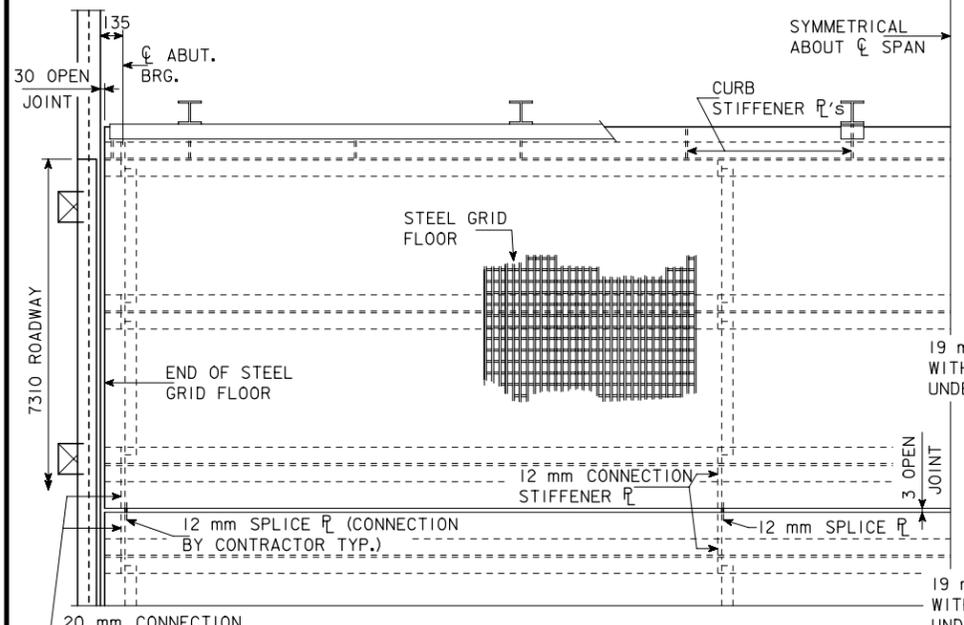
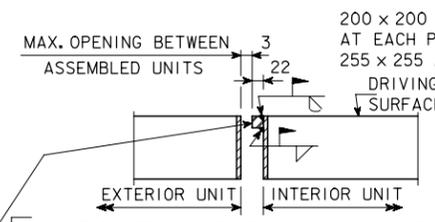


PART LONGITUDINAL SECTION



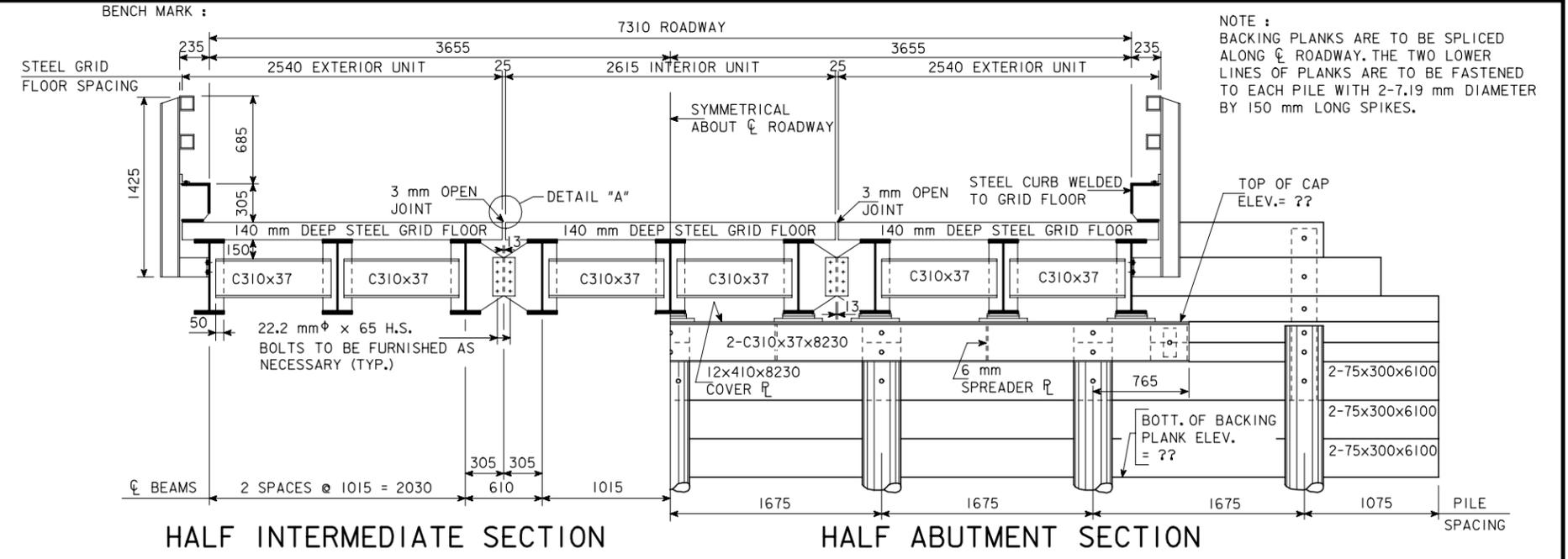
PART PLAN

NOTE : SUPERSTRUCTURE UNITS AND ABUTMENT CAPS ARE ALREADY FABRICATED. DETAILS SHOWN ARE FOR INFORMATIONAL PURPOSES ONLY.



IF THIS 25x22 BAR IS NOT ALREADY ATTACHED TO BOTH SIDES OF THE INTERIOR UNITS, THE CONTRACTOR SHALL FURNISH THE BARS AND WELD THEM IN POSITION AS INDICATED BY THESE DETAILS. THE BARS ARE TO EXTEND FULL LENGTH OF THE UNITS BUT LENGTH MAY BE MADE UP OF SEVERAL PIECES. IF A MAXIMUM 3 mm OPENING BETWEEN UNITS CANNOT BE OBTAINED WITH THE USE OF THE 22.2 mm φ H.S. BOLTS IN THE SPLICE PLATES, 19 mm φ H.S. BOLTS WITH A HARDENED WASHER UNDER BOTH THE NUT AND BOLT HEAD SHALL BE SUBSTITUTED FOR THE 22.2 mm φ BOLTS TO PROVIDE ADDITIONAL LATERAL ADJUSTMENT OF THE SUPERSTRUCTURE UNITS. COST OF FURNISHING AND INSTALLING THE BARS AND THE 19 mm φ H.S. BOLTS WILL BE CONSIDERED INCIDENTAL TO THE COST OF ERECTING THE DETOUR BRIDGE.

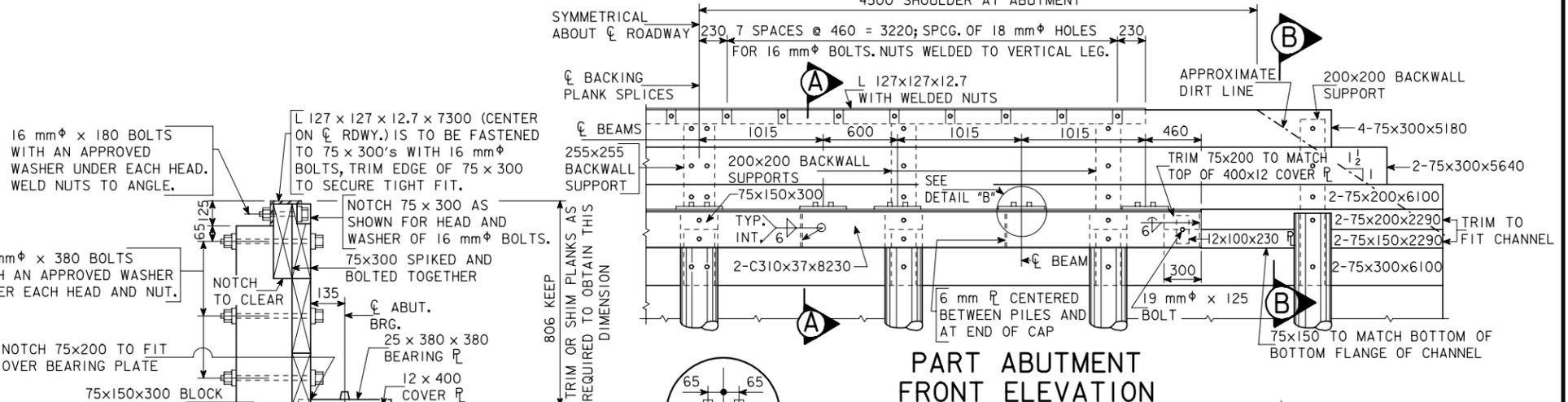
DETAIL "A"



HALF INTERMEDIATE SECTION

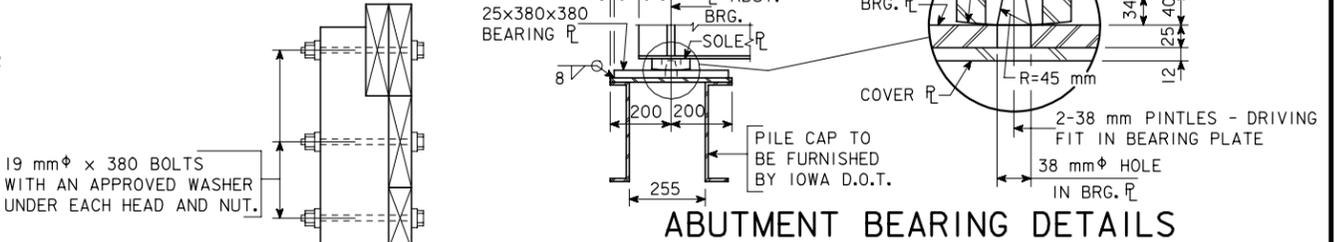
HALF ABUTMENT SECTION

NOTE : BACKING PLANKS ARE TO BE SPLICED ALONG C ROADWAY. THE TWO LOWER LINES OF PLANKS ARE TO BE FASTENED TO EACH PILE WITH 2-7.19 mm DIAMETER BY 150 mm LONG SPIKES.



PART ABUTMENT FRONT ELEVATION

DETAIL "B" (TYPICAL FOR ALL BEAMS)



ABUTMENT BEARING DETAILS

SECTION B-B

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. _____ OF _____ FILE NO. _____ DESIGN NO. _____

DETOUR BRIDGE NOTES:

ALL DIMENSIONS UNLESS OTHERWISE NOTED OR SHOWN ARE IN MILLIMETERS (mm).
 THE 11940 x 7310 mm I-BEAM DETOUR BRIDGE IS DESIGNED FOR M18 LOADING. THE SUPERSTRUCTURE IS COMPOSED OF THREE PREFABRICATED UNITS OF I-BEAMS AND ATTACHED STEEL GRID FLOOR. EXTERIOR UNITS ARE FURNISHED WITH CURBS AND HANDRAILS.

THE ABUTMENT PILE CAPS ARE TO BE FURNISHED BY THE IOWA D.O.T. MAINTENANCE DIVISION. THE CONTRACTOR IS TO FURNISH AND INSTALL NEW TREATED TIMBER TRESTLE PILES, NEW LUMBER FOR THE BACKWALLS AND ANGLE ARMOR FOR THE TOPS OF THE BACKWALLS.

THE PRICE BID FOR "HAUL DETOUR BRIDGE UNITS" SHALL INCLUDE THE COST OF LOADING AND HAULING 3 UNITS OF THE BRIDGE SUPERSTRUCTURE AND 2 ABUTMENT PILE CAPS FROM THE IOWA D.O.T. MAINTENANCE YARD AT WILLIAMS TO THE BRIDGE SITE. IT SHALL ALSO INCLUDE THE COST OF LOADING AND HAULING THE SUPERSTRUCTURE UNITS AND ABUTMENT PILE CAPS TO WILLIAMS AFTER THE DETOUR BRIDGE IS NO LONGER NEEDED AT THIS SITE AND STORING ALL UNITS AS DIRECTED BY THE MAINTENANCE ENGINEER.

THE BRIDGE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE DETOUR BRIDGE IN GOOD CONDITION DURING THE PERIOD IT IS BEING USED TO CARRY DETOUR TRAFFIC. ANY DAMAGE CAUSED BY MISHANDLING, BY THE BRIDGE CONTRACTOR, SHALL BE REPAIRED BY THE BRIDGE CONTRACTOR AT NO ADDITIONAL COST TO THE STATE. OTHER DAMAGES TO THE UNITS, CAUSED BY TRAFFIC OR CONDITIONS BEYOND THE BRIDGE CONTRACTORS CONTROL SHALL BE REPAIRED BY THE BRIDGE CONTRACTOR, AS DIRECTED BY THE ENGINEER, AND WILL BE PAID FOR AS EXTRA WORK. THE BRIDGE CONTRACTOR SHALL MAKE A REASONABLE EFFORT TO ENSURE THE DETOUR BRIDGE IS IN GOOD CONDITION AND ALL REPAIRS ARE COMPLETED BEFORE STORING THE BRIDGE UNITS AT THE D.O.T. MAINTENANCE YARD.

THE HANDRAIL ASSEMBLIES, ATTACHED TO THE EXTERIOR UNITS, MAY BE REMOVED WHEN TRANSPORTING THE EXTERIOR UNITS, AT THE CONTRACTOR'S OPTION. HANDRAIL ASSEMBLIES, WHEN DETACHED, SHALL BE MATCH MARKED TO FACILITATE RE-ERECTION. HANDRAIL ASSEMBLIES ARE TO BE RE-CONNECTED BEFORE THE FINAL STORAGE AT THE D.O.T. MAINTENANCE YARD. COST OF REMOVAL AND REPLACEMENT OF RAIL ASSEMBLIES IS CONSIDERED INCIDENTAL AND NO SPECIAL PAYMENT WILL BE MADE. SEE PAINTING NOTE.

THE SUPERSTRUCTURE UNITS SHALL BE PICKED UP BY THE LIFTING U-BOLTS PROVIDED AT ALL FOUR CORNERS OF EACH UNIT. THE U-BOLTS ARE TO BE REMOVED DURING THE TIME THE DETOUR BRIDGE IS OPEN TO TRAFFIC AND STORED IN A LOCATION WHERE THEY WILL BE PROTECTED FROM ANY DAMAGE.

THE PRICE BID FOR "ERECT DETOUR BRIDGE UNITS" SHALL INCLUDE THE COST OF PLACING THE SUPERSTRUCTURE ON THE COMPLETED ABUTMENTS. IT SHALL ALSO INCLUDE THE COST OF REMOVING THE SUPERSTRUCTURE AND ABUTMENTS AFTER THE DETOUR BRIDGE IS NO LONGER NEEDED AT THIS SITE. ALL 22.2 mm DIAMETER HIGH STRENGTH BOLTS NECESSARY TO BOLT UP THE SPLICES (SEE DETOUR BRIDGE CROSS SECTION) SHALL ALSO BE INCLUDED IN THE BID ITEM. IT SHOULD BE NOTED THAT MOST OF THE 22.2 mm DIAMETER H.S. BOLTS REQUIRED FOR THE SUPERSTRUCTURE ARE STORED WITH THE SUPERSTRUCTURE UNITS. ABUTMENT PILES ARE TO BE REMOVED TO 300 mm BELOW EXISTING GROUND LINE. THE TRESTLE PILING AND BACKWALL LUMBER SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR.

THE BID ITEM "STRUCTURAL STEEL" SHALL INCLUDE FURNISHING AND ERECTING THE GALVANIZED ANGLES AT THE TOP OF THE BACKWALLS. ALL STEEL FURNISHED UNDER THIS BID ITEM IS TO BE NEW MATERIAL AND SHALL REMAIN THE PROPERTY OF THE IOWA D.O.T. MAINTENANCE DIVISION.

THE BID ITEM "GALVANIZED HARDWARE" IS TO INCLUDE ALL BOLTS, NUTS, WASHERS AND TIMBER CONNECTORS REQUIRED FOR ABUTMENT PILE CAPS AND ABUTMENT BACKWALLS OF THE DETOUR BRIDGE.

TIMBER CONNECTORS ARE TO BE BULLDOG P 100 mm SQUARE x 1.5 mm THICK, TECO TOOTHED RING 85 mm x 1.5 mm THICK, TECO SPIKE GRID 100 mm CAST OR AN APPROVED EQUAL ALL LUMBER MAY BE UNTREATED. WIDTHS SHOWN ARE NOMINAL. ROUGH LUMBER MAY BE USED. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE BACKWALL CONFIGURATION APPROXIMATELY AS SHOWN.

THE MASS OF SUPERSTRUCTURE UNITS IS 7258 kg FOR INTERIOR UNIT AND 7802 kg FOR EXTERIOR UNIT (8618 kg WITH RAIL POST ASSEMBLY LEFT IN PLACE).

ALL BOLTS ARE TO HAVE SQUARE OR HEX. HEADS. ALL BOLTS ARE TO HAVE 125 mm MINIMUM THREADS.

EXCAVATION REQUIRED FOR CONSTRUCTION OF DETOUR STRUCTURE IS TO BE CONSIDERED INCIDENTAL.

BENCH MARK :

PILE DRIVING NOTE FOR DETOUR BRIDGE:

THE DESIGN BEARING FOR THE ABUTMENT PILES IS 180 KN.

ESTIMATED QUANTITIES - DETOUR BRIDGE

| ITEM | UNITS | QUANTITY |
|--|----------------|----------|
| STRUCTURAL STEEL | kg | |
| UNTREATED LUMBER | m ³ | |
| GALVANIZED HARDWARE | kg | |
| HAUL DETOUR BRIDGE UNITS | LS | 1.0 |
| ERECT DETOUR BRIDGE UNITS | LS | 1.0 |
| PILES, FURNISH WOOD (TREATED TIMBER TRESTLE PILES) ?@? m | m | |
| PILES, DRIVE WOOD (TREATED TIMBER TRESTLE PILES) ?@? m | m | |
| | | |
| | | |
| | | |

NOTE: ABOVE QUANTITIES ARE INCLUDED IN "TOTAL ESTIMATED BRIDGE QUANTITIES" ON DES. SHT. ?.

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. ____ OF ____ FILE NO. _____ DESIGN NO. _____

REVISED 07-04 - PAINTING NOTE AND ESTIMATED QUANTITIES BOX CHANGED. HMI035A.SOI ; THIS SHEET ISSUED, 9-1-95.

DETOUR BRIDGE NOTES:

ALL DIMENSIONS UNLESS OTHERWISE NOTED OR SHOWN ARE IN MILLIMETERS (mm).

THE X x 7310 mm I-BEAM DETOUR BRIDGE IS DESIGNED FOR M18 LOADING. THE SUPERSTRUCTURE IS COMPOSED OF THREE PREFABRICATED UNITS OF I-BEAMS AND ATTACHED STEEL GRID FLOOR. EXTERIOR UNITS ARE FURNISHED WITH CURBS AND HANDRAILS.

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THE PRICE BID FOR "HAUL DETOUR BRIDGE UNITS" SHALL INCLUDE THE COST OF LOADING AND HAULING X UNITS OF THE BRIDGE SUPERSTRUCTURE, 2 ABUTMENT PILE CAPS AND THE PIER CAPS FROM THE IOWA D.O.T. MAINTENANCE YARD AT WILLIAMS TO THE BRIDGE SITE. IT SHALL ALSO INCLUDE THE COST OF LOADING AND HAULING THE SUPERSTRUCTURE UNITS, ABUTMENT PILE CAPS AND THE PIER CAPS TO WILLIAMS AFTER THE DETOUR BRIDGE IS NO LONGER NEEDED AT THIS SITE AND STORING ALL UNITS AS DIRECTED BY THE MAINTENANCE ENGINEER.

