



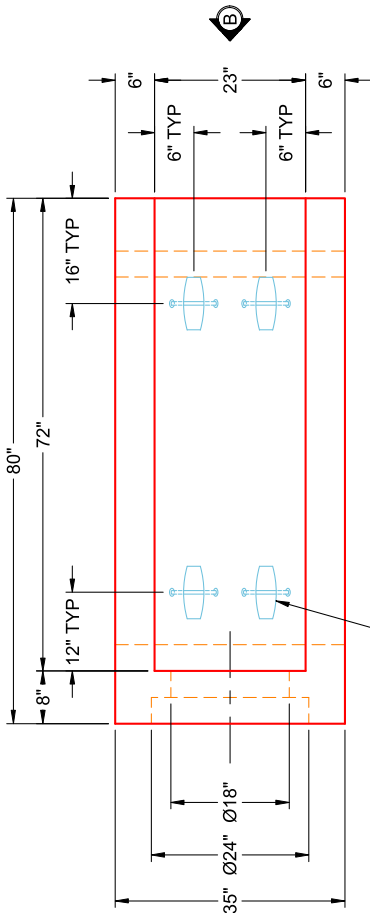
**Structure ID: HW 12 (10)**

**P1 HWTDOT3-1TU18**

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

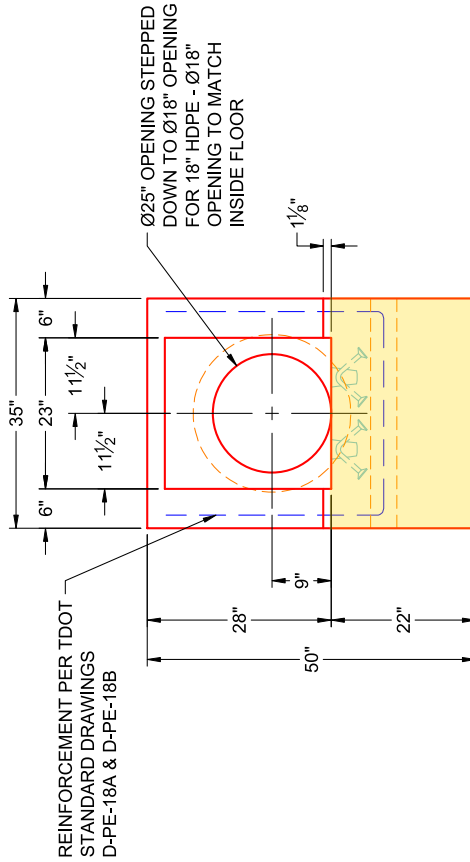
**GENERAL NOTES:**

- PER TDOT D-PE-18 SPECIFICATIONS
- CONCRETE: 4,500 PSI AT 28 DAYS
- REINFORCEMENT: PER TDOT STANDARD DRAWINGS D-PE-18A & D-PE-18B
- WEIGHT: 3,375 LBS  
 - FIRST POUR: 2,010 LBS  
 - SECOND POUR: 1,365 LBS



