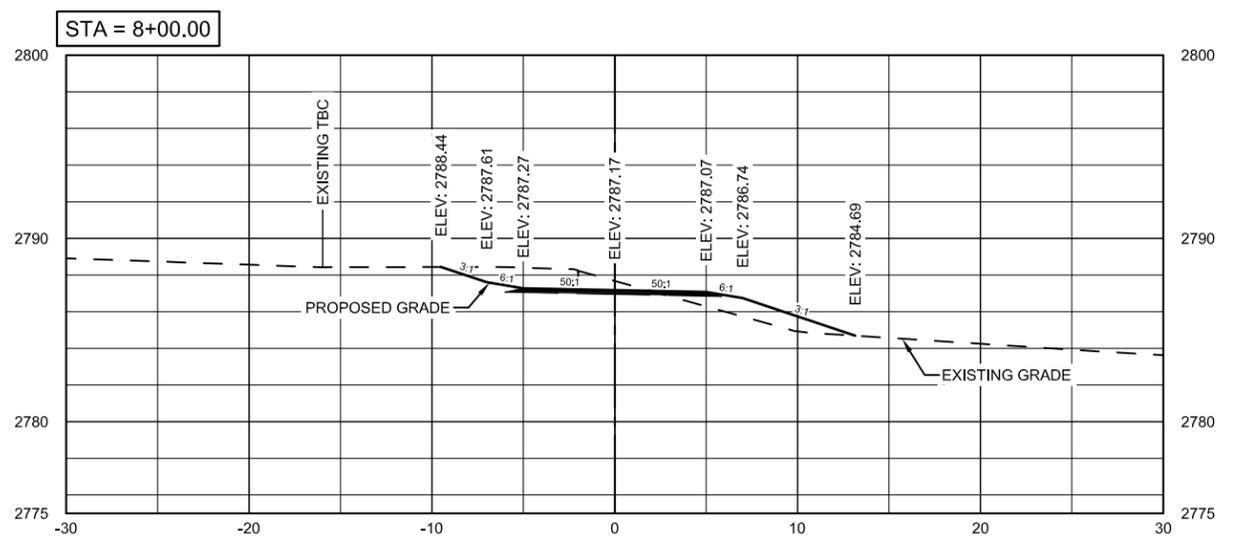
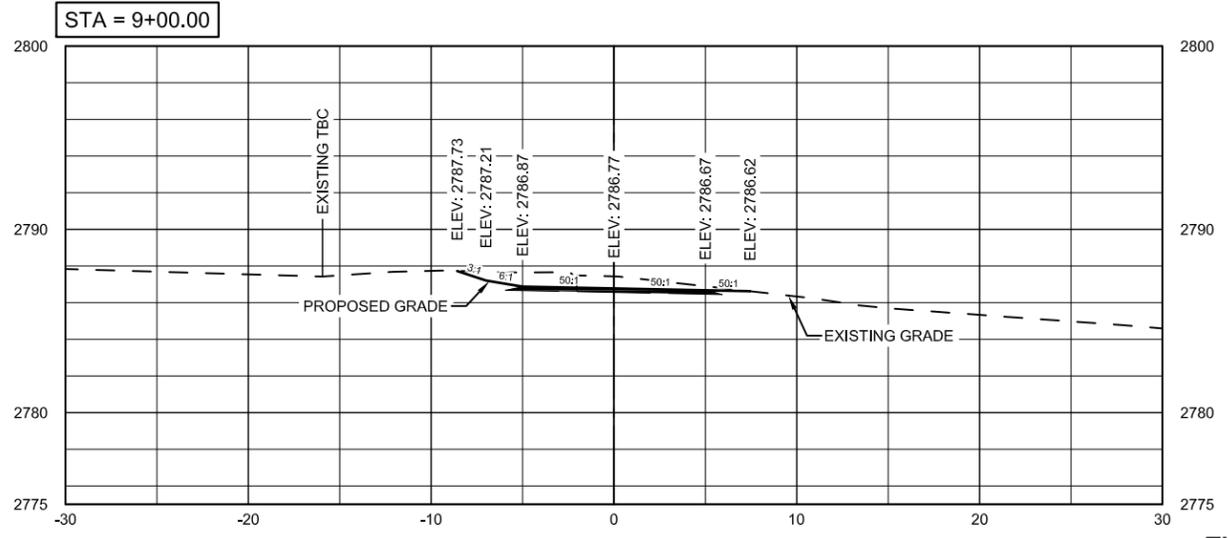
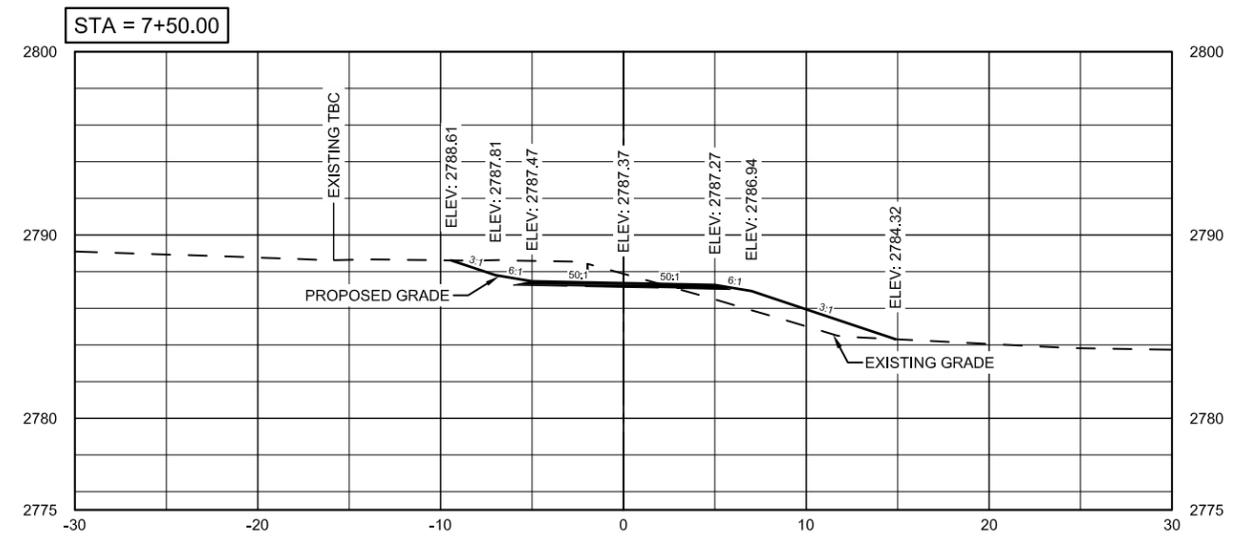
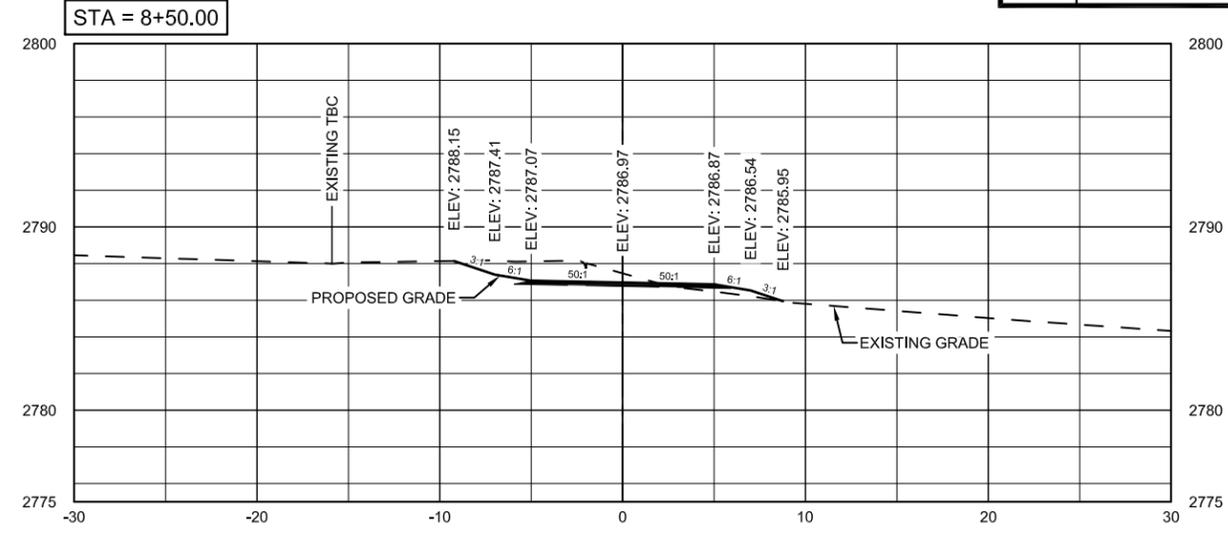
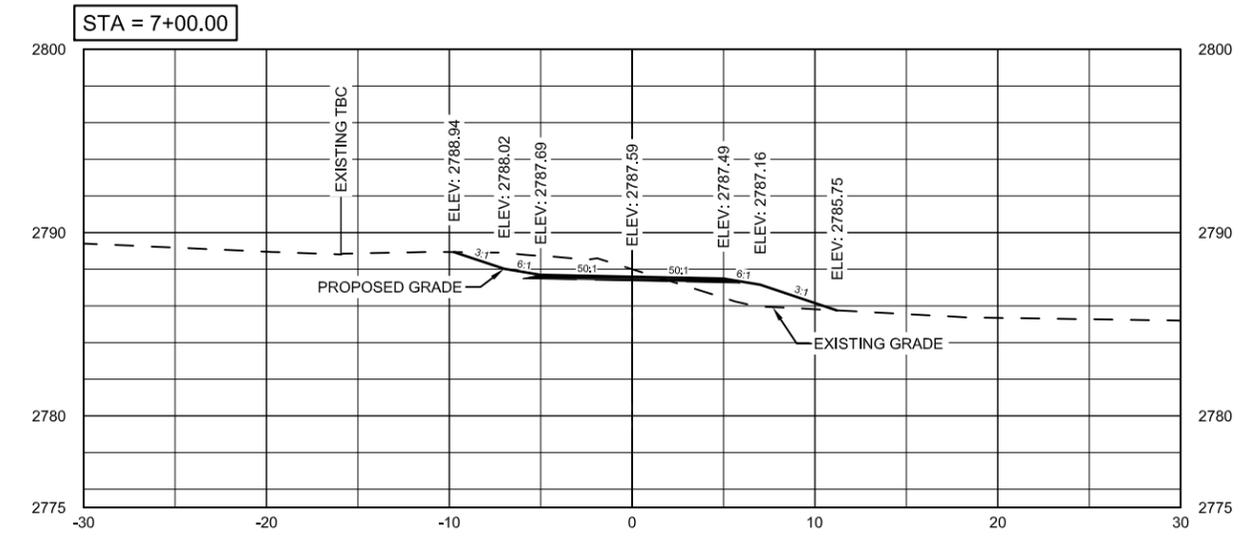
BEACH SUP - PHASE II
CITY OF BEACH
BEACH, NORTH DAKOTA

KLJ

CROSS SECTIONS
STA 04+00 - STA 06+50

DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113	DATE 01/30/2015
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Revision	Date	Description

BEACH SUP - PHASE II
CITY OF BEACH
BEACH, NORTH DAKOTA

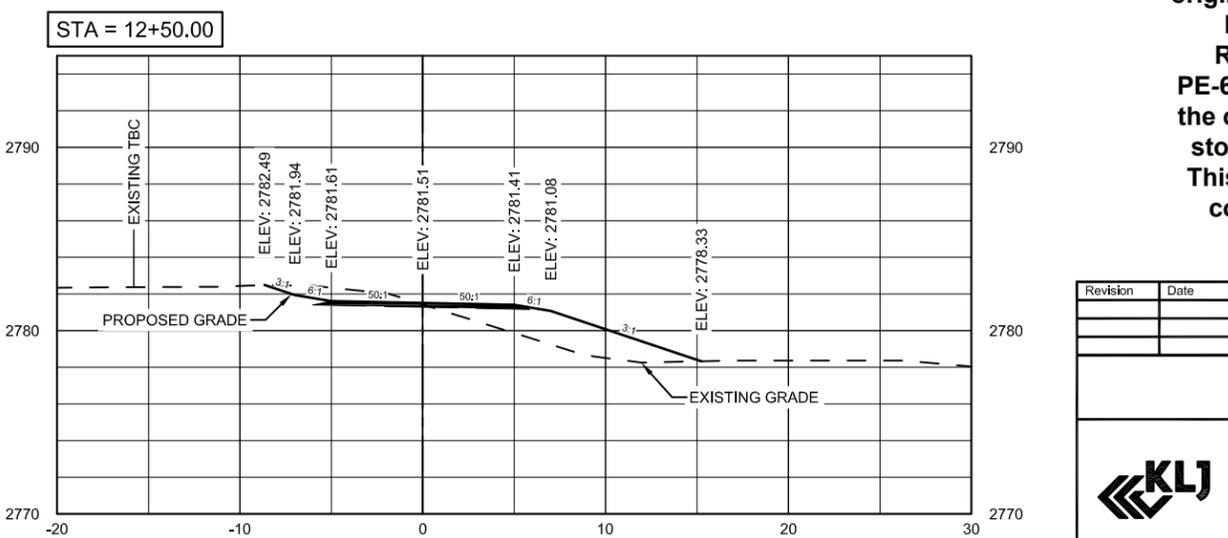
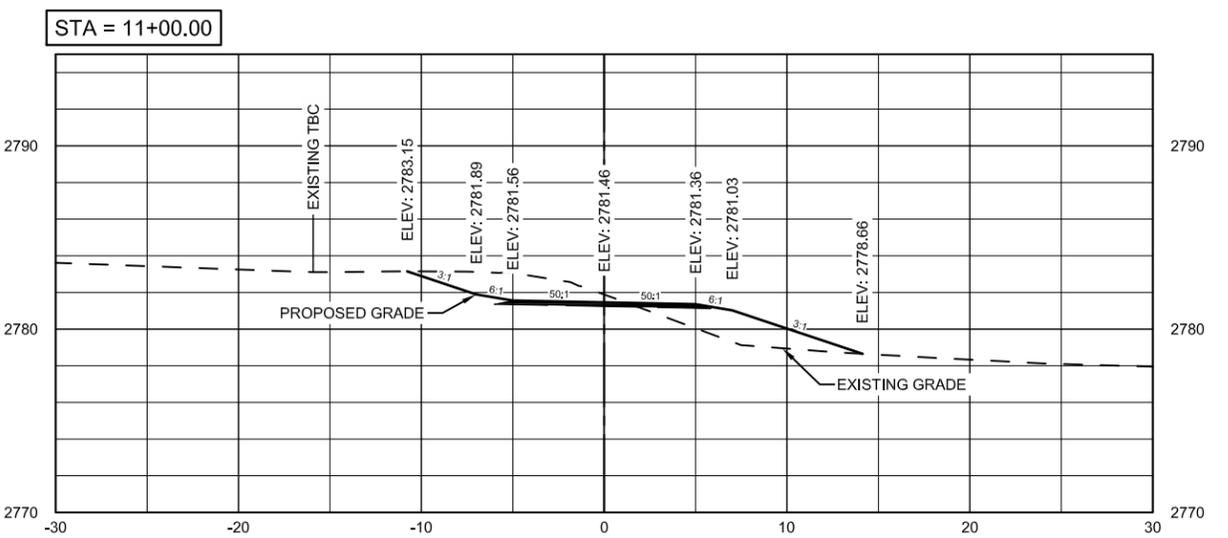
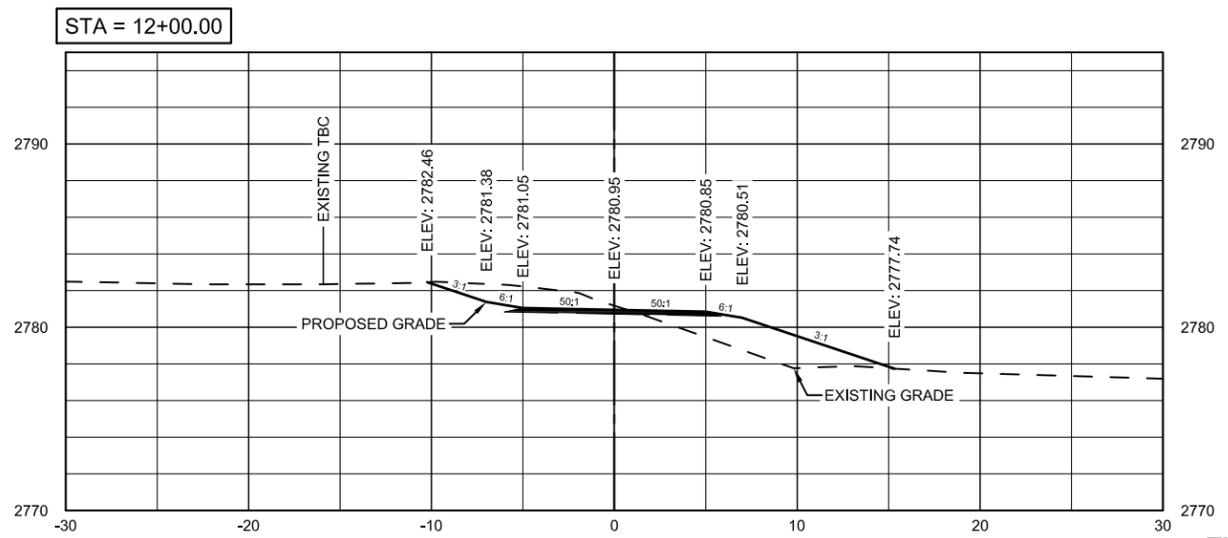
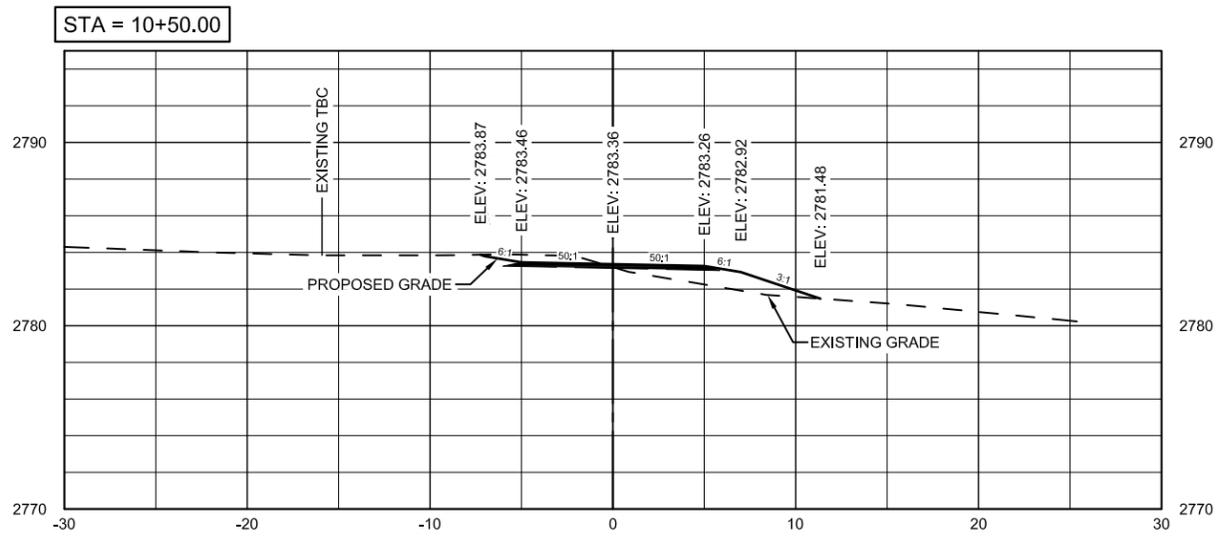
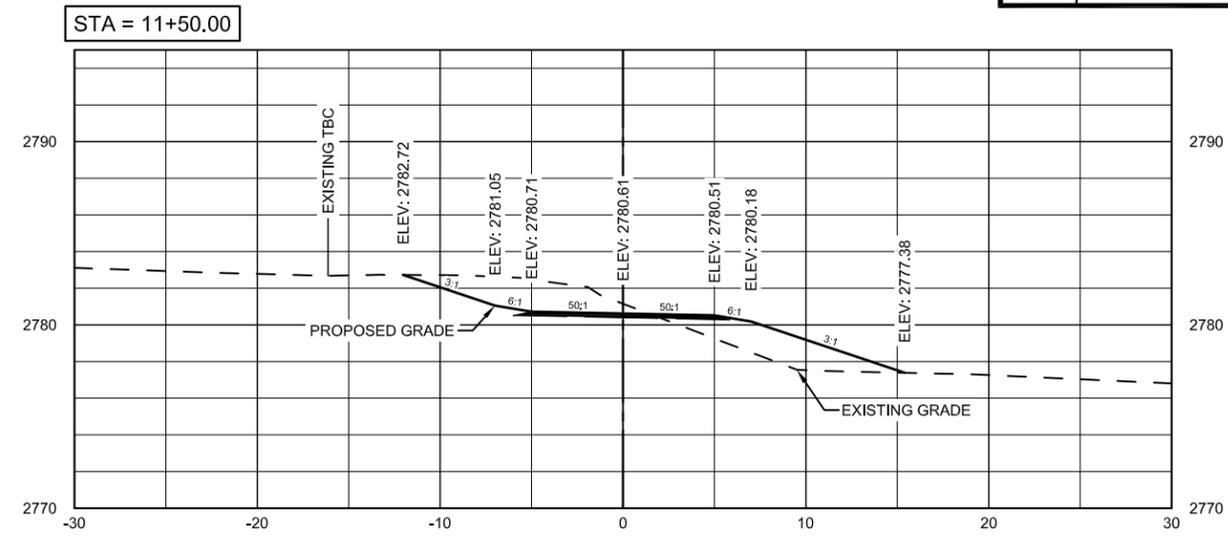
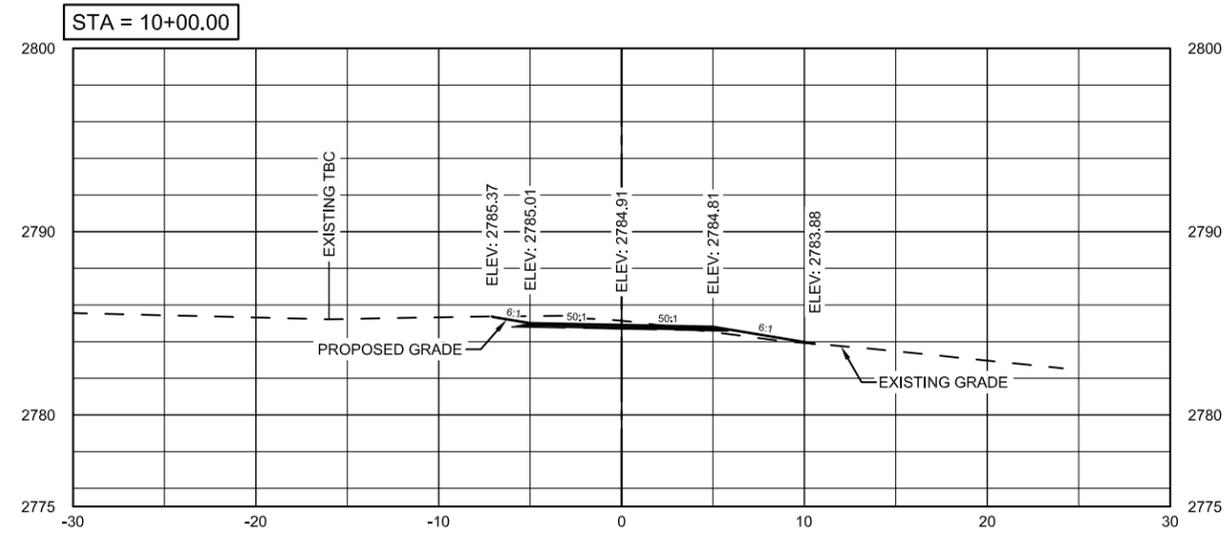
KLJ

CROSS SECTIONS
STA 07+00 - STA 09+50

DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113	DATE 01/30/2015
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	200	4



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Revision	Date	Description

BEACH SUP - PHASE II
CITY OF BEACH
BEACH, NORTH DAKOTA

KLJ

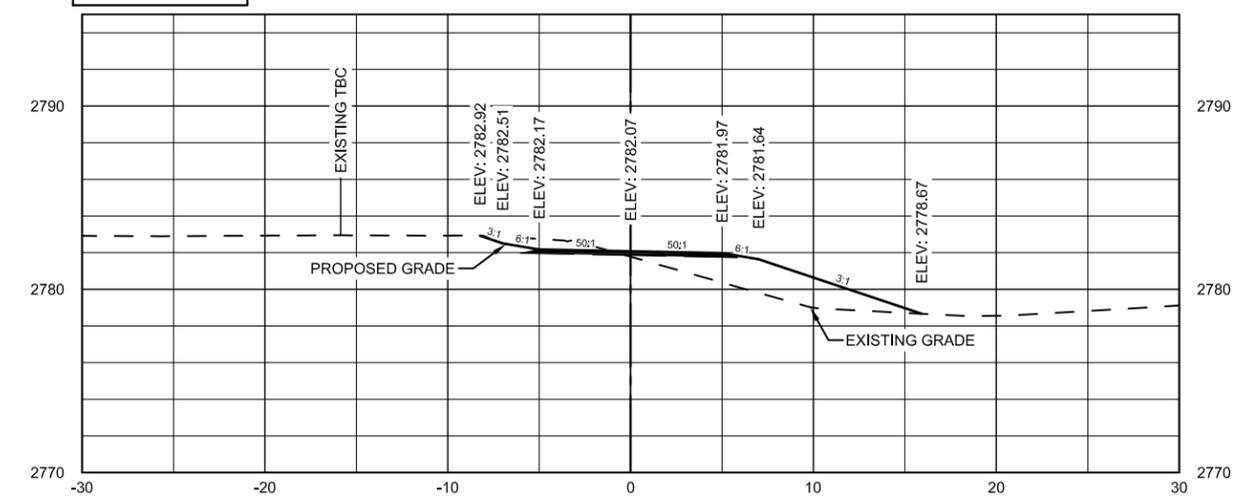
CROSS SECTIONS
STA 10+00 - STA 12+50

DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113	DATE 01/30/2015
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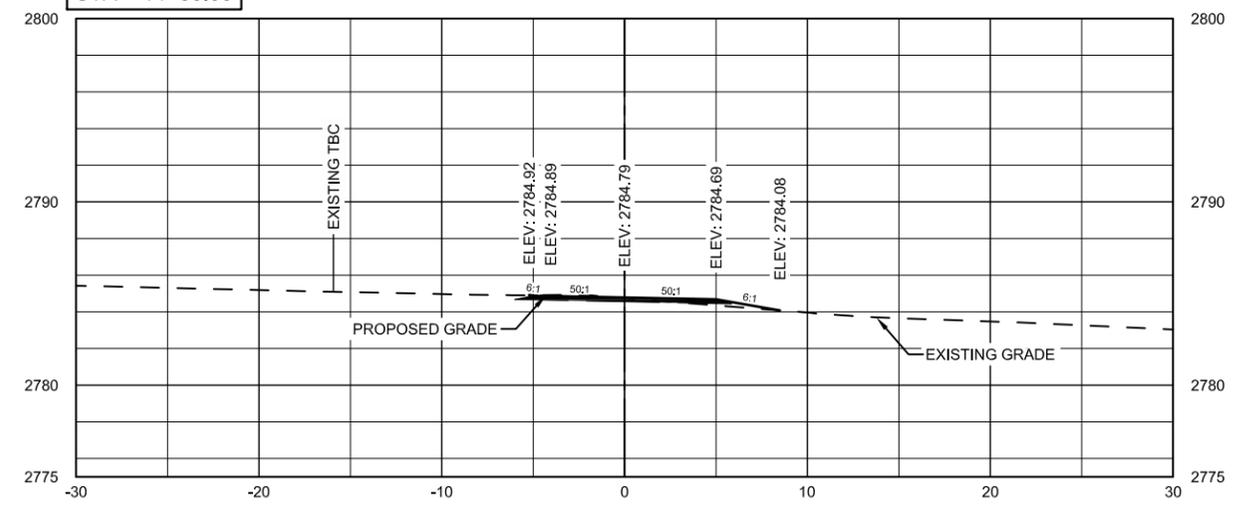
Kadmas, Lee & Jackson, Inc.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	200	5