THE BRIDGE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE DETOUR BRIDGE IN GOOD CONDITION DURING THE PERIOD IT IS BEING USED TO CARRY DETOUR TRAFFIC. ANY DAMAGE CAUSED BY MISHANDLING, BY THE BRIDGE CONTRACTOR, SHALL BE REPAIRED BY THE BRIDGE CONTRACTOR AT NO ADDITIONAL COST TO THE STATE. OTHER DAMAGES TO THE UNITS, CAUSED BY TRAFFIC OR CONDITIONS BEYOND THE BRIDGE CONTRACTORS CONTROL SHALL BE REPAIRED BY THE BRIDGE CONTRACTOR, AS DIRECTED BY THE ENGINEER, AND WILL BE PAID FOR AS EXTRA WORK. THE BRIDGE CONTRACTOR SHALL MAKE A REASONABLE EFFORT TO ENSURE THE DETOUR BRIDGE IS IN GOOD CONDITION AND ALL REPAIRS ARE COMPLETED BEFORE STORING THE BRIDGE UNITS AT THE D.O.T. MAINTENANCE YARD.

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THE BID ITEM "STRUCTURAL STEEL" SHALL INCLUDE FURNISHING AND ERECTING THE GALVANIZED ANGLES AT THE TOP OF THE BACKWALLS. ALL STEEL FURNISHED UNDER THIS BID ITEM IS TO BE NEW MATERIAL AND SHALL REMAIN THE PROPERTY OF THE IOWA D.O.T. MAINTENANCE DIVISION.

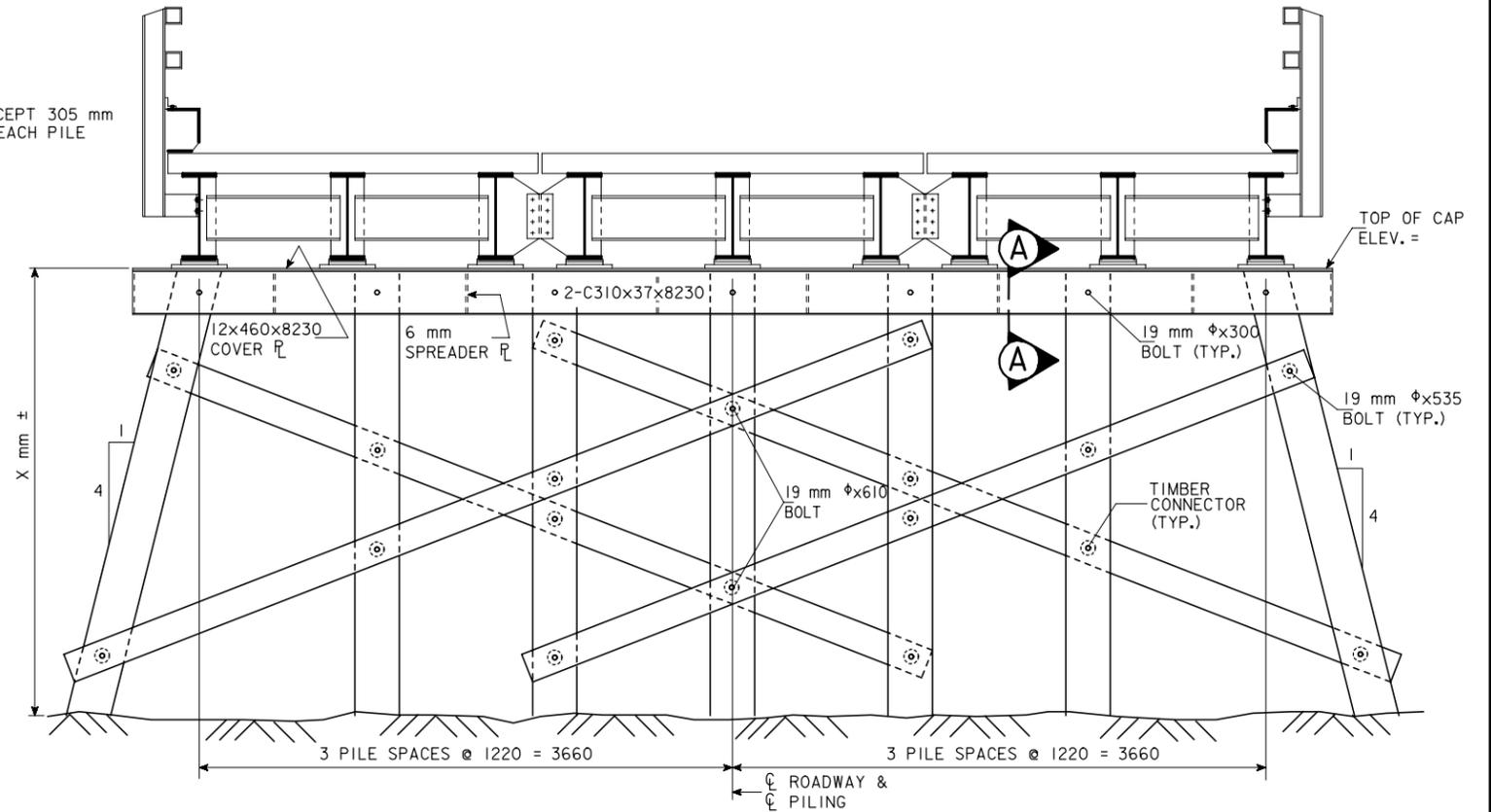
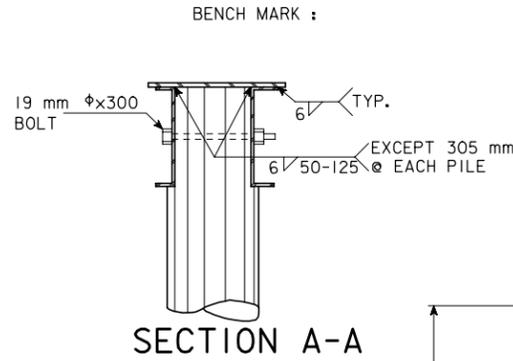
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ALL BOLTS ARE TO HAVE SQUARE OR HEX HEADS. ALL BOLTS ARE TO HAVE 125 mm MINIMUM THREADS.

EXCAVATION REQUIRED FOR CONSTRUCTION OF DETOUR STRUCTURE IS TO BE CONSIDERED INCIDENTAL.

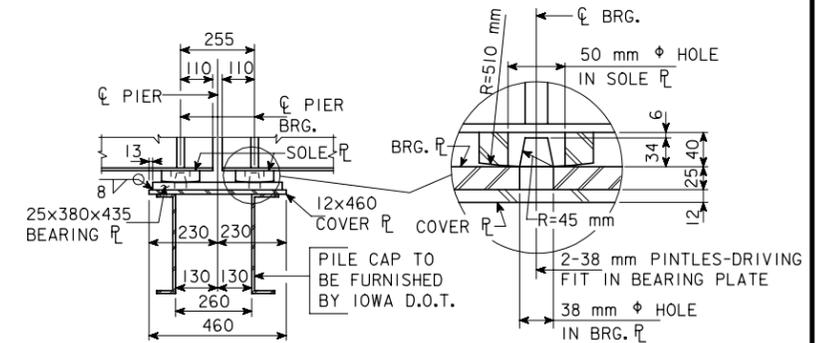


PILE DRIVING NOTE FOR DETOUR BRIDGE:

THE DESIGN BEARING FOR THE ABUTMENT AND PIER PILES IS 180 KN.

PIER SECTION

PIER PILING SHALL BE BRACED. BRACING SHALL CONSIST OF 75x200's PLACED DIAGONALLY ON BOTH SIDES OF BENT. EACH BRACING PLANK IS TO BE FASTENED TO EACH PILE WITH TIMBER CONNECTOR AND 2-180 mm GALVANIZED SPIKES IN ADDITION TO A 19 mm DIA. BOLT WITH 180 mm THREAD.



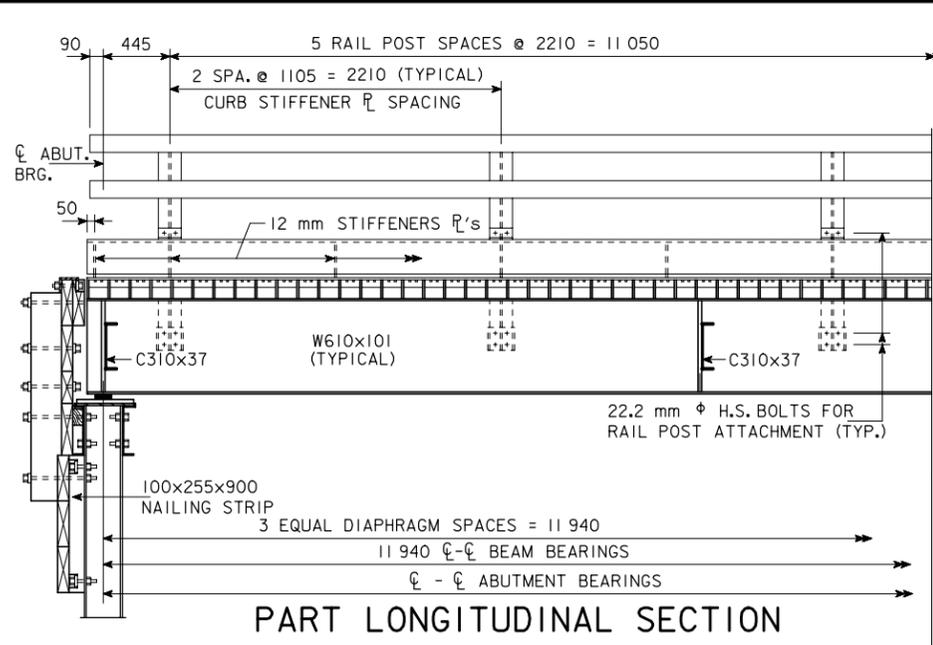
NOTE :
SUPERSTRUCTURE UNITS AND PIER CAPS ARE ALREADY FABRICATED. DETAILS SHOWN ARE FOR INFORMATIONAL PURPOSES ONLY.

ESTIMATED QUANTITIES - DETOUR BRIDGE

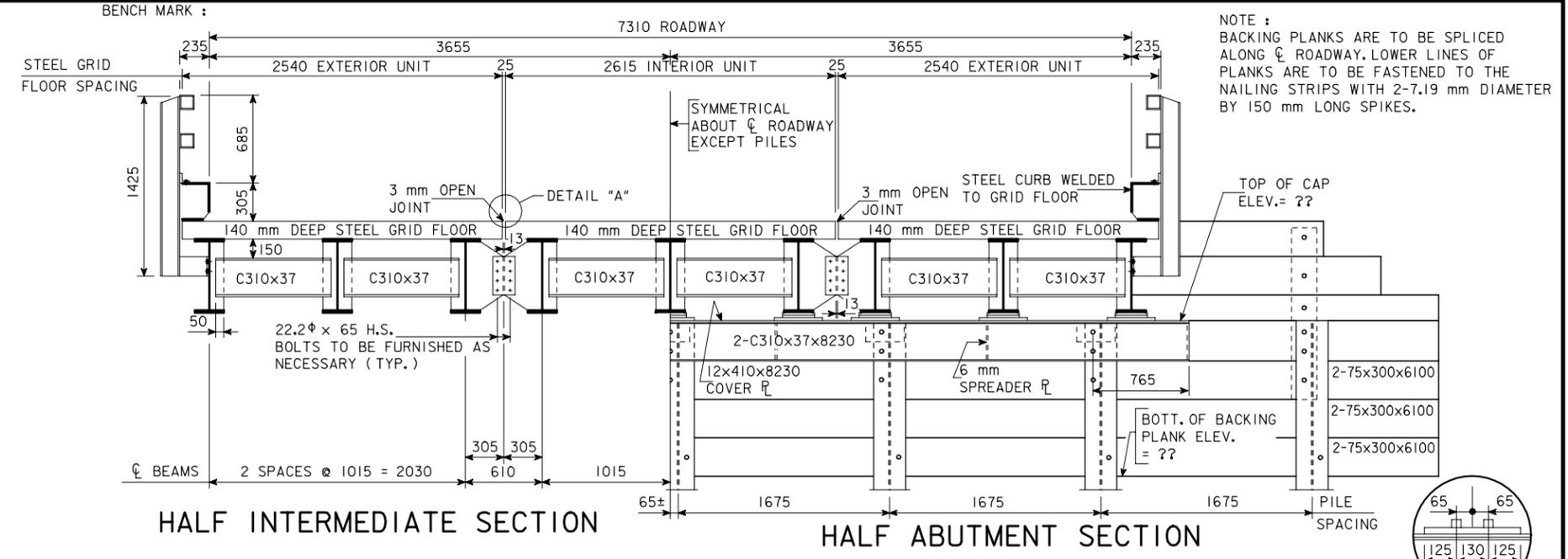
| ITEM | UNITS | QUANTITY |
|--|----------------|----------|
| STRUCTURAL STEEL | kg | |
| UNTREATED LUMBER | m ³ | |
| GALVANIZED HARDWARE | kg | |
| HAUL DETOUR BRIDGE UNITS | LS | 1.0 |
| ERECT DETOUR BRIDGE UNITS | LS | 1.0 |
| PILES, FURNISH WOOD (TREATED TIMBER TRESTLE PILES) ?@? m | m | |
| PILES, DRIVE WOOD (TREATED TIMBER TRESTLE PILES) ?@? m | m | |
| | | |
| | | |

NOTE: ABOVE QUANTITIES ARE INCLUDED IN "TOTAL ESTIMATED BRIDGE QUANTITIES" ON DES. SHT. ?.

REVISED 07-04 - PAINTING NOTE AND ESTIMATED QUANTITIES BOX CHANGED. HMI035B.SOI ; THIS SHEET ISSUED, 9-1-95.



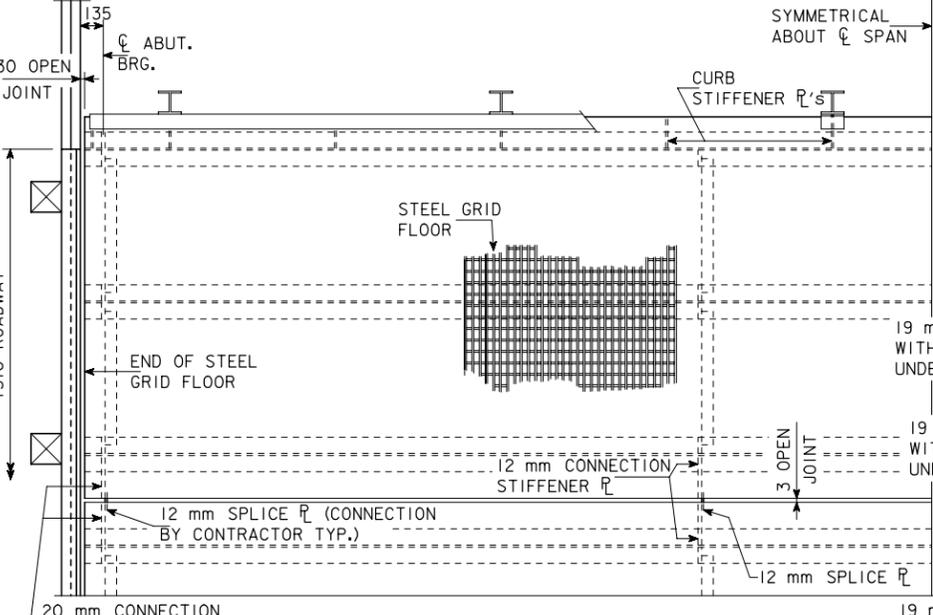
PART LONGITUDINAL SECTION



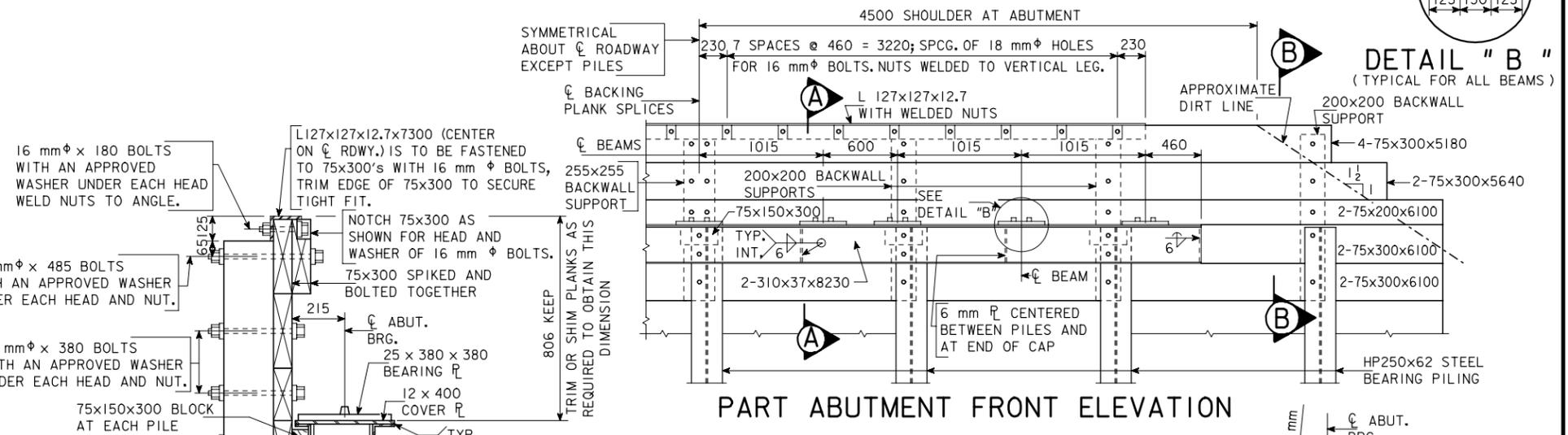
HALF INTERMEDIATE SECTION

HALF ABUTMENT SECTION

NOTE :
BACKING PLANKS ARE TO BE SPLICED ALONG C ROADWAY. LOWER LINES OF PLANKS ARE TO BE FASTENED TO THE NAILING STRIPS WITH 2-7.19 mm DIAMETER BY 150 mm LONG SPIKES.

