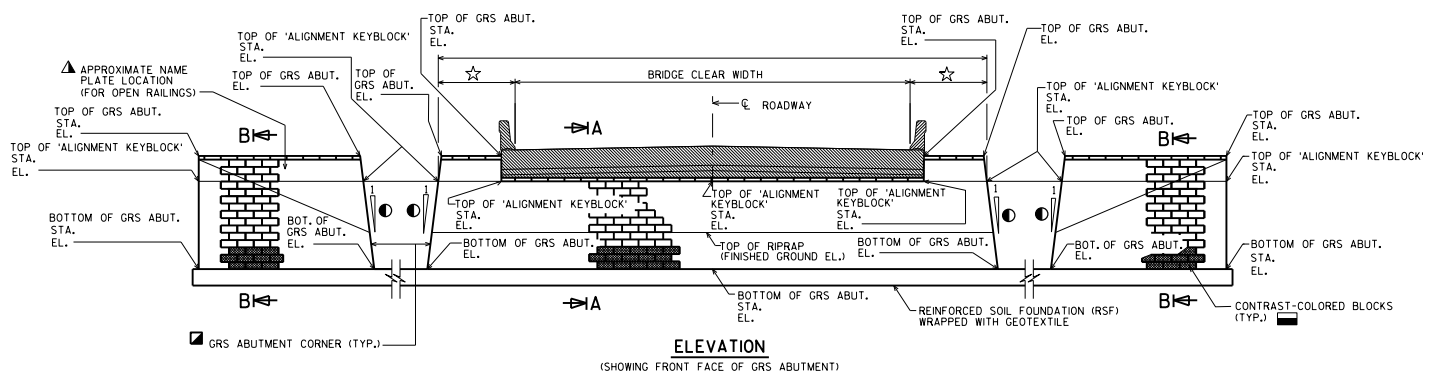


PLAN



ELEVATION
(SHOWING FRONT FACE OF GRS ABUTMENT)

SECTIONS A-A AND B-B ARE SHOWN ON STANDARD 7.02

NOTES

- DRAWINGS SHALL NOT BE SCALED.
- ALL GRS ABUTMENT STATIONING AND OFFSETS ARE GIVEN AT THE FRONT FACE OF THE 'ALIGNMENT KEYBLOCK'. SEE SECTIONS A-A AND B-B ON STANDARD 7.02 FOR LOCATION OF THE 'ALIGNMENT KEYBLOCK'.
- FACTORED BEARING RESISTANCE OF XX PSF AT BOTTOM OF REINFORCED SOIL FOUNDATION.
- MAXIMUM ALLOWABLE WALL BATTER IS 8 VERTICAL TO 1 HORIZONTAL OR 7.1 DEGREES.
- PROTECT MODULAR BLOCK DURING PLACEMENT OF HEAVY RIPRAP.
- SEE SECTIONS A-A AND B-B AND 'GRS ABUTMENT INFORMATION' TABLE ON STANDARD 7.02 FOR REQUIRED LENGTHS OF GEOTEXTILE REINFORCEMENT.
- PROVIDE CORNER BLOCKS AND/OR DETAILS COMPATIBLE WITH THE SELECTED MODULAR BLOCK SYSTEM. ROUNDED CORNERS ARE ALLOWABLE.
- TEMPORARY FALSEWORK NOT TO BE SUPPORTED ON THE GRS ABUTMENT UNLESS APPROVED BY THE BUREAU OF STRUCTURES DEVELOPMENT SECTION.

DESIGNER NOTES

- THE USE OF GRS ABUTMENTS IS SUBJECT TO PRIOR APPROVAL BY THE BUREAU OF STRUCTURES.
- PROVIDE AN ADEQUATE WORKING WIDTH FOR GUARDRAIL DEFLECTION PER FDM REQUIREMENTS. MINIMUM WIDTH SHALL BE 6'-6" FROM FRONT FACE OF THRIE BEAM TO FRONT FACE OF WALL.
- MAXIMUM SKEW ANGLE IS 15°.
- THE TOP OF THE CONTRAST-COLORED BLOCKS SHALL BE 2-3 BLOCK COURSES BELOW THE TOP OF RIPRAP ELEVATION.
- NAME PLATE TO BE LOCATED ON THE OUTSIDE OF THE FIRST RIGHT GRS ABUTMENT WHEN TRAVELING UPSTATION (FOR OPEN RAILINGS).
- THE MINIMUM REQUIRED TENSILE STRENGTH OF THE GEOSYNTHETIC REINFORCEMENT SHALL BE SHOWN WITHIN THE SPECIAL PROVISION, 'GEOSYNTHETIC REINFORCED SOIL ABUTMENT'.

TABLE OF GRS ABUTMENT STATIONS AND ELEVATIONS

GRS ABUT. STA.	ROADWAY ALIGN. STA.	ROADWAY STATION OFFSET (FT)	OFFSET DIR.	GRS ABUT. HT. (FT)	BOT. GRS ABUT. EL.	FINISHED GROUND EL.	TOP GRS ABUT. EL.

