



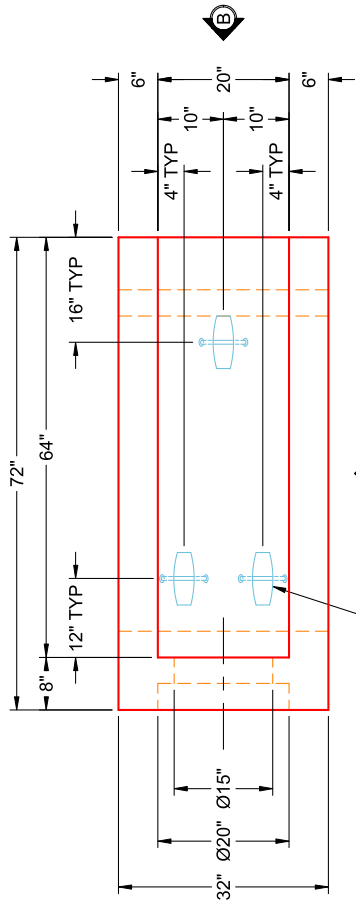
Structure ID: HW 13 (11)

P1 HWTDOT3-1TU15

15" - HW TDOT 3:1 Type U Cross Drain Endwall F/F

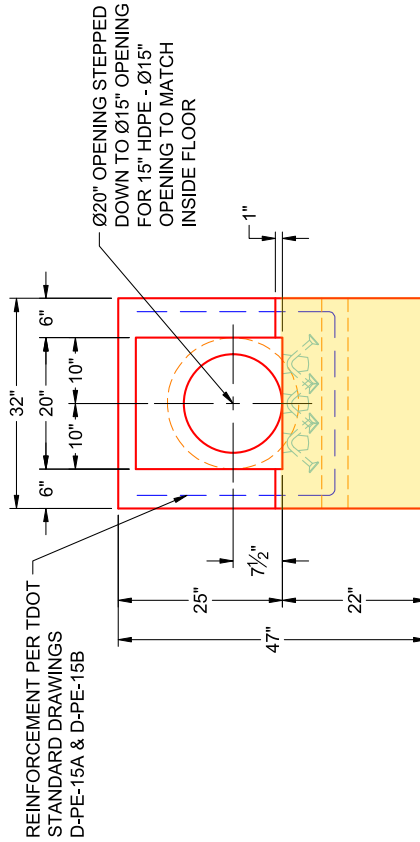
GENERAL NOTES:

- PER TDOT D-PE-15 SPECIFICATIONS
- CONCRETE: 4,500 PSI AT 28 DAYS
- REINFORCEMENT: PER TDOT STANDARD DRAWINGS D-PE-15A & D-PE-15B
- WEIGHT: 2,825 LBS
 - FIRST POUR: 1,715 LBS
 - SECOND POUR: 1,110 LBS

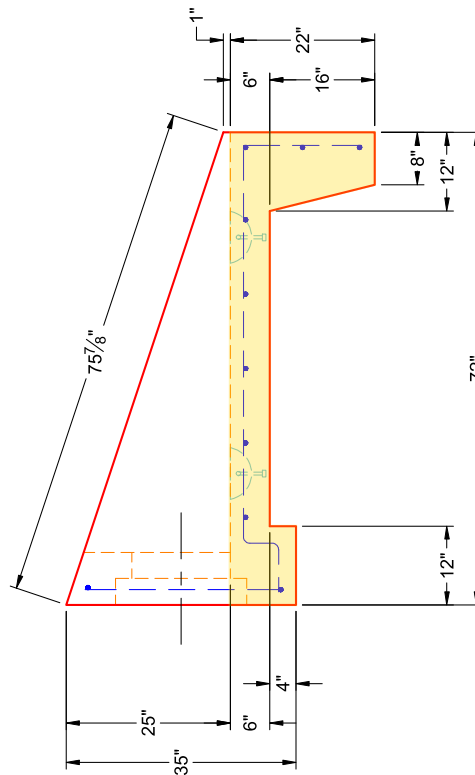


3 EA. 5CA14 CONAC A-ANCHORS FOR PLANT & FIELD HANDLING

PLAN VIEW (RIGHT SIDE UP)



VIEW B (RIGHT SIDE UP)