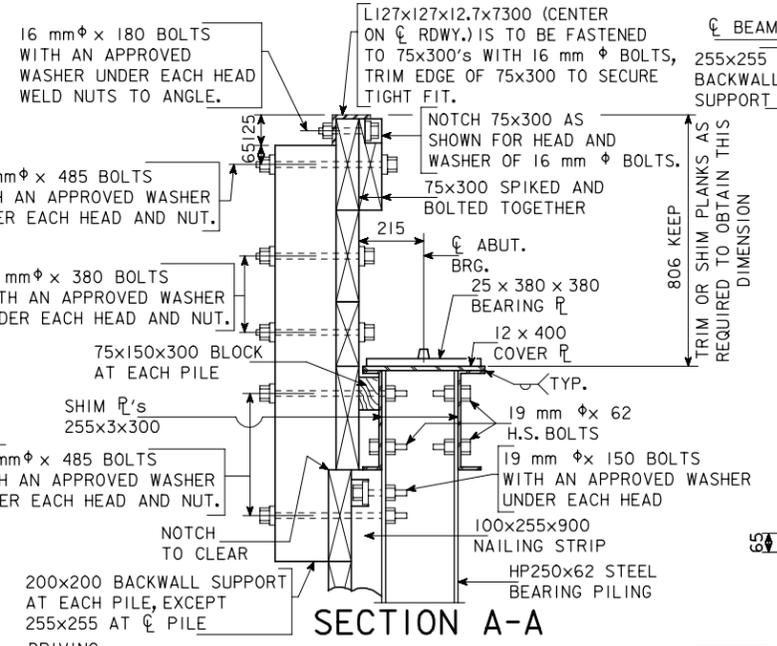


PART PLAN

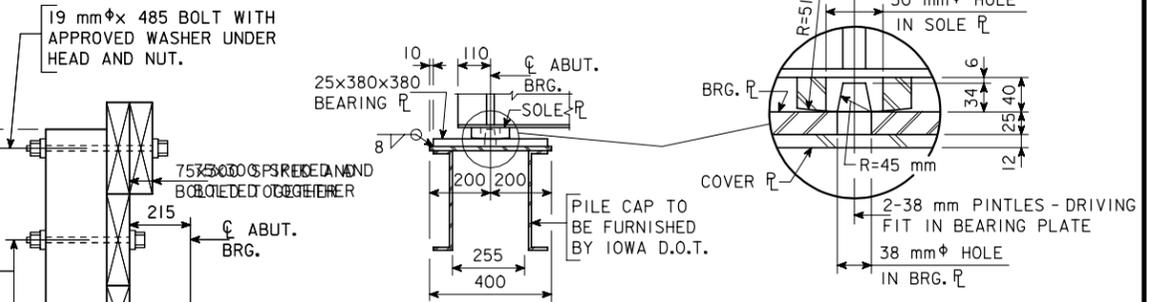


PART ABUTMENT FRONT ELEVATION

DETAIL " B "
(TYPICAL FOR ALL BEAMS)

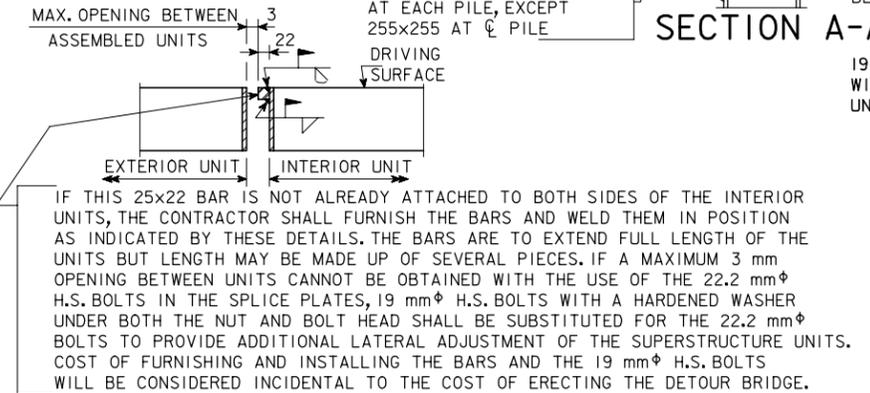


SECTION A-A

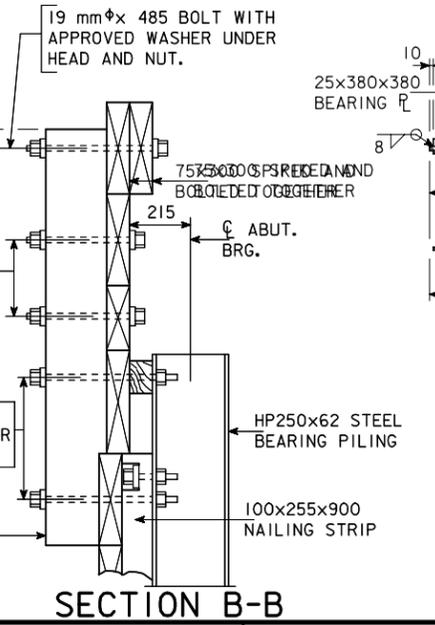


ABUTMENT BEARING DETAILS

NOTE :
SUPERSTRUCTURE UNITS AND ABUTMENT CAPS ARE ALREADY FABRICATED. DETAILS SHOWN ARE FOR INFORMATIONAL PURPOSES ONLY.



DETAIL " A "



SECTION B-B

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. _____ OF _____ FILE NO. _____ DESIGN NO. _____

HM1035C.S01 : THIS SHEET ISSUED, 9-1-95.

BENCH MARK :

DETOUR BRIDGE NOTES:

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THE BRIDGE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE DETOUR BRIDGE IN GOOD CONDITION DURING THE PERIOD IT IS BEING USED TO CARRY DETOUR TRAFFIC. ANY DAMAGE CAUSED BY MISHANDLING, BY THE BRIDGE CONTRACTOR, SHALL BE REPAIRED BY THE BRIDGE CONTRACTOR AT NO ADDITIONAL COST TO THE STATE. OTHER DAMAGES TO THE UNITS, CAUSED BY TRAFFIC OR CONDITIONS BEYOND THE BRIDGE CONTRACTORS CONTROL SHALL BE REPAIRED BY THE BRIDGE CONTRACTOR, AS DIRECTED BY THE ENGINEER, AND WILL BE PAID FOR AS EXTRA WORK. THE BRIDGE CONTRACTOR SHALL MAKE A REASONABLE EFFORT TO ENSURE THE DETOUR BRIDGE IS IN GOOD CONDITION AND ALL REPAIRS ARE COMPLETED BEFORE STORING THE BRIDGE UNITS AT THE D.O.T. MAINTENANCE YARD.

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THE BID ITEM "STRUCTURAL STEEL" SHALL INCLUDE FURNISHING AND ERECTING THE GALVANIZED ANGLES AT THE TOP OF THE BACKWALLS. ALL STEEL FURNISHED UNDER THIS BID ITEM IS TO BE NEW MATERIAL AND SHALL REMAIN THE PROPERTY OF THE IOWA D.O.T. MAINTENANCE DIVISION.

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EXCAVATION REQUIRED FOR CONSTRUCTION OF DETOUR STRUCTURE IS TO BE CONSIDERED INCIDENTAL.

PILE DRIVING NOTE FOR DETOUR BRIDGE:

THE DESIGN BEARING FOR THE ABUTMENT PILES IS 180 KN.

ESTIMATED QUANTITIES - DETOUR BRIDGE

| ITEM | | UNITS | QUANTITY |
|--------------------------------|-----------------|----------------|----------|
| STRUCTURAL STEEL | | kg | |
| UNTREATED LUMBER | | m ³ | |
| GALVANIZED HARDWARE | | kg | |
| HAUL DETOUR BRIDGE UNITS | | LS | 1.0 |
| ERECT DETOUR BRIDGE UNITS | | LS | 1.0 |
| PILES, STEEL BEARING, HP250x62 | FURNISH ? @ ? m | m | |
| | DRIVE ? @ ? m | m | |
| | | | |
| | | | |
| | | | |

NOTE: ABOVE QUANTITIES ARE INCLUDED IN "TOTAL ESTIMATED BRIDGE QUANTITIES" ON DES. SHT. ?.

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. ____ OF ____ FILE NO. _____ DESIGN NO. _____

REVISED 07-04 - PAINTING NOTE AND ESTIMATED QUANTITIES BOX CHANGED. HMI035D.S01 : THIS SHEET ISSUED, 9-1-95.

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 THE ? x 7310 mm I-BEAM DETOUR BRIDGE IS DESIGNED FOR M18 LOADING. THE SUPERSTRUCTURE IS COMPOSED OF THREE PREFABRICATED UNITS OF I-BEAMS AND ATTACHED STEEL GRID FLOOR. EXTERIOR UNITS ARE FURNISHED WITH CURBS AND HANDRAILS.

THE ABUTMENT AND PIER PILE CAPS ARE TO BE FURNISHED BY THE IOWA D.O.T. MAINTENANCE DIVISION. THE CONTRACTOR IS TO FURNISH AND INSTALL NEW STEEL PILES, NEW LUMBER FOR THE BACKWALLS, ANGLE ARMOR FOR THE TOPS OF THE BACKWALLS AND BRACING PLANK FOR THE PIERS, AS REQUIRED.

THE PRICE BID FOR "HAUL DETOUR BRIDGE UNITS" SHALL INCLUDE THE COST OF LOADING AND HAULING X UNITS OF THE BRIDGE SUPERSTRUCTURE, 2 ABUTMENT PILE CAPS AND PIER CAPS FROM THE IOWA D.O.T. MAINTENANCE YARD AT WILLIAMS TO THE BRIDGE SITE. IT SHALL ALSO INCLUDE THE COST OF LOADING AND HAULING THE SUPERSTRUCTURE UNITS, ABUTMENT PILE CAPS AND PIER CAPS TO WILLIAMS AFTER THE DETOUR BRIDGE IS NO LONGER NEEDED AT THIS SITE AND STORING ALL UNITS AS DIRECTED BY THE MAINTENANCE ENGINEER.

THE BRIDGE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE DETOUR BRIDGE IN GOOD CONDITION DURING THE PERIOD IT IS BEING USED TO CARRY DETOUR TRAFFIC. ANY DAMAGE CAUSED BY MISHANDLING, BY THE BRIDGE CONTRACTOR, SHALL BE REPAIRED BY THE BRIDGE CONTRACTOR AT NO ADDITIONAL COST TO THE STATE. OTHER DAMAGES TO THE UNITS, CAUSED BY TRAFFIC OR CONDITIONS BEYOND THE BRIDGE CONTRACTORS CONTROL SHALL BE REPAIRED BY THE BRIDGE CONTRACTOR, AS DIRECTED BY THE ENGINEER, AND WILL BE PAID FOR AS EXTRA WORK. THE BRIDGE CONTRACTOR SHALL MAKE A REASONABLE EFFORT TO ENSURE THE DETOUR BRIDGE IS IN GOOD CONDITION AND ALL REPAIRS ARE COMPLETED BEFORE STORING THE BRIDGE UNITS AT THE D.O.T. MAINTENANCE YARD.

THE HANDRAIL ASSEMBLIES, ATTACHED TO THE EXTERIOR UNITS, MAY BE REMOVED WHEN TRANSPORTING THE EXTERIOR UNITS, AT THE CONTRACTOR'S OPTION. HANDRAIL ASSEMBLIES, WHEN DETACHED, SHALL BE MATCH MARKED TO FACILITATE RE-ERECTION. HANDRAIL ASSEMBLIES ARE TO BE RE-CONNECTED BEFORE THE FINAL STORAGE AT THE D.O.T. MAINTENANCE YARD. COST OF REMOVAL AND REPLACEMENT OF RAIL ASSEMBLIES IS CONSIDERED INCIDENTAL AND NO SPECIAL PAYMENT WILL BE MADE. SEE PAINTING NOTE.

THE SUPERSTRUCTURE UNITS SHALL BE PICKED UP BY THE LIFTING U-BOLTS PROVIDED AT ALL FOUR CORNERS OF EACH UNIT. THE U-BOLTS ARE TO BE REMOVED DURING THE TIME THE DETOUR BRIDGE IS OPEN TO TRAFFIC AND STORED IN A LOCATION WHERE THEY WILL BE PROTECTED FROM ANY DAMAGE.

THE PRICE BID FOR "ERECT DETOUR BRIDGE UNITS" SHALL INCLUDE THE COST OF PLACING THE SUPERSTRUCTURE ON THE COMPLETED ABUTMENTS AND PIERS. IT SHALL ALSO INCLUDE THE COST OF REMOVING THE SUPERSTRUCTURE, ABUTMENTS AND PIERS AFTER THE DETOUR BRIDGE IS NO LONGER NEEDED AT THIS SITE. ALL 22.2 mm DIAMETER HIGH STRENGTH BOLTS NECESSARY TO BOLT UP THE SPLICES (SEE DETOUR BRIDGE CROSS SECTION) SHALL ALSO BE INCLUDED IN THE BID ITEM. IT SHOULD BE NOTED THAT MOST OF THE 22.2 mm DIAMETER H.S. BOLTS REQUIRED FOR THE SUPERSTRUCTURE ARE STORED WITH THE SUPERSTRUCTURE UNITS. ABUTMENT PILES ARE TO BE REMOVED TO 300 mm BELOW EXISTING GROUND LINE. PIER PILES ARE TO BE REMOVED TO 300 mm BELOW NATURAL STREAM BOTTOM. THE STEEL PILING, BACKWALL LUMBER AND PIER BRACING PLANKS SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR.

THE BID ITEM "STRUCTURAL STEEL" SHALL INCLUDE FURNISHING AND ERECTING THE GALVANIZED ANGLES AT THE TOP OF THE BACKWALLS. ALL STEEL FURNISHED UNDER THIS BID ITEM IS TO BE NEW MATERIAL AND SHALL REMAIN THE PROPERTY OF THE IOWA D.O.T.

THE BID ITEM "GALVANIZED HARDWARE" IS TO INCLUDE ALL BOLTS, NUTS AND WASHERS REQUIRED FOR ABUTMENT PILE CAPS, PIER PILE CAPS AND ABUTMENT BACKWALLS OF THE DETOUR BRIDGE.

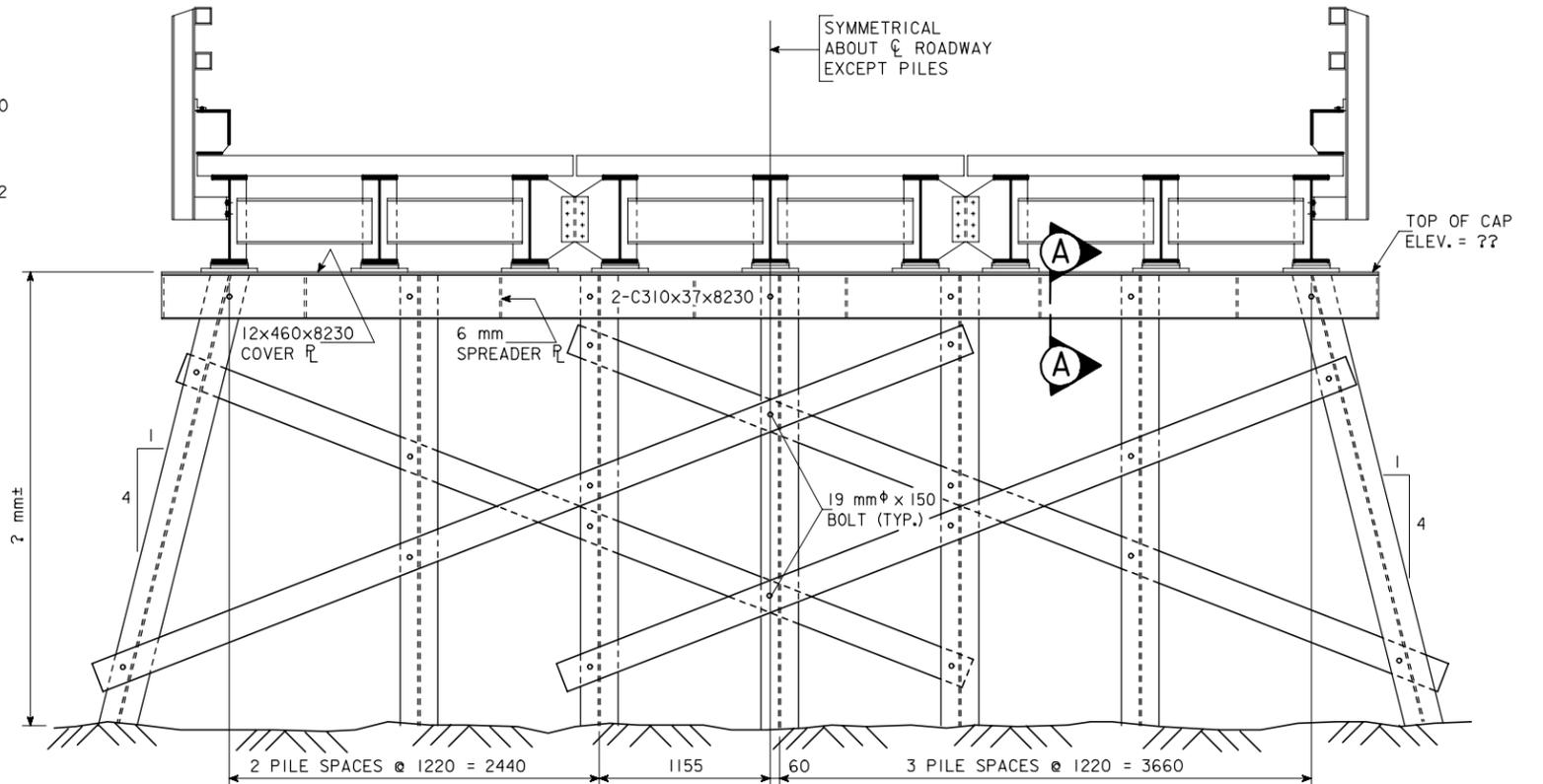
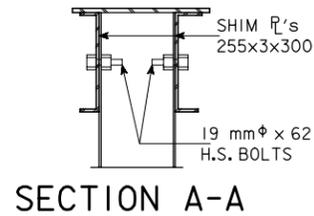
ALL LUMBER MAY BE UNTREATED. WIDTHS SHOWN ARE NOMINAL. ROUGH LUMBER MAY BE USED. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE BACKWALL CONFIGURATION APPROXIMATELY AS SHOWN.

THE MASS OF SUPERSTRUCTURE UNITS IS 7258 kg FOR INTERIOR UNIT AND 7802 kg FOR EXTERIOR UNIT (8618 kg WITH RAIL POST ASSEMBLY LEFT IN PLACE).

ALL BOLTS ARE TO HAVE SQUARE OR HEX. HEADS. ALL BOLTS ARE TO HAVE 125 mm MINIMUM THREADS, EXCEPT FOR THE 19 mm DIAMETER x 62 mm H.S. BOLTS.

EXCAVATION REQUIRED FOR CONSTRUCTION OF DETOUR STRUCTURE IS TO BE CONSIDERED INCIDENTAL.

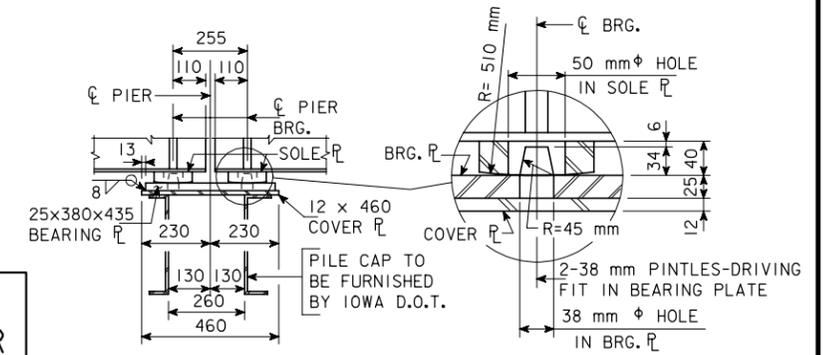
BENCH MARK :



PILE DRIVING NOTE FOR DETOUR BRIDGE:
 THE DESIGN BEARING FOR THE ABUTMENT AND PIER PILES IS 180 KN.

CL ROADWAY & PILE CAP
 CL PILING
PIER SECTION

NOTE : EACH BRACING PLANK IS TO BE FASTENED TO EACH PILE WITH 1-19 mm DIA. x 150 mm BOLT WITH AN APPROVED WASHER UNDER EACH HEAD AND NUT BEARING ON WOOD. THE 19 mm DIA. x 150 mm BOLT IS TO HAVE 75 mm THREAD LENGTH. ALL BRACING IS TO BE 75x200's. BRACING MAY BE OMITTED WHEN THE DISTANCE FROM TOP OF CAP TO GROUND IS LESS THAN ? mm. THE COST OF BRACING, IF REQUIRED, WILL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.



