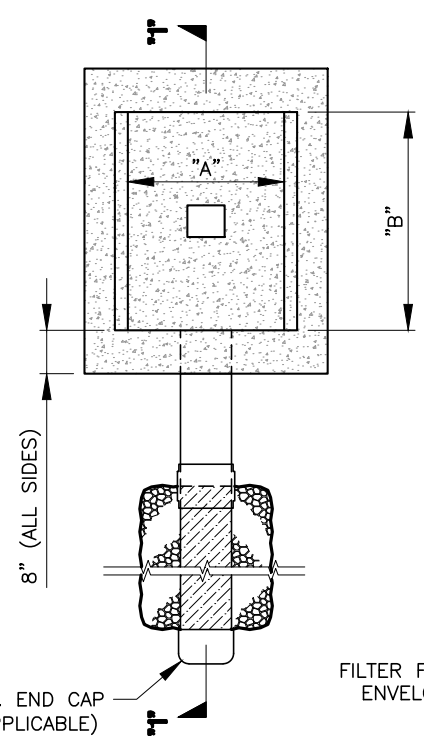
XI. STANDARD DETAILS

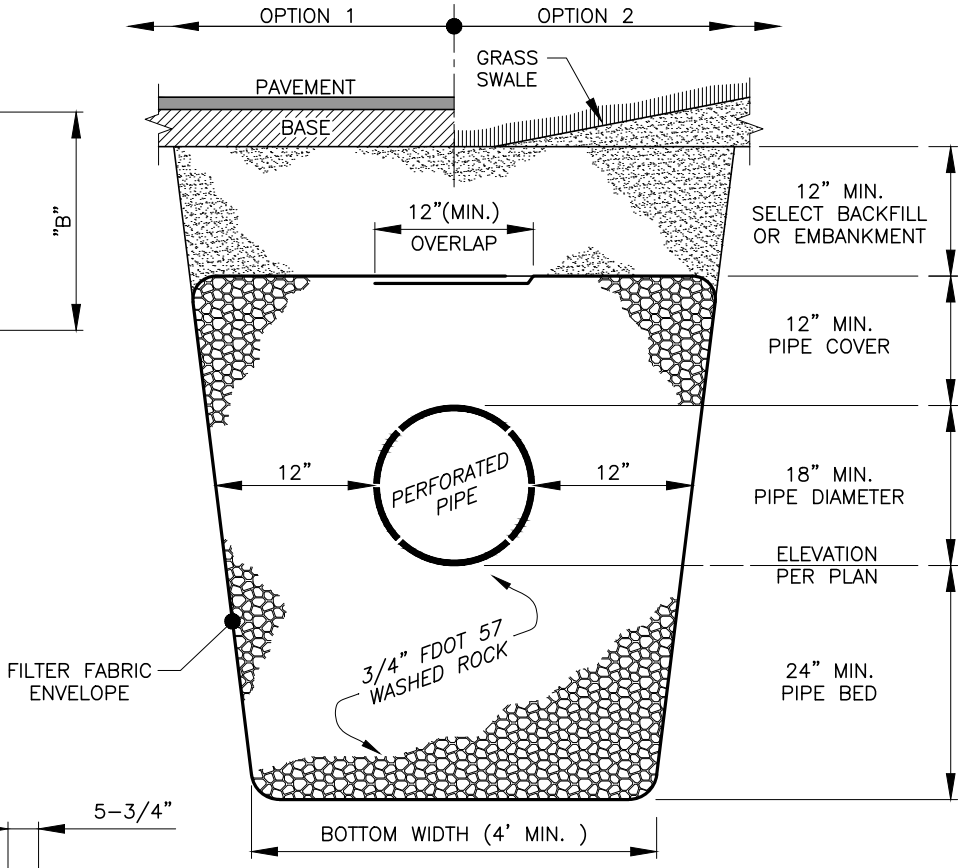
STORMWATER DETAILS

It is the intent of this Article that the latest Florida Department of Transportation *"Standard Specifications for Road and Bridge Construction"* be used as the basis for the specifications cited, and that where such wording which refers to the State of Florida and its Department of Transportation and Personnel is intended to be replaced with that wording which would provide proper terminology, thereby making such Standard Specifications and Special Provisions as though they were those Standard Specifications and Special Provisions of the Department and/or the Standard Specifications and Special Provisions of the Department in conjunction with the Department's retained consultants. In addition to these referenced Standard Specifications and Special Provisions, the latest Florida Department of Transportation *"Roadway and Traffic Design Standards"* for design, construction, maintenance and utility operations on the state highway system is to be used as the basis for the standard details for stormwater design and construction within the City of Boynton Beach as the standard details of the Department. Other drawings not included within these standards are noted below.

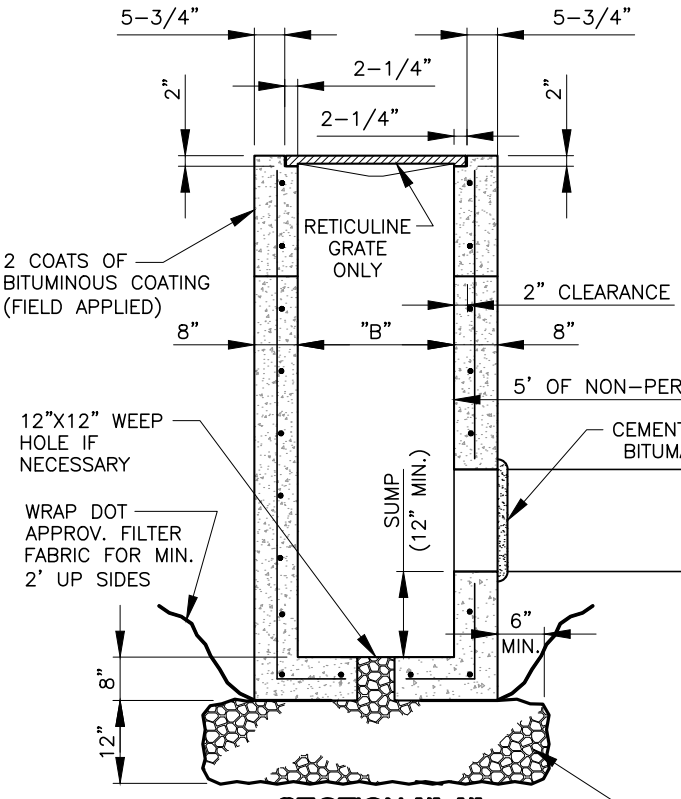
DRAWING INDEX



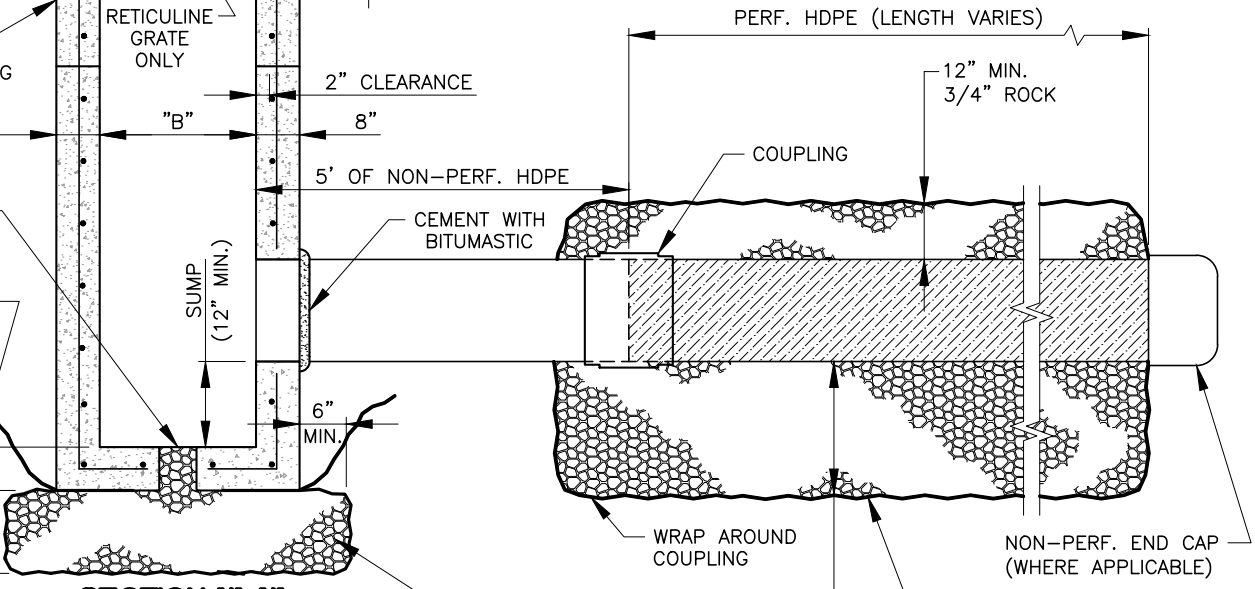
PLAN



TYPICAL EXFILTRATION TRENCH CROSS SECTION



SECTION "1"-"1"