VIEW A (RIGHT SIDE UP)

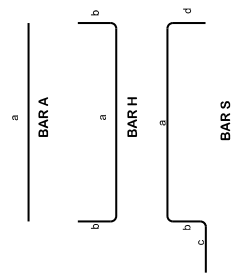
PRODUCTION WORK ORDER		PRODUCT I.D.: HWTDOT3-1TU15	DESCRIPTION: 15" TDOT D-PE-15 TYPE "U" CROSS DRAIN EW 3:1
QUALITY CONTROL CHECKLIST		PRODUCT VIEW: RIGHT SIDE UP	CUSTOMER: PARKER EXCAVATING, LLC
<input type="checkbox"/> ALL DIMENSIONS CORRECT.		PLANT: BEAVER DAM, KY	PROJECT: GOVERNMENT CENTER
<input type="checkbox"/> LIFTERS INSTALLED.		WEIGHT: 2,825 LBS	STRUCTURE: HW 13 (11)
<input type="checkbox"/> OPENING CENTERED.		TOP SECTION JOINT: N/A	ORDER NO: 25-4566
<input type="checkbox"/> REINFORCING CORRECT.		BASE SECTION JOINT: N/A	PE: J.H. ROSS
<input type="checkbox"/> SURFACE QUALITY ACCEPTABLE.		QC CHECK INITIALS:	DRAWING: K. CARDWELL
<input type="checkbox"/> EDGES CHAMFERED.			SCALE: NTS
<input type="checkbox"/> ALL PATCHWORK ACCEPTABLE.			PG. 1 OF 1



BILL OF STEEL

CODE NO.	LOCATION	BAR SIZE	3:1 WINGWALL SLOPE				4:1 WINGWALL SLOPE				6:1 WINGWALL SLOPE			
			a	b	c	d	REQD	LENGTH	a	b	c	d	REQD	LENGTH
A400	TOEWALL	4	2'-4"	-	-	-	3	2'-4"	2'-4"	-	-	-	3	2'-4"
A431	WINGWALLS	4	4'-10"	-	-	-	2	4'-10"	-	-	-	-	-	
A432	WINGWALLS	4	1'-10"	-	-	-	2	1'-10"	-	-	-	-	-	
A433	WINGWALLS	4	5'-3"	-	-	-	2	5'-3"	-	-	-	-	-	
A441	WINGWALLS	4	-	-	-	-	-	6'-6 3/4"	-	-	-	-	-	
A442	WINGWALLS	4	-	-	-	-	-	2'-6 3/4"	-	-	-	-	-	
A443	WINGWALLS	4	-	-	-	-	-	6'-11"	-	-	-	-	-	
A461	WINGWALLS	4	-	-	-	-	-	-	-	-	-	2	9'-11"	
A462	WINGWALLS	4	-	-	-	-	-	-	-	-	-	2	3'-11"	
A463	WINGWALLS	4	-	-	-	-	-	-	-	-	-	2	10'-4"	
A701	HEADWALL	7	1'-3"	-	-	-	2	1'-3"	-	-	-	2	1'-3"	
A702	HEADWALL	7	2'-4"	-	-	-	1	2'-4"	-	-	-	1	2'-4"	
SERIES H430	BOTTOM SLAB & WINGWALL	4	2'-4"	*	-	-	1	19'-0"	-	-	-	-	-	
			* DIMENSION "b" VARIES FROM 1'-8 1/2" TO 0'-8 1/2" IN INCREMENTS OF 0'-4" (4 BARS)											
H431	BOTTOM SLAB & HEADWALL	4	2'-4"	2'-4 1/2"	-	-	1	7'-1"	-	-	-	-	-	-
SERIES H440	BOTTOM SLAB & WINGWALL	4	-	-	-	-	-	2'-4"	*	-	-	1	28'-4 1/2"	
			* DIMENSION "b" VARIES FROM 1'-9 1/2" TO 0'-6 1/2" IN INCREMENTS OF 0'-3" (6 BARS)											
H441	BOTTOM SLAB & HEADWALL	4	-	-	-	-	-	2'-4"	2'-4 1/2"	-	-	1	7'-1 1/2"	
SERIES H460	BOTTOM SLAB & WINGWALL	4	-	-	-	-	-	-	-	-	-	-	1	47'-1"
			* DIMENSION "b" VARIES FROM 1'-11 1/4" TO 0'-5 1/4" IN INCREMENTS OF 0'-2" (10 BARS)											
H461	BOTTOM SLAB & HEADWALL	4	-	-	-	-	-	-	-	-	-	-	1	7'-7 1/2"
S430	BOTTOM SLAB & TOEWALL	4	4'-11 1/2"	0'-4 1/2"	0'-8"	1'-5"	4	7'-5"	-	-	-	-	-	
S440	BOTTOM SLAB & TOEWALL	4	-	-	-	-	-	6'-11 1/2"	0'-4 1/2"	0'-8"	1'-5"	4	9'-5"	
S460	BOTTOM SLAB & TOEWALL	4	-	-	-	-	-	-	-	-	-	-	4	12'-7"