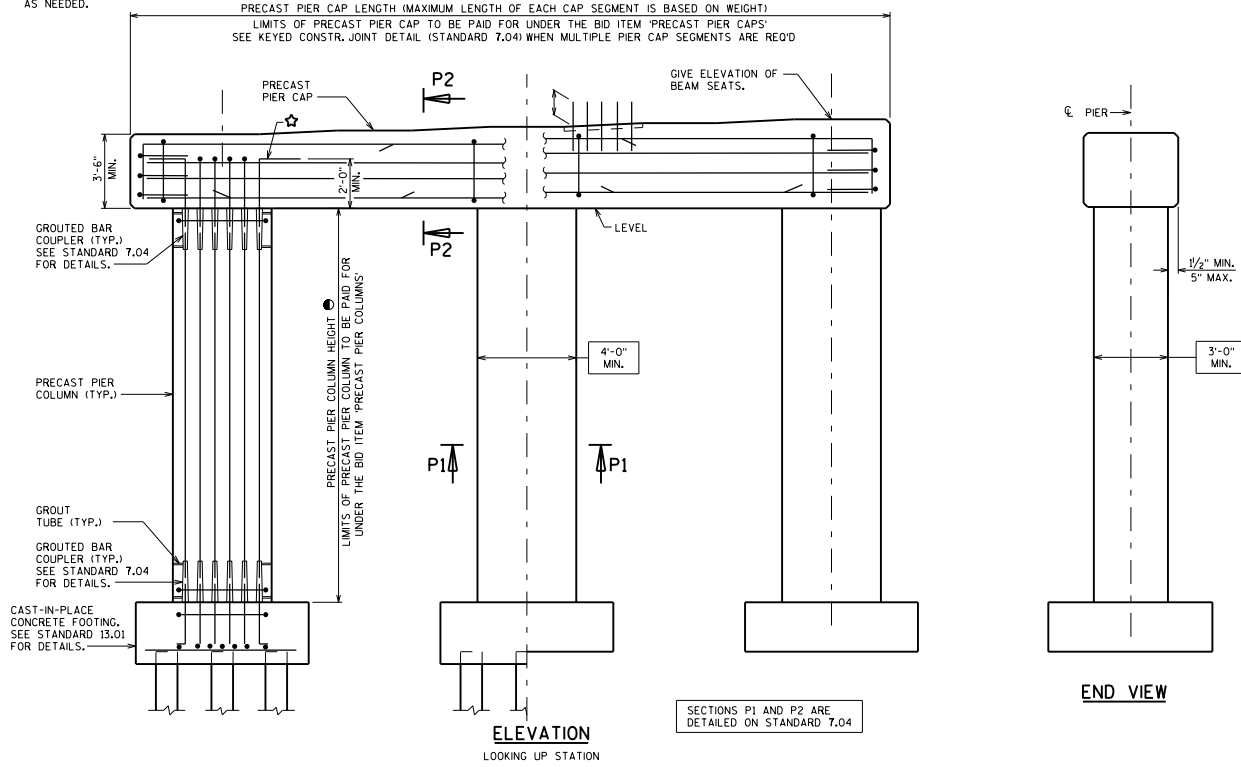
NOTE: STATIONS AND OFFSETS GIVEN AT FRONT FACE OF 'ALIGNMENT KEYBLOCK' AND AT ELEVATION XX.XX. THESE STATIONS AND OFFSETS SHALL BE HELD REGARDLESS OF ACTUAL MODULAR BLOCK SIZE OR GRS ABUTMENT BATTER.

GRS ABUTMENT GENERAL PLAN

BUREAU OF
STRUCTURES

DATE:
APPROVED: *Laura Shadewald* 7-18

★ STD. HOOK (TYP.)
ROTATE AND STAGGER
AS NEEDED.



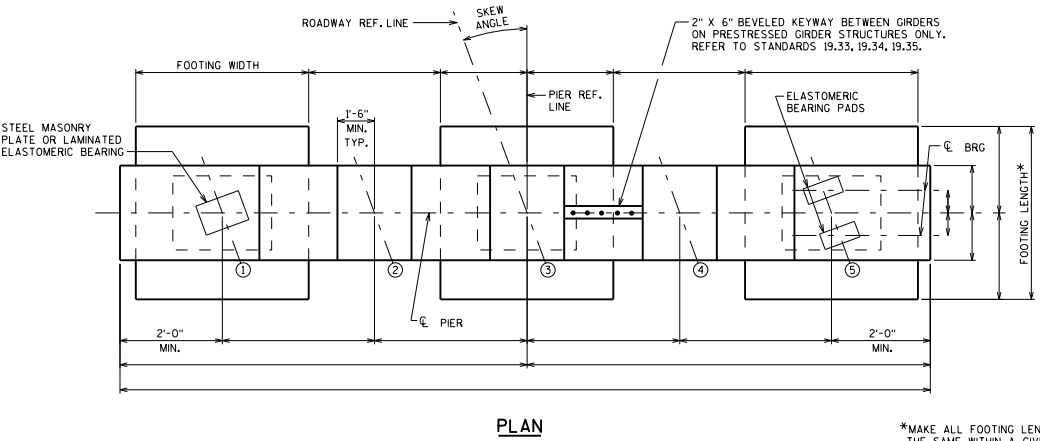
NOTES

- PROVIDE A SUITABLE LIFTING DEVICE FOR THE PRECAST CAP AND COLUMN(S). CAST-IN-PLACE ALTERNATIVE IS NOT ALLOWED.
- STIRRUPS AT THE GROUTED COUPLERS ARE SIZED BASED ON A XX" OUTER DIAMETER COUPLER SLEEVE. ADJUST STIRRUP DIMENSIONS AS REQUIRED IF THE ACTUAL COUPLER SLEEVE DIAMETER DIFFERS.
- MANUFACTURER TO DETERMINE THE PRECAST PIER COLUMN LENGTHS ASSUMING 1/2" STEEL SHIMS AT THE TOP AND BOTTOM OF THE COLUMN.
- BID ITEM "PRECAST PIER COLUMNS" PAID PER PLAN VALUE AS BOTTOM OF PIER CAP ELEVATION MINUS TOP OF FOOTING ELEVATION.


