Standards Committee
Meeting Agenda
Wednesday, July 3, 2024, at 9:00am
Meeting Location: 1900 Kanawha Blvd. E., Building 5, Room 820, Charleston, WV
Also meeting virtually via Google Meet. E-mail distribution includes instruction.

Call to Order

Roll Call of Attendees

Approval of Minutes of 5-1-2024 Meeting

Unfinished Business – Standards discussed at last Committee meeting.

TITLE	Champion
2nd time to Committee. *Design Directive (DD)-202 Field and Office Reviews for Initial Engineering, Preliminary Engineering and Final Design*. DD-202 Plan Distribution Schedule. Updated to add additional Traffic Engineering personnel. It is a redline copy showing the revisions. Note: This list isn't required to go through the Standards Committee for updates, but we've included it so that others can provide input or further updates, if needed.	D. Begley
2nd time to Committee. *Structure Directive (SD)-1045 Foundation Types*. Updates the approval requirements of Intermediate Geomaterial. It is a redline copy showing the revisions.	R. Scites

New Business

TITLE	Champion
1st time to Committee. *Standard Drainage Details.* Inlet and Manhole details with a 6" thickness. They have 28-day strengths of 5000 psi and include a note (12) which is their version of, "Flow of outlet pipe shall match bottom elevation of inlet."	A. Gillispie

Next Meeting Date: Wednesday, September 4, 2024.
Deadline for submissions: August 14, 2024.

Adjournment

DD-202 PLAN DISTRIBUTION SCHEDULE

May 1, 2024

DIVISION/AGENCY	ELECTRONIC SUBMITTAL	LABEL	DESIGN REP.		CONTRACT PLAN DEVELOPMENT PROJECTS (Note 1)												
			FIELD REV.	OFFICE REV.	RW-1	PREL. FIELD REV.	RW-1 & RW-2 Comb.	SPAN ARR.	SLOPE REV.	COMB. TS&L	RW-2	FINAL FIELD REV.	RW-3	REV. RW-3 (Note 2)	FINAL OFFICE REV.	FINAL DET. BRIDGE PLANS	Half-Size PS&E Plans
FHWA (concurrence & nonexempt projects) Area Engineers	FHWA Area Engineers	FHWA-Area	C,X	C,X	R	C,X	R	C	C,X	C	R	C,X			C,X,S,W	C,S,W	C,X,S,W
ROW Section	Jeffrey.Robinette@dot.gov	FHWA-R/W	N	N		N						N			N		
Division Bridge Engineer	Bert.Buchanan@dot.gov	FHWA-Br.						C		C						C,S,W	C,S,W
Engineering Division Engineering Division	Raymond.J.Scites@wv.gov David.P.Bodnar@wv.gov	DD	C,X	C,X		C,X		C	N	N		N	N		N	N	
Roadway	Feras.Tolaymat@wv.gov Dirar.M.Ahmad@wv.gov	DDR/DDI(Road.	C,X	C,X	R	C,X	R	C	C,X	C	R	C,X	R	R	C,X,S,W	C,S,W	C,X,S,W
PS&E	Michael.Carter@wv.gov	DDR (PS&E)															C, X, S, W
Bridge Review	Robert.L.Douglas@wv.gov	DDI						C		C		C, X			C,X,S,W	C,S,W	C, X, S, W
Bridge (If applicable)	Tim.A.Hermansdorfer@wv.gov	DDI(Br.)	C	C		C		C		C		C			C,S,W	C,S,W	C,S,W
Right-of-Way (Note 4)	Katrena.J.Parsons@wv.gov	DDR(R/W)			R	N	R				R	N	R,A	R	N		
Consultant Services	Erika.J.Carroll@wv.gov	DDC	C, N	C, N													
Initial Design	Mark.J.White@wv.gov	DDD	C, N	C, N												C	
Traffic Engineering Division Division Director	Ted.J.Whitmore@wv.gov	OS-Design	C	C		C						C					
Design	Rubina.Tabassum@wv.gov	OS-Design	C	C		C				C		C			C		C
Operations		OS-Operations	C	C		~~C~~						C					
Safety	Donna.J.Hardy@wv.gov	OS-Safety	C	C		C						C					
Traffic Services	Danny.G.Young@wv.gov	OS-Traffic Servi										C					
Technical Support Division Geotechnical	Mark.A.Nettleton@wv.gov	DSG	C,X	C,X		C,X		C	C,X	C		C,X			C,X	C	
Environmental	Ben.L.Hark@wv.gov	DSE	C	C		C,X		C		C		C,X			C,X	C	C
Permitting	~~Jessica.J.Boggs@wv.gov~~	DSE	C	C		C		C		C		C			C	C	
Publications Section	~~Steve.D.Boggs@wv.gov~~	DSP													C, N,S	C, N,S	C
Right-of-Way Division Division Director	Chad.J.Toney@wv.gov	DR	N	N	N	N	N				N	N	N	N	N		
Estimator		DR-Est.	C	C		C						C,X			C		
Utilities	Sarah.L.Runyon@wv.gov	DR(Util.)	C	C		C				C		C			C		
Contract Administration Division	Shawn.A.Smith@wv.gov	FC				C,X		C		C		C,X			C,X,S,W	C,S,W	C,X,S,W
Materials Control, Soils, Testing Div.	Ron.L.Stanevich@wv.gov	FM													C,S	C,S	
Programming Division	Kenneth.T.Given@wv.gov	PP	C	C		C						C					C, E
Planning Division	Elwood.C.Penn@wv.gov	PR	C	C		C						C					
Chief Engineer Construction	Stephen.T.Rumbaugh@wv.gov	HF	C, N	C, N		N						N			N		N
Chief Engineer Development	Jason.C.Foster@wv.gov	HD	C, N	C, N		N						N			N		N
Chief Engineer Operations	Joseph.M .Pack@wv.gov	HO	N	N		N			N			N			N		
Operations Division	Stephen.G.Johnson@wv.gov	OM				N						N			N		
District District Engineer/Manager	Division of Highways Districts	D#-E/M	C,X	C,X		C		C		C		C			C,S,W	C,S,W	
District Development Engineer		D#-Devel	C,X	C,X		C		C		C		C					
Dist. Right-of-Way Agent		D#-R/W	C	C		C						C			C		
Dist. Bridge Eng.(If appl.)		D#-Bridge	C	C		N		C		C		N			N	C,S,W	
Dist. Const. Engineer		D#-Const.				C,X		C		C		C,X			C,X,S	C,S	
Dist. Util. Supervisor		D#-Util.				C						C			C		
Dist. Traffic Engineer		D#-Traffic	C	C								C			C		
DEP-Office of Water Resources	DEP Water Resources Map	DEP-OWR	C	C		C,X						C,X					
DNR Wildlife Resources	DNR Wildlife Resources Map	DNR-WR	2C	2C		2C,2X						2C,2X					
U. S. Army Corps of Engineers	sarah.m.workman@usace.army.mil	US-COE	C	C		C		C		C		C					
Railroad Company (If appl.)	Sarah.L.Runyon@wv.gov	DDR-RR	4C,4X			4C,4X				4C		4C,4X			4C,4X	4C	
Utility Companies Encountered	Utility Contact List	Util. Co. Name				C,X						C,X			C,X		
Other Appropriate Agencies			C	C		C						C			C	C	
Commissioner's Office of Econ. Dev.	Perry.J.Keller@wv.gov	CD	C	C		C											

NOTE 1 : **C** = Const. plans or Design Report; **R** = R/W plans; **N** = Notification by PM; **X** = Cross sections; **S** = Project-specific special provisions ; **W** = Working-time chart;
E = All electronic plans in CADD format with electronic alignment files on acceptable media; **A** = Copy of asbestos inspection request memo to DDC+A1

NOTE 2: Right of Way Plans (3R) shall include 1R with changes highlighted in red **NOTE 3**: All Corr. "H" & Rt. "9" projects contact CH(CR) for environmental agency distribution list **NOTE 4**: Submit in PDF format

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

STRUCTURE DIRECTIVE 1045
FOUNDATION TYPES
~~*May 4, 2022*~~ *May 1, 2024*
~~*First Edition*~~ *Superseded May 4, 2022*

All feasible foundation types must be considered in the preliminary phases of the project. The WVDOH's policy is to find all new bridge foundations on rock. However, bridges may be allowed to be supported on Intermediate Geomaterial (IGM) at the ~~discretion of the Geotechnical Engineer~~ approval of the State Bridge Engineer.

1045.1-SPREAD FOOTING

Spread footings have been found to be economical for depths to twenty (20) feet. Preferably, spread footings should be founded on rock. However, spread footing foundations may be supported on Geosynthetic Reinforced Soil-Integrated Bridge Systems or MSE retaining wall backfill where allowed by the State Bridge Engineer.

In situations where a cofferdam may be required for the construction of a spread footing, the cost of the cofferdam shall be included when comparing foundation options. Spread footing foundations shall be placed below the scour depth. Other concerns to consider include the stability of approach embankments, differential settlement, etc.

1045.2-PILING

Piling must be designed for both axial and lateral loads as appropriate. As a minimum, piling shall be sized using a wave equation program such as GRLWEAP. Loads may include external (non-structure related) as well as structural loads. For example, pile foundations might be used to enhance stability of the approach embankment if the embankment factor of safety is questionable.

Piling to competent rock will normally be designed as end bearing and driven to refusal. Additional loading from negative skin friction (downdrag forces), resulting from embankment settlement, must be added to that from structural loads and any other external loads. Battered piles may be required to help resist lateral loads but shall be avoided wherever possible. Pile tips shall be used for refusal on rock. The cost for pile tips shall be included in the cost estimate for the pile foundation.

With permission of the ~~Bridge Project Manager~~State Bridge Engineer, friction piles and end bearing piles on non-competent rock strata may be considered when site-specific conditions warrant and when all other concerns (such as settlement or scour) are addressed.

The minimum piling length shall be ten (10) feet. See SD 2120.3 for further discussion.

For integral abutments, ~~single line~~single line piling systems shall be used, predrilled fifteen (15.0) feet deep using one (1.0) foot diameter for soil or two (2.0) foot diameter for rock.

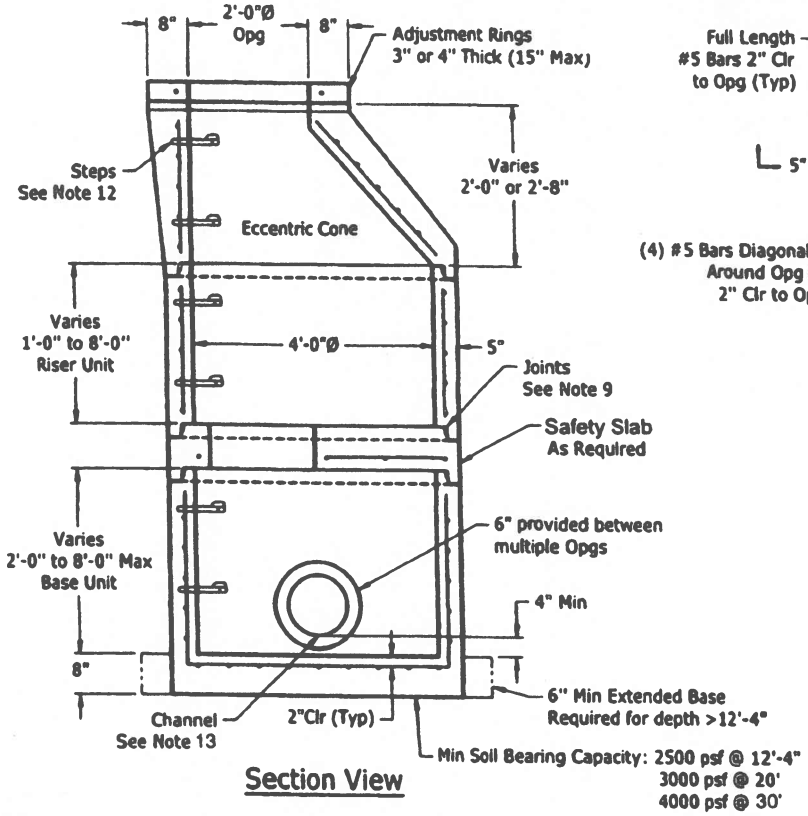
Foundations supported on piling should be placed below the scour depth. When the bridge scour computations indicate that the steel piling may be exposed due to scour, then the piling cap placement must be designed in accordance with SD 2120.3.

