POTTAWATTAMIE COUNTY - BRIDGE AND APPROACHES - OTHER - BRF-006-1(114)--38-78 - LETTING DATE 2-15-2011

POTTAWATTAMIE COUNTY - DESIGN NO. 111 & 211

CONVENTIONAL SIGNS

- 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

Iowa Department of Transportation

Highway Division

PLANS OF PROPOSED IMPROVEMENTS ON THE

PRIMARY ROAD SYSTEM

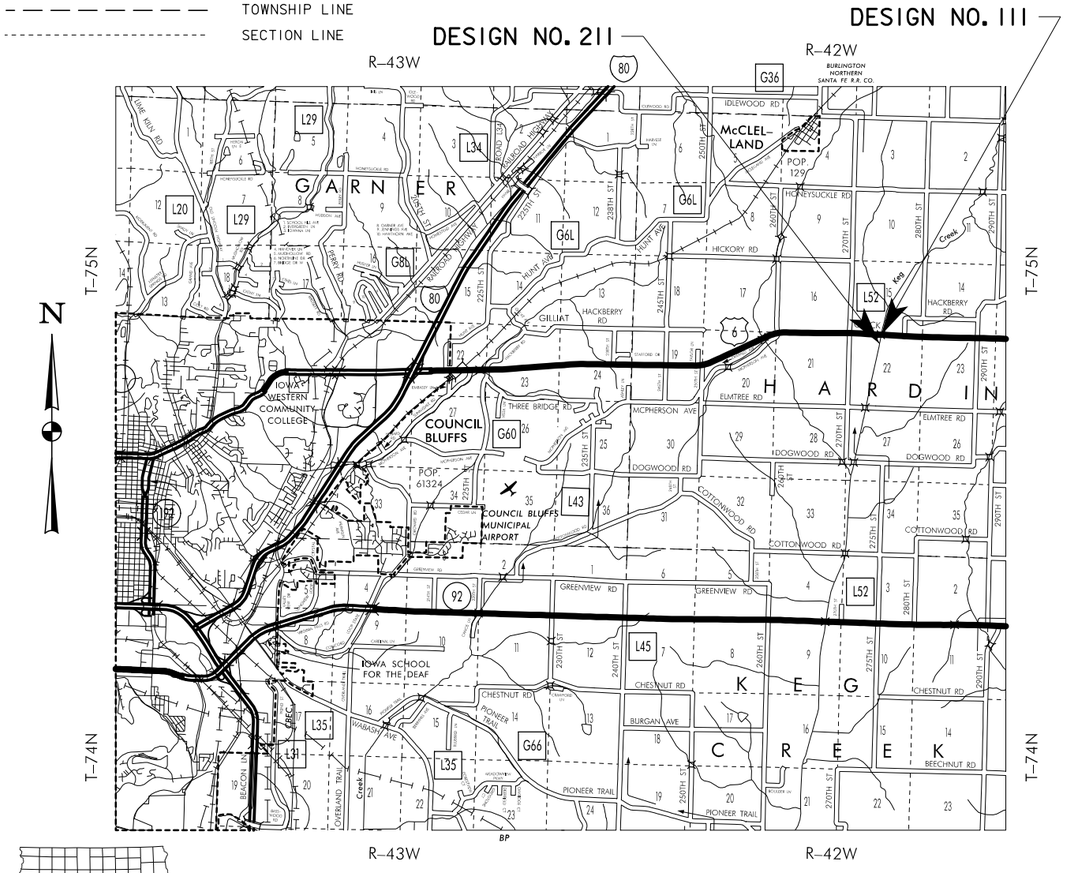
POTTAWATTAMIE COUNTY

BRIDGE AND APPROACHES - OTHER

US 6 OVER KEG CREEK

0.4 MI. E. OF S.R. L52

THE 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.



LOCATION MAP

PROJECT DIRECTORY NAME: 7800602005

ENGLISH STANDARD CULVERT PLANS

STANDARD	ISSUED	REVISED
FBJ-02-04	I-04	5-09
RCFB-02-04	I-04	4-07

REVISIONS
SEE REVISION SHEET 6-16-11

	TOTAL SHEETS
	87
PROJECT NUMBER	
BRF-006-1(114)--38-78	
R.O.W. PROJECT NUMBER	
PROJECT IDENTIFICATION NUMBER	
05-78-006-020	

INDEX OF SHEETS

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811 Know what's below. Call before you dig.

ALL WORKING DRAWINGS INCLUDING SHOP DRAWINGS AND FALSEWORK DRAWINGS WILL BE CHECKED BY:

HNTB
CENTRAL PARK PLAZA NORTH
222 SOUTH 15TH STREET, SUITE 247-N
OMAHA, NE 68012

SHRP PROJECT R04

INNOVATIVE BRIDGE DESIGNS
FOR RAPID RENEWAL
ABC DEMONSTRATION PROJECT

STANDARD ROAD PLANS

STANDARD ROAD PLANS ARE LISTED ON SHEET C.3

DESIGN DATA RURAL

2009	AADT	3,890	V.P.D.
2029	AADT	5,380	V.P.D.
	DHV		V.P.H.
TRUCKS		9	%
Total Design ESALs			

INDEX OF SEALS

SHEET NO.	NAME	TYPE
1, 43	WILLIAM L. KAUFMAN	HYDRAULIC DESIGN
2	MICHAEL D. LAVIOLETTE	STRUCTURAL DESIGN
43	DAVID L. BARE	STRUCTURAL DESIGN
SPS.1, C.6	ROBERT L. STANLEY	GEOTECHNICAL DESIGN
A.2	JASON R. STRUM	ROADWAY DESIGN
S.1	CHIN-TA TSAI	HYDRAULIC DESIGN
CULVERT STANDARDS	NORMAN L. MCDONALD	STRUCTURAL DESIGN

HYDRAULIC DESIGN

LICENSED PROFESSIONAL ENGINEER
William L. Kaufman
15098
IOWA

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.

William L. Kaufman — 12-06-2010
Signature — Date

William L. Kaufman
Printed or Typed Name

My license renewal date is December 31, 2011

Pages or sheets covered by this seal: SHEETS 6 THRU 8 OF 87

DESIGN TEAM	ENGLISH		FILE NO.		PROJECT NUMBER	SHEET NUMBER
DRE / BDK / RDM	IOWA DOT * OFFICE OF BRIDGES AND STRUCTURES		30387	POTTAWATTAMIE COUNTY	BRF-006-1(114)--38-78	I

6/17/2011 1:07:38 PM bkloss W:\Projects\7800602005\BRFinal\78006114.brg 780111S000 11x17_pdf.pltcfg

LISTING OF PROJECT REVISIONS

DATE	SHEET NUMBER	DESCRIPTION OF REVISIONS
6-16-2011	1A OF 42	REVISION SHEET ADDED.
	2 OF 42	BRIDGE QUANTITIES CHANGE.
		REASON: UPDATE FOR STRUCTURAL STEEL CHANGES TO OTHER SHEETS.
	19 OF 42	ADDED ROCK SOCKET DIMENSION AND NOTE.
		REASON: NO CHANGE, CLARIFICATION ONLY.
	23 OF 42	SHEAR STUD CALLOUT REVISED.
		REASON: PROVIDE FOR HAUNCH AT ENDS OF MODULE.
	24 OF 42	SHEET VOIDED.
		REASON: REPLACED WITH SHEET 24A.
	24A OF 42	CHANGED CLOSURE POUR DETAILS, SHEAR STUD LAYOUT, AND NOTE 7.
		REASON: REVISED HAIRPIN BAR DETAILS TO PROVIDE ADDITIONAL CLEARANCE AND SHEAR STUD LAYOUT TO PROVIDE ADEQUATE CLEARANCES FOR HAUNCHING
	26 OF 42	5e1 AND 5f1 BENT BAR DETAILS.
		REASON: IMPROVE FIT-UP AND CLEARANCE.
	28 OF 42	MAXIMUM HAUNCH CHANGE IN NOTE 4.
		REASON: IMPROVE FIT-UP AND CLEARANCE.
	29 OF 42	5e1 AND 5f1 BENT BAR DETAILS.
		REASON: IMPROVE FIT-UP AND CLEARANCE.
	30 OF 42	MAXIMUM HAUNCH CHANGE IN NOTE 4.
		REASON: IMPROVE FIT-UP AND CLEARANCE.
	31 OF 42	5e1 AND 5f1 BENT BAR DETAILS.
		REASON: IMPROVE FIT-UP AND CLEARANCE.
	33 OF 42	MAXIMUM HAUNCH CHANGE IN NOTE 4.
		REASON: IMPROVE FIT-UP AND CLEARANCE.
	34 OF 42	5e1 AND 5f1 BENT BAR DETAILS.
		REASON: IMPROVE FIT-UP AND CLEARANCE.
	35 OF 42	ADDED FIELD WELD FLAG AND MORE DETAIL TO NOTE 7.
		REASON: PERMIT FIELD WELDING OF SOLE PLATE TO BEAM
	36 OF 42	CHANGED STRUCTURAL STEEL BAR SIZE ON TIE PLATE DETAIL.
		REASON: CLEARANCE TO REDUCE CHANCE FOR INTERFERENCE
	39 OF 42	ADDED 5b5 BAR AND MODIFIED 5b4 BAR QUANTITY.
		REASON: MODIFIED HAIRPIN BARS FOR USE WITH UHPC
	40 OF 42	ADDED 5b5 BAR, MODIFIED 5b4 BAR DETAIL AND CHANGED BOTTOM CLEAR COVER FOR SLAB REINFORCEMENT.
		REASON: MODIFIED HAIRPIN BARS FOR USE WITH UHPC

STRUCTURAL DESIGN

REGISTERED PROFESSIONAL ENGINEER
Michael D. LaViolette
15153
IOWA

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 6/16/2011

Michael D. LaViolette
Printed or Typed Name

My license renewal date is December 31, **2011**

Pages or sheets covered by this seal: **SHEETS 1A, 2, 19, 23, 24, 24A, 26, 28 THRU 31, 33 THRU 36, 39, 40**

POTTAWATTAMIE COUNTY
DESIGN NO. 111
REVISION SHEET

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

REVISED: JUNE 16, 2011

ESTIMATED BRIDGE QUANTITIES

ITEM NO.	ITEM CODE	ITEM DESCRIPTION	UNIT	TOTAL	AS BUILT QUANTITY
1	2104-2710020	EXCAVATION, CL 10, CHANNEL	CY	10,977	
2	2401-6745650	RMVL OF EXIST STRUCT	LS	1	
3	2402-2720000	EXCAVATION, CL 20	CY	304	
4	2404-7775000	REINFORCING STEEL	LB	46,594	
5	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	3,754	
6	2412-0000100	LONGITUDINAL GROOVING IN CONC	SY	1,300	
7	2433-0001072	CONC DRILLED SHAFT, 72" DIA	LF	300	
8	2433-0003000	DEMONSTRATION SHAFT	LF	75	
9	2501-0201057	PILE, STEEL, HP 10X57	LF	1,920	
10	2507-3250005	ENGINEERING FABRIC	SY	3,295	
11	2507-6800061	REVETMENT, CLASS E	TON	3,209	
12	2526-8285000	CONSTRUCTION SURVEY	LS	1	
13	2533-4980005	MOBILIZATION	LS	1	
14	2599-9999005	ABUTMENT STEM	EACH	2	
15	2599-9999005	ABUTMENT WINGWALL	EACH	4	
16	2599-9999005	EXTERIOR APPROACH SLAB	EACH	4	
17	2599-9999005	EXTERIOR SUPERSTRUCTURE MODULE 1	EACH	4	
18	2599-9999005	EXTERIOR SUPERSTRUCTURE MODULE 2	EACH	2	
19	2599-9999005	INTERIOR APPROACH SLAB	EACH	4	
20	2599-9999005	INTERIOR SUPERSTRUCTURE MODULE 1	EACH	8	
21	2599-9999005	INTERIOR SUPERSTRUCTURE MODULE 2	EACH	4	
22	2599-9999005	PIER CAP	EACH	2	
23	2599-9999005	PIER COLUMN	EACH	4	
24	2599-9999005	SLEEPER SLAB	EACH	2	
25	2599-9999018	PAVEMENT SURFACE REPAIR (GRINDING LIMESTONE OR GRAVEL)	SY	1,300	
26	2601-2638620	MACADAM STONE SLOPE PROTECTION	SY	70	

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
1	2104-2710020	EXCAVATION, CL 10, CHANNEL
2	2401-6745650	RMVL OF EXIST STRUCT INCLUDES: BRIDGE DEMOLITION, REMOVAL OF 30" AND 72" CORRUGATED METAL PIPE ON SOUTH SIDE OF BRIDGE.
3	2402-2720000	EXCAVATION, CL 20
4	2404-7775000	REINFORCING STEEL
5	2404-7775005	REINFORCING STEEL, EPOXY COATED
6	2412-0000100	LONGITUDINAL GROOVING IN CONC INCLUDES: 1,104 SY FOR BRIDGE DECK AND 196 SY FOR APPROACH SLAB
7	2433-0001072	CONC DRILLED SHAFT, 72" DIA INCLUDES: ALL COSTS ASSOCIATED WITH CONSTRUCTION OF DRILLED SHAFT EXCLUDING REINFORCING STEEL
8	2433-0003000	DEMONSTRATION SHAFT
9	2501-0201057	PILE, STEEL, HP 10X57 INCLUDES: HEADED STUDS
10	2507-3250005	ENGINEERING FABRIC
11	2507-6800061	REVETMENT, CLASS E
12	2526-8285000	CONSTRUCTION SURVEY
13	2533-4980005	MOBILIZATION
14	2599-9999005	ABUTMENT STEM (ABC ITEM) INCLUDES: PRECAST ABUTMENT STEM, WINGWALL EXTENSIONS, EXTENSION FOOTINGS, EPOXY-COATED REINFORCING, SELF-CONSOLIDATING CONCRETE AT STEEL PILES, GALVANIZED METAL PT DUCTS FOR ANCHOR BOLTS, LIFTING ANCHORS, PREFORMED CLOSED CELL FOAM, SUBDRAIN, FLOODABLE BACKFILL, POROUS BACKFILL, GEOTEXTILE FABRIC, WATER FLOODING, SUBDRAIN OUTLET HIGH PERFORMANCE STRUCTURAL CONCRETE 46 CY SELF-CONSOLIDATING CONCRETE 5 CY EPOXY-COATED REINFORCEMENT 7,014 LBS
15	2599-9999005	ABUTMENT WINGWALL (ABC ITEM) INCLUDES: PRECAST WINGWALLS AND FOOTINGS, EPOXY-COATED REINFORCING, BARRIERS, BARRIER END SECTION, SELF-CONSOLIDATING CONCRETE CLOSURE POURS, SELF-CONSOLIDATING CONCRETE AT STEEL PILES, LIFTING ANCHORS, HIGH PERFORMANCE STRUCTURAL CONCRETE 46 CY SELF-CONSOLIDATING CONCRETE 5 CY EPOXY-COATED REINFORCEMENT 5,333 LBS
16	2599-9999005	EXTERIOR APPROACH SLAB (ABC ITEM) INCLUDES: PRECAST CONCRETE APPROACH SLAB, EPOXY-COATED REINFORCING, STEEL SPIKES, RESILIENT JOINT FILLERS, PRESSURE RELIEF JOINT TYPE CF, LIFTING ANCHORS, E JOINT FILLER AND SEALANT. HIGH PERFORMANCE STRUCTURAL CONCRETE 34 CY EPOXY-COATED REINFORCEMENT 6,720 LBS

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
17	2599-9999005	EXTERIOR SUPERSTRUCTURE MODULE 1 (ABC ITEM) INCLUDES: STEEL GIRDERS, STIFFENERS, DIAPHRAGMS, TIE PLATES, SHEAR STUDS, LIFTING ANCHORS, DECK DRAINS WITH SUPPORTS AND CONNECTORS, FLANGE DEFLECTORS, HARDWARE, CONNECTORS, SHEAR KEYS, STEEL SOLE PLATES, SHIMS, ELASTOMERIC BEARINGS, ANCHOR BOLTS, GROUT, PRECAST CONCRETE DECK, PRECAST CONCRETE BACKWALL, EPOXY-COATED REINFORCING, BARRIERS STRUCTURAL STEEL ~~61,604 LBS~~ 61,469 LBS HIGH PERFORMANCE STRUCTURAL CONCRETE 62.7 CY EPOXY-COATED REINFORCEMENT 22,972 LBS
18	2599-9999005	EXTERIOR SUPERSTRUCTURE MODULE 2 (ABC ITEM) INCLUDES: STEEL GIRDERS, STIFFENERS, DIAPHRAGMS, SHEAR STUDS, LIFTING ANCHORS, DECK DRAINS WITH SUPPORTS AND CONNECTORS, HARDWARE, CONNECTORS, STEEL SOLE PLATES, SHIMS, ELASTOMERIC BEARINGS, ANCHOR BOLTS, GROUT, PRECAST CONCRETE DECK, EPOXY-COATED REINFORCING, BARRIERS, UHPC TRANSVERSE CLOSURE, UHPC BARRIER CLOSURE STRUCTURAL STEEL ~~29,740 LBS~~ 29,669 LBS HIGH PERFORMANCE STRUCTURAL CONCRETE 27.6 CY ULTRA HIGH PERFORMANCE CONCRETE 2.0 CY EPOXY-COATED REINFORCEMENT 10,609 LBS
19	2599-9999005	INTERIOR APPROACH SLAB (ABC ITEM) INCLUDES: PRECAST CONCRETE APPROACH SLAB, EPOXY-COATED REINFORCING, UHPC CLOSURE POURS, STEEL SPIKES, RESILIENT JOINT FILLERS, PRESSURE RELIEF JOINT TYPE CF, LIFTING ANCHORS HIGH PERFORMANCE STRUCTURAL CONCRETE 32 CY ULTRA HIGH PERFORMANCE CONCRETE 2 CY EPOXY-COATED REINFORCEMENT 6,420 LBS
20	2599-9999005	INTERIOR SUPERSTRUCTURE MODULE 1 (ABC ITEM) INCLUDES: STEEL GIRDERS, STIFFENERS, DIAPHRAGMS, TIE PLATES, SHEAR STUDS,LIFTING ANCHORS, HARDWARE, CONNECTORS, SHEAR KEYS, STEEL SOLE PLATES,SHIMS, ELASTOMERIC BEARINGS, ANCHOR BOLTS, GROUT, PRECAST CONCRETE DECK, PRECAST CONCRETE BACKWALL, EPOXY-COATED REINFORCING, UHPC LONGITUDINAL CLOSURE POURS STRUCTURAL STEEL ~~122,128 LBS~~ 121,859 LBS HIGH PERFORMANCE STRUCTURAL CONCRETE 120.8 CY ULTRA HIGH PERFORMANCE CONCRETE 13.5 CY EPOXY-COATED REINFORCEMENT 43,611 LBS
21	2599-9999005	INTERIOR SUPERSTRUCTURE MODULE 2 (ABC ITEM) INCLUDES: STEEL GIRDERS, STIFFENERS, DIAPHRAGMS, SHEAR STUDS, LIFTING ANCHORS, HARDWARE, CONNECTORS, STEEL SOLE PLATES,SHIMS, ELASTOMERIC BEARINGS, ANCHOR BOLTS, GROUT, PRECAST CONCRETE DECK, EPOXY-COATED REINFORCING, UHPC TRANSVERSE AND LONGITUDINAL CLOSURE POURS STRUCTURAL STEEL ~~59,480 LBS~~ 59,337 LBS HIGH PERFORMANCE STRUCTURAL CONCRETE 51.2 CY ULTRA HIGH PERFORMANCE CONCRETE 8.1 CY EPOXY-COATED REINFORCEMENT 14,087 LBS
22	2599-9999005	PIER CAP (ABC ITEM) INCLUDES: PRECAST CONCRETE CAP BEAM, STYROFOAM BLOCKOUTS, EPOXY-COATED REINFORCING, SPONGE RUBBER, NON-SHRINK GROUT, GROUTED SPLICE COUPLERS, GALVANIZED METAL PT DUCTS, STEEL SHIMS, LIFTING ANCHORS HIGH PERFORMANCE STRUCTURAL CONCRETE 66.4 CY EPOXY-COATED REINFORCEMENT 32,156 LBS
23	2599-9999005	PIER COLUMN (ABC ITEM) INCLUDES: PRECAST CONCRETE COLUMNS, EPOXY-COATED REINFORCING, NON-SHRINK GROUT, GROUTED SPLICE COUPLERS, STEEL SHIMS, LIFTING ANCHORS HIGH PERFORMANCE STRUCTURAL CONCRETE 52 CY EPOXY-COATED REINFORCEMENT 11,422 LBS
24	2599-9999005	SLEEPER SLAB (ABC ITEM) INCLUDES: PRECAST CONCRETE SLEEPER SLAB, EPOXY-COATED REINFORCEMENT, LIFTING ANCHORS. HIGH PERFORMANCE STRUCTURAL CONCRETE 18 CY EPOXY-COATED REINFORCEMENT 2,544 LBS
25	2599-9999018	PAVEMENT SURFACE REPAIR (GRINDING LIMESTONE OR GRAVEL) CONTRACTOR TO BID DIAMOND GRINDING BASED ON THE TYPE OF COARSE AGGREGATE IN THE CONCRETE MIX FOR BRIDGE DECKS. REFER TO DIAMOND GRINDING NOTE ON DESIGN SHEET NO. 2. GRINDING OF THE BRIDGE DECK SHALL BE IN ACCORDANCE WITH SECTION 2532 OF THE STANDARD SPECIFICAITONS. INCLUDES: 1,104 SY FOR BRIDGE DECK AND 196 SY FOR APPROACH SLABS.
26	2601-2638620	MACADAM STONE SLOPE PROTECTION INCLUDES: ENGINEERING FABRIC, MACADAM STONE, 4X6 TREATED TIMBERS, ½" DIA. STEEL PINS OR REBAR, ALL REQUIRED EXCAVATION, SHAPING AND COMPACTING FOR WINGWALL ARMORING.

STRUCTURAL DESIGN

REGISTERED PROFESSIONAL ENGINEER
Michael D. LaViolette
15153
IOWA

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.

Mike LaViolette 12/6/2010
Signature

Michael D. LaViolette
Printed or Typed Name

My license renewal date is December 31, 2011

Pages or sheets covered by this seal: SHEETS 2 thru 6 AND 9 thru 42

REVISED 6-16-2011: BRIDGE QUANTITIES CHANGE

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS 70'-0 INTERIOR SPAN

QUANTITIES

STA. 20+85.00 FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 41 FILE NO. 30387 DESIGN NO. 111

REVISED: JUNE 16, 2011

DGN$SYTIME0123456 DGN$USERNAME DGN$SPEC

GENERAL NOTES:

THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING 180'-0x28'-0 CONTINUOUS CONCRETE GIRDER BRIDGE, DESIGN NO. 5452, ON US 6 OVER KEG CREEK 6 MILES EAST OF COUNCIL BLUFFS. THE INTENT OF THIS PLAN IS TO PERFORM AN ACCELERATED REPLACEMENT OF THE BRIDGE USING PRECAST ABUTMENT, PIERS AND A MODULAR STEEL SUPERSTRUCTURE, REQUIRING THE BRIDGE TO BE REPLACED IN THE 2 WEEK ABC PERIOD.

PLANS OF THE EXISTING BRIDGE WILL BE MADE AVAILABLE TO THE CONTRACTOR. CONTACT THE OFFICE OF CONTRACTS - HIGHWAY DIVISION - IOWA D.O.T. - AMES.

THE LUMP SUM BID FOR "REMOVAL OF EXISTING STRUCTURE" SHALL INCLUDE ALL OF THE EXISTING 180'-0x28'-0 CONTINUOUS CONCRETE GIRDER BRIDGE, A 72" C.M.P., AND A 30" C.M.P. REMOVAL SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS, AND SPECIAL PROVISIONS THERETO. BRIDGE REMOVALS WILL BEGIN AT THE CLOSURE OF THE BRIDGE, AT THE START OF THE ABC PERIOD.

THE ROAD WILL BE CLOSED TO TRAFFIC ONLY DURING THE ABC PERIOD. SEE TRAFFIC CONTROL PLAN NOTE ON THIS SHEET.

THIS BRIDGE IS DESIGNED FOR HL-93 LOADING, PLUS 20 LBS PER SQUARE FOOT OF FUTURE WEARING SURFACE.

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 STARTING DATE.

ALL DIMENSIONS AND DETAILS SHOWN IN THESE PLANS PERTINENT TO NEW CONSTRUCTION IN RELATION TO EXISTING PORTIONS OF THE STRUCTURE SHALL BE VERIFIED IN THE FIELD BY THE BRIDGE CONTRACTOR BEFORE STARTING CONSTRUCTION.

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURE.

THE BRIDGE CONTRACTOR WILL BE THE ONLY CONTRACTOR AT THE SITE AND IS RESPONSIBLE FOR THE COMPLETION OF ALL WORK AS DETAILED AND NOTED IN THESE PLANS.

THE BRIDGE CONTRACTOR IS TO INSTALL SUBDRAINS BEHIND THE ABUTMENTS AS DETAILED. THE SUBDRAINS SHALL BE 4" DIA. PERFORATED SUBDRAIN (POLYETHYLENE CORRUGATED TUBING). THE SUBDRAIN OUTLET WILL CONSIST OF A 6'-0 LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD AS DETAILED IN THESE PLANS.

THE BRIDGE CONTRACTOR IS TO CLEAR AND/OR SHAPE THE CHANNEL WITHIN THE APPROXIMATE LIMITS SHOWN ON THE "SITUATION PLAN" AND "LONGITUDINAL SECTION ALONG CENTERLINE ROADWAY" ON DESIGN SHEETS 5, 6 AND 7.

CLASS 20 EXCAVATION QUANTITIES ARE BASED ON THE ASSUMPTION THAT THE CHANNEL EXCAVATION IS COMPLETED PRIOR TO STARTING CONSTRUCTION OF THE ABUTMENTS AND PIERS.

IT SHALL BE THE BRIDGE CONTRACTOR'S RESPONSIBILITY TO PROVIDE SITES FOR EXCESS EXCAVATED MATERIAL. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES.

KEYWAY DIMENSIONS SHOWN ON THE PLANS ARE BASED ON NOMINAL DIMENSIONS UNLESS STATED OTHERWISE. IN ADDITION, THE BEVEL USED ON THE KEYWAY SHALL BE LIMITED TO A MAXIMUM OF 10 DEGREES FROM VERTICAL.

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5ai IS $\frac{5}{8}$ INCH DIAMETER BAR). ENGLISH REINFORCING RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING "BAR DESIGNATION". THE "BAR DESIGNATION" IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

ENGLISH SIZE	3	4	5	6	7	8	9	10	11	14
BAR DESIGNATION	10	13	16	19	22	25	29	32	36	43

LIFTING ANCHORS:

PRECAST CONCRETE SUBSTRUCTURE AND APPROACH SLABS:

THE PRECAST FABRICATOR SHALL SUBMIT LIFTING LOCATIONS AND LIFTING ANCHOR DETAILS FOR APPROVAL BY ENGINEER PRIOR TO USE. THE TOP OF THE LIFTING ANCHORS SHALL BE RECESSED $\frac{1}{2}$ INCH MINIMUM FROM THE SURFACE OF THE PRECAST PANEL. THE LIFTING ANCHORS SHALL BE HOT-DIPPED GALVANIZED.

SUPERSTRUCTURE MODULES:

LIFTING ANCHORS AND LOCATIONS ARE SHOWN ON PLANS. THE ANCHORS ARE DESIGNED BASED ON 60 DEGREE ANGLE FROM HORIZONTAL TO LIFTING LINES. CONTRACTOR MAY PROPOSE ALTERNATE LIFTING DETAILS THAT MUST BE APPROVED BY THE ENGINEER PRIOR TO USE.

PRECASTING:

PRECASTING MATERIALS AND PROCEDURES SHALL CONFORM TO SECTION 2407 OF THE STANDARD SPECIFICATIONS AND MATERIALS I.M. 445. SITE CASTING SHALL CONFORM TO ALTERNATE SITE CASTING PROVISIONS LISTED ON SHEET 5.

REMOVAL AND STORAGE:

ALL PRECAST ELEMENTS SHALL BE REMOVED FROM THE FORMS IN SUCH A MANNER THAT NO DAMAGE OCCURS TO THE ELEMENT. FORM REMOVAL SHALL CONFORM TO THE REQUIREMENTS OF ARTICLE 2407.03.F OF THE STANDARD SPECIFICATIONS. ANY MATERIALS FORMING BLOCKOUTS IN THE PRECAST ELEMENTS SHALL BE REMOVED SUCH THAT DAMAGE DOES NOT OCCUR TO THE PRECAST ELEMENTS OR THE BLOCKOUT. PRECAST ELEMENTS SHALL BE STORED IN SUCH A MANNER THAT ADEQUATE SUPPORT IS PROVIDED TO PREVENT CRACKING OR CREEP-INDUCED DEFORMATION (SAGGING). DURING STORAGE FOR LONG PERIODS OF TIME (LONGER THAN ONE MONTH),ALL PRECAST ELEMENTS SHALL BE CHECKED AT LEAST ONCE PER MONTH TO ENSURE CREEP-INDUCED DEFORMATION DOES NOT OCCUR.

LIFTING AND HANDLING:

ALL PRECAST ELEMENTS SHALL BE HANDLED IN SUCH A MANNER AS NOT TO DAMAGE THE PRECAST ELEMENTS DURING LIFTING OR MOVING. LIFTING ANCHORS CAST INTO THE PRECAST ELEMENTS SHALL BE USED FOR LIFTING AND MOVING THE PRECAST ELEMENTS AT THE FABRICATION PLANT AND IN THE FIELD. THE ANGLE BETWEEN THE TOP SURFACE OF THE PRECAST ELEMENTS AND THE LIFTING LINE SHALL NOT BE LESS THAN SIXTY DEGREES, WHEN MEASURED FROM THE TOP SURFACE OF THE PRECAST ELEMENTS TO THE LIFTING LINE. DAMAGE CAUSED TO ANY PRECAST ELEMENTS SHALL BE REPAIRED AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER.

TRANSPORTATION:

ALL PRECAST ELEMENTS SHALL BE TRANSPORTED IN SUCH A MANNER THAT THE PRECAST ELEMENTS WILL NOT BE DAMAGED DURING TRANSPORTATION. PRECAST ELEMENTS SHALL BE PROPERLY SUPPORTED DURING TRANSPORTATION SUCH THAT CRACKING OR DEFORMATION (SAGGING) DOES NOT OCCUR. IF MORE THAN ONE PRECAST ELEMENTS IS TRANSPORTED PER VEHICLE, PROPER SUPPORT AND SEPARATION MUST BE PROVIDED BETWEEN THE INDIVIDUAL PRECAST ELEMENTS. PRECAST ELEMENTS SHALL LIE HORIZONTAL DURING TRANSPORTATION, UNLESS OTHERWISE APPROVED.

REPAIRS:

REPAIRS OF DAMAGE CAUSED TO THE PRECAST ELEMENTS DURING FABRICATION, LIFTING AND HANDLING, OR TRANSPORTATION SHALL BE ADDRESSED ON A CASE-BY-CASE BASIS. DAMAGE WITHIN ACCEPTABLE LIMITS CAUSED TO THE TOP SURFACE (DRIVING SURFACE) OR TO KEYED EDGES OF THE PRECAST ELEMENTS SHALL BE REPAIRED USING MATERIALS I.M. 445 AT THE FABRICATION PLANT AT THE EXPENSE OF THE FABRICATOR. REPETITIVE DAMAGE TO PANELS SHALL BE CAUSE FOR STOPPAGE OF FABRICATION OPERATIONS UNTIL THE CAUSE OF THE DAMAGE CAN BE REMEDIED. ALL PROPOSED REPAIRS SHALL BE APPROVED BY ENGINEER IN ADVANCE.

VALUE ENGINEERING CHANGE PROPOSALS:

CONTRACTORS MAY DEVELOP ALTERNATIVE CONSTRUCTION PROPOSALS USING PRECAST CONCRETE SUPERSTRUCTURE MODULES THAT ALLOW THE STATE TO BENEFIT FROM REDUCED COSTS, WHILE MAINTAINING THE SAME OR REDUCED ABC CONSTRUCTION SCHEDULE FOR THE PROJECT. THE CONTRACTOR SHALL ALSO PERFORM ANY NECESSARY REDESIGN OF SUBSTRUCTURE COMPONENTS RESULTING FROM THE CHANGES TO THE SUPERSTRUCTURE MODULES. ONLY ALTERNATE DESIGNS THAT UTILIZE CONCRETE MODULAR SYSTEMS ASSEMBLED USING UHPC AND SCC FULL MOMENT CONNECTIONS WILL BE ACCEPTED FOR REVIEW UNDER THE VALUE ENGINEERING CHANGE PROPOSAL. THESE DESIGNS MUST PROVIDE THE REQUIRED PERFORMANCE, RELIABILITY, QUALITY AND CONSTRUCTABILITY.

UHPC (ULTRA HIGH PERFORMANCE CONCRETE):

MOCK POURS OF UHPC JOINTS WILL BE REQUIRED PRIOR TO FIELD ASSEMBLY OF SUPERSTRUCTURE MODULES (SEE SPECIAL PROVISIONS). EACH LONGITUDINAL, TRANSVERSE, AND VERTICAL CLOSURE POUR SHALL BE CONSTRUCTED IN ONE CONTINUOUS POUR. COST OF MOCK POURS IS INCIDENTAL TO CONSTRUCTION OF PRECAST ELEMENTS AND WILL NOT BE PAID SEPARATELY.

DIAMOND GRINDING:

CONTRACTOR TO BID DIAMOND GRINDING BASED ON THE TYPE OF COARSE AGGREGATE IN THE CONCRETE MIX FOR BRIDGE DECKS. FOR PLANT PRECASTING OF ABC COMPONENTS, COARSE AGGREGATE SHALL BE IN ACCORDANCE WITH SECTION 2407 OF THE STANDARD SPECIFICATIONS. FOR ALTERNATE FABRICATION OF ABC COMPONENTS AT A TEMPORARY CASTING FACILITY, COARSE AGGREGATE SHALL BE IN ACCORDANCE WITH THE DEVELOPMENTAL SPECIFICATION FOR HIGH PERFORMANCE CONCRETE FOR STRUCTURES (COUNCIL BLUFFS SYSTEM), DS-09033. DIAMOND GRINDING OF THE BRIDGE DECK SHOULD BE IN ACCORDANCE WITH SECTION 2532 OF THE STANDARD SPECIFICATIONS.

SPECIFICATIONS:

DESIGN: AASHTO LRFD 5TH EDITION, SERIES 2010.

DESIGN LIVE LOAD: HL-93

LIVE LOAD DEFLECTION LIMIT: L/1000

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, INCLUDING SPECIAL PROVISIONS FOR PREFABRICATED SUPERSTRUCTURE MODULES, PRECAST CONCRETE APPROACH SLAB ELEMENTS, PRECAST CONCRETE SUBSTRUCTURE ELEMENTS, AND ULTRA HIGH-PERFORMANCE CONCRETE.

WELDING: AASHTO/AWS D1.5 AS SPECIFIED AND MODIFIED BY THE STANDARD SPECIFICATIONS AND CURRENT SUPPLEMENTAL SPECIFICATIONS.

CONCRETE: HIGH PERFORMANCE CONCRETE (HPC) SHALL BE USED FOR ALL PRECAST ELEMENTS, INCLUDING BRIDGE SUBSTRUCTURES, DECKS, AND BARRIERS. HPC SHALL BE IN ACCORDANCE WITH PROJECT SPECIAL PROVISIONS.

TARGET PERMEABILITY: 2500 COLOUMBS FOR SUBSTRUCTURE
1500 COLOUMBS FOR THE DECK

ULTRA HIGH PERFORMANCE CONCRETE (UHPC) SHALL BE USED FOR CAST-IN-PLACE JOINTS IN SUPERSTRUCTURE AND APPROACH SLABS. UHPC SHALL BE IN ACCORDANCE WITH SPECIAL PROVISIONS.

HIGH EARLY STRENGTH SELF CONSOLIDATING CONCRETE SHALL BE USED IN ABUTMENT CLOSURE POURS AND PILE POCKET FILLS. CONCRETE TO BE IN ACCORDANCE WITH SPECIAL PROVISIONS.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 5TH EDITION, SERIES 2010:

REINFORCING STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 5, GRADE 60.

PREFABRICATED SUPERSTRUCTURE MODULES AND PRECAST APPROACH SLAB CONCRETE IN ACCORDANCE WITH AASHTO LRFD SECTION 5, f'c=5000 PSI, EXCEPT CAST-IN-PLACE JOINTS AS NOTED.

PRECAST SUBSTRUCTURE CONCRETE IN ACCORDANCE WITH AASHTO LRFD SECTION 5, f'c=5000 PSI.

ULTRA HIGH PERFORMANCE CONCRETE (UHPC) IN ACCORDANCE WITH SPECIAL PROVISIONS, f'c=21,000 PSI.

SELF CONSOLIDATING CONCRETE (SCC) IN ACCORDANCE WITH SPECIAL PROVISIONS, COMPRESSIVE STRENGTH OF 2500 PSI AT 6 HRS. AND 4000 PSI AT 7 DAYS.

STRUCTURAL STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 6, ASTM A709 GRADE 50W, UNLESS NOTED OTHERWISE IN THIS PLAN.

TRAFFIC CONTROL PLAN

THE ROADWAY WILL BE CLOSED TO THRU TRAFFIC ONLY DURING ABC PERIOD. DETAILS SHOWN ELSEWHERE.

NOTES:

1. FOR CONTINUATION OF GENERAL NOTES, SEE DESIGN SHEETS 3 AND 4.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS 70'-0 INTERIOR SPAN

GENERAL NOTES I

STA. 20+85.00 FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 41 FILE NO. 30387 DESIGN NO. 111

WEATHERING STEEL NOTES:

ALL STRUCTURAL STEEL, EXCEPT AS NOTED, SHALL CONFORM TO ASTM A709 GRADE 50W. THE MINIMUM YIELD POINT FOR GRADE 50W STRUCTURAL STEEL IS 50 KSI FOR PLATES 4" AND UNDER IN THICKNESS, AND ALL STRUCTURAL SHAPES. THE GRADE 50W STEEL IS A WEATHERING STEEL AND IS TO REMAIN UNPAINTED, EXCEPT AS NOTED. CVN TESTING IS REQUIRED FOR MAIN BEAMS AND ALL SPLICE PLATES.

FLOOR DRAINS INCLUDING PLATES WELDED TO THE DRAIN FOR DRAIN SUPPORT ARE TO BE GRADE 36 STEEL.

FLANGE DEFLECTORS ARE TO BE ASTM A709 GRADE 50W OR 36.

SHEAR STUDS ARE TO BE OF AN APPROVED TYPE LISTED IN MATERIALS I.M. 453.10, APPENDIX A.

THE PAINTED FINISH ON BEARINGS, FLANGE DEFLECTORS AND WEATHERING STEEL SHALL BE IN ACCORDANCE WITH THE PLAN NOTES AND ARTICLE 2408.02, Q, OF THE STANDARD SPECIFICATIONS. ALL WEATHERING STEEL EMBEDDED INTO AN INTEGRAL ABUTMENT SHALL BE PAINTED TO A DISTANCE OF 2'-9 FROM THE PLANE THROUGH THE ABUTMENT BEARINGS AND SEALED BY CAULKING AT THE ABUTMENT CONCRETE AND STEEL INTERFACE.

BOLTS FOR USE WITH WEATHERING STEEL SHALL BE A325 TYPE III WITH A563 GRADE DH3 NUTS AND F436 TYPE III WASHERS.

BOLTS USED TO SPLICE BEAM SECTIONS ARE TO BE INSTALLED SUCH THAT NUTS ARE ON THE INSIDE FACE OF THE BEAM WEBS FOR THE EXTERIOR BEAMS, AND ON THE TOP OF BOTH TOP AND BOTTOM FLANGES OF ALL THE BEAMS.

THE STEEL SHALL BE KEPT FREE OF OIL, GREASE, DIRT, CRAYON OR CHALK MARKS, CONCRETE SPATTER AND ANY OTHER FOREIGN MATTER THAT MAY AFFECT THE NATURAL OXIDATION OF THE STEEL. ANY FOREIGN MATTER REMAINING ON THE STEEL AFTER COMPLETION OF BRIDGE CONSTRUCTION SHALL BE REMOVED BY THE BRIDGE CONTRACTOR AS DIRECTED BY THE ENGINEER. THE RESULTANT SURFACE SHALL BE FREE OF ALL VISIBLE RESIDUES. ALL COSTS ASSOCIATED WITH CLEANING STEEL SURFACES SHALL BE BORNE BY THE BRIDGE CONTRACTOR.

SEAL MATERIAL FOR CAULKING SHALL BE NEUTRAL CURE AND NON SAG SILICONE. TWO PRODUCTS MEETING THESE CRITERIA ARE DOW 888, CSL342 JOINT SEALANT, OR CRAFCO ROADSAVER SILICONE.

ALL FIELD CONNECTIONS ARE TO BE BOLTED USING "HIGH TENSILE STRENGTH BOLTS". UNLESS OTHERWISE NOTED, ALL OPEN HOLES ARE TO BE $\frac{15}{16}$" Φ AND ALL BOLTS ARE TO BE $\frac{7}{8}$" Φ.

FILL PLATE THICKNESSES SHOWN ON PLANS ARE BASED ON NOMINAL BEAM DIMENSIONS. THESE THICKNESSES ARE TO BE VERIFIED OR ADJUSTED DURING FABRICATION TO SECURE A CLOSE FIT. EACH FILL PLATE SHALL FIT TO THE NEAREST $\frac{1}{16}$" IN THICKNESS AND SINGLE PLATES ARE REQUIRED AT EACH FILL LOCATION.

THE DESIGN DRAWINGS INDICATE AWS PREQUALIFIED WELDED JOINTS, AND UNLESS OTHERWISE NOTED THE DESIGN JOINT DETAILS ARE FOR MANUAL SHIELDED METAL-ARC WELDING. ALTERNATE JOINT DETAILS MAY BE SUBMITTED FOR APPROVAL.

BRIDGE DECK DIMENSIONS TABLE

NO.	ITEM	UNIT	QUANTITY
1	DECK LENGTH	L.F.	210.2
2	MINIMUM DECK WIDTH	L.F.	47.2
3	MAXIMUM DECK WIDTH	L.F.	47.2
4	DECK AREA	S.F.	9921

1. DECK LENGTH IS MEASURED FROM FACE-TO-FACE OF PAVING NOTCHES ALONG THE CENTERLINE OF THE ROADWAY.

2,3. DECK WIDTHS ARE MEASURED FROM OUT-TO-OUT OF DECK PERPENDICULAR TO THE CENTERLINE OF ROADWAY.

4. DECK AREA IS TO BE BASED ON THE FACE-TO-FACE PAVING NOTCH DISTANCE AND OUT-TO-OUT DECK DIMENSIONS.

DESIGN HISTORY AT THIS SITE

DESIGN NO.	TYPE OF WORK
597	RETROFIT BARRIER RAIL
368	DECK OVERLAY
5452	EXISTING CONCRETE GIRDER BRIDGE
1027	(OLD) PONY TRUSS BRIDGE

ESTIMATED WEIGHTS OF MODULES

MODULE	ESTIMATED WEIGHT
INTERIOR MODULE - INT. SPAN	80 KIPS
EXTERIOR MODULE - INT. SPAN	112 KIPS
INTERIOR MODULE - END SPAN	69 KIPS
EXTERIOR MODULE - END SPAN	102 KIPS
PIER COLUMN	52 KIPS
PIER CAP - REINFORCED	168 KIPS
ABUTMENT - STEM UNIT	93 KIPS
ABUTMENT - WINGWALL UNITS	26 KIPS
APPROACH SLAB - INT. PANEL	31 KIPS
APPROACH SLAB - EXT. PANEL	37 KIPS
SLEEPER SLAB	35 KIPS

NOTE:
POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN THESE PLANS.

NOTES:

1. FOR ADDITIONAL GENERAL NOTES, SEE DESIGN SHEETS 2 AND 4.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS 70'-0 INTERIOR SPAN

GENERAL NOTES 2

STA. 20+85.00 FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 41 FILE NO. 30387 DESIGN NO. 111

DGN$SYTIME0123456 DGN$USERNAME DGN$SPEC

ALTERNATE SITE CASTING:

ALTERNATE SITE CASTING:
IF THE CONTRACTOR ELECTS TO PRECAST THE SUPERSTRUCTURE, SUBSTRUCTURE, AND BRIDGE APPROACH COMPONENTS AT A TEMPORARY CASTING FACILITY, STRUCTURAL CONCRETE SHALL CONFORM TO THE DEVELOPMENTAL SPECIFICATION FOR HIGH PERFORMANCE CONCRETE FOR STRUCTURES (COUNCIL BLUFF SYSTEM), DS-09033, AND CASTING SHALL COMPLY WITH SECTION 2403 AND THE PROVISIONS OF SECTION 2407 LISTED BELOW:

2407.03 CONSTRUCTION:

A. EQUIPMENT.
USE EQUIPMENT MEETING THE REQUIREMENTS OF SECTION 2001 AND THE FOLLOWING:

1. CASTING BEDS.
A. FOR PRECAST CONCRETE, USE CASTING BEDS RIGIDLY CONSTRUCTED AND SUPPORTED SO THAT UNDER THE WEIGHT (MASS) OF THE CONCRETE AND THE VERTICAL REACTIONS OF HOLDUPS AND HOLD DOWNS THERE WILL BE NO VERTICAL DEFORMATION OF THE BED.

2. FORMS.
A. USE FORMS FOR PRECAST TRUE TO THE DIMENSIONS AS SHOWN IN THE CONTRACT DOCUMENTS, TRUE TO LINE, MORTAR TIGHT, AND OF SUFFICIENT RIGIDITY TO NOT SAG OR BULGE OUT OF SHAPE UNDER PLACEMENT AND VIBRATION OF CONCRETE. ENSURE INSIDE SURFACES ARE SMOOTH AND FREE OF ANY PROJECTIONS, INDENTATIONS, OR OFFSETS THAT MIGHT RESTRICT DIFFERENTIAL MOVEMENTS OF FORMS AND CONCRETE.

D. CURING.

1. USE A METHOD OF CURING THAT PREVENTS LOSS OF MOISTURE AND MAINTAINS AN INTERNAL CONCRETE TEMPERATURE AT LEAST 40°F (4°C) DURING THE CURING PERIOD. OBTAIN THE ENGINEER*S APPROVAL FOR THIS METHOD.

2. WHEN USING ACCELERATED HEAT CURING, DO SO UNDER A SUITABLE ENCLOSURE. USE EQUIPMENT AND PROCEDURES THAT WILL ENSURE UNIFORM CONTROL AND DISTRIBUTION OF HEAT AND PREVENT LOCAL OVERHEATING. ENSURE THE CURING PROCESS IS UNDER THE DIRECT SUPERVISION AND CONTROL OF COMPETENT OPERATORS.

3. WHEN ACCELERATED HEAT IS USED TO OBTAIN TEMPERATURES ABOVE 100°F (38°C):

A. RECORD THE TEMPERATURE OF THE INTERIOR OF THE CONCRETE USING A SYSTEM CAPABLE OF AUTOMATICALLY PRODUCING A TEMPERATURE RECORD AT INTERVALS OF NO MORE THAN 15 MINUTES DURING THE ENTIRE CURING PERIOD.

B. SPACE THE SYSTEMS AT A MINIMUM OF ONE LOCATION PER 100 FEET (30 M) OF LENGTH PER UNIT OR FRACTION THEREOF, WITH A MAXIMUM OF THREE LOCATIONS ALONG EACH LINE OF UNITS BEING CURED.

C. ENSURE ALL UNITS, WHEN CALIBRATED INDIVIDUALLY, ARE ACCURATE WITHIN ± 5°F (3°C).

D. DO NOT ARTIFICIALLY RAISE THE TEMPERATURE OF THE CONCRETE ABOVE 100°F (38°C) FOR A MINIMUM OF 2 HOURS AFTER THE UNITS HAVE BEEN CAST. AFTER THE 2 HOUR PERIOD, THE TEMPERATURE OF THE CONCRETE MAY BE RAISED TO A MAXIMUM TEMPERATURE OF 160°F (71°C) AT A RATE NOT TO EXCEED 25°F (15°C) PER HOUR.

F. LOWER THE TEMPERATURE OF THE CONCRETE AT A RATE NOT TO EXCEED 40°F (22°C) PER HOUR BY REDUCING THE AMOUNT OF HEAT APPLIED UNTIL THE INTERIOR OF THE CONCRETE HAS REACHED THE TEMPERATURE OF THE SURROUNDING AIR.

4. IN ALL CASES, COVER THE CONCRETE AND LEAVE COVERED UNTIL CURING IS COMPLETED. SIDE FORMS AND PANS FORMING THE UNDERSIDE OF CHANNEL SHAPES MAY BE REMOVED DURING THIS PERIOD IF THE COVER IS IMMEDIATELY REPLACED. DO NOT, UNDER ANY CIRCUMSTANCES, REMOVE UNITS FROM THE CASTING BED UNTIL THE STRENGTH REQUIREMENTS ARE MET.

F. REMOVAL OF FORMS.
IF FORMS ARE REMOVED BEFORE THE CONCRETE HAS ATTAINED THE STRENGTH WHICH WILL PERMIT THE UNITS TO BE MOVED OR STRESSED, REMOVE PROTECTION ONLY FROM THE IMMEDIATE SECTION FROM WHICH FORMS ARE BEING REMOVED. IMMEDIATELY REPLACE THE PROTECTION AND RESUME CURING AFTER THE FORMS ARE REMOVED. DO NOT REMOVE PROTECTION ANY TIME BEFORE THE UNITS ATTAIN THE SPECIFIED COMPRESSIVE STRENGTH WHEN THE SURROUNDING AIR TEMPERATURE IS BELOW 20°F (-7°C).

ALTERNATE SITE CASTING: CONT'D

J. TOLERANCES.
APPLY THE FOLLOWING TOLERANCES FOR PRECAST UNITS, UNLESS OTHERWISE SHOWN ELSEWHERE IN THESE PLANS:

A. LIMIT VARIATION FROM DIMENSIONS SHOWN IN THE CONTRACT DOCUMENTS TO NO MORE THAN $\frac{1}{8}$ INCH (3 MM). FOR OVERRUNS, GREATER DEVIATION MAY BE ACCEPTED IF, IN THE ENGINEERS OPINION, IT DOES NOT IMPAIR THE SUITABILITY OF THE MEMBER FOR ITS INTENDED USE.

B. ENSURE BEAM SEAT BEARING AREAS AT EACH END OF THE UNIT ARE FLAT AND TRUE AND PERPENDICULAR TRANSVERSELY TO THE VERTICAL AXIS OF THE BEAM.

C. LIMIT THE DIFFERENCE OF CAMBERS BETWEEN TWO ADJACENT UNITS, AS ASSEMBLED, TO NO MORE THAN $\frac{1}{8}$ INCH (3 MM).

K. HANDLING AND STORAGE.

1. WHEN LIFTING AND HANDLING PRECAST UNITS, SUPPORT THEM AT OR NEAR THE POINTS DESIGNATED IN THE CONTRACT DOCUMENTS.

2. DO NOT LIFT OR STRAIN UNITS IN ANY WAY BEFORE THEY HAVE DEVELOPED THE STRENGTH SPECIFIED. IN STORAGE, SUPPORT UNITS AT POINTS ADJACENT TO THE BEARINGS.

5. DURING FABRICATION, STORAGE, HANDLING, AND HAULING TAKE CARE TO PREVENT CRACKING, TWISTING, UNNECESSARY ROUGHNESS, OR OTHER DAMAGE. IN PARTICULAR, DO NOT ALLOW TIEDOWNS TO COME IN DIRECT CONTACT WITH CONCRETE SURFACES. DO NOT SUBJECT UNITS TO EXCESSIVE IMPACT. REPLACE AT NO ADDITIONAL COST TO THE CONTRACTING AUTHORITY UNITS THAT ARE, IN THE ENGINEER*S OPINION, DAMAGED IN A WAY TO IMPAIR THEIR STRENGTH OR SUITABILITY FOR THEIR INTENDED USE.

L. FINISH.

1. FINISH ALL SURFACES WHICH WILL BE EXPOSED IN THE FINISHED STRUCTURE AS PROVIDED IN ARTICLE 2403.03, P, 2, B, AND ENSURE THEY ARE FREE OF HONEYCOMB OR SURFACE DEFECTS. SUBMIT STRUCTURAL REPAIR PROCEDURES TO THE ENGINEER FOR APPROVAL. THE TOP WEARING SURFACE OF THE PRECAST DECK AND APPROACH SLAB SHALL HAVE A TEXTURE APPLIED CONFORMING TO SECTION 2301.03, H, 2 OF THE STANDARD SPECIFICATIONS.

DEMONSTRATION PROJECT:

THIS PROJECT IS PARTIALLY FUNDED UNDER THE NCHRP SHRP2 RESEARCH PROGRAM RELATED TO ACCELERATED BRIDGE CONSTRUCTION. DURING CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE UNRESTRICTED SITE ACCESS TO THE RESEARCH TEAM AND VISITORS. A ONE-DAY SHOWCASE WILL BE CONDUCTED DURING THE ABC PERIOD OF CONSTRUCTION AND A MODERATE NUMBER OF VISITORS SHOULD BE ANTICIPATED. IT IS UNDETERMINED AT THIS TIME WHETHER INSTRUMENTATION MAY BE INSTALLED ON THE BRIDGE DURING CONSTRUCTION. THESE ACTIVITIES ARE NOT EXPECTED TO IMPACT THE CONTRACTORS OPERATIONS OR SCHEDULE IN any WAY.

NOTES:

1. FOR ADDITIONAL GENERAL NOTES, SEE DESIGN SHEETS 2 AND 3.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS 70'-0 INTERIOR SPAN

GENERAL NOTES 3

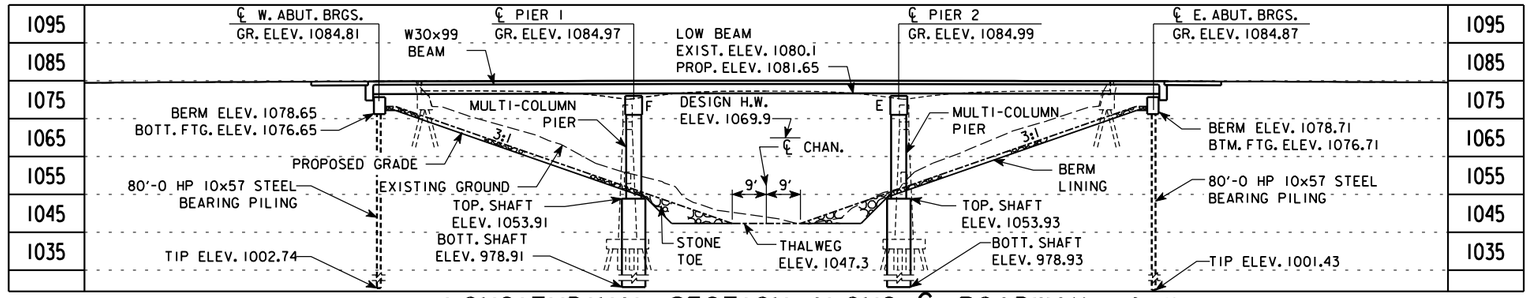
STA. 20+85.00 FEBRUARY, 2011

POTTAWATTAMIE COUNTY

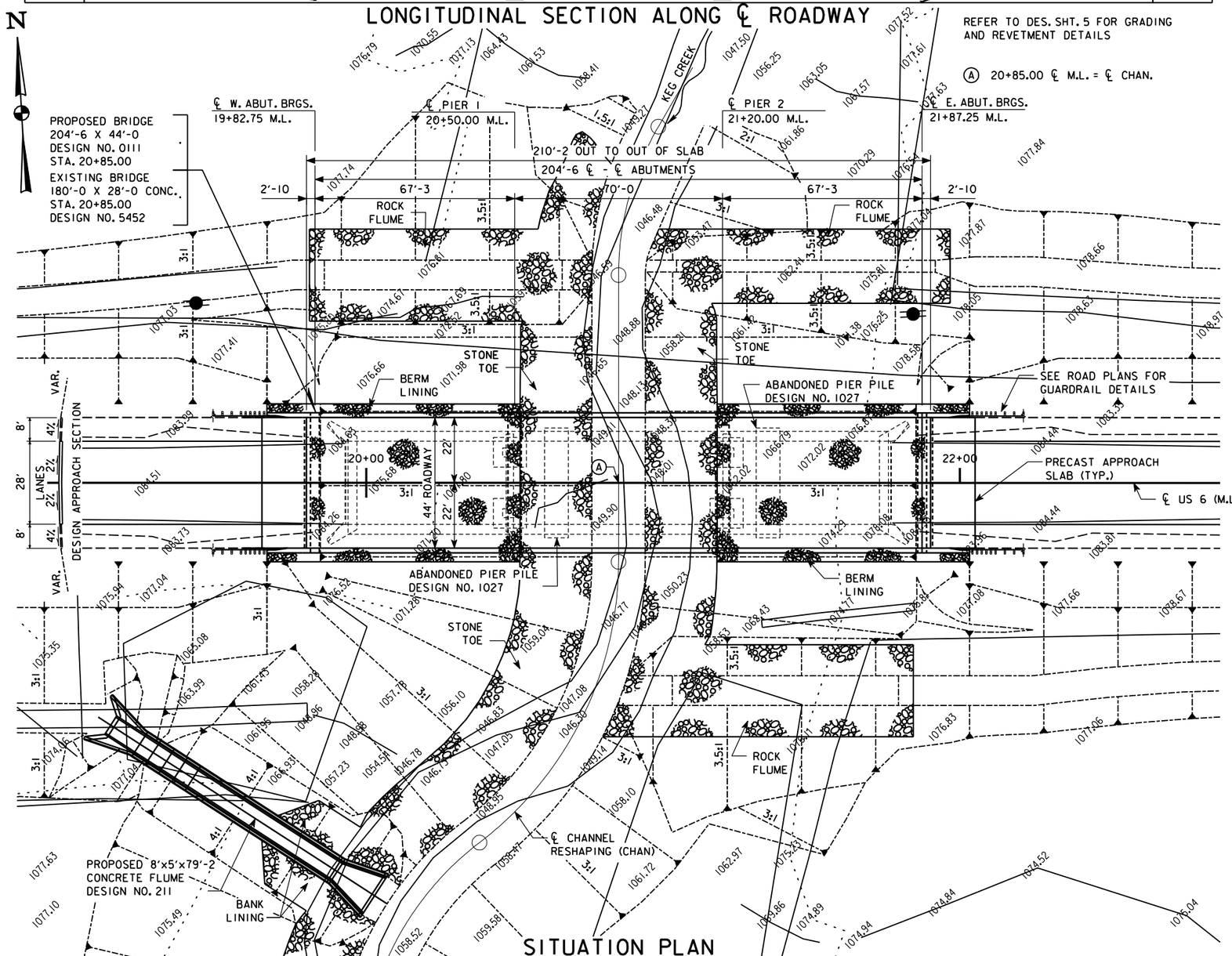
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 4 OF 41 FILE NO. 30387 DESIGN NO. 111

BM NO. 501 STA. 19+90.2, 15.4' RT., D.O.T. PLUG S.W. COR. BRIDGE WING, ELEV. = 1087.55



LONGITUDINAL SECTION ALONG ℄ ROADWAY



SITUATION PLAN

+0.600% -0.540%

PVI STA 20+85.00
PVI ELEV. 1085.52
LVC = 364.00 FT.

PROPOSED GRADE ON US 6

HYDRAULIC DATA

DRAINAGE AREA = 98.1 SQ. MI.
STREAM SLOPE = 5.3 FT./MI.

Q2= 2,300 CFS
STAGE = ELEV. 1060.4
CHANNEL VELOCITY = 4.6 FPS

Q50= 10,300 CFS
STAGE = ELEV. 1069.9
BACKWATER = 0.1 FT.
BRIDGE VELOCITY = 5.4 FPS

Q100= 12,100 CFS
STAGE = ELEV. 1071.4
BACKWATER = 0.1 FT.
DESIGN SCOUR = ELEV. 1040.0

Q500= 16,700 CFS
STAGE = ELEV. 1074.7
CHECK SCOUR = ELEV. 1039.5

ROADWAY OVERTOP ELEV. 1084.0
STA. 25+00

AVG. LOW WATER STAGE = ELEV. 1048.8
DATE = JAN. 2006

POTTAWATTAMIE COUNTY F.I.S. DATUM
0.35 FT. BELOW PROJECT DATUM.

LOCATION

U.S. 6 OVER KEG CREEK
T-75 N R-42 W
SECTION 15
HARDIN TOWNSHIP
POTTAWATTAMIE COUNTY
MAINT. NO. 7814.2S006
FHWA NO. 43231

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS 70'-0 INTERIOR SPAN

GENERAL PLAN AND ELEVATION

STA. 20+85.00 FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 5 OF 41 FILE NO. 30387 DESIGN NO. 111

DESIGN TEAM HNTB | POTTAWATTAMIE COUNTY | PROJECT NUMBER BRF-006-1(114)-38-78 | SHEET NUMBER 6

DGN$SYTIME0123456 DGN$USERNAME DGN$SPEC

BM NO. 501 STA. 19+90.2, 15.4' RT., D.O.T. PLUG S.W. COR. BRIDGE WING, EL. = 1087.55

GRADING CONTROL:

(A) 20+85.00 ℄ M.L. = 100+00.00 ℄ CHAN, Δ= 90° LT.

(A1) 19+85.9 M.L., 75.0' LT., LT. EDGE FLUME TOP SLOPE, EL. 1074.0

(A2) 20+66.0 M.L., 75.0' LT., LT. EDGE FLUME BTM. SLOPE, EL. 1047.3

(B1) 21+91.7 M.L., 75.0' LT., LT. EDGE FLUME TOP SLOPE, EL. 1072.2

(B2) 21+04.5 M.L., 75.0' LT., LT. EDGE FLUME BTM. SLOPE, EL. 1047.3

(C1) 21+79.3 M.L., 75.0' RT., RT. EDGE FLUME TOP SLOPE, EL. 1072.7

(C2) 21+03.1 M.L., 75.0' RT., RT. EDGE FLUME BTM. SLOPE, EL. 1047.3

(D1) 97+50.0 CHAN, BEGIN STONE TOE W (224.4' RT. M.L.)

(D2) 101+05.0 CHAN, END STONE TOE W (107.4' LT. M.L.)

(E1) 99+37.1 CHAN, BEGIN STONE TOE E (65.0' RT. M.L.)

(E2) 100+71.1 CHAN, END STONE TOE E (71.0' LT. M.L.)

(F1) 97+31.4 CHAN, 9' LT., BEGIN CHAN. RESHAPING W (243.8' RT. M.L.) 50' TRANS. FROM 2:1 TO 3:1 SLOPE.

(F2) 101+22.4 CHAN, 9' LT., END CHAN. RESHAPING W (124.5 LT. M.L.) 50' TRANS. FROM 3:1 TO 1.5:1 SLOPE.

(G1) 97+31.4 CHAN, 9' RT., BEGIN CHAN. RESHAPING E (236.9' RT. M.L.) 50' TRANS. FROM 2:1 TO 3:1 SLOPE

(G2) 101+35.4 CHAN, 12.5' RT., END CHAN. RESHAPING E (125.0' LT. M.L.) 30' TRANSITION FROM 3:1 TO 2:1 SLOPE

ALIGNMENT DATA

℄ CHANNEL RESHAPING (CHAN)

POT 97+10.04 = 20+14.37 M.L., 260.00' RT.

PI CURVE1 = 19+76.25 M.L., 168.43' RT
PC 97+31.35 = 20+06.18 M.L., 240.32' RT
PT 98+64.04 = 20+38.17 M.L., 121.20' RT
Δ = 75°16' 08.81" (RT)
R = 101.00'
L = 132.68'
T = 77.88'

PI CURVE2 = 20+85.00 M.L., 85.48' RT.
PC 98+64.04 = 20+38.17 M.L., 121.20' RT.
PT 99+73.42 = 20+85.00 M.L., 26.58' RT.
Δ = 52°39' 55.21" (LT)
R = 119.00'
L = 109.38'
T = 58.90'

PI CURVE3 = 20+85.00 M.L., 96.79' LT.
PC 100+70.00 = 20+85.00 M.L., 70.00' LT.
PT 101+22.36 = 20+98.40 M.L., 120.00' LT.
Δ = 30°00' 00.00" (RT)
R = 100.00'
L = 52.36'
T = 26.79'

POT 101+45.45 = 21+09.94 M.L., 140.00' LT.

EXCAVATION NOTE:
CUT - 10,977 CY
FILL - 1,879 CY
INCL. RIPRAP EXCAV.

REVETMENT LAYOUT NOTES:

(A) STONE TOE - CL. E REVETMENT UNDERLAIN W/ ENGINEERING FABRIC. REFER TO DETAILS DES. SHT. 7.

(B) ROCK FLUME - CL. E REVETMENT UNDERLAIN W/ ENGINEERING FABRIC. REFER TO DETAILS DES. SHT. 7.

(C) BANK LINING - CL. E REVETMENT UNDERLAIN W/ ENGINEERING FABRIC. WIDTH 12'-0 FROM EDGE OF CONCRETE FLUME, DEPTH 24". CARRY UP SLOPE TO EL. 1060.0. REFER TO LONGITUDINAL SECTION DES. NO. 211.

(D) BERM LINING - CL. E REVETMENT UNDERLAIN W/ ENGINEERING FABRIC. DEPTH 1'-6. WIDTH TO 3'-0 OUTSIDE BRIDGE FACIA. CARRY UP SLOPE FROM EDGE OF STONE TOE TO ABUTMENT FACE OR TO EDGE OF WING ARMORING.

GRADING/REVETMENT PLAN

DESIGN FOR 0° SKEW

204'-6 x 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS 70'-0 INTERIOR SPAN

GRADING AND REVETMENT PLAN

STA. 20+85.00 FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 6 OF 41 FILE NO. 30387 DESIGN NO. 111

DESIGN TEAM DRE / BDK / RDM | POTTAWATTAMIE COUNTY | PROJECT NUMBER BRF-006-1(114)--38-78 | SHEET NUMBER 7

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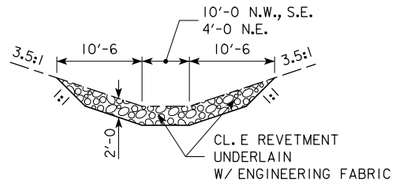
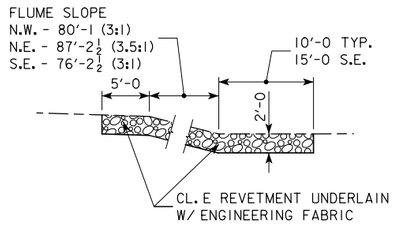


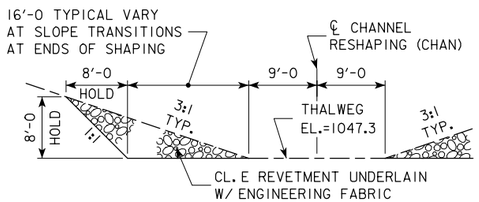
SECT. THROUGH ROCK FLUME



SECT. ALONG ROCK FLUME

REVETMENT QUANTITIES			
LOCATION	REVETMENT CL. E (TON)		ENGR. FABRIC (SY)
STONE TOE WEST	1,016		891
STONE TOE EAST	454		350
ROCK FLUME N.W.	320		374
ROCK FLUME N.E.	256		328
ROCK FLUME S.E.	328		378
BANK LINING (CONC. FLUME)	121		124
BERM LINING WEST	357		425
BERM LINING EAST	357		425
TOTALS	3,209		3,295

REVETMENT/EROSION STONE ESTIMATED AT 1.6 TON/CY.
FILL BELOW OHW (EL. 1060.4) 978 CY.



SECT. THROUGH STONE
TOE / CHANNEL RESHAPING

DESIGN FOR 0° SKEW

204'-6 x 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS 70'-0 INTERIOR SPAN

GRADING AND REVETMENT DETAILS

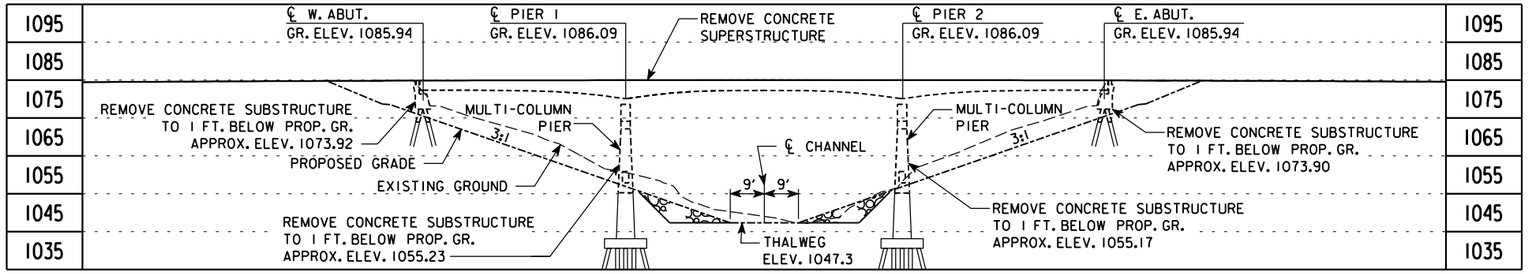
STA. 20+85.00 FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

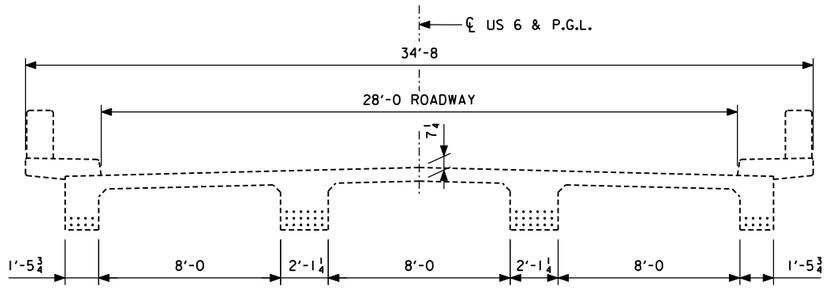
DESIGN SHEET NO. 7 OF 41 FILE NO. 30387 DESIGN NO. 111

BM NO. 501 STA. 19+90.2, 15.4' RT., D.O.T. PLUG S.W. COR. BRIDGE WING, ELEV. = 1087.55

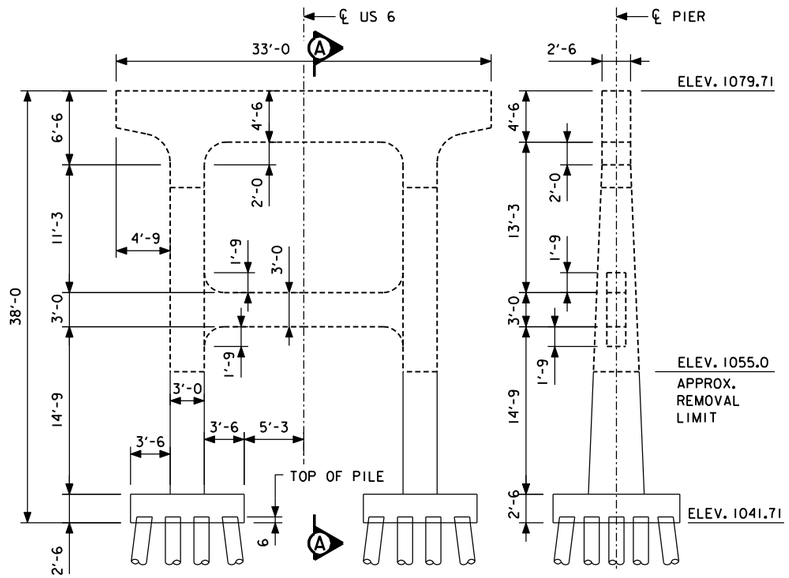


LONGITUDINAL SECTION ALONG ℄ ROADWAY

0 ENGLISH 40
SCALE IN FEET



EXISTING CROSS SECTION AT CENTERLINE



PIER ELEVATION

SECTION A-A

DEMOLITION NOTES:

A SCRAPE SAMPLE WAS TAKEN FROM AN AREA OF THIS BRIDGE TO GET AN INDICATION OF THE EXISTENCE OF AND LEVEL OF TOTAL CHROMIUM AND TOTAL LEAD. ANALYSIS OF TOTAL LEAD ON THIS SAMPLE WAS 101,000 (INCLUDES 268 PPM LEACHABLE) PARTS PER MILLION (PPM). ANALYSIS OF TOTAL CHROMIUM ON THIS SAMPLE WAS 1100 (INCLUDES 0.87 PPM LEACHABLE) PPM. THESE ANALYSES SHOW THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS. LEVELS INDICATED BY THESE TESTS COULD CREATE CONDITIONS ABOVE REGULATORY LIMITS FOR HEALTH AND SAFETY REQUIREMENTS. NO OTHER CONSTITUENTS WERE ANALYZED. THE BIDDER SHOULD NOT RELY ON THE DEPARTMENT'S TESTING AND ANALYSIS FOR ANY PURPOSE OTHER THAN AS AN INDICATION OF THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS.