DESIGNER NOTES

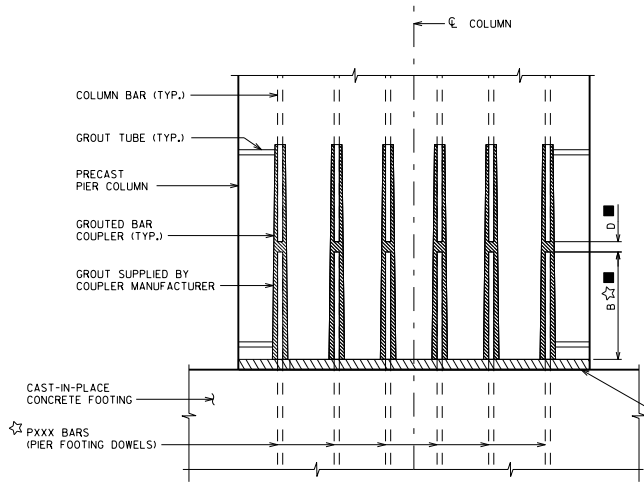
- PIERS SHALL BE SUPPORTED BY A MINIMUM OF 3 COLUMNS. WHEN MULTIPLE PIER CAPS ARE USED EACH SEGMENT SHALL BE SUPPORT BY A MINIMUM OF 2 COLUMNS.
- THE FOLLOWING SPECIAL PROVISIONS SHALL BE USED:
GROUTED BAR COUPLERS (505.1000.S)
PRECAST PIER COLUMNS (SPV.0090.XXX)
PRECAST PIER CAPS (SPV.0090.XXX)
- THE MAXIMUM WEIGHT OF EACH PRECAST ELEMENT SHALL BE 90 KIP.
- GROUTED COUPLER SLEEVES MAY BE OVERSIZED TO ALLOW FOR ADDITIONAL LATERAL TOLERANCE IN THE FIELD. STANDARD WISDOT PRACTICE IS TO OVERSIZE COUPLER SLEEVES BY 1 BAR SIZE. ADJUST SHEAR STIRRUPS AS NECESSARY TO ACCOUNT FOR LARGER DIAMETER COUPLER SLEEVES.
- VERIFY SEVERAL MANUFACTURER'S COUPLER SLEEVE DIMENSIONS PRIOR TO DESIGN. ASSUME THE MAXIMUM DIAMETER OF COUPLER SLEEVE FOR COLUMN REINFORCEMENT DESIGN.
- SEE STANDARDS 13.01 AND 13.07 FOR ADDITIONAL PIER NOTES AND DETAILS.

DETAILS AS SHOWN ON THIS STANDARD ARE INTENDED FOR REQUIRED PRECAST PIERS DESIGNED TO MEET PROJECT SPECIFIC REQUIREMENTS. SEE 7.1.4.1.2 IN THE BRIDGE MANUAL AND STANDARDS 7.05 AND 7.06 FOR ADDITIONAL GUIDANCE.



MATERIAL PROPERTIES:
CONCRETE MASONRY $f'_c = 3,500$ P.S.I.
BAR REINFORCEMENT, GRADE 60 $f_y = 60,000$ P.S.I.

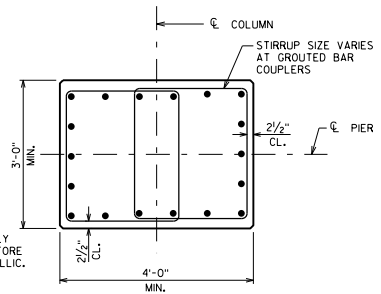
PRECAST PIER CAP AND COLUMNS	
	BUREAU OF STRUCTURES
APPROVED: <i>Laura Shadewald</i>	DATE: 1-19



GROUDED BAR COUPLER DETAILS

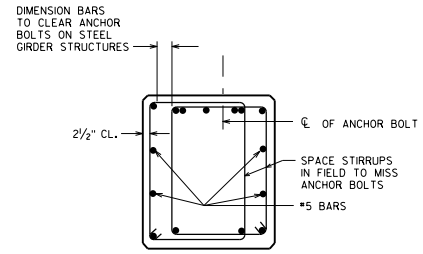
(PIER COLUMN/FOOTING CONNECTION SHOWN. PIER CAP/COLUMN CONNECTION SIMILAR)

1/2" ± NON-SHRINK GROUT AND STEEL SHIMS. BEDDING GROUT TO HAVE THICKNESS SLIGHTLY LARGER THAN SHIMS IF PLACED IN SEAT BEFORE COLUMN. BEDDING GROUT SHALL BE NONMETALLIC.



