

CASS COUNTY

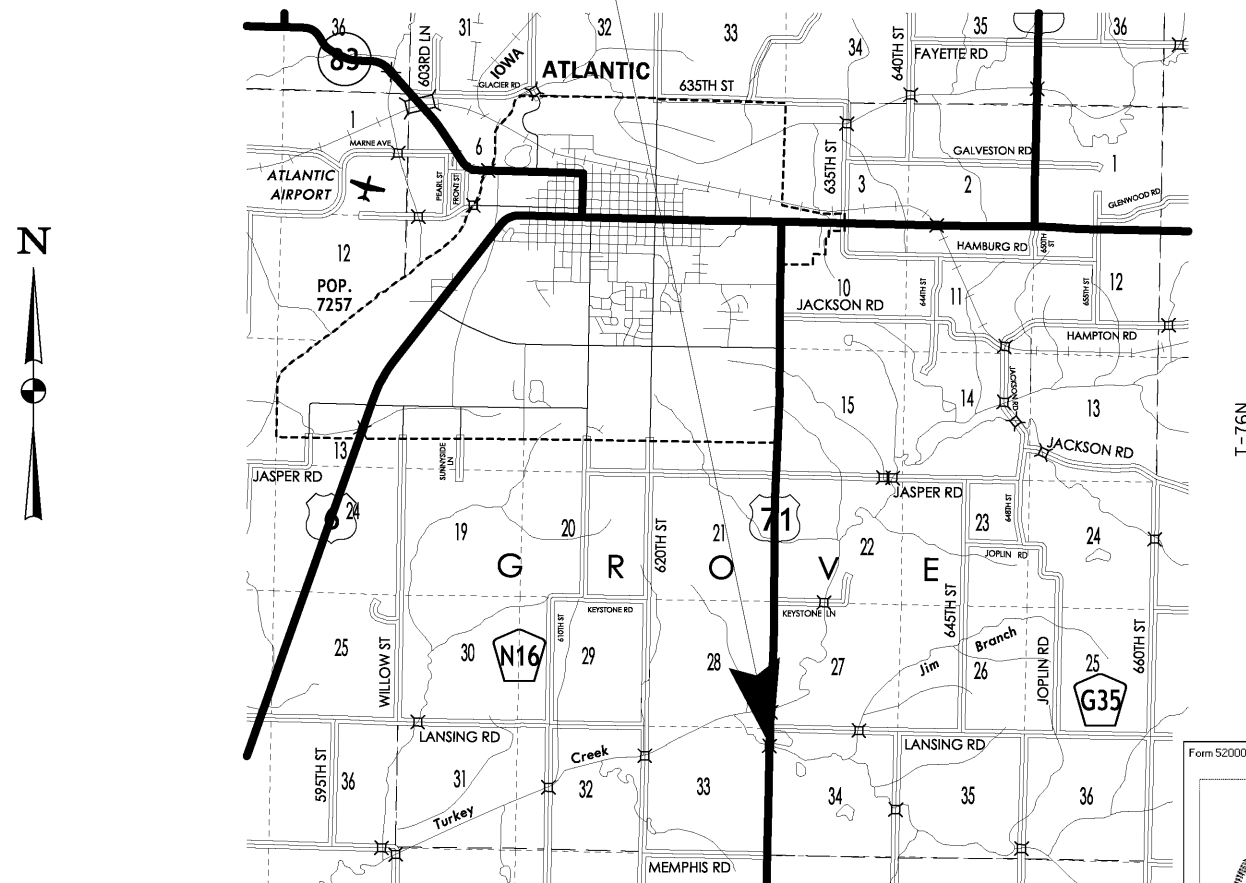
DIVIDED HIGHWAY
PAVED ROAD
BITUMINOUS ROAD
GRAVEL ROAD
EARTH ROAD

INTERSTATE HIGHWAY
UNITED STATES HIGHWAY
STATE HIGHWAY
COUNTY HIGHWAY

RAILROAD
PIPELINE
AIRPORT
HYDROLOGY
BRIDGE
STATE BOUNDARY
COUNTY BOUNDARY
CORPORATE LIMIT LINE
TOWNSHIP LINE
SECTION LINE



DESIGN NO. 312



R-36W

LOCATION MAP

PROJECT DIRECTORY NAME: 1507101007

NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATE SHEET - DESIGN 312
2-7	DESIGN 312
C.1	ESTIMATE SHEET FOR ROADWAY
A.1-J.4	ROADWAY SHEETS

REVISIONS



STANDARD ROAD PLANS ARE LISTED
ON SHEET NUMBER C.2

2010	AADT	<u>2610</u>	V.P.D.
202	AADT	<u> </u>	V.P.D.
202	DHV	<u> </u>	V.P.H.
TRUCKS		<u>12</u>	%
Total			
Design	ESALs		

SHEET NO.	NAME	TYPE
I	DEAN G. BIERWAGEN	STRUCTURAL DESIGN
A.I	YANXIAO JIA	ROADWAY DESIGN

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature Dean G. Bierwagen Date 12-6-11
Dean G. Bierwagen

My license renewal date is December 31, 2012

Pages or sheets covered by this seal: SHEETS 1 THRU 7 OF 21

SHEET NUMBER

12/5/2011	7:07:04 PM	dbierwa	W:\Projects\1507101007\BRFinal\15071049.brg	150312s000	11x17bw_pdf.plt
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ESTIMATED BRIDGE REPAIR QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2413-0698075	DECK REPAIR, CLASS B	SY	5.0	18.642
2	2533-4980005	MOBILIZATION	LS	1.00	\$1,000.00
3	2599-9999003	CONCRETE REPAIR, REPLACE VARIABLE DEPTH CONCRETE	CY	14.0	63.53
4	2599-9999018	HYDRODEMOLITION, REMOVAL	SY	999.0	999.0
		ALTERNATE AA OPTION 1			
5A	2413-0698066	DECK OVERLAY (CLASS 0 PCC)	SY	1557.0	
		ALTERNATE AA OPTION 2			
5B	2413-0698067	DECK OVERLAY (CLASS HPC-0 PCC)	SY	1557.0	1635.672

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
1	2413-0698075	DECK REPAIR, CLASS B ACTUAL QUANTITY OF REMOVAL WILL BE DETERMINED BY THE ENGINEER. IF THE ENGINEER DETERMINES THAT NO CLASS B REMOVAL IS REQUIRED, THE BID ITEM WILL BE REMOVED.
2	2533-4980005	MOBILIZATION - -
3	2599-9999003	CONCRETE REPAIR, REPLACE VARIABLE DEPTH CONCRETE - -
4	2599-9999018	HYDRODEMOLITION, REMOVAL INCLUDES HYDRODEMOLITION OF THE FULL BRIDGE DECK AREA AS DESCRIBED IN THESE PLANS.
5A	2413-0698066	DECK OVERLAY (CLASS O PCC) INCLUDES FURNISHING AND PLACING CONCRETE SEALER. INCLUDES 558 SQUARE YARDS OF OVERLAY FOR THE APPROACH SLABS.
5B	2413-0698067	DECK OVERLAY (CLASS HPC-O PCC) INCLUDES FURNISHING AND PLACING CONCRETE SEALER. INCLUDES 558 SQUARE YARDS OF OVERLAY FOR THE APPROACH SLABS.

CHANGE ORDER ESTIMATE REFERENCE INFORMATION

PROP ITEM#	ITEM CODE	DESCRIPTION	REASON	UNIT	PROPOSED TOTAL	ASBUILT QUANTITIES
1150	6200-7000061	PRICE ADJINCENTIVE-	Add Item: Price Adj/Incentive Smoothness-Overlay	EACH	2000.000	2000.000

DESIGN FOR REPAIRS TO A 15° SKEW
 201'-4" X 44' PRETENSIONED
 PRESTRESSED CONCRETE BEAM BRIDGE
 68'-2 1/4" & 64'-0 9/16" END SPANS 68'-11 3/8" INTERIOR SPAN
 ESTIMATED QUANTITIES
 STA. 595+93.00 (C U.S. 71) DECEMBER 2011
 CASS COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 6 FILE NO. 30551 DESIGN NO. 312

GENERAL NOTES:

IT IS THE INTENT OF THIS DESIGN TO REPAIR AND OVERLAY THE BRIDGE DECK, AND APPLY SEALER TO THE EXISTING BARRIER RAILS ON A 201'-4 X 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE ON U.S. 71 (STA. 565+93.00). REMOVALS SHALL BE DONE USING THE HYDRODEMOLITION METHOD.

COPIES OF ORIGINAL DESIGN PLANS WILL BE MADE AVAILABLE TO THE CONTRACTOR. CONTACT THE OFFICE OF CONTRACTS - HIGHWAY DIVISION - IOWA D.O.T. - AMES. DIMENSIONS SHOWN ON THESE PLANS ARE BASED ON DESIGN PLANS (ORIGINAL DESIGN NO. 369 & 1189 CASS COUNTY).

FAINT LINES ON PLANS INDICATE EXISTING STRUCTURE.

THE TOP AND INTERIOR FACES OF THE EXISTING CONCRETE RAILING ARE TO BE CLEANED AND SEALED IN ACCORDANCE WITH ARTICLE 2403.03, P, OF THE STANDARD SPECIFICATIONS. IF NEW SECTIONS OF RAIL ARE CONSTRUCTED, THE NEW SECTIONS SHALL NOT BE SEALED. ALL COSTS ASSOCIATED WITH CLEANING AND SEALING OF THE CONCRETE RAILS SHALL BE INCLUDED IN THE UNIT PRICE BID ITEM "CONCRETE REPAIR".

ALL DIMENSIONS AND DETAILS SHOWN ON THESE PLANS PERTINENT TO NEW CONSTRUCTION SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE STARTING CONSTRUCTION.

CONSTRUCTION STAGES AS DETAILED IN THE ROAD PLANS MAY BE REVERSED AT THE CONTRACTOR'S OPTION SUBJECT TO THE ENGINEER'S APPROVAL. CONSTRUCTION SHALL BE DONE WITH THE ONE LANE OF TRAFFIC MAINTAINED AT ALL TIMES IN ACCORDANCE WITH "TRAFFIC CONTROL PLAN" NOTE.

THE CITY AND UTILITY COMPANIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE BRIDGE CONTRACTOR OF THE CONSTRUCTION STARTING DATE.

BEFORE PROCEEDING WITH BRIDGE FLOOR OVERLAY AND BRIDGE FLOOR REPAIR THE CONTRACTOR MAY COMPLETE ALL STAGES OF OTHER CONSTRUCTION. ANY CONSTRUCTION SHALL HAVE STAGE LIMITS, TEMPORARY BARRIER RAIL AND TRAFFIC CONTROL AS DETAILED ON THESE PLANS. TEMPORARY BARRIER RAIL AND TRAFFIC CONTROL MAY BE ADJUSTED TO FIT THE ACTUAL WORK AND STORAGE AREA. WHEN BACKWALLS AND/OR APPROACH SECTIONS ARE TO BE REBUILT TO A RAISED SURFACE, AND WHEN FLOOR OVERLAY IS NOT A PART OF THE SAME STAGE, THE CONTRACTOR SHALL PROVIDE FOR PROFILE TRANSITION WITH H.M.A. SURFACING. PROFILE TRANSITION SHALL BE TAPERED AT A RATE OF 25' FOR 1 1/2 INCHES OF RAISE. THE H.M.A. TRANSITION MATERIAL SHALL BE A COMMERCIAL GRADE HOT SURFACING MIX OR A MIX APPROVED BY THE ENGINEER. H.M.A. MAY BE PLACED BY HAND METHODS AND MAY BE COMPACTED BY ANY APPROVED METHOD. ALL COSTS FOR ADDITIONAL TRAFFIC CONTROL, REPOSITIONING OF BARRIER AND H.M.A. SURFACING SHALL BE BORNE BY THE CONTRACTOR.