REINFORCING STEEL LEGEND



REINFORCING STEEL CODE

TYPE	SIZE	SERIES
A	5	06

DIMENSIONS SHOWN ON THIS SHEET ARE OUTSIDE TO OUTSIDE OF BAR. STANDARD C.R.S.I. HOOK DETAILS SHALL APPLY, EXCEPT AS NOTED.

PRECAST NOTES

- PRECAST UNITS:**
- THE CONTRACTOR MAY, WITH PERMISSION FROM THE ENGINEER, SUBSTITUTE PRECAST ENDWALLS FOR CAST-IN-PLACE ENDWALLS PROVIDED THAT:**
- APPROPRIATE SIZING AND LOCATION OF THE LIFTING INSERTS SHALL BE THE RESPONSIBILITY OF THE FABRICATOR TO ASSURE BALANCED HANDLING DURING INSTALLATION OF THE PRECAST ENDWALL.
 - THE CONTRACTOR TO PATCH ALL LIFTING INSERT HOLES AND PLACE A MINIMUM OF ONE (1) INCH OF COVER OVER THE HARDWARE OF THESE DEVICES ON BOTH TOP AND BOTTOM SURFACES.
 - PAYMENT FOR PRECAST ENDWALLS BASED ON THE QUANTITIES FOR CAST-IN-PLACE ENDWALLS IS ACCEPTABLE.
 - PRECAST ENDWALL UNITS WHICH ARE DAMAGED DURING SHIPPING OR INSTALLATION WILL BE REJECTED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE THE DAMAGED ENDWALL UNITS AT HIS OWN EXPENSE.
 - PIPE OPENINGS FOR HEADWALLS ARE BASED ON REINFORCED CONCRETE PIPE WITH TYPE "B" WALL THICKNESS (ASHTO M70).
 - ADDITIONAL REINFORCING STEEL NECESSARY TO MAINTAIN THE INTEGRITY OF THE STRUCTURE DURING HANDLING AND PLACEMENT SHALL BE THE RESPONSIBILITY OF THE FABRICATOR.
- CONCRETE: Fc=4,500 POUNDS PER SQUARE INCH MINIMUM AT 28 DAYS.
 REINFORCING STEEL: ASTM A615, Fy=60,000 POUNDS PER SQUARE INCH.

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED



TYPE "U"
CROSS DRAIN ENDWALL FOR 15" PIPE, BILL OF STEEL AND PRECAST NOTES



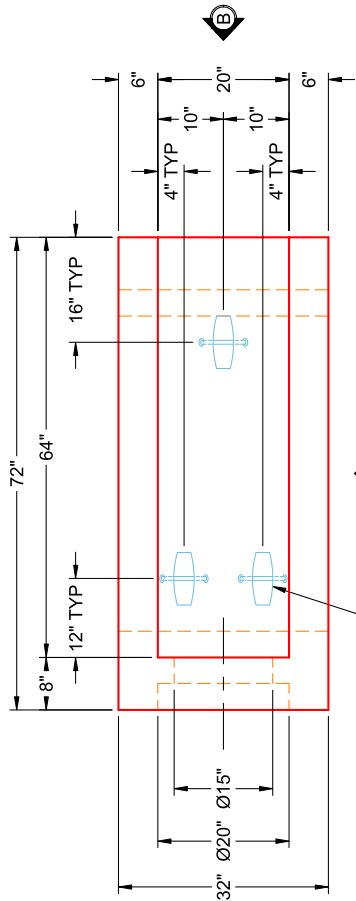
Structure ID: HW 13 (11)

