SCHEDULE OF STREET SEGEMENTS

revised 07/17/17

ID	Street Segment Name	Segment Begins	Segment End	Street Direction	Length	Asphalt / Concrete Width	ROW Width	Road Center	Asphalt Work	Driveway	North / West R/W Treatment	South / East R/W Treatment	Additional Notes / Work Requirements
Grant Funded Items													
1	NW 167 PL	Terminus	NW CR 241	W - E	1027	20 , 10	40	Inverted	Mill & Overlay	17	Shoulder	Shoulder	(4) MH (2) WV (1) SI (17) DRW
2	NW 142 TER	NW 167 PL	NW 166 PL	N - S	400	20	40	Inverted	Overlay	1	Shoulder	Shoulder	(1) MH (2) WV (1) SI (1) DRW
3	NW 166 PL	NW 142 TER	NW CR 241	W - E	800	20, 15, 18	40	Crowned	Overlay	6	Swale / C&G	Shoulder	(1) MH (6) DRW
4	NW 158 AV	Terminus	NW 141 ST	W - E	714	15,20	25	Crowned	Overlay	5	C&G	C&G	(5) DRW
5	NW 157 PL	Terminus	NW 141 ST	W - E	754	18	40	Inverted	Overlay	4	C&G	C&G	(4) DRW (2) MH
6	NW 156 PL	Terminus	NW 141 ST	W - E	775	18	40	Inverted	Mill & Overlay	13	C&G	C&G Sidewalk	(2) MH (2) CR (2) DW (13) DRW
7	NW 156 AV	Terminus	NW 141 ST	W - E	700	18	40	Inverted, Crown	Mill & Overlay	4	C&G	C&G	(2) MH (4) DRW
8	NW 155 PL	Terminus	NW 141 ST	W - E	820	18	40	Inverted	Inverted	8	C&G	C&G	(2) MH (8) DRW
9	NW 154 PL	Terminus	NW 141 ST	W - E	800	18	40	Inverted	Overlay	5	C&G	C&G	(1) MH (5) DRW
10	NW 154 AV	US HWY 441	NW 141 ST	W - E	546	20	40	Inverted	Overlay	1	C&G Sidewalk	C&G	(1) MH (1) WV (1) CR (1) DW
11	NW 142 TER	NW 158 AV	NW 154 AV	N - S	1277	18	60	Inverted	Mill & Overlay	6	C&G Sidewalk	C&G	(1) MH (12) CR (12) DW (6) DRW
12	NW 155 LN	NW 140 ST	NW 138 WAY	W - E	600	24	50	Crowned	Mill & Overlay	None	None	None	(2) MH
13	NW 138 WAY	NW 155 LN	NW 155 AV	N - S	200	24	50	Crowned	Mill & Overlay	None	None	None	(2) MH
14	NW 155 AV	NW 140 ST	NW 138 WAY	W - E	600	24	50	Crowned	Mill & Overlay	None	None	None	(1) MH
15	NW 158 AV	NW 141 ST	NW 140 ST	W - E	420	18	25	Crowned	Mill & Overlay	3	C&G	C&G	(3) DRW (1) MH
16	NW 158 AV	NW 135 TER	NW 133 TER	W - E	715	5	30					Sidewalk Only	(2) CR (2) DW
17	NW 135 TER	NW 158 AV	NW 154 AV	N - S	1260	5	60				Sidewalk Only		(4) CR (4) DW
18	NW 133 TER	NW 158 AV	NW 155 PL	N - S	740	5	60				Sidewalk Only		(4) CR (4) DW
19	NW 157 AV	NW 134 TER	NW 133 TER	W - E	322	5	60					Sidewalk Only	(2) CR (2) DW
20	NW 134 TER	NW 157 AV	NW 155 PL	N - S	373	5	60				Sidewalk Only		(1) CR (1) DW
21	NW 154 AV	NW 135 TER	NW 135 TER	W - E	26	5	60					Sidewalk Only	(2) CR (2) DW
22	NW 155 PL	NW 134 TER	NW 133 TER	W - E	315	5	60					Sidewalk Only	(2) CR (2) DW
23	NW 155 PL	NW 133 TER	Hippway	W - E	240	5	60					Sidewalk Only	(2) CR (2) DW
24	Hippway	Terminus	NW 155 PL	N - S	227	5	60				Sidewalk Only		(1) CR (1) DW
25	NW 133 TER	NW 155 PL	NW 154 AV	N - S	486	5	60				Sidewalk Only		(2) CR (2) DW
26	NW 154 AV	NW 134 TER	NW 133 TER	W - E	310	5	132					Sidewalk Only	(2) CR (2) DW
27	NW 134 TER	NW 155 PL	NW 154 AV	N - S	481	5	60				Sidewalk Only		(2) CR (2) DW
28													
29													
30													
31													
32													

Note: Reference FDOT Curb and Gutter and Sidewalk Standards

Legend

MH = Manhole

WV = Water Valve

SI = Storm Inlet

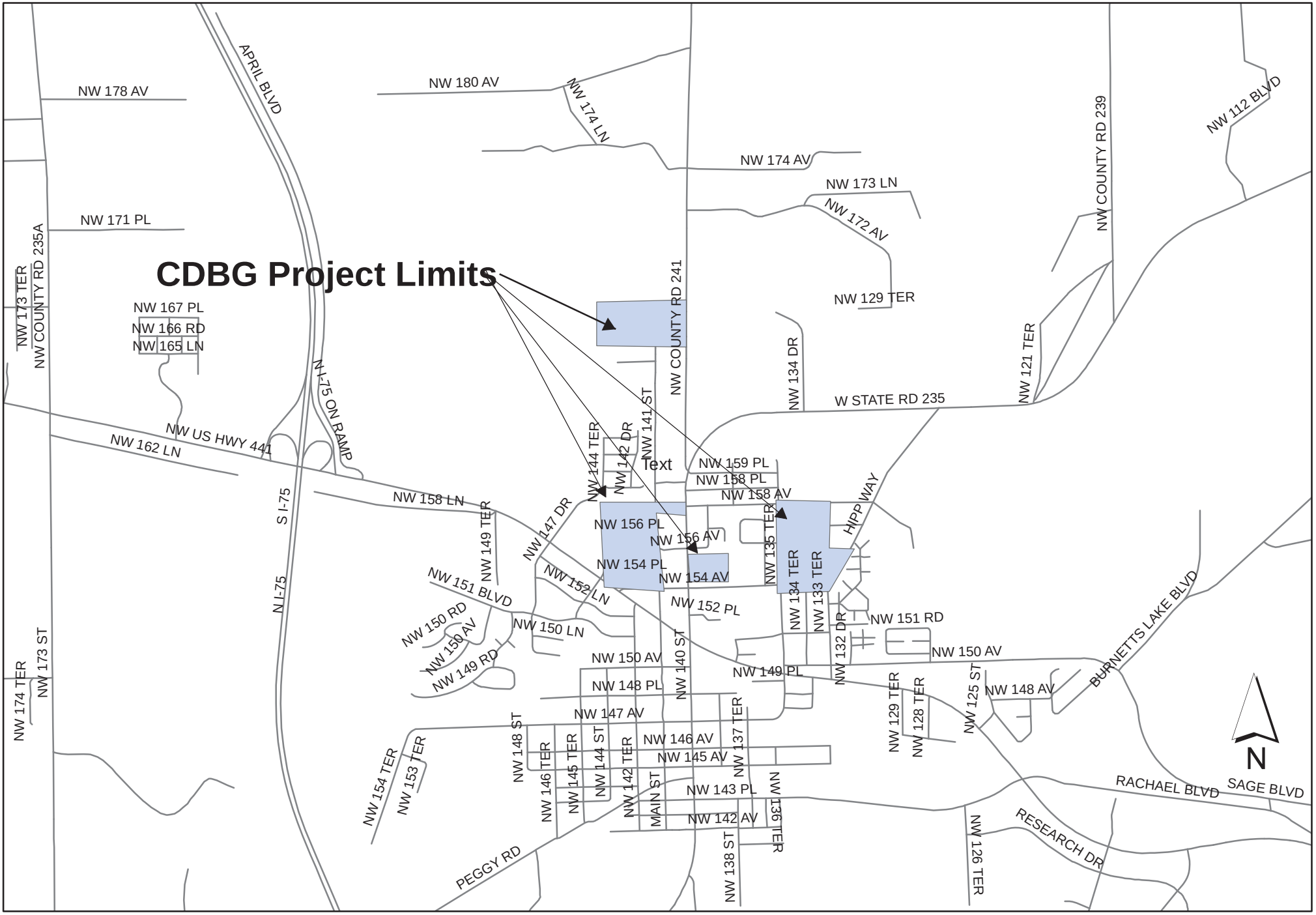
CR = Sidewalk Curb Ramp

DW = Detectable Warning Surface

DRW = Driveway

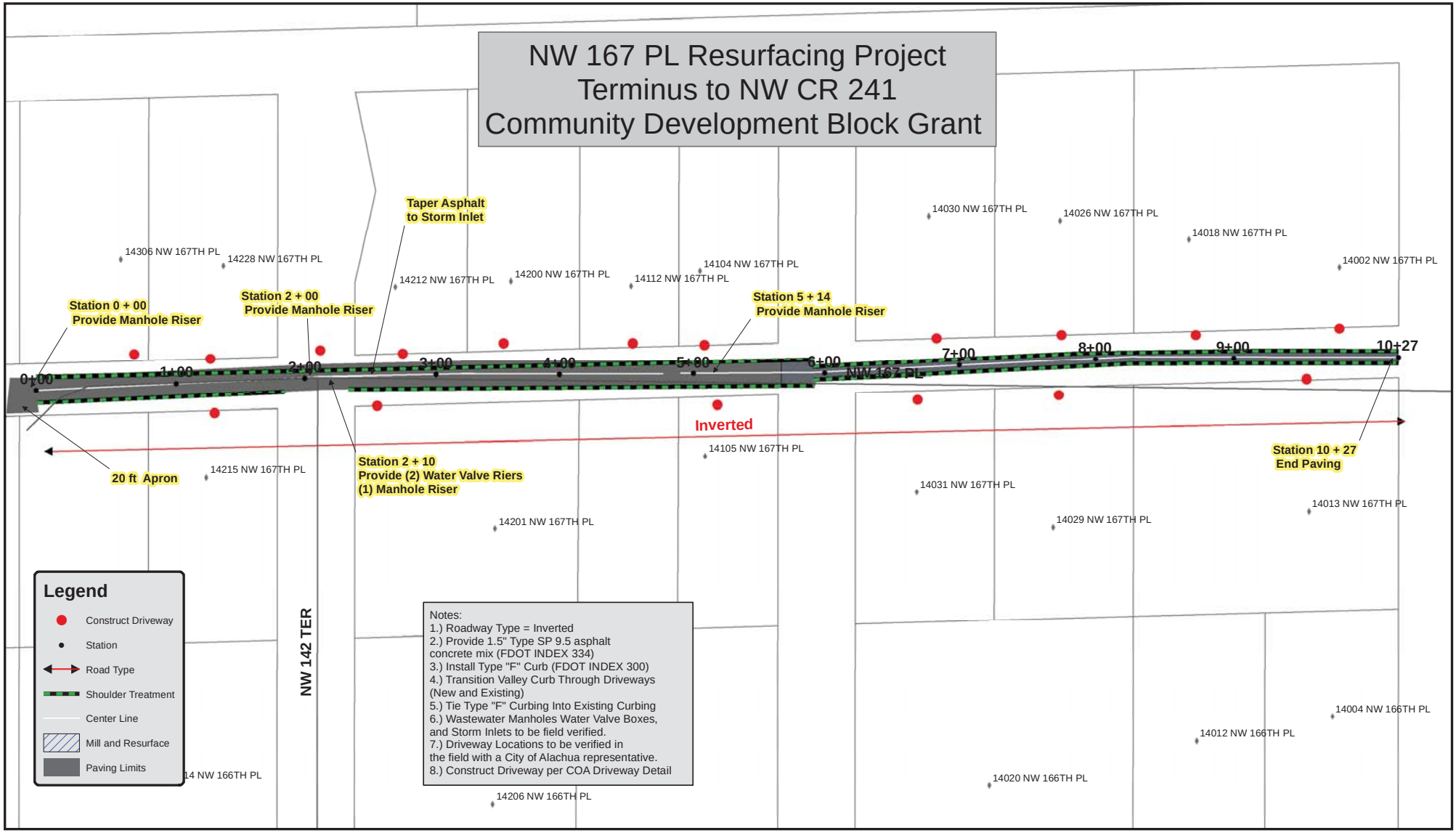
Contractor shall field verify all dementions.

Project Location Map



City of Alachua

NW 167 PL Resurfacing Project
Terminus to NW CR 241
Community Development Block Grant



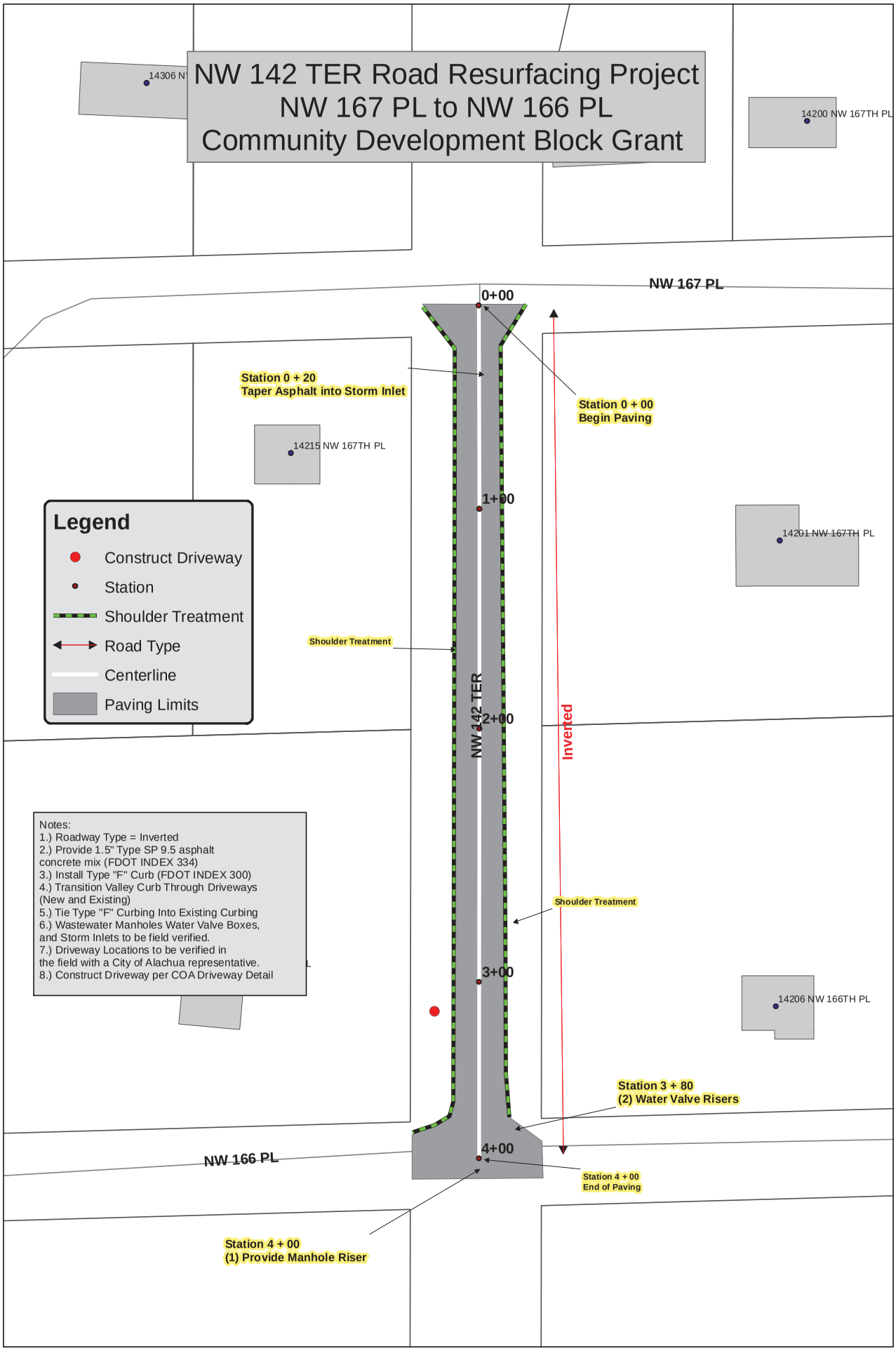
0 70 140 280 Feet

1 inch equals 70 feet

N
W E
S

Station 0 + 00 through 10 + 27
Street Segment Id (1)

NW 142 TER Road Resurfacing Project
NW 167 PL to NW 166 PL
Community Development Block Grant



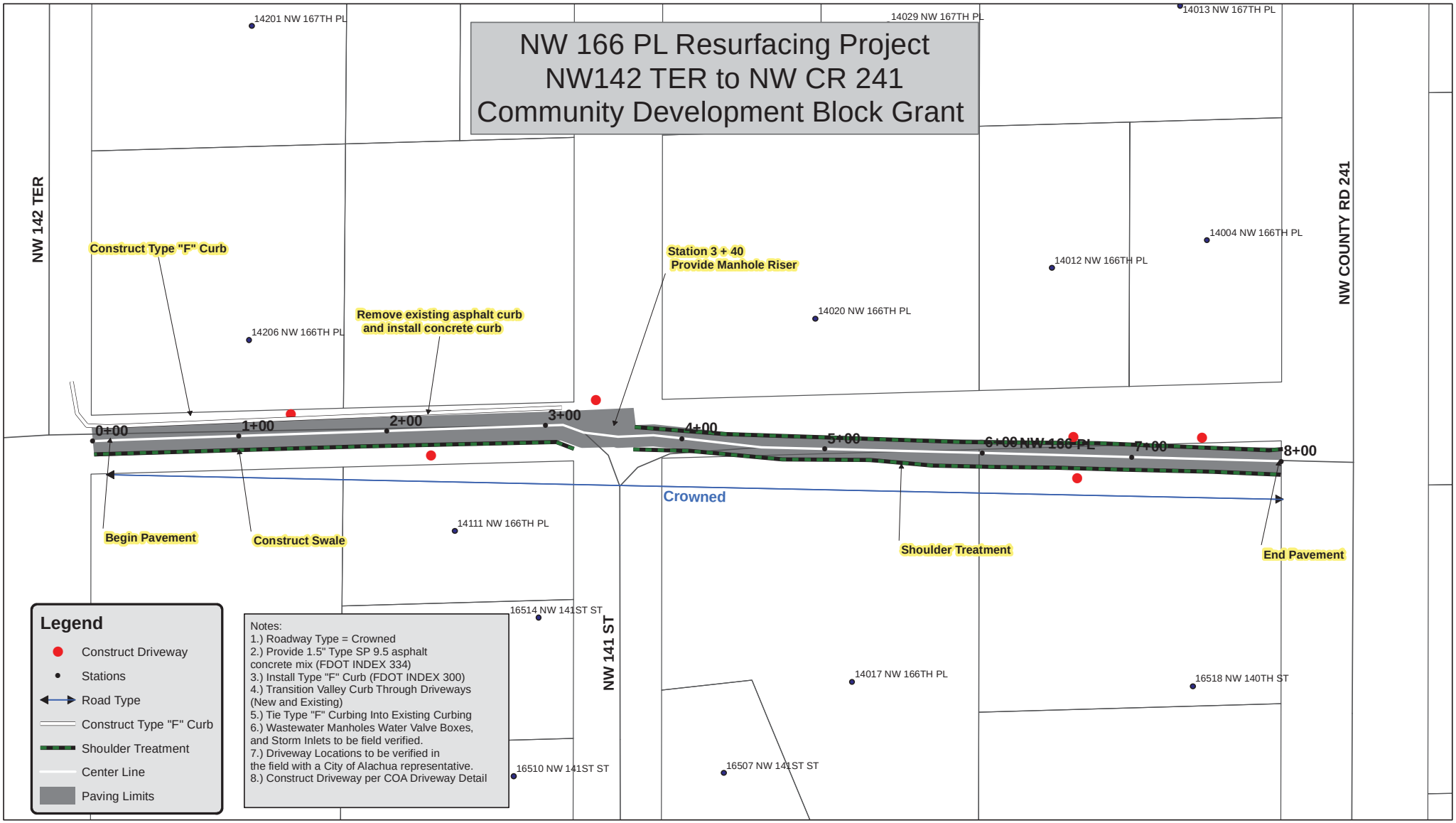
0 40 80 160 Feet

1 inch = 40 feet

Station 0 + 00 through 4 + 00
Street Segment Id (2)

N
W E
S

NW 166 PL Resurfacing Project
NW142 TER to NW CR 241
Community Development Block Grant



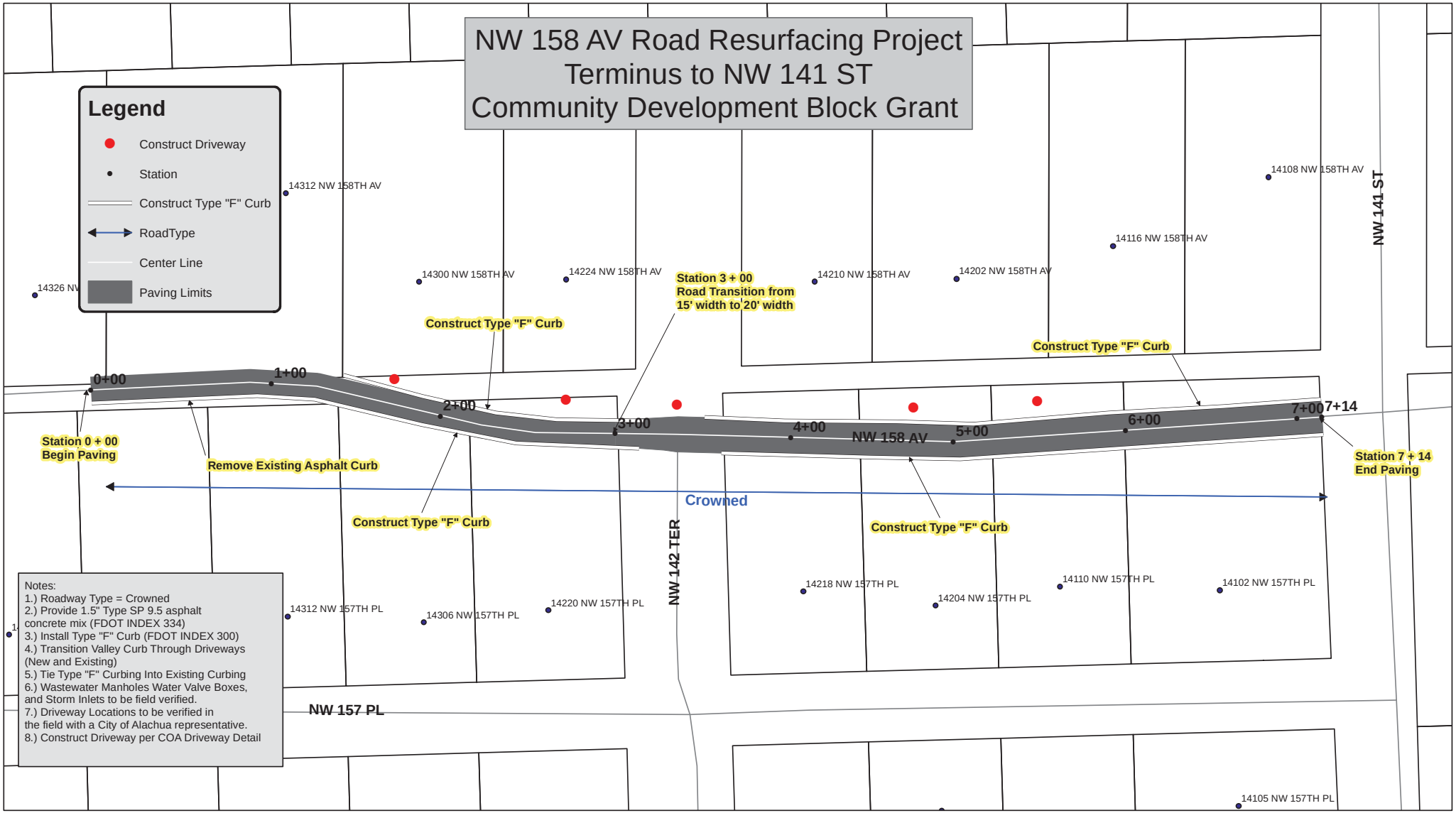
0 60 120 240 Feet

1 inch = 60 feet

N W E S

Station 0 + 00 through 8 +00
Street Segment Id (3)

NW 158 AV Road Resurfacing Project
Terminus to NW 141 ST
Community Development Block Grant



Notes:
1.) Roadway Type = Crowned
2.) Provide 1.5" Type SP 9.5 asphalt concrete mix (FDOT INDEX 334)
3.) Install Type "F" Curb (FDOT INDEX 300)
4.) Transition Valley Curb Through Driveways (New and Existing)
5.) Tie Type "F" Curbing Into Existing Curbing
6.) Wastewater Manholes Water Valve Boxes, and Storm Inlets to be field verified.
7.) Driveway Locations to be verified in the field with a City of Alachua representative.
8.) Construct Driveway per COA Driveway Detail

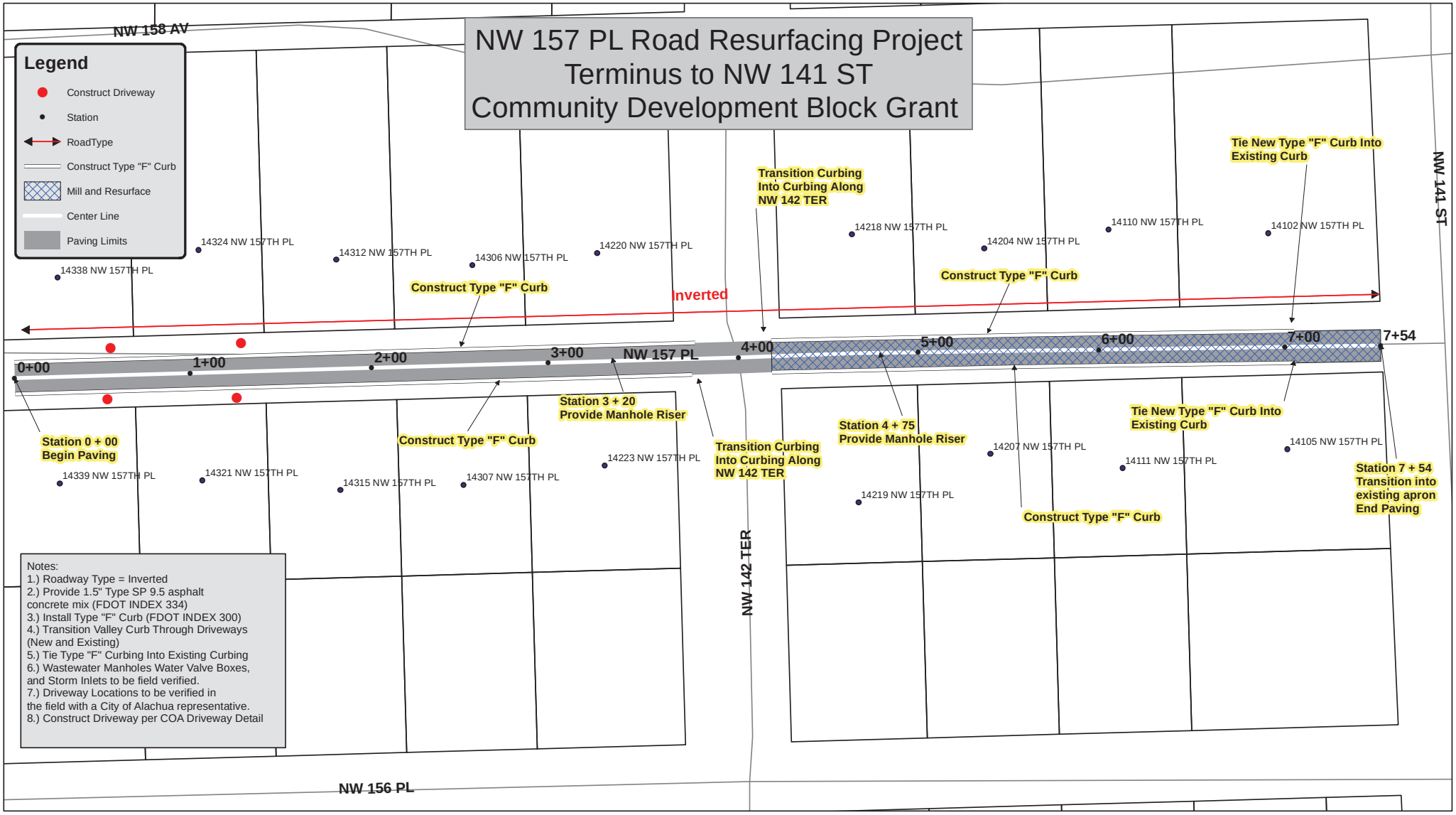
0 50 100 200 Feet

1 inch = 50 feet

Station 0 + 00 through 7 + 14
Street Segment Id (4)

N

NW 157 PL Road Resurfacing Project
Terminus to NW 141 ST
Community Development Block Grant



Notes:
1.) Roadway Type = Inverted
2.) Provide 1.5" Type SP 9.5 asphalt concrete mix (FDOT INDEX 334)
3.) Install Type "F" Curb (FDOT INDEX 300)
4.) Transition Valley Curb Through Driveways (New and Existing)
5.) Tie Type "F" Curbing Into Existing Curbing
6.) Wastewater Manholes Water Valve Boxes, and Storm Inlets to be field verified.
7.) Driveway Locations to be verified in the field with a City of Alachua representative.
8.) Construct Driveway per COA Driveway Detail

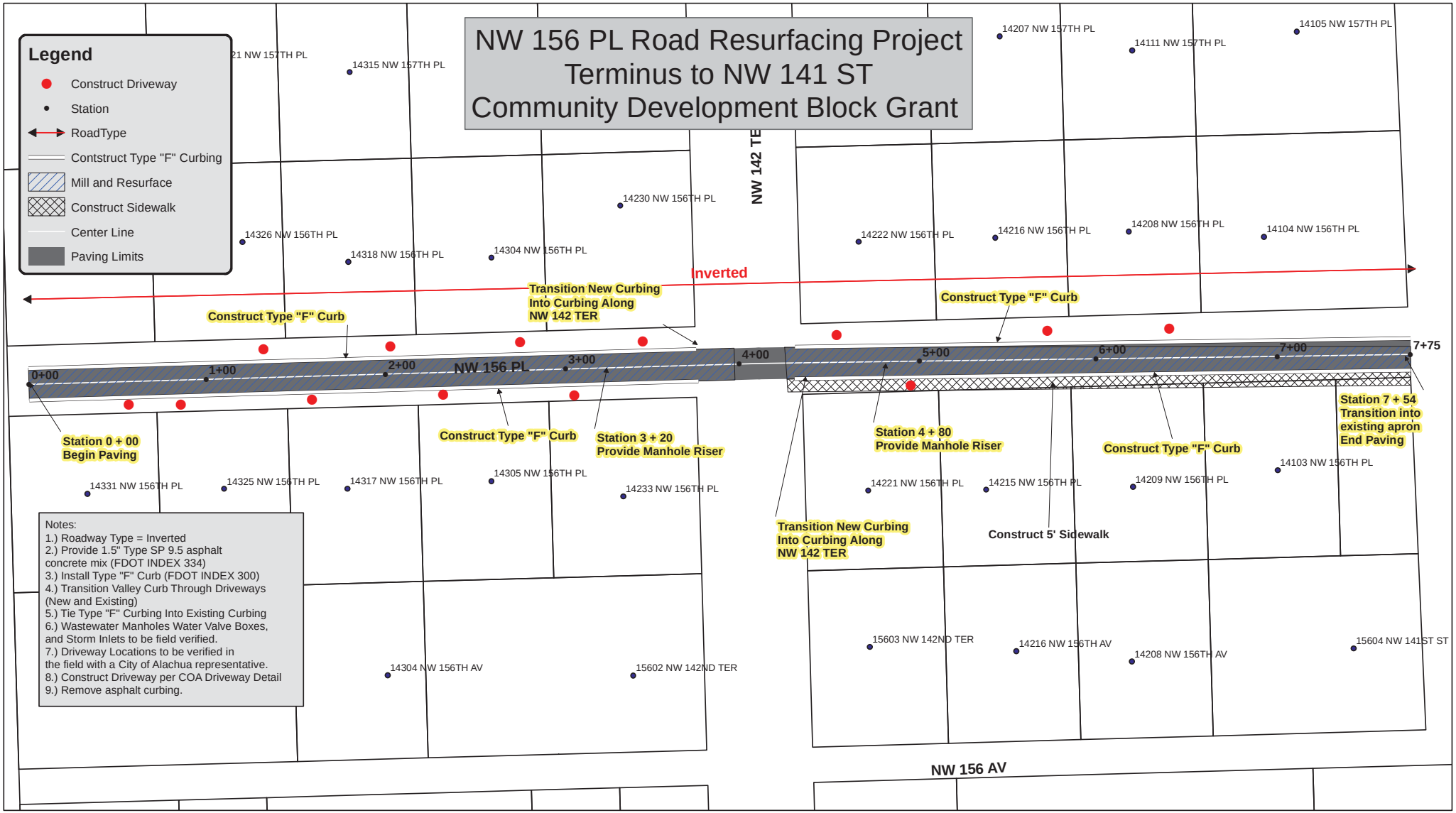
0 50 100 200 Feet

1 inch = 50 feet

Station 0 + 00 through 7 + 54
Street Segment Id (5)

N

NW 156 PL Road Resurfacing Project
Terminus to NW 141 ST
Community Development Block Grant



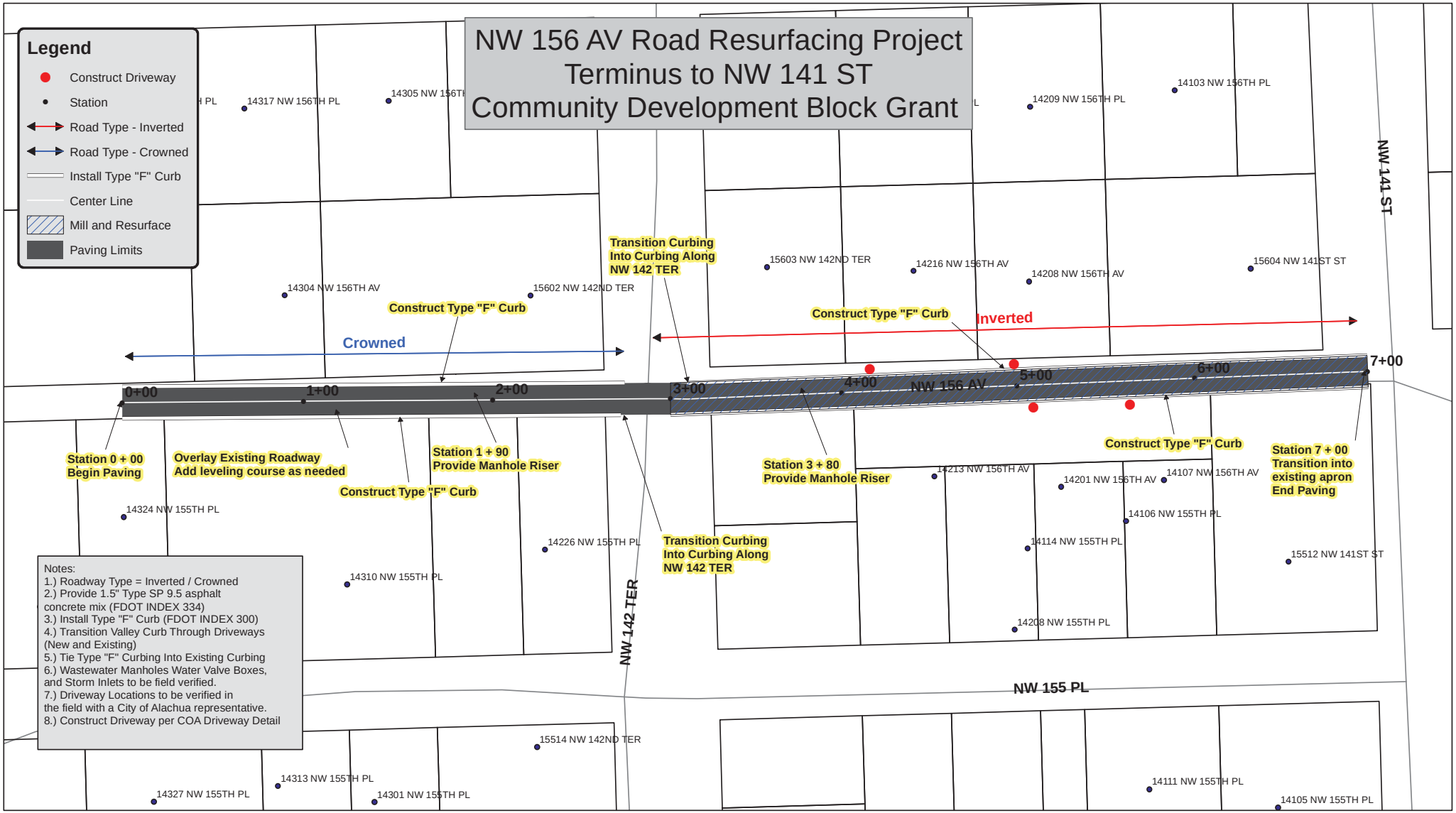
0 50 100 200 Feet

1 inch = 50 feet

Station 0 + 00 through 7 + 75
Street Segment Id (6)

N

NW 156 AV Road Resurfacing Project
Terminus to NW 141 ST
Community Development Block Grant



Notes:
1.) Roadway Type = Inverted / Crowned
2.) Provide 1.5" Type SP 9.5 asphalt concrete mix (FDOT INDEX 334)
3.) Install Type "F" Curb (FDOT INDEX 300)
4.) Transition Valley Curb Through Driveways (New and Existing)
5.) Tie Type "F" Curbing Into Existing Curbing
6.) Wastewater Manholes Water Valve Boxes, and Storm Inlets to be field verified.
7.) Driveway Locations to be verified in the field with a City of Alachua representative.
8.) Construct Driveway per COA Driveway Detail

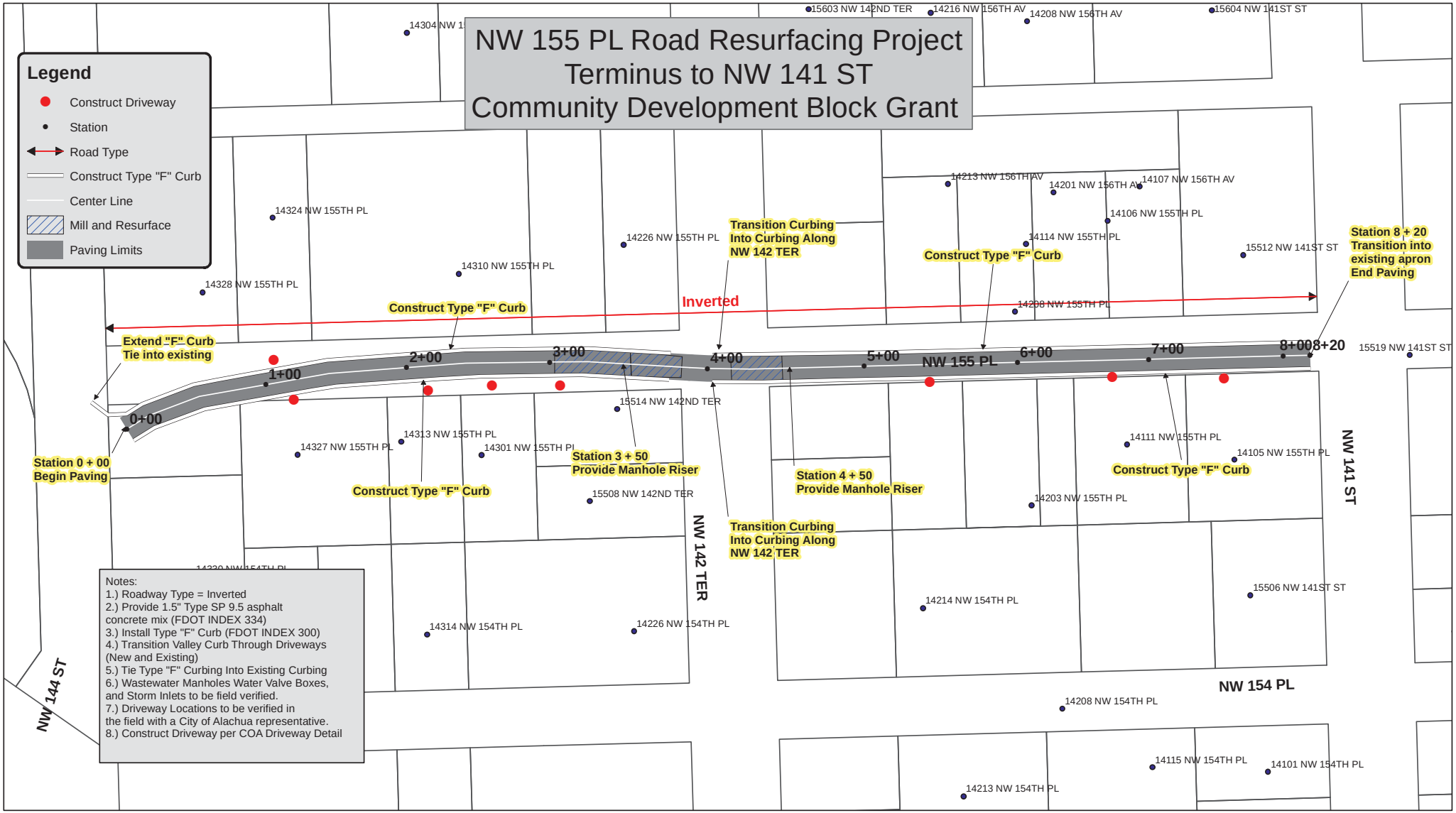
0 50 100 200 Feet

1 inch = 50 feet

Station 0 + 00 through 7 + 00
Street Segment Id (7)