SECTION P1

(PRECAST PIER COLUMN REINF. TO BE DESIGNED BY DESIGN ENGINEER)



SECTION P2

(PRECAST PIER CAP REINF. TO BE DESIGNED BY DESIGN ENGINEER)

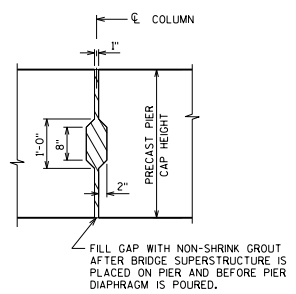
SECTIONS P1 AND P2 ARE CUT ON STANDARD 7.03

BILL OF BARS

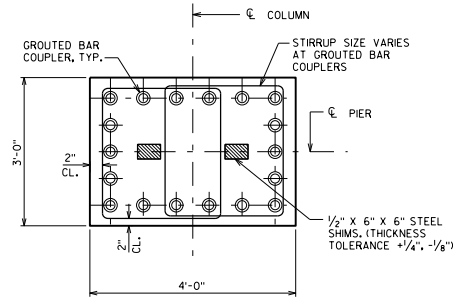
TOTAL COATED: XX LBS

BAR MARK	NO. REQ'D.	LENGTH	COAT	BENT	LOCATION

NOTE: THIS BILL OF BARS IS SHOWN FOR INFORMATION ONLY. PAYMENT FOR REINFORCEMENT IN PRECAST COLUMNS AND PRECAST CAP IS INCLUDED IN THE BID ITEMS 'PRECAST PIER COLUMNS' AND 'PRECAST PIER CAPS'.



KEYED CONSTR. JOINT ELEVATION DETAIL
(FOR PRECAST PIER CAPS WITH MULTIPLE SEGMENTS)



GROUDED COUPLER PLAN AT TOP AND BOTTOM OF COLUMN

GROUDED SPLICE COUPLER CONNECTION SEQUENCE

FOLLOW THE WRITTEN INSTALLATION PROCEDURES OF THE COUPLER MANUFACTURER. THE FOLLOWING ARE GENERAL PROCEDURES THAT APPLY TO MOST COUPLER MANUFACTURERS:

1. IT IS RECOMMENDED THAT THE ELEMENT WITH THE REINFORCEMENT BARS EXTENDING OUT BE FABRICATED WITH EXTRA BAR LENGTHS.
2. SURVEY LOCATION AND ELEVATION OF LOWER ELEMENT.
3. DETERMINE THE REQUIRED REINFORCING BAR EXTENSION LENGTHS AND THE REQUIRED SHIM HEIGHTS BASED ON THE SURVEY.
4. CUT THE BAR EXTENSIONS TO THE REQUIRED LENGTH BASED ON THE SURVEY AND THE COUPLER MANUFACTURER'S RECOMMENDATIONS. FOR COATED BARS, THE ENDS OF THE BARS SHALL BE RE-COATED.
5. PLACE BEDDING GROUT ON TOP OF LOWER ELEMENT. THE USE OF EXTRA GROUT THAT IS ALLOWED TO FLOW OUT DURING ELEMENT PLACEMENT IS RECOMMENDED. IN LIEU OF PRE-PLACEMENT OF BEDDING GROUT, THE BEDDING GROUT CAN BE FLOWED INTO PLACE AFTER ELEMENT ERECTION BUT PRIOR TO GROUING OF COUPLERS.
6. ERECT UPPER ELEMENT TO WITHIN THE SPECIFIED ERECTION TOLERANCES INDICATED IN THE SPECIAL PROVISIONS. PREVENT BEDDING GROUT FROM FLOWING INTO COUPLER.
7. MAINTAIN INTEGRITY OF GROUT BED DURING SETTING OPERATION. REPAIR GROUT THAT IS DISPLACED OR GAPS THAT DEVELOP IN THE GROUT JOINT USING HAND TOOLS.
8. BRACE THE UPPER ELEMENT.
9. INSTALL GROUT IN COUPLERS FOLLOWING THE MANUFACTURER'S WRITTEN PROCEDURES. IF THE COUPLER IS BELOW THE JOINT, COUPLER GROUT CAN BE INSTALLED PRIOR TO APPLICATION OF BEDDING GROUT.
10. ERECTION OF SUBSEQUENT ELEMENTS ABOVE A CONNECTION SHALL NOT COMMENCE UNTIL THE CONNECTION HAS ACHIEVED ADEQUATE STRENGTH AS DETERMINED THROUGH STRENGTH TESTING OF THE GROUT. THE TIMING OF SUBSEQUENT CONSTRUCTION STEPS SHOULD BE SPECIFIED IN BRIDGE ASSEMBLY PLAN.