P1 HWTDOT3-1TU15

15" - HW TDOT 3:1 Type U Cross Drain Endwall F/F

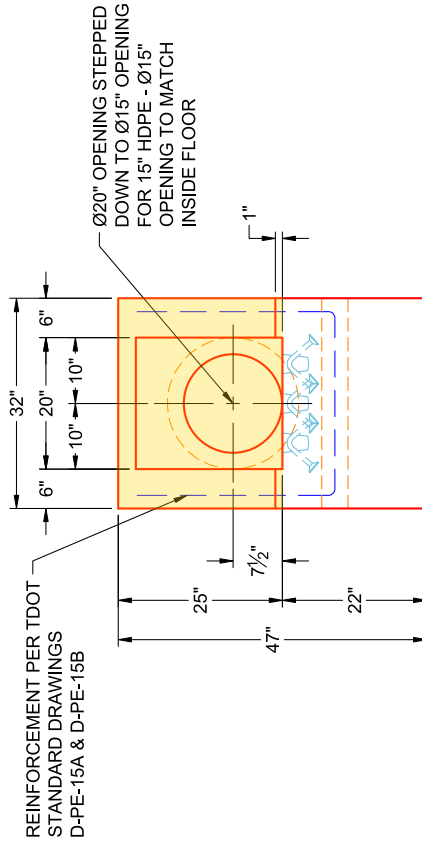
GENERAL NOTES:

- PER TDOT D-PE-15 SPECIFICATIONS
- CONCRETE: 4,500 PSI AT 28 DAYS
- REINFORCEMENT: PER TDOT STANDARD DRAWINGS D-PE-15A & D-PE-15B
- WEIGHT: 2,825 LBS
 - FIRST POUR: 1,715 LBS
 - SECOND POUR: 1,110 LBS

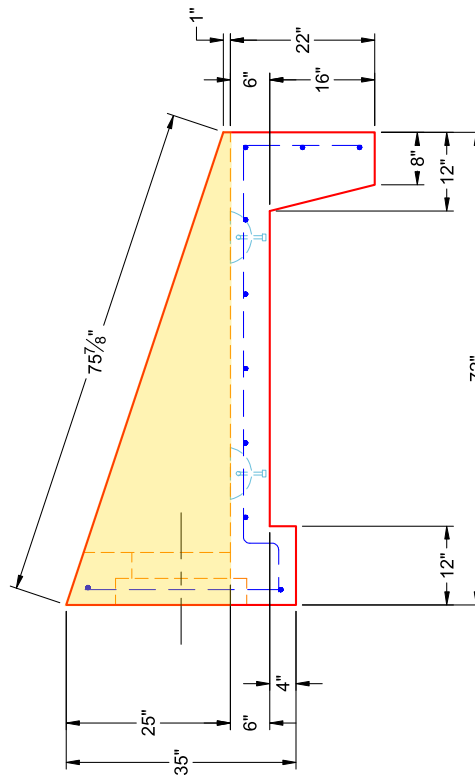


3 EA. 5CA14 CONAC A-ANCHORS FOR PLANT & FIELD HANDLING

PLAN VIEW (RIGHT SIDE UP)



VIEW B (RIGHT SIDE UP)

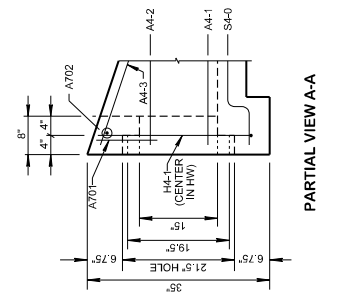


VIEW A (RIGHT SIDE UP)