N

NW 155 PL Road Resurfacing Project
Terminus to NW 141 ST
Community Development Block Grant



Notes:
1.) Roadway Type = Inverted
2.) Provide 1.5" Type SP 9.5 asphalt concrete mix (FDOT INDEX 334)
3.) Install Type "F" Curb (FDOT INDEX 300)
4.) Transition Valley Curb Through Driveways (New and Existing)
5.) Tie Type "F" Curbing Into Existing Curbing
6.) Wastewater Manholes Water Valve Boxes, and Storm Inlets to be field verified.
7.) Driveway Locations to be verified in the field with a City of Alachua representative.
8.) Construct Driveway per COA Driveway Detail

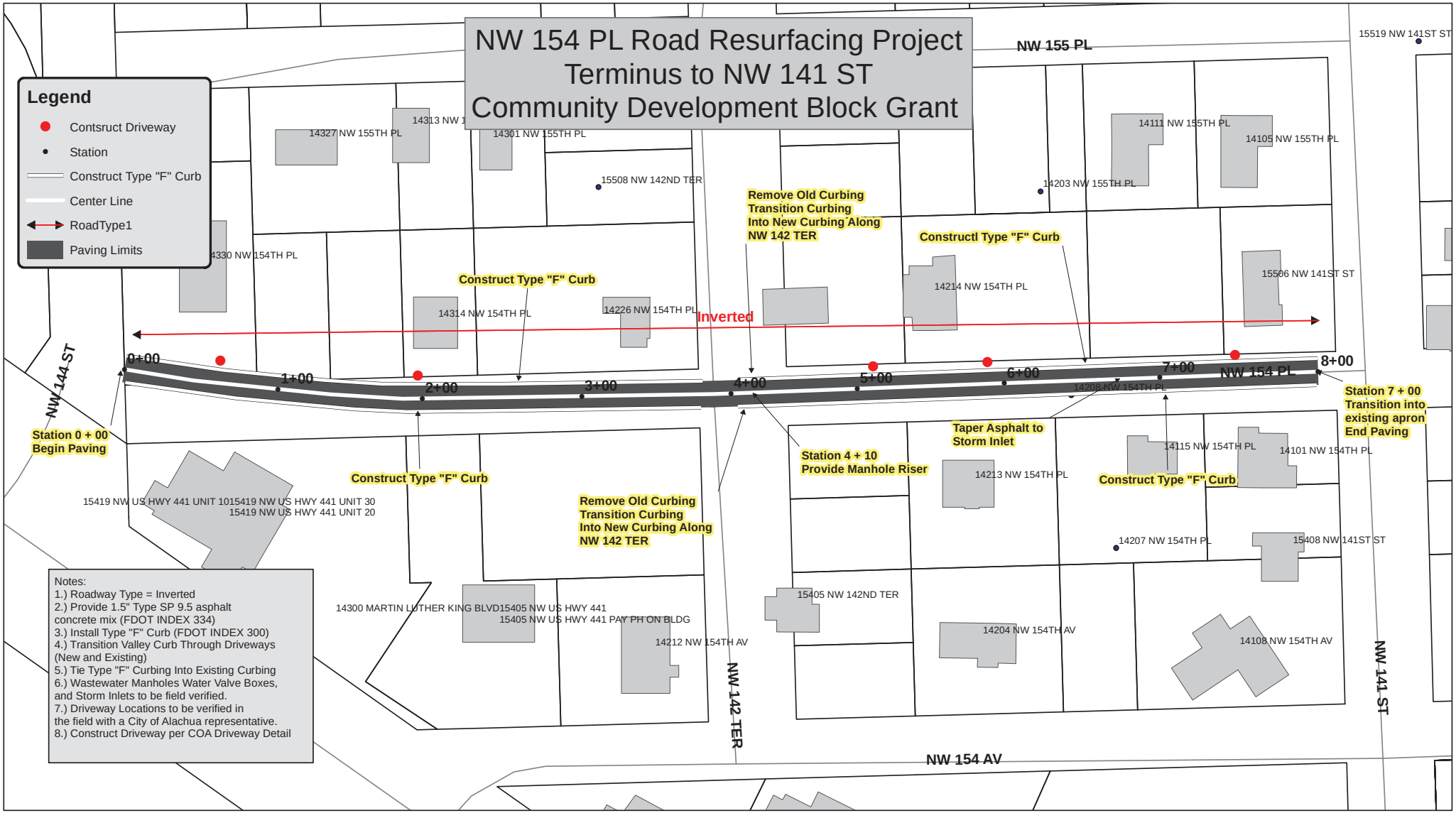
0 60 120 240 Feet

1 inch = 60 feet

Station 0 + 00 through 8 + 20
Street Segment Id (8)

N

NW 154 PL Road Resurfacing Project
Terminus to NW 141 ST
Community Development Block Grant



Notes:
1.) Roadway Type = Inverted
2.) Provide 1.5" Type SP 9.5 asphalt concrete mix (FDOT INDEX 334)
3.) Install Type "F" Curb (FDOT INDEX 300)
4.) Transition Valley Curb Through Driveways (New and Existing)
5.) Tie Type "F" Curbing Into Existing Curbing
6.) Wastewater Manholes Water Valve Boxes, and Storm Inlets to be field verified.
7.) Driveway Locations to be verified in the field with a City of Alachua representative.
8.) Construct Driveway per COA Driveway Detail

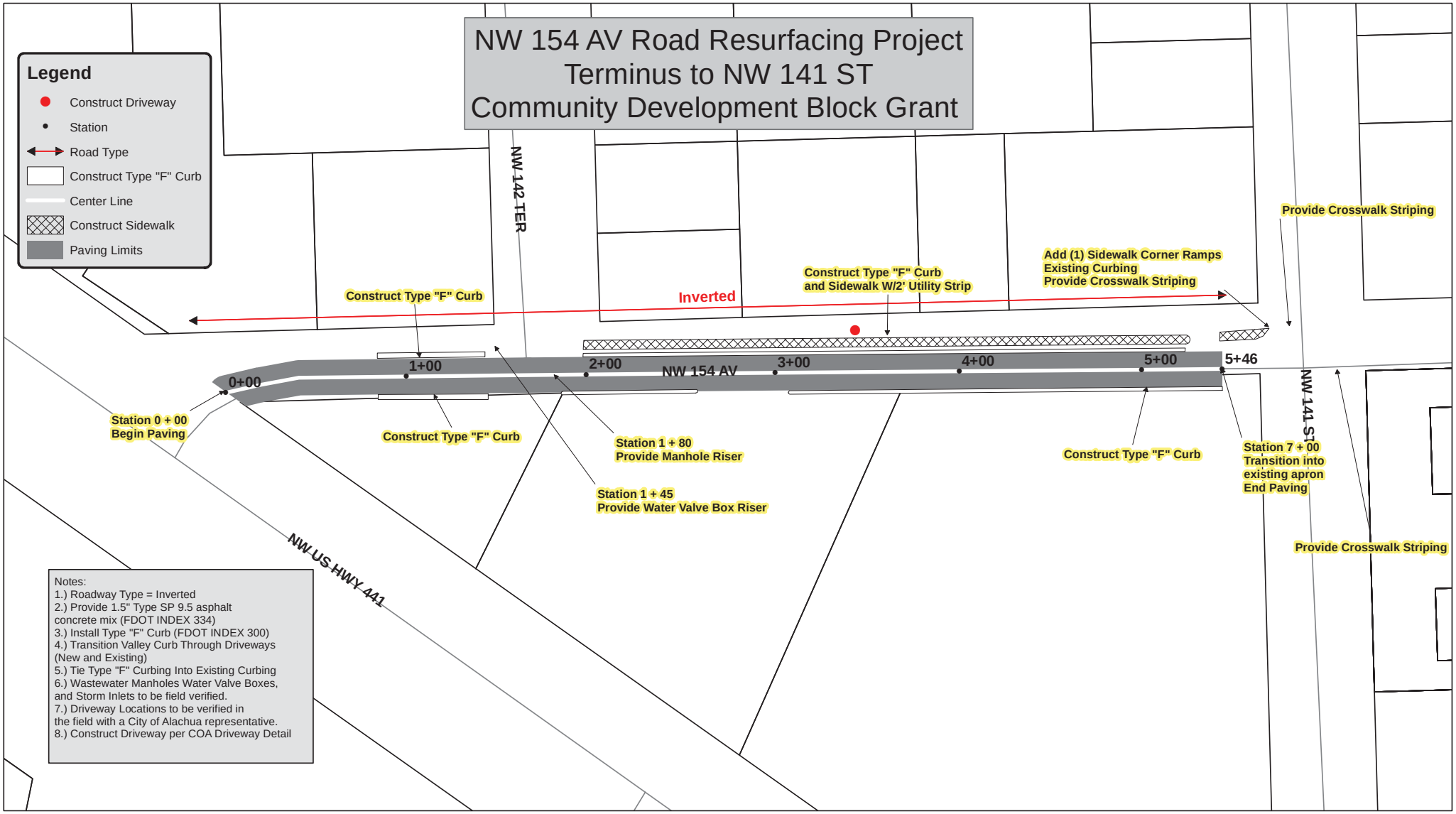
0 60 120 240 Feet

1 inch = 60 feet

Station 0 + 00 through 8 + 00 Street Segment Id (9)

N

NW 154 AV Road Resurfacing Project
Terminus to NW 141 ST
Community Development Block Grant



Notes:
1.) Roadway Type = Inverted
2.) Provide 1.5" Type SP 9.5 asphalt concrete mix (FDOT INDEX 334)
3.) Install Type "F" Curb (FDOT INDEX 300)
4.) Transition Valley Curb Through Driveways (New and Existing)
5.) Tie Type "F" Curbing Into Existing Curbing
6.) Wastewater Manholes Water Valve Boxes, and Storm Inlets to be field verified.
7.) Driveway Locations to be verified in the field with a City of Alachua representative.
8.) Construct Driveway per COA Driveway Detail

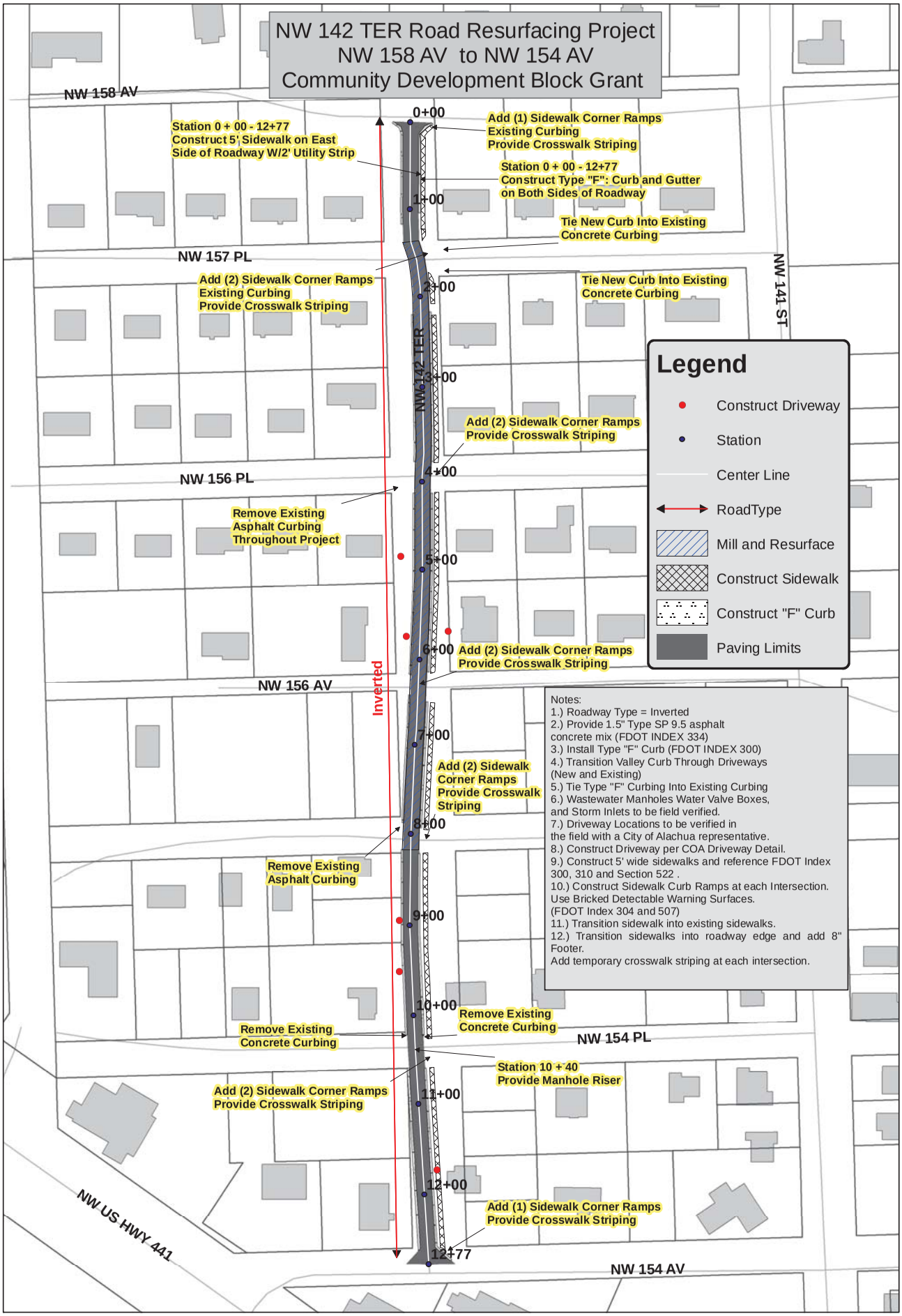
0 50 100 200 Feet

1 inch = 50 feet

Station 0 + 00 through 5 + 46
Street Segment Id (10)

N

NW 142 TER Road Resurfacing Project
NW 158 AV to NW 154 AV
Community Development Block Grant



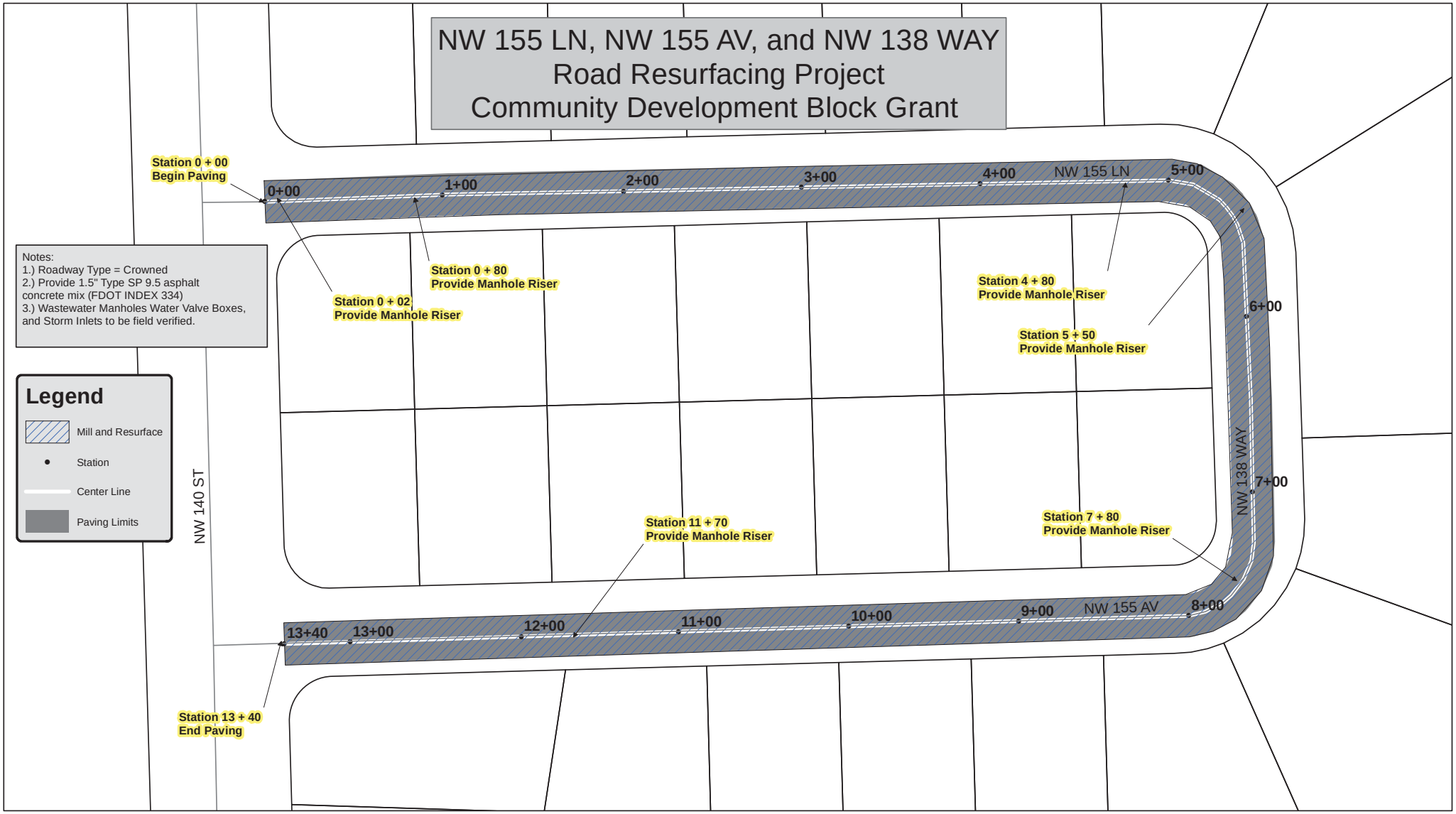
0 95 190 380 Feet

1 inch = 96 feet

Station 0 + 00 through 12 + 77
Street Segment Id (11)

N

NW 155 LN, NW 155 AV, and NW 138 WAY
Road Resurfacing Project
Community Development Block Grant



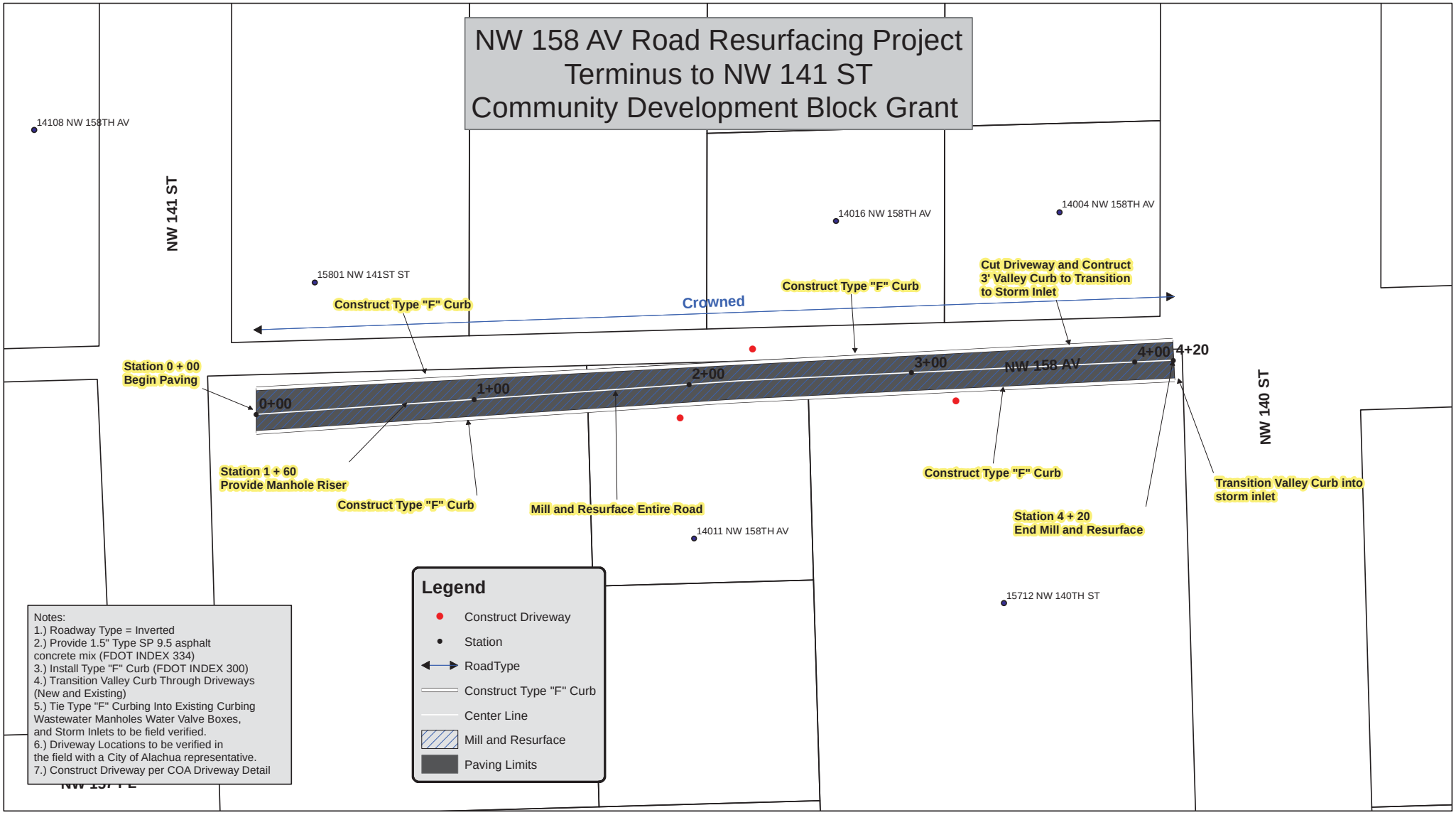
0 50 100 200 Feet

1 inch = 50 feet

Station 0 + 00 through 4 + 00
Street Segment Id (12,13, and 14)

N

NW 158 AV Road Resurfacing Project
Terminus to NW 141 ST
Community Development Block Grant



Notes:
1.) Roadway Type = Inverted
2.) Provide 1.5" Type SP 9.5 asphalt concrete mix (FDOT INDEX 334)
3.) Install Type "F" Curb (FDOT INDEX 300)
4.) Transition Valley Curb Through Driveways (New and Existing)
5.) Tie Type "F" Curbing Into Existing Curbing Wastewater Manholes Water Valve Boxes, and Storm Inlets to be field verified.
6.) Driveway Locations to be verified in the field with a City of Alachua representative.
7.) Construct Driveway per COA Driveway Detail

0 40 80 160 Feet

1 inch = 40 feet

Station 0 + 00 through 4 + 20
Street Segment Id (15)

N

Notes:
1.) ALL CONSTRUCTION MATERIALS AND METHODS FOR POTABLE WATER, WASTEWATER, AND RECLAIMED WATER SYSTEMS SHALL BE IN CONFORMANCE WITH CITY'S DESIGN & CONSTRUCTION STANDARDS, LATEST EDITION.

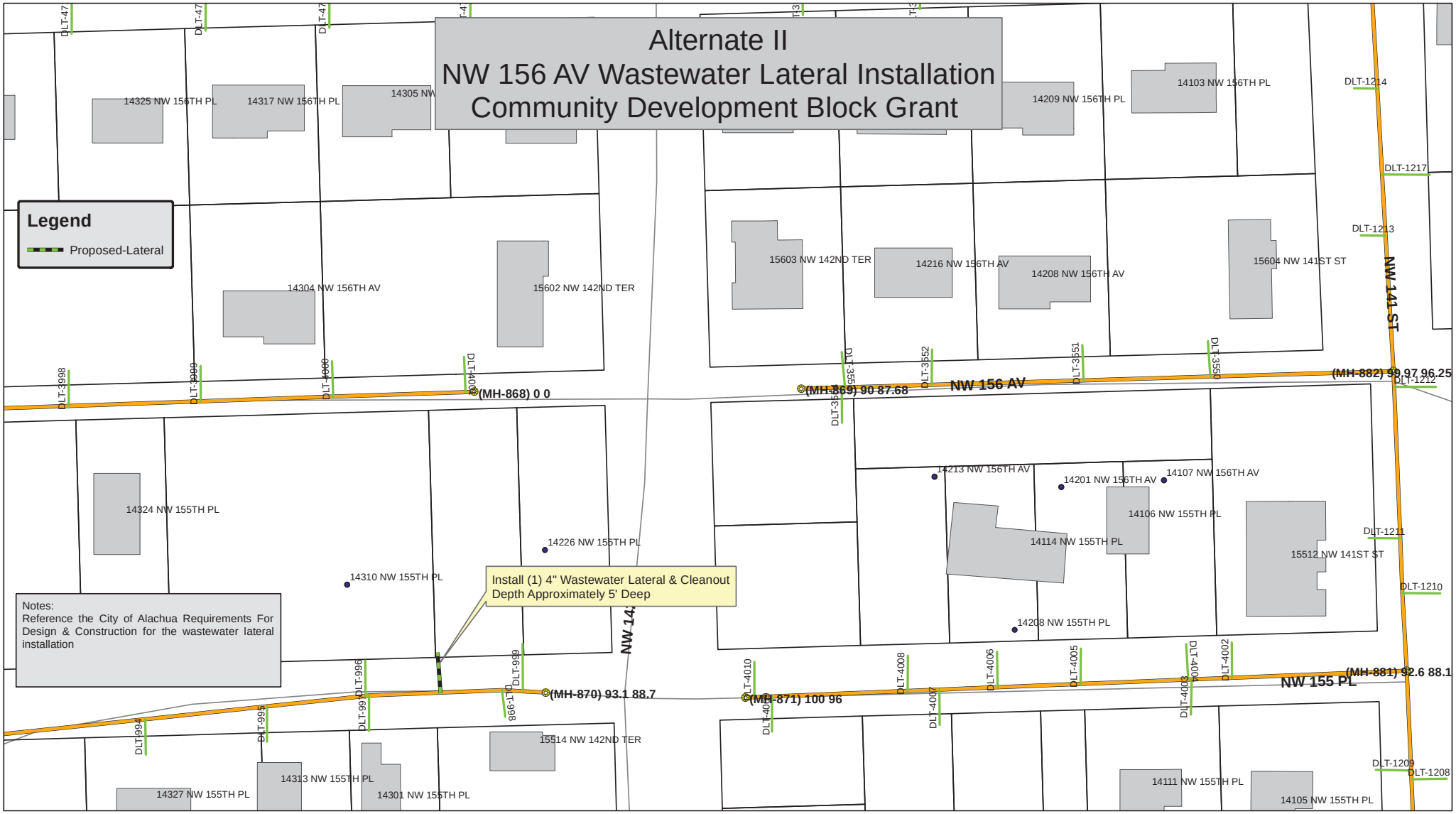
0 75 150 300 Feet

1 inch = 75 feet

Station 0 + 00 through 7 + 14
Street Segment Id (4)

N

Alternate II
NW 156 AV Wastewater Lateral Installation
Community Development Block Grant



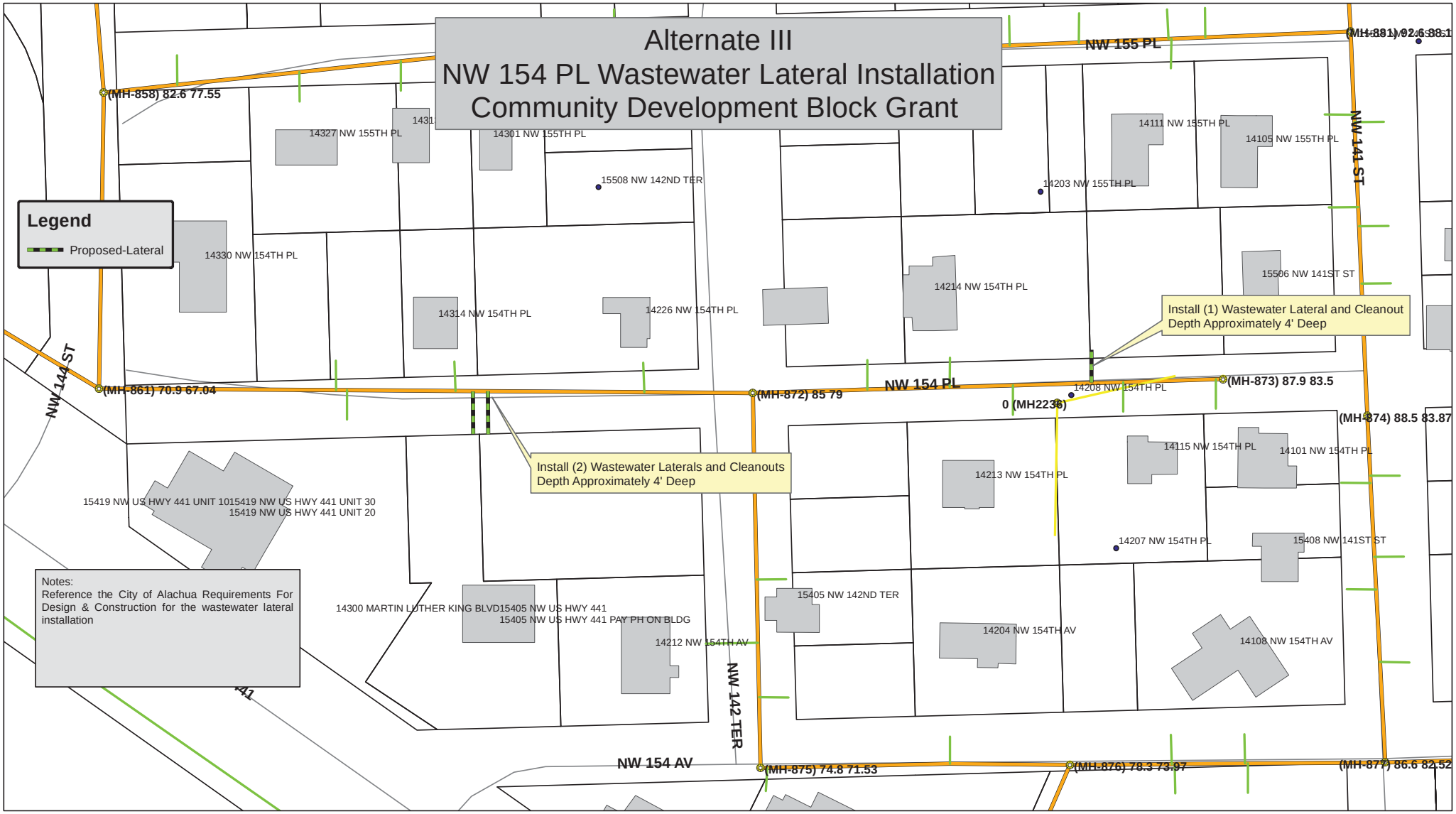
0 50 100 200 Feet

1 inch = 50 feet

Station 0 + 00 through 7 + 00
Street Segment Id (7)

N

Alternate III
NW 154 PL Wastewater Lateral Installation
Community Development Block Grant



Notes:
Reference the City of Alachua Requirements For Design & Construction for the wastewater lateral installation

0 60 120 240 Feet

1 inch = 60 feet

Station 0 + 00 through 8 + 00
Street Segment Id (9)

N

General Notes:

1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE VARIOUS UTILITIES AND TO MAKE NECESSARY ARRANGEMENTS FOR ANY RELOCATION OF UTILITIES WITH THE OWNER OF THE UTILITY. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN CROSSING ANY UNDERGROUND UTILITY LOCATED BY THE UTILITY COMPANY. THE RESPECTIVE UTILITY COMPANIES SHALL RELOCATE ALL UTILITIES THAT INTERFERE WITH THE PROPOSED CONSTRUCTION. THE CONTRACTOR SHALL COOPERATE WITH THE UTILITY COMPANIES DURING THE RELOCATION OPERATIONS. ANY DELAY OR INCONVENIENCE CAUSED TO THE CONTRACTOR BY THE VARIOUS UTILITIES SHALL BE INCIDENTAL TO THE CONTRACT AND NO EXTRA COMPENSATION WILL BE ALLOWED.

2. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO EXISTING FACILITIES, ABOVE OR BELOW GROUND THAT MAY OCCUR AS A RESULT OF THE WORK PERFORMED BY THE CONTRACTOR.

3. REPAIR AND REPLACEMENT OF ALL PRIVATE AND PUBLIC PROPERTY AFFECTED BY THIS WORK SHALL BE RESTORED TO A CONDITION EQUAL TO OR BETTER THAN EXISTING CONDITIONS BEFORE COMMENCING CONSTRUCTION WORK, UNLESS SPECIFICALLY EXEMPTED BY THE PLANS. ADDITIONAL COSTS ARE INCIDENTAL TO OTHER CONSTRUCTION AND NO EXTRA COMPENSATION WILL BE ALLOWED.

4. ALL WORK PERFORMED SHALL COMPLY WITH THE REGULATIONS AND ORDINANCES OF THE VARIOUS GOVERNMENTAL AGENCIES HAVING URISDICTION OVER THE WORK INCLUDING LANDSCAPING.

5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BECOME FAMILIAR WITH THE INSPECTION REQUIREMENTS OF THE CITY OF ALACHUA. THE CONTRACTOR SHALL SCHEDULE INSPECTIONS ACCORDING TO AGENCY AND/OR MUNICIPALITY INSTRUCTIONS.

6. CONTRACTOR SHALL CLEAR AND GRUB ONLY THOSE PORTIONS OF THE SITE NECESSARY FOR CONSTRUCTION. DISTURBED AREAS SHALL BE SODDED, SEEDED, MULCHED, OR PLANTED WITH OTHER APPROVED LANDSCAPE MATERIAL, AS DIRECTED BY THESE PLANS, IMMEDIATELY FOLLOWING CONSTRUCTION PER LOCAL INSPECTOR.

7. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO COMPLY WITH AND ENFORCE ALL APPLICABLE SAFETY REGULATIONS.

8. THE GOVERNING STANDARDS AND SPECIFICATIONS, UNLESS STATED OTHERWISE SHALL BE PER FLORIDA DEPARTMENT OF TRANSPORTATION DESIGN STANDARDS DATED 2015, AND STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION DATED 2015, AS AMENDED BY CONTRACT DOCUMENTS. ALL MATERIALS AND METHODS SHALL MEET FDOT SPECIFICATIONS AND SHALL BE PRODUCED OR OBTAINED FROM AN FDOT APPROVED SOURCE.

9. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING PROPER BENCHMARKS ON-SITE. EXISTING BENCH MARKS SCHEDULED FOR REMOVAL SHALL BE RELOCATED AT CONTRACTORS EXPENSE AND RE-ESTABLISHED BY A LICENSED SURVEYOR.

10. ANY CHANGE ORDER REQUESTS, SITE REVISIONS, AND PAY REQUESTS MUST BE SUBMITTED TO AND APPROVED BY THE ENGINEER OF RECORD.

11. CONTRACTOR SHALL WORK AROUND EXISTING TREES AND LIMIT ROOT SYSTEM DAMAGE WHERE POSSIBLE. ALL FENCES AND OTHER MPROVEMENTS REMOVED DURING CONSTRUCTION SHALL BE RESTORED TO EXISTING OR BETTER THAN EXISTING CONDITIONS UPON COMPLETION OF CONSTRUCTION. THIS INCLUDES SODDING OF DISTURBED AREAS.

12. CONTRACTOR IS TO SUBMIT FDOT APPROVED ASPHALT DESIGN MIXES TO THE OWNER'S REPRESENTATIVE AND ENGINEER OF RECORD BEFORE ANY WORK IS TO COMMENCE ON PROJECT. THE MIXTURE AT THE PLANT OR ON THE ROAD SHALL NOT EXCEED 335 DEGREES. THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE AND PROVIDE TEMPERATURE READINGS PRIOR TO LAYING ASPHALT.

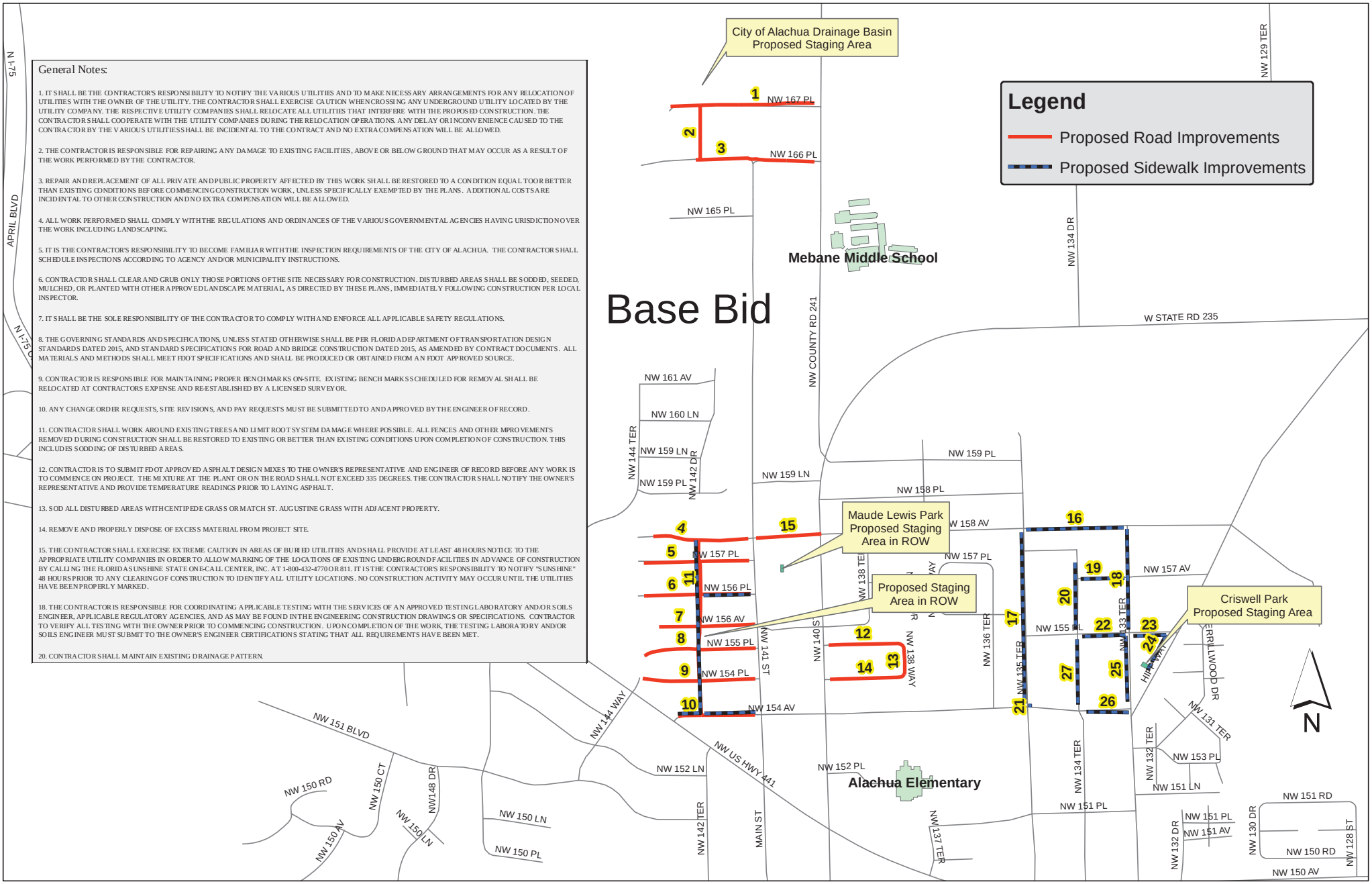
13. SOD ALL DISTURBED AREAS WITH CENTIPEDE GRASS OR MATCH ST. AUGUSTINE GRASS WITH ADJACENT PROPERTY.

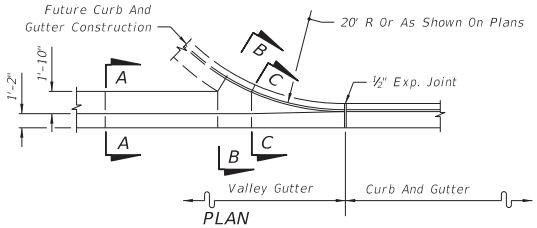
14. REMOVE AND PROPERLY DISPOSE OF EXCESS MATERIAL FROM PROJECT SITE.

15. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION IN AREAS OF BURIED UTILITIES AND SHALL PROVIDE AT LEAST 48 HOURS NOTICE TO THE APPROPRIATE UTILITY COMPANIES IN ORDER TO ALLOW MARKING OF THE LOCATIONS OF EXISTING UNDERGROUND FACILITIES IN ADVANCE OF CONSTRUCTION BY CALLING THE FLORIDA SUNSHINE STATE ONE-CALL CENTER, INC. AT 1-800-432-4770 OR 811. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY "SUNSHINE" 48 HOURS PRIOR TO ANY CLEARING OF CONSTRUCTION TO IDENTIFY ALL UTILITY LOCATIONS. NO CONSTRUCTION ACTIVITY MAY OCCUR UNTIL THE UTILITIES HAVE BEEN PROPERLY MARKED.

