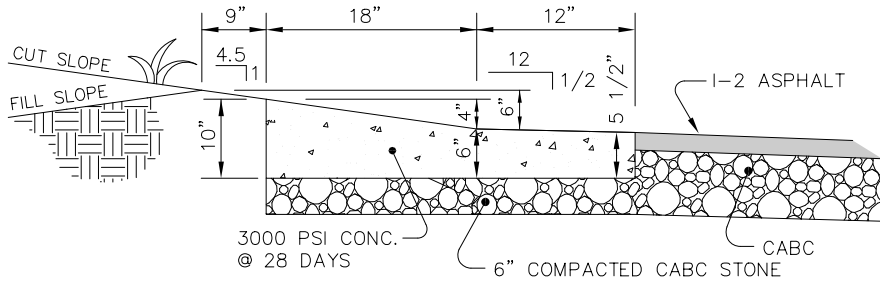
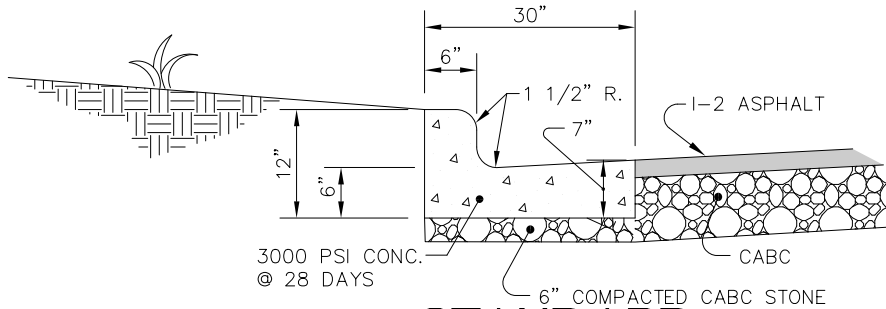


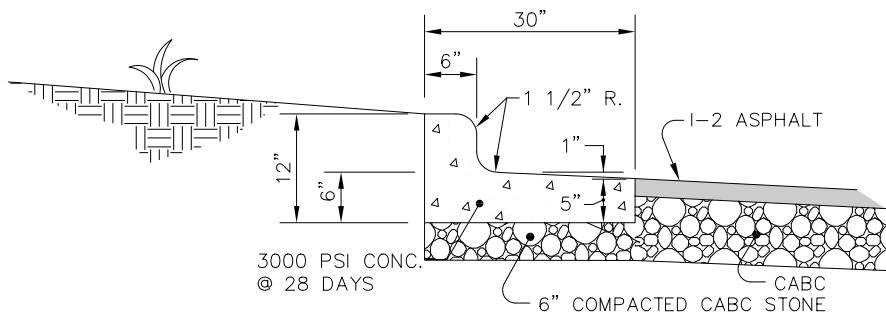
### 30" VALLEY - STANDARD



### 30" VALLEY - SPILL



### STANDARD



### SPILL

**NOTES:**

1. SCORE CURB / VALLEY GUTTER AT 15' O.C.
2. PROVIDE 1/2" EXPANSION JOINTS AT 90' O.C.
3. FOR TRANSITION OF CURB TO CURB OPENING INLET, SEE STANDARD DETAIL 33.



## TOWN OF ZEBULON

STD. CURB & GUTTER &  
VALLEY GUTTER DETAIL

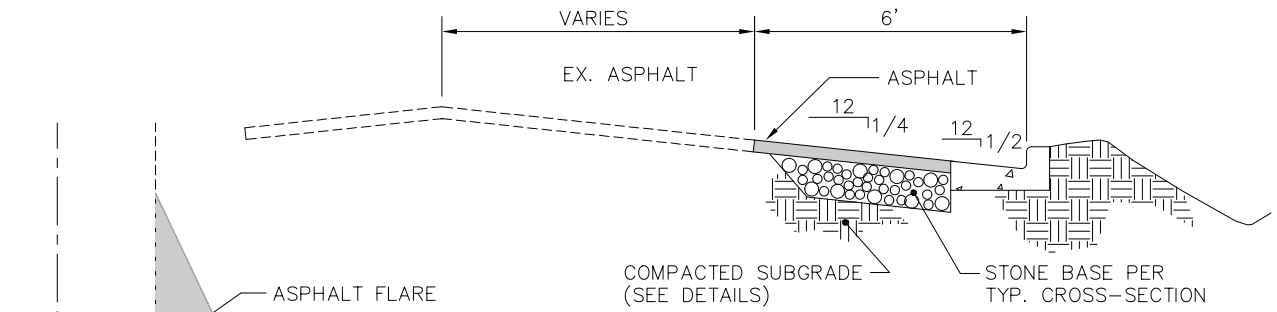
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DETAIL #  
**3**

DATE:  
JULY 2010

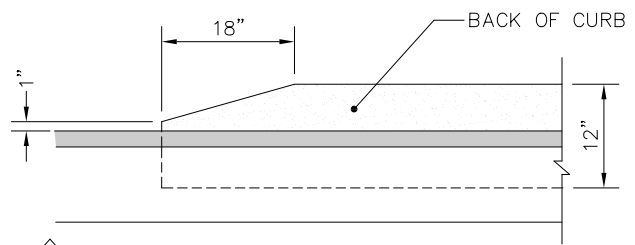
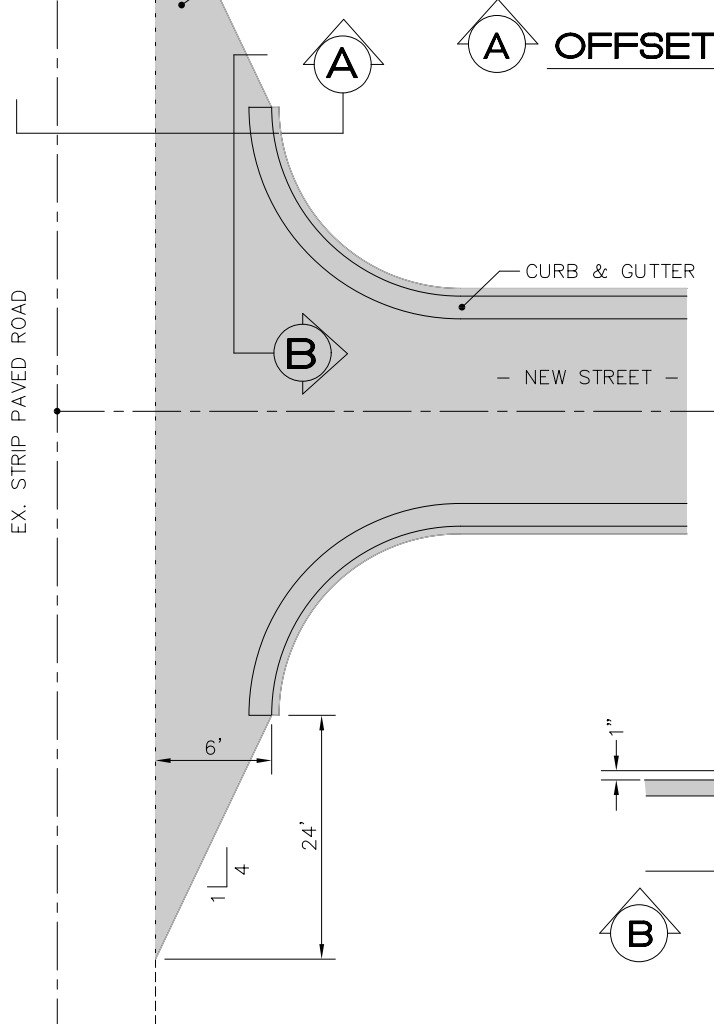
SHEET #:  
1 OF 1

USE WITH STANDARD SPECIFICATIONS ONLY



### OFFSET CURB PAVEMENT WIDENING

NOT TO SCALE



### CURB END TAPER

NOT TO SCALE



## TOWN OF ZEBULON

TERMINAL END OF CURB  
at SHOULDER SECTIONS

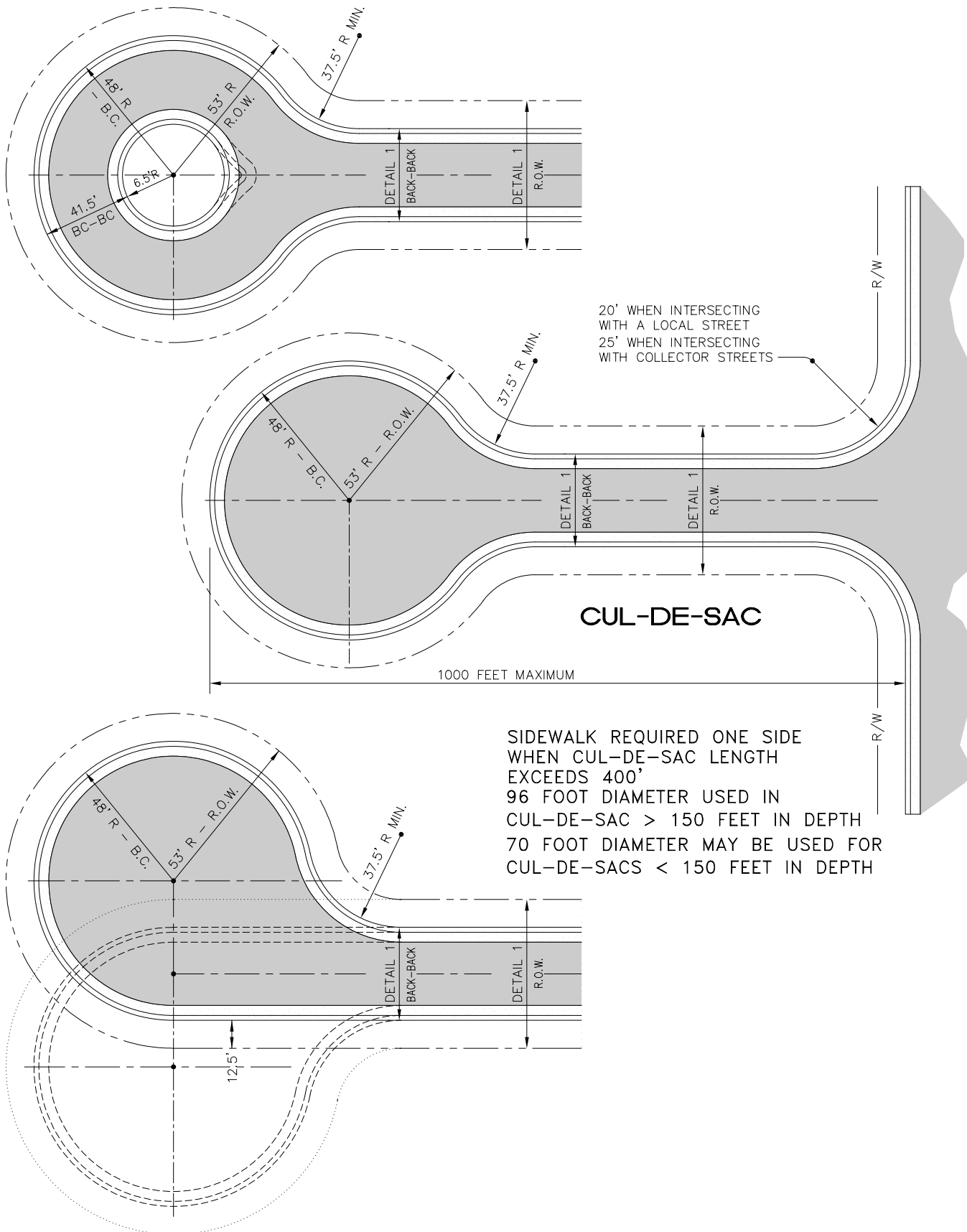
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DETAIL #  
**4**

DATE:  
JULY 2010

SHEET #:  
1 OF 1



SIDEWALK REQUIRED ONE SIDE  
WHEN CUL-DE-SAC LENGTH  
EXCEEDS 400'  
96 FOOT DIAMETER USED IN  
CUL-DE-SAC > 150 FEET IN DEPTH  
70 FOOT DIAMETER MAY BE USED FOR  
CUL-DE-SACS < 150 FEET IN DEPTH



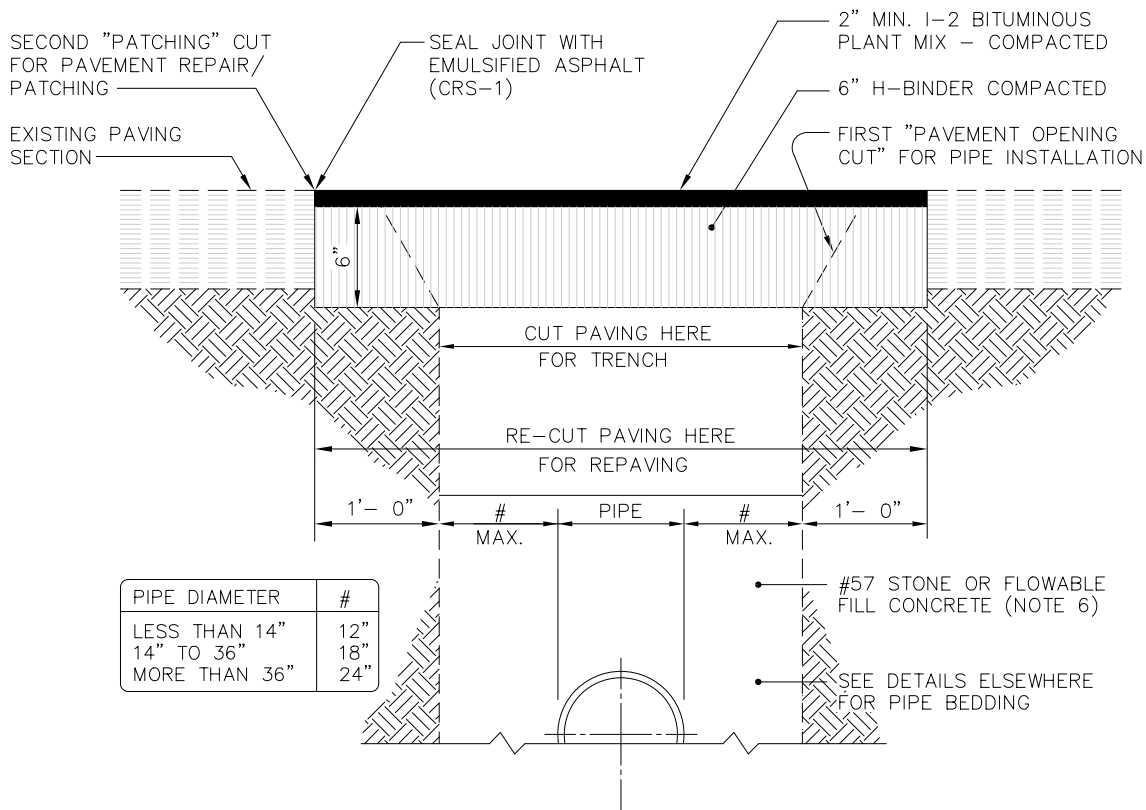
**TOWN OF ZEBULON**

**CUL-DE-SAC  
DIMENSIONS**

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE  
DATE:  
JULY 2010

DETAIL #  
**5**  
SHEET #:  
1 OF 1



**SECTIONAL VIEW**

**NOTES:**

1. PAVEMENT REPAIRS SHALL HAVE 6" COMPACTED H-BINDER AND 2" TOPPING OF SF9.5B.
2. TRENCH IS TO BE BACK FILLED IN 6" LIFTS AND COMPACTED TO 98% STANDARD DENSITY AS DETERMINED BY AASHTO TEST METHOD T-99 OR ASTM D-698 BEFORE PAVEMENT REPAIRS ARE MADE.
3. COMPACTION TEST MAY BE REQUIRED AT REQUEST OF INSPECTOR.
4. ALL EXISTING PAVED STREETS AND SECONDARY ROADS WHICH ARE OPEN CUT TO INSTALL SEWER OR WATER PIPE, MUST BE REPAIRED ACCORDING TO THIS DETAIL.
5. CABC BACKFILL IS NOT ALLOWED IN ANY PART OF TRENCH WITHIN PAVEMENT.
6. FIBER OPTIC & GAS: #57 STONE OR FLOWABLE FILL CONCRETE (MINIMUM 50 PSI) BUT MIN. 6" COMPACTED CLASS II OR III (DEFINITION IN SECTION 02210 - PARAGRAPH 3B OF SPECS) FILL OVER TOP OF FIBER OPTIC CABLE OR GAS PIPE.



**TOWN OF ZEBULON**

FULL DEPTH ASPHALT REPAIR  
DETAIL FOR UTILITY CUTS

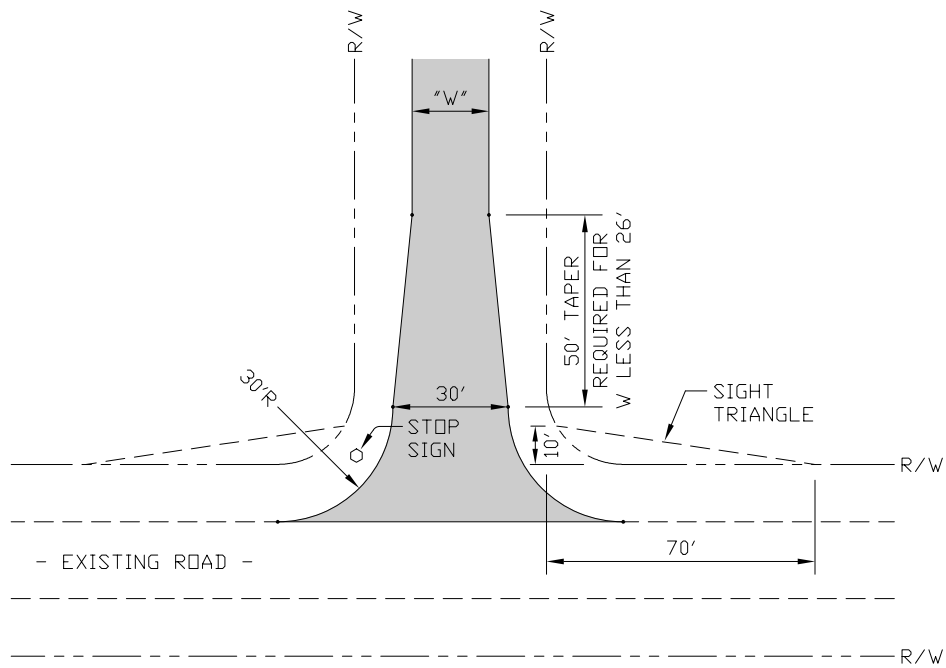
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DETAIL #  
**6**

DATE:  
JULY 2010

SHEET #:  
1 OF 1



**PLAN VIEW**



**TOWN OF ZEBULON**

TIE-IN OF STREETS at DOT  
SHOULDER ROADS – STREETS

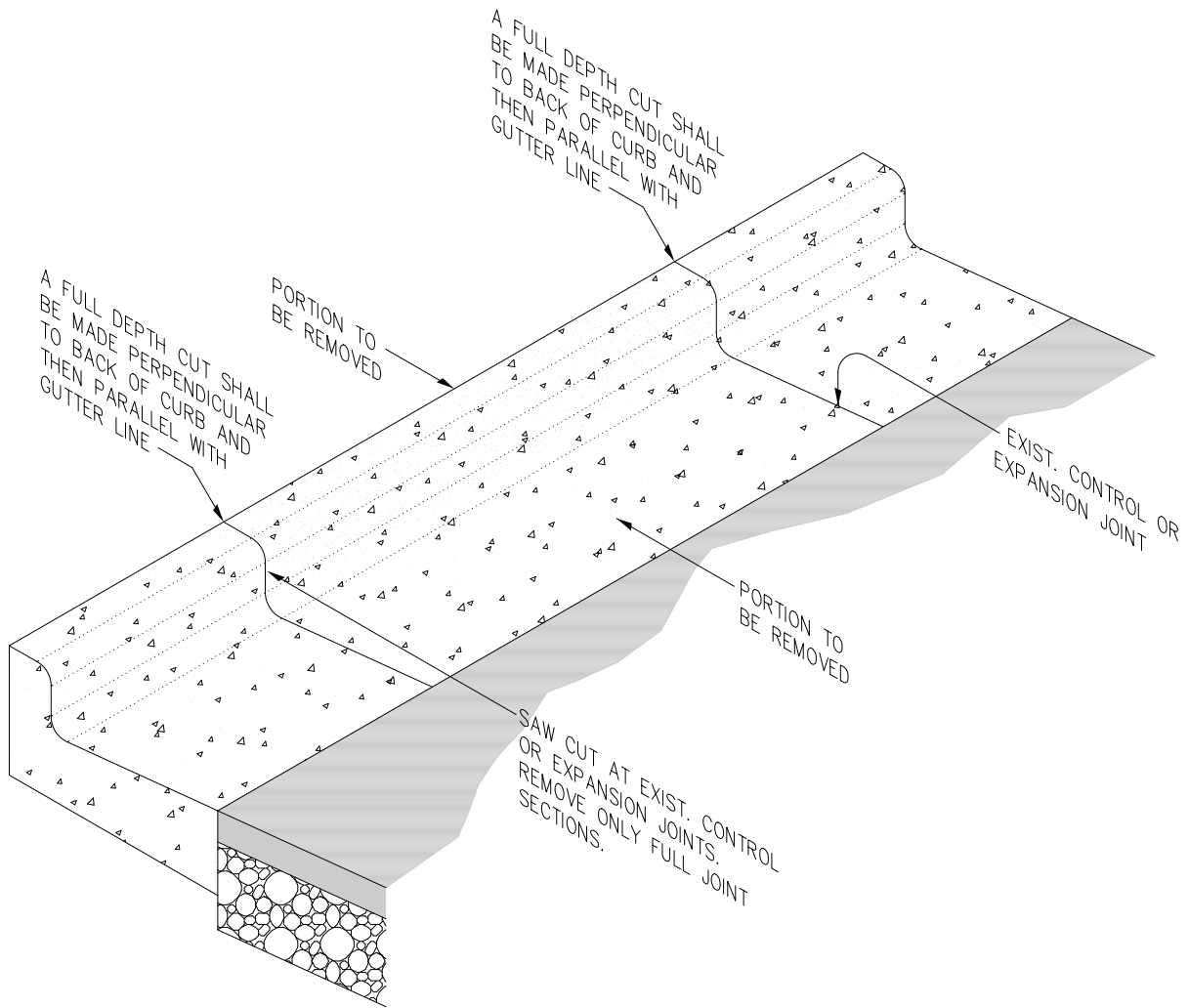
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DETAIL #  
**7**

DATE:  
JULY 2010

SHEET #:  
1 OF 1



## PERSPECTIVE

### NOTES:

1. CARE SHOULD BE EXERCISED WHEN REMOVING CONCRETE CURB NOT TO DAMAGE EXSTING CURB TO REMAIN.
2. DAMAGE TO EXISTING CURB TO REMAIN WILL REQUIRE REMOVAL OF ENTIRE SECTION OF CURB.
3. SEE INSTALLATION REQUIREMENTS ON SHEET 2 OF 2.



## TOWN OF ZEBULON

STREET CURB CUT FOR  
DRIVEWAYS ON C&G STREETS

USE WITH STANDARD SPECIFICATIONS ONLY

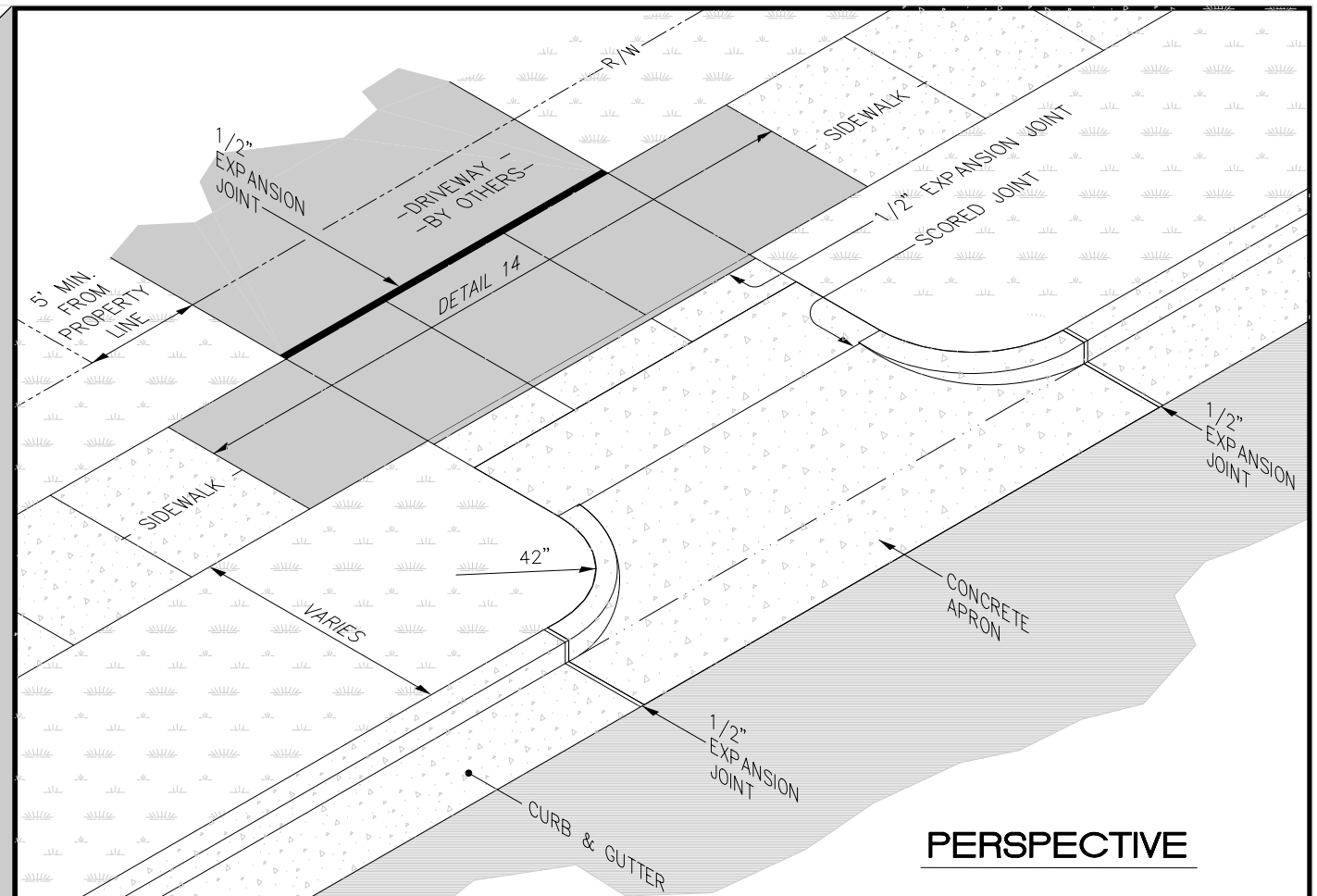
SCALE:  
NOT TO SCALE

DATE:  
JULY 2010

DETAIL #  
**8**

SHEET #:  
1 OF 2

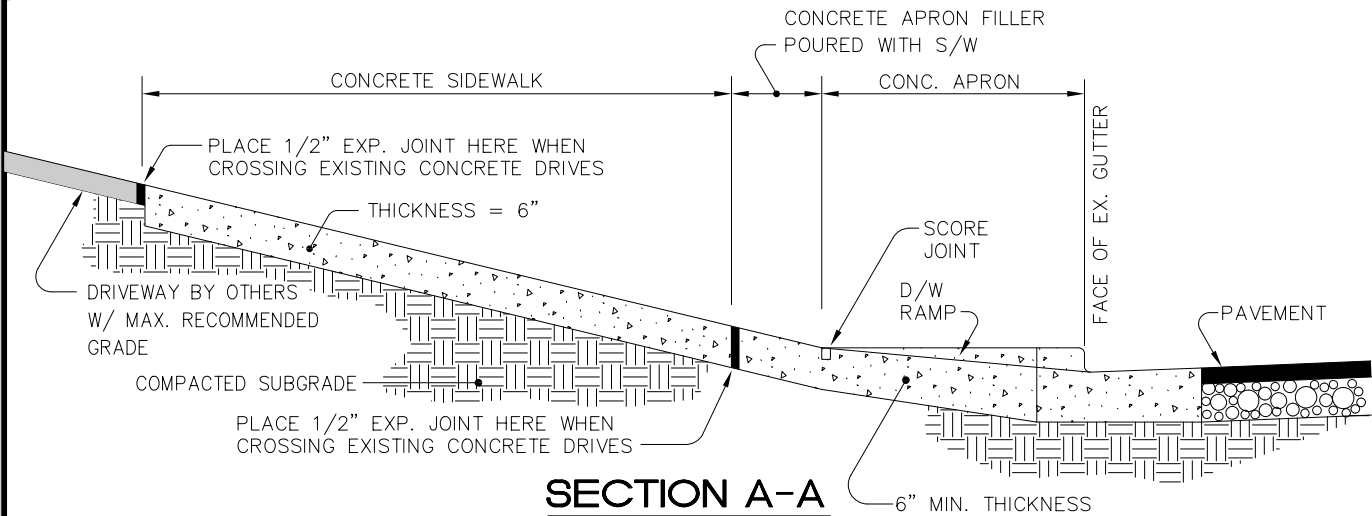




**PERSPECTIVE**

**NOTES:**

1. RESIDENTIAL DRIVEWAY TO BE 12' TO 24' IN WIDTH.
2. COMMERCIAL AND INDUSTRIAL DRIVEWAYS TO BE A MAXIMUM OF 36' WIDE.
3. ALL CONCRETE SHALL BE 3000 PSI @ 28 DAYS AIR ENTRAINED.
4. CURB SHALL BE TAPERED TO FINISH FLUSH WITH SIDEWALK.
5. BEGINNING RADIUS SHALL NOT ENCROACH ON ADJACENT PROPERTIES BASED ON A PROJECTION OF PROPERTY LINE FROM THE RIGHT-OF-WAY TO THE CURB LINE.
6. SIDEWALK SECTION SHALL NOT BE REQUIRED ALONG STREETS WHICH ARE NOT PLANNED FOR SIDEWALK.