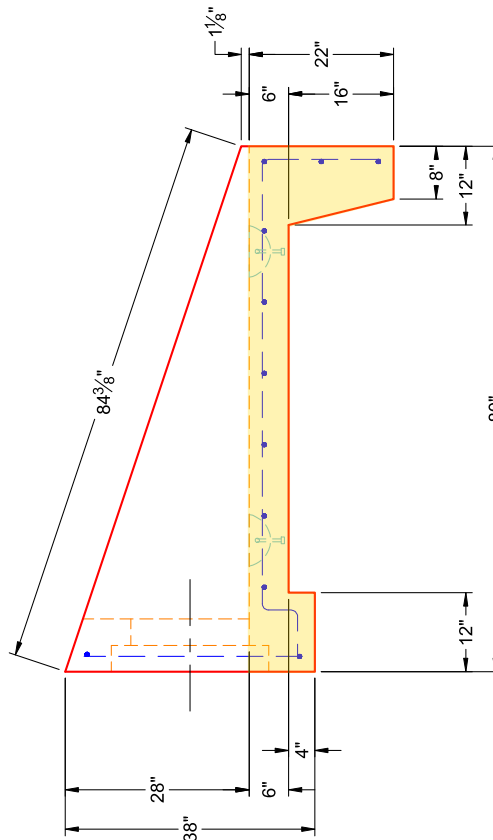
**PLAN VIEW  
(RIGHT SIDE UP)**

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



**VIEW B  
(RIGHT SIDE UP)**

REINFORCEMENT PER TDOT STANDARD DRAWINGS D-PE-18A & D-PE-18B

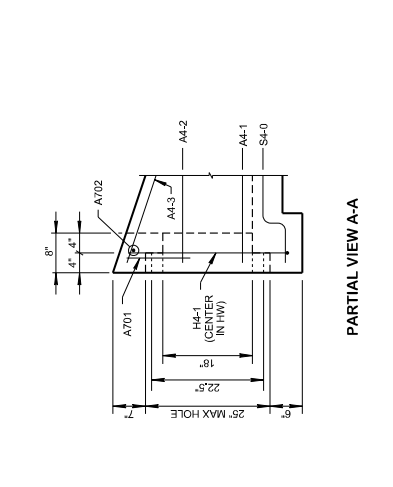


**VIEW A  
(RIGHT SIDE UP)**

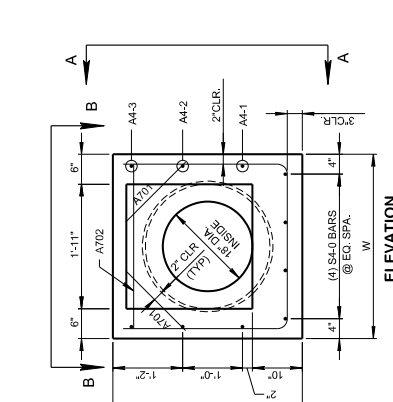
<b>PRODUCTION WORK ORDER</b> QUALITY CONTROL CHECKLIST <input type="checkbox"/> ALL DIMENSIONS CORRECT. <input type="checkbox"/> LIFTERS INSTALLED. <input type="checkbox"/> OPENING CENTERED. <input type="checkbox"/> REINFORCING CORRECT. <input type="checkbox"/> SURFACE QUALITY ACCEPTABLE. <input type="checkbox"/> EDGES CHAMFERED. <input type="checkbox"/> ALL PATCHWORK ACCEPTABLE.	PRODUCT I.D.: HWTDOT3-1TU18 PRODUCT VIEW: RIGHT SIDE UP PLANT: BEAVER DAM, KY WEIGHT: 3,375 LBS TOP SECTION JOINT: N / A BASE SECTION JOINT: N / A QC CHECK INITIALS:	DESCRIPTION: 18" TDOT D-PE-18 TYPE "U" CROSS DRAIN EW 3:1 CUSTOMER: PARKER EXCAVATING, LLC PROJECT: GOVERNMENT CENTER STRUCTURE: HW 12 (10) ORDER NO: 25-4566 PE: J.H. ROSS DATE: 04/03/26	DRAWING: K. CARDWELL SCALE: NTS PG. 1 OF 1

THIS DRAWING IS THE PROPERTY OF INFRASTRUCTURE PRECAST, INC. ANY USE OR DUPLICATION OF THIS DRAWING WITHOUT PRIOR AUTHORIZATION IS STRICTLY PROHIBITED.

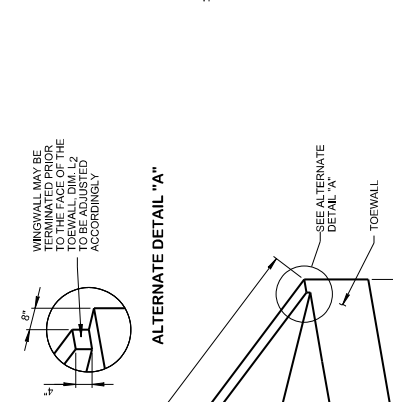
REV. 05-14-13 REVISED NOTES @ ADDED  
 NOTE: @BANK @  
 REV. 14-15: REINFORCED HOLE OPENING  
 SIZE: ADDED STEPPED HOLE DETAIL  
 VIEW, REINFORCED AND REINFORCED SHEET.



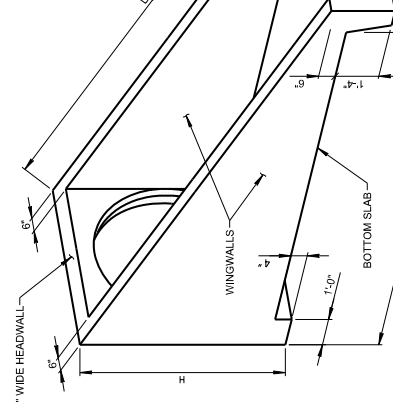
**ISOMETRIC VIEW**  
 NOTE: 3/8\"/>



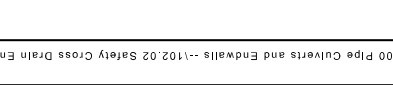
**ALTERNATE DETAIL "A"**  
 WINGWALL MAY BE  
 TOE WALL, DIM. L2  
 TO BE ADJUSTED  
 ACCORDINGLY



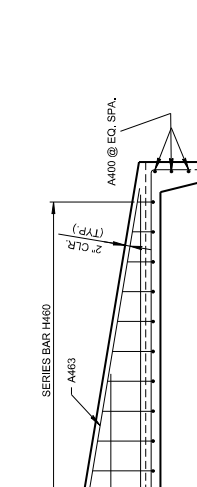
**PARTIAL VIEW A-A**



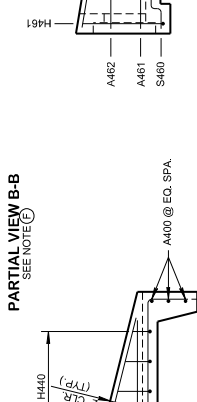
**ELEVATION**  
 25\"/>



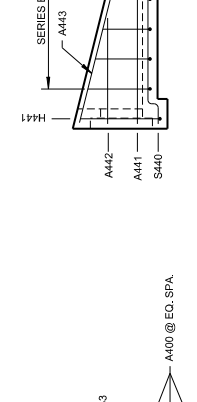
**PARTIAL VIEW B-B**  
 SEE NOTE @



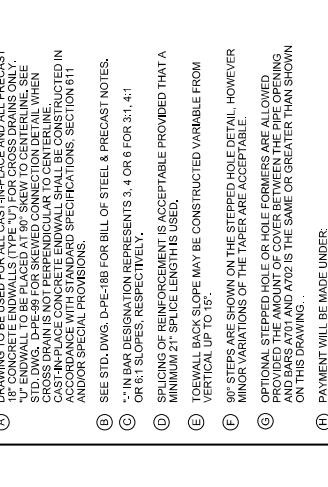
**3:1 WINGWALL ELEVATION**  
 NOTE: A-BARS IN HEADWALL NOT SHOWN FOR CLARITY.