NOTE:
SEE SHEET D-2 FOR INLET GRATE DETAILS AND NOTES

*FOR PIPE SIZES GREATER THAN 24" REFER TO MANUFACTURERS RECOMENDATION & SUBMIT FOR DEPARTMENT APPROVAL

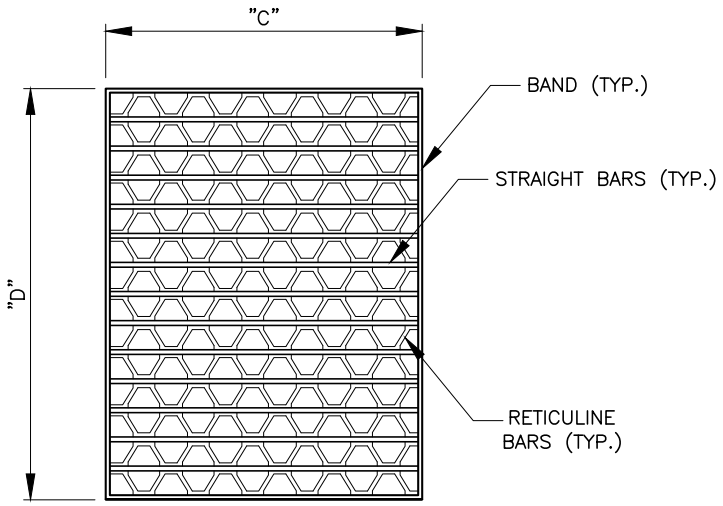
\\cadd\UTIL CADD Gis\Map and Drawings from Share Drive\CBB Revised Standards in Layouts\Transfer\2024 Revisions\Drainage Details - 2024.dwg

UTILITIES
ENGINEERING DIVISION

BOYNTON BEACH UTILITIES DEPARTMENT CONSTRUCTION STANDARDS & DETAILS

TYPICAL INLET & EXFILTRATION TRENCH DETAIL

NOT TO SCALE	EFF. DATE 05/24
PAGE NUMBER D-1	



RETICULINE STEEL GRATE

STRAIGHT BARS: 2"x1/4"
RETICULINE BARS: 1-1/4"x3/16"
BANDS: 2"x1/14"

TYPE INLET	DIMENSIONS					MAX. PIPE DIAMETER	
	"A"	"B"	"C"	"D"	"E"	"A"	"B"
"C"	2'-0"	3'-1"	2'-4"	3'-0"	11"	18"	30"
"E"	3'-0"	4'-6"	3'-4"	4'-4"	1'-5"	30"	48"

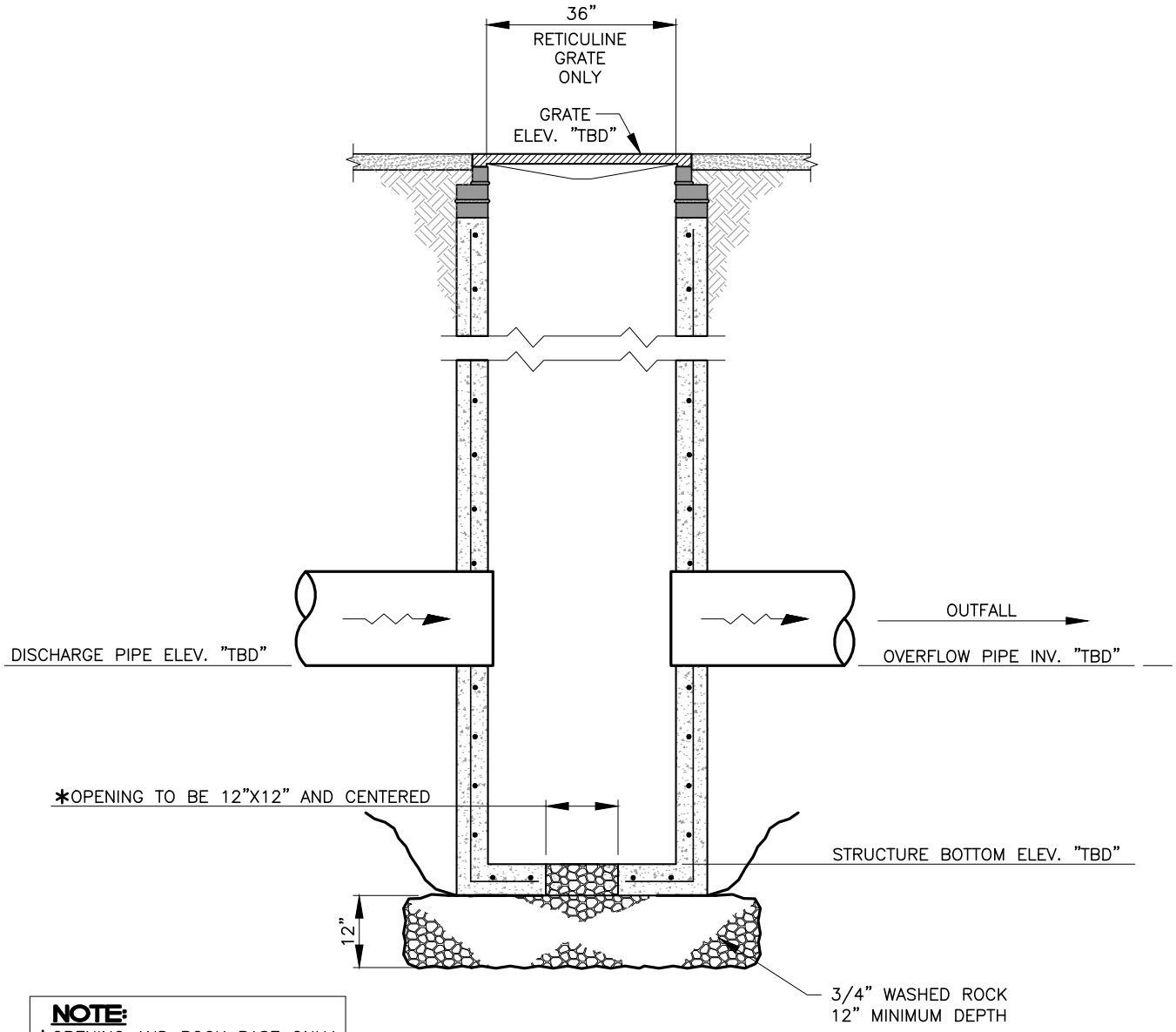
INLET NOTES:

- ALL GRATES SHALL BE RETICULINE TYPE. ADA TYPE GRATES MAY BE USED AS APPROVED BY UTILITIES.
- BEVELED EDGES: ALL EXPOSED CORNERS AND EDGES TO BE CHAMFERED 3/4".
- FOUNDATION MATERIAL: WHERE MATERIAL UNSATISFACTORY FOR FOUNDATION IS ENCOUNTERED, ALL SUCH MATERIAL MUST BE REMOVED DOWN TO SATISFACTORY MATERIAL AND BACKFILLED TO SUBGRADE WITH CLEAN SAND.
- GRATES: IN ACCORDANCE WITH F.D.O.T. SPECIFICATIONS.
- INLET TYPES: INLETS ARE TO BE CONSTRUCTED TO THE DIMENSIONS SHOWN HEREON. TYPE "E MOD." IS A TYPE "E" TURNED 90° TO RECIEVE R.C.P. UP TO 48" DIAMETER.
- MATERIAL: INLET WALLS AND BASES MAY BE EITHER CAST-IN-PLACE CLASS I, 2500 P.S.I. CONCRETE OR PRECAST CLASS II, 4000 P.S.I. CONCRETE.
- LOCKDOWN: PROVIDE EYEBOLT PER F.D.O.T. STANDARD INDEX 201.
- ALL GRATES SHALL BE CHAINED TO THE STRUCTURE.