**SECTION A-A**

**TOWN OF ZEBULON**

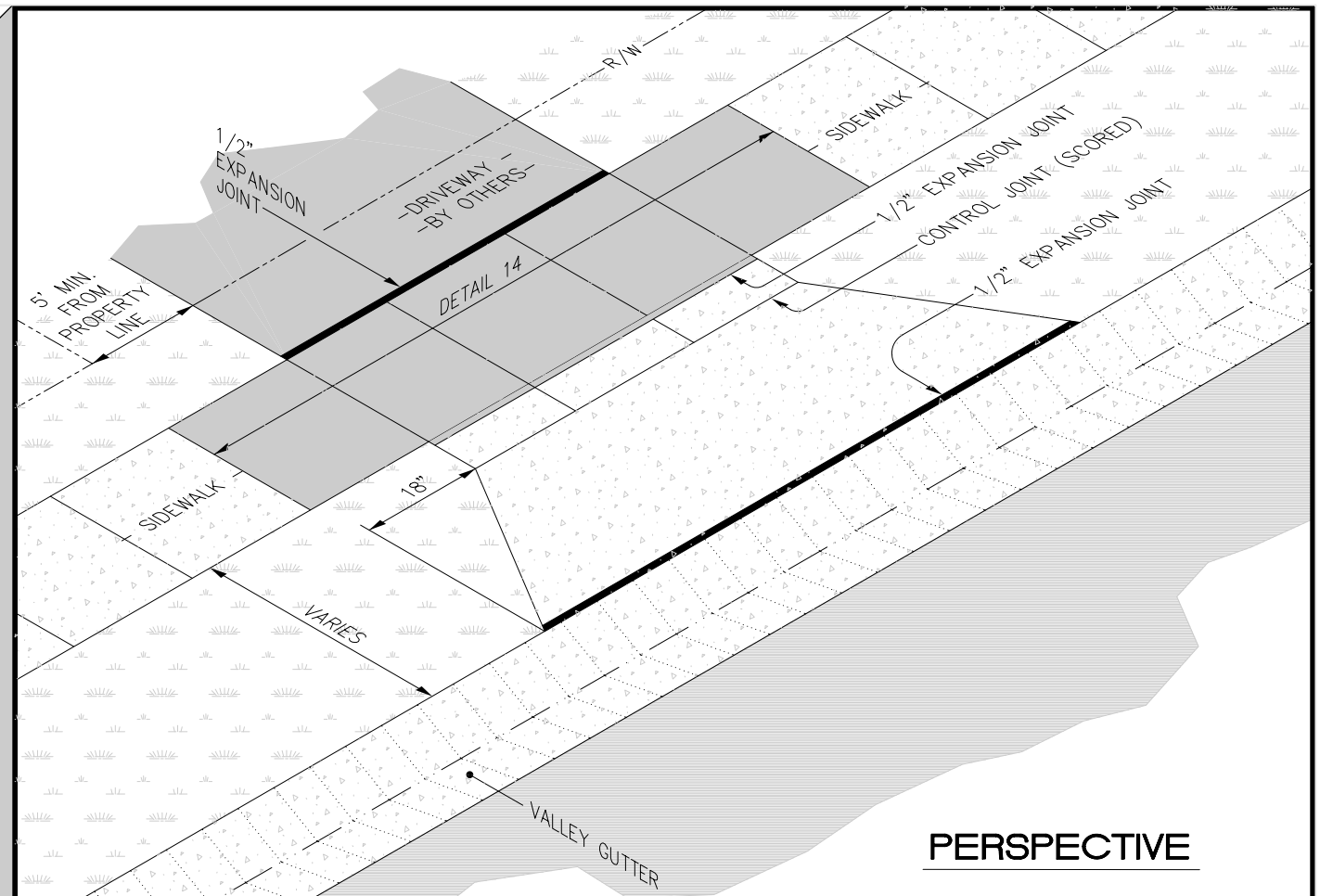
**STREET CURB CUT FOR DRIVEWAYS ON C&G STREETS**

USE WITH STANDARD SPECIFICATIONS ONLY



SCALE:  
NOT TO SCALE  
DATE:  
JULY 2010

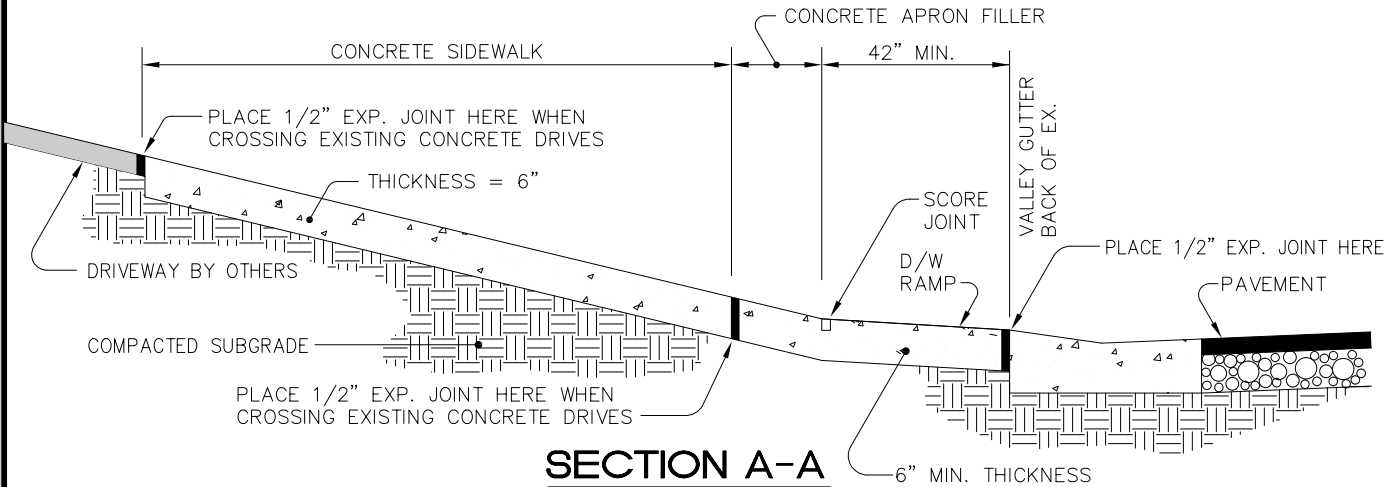
DETAIL #  
**8**  
SHEET #:  
2 OF 2



**PERSPECTIVE**

**NOTES:**

1. RESIDENTIAL DRIVEWAY TO BE 12' TO 24' IN WIDTH.
2. COMMERCIAL AND INDUSTRIAL DRIVEWAYS TO BE A MAXIMUM OF 36' WIDE.
3. ALL CONCRETE SHALL BE 3000 PSI @ 28 DAYS AIR ENTRAINED.
4. CURB SHALL BE TAPERED TO FINISH FLUSH WITH SIDEWALK.
5. BEGINNING RADIUS SHALL NOT ENCROACH ON ADJACENT PROPERTIES BASED ON A PROJECTION OF PROPERTY LINE FROM THE RIGHT-OF-WAY TO THE CURB LINE.
6. SIDEWALK SECTION SHALL NOT BE REQUIRED ALONG STREETS WHICH ARE NOT PLANNED FOR SIDEWALK.



**SECTION A-A**

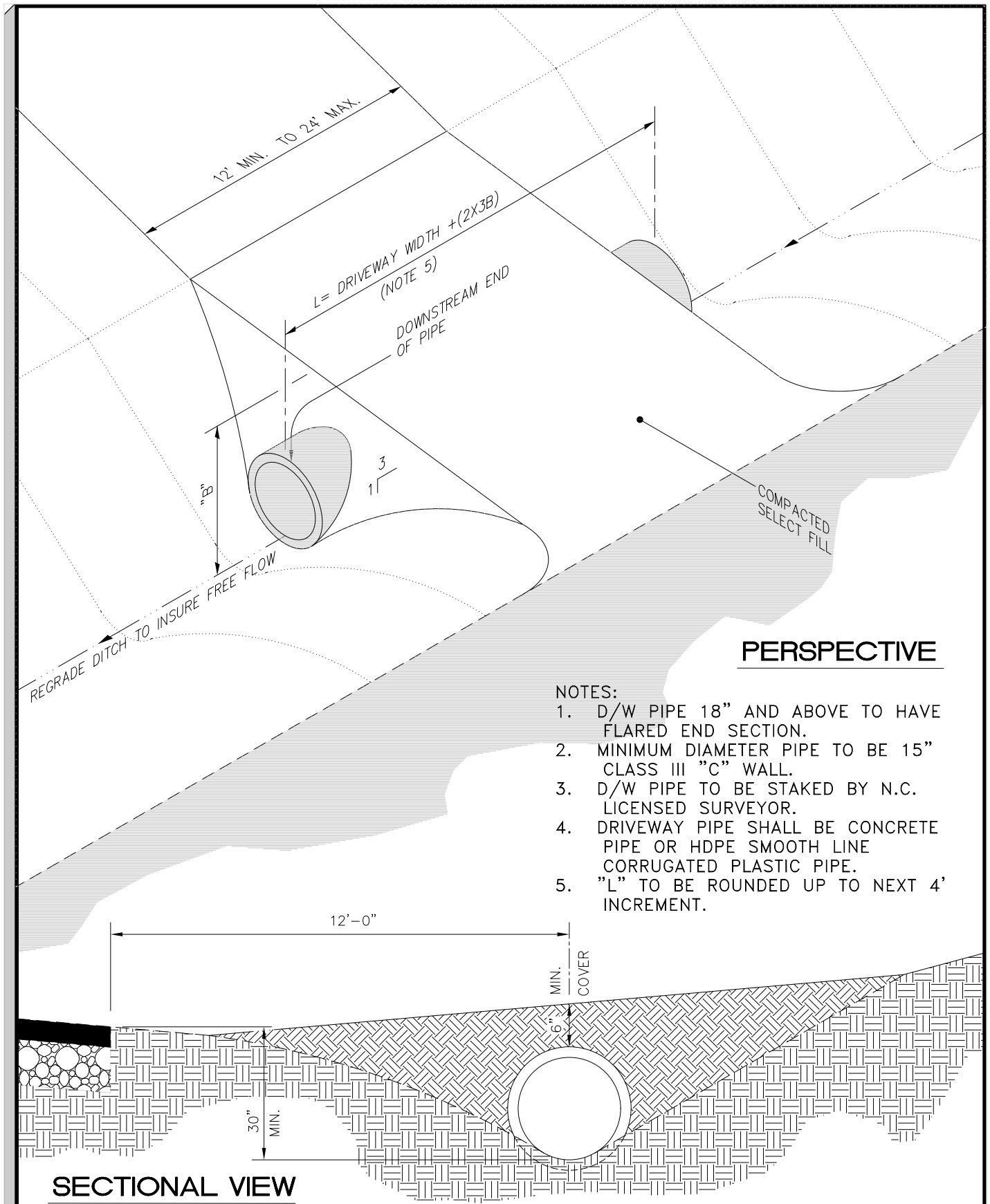
**TOWN OF ZEBULON**

**FLARED DRIVEWAY ENTRANCE TO VALLEY GUTTER**

USE WITH STANDARD SPECIFICATIONS ONLY



SCALE: NOT TO SCALE	DETAIL # <b>9</b>
DATE: JULY 2010	SHEET #: 1 OF 1

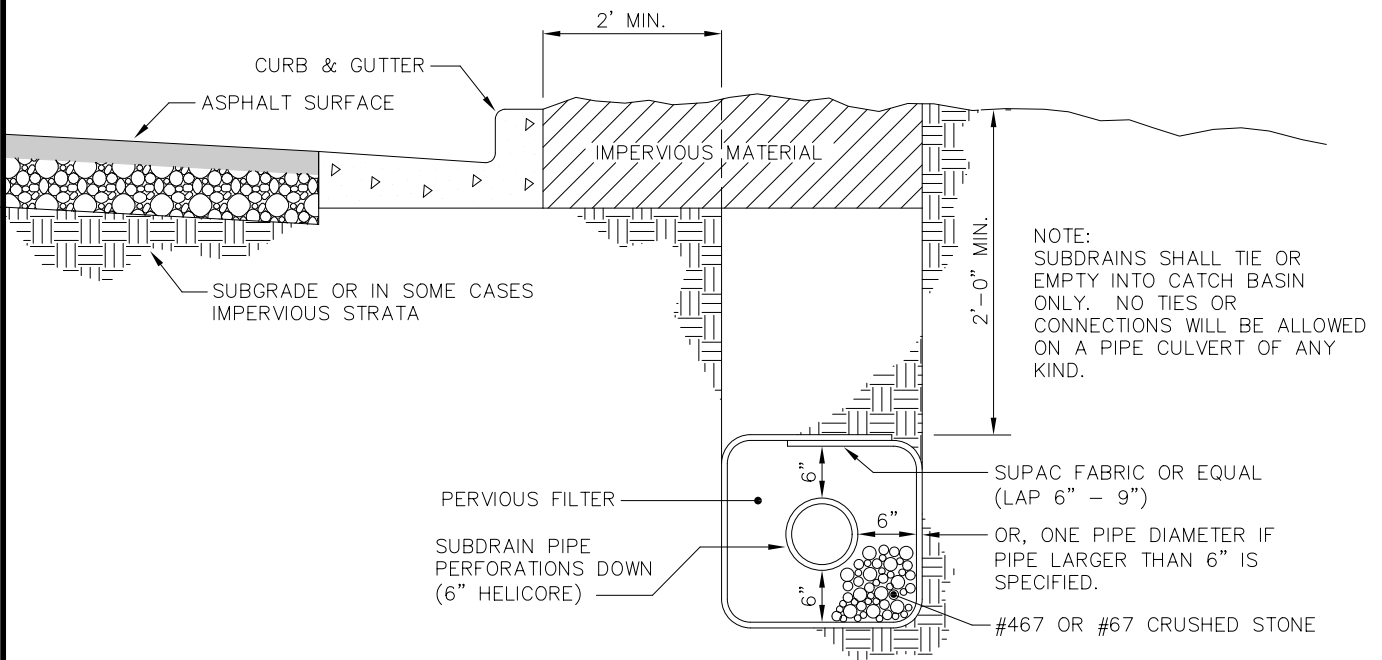


**TOWN OF ZEBULON**

INSTALLATION OF D/W PIPE IN STREET SECTION

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE: NOT TO SCALE	DETAIL # <b>10</b>
DATE: JULY 2010	SHEET #: 1 OF 1



## SECTIONAL VIEW



## TOWN OF ZEBULON

### STD. SUBDRAIN BEHIND CURB & GUTTER

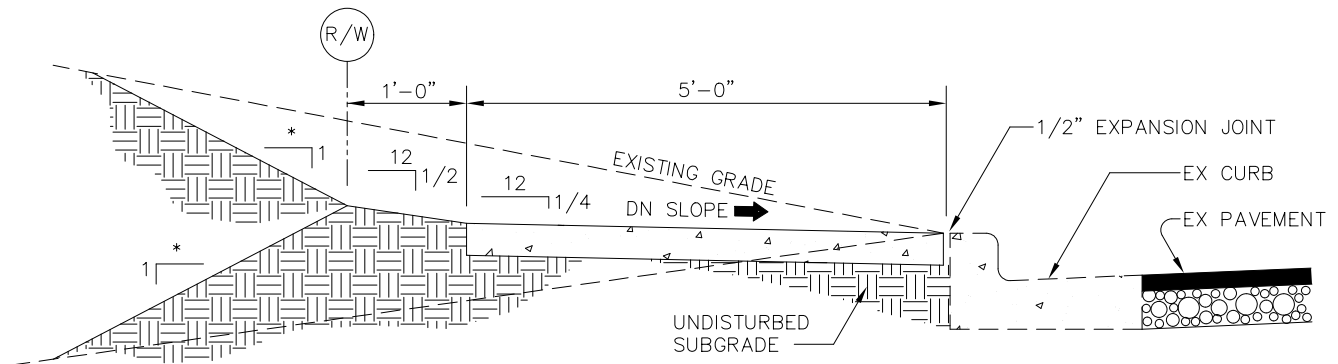
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DETAIL #  
**11**

DATE:  
JULY 2010

SHEET #:  
1 OF 1



\* VARIES, MAXIMUM SLOPE 2:1  
UNLESS SHOWN OTHERWISE

## SECTIONAL VIEW

1. PROVIDE 3/4" DEEP TOOLED SCORE AT 5'-0" O.C.
2. EXPANSION JOINTS TO BE PLACED 30'-0" O.C. LONGITUDINALLY, ADJACENT TO CURBS, AND WHEN BUTTING EXISTING STRUCTURES, CONCRETE, OR BUILDINGS.
3. CONCRETE TO BE 3000 P.S.I. AT 28 DAYS, AIR-ENTRAINED.
4. SUBGRADE SHOULD NOT CONTAIN ORGANIC MATTER OR PLASTIC CLAYS. WHEN FOUND, REFER TO SPECS OR CONTACT ENGINEER FOR DIRECTIONS.
5. AREAS OF FILL ARE TO BE COMPACTED TO 95% STANDARD PROCTOR USING NCDOT CLASS III BORROW OR BETTER. REMOVE TOPSOIL BEFORE PLACING BORROW.
6. SIDEWALK TRANSVERSE SLOPE MAY INCREASE TO 1/2 IN 12 WITH TOWN'S ENGINEER APPROVAL.



## TOWN OF ZEBULON

TYP SIDEWALK in  
CUT or FILL SECTIONS

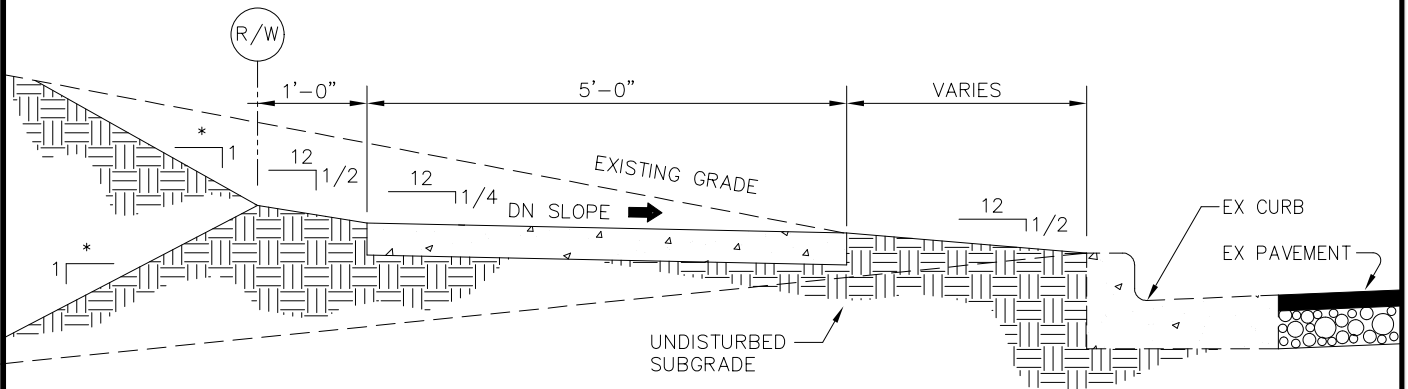
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DATE:  
JULY 2010

DETAIL #  
**12**

SHEET #:  
1 OF 1



\* VARIES, MAXIMUM SLOPE 2:1  
UNLESS SHOWN OTHERWISE

### SECTIONAL VIEW

1. PROVIDE 3/4" DEEP TOOLED SCORE AT 5'-0" O.C.
2. EXPANSION JOINTS TO BE PLACED 30'-0" O.C. LONGITUDINALLY, ADJACENT TO CURBS, AND WHEN BUTTING EXISTING STRUCTURES, CONCRETE, OR BUILDINGS.
3. CONCRETE TO BE 3000 P.S.I. AT 28 DAYS, AIR-ENTRAINED.
4. SUBGRADE SHOULD NOT CONTAIN ORGANIC MATTER OR PLASTIC CLAYS. WHEN FOUND, REFER TO SPECS OR CONTACT ENGINEER FOR DIRECTIONS.
5. AREAS OF FILL ARE TO BE COMPACTED TO 95% STANDARD PROCTOR USING NCDOT CLASS III BORROW OR BETTER. REMOVE TOPSOIL BEFORE PLACING BORROW.
6. SIDEWALK TRANSVERSE SLOPE MAY INCREASE TO 1/2 IN 12 WITH TOWN'S ENGINEER APPROVAL.



## TOWN OF ZEBULON

TYP SIDEWALK in  
CUT or FILL SECTIONS

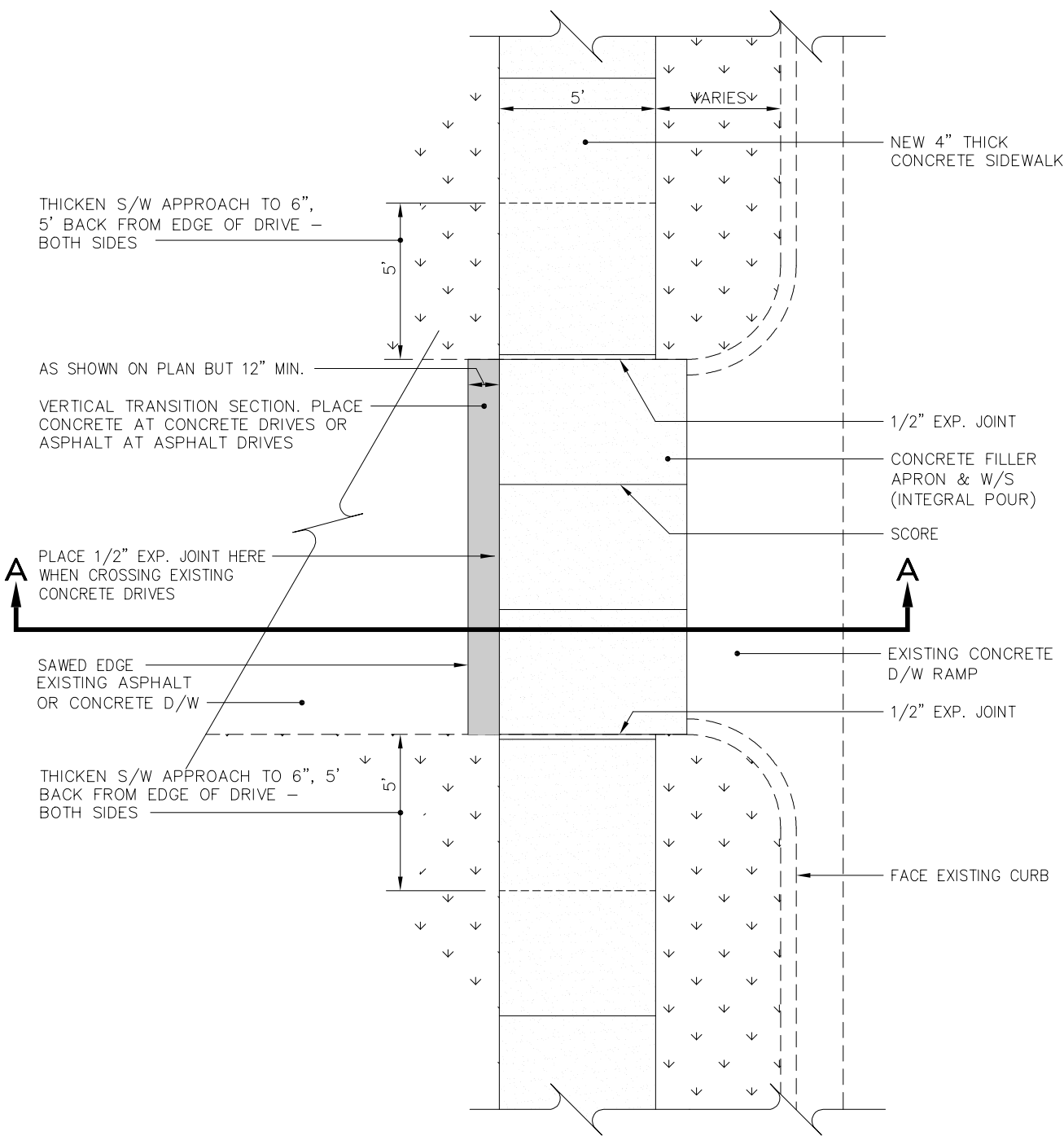
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DETAIL #  
**13**

DATE:  
JULY 2010

SHEET #:  
1 OF 1



**PLAN VIEW**



**TOWN OF ZEBULON**

**SIDEWALK DETAIL X-ING EX. DRIVEWAYS**

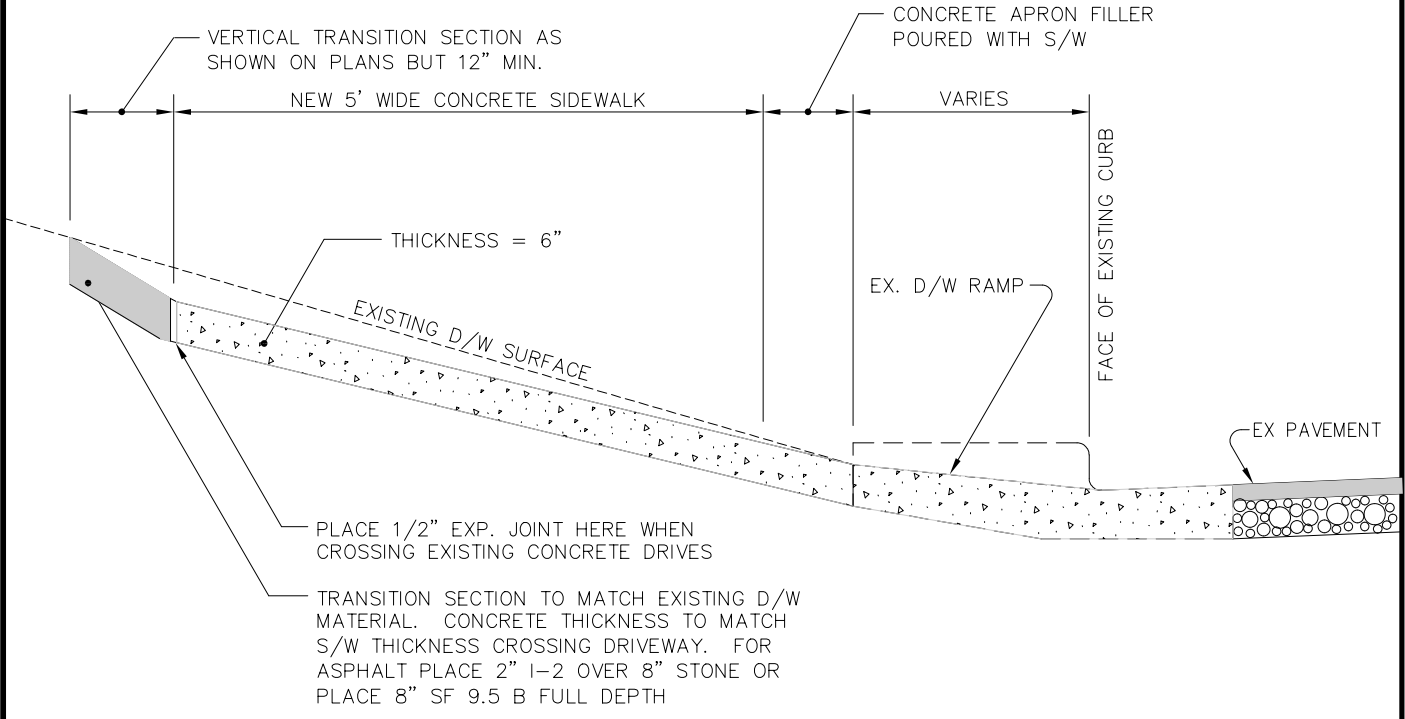
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
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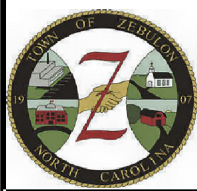
DETAIL #  
**14**

DATE:  
JULY 2010

SHEET #:  
1 OF 1



**SECTION A-A**



**TOWN OF ZEBULON**

**SIDEWALK DETAIL X-ING EX. DRIVEWAYS**

USE WITH STANDARD SPECIFICATIONS ONLY

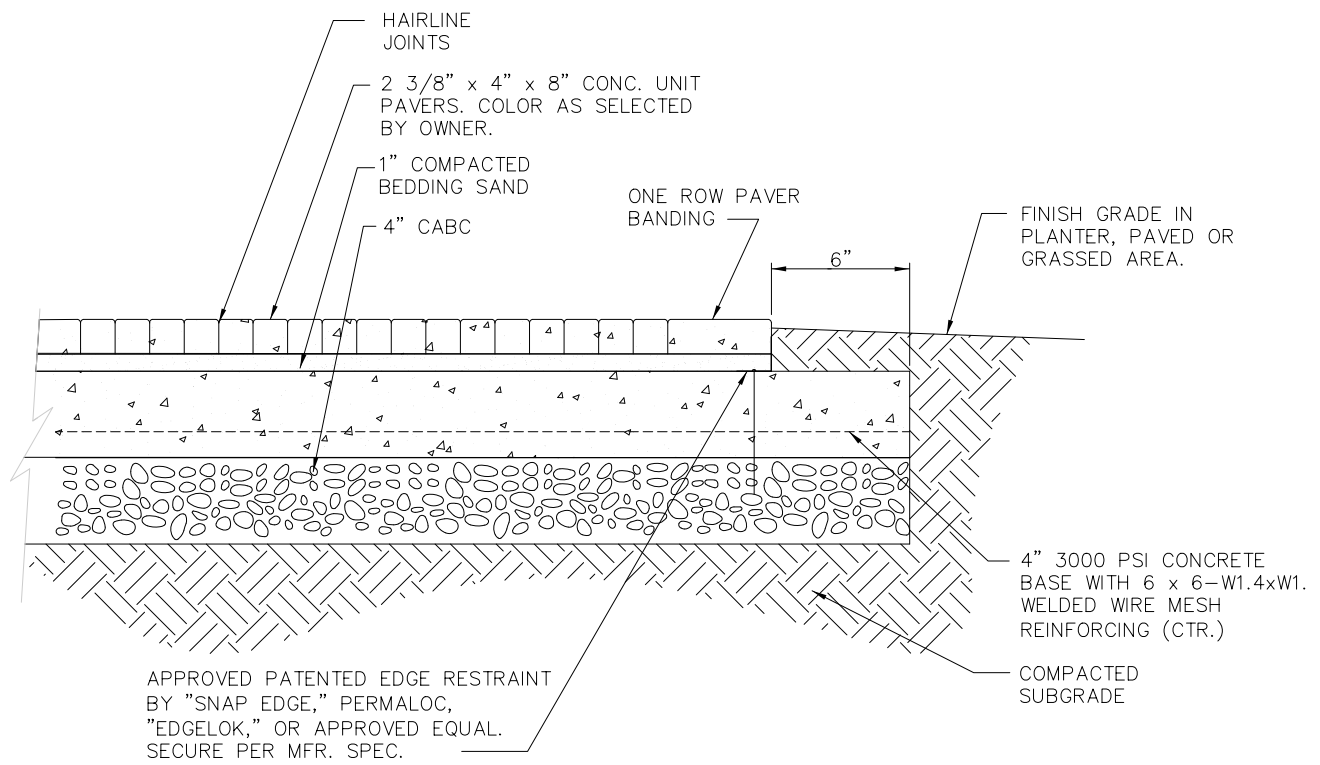
SCALE:  
NOT TO SCALE

DETAIL #  
**15**

DATE:  
JULY 2010

SHEET #:  
1 OF 1





NOTE:  
 LEVELING COURSE/SETTING BED SHALL BE WELL GRADED CONCRETE SAND MEETING ASTM C33, NOT MASON'S SAND, NOT PLAY YARD SAND.