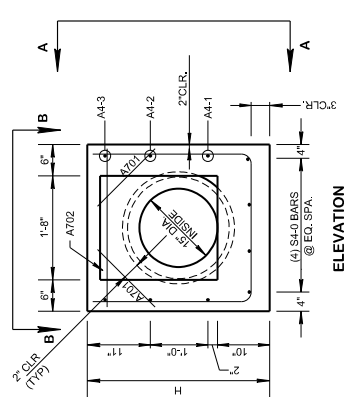
PRODUCTION WORK ORDER		PRODUCT I.D.: HWTDOT3-1TU15	DESCRIPTION: 15" TDOT D-PE-15 TYPE "U" CROSS DRAIN EW 3:1
QUALITY CONTROL CHECKLIST		PRODUCT VIEW: RIGHT SIDE UP	CUSTOMER: PARKER EXCAVATING, LLC
<input type="checkbox"/> ALL DIMENSIONS CORRECT.		PLANT: BEAVER DAM, KY	PROJECT: GOVERNMENT CENTER
<input type="checkbox"/> LIFTERS INSTALLED.		WEIGHT: 2,825 LBS	STRUCTURE: HW 13 (11)
<input type="checkbox"/> OPENING CENTERED.		TOP SECTION JOINT: N/A	ORDER NO: 25-4566
<input type="checkbox"/> REINFORCING CORRECT.		BASE SECTION JOINT: N/A	PE: J.H. ROSS
<input type="checkbox"/> SURFACE QUALITY ACCEPTABLE.		QC CHECK INITIALS:	DRAWING: K. CARDWELL
<input type="checkbox"/> EDGES CHAMFERED.			SCALE: NTS
<input type="checkbox"/> ALL PATCHWORK ACCEPTABLE.			PG. 1 OF 1



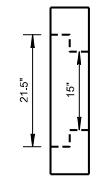
REV 05-14-13 REVISED NOTE ① ADDED
 NOTES ① AND ②
 REV 05-28-19 ADJUSTED A-4 AND
 ELEVATION VIEWS, REMOVED AND
 REDREW SHEET.



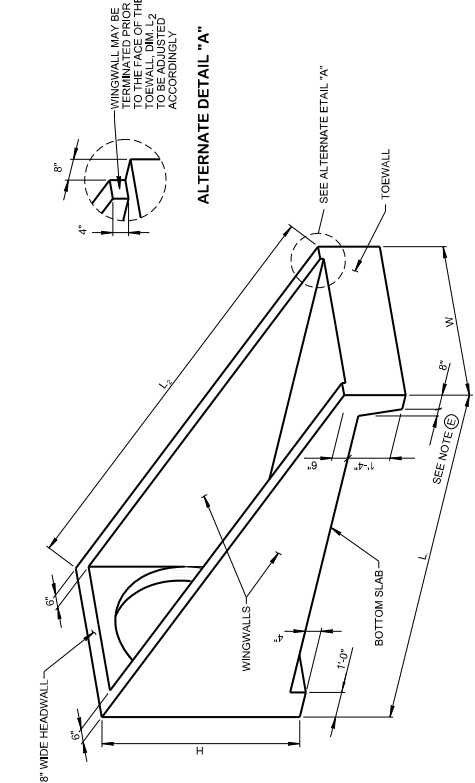
PARTIAL VIEW A-A



ELEVATION

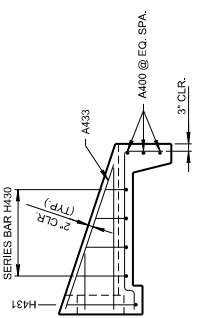


PARTIAL VIEW B-B



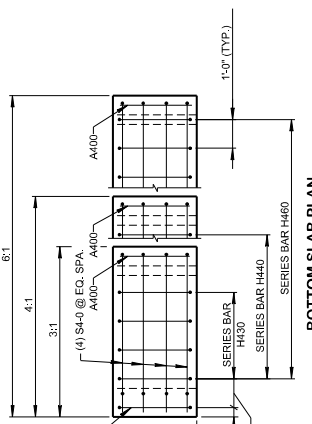
ISOMETRIC VIEW

NOTE: 1/4" CHAMFER REQUIRED ON ALL EXPOSED EDGES



3-1 WINGWALL ELEVATION

NOTE: A-BARS IN HEADWALL NOT SHOWN FOR CLARITY.