1045.3-ROCK SOCKETED DRILLED SHAFTS

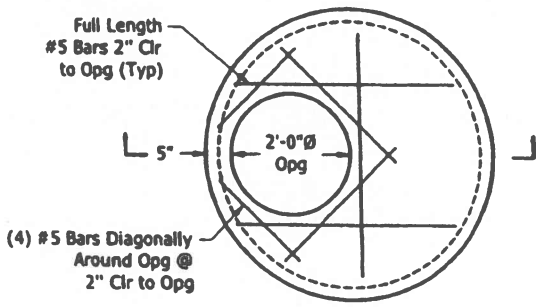
Rock socketed drilled shafts provide superior scour protection versus traditional steel piling, greater resistance against high lateral and uplift loads, and accommodation of site concerns associated with the pile driving process (vibrations, interference due to battered piles, etc.), and in some cases exclude the need of cofferdams. In addition, rock socketed drilled shafts may eliminate the need of caisson caps, for certain configurations such as single or multiple column piers.

Rock socketed drilled shafts shall be designed using soil-structure ~~intersection~~ interaction software such as LPILE. The rock socket length shall be determined as to the second node that crosses the zero-deflection line in the service limit state. For strong rock both end and side resistance can be added directly. For soft rock, such as claystone and soft siltstone, only end resistance shall be used.

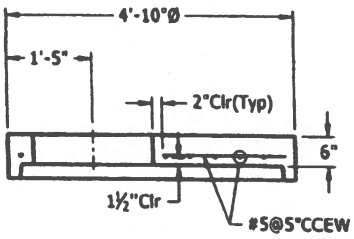
Construction techniques shall be in accordance with the Standard Specifications. These include testing by the Division of: pre-installation core holes, wet or dry hole condition, plumbness, shaft sidewall and bottom cleanliness, and concrete inspection. Results from the testing may require remedial action from the Contractor.



Section View



Plan View
(Precast Flattop Option)



Section View
(Precast Flattop Option)

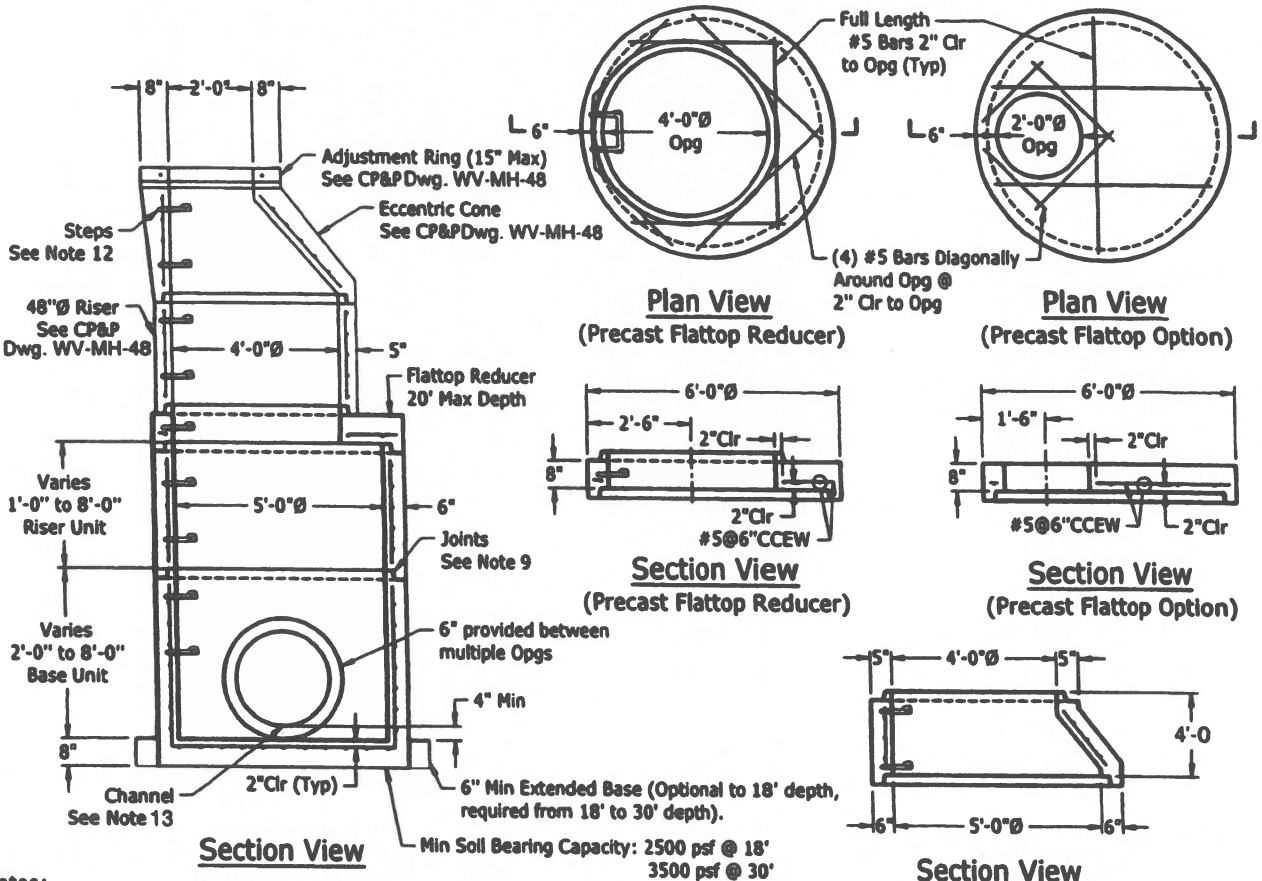
Notes:

1) This design is intended for precast structures produced by CP&P only.
2) Concrete to be 5,000 psi
3) Bar reinforcement conforms to ASTM A615 or A706, Grade 60 min. WWR reinforcement conforms to ASTM A1064, Grade 65 min.
4) Reinforcing: Walls: Min 0.12 in²/ft circumferential steel, Max Spacing 6".
   Base: #4@10" OCEW (max) or WWR 4x4-W6.0xW6.0 to 20' depth; #4@8" OCEW (max) or WWR 4x4-W10.5xW10.5 to 37' depth.
5) Equivalent WWR may be used for rebar shown.
6) Manhole sections meet ASTM C478 / AASHTO M199.
7) Lifting devices provided for handling at manufacturer's discretion.
8) Grade and slope adjustments to be completed in the field by contractor.
9) Joints per manufacturer's design, sealed in field by contractor.
10) Pipe openings to be provided as required. For size, location, and invert elevations refer to construction plans.
11) Knockouts or holes for underdrain connections to be provided and located as directed on construction plans.
12) Step type to be M.A. Industries PS1-PF-DF at 16" spacing, aligned vertically.
13) Invert shaping to be constructed in the field by contractor, channel slopes at 2 in/ft, half depth of pipe. ⚠

WVDOT A MANHOLE
Precast 48" Ø Manhole for up to 24" Pipes

Dwg: WV-MH-48	Review Stamp	Seal for Precast Only
Orig Date: 3/27/24		CYNTHIA R. KING REGISTERED 11880 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER 3/27/24
Last Rev: ---		

CP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005



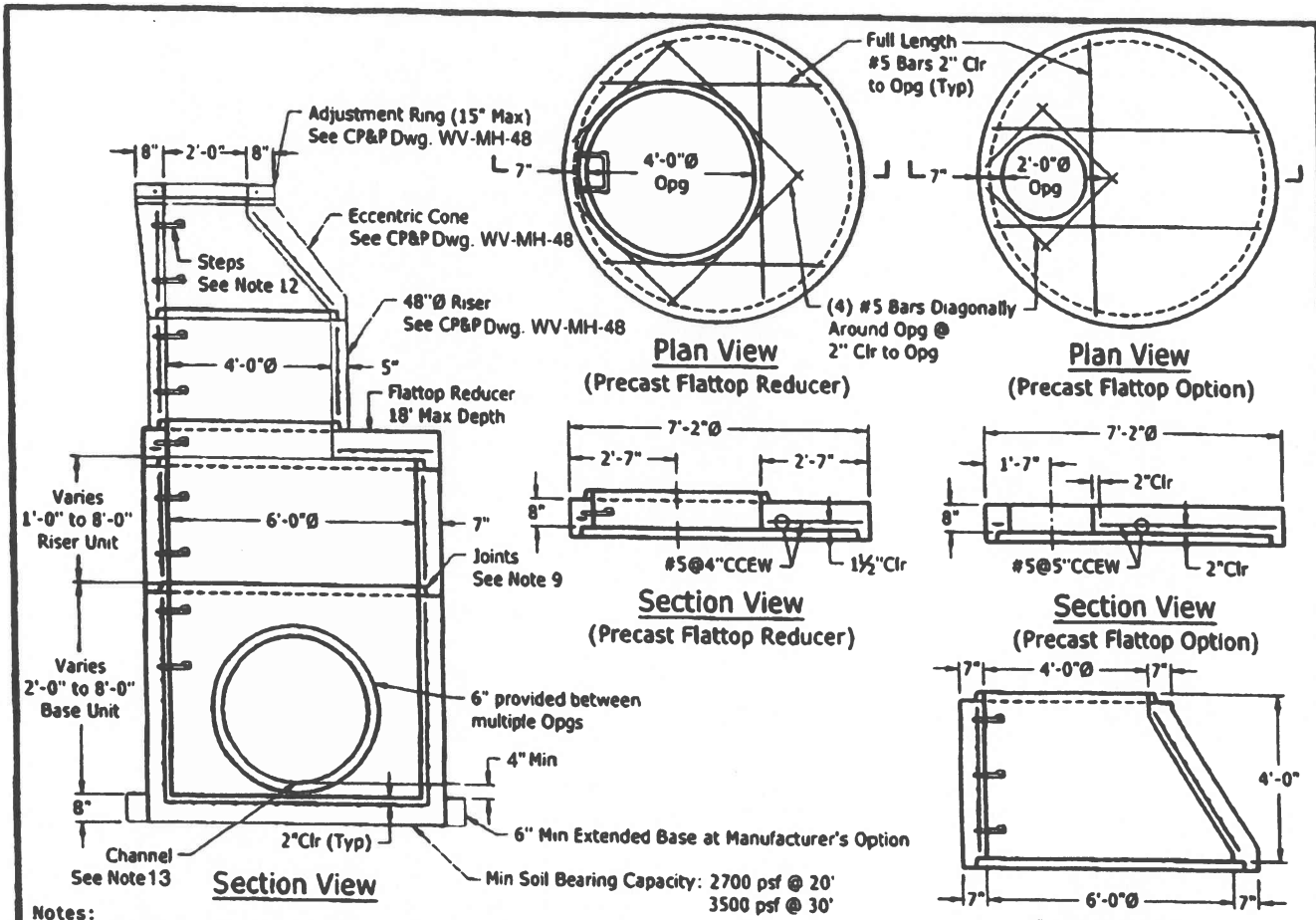
Notes:

1) This design is intended for precast structures produced by CP&P only.
2) Concrete to be 5,000 psi
3) Bar reinforcement conforms to ASTM A615 or A706, Grade 60 min. WWR reinforcement conforms to ASTM A1064, Grade 65 min.
4) Reinforcing: Walls: Min 0.15 in²/ft circumferential steel, Max Spacing 6".
   Base:#4@8" OCEW (max) or WWR 4x4-W10.5xW10.5 to 18' depth; #4@6" OCEW (max) or WWR 4x4-W10.5xW10.5 to 30' depth.
5) Equivalent WWR may be used for rebar shown.
6) Manhole sections meet ASTM C478 / AASHTO M199.
7) Lifting devices provided for handling at manufacturer's discretion.
8) Grade and slope adjustments to be completed in the field by contractor.
9) Joints per manufacturer's design, sealed in field by contractor.
10) Pipe openings to be provided as required. For size, location, and invert elevations refer to construction plans.
11) Knockouts or holes for underdrain connections to be provided and located as directed on construction plans.
12) Step type to be M.A. Industries PS1-PF-DF at 16" spacing, aligned vertically
13) Invert shaping to be constructed in the field by contractor, channel slopes at 2 in/ft, half depth of pipe. ⚠

WVDOT A MANHOLE
Precast 60" Ø Manhole for up to 36" Pipes

Dwg: WV-MH-60	Review Stamp	Seal for Precast Only
Orig Date: 3/27/24		CYNTHIA R. KING REGISTERED 11880 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER 3/27/24
Last Rev: ---		

CP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005



Notes:

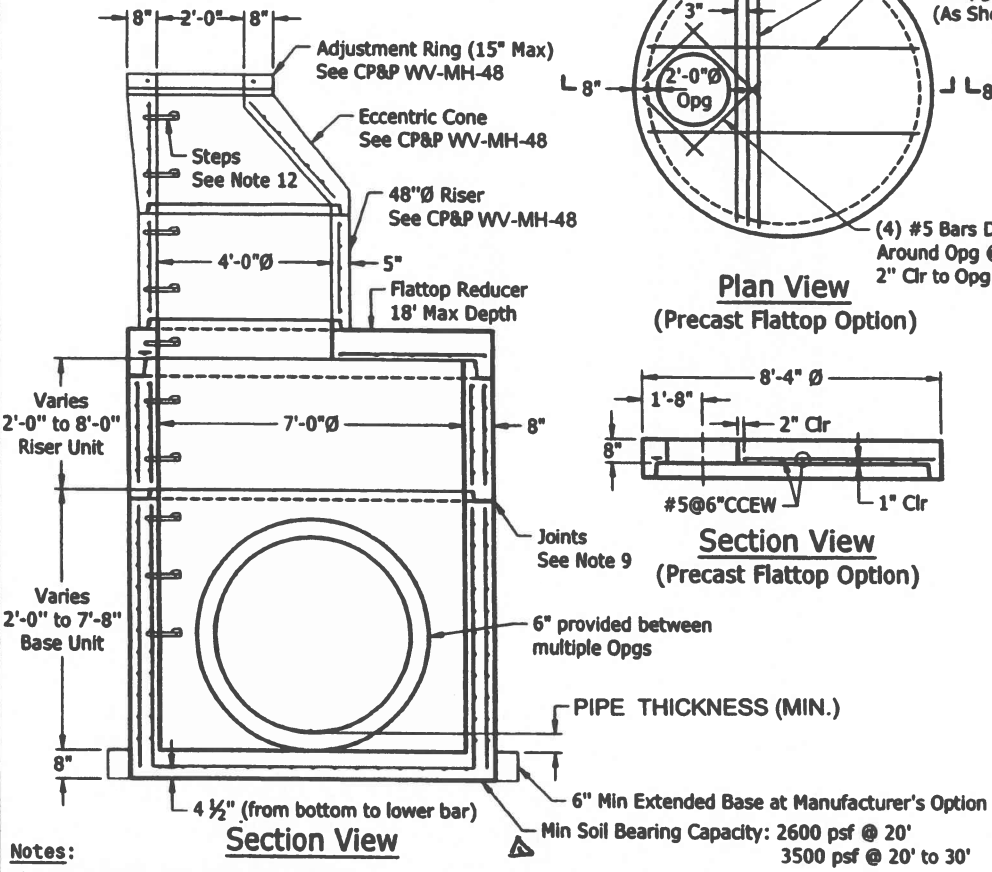
1) This design is intended for precast structures produced by CP&P only.
2) Concrete to be 5,000 psi
3) Bar reinforcement conforms to ASTM A615 or A706, Grade 60 min. WWR reinforcement conforms to ASTM A1064, Grade 65 min.
4) Reinforcing: Walls: Min 0.18 in²/ft circumferential steel, Max Spacing 6".
   Base:#4@6" OCEW or WWR 6x6-D20xW20 to 20' depth; #5@6" OCEW or WWR 6x6-D20xW20 with additional #4@12" OCEW for 20' to 30' depths.
5) Equivalent WWR may be used for rebar shown.
6) Manhole sections meet ASTM C478 / AASHTO M199.
7) Lifting devices provided for handling at manufacturer's discretion.
8) Grade and slope adjustments to be completed in the field by contractor.
9) Joints per manufacturer's design, sealed in field by contractor.
10) Pipe openings to be provided as required. For size, location, and invert elevations refer to construction plans.
11) Knockouts or holes for underdrain connections to be provided and located as directed on construction plans.
12) Step type to be M.A. Industries PS1-PF-DF at 16" spacing, aligned vertically.
13) Invert shaping to be constructed in the field by contractor, channel slopes at 2 in/ft, half depth of pipe. ⚠

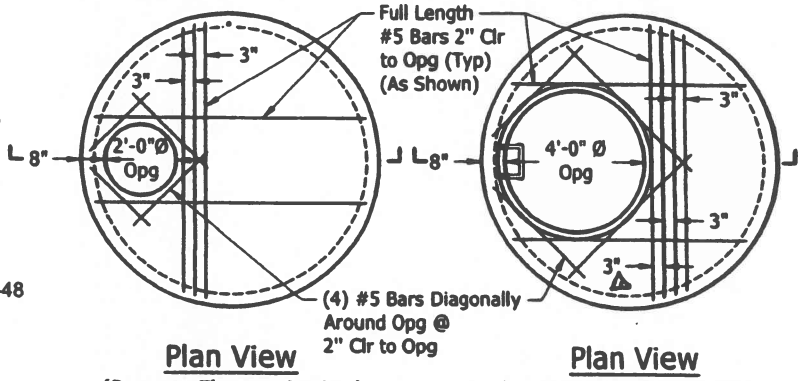
WVDOT A MANHOLE
Precast 72" Ø Manhole for up to 48" Pipes

Dwg: WV-MH-72	Review Stamp	Seal for Precast Only
Orig Date: 3/27/24		
Last Rev: ---		

OCP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005

CYNTHIA R. KING
REGISTERED
11680
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER
3/27/24





Notes:

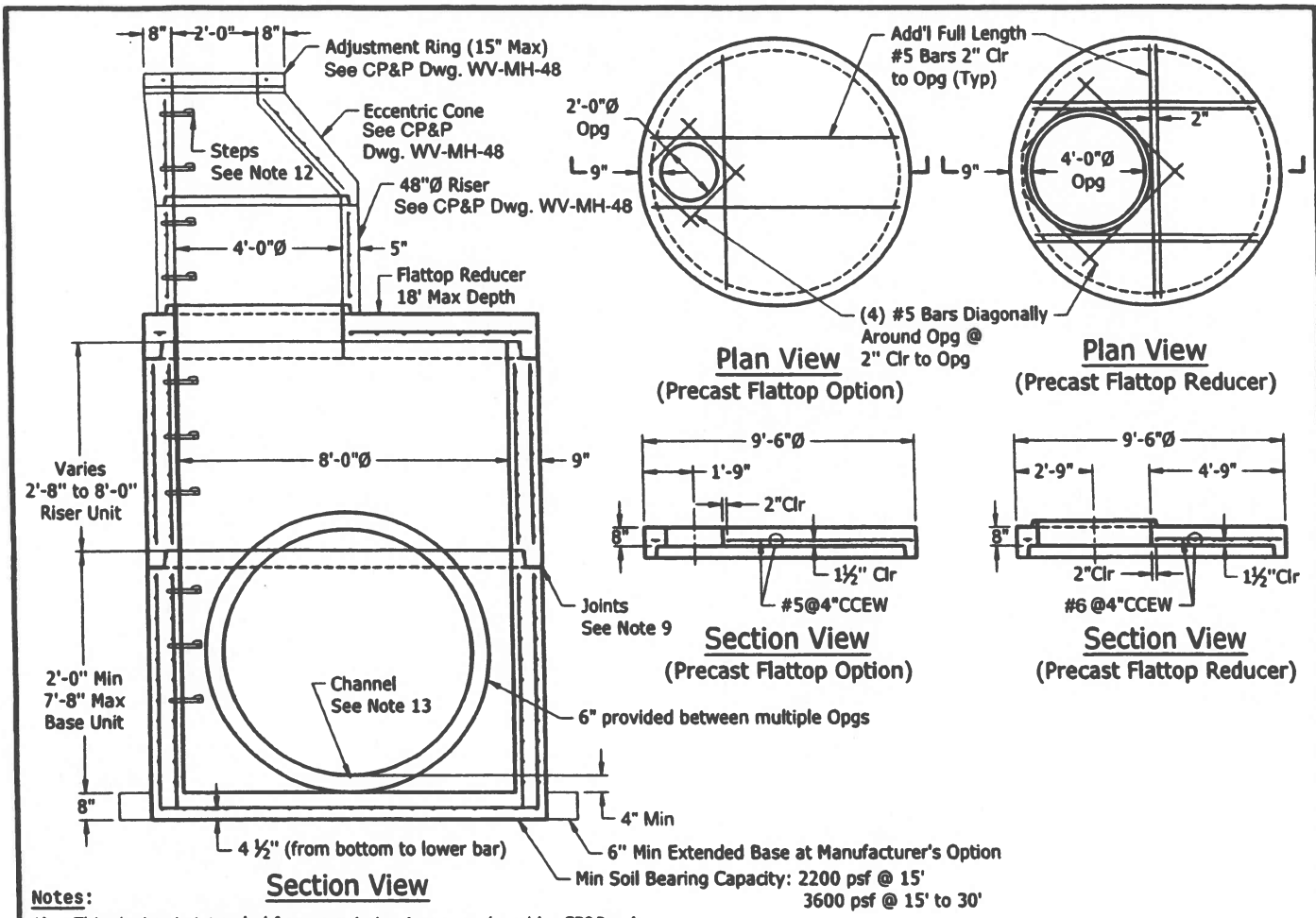
1) This design is intended for precast structures produced by CP&P only.
2) Concrete to be 5000 PSI
3) Bar reinforcement conforms to ASTM A615 or A706, Grade 60 min. WWR reinforcement conforms to ASTM A1064, Grade 65 min.
4) Reinforcing: Walls: Min 0.21 in²/ft circumferential steel, Max Spacing 6".
   Base:#5@6" OCEW for depths to 20' depth; #5@5" OCEW for 20' to 30' depths.
5) Equivalent WWR may be used for rebar shown.
6) Manhole sections meet ASTM C478 / AASHTO M199.
7) Lifting devices provided for handling at manufacturer's discretion.
8) Grade and slope adjustments to be completed in the field by contractor.
9) Joints per manufacturer's design, sealed in field by contractor.
10) Pipe openings to be provided as required. For size, location, and invert elevations refer to construction plans.
11) Knockouts or holes for underdrain connections to be provided and located as directed on construction plans.
12) Step type to be M.A. Industries PS1-PF-DF at 16" spacing, aligned vertically.
13) Invert shaping to be constructed in the field by contractor, channel slopes at 2 in/ft, half depth of pipe. ⚠

WVDOT A MANHOLE
Precast 84" Ø Manhole for up to 60" Pipes

Dwg: WV-MH-84	Review Stamp	Seal for Precast Only
Orig Date: 3/27/24		
Last Rev: ---		

CP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005

CYNTHIA R. KING
REGISTERED
11880
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER
3/27/24



Notes:

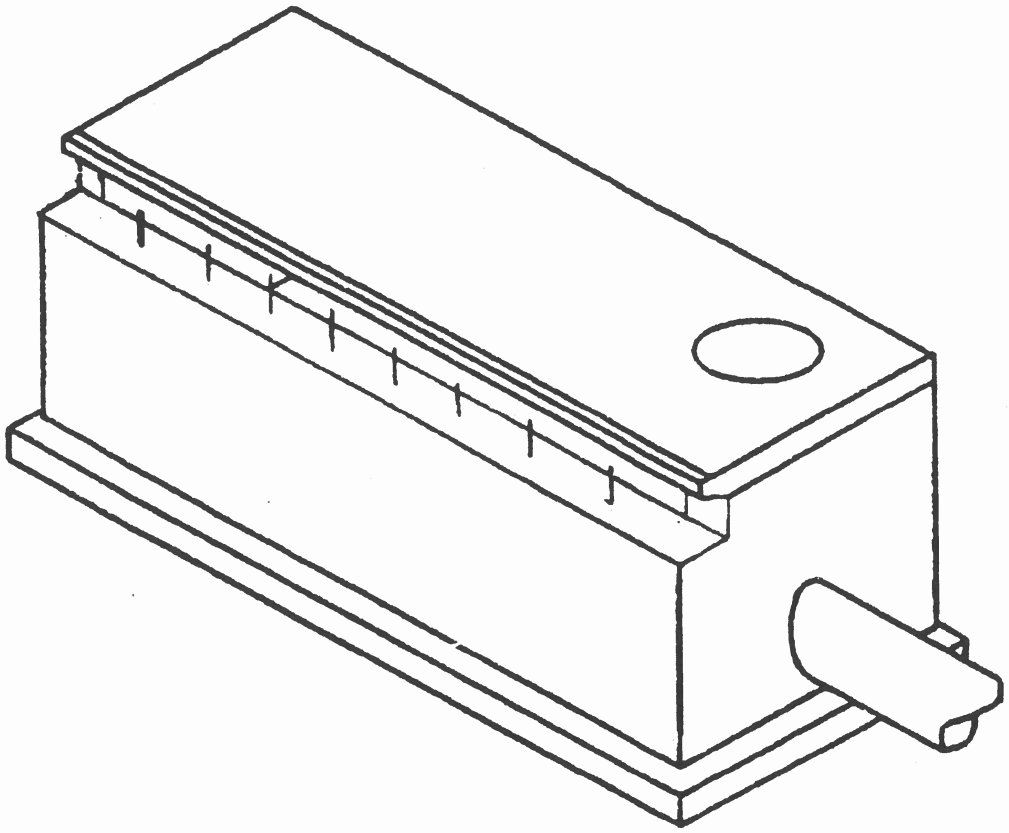
1) This design is intended for precast structures produced by CP&P only.
2) Concrete to be 5,000 psi
3) Bar reinforcement conforms to ASTM A615 or A706, Grade 60 min. WWR reinforcement conforms to ASTM A1064, Grade 65 min.
4) Reinforcing: Walls: Min 0.24 in²/ft circumferential steel, Max Spacing 6".
   Base: #5@5" OCEW or #6@7" OCEW to 15' depth; #5@3" OCEW or #6@5" OCEW for 15' to 30' depths.
5) Equivalent WWR may be used for rebar shown.
6) Manhole sections meet ASTM C478 / AASHTO M199.
7) Lifting devices provided for handling at manufacturer's discretion.
8) Grade and slope adjustments to be completed in the field by contractor.
9) Joints per manufacturer's design, sealed in field by contractor.
10) Pipe openings to be provided as required. For size, location, and invert elevations refer to construction plans.
11) Knockouts or holes for underdrain connections to be provided and located as directed on construction plans.
12) Step type to be M.A. Industries PS1-PF-DF at 16" spacing, aligned vertically.
13) Invert shaping to be constructed in the field by contractor, channel slopes at 2 in/ft, half depth of pipe.