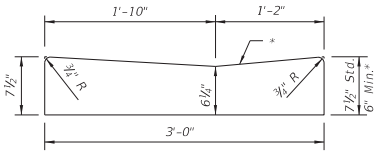
18. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING APPLICABLE TESTING WITH THE SERVICES OF AN APPROVED TESTING LABORATORY AND/OR SOILS ENGINEER, APPLICABLE REGULATORY AGENCIES, AND AS MAY BE FOUND IN THE ENGINEERING CONSTRUCTION DRAWINGS OR SPECIFICATIONS. CONTRACTOR TO VERIFY ALL TESTING WITH THE OWNER PRIOR TO COMMENCING CONSTRUCTION. UPON COMPLETION OF THE WORK, THE TESTING LABORATORY AND/OR SOILS ENGINEER MUST SUBMIT TO THE OWNER'S ENGINEER CERTIFICATIONS STATING THAT ALL REQUIREMENTS HAVE BEEN MET.

20. CONTRACTOR SHALL MAINTAIN EXISTING DRAINAGE PATTERN.

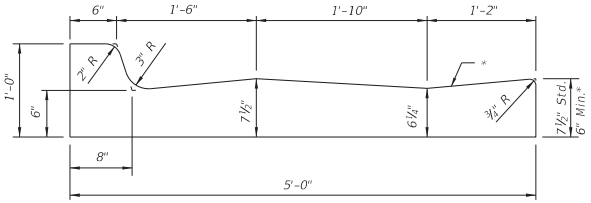




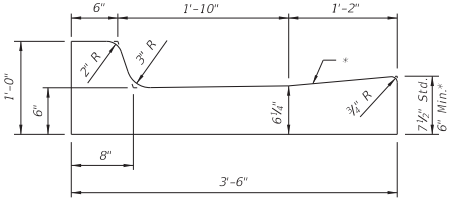
PLAN



SECTION AA



SECTION BB



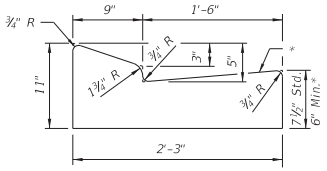
SECTION CC

VALLEY GUTTER

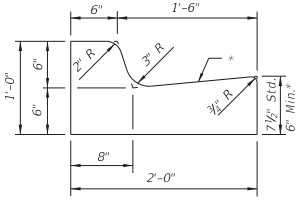
* When used on high side of roadways, the cross slope of the gutter shall match the cross slope of the adjacent pavement. The thickness of the lip shall be 6", unless otherwise shown on plans.

◪ Rotate entire section so that gutter cross slope matches slope of adjacent circulating roadway pavement.

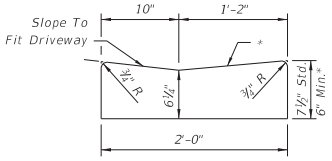
For use adjacent to concrete or flexible pavement. For details depicting usage adjacent to flexible pavement, see Sheet 2. Expansion joint, preformed joint filler and joint seal are required between curb & gutter and concrete pavement only, see Sheet 2.



TYPE E

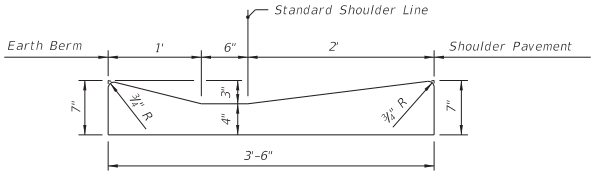


TYPE F

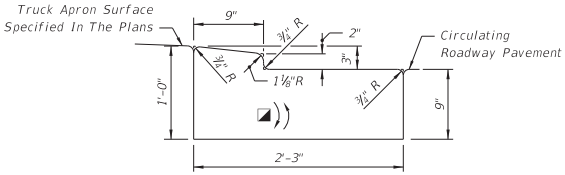


Note: To be paid for as parent curb.

DROP CURB

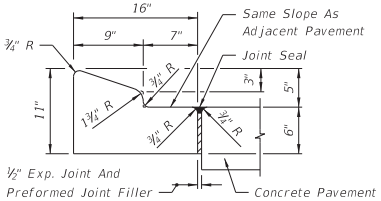


SHOULDER GUTTER



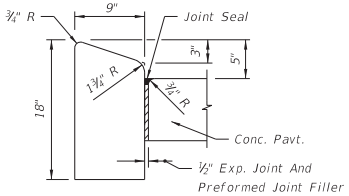
TRAFFIC BEARING SECTION FOR USE IN ROUNDABOUT CENTRAL ISLAND CONSTRUCTION

TYPE RA

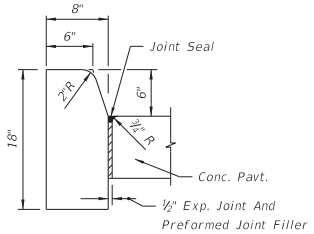


For details depicting usage adjacent to flexible pavement, see diagram right.

TYPE A



TYPE B



TYPE D

Note: For use adjacent to concrete or flexible pavement, concrete shown. Expansion joint, preformed joint filler and joint seal are required between curbs and concrete pavement only, see Sheet 2.

CONCRETE CURB

CONCRETE CURB AND GUTTER

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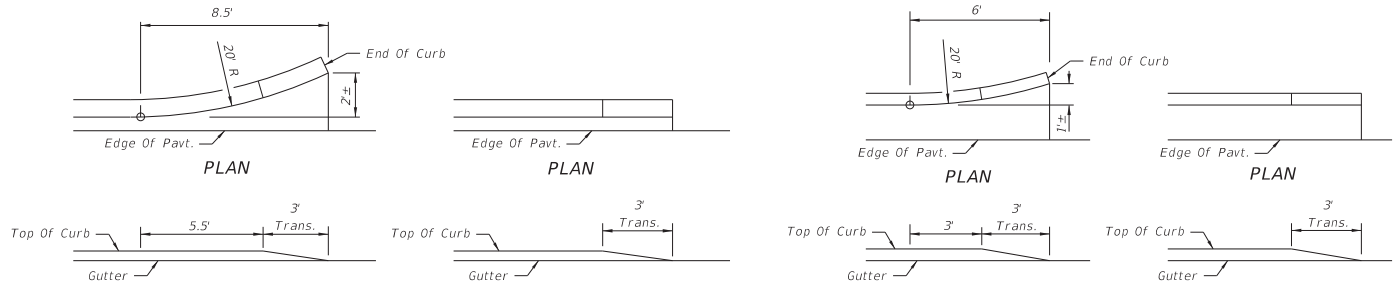
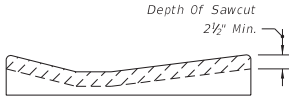
LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
00			FDOT DESIGN STANDARDS FY 2012/2013	CURB & CURB AND GUTTER	300	1



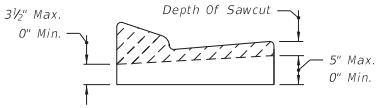
CURB TYPE A

CURB AND GUTTER TYPES E & F

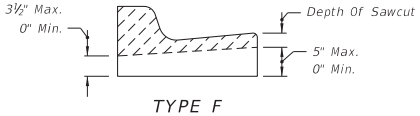
CURB AND GUTTER ENDINGS



SHOULDER GUTTER



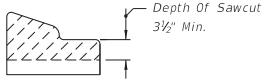
TYPE E



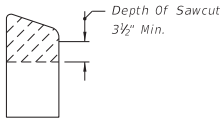
TYPE F

Sawcuts should be avoided within valley gutter and within curb and gutter endings.

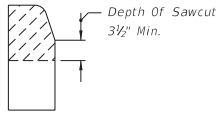
CONTRACTION JOINT IN CURB AND GUTTER



TYPE A

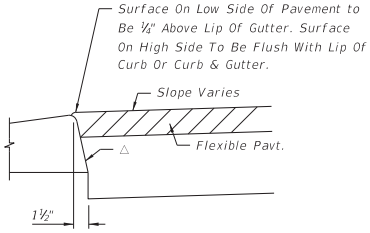


TYPE B



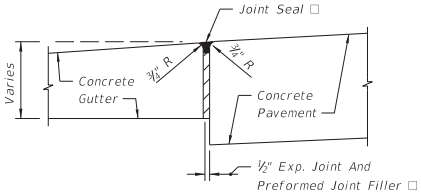
TYPE D

CONTRACTION JOINT IN CURB



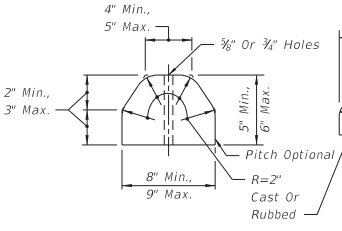
△ Applies to both high and low sides of pavement, low side shown.
Applies to shoulder gutter only where adjoining traffic lanes.

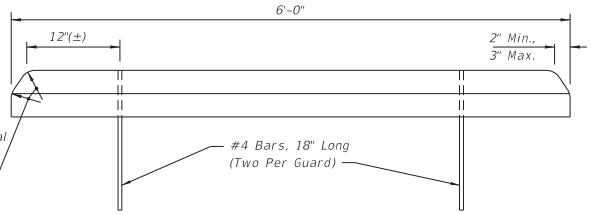
CURB AND GUTTER AND TYPE A CURB ADJACENT TO FLEXIBLE PAVEMENT



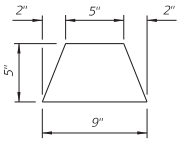
□ Applies to both high and low sides of pavement, low side shown.

EXPANSION JOINT BETWEEN GUTTER AND CONCRETE PAVEMENT





CONCRETE BUMPER GUARD



ASPHALTIC CONCRETE CURB

GENERAL NOTES

1. For curb, gutter and curb & gutter provide ⅛" – ¼" contraction joints at 10' centers (max.). Contraction joints adjacent to concrete pavement on tangents and flat curves are to match the pavement joints, with intermediate joints not to exceed 10' centers. Curb, gutter and curb & gutter expansion joints shall be located in accordance with Section 520 of the Standard Specifications.

2. Ends of Curbs Types B and D shall transition from full to zero heights in 3'.

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LAST REVISION	REVISION	DESCRIPTION:				INDEX NO.	SHEET NO.
00			STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	FDOT DESIGN STANDARDS FY 2012/2013	CURB & CURB AND GUTTER	300	2

TURN LANES • CURBED AND UNCURBED MEDIANS

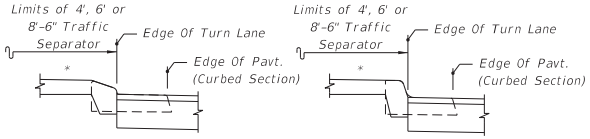
Design Speed (mph)	Entry Speed (mph)	Clearance Distance L_1	URBAN CONDITIONS Brake To Stop Distance L_2	Total Decel. Distance L	Clearance Distance L_3	RURAL CONDITIONS Brake To Stop Distance L_2	Total Decel. Distance L	Clearance Distance L_3
35	25	70'	75'	145'	110'	——	——	——
40	30	80'	75'	155'	120'	——	——	——
45	35	85'	100'	185'	135'	——	——	——
50	40/44	105'	135'	240'	160'	185'	290'	160'
55	48	125'	——	——	——	225'	350'	195'
60	52	145'	——	——	——	260'	405'	230'
65	55	170'	——	——	——	290'	460'	270'

DESIGN NOTES

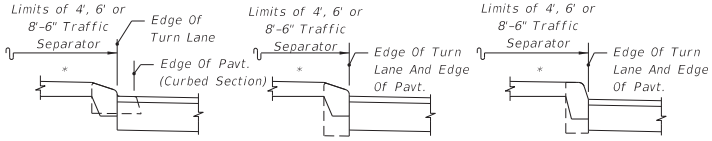
1. Basis for turn lane configurations:
   - Informed Driver.
   - Stop condition (With Or Without Stop Control).
   - Wet Pavement.
   - Reaction preceding entry point.
   - Minimum braking distance for urban conditions.
   - 75' min. for L_2.
   - Comfortable deceleration rates for rural conditions (AASHTO 2001 threshold rate of 11.2 ft./s²).

GENERAL NOTES

1. The plan views shown are for turn lane taper shapes and dimensional purposes only, they do not prescribe the use of curb, curb and gutter, shoulders nor separators specifically to either rural or urban conditions.
2. Total deceleration distances must not be reduced except where lesser values are imposed by unrelocatable control points.
3. Right turn lane tapers and distances identical to left turn lanes under stop control conditions. Right turn lane tapers and/or distances are site specific under free flow or yield conditions.
4. These left turn configurations apply to continuous left turn lanes only where specifically called for in the plans.
5. For pavement markings see Index No. 17346.



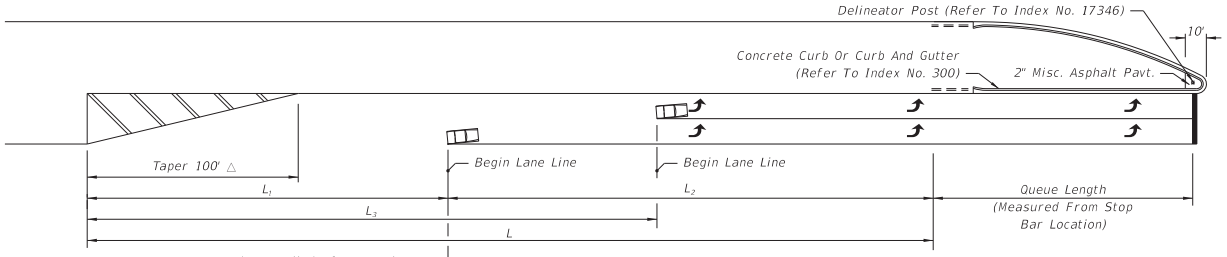
TYPE E — CURB AND GUTTER — TYPE F



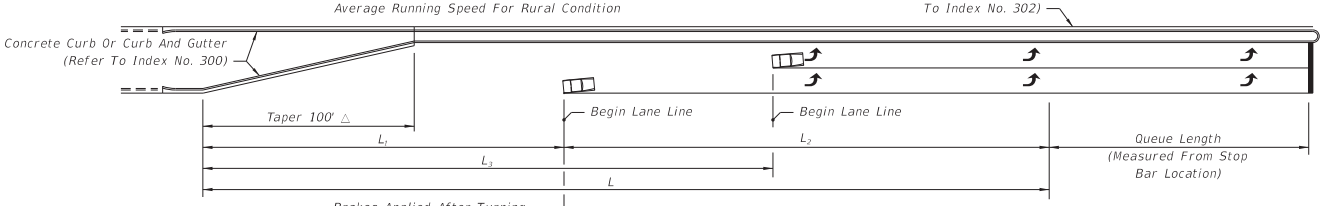
TYPE A — TYPE B CURB — TYPE D

For Curb And Curb & Gutter Types, See Index No. 300
* Option I Separators Shown (Refer To Index No. 302)

MEDIAN CURB AND TRAFFIC SEPARATOR JUNCTURE DETAILS

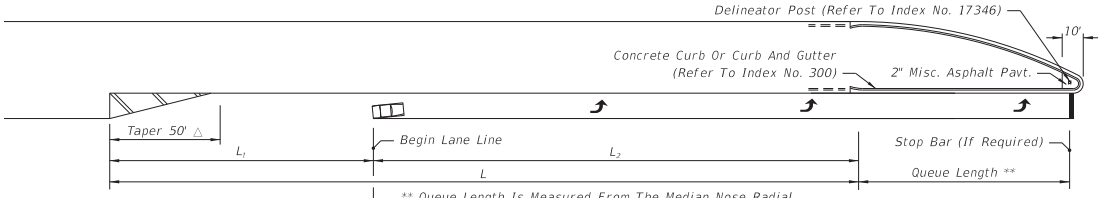


FLUSH AND/OR CURBED SEPARATION

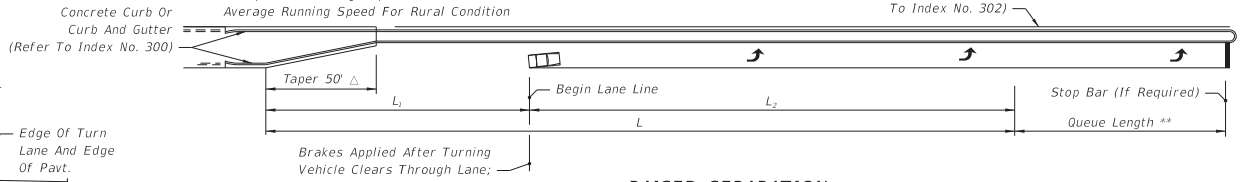


RAISED SEPARATION

DOUBLE LEFT TURNS



FLUSH AND/OR CURBED SEPARATION



RAISED SEPARATION

SINGLE LEFT TURNS

△ The length of taper may be increased to L_1 for single left turns and L_3 for double left turns when:
a. Left turn queue vehicles are adequately provided for within the design queue length.
b. Through vehicle queues will not block access to left turn lane.
c. Approved by District Design Engineer.

LAST REVISION	REVISION	DESCRIPTION:	FDOT DESIGN STANDARDS FY 2012/2013	TURN LANES	INDEX NO.	SHEET NO.
07/01/05					301	1

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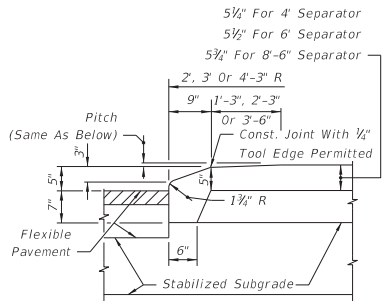
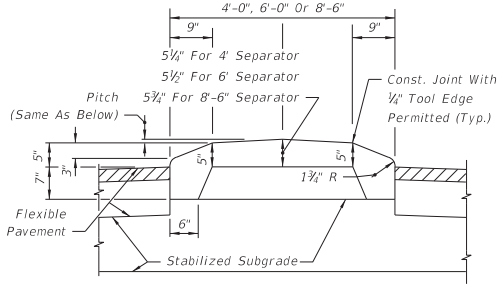
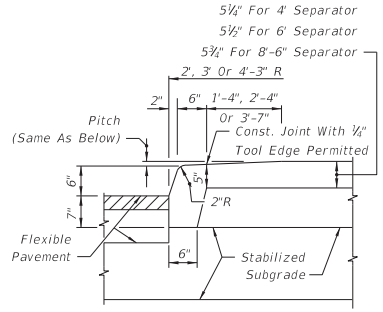


LONGITUDINAL SECTION (NOSE)

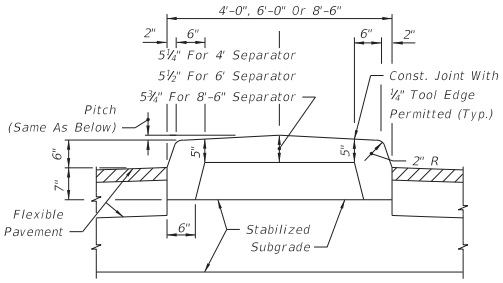


TRANSVERSE SECTION

OPTION I

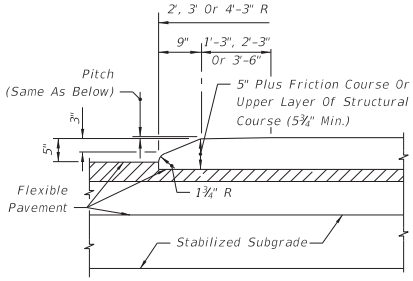


LONGITUDINAL SECTION (NOSE)

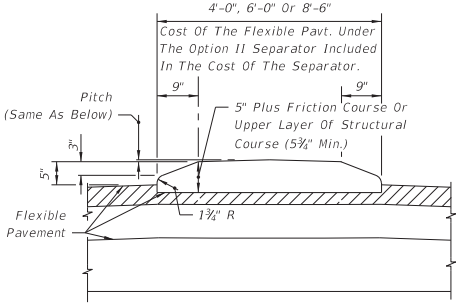


TRANSVERSE SECTION

OPTION I



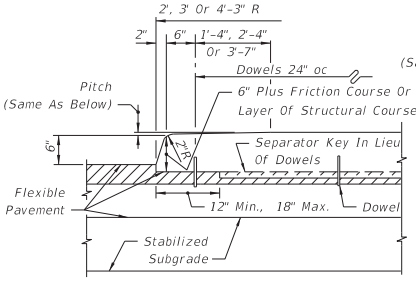
LONGITUDINAL SECTION (NOSE)



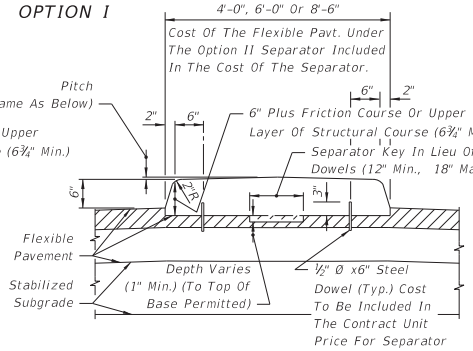
TRANSVERSE SECTION

OPTION II

TYPE I CONCRETE TRAFFIC SEPARATOR



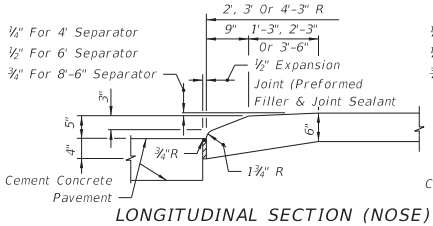
LONGITUDINAL SECTION (NOSE)



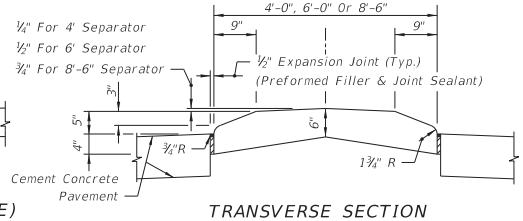
TRANSVERSE SECTION

OPTION II

TYPE IV CONCRETE TRAFFIC SEPARATOR

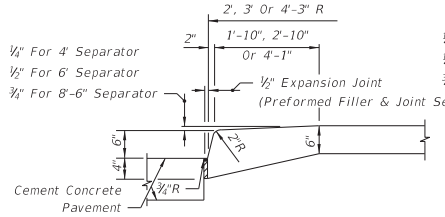


LONGITUDINAL SECTION (NOSE)

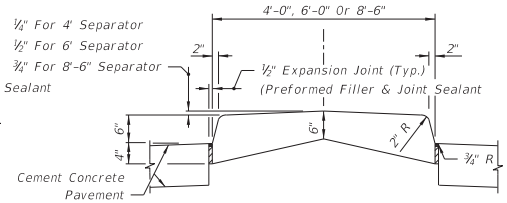


TRANSVERSE SECTION

TYPE II CONCRETE TRAFFIC SEPARATOR



LONGITUDINAL SECTION (NOSE)



TRANSVERSE SECTION

TYPE V CONCRETE TRAFFIC SEPARATOR

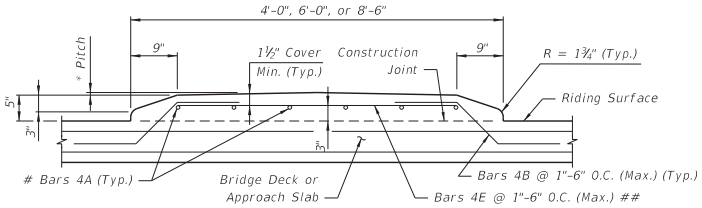
NOTES

1. Separators Type I and IV are to be used with flexible pavement. Separators Types II and V are to be used with rigid pavement.
2. Either Option I or Option II may be used for Types I and IV separators except when a specific option is called for in the plans.
3. For all separators provide ⅛"- ¼" contraction joints at 10' centers (max.). Contraction joints adjacent to concrete pavement on tangents and flat curves are to match the pavement joints, with intermediate joints not to exceed 10' centers.
4. Separators having widths of 4', 6' or 8'-6" shall be paid for under the contract unit price for Concrete Traffic Separator (Type_) (_' Wide) LF. Separators having widths other than 4', 6' or 8'-6" shall be detailed in the plans as special separators and paid for under the contract unit price for Concrete Traffic Separator (Special) SY.

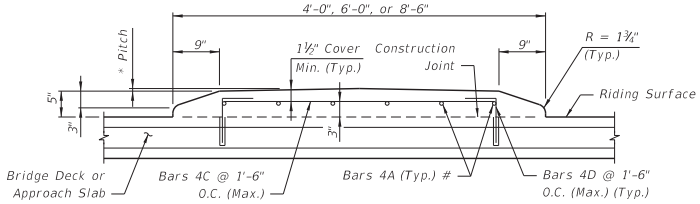
ROADWAY INSTALLATIONS

LAST REVISION	REVISION	DESCRIPTION:	FDOT DESIGN STANDARDS FY 2012/2013	TRAFFIC SEPARATORS	INDEX NO.	SHEET NO.
07/01/07					302	1

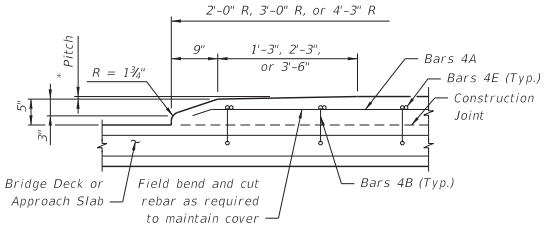
12/30/2011 11:10:08 AM rd960rh C:\n\projects\standards\roadway\00300-s\00302-01.dgn



TYPICAL SECTION THRU TRAFFIC SEPARATOR
(Bridge Deck Shown, Approach Slab Similar)



TYPICAL SECTION THRU TRAFFIC SEPARATOR
(Bridge Deck Shown, Approach Slab Similar)



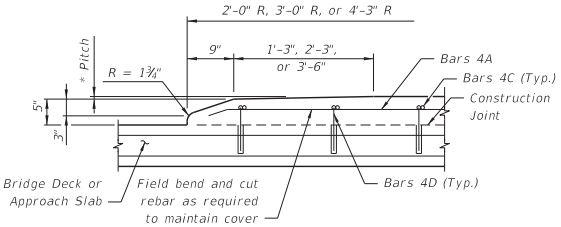
LONGITUDINAL SECTION THRU TRAFFIC
SEPARATOR AT NOSE
(Bridge Deck Shown, Approach Slab Similar)

REINFORCING STEEL OPTION A

For 4'-0" width: Bars 4A @ 3 equal spaces (continuous).
For 6'-0" width: Bars 4A @ 5 equal spaces (continuous).
For 8'-6" width: Bars 4A @ 7 equal spaces (continuous).

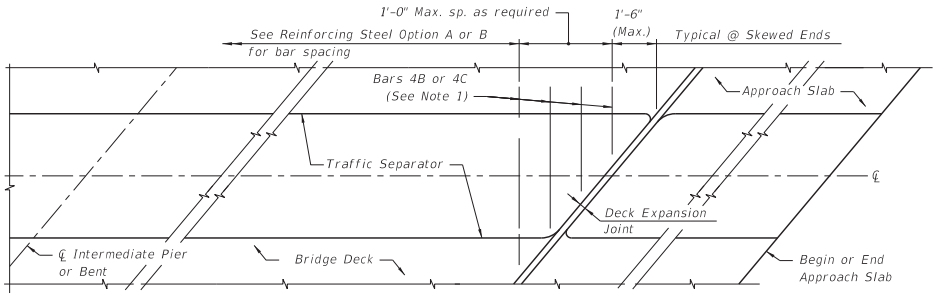
At the Contractor's option a one piece bar may be substituted for Bars 4B and 4E.

* Pitch: ¼" For 4'-0" Separator
½" For 6'-0" Separator
¾" For 8'-6" Separator

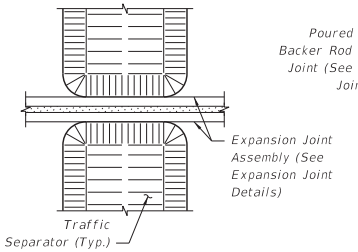


LONGITUDINAL SECTION THRU TRAFFIC
SEPARATOR AT NOSE
(Bridge Deck Shown, Approach Slab Similar)

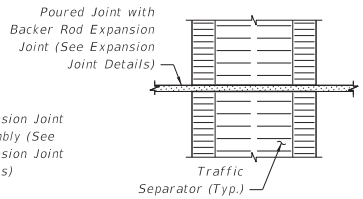
REINFORCING STEEL OPTION B (NOT PERMITTED ON BRIDGE DECKS WITH PRESTRESSING STEEL)



PARTIAL PLAN VIEW OF SKEWED BRIDGE DECK AND
APPROACH SLAB WITH TRAFFIC SEPARATOR
(Deck Expansion Joint at Begin or End Bridge Shown,
Expansion Joint at ℄ Pier or Intermediate Bents Similar)



DETAIL AT EXPANSION JOINTS
(Strip Seal Shown,
Other Armored Joint Types Similar)



DETAIL AT POURED JOINT WITH
BACKER ROD EXPANSION JOINTS

Notes:
1. Traffic Separator transverse reinforcement adjacent to deck expansion joints shall be field adjusted to maintain clearance and spacing. Bars shall be field cut as shown, bars may be rotated to maintain clearance.
2. Traffic Separator ends at deck expansion joints shall follow the deck joint limits. Drainage joints and ½" V-Grooves shall be placed perpendicular or radial to the ℄ of the Traffic Separator. See Structures Plans, Superstructure and Approach Slab Sheets for details.
3. See Structures Plans, Superstructure Sheets for actual dimensions and joint orientation.

BRIDGE INSTALLATIONS - TYPE "E" CURB

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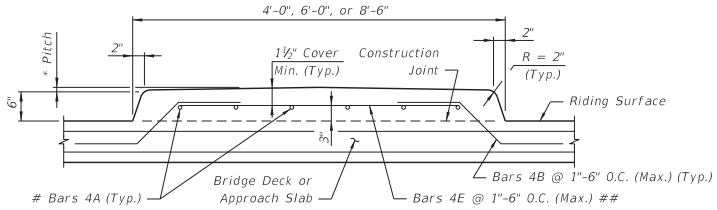
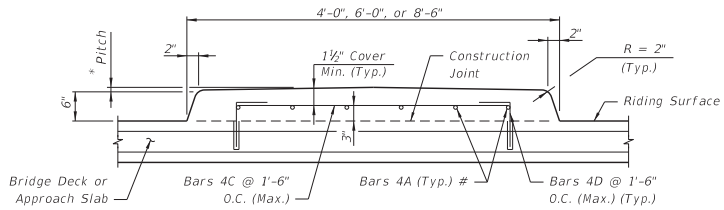
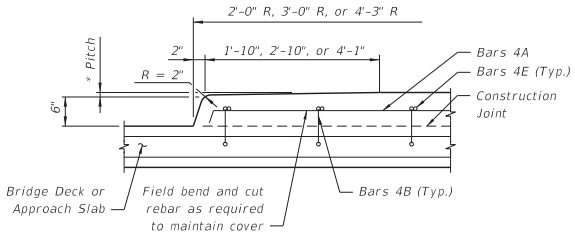


TYPICAL SECTION THRU TRAFFIC SEPARATOR
(Bridge Deck Shown, Approach Slab Similar)



TYPICAL SECTION THRU TRAFFIC SEPARATOR
(Bridge Deck Shown, Approach Slab Similar)



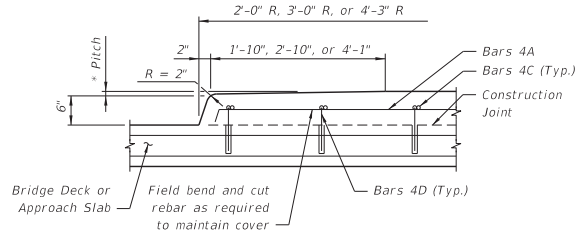
LONGITUDINAL SECTION THRU TRAFFIC
SEPARATOR AT NOSE
(Bridge Deck Shown, Approach Slab Similar)

REINFORCING STEEL OPTION A

For 4'-0" width: Bars 4A @ 3 equal spaces (continuous).
For 6'-0" width: Bars 4A @ 5 equal spaces (continuous).
For 8'-6" width: Bars 4A @ 7 equal spaces (continuous).

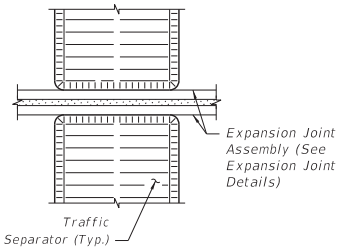
At the Contractor's option a one piece bar may be substituted for Bars 4B and 4E.

* Pitch: ¼" For 4'-0" Separator
½" For 6'-0" Separator
¾" For 8'-6" Separator

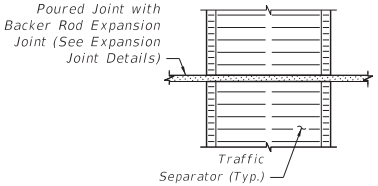


LONGITUDINAL SECTION THRU TRAFFIC
SEPARATOR AT NOSE
(Bridge Deck Shown, Approach Slab Similar)

REINFORCING STEEL OPTION B (NOT PERMITTED
ON BRIDGE DECKS WITH PRESTRESSING STEEL)



DETAIL AT EXPANSION JOINTS
(Strip Seal Shown,
Other Armored Joint Types Similar)

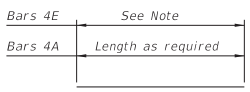


DETAIL AT POURED JOINT WITH
BACKER ROD EXPANSION JOINTS

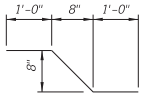
Note: Treatment of separators on straight bridges shown. For additional notes and treatment of separators on skewed bridges, see Sheet 2.

BRIDGE INSTALLATIONS - TYPE "F" CURB

CONVENTIONAL REINFORCING STEEL BENDING DIAGRAMS



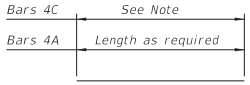
Bars 4A & 4E



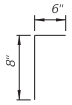
Bar 4B

Note:
Length of Bars 4E is 2'-5" for 4'-0" Separator.
Length of Bars 4E is 4'-5" for 6'-0" Separator.
Length of Bars 4E is 6'-11" for 8'-6" Separator.

REINFORCING STEEL OPTION A



Bars 4A & 4C



Bar 4D

Note:
Length of Bars 4C is 2'-4½" for 4'-0" Separator.
Length of Bars 4C is 4'-4½" for 6'-0" Separator.
Length of Bars 4C is 6'-10½" for 8'-6" Separator.

REINFORCING STEEL OPTION B

REINFORCING STEEL NOTES:

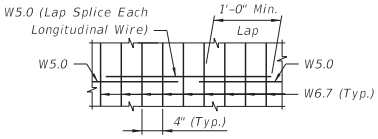
1. All dimensions are out to out.
2. The 8" vertical dimension shown for Bars 4B and 4D are based on a slab 8½" thick or greater without a wearing surface. If slab thickness is less than 8½", decrease this dimension by an amount equal to the difference in thickness. If a wearing surface is to be provided, increase this dimension by an amount equal to the wearing surface thickness.

ALTERNATE REINFORCING STEEL DETAILS (WELDED WIRE REINFORCEMENT)

OPTION A: Use Welded Wire Reinforcement 3 x 4 - W5.0 x W6.7 as required by plans in place of Bars 4A, 4B and 4E. Bend the Welded Wire Reinforcement to the dimensions of Bar 4B shown in the Bending Diagram for Reinforcing Steel Option A.

OPTION B: Use Welded Wire Reinforcement 3 x 4 - W5.0 x W6.7 as required by plans in place of Bars 4A and 4C shown in Reinforcing Steel Option B.

Note: Welded Wire Reinforcement shall conform to ASTM A185.



SPLICE DETAIL
(Between WWR 3 x 4 - W5.0 x W6.7 Sections)

ESTIMATED TRAFFIC SEPARATOR QUANTITIES

CONCRETE:
CONSTANT WIDTH OF SEPARATOR:

	TYPE "E"		TYPE "F"
4'-0"	Width = 0.056 CY per Ft.	-	0.072 CY per Ft.
6'-0"	Width = 0.089 CY per Ft.	-	0.112 CY per Ft.
8'-6"	Width = 0.132 CY per Ft.	-	0.164 CY per Ft.

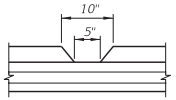
NOSE:

	TYPE "E"		TYPE "F"
4'-0"	Width = 0.080 CY	-	0.109 CY
6'-0"	Width = 0.193 CY	-	0.257 CY
8'-6"	Width = 0.403 CY	-	0.536 CY

REINFORCING STEEL:
(All quantities are based on an 8½" slab.)

OPTION A:
4'-0" Width - 6.37 Lbs. per Ft.
6'-0" Width - 8.60 Lbs. per Ft.
8'-6" Width - 11.05 Lbs. per Ft.

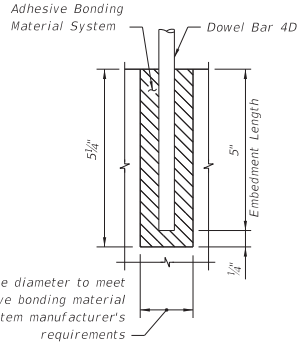
OPTION B:
4'-0" Width - 4.77 Lbs. per Ft.
6'-0" Width - 7.00 Lbs. per Ft.
8'-6" Width - 9.45 Lbs. per Ft.



DRAINAGE JOINT DETAIL FOR 5" OPENING OR LESS

See Structures Plans, Superstructure Sheets for location(s) of drainage joints. Locations for drainage joints shall be limited to the constant width section of separator.

NOTES:
CONCRETE: See General Notes in Structures Plans.
REINFORCING STEEL: Reinforcing Steel shall be ASTM A615 Grade 60.
PAYMENT: Separators having widths of 4'-0", 6'-0", and 8'-6" shall be paid under the contract unit price for Traffic Separator Concrete (Type II or V) (__' Wide), LF. Separators having widths other than 4'-0", 6'-0", or 8'-6" shall be detailed in the plans as special separators and paid under the contract unit price for Traffic Separator Concrete (Special), S.Y.
TRAFFIC SEPARATOR CONSTRUCTION: The Contractor may construct the separator by the use of stationary removable forms or by the use of slip forms without altering the separator dimensions shown.
½" V-GROOVES: For all separators provide ½" V-Grooves at 30'-0" centers (max.) equally spaced between expansion joints, and/or drainage joints.



DOWEL DETAIL

Dowel Notes:
1. Shift Dowel Holes to clear if existing reinforcement is encountered.
2. Provide and install an adhesive bonding material system in accordance with Sections 416 and 937 of the Specifications.

BRIDGE INSTALLATIONS - TYPE "E" AND "F" CURBS

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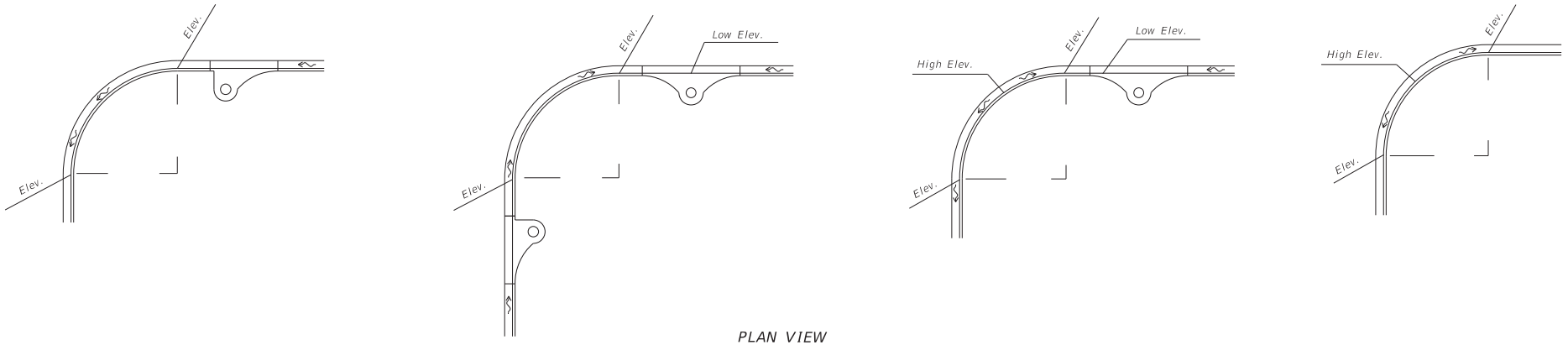
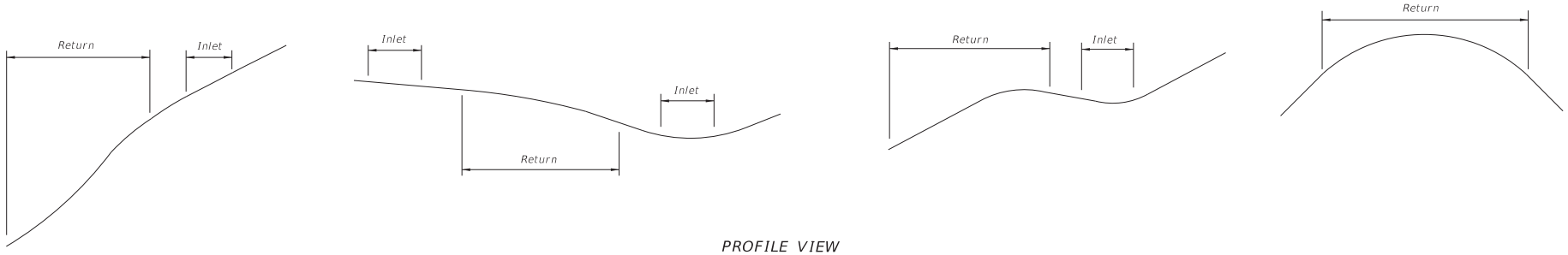


PLAN VIEW



PROFILE VIEW

Note:
Profile grades should be established that will allow inlets to be located outside the return whenever practical. Inlets should be located to avoid conflict with pedestrian movement. Special care must be exercised to prevent conflict with public sidewalk curb ramps for the disabled. For information on public sidewalk curb ramps refer to Index No. 304.