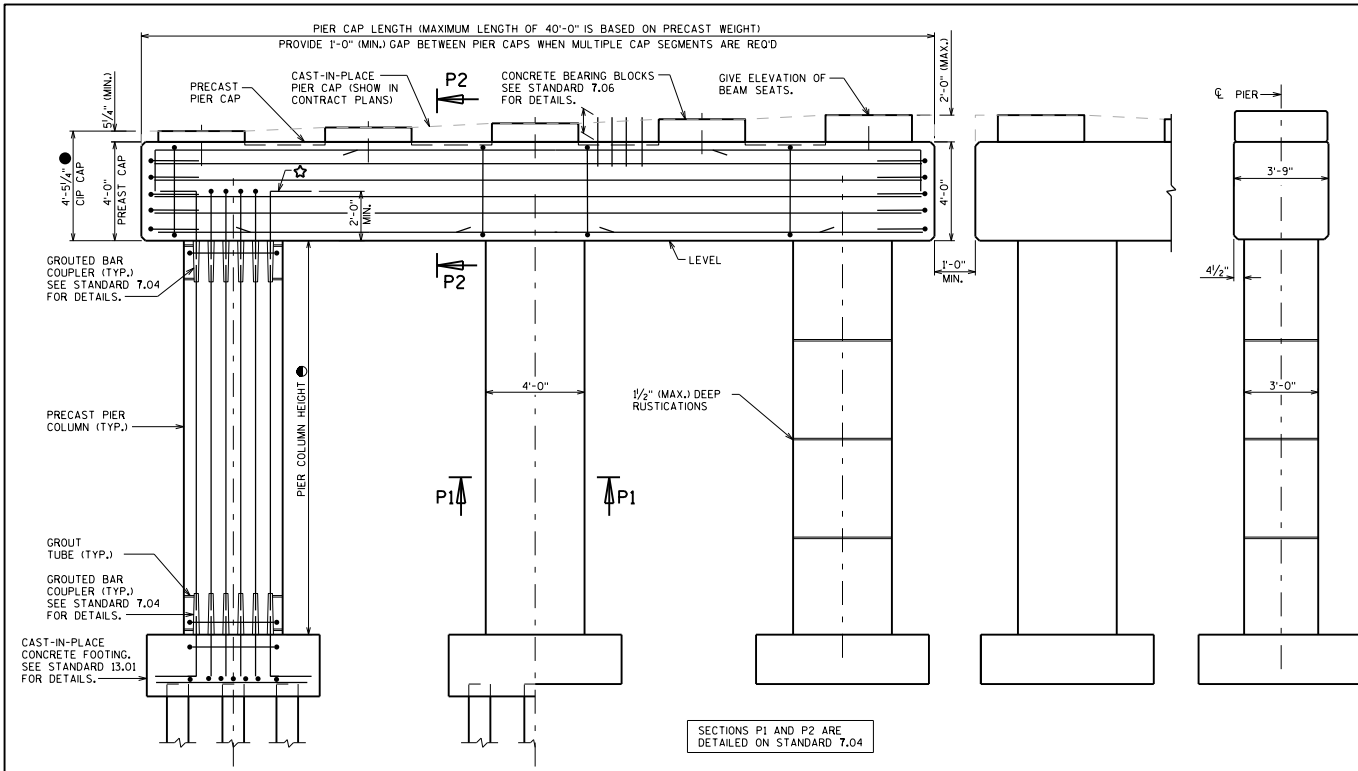
GROUDED COUPLER NOTES

- USE MATCHING TEMPLATES FOR THE LOCATION OF REINFORCEMENT AND GROUDED COUPLER PLACEMENT WITHIN THE ELEMENTS TO CONTROL CRITICAL DIMENSIONS AND ORIENTATION IN ALL DIRECTIONS.
- CONSULT MANUFACTURER OF THE GROUDED COUPLER FOR PROPER DIMENSIONS "B" AND "D" AND FOR TOLERANCE OF THESE DIMENSIONS. FIELD CUT FOOTING AND CAP DOWELS AS REQUIRED.
- BEFORE EXECUTING GROUDED COUPLER ASSEMBLIES, ALWAYS SEEK INSTALLATION RECOMMENDATIONS FROM THE MANUFACTURER OF THE GROUDED COUPLER USED.
- CONTRACTOR TO PROVIDE ADEQUATE BRACING OF COLUMNS UNTIL GROUDED COUPLER CONNECTIONS HAVE ACHIEVED ADEQUATE STRENGTH.
- ALL GROUDED COUPLERS SHALL BE EPOXY COATED.
- ADJUST SHIM STACK HEIGHT TO CONTROL ERECTION ELEVATIONS.
- SUPPLY REINFORCING BARS ACCORDING TO GROUDED COUPLER REQUIREMENTS FOR EMBEDMENT. BARS MAY BE FIELD CUT IF NEEDED.
- PRECASTER SHALL PROVIDE PORTS IN THE PRECAST ELEMENTS TO ALLOW THE COUPLERS TO BE GROUDED AFTER THE PRECAST ELEMENTS HAVE BEEN ERECTED.