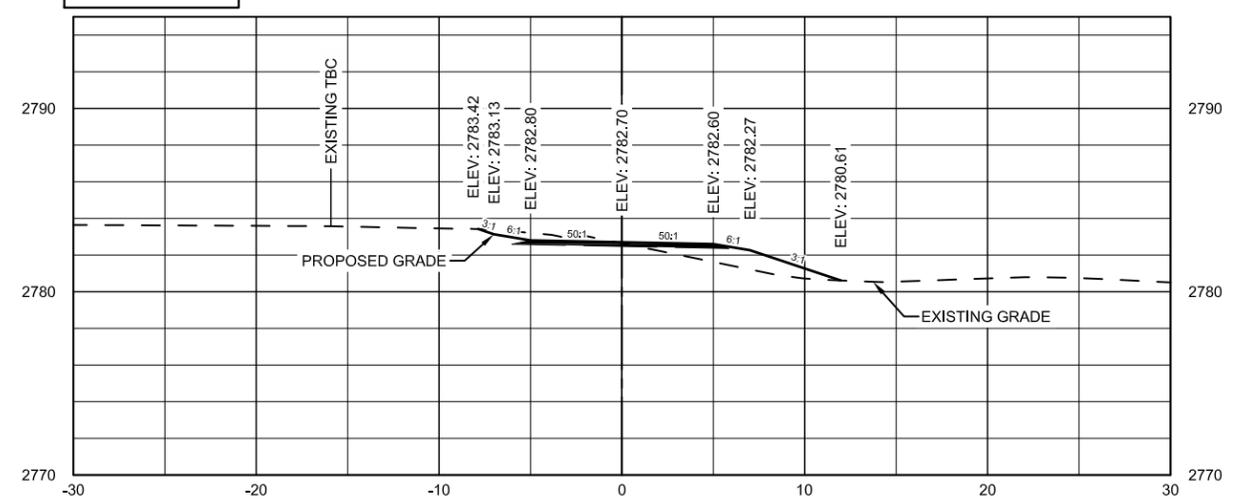
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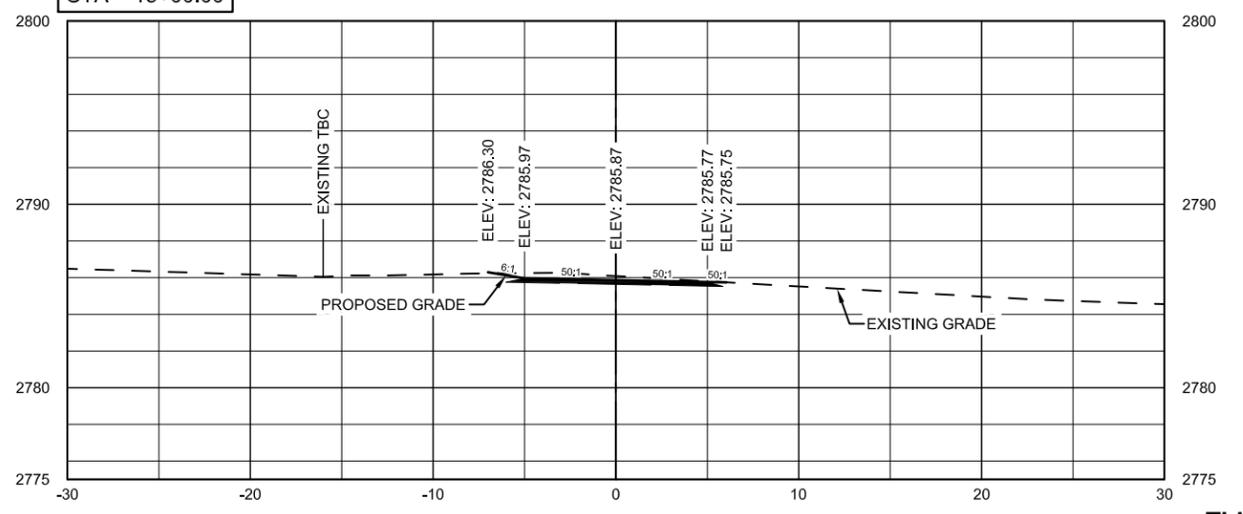
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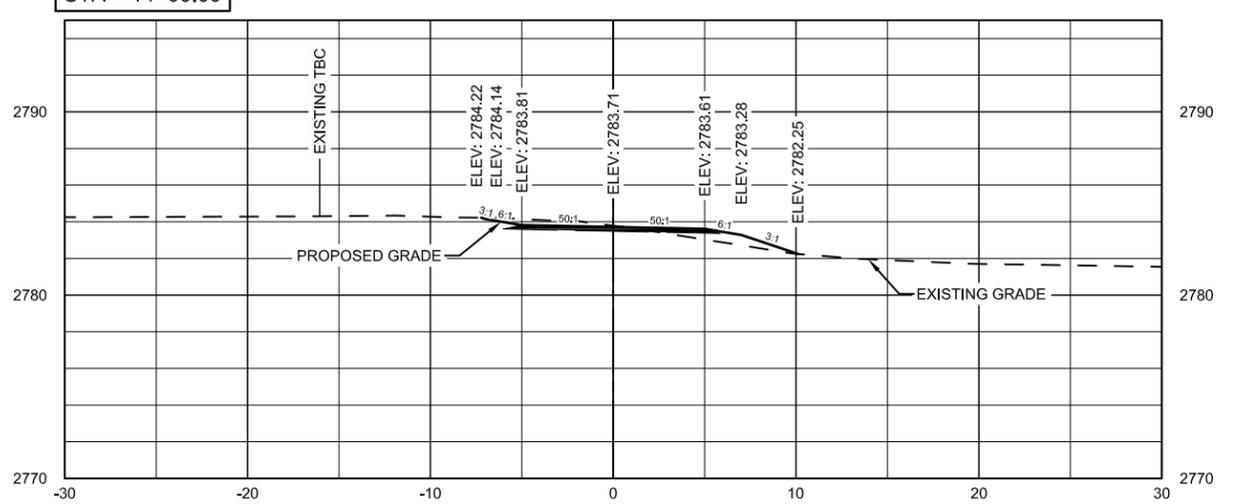
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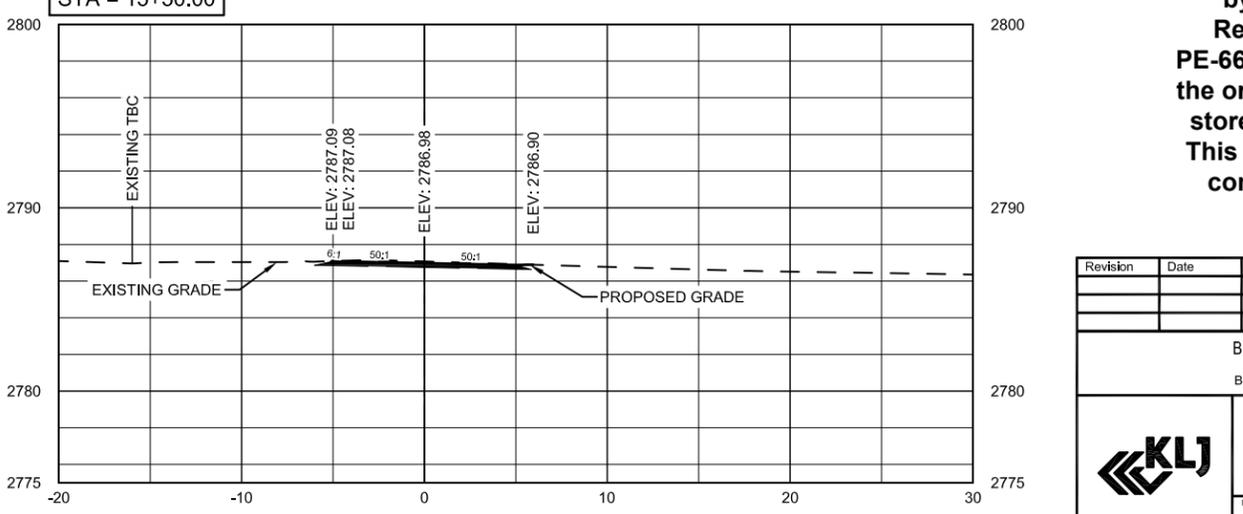
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STA = 14+00.00



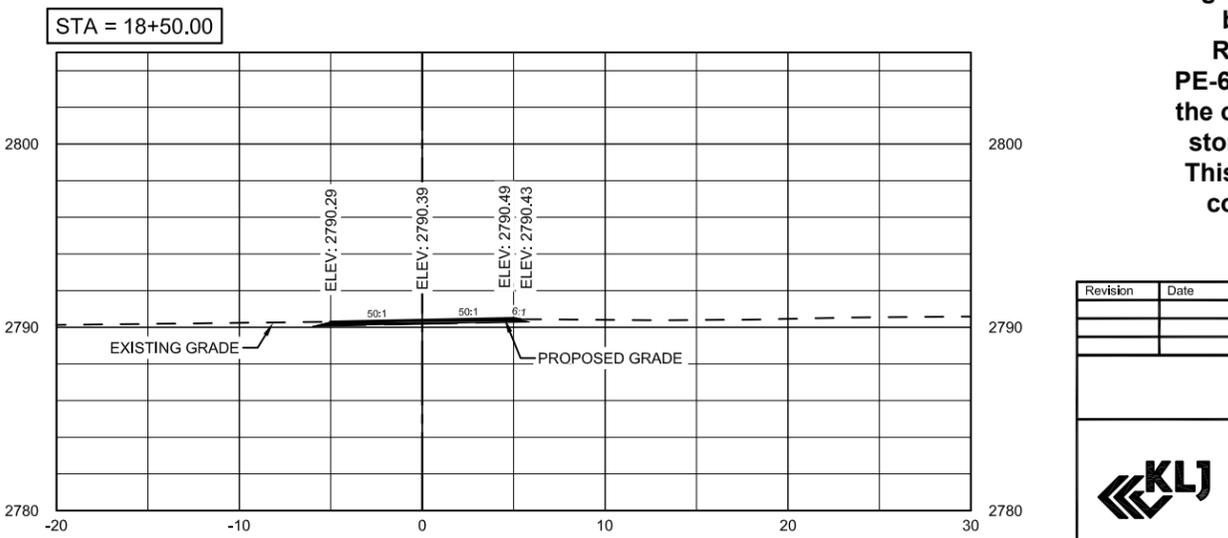
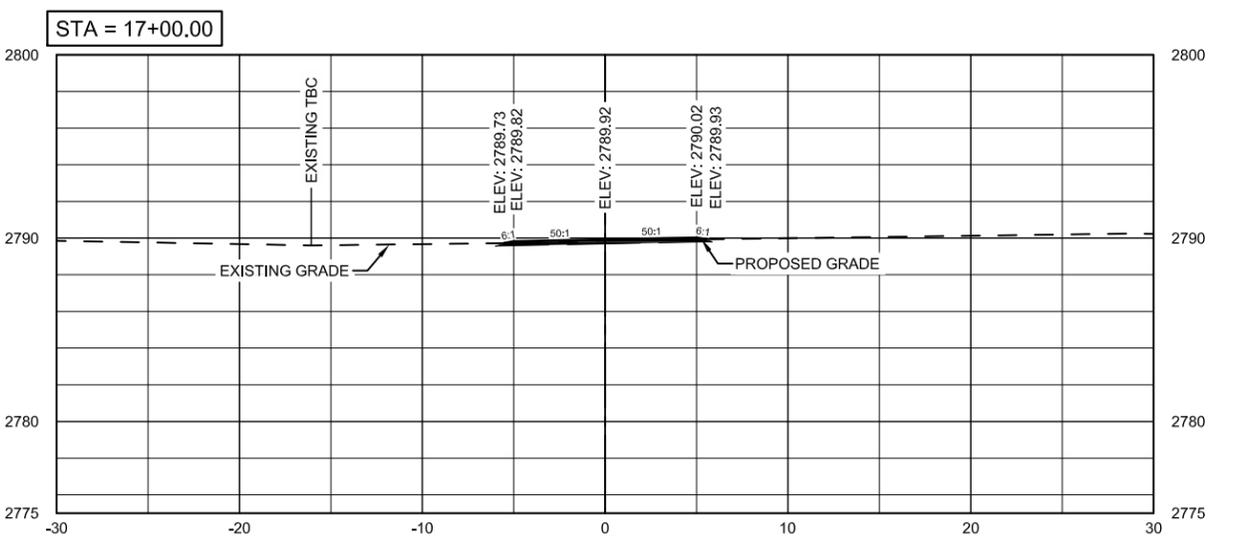
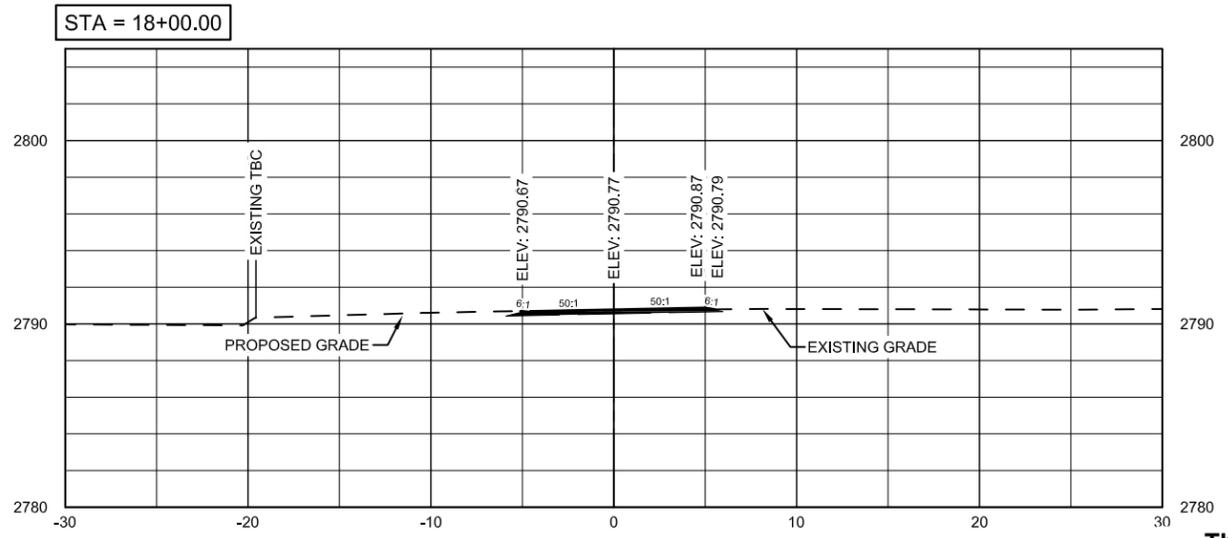
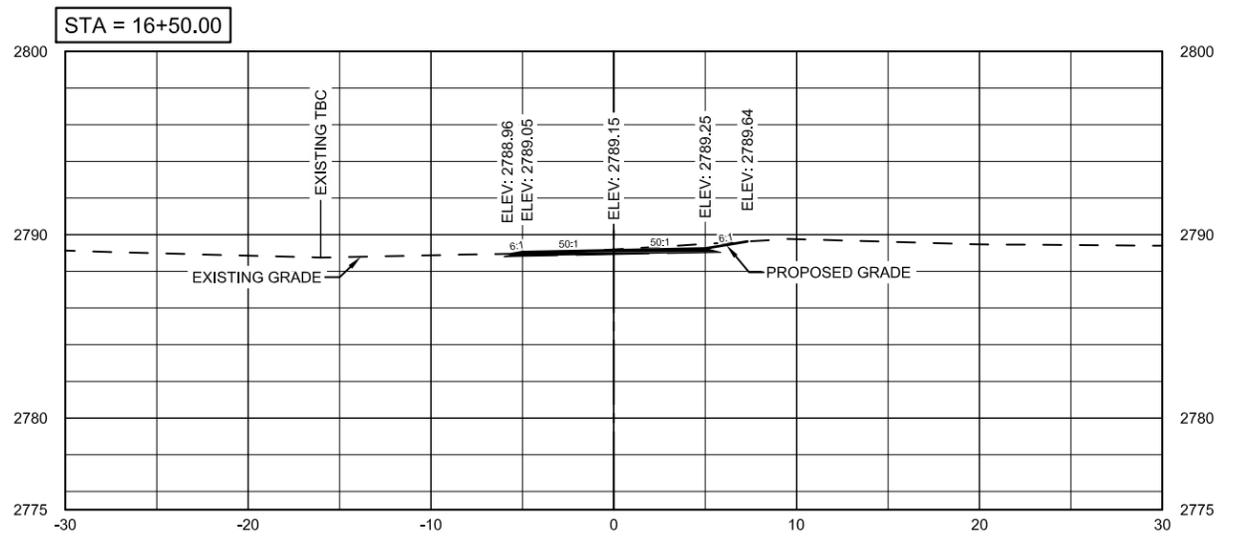
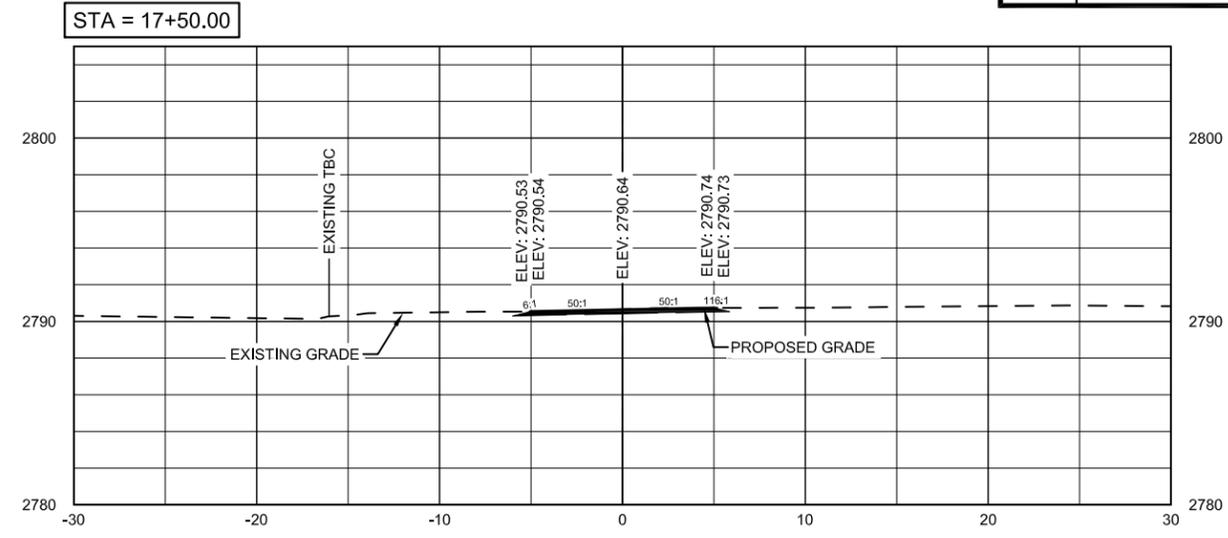
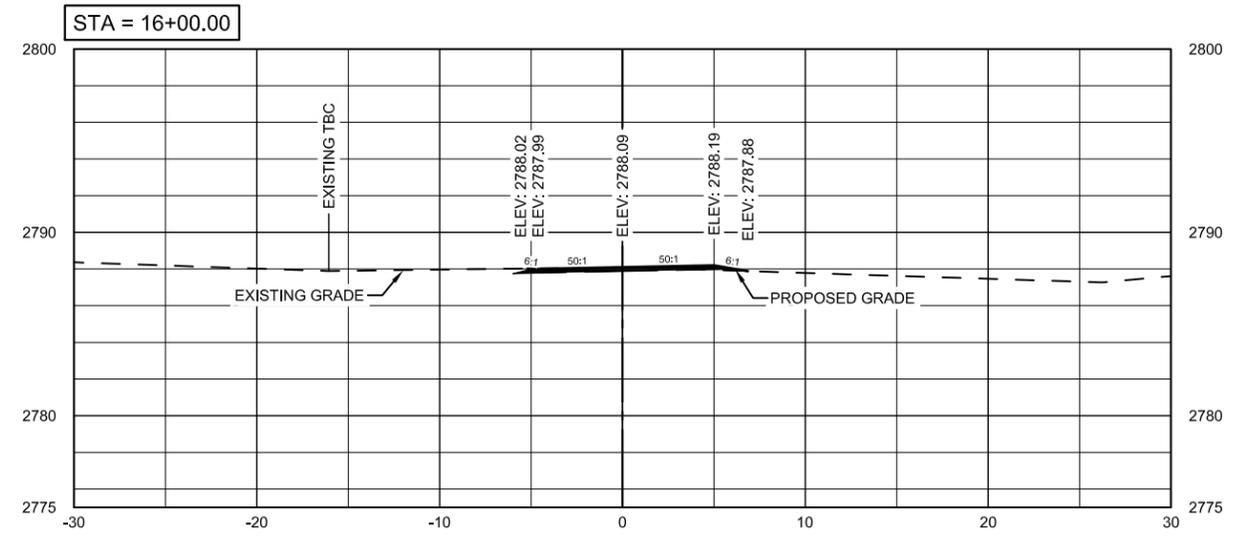
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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
KLJ CROSS SECTIONS STA 13+00 - STA 15+50		
DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113
DATE 01/30/2015		© Kadmas, Lee & Jackson, Inc.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	200	6



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Revision	Date	Description

BEACH SUP - PHASE II
CITY OF BEACH
BEACH, NORTH DAKOTA

KLJ

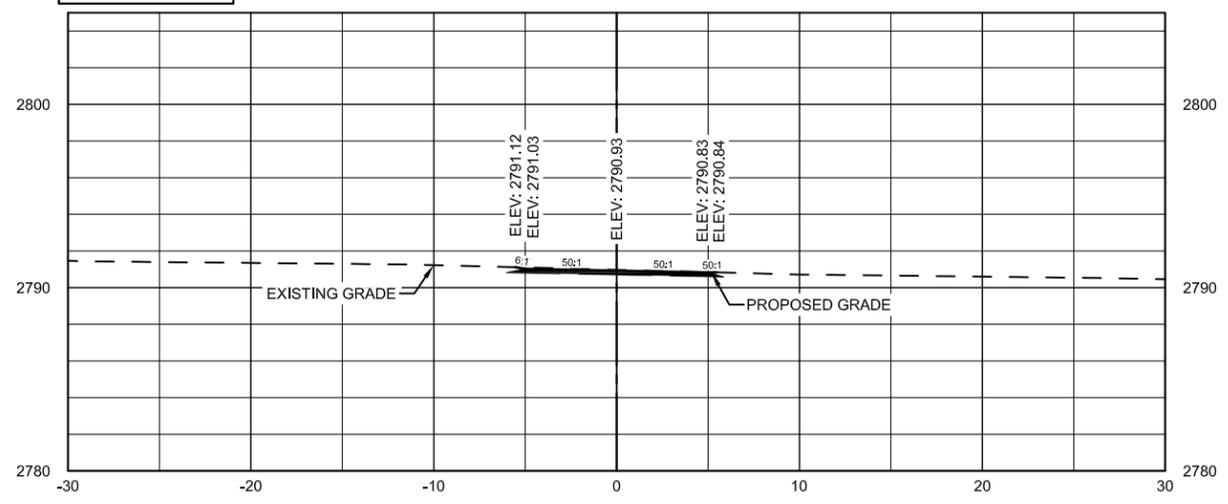
CROSS SECTIONS
STA 16+00 - STA 18+50

DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113	DATE 01/30/2015
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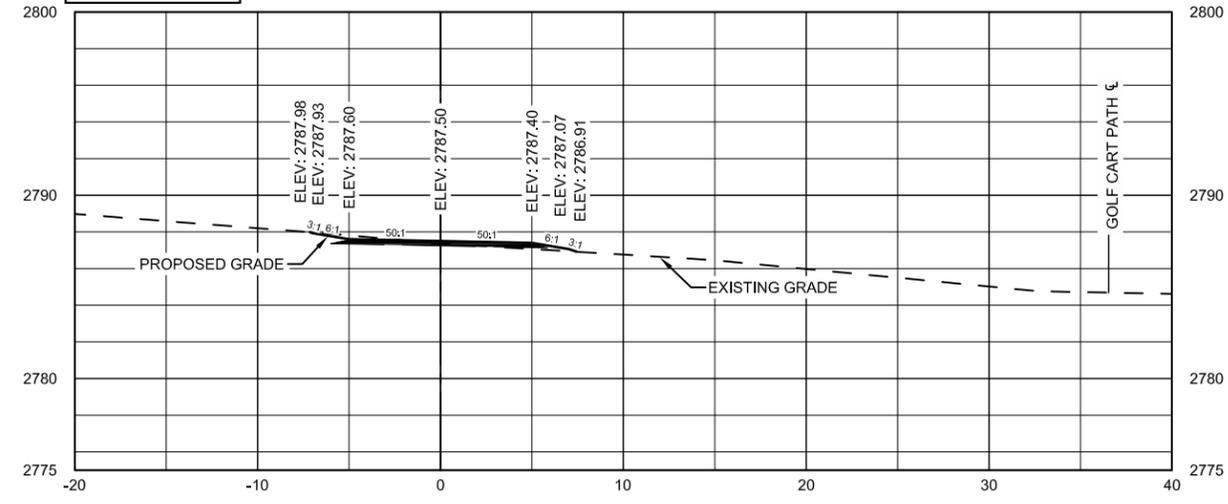
Kadmas, Lee & Jackson, Inc.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	200	7