TRANSVERSE GROOVING OR TINING IN THE PLASTIC CONCRETE OF THE BRIDGE DECK (BRIDGE DECK OVERLAY) AND BRIDGE APPROACH SECTIONS (OVERLAY OF THE BRIDGE APPROACH) IS NOT ALLOWED. LONGITUDINAL GROOVES WILL BE CUT IN THE HARDENED CONCRETE USING A MECHANICAL CUTTING DEVICE. THE BID ITEM FOR "LONGITUDINAL GROOVING IN CONCRETE" IS PART OF THIS CONTRACT AND WILL BE INCLUDED IN THE ROADWAY QUANTITIES ASSOCIATED WITH THIS CONTRACT.

SPECIFICATIONS:

DESIGN: AASHTO SERIES OF 2002.
CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2009, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2002. REINFORCING STEEL IN ACCORDANCE WITH SECTION 8, GRADE 60. CONCRETE IN ACCORDANCE WITH SECTION 8, f'c = 3,500 PSI.

DESIGN HISTORY AT THIS SITE	
DES. NO.	TYPE OF WORK
369	ORIGINAL DESIGN
1189	RETROFIT RAILS
312	DECK REPAIR AND OVERLAY

DESIGN FOR REPAIRS TO A 15° SKEW

201'-4 X 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

68'-2 1/4 & 64'-0 9/16 END SPANS68'-11 3/8 INTERIOR SPAN

GENERAL NOTES

STA. 565+93.00 (C U.S. 71)DECEMBER 2011

CASS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 6FILE NO. 30551DESIGN NO. 312

NOTE:
ROADWAY QUANTITIES SHOWN
ELSEWHERE IN THESE PLANS.

TRAFFIC CONTROL PLAN

NOTE: THE ROADWAY WILL BE OPEN
TO THRU TRAFFIC. REFER TO
THE TRAFFIC CONTROL PLAN ON THE
ROAD PLAN IN THESE PLANS.

HYDRODEMOLITION NOTES:

IT IS THE INTENT TO USE THE HYDRODEMOLITION PROCESS TO REMOVE ALL UNSOUND CONCRETE AS DIRECTED BY THE ENGINEER BY USING A HIGH PRESSURE WATER STREAM. REMOVALS SHALL CREATE A VERY ROUGH, BONDABLE SURFACE FOR NEW CONCRETE TO ADHERE TO.

THE COMPLETE BRIDGE DECK SURFACE SHALL BE MILLED TO A DEPTH OF ¼ INCH BEFORE HYDRODEMOLITION BEGINS.

THE CONTRACTOR SHALL USE COMPUTERIZED SELF-PROPELLED HYDRODEMOLITION EQUIPMENT THAT PROVIDES A HIGH PRESSURE WATER JET STREAM FOR CONCRETE REMOVALS. THIS EQUIPMENT SHALL BE CAPABLE OF REMOVING ANY UNSOUND CONCRETE, AS WELL AS REMOVING RUST AND CONCRETE PARTICLES FROM EXPOSED REINFORCING STEEL.

CLEAN POTABLE WATER SHALL BE PROVIDED FOR HIGH PRESSURE REMOVALS AND THE EXCESS WATER RECLAIMED USING VACUUM METHODS OF COLLECTION, THEN FILTERED AND REUSED AS MUCH AS PRACTICAL.

OPERATION OF THE HYDRODEMOLITION EQUIPMENT SHALL BE PERFORMED AND SUPERVISED BY QUALIFIED PERSONNEL CERTIFIED BY THE EQUIPMENT MANUFACTURER.

CALIBRATING HYDRODEMOLITION

PRIOR TO THE COMMENCEMENT OF THE REMOVAL OPERATION WITH HYDRODEMOLITION, THE EQUIPMENT SHALL BE CALIBRATED ON TWO SECTIONS DESIGNATED BY THE ENGINEER TO DEMONSTRATE THAT EQUIPMENT, PERSONNEL AND METHODS OF OPERATION ARE CAPABLE OF PRODUCING RESULTS SATISFACTORY TO THE ENGINEER. THE TRIAL SECTIONS WILL BE APPROXIMATELY 100 SQUARE FEET EACH, CONSISTING OF ONE SECTION OF SOUND CONCRETE THEN ONE SECTION OF DETERIORATED CONCRETE. THE CALIBRATION SHALL NOT INCLUDE ANY AREAS OF EXISTING OVERLAY OR PATCH MATERIAL. THE CONTRACTOR WILL DOCUMENT THE FOLLOWING INITIAL SETTINGS:

- 1. WATER PRESSURE GAUGE (13,000 PSI MINIMUM)
- 2. WATER USAGE (55 GALLONS PER MINUTE, MINIMUM)
- 3. MACHINE STAGING CONTROL (STEP)
- 4. NOZZLE SIZE
- 5. NOZZLE SPEED (TRAVEL).
- 6. AREA OF THE BRIDGE WHERE THE SETTINGS WERE UTILIZED SHALL ALSO BE NOTED (SEE DESIGN SHEET 4.)

AFTER THE INITIAL TEST ON SOUND CONCRETE, THE EQUIPMENT SHALL THEN BE MOVED TO THE DETERIORATED AREA TO VERIFY THAT INITIAL SETTINGS WILL FULLY REMOVE UNSOUND CONCRETE WITHIN THE DESIGNATED AREA. THE INITIAL SETTINGS MAY NEED TO BE ADJUSTED, WITHIN THE LIMITS ESTABLISHED ABOVE, IN ORDER TO ACHIEVE TOTAL REMOVAL OF UNSOUND CONCRETE. THE CONTRACTOR SHALL DOCUMENT THE FINAL EQUIPMENT SETTINGS RESULTING FROM THE CALIBRATION PROCESS. IN ADDITION, A RECORD WILL BE KEPT AND MAINTAINED OF THE EQUIPMENT SETTINGS THROUGHOUT THE HYDRODEMOLITION PROCESS. A COPY SHALL BE GIVEN TO THE ENGINEER AND FORWARDED TO THE OFFICE OF BRIDGES AND STRUCTURES WHEN THE WORK IS COMPLETED SHOWING THE AREAS OF REMOVALS AND APPROXIMATE DEPTHS AND THE SETTINGS UTILIZED DURING REMOVAL. DESIGN SHEET 4 HAS BEEN PROVIDED FOR THIS RECORD.

CONCRETE BRIDGE DECK REMOVAL BY HYDRODEMOLITION:

AFTER CALIBRATION OF THE EQUIPMENT, CONCRETE REMOVAL BY HYDRODEMOLITION SHALL BE CONDUCTED ON THE BRIDGE DECK. THE REMOVAL WILL BE VERIFIED, AS NECESSARY, AND AT LEAST EVERY 20 FEET ALONG THE CUTTING PATH. THE EQUIPMENT SETTINGS WILL BE DOCUMENTED BY THE CONTRACTOR AND PROVIDED TO THE ENGINEER. CALIBRATION OF THE HYDRODEMOLITION EQUIPMENT SHALL BE CONDUCTED FOR EVERY DAY OF OPERATION AND, IF NECESSARY, RE-CALIBRATED TO INSURE REMOVAL OF KNOWN AREAS OF DELAMINATED CONCRETE AS WELL AS TO GUARD AGAINST EXCESSIVE REMOVAL OF SOUND CONCRETE. HANDCHIPPING MAY BE USED IN AREAS THAT ARE INACCESSIBLE TO THE SELF-PROPELLED OR HAND OPERATED HYDRODEMOLITION EQUIPMENT. HANDCHIPPING TOOLS (15 LBS. MAXIMUM) MAY BE HAND OR MECHANICALLY DRIVEN.

THE CONTRACTOR SHALL SUBMIT A PLAN FOR APPROVAL BY THE ENGINEER FOR CONTROL AND FILTERING OF ALL WATER DISCHARGED DURING HYDRODEMOLITION OPERATIONS TO PRODUCE VISIBLY CLEAR WATER PRIOR TO RELEASE TO THE SURROUNDING ENVIRONMENT. THE CONTRACTOR SHALL BLOCK ALL DRAINS ON THE DECK AND INSTALL DAMS TO STRAIN THE RUNOFF. THE DAMS SHALL BE CONSTRUCTED FROM SILT SOCKS, AGGREGATE OR STRAW HAVING MINIMUM DIMENSIONS OF 6 INCHES IN HEIGHT, BY 1 FOOT IN WIDTH. THE EXPOSED BRIDGE DECK MAY BE USED AS A SETTLEMENT BASIN FOR RUNOFF. AN ADDITIONAL SETTLEMENT BASIN OUTSIDE THE LIMITS OF THE BRIDGE DECK MY BE REQUIRED IF FURTHER STRAINING IS NECESSARY.

ADDITIONAL REMOVAL:

AFTER CONCRETE BRIDGE DECK REMOVAL BY HYDRODEMOLITION HAS BEEN COMPLETED FOR THE CONSTRUCTION PHASE, THE DECK WILL UNDERGO FINAL SOUNDING TO ASSURE THAT ALL UNSOUND CONCRETE HAS BEEN REMOVED. THE PREPARED DECK SURFACE WILL BE COMPLETELY DRY PRIOR TO FINAL SOUNDING AND WILL CONSIST OF AS MANY SUCCESSIVE SOUNDINGS AS REQUIRED TO ENSURE THAT ALL DELAMINATED OR DEBONDED CONCRETE HAS BEEN REMOVED. ADDITIONAL CONCRETE REMOVAL SHALL BE PERFORMED BY HANDCHIPPING AND/OR HYDRODEMOLITION. HANDCHIPPING TOOLS MAY BE HAND OR MECHANICALLY DRIVEN AND OPERATED AS SPECIFIED IN ARTICLE 2413.03 OF THE STANDARD SPECIFICATIONS.

FULL DEPTH REPAIR OF BRIDGE FLOOR:
WHERE THE DECK IS SOUND FOR LESS THAN HALF OF ITS ORIGINAL DEPTH, THE CONCRETE SHALL BE REMOVED FULL DEPTH EXCEPT FOR LIMITED AREAS AS DETERMINED BY THE ENGINEER.

THE CONTRACTOR SHALL ENSURE CONTAINMENT OF ALL DISLODGED MATERIAL, FLYING DEBRIS AND EXCESS WATER WITHIN THE EXISTING ROADWAY AND NOT ALLOW DEBRIS OR WATER TO ENTER ADJACENT TRAVEL LANES OR TRAFFIC, OR BELOW THE WORK AREA.

DURING REMOVALS, WHERE REINFORCING STEEL IS EXPOSED AND CONCRETE AND STEEL ARE NO LONGER BONDED, REMOVE ANY CONCRETE TO CLEAR AT LEAST 1" INCH AROUND THE EXPOSED BARS. DO NOT USE CHIPPING HAMMERS HEAVIER THAN 15 LBS. TO REMOVE CONCRETE. EXTREME CARE SHALL BE TAKEN TO ENSURE THAT NO DAMAGE IS DONE TO ANY REINFORCING BARS EXPOSED DURING THE REMOVAL PROCESS. ANY DAMAGE DONE SHALL BE REPAIRED BY THE CONTRACTOR AS APPROVED BY THE ENGINEER AT NO ADDITIONAL COST TO THE STATE.

PREPARATION OF BRIDGE FLOOR PRIOR TO OVERLAY PLACEMENT:
AFTER COMPLETION OF HYDRODEMOLITION, BUT NOT MORE THAN 24 HOURS PRIOR TO PLACEMENT OF THE OVERLAY, THE ENTIRE DECK SHALL BE HEAVILY SANDBLASTED OR WATER BLASTED TO EXPOSE FINE AND COARSE AGGREGATES AND TO REMOVE LAITANCE FROM THE SURFACE. EXPOSED REINFORCING STEEL AND THE CONCRETE UNDER AND AROUND THE EXPOSED STEEL SHALL BE THOROUGHLY CLEANED BY SANDBLASTING OR WATER BLASTING. THE SURFACE SHALL BE CLEANED USING COMPRESSED AIR TO REMOVE ALL DUST, CHIPS AND WATER. AIR LINES FOR SANDBLASTING AND COMPRESSED AIR CLEANING SHALL BE EQUIPPED WITH OIL TRAPS.

REMOVAL IN AREAS THAT ARE NOT ACCESSIBLE TO HYDRODEMOLITION EQUIPMENT SHALL BE PERFORMED USING CONVENTIONAL METHODS.