**SECTIONAL VIEW**



**TOWN OF ZEBULON**

**TYPICAL CONCRETE PAVERS STREET STANDARDS**

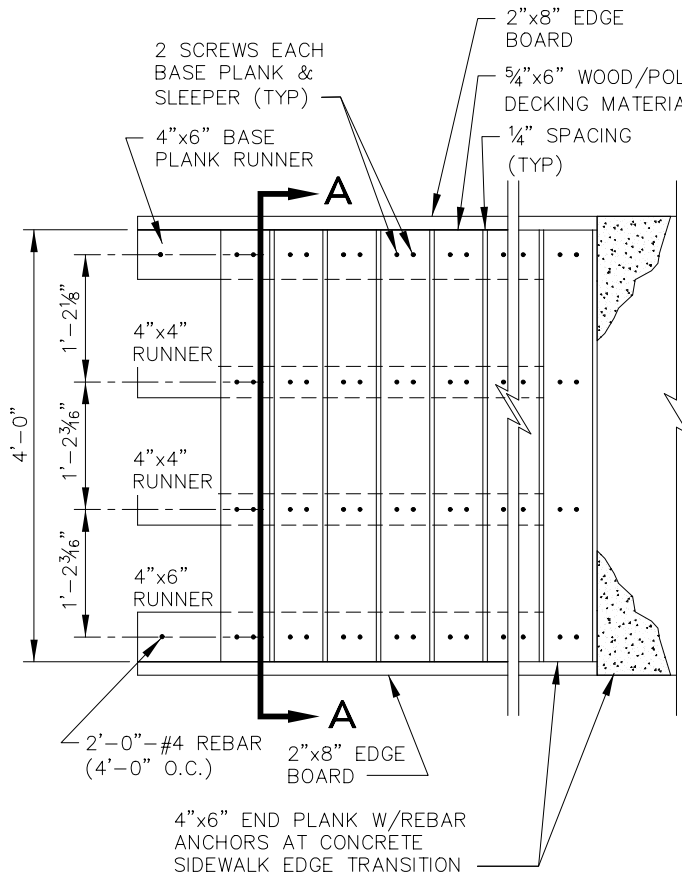
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

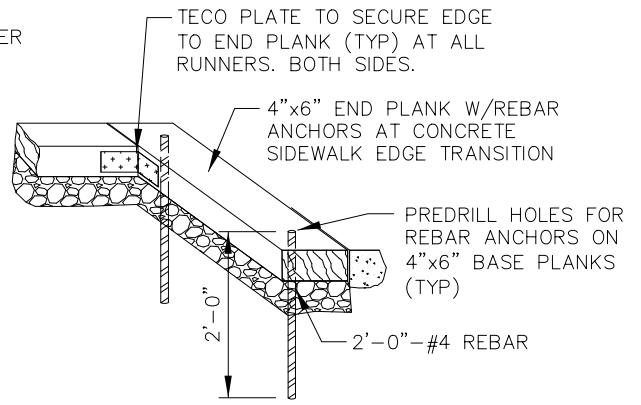
DETAIL #  
**16**

DATE:  
JULY 2010

SHEET #:  
1 OF 1



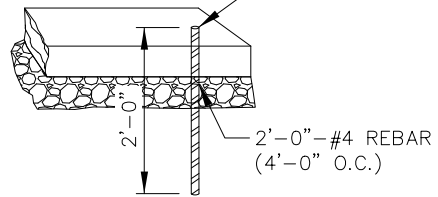
**PLAN VIEW**



**ISOMETRIC VIEW**

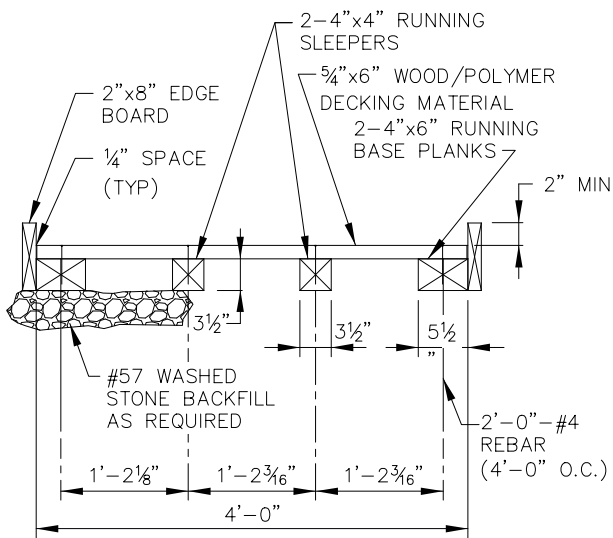
WOOD SIDEWALK TO CONCRETE TRANSITION

PREDRILL HOLES FOR REBAR ANCHORS. SPACE 4'-0" O.C. ALONG 4"x6" BASE PLANKS

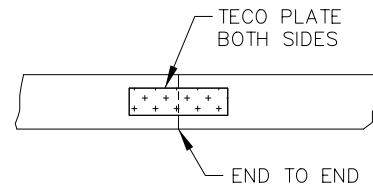


**ISOMETRIC VIEW**

4"x6" BASE PLANK RUNNERS



**SECTION A-A**



**RUNNER SPLICE DETAIL**

TECO PLATE TO SECURE 4"x4" & 4"x6" SPLICED UNITS TOGETHER

**NOTES:**

1. STAGGER RUNNER JOINTS ON ALL LINEAR MEMBERS.
2. USE GRAVEL FILL TO LEVEL THE BASE MEMBERS. COMPACT #57 STONE FILL TO 95% STANDARD PROCTOR DENSITY (ASTM D 698).
3. USE FASTENERS AS SPECIFIED.
4. USE TECO PLATES AT JOINTS AND FOR FASTENING EDGING.
5. PREDRILL HOLES FOR ANCHORING DECK BOARDS.
6. ALL LUMBER TO BE PRESSURE TREATED SYP WITH 4X STOCK RATED FOR GROUND CONTACT.
7. DECK BOARDS TO BE WOOD/POLYMER MATERIAL AS SPECIFIED.
8. WOOD WALK HORIZONTAL AND VERTICAL ALIGNMENT TO MEET ADA ACCESSIBILITY REQUIREMENTS (MAX. VERTICAL GRADE OF 5% AND MAX CROSS SLOPE OF 2%). END RAMPS 8% MAXIMUM.



**TOWN OF ZEBULON**

**WOOD SIDEWALK  
DETAIL**

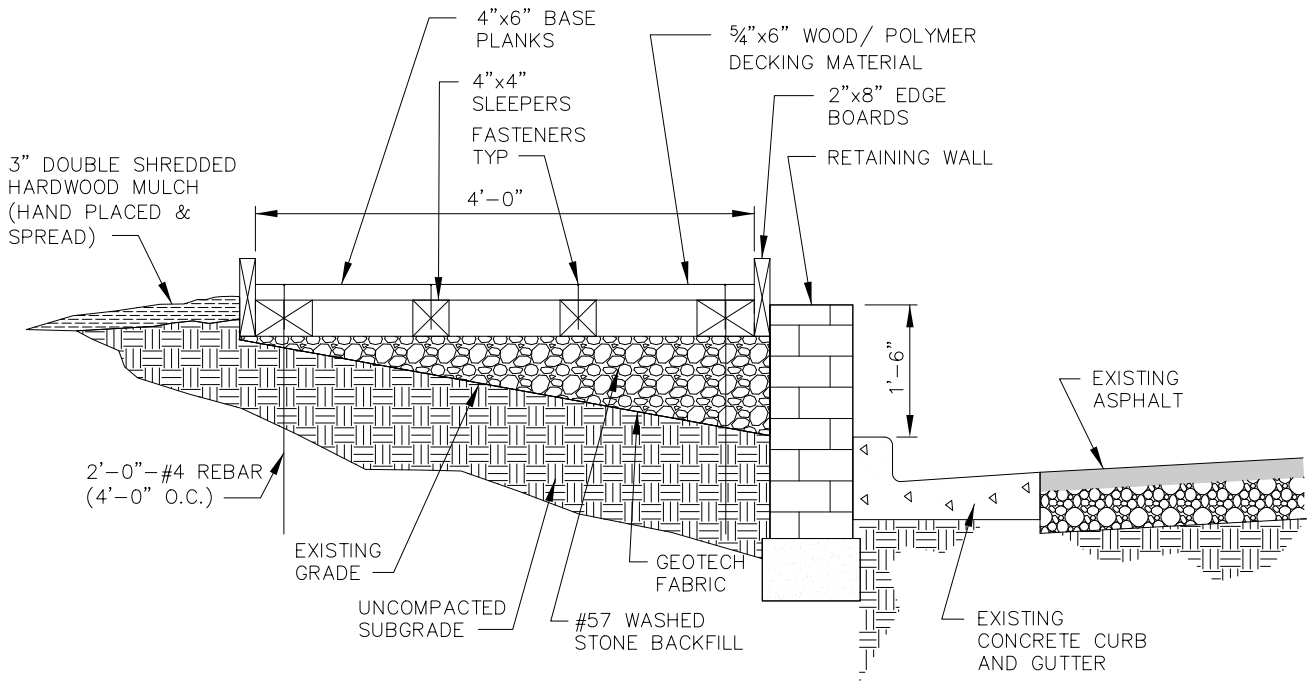
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DETAIL #  
**17**

DATE:  
JULY 2010

SHEET #:  
1 OF 1



### SECTIONAL VIEW

**NOTES:**

1. CLEAR VEGETATION, ORGANIC MATERIAL AND OTHER OBSTRUCTIONS FROM SIDEWALK SUBGRADE.
  - A. RAKE CLEAN & SMOOTH
  - B. DO NOT GRUB
  - C. DO NOT COMPACT SIDEWALK SUBGRADE
2. EXCAVATE ONLY AS NECESSARY TO INSTALL WOOD SIDEWALK STRUCTURE & GEOTEXTILE FABRIC TO PLANNED GRADE. PLACE FABRIC ON SUBGRADE (FULL WIDTH) & UP TO TOP OF WALL.
3. USE GRAVEL FILL TO LEVEL THE BASE MEMBERS. COMPACT #57 STONE FILL TO 95% STANDARD PROCTOR DENSITY (ASTM D 698).
4. FINISH GRADES OF WOOD WALK AND CONCRETE SIDEWALK SHALL BE A SMOOTH TRANSITION. INSTALL 4"x6" END PLANK AT EDGE OF CONCRETE SIDEWALK.
5. WOOD WALK HORIZONTAL AND VERTICAL ALIGNMENT TO MEET ADA ACCESSIBILITY REQUIREMENTS (MAX. VERTICAL GRADE OF 5% AND MAX CROSS SLOPE OF 2%). END RAMPS 8% MAXIMUM.



## TOWN OF ZEBULON

### WOOD SIDEWALK SECTION

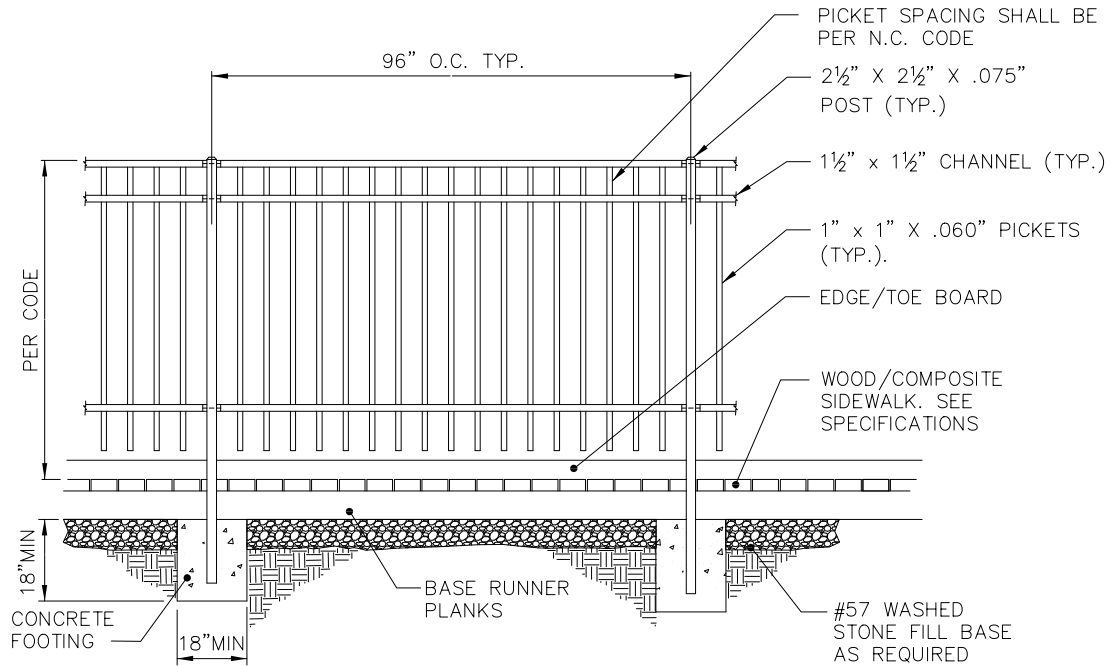
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DATE:  
JULY 2010

DETAIL #  
**18**

SHEET #:  
1 OF 1



### SIDE ELEVATIONAL VIEW

NOTES:

1. ALUMINUM RAILING TO BE ASTM MANUFACTURERS INDUSTRIAL GRADE, FABRICATED AND INSTALLED PER MANUFACTURER'S STANDARDS AND SPECIFICATIONS TO N.C. STATE CODE. NC DESIGN CODE RATING FOR HANDRAILS SHALL BE USED FOR DESIGN PARAMETERS. REFER TO NC BUILDING CODE.
2. ALL ALUMINUM RAILING SHALL HAVE AN ELECTROSTATICALLY APPLIED BAKED ON FLEXIBLE ACRYLIC BLACK FINISH THAT MEETS OR EXCEEDS INDUSTRY STANDARD TESTS (ASTM).
3. CONTRACTOR SHALL SUBMIT STAMPED SHOP DRAWINGS FROM A NC REGISTERED ENGINEER AND SAMPLES OF ALUMINUM RAILING PRIOR TO OWNER'S APPROVAL. DESIGN MUST MEET ALL LOCAL AND STATE CODES HAVING JURSDICTION.
4. CONTRACTOR SHALL SETUP A SAMPLE SECTION OF ALUMINUM RAILING (ONE RAIL PANEL LENGTH, MINIMUM) FOR OWNER'S APPROVAL, PRIOR TO RAILING INSTALLATION.



## TOWN OF ZEBULON

### ALUMINUM RAILING DETAIL

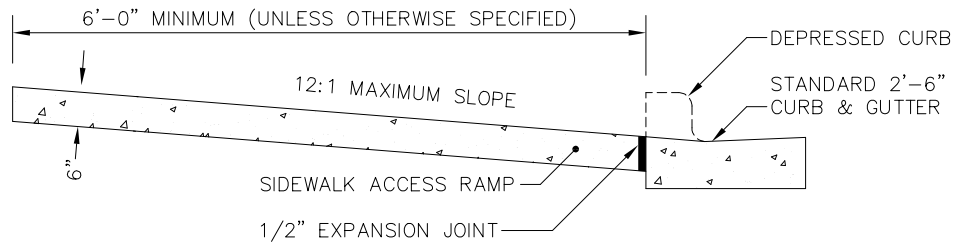
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DETAIL #  
**19**

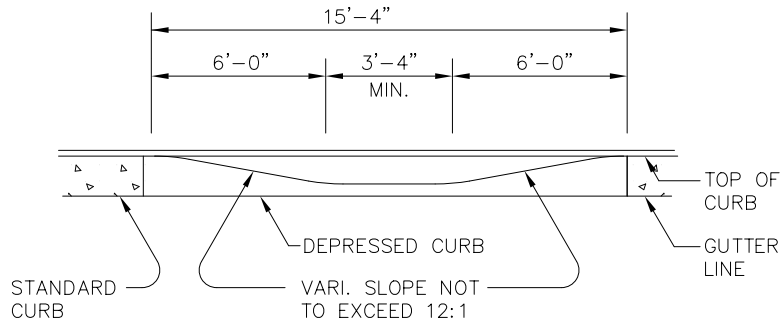
DATE:  
JULY 2010

SHEET #:  
1 OF 1



### LONGITUDINAL SECTION

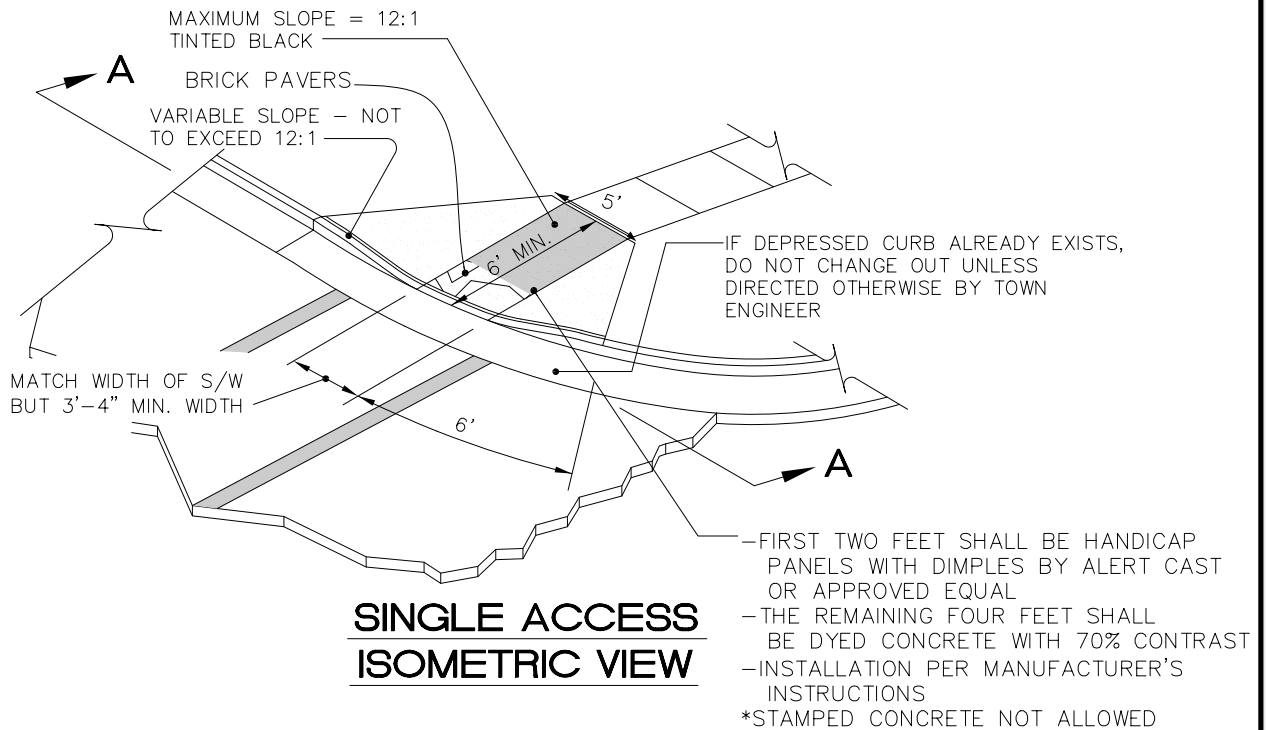
NOT TO SCALE



### SECTION A-A

### ELEVATION OF SINGLE ACCESS RAMP

NOT TO SCALE



### SINGLE ACCESS ISOMETRIC VIEW



## TOWN OF ZEBULON

### SINGLE HANDICAP RAMP DETAIL

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

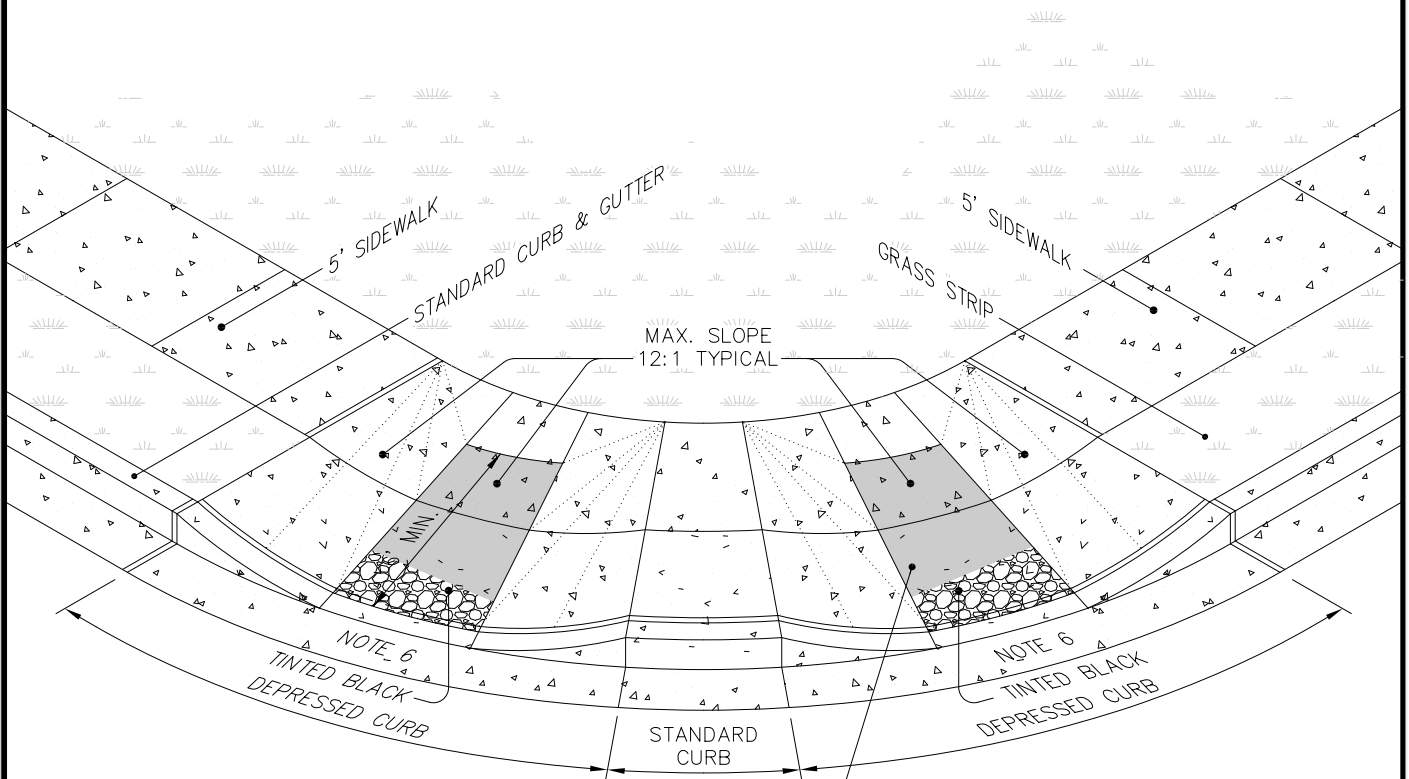
DETAIL #  
**20**

DATE:  
JULY 2010

SHEET #:  
1 OF 1

## NOTES:

1. WHEELCHAIR RAMPS SHALL BE PROVIDED AT LOCATIONS AS SHOWN ON THESE PLANS OR AS DIRECTED BY THE ENGINEER. WHEELCHAIR RAMPS SHALL BE LOCATED AS INDICATED IN THESE DETAILS; HOWEVER, THE LOCATION MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER WHERE EXISTING LIGHT POLES, FIRE HYDRANTS, DROP INLETS, ETC. AFFECT PLACEMENT. AT THESE LOCATIONS, NOT LESS THAN 2 FEET OF FULL HEIGHT CURB SHALL BE PLACED BETWEEN ADJACENT RAMPS.
2. NO SLOPE ON THE WHEELCHAIR RAMP SHALL EXCEED 1"/12" (12:1) IN RELATIONSHIP TO THE GRADE OF THE STREET.
3. IN NO CASE SHALL THE WIDTH OF THE WHEELCHAIR RAMP BE LESS THAN 40" (3'-4") HOWEVER, WIDTH MAY EXCEED 40".
4. USE AIR ENTRAINED 3000 PSI CONCRETE WITH A SIDEWALK FINISH IN ORDER TO OBTAIN A ROUGH NON-SKID TYPE SURFACE.
5. A 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE CONCRETE WHEELCHAIR RAMP JOINS THE CURB AND AS SHOWN ON STANDARD DRAWINGS.
6. CURB DEPRESSION MUST GO IN WHETHER OR NOT SIDEWALK IS PLACED.



- FIRST TWO FEET SHALL BE HANDICAP TILES WITH DIMPLES BY ALERT CAST OR APPROVED EQUAL
- THE REMAINING FOUR FEET SHALL BE DYED CONCRETE WITH 70% CONTRAST
- INSTALLATION PER MANUFACTURER'S INSTRUCTIONS
- \*STAMPED CONCRETE NOT ALLOWED

## STANDARD ADA WHEELCHAIR SIDEWALK ACCESS AT CURB RETURNS

### PERSPECTIVE



## TOWN OF ZEBULON

### DOUBLE HANDICAP RAMP DETAIL

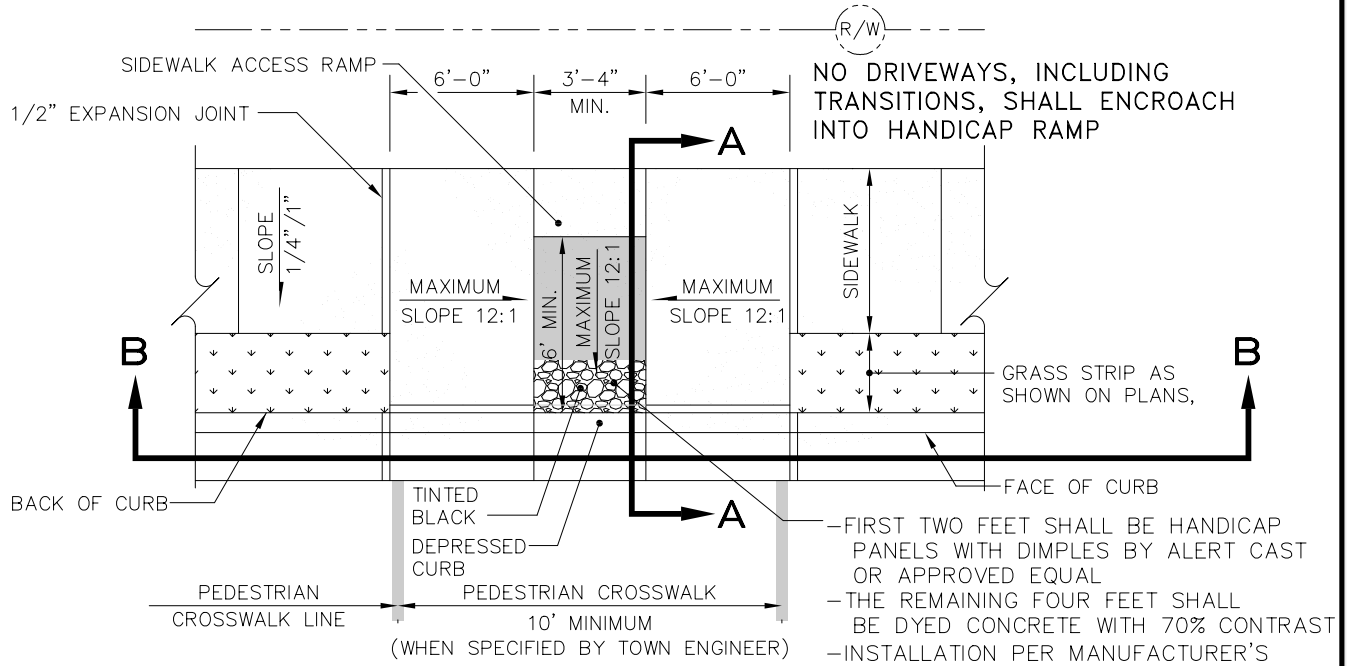
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

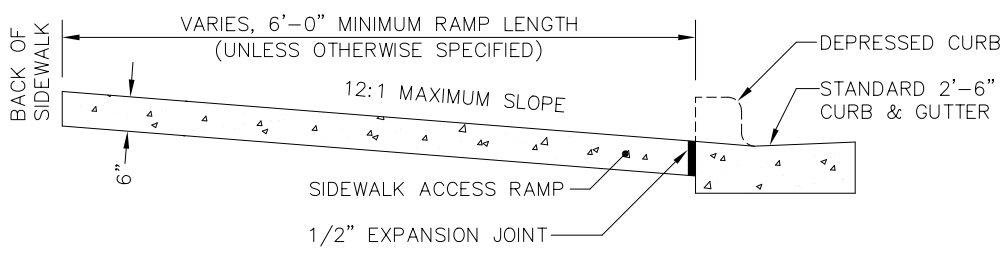
DETAIL #  
**21**

DATE:  
JULY 2010

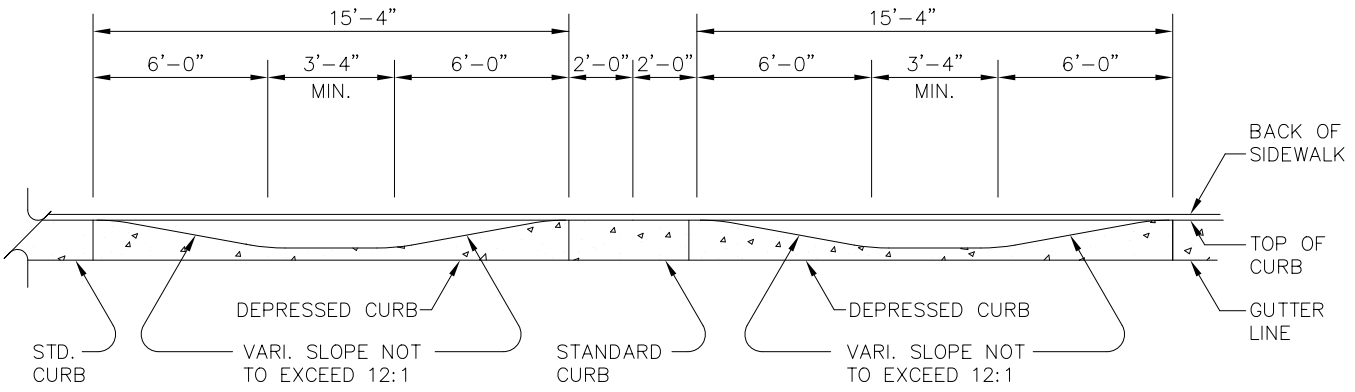
SHEET #:  
1 OF 2



**SIDEWALK ACCESS RAMP**  
 NOT TO SCALE (SHOWN W/SINGLE RAMP)



**SECTION A-A**  
**PUBLIC STREET TIE-IN**  
 NOT TO SCALE



**SECTION B-B**  
 NOT TO SCALE

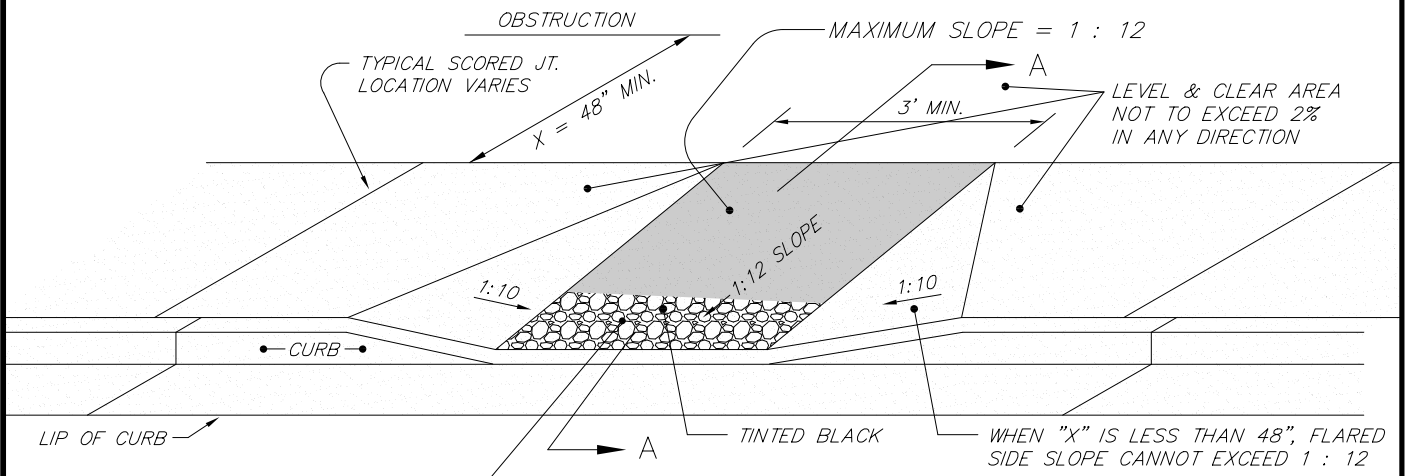


**TOWN OF ZEBULON**

**DOUBLE HANDICAP RAMP DETAIL**

USE WITH STANDARD SPECIFICATIONS ONLY

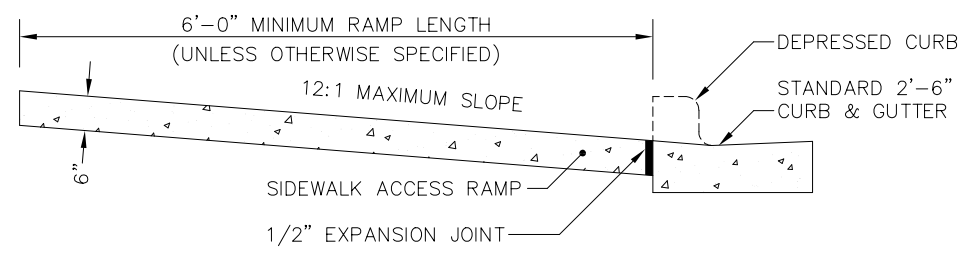
SCALE: NOT TO SCALE	DETAIL # <b>21</b>
DATE: JULY 2010	SHEET #: <u>2</u> OF <u>2</u>