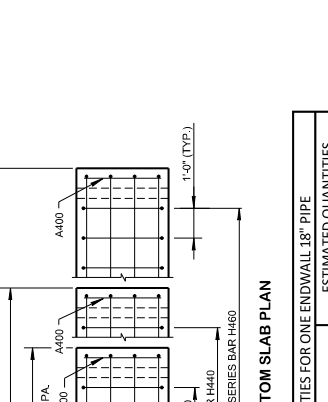
**4:1 WINGWALL ELEVATION**  
 NOTE: A-BARS IN HEADWALL NOT SHOWN FOR CLARITY.



**6:1 WINGWALL ELEVATION**  
 NOTE: A-BARS IN HEADWALL NOT SHOWN FOR CLARITY.

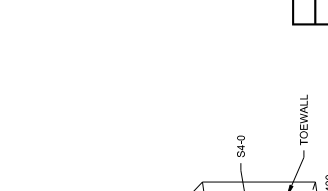


**ISOMETRIC HALF-SECTION  
 SHOWING REINFORCEMENT**  
 (3:1 SHOWN, 4:1 & 6:1 SIMILAR)  
 SEE GENERAL NOTE @



**BOTTOM SLAB PLAN**

SLOPE	CONCRETE ENDWALL DIMENSIONS			ESTIMATED QUANTITIES		
	H	L <sub>1</sub>	L <sub>2</sub>	W	CONC. CU. YD.	STEEL BAR REINF. LB.
3:1	6'-8"	7'-0 3/4"	7'-0 3/4"	2'-11"	0.87	79
4:1	8'-8"	8'-11 1/2"	8'-11 1/2"	2'-11"	1.08	98
6:1	12'-8"	12'-10 1/2"	12'-10 1/2"	2'-11"	1.49	137



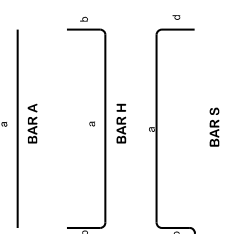
**GENERAL NOTES**

- REINFORCEMENT TO BE USED FOR ALL CAST-IN-PLACE AND ALL PRECAST CONCRETE ENDWALLS (TYPE "U") FOR CROSS DRAIN ONLY. "U" ENDWALL TO BE PLACED AT 90° SKEW TO CENTERLINE. SEE STD. DWG. D-PE-88 FOR SKEWED CONNECTION DETAIL WHEN APPLICABLE. ALL REINFORCEMENT SHALL BE CAST-IN-PLACE CONCRETE ENDWALL SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, SECTION 611 AND/OR SPECIAL PROVISIONS.
- SEE STD. DWG. D-PE-188 FOR BILL OF STEEL & PRECAST NOTES.
- \*\* IN BAR DESIGNATION, REPRESENTS 3, 4 OR 6 FOR 3:1, 4:1 OR 6:1 SLOPES, RESPECTIVELY.
- SPACING OF REINFORCEMENT IS ACCEPTABLE PROVIDED THAT A MINIMUM 2" SPlice LENGTH IS USED.
- TOEWALL BACK SLOPE MAY BE CONSTRUCTED VARIABLE FROM VERTICAL UP TO 15°.
- 90° STEPS ARE SHOWN ON THE STEPPED HOLE DETAIL, HOWEVER MINOR VARIATIONS OF THE TAPER ARE ACCEPTABLE.
- OPTIONAL STEPPED HOLE OR HOLE FORMERS ARE ALLOWED PROVIDED THE AMOUNT OF COVER BETWEEN THE PIPE OPENING AND A702 IS THE SAME OR GREATER THAN SHOWN ON THIS DRAWING.
- PAYMENT WILL BE MADE UNDER:  
 611-07.54 18" ENDWALL (CROSS DRAIN) 3:1 EACH  
 611-07.55 18" ENDWALL (CROSS DRAIN) 4:1 EACH  
 611-07.56 18" ENDWALL (CROSS DRAIN) 6:1 EACH
- THE CONTRACTOR MAY ELECT TO SUBSTITUTE AN APPROVED ALTERNATIVE DESIGN.
- DIMENSIONAL AND REINFORCING TO FINANCES WILL BE AS SHOWN IN STANDARD OPERATING PROCEDURE (SOP) 5-3.