WVDOT A MANHOLE
Precast 96" Ø Manhole for up to 72" Pipes

Dwg: WV-MH-96	Review Stamp	Seal for Precast Only
Orig Date: 3/27/24		
Last Rev: ---		
UID:		

CP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005

CYNTHIA R. KING
REGISTERED
11880
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER
3/27/24



Notes:

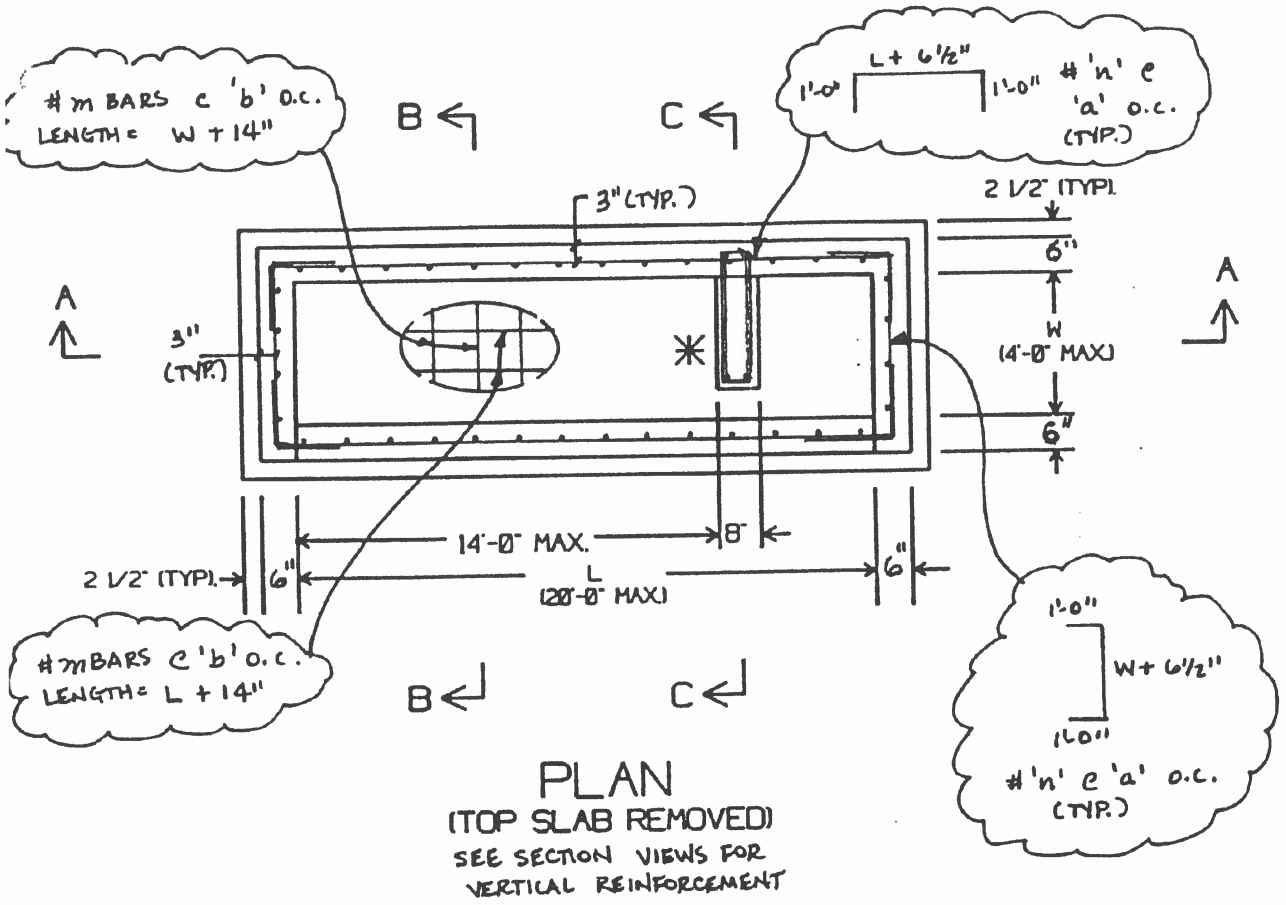
1. **Minimum Concrete Compressive Strength to be 5000 psi.**
2. **Rebar to be ASTM A706 or A615, Grade 60.**
3. **Steps provided when height is 4'-0" or greater.**
4. **Gutter Pan/ Throat Face to be poured in field by others.**
5. **Out pipe has a 4" minimum sump.**
6. **Invert shaping to be constructed in field by contractor, channel slope at 2 in/ft. half depth of pipe.**

WEST VIRGINIA D.O.T. REF DR6-D
WEST VIRGINIA D.O.T. REF DR6-E

WVDOT TYPE D / E INLET (SHALLOW)

Dwg: **WVDOT SHALLOW D / E INLET**	Review Stamp	Seal for Precast Only
Orig Date: **3/27/24**		
Last Rev:		
UID:		

CP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005



PLAN
(TOP SLAB REMOVED)
SEE SECTION VIEWS FOR VERTICAL REINFORCEMENT

✳ CENTER WALL TO BE USED WHEN THROAT LENGTH EXCEEDS 14'-0". (SEE SEC. C-C).

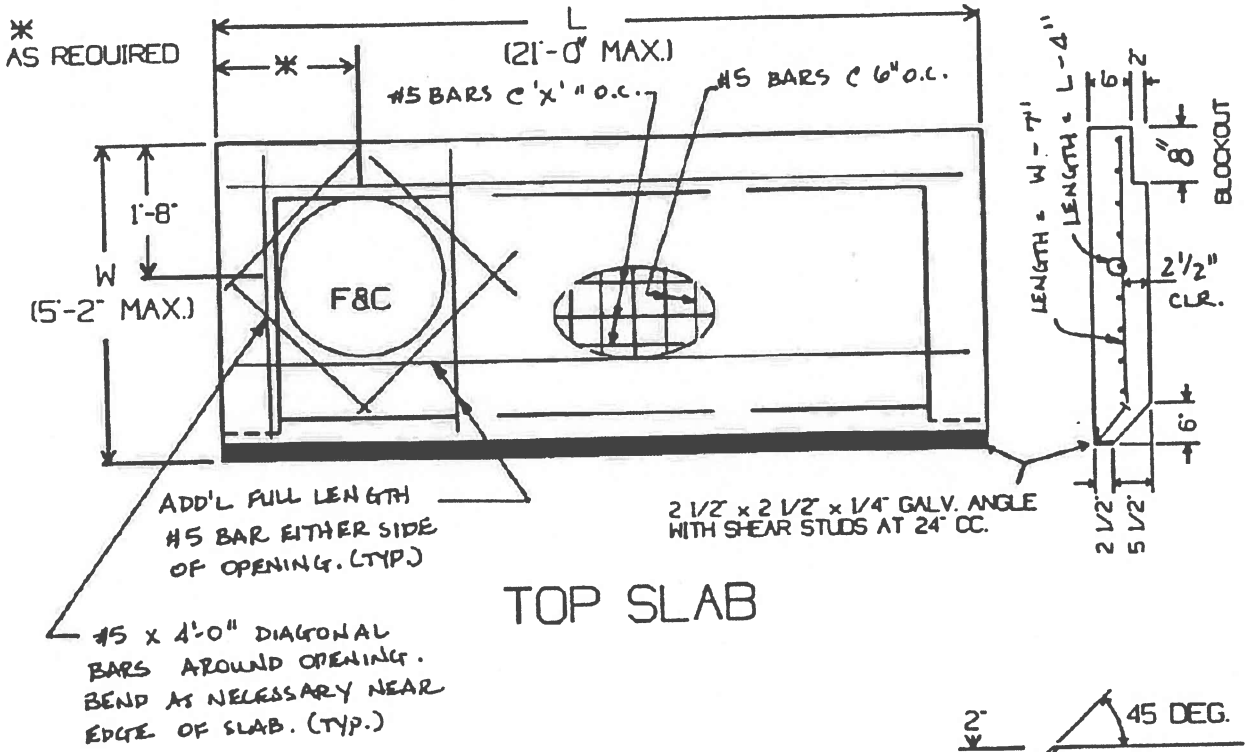
BAR SPACING				
L	Horiz.		Base	
—	n	a	m	b
>16'	5	6"	4	12"
>12'	5	9"	4	12"
>8'	4	9"	4	16"
≤8'	4	14"	4	16"

WEST VIRGINIA D.O.T. REF DR6-D
WEST VIRGINIA D.O.T. REF DR6-E

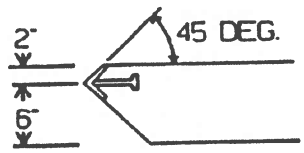
WVDOT TYPE D / E INLET (SHALLOW)

Dwg: WVDOT SHALLOW D / E INLET	Review Stamp	Seal for Precast Only
Orig Date: 3/27/24		
Last Rev:		
UID:		

CP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005



TOP SLAB



Alternate Nosing - 4" Curb Height

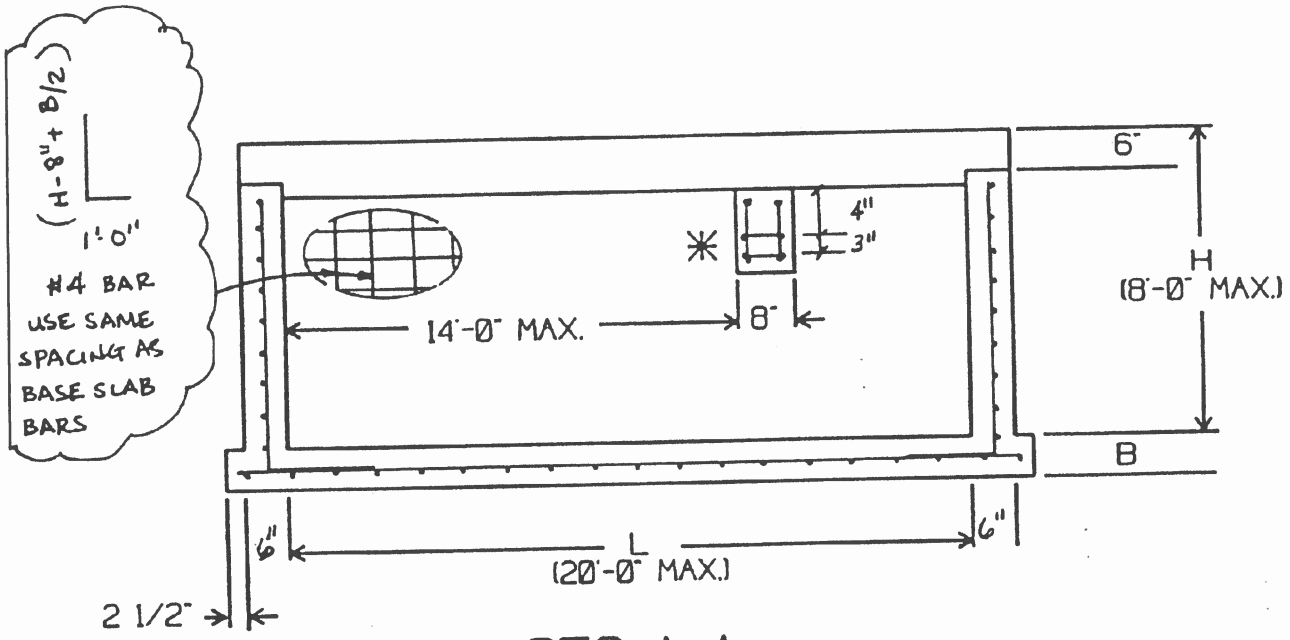
LONGITUDINAL SPACING	
L (ft.)	X (in.)
> 11'	4"
> 8'	6"
> 7'	8"
≤ 7'	10"

WEST VIRGINIA D.O.T. REF DR6-D
WEST VIRGINIA D.O.T. REF DR6-E

WVDOT TYPE D / E INLET (SHALLOW)

Dwg: WVDOT SHALLOW D / E INLET	Review Stamp	Seal for Precast Only
Orig Date: 3/27/24		
Last Rev:		
UID:		

CP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005



SEC A-A

NOTE: PLACE ADD'L VERT. & HOR. BARS ON EITHER SIDE OF OPENINGS. PLACE (2) #5 DIAGONALS AROUND OPENING, BENDING AS NECESSARY NEAR WALL EDGES. DIAGONAL LENGTH TO BE OPENING SIZE + 24".