VACUUMING OF DEBRIS AND WATER SHALL BE DONE IMMEDIATELY AFTER ANY HYDRODEMOLITION WORK. CONTRACTOR IS TO ENSURE ALL WATER RUN-OFF AND RESIDUAL MATERIAL IS CONTAINED WITHIN THE WORK AREA AND COLLECTED FOR DISPOSAL. DISPOSE OF EXCESS WATER AND DEBRIS AS APPROVED BY THE ENGINEER.

CLEANING OF THE HYDRODEMOLITION DEBRIS AND SLURRY SHALL BE PERFORMED WITH A VACUUM SYSTEM EQUIPPED WITH DUST CONTROL DEVICES AND CAPABLE OF REMOVING WET DEBRIS AND WATER IN THE SAME PASS. THE VACUUM EQUIPMENT SHALL BE CAPABLE OF WASHING THE DECK WITH PRESSURIZED WATER DURING THE VACUUM OPERATION TO DISLodge ALL DEBRIS AND SLURRY FROM THE BRIDGE DECK SURFACE. CLEANING SHALL BE DONE BEFORE DEBRIS AND SLURRY IS ALLOWED TO DRY ON THE BRIDGE DECK SURFACE.

DEFECTS IN EMBEDDED REINFORCING STEEL DUE TO CORROSION, WHICH HAS REDUCED THE CROSS SECTIONAL AREA OF THE STEEL BY 25% OR GREATER, SHALL HAVE NEW REINFORCING STEEL OF THE SAME SIZE OR GREATER CROSS SECTIONAL AREA LAPPED TO EACH SIDE OF THE DAMAGED AREA. 2'-2" LAP LENGTHS SHALL BE USED. NEW REINFORCEMENT SHALL BE EPOXY COATED. NEW REINFORCEMENT SHALL BE PAID FOR AS AN EXTRA WORK ORDER.

THE BID ITEM "HYDRODEMOLITION REMOVAL" SHALL INCLUDE ALL COSTS FOR HYDRODEMOLITION, CLEAN-UP, WATER CONTROL, DISPOSAL, AND FINAL CLEAN-UP IN PREPARATION FOR "CONCRETE REPAIR, REPLACE VARIABLE DEPTH CONCRETE".

THE BID ITEM "CONCRETE REPAIR, REPLACE VARIABLE DEPTH CONCRETE", CUBIC YARDS, SHALL INCLUDE THE ADDITIONAL CONCRETE TO REPAIR THE DECK FROM THE HYDRO-DEMOLITION REMOVAL AND HAND REMOVAL. FOR THE FIELD MEASUREMENT OF THIS ITEM, THE CONCRETE REQUIRED FOR THE DECK OVERLAY (60.5 CUBIC YARDS) WILL BE DEDUCTED FROM THE TOTAL CONCRETE VOLUME PLACED DURING THE OVERLAY OPERATION. THE 60.5 YD3 QUANTITY WAS DETERMINED USING A 2¼ INCH OVERLAY THICKNESS (1¾ INCH NOMINAL PLUS ½ INCH ALLOWABLE VARIATION). IT IS ASSUMED THE OVERLAY OPERATION WILL PLACE ALL DECK CONCRETE (EXCLUDING AREAS OF CLASS B REPAIR) IN ONE OPERATION.

THE BID ITEM "DECK OVERLAY (CLASS O PPC)" OR "DECK OVERLY (CLASS HPC-O PCC)" SHALL INCLUDE THE COST OF THE 60.5 YD3 OF CONCRETE MATERIAL NOTED AS A DEDUCTION WHEN CALCULATING THE "CONCRETE REPAIR, REPLACE VARIABLE DEPTH CONCRETE" PAY QUANTITY.

WHERE THE DECK IS UNSOUND FOR MORE THAN HALF OF ITS ORIGINAL DEPTH AS DETERMINED BY THE ENGINEER, THE CONCRETE SHALL BE REMOVED FULL DEPTH. FOR THESE AREAS OF FULL DEPTH REMOVAL, THE WORK SHALL BE FIELD MEASURED AND PAID FOR AS CLASS B, DECK REPAIR, PER SQUARE YARD.

DESIGN FOR REPAIRS TO A 15° SKEW

201'-4 X 44' PRETENSIONED

PRESTRESSED CONCRETE BEAM BRIDGE

68'-2¼ & 64'-0⅝ END SPANS68'-11⅓ INTERIOR SPAN

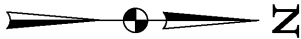
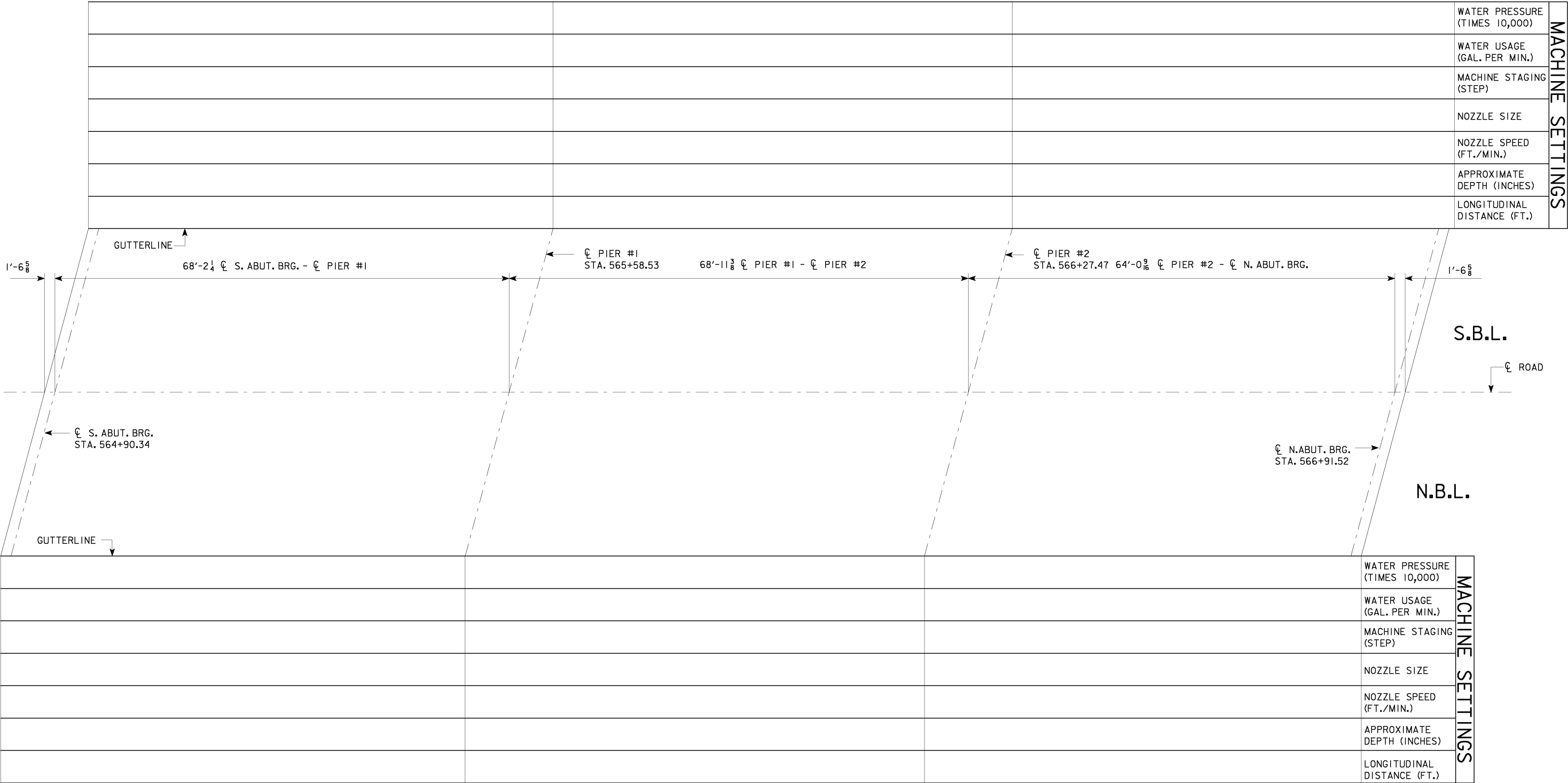
HYDRODEMOLITION NOTES

STA. 565+93.00 (☹ U.S. 71)DECEMBER 2011

CASS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 6FILE NO. 30551DESIGN NO. 312



AREAS, REMOVAL DEPTHS AND SETTINGS OF HYDRODEMOLITION PROCESS

DESIGN FOR REPAIRS TO A 15° SKEW

201'-4 X 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

68'-2 1/4" & 64'-0 9/16" END SPANS 68'-11 3/8" INTERIOR SPAN

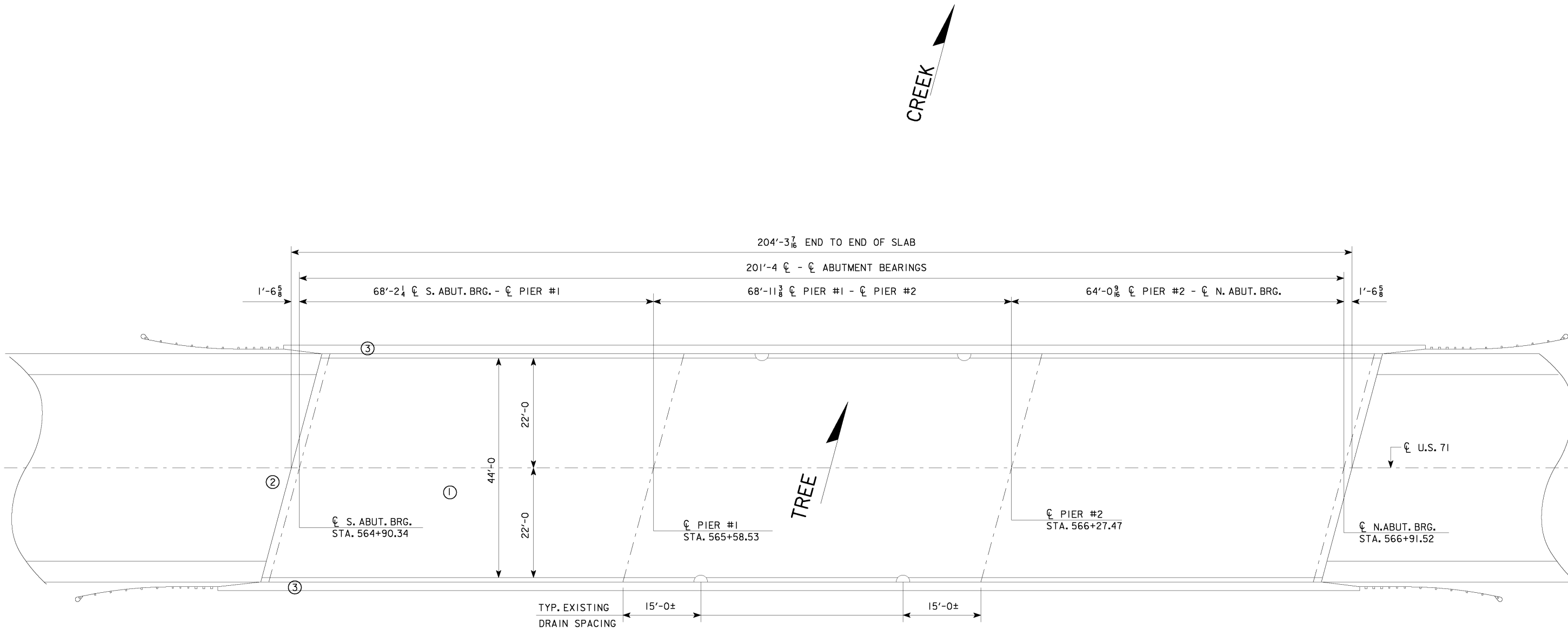
RECORD OF HYDRODEMOLITION PROCESS

STA. 565+93.00 (CL U.S. 71) DECEMBER 2011

CASS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 4 OF 6 FILE NO. 30551 DESIGN NO. 312



SITUATION PLAN

REPAIR NOTES:

- ① SCARIFY THE DECK, PERFORM HYDRODEMOLITION AND OVERLAY THE BRIDGE WITH PCC.
- ② RECONSTRUCT JOINT BETWEEN APPROACH SLAB AND BRIDGE DECK USING STANDARD (CF) CRUMB RUBBER.
- ③ APPLY CONCRETE SEALER TO EXISTING BARRIER RAILS.