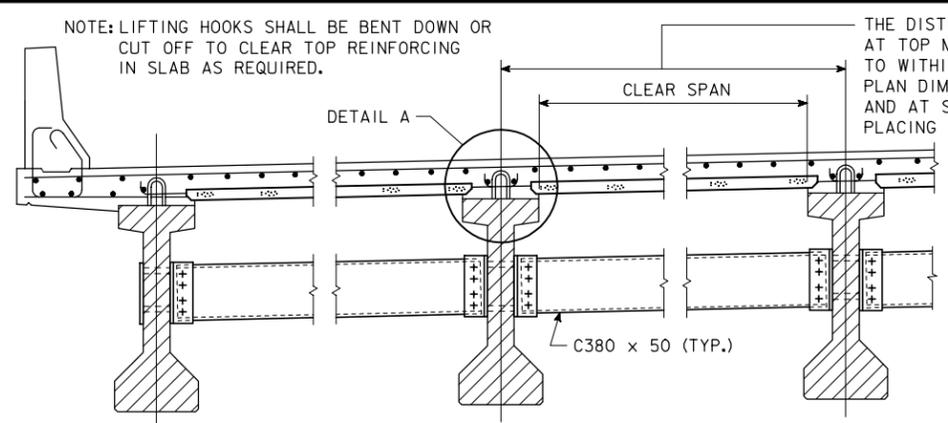
NOTE :
 SUPERSTRUCTURE UNITS AND PIER CAPS ARE ALREADY FABRICATED. DETAILS SHOWN ARE FOR INFORMATIONAL PURPOSES ONLY.

ESTIMATED QUANTITIES - DETOUR BRIDGE

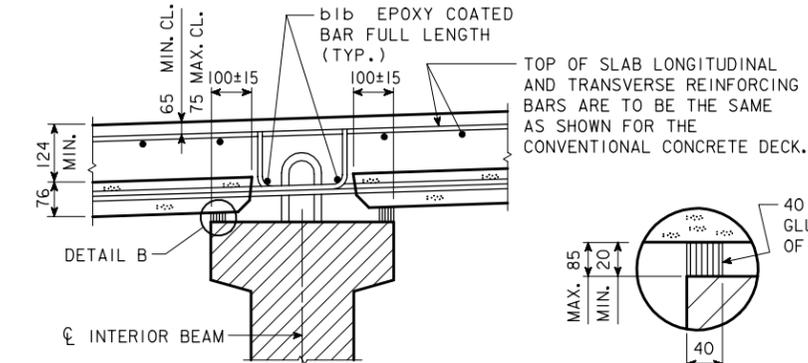
| ITEM | UNITS | QUANTITY |
|---------------------------|----------------|----------|
| STRUCTURAL STEEL | kg | |
| UNTREATED LUMBER | m ³ | |
| GALVANIZED HARDWARE | kg | |
| HAUL DETOUR BRIDGE UNITS | LS | 1.0 |
| ERECT DETOUR BRIDGE UNITS | LS | 1.0 |
| PILES, STEEL | FURNISH | ? @ ? m |
| BEARING, HP250x62 | DRIVE | ? @ ? m |
| | | |
| | | |
| | | |

NOTE: ABOVE QUANTITIES ARE INCLUDED IN "TOTAL ESTIMATED BRIDGE QUANTITIES" ON DES. SHT. ?.

REVISED 07-04 - PAINTING NOTE AND ESTIMATED QUANTITIES BOX CHANGED. HMI035E.SOI ; THIS SHEET ISSUED, 9-1-95.

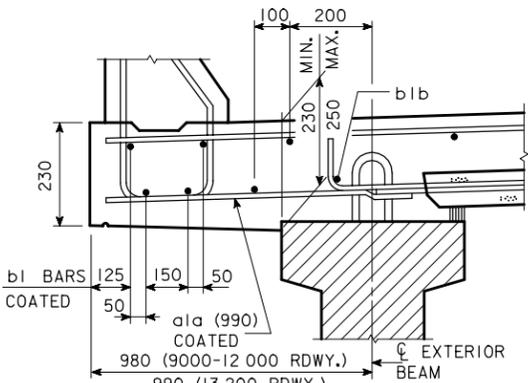


SECTION SHOWING INTERMEDIATE DIAPHRAGM

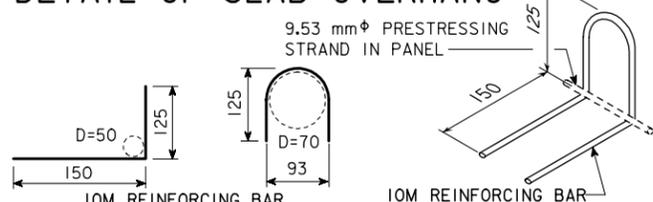


DETAIL A

DETAIL B



DETAIL OF SLAB OVERHANG



LIFTING HOOK DETAIL

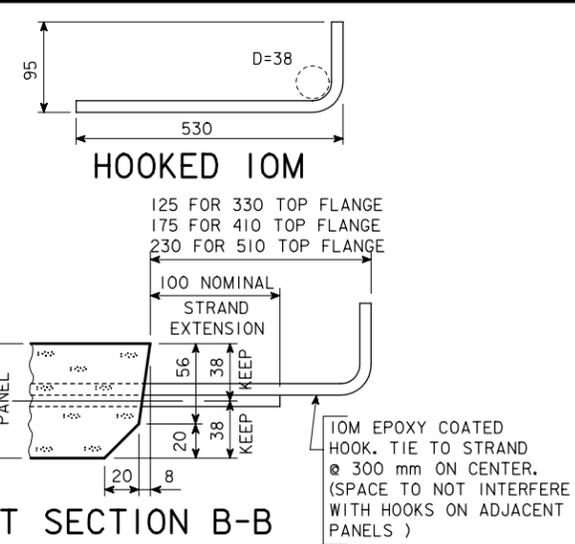
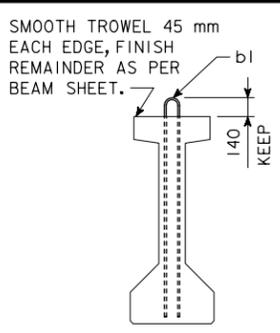
NOTE: ALTERNATE LIFTING HOOK MAY BE SUBSTITUTED WITH THE APPROVAL OF THE ENGINEER.

| b1 DIMENSIONS | |
|---------------|------|
| BEAM DEPTH | L |
| 810 | 910 |
| 990 | 1090 |
| 1140 | 1240 |
| 1370 | 1470 |

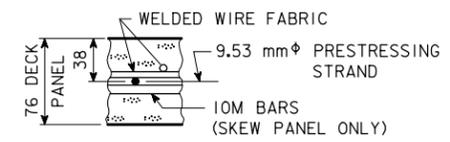
NOTE: BEAM STIRRUP b1 SHALL BE MODIFIED AS SHOWN WHEN DECK PANELS ARE USED. D = PIN DIAMETER. STIRRUP DIMENSIONS ARE OUT TO OUT.

STIRRUP b1 DETAILS

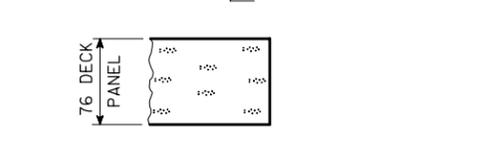
THE DISTANCE ϕ TO ϕ OF BEAMS AT TOP MUST BE FIELD ADJUSTED TO WITHIN ± 13 mm OF THE PLAN DIMENSIONS AT BEAM ENDS AND AT STEEL DIAPHRAGM BEFORE PLACING PANELS.



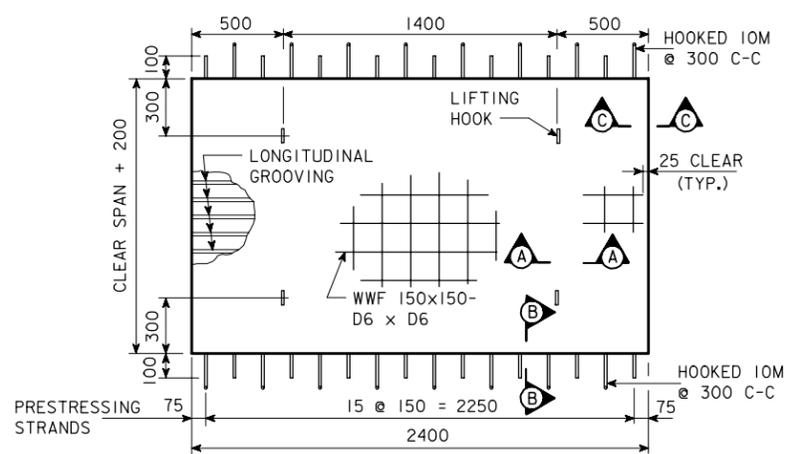
PART SECTION B-B



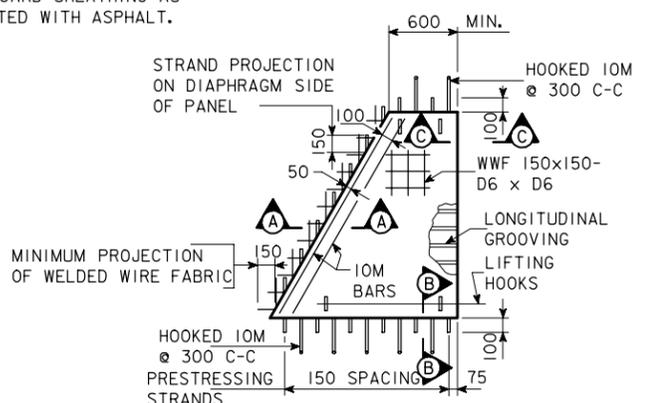
PART SECTION A-A



PART SECTION C-C

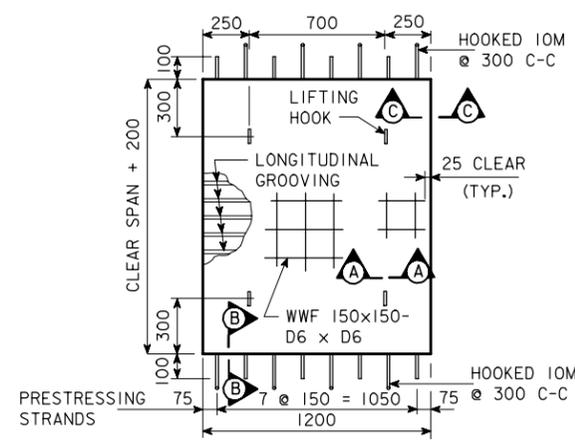


2400 DECK PANEL
MAXIMUM CLEAR SPAN = 2130 mm



END SKEW DECK PANEL
MAXIMUM CLEAR SPAN = 2130 mm

NOTE: FOR 0° SKEWS, NO MINIMUM PROJECTION OF WELDED WIRE FABRIC OVER DIAPHRAGMS ARE REQUIRED; MAINTAIN 25 mm CLEAR DISTANCE FROM ALL PANEL EDGES TO WELDED WIRE FABRIC.



1200 DECK PANEL
MAXIMUM CLEAR SPAN = 2130 mm

GENERAL NOTES:

THE STAY-IN-PLACE DECK PANELS ARE DESIGNED TO SUPPORT THE DEAD LOAD OF THE PANEL, REINFORCEMENT, PLASTIC CAST-IN-PLACE CONCRETE AND 2400 Pa OF CONSTRUCTION LOAD. THE PANEL AND CAST-IN-PLACE SLAB, ACTING AS A COMPOSITE SECTION IS DESIGNED FOR MS18 LOADING PLUS 960 Pa OF ROADWAY FOR FUTURE WEARING SURFACE.

SHOP DRAWINGS SHOWING LAYOUT AND CONSTRUCTION DETAILS OF THE DECK PANELS SHALL BE SUBMITTED FOR APPROVAL.

THE MAXIMUM ALLOWABLE DIMENSIONAL TOLERANCE FOR THE DECK PANELS SHALL BE AS FOLLOWS:

- THICKNESS + 5 mm OR -0 mm
- LENGTH \pm 6 mm
- WIDTH \pm 3 mm
- SQUARE ENDS (DEVIATION FROM SQUARE) \pm 10 mm

THE TOP SURFACE OF THE DECK PANELS SHALL BE GIVEN A SUITABLE TEXTURE WITH A WIRE BROOM OR COMB HAVING A SINGLE ROW OF TINES. THE DESIRED GROOVING IS LONGITUDINAL GROOVING (PARALLEL TO THE CENTERLINE OF BRIDGE ROADWAY) WHICH MAY VARY FROM 2 mm WIDTH AT 13 mm CENTERS TO 5 mm WIDTH AT 20 mm CENTERS, AND THE GROOVE DEPTH SHOULD BE 3 mm TO 5 mm.

SANDBLASTING THE PLANK SURFACE IS NOT CONSIDERED NECESSARY, UNDER NORMAL CONDITIONS, BUT MAY BE REQUIRED TO REMOVE UNUSUAL SURFACE LAITANCE OR OTHER SURFACE CONTAMINANTS. PRIOR TO CONCRETE PLACEMENT, THE PLANK SURFACE AND BEAM TOP SHALL BE BLOWN FREE OF DUST AND DEBRIS WITH AN OIL FREE AIR BLAST. SPECIAL CARE MUST BE TAKEN TO REMOVE ALL DEBRIS FROM UNDER THE ENDS OF THE PLANK. THE PLANK SURFACE SHALL BE DRY AND DUST FREE WHEN CAST-IN-PLACE CONCRETE IS PLACED ON THE PLANK.

THE PRESTRESSING STRANDS SHALL BE 9.53 mm GRADE 270 ASTM A416 LOW-RELAXATION STRANDS WITH AN INITIAL TENSION OF 71.6 kN PER STRAND (70% OF THE GUARANTEED ULTIMATE TENSILE STRENGTH.)

THE WELDED DEFORMED STEEL WIRE FABRIC SHALL BE ASTM A497. 10M REINFORCING BARS SPACED AT 300 mm CENTERS IN BOTH DIRECTIONS SHALL BE CONSIDERED AN ALLOWABLE SUBSTITUTION FOR THE WWF 150x150-D6 x D6. NO ADDITIONAL PAYMENT WILL BE PROVIDED.

THE PANEL CONCRETE SHALL HAVE A MINIMUM 28 DAY STRENGTH OF 41 MPa AND A MINIMUM RELEASE STRENGTH OF 31 MPa.

THE DECK PANELS SHALL BE AT LEAST 28 DAYS OLD BEFORE THE CAST-IN-PLACE SLAB IS PLACED OR AS APPROVED BY THE ENGINEER.

WHEN DECK PANELS ARE USED IN CONSTRUCTION OF BRIDGE DECK, THE BOTTOM MAT OF SLAB REINFORCING BARS BETWEEN ALL BEAMS WILL BE REPLACED BY CONCRETE DECK PANELS. THE BOTTOM LONGITUDINAL REINFORCING BARS IN THE SLAB OVERHANG AND THE TOP MAT OF REINFORCING BARS FOR THE SLAB ARE TO REMAIN THE SAME AS SHOWN FOR THE CONVENTIONAL FULL-DEPTH CAST-IN-PLACE SLAB. THE ϕ BOTTOM TRANSVERSE REINFORCING BARS IN THE SLAB OVERHANG SHALL BE USED IN LIEU OF THE ϕ BOTTOM TRANSVERSE REINFORCING BARS. THE ϕ BARS SHALL BE SPACED AND ORIENTED THE SAME AS ϕ BARS.

ADDITIONAL EPOXY COATED LONGITUDINAL BARS b1b WILL ALSO BE REQUIRED FOR THE FULL LENGTH OF THE BRIDGE. THE LOCATION AND NUMBER OF THESE BARS IS SHOWN IN DETAIL A AND THE SLAB OVERHANG DETAIL.

SPECIFICATIONS:

DESIGN: AASHTO SERIES OF 1996.
CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION METRIC STANDARD SPECIFICATIONS, CURRENT SERIES, PLUS CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.

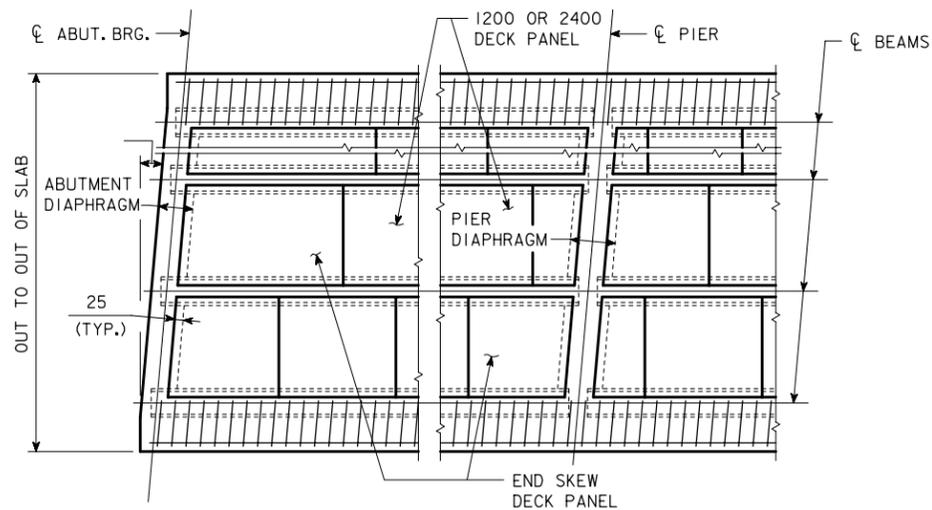
DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 1996.
REINFORCING STEEL IN ACCORDANCE WITH SECTION 8, GRADE 400.
CONCRETE IN ACCORDANCE WITH SECTION 9, $f'c = 41$ MPa.
PRESTRESSING STEEL IN ACCORDANCE WITH SECTION 9, GRADE 270.

PRECAST DECK PANEL DETAILS

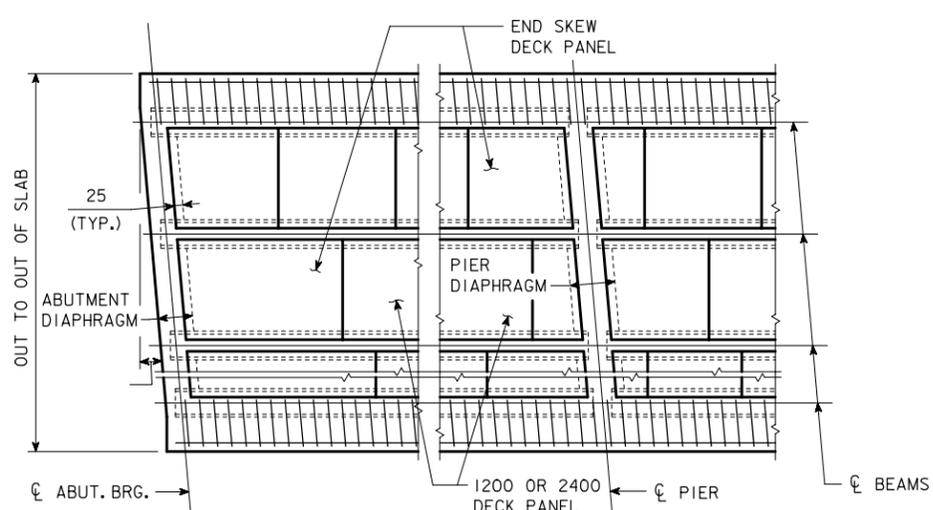
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. ____ OF ____ FILE NO. ____ DESIGN NO. ____

REVISED: 5-99 - MAXIMUM CLEAR SPAN AND STRAND EXTENSION CHANGED. HMI037.S01 - THIS SHEET ISSUED 9-1-95.