✳ CENTER WALL TO BE USED WHEN THROAT LENGTH EXCEEDS 14'-0". (SEE SEC. C-C).

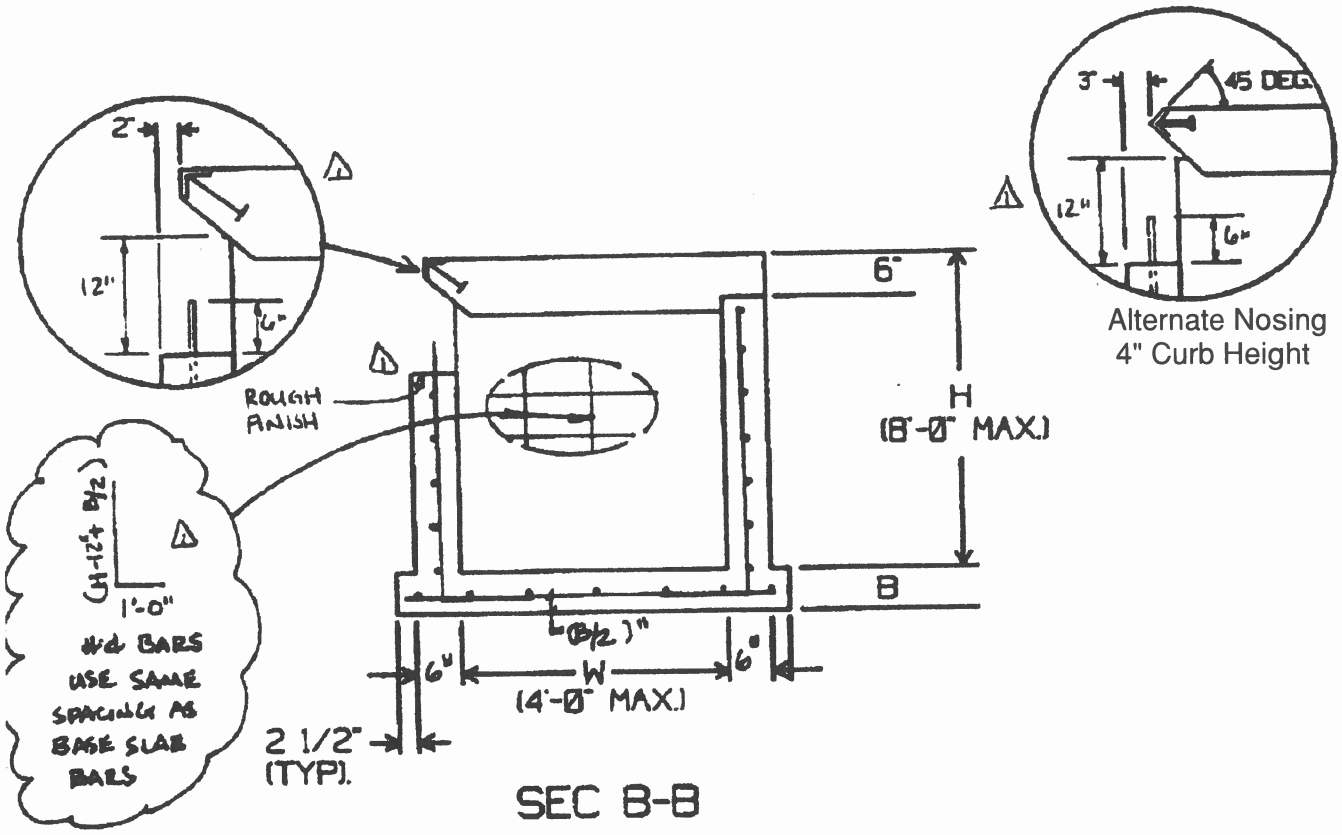
SLAB THICKNESS		
H	L	B
>7'	>14'	8"
>7'	≤14'	6"
≤7'	≤Lmax	6"

WEST VIRGINIA D.O.T. REF DR6-D
WEST VIRGINIA D.O.T. REF DR6-E

WVDOT TYPE D / E INLET (SHALLOW)

Dwg: WVDOT SHALLOW D / E INLET	Review Stamp	Seal for Precast Only
Orig Date: 3/27/24		
Last Rev:		
UID:		

CP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005



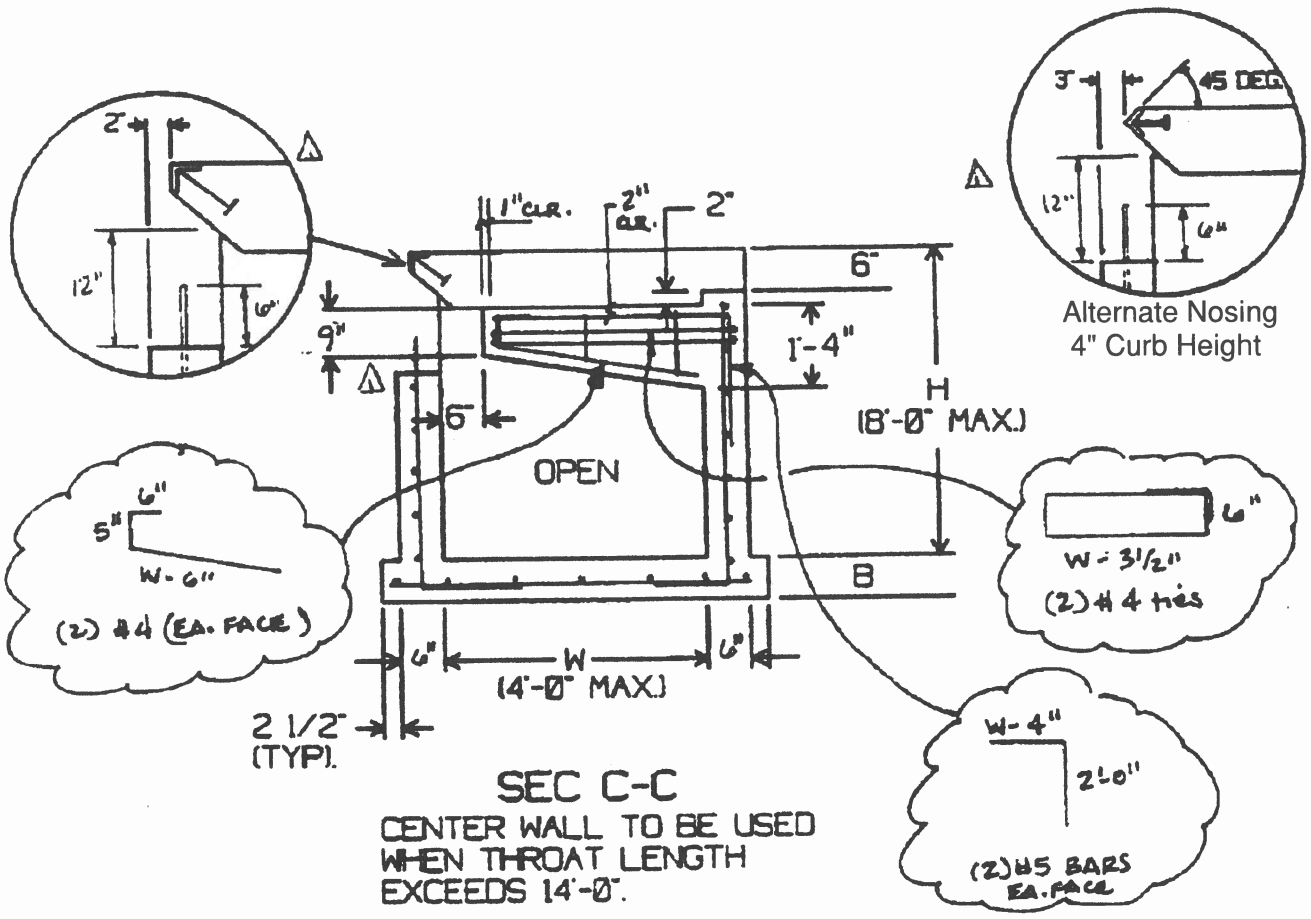
SEC B-B

WEST VIRGINIA D.O.T. REF DR6-D
WEST VIRGINIA D.O.T. REF DR6-E

WVDOT TYPE D / E INLET (SHALLOW)

Dwg: **WVDOT SHALLOW D / E INLET**	Review Stamp	Seal for Precast Only
Orig Date: **3/27/24**		
Last Rev:		
UID:		

CP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005



SEC C-C

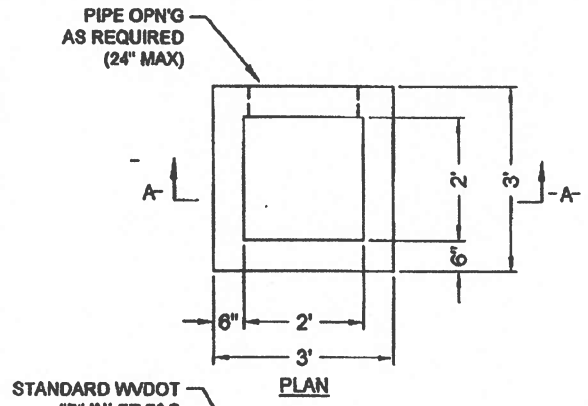
CENTER WALL TO BE USED WHEN THROAT LENGTH EXCEEDS 14'-0".

WEST VIRGINIA D.O.T. REF DR6-D
WEST VIRGINIA D.O.T. REF DR6-E

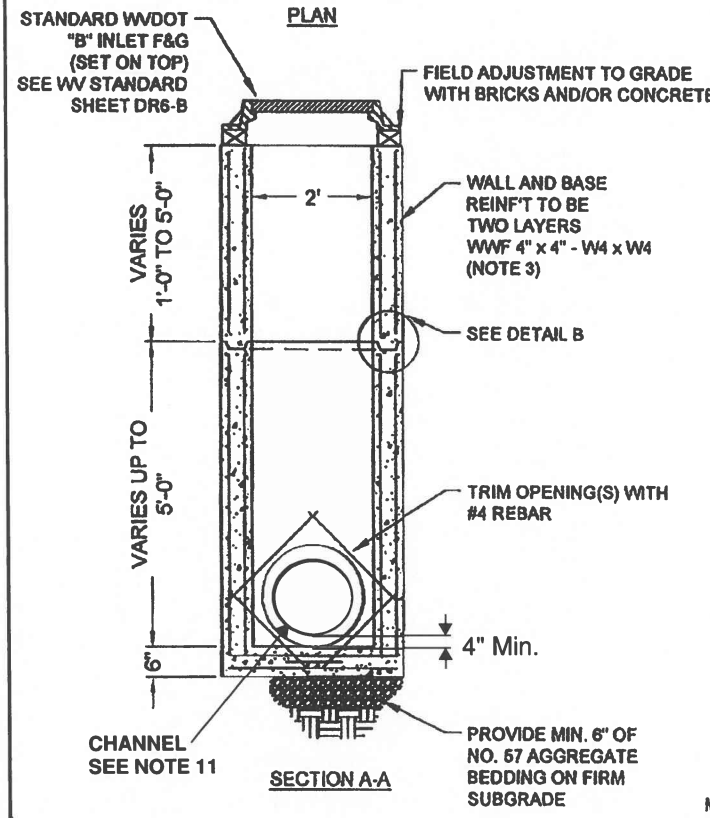
WVDOT TYPE D / E INLET (SHALLOW)

Dwg: WVDOT SHALLOW D / E INLET	Review Stamp	Seal for Precast Only
Orig Date: 3/27/24		
Last Rev:		
UID:		

CP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005



PLAN



SECTION A-A

NOTES:

1. INLET TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C 913.

2. CONCRETE MIX TO BE 5,000 PSI AT 28 DAYS MIN, TYPE II PORTLAND CEMENT.

3. REINFORCING DEFORMED BARS SHALL BE ASTM A-616, GR. 80, AND WELDED WIRE FABRIC REINFORCING IN ACCORDANCE WITH ASTM A185 & A82 GRADE 65. REINFORCING STEEL SHALL HAVE 1 ½" CONCRETE COVER EACH FACE.