LOCATION:

U.S. 71 OVER LONE TREE CREEK
T-76N R-36W
SECTIONS 33-34
GROVE TWP.
CASS COUNTY
MAINT. NO. 1554.9S071
FHWA NO. 17550
LATITUDE: 41.34385309
LONGITUDE: -94.9845588

TRAFFIC ESTIMATE

2010	AADT	2610	V.P.D.
202	AADT	-	V.P.D.
202	DHV	-	V.P.H.
TRUCKS		12	%
TOTAL			
DESIGN ESALs		-	

DESIGN FOR REPAIRS TO A 15° SKEW

**201'-4 X 44' PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**

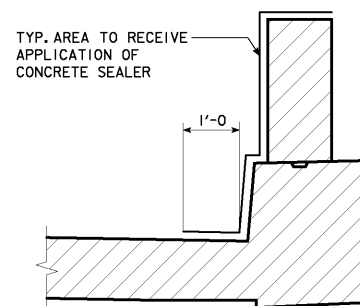
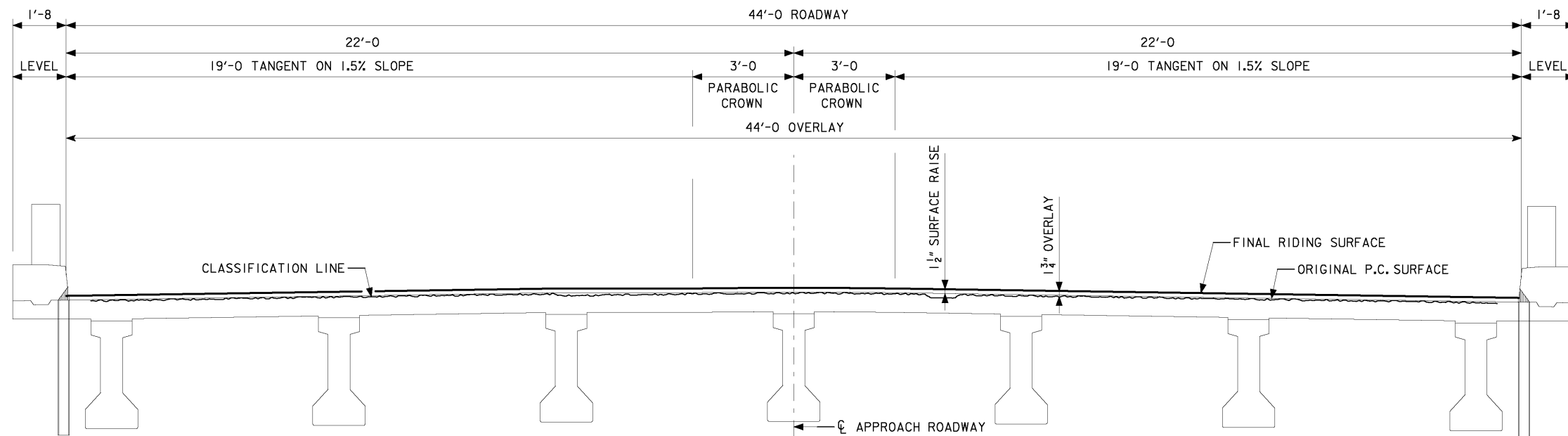
68'-2¹/₄ & 64'-0³/₁₆ END SPANS 68'-11³/₈ INTERIOR SPAN

SITUATION PLAN

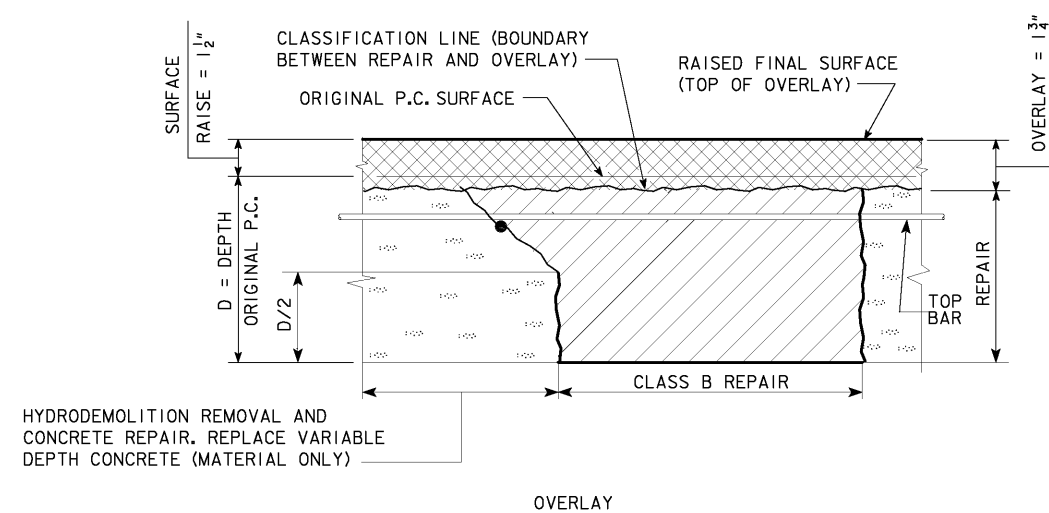
STA. 565+93.00 (CL U.S. 71) DECEMBER 2011

CASS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 5 OF 6 FILE NO. 30551 DESIGN NO. 312

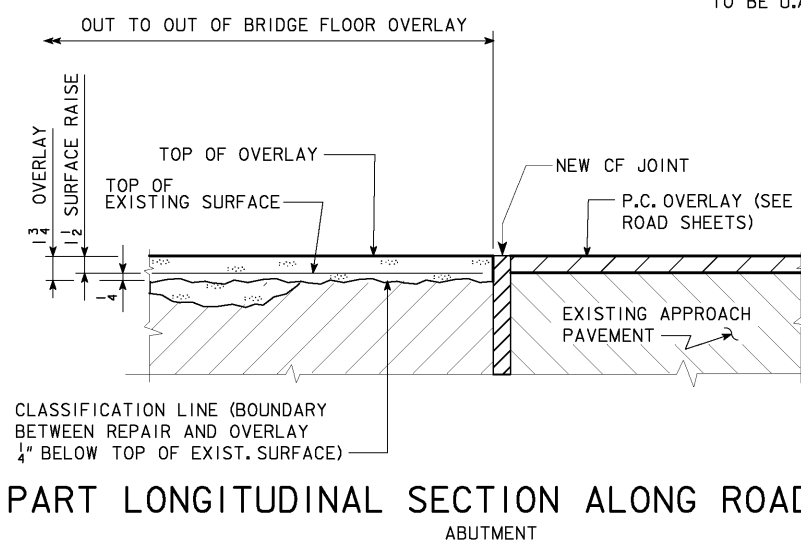


DETAIL OF CONCRETE SEALER AREA



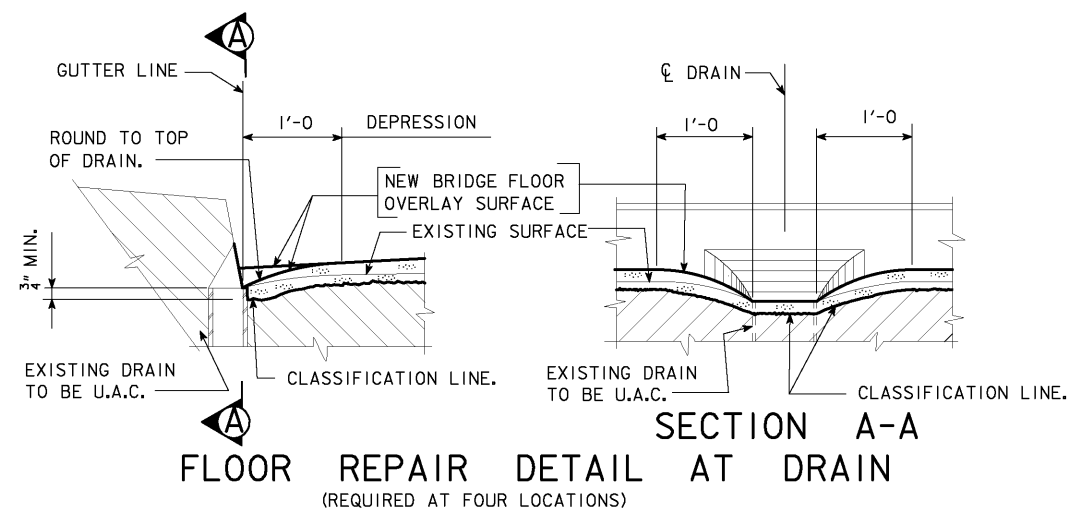
REPAIR AND OVERLAY DEFINITION

(SEE "CONCRETE REPAIR NOTES" FOR INFORMATION FOR CONCRETE QUANTITIES IN ADDITION TO 1 3/4" OVERLAY QUANTITIES.)



PART LONGITUDINAL SECTION ALONG ROADWAY

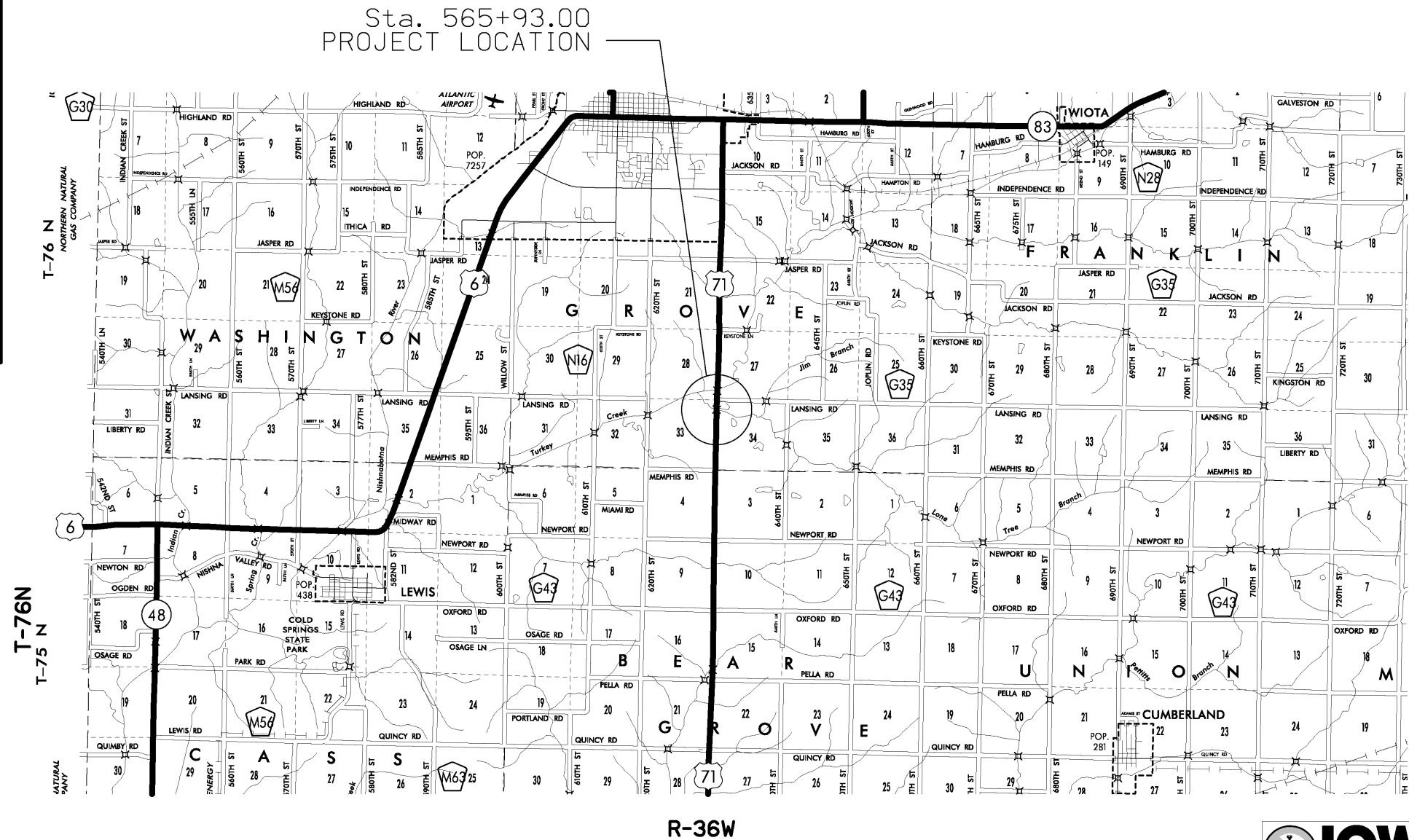
ABUTMENT



FLOOR REPAIR DETAIL AT DRAIN

DESIGN FOR REPAIRS TO A 15° SKEW
**201'-4 X 44' PRETENSIONED
 PRESTRESSED CONCRETE BEAM BRIDGE**
 68'-2 1/4' & 64'-0 3/8" END SPANS 68'-11 3/8" INTERIOR SPAN
DECK REPAIR DETAILS
 STA. 565+93.00 (C U.S. 71) DECEMBER 2011
CASS COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 6 OF 6 FILE NO. 30551 DESIGN NO. 312

INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	Title Sheets
A.1	Title Sheet
A.1	Location Map
B Sheets	Typical Cross Sections and Details
B.1 - 2	Typicals and Details
B.3	As Built Typical Sheet - For Information Only
C Sheets	Quantities and General Information
C.1	Estimated Project Quantities
C.1	Estimate Reference Information
C.2	Index of Tabulations
C.2	Standard Road Plans
C.3 - 5	Tabulations
D Sheets	Mainline Plan and Profile Sheets
D.1	As Built Plan & Profile Sheet - FOR INFORMATION ONLY
J Sheets	Traffic Control and Staging Sheets
* J.1	Special Events, Traffic Control Plan & Staging Notes
* J.2	Traffic Control & Staging Legend & Symbol Info. Sheet
* J.3 - 4	Traffic Control/Staging Layout Sheets
* Color Plan Sheets	



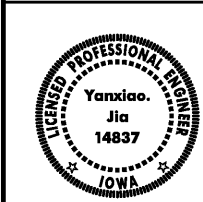
NO MILEAGE SUMMARY



ROADWAY DESIGN

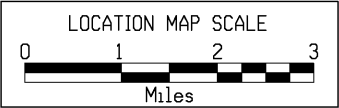
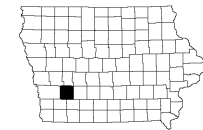
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

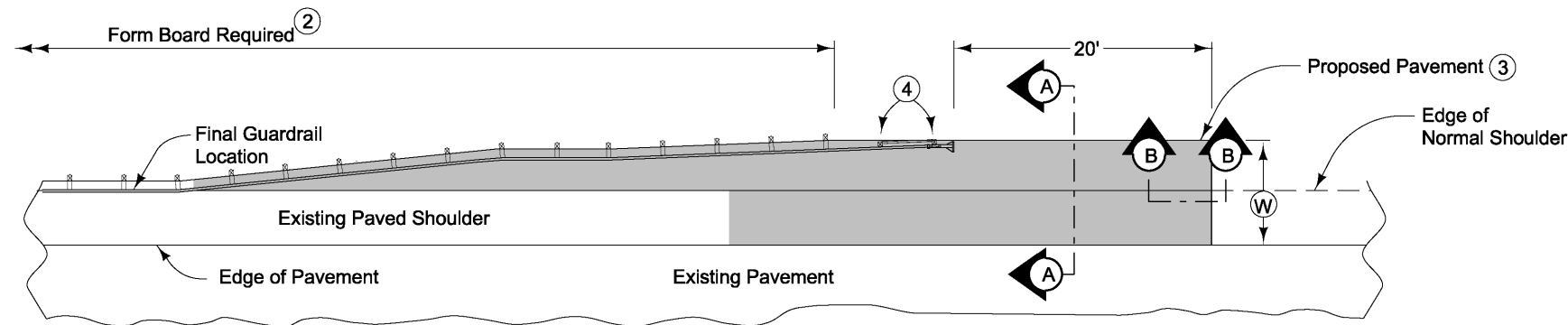
Yanxiao Jia 09-30-2011
Signature Date
Yanxiao Jia
Printed or Typed Name
My license renewal date is December 31, 2012



Pages or sheets covered by this seal: A.1, B.1-B.3, C.1-C.5, D.1, J.1-J.4

Design No. 312
File No. 30551



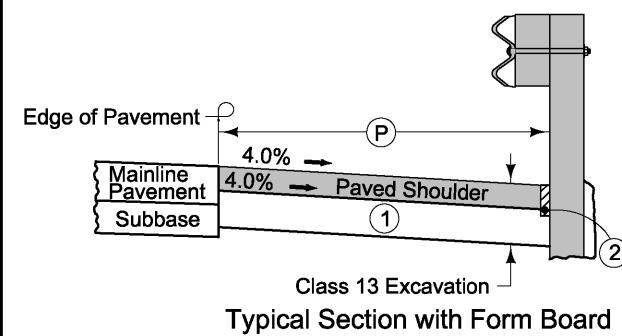


8" HMA Paved Shoulder at guardrail. 7" PCC may be substituted with the following jointing layout:

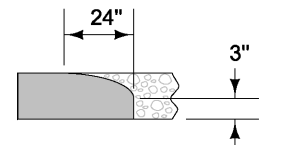
Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse joints in shoulder at mid-panel of the mainline pavement. Place longitudinal joint at W/2 from edge of mainline pavement when W is greater than 10' wide. Terminate longitudinal joint at transverse joint less than 10' in length.

Compaction of HMA is required to face of guardrail post. Hand compaction will be allowed under guardrail. Removal & reinstallation of guardrail will be allowed with no additional payment.

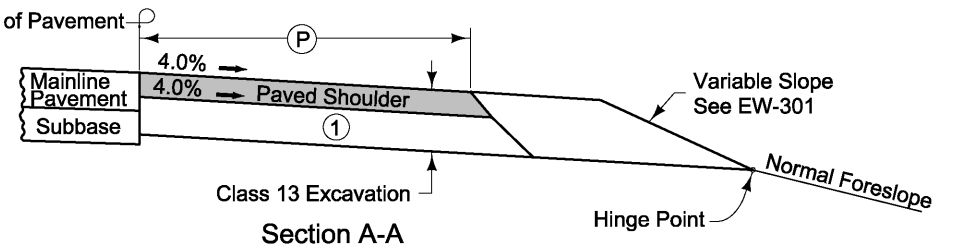
- ① 6" Special Backfill.
- ② When guardrail posts are installed prior to construction of paved shoulder, nail 1" x 6" untreated form boards along the face of guardrail posts for the length shown. This board is to prevent shoulder material from contacting the sides of the posts and altering the function of the guardrail. Form board not required for final 2 posts.
- ③ Continue paved shoulder to existing paved shoulder or 20' beyond the end of guardrail.
- ④ Shoulder may be notched for final 2 posts or post sleeves may be installed through pavement.



Typical Section with Form Board



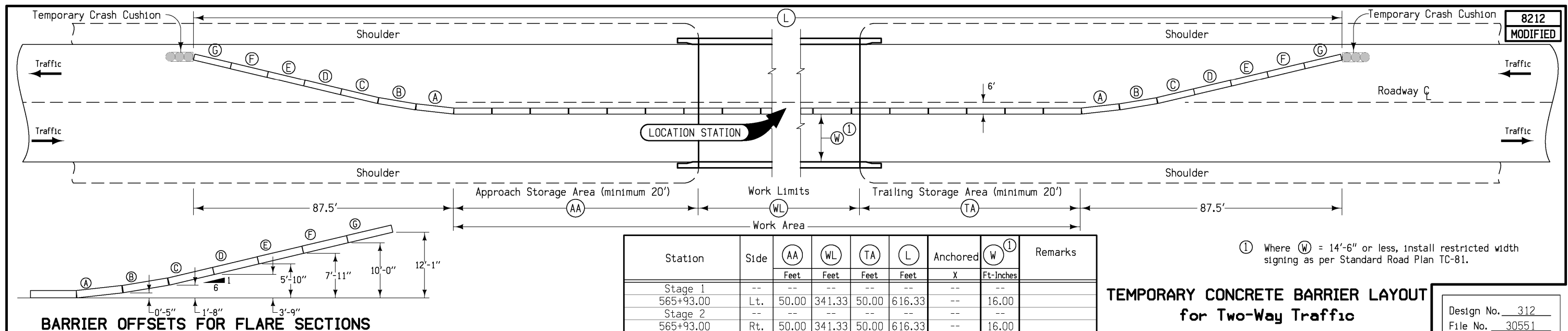
Section B-B
Roll down at granular shoulder or earth.



Section A-A

PAVED SHOULDER AT GUARDRAIL

Location			Ⓟ Feet	Subgrade ① Treatment		Paved Shoulder SY	Class 13 Excavation CY	Remarks
Road Identification	Station To Station	Side		Special Backfill Tons	Modified Subbase CY			
NBL - Approaching	Stage 1							
U.S. 71	563+29	Rt.	12.5	14.2	--		17.5	
U.S. 71		Rt.	12.5-11.2	13.5	--		16.7	
U.S. 71		Rt.	3.2-3	0.5	--		0.6	
U.S. 71		Rt.	3	3.9	--		4.8	
U.S. 71		Rt.	3-1.7	1.0	--	85.889	1.3	
NBL - Trailing								
U.S. 71	567+62	Rt.	1.7-3.2	3.2	--		3.9	
U.S. 71		Rt.	3.2	2.0	--		2.4	
U.S. 71	567+89	Rt.	9.2	4.8	--	13.889	6.0	
SBL - Approaching	Stage 2							
U.S. 71	567+41.52	Rt.	1.7-3	1.0	--		1.3	
U.S. 71		Rt.	3	3.9	--		4.8	
U.S. 71		Rt.	3-3.4	1.2	--		1.5	
U.S. 71		Rt.	5.4-6.5	5.6	--		6.9	
U.S. 71	568+49.52	Rt.	6.5	7.4	--	53.942	9.1	
SBL - Trailing								
U.S. 71	567+93.52	Lt.	7.2	5.8	--		7.1	
U.S. 71		Lt.	1.7	0.6	--		0.7	
U.S. 71	564+40.34	Lt.	1.7-0.2	1.2	--	19.422	1.5	
Project Totals:			--	69.7	--	173.142	86.0	



① Where Ⓦ = 14'-6" or less, install restricted width signing as per Standard Road Plan TC-81.