# BILL OF STEEL

CODE NO.	LOCATION	BAR SIZE	3:1 WINGWALL SLOPE				4:1 WINGWALL SLOPE				5:1 WINGWALL SLOPE							
			BENDING DIMENSIONS			NO. REQ'D	BENDING DIMENSIONS			NO. REQ'D	BENDING DIMENSIONS			NO. REQ'D	LENGTH			
			a	b	c	d		a	b	c	d		a	b	c	d		LENGTH
A400	TOEWALL	4	2'-7"	-	-	-	3	2'-7"	-	-	-	3	2'-7"	-	-	-	3	2'-7"
A431	WINGWALLS	4	5'-7"	-	-	-	2	2'-7"	-	-	-	-	-	-	-	-	-	-
A432	WINGWALLS	4	2'-7"	-	-	-	2	2'-7"	-	-	-	-	-	-	-	-	-	-
A433	WINGWALLS	4	6'-0"	-	-	-	2	6'-0"	-	-	-	-	-	-	-	-	-	-
A441	WINGWALLS	4	-	-	-	-	-	7'-5"	-	-	-	2	7'-6"	-	-	-	-	-
A442	WINGWALLS	4	-	-	-	-	-	3'-5"	-	-	-	2	3'-6"	-	-	-	-	-
A443	WINGWALLS	4	-	-	-	-	-	7'-11"	-	-	-	2	7'-11"	-	-	-	-	-
A461	WINGWALLS	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11'-5"
A462	WINGWALLS	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5'-5"
A463	WINGWALLS	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11'-10"
A701	HEADWALL	7	1'-4"	-	-	-	2	1'-4"	-	-	-	2	1'-4"	-	-	-	2	1'-4"
A702	HEADWALL	7	2'-7"	-	-	-	1	2'-7"	-	-	-	1	2'-7"	-	-	-	1	2'-7"
SERIES H430	BOTTOM SLAB & WINGWALL	4	2'-7"	*	-	-	1	25'-10"	-	-	-	-	-	-	-	-	-	-
			* DIMENSION "b" VARIES FROM 1'-11 1/2" TO 0'-7 1/2" IN INCREMENTS OF 0'-4" (5 BARS)															
H431	BOTTOM SLAB & HEADWALL	4	2'-7"	-	-	-	1	7'-10"	-	-	-	-	-	-	-	-	-	-
SERIES H440	BOTTOM SLAB & WINGWALL	4	-	-	-	-	-	2'-7"	*	-	-	1	36'-7 1/4"	-	-	-	-	-
			* DIMENSION "b" VARIES FROM 2'-0 1/2" TO 0'-6 1/2" IN INCREMENTS OF 0'-3" (7 BARS)															
H441	BOTTOM SLAB & HEADWALL	4	-	-	-	-	-	2'-7"	-	-	-	1	7'-10 1/4"	-	-	-	-	-
SERIES H460	BOTTOM SLAB & WINGWALL	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			* DIMENSION "b" VARIES FROM 2'-2 1/2" TO 0'-4 1/2" IN INCREMENTS OF 0'-2" (11 BARS)															
H461	BOTTOM SLAB & HEADWALL	4	-	-	-	-	-	-	-	-	-	1	7'-11 1/2"	-	-	-	-	-
S430	BOTTOM SLAB & TOEWALL	4	5'-7 1/2"	-	-	-	4	8'-1"	-	-	-	-	-	-	-	-	-	-
S440	BOTTOM SLAB & TOEWALL	4	-	-	-	-	-	7'-7 1/2"	-	-	-	4	10'-1"	-	-	-	-	-
S460	BOTTOM SLAB & TOEWALL	4	-	-	-	-	-	0'-4 1/2"	-	-	-	4	14'-1"	-	-	-	-	-
			11'-7 1/2" 0'-4 1/2" 0'-8" 1'-5" 0'-8" 1'-5" 4															

### REINFORCING STEEL LEGEND



### REINFORCING STEEL CODE

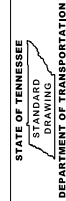
TYPE	SIZE	SERIES
A	5	06

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 UNITS BASED ON THE QUANTITIES FOR CAST-IN-PLACE ENDWALLS IS ACCEPTABLE.
  - PRECAST ENDWALL UNITS WHICH ARE DAMAGED DURING SHIPMENT 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 M170).
  - ADDITIONAL PIPE OPENINGS FOR STEEL FABRICATOR TO MAINTAIN THE INTEGRITY OF THE STRUCTURE DURING HANDLING AND PLACEMENT SHALL BE THE RESPONSIBILITY OF THE FABRICATOR.
  - CONCRETE FILLING FOR JOINTS SHALL BE MINIMUM 17.5% BARS REINFORCING STEEL ASTM A615, F-60,000 POUNDS PER SQUARE INCH.