4. LIFT HOLES OR LIFT EYES PROVIDED IN EACH SECTION FOR HANDLING ARE TO BE FILLED WITH AN APPROVED NON-SHRINK GROUT OR CONCRETE BY CONTRACTOR AS SPECIFIED (IF APPLICABLE).

5. TRIM ALL OPNE'S IN BASE, WALLS, AND T/S WITH#4 DEFORMED BAR, UNLESS NOTED.

6. ANNULAR SPACE BETWEEN PIPE AND HOLE TO BE FILLED WITH AN APPROVED NON-SHRINK GROUT OR CONCRETE BY CONTRACTOR AS REQUIRED.

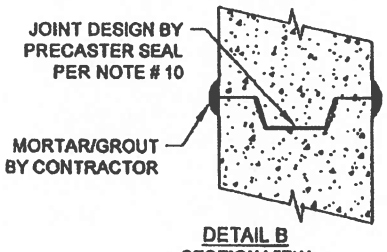
7. PROVIDE BENT CONTINUOUS WWF OR BAR AT WALL CORNERS TO PROVIDE CONTINUOUS HORIZONTAL REINFORCING. BAR LAPS 16 INCHES MINIMUM.

8. THE JOINTS ARE TO BE GROUTEO WITH NON-SHRINK GROUT AND/OR MORTAR, INSIDE AND OUT, AND SEALED BY THE CONTRACTOR TO A WATERTIGHT SEAL. SEAL TO BE ACHIEVED USING NON-SHRINK GROUT, MORTAR, RUBBER GASKETS, ANDIOR BITUMINOUS MASTIC AS REQUIRED 8Y CONTRACT DRAWINGS. RUBBER GASKET SEAL MEETS AASHTO M 188 TYPE B OR ASTM C 361 & ASTM C 443.

9. STANDARD PRECAST MANHOLE(S) ARE DESIGNED FOR LATERAL EARTH PRESSURES IN EXCESS OF 50 FEET OF VERTICAL DEPTH.

10. WEEP HOLES AS REQUIRED.

11. INVERT SHAPING TO BE CONSTRUCTED IN THE FIELD BY CONTRACTOR, CHANNEL SLOPES AT 2 IN/FT, HALF DEPTH OF PIPE.



DETAIL B
SECTION VIEW

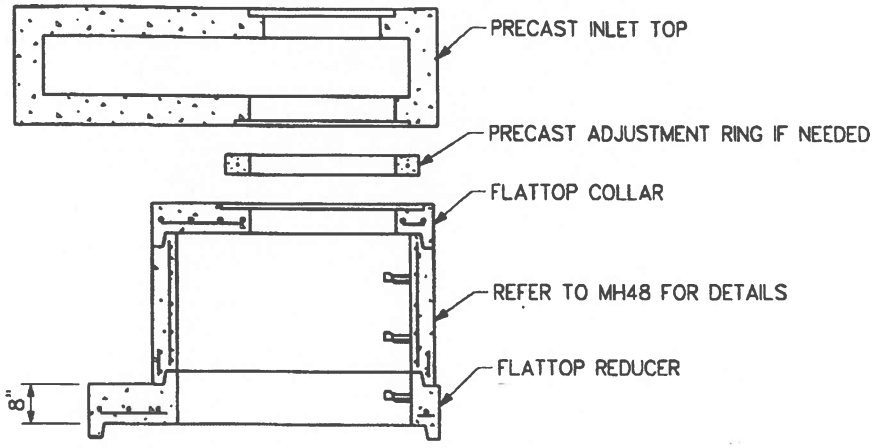
WEST VIRGINIA D.O.T. REF DR6-B

"B" INLET 24"x24" (2'x2')
SQUARE INLET

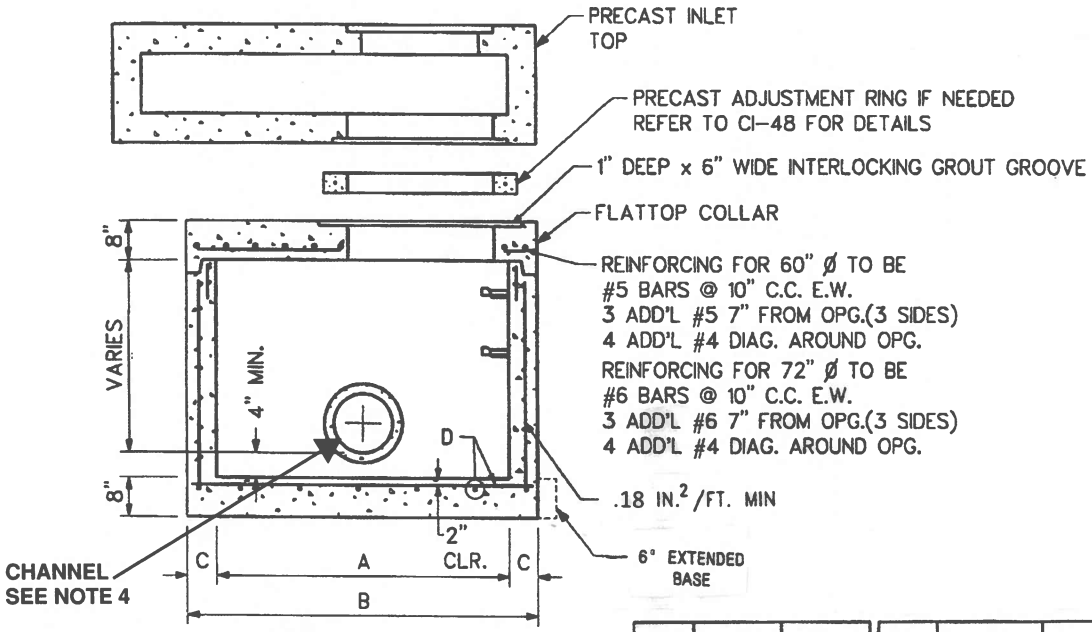
Dwg: "B" INLET 24X24 - WVDOT	Review Stamp	Seal for Precast Only
Orig Date: 3/27/24		
Last Rev:		
UID: BI-24X24		

CP&P

Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005



ALT. REDUCING METHOD DETAIL



SECTION VIEW

DIM	CI-60	CI-72
"A"	60"	72"
"B"	72"	86"
"C"	6"	7"

DIM	CI-60	CI-72
"D"	#5 @ 12" C.C. E.W.	#6 @ 12" C.C. E.W.

Notes:

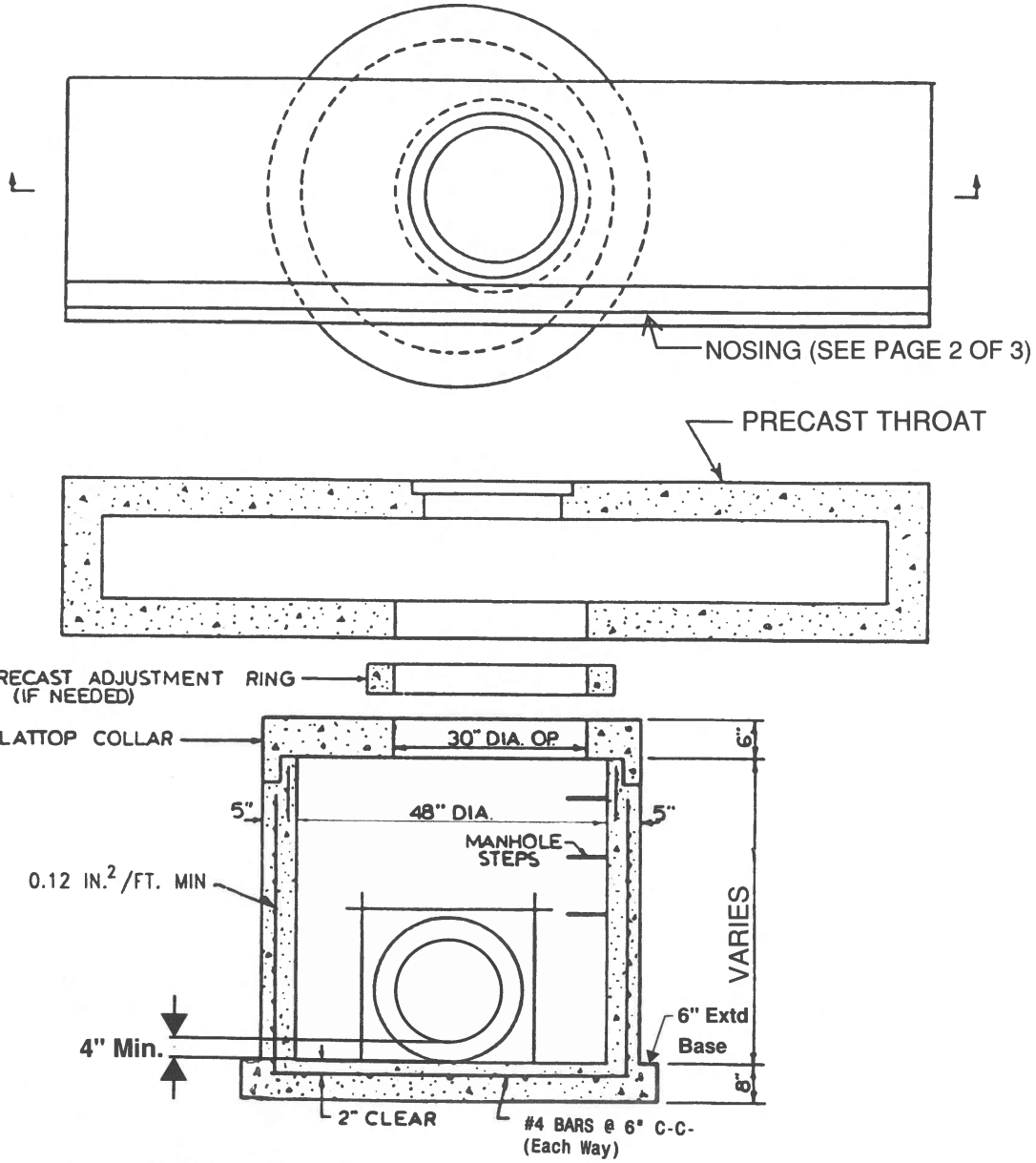
1. **Minimum Concrete Compressive Strength to be 5000 psi.**
2. **Rebar to be ASTM A706 or A615, Grade 60.**
   Welded Wire Reinforement to be ASTM A1064, Grade 65.
3. **Dowel Holes provided to prevent settlement of adjacent concrete.**
4. **Invert shaping to be constructed in field by contractor, channel slope at 2 in/ft. half depth of pipe.**

WVDOT TYPE D / E INLET

WEST VIRGINIA D.O.T. DWG REF DR6-E

Dwg: **WVDOT E-INLET**	Review Stamp	Seal for Precast Only
Orig Date: **3/27/24**		
Last Rev:		
UID:		

CP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005



Notes:

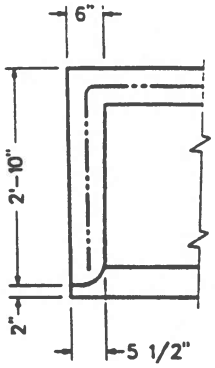
1. **Minimum Concrete Compressive Strength to be 5000 psi.**
2. **Rebar to be ASTM A706 or A615, Grade 60.**
   Welded Wire Reinforement to be ASTM A1064, Grade 65.
3. **Dowel Holes provided to prevent settlement of adjacent concrete.**
4. **invert shaping to be constructed in field by contractor, channel slope at 2 in/ft. half depth of pipe.**