THE CONTRACTOR SHALL CONDUCT THEIR OPERATIONS IN SUCH A MANNER THAT ANY PAINT REMOVED DURING DEMOLITION IS CONTAINED, COLLECTED, AND DISPOSED OF IN ACCORDANCE WITH STANDARD SPECIFICATION 2508. COST OF THIS WORK SHALL BE INCIDENTAL TO THE BID ITEM "REMOVAL OF EXISTING BRIDGE". BEFORE DELIVERY OF ANY SCRAP STEEL THE CONTRACTOR SHALL PROVIDE A WRITTEN NOTICE TO THE RECEIVING FACILITY. THIS NOTICE SHALL AT A MINIMUM INCLUDE:

1. A NOTICE THAT THE SCRAP STEEL IS COATED WITH PAINT THAT HAS REGULATED MATERIALS AT LEVELS WHICH COULD BE HAZARDOUS TO EMPLOYEES OR THE ENVIRONMENT.
2. A COPY OF THE SCRAPE SAMPLE PROVIDED IN THE CONTRACT DOCUMENTS.
3. A SIGNATURE BLOCK FOR THE RECEIVING FACILITY TO CONFIRM THEIR RECEIPT OF THIS INFORMATION.

A COPY OF THIS NOTICE, SIGNED BY THE RECEIVING FACILITY, SHALL BE RETURNED TO THE ENGINEER BEFORE ANY SCRAP STEEL IS REMOVED FROM THE PROJECT.

CONTRACTOR SHALL PROPERLY PROTECT FOUNDATIONS FOR NEW STRUCTURE PLACED PRIOR TO REMOVAL OPERATIONS. PROTECTION MEASURES SHALL REMAIN IN PLACE FOR DURATION OF REMOVAL OPERATIONS.

CONTRACTOR REMOVAL METHOD SHALL NOT ENDANGER FOUNDATIONS FOR NEW STRUCTURE PLACED PRIOR TO REMOVAL OPERATIONS.

AT LEAST 30 DAYS PRIOR TO REMOVAL OPERATIONS THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW THE PROPOSED METHOD OF REMOVAL OF THE EXISTING BRIDGE, INCLUDING ANY MEASURES TAKEN TO PROTECT THE FOUNDATIONS OF NEW STRUCTURE PLACED PRIOR TO REMOVAL OPERATIONS, AND A CPM SCHEDULE FOR ALL OPERATIONS.

NOTES:

1. BRIDGE REMOVAL SHALL BE COORDINATED WITH CONSTRUCTION SEQUENCE SHOWN ON DESIGN SHEET 9.
2. THIS SHEET IS FOR INFORMATIONAL USE ONLY. CONTRACTOR SHALL REVIEW EXISTING BRIDGE PLANS PRIOR TO DEMOLITION.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS 70'-0 INTERIOR SPAN

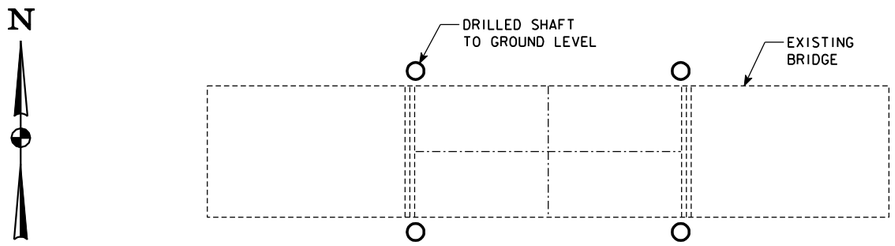
DEMOLITION PLAN

STA. 20+85.00 FEBRUARY, 2011

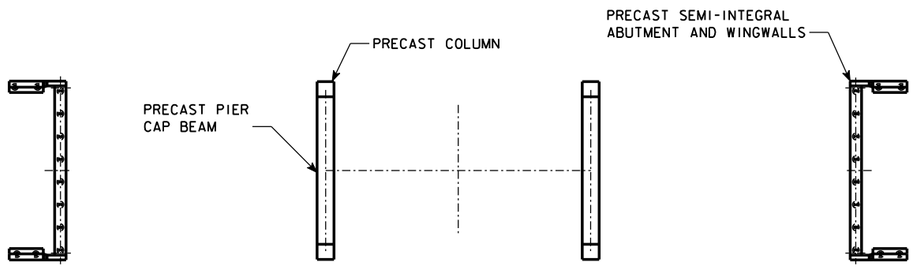
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

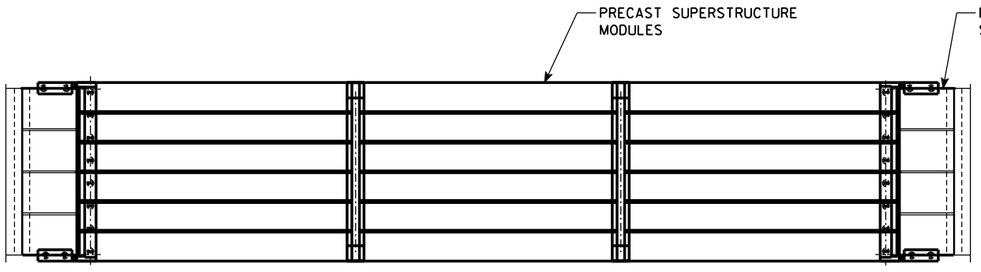
DESIGN SHEET NO. 8 OF 41 FILE NO. 30387 DESIGN NO. 111



STAGE 1



STAGE 2



STAGE 3

PROPOSED BRIDGE CONSTRUCTION SEQUENCE:

(INCLUDES ON-SITE WORK ONLY)

STAGE 1: WORK TO BE COMPLETED UP TO EXISTING BRIDGE DEMOLITION

- CONSTRUCT DRILLED SHAFTS TO THE ELEVATION SHOWN ON DESIGN SHEET 18
- CLOSE BRIDGE, ENACT DETOUR (START "ABC PERIOD" OF CONTRACT)
- DEMOLISH EXISTING BRIDGE

STAGE 2: SUBSTRUCTURE WORK TO BE COMPLETED AFTER EXISTING BRIDGE DEMOLITION

- ASSEMBLE PRECAST COLUMNS AND PRECAST PIER CAP BEAMS
- DRIVE ABUTMENT H-PILES
- ASSEMBLE ABUTMENT STEM AND WINGWALLS

STAGE 3: ASSEMBLE SUPERSTRUCTURE AND APPROACH SLABS

- ASSEMBLE MODULAR SUPERSTRUCTURE INCLUDING BARRIERS, ASSEMBLE PRECAST APPROACH SLABS
- CONSTRUCT CLOSURE POUR JOINTS, GRIND DECK AND APPROACH TO FINAL PROFILE
- OPEN TO TRAFFIC (END "ABC PERIOD" OF CONTRACT)
- COMPLETE GRADING AND REVETMENT

NOTE: APPROACH RAILS TO BE COMPLETED PRIOR TO OPENING TO TRAFFIC.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS 70'-0 INTERIOR SPAN

CONSTRUCTION SEQUENCE

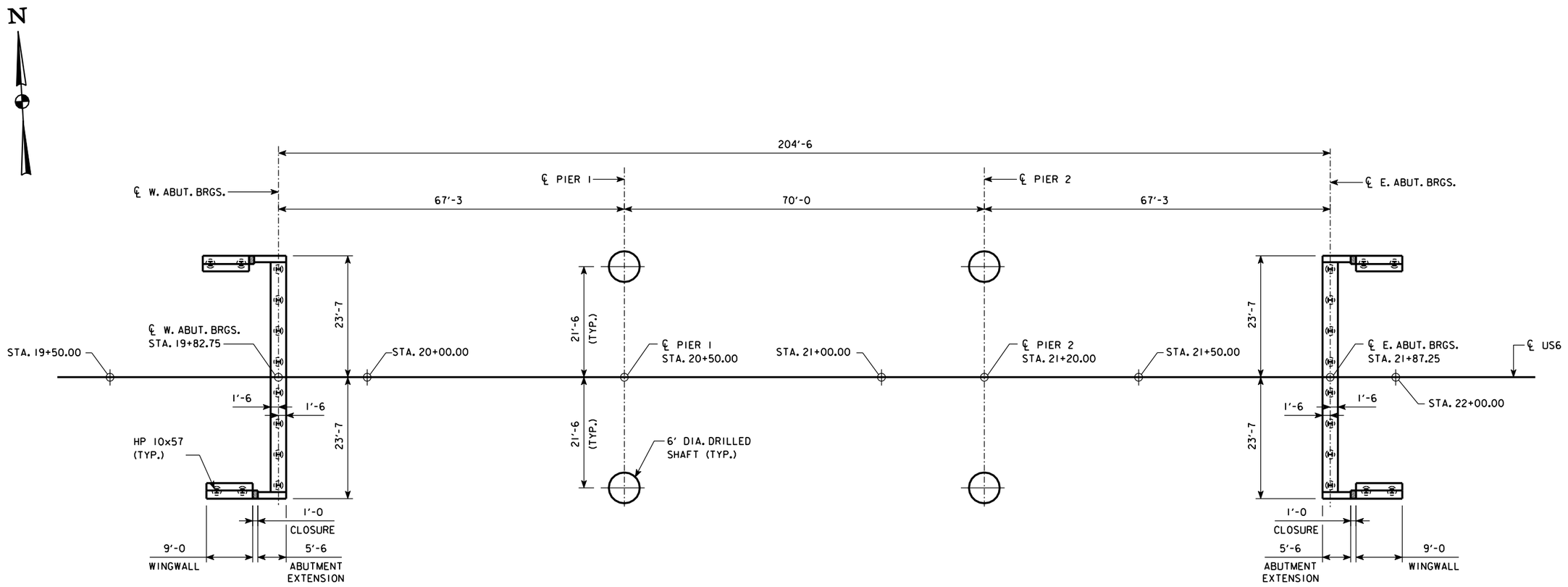
STA. 20+85.00 FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 9 OF 41 FILE NO. 30387 DESIGN NO. 111

BM NO. 501 STA. 19+90.2, 15.4' RT., D.O.T. PLUG S.W. COR. BRIDGE WING, ELEV. = 1087.55



FOUNDATION PLAN

NOTES:

1. FOR GENERAL NOTES, SEE DESIGN SHEETS 2, 3 AND 4.

2. FINAL DRILLED SHAFT POSITIONS SHALL NOT DEVIATE FROM THE LOCATIONS DESIGNATED IN THESE PLANS BY MORE THAN 1" IN ANY DIRECTION.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS 70'-0 INTERIOR SPAN

FOUNDATION PLAN

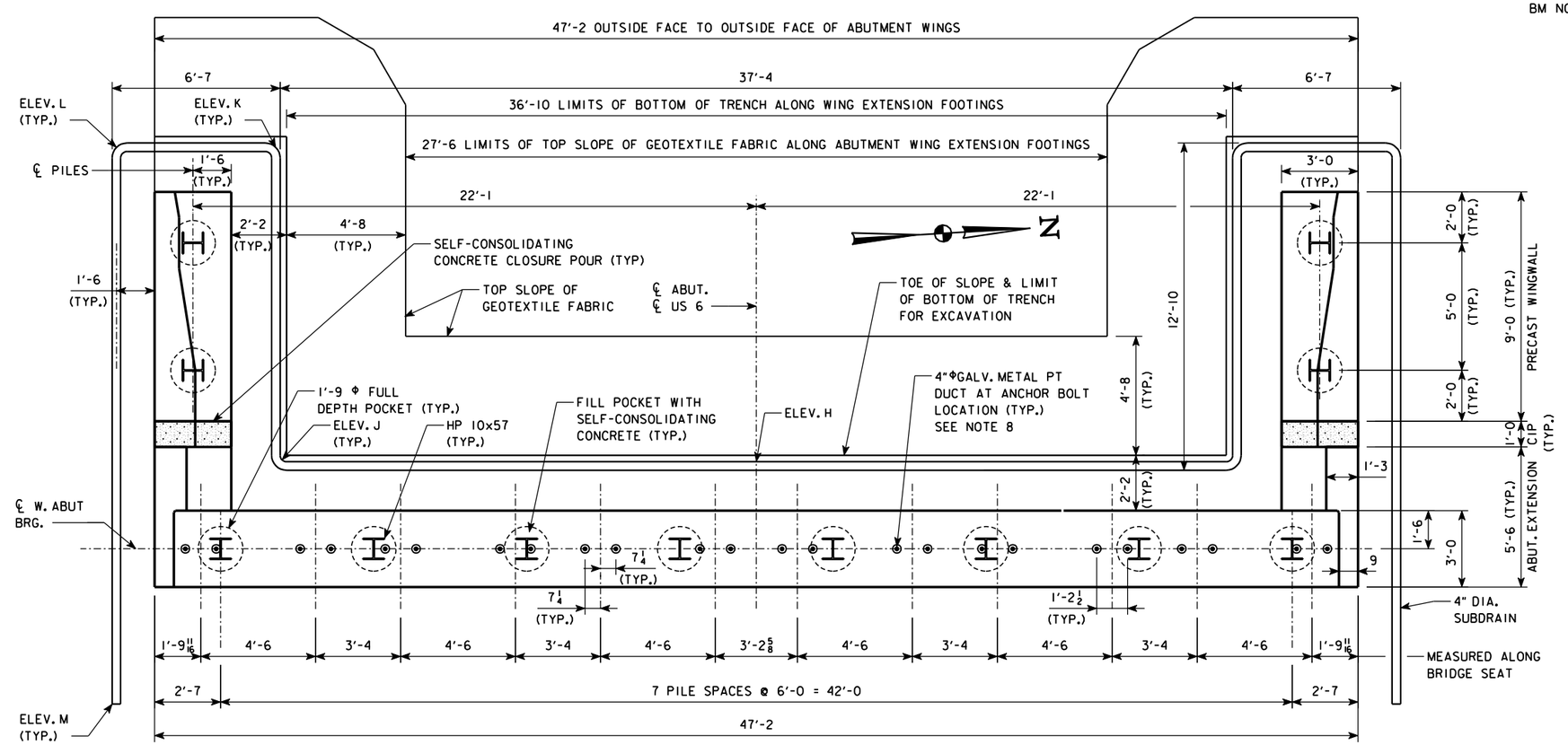
STA. 20+85.00 FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

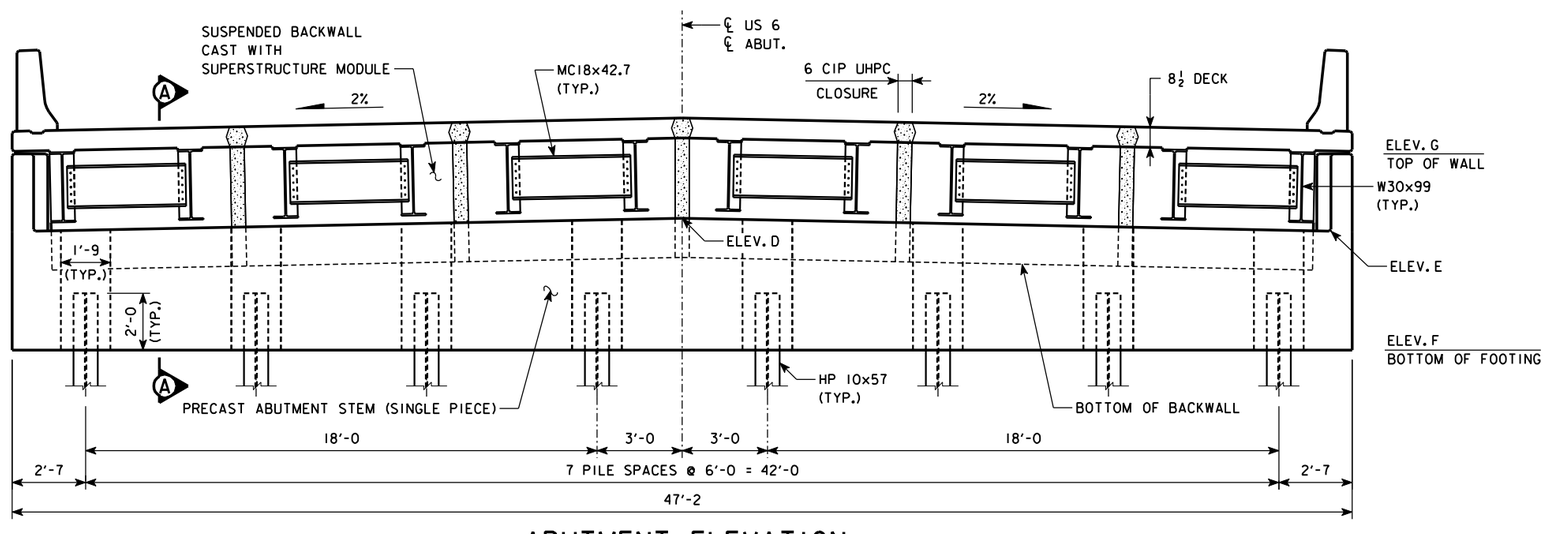
DESIGN SHEET NO. 10 OF 41 FILE NO. 30387 DESIGN NO. 111

BM NO. 501 STA. 19+90.2, 15.4' RT., D.O.T. PLUG S.W. COR. BRIDGE WING, ELEV. = 1087.55



ABUTMENT PLAN AND PILE LAYOUT

(WEST ABUTMENT SHOWN, EAST ABUTMENT SIMILAR)



ABUTMENT ELEVATION

SUBDRAIN OUTLET ELEVATIONS		
LOCATION	ELEVATION	
	WEST ABUTMENT	EAST ABUTMENT
ELEV. H HIGH POINT	1077.15	1077.21
ELEV. J	1076.76	1076.83
ELEV. K	1076.50	1076.57
ELEV. L	1076.37	1076.43
ELEV. M OUTLET	1075.93	1075.99

ABUTMENT ELEVATIONS				
ELEVATION	D	E	F	G
W. ABUTMENT	1081.30	1080.84	1076.65	1083.57
E. ABUTMENT	1081.36	1080.90	1076.71	1083.63

NOTES:

1. FINAL PILE POSITIONS SHALL NOT DEVIATE FROM THE LOCATIONS DESIGNATED IN THESE PLANS BY MORE THAN 3" IN ANY DIRECTION.
2. FOR SECTION A-A, SEE DESIGN SHEET 12.
3. PILES SHALL BE DRIVEN TO ROCK. PILE DESIGN BEARING IS 65 TONS.
4. FOR ABUTMENT BACKFILL PROCESS AND NOTES, SEE DESIGN SHEET 12.
5. FOR WING ARMORING AND SUBDRAIN DETAILS, SEE DESIGN SHEET 17.
6. PRECAST CONCRETE ABUTMENT SHALL CONFORM TO PRECAST CONCRETE SUBSTRUCTURE ELEMENTS SPECIAL PROVISIONS.
7. USE 1'-9" GALVANIZED CORRUGATED METAL PIPE FOR POCKETS.
8. GALVANIZED METAL PT DUCTS SHALL BE USED AT ALL ANCHOR BOLT LOCATIONS EXCEPT THOSE THAT FALL IN PILE POCKETS. THESE LOCATIONS SHALL BE FIELD DRILLED ONCE POCKET CONCRETE HAS ACHIEVED 3000 PSI COMPRESSIVE STRENGTH. GROUT 1 1/2" DIA. x 1'-7 1/2 SWEDGED ANCHORS IN FIELD. SEE DESIGN SHEET NO. 34.
9. 12 - 80'-0 HP 10x57 STEEL BEARING PILING AT SOUTH ABUTMENT.
10. 12 - 80'-0 HP 10x57 STEEL BEARING PILING AT NORTH ABUTMENT.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

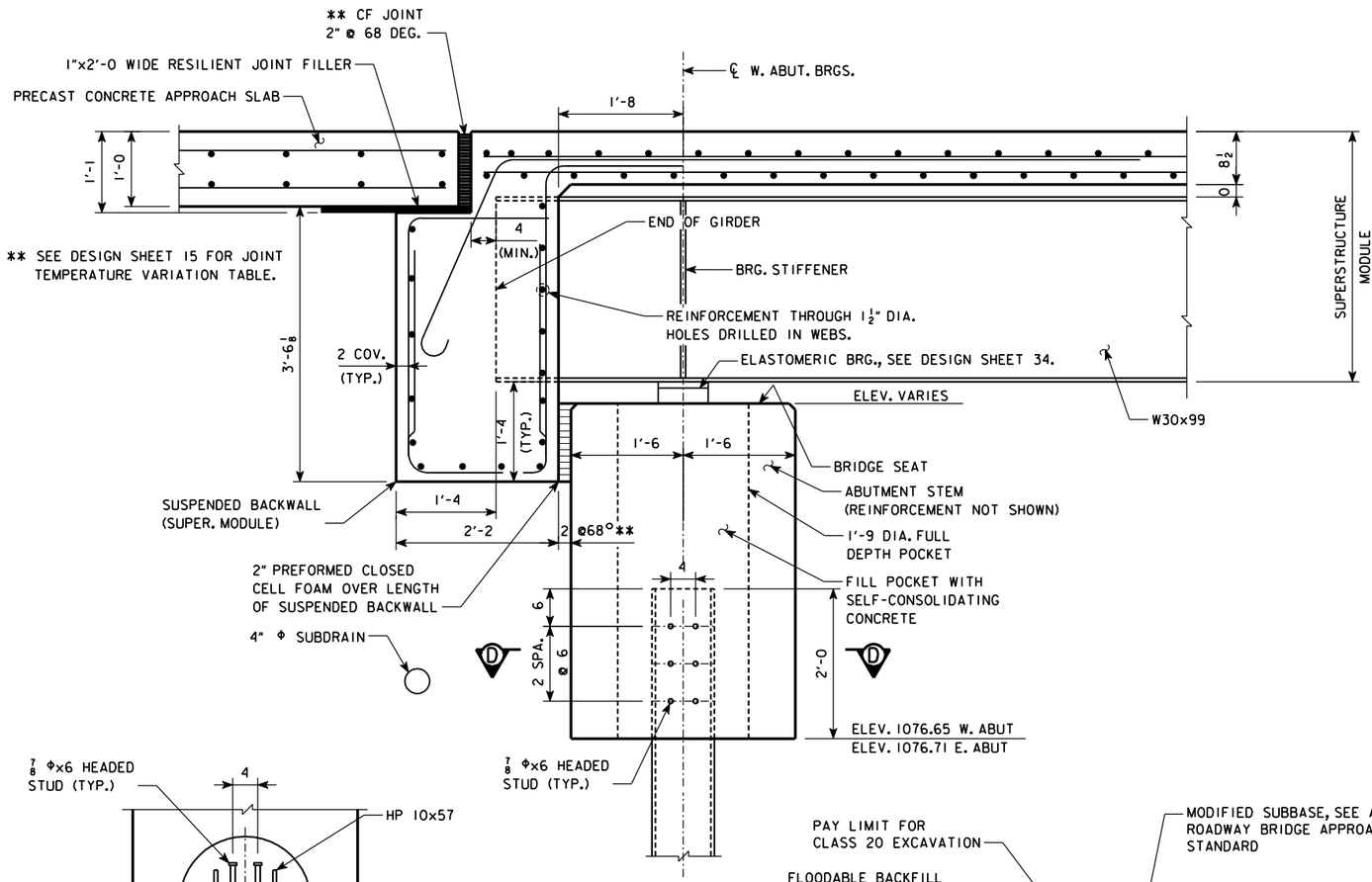
ABUTMENT PLAN & ELEVATION

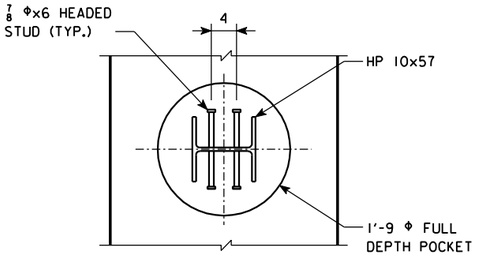
STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 11 OF 41 FILE NO. 30387 DESIGN NO. 111

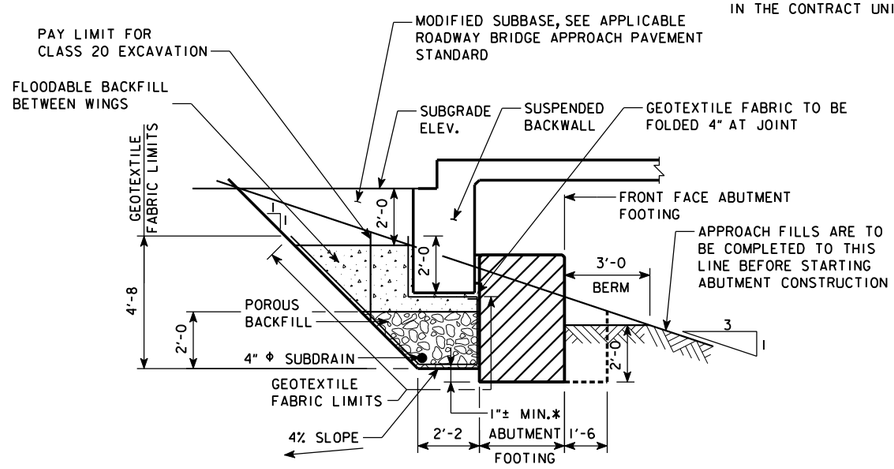




SECTION D-D

SECTION A-A

TECHNICAL DATA INFORMATION - GEOTEXTILE FABRIC				
MECHANICAL PROPERTIES	TEST METHOD	UNIT	MINIMUM AVERAGE ROLL VALUE	
			MD	CD
TENSILE STRENGTH (AT 5% STRAIN)	ASTM D 4595	kN/m (LBS/FT)	19.8 (1356)	19.8 (1356)
APPARENT OPENING SIZE (AOS)	ASTM D 4751	mm (U.S. SIEVE)	0.43 MAX (#40)	
FLOW RATE	ASTM D 4491	$L/MIN/m^2$ ($GAL/MIN/FT^2$)	733 (18)	
UV RESISTANCE (AT 500 HOURS)	ASTM D 4355	% STRENGTH RETAINED	70	



BACKFILL DETAILS

NOTE: GEOTEXTILE FABRIC WILL BE ATTACHED TO FACE OF ABUTMENT STEM, SUSPENDED BACKWALL, AND WINGS

* DIMENISON VARIES DUE TO 2% SUBDRAIN SLOPE

ABUTMENT BACKFILL PROCESS:

THE BASE OF THE EXCAVATION SUBGRADE BEHIND THE ABUTMENT IS TO BE GRADED WITH A 4% SLOPE AWAY FROM THE ABUTMENT FOOTING AND A 2% CROSS SLOPE IN THE DIRECTION OF THE SUBDRAIN OUTLET. THIS EXCAVATION SHAPING IS TO BE DONE PRIOR TO BEGINNING INSTALLATION OF THE GEOTEXTILE AND BACKFILL MATERIAL.

AFTER THE SUBGRADE HAS BEEN SHAPED, THE GEOTEXTILE FABRIC SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS SHOWN. THE FABRIC IS INTENDED TO BE INSTALLED IN THE BASE OF THE EXCAVATION AND EXTENDED VERTICALLY UP THE ABUTMENT BACKWALL, ABUTMENT WING WALLS, AND EXCAVATION FACE TO A HEIGHT THAT WILL BE APPROXIMATELY 2 FOOT HIGHER THAN THE BOTTOM OF THE SUSPENDED BACKWALL AS SHOWN IN THE BACKFILL DETAILS ON THIS SHEET. THE STRIPS OF THE FABRIC PLACED SHALL OVERLAP APPROXIMATELY 1 FOOT AND SHALL BE PINNED IN PLACE. THE FABRIC SHALL BE ATTACHED TO THE ABUTMENT AND SUSPENDED BACKWALL USING LATH FOLDED IN THE FABRIC AND SECURED TO THE CONCRETE WITH SHALLOW CONCRETE NAILS. THE FABRIC SHALL BE TIGHTLY SECURED TO THE BOTTOM OF THE SUSPENDED BACKWALL AND A 4 INCH LENGTH OF FABRIC SHALL BE FOLDED OVER AT THE EXPANSION JOINT LOCATION. THE FABRIC PLACED AGAINST THE EXCAVATION FACE SHALL BE PINNED.

WHEN THE FABRIC IS IN PLACE, THE SUBDRAIN SHALL BE INSTALLED DIRECTLY ON THE FABRIC AT THE TOE OF THE REAR EXCAVATION SLOPE. A SLOT WILL NEED TO BE CUT IN THE FABRIC AT THE POINT WHERE THE SUBDRAIN EXITS THE FABRIC NEAR THE END OF THE ABUTMENT WING WALL.

POROUS BACKFILL IS THEN PLACED AND LEVELED, NO COMPACTION IS REQURIED.

THE REMAINING WORK INVOLVES BACKFILLING WITH FLOODABLE BACKFILL, SURFACE FLOODING, AND VIBRATORY COMPACTION. THE FLOODABLE BACKFILL MATERIAL SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE FLOODABLE BACKFILL SHALL BE PLACED IN INDIVIDUAL LIFTS, SURFACE FLOODED, AND COMPACTED WITH VIBRATORY COMPACTION TO ENSURE FULL CONSOLIDATION. LIMIT THE LOOSE LIFTS TO NO MORE THAN 2 FEET OF THICKNESS.

START SURFACE FLOODING FOR EACH FLOODABLE BACKFILL LIFT AT THE HIGH POINT OF THE SUBDRAIN AND PROGRESS TO THE LOW POINT WHERE THE SUBDRAIN EXITS THE FABRIC. TO ENSURE UNIFORM SURFACE FLOODING, WATER RUNNING FULL IN A 2-INCH DIAMETER HOSE SHOULD BE SPRAYED IN SUCCESSIVE 6-FOOT TO 8-FOOT INCREMENTS FOR 3 MINUTES WITHIN EACH INCREMENT.

FLOODABLE BACKFILL LIFT PLACEMENT, FLOODING, AND COMPACTION SHALL PROGRESS UNTIL THE REQUIRED FULL THICKNESS OF THE ABUTMENT BACKFILL HAS BEEN COMPLETED.

WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS WILL NOT BE MEASURED SEPARATELY FOR PAYMENT.

THE COST OF WATER REQUIRED FOR FLOODING AND FLOODABLE BACKFILL SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR ABUTMENT STEM.

THE COST OF SUBDRAIN, GEOTEXTILE FABRIC, AND POUROUS BACKFILL SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR ABUTMENT STEM.

NOTES:

1. ABUTMENT SHALL NOT BE BACKFILLED UNTIL THE SUPERSTRUCTURE IS IN PLACE.
2. PROVIDE TEMPORARY SUPPORT OF THE PRECAST PANELS UNTIL THE POCKET CONCRETE HAS BEEN PLACED AND CURED TO ACHIEVE 3000 psi COMPRESSIVE STRENGTH.
3. FINAL PILE POSITIONS SHALL NOT DEVIATE FROM THE LOCATIONS DESIGNATED IN THESE PLANS BY MORE THAN 3" IN ANY DIRECTION.
4. FOR LOCATION OF SECTION A-A, SEE DESIGN SHEET 11.
5. SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM ℄ APPROACH ROADWAY. FOR BRIDGE WING ARMORING AND SUBDRAIN DETAILS, SEE DESIGN SHEET 17.
6. SUSPENDED BACKWALL AND PRECAST APPROACH SLAB INCLUDING UHPC CLOSURE POURS ARE INCLUDED IN OTHER BID ITEMS.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

ABUTMENT SECTION

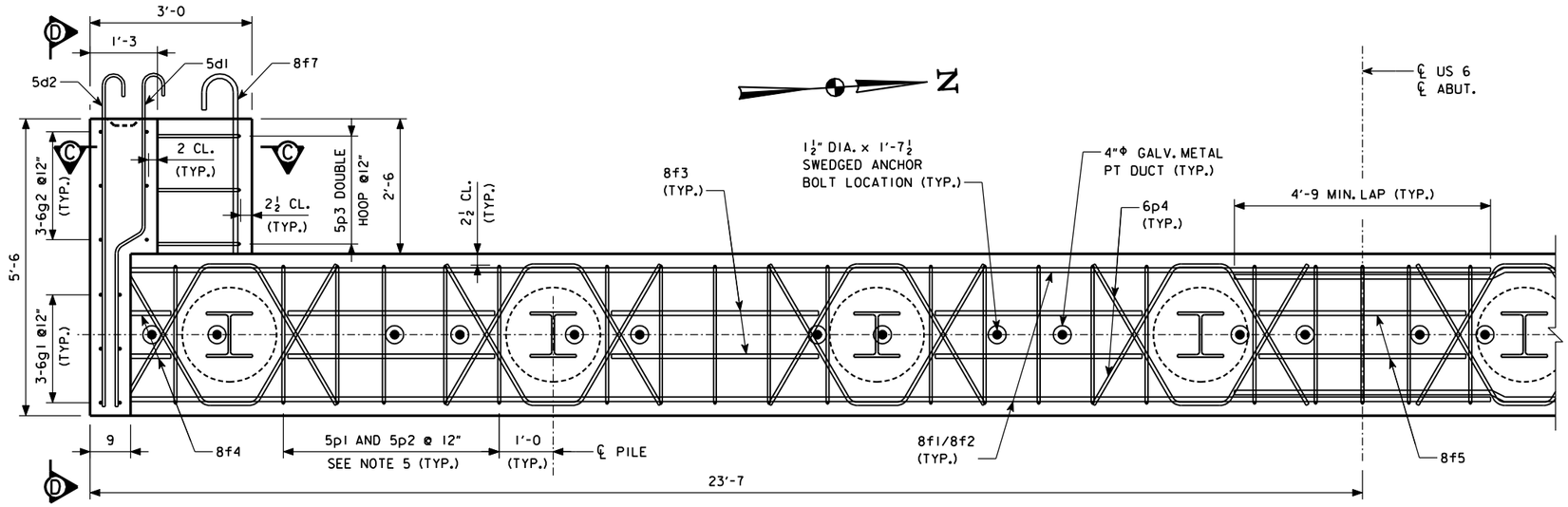
STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

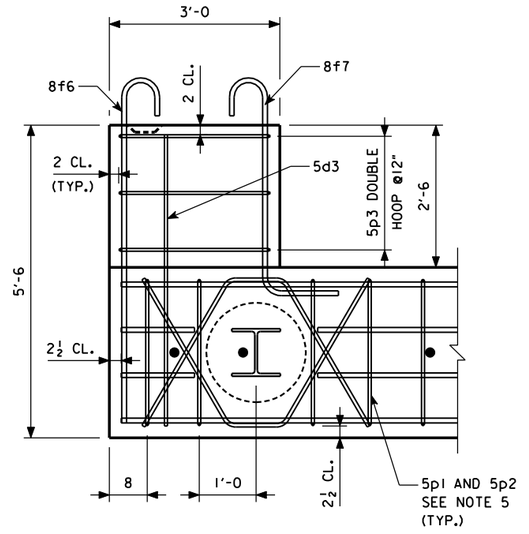
DESIGN SHEET NO. 12 OF 41 FILE NO. 30387 DESIGN NO. 111

BM NO. 501 STA. 19+90.2, 15.4' RT., D.O.T. PLUG S.W. COR. BRIDGE WING, ELEV. = 1087.55



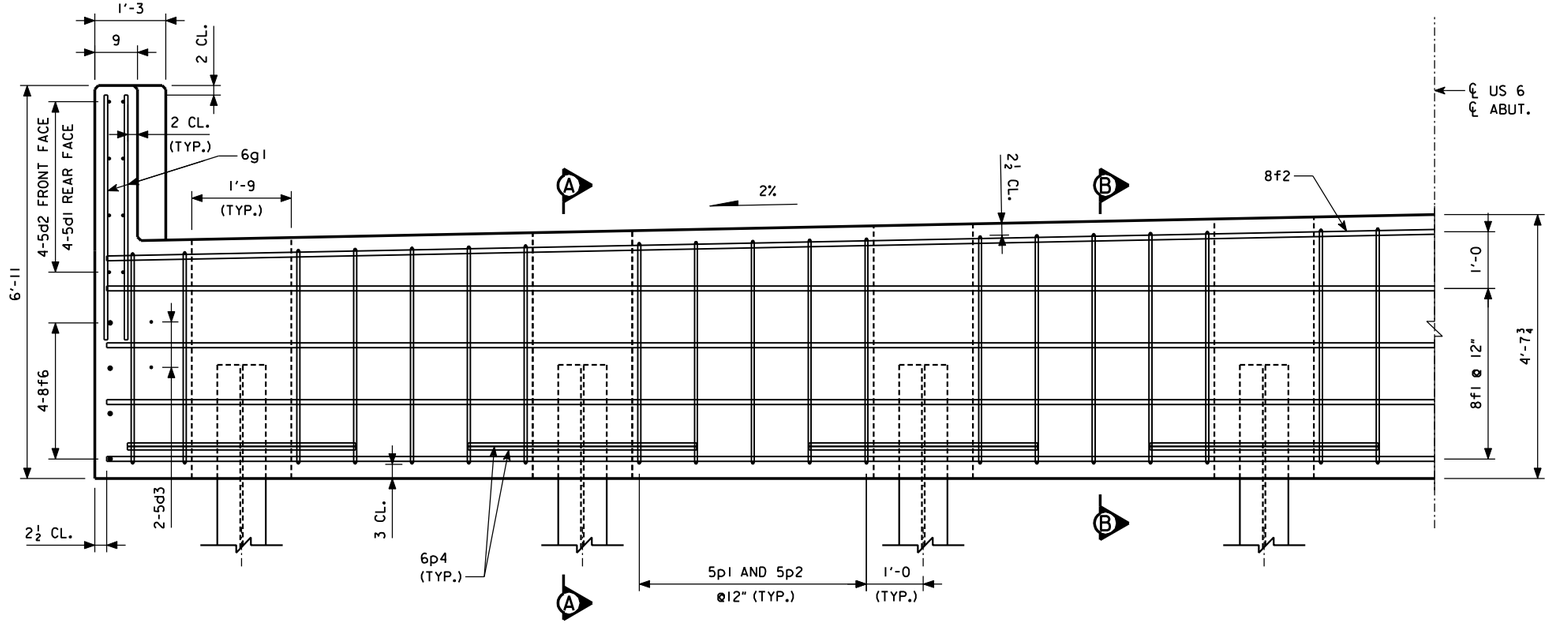
ABUTMENT REINFORCEMENT PLAN

(WEST ABUTMENT SHOWN, EAST ABUTMENT SIMILAR)
(SYMMETRICAL ABOUT ℄ US 6)



PARTIAL ABUTMENT FOOTING REINFORCEMENT PLAN

(FOR DETAILS NOT SHOWN, SEE ABUTMENT REINFORCEMENT PLAN)



PARTIAL ABUTMENT ELEVATION

(SYMMETRICAL ABOUT ℄ US 6)

NOTE:

1. THE ESTIMATED WEIGHT OF THE PRECAST ABUTMENT MODULE IS 93 KIPS. CONTRACTOR SHALL SUBMIT LIFTING DETAILS FOR REVIEW AND APPROVAL.
2. FOR ABUTMENT PLAN AND ELEVATION AND PILE LAYOUT, SEE DESIGN SHEET 11.
3. FOR ABUTMENT REINFORCING BAR LIST AND BENT BAR DETAILS, SEE DESIGN SHEET 14.
4. FOR ADDITIONAL NOTES, SEE DESIGN SHEETS 11 AND 12.
5. ABUTMENT STEM HOOP BARS SHALL BE PLACED IN SUCH A WAY AS TO BE CLEAR OF PT DUCTS FOR BEARING ANCHOR BOLTS.
6. FOR ANCHOR BOLT LAYOUT, SEE ABUTMENT PLAN AND PILE LAYOUT ON DESIGN SHEET 11.
7. FOR SECTIONS A-A, B-B, C-C, AND D-D, SEE DESIGN SHEET 14.
8. ANCHOR BOLTS AND NON-SHRINK GROUT ARE INCLUDED IN PRICE BID FOR SUPERSTRUCTURE MODULES.
9. CONSTRUCTION TOLERANCES PER SPECIAL PROVISIONS.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

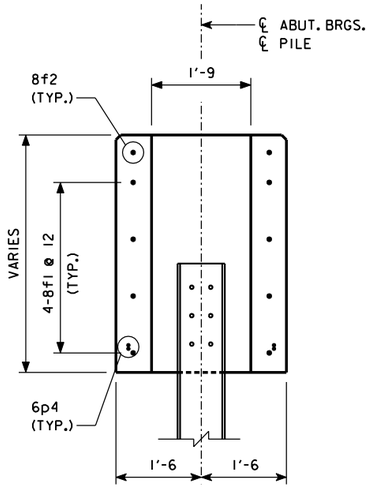
ABUT. REINFORCEMENT DETAILS 1

STA. 20+85.00 — FEBRUARY, 2011

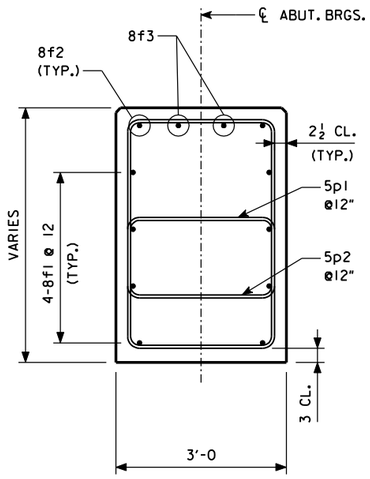
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

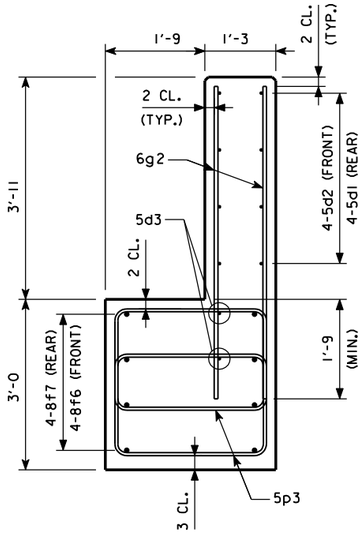
DESIGN SHEET NO. 13 OF 41 FILE NO. 30387 DESIGN NO. 111



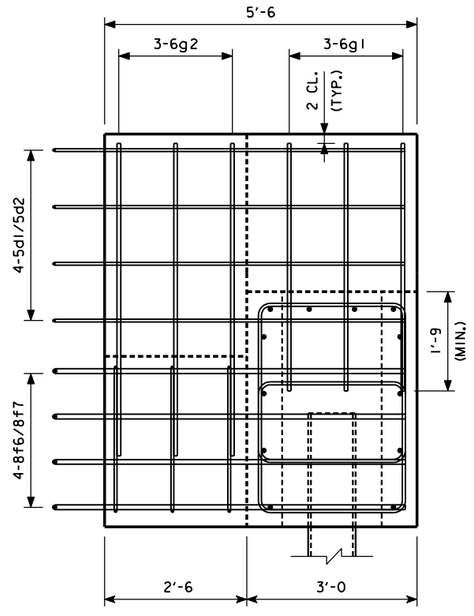
SECTION A-A



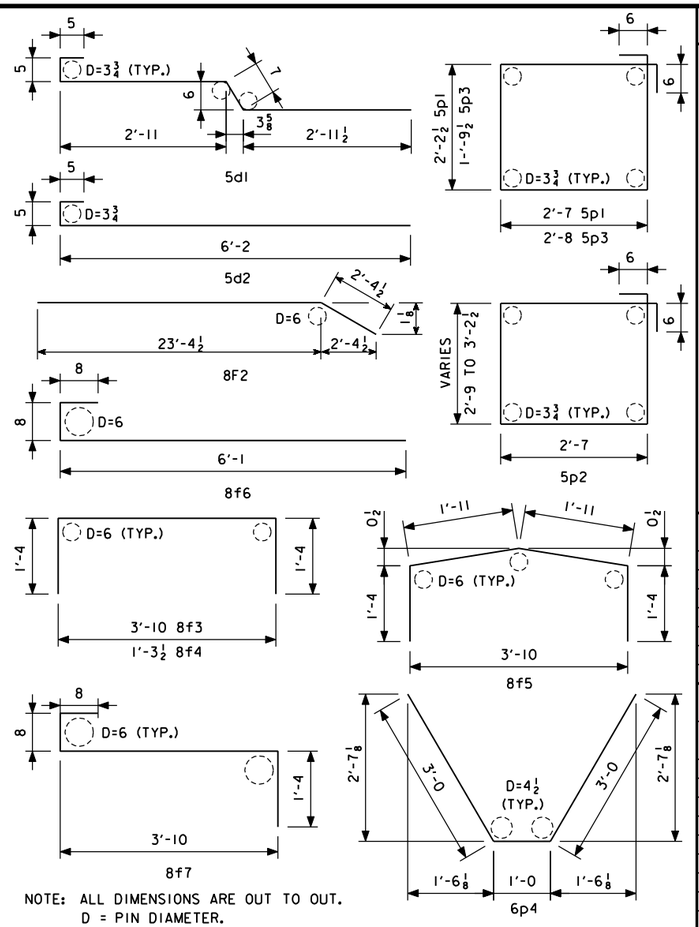
SECTION B-B



SECTION C-C



SECTION D-D



NOTE: ALL DIMENSIONS ARE OUT TO OUT.
D = PIN DIAMETER.

BENT BAR DETAILS

REINFORCING BAR LIST-TWO ABUTMENTS

EPOXY COATED REINFORCING

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5d1	ABUT. DIAPH. WING EXT. LONGIT.		16	7'-3½	222
5d2	ABUT. DIAPH. WING EXT. LONGIT.		16	7'-0	117
5d3	ABUT. DIAPH. WING EXT. LONGIT.		8	5'-1½	43
8f1	ABUT. FOOTING LONGIT. BOTH F.		32	25'-9	2,203
8f2	ABUT. FOOTING LONGIT. TOP		8	25'-9	551
8f3	ABUT. FOOTING LONGIT. TOP		24	6'-6	417
8f4	ABUT. FOOTING LONGIT. TOP		8	3'-11½	85
8f5	ABUT. FOOTING LONGIT. TOP		4	6'-6	70
8f6	ABUT. EXTENSION LONGIT.		16	7'-5	312
8f7	ABUT. EXTENSION LONGIT.		16	6'-6	278
6g1	ABUT. CHEEKWALL VERTICAL		24	4'-4	157
6g2	ABUT. WING EXT. VERT.		24	5'-6	199
5p1	ABUT. HOOPS	□	78	10'-7	862
5p2	ABUT. HOOPS	□	78	VARIES	1,006
5p3	ABUT. EXTENSION HOOPS	□	24	9'-11	249
6p4	ABUT. BOTT. AT PILES		32	7'-0	337
	REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)				7,014

CONC. PLACEMENT QUANTITIES

TWO ABUTS.

LOCATION	QUANTITY
WEST ABUTMENT MODULE	23
EAST ABUTMENT MODULE	23
PILE POCKETS	5
TOTAL (CU. YDS.)	51

ESTIMATED QUANTITIES

TWO ABUTS.

ITEM	UNIT	QUANTITY
HIGH PERFORMANCE CONCRETE	CU. YD.	46
REINFORCING STEEL EPOXY COATED	LBS.	7,014
CLASS 20 EXCAVATION	CU. YD.	304
PILES HP 10x57	L.F.	1,815
S-C CONCRETE CLOSURE POURS - PILE POCKETS	CU. YD.	5

NOTES:

1. FOR ABUTMENT PLAN AND ELEVATION AND PILE LAYOUT, SEE DESIGN SHEET 11.
2. FOR THE LOCATION OF SECTIONS A-A, B-B, C-C, AND D-D, SEE DESIGN SHEET 13.
3. FOR CAST IN PLACE CLOSURE POUR BAR LIST AND QUANTITIES, SEE DESIGN SHEET 16.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

ABUT. REINFORCEMENT DETAILS 2

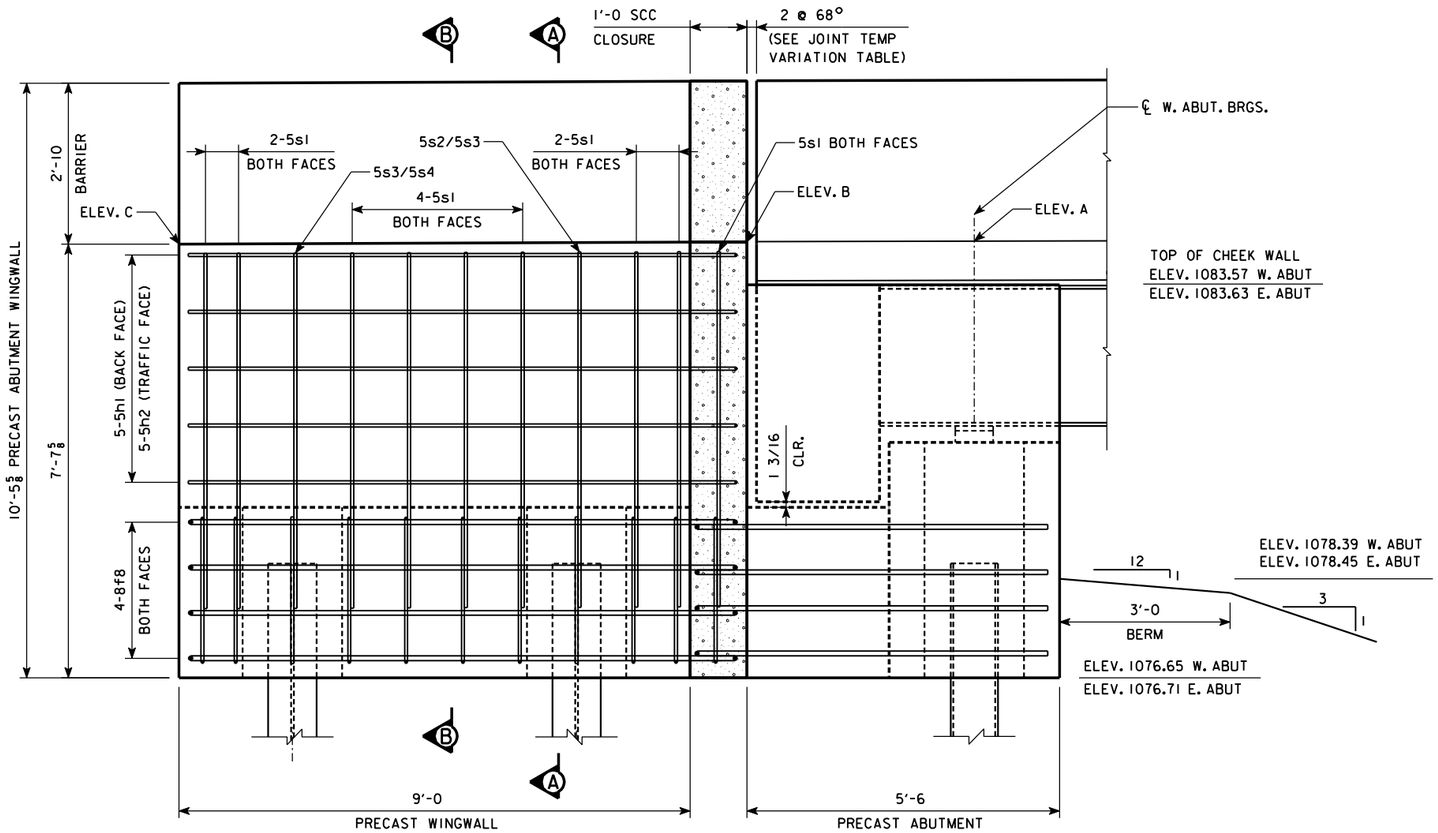
STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

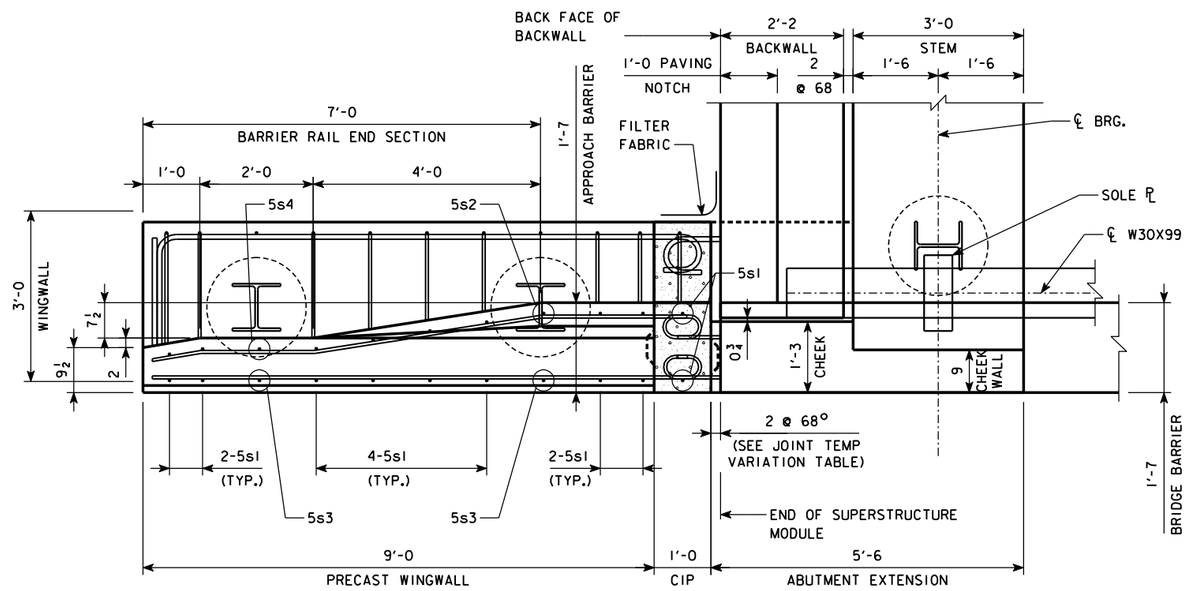
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 14 OF 41 FILE NO. 30387 DESIGN NO. 111

BM NO. 501 STA. 19+90.2, 15.4' RT., D.O.T. PLUG S.W. COR. BRIDGE WING, ELEV. = 1087.55



PARTIAL ELEVATION



PARTIAL PLAN

NOTE:

1. ABUTMENT WINGWALLS SHALL NOT BE BACKFILLED UNTIL THE SUPERSTRUCTURE IS IN PLACE.
2. PROVIDE TEMPORARY SUPPORT OF THE PRECAST MODULE UNTIL THE POCKET CONCRETE HAS BEEN PLACED AND CURED TO ACHIEVE 3000 psi COMPRESSIVE STRENGTH.
3. FOR ABUTMENT BACKFILL PROCESS, SEE DESIGN SHEET 12.
4. THE ESTIMATED WEIGHT OF THE PRECAST WINGWALL MODULE IS 26 KIPS. CONTRACTOR SHALL SUBMIT LIFTING DETAILS FOR REVIEW AND APPROVAL.
5. FOR SECTIONS A-A AND B-B, WINGWALL FOOTING REINFORCEMENT PLAN, WINGWALL REINFORCING BAR LIST AND BENT BAR DETAILS, SEE DESIGN SHEET 16.
6. FOR ABUTMENT AND CHEEKWALL REINFORCING DETAILS, SEE DESIGN SHEETS 13 AND 14.
7. FOR BARRIER RAIL END SECTION REINFORCEMENT, SEE DESIGN SHEET 40.
8. WINGWALL, WINGWALL BARRIER RAIL, REINFORCING, AND CAST-IN-PLACE CLOSURE POUR ARE INCLUDED IN PRICE BID FOR ITEM ABUTMENT WINGWALL.
9. CAST-IN-PLACE CLOSURE POUR SHALL USE HIGH-EARLY STRENGTH SELF-CONSOLIDATING CONCRETE MIX IN ACCORDANCE WITH CONTRACT DOCUMENTS.
10. CONSTRUCTION TOLERANCES PER SPECIAL PROVISIONS.

WINGWALL ELEVATIONS

ELEVATION	A	B	C
W. ABUTMENT	1084.34	1084.32	1084.28
E. ABUTMENT	1084.40	1080.39	1080.35

JOINT TEMPERATURE VARIATION TABLE

TEMPERATURE	40 DEG	50 DEG	68 DEG	80 DEG	90 DEG
W. ABUTMENT	1 7/8	1 7/8	2	2 1/8	2 1/8
E. ABUTMENT	1 5/8	1 3/4	2	2 1/8	2 1/4

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

WINGWALL DETAILS 1

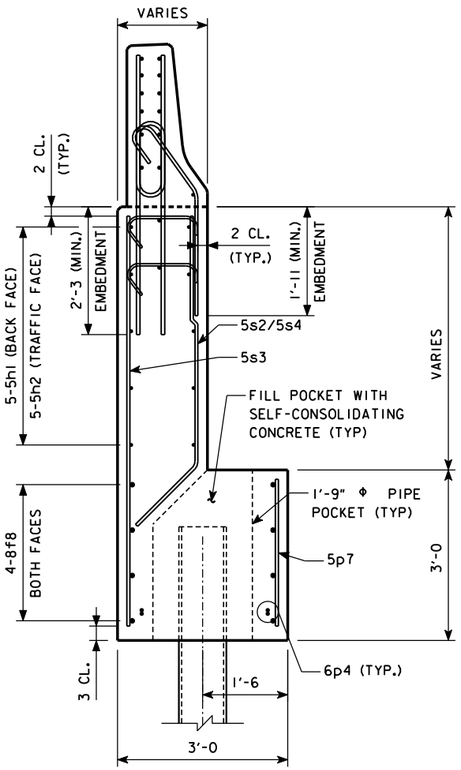
STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

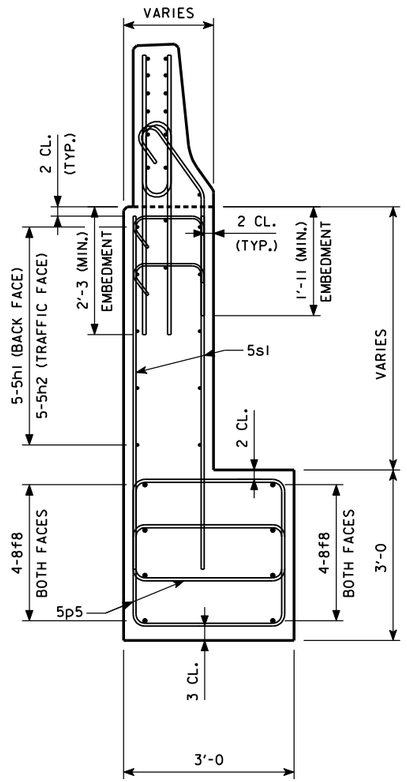
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 15 OF 41 FILE NO. 30387 DESIGN NO. 111

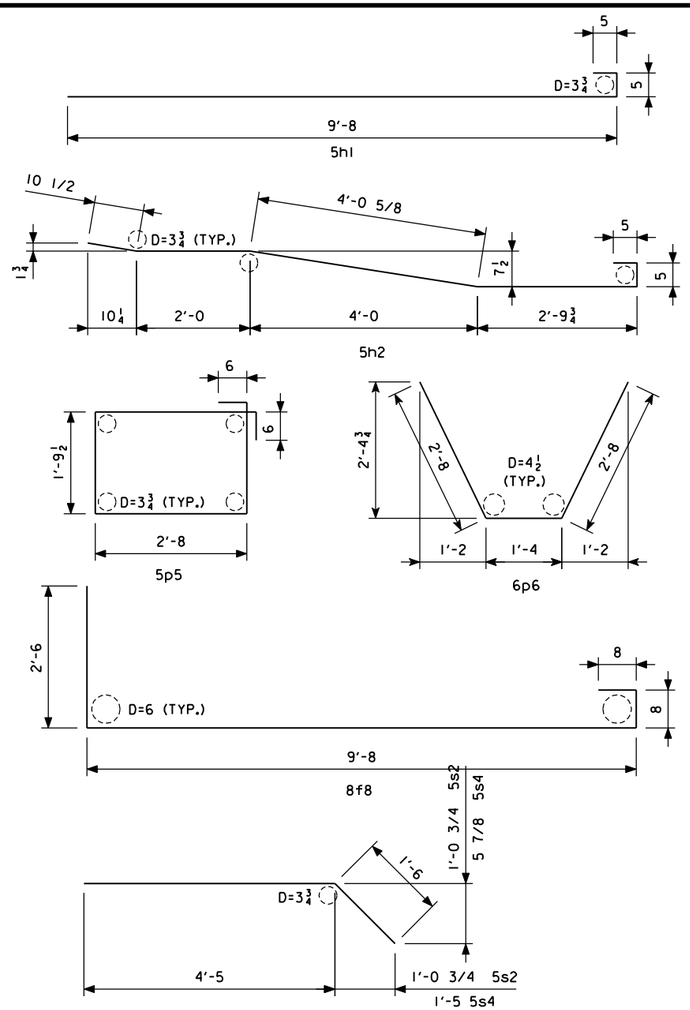
BM NO. 501 STA. 19+90.2, 15.4' RT., D.O.T. PLUG S.W. COR. BRIDGE WING, ELEV. = 1087.55



SECTION A-A

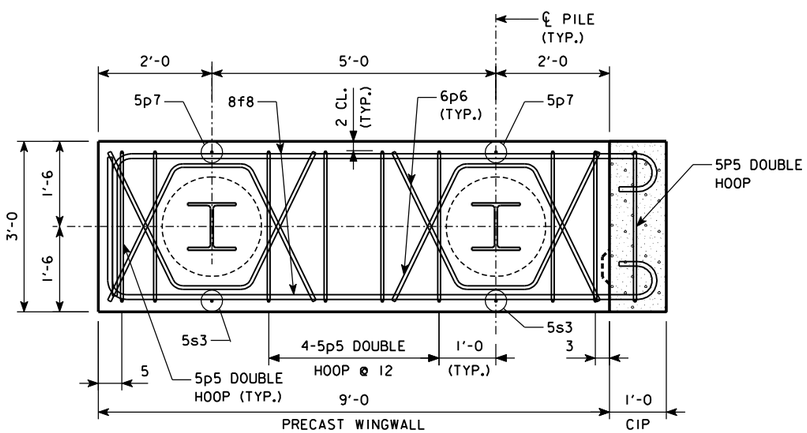


SECTION B-B



NOTE: ALL DIMENSIONS ARE OUT TO OUT.
D = PIN DIAMETER.

BENT BAR DETAILS



WINGWALL FOOTING REINFORCEMENT PLAN

NOTE:

1. FOR THE LOCATION OF SECTIONS A-A AND B-B AND FOR ADDITIONAL NOTES, SEE DESIGN SHEET 15.
2. FOR CLASS 20 EXCAVATION QUANTITIES AND PILE QUANTITIES, SEE DESIGN SHEET 15.
3. FOR BARRIER REINFORCEMENT DETAILS, BAR LIST, AND BAR BEND DETAILS, SEE DESIGN SHEET 40.
4. WINGWALL, WINGWALL BARRIER RAIL, REINFORCEMENT, AND CAST-IN-PLACE CLOSURE POUR ARE INCLUDED IN PRICE BID FOR ABUTMENT WINGWALL.
5. CAST-IN-PLACE CLOSURE POUR SHALL USE A HIGH EARLY STRENGTH SELF-CONSOLIDATING CONCRETE MIX IN ACCORDANCE WITH CONTRACT DOCUMENTS.
6. PILE TOPS SHALL HAVE HEADED STUDS INSTALLED ACCORDING TO DETAILS SHOWN ON DESIGN SHEET 12.

EPOXY COATED REINFORCING

REINF. BAR LIST-FOUR WINGWALLS

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
8f8	WINGWALL FOOTING LONGIT.	⌊⌋	32	13'-6	1,155
5h1	WINGWALL HORIZONTAL BACK FACE	⌐	20	10'-6	220
5h2	WINGWALL HORIZONTAL TRAFFIC FACE	⌐	20	10'-7	221
5p5	WINGWALL FOOTING HOOPS	□	64	9'-11	663
6p6	WINGWALL BOTT. AT PILES	⌒	16	6'-8	161
5p7	WINGWALL FOOTING VERT. AT PILES	—	8	2'-7	22
5s1	WINGWALL VERTICAL BOTH FACES	—	64	6'-3	418
5s2	WINGWALL VERTICAL AT PILES	⌐	4	5'-11	25
5s3	WINGWALL VERTICAL AT PILES	—	8	7'-2 1/2	61
5s4	WINGWALL VERTICAL AT PILES	⌐	4	5'-11	25
	REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)				2,971

REINF. BAR LIST-FOUR CIP POURS

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5p5	WINGWALL FOOTING HOOPS	□	8	9'-11	83
5s1	WINGWALL VERTICAL BOTH FACES	—	8	6'-3	53
	REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)				136

CONC. PLACEMENT QUANTITIES — FOUR WINGWALLS

LOCATION	QUANTITY
WINGWALL MODULE (EACH)	10.7
WINGWALL BARRIER (EACH)	0.9
TOTAL (CU. YDS.)	46

CONC. PLACEMENT QUANTITIES — FOUR WINGWALLS

LOCATION	QUANTITY
S-C CONCRETE CLOSURE WINGWALL	2.4
S-C CONCRETE CLOSURE BARRIER	0.5
S-C CONCRETE CLOSURE PILE POCKETS	2.1
TOTAL (CU. YDS.)	5

ESTIMATED QUANTITIES — FOUR WINGWALLS

ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE (BRIDGE) - INCLUDES BARRIER	CU. YD.	46
S-C CONCRETE CLOSURE POURS - INCLUDES BARRIER	CU. YD.	5
REINFORCING STEEL EPOXY COATED - INCLUDES BARRIER	LBS.	5,333

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

WINGWALL DETAILS 2

STA. 20+85.00 — FEBRUARY, 2011

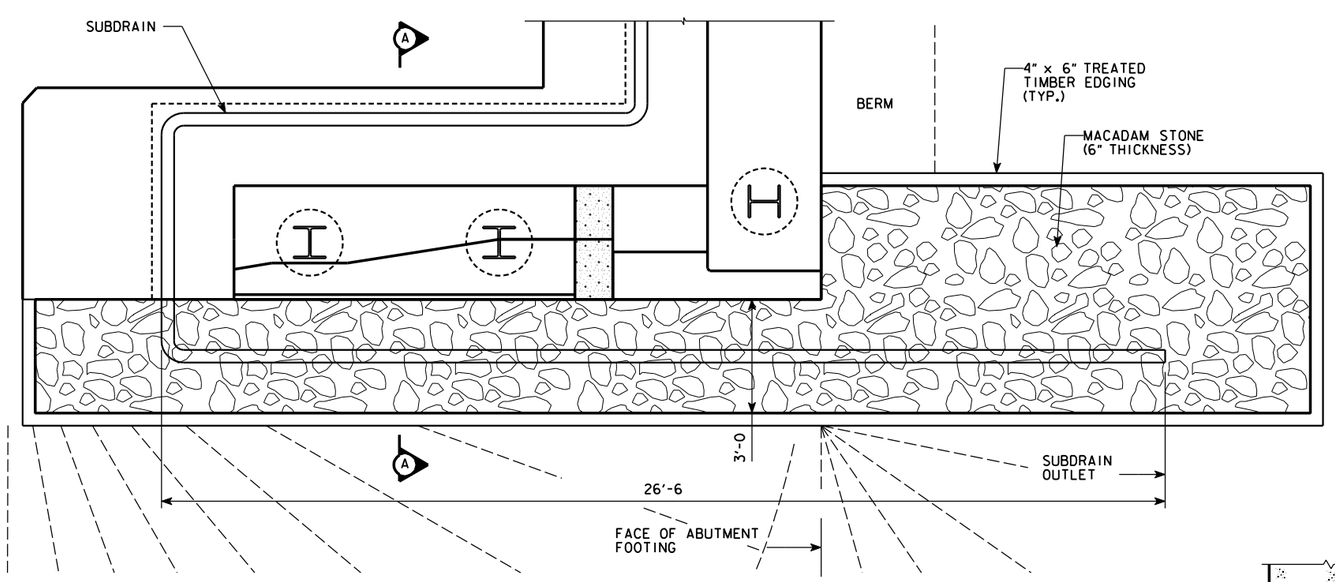
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 16 OF 41 FILE NO. 30387 DESIGN NO. 111

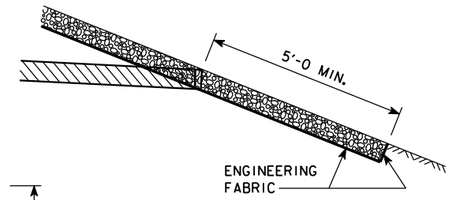
DGN$SYTIME0123456 DGN$USERNAME DGN$SPEC

BM NO. 501 STA. 19+90.2, 15.4' RT., D.O.T. PLUG S.W. COR. BRIDGE WING, ELEV. = 1087.55

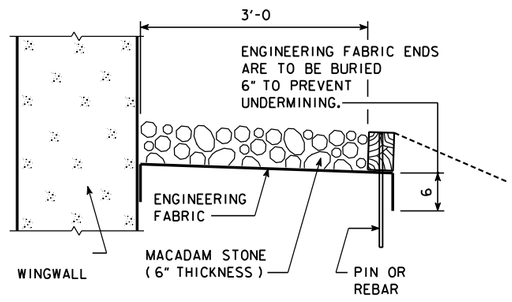


TOP VIEW OF WING ARMORING WITH WING EXTENSION

THE MACADAM STONE USED IN THE BRIDGE WING ARMORING DETAILS SHALL NOT BE SUBSTITUTED WITH REVETMENT MATERIAL. IF CLASS B OR CLASS E REVETMENT IS PRESENT, THE CONTRACTOR SHALL REMOVE THE REVETMENT TO THE ARMORING DIMENSIONS. THE REMOVED REVETMENT SHALL BE PLACED AS DIRECTED BY THE ENGINEER. IN ADDITION, A CHECK SHALL BE MADE AT THE SUBDRAIN OUTLET TO INSURE THAT IT IS DRAINING PROPERLY DURING THE BACKFILL FLOODING PROCESS.



TYPICAL SECTION OF SUBDRAIN OUTLET



SECTION A-A

GENERAL NOTES:

MACADAM STONE SHALL BE PLACED ALONG THE SIDE OF THE WING AND ABUTMENT FOOTING AS SHOWN IN SECTION A-A. THIS IS TYPICAL AT EACH CORNER OF THE BRIDGE UNLESS OTHERWISE NOTED IN THE PLANS. THE MACADAM STONE AT THESE LOCATIONS SHALL BE UNDERLAYED WITH ENGINEERING FABRIC IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS.

THE MACADAM STONE SHALL BE IN ACCORDANCE WITH SECTION 4122, OF THE STANDARD SPECIFICATIONS, COARSE MATERIAL (NO CHOKE STONE IS ALLOWED).

WOOD PRESERVATIVE TREATMENT FOR THE TIMBER EDGING SHALL MEET THE REQUIREMENTS FOR GUARDRAIL POSTS, SAWED FOUR SIDES, IN ACCORDANCE WITH SECTION 4161, OF THE STANDARD SPECIFICATIONS.

THE MACADAM STONE SHALL BE DEPOSITED, SPREAD, CONSOLIDATED AND SHAPED BY MECHANICAL OR HAND METHODS THAT WILL PROVIDE UNIFORM 6" DEPTH AND DENSITY AND PROVIDE UNIFORM SURFACE APPEARANCE.

PAYMENT FOR THE BRIDGE WING ARMORING SHALL BE INCIDENTAL TO THE BID ITEM MACADAM STONE SLOPE PROTECTION AND SHALL INCLUDE COSTS OF ALL MATERIAL AND LABOR TO CONSTRUCT THE WING ARMORING AS SHOWN ON THESE PLANS.

SUBDRAIN NOTES :

THIS PLAN SHEET SHOWS DETAILS FOR PLACING ALL SUBDRAINS AND SUBDRAIN OUTLETS REQUIRED FOR THIS STRUCTURE.