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED



TYPE "U"  
CROSS DRAIN ENDWALL  
FOR 18" PIPE,  
BILL OF STEEL AND  
PRECAST NOTES

03-01-2012

D-PE-16B



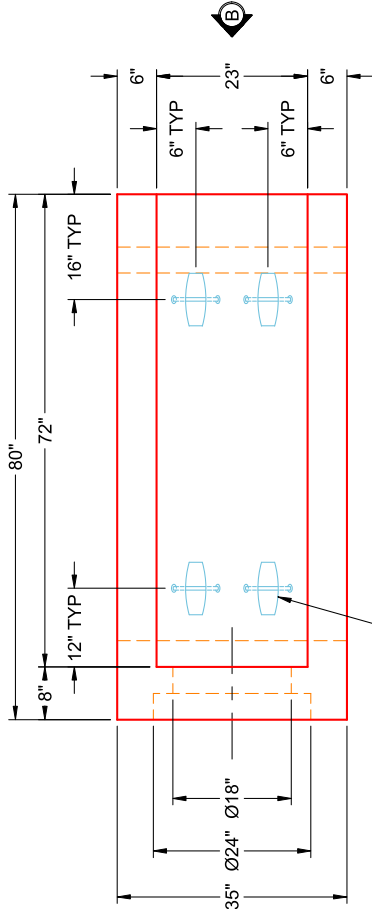
**Structure ID: HW 12 (10)**

**P1 HWTDOT3-1TU18**

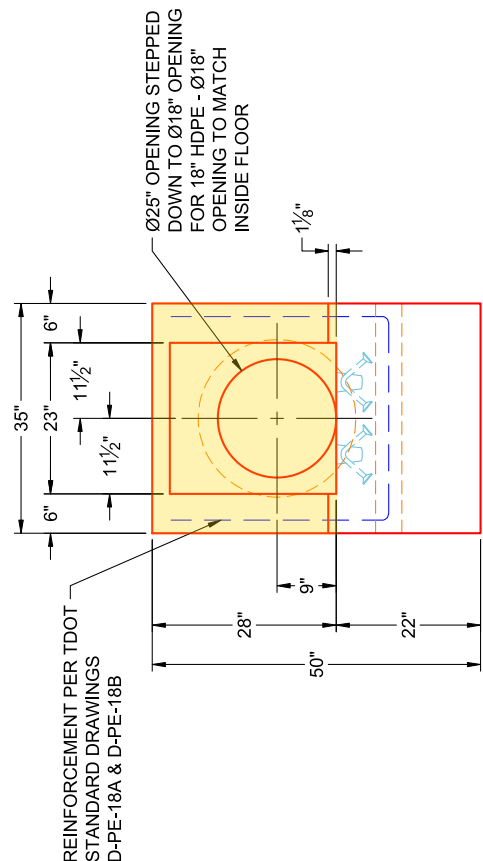
**18" - HW TDOT 3:1 Type U Cross Drain Endwall F/F**

**GENERAL NOTES:**

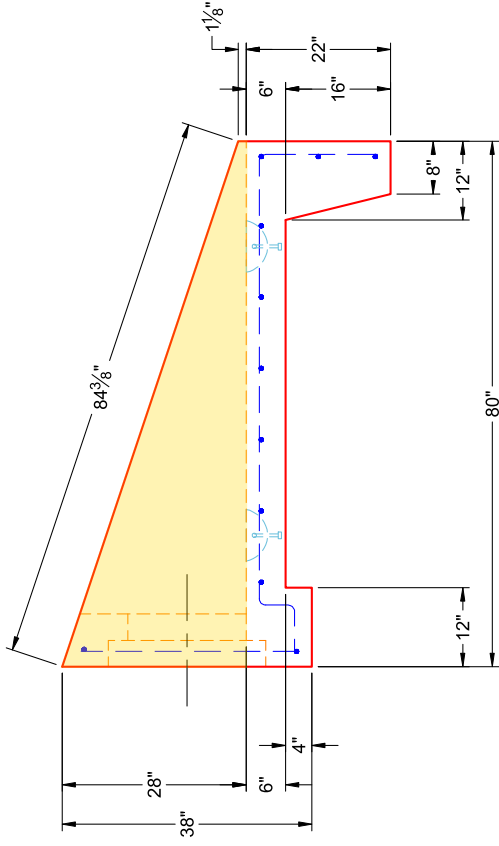
- PER TDOT D-PE-18 SPECIFICATIONS
- CONCRETE: 4,500 PSI AT 28 DAYS
- REINFORCEMENT: PER TDOT STANDARD DRAWINGS D-PE-18A & D-PE-18B
- WEIGHT: 3,375 LBS  
 - FIRST POUR: 2,010 LBS  
 - SECOND POUR: 1,365 LBS



**PLAN VIEW  
(RIGHT SIDE UP)**



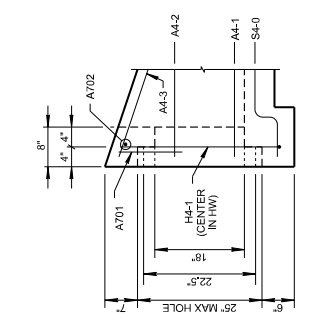
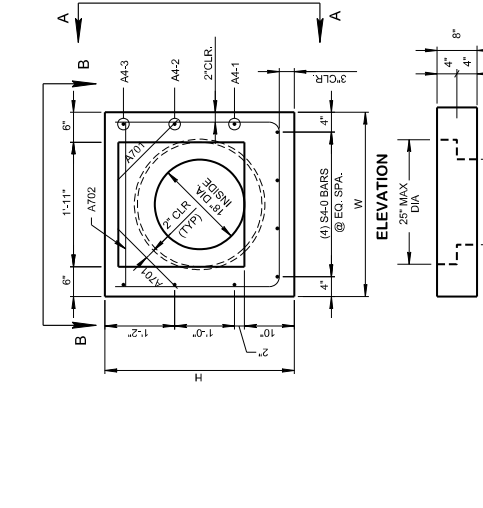
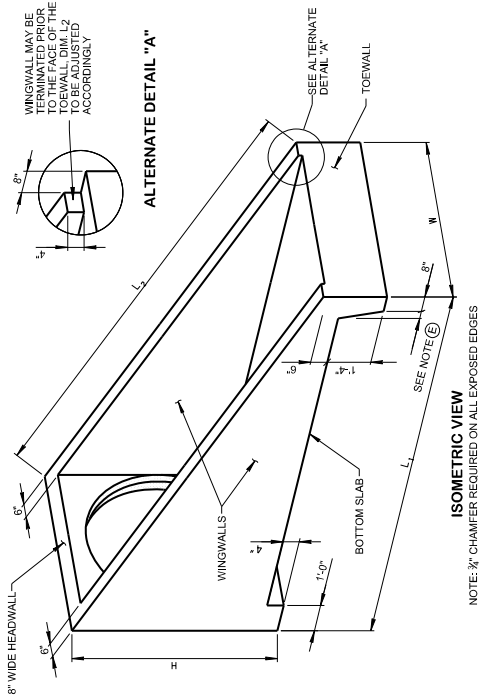
**VIEW B  
(RIGHT SIDE UP)**