BACKFILL NOTE:

COMPACT TRENCH BACKFILL AND SOIL WITHIN MIN. 5' OF TRENCH TO MIN. 95% OF MAX IN GRASS AREA, 98% OF MAX IN PAVED AREAS. DRY DENSITY PER ASTM D-1557.

"TBD" STANDS FOR "TO BE DETERMINED" WHICH SHALL BE FILLED IN BY THE ENGINEER OF RECORD & APPROVED BY THE CITY OF BOYNTON BEACH.



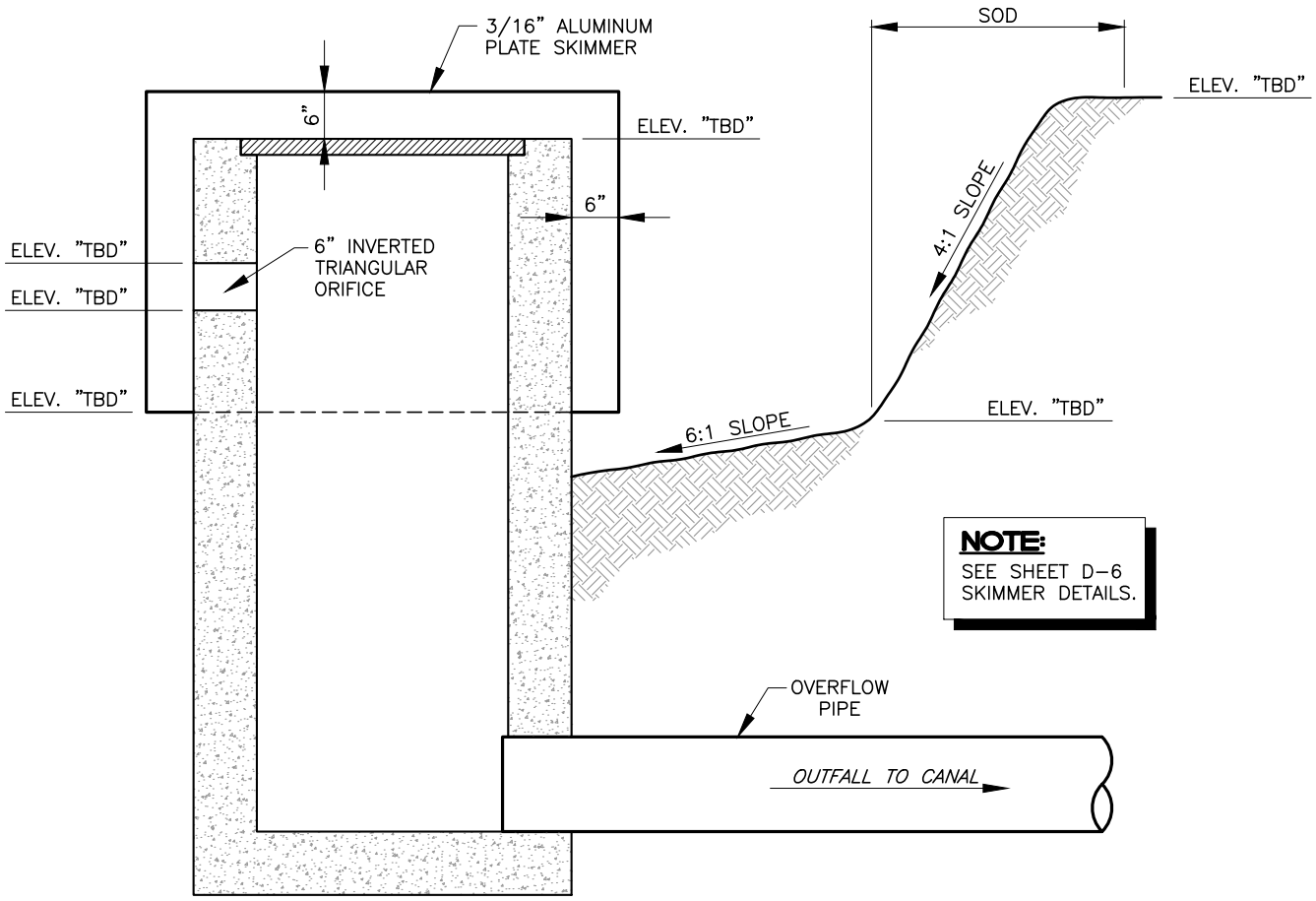
NOTE:
*OPENING AND ROCK BASE ONLY AS APPROVED BY UTILITIES

TYPICAL DRAINAGE CONTROL STRUCTURE CROSS SECTION

TYPE E MODIFIED – SEE F.D.O.T. TYPICAL INLET DETAIL SHEET

EROSION AND SEDIMENTATION REQUIREMENTS DURING CONSTRUCTION:

1. THE CONTRACTOR SHALL MAKE EVERY EFFORT DURING CONSTRUCTION TO CONTROL WIND AND WATER EROSION OF THE SOIL ON SITE.
2. THE CONTRACTOR SHALL CONTROL EXCESSIVE RUNOFF FROM THE PROJECT BY EXCAVATING THE PROPOSED SWALE AREAS DURING THE PRELIMINARY CLEANING AND GRUBBING OPERATION OF THE PROJECT.
3. SHOULD THE SITE BECOME EXCESSIVELY DRY, AND WIND AND SOIL EROSION BECOMES PREVELANT AND A NUISANCE, THE CONTRACTOR SHALL WATER AND/OR SEED AND MULCH THE AREA, AND/OR PROVIDE FENCING AS NECESSARY.
4. TYPE I HAY BALE BARRIERS SHALL BE PLACED AROUND ALL EXISTING DITCH BOTTOM INLETS IN ACCORDANCE WITH F.D.O.T. STANDARD INDEX NO. 102.
5. ALL GRATES SHALL BE RETICULINE ONLY.