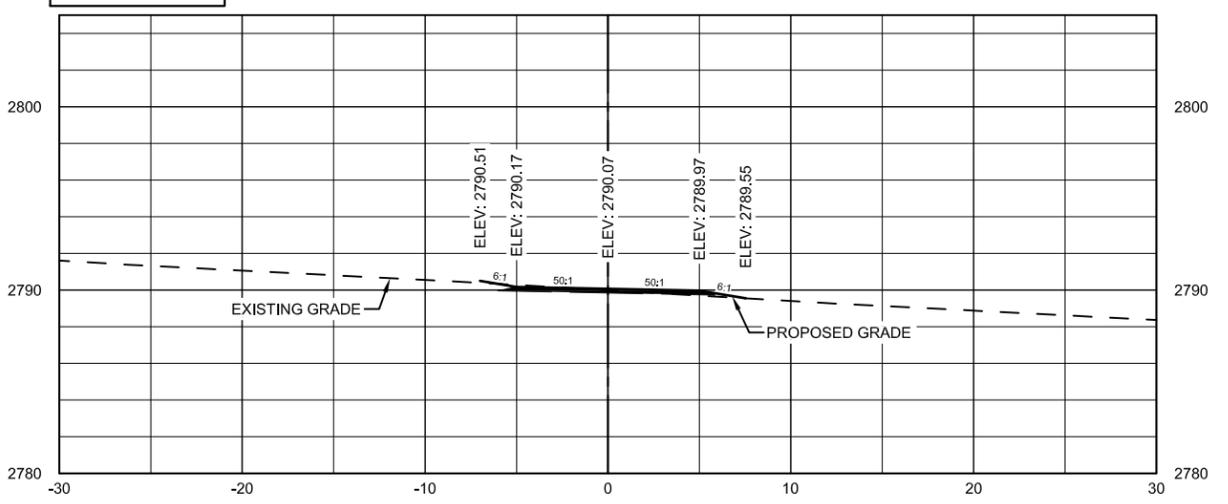
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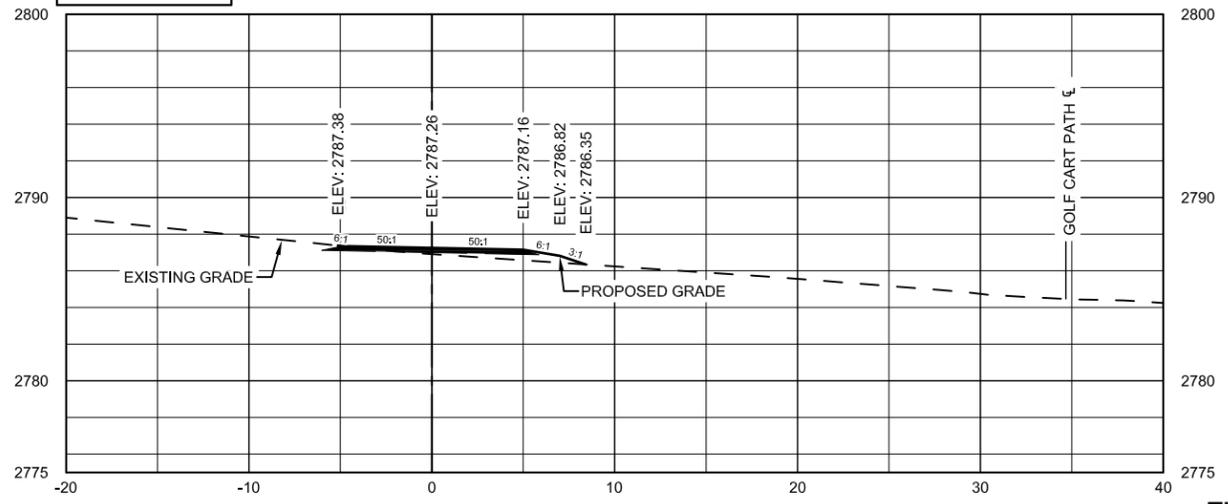
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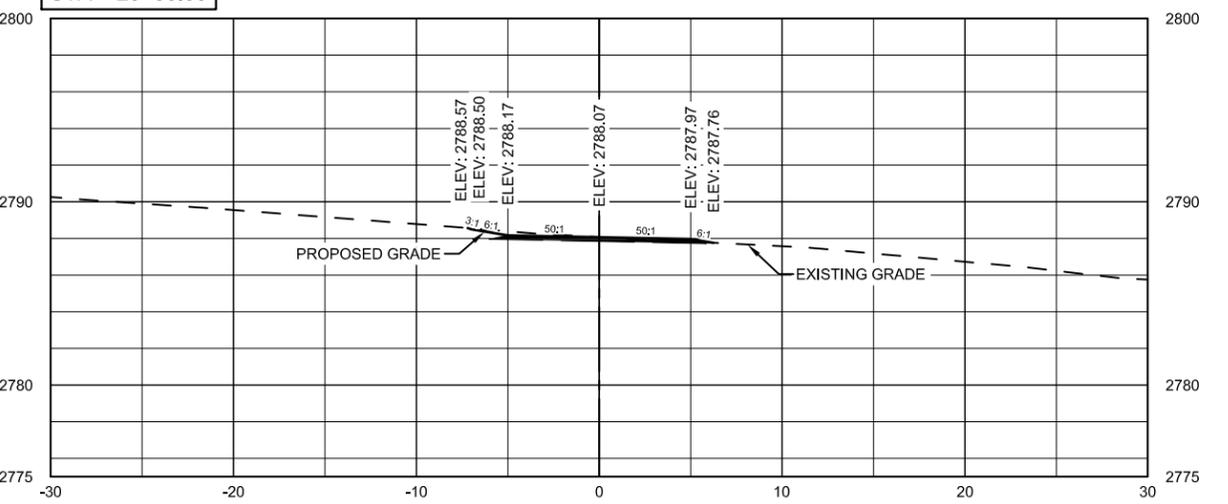
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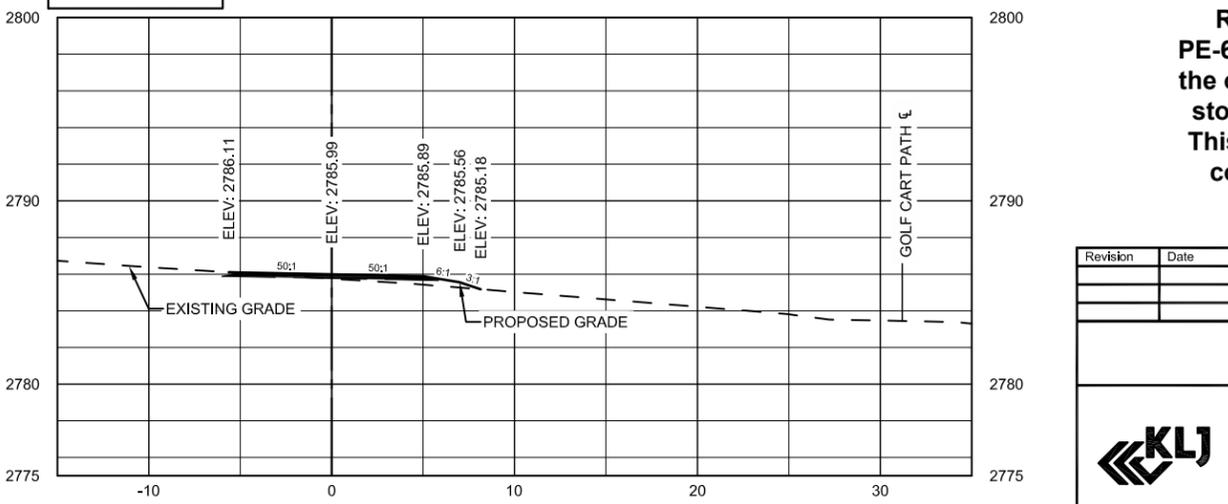
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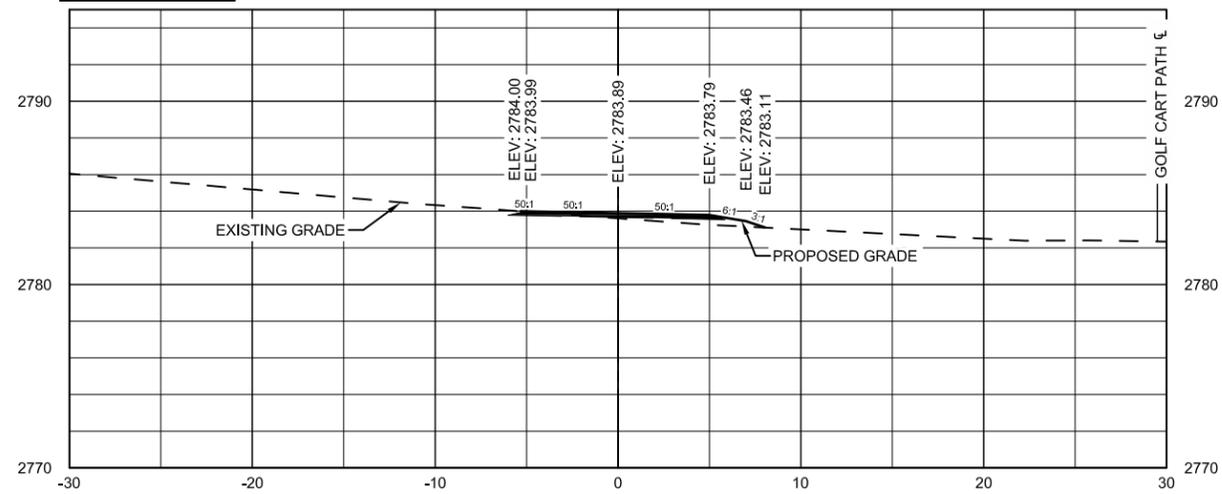


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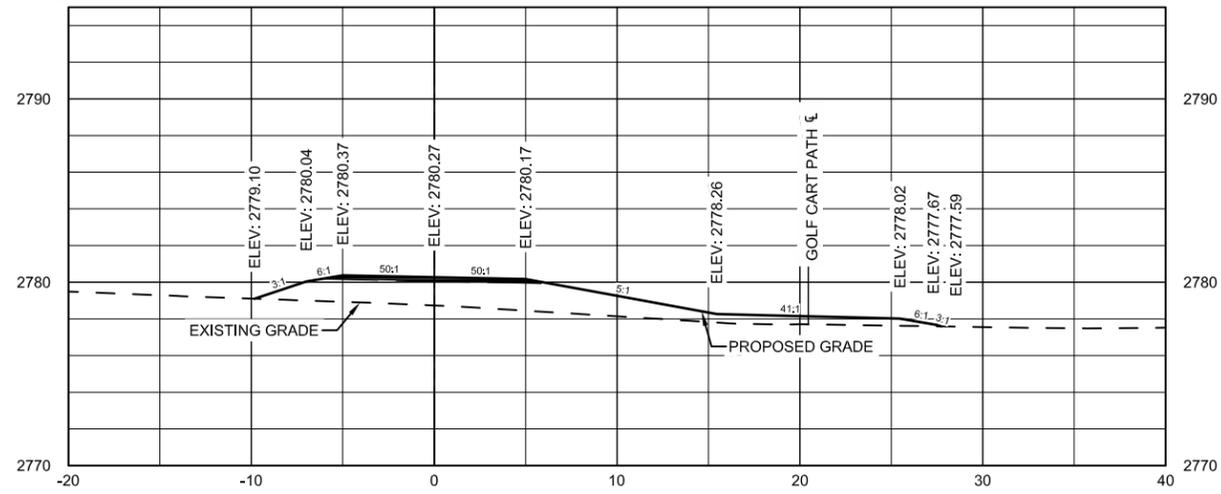
Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
KLJ CROSS SECTIONS STA 19+00 - STA 21+50		
DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113
DATE 01/30/2015		© Kadmas, Lee & Jackson, Inc.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BEACH SUP - PHASE II	200	8

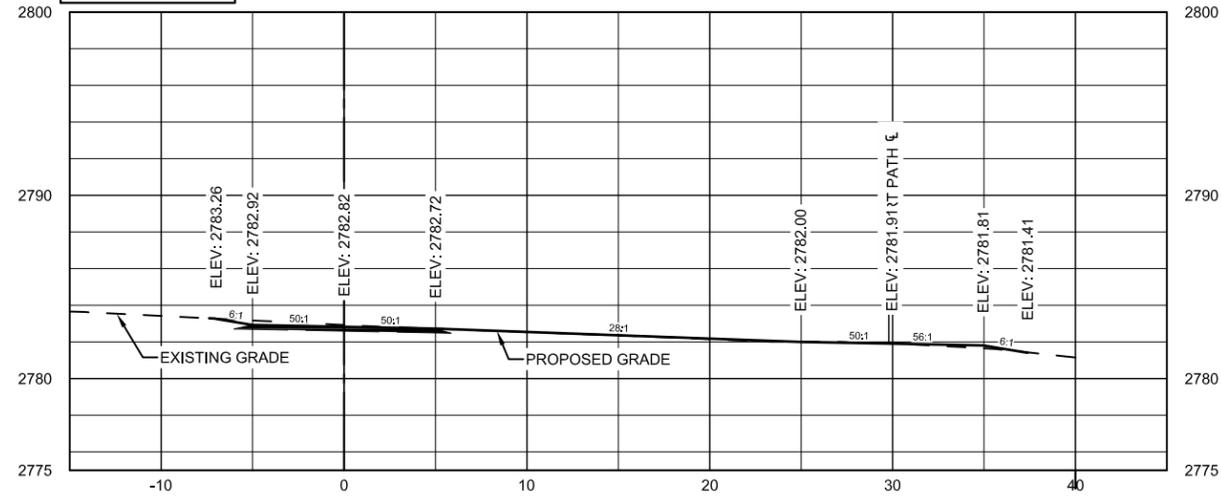
STA = 22+00.00



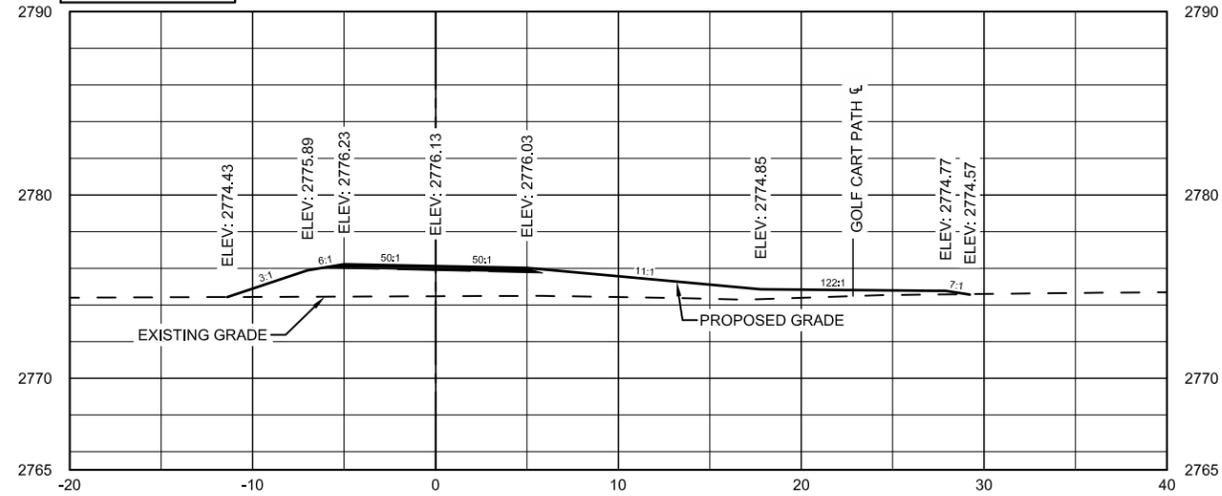
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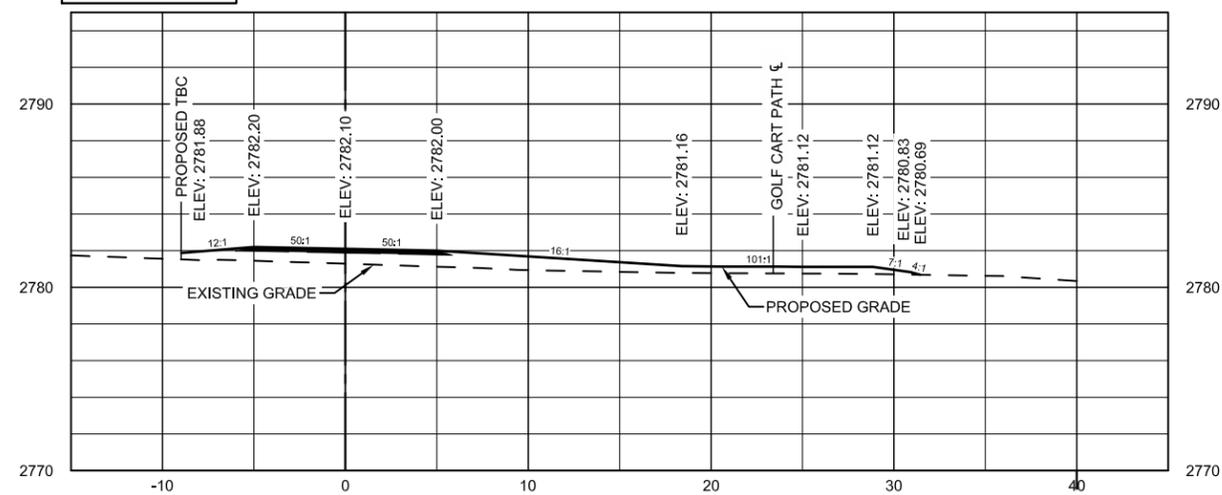
STA = 22+50.00



STA = 24+00.00



STA = 23+00.00



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Revision	Date	Description
BEACH SUP - PHASE II CITY OF BEACH BEACH, NORTH DAKOTA		
KLJ CROSS SECTIONS STA 22+00 - STA 24+00		
DRWN BY AJW	CHKD BY ADW	PROJECT NO. 1614113
DATE 01/30/2015		
Kadmas, Lee & Jackson, Inc.		

NDDOT ABBREVIATIONS

? This is a special text character used in the labeling of existing features. It indicates a feature that has an unknown characteristic, potentially based on: lack of description, location accuracy or purpose.

Abn abandoned
 Abut abutment
 Ac acres
 Adj adjusted
 Aggr aggregate
 Ahd ahead
 ARV air release valve
 Align alignment
 Al alley
 Alt alternate
 Alum aluminum
 ADA Americans with Disabilities Act
 A ampere
 & and
 Appr approach
 Approx approximate
 ACP asbestos cement pipe
 Asph asphalt
 AC asphalt cement
 Assmd assumed
 @ at
 Atten attenuation
 ATR automatic traffic recorder
 Ave Avenue
 Avg average
 ADT average daily traffic
 Az azimuth
 Bk back
 BF back face
 Bs backsight
 Balc balcony
 B Wire barbed wire
 Barr barricade
 Btry battery
 Brg bearing
 BI beehive inlet
 Beg begin
 BM bench mark
 Bkwy bikeway
 Bit bituminous
 Blk block
 Bd Ft board feet
 BH bore hole
 BS both sides
 Bot bottom
 Blvd Boulevard
 Bndry boundary
 BC brass cap
 Brkwy breakaway
 Br bridge
 Bldg building

BV butterfly valve
 Byp bypass
 C Gdrl cable guardrail
 Calc calculate
 Cd candela
 CIP cast iron pipe
 CB catch basin
 CRS cationic rapid setting
 C Gd cattle guard
 C To C center to center
 Cl or C centerline
 Cm centimeter
 Ch chain
 Chnlk chain-link
 Ch Blk channel block
 Ch Ch channel change
 Chk check
 Chsld chiseled
 Cir circle
 Cl class
 Cl clay
 Cl F clay fill
 Cl Hvy clay heavy
 Cl Lm clay loam
 Clnt clean-out
 Clr clear
 Cl&gr clearing & grubbing
 Co S coal slack
 Comb. combination
 Coml commercial
 Compr compression
 CADD computer aided drafting & design
 Conc concrete
 Cond conductor
 Const construction
 Cont continuous
 CSB continuous split barrel sample
 Contr contraction
 Contr contractor
 CP control point
 Coord coordinate
 Cor corner
 Corr corrected
 CAES corrugated aluminum end section
 CAP corrugated aluminum pipe
 CMES corrugated metal end section
 CMP corrugated metal pipe
 CPVCP corrugated poly-vinyl chloride pipe
 CSES corrugated steel end section
 CSP corrugated steel pipe
 C coulomb
 Co County
 Crse course
 C Gr course gravel
 CS course sand

Ct Court
 Xarm cross arm
 Xbuck cross buck
 Xsec cross sections
 Xing crossing
 Xrd Crossroad
 Crn crown
 CF cubic feet
 M3 cubic meter
 M3/s cubic meters per second
 CY cubic yard
 Cy/mi cubic yards per mile
 Culv culvert
 C&G curb & gutter
 CI curb inlet
 CR curb ramp
 CS curve to spiral
 C cut
 Dd Ld dead load
 Defl deflection
 Defm deformed
 Deg or D degree
 DInt delineate
 DIntr delineator
 Depr depression
 Desc description
 Det detail
 DWP detectable warning panel
 Dtr detour
 Dia diameter
 Dir direction
 Dist distance
 DM disturbed material
 DB ditch block
 DG ditch grade
 Dbl double
 Dn down
 Dwg drawing
 Dr drive
 Drwy driveway
 DI drop inlet
 D dry density
 Ea each
 Esmt easement
 E East
 EB Eastbound
 Elast elastomeric
 EL electric locker
 E Mtr electric meter
 Elec electric/al
 EDM electronic distance meter
 Elev or El elevation
 Ellipt elliptical
 Emb embankment
 Emuls emulsion/emulsified

ES end section
 Engr engineer
 ESS environmental sensor station
 Eq equal
 Eq equation
 Evgr evergreen
 Exc excavation
 Exst existing
 Exp expansion
 Expy Expressway
 E external of curve
 Extru extruded
 FOS factor of safety
 F Fahrenheit
 FS far side
 F farad
 Fed Federal
 FP feed point
 Ft feet/foot
 Fn fence
 Fn P fence post
 FO fiber optic
 FB field book
 FD field drive
 F fill
 FAA fine aggregate angularity
 FS fine sand
 FH fire hydrant
 Fl flange
 Flrd flared
 FES flared end section
 F Bcn flashing beacon
 FA flight auger sample
 FL flow line
 Ftg footing
 FM force main
 Fs foresight
 Fnd found
 Fdn foundation
 Frac fractional
 Frwy freeway
 Frt front
 FF front face
 F Disp fuel dispenser

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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NDDOT ABBREVIATIONS

D-101-2

FFP	fuel filler pipes	IP	iron Pipe	M	mega	Ped	pedestrian
FLS	fuel leak sensor	Jt	joint	Mer	meridian	PPP	pedestrian pushbutton post
Furn	furnish/ed	J	joule	M	meter	Pen.	penetration
Gal	gallon	Jct	junction	M/s	meters per second	Perf	perforated
Galv	galvanized	K	kelvin	M	mid ordinate of curve	Per.	perimeter
Gar	garage	Kn	kilo newton	Mi	mile	PL	pipeline
Gs L	gas line	Kpa	kilo pascal	MM	mile marker	PI	place
G Reg	gas line regulator	Kg	kilogram	MP	mile post	P&P	plan & profile
GMV	gas main valve	Kg/m3	kilogram per cubic meter	MI	milliliter	PL	plastic limit
G Mtr	gas meter	Km	kilometer	Mm	millimeter	PI	plate
GSV	gas service valve	K	Kip(s)	Mm/hr	millimeters per hour	Pt	point
GVP	gas vent pipe	LS	Land Surveyor (licensed)	Min	minimum	PCC	point of compound curve
GV	gate valve	LSIT	Land Surveyor In Training	Misc	miscellaneous	PC	point of curve
Ga	gauge	Ln	lane	Mon	monument	PI	point of intersection
Geod	geodetic	Lg	large	Mnd	mound	PRC	point of reverse curvature
GIS	Geographical Information System	Lat	latitude	Mtbl	mountable	PT	point of tangent
G	giga	Lt	left	Mtd	mounted	POC	point on curve
GPS	Global Positioning System	L	length of curve	Mtg	mounting	POT	point on tangent
Gov	government	Lens	lenses	Mk	muck	PE	polyethylene
Grd	graded/grade	Lvl	level	Mun	municipal	PVC	polyvinyl chloride
Gr	gravel	LB	level book	N	nano	PCC	Portland Cement concrete
Grnd	ground	LvIng	leveling	NGS	National Geodetic Survey	Lb or #	pounds
GWM	ground water monitor	Lht	light	NS	near side	PP	power pole
Gdrl	guardrail	LP	light pole	Neop	neoprene	Preempt	preemption
Gtr	gutter	Ltg	lighting	Ntwk	network	Prefab	prefabricated
H Plg	H piling	Lig Co	lignite coal	N	newton	Prfmd	performed
Hdwl	headwall	Lig Sl	lignite slack	N	North	Prep	preparation
Ha	hectare	LF	linear foot	NE	North East	Press.	pressure
Ht	height	Liq	liquid	NW	North West	PRV	pressure relief valve
HI	height of instrument	LL	liquid limit	NB	Northbound	Prestr	prestressed
Hel	helical	L	litre	No. or #	number	Pvt	private
H	henry	Lm	loam	Obsc	obscure(d)	PD	private drive
HZ	hertz	Loc	location	Obsn	observation	Prod.	production/produce
HDPE	high density polyethylene	LC	long chord	Ocpd	occupied	Prog	programmed
HM	high mast	Long.	longitude	Ocpy	occupy	Prop.	property
HP	high pressure	Lp	loop	Off Loc	office location	Prop Ln	property line
HPS	high pressure sodium	LD	loop detector	O/s	offset	Ppsd	proposed
Hwy	highway	Lm	lumen	OC	on center	PB	pull box
Hor	horizontal	Lum	luminaire	C	one dimensional consolidation		
HBP	hot bituminous pavement	L Sum	lump sum	OC	organic content		
Hr	hour(s)	Lx	lux	Orig	original		
Hyd	hydrant	ML	main line	O To O	out to out		
Ph	hydrogen ion content	M Hr	man hour	OD	outside diameter		
Id	identification	MH	manhole	OH	overhead		
In or "	inch	Mkd	marked	PMT	pad mounted transformer		
Incl	inclinometer tube	Mkr	marker	Pg	pages		
IMH	inlet manhole	Mkg	marking	Pntd	painted		
ID	inside diameter	MA	mast arm	Pr	pair		
Inst	instrument	Matl	material	Pnl	panel		
Intchg	interchange	Max	maximum	Pk	park		
Intmdt	intermediate	MC	meander corner	PK	Parker-Kalon nail		
Intscn	intersection	Meas	measure	Pa	pascal		
Inv	invert	Mdn	median	PSD	passing sight distance		
IM	iron monument	MD	median drain	Pvmt	pavement		
IPn	Iron Pin	MC	medium curing	Ped	pedestal		

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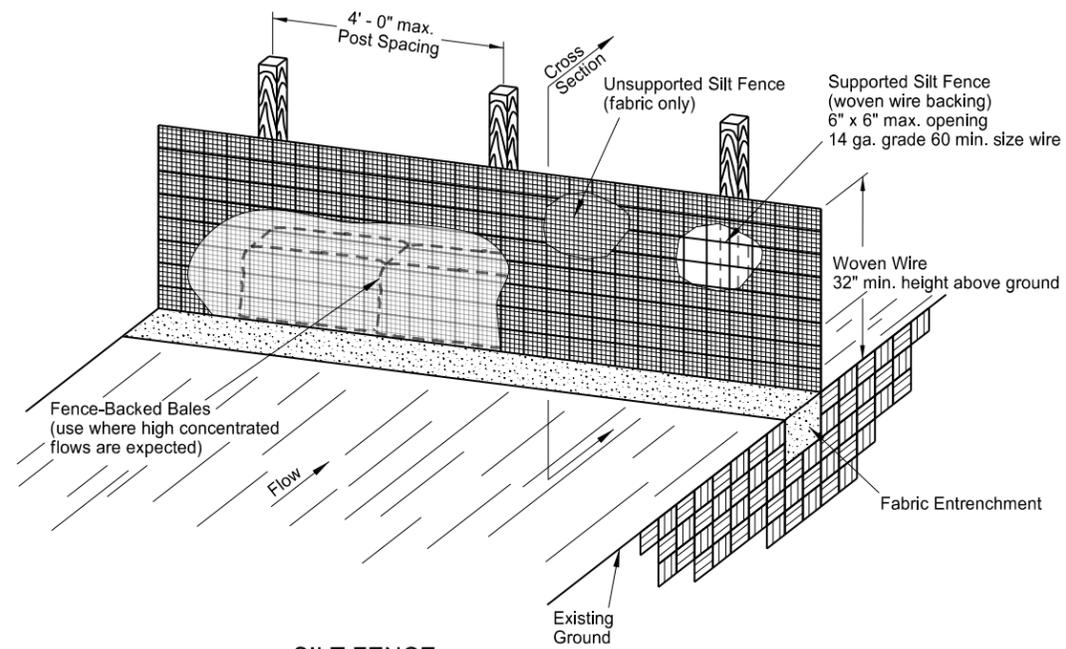
NDDOT ABBREVIATIONS