SHOWING LOCATION OF INLETS AT RETURNS

TYPICAL RETURN PROFILES

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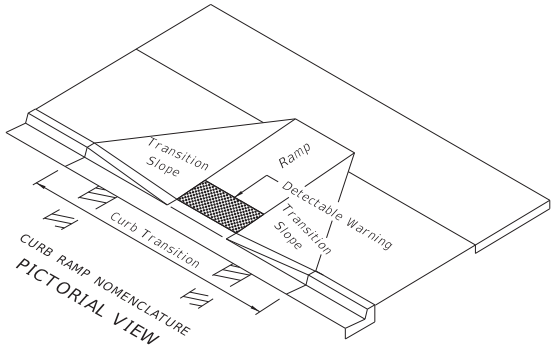
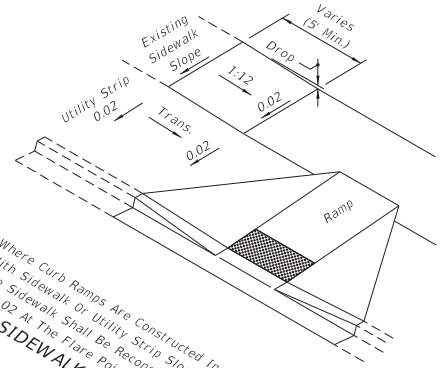
LAST REVISION	REVISION	DESCRIPTION:				INDEX NO.	SHEET NO.
01/01/12			FDOT DESIGN STANDARDS FY 2012/2013	CURB RETURN PROFILES		303	1

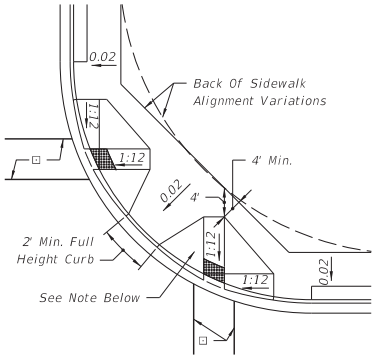


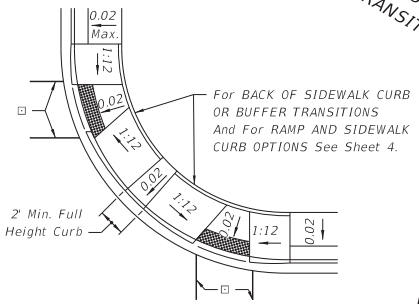
CURB RAMP NOMENCLATURE
PICTORIAL VIEW



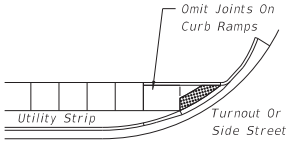
Where Curb Ramps Are Constructed In Existing Sidewalks With Sidewalk Or Utility Strip Slopes Greater Than 0.02, The Sidewalk Shall Be Reconstructed To Reduce The Slopes To 0.02 At The Flare Point.

SIDEWALK / UTILITY STRIP TRANSITION





Note: A portion of one or both ramps may extend outside the return.



LINEAR SIDEWALK RAMPS

Note:
When crosswalk markings are required, ramp runs must fall within crosswalk limits and where practical, be parallel with the projected crosswalk alignment. The bottom of the ramp beyond the curb line shall have a clear space 48" minimum within the markings of a marked crosswalk. If no crosswalk markings are present, the bottom of the ramp beyond the curb ramp shall have a clear space 48" minimum outside active traffic lanes.

⊡ Crosswalk widths and configuration vary; must conform to Index No. 17344 and 17346.

TYPICAL PLACEMENT OF PUBLIC SIDEWALK CURB RAMPS AT CURBED RETURNS

GENERAL NOTES

1. Public sidewalk curb ramps shall be constructed in the public right of way at locations that will provide continuous unobstructed pedestrian circulation paths to pedestrian areas, elements and facilities in the public right of way and to accessible pedestrian routes on adjacent sites. Curbed facilities with sidewalks and those without sidewalks are to have curb ramps constructed at all street intersections and at turnouts that have curbed returns. Partial curb returns shall extend to the limit prescribed by Index No. 515 to accommodate curb ramps. Ramps constructed at locations without sidewalks shall have a landing constructed at the top of each ramp, see Sheet 5.

2. The location and orientation of curb ramps shall be as shown in the plans.

3. Curb ramp running slopes at unrestrained sites shall not be steeper than 1:12 and cross slope shall be 0.02 or flatter. Transition slopes shall not be steeper than 1:12.

   When altering existing pedestrian facilities where existing site development precludes the accommodation of a ramp slope of 1:12, a running slope between 1:12 and 1:10 is permitted for a rise of 6" maximum and a running slope of between 1:10 and 1:8 is permitted for a rise of 3" maximum. Where compliance with the requirements for cross slope cannot be fully met, the minimum feasible cross slope shall be provided.

   Ramp running slope is not required to exceed 8' in length, except at sites where the plans specify a greater length.

4. If a curb ramp is located where pedestrians must walk across the ramp, then the walk shall have transition slopes to the ramp; the maximum slope of the transitions shall be 1:12. Ramps with curb returns may be used at locations where other improvements provide guidance away from that portion of curb perpendicular to the sidewalk; improvements for guidance are not required at curb ramps for linear pedestrian traffic.

5. Curb ramp detectable warning surfaces shall extend the full width of the ramp and 24" deep. Detectable warning surfaces shall be constructed in accordance with Specification 527. See Sheet 6 for detectable warning layouts. Transition slopes are not to have detectable warnings. Detectable warnings are required on sidewalks at intersecting roads, streets and railroads. For requirements for detectable warnings on sidewalks at intersecting driveways, see Index 310.

6. Where a curb ramp is constructed within existing curb, curb and gutter and/or sidewalk, the existing curb or curb and gutter shall be removed to the nearest joint beyond the curb transitions or to the extent that no remaining section of curb or curb and gutter is less than 5' long. The existing sidewalk shall be removed to the nearest joint beyond the transition slope or walk around or to the extent that no remaining section of sidewalk is less than 5' long. For details of Concrete Sidewalk See Index 310.

7. Alpha-numeric identifications are for reference (plans, permits, etc.).

8. Public sidewalk curb ramps are to be paid for as follows:

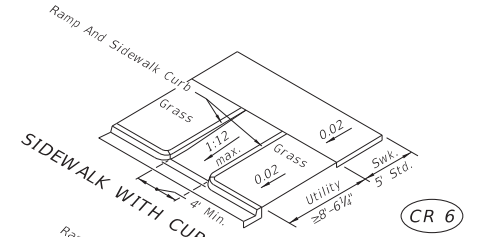
   Ramps, reconstructed sidewalks, walk around sidewalks, sidewalk landings and sidewalk curbs are to be paid for under the contract unit price for Sidewalk Concrete, (__" Thick), SY. Curb transitions and reconstructed curbs are to be paid for under the contract unit price for the parent curb, i.e., Concrete Curb (Type __), LF or Concrete Curb and Gutter (Type __), LF.

   When a separate pay item for the removal and disposal of existing curb, curb and gutter, and/or sidewalk is not provided in the plans, the cost of removal and disposal of these features shall be included in the contract unit price for new curb, curb and gutter and/or sidewalk respectively.

9. Acceptance Criteria for Detectable Warnings:

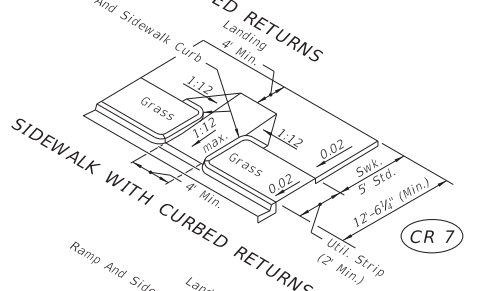
   a. The ramp detectable warning surface shall be complete and uniform in color and texture
   b. 90% of the individual truncated domes must comply with the design criteria
   c. There may be no more than 4 non-complying domes in any one square foot of surface
   d. No two adjacent domes may be non-compliant
   e. Surface may not deviate more than 0.10" from a true plane

10. All sidewalk surfaces, ramp surfaces, and landings with a cross slope shown in this Index to be 0.02 shall be 0.02 maximum. All ramp surfaces and ramp transition slopes with a slope shown in this Index to be 1:12 shall be 1:12 maximum.



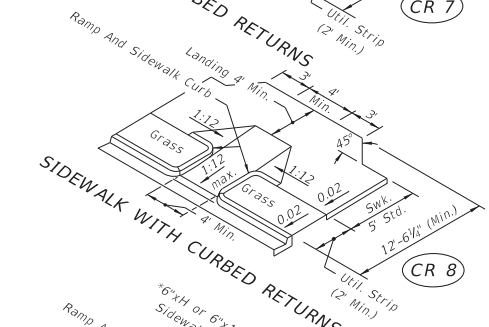
SIDEWALK WITH CURBED RETURNS

CR 6



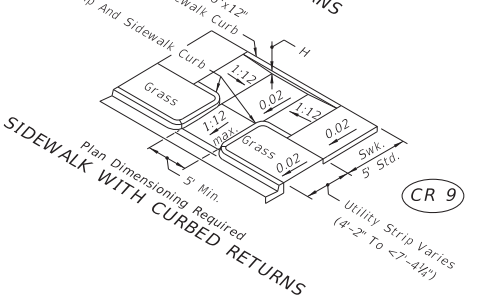
SIDEWALK WITH CURBED RETURNS

CR 7



SIDEWALK WITH CURBED RETURNS

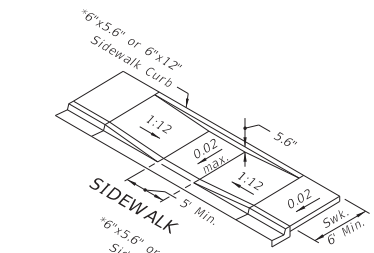
CR 8



Plan Dimensioning Required

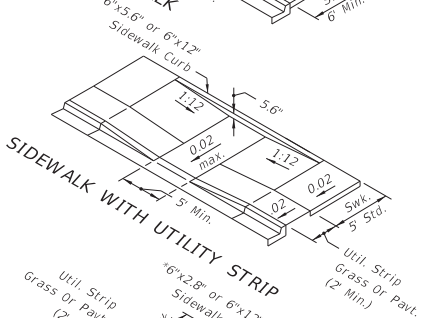
SIDEWALK WITH CURBED RETURNS

CR 9



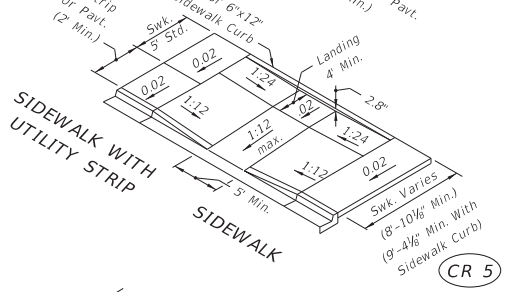
SIDEWALK

CR 3



SIDEWALK WITH UTILITY STRIP

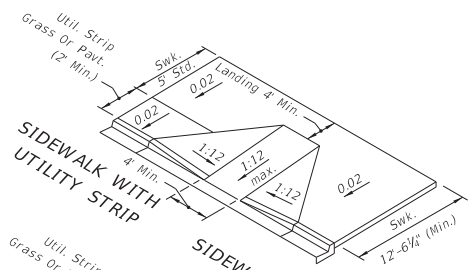
CR 4



SIDEWALK WITH UTILITY STRIP

SIDEWALK

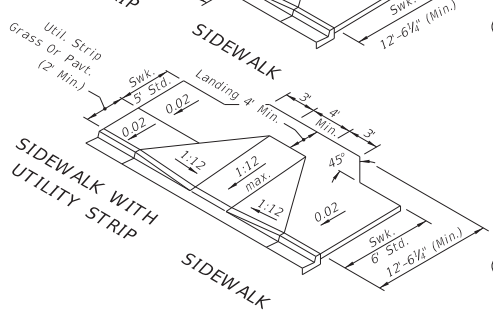
CR 5



SIDEWALK WITH UTILITY STRIP

SIDEWALK

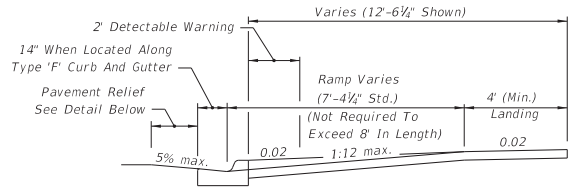
CR 1



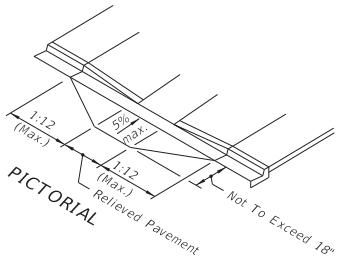
SIDEWALK WITH UTILITY STRIP

SIDEWALK

CR 2

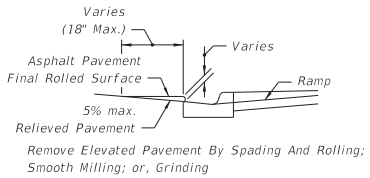


SECTION THROUGH RAMP RUN AND LANDINGS WITH UPPER LANDING AT NORMAL SIDEWALK ELEVATION



PICTORIAL

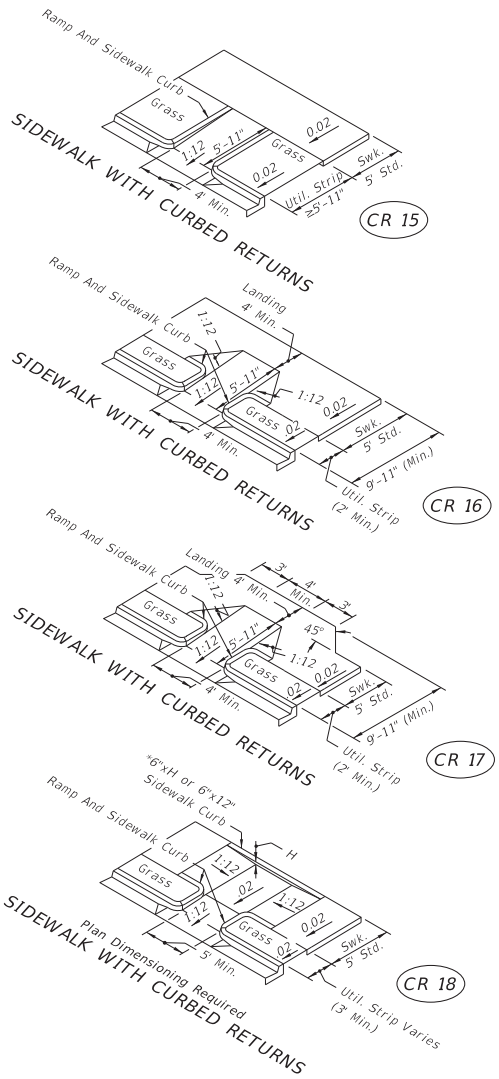
PAVEMENT RELIEF AT LIP OF CURB

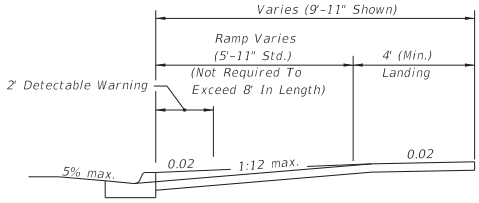


SECTION

* For BACK OF SIDEWALK CURB OR BUFFER TRANSITION And For RAMP AND SIDEWALK CURB OPTIONS See Sheet 4.

DIMENSIONAL FEATURES FOR PUBLIC SIDEWALK CURB RAMPS WHERE RAMP AND LANDING DEPTH ARE NOT RESTRICTED BY RIGHT OF WAY

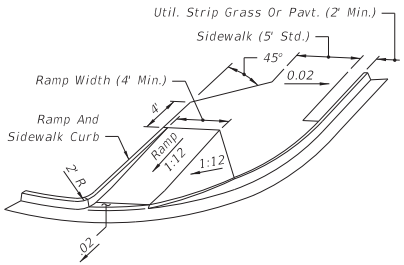




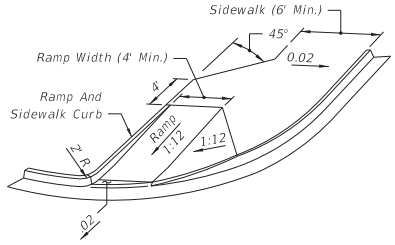
SECTION THROUGH RAMP RUN AND LANDINGS WITH UPPER LANDING AT NORMAL SIDEWALK ELEVATION

* For BACK OF SIDEWALK CURB OR BUFFER TRANSITION And For RAMP AND SIDEWALK CURB OPTIONS See Sheet 4.

DIMENSIONAL FEATURES FOR PUBLIC SIDEWALK CURB RAMPS WHERE RAMP AND LANDING DEPTH ARE RESTRICTED BY RIGHT OF WAY



CR 25



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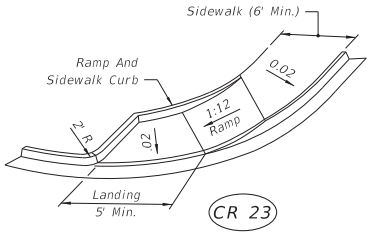

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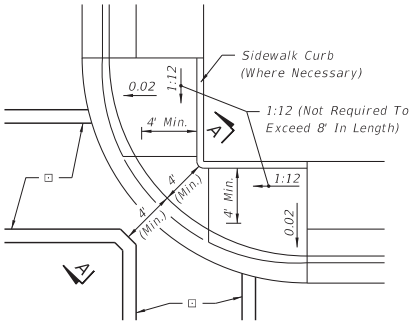
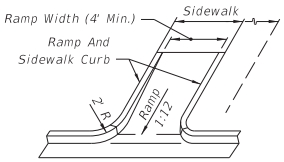


Crosswalk width and configuration vary;
must conform to Index No. 17344 and 17346.

PLAN



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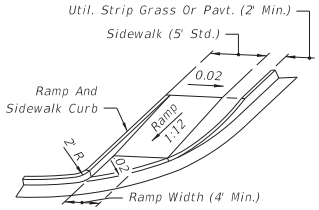
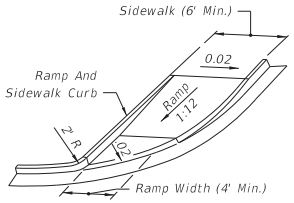
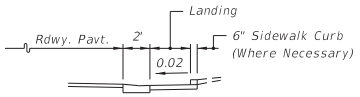


CR 21



CR 20

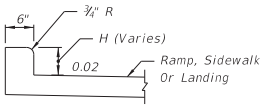
DIMENSIONAL FEATURES FOR PUBLIC SIDEWALK CURB RAMPS FOR LINEAR PEDESTRIAN TRAFFIC



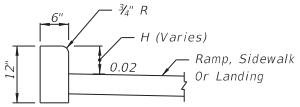
SECTION AA

CR 26

DIMENSIONAL FEATURES FOR
PUBLIC SIDEWALK COMBINED CORNER
RAMPS UNDER CONDITIONS OF INFEASIBILITY

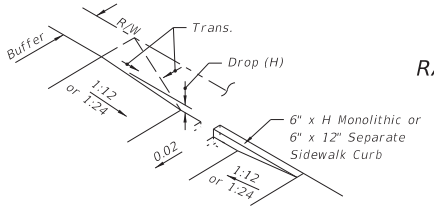


MONOLITHIC CAST CURB



SEPARATELY CAST CURB

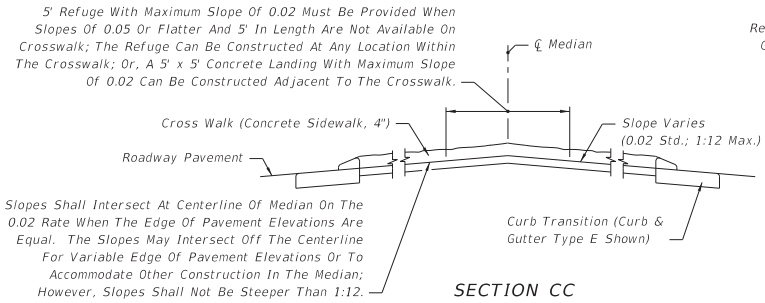
RAMP AND SIDEWALK CURB OPTIONS



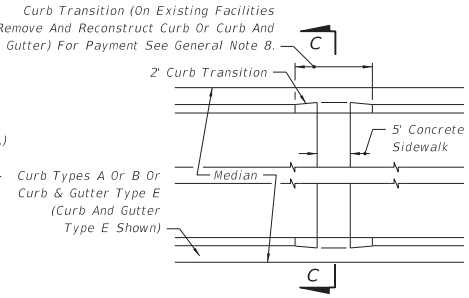
Construct Sidewalk Curb In Absence Of Adequate Buffer,
Maintainable Surface Contour, Abutting Structure, Or When Called
For In The Plans Or Standards

BACK OF SIDEWALK CURB
OR BUFFER TRANSITION

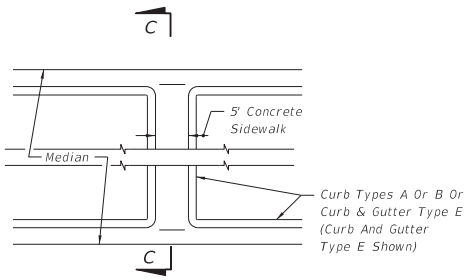
12/30/2011 11:10:14 AM rd960rh C:\n\projects\standards\roadway\00300-s\00304-04.dgn



SECTION CC

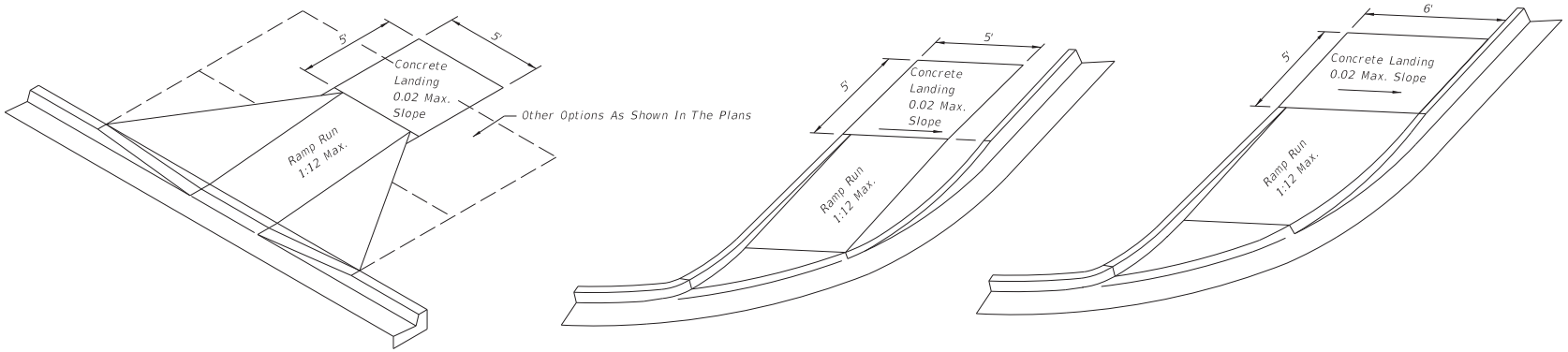


PLAN



PLAN - (ALTERNATE DETAIL)

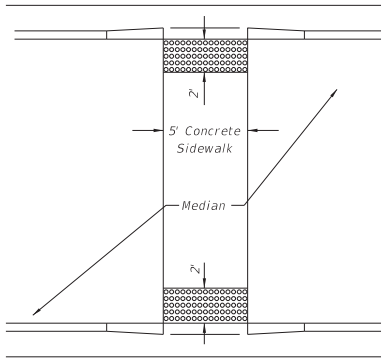
MEDIAN CROSSWALKS



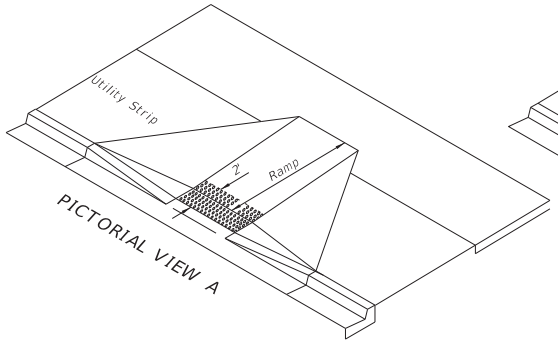
LANDINGS FOR RAMPS WITHIN PUBLIC RIGHT OF WAY CONSTRUCTED AT LOCATIONS WHERE FUTURE SIDEWALKS ARE PROPOSED, WHERE STABLE SURFACES OTHER THAN SIDEWALKS ARE PART OF A CONTINUOUS PASSAGE OR WHERE A CURB FALLS ALONG THE CIRCULATION PATH TO PEDESTRIAN ROUTES ON ADJACENT SITES

12/30/2011 11:10:15 AM rd960rh C:\d\projects\standards\roadway\00300-s\00304-05.dgn

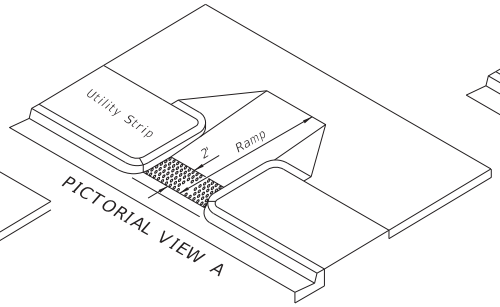
On curb ramps, landings and flush transitions perpendicular to the curb line: Rows of domes shall be aligned with the centerline of the ramp. (See Pictorial View A)



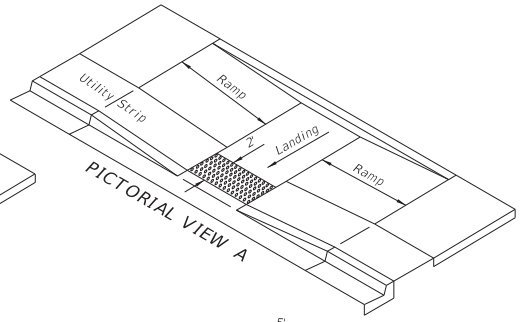
PLAN



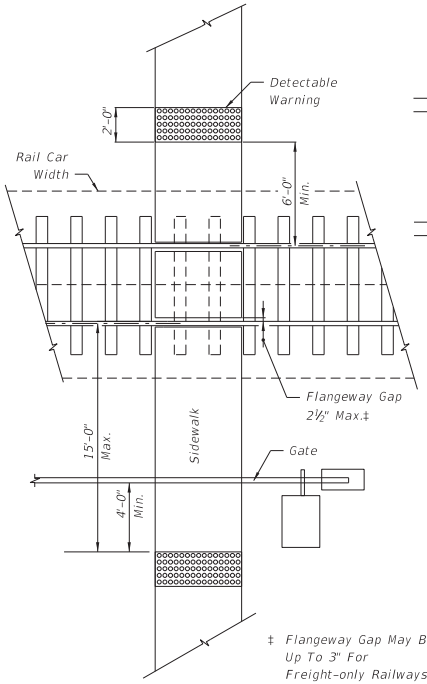
PICTORIAL VIEW A



PICTORIAL VIEW A

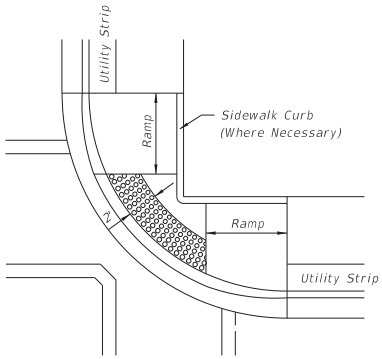


PICTORIAL VIEW A

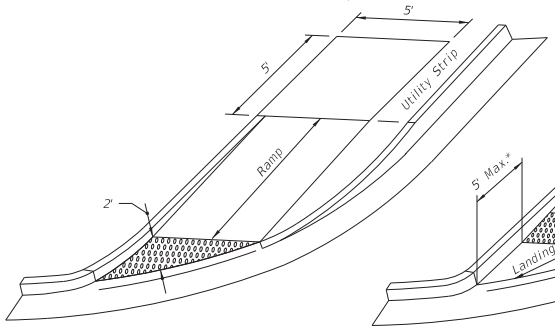


‡ Flangeway Gap May Be Up To 3" For Freight-only Railways

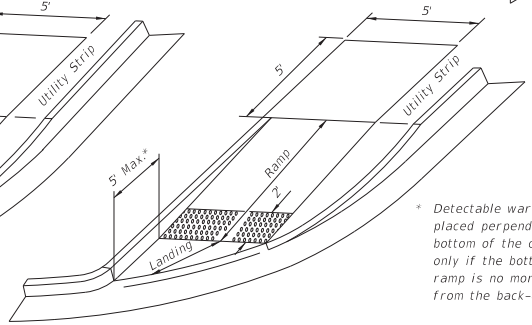
Rail Road Crossing
PLAN



PLAN

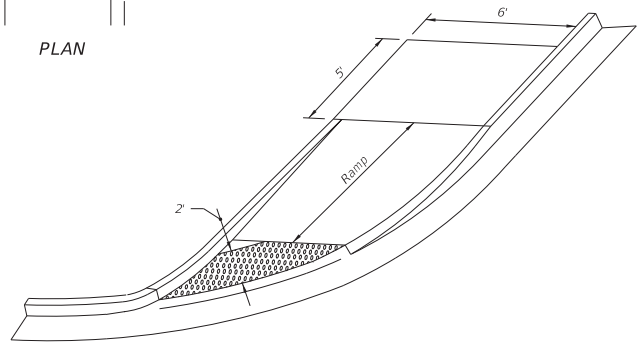


PICTORIAL VIEW B



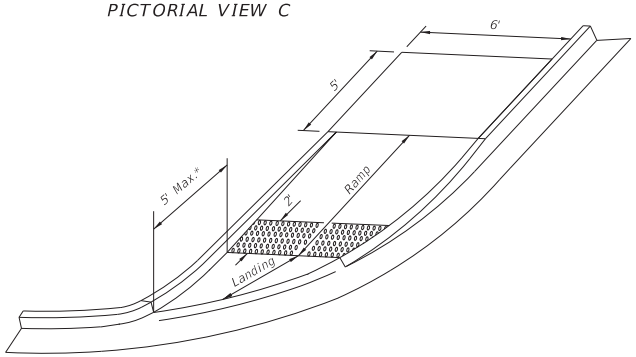
PICTORIAL VIEW C

* Detectable warnings may be placed perpendicular across the bottom of the curb ramp, but only if the bottom of the curb ramp is no more than 5 feet from the back-of-curb.



PICTORIAL VIEW B

On landings and flush transitions at radius returns: Rows of domes are not required to be aligned with the centerline of the ramp. (See Pictorial View B)



PICTORIAL VIEW C

On curb ramps at radius returns: Rows of domes shall be aligned with the centerline of the ramp. (See Pictorial View C)

TYPICAL PLACEMENT OF DETECTABLE WARNING AT CURB RAMPS

LAST REVISION	REVISION	DESCRIPTION:				INDEX NO.	SHEET NO.
01/01/11			FDOT DESIGN STANDARDS FY 2012/2013	PUBLIC SIDEWALK CURB RAMPS		304	6

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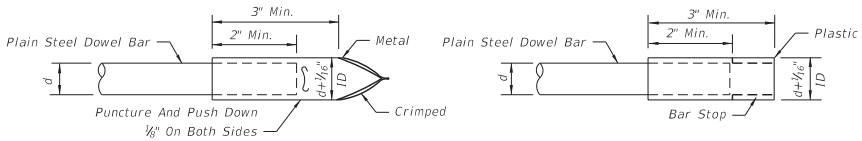
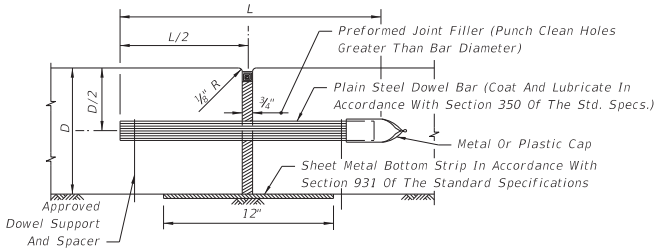
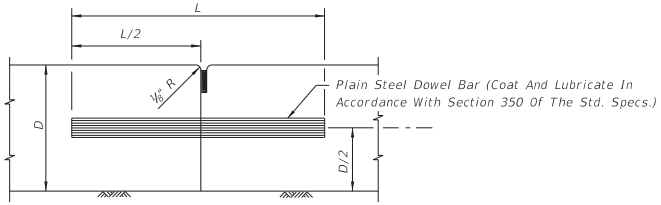


METAL OR PLASTIC CAPS FOR DOWEL BARS

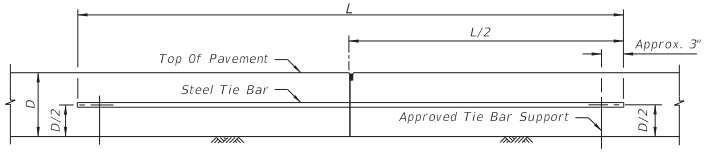


Note: Expansion joints to be placed on approaches to bridges, at street intersections and other locations indicated in detail plans.

TRANSVERSE EXPANSION JOINT

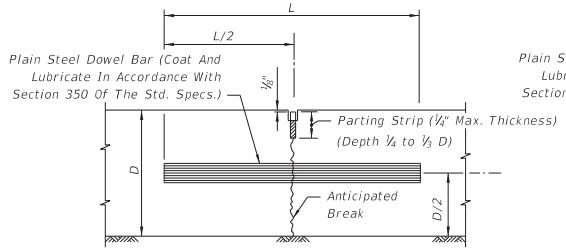


BUTT CONSTRUCTION JOINT TO BE USED AT DISCONTINUANCES OF WORK

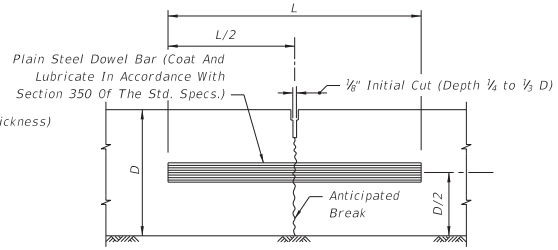


Note: Tie bar spacing shall not exceed 24" at these joints.

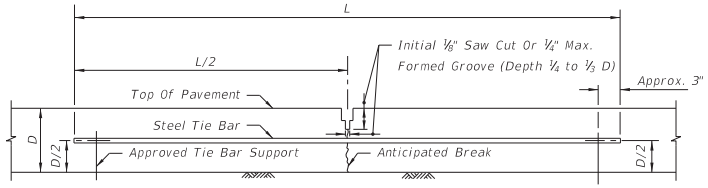
LONGITUDINAL BUTT CONSTRUCTION JOINT



TRANSVERSE CONTRACTION JOINT, VIBRO CAST METHOD



TRANSVERSE CONTRACTION JOINT, SAWED METHOD



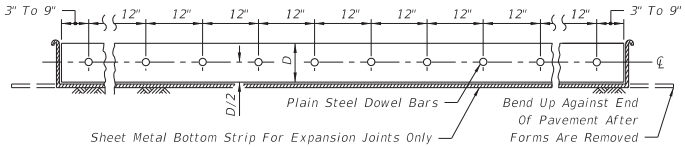
Note: Slabs poured simultaneously. Tie bars may be inserted in the plastic concrete by means approved by the Engineer.

LONGITUDINAL LANE-TIE JOINT

Tie bars are deformed #4 or #5 reinforcing steel bars meeting the requirements of Section 931 of the Standard Specifications.

Provide a standard load transfer tied joint with #4 bars 25" in length at 24" or #5 bars 30" in length at 38" spacing.

LONGITUDINAL JOINTS



DOWEL BAR LAYOUT

DOWELS (LENGTH 18")	
Pavement Thickness "D"	Diameter
6"-6½"	¾"
7"-8½"	1"
9"-10½"	1¼"
≥11"	1½"

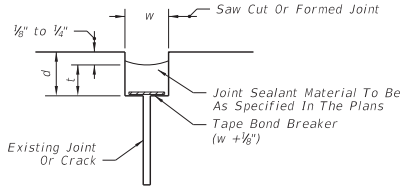
TRANSVERSE JOINTS ARE TO BE SPACED AT A MAXIMUM OF 15'. DOWELS ARE REQUIRED AT ALL TRANSVERSE JOINTS UNLESS OTHERWISE NOTED IN PLANS.

TRANSVERSE JOINTS

Note: For joint seal dimensions see Sheet 2.

LAST REVISION	REVISION	DESCRIPTION:	FDOT DESIGN STANDARDS FY 2012/2013	CONCRETE PAVEMENT JOINTS	INDEX NO.	SHEET NO.
07/01/09					305	1

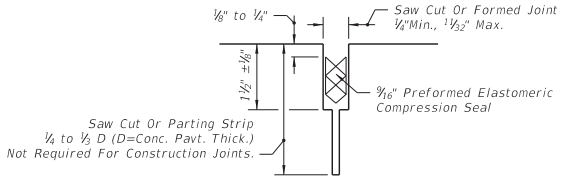
12/30/2011 11:10:16 AM rd960rh C:\n\projects\standards\roadway\00300-s\00305-01.dgn



Note: Dimension w will be shown in the plans or established by the Engineer based on field conditions. Dimension d will be constructed so that the shape factor w/t has a maximum value of 2.0 and a minimum value of 1.0.

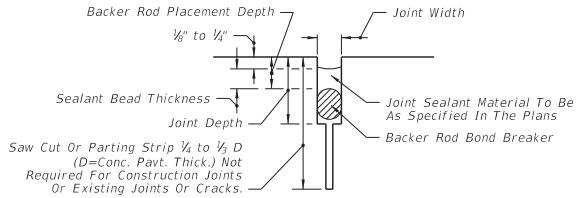
FOR REHABILITATION PROJECTS

TAPE BOND BREAKER



FOR NEW PROJECTS

PREFORMED ELASTOMERIC COMPRESSION SEAL

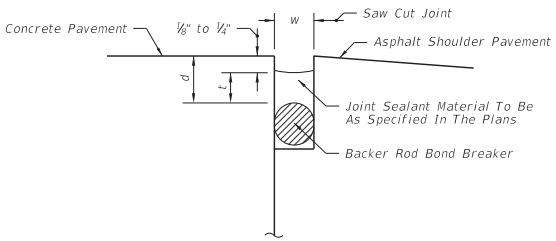


FOR NEW AND REHABILITATION PROJECTS

BACKER ROD BOND BREAKER

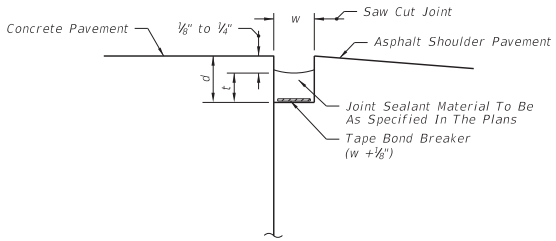
CONCRETE-CONCRETE JOINTS

d = w = ¾" Unless Specified Otherwise In The Plans



BACKER ROD BOND BREAKER

d = w = ¾" Unless Specified Otherwise In The Plans



TAPE BOND BREAKER

FOR NEW AND REHABILITATION PROJECTS;
EITHER TAPE OR BACKER ROD BOND BREAKER REQUIRED;
SHOULDER MUST BE REPAIRED IF PROPER JOINT SHAPE
CAN NOT BE ATTAINED

CONCRETE-ASPHALT SHOULDER JOINTS

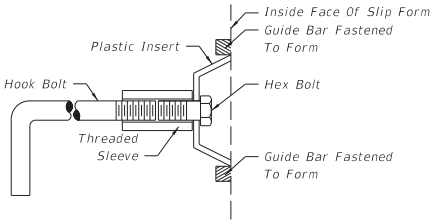
JOINT SEAL DIMENSIONS

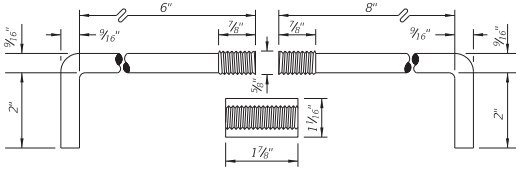
BACKER ROD BOND BREAKER (CONCRETE-CONCRETE JOINTS)

JOINT DIMENSIONS (INCHES)				
JOINT WIDTH	SEALANT BEAD THICKNESS	BACKER ROD DIA.	MINIMUM JOINT DEPTH	BACKER ROD PLACEMENT DEPTH
¼	¼	⅜	1	½
⅜	¼	½	1¼	½
½	¼	⅝	1¼	½
⅝	5/16	¾	1½	9/16
¾	⅜	1	1¾	⅝
⅞	7/16	1⅛	1¾	11/16
1	½	1¼	2	¾
>1	½	1¼+	2+	¾

Unless otherwise indicated on the plans the joint width for new construction will be ¼" for construction joints, ⅜" for all other joints.

For rehabilitation projects the joint width will be shown on the plans or established by the Engineer based on field conditions.