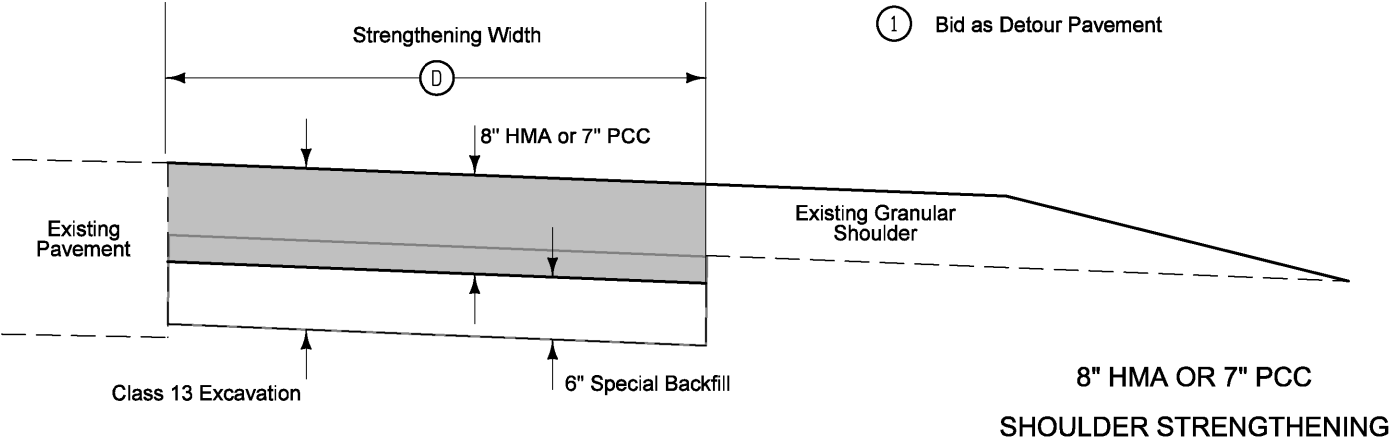
TEMPORARY CONCRETE BARRIER LAYOUT
for Two-Way Traffic

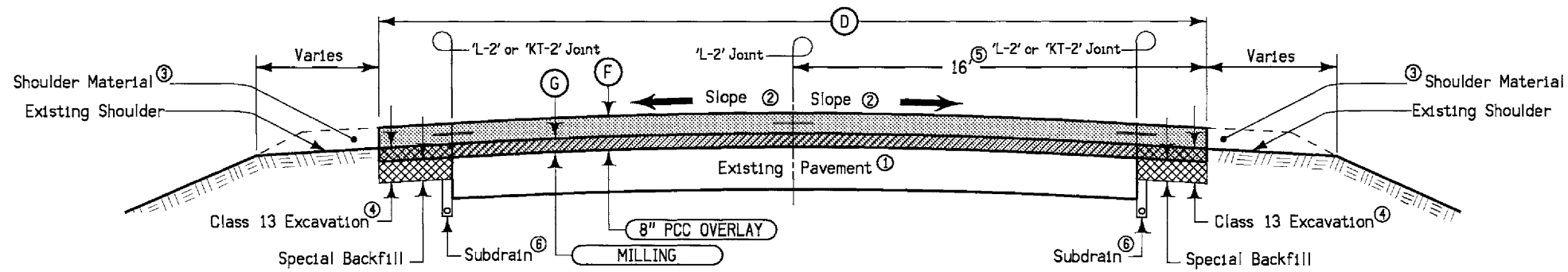
Design No. 312
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NOTE: Refer to Sheets J.3 and J.4 for details on
Placement and Location of Paved Shoulders.

① Bid as Detour Pavement

STATION TO STATION		INSIDE OR OUTSIDE	Dir. of Travel	Ⓚ Feet	Shoulder Strengthening SY ①	Class 13 Excavation CY		Special Backfill
						HMA	PCC	Tons
Prior to Stage 1 - SBL - Trailing 561+50.5	564+14.0	OUTSIDE	SB	4.0	117.111	45.5	42.3	36.9
Prior to Stage 1 - SBL - Approaching 567+93.9	570+32.2	OUTSIDE	SB	4.0	105.911	41.2	38.2	33.4
Stage 1 - NBL - Approaching 561+45	563+29	OUTSIDE	NB	4.0	81.778	30.8	28.6	24.9
Stage 1 - NBL - Trailing 567+89	570+36	OUTSIDE	NB	4.0	109.778	41.7	38.8	33.8
			Totals:		414.578	159.3	147.9	129.0





DESIGN RATES	
ITEM	RATE
Milling	145 lbs./cu. ft.
Special Backfill	140 lbs./cu. ft.

TABLE OF DESIGN QUANTITIES Per Station										
LOCATION			(F)	(G)	(D)	MILLING SY	CLASS 13 EXCAVATION CY (4)	SPECIAL BACKFILL Tons	8" PCC OVERLAY SY	8" PCC OVERLAY CY
ROAD IDENTIFICATION	STATION TO STATION		Inches	Inches	Feet					
US 71	683+77.00	(7) 894+84.68	8	3	32	266.7	22.2	28	355.56	79.01
US 71	(7) 100+00.00	434+90.00	8	3	32	266.7	22.2	28	355.56	79.01
US 71	564+21.00	582+91.00	8	6	32	266.7	22.2	14	355.56	79.01

Notes:

- Existing pavement width is 24 ft.
- Finished slope shall match existing pavement except that the maximum allowable slope is 3.0% minimum allowable slope is 2.0%. Section may be modified as directed by the Engineer through areas of special shaping.
- Shoulder material as specified elsewhere in these plans; refer to Typical 7110M.
- 9" depth 4' wide. 6" to be replaced with Special Backfill for subdrain work prior to PCC overlay. (Both sides)
- Includes 4' PCC paved shoulder. Refer to Typical 2205M for climbing lane details.
- Refer to Typical PCC-4 for details. See Tab 104-9 for locations.
- Equation Sta. 894+84.68 Back = Sta. 100+00.00 Ahead
- Refer to Detail Sheet U.03 for details.

TYPICAL CROSS SECTION
PCC OVERLAY

This Sheet
For Information Only

Design No. 312
File No. 30551

ESTIMATED PROJECT QUANTITIES
(UP TO A 5 DIVISION PROJECT)

Item No.	Item Code	Item	Unit	Quantities											
				Estimated						As Built					
				Division 1	Division 2	Division 3	Division 4	Division 5	Total	Division 1	Division 2	Division 3	Division 4	Division 5	
1	2102-0425071	SPECIAL BACKFILL	CY	198.7						198.7				97.955	
2	2102-2625000	EMBANKMENT-IN-PLACE	CY	307.6						307.6				307.6	
3	2122-5500080	PAVED SHOULDER, HOT MIX ASPHALT MIXTURE, 8 IN.	SY	221.2						221.2				173.142	
4	2213-2713300	EXCAVATION, CLASS 13, FOR WIDENING	CY	233.9						233.9				233.9	
5	2304-0100000	DETOUR PAVEMENT	SY	409.5						409.5				414.578	
6	2412-0000100	LONGITUDINAL GROOVING IN CONCRETE	SY	1557.5						1557.5				1557.5	
7	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL	LF	400.2						400.2				266.0	
8	2505-4008300	STEEL BEAM GUARDRAIL	LF	100						100				100.0	
9	2505-4008400	STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION	EACH	4						4				4	
10	2505-4021010	STEEL BEAM GUARDRAIL END ANCHOR, BOLTED	EACH	4						4				4	
11	2505-4021700	STEEL BEAM GUARDRAIL END TERMINAL	EACH	4						4				4	
12	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	85.93						85.93				31.001	
13	2527-9263131	WET RETROREFLECTIVE REMOVABLE TAPE MARKINGS	STA	3.4						3.4				6.26	
14	2527-9263180	PAVEMENT MARKINGS REMOVED	STA	85.93						85.93				32.078	
15	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE	LF	1250						1250				1200.0	
16	2528-8400157	TEMPORARY FLOODLIGHTING LUMINAIRE	EACH	2						2				2	
17	2528-8400256	TEMPORARY TRAFFIC SIGNALS	EACH	2						2				2	
18	2528-8445110	TRAFFIC CONTROL	LS	1						1				\$3,890.00	
19	2528-8445113	FLAGGERS	EACH							See Proposal				4	
20	2551-0000110	TEMP CRASH CUSHION	EACH	4						4				4	
21	2555-0000010	DELIVER AND STOCKPILE SALVAGED MATERIALS	LS	1						1				\$2,500.00	
22	2602-0000020	SILT FENCE	LF	698						698				558.0	
23	2602-0000090	CLEAN-OUT OF SILT FENCE	LF	279						279				0	

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
1	2102-0425071	SPECIAL BACKFILL Refer to Typical 7156 for location and details on Sheet B.1 and Typical Shoulder Strengthening on Sheet B.2.
2	2102-2625000	EMBANKMENT-IN-PLACE Refer to Tab. 107-23 for additional information.
3	2122-5500080	PAVED SHOULDER, HOT MIX ASPHALT MIXTURE, 8 IN. Refer to Typical 7156 for location and details on Sheet B.1.
4	2213-2713300	EXCAVATION, CLASS 13, FOR WIDENING Refer to Typical 7156 for location and details on Sheet B.1 and Typical Shoulder Strengthening on Sheet B.2.
5	2304-0100000	DETOUR PAVEMENT Refer to Typical Shoulder Strengthening on Sheet B.2
6	2412-0000100	LONGITUDINAL GROOVING IN CONCRETE Refer to Tab. 100-28 for additional information.
7	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL Refer to Tab. 110-7A for additional information.
8	2505-4008300	STEEL BEAM GUARDRAIL
9	2505-4008400	STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION
10	2505-4021010	STEEL BEAM GUARDRAIL END ANCHOR, BOLTED
11	2505-4021700	STEEL BEAM GUARDRAIL END TERMINAL Refer to Tab. 108-8A for additional information.
12	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED
13	2527-9263131	WET RETROREFLECTIVE REMOVABLE TAPE MARKINGS Refer to Tab.108-22 for additional information.
14	2527-9263180	PAVEMENT MARKINGS REMOVED Refer to Tab. 108-22 for additional information.
15	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE Refer to Tab. 108-33 for additional information. Refer to Typical 8212 for location and details on Sheet B.1.
16	2528-8400157	TEMPORARY FLOODLIGHTING LUMINAIRE Refer to Tab. 108-27 for additional information.
17	2528-8400256	TEMPORARY TRAFFIC SIGNALS Refer to Tab. 108-28 for additional information.
18	2528-8445110	TRAFFIC CONTROL Refer to Sheet J.1 for additional information.

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
19	2528-8445113	FLAGGERS - -
20	2551-0000110	TEMP CRASH CUSHION Refer to Tab. 108-30 for additional information.
21	2555-0000010	DELIVER AND STOCKPILE SALVAGED MATERIALS Refer to Tab. 110-13.
22	2602-0000020	SILT FENCE Refer to Tab. 100-17 for additional information. This item includes 25% more silt fence than the tab quantity for field adjustments and replacements.
23	2602-0000090	CLEAN-OUT OF SILT FENCE Refer to Tab. 100-17 for additional information. The bid quantity shall be equal to 50% of the tab quantity for silt fence.

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INDEX OF TABULATIONS			111-25 10-18-11
Tabulation	Tabulation Title	Sheet No.	
100-17	TABULATION OF SILT FENCES	C.3	
100-28	LONGITUDINAL GROOVING	C.3	
102-5	EXISTING PAVEMENT	C.4	
105-4	STANDARD ROAD PLANS	C.2	
107-23	GRADING FOR GUARDRAIL INSTALLATIONS	C.4	
108-22	PAVEMENT MARKING LINE TYPES	C.5	
108-27	TEMPORARY FLOODLIGHTING LUMINAIRES	C.3	
108-28	TEMPORARY TRAFFIC SIGNALS	C.3	
108-30	CRASH CUSHIONS	C.3	
108-33	TEMPORARY BARRIER RAIL	C.3	
108-8A	STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE END POST	C.4	
110-13	DELIVERY AND STOCKPILING	C.2	
110-7A	REMOVAL OF STEEL BEAM GUARDRAIL	C.3	
102-15	TABULATION OF SPECIAL EVENTS	J.1	
108-23A	TRAFFIC CONTROL PLAN	J.1	
108-26A	STAGING NOTES	J.1	

DELIVERY AND STOCKPILING						110-13 04-20-10
Item Description	Quantity	Units	Delivery Location	Contact Name & Number	Remarks	
Steel Beam Gaurdrail and Hardware	400.2	LF	Atlantic - Maintenance Garage	Kurt Reason (712-243-3114)	Delivery between hours of - 6:30 A.M. and 3:00 P.M. - Make arrangements for delivery 24 hours in advance.	