SECTION

MODIFIED F.D.O.T. TYPE "C" INLET WITH SKIMMER AND ORIFICE

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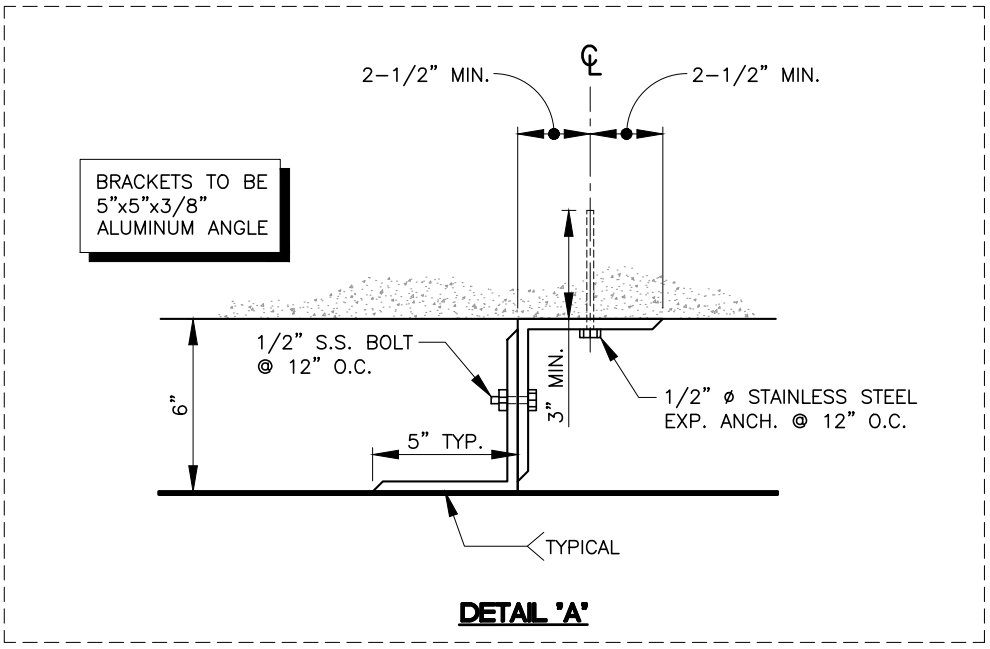
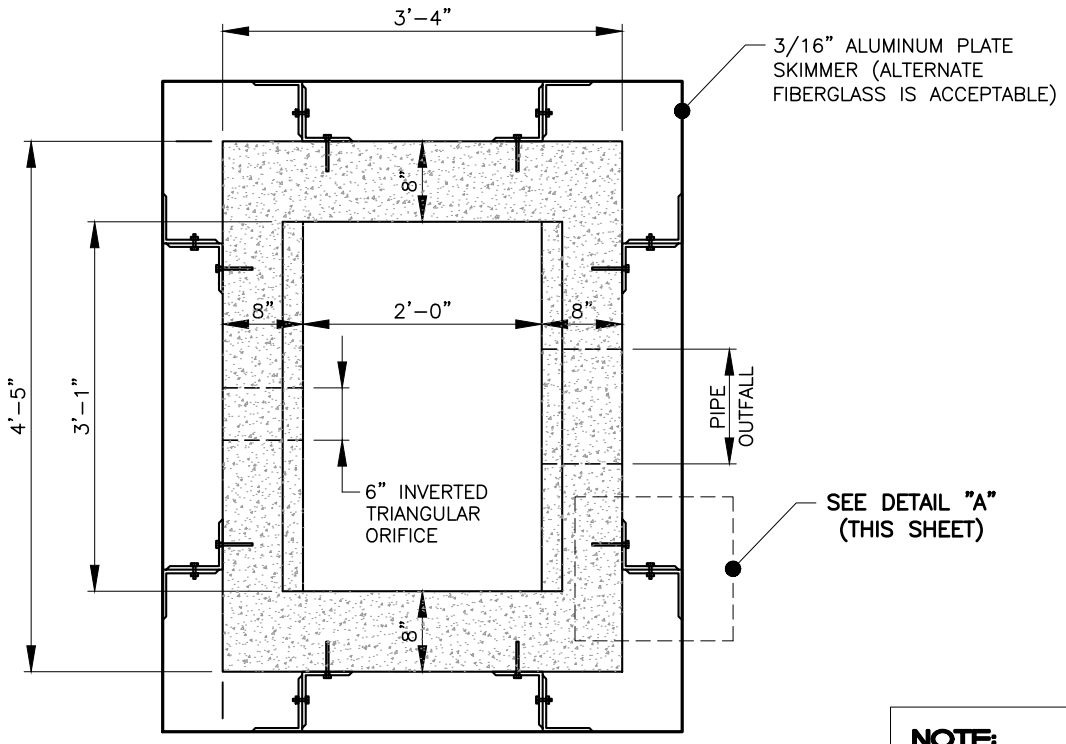


DETAIL 'A'



TOP VIEW

NOTE:
SEE SHEET D–5 FOR SECTION THRU TYPE "C" INLET WITH SKIMMER

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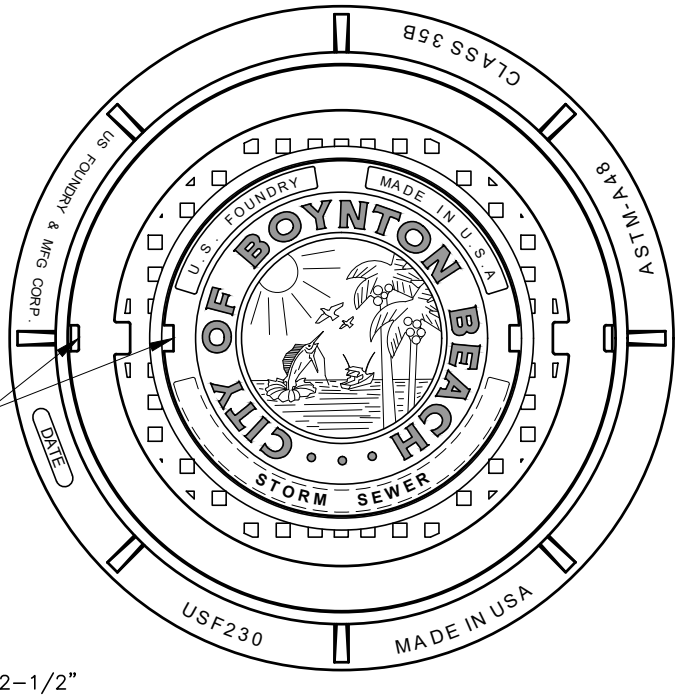
UTILITIES ENGINEERING DIVISION

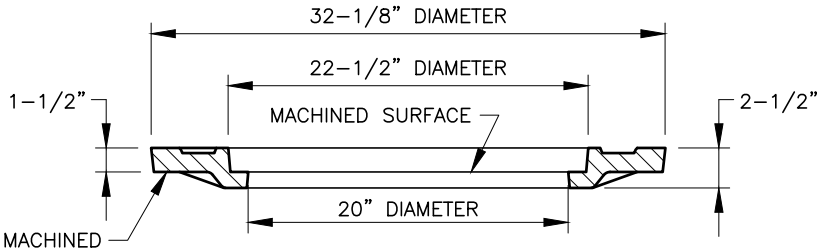
BOYNTON BEACH UTILITIES DEPARTMENT CONSTRUCTION STANDARDS & DETAILS

DRAINAGE CONTROL STRUCTURE DETAIL - TYPE B (SKIMMER DETAILS)

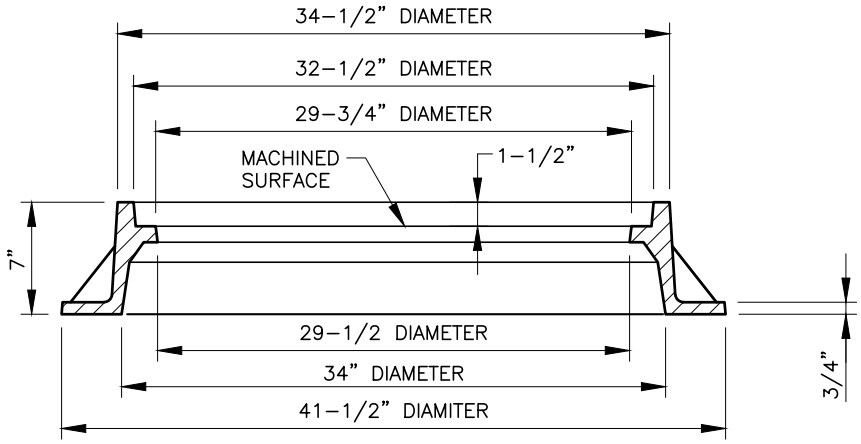
NOT TO SCALE	EFF. DATE 05/24

PAGE NUMBER D–5





DOUBLE COVER (USF 230 AB-MC)



RING (USF 230 AB-MC)

NOTES:

1. IN GREEN AREAS OR ANY AREA DEEMED TO HAVE QUESTIONABLE DRAINAGE, A WATER–TIGHT MANHOLE INSERT SUCH AS "SEWER GUARD" OR APPROVED EQUAL WILL BE REQUIRED.
2. APPROVED MANHOLES (DOUBLE COVER TYPE): U.S. FOUNDRY MODEL No. 230–AB–MC DRAWINGS #A4218 INNER COVER.
3. MANHOLE ADJUSTING SHALL BE BY ADDITIONAL BRICKS USED TO ELEVATE MANHOLE COVERS TO RESURFACED GRADE (MAX. 4" HEIGHT).
4. CONCRETE COLLAR 6'x6'x8" WITH 4"x4" WIRE MESH REINFORCING MAY BE REQUIRED FOR MANHOLES IN LANDSCAPE AREA.

