State of New Jersey

Department of Transportation

STANDARD ROADWAY CONSTRUCTION – TRAFFIC CONTROL – BRIDGE CONSTRUCTION DETAILS

2007

BDC07D-01-ORIGINAL SHEET

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ABBREVIATIONS

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TCD = TRAFFIC CONTROL DETAILS
BCD = BRIDGE CONSTRUCTION DETAILS

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CD = ROADWAY
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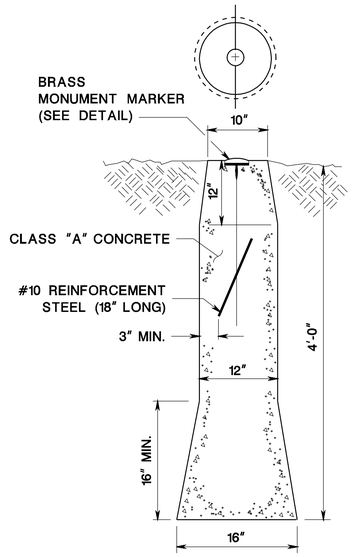