PRECAST PIER CAP AND COLUMN DETAILS

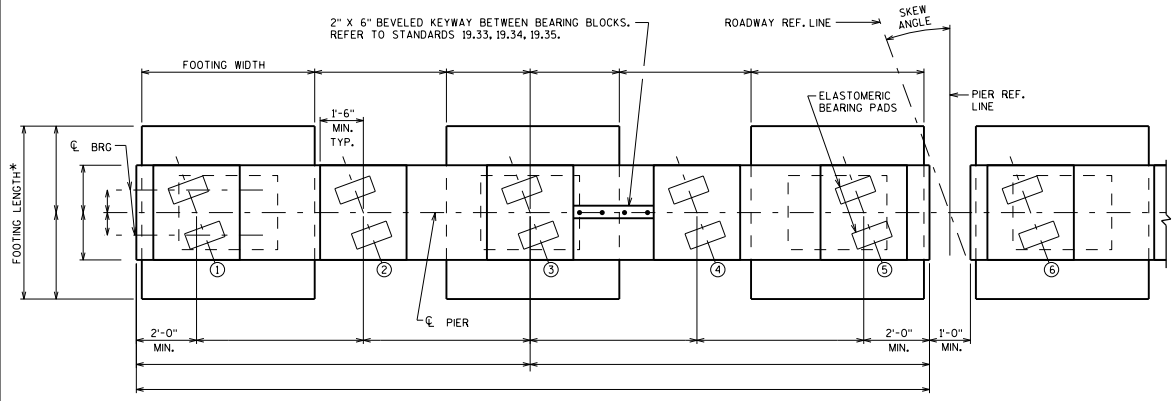
BUREAU OF STRUCTURES

APPROVED: *Laura Shadewald* DATE: 1-14



ELEVATION
LOOKING UP STATION

END VIEW



PLAN

*MAKE ALL FOOTING LENGTHS THE SAME WITHIN A GIVEN PIER

CONTRACTOR NOTES

- THE CONTRACTOR SHALL FOLLOW THIS STANDARD WHEN PRECAST PIERS ARE USED IN LIEU OF THE CAST-IN-PLACE PIER. THE USE OF OPTIONAL PRECAST PIER DETAILS SHALL ONLY BE USED WHEN PLANS INDICATE ALLOWANCE OR WITH APPROVAL BY THE BUREAU OF STRUCTURES.
- PROVIDE A SUITABLE LIFTING DEVICE FOR THE PRECAST CAP, COLUMN AND BEARING BLOCK UNITS.
- STIRRUPS AT THE GROUTED COUPLERS ARE SIZED BASED ON A XX" OUTER DIAMETER COUPLER SLEEVE. ADJUST STIRRUP DIMENSIONS AS REQUIRED IF THE ACTUAL COUPLER SLEEVE DIAMETER DIFFERS.
- MANUFACTURER TO DETERMINE THE PRECAST PIER COLUMN LENGTHS ASSUMING 1/2" STEEL SHIMS AT THE TOP AND BOTTOM OF THE COLUMN.
- GROUTED COUPLER SLEEVES MAY BE OVERSIZED TO ALLOW FOR ADDITIONAL LATERAL TOLERANCE IN THE FIELD. STANDARD WISDOT PRACTICE IS TO OVERSIZE COUPLER SLEEVES BY 1 BAR SIZE. ADJUST SHEAR STIRRUPS AS NECESSARY TO ACCOUNT FOR LARGER DIAMETER COUPLER SLEEVES.
- ALL PRECAST ELEMENTS AND DIAPHRAGM ITEMS PAID PER C.I.P. BID ITEMS. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR THE PRECAST PIER OPTION.
- THE FOLLOWING SPECIAL PROVISIONS SHALL BE USED:
 - GROUTED BAR COUPLERS (505,1000,S)
 - PRECAST PIER COLUMNS (SPV,0090,XXX)
 - PRECAST PIER CAPS (SPV,0090,XXX)
- THE FOLLOWING ADDITIONAL STANDARDS SHALL BE USED:
 - STANDARD 7.04 - PRECAST PIER CAP AND COLUMN DETAILS
 - STANDARD 7.06 - PRECAST BEARING BLOCKS DETAILS
- THE CONTRACTOR MAY USE PRECAST SEGMENTS AT THEIR DISCRETION (E.G. PRECAST CAP ONLY) WITH APPROVAL BY THE BUREAU OF STRUCTURES. SEE STANDARD 7.07 FOR CAST-IN-PLACE BEARING BLOCK DETAILS AND ADDITIONAL NOTES.

DESIGNER NOTES

INCLUDE THE FOLLOWING NOTE ON AT LEAST ONE PIER SHEET FOR EACH PIER:
 THE CONTRACTOR MAY FURNISH A PRECAST CONCRETE PIER (INSERT ALLOWABLE PRECAST ELEMENTS) IN LIEU OF THE CAST-IN-PLACE PIER WITH THE ACCEPTANCE OF THE SHOP DRAWINGS BY THE STRUCTURES DESIGN SECTION. THE PRECAST CONCRETE PIER SHALL CONFORM TO PRECAST DETAILS IN CHAPTER 7 STANDARDS OF THE CURRENT WISCONSIN DOT BRIDGE MANUAL AND SPECIAL PROVISIONS RELATED TO PRECAST ELEMENTS WITH THE EXCEPTION OF METHOD OF PAYMENT. PAYMENT FOR THE PRECAST PIER SHALL BE BASED ON THE QUANTITIES AND PRICES BID FOR THE ITEMS LISTED IN THE "TOTAL ESTIMATED QUANTITIES" FOR THE CAST-IN-PLACE PIER.

ALLOWABLE PRECAST ELEMENTS INCLUDE COLUMNS, CAPS, AND BEARING BLOCKS THAT HAVE BEEN DETERMINED TO BE INTERCHANGEABLE BETWEEN C.I.P. AND PRECAST OPTIONS. WHEN A PIER CAP HAS BEEN DETERMINED NON-INTERCHANGEABLE "COLUMNS ONLY" MAY BE USED.

PROVIDE CAST-IN-PLACE DETAILS ONLY. PRECAST PIER REFERENCES ARE FOR DESIGNER INFORMATIONAL PURPOSES ONLY AND SHALL NOT BE PLACED ON THE PLANS. PRECAST PIER CONFIGURATION SHALL BE INTERCHANGEABLE BETWEEN C.I.P. AND PRECAST OPTIONS.

ONLY THE PIER CAP LENGTH AND COLUMN LENGTHS SHALL BE MODIFIED. ALL NOTED DIMENSIONS SHALL BE FOLLOWED.