UTILITIES ENGINEERING DIVISION

BOYNTON BEACH UTILITIES DEPARTMENT CONSTRUCTION STANDARDS & DETAILS

MANHOLE FRAME AND COVER

NOT TO SCALE | EFF. DATE 05/24

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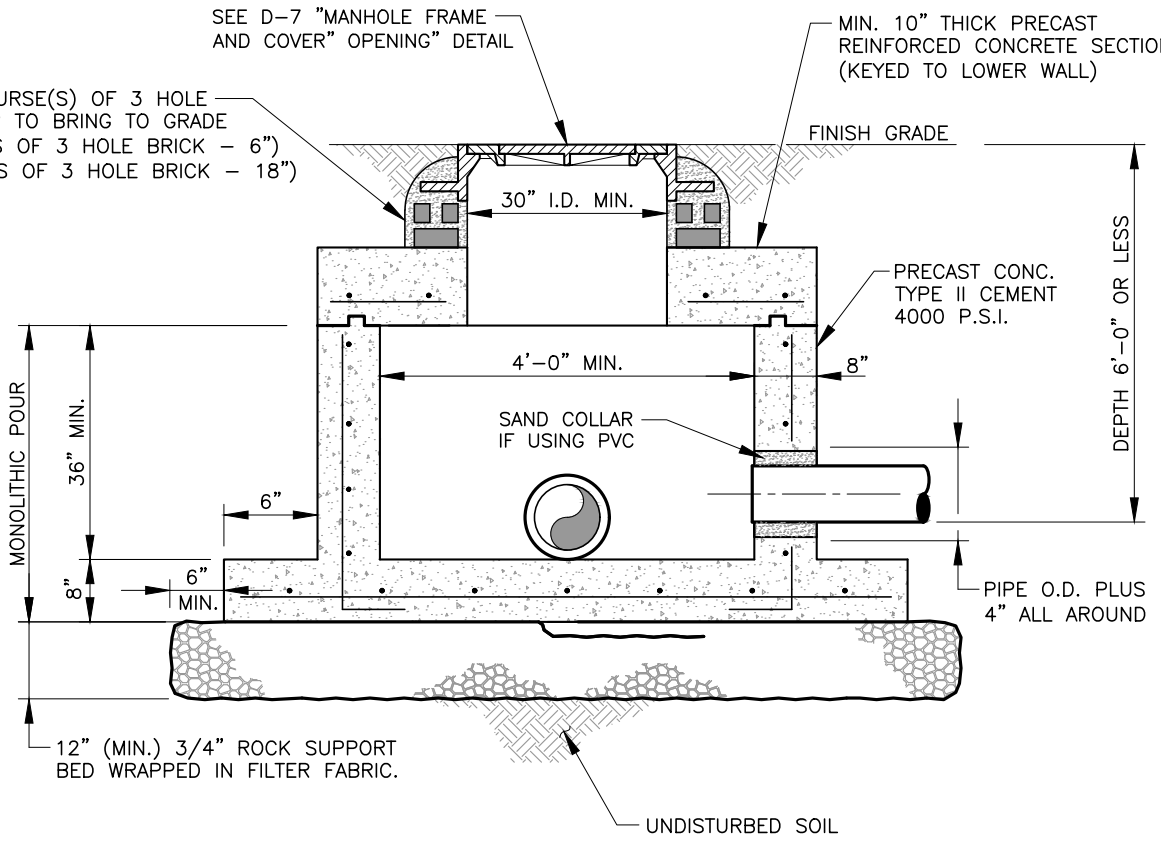

NOTES:

1. BRICK MASONRY CONSTRUCTION TO BE STUCCOED WITH 3/4" CEMENT PLASTER INSIDE AND OUTSIDE, TYPE II CEMENT SHALL BE USED.
2. LIFT HOLES THROUGH PRECAST STRUCTURE ARE NOT PERMITTED.
3. SEE TECHNICAL SPECIFICATIONS FOR BEDDING REQUIREMENTS.
4. "RAM-NEK" OR APPROVED EQUAL AT ALL RISER JOINTS (1/2" THICK WITH WIDTH AT LEAST 1/2 THE WALL THICKNESS) WITH GROUT ON INSIDE AND OUTSIDE.
5. ALL OPENINGS SHALL BE SEALED WITH A WATERPROOF, NON-SHRINKING GROUT.
6. IF TWO CAGES OF WIRE MESH ARE USED, ONE SHALL BE POSITIONED 3" FROM THE INSIDE SURFACE AND ONE 3" FROM THE OUTSIDE SURFACE. IF A SINGLE CAGE OR REBAR IS USED, IT SHALL BE CENTERED WITHIN WALL THICKNESS. NO EXPOSED STEEL SHALL BE PERMITTED.
7. WALL REINFORCEMENTS A.S.T.M. DESIGNATION A185-64.(LATEST REVISION)(MIN.)
8. MANHOLES SHALL CONFORM TO A.S.T.M. C478.(MIN.)
9. A MINIMUM OF SEVEN DAYS CURE TIME IS REQUIRED PRIOR TO DELIVERY.
10. ALL PIPE HOLES SHALL BE PRECAST OR CORE-DRILLED. OVERSIZED HOLES WILL BE REJECTED.
11. ANY VISIBLE REINFORCING WIRE, STEEL OR HONEYCOMBS SHALL BE CAUSE FOR REJECTION.
12. SHOP DRAWINGS SHALL BE APPROVED BY THE DEPARTMENT.
13. MANHOLE LID SHALL BE MARKED "STORM SEWER".
14. WEEP HOLE MAY BE REQUIRED PER THE ENGINEER'S DESIGN.

UTILITIES ENGINEERING DIVISION

BOYNTON BEACH UTILITIES DEPARTMENT CONSTRUCTION STANDARDS & DETAILS

STANDARD PRECAST MANHOLE TYPE II (SHALLOW)

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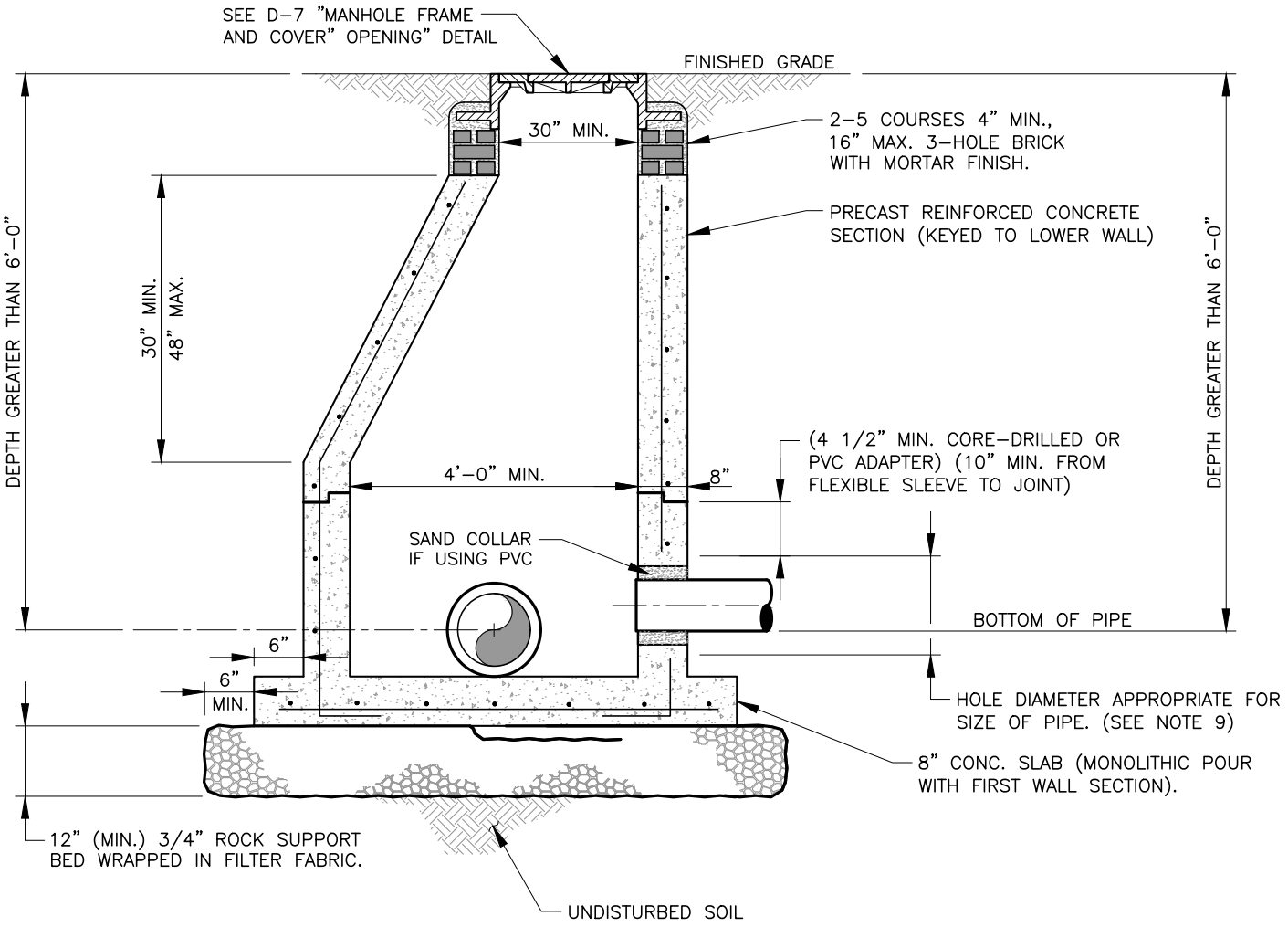
PAGE NUMBER D-7