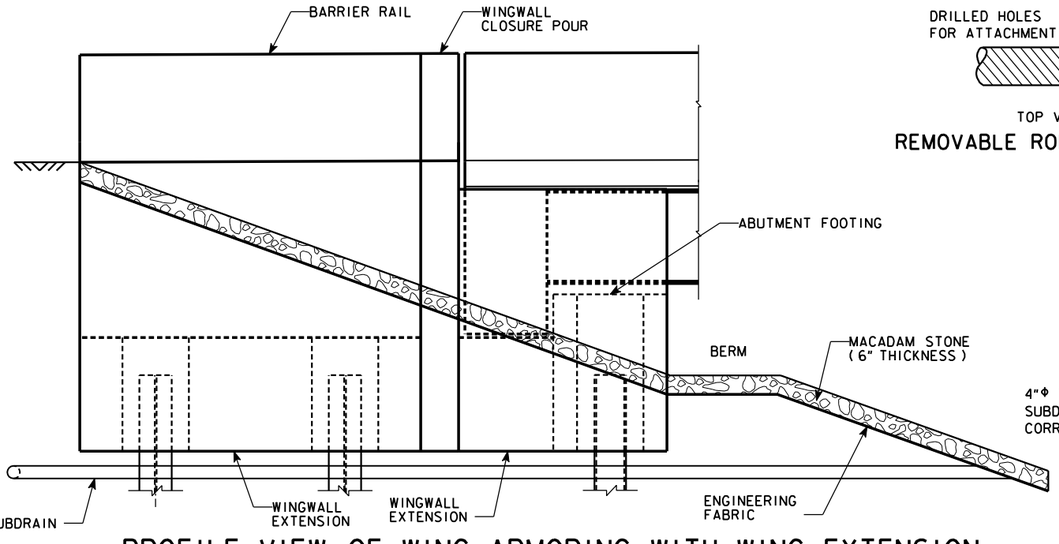
THE SUBDRAINS SHALL BE 4" IN DIAMETER AND SHALL BE IN ACCORDANCE WITH ARTICLE 4143.01, B, OF THE STANDARD SPECIFICATIONS. THE SUBDRAIN OUTLET SHALL CONSIST OF A 6'-0 LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD AS DETAILED ON THIS SHEET.

THE COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), GRANULAR BACKFILL, AND POROUS BACKFILL IS TO BE INCLUDED IN THE PRICE BID FOR ABUTMENT STEM.

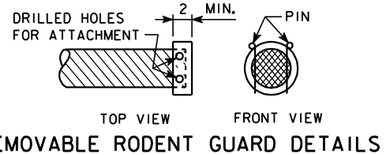
THE COST OF FURNISHING & PLACING SUBDRAIN OUTLETS AT BERM FORESLOPE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ABUTMENT STEM.

THE DIMENSIONS SHOWN FOR THE PROPOSED SUBDRAINS ARE BASED ON THE PROPOSED GRADING LAYOUT OF BRIDGE BERMS. THE DIMENSIONS SHOWN ARE FOR ESTIMATING ONLY. REQUIRED LENGTHS AND GENERAL LOCATIONS OF SUBDRAINS ARE SUBJECT TO CHANGE DUE TO FIELD ADJUSTMENTS OF THE GRADING LAYOUT.

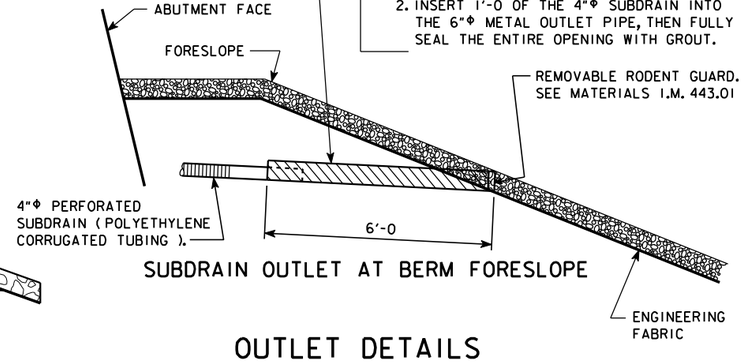
THE UPHILL END OF THE PERFORATED SUBDRAIN AT THE TOE OF SLOPE PROTECTION SHALL BE CAPPED AS APPROVED BY THE ENGINEER.



PROFILE VIEW OF WING ARMORING WITH WING EXTENSION



REMOVABLE RODENT GUARD DETAILS

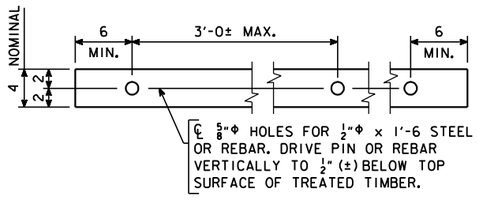


SUBDRAIN OUTLET AT BERM FORESLOPE

OUTLET DETAILS

NOTE:

1. FOR SUBDRAIN OUTLET ELEVATIONS AND SUBDRAIN LAYOUT, SEE DESIGN SHEET 11.



4" x 6" TREATED TIMBER EDGING DETAILS

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

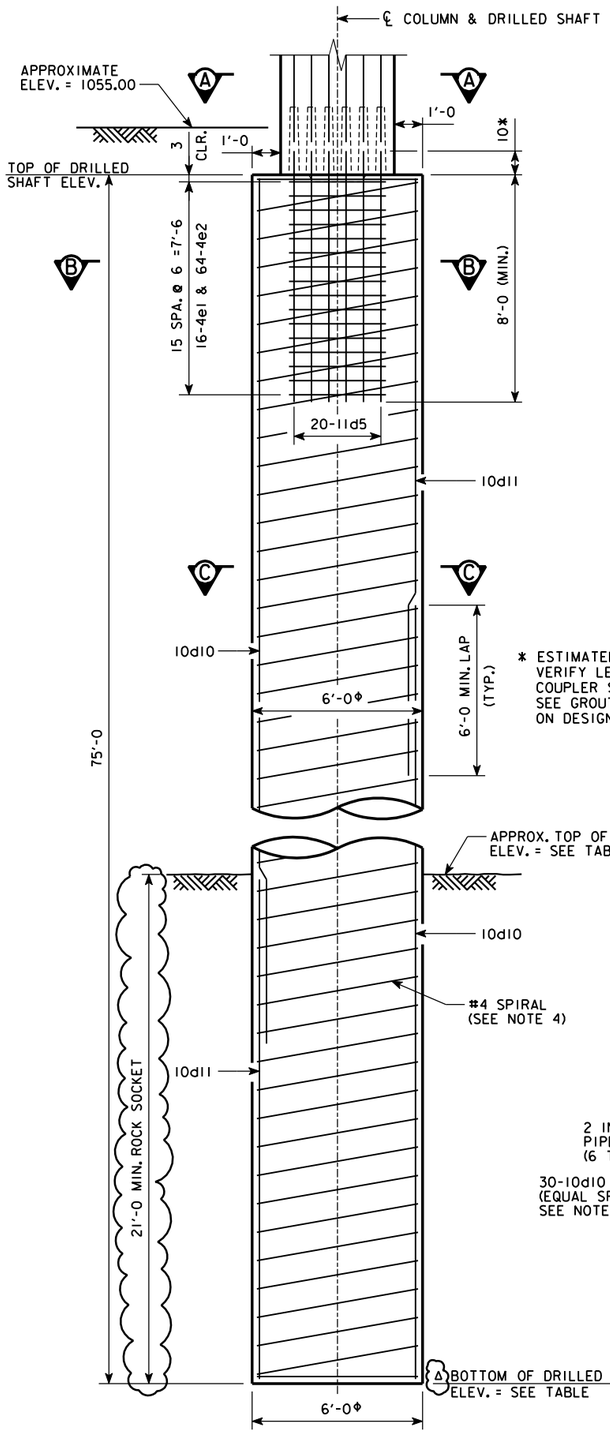
BRIDGE WING ARMORING

STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 17 OF 41 FILE NO. 30387 DESIGN NO. 111



DRILLED SHAFT ELEVATION

TABLE OF ELEVATIONS

LOCATION	TOP OF DRILLED SHAFT	BOT. DRILLED SHAFT	APPROX. TOP OF BEDROCK
PIER 1	1053.91	978.91	1000.00
PIER 2	1053.93	978.93	1000.00

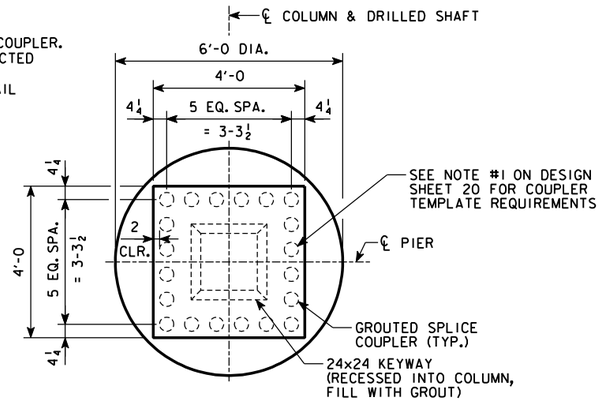
TOTAL REQUIRED DESIGN BEARING

LOCATION	TONS
PIER 1	395
PIER 2	395

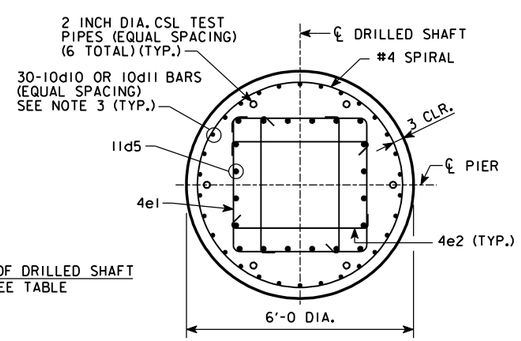
ⓘ EPOXY COATED BARS

NOTE:
1. CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 3500 PSI AT 28 DAYS.
2. CONTRACTOR SHALL FOLLOW THE IDOT "STANDARD SPECIFICATIONS, SERIES 2009" SECTION 2433 FOR DRILLED SHAFT CONSTRUCTION.
3. ALTERNATE LONG AND SHORT VERTICAL BARS AT TOP OF DRILLED SHAFT SECTION TO STAGGER LAP LOCATIONS.
4. SPIRAL REINFORCING IS TO BE #4 BAR WITH 66 INCH DIA., 12 INCH PITCH WITH 4 EQUALLY SPACED L1x1x$\frac{1}{8}$ SPACERS PUNCHED TO HOLD SPIRALS. SPIRALS ARE TO HAVE 1$\frac{1}{2}$ EXTRA TURNS AT TOP AND BOTTOM. THE SPIRAL REINFORCING MAY BE SPLICED BY LAPPING 1'-6. THE LENGTH OF SPIRAL SHOWN DOES NOT INCLUDE THE LAPPED LENGTH OF THE SPLICES. THE COST OF THE LAPS AT SPLICES IS TO BE INCLUDED IN THE PRICE BID FOR CONCRETE DRILLED SHAFT, 72 INCH DIA. COLUMN TIES SPACED AT 12" CENTERS MAY BE SUBSTITUTED FOR THE SPIRAL REINFORCEMENT. PAYMENT WILL BE BASED ON THE WEIGHT OF SPIRAL REINFORCEMENT. NO ADJUSTMENTS IN REINFORCING STEEL PAY WEIGHT WILL BE ALLOWED. SEE BENT BAR DETAILS FOR SPLICE LAP LENGTH.
5. ENSURE DRILLED SHAFT IS WITHIN 1" OF PLAN POSITION AT THE TOP OF SHAFT.
6. GROUTED SPLICE COUPLER INCLUDED IN PRICE BID FOR PIER COLUMN.
7. COST OF STRUCTURAL STEEL INCLUDED IN PRICE BID FOR CONCRETE DRILLED SHAFT, 72 INCH DIA.
8. GROOVING OF SHALE AND LIMESTONE REQUIRED PER GEOTECHNICAL RECOMMENDATIONS.

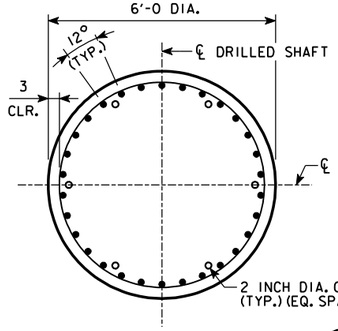
* ESTIMATED LENGTH FOR BAR INTO COUPLER. VERIFY LENGTH REQUIRED FOR SELECTED COUPLER SYSTEM. SEE GROUTED SPLICE COUPLER DETAIL ON DESIGN SHEET 20.



SECTION A-A
PRECAST COLUMN



SECTION B-B



SECTION C-C

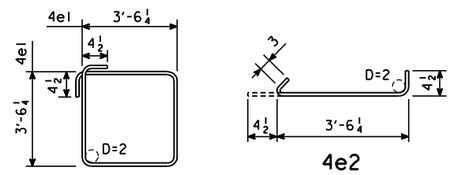
REINFORCING BAR LIST - DRILLED SHAFT

		PIER 1				PIER 2			
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	SHAPE	NO.	LENGTH	WEIGHT
10d10	DRILLED SHAFT, VERTICAL	—	60	50'-0	12,909	—	60	50'-0	12,909
10d11	DRILLED SHAFT, VERTICAL	—	60	30'-8	7918	—	60	30'-8	7918
ⓘ 11d5	DRILLED SHAFT, VERTICAL DOWELS	—	40	8'-10*	1877	—	40	8'-10*	1877
4e1	COLUMN TIE		32	14'-10	317		32	14'-10	317
4e2	COLUMN TIE		128	4'-4	371		128	4'-4	371
#4	DRILLED SHAFT SPIRAL		2	1334'-0	1782		2	1334'-0	1782
	REINFORCING STEEL PIER 1 TOTAL (LBS.)				23,297				
	REINFORCING STEEL - EPOXY COATED - PIER 1 TOTAL (LBS.)				1877				
	REINFORCING STEEL PIER 2 TOTAL (LBS.)				23,297				
	REINFORCING STEEL - EPOXY COATED - PIER 2 TOTAL (LBS.)				1877				

STRUCTURAL STEEL

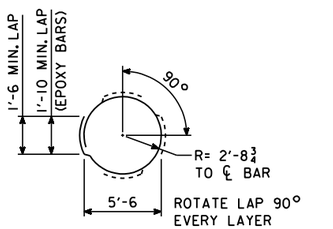
		PIER 1				PIER 2			
SIZE	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	SHAPE	NO.	LENGTH	WEIGHT
L1x1x$\frac{1}{8}$	DRILLED SHAFT CAGE		8	74'-6	477		8	74'-6	477

BENT BAR DETAILS - DRILLED SHAFT



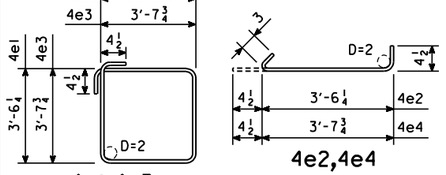
4e1

4e2



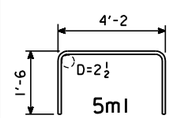
ALTERNATE SHAFT #4 TIE DETAIL

BENT BAR DETAILS - PIER

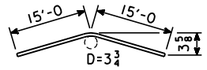


4e1,4e3

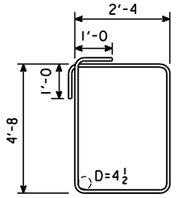
4e2,4e4



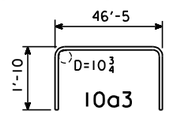
5m1



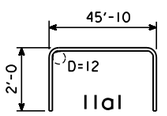
5a1



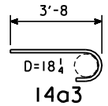
6c1



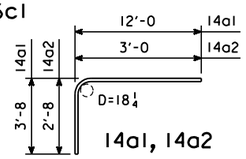
10a3



11a1



14a3



14a1, 14a2

NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIA

Δ BOTTOM OF SHAFT ELEVATIONS, SHAFT LENGTH, AND QUANTITIES ARE BASED ON 21'-0 EMBEDMENT BELOW ROCK ELEVATIONS FROM THE BORING LOGS. FINAL BOTTOM OF SHAFT ELEVATIONS, SHAFT LENGTH, AND QUANTITIES ARE DEPENDENT ON ACTUAL ROCK ELEVATIONS IN THE FIELD.

REVISED 6-16-2011: ADDED ROCKSOCKET DIMENSION AND NOTE

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

FOUNDATION DETAILS

STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

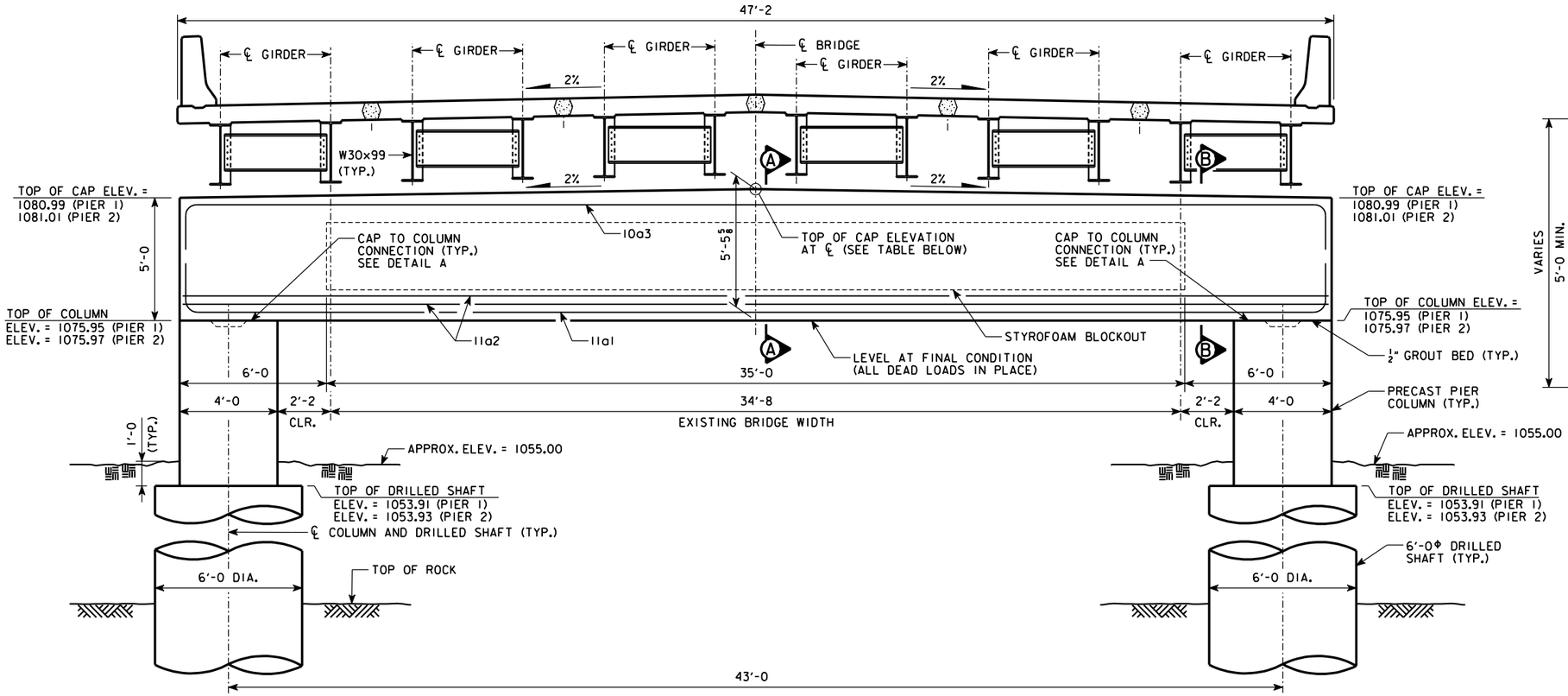
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 18 OF 41 — FILE NO. 30387 — DESIGN NO. 111

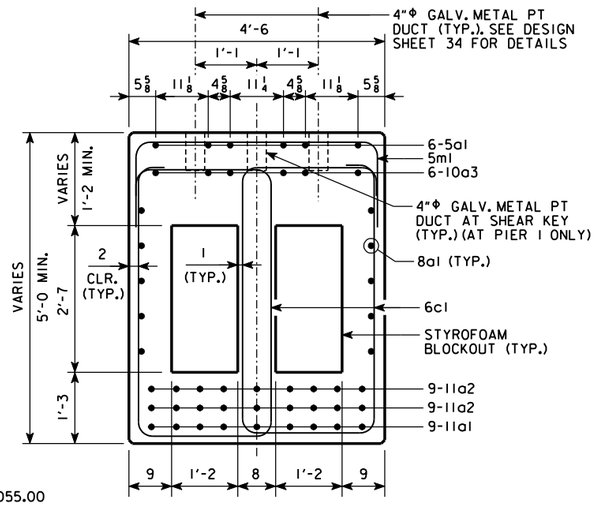
REVISED: JUNE 16, 2011

DGN$SYTIME0123456 DGN$USERNAME DGN$SPEC

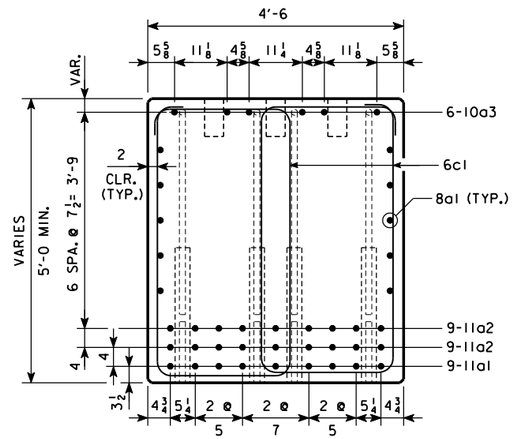
BENCH MARK NO. 501 - STA. 19+90.20, 15.33' RT., D.O.T. PLUG S.W CORNER BRIDGE WING - ELEV.=1087.55



PIER ELEVATION

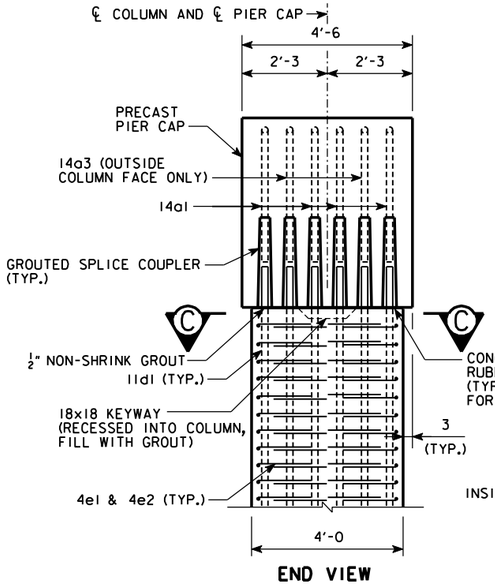


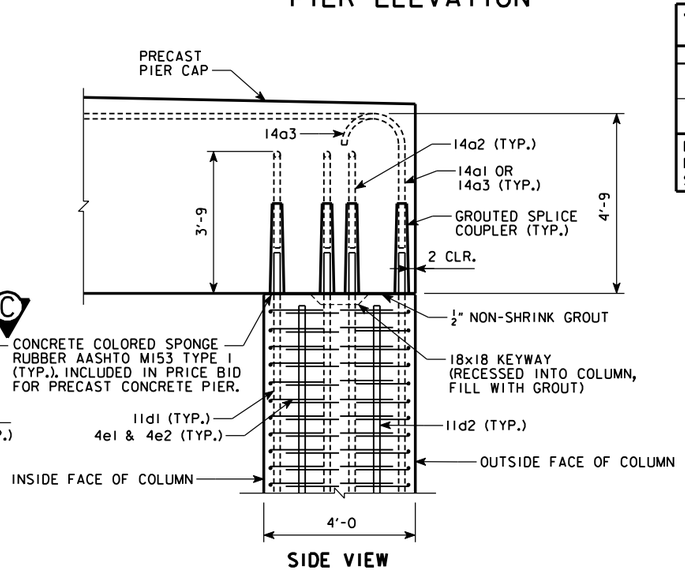
SECTION A-A PRECAST PIER CAP



SECTION B-B PRECAST PIER CAP

℄ COLUMN AND ℄ PIER CAP

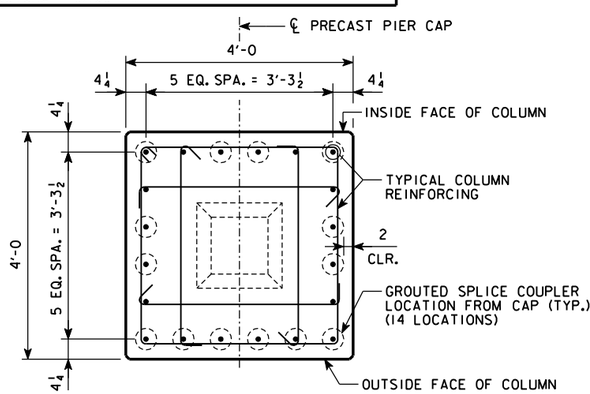




DETAIL A CAP TO COLUMN CONNECTION

TOP OF CAP ELEVATIONS AT ℄		
LOCATION	STAGE	ELEVATION
PIER 1	AT ERECTION	1081.47
	FINAL	1081.46
PIER 2	AT ERECTION	1081.49
	FINAL	1081.48

ELEVATIONS ARE BASED ON THE FOLLOWING DEFLECTIONS:
PIER CAP SELF WEIGHT = 0.055 in.
SUPERSTRUCTURE = 0.156 in.



SECTION C-C PRECAST COLUMN

NOTE:
SEE DESIGN SHEET 21 FOR ADDITIONAL PIER CAP DETAILS.

PRECAST CONCRETE PIER SHALL CONFORM TO SPECIAL PROVISIONS FOR PRECAST CONCRETE SUBSTRUCTURE ELEMENTS.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

REINFORCED PIER ELEV. & DETAILS

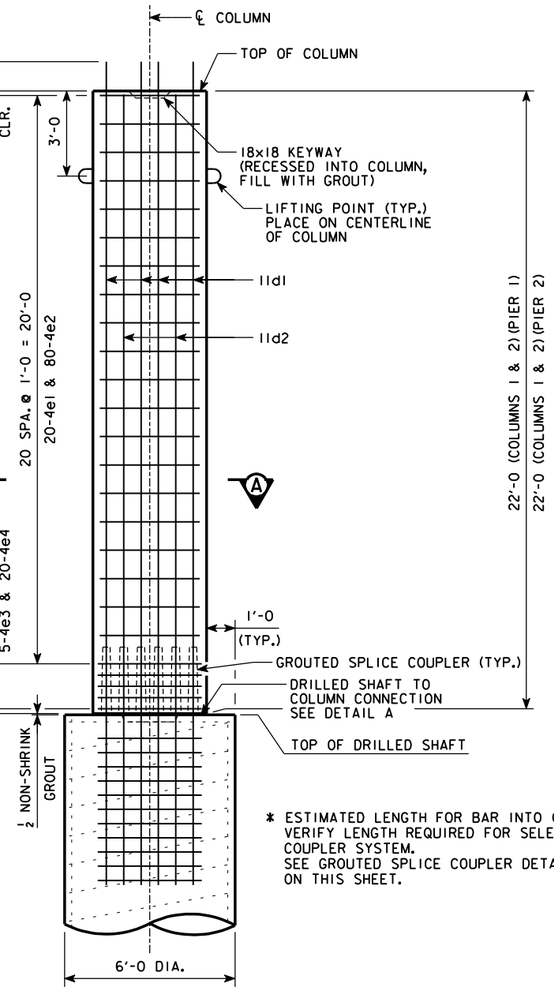
STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

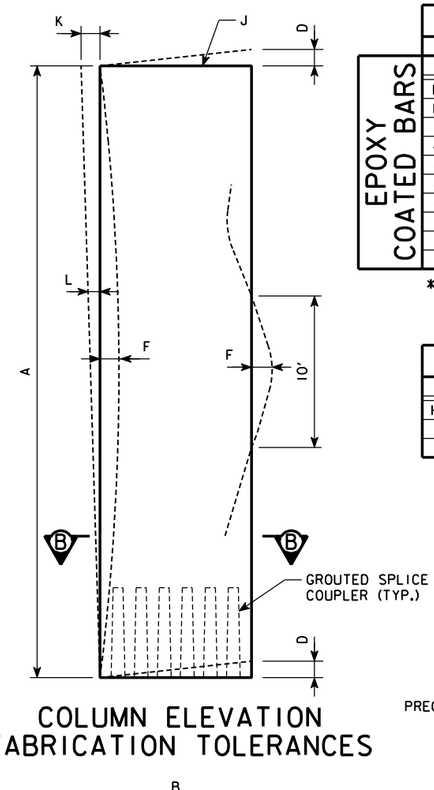
DESIGN SHEET NO. 19 OF 41 FILE NO. 30387 DESIGN NO. 111

DGN$SYTIME0123456 DGN$USERNAME DGN$SPEC

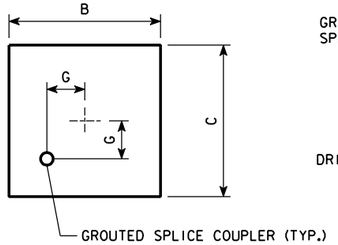


COLUMN ELEVATION
(INSIDE FACE OF COLUMN SHOWN)

* ESTIMATED LENGTH FOR BAR INTO COUPLER. VERIFY LENGTH REQUIRED FOR SELECTED COUPLER SYSTEM. SEE GROUTED SPLICE COUPLER DETAIL ON THIS SHEET.



COLUMN ELEVATION
FABRICATION TOLERANCES



SECTION B-B

REINFORCING BAR LIST - COLUMN

			PIER 1				PIER 2			
	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	SHAPE	NO.	LENGTH	WEIGHT
EPOXY COATED BARS	11d1	COLUMN VERTICAL	—	28	22'-2*	3298	—	28	22'-2*	3298
	11d2	COLUMN VERTICAL	—	12	20'-11*	1334	—	12	20'-11*	1334
	4e1	COLUMN TIE	⌐¬	40	14'-10	396	⌐¬	40	14'-10	396
	4e2	COLUMN TIE	⌐¬	160	4'-4	463	⌐¬	160	4'-4	463
	4e3	COLUMN TIE	⌐¬	10	15'-4	102	⌐¬	10	15'-4	102
	4e4	COLUMN TIE	⌐¬	40	4'-5	118	⌐¬	40	4'-5	118
		REINFORCING STEEL - EPOXY COATED - PIER 1 TOTAL (LBS.)				5711				
		REINFORCING STEEL - EPOXY COATED - PIER 2 TOTAL (LBS.)								5711

* BASED ON ESTIMATED LENGTH OF COUPLER.
VERIFY LENGTH REQUIRED FOR SELECTED COUPLER SYSTEM.

CONC. PLACEMENT QUANT. PER COLUMN

LOCATION	QUANTITY
HIGH PERFORMANCE STRUCTURAL CONCRETE, COLUMN	13.0
TOTAL (CU. YDS.)	13.0

COLUMN FABRICATION TOLERANCES

A	LENGTH	+/- 1/2"
B	WIDTH (OVERALL)	+/- 1/4"
C	DEPTH (OVERALL)	+/- 1/4"
D	VARIATION FROM SPECIFIED END SQUARENESS OR SKEW	+/- 1/8" PER 12 WIDTH +/- 3/8" MAXIMUM
F	SWEEP, FOR MEMBER LENGTH:	+/- 1/8" PER 10 FEET +/- 1/2" MAXIMUM
G	LOCATION OF GROUTED SPLICE COUPLER MEASURED FROM A COMMON REFERENCE POINT	+/- 1/4"
H	LOCAL SMOOTHNESS OF ANY SURFACE	+/- 1/4" IN 10 FEET

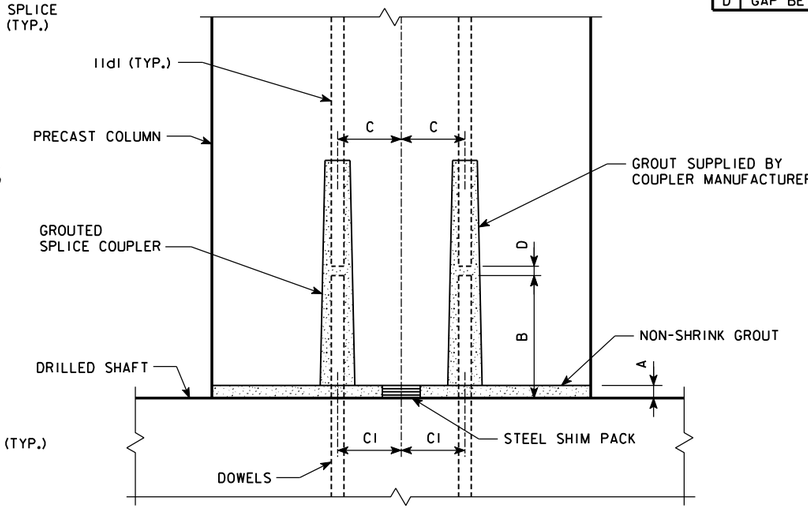
COLUMN ERECTION TOLERANCES

J	TOP ELEVATION FROM NOMINAL TOP ELEVATION MAXIMUM LOW MAXIMUM HIGH	 1/2" 1/4"
K	MAXIMUM PLUMB VARIATION OVER HEIGHT OF COLUMN	1/2"
L	PLUMB IN ANY 10 FEET OF COLUMN HEIGHT	1/4"

GROUTED SPLICE COUPLER TOLERANCES

A	SHIM PACK HEIGHT	3/4 +/- 3/8
B	DOWEL HEIGHT	CONSULT MANUFACTURER
C C1	LOCATION OF COLUMN REINFORCING, GROUTED SPLICE COUPLER, AND DRILLED SHAFT DOWELS MEASURED FROM A COMMON REFERENCE POINT	+/- 1/4
D	GAP BETWEEN DOWELS AND COLUMN REINFORCING	CONSULT MANUFACTURER

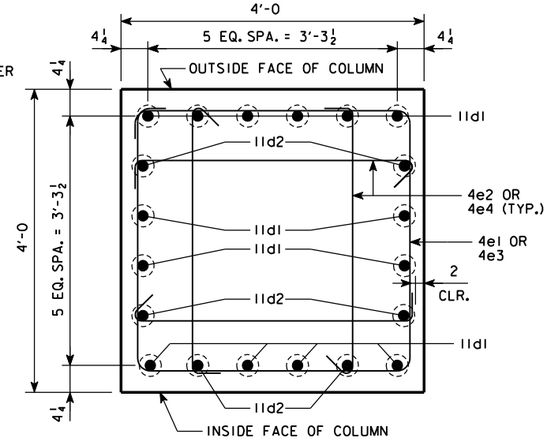
DETAIL A
DRILLED SHAFT TO COLUMN CONNECTION



GROUTED SPLICE COUPLER DETAILS

NOTE:
1. USE MATCHING TEMPLATES FOR THE LOCATION OF COLUMN REINFORCEMENT AND GROUTED SPLICE COUPLER PLACEMENT WITHIN THE ELEMENT TO CONTROL CRITICAL DIMENSIONS "C" AND "C1", WHICH WOULD BE IDENTICAL.
2. CONSULT MANUFACTURER OF THE GROUTED SPLICE COUPLER FOR PROPER DIMENSIONS "B" AND "D" AND FOR TOLERANCE ON THESE DIMENSIONS.
3. BEFORE EXECUTING GROUTED SPLICE COUPLER ASSEMBLIES, ALWAYS SEEK INSTALLATION RECOMMENDATIONS FROM THE MANUFACTURER OF THE GROUTED SPLICE COUPLER USED.

NOTE:
SEE BENT BAR DETAILS ON DESIGN SHEET 18.



SECTION A-A
PRECAST COLUMN

NOTE:
REINFORCEMENT SHOWN AS ⊙ ARE CONNECTED TO DRILLED SHAFT.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

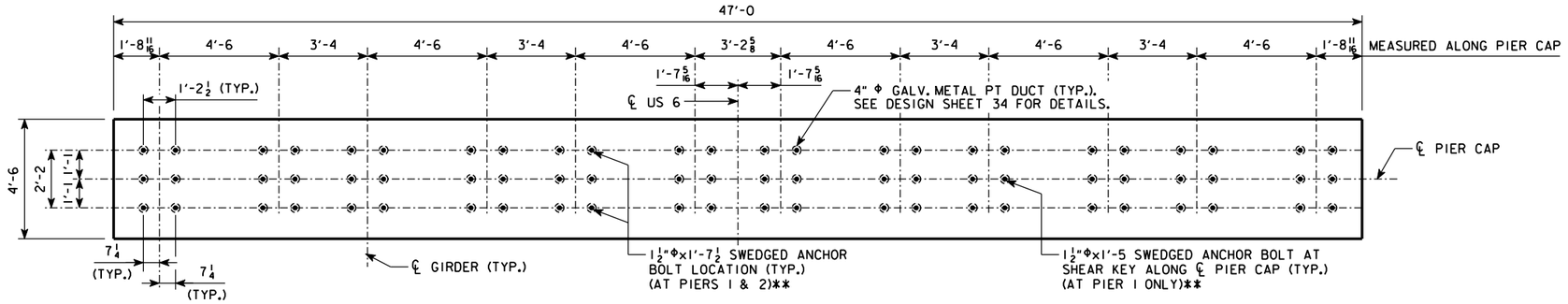
COLUMN DETAILS

STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

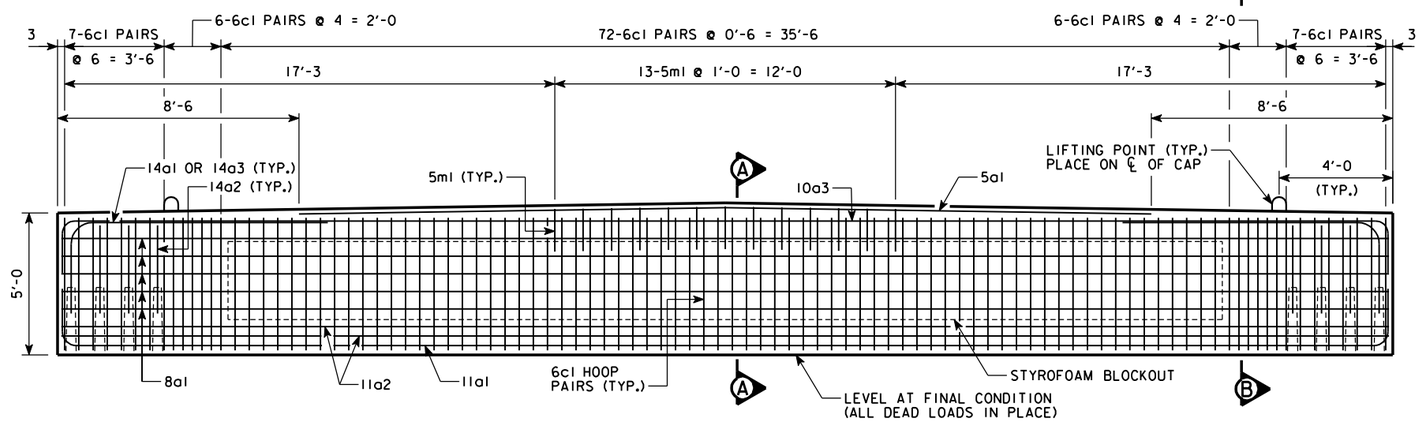
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 20 OF 41 FILE NO. 30387 DESIGN NO. 111

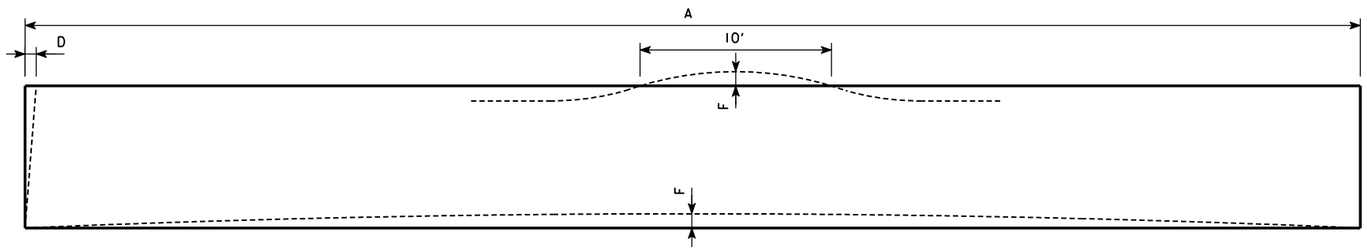


PIER CAP PLAN

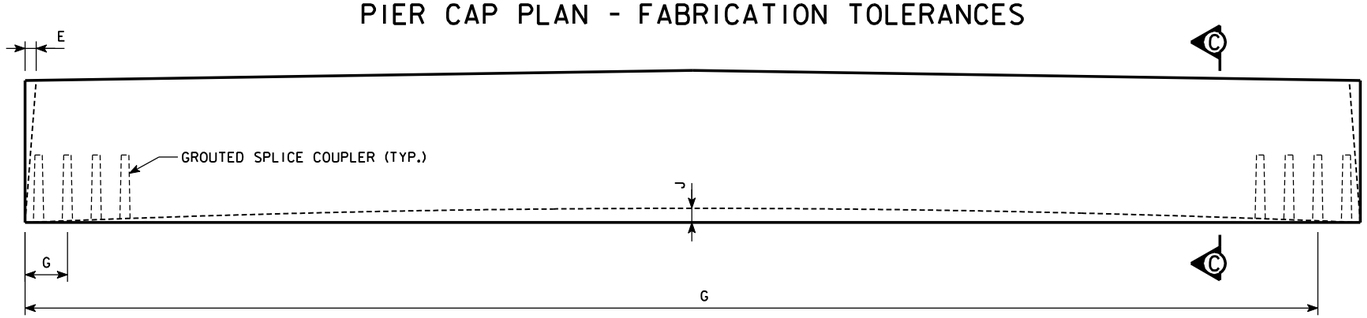
** ANCHOR BOLTS TO BE INSTALLED IN THE FIELD.



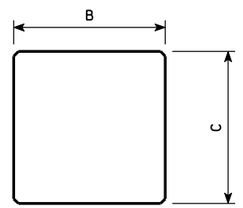
PIER CAP ELEVATION



PIER CAP PLAN - FABRICATION TOLERANCES



PIER CAP ELEVATION - FABRICATION TOLERANCES



SECTION C-C

PIER CAP FABRICATION TOLERANCES

A	LENGTH	+/- 3/4"
B	WIDTH (OVERALL)	+/- 1/4"
C	DEPTH (OVERALL)	+/- 1/4"
D	VARIATION FROM SPECIFIED PLAN END SQUARENESS OR SKEW	+/- 1/8" PER 12 WIDTH +/- 1/2" MAXIMUM
E	VARIATION FROM SPECIFIED ELEVATION END SQUARENESS OR SKEW	+/- 1/8" PER 12 WIDTH +/- 1/2" MAXIMUM
F	SWEEP, FOR MEMBER LENGTH: UP TO 40 FEET 40 FEET TO 60 FEET	 +/- 1/4" +/- 1/2"
G	LOCATION OF GROUTED SPLICE COUPLER MEASURED FROM A COMMON REFERENCE POINT	+/- 1/4"
H	LOCAL SMOOTHNESS OF ANY SURFACE	+/- 1/4" IN 10 FEET
J	VARIATION FROM SPECIFIED CAMBER	+/- 1/8" PER 10 FEET +/- 1/4" MAXIMUM

REINFORCING BAR LIST - PIER CAP

			PIER 1				PIER 2		
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	SHAPE	NO.	LENGTH	WEIGHT
EPOXY COATED BARS									
14a1	CAP TOP BEND BAR	⌐	8	15'-8*	959	⌐	8	15'-8*	959
14a2	CAP TOP BEND BAR	⌐	16	5'-8*	694	⌐	16	5'-8*	694
14a3	CAP TOP BEND BAR	⊂	4	5'-11*	181	⊂	4	5'-11*	181
11a1	CAP BOTTOM	⌐	9	49'-10	2383	⌐	9	49'-10	2383
11a2	CAP BOTTOM	—	18	45'-3	4327	—	18	45'-3	4327
10a3	CAP TOP	⌐	6	50'-1	1293	⌐	6	50'-1	1293
8a1	CAP SIDE	—	10	46'-8	1246	—	10	46'-8	1246
5a1	CAP TOP	⌒	6	30'-0	188	⌒	6	30'-0	188
6c1	CAP HOOPS	□	196	16'-0	4710	□	196	16'-0	4710
5m1	CAP TRANSVERSE	⌐	13	7'-2	97	⌐	13	7'-2	97
	REINFORCING STEEL - EPOXY COATED - PIER 1 TOTAL (LBS.)				16,078				
	REINFORCING STEEL - EPOXY COATED - PIER 2 TOTAL (LBS.)				16,078				

* BASED ON ESTIMATED LENGTH OF COUPLER.
VERIFY LENGTH REQUIRED FOR SELECTED COUPLER SYSTEM.

CONC. PLACEMENT QUANT. PER CAP

LOCATION	QUANTITY
HIGH PERFORMANCE STRUCTURAL CONCRETE, CAP	33.2
TOTAL (CU. YDS.)	33.2

NOTE:
SEE DESIGN SHEET 19 FOR SECTIONS A-A & B-B.

SEE DEIGN SHEET 18 FOR BENT BAR DETAILS FOR PIER CAP.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS 70'-0 INTERIOR SPAN

PIER CAP DETAILS

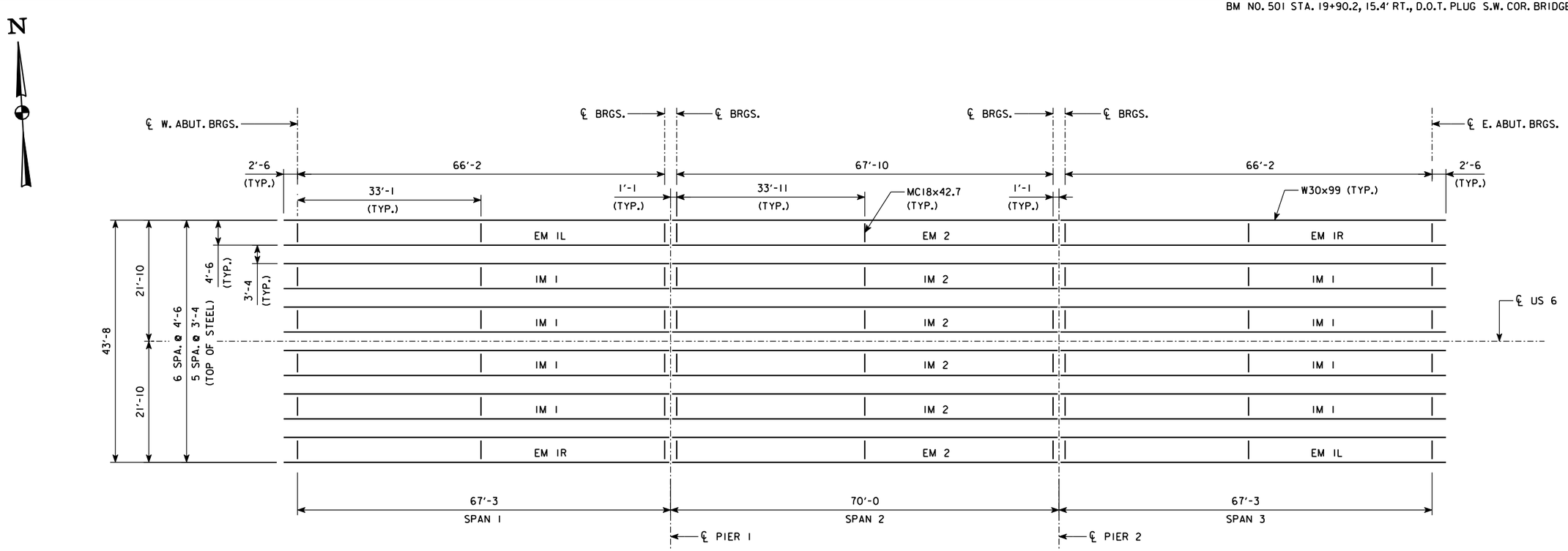
STA. 20+85.00 FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 21 OF 41 FILE NO. 30387 DESIGN NO. 111

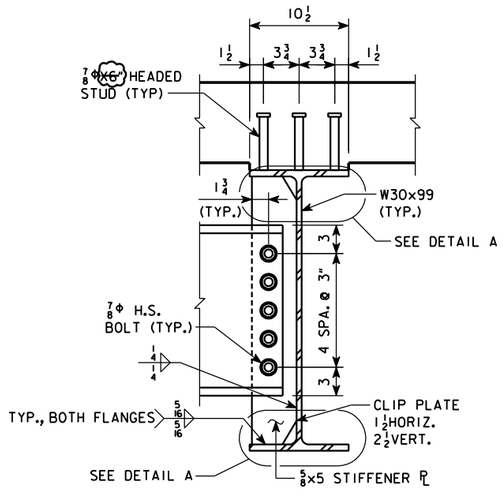
BM NO. 501 STA. 19+90.2, 15.4' RT., D.O.T. PLUG S.W. COR. BRIDGE WING, ELEV. = 1087.55



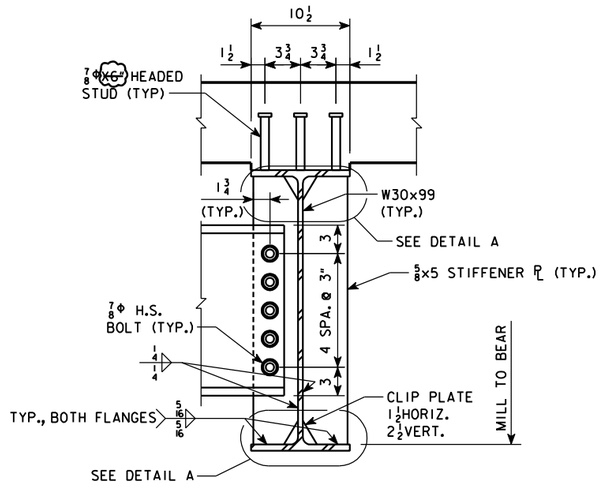
FRAMING PLAN

NOTES:

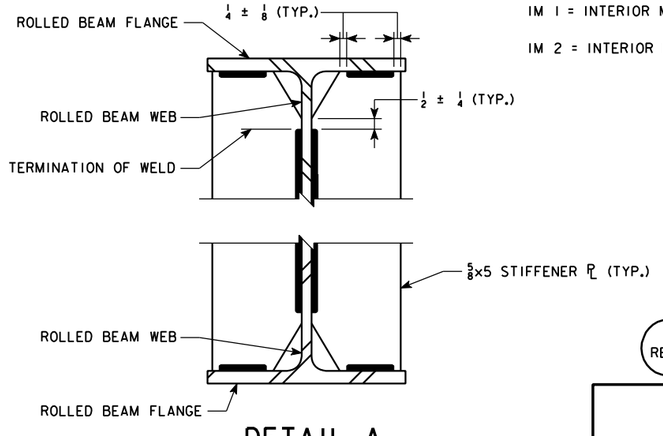
1. EM IL = EXTERIOR MODULE 1 LEFT. FOR DETAILS SEE DESIGN SHEET 29.
   EM IR = EXTERIOR MODULE 1 RIGHT. FOR DETAILS SEE DESIGN SHEET 29.
   EM 2 = EXTERIOR MODULE 2. FOR DETAILS SEE DESIGN SHEET 32.
   IM 1 = INTERIOR MODULE 1. FOR DETAILS SEE DESIGN SHEET 24.
   IM 2 = INTERIOR MODULE 2. FOR DETAILS SEE DESIGN SHEET 27.



TYPICAL INTERMEDIATE DIAPHRAGM CONNECTION AT MIDSPAN



TYPICAL DIAPHRAGM CONNECTION AT ABUTMENT AND PIER BEARINGS



DETAIL A
CONNECTION PLATE WELD TERMINATION DETAIL (ABUTMENT, PIER, AND INTERMEDIATE DIAPHRAGM)

REVISED 6-16-2011: SHEAR STUD CALLOUT REVISED

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

FRAMING PLAN

STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

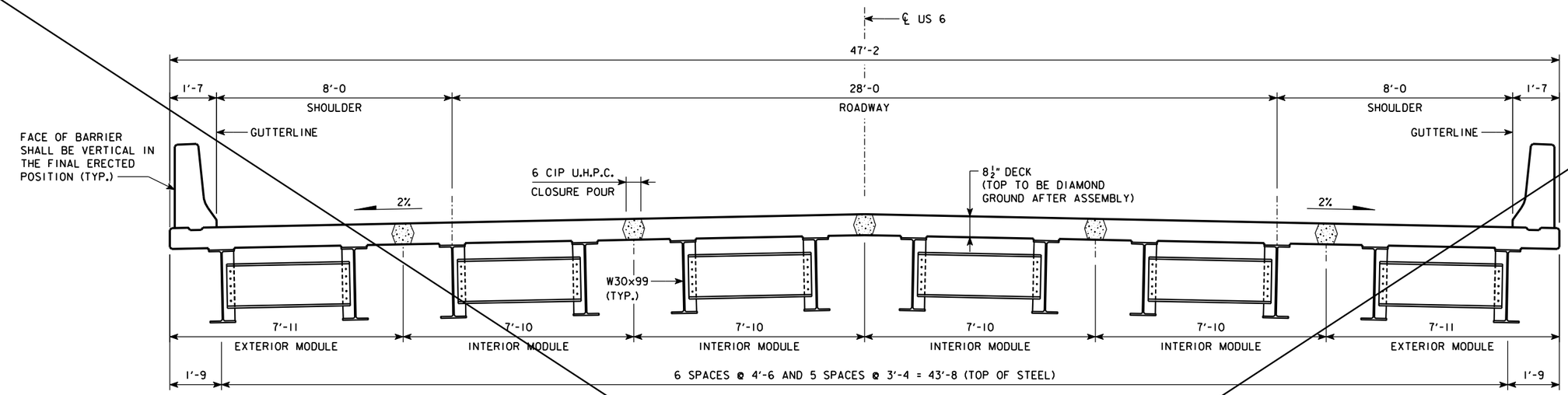
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 22 OF 41 FILE NO. 30387 DESIGN NO. 111

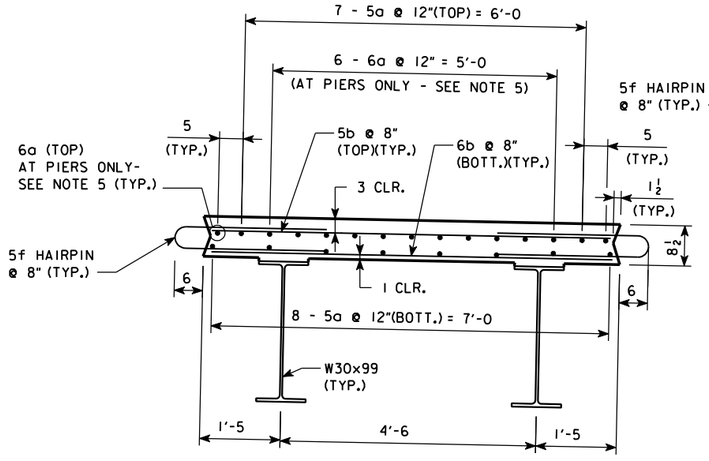
REVISED: JUNE 16, 2011

DESIGN TEAM HNTB	POTTAWATTAMIE COUNTY	PROJECT NUMBER BRF-006-1(114)-38-78	SHEET NUMBER 23

DGN$SYTIME0123456 DGN$USERNAME DGN$SPEC

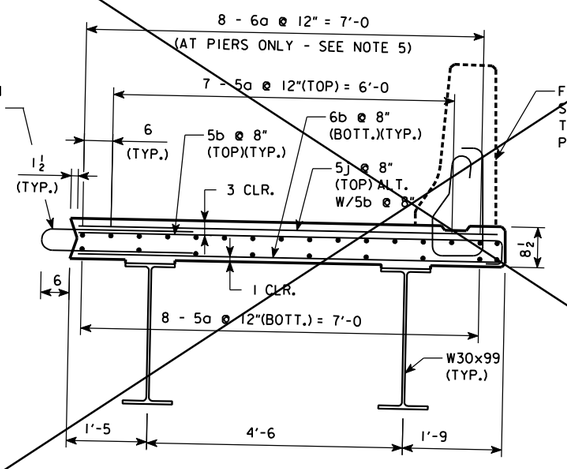


BRIDGE DECK CROSS SECTION



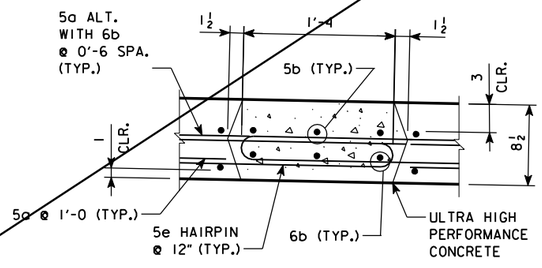
INTERIOR MODULE REINFORCING DETAIL

(SHEAR STUDS OMITTED FOR CLARITY)

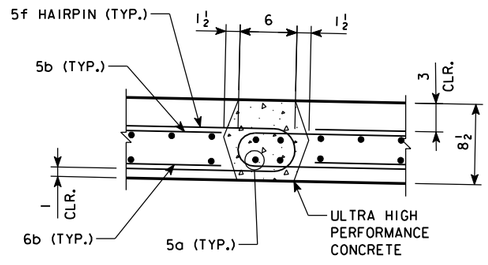


EXTERIOR MODULE REINFORCING DETAIL

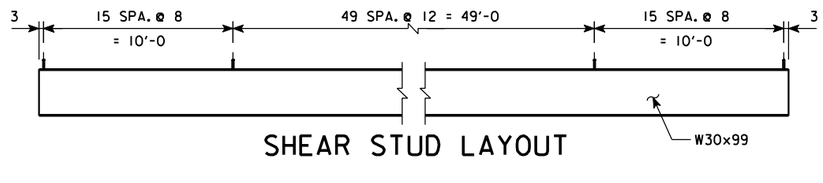
(SHEAR STUDS OMITTED FOR CLARITY)



TRANSVERSE CLOSURE POUR DETAIL



LONGITUDINAL CLOSURE POUR DETAIL



SHEAR STUD LAYOUT

NOTE:

1. UPON COMPLETION OF DECK CLOSURE POURS, TOP OF DECK SHALL BE DIAMOND GROUND TO MAXIMUM DEPTH OF ½" AND GROOVED.
2. STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 50W.
3. USE CONTINUOUS TOP AND BOTTOM FORMS FOR UHPC JOINTS.
4. FOR BARRIER DETAILS, SEE DESIGN SHEET 41.
5. ADDITIONAL #6(E) LONGITUDINAL TOP BARS SHALL BE USED WITHIN 6 FT. OF EACH PIER CENTERLINE. SEE MODULE REINFORCING SHEETS FOR DETAILS.
6. HAIRPIN BARS IN CLOSURE POURS SHALL BE IN OFFSETTING LOCATIONS.
7. SEE CAMBER AND HAUNCH NOTE 4 ON DESIGN SHEET 24.
8. INTERIOR MODULES, EXTERIOR MODULES, AND THEIR ASSEMBLY INTO A FULL SUPERSTRUCTURE SPAN SHALL CONFORM TO INTERIOR/EXTERIOR MODULES SPECIAL PROVISIONS.

REVISED 6-16-2011: THIS SHEET VOIDED

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

TYPICAL SECTION DETAILS

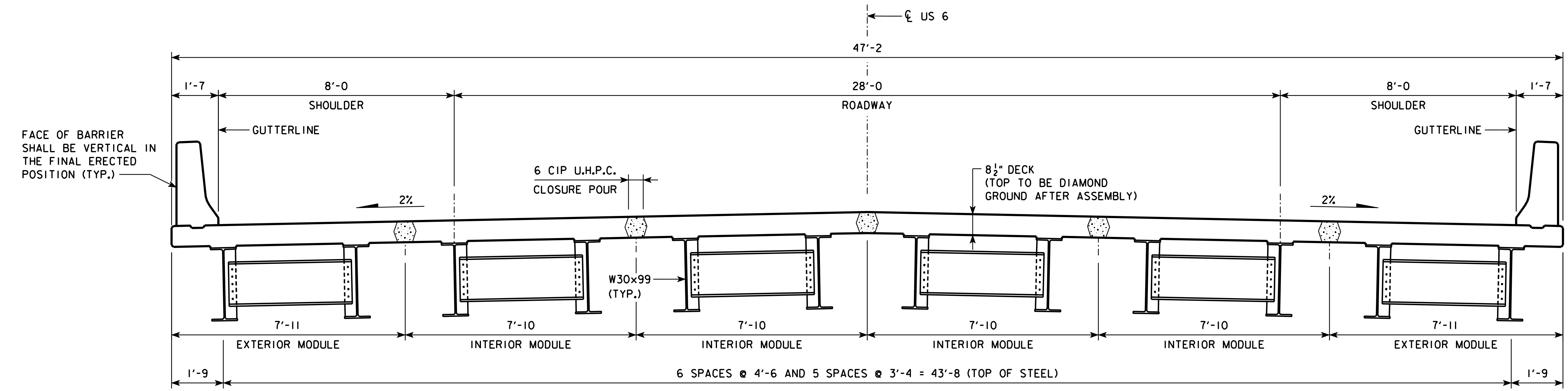
STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

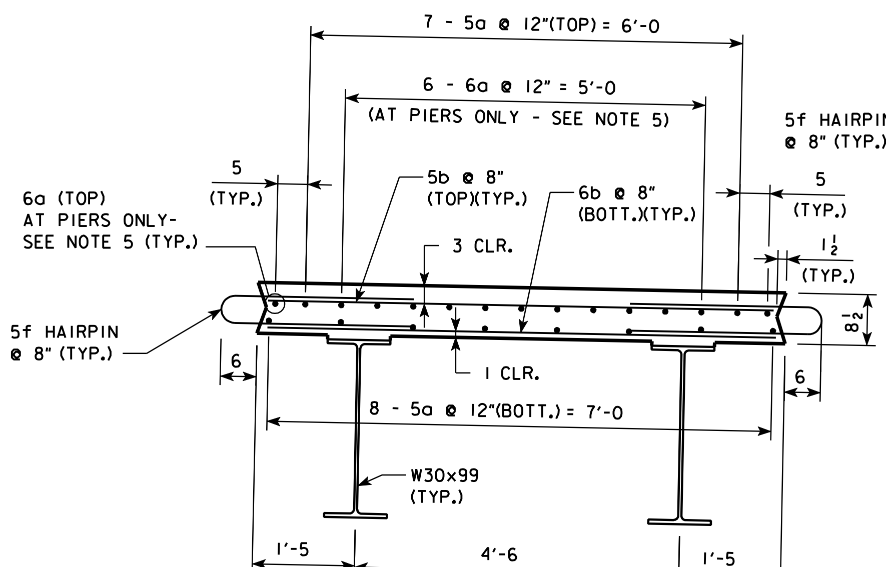
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 23 OF 41 FILE NO. 30387 DESIGN NO. 111

REVISED: JUNE 16, 2011

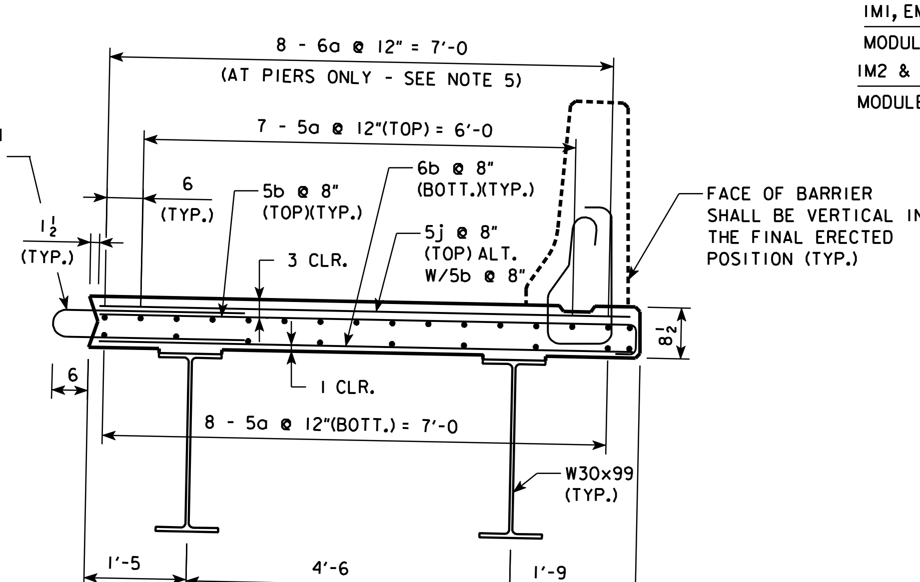


BRIDGE DECK CROSS SECTION



INTERIOR MODULE REINFORCING DETAIL

(SHEAR STUDS OMITTED FOR CLARITY)



EXTERIOR MODULE REINFORCING DETAIL

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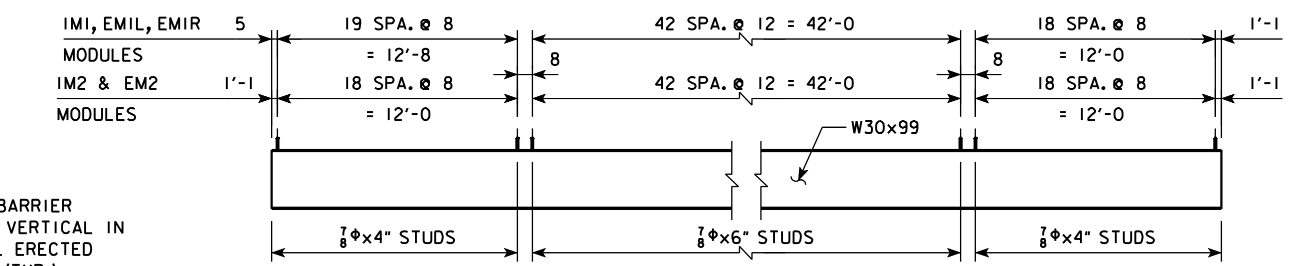
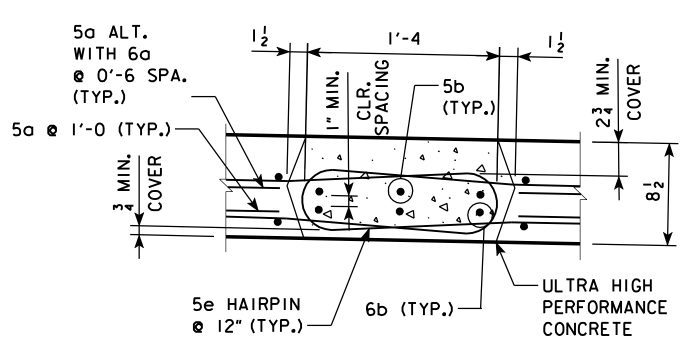


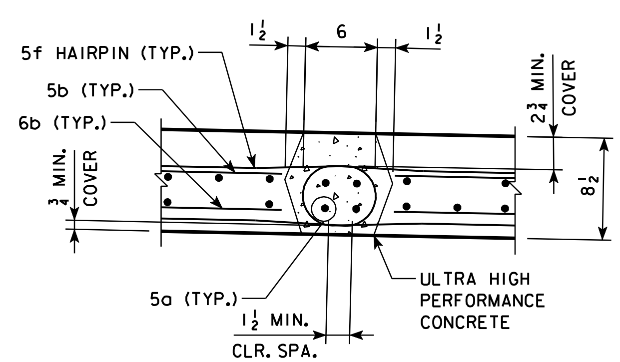
SHEAR STUD LAYOUT

NOTE:

1. UPON COMPLETION OF DECK CLOSURE POURS, TOP OF DECK SHALL BE DIAMOND GROUND TO MAXIMUM DEPTH OF ¼" AND GROOVED.
2. STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 50W.
3. USE CONTINUOUS TOP AND BOTTOM FORMS FOR UHPC JOINTS.
4. FOR BARRIER DETAILS, SEE DESIGN SHEET 41.
5. ADDITIONAL #6(E) LONGITUDINAL TOP BARS SHALL BE USED WITHIN 6 FT. OF EACH PIER CENTERLINE. SEE MODULE REINFORCING SHEETS FOR DETAILS.
6. HAIRPIN BARS IN CLOSURE POURS SHALL BE IN OFFSETTING LOCATIONS.
7. SEE CAMBER AND HAUNCH NOTE 4 ON ALL SUPERSTRUCTURE SHEETS.
8. INTERIOR MODULES, EXTERIOR MODULES, AND THEIR ASSEMBLY INTO A FULL SUPERSTRUCTURE SPAN SHALL CONFORM TO INTERIOR/EXTERIOR MODULES SPECIAL PROVISIONS.