WEST VIRGINIA D.O.T. REF DR6-D
WEST VIRGINIA D.O.T. REF DR6-E

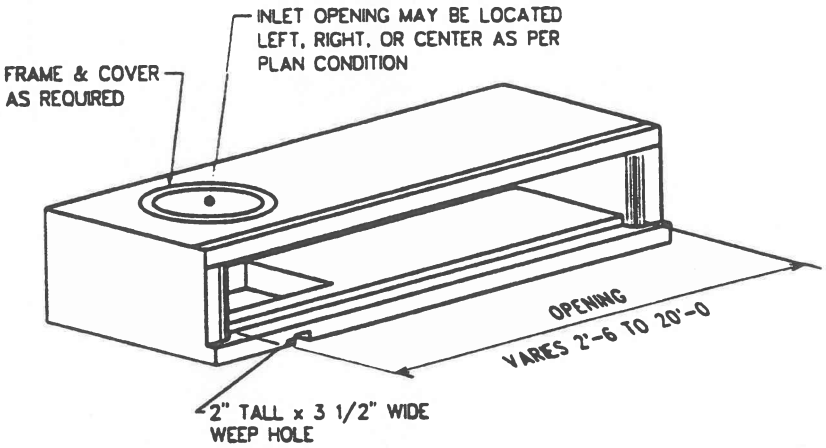
WVDOT TYPE D / E INLET

Dwg: **WVDOT D / E INLET**	Review Stamp	Seal for Precast Only
Orig Date: **3/27/24**		
Last Rev:		
UID:		

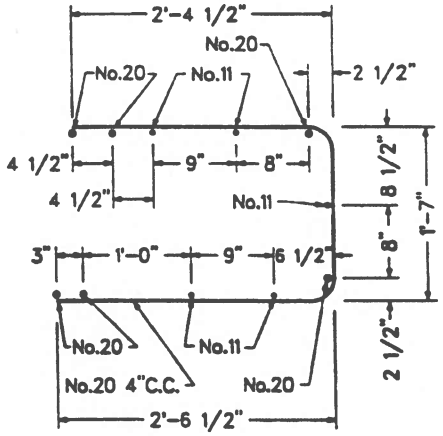
CP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005



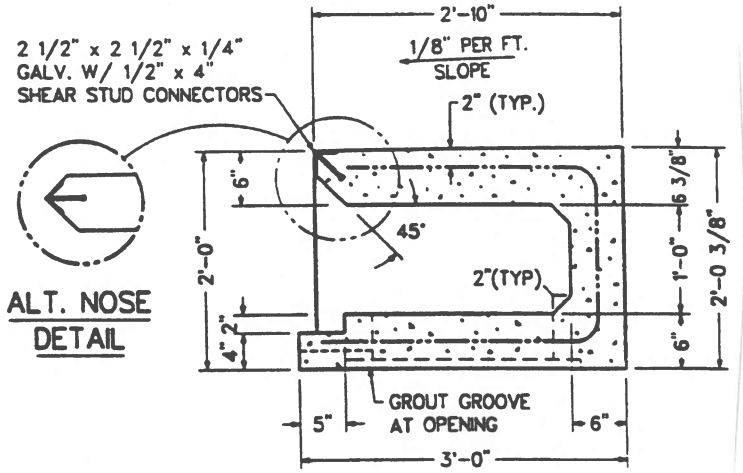
END WALL DETAIL



PERSPECTIVE VIEW



REINFORCEMENT DETAIL
WELDED WIRE FABRIC



ALT. NOSE DETAIL

SECTION VIEW

Notes:

1. **Minimum Concrete Compressive Strength to be 5000 psi.**
2. **Rebar to be ASTM A706 or A615, Grade 60.**
   Welded Wire Reinforement to be ASTM A1064, Grade 65.
3. **Dowel Holes provided to prevent settlement of adjacent concrete.**
4. **invert shaping to be constructed in field by contractor, channel slope at 2 in/ft. half depth of pipe.**

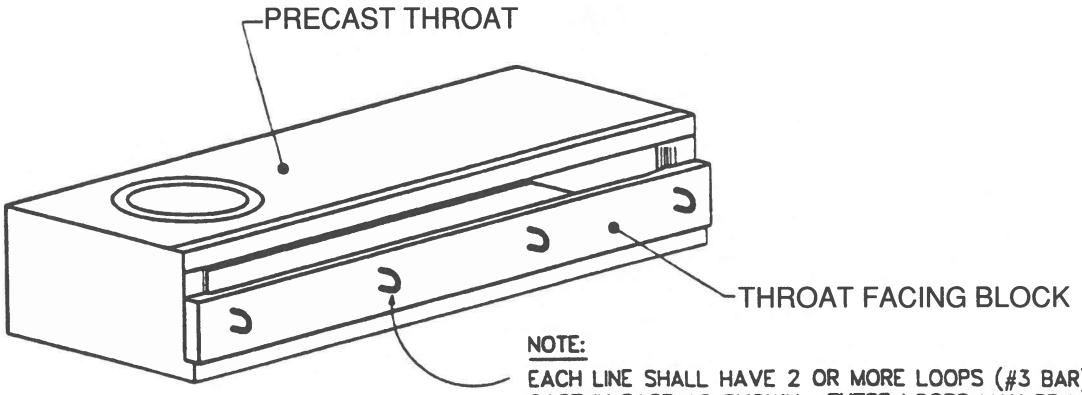
WEST VIRGINIA D.O.T. REF DR6-D
WEST VIRGINIA D.O.T. REF DR6-E

WVDOT TYPE D / E INLET

THROAT SECTION

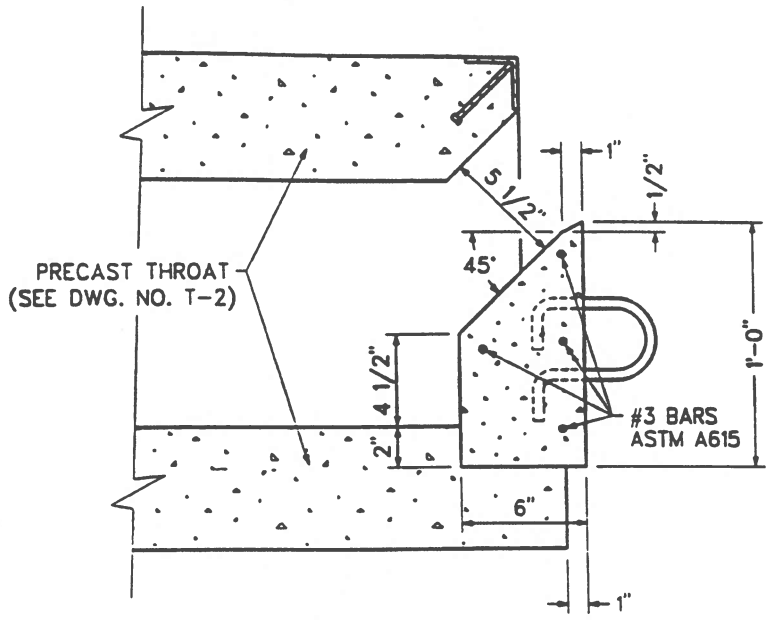
Dwg: **WVDOT D / E INLET**	Review Stamp	Seal for Precast Only
Orig Date: **3/27/24**		
Last Rev:		
UID:		

CP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005



NOTE:
EACH LINE SHALL HAVE 2 OR MORE LOOPS (#3 BAR) CAST IN FACE AS SHOWN. THESE LOOPS MAY BE USED FOR LIFTING, AND FOR TYING IN THE POURED IN PLACE GUTTER SECTION.

PERSPECTIVE VIEW



SECTION VIEW

Notes:

1. **Minimum Concrete Compressive Strength to be 5000 psi.**
2. **Rebar to be ASTM A706 or A615, Grade 60.**
   Welded Wire Reinforement to be ASTM A1064, Grade 65.
3. **Dowel Holes provided to prevent settlement of adjacent concrete.**
4. **invert shaping to be constructed in field by contractor, channel slope at 2 in/ft. half depth of pipe.**

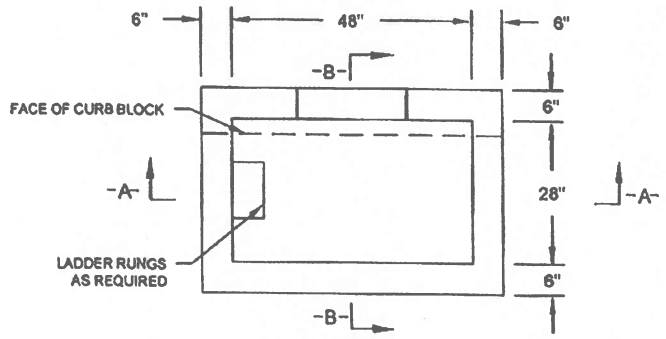
WEST VIRGINIA D.O.T. REF DR6-D
WEST VIRGINIA D.O.T. REF DR6-E

WVDOT TYPE D / E INLET

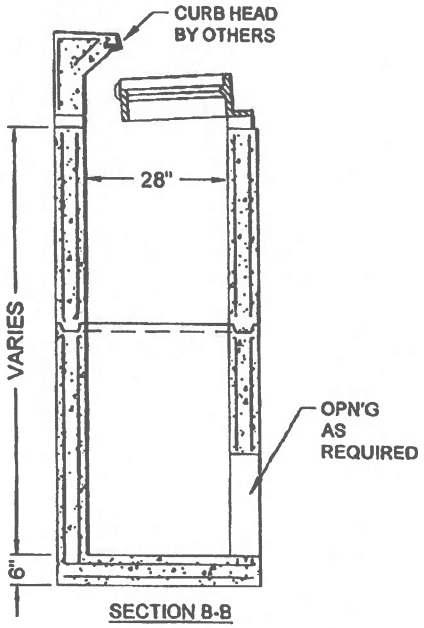
PAGE 3 OF 3
THROAT FACING BLOCK

Dwg: **WVDOT D / E INLET**	Review Stamp	Seal for Precast Only
Orig Date: **3/27/24**		
Last Rev:		
UID:		

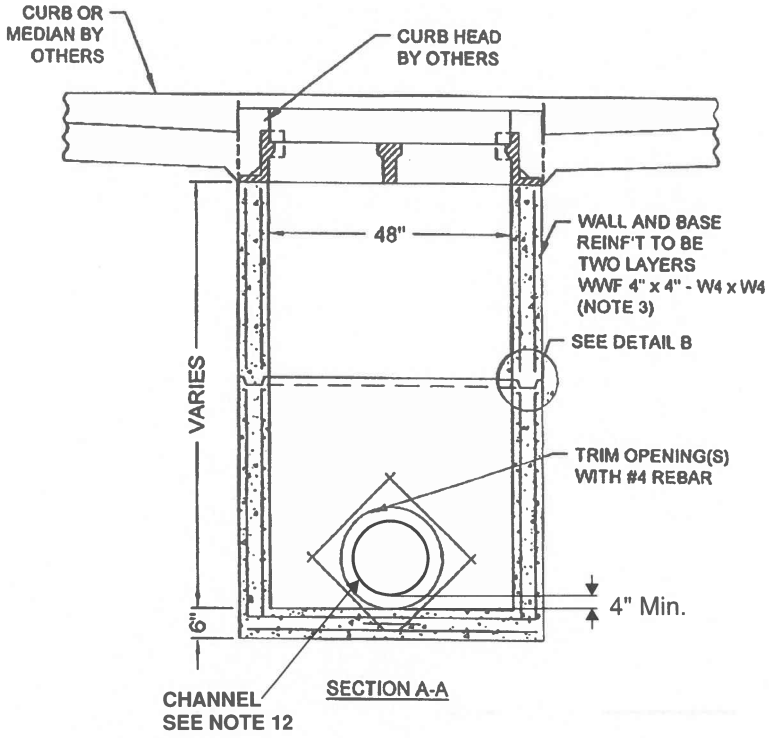
CP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005



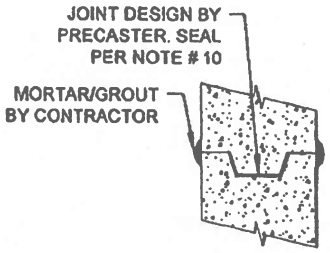
PLAN VIEW
OPTIONAL CURBHEAD & GRATE REMOVED



SECTION B-B



SECTION A-A



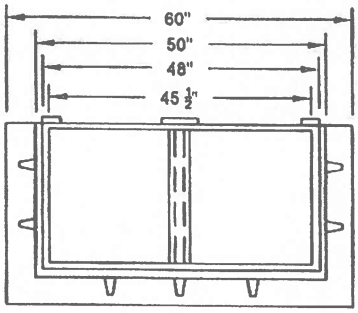
DETAIL B
SECTION VIEW

WEST VIRGINIA D.O.T. REF DR6-F

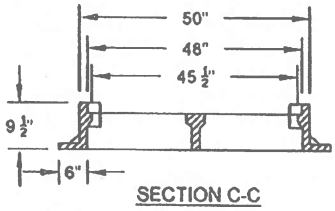
"F" INLET

Dwg: **F- INLET WVDOT**	Review Stamp	Seal for Precast Only
Orig Date: **3/27/24**		
Last Rev:		
UID: **F- INLET**		

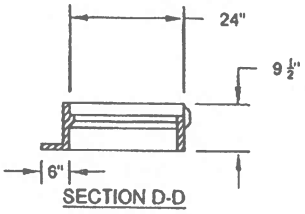
CP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005



PLAN



SECTION C-C



SECTION D-D

NOTES:

1. INLET TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C 913.

2. CONCRETE MIX TO BE 5,000 PSI AT 28 DAYS MIN, TYPE II PORTLAND CEMENT.

3. REINFORCING DEFORMED BARS SHALL BE ASTM A-616, GR. 80, AND WELDED WIRE FABRIC REINFORCING IN ACCORDANCE WITH ASTM A185 & A82 GRADE 65. REINFORCING STEEL SHALL HAVE 1 ½" CONCRETE COVER EACH FACE.