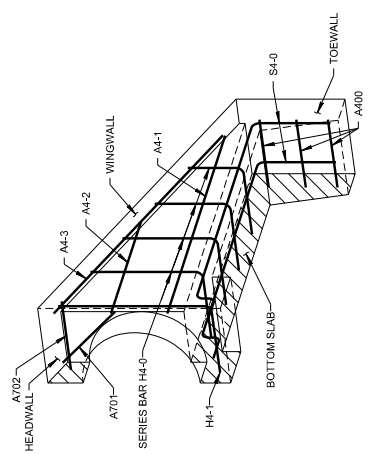


4-1 WINGWALL ELEVATION

NOTE: A-BARS IN HEADWALL NOT SHOWN FOR CLARITY.

BOTTOM SLAB PLAN

DIMENSIONS AND QUANTITIES FOR ONE ENDWALL 15" PIPE		ESTIMATED QUANTITIES	
CONCRETE ENDWALL DIMENSIONS		CLASS "A"	STEEL BAR
SLOPE	CONC. CU. YD.	W	REIN. LB.
3:1	0.72	6'-0"	68
4:1	0.89	8'-0"	85
6:1	1.21	11'-2"	117

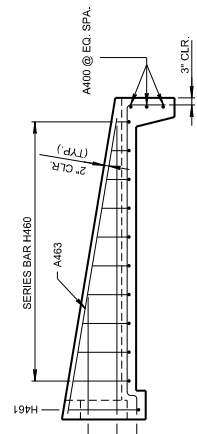


ISOMETRIC HALF-SECTION SHOWING REINFORCEMENT

(3:1 SHOWN, 4:1 & 6:1 SIMILAR)
 SEE GENERAL NOTE ①

HEADWALL DETAILS

NOTES: INSTALL BARS A702 AT 6" SEE GENERAL NOTES ① & ②



6-1 WINGWALL ELEVATION

NOTE: A-BARS IN HEADWALL NOT SHOWN FOR CLARITY.

GENERAL NOTES

- ① DRAWING TO BE USED FOR ALL CAST-IN-PLACE AND ALL PRECAST 15" CONCRETE ENDWALLS (TYPE 'U') FOR CROSS DRAINS ONLY. 1" ENDWALL TO BE PLACED AT 90° SKEW TO CENTERLINE. SEE GENERAL NOTES ① AND ② FOR DETAILS. CROSS DRAINS NOT PERPENDICULAR TO CENTERLINE SHALL BE CAST-IN-PLACE CONCRETE ENDWALL SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, SECTION 611 AND/OR SPECIAL PROVISIONS.
- ② SEE STD. DWG. D-PE-198 FOR BILL OF STEEL & PRECAST NOTES.
- ③ ** IN BAR DESIGNATION REPRESENTS 3, 4 OR 6 FOR 3:1, 4:1 OR 6:1 SLOPES, RESPECTIVELY.
- ④ SPLICING OF REINFORCEMENT IS ACCEPTABLE PROVIDED THAT A MINIMUM 2' SPlice LENGTH IS USED.
- ⑤ TOEWALL BACK SLOPE MAY BE CONSTRUCTED VARIABLE FROM VERTICAL UP TO 15°.
- ⑥ OPTIONAL STEPPED HOLE IS ALLOWED PROVIDED THE AMOUNT OF MATERIAL REMOVED IS NOT GREATER THAN SHOWN ON THIS DRAWING. THE SAME OR GREATER THAN SHOWN ON THIS DRAWING.
- ⑦ PAYMENT WILL BE MADE UNDER:
 - 611-07.51 15IN ENDWALL (CROSS DRAIN) 31 EACH
 - 611-07.52 15IN ENDWALL (CROSS DRAIN) 4:1 EACH
 - 611-07.53 15IN ENDWALL (CROSS DRAIN) 6:1 EACH
- ⑧ THE CONTRACTOR MAY ELECT TO SUBSTITUTE AN APPROVED ALTERNATIVE DESIGN.
- ⑨ DIMENSIONAL AND REINFORCEMENT TOLERANCES WILL BE AS SHOWN IN STANDARD OPERATING PROCEDURE (SOP) 5.3.