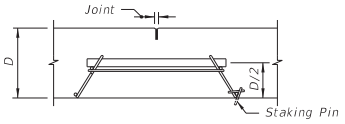
Note: After the concrete has set to the extent that the Keyway will retain its shape, the hex bolt and plastic insert shall be removed. The remaining portion of the hook bolt assembly shall be installed immediately prior to placing of concrete in the adjacent lane.

Anchor bolts shall be Grade C in accordance with ASTM A 307.

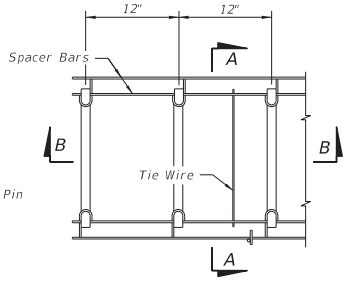
Threaded sleeves shall develop the full strength of the bolt and meet the material and thread requirements of ASTM A 563.

ALTERNATE KEYWAY AND HOOK BOLT

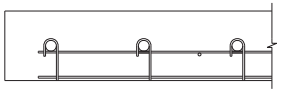
STEEL HOOK BOLT ASSEMBLY



SECTION AA

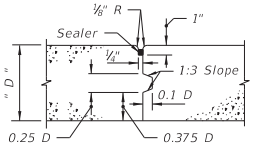


TOP VIEW

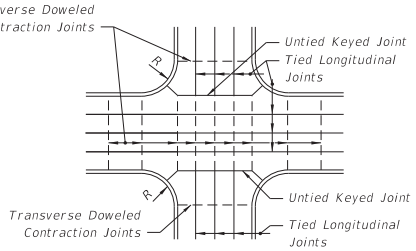


SECTION BB

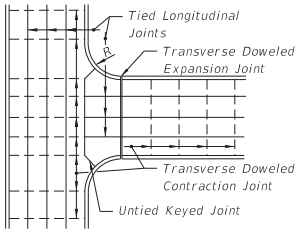
CONTRACTION ASSEMBLY



KEYED JOINT

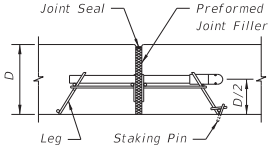


JOINT LAYOUT AT THRU INTERSECTION

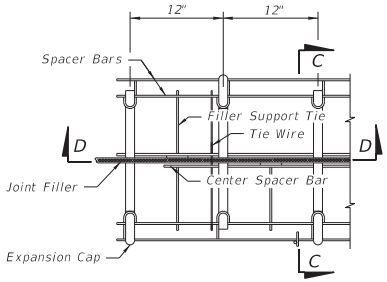


JOINT LAYOUT AT 'T' INTERSECTIONS

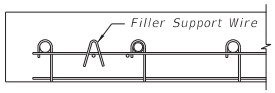
JOINT ARRANGEMENT



SECTION CC



TOP VIEW



SECTION DD

EXPANSION ASSEMBLY

Note: Proprietary contraction and expansion assemblies may be used. Products shall be introduced to the State Construction Office in accordance with section (C) of the Product Evaluation Procedure.

NOTES

1. Longitudinal joints will not be required for single lane pavement 14' or less in width. For entrance and exit ramp joint details, see Sheet 4.
2. Arrangement of longitudinal joints are to be as directed by the Engineer.
3. All manholes, meter boxes and other projections into the pavement shall be boxed-in with ½" preformed expansion joint material.

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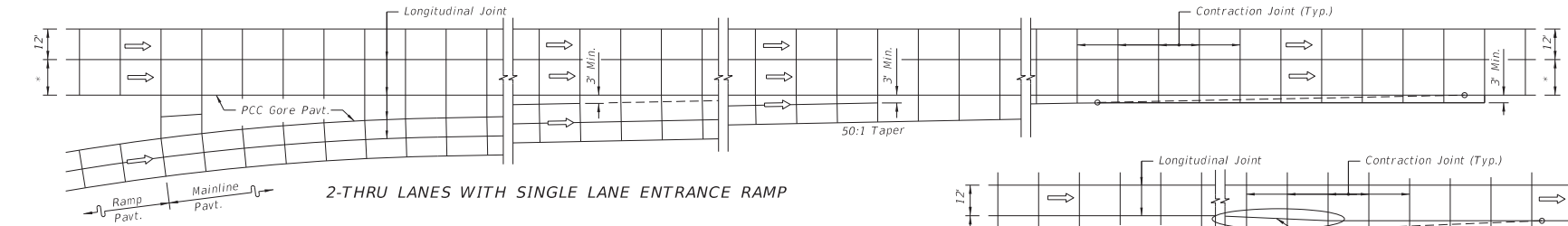
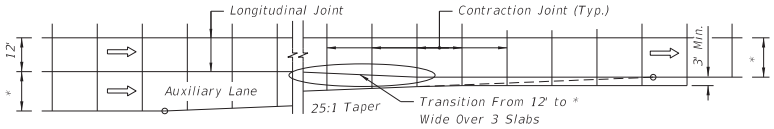
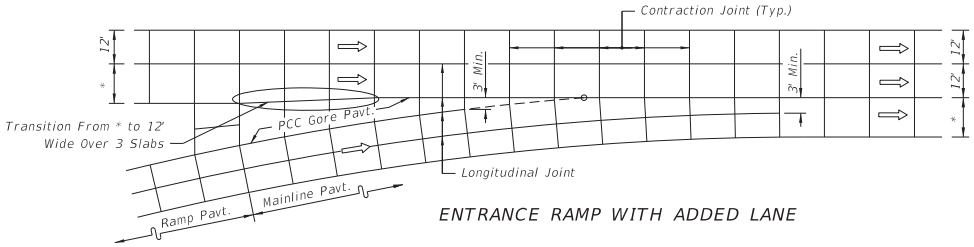


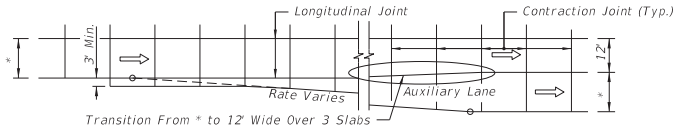
2-THRU LANES WITH SINGLE LANE ENTRANCE RAMP



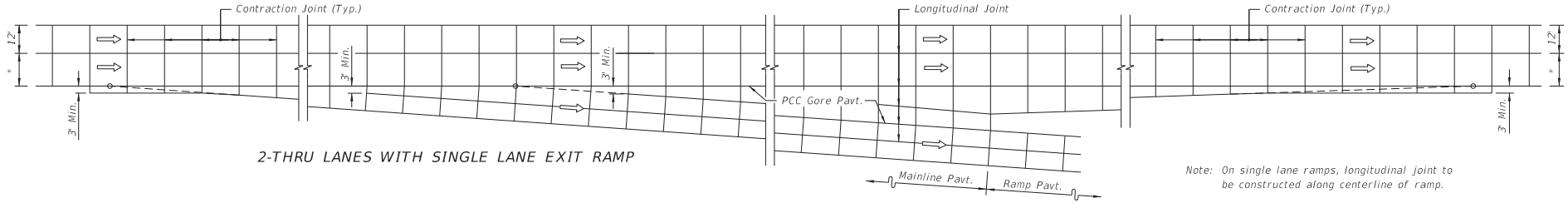
ENTRANCE TAPER WITH AUXILIARY LANE



ENTRANCE RAMP WITH ADDED LANE

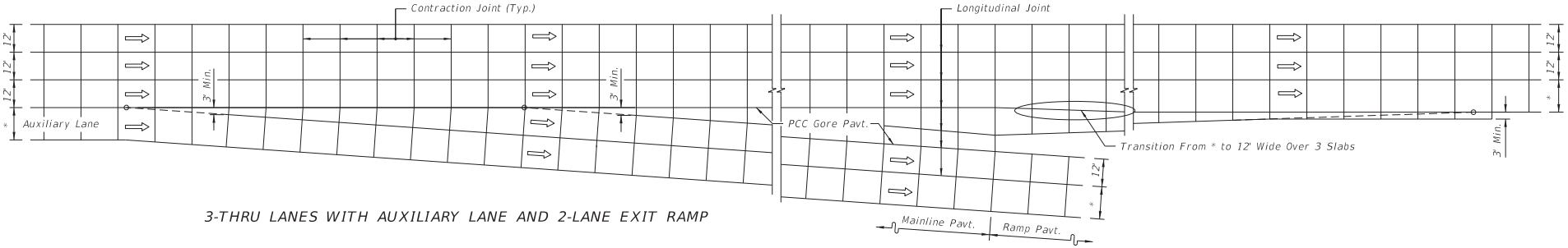


EXIT TAPER WITH AUXILIARY LANE



2-THRU LANES WITH SINGLE LANE EXIT RAMP

Note: On single lane ramps, longitudinal joint to be constructed along centerline of ramp.



3-THRU LANES WITH AUXILIARY LANE AND 2-LANE EXIT RAMP

* 13' with tied Concrete Shoulders or 14' with Asphalt Shoulders.

JOINT LAYOUT AT ENTRANCE AND EXIT RAMP TERMINALS

LAST REVISION	REVISION	DESCRIPTION:				INDEX NO.	SHEET NO.
07/01/09			FDOT DESIGN STANDARDS FY 2012/2013	CONCRETE PAVEMENT JOINTS		305	4

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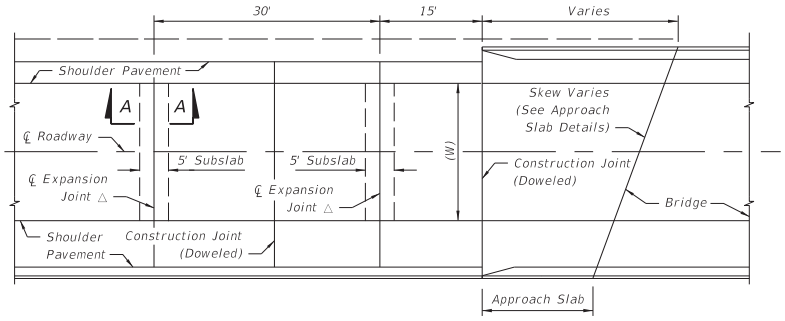


△ Expansion Joints Shall Be Constructed Parallel To The Existing Transverse Pavement Joints On Rehabilitation Projects, And Parallel To The Standard Transverse Pavement Joints Shown In The Plans For New Construction.

PLAN

DESIGN NOTES

1. For rehabilitation projects, the designer must indicate in the plans the number of slabs to be removed, the number of subslabs to be constructed/reconstructed, and the location of expansion joints.

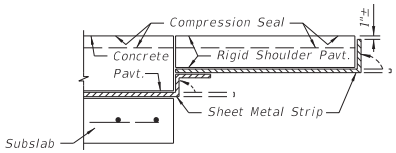
2. Pay quantity of expansion joint to be calculated across pavement at right angles to the centerline of the roadway pavement. Shoulder pavement joint included.

GENERAL NOTES

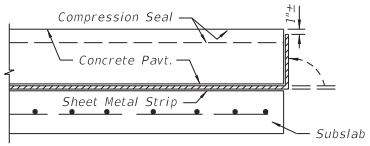
1. The centerline of roadway and the centerline of bridge do not necessarily coincide. Prior to the placement of the expansion joint, the centerline of the roadway pavement shall be determined.

2. For information on other types of concrete pavement joints see Index No. 305.

3. Pay quantity for expansion joint is the length of joint to be constructed across the roadway and shoulder pavements, measured at right angles to the centerline of the roadway. Payment for expansion joint shall be full compensation for joint construction, including reinforced concrete subslab, sheet metal strip and compression seal, but, not including roadway pavement reconstruction associated with joint replacement or reconstruction. Expansion joint to be paid for under the contract unit price for Bridge Approach Expansion Joint, LF.



WITH RIGID SHOULDER PAVEMENT

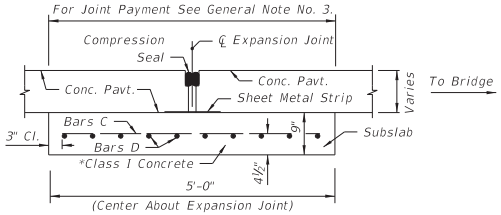


WITH GRASSED SHOULDER OR FLEXIBLE SHOULDER PAVEMENT

Note:
Immediately prior to placing the seal, the joint shall be thoroughly cleaned of all foreign material. Immediately after the seal is placed, sheet metal strip shall be bent up against the pavement edge.

The sheet metal strip shall be a minimum 16 gage steel, 12" wide and shall be galvanized in accordance with ASTM A-526, Coating Designation G90.

DETAIL SHOWING SHEET METAL STRIP

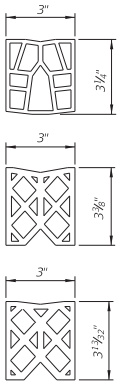


REINFORCING STEEL				
Mark	Size	Spac.	No. Req.	Length
C	5	6"	Varies	4'-6"
D	5	6"	10	W Minus 6"

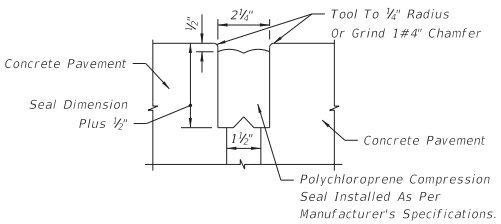
* Finish surface smooth. Cure with heavy coating of wax base white pigmented curing compound. Apply second application immediately prior to placing pavement.

SECTION AA

EXPANSION JOINT



OPTIONAL SEALS



Note: All contacting surfaces between the compression seal and concrete shall be thoroughly coated with a lubricant-adhesive.

JOINT DIMENSIONS

COMPRESSION SEAL DETAIL

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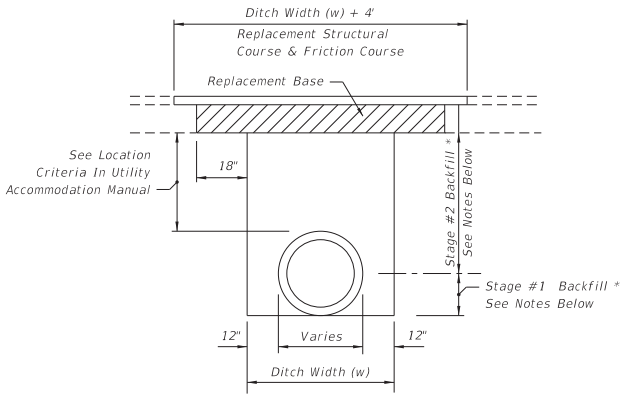
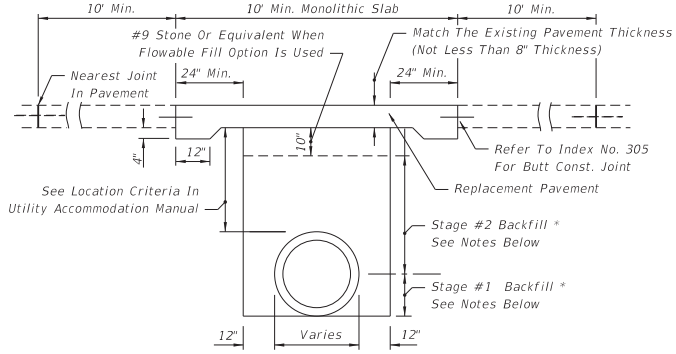
LAST REVISION	REVISION	DESCRIPTION:				
04			FDOT DESIGN STANDARDS FY 2012/2013	BRIDGE APPROACH EXPANSION JOINT CONCRETE PAVEMENT	INDEX NO. 306	SHEET NO. 1





FLEXIBLE PAVEMENT NOTES

PAVEMENT REMOVAL AND REPLACEMENT

Pavement shall be mechanically sawed.

The replacement asphalt shall match the existing structural and friction courses for type and thickness in accordance with current FDOT asphalt mix specifications

The new base materials shall be either of the same type and composition as the materials removed or of equal or greater structural adequacy (See Index No. 514).

BACKFILL

COMPACTED AND STABILIZED FILL OPTION

Backfill material shall be placed in accordance with Section 125 of the Standard Specifications.

In Stage #1, construct compacted fill beneath the haunches of the pipe, using mechanical tamps suitable for this purpose. This compaction applies to the material placed beneath the haunches of the pipe and above any bedding.

In Stage #2, construct compacted fill along the sides of the pipe and up to the bottom of the base,with the upper 12" receiving Type B Stabilization. In lieu of Type B Stabilization, the Contractor may construct using Optional Base Group 3.

* FLOWABLE FILL OPTION

If compaction can not be achieved through normal mechanical methods then flowable fill may be used.

Flowable fill is to be placed in accordance with Section 121 of the Specifications, as approved by the Engineer.

Do not allow the utility being installed to float. If a method is provided to prevent flotation from occurring, Stages #1 and #2 can be combined, if approved by the Engineer.

In Stage #1, place flowable fill midway up on both sides of the utility. Allow to harden before placing Stage #2.

In Stage #2, place flowable fill to the bottom of the existing base course.

FLEXIBLE PAVEMENT CUT

RIGID PAVEMENT NOTES

PAVEMENT REMOVAL AND REPLACEMENT

High early strength cement concrete (3000 psi) meeting the requirements of Standard Specification 346 shall be used for rigid pavement replacement.

Pavement shall be mechanically sawed and restored to conform with existing pavement joints within 12 hours. (See Index No. 305)

GRANULAR BACKFILL

Any edgedrain system that is removed shall be replaced with the same type materials. Any edgedrain system that is damaged shall be repaired with methods approved by the Engineer.

Fill material shall be placed in accordance with the Standard Specifications. Fill material shall be special select soil in accordance with Index No. 505.

In Stage #1, construct compacted fill beneath the haunches of the pipe, using mechanical tamps suitable for this purpose. This compaction applies to the material placed beneath the haunches of the pipe and above any bedding.

In Stage #2, construct fill along the sides of the pipe and up to the bottom of replacement pavement.

* FLOWABLE FILL OPTION

If mechanical compaction can not be achieved through normal mechanical methods then flowable fill may be used.

Flowable fill is to be placed in accordance with Section 121 of the Specifications, as approved by the Engineer.

Do not allow the utility being installed to float. If a method is provided to prevent flotation from occurring, Stages #1 and #2 can be combined, if approved by the Engineer.

In Stage #1, place flowable fill midway up on both sides of the utility. Allow to harden before placing Stage #2.

In Stage #2, place flowable fill to the bottom of the stone layer.

RIGID PAVEMENT CUT

GENERAL NOTES

1. The details provided in this standard index apply to cases in which jack and bore or directional boring methods are not required by the Engineer.
2. Flowable fill shall not be placed directly over loose, or high plastic, or muck material (see Index 505) which will cause settlement due to fill weight. Where highly compressible material exists, the amount, shape and depth of flowable fill must be engineered to prevent pavement settlement.
3. These details do not apply to utility cuts longitudinal to the centerline of the roadway which may require the additional use of geotextiles, special bedding and backfill, or other special requirements.
4. Method of construction must be approved by the Engineer.
5. Some pipe may require special granular backfill up to 6" above top of pipe. Geotextiles may be required to encapsulate the special granular material.
6. Where asphalt concrete overlays exist over full slab concrete pavement, the replacement pavement shall have an overlay constructed over the replacement slab. The overlay shall match the existing asphalt pavement thickness. The replacement friction course shall match the existing friction course, except structural course may be used in lieu of dense graded friction course.
7. All shoulder pavement, curb, curb and gutter, and their substructure disturbed by utility trench cut construction shall be restored in kind.
8. The use of flowable fill to reduce the time traffic is taken off a facility is acceptable but must have prior approval by the Engineer. Flowable fill use is allowed only when properly engineered for pavement crossings, whether straight or diagonal, and shall not be installed for significant depths or lengths. The maximum length shall be fifty (50) feet and a maximum depth of six (6) feet unless supported by an engineering document prepared by a registered professional engineer that specializes in soils engineering. The engineering document shall address the evaluation of local groundwater flow interruption and settlement potential.
9. Excavatable flowable fill is to be used when the flowable fill option is selected.
10. When approved by the Engineer, in lieu of the pavement and base, non-excavatable flowable fill may be used for manhole stabilization and ring and cover adjustments. Excavatable flowable fill shall not be used within the limits of the pavement and base.

TRENCH CUTS AND RESTORATIONS ACROSS ROADWAYS

LAST REVISION	REVISION	DESCRIPTION:				INDEX NO.	SHEET NO.
01/01/10			FDOT DESIGN STANDARDS FY 2012/2013	MISCELLANEOUS UTILITY DETAILS		307	1

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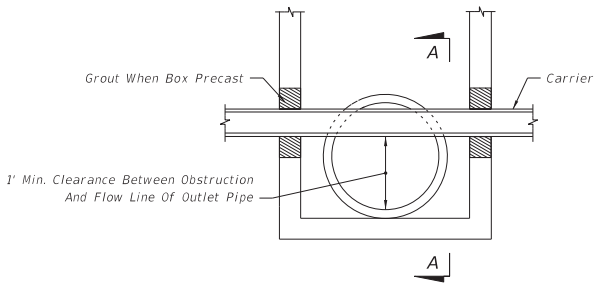


SECTION LONGITUDINAL TO CARRIER PIPE
(Nonpressure Or Nonfluid Carrier Installations)
No Joints Allowed Within Structure

UTILITY CONFLICT CONDITION I

NOTES FOR UTILITY CONFLICT PIPE

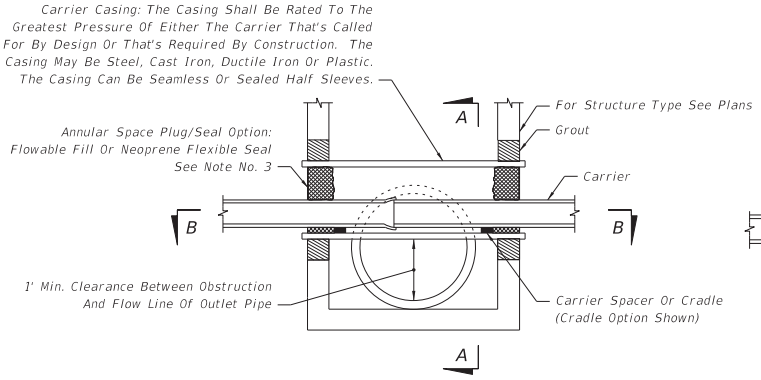
1. These details are for construction field expediency to resolve utility conflicts that cannot be remedied by relocation. For conflicts determined during design, use the construction shop drawings for structure details.

2. Concrete used in conflict structures shall be as specified in ASTM C478. 4000 psi may be used in lieu of Class I concrete.

3. Maximum opening for pipe shall be the pipe OD plus 6". Mortar used to seal the pipe into the opening will be of such mix that shrinkage will not cause leakage into or out of the structure.

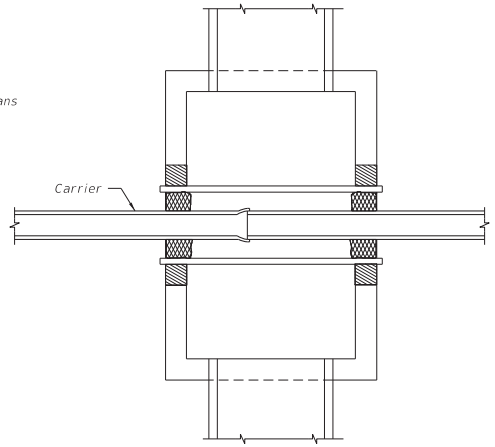
4. If the conflict structure is round or there are multiple inlet or outlet pipes, then the wall section should be reviewed for strength.

5. If during construction or the plans design process it is determined that a potable water supply line must pass though a storm drain structure, it must be in compliance with Chapter 62-555.314 (3) F.A.C. and shown on the design or construction plans and submitted to the Florida Department of Environmental Protection (FDEP) Administrator For Drinking Water in the respective FDEP District for review and comment. This index and rule citation provide accepted methods for addressing conflicts when and where they cannot be reasonably avoided. To be submitted along with the plans shall be a justification describing inordinate cost and the impracticality of avoidance. If identified, properly justified, and accomplished in accordance with this index, approval is granted. Upon request, the Utility Agency Owner (UAO) must provide support data on the cost of relocation or adjustment to the FDOT for submittal to the FDEP. See the following web site for District FDEP Drinking Water Contacts: www.dep.state.fl.us/water/drinkingwater/index.htm and click on "Organization" on the menu to the right.

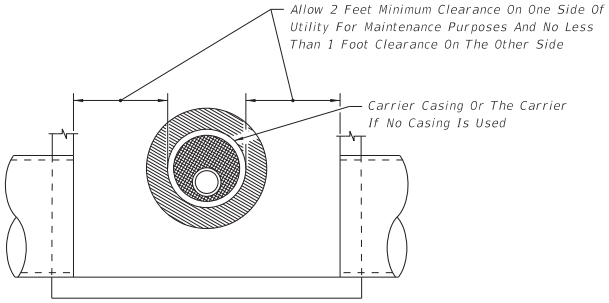


SECTION LONGITUDINAL TO CARRIER PIPE
(Pressure Or Fluid Carrier Installations)

UTILITY CONFLICT CONDITION II



SECTION BB

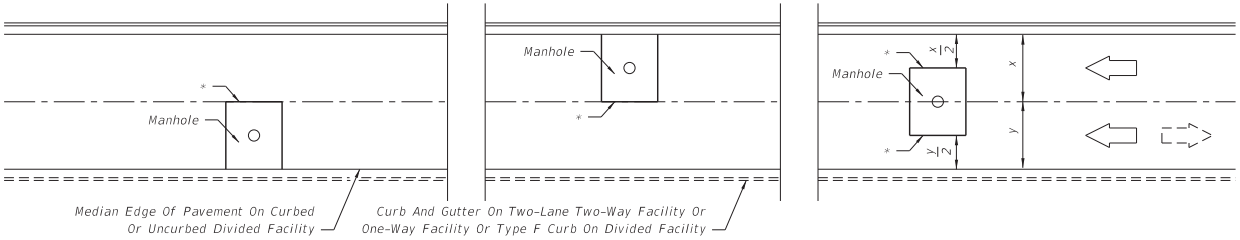


DESIGNER'S NOTE

"Sumped" Conflict Manholes Shall Not Be Used Unless The System Is Hydraulically Designed To Account For The Headloss Generated If The Sump Is Completely Blocked

SECTION AA

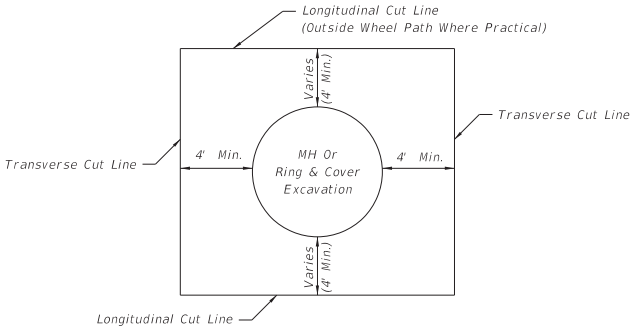
UTILITY CONFLICT PIPES THRU STORM DRAIN STRUCTURES



* Longitudinal Cut Lines For Both Curbed And Uncurbed Facilities Must Coincide With A Regular Seam Or Midlane Point In Order To Be Outside The Wheel Path

PLAN VIEW

FOR TWO OR MORE LANES (TWO LANES SHOWN)



PARTIAL CUTS FOR RING AND COVER ADJUSTMENTS

NOTES

1. No irregular seams are permitted. All seams must be clean sawed.

2. Pavement cut seams for underground utility structures in rigid pavement are the same longitudinally, but the transverse seams shall extend to the nearest existing joint.

3. See Sheet 1 for replacement pavement.

NONTRENCH PAVEMENT CUTS FOR UNDERGROUND UTILITY STRUCTURES IN PAVEMENT

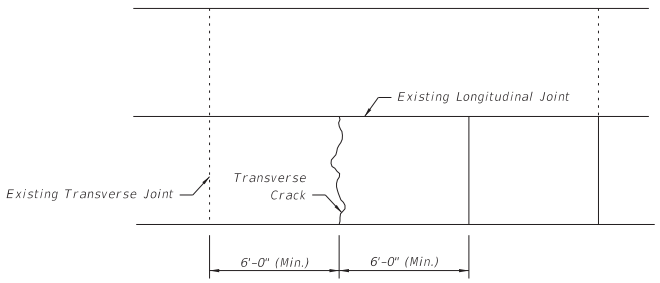


FIGURE 10.2 - REPAIR METHOD: NONE OR CLEAN AND SEAL

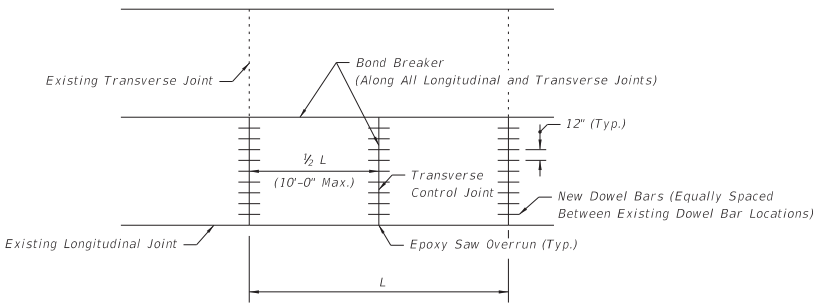


FIGURE 10.3 - FULL SLAB FULL DEPTH REPLACEMENT

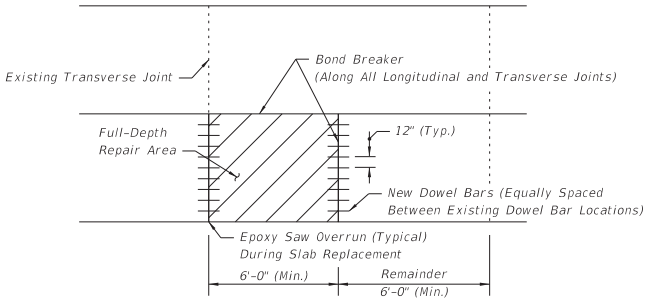


FIGURE 10.4 - PARTIAL SLAB FULL DEPTH REPLACEMENT

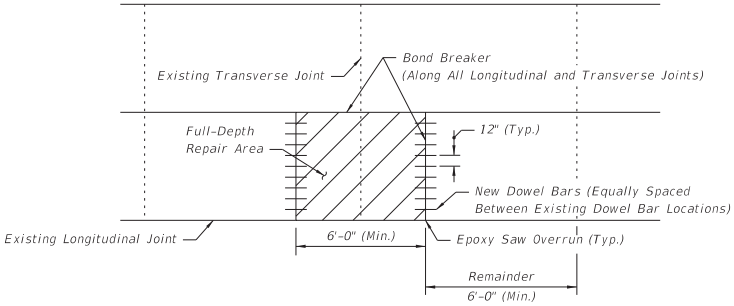


FIGURE 10.5 - FULL-DEPTH REPAIR ON BOTH SIDES OF THE JOINT

GENERAL NOTES

1. For Repair and Replacement Criteria see Sheet 2.

2. Full depth repairs consist of removing and replacing at least a portion of the existing slab to the bottom of the concrete.

3. Repair boundaries shall be sawed full-depth with diamond saw blades. On hot days, it may not be possible to make this cut without first making a wide, pressure relief cut within the repair boundaries. A carbide-tipped wheel saw may be used for this purpose, but the wheel saw must not intrude on the adjacent lane, unless the lane is slated for repair. The wheel saw cuts produce a ragged edge that promotes excessive spalling along joints. Hence, if wheel saw cuts are made, diamond saw cuts must be made 18 in. outside the wheel saw cuts. To prevent damage to the base, the wheel saw must not be allowed to penetrate more than 0.5 in. into the base.

4. No additional base or subgrade material shall be added and all loose base or subgrade material shall be removed prior to placement of the new concrete slab. The concrete slab shall be placed to the full depth of the material removed. No additional compensation will be allowed for additional concrete required to bring proposed concrete slab up to finished grade.

5. Removal of the damaged concrete pavement shall be by lifting. Any good concrete pavement which is damaged during removal of damaged areas shall be removed and replaced by the contractor at his expense.

6. If the roadway contract includes grinding, then the slab replacement shall be performed first.

7. During slab replacement operations, fill any saw cut over runs into adjacent slabs with epoxy.

SLAB REPAIR AND REPLACEMENT CRITERIA

DISTRESS PATTERN	SEVERITY/DESCRIPTION		REPAIR METHOD	REFERENCE
CRACKING				
Longitudinal	Light	<⅛", no faulting, spalling <½" wide	None	Figure 10.2
	Moderate	⅛" <width <½", spalling <3" wide	Clean and Seal	Figure 10.2
	Severe	width >½", spalling >3" faulting >½"	Replace	Figure 10.3
Transverse	Light	<⅛", no faulting, spalling <½" wide	None	Figure 10.2
	Moderate	⅛" <width <½", spalling <3" wide	Clean and Seal	
	Severe	width >½", spalling >3" faulting >½"	Replace	Figure 10.3, 10.4 and 10.5
Corner Breaks	A corner of the slab is separated by a crack that intersects the adjacent longitudinal and transverse joint, describing an approximate 45° angle with the direction of traffic.		Full Depth	Figure 10.4 and 10.5
Intersecting Random Cracks (Shattered Slab)	Cracking patterns that divide the slab into three or more segments.		Full Depth	Figure 10.3 and 10.4
JOINT DEFICIENCIES				
Spall Nonwheel Path	Light	spall width <1½", < ⅓ slab depth, <12" in length	None	Figure 10.4 and 10.5
	Moderate	1½" <spall width <3", < ⅓ slab depth, <12" in length	None	Figure 10.4 and 10.5
	Severe	spall width >3" or length >12"	Full Depth	Figure 10.4 and 10.5
Spall Wheel Path	Light	spall width <1½", <than ⅓ slab depth, <12" in length	None	Figure 10.4 and 10.5
	Moderate	1½" <spall width <3", < ⅓ slab depth, <12" in length	Full Depth	Figure 10.4 and 10.5
	Severe	spall width >3" or length >12"	Full Depth	Figure 10.4 and 10.5
SURFACE DETERIORATION				
Pop Outs Nonwheel Path	Small pieces of surface pavement broken loose, normally ranging from 1 to 4 in. diameter and ½ to 2 in. in depth.			
	Light	Not deemed to be a traffic hazard	Keep under observation	
	Severe	Flying debris deemed a traffic hazard	Full Depth	Figure 10.4
Pop Outs Wheel Path	Small pieces of surface pavement broken loose, normally >3" diameter and 2" in depth.			
	Light	Deemed to be a traffic hazard	Full Depth	Figure 10.4
	Severe	Flying debris deemed a traffic hazard	Full Depth	Figure 10.4
MISCELLANEOUS DISTRESS				
Faulting	Elevation differences across joints or cracks.			
	Light	Faulting <4/32"	None	
	Moderate	4 <Faulting <16/32"	Grind	
	Severe	Faulting >16/32"	Grind	
Lane To Shoulder Drop-Off	Light	0 <drop-off <1"	None	N/A
	Moderate	1" <drop-off <3"	Build Up	
	Severe	drop-off >3 "	Build Up	
Water Bleeding Or Pumping	Seeping or ejection of water through joints or cracks.		Install appropriate drainage, edge drain, permeable subbase, reseal joints, etc.	N/A
Blowups	Upward movement at transverse joints or cracks often accompanied by shattering of the concrete.		Full Depth	Figure 10.3 and 10.4

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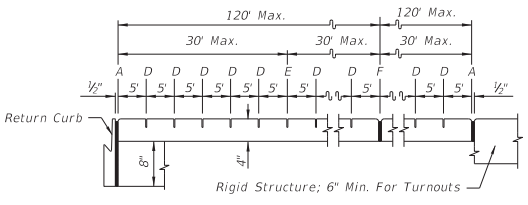
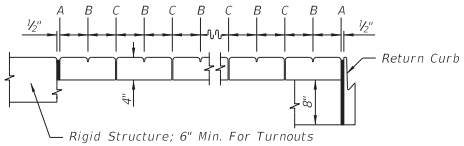


NOTE: "E" Joint(s) Required When Length Exceeds 30'

SAWED JOINTS

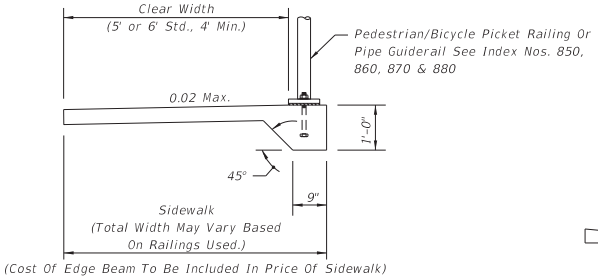


OPEN JOINTS

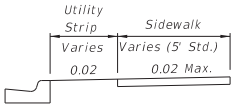
EXAGGERATED SCALE

LONGITUDINAL SECTION

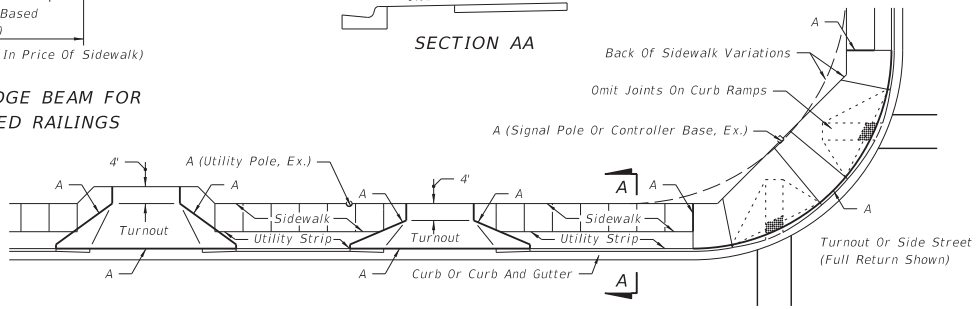
SIDEWALK JOINTS



SIDEWALK WITH EDGE BEAM FOR SURFACE MOUNTED RAILINGS

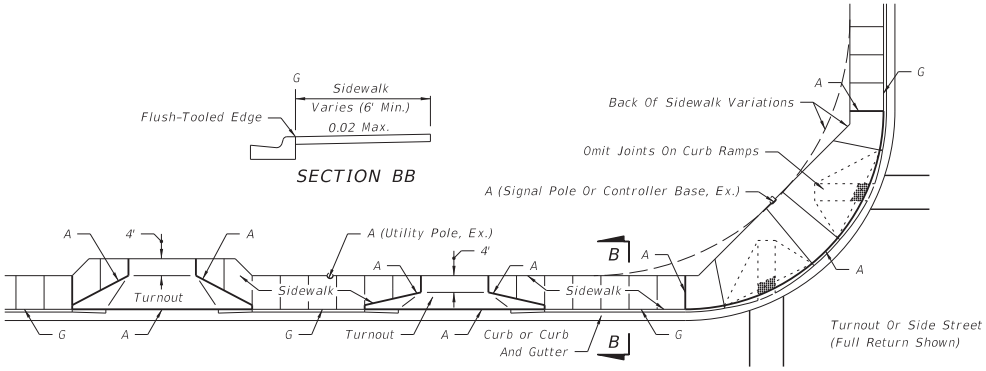


SECTION AA



SIDEWALK WITH UTILITY STRIP

SECTION BB



SIDEWALK WITHOUT UTILITY STRIP

JOINT LEGEND

A- ½" Expansion Joints (Preformed Joint Filler)

B- ⅛" Dummy Joints, Tooled

C- ⅛" Formed Open Joints

D- 3/16" Saw Cut Joints, 1½" Deep (within 96 hours) Max. 5' Centers

E- 3/16" Saw Cut Joints, 1½" Deep (within 12 hours) Max. 30' Centers

F- ½" Expansion Joint When Run Of Sidewalk Exceeds 120'.
Intermediate locations when called for in the plans or at locations as directed by the Engineer.

G- Cold Joint With Bond Breaker, Tooled

NOTES FOR CONCRETE SIDEWALK ON CURBED ROADWAYS

1. Sidewalks shall be constructed in accordance with Section 522 of the FDOT Standard Specifications. Public sidewalk curb ramps shall include detectable warnings and be constructed in accordance with Index No. 304. Detectable warnings are not required where sidewalks intersect urban flared turnouts.
2. Bond breaker material can be any impermeable coated or sheet membrane or preformed material having a thickness of not less than 6 mils nor more than ½".
3. For turnouts see Index No. 515.
4. Construct sidewalks with 1' thick Edge Beam through the limits of any surface mounted Pedestrian/Bicycle Picket Railing or Pipe Guiderail shown in the plans.
5. Sidewalk shall be paid for under the contract unit price for Sidewalk Concrete (___Thick), S.Y.