NOTES:

1. PRECAST CONCRETE TYPE II 4000 P.S.I.
2. "RAMNEK" OR EQUAL AT ALL RISER JOINTS (1/2" THICK WITH THE WIDTH AT LEAST 1/2 THE WALL THICKNESS) WITH GROUT ON INSIDE & OUTSIDE.
3. ALL OPENINGS SHALL BE SEALED WITH A WATERPROOF NON-SHRINKING GROUT.
4. LIFT HOLES ARE NOT PERMITTED.
5. ALL PIPE HOLES SHALL BE PRECAST.
6. MANHOLE FABRICATION SHALL BE IN ACCORDANCE WITH ASTM C-478, LATEST STANDARD.
7. ANY VISIBLE REINFORCING WIRE, STEEL OR HONEYCOMBSSHALL BE CAUSE FOR REJECTION.
8. REFER TO F.D.O.T. STANDARD INDEXES 200 & 201 FOR OTHER APPOVED MANHOLES TO BE PERMITTED/
9. SHOP DRAWINGS SHALL BE APPROVED BY THE DEPARTMENT.
10. MANHOLE LID SHALL BE MARKED "STORM SEWER".
11. WEEP HOLE MAY BE REQUIRED PER THE ENGINEER'S DESIGN.
12. "RAM-NEK" OR APPROVED EQUAL AT ALL RISER JOINTS (1/2" THICK WITH WIDTH AT LEAST 1/2 THE WALL THICKNESS) WITH GROUT ON INSIDE AND OUTSIDE.
13. MANHOLE EXTERIOR PROTECTION SHALL CONSIST OF THE USE OF CARBOLINE (KOPPERS) BITUMASTIC 300M (OR APPROVED EQUAL). THE FIRST COAT IN THE COLOR GRAY OR RED & THE SECOND COAT BEING THE COLOR BLACK.
14. LIFTING HOOKS SHALL BE INSIDE STRUCTURE.

UTILITIES ENGINEERING DIVISION

BOYNTON BEACH UTILITIES DEPARTMENT CONSTRUCTION STANDARDS & DETAILS

STANDARD MANHOLE (WITH ECCENTRIC CONE)

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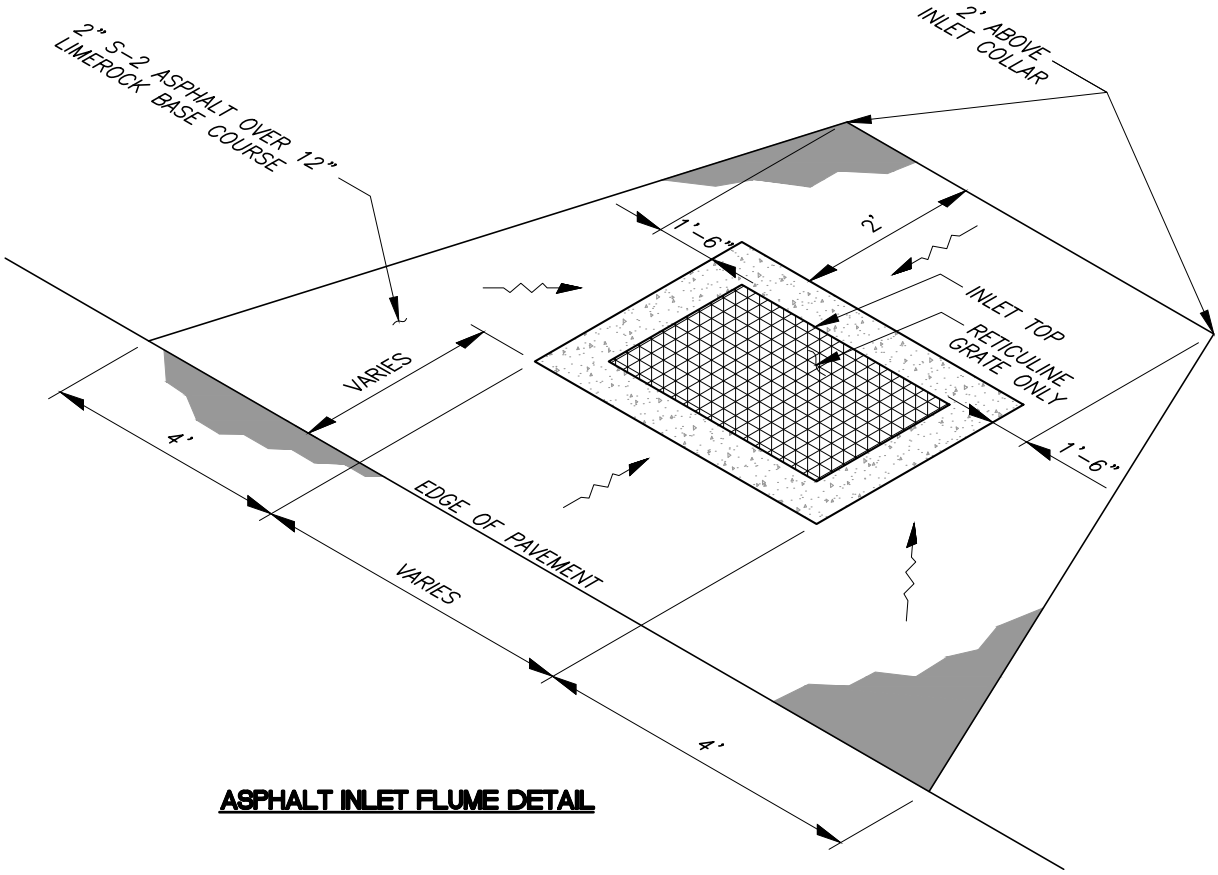
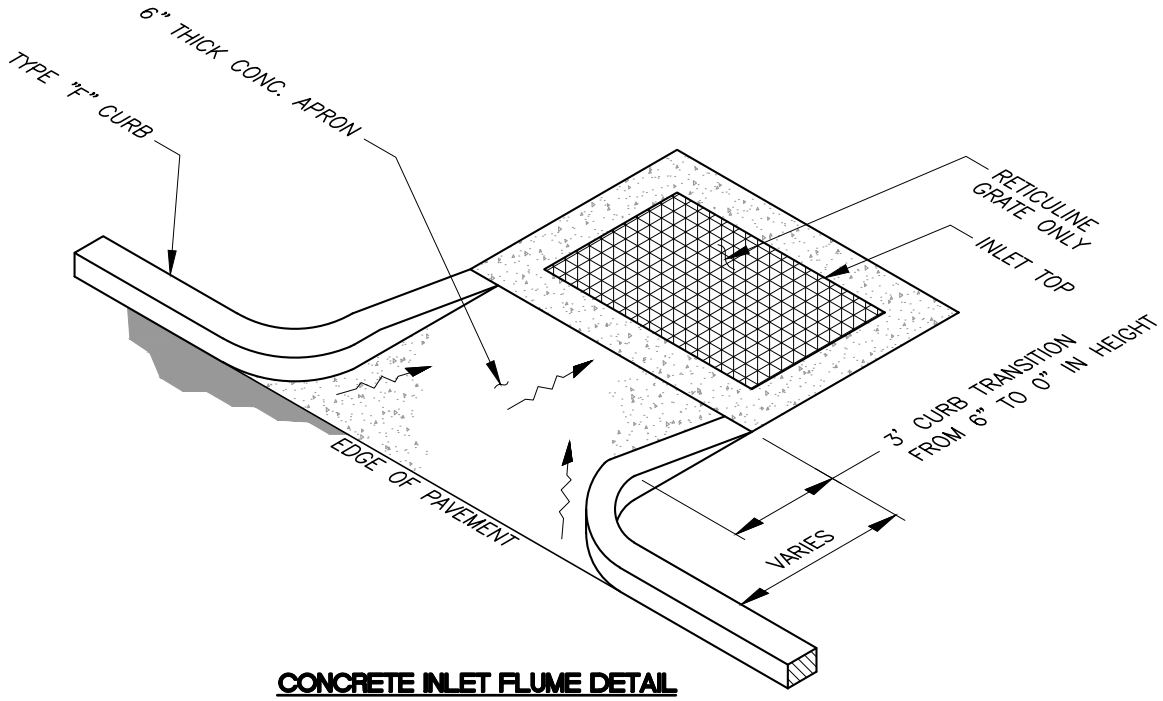