TRANSVERSE CLOSURE POUR DETAIL



LONGITUDINAL CLOSURE POUR DETAIL

REVISED 6-16-2011: CHANGED CLOSURE POUR DETAILS, SHEAR STUD LAYOUT, AND NOTE 7

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS 70'-0 INTERIOR SPAN

TYPICAL SECTION DETAILS

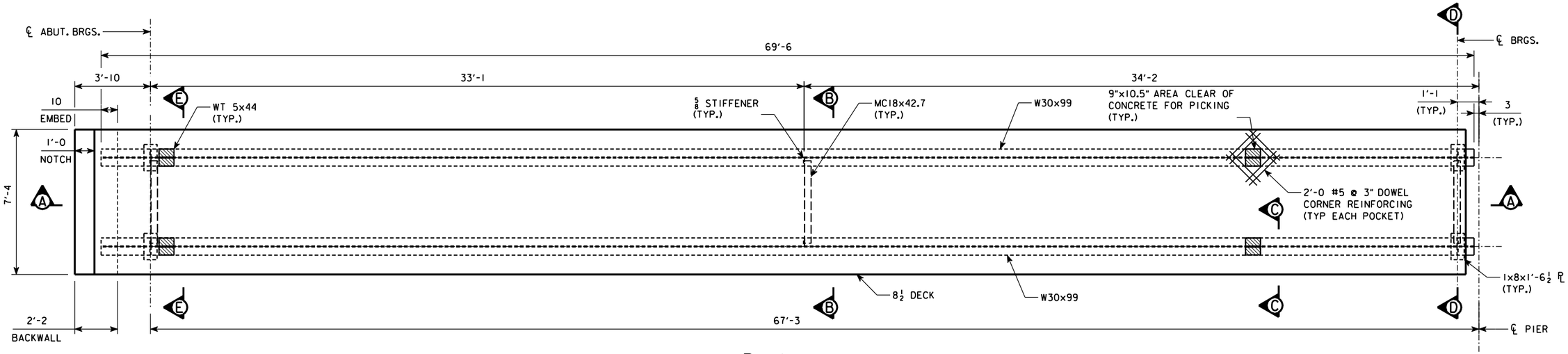
STA. 20+85.00 FEBRUARY, 2011

POTTAWATTAMIE COUNTY

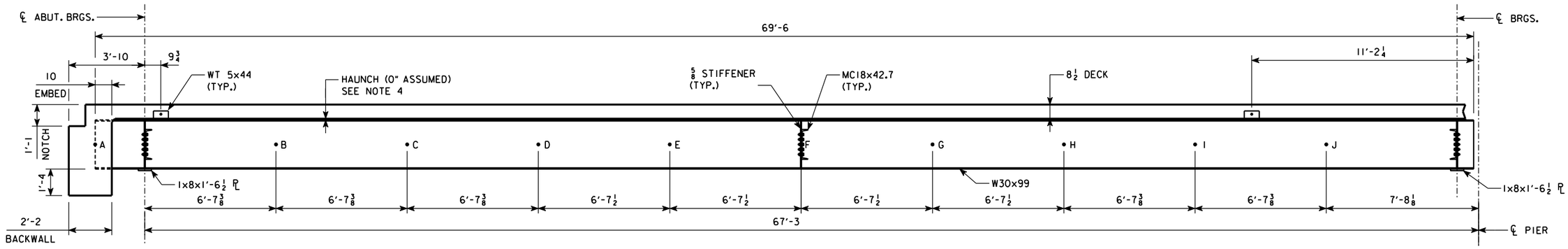
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 23A OF 41 FILE NO. 30387 DESIGN NO. 111

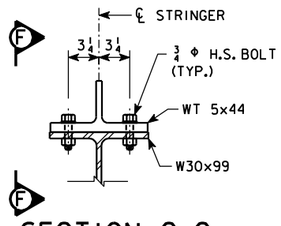
REVISED: JUNE 16, 2011



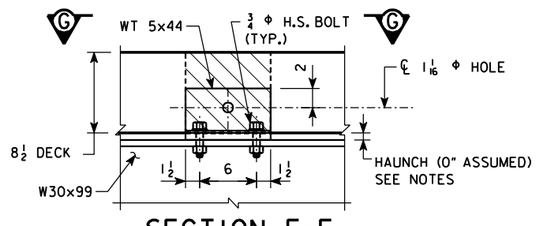
PLAN



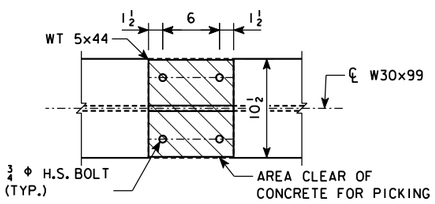
SECTION A-A



SECTION C-C
(DECK NOT SHOWN FOR CLARITY)



SECTION F-F



SECTION G-G

DEAD LOAD DEFLECTIONS - INTERIOR MODULE I										
	A (IN.)	B (IN.)	C (IN.)	D (IN.)	E (IN.)	F (IN.)	G (IN.)	H (IN.)	I (IN.)	J (IN.)
STEEL	0.047	-0.122	-0232	-0.317	-0.372	-0.390	-0.372	-0.317	-0.232	-0.123
DECK*	0.175	-0.459	-0.873	-1.202	-1.413	-1.488	-1.421	-1.215	-0.889	-0.470

*INCLUDES BACKWALL (ASSUMED 0" HAUNCH)

NOTES:

1. UPON COMPLETION OF DECK CLOSURE POURS, TOP OF DECK SHALL BE DIAMOND GROUND TO MAXIMUM DEPTH OF 1/2" AND GROOVED. SEE DESIGN SHEET 36.
2. STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 50W.
3. FOR BEARING DETAILS, SEE DESIGN SHEET 34.
4. STEEL BEAMS NEED NOT BE CAMBERED FOR DEAD LOADS. CONTRACTOR TO CHECK MILL CAMBER AND SET HAUNCHES SO THAT THE TOP OF DECK WILL BE FLAT AT ERECTION. MODULES ARE DESIGNED TO ACCEPT 2" MAXIMUM HAUNCH.
5. FOR DIAPHRAGM CONNECTION AND SHEAR STUD DETAILS, SEE DESIGN SHEET 22.
6. MODULE SHALL BE SUPPORTED AT BEARING POINTS DURING CASTING OPERATIONS AND STORAGE.
7. ALTERNATE LIFT CONFIGURATION MAY BE PROPOSED BY THE CONTRACTOR. CONTRACTOR SHALL SUBMIT LIFT CONFIGURATION DESIGN AND CALCULATIONS.
8. POCKETS FOR LIFTING CONNECTIONS SHALL BE FILLED WITH U.H.P.C. UPON COMPLETION OF LIFTING OPERATIONS AND PRIOR TO DIAMOND GRINDING. INCLUDED IN PRICE BID FOR SUPERSTRUCTURE MODULES.
9. FOR SECTIONS B-B, D-D AND E-E, SEE DESIGN SHEET 25.
10. LONGITUDINAL BARS THAT INTERFERE WITH PICK LOCATIONS SHALL BE CUT. TRANSVERSE BARS THAT INTERFERE WITH PICK LOCATIONS SHALL ADJUST SPACING TO PREVENT CONFLICT.
11. LIFTING POCKET CORNER REINFORCING SHALL BE EPOXY COATED AND IS CONSIDERED INCIDENTAL TO PRICE BID FOR SUPERSTRUCTURE MODULES.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS 70'-0 INTERIOR SPAN

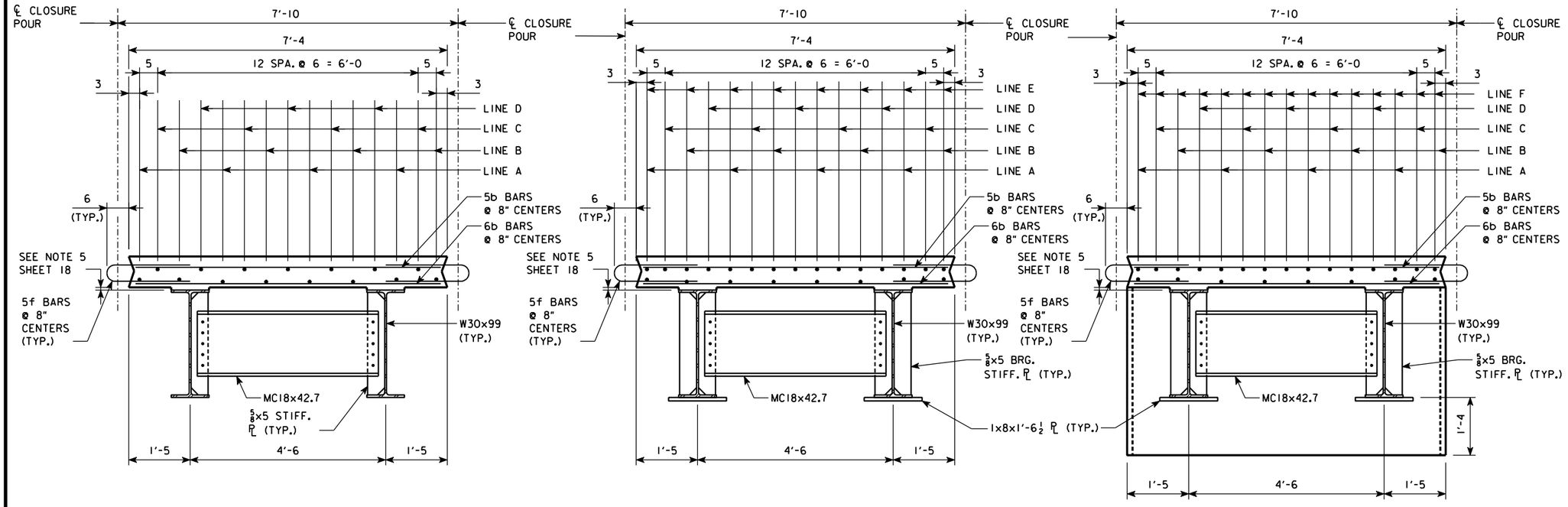
INTERIOR MODULE I

STA. 20+85.00 FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 24 OF 41 FILE NO. 30387 DESIGN NO. 111

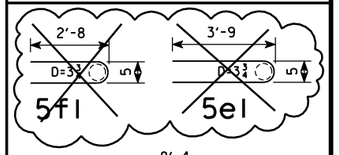


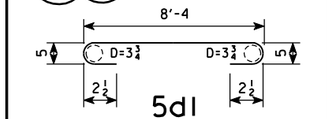
SECTION B-B

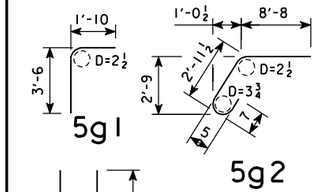
SECTION D-D

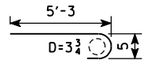
SECTION E-E
(BACKWALL REINFORCEMENT NOT SHOWN FOR CLARITY)

BENT BAR DETAILS









NOTES:
ALL DIMENSION ARE OUT TO OUT

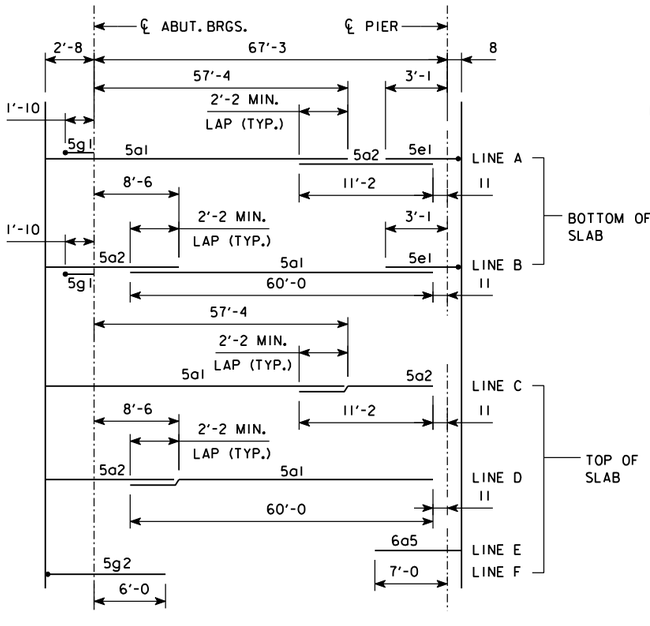
D = PIN DIAMETER

CONCRETE PLACEMENT QUANTITIES

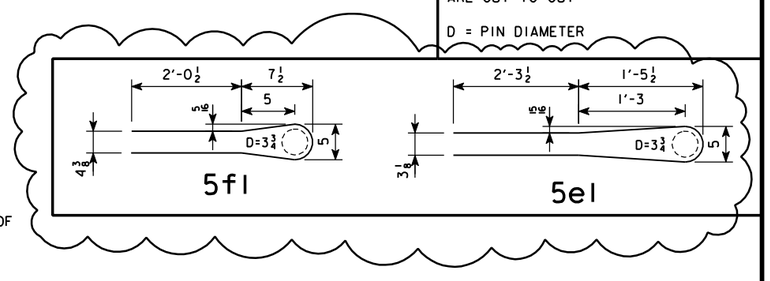
LOCATION	QUANTITY
INTERIOR MODULE I, SLAB	12.7
INTERIOR MODULE I, BACKWALL	2.4
8 MODULES, TOTAL (CU.YDS.)	120.0

EPOXY COATED REINFORCING BAR LIST AND ESTIMATED QUANTITIES PER MODULE

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a1	SLAB LONG. BOTT. + TOP		15	60'-0	939
5a2	SLAB LONG. BOTT. + TOP		15	11'-2	175
6a5	SLAB LONG. TOP		8	7'-8	92
6b2	SLAB TRANSVERSE BOTT.		104	6'-10	1,067
5b3	SLAB TRANSVERSE TOP		104	6'-10	741
5d1	BACKWALL TRANSVERSE		10	9'-7	100
5d3	BACKWALL TRANSVERSE		10	5'-10½	61
5e1	SLAB LONG. HAIRPIN		8	7'-11	66
5f1	SLAB TRANVERSE HAIRPIN		208	5'-9	1,247
5g1	ABUTMENT VERTICAL EXTENSION - F.F.		8	5'-4	45
5g2	ABUTMENT VERTICAL EXTENSION - B.F.		15	12'-7½	198
5g3	ABUTMENT VERTICAL STIRRUP		8	8'-4	70
5g4	ABUTMENT VERTICAL - B.F.		8	4'-10½	41
INTERIOR MODULE I			8 AT 4,842 LBS.		38,736



PLACEMENT FOR LONGITUDINAL REINFORCEMENT



NOTES:

1. FOR LOCATION OF SECTIONS B-B, D-D, AND E-E, SEE DESIGN SHEET 24.
2. ALL REINFORCING STEEL IS TO BE EPOXY COATED.
3. FOR BACKWALL REINFORCEMENT DETAILS, SEE DESIGN SHEET 26.

REVISED 6-16-2011: 5e1 AND 5f1 BENT BAR DETAILS

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

INTERIOR MODULE I REINF. I

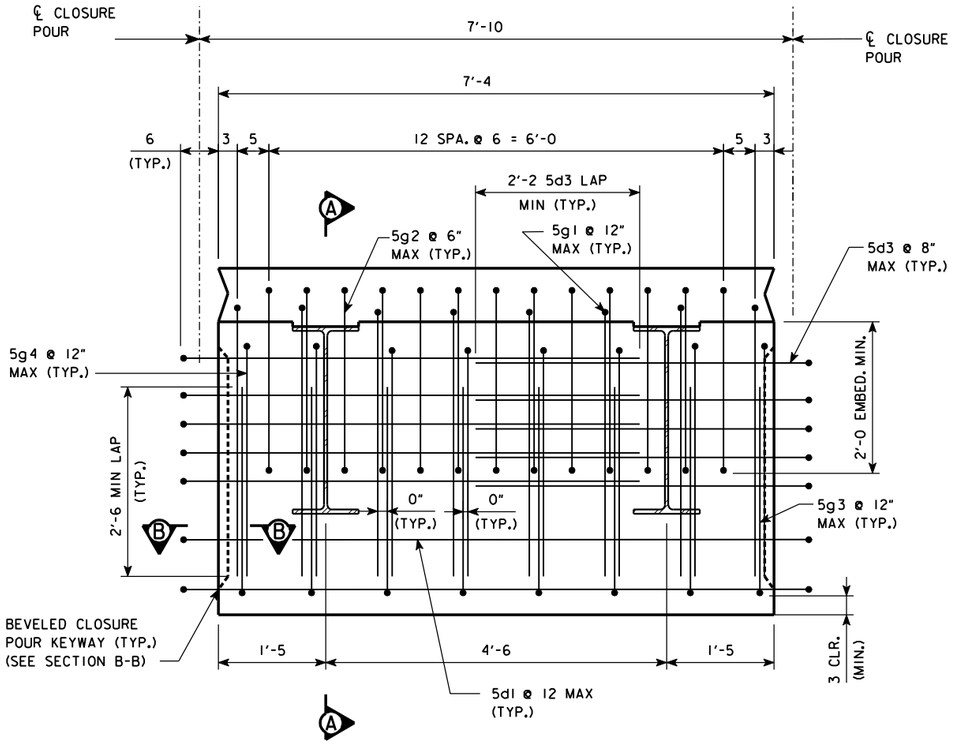
STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

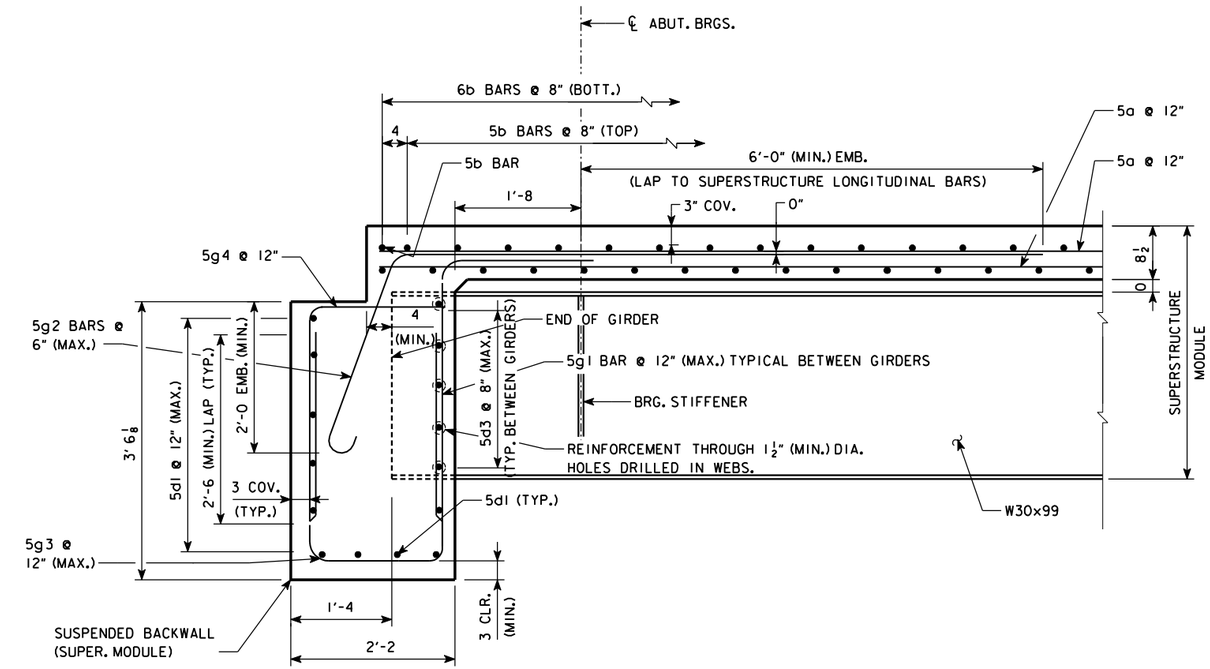
DESIGN SHEET NO. 25 OF 41 FILE NO. 30387 DESIGN NO. 111

REVISED: JUNE 16, 2011

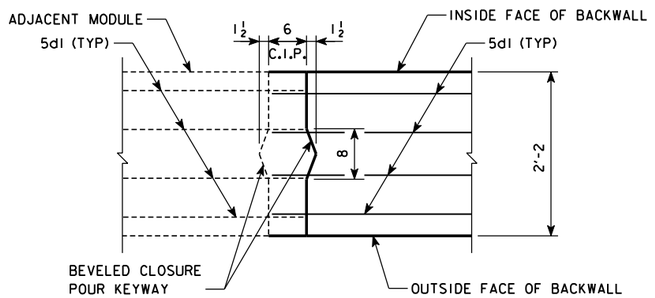


SECTION E-E

(SLAB REINFORCEMENT AND STEEL DETAILS NOT SHOWN FOR CLARITY)



SECTION A-A



SECTION B-B

VERTICAL CLOSURE POUR DETAIL

NOTES:

1. FOR LOCATION OF SECTIONS E-E, SEE DESIGN SHEET 24.
2. ALL REINFORCING STEEL IS TO BE EPOXY COATED.
3. FOR BAR LIST AND ADDITIONAL BENT BAR DETAILS, SEE DESIGN SHEET 25.
4. SUSPENDED BACKWALL AND BACKWALL CLOSURE POURS SHALL BE INCLUDED IN PRICE BID FOR SUPERSTRUCTURE MODULES.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

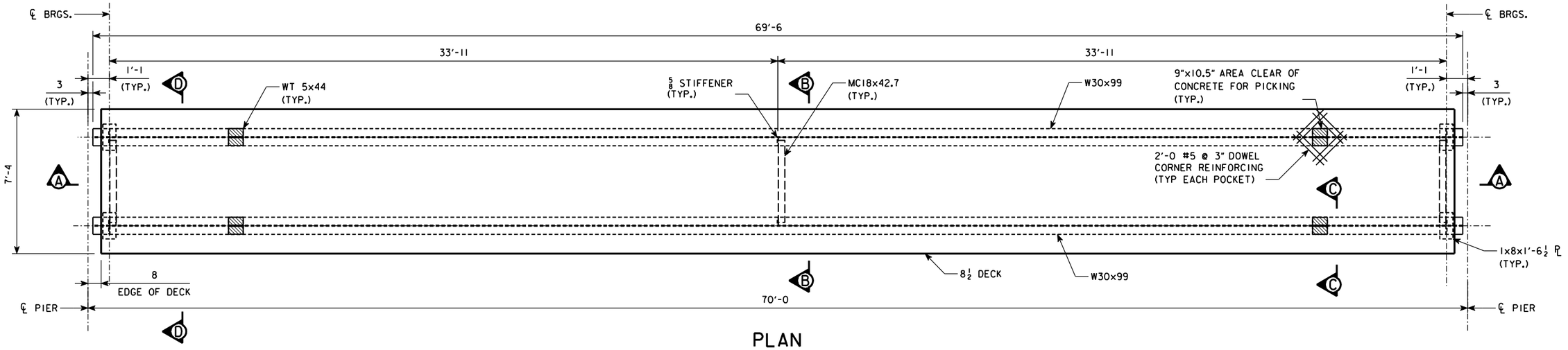
INTERIOR MODULE I REINF. 2

STA. 20+85.00 — FEBRUARY, 2011

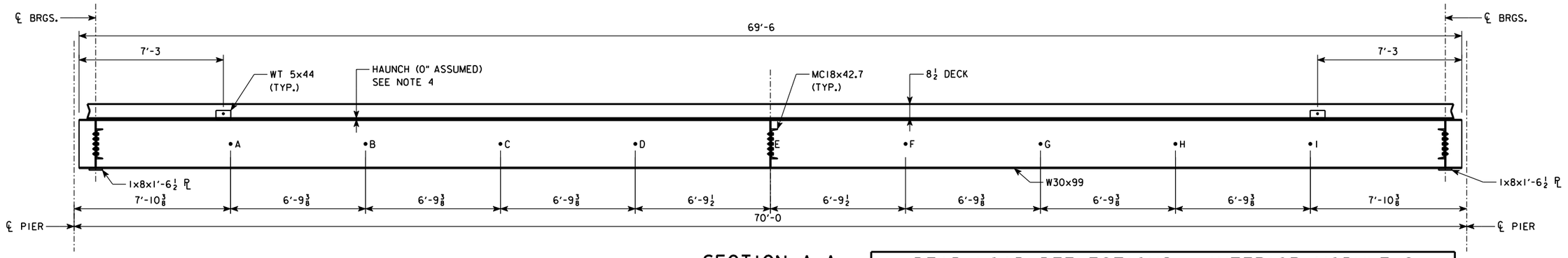
POTTAWATTAMIE COUNTY

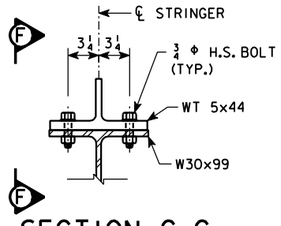
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 26 OF 41 FILE NO. 30387 DESIGN NO. 111

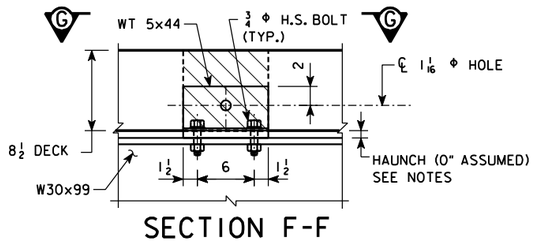


PLAN

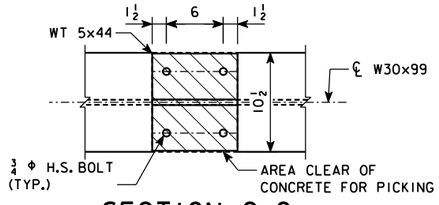




SECTION C-C
(DECK NOT SHOWN FOR CLARITY)



SECTION F-F



SECTION G-G

SECTION A-A

DEAD LOAD DEFLECTIONS - INTERIOR MODULE 2									
	A (IN.)	B (IN.)	C (IN.)	D (IN.)	E (IN.)	F (IN.)	G (IN.)	H (IN.)	I (IN.)
STEEL	-0.136	-0.257	-0.352	-0.412	-0.433	-0.412	-0.352	-0.257	-0.136
DECK	-0.537	-1.017	-1.392	-1.630	-1.712	-1.630	-1.392	-1.017	-0.537

NOTES:

1. UPON COMPLETION OF DECK CLOSURE POURS, TOP OF DECK SHALL BE DIAMOND GROUND TO MAXIMUM DEPTH OF ¼" AND GROOVED. SEE DESIGN SHEET 36.
2. STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 50W.
3. FOR BEARING DETAILS, SEE DESIGN SHEET 34.
4. STEEL BEAMS NEED NOT BE CAMBERED FOR DEAD LOADS. CONTRACTOR TO CHECK MILL CAMBER AND SET HAUNCHES SO THAT THE TOP OF DECK WILL BE FLAT AT ERECTION. MODULES ARE DESIGNED TO ACCEPT 2" MAXIMUM HAUNCH. ~~3"~~
5. FOR DIAPHRAGM CONNECTION AND SHEAR STUD DETAILS, SEE DESIGN SHEET 22.
6. MODULE SHALL BE SUPPORTED AT BEARING POINT DURING CASTING OPERATIONS AND STORAGE.
7. ALTERNATE LIFT CONFIGURATION MAY BE PROPOSED BY THE CONTRACTOR. CONTRACTOR SHALL SUBMIT LIFT CONFIGURATION DESIGN AND CALCULATIONS.
8. POCKETS FOR LIFTING CONNECTIONS SHALL BE FILLED WITH U.H.P.C. UPON COMPLETION OF LIFTING OPERATIONS AND PRIOR TO DIAMOND GRINDING. INCLUDED IN PRICE BID FOR SUPERSTRUCTURE MODULES.
9. FOR SECTIONS B-B AND D-D, SEE DESIGN SHEET 28.
10. LONGITUDINAL BARS THAT INTERFERE WITH PICK LOCATIONS SHALL BE CUT. TRANSVERSE BARS THAT INTERFERE WITH PICK LOCATIONS SHALL ADJUST SPACING TO PREVENT CONFLICT.
11. LIFTING POCKET CORNER REINFORCING SHALL BE EPOXY COATED AND IS CONSIDERED INCIDENTAL TO PRICE BID FOR SUPERSTRUCTURE MODULES.

REVISED 6-16-2011: MAXIMUM HAUNCH CHANGE IN NOTE 4

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

INTERIOR MODULE 2

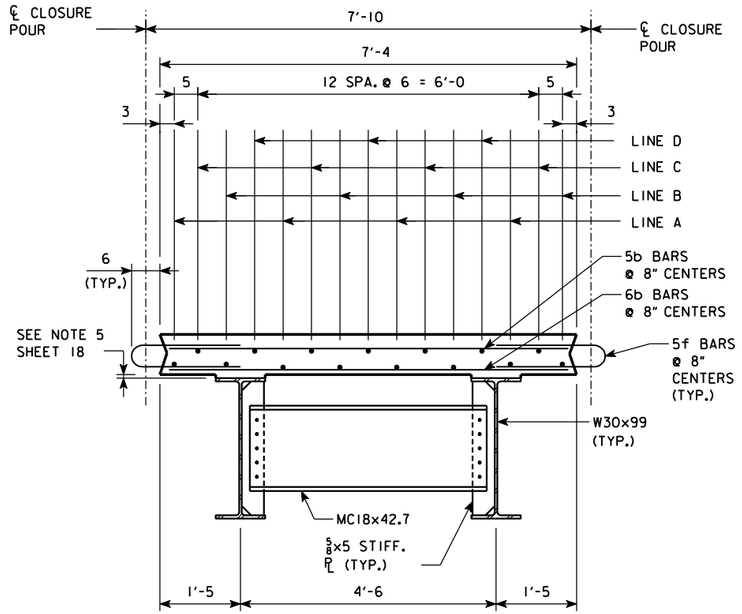
STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

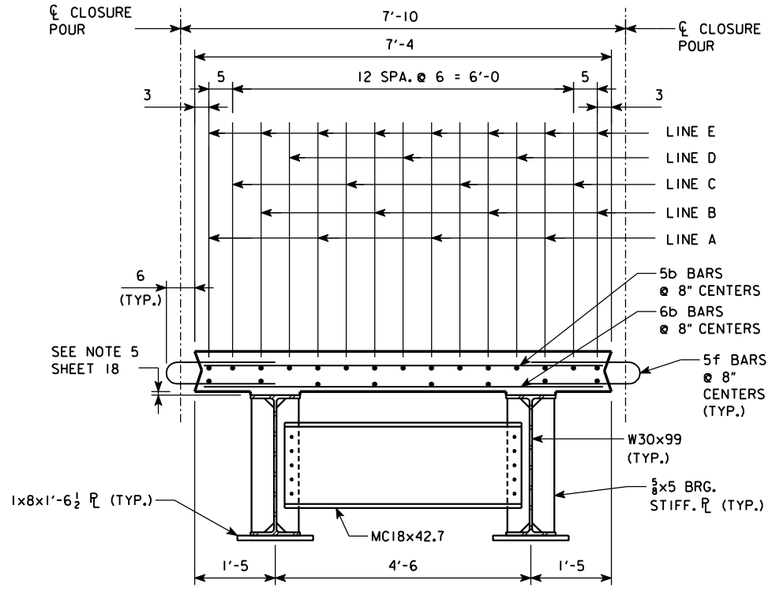
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 27 OF 41 FILE NO. 30387 DESIGN NO. 111

REVISED: JUNE 16, 2011

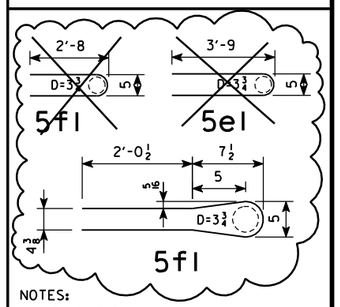


SECTION B-B



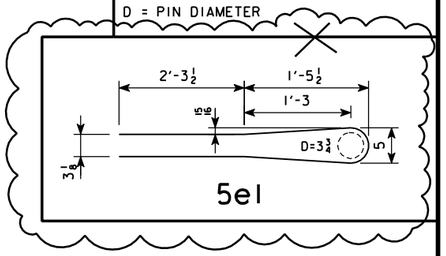
SECTION D-D

BENT BAR DETAILS



NOTES:
ALL DIMENSION ARE OUT TO OUT

D = PIN DIAMETER

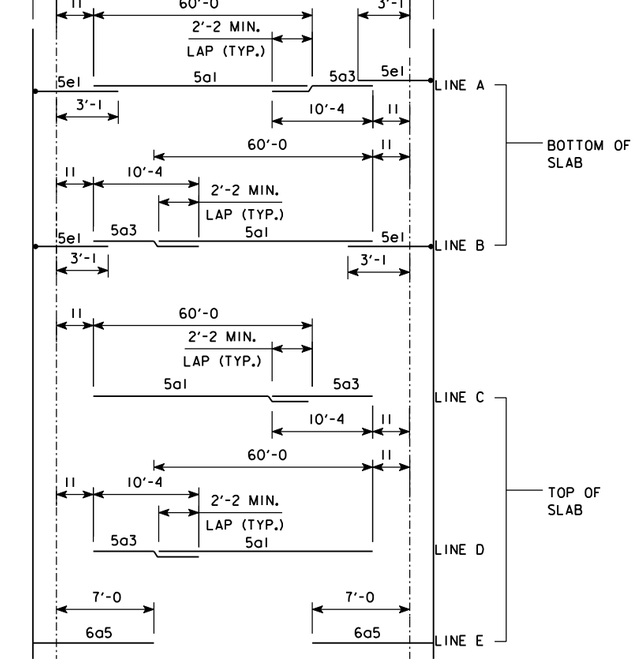


CONCRETE PLACEMENT QUANTITIES

LOCATION	QUANTITY
INTERIOR MODULE 2, SLAB	12.8
4 MODULES, TOTAL (CU.YDS.)	51.0

EPOXY COATED REINFORCING BAR LIST AND ESTIMATED QUANTITIES PER MODULE

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a1	SLAB LONG. BOTT. + TOP	———	15	60'-0	939
5a3	SLAB LONG. BOTT. + TOP	———	15	10'-4	162
6a5	SLAB LONG. TOP	———	16	7'-8	184
6b2	SLAB TRANSVERSE BOTT.	———	103	6'-10	1,057
5b3	SLAB TRANSVERSE TOP	———	103	6'-10	734
5e1	SLAB LONG. HAIRPIN	———	16	7'-11	132
5f1	SLAB TRANSVERSE HAIRPIN	———	206	5'-9	1,235
INTERIOR MODULE 2			4 AT 3,343 LBS.		13,372



PLACEMENT FOR LONGITUDINAL REINFORCEMENT

NOTES:

1. FOR LOCATION OF SECTIONS B-B AND D-D, SEE DESIGN SHEET 27.
2. ALL REINFORCING STEEL IS TO BE EPOXY COATED.

REVISED 6-16-2011: 5e1 AND 5f1 BENT BAR DETAILS

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

INTERIOR MODULE 2 REINF.

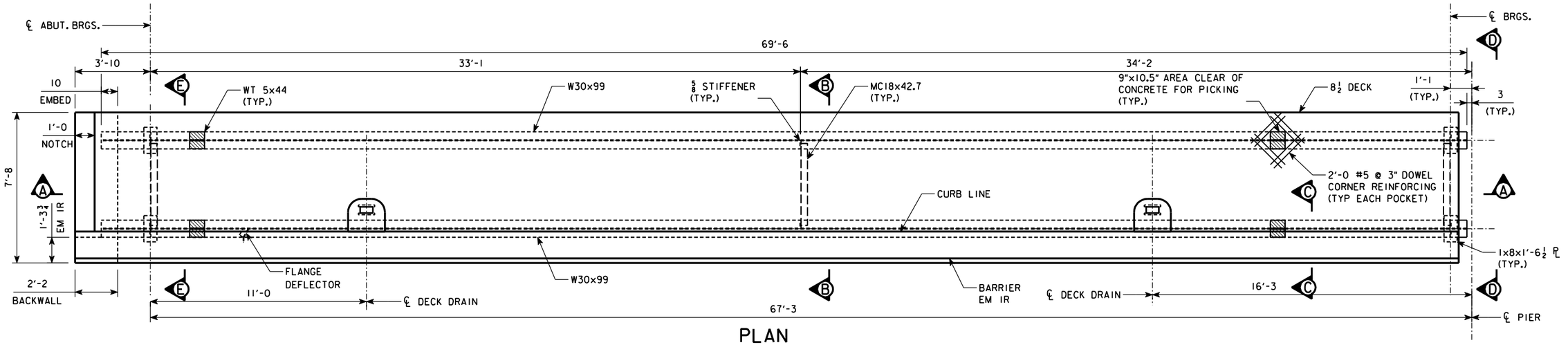
STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

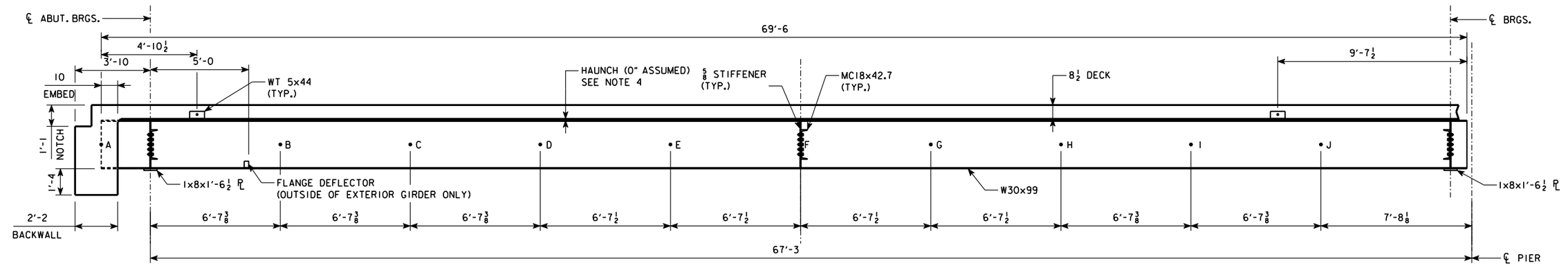
DESIGN SHEET NO. 28 OF 41 FILE NO. 30387 DESIGN NO. 111

REVISED: JUNE 16, 2011



PLAN

(EM IR SHOWN, EM IL OPPOSITE HAND)



SECTION A-A

DEAD LOAD DEFLECTIONS - EXTERIOR MODULE I										
	A (IN.)	B (IN.)	C (IN.)	D (IN.)	E (IN.)	F (IN.)	G (IN.)	H (IN.)	I (IN.)	J (IN.)
STEEL	0.047	-0.122	-0.232	-0.317	-0.372	-0.390	-0.372	-0.317	-0.232	-0.123
DECK*	0.181	-0.473	-0.898	-1.234	-1.450	-1.525	-1.44	-1.244	-0.909	-0.481
BARRIER**	0.074	-0.191	-0.362	-0.495	-0.580	-0.609	0.580	-0.496	-0.362	-0.191

*INCLUDES BACKWALL (ASSUMED 0" HAUNCH)
**INCLUDES COMPOSITE ACTION

NOTES:

1. UPON COMPLETION OF DECK CLOSURE POURS, TOP OF DECK SHALL BE DIAMOND GROUND TO MAXIMUM DEPTH OF ½" AND GROOVED. SEE DESIGN SHEET 36.
2. STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 50W.
3. FOR BEARING DETAILS, SEE DESIGN SHEET 34.
4. STEEL BEAMS NEED NOT BE CHAMBERED FOR DEAD LOADS. CONTRACTOR TO CHECK MILL CAMBER AND SET HAUNCHES SO THAT THE TOP OF DECK WILL BE FLAT AT ERECTION. MODULES ARE DESIGNED TO ACCEPT 2" (3") MAXIMUM HAUNCH.
5. FOR DIAPHRAGM CONNECTION AND SHEAR STUD DETAILS, SEE DESIGN SHEET 22.
6. MODULE SHALL BE SUPPORTED AT BEARING POINTS DURING CASTING OPERATIONS AND STORAGE.
7. ALTERNATE LIFT CONFIGURATION MAY BE PROPOSED BY THE CONTRACTOR. CONTRACTOR SHALL SUBMIT LIFT CONFIGURATION DESIGN AND CALCULATIONS.
8. POCKETS FOR LIFTING CONNECTIONS SHALL BE FILLED WITH U.H.P.C. UPON COMPLETION OF LIFTING OPERATIONS AND PRIOR TO DIAMOND GRINDING. INCLUDED IN PRICE BID FOR SUPERSTRUCTURE MODULES.
9. FOR SECTIONS B-B, D-D AND E-E, SEE DESIGN SHEET 30.
10. FOR SECTION C-C, SEE DESIGN SHEET 27.
11. FOR FLANGE DEFLECTOR AND DRAIN DETAILS, SEE DESIGN SHEET 35.
12. LONGITUDINAL BARS THAT INTERFERE WITH PICK LOCATIONS SHALL BE CUT. TRANSVERSE BARS THAT INTERFERE WITH PICK LOCATIONS SHALL ADJUST SPACING TO PREVENT CONFLICT.
13. LIFTING POCKET CORNER REINFORCING SHALL BE EPOXY COATED AND IS CONSIDERED INCIDENTAL TO PRICE BID FOR SUPERSTRUCTURE MODULES.

REVISED 6-16-2011: MAXIMUM HAUNCH CHANGE IN NOTE 4

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS 70'-0 INTERIOR SPAN

EXTERIOR MODULE IL AND IR

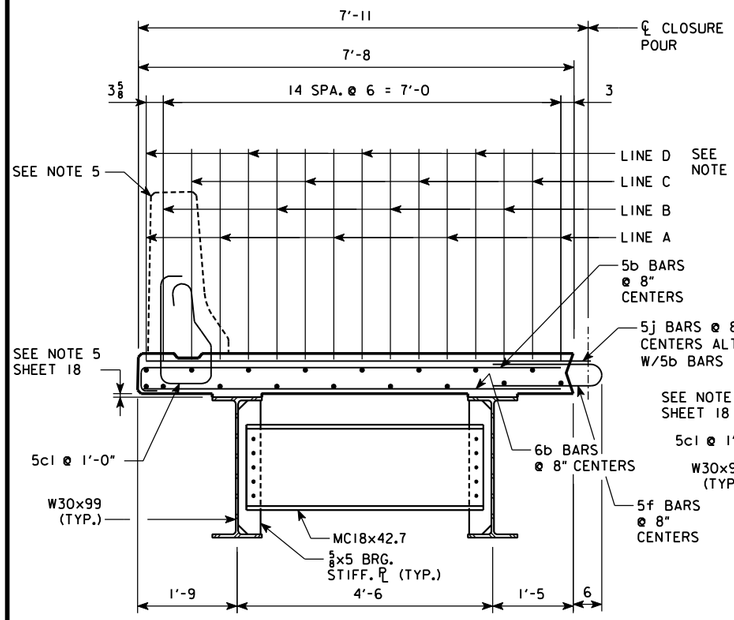
STA. 20+85.00 FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

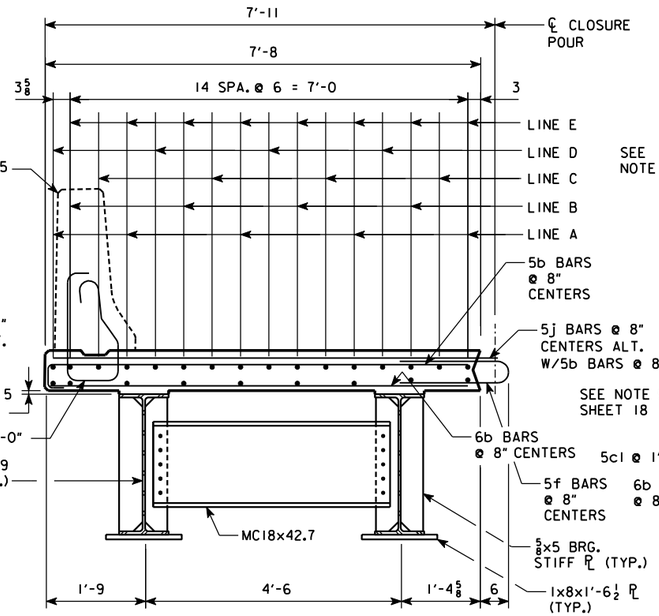
DESIGN SHEET NO. 29 OF 41 FILE NO. 30387 DESIGN NO. 111

REVISED: JUNE 16, 2011



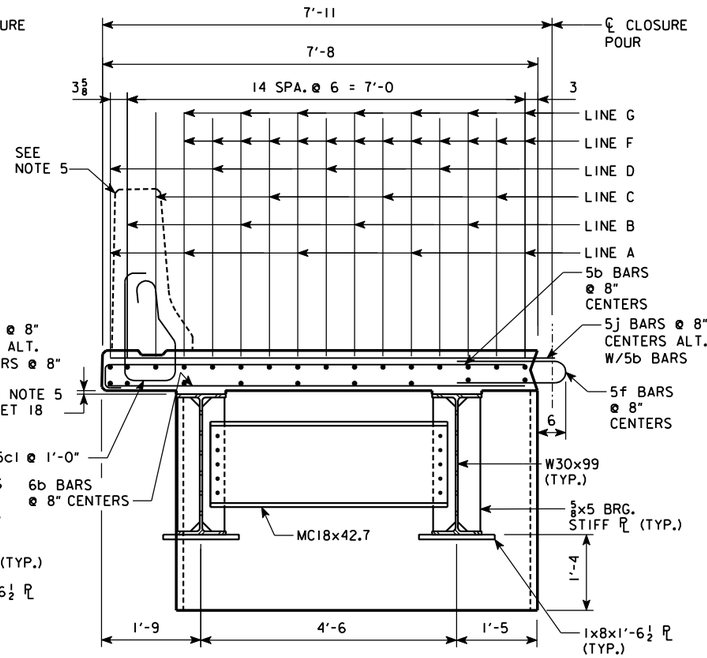
SECTION B-B

(EM IR SHOWN, IL OPPOSITE HAND)



SECTION D-D

(EM IR SHOWN, IL OPPOSITE HAND)



SECTION E-E

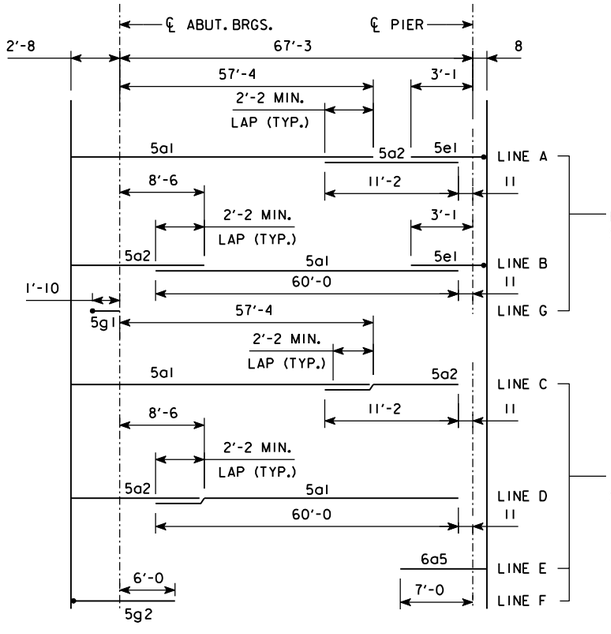
(EM IR SHOWN, IL OPPOSITE HAND)
(BACKWALL REINFORCEMENT NOT SHOWN FOR CLARITY)

CONCRETE PLACEMENT QUANTITIES

LOCATION	QUANTITY
EXTERIOR MODULE I, SLAB	13.5
EXTERIOR MODULE I, BACKWALL	2.2
4 MODULES, TOTAL (CU.YDS.)	62.7

EPOXY COATED REINFORCING BAR LIST AND ESTIMATED QUANTITIES PER MODULE

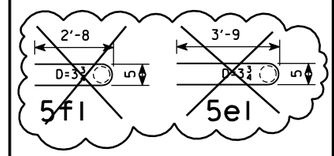
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a1	SLAB LONG. BOTT. + TOP		17	60'-0	1,064
5a2	SLAB LONG. BOTT. + TOP		17	11'-2	198
6a5	SLAB LONG. TOP		8	7'-8	92
5b1	SLAB TRANSVERSE TOP		104	7'-10	850
6b5	SLAB TRANSVERSE BOTT.		104	7'-3	1,133
5c1	SLAB CONNECTION TO BARRIER		70	6'-0	438
5d2	BACKWALL TRANSVERSE		10	7'- 8 1/2	80
5d4	BACKWALL TRANSVERSE		10	4'-11 1/2	52
5e1	SLAB LONG. HAIRPIN		9	7'-11	74
5f1	SLAB TRANSVERSE HAIRPIN		104	5'-9	624
5g1	ABUTMENT VERTICAL EXTENSION - F.F.		7	5'-4	39
5g2	ABUTMENT VERTICAL EXTENSION - B.F.		13	12'-7 1/2	171
5g3	ABUTMENT VERTICAL STIRRUP		7	8'-4	61
5g4	ABUTMENT VERTICAL - B.F.		7	4'-10 1/2	36
5j1	SLAB TRANSVERSE AT RAIL		103	7'-9	833
EXTERIOR MODULE IL AND IR			4 AT X 5,743 LBS.		22,972

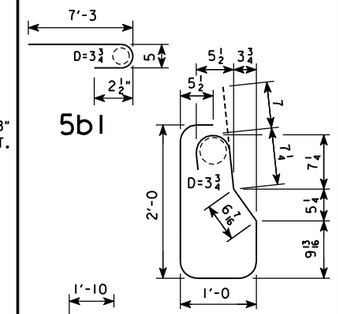


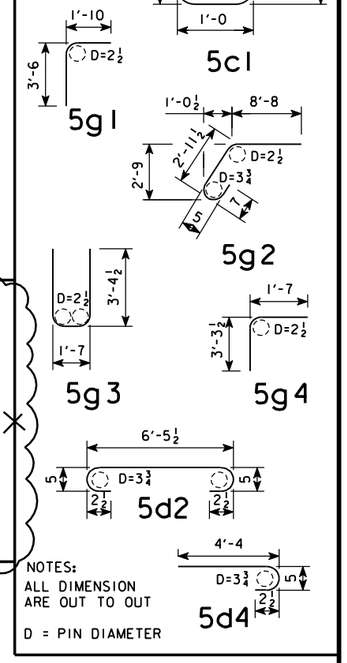
PLACEMENT FOR LONGITUDINAL REINFORCEMENT

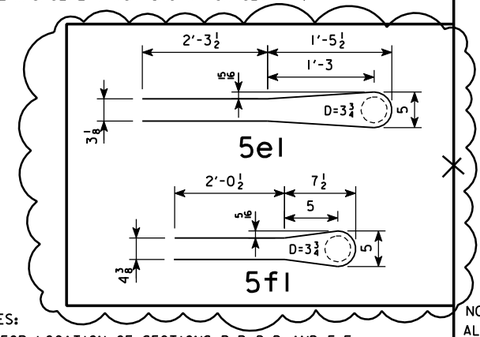
REVISED 6-16-2011: 5e1 AND 5f1 BENT BAR DETAILS

BENT BAR DETAILS









NOTES:

1. FOR LOCATION OF SECTIONS B-B, D-D, AND E-E, SEE DESIGN SHEET 29.
2. ALL REINFORCING STEEL IS TO BE EPOXY COATED.
3. FOR ADDITIONAL BARRIER REINFORCING AND DETAILS, SEE DESIGN SHEET 41.
4. FOR BACKWALL REINFORCEMENT DETAILS, SEE DESIGN SHEET 31.
5. FACE OF BARRIER SHALL BE VERTICAL IN THE FINAL ERECTED POSITION.

NOTES:
ALL DIMENSION ARE OUT TO OUT

D = PIN DIAMETER

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

EXT. MODULE IL AND IR REINF. I

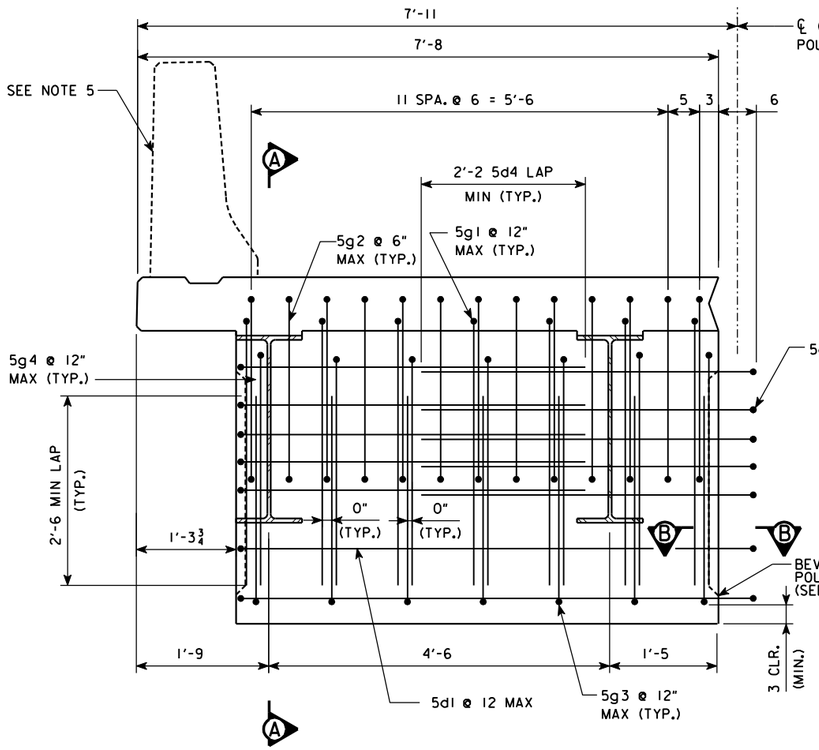
STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

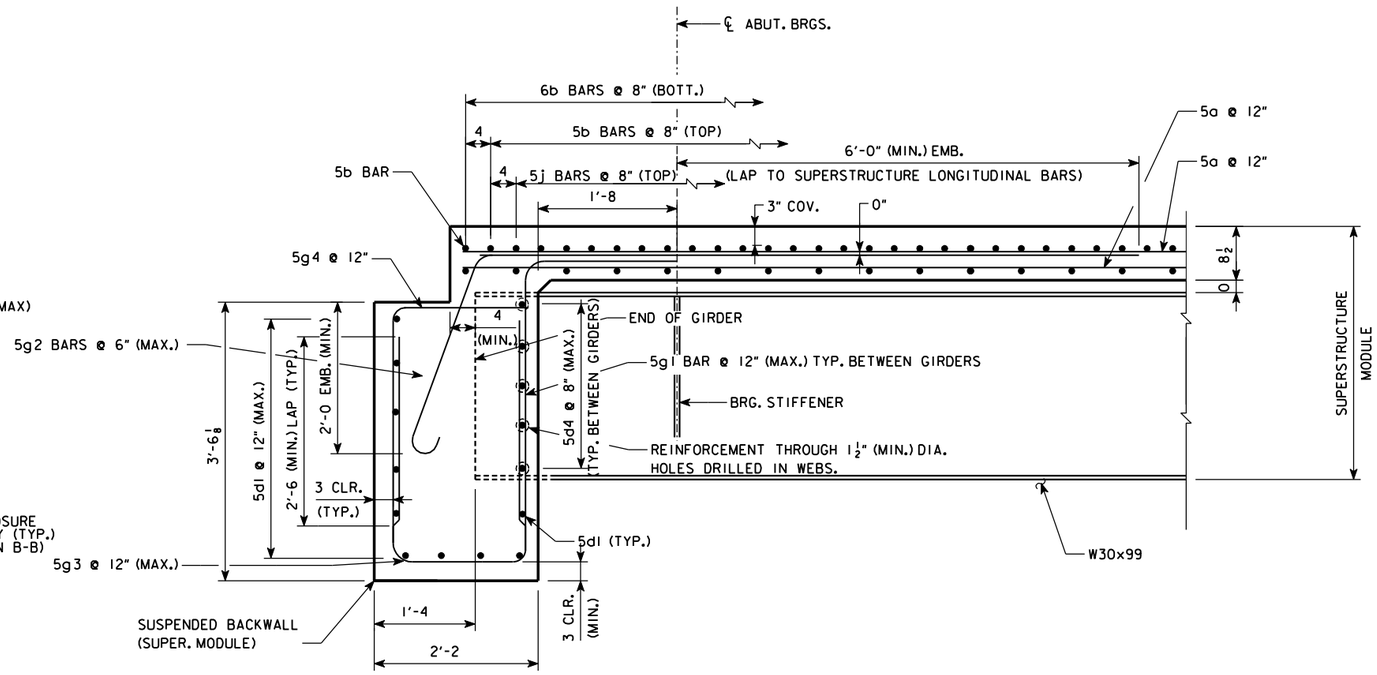
DESIGN SHEET NO. 30 OF 41 FILE NO. 30387 DESIGN NO. 111

REVISED: JUNE 16, 2011

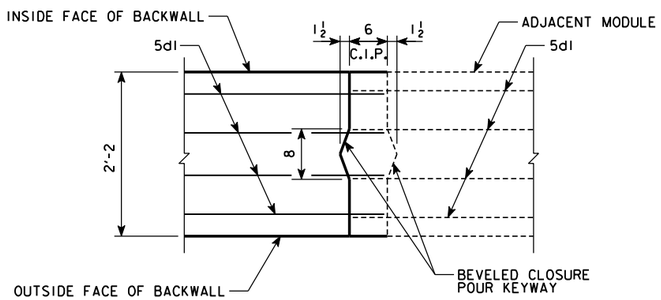


SECTION E-E

(EM IR SHOWN, IL OPPOSITE HAND)
(SLAB REINFORCEMENT AND STEEL MODULE NOT SHOWN FOR CLARITY)



SECTION A-A



SECTION B-B

VERTICAL CLOSURE POUR DETAIL

NOTES:

1. FOR LOCATION OF SECTIONS E-E, SEE DESIGN SHEET 29.
2. ALL REINFORCING STEEL IS TO BE EPOXY COATED.
3. FOR BAR LIST AND BENT BAR DETAILS, SEE DESIGN SHEET 30.
4. SUSPENDED BACKWALL AND BACKWALL CLOSURE POURS SHALL BE INCLUDED IN PRICE BID FOR SUPERSTRUCTURE MODULES.
5. FACE OF BARRIER SHALL BE VERTICAL IN THE FINAL ERECTED POSITION.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

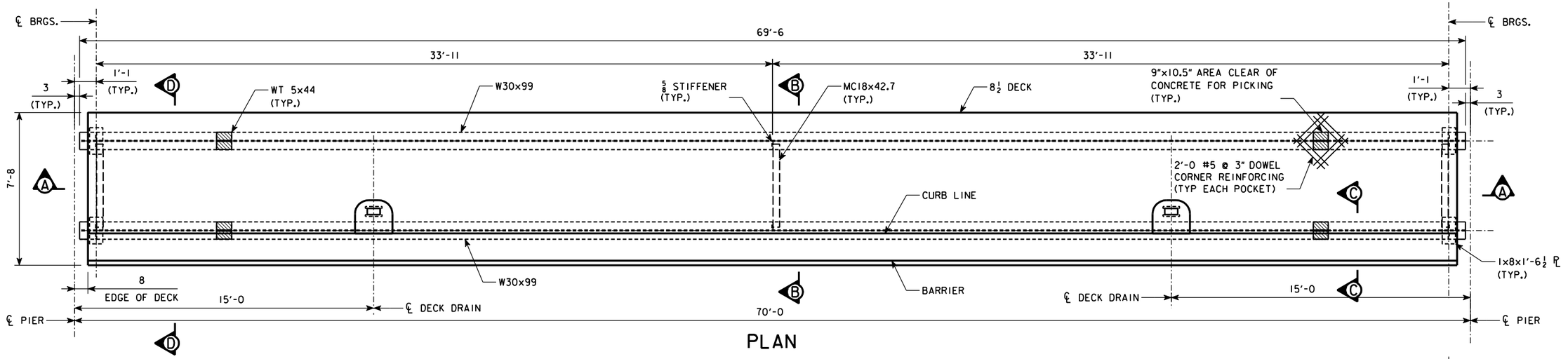
EXT. MODULE IL AND IR REINF. 2

STA. 20+85.00 — FEBRUARY, 2011

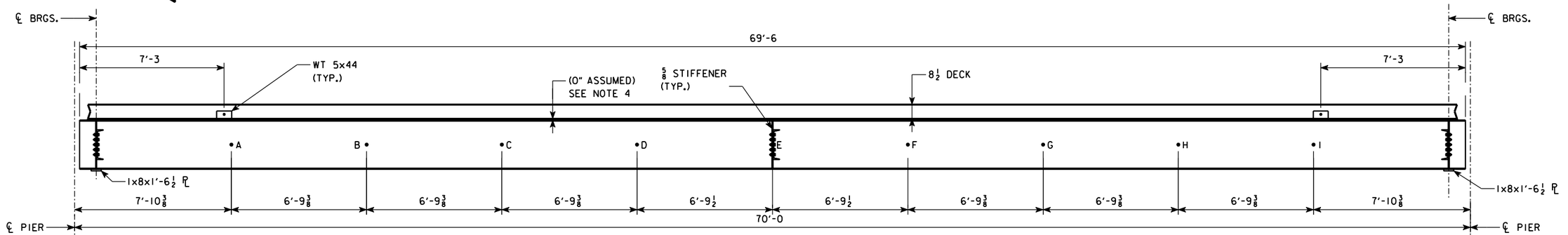
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

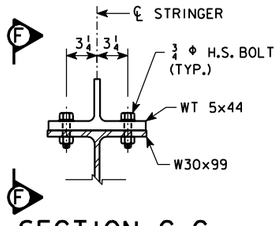
DESIGN SHEET NO. 31 OF 41 FILE NO. 30387 DESIGN NO. 111



PLAN

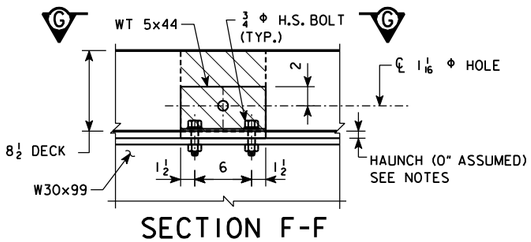


SECTION A-A

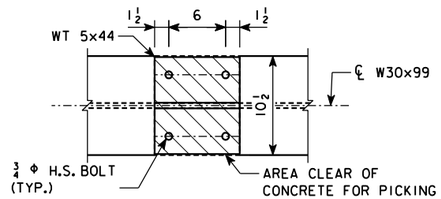


SECTION C-C

(DECK NOT SHOWN FOR CLARITY)



SECTION F-F



SECTION G-G

DEAD LOAD DEFLECTIONS - EXTERIOR MODULE 2									
	A (IN.)	B (IN.)	C (IN.)	D (IN.)	E (IN.)	F (IN.)	G (IN.)	H (IN.)	I (IN.)
STEEL	-0.136	-0.257	-0.352	-0.412	-0.433	-0.412	-0.352	-0.257	-0.136
DECK	-0.544	-1.029	-1.409	-1.650	-1.733	-1.650	-1.409	-1.029	-0.544
BARRIER**	-0.212	-0.401	-0.549	-0.643	-0.675	-0.643	-0.549	-0.401	-0.212

**INCLUDES COMPOSITE ACTION

NOTES:

1. UPON COMPLETION OF DECK CLOSURE POURS, TOP OF DECK SHALL BE DIAMOND GROUND TO MAXIMUM DEPTH OF ½" AND GROOVED. SEE DESIGN SHEET 36.
2. STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 50W.
3. FOR BEARING DETAILS, SEE DESIGN SHEET 34.
4. STEEL BEAMS NEED NOT BE CAMBERED FOR DEAD LOADS. CONTRACTOR TO CHECK MILL CAMBER AND SET HAUNCHES SO THAT THE TOP OF DECK WILL BE FLAT AT ERECTION. MODULES ARE DESIGNED TO ACCEPT 2" MAXIMUM HAUNCH. ~~2~~ 3"
5. FOR DIAPHRAGM CONNECTION AND SHEAR STUD DETAILS, SEE DESIGN SHEET 22.
6. MODULE SHALL BE SUPPORTED AT BEARING POINTS DURING CASTING OPERATIONS AND STORAGE.
7. ALTERNATE LIFT CONFIGURATION MAY BE PROPOSED BY THE CONTRACTOR. CONTRACTOR SHALL SUBMIT LIFT CONFIGURATION DESIGN AND CALCULATIONS.
8. POCKETS FOR LIFTING CONNECTIONS SHALL BE FILLED WITH U.H.P.C. UPON COMPLETION OF LIFTING OPERATIONS AND PRIOR TO DIAMOND GRINDING. INCLUDED IN PRICE BID FOR SUPERSTRUCTURE MODULES.
9. FOR SECTIONS B-B AND D-D, SEE DESIGN SHEET 33.
10. FOR DRAIN DETAILS, SEE DESIGN SHEET 35.
11. LONGITUDINAL BARS THAT INTERFERE WITH PICK LOCATIONS SHALL BE CUT. TRANSVERSE BARS THAT INTERFERE WITH PICK LOCATIONS SHALL ADJUST SPACING TO PREVENT CONFLICT.
12. LIFTING POCKET CORNER REINFORCING SHALL BE EPOXY COATED AND IS CONSIDERED INCIDENTAL TO PRICE BID FOR SUPERSTRUCTURE MODULES.

REVISED 6-16-2011: MAXIMUM HAUNCH CHANGE IN NOTE 4

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

EXTERIOR MODULE 2

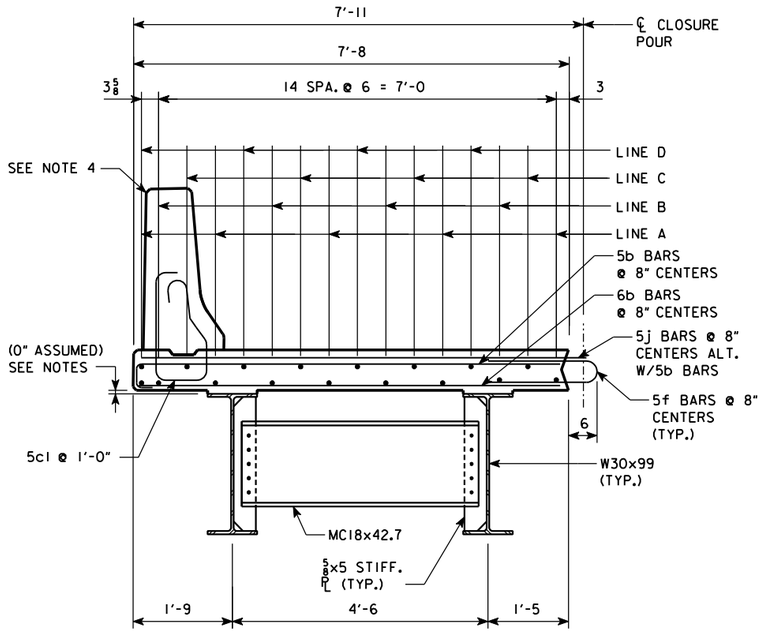
STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

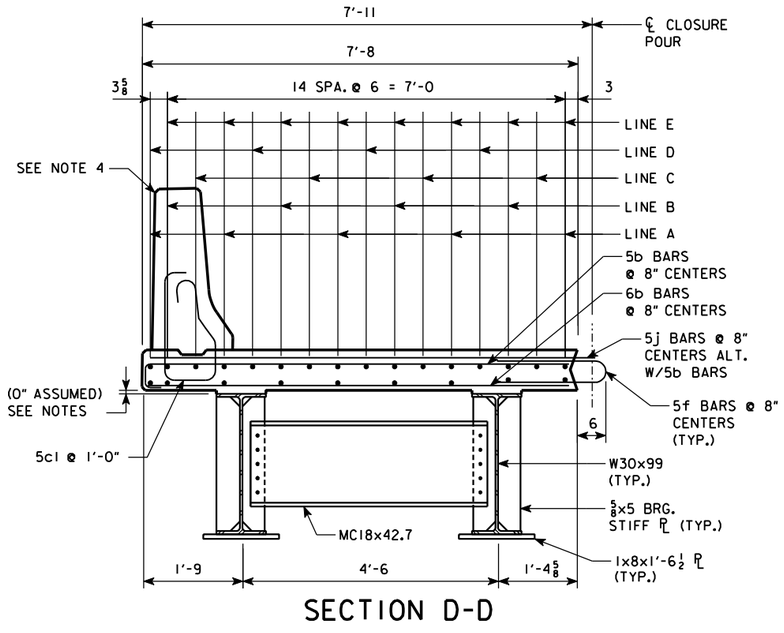
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 32 OF 41 FILE NO. 30387 DESIGN NO. 111

REVISED: JUNE 16, 2011

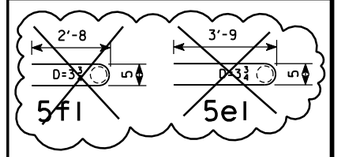


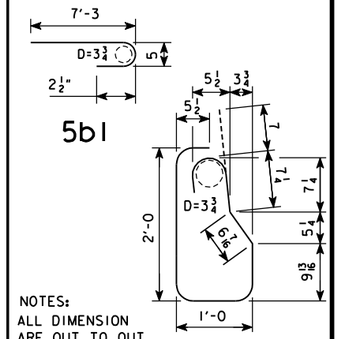
SECTION B-B



SECTION D-D

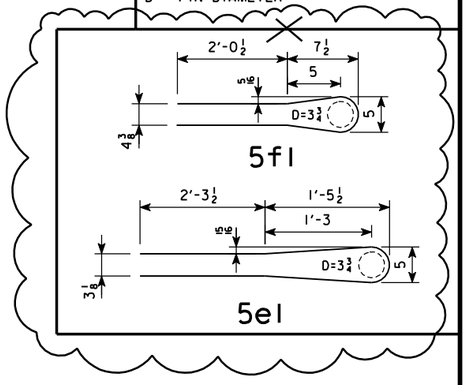
BENT BAR DETAILS





NOTES:
ALL DIMENSION ARE OUT TO OUT

D = PIN DIAMETER

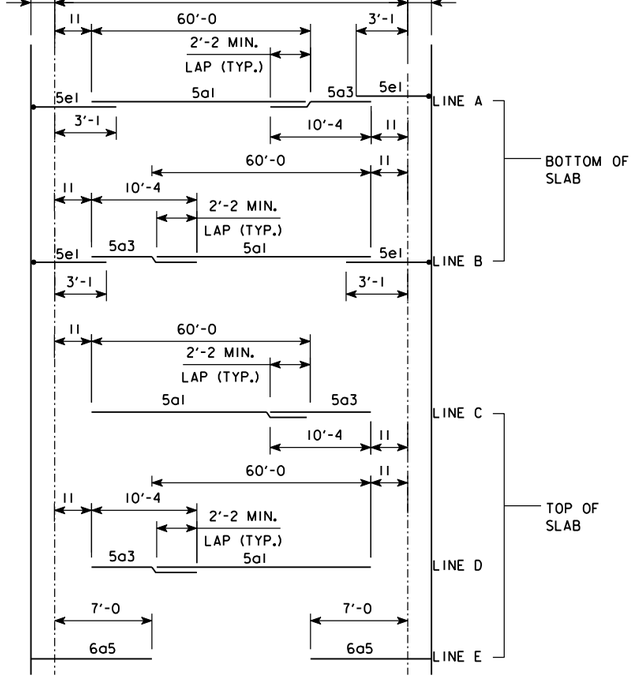


CONCRETE PLACEMENT QUANTITIES

LOCATION	QUANTITY
EXTERIOR MODULE 2, SLAB	13.8
2 MODULES, TOTAL (CU.YDS.)	27.6

EPOXY COATED REINFORCING BAR LIST AND ESTIMATED QUANTITIES PER MODULE

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a1	SLAB LONG. TOP & BOTT.		17	60'-0	1,064
5a3	SLAB LONG. TOP & BOTT.		17	10'-4	162
6a5	SLAB LONG. TOP		16	7'-8	184
5b1	SLAB TRANSVERSE TOP		103	7'-10	842
6b2	SLAB TRANSVERSE BOTT.		103	7'-3	1,122
5c1	SLAB CONNECTION TO BARRIER		69	6'-0	432
5e1	SLAB LONG. HAIRPIN		9	7'-11	74
5f1	SLAB TRANSVERSE HAIRPIN		103	5'-9	618
5j1	SLAB TRANSVERSE AT RAIL		102	7'-9"	824
EXTERIOR MODULE 2			2 AT 5,305 LBS.		10,609



PLACEMENT FOR LONGITUDINAL REINFORCEMENT

NOTES:

1. FOR LOCATION OF SECTIONS B-B AND D-D, SEE DESIGN SHEET 32.
2. ALL REINFORCING STEEL IS TO BE EPOXY COATED.
3. FOR ADDITIONAL BARRIER REINFORCING AND DETAILS, SEE DESIGN SHEET 41.
4. FACE OF BARRIER SHALL BE VERTICAL IN THE FINAL ERECTED POSITION.

REVISED 6-16-2011: 5e1 AND 5f1 BENT BAR DETAILS

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

EXT. MODULE 2 REINF.

STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 33 OF 41 FILE NO. 30387 DESIGN NO. 111

REVISED: JUNE 16, 2011

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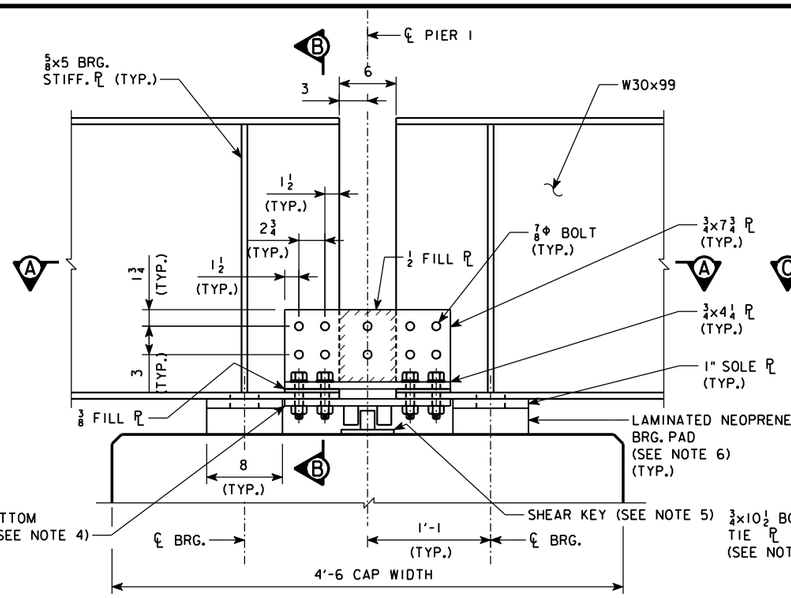
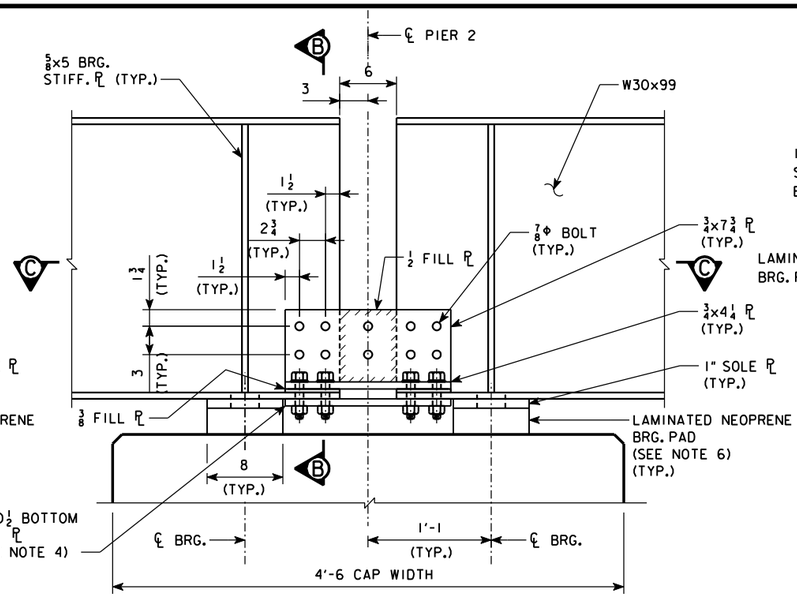


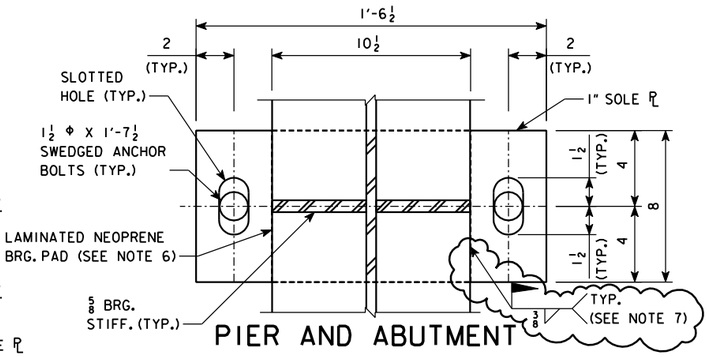
PIER 1 ELEVATION

(DECK NOT SHOWN)

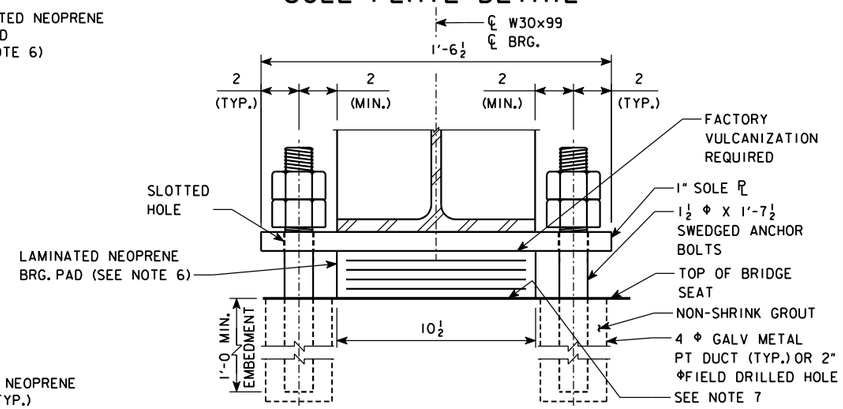


PIER 2 ELEVATION

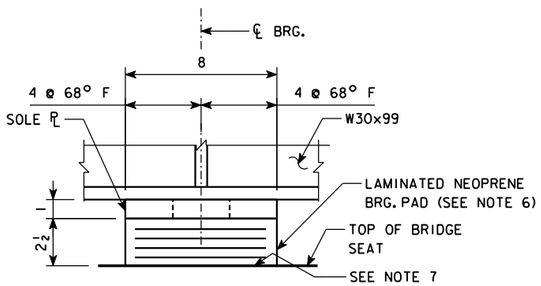
(DECK NOT SHOWN)



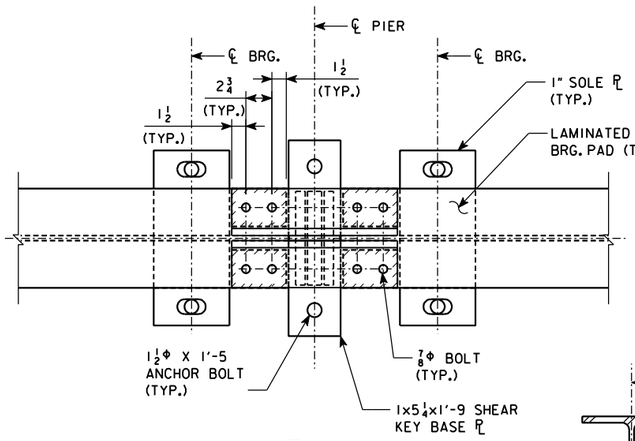
PIER AND ABUTMENT SOLE PLATE DETAIL



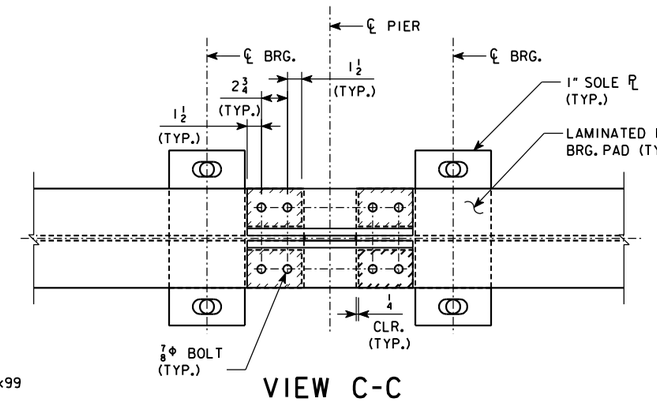
PIER AND ABUTMENT BEARING ASSEMBLY FRONT ELEVATION VIEW



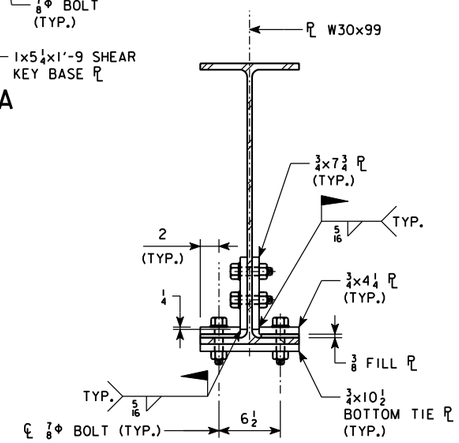
PIER AND ABUTMENT BEARING ASSEMBLY SIDE ELEVATION VIEW



VIEW A-A



VIEW C-C



SECTION B-B

NOTES:

1. FOR GENERAL NOTES, SEE DESIGN SHEETS 2, 3 & 4.
2. CAUTION SHALL BE EXERCISED WHERE A FIELD WELD OR SHOP WELD WILL BE MADE WHILE ELASTOMERIC BEARING PADS ARE IN CONTACT WITH STEEL. IN NO CASE SHALL THE ELASTOMER BE EXPOSED TO INSTANTANEOUS TEMPS GREATER THAN 400°F.
3. PROVIDE GRADE 60 DUROMETER ELASTOMER WITH A SHEAR MODULUS OF 175 PSI, IN ACCORDANCE WITH AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS.
4. FOR BOTTOM TIE PLATE DETAILS, SEE DESIGN SHEET 35.
5. FOR SHEAR KEY DETAILS, SEE DESIGN SHEET 35.
6. FOR LAMINATED NEOPRENE BEARING PAD DETAILS, SEE DESIGN SHEET 35.
7. CONTRACTOR TO HAVE AVAILABLE 1/8 NEOPRENE PADS TO BE PLACED ON THE PIER CAP TO PROVIDE VERTICAL ADJUSTMENT. PLACE BEARING ON THE NEOPRENE PAD WITH MAXIMUM OF 3 SUCH PADS PER BEARING. THE SHEAR KEY BASE PLATE SHALL BE ADJUSTED WITH NEOPRENE PADS TO MATCH VERTICAL ADJUSTMENTS OF BEARINGS (IF ANY).
8. TIE PLATES, SHEAR KEYS, ANCHOR BOLTS, NON-SHRINK GROUT, AND ELASTOMERIC BEARINGS SHALL BE INCLUDED IN PRICE BID FOR SUPERSTRUCTURE MODULES.

REVISED 6-16-2011: ADDED FIELD WELD FLAG AND MORE DETAIL TO NOTE 7

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS 70'-0 INTERIOR SPAN

BEARING DETAILS

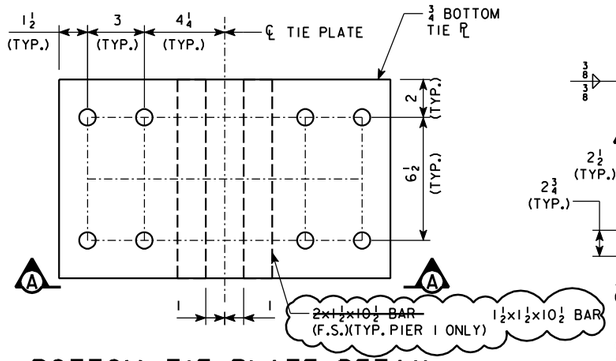
STA. 20+85.00 FEBRUARY, 2011

POTTAWATTAMIE COUNTY

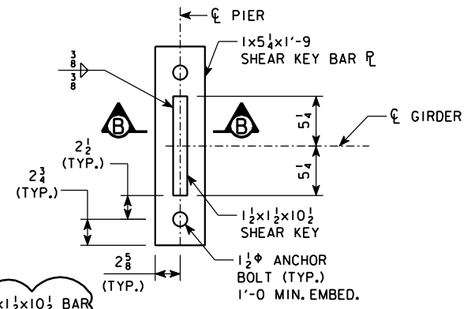
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 34 OF 41 FILE NO. 30387 DESIGN NO. 111

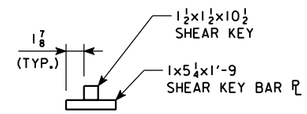
REVISED: JUNE 16, 2011



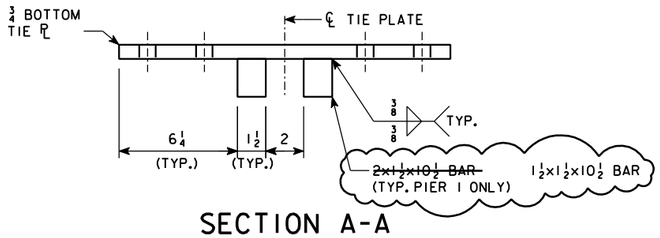
BOTTOM TIE PLATE DETAIL



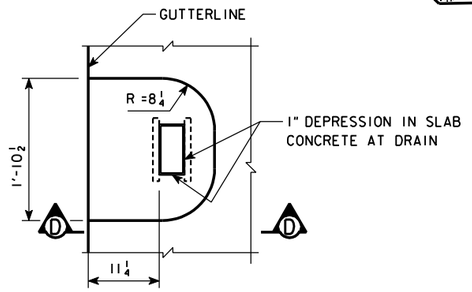
SHEAR KEY BASE PLATE DETAIL



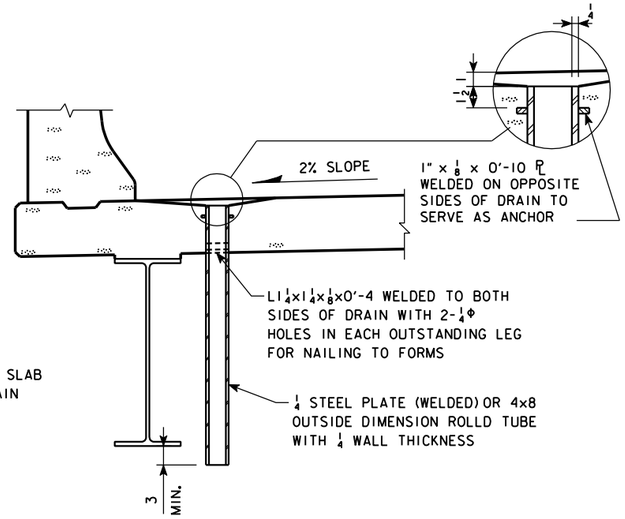
SECTION B-B



SECTION A-A

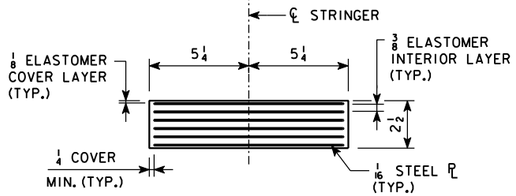


DECK DRAIN DETAILS

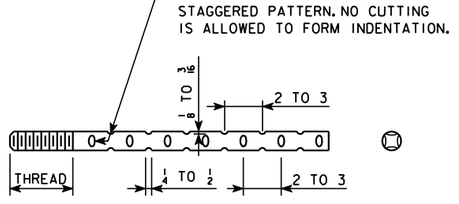


SECTION D-D

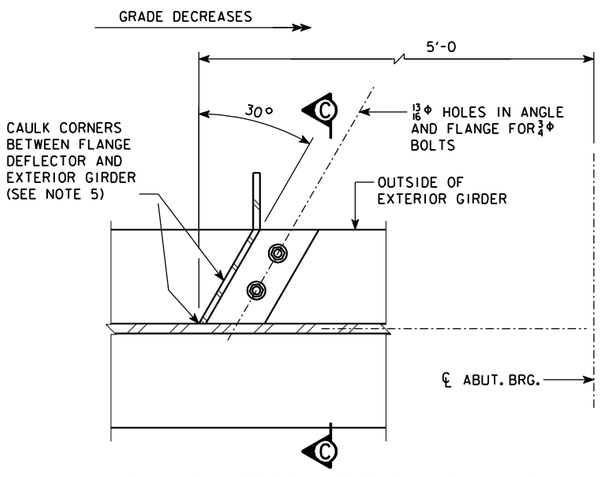
(REINFORCEMENT NOT SHOWN FOR CLARITY)



LAMINATED NEOPRENE BEARING PAD DETAIL

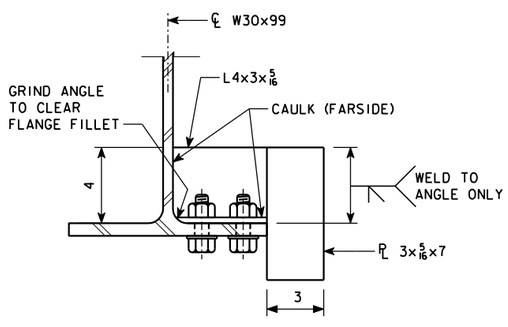


ANCHOR BOLT SWEDGE DETAIL



FLANGE DEFLECTOR DETAILS

(4 REQUIRED PER BRIDGE)



SECTION C-C

NOTES:

1. FOR GENERAL NOTES, SEE DESIGN SHEETS 2, 3 & 4.
2. CAUTION SHALL BE EXERCISED WHERE A FIELD WELD OR SHOP WELD WILL BE MADE WHILE ELASTOMERIC BEARING PADS ARE IN CONTACT WITH STEEL. IN NO CASE SHALL THE ELASTOMER BE EXPOSED TO INSTANTANEOUS TEMPS GREATER THAN 400°F.
3. PROVIDE 60 DUROMETER ELASTOMER WITH SHEAR MODULUS 175 PSI, IN ACCORDANCE WITH AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS.
4. FOR LOCATION OF BOTTOM TIE PLATE, SHEAR KEY BASE PLATE, AND ELASTOMERIC BEARING PAD, SEE DESIGN SHEET 34.
5. CAULKING MATERIAL SHALL BE DOW 888, CSL 342 JOINT SEALANT, OR CRAFCO ROADSAVER SILICONE NEUTRAL CURE AND NON-SAG SILICONE.
6. FOR DRAIN LOCATIONS, SEE DESIGN SHEETS 29 AND 32.

NOTE:

DRAINS ARE TO BE GALVANIZED. 12 DRAINS REQUIRED. SEE MODULE PLANS FOR LOCATION. COST FURNISHING AND INSTALLING DECK DRAINS SHALL BE INCLUDED IN PRICE BID FOR SUPERSTRUCTURE MODULES.

WEIGHT OF DRAINS IS SHOWN FOR INFORMATION ONLY.

DATA FOR ONE DRAIN	
WT. LBS.	68
LENGTH FT.	3'-6

REVISED 6-16-2011: CHANGED STRUCTURAL STEEL BAR SIZE ON TIE PLATE DETAIL

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS 70'-0 INTERIOR SPAN

MISCELLANEOUS DETAILS

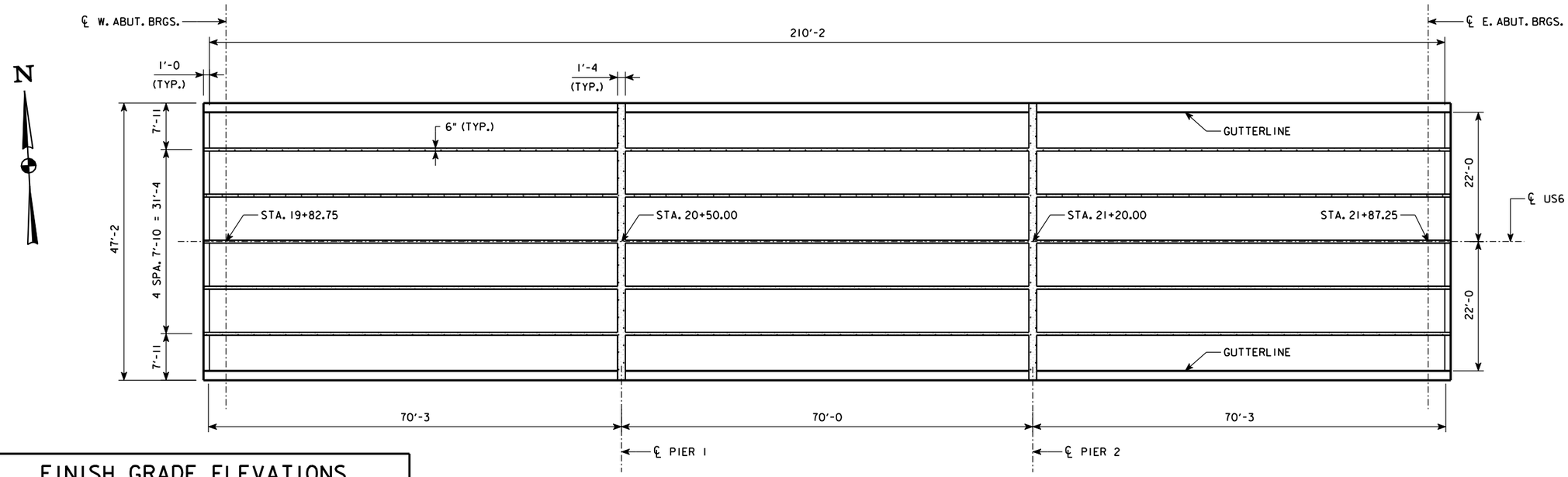
STA. 20+85.00 FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 35 OF 41 FILE NO. 30387 DESIGN NO. 111

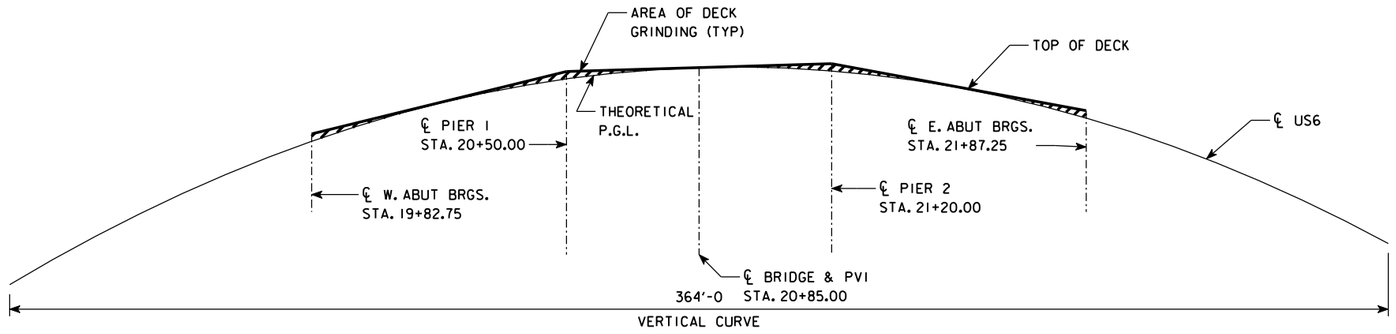
REVISED: JUNE 16, 2011



DECK PLAN

FINISH GRADE ELEVATIONS

	STATION	℄ US 6	GUTTERLINE
WEST ABUTMENT	19+82.75	1084.81	1084.37
	19+92.75	1084.84	1084.40
	20+02.75	1084.87	1084.43
	20+12.75	1084.90	1084.46
	20+22.75	1084.92	1084.48
	20+32.75	1084.94	1084.50
	20+42.75	1084.96	1084.52
PIER 1	20+50.00	1084.97	1084.53
	20+60.00	1084.98	1084.54
	20+70.00	1084.99	1084.55
	20+80.00	1085.00	1084.56
PVI	20+85.00	1085.00	1084.56
	20+95.00	1085.00	1084.56
	21+05.00	1085.00	1084.56
	21+15.00	1085.00	1084.56
PIER 2	21+20.00	1084.99	1084.55
	21+30.00	1084.98	1084.54
	21+40.00	1084.97	1084.53
	21+50.00	1084.96	1084.52
	21+60.00	1084.94	1084.50
	21+70.00	1084.91	1084.47
	21+80.00	1084.89	1084.45
EAST ABUTMENT	21+87.25	1084.87	1084.43



DECK GRINDING DIAGRAM
(100x vertical scale)

NOTES:

1. AFTER COMPLETION OF THE DECK CLOSURE POURS, THE TOP OF DECK SHALL BE SURVEYED AND COMPARED TO FINISHED GRADE ELEVATIONS. TOP OF DECK SHALL BE DIAMOND GROUND TO A MAXIMUM DEPTH OF $\frac{1}{2}$" TO MEET FINISHED DECK ELEVATIONS AND THEN MACHINE GROOVED. THE MINIMUM DECK THICKNESS AFTER GRINDING SHALL BE 8".
2. FOR CAST IN PLACE DECK JOINT REINFORCEMENT DETAILS, DESIGN SHEETS 23 AND 37.
3. FOR BARRIER CAST IN PLACE CLOSURE POUR DETAILS, SEE DESIGN SHEET 41.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

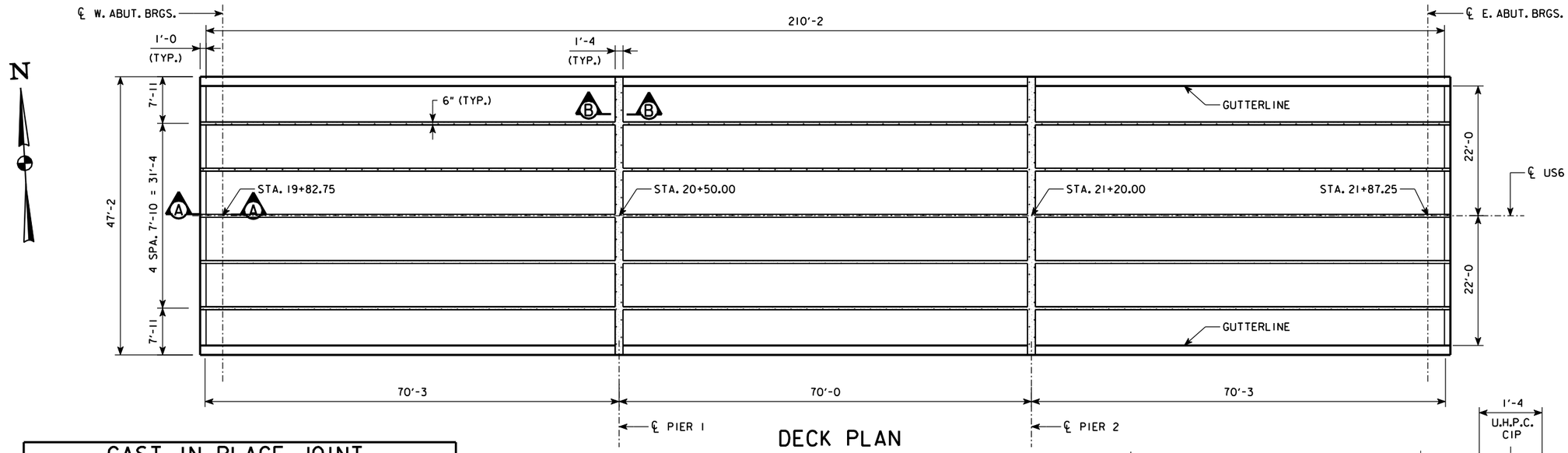
DECK ELEVATIONS

STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

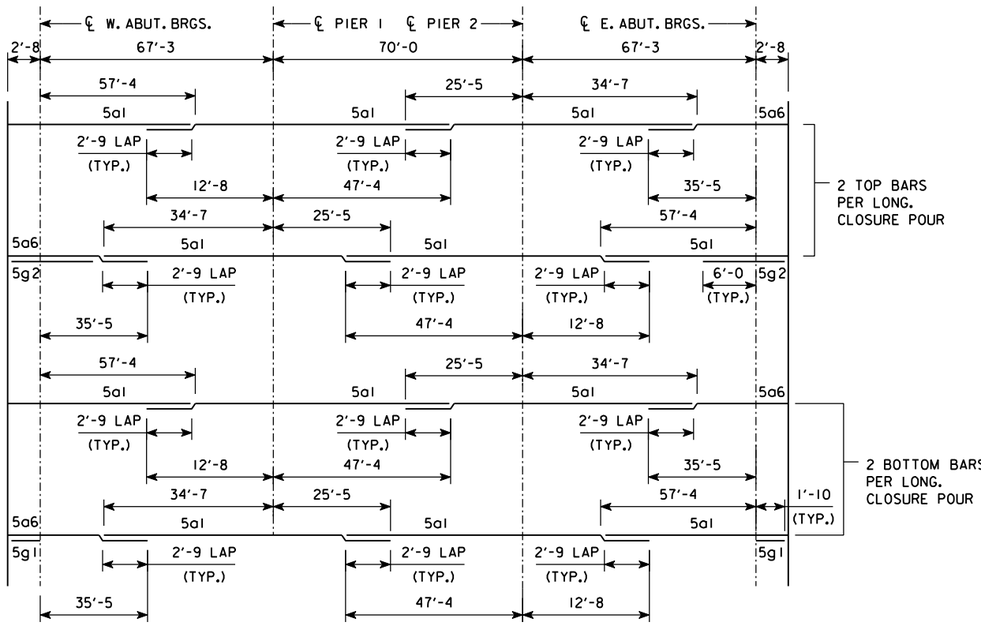
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 36 OF 41 FILE NO. 30387 DESIGN NO. 111

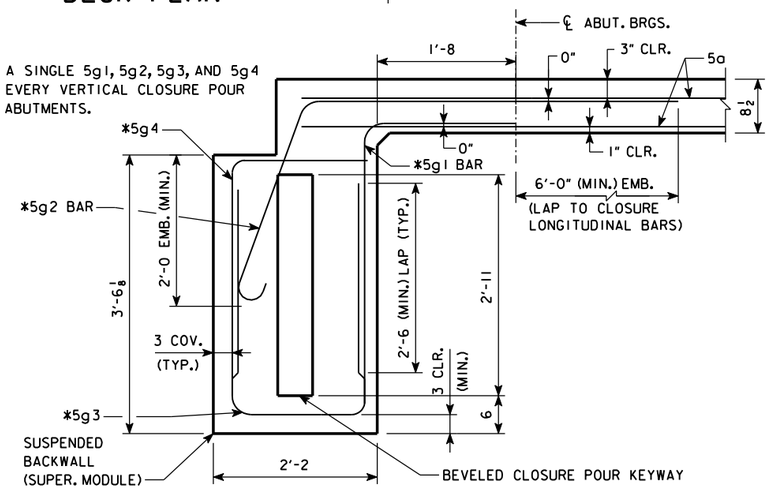


DECK PLAN

CAST IN PLACE JOINT CONCRETE PLACEMENT QUANTITIES	
LOCATION	QUANTITY
U.H.P.C. SUPERSTRUCTURE DECK JOINTS	21.6
TOTAL (CU. YD.)	21.6

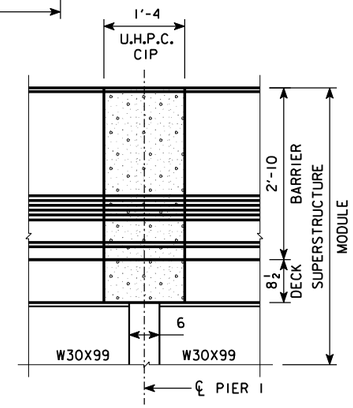


PLACEMENT FOR LONGITUDINAL JOINT REINFORCEMENT



SECTION A-A

(BARS FROM SUPERSTRUCUTRE MODULES NOT SHOWN FOR CLARITY)



SECTION B-B

(REINFORCEMENT NOT SHOWN FOR CLARITY - SEE NOTE 2)

CLOSURE POUR EPOXY COATED REINF. BAR LIST AND ESTIMATED QUANTITIES					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a1	LONG. JOINT		60	60'-0	3,755
5a6	LONG. JOINT		20	38'-1	794
6b6	TRANS. JOINT (BOTTOM)		6	46'-8	422
5b7	TRANS. JOINT (TOP)		6	46'-8	293
5g1	ABUTMENT VERTICAL EXTENSION - F.F.		10	5'-4	56
5g2	ABUTMENT VERTICAL EXTENSION - B.F.		10	12'-7	132
5g3	ABUTMENT VERTICAL STIRRUP		10	8'-5	88
5g4	ABUTMENT VERTICAL - B.F.		10	3'-11	51
				TOTAL (LBS)	5,590

NOTES:

1. FOR CAST IN PLACE DECK JOINT REINFORCEMENT DETAILS, DESIGN SHEET 23.
2. FOR BARRIER CAST IN PLACE JOINT DETAILS, SEE DESIGN SHEET 41.
3. LONGITUDINAL UHPC CLOSURE POURS SHALL BE INCLUDED IN PRICE BID FOR INTERIOR SUPERSTRUCTURE MODULES 1 AND 2. TRANSVERSE UHPC CLOSURE POURS SHALL BE INCLUDED IN PRICE BID FOR INTERIOR SUPERSTRUCTURE MODULE 2 AND EXTERIOR SUPERSTRUCTURE MODULE 2.
4. FOR BENT BAR DETAILS, SEE DESIGN SHEET 25.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

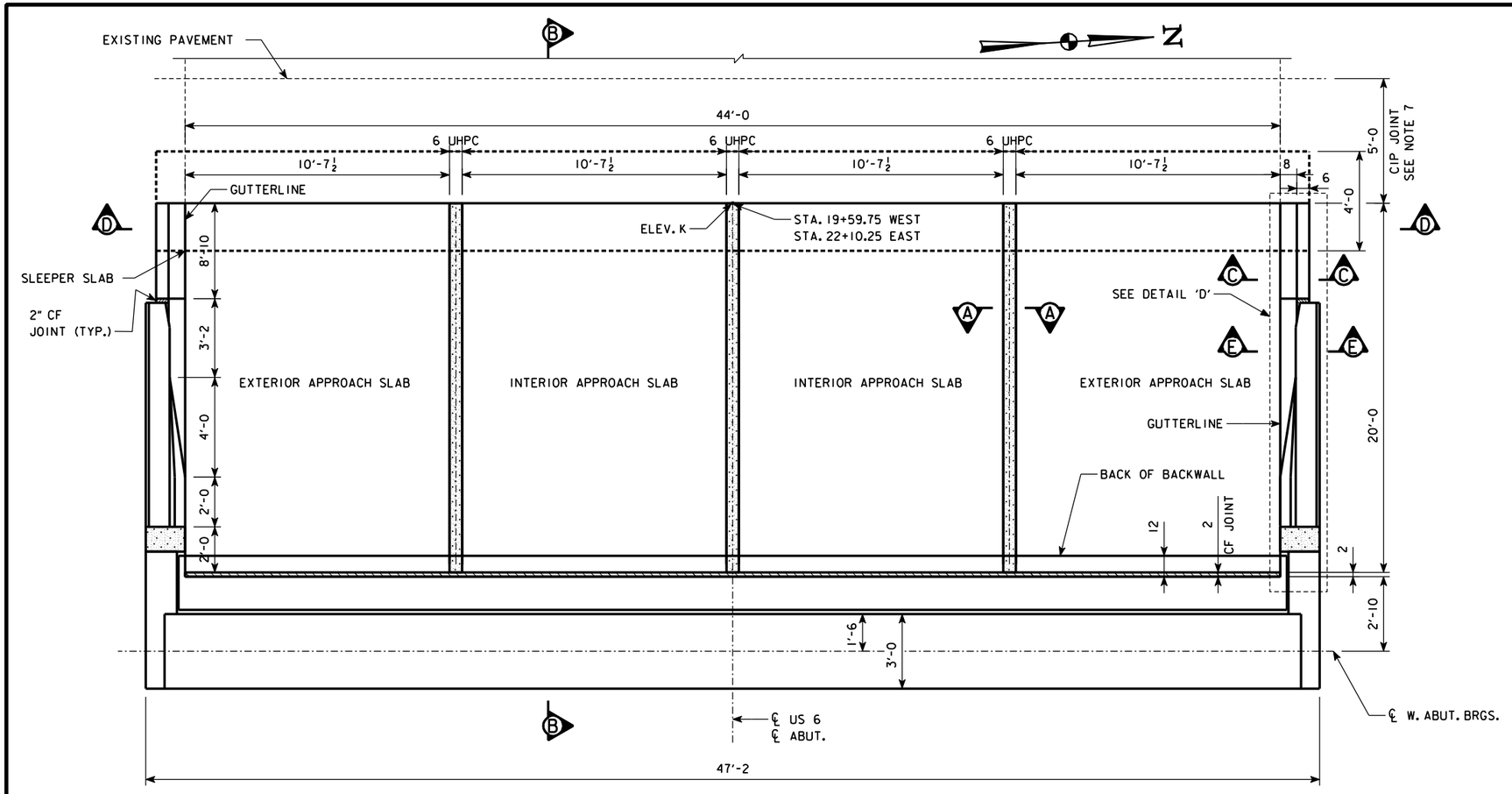
DECK CLOSURE POUR DETAILS

STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 37 OF 41 FILE NO. 30387 DESIGN NO. 111

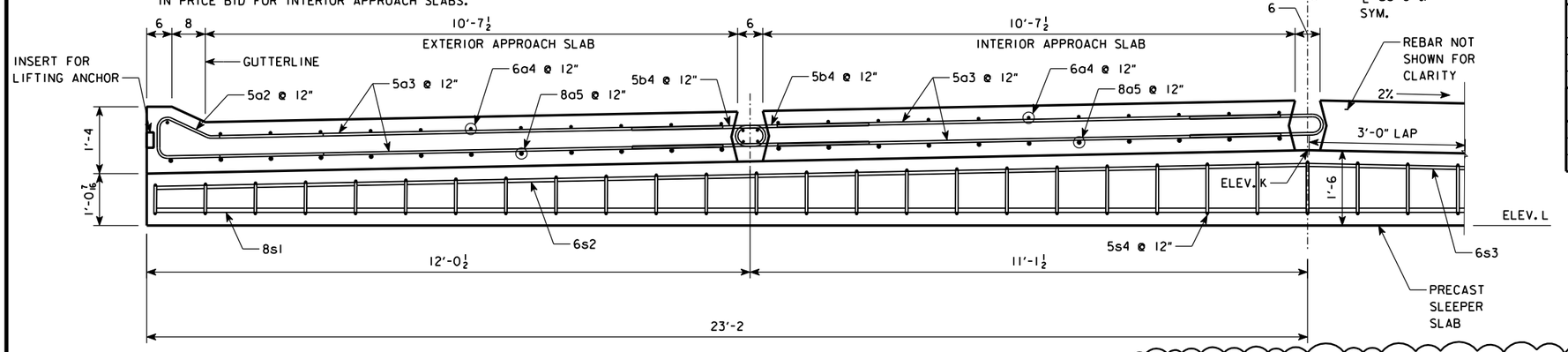


NOTES:

1. SEE ROADWAY PLANS FOR CONNECTION OF GUARDRAIL TO APPROACH BARRIER.
2. SEE DESIGN SHEET 40 FOR END BARRIER SECTION.
3. FOR ADDITIONAL SECTIONS AND DETAILS, AND BAR BENDING DIAGRAMS, SEE DESIGN SHEET 39.
4. LONGITUDINAL UHPC CLOSURE POURS ARE INCLUDED IN PRICE BID FOR INTERIOR APPROACH SLABS.
5. PRECAST APPROACH SLAB SHALL CONFORM TO PRECAST CONCRETE APPROACH SLAB ELEMENTS SPECIAL PROVISIONS.
6. USE 5b4 HAIRPIN BARS AS LIFTING POINTS WHEN AVAILABLE; OTHERWISE, INSERT LIFTING ANCHORS. CONTRACTOR SHALL SUBMIT LIFTING DETAILS FOR REVIEW AND APPROVAL.
7. 5'-0 TRANSVERSE CIP JOINT TO BE INCLUDED IN ROADWAY WORK. SEE ROADWAY SHEETS ELSEWHERE IN THIS PLAN.

APPROACH SLAB PLAN

(WEST ABUTMENT SHOWN, EAST ABUTMENT SIMILAR)



HALF-SECTION D-D

REVISED 6-16-2011: ADDED 5b5 BAR AND MODIFIED 5b4 BAR QUANTITY

EPOXY-COATED REINFORCING BAR LIST-INTERIOR PANELS

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5b4	APPROACH SLAB HAIRPIN	40	~~51~~	5'-6	~~293~~ 229
5a3	APPROACH SLAB TRANSVERSE BARS		40	10'-0	417
6a4	APPROACH SLAB TOP LONGITUDINAL		11	19'-6	322
8a5	APPROACH SLAB BOTTOM LONGITUDINAL		11	19'-6	573
5b5	APPROACH SLAB HAIRPIN		11	5'-7	64
	TOTAL, 4 UNITS - 1,605 LBS				6,420

EPOXY-COATED REINFORCING BAR LIST-EXTERIOR PANELS

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5b4	APPROACH SLAB HAIRPIN	26	~~37~~	5'-6	~~212~~ 149
5a2	APPROACH SLAB CURB		9	6'-8	63
5a3	APPROACH SLAB TRANSVERSE BARS		40	10'-0	417
6a4	APPROACH SLAB TOP LONGITUDINAL		11	19'-6	322
8a5	APPROACH SLAB BOTTOM LONGITUDINAL		11	19'-6	573
6a7	APP. SLAB CURB TOP LONGITUDINAL		1	8'-2	13
8a8	APP. SLAB CURB BOT. LONGITUDINAL		1	8'-2	22
6a9	APP. SLAB CURB TOP LONGITUDINAL		1	14'-0	21
8a10	APP. SLAB CURB BOT. LONGITUDINAL		1	14'-0	37
5b5	APPROACH SLAB HAIRPIN		11	5'-7	64
	TOTAL, 4 UNITS - 1,680 LBS				6,720

EPOXY-COATED REINFORCING BARS-CLOSURE POUR

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a6	APPROACH SLAB LONGITUDINAL CLOSURE		24	19'-6	488
				TOTAL	488

EPOXY-COATED REINFORCING BAR LIST-SLEEPER SLAB

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
8s1	SLEEPER SLAB BOTTOM		4	46'-0	492
6s2	SLEEPER SLAB TOP		4	26'-0	156
6s3	SLEEPER SLAB TOP		4	23'-0	138
5s4	SLEEPER SLAB HOOPS	□	47	9'-11	486
	TOTAL, 2 UNITS - 1,272 LBS				2,544

CONC. PLACEMENT QUANTITIES TWO APPROACHES

LOCATION	QUANTITY
INTERIOR PANEL	32 CY
EXTERIOR PANEL	34 CY
SLEEPER SLAB	18 CY
TOTAL (CU. YDS.)	84 CY

ESTIMATED QUANTITIES

ITEM	UNIT	TWO ABUTS. QUANTITY
HIGH PERFORMANCE STRUCTURAL CONCRETE	CU. YD.	84
REINFORCING STEEL EPOXY COATED	LBS.	16,172
ULTRA HIGH-PERFORMANCE CONCRETE	CU. YD.	2

ELEVATIONS

LOCATION	K	L
W. APPROACH	1083.72	1082.22
E. APPROACH	1083.79	1082.29

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

APPROACH SLAB PLAN

STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

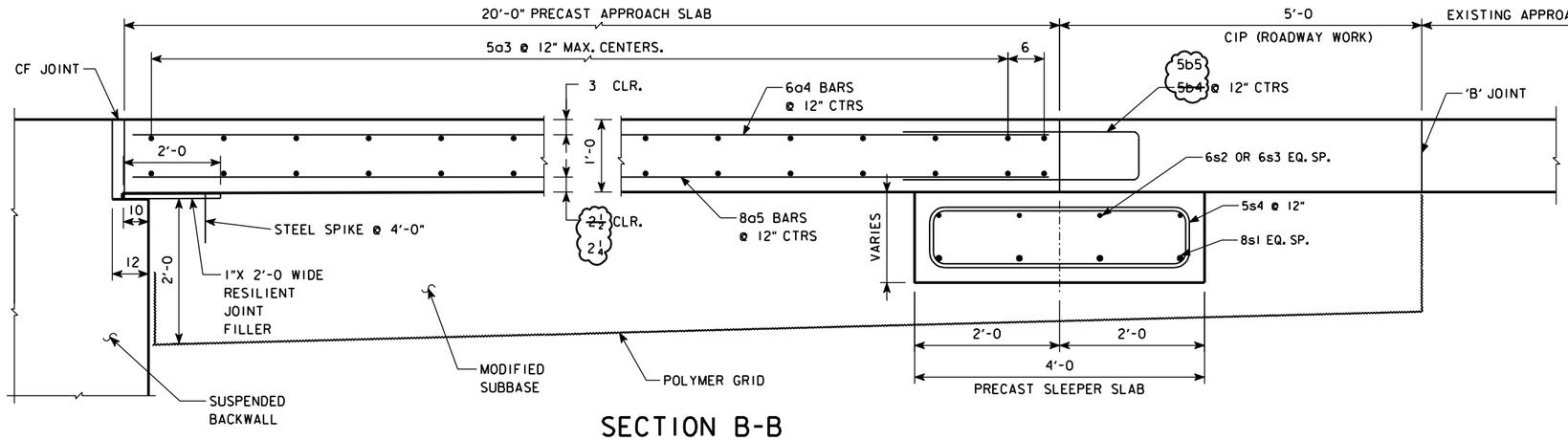
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 38 OF 41 FILE NO. 30387 DESIGN NO. 111

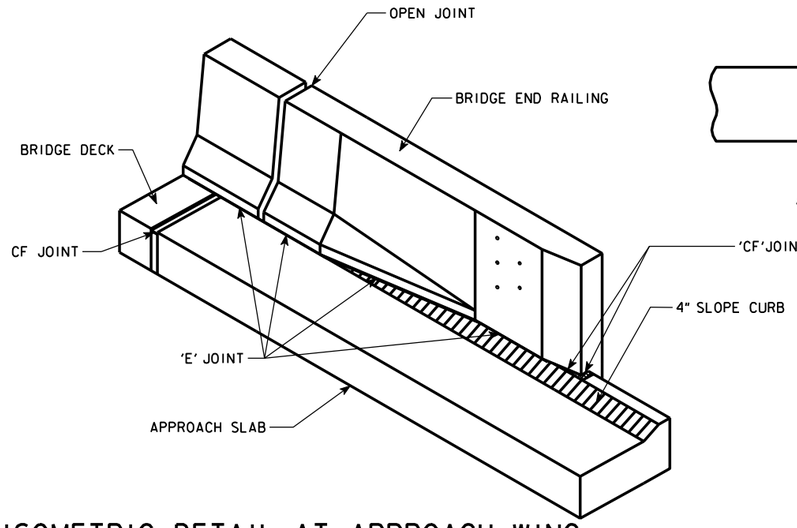
REVISED: JUNE 16, 2011

DESIGN TEAM HNTB | POTTAWATTAMIE COUNTY | PROJECT NUMBER BRF-006-1(114)-38-78 | SHEET NUMBER 39

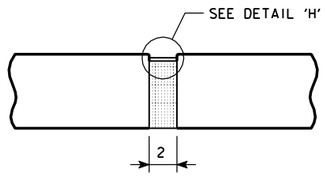
DGN$SYTIME0123456 DGN$USERNAME DGN$SPEC



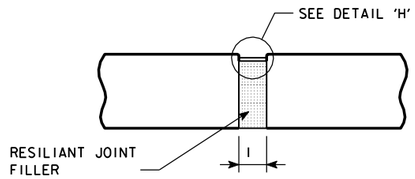
SECTION B-B



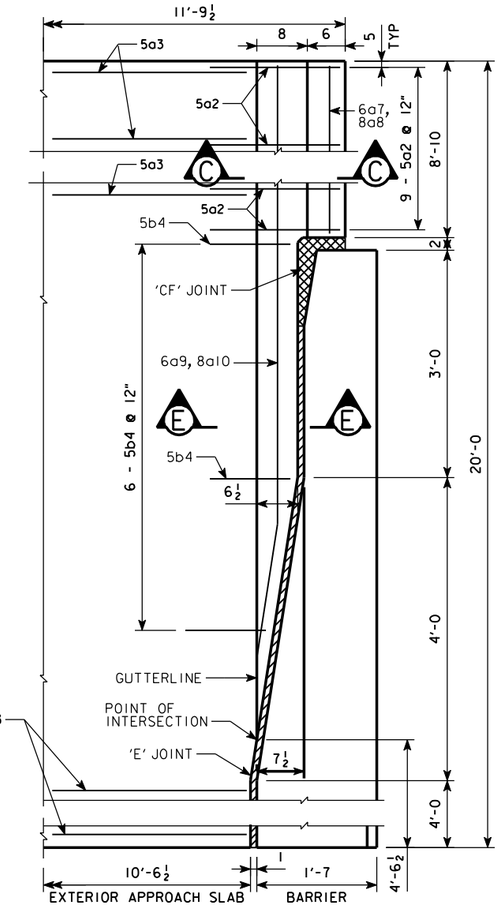
ISOMETRIC DETAIL AT APPROACH WING
(SHOWING JOINT BETWEEN APPROACH SLAB AND END RAILING)



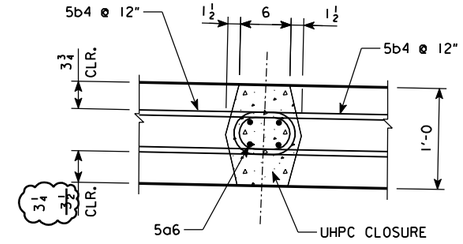
'CF' JOINT



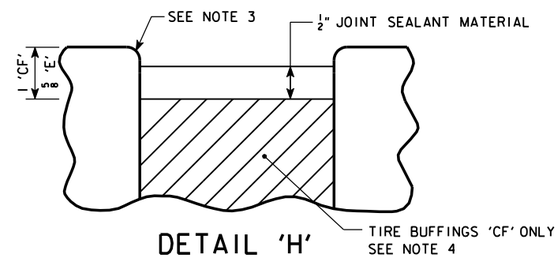
'E' JOINT



DETAIL 'D'
PART PLAN OF EXTERIOR APPROACH SLAB



SECTION A-A

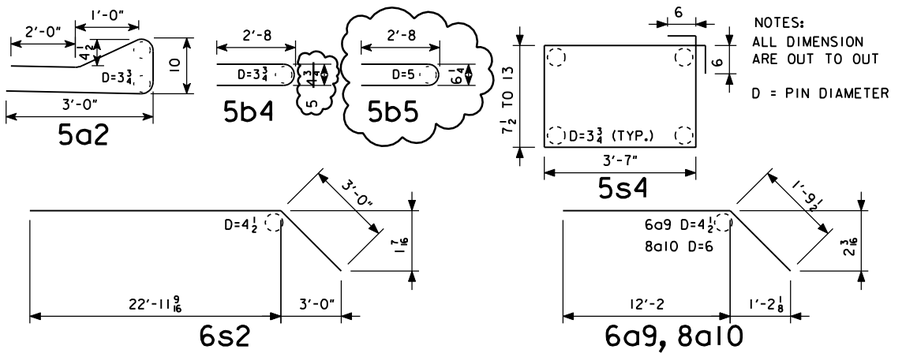


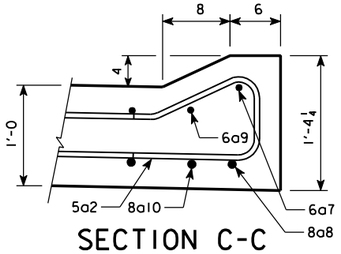
DETAIL 'H'

NOTES:

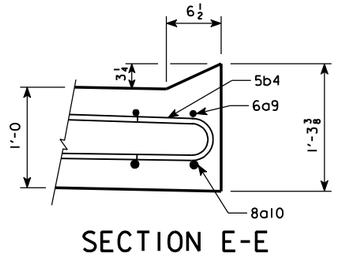
1. FOR LOCATION OF SECTIONS AND DETAILS, SEE DESIGN SHEET 38.
2. MINIMUM LAP LENGTHS AS FOLLOWS:
   #5 BAR - 17"
   #6 BAR - 24"
   #8 BAR - 45"
3. EDGE WITH ¼" TOOL FOR LENGTH OF JOINT INDICATED IF FORMED; EDGING NOT REQUIRED WHEN CUT WITH DIAMOND BLADE SAW.
4. COMPACT TIRE BUFFINGS BY SPADING WITH A SQUARE-NOSE SHOVEL.

BENT BAR DETAILS





SECTION C-C



SECTION E-E

REVISED 6-16-2011: ADDED 5b5 BAR, MODIFIED 5b4 BAR DETAIL AND CHANGED CLEAR COVER FOR SLAB BARS

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

APPROACH SLAB DETAILS

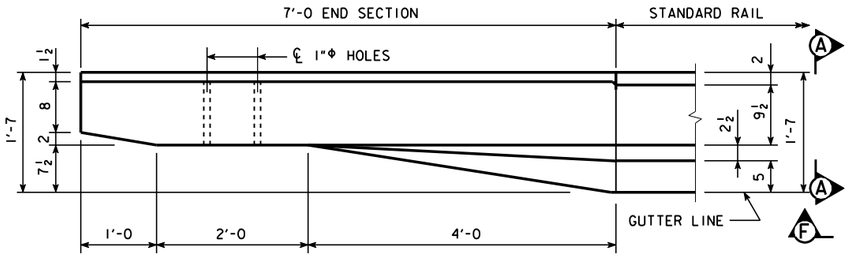
STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

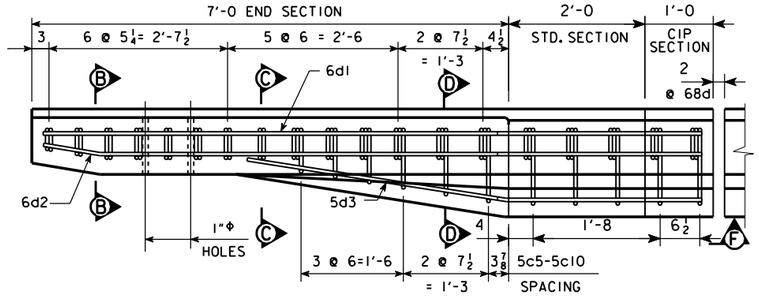
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 39 OF 41 — FILE NO. 30387 — DESIGN NO. 111

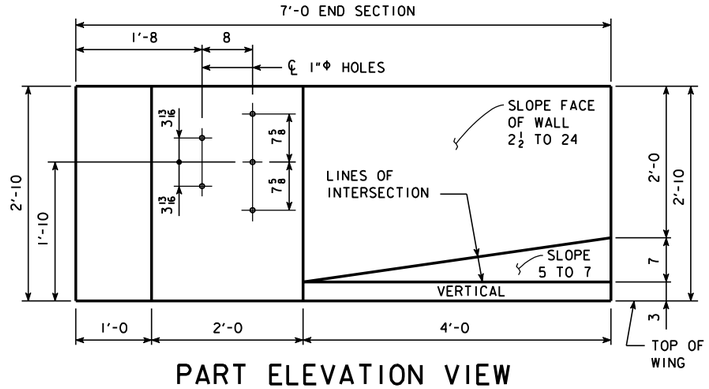
REVISED: JUNE 16, 2011



PART PLAN VIEW

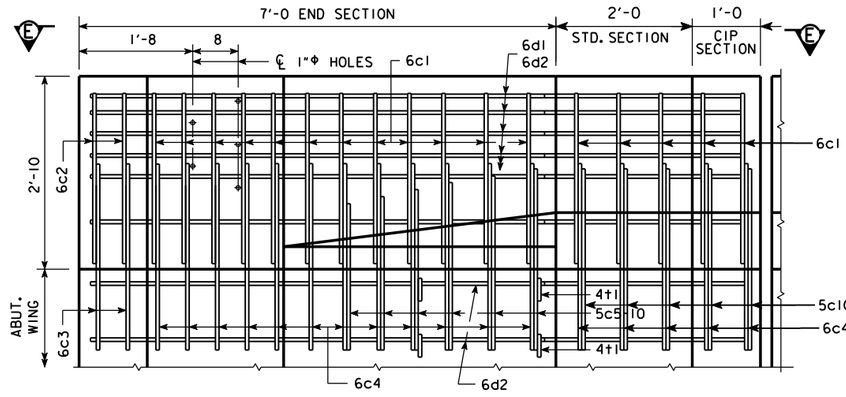


PART VIEW E-E

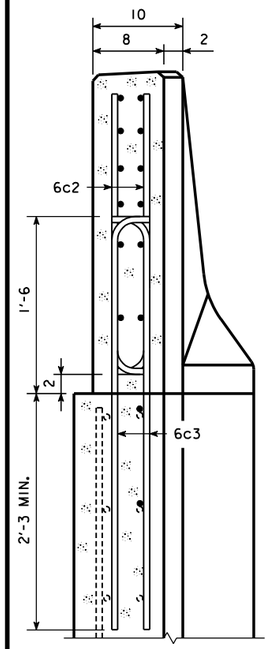


PART ELEVATION VIEW

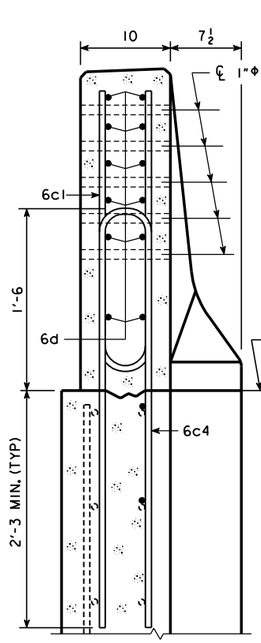
PROVIDE 5 HOLES FORMED WITH 1"Φ PLASTIC CONDUIT. COST TO BE INCLUDED IN PRICE BID FOR ABUTMENT WINGWALL.



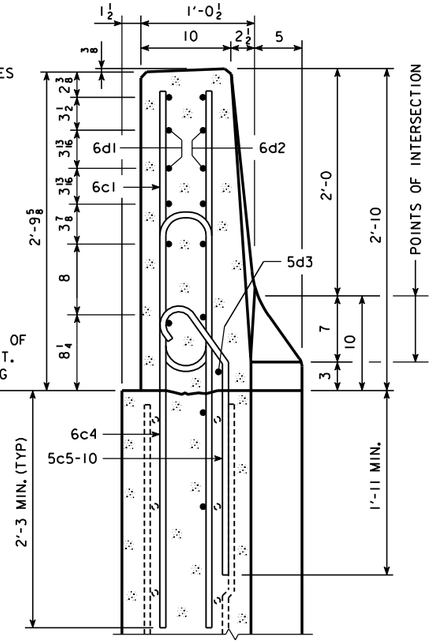
PART VIEW F-F



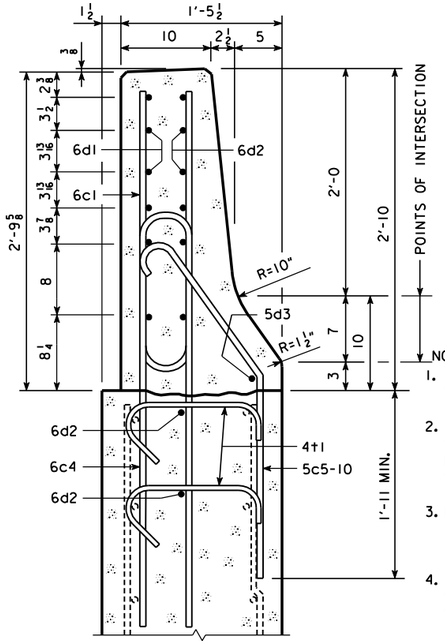
VIEW A-A



SECTION B-B



SECTION C-C



SECTION D-D

NOTES:

1. 4t1 PLACEMENT- 2 BARS EACH LEVEL OF 6d2 IN WING WALL.
2. THE 10" RADIUS AND 1½" RADIUS ARE TYPICAL AND SHALL BE USED WHEN CONSTRUCTING THE CORNERS FOR VIEW A-A, SECTION B-B, SECTION C-C AND SECTION D-D.
3. DASHED LINES BELOW THE TOP OF WING ARE THE ABUTMENT WING REINFORCING STEEL. SEE WING ABUTMENT SHEET FOR PLACEMENT.
4. WINGWALL BARRIER RAIL AND REINFORCEMENT SHALL BE INCLUDED IN PRICE BID FOR ABUTMENT WINGWALL.

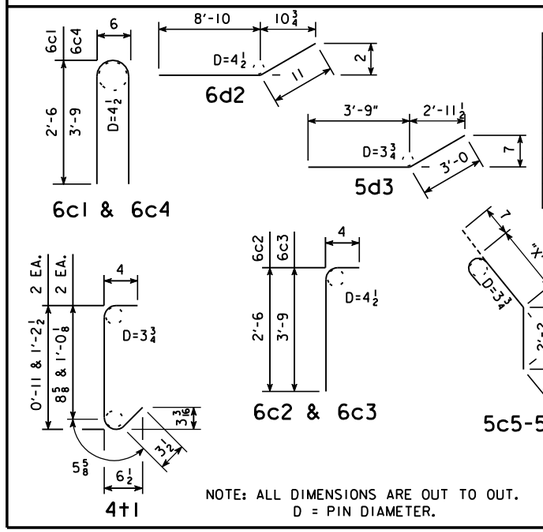
EPOXY REINFORCING STEEL - FOUR END SECTION

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c1	VERTICAL	⊓	53	5'-6	438
6c2	VERTICAL	⌐	16	2'-10	69
6c3	VERTICAL	⌐	16	4'-1	99
6c4	VERTICAL	⊓	53	8'-0	637
5c5-10	VERTICAL	⌐	24	VARIES	96
5c10	VERTICAL	⌐	5	4'-1	21
6d1	HORIZONTAL	—	24	9'-8	349
6d2	HORIZONTAL	—	32	9'-9	468
5d3	HORIZONTAL	—	4	6'-9	28
4t1	ABUTMENT WING TIE BARS	⊐	16	VARIES	21
(INCLUDE WITH WING WALL MODULE REINFORCING)		TOTAL WEIGHT (LBS.)			2226

CONCRETE PLACEMENT SUMMARY

SECTION	TOTAL
BARRIER RAIL ONE END SECTION	0.65 CU. YD.

BENT BAR DETAILS



BAR	"X"
5c5	0'-6½
5c6	0'-8½
5c7	0'-10¼
5c8	1'-0¼
5c9	1'-2
5c10	1'-4

NOTE: ALL DIMENSIONS ARE OUT TO OUT.
D = PIN DIAMETER.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

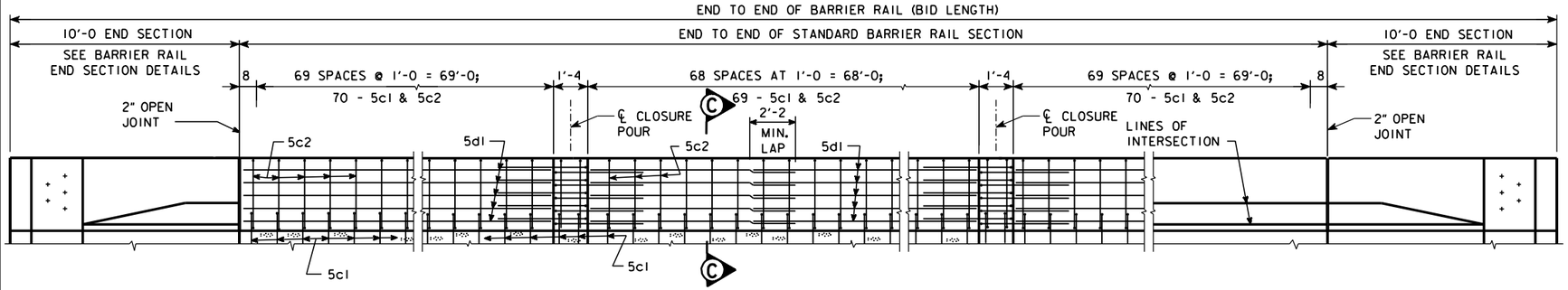
BARRIER RAIL END SECTION DETAILS

STA. 20+85.00 — FEBRUARY, 2011

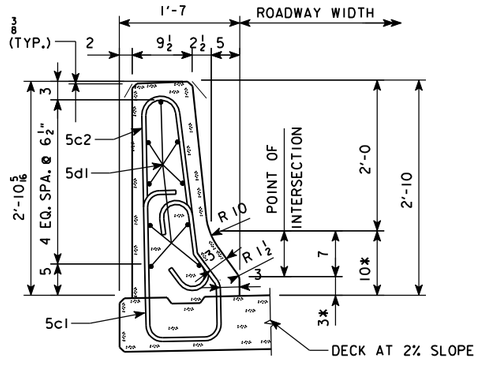
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 40 OF 41 FILE NO. 30387 DESIGN NO. 111

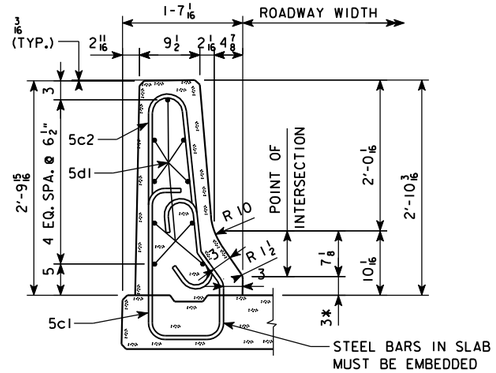


ELEVATION OF BARRIER RAIL LAYOUT



PART SECTION C-C AT FINAL ERECTED POSITION

*DENOTES THE MAXIMUM VALUE FOR THIS DIMENSION. THIS DIMENSION MAY VARY DUE TO CONSTRUCTION INACCURACIES.

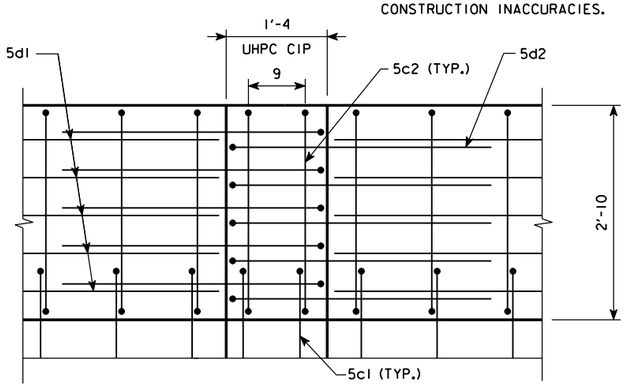


PART SECTION C-C AT HORIZONTAL CASTING OF EXTERIOR SUPERSTRUCTURE MODULE

*DENOTES THE MAXIMUM VALUE FOR THIS DIMENSION. THIS DIMENSION MAY VARY DUE TO CONSTRUCTION INACCURACIES.

BARRIER RAIL NOTES:

1. MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.
2. THE PERMISSIBLE CONSTRUCTION JOINTS ARE TO BE PLACED BETWEEN VERTICAL BARS AT A MINIMUM SPACING OF 20 FEET. CONSTRUCTION JOINT CONTACT SURFACES ARE TO BE COATED WITH AN APPROVED BOND BREAKER.
3. COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.
4. ALL BARRIER RAIL REINFORCING STEEL IS TO BE EPOXY COATED.
5. THE CONCRETE BARRIER RAIL SHALL BE INCLUDED IN PRICE BID FOR EXTERIOR SUPERSTRUCTURE MODULE 1 & 2. THIS SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, INCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS.
6. THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.
7. TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL ℄ GRADE.
8. CROSS SECTIONAL AREA OF THE STANDARD SECTION OF THE BARRIER RAIL = 2.84 SQUARE FEET.
9. UHPC CONCRETE CLOSURE POURS ARE INCLUDED IN PRICE BID FOR EXTERIOR SUPERSTRUCTURE MODULE 2.
10. OUTSIDE FACE OF BARRIER SHALL BE VERTICAL IN THE FINAL ERECTED POSITION. THE BARRIER WILL HAVE TO BE CAST 2% FROM VERTICAL SO THAT IT IS VERTICAL IN THE FINAL ERECTED POSITION. CONTRACTOR IS ALERTED TO THE FACT THAT ALL FORMWORK AND REINFORCING WILL NEED TO BE ADJUSTED ACCORDINGLY.

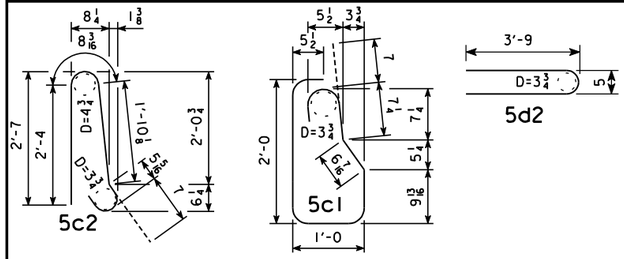


BARRIER CLOSURE POUR REINFORCEMENT DETAIL

EPOXY REINF. STEEL-TWO BARRIER RAILS

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTION	5c1	VERTICAL - SEE SUPERSTRUCTURE MODULE DETAILS		-	6'-0	-
	5c2	VERTICAL		209	5'-11	1,290
	5d1	LONGITUDINAL		54	35'-4	1,990
	5d2	LONG. HAIRPIN		30	7'-11	248
CLOSURE POURS	5c1	VERTICAL		8	6'-0	50
	5c2	VERTICAL		8	5'-11	49
BARRIER RAIL				2 AT 3,627 LBS.		
(INCLUDE WITH SUPERSTRUCTURE REINFORCING)				TOTAL (LBS)		7,254

BENT BAR DETAILS



NOTE:
ALL DIMENSIONS ARE OUT TO OUT.
D = PIN DIAMETER.

CONCRETE PLACEMENT SUMMARY

SECTION		TOTAL
STANDARD SECTION	418'-4 @ 0.1052 CU.YD. PER FT.	44.0
	TOTAL (CU. YD.)	44.0

CAST IN PLACE JOINT CONCRETE PLACEMENT SUMMARY

SECTION		TOTAL
U.H.P.C. BARRIER CLOSURE POURS	5'-4 @ 0.1052 CU.YD. PER FT.	0.6
	TOTAL (CU. YD.)	0.6

CONCRETE BARRIER RAIL QUANTITIES

ITEM	UNIT	QUANTITY
CONCRETE BARRIER RAILING	L.F.	464

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS — 70'-0 INTERIOR SPAN

BARRIER DETAILS

STA. 20+85.00 — FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 41 OF 41 FILE NO. 30387 DESIGN NO. 111

DGN$SYTIME0123456 DGN$USERNAME DGN$SPEC

ESTIMATED PIPE AND FLUME QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2402-2720000	EXCAVATION, CLASS 20	CY	355	
2	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT)	CY	83.4	
3	2404-7775000	REINFORCING STEEL	LB	14,284	
4	2526-8285000	CONSTRUCTION SURVEY	LS	1.00	

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
1	2402-2720000	EXCAVATION, CLASS 20 - -
2	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT) INCLUDES ALL PREFORMED EXPANSION JOINT FILLER REQUIRED.
3	2404-7775000	REINFORCING STEEL - -
4	2526-8285000	CONSTRUCTION SURVEY - -

NOTE:
ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

HYDRAULIC DESIGN

LICENSED PROFESSIONAL ENGINEER
William L. Kaufman
15098
IOWA

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.

William L. Kaufman — 12-06-2010
Signature — Date

William L. Kaufman
Printed or Typed Name

My license renewal date is December 31, 2011

Pages or sheets covered by this seal: SHEET 45 OF 87

STRUCTURAL DESIGN

LICENSED PROFESSIONAL ENGINEER
David L. Bare
15597
IOWA

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.

12-06-2010
Signature — Date

David L. Bare
Printed or Typed Name

My license renewal date is December 31, 2012

Pages or sheets covered by this seal: SHEETS 43 THRU 49 OF 87

DESIGN FOR
8'-0 x 5'-0 REINFORCED CONCRETE FLUME
QUANTITIES

STA. 19+12.12 (US 6) FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 7 FILE NO. 30387 DESIGN NO. 211

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GENERAL NOTES:

IT IS THE INTENT OF THIS DESIGN TO CONSTRUCT AN 8'-0 x 5'-0 REINFORCED CONCRETE FLUME AT STATION 19.27 ON US 6, 80.57 RT.

THE WEIGHT OF EARTH IS ASSUMED AS 140 PCF. FOR LATERAL EARTH LOADS EQUIVALENT FLUID PRESSURE IS ASSUMED AS 36 PSF/FT. Z = 170 k/in FOR CRACK CONTROL.

FAINT LINES ON PLANS INDICATE EXISTING STRUCTURE.

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

BELL JOINTS SHALL BE PLACED ON THE UPSTREAM END OF THE BARREL SECTIONS.

ALL CONSTRUCTION JOINTS ARE TO BE FORMED WITH BEVELED 2 x 4 KEYWAYS, EXCEPT AT BELL JOINTS.

FLOOR OF BARREL IS TO BE FINISHED SMOOTH. SIDES OF FOOTING ARE TO BE FORMED TO INSURE CORRECT LINE AND GRADE.

METAL BAR CHAIRS SPACED AT NOT OVER 3'-0 C.-C. IN EITHER DIRECTION ARE TO BE USED TO SUPPORT ALL SLAB AND FLOOR STEEL AS OUTLINED IN THE STANDARD SPECIFICATIONS.

THE REINFORCEMENT SUPPLIED FOR THIS STRUCTURE SHALL BE GRADE 60.

REINFORCING BAR CLEARANCES WILL BE AS FOLLOWS:

EDGE CLEARANCES 2" EXCEPT
TOP OF FLOOR 2¼" TO NEAR TRANSV. REINF. BAR
BOTTOM OF FLOOR 3½" TO NEAR TRANSV. REINF. BAR

END CLEARANCES:
VERTICAL TOP 2"
VERTICAL BOTTOM 3½"
TRANSVERSE 2"

KEYWAY DIMENSIONS SHOWN ON THE PLANS ARE BASED ON NOMINAL DIMENSIONS UNLESS STATED OTHERWISE. IN ADDITION, THE BEVEL USED ON THE KEYWAY SHALL BE LIMITED TO A MAXIMUM OF 10 DEGREES FROM VERTICAL.

THESE FLUME PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5a1 IS $\frac{5}{8}$ INCH DIAMETER BAR). ENGLISH REINFORCING STEEL RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING "BAR DESIGNATION". THE "BAR DESIGNATION" IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

ENGLISH SIZE	3	4	5	6	7	8	9	10	11
BAR DESIGNATION	10	13	16	19	22	25	29	32	36

WHEN DE-WATERING PRESENTS A PROBLEM FOR PLACING THE CURTAIN WALLS AS DETAILED, ALTERNATE METHODS SUCH AS STEEL SHEET PILE AND PRECAST CONCRETE WALLS MAY BE APPROVED BUT AT NO ADDITIONAL COST. THE CULVERT CONTRACTOR IS TO SUBMIT TO THE ENGINEER FOR APPROVAL COMPLETE DRAWINGS OF THE PROPOSED CURTAIN WALL ALTERNATE BEFORE BEGINNING CONSTRUCTION.

SUMMARY OF REINFORCING STEEL

LOCATION	QUANTITY	TOTAL
HEADWALL 0° SKEW 8'-0 x 6'-0	1 AT 2306	2306
FLUME 8'-0 x 5'-0	1 AT 8155	8155
FLUME CHUTE BELL JOINTS (2 REQ'D.)	2 AT 382	764
FLUME BASIN 8'-0 x 5'-0	1 AT 3059	3059
	TOTAL (LBS.)	14284

CONCRETE PLACEMENT QUANTITIES

LOCATION	FOOTING	WALLS	TOTAL
HEADWALL 0° SKEW 8'-0 x 6'-0	1 AT 11.7	1 AT 5.0	16.7
FLUME 8'-0 x 5'-0	1 AT 31.8	1 AT 17.1	48.9
FLUME CHUTE BELL JOINTS (2 REQ'D.)	2 AT 1.5 = 3.0	2 AT 0.6 = 1.2	4.2
FLUME BASIN 8'-0 x 5'-0	1 AT 10.0	1 AT 3.6	13.6
TOTAL (CU. YDS.)			83.4

SPECIFICATIONS:

DESIGN: AASHTO SERIES OF 1992.

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 1992.

REINFORCING STEEL IN ACCORDANCE WITH SECTION 8, GRADE 60.

CONCRETE IN ACCORDANCE WITH SECTION 8, f'c = 3,500 PSI.

NOTE:
POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN THESE PLANS.