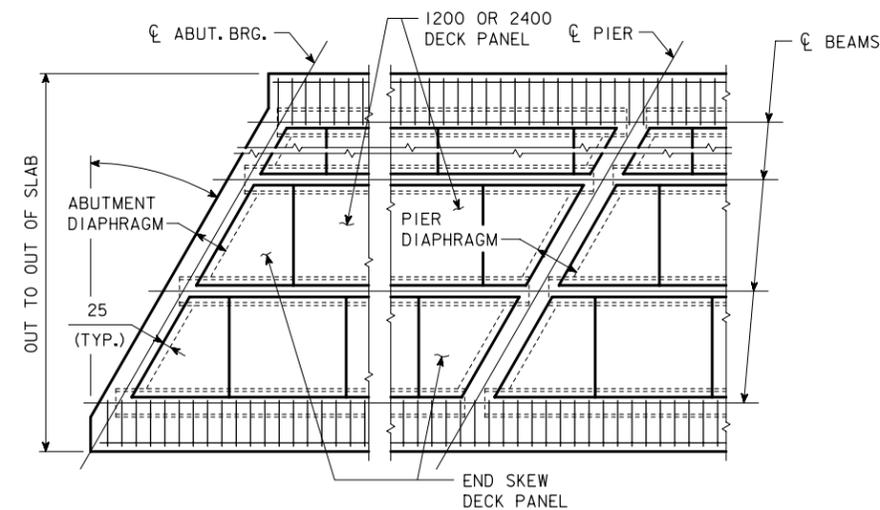
DECK PANEL LOCATION PART PLAN
(FOR L. A. SKEWS 0° TO 7°30')

NOTE:
AREAS OUTSIDE OF PANEL SECTIONS ARE FULL DEPTH CAST-IN-PLACE SLAB AND DIAPHRAGMS. ALTERNATE DETAIL OF USING FULL DEPTH CAST-IN-PLACE SLAB AT THE SKEWED ENDS MAY BE SUBMITTED FOR APPROVAL.



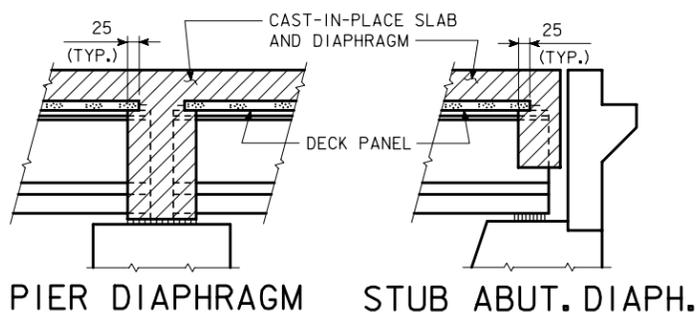
DECK PANEL LOCATION PART PLAN
(FOR R. A. SKEWS 0° TO 7°30')

NOTE:
AREAS OUTSIDE OF PANEL SECTIONS ARE FULL DEPTH CAST-IN-PLACE SLAB AND DIAPHRAGMS. ALTERNATE DETAIL OF USING FULL DEPTH CAST-IN-PLACE SLAB AT THE SKEWED ENDS MAY BE SUBMITTED FOR APPROVAL.

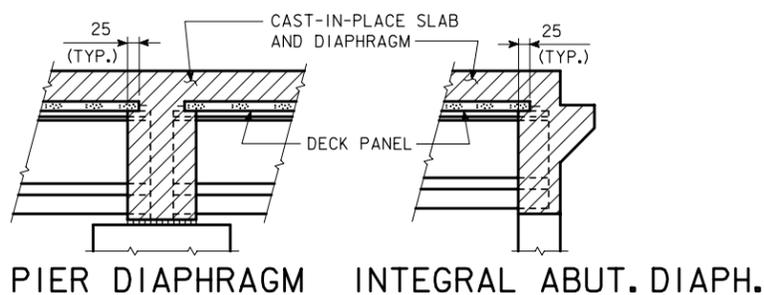


DECK PANEL LOCATION PART PLAN
(FOR L. A. SKEWS 7°31' TO 30°)

NOTE:
AREAS OUTSIDE OF PANEL SECTIONS ARE FULL DEPTH CAST-IN-PLACE SLAB AND DIAPHRAGMS. ALTERNATE DETAIL OF USING FULL DEPTH CAST-IN-PLACE SLAB AT THE SKEWED ENDS MAY BE SUBMITTED FOR APPROVAL.



PIER DIAPHRAGM STUB ABUT. DIAPH.

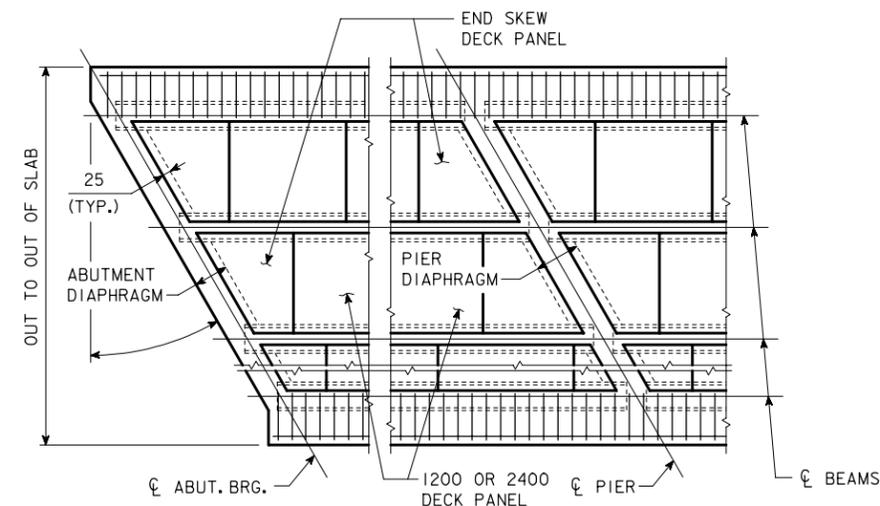


PIER DIAPHRAGM INTEGRAL ABUT. DIAPH.

IF THE PRECAST PRESTRESSED CONCRETE DECK PANELS ARE TO BE USED IN THE CONSTRUCTION OF THE BRIDGE DECK IN LIEU OF THE CONVENTIONAL CAST-IN-PLACE DECK, THE FOLLOWING ADJUSTMENTS TO THE SUPERSTRUCTURE EPOXY COATED REINFORCING STEEL SHALL BE MADE.

| ADJUSTMENTS TO EPOXY COATED REINFORCING STEEL | | | | | | | |
|---|------|------|-------------------|-------|-----|--------|------|
| | MARK | SIZE | LOCATION | SHAPE | NO. | LENGTH | MASS |
| DELETE | a1 | 15 | SLAB TRANSV. BOT. | — | | | |
| | b1 | 15 | SLAB LONGIT. BOT. | — | | | |
| ADD | a1a | 15 | SLAB TRANSV. BOT. | — | | 990 | |
| | b1b | 10 | SLAB LONGIT. BOT. | — | | | |
| REINFORCING STEEL EPOXY COATED - REDUCTION (kg) | | | | | | | |

PUT ON SUPERSTRUCTURE BAR LIST SHEET.



DECK PANEL LOCATION PART PLAN
(FOR R. A. SKEWS 7°31' TO 30°)

NOTE:
AREAS OUTSIDE OF PANEL SECTIONS ARE FULL DEPTH CAST-IN-PLACE SLAB AND DIAPHRAGMS. ALTERNATE DETAIL OF USING FULL DEPTH CAST-IN-PLACE SLAB AT THE SKEWED ENDS MAY BE SUBMITTED FOR APPROVAL.

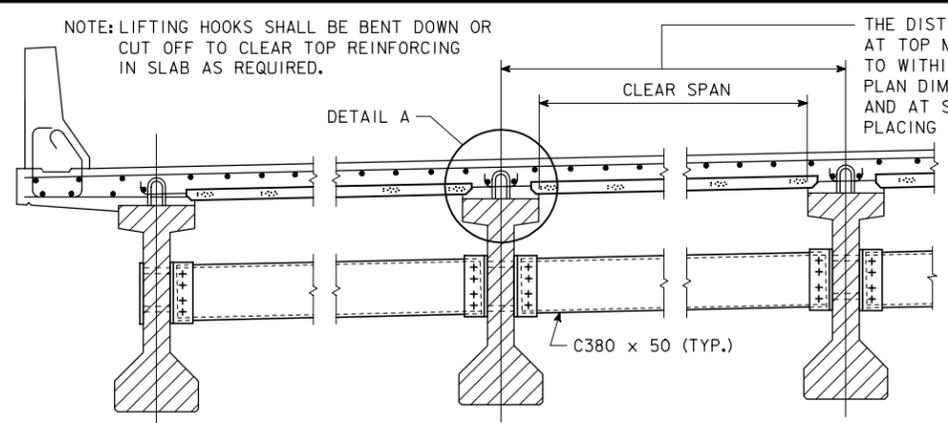
NOTE:
IF THE PRECAST PRESTRESSED CONCRETE DECK PANELS ARE TO BE USED IN CONSTRUCTION OF THE BRIDGE DECK IN LIEU OF THE CONVENTIONAL CAST-IN-PLACE DECK, THE b1 STIRRUPS SHOWN ON THIS SHEET SHALL BE MODIFIED AS SHOWN ON DESIGN SHEET

PUT ON BEAM SHEET.

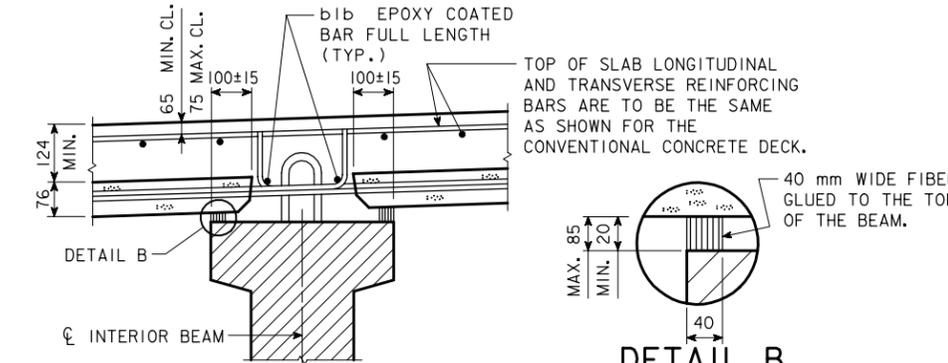
PRECAST DECK PANEL DETAILS

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. _____ OF _____ FILE NO. _____ DESIGN NO. _____

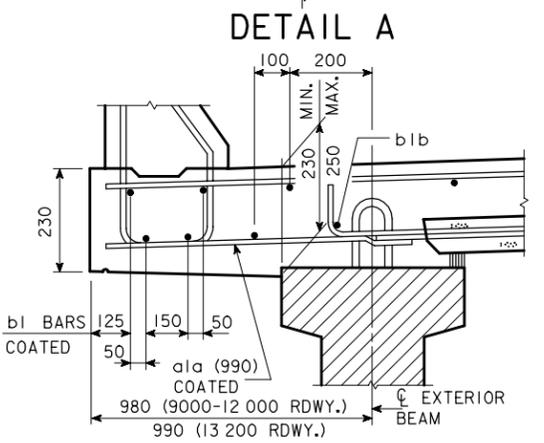
REVISED 5-99 - REINFORCING BAR LIST CHANGED. HMI037A.S01 : THIS SHEET ISSUED 9-1-95.



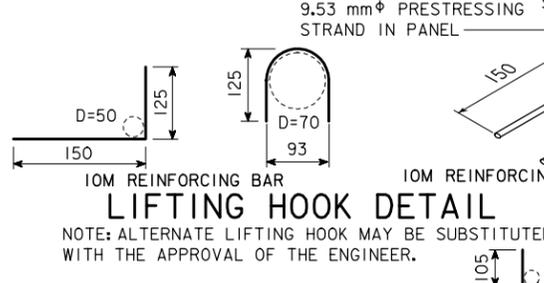
SECTION SHOWING INTERMEDIATE DIAPHRAGM



DETAIL B



DETAIL OF SLAB OVERHANG

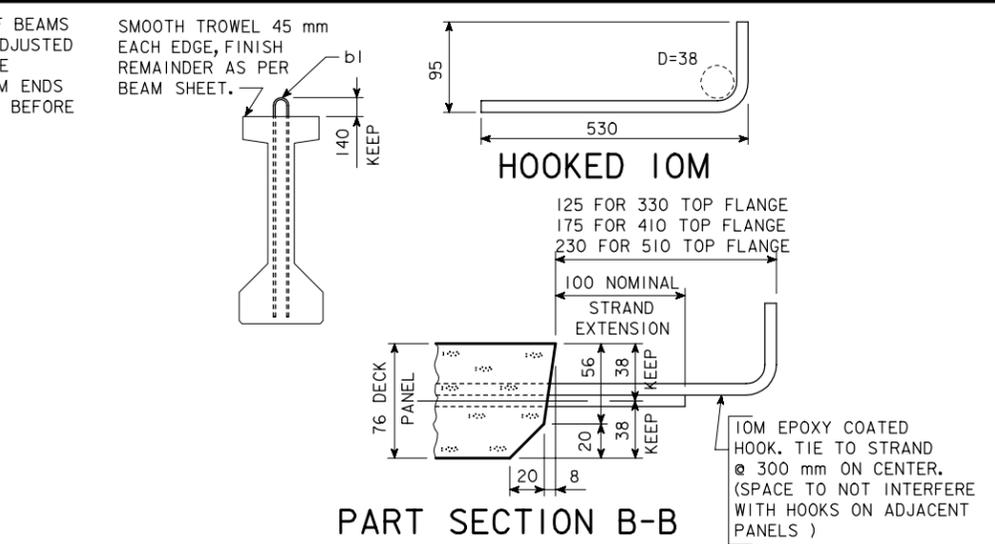


LIFTING HOOK DETAIL

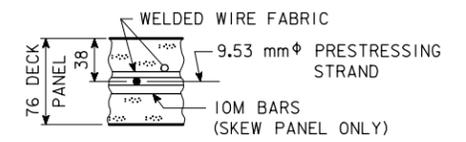
| b1 DIMENSIONS | |
|---------------|------|
| BEAM DEPTH | L |
| 810 | 910 |
| 990 | 1090 |
| 1140 | 1240 |
| 1370 | 1470 |

NOTE: BEAM STIRRUP b1 SHALL BE MODIFIED AS SHOWN WHEN DECK PANELS ARE USED. D = PIN DIAMETER. STIRRUP DIMENSIONS ARE OUT TO OUT.

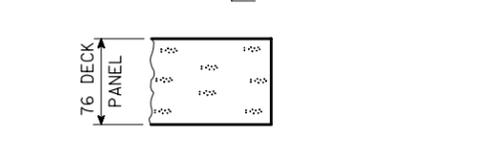
STIRRUP b1 DETAILS



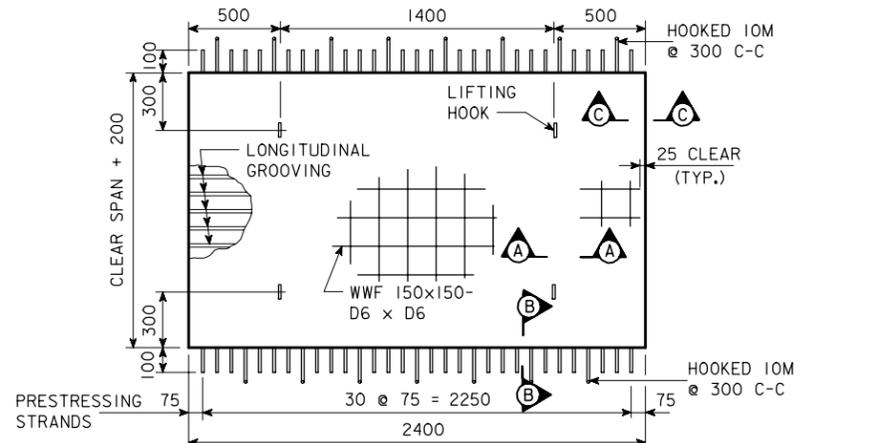
PART SECTION B-B



PART SECTION A-A

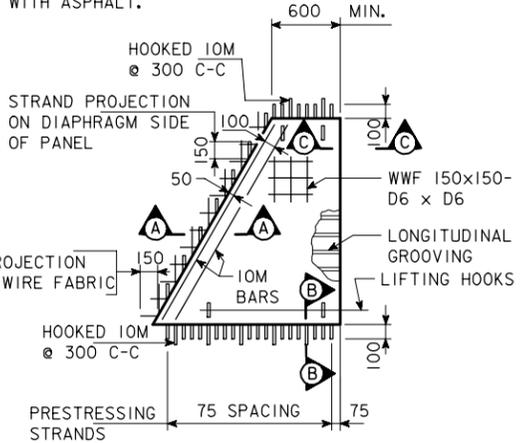


PART SECTION C-C



2400 DECK PANEL

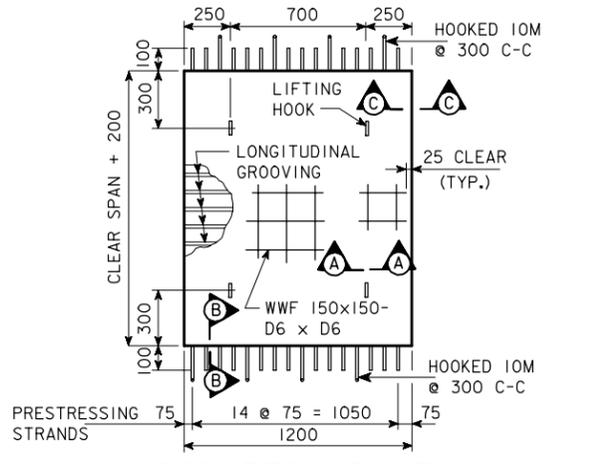
(MINIMUM CLEAR SPAN > 2130 mm)
(MAXIMUM CLEAR SPAN = 3050 mm)



END SKEW DECK PANEL

(MINIMUM CLEAR SPAN 2130 mm)
(MAXIMUM CLEAR SPAN 3050 mm)

NOTE: FOR 0° SKEWS, NO MINIMUM PROJECTION OF WELDED WIRE FABRIC OVER DIAPHRAGMS ARE REQUIRED; MAINTAIN 25 mm CLEAR DISTANCE FROM ALL PANEL EDGES TO WELDED WIRE FABRIC.