- FIRST TWO FEET SHALL BE HANDICAP TILES WITH DIMPLES BY ALERT CAST OR APPROVED EQUAL
- THE REMAINING FOUR FEET SHALL BE DYED CONCRETE WITH 70% CONTRAST
- INSTALLATION PER MANUFACTURER'S INSTRUCTIONS
- \*STAMPED CONCRETE NOT ALLOWED

**PERSPECTIVE**

NEED FOR PAVEMENT STRIPPING AT ACCESS RAMP TO BE DETERMINED BY PUBLIC WORKS DIRECTOR



**SECTION A-A**

**IN-WALK HANDICAP RAMP**

\* THIS DETAIL APPLICABLE FOR PARALLEL PARKING IN MUNICIPAL APPLICATIONS ONLY



**TOWN OF ZEBULON**

**HANDICAP PARKING STALL DETAIL \***

USE WITH STANDARD SPECIFICATIONS ONLY

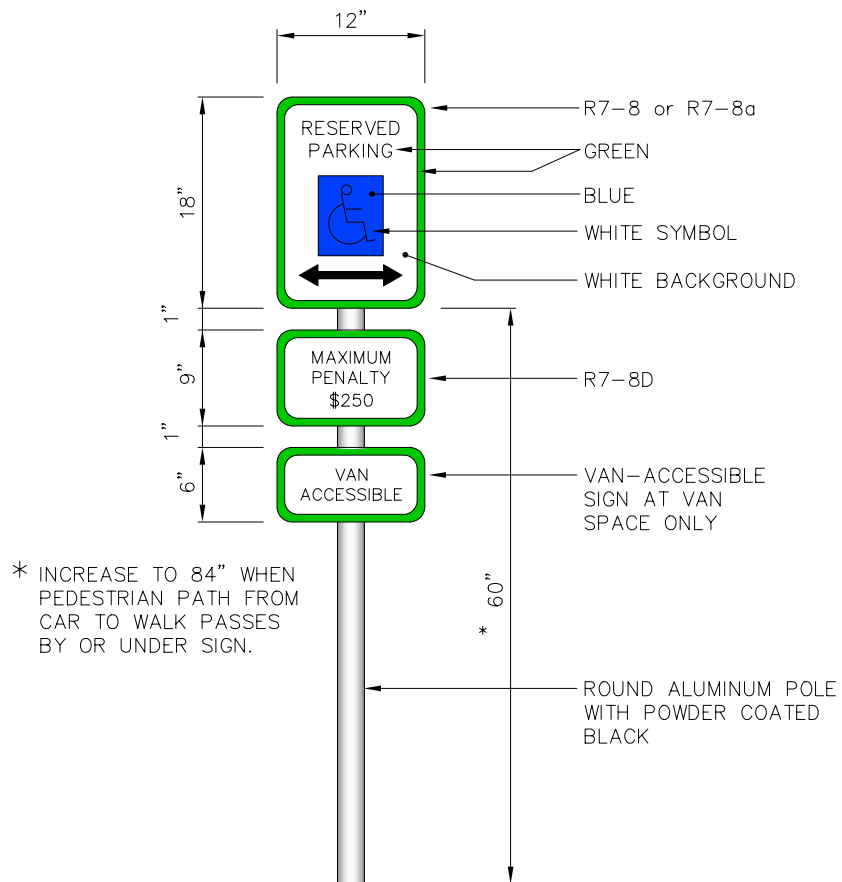
SCALE:  
NOT TO SCALE

DATE:  
JULY 2010

DETAIL #  
**22**

SHEET #:  
1 OF 1





ELEVATIONAL VIEW



TOWN OF ZEBULON

R7-8 HANDICAP SIGN DETAIL

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

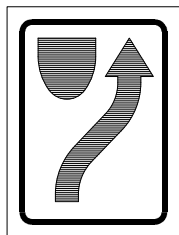
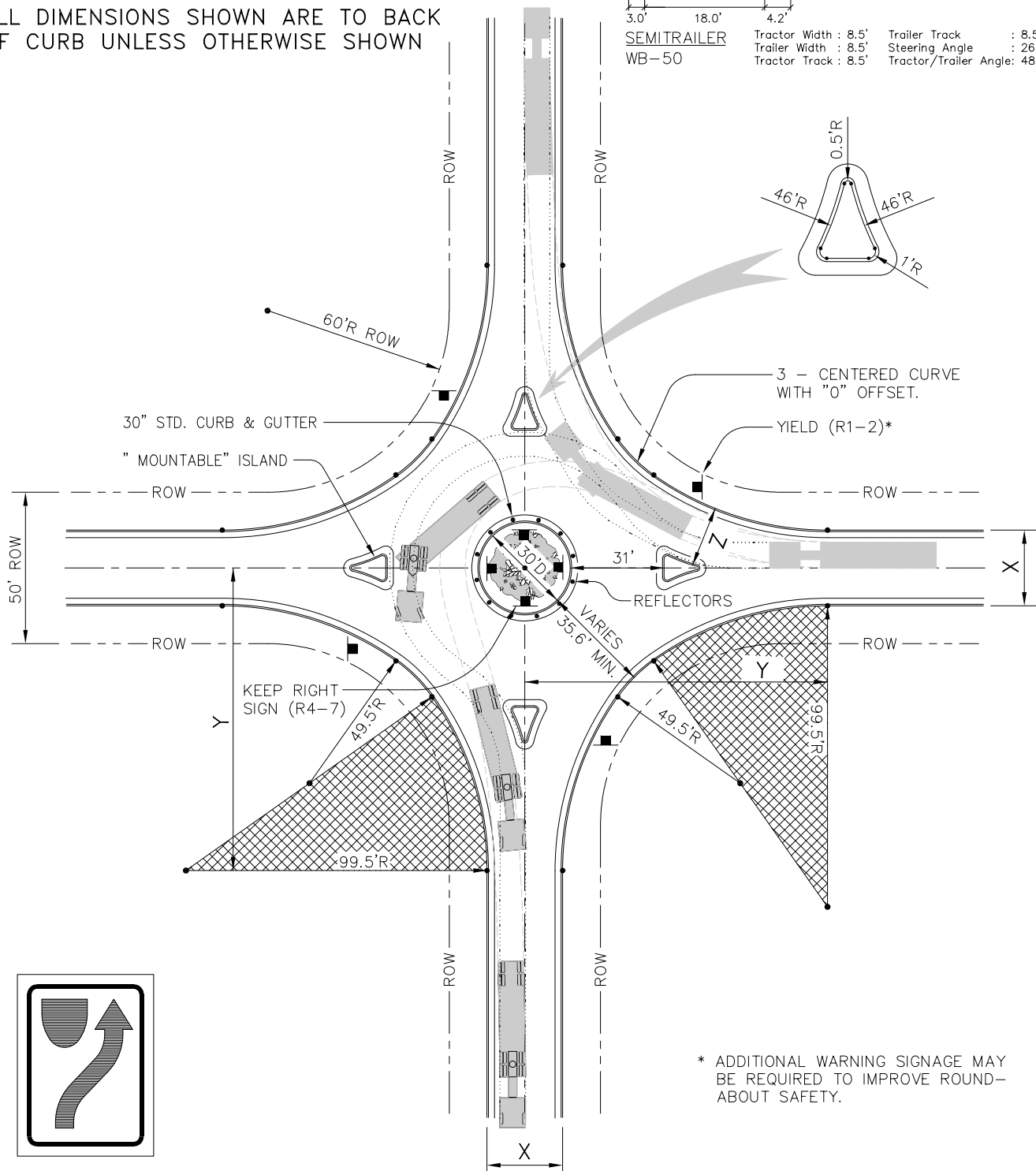
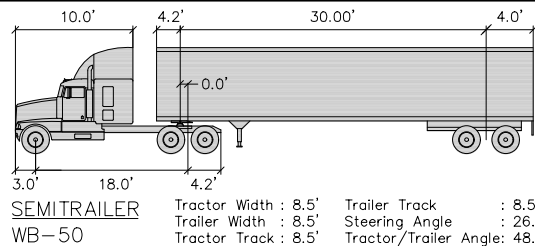
DETAIL #  
**23**

DATE:  
JULY 2010

SHEET #:  
1 OF 1

STREET WIDTH (X)	25'	27'	37'
DISTANCE (Y)	100'	92'	84'
DISTANCE (Z) (MIN.)	20'	18'	21'

ALL DIMENSIONS SHOWN ARE TO BACK OF CURB UNLESS OTHERWISE SHOWN



R4-7  
24" x 30"

R1-2 AND R4-7 ARE MUTCD SIGN DESIGNATIONS.  
(MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.)

\* ADDITIONAL WARNING SIGNAGE MAY BE REQUIRED TO IMPROVE ROUNDABOUT SAFETY.



## TOWN OF ZEBULON

### ROUND ABOUT STD. TRAFFIC CIRCLE DETAIL

USE WITH STANDARD SPECIFICATIONS ONLY

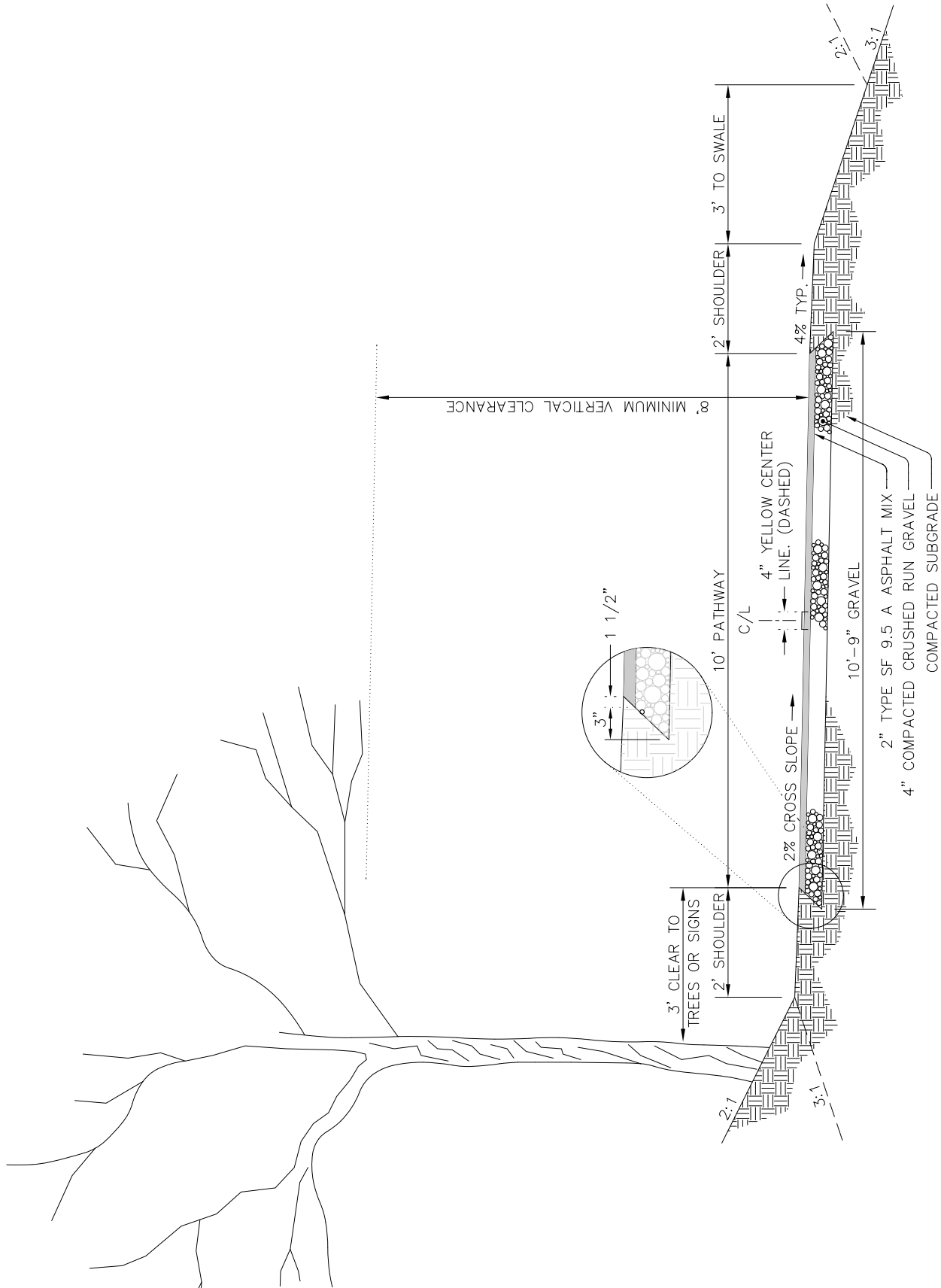
SCALE:  
NOT TO SCALE

DETAIL #  
**24**

DATE:  
JULY 2010

SHEET #:  
1 OF 1





**SECTIONAL VIEW**

- 2" TYPE SF 9.5 A ASPHALT MIX
- 4" COMPACTED CRUSHED RUN GRAVEL
- 10'-9" GRAVEL
- COMPACTED SUBGRADE



**TOWN OF ZEBULON**

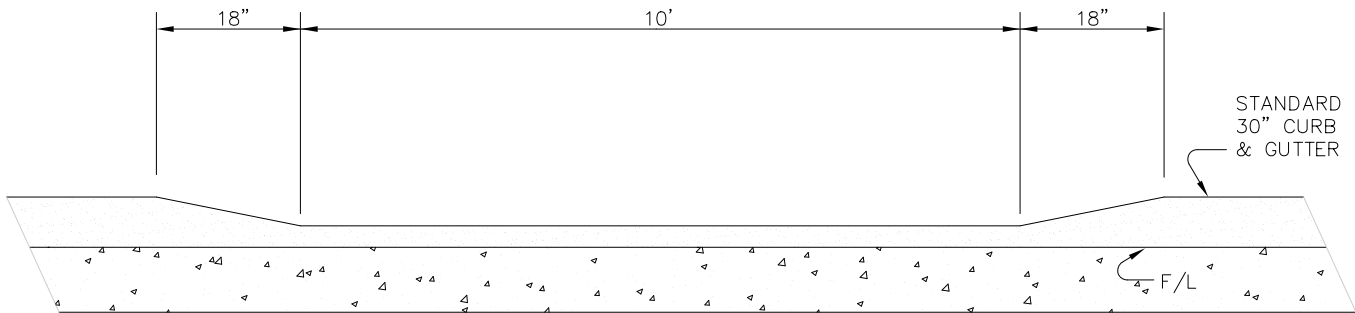
**STD. BIKE WAY PATH  
DETAIL**

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE  
DATE:  
JULY 2010

DETAIL #  
**25**  
SHEET #:  
2 OF 2

# TRUCK ACCESS CURB DEPRESSION FOR PUBLIC DRAINAGE AND UTILITY EASEMENTS



SECTIONAL VIEW



## TOWN OF ZEBULON

### 10' CURB DEPRESSION

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DATE:  
JULY 2010

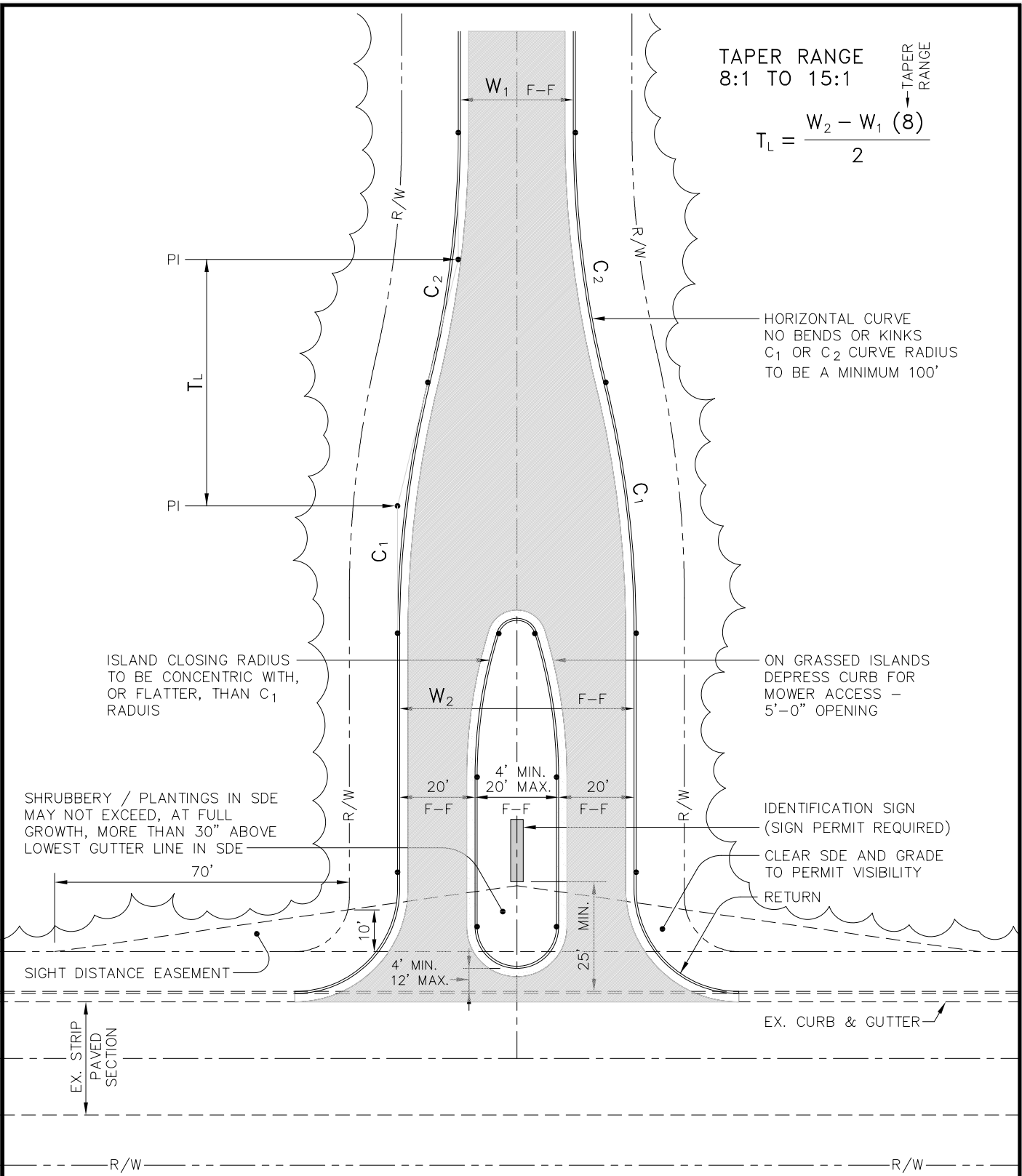
DETAIL #  
**26**

SHEET #:  
1 OF 1

TAPER RANGE  
8:1 TO 15:1

TAPER RANGE

$$T_L = \frac{W_2 - W_1}{2} (8)$$



PLAN VIEW

TOWN OF ZEBULON



ISLAND ENTRANCE TO EXISTING STRIP PAVED

USE WITH STANDARD SPECIFICATIONS ONLY

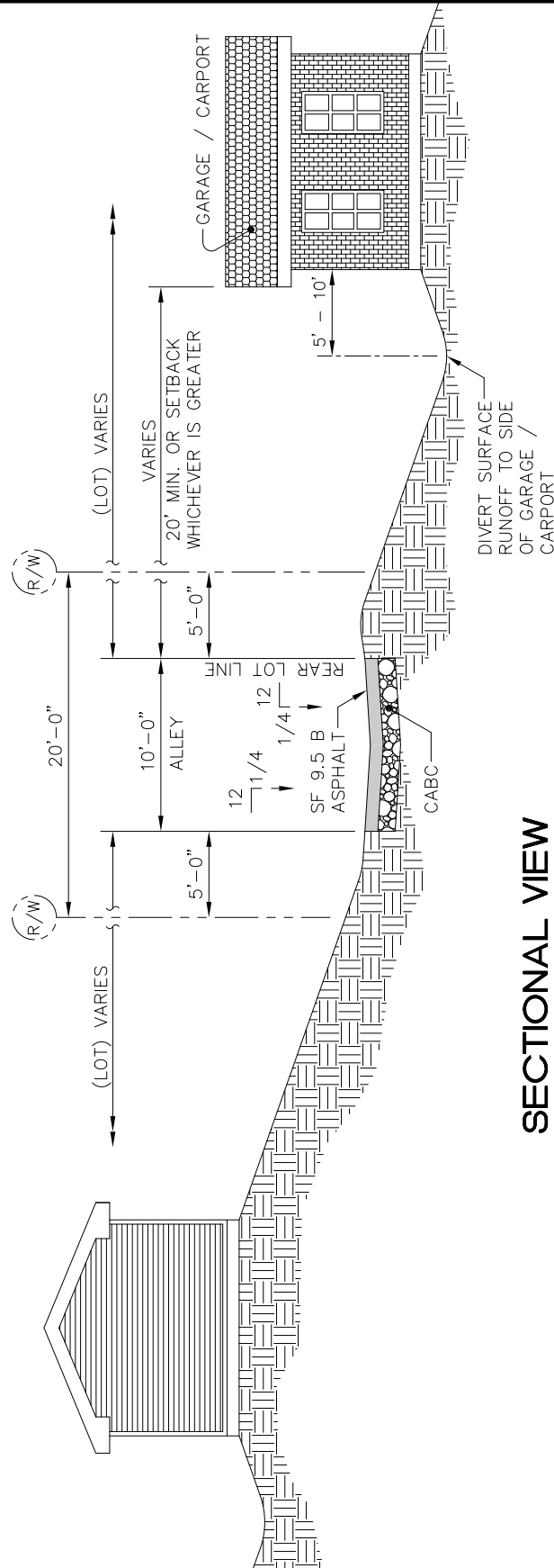
SCALE:  
NOT TO SCALE

DETAIL #  
**27**

DATE:  
JULY 2010

SHEET #:  
1 OF 2





**SECTIONAL VIEW**

- When so required or proposed by the subdivider, alleys shall conform to the following:
1. Property line radius at intersections.....20 ft.
  2. Minimum radius to centerline when deflection angle of more than 10 degrees occurs.....35 ft.
  3. Pavement radius at intersecting street.....20 ft.



**TOWN OF ZEBULON**

**TYPICAL SERVICE ALLEY DETAIL**

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DATE:  
JULY 2010

DETAIL #  
**28**

SHEET #:  
1 OF 1





SIGN TYPE "A"



SIGN TYPE "C"



SIGN TYPE "D"

NOTES:

1. WHERE REQUIRED BY THE FIRE CODE OFFICIAL, FIRE APPARATUS ACCESS ROADS SHALL BE MARKED WITH PERMANENT NO PARKING.
2. SIGNS SHALL HAVE MIN. DIMENSION OF 12-INCHES WIDE BY 18-INCHES HIGH AND HAVE RED LETTERS ON WHITE HIGH INTENSITY GRADE REFLECTIVE SHEETING.
3. SIGNS SHALL BE POSTED ON ONE OR BOTH SIDES OF THE FIRE APPARATUS ROAD AS REQUIRED BY SECTION D103.6.1 OR D103.6.2 OF THE NORTH CAROLINA FIRE CODE.
4. SIGNAGE SHALL MEET STANDARD OR PREMIUM SIGN INSTALLATION DETAIL REQUIREMENTS.



**TOWN OF ZEBULON**

FIRE DEPARTMENT SIGNAGE  
FIRE LANE

USE WITH STANDARD SPECIFICATIONS ONLY

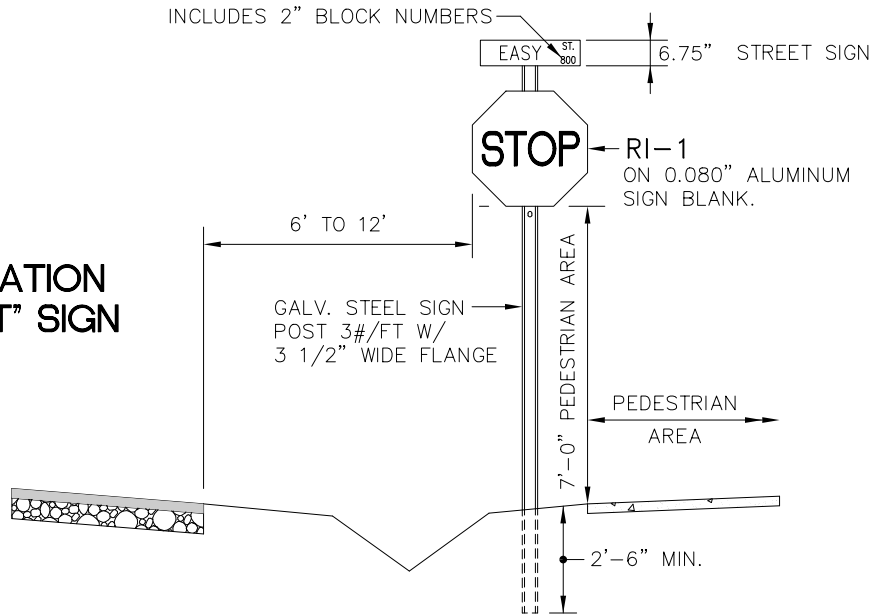
SCALE:  
NOT TO SCALE

DATE:  
JULY 2010

DETAIL #  
**29**

SHEET #:  
1 OF 1

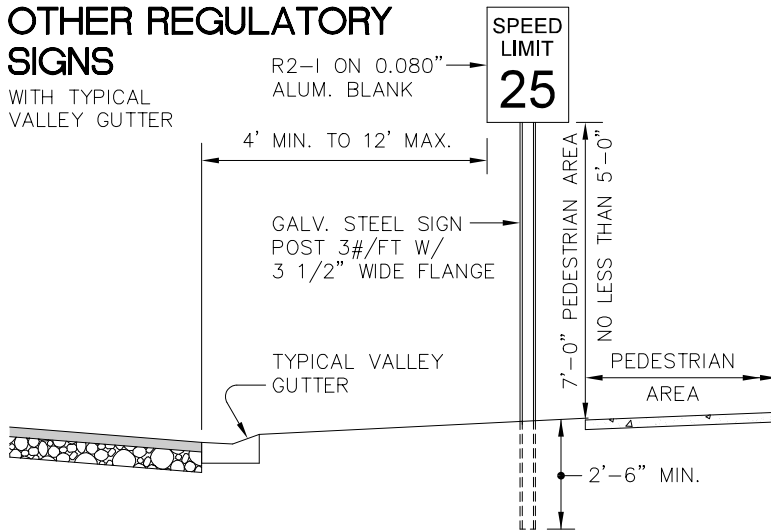
**STANDARD COMBINATION  
"STOP" AND "STREET" SIGN**  
WITHOUT CURB  
OR GUTTER



**ELEVATIONAL VIEW**

**OTHER REGULATORY  
SIGNS**

WITH TYPICAL  
VALLEY GUTTER



**ELEVATIONAL VIEW**

**NOTES:**

1. STREET NAME SIGNS SHALL BE A MINIMUM OF EXTRUDED ALUMINUM BLADES USING A MINIMUM OF 4" C SERIES LETTERING IN HIGH INTENSITY SILVER & HIGH INTENSITY GREEN BACKGROUND (2" LETTERS FOR BLOCK NUMBERS)
2. ALL REFLECTIVE SIGNS SHALL BE MADE OF HIGH INTENSITY GRADE REFLECTIVE SHEETING OR APPROVED EQUIVALENT.
3. ALL SIGNS PLACED IN RIGHT-OF-WAY WILL BE APPROVED BY TOWN'S PUBLIC WORKS DIRECTOR.
4. ERECT STREET SIGNS PLUMB.
5. DEVELOPER SHALL BE RESPONSIBLE FOR FURNISHING & ERECTING ALL STREET NAME & REGULATORY SIGNS.
6. ALL HARDWARE MUST BE GALVANIZED.



**TOWN OF ZEBULON**

STANDARD SIGN  
INSTALLATION  
DETAIL

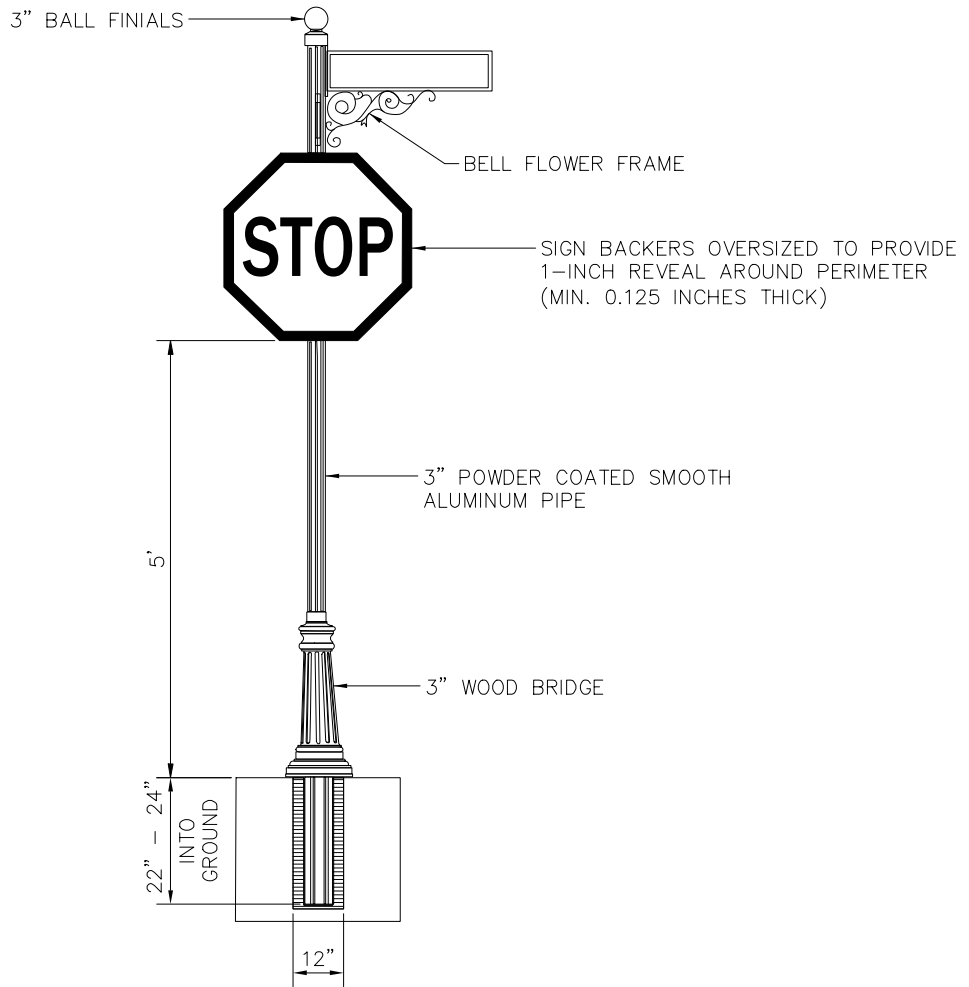
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DETAIL #  
**30**

DATE:  
JULY 2010

SHEET #:  
1 OF 1



## ELEVATIONAL VIEW

### NOTES:

1. SIGNS WILL BE CONSTRUCTED FROM QUALITY ALUMINUM AND POWDER COATED WITH GLOSS BLACK POLYESTER TWO COAT PROCESS.
2. ALL FASTENERS WILL BE STAINLESS STEEL.
3. STOP SIGNS WILL HAVE A  $\frac{1}{8}$ " BLACK ALUMINUM BACKER.
4. ALL STREET BLADES WILL BE FRAMED IN WITH ALUMINUM CASING.
5. ALL REFLECTIVE SIGNS SHALL BE MADE OF HIGH INTENSITY GRADE REFLECTIVE SHEETING.
6. DEVELOPER SHALL BE RESPONSIBLE FOR FURNISHING AND ERECTING ALL STREET NAME AND REGULATORY SIGNS.