DESIGN FOR

8'-0 x 5'-0 REINFORCED CONCRETE FLUME

NOTES AND QUANTITIES

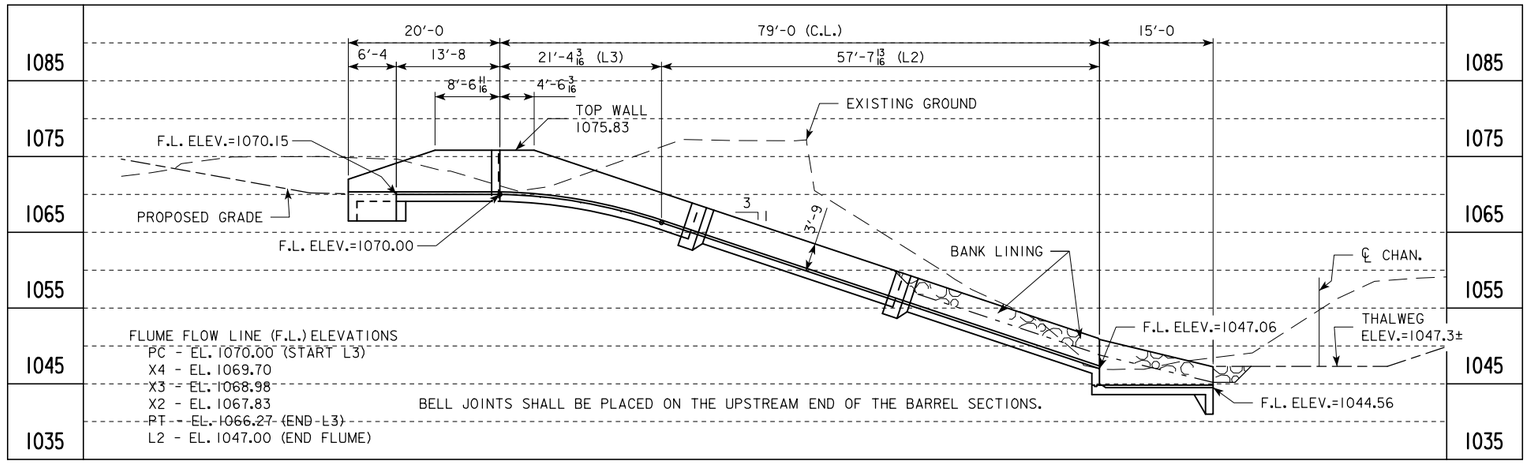
STA. 19+12.12 (US 6) FEBRUARY, 2011

POTTAWATTAMIE COUNTY

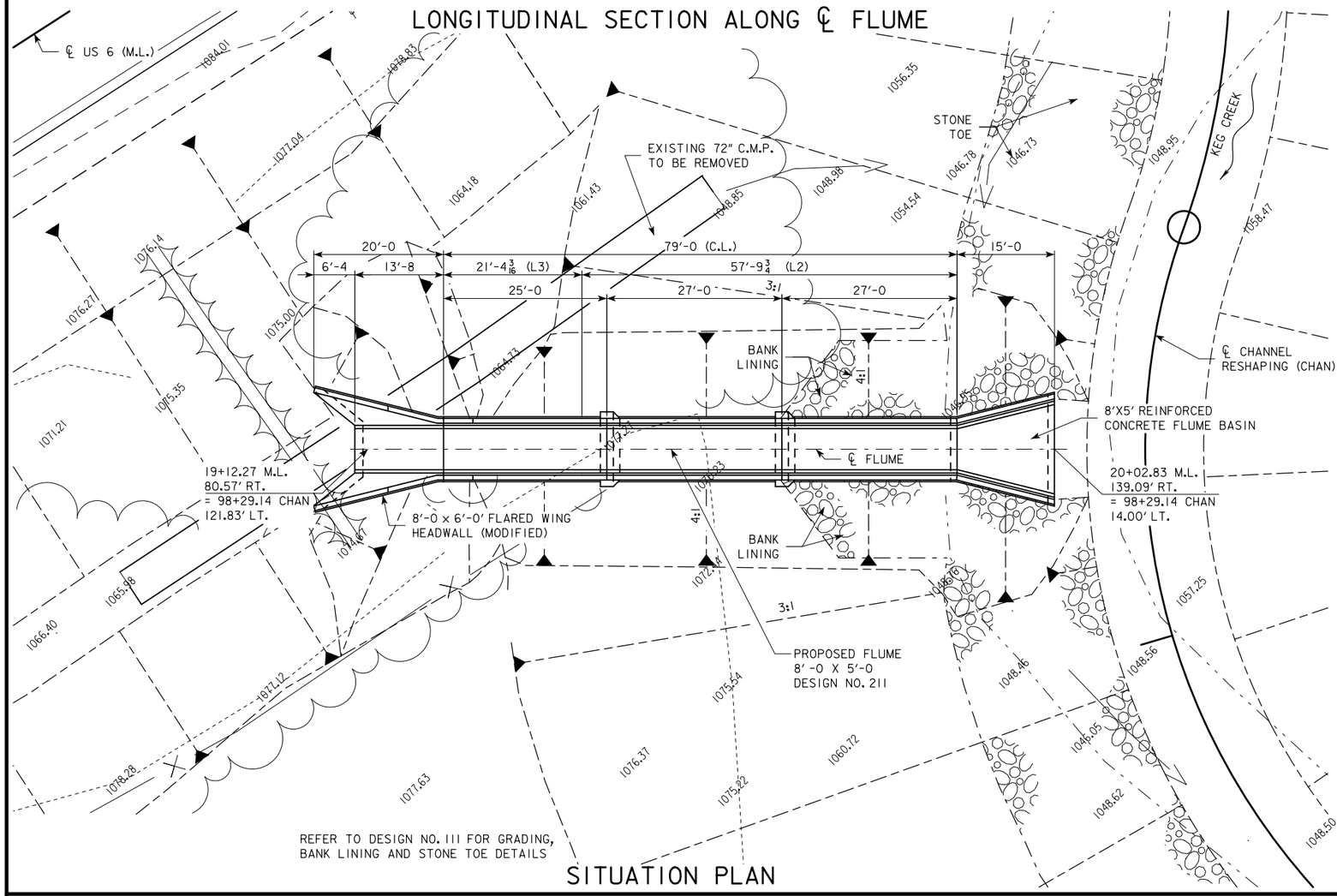
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 7 FILE NO. 30387 DESIGN NO. 211

BM NO. 501 STA. 19+90.2, 15.4' RT., D.O.T. PLUG S.W. COR. BRIDGE WING, EL. = 1087.55



LONGITUDINAL SECTION ALONG ℄ FLUME



REFER TO DESIGN NO. 111 FOR GRADING, BANK LINING AND STONE TOE DETAILS

SITUATION PLAN

HYDRAULIC DATA

DRAINAGE AREA = 210 AC

Q10= 175 CFS
HIGH WATER = EL. 1073.69

Q50= 250 CFS
DESIGN HIGH WATER = EL. 1074.67

HIGH WATER REFLECTS ENERGY GRADE AT FLUME CREST.

LOCATION

NEAR US 6 FLOWING INTO KEG CREEK
T-75 N R-42 W
SECTION 15
HARDIN TOWNSHIP
POTTAWATTAMIE COUNTY

DESIGN FOR

8'-0 x 5'-0 REINFORCED CONCRETE FLUME

SITUATION PLAN

STA. 19+12.12 (US 6) FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 7 FILE NO. 30387 DESIGN NO. 211

DESIGN TEAM JDC / DLB | POTTAWATTAMIE COUNTY | PROJECT NUMBER BRF-006-1(114)--38-78 | SHEET NUMBER 45

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BILL OF REINFORCING FOR ONE HEADWALL 0° SKEW 8'-0 x 6'-0

LOCATION	SHAPE	BAR	8' X 6' NO.	LENGTH	WT.
FENCE ANCHOR		5fa	2	3'-1	6
WINGWALL, B.F.H.		4b1	2	22'-11	31
WINGWALL, B.F.H.		4b2	8 VAR	2 EACH 12'-2 TO 21'-6	90
WINGWALL, F.F.H.		5b3	2	22'-11	48
WINGWALL, F.F.H.		5b4	8 VAR	2 EACH 12'-2 TO 21'-6	140
WINGWALL, F.F.V.		4c1	40 VAR	2'-7 TO 6'-3	137
WINGWALL, B.F.V.		5c3	12 VAR	2 EACH 2'-7 TO 4'-3	43
WINGWALL, B.F.V.		5c4	28 VAR	8'-7 TO 10'-3	289
APRON, LONGIT., BOTT.		5d1	8	15'-6	129
APRON, LONGIT., BOTT.		5d2	6	17'-4	108
APRON, LONGIT., TOP		6f1	8	15'-6	186
APRON, LONGIT., TOP		6f2	10 VAR	2 EACH 5'-9 TO 11'-3	77
APRON, LONGIT., TOP		6f3	2	22'-5	67
APRON, TRANS., TOP		6m1	25 VAR	9'-4 TO 15'-9	339
APRON, TRANS., BOTT.		6m2	24 VAR	3'-9 TO 9'-3	117
CURTAIN, HORIZONTAL		6p1	4	8'-6	51
CURTAIN, HORIZONTAL		6p2	8	11'-1	133
WING SLOPE, BOTH F.		6s2	4	23'-0	138
WING SLOPE, F.F		6s3	2	23'-0	69
CURTAIN, VERT.		5t1	16	6'-6	108

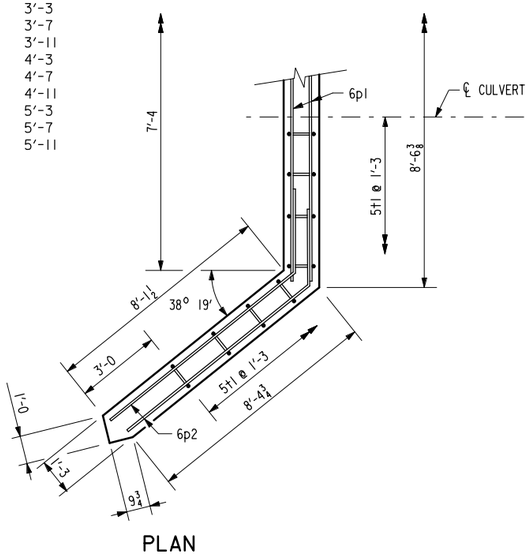
ESTIMATED QUANTITIES ONE HEADWALL			
REINF. STEEL		2306 lbs.	
CONCRETE	WINGWALLS	5.0	16.7 cu. yd.
	FOOTINGS	11.7	

BAR 5b4 & 4b2
8 BARS
4 VAR. - 2 EA. LGTH.
12'-2
15'-3
18'-5
21'-6

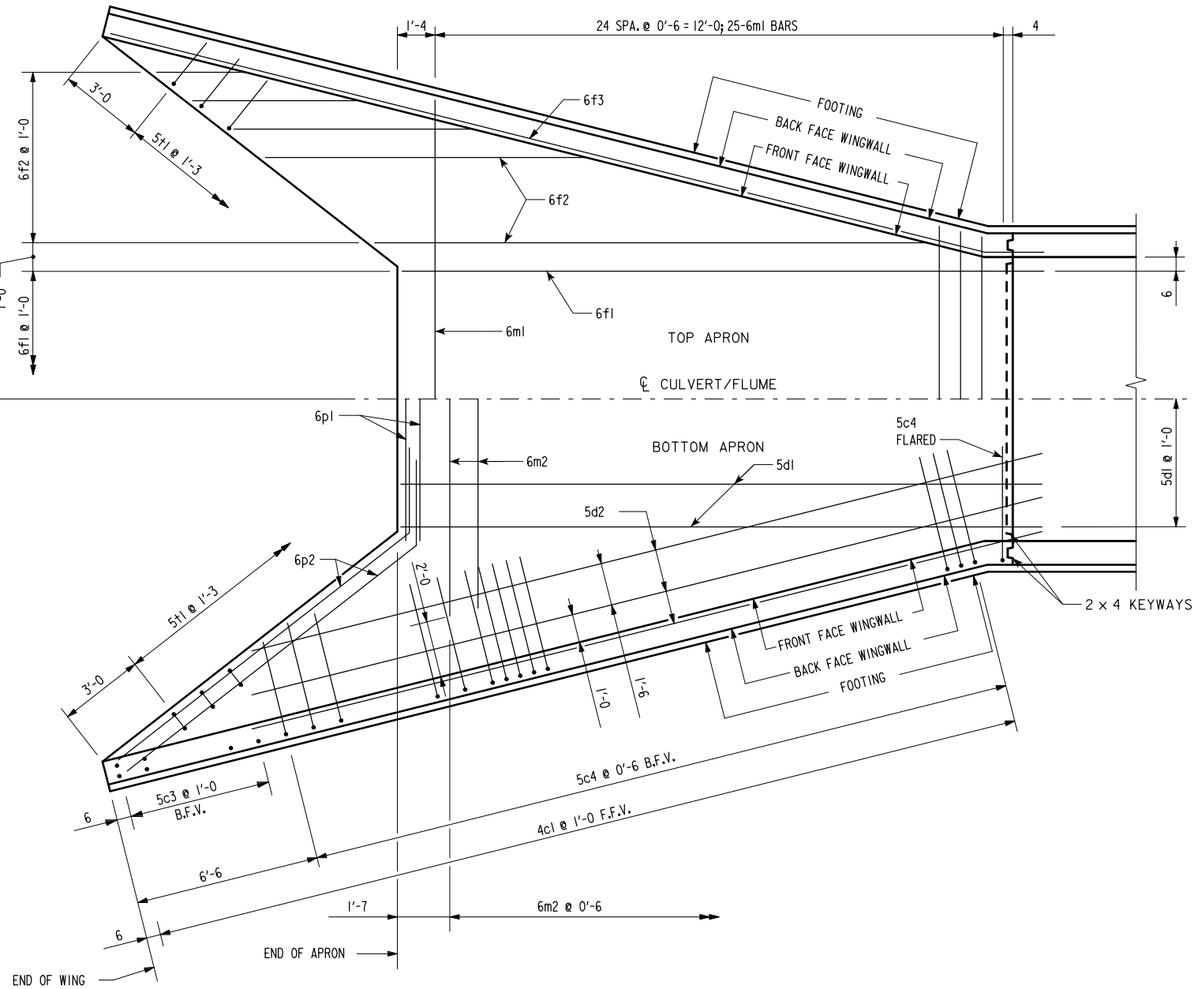
BAR 5c4
28 BARS
18 @ 10'-3
10 VAR. - 2 EA. LGTH.
8'-7
8'-11
9'-3
9'-7
9'-11

BAR 5c3
12 BARS
6 VAR. - 2 EA. LGTH.
2'-7
2'-11
3'-3
3'-7
3'-11
4'-3

BAR 4c1
40 BARS
18 @ 6'-3
11 VAR. - 2 EA. LGTH.
2'-7
2'-11
3'-3
3'-7
3'-11
4'-3
4'-7
4'-11
5'-3
5'-7
5'-11

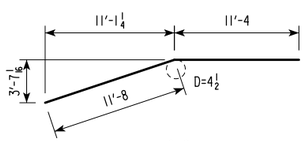


PLAN

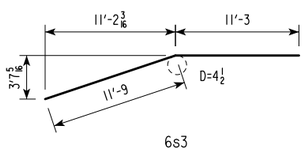


PLAN VIEW - TOP & BOTTOM OF APRON REINFORCING BARS

BENT BAR DETAILS



6s2



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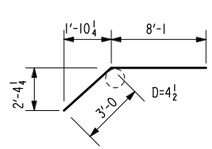

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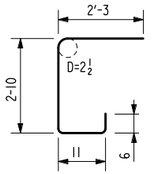
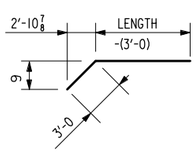
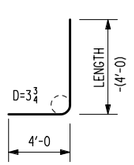


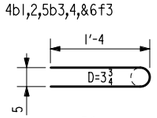
5t1



4b1,2,5b3,4,&6f3



5c4



5fa

NOTE:
ALL DIMENSIONS ARE OUT TO OUT.
D = PIN DIAMETER.

HEADWALL NOTES:

THIS HEADWALL IS BASED ON A 3:1 SLOPE.

THE SIDES OF THE FOOTING ARE TO BE FORMED TO INSURE CORRECT LINE AND GRADE.

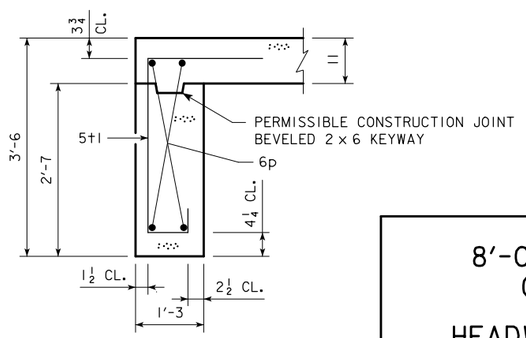
ALL EXPOSED CORNERS OF 90° OR SHARPER ARE TO BE FILLETED WITH A 3/4" DRESSED AND BEVELED STRIP.

ALL REINFORCING IS TO BE SECURELY WIRED IN PLACE BEFORE THE CONCRETE IS POURED. ALL FLOOR REINFORCING STEEL IS TO BE SUPPORTED BY BAR CHAIRS AT INTERVALS OF NOT MORE THAN 3'-0 IN EITHER DIRECTION AS OUTLINED IN THE STANDARD SPECIFICATIONS.

CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN. CLEARANCE TO THE BOTTOM ENDS OF VERTICAL BARS SHALL BE 3 INCHES.

HORIZONTAL TAILS OF BARS "b" & "s" ESTIMATED TO EXTEND 2'-6 BEYOND END OF WINGWALL (INTO END OF FLUME). LONGITUDINAL BARS "d", "6f1", AND "6f3" ESTIMATED TO PROJECT INTO END OF FLUME A MINIMUM OF 2'-0 BEYOND END OF WINGWALL.

THE "LENGTH" COLUMN REFLECTS TOTAL NUMBER OF FEET NECESSARY TO MEET THESE REQUIREMENTS.



SECTION

CURTAIN WALL DETAILS

DESIGN FOR
8'-0 x 5'-0 REINFORCED CONCRETE FLUME

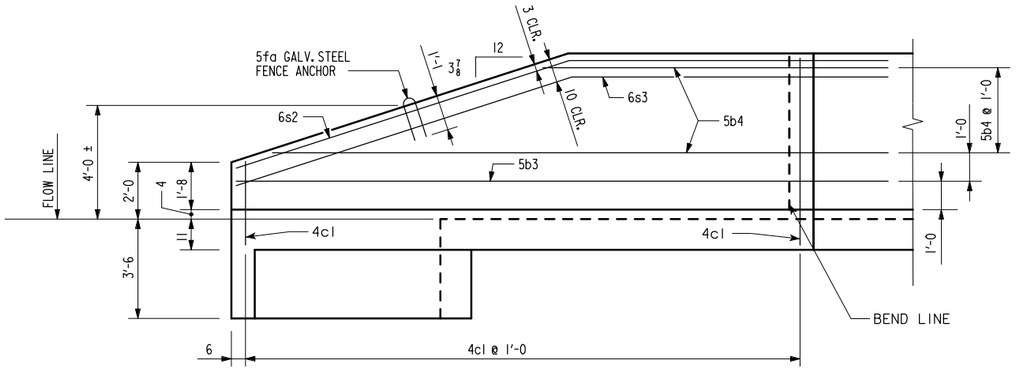
HEADWALL REINFORCEMENT

STA. 19+12.12 (US 6) FEBRUARY, 2011

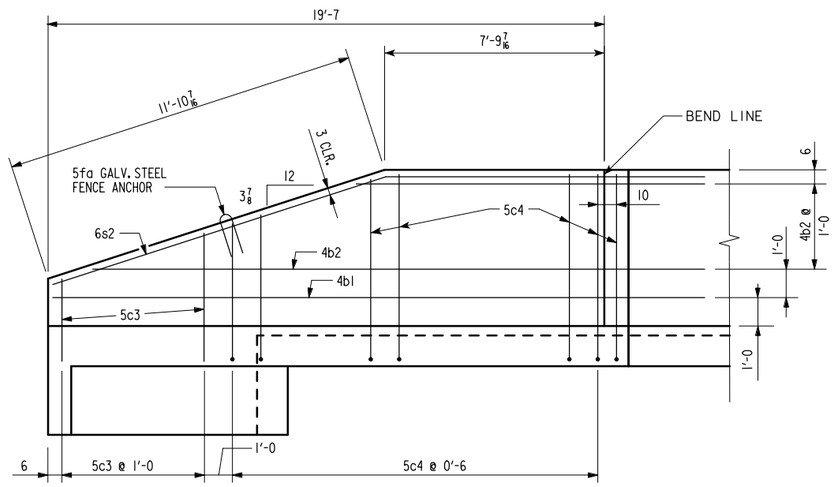
POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

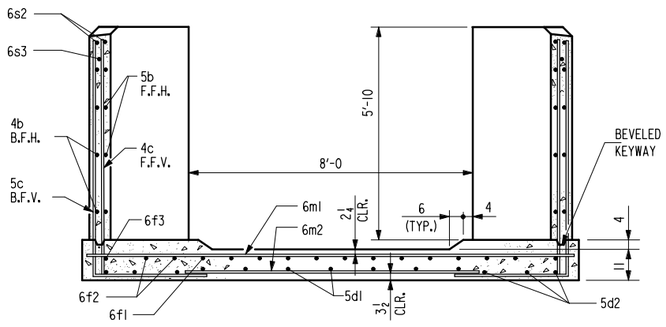
DESIGN SHEET NO. 4 OF 7 FILE NO. 30387 DESIGN NO. 211



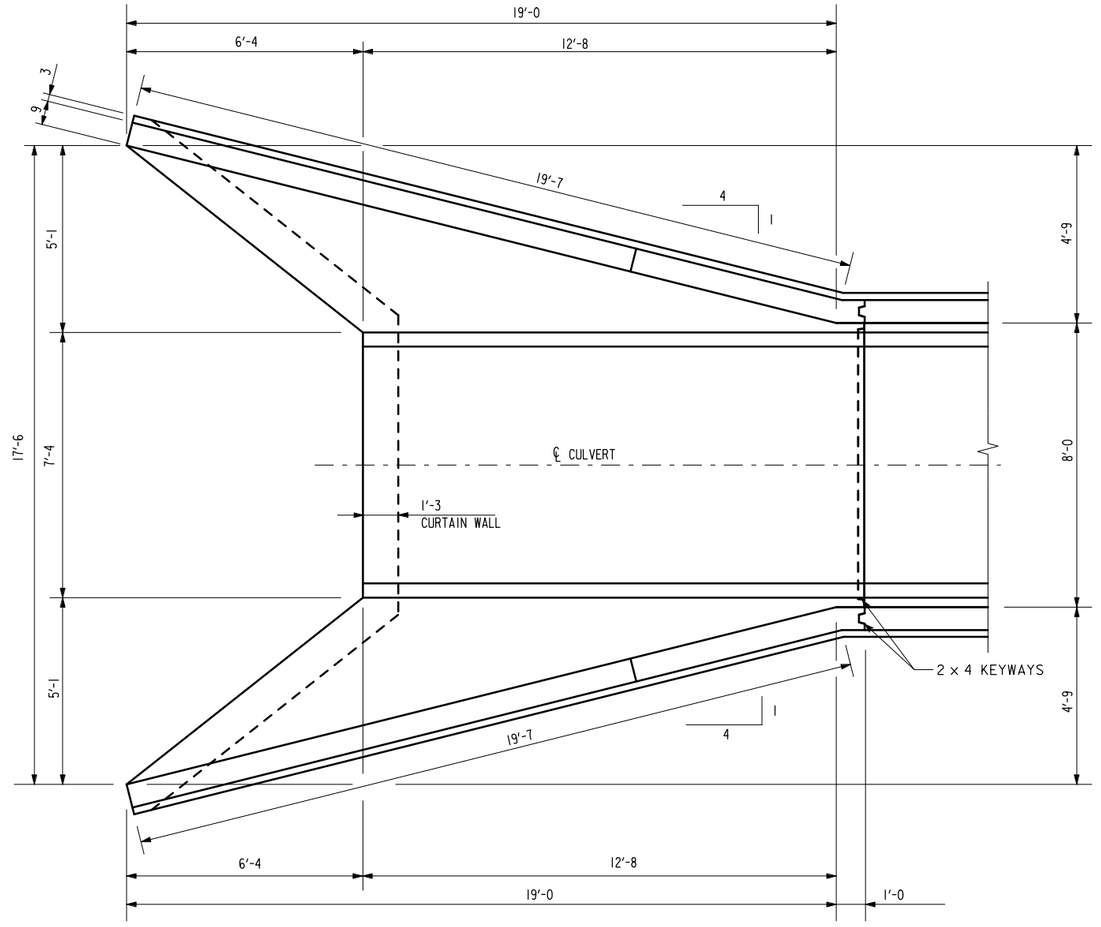
VIEW - FRONT FACE REINFORCING



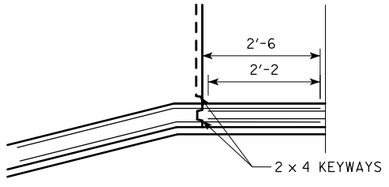
VIEW - BACK FACE REINFORCING



SECTION - NEAR CENTER OF APRON



PLAN VIEW



PLAN VIEW SHOWING LAP AT
HEADWALL/FLUME JOINT

DESIGN FOR

8'-0 x 5'-0 REINFORCED CONCRETE FLUME

HEADWALL REINFORCEMENT

STA. 19+12.12 (US 6) FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 5 OF 7 FILE NO. 30387 DESIGN NO. 211

FLUME NOTES:

REINFORCING BAR CLEARANCES WILL BE AS FOLLOWS:

EDGE CLEARANCES: 2" EXCEPT

TOP OF FLOOR $2\frac{1}{4}$" TO NEAR TRANSV. REINF. BAR

BOTTOM OF FLOOR $3\frac{1}{2}$" TO NEAR TRANSV. REINF. BAR

END CLEARANCES:

VERTICAL TOP 2"

VERTICAL BOTTOM $3\frac{1}{2}$"

TRANSVERSE 2"

FLOOR OF FLUME IS TO BE FINISHED SMOOTH. SIDES OF FOOTING ARE TO BE FORMED TO INSURE CORRECT LINE AND GRADE.

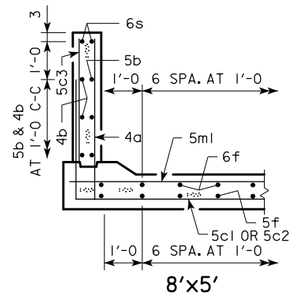
ALL FLOOR REINFORCING STEEL IS TO BE SUPPORTED AT INTERVALS OF NOT MORE THAN 3'-0 IN EITHER DIRECTION AS OUTLINED IN THE STANDARD SPECIFICATIONS.

THE VERTICAL BARS IN THE WALLS MAY BE SPLICED ABOVE THE FOOTING AT THE CONTRACTOR'S OPTION AS FOLLOWS:

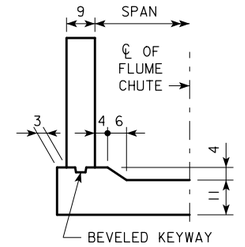
BAR SIZE NUMBER	4	5	6	7	8
MINIMUM SPLICE LENGTH	21"	26"	31"	43"	55"

THIS SPLICE, IF USED WILL BE AT THE CONTRACTOR'S EXPENSE.

BEVELED 2x4 KEYWAYS ARE TO BE USED FOR 9" WALLS AND 2x6 KEYWAYS ARE USED FOR 10" AND GREATER WALL THICKNESS.



8'x5'



FLUME CHUTE DETAILS

(NORMAL TO FLOWLINE)

CONCRETE PLACEMENT QUANTITIES

LOCATION	FOOTING	WALLS	TOTAL
FLUME - SECTION 1	8.2	5.3	13.5
FLUME - SECTION 2	10.8	5.4	16.2
FLUME - SECTION 3 (+BASIN CURT.)	11.3	5.4	16.7
CHUTE BELL (2 REQUIRED)	2 @ 1.5 = 3.0	2 @ 0.6 = 1.2	4.2
BASIN	10	3.6	13.6
TOTAL (CU. YDS.)	43.3	20.9	64.2

DESIGN FOR

8'-0 x 5'-0 REINFORCED CONCRETE FLUME

FLUME NOTES

STA. 19+12.12 (US 6) FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

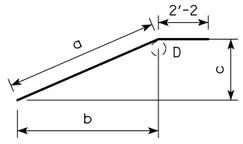
DESIGN SHEET NO. 6 OF 7 FILE NO. 30387 DESIGN NO. 211

REINFORCING BAR LIST - FLUME

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4a1	WALLS FFV	I	146	LISTED	429
4a2	WALLS, FLUME AT HDWL., F.F.V.	I	14	5'-0	47
5b1	WALLS FFH - SECTION I	⟍	10	LISTED	197
4b2	WALLS BFH - SECTION I	⟍	10	LISTED	126
5b3	WALLS FFH - SECTION 2	⟍	6	28'-1	176
4b4	WALLS BFH - SECTION 2	⟍	6	28'-1	113
5b5	WALLS FFH - SECTION 3	⟍	6	LISTED	173
4b6	WALLS BFH - SECTION 3	⟍	6	LISTED	111
5c1	BOTT. FLOOR & WALLS BFV	⌊⌋	143	LISTED	2622
5c2	BOTT. FLOOR & WALLS BFV - SPLICED	⌊⌋	7	16'-8	122
5c3	WALLS, FLUME AT HDWL., B.F.V.	I	14	5'-0	73
6f1	FLOOR LONGIT. TOP - SECTION I	⟍	9	25'-6	345
5f2	FLOOR LONGIT. BOTT. - SECTION I	⟍	9	25'-4	238
6f3	FLOOR LONGIT. TOP - SECTION 2	⟍	9	28'-1	380
5f4	FLOOR LONGIT. BOTT. - SECTION 2	⟍	9	28'-1	264
6f5	FLOOR LONGIT. TOP - SECTION 3	⟍	9	27'-10	376
5f6	FLOOR LONGIT. BOTT. - SECTION 3	⟍	9	28'-0	263
5m1	FLOOR TRANSV. TOP	—	159	9'-8	1603
6s1	WALLS BOTH F ALONG SLOPE - SECTION I	⟍	4	26'-10	161
6s2	WALLS BOTH F ALONG SLOPE - SECTION 2	⟍	4	28'-1	169
6s3	WALLS BOTH F ALONG SLOPE - SECTION 3	⟍	4	26'-9	161
5u1	FENCE ANCHORS (GALVANIZED)	⊃	2	3'-1	6
				TOTAL (LBS.)	8155

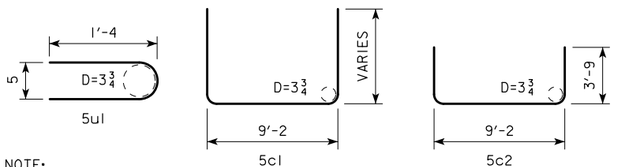
BENT BAR DETAILS

	a	b	c
27'-0	24'-10	23'-7 1/16	7'-10 5/16
26'-8	24'-6	23'-3 1/4	7'-9 1/16
26'-4	24'-2	22'-11 1/4	7'-7 13/16
9'-9	7'-7	7'-2 7/16	2'-4 13/16
4'-8	2'-6	2-4 1/2	9 1/2



5b1, 4b2 BARS

D=3 FOR #4
D=3 3/4 FOR #5



NOTE:
ALL DIMENSIONS ARE OUT TO OUT.
D = PIN DIAMETER.

LISTED BARS

BAR 4a1 - SEC. 1
38 BARS
2 @ 5'-9
2 @ 5'-7
2 @ 5'-5
2 @ 5'-3
2 @ 5'-1
2 @ 4'-11
2 @ 4'-10
4 @ 4'-8
4 @ 4'-7
4 @ 4'-6
6 @ 4'-5
2 @ 4'-3
2 @ 4'-2
2 @ 4'-1

BAR 4a1 - SEC. 2
56 @ 4'-2

BAR 4a1 - SEC. 3
4 @ 4'-2
2 @ 4'-3
46 @ 4'-5

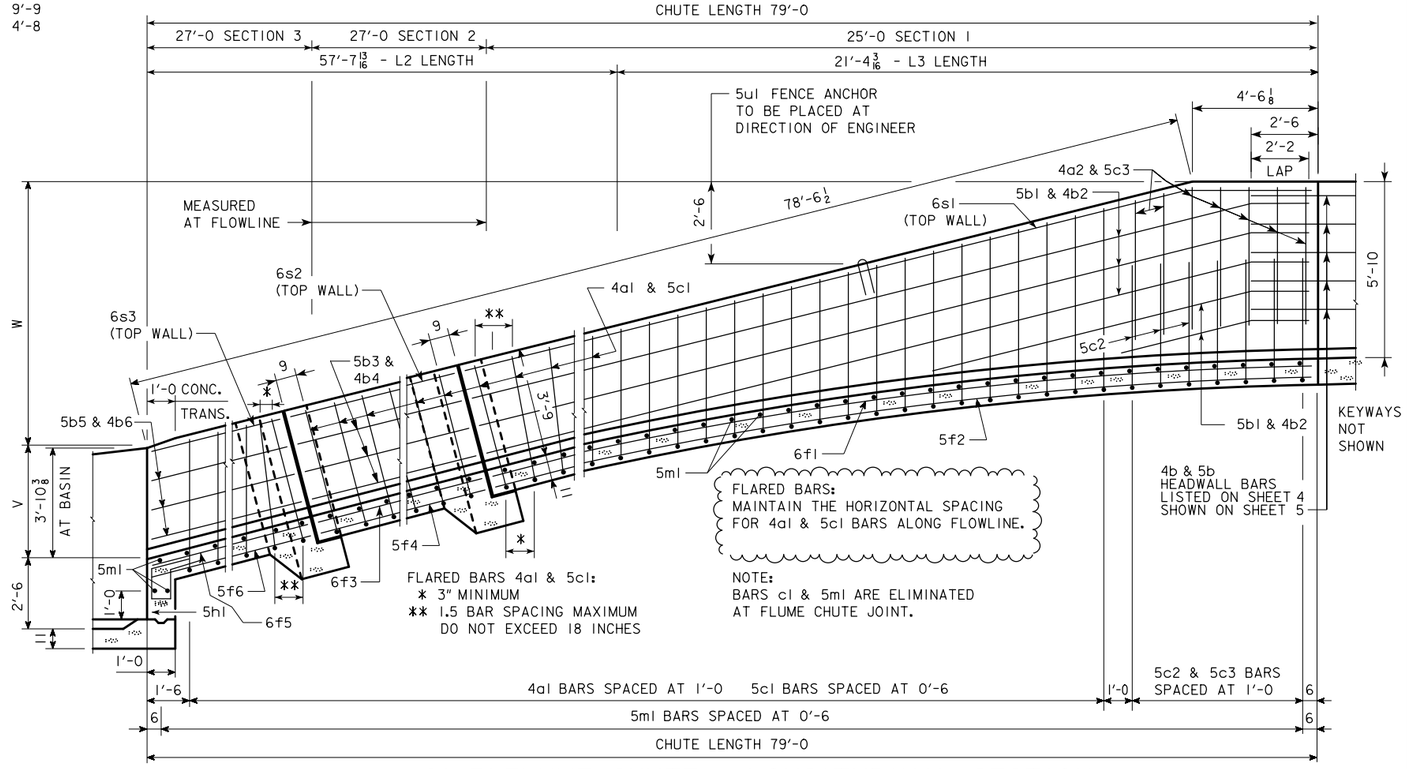
BAR 5c1 - SEC. 1
37 BARS
20'-8
20'-6
20'-4
20'-2
20'-0
19'-10
19'-8
19'-6
19'-4
19'-2
2 @ 19'-0
2 @ 18'-10
4 @ 18'-6
4 @ 18'-4
4 @ 18'-2
3 @ 18'-0
17'-8
2 @ 17'-6
2 @ 17'-4

BAR 5c1 - SEC. 2
55 BARS
17'-6

BAR 5c1 - SEC. 3
51 BARS
3 @ 17'-6
3 @ 17'-8
45 @ 18'-0

BAR 5b1 AND 4b2 - SEC. 1
10 BARS - 2 EA. LGTH.
27'-0
26'-8
26'-4
9'-9
4'-8

BAR 5b5 AND 4b6 - SEC. 3
6 BARS - 2 EA. LGTH.
27'-3
27'-8
28'-1



FLARED BARS:
MAINTAIN THE HORIZONTAL SPACING FOR 4a1 & 5c1 BARS ALONG FLOWLINE.

FLARED BARS 4a1 & 5c1:
* 3" MINIMUM
** 1.5 BAR SPACING MAXIMUM
DO NOT EXCEED 18 INCHES

NOTE:
BARS c1 & 5m1 ARE ELIMINATED AT FLUME CHUTE JOINT.

4b & 5b HEADWALL BARS LISTED ON SHEET 4 SHOWN ON SHEET 5

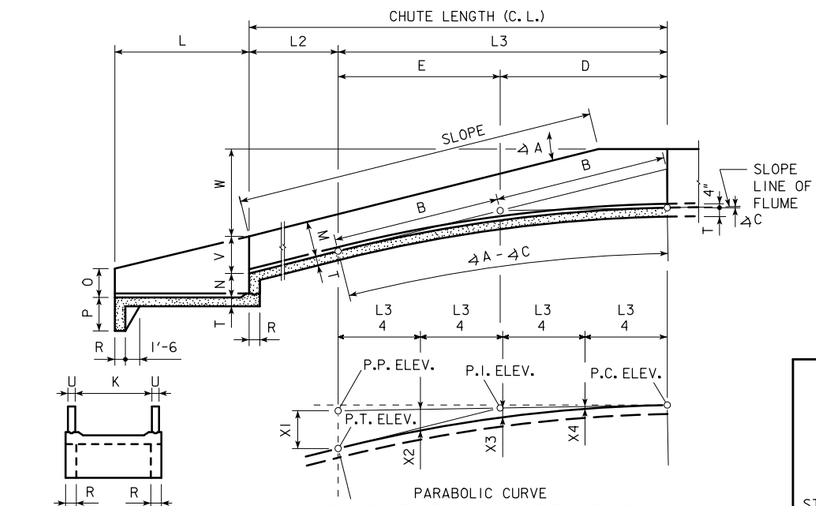
8'x5' FLUME CHUTE - LONGITUDINAL SECTION

FLUME DATA

∡ A = 18°26'
∡ C = 1°00'
B = 11'- 2 11/16
S = 78'-6 1/2
V = 3'-11 3/8
W = 24'-9 7/8
M = 3'-9
T = 0'-11
H = 5'-0

CURVE DATA

C. L. = 79'-0
L2 = 57'-7 13/16
L3 = 21'-4 3/16
D = 10'-8 15/16
E = 10'-7 1/4
P. C. ELEV. = 1070.00
P.I. ELEV. = 1069.81
P. P. ELEV. = 1069.63
P. T. ELEV. = 1066.27
X1 = 3'-4 5/16
X2 = 1'-10 11/16
X3 = 0'-10 1/16
X4 = 0'-2 1/2
L3/4 = 5'-4 1/16



LONGITUDINAL SECTION WITH FLUME

SECTIONS NOT SHOWN

END VIEW

SEE BASIN STANDARDS FOR ADDITIONAL DETAILS NOT SHOWN.

NOTE:
SEE STANDARD FBJ-02-04 FOR BELL JOINT INFORMATION AND DETAILS NOT SHOWN.

SEE STANDARD RCFB-02-04 FOR FLUME BASIN INFORMATION AND DETAILS NOT SHOWN.

DESIGN FOR
8'-0 x 5'-0 REINFORCED CONCRETE FLUME

FLUME DETAILS

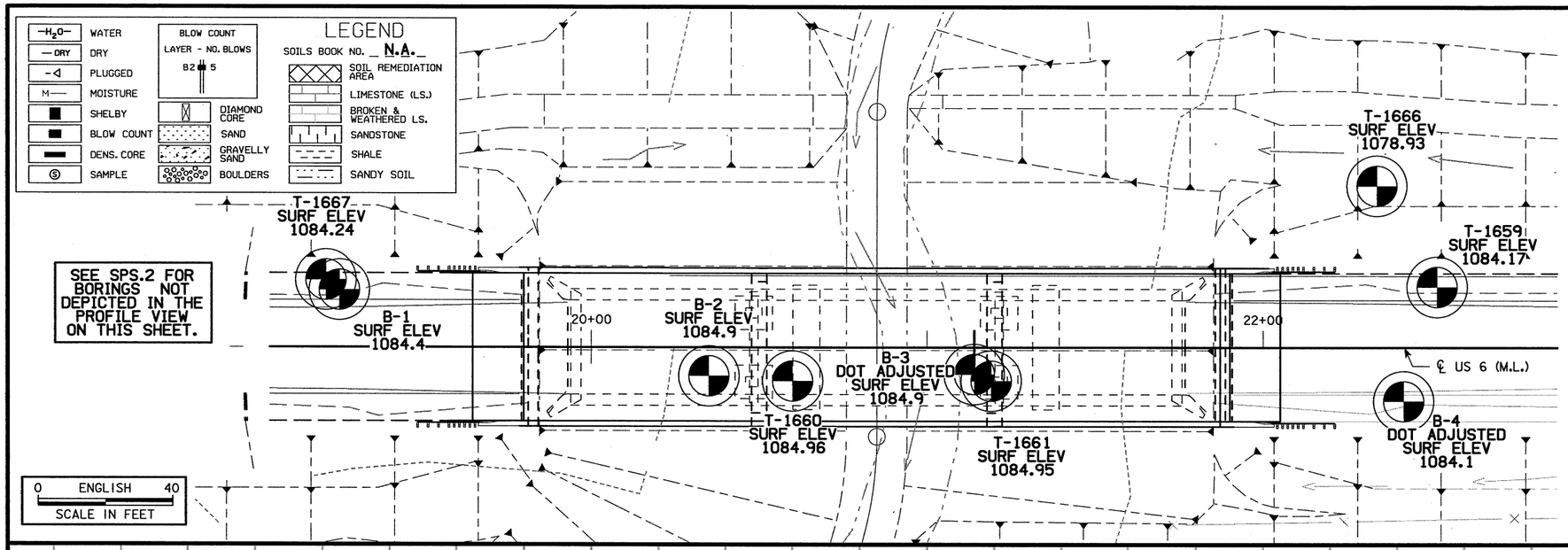
STA. 19+12.12 (US 6) FEBRUARY, 2011

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 7 OF 7 FILE NO. 30387 DESIGN NO. 211

DESIGN TEAM JDC / DLB | POTTAWATTAMIE COUNTY | PROJECT NUMBER BRF-006-1(114)--38-78 | SHEET NUMBER 49



N

GEOTECHNICAL 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.

Robert L. Stanley 11-16-10
Signature Robert L. Stanley Date
Printed or Typed Name

My license renewal date is December 31, 2010

Pages or sheets covered by this seal: SPS.1 - SPS.4

LOCATION

U.S. 6 OVER KEG CREEK
T-75 N R-42 W
SECTION 15
HARDIN TOWNSHIP
POTTAWATTAMIE COUNTY
MAINT. NO. 7814.2S006
FHWA NO. 43230

THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.

DESIGN FOR 0° SKEW

204'-6 X 44'-0 STEEL MODULAR BRIDGE

67'-3 END SPANS 70'-0 INTERIOR SPAN

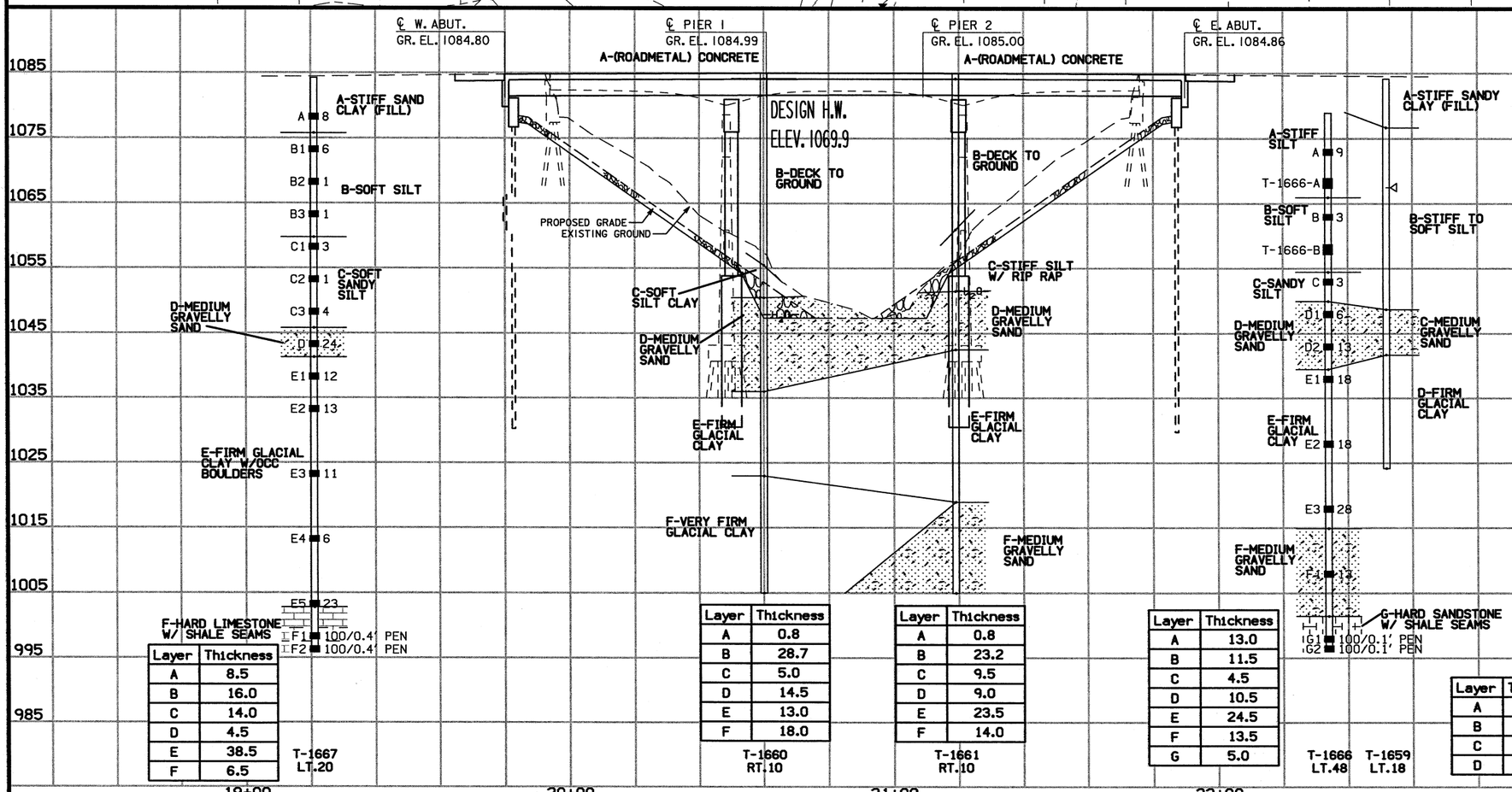
SOIL PROFILE SHEET

STA. 20+85.00 OCTOBER, 2010

POTTAWATTAMIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 4 FILE NO. 30387 DESIGN NO. 111



Layer	Thickness
A	8.5
B	16.0
C	14.0
D	4.5
E	38.5
F	6.5

T-1667 LT.20

Layer	Thickness
A	0.8
B	28.7
C	5.0
D	14.5
E	13.0
F	18.0

T-1660 RT.10

Layer	Thickness
A	0.8
B	23.2
C	9.5
D	9.0
E	23.5
F	14.0

T-1661 RT.10

Layer	Thickness
A	13.0
B	11.5
C	4.5
D	10.5
E	24.5
F	13.5
G	5.0

T-1666 LT.48 T-1659 LT.18

Layer	Thickness
A	7.5
B	28.0
C	7.0
D	17.5

Boring No.	Date Drilled	GroundWater Level (Ft.)
T-1659	03-04-09	16.7 DRY
T-1660	03-04-09	37.1
T-1661	03-04-09	33.4
T-1666	03-04-09	WASH BORE
T-1667	03-04-09	WASH BORE

SHELBY TUBE CORE DATA

CORE NO.	T-1666-A	T-1666-B
CLASSIFICATION [AASHTO]	A-7-6(31)	A-7-6(32)
COEFF.CONSOL. SQ.FT /DAY	0.089	0.433
TRIAXIAL COMPRESSION	CU	CU
COHESION - PSF	247	212
FRICTION COEFF.	0.168	0.099
MOISTURE CONTENT %	30.5	34.1
DRY DENSITY - PCF	96.8	92.1

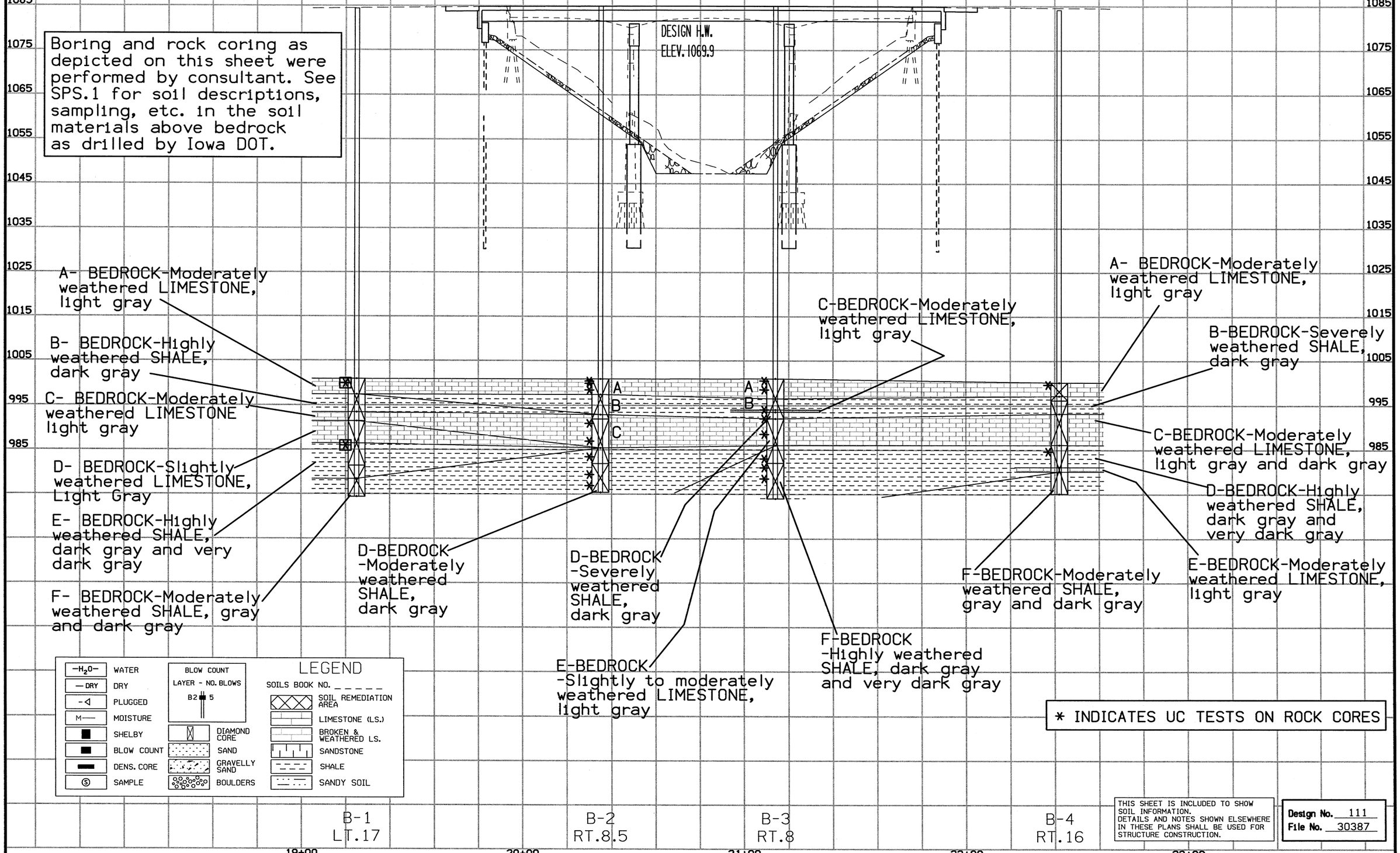
UU-UNCONSOLIDATED & UNDRAINED
CU-CONSOLIDATED & UNDRAINED

Borings T-1659, T-1660, T-1661, T-1666, and T-1667 were drilled by Iowa DOT. Borings B-1, B-2, B-3 and B-4 were drilled by consultant. See SPS.2 and SPS.3 for rock coring information from Borings B-1, B-2, B-3, and B-4.

ENGLISH	IOWA DOT	DESIGN TEAM	STANLEY/SCHAPPAUGH	POTTAWATTAMIE	COUNTY	PROJECT NUMBER	BRF-006-1(114)--38-78	SHEET NUMBER SPS.1

7:32:45 AM 11/16/2010 rschapp W:\Projects\7800602005\Soils\S4\(114)111\780111_sps1.sht

Boring and rock coring as depicted on this sheet were performed by consultant. See SPS.1 for soil descriptions, sampling, etc. in the soil materials above bedrock as drilled by Iowa DOT.



LEGEND

$-H_2O-$ WATER	BLOW COUNT	SOILS BOOK NO. _ _ _ _ _	
— DRY DRY	LAYER - NO. BLOWS		SOIL REMEDIATION AREA
-◁ PLUGGED	B2 5		LIMESTONE (LS.)
M— MOISTURE		DIAMOND CORE	BROKEN & WEATHERED LS.
SHELBY		SAND	SANDSTONE
BLOW COUNT		GRAVELLY SAND	SHALE
DENS. CORE		BOULDERS	SANDY SOIL
Ⓢ SAMPLE			

* INDICATES UC TESTS ON ROCK CORES

THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION.
DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.

Design No. 111
File No. 30387

ENGLISH	IOWA DOT	DESIGN TEAM	STANLEY/SCHAPPAUGH	POTTAWATTAMIE	COUNTY	PROJECT NUMBER	BRF-006-1(114)--38-78	SHEET NUMBER	SPS.2

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ROCK CORE COMPRESSIVE STRENGTH AND TESTING REPORT

Sample Number	Boring Number	Length of Sample (in)	Elevation	Material Description (See profile for additional details.)	Unit Load (psi)	Moisture(%)	Dry Density(PCF)
#1	B-1	3.943	999.9	LIMESTONE	4,461	7.2	146.1
#2	B-1	4.024	985.9	SHALE	81	17.4	117.6
#3	B-2	4.053	1000.4	LIMESTONE	6,345	3.4	153.8
#4	B-2	4.082	998.4	LIMESTONE	1,803	8.5	140.7
#5	B-2	3.975	999.9	LIMESTONE	5,532	15.8	137.2
#6	B-2	4.158	990.9	LIMESTONE	5,292	5.7	148.8
#7	B-2	4.088	986.9	LIMESTONE	5,156	2.6	157.3
#8	B-2	4.163	983.4	SHALE	438	11.6	117.2
#9	B-2	4.217	979.4	SHALE	309	13.5	123.2
#10	B-2	4.093	976.9	SHALE	2,024	8.3	140.9
#11	B-3	4.119	1000.4	LIMESTONE	4,302	3.6	154.6
#12	B-3	4.026	998.4	LIMESTONE	3,224	3.8	150.2
#13	B-3	3.906	993.9	LIMESTONE	4,265	2.5	156.1
#14	B-3	3.89	991.9	LIMESTONE	4,851	4.8	149.6
#15	B-3	4.014	988.4	LIMESTONE	12,745	4.8	155.6
#16	B-3	3.324	982.9	SHALE	423	17.0	111.0
#17	B-3	4.073	980.9	SHALE	350	15.7	117.5
#18	B-3	4.012	978.4	SHALE	626	12.3	124.5
#19	B-4	3.998	999.6	LIMESTONE	563	7.1	141.2
#20	B-4	4.013	984.6	SHALE	243	20.4	111.6

ROCK CORE INFORMATION

Boring	Approx.Surf.El.(ft)	Run No.	Interval(ft)	Recovery(%)	RQD(%)
B-1	1084.4	1	83.5-93.0	68	31
		2	93.0-103.0	93	62
		3	103.0-110.0	98	85
B-2	1084.9	1	84.0-93.0	94	28
		2	93.0-103.0	91	59
		3	103.0-109.5	97	68
B-3	1084.9	1	84.0-93.0	70	27
		2	93.0-103.0	89	61
		3	103.0-111.0	98	72
B-4	1084.1	1	84.0-88.0	90	58
		2	88.0-98.0	79	53
		3	98.0-109.0	88	62

GroundWater (Ft.)		Water level While Drilling	Water level 24 Hours
Boring No.	Date Drilled		
B-1	07/01/10	--	--
B-2	06/30/10	--	30'
B-3	06/29/10	31'	31'
B-4	07/28/10	--	22'

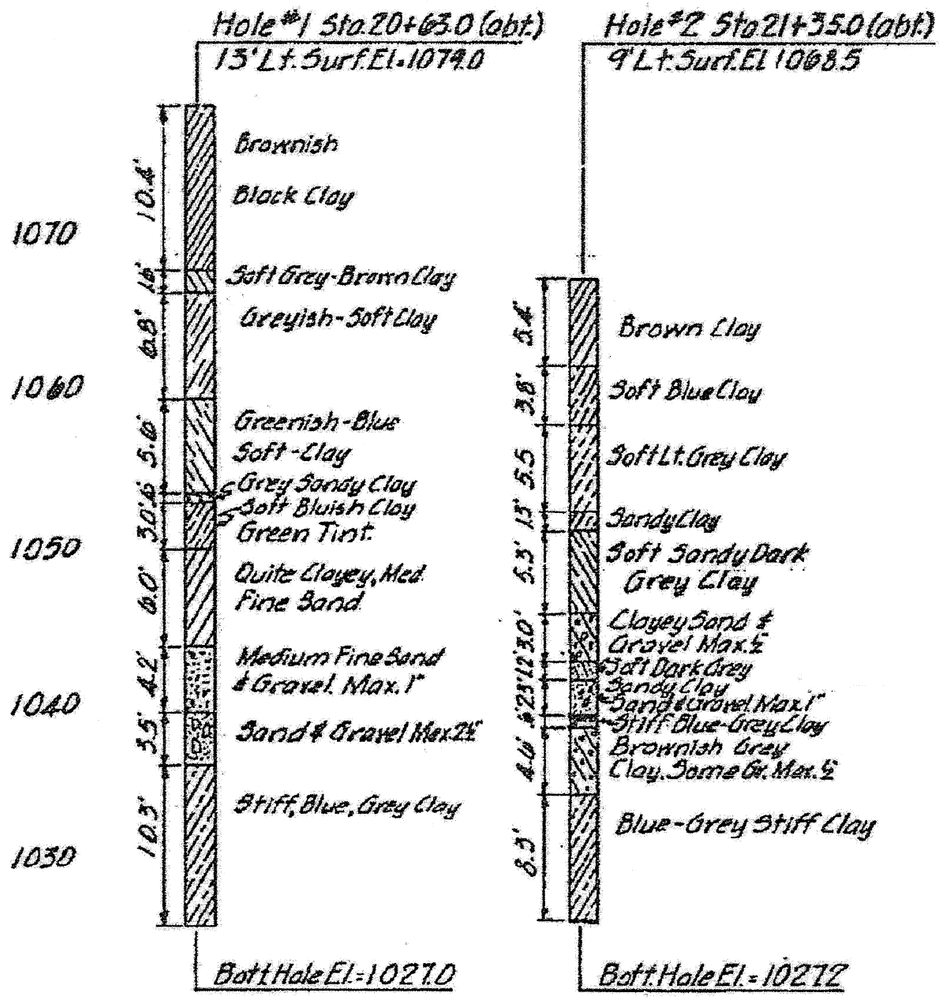
BORING	B-1	B-2	B-3	B-4
Layer	Thickness	Thickness	Thickness	Thickness
A	3.5	3.5	4.5	3.0
B	4.0	4.5	2.5	4.0
C	2.0	7.5	0.5	7.0
D	5.0	10.0	1.5	5.0
E	8.0	--	6.0	1.0
F	4.0	--	12.0	5.0

THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION.
DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.

Design No. 111
File No. 30387

FOR INFORMATION ONLY. PORTION OF SITUATION PLAN (DECEMBER, 1952) FOR EXISTING BRIDGE.

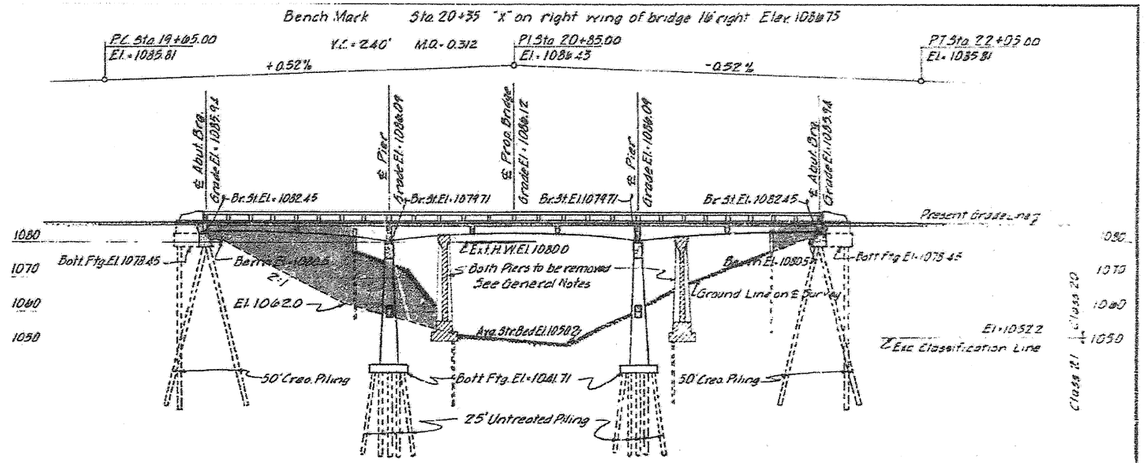
DO NOT SCALE.



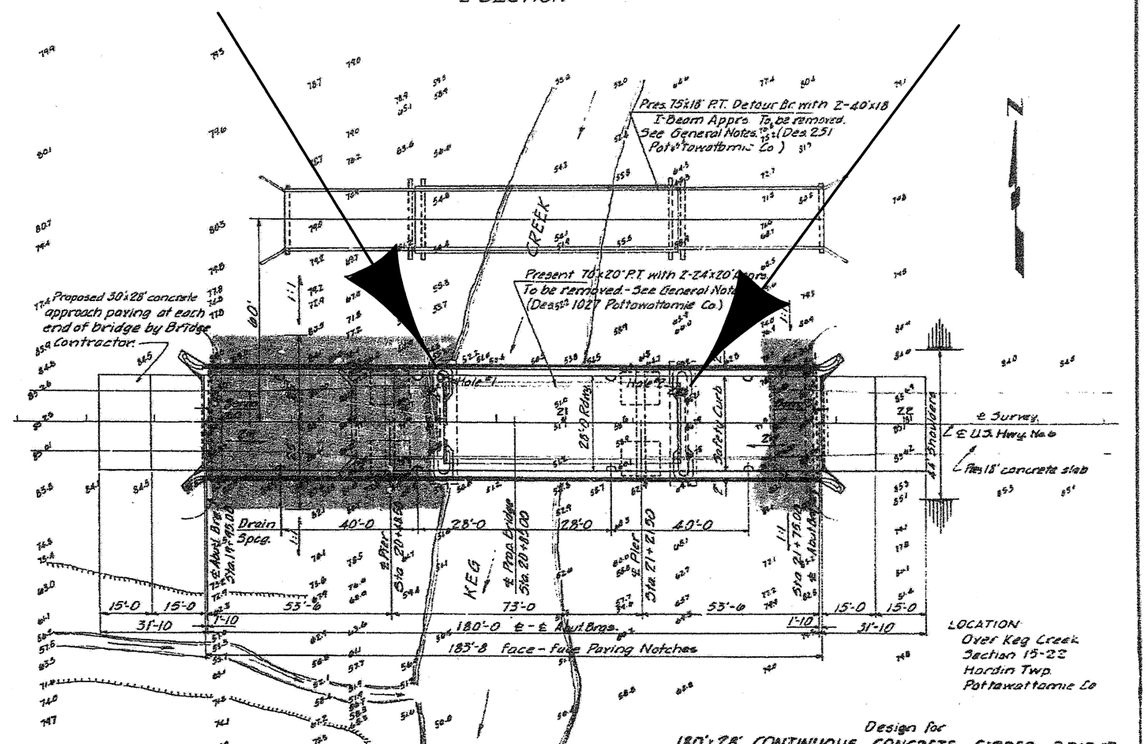
SOUNDING DATA

Scale: 1" = 10'

No water shown. Soundings taken from Des. 1027, Pottawattamie Co. Sounding data June 22, 1927.



℄ SECTION



SITUATION PLAN
Scale: 1" = 20'

Design for
180'x28' CONTINUOUS CONCRETE GIRDER BRIDGE
53'-6" End Spans 75'-0 Center Span
Concrete Rail & Substructure
SITUATION PLAN
Sta. 20+85.00 Project I-310(5)
POTTAWATTAMIE COUNTY
IOWA STATE HIGHWAY COMMISSION
December, 1952 Sheet 1 of 7

Design 5452 Pottawattamie Co. File No. 15709
Designed by: M.K. Traced by: D.J.K. Checked by: CH

Design No. 111
File No. 30387

ENGLISH	IOWA DOT	DESIGN TEAM	STANLEY/SCHAPPAUGH	POTTAWATTAMIE	COUNTY	PROJECT NUMBER	BRF-006-1(114)--38-78	SHEET NUMBER SPS.4

3:15:02 PM 11/15/2010 rschapp W:\Projects\7800602005\Soils\S4\(114)111\780111_sps4.sht

STANDARD SYMBOLS

- Interstate Highway Symbol
- U.S. Highway Symbol
- Iowa Highway Symbol
- County Road Highway Symbol
- Evergreen Tree
- Deciduous Tree
- Fruit Tree
- Shrub (Bushes)
- Timber
- Hedge
- Stump
- Swamp
- Rock Outcrop
- Broken Concrete
- Revetment (Rip Rap)
- Cemetery
- Grave
- Cave
- Sink Hole
- Board Fence
- Chain Link or Security Fence
- Wire Fence
- Terrace
- Earth Dam or Dike (Existing)
- Earth Dam or Dike (Proposed)
- Tile Outlet
- Edge of Water
- Existing Drainage
- Proposed Drainage
- Right of Way Rail or Lot Corner
- Concrete Monument
- Well
- Windmill
- Beehive Intake
- Existing Intake
- Proposed Intake
- Existing Utility Access (Manhole)
- Proposed Utility Access (Manhole)
- Fire Hydrant
- WH Water Hydrant (Rural)

- Septic Tank
- Cistern
- L.P. Gas Tank (No Footing)
- Underground Storage Tank
- Latrine
- Luminaire
- Traffic Signal
- Traffic Signal with Luminaire
- TP Telephone Pedestal
- TVP Television Pedestal
- Telephone Pole
- Telephone Pole (Second Company)
- Telephone Pole (Third Company)
- Telephone Pole (Fourth Company)
- Telephone Pole (Fifth Company)
- Power Pole
- Power Pole (Second Company)
- Power Pole (Third Company)
- Power Pole (Fourth Company)
- Power Pole (Fifth Company)
- Electrical Highline Tower (Metal or Concrete)
- Telephone Riser Pole
- Power Riser Pole
- Telegraph Pole
- Satellite TV Dish
- —W— Existing Water Line
- —W2— Existing Water Line (Second Company)
- —San.— Existing Sanitary Sewer Line
- —T— Existing Telephone Line
- —T2— Existing Telephone Line (Second Company)
- —FO-1— Existing Fiber Optics Telephone Line
- —St. S.— Existing Storm Sewer Line
- —G— Existing Gas Line
- —G-HP— Existing High Pressure Gas Line
- —G2— Existing Gas Line (Second Company)
- —G2-HP— Existing High Pressure Gas Line (Second Company)
- ------E------ Existing Power Line
- ------E2------ Existing Power Line (Second Company)
- ----TV---- Cable Television Line

- Guardrail (Beam or Cable)
- GP Guard Post (one or two)
- Guard Post (over two)
- FP Filler Pipe
- GV Gas Valve
- WV Water Valve
- SL Speed Limit Sign
- MM Mile Marker Post
- SIGN Sign
- WHU Water Hook Up
- RT Radio Tower
- TA Tower Anchor
- EB Electric Box
- TCB Traffic Signal Control Box
- RRB Rail Road Signal Control Box
- TSB Telephone Switch Box

04-30-02 101-4

DESIGN DATA RURAL

2009	AADT	3,890	V.P.D.
2029	AADT	5,380	V.P.D.
20	DHV		V.P.H.
TRUCKS		9	%
Total Design ESALs			

- Shading - Proposed Paved Surface
- Shading - Proposed Granular Surface
- Shading - Other, with identification
- Shading - Clearing & Grubbing Area

IOWA 1-CALL# 1-800-292-8989

UTILITY LEGEND

102-13
02-23-93

- Mid-American Energy
- FO Qwest

INDEX OF SHEETS

105-3
10-18-05

MILEAGE SUMMARY

105-1
09-27-94

Div.	Location	Lin. Ft.	Miles
	Rural Project - Pavement		
	Sta. 19+29.75 to Sta. 19+59.75	30.00	0.006
	Sta. 20+10.25 to Sta. 22+62.13	252.00	0.048
	Structural Project - Bridge		
	Bridge at Sta. 20+85.00	245.00	0.046
	Net Length of Rural Project	282.00	0.053
	Net Length of Structural Project	245.00	0.046
	Total Length of Project	527.00	0.099
	Total		0.10

ROADWAY DESIGN

LICENSED PROFESSIONAL ENGINEER — Jason R. Strum 16333 — IOWA

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 — Date: 12-17-2010

Jason R. Strum
Printed or Typed Name

My license renewal date is December 31, 2011

Pages or sheets covered by this seal: A.2, A.3, B.1-B.4, C.1-C.5, C.7-C.8, D.1, G.1, H.1, T.1 and W.1-W.15

RIGHT OF WAY LEGEND

- Proposed Right of Way
- Existing Right of Way
- Existing and Proposed Right of Way
- Easement and Existing Right of Way
- Borrow
- Easement (Temporary)
- Easement
- Excess
- Property Line
- A/C Access Control

CONVENTIONAL SIGNS

- Survey Line (Station — Reference Point)
- Section Corner
- Proposed Profile Grade
- Railroad
- Field Tile (Existing — Proposed)
- Culverts (Existing — Proposed)
- Stream

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www.iowaonecall.com

Design No. 111/211
File No. 30387

Legend And Symbol Information Sheet

(Symbols are Typical Only)

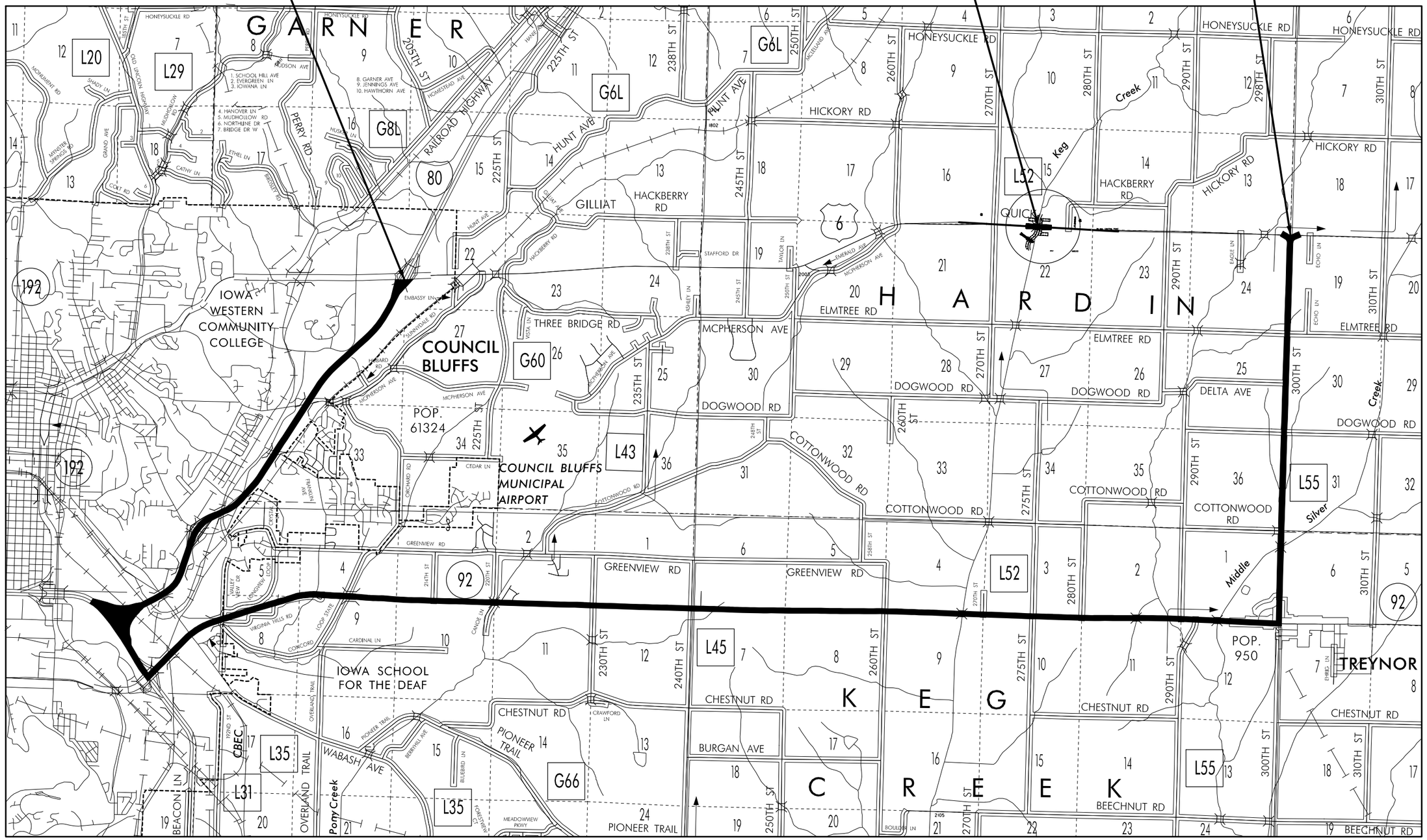
ENGLISH	IOWA DOT	DESIGN TEAM J1a\Strum\Prindle	POTTAWATTAMIE COUNTY	PROJECT NUMBER BRF-006-1(114)--38-78	SHEET NUMBER A.2

8:30:39 AM 12/17/2010 jstrum W:\Projects\7800602005\Design\78006114A1.dgn

Off Site Detour

Sta. 20+85.00
Bridge Replacement

Off Site Detour



LOCATION MAP SCALE
0 1 2 3
Miles

Design No. 111/211
File No. 30387

US 6 DETOUR

ENGLISH	IOWA DOT	DESIGN TEAM Jla\Strum\Prindle	POTTAWATTAMIE COUNTY	PROJECT NUMBER BRF-006-1(114)--38-78	SHEET NUMBER A.3

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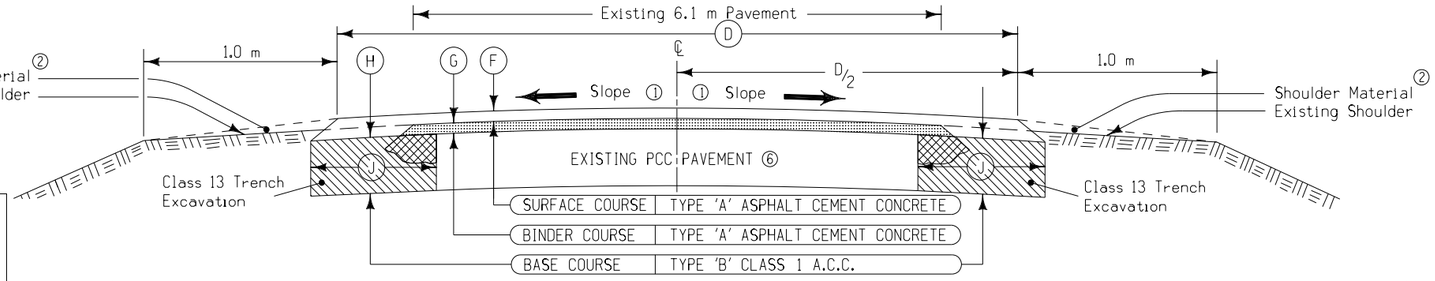


LEGEND

- Scarify Existing A.C.C. (133 mm) Nominal Depth
- Removal of A.C.C. Edge Rut (Outside 0.3 m) Depth Varies
- Base Widening

DESIGN RATES	
ITEM	RATE
Surface Course	2325 kg/m^3
Binder Course	2325 kg/m^3
Base	2325 kg/m^3
Tack Coat	0.20 L/m^2

TABLE OF DESIGN QUANTITIES Per Station — * Bid Items

LOCATION		J	H	F	G	D	PRIME & TACK COAT	ASPHALT CEMENT *	CLASS 13 TRENCH EXCAVATION *	ASPHALT CEMENT CONCRETE *		BASE *	SCARIFIED PCC *
ROAD IDENTIFICATION	STATION TO STATION									SURFACE	BINDER		
		m	mm	mm	mm	m	L ③	Mg ⑤	m^3 ④	Mg		Mg ④	Mg
U.S. HWY. 6	** 466+03.583	** 5+17.519	1.0	200	50	100	7.2	524	19.68	40.00	84.28	172.05	93.00	173.73
U.S. HWY. 6	7+53.496	42+85.977	1.0	200	50	100	7.2	524	19.68	40.00	84.28	172.05	93.00	173.73
U.S. HWY. 6	44+20.853	63+01.858	1.0	200	50	100	7.2	524	19.68	40.00	84.28	172.05	93.00	173.73
U.S. HWY. 6	70+09.974	127+17.581	1.0	200	50	100	7.2	524	19.68	40.00	84.28	172.05	93.00	173.73
U.S. HWY. 6	128+52.142	212+45.000	1.0	200	50	100	7.2	524	19.68	40.00	84.28	172.05	93.00	173.73

Notes:

① 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.