STANDARD ROAD PLANS			105-4 10-18-11
The following Standard Road Plans apply to construction work on this project.			
Number	Date	Title	
BA-200	10-18-11	Steel Beam Guardrail Components	
BA-201	10-19-10	Steel Beam Guardrail Barrier Transition Section	
BA-202	10-18-11	Steel Beam Guardrail Bolted End Anchor	
BA-205	10-18-11	Steel Beam Guardrail End Terminal	
BA-250	10-18-11	Steel Beam Guardrail Installation at Concrete Barrier or Bridge End Post	
BA-401	04-20-10	Temporary Barrier Rail (Precast Concrete)	
BA-500	04-20-10	Temporary Crash Cushions Sand Barrel	
EC-201	04-20-10	Silt Fence	
EW-301	04-19-11	Guardrail Grading	
PM-110	04-19-11	Line Types	
RM-48	10-17-06	Temporary Floodlighting	
SI-173	04-20-10	Object Markers	
SI-211	10-19-10	Object Marker and Delineator Placement with Guardrail	
SI-881	04-19-11	Special Signs for Workzones	
TC-1	10-18-11	Work Not Affecting Traffic (Two-Lane or Multi-Lane)	
TC-202	04-20-10	Shoulder Closure (One Lane)	
TC-213	10-21-08	Lane Closure with Flaggers	
TC-217	10-19-10	Lane Closure with Signals and TBR	
TC-233	10-18-11	Pavement Marking Operations Two-Lane	

213-1 04-15-08
WASTE (NON-DESIRABLE MATERIAL)
It shall be the contractor's responsibility to provide waste areas or disposal sites for excess material (excavated material or broken concrete) which is not desirable to be incorporated into the work involved on this project.
It shall be the contractor's responsibility to ensure that areas (including haul roads) selected for waste or disposal not impact 1) culturally sensitive sites or graves or 2) wetlands or "Waters of the U.S.", including streams or stream banks below the "ordinary high water mark", without an approved U.S. Army Corps of Engineers Section 404 Permit.
No payment for overhaul will be allowed for material hauled to these sites. No material shall be placed within the right-of-way, unless specifically stated in the plans.

232-3A 10-18-11
EROSION CONTROL (RURAL SEEDING)
Following the completion of work in a disturbed area, place seed, fertilizer, and mulch on the portion of the area lying 8 feet adjacent to shoulder as follows:
SEEDING: 3 lbs. of Fescue or Fawn per 1000 sq. ft.
FERTILIZER: 17 lbs. of 13-13-13 (or equivalent) commercial fertilizer per 1000 sq. ft.
MULCH: 70 lbs. of dry cereal straw per 1000 sq. ft. Consolidate all mulch into the soil using a mulch stabilizer.
Preparing the seedbed and furnishing and applying seed, fertilizer, and mulch is incidental to mobilization. No extra compensation will be allowed.

262-6 10-18-05
UTILITIES (NOT A POINT 25 PROJECT)
This is NOT a POINT 25 project and is not subject to the provisions of IAC 761-115.25.

108-30
04-20-10

- * Bid Item

[illegible]

108-28
08-01-08

No.	Location Station	Type			Remarks
		One Lane Traffic	Haul Road	Intersection	
1	562+10.34	x			
2	569+71.52	x			

100-17
04-20-10

Location			Length	Remarks
Begin Station	End Station	Side	LF	
NB Approach 563+25.0	564+90.0	Rt.	165.0	
SB Trailing 563+76.0	564+90.0	Lt.	114.0	
NB Trailing 566+92.0	568+06.0	Rt.	114.0	
SB Approach 566+92.0	568+57.0	Lt.	165.0	
Total:			558.0	

110-7A
10-19-10

- ① Lane(s) to which the installation is adjacent.

[illegible]

108-33
04-20-10

No.	Station to Station		Length LF	(Select One)		Remarks
				Concrete BA-401	Steel BA-400	
1	562+82.8	568+99.0	600.0	x		Stage 1
2	562+82.8	568+99.0	600.0	x		Stage 2
		Total:	1200.0			

108-27
08-01-08

No.	Location Station	Type	Number Lumin.	Remarks
1	563+10.34	Conventional	1	
2	568+71.52	Conventional	1	

100-28
10-19-10

Location	Total	Remarks
	SY	
565+93.00	999.5	Lone Tree Creek - Bridge - Center Sta.
S. Approach	279.0	
N. Approach	279.0	
Total:	1557.5	

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GRADING FOR GUARDRAIL INSTALLATIONS

Refer to EW-301

STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE END POST

① See Standards for list of materials.

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PAVEMENT MARKING LINE TYPES

See PM Series

*BCY4 - Place on the same side of the roadway to match existing markings near the project.

**NPY4 - For estimating purposes only. No Passing Zone Lines will be located in the field.

BCY4: Broken Centerline (Yellow) @ 0.25

DCY4: Double Centerline (Yellow) @ 2.00

NPY4: No Passing Zone Line (Yellow) @ 1.25

BLW4: Broken Lane Line (White) @ 0.25

ELW4: Edge Line Right (White) @ 1.00

ELY4: Edge Line Left (Yellow) @ 1.00

SLW2: Stop Line (White) @ 6.00

			Location					Length by Line Type (Unfactored)															Remarks
Road ID	Station to Station		Dir. of Travel	Marking Type	Side			BCY4*	DCY4	NPY4**	BLW4	ELW4	ELY4	SLW2									
					L	C	R																
Stage 1	546+40.3	585+41.5		Removal		C		39.01															
	561+40.3	570+41.5		Removal	L		R					18.02											
	546+40.3	561+40.3		Waterborne/Solvent Paint		C				15.00													
	570+41.5	585+41.5		Waterborne/Solvent Paint		C				15.00													
	561+40.3	561+40.3		Waterborne/Solvent Paint			R							0.12									
	570+41.5	570+41.5		Waterborne/Solvent Paint	L									0.12									
	561+40.3	570+41.5		Waterborne/Solvent Paint			R					9.01											
	561+40.3	563+10.3		Wet Retroreflective Removable Tape			R					1.70											
	563+10.3	563+70.3		Waterborne/Solvent Paint			R					0.60											
Stage 2																							
	563+10.3	563+70.3		Removal			R					0.60											
	561+40.3	570+41.5		Removal	L							9.01											
	568+11.5	568+71.5		Waterborne/Solvent Paint	L							0.60											
	568+71.5	570+41.5		Wet Retroreflective Removable Tape	L							1.70											
	561+40.3	570+41.5		Waterborne/Solvent Paint			R					9.01											
Final																							
	561+40.3	570+41.5		Removal			R					9.01											
	568+11.5	568+71.5		Removal	L							0.60											
	561+40.3	561+40.3		Removal			R							0.12									
	570+41.5	570+41.5		Removal	L									0.12									
	546+40.3	561+40.3		Removal		C				15.00													
	570+41.5	585+41.5		Removal		C				15.00													
	546+40.3	585+41.5		Waterborne/Solvent Paint		C		39.01															
	561+40.3	570+41.5		Waterborne/Solvent Paint	L		R					18.02											

Design No. 312
File No. 30551

47. Glen M. & Carrie M. Davis
48. Richard J. Rudolph
49. Jean I. Everest & Arthur R. Friday
45A. Calla Struthers Estate

ACRES R.O.W. _____
ACQUIRED BY _____
RECORDED IN BOOK _____

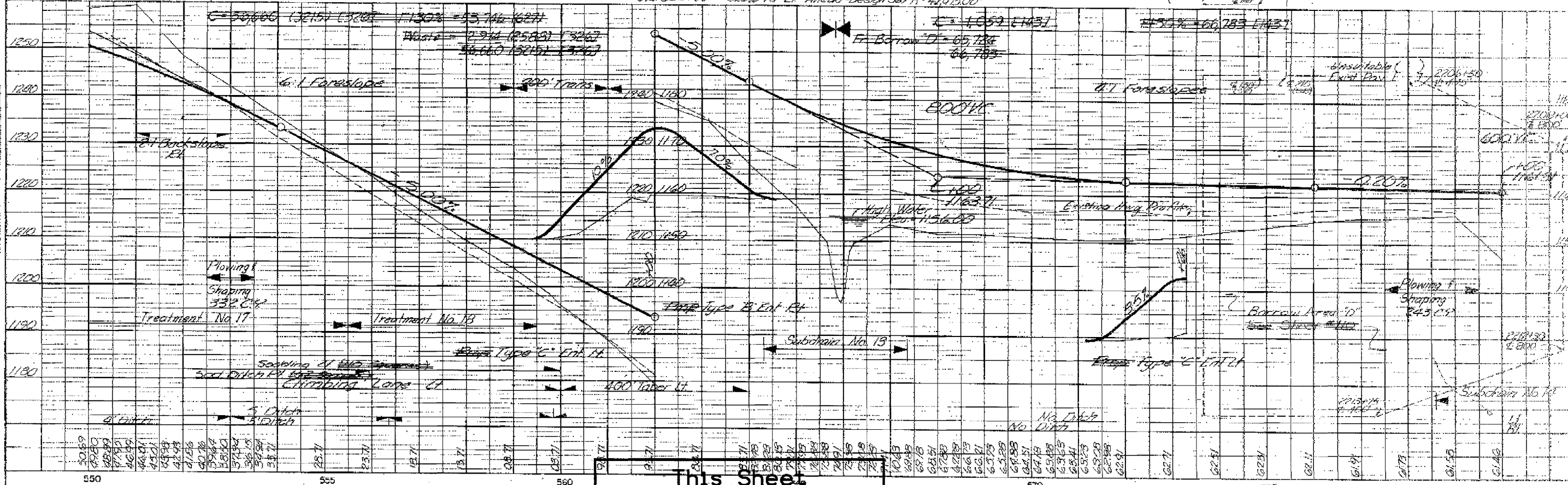
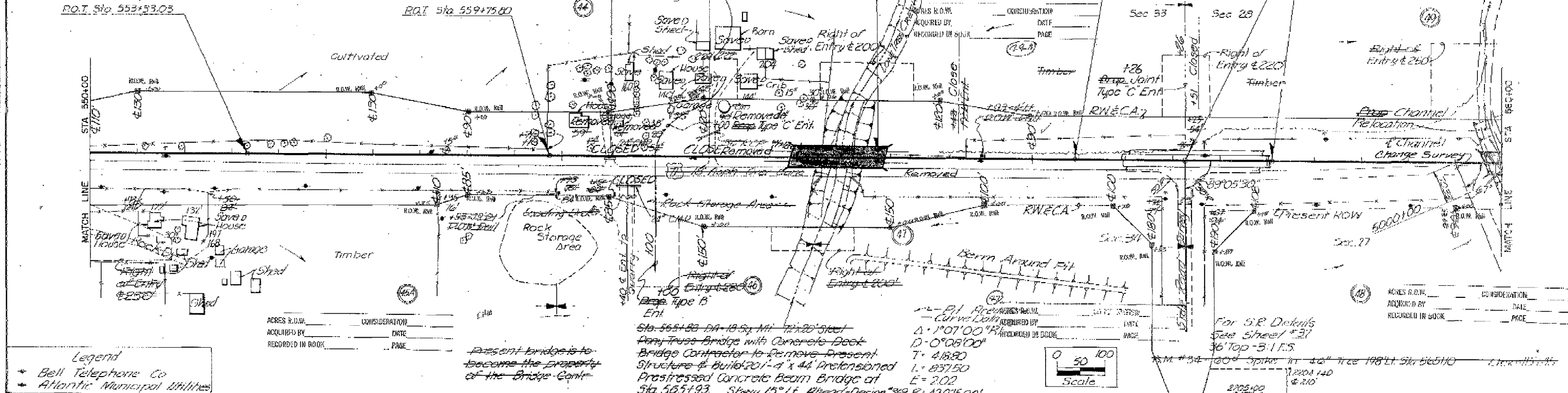
ACRES R.O.W. _____
ACQUIRED BY _____
RECORDED IN BOOK _____

ACRES R.O.W. _____
ACQUIRED BY _____
RECORDED IN BOOK _____

ACRES R.O.W. _____
ACQUIRED BY _____
RECORDED IN BOOK _____

ACRES R.O.W. _____
ACQUIRED BY _____
RECORDED IN BOOK _____

ACRES R.O.W. _____
ACQUIRED BY _____
RECORDED IN BOOK _____



This Sheet
For Information Only

CASS COUNTY PROJECT F-71-3(8)-20-15 SHEET NO. 19

Design No. 312
File No. 30551

102-15 08-01-08		
TABULATION OF SPECIAL EVENTS		
Event	Location	Date
SPECIAL EVENTS - CASS COUNTY		
Cass County Fair	Atlantic	July 28 - August 03 2012
Coca Cola Days	Atlantic	September 21-22 2012

108-23A 08-01-08
TRAFFIC CONTROL PLAN
1. Traffic will be maintained on Iowa 71 at all times via temporary traffic signals.
2. Traffic control on this project shall be in accordance with Standard Road Plans listed on Tab. 105-4. For Additional complimentary information, refer to Part 6 of the Manual on Uniform Traffic Control Devices.
3. Work on projects BRFN-071-3(49)--39-15 and BRFN-071-3(50)--39-15 shall proceed on only one bridge at a time. Both bridges shall not be under construction at the same time.