## TOWN OF ZEBULON

### PREMIUM SIGN INSTALLATION DETAIL

USE WITH STANDARD SPECIFICATIONS ONLY

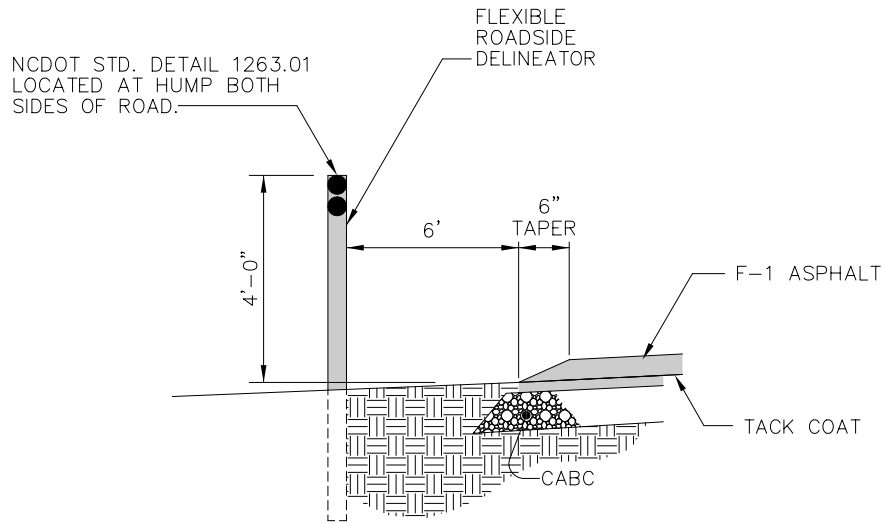
SCALE:  
NOT TO SCALE

DETAIL #  
**31**

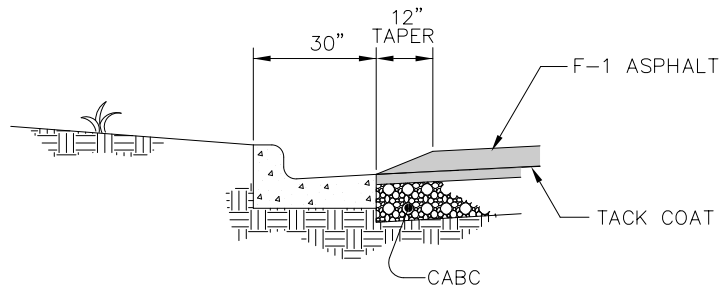
DATE:  
JULY 2010

SHEET #:  
1 OF 1





**SECTION B-B**  
**SHOULDER DETAIL FOR**  
**STREETS WITHOUT CURBS**  
NOT TO SCALE



**SECTION B-B**  
**CURB DETAIL**  
NOT TO SCALE



**TOWN OF ZEBULON**

14' LOCAL  
SPEED BUMP

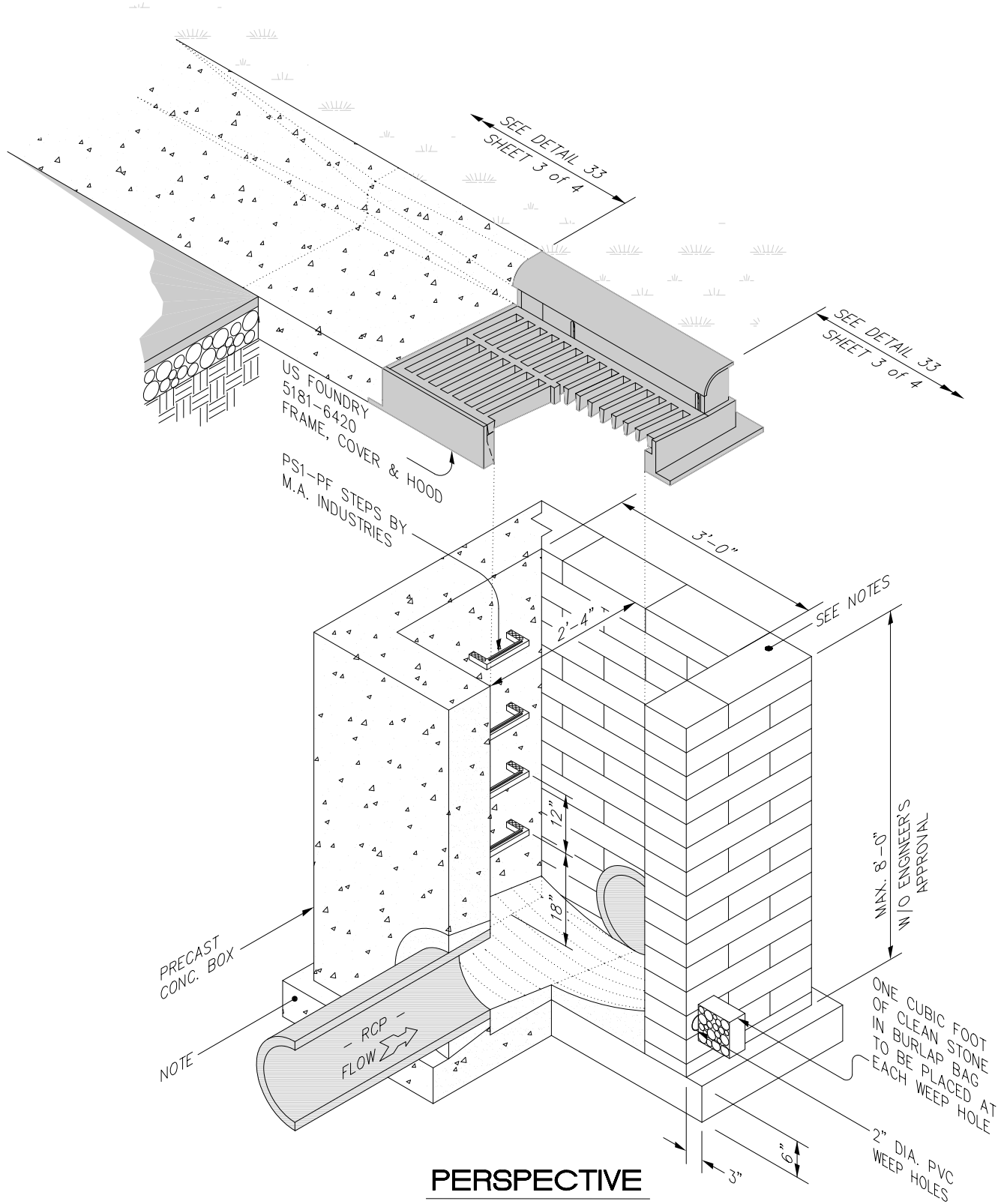
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DETAIL #  
**32**

DATE:  
JULY 2010

SHEET #:  
2 OF 2



**PERSPECTIVE**



**TOWN OF ZEBULON**

**STD. C&G INLET W/HOOD  
DETAIL**

USE WITH STANDARD SPECIFICATIONS ONLY

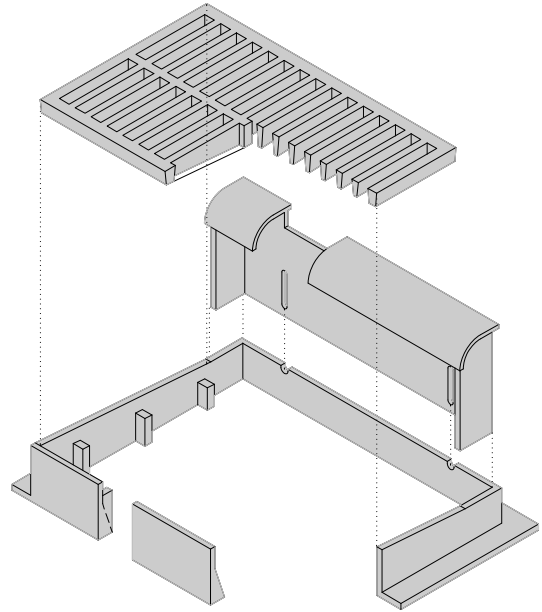
SCALE:  
NOT TO SCALE

DATE:  
JULY 2010

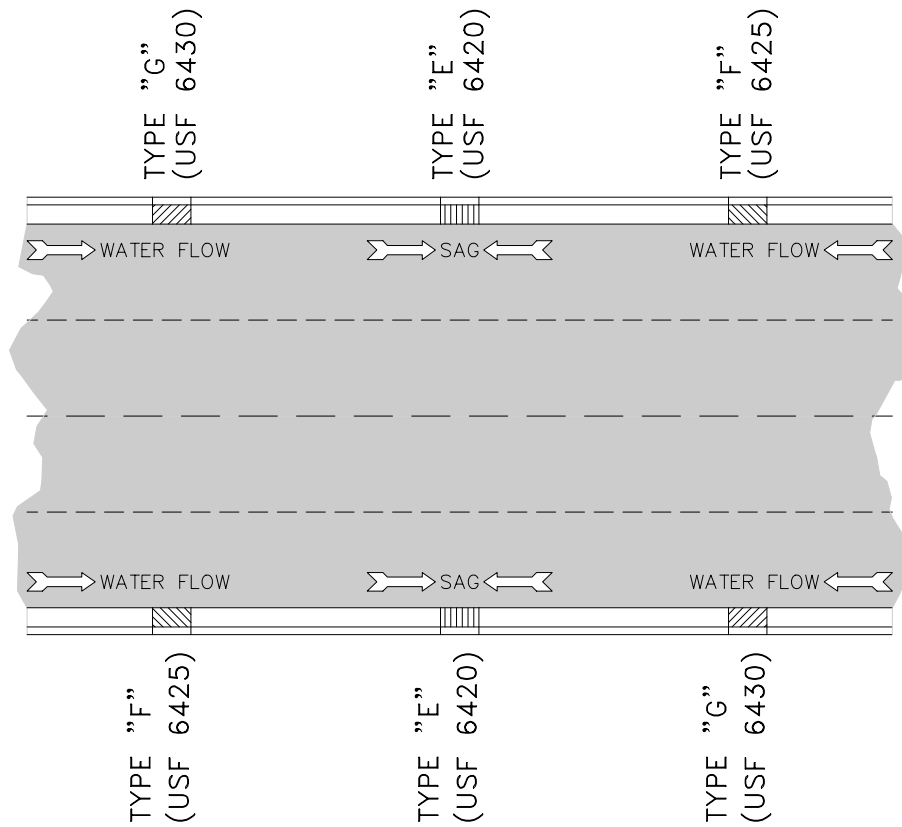
DETAIL #  
**33**

SHEET #:  
1 OF 4

U.S. FOUNDRY 5181 CURB & GUTTER INLET FRAME  
 (SHOWN WITH 6420 GRATE)  
 HEAVY DUTY FRAME, COVER & HOOD  
 FRAME, COVER & HOOD WEIGHT = 550 LBS.  
 WEIGHT MAY NOT DEVIATE BY  
 MORE THAN -5.0%



**PERSPECTIVE**



**DETAIL SHOWING TYPES OF GRATES  
 TO BE USED ACCORDING TO WATER FLOW**



**TOWN OF ZEBULON**

STD. C&G INLET W/HOOD  
 DETAIL

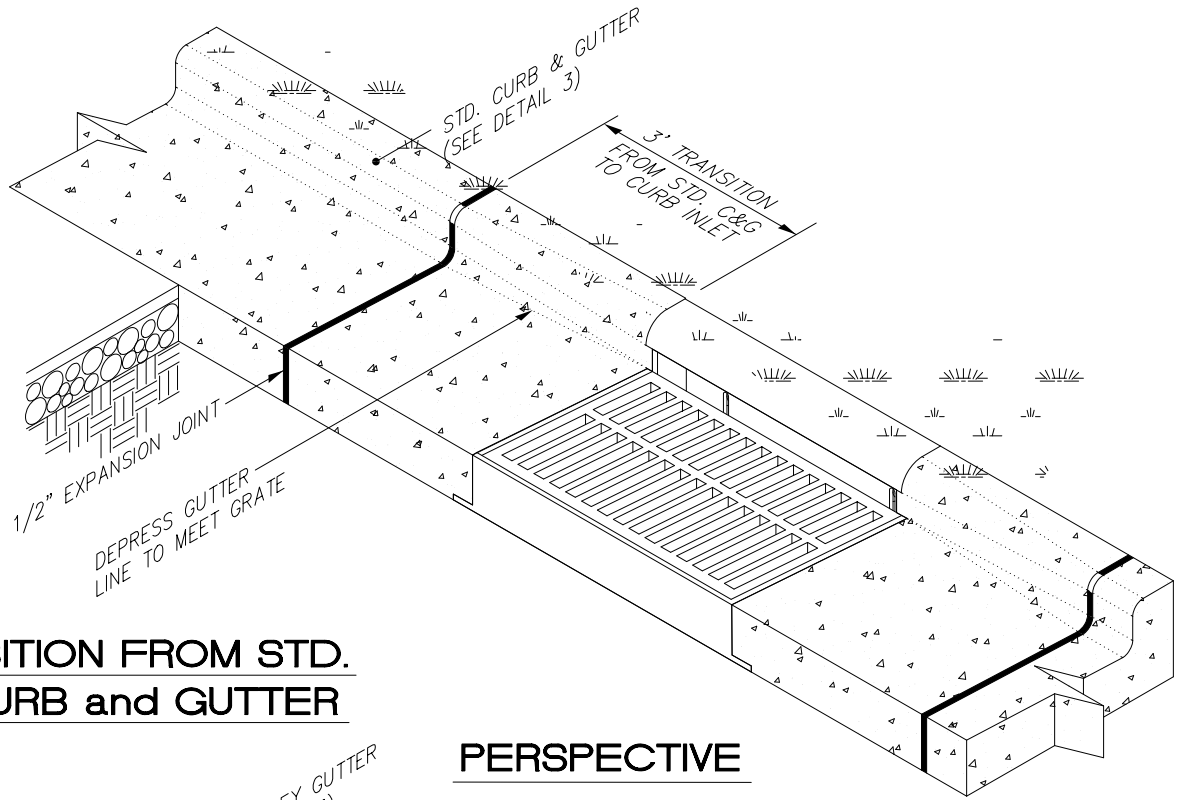
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
 NOT TO SCALE

DETAIL #  
**33**

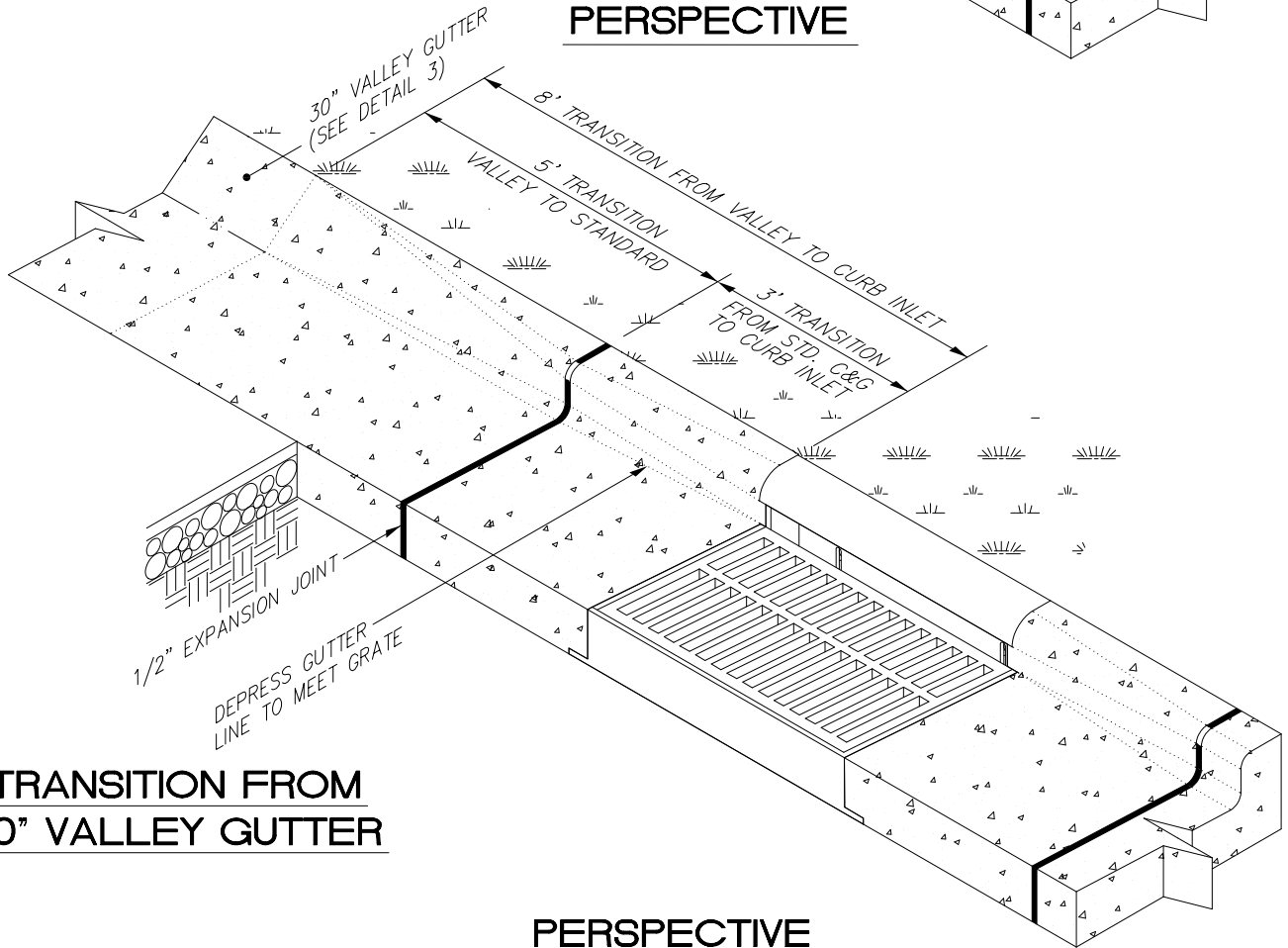
DATE:  
 JULY 2010

SHEET #:  
 2 OF 4



**TRANSITION FROM STD.  
30" CURB and GUTTER**

**PERSPECTIVE**



**TRANSITION FROM  
30" VALLEY GUTTER**

**PERSPECTIVE**



**TOWN OF ZEBULON**

STD. TRANSITION FROM INLET  
TO STD. C&G / VALLEY GUTTER

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DATE:  
JULY 2010

DETAIL #  
**33**

SHEET #:  
**3** OF **4**



**EAST JORDAN  
IRON WORKS, INC.**  
P.O. BOX 439  
EAST JORDAN, MI. 49727  
1-800-874-4100  
FAX 231-536-4458

DRAWN SMH	DATE 12/09/00
APPROVED	DATE

**V-4520-1  
GRATE**

PRODUCT NO.  
**44520130**

CATALOG NO.  
V-4520-1

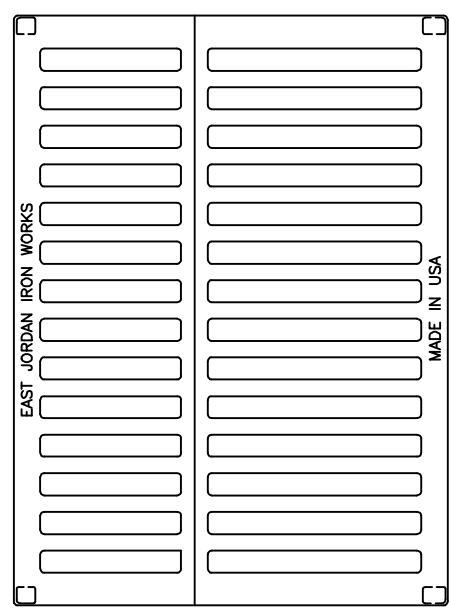
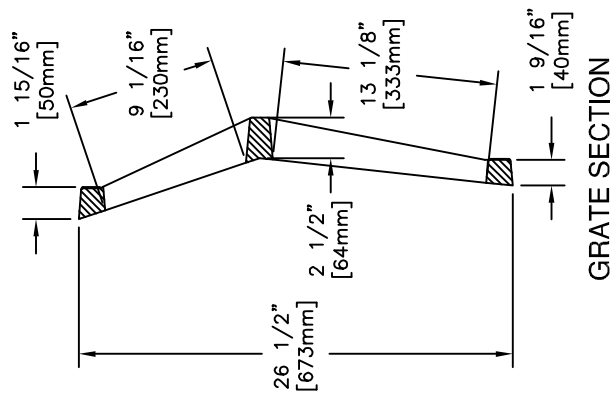
REF. PRODUCT DRAWING  
44520130

EST. WT.  
GRATE: 235 LBS 107kg

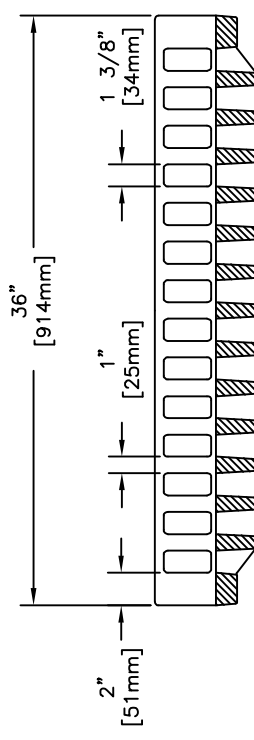
OPEN AREA  
458 SQ IN  
2955 sq cm

MAT'L SPEC.  
GRATE - GRAY IRON  
ASTM A48 CL35

LOAD RATING  
HEAVY DUTY



GRATE TOP VIEW



GRATE SECTION

NOTE: USE EAST JORDAN IRON WORKS V-4520-1 GRATE OR EQUIVALENT BY US FOUNDRY.

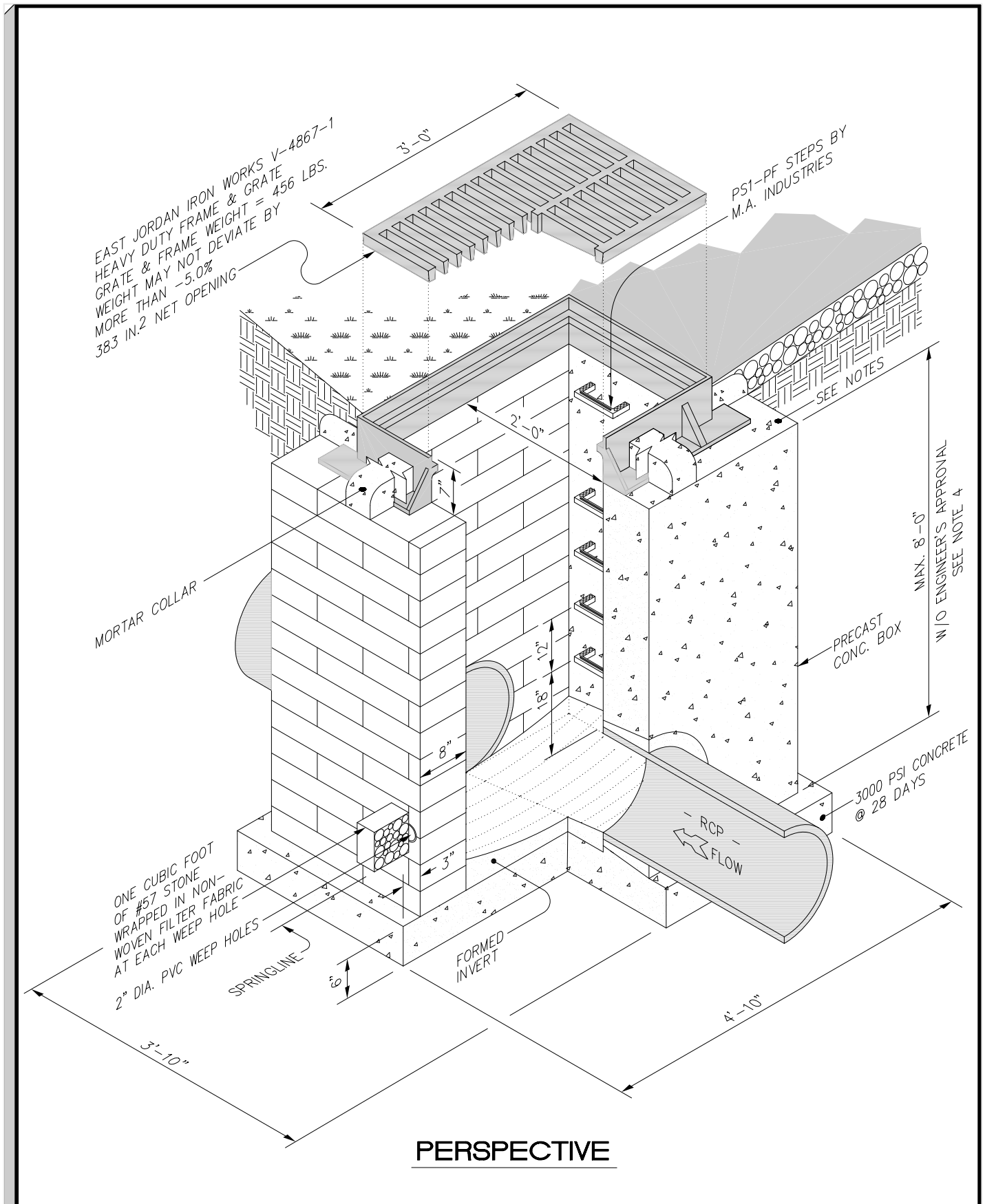


**TOWN OF ZEBULON**

DETAIL FOR STORM DRAIN  
WITH DRIVEWAY CONFLICT

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE: NOT TO SCALE	DETAIL # <b>33</b>
DATE: JULY 2010	SHEET #: <u>4</u> OF <u>4</u>



**PERSPECTIVE**



**TOWN OF ZEBULON**

2x3  
**DROP INLET**

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DATE:  
JULY 2010

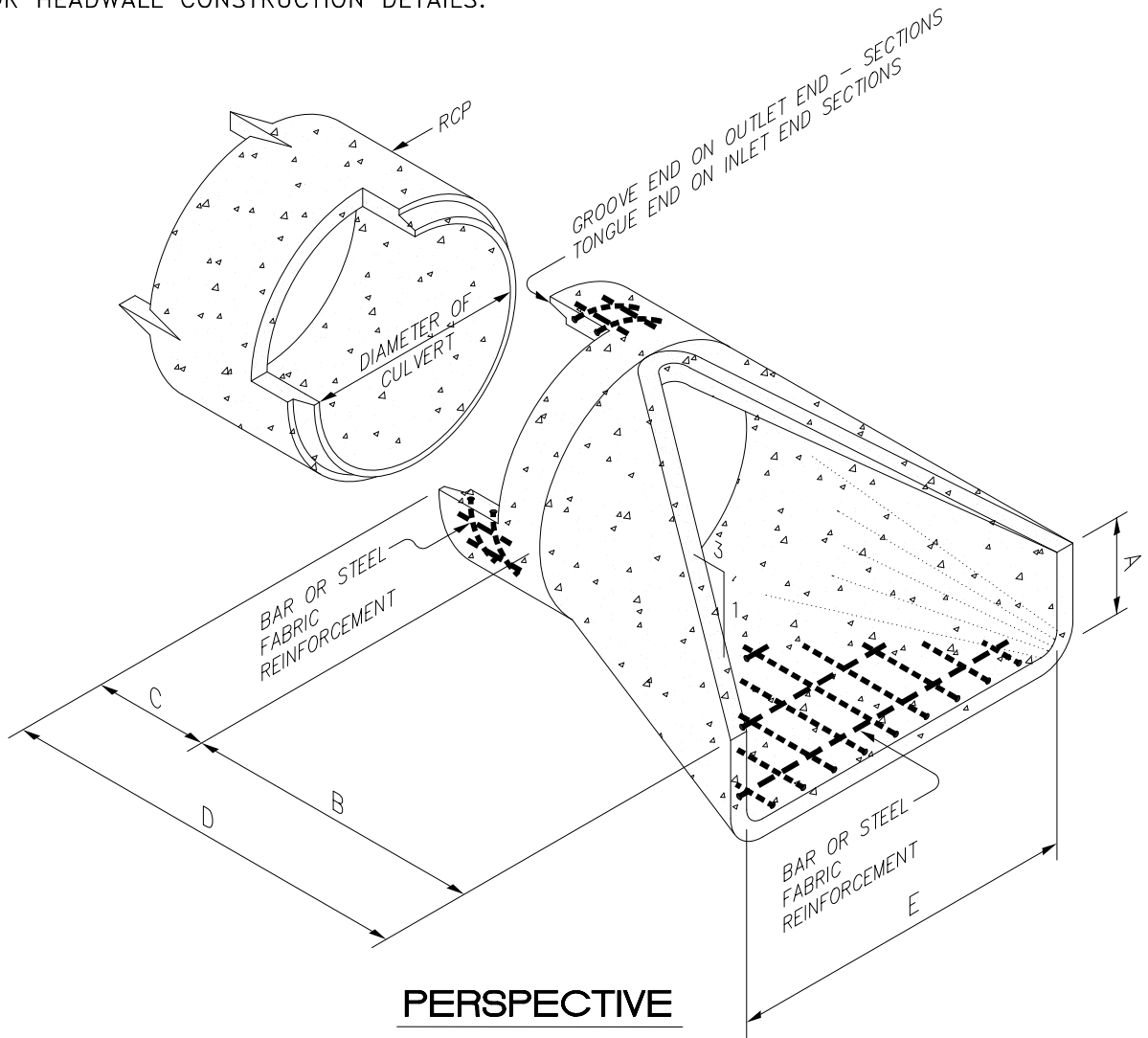
DETAIL #  
**34**

SHEET #:  
1 OF 1

END SECTION DIMENSIONS					
DIA.	A	B	C	D	E
15"	7"	2'-3 1/4"	3'-11 1/2"	6'-2 3/4"	2'-6"
18"	9"	2'-3"	3'-11 3/4"	6'-2 3/4"	3'-0"
24"	9"	3'-7"	3'-1"	6'-8"	3'-11 3/4"
30"	1'-0"	4'-6 1/2"	1'-10 1/2"	6'-5"	5'-0"
36"	1'-4"	5'-0"	3'-1 1/2"	8'-1 1/2"	5'-11"
42"	1'-10 1/4"	5'-1 3/8"	3'-1"	8'-2 3/8"	6'-5 1/4"

**NOTES:**

1. DESIGN OF END-SECTION SHALL CONFORM TO STANDARD REINFORCED SECTIONAL CONCRETE CULVERT PIPE.
2. ANY TWIN BARREL SYSTEM GREATER THAN 42" RCP REQUIRES A HEADWALL.
3. ANY SYSTEM OF MORE THAN 2 PIPES REQUIRES A HEADWALL.
4. SEE NCDOT "ROADWAY STANDARD DRAWINGS" FOR HEADWALL CONSTRUCTION DETAILS.