PIERS SHALL BE SUPPORTED BY A MINIMUM OF 3 COLUMNS. WHEN MULTIPLE PIER CAPS ARE USED, EACH SEGMENT SHALL BE SUPPORTED BY A MINIMUM OF 2 COLUMNS.

PROVIDE A CONCRETE DIAPHRAGM BETWEEN PIER CAP SEGMENTS.

MULTIPLE PIER CAP SEGMENTS MAY BE SET AT DIFFERENT ELEVATIONS TO ACCOMMODATE BEARING ELEVATIONS BEYOND CONCRETE BEARING BLOCK LIMITS.

THE MAXIMUM WEIGHT OF EACH PRECAST ELEMENT SHALL BE 90 KIP.


SEE STANDARDS 7.03, 7.04, 7.06, 13.01 AND 13.07 FOR ADDITIONAL PIER NOTES AND DETAILS.

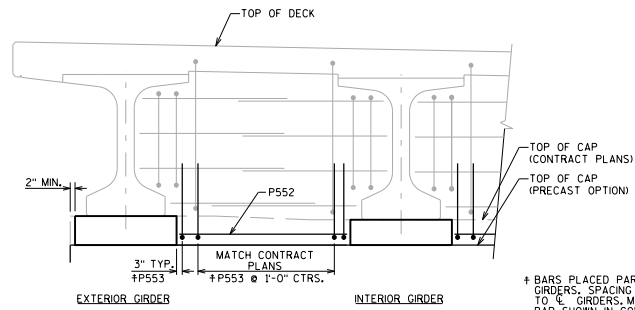
SEE 7.1.4.1.2 FOR ADDITIONAL PRECAST PIER GUIDANCE.

LEGEND

- ☆ STD. HOOK (TYP.) ROTATE AND STAGGER AS NEEDED.
- DIMENSION IS FROM BOTTOM OF PIER CAP TO LOW BEAM SEAT.

MATERIAL PROPERTIES:
 CONCRETE MASONRY $f'c = 3,500$ P.S.I.
 BAR REINFORCEMENT, GRADE 60 $f_y = 60,000$ P.S.I.

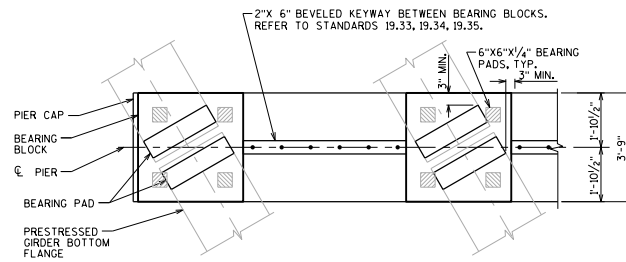
PRECAST PIER (OPTIONAL) CAP AND COLUMNS	
	BUREAU OF STRUCTURES
APPROVED: <i>Laura Shadewald</i>	DATE: 1-19



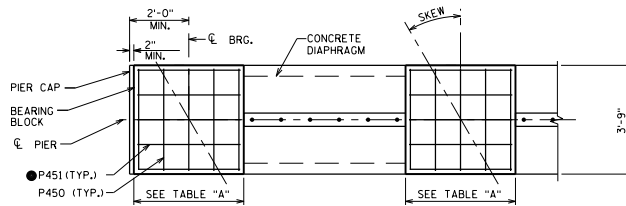
**PARTIAL TRANSVERSE SECTION
AT DIAPHRAGM PIER**

STD. 19.35 SHOWN (STD. 19.33 & 19.34 SIM.)

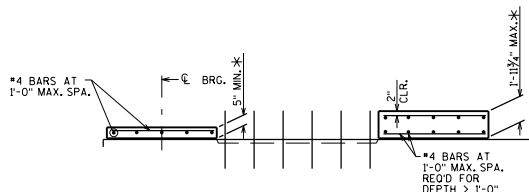
† BARS PLACED PARALLEL TO GIRDERS. SPACING PERPENDICULAR TO GIRDERS. MATCH SIMILAR BAR SHOWN IN CONTRACT PLANS.



PLAN



PLAN



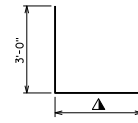
ELEVATION

BILL OF BARS

TOTAL COATED: XX LBS

BAR MARK	NO. REQ'D.	LENGTH	COAT	BENT	LOCATION
P450		3'-5"	X		TOP & BOT. TRANS.
P451		●	X		TOP & BOT. LONG.
P552		1'-"	X		PIER DIAPHRAGM - BOTH FACES HORIZ. - BTWN GIRDERS
P553		1'-"	X	X	PIER DIAPHRAGM - VERT. - BTWN GIRDERS

NOTE: THIS BILL OF BARS IS SHOWN FOR INFORMATION ONLY. PRECAST PIER SHOP DRAWINGS SHALL INCLUDE BILL OF BARS FOR DIAPHRAGM REINFORCEMENT. PAYMENT FOR ALL ITEMS ASSOCIATED WITH THE OPTIONAL PRECAST PIERS SHALL BE INCLUDED IN THE CAST-IN-PLACE CONCRETE BID ITEMS.



P553

▲ MATCH SIMILAR DIAPHRAGM REIN. AS SHOWN IN CONTRACT PLANS.