ASPHALT INLET FLUME DETAIL



CONCRETE INLET FLUME DETAIL

UTILITIES
ENGINEERING DIVISION

BOYNTON BEACH UTILITIES DEPARTMENT CONSTRUCTION STANDARDS & DETAILS

INLET FLUME DETAILS

NOT TO SCALE

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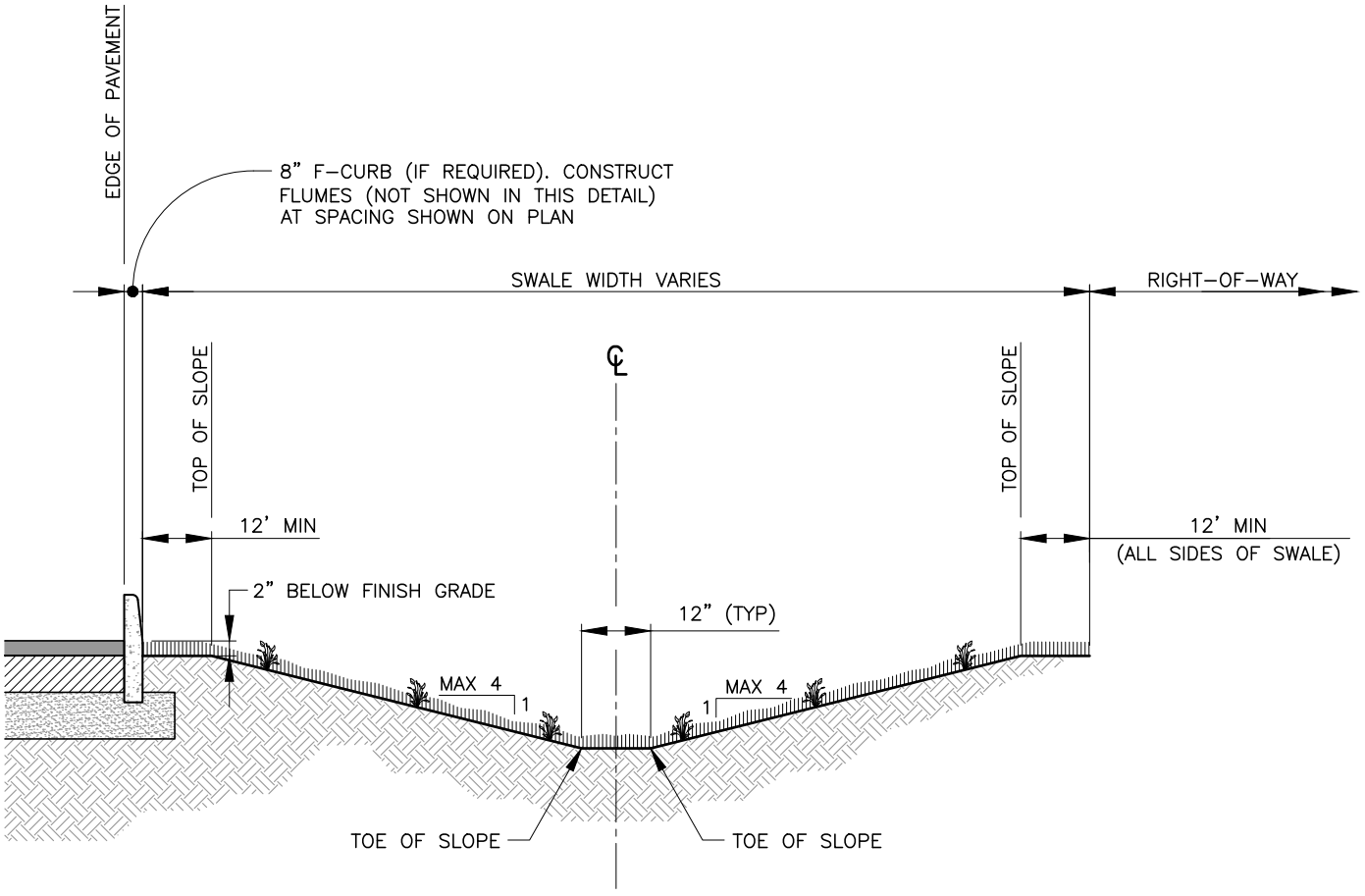
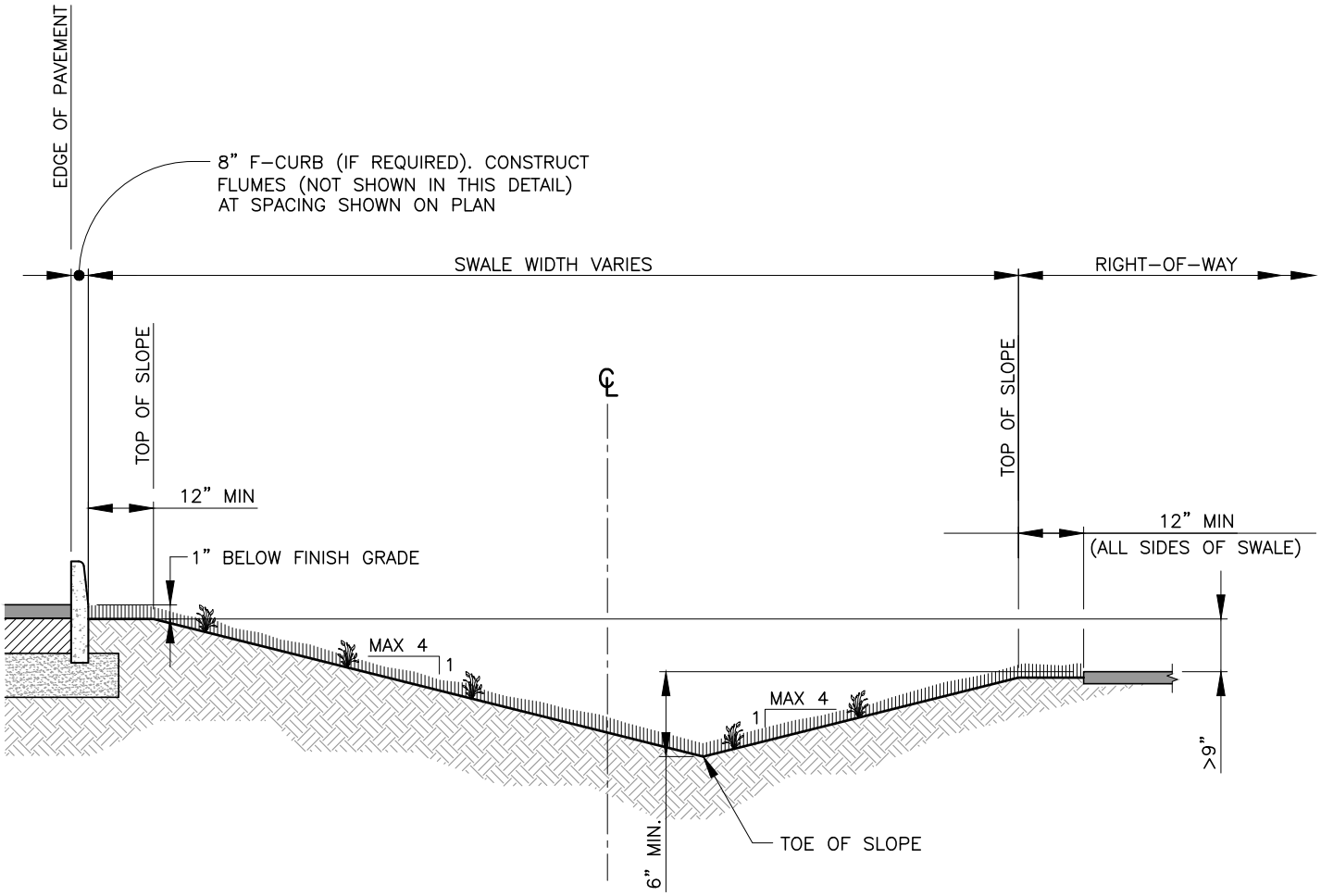