**TOWN OF ZEBULON**

STD. FLARED END SECTIONS  
DESIGN AID DETAIL

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DETAIL #  
**35**

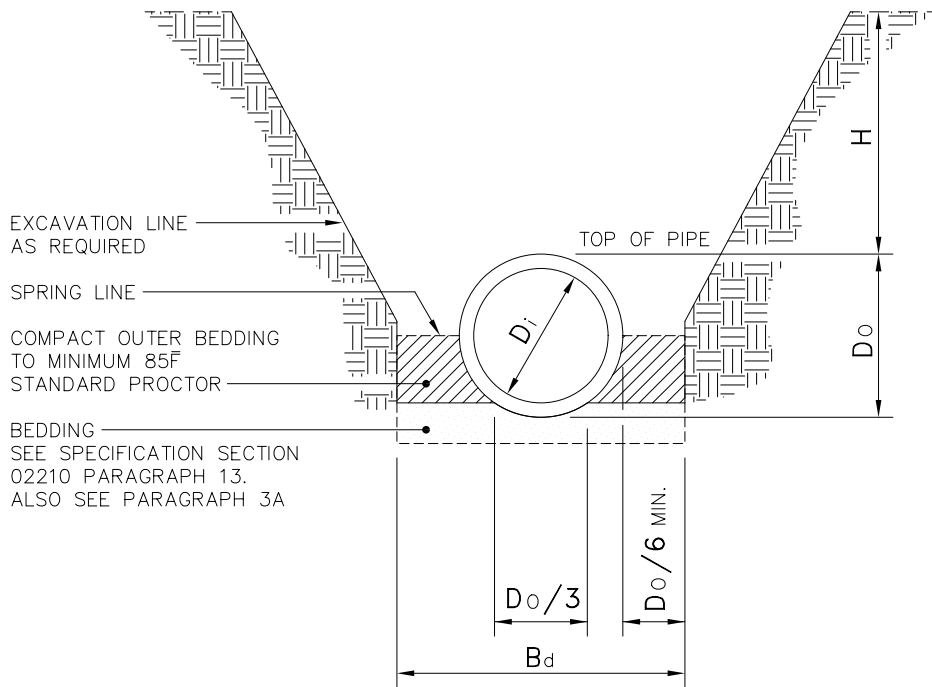
DATE:  
JULY 2010

SHEET #:  
1 OF 1

$D_i$  = INSIDE DIAMETER OF PIPE  
 $D_o$  = OUTSIDE DIAMETER OF PIPE  
 $B_d$  = TRENCH WIDTH  
 $H$  = BACKFILL COVER ABOVE TOP OF PIPE

PIPE $D_i$	MAX. $B_d$	MAX. BURY H CLASS III (0.01 CRACK)	MAX. BURY H CLASS IV (0.01 CRACK)
15"	4'	9.5'	14.5'
18"	4'	9.5'	15.0'
24"	4'	12.0'	23.5'
30"	5.5'	10.0'	17.0'
36"	6'	10.5'	18.0'
42"	6.5'	13.0'	19.0'
48"	7'	13.5'	20.0'
54"	8'	13.0'	18.5'
60"	9'	11.0'	18.0'
72"	10'	13.0'	19.0'

THIS TABLE ASSUMES TYPE 4 INSTALLATION & NO STONE BEDDING



### SECTIONAL VIEW

#### NOTES:

1. FOR OTHER BURY DEPTHS THAN SHOWN (H), NORTH CAROLINA PE TO PROVIDE CALCS ON PIPE BURY THAT EXCEED THOSE GIVEN IN THIS CHART FOR THE CONDITIONS IN WHICH IT IS PROPOSED TO BE USED.
2. THIS TABLE OF BURY DEPTHS (H) APPLIES EQUALLY TO A CLASS C STONE BEDDING, TYPE 4 LAYING CONDITIONS.
3. MINIMUM COVER NOT SHOWN BUT NO LESS THAN 12" W/O ENGINEERS APPROVAL UP TO 48" PIPE.



## TOWN OF ZEBULON

STD. TRENCH INSTALLATION  
 FOR CONCRETE PIPE  
 (FOR CONTRACTOR'S USE)

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
 NOT TO SCALE

DETAIL #  
**36**

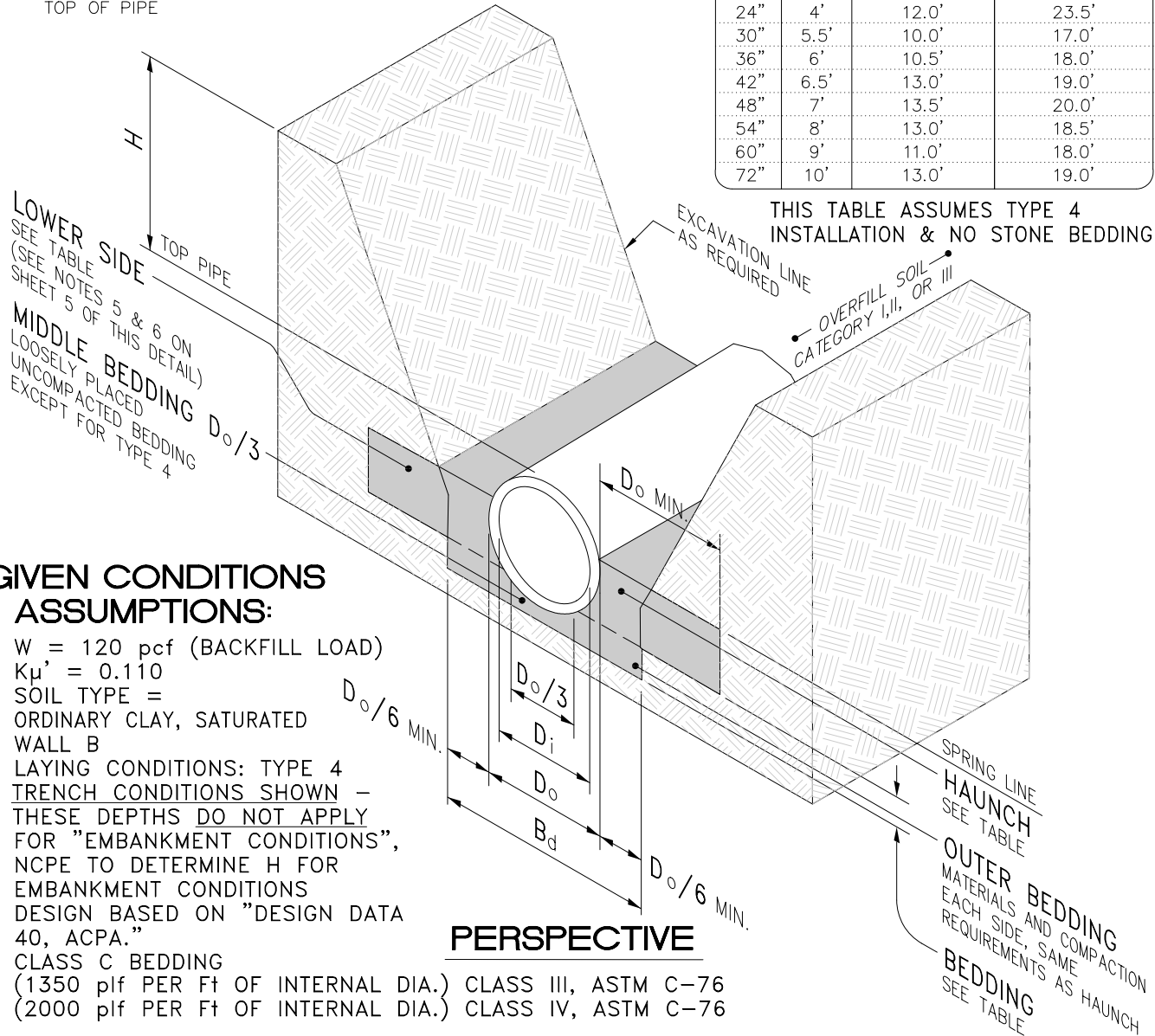
DATE:  
 JULY 2010

SHEET #:  
 1 OF 5

$D_i$  = INSIDE DIAMETER OF PIPE  
 $D_o$  = OUTSIDE DIAMETER OF PIPE  
 $B_d$  = TRENCH WIDTH  
 $H$  = BACKFILL COVER ABOVE TOP OF PIPE

PIPE $D_i$	MAX. $B_d$	MAX. BURY H CLASS III (0.01 CRACK)	MAX. BURY H CLASS IV (0.01 CRACK)
15"	4'	9.5'	14.5'
18"	4'	9.5'	15.0'
24"	4'	12.0'	23.5'
30"	5.5'	10.0'	17.0'
36"	6'	10.5'	18.0'
42"	6.5'	13.0'	19.0'
48"	7'	13.5'	20.0'
54"	8'	13.0'	18.5'
60"	9'	11.0'	18.0'
72"	10'	13.0'	19.0'

THIS TABLE ASSUMES TYPE 4 INSTALLATION & NO STONE BEDDING



**GIVEN CONDITIONS / ASSUMPTIONS:**

- \*  $W = 120$  pcf (BACKFILL LOAD)
- \*  $K\mu' = 0.110$
- \* SOIL TYPE = ORDINARY CLAY, SATURATED
- \* WALL B
- \* LAYING CONDITIONS: TYPE 4
- \* TRENCH CONDITIONS SHOWN - THESE DEPTHS DO NOT APPLY FOR "EMBANKMENT CONDITIONS", NCPE TO DETERMINE H FOR EMBANKMENT CONDITIONS
- \* DESIGN BASED ON "DESIGN DATA 40, ACPA."
- \* CLASS C BEDDING  
 (1350 plf PER Ft OF INTERNAL DIA.) CLASS III, ASTM C-76  
 (2000 plf PER Ft OF INTERNAL DIA.) CLASS IV, ASTM C-76

**NOTES:**

1. GREATER DEPTHS ARE ACHIEVABLE BY EITHER CONTROLLING BACKFILL TYPE, NARROWING TRENCH WIDTH BUT SUPPLY SUFFICIENT ROOM FOR COMPACTION, IMPROVING BEDDING OR LOADING TO ULTIMATE LOAD ( $D_u$ ). FOR OTHER BURY DEPTHS THAN SHOWN ( $H$ ), NORTH CAROLINA PE TO PROVIDE CALCS ON PIPE BURY THAT EXCEED THOSE GIVEN IN THIS CHART FOR THE CONDITIONS IN WHICH IT IS PROPOSED TO BE USED.
2. THIS TABLE OF BURY DEPTHS ( $H$ ) APPLIES EQUALLY TO A CLASS C STONE BEDDING, TYPE 4. LAYING CONDITIONS
3. MINIMUM COVER NOT SHOWN
4. MAXIMUM BURY TABLE FOR "TRENCH CONDITIONS" PER THE DETAIL SHOWN THIS SHEET



**TOWN OF ZEBULON**

STD. TRENCH INSTALLATION  
 FOR CONCRETE PIPE  
 (FOR ENGINEER'S USE)

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
 NOT TO SCALE

DETAIL #  
**36**

DATE:  
 JULY 2010

SHEET #:  
 2 OF 5

Table 1 Equivalent USCS and AASHTO Soil Classification for SIDD Soil Designations

SIDD Soil	Representative Soil Types		Percent Compaction	
	USCS,	AASHTO	Standard Proctor	Modified Proctor
Gravelly Sand (Category I)	SW, SP, GW, GP	A1,A3	100 95 90 85 80 61	95 90 85 80 75 59
Sandy Silt (Category II)	GM, SM, ML Also GC, SC with less than 20% passing #200 sieve	A2,A4	100 95 90 85 80 49	95 90 85 80 75 46
Silty Clay (Category III)	CL, MH GC, SC  CH	A5,A6	100 95 90 85 80 45  100 95 90 45	90 85 80 75 70 40  90 85 80 40



**TOWN OF ZEBULON**

STD. TRENCH INSTALLATION  
(TRENCH CONDITION SHOWN)

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DETAIL #  
**36**

DATE:  
JULY 2010

SHEET #:  
3 OF 5

Installation Type <sup>4</sup>	Bedding Thickness	Haunch and Outer Bedding	Lower Side
Type 1	D <sub>0</sub> /24 minimum, not less than 75 mm (3"). If rock foundation, use D <sub>0</sub> /12 minimum, not less than 150 mm (6").	98% Category I	90% Category I, 95% Category II, or 100% Category III
Type 2	D <sub>0</sub> /24 minimum, not less than 75 mm (3"). If rock foundation, use D <sub>0</sub> /12 minimum, not less than 150 mm (6").	90% Category I or 95% Category II	85% Category I, 90% Category II, or 95% Category III
Type 3	D <sub>0</sub> /24 minimum, not less than 75 mm (3"). If rock foundation, use D <sub>0</sub> /12 minimum, not less than 150 mm (6").	85% Category I, 90% Category II, or 95% Category III	85% Category I, 90% Category II, or 95% Category III
Type 4	D <sub>0</sub> /24 minimum, not less than 75 mm (3"). If rock foundation, use D <sub>0</sub> /12 minimum, not less than 150 mm (6").	No compaction required, except if Category III, use 85% Category III	No compaction required, except if Category III, use 85% Category III

**Notes:**

1. Compaction and soils symbols – i.e. "98% Category I" refers to Category 1 soil material with a minimum standard Proctor compaction of 98%. See Table 1 for equivalent modified Proctor values.
2. Soil in the outer bedding, haunch, and lower side zones, except within D<sub>0</sub>/3 from the pipe springline, shall be compacted to at least the same compaction as the majority of the soil in the overfill zone.
3. Subtrenches
  - 3.1 A subtrench is defined as a trench with its top below finished grade by more than 0.1 H or, for roadways, its top is at an elevation lower than 0.3 m (1') below the bottom of the pavement base material.
  - 3.2 The minimum width of a subtrench shall be 1.33 D<sub>0</sub> or wider if required for adequate space to attain the specified compaction in the haunch and bedding zones.
  - 3.3 For subtrenches with wall of natural soil, any portion of the lower side zone in the subtrench wall shall be at least as firm as an equivalent soil placed to the compaction requirements specified for the lower side zone and as firm as the majority of soil in the overfill zone, or shall be removed and replaced with soil compacted to the specified level.
4. Type 1 installation = relatively high quality material & high compaction effort.  
Type 4 installation = little or no control over material and compaction.



**TOWN OF ZEBULON**

STD. TRENCH INSTALLATION  
(TRENCH CONDITION SHOWN)

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DETAIL #  
**36**

DATE:  
JULY 2010

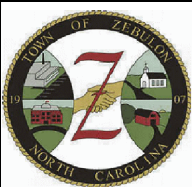
SHEET #:  
4 OF 5

**Table 3 Standard TRENCH Installations Soils and Minimum Compaction Requirements**

Installation <sup>7</sup> Type	Bedding Thickness	Haunch Outer Bedding	Lower Side
Type 1	D <sub>o</sub> /24 minimum, not less than 75 mm (3"). If rock foundation, use D <sub>o</sub> /12 minimum, not less than 150 mm (6").	98% Category I	90% Category I, 95% Category II, or 100% Category III
Type 2	D <sub>o</sub> /24 minimum, not less than 75 mm (3"). If rock foundation, use D <sub>o</sub> /12 minimum, not less than 150 mm (6").	90% Category I or 95% Category II	85% Category I, 90% Category II, or 95% Category III
Type 3	D <sub>o</sub> /24 minimum, not less than 75 mm (3"). If rock foundation, use D <sub>o</sub> /12 minimum, not less than 150 mm (6").	85% Category I, 90% Category II, or 95% Category III	85% Category I, 90% Category II, or 95% Category III
Type 4	D <sub>o</sub> /24 minimum, not less than 75 mm (3"). If rock foundation, use D <sub>o</sub> /12 minimum, not less than 150 mm (6").	No compaction required, except if Category III, use 85% Category III	No compaction required, except if Category III, use 85% Category III

**Notes:**

1. Compaction and soils symbols – i.e. "98% Category I" refers to Category I soil materials with minimum standard Proctor compaction of 98%. See Table 1 for equivalent modified Proctor values.
2. The trench top elevation shall be no lower than 0.1 H below finished grade or, for roadways, its top shall be no lower than an elevation of 0.3 m (1') below the bottom of the pavement base material.
3. Soil in bedding and haunch zones shall be compacted to at least the same compaction as specified for the majority of soil in the backfill zone.
4. The trench width shall be wider than shown if required for adequate space to attain the specified compaction in the haunch and bedding zone.
5. For trench walls that are within 10 degrees of vertical, the compaction or firmness of the soil in the trench walls and lower side zone need not be considered.
6. For trench walls with greater than 10 degrees slopes that consist of embankment, the lower side shall be compacted to at least the same compaction as specified for the soil in the backfill zone.
7. Type 1 installation = relatively high quality material & high compaction effort.  
Type 4 installation = little or no control over material and compaction.



**TOWN OF ZEBULON**

STD. TRENCH INSTALLATION  
(TRENCH CONDITION SHOWN)

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

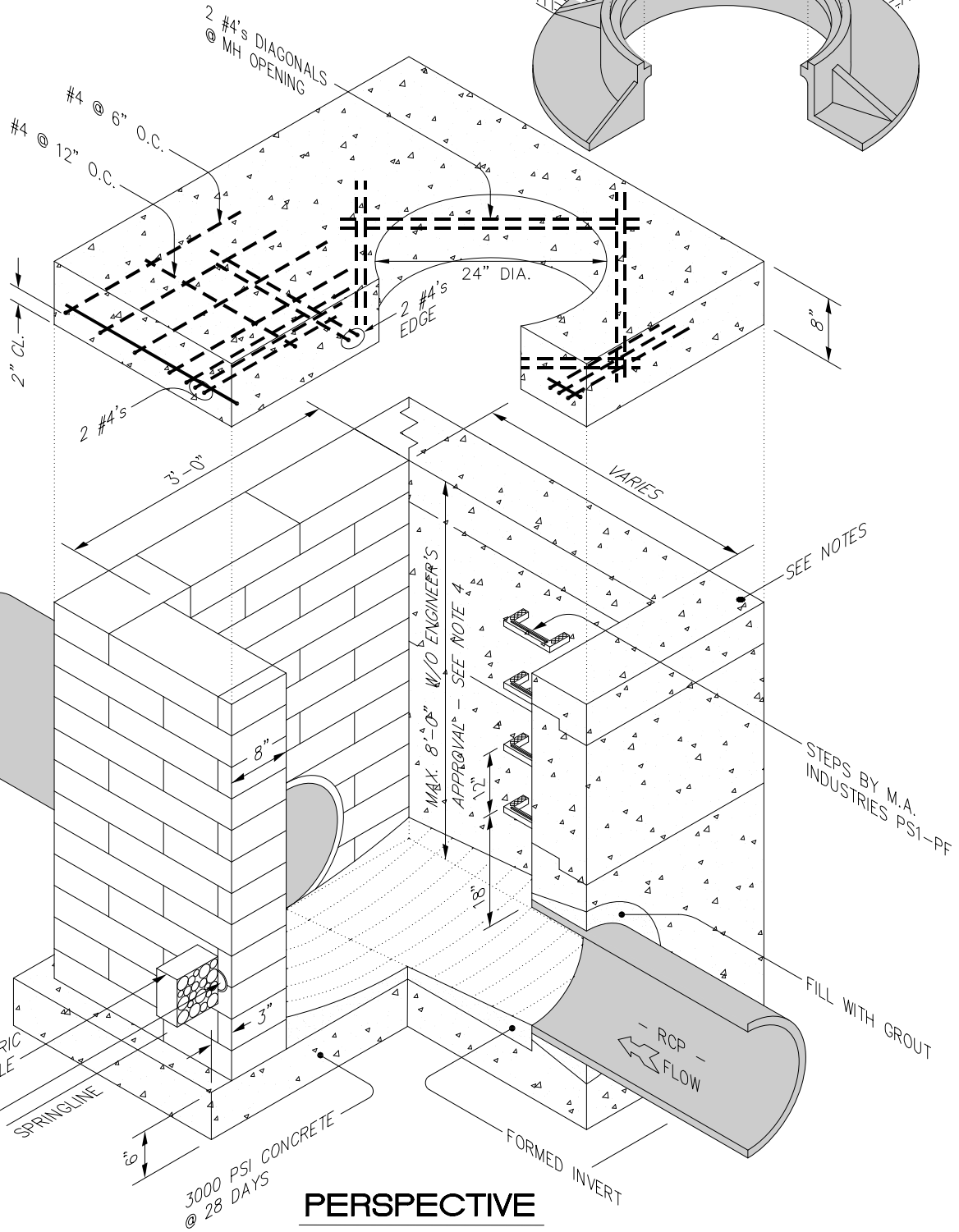
DETAIL #  
**36**

DATE:  
JULY 2010

SHEET #:  
5 OF 5



SEE DETAIL 37 SHEETS 2 & 3  
TOP TO READ "STORM"



ONE CUBIC FOOT  
OF #57 STONE  
WRAPPED IN NON-  
WOVEN FILTER FABRIC  
AT EACH WEEP HOLE  
2" DIA. PVC  
WEEP HOLES  
SPRINGLINE

3000 PSI CONCRETE  
@ 28 DAYS

**PERSPECTIVE**

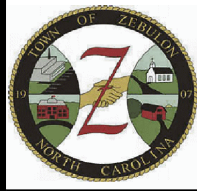
**TOWN OF ZEBULON**

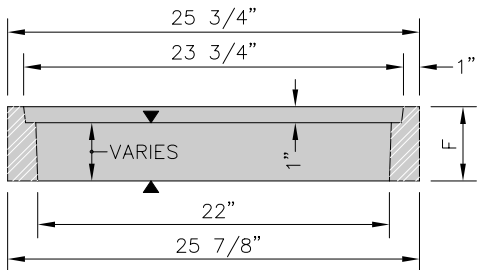
STD. M.H. J.B.  
VARIABLE LENGTH

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE  
DATE:  
JULY 2010

DETAIL #  
**37**  
SHEET #:  
1 OF 3

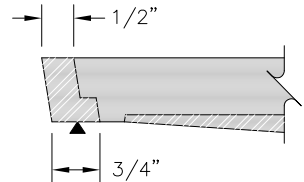




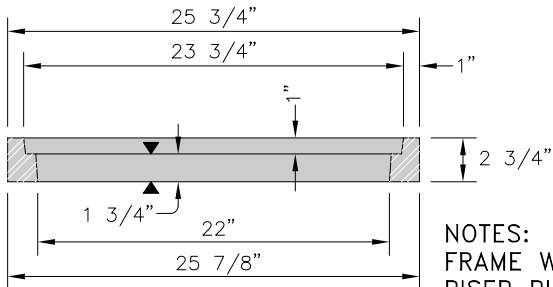
**REPLACEMENT RISER RINGS**

RISE *	PART NO.	F
1/2"	V-1984-05	3 1/4"
1"	V-1984-10	3 3/4"
1 1/2"	V-1984-15	4 1/4"
2"	V-1984-20	4 3/4"
2 1/2"	V-1984-25	5 1/4"
3"	V-1984-30	5 3/4"
3 1/2"	V-1984-35	6 1/4"
4"	V-1984-40	6 3/4"

\* RISE ABOVE TOP OF BASE



(2) TYPE ONE PICKSLOTS  
**PICKHOLE DETAIL**



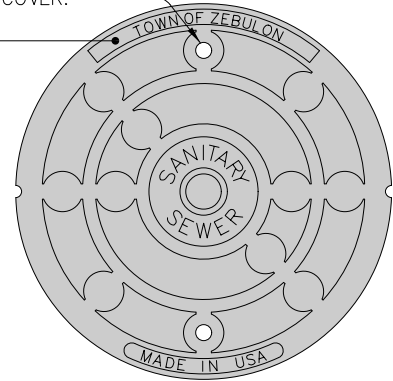
**BASIC RISER RING**

NO VENT HOLES FOR COVERS USED IN STREET AND 4 HOLES FOR COVERS OUTSIDE STREET. THE EXCEPTION TO THIS IS WHERE MANHOLES COULD COLLECT STORM RUNOFF IN THEIR VICINITY. IN THIS CASE, THERE ARE TO BE NO VENT HOLES IN COVER.

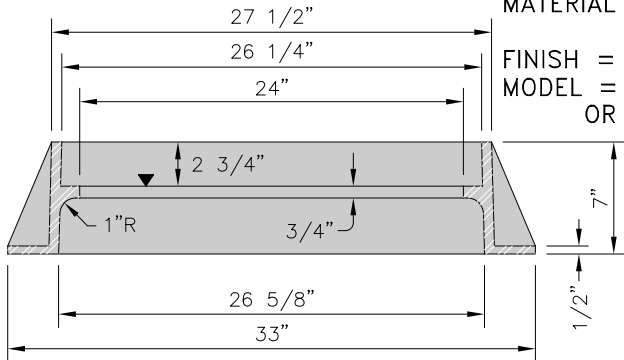
"REQUESTED WORDING"

NOTES:  
 FRAME WEIGHT = 175 LBS.  
 RISER RING WEIGHT = 50 LBS.  
 COVER WEIGHT = 135 LBS.  
 LOAD RATING = HEAVY DUTY  
 MATERIAL = ASTM A 48  
 CLASS 30

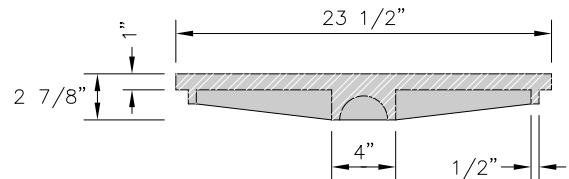
FINISH = UNCOATED  
 MODEL = VULCAN V1984-95  
 OR VULCAN V1995-95



**COVER FACE**

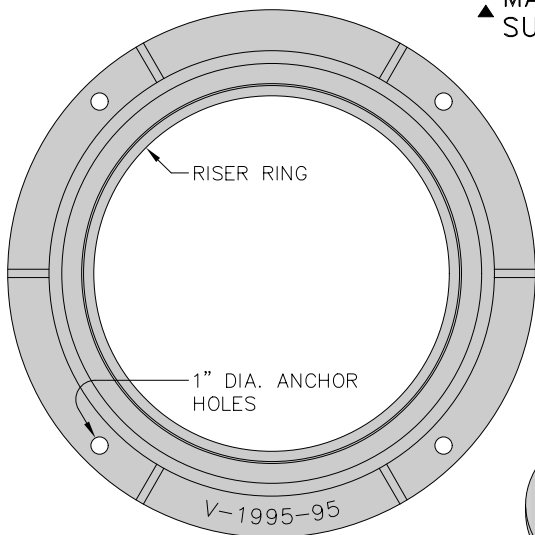


**FRAME SECTION**



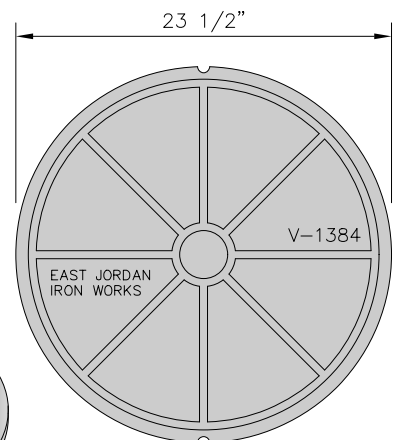
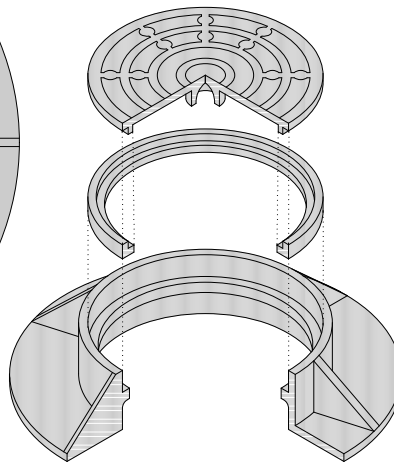
**COVER SECTION**

▲ MACHINED SURFACES

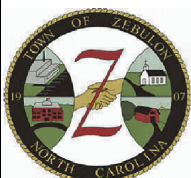


**FRAME TOP VIEW**

**ISOMETRIC**



**COVER BACK**



**TOWN OF ZEBULON**

STANDARD MANHOLE COVER & RING  
 ADJUSTABLE - EAST JORDAN IRON WORKS V-1984

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
 NOT TO SCALE

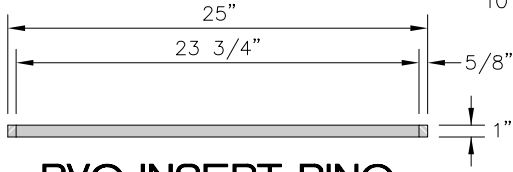
DETAIL #  
**37**

DATE:  
 JULY 2010

SHEET #:  
 2 OF 3

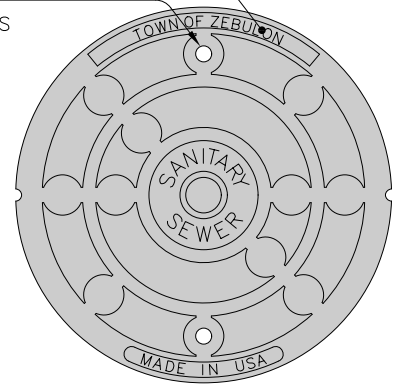
"REQUESTED WORDING"

NO VENT HOLES FOR COVERS USED IN STREET AND 4 HOLES FOR COVERS OUTSIDE STREET. THE EXCEPTION TO THIS IS WHERE MANHOLES COULD COLLECT STORM RUNOFF IN THEIR VICINITY. IN THIS CASE, THERE ARE TO BE NO VENT HOLES IN COVER.