1200 DECK PANEL

(MINIMUM CLEAR SPAN 2130 mm)
(MAXIMUM CLEAR SPAN 3050 mm)

GENERAL NOTES:
THE STAY-IN-PLACE DECK PANELS ARE DESIGNED TO SUPPORT THE DEAD LOAD OF THE PANEL, REINFORCEMENT, PLASTIC CAST-IN-PLACE CONCRETE AND 2400 Pa OF CONSTRUCTION LOAD. THE PANEL AND CAST-IN-PLACE SLAB, ACTING AS A COMPOSITE SECTION IS DESIGNED FOR MS18 LOADING PLUS 960 Pa OF ROADWAY FOR FUTURE WEARING SURFACE.
SHOP DRAWINGS SHOWING LAYOUT AND CONSTRUCTION DETAILS OF THE DECK PANELS SHALL BE SUBMITTED FOR APPROVAL.
THE MAXIMUM ALLOWABLE DIMENSIONAL TOLERANCE FOR THE DECK PANELS SHALL BE AS FOLLOWS:
THICKNESS + 5 mm OR -0 mm
LENGTH ± 6 mm
WIDTH ± 3 mm
SQUARE ENDS (DEVIATION FROM SQUARE) ± 10 mm

THE TOP SURFACE OF THE DECK PANELS SHALL BE GIVEN A SUITABLE TEXTURE WITH A WIRE BROOM OR COMB HAVING A SINGLE ROW OF TINES. THE DESIRED GROOVING IS LONGITUDINAL GROOVING (PARALLEL TO THE CENTERLINE OF BRIDGE ROADWAY) WHICH MAY VARY FROM 2 mm WIDTH AT 13 mm CENTERS TO 5 mm WIDTH AT 20 mm CENTERS, AND THE GROOVE DEPTH SHOULD BE 3 mm TO 5 mm.
SANDBLASTING THE PLANK SURFACE IS NOT CONSIDERED NECESSARY, UNDER NORMAL CONDITIONS, BUT MAY BE REQUIRED TO REMOVE UNUSUAL SURFACE LAITANCE OR OTHER SURFACE CONTAMINANTS. PRIOR TO CONCRETE PLACEMENT, THE PLANK SURFACE AND BEAM TOP SHALL BE BLOWN FREE OF DUST AND DEBRIS WITH AN OIL FREE AIR BLAST. SPECIAL CARE MUST BE TAKEN TO REMOVE ALL DEBRIS FROM UNDER THE ENDS OF THE PLANK. THE PLANK SURFACE SHALL BE DRY AND DUST FREE WHEN CAST-IN-PLACE CONCRETE IS PLACED ON THE PLANK.

THE PRESTRESSING STRANDS SHALL BE 9.53 mm GRADE 270 ASTM A416 LOW-RELAXATION STRANDS WITH AN INITIAL TENSION OF 71.6 kN. PER STRAND (70% OF THE GUARANTEED ULTIMATE TENSILE STRENGTH.)
THE WELDED DEFORMED STEEL WIRE FABRIC SHALL BE ASTM A497.
10M REINFORCING BARS SPACED AT 300 mm CENTERS IN BOTH DIRECTIONS SHALL BE CONSIDERED AN ALLOWABLE SUBSTITUTION FOR THE WWF 150x150-D6 x D6. NO ADDITIONAL PAYMENT WILL BE PROVIDED.
THE PANEL CONCRETE SHALL HAVE A MINIMUM 28 DAY STRENGTH OF 41 MPa AND A MINIMUM RELEASE STRENGTH OF 31 MPa.

THE DECK PANELS SHALL BE AT LEAST 28 DAYS OLD BEFORE THE CAST-IN-PLACE SLAB IS PLACED OR AS APPROVED BY THE ENGINEER.
WHEN DECK PANELS ARE USED IN CONSTRUCTION OF BRIDGE DECK, THE BOTTOM MAT OF SLAB REINFORCING BARS BETWEEN ALL BEAMS WILL BE REPLACED BY CONCRETE DECK PANELS. THE BOTTOM LONGITUDINAL REINFORCING BARS IN THE SLAB OVERHANG AND THE TOP MAT OF REINFORCING BARS FOR THE SLAB ARE TO REMAIN THE SAME AS SHOWN FOR THE CONVENTIONAL FULL-DEPTH CAST-IN-PLACE SLAB. THE α1α BOTTOM TRANSVERSE REINFORCING BARS IN THE SLAB OVERHANG SHALL BE USED IN LIEU OF THE α1 BOTTOM TRANSVERSE REINFORCING BARS. THE α1α BARS SHALL BE SPACED AND ORIENTED THE SAME AS α1 BARS.

ADDITIONAL EPOXY COATED LONGITUDINAL BARS b1b WILL ALSO BE REQUIRED FOR THE FULL LENGTH OF THE BRIDGE. THE LOCATION AND NUMBER OF THESE BARS IS SHOWN IN DETAIL A AND THE SLAB OVERHANG DETAIL.

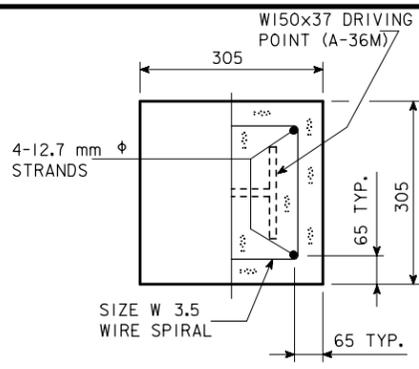
SPECIFICATIONS:
DESIGN: AASHTO SERIES OF 1996.
CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION METRIC STANDARD SPECIFICATIONS, CURRENT SERIES, PLUS CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.

DESIGN STRESSES:
DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 1996.
REINFORCING STEEL IN ACCORDANCE WITH SECTION 8, GRADE 400.
CONCRETE IN ACCORDANCE WITH SECTION 9, f'c = 41 MPa.
PRESTRESSING STEEL IN ACCORDANCE WITH SECTION 9, GRADE 270.

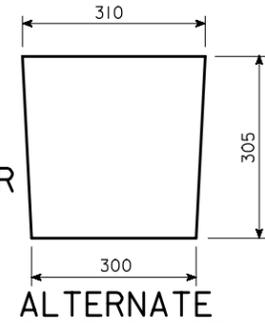
PRECAST DECK PANEL DETAILS

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. ____ OF ____ FILE NO. ____ DESIGN NO. ____

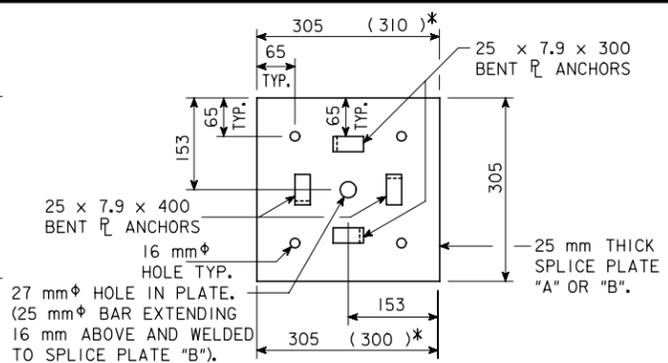
HMI037B.S01 : THIS SHEET ISSUED 5-99.



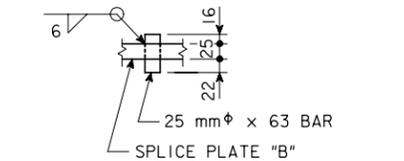
TOP OF PILE
(SPLICE PLATE NOT SHOWN)



ALTERNATE
PILE SHAPE



ANCHOR SIDE OF
SPLICE PLATE



25 mm diameter BAR DETAIL

GENERAL NOTES:

ALL DIMENSIONS ARE IN MILLIMETERS (mm) UNLESS OTHERWISE NOTED OR SHOWN.
 THE 305 mm PRESTRESSED CONCRETE FOUNDATION PILE SHALL BE USED IN PIER FOOTINGS AND STUB ABUTMENT FOOTINGS ONLY.
 EXCEPT AS NOTED ELSEWHERE, MATERIAL, CONSTRUCTION, DRIVING AND EXTENSIONS SHALL BE IN ACCORDANCE WITH THE IOWA D. O. T. METRIC STANDARD SPECIFICATIONS AND CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS, WHEN APPLICABLE.
 BEARING VALUE SHOWN IS FOR FRICTION TYPE BEARING. BEARING VALUE SHALL BE AS SPECIFIED ON THE PLANS.
 DRIVING POINT, IF CALLED FOR ON THE PLANS, SHALL BE AS DETAILED. COST OF ALL DRIVING POINTS IS TO BE INCLUDED IN THE PRICE BID PER METER FOR PILING.
 ARTICLE 2501.18 SHALL NOT APPLY FOR SPLICING THE PILES.
 ALL PILES, EXCEPT PILE EXTENSIONS IF REQUIRED, SHALL HAVE SPLICE PLATE "A" INSTALLED ON TOP END OF PILE TO FACILITATE SPLICING OF PILES AS NECESSARY.
 HEADS OF PRESTRESSED PILES SHALL BE NORMAL TO AXIS OF PILE.
 ALL PRESTRESSING STRANDS ARE TO BE 12.7 mm diameter (ASTM A-416) GRADE 270. THE TOTAL INITIAL PRESTRESSING FORCE IS TO BE 515 kN FOR NORMAL CURING OR 545 kN FOR ARTIFICIAL CURING.
 WIRE SPIRAL SHALL CONFORM TO ASTM A-82.

PILE SPLICE NOTES:

ALL PILES ARE REQUIRED TO HAVE A PILE SPLICE PLATE "A" INSTALLED IN THE UPPER END OF THE PILE TO FACILITATE PILE EXTENSION IN THE EVENT THE PLAN LENGTH PILES ARE NOT ADEQUATE. PILE SPLICERS SHALL BE AS DETAILED ON THIS SHEET.
 THE MAXIMUM LENGTH (L) OF AN INDIVIDUAL SECTION OF PILE SHALL BE 17 METERS. WHEN PILES LONGER THAN 17 METERS ARE REQUIRED ON THE PLANS, PILE SPLICERS SHALL BE USED TO FASTEN PILE SECTIONS TOGETHER TO PROVIDE THE REQUIRED PLAN LENGTH. ONE PILE SPLICE ONLY WILL BE ALLOWED IN THE PLAN LENGTH OF PILES 17 TO 34 METERS. PILE SECTIONS SHALL BE WELDED TOGETHER AT SPLICES AFTER FIRST SECTION OF PILE IS DRIVEN.
 COST OF STRUCTURAL STEEL REQUIRED FOR SPLICE PLATES SHALL BE CONSIDERED INCIDENTAL TO PRICE BID FOR "PRESTRESSED CONCRETE PILING - 305 mm."

SPECIFICATIONS:

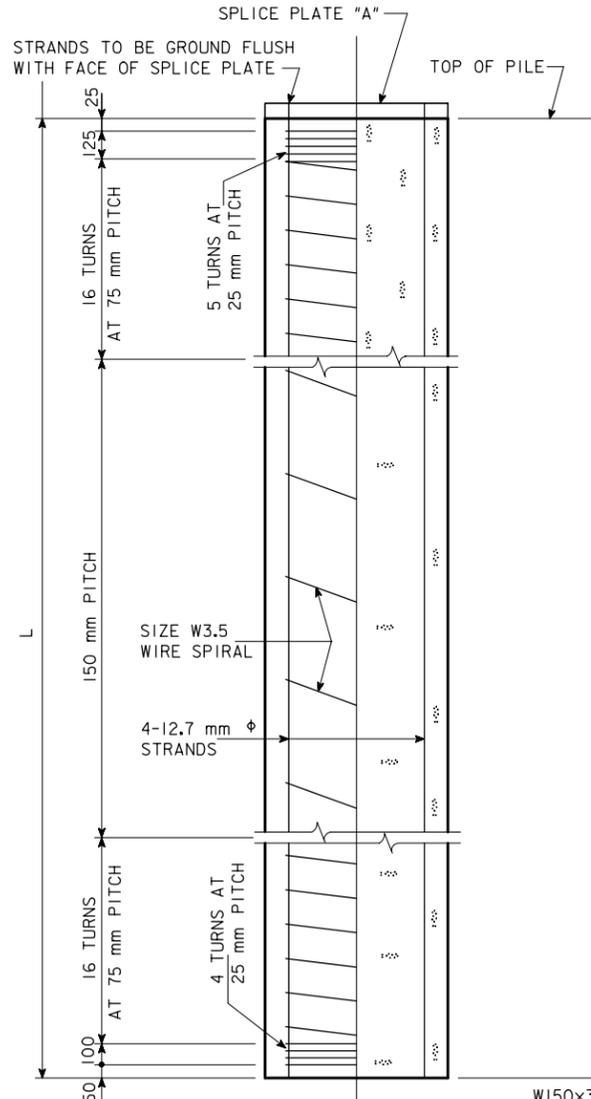
DESIGN: AASHTO SERIES OF 1992.
 CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION METRIC STANDARD SPECIFICATIONS, CURRENT SERIES, PLUS CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.

DESIGN STRESSES:

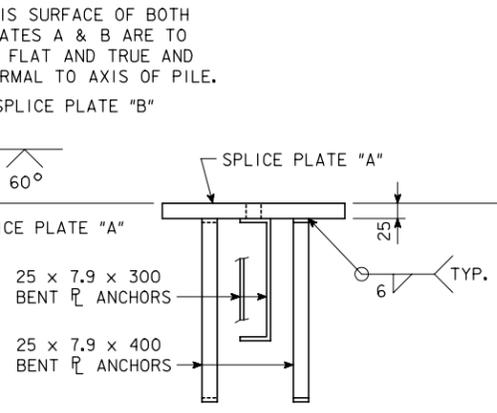
DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 1992. DESIGN STRESS INFORMATION HAS BEEN CONVERTED TO A METRIC VERSION.
 CONCRETE IN ACCORDANCE WITH SECTION 9, $f'_c = 35$ MPa.
 PRESTRESSING STEEL IN ACCORDANCE WITH SECTION 9, $f'_s = 1860$ MPa.
 STRUCTURAL STEEL IN ACCORDANCE WITH SECTION 10, ASTM A-36M.

NOTE:

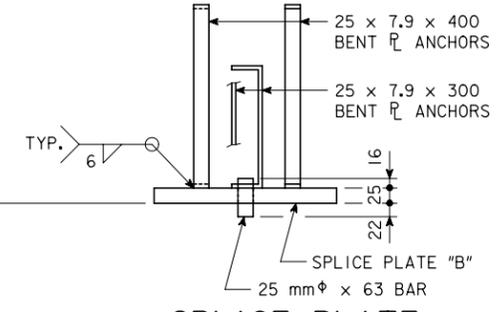
THE TOP PORTIONS OF THE PRESTRESSED CONCRETE FOUNDATION PILES THAT ARE TO BE ENCASED IN CONCRETE SHALL BE ROUGHENED, AFTER PILES HAVE BEEN DRIVEN, BY SANDBLASTING OR OTHER APPROVED METHODS TO PROVIDE SUITABLE BOND BETWEEN THE PILE AND FOOTING IN ACCORDANCE WITH ARTICLE 2403.14 OF THE SPECIFICATIONS. COST OF THIS WORK IS TO BE INCLUDED IN THE PRICE BID FOR "PRESTRESSED CONCRETE PILING - 305 mm."



PRESTRESSED
CONCRETE
FOUNDATION PILE
SPLICE DETAIL

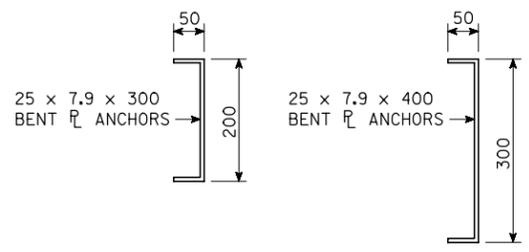


SPLICE PLATE
"A" DETAIL
MASS OF SPLICE PLATE "A" = 21 kg



SPLICE PLATE
"B" DETAIL
MASS OF SPLICE PLATE "B" = 21 kg

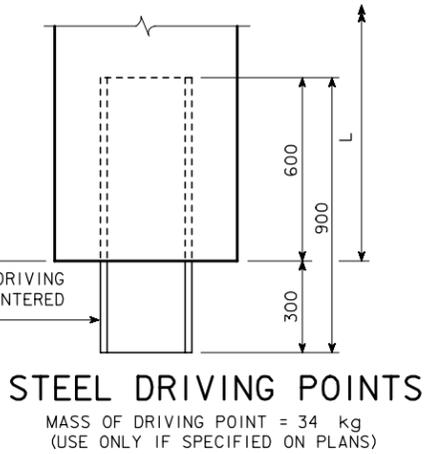
NOTE:
 SPLICE PLATE "A" AND "B" ARE THE SAME EXCEPT FOR 25 mm diameter x 63 BAR WELDED IN CENTER HOLE OF SPLICE PLATE "B".



ANCHOR DETAILS

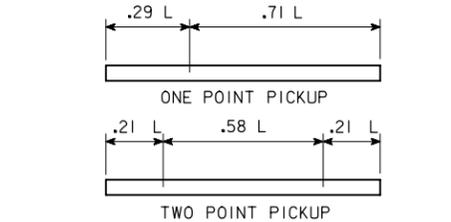
REVISED 07-04 - BENT ANCHOR SIZE CHANGED. FH1046.S01; THIS SHEET ISSUED, 9-1-95.

PRESTRESSED
CONCRETE
FOUNDATION PILE



STEEL DRIVING POINTS
 MASS OF DRIVING POINT = 34 kg
 (USE ONLY IF SPECIFIED ON PLANS)

| PILE DATA | | | |
|---------------------------|-----|--|-----|
| MAX. LENGTH 1 PT. PICK-UP | m | | 13 |
| MAX. LENGTH 2 PT. PICK-UP | m | | 17 |
| f'_c | MPa | | 35 |
| MAX. BEARING VALUE | kN | | 450 |



PILE HANDLING DIAGRAM

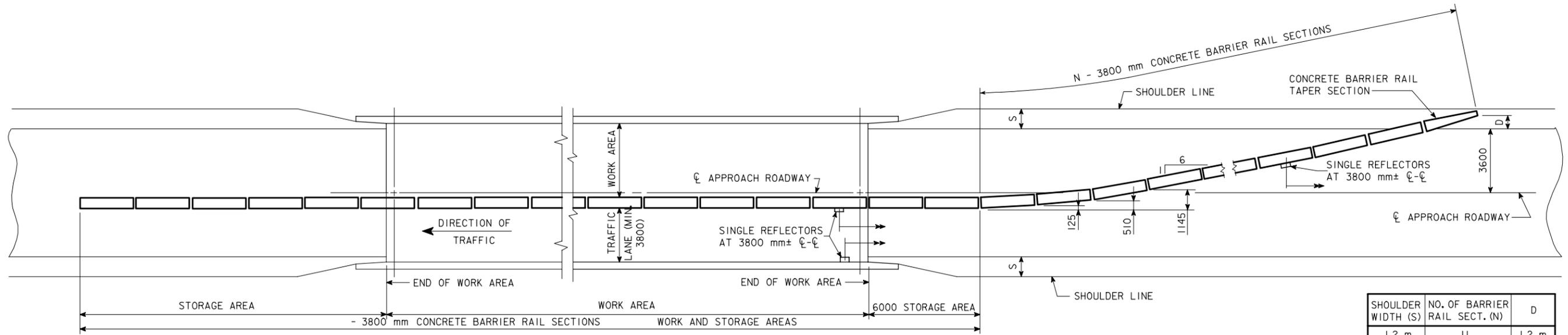
| 305 mm PRESTR. CONC. FOUNDATION PILE MATERIAL COMPONENTS | | | | |
|--|----------------|--------|---------------------|--|
| ITEM | UNIT | L=15 m | ONE METER INCREMENT | |
| CONCRETE | m ³ | 1.4 | 0.093 | |
| SIZE No. W 3.5 WIRE SPIRAL | kg | 17 | 0.93 | |
| PRESTRESSING STEEL | kg | 47 | 3.13 | |
| SPLICE PLATE "A" OR "B" | kg | 21 | | |

APPROVED BY: *William A. Lundquist*
 BRIDGE ENGINEER

305 mm PRESTR. CONC. FOUNDATION PILES

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. ___ OF ___ FILE NO. ___ DESIGN NO. ___

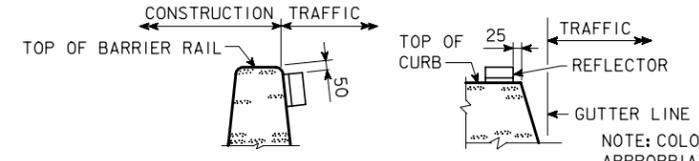
REVISION 07-04 - TEMPORARY BARRIER RAIL TIE-DOWN DETAILS DELETED. NOTES CHANGED TO REFLECT TIE-DOWN REFERENCE. CONCRETE ANCHOR NOTES DELETED.
 FMI049.S01-- GAN: 9-97, THIS SHEET REDRAWN.