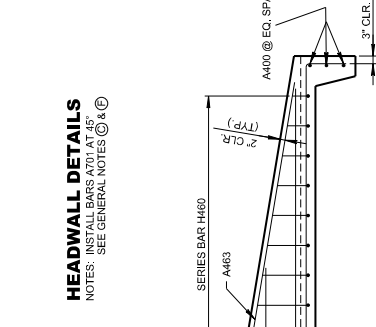
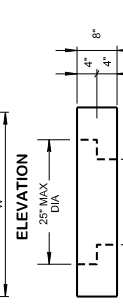
**VIEW A  
(RIGHT SIDE UP)**

<b>PRODUCTION WORK ORDER</b> QUALITY CONTROL CHECKLIST <input type="checkbox"/> ALL DIMENSIONS CORRECT. <input type="checkbox"/> LIFTERS INSTALLED. <input type="checkbox"/> OPENING CENTERED. <input type="checkbox"/> REINFORCING CORRECT. <input type="checkbox"/> SURFACE QUALITY ACCEPTABLE. <input type="checkbox"/> EDGES CHAMFERED. <input type="checkbox"/> ALL PATCHWORK ACCEPTABLE.	PRODUCT I.D.: HWTDOT3-1TU18 PRODUCT VIEW: RIGHT SIDE UP PLANT: BEAVER DAM, KY WEIGHT: 3,375 LBS TOP SECTION JOINT: N/A BASE SECTION JOINT: N/A QC CHECK INITIALS:	DESCRIPTION: 18" TDOT D-PE-18 TYPE "U" CROSS DRAIN EW 3:1 CUSTOMER: PARKER EXCAVATING, LLC PROJECT: GOVERNMENT CENTER STRUCTURE: HW 12 (10) ORDER NO: 25-4566 PE: J.H. ROSS DATE: 04/03/26	DRAWING: K. CARDWELL SCALE: NTS PG. 1 OF 1
		THIS DRAWING IS THE PROPERTY OF INFRASTRUCTURE PRECAST, INC. ANY USE OR DUPLICATION OF THIS DRAWING WITHOUT PRIOR AUTHORIZATION IS STRICTLY PROHIBITED.	

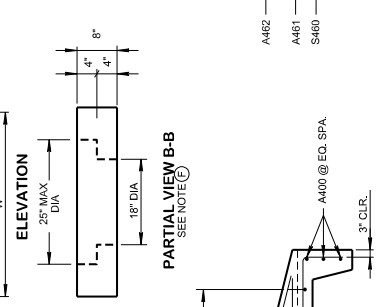
REV. 05-14-13 REVISED NOTES @ ADDED  
 NOTE: @BANK @  
 REV. 14-15: REINFORCED HOLE OPENING  
 SIZE: ADDED STEPPED HOLE DETAIL  
 REV. 05-28-16: ADJUSTED ELEVATION  
 VIEW, REINFORCED AND REINFORCED SHEET.



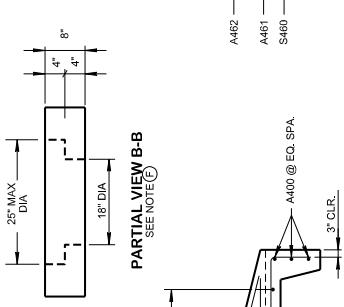
**HEADWALL DETAILS**  
 NOTES: INSTALL BARS A701 AT 45°  
 SEE GENERAL NOTES (C) & (F)



**3:1 WINGWALL ELEVATION**  
 NOTE: A-BARS IN HEADWALL NOT SHOWN FOR CLARITY.



**6:1 WINGWALL ELEVATION**  
 NOTE: A-BARS IN HEADWALL NOT SHOWN FOR CLARITY.

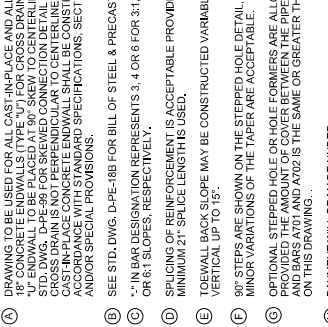
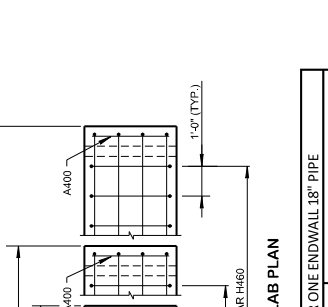


**BOTTOM SLAB PLAN**

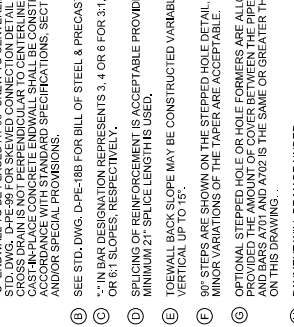
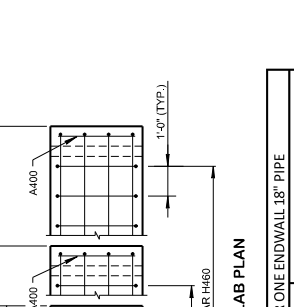
SLOPE	CONCRETE ENDWALL DIMENSIONS			ESTIMATED QUANTITIES		
	H	L <sub>1</sub>	L <sub>2</sub>	W	CONC. CU. YD.	STEEL BAR REINF. LB.
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**GENERAL NOTES**