**PVC INSERT RING**

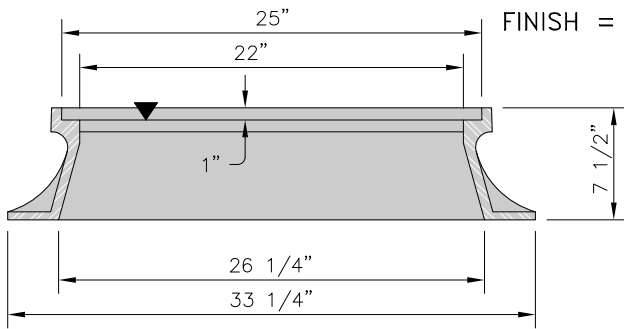
▲ MACHINED SURFACES



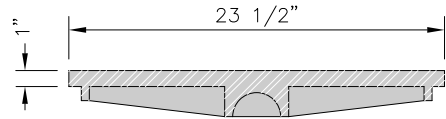
**COVER FACE**

NOTES:

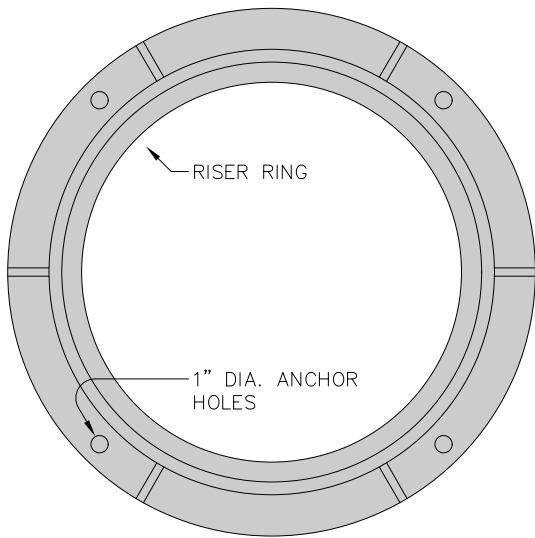
FRAME WEIGHT = 205 LBS.  
 COVER WEIGHT = 125 LBS.  
 LOAD RATING = HEAVY DUTY  
 MATERIAL = ASTM A48  
 CLASS 35B GRAY IRON  
 FINISH = UNCOATED



**FRAME SECTION**

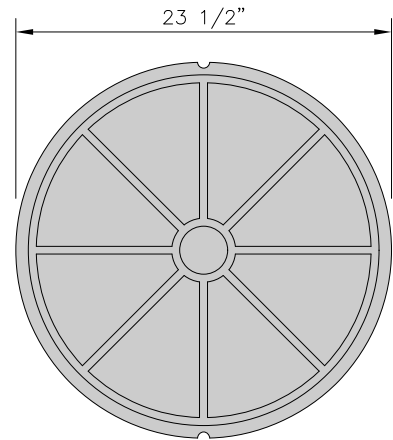
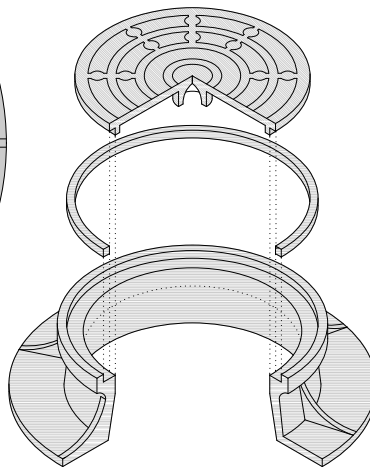


**COVER SECTION**

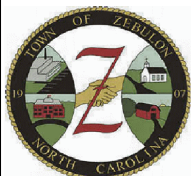


**FRAME TOP VIEW**

**ISOMETRIC**



**COVER BACK**



**TOWN OF ZEBULON**

STANDARD MANHOLE & RING

US FOUNDRY 700 KL

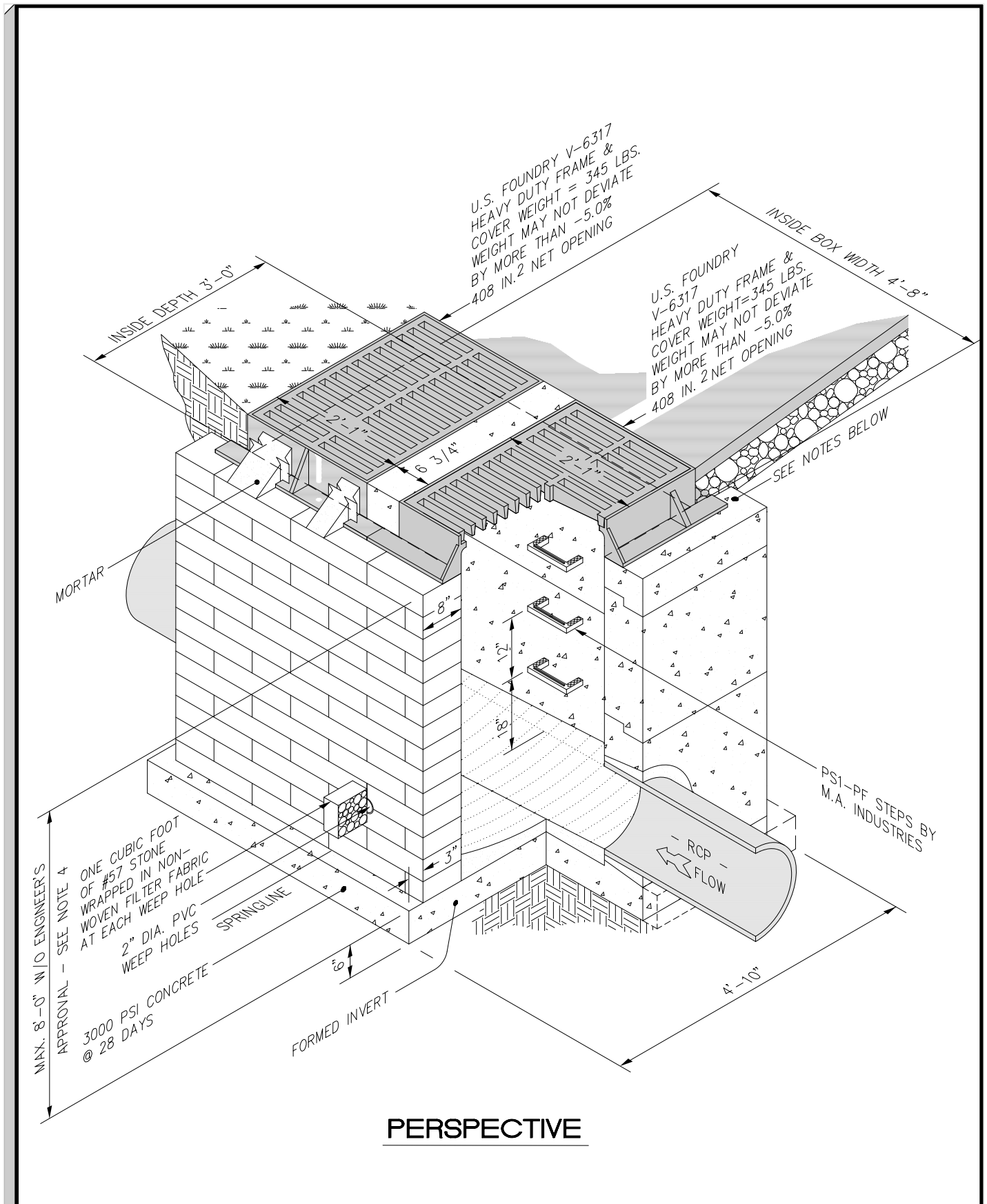
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DATE:  
JULY 2010

DETAIL #  
**37**

SHEET #:  
3 OF 3



**PERSPECTIVE**



**TOWN OF ZEBULON**

STD. MULTIPLE 2' x 3'  
CATCH BASIN DETAIL

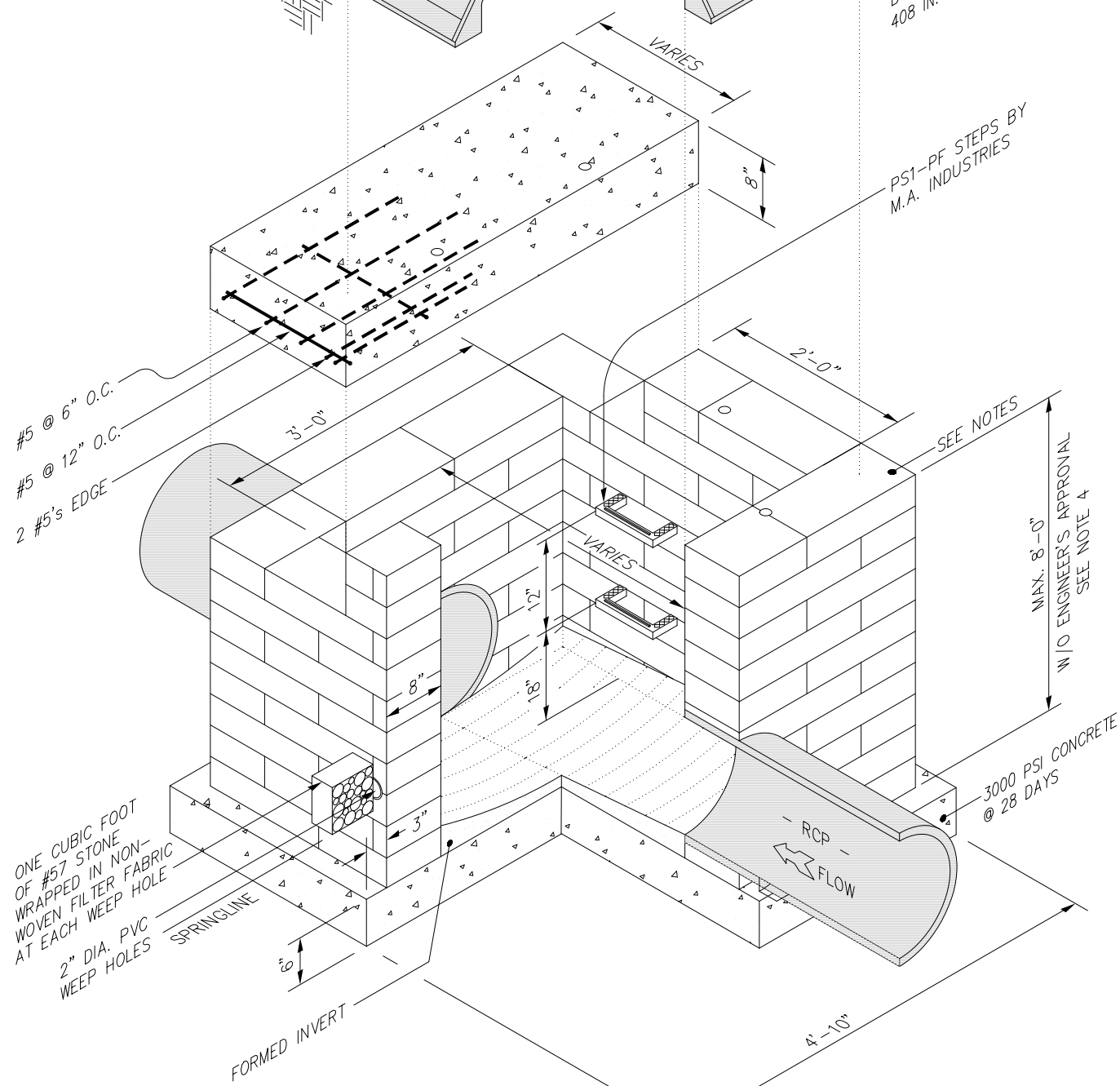
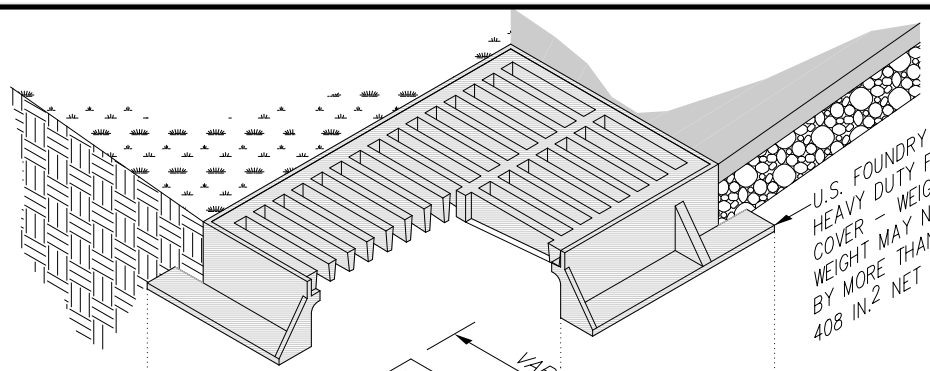
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DATE:  
JULY 2010

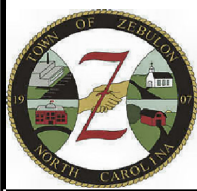
DETAIL #  
**38**

SHEET #:  
1 OF 1



**PERSPECTIVE**

**TOWN OF ZEBULON**



STD. 3' x VARIABLE LENGTH  
BOX WITH 2' x 3' C.B.

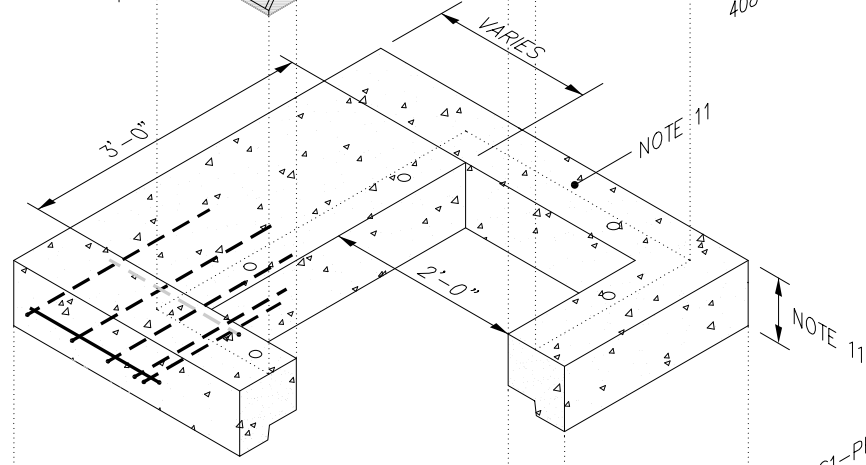
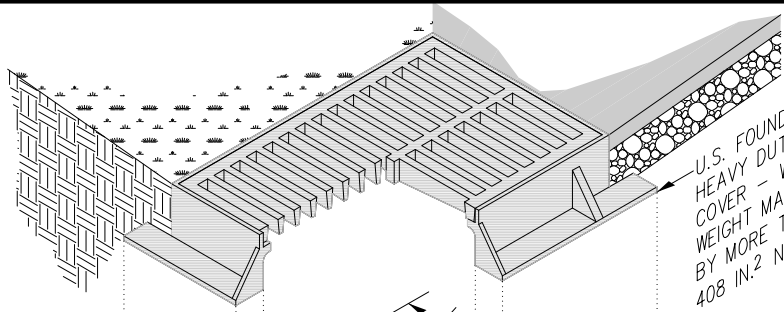
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

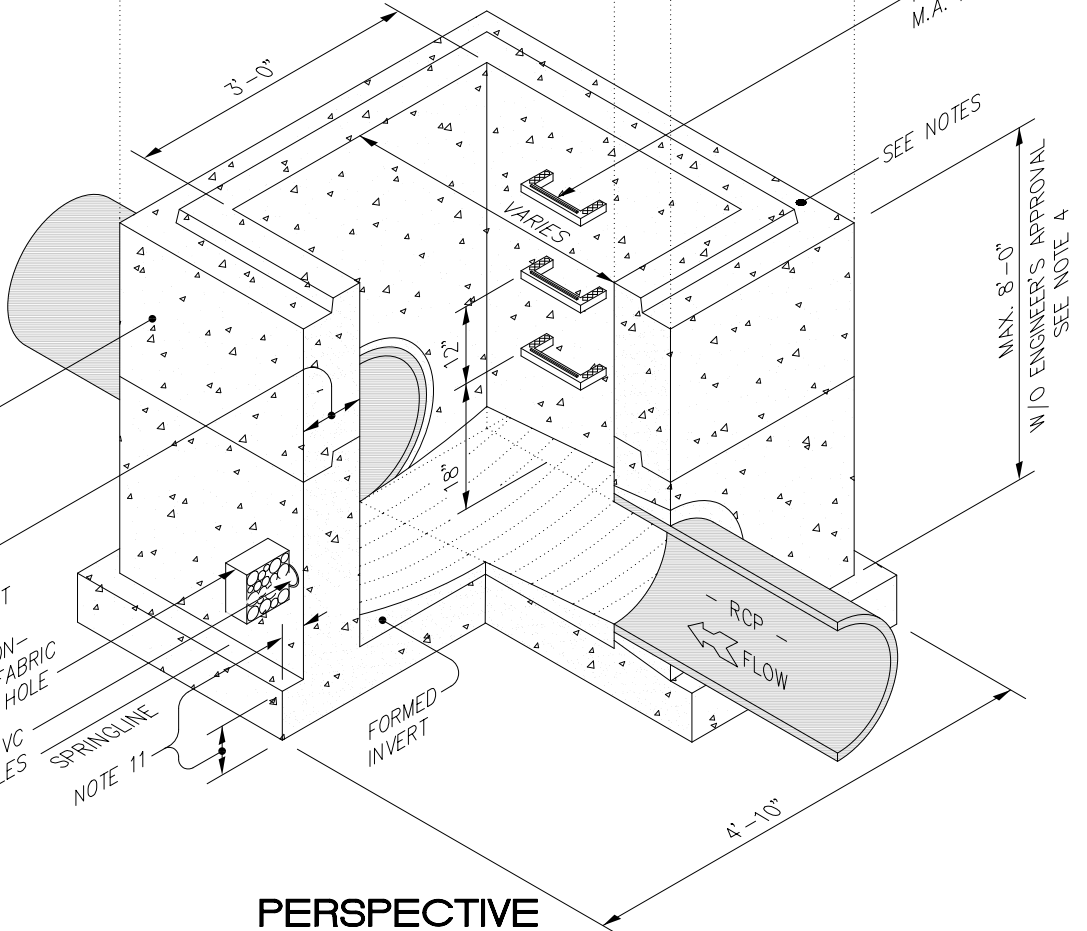
DATE:  
JULY 2010

DETAIL #  
**39**

SHEET #:  
1 OF 2



PS1-PF STEPS BY  
M.A. INDUSTRIES



**PERSPECTIVE**

**TOWN OF ZEBULON**



STD. 3' x VARIABLE LENGTH  
PRECAST BOX WITH 2' x 3' C.B.

USE WITH STANDARD SPECIFICATIONS ONLY

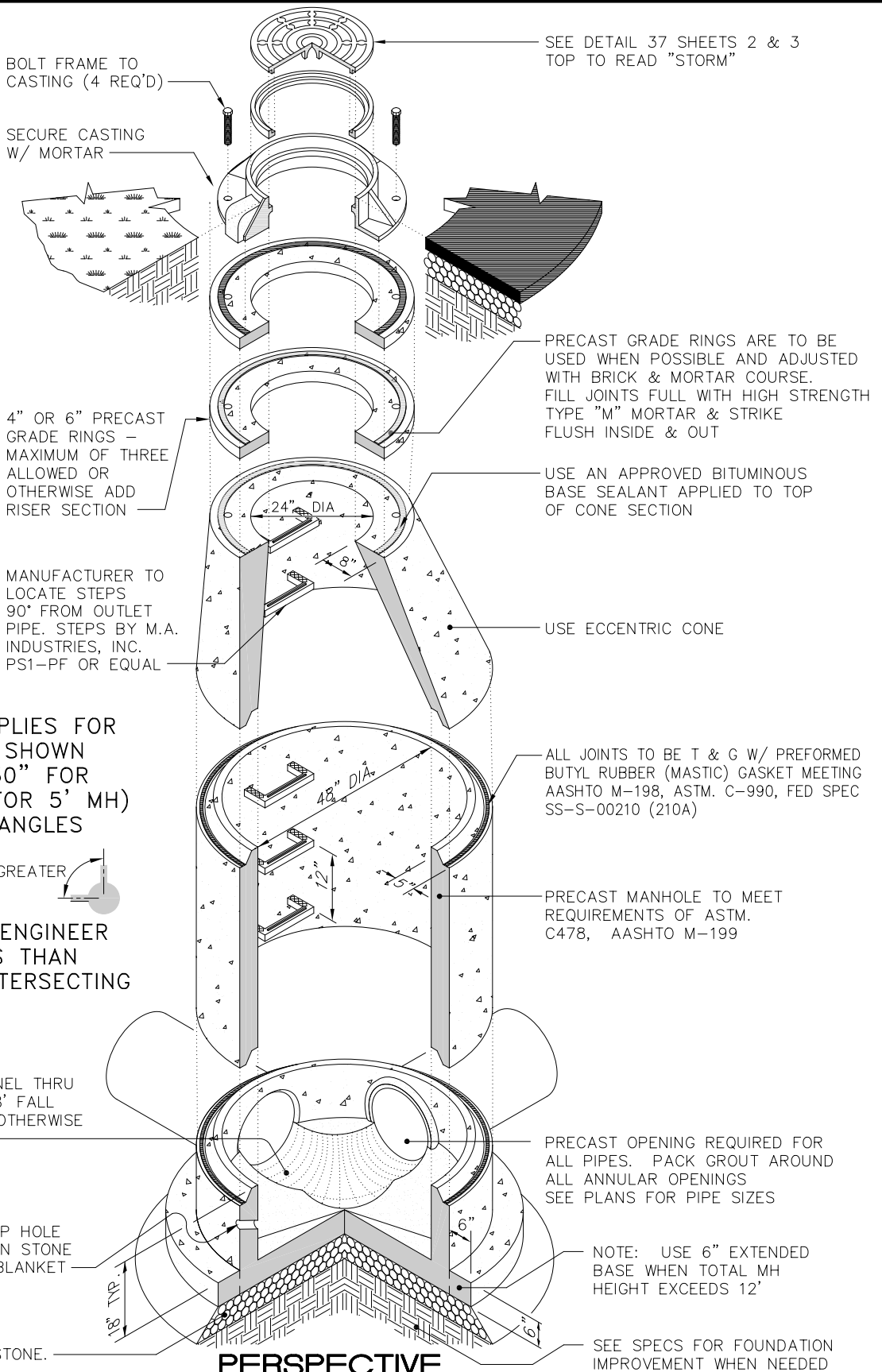
SCALE:  
NOT TO SCALE

DATE:  
JULY 2010

DETAIL #  
**39**

SHEET #:  
2 OF 2





NOTE:  
 THIS DETAIL APPLIES FOR  
 LARGEST PIPES SHOWN  
 BELOW (I.E.: 30" FOR  
 4' MH & 42" FOR 5' MH)  
 WITH INTERIOR ANGLES  
 AS FOLLOWS:  
 90° OR GREATER

CONSULT WITH ENGINEER  
 IF ANGLES LESS THAN  
 90° ON TWO INTERSECTING  
 PIPES.

SLOPE OF CHANNEL THRU  
 MANHOLE = 0.08' FALL  
 UNLESS SHOWN OTHERWISE  
 ON PLANS.

2" DIA. PVC WEEP HOLE  
 W/1 CF OF CLEAN STONE  
 IN MIRAFI 140N BLANKET

SET MANHOLE IN  
 6" TO 12" #57 STONE.

SEE DETAIL 37 SHEETS 2 & 3  
 TOP TO READ "STORM"

BOLT FRAME TO  
 CASTING (4 REQ'D)

SECURE CASTING  
 W/ MORTAR

4" OR 6" PRECAST  
 GRADE RINGS -  
 MAXIMUM OF THREE  
 ALLOWED OR  
 OTHERWISE ADD  
 RISER SECTION

MANUFACTURER TO  
 LOCATE STEPS  
 90° FROM OUTLET  
 PIPE. STEPS BY M.A.  
 INDUSTRIES, INC.  
 PS1-PF OR EQUAL

PRECAST GRADE RINGS ARE TO BE  
 USED WHEN POSSIBLE AND ADJUSTED  
 WITH BRICK & MORTAR COURSE.  
 FILL JOINTS FULL WITH HIGH STRENGTH  
 TYPE "M" MORTAR & STRIKE  
 FLUSH INSIDE & OUT

USE AN APPROVED BITUMINOUS  
 BASE SEALANT APPLIED TO TOP  
 OF CONE SECTION

USE ECCENTRIC CONE

ALL JOINTS TO BE T & G W/ PREFORMED  
 BUTYL RUBBER (MASTIC) GASKET MEETING  
 AASHTO M-198, ASTM. C-990, FED SPEC  
 SS-S-00210 (210A)

PRECAST MANHOLE TO MEET  
 REQUIREMENTS OF ASTM.  
 C478, AASHTO M-199

PRECAST OPENING REQUIRED FOR  
 ALL PIPES. PACK GROUT AROUND  
 ALL ANNULAR OPENINGS  
 SEE PLANS FOR PIPE SIZES

NOTE: USE 6" EXTENDED  
 BASE WHEN TOTAL MH  
 HEIGHT EXCEEDS 12'

SEE SPECS FOR FOUNDATION  
 IMPROVEMENT WHEN NEEDED

**PERSPECTIVE**

**TOWN OF ZEBULON**

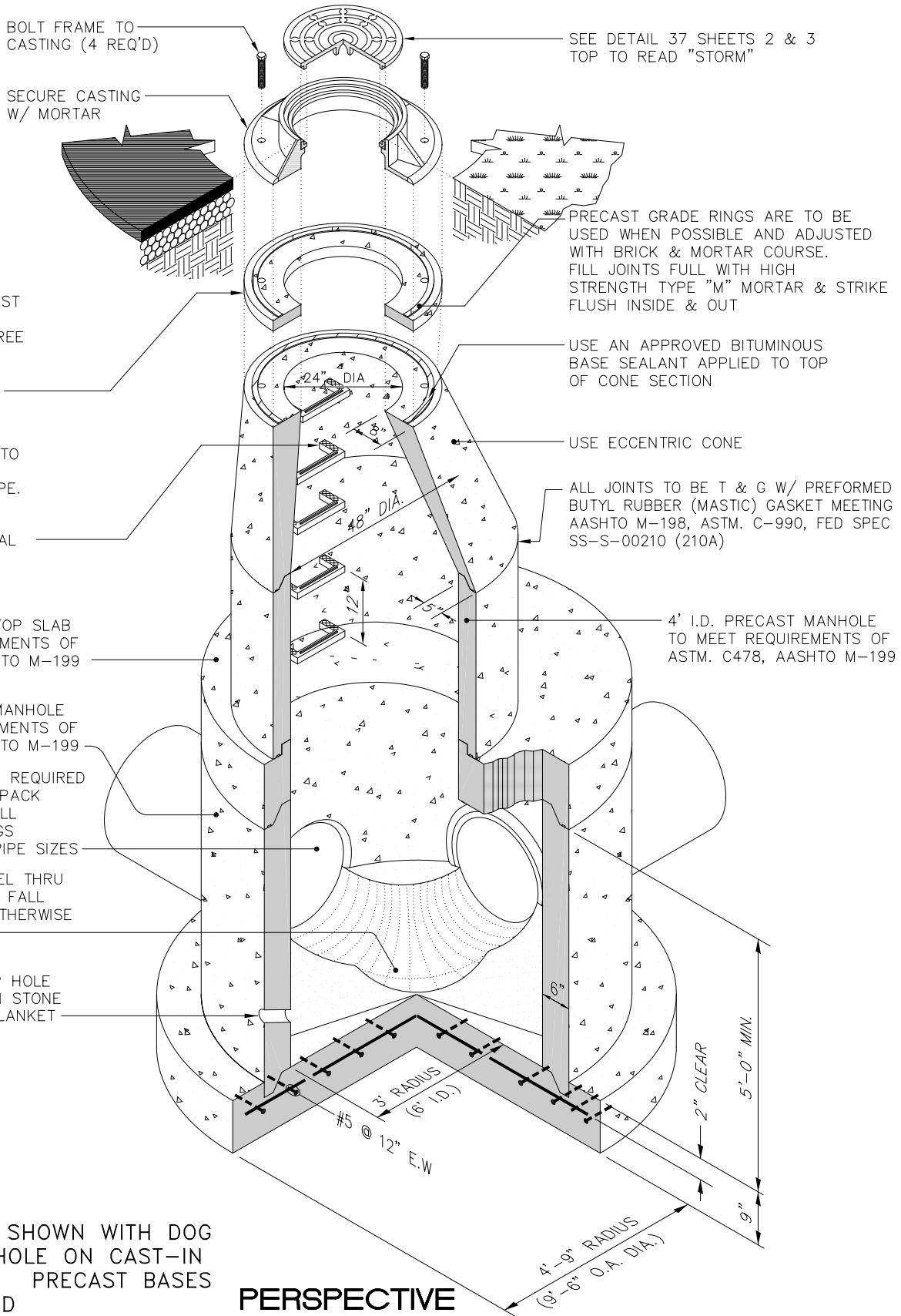


PRECAST CONCRETE  
 4' DIA. MH JB

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
 NOT TO SCALE  
 DATE:  
 JULY 2010

DETAIL #  
**40**  
 SHEET #:  
 1 OF 1



NOTE:  
 THIS DETAIL SHOWN WITH DOG  
 HOUSE MANHOLE ON CAST-IN  
 PLACE SLAB. PRECAST BASES  
 MAY BE USED

**PERSPECTIVE**



**TOWN OF ZEBULON**

PRECAST CONCRETE  
 6' TO 4' DIA. MH JB

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
 NOT TO SCALE  
 DATE:  
 JULY 2010

DETAIL #  
**41**  
 SHEET #:  
 1 OF 1



**NOTE: SITE ACCESS TO POND FOR MAINTENANCE SHOULD NOT CROSS OVER EMERGENCY SPILLWAY UNLESS IT IS PROPERLY STABILIZED!**

PROVIDE 10-15% EXTRA FILL HEIGHT TO ACCOUNT FOR POSSIBLE SUBSIDENCE IF GEOTECHNICAL TESTING IS NOT PERFORMED

SETTLED TOP OF EMBANKMENT

EMERGENCY SPILLWAY

VALVE BOX TOP LOCATED ABOVE STORAGE ELEVATION

SPLITTER PLATE & TRASH RACK

NEGATIVELY SLOPED PIPE - PIPE DIAMETER DETERMINED BY ROUTING

PERMANENT POOL ELEVATION

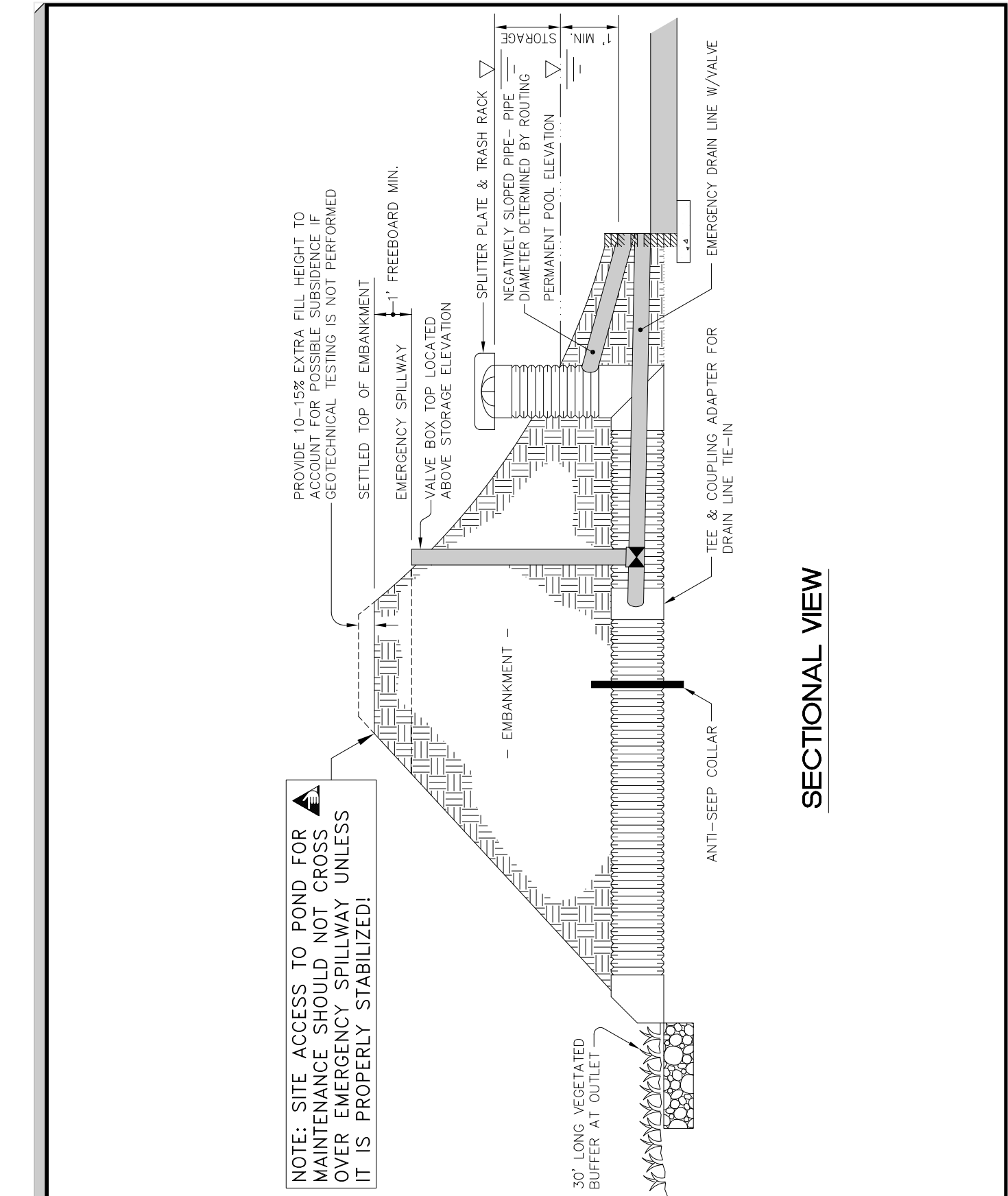
30' LONG VEGETATED BUFFER AT OUTLET

ANTI-SEEP COLLAR

TEE & COUPLING ADAPTER FOR DRAIN LINE TIE-IN

EMERGENCY DRAIN LINE W/VALVE

1' MIN. STORAGE



**SECTIONAL VIEW**



**TOWN OF ZEBULON**

TYPICAL SPILLWAY  
DETAIL

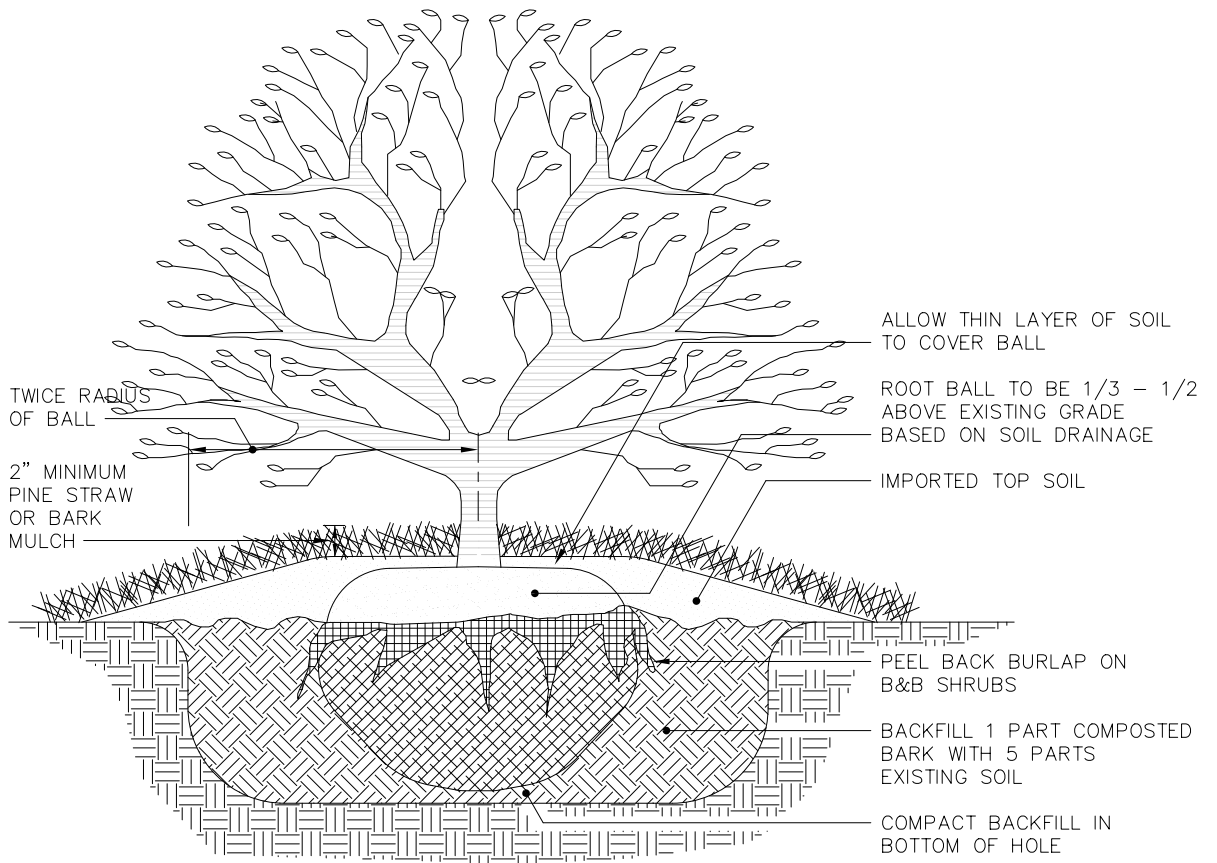
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