TEMPORARY CONCRETE BARRIER RAIL LAYOUT FOR ONE WAY TRAFFIC

| SHOULDER WIDTH (S) | NO. OF BARRIER RAIL SECT. (N) | D |
|--------------------|-------------------------------|-------|
| 1.2 m | 11 | 1.2 m |
| 1.8 m | 12 | 1.7 m |
| 2.4 m | 12 | 2.1 m |
| 3.0 m | 13 | 2.7 m |

SHOULDER WIDTH(S) AT THIS BRIDGE SITE ARE ?? & ?? METERS. THEREFORE ?? & ?? CONCRETE BARRIER RAIL SECTIONS ARE REQUIRED FOR THE APPROACH END OF THE BRIDGE.



REFLECTOR DETAILS

NOTE: COLOR OF REFLECTOR SHALL BE APPROPRIATE FOR EDGE LINE.

CONCRETE TEMPORARY BARRIER RAIL NOTES:

CONCRETE TEMPORARY BARRIER RAIL SHALL BE CONSTRUCTED AS DETAILED AND NOTED ON THE METRIC RE-71 (1), RE-71 (2) AND RE-72 STANDARD ROAD PLANS.
 TRAFFIC REFLECTORS SHALL BE A RETRO-REFLECTIVE TYPE, APPROVED BY THE ENGINEER, AND THEY SHALL BE LOCATED AS SHOWN ON THIS SHEET. THE CONTRACTOR SHALL MAINTAIN THE REFLECTORS AND SHALL PROMPTLY REPLACE ANY MISSING OR DAMAGED UNITS. ALL COSTS FOR FURNISHING, INSTALLING AND MAINTAINING REFLECTORS SHALL BE INCLUDED IN THE PRICE BID FOR THE TEMPORARY BARRIER RAIL.
 REFER TO OTHER DETAILS, NOTES, AND QUANTITY ITEMS ELSEWHERE IN THESE PLANS FOR TRAFFIC CONTROL TO BE ESTABLISHED IN CONJUNCTION WITH THE TEMPORARY BARRIER RAIL.
 NO STATIONARY EQUIPMENT OR CONSTRUCTION MATERIAL IS TO BE PLACED IN FRONT OF THE TEMPORARY BARRIER RAIL AT ANY TIME.
 TIE-DOWNS WITH CONCRETE ANCHORS ARE REQUIRED ONLY WHERE THE TEMPORARY BARRIER RAIL IS ADJACENT TO A DROP-OFF. WHEN TIE-DOWNS ARE REQUIRED, TYPE "B" TIE-DOWN STRAPS AS SHOWN ON STANDARD ROAD PLAN RE-71C(2) SHALL BE USED. HOLES FOR CONCRETE ANCHORS MAY BE DRILLED AFTER POSITIONING THE TEMPORARY BARRIER RAIL.
 ALL COSTS FOR TIE DOWNS SHALL BE INCLUDED IN THE PRICE BID FOR TEMPORARY BARRIER RAIL.

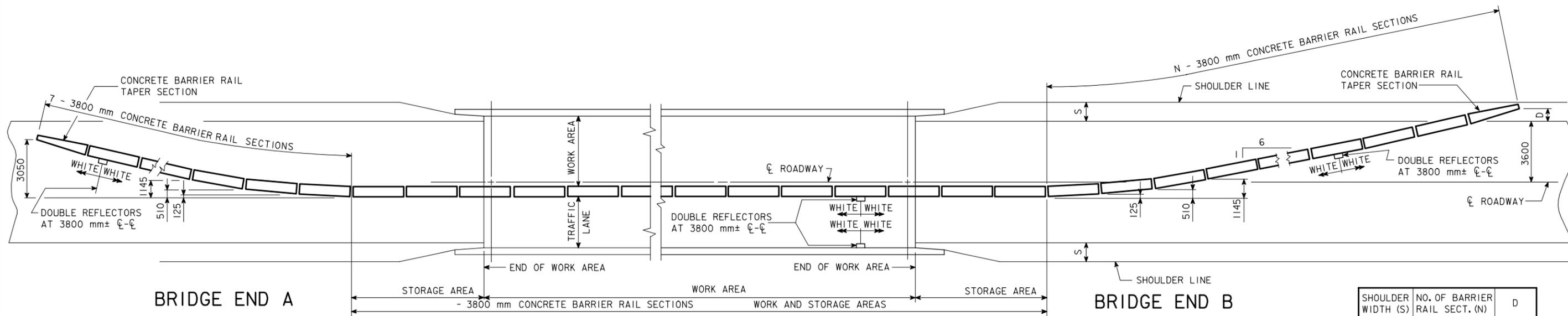
| ESTIMATED QUANTITIES | |
|------------------------|--------|
| ITEM | AMOUNT |
| TEMPORARY BARRIER RAIL | m |

ITEM REFERENCE:
 ALL TEMPORARY BARRIER RAIL SHALL BE NOMINAL 3800 mm LONG CONCRETE UNITS.

F-SHAPE TEMP. BARR. RAIL-CONC.

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. ____ OF ____ FILE NO. ____ DESIGN NO. ____

REVISD 07-04 - TEMPORARY BARRIER RAIL TIE-DOWN DETAILS DELETED. NOTES CHANGED TO REFLECT TIE-DOWN REFERENCE. CONCRETE ANCHOR NOTES DELETED.
 HM1050.S01--GAIN; 9-97, THIS SHEET REDRAWN.

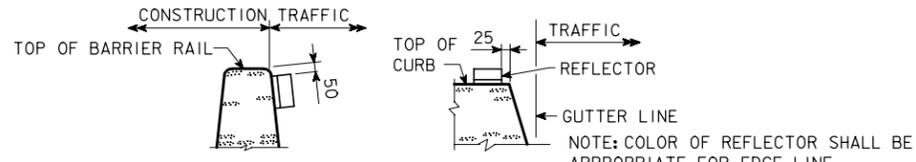


TEMPORARY CONCRETE BARRIER RAIL LAYOUT FOR TWO WAY TRAFFIC

NOTE: THE LAYOUT SHOWN IS FOR ONE STAGE OF CONSTRUCTION AND WOULD BE THE SAME FOR THE OTHER STAGE BY ROTATING 180°.

| SHOULDER WIDTH (S) | NO. OF BARRIER RAIL SECT. (N) | D |
|--------------------|-------------------------------|-------|
| 1.2 m | 11 | 1.2 m |
| 1.8 m | 12 | 1.7 m |
| 2.4 m | 12 | 2.1 m |
| 3.0 m | 13 | 2.7 m |

SHOULDER WIDTH AT THIS BRIDGE SITE IS ?? METERS, THEREFORE ?? CONCRETE BARRIER RAIL SECTIONS ARE REQUIRED FOR BRIDGE END "B".



REFLECTOR DETAILS

CONCRETE TEMPORARY BARRIER RAIL NOTES:

CONCRETE TEMPORARY BARRIER RAIL SHALL BE CONSTRUCTED AS DETAILED AND NOTED ON THE METRIC RE-71 (1), RE-71 (2) AND RE-72 STANDARD ROAD PLANS.

TRAFFIC REFLECTORS SHALL BE A RETRO-REFLECTIVE TYPE, APPROVED BY THE ENGINEER, AND THEY SHALL BE LOCATED AS SHOWN ON THIS SHEET. THE CONTRACTOR SHALL MAINTAIN THE REFLECTORS AND SHALL PROMPTLY REPLACE ANY MISSING OR DAMAGED UNITS. ALL COSTS FOR FURNISHING, INSTALLING AND MAINTAINING REFLECTORS SHALL BE INCLUDED IN THE PRICE BID FOR THE TEMPORARY BARRIER RAIL.

REFER TO OTHER DETAILS, NOTES, AND QUANTITY ITEMS ELSEWHERE IN THESE PLANS FOR TRAFFIC CONTROL TO BE ESTABLISHED IN CONJUNCTION WITH THE TEMPORARY BARRIER RAIL.

NO STATIONARY EQUIPMENT OR CONSTRUCTION MATERIAL IS TO BE PLACED IN FRONT OF THE TEMPORARY BARRIER RAIL AT ANY TIME.

TIE-DOWNS WITH CONCRETE ANCHORS ARE REQUIRED ONLY WHERE THE TEMPORARY BARRIER RAIL IS ADJACENT TO A DROP-OFF. WHEN TIE-DOWNS ARE REQUIRED, TYPE B TIE-DOWN STRAPS AS SHOWN ON STANDARD ROAD PLAN RE-71 (2) SHALL BE USED. HOLES FOR CONCRETE ANCHORS MAY BE DRILLED AFTER POSITIONING THE TEMPORARY BARRIER RAIL.

ALL COSTS FOR TIE DOWNS SHALL BE INCLUDED IN THE PRICE BID FOR TEMPORARY BARRIER RAIL.

| ESTIMATED QUANTITIES | |
|------------------------|--------|
| ITEM | AMOUNT |
| TEMPORARY BARRIER RAIL | m |

ITEM REFERENCE:
 ALL TEMPORARY BARRIER RAIL SHALL BE NOMINAL 3800 mm LONG CONCRETE UNITS.

F-SHAPE TEMP. BARR. RAIL-CONC.

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. ____ OF ____ FILE NO. ____ DESIGN NO. ____

STEEL TEMPORARY BARRIER RAIL NOTES :

THE STEEL HP360x108 TEMPORARY BARRIER RAILS SHALL BE CONSTRUCTED AS DETAILED AND NOTED ON THE METRIC RE-?? STANDARD ROAD PLANS.

HP360x108 SECTIONS ARE TO BE JOINED BEFORE P.C. CONCRETE FILL IS PLACED. HP SECTIONS MAY BE JOINED BY BUTT WELDS ON BOTH EXTERIOR FACES AS DETAILED OR BY OTHER MEANS APPROVED BY THE ENGINEER. HP SECTIONS SHALL BE FREE FROM EXCESSIVE SWEEP AND CAMBER; STRAIGHTENING MAY BE REQUIRED BY THE ENGINEER IN ORDER TO PRODUCE A STABLE BARRIER.

CONCRETE MIX FOR THE P.C. FILL MAY BE ANY IOWA D.O.T. CONSTRUCTION SPECIFICATION MIX OR MAY BE A COMMERCIAL READY-MIX WITH A MINIMUM F'C = 17 MPa. THE P.C. FILL MAY BE DEPOSITED BY A METHOD ACCEPTABLE TO THE ENGINEER. LIMITS OF FILL SHOWN ARE APPROXIMATE AND MAY BE ROUGH OR SLUMPED DEPENDING ON THE METHOD OF BULKHEADING.

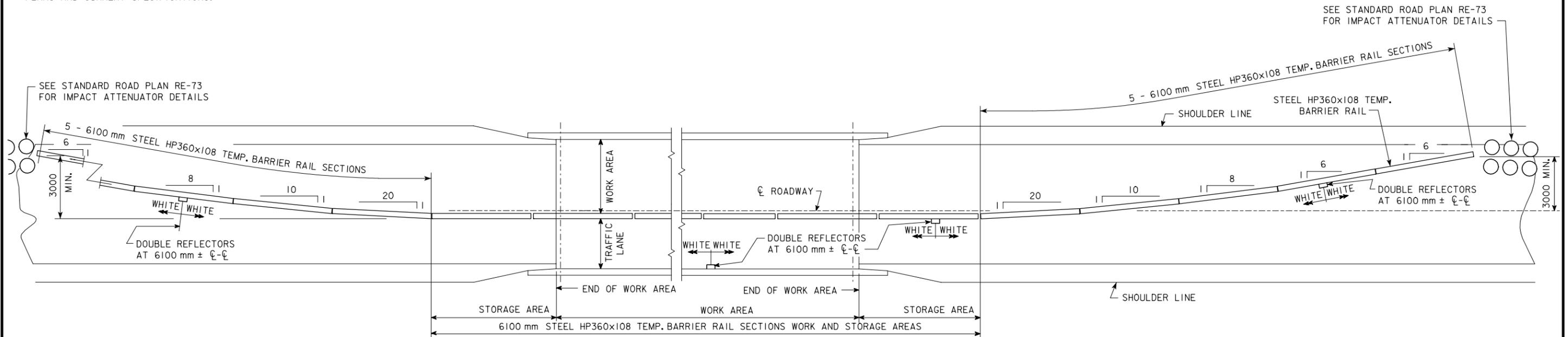
REFER TO OTHER DETAILS, NOTES AND QUANTITY ITEMS, ELSEWHERE IN THESE PLANS FOR TRAFFIC CONTROL TO BE ESTABLISHED IN CONJUNCTION WITH THE TEMPORARY BARRIER RAIL. NO STATIONARY EQUIPMENT OR CONSTRUCTION MATERIAL IS TO BE PLACED IN FRONT OF THE TEMPORARY BARRIER RAIL AT ANY TIME.

TRAFFIC REFLECTORS SHALL BE A RETRO-REFLECTIVE TYPE, IN ACCORDANCE WITH MATERIALS I.M. 486.06. THEY SHALL BE LOCATED AS SHOWN ON THIS SHEET. THE CONTRACTOR SHALL MAINTAIN THE REFLECTORS AND SHALL PROMPTLY REPLACE ANY MISSING OR DAMAGED UNITS. ALL COSTS FOR FURNISHING, INSTALLING AND MAINTAINING REFLECTORS SHALL BE INCLUDED IN THE PRICE BID FOR "TEMPORARY BARRIER RAIL, STEEL".

CARE SHALL BE TAKEN IN MOVING THE STEEL TEMPORARY BARRIER RAIL FOR STAGE 2 CONSTRUCTION, SO THAT THE NEW CONCRETE OF STAGE 1 WILL NOT BE DAMAGED. ANY DAMAGE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

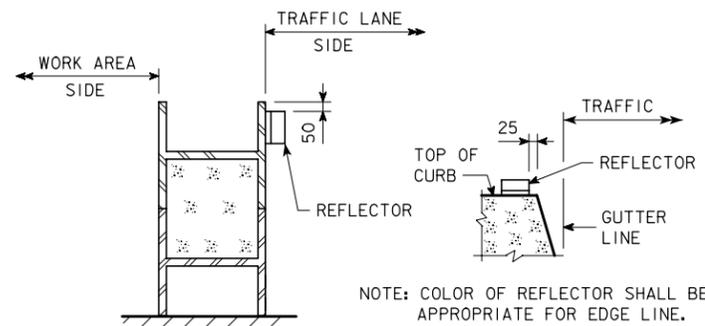
THE STEEL HP 360x108 TEMPORARY BARRIER RAIL IS TO BE BID ON A METRIC BASIS. THE NUMBER OF METERS OF TEMPORARY BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER METER BASED ON PLAN QUANTITIES. PRICE BID FOR "TEMPORARY BARRIER RAIL, STEEL" SHALL BE FULL COMPENSATION FOR FINISHING ALL MATERIAL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS.

ROAD STANDARD STILL PENDING.
CHECK WITH BRIDGE METHODS
FOR DETAILS.



TEMPORARY BARRIER RAIL LAYOUT FOR TWO WAY TRAFFIC

NOTE:
THE LAYOUT SHOWN IS FOR ONE STAGE OF CONSTRUCTION AND WOULD BE A MIRROR IMAGE FOR THE OTHER STAGE.



REFLECTOR DETAILS

ESTIMATED QUANTITIES

| ITEM | AMOUNT |
|---|--------|
| TEMPORARY BARRIER RAIL, STEEL | M |
| TEMPORARY ATTENUATOR, SAND-FILLED PLASTIC BARREL ARRAYS (RE-73) | EACH |

NOTE :
ALL CONNECTION MATERIAL IS TO BE INCLUDED IN THE PRICE BID FOR "TEMPORARY BARRIER RAIL, STEEL".

STEEL HP360x108 TEMP. BARR. RAIL

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. ____ OF ____ FILE NO. ____ DESIGN NO. ____

HM1056.S01 - THIS SHEET ISSUED 07-04.

STEEL TEMPORARY BARRIER RAIL NOTES :

THE STEEL HP360x108 TEMPORARY BARRIER RAILS SHALL BE CONSTRUCTED AS DETAILED AND NOTED ON THE METRIC RE-?? STANDARD ROAD PLANS.

HP360x108 SECTIONS ARE TO BE JOINED BEFORE P.C. CONCRETE FILL IS PLACED. HP SECTIONS MAY BE JOINED BY BUTT WELDS ON BOTH EXTERIOR FACES AS DETAILED OR BY OTHER MEANS APPROVED BY THE ENGINEER. HP SECTIONS SHALL BE FREE FROM EXCESSIVE SWEEP AND CAMBER; STRAIGHTENING MAY BE REQUIRED BY THE ENGINEER IN ORDER TO PRODUCE A STABLE BARRIER.

CONCRETE MIX FOR THE P.C. FILL MAY BE ANY IOWA D.O.T. CONSTRUCTION SPECIFICATION MIX OR MAY BE A COMMERCIAL READY-MIX WITH A MINIMUM F'C = 17 MPa. THE P.C. FILL MAY BE DEPOSITED BY A METHOD ACCEPTABLE TO THE ENGINEER. LIMITS OF FILL SHOWN ARE APPROXIMATE AND MAY BE ROUGH OR SLUMPED DEPENDING ON THE METHOD OF BULKHEADING.

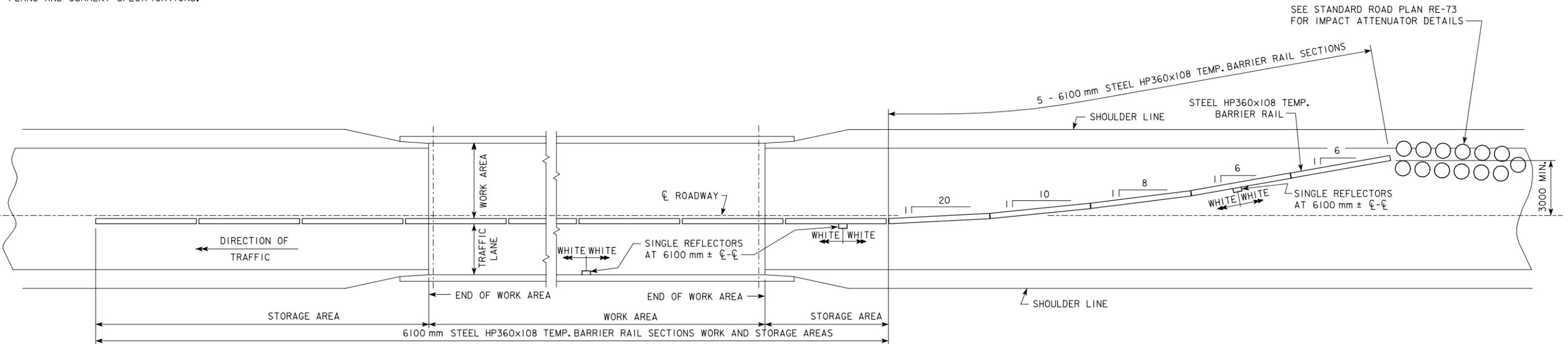
REFER TO OTHER DETAILS, NOTES AND QUANTITY ITEMS, ELSEWHERE IN THESE PLANS FOR TRAFFIC CONTROL TO BE ESTABLISHED IN CONJUNCTION WITH THE TEMPORARY BARRIER RAIL. NO STATIONARY EQUIPMENT OR CONSTRUCTION MATERIAL IS TO BE PLACED IN FRONT OF THE TEMPORARY BARRIER RAIL AT ANY TIME.