CONCRETE SIDEWALK FOR CURBED ROADWAYS

LAST REVISION	REVISION	DESCRIPTION:		FDOT DESIGN STANDARDS FY 2012/2013	CONCRETE SIDEWALK	INDEX NO.	SHEET NO.
01/01/10						310	1

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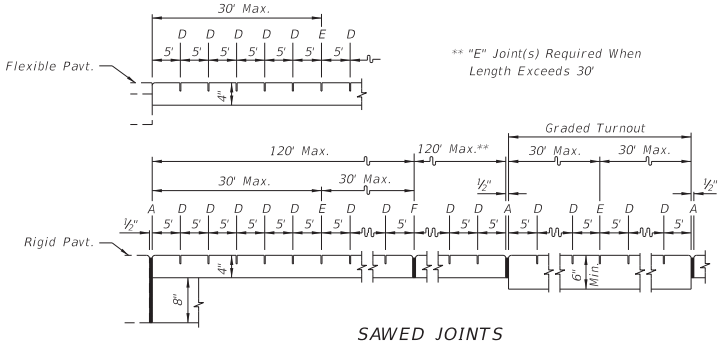
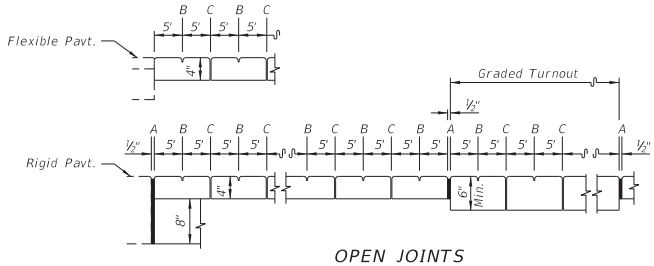


SAWED JOINTS



OPEN JOINTS
EXAGGERATED SCALE

LONGITUDINAL SECTIONS
SIDEWALK JOINTS

JOINT LEGEND

A- ½" Expansion Joints (Preformed Joint Filler)

B- ⅛" Dummy Joints, Tooled

C- 3/16" Formed Open Joints

D- 3/16" Saw Cut Joints, 1½" Deep (96 Hour) Max. 5' Centers

E- ½" Saw Cut Joints, 1½" Deep (12 Hour) Max. 30' Centers

F- ½" Expansion Joint When Run Of Sidewalk Exceeds 120'. Intermediate locations when called for in the plans or at locations as directed by the Engineer.

NOTES FOR CONCRETE SIDEWALKS ON UNCURBED ROADWAYS

1. Sidewalks shall be constructed in accordance with Section 522 of the FDOT Standard Specifications.

2. Provide detectable warnings that extend the full width of the sidewalk and 24" deep from the edge of pavement where sidewalks adjoin the following vehicular ways:

   -side roads and streets
   -driveways with signalized entrances
   -driveways with entrance volumes greater than 600vpd
   -driveways with entrance speeds of 25 mph or greater
   -right in-right out composite driveways

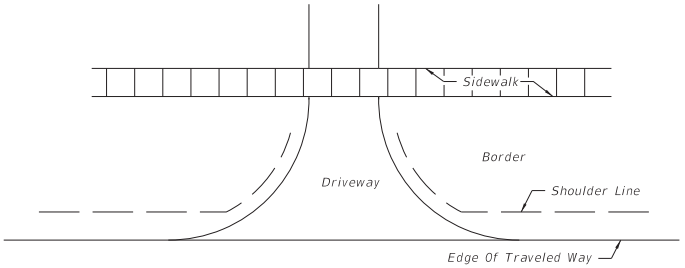
   Detectable warning surfaces shall conform to the requirements described in the General Notes of Index 304. To the extent practical, the rows of truncated domes in a detectable warning surface should be aligned to be perpendicular or radial to the street, roadway, or driveway, as applicable.

   For sidewalks continuous through driveways, detectable warning surfaces are not required.

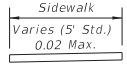
3. For turnouts see Index No. 515.

4. Construct sidewalks with 1' thick Edge Beam through the limits of any surface mounted Pedestrian/Bicycle Picket Railing or Pipe Guiderail shown in the plans. See Sheet 1 for details.

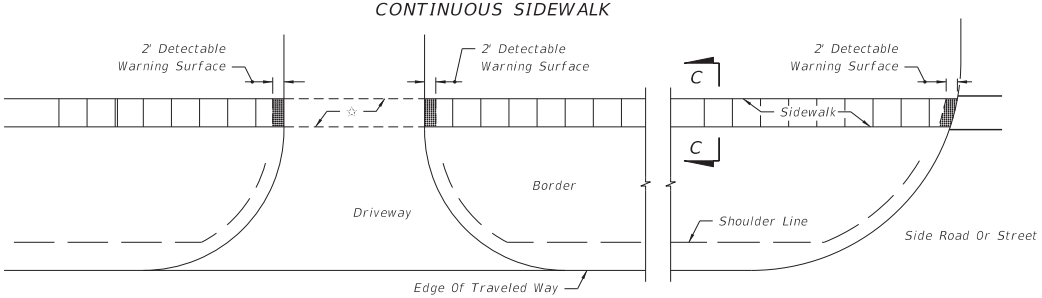
5. Sidewalk shall be paid for under the contract unit price for Sidewalk Concrete (___Thick), SY.



CONTINUOUS SIDEWALK



SECTION CC



☆ When driveway is new construction, reconstruction, or altered, cross slope within this area shall not exceed 0.02. Existing driveways that are not being altered may be left as they are.

DISCONTINUOUS SIDEWALK

PLAN

CONCRETE SIDEWALK FOR UNCURBED ROADWAYS

LAST REVISION	REVISION	DESCRIPTION:				INDEX NO.	SHEET NO.
07/01/09			FDOT DESIGN STANDARDS FY 2012/2013	CONCRETE SIDEWALK		310	2

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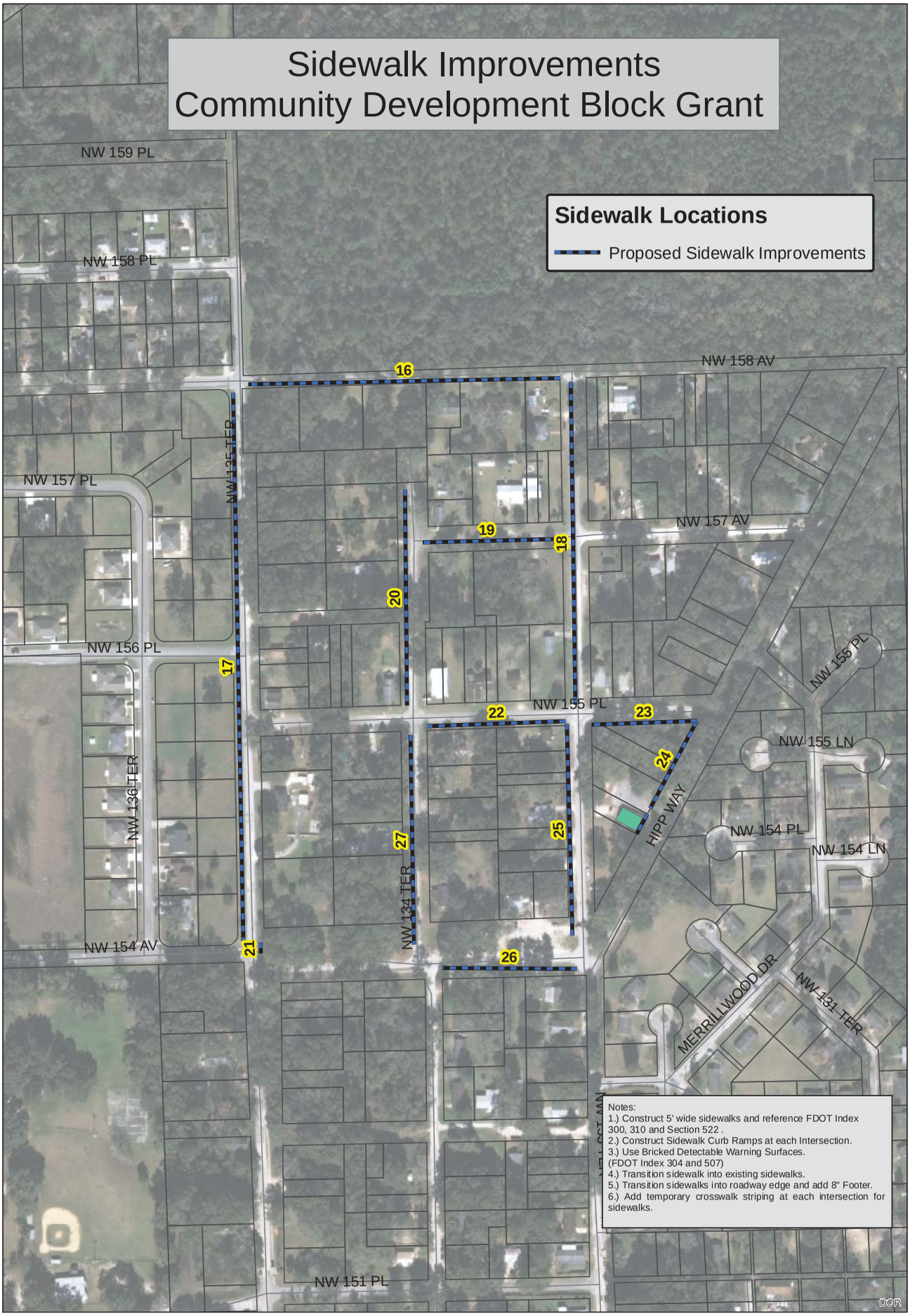
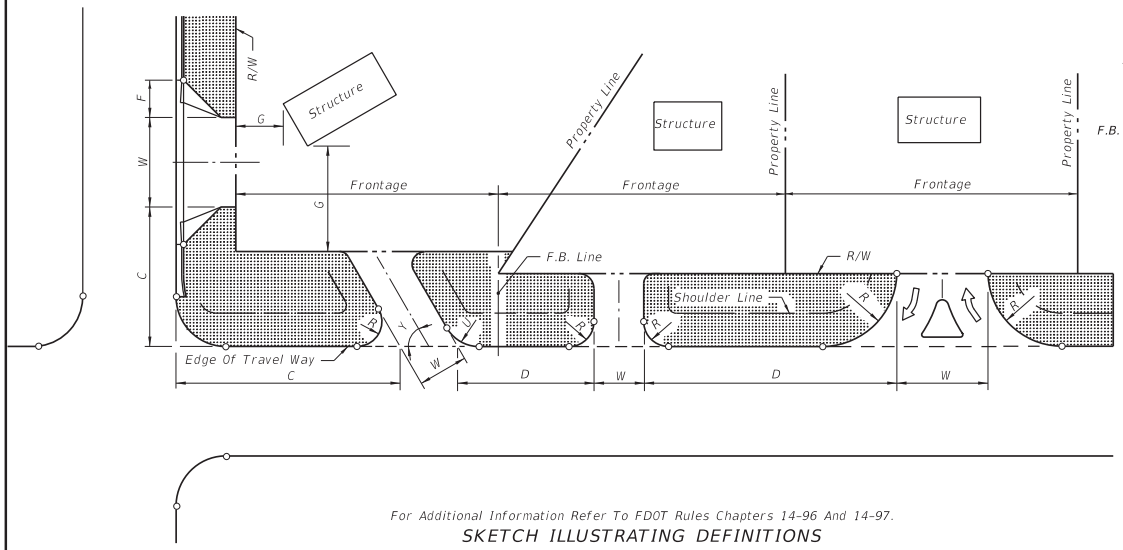


0 100 200 400 600 Feet

1 inch = 200 feet

N

Street Sement Id (16 - 27)



LEGEND

-O-	Return Radius Point Or Flare Point
▦	Buffer Areas
F.B. Line	Frontage Boundary Line
W	Driveway Width
Y	Driveway Angle
C	Corner Clearance
G	Setback
R	Outside Radius
U	Inside Radius
D	Distance Between Connections
F	Flare

For Additional Information Refer To FDOT Rules Chapters 14-96 And 14-97.

SKETCH ILLUSTRATING DEFINITIONS

ELEMENT DESCRIPTION	URBAN (CURB & GUTTER)			RURAL		
	1-20 Trips/Day or 1-5 Trips/Hour	21-600 Trips/Day or 6-60 Trips/Hour	601-4000 Trips/Day ◪ or 61-400 Trips/Hour	1-20 Trips/Day or 1-5 Trips/Hour	21-600 Trips/Day or 6-60 Trips/Hour	601-4000 Trips/Day ◪ or 61-400 Trips/Hour
		2-Way □	2-Way □		2-Way □	2-Way □
CONNECTION WIDTH W	12' Min. 24' Max.	24' Min. 36' Max. ☆	24' Min. 36' Max. ☆	12' Min. 24' Max.	24' Min. 36' Max. ☆	24' Min. 36' Max. ☆
FLARE (Drop Curb) F	10' Min.	10' Min.	N/A	N/A	N/A	N/A
RETURNS (Radius) R & U	N/A	△	25' Min. 50' Std. 75' Max.	15' Min. 25' Std. 50' Max.	25' Min. 50' Std. 75' Max.	25' Min. 50' Std. (Or 3-Centered Curves)
ANGLE OF DRIVE Y		60°-90°	60°-90°		60°-90°	60°-90°
DIVISIONAL ISLAND (Throat Median)		4'-22' Wide	4'-22' Wide		4'-22' Wide	4'-22' Wide
SETBACK G	12' Min., All categories. See General Note No. 5.					

◪ Street or road intersection design, with possible auxiliary lanes and channelization, may be necessary. Intersection design, with possible auxiliary lanes and channelization, should be considered for connections with more than 4000 trips/days.

□ "2-Way" refers to one "in" movement and one "out" movement i.e., not exclusive left or right turn lanes on the connection.

☆ When more than 2 lanes in the turnout connection are required, the 36' max. width may be increased to relieve interference between entering and exiting traffic which adversely affects traffic flow. These cases require documented site specific study and design.

△ Small radii may be used in lieu of flares as approved by the Department.

DESIGN NOTE: 1-Way connections will be designed to effectively eliminate unpermitted movements.

NOT INTENDED FOR FULL INTERSECTION DESIGN

SUMMARY OF GEOMETRIC REQUIREMENTS FOR TURNOUTS

GENERAL NOTES

1. For definitions and descriptions of access connection "Categories" and access "Classifications" of highway segments, and for other detailed information on access to the State Highway System, refer to FDOT Rule Chapter 14-96, "State Highway Connection Permits Administrative Process" and Rule Chapter 14-97, "State Highway System Access Management Classification System And Standards."

2. For this index the term 'turnout' applies to that portion of driveways, roads or streets adjoining the outer roadway. For this index the term 'connection' encompasses a driveway, street or road and their appurtenant islands, separators, transition tapers, auxiliary lanes, travelway flares, drainage pipes and structures, crossovers, sidewalks, curb cut ramps, signing, pavement marking, required signalization, maintenance of traffic or other means of access to or from controlled access facilities. The turnout requirements set forth in this index do not provide complete intersection design, construction or maintenance requirements.

3. The location, positioning, orientation, spacing and number of connections and median openings shall be in conformance with FDOT Rule Chapter 14-97.

4. On Department construction projects all driveways not shown on the plans are to be reconstructed at their existing location in conformance to these standards, or, in conformance to permits issued during the construction project.

5. Driveways shall have sufficient length and size for all vehicular queueing, stacking, maneuvering, standing and parking to be carried out completely beyond the right of way line. Except for vehicles stopping to enter the highway, the turnout areas and drives within the right of way shall be used only for moving vehicles entering or leaving the highway.

6. Connections with expected daily traffic over 4000 vpd are to be constructed as intersecting streets or roads. The design requirement of this index and that of the local government will be used to select appropriate connection widths, radii and intersection design, subject to the approval of the Department. For connections with expected daily traffic less than 4000 vpd, the Department will determine if drop curbs or radius returns are required in accordance with existing or planned connections. Where radius returns apply, the design requirements of this index and that of the local government will be used to select appropriate connection widths, radii and intersection design, subject to the approval of the Department.

   For connections that are intended to daily accommodate either multi-unit vehicles or single unit vehicles exceeding 30' in length, returns with 50' radii are to be used, unless otherwise called for in the plans or otherwise stipulated by permit. Where large numbers of multi-unit vehicles will use the connection, the connection width and radii are to be increased and auxiliary lanes, tapers, lane flares, separators and/or islands constructed, as determined by the Department to be necessary for safe turning movements.

7. Any connection requiring or having a specified median opening with left turn storage and served directly by that opening shall have radial returns.

8. Where a connection is intended to align with a connection across the highway, the through lanes are to align directly with the corresponding through lanes.

9. For new connections and for connections on all new construction and reconstruction projects, pavement materials and thicknesses shall meet the requirements applicable to either that detailed for "Urban Flared Turnouts", or, that described in "Table 515-1" for connections with radial returns and/or auxiliary lanes.

10. The responsibility for the cost of construction or alteration to an access connection shall be in accordance with FDOT Rule Chapter 14-96.

DESIGN NOTES

1. Prior to the adoption of FDOT Rules Chapters 14-96 and 14-97, connections to the State Highway System were defined and permitted by Classes. Connections have been redfined by Categories under Rule 14-96; and, the term "Class" has been applied to highway segments of the State Highway System as defined under Rule 14-97.

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Footnotes:

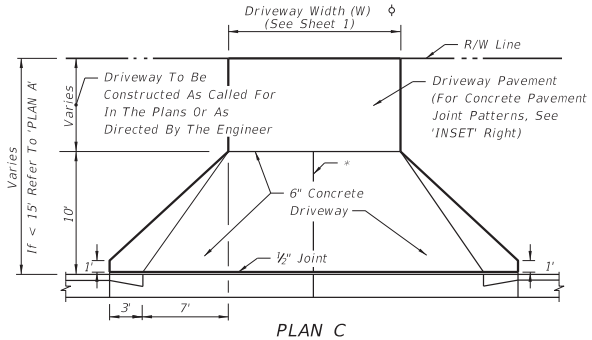
All ½" joints shall be constructed with preformed joint filler.

* ⅛" Open joints placed at equal (20' max.) intervals for driveways over 20' wide. Joints in curb and gutter to match joints in driveways.

△ When connecting to sidestreet curb and gutter sections, the no drop curb limits should extend back to the sidestreet radius point. With or without curb and gutter, no driveway should encroach on the corner radius.

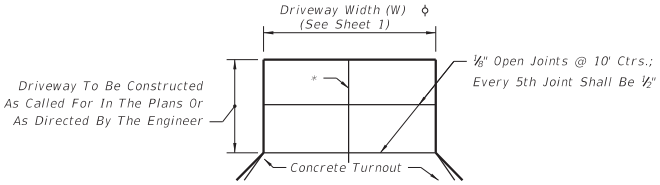
ϕ Driveways (6" concrete) shall be of a uniform width (W) to the right of way line.

(– – –) Alpha-numeric identification of a flared driveway type specifically called for in the plans, see sheets 3 and 4.

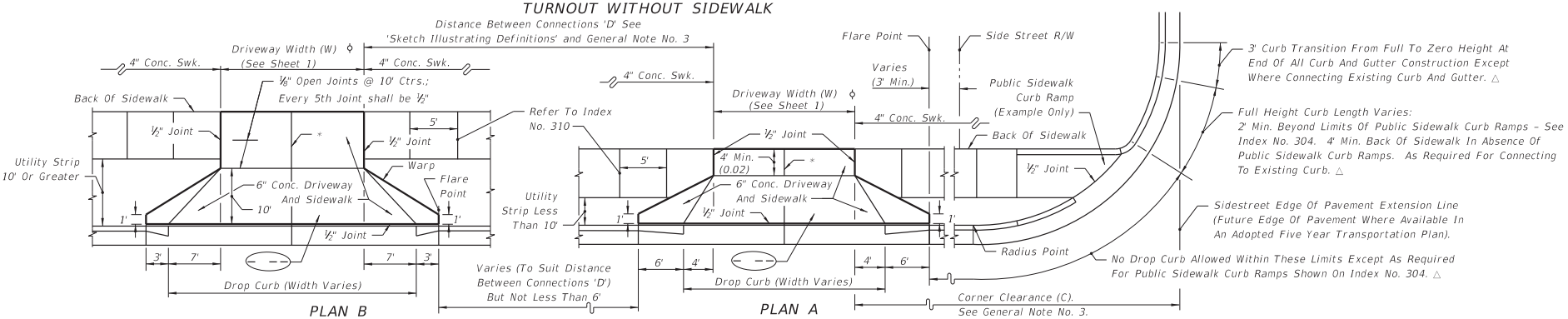


PLAN C

TURNOUT WITHOUT SIDEWALK



JOINT PATTERN WHEN CONCRETE DRIVE CONSTRUCTED INSET



PLAN B

TURNOUT WITH SIDEWALK AND UTILITY STRIP (10' OR GREATER)

PLAN A

TURNOUT WITH SIDEWALK AND UTILITY STRIP (LESS THAN 10')

SPECIAL NOTES FOR URBAN FLARED TURNOUTS

1. Driveway 6" concrete pavement and drop curb shall meet the material and construction requirements of Sections 522 and 520 respectively of the FDOT Standard Specifications. The driveway foundation shall meet the requirement of Subarticle 522-4.

2. For details of drop curb and public sidewalk curb ramps refer to Indexes Nos. 300 and 304 respectively.

3. Where turnouts are constructed within existing curb and gutter, the existing curb and gutter shall be removed either to the nearest joint beyond the flare point or to the extent that no remaining section is less than 5' long; and, drop curb constructed in accordance with Notes Nos. 1 and 2.

4. Cost for preformed joint filler shall be included in the cost for the concrete pavement (Concrete Sidewalk, 6" Thick).

5. For turnouts with radial returns see the requirements under the "Summary Of Geometric Requirements For Turnouts", the "General Notes", the details of "Rural Turnout Construction" and the detail of "Limits Of Clearing & Grubbing, Stabilization And Base At Intersections".

6. Department maintenance of pavement shall extend out to the right of way or 2' back of sidewalk, whichever distance is less.

7. The maintenance and operation of highway lighting, traffic signals, associated equipment, and other necessary devices shall be the responsibility of a public agency.

8. All pavement markings on the State highways, including acceleration and deceleration lane markings, and signing installed for the operation of the State highway shall be maintained by the Department.

9. All signing and marking installed for the operation of the connection (such as stop bars and stop signs for the connection) shall be the responsibility of the permittee.

10. Turnouts will be paid for under the contract unit price for Concrete Sidewalk (6" Thick), SY.

11. All sidewalk surfaces crossing driveways with a cross slope shown in this Index to be 0.02 shall be 0.02 Maximum.

DESIGN NOTES FOR URBAN FLARED TURNOUTS

1. Driveways indicated as 'Adverse Applications' are those with slopes that can cause overhang drag for representative standard passenger vehicles under fully loaded conditions; or, those with slopes that can cause drivers who are leaving the roadway to slow or pause to the extent that traffic demand volumes will be impeded.

   Driveways indicated as 'Marginal Applications' are those with slopes that can cause overhang drag for representative standard passenger vehicles under fully loaded conditions when the driveway is located on the low side of fully superelevated roadways.

   Driveways indicated as 'General Applications' are those with slopes that can readily accommodate representative standard passenger vehicles and those that can accommodate representative standard trucks, vans, buses and recreational vehicles operating under normal crown and superelevation conditions.

2. The standard flared driveways on this index may not accommodate vehicles with low beds, low undercarriage or low appendage features. Where such vehicles are design vehicles, driveways are to have site specific flare designs or Category III designs.

3. When specific flare type driveways are to be constructed, the type shall be designated in the plans using the assigned alpha-numeric designation.

Note: See sheet 1 for 'GENERAL NOTES'

URBAN FLARED TURNOUTS

LAST REVISION	REVISION	DESCRIPTION:		FDOT DESIGN STANDARDS 2013	TURNOUTS	INDEX NO.	SHEET NO.
07/01/12						515	2

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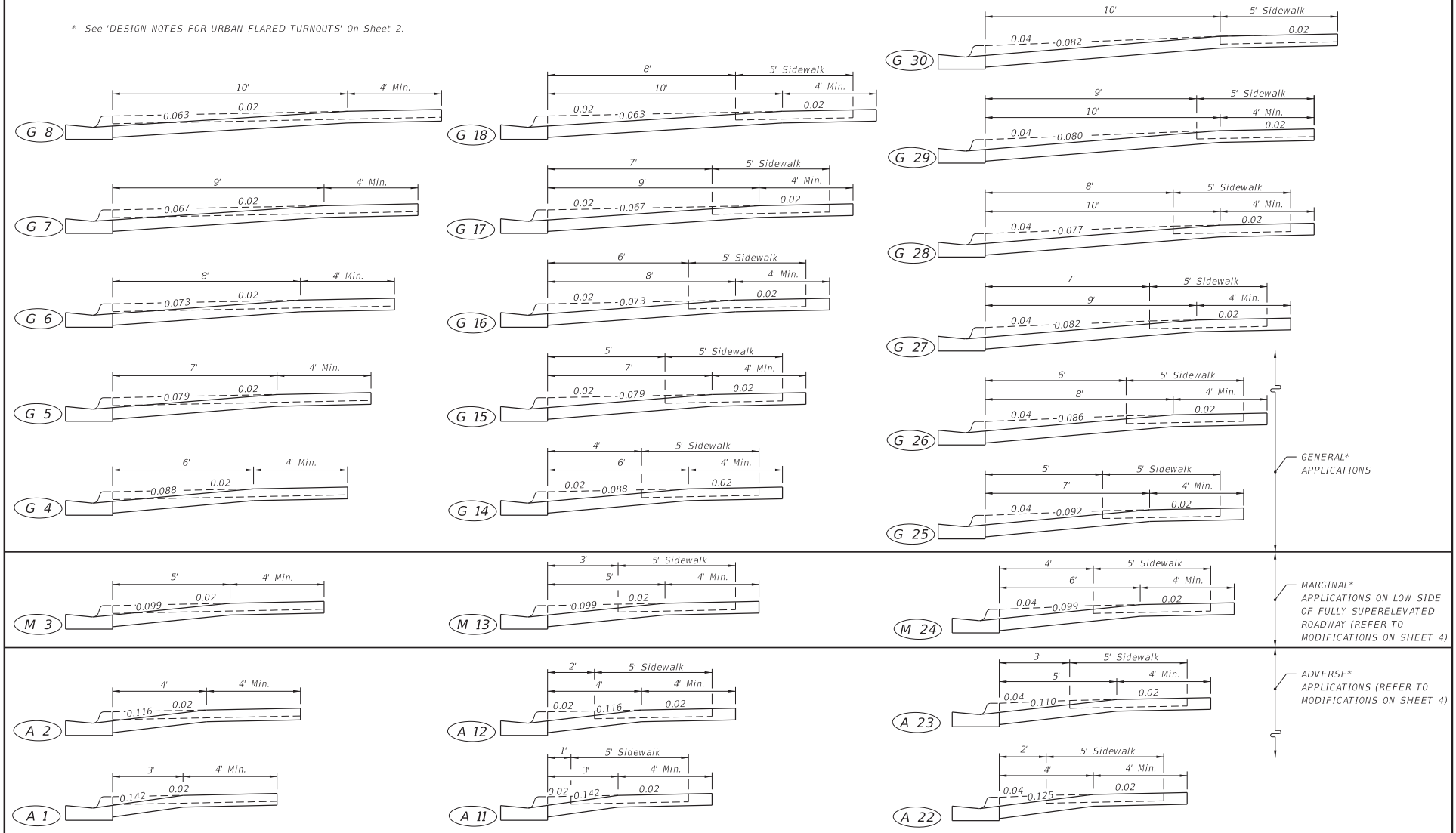
* See 'DESIGN NOTES FOR URBAN FLARED TURNOUTS' On Sheet 2.



DRIVEWAY SECTIONS ON CURBED FACILITIES WITH SIDEWALKS

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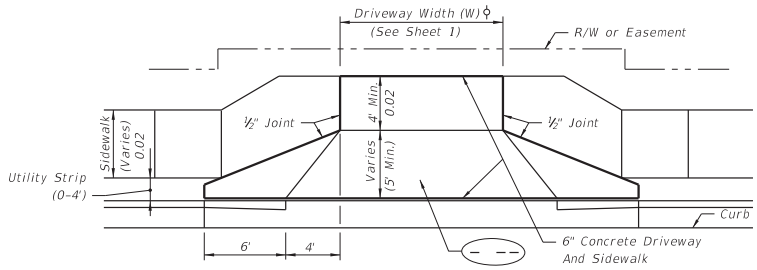
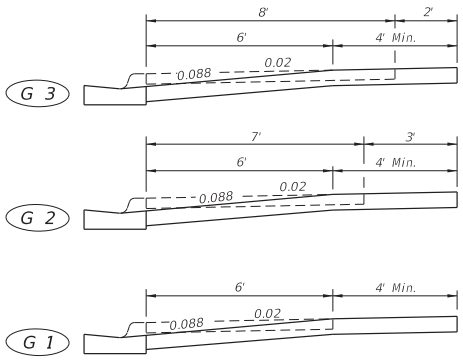
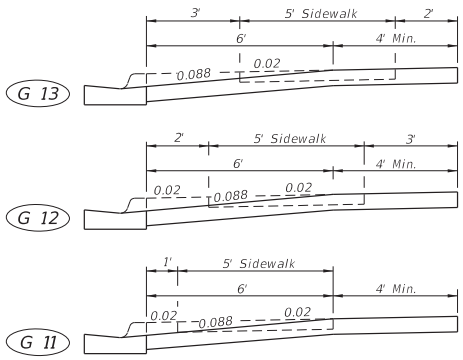
LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
07/01/12			FDOT DESIGN STANDARDS 2013	TURNOUTS	515	3

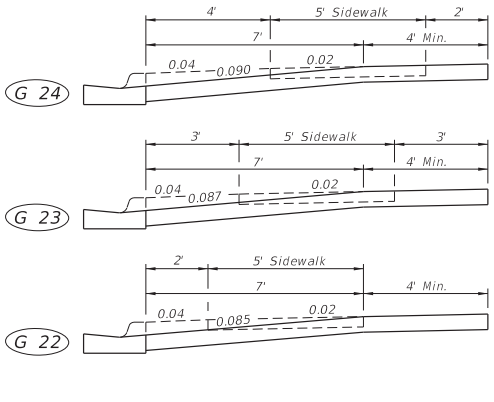


PLAN

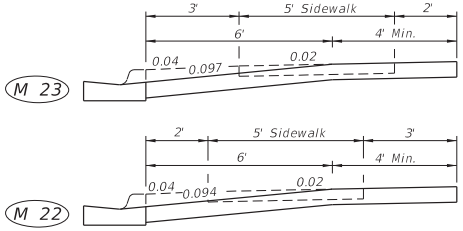
MODIFICATIONS OF 'ADVERSE' AND 'MARGINAL' APPLICATIONS





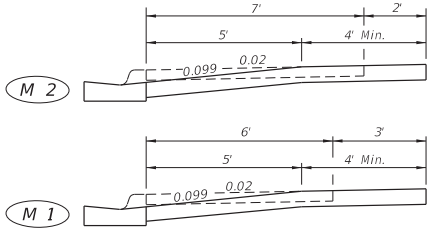


ADVERSE* AND MARGINAL* SECTIONS MODIFIED TO ACHIEVE GENERAL* APPLICATION

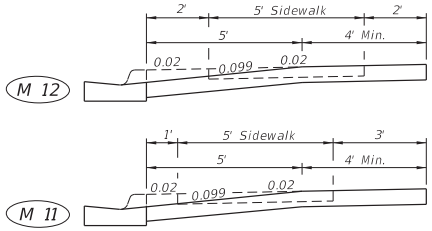


ADVERSE* SECTIONS MODIFIED TO ACHIEVE MARGINAL* APPLICATION

SIDEWALK WITH UTILITY STRIP ON 0.04 SLOPE



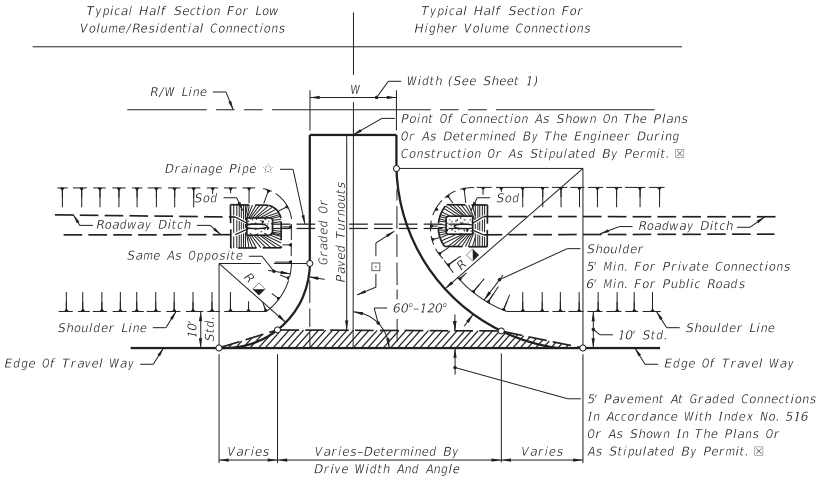
SIDEWALK ADJACENT TO CURB



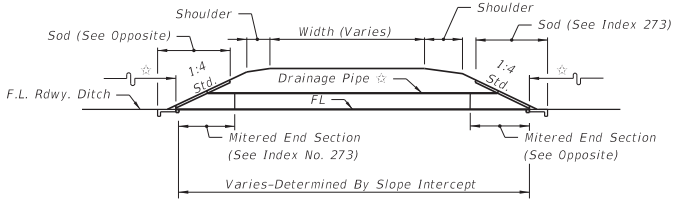
SIDEWALK WITH UTILITY STRIP ON 0.02 SLOPE

* See 'DESIGN NOTES FOR URBAN FLARED TURNOUTS' On Sheet 2.

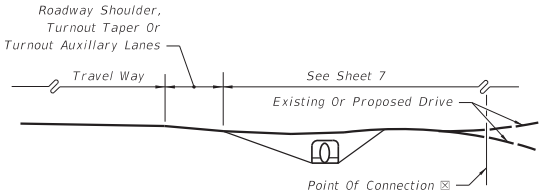
MODIFICATIONS TO ADVERSE AND MARGINAL SECTIONS



PLAN

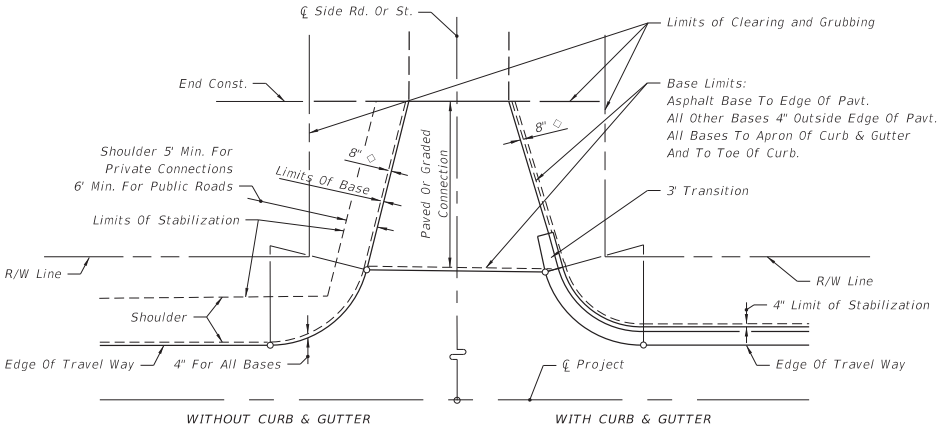


DRAINAGE SECTION



TURNOUT PROFILE AND END VIEW

RURAL TURNOUT CONSTRUCTION



PLAN

LIMITS OF CLEARING & GRUBBING, STABILIZING AND BASE AT INTERSECTIONS

INTERSECTIONS NOTES:

○ Return Radius Point or Transition Point.

◇ 8" Or Match Exist. Stabilization Limits (8" Min.).

DRIVE ENTRANCES NOTES:

☆ Drainage pipe size and length shall be that shown on the plans, or as stipulated by permit, or, as determined by the Engineer during construction. The size shall be at least that established by the FDOT District, but not less than 15" diameter or equivalent. For minimum cover over drainage pipe see Index No. 205. Pipe arch or elliptical pipe may be required to obtain necessary cover. At minimal cover applications a modified pavement apron is permitted. See 'PERMISSIBLE PAVEMENT MODIFICATION' Index No. 273. For spacing between adjacent pipe end treatments see Index No. 273.

⊡ Stable material may be required for graded turnouts to private property as directed by the Engineer in accordance with Section 102-8 of the Standard Specifications.

☒ The 5' pavement at graded connections is not required where there is paved shoulder 4' or more in width. The 5' pavement requirement may be waived for connections serving one or two homes or field entrances with less than 20 trips per day, or 5 trips per hour as approved by permit or by the Engineer, or when not itemized in the plans.

Paved turnouts are to be constructed for all paved connecting facilities. The connecting point will be determined by the Engineer.

Paved turnouts are to be constructed for all business, commercial, industrial or high volume residential graded connecting facilities. The connecting point shall be 30' from edge of travel way or at R/W line, whichever is less.

Paved turnouts are to be constructed for all connecting facilities over 4000 vehicles per day. The connecting point shall be at the R/W line.

◪ See "Summary Of Geometric Requirements For Turnouts" chart for return radii lengths and supplemental information.

○ Return Radius Point or Flare Point.

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MATERIAL TYPES AND THICKNESSES IN DRIVING AREAS FOR RURAL AND URBAN CONNECTIONS

Course	Materials ②	Thickness (in.) ①	
		Connections ③	Roadway ④
Structural	Asphaltic Concrete	1"	1½"
Bases	Optional Base (See Index No. 514)	O.B.G. 1	O.B.G. 3

① Minimum thickness.
② All materials shall be approved by the Department prior to being placed.
③ Connection structure other than traffic lanes. See Notes 1 and 2 below.
④ Travel way flares (bypass lanes), auxiliary lanes serving more than a single connection, and all median crossovers including their auxiliary lanes and/or transition tapers. See Notes 1 and 2 below.

NOTES

1. The pavement should be structurally adequate to meet the expected traffic loads and should not be less than that shown above, except as approved by the Department for graded connections. Other Department approved equivalent pavements may be used at the discretion of the Engineer. For additional information see Index No. 514.

2. Auxiliary lanes and their transition tapers shall be the same structure as the abutting travel way pavement thickness or any of the roadway structures tabulated above, whichever is thicker.

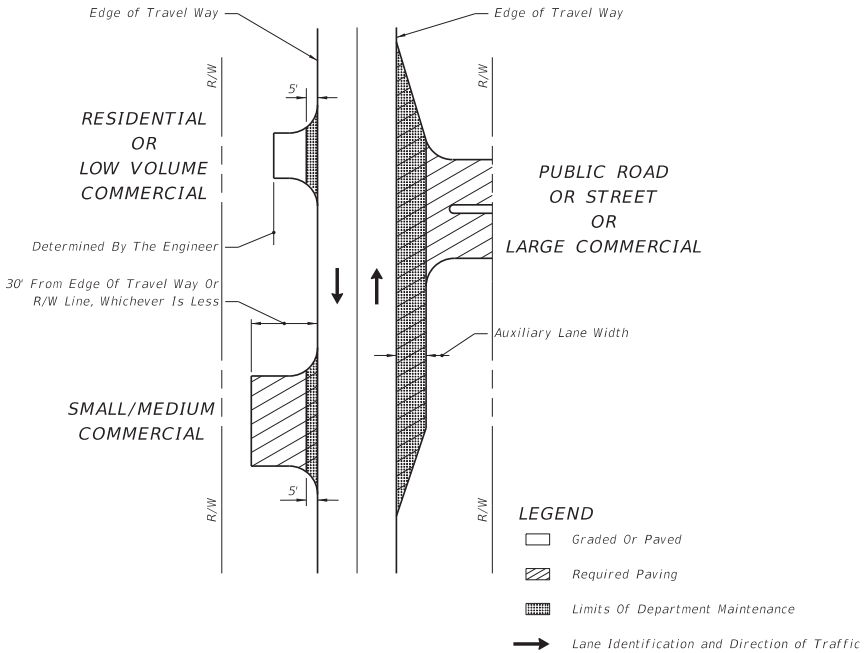
3. If an asphalt base course is used for a turnout, its thickness may be increased to match the edge of travel way pavement thickness in lieu of a separate structural course. 6" of Portland cement concrete will be acceptable in lieu of the asphalt base and structural courses. See Notes 4 and 5 below.

4. A structural course is required for flexible pavements when they are used for auxiliary lanes serving more than a single connection.

5. Connections paved with Portland cement concrete shall be Class NS concrete at least 6" thick. The Department may require greater thickness when called for in the plans or stipulated by permit. Materials and construction are to conform with FDOT Standard Specifications Sections 347, 350 and 522.

6. The Department may require other pavement criteria where local conditions warrant.

PAVEMENT STRUCTURE FOR TURNOUTS AND AUXILIARY LANES
TABLE 515-1



NOTES

1. Auxiliary lane pavements and crossover pavements shall be maintained by the Department.

2. Department maintenance of turnout pavement shall extend out to 5' from edge of the travel way or limits of paved shoulders, and, extend to include auxiliary lanes. The remainder of any turnout paved area on the right of way shall be maintained by the owner or his authorized agent. As a function of routinely reworking shoulders, the Department may grade and shape existing material on nonpaved areas beyond the maintained pavement.

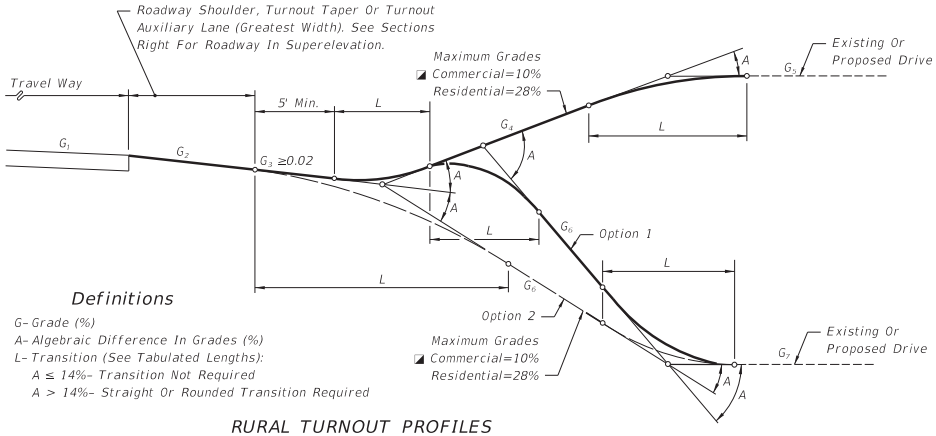
3. Control and maintenance of drainage facilities within the right of way shall be solely the responsibility of the Department, unless specified differently by Department permit.