4. LADDER RUNGS INSTALLED IN VERTICAL ALIGNMENT DESIGNED TO PREVENT LATERAL SLIPPAGE, 1'-0" C/C MAX.

5. LIFT HOLES OR LIFT EYES PROVIDED IN EACH SECTION FOR HANDLING ARE TO BE FILLED WITH AN APPROVED NON-SHRINK GROUT OR CONCRETE BY CONTRACTOR AS SPECIFIED (IF APPLICABLE).

6. TRIM ALL OPNE'S IN BASE, WALLS, AND T/S WITH#4 DEFORMED BAR, UNLESS NOTED.

7. ANNULAR SPACE BETWEEN PIPE AND HOLE TO BE FILLED WITH AN APPROVED NON-SHRINK GROUT OR CONCRETE BY CONTRACTOR AS REQUIRED.

8. PROVIDE BENT CONTINUOUS WWF OR BAR AT WALL CORNERS TO PROVIDE CONTINUOUS HORIZONTAL REINFORCING. BAR LAPS 16 INCHES MINIMUM.

9. THE JOINTS ARE TO BE GROUTEO WITH NON-SHRINK GROUT AND/OR MORTAR, INSIDE AND OUT, AND SEALED BY THE CONTRACTOR TO A WATERTIGHT SEAL. SEAL TO BE ACHIEVED USING NON-SHRINK GROUT, MORTAR, RUBBER GASKETS, ANDIOR BITUMINOUS MASTIC AS REQUIRED 8Y CONTRACT DRAWINGS. RUBBER GASKET SEAL MEETS AASHTO M 188 TYPE B OR ASTM C 361 & ASTM C 443.

10. STANDARD PRECAST MANHOLE(S) ARE DESIGNED FOR LATERAL EARTH PRESSURES IN EXCESS OF 50 FEET OF VERTICAL DEPTH.

11. WEEP HOLES AS REQUIRED.

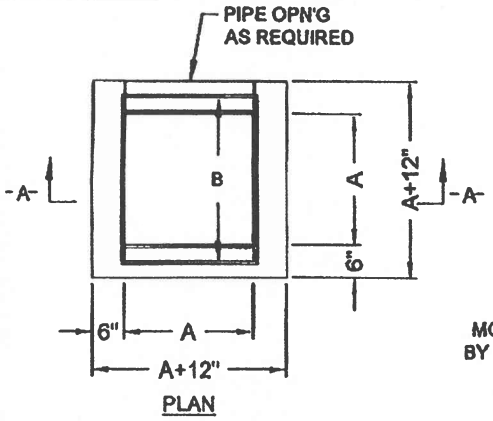
12. INVERT SHAPING TO BE CONSTRUCTED IN THE FIELD BY CONTRACTOR, CHANNEL SLOPES AT 2 IN/FT, HALF DEPTH OF PIPE.

WEST VIRGINIA D.O.T. REF DR6-F

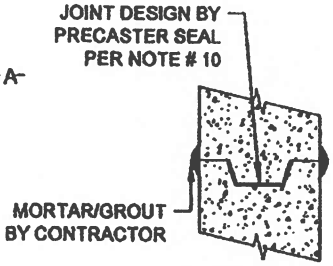
"F" INLET

Dwg: **F- INLET WVDOT**	Review Stamp	Seal for Precast Only
Orig Date: **3/27/24**		
Last Rev:		
UID: **F- INLET**		

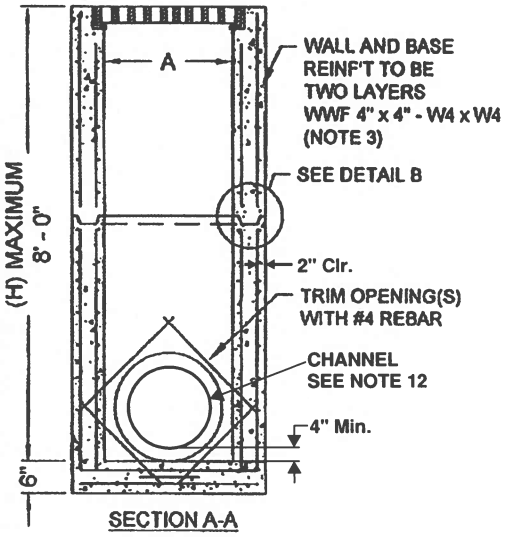
CP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005



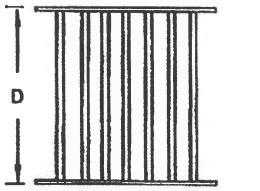
PLAN



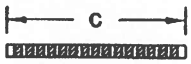
DETAIL B
SECTION VIEW



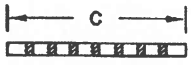
SECTION A-A



PLAN VIEW-TYPE 2 GRATE



SECTION THROUGH
TYPE 1 GRATE



SECTION THROUGH
TYPE 2 GRATE

DIMENSIONS					
PIPE SIZE	A	B	C	D	H (MIN)
18"	2' - 8"	3' - 2"	2' - 7 3/4"	3' - 1 3/4"	2' - 0"
21"	2' - 8"	3' - 2"	2' - 7 3/4"	3' - 1 3/4"	2' - 3"
24"	2' - 8"	3' - 2"	2' - 7 3/4"	3' - 1 3/4"	2' - 6"
27"	3' -0"	3' - 6"	2' - 11 3/4"	3' - 5 3/4"	2' - 9"
30"	3' - 6"	4' - 0"	3' - 5 3/4"	3' - 11 3/4"	3' - 0"
33"	3' - 9"	4' - 3"	3' - 8 3/4"	4' - 2 3/4"	3' - 3"
36"	4' - 0"	4' - 6"	3' - 11 3/4"	4' - 5 3/4"	3' - 6"
42"	4' - 6"	5' - 0"	4' - 5 3/4"	4' - 11 3/4"	4' - 0"
48"	5' - 0"	5' - 6"	4' - 11 3/4"	5' - 5 3/4"	4' - 6"

NOTES:

1. INLET TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C 913.

2. CONCRETE MIX TO BE 5,000 PSI AT 28 DAYS MIN, TYPE II PORTLAND CEMENT.

3. REINFORCING DEFORMED BARS SHALL BE ASTM A-616, GR. 80, AND WELDED WIRE FABRIC REINFORCING IN ACCORDANCE WITH ASTM A185 & A82 GRADE 65. REINFORCING STEEL SHALL HAVE 1 ½" CONCRETE COVER EACH FACE.

4. LADDER RUNGS INSTALLED IN VERTICAL ALIGNMENT DESIGNED TO PREVENT LATERAL SLIPPAGE, 1'-0" C/C MAX.

5. LIFT HOLES OR LIFT EYES PROVIDED IN EACH SECTION FOR HANDLING ARE TO BE FILLED WITH AN APPROVED NON-SHRINK GROUT OR CONCRETE BY CONTRACTOR AS SPECIFIED (IF APPLICABLE).

6. TRIM ALL OPNE'S IN BASE, WALLS, AND T/S WITH#4 DEFORMED BAR, UNLESS NOTED.

7. ANNULAR SPACE BETWEEN PIPE AND HOLE TO BE FILLED WITH AN APPROVED NON-SHRINK GROUT OR CONCRETE BY CONTRACTOR AS REQUIRED.

8. PROVIDE BENT CONTINUOUS WWF OR BAR AT WALL CORNERS TO PROVIDE CONTINUOUS HORIZONTAL REINFORCING. BAR LAPS 16 INCHES MINIMUM.

9. THE JOINTS ARE TO BE GROUTEO WITH NON-SHRINK GROUT AND/OR MORTAR, INSIDE AND OUT, AND SEALED BY THE CONTRACTOR TO A WATERTIGHT SEAL. SEAL TO BE ACHIEVED USING NON-SHRINK GROUT, MORTAR, RUBBER GASKETS, ANDIOR BITUMINOUS MASTIC AS REQUIRED 8Y CONTRACT DRAWINGS. RUBBER GASKET SEAL MEETS AASHTO M 188 TYPE B OR ASTM C 361 & ASTM C 443.

10. STANDARD PRECAST MANHOLE(S) ARE DESIGNED FOR LATERAL EARTH PRESSURES IN EXCESS OF 50 FEET OF VERTICAL DEPTH.

11. WEEP HOLES AS REQUIRED.

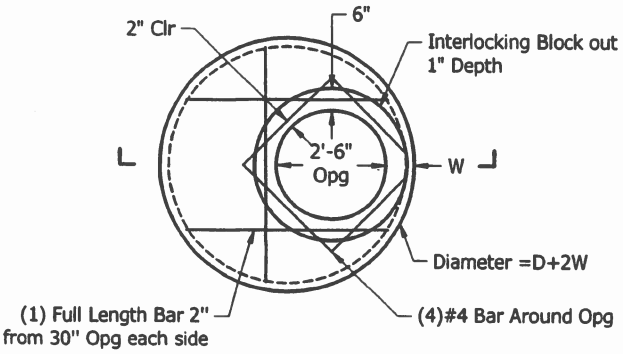
12. INVERT SHAPING TO BE CONSTRUCTED IN THE FIELD BY CONTRACTOR, CHANNEL SLOPES AT 2 IN/FT, HALF DEPTH OF PIPE.

"G" INLET

WEST VIRGINIA D.O.T. REF DR6-G

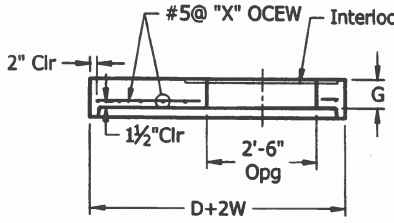
Dwg: "G" INLET - WVDOT	Review Stamp	Seal for Precast Only
Orig Date: 3/27/24		
Last Rev:		
UID:		

CP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005

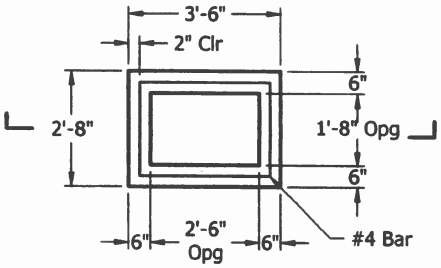


Plan View

Flattop Collar

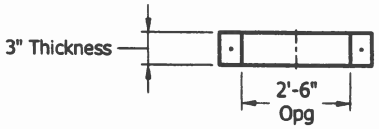


Section View



Plan View

Adjustment Collar



Section View

Circular Inlet Slab Dimensions			
D (in)	X (in)	G (in)	W
36"	N/A	N/A	4"
48"	5"	6"	5"
60"	8"	8"	6"
72"	8"	8"	7"
84"	6"	8"	8"
96"	6"	8"	9"
120"	5"	8"	10"

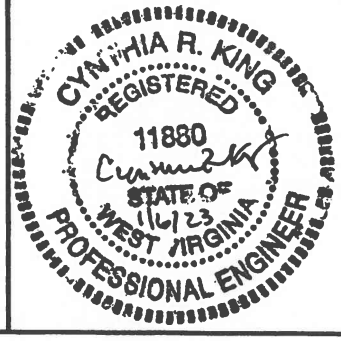
Notes:
1) This design is intended for precast structures produced by CP&P only.
2) Concrete to be 5000 PSI
3) Bar reinforcement conforms to ASTM A615 or A706, Grade 60 min.

WVDOT Type E Inlet
Precast Flattop Collar and Adjustment Collar

Dwg:	WV-FTC-AC
Orig Date:	2023-01-06
Last Rev:	---

Review Stamp

Seal for Precast Only



CP&P
Concrete Pipe & Precast, LLC | 800.999.2278
10364 Design Road | Ashland, VA 23005