108-26A 08-01-08
STAGING NOTES
Prior to Stage 1 construction, strengthen shoulders on southbound lanes.
Stage 1: Northbound lane construction, guardrail and shoulder strengthening.
Stage 2: Southbound lane construction and guardrail.
Assume Northbound lanes constructed first. Contractor may construct Northbound or Southbound lanes first.

Design No. 312
File No. 30551

CROSS SECTION VIEW COLOR LEGEND
OF TRAFFIC CONTROL AND STAGING SHEETS

SHADING	Design Color No.		
Green, Light	(225)		Existing Pavement Shading
Gray, Light	(48)		Previously Constructed Pavement Shading
Gray, Med	(80)		Previously Constructed Granular Surface Shading
Blue, Light	(230)		Proposed Pavement Shading
Lavender	(9)		Temporary Pavement Shading
Brown, Light	(236)		Proposed Grading Limits Shading
Brown, Med	(237)		Future Proposed Pavement Shading

CROSS SECTION VIEW PATTERN AND SYMBOL LEGEND
OF TRAFFIC CONTROL AND STAGING SHEETS

	Pavement Removal		Proposed Granular Shoulder
	Proposed Granular Subbase		Temporary Shoulder
	Proposed Special Backfill		Existing Shoulder Strengthening
	Temporary Barrier Rail		Permanent Barrier Rail
			Channelizing Device

PLAN VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

LINEWORK	Design Color No.		
Green	(2)		Existing Topographic Features and Labels
Magenta	(5)		Pavement Marking Call Outs
Blue	(1)		Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Yellow	(4)		Pavement Markings, Yellow
Off White	(254)		Pavement Markings, White

SHADING

Design Color No.

Green, Light	(225)		Existing Pavement Shading
Gray, Light	(48)		Previously Constructed Pavement Shading
Gray, Med	(80)		Previously Constructed Granular Surface Shading
Blue, Light	(230)		Proposed Pavement Shading
Lavender	(9)		Temporary Pavement Shading
Brown, Light	(236)		Proposed Grading Limits Shading
Pink, Dark	(13)		Proposed MSE or CIP Wall Shading
Red	(3)		Proposed Bridge Shading and Sign Trusses
Black w/Gray, Light Fill	(0,48)		Previously Constructed Structure

PLAN VIEW PATTERN AND SYMBOL LEGEND
OF TRAFFIC CONTROL AND STAGING SHEETS

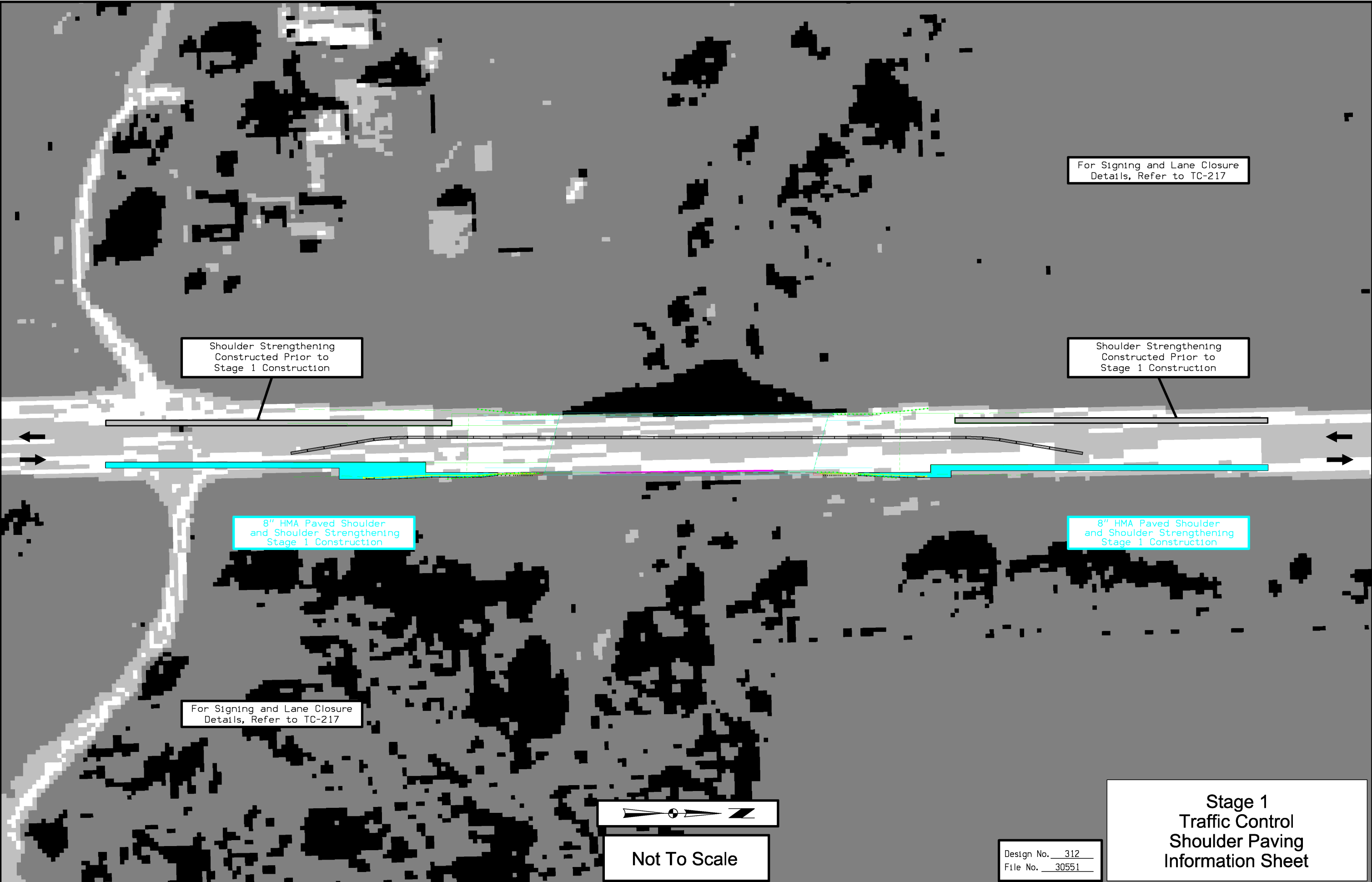
	Channelizing Device		Crash Cushion
	Drum		Traffic Signal
	Temporary Lane Seperator		Flagger
	Tubular Marker		Temporary Floodlighting
	Channelizer Marker		Traffic Sign
	Concrete Barrier Marker		Type III Barricade
	Delineator		Type A Warning Light
	Temporary Barrier Rail		Direction of Traffic
	Pavement Removal		Road Closure

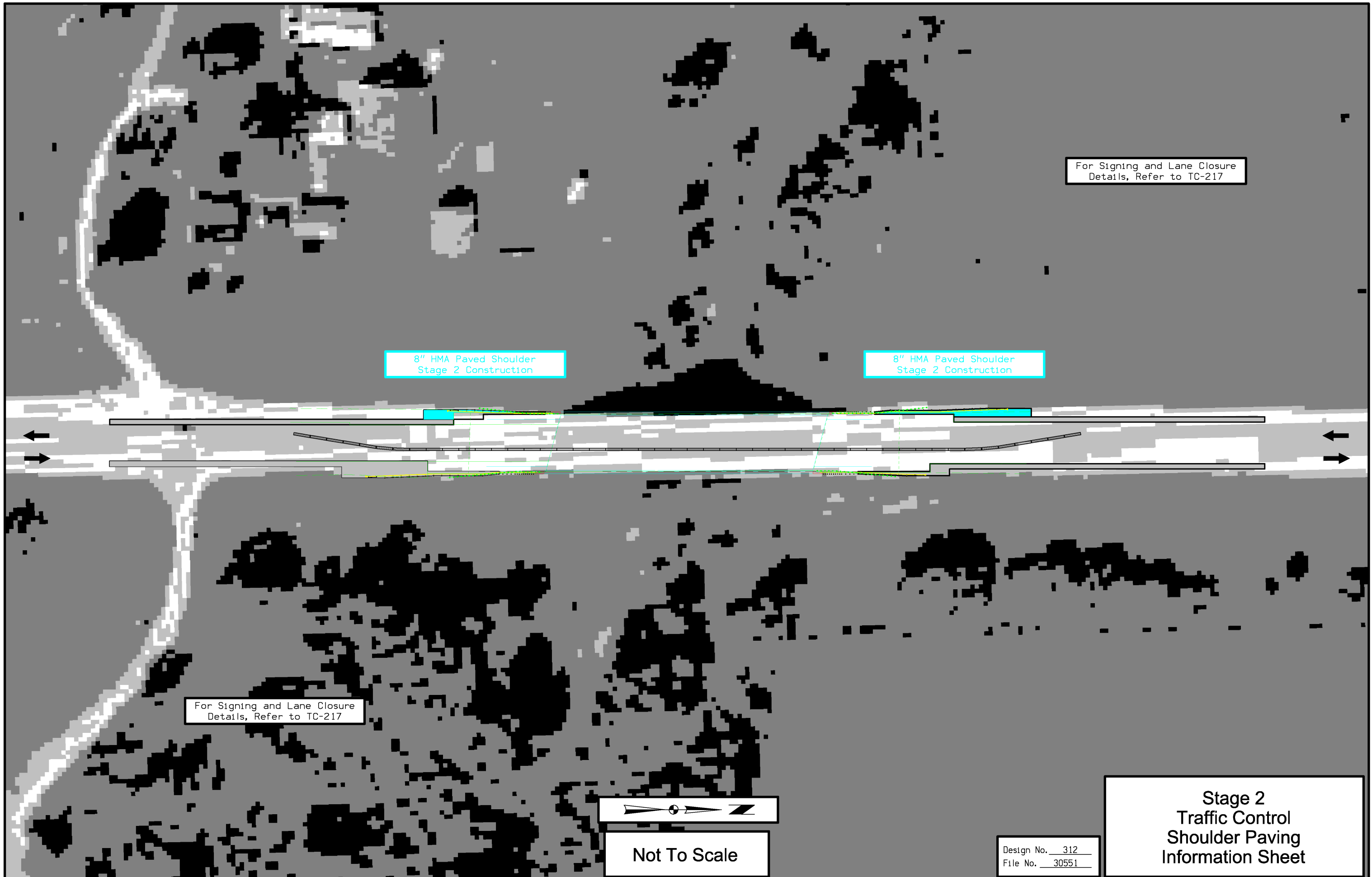
NOTE: Device spacing according to Standard Road Plans unless specifically dimensioned.

TRAFFIC CONTROL
AND
STAGING
LEGEND AND SYMBOL
INFORMATION SHEET

(COVERS SHEET SERIES J)

Design No. 312
File No. 30541



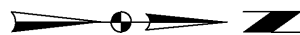


For Signing and Lane Closure
Details, Refer to TC-217

8" HMA Paved Shoulder
Stage 2 Construction

8" HMA Paved Shoulder
Stage 2 Construction

For Signing and Lane Closure
Details, Refer to TC-217



Not To Scale

Design No. 312
File No. 30551

Stage 2
Traffic Control
Shoulder Paving
Information Sheet