D-101-3

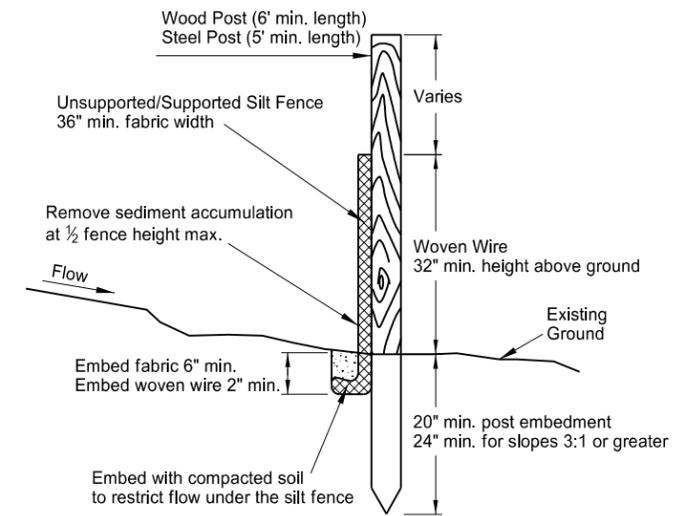
Qty	quantity	Sig	signal	TS	tangent to spiral	WB	Westbound
Qtr	quarter	Si Cl	silt clay	Tel	telephone	Wrng	wiring
Rad or R	radius	Si Cl Lm	silty clay loam	Tel B	Telephone Booth	W/	with
RR	railroad	Si Lm	silty loam	Tel P	telephone pole	W/o	without
Rlwy	railway	Sgl	single	Temp	temperature	WC	witness corner
Rsd	raised	SC	slow curing	Temp	temporary	WGS	World Geodetic System
RTP	random traverse point	SS	slow setting	TBM	temporary bench mark	Z	zenith
Rge or R	range	Sm	small	T	tesla		
RC	rapid curing	S	South	T	thinwall tube sample		
Rec	record	SE	South East	T/mi	tons per mile		
Rcy	recycle	SW	South West	Ts	topsoil		
RPCC	recycled Portland cement concrete	SB	Southbound	Twp or T	township		
Ref	reference	Sp	spaces	Traf	traffic		
R Mkr	reference marker	Spcl	special	TSCB	traffic signal control box		
RM	reference monument	SA	special assembly	Tr	trail		
Refl	reflectorized	SP	special provisions	Transf	transformer		
RCB	reinforced concrete box	G	specific gravity	TB	transit book		
RCES	reinforced concrete end section	Spk	spike	Trans	transition		
RCP	reinforced concrete pipe	SC	spiral to curve	TT	transmission tower		
RCPS	reinforced concrete pipe sewer	ST	spiral to tangent	Trans	transverse		
Reinf	reinforcement	SB	split barrel sample	Trav	traverse		
Res	reservation	SH	sprinkler head	TP	traverse point		
Ret	retaining	SV	sprinkler valve	Trtd	treated		
Rev	reverse	Sq	square	Trmt	treatment		
Rt	right	SF	square feet	Qc	triaxial compression		
R/W	right of way	Km2	square kilometer	TERO	tribal employment rights ordinance		
Riv	river	M2	square meter	Tpl	triple		
Rd	road	SY	square yard	TP	turning point		
Rdbd	road bed	Stk	stake	Typ	typical		
Rdwy	roadway	Std	standard	Qu	unconfined compressive strength		
RWIS	Roadway Weather Information System	N	standard penetration test	Ugrnd	underground		
Rk	rock	Std Specs	Standard Specifications	USC&G	US Coast & Geodetic Survey		
Rt	route	Sta	station	USGS	US Geologic Survey		
Salv	salvage(d)	Sta Yd	station yards	Util	utility		
Sd	sand	Stm L	steam line	VG	valley gutter		
Sdy Cl	sandy clay	SEC	steel encased concrete	Vap	vapor		
Sdy Cl Lm	sandy clay loam	SSD	stopping sight distance	Vert	vertical		
Sdy Fl	sandy fill	SD	storm drain	VC	vertical curve		
Sdy Lm	sandy loam	St	street	VCP	vitrified clay pipe		
San	sanitary sewer line	SPP	structural plate pipe	V	volt		
Sc	scoria	SPPA	structural plate pipe arch	Vol	volume		
Sec	seconds	Str	structure	Wkwy	walkway		
Sec	section	Subd	subdivision	W	water content		
SL	section line	Sub	subgrade	WGV	water gate valve		
Sep	separation	Sub Prep	subgrade preparation	WL	water line		
Seq	sequence	Ss	subsoil	WM	water main		
Serv	service	SE	superelevation	WMV	water main valve		
Sh	shale	SS	supplement specification	W Mtr	water meter		
Sht	sheet	Supp	supplemental	WSV	water service valve		
Shtng	sheeting	Surf	surfacing	WW	water well		
Shldr	shoulder	Surv	survey	W	watt		
Sw	sidewalk	Sym	symmetrical	Wrng	wearing		
S	siemens	SI	Systems International	Wb	weber		
SD	sight distance	Tan	tangent	WIM	Weigh In Motion		
SN	sign number	T	tangent (semi)	W	West		

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SILT FENCE
SUPPORTED AND UNSUPPORTED

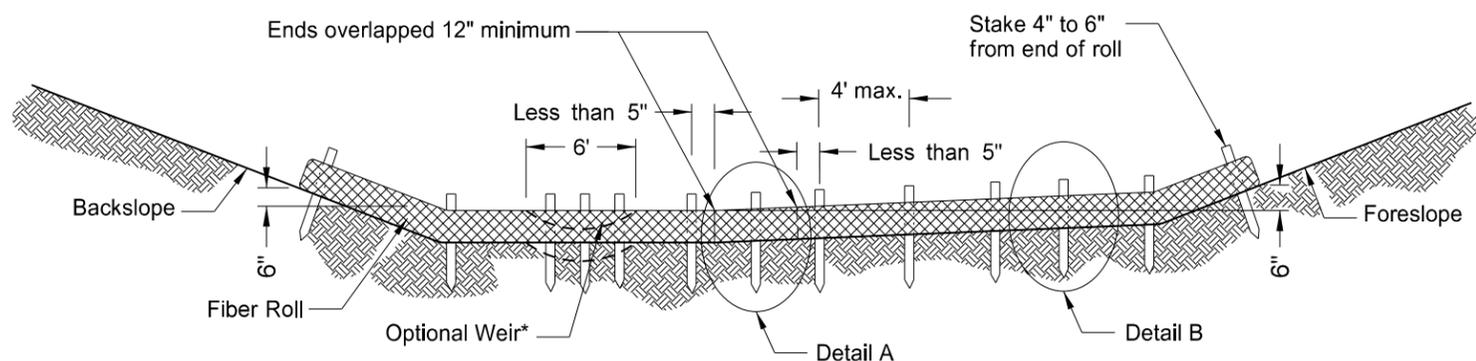


SILT FENCE
CROSS SECTION

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Standard drawing resulted from splitting standard D-708-2.

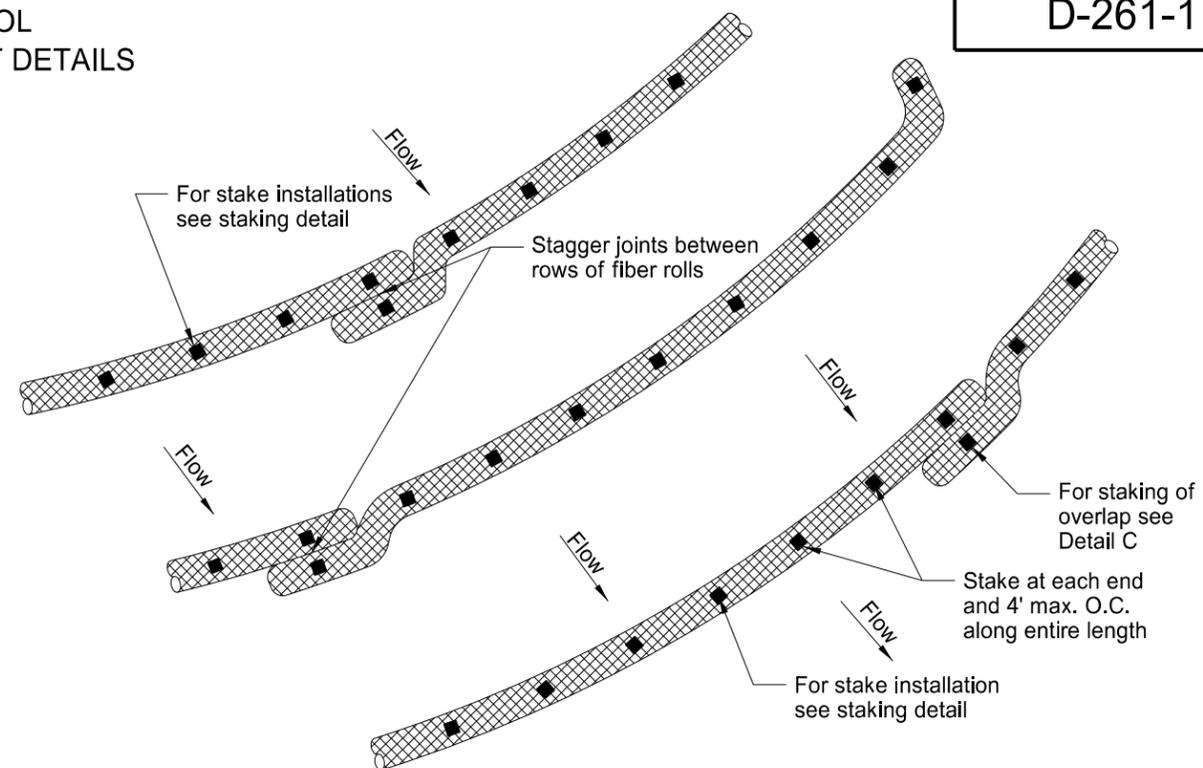
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EROSION CONTROL
FIBER ROLL PLACEMENT DETAILS

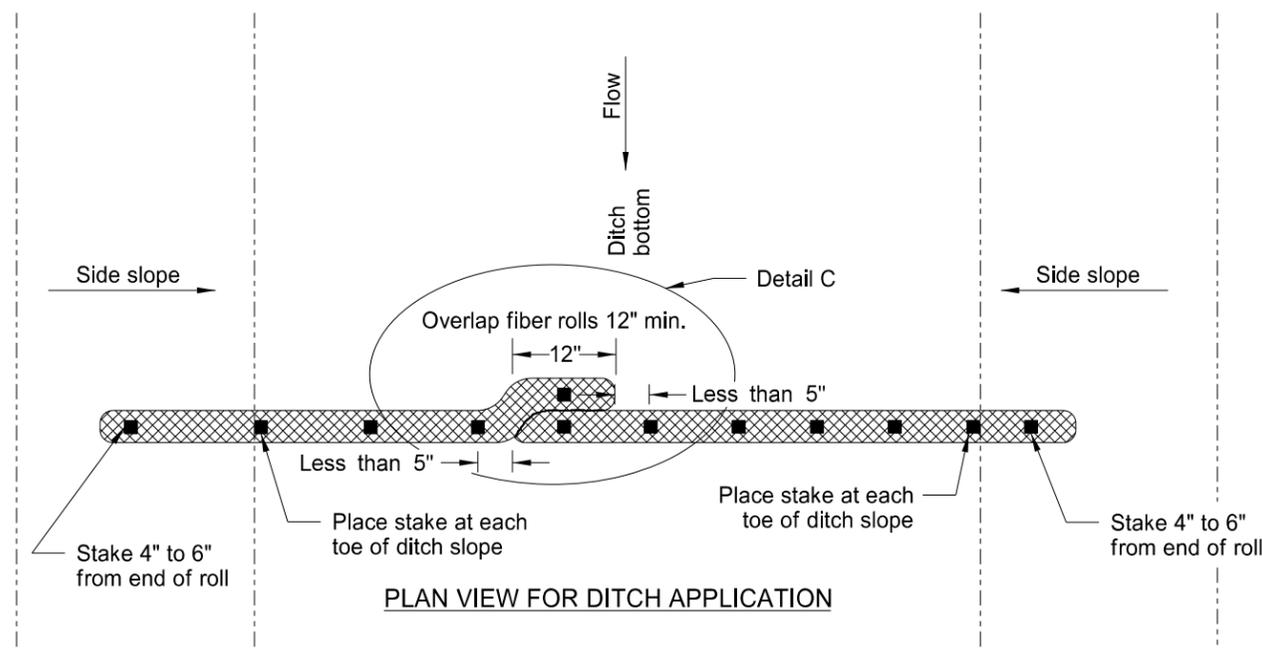


*Optional Weir. Use in flat areas, such as the Red River Valley, where there is potential for water to back up on adjacent property. Lower fiber roll enough to prevent water from backing up on adjacent property. Do not use 20-inch fiber rolls in flat areas where there is potential for water to back up on adjacent property.

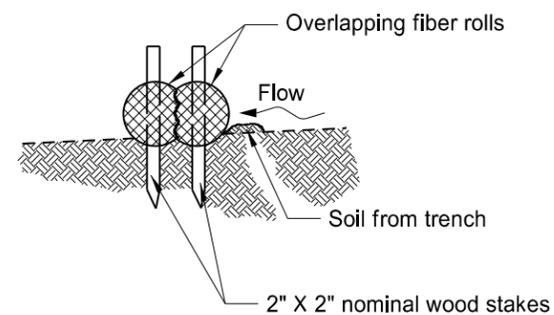
12 OR 20 INCH FIBER ROLL - DITCH BOTTOM



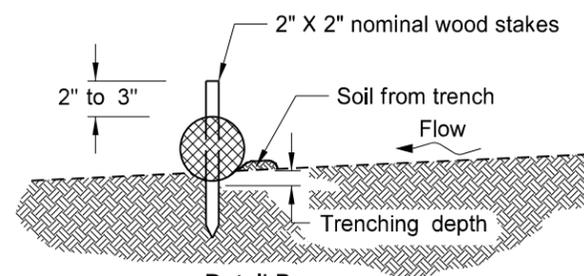
PLAN VIEW FOR SLOPE APPLICATION



PLAN VIEW FOR DITCH APPLICATION



Detail A
Fiber Roll Overlapping Staking Detail



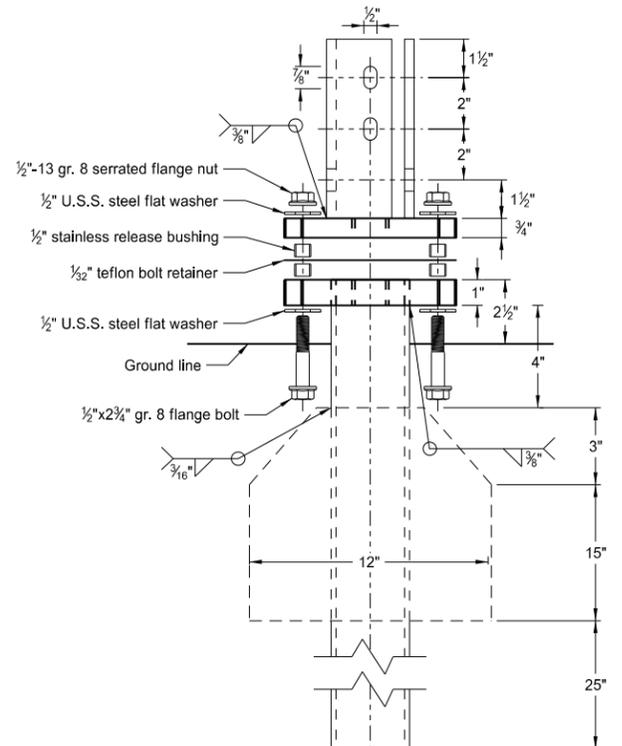
Detail B
Fiber Roll Staking Detail

FIBER ROLL DIAMETER	NOMINAL STAKE SIZE	MINIMUM STAKE LENGTH	MINIMUM TRENCH DEPTH	MAXIMUM TRENCH DEPTH
6"	2" x 2"	18"	2"	2"
12"	2" x 2"	24"	2"	3"
20"	2" x 2"	36"	3"	5"

NOTE: Runoff must not be allowed to run under or around roll.

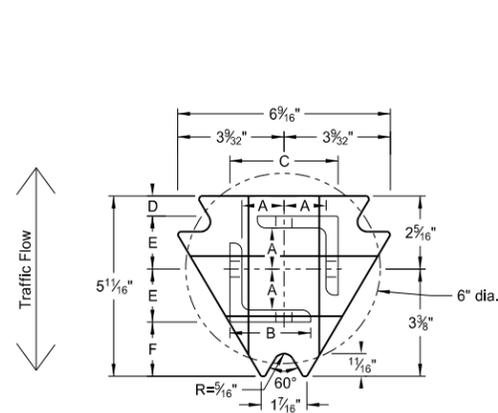
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-18-10	
REVISIONS	
DATE	CHANGE
06-10-13	Added plan view for ditch and slope application, Added table with values for stake and trench dimensions.
10-04-13	Revised fiber roll overlap detail.
06-26-14	Changed standard drawing number from D-708-7 to D-261-1

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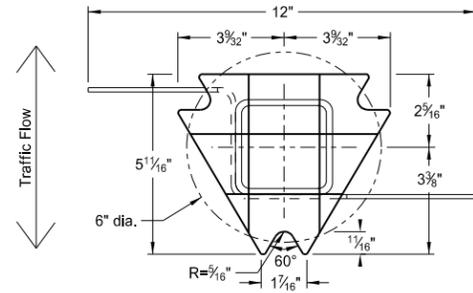


Multi-Directional Slip Base Assembly

Perforated Tube



Top Post Receiver
Plate - ASTM A572 grade 50
Angle Receiver - 2 1/2"x2 1/2"x3/8" 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

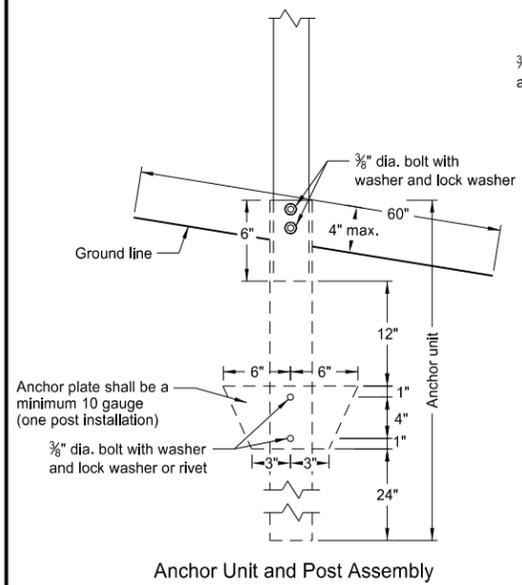
Notes:

1. Slip base bolts shall be torqued as specified by the manufacturer.
2. Anchor shall have a yield strength of 43.9 KSI and tensile strength of 59.3 KSI.
3. The 4" vertical clearance is required for the anchor or breakaway base. The 4"x60" measurement shall be made above and below post location and also back and ahead of the post.
4. When used in concrete sidewalk, anchor shall be same except without the wings.
5. Four post signs shall have over 7' between the first and the fourth posts.

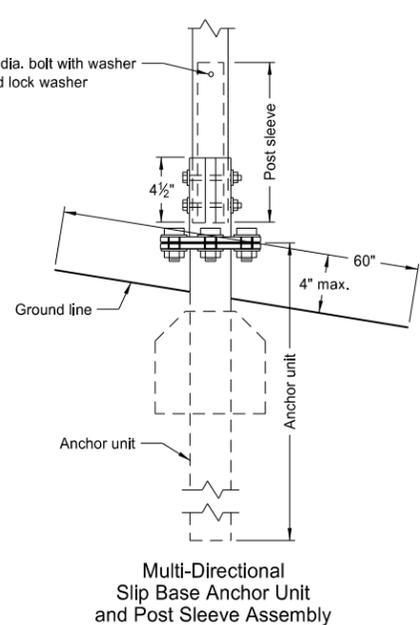
Telescoping Perforated Tube						
Number of Posts	Post Size in.	Wall Thickness Gauge	Sleeve Size in.	Wall Thickness Gauge	Slip Base	Anchor Size without Slip Base in.
1	2	12			No	2 1/4
1	2 1/4	12			No	2 1/2
1	2 1/2	12			(A)	3
1	2 1/2	10			Yes	
1	2 1/4	12	2	12	Yes	
1	2 1/2	12	2 1/4	12	Yes	
2	2	12			No	2 1/4
2	2 1/4	12			No	2 1/2
2	2 1/2	12			Yes	
2	2 1/2	12			Yes	
2	2 1/4	10	2	12	Yes	
2	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/2	12			Yes	
3 & 4	2 1/2	10			Yes	
3 & 4	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/4	12	2	12	Yes	
3 & 4	2 1/2	10	2 3/16	10	Yes	

Properties of Telescoping Perforated Tube						
Tube Size in.	Wall Thickness in.	U.S. Standard Gauge	Weight per Foot lbs.	Moment of Inertia in. ⁴	Cross Sec. Area in. ²	Section Modulus in. ³
1 1/2 x 1 1/2	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
2 1/4 x 2 1/4	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.785

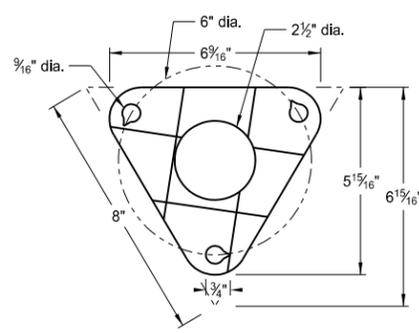
Top Post Receiver Data Table						
Square Post Sizes (B)	A	B	C	D	E	F
2 3/16"x10 ga.	1 9/64"	2 1/2"	3 1/32"	2 5/32"	1 33/64"	1 1/8"
2 1/2"x10 ga.	1 9/32"	2 1/2"	3 5/16"	5/8"	1 21/32"	1 3/4"



Anchor Unit and Post Assembly



Multi-Directional Slip Base Anchor Unit and Post Sleeve Assembly



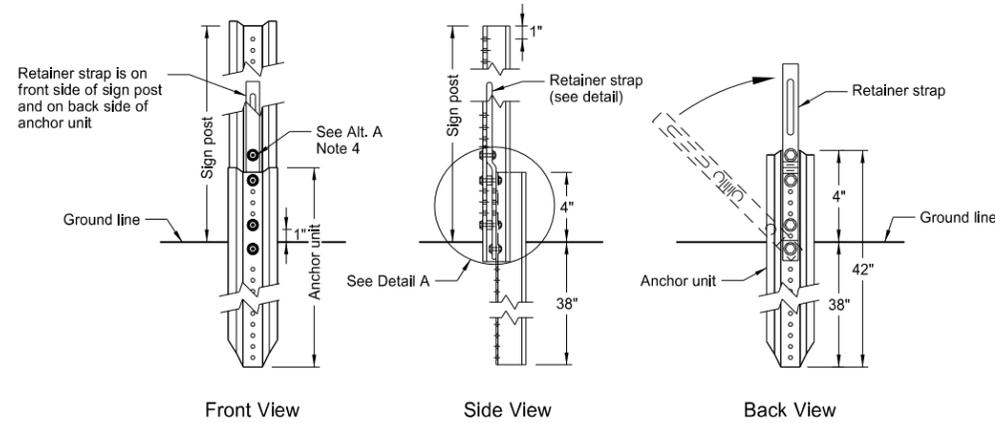
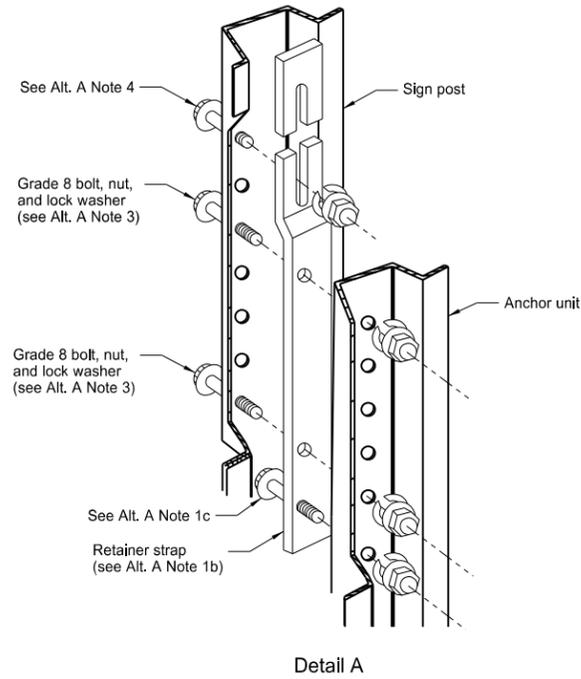
Bolt Retainer for Base Connection
Bolt Retainer - 1/32" Reprocessed Teflon

- (A) The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak.
(B) The 2 3/16"x10 ga. may be inserted into 2 1/2"x10 ga. for additional wind load.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
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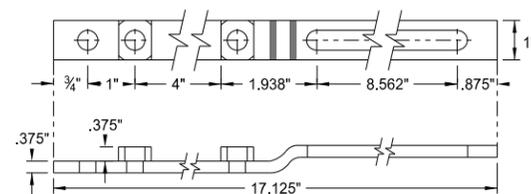
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U-Channel Post

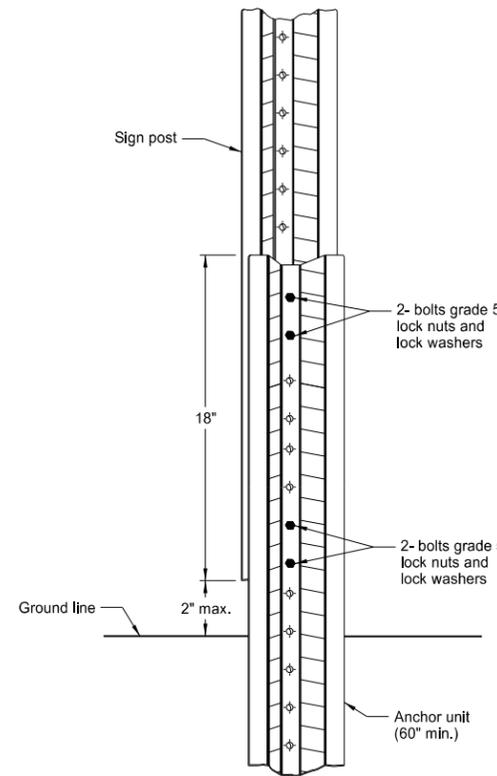


Breakaway U-Channel Detail Alternate A

A maximum of 2 posts shall be installed within 7'.

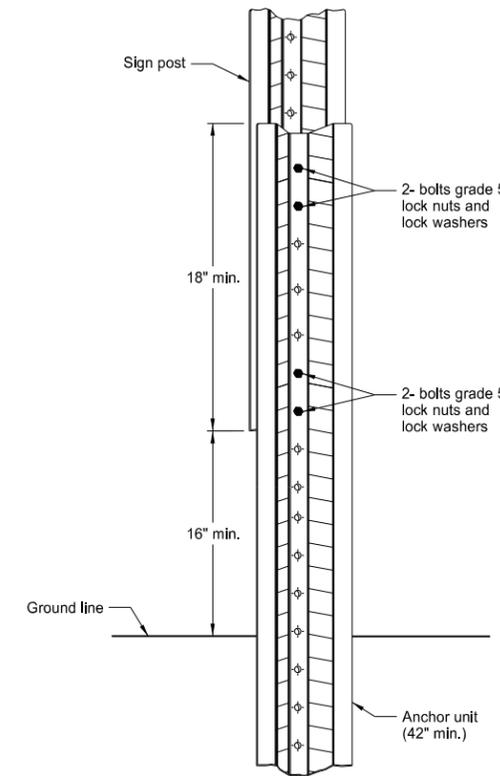


Retainer Strap Detail



Breakaway U-Channel Splice Detail Alternate B (2.5 and 3 lb/ft)

A maximum of 3 posts shall be installed within 7'.