Refer to tabulation listing of superelevated curves and Standard Road Plans for additional requirements through superelevated curves.

② Shoulder material as specified elsewhere in these plans; refer to typical 7135 for "Type 'B' Granular Surfaced Shoulders".

③ Quantity is estimated for 2 applications for base widening units, 2 applications for binder courses, and 1 application for surface course. Quantity includes 80 liters per station for placement of both widening units.

④ Quantity is for placement of both widening units per station.

⑤ Surface and Binder is estimated at 5.5% and Base is estimated at 6.0%. Quantity includes 5.58 Mg per station for base for both widening units.

⑥ Widen and resurface after all existing ACC (133 mm nominal thickness) has been scarified off of the existing PCC. The curb shall be ground off of the existing PCC. See existing pavement typical on sheet B.04 for curb information.

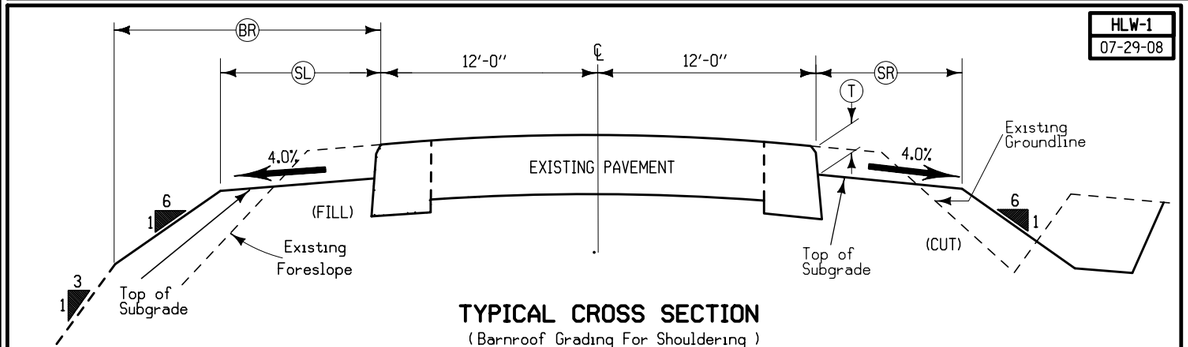
** EQUATION: Sta. 475+80.442 (Back) = Sta. 0+00.000 (Ahead)

See appropriate details and tabulations for additional information.

2602M
MODIFIED
Dimensions in mm unless noted.

EXISTING TYPICAL CROSS SECTION ACC WIDENING AND RESURFACING

HLW-1
07-29-08



TYPICAL CROSS SECTION
(Barnroof Grading For Shouldering)

NOTE:
Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designatedby the engineer.

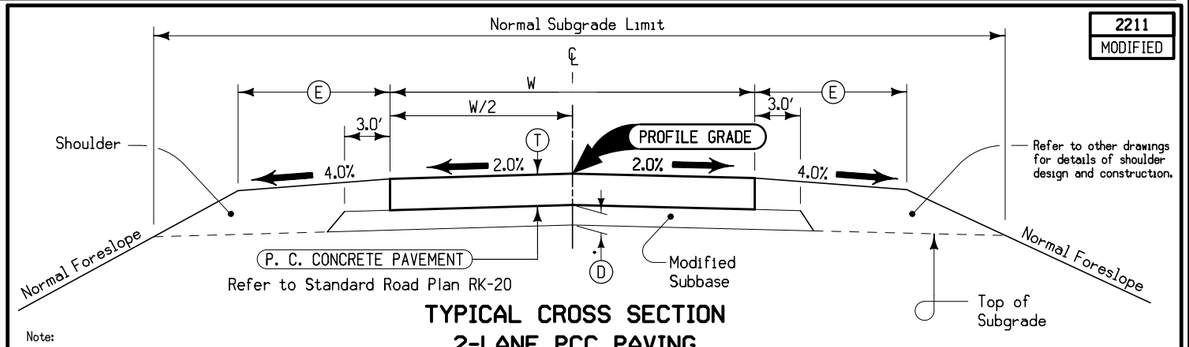
Refer to other plans and drawings for details of ditches and backslopes.

Refer to Typicals for details of shoulder construction.

ROAD IDENT.	STATION TO STATION		(SL)	(SR)	(T)	(BR)	SHOULDER TYPE
U.S. 6	17+94.12	18+19.12		3.5-14.2 *	12	30	GRANULAR
U.S. 6	18+31.56	18+56.56	4.2-13.8 *		12	30	GRANULAR
U.S. 6	23+13.44	23+38.44		13.4-6.3 *	12	30	GRANULAR
U.S. 6	23+50.88	23+75.88	14.5-4.5 *		12	30	GRANULAR

* - VARIES WITH GUARDRAIL BLISTER - SEE RL-14A

2211
MODIFIED

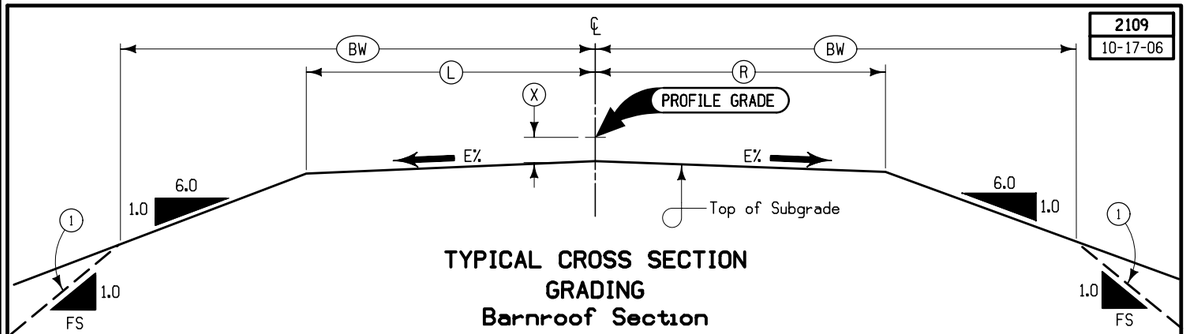


TYPICAL CROSS SECTION
2-LANE PCC PAVING

Note:
Normal sections shown may be appropriately modified for areas specifically designated by the Engineer such as intersections or superelevated curves.

LOCATION			(T)	(D)	(E)	(W)	SHOULDER TYPE
ROAD IDENTIFICATION	STATION TO STATION		Inches	Inches	Feet	Feet	
U.S. 6	19+54.75	19+59.75	12	12	8	25.5	
U.S. 6	22+10.25	22+15.25	12	12	8	26.6	

2109
10-17-06



TYPICAL CROSS SECTION
GRADING
Barnroof Section

Note:
Normal sections shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.

See appropriate Typical Sections in this plan for details of ditches and backslopes.

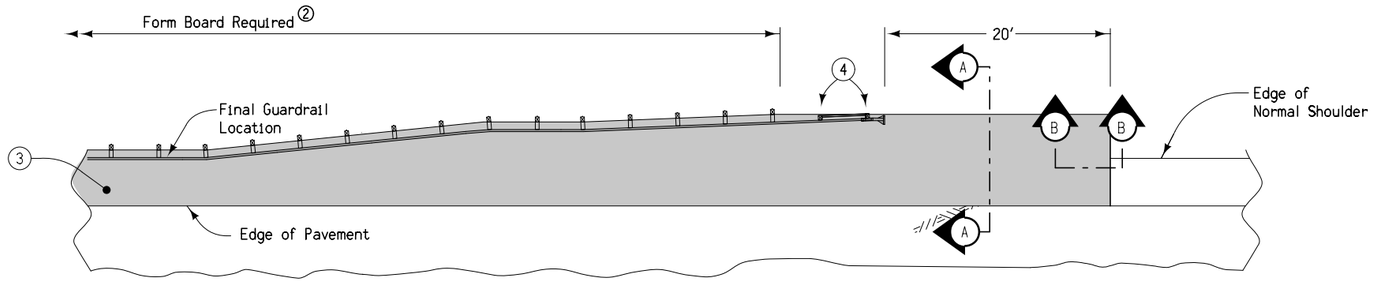
(1) Refer to Detail Project Plan and Cross Section for specific location of foreslope change.

LOCATION			(L)	(R)	(X)	(BW)	FS	E%
ROAD IDENTIFICATION	STATION TO STATION		Feet	Feet	Inches	Feet		
U.S. 6	19+54.75	19+59.75	Var.	Var.	12	42	3	2.0
U.S. 6	22+10.25	22+15.25	Var.	Var.	12	42	3	2.0

Design No. 111/211
File No. 30387

ENGLISH	IOWA DOT	DESIGN TEAM Jia\Strum\Prindle	POTTAWATTAMIE COUNTY	PROJECT NUMBER BRF-006-1(114)--38-78	SHEET NUMBER B.1

7156
04-20-10



6″ HMA Paved Shoulder at guardrail. 7″ PCC may be substituted pending approval of jointing layout.

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.

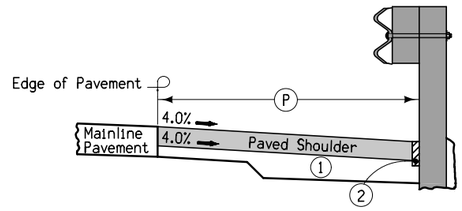
(1) 6″ subgrade treatment.

(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.

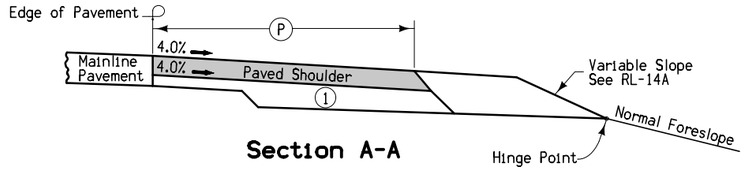
(3) Continue paved shoulder to existing paved shoulder or 20′ beyond the end of guardrail.

(4) Shoulder may be notched for final 2 posts or post sleeves may be installed through pavement.

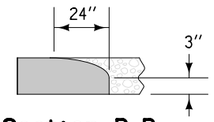
Location				(P)	Subgrade ① Treatment		Paved Shoulder	Remarks
Road Identification	Station To Station		Side	Feet	Special Backfill Tons	Modified Subbase CY	SY	
US 6	18+56.6	18+91.1	Lt	13.7		15.0	52.5	
US 6	18+91.1	19+19.8	Lt	13.7-12.3		11.8	41.5	
US 6	22+50.3	22+53.7	Lt	11.7-12.1		1.3	4.6	
US 6	22+53.7	22+78.7	Lt	12.1-12.5		9.8	34.7	
US 6	22+78.7	23+16.3	Lt	12.5-14.5		16.2	56.4	
US 6	23+16.3	23+51.0	Lt	14.5		15.9	55.9	
US 6	18+19.0	18+53.7	Rt	14.3		15.6	55.1	
US 6	18+53.7	18+91.3	Rt	14.3-12.6		16.1	56.2	
US 6	18+91.3	19+16.3	Rt	12.6-12.4		10.0	34.7	
US 6	19+16.3	19+19.8	Rt	12.4-12.0		1.3	4.7	
US 6	22+50.3	22+78.9	Rt	11.2-12.8		11.0	38.1	
US 6	22+78.9	23+13.5	Rt	12.8-13.4		14.4	50.4	



Typical Section with Form Board



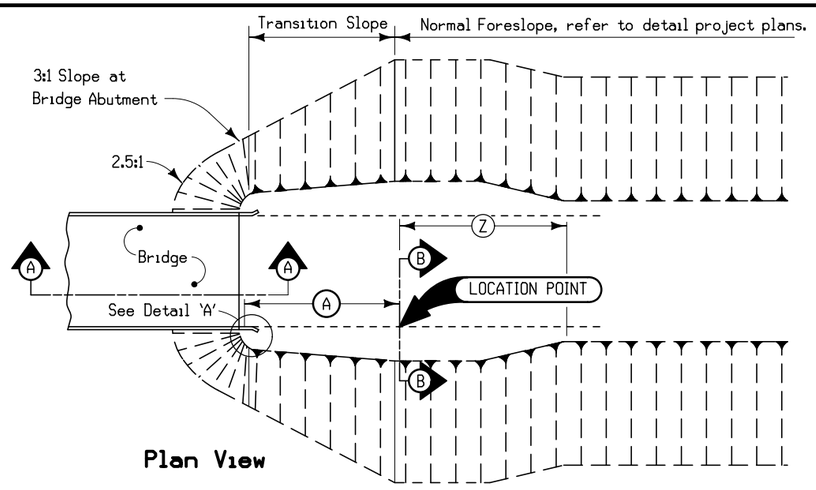
Section A-A



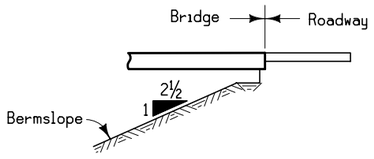
Section B-B
Roll down at granular shoulder or earth.

PAVED SHOULDER AT GUARDRAIL

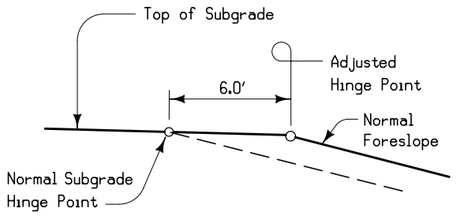
4303
04-20-04



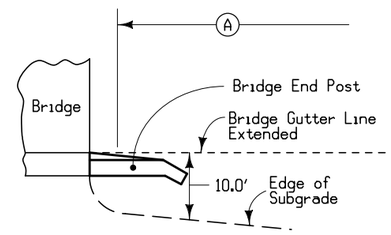
Plan View



Section A-A



Section B-B



Detail "A"

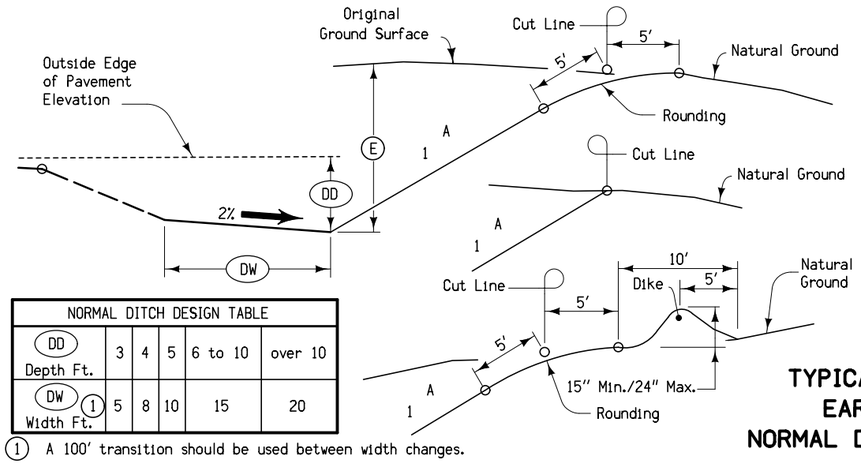
Note;
Refer to tabulation 107-23 for listings of Location Points and Dimensions Ⓐ and Ⓩ.

Design No. 111/211
File No. 30387

FORESLOPE TRANSITION AT BRIDGE

ENGLISH	IOWA DOT	DESIGN TEAM Jia\Strum\Prindle	POTTAWATTAMIE COUNTY	PROJECT NUMBER BRF-006-1(114)--38-78	SHEET NUMBER B.2

4101
10-18-05



For normal conditions, backslopes (A) shall be 3.0 on 1.0 for E depths less than 25', unless specified otherwise. Refer to detail project plans and cross sections for Ditch Depth or for Special Ditches.

Refer to project plans for locations of areas where rounding of the back slope is not required.

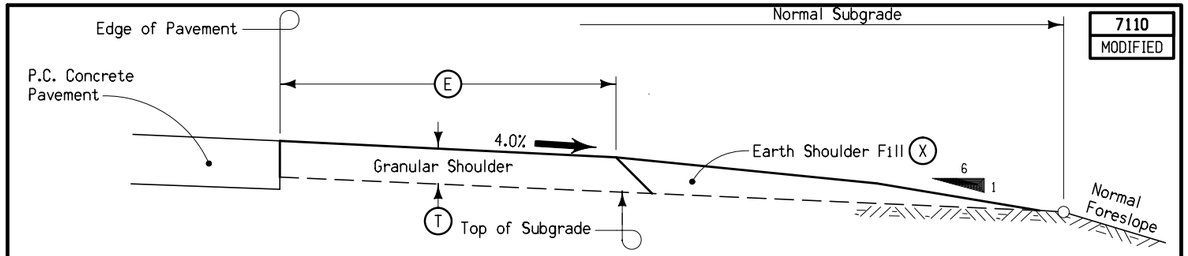
Refer to plans for locations of intercepting ditches. Dike for intercepting ditch shall be made by taking earth from roadway side. Do not excavate back of dike.

NORMAL DITCH DESIGN TABLE					
DD Depth Ft.	3	4	5	6 to 10	over 10
DW (1) Width Ft.	5	8	10	15	20

(1) A 100' transition should be used between width changes.

TYPICAL CROSS SECTION EARTH EXCAVATION NORMAL DITCH AND BACKSLOPE

7110
MODIFIED

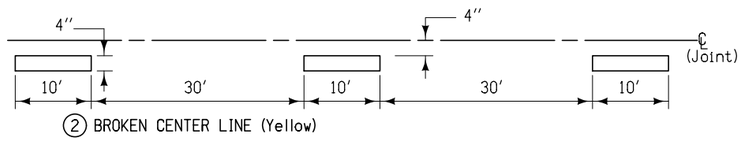


Location			E	T	Side	X
Road Identification	Station to Station		Feet	Inches		Cu. Yds.
U.S. 6	18+31.0	18+56.6	4.2-13.8	Vari	Lt	7.8
	23+51.0	23+76.0	14.5-4.5	Vari	Lt	8.1
	17+94.0	18+19.0	3.5-14.2	Vari	Rt	7.7
	23+13.5	23+39.0	13.4-6.3	Vari	Rt	8.3

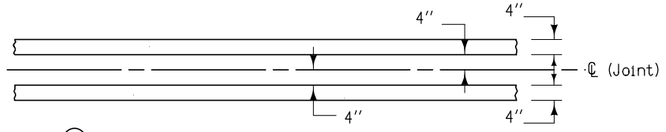
Earth Shoulder fill requires approximately (X) cubic yards of excavation, including 30% for shrinkage, per shoulder per station.

TYPICAL SECTION TYPE 'A' OR 'B' GRANULAR SHOULDER Adjacent to PCC Pavement

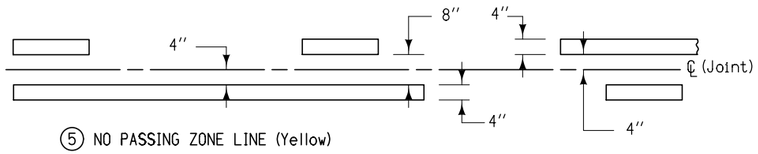
9001
10-19-10



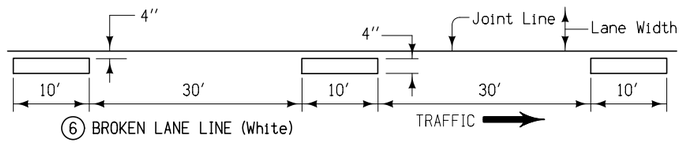
(2) BROKEN CENTER LINE (Yellow)



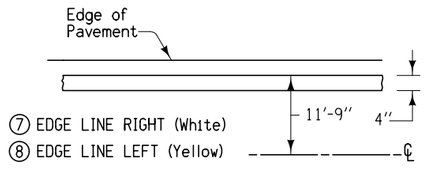
(3) DOUBLE CENTER LINE (Yellow)



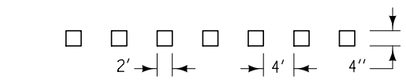
(5) NO PASSING ZONE LINE (Yellow)



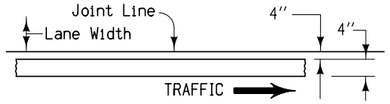
(6) BROKEN LANE LINE (White)



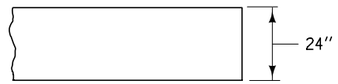
(7) EDGE LINE RIGHT (White)
(8) EDGE LINE LEFT (Yellow)



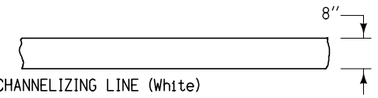
(9) DOTTED LINE (White)



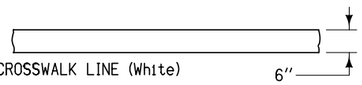
(10) SOLID LANE LINE (White)



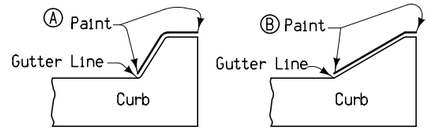
(13) STOP LINE (White)



(11) CHANNELIZING LINE (White)
(12) CHANNELIZING LINE (Yellow)

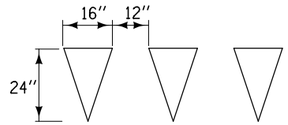


(14) CROSSWALK LINE (White)

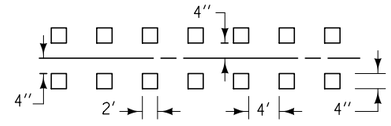


(A) Paint 12" width for 6" Standard Curb,
(B) Paint 14" width for 6" Sloped Curb.

(15) YELLOW CURB (16) WHITE CURB



(17) YIELD LINE (White)

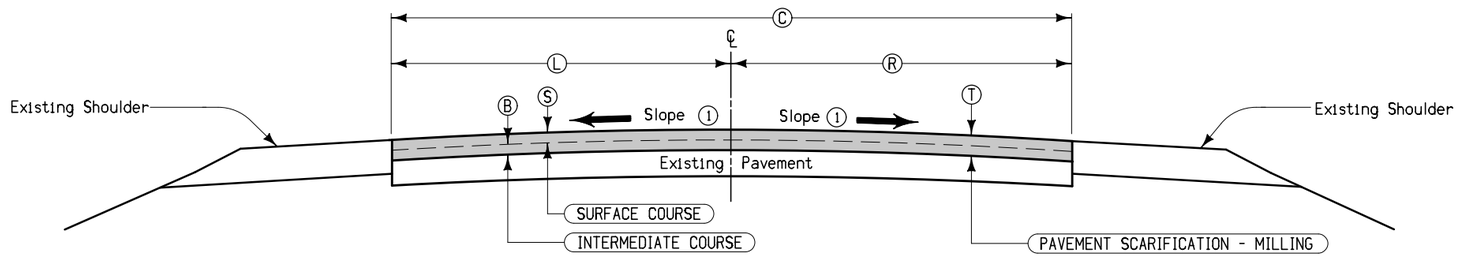


(18) DOUBLE DOTTED LINE (Yellow)

Design No. 111/211
File No. 30387

STANDARD TYPES OF PAVEMENT MARKINGS

2618
10-17-06



Notes:

(1) 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.

Refer to tabulation listing of superelevated curves and Standard Road Plans for additional requirements through superelevated curves.

(2) Tack Coat estimated for ___ applications.

DESIGN RATES	
ITEM	RATE
Surface Course	145 lbs./cu. ft.
Intermediate Course	145 lbs./cu. ft.
Tack Coat	0.05 gal./sq. yd.

Design Quantities Per Station

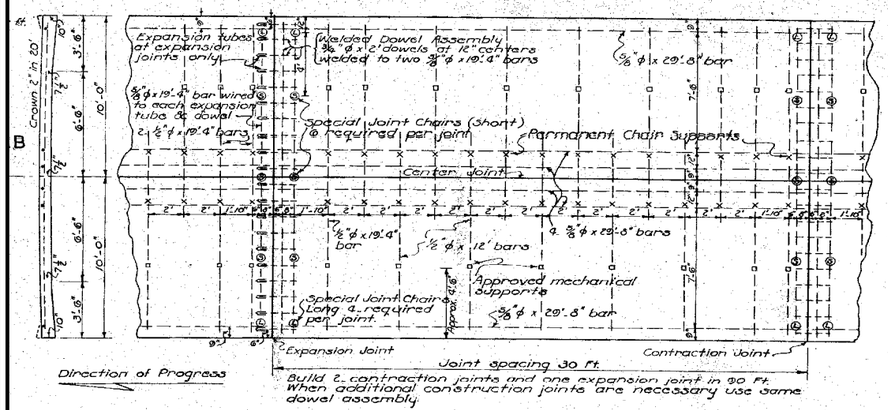
Location			Ⓢ	Ⓑ	Ⓣ	Ⓒ	Ⓛ	Ⓡ	Tack Coat (2)	Asphalt Binder	Hot Mix Asphalt (Tons)		Pavement Scarification	Remarks
Road Identification	Station To Station		Inches	Inches	Inches	Feet	Feet	Feet	Gallons	Tons	Surface	Intermediate	Sq. Yds.	
U.S. 6	19+30	19+55	2	0	2-1.5	25.0	12.1	12.9	3.5	0.5	7.6		70	
	22+15	22+62	2	0	1.1-2	25.9	13.0	12.9	6.8	0.9	14.7		136	

TYPICAL CROSS SECTION HMA RESURFACING & PAVEMENT SCARIFICATION

FED. ROAD DIST. NO.	STATE	F.N. PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA	310"F"		3A	23

(USE AS REFERENCE ONLY)

PAVEMENT REINFORCING PLAN - 20 FT. ROADWAY



Build 2 contraction joints and one expansion joint in 30 Ft. When additional construction joints are necessary use same dowel assembly.

See sheet No. 5 for special bridge approach slab details.

*Above reinforcing plan shows welded joint dowel assembly supported by special joint chairs. Other devices or methods of dowel support will be considered. In case other devices or methods of dowel support are approved for use, the same steel arrangement shall apply, except that the three 5/8" ϕ x 19'-8" bars forming a part of the welded dowel assembly shown may be changed to 1 1/2" ϕ x 19'-4" bars, wire tied to each dowel. All reinforcing to be plain round bars.

All longitudinal reinforcing to be 3/4" ϕ bars, placed with top of bar 3 inches below slab surface. Ends of longitudinal bars to be 2 inches from center of transverse joints.

All transverse reinforcing to be 1" ϕ bars, except for three 3/4" ϕ bars for welded dowel assembly. Transverse bars to be placed under longitudinal bars.

All reinforcing to be held rigidly in true position.

Minimum Construction Requirements:

1. All transverse bars to be placed under longitudinal bars and to be supported by two permanent chairs and one removable device. When construction or subgrade conditions require more supports, the contractor shall furnish and place one additional permanent chair per each transverse bar without additional cost to the State.

2. Dowel and transverse bars of dowel assembly to be supported in a plane parallel to the slab surface. Support for welded assembly shall be special joint chairs. Center of dowels to be 4 inches below slab surface.

3. Side longitudinal bars to be supported by removable brackets from the side forms. Top of bar to be 3 inches below slab surface.

4. All splice laps in bars to be 2 feet and all splices and intersections of bars to be securely wired.

5. Permanent chair supports to be pressed metal pins of U-shaped cross section with bar hole and subgrade lug. Penetration into subgrade to be not less than 4 inches. Distance from subgrade lug to bottom of bar hole to be 3 3/4 inches. Metal to be not less than 16 guage.

6. Special joint chairs to be pressed sheet metal pins of U-shaped cross section of not less than 12-guage. To have bar notch & wire tie lug in top and subgrade lug. Special joint chairs long Ⓒ Distance from bottom of bar notch to subgrade lug 4 5/8 inches. Penetration below subgrade lug 6 inches. Special joint chairs - short Ⓢ Distance from bottom of bar notch to subgrade lug 2 1/2 inches. Penetration below subgrade lug 4 inches.

*Transverse bars in dowel assembly may be of structural grade new billet stock.

Design No. 111/211
File No. 30387

ENGLISH	IOWA DOT	DESIGN TEAM Jia\Strum\Prindle	POTTAWATTAMIE COUNTY	PROJECT NUMBER BRF-006-1(114)--38-78	SHEET NUMBER B.4

ESTIMATED PROJECT QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2101-0850001	CLEARING AND GRUBBING	ACRE	1.0	
2	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	6,542.0	
3	2102-2712015	EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS	CY	10.0	
4	2102-4560000	LOCATING TILE LINES	STA	21.50	
5	2105-8425011	TOPSOIL, SPREAD	CY	41.0	
6	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY	2,098.0	
7	2113-0001100	SUBGRADE STABILIZATION MATERIAL, POLYMER GRID	SY	222.0	
8	2115-0100000	MODIFIED SUBBASE	CY	253.0	
9	2121-7425010	GRANULAR SHOULDERS, TYPE A	TON	68.8	
10	2122-5190501	PAVED SHOULDER, PORTLAND CEMENT CONCRETE (PAVED SHOULDER PANEL FOR BRIDGE END DRAIN)	SY	163.8	
11	2122-5500060	PAVED SHOULDER, HOT MIX ASPHALT MIXTURE, 6 IN.	SY	484.8	
12	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	4.29	
13	2214-5145150	PAVEMENT SCARIFICATION	SY	206.0	
14	2301-1033095	STANDARD OR SLIP FORM PORTLAND CEMENT CONCRETE PAVEMENT, CLASS C, CLASS 3 DURABILITY, 9.5 IN.	SY	28.9	
15	2303-0033504	HOT MIX ASPHALT MIXTURE (1,000,000 ESAL), SURFACE COURSE, 1/2 IN. MIX, FRICTION L-4	TON	22.3	
16	2303-0246422	ASPHALT BINDER, PG 64-22	TON	1.4	
17	2412-0000100	LONGITUDINAL GROOVING IN CONCRETE	SY	28.0	
18	2503-0500400	BRIDGE END DRAIN, RF-40	EACH	4	
19	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL	LF	240.0	
20	2505-4008300	STEEL BEAM GUARDRAIL	LF	125.0	
21	2505-4008400	STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION	EACH	4	
22	2505-4021010	STEEL BEAM GUARDRAIL END ANCHOR, BOLTED	EACH	4	
23	2505-4021700	STEEL BEAM GUARDRAIL END TERMINAL	EACH	4	
24	2507-3250005	ENGINEERING FABRIC	SY	165.0	
25	2507-6800061	REVETMENT, CLASS E	TON	160.0	
26	2510-6745850	REMOVAL OF PAVEMENT	SY	230.0	
27	2518-6910000	SAFETY CLOSURE	EACH	2	
28	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	7.47	
29	2528-8445110	TRAFFIC CONTROL	LS	1.00	
30	2601-2634100	MULCHING	ACRE	2.0	
31	2601-2636015	NATIVE GRASS SEEDING	ACRE	2.0	
32	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	0.3	
33	2601-2640350	SPECIAL DITCH CONTROL, WOOD EXCELSIOR MAT	SQ	96.0	
34	2601-2642100	STABILIZING CROP - SEEDING AND FERTILIZING	ACRE	2.3	
35	2601-2643110	WATERING FOR SOD, SPECIAL DITCH CONTROL, OR SLOPE PROTECTION	MGAL	19.20	
36	2602-0000020	SILT FENCE	LF	1,825.0	
37	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF	90.0	
38	2602-0000090	CLEAN-OUT OF SILT FENCE	LF	730.0	
39	2602-0000100	CLEAN-OUT OF SILT FENCE FOR DITCH CHECK	LF	30.0	

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
1	2101-0850001	**CLEARING AND GRUBBING** Dispose per Standard Note 213-1, sheet C.5.
2	2102-2710070	**EXCAVATION, CLASS 10, ROADWAY AND BORROW** Includes 4,127 CY of suitable material to be used in the roadway fill. Includes 1,895 CY of suitable material to be wasted per Std. Note 213-1. Includes 41 CY of Unsuitable Type "B" material to be used for topsoil and 479 CY of Unsuitable Type "B" material to be wasted per Std. Note 213-1. Refer to Tab 103-4 on sheet C.5 for details.
3	2102-2712015	**EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS** Refer to Tab. 103-7 on sheet C.6 for details.
4	2102-4560000	**LOCATING TILE LINES** Item is estimated at twice the project length.
5 6	2105-8425011 2105-8425015	**TOPSOIL, SPREAD** **TOPSOIL, STRIP, SALVAGE AND SPREAD** Refer to Tab. 103-4 on Sheet C.5 for location and details.
7	2113-0001100	**SUBGRADE STABILIZATION MATERIAL, POLYMER GRID** Refer to Tab. 112-6 on Sheet C.7 for details. Must be completed prior to the completion of the critical closure.
8	2115-0100000	**MODIFIED SUBBASE** Refer to Typical 7156 on sheet B.2 for locations and details. Must be completed prior to the completion of the critical closure.
9	2121-7425010	**GRANULAR SHOULDERS, TYPE A** Refer to Typical 7110 on Sheet B.3 for location and details.
10	2122-5190501	**PAVED SHOULDER, PORTLAND CEMENT CONCRETE (PAVED SHOULDER PANEL FOR BRIDGE END DRAIN)** Refer to Tab 104-8A on sheet C.8 for location and details. Must be completed prior to the completion of the critical closure.
11	2122-5500060	**PAVED SHOULDER, HOT MIX ASPHALT MIXTURE, 6 IN.** Refer to Typical 7156 on sheet B.2 for location and details. Must be completed prior to the completion of the critical closure.
12	2123-7450000	**SHOULDER CONSTRUCTION, EARTH** Requires 165 CY of Earth Shoulder Fill. Refer to Typical 7156 on sheet B.2 and 7110 on sheet B.3 for details.
13	2214-5145150	**PAVEMENT SCARIFICATION** Refer to Typical 2618 on Sheet B.4 for locations and details. Must be completed prior to the completion of the critical closure.
14	2301-1033095	**STANDARD OR SLIP FORM PORTLAND CEMENT CONCRETE PAVEMENT, CLASS C, CLASS 3 DURABILITY, 9.5 IN.** Refer to Typical 2211 on sheet B.1 for locations and details. Must be completed prior to the completion of the critical closure.
15 16	2303-0033504 2303-0246422	**HOT MIX ASPHALT MIXTURE (1,000,000 ESAL), SURFACE COURSE, 1/2 IN. MIX, FRICTION L-4** **ASPHALT BINDER, PG 64-22** Refer to Typical 2618 on Sheet B.4 for locations and details. Must be completed prior to the completion of the critical closure.
17	2412-0000100	**LONGITUDINAL GROOVING IN CONCRETE** Refer to Tab 100-28 on sheet C.7 for details. Must be completed prior to the completion of the critical closure.
18	2503-0500400	**BRIDGE END DRAIN, RF-40** Refer to Tab 104-8A on sheet C.8 for details.
19	2505-4008120	**REMOVAL OF STEEL BEAM GUARDRAIL** Refer to Tab 110-7A on sheet C.7 for details.

Design No. 111/211
File No. 30387

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
20 21 22 23	2505-4008300 2505-4008400 2505-4021010 2505-4021700	STEEL BEAM GUARDRAIL STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION STEEL BEAM GUARDRAIL END ANCHOR, BOLTED STEEL BEAM GUARDRAIL END TERMINAL Refer to Tab 108-8A on sheet C.8 for details. Must be completed prior to the completion of the critical closure.
24	2507-3250005	ENGINEERING FABRIC Refer to Estimated Project Quantities Tabulation on Sheet S.1
25	2507-6800061	REVETMENT, CLASS E Refer to Estimated Project Quantities Tabulation on Sheet S.1
26	2510-6745850	REMOVAL OF PAVEMENT Refer to Tab 110-1 and 102-5 on Sheet C.7 for location and details.
27	2518-6910000	SAFETY CLOSURE Refer to Tab. 108-13A on Sheet C.7 for locations.
28	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED Refer to Tab. 108-22 on Sheet C.8 for location and details.
29	2528-8445110	TRAFFIC CONTROL Refer to Traffic Control Plan on Sheet C.3.
30	2601-2634100	MULCHING Mulch: Rate -- 1.5 tons of dry cereal straw per acre. All mulch is to be consolidated into the soil with the mulch tiller. Mulch shall be Certified Noxious Weed Seed Free Mulch as certified by the Iowa Crop Improvement Association or adjacent states Crop Improvement Associations.
31	2601-2636015	NATIVE GRASS SEEDING Included for all disturbed areas following final construction. Seed Mixture: (Area outside 8 ft adj. to shoulder) *Canada Wildrye 10 lbs. PLS per acre Grain Rye 40 lbs. per acre *Indiangrass 10 lbs. per acre *Big Bluestem 10 lbs. PLS per acre *Switchgrass 5 lbs. PLS per acre *Sideoats Grama 5 lbs. PLS per acre *Little Bluestem 5 lbs. PLS per acre *Blackeyed Susan 4 ozs. PLS per acre *Purple Prairie Clover 4 ozs. PLS per acre *Prairie Blazing Star 4 ozs. PLS per acre *Grayhead Prairie Coneflower 4 ozs. PLS per acre *Purple Coneflower 4 ozs. PLS per acre *Seed shall be certified as Source Identified Class (Yellow Tag) Source/GO-Iowa Fertilizer: Rate--400 lbs. of 13-13-13 or equivalent commercial fertilizer per acre.
32	2601-2636043	SEEDING AND FERTILIZING (RURAL) Included for all disturbed areas following final construction. Seed Mixture: (Area 8 ft adj. to shoulder) Fescue, Tall(Fawn) 55 lbs. per acre Ryegrass, Perennial 45 lbs. per acre Birdsfoot Trefoil (Empire) 5 lbs. per acre Fertilizer: Rate--750 lbs. of 13-13-13 or equivalent commercial fertilizer per acre.
33	2601-2640350	SPECIAL DITCH CONTROL, WOOD EXCELSIOR MAT Refer to EC-101. Sta. 17+75 to Sta. 19+75 - 16 ft width Sta. 22+00 to Sta. 24+00 - 16 ft width Sta. 22+00 to Sta. 24+00 - 16 ft width

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
34	2601-2642100	STABILIZING CROP - SEEDING AND FERTILIZING Included for all disturbed areas. Seed Mixture: Spring--March 1 to May 20 Oats 2 bu. per acre Grain Rye 25 lbs. per acre Red Clover 5 lbs. per acre Timothy 5 lbs. per acre Summer--May 21 to July 20 Oats 3 bu. per acre Grain Rye 35 lbs. per acre Red Clover 5 lbs. per acre Timothy 5 lbs. per acre Fall--July 21 to September 30 Oats 2 bu. per acre Grain Rye 35 lbs. per acre Red Clover 5 lbs. per acre Timothy 5 lbs. per acre Fertilizer: Rate--450 lbs. of 13-13-13 or equivalent commercial fertilizer per acre.
35	2601-2643110	WATERING FOR SOD, SPECIAL DITCH CONTROL, OR SLOPE PROTECTION Estimate is based on four waterings of the special ditch control. Rate: 0.5 gal/sq. ft.
36	2602-0000020	SILT FENCE Item includes estimated locations for placement of "Silt Fence" to address erosion encountered during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 25% additional quantity for other locations of erosion. Refer to Tab 100-17 on sheet C.7 for locations and details.
37	2602-0000030	SILT FENCE FOR DITCH CHECKS Item includes estimated locations for placement of "Silt Fence for Ditch Checks" to address erosion encountered during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes an additional 50% for field adjustments and replacements. Refer to Tab 100-18 on sheet C.7 for locations and details.
38	2602-0000090	CLEAN-OUT OF SILT FENCE Item is included for maintaining silt fence during construction.
39	2602-0000100	CLEAN-OUT OF SILT FENCE FOR DITCH CHECK Item is included for maintaining the ditch check silt fence during construction.

Design No. 111/211
File No. 30387

STANDARD ROAD PLANS

105-4
04-20-10

The following Standard Road Plans shall be considered applicable to construction work on this project.

Number	Date	Title
BA-200	10-19-10	Steel Beam Guardrail Components
BA-201	10-19-10	Steel Beam Guardrail Barrier Transition Section
BA-202	04-20-10	Steel Beam Guardrail Bolted End Anchor
BA-205	04-20-10	Steel Beam Guardrail End Terminal
BA-250	10-19-10	Steel Beam Guardrail Installation at Concrete Barrier or Bridge End Post
EC-101	04-20-10	Wood Excelsior Mat for Ditch Protection
EC-201	04-20-10	Silt Fence
RF-40	10-19-10	Rock Flume for Bridge End Drain
RG-6	10-02-01	Details for Hot Mix Asphalt Resurfacing (Single Course)
RK-20	04-19-11	Double Reinforced 12" Approach
RK-30	04-19-11	Bridge Approach (Abutting Pavement)
RL-1A	10-03-00	Embankment and Rebuilding Embankments
RL-2A	10-18-05	Details of Embankment Subgrade Treatment, Moisture Density Control & Special Compaction
RL-14A	10-19-10	Guardrail Grading
RL-17	10-16-07	Bridge Berm Grading without Recoverable Slope (Barnroof Section)
TC-1	10-17-06	Work Not Affecting Traffic
TC-202	04-20-10	Shoulder Closure (One Lane)
TC-213	10-21-08	Lane Closure with Flaggers
TC-233	04-19-11	Pavement Marking Operations Two-Lane
TC-252	10-20-09	Road Closure

TRAFFIC CONTROL PLAN

108-23
04-04-89

U.S. 6 will be closed to traffic. Iowa DOT staff will sign a detour route along Interstate 80, IA 92, and Co. Rd. L55.

Traffic Control on this project will be in accordance with Standard Road Plans TC-1, TC-202, TC-213, TC-233, and TC-252. For additional complementary information, refer to Part 6 of the Manual on Uniform Traffic Control Devices and to the current Standard Specifications.

POLLUTION PREVENTION PLAN

110-12A

STORM WATER POLLUTION PREVENTION PLAN
ENGLISH
December 2009 Version

This Base Pollution Prevention Plan (PPP) includes information on Roles and Responsibilities, Project Site Description, Controls, Maintenance Procedures, Inspection Requirements, Non-Storm Water Controls, Potential Sources of Off Right-of-Way Pollution, and Definitions. This plan references other documents rather than repeating the information contained in the documents. A copy of this Base Pollution Prevention Plan, amended as needed per plan revisions or by contract modification, will be readily available for review.

All contractors shall conduct their operations in a manner that controls pollutants, minimizes erosion, and prevents sediments from entering waters of the state and leaving the highway right-of-way. The prime contractor shall be responsible for compliance and implementation of the PPP for their entire contract. This responsibility shall be further shared with subcontractors whose work is a source of potential pollution as defined in this PPP.

1. ROLES AND RESPONSIBILITES
- Designer:
  - Prepares Base PPP included in the project plan.
  - Prepares Notice of Intent (NOI) submitted to Iowa DNR.
  - Signature authority on the Base PPP and NOI.
- Contractor/Subcontractor:
  - Affected contractors/subcontractors are co-permittees with the IDOT and will sign a certification statement adhering to the requirements of the NPDES permit and this PPP plan.

  All co-permittees are legally required under the Clean Water Act and the Iowa Administrative Code to ensure compliance with the terms and conditions of this PPP.
  - Submit a detailed schedule according to Article 2602 of the Specifications and any additional plan notes.
  - Install and maintain appropriate controls.
  - Supervise and implement good housekeeping practices.
  - Conduct joint required inspections of the site with inspection staff.
  - Signature authority on Co-Permittee Certification Statements and storm water inspection reports.
- RCE/Inspector:
  - Update PPP whenever there is a change in design, construction, operation or maintenance, which has a significant effect on the discharge of pollutants from the project.
  - Maintain an up-to-date list that identifies contractors and subcontractors as co-permittees.
  - Make these plans available to the DNR upon their request.
  - Conduct joint required inspections of the site with the contractor/subcontractor.
  - Complete an inspection report after each inspection.
  - Signature authority on storm water inspection reports and Notice of Discontinuation (NOD).

2. PROJECT SITE DESCRIPTION
This Pollution Prevention Plan (PPP) is for the construction of a bridge replacement on US 6 in Pottawattamie County over Keg Creek 5.9 miles east of Council Bluffs.

This PPP covers approximately 5.1 acres with an estimated 3.8 acres being disturbed. The portion of the PPP covered by this contract has 3.8 acres disturbed.

The PPP is located in an area of one soil association (Monona-Ida-Hamburg). The estimated average SCS runoff curve number for this PPP after completion will be 52.

Storm Water Site Map - Multiple sources of information comprise the base storm water site map including:
- Drainage patterns Plan and Profile sheets and Situation plans.
- Proposed Slopes Cross Sections.
- Areas of Soil Disturbance construction limits shown on Plan and Profile sheets.
- Location of Structural Controls Tabulations on C sheets.
- Locations of Non-structural Controls Tabulations on C sheets.
- Locations of Stabilization Practices generally within construction limits shown on Plan and Profile sheets.
- Surface Waters (including wetlands) Plan and Profile sheets.
- Locations where storm water is discharged Plan and Profile sheets.

The base site map is amended by contract modifications and progress payments of completed erosion control work.

Runoff from this work will flow into various unnamed ditches and Keg Creek which flow into the Missouri River.

Design No. 111/211
File No. 30387

POLLUTION PREVENTION PLAN

110-12A

3. CONTROLS
The contractor's work plan and sequence of operations specified in Article 2602.03 for accomplishment of storm water controls should clearly describe the intended sequence of major activities and for each activity define the control measure and the timing during the construction process that the measure will be implemented.

Preserve vegetation in areas not needed for construction.

Section 2601 and 2602 of the Standard Specifications define requirements to implement erosion and sediment control measures. Actual quantities used may vary from the Base PPP and amendment of the plan will be documented via fieldbook entries or by contract modification. Additional erosion and sediment control items may be required as determined by the inspector and/or contractor during storm water monitoring inspections. If the work involved is not applicable to any contract items, the work will be paid for according to Article 1109.03 paragraph B.

A. EROSION AND SEDIMENT CONTROLS

1. Stabilization Practices - Site plans will ensure that existing vegetation is preserved where attainable and disturbed portions of the site will be stabilized.

Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased.

Temporary stabilizing seeding shall be completed as the disturbed areas are constructed. If construction activity is not planned to occur in a disturbed area for at least 21 days, the area shall be stabilized by temporary seeding or mulching within 14 days. Other stabilizing methods shall be used outside the seeding time period.

Stabilization measures to be used for this project are located in the Estimated Project Quantities (100-1A) and Estimate Reference Information (100-4A) located on the C sheets of the plan.
Additional items may be found in the Inspector's Daily Reports (IDR) or Contract Modifications.

2. Structural Practices - Structural practices will be implemented to divert flows from exposed soils and detain or otherwise limit runoff and the discharge of pollutants from exposed areas of the site.

Structural items to be used for this project are located in the Estimated Project Quantities (100-1A) and Estimate Reference Information (100-4A) located on the C sheets of the plan, as well as all other item specific Tabulations. Typical drawings detailing construction of the devices to be used on this project can be found on the B sheets of the plan or are referenced in the Standard Road Plans Tabulation.

3. Storm Water Management - Measures shall be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed. The installation of these devices may be subject to Section 404 of the Clean Water Act.

B. OTHER CONTROLS
Contractor disposal of unused construction materials and construction material wastes shall comply with applicable state and local waste disposal, sanitary sewer, or septic system regulations. In the event of a conflict with other governmental laws, rules and regulations, the more restrictive laws, rules or regulations shall apply.

1. Vehicle Entrances and Exits - Construct and maintain entrances and exits to prevent tracking of sediments onto roadways.

2. Material Delivery, Storage and Use - Implement practices to prevent discharge of construction materials during delivery, storage, and use.

3. Stockpile Management - Install controls to reduce or eliminate pollution of storm water from stockpiles of soil and paving.

4. Waste Disposal - Do not discharge any materials, including building materials, into waters of the state, except as authorized by a Section 404 permit.

5. Spill Prevention and Control - Implement procedures to contain and clean-up spills and prevent material discharges to the storm drain system and waters of the state.

6. Concrete Residuals and Washout Wastes - Designate temporary concrete washout facilities for rinsing out concrete trucks. Provide directions to truck drivers where designated washout facilities are located.

7. Vehicle and Equipment Cleaning - Employ washing practices that prevent contamination of surface and ground water from wash water.

8. Vehicle and Equipment Fueling and Maintenance - Perform on site fueling and maintenance in accordance with all environment laws such as proper storage of onside fuels and proper disposal of used engine oil or other fluids on site.

9. Litter Management - Ensure employees properly dispose of litter.

POLLUTION PREVENTION PLAN

110-12A

C. APPROVED STATE OR LOCAL PLANS
During the course of this construction, it is possible that situations will arise where unknown materials will be encountered. When such situations are encountered, they will be handled according to all federal, state, and local regulations in effect at the time.

4. MAINTENANCE PROCEDURES
The contractor is required to maintain all temporary erosion and sediment control measures in proper working order, including cleaning, repairing, or replacing them throughout the contract period. This shall begin when the features have lost 50% of their capacity.

5. INSPECTION REQUIREMENTS
Inspections shall be made jointly by the contractor and the contracting authority at least once every seven calendar days and after each rain event that is ½" or greater. Storm water monitoring inspections will include:
- Date of the inspection.
- Summary of the scope of the inspection.
- Name and qualifications of the personnel making the inspection.
- Rainfall amount.
- Review erosion and sediment control measures within disturbed areas for the effectiveness in preventing impacts to receiving waters.
- Major observations related to the implementation of the PPP.
- Identify corrective actions required to maintain or modify erosion and sediment control measures.
- Verify that locations where vehicles enter or exit the site control offsite sediment tracking.

Include storm water monitoring inspection reports in the Amended PPP. Incorporate any additional erosion and sediment control measures determined as a result of the inspection. Immediately begin corrective actions on all deficiencies found and complete all actions within 3 calendar days of the inspection.

6. NON-STORM WATER DISCHARGES
This includes subsurface drains (i.e. longitudinal and standard subdrains) and slope drains. The velocity of the discharge from these features may be controlled by the use of patio blocks, Class A stone, erosion stone or other appropriate materials.

7. POTENTIAL SOURCES OF OFF RIGHT-OF-WAY (ROW) POLLUTION
Silts, sediment, and other forms of pollution may be transported onto highway right-of-way (ROW) as a result of a storm event. Potential sources of pollution located outside highway ROW are beyond the control of this PPP. Pollution within highway ROW will be conveyed and controlled per this PPP.

8. DEFINITIONS

Base PPP - Initial Pollution Prevention Plan.
Amended PPP - May include Plan Revisions or Contract Modifications for new items and fieldbook entries made by the inspector.
IDR - Inspector's Daily Report this contains the inspector's daily diary and item postings.
Controls - Methods, practices, or measures to minimize or prevent erosion, control sedimentation, control storm water, or minimize contaminants from other types of waste or materials.
Signature Authority - Representative from Designer, Contractor/Subcontractor, or RCE/Inspector authorized to sign various storm water documents.

Design No. 111/211
File No. 30387

04-15-08 213-1

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.

04-30-02 213-7

Unless otherwise directed or authorized, all hot mix asphalt and other bituminous materials which are not specifically addressed or described in the contract documents shall become the property of the contractor.

The contractor, in accordance with current rules and regulations of the Iowa Department of Natural Resources, may:

1. With the approval of the Engineer, blend or otherwise process the material for use with shoulder or special backfill aggregate, for use on the project.
2. With the approval of the Engineer, place with material in areas designated by the Engineer as Soil Aggregate Subbase without extra charge.
3. Remove the material from the project and stockpile for the contractor's future use.

01-20-84 232-5

The contractor shall not disturb desirable grass areas and desirable trees outside the construction limits. The contractor will not be permitted to park or service vehicles and equipment or use these areas for storage of materials. Storage, parking and service area(s) will be subject to the approval of the resident engineer.

06-07-94 232-8

The top six (6) inches of the disturbed areas shall be free of rock and debris and shall be suitable for the establishment of vegetation, subject to the approval of the Engineer.

10-18-05 232-9

The contractor shall cut down all trees included in Clearing and Grubbing after September 15 and before April 15. This is due to the potential of these trees being inhabited by the Indiana Bat (Myotis sodalis), a State and Federal listed endangered species. The removal of a tree between April 15 and September 15 that is being used by an Indiana Bat constitutes a "taking" of a protected species, which is punishable by law.

10-28-97 232-10

The contractor is expected to have materials, equipment, and labor available on a daily basis to install and maintain erosion control features on the project. This may involve seeding, silt fence, rock ditch checks, silt basins, or silt dikes.

01-20-84 241-1

Road contractor is to use due caution in working over and around all tile lines. Breaks in the tile line due to the contractor's carelessness are to be replaced at his expense without cost to the State of Iowa. Any tile lines broken or disturbed by our cut lines will be replaced as directed by the engineer in charge of construction and at the State of Iowa's expense.

01-19-88 251-1

The contractor shall be responsible to maintain access to individual properties during construction.

Relocated access shall be completed to individual properties prior to removal of existing access.

If the permanent access cannot be completed prior to removal of the existing access, the contractor shall provide and maintain an alternate access. Temporary Granular Surfacing will be paid for as a contract item or by extra work.

10-18-05 262-6

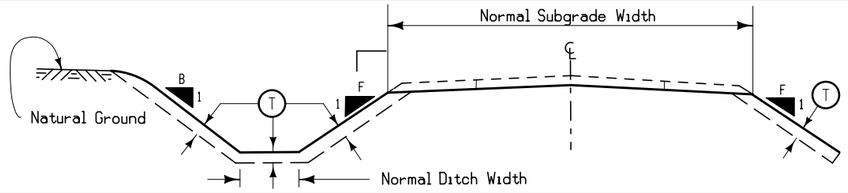
This project is NOT a POINT 25 project and is not subject to the provisions of IAC 761-115.25.

04-20-10 281-1

This project shall be constructed in accordance with the requirements of U.S. Army Corps of Engineers Nation Wide Permit, Permit No. 14. A copy of this permit is available from the Iowa DOT Office of Contracts upon request. The U.S. Army Corps of Engineers reserves the right to visit the site without prior notice.

TABULATION OF SPREADING TOPSOIL

103-4
10-19-10



NOTE:
This work shall be done in accordance with current specifications for "Stripping, Salvaging, and Spreading Topsoil". Prior to placing of topsoil on any cohesive soil, the area to be covered shall be scarified to a minimum depth of 3".

Appropriate adjustments have been made in the template quantities to reflect the placement of topsoil on foreslope, backslope and ditch bottom as detailed hereon.

PLACEMENT DESCRIPTION							TOPSOIL EXCAVATION AVAILABLE FROM			
AREA No.	QUANTITY Cu. Yds.	LOCATION Station to Station		SIDE L. or R.	SLOPE B. or F.	(T) In.	Amount Reserved Cu. Yds.	Station to Station		REMARKS
1	1054	15+25	19+78	Both	Both	7		15+25	20+75	Class 10 Topsoil
2	252	19+78	20+75	Both	Both	7		21+00	21+56	Class 10 Topsoil
3	416	21+00	23+55	Both	Both	7		21+56	24+25	Class 10 Topsoil
4	376	23+55	23+98	Both	Both	7		21+75	24+25	Uns. 'B' Topsoil
	2098	Topsoil - Strip,	Salvage, & Spread							
5	41	23+80	24+25	Both	Both	7		23+78	24+25	Uns. 'B'
	41	Topsoil - Spread								

Design No. 111/211
File No. 30387

104-9
10-19-10

LONGITUDINAL SUBDRAIN SHOULDER AND BACKSLOPE

① Refer to RL-13 or RL-15.

Refer to Soils Sheets

* Not a bid item

Location					Longitudinal Subdrain (RF-19C)							Subdrain Outlet					
Line No.	Road or Lane Ident.	Station to Station	Side	Depth (D)	Shoulder		Backslope		Bridge Berm①			RF-19C, RF-19E, or RF-19F			Porous* Backfill	Class "A"* Crushed Stone	Remarks
					Size	Length	Size	Length	Size	Type	Length	Station	Size	Standard Road Plan and Type			
				IN	IN	FT	IN	FT	IN		FT		IN		CY	CY	
NOTE: RECORDS DO NOT INDICATE ANY EXISTING LONGITUDINAL SUBDRAINS IN THE PROJECT AREA. ANY EXISTING LONGITUDINAL SUBDRAINS AND ASSOCIATED OUTLETS THAT ARE IDENTIFIED SHALL BE MAINTAINED, INCLUDING INSTALLING NEW OUTLETS AS MAY BE NECESSARY.																	

103-7
08-01-08

SHRINKAGE DATA

Material	%	Remarks
Topsoil	40%	
Class 10	30%	
		Boulders 10 Cu. Yds.

Special attention should be given to Section 2107.03.C, Standard Specification Series of 2009, on this project.

Design No. 111/211
File No. 30387

GEOTECHNICAL DESIGN

LICENSED PROFESSIONAL ENGINEER
Robert L. Stanley
08468
IOWA

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.

Robert Stanley 12-15-10
Signature Date

Robert L. Stanley
Printed or Typed Name

My license renewal date is December 31, 2012

Pages or sheets covered by this seal: C.6

ENGLISH	IOWA DOT	DESIGN TEAM	Stanley/Schappaugh	Pottawattamie COUNTY	PROJECT NUMBER BRF-006-1(114)--38-78	SHEET NUMBER C.6

12/15/2010 8:48:53 AM rschapp W:\Projects\7800602005\Soils\SPREDSHT\SolCalFil.xlsm

TABULATION OF EXISTING PAVEMENT

102-5
10-29-02

No.	Location	Existing Pavement (Type)	Coarse Aggregate TYPE Gravel	Coarse Aggregate TYPE Crushed Stone	Coarse Aggregate Source	Coarse Aggregate Durability Class	Pavement Thickness (Inches)	Reinforcement (Type)	Detail Typical
	U.S. 6	RAC		X	Crescent		2		
		RAC		X	Macendonia		1.5		
		AAC		X	Crescent		0.75		
		AAC		X	Alden		1.5		
		PC7	X		Oreapolis	3	7		

REMOVAL OF STEEL BEAM GUARDRAIL

* Not a bid item.
(1) Lane(s) to which the installation is adjacent.

110-7A
10-19-10

No.	(1) Direction of Traffic	Location Station to Station		Side	Guardrail Remove LF	End Terminals and Anchors* Remove No.	End Terminals and Anchors* Type	Remarks
1	WB	19+87		Lt	60	1		
2	EB	19+87		Rt	60	1		
3	WB	21+83		Lt	60	1		
4	EB	21+83		Rt	60	1		
			Totals		240	4		

REMOVAL OF PAVEMENT

Refer to Tabulation 102-5

* Not a Bid Item

110-1
04-19-05

Station to Station		Pavement Type	Area (Sq. Yds.)	Saw Cut* (Lin. Ft.)	Intakes and Utility Accesses (No.)	Remarks
19+54	19+93	HMA/PCC	114	26		
21+76	22+15	HMA/PCC	116	27		

TABULATION OF SAFETY CLOSURES

Refer to Section 2518 of the Standard Specifications

108-13A
10-28-97

STATION	CLOSURE TYPE Road Qty.	CLOSURE TYPE Hazard Qty.	REMARKS
17+00	1		
25+00	1		

TABULATION OF SILT FENCES

Refer to EC-201

100-17
04-20-10

Location Station to Station		Side	Length (Lin. Ft.)	Remarks
17+75	19+75	Lt	220	Foreslope
18+50	19+75	Lt	145	Backslope
22+00	24+00	Lt	220	Foreslope
22+00	24+00	Lt	220	Backslope
17+50	19+00	Rt	170	Foreslope
17+50	19+00	Rt	170	Backslope
22+00	24+00	Rt	220	Foreslope
22+00	22+75	Rt	95	Backslope
	Total		1460	

BRIDGE APPROACH SECTION

Refer to the RK-Series Standard Road Plans.

* Not a bid item

112-6
MODIFIED

Location Bridge Station	Location End	Approach Pavement (T) Thickness Inches	Approach Pavement * Pay Length Feet	Approach Pavement Non-Reinf. Pavement Area Sq. Yds.	Approach Pavement Single-Reinf. Pavement Area Sq. Yds.	Approach Pavement Double-Reinf. Pavement Area Sq. Yds.	Fixed or Movable Abutment F or M	Subdrain * Perforated Subdrain 4" Lin. Ft.	Subdrain * Subdrain Outlet Station	Subdrain * Subdrain Outlet Side	Subdrain * Porous Backfill Cu. Yds.	Subdrain * Class 'A' * Crushed Backfill Cu. Yds.	Modified Subbase Tons	Polymer Grid Sq. Yds.	Remarks
20+85	West	12	20				M						104	111	Precast appoach pavement included elsewhere
20+85	East	12	20				M						104	111	in these plans

TABULATION OF SILT FENCES FOR DITCH CHECKS

Refer to EC-201

100-18
04-20-10

Location Station	Side	Lin. Ft.	Remarks
19+75	Lt	15	
22+00	Lt	15	
19+00	Rt	15	
22+00	Rt	15	
Total		60	

GRADING FOR GUARDRAIL INSTALLATIONS

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

Refer to RL-14A

107-23
10-19-10

Location No.	(1) Direction of Traffic	Location Station	Location Side	Foreslope at Guardrail	Dimensions (Feet) X1	Y1	X2	Y2	X3	Y3	X4	Y4	Z	Slope in Front of Guardrail %	Earthwork Excavation Class 10 CY	Earthwork Embankment in Place CY	Remarks
1	WB	19+69	Lt	6:1	40.6	5.6					90.6	7.1	73.2	4			
2	EB	19+69	Rt	6:1	40.6	5.6	53	14.9	78	14.9	128	18.2	76.7	4			
3	WB	22+01	Lt	6:1	40.6	5.6	53	14.9	78	16.5	128	18.5	74.2	4			
4	EB	22+01	Rt	6:1	40.6	5.6					90.6	17	63.6	4			

LONGITUDINAL GROOVING

100-28
10-16-07

Location	Total Sq. Yds.	Remarks
19+55	13.2	West cast-in-place appr.
22+10	14.8	East cast-in-place appr.

Design No. 111/211
File No. 30387

ENGLISH	IOWA DOT	DESIGN TEAM Jia\Strum\Prindle	POTTAWATTAMIE COUNTY	PROJECT NUMBER BRF-006-1(114)--38-78	SHEET NUMBER C.7

STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE END POST

Refer to BA-200, BA-201, BA-202, BA-205, BA-250, SI-172, SI-173 and SI-211.

108-8A
10-19-10

Location Station			Layout Lengths				Delineators and Object Markers					Bid Items (1)						(1) See Standards for list of materials.
			(VT1)	(VF)	(VT2)	(ET) Terminal	Type	Delineator Type 1	Object Marker Type 2	Object Marker Type 3		End Anchor Bolted	Barrier Transition Section	Steel Beam Guardrail	End Terminal Standard	End Terminal Flared for Cable Connection	Adapter	
								White		OM-3L	OM-3R	BA-202	BA-201	BA-200	BA-205	BA-206	BA-210	
No.	Station	Offset	LF	LF	LF	LF		No.	No.	No.	No.	Type	No.	LF	No.	No.	No.	Remarks
	19+69		40.60			50.00				1		A	1	12.50	1			
	19+69		40.60	12.50	25.00	50.00					1	A	1	50.00	1			
	22+01		40.60	12.50	25.00	50.00				1		A	1	50.00	1			
	22+01		40.60			50.00					1	A	1	12.50	1			
											Totals	4	4	125.00	4			

PAVEMENT MARKINGS

108-22
04-20-10

* See Typical 9001 for 'A' and 'B' designation

(2) Broken Center Line (Yellow) (5) No-Passing Zone Line (Yellow) (7) Edge Line Right (White) (9) Dotted Line (White) (11) Channelizing Line (White) (13) Stop Line (White) (15) Yellow Curb (17) Yield Line (White)
(3) Double Center Line (Yellow) (6) Broken Lane Line (White) (8) Edge Line Left (Yellow) (10) Solid Lane Line (White) (12) Channelizing Line (Yellow) (14) Crosswalk Line (White) (16) White Curb (18) Double Dotted Line (Yellow)

Location					Length (In Stations)																		Remarks
Road Identification	Station to Station		Side L	Side R	(2)	(3)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15A)*	(15B)*	(16A)*	(16B)*	(17)	(18)	
U.S. 6		22+62	X						3.32														
		22+62			3.32																		
		22+62		X					3.32														
	Length Subtotals				3.32				6.64														
	Quantity Factors				.25	2	1	.25	1	1	.33	1	2	2	6	1.5	3	3.5	3	3.5	1.71	.66	
	Totals				0.83				6.64														

SCOUR PROTECTION OR ROCK FLUME FOR BRIDGE END DRAIN

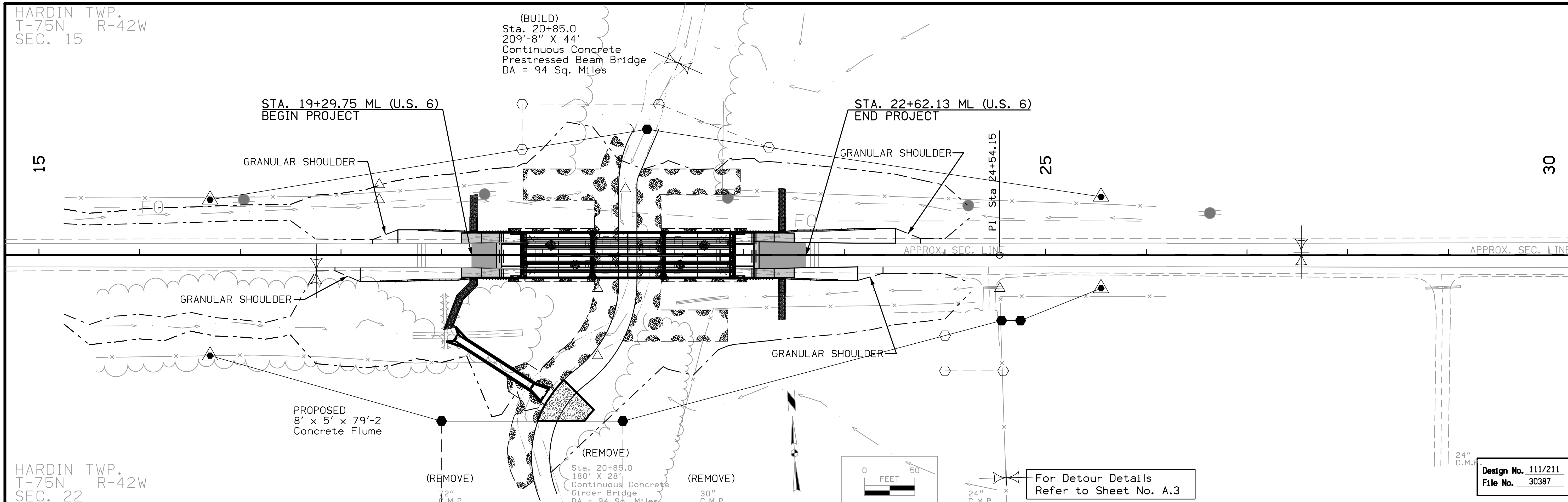
Refer to Standard Road Plan RF-39 or RF-40

(1) Not a Bid Item

104-8A
04-20-10

Location			Shoulder				Rock Flume RF-40			Scour Protection RF-39		Remarks
Bridge Station	Bridge Corner	Distance DI-1 or DI-2	Panels Required A B C or D	PCC Sq. Yds.	Polymer Grid (1) Sq. Yds.	Modified Subbase Tons (1)	Macadam Stone Base Material Tons (1)	Engineering Fabric (1) Sq. Yds.	Erosion Stone Tons (1)	OUTLET OR CHANNEL SCOUR PROTECTION Sq. Feet	TURF REINFORCED MAT (TRM) Squares	
20+85	NW	38.6	A,D	44.2	53.1	44.6	1.5	13.8	31.5			
20+85	SW	38.6	B,C	40.6	49.5	41.6	1.5	18.6	50.6			
20+85	NE	38.6	B,C	39.5	48.4	40.7	1.5	15.3	37.2			
20+85	SE	38.6	A,D	39.5	48.4	40.7	1.5	14.8	35.3			
Totals				163.8	199.4	167.6	6.0	62.5	154.6			

Design No. 111/211
File No. 30387



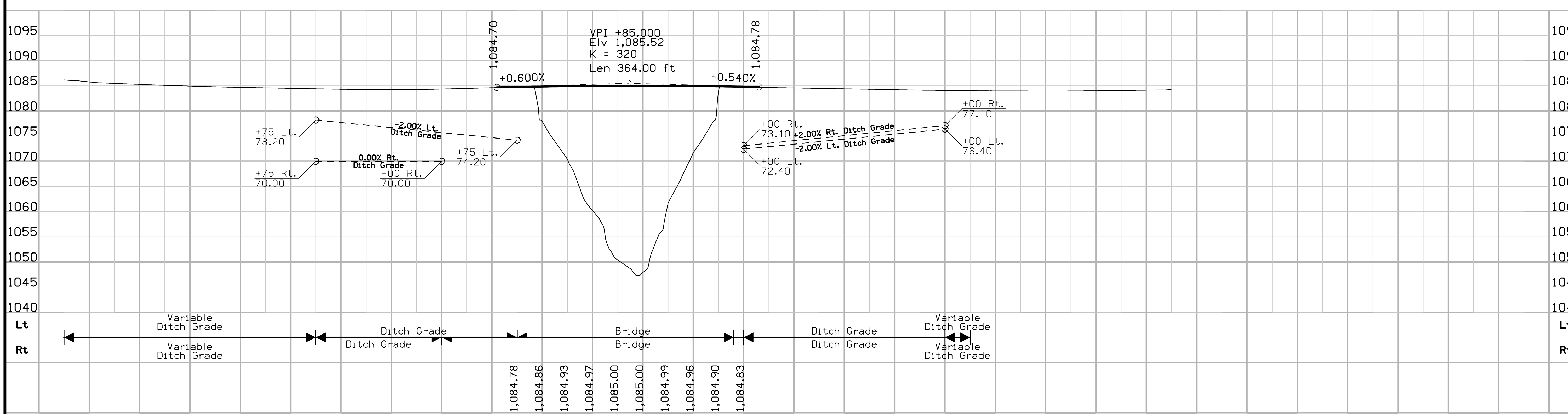
Design No. 111/211
File No. 30387

Cut = 2,965 CY
From 21+12 = 483 CY
3,448 CY

Fill + 30% = 3,448 CY
3,448 CY

Cut = 3,057 CY
Uns. 'B' Cut = 520 CY
3,577 CY

Fill + 30% = 679 CY
To 18+43 = 483 CY
Suit. Waste = 1,895 CY
Uns. 'B' for Topsoil = 41 CY
Uns. 'B' = 479 CY
3,577 CY



ENGLISH	IOWA DOT	DESIGN TEAM Jia\Strum\Prindle	POTTAWATTAMIE COUNTY	PROJECT NUMBER BRF-006-1(114)--38-78	SHEET NUMBER D.1

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GENERAL INFORMATION

This survey is a retrace of present US 6, excepting that some or all PI delta angles will not match the original plan deltas. If centerline curves are to be calculated, the new PI deltas would need to be used along with the original plan length data of the curve. Stationing was not adjusted (or equated) for horizontal error between PI's, all PI's on this survey are held to the same stationing as on the orginal plan, this will result in excess or deficiency when comparing the distances between plan PI's and actual field measured PI's. The District 4 Right of Way Office in Atlantic will have an equated centerline available and bench mark information per request.