4. The maintenance and operation of highway lighting, traffic signals, associated equipment, and other necessary devices shall be the responsibility of a public agency.

5. All pavement markings on the State highways, including acceleration and deceleration lane markings, and signing installed for the operation of the State highway shall be maintained by the Department.

6. All signing and marking installed for the operation of the connection (such as stop bars and stop signs for the connection) shall be the responsibility of the permittee.

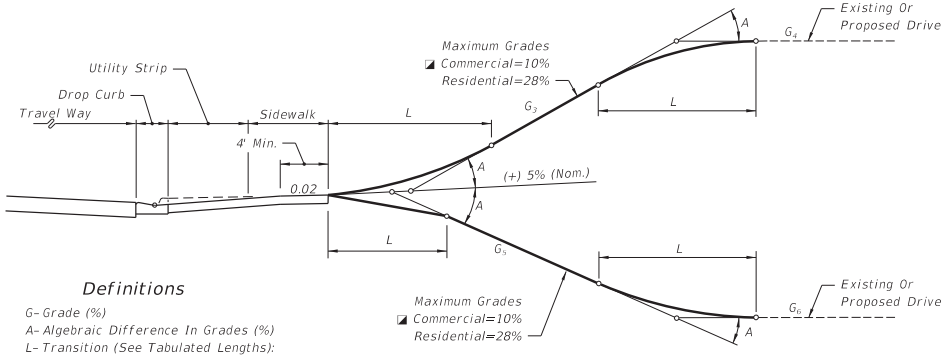
LIMITS OF
CONSTRUCTION AND MAINTENANCE
FOR RURAL CONNECTIONS



Definitions

G- Grade (%)
A- Algebraic Difference In Grades (%)
L- Transition (See Tabulated Lengths):
A ≤ 14%- Transition Not Required
A > 14%- Straight Or Rounded Transition Required

RURAL TURNOUT PROFILES



Definitions

G- Grade (%)
A- Algebraic Difference In Grades (%)
L- Transition (See Tabulated Lengths):
A ≤ 14%- Transition Not Required
A > 14%- Straight Or Rounded Transition Required

URBAN TURNOUT PROFILES

◪ When restoring or reconstructing existing commercial turnout connections on new construction and reconstruction projects, the maximum 10% commercial grade may be exceeded provided this does not create adverse roadway operational or safety impacts. This shall be approved by the District Design Engineer and supported by documented site specific findings.

LENGTHS (L) (FT.)								
A	CRESTS				SAGS			
	STRAIGHT		ROUNDED		STRAIGHT		ROUNDED	
	Desirable	Minimum	Desirable	Minimum	Desirable	Minimum	Desirable	Minimum
6-13%	3	0	5	0	3	0	5	0
14%	3	0	10	0	3	0	10	0
15%	3	2.5	10	3	5	3	10	5
16%	5	3	10	4	6	4	10	6
17%	6	3.5	10	5	8	5	10	7
18%	6	4	10	6	9	6	10	8
19%	7	4.5	10	7	11	7	12	9
20%	8	5	11	8	12	8	13	10
21%	9	5.5	12	9	13	8.5	14	11
22%	10	6	13	10	14	9	16	12
23%	10	6.5	14	10.5	14	9.5	16	12.5
24%	11	7	15	11	15	10	17	13
25%	12	7.5	15	11.5	16	10.5	18	13.5
26%	12	8	16	12	17	11	18	14
27%	13	8.5	17	12.5	17	11.5	19	14.5
28%	14	9	17	13	18	12	20	15
29%	NA	NA	22	14	NA	NA	21	17
30-31%	NA	NA	23	15	NA	NA	22	18
32-33%	NA	NA	24	16	NA	NA	23	20
34-36%	NA	NA	26	17	NA	NA	25	21
37-38%	NA	NA	27	18	NA	NA	26	22
39-41%	NA	NA	29	19	NA	NA	28	24
42-43%	NA	NA	30	20	NA	NA	29	25
44-46%	NA	NA	32	21	NA	NA	31	26
47-48%	NA	NA	33	22	NA	NA	32	27
49-51%	NA	NA	34	23	NA	NA	34	28
52-54%	NA	NA	36	24	NA	NA	35	30
55-56%	NA	NA	37	25	NA	NA	36	31

Rounded: Either circular, parabolic, or spline curvature. The plans or the Engineer may specify a particular type of curvature.

Desirable: Desirable minimum lengths
Minimum: Absolute minimum lengths

{Greater lengths than minimum and desirable are recommended where practical for flatter and smoother profile.}

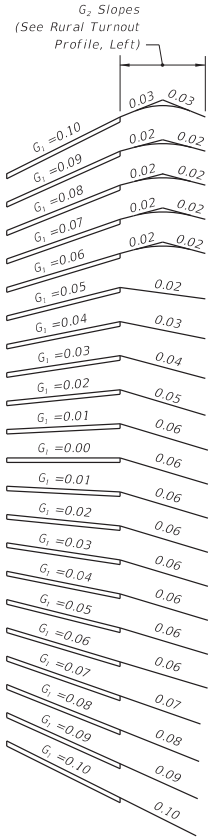
RECOMMENDED TURNOUT PROFILE TRANSITION LENGTHS (L) (FT.)

STORMWATER RUNOFF AND PROFILE OPTION NOTES

1. Turnouts shall neither cause water to flow on or across the roadway pavement, nor cause water ponding or erosion within the State right of way. On all rural turnouts the transition (L) nearest the roadway shall be sloped or crowned to direct stormwater runoff to the roadside ditch. Inlets, flumes or other appropriate runoff control devices shall be constructed when runoff volumes are sufficient to cause erosion of the shoulder. Similar runoff control devices shall be constructed as necessary to properly direct and control the stormwater runoff on urban turnouts.

2. The Option 1 profile is intended for locations where roadway, turnout taper and auxiliary lane stormwater runoff volumes are relatively large. The Option 2 profile is intended for locations where runoff volumes are relatively small and/or where there is no roadside ditch.

TURNOUT PROFILES



ROADWAY PAVEMENT SLOPES AND SLOPES OF ABUTTING RURAL TURNOUT SURFACES (G_2)

SUPERELEVATION SECTIONS

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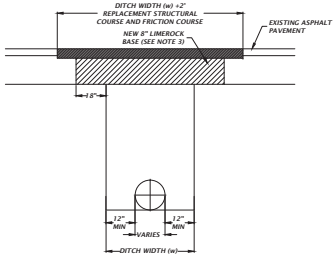
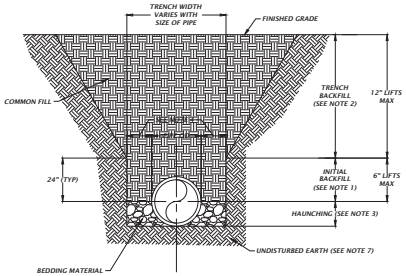


NOTES:

1. SEE BEDDING AND TRENCHING DETAIL FOR SPECIFICATIONS ON BACKFILL OVER A PIPE.
2. NEW 8" LIMEROCK BASE SHALL BE COMPACTED TO NOT LESS THAN 98% OF MAX DENSITY AS SPECIFIED BY THE FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION 200-7.2. THE WIDTH OF THE LIMEROCK BASE SHALL BE THE WIDTH OF THE PIPE TRENCH PLUS 18" ON BOTH SIDES SEE DETAIL.
3. UNLESS OTHERWISE SPECIFIED, MATERIALS AND METHODS OF OPERATION REQUIRED TO INSTALL NEW AND REPLACEMENT PAVEMENT SHALL BE IN ACCORDANCE WITH THE LATEST APPLICABLE REQUIREMENTS OF THE FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
4. PAVEMENT SHALL BE REMOVED TO NEATLY SAWED STRAIGHT EDGES.
5. THE TYPE AND THICKNESS OF THE NEW SURFACE MATERIAL SHALL BE CONSISTENT WITH THAT OF THE EXISTING SURFACE, BUT IN ALL CASES SHALL MEET THE MINIMUM STANDARDS ESTABLISHED BY THE PLANS AND SPECIFICATIONS.
6. THE BACKFILLING AND PAVEMENT REPLACEMENT MUST BE DONE IN ACCORDANCE WITH FDOT INDEX 307.

DETAIL No. 410 - BACKFILL OVER PIPE/PAVEMENT REPAIR DETAIL

NTS

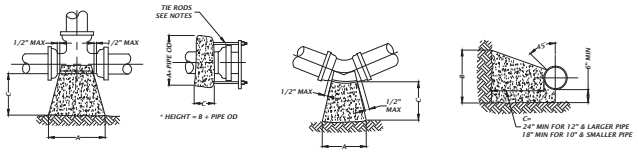


NOTES:

1. INITIAL BACKFILL: COMMON FILL COMPACTED TO 95% (98% UNDER PAVEMENT) OF THE MAXIMUM DENSITY AS PER AASHTO T-180. FROM THE SPRINGLINE OF THE PIPE TO TWO (2) FEET ABOVE THE PIPE THE SOIL SHALL BE CAREFULLY BACKFILLED IN 6" LIFTS AND THE SOIL CONSOLIDATED WITH A HAND OPERATED TAMPING MACHINE (OR AS REQUIRED BY CITY, COUNTY, OR STATE INSPECTORS).
2. TRENCH BACKFILL: COMMON FILL COMPACTED TO 95% (98% UNDER PAVEMENT) OF THE MAXIMUM DENSITY AS PER AASHTO T-180. AFTER PLACEMENT AND COMPACTION OF THE INITIAL BACKFILL, THE BALANCE OF THE BACKFILL MATERIAL MAY BE MACHINE PLACED OR AS REQUIRED BY THE INSPECTOR AND SHALL NOT CONTAIN ANY ROCKS OR DEBRIS.
3. TYPE A BEDDING MATERIAL SHALL CONFORM TO FDOT NO. 57 AGGREGATE.
4. 15" MAX (12" MIN) FOR PIPE DIAMETER LESS THAN 24" AND 24" MAX (12" MIN) FOR PIPE DIAMETER 24" AND LARGER.
5. WATER SHALL NOT BE PERMITTED IN THE TRENCH DURING CONSTRUCTION.
6. ALL PIPE TO BE INSTALLED WITH BELL FACING UPSTREAM TO THE DIRECTION OF THE FLOW.
7. DEPTH FOR REMOVAL OF UNSUITABLE MATERIAL SHALL GOVERN DEPTH OF BEDDING ROCK BELOW THE PIPE. UTILITIES SHALL DETERMINE IN THE FIELD REQUIRED REMOVAL OF UNSUITABLE MATERIAL TO REACH SUITABLE FOUNDATION. THE BOTTOM OF THE TRENCH SHALL NOT BE EXCAVATED BELOW THE SPECIFIED GRADE. IF UNDERCUTTING OCCURS, THE BOTTOM OF THE TRENCH SHALL BE BROUGHT UP TO THE ORIGINAL GRADE WITH APPROVED MATERIAL AND THOROUGHLY COMPACTED TO A MINIMUM OF 95% MODIFIED PROCTOR.
8. FINAL RESTORATION IN IMPROVED AREAS SHALL BE IN COMPLIANCE WITH ALL APPLICABLE REGULATIONS OF GOVERNING AGENCIES.

DETAIL No. 420 - BEDDING AND TRENCHING DETAIL

NTS



THRUST BLOCK FOR TEES AND PLUGS				
	90° BEND			SF BEARING SURFACE
SIZE	A	B	C	
4"	16"	16"	18"	1.78
6"	20"	24"	18"	3.33
8"	26"	32"	18"	5.78
10"	32"	40"	18"	8.89
12"	36"	48"	24"	12.00
14"	40"	56"	24"	15.56
16"	48"	60"	24"	20.00
18"	56"	64"	24"	24.89
20"	60"	76"	24"	31.67
24"	72"	90"	24"	45.00
30"	86"	102"	24"	60.67
36"	116"	108"	24"	86.11

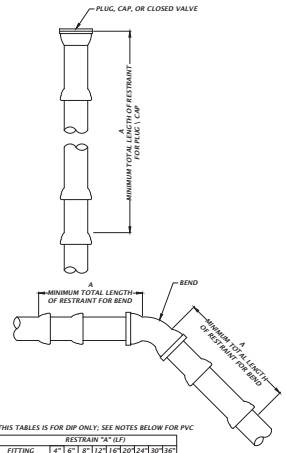
NOTES:

1. ALL BEARING SURFACES TO BE CARRIED TO UNDISTURBED SOIL.
2. THESE TABLES SHOW MINIMUM SIZES FOR THRUST BLOCKS IN GOOD SOIL (A-1 THRU A-3, CLEAN SANDS AND GRAVELS) WITH MINIMUM BEARING CAPACITY OF 2000 psi.
3. POOR SOILS A-4 THRU A-8, SILTY SOILS, CLAYS, MUCK AND PEAT WILL REQUIRE LARGER THRUST BLOCKING.
4. BOTH CONCRETE THRUST BLOCKS AND TIE RODS MUST BE USED WHEN, IN THE JUDGEMENT OF THE ENGINEER, THE NATURE AND CRITICALITY OF AN INSTALLATION IS SUCH AS TO REQUIRE POSITIVE ASSURANCE OF STABILITY.
5. THE USE OF THRUST BLOCKS SHALL BE LIMITED TO SITUATIONS SUCH AS POINT REPAIR WHERE EXPOSING SEVERAL JOINTS OF PIPE IS NOT FEASIBLE DUE TO EXISTING GROUND CONDITIONS.
6. CONCRETE COLLARS WITH TIE RODS MAY BE USED ON DEAD END LINES AT THE CONTRACTOR'S DISCRETION.
   NUMBER OF TIE RODS REQUIRED IS AS FOLLOWS:
   3" - 8" DIAMETER MAIN - 2 TIE RODS REQUIRED PER JOINT (3/4" ROD)
   10" - 12" DIAMETER MAIN - 4 TIE RODS REQUIRED PER JOINT (3/4" ROD)
   14" - 16" DIAMETER MAIN - 6 TIE RODS REQUIRED PER JOINT (3/4" ROD)
   18" - 20" DIAMETER MAIN - 8 TIE RODS REQUIRED PER JOINT (3/4" ROD)
   24" DIAMETER MAIN -12 TIE RODS REQUIRED PER JOINT (3/4" ROD)
   30" - 36" DIAMETER MAIN -14 TIE RODS REQUIRED PER JOINT (1" ROD)
   42" - 48" DIAMETER MAIN -16 TIE RODS REQUIRED PER JOINT (1 1/4" ROD)
   54" DIAMETER MAIN -18 TIE RODS REQUIRED PER JOINT (1 1/4" ROD)
7. MAXIMUM TEST PRESSURE TO BE 150 PSI.

THRUST BLOCK FOR BENDS																
	90° BEND			SF BEARING SURFACE	45° BEND			SF BEARING SURFACE	22-1/2° BEND			SF BEARING SURFACE	11-1/4° BEND			SF BEARING SURFACE
SIZE	A	B	C		A	B	C		A	B	C		A	B	C	
4"	16"	16"	18"	1.78	14"	16"	18"	1.56	14"	16"	18"	1.56	14"	16"	18"	1.56
6"	22"	32"	18"	4.89	16"	18"	18"	2.00	14"	16"	18"	1.56	14"	16"	18"	1.56
8"	32"	36"	18"	8.00	24"	28"	18"	4.67	16"	18"	18"	2.00	14"	16"	18"	1.56
10"	36"	46"	18"	11.50	26"	36"	18"	6.50	20"	24"	18"	3.33	14"	18"	18"	1.75
12"	44"	56"	24"	17.11	32"	40"	24"	8.89	24"	30"	24"	5.00	16"	20"	24"	2.22
14"	52"	62"	24"	22.39	36"	48"	24"	12.00	26"	36"	24"	6.50	20"	24"	24"	3.33
16"	58"	72"	24"	29.00	40"	54"	24"	15.00	32"	38"	24"	8.44	22"	26"	24"	3.97
18"	64"	80"	24"	35.56	46"	60"	24"	19.17	36"	42"	24"	10.50	24"	32"	24"	5.33
20"	72"	88"	24"	44.00	52"	66"	24"	23.83	38"	48"	24"	12.67	26"	36"	24"	6.50
24"	96"	96"	24"	36.89	64"	78"	24"	34.67	46"	56"	24"	17.89	32"	40"	24"	8.89
30"	122"	102"	24"	86.11	72"	94"	24"	47.00	56"	62"	24"	24.11	36"	48"	24"	12.00
36"	166"	104"	24"	123.33	88"	108"	24"	66.00	64"	78"	24"	34.67	44"	54"	24"	16.50

DETAIL No. 430 - THRUST BLOCK DETAILS

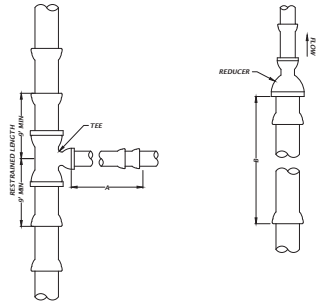
NTS



NOTE: THIS TABLES IS FOR DIP ONLY; SEE NOTES BELOW FOR PVC

RESTRAIN "A" (LF)									
FITTING	4"	6"	8"	12"	16"	20"	24"	30"	36"
11½° BEND	3	4	5	6	8	9	10	12	13
22½° BEND	5	7	9	12	15	17	20	23	26
45°/OFFSET	10	14	18	24	30	35	40	47	53
90° BEND	24	33	42	58	72	85	97	112	126
DEAD END	42	58	75	104	133	157	181	213	243

A=MINIMUM FOOTAGE OF PIPE TO BE RESTRAINED.



NOTES:

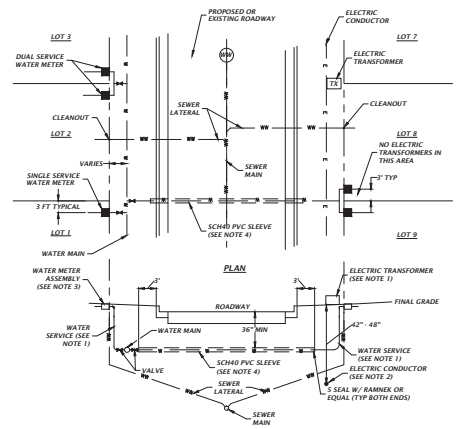
1. THIS TABLE IS BASED ON THE RESTRAINT CALCULATION SOFTWARE PROVIDED FREE OF CHARGE BY EBAA IRON INC. AT http://www.ebaa.com/engineering.htm AND THE FOLLOWING INPUT VARIABLES:
   A. MAXIMUM TEST PRESSURE OF 150 PSI
   B. LAYING CONDITION TYPE 3
   C. POOR SOIL CONDITIONS (SOIL TYPE ML)
   D. USING DIP
   E. 2 FEET OF COVER
   F. HORIZONTAL BENDS ONLY - ENGINEER TO SUBMIT CALCULATIONS FOR VERTICAL RESTRAINTS
   G. SAFETY FACTOR = 1.5 TO 1
2. FOR POLYWRAPPED DIP, MULTIPLY THE FOOTAGE BY 1.50
3. FOR PVC PIPE, MULTIPLY FOOTAGE BY 1.34
4. RESTRAINED PIPE SHALL BE MANUFACTURED RESTRAINED PIPE, PUSH-ON RESTRAINTS OR MECHANICAL JOINT PIPE RESTRAINED BY EBAA MEGALUG.
5. ANY ADDITIONAL FITTINGS WITHIN THE RESTRAINED SECTION SHALL BE RESTRAINED ACCORDINGLY.

	RESTRAIN (LF)	
FITTING SIZE	TEE "A"	REDUCER "B"
4x4	21	*
6x4	10	30
6x6	37	*
8x4	A.T.	54
8x6	28	32
8x8	54	*
12x4	A.T.	90
12x6	11	76
12x8	37	55
12x12	82	*
16x6	A.T.	111
16x8	21	96
16x12	66	56
16x16	109	*
20x6	A.T.	141
20x8	8	130
20x12	51	99
20x16	93	55
20x20	134	*
24x6	A.T.	168
24x8	A.T.	159
24x12	37	134
24x16	77	99
24x20	117	54
24x24	157	*
30x6	A.T.	203
30x8	A.T.	196
30x12	20	177
30x16	57	150
30x20	94	116
30x24	132	75
30x30	189	*
36x6	A.T.	235
36x8	A.T.	229
36x12	7	214
36x16	40	193
36x20	74	166
36x24	109	133
36x30	162	74
36x36	218	*

A.T.=RESTRAINT REQUIRED AT TEE ONLY.
*=NOT APPLICABLE

DETAIL No. 440 - JOINT RESTRAINT

NTS



NOTES:

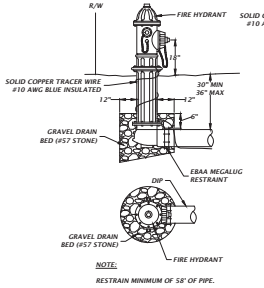
1. WATER METER SERVICE SHALL BE 2" PVC, OATEY PRIMER AND SOLVENT WELD JOINTS AND BE LOCATED TO AVOID CONFLICT WITH LOCATIONS OF ELECTRIC TRANSFORMERS AND FIRE HYDRANTS.
2. ELECTRIC CONDUCTORS MAY BE ON EITHER SIDE OF THE ROADWAY. WATERMAIN SHOULD BE ON THE OPPOSITE SIDE OF TRANSFORMERS.
3. PVC SLEEVE TO BE 4" SCHEDULE 40 PVC SOLVENT WELD.
4. SEAL BOTH ENDS OF 4" SLEEVE WITH RAMNEK OR EQUAL.

DETAIL No. 450 - SUBDIVISION SERVICE CONNECTIONS

NTS

ABBREVIATIONS

DI	DUCTILE IRON
DIP	DUCTILE IRON PIPE
FLG	FLANGED
FT	FOOT
GA	GAUGE
GALV	GALVANIZED
GSP	GALVANIZED STEEL PIPE
GV	GATE VALVE
ID	INSIDE DIAMETER
LF	LINEAR FEET
MAX	MAXIMUM
MIN	MINIMUM
MJ	MECHANICAL JOINT
NTS	NOT TO SCALE
OD	OUTSIDE DIAMETER
R/W	RIGHT OF WAY
SF	SQUARE FEET
SS	STAINLESS STEEL
TYP	TYPICAL

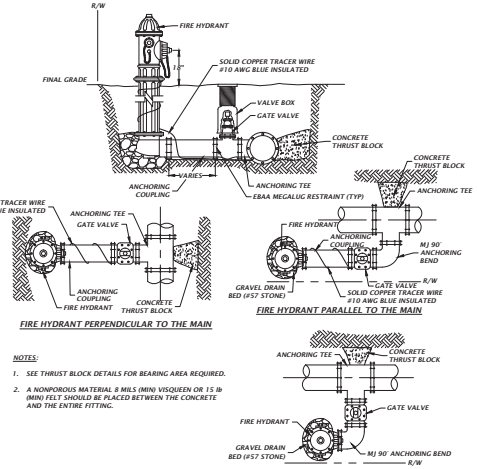


NOTE:

RESTRAIN MINIMUM OF 58' OF PIPE.

DETAIL No. 205 - FIRE HYDRANT (DEAD END)

NTS

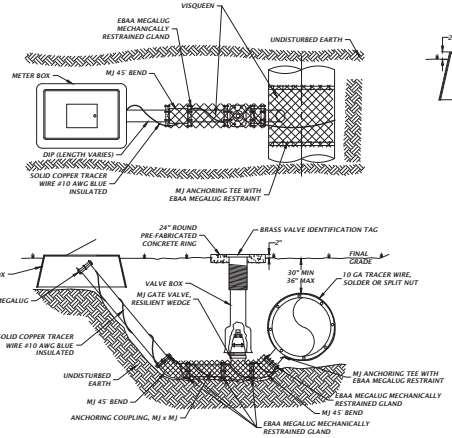


NOTES:

1. SEE THRUST BLOCK DETAILS FOR BEARING AREA REQUIRED.
2. A NONPOROUS MATERIAL 8 MILS (MIN) VISQUEEN OR 15 lb (MIN) FELT SHOULD BE PLACED BETWEEN THE CONCRETE AND THE ENTIRE FITTING.

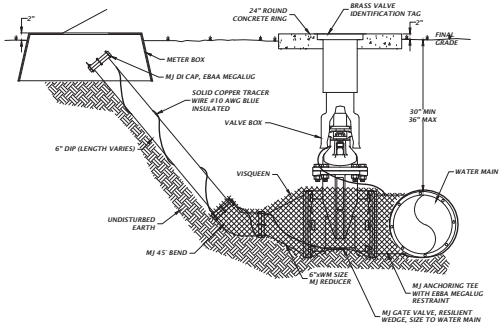
DETAIL No. 210 - FIRE HYDRANT (PERPENDICULAR/PARALLEL TO MAIN)

NTS



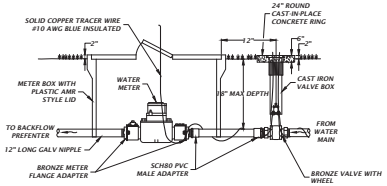
DETAIL No. 215 - 2" AND 3" BLOW-OFF ASSEMBLY

NTS



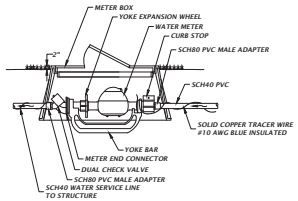
DETAIL No. 220 - 6" BLOW-OFF ASSEMBLY

NTS



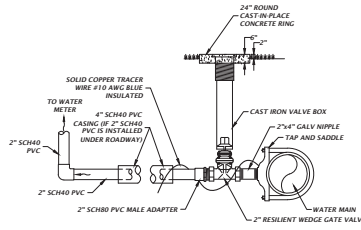
DETAIL No. 225 - 1 1/2" AND 2" METER ASSEMBLY

NTS



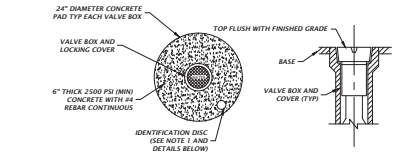
DETAIL No. 230 - 3/4" AND 1" WATER METER ASSEMBLY

NTS



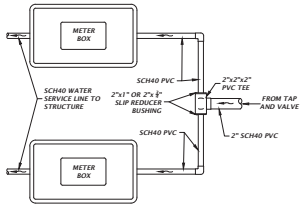
DETAIL No. 235 - 2" WATER SERVICE CONNECTION

NTS



OUTSIDE PAVEMENT

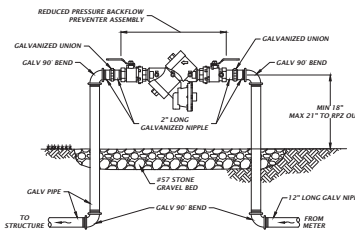
INSIDE PAVEMENT



PLAN VIEW

ABBREVIATIONS

DI	DUCTILE IRON
DIP	DUCTILE IRON PIPE
FLG	FLANGED
FT	FOOT
GA	GAUGE
GALV	GALVANIZED
GSP	GALVANIZED STEEL PIPE
GV	GATE VALVE
ID	INSIDE DIAMETER
LF	LINEAR FEET
MAX	MAXIMUM
MIN	MINIMUM
MJ	MECHANICAL JOINT
NTS	NOT TO SCALE
OD	OUTSIDE DIAMETER
R/W	RIGHT OF WAY
SF	SQUARE FEET
SS	STAINLESS STEEL
TYP	TYPICAL

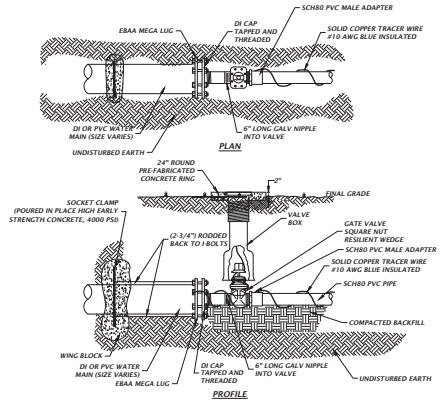


NOTE:

BACKFLOW PREVENTER ASSEMBLY MUST HAVE FREEZE PROTECTION.

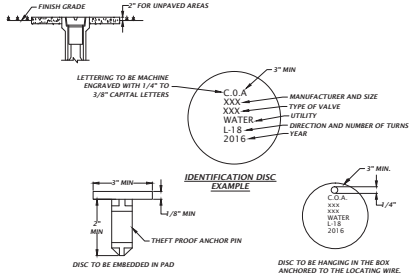
DETAIL No. 240 - 3/4" TO 2" BACKFLOW PREVENTER

NTS



DETAIL No. 245 - WATER MAIN REDUCTION OF LINE SIZE

NTS

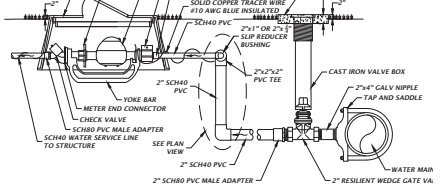


NOTES:

1. BRASS IDENTIFICATION DISC SHALL BE REQUIRED FOR ALL VALVES.
2. CONCRETE PAD SHALL BE POURED-IN-PLACE FOR NEW CONSTRUCTION.

DETAIL No. 250 - VALVE BOX PAD

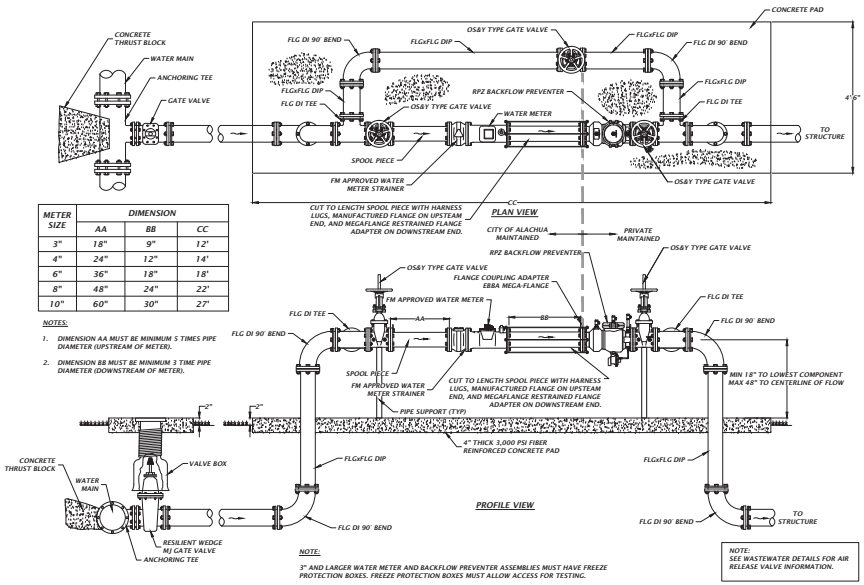
NTS



DETAIL No. 255 - DUAL WATER SERVICE CONNECTION

NTS

01 WATER DETAILS



METER SIZE	DIMENSION		
	AA	BB	CC
3"	18"	9"	12'
4"	24"	12"	14'
6"	36"	18"	18'
8"	48"	24"	22'
10"	60"	30"	27'

NOTES:

1. DIMENSION AA MUST BE MINIMUM 5 TIMES PIPE DIAMETER (UPSTREAM OF METER).
2. DIMENSION BB MUST BE MINIMUM 3 TIME PIPE DIAMETER (DOWNSTREAM OF METER).

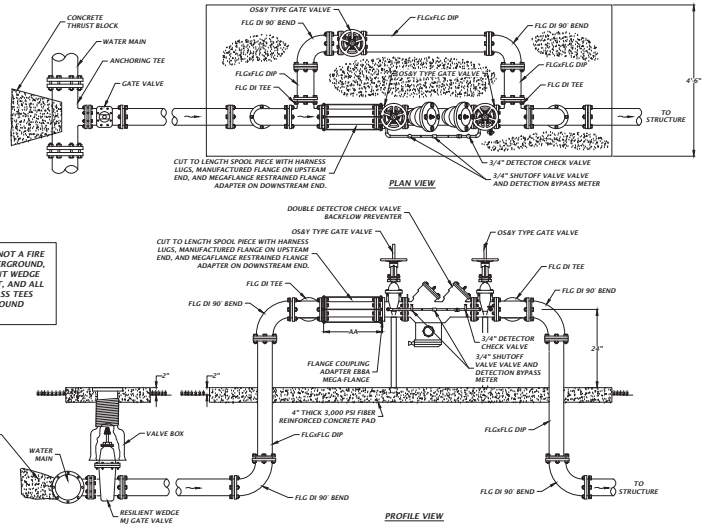
NOTE:
3" AND LARGER WATER METER AND BACKFLOW PREVENTER ASSEMBLIES MUST HAVE FREEZE PROTECTION BOXES. FREEZE PROTECTION BOXES MUST ALLOW ACCESS FOR TESTING.

NOTE:
SEE WASTEWATER DETAILS FOR AIR RELEASE VALVE INFORMATION.

DETAIL No. 260 - 3" AND LARGER WATER METER AND BACKFLOW PREVENTER ASSEMBLY (WITH DOWNSTREAM DIESEL FIRE PUMP)

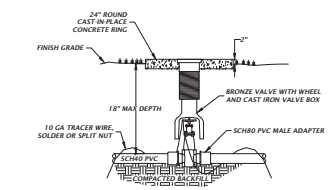
NTS

NOTE: EVERY INSTALLATION THAT IS NOT A FIRE LINE CAN HAVE THE BYPASS LINE UNDERGROUND, WITH THE BYPASS VALVE AS A RESILIENT WEDGE GATE VALVE WITH A 2" OPERATOR NUT, AND ALL OTHER VALVES AS OS&Y VALVES. BYPASS TEES SHALL BE ON THE RISER FOR UNDERGROUND INSTALLATIONS.



DETAIL No. 265 - FIRE DOUBLE DETECTOR CHECK VALVE BACKFLOW PREVENTER (NO DOWNSTREAM DIESEL FIRE PUMP)

NTS

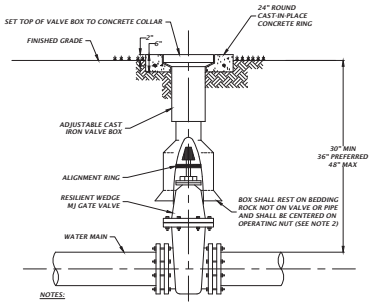


NOTES:

1. WATER VALVE BOX TOPS ARE TO BE CAST WITH THE WORD "WATER" ON TOP AND PAINTED BLUE.
2. CONCRETE PAD SHALL BE PROVIDED AROUND VALVE BOX IN UNPAVED AREAS. SEE CONCRETE PAD DETAIL.

DETAIL No. 270 - BRONZE GATE VALVE FOR WATER AND RECLAIMED WATER MAINS 2" OR SMALLER

NTS

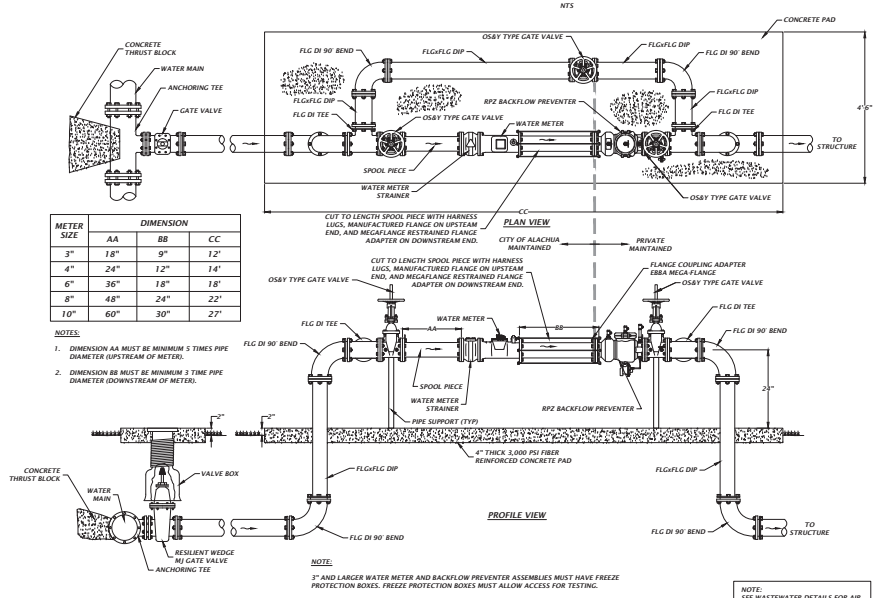


NOTES:

1. PVC EXTENSIONS SHALL NOT BE USED ON VALVE BOX INSTALLATION.
2. WHEN VALVE BOX IS TO BE INSTALLED IN ROADWAY OR OTHER TRAFFIC AREAS SET VALVE BOX ON FIVE (5) SOLID COMMON BRICKS.
3. VALVE BOX LID TO BE LETTERED WITH THE WORD "WATER" OR "RECLAIMED".
4. INSTALL BRASS ID TAG IN CONCRETE.

DETAIL No. 275 - GATE VALVE FOR WATER AND RECLAIMED WATER MAINS 3" OR LARGER

NTS



METER SIZE	DIMENSION		
	AA	BB	CC
3"	18"	9"	12'
4"	24"	12"	14'
6"	36"	18"	18'
8"	48"	24"	22'
10"	60"	30"	27'

NOTES:

1. DIMENSION AA MUST BE MINIMUM 5 TIMES PIPE DIAMETER (UPSTREAM OF METER).
2. DIMENSION BB MUST BE MINIMUM 3 TIME PIPE DIAMETER (DOWNSTREAM OF METER).

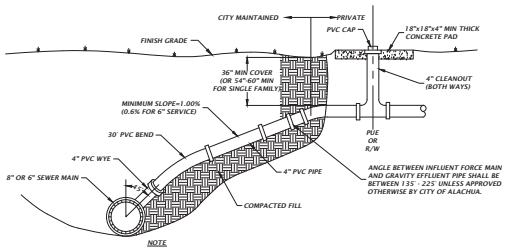
NOTE:
3" AND LARGER WATER METER AND BACKFLOW PREVENTER ASSEMBLIES MUST HAVE FREEZE PROTECTION BOXES. FREEZE PROTECTION BOXES MUST ALLOW ACCESS FOR TESTING.

NOTE:
SEE WASTEWATER DETAILS FOR AIR RELEASE VALVE INFORMATION.

DETAIL No. 280 - 3" AND LARGER WATER METER AND BACKFLOW PREVENTER ASSEMBLY (NO DOWNSTREAM DIESEL FIRE PUMP)

ABBREVIATIONS

DI	DUCTILE IRON
DIP	DUCTILE IRON PIPE
FLG	FLANGED
FT	FOOT
GA	GAUGE
GALV	GALVANIZED
GSP	GALVANIZED STEEL PIPE
GV	GATE VALVE
ID	INSIDE DIAMETER
LF	LINEAR FEET
MAX	MAXIMUM
MIN	MINIMUM
MJ	MECHANICAL JOINT
NTS	NOT TO SCALE
OD	OUTSIDE DIAMETER
R/W	RIGHT OF WAY
SF	SQUARE FEET
SS	STAINLESS STEEL
TYP	TYPICAL

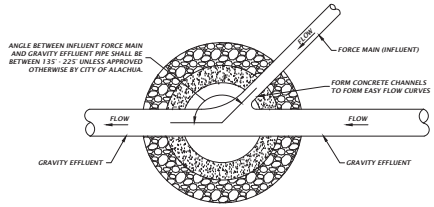


NOTE

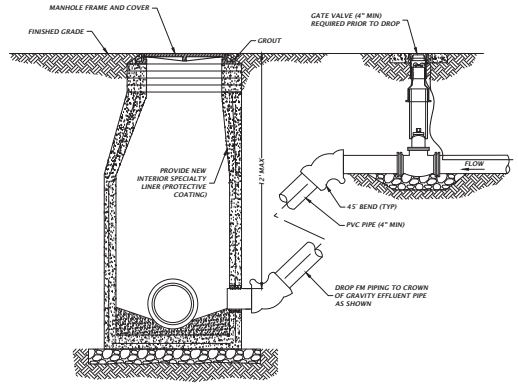
SINGLE SERVICES SHALL BE MINIMUM 4" DIAMETER PVC, SDR 35, GREEN OR GREEN STRIPED.