Breakaway U-Channel Splice Detail Alternate C (2.5 and 3 lb/ft)

A maximum of 3 posts shall be installed within 7'.

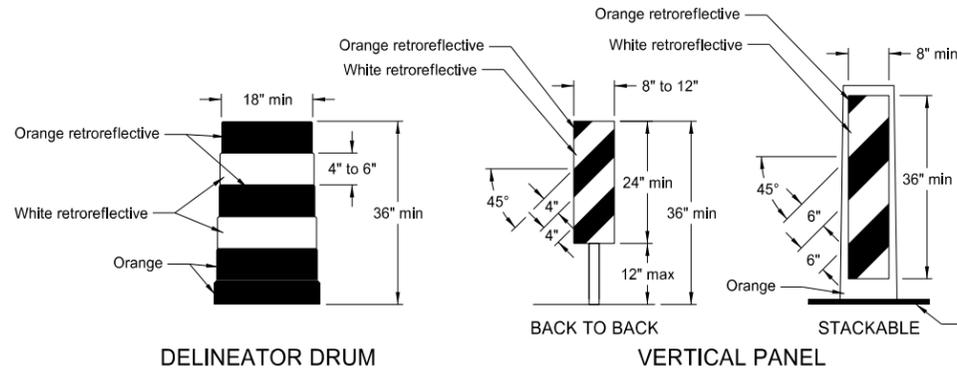
Alternate A Steps of Installation:

1. a) Drive anchor unit to within 12" of ground level.
b) Proper assembly established by lining up the bottom hole of retainer strap with the 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.
2. a) Drive anchor unit to 4" above ground.
b) Rotate strap to vertical position.
3. a) Place 5/16"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 5/16"x2" bolt (this fastens sign post to retainer strap).
5. The base post, strap and sign post shall be properly nested. 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.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
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DATE	CHANGE

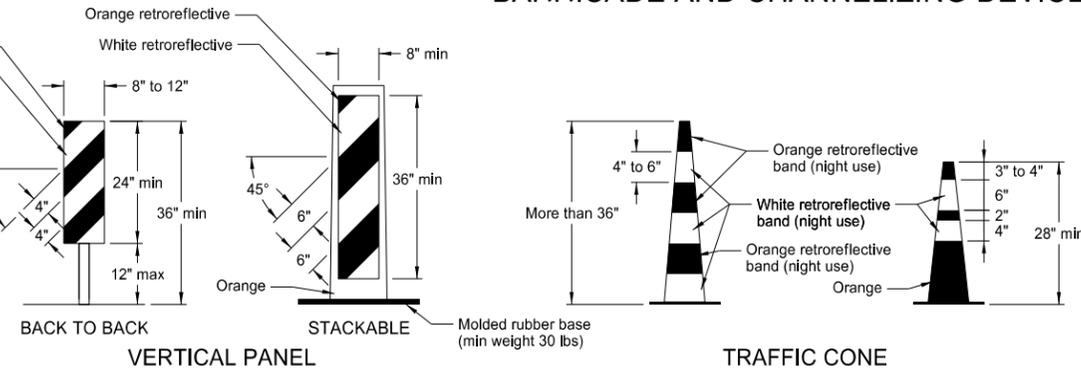
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BARRICADE AND CHANNELIZING DEVICE DETAILS



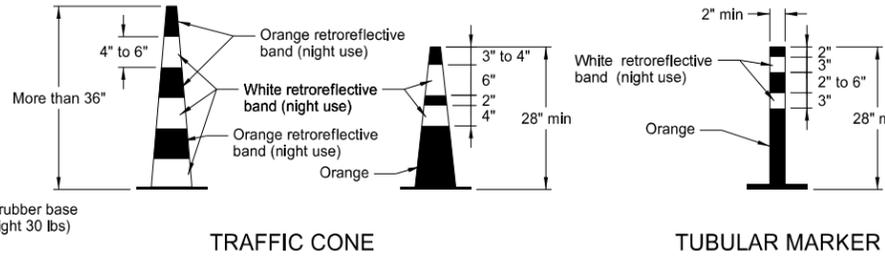
DELINEATOR DRUM

The markings on drums shall be horizontal, circumferential, alternating orange and white retroreflective stripes 4\"/>



VERTICAL PANEL

Markings for vertical panels shall be alternating orange and white retroreflective stripes, sloping downward in the direction vehicular traffic is to pass. Retroreflective sheeting shall be placed on both sides of panel and shall have a minimum of 270 square inches of retroreflective area facing vehicular traffic. Where the height of the retroreflective material on the vertical panel is 36 inches or more, a stripe width of 6 inches shall be used.

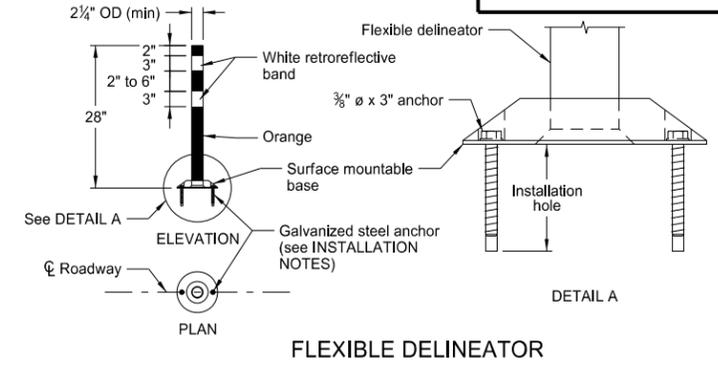


TRAFFIC CONE

RetroreflectORIZATION of cones more than 36\"/>

TUBULAR MARKER

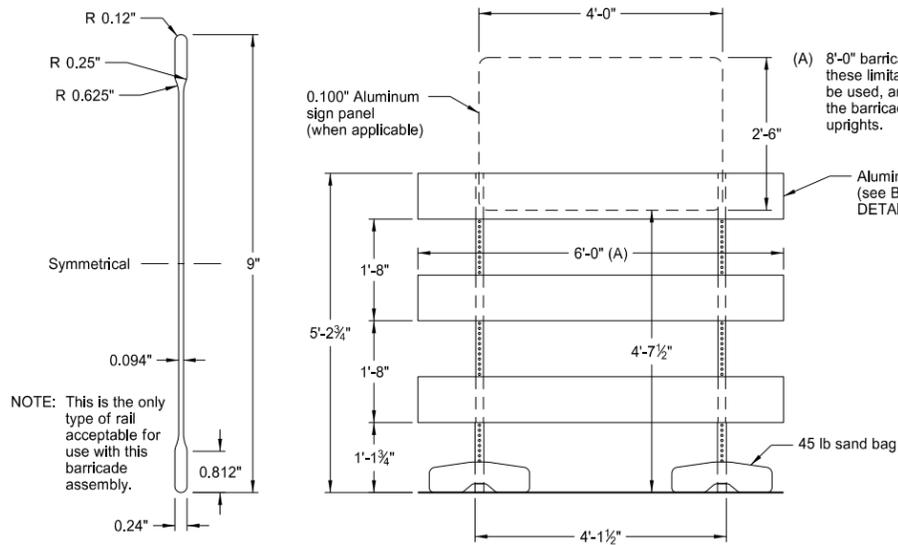
RetroreflectORIZATION of tubular markers more than 42\"/>



FLEXIBLE DELINEATOR

INSTALLATION NOTES:

1. Drill installation holes to diameter and depth as required by manufacturer's specifications.
2. For removal, remove anchors and fill installation hole with an epoxy designed to bond to pavement surface.
3. In lieu of bolted down base, the contractor may use an 8\"/>

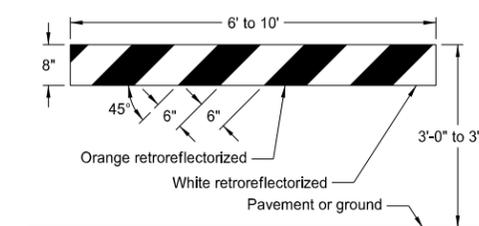


BARRICADE BLADE DETAIL

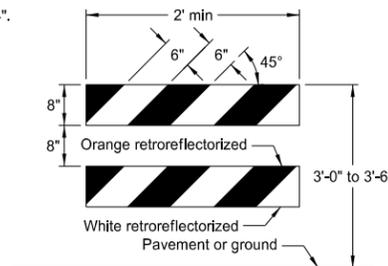
ELEVATION VIEW

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)

NOTE: Markings for barricades shall be alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Retroreflective sheeting shall be placed on both sides of the rails and shall have a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the barricade length is less than 36\",/>

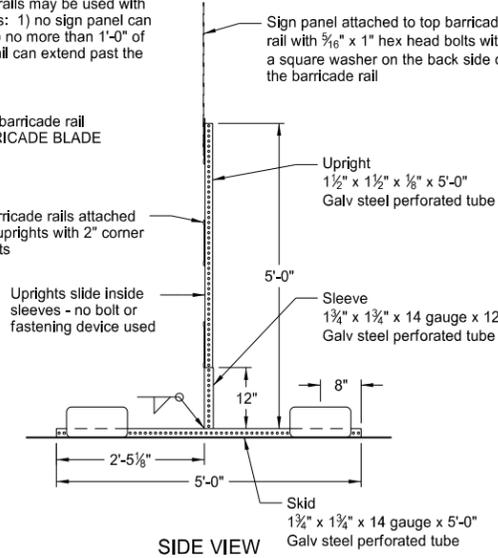


TYPE I BARRICADE



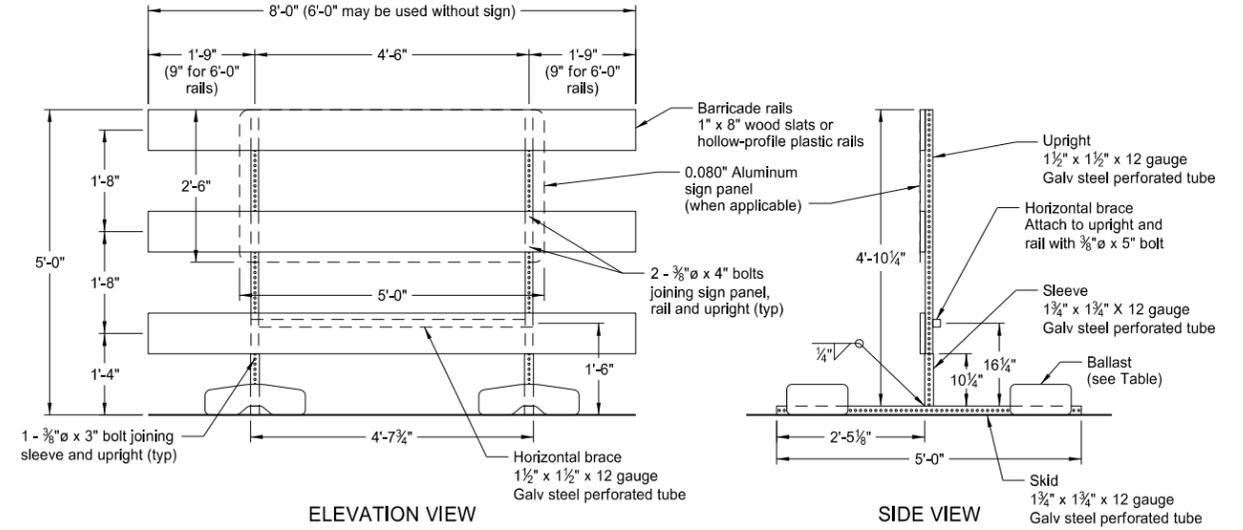
TYPE II BARRICADE

BARRICADE RAIL DETAILS



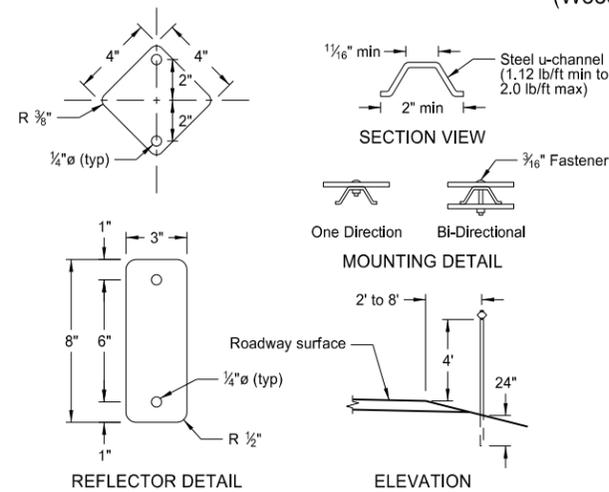
SIDE VIEW

BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)



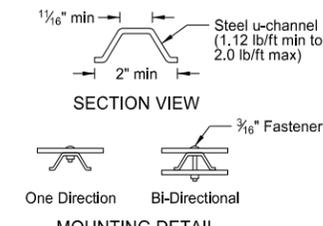
ELEVATION VIEW

SIDE VIEW



REFLECTOR DETAIL

DELINEATORS



MOUNTING DETAIL

MINIMUM BALLAST (For each side of barricade support)

Without Sign	4 - 25 lb sandbags
With Sign	6 - 25 lb sandbags

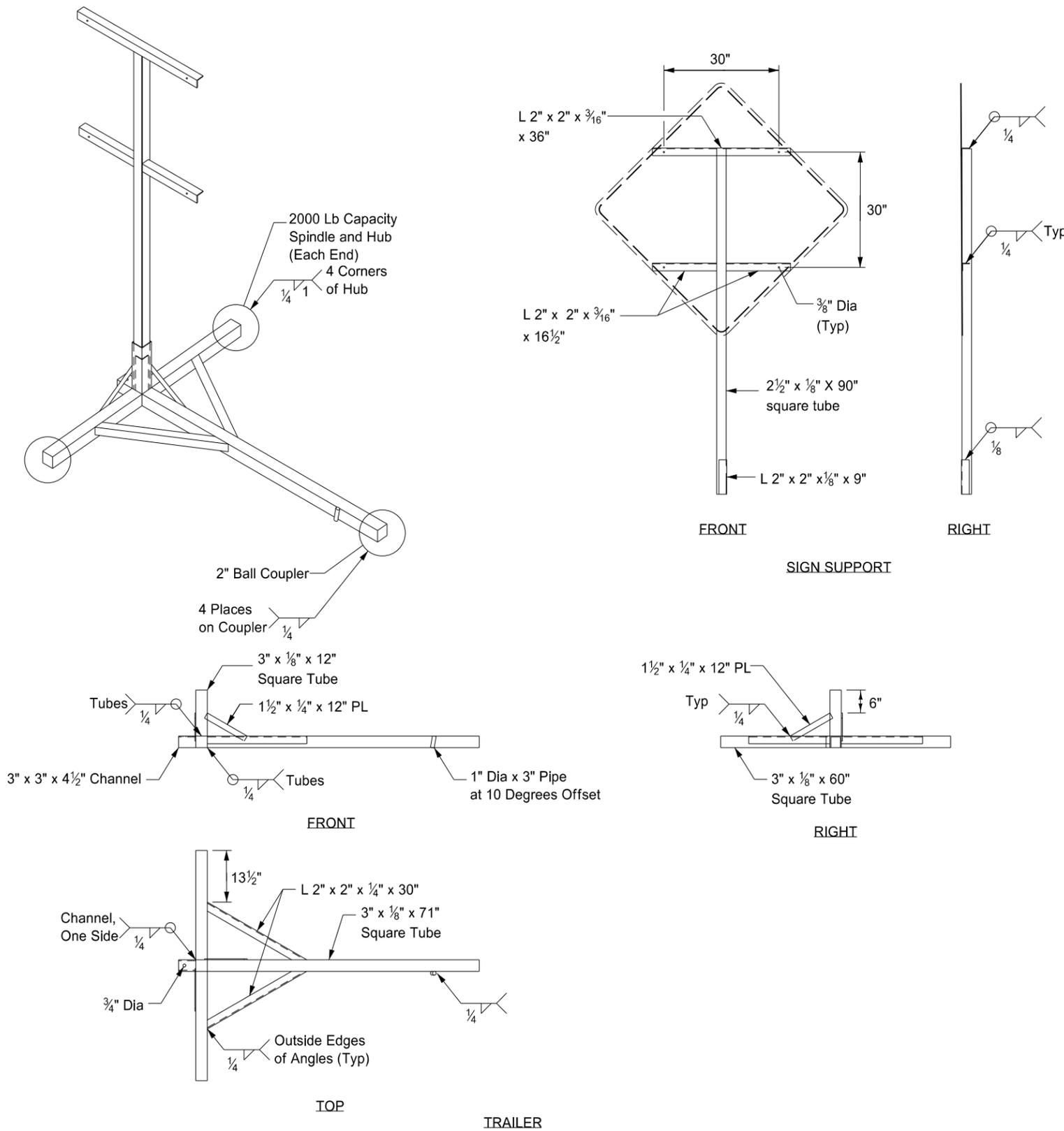
Note: The number of sandbags are based on a wind speed of 55 MPH. The sandbags are assumed to be placed at or near the ends of the skids.

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10-3-13	
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PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50



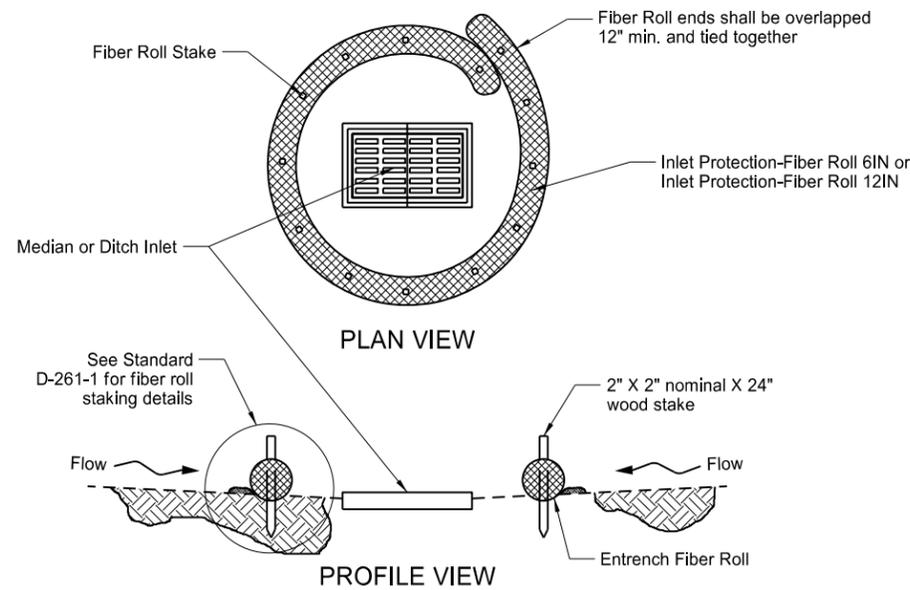
Notes:

- ① The maximum weight of the assembly is 250 pounds.
- ② Use a 14" wheel and tire.
- ③ Automotive and equipment axle assemblies may not be used for trailer-mounted sign supports.
- ④ Other NCHRP 350 crash tested assemblies are acceptable.

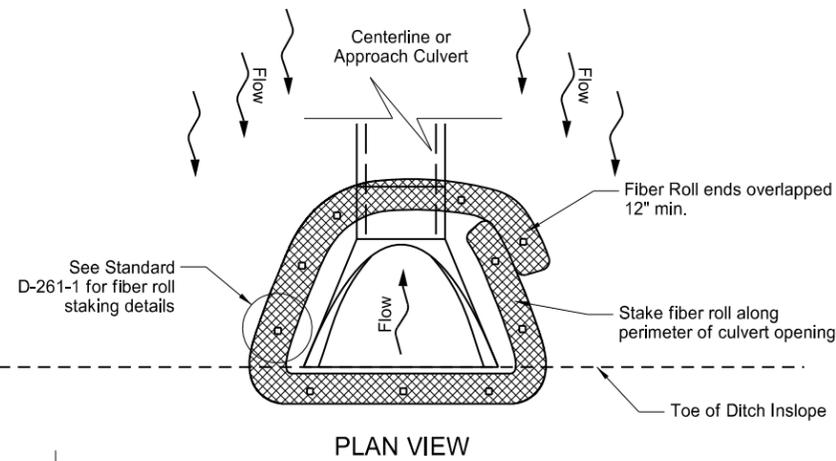
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-23-10	
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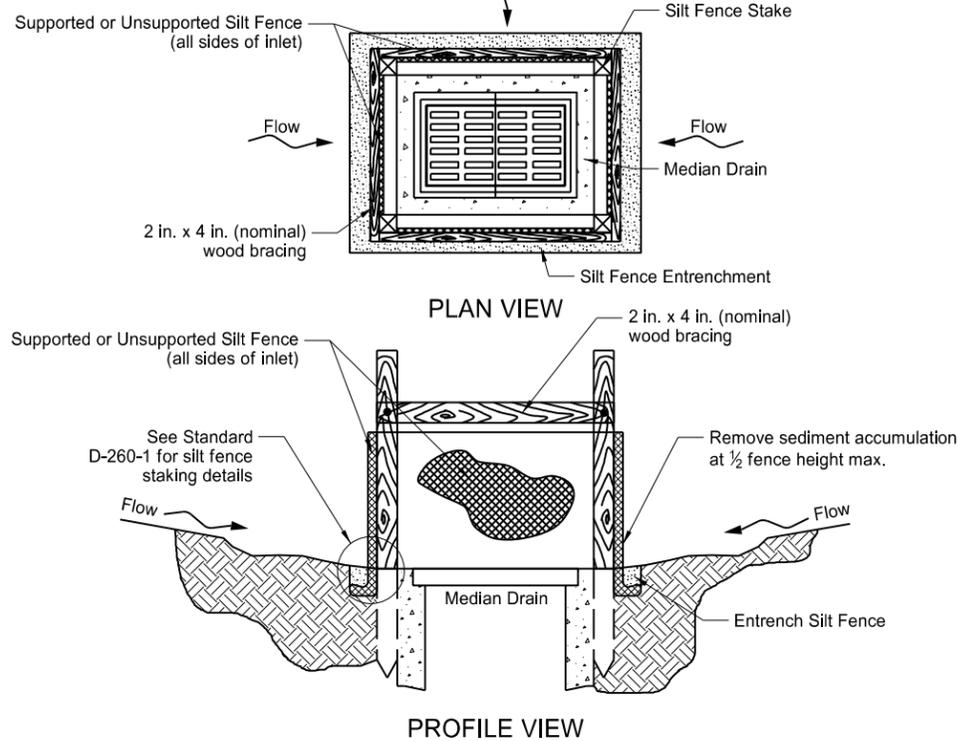
EROSION AND SILTATION CONTROLS
MEDIAN OR DITCH INLET PROTECTION



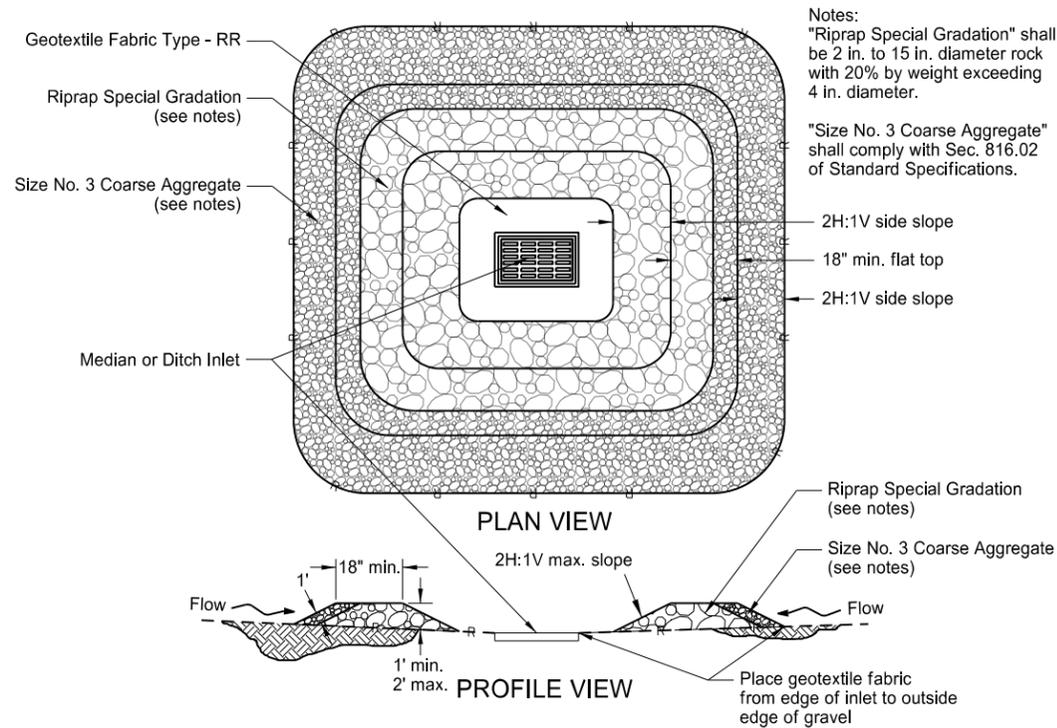
FIBER ROLL PROTECTION (MEDIAN OR DITCH INLET)



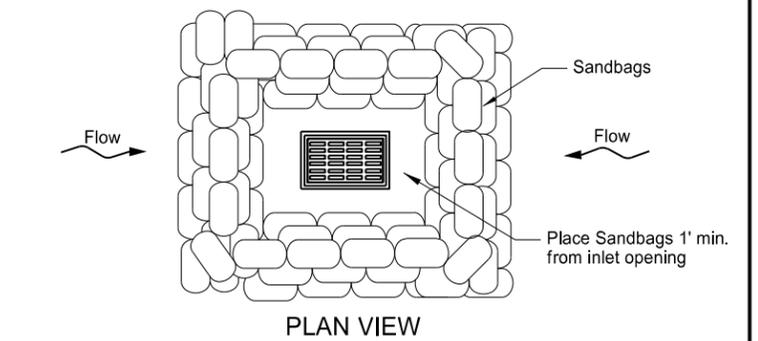
FIBER ROLL PROTECTION (INLET OF CULVERT)



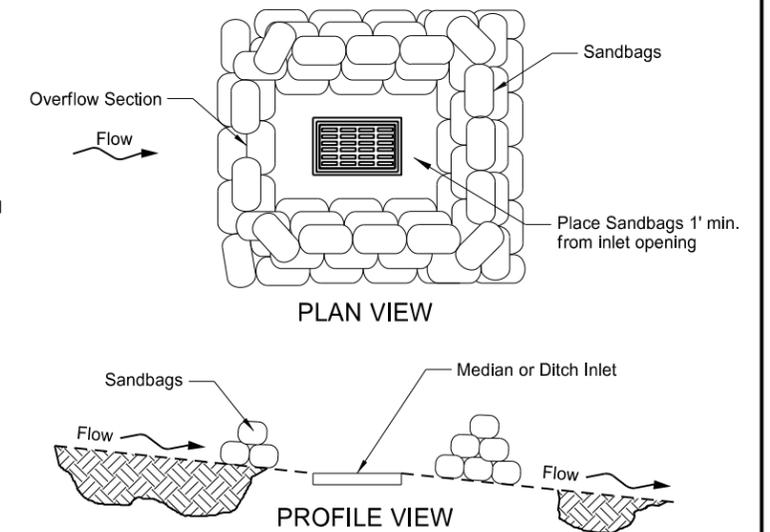
SILT FENCE PROTECTION (MEDIAN OR DITCH INLET)



GRAVEL INLET PROTECTION (MEDIAN OR DITCH INLET)



SANDBAG PROTECTION (LOW POINT)



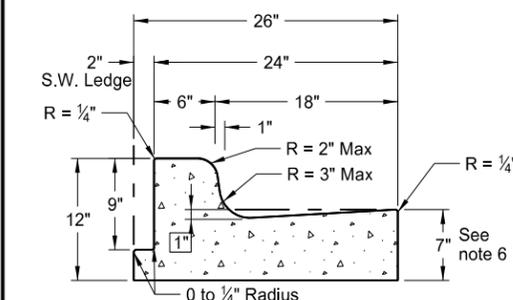
SANDBAG PROTECTION (ON SLOPE)

Notes:
 "Riprap Special Gradation" shall be 2 in. to 15 in. diameter rock with 20% by weight exceeding 4 in. diameter.
 "Size No. 3 Coarse Aggregate" shall comply with Sec. 816.02 of Standard Specifications.