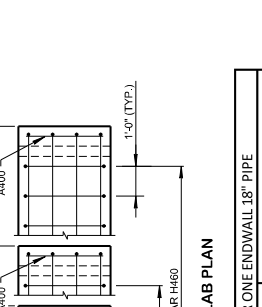
- FORMWORK TO BE USED FOR ALL CAST-IN-PLACE AND ALL PRECAST CONCRETE ENDWALLS (TYPE "U") FOR CROSS DRAIN ONLY. "U" ENDWALL TO BE PLACED AT 90° SKEW TO CENTERLINE. SEE STD. DWG. D-PE-88 FOR SKEWED CONNECTION DETAIL WHEN APPLICABLE. ALL CAST-IN-PLACE CONCRETE ENDWALLS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, SECTION 611 AND/OR SPECIAL PROVISIONS.
- SEE STD. DWG. D-PE-188 FOR BILL OF STEEL & PRECAST NOTES.
- \*\* IN BAR DESIGNATION REPRESENTS 3, 4 OR 6 FOR 3:1, 4:1 OR 6:1 SLOPES, RESPECTIVELY.
- SPACING OF REINFORCEMENT IS ACCEPTABLE PROVIDED THAT A MINIMUM 2" SPlice LENGTH IS USED.
- TOEWALL BACK SLOPE MAY BE CONSTRUCTED VARIABLE FROM VERTICAL UP TO 15°.
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- OPTIONAL STEPPED HOLE OR HOLE FORMERS ARE ALLOWED PROVIDED THE AMOUNT OF COVER BETWEEN THE PIPE OPENING AND A702 IS THE SAME OR GREATER THAN SHOWN ON THIS DRAWING.
- PAYMENT WILL BE MADE UNDER:
  - 611-07.54 18IN ENDWALL (CROSS DRAIN) 3:1 EACH
  - 611-07.55 18IN ENDWALL (CROSS DRAIN) 4:1 EACH
  - 611-07.56 18IN ENDWALL (CROSS DRAIN) 6:1 EACH
- THE CONTRACTOR MAY ELECT TO SUBSTITUTE AN APPROVED ALTERNATIVE DESIGN.
- DIMENSIONAL AND REINFORCING TO FINANCES WILL BE AS SHOWN IN STANDARD OPERATING PROCEDURE (SOP) 5-3.



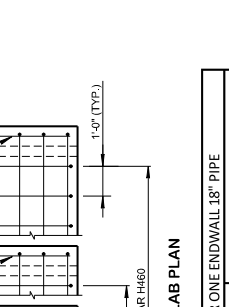
**HEADWALL DETAILS**  
 NOTES: INSTALL BARS A701 AT 45°  
 SEE GENERAL NOTES (C) & (F)



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



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**BOTTOM SLAB PLAN**

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6:1	12'-8"	12'-10 1/2"	12'-10 1/2"	2'-11"	1.49	137

**GENERAL NOTES**

- FORMWORK TO BE USED FOR ALL CAST-IN-PLACE AND ALL PRECAST CONCRETE ENDWALLS (TYPE "U") FOR CROSS DRAIN ONLY. "U" ENDWALL TO BE PLACED AT 90° SKEW TO CENTERLINE. SEE STD. DWG. D-PE-88 FOR SKEWED CONNECTION DETAIL WHEN APPLICABLE. ALL CAST-IN-PLACE CONCRETE ENDWALLS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, SECTION 611 AND/OR SPECIAL PROVISIONS.
- SEE STD. DWG. D-PE-188 FOR BILL OF STEEL & PRECAST NOTES.
- \*\* IN BAR DESIGNATION REPRESENTS 3, 4 OR 6 FOR 3:1, 4:1 OR 6:1 SLOPES, RESPECTIVELY.
- SPACING OF REINFORCEMENT IS ACCEPTABLE PROVIDED THAT A MINIMUM 2" SPlice LENGTH IS USED.
- TOEWALL BACK SLOPE MAY BE CONSTRUCTED VARIABLE FROM VERTICAL UP TO 15°.
- 90° STEPS ARE SHOWN ON THE STEPPED HOLE DETAIL, HOWEVER MINOR VARIATIONS OF THE TAPER ARE ACCEPTABLE.
- OPTIONAL STEPPED HOLE OR HOLE FORMERS ARE ALLOWED PROVIDED THE AMOUNT OF COVER BETWEEN THE PIPE OPENING AND A702 IS THE SAME OR GREATER THAN SHOWN ON THIS DRAWING.
- PAYMENT WILL BE MADE UNDER:
  - 611-07.54 18IN ENDWALL (CROSS DRAIN) 3:1 EACH
  - 611-07.55 18IN ENDWALL (CROSS DRAIN) 4:1 EACH
  - 611-07.56 18IN ENDWALL (CROSS DRAIN) 6:1 EACH
- THE CONTRACTOR MAY ELECT TO SUBSTITUTE AN APPROVED ALTERNATIVE DESIGN.
- DIMENSIONAL AND REINFORCING TO FINANCES WILL BE AS SHOWN IN STANDARD OPERATING PROCEDURE (SOP) 5-3.