DETAIL No. 310 - WASTEWATER SERVICE LATERAL

NTS



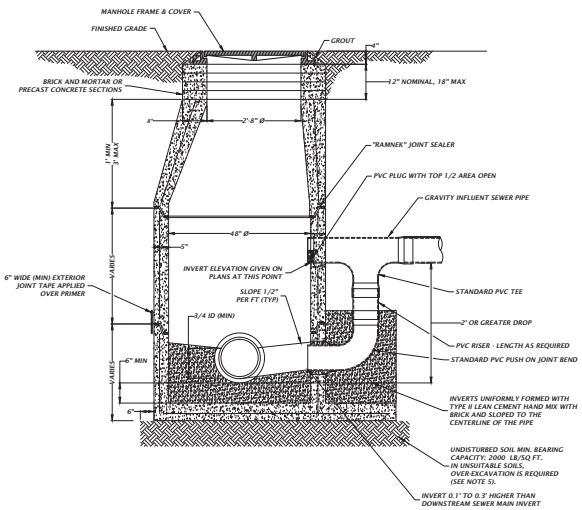
PLAN



SECTION

DETAIL No. 330 - MANHOLE FORCE MAIN CONNECTION

NTS



NOTES:

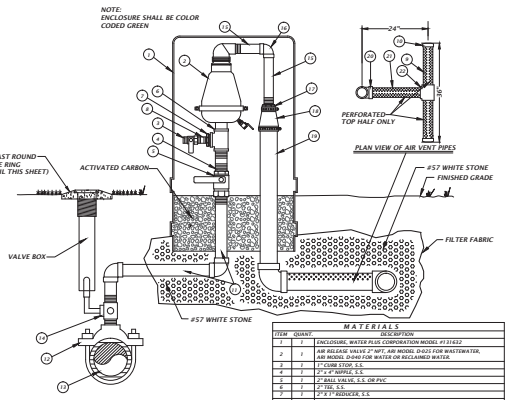
1. PRECAST MANHOLE SECTIONS TO BE MANUFACTURED IN ACCORDANCE WITH THE LATEST EDITIONS OF A.S.T.M. C-478-73 WITH 4000 LB. CONC., TYPE II CEMENT. ALL LIFTING HOLES AND OUTSIDE INSERTS SHALL BE FILLED WITH NON-SHRINK GROUT AND SEALED WITH "REMNEK" SEALER.
2. THE INTERIOR AND EXTERIOR OF MANHOLE AND THE INTERIOR OF THE ADJUSTMENT RINGS SHALL BE JOINED AND SEALED WITH "RAMNEK" SEALER.
3. TYPE "D" MANHOLE SHALL BE USED FOR 12" OR LARGER INFLUENT PIPES W/ 2' OR GREATER INFLUENT DROP.
4. ALL M/H JOINTS BELOW THE TOP CONE SECTION SHALL INCLUDE A 6" WIDE (MIN) EXTERIOR JOINT TAPE (W/PRIMER). TAPE ON THE CONE SECTION IS OPTIONAL.
5. PRECAST BASE SECTIONS WITH A BOTTOM SHALL BE INSTALLED ON UNDISTURBED EARTH. BEDDING IS REQUIRED WHEN THE SOIL CONDITIONS ARE WET OR WHEN THE SOIL IS UNSUITABLE. UTILITIES SHALL DETERMINE IN THE FIELD REQUIRED REMOVAL OF UNSUITABLE MATERIAL TO REACH SUITABLE FOUNDATION. IF UNDERCUTTING OCCURS, THE BOTTOM OF THE TRENCH SHALL BE BROUGHT UP TO THE ORIGINAL GRADE WITH APPROVED MATERIAL AND THOROUGHLY COMPACTED TO A MINIMUM OF 95% MODIFIED PROCTOR.

DETAIL No. 360 - STANDARD MANHOLE DROP

NTS

ABBREVIATIONS

DI	DUCTILE IRON
DIP	DUCTILE IRON PIPE
FLG	FLANGED
FT	FOOT
GA	GAUGE
GALV	GALVANIZED
GSP	GALVANIZED STEEL PIPE
GV	GATE VALVE
ID	INSIDE DIAMETER
LF	LINEAR FEET
MAX	MAXIMUM
MIN	MINIMUM
MJ	MECHANICAL JOINT
NTS	NOT TO SCALE
OD	OUTSIDE DIAMETER
R/W	RIGHT OF WAY
SF	SQUARE FEET
SS	STAINLESS STEEL
TYP	TYPICAL



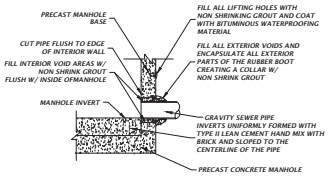
MATERIALS		
ITEM	QUANT.	DESCRIPTION
1	1	ENCLOSURE, WATER PLUS CORPORATION MODEL #131632
2	1	AIR RELEASE VALVE 2" NPT, AIR MODEL D-025 FOR WASTEWATER, AIR MODEL D-040 FOR WATER OR RECLAIMED WATER.
3	1	1" CURB STOP, S.S.
4	1	2"x 4" NIPPLE, S.S.
5	1	2" BALL VALVE, S.S. OR PVC
6	1	2" TEE, S.S.
7	1	2"X 1" REDUCER, S.S.
8	1	1" SHORT NIPPLE, S.S.
9	2	5" PIPE, PVC, LENGTH AS SHOWN,PERFORATED TOP HALF ONLY
10	2	2" CAP, PVC
11	1	2" PIPE, S.S. LENGTH AS REQUIRED
12	1	2" DOUBLE STRAP TAPPING SADDLE, STAINLESS STEEL
13	1	4" & LARGER PIPE- D.I. OR PVC OR LF.
14	1	MODEL F007 S.S. FLANGED END BALL VALVE, 2" NUT WITH RIGHT ANGLE
15	2	1-1/2" PIPE, PVC, LENGTH AS REQUIRED
16	1	1-1/2" x 90° ELBOW, PVC
17	1	2" X 1-1/2" REDUCER, PVC
18	1	2" X 2" FLEX COUPLING
19	1	2" PIPE, PVC, LENGTH AS REQUIRED
20	1	2" x 90° ELBOW, PVC
21	1	5" PIPE, PVC, LENGTH AS SHOWN,PERFORATED TOP HALF ONLY
22	1	2" TEE, PVC

NOTES:

1. AIR RELEASE VALVES 2" IN DIAMETER SHALL BE USED ON 4" THROUGH 8" DIAMETER FORCE MAINS. 12" THROUGH 16" DIAMETER FORCE MAINS SHALL BE PROVIDED WITH 3" AIR RELEASE VALVES.
2. WASTEWATER AIR RELEASE VALVES SHALL HAVE ODOR PROTECTION AS SHOWN WHEN LOCATED ADJACENT TO RESIDENTIAL OR POPULATED AREAS.

DETAIL No. 320 - SEWER AIR RELEASE VALVE

NTS

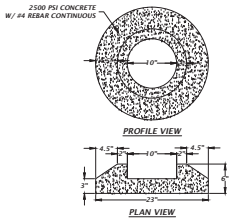


NOTE:

RUBBER BOOT, DOUBLE BANDED, 316 S/S CLAMPS, MEETING THE ASTM C923 STANDARD. Kor-N-Seal® I EX SERIES CONNECTOR WITH DOUBLE STAINLESS STEEL BANDS OR EQUAL

DETAIL No. 340 - MANHOLE PIPE CONNECTION

NTS



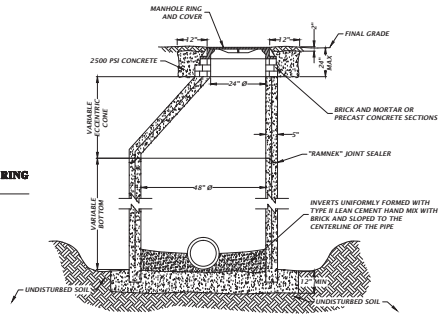
PROFILE VIEW

PLAN VIEW

DETAIL No. 370 - PRECAST CONCRETE CLEANOUT RING

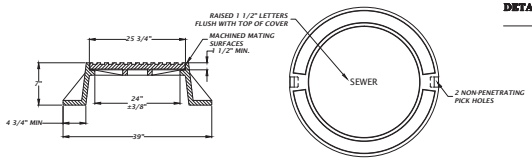
(FOR WASTEWATER CLEANOUTS AND VALVE BOXES)

NTS



DETAIL No. 380 - STANDARD DOGHOUSE MANHOLE CONSTRUCTION

NTS



ELEVATION

PLAN

DETAIL No. 250 - STANDARD SEWER MANHOLE FRAME AND COVER

NTS

SECTION 334
SUPERPAVE ASPHALT CONCRETE

334-1 Description.

334-1.1 General: Construct a Superpave Asphalt Concrete pavement with the type of mixture specified in the Contract Documents, or when offered as alternates, as selected. Superpave mixes are identified as Type SP-9.5, Type SP-12.5 or Type SP-19.0.

Meet the requirements of Section 320 for plant and equipment. Meet the general construction requirements of Section 330, except as modified herein, including the provision for Quality Control (QC) Plans and QC Systems as specified in Section 105.

334-1.2 Traffic Levels: The requirements for Type SP Asphalt Concrete mixtures are based on the design traffic level of the project, expressed in 18,000 pound Equivalent Single Axle Loads (ESAL's). The five traffic levels are as shown in Table 334-1.

Table 334-1
Superpave Traffic Levels

Traffic Level	Traffic Level ($1x10^6$ ESAL's)
A	<0.3
B	0.3 to <3
C	3 to <10
D	10 to <30
E	≥30

The traffic levels for the project are as specified in the Contract Documents. A Type SP mix one traffic level higher than the traffic level specified in the Contract Documents may be substituted, at no cost to the Department (i.e., Traffic Level B may be substituted for Traffic Level A, etc.).

334-1.3 Gradation Classification: The Superpave mixes are classified as fine and are defined in 334-3.2.2.

The equivalent AASHTO nominal maximum aggregate size Superpave mixes are as follows:

Type SP-9.5..... 9.5 mm
Type SP-12.5..... 12.5 mm
Type SP-19.0..... 19.0 mm

334-1.4 Thickness: The total thickness of the Type SP asphalt layers will be the plan thickness as shown in the Contract Documents. Before paving, propose a thickness for each individual layer meeting the requirements of this specification, which when combined with other layers (as applicable) will equal the plan thickness. For construction purposes, the plan thickness and individual layer thickness will be converted to spread rate based on the maximum specific gravity of the asphalt mix being used, as well as the minimum density level, as shown in the following equation:

$$\text{Spread rate (lbs/yd}^2) = t \times G_{mm} \times 43.3$$

Where: t = Thickness (in.) (plan thickness or individual layer thickness)
G_{mm} = Maximum specific gravity from the verified mix design

The weight of the mixture shall be determined as provided in 320-3.2. For target purposes only, spread rate calculations should be rounded to the nearest whole number.

Note: Plan quantities are based on a G_{mm} of 2.540, corresponding to a spread rate of 110 lbs/yd^2-in. Pay quantities will be based on the actual maximum specific gravity of the mix being used.

334-1.4.1 Layer Thicknesses - Fine Mixes: The allowable layer thicknesses for fine Type SP Asphalt Concrete mixtures are as follows:

Type SP-9.5.....1 to 1-1/2 inches
Type SP-12.5..... 1-1/2 to 2-1/2 inches
Type SP-19.0.....2 to 3-1/2 inches

In addition to the minimum and maximum thickness requirements, the following restrictions are placed on fine mixes when used as a structural course:

Type SP-9.5 - Limited to the top two structural layers, two layers maximum.

Type SP-9.5 – May not be used on Traffic Level D and E applications.

Type SP-19.0 - May not be used in the final (top) structural layer below FC-5 mixtures. Type SP-19.0 mixtures are permissible in the layer directly below FC-9.5 and FC-12.5 mixtures.

334-1.4.2 Additional Requirements: The following requirements also apply to Type SP Asphalt Concrete mixtures:

1. A minimum 1-1/2 inch initial lift is required over an Asphalt Rubber Membrane Interlayer (ARMI).

2. When construction includes the paving of adjacent shoulders (less than or equal to 5 feet wide), the layer thickness for the upper pavement layer and shoulder must be the same and paved in a single pass, unless called for differently in the Contract Documents.

3. All overbuild layers must be fine Type SP Asphalt Concrete designed at the traffic level as stated in the Contract Documents. Use the minimum and maximum layer thicknesses as specified above unless called for differently in the Contract Documents. On variable thickness overbuild layers, the minimum and maximum allowable thicknesses will be as specified below, unless called for differently in the Contract Documents.

Type SP-9.5.....3/8 to 2 inches
Type SP-12.5.....1/2 to 3 inches
Type SP-19.0..... 1-1/2 to 3-1/2 inches

4. Variable thickness overbuild layers constructed using a Type SP-9.5 or SP-12.5 mixtures may be tapered to zero thickness provided the contract documents require a minimum of 1-1/2 inches of dense-graded mix placed over the variable thickness overbuild layer.

334-2 Materials.

334-2.1 General Requirements: Meet the material requirements specified in Division III. Specific references are as follows:

Superpave PG Asphalt Binder .....Section 916
Coarse Aggregate.....Section 901
Fine Aggregate.....Section 902

334-2.2 Superpave Asphalt Binder: Unless specified otherwise in the Contract Documents, use a PG 67-22 asphalt binder. In addition, meet the requirements of 334-2.3.

334-2.3 Reclaimed Asphalt Pavement (RAP) Material:

334-2.3.1 General requirements: RAP may be used as a component of the asphalt mixture subject to the following requirements:

1. When using a PG 76-22 (PMA), or PG 76-22 (ARB), or PG 82-22 (PMA) asphalt binder, limit the amount of RAP material used in the mix to a maximum of 20% by weight of total aggregate. As an exception, amounts greater than 20% RAP by weight of total aggregate can be used if no more than 20% by weight of the total asphalt binder comes from the RAP material.

2. Assume full responsibility for the design, production and construction of asphalt mixes which incorporate RAP as a component material.

3. Use RAP from a Department approved stockpile or millings from a Department project.

4. Provide stockpiled RAP material that is reasonably consistent in characteristics and contains no aggregate particles which are soft or conglomerates of fines.

5. Provide RAP material having a minimum average asphalt binder content of 4.0% by weight of RAP. As an exception, when using fractionated RAP, the minimum average asphalt binder content for the coarse portion of the RAP shall be 2.5% by weight of the coarse portion of the RAP. The coarse portion of the RAP shall be the portion of the RAP retained on the No. 4 sieve. The Engineer may sample the stockpiles to verify that this requirement is met.

334-2.3.2 Material Characterization for Mix Design: Assume responsibility for establishing the asphalt binder content, gradation, and bulk specific gravity (G_{sb}) of the RAP material based on a representative sampling of the material by roadway cores or stockpile samples. For roadway core samples, assume responsibility for the degradation that will occur during the milling operation.

334-2.3.3 RAP Stockpile Approval: Prior to the incorporation of RAP into the asphalt mixture, stockpile the RAP material and obtain approval for the stockpile by one of the following methods:

1. Continuous stockpile: When RAP is obtained from one or multiple sources and is either processed, blended, or fractionated, and stockpiled in a continuous manner, assure an adequate number of test results are obtained for stockpile approval. Test the RAP material for gradation and asphalt content at a minimum frequency of one sample per 1000 tons with a minimum of six test results. Test the RAP material for G_{mm} (for G_{sb} determination) at a minimum frequency of one sample per 5000 tons with a minimum of two test results. Based on visual inspection and a review of the test data, the Engineer will determine the suitability of the stockpiled material. In addition, address in the QC Plan the details and specifics of the processing, sampling, testing and actions to be taken.

2. Non-continuous single stockpile: When an individual stockpile is being constructed, obtain representative samples at random locations and test the RAP material for gradation and asphalt content at a minimum frequency of one sample per 1000 tons with a minimum of six test results. Test the RAP material for G_{mm} (for G_{sb} determination) at a minimum frequency of one sample per 5000 tons with a minimum of two test results. Based on visual inspection and a review of the test data, the Engineer will determine the suitability of the stockpiled material. Once the RAP stockpile has been approved, do not add additional material without prior approval of the Engineer.

Determine the asphalt binder content and gradation of the RAP material in accordance with FM 5-563 and FM 1-T 030, respectively. Establish the G_{sb} of the RAP material by using one of the following methods:

a. Calculate the G_{sb} value based upon the effective specific gravity (G_{se}) of the RAP material, determined on the basis of the asphalt binder content and maximum specific gravity (G_{mm}) of the RAP material. The Engineer will approve the estimated asphalt binder absorption value used in the calculation.

b. Measure the G_{sb} of the RAP aggregate, in accordance with FM 1-T 084 and FM 1-T 085. Obtain the aggregate by using a solvent extraction method.

334-2.3.4 Pavement Coring Report: When the Contract includes milling of the existing asphalt pavement, the Pavement Coring Report may be available on the Department's website.

334-2.3.5 Asphalt Binder for Mixes with RAP: Select the appropriate asphalt binder grade based on Table 334-2. Obtain a sample of the mixture for the Engineer within the first 1,000 tons of production and at a continuing frequency of one sample per 4,000 tons of mix. The Engineer reserves the right to change the asphalt binder type and grade at design based on the characteristics of the RAP asphalt binder, and reserves the right to make changes during production.

Table 334-2
Asphalt Binder Grade for Mixes Containing RAP

Percent RAP	Asphalt Binder Grade
0 - 15	PG 67-22
16 - 30	PG 58-22
>30	PG 52-28

334-2.4 Recycled Crushed Glass: Recycled crushed glass may be used as a component of the asphalt mixture subject to the following requirements:

1. Consider the recycled crushed glass a local material and meet all requirements specified in 902-6.
2. Limit the amount of recycled crushed glass to a maximum of 15% by weight of total aggregate.
3. Use an asphalt binder that contains a minimum of 0.5% anti-stripping agent by weight of binder. The anti-strip additive shall be one of the products listed on the Approved Product List (APL). The anti-strip additive shall be introduced into the asphalt binder by the supplier during loading.
4. Do not use recycled crushed glass in friction course mixtures or in structural course mixtures which are to be used as the final wearing surface.

334-3 General Composition of Mixture.

334-3.1 General: Compose the asphalt mixture using a combination of aggregate (coarse, fine or mixtures thereof), mineral filler, if required, and asphalt binder material. Size, grade and combine the aggregate fractions to meet the grading and physical properties of the mix design. Aggregates from various sources may be combined.

334-3.2 Mix Design:

334-3.2.1 General: Design the asphalt mixture in accordance with AASHTO R 35-12, except as noted herein. Prior to the production of any asphalt mixture, submit the proposed mix design with supporting test data indicating compliance with all mix design criteria to the Engineer. For Traffic Level B through E mix designs, include representative samples of all component materials, including asphalt binder. Allow the State Materials Engineer a maximum of four weeks to either conditionally verify or reject the mix as designed.

Do not use more than four mix designs per nominal maximum aggregate size per traffic level per binder grade per year, where the year starts at the Notice to Proceed. Exceeding this limitation will result in a maximum Composite Pay Factor (CPF) of 1.00 as defined in 334-8.2 for all designs used beyond this limit.

Warm mix technologies (additives, foaming techniques, etc.) listed on the Department's website may be used in the production of the mix. The URL for obtaining this information, if available, is: http://www.dot.state.fl.us/statematerialsoffice/quality/programs/warmmixasphalt/index.shtm.

The Engineer will consider any marked variations from original test data for a mix design or any evidence of inadequate field performance of a mix design as sufficient evidence that the properties of the mix design have changed, and the Engineer will no longer allow the use of the mix design.

334-3.2.2 Mixture Gradation Requirements: Combine the coarse and fine aggregate in proportions that will produce an asphalt mixture meeting all of the requirements defined in this specification and conform to the gradation requirements at design as defined in AASHTO M 323-12, Table 3. Aggregates from various sources may be combined.

334-3.2.2.1 Mixture Gradation Classification: Plot the combined mixture gradation on an FHWA 0.45 Power Gradation Chart. Include the Control Points from AASHTO M 323-12, Table-3, as well as the Primary Control Sieve (PCS) Control Point from AASHTO M 323-12, Table 4. Fine mixes are defined as having a gradation that passes above the primary control sieve control point and above the maximum density line for all sieve sizes smaller than the primary control sieve and larger than the No. 100 sieve.

334-3.2.3 Aggregate Consensus Properties: For Traffic Level C through E mixtures, meet the following consensus properties at design for the aggregate blend. Aggregate consensus properties do not apply to Traffic Level A and B mixtures.

334-3.2.3.1 Coarse Aggregate Angularity: When tested in accordance with ASTM D 5821-01 (2006), meet the percentage of fractured faces requirements specified in AASHTO M 323-12, Table 5.

334-3.2.3.2 Fine Aggregate Angularity: When tested in accordance with AASHTO T 304-11, Method A, meet the uncompacted void content of fine aggregate specified in AASHTO M 323-12, Table 5.

334-3.2.3.3 Flat and Elongated Particles: When tested in accordance with ASTM D 4791-10, (with the exception that the material passing the 3/8 inch sieve and retained on the No. 4 sieve shall be included), meet the requirements specified in AASHTO M 323-12, Table 5. Measure the aggregate using the ratio of 5:1, comparing the length (longest dimension) to the thickness (shortest dimension) of the aggregate particles.

334-3.2.3.4 Sand Equivalent: When tested in accordance with AASHTO T 176-08, meet the sand equivalent requirements specified in AASHTO M 323-12, Table 5.

334-3.2.4 Gyratory Compaction: Compact the design mixture in accordance with AASHTO T 312-12, with the following exception: use the number of gyrations at N_{design} as defined in Table 334-3. Measure the inside diameter of gyratory molds in accordance with AASHTO T 312-12.

Table 334-3 Gyratory Compaction Requirements	
Traffic Level	N_{design} Number of Gyrations
A	50
B	65
C	75
D	100
E	100

334-3.2.5 Design Criteria: Meet the requirements for nominal maximum aggregate size as defined in AASHTO M 323-12, as well as for relative density, VMA, VFA, and dust-to-binder ratio as specified in AASHTO M 323-12, Table 6. $N_{initial}$ and $N_{maximum}$ requirements are not applicable.

334-3.2.6 Moisture Susceptibility:

1. For Traffic Level A and B mixtures, use a liquid anti-strip additive, at a rate of 0.5% by weight of the asphalt binder. The anti-strip additive must be listed on the APL. Other rates of anti-strip additive may be used upon approval of the Engineer.

2. For Traffic Level C through E mixtures, test 4 inch specimens in accordance with FM 1-T 283. Provide a mixture having a retained tensile strength ratio of at least 0.80 and a minimum tensile strength (unconditioned) of 100 psi. If necessary, add a liquid anti-stripping agent and/or hydrated lime (meeting the requirements of Section 337) in order to meet these criteria. The anti-strip additive must be listed on the APL.

334-3.2.7 Additional Information: In addition to the requirements listed above, provide the following information with each proposed mix design submitted for verification:

1. The design traffic level and the design number of gyrations (N_{design}).

2. The source and description of the materials to be used.

3. The Department source number and the Department product code of the aggregate components furnished from a Department approved source.

4. The gradation and proportions of the raw materials as intended to be combined in the paving mixture. The gradation of the component materials shall be representative of the material at the time of use. Compensate for any change in aggregate gradation caused by handling and processing as necessary.

5. A single percentage of the combined mineral aggregate passing each specified sieve. Degradation of the aggregate due to processing (particularly material passing the No. 200 sieve) should be accounted for and identified.

6. The bulk specific gravity (G_{sb}) value for each individual aggregate and RAP component, as identified in the Department's aggregate control program.

7. A single percentage of asphalt binder by weight of total mix intended to be incorporated in the completed mixture, shown to the nearest 0.1%.

8. A target temperature for the mixture at the plant (mixing temperature) and a target temperature for the mixture at the roadway (compaction temperature) in accordance

with 320-6.3. Do not exceed a target temperature of 340°F for PG 82-22 (PMA) asphalt binders, 330°F for PG 76-22 (PMA) and PG 76-22 (ARB) asphalt binders, and 315°F for unmodified asphalt binders.

9. Provide the physical properties achieved at four different asphalt binder contents. One of which must be at the optimum asphalt content, and must conform to all specified physical requirements.

10. The name of the Construction Training Qualification Program (CTQP) Qualified Mix Designer.

11. The ignition oven calibration factor.

12. The warm mix technology, if used.

334-3.3 Mix Design Revisions: During production, the Contractor may request a target value revision to a mix design, subject to meeting the following requirements: (1) the target change falls within the limits defined in Table 334-4, (2) appropriate data exists demonstrating that the mix complies with production air voids specification criteria, and (3) the mixture gradation meets the basic gradation requirements defined in 334-3.2.2.

Table 334-4
Limits for Potential Adjustments to Mix Design Target Values

Characteristic	Limit from Original Mix Design
No. 8 sieve and Coarser	± 5.0%
No. 16 sieve	± 4.0%
No. 30 sieve	± 4.0%
No. 50 sieve	± 3.0%
No. 100 sieve	± 3.0%
No. 200 sieve	± 1.0%
Asphalt Binder Content (1)	± 0.3%
Each Component of Aggregate Blend (2)	± 5.0 %

(1) Reductions to the asphalt binder content will not be permitted if the VMA during production is lower than 1.0% below the design criteria.
(2) Revisions to FC-5 mixtures to be determined by the Engineer.

Submit all requests for revisions to mix designs, along with supporting documentation, to the Engineer. In order to expedite the revision process, the request for revision or discussions on the possibility of a revision may be made verbally, but must be followed up by a written request. The verified mix design will remain in effect until the Engineer authorizes a change. In no case will the effective date of the revision be established earlier than the date of the first communication between the Contractor and the Engineer regarding the revision.

A new design mix will be required if aggregate sources change, or for any substitution of an aggregate product with a different aggregate code, unless approved by the Engineer.

334-4 Contractor Process Control (PC).

Assume full responsibility for controlling all operations and processes such that the requirements of these Specifications are met at all times. Perform any tests necessary at the plant and roadway for process control purposes. Enter all PC test data into the Department's database. The Engineer will not use these test results in the acceptance payment decision.

Address in the QC Plan how PC failures will be handled. When a PC failure occurs, investigate, at a minimum, the production process, testing equipment and/or sampling methods to determine the cause of the failure, and make any necessary changes to assure compliance with these Specifications. Obtain a follow up sample immediately after corrective actions are taken to assess the adequacy of the corrections. In the event the follow-up PC sample also fails to meet Specification requirements, cease production of the asphalt mixture until the problem is adequately resolved to the satisfaction of the QC Manager.

334-5 Acceptance of the Mixture.

334-5.1 General: The mixture will be accepted at the plant with respect to gradation (P_{-8} and P_{-200}), asphalt content (P_b), and volumetrics (volumetrics is defined as air voids at N_{design}). The mixture will be accepted on the roadway with respect to density of roadway cores. Acceptance will be on a LOT by LOT basis (for each mix design) based on tests of random samples obtained within each sublot taken at a frequency of one set of samples per sublot. A roadway LOT and a plant production LOT shall be the same. Acceptance of the mixture will be based on Contractor QC test results that have been verified by the Department.

334-5.1.1 Sampling and Testing Requirements: Obtain the samples in accordance with FM 1-T 168. Obtain samples at the plant of a sufficient quantity to be split into three smaller samples; one for QC, one for Verification testing and one for Resolution testing; each sample at approximately 35 pounds. The split samples for Verification testing and Resolution testing shall be reduced in size and stored in three boxes each. The approximate size of each box must be 12 inches x 8 inches x 4 inches. Provide, label and safely store sample boxes in a manner agreed upon by the Engineer for future testing.

The asphalt content of the mixture will be determined in accordance with FM 5-563. The gradation of the recovered aggregate will be determined in accordance with FM 1-T 030. Volumetric testing will be in accordance with AASHTO T 312-12and FM 1-T 209. Prior to testing volumetric samples, condition the test-sized sample for one hour, plus or minus five minutes, at the target roadway compaction temperature in a shallow, flat pan, such that the mixture temperature at the end of the one hour conditioning period is within plus or minus 20°F of the roadway compaction temperature. Test for roadway density in accordance with FM 1-T 166.

334-5.1.2 Acceptance Testing Exceptions: When the total combined quantity of hot mix asphalt for the project, as indicated in the Plans for Type SP and Type FC mixtures only, is less than 2000 tons, the Engineer will accept the mix on the basis of visual inspection. The Engineer may require the Contractor to run process control tests for informational purposes, as defined in 334-4, or may run independent verification tests to determine the acceptability of the material.

Density testing for acceptance will not be performed on widening strips or shoulders with a width of 5 feet or less, open-graded friction courses, variable thickness overbuild courses, leveling courses, any asphalt layer placed on subgrade (regardless of type), miscellaneous asphalt pavement, shared use paths, crossovers, or any course with a specified thickness less than 1 inch or a specified spread rate that converts to less than 1 inch as described in 334-1.4. Density testing for acceptance will not be performed on asphalt courses placed on bridge decks or approach slabs; compact these courses in static mode only per the requirements of 330-7.7. In addition, density testing for acceptance will not be performed on the following areas when they are less than 1,000 feet (continuous) in length: turning lanes, acceleration lanes, deceleration lanes, shoulders, parallel parking lanes or ramps. Do not perform density testing for

acceptance in situations where the areas requiring density testing is less than 50 tons within a sublot.

Density testing for acceptance will not be performed in intersections. The limits of the intersection will be from stop bar to stop bar for both the mainline and side streets. A random core location that occurs within the intersection shall be moved forward or backward from the intersection at the direction of the Engineer.

Where density testing for acceptance is not required, compact these courses (with the exception of open-graded friction courses) in accordance with the rolling procedure (equipment and pattern) as approved by the Engineer or with Standard Rolling Procedure as specified in 330-7.2. In the event that the rolling procedure deviates from the procedure approved by the Engineer, or the Standard Rolling Procedure, placement of the mix shall be stopped.

The density pay factor (as defined in 334-8.2) for areas not requiring density testing for acceptance will be paid at the same density pay factor as for the areas requiring density testing within the same LOT. If the entire LOT does not require density testing for acceptance, the LOT will be paid at a density pay factor of 1.00.

334-5.2 Full LOTs: Each LOT will be defined (as selected by the Contractor prior to the start of the LOT) as either (1) 2,000 tons, with each LOT subdivided into four equal sublots of 500 tons each, or (2) 4,000 tons, with each LOT subdivided into four equal sublots of 1,000 tons each. As an exception to this, the initial LOT of all new mix designs shall be defined as 2,000 tons, subdivided into four equal sublots of 500 tons each. Before the beginning of a LOT, the Engineer will develop a random sampling plan for each sublot and direct the Contractor on sample points, based on tonnage, for each sublot during construction.

334-5.3 Partial LOTs: A partial LOT is defined as a LOT size that is less than a full LOT. A partial LOT may occur due to the following:

l. The completion of a given mix type or mix design on a project.

2. Closure of the LOT due to time. LOTs will be closed 30 calendar days after the start of the LOT. Time periods other than 30 calendar days may be used if agreed to by both the Engineer and the Contractor, but under no circumstances shall the LOT be left open longer than 60 days.

3. A LOT is terminated per 334-5.4.4.

All partial LOTs will be evaluated based on the number of tests available, and will not be redefined. If a LOT is closed before the first plant random sample is obtained, then the LOT will be visually accepted by the Engineer and the LOT pay factor will be 1.00.

334-5.4 QC Sampling and Testing: Obtain all samples randomly as directed by the Engineer.

Should the Engineer determine that the QC requirements are not being met or that unsatisfactory results are being obtained, or should any instances of falsification of test data occur, approval of the Contractor's QC Plan will be suspended and production will be stopped.

334-5.4.1 Lost or Missing Verification/Resolution Samples: In the event that any of the Verification and/or Resolution samples that are in the custody of the Contractor are lost, damaged, destroyed, or are otherwise unavailable for testing, the minimum possible pay factor for each quality characteristic as described in 334-8.2 will be applied to the entire LOT in question, unless called for otherwise by the Engineer. Specifically, if the LOT in question has more than two sublots, the pay factor for each quality characteristic will be 0.55. If the LOT has

two or less sublots, the pay factor for each quality characteristic will be 0.80. In either event, the material in question will also be evaluated in accordance with 334-5.9.5.

If any of the Verification and/or Resolution samples that are in the custody of the Department are lost, damaged, destroyed or are otherwise unavailable for testing, the corresponding QC test result will be considered verified, and payment will be based upon the Contractor's data.

334-5.4.2 Plant Sampling and Testing Requirements: Obtain one random sample of mix per sublot in accordance with 334-5.1.1 as directed by the Engineer. Test the QC split sample for gradation, asphalt binder content and volumetrics in accordance with 334-5.1.1. Complete all QC testing within one working day from the time the samples were obtained.

334-5.4.3 Roadway Sampling and Testing Requirements: Obtain five 6 inch diameter roadway cores within 24 hours of placement at random locations as directed by the Engineer within each sublot. Test these QC samples for density (G_{mb}) in accordance with 334-5.1.1. Obtain a minimum of three cores per sublot at random locations as identified by the Engineer in situations where the sublot/LOT was closed or terminated before the random numbers were reached or where it is impractical to cut five cores per sublot. Do not obtain cores any closer than 12 inches from an unsupported edge. The Engineer may adjust randomly generated core locations for safety purposes or as the Engineer deems necessary. Maintain traffic during the coring operation; core the roadway, patch the core holes (within three days of coring); and trim the cores to the proper thickness prior to density testing.

Density for the sublot shall be based on the average value for the cores cut from the sublot with the target density being the maximum specific gravity (G_{mm}) of the sublot. Once the average density of a sublot has been determined, do not retest the samples unless approved by the Engineer. Ensure proper handling and storage of all cores until the LOT in question has been accepted.

334-5.4.4 Individual Test Tolerances for QC Testing: Terminate the LOT if any of the following QC failures occur:

1) An individual test result of a sublot for air voids does not meet the requirements of Table 334-5,

2) The average sublot density does not meet the requirements of Table 334-5,

3) Two consecutive test results within the same LOT for gradation or asphalt binder content do not meet the requirements of Table 334-5,

When a LOT is terminated due to a QC failure, stop production of the mixture until the problem is resolved to the satisfaction of the QC Manager and/or Asphalt Plant Level II technician responsible for the decision to resume production after a QC failure, as identified in 105-8.6.4. In the event that it can be demonstrated that the problem can immediately be or already has been resolved, it will not be necessary to stop production. When a LOT is terminated, make all necessary changes to correct the problem. Do not resume production until appropriate corrections have been made. Inform the Engineer of the problem and corrections made to correct the problem. After resuming production, sample and test the material to verify that the changes have corrected the problem. Summarize this information and provide it to the Engineer prior to the end of the work shift when production resumes.

In the event that a QC failure is not addressed as defined above, the Engineer's approval will be required prior to resuming production after any future QC failures.

Address any material represented by a failing test result in accordance with 334-5.9.5. Any LOT terminated under this subarticle will be limited to a maximum Pay Factor of 1.00 (as defined in 334-8.2) for each quality characteristic.

In the event that a G_{mm} test result differs by more than 0.040 from the mix design G_{mm}, investigate the causes of the discrepancy and report the findings and proposed actions to the Engineer.

Table 334-5 Master Production Range	
Characteristic	Tolerance [1]
Asphalt Binder Content (%)	Target ±0.55
Passing No. 200 Sieve (%)	Target ±1.50
Air Voids (%) Fine Graded	2.30 – 6.00
Density (minimum % G_{mm})	90.00
[1] Tolerances for sample size of n = 1 from the verified mix design [2] Based on an average of 5 randomly located cores	

334-5.5 Verification Testing: In order to determine the validity of the Contractor's QC test results prior to their use in the Acceptance decision, the Engineer will run verification tests.

334-5.5.1 Plant Testing: At the completion of each LOT, the Engineer will test a minimum of one Verification split sample randomly selected from the LOT. Results of the testing and analysis for the LOT will be made available to the Contractor within one working day from the time the LOT is completed. Verification samples shall be reheated at the target roadway compaction temperature for 1-1/2 hours, plus or minus 5 minutes, reduced to the appropriate testing size, and conditioned and tested as described in 334-5.1.1. In lieu of the 1-1/2 hours reheating procedure, the mixture may be reheated to within plus or minus 20°F of the roadway compaction temperature using a microwave oven. Stir the mixture as necessary during the reheating process to maintain temperature uniformity. Subsequently, condition and test the mixture as described in 334-5.1.1.

The Verification test results will be compared with the QC test results based on the between-laboratory precision values shown in Table 334-6.

Table 334-6 Between-Laboratory Precision Values	
Property	Maximum Difference
G_{mm}	0.016
G_{mb} (gyratory compacted samples)	0.022
Gmb (roadway cores)	0.015
P_b	0.44%
P_{-200}	FM 1-T 030 (Figure 2)
P_{-8}	FM 1-T 030 (Figure 2)

If all of the specified mix characteristics compare favorably, then the LOT will be accepted, with payment based on the Contractor's QC test data for the LOT.

If any of the results do not compare favorably, then the Resolution samples from the LOT will be sent to the Resolution laboratory for testing, as described in 334-5.6.

334-5.5.2 Roadway Testing: At the completion of each LOT, the Engineer will determine the density (G_{mb}) of each core (previously tested by QC) as described in 334-5.1.1 from the same sublot as the plant samples. For situations where roadway density is not required for the random sublot chosen, then another sublot shall be randomly chosen for roadway density cores only. Results of the testing and analysis for the LOT will be made available to the Contractor within one working day from the time the LOT is completed.

The individual Verification test results will be compared with individual QC test results by the Engineer based on the between-laboratory precision values given in Table 334-6.

If each of the core test results compare favorably, then the LOT will be accepted with respect to density, with payment based on the Contractor's QC test data for the LOT.

If any of the results do not compare favorably, then the core samples from the LOT will be sent to the Resolution laboratory for testing as specified in 334-5.6.

334-5.6 Resolution System:

334-5.6.1 Plant Samples: In the event of an unfavorable comparison between the Contractor's QC test results and the Engineer's Verification test results on any of the properties identified in Table 334-6, the Resolution laboratory will test all of the split samples from the LOT for only the property (or properties) in question. Resolution samples shall be reheated at the target roadway compaction temperature for 1-1/2 hours, plus or minus 5 minutes, reduced to the appropriate testing size, and conditioned and tested as described in 334-5.1.1. In lieu of the 1-1/2 hours reheating procedure, the mixture may be reheated to within plus or minus 20°F of the roadway compaction temperature using a microwave oven. Stir the mixture as necessary during the reheating process to maintain temperature uniformity. Subsequently, condition and test the mixture as described in 334-5.1.1.

334-5.6.2 Roadway Samples: In the event of an unfavorable comparison between the Contractor's QC test data and the Engineer's Verification test data on the density results, the Resolution laboratory will test all of the cores from the LOT. Testing will be as described in 334-5.1.1. Any damaged roadway cores will not be included in the evaluation; replace damaged cores with additional cores at the direction of the Engineer.

334-5.6.3 Resolution Determination: The Resolution test results (for the property or properties in question) will be compared with the QC test results based on the between-laboratory precision values shown in Table 334-6.

If the Resolution laboratory results compare favorably with all of the QC results, then acceptance and payment for the LOT will be based on the QC results, and the Department will bear the costs associated with Resolution testing. No additional compensation, either monetary or time, will be made for the impacts of any such testing.

If the Resolution laboratory results do not compare favorably with all of the QC results, then acceptance and payment for the LOT will be based on the Resolution test data for the LOT, and the costs of the Resolution testing will be deducted from monthly estimates. No additional time will be granted for the impacts of any such testing. In addition, in the event that the application of the Resolution test data results in a failure to meet the

requirements of Table 334-5, address any material represented by the failing test result in accordance with 334-5.9.5.

In the event of an unfavorable comparison between the Resolution test results and QC test results, make the necessary adjustments to assure that future comparisons are favorable.

334-5.7 Independent Verification (IV) Testing:

334-5.7.1 Plant: The Contractor shall provide sample boxes and take samples as directed by the Engineer for IV testing. Obtain enough material for three complete sets of tests (two samples for IV testing by the Engineer and one sample for testing by the Contractor). If agreed upon by both the Engineer and the Contractor, only one sample for IV testing by the Engineer may be obtained. IV samples will be reheated at the target roadway compaction temperature for 1-1/2 hours, plus or minus 5 minutes, reduced to the appropriate testing size, and conditioned and tested as described in 334-5.1.1. The Contractor's split sample, if tested immediately after sampling, shall be reduced to the appropriate testing size, and conditioned and tested as described in 334-5.1.1. If the Contractor's sample is not tested immediately after sampling, then the sample shall be reheated at the target roadway compaction temperature for 1-1/2 hours, plus or minus 5 minutes, reduced to the appropriate testing size, and conditioned and tested as described in 334-5.1.1. For the IV and Contractor's samples, in lieu of the 1-1/2 hours reheating procedure, the mixture may be reheated to within plus or minus 20°F of the roadway compaction temperature using a microwave oven. Stir the mixture as necessary during the reheating process to maintain temperature uniformity. Subsequently, condition and test the mixture as described in 334-5.1.1. The Contractor's test results shall be provided to the Engineer within one working day from the time the sample was obtained.

If any of the IV test results do not meet the requirements of Table 334-5, then a comparison of the IV test results and the Contractor's test results, if available, will be made. If a comparison of the IV test results and the Contractor's test results meets the precision values of Table 334-6 for the material properties in question, or if the Contractor's test results are not available, then the IV test results are considered verified and the Contractor shall cease production of the asphalt mixture until the problem is adequately resolved (to the satisfaction of the Engineer), unless it can be demonstrated to the satisfaction of the Engineer that the problem can immediately be (or already has been) resolved. Address any material represented by the failing test results in accordance with 334-5.9.5.

If a comparison of the IV test results and the Contractor's test results does not meet the precision values of Table 334-6 for the material properties in question, then the second IV sample shall be tested by the Engineer for the material properties in question. If a comparison between the first and second IV test results does not meet the precision values of Table 334-6 for the material properties in question, then the first IV test results are considered unverified for the material properties in question and no action shall be taken.

If a comparison between the first and second IV test results meets the precision values of Table 334-6 for the material properties in question, then the first IV sample is considered verified and the Contractor shall cease production of the asphalt mixture until the problem is adequately resolved (to the satisfaction of the Engineer), unless it can be demonstrated to the satisfaction of the Engineer that the problem can immediately be (or already has been) resolved. Address any material represented by the failing test results in accordance with 334-5.9.5.