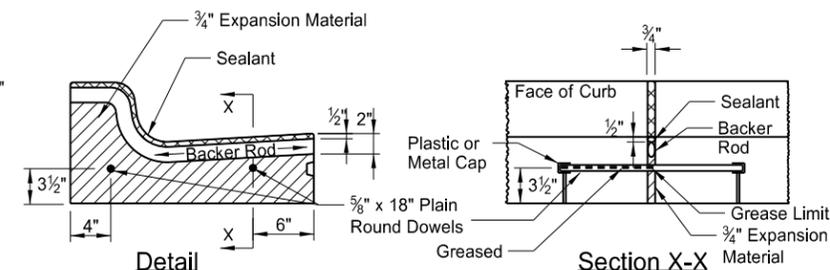
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Updated reference to standard drawing number for fiber roll staking details.
10-01-14	Updated reference to standard drawing number for silt fence.

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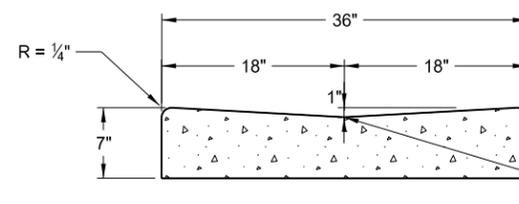
Curb & Gutter and Valley Gutter



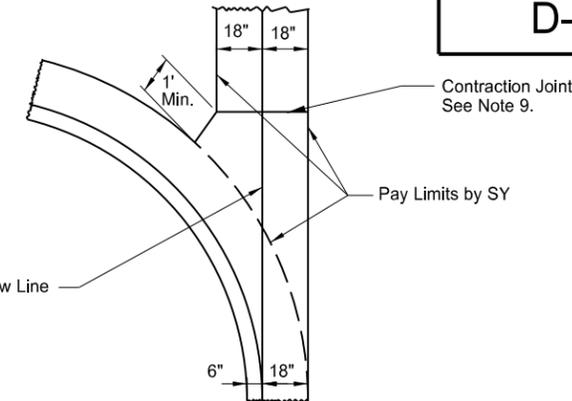
Curb & Gutter Type 1 (Sec. A & B)
Adjacent to Concrete Sidewalk,
Median, or Parking Lot.
(Sec. A shown. See Sec B for
additional details.)



Isolation Joint



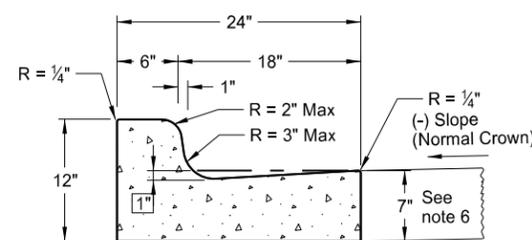
36" Concrete Valley Gutter Detail



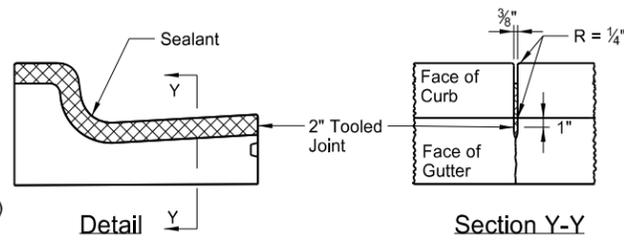
36" Concrete Valley Gutter Plan

NOTES:

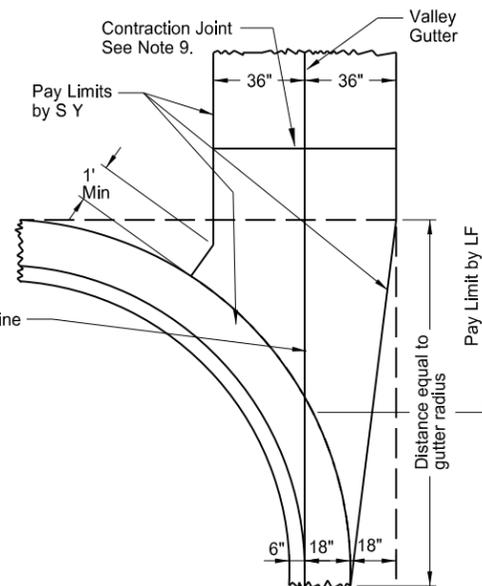
1. Curb and Gutter Type 1 (Sec. A & B) to be used. Section "A" to be used with (-) pavement slopes and section "B" to be used with (+) pavement slopes.
2. Contraction Joints: Tool the Curb & Gutter 2" as shown on the contraction joint details.
3. Isolation Joints: Isolation joint material shall be 3/4" preformed expansion joint filler conforming to the standard specifications. The opening for the backer rod and joint sealant shall be formed by 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, plastic or metal caps and greased dowels shall be installed in the cold joint for the second pour.
4. Joint Spacing: For hot bituminous pavements the joint spacing for the curb and gutter shall be 10' max. with the panels on each side of the inlets. For concrete pavements the joint spacing for the curb and gutter shall match the pavement joint on PCC Pavements of approximately 15' spacing.
5. Joint sealing: All contraction and isolation joints shall be sealed as shown in the details. The joint sealant for contraction joints shall conform to section 826.02B. The sealant for expansion joints shall be as specified in note 3 above. The sealant shall be tooled and installed in accordance with the manufacturer's recommendations.
6. Depth of Face of Gutter: For hot bituminous pavement the depth of gutter shall be 7" as shown. For PCC pavements, the Contractor has the option to match the depth of gutter to the depth of the adjacent PCC pavement or to construct a 7" depth as shown.
7. When the curb and gutter abuts PCC pavement, it shall be tied to the PCC pavement. The tie bar shall consist of a No. 3 bar, 1'-6" in length spaced 4' center to center.
8. On street returns and other locations where the new curb and gutter ends and does not abut existing curb and gutter, the end two (2) feet of the curb shall be tapered from 6" in height to 0". A 1/2" preformed isolation joint which is full depth and the same shape as the curb and gutter shall be installed just ahead of the taper. An 18" tie bar shall be installed across the joint.
9. Valley Gutter Joints: Contraction joints are required at approx. 10' intervals. The contraction joints shall be 1/8" min. to 3/8" max. in width. The joints shall be formed by sawing or scoring to a minimum depth of 2". The joint sealant shall be a hot poured elastic type joint sealer in accordance with Section 826.02A.2 of the Standard Specifications. The joint and sealant shall be included in the price bid for Valley Gutter.



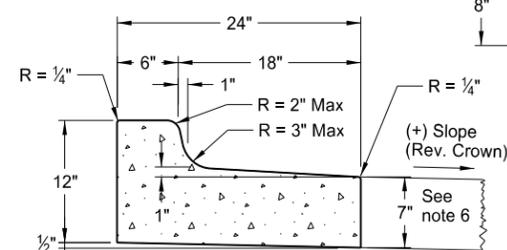
Curb & Gutter Type 1 (Sec. A)



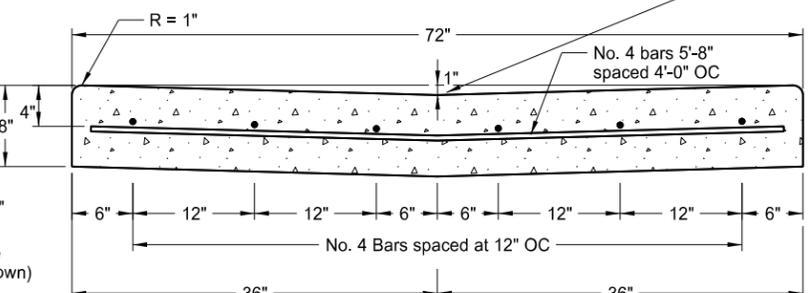
Contraction Joint



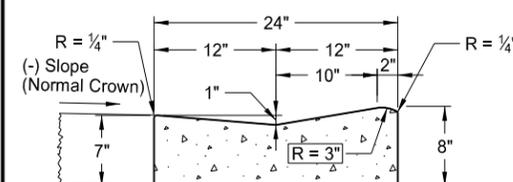
72" Concrete Valley Gutter Plan



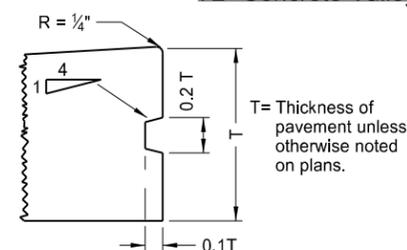
Curb & Gutter Type 1 (Sec. B)



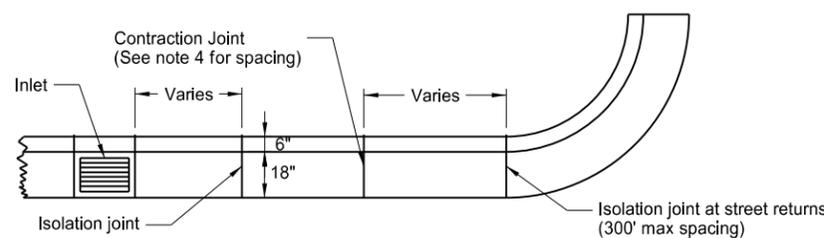
72" Concrete Valley Gutter Detail



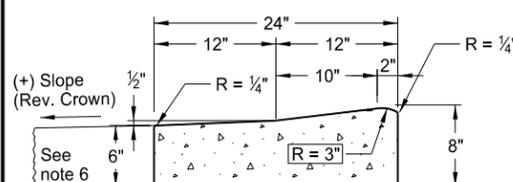
Mountable Curb & Gutter Type 1 (Sec. A)



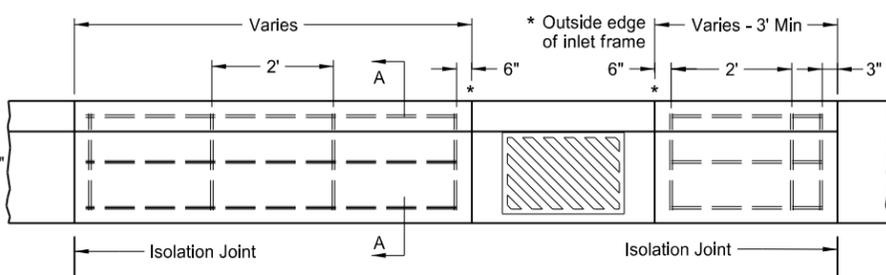
Keyway Detail for Curb & Gutter
(To be used with PCC Pavement and Drives)



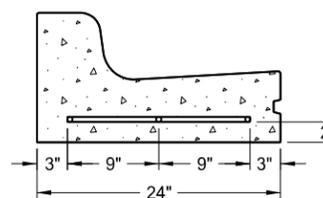
Joint Location Detail



Mountable Curb & Gutter Type 1 (Sec. B)



Curb & Gutter Reinforcing at Inlets



Section A-A

NOTE: All bars shall be #4 deformed reinforcing bars. Splices will not be permitted. Reinforcing bars at inlet locations will not be paid for separately, but shall be included in the price bid for "Curb and Gutter - Type 1." This includes inlets located on radii. The reinforcement shall be extended to the second joint (rebar placed through the first joint) in cases where the 3' min. panel length cannot be obtained.

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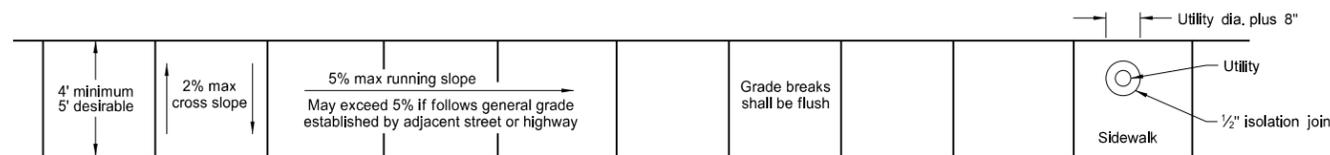
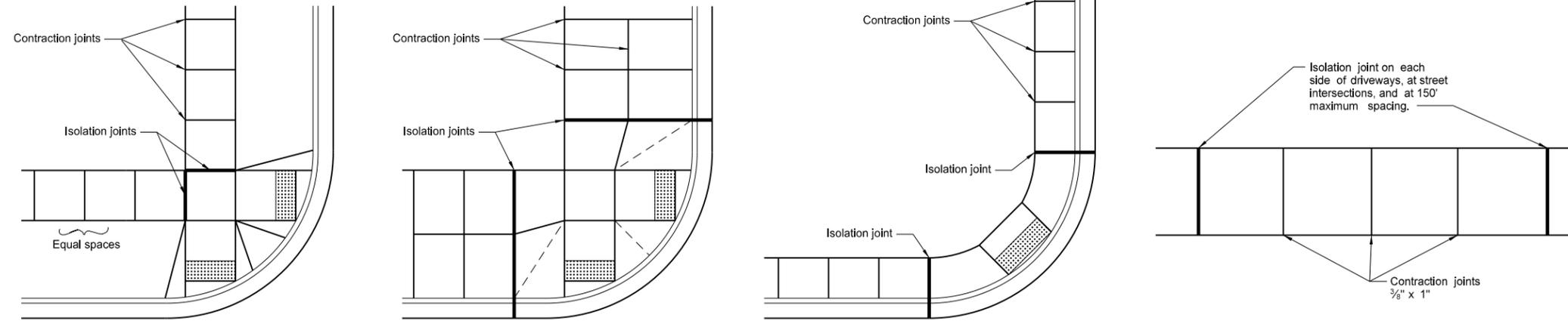
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SIDEWALK

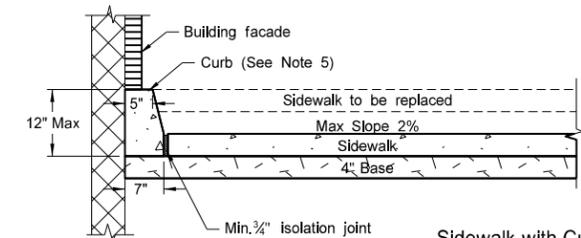
D-750-2

NOTES:

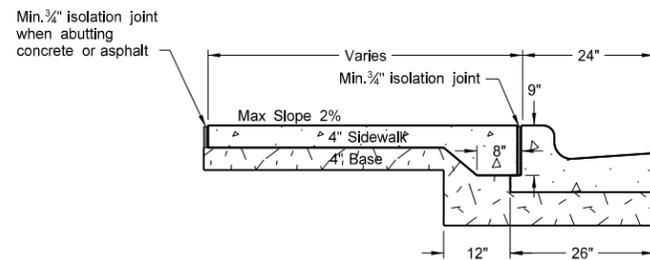
1. Curb ramp and detectable warning panel layouts are for informational purposes only. See Standard Drawing D-750-3 for curb ramp and detectable warning panel details.
2. Joint Spacing: Transverse contraction joint spacing shall vary from 4' to 6' to create approximate square panels. Longitudinal contraction joints shall be used where the sidewalk width is 8' or greater, and shall be spaced at half the sidewalk width. The contraction joints may be sawed or a grooved joint, and shall be a minimum of 1/3 the depth of the concrete. When the sidewalk is adjacent to the curb & gutter, the sidewalk joint spacing shall be varied to match up with the curb & gutter joints. Isolation joints should also be used between separately poured concretes, or between old and new concrete. The cost for all labor, equipment, and material necessary to construct contraction and isolation joints shall be included in the price bid for sidewalk concrete.
3. 4" sidewalk concrete thickness to be used unless otherwise specified in the plans.
4. 4" base material thickness to be used unless otherwise specified in the plans. All labor and materials necessary to place the base material shall be included in the price bid for "Salvage Base Course" or "Aggregate Base Course CL 5."
5. Landscaping is preferred to modify existing ground slope changes as needed. If not possible, such as adjacent buildings, a vertical curb may be used as shown in the detail below. The curb will be paid for at the unit price bid for the item "Curb - Type I" per lineal foot.



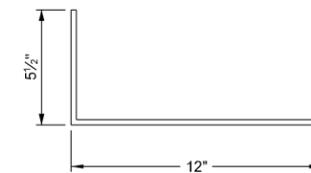
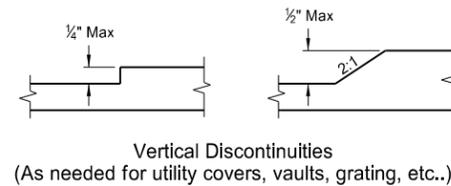
Utility Blockout



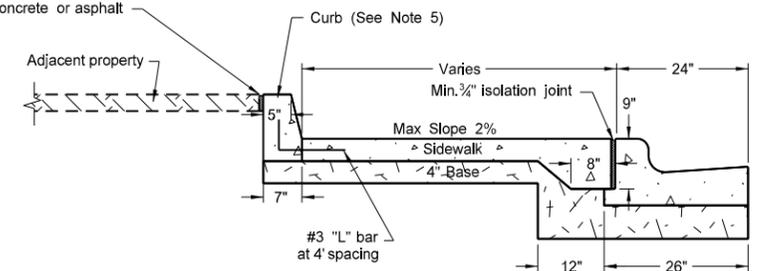
Sidewalk with Curb Detail (Building face application)



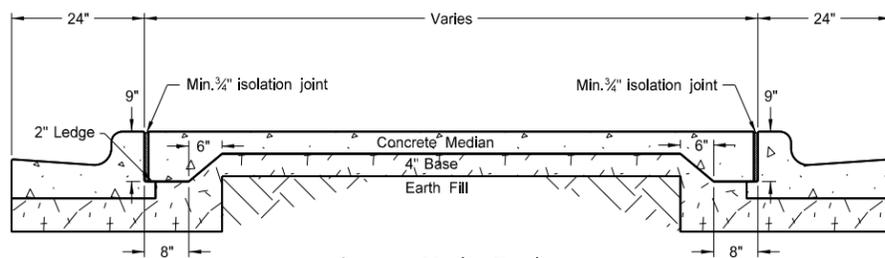
Sidewalk Detail (Installed adjacent to curb and gutter)



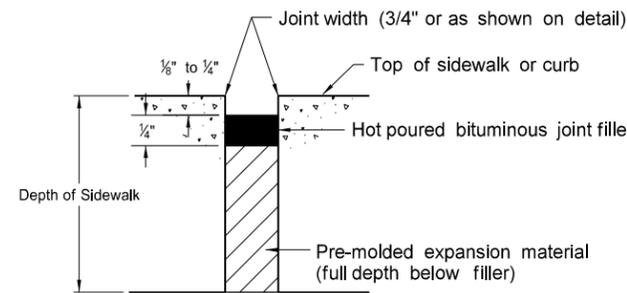
Min. 3/4" isolation joint when abutting concrete or asphalt



Sidewalk with Curb Detail (Adjacent property application)



Concrete Median Detail



Typical Isolation Joint Seal (longitudinal and transverse)

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CURB RAMP DETAILS

D-750-3

+More Right of Way ←

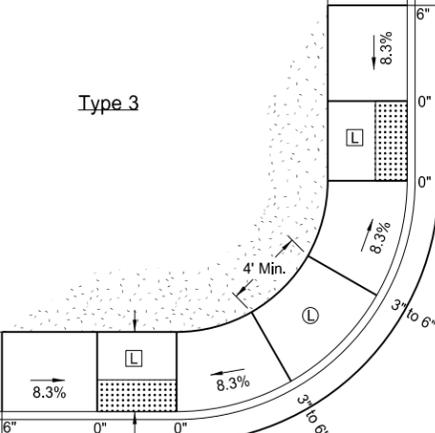
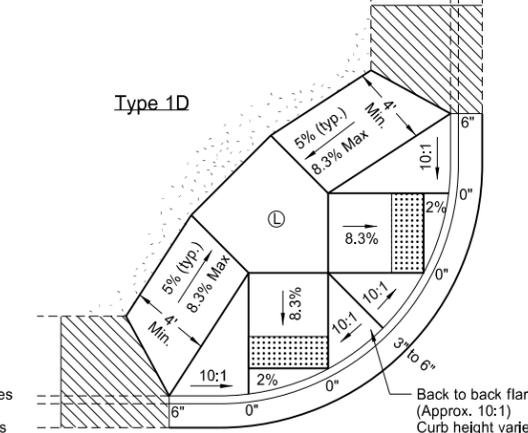
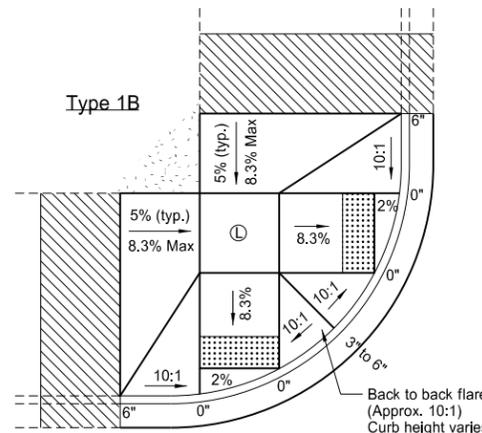
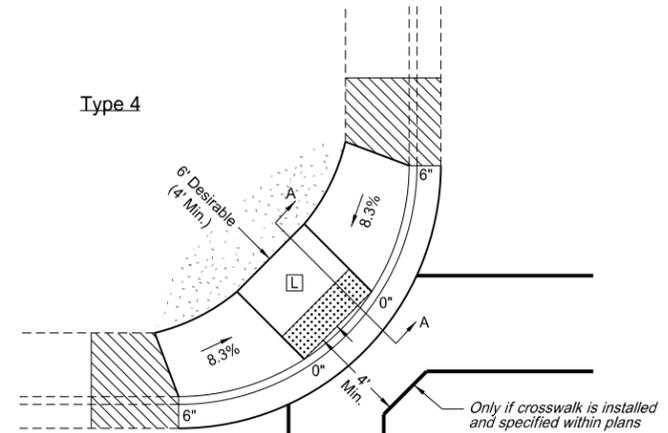
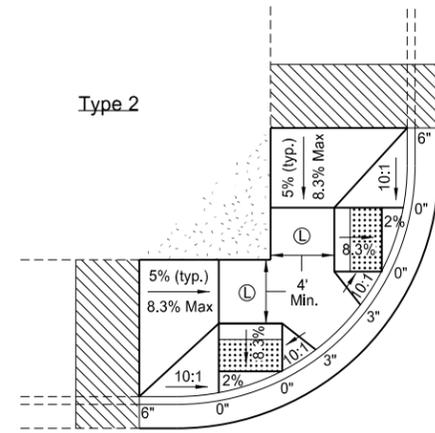
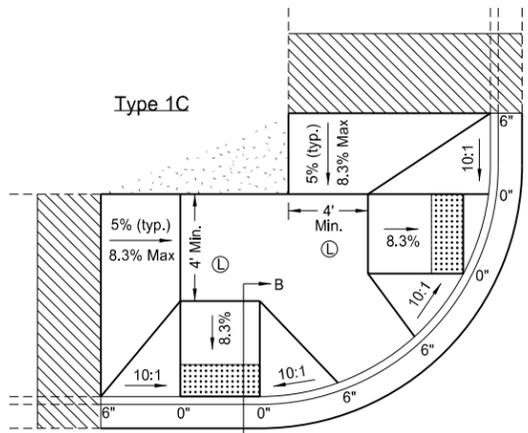
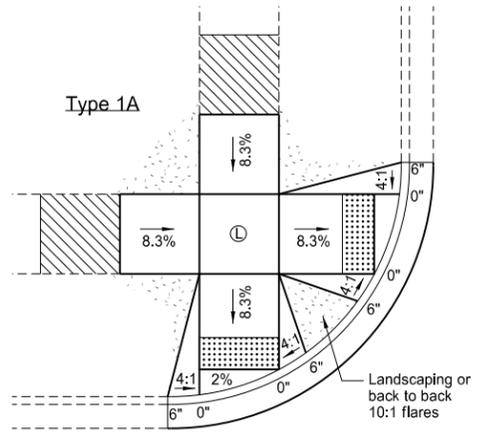
Less Right of Way →

NOTES:

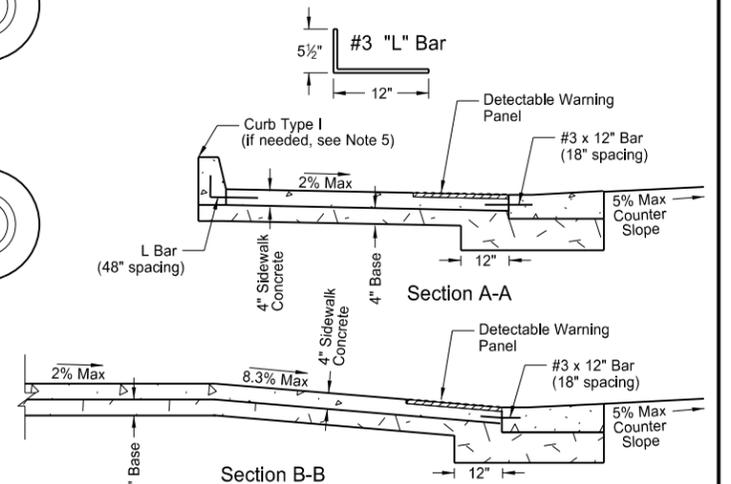
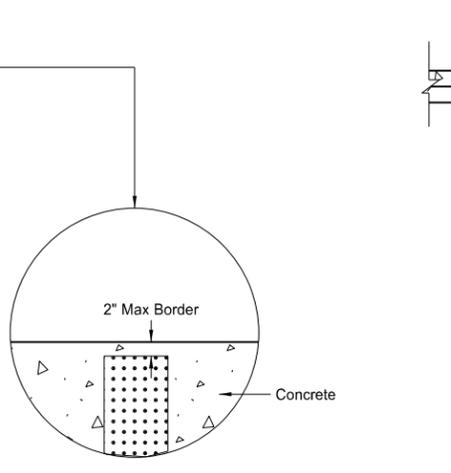
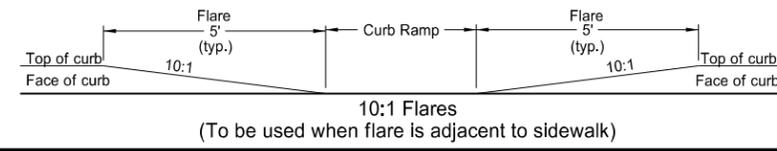
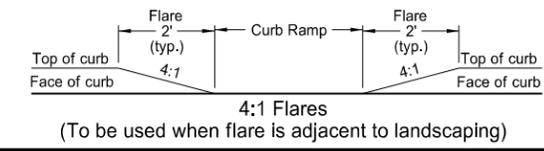
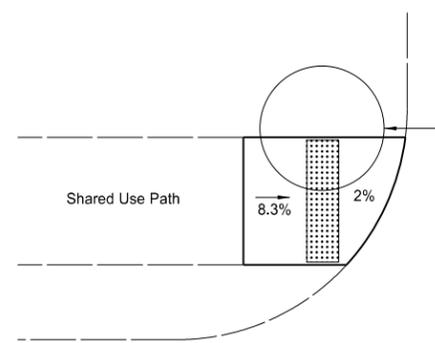
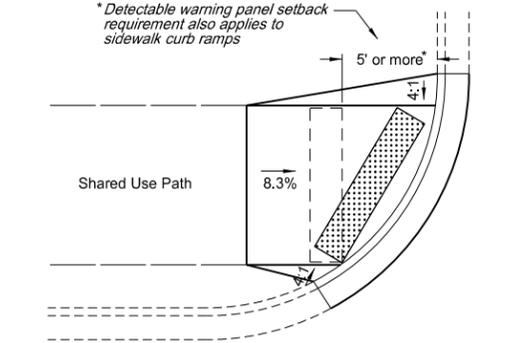
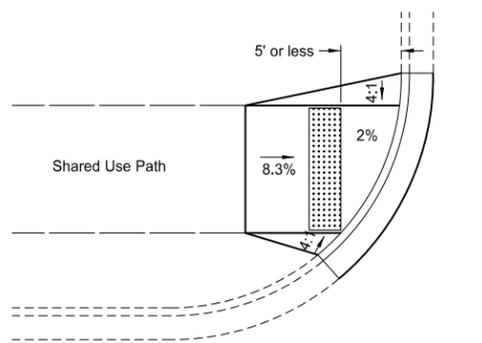
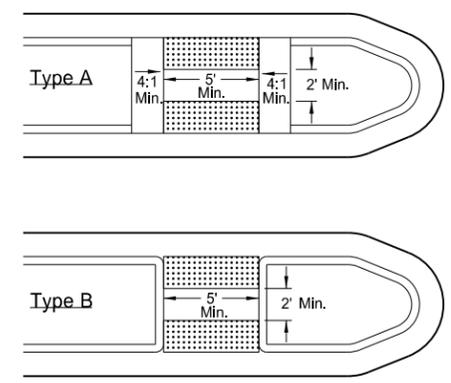
1. Ramp width is defined as the useable portion of the ramp, excluding flares if used.
Curb ramp width should match the existing sidewalk width. 4' width minimum.
Ramp width for shared-use paths should match the existing shared use path width.
Ramp length shall be maximum of 15'.
2. Landings shall be a minimum of 4' x 4' and shall have a max 2% slope in any direction. Landings are desirably 5' x 5' or larger.
3. Detectable warning panels shall match the ramp width. Radial panels may also be used. The detectable warning panel may be located within the lower landing.
4. The pedestrian access route shall be continuous 4' min. width. Max 2% cross slope applies to all concrete, excluding flares.
5. Landscaping is preferred to modify existing ground slope changes as needed. If not possible, such as adjacent buildings, a vertical curb may be used as shown in the detail below. The curb will be paid for at the unit price bid for the item "Curb - Type I" per lineal foot.

LEGEND:

- : Detectable Warning Panel
- : Landscaping
- : Transitional tie-in segment if needed for retrofits. Max grade slope 8.3%.
- : Upper Landing
- : Lower Landing
- 0", 3", or 6" : Curb Height
- 8.3% : All slopes shown are max grades. Flatter slopes may be used.



Median Refuge Islands (Cut-Through)



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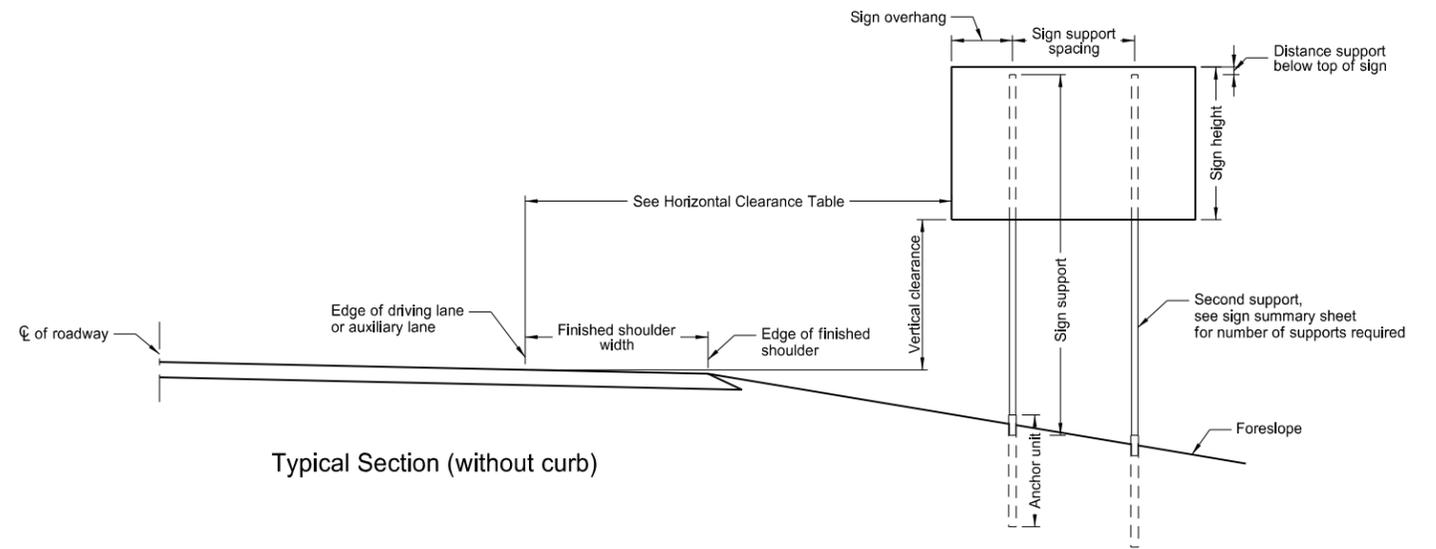
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PERFORATED TUBE ASSEMBLY DETAILS

D-754-23

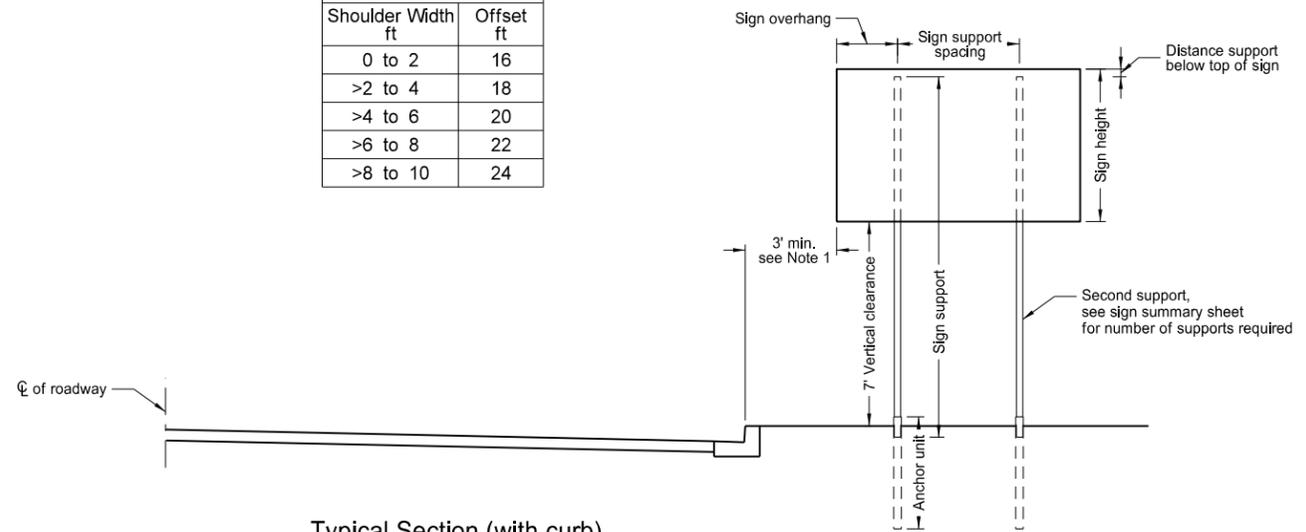
Notes:

1. Curbed Roadways: The clearance from the face of the curb should be 3' except where right of way or sidewalk width is limited, a minimum clearance of 2' shall be provided. The horizontal clearance may need to be increased to maintain a minimum sidewalk clear width of 4' from the sign support, not including any attached curb.
2. Minimum vertical clearance: Signs installed at the side of the road in rural districts shall be at least 5' measured from the bottom of the sign to the edge of the driving lane or auxiliary lane. Where parking or pedestrian movements occur, the clearance to the bottom of the sign shall be at least 7'.
- Signs on expressways shall be installed with a minimum height of 7'.
- Adopt-a-highway signs installed on Freeways shall be at least 7' above the edge of the driving lane.
- The vertical clearance shall have a maximum height of 6" above the vertical clearance specified above.
3. Offset signs: Where signs are placed at least 30 feet or more from the edge of the traveled way, the height to the bottom of such sign shall be 5' above the edge of the driving lane.
4. The clearance from edge of shared use path to edge of sign should be 3' except where width is limited, a minimum clearance of 2' shall be provided.

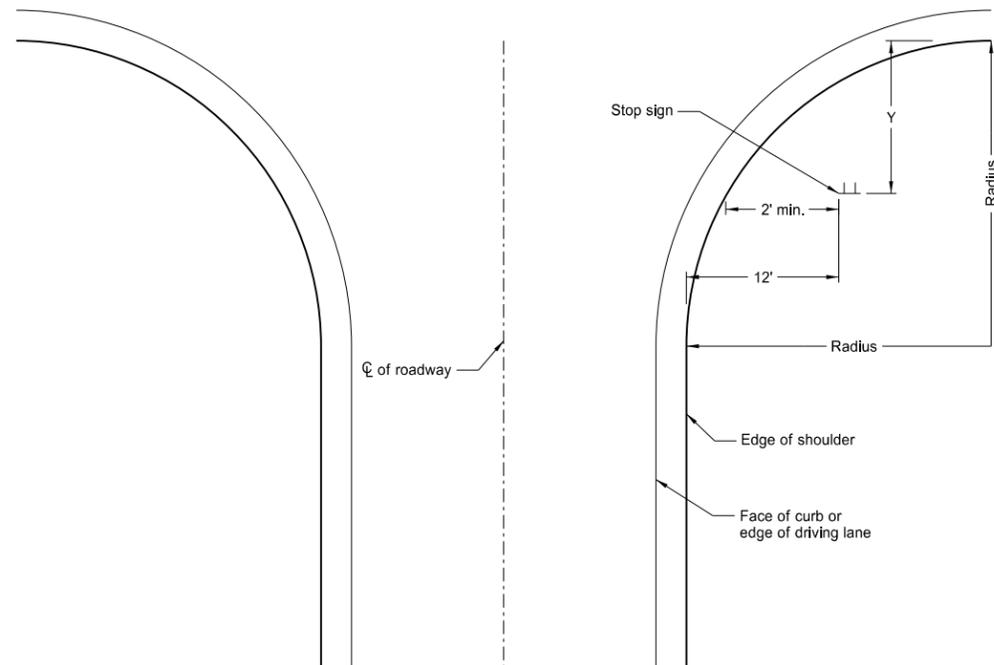


Typical Section (without curb)

Horizontal Clearance Table	
Shoulder Width ft	Offset ft
0 to 2	16
>2 to 4	18
>4 to 6	20
>6 to 8	22
>8 to 10	24



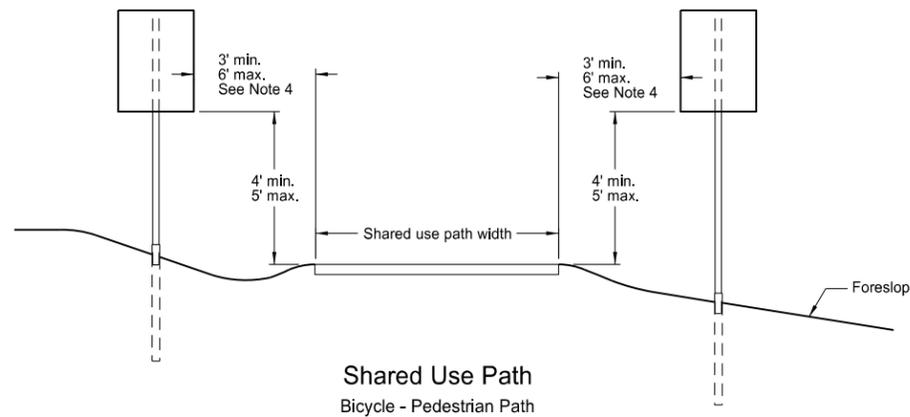
Typical Section (with curb)
Residential or Business District



Stop Sign Location
Wide Throat Intersection

This layout is to be used for the placement of "Stop" signs.

Radius ft.	Y-max. ft.	Y-min. ft.
40	50	15
45	50	18
50	50	21
55	50	25
60	50	28
65	50	32
70	50	35
75	50	39
80	50	43



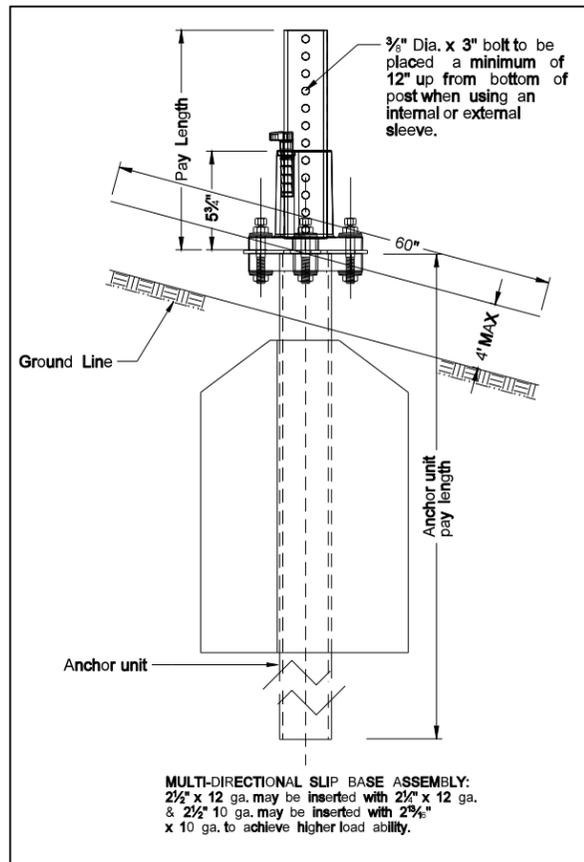
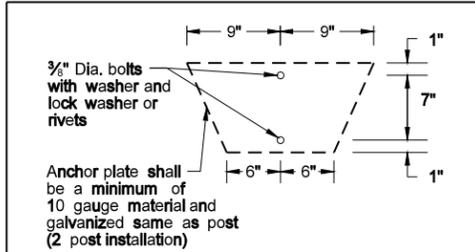
Shared Use Path
Bicycle - Pedestrian Path

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
7-8-14	Revised note 2, added note 4.

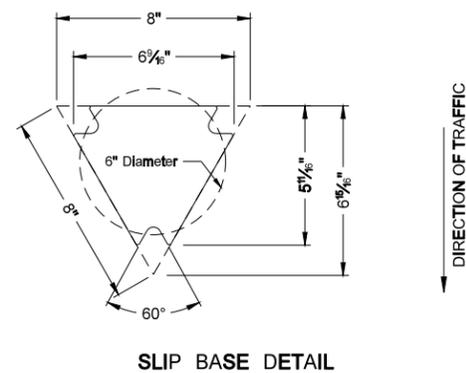
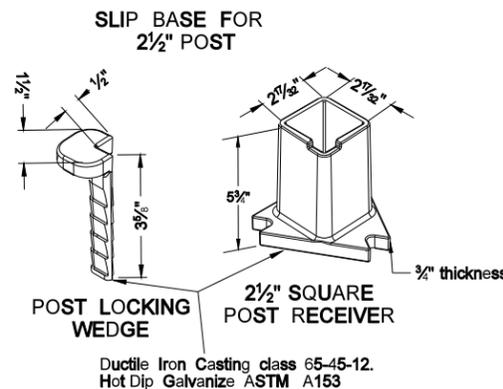
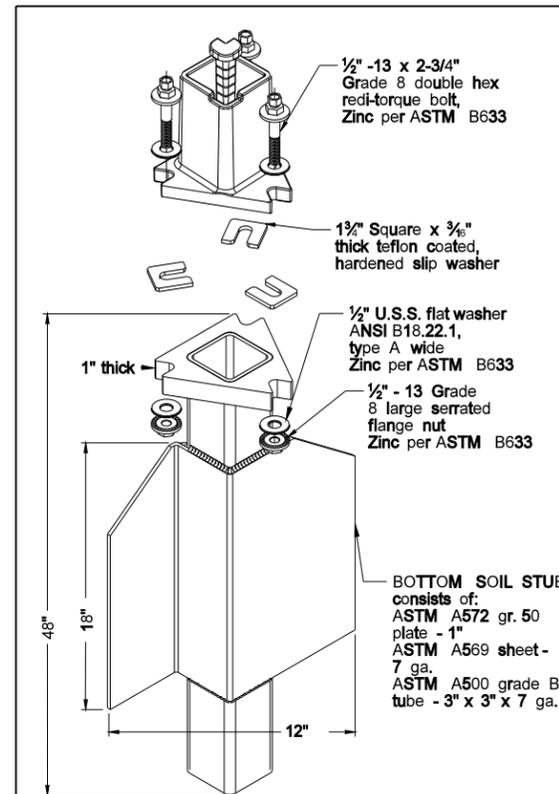
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 of Transportation

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

(B) - The 2 1/2", 12 gauge posts do not need breakaway bases when placed in standard soils, but require a shim as specified by the manufacturer. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.
 (C) - 3" anchor unit
 (D) - 2 1/2" x 12 ga. x 18" minimum length external sleeve required.



Mounting Details Perforated Tube

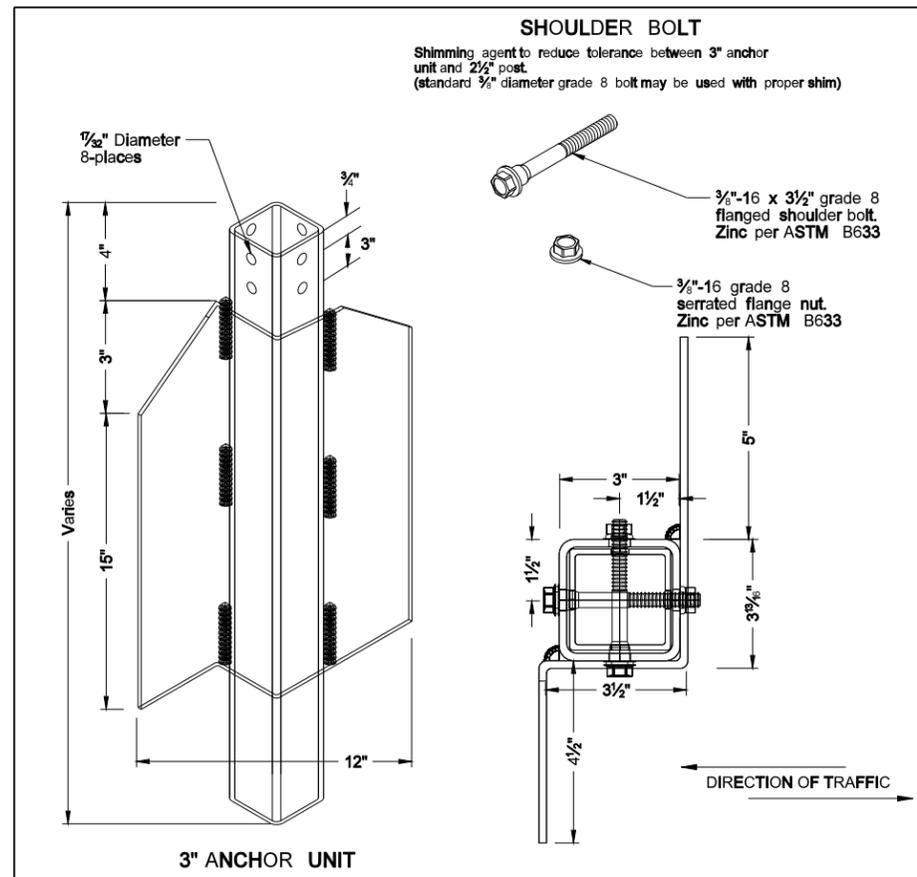
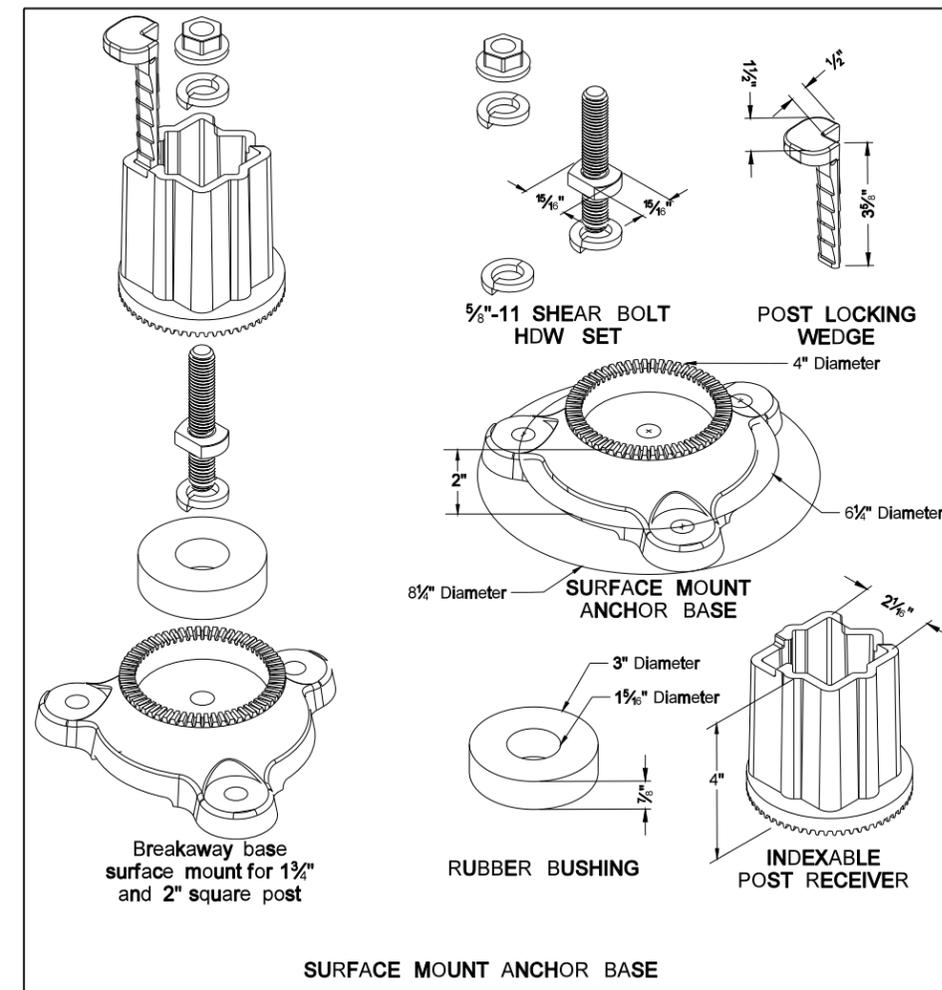


Properties of Telescoping Perforated Tubes						
Tube Size In.	Wall Thickness in.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia In. ⁴	Cross Sect. Area In. ²	Section Modulus In. ³
1 1/2 x 1 1/2	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2 1/2 x 2 1/2	0.105	12	2.773	0.561	0.695	0.499
2 3/8 x 2 3/8	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.783

The 2 3/8" size 10 gauge is shown as 2.19" size on the plans; The 2 1/2" size is shown as 2.51" size on the plans.

NOTE:

- 4" Vertical clearance of anchor or breakaway base. The 4" x 60" measurement shall be made above and below post location and also back and ahead of post.
- Anchor material shall be 7 gauge H.R.P.O. Commercial quality ASTM A569 and 3" x 3" x 7" gauge ASTM A500 grade B. Anchor shall have a yield strength 43.9 KSI and tensile strength of 59.3 KSI. Anchor shall be hot dipped galvanized per ASTM A123/153. All tolerances on anchor unit and slip base bottom assembly are +/- 0.005" unless otherwise noted.
- When used in concrete sidewalk, anchor shall be the same concept without the wings.
- Four post signs shall have over 8" between the first and fourth posts.
- Installation procedures as per manufacturers recommendation.
- Concrete fasteners for surface mount breakaway base shall be a minimum 1/2" diameter x 4" grade 8.



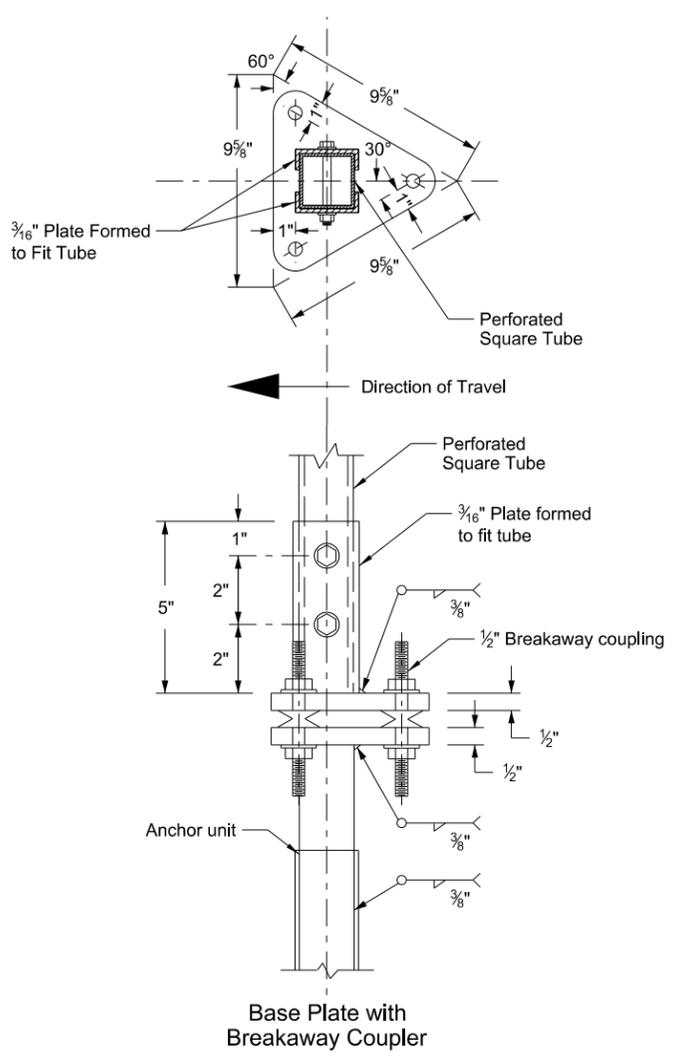
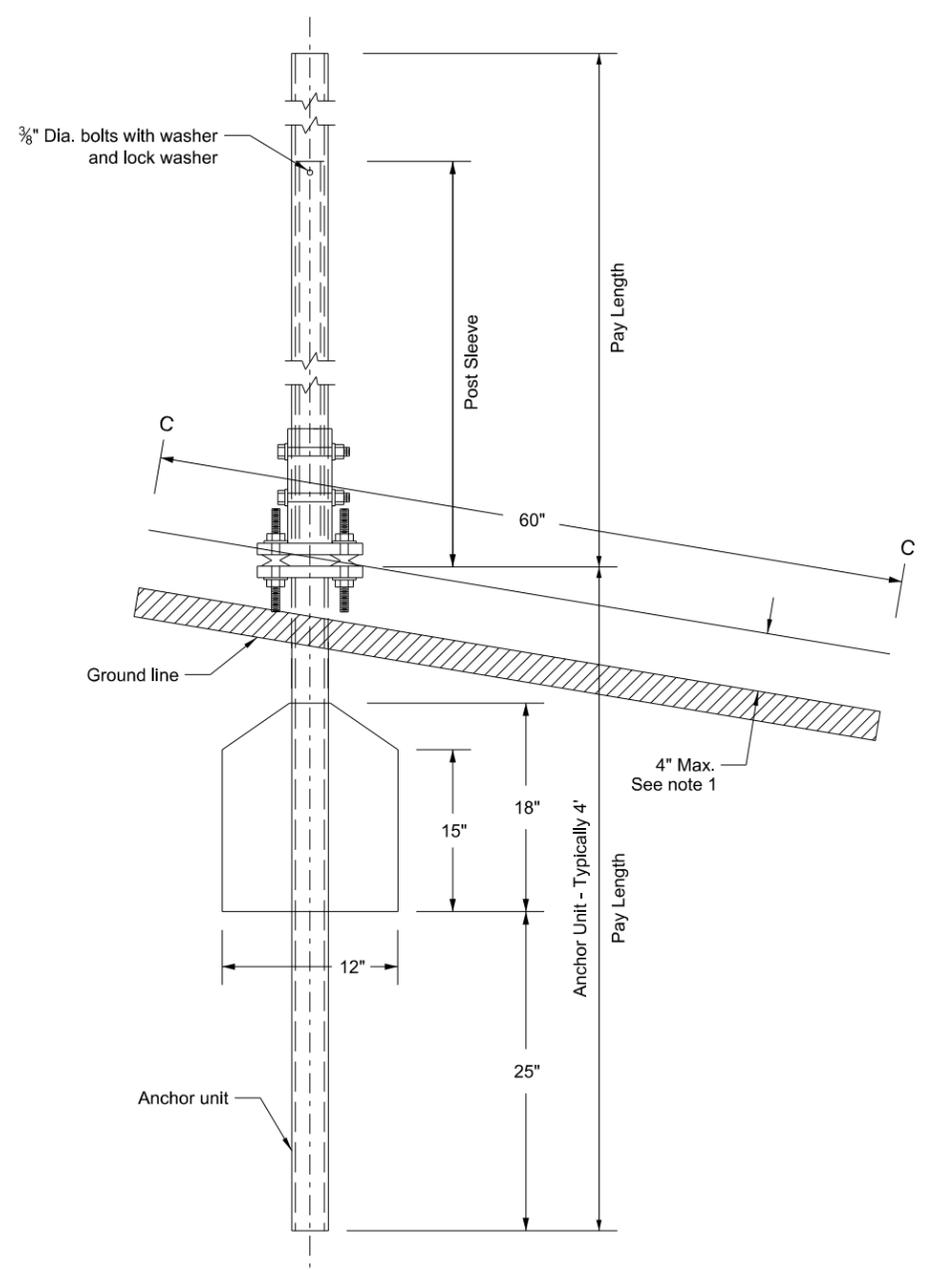
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-6-09	
REVISIONS	
DATE	CHANGE

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Breakaway Coupler System for Perforated Tubes

Notes:

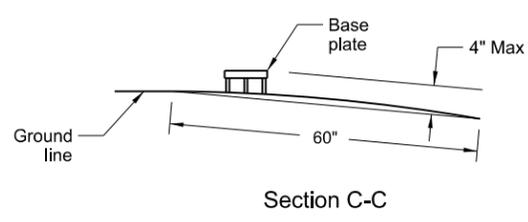
- 4" Vertical clearance of anchor or breakaway base. The 4" x 60" measurement shall be made above and below post location and also back and ahead of post.
- Anchor unit shall be the same size as the post and shall have the same specification as the post.
- Four post signs shall have over 8' between the first and fourth post.
- In lieu of the breakaway base system on standard D-754-24 the breakaway coupling system may be used. The breakaway coupler system shall be manufactured from material meeting the requirements of ASTM A325 fasteners with the special requirements as specified by DENT BREAKAWAY IND., INC. which meets the test requirements of NCHRP Report 350.



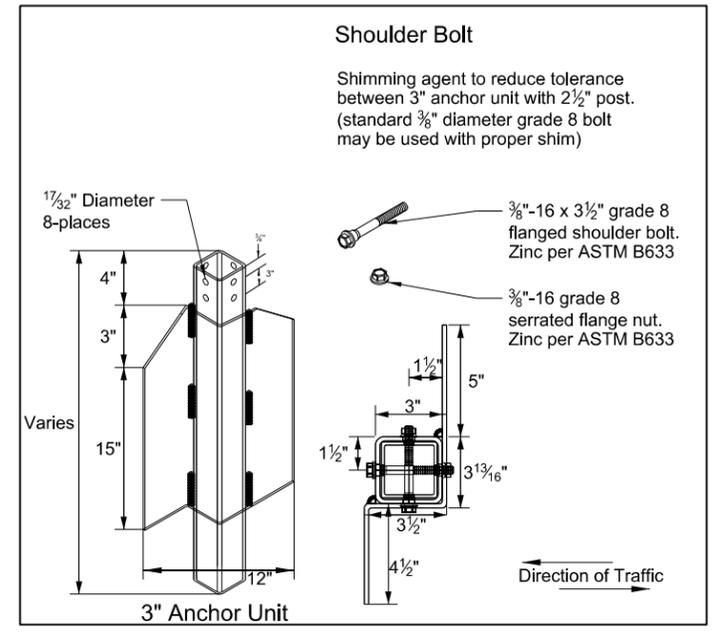
Number of Posts	Telescoping Perforated Tube						
	Post Size In.	Wall Thickness Gauge	Sleeve Size In.	Wall Thickness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thickness Gauge
1	2	12			No	2 1/4	12
1	2 1/4	12			No	2 1/2	12
1	2 1/2	12			(B)	3(C)	7
1	2 1/2	10			Yes		7
1	2 1/4	12	2	12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

(B) - The 2 1/2" 12 gauge posts do not need breakaway bases when placed in standard soils. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.

(C) - 3" anchor unit



Max. protection of the stub post is 4" above a 60" chord aligned radially to the center line of the highway and connecting any point, within the length of the chord, on the ground surface on one side of the support to a point in the ground surface on the other side.



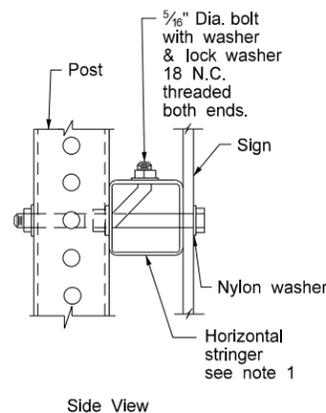
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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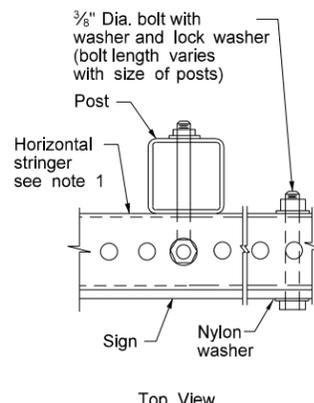
Mounting Details Perforated Tube

Note:

- Horizontal stringers - In lieu of perforated tubes, the contractor may substitute z bar stringers. The z bar stringers shall be 1 1/2" x 3/16" thick, 1.08 lbs./ft aluminum or 3.16 lbs./ft steel.
- Metal washers used on sign face shall have a minimum outside diameter of 5/16" ± 1/16" and 10 gauge thickness.
- No Parking Signs: All no parking signs with directional arrows shall be placed at a 30 to 45 degree angle with the line of traffic flow. No parking signs required at the above angles may have the support turned to the correct angle. If the no parking sign is placed with another sign that has to be placed at a 90 degree angle with the line of traffic flow, the detailed angle strap should be used to mount the no parking sign. Flat washers and lock washers shall be used with all nylon washers.
- In lieu of using the bent bolt to attach the post to the stringer, the contractor may choose to punch the sign backing and place the bolt through the sign, the stringer and the post.
- 4" vertical clearance of anchor or breakaway base. The 4" x 60" measurement shall be made above and below post location and also back and ahead of post.

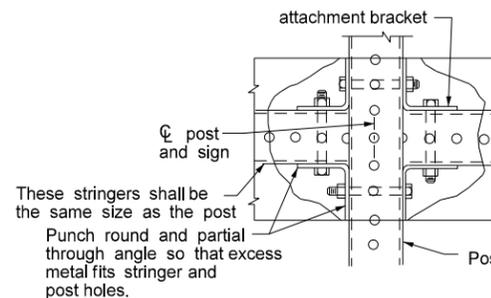


Side View



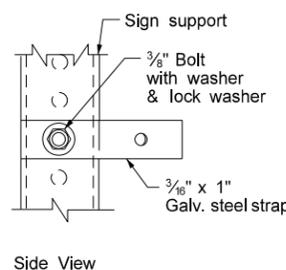
Top View

STRINGER MOUNTING
(WITH STRINGER IN FRONT OF POST)

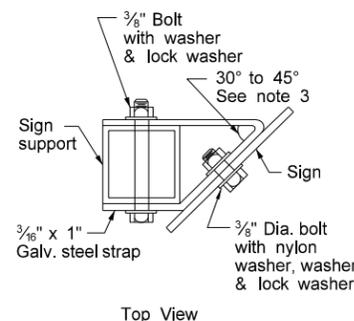


These stringers shall be the same size as the post. Punch round and partial through angle so that excess metal fits stringer and post holes.

STREET NAME SIGNS
AND ONE WAY SIGNS
SINGLE POST ASSEMBLY
ONE STRINGER OR
BACK TO BACK MOUNTING

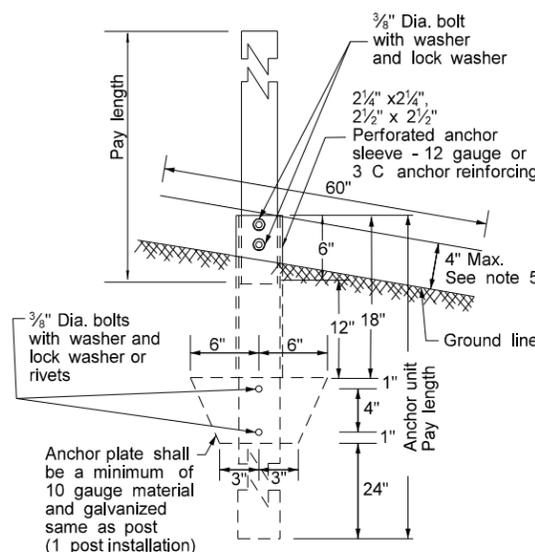


Side View

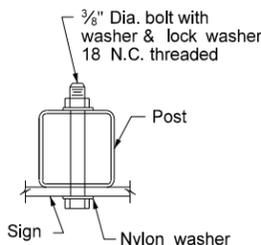
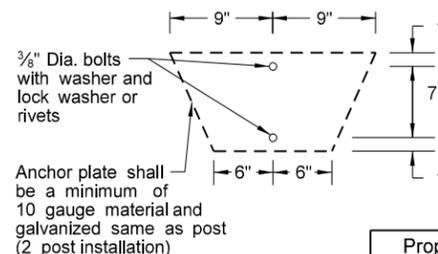


Top View

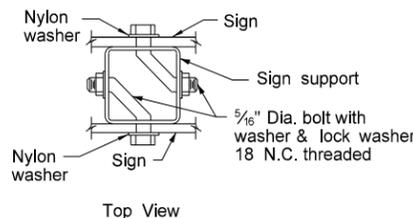
STRAP DETAIL



ANCHOR UNIT AND
POST ASSEMBLY



BOLT MOUNTING



Top View

BACK TO BACK
MOUNTING

Properties of Telescoping Perforated Tubes						
Tube Size In.	Wall Thickness In.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia In. ⁴	Cross Sect. area In. ²	Section Modulus In. ³
1 1/2 x 1 1/2	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
2 1/4 x 2 1/4	0.105	12	2.773	0.561	0.695	0.499
2 3/8 x 2 3/8	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
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The 2 3/8" size 10 gauge is shown as 2.19" size on the plans.
The 2 1/2" size is shown as 2.51" size on the plans.

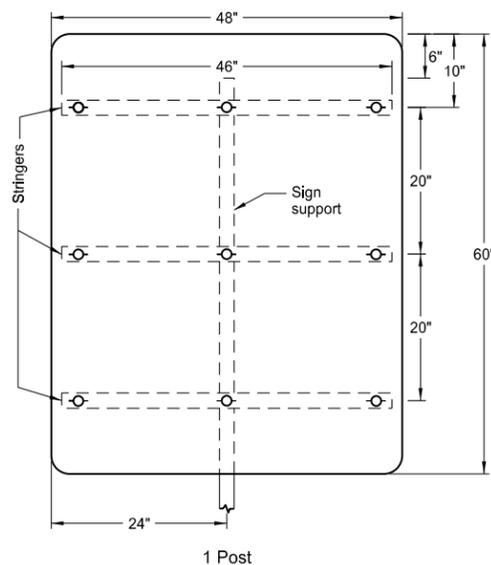
Number of Posts	Telescoping Perforated Tube						
	Post Size In.	Wall Thickness Gauge	Sleeve Size In.	Wall Thickness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thickness Gauge
1	2	12			No	2 1/4	12
1	2 1/4	12			No	2 1/2	12
1	2 1/2	12			(B)	3(C)	7
1	2 1/2	10			Yes		7
1	2 1/4	12	2 1/2(D)	12	Yes		7
1	2 1/2	12	2 1/4	12	Yes		7
2	2 1/2	10			Yes		7
2	2 1/4	12	2 1/2(D)	12	Yes		7
2	2 1/2	12	2 1/4	12	Yes		7
3 & 4	2 1/2	12			Yes		7
3 & 4	2 1/2	10			Yes		7
3 & 4	2 1/2	12	2 1/4	12	Yes		7
3 & 4	2 1/4	12	2 1/2(D)	12	Yes		7
3 & 4	2 1/2	10	2 3/8	10	Yes		7

(B) - The 2 1/2", 12 gauge posts do not need breakaway bases when placed in standard soils, but require a shim as specified by the manufacturer. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.
(C) - 3" anchor unit
(D) - 2 1/2" x 12 ga. x 18" minimum length external sleeve required.

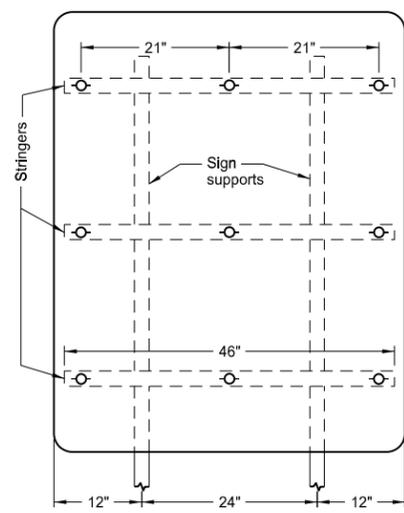
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-6-09	
REVISIONS	
DATE	CHANGE
7-8-14	Revised Note 3

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

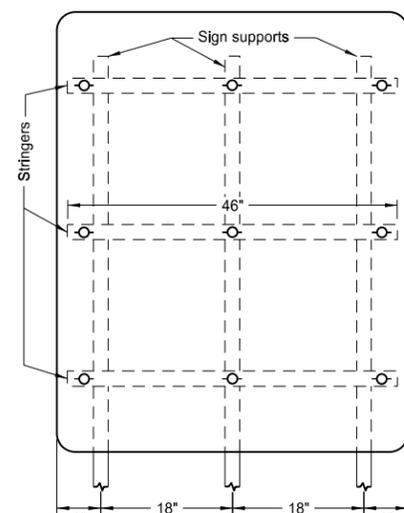


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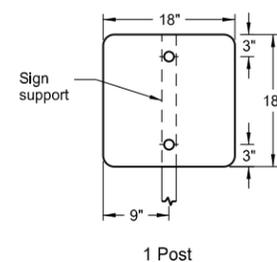


2 Posts

Assembly No. 12

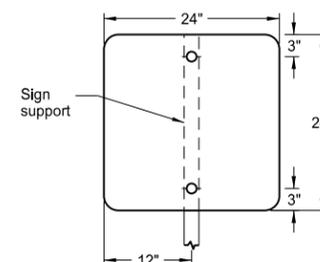


3 Posts



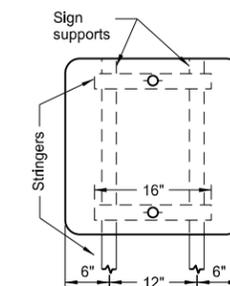
1 Post

Assembly No. 13

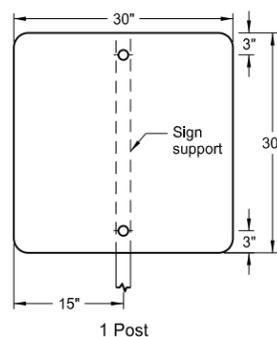


1 Post

Assembly No. 14

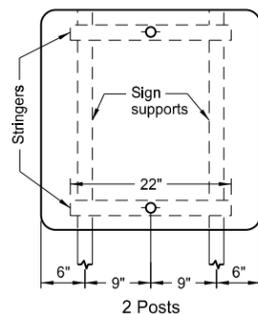


2 Posts

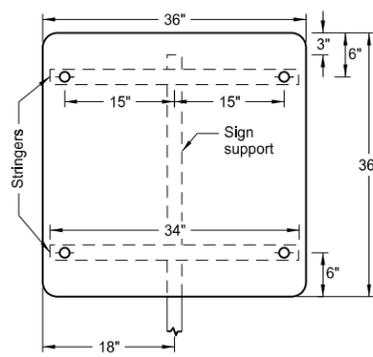


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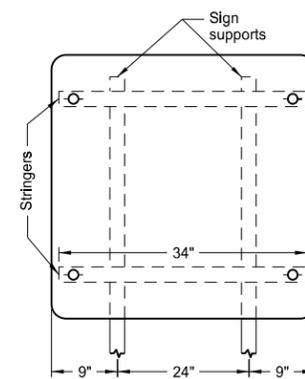
Assembly No. 15



2 Posts

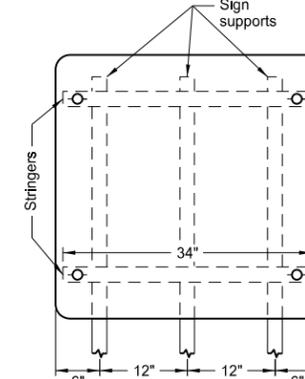


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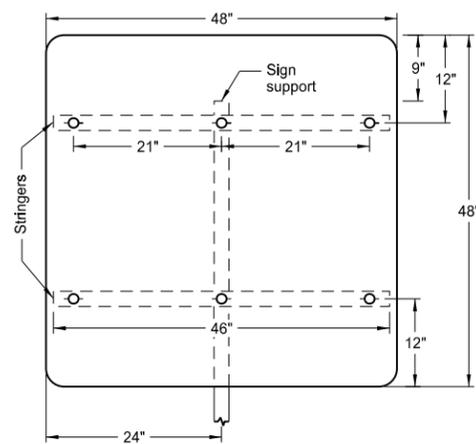


2 Posts

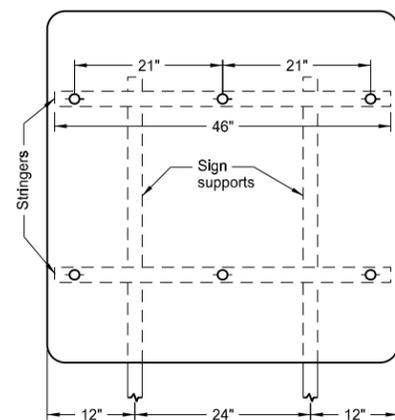
Assembly No. 16



3 Posts

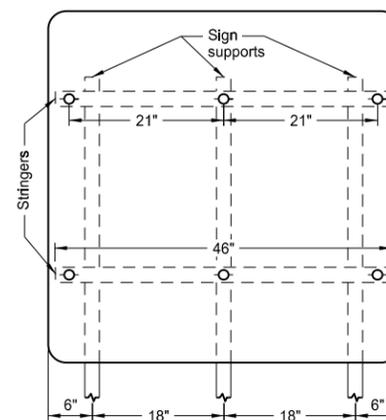


1 Post



2 Posts

Assembly No. 17



3 Posts

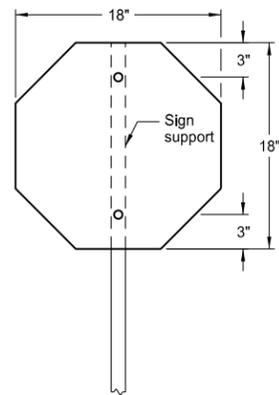
Notes:

1. See Standard D-754-25 for mounting details.
2. The minimum sign backing material thickness shall be 0.100 inch.
3. Perforated square tube stringer shall be 1½" x 1½".
4. All holes shall be punched round for ⅜" bolt.

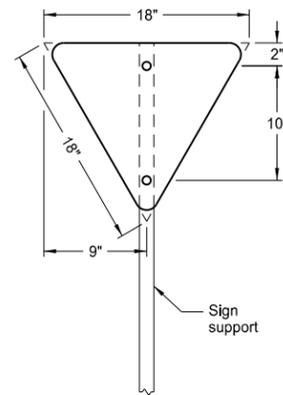
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE

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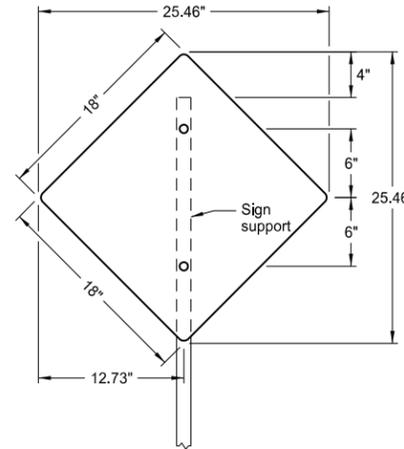
BIKE ROUTE SIGNS
PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS FOR
REGULATORY, WARNING AND GUIDE SIGNS



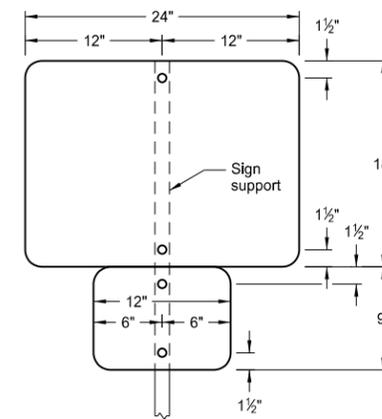
1 Post
Assembly No. 100



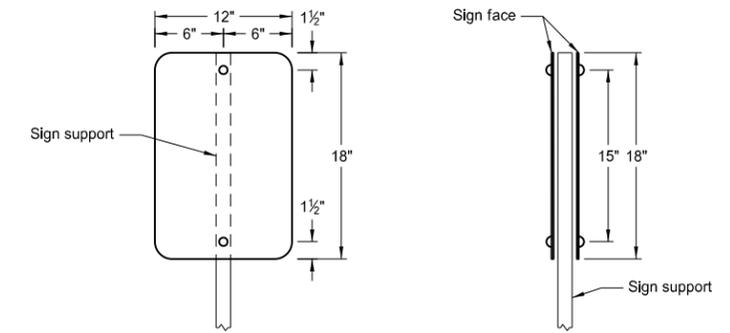
1 Post
Assembly No. 101



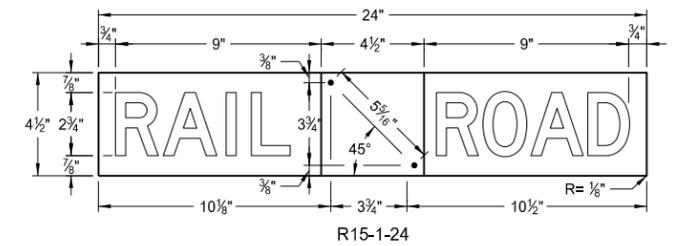
1 Post
Assembly No. 102



1 Post
Assembly No. 103

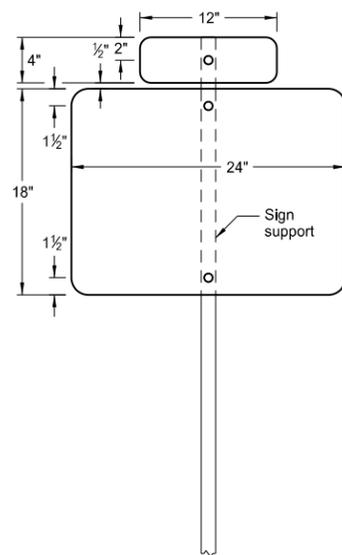
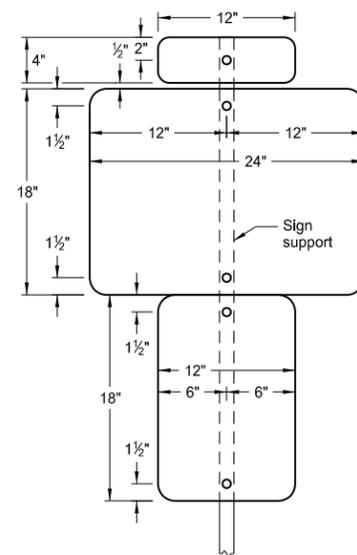


1 Post
back to back
Assembly No. 104

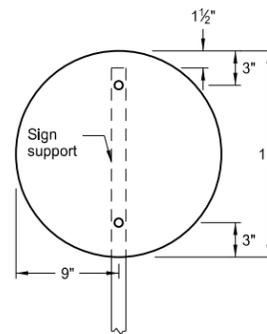
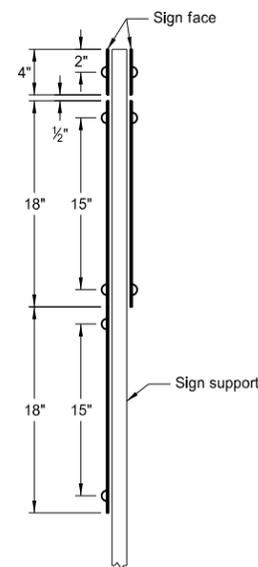


Railroad Crossing Sign Details
R15-1-24

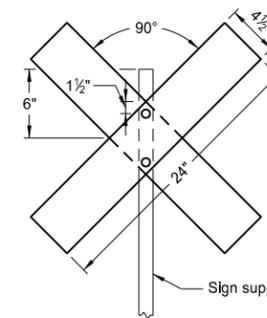
White reflectorized background
Black non-reflectorized letters
Holes to be punched round for 3/8" dia bolts. Bolt location rotated 90 degrees from detail above.



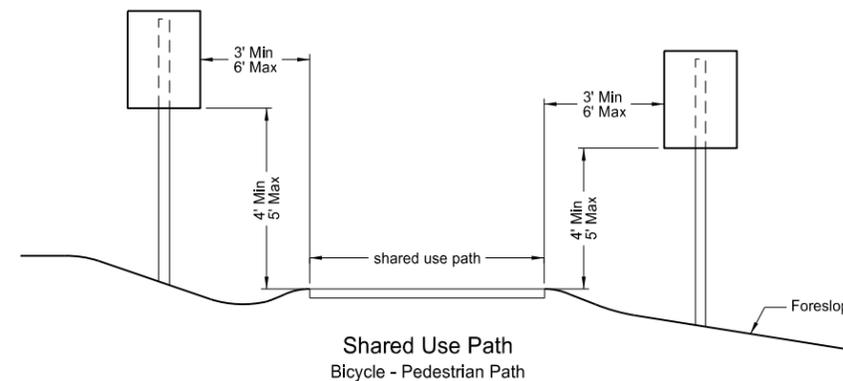
1 Post
back to back
Assembly No. 105



1 Post
Assembly No. 106



1 Post
Assembly No. 107



Shared Use Path
Bicycle - Pedestrian Path

- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
 2. All holes shall be punched round for 3/8" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel Registration Number PE-2930, on 8/22/12 and the original document is stored at the North Dakota Department of Transportation