TRAFFIC REFLECTORS SHALL BE A RETRO-REFLECTIVE TYPE, IN ACCORDANCE WITH MATERIALS I.M. 486.06. THEY SHALL BE LOCATED AS SHOWN ON THIS SHEET. THE CONTRACTOR SHALL MAINTAIN THE REFLECTORS AND SHALL PROMPTLY REPLACE ANY MISSING OR DAMAGED UNITS. ALL COSTS FOR FURNISHING, INSTALLING AND MAINTAINING REFLECTORS SHALL BE INCLUDED IN THE PRICE BID FOR "TEMPORARY BARRIER RAIL, STEEL".

CARE SHALL BE TAKEN IN MOVING THE STEEL TEMPORARY BARRIER RAIL FOR STAGE 2 CONSTRUCTION, SO THAT THE NEW CONCRETE OF STAGE 1 WILL NOT BE DAMAGED. ANY DAMAGE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

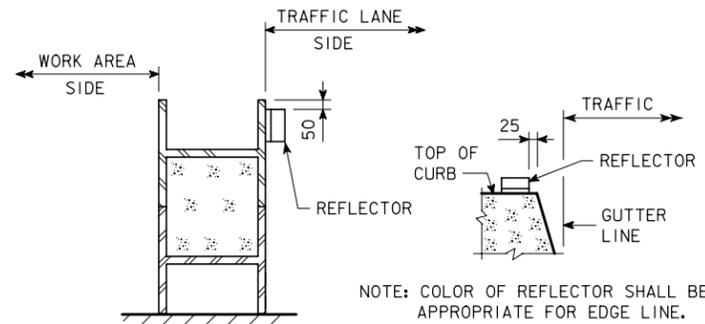
THE STEEL HP 360x108 TEMPORARY BARRIER RAIL IS TO BE BID ON A METRIC BASIS. THE NUMBER OF METERS OF TEMPORARY BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER METER BASED ON PLAN QUANTITIES. PRICE BID FOR "TEMPORARY BARRIER RAIL, STEEL" SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS.

ROAD STANDARD STILL PENDING.
CHECK WITH BRIDGE METHODS
FOR DETAILS.



TEMPORARY BARRIER RAIL LAYOUT FOR ONE WAY TRAFFIC

NOTE: THE LAYOUT SHOWN IS FOR ONE STAGE OF CONSTRUCTION AND WOULD BE A MIRROR IMAGE FOR THE OTHER STAGE.



REFLECTOR DETAILS

| ESTIMATED QUANTITIES | |
|---|--------|
| ITEM | AMOUNT |
| TEMPORARY BARRIER RAIL, STEEL | M |
| TEMPORARY ATTENUATOR, SAND-FILLED PLASTIC BARREL ARRAYS (RE-73) | EACH |

NOTE : ALL CONNECTION MATERIAL IS TO BE INCLUDED IN THE PRICE BID FOR "TEMPORARY BARRIER RAIL, STEEL".

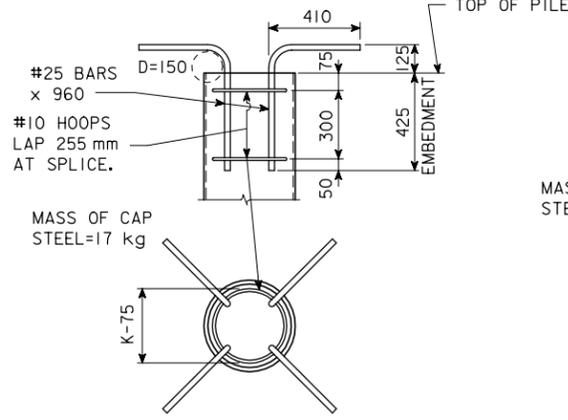
STEEL HP360x108 TEMP. BARR. RAIL

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. ____ OF ____ FILE NO. ____ DESIGN NO. ____

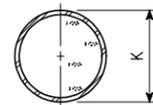
HM1058.S01 - THIS SHEET ISSUED 07-04.

REVISED 09-06 - PILE BID NOTES CHANGED. NUMBER OF L'S USED TO HOLD PILE SPIRAL CHANGED FROM 4 TO 2. HPI0A.SOI. THIS SHEET ISSUED, 9-1-95.

CAST IN PLACE

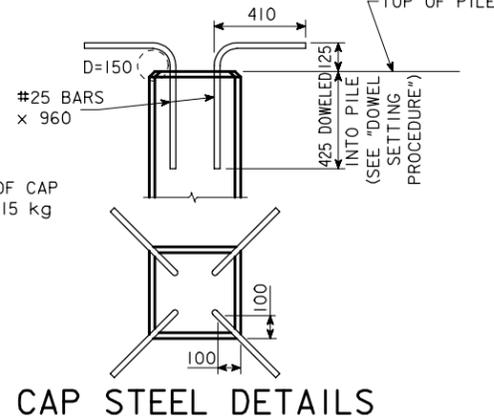


CAP STEEL DETAILS

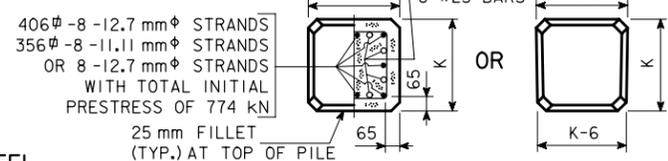


SPIRAL WELDED OR SEAMLESS STEEL PIPE ASTM A252 BR. 2 OR BR. 3

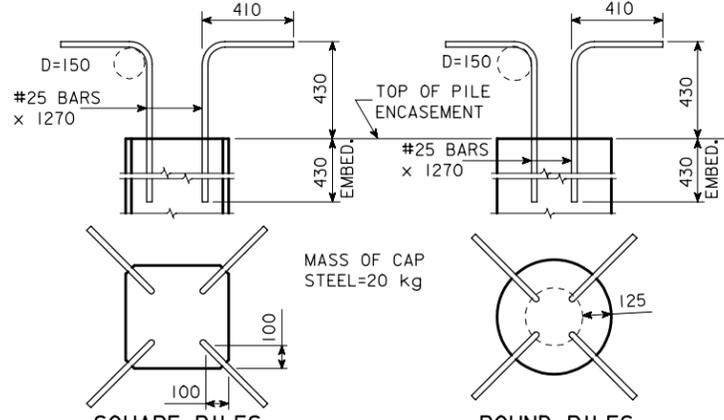
PRESTRESSED



CAP STEEL DETAILS



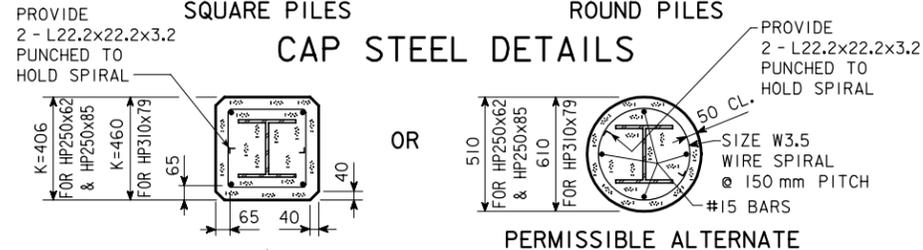
CONCRETE ENCASED STEEL H PILE



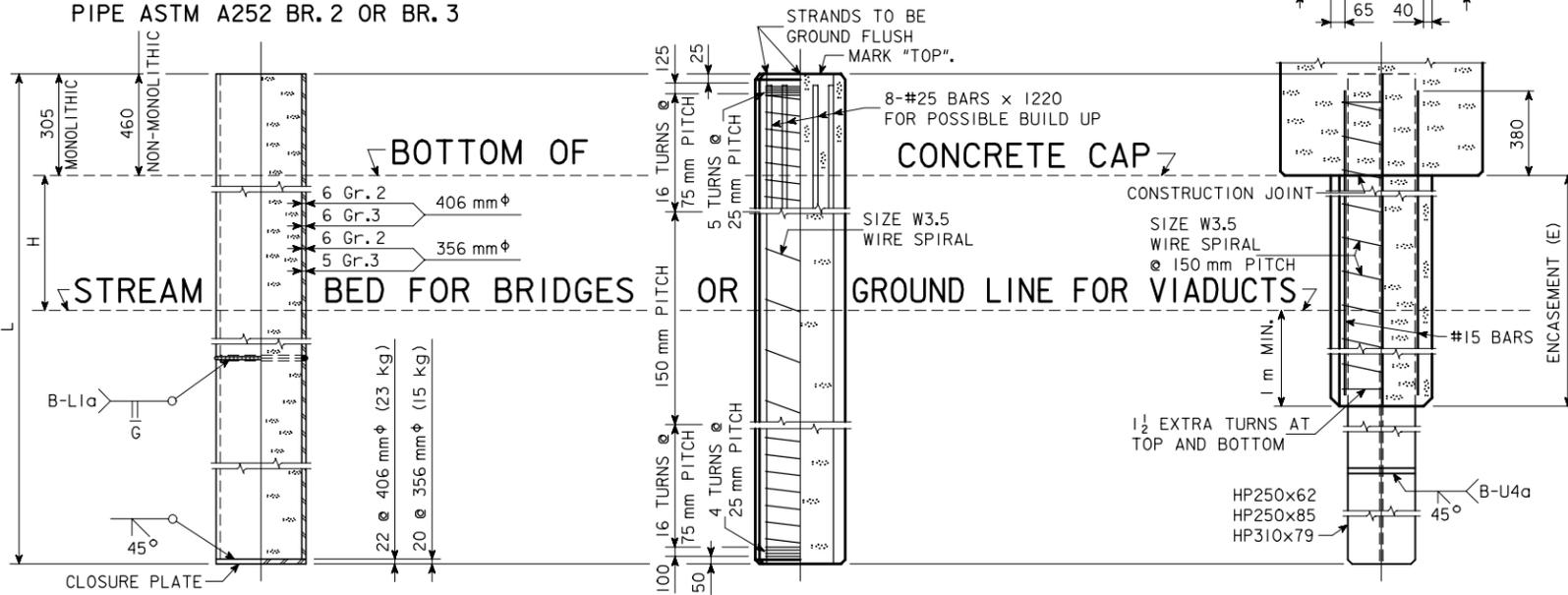
SQUARE PILES

ROUND PILES

CAP STEEL DETAILS



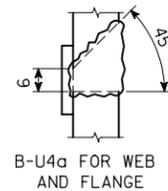
PERMISSIBLE ALTERNATE ENCASEMENT



TYPE 1

TYPE 2

TYPE 3



STEEL DRIVING POINTS

ASTM-A36M

| K DIMENSION | 356 mm φ | | 406 mm φ | |
|---------------------------|----------------------|-------|----------|-------|
| H MAXIMUM | 4.0 | | 6.5 | |
| SHELL ASTM A-252 | GR. 2 | GR. 3 | GR. 2 | GR. 3 |
| CONCRETE PER METER | m ³ 0.093 | 0.094 | 0.122 | 0.122 |
| ① MASS OF SHELL PER METER | kg 47.92 | 41.16 | 57.65 | 54.87 |
| f'c | MPa 24 | 24 | 24 | 24 |
| BEARING VALUE | kN 270 | 270 | 320 | 320 |

① ADD MASS OF CLOSURE PLATE.

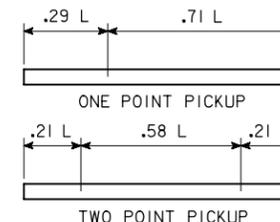
STEEL DRIVING POINTS

| STRANDS (ASTM-A416) | GRADE 270 | |
|------------------------|----------------------|--------|
| K DIMENSION | mm 356 φ | 406 φ |
| H MAXIMUM | m 4.0 | 6.5 |
| CONCRETE (L=10 m) | m ³ 1.26 | 1.64 |
| CONCRETE PER METER | m ³ 0.126 | 0.164 |
| ② REINFORCING (L=10 m) | kg 139.75 | 151.14 |
| REINFORCING PER METER | kg 7.42 | 7.65 |
| MAX. L 1 PT. PICK-UP | m 17.0 | 18.0 |
| MAX. L 2 PT. PICK-UP | m 25.0 | 26.0 |
| f'c | MPa 35 | 35 |
| BEARING VALUE | kN 300 | 340 |
| ③ INITIAL PRESTRESS | kN 774 | 1028 |

② INCLUDES PRESTRESSING STRANDS.
③ INCREASE 5% FOR ARTIFICIAL CURING.

| STEEL H PILE | HP250x62 | HP250x85 | HP310x79 |
|--------------------------------|----------------------|----------|----------|
| H MAXIMUM | m 5.0 | 5.0 | 8.0 |
| CONCRETE (E=6 m) | m ³ 0.92 | 0.90 | 1.188 |
| CONCRETE PER METER | m ³ 0.154 | 0.151 | 0.198 |
| REINFORCING (E=6 m) | kg 73.66 | 73.66 | 75.40 |
| REINFORCING 1 m CHANGE | kg 12.28 | 12.28 | 12.57 |
| CONCRETE (E=6 m) | m ³ 1.176 | 1.16 | 1.692 |
| CONCRETE PER METER | m ³ 0.196 | 0.193 | 0.282 |
| REINFORCING (E=6 m) | kg 81.35 | 81.35 | 77.63 |
| REINFORCING 1 m CHANGE | kg 13.56 | 13.56 | 12.94 |
| BEARING VALUE MAX. | kN 330 | 440 | 410 |
| f'c = 24 MPa : ASTM A36M STEEL | | | |

PILE HANDLING DIAGRAM



GENERAL NOTES:

ALL DIMENSIONS ARE IN MILLIMETERS (mm) UNLESS OTHERWISE NOTED OR SHOWN.
EXCEPT AS NOTED ELSEWHERE, MATERIAL, CONSTRUCTION, DRIVING AND EXTENSIONS OR BUILD UPS WHEN NECESSARY SHALL BE IN ACCORDANCE WITH THE IOWA D.O.T. STANDARD SPECIFICATIONS AND CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS, WHEN APPLICABLE.
CAP STEEL SHALL BE AS DETAILED ON THIS SHEET (D=PIN DIAMETER). IT SHOULD BE USED IF PILE EMBEDMENT IS LESS THAN 460 mm.
"BEARING VALUE" AND "H" AS GIVEN IN TABLES ARE RECOMMENDED DESIGN VALUES FOR ORDINARY CONDITIONS, BUT MAY BE MODIFIED FOR SPECIAL CONDITIONS ON ANY GIVEN JOB.
BEARING VALUE AND PILE SIZE REQUIRED SHALL IN ALL CASES BE AS SPECIFIED ON THE PLANS.
BEARING VALUES SHOWN ARE FOR FRICTION TYPE BEARING EXCEPT FOR TYPE 3 PILING WHERE THE BEARING VALUES SHOWN COULD BE EITHER FRICTION OR POINT BEARING.
COST OF ALL DRIVING POINTS AND CAP STEEL IS TO BE INCLUDED IN THE PRICE BID PER METER FOR PILING.
WIRE SPIRAL SHALL CONFORM TO ASTM A-82.

CAST IN PLACE PILE NOTES:

SHELL THICKNESSES SHOWN ARE MINIMUM REQUIREMENTS. THE METHOD OF DRIVING STEEL SHELL PILES SHALL BE ADAPTED TO THE TYPE AND THICKNESS OF SHELL SPECIFIED. ANY SHELLS WHICH HAVE BEEN IMPROPERLY DRIVEN, BROKEN OR ARE OTHERWISE DEFECTIVE SHALL BE REMOVED AND REPLACED BY THE BRIDGE CONTRACTOR.
ALL CAST IN PLACE PILES SHALL HAVE A CLOSURE PLATE. DRIVING POINTS SHALL BE USED IF SPECIFIED ON THE PLANS.

PRESTRESSED PILE NOTES:

EXCEPT AS OTHERWISE NOTED ALL EXPOSED CORNERS 90° OR SHARPER SHALL BE FILLETED 20 mm.
DRIVING POINTS FOR PRESTRESSED PILES, IF CALLED FOR ON THE PLANS, SHALL BE AS DETAILED.
HEADS OF PRESTRESSED PILES TO BE FINISHED SMOOTH AND NORMAL TO AXIS OF PILE.

BIDDING NOTES:

THE PLANS SHALL DESIGNATE THE SIZE OF PILE TO BE USED. THEY SHALL ALSO SPECIFY THE TYPE, EITHER TYPE 1, TYPE 2, OR TYPE 3. IF THE OPTION OF TYPE 1 OR 2 IS GIVEN ON THE PLANS, THE CONTRACTOR SHALL CHOOSE THE TYPE TO BE USED. IF TYPE 3 IS SPECIFIED, TYPE 3 SHALL BE USED, BUT THE CONTRACTOR MAY CHOOSE THE SHAPE OF THE ENCASEMENT. IT SHOULD BE KEPT IN MIND THAT FOR A GIVEN SIZE AND BEARING VALUE, LENGTH MAY VARY WITH THE SHAPE (SQUARE OR ROUND).
PILES SHALL BE BID DESIGNATING THE SIZE, TYPE AND LENGTH.
TYPE 1 PILING WILL BE BID PER METER OF PILE.
TYPE 2 PILING WILL BE BID PER METER OF PILE.
TYPE 3 PILING WILL BE BID PER METER OF PILE AND METER OF ENCASEMENT. PRICE BID FOR ENCASEMENT SHALL BE FULL PAYMENT FOR NECESSARY EXCAVATION AND FOR FURNISHING AND PLACING ALL MATERIAL.

DOWEL SETTING PROCEDURE:

IF CAP STEEL IS REQUIRED FOR THE PRESTRESSED PILES THE #25x960 mm BARS ARE TO BE SET AS DOWELS INTO THE PILES WITH EPOXY GROUT IN ACCORDANCE WITH ARTICLE 2301.12 OR BY THE FOLLOWING PROCEDURE.
A. DRILL HOLE APPROXIMATELY TWICE THE DIAMETER OF THE DOWEL BAR AND TO THE DEPTH INDICATED.
B. FILL HOLE WITH WATER AND ALLOW TO STAND LONG ENOUGH TO THOROUGHLY SATURATE THE SURROUNDING CONCRETE (ABOUT FOUR HOURS).
C. BLOW OUT ALL FREE WATER AND FILL HOLE 2/3 FULL OF MORTAR.
D. INSERT DOWEL BY DRIVING, IF NECESSARY, AND MANIPULATE OR TAP WITH A HAMMER TO CONSOLIDATE MORTAR AND SECURE COMPLETE EMBEDMENT.
E. ADD MORE MORTAR, IF NECESSARY, TO FILL HOLE.
F. MORTAR SHALL CONSIST OF EQUAL PARTS PORTLAND CEMENT AND SAND WITH JUST ENOUGH WATER TO MAKE A WORKABLE MIX.

APPROVED BY: *Norman E. Mc Donald*
BRIDGE ENGINEER

STANDARD DESIGN
CONCRETE AND STEEL PILES
CAST IN PLACE, PRESTRESSED AND ENCASED
FOR USE IN
TRESTLE PILE BENTS - MPIOA

LATEST REVISION
DATE: 09-06

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. ___ OF ___ FILE NO. ___ DESIGN NO. ___