MINOR REVISION -- FHWA
 APPROVAL NOT REQUIRED

STATE OF TENNESSEE
 STANDARD
 DEPARTMENT OF TRANSPORTATION

TYPE "U"
 CROSS DRAIN
 ENDWALL
 FOR 15" PIPE
 (FOR 3:1, 4:1 & 6:1 SLOPES)

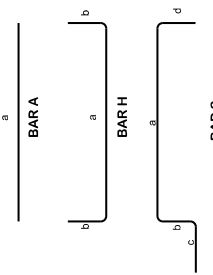
D-PE-15A
 03-01-2012

NOT TO SCALE

BILL OF STEEL

CODE NO.	LOCATION	BAR SIZE	3:1 WINGWALL SLOPE				4:1 WINGWALL SLOPE				6:1 WINGWALL SLOPE			
			a	b	c	d	REQD	LENGTH	a	b	c	d	REQD	LENGTH
A400	TOEWALL	4	2'-4"	-	-	-	3	2'-4"	-	-	-	3	2'-4"	
A431	WINGWALLS	4	4'-10"	-	-	-	2	4'-10"	-	-	-	-		
A432	WINGWALLS	4	1'-10"	-	-	-	2	1'-10"	-	-	-	-		
A433	WINGWALLS	4	5'-3"	-	-	-	2	5'-3"	-	-	-	-		
A441	WINGWALLS	4	-	-	-	-	-	6'-6 3/4"	-	-	-	-		
A442	WINGWALLS	4	-	-	-	-	-	2'-6 3/4"	-	-	-	-		
A443	WINGWALLS	4	-	-	-	-	-	6'-11"	-	-	-	-		
A461	WINGWALLS	4	-	-	-	-	-	-	-	-	-	9'-11"		
A462	WINGWALLS	4	-	-	-	-	-	-	-	-	-	3'-11"		
A463	WINGWALLS	4	-	-	-	-	-	-	-	-	-	10'-4"		
A701	HEADWALL	7	1'-3"	-	-	-	2	1'-3"	-	-	-	2	1'-3"	
A702	HEADWALL	7	2'-4"	-	-	-	1	2'-4"	-	-	-	1	2'-4"	
SERIES H430	BOTTOM SLAB & WINGWALL	4	2'-4"	*	-	-	1	19'-0"	-	-	-	-		
			* DIMENSION "b" VARIES FROM 1'-8 1/2" TO 0'-8 1/2" IN INCREMENTS OF 0'-4" (4 BARS)											
H431	BOTTOM SLAB & HEADWALL	4	2'-4"	2'-4 1/2"	-	-	1	7'-1"	-	-	-	-	-	
SERIES H440	BOTTOM SLAB & WINGWALL	4	-	-	-	-	-	2'-4"	*	-	-	1	28'-4 1/2"	
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H441	BOTTOM SLAB & HEADWALL	4	-	-	-	-	-	2'-4"	2'-4 1/2"	-	-	1	7'-1 1/2"	
SERIES H460	BOTTOM SLAB & WINGWALL	4	-	-	-	-	-	-	-	-	-	-	2'-4"	
			* DIMENSION "b" VARIES FROM 1'-11 1/4" TO 0'-5 1/4" IN INCREMENTS OF 0'-2" (10 BARS)											
H461	BOTTOM SLAB & HEADWALL	4	-	-	-	-	-	-	-	-	-	-	2'-5 1/2"	
S430	BOTTOM SLAB & TOEWALL	4	4'-11 1/2"	0'-4 1/2"	0'-8"	1'-5"	4	7'-5"	-	-	-	-	-	
S440	BOTTOM SLAB & TOEWALL	4	-	-	-	-	-	6'-11 1/2"	0'-4 1/2"	0'-8"	1'-5"	4	9'-5"	
S460	BOTTOM SLAB & TOEWALL	4	-	-	-	-	-	-	-	-	-	-	10'-1 1/2"	
			0'-4 1/2" 0'-8" 1'-5" 4 12'-7"											

REINFORCING STEEL LEGEND



REINFORCING STEEL CODE

TYPE	SIZE	SERIES
A	5	06

DIMENSIONS SHOWN ON THIS SHEET ARE OUTSIDE TO OUTSIDE OF BAR. STANDARD C.R.S.I. HOOK DETAILS SHALL APPLY, EXCEPT AS NOTED.

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REINFORCING STEEL: ASTM A615, Fy=60,000 POUNDS PER SQUARE INCH.

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
TYPE "U"
CROSS DRAIN ENDWALL
FOR 15" PIPE,
BILL OF STEEL AND
PRECAST NOTES

03-01-2012 D-PE-15B