MINOR REVISION -- FHWA  
 APPROVAL NOT REQUIRED

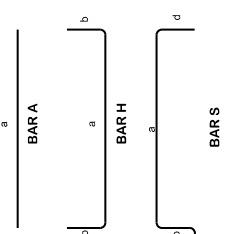
STATE OF TENNESSEE  
 STANDARD  
 DEPARTMENT OF TRANSPORTATION  
**TYPE "U"  
 CROSS DRAIN  
 ENDWALL  
 FOR 18" PIPE**  
 (FOR 3:1, 4:1 & 6:1 SLOPES)

03-01-2012 D-PE-16A

# BILL OF STEEL

CODE NO.	LOCATION	BAR SIZE	3:1 WINGWALL SLOPE				4:1 WINGWALL SLOPE				5:1 WINGWALL SLOPE				
			BENDING DIMENSIONS			NO. REQ'D	BENDING DIMENSIONS			NO. REQ'D	BENDING DIMENSIONS			NO. REQ'D	LENGTH
			a	b	c	d	a	b	c	d	a	b	c	d	LENGTH
A400	TOEWALL	4	2'-7"	-	-	-	2'-7"	-	-	-	2'-7"	-	-	-	2'-7"
A431	WINGWALLS	4	5'-7"	-	-	-	2'-7"	-	-	-	2'-7"	-	-	-	2'-7"
A432	WINGWALLS	4	2'-7"	-	-	-	2'-7"	-	-	-	2'-7"	-	-	-	-
A433	WINGWALLS	4	6'-0"	-	-	-	2'-7"	-	-	-	2'-7"	-	-	-	-
A441	WINGWALLS	4	-	-	-	-	7'-5"	-	-	-	7'-6"	-	-	-	-
A442	WINGWALLS	4	-	-	-	-	3'-5"	-	-	-	3'-6"	-	-	-	-
A443	WINGWALLS	4	-	-	-	-	7'-11"	-	-	-	7'-11"	-	-	-	-
A461	WINGWALLS	4	-	-	-	-	-	-	-	-	-	-	-	-	11'-5"
A462	WINGWALLS	4	-	-	-	-	-	-	-	-	-	-	-	-	5'-5"
A463	WINGWALLS	4	-	-	-	-	-	-	-	-	-	-	-	-	11'-10"
A701	HEADWALL	7	1'-4"	-	-	-	1'-4"	-	-	-	1'-4"	-	-	-	1'-4"
A702	HEADWALL	7	2'-7"	-	-	-	2'-7"	-	-	-	2'-7"	-	-	-	2'-7"
SERIES H430	BOTTOM SLAB & WINGWALL	4	2'-7"	*	-	-	25'-10"	-	-	-	-	-	-	-	-
			* DIMENSION "b" VARIES FROM 1'-11 1/2" TO 0'-7 1/2" IN INCREMENTS OF 0'-4" (5 BARS)												
H431	BOTTOM SLAB & HEADWALL	4	2'-7"	2'-7 1/2"	-	-	7'-10"	-	-	-	-	-	-	-	-
SERIES H440	BOTTOM SLAB & WINGWALL	4	-	-	-	-	2'-7"	*	-	-	36'-7 1/2"	-	-	-	-
			* DIMENSION "b" VARIES FROM 2'-0 1/2" TO 0'-6 1/2" IN INCREMENTS OF 0'-3" (7 BARS)												
H441	BOTTOM SLAB & HEADWALL	4	-	-	-	-	2'-7"	2'-7 1/2"	-	-	7'-10 1/2"	-	-	-	-
SERIES H460	BOTTOM SLAB & WINGWALL	4	-	-	-	-	-	-	-	-	-	-	-	-	58'-2 1/2"
			* DIMENSION "b" VARIES FROM 2'-2 1/2" TO 0'-6 1/2" IN INCREMENTS OF 0'-2" (11 BARS)												
H461	BOTTOM SLAB & HEADWALL	4	-	-	-	-	-	-	-	-	2'-7"	2'-8 1/4"	-	-	7'-11 1/2"
S430	BOTTOM SLAB & TOEWALL	4	5'-7 1/2"	0'-4 1/2"	1'-5"	4	8'-1"	-	-	-	-	-	-	-	-
S440	BOTTOM SLAB & TOEWALL	4	-	-	-	-	7'-7 1/2"	0'-4 1/2"	0'-8"	1'-5"	4	10'-1"	-	-	-
S460	BOTTOM SLAB & TOEWALL	4	-	-	-	-	-	-	-	-	11'-7 1/2"	0'-4 1/2"	0'-8"	1'-5"	4
			14'-1"												

### 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 SHIPMENT 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 M170).
  - ADDITIONAL PIPE OPENINGS FOR STEEL FABRICATOR TO MAINTAIN THE INTEGRITY OF THE STRUCTURE DURING HANDLING AND PLACEMENT SHALL BE THE RESPONSIBILITY OF THE FABRICATOR.
  - CONCRETE FLOOR JOISTS PER SQUARE INCH MINIMUM AT 25 BARS. REINFORCING STEEL: ASTM A615, F-60,000 POUNDS PER SQUARE INCH.

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED



**TYPE "U"**  
**CROSS DRAIN ENDWALL FOR 18" PIPE, BILL OF STEEL AND PRECAST NOTES**