TABLE "A"

SKEW ANGLE	BEARING BLOCK WIDTH (MIN.)	LONG. BAR LENGTH ●
0° TO 15°	3'-3"	2'-11"
15° TO 20°	3'-6"	3'-2"
> 20°	3'-9"	3'-5"

DESIGNER NOTE

SEE 7.1.4.1.2 FOR ADDITIONAL PRECAST PIER GUIDANCE.

CONTRACTOR NOTES

THE CONTRACTOR SHALL FOLLOW THIS STANDARD WHEN PRECAST PIERS ARE USED IN LIEU OF THE CAST-IN-PLACE PIER.

THE CONTRACTOR MAY USE CAST-IN-PLACE BEARING BLOCKS IN LIEU OF PRECAST BEARING BLOCK DETAILS. THE CONTRACTOR IS RESPONSIBLE FOR THE ADDITIONAL WEIGHT, WHICH MAY CAUSE PIER CAP SEGMENTS TO BE IN EXCESS OF 90 KIPS.

SEE STANDARD 7.07 FOR CAST-IN-PLACE BEARING BLOCK DETAILS AND ADDITIONAL NOTES.

PRECAST CONCRETE DETAIL NOTES

PRECAST BEARING BLOCK DETAILS SHALL ONLY BE USED WHEN PLANS INDICATE ALLOWANCE FOR PRECAST PIERS.

* PRECAST HEIGHT = VARIES (5" MIN. TO 1'-11 1/4" MAX.). MANUFACTURER TO DETERMINE THE PRECAST BEARING BLOCK HEIGHT ASSUMING 1/4" GROUT AT THE BOTTOM OF THE BEARING BLOCK.

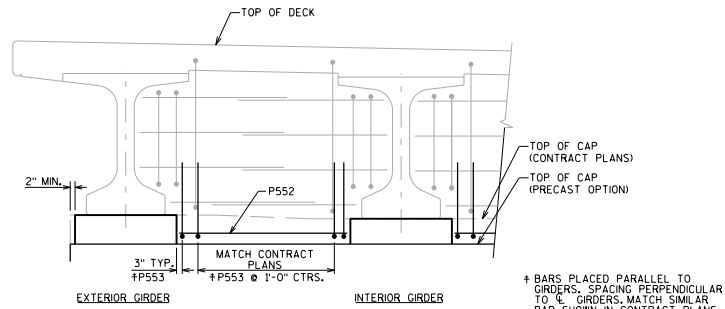
GROUT 1/4" BENEATH PRECAST ELEMENT.

**PRECAST BEARING
BLOCK DETAILS**



**BUREAU OF
STRUCTURES**

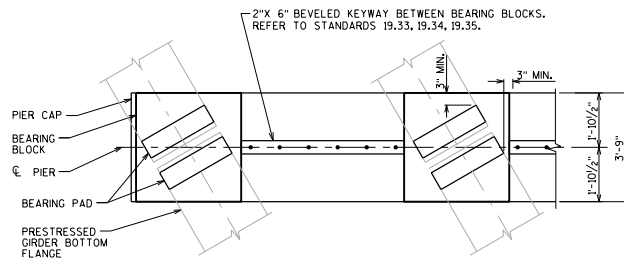
APPROVED: *Laura Shadewald* DATE: 1-18



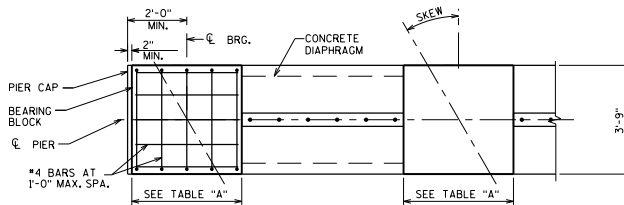
**PARTIAL TRANSVERSE SECTION
AT DIAPHRAGM PIER**

STD. 19.35 SHOWN (STD. 19.33 & 19.34 SIM.)

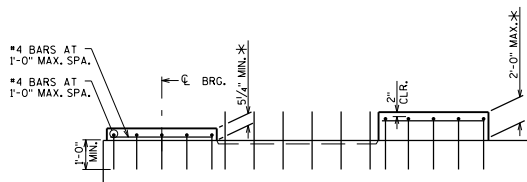
† BARS PLACED PARALLEL TO GIRDERS. SPACING PERPENDICULAR TO GIRDERS. MATCH SIMILAR BAR SHOWN IN CONTRACT PLANS.



PLAN



PLAN



ELEVATION

DESIGNER NOTE

SEE 7.1.4.1.2 FOR ADDITIONAL PRECAST PIER GUIDANCE.


CONTRACTOR NOTES

THE CONTRACTOR SHALL FOLLOW THIS STANDARD WHEN PRECAST PIERS ARE USED AND WHEN CAST-IN-PLACE BEARING BLOCKS ARE USED IN LIEU OF PRECAST BEARING BLOCKS. SEE STANDARD 7.06 FOR ADDITIONAL NOTES AND DETAILS.

CAST-IN-PLACE CONCRETE DETAIL NOTES

CAST-IN-PLACE BEARING BLOCK DETAILS SHALL ONLY BE USED WHEN PLANS INDICATE ALLOWANCE FOR PRECAST PIERS.

* CAST-IN-PLACE HEIGHT = VARIES (5/4\"/>

CAST-IN-PLACE BEARING BLOCK DETAILS	
	BUREAU OF STRUCTURES
APPROVED: <i>Laura Shadewald</i>	DATE: 1-18