Iowa D.O.T. observed two points for 4.5 hours using static methods and provided Opus coordinate positions on two GPS control points named Gps100 and Gps200. In the RTK GPS survey, Opus State plane Coordinates were held. The Opus elevation was not used, The elevation used came from National Geodetic Survey (NGS) monument disk Stamped "M 106 1935" in the town of Underwood Iowa.

When using State Plane Coordinates to calculate or measure accurate surface distances a combination scale of 1.00010919 must be applied.

Vertical Datum

Elevation for this survey was determined fron the OPUS occupation and are 0.49 lower than NGS Bench Mark MJ0652.
(1072.69 NGS MJ0652 - this survey 1072.20 = 0.49)

Elevation was tranfered by RTK with a Trimble 5700 GPS from "MJ0652" (elev. 1072.69) to Opus Point No. GPS Point GPS100 and also to point No. 501 (bridge bench mark).

Plans used to retrace centerline of US 6.
Pottawattamie County Grading Plan STP-6-1(87)--2J-78

BENCHMARKS

PT. NO. 501
STA.19+90.22
XC= 1,048,366.1150
YC= 477,165.5860
ELEVEVATION 1087.551
FND. D.O.T PLUG SW CORNER BRIDGE WING WALL

P.T. STA. 0-13.66

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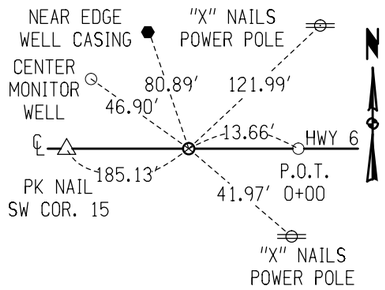
XC=1,044,255.511 YC=477,402.221
ELEVATION 1118.004



P.I. STA. 24+54.40

FOUND PK NAIL PT. NO. 3010
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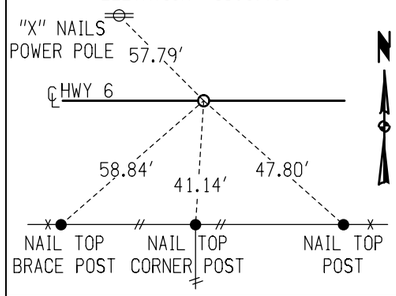
ELEVATION 1083.935



P.I. STA. 41+04.16

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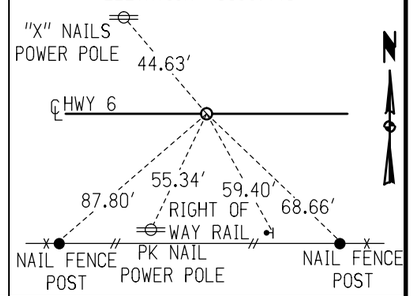
ELEVATION 1156.440



DETAILS OF REFERENCE INFORMATION

All References are Plumb Distances unless otherwise noted.

Design No. 111/211
File No. 30387

ENGLISH	IOWA DOT	DESIGN TEAM J1a\Strum\Prindle	POTTAWATTAMIE COUNTY	PROJECT NUMBER BRF-006-1(114)--38-78	SHEET NUMBER G.1

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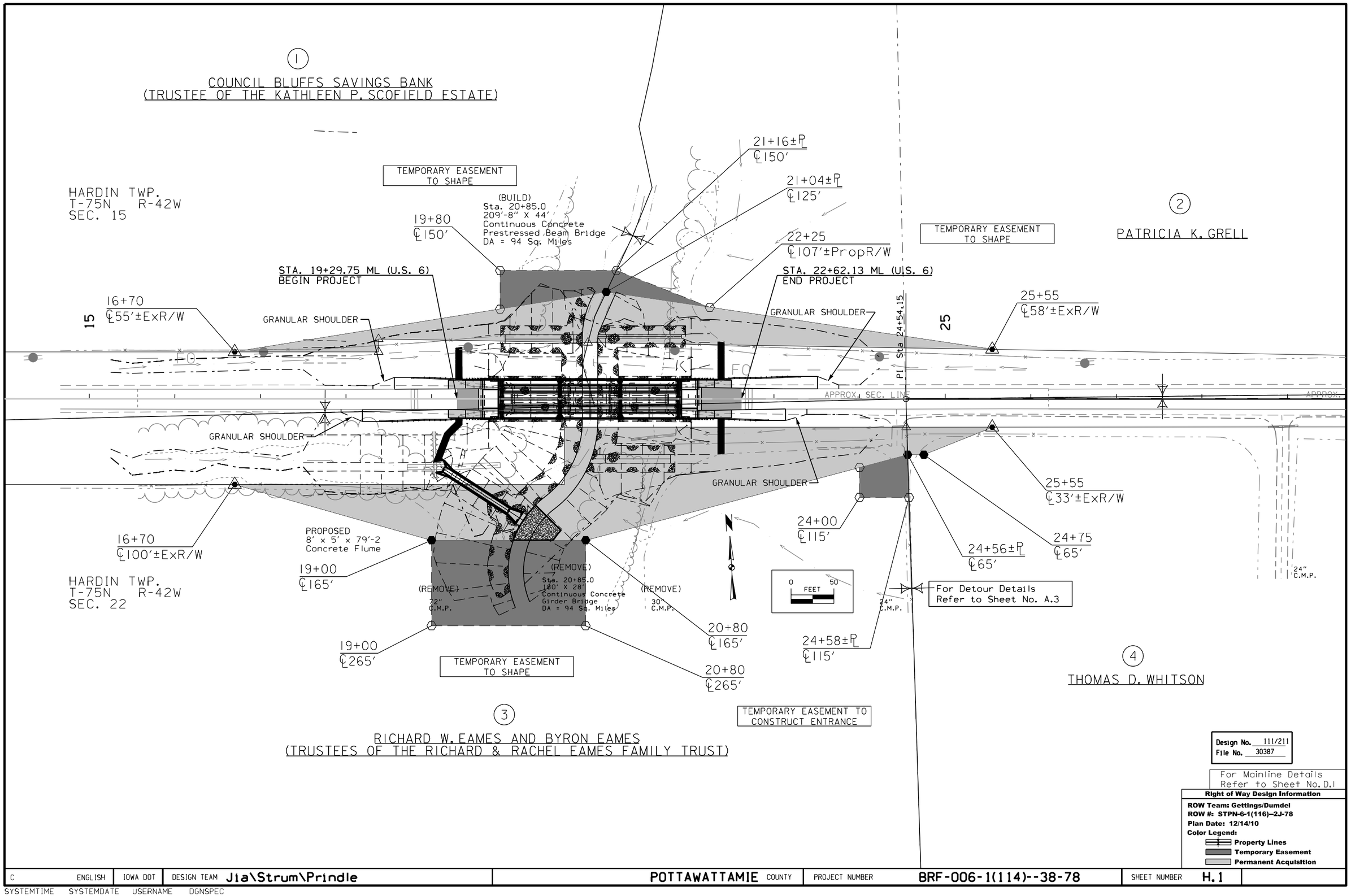


Design No. 111/211
File No. 30387

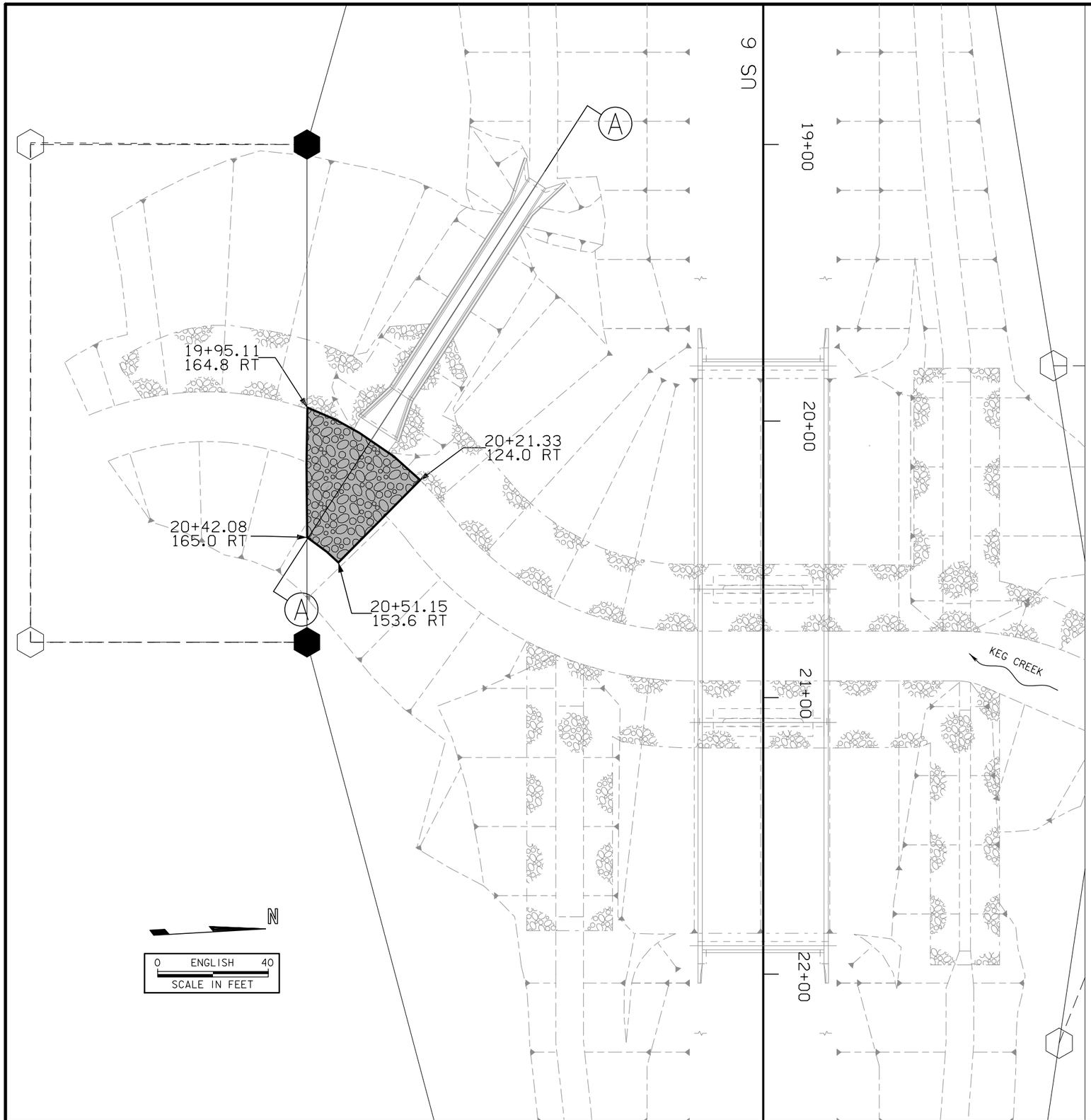
For Mainline Details
Refer to Sheet No. D.1

Right of Way Design Information

ROW Team: Gettings/Dumdei
ROW #: STPN-6-1(116)--2J-78
Plan Date: 12/14/10
Color Legend:
- Property Lines
- Temporary Easement
- Permanent Acquisition

C	ENGLISH	IOWA DOT	DESIGN TEAM Jia\Strum\Prindle	POTTAWATTAMIE COUNTY	PROJECT NUMBER BRF-006-1(114)--38-78	SHEET NUMBER H.1

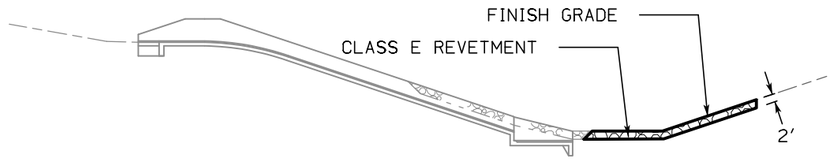
SYSTEMTIME SYSTEMDATE USERNAME DGNSPEC



ESTIMATED PROJECT QUANTITIES

Item No.	Item	Unit	Total
1.	CLASS E REVETMENT	TON	160
2.	ENGINEERING FABRIC	SY	165

NOTE: PLACE CLASS E REVETMENT UNDERLAID WITH ENGINEERING FABRIC AND KEYED INTO THE FINISH GRADE.



SECTION A-A

Design No. 111-211
File No. 30387

LICENSED PROFESSIONAL ENGINEER
CHIN-TA TSAI
16042
IOWA

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.

Chin-Ta Tsai 02/04/2010
Signature Date

CHIN-TA TSAI
Printed or Typed Name

My license renewal date is December 31, 20 11

Pages or sheets covered by this seal: S.1

STREAM MITIGATION STRUCTURE

(ROCK SPLASH BASIN / ROCK GRADE CONTROL)

ENGLISH	IOWA DOT	DESIGN TEAM MARLER\TSAI	POTTAWATTAMIE COUNTY	PROJECT NUMBER BRF-006-1(114)--38-78	SHEET NUMBER S.1

SYSTEMTIME USERNAME DGNSPEC

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Refer to Standard Plan RL-1A and RL-1B

107-29
04-03-01

STATION	TOTAL CUT	TOPSOIL CLASS 10 SAVED -C	TOPSOIL TYPE B SAVED -C	UNSUIT TYPE B CUT	CLASS 10 SUITABLE CUT	ADJUSTED CLASS 10 TOTAL	TOTAL FILL	CLASS 10 SUITABLE + 30% SHRINK	TOTAL FILL WITH SHRINK
15+25.000									
15+50.000	33	13			20	20			
15+75.000	53	27			26	26			
16+00.000	41	29			12	12	1	1	1
16+25.000	42	30			12	12	1	1	1
16+50.000	39	27			12	12	2	3	3
16+75.000	33	24			9	9	3	4	4
17+00.000	32	24			8	8	3	4	4
17+25.000	30	23			7	7	4	5	5
17+50.000	28	22			6	6	6	8	8
17+75.000	66	37			29	29	27	35	35
18+00.000	107	52			55	55	65	85	85
18+25.000	120	55			65	65	142	185	185
18+50.000	108	50			58	58	229	298	298
18+75.000	80	33			47	47	232	302	302
19+00.000	149	48			101	101	164	213	213
19+25.000	167	56			111	111	211	274	274
19+50.000	313	35			278	278	479	623	623
19+75.000	362	46			316	316	626	814	814
20+00.000	470	125			345	345	377	490	490
20+25.000	775	143			632	632	79	103	103
20+50.000	653	93			560	560			
20+75.000	318	62			256	256			
21+00.000	0				0	0			
21+25.000	628	112			516	516			
21+50.000	692	105			587	587			
21+75.000	832	136			696	696			
22+00.000	625	101	21	48	455	503	49	64	64
22+25.000	282	32	42	84	124	208	94	122	122
22+50.000	273	31	43	67	132	199	72	94	94
22+75.000	263	31	45	69	118	187	59	77	77
23+00.000	250	30	44	70	106	176	65	85	85
23+25.000	221	14	53	61	93	154	66	86	86
23+50.000	186	13	48	44	81	125	55	72	72
23+75.000	163	26	32	35	70	105	36	47	47
24+00.000	141	25	32	30	54	84	19	25	25
24+25.000	65	12	16	12	25	37	5	7	7
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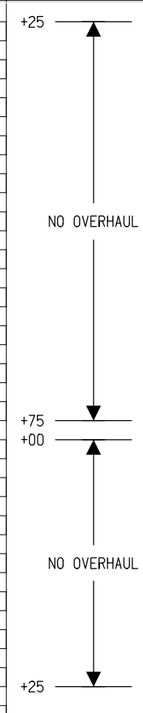
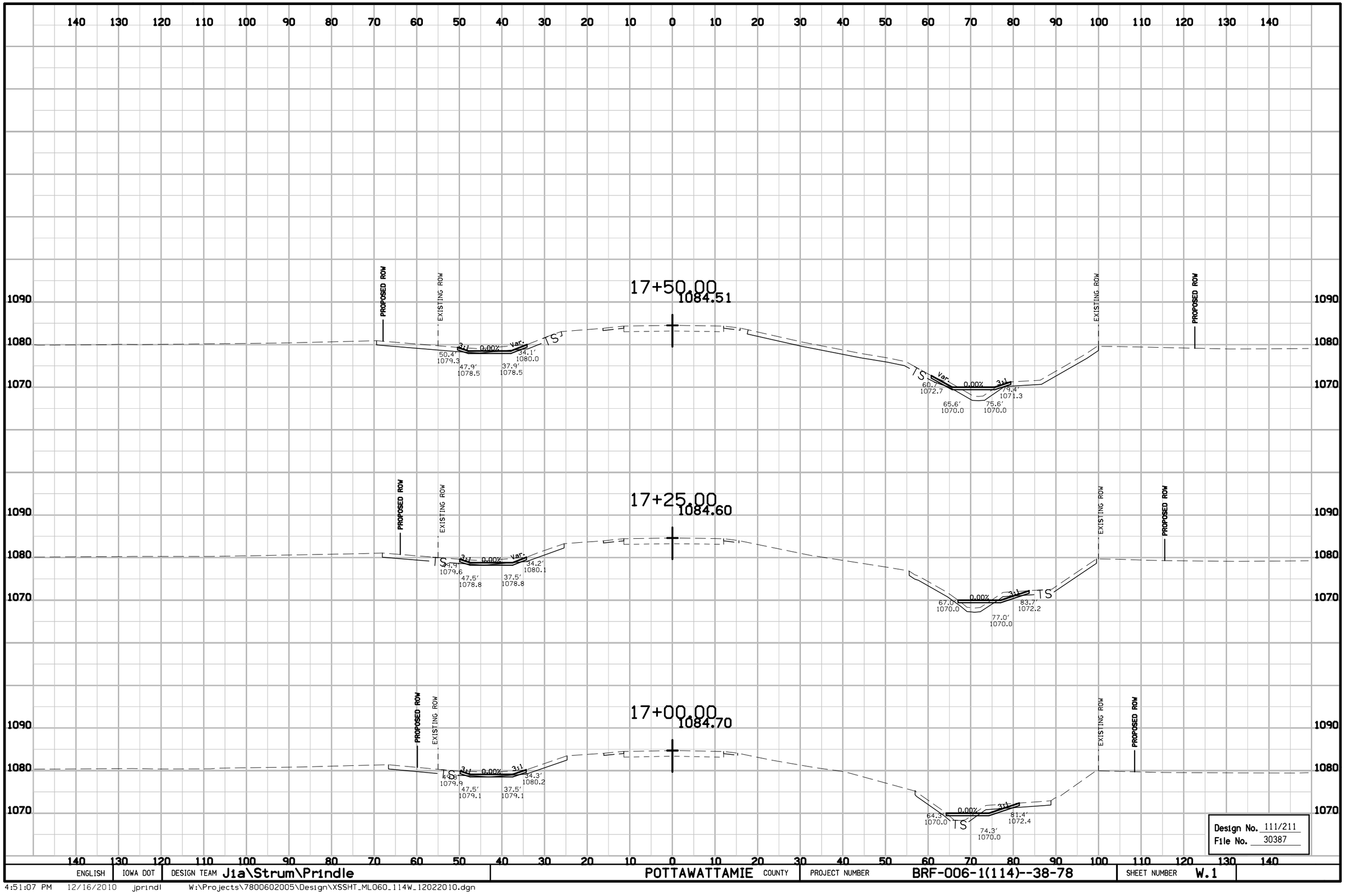


STATION	TOTAL CUT	TOPSOIL CLASS 10 SAVED -C	TOPSOIL TYPE B SAVED -C	UNSUIT TYPE B CUT	CLASS 10 SUITABLE CUT	ADJUSTED CLASS 10 TOTAL	TOTAL FILL	CLASS 10 SUITABLE + 30% SHRINK	TOTAL FILL WITH SHRINK

Design No. 111/211
File No. 30387

ENGLISH	IOWA DOT	DESIGN TEAM Jia\Strum\Prindle	POTTAWATTAMIE COUNTY	PROJECT NUMBER BRF-006-1(114)--38-78	SHEET NUMBER T.1



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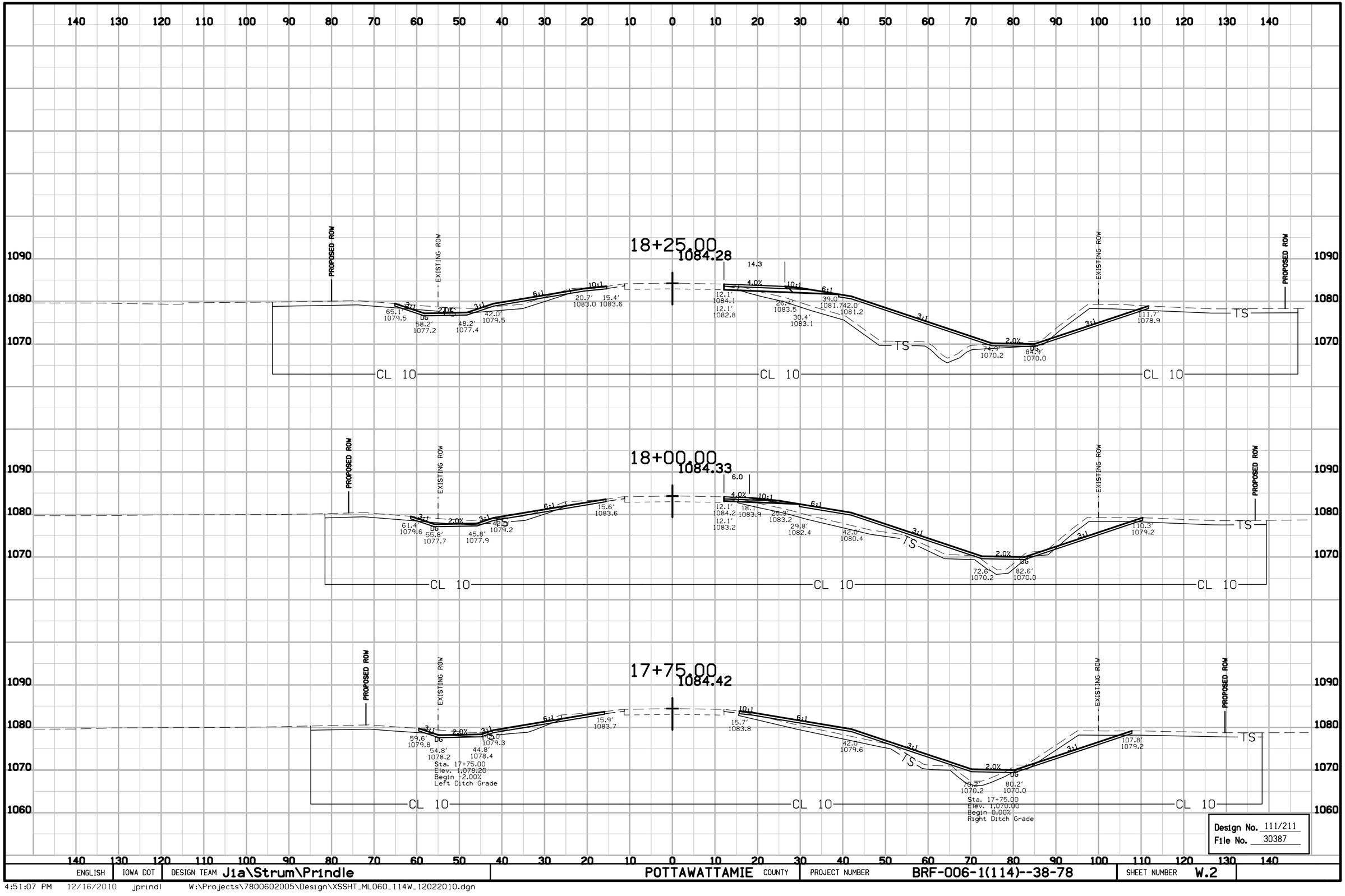

Design No. 111/211
File No. 30387

ENGLISH	IOWA DOT	DESIGN TEAM J1a\Strum\Prindle	POTTAWATTAMIE COUNTY	PROJECT NUMBER BRF-006-1(114)--38-78	SHEET NUMBER W.2

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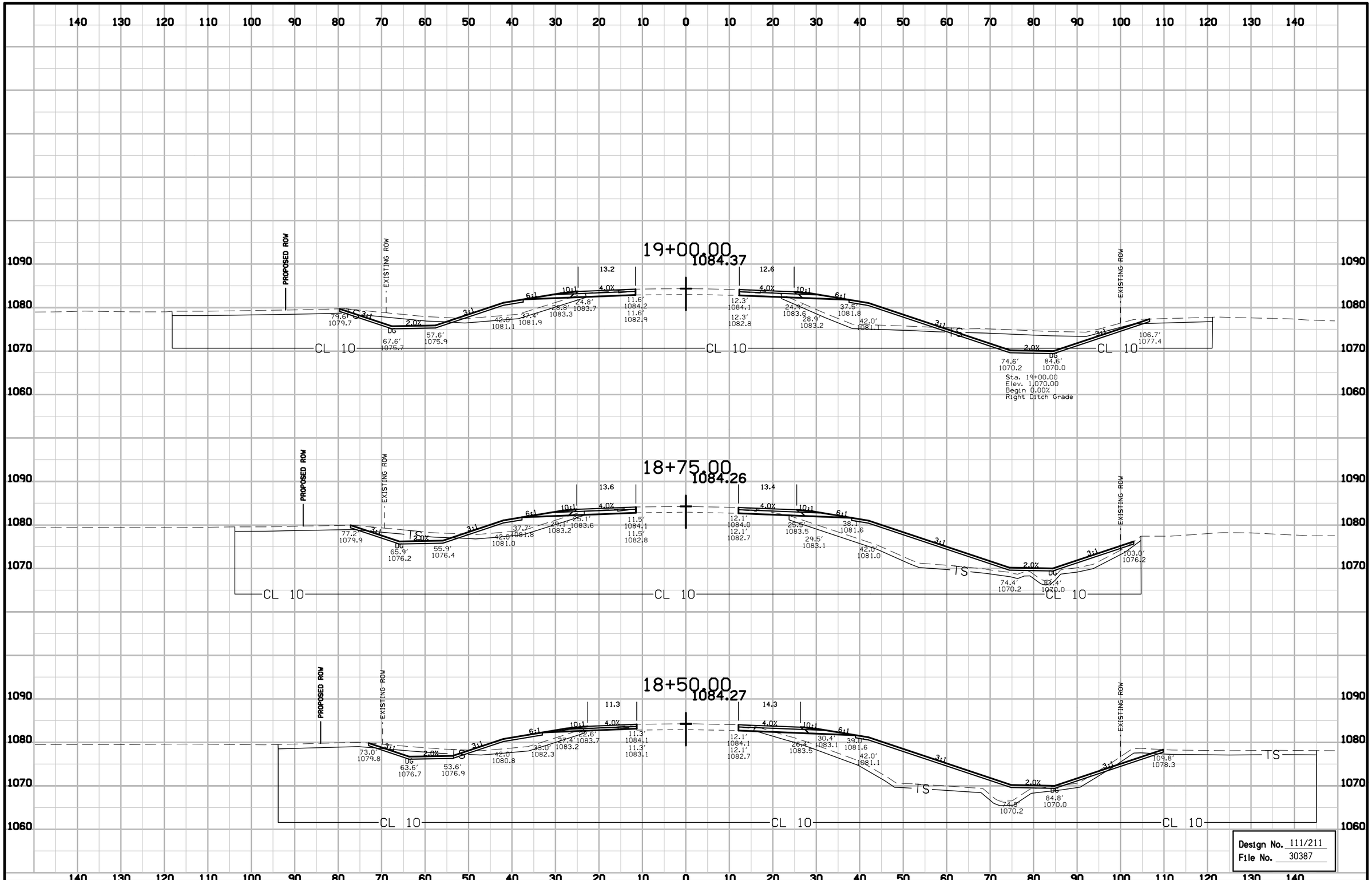

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File No. 30387

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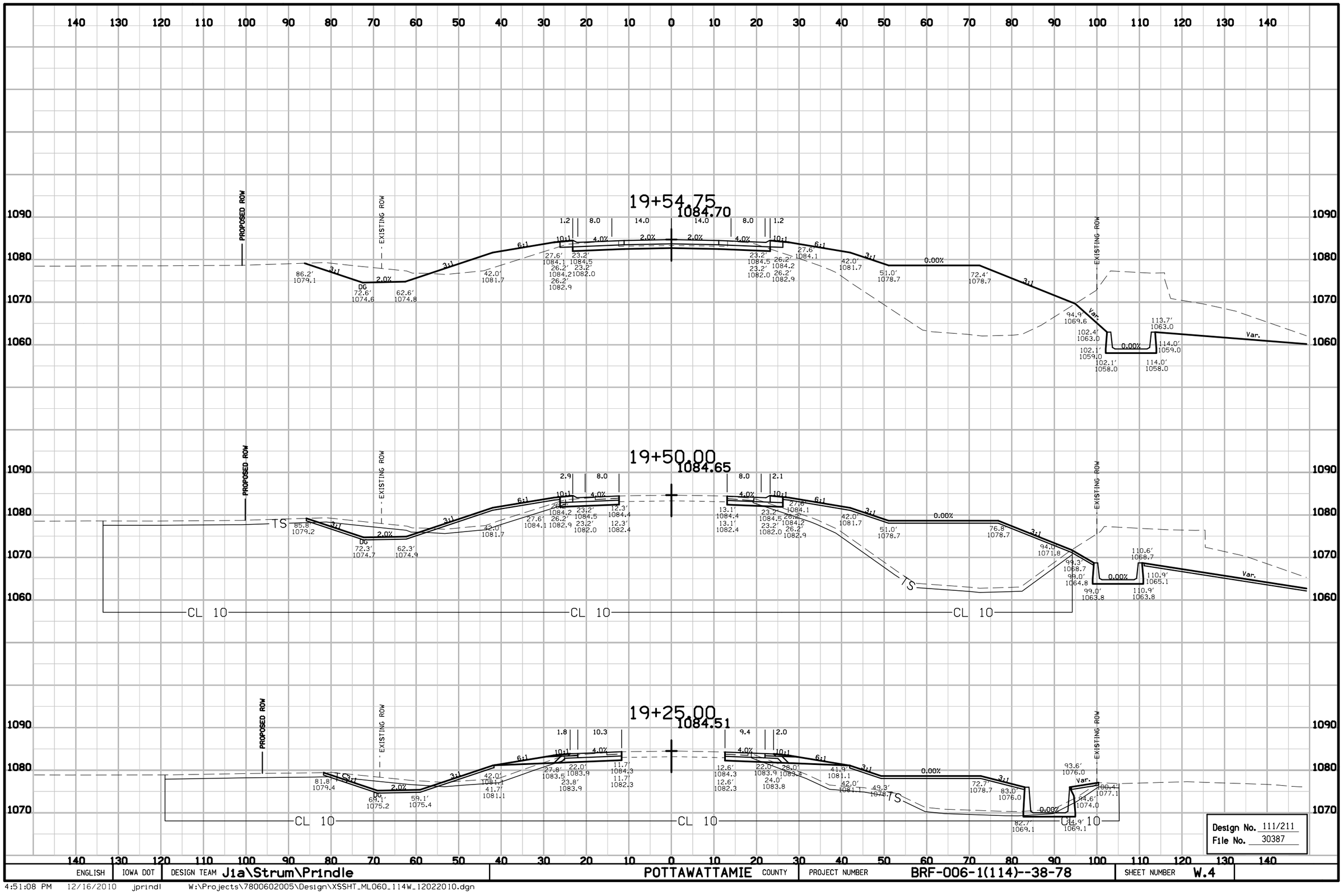

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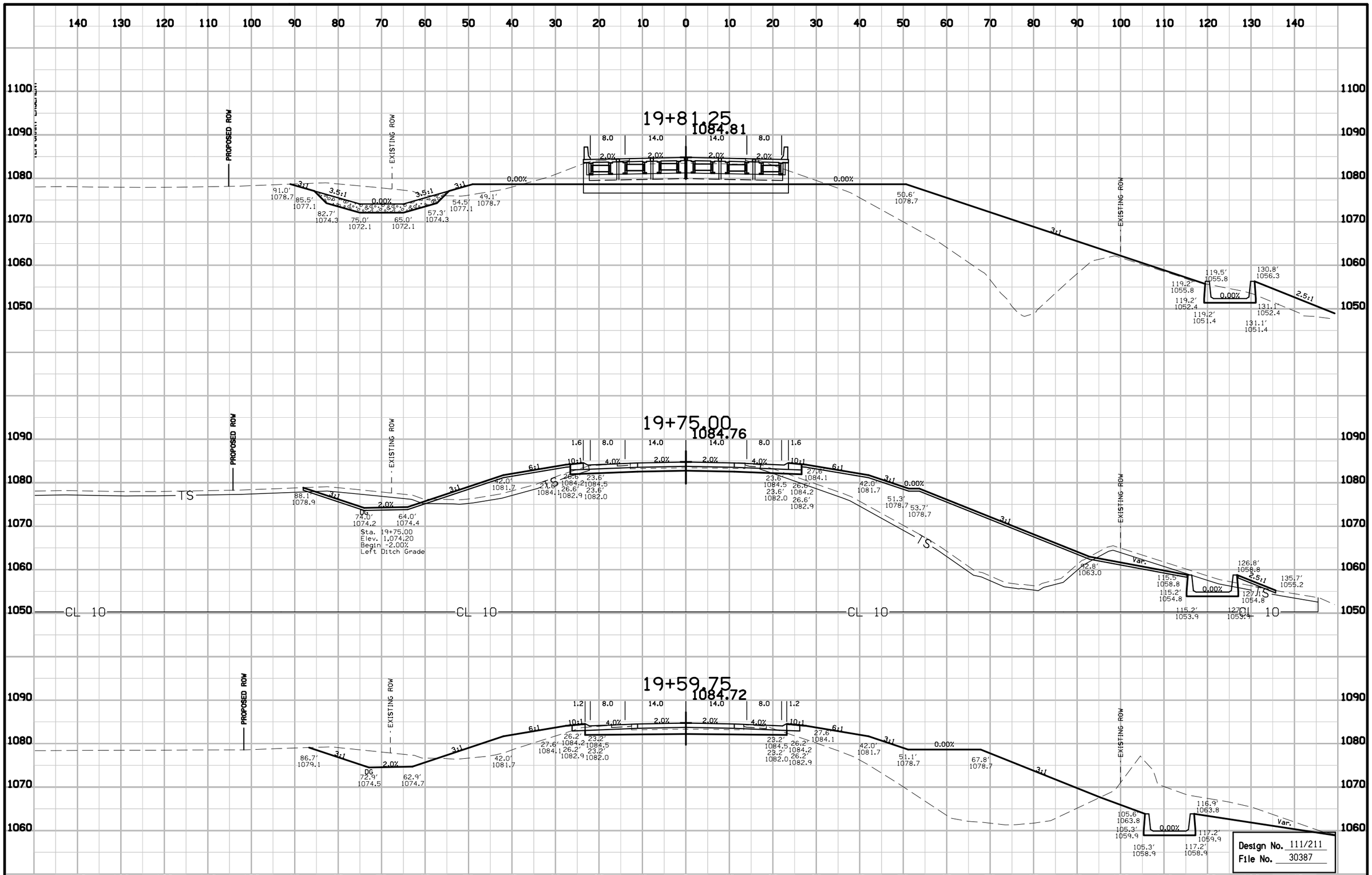

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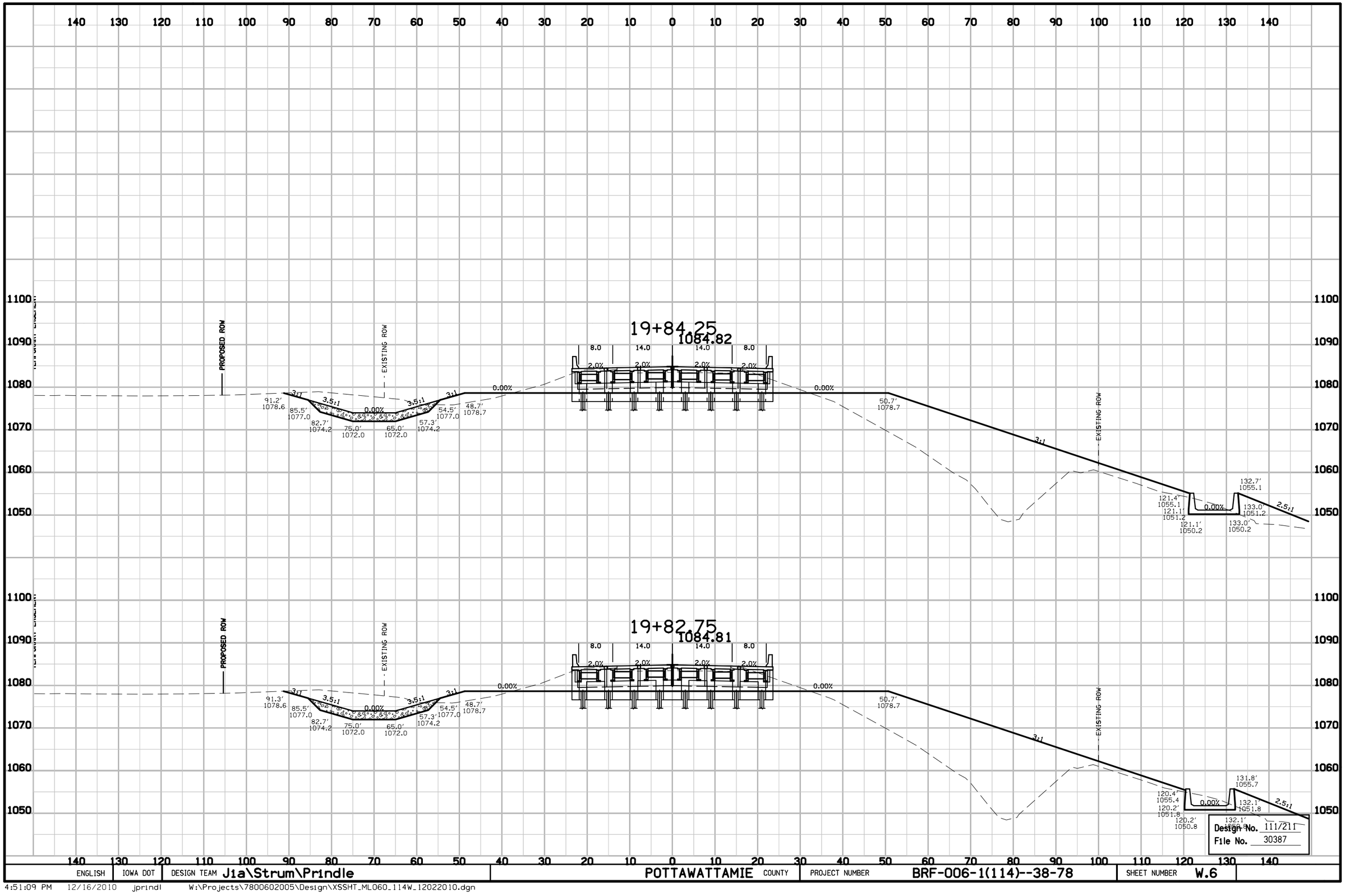

Design No. 111/211
File No. 30387

ENGLISH	IOWA DOT	DESIGN TEAM J1a\Strum\Prindle	POTTAWATTAMIE COUNTY	PROJECT NUMBER BRF-006-1(114)--38-78	SHEET NUMBER W.6

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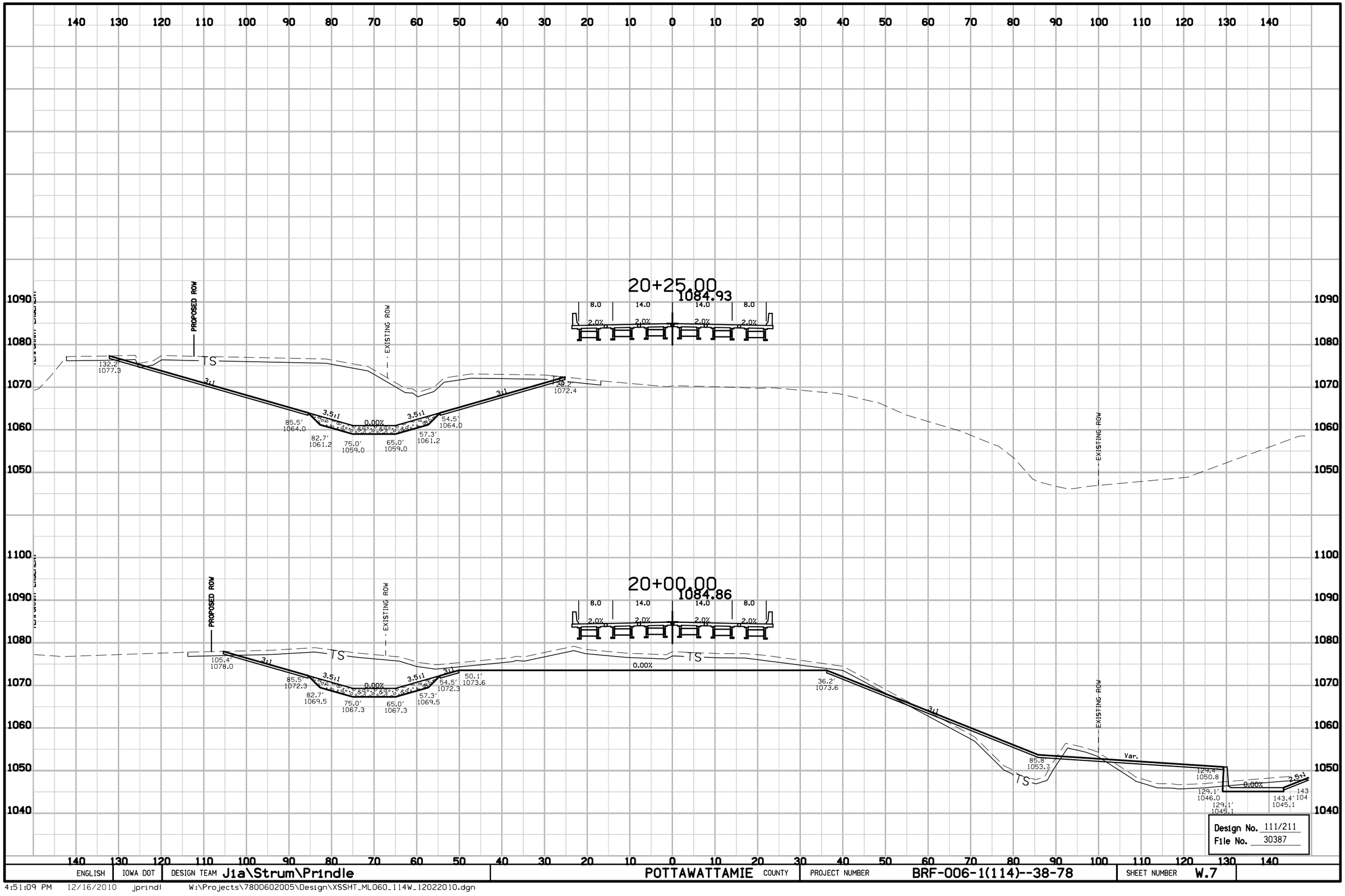

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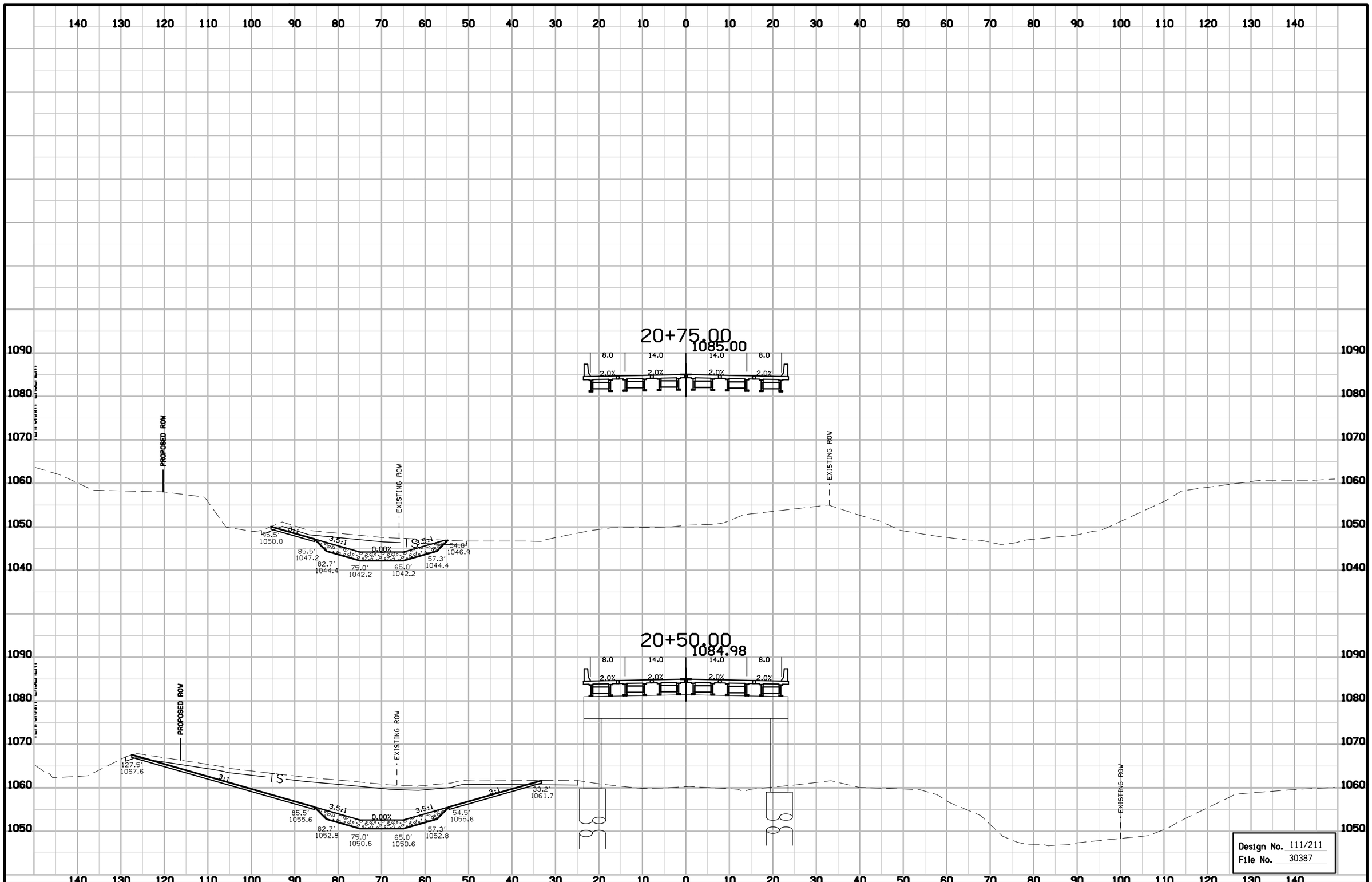

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File No. 30387

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1090 1080 1070 1060 1050

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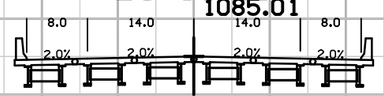
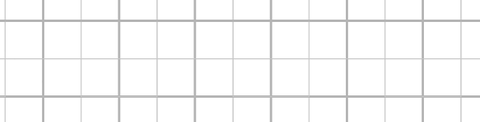
1085.01



TERMINUS CONSTRUCTION

PROPOSED ROW

EXISTING ROW



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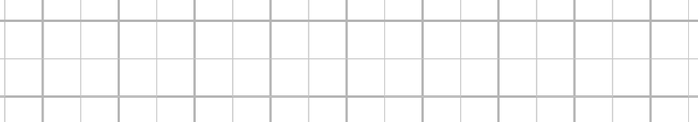

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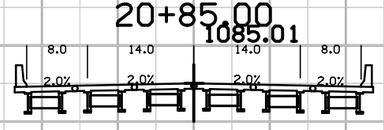

TERMINUS CONSTRUCTION

PROPOSED ROW

EXISTING ROW

EXISTING ROW

Design No. 111/211
File No. 30387

ENGLISH	IOWA DOT	DESIGN TEAM J1a\Strum\Prindle	POTTAWATTAMIE COUNTY	PROJECT NUMBER BRF-006-1(114)--38-78	SHEET NUMBER W.9

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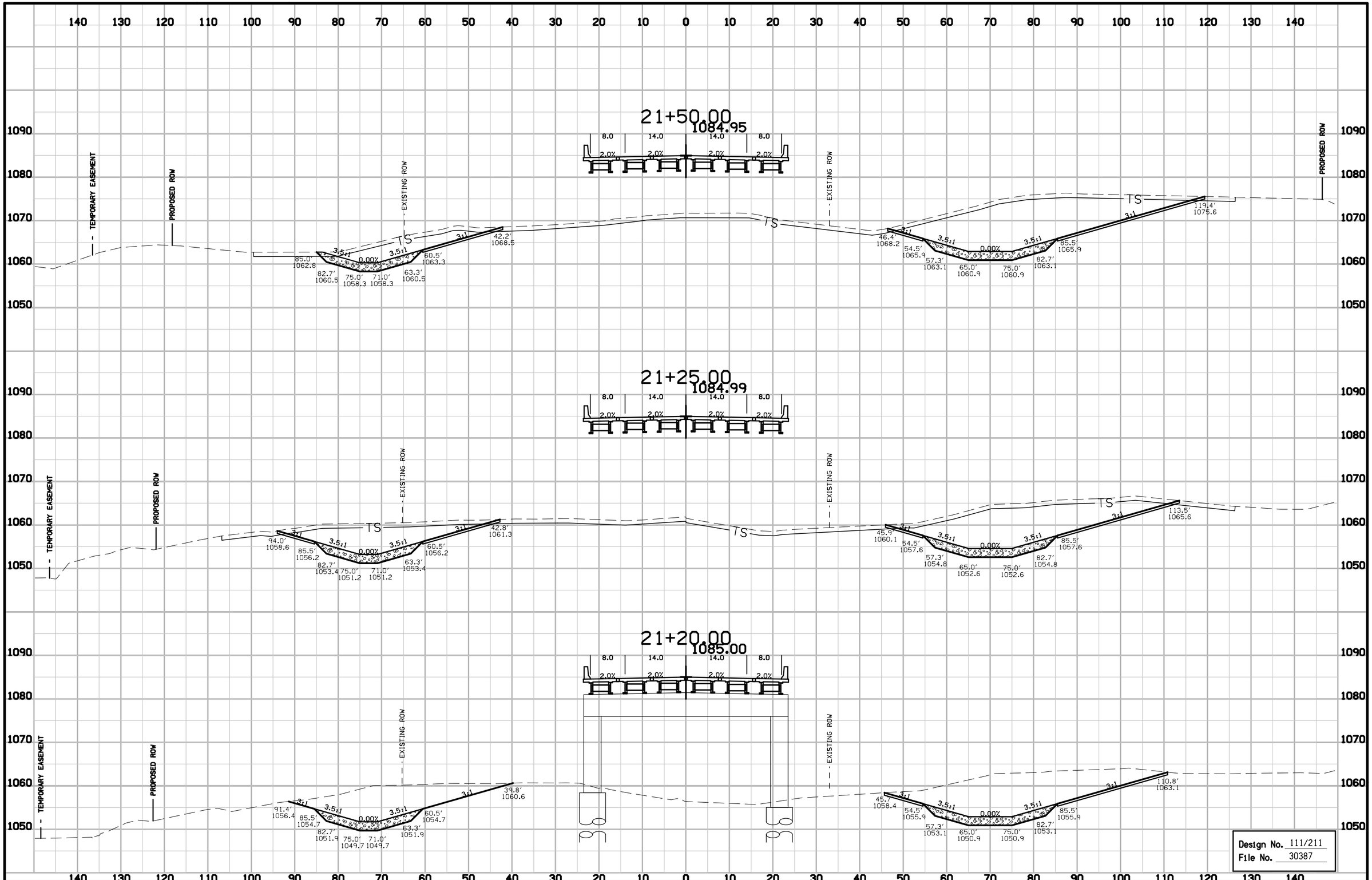

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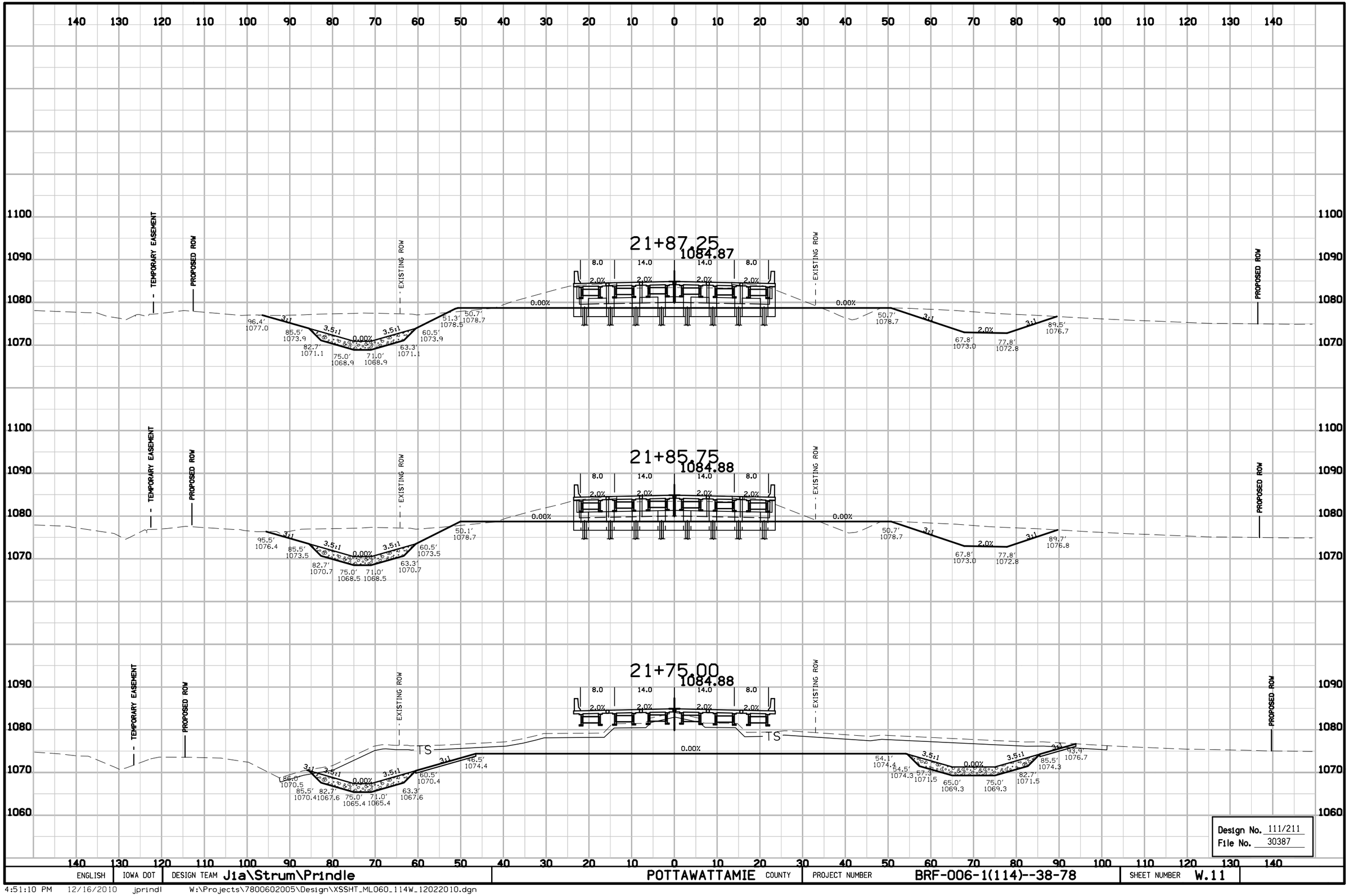

Design No. 111/211
File No. 30387

ENGLISH	IOWA DOT	DESIGN TEAM J1a\Strum\Prindle	POTTAWATTAMIE COUNTY	PROJECT NUMBER BRF-006-1(114)--38-78	SHEET NUMBER W.11

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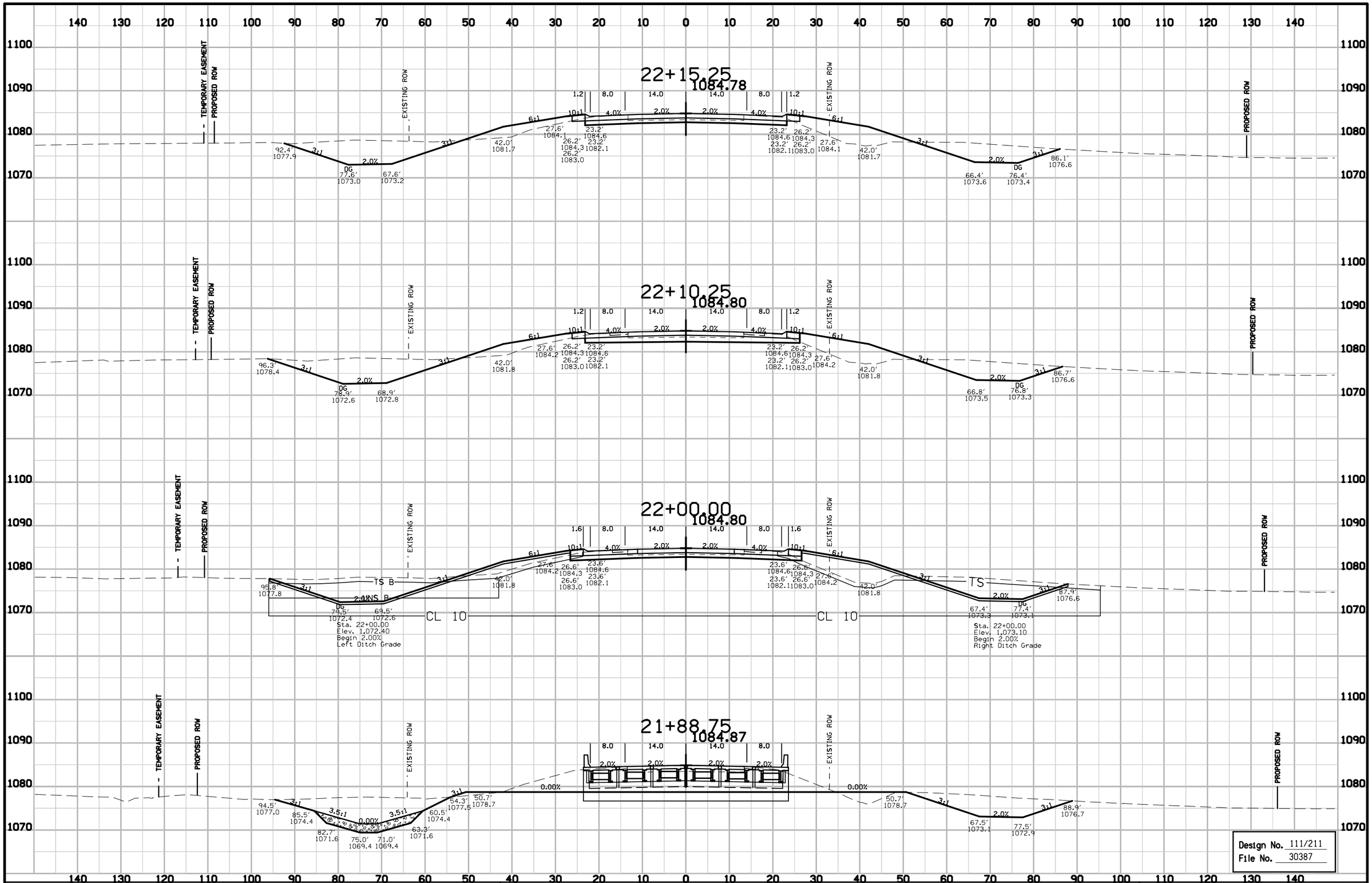

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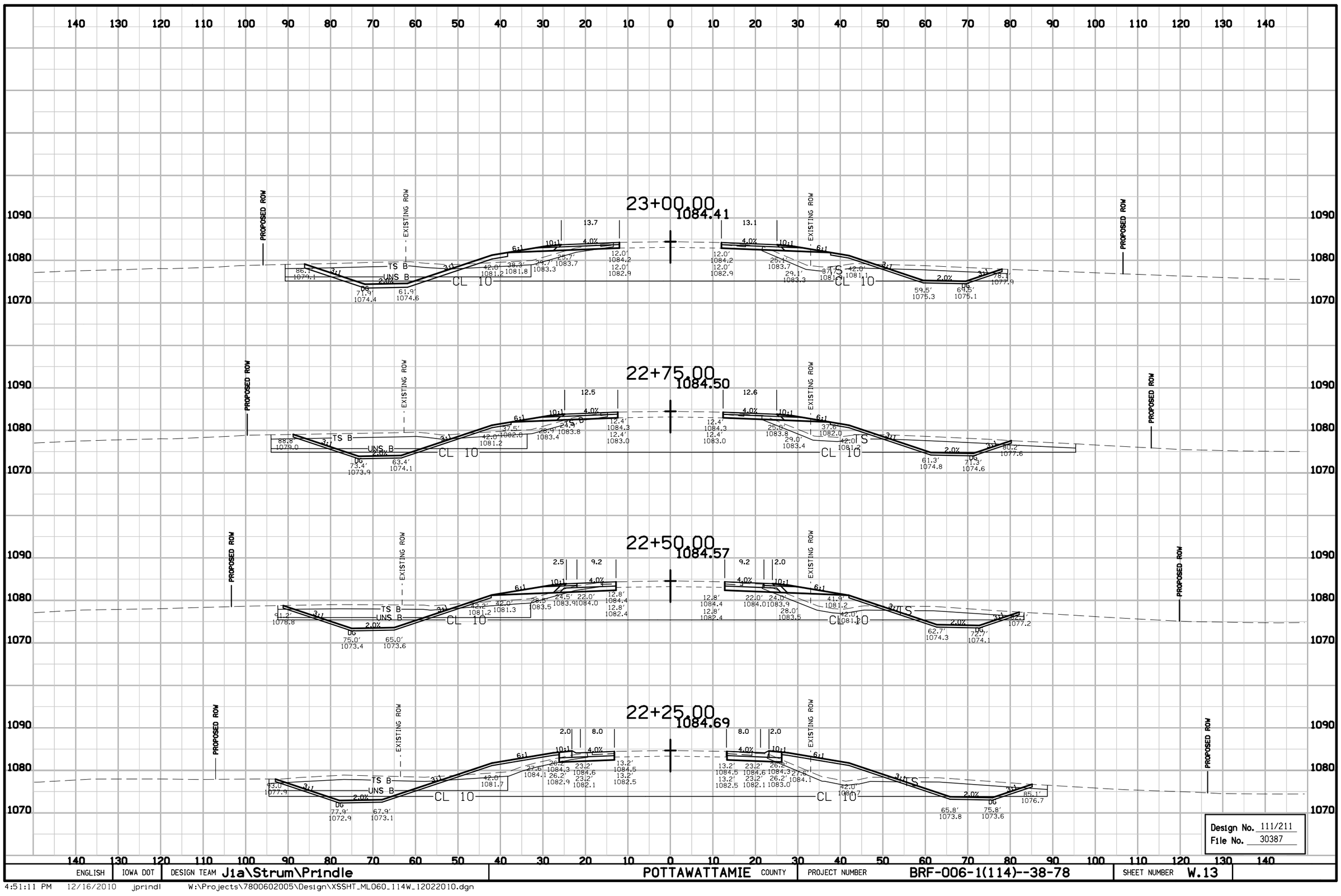

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File No. 30387

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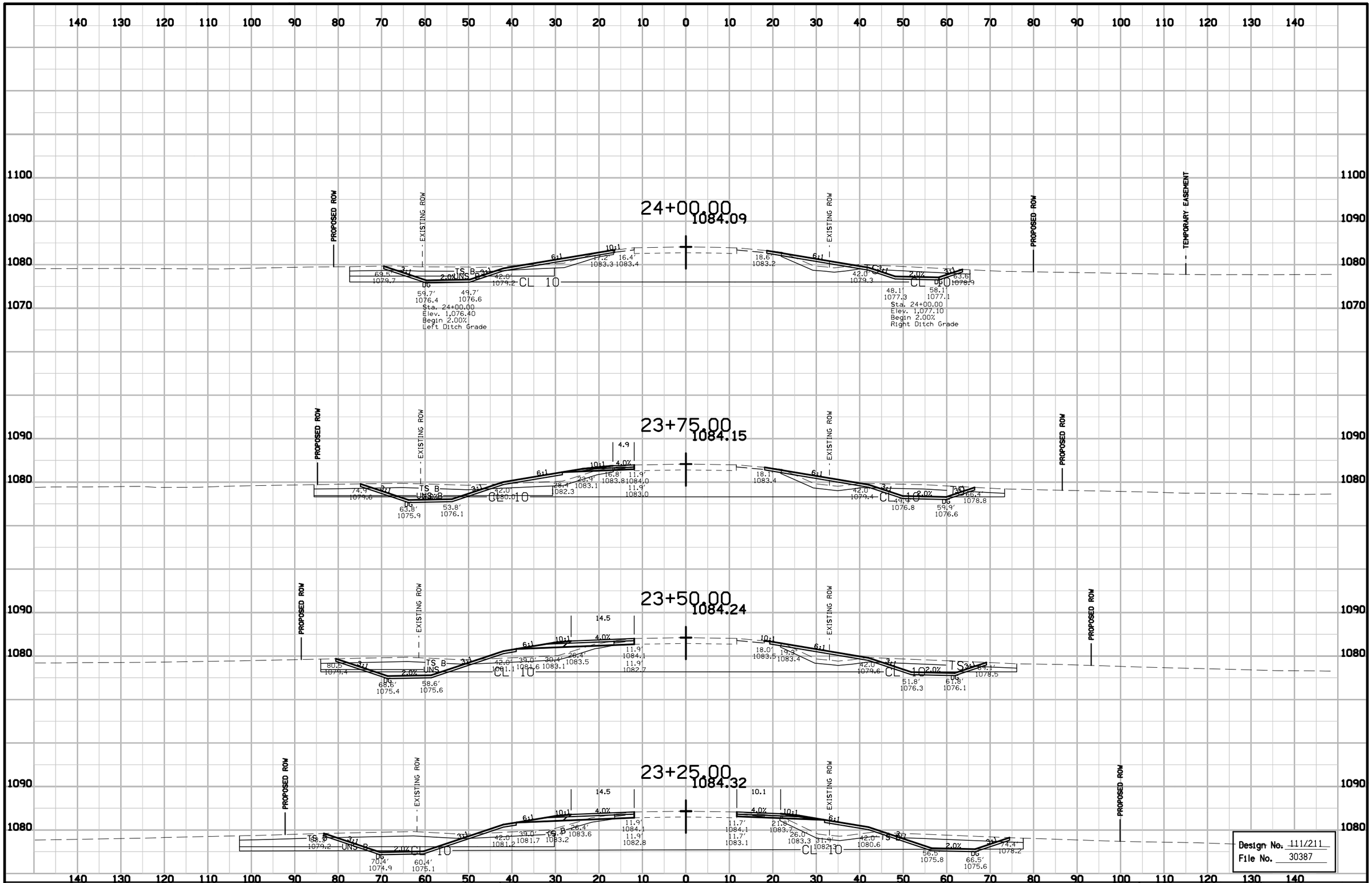

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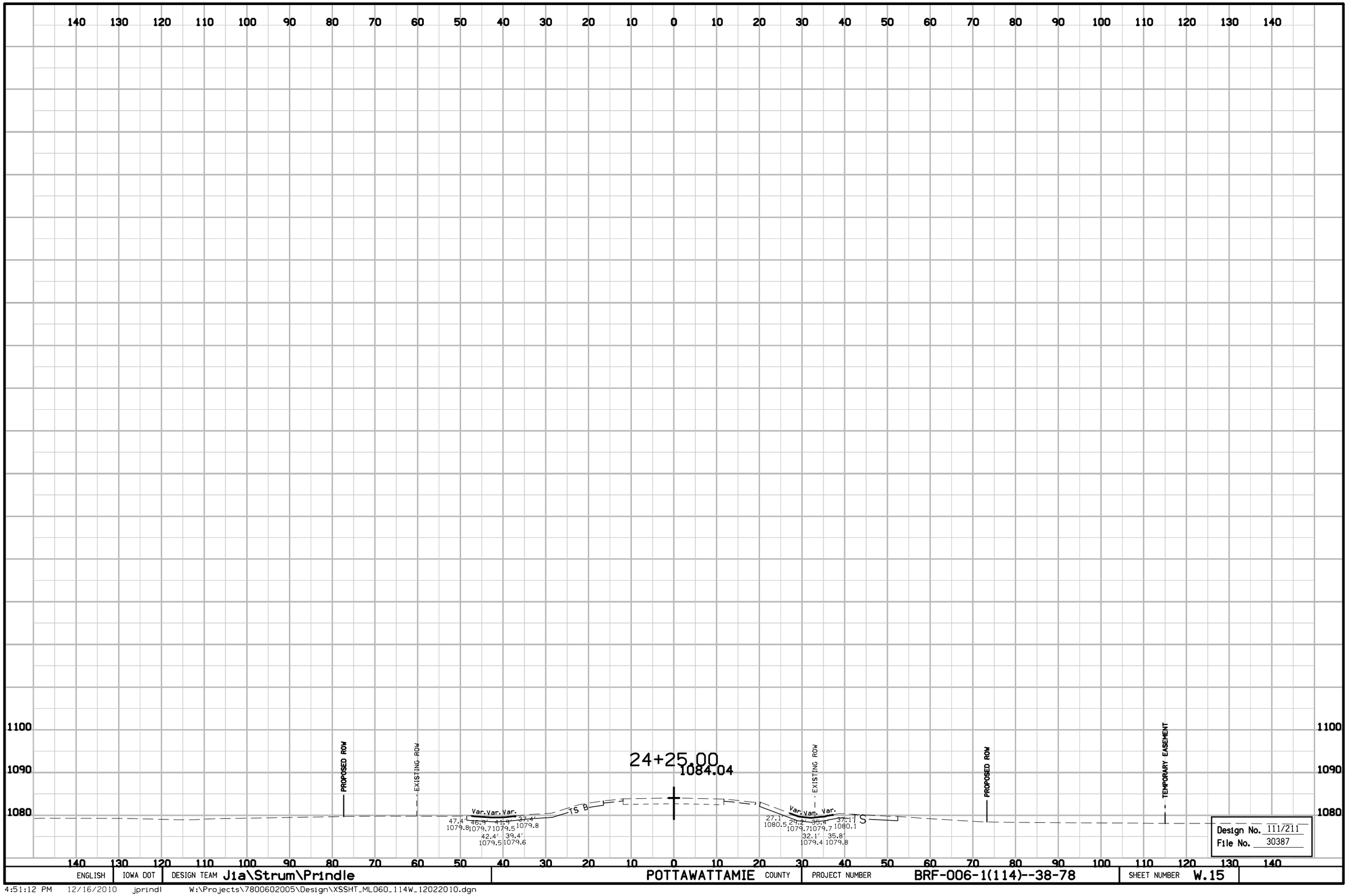

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