DATE:  
JULY 2010

DETAIL #  
**42**

SHEET #:  
1 OF 1



### SECTIONAL VIEW



## TOWN OF ZEBULON

### TYPICAL SHRUB PLANTING DETAIL

USE WITH STANDARD SPECIFICATIONS ONLY

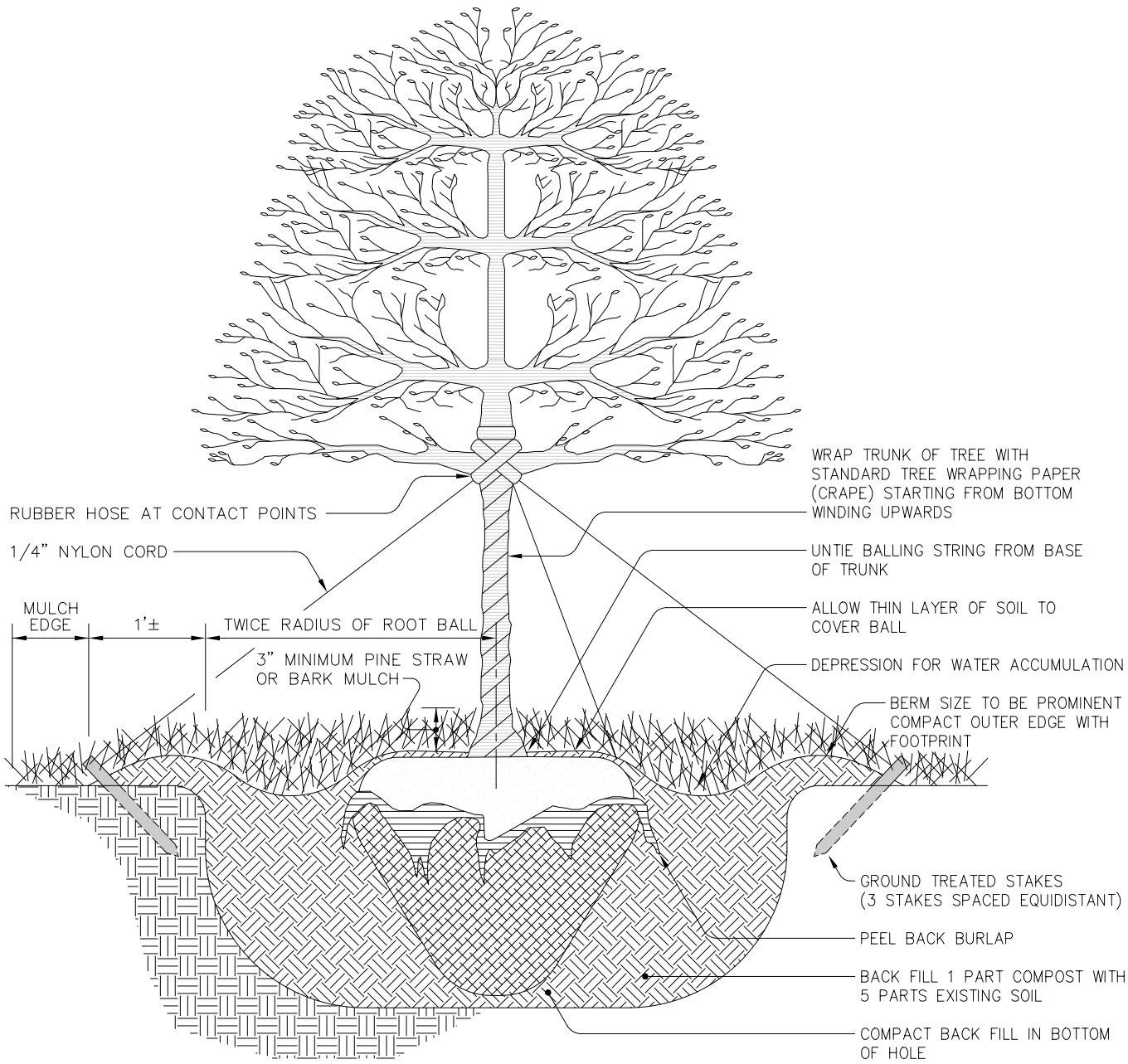
SCALE:  
NOT TO SCALE

DATE:  
JULY 2010

DETAIL #  
**43**

SHEET #:  
1 OF 1

NOTE:  
 PRUNE LOWER BRANCHES OF TREE BACK  
 TO MAIN TRUNK SO THAT REMAINING  
 HEAD IS APPROX. 1/2 OF TOTAL TREE  
 HEIGHT



**SECTIONAL VIEW**



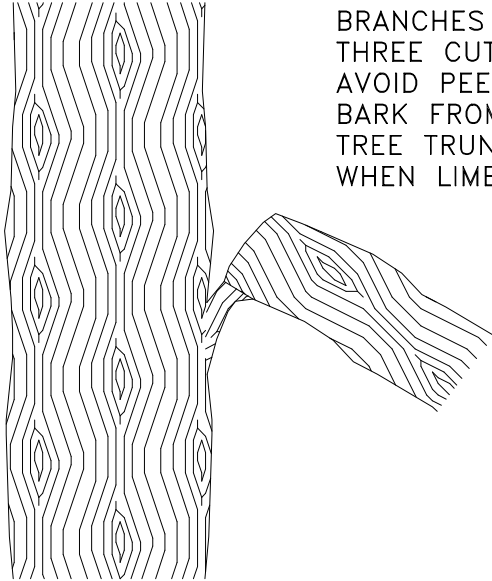
**TOWN OF ZEBULON**

TYPICAL TREE STAKING  
 and PLANTING DETAIL

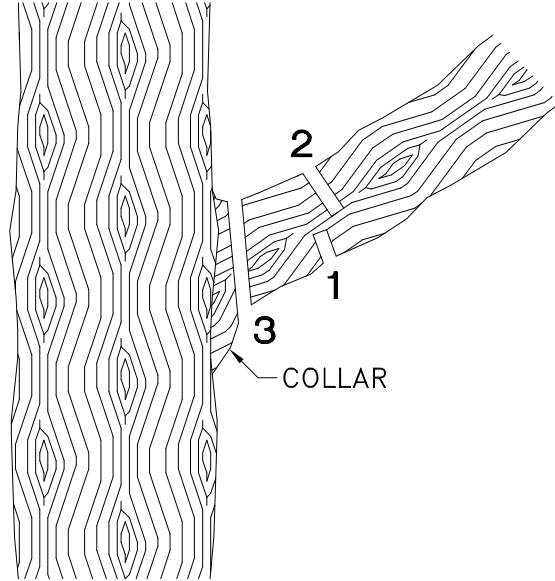
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE: NOT TO SCALE	DETAIL # <b>44</b>
DATE: JULY 2010	SHEET #: 1 OF 1

PRUNE DAMAGED  
BRANCHES WITH  
THREE CUTS TO  
AVOID PEELING  
BARK FROM THE  
TREE TRUNK  
WHEN LIMB FALLS

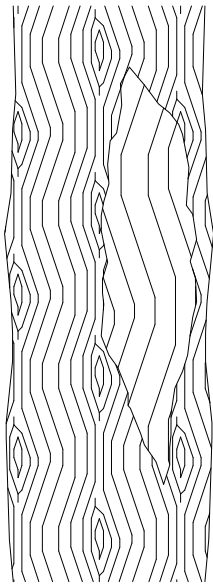


INCORRECT

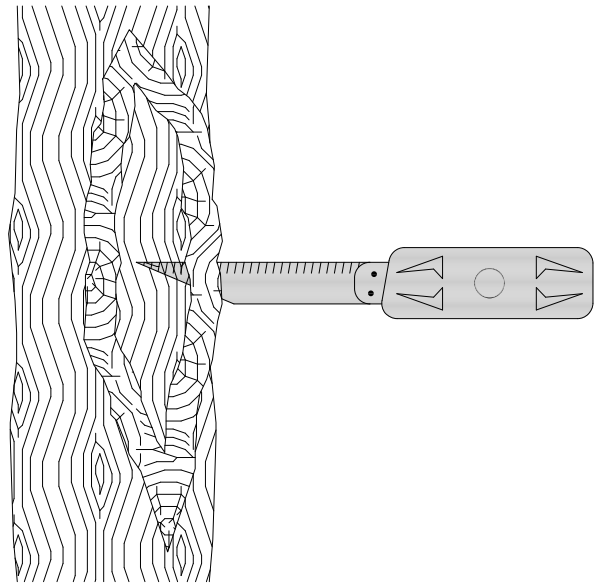


CORRECT

TRIM BARK  
WOUNDS WITH  
A TAPERED CUT,  
THEN APPLY  
TREE PAINT



TREE WOUND



TRIM AND TAPER



**TOWN OF ZEBULON**

TREE SURGERY  
DETAIL

USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

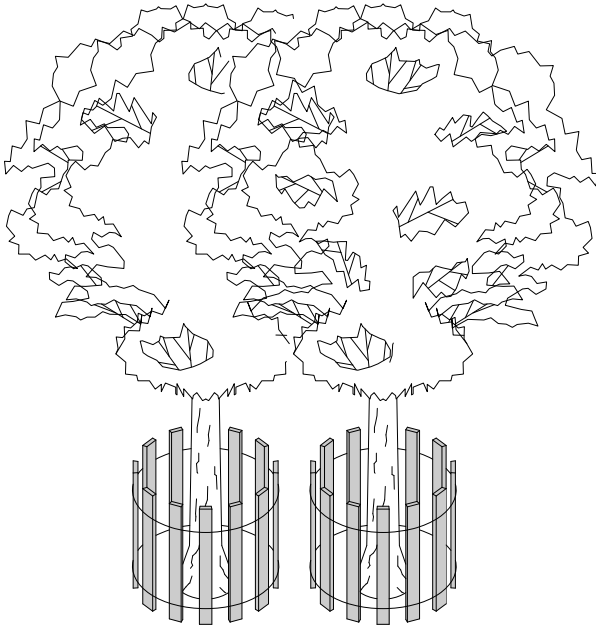
DETAIL #  
**45**

DATE:  
JULY 2010

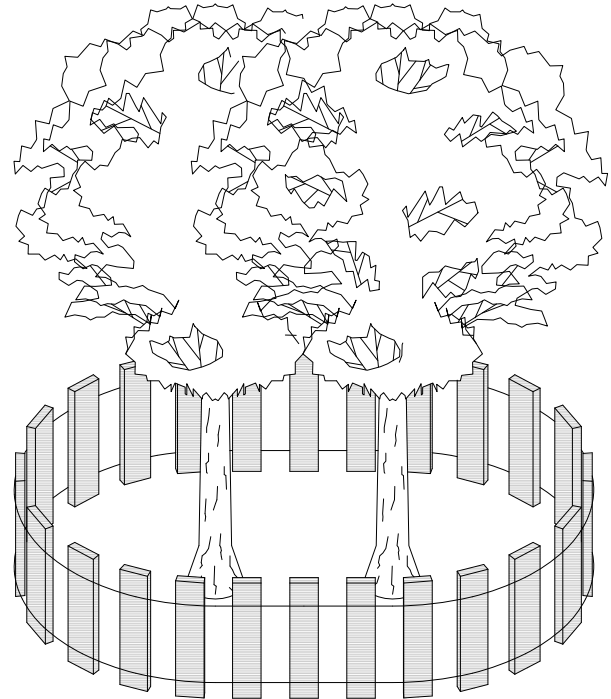
SHEET #:  
1 OF 1

**NOTES:**

- IN SPITE OF PRECAUTIONS, SOME DAMAGE TO TREES MAY OCCUR.
- IN SUCH CASES REPAIR ANY DAMAGE TO CROWN, TRUNK OR ROOT SYSTEM IMMEDIATELY.
- REPAIR ROOTS BY CUTTING OFF THE DAMAGED AREAS AND PAINT THEM WITH TREE PAINT.
- SPREAD PEAT MOSS OR MOIST TOPSOIL OVER EXPOSED ROOTS.
- REPAIR DAMAGE TO BARK BY TRIMMING AROUND THE DAMAGED AREA AS SHOWN IN DETAIL 45
- TAPER THE CUT TO PROVIDE DRAINAGE AND PAINT WITH TREE PAINT.
- CUT OFF ALL DAMAGED TREE LIMBS ABOVE THE TREE COLLAR AT THE TRUNK OR MAIN BRANCH.
- USE THREE SEPARATE CUTS AS SHOWN IN DETAIL 45 TO AVOID PEELING BARK FROM HEALTHY AREAS OF TREE.

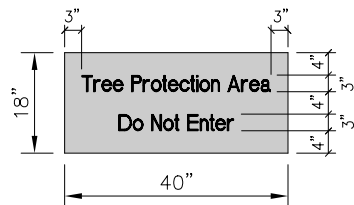


INCORRECT



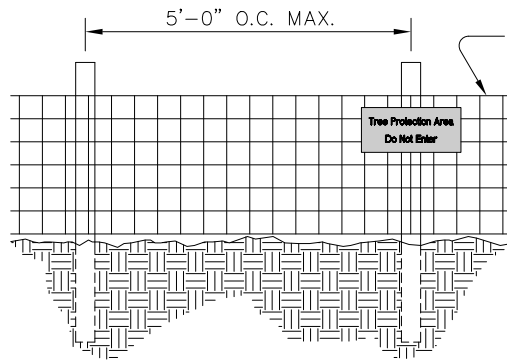
CORRECT

BARRIER SHOULD BE INSTALLED AT THE DRIP LINE OF TREE BRANCHES



**WEATHERPROOF SIGN**

SEE NOTES BELOW FOR CONSTRUCTION AND SPACING DATA



ORANGE, UV-RESISTANT, HIGH-TENSILE STRENGTH, POLY BARRICADE FABRIC

4'-0" MIN.

POSTS MAY BE EITHER 4" DIA. PINE, 2" DIA. OAK, OR 1.33 LB/LF STEEL.

SUBGRADE

**ELEVATIONAL VIEW**

**NOTES:**

1. INSTALL TREE PROTECTION FENCE AND SIGNAGE PRIOR TO CALLING FOR THE INITIAL ON SITE INSPECTION BY THE TOWN OF ZEBULON CONSTRUCTION INSPECTOR.
2. WARNING SIGNS TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL.
3. LETTERS ARE TO BE 3" HIGH MINIMUM, CLEARLY LEGIBLE AND SPACED AS DETAILED.
4. SIGNS ARE TO BE PLACED NO GREATER THAN 200' ON CENTER.
5. PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AREAS AND 200' ON CENTER THEREAFTER.
6. FOR TREE PROTECTION AREAS LESS THAN 200' IN PERIMETER, PROVIDE NO LESS THAN ONE SIGN PER PROTECTED AREA.
7. ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC.
8. MAINTAIN TREE PROTECTION FENCE THROUGHOUT DURATION OF PROJECT.
9. ADDITIONAL SIGNS MAY BE REQUIRED BY TOWN OF ZEBULON PUBLIC WORKS DEPT. BASED ON ACTUAL FIELD CONDITIONS.



**TOWN OF ZEBULON**

STANDARD TREE PROTECTION DETAIL

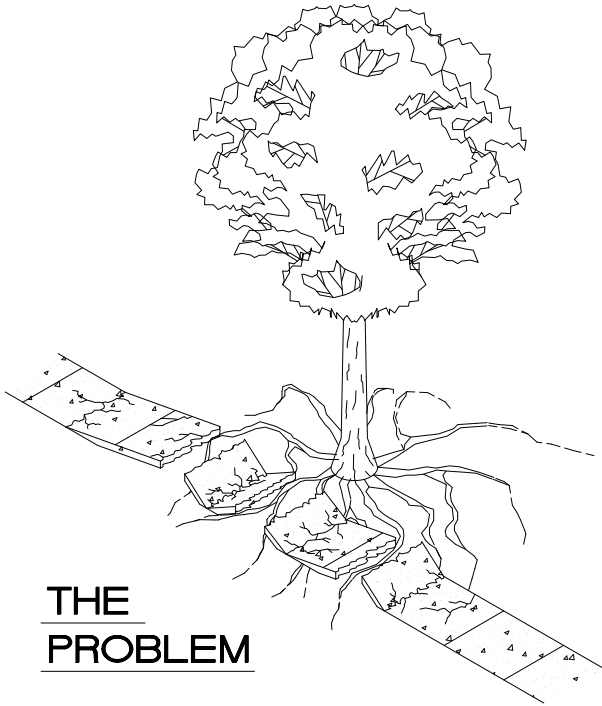
USE WITH STANDARD SPECIFICATIONS ONLY

SCALE:  
NOT TO SCALE

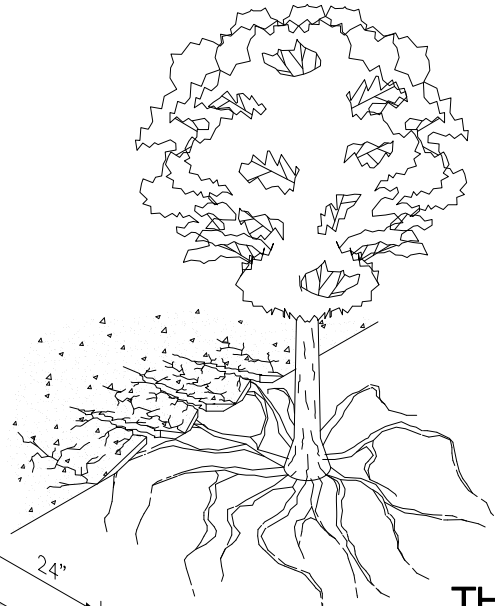
DETAIL #  
**46**

DATE:  
JULY 2010

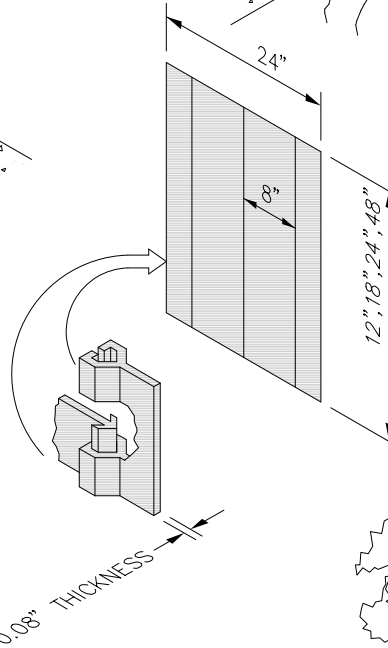
SHEET #:  
1 OF 1



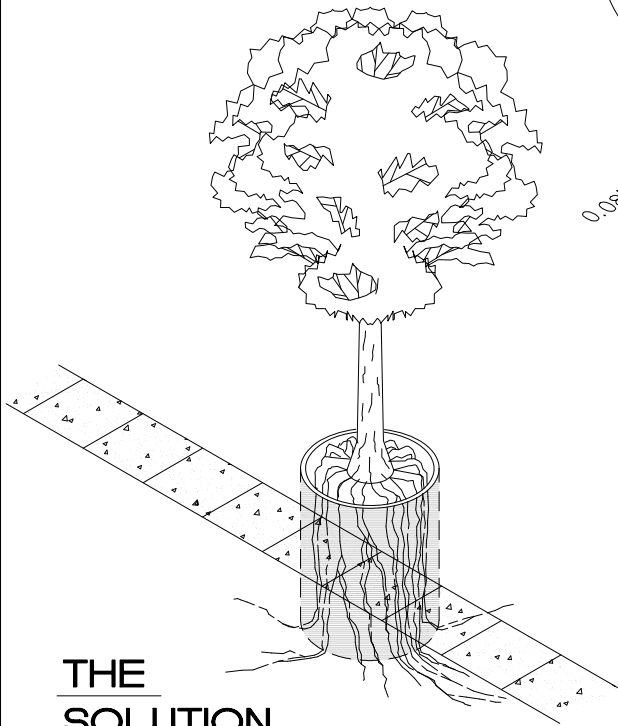
THE PROBLEM



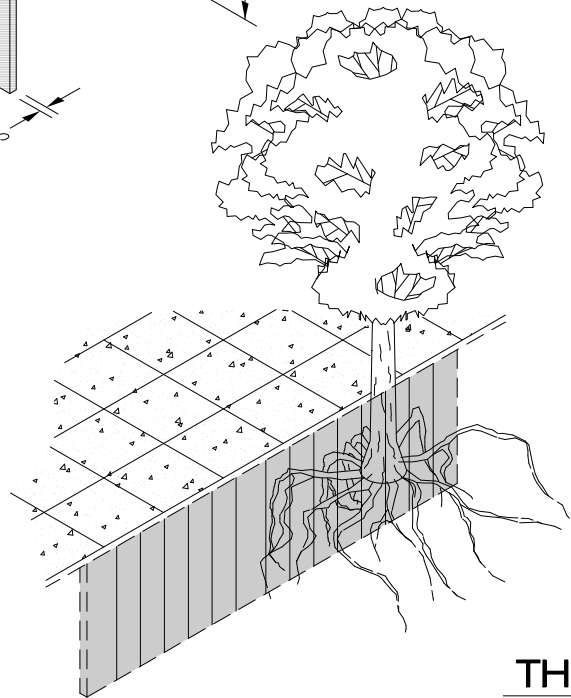
THE PROBLEM



BARRIERS ARE TO BE BY ROOT SOLUTIONS, INC. OR APPROVED EQUAL.



THE SOLUTION



THE SOLUTION



**TOWN OF ZEBULON**

STANDARD ROOT BARRIER DETAIL

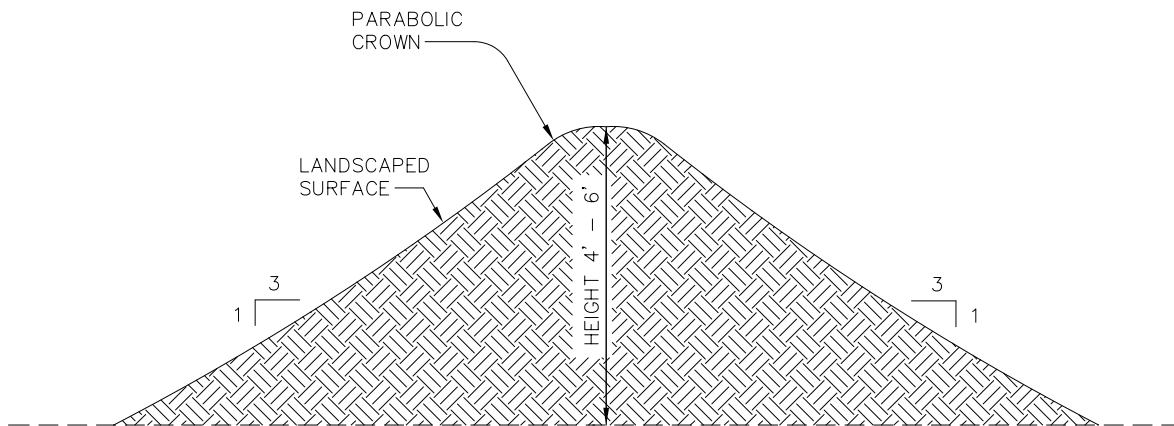
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DATE:  
JULY 2010

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**47**

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1 OF 1



**DETAIL FOR EARTHEN BERMS  
WHEN REQUIRED IN COMBINATION WITH  
PLANT MATERIAL AND FENCING.**

**SECTIONAL VIEW**

**NOTES:**

1. FILL FOR BERM MAY BE EXCESS TOPSOIL STRIPPED FROM SITE OR UNSUITABLE EARTHEN EXCAVATION FROM PROJECT. CONTRACTOR MAY BURY ROCK AND CONCRETE BUT NO MATERIAL MAY BE BURIED THAT WOULD OTHERWISE REQUIRE A PERMIT AS A DEMOLITION LAND FILL SUCH AS ASPHALT, TIMBER, STUMPS, ETC. SUCH MATERIAL MUST BE BURIED IN A LANDFILL PERMITTED TO ACCEPT THIS TYPE OF WASTE MATERIAL.
2. LANDSCAPE SURFACE SHALL COMPLY WITH TOWN OF ZEBULON LANDSCAPE ORDINANCE. SEE PLANNING DEPARTMENT FOR ADDITIONAL INFORMATION.



**TOWN OF ZEBULON**

**STANDARD LANDSCAPE BERM  
– NOISE BARRIER DETAIL**

USE WITH STANDARD SPECIFICATIONS ONLY

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DATE:  
JULY 2010

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**48**

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1 OF 1

RESERVED



TOWN OF ZEBULON

TEMPORARY STREET DRAINAGE

USE WITH STANDARD SPECIFICATIONS ONLY

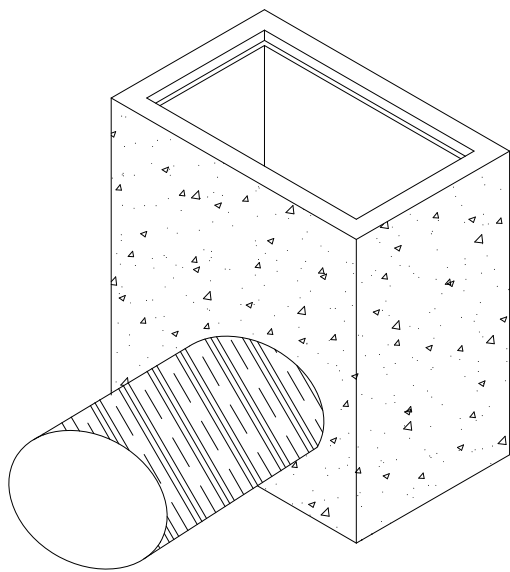
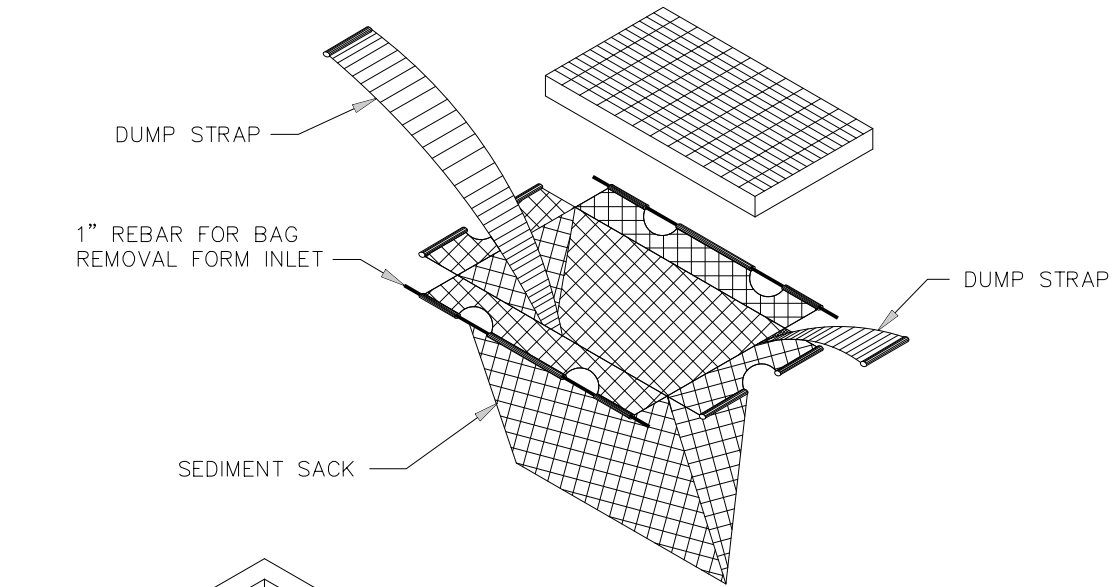
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JULY 2010

DETAIL #  
**49**

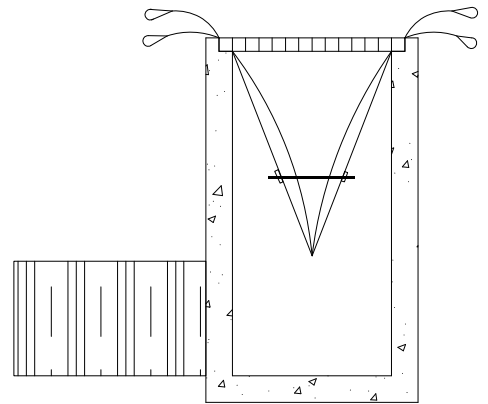
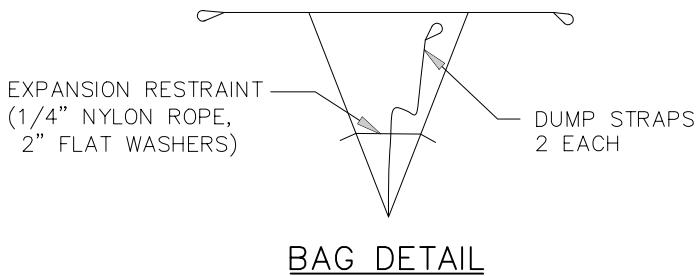
SHEET #:  
1 OF 1





NOTES:

1. SOME MUNICIPALITIES DO NOT ALLOW GUTTER PROTECTION ON PUBLIC ROADS. SILT BAGS SHOULD BE USED WITH THESE CASES.
2. BAGS SHOULD BE CLEANED OUT AFTER EVERY RAIN EVENT AND/OR AS NEEDED.



INSTALLATION DETAIL



**TOWN OF ZEBULON**

CATCH BASIN — SEDIMENT CONTROL DEVICES

USE WITH STANDARD SPECIFICATIONS ONLY

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JULY 2010

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