SWALE REPLACEMENT DETAIL

NOTE:

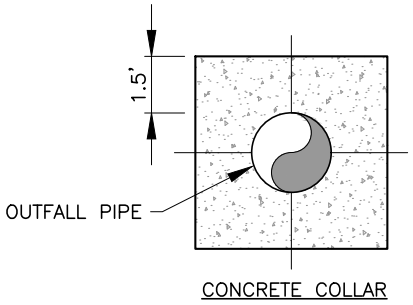
1. SOD SHALL BE PLACED PER SPECIFICATIONS.
2. STANDARD MAXIMUM SWALE DEPTH SHALL BE 9" AND MINIMUM 6".
3. OFFSET BOTTOM OF SWALE AS REQUIRED. DEEPER SWALES MAY BE APPROVED BY THE DEPARTMENT FOR SPECIFIC SITE CONDITIONS.
4. 12" FLAT AT BOTTOM OF SWALE MAY BE OMITTED WHEN REQUIRED TO ATTAIN MAXIMUM 4:1 SLOPES.
5. DEEPER SWALES MAY BE APPROVED BY THE DEPARTMENT FOR SPECIFIC SITE CONDITIONS.
6. SWALES MUST BE INSPECTED AND APPROVED BY UTILITIES PRIOR TO INSTALLING SOD.

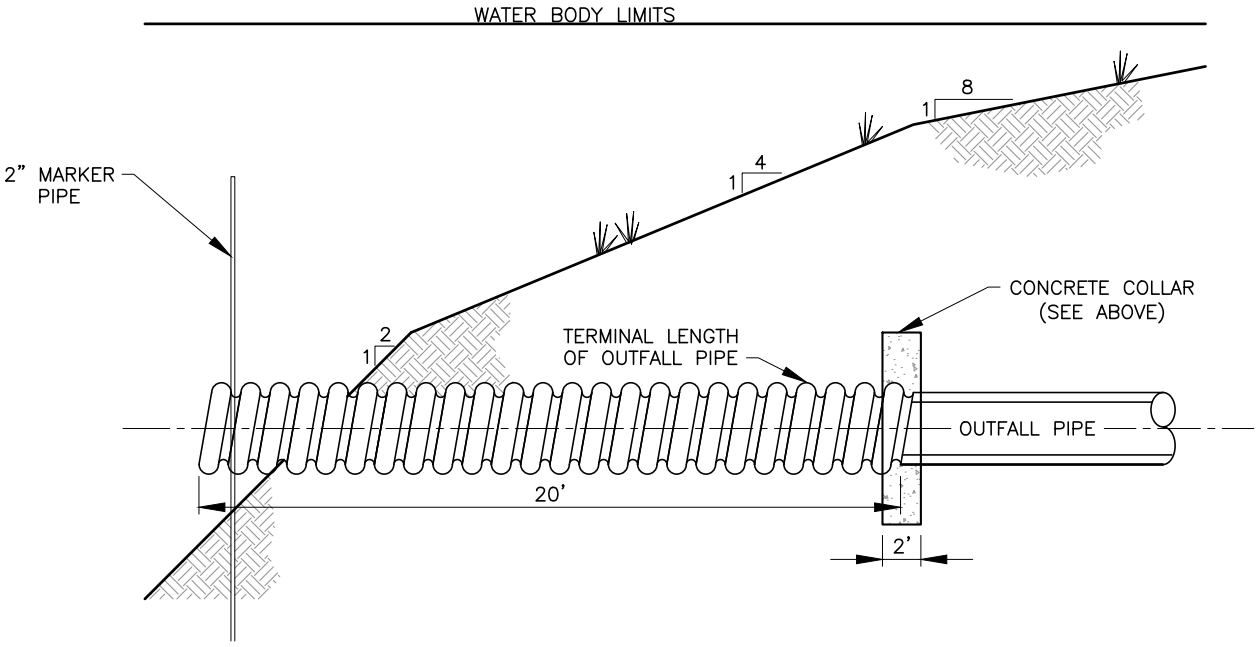


OFFSET SWALE REPLACEMENT DETAIL

NOTES:

1. SOD SHALL BE PLACED PER SPECIFICATIONS.
2. MAXIMUM SWALE DEPTH SHALL BE 9" AND MINIMUM 6".
3. PROVIDE POSITIVE SLOPE OFF THE ROAD, 12" MINIMUM FLAT.
4. MAINTAIN MAXIMUM 4:1 SLOPES ON EACH SIDE OF SWALE.
5. 12" FLAT AT BOTTOM OF SWALE MAY BE OMITTED WHEN REQUIRED TO ATTAIN MAXIMUM 4:1 SLOPES.
6. OFFSET BOTTOM OF SWALE AS REQUIRED. DEEPER SWALES MAY BE APPROVED BY THE DEPARTMENT FOR SPECIFIC SITE CONDITIONS.
7. DETAIL APPLICABLE FOR NARROW AREAS AND ELEVATION DIFFERENCES BETWEEN SIDEWALK AND EDGE OF PAVEMENT >9"
8. SWALES MUST BE INSPECTED AND APPROVED BY UTILITIES PRIOR TO INSTALLING SOD.





TYPICAL SUBMERGED OUTFALL DETAIL

NOTES:

1. OUTFALL PIPE SHALL BE JOINED TO WATER BODY WITH AN JURISDICTIONAL APPROVED TERMINAL LENGTH OF CORRUGATED PIPE.
2. OUTFALL PIPE SHALL BE PLACED IN THE CENTER OF THE CONCRETE COLLAR WITH NO LESS THAN 1.5' OF CONCRETE SUROUNDING IT ON EITER SIDE.
3. MARKER PIPE LOCATED AT TERMINAL END OF OUTFALL PIPE SHALL BE 2" DIAMETER (OR LARGER) PVC PIPE, CONCRETE FILLED, LOCATED ADJACENT TO EACH SIDE OF PIPE. A 6"x12" IDENTIFYING SIGN MOUNTED TO MARKER PIPE IS OPTIONAL.