DESIGN DATA					
Traffic	Average Daily				Est.Max.Hr.
Current 1998	Pass: 1370	Trucks 230	Total 1600		160
Forecast 2018	Pass: 1600	Trucks 350	Total 1950		195
Minimum Sight Dist. for:		Design Speed 70			
Stopping 475′		Bridges Hs-20			
Safe Passing 2300′					
Passing for Marking 1000′					

JOB# 20

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	NH-7-002(050)069	1

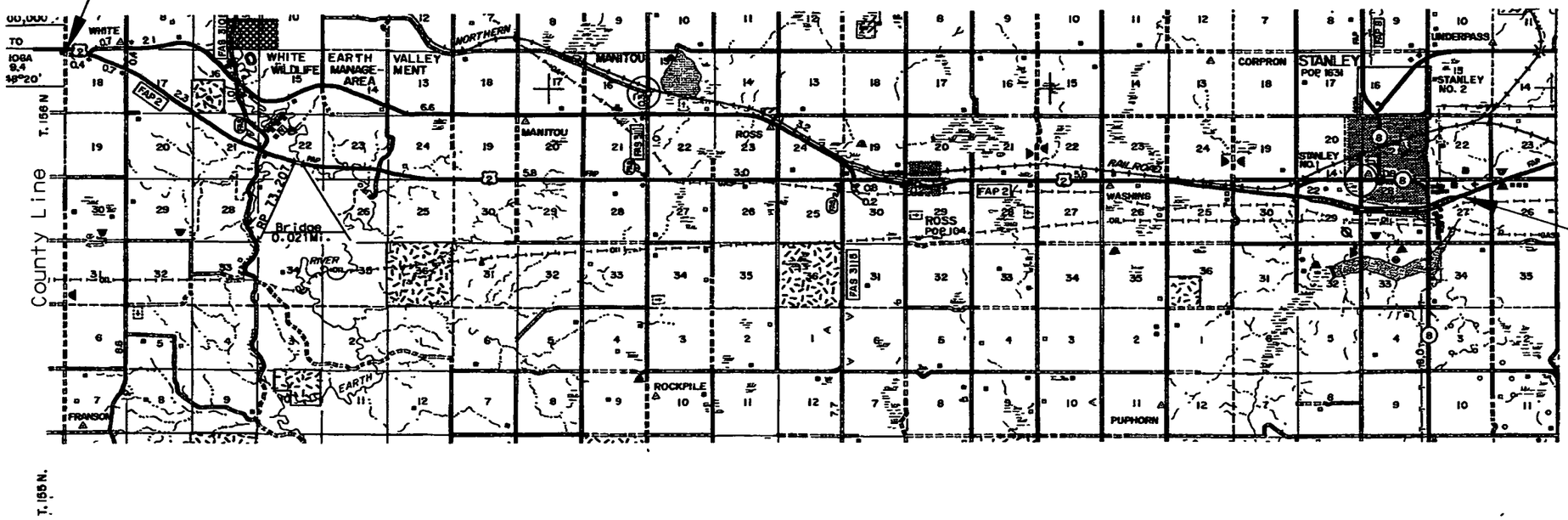
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

Mountrail County
NH-7-002(050)069
Mine & Blend, Hot Bit. Pvm't, Bridge Deck Overlay, Safety Improvements, Lighting, Signing, Marking and Incidentals

GOVERNING SPECIFICATIONS:
Standard Specifications adopted by the North Dakota Department of Transportation October 1997: Standard Drawings currently in effect: and other Contract Provisions submitted herein.

LENGTH OF PROJECT
NH-7-002(050)069 22.223 Miles

Beg. Project
NH-7-002(050)069
R.P. 69.206
Sta. 3654+07.68



End Project
NH-7-002(050)069
R.P. 91.429
Sta. 4827+44.63

DESIGNER Brad Pfeifer
DESIGNER Monte Dockter
DESIGNER John Schmidt
RECOMMEND APPROVAL 3-22, 1999
DESIGN ENGINEER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR DATE

APPROVED DATE 3/26/99

DIRECTOR OF HIGHWAYS AND ENGINEERING

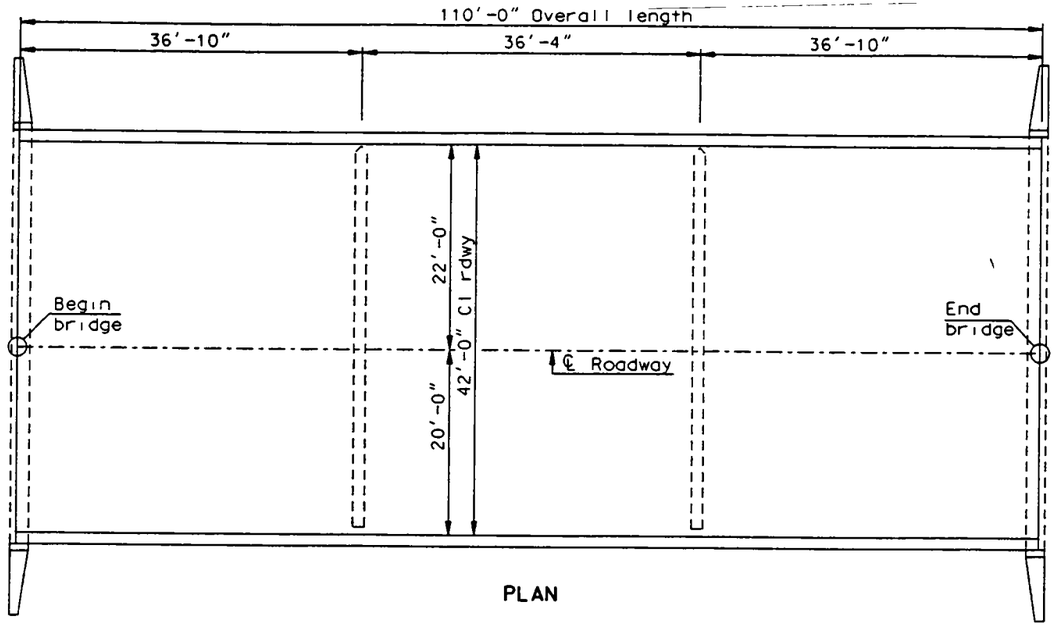
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

DAVID K. O. LEER REGISTERED PROFESSIONAL P.E. 1199 ENGINEER NORTH DAKOTA

\70002069 050\design\title dgn Mar 22, 1999 13:40 11

02-073 • 218 L

BRIDGE CODE	FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO
X-081	8	ND	NH-7-002(050)069	42



PLAN

100 SCOPE OF WORK: The work at this site consists of placing a deck overlay .

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
650	0700	CLASS 1 OVERLAY	SY	513
650	0701	CLASS 2 OVERLAY	SY	103
650	0702	CLASS 3 OVERLAY	SY	26
650	0703	CLASS 2A OVERLAY	LF	185

(For Lane closure)
See NOTE 704-450

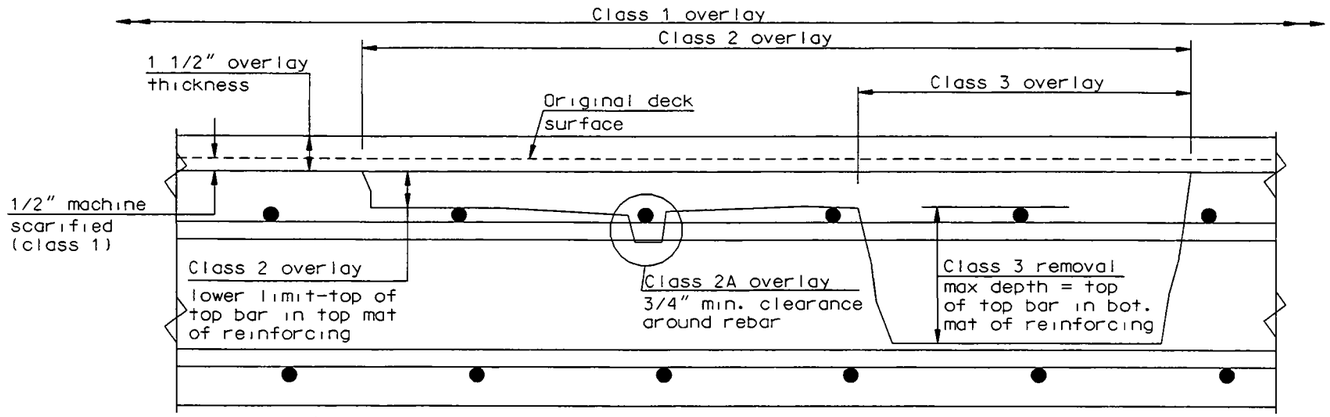
WHITE EARTH RIVER

BRIDGE LAYOUT

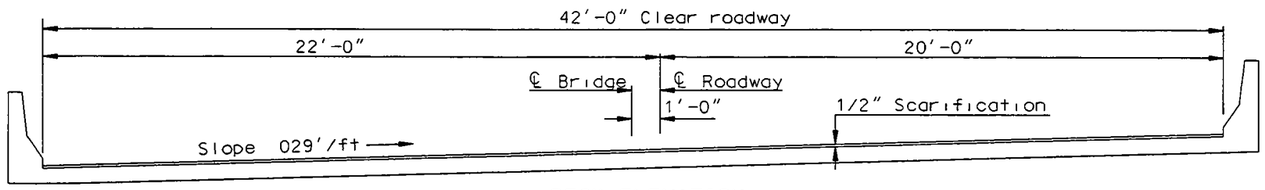
BRLO 99LCS008 LLS

2-073.218 L

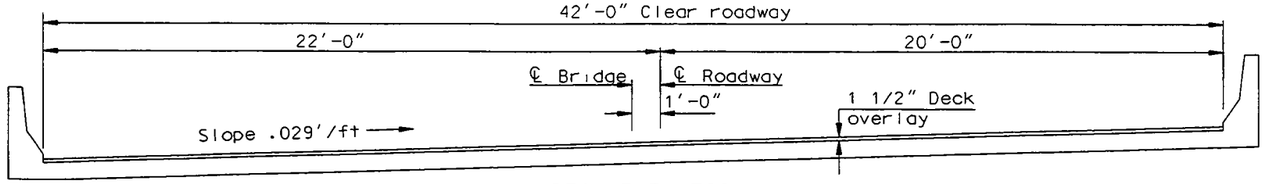
FHWA REGION	STATE	FEDERAL AID PROJECT NUMBER	SHEET NO
8	ND	NH-7-002(050)069	43



BRIDGE DECK
(Overlay classifications)



DECK ELEVATION
Showing removal



DECK ELEVATION
Showing deck overlay

QUANTITIES	
Class 1 Overlay	513 SY
Class 2 Overlay	103 SY
Class 3 Overlay	26 SY
Class 2A Overlay	185 SY

WHITE EARTH RIVER

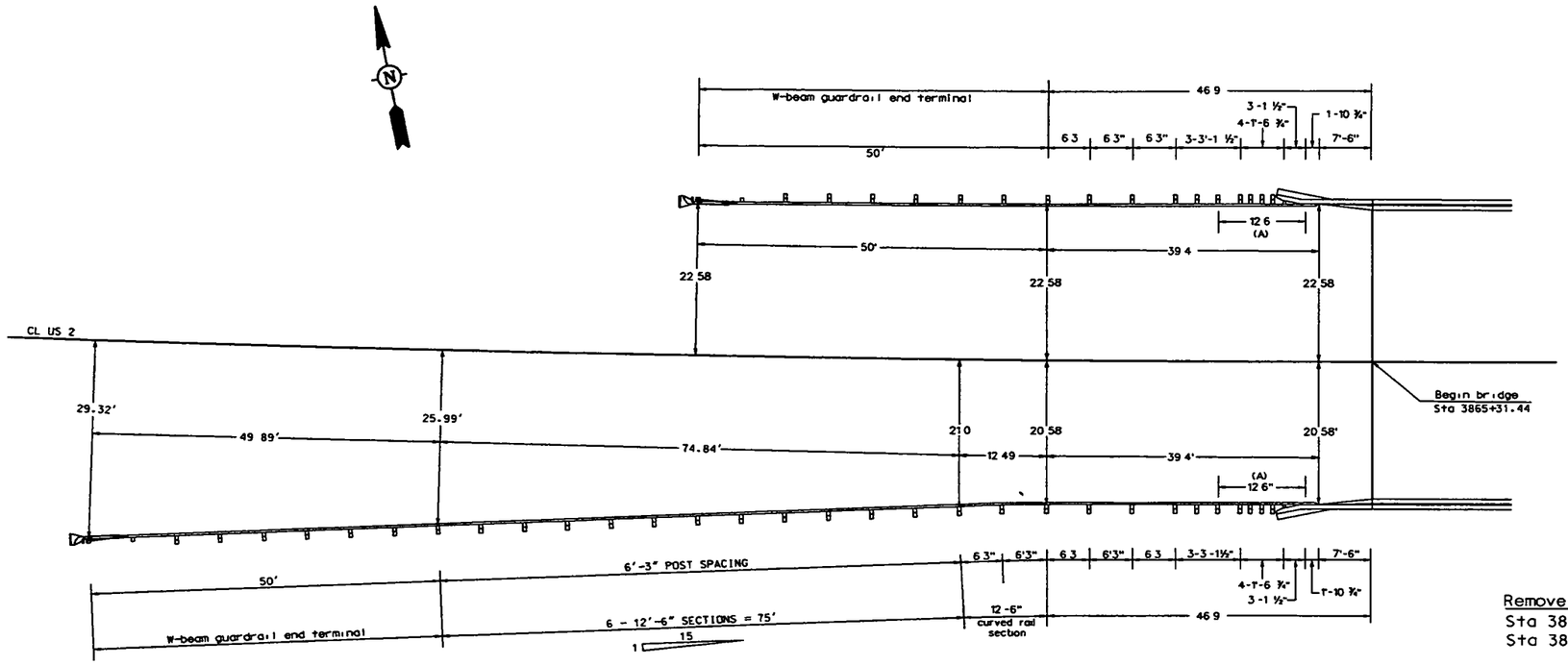
OVERLAY DETAILS

DECKOV 99LCS009 LLS

2-073.218E1

FHWA REGION	STATE	PROJECT NO.	SHEET NO.
8	ND	NH-7-002(050)069	44

23 USC §409 Documents
NDDOT Reserves All Objections



Remove W-beam guardrail & posts

Sta 3863+09.91 to 3865+23.94 rt	214.4 LF
Sta 3863+84.74 to 3865+23.94 lt	139.4 LF
Total	353.8 LF

Remove end treatment & transition

Sta 3862+73.04 to 3863+09.91 rt	1 ea
Sta 3863+47.87 to 3863+84.74 lt	1 ea
Total	2 ea

Reset W-beam guardrail

Sta 3864+09.70 to 3865+23.94 rt	126.9 LF
Sta 3864+84.54 to 3865+23.94 lt	39.4 LF
Total	166.3 LF

W-beam guardrail end terminal

Sta 3863+59.81 to 3864+09.70 rt	1 ea
Sta 3864+34.54 to 3864+84.54 lt	1 ea
Total	2 ea

Reset W-Beam Guardrail Layout
and Quantities
At Beginning of Bridge

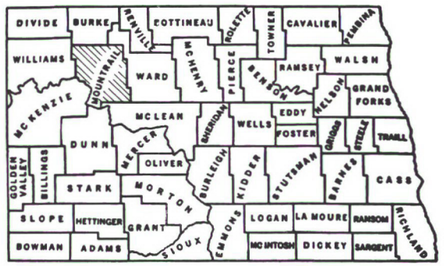
White Earth River Bridge

RP 73.218
US 2

\traffic\lgdrl1 dgn Mar 02, 1999 08 09 17

02-073,218 L
2-73.000

FED ROAD DIV NO	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	F-7-002(08)	1



SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

PLANS

FOR THE PROPOSED IMPROVEMENT OF A

STATE HIGHWAY

IN MOUNTRAIL COUNTY

FEDERAL AID PROJECT NO. F-7-002(08)069

~~GRADE, BASE~~, STRUCTURAL ITEMS

LENGTH OF PROJECT		
PROJECT	MILES-GROSS	MILES-NET
F-7-002(08)069	18.816	18.816
TOTALS	18.816	18.816

GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota State Highway department Oct. 1976 and approved by the Federal Highwcy Administration on Dec. 17, 1976 and other Contract Provisions submitted herewith.

SCALES
- LAYOUT SHEET: 1 IN. = 4000 FT.
- PLAN AND PROFILE DRAWINGS: HOR. 1 IN. = 100 FT. VERT. 1 IN. = 10 FT.
- STRUCTURAL DRAWINGS:- AS SHOWN
- CROSS SECTION SHEETS:- HOR. 1 IN = 20FT VERT. 1 IN = 10FT.
  - STA. 710+00 TO 740+00 PLAN AND PROFILE: HOR. 1 IN = 50 FT. VERT. 1 IN = 10 FT

DESIGN DATA

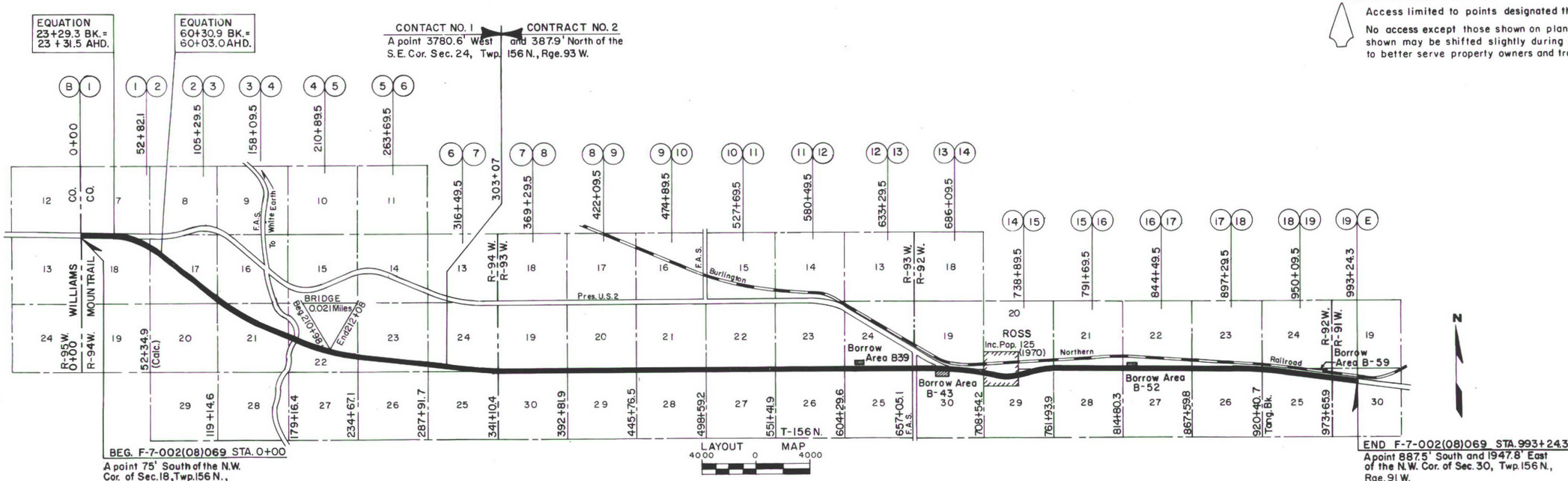
TRAFFIC	AVERAGE DAILY	EST. 30TH MAX. HR.
CURRENT TRAFFIC (1978)	1300 PASS. 300 TRUCKS 1600 TOTAL	200
TRAFFIC FORECAST (1998)	2625 PASS. 575 TRUCKS 3200 TOTAL	400

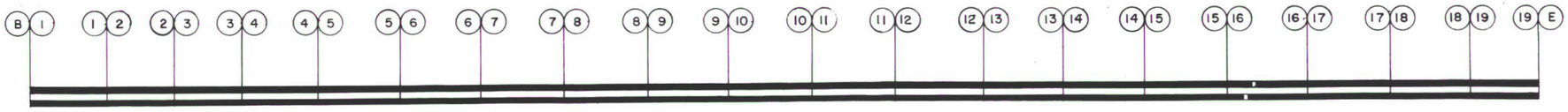
		MPH
DESIGN SPEED	70	
TRAFFIC CLASSIFICATION	"M"	
MINIMUM SIGHT DISTANCE (STOPPING)		850'
MINIMUM SIGHT DISTANCE (SAFE PASSING)		3200'
MINIMUM PASSING SIGHT DISTANCE FOR MARKING		1200'
BRIDGE DESIGN LOADING	HS-20	
CLEAR ROADWAY WIDTH	42'	

LIMITED ACCESS CONTROL

Access limited to points designated thus.

No access except those shown on plans. Access points as shown may be shifted slightly during construction if necessary to better serve property owners and traffic.





BARRIER STRIPING DIAGRAM

LEGEND

Passing Zones (1200' Min. S.D.)
Non Passing Zones (Barrier Stripe)
He = 3.75 Ft., Ho = 4.5 Ft.

APPROVED DATE 3-10-78

CHIEF ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

L. W. BRADLEY REGISTERED PROFESSIONAL ENGINEER NORTH DAKOTA NO. 880

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ENGINEER DATE

F-7-002(08)069

MATHISON CO. 200 3-79 80013

SYMBOLS

STATE & NATIONAL LINES

COUNTY LINE

TOWNSHIP & RANGE LINES

SECTION LINE

QUARTER SECTION LINE

SECTION CORNER

QUARTER SECTION CORNER

OLD RIGHT OF WAY LINE

NEW RIGHT OF WAY LINE

GRADE LINE

CENTERLINE OF CONSTRUCTION — 500

RAILROAD RIGHT OF WAY LINE

CITY OR VILLAGE CORPORATE LIMITS

PROPERTY LINE

EASEMENT LINE

FENCES

SNOW FENCE

DRAINAGE

WATERS EDGE

MARSH OR SWAMP

RIPRAP

DRAINAGE DITCH

APPROACH — 502 + 00

TRAVELED WAY

RAILROADS — NAME

GUARD RAIL

GUIDE POSTS

DELINEATORS

HEDGES AND TREES

INTERCHANGE

HIGHWAY GRADE SEPARATION – NO CONNECTION

OTHER BRIDGE

SERVICE ROAD

TERMINATED CROSS-ROAD

BUILDINGS

TELEGRAPH LINES

TELEPHONE LINES

POWER LINES

CULVERTS (In Place)

CULVERTS (Install)

CONCRETE BOX CULVERTS (Install)

BRIDGES (Install)

CONCRETE CURB

CONCRETE CURB AND GUTTER

CONCRETE WALK

CATCH BASIN (Existing)

CATCH BASIN (New)

MANHOLE (Existing)

MANHOLE (New)

CURB INLET (Existing)

CURB INLET (New)

GROUND MOUNTED SIGNS

OVERHEAD SIGNS

HYDRANT

LIGHT STANDARDS

TRAFFIC SIGNALS (Plan & Profile Sheets)

HIGH MAST LIGHTING ASSEMBLY

GROUND ELEVATION / GRADE — 6430 / 6410 / N245

CENTERLINE

SECTION LINE

DEFLECTION ANGLE (Delta)

SOD OR JUTE MESH

POLES TO BE MOVED

POLES TO BE LOWERED

CONCRETE FOUNDATION

CONDUIT

CONDUCTOR

CONCRETE PULL BOX

FEED POINT

250 WATT LIGHT STANDARDS

400 WATT LIGHT STANDARDS

700 WATT LIGHT STANDARDS

1000 WATT LIGHT STANDARDS

FLASHING BEACON

TRAFFIC SIGNAL – MAST ARM MOUNTED

TRAFFIC SIGNAL – POST MOUNTED

SIGNAL HEAD — 3

PEDESTRIAN PUSHBUTTON POST

TRAFFIC SIGNAL CONTROLLER

FEED POINT – PAD MOUNTED

ABBREVIATIONS

Aggr	Aggregate
Ahd	Ahead
Alt	Alternate
Approx	Approximate or Approximately
Appr	Approach
Asph Cem or A C	Asphalt Cement
Asph Conc	Asphaltic Concrete
Bit	Bituminous or Bitumen
Bk	Back
B M	Bench Mark
Bldg	Building
Br	Bridge
C A E S	Corrugated Aluminum End Section
C A P	Corrugated Aluminum Pipe
C B	Catch Basin
C & G	Curb and Gutter
Ch Blk	Channel Block
Ch Ch	Channel Change
C I	Curb Inlet
C I P	Cast Iron Pipe
Cl	Class
C S E S	Corrugated Steel End Section
C S P	Corrugated Steel Pipe
CMS	Cationic Medium Setting
Comp	Compression
Const	Construction
Conc	Concrete
Cont Reinf Conc Pvmt	Continuously Reinforced Concrete Pavement
Contn	Contraction
Crn	Crown
CRS	Cationic Rapid Setting
Crse	Course
C S	Curve to Spiral
C to C	Center to Center
C Y	Cubic Yard
D	Degree of Curvature
D-Load	Dead Load
D B	Ditch Block
Def	Deformed
Del	Deliver
D G	Ditch Grade
El or Elev	Elevation
Ellipt	Elliptical
Emb	Embankment
Emul	Emulsified
Engr	Engineer
Eq	Equation
E R	East Roadway
E S	End Section
Esmt	Easement
Exc	Excavation
Exp	Expansion
F D	Field Drive
Found	Foundation
F P	Fence Post
Furn	Furnish
Ga	Gage or Gauge
Gr	Gravel
Grd	Graded
G V	Gate Valve
Hel	Helical
Hyd	Hydrant
Ident	Identification
Inchg	Interchange
I M	Iron Monument
Inst	Install
Inter	Intersection
Inv	Invert
Jt	Joint
L	Length of Curve
Lc	Length of Spiral
Levg	Leveling
L F	Linear or Lineal Foot
Liq	Liquid
Long	Longitudinal
L P	Light Pole
Lt	Left
M	One Thousand
Matl	Material
Max	Maximum
MC	Medium Curing
M H	Manhole
Min	Minimum
M L	Main Line
N R	North Roadway
Off Loc	Office Location
O to O	Out to Out
P & P	Plan and Profile
P C	Point of Curvature
P C C	Point of Compound Curve
P C C Pvmt	Portland Cement Concrete Pavement
P D	Private Drive
Pen	Penetration
Perf	Perforated
P I	Point of Intersection
P O C	Point on Curve
P O T	Point on Tangent
P P	Power Pole
P R C	Point of Reverse Curvature
Pref	Preformed
P S D	Passing Sight Distance
P T	Point of Tangency
P V C	Polyvinyl Chloride Sewer Pipe
Quant	Quantity or Quantities
R	Radius
R or Rge	Range
RC	Rapid Curing
R C E S	Reinforced Concrete End Section
R C P	Reinforced Concrete Pipe
R C P S	Reinforced Concrete Pipe Sewer
Rd	Road
Rdbd	Roadbed
Rdwy	Roadway
Refl	Reflectorized
R R	Railroad
Rt	Right
R/W	Right of Way
Salv	Salvage
San	Sanitary
S C	Spiral to Curve
SC	Slow Curing
Sc	Spiral Deflection Angle
S D	Sight Distance
S E	Superelevation
Sec	Section
Sec Line Appr	Section Line Approach
Sep	Separation
Serv	Service
Sgr Prep	Subgrade Preparation
Shldr	Shoulder
SP	Special Provision
S P P	Structural Plate Pipe
S P P A	Structural Plate Pipe Arch
S R	South Roadway
SS	Slow Setting or Supplement Specification
S S D	Stopping Sight Distance
S T	Spiral to Tangent
Sta	Station
Std	Standard
Std Specs	Standard Specifications
Struct	Structure
Surf	Surface or Surfacing
Surv	Survey
S W	Sidewalk
S Y	Square Yard
T	Tangent Length (circular curve)
T or Twp	Township
Tel	Telephone
Temp	Temporary
T P	Telephone Pole
Tr	Traffic
Trans	Transverse or Transition
Trtd	Treated
Ts	Tangent Length (curve with spirals)
T S	Tangent to Spiral
U S C & G S	United States Coast and Geodetic Survey
V C	Vertical Curve
V C P	Vitrified Clay Pipe
W M	Water Main
W M V	Water Main Valve
W R	West Roadway
Wrng	Wearing
W S V	Water Service Valve
X-Sec	Cross Section
Xc	Spiral Coordinate
Yc	Spiral Coordinate

FED. REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	ND	F-7-002(08)	3

NOTE SHEET

1. GENERAL: The Engineer will attend to the removal of existing fences to the new right-of-way line and to the relocation or adjustment of utility facilities as shown on the plans. Equipment shall work around utility poles that are not to be disturbed.

2. GUARD RAIL & GUARD POSTS: All guard rail and guard posts in place shall be moved by the State Highway Maintenance Department prior to construction.

3. REMOVAL OF STRUCTURES: Removal of structures and obstructions shall be in accordance with Sec. 202 of the Standard Specifications.

4. INTERCEPTING DITCH: Interception ditches shall be constructed wherever considered necessary by the Engineer.

*5. SHRINKAGE: 15% additional volume in yardage computed by the end area method is allowed for shrinkage in earth embankment. (05% Sta. 156+00 to 320+00)
(20% Sta. 712+00 to 993+24.3)

6. POLE LINES: Designation of poles to be moved. Designation of poles to be lowered.

*7. UTILITIES: Separate plans, if any, showing the utility relocation or adjustment work to be performed by utility companies to accommodate highway construction will be made available to the Contractor upon his request to the Engineer.

8. CLEARING & GRUBBING: Total excavation to be removed under Clearing and Grubbing is approximately:
Contract No. 1 = 58429 C.Y.
Contract No. 2 = 81302 C.Y.

*9. QUANTITIES: Total quantities have been rounded off to the nearest whole unit for bidding purposes.

*10. COMPACTION & DENSITY CONTROL: Compaction and density control shall be in accordance with Sec. 203-2.3.3 of the Standard Specifications, except that, if the embankment is unstable (as evidenced by sponginess or rutting) when compacted to the required density, it will be necessary to dry the soils below optimum moisture to obtain adequate stability. The cost of such drying will be incidental to the price bid for Roadway Excavation (and/or Borrow, if used).

11. FOUNDATION FILL: Volume + 25% (If in the opinion of the Engineer, a suitable foundation exists at culvert sites, item Foundation Fill may be eliminated.)

12. COAL SLACK: When coal is encountered, remove to a depth of 6' below profile grade between graded shoulders and 1' below ditch bottom to toe of backslope. All exposed coal slack in the backslope shall be subcut to a minimum depth of 1' and backfilled with better material from within the haul limits.

*13. TREES, SHRUBS & NATIVE GRASSES that are within the right-of-way and outside of construction limits are not to be disturbed.

14. SUBCUT: 5, 15 & 20 percent of subcut excavation has been added to the excavation and embankment quantities to allow for shrinkage and shall be obtained within the right-of-way limits.

15. BORROW AREA: Average haul shown does not include dead haul from borrow area to point of entry into mass.

16. DIRT BALANCES: The excavation from the full graded sections that hauls into the widened portions has been shown on the plans. The side it is to be hauled to has also been shown.

17. BACKSLOPES: The backslopes going into and out of deep cut section shall be flattened as directed by the field engineer.

*18. CONSTRUCTION & PUBLIC TRAFFIC· At the pre-job conference prior to hauling over the project, the contractor and engineer shall agree on the designated haul roads.

19. SIGNS: U.S. #2 North Dakota State Maintenance forces are to remove and install signs on this project. This work is Non-Participating State Funds only.

20. EXISTING PAVEMENT (Widened Areas)· The Contractor shall protect the existing pavement on the widened sections, from his hauling operation during the course of construction. Surface repair, which is required because of the Contractor's operations shall be repaired by the Contractor at his own expense. Normal maintenance of pavement on widened sections shall be performed by the State Highway Department Maintenance forces.

21. INSLOPES (Widened areas)· All inslopes on areas that are to be widened regardless of rate of slope shall be benched unless otherwise directed by the Engineer. Benches shall be deep enough to provide a sufficient width to permit placing, spreading and compacting equipment to operate. Each bench shall be thoroughly compacted before additional embankment is placed. Cost of benching shall be included in the price bid for Common Excavation, Type "A".

22. PLUG CULVERT: At locations designated on the plans for plugging existing culverts, the Contractor shall remove and salvage any barrel sections of concrete culvert that the Engineer designates for removal. He shall then plug the ends of the remaining culvert with concrete as approved by the Engineer. Cost of plugging and culvert removal shall be included in price bid for other items.

*23. SOILS SURVEY: The soil survey information has been carefully prepared and while not guaranteed, is believed to be correct. The Contractor is presumed to have verified the soils survey information to his satisfaction before he submits his bid.

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	F-7-002(08)	4

24. HAUL LIMITATIONS: At locations where it is necessary to haul across Highway 2, the Contractor shall construct a dirt ramp across the existing highway. The ramp section shall be thick enough to protect the existing pavement from any damage and shall be constructed in a manner that will allow for through traffic on Highway 2 at all times. This ramp will be removed whenever hauling operations are suspended for the day and will be removed permanently as soon as hauling operations at the locations are complete. Flagpersons will be required for each direction of traffic whenever the ramp is in place. Cost of construction and removal of ramp to be included in price bid for other items. Flagpersons will be paid for as flagging.

25. UTILITIES IN BORROW AREAS: No excavation shall be done within 5' of telephone or power poles located within borrow areas. Backslopes of excavation near poles shall not be less than 3:1.

*26. WHITE EARTH RIVER CONST. LIMITATIONS: Prior to June 1, 1978. The Contractor will not be permitted to till, dredge or excavate in any portion of the White Earth River channel which contains water.

27. WETLANDS: Where wetland agreements are specified and have been incorporated into the plans (as shown by wetlands stamp on the Plan and Profile Sheets) the Engineer to refer to cross sections for culvert elevations. Throughout the entire project, approach culverts have been raised 1'-1.5 feet, as shown on the cross sections.

28. MULTIPLE PIPE INSTALLATION: For multiple pipe installation, the distance between centerlines of pipe shall be sufficient to permit proper compaction by either hand or mechanical method.

*29. WATER: The Contractor shall be responsible for obtaining a water source, particularly whether sloughs can be utilized because of wetland agreements or other considerations.

30. WELLS: The wells shall be backfilled in accordance with Sec. 202 of the Standard Specifications. Sta. 718+06 Rt., 718+40 Rt., 734+65 Rt., 735+26 Rt., 970+39 Rt.

31. DEMOLISH & REMOVAL OF BUILDINGS: The Contractor shall remove or demolish buildings and foundations in accordance with Sec. 202 of the Standard Specifications. Cost shall be included in price bid for other items. Sta. 736+35 to 739+30 Rt.

32. Prior to disposal, the Project Engineer shall contact the local health officer or State Health Department to determine if rodents are present. If rodents are present, a qualified Pest Control operator will be employed. The Project Engineer will submit a written report to the Right-of-Way Division when this has been done.

33. AGGREGATE BASE COURSE (Selective Grading Sec.): 4" of Aggregate Base Course to be placed on full graded sections to accommodate traffic. Final aggregate base course to be added in conjunction with bituminous base operation.

34. BARRICADES: Where Barricades (Type III) require Road Closed Sign (CR-88-48), cost of sign to be included in price bid for Barricades.

35. RAILWAY INSURANCE: The Contractor shall be required to furnish R.R. Protection Insurance for this project in accordance with S.P. 70. (If Borrow Area B-59 is used.)

36. RAILROAD FLAGGING: The Contractor will reimburse the Highway Department for the actual cost of railroad flagging. Railroad flagging is not a separate pay item, but shall be included in the price bid for Borrow. Approximate rate is $10.00 per man hour. Haul operations across the Burlington Northern will require flagging. A minimum of 3 flagpersons will be required at each railroad crossing. 48 hour advance notice will be required. Contact Supervisor George Ras, Stanley, North Dakota. Phone No. 628-2848 or 628-2902.

37. MUCK AREAS: Sta. 81+90 to 89+20, 92+50 to 95+50, 98+20 to 100+30, 271+00 to 272+30, 273+60 to 275+10, 667+70 to 672+50 Those areas where muck is removed shall be backfilled with foundation fill to existing water level. The material removed by muck excavation shall be placed in the berm area on the proposed embankment at the approximate stations shown on the plan and profile sheets, where it can be spread to the desired berm section after construction of the subgrade embankment. Additional payment for spreading and shaping muck excavation will not be made, but the cost shall be included in the price bid for muck excavation.

38. SUBCUT ROAD CROSSINGS: When crossing a section line or other road, subcut down to ditch grade and transition each end beyond toe of existing inslope.

39. CONCRETE PLUG: The cost of 24" precast concrete plug with handling ring to be included in the price bid for culverts to be used with all ℄ Tee-Sections.

40. VERTICAL PANELS: Vertical panels shall be installed at the edge of each driving lane in the widened construction areas as directed by the Engineer. Estimated quantities is based on post spacing of 200'. As construction progresses, the vertical panels shall be removed and remain the property of the Contractor. Standard vertical panels will be required.

41. CULVERT REMOVAL: No payment will be made for removal of culverts damaged by the Contractor in the removal operation. If end sections are in place on the culvert to be removed, measurement will be made to the nearest linear foot between outside ends of the end section. End sections will not be measured separately, but will be considered as part of the culvert.

42. INLET & OUTLET DITCH: Engineer in the field shall obtain original and final cross sections of inlet and outlet ditch construction areas and also adjust alignment and gradient if necessary.

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	ND	F-7-002(08)	5

43. ROAD CONNECTION (To Old U.S. No. 2): Sta. 674+50 Lt. The Engineer in the field to shift road connection further west if possible and adjust curve.
Engineer also to obtain original and final cross sections and adjust gradient of connection if necessary.

44. CULVERT INSTALLATION: Where new culverts are to be installed through present roadway (widened sections), the present surfacing will be removed and trench cut to accommodate new culvert installation. The top 12" of backfill shall be a bituminous base material approved by the Engineer. Cost of backfill shall be included in price bid for other items.

45. MISSILE CABLES: Missile cables shown on the plans have been lowered to the required depth and location requested by the utilities engineer. The lowering of the missile cable was done in the year of 1977.

46. ORIGNINAL & FINAL CROSS SECTIONS: Engineer in the field shall obtain original and final cross sections where additional R/W has been acquired for approaches and service roads and there are no cross sections included in the plans. The gradients and alignments of these approaches and service roads to be adjusted if necessary.

47. AGGREGATE SURFACE COURSE: Gravel surfacing to be placed on all mainline locations where traveled roads will cross. Gravel surfacing will also be placed on mainline at the following location to accommodate local traffic. 445+76.5 to 680+50 M.L., also any other locations deemed necessary by the field engineer.

48. RELAY PIPE: Required corrugated steel connecting bands for Relay Pipe shall be furnished by the Contractor. Cost to be included in price bid for other items.

49. PLAN DIMENSIONS: Thicknesses shown on the typical sections for surfacing are approximate. It is intended that the plan tonnages provided for by the Basis of Estimate will be used uniformly throughout the project, unless otherwise authorized by the Engineer.

50. REMOVAL OF FOUNDATIONS: Foundations encountered within the R/W shall be removed in accordance with Sec. 202 of the Standard Specifications.

51. PRIME, FOG OR TACK COAT: When directed by the Engineer, Emulsified Asphalt for Prime, Fog or Tack Coat shall be diluted with water prior to application in a 50:50 ratio or other approved proportions. Quantity shown does not include water. Cost of water shall be included in the price bid for Emulsified Asphalt for Prime, Fog or Tack Coat.

52. EXCAVATION: Excavate, if necessary, at all points where existing pavement is met to allow placement of the full depth of surfacing course. Excavation not a pay item, to be considered incidental to other items.

53. TEMPORARY STRIPING: (Item 776) Reflectorized tapes for temporary striping shall be applied as a twelve inch minimum length strip at intervals of not more than forty (40) feet. The color for reflectorized tape or pavement marking shall be yellow.

54. GRADE OF BITUMEN: Grade of bitumen for prime and fog coat to be specified by the Engineer.

55. AGGREGATE BASE COURSE: Depth of aggregate base course, exceeding 6" will be placed in two (2) lifts.

56. CH. CH. STA. 255+75 RT.: In areas of channel bottom that are not designated for loose Rock Rip Rap, rock will be randomly placed to cover approx. 30% of Channel bottom. Diameter of rock used will be approx. 12" to 18". Rock for above operation will be included in Loose Rock Riprap Quantities.

57. REMOVAL OF BUILDINGS: The owners and purchasers of buildings that are located within the R/W limits that are to be removed have until June 19, 1978, to remove them. Buildings that remain, shall be removed by the Contractor and will be paid for in accordance with Sec. 109-5 of the Standard Specifications.

58. ADDITIONAL EXC: Sta. 712+28 to 993+24.3 5% additional excavation has been added to Excavation and Embankment quantities and shall be obtained from the Borrow Areas, or within the right-of-way limits.

59. SPECIFIED DENSITY: Hot Bit. Pavement shall be compacted in accordance with Sec. 406-4.8.2 of the Standard Specifications.

*Indicates notes which pertain to the Structural Contract.

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	ND	F-7-002(08)	6

SPECIAL PROJECT CONSIDERATIONS

The following notes are a summary of special considerations which relate to environmental and other project features. These notes are furnished for informational purposes only to both the Engineer and the Contractor. They do not modify the plans, specifications or special provisions for the project. The Construction Division will consult with the Design Division as to any possible field changes regarding these items or locations.

1. Muck Excavation Berms as indicated on the Plans.
2. Sta. 255+75 Rt. (3) Pool areas and random placing of field rock has been provided for on Ch. Ch. location.
3. Wetland block in Lt. ditch, Sta. 376±.
4. Maintain existing ditch elevation on Lt. side, Sta. 405±.
5. Wetland dike constructed on Rt. side, Sta. 446+00 to 448+00.
6. Retain wetland on Rt. side, Sta. 462±.
7. U.S. No. 2 Connection, Sta. 674+50 Lt. to be shifted west to minimize filling of wetland.
8. Wetland block on Lt. side, Sta. 852±.
9. Wetland blocks Bk. & Ahd. of ℄ culvert Lt. side, Sta. 857+50.
10. Retain existing elevation of Ditch Rt. side, Sta. 980+00.
11. Wetland Blocks to be installed at the following locations:

99+00 Lt.	531+00 Lt.	810+00 Lt.
101+00 Lt.	537+00 Lt.	825+00 Lt.
352+00 Lt.	541+00 Lt.	835+00 Lt.
358+00 Lt.	556+00 Lt.	861+00 Lt.
378+00 Lt.	766+00 Lt.	888+00 Lt.
452+00 Lt.	779+00 Lt.	896+00 Lt.
456+00 Lt.	788+00 Lt.	907+00 Lt.
515+00 Lt.	790+00 Lt.	919+00 Lt.
520+00 Lt.	794+00 Lt.	
528+00 Lt.	808+00 Lt.	

12. If other, wetlands are encountered, precautions should be taken to prevent drainage.
13. S.P. 726-14 Special Seed Mixture will be included.
14. Std. D-900-20, Temporary Erosion & Siltation Controls will be included.
15. Two (2) 48" RCP Culverts will be installed at approx. Sta. 251+35 ℄ and 264+50 ℄ to allow water to flow between White Earth River and cut off segment of natural channel.

The Contractor will be required to conduct his activities in such a manner as to comply with the Air Pollution Control Regulations of the State of North Dakota. Water will be used to control dust on the construction site and also on any haul roads. The Contractor will be required to comply with the North Dakota State Highway Department's Standard Specifications an any Special Provisions that are considered necessary to adequately control erosion.

The Contractor will be required to conduct its activities in such a manner so as to be in compliance with the Standards of Surface Water Quality for the State of North Dakota.

Wetlands beyond the limits of the slope stakes shall not be filled or drained. Slope stakes may be adjusted for grade changes necessary to accommodate construction.

If any scientific or historical information is encountered after construction is in progress the Highway Department will immediately notify the Historical Society and efforts will be made to protect the material until it has been examined by an archaeologist from the Historical Society.

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
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SUMMARY OF QUANTITIES (SURFACING)

				CONTRACT 2					CONTRACT 1			
Spec. No.	Code No.	Description	Unit	Wid. Portion 184.7 Sta.	Grad. Portion 138.5 Sta.	Sec. Line App. to R/W		P.D. Apprs.		Wid. Portion 0+00-16+00	Total Contract 1	Total Contract 2
216	0100	Water	M Gal.	209	706	36		6 *1		18	18	957
302	0120	Aggr. Base Crse., Cl. 5	Ton	10417	28694	1887		300 *20		902	902	41298
401	0100	MC-70, 250 Liq. Asph. (Prime)	Gal.	21610	40936	3383		525 *35		1872	1872	66454
401	0160	Blotter Material, Cl. 44	Ton		241							241
406	0185	Hot Bit. Pavement, Cl. 24	Ton		5386							5386
406	0320	120-150 Asph. Cement	Ton		307							307
776	0100	Temp. Striping	Mi.		3.2							3.2
401	0152	SS-1h or CSS-1h Emuls. Asph. (Prime & Tack)	Gal.	1108	2539							3647
401	0100	MC-70, 250 Liq. Asph. (Fog)	Gal.		2308							2308
401	0160	Blotter Matl., Cl. 44 (Fog Coat)	Ton		110							110

(*P.D. Contr. #1)

SUMMARY OF QUANTITIES (STRUCTURAL)

Spec.	Code	Description	Unit	Sta. 211+53	Total
203	0101	Common Excavation	CY	8268	8268
208	0100	Class I Excavation	CY	103	103
208	0110	Class 2 Excavation	CY	112	112
208	0120	Class 3 Excavation	CY	6622	6622
228	0100	Select Backfill	CY	207	207
602	0130	Cl. AAE-3 Concrete	CY	152.7	153
602	1110	Cl. AE-1 Concrete	CY	168.6	169
604	9600	21"x36" Prestressed Box Beam (15 @ 35'-8")	LF	535	535
612	0115	Reinf. Steel (Gr. 60)	Lbs.	27986	27986
612	0116	Reinf. Steel (Gr. 60) Epoxy Ctd.	Lbs.	15311	15311
616	7000	A-36 Steel Rolled	Lbs.	1453	1453
622	4630	Treated Timber Piling (37 @ 35') (16 @ 40')	LF	1935	1935
622	5360	Treated Timber Test Piling (1 @ 45') (2 @ 55')	LF	155	155
702	0130	Loose Rock Rip Rap	CY	591	591
705	0100	Mobilization	L Sum	1	1
750	0100	Linseed Oil Treatment	Gal.	8	8
900	3000	Bridge Bench Marks	Set	1	1
756	0100	Field Laboratory, Type A	Ea.	1	1
216	0100	Water	M Gal.	149	149

ITEM REVISION	DATE	FED. AID PROJ. NO.	SHEET NO.
8	ND	F-7-002(08)	11

SUPPLEMENTAL SPECIFICATIONS & SPECIAL PROVISIONS

GRADING

SP 102-1	Bidding Requirements & Conditions
SS 107-1	Legal Relations & Responsibility to Public
SP 107-2	Legal Relations & Responsibility to Public
SS 203-2	Excavation & Embankment
SS 406-1	Hot Bituminous Pavement
SP 762-3	Maintenance & Protection of Traffic
SP 726-14	Special Seed
SP	Trainee
SP	Borrow Area List (Contract #2)
SP-12	Haul Road
SP-70	Railway Protection Insurance (Contract #2)

STRUCTURAL

SP 102-1	Bidding Requirements & Conditions
SS 107-1	Legal Relations & Responsibility to Public
SP 107-2	Legal Relations & Responsibility to Public
SP 82	Epoxy Coated Reinforcing Steel
SS 610-1	Portland Cement Concrete
SS 610-2	Portland Cement Concrete
SP 806-1	Aggr. P.C.C. Conc. (Struct.)

BASIS OF ESTIMATE (GRADING)

Water for Compaction:

10 Gal. per C.Y. of Embankment Quantity
20 Gal. per Ton of Aggregate Base Course

Foundation Fill:

Volume + 25%

Seeding:

Entire R/W and construction areas in easements except top of roadbed

Topsoil:

Topsoil shall be removed from the entire construction area max. 6" deep. Removal of topsoil from excavation areas will be paid for as Common Excavation, Type A. Removal of topsoil from embankment areas will be included in the price bid for Clearing & Grubbing. Topsoil from muck areas will be paid for as Muck Excavation.

Temporary Cover Crop:

50% of Permanent Seeded Areas

Aggregate Surfacing:

Cl. 5 1.5 Ton/C.Y. + 25%
43.4 Ton/Sta. for ℄ & Road Appr. Xings.
43.4 Ton/Sta. for Mainline (Sta. 445+00 to 684+50)
54.0 Ton/Sta. for White Earth Road

Fiberglass Roving:

Fiberglass Roving = 0.30 Lbs./S.Y.
Bit. for Fiberglass Roving = 0.30 Gals./S.Y.

STATE	DIST	FED AID PROJ NO	SHT NO
8	ND	F-7-002(08)	32

BENCH MARKS

No	DESCRIPTION	LOCATION	ELEV
22	Paint Spot on Rock	180+58 - 78' Lt	2157.41
23	Paint Spot on Rock	188+62 - 58 Lt	2109.71
24	Paint Spot on Rock	193+14 - 32 Rt	2076.50
25	Iron Pin 2x2 Brass	193+09 - 01 Lt	2051.54
26	Iron Pin 2x2 Brass	207+74 - ℄	2052.25

INSTALL PIPE CULVERTS

180+50 ℄ 24" x 86' R.C.P CL. III 2-R.C.E.S.

INSTALL CONDUIT PIPE

185+00 LT. 24" X 57'
202+00 RT 18" X 45'
202+00 LT. 24" X 47'

INSTALL BARRICADES

184+50 ℄ TYPE III 1 EA. (1-CR-88-48)
185+50 ℄ TYPE III 1 EA. (1-CR-88-48)

INSTALL LOOSE ROCK RIPRAP

180+50 RT. 144 C Y

INSTALL FIBERGLASS ROVING

180+00 TO 188+00 LT 1200 LBS.
180+00 TO 181+75 RT. 73 LBS.
184+75 TO 186+75 RT. 180 LBS.

INSTALL LIQ. BIT. FOR FIBERGLASS ROVING

180+00 TO 188+00 LT. 1200 GALS.
180+00 TO 181+75 RT. 73 GALS.
184+75 TO 186+75 RT. 180 GALS

INSTALL R/W MARKERS

183+25	RT.	1 EA.
183+32	LT	1 EA.
183+63	RT.	1 EA.
184+32	LT	1 EA.
185+64	RT	1 EA.
186+38	LT.	1 EA.
186+53	RT.	1 EA.
188+90	LT.	1 EA.
196+00	LT & RT	2 EA.
206+22.1	LT & RT.	2 EA.
208+22.1	LT. & RT.	2 EA.

Sec 22
Twp 156 N
Rge 98 W

145 Temp Slope Esmt
180 DB
75
175'
52'
DB
200
Rip Rap
Barricade
Temp Const Esm't
Const Limits 85' Rt Med ℄
C L 130' Rt
175'
End Climbing Lane 187+00 to 188+50 Lt. Transition (7:1)
Sec 22
100
175'
205
210
TS 202+45 Iron Pin (Found)
SC 203+45 Iron Pin (Found)
500' S D Δ Lt
300' S D Δ Rt
100 100 100'
Safe Passing Sect
3200' Min Sight Dist.

Topsoil Exc 4267 C Y
Subcut Exc 9927 C Y (7328 C Y Coal) (Use)*
Exc 179320 C Y (61554 C Y White Earth Rd & 21701 C Y Coal (Use)*
Emb 127693 C Y
Cl & Gr 4847 C Y
Ave Haul = 10.16 Sta. (176472 C Y)

197+69

* Coal to be used in Emb as shown by Typ. Sect.

Topsoil Exc 1246 C Y
Exc 2262 C Y
Ch. Ch. Exc. 14890 C.Y. (Struct. Contract)
Emb. 17152 C.Y. (14890 C.Y. X Str. Cont.)
Cl. & Gr. 2645 C.Y.
Ave. Haul = 7.49 Sta. (14880 C.Y.)

180+75 Lt. & Rt.
Constr. Ditch Blocks

180+50 Rt.
Constr. Outlet Ditch

185+00 Lt & Rt
Const Type "A"
Flared Intersections

In Lt 175'
Out Rt 165

-3.977%

Sub 2'
Exc. 1134 C.Y.

+50'

181+00

180+50 ℄
24" x 86' RCP
2-24" RCES

P.I 197+35
El 2055.5
V C 900'

202+00 Lt & Rt
475 C Y Prov for P D Apprs

0.0%

NOTE
Use Waste Coal Slack in Berms
Sta 182+50 to 184+50 Rt.
Sta 181+50 to 196+00 Lt. & Rt

2160 2150 2140 2130 2120 2110 2100 2090 2080

2100 2090 2080 2070 2060 2050 2040 2030

180 1 2 3 4 185 6 7 8 9 190 1 2 3 4 195 6 7 8 9 200 1 2 3 4 205 6 7 8 9 210

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	ND	F-7-002(08)	34

BENCH MARKS			
NO	DESCRIPTION	LOCATION	ELEV
27	Point Spot on Rock	213+52 - 187 Lt	2071.67
28	Iron Pin by Fn	223+22 - 99 Rt	2044.44
29	Iron Pin by Fn	237+30 - 101 Lt	2049.69

INSTALL BRIDGE

211+53 ℄ (PRESTRESSED BOX BEAM)

INSTALL PIPE CULVERTS

233+25 ℄ 30" X 94' R.C.P. CL II 2-R.C.E S

INSTALL CONDUIT PIPE

222+00 LT. 18" X 45' C S.P.

Δ=14°49'30" Lt
D=1°00' 2-200 Ap
Xc=116'
Yc=189.99'
Ro=1°00'
TS=835.58'
L=1282.50'
R=5729.65'
SE=0.029 ft/ft

INSTALL REINF. CONC. BAFFLE RINGS

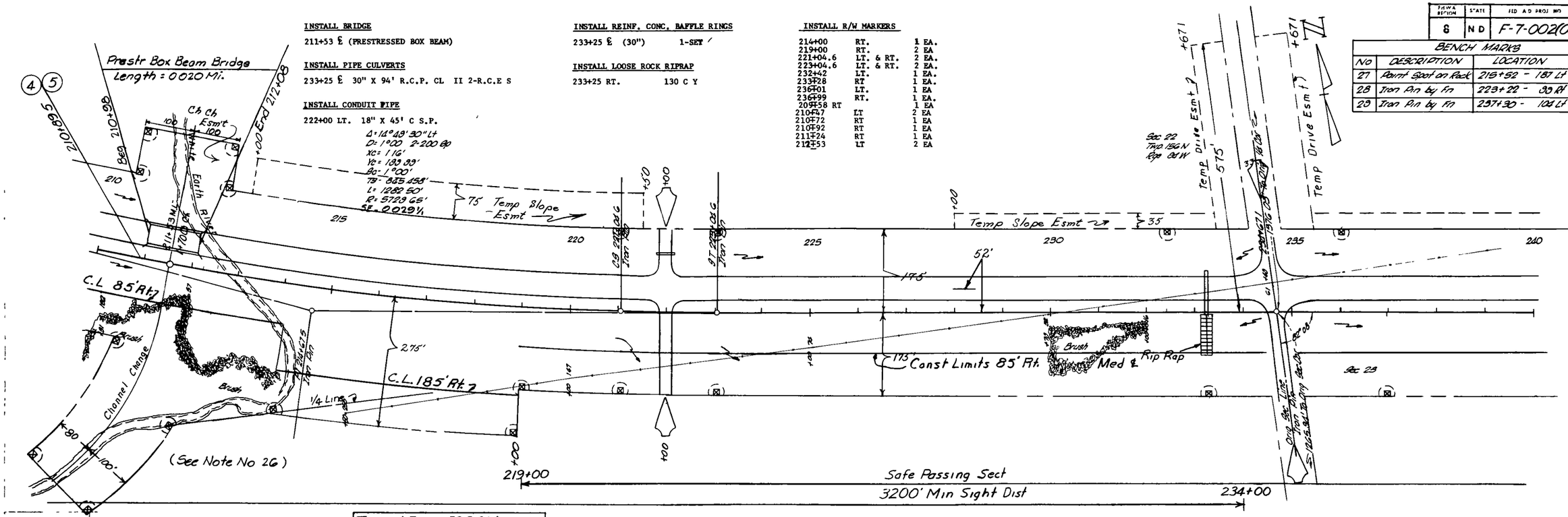
233+25 ℄ (30") 1-SET

INSTALL LOOSE ROCK RIPRAP

233+25 RT. 130 C Y

INSTALL R/W MARKERS

214+00	RT.	1 EA.
219+00	RT.	2 EA
221+04.6	LT. & RT.	2 EA.
223+04.6	LT. & RT.	2 EA.
232+42	LT.	1 EA.
233+28	RT	1 EA.
236+01	LT.	1 EA
236+99	RT.	1 EA.
209+58 RT		1 EA
210+47	LT	2 EA
210+72	RT	1 EA
210+92	RT	1 EA
211+24	RT	1 EA
212+53	LT	2 EA

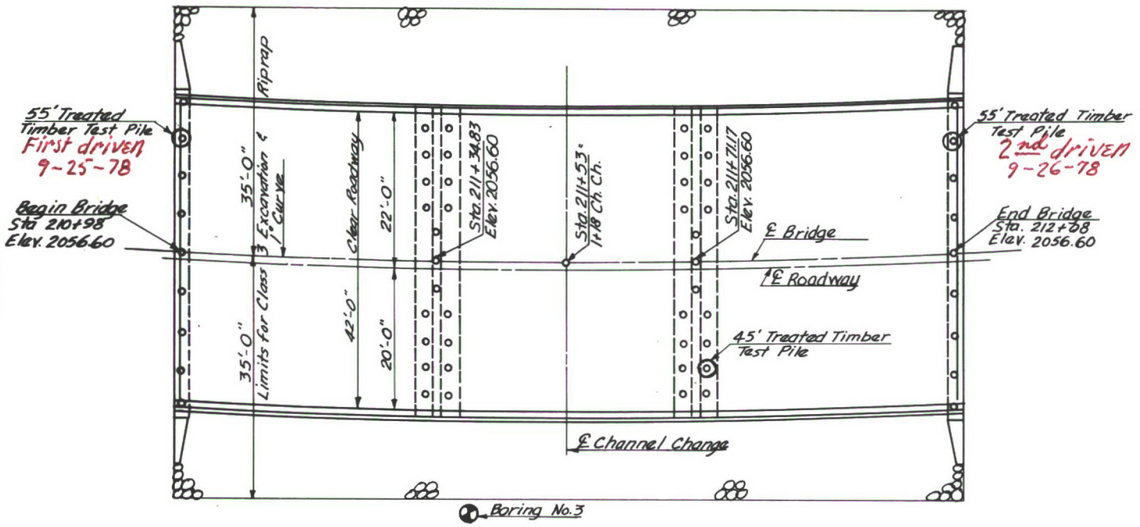


NOTE: Excavation Quantities shown are total Quantities 14890 C.Y. of this total has been deducted from the Grading Contract and included in the Structural Contract. 3300 C Y of topsoil shall be removed and stockpiled cost of handling topsoil to be included in the Price bid for Excavation Cl. Cl removal by Struct Contract.

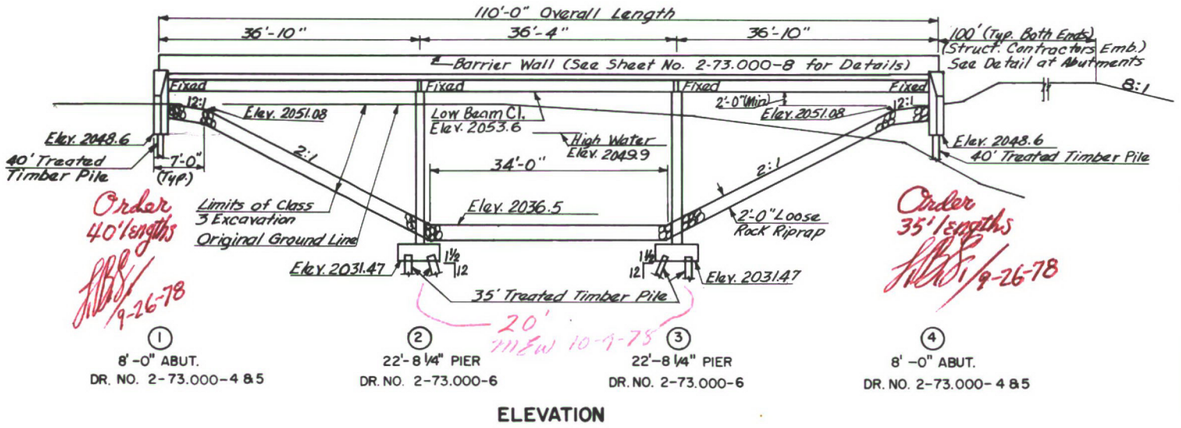
PLAN

BRIDGE CODE	FED ROAD DIST NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
X-081	5	N. D.	F-7-002( ) 069	94	

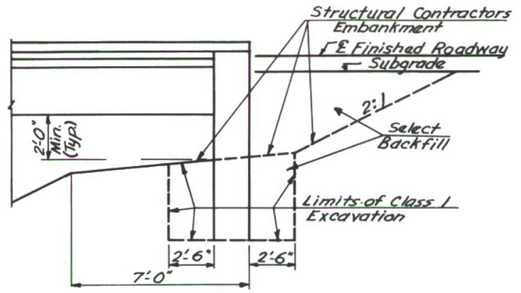
	CHECKED BY	MADE BY
TOPOGRAPHY		WJC
DETAILS		LAS
TRACING		WAB
QUANTITIES		WAB



PLAN



ELEVATION

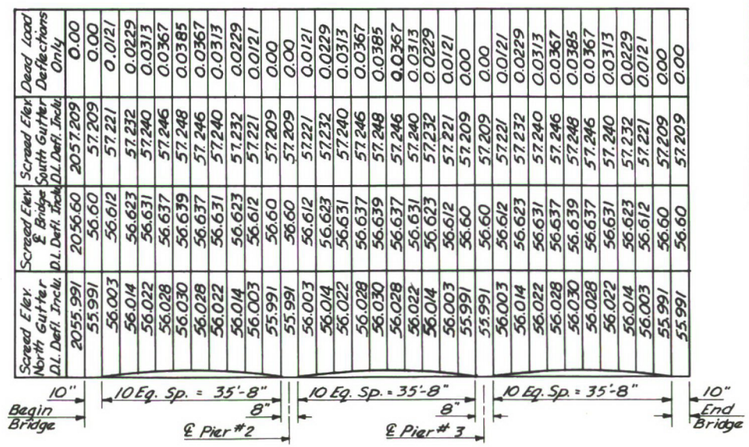


DETAIL AT ABUTMENTS
Not to Scale

P.I. Sta. 214+67.5
Δ = 14°49'30" Lt
D = 1°00', 2-200' Sp.
XC = 1.15'
SC. = 1°00'
T.S. = 865.458'
L = 1282.50'
R = 5729.65'
S.E = 0.0291'

HORIZONTAL CURVE DATA

Dead Load Deflections Only	Screed Elev. South Gutter D.L. Defl. Incls.	Screed Elev. ℄ Bridge D.L. Defl. Incls.	Screed Elev. North Gutter D.L. Defl. Incls.
0.00	2057.209	2056.60	2055.991
0.00	57.209	56.60	55.991
0.0121	57.221	56.612	56.003
0.0229	57.232	56.623	56.014
0.0313	57.240	56.631	56.022
0.0367	57.246	56.637	56.028
0.0385	57.248	56.639	56.030
0.0367	57.246	56.637	56.028
0.0313	57.240	56.631	56.022
0.0229	57.232	56.623	56.014
0.0121	57.221	56.612	56.003
0.00	57.209	56.60	55.991
0.00	57.209	56.60	55.991
0.0121	57.221	56.612	56.003
0.0229	57.232	56.623	56.014
0.0313	57.240	56.631	56.022
0.0367	57.246	56.637	56.028
0.0385	57.248	56.639	56.030
0.0367	57.246	56.637	56.028
0.0313	57.240	56.631	56.022
0.0229	57.232	56.623	56.014
0.0121	57.221	56.612	56.003
0.00	57.209	56.60	55.991
0.00	57.209	56.60	55.991
0.0121	57.221	56.612	56.003
0.0229	57.232	56.623	56.014
0.0313	57.240	56.631	56.022
0.0367	57.246	56.637	56.028
0.0385	57.248	56.639	56.030
0.0367	57.246	56.637	56.028
0.0313	57.240	56.631	56.022
0.0229	57.232	56.623	56.014
0.0121	57.221	56.612	56.003
0.00	57.209	56.60	55.991
0.00	57.209	56.60	55.991



SCREED ELEVATIONS
Not to Scale

SPECIAL PROVISIONS

NO.	NAME
82	EPOXY COATED REINFORCING STEEL

ESTIMATE OF QUANTITIES

CODE NO.	SPEC. NO.	BID ITEM		
0101	203	COMMON EXCAVATION	8268	CU. YD.
0100	208	CLASS 1 EXCAVATION	103	CU. YD.
0110	208	CLASS 2 "	112	CU. YD.
0120	208	CLASS 3 "	6622	CU. YD.
0180	228	SELECT BACKFILL	207	CU. YD.
0130	602	CLASS AAE-3 CONCRETE	152.7	CU. YD.
1110	602	CLASS AE-1 CONCRETE	168.6	CU. YD.
9600	604	21" X 36" PRESTRESSED BOX BEAMS (15 @ 35'-8")	535	L. F.
0115	612	REINFORCING STEEL-GRADE 60	27986	LBS.
0116	612	REINFORCING STEEL-GRADE 60 (EPOXY COATED)	15311	LBS.
7000	616	A-36 STEEL-ROLLED	1453	LBS.
4630	622	TREATED TIMBER PILING 37 @ 35', 16 @ 40'	1935	L. F.
5360	622	TREATED TIMBER TEST PILING 1 @ 45', 2 @ 55'	155	L. F.
0130	702	LOOSE ROCK RIP RAP	591	CU.YD.
0100	705	MOBILIZATION	1	L. SUM
0100	750	LINSEED OIL TREATMENT	8	GAL.
3000	900	BRIDGE BENCH MARKS	1	SET

BENCH MARKS

NO.	DESCRIPTION	LOCATION		ELEV.
25	Iron Pin 2x2 Gds.	194+09	1'-Lt	2051.54
26	Iron Pin 2x2 Gds.	207+74	℄	2052.25
27	Paint Spot on Rock	215+52	187' Lt	2071.67
28	Iron Pin by Fence	223+22	99' Rt	2044.44

PILE LOADING

LOCATION	DEAD LOAD + EARTH	LIVE LOAD	DRAW DOWN	DESIGN LOAD	MAXIMUM REQ'D BEARING	MINIMUM PENETRATION
Abut. 1&4	15.4 T.	7.5 T.		22.9 T.	24.0 T.	30'
Pier 2&3	16.0 T.	7.3 T.		23.3 T.	24.0 T.	15'

STRUCTURAL DRAWINGS

GENERAL DRAWING (This Sheet)	2-73.000-1, 2 & 3
SUBSTRUCTURE	2-73.000-4, 5 & 6
SUPERSTRUCTURE	2-73.000-7 & 8, H-501, H-7002, D-900-1

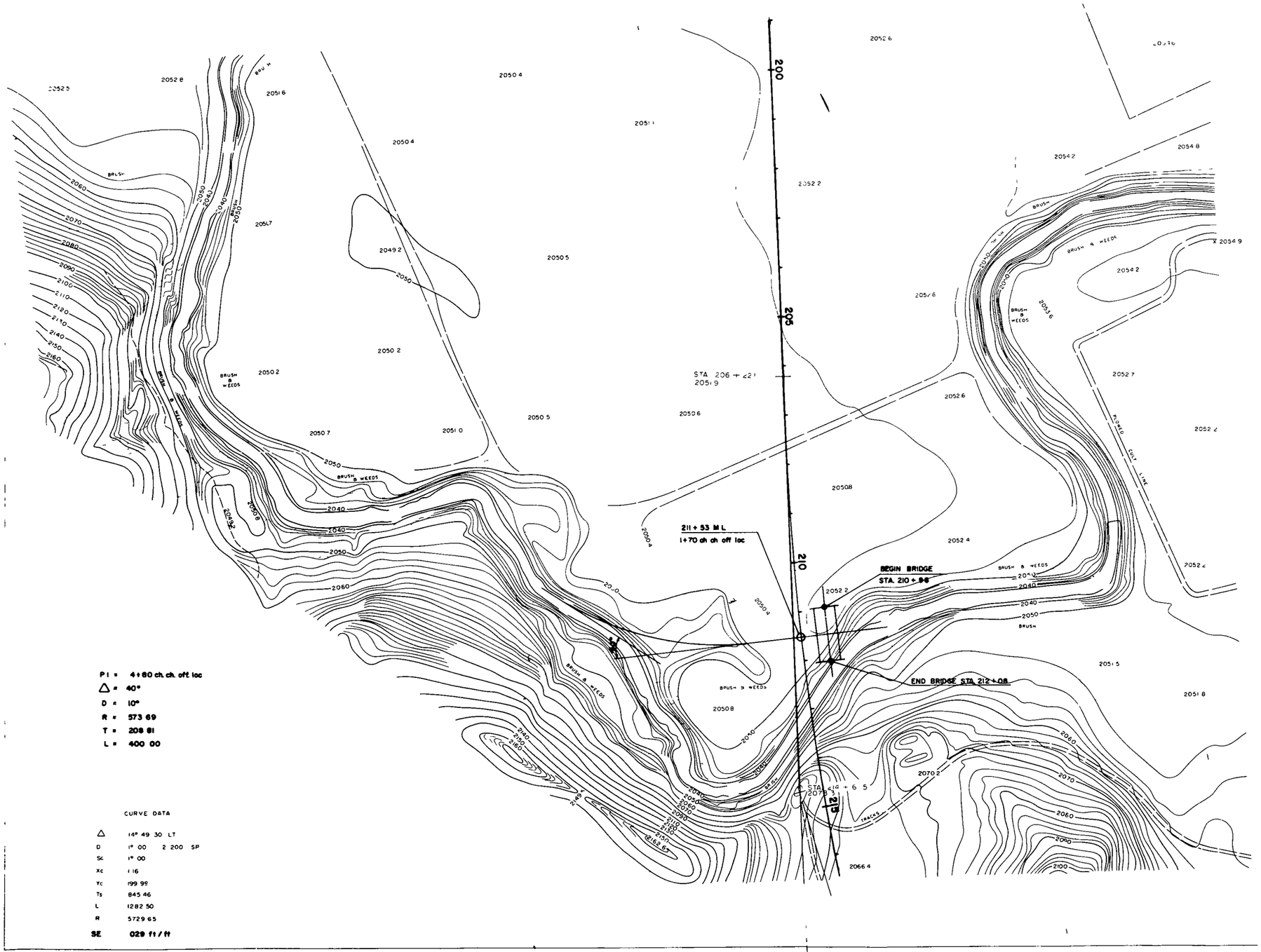
DESIGN LOADING	SCALE
HS20	1 INCH = 10 FEET

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
WHITE EARTH RIVER
BRIDGE LAYOUT
PROJECT F-7-002(08)069 STA. 211+53
MOUNTRAIL COUNTY

APPROVED
7-3-17
DATE
BRIDGE ENGINEER

2-73.000

8	N D	F 7 002(08)	95



HYDRAULIC DESIGN DATA

DRAINAGE AREA	328 SQ MI
DESIGN FREQUENCY	50 YEAR
DESIGN DISCHARGE	3900 CFS
DESIGN STAGE	2049 9
STREAM GRADIENT	000723 FT/FT
WATERWAY PROVIDED BELOW DESIGN STAGE	841 SQ FT
WATERWAY PROVIDED BELOW CLEARANCE	297 SQ FT
AVERAGE VELOCITY OF FLOW IN NATURAL CHANNEL	4 66 FPS
DEPTH OF FLOW	13 7 FT
VELOCITY OF FLOW UNDER BRIDGE	4 64 FPS
FREEBOARD PROVIDED	3 8 FT
100-YEAR FREQUENCY DISCHARGE	4719 CFS
100-YEAR FREQUENCY STAGE	
MINIMUM WATER ELEVATION	NO FLOW AT SOME TIMES

PREPARED FOR NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

BISMARCK, N. D.

BRIDGE SITE

F-7-2(2)69
MOUNTRAIL CO.
WHITE EARTH VALLEY
Scale 1 100

Contour Interval 2

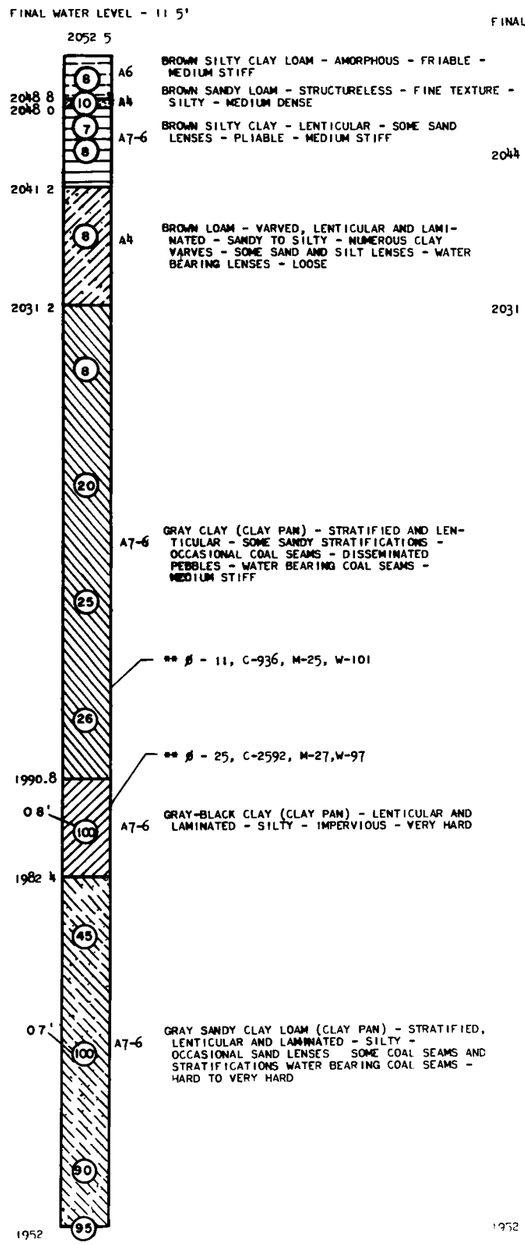
TOPOGRAPHIC SURVEY
by
A E KNIGHT PHOTOGRAMMETRY

Compiled by Photogrammetric Means

2-73.000-1

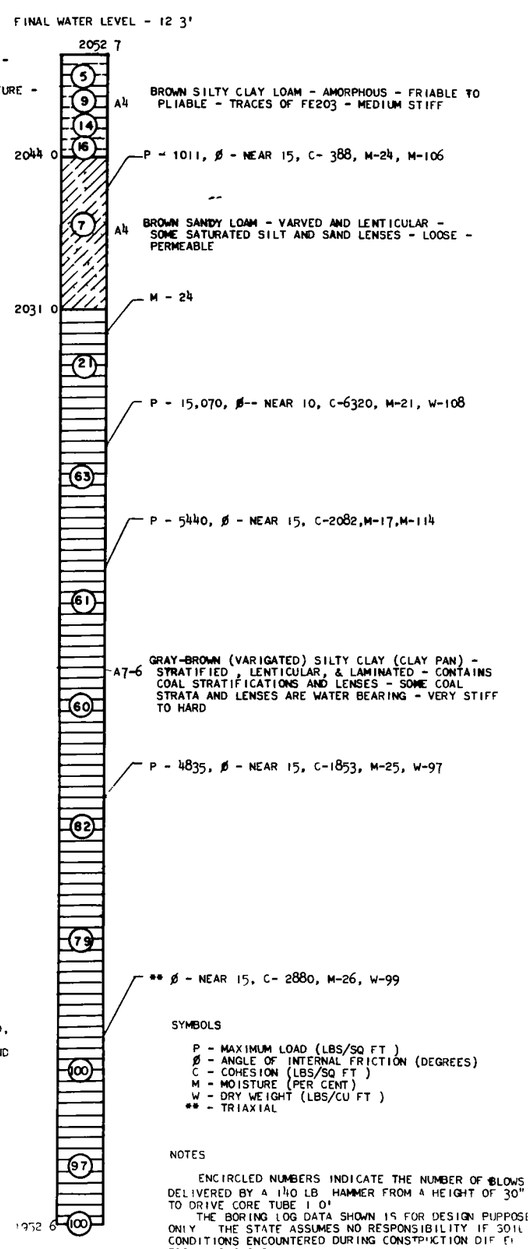
FED ROAD DIST NO	STATE	PROJ NO	SHEET NO	TOTAL SHEETS
5	N D	F 7002( )069	96	

TRACING CHECKED BY
QUANTITIES CHECKED BY



BORING NO 1

STA 210+35-15' LT of Surv ℄



SYMBOLS

P - MAXIMUM LOAD (LBS/SQ FT)
ø - ANGLE OF INTERNAL FRICTION (DEGREES)
C - COHESION (LBS/SQ FT)
M - MOISTURE (PER CENT)
W - DRY WEIGHT (LBS/CU FT)
** - TRIAXIAL

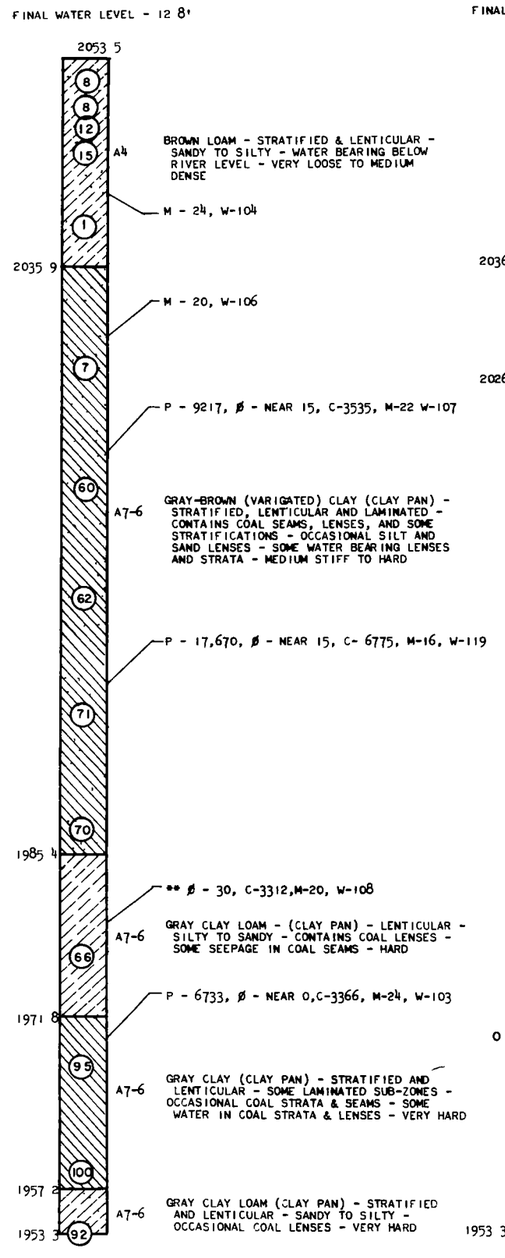
NOTES

ENCIRCLED NUMBERS INDICATE THE NUMBER OF BLOWS DELIVERED BY A 140 LB. HAMMER FROM A HEIGHT OF 30" TO DRIVE CORE TUBE 1 0'

THE BORING LOG DATA SHOWN IS FOR DESIGN PURPOSES ONLY THE STATE ASSUMES NO RESPONSIBILITY IF SOIL CONDITIONS ENCOUNTERED DURING CONSTRUCTION DIFFER FROM THOSE SHOWN

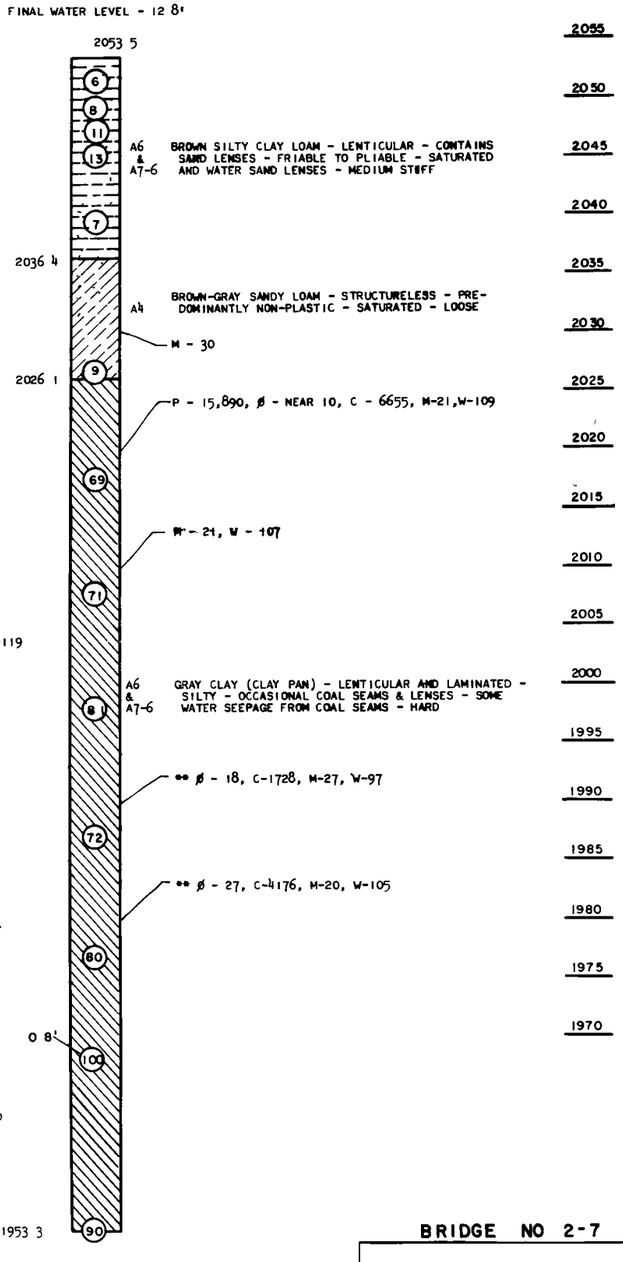
BORING NO 2

STA 210+81-15' RT of Surv ℄



BORING NO 3

STA 211+39-15' LT of Surv ℄



BORING NO 4

STA 211+85-15'RT of Surv ℄

BRIDGE NO 2-7

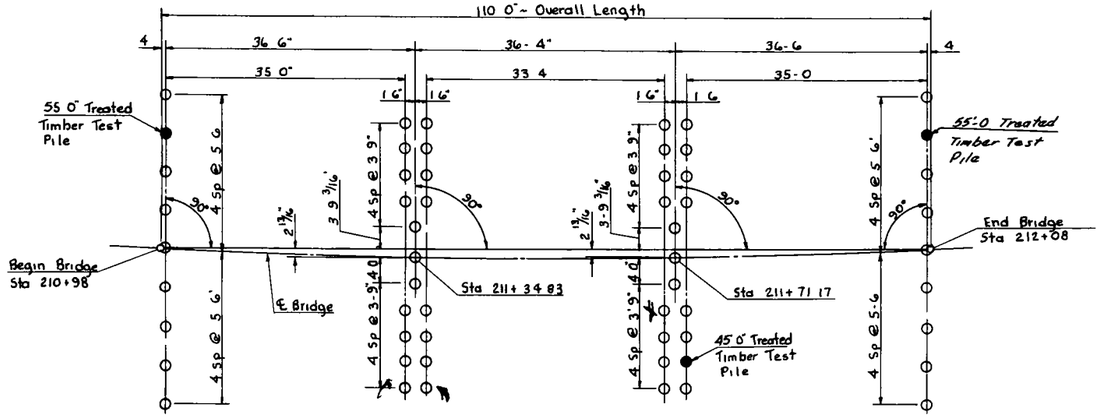
BORING LOG

WHITE EARTH RIVER

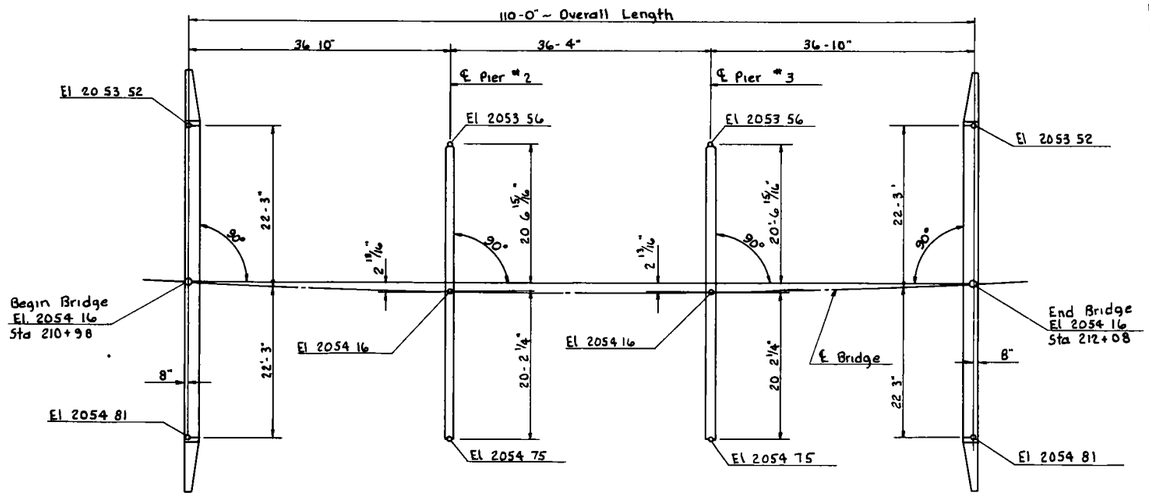
MOUNTRAIL COUNTY

2-73.000-2

FED. ROAD DIST. NO.	STATE	PROJ. NO	SHEET NO	TOTAL SHEETS
8	N D	F 7002( )069	97	



PILING LAYOUT
(Not to Scale)



ABUTMENT & PIER CAP ELEVATIONS
Elevations are to top of finished concrete
(Not to Scale)

1 GENERAL WORK SHALL CONFORM TO ALL APPLICABLE PARAGRAPHS OF THE NORTH DAKOTA STATE HIGHWAY DEPARTMENT SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTIONS

THE COST OF FURNISHING AND PLACING ASPHALT CURB SEAL, PREMOLDED JOINT FILLER, BAR SPACERS, BAR SUPPORTS, SCREED CHAIRS, THREADED INSERTS AND OTHER MISCELLANEOUS ITEMS SHALL BE INCLUDED IN THE PRICE BID FOR CLASS AE-1 AND AAE-3 CONCRETE

DEAD LOAD DEFLECTIONS HAVE BEEN ACCOUNTED FOR IN THE SCREED ELEVATIONS

2 CONCRETE THE "RUBBED SURFACE FINISH" WILL BE REQUIRED FOR THE EDGES OF SLABS, ALL FACES OF BARRIER WALL, AND ALL EXPOSED FACES OF ABUTMENT WINGS ALL OTHER SURFACES SHALL HAVE THE "ORDINARY SURFACE FINISH" ALL ORDINARY SURFACE FINISH SHALL BE COMPLETED WITHIN 24 HOURS AFTER THE REMOVAL OF FORMS THE CONTRACTOR HAS THE OPTION OF USING THE "SPECIAL SURFACE FINISH" AS PROVIDED IN SECTION 602-3 10 5 OF THE STANDARD SPECIFICATIONS IN LIEU OF THE "RUBBED SURFACE FINISH" (602-3 10 3) CALLED FOR ABOVE IF THE CONTRACTOR USED THE "SPECIAL SURFACE FINISH" ON THE OUTSIDE FACES OF SLAB, AND BARRIER WALL, THE OUTSIDE FACE OF THE PRESTRESSED FACIA GIRDER SHALL BE GIVEN THE SAME TREATMENT COST SHALL BE INCIDENTAL TO CLASS AAE-3 CONCRETE IF THE EXPOSED FACES OF THE ABUTMENT WINGS HAVE A SURFACE FINISH ACCEPTABLE TO THE ENGINEER WITHOUT RUBBING, THE REQUIREMENTS FOR RUBBED SURFACE FINISH MAY BE WAIVED AT THE OPTION OF THE ENGINEER AND THE ORDINARY SURFACE FINISH WILL APPLY

AIR-ENTRAINED PORTLAND CEMENT SHALL BE USED IN THE ENTIRE BRIDGE EXCEPT IN THE PRESTRESSED GIRDERS TYPE I, IS, II OR IS-MH-MS PORTLAND CEMENT SHALL BE USED IN THE PRESTRESSED GIRDERS ALL EXPOSED EDGES OF CONCRETE SHALL BE BEVELED WITH 3/4 INCH TRIANGULAR MOLDING UNLESS OTHERWISE NOTED

SUBSTRUCTURE CONCRETE SHALL BE CLASS AE-1 SUPERSTRUCTURE CONCRETE SHALL BE CLASS AAE-3

THE CONTRACTOR MAY SUBSTITUTE AE-3 CONCRETE FOR AE-1, BUT NOT AE-1 FOR AE-3 ANY SUBSTITUTION, HOWEVER, WILL BE AT THE CONTRACTOR'S EXPENSE AND CLASS OF CONCRETE PAID FOR WILL BE THAT CLASS SHOWN ON THE PLANS

3 CURING OF DECK SLAB CONCRETE THE WATER-SOLUBLE LIQUID MEMBRANE CURE (SECTIONS 550-4 13 2 1 AND 550-5 OF THE STANDARD SPECIFICATIONS) SHALL BE USED FOR CURING THE DECK SLAB CONCRETE A PROTECTIVE COVERING SHALL BE USED SO THAT LINSEED OIL IS NOT APPLIED TO AN AREA WITHIN THREE INCHES OF THE GUTTER LINE UNTIL AFTER THE ASPHALT CURB SEAL IS IN PLACE

4 LINSEED OIL TREATMENT LINSEED OIL TREATMENT SHALL NOT BE DONE UNTIL ALL CONCRETE WORK IS COMPLETED AND THE ASPHALT CURB SEAL HAS BEEN INSTALLED

ONLY ONE UNIFORM APPLICATION OF 015 GALLONS PER SQUARE YARD SHALL BE APPLIED TO THE DECK.

5 EXCAVATIONS ALL EXCAVATION AT THE ABUTMENTS SHALL BE CLASS I WITHIN THE SPECIFIED LIMITS (208-4 1 AND 208-4 1 1)

ALL EXCAVATION AT PIERS SHALL BE CLASS II AS SPECIFIED IN SECTION 208-4 1 AND 208-4 1 2 CLASS III EXCAVATION LIMITS SHALL BE AS SHOWN ON THE LAYOUT COMMON EXCAVTION SHALL BE OBTAINED FROM AREAS AS DIRECTED BY THE ENGINEER

6 EMBANKMENT THE EMBANKMENT SHALL CONSIST OF CLASS III EXCAVATION AND THE ADDITIONAL COMMON EXCAVATION AS REQUIRED, AND SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 203-2 3 2

7 BACKFILL BACKFILLING SHALL BE DONE IN ACCORDANCE WITH SECTION 228 AND 203-2 3 2 OF THE STANDARD SPECIFICATIONS THE SELECT BACKFILL SHALL NOT BE PLACED ABOVE THE BERM ELEVATION UNTIL THE ENTIRE SUPERSTRUCTURE SLAB HAS BEEN CURED

8 REINFORCING DIMENSIONS FOR REINFORCING STEEL BENT BARS ARE GIVEN OUT TO OUT UNLESS OTHERWISE NOTED THE BAR FABRICATOR SHALL ADD A PREFIX TO ALL BAR DESIGNATIONS TO DIFFERENTIATE BETWEEN THE SEVERAL PARTS OF THE STRUCTURE

THE TOP LAYER OF TRANSVERSE DECK SLAB REINFORCEMENT SHALL BE TIED DOWN WITH WIRE TIES TO THE PROTUDING SHEAR REINFORCEMENT OF THE PRESTRESS BEAMS

THE TIES SHALL BE INTERVALS OF 5 TO 6 FEET ALONG THE FULL LENGTH OF ALL BEAMS TO PREVENT THE SLAB REINFORCEMENT FROM RISING WHEN THE CONCRETE IS PLACED

THE TIES SHALL CONSIST OF A DOUBLE WRAP OF 14 GAGE WIRE (MINIMUM) (PLASTIC COATED)

9 COMMON EXCAVATION ALL EXCAVATION THROUGH THE CHANNEL CHANGE AND OUTSIDE THE LIMITS OF THE CLASS III EXCAVATION SHALL BE COMMON EXCAVAT ON AND SHALL BE THE RESPONSIBILITY OF THE STRUCTURAL CONTRACTOR

COMMON EXCAVATION SHALL EITHER BE STOCK PILED OR PLACED IN THE ROADWAY EMBANKMENT

IT IS ADVISED THAT THE STRUCTURAL CONTRACTOR EXCAVATE FROM THE OUTLET END OF THE CHANNEL CHANGE TO THE STRUCTURE TO LOWER THE HIGH WATER TABLE AND FACILITATE THE CONSTRUCTION OF THE BRIDGE PIERS.

10. PILING - THE PILING MAY BE DRIVEN IN ACCORDANCE WITH SECTION 622-4 1 17 BUT IN NO CASE SHALL THE FALL BE GREATER THAN 10 FEET.

THE ACTUAL ABUTMENT AND BENT PILING LENGTHS WILL BE DETERMINED BY THE ENGINEER AFTER THE RESULTS OF THE TEST PILES HAVE BEEN REVIEWED.

THE CONTRACTOR WILL BE REQUIRED TO DRILL HOLES FOR PILING AT THE EAST ABUTMENT THROUGH THE EMBANKMENT TO THE ELEVATION OF 2638.0 OR ORIGINAL GROUND.

ALL PILOT HOLES NOT COMPLETELY FILLED BY THE PILES SHALL BE BACKFILLED WITH SAND OR FINE GRAVEL BEFORE STRUCTURE IS PLACED.

11 DESIGN STRESSES.

F'C -- 4000 PSI	FC - 1600 PSI	CLASS AAE-3 CONCRETE
F'C - 3000 PSI	FC - 1200 PSI	CLASS AE-1 CONCRETE
F'Y -60000 PSI	FS -24000 PSI	GRADE 60 REINFORCING STEEL
F'C - 5000 PSI	FC - 2000 PSI	PRESTRESSED GIRDER CONCRETE

12 CONCRETE AGGREGATE: IN AREAS WHERE CLASS 3 AGGREGATE IS IMPOSSIBLE TO OBTAIN, CONTRACTOR MAY SUBSTITUTE CLASS 4 AGGREGATE FOR CLASS 3

13 STRUCTURAL STEEL SHOP DRAWINGS FOR ALL STRUCTURAL STEEL ITEMS SHALL BE SUBMITTED FOR APPROVAL IN ACCORDANCE WITH PARAGRAPH 616-3 1 4 OF THE STANDARD SPECIFICATIONS

The piling may be driven in North Dakota

QUANTITIES

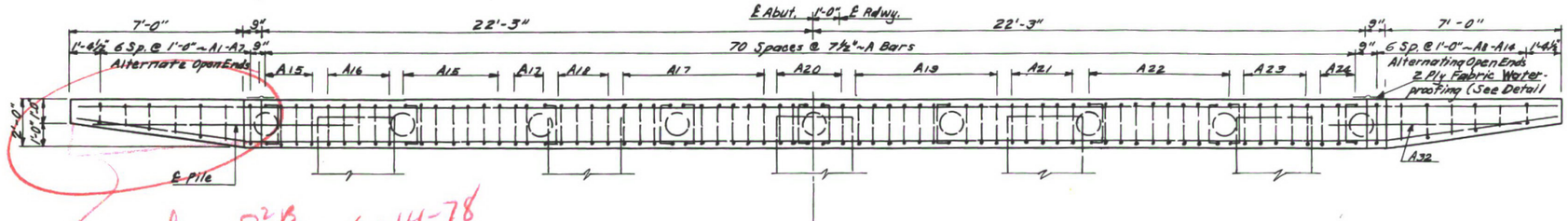
WHITE EARTH RIVER

PILING LAYOUT & NOTES & ABUTMENT & PIER CAP ELEVATIONS

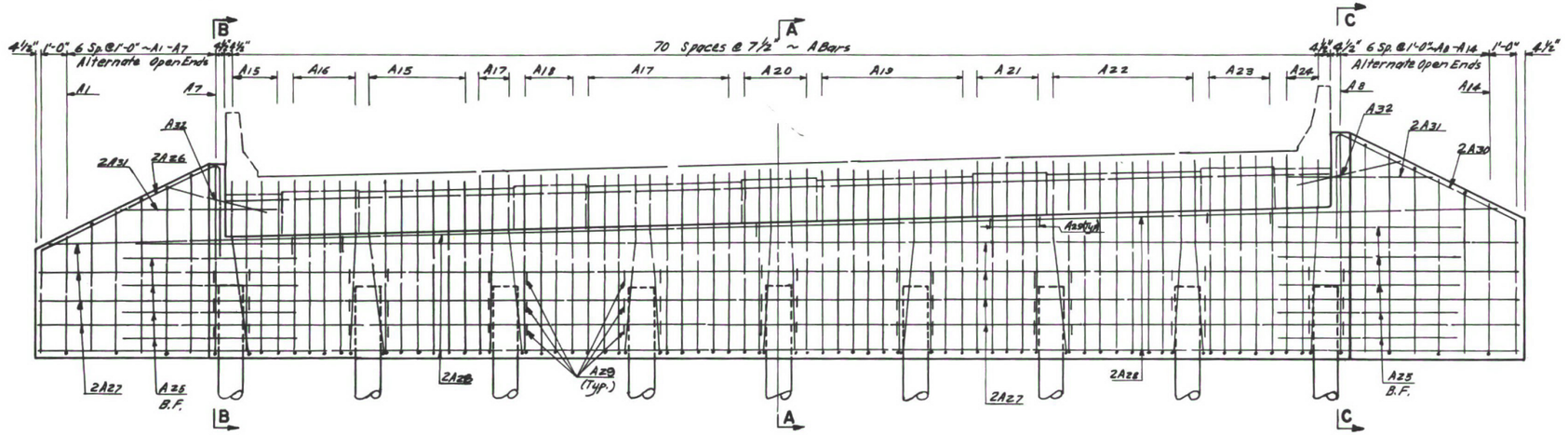
2-73000-3

TRACING QUANTITIES CHECKED BY

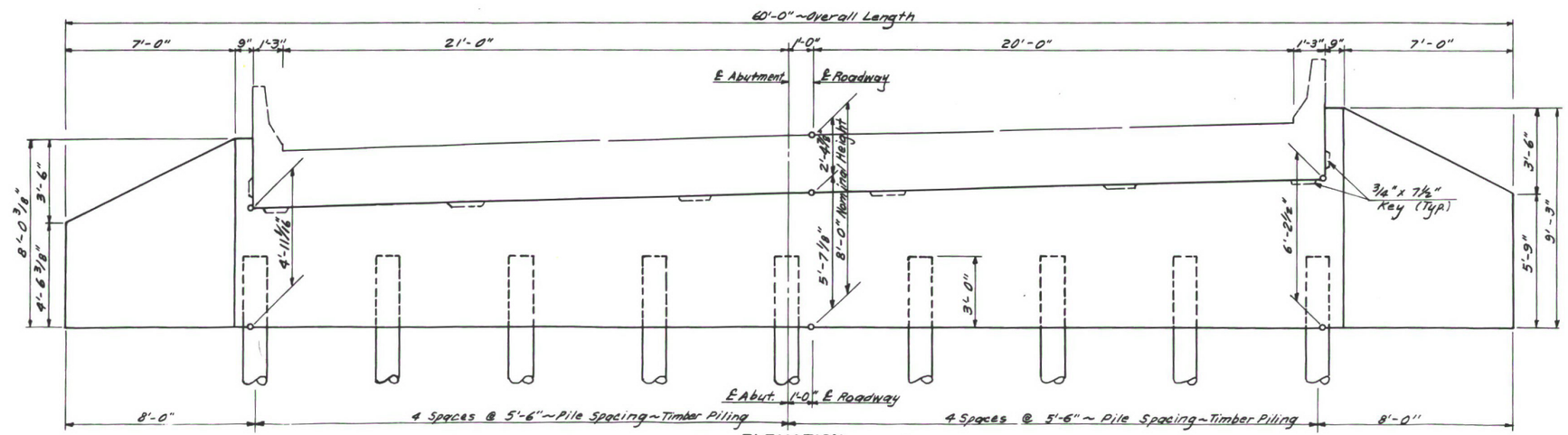
FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	F-7-002( )069	98	



PLAN
Showing Reinforcing & Dimensions



ELEVATION
Showing Reinforcing



ELEVATION
Showing Dimensions

FABRIC WATERPROOFING DETAIL

NOTE:

Two Ply Fabric Waterproofing shall consist of furnishing materials and placing dampproofing and fabric waterproofing at areas designated on this sheet in accordance with Sec. 736 of the Standard Specifications for Two Ply Fabric Waterproofing. All materials and work shall be considered incidental to the pay item for Class AE-1 Concrete.

TRACING CHECKED BY DCS
QUANTITIES MADE BY LCS
QUANTITIES CHECKED BY WAB

QUANTITIES

See Sheet No. 2-73.000-5

WHITE EARTH RIVER

8'-0" ABUTMENT

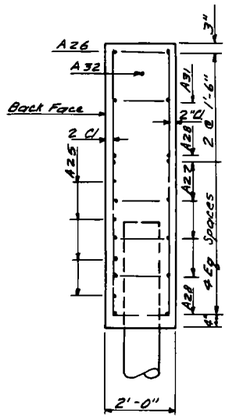
42'-0" CLEAR ROADWAY
HS20 LOADING

2-73.000-4

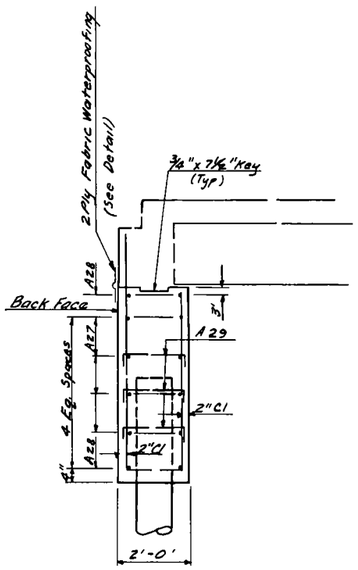
FED ROAD DIST NO	STATE	PROJ NO	SHEET NO	TOTAL SHEETS
8	N D	F 7002(1069	99	

WHC
JLS
LCS
LCS
WAB

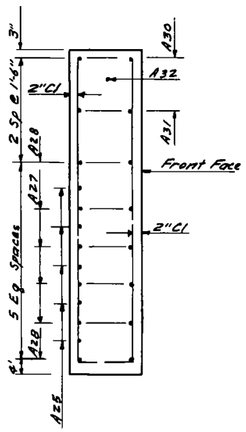
PLAN QUANTITIES CHECKED BY



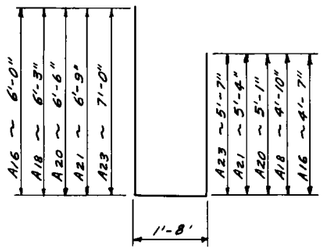
B - B



A - A



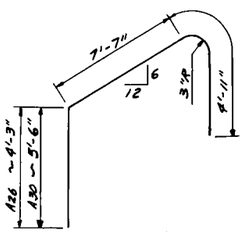
C - C



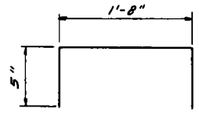
A16, A18, A20, A21, A23

BAR LIST (ONE ABUT)

MARK	NO	SIZE	LENGTH	SHAPE
A1	1	4	10'-2"	Bent
A2	1	4	11'-4"	"
A3	1	4	12'-5"	"
A4	1	4	13'-7"	"
A5	1	4	14'-9"	"
A6	1	4	15'-9"	"
A7	1	4	16'-8"	"
A8	1	4	19'-0"	"
A9	1	4	18'-3"	"
A10	1	4	17'-1"	"
A11	1	4	15'-11"	"
A12	1	4	14'-9"	"
A13	1	4	13'-8"	"
A14	1	4	12'-6"	"
A15	11	4	14'-4"	"
A16	5	4	12'-3"	"
A17	13	4	15'-0"	"
A18	4	4	12'-9"	"
A19	10	4	15'-6"	"
A20	5	4	13'-9"	"
A21	5	4	13'-9"	"
A22	10	4	16'-1"	"
A23	5	4	14'-3"	"
A24	3	4	16'-8"	"
A25	9	4	7'-0"	Str.
A26	2	6	16'-9"	Bent
A27	16	4	31'-3"	Str.
A28	8	6	31'-6"	"
A29	64	4	2'-6"	Bent
A30	2	6	18'-0"	"
A31	4	4	6'-0"	Str.
A32	2	4	8'-0"	Bent



A26 & A30



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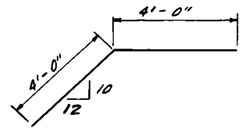

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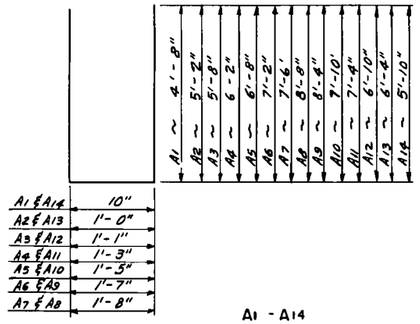
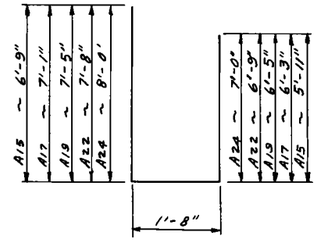


A1 - A14



A15, A17, A19, A22, A24

BENT BAR DETAILS

Dimensions Shown Are Out to Out

QUANTITIES

Concrete Class AE-1	24.0 C.Y.
Reinforcing Steel	1822 Lbs.
See Layout Sheet for Excavation	

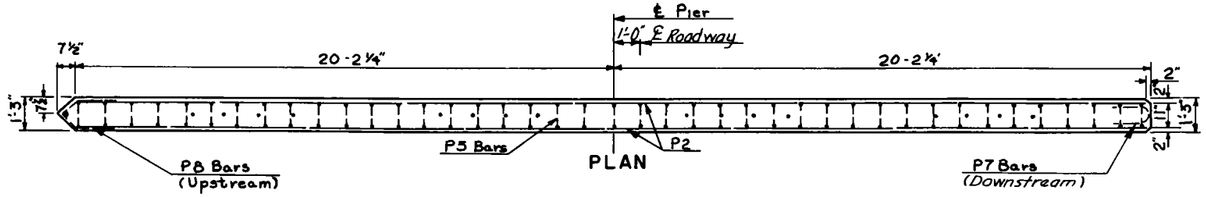
WHITE EARTH RIVER

8'-0" ABUTMENT

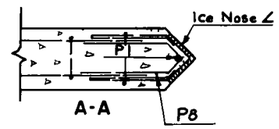
42'-0" CLEAR ROADWAY
HS20 LOADING

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N D	F 7-002(1069	100	

* P6 bars shall be plain round mild steel, wrap upper half with aluminum foil before pouring diaphragms



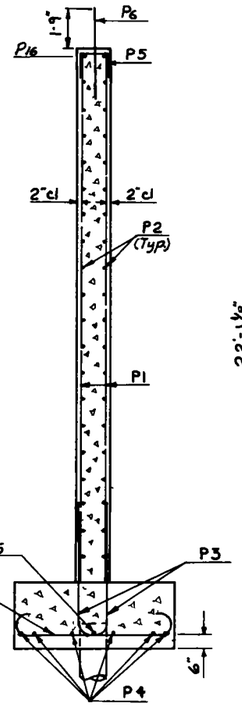
PLAN



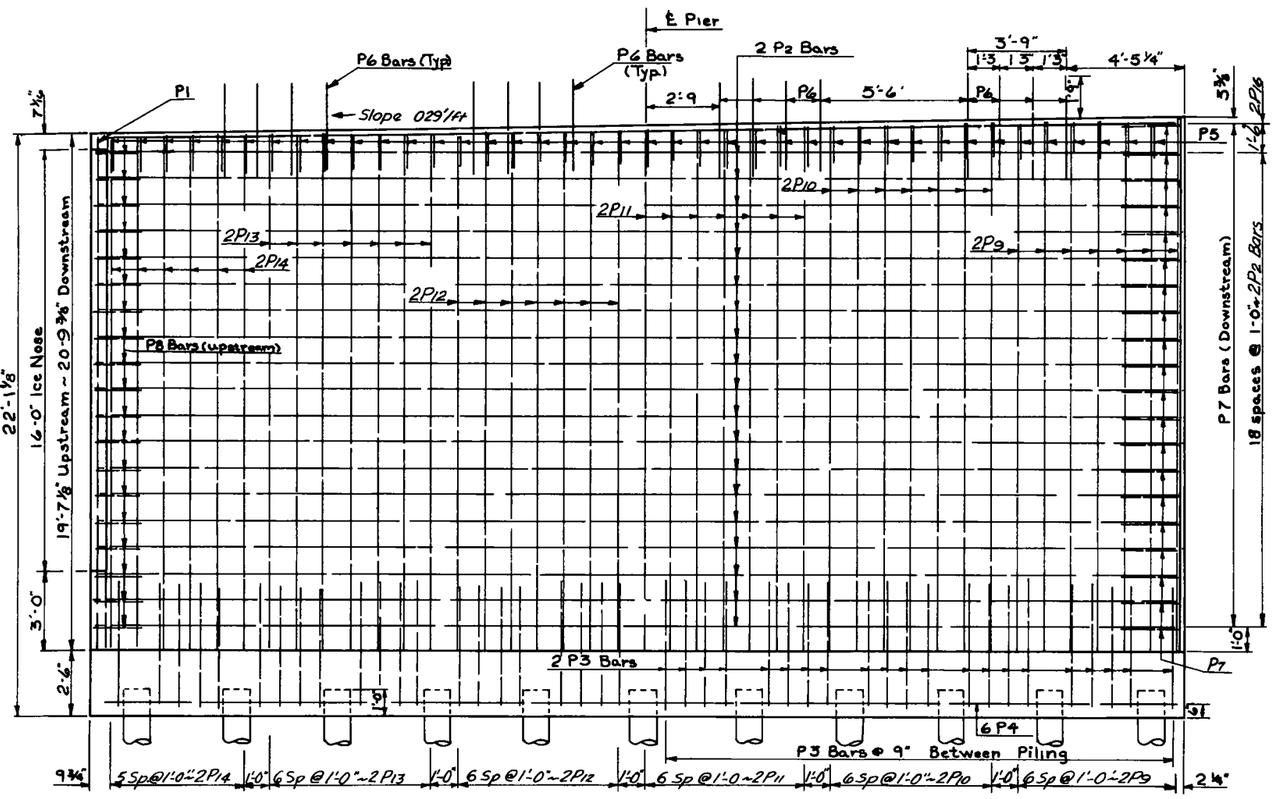
A-A

BAR LIST (ONE PIER)

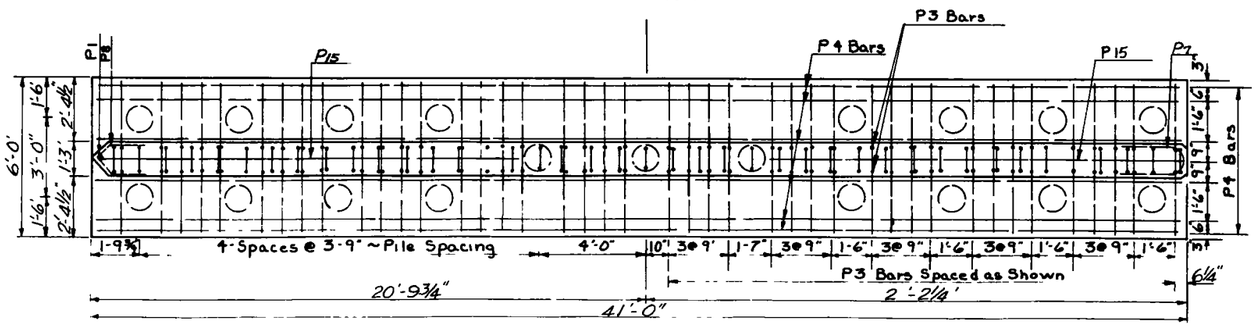
MARK	NUMBER FOOTING	NUMBER WALL			SIZE	LENGTH	UNIT WEIGHT	SHAPE
P1		1			6	19'4"		Str
P2		38			5	40'2"		Str.
P3	84				5	7'-7"		Bent
P4	6				4	40'-0"		Str.
P5		41			6	3'-3"		Bent
P6		16			6	3'-6"		Str.
P7		20			5	4'-5"		Bent
P8		19			5	4'-3"		Bent
P9		14			6	20'-6"		Str.
P10		14			6	20'-3"		Str.
P11		14			6	20'-1"		Str.
P12		14			6	19'-10"		Str.
P13		14			5	19'-8"		Str.
P14		12			5	19'-6"		Str
P15		2			4	15'-5"		Str
P16		2			6	40'-2"		Str



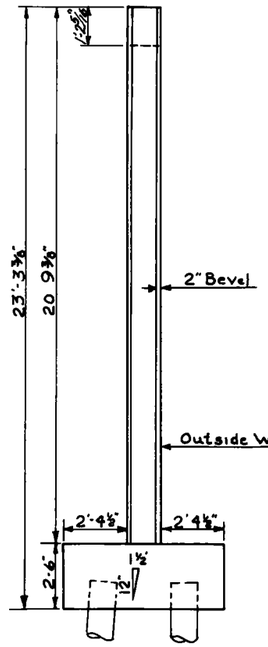
℄ SECTION



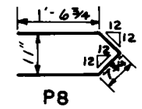
ELEVATION

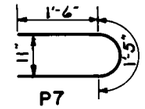


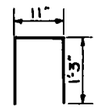
FOOTING PLAN
Showing Reinforcing

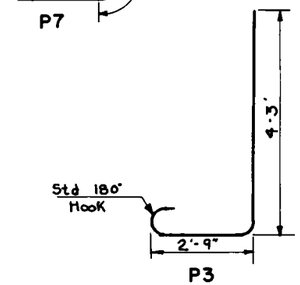


END VIEW PIER NO. 3

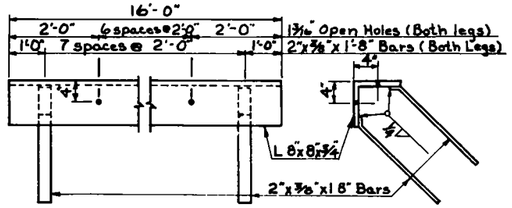








BENT BAR DETAILS
Dimensions are out to out



ICE NOSE ANGLE

QUANTITIES

Class A Concrete	60.3 C.Y.
Reinforcing Steel	4706 Lbs
A-36 Steel-Rolled	691 Lbs

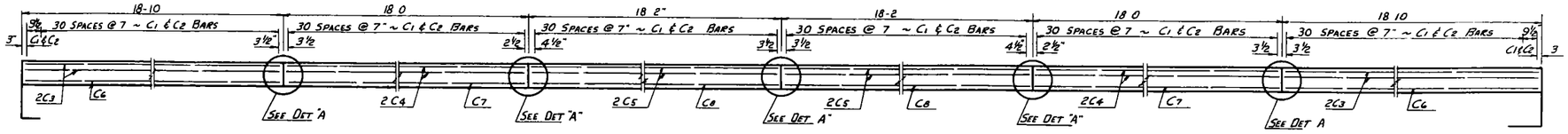
WHITE EARTH RIVER
22'-8¼" PIER DETAILS
42'-0" CLEAR RDWY
HS 20 LOADING

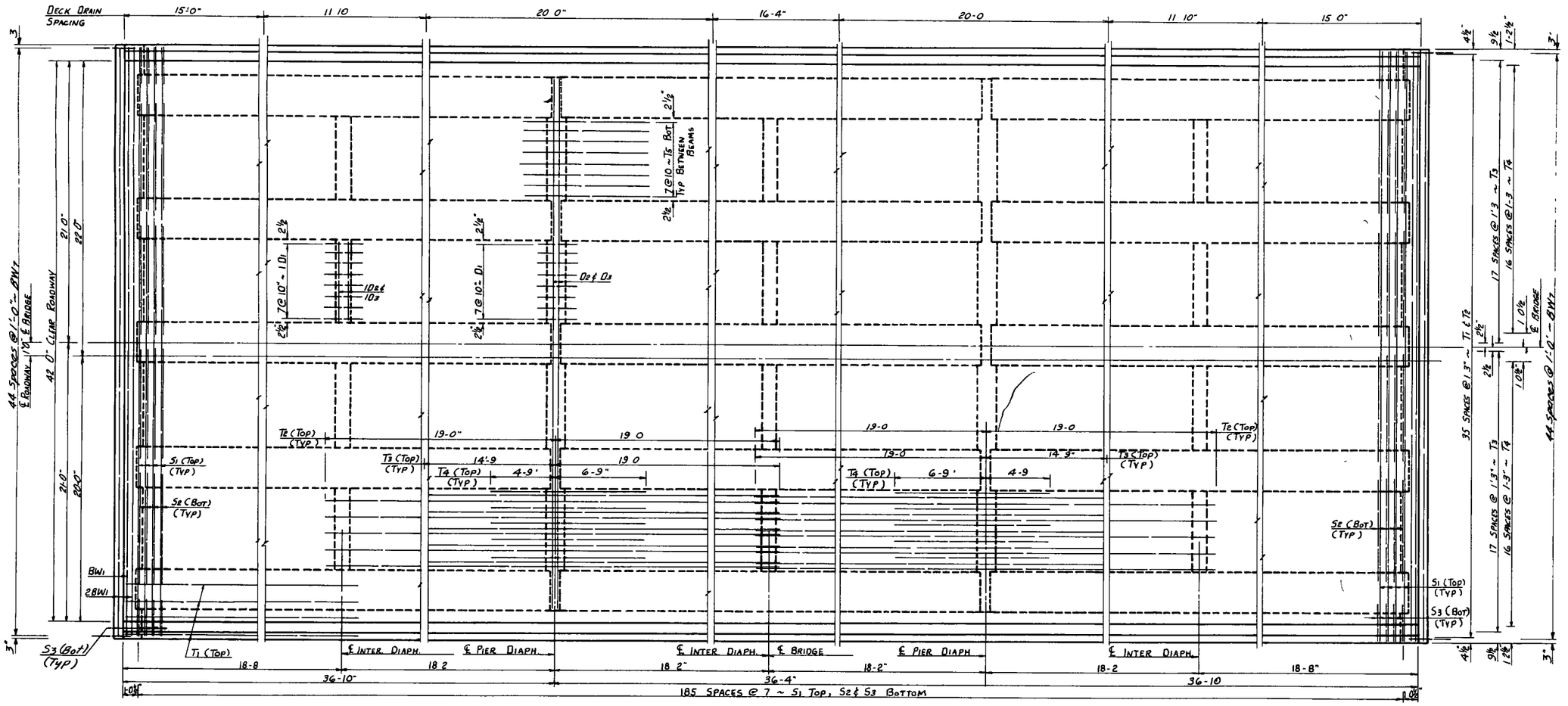
2-73.000-6

QUANTITIES CHECKED BY MAB

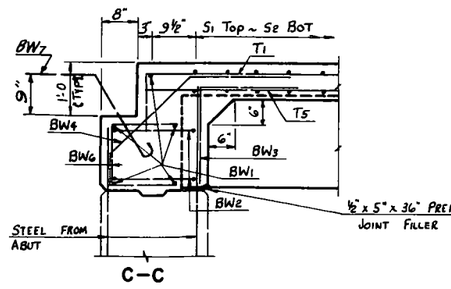
FED ROAD DIST NO	STATE	PROJ NO	SHEET NO	TOTAL SHEETS
8	N D	F-7-002( ) 069	101	

DETAILS LCS
TRACING WAB
QUANTITIES LCS
MADE BY WAB
CHECKED BY

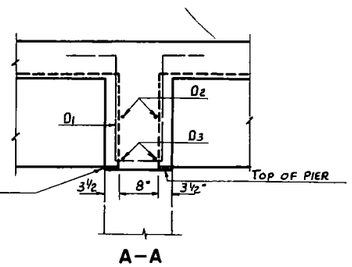




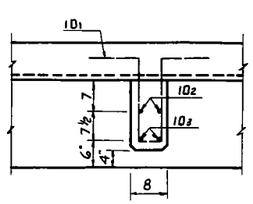
PLAN
SHOWING DIMENSIONS & REINFORCING



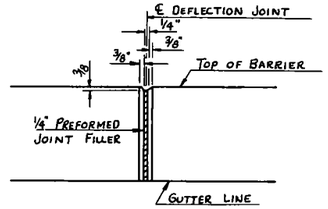
C–C



A–A



B–B



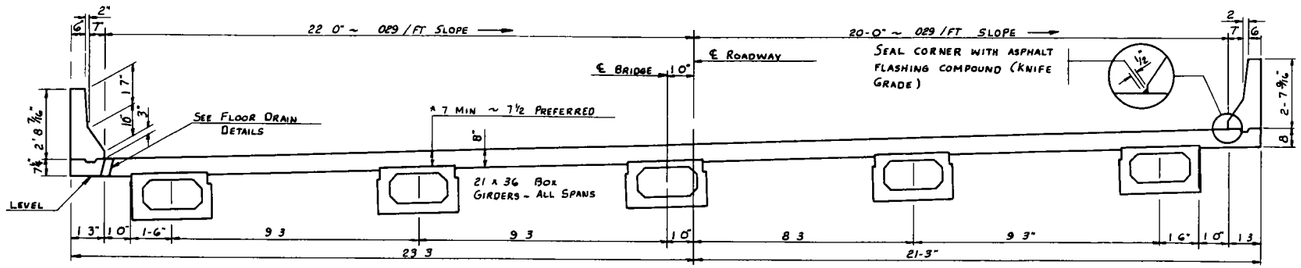
DETAIL "A"

QUANTITIES
See Sheet No 2-73.000-B

WHITE EARTH RIVER
SUPERSTRUCTURE DETAILS
42'-0" CLEAR ROADWAY
HS20 LOADING

2-73.000-7

FED. ROAD DIST NO.	STATE	PROJ NO	SHEET NO.	TOTAL SHEETS
8	N D	F-7-002( )069	102	

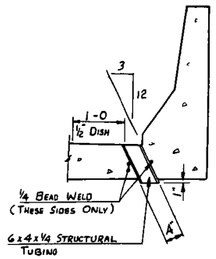


SLAB SECTION

SHOWING DIMENSIONS

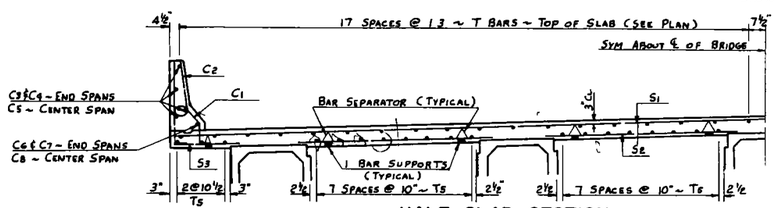
NOTE

* THE DIMENSIONS SHOWN WILL VARY DUE TO VARIABLE CAMBER OF THE PRESTRESSED BOX GIRDERS THE FIELD ENGINEER SHALL TAKE MEASUREMENTS, FOR SLAB THICKNESS, OVER AND BETWEEN GIRDERS AT INTERVALS NOT TO EXCEED THE SPACING OF THE SCREED ELEVATIONS WHEN THE SLAB THICKNESS OVER ANY GIRDER IS LESS THAN 7" THE GRADE FOR THE ENTIRE BRIDGE SHALL BE REVISED TO OBTAIN THE 7" MINIMUM THICKNESS THE 8" DIMENSION BETWEEN GIRDERS IS A FIXED DIMENSION THE QUANTITIES SHOWN ARE FOR THE DIMENSIONS SHOWN ADJUSTMENTS IN QUANTITIES SHALL BE MADE IN ACCORDANCE WITH THE REVISIONS MADE IN SLAB DIMENSIONS.



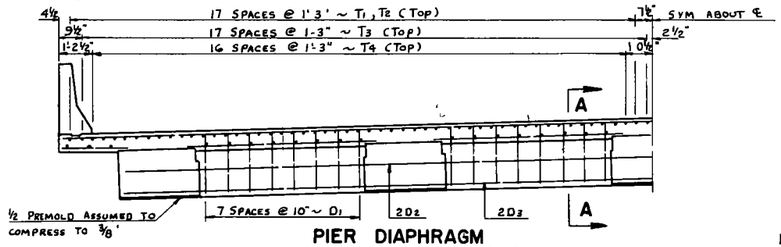
FLOOR DRAIN DETAILS

TO BE PAID FOR AS STRUCTURAL STEEL



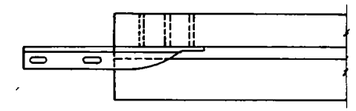
HALF SLAB SECTION

SHOWING REINFORCING @ CENTER OF SPAN



PIER DIAPHRAGM

SHOWING REINFORCING OVER PIERS



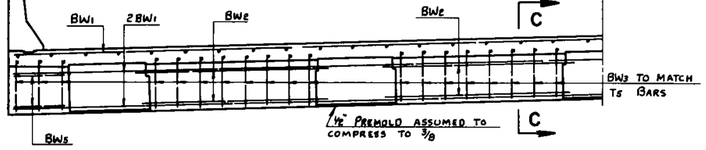
PLAN

BARRIERS SHALL BE PLACED IN ALTERNATE SECTIONS AND SHALL HAVE A CURING PERIOD OF 3 DAYS BETWEEN PLACEMENT

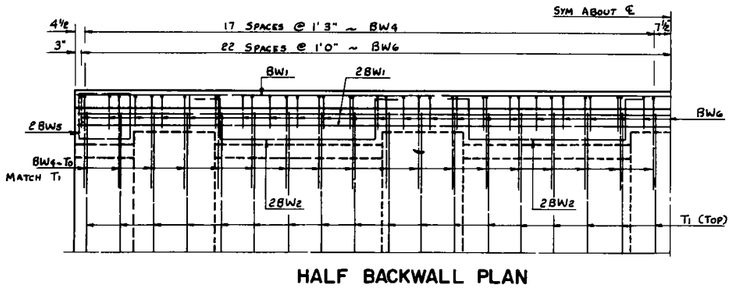
* EPOXY COATED BARS

BAR LIST

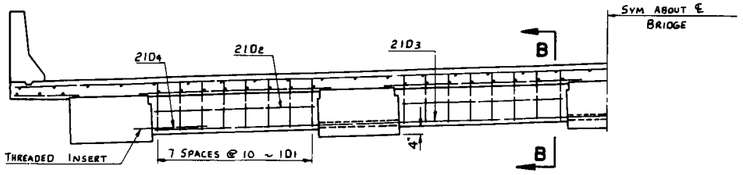
	MARK	NO	SIZE	LENGTH	SHAPE
*	T1	72	4	20-7	BENT
*	T2	72	4	38 0	STR
*	T3	72	4	33-9"	"
*	T4	68	4	11-6	"
	T5	114	4	38 3"	"
*	S1	186	5	44-0	STR
	S2	744	5	7 3"	"
	S3	372	5	2 6	
	BW1	10	6	44-0	STR
	BW2	16	6	10 9	BENT
	BW3	76	4	3 3"	
	BW4	72	6	5-6	
	BW5	8	6	7 6	
	BW6	88	4	2-4"	"
*	BW7	90	6	3'2"	"
	D1	64	4	6-10	BENT
	D2	4	5	39-6"	STR
	D3	4	6	39 6	
	ID1	96	4	5-8	BENT
	ID2	24	4	5'-10"	STR
	ID3	6	7	33-6"	"
	ID4	12	1"ϕ	3'-0"	"
*	C1	372	4	5-0	BENT
	C2	372	4	5 8"	
	C3	16	4	18-6"	STR
	C4	16	4	17-8"	"
	C5	16	4	17-9"	
*	C6	4	4	18-6"	"
*	C7	4	4	17-8"	"
*	C8	4	4	17-9	



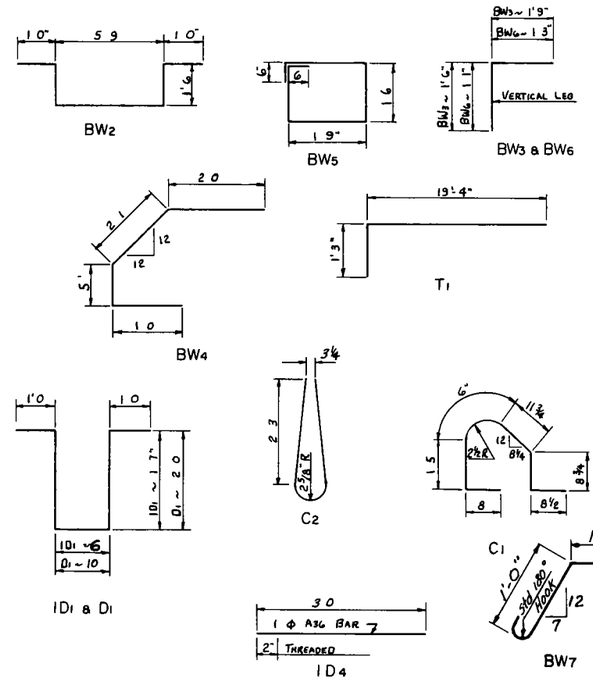
HALF BACKWALL ELEVATION



HALF BACKWALL PLAN

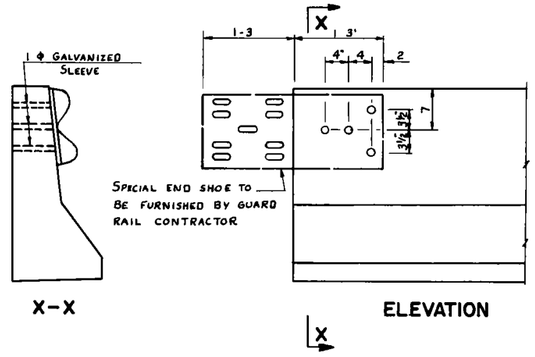


INTERMEDIATE DIAPHRAGM



BENT BAR DETAILS

DIMENSIONS SHOWN ARE OUT TO OUT



BARRIER END DETAILS

QUANTITIES

CONCRETE CLASS AAE 3	152.7 C.Y.
REINFORCING STEEL	14930 LBS
Reinforcing Steel (Epoxy coated)	15311 Lbs
A-36 Steel - Rolled	71 Lbs

WHITE EARTH RIVER

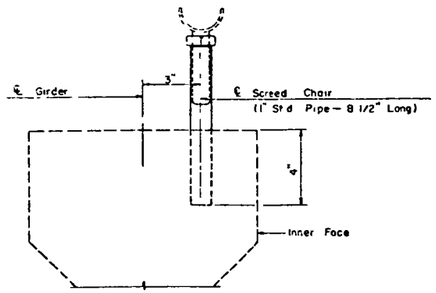
SUPERSTRUCTURE DETAILS

42'-0" CLEAR ROADWAY

HS20 LOADING

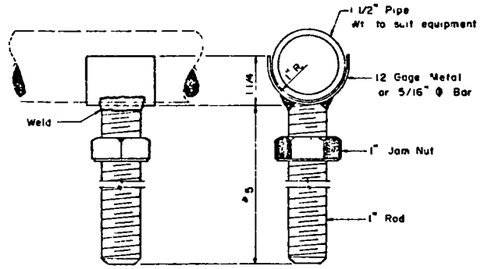
2-73.000-8

CHECKED BY
MADE BY
CHECKED BY
QUANTITIES



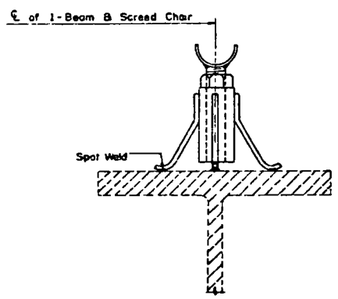
SCREED CHAIR IN PRESTRESSED GIRDER

(Outside Girders Only)

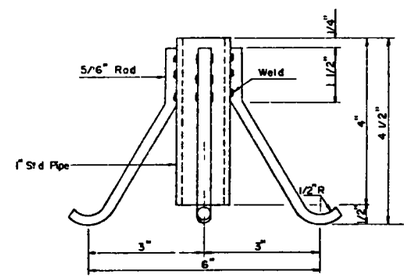


ADJUSTABLE SCREED HOLDER

* Useable with slab thickness of 7 or less. For greater slab thickness adjust length accordingly.



I-BEAM WITH SCREED CHAIR



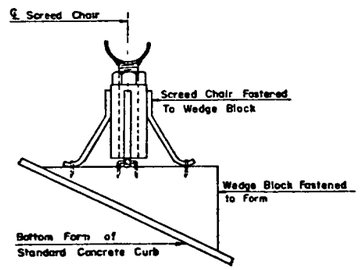
SCREED CHAIR

NOTE:

THE SPACING OF SCREED CHAIRS SHALL BE SUCH THAT NO NOTICEABLE DEFLECTION OCCURS IN THE SCREED WHEN THE VIBRATION STRIKE-OFF IS IN OPERATION. CHAIRS SHALL BE SIMILARLY PLACED FOR ALL SCREEDS ON THE SAME BRIDGE SPAN WITH A MAXIMUM SPACING OF THREE FEET WHEN USING 1" EXTRA STRONG PIPE FOR A SCREED. SCREEDS SHALL BE SET ON OUTER BEAMS AND ALSO ON INTERMEDIATE BEAMS IF NECESSARY TO MAINTAIN THE REQUIRED TEMPLATE

THE COST OF THE SCREED CHAIRS AND HOLDERS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE VARIOUS PAY ITEMS. UPON COMPLETION OF THE PROJECT THE SCREED AND SCREED HOLDERS SHALL REMAIN THE PROPERTY OF THE CONTRACTOR

THE DESIGN SHOWN FOR THE SCREED CHAIRS AND SEAT MAY BE VARIED SLIGHTLY TO SUIT MANUFACTURERS PRODUCTS IF APPROVED BY THE ENGINEER



BOTTOM CURB FORM WITH SCREED CHAIR

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

SCREED CHAIR & ADJUSTABLE SCREED HOLDER

APPROVED
8-20-73
DATE

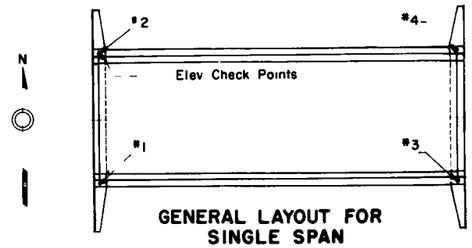
BRIDGE ENGINEER

H-0501

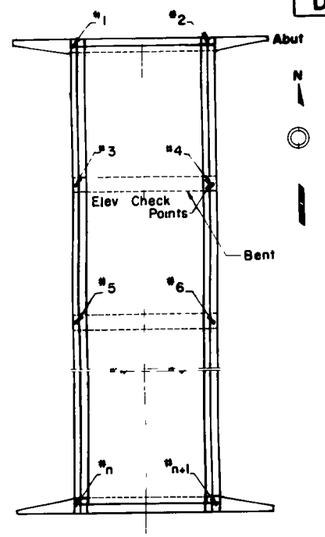
BRIDGE BENCH MARKS

8 ND F-7002(08) 104

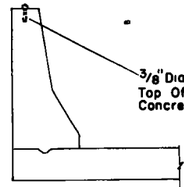
D-900-1



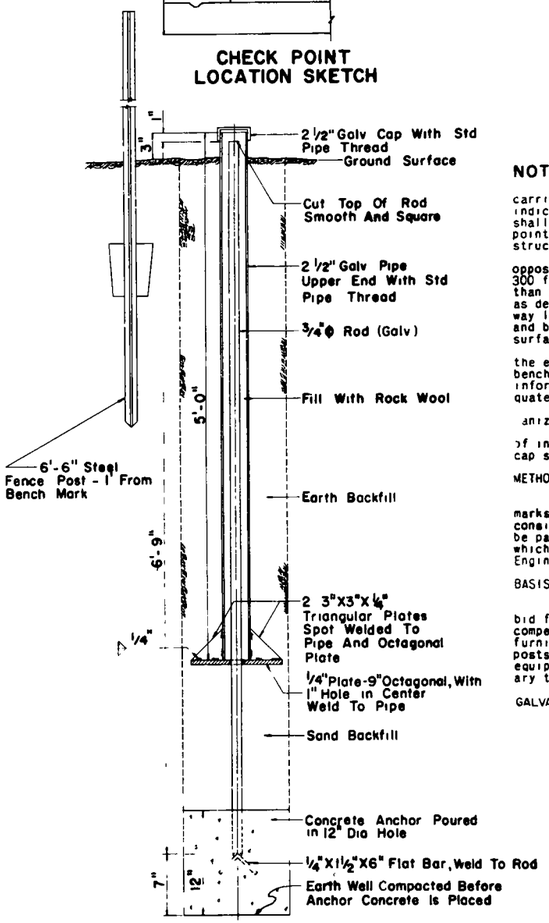
GENERAL LAYOUT FOR SINGLE SPAN



GENERAL LAYOUT FOR MULTIPLE SPAN



CHECK POINT LOCATION SKETCH



BENCH MARK DETAIL

NOTES

Elevation check points shall consist of 3/8"x 3" galvanized carriage bolts (or equal) set in the concrete curb at the points indicated on the General Layout Sketches. The top of bolt head shall project above the finished concrete 1/8". Elevation check points shall be placed on each curb over each unit of the substructure for each bridge at a structural location.

Two bench marks as detailed hereon shall be set at diagonal opposite positions away from the structure location and at least 300 feet from the nearest point on the bridge or bridges (if more than one at a location). These bench marks shall be constructed as detailed on this sheet and located near the Highway Right-of-way lines. The steel fence post shall extend 4'-0" above ground and be painted with two coats of white paint suitable for steel surfaces.

The Project Engineer shall run a set of levels determining the elevation of each check point on the structure and the two bench marks immediately after the completion of the bridge. This information shall be submitted to the Bridge Engineer with adequate information locating each check point and bench mark.

Except for fence posts, all metal parts to be hot dip galvanized after punching, shearing, welding, and fabrication.

Threads of cap and pipe are not to be galvanized. At time of installation these threads are to be coated with grease and cap screwed to snug fit.

METHOD OF MEASUEMENT

Each set of Bridge Bench Marks consisting of two bench marks and the required number of elevation check points shall be considered as one unit for bidding purposes and the quantity to be paid for shall be the number of sets of bridge bench marks which have been installed complete in place and accepted by the Engineer.

BASIS OF PAYMENT

Bridge Bench Marks shall be paid for at the contract price bid for each set of Bridge Bench Marks, which price shall be full compensation for all excavation, backfill and clean-up, and for furnishing, hauling and placing all elevation check points, fence posts, galvanized pipe, caps, rods, sand backfill, concrete, rock equipment, tools and incidentals, including galvanizing, necessary to complete this item.

GALVANIZING

After fabrication the complete assembly shall be Hot Dip Galvanized.

Revised 7-26-77
Revised 10-20-59
Revised 6-9-59

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

Submitted Joseph R. Kuchy
Bridge Engineer

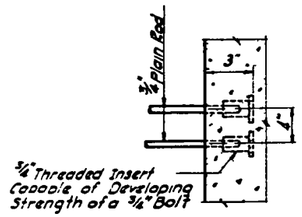
Recommended
Director, Staff Division

Approved
Chief Engineer

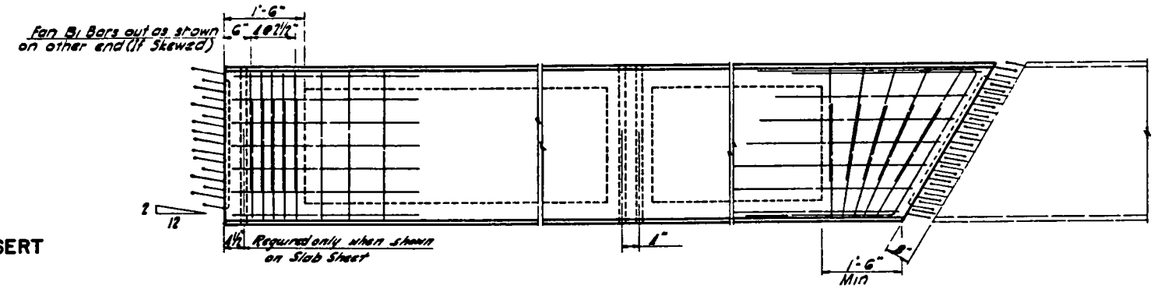
Date 3-3-58

FED ROAD DIV NO.	STATE	PROJ NO	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
68	N. D.	F7002(28),		105	-

Weight of Girder in Tons = (0.2335)(Length of Girder in Feet) + (0.1332)(No. of Diaphragms) + (0.4797)(1 + Tangent of Skew Angle)

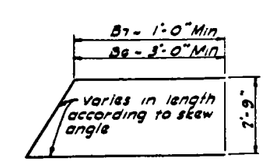


DIAPHRAGM BAR INSERT
Outer Girders Only

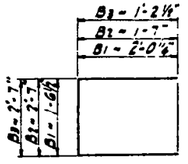


PARTIAL PLAN
Showing Square End

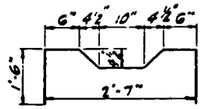
PARTIAL PLAN
Showing Skewed End



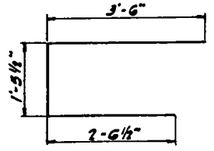
B6 & B7 BARS



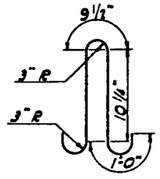
B1-3 BARS



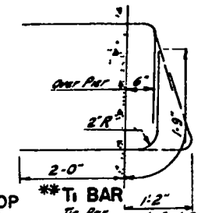
B4 BAR



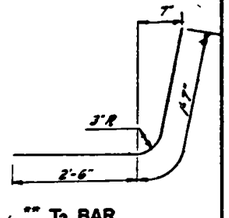
B5 BAR



SUGGESTED LOOP
⅞" ϕ Mild Steel

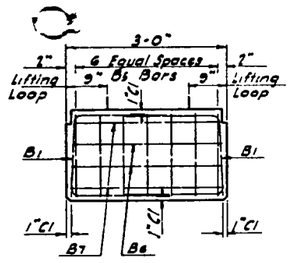


****T1 BAR**
Tie Bar — About End Only

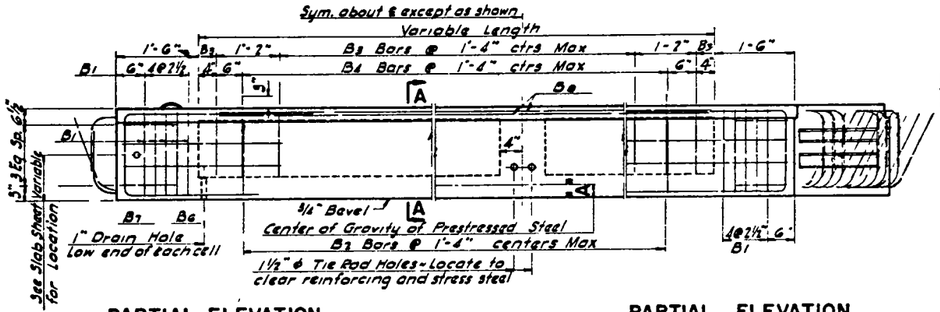


**** T2 BAR**
Suspender Bar

BENT BAR DETAILS

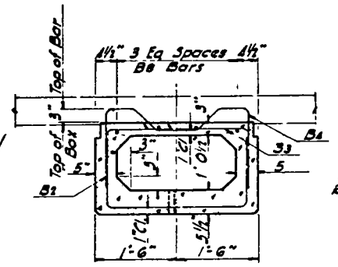


END BLOCK

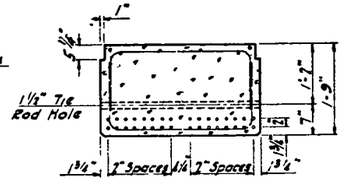


PARTIAL ELEVATION
Showing Square End

PARTIAL ELEVATION
Showing Skewed End

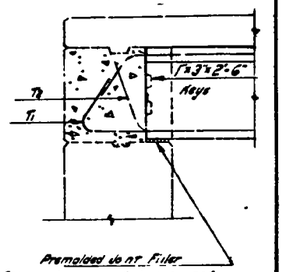


A - A



Suggested Prestressing Steel Locations

℄ SECTION OF DIAPHRAGM



Premolded Joint Filler (When shown on slab drawing)

ASSEMBLY AT ABUTMENT
Showing T Bars

⁰4600 PSI CONCRETE @ DETENSIONING

GIRDER DATA

LENGTH L	SPACE BETWEEN BEAMS	THICKNESS OF SLAB BETWEEN TOP BEAMS	THICKNESS OF SLAB ON TOP BEAMS	BRIDGE NO	LIVE LOAD	FINAL STRESSING FORCE AT MIDSPAN A	KIPS	A	KIPS	A	KIPS	WEIGHT "TONS"
32'-4"	4'-0"	7"	6½"	29 6142	HS20	2.75	269.1	3.25	280.7	3.75	293.4	8.1
38'-2"	5'-4"	7"	6½"	94-1397	H20	2.25	360.2	2.75	375.1	3.25	391.3	9.5
38'-5"	4'-0"	7"	6⅛"		HS20	L75.	350.4	2.25	364.3	2.75	379.2	9.5
42'-2	6'-0"	7"	6½	49-13	HS20	2.25	490.6	2.75	510.9	3.25	532.9	10.3
44'-3"	4'-0"	7"	6½"	8-114 44	HS20	2.25	470.6	2.75	490.0	3.25	511.2	10.6
50' 0"	3'-3"	6¾"	6"		H20	1.75	533	2.25	555	2.75	576	11.7
41'-4"	3'-4"	7"	6½"	18 23179	HS20	2.25	386.4	2.75	402.3	3.25	419.7	10.2
46'-0"	3'-4	7"	6½	13-186 35	HS20	2.25	432.7	2.75	450.6	3.25	470.0	10.8
44'-0"	4'-0"	7	6½2	29-14.57	HS20	2.75	476.1	3.25	496.6	3.75	516.9	10.8
40'-8"	9'-0"	7	6½"	16-82.92	HS20	2.25	459.5	2.75	478.5	3.75	499.1	10.0
45'-7½"	4'-5"	8"	7½"	83-92070	HS20	2.25	495.8	2.75	516.3	3.25	538.5	11.3
35'-4"	5'-9"	8"	7½"	22-60 43	HS20	2.75	442.0	3.25	461.1	3.75	481.8	9.7
31'-4	5'-9"	8"	7½	22-60 43	HS20	2.75	295.9	3.25	308.6	3.75	322.5	7.9
44' 4	6'-0"	8"	7½	989-02	HS20	2.75	563.4	3.25	587.7	3.75	614.2	10.4
35'-8"	6'-3"	8"	7½"	2-730	HS20	2.25	368.5	2.75	383.7	3.25	400.2	8.8

NOTES

Design Specifications A.A.S.H.O.

Design and Shop Drawing At least 14 days prior to the forming and pouring of any girders, the Contractor shall submit checked design figures and shop drawings for the approval of the Bridge Engineer of the State Highway Department. The design figures shall show the total initial prestress force required as the sum of the final prestress force taken from the contract drawings and the losses in prestress due to friction, elastic shortening of concrete, shrinkage of concrete, creep of concrete and relaxation of steel stress as determined by the Contractor for his method of stressing. If the Contractor wishes, the loss of steel stress not including friction and elastic shortening losses may be assumed as 35,000 p.s.i. for pretensioning and 25,000 p.s.i. for post-tensioning.

Shop drawings shall show wire, strand or bar layout, end anchor plate details, pull down locations, tensioning forces, elongation and order of tensioning and any proposed changes in reinforcing steel.

* The final prestress force (remaining after all losses have been accounted for) and its corresponding dimension "A" shall be selected from those on a curve determined by the three values shown on this drawing.

The girders shall be poured in all-steel forms.

All reinforcing steel shall be intermediate grade Grade 40.

Minor changes to the shape of the girder and to the reinforcing steel may be made to accommodate the forms of various contractors and their construction methods with the approval of the Bridge Engineer.

All tension in the top of the beam shall be taken care of by draping prestress steel, by adding mild steel in the top or by a combination of the two.

C.G. = 9.50" from bottom
Area = 442.5 sq. in.
Moment of Inertia = 22,612 in⁴

* If not shown on this drawing, see plans on Specific Project.

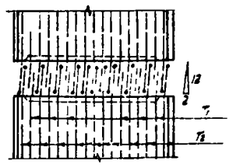
The dead load provisions in the design include composite concrete slab, 25 p.s.f. future wearing surface and curb weight uniformly distributed over all units.

The center of gravity of the tensioning units at all points along the girder shall lie on or below the curve of a draped chalk line that sags freely with dimension "A" as shown and with the end 7" above the bottom of the girder.

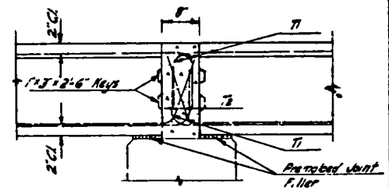
Concrete test cylinder strength at time of stress transfer shall be at least 4000 p.s.i.

Stressing forces for lengths not shown shall be interpolated from values in table.

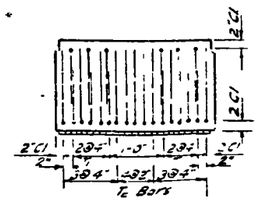
Shop drawing Missing
Info from
17 Strand
C.g Middle 2.82"
C.g End 6.35"
F.inal 392.17K



PLAN VIEW
Showing T Bars



ASSEMBLY AT PIER
Showing T Bars



END VIEW
Showing T Bars

** T 1/2 bars shall be straight when concrete is poured. After the concrete has set the bars shall be bent by the beam fabricator as shown.

BAR LIST

MARK	SIZE	LENGTH	SHAPE
B1	4	5-7"	Sent
B2	4	5-9"	"
B3	4	5-0"	"
B4	4	5-10"	"
B5	3	7-6"	"
B6	4	Variable	Str
B7	4	"	"
B8	4	"	"
T1	5	3 9"	"
T2	5	4-1	"

21" x 36" SPREAD SUSPENDED PRESTRESSED BOX GIRDER

COMPOSITE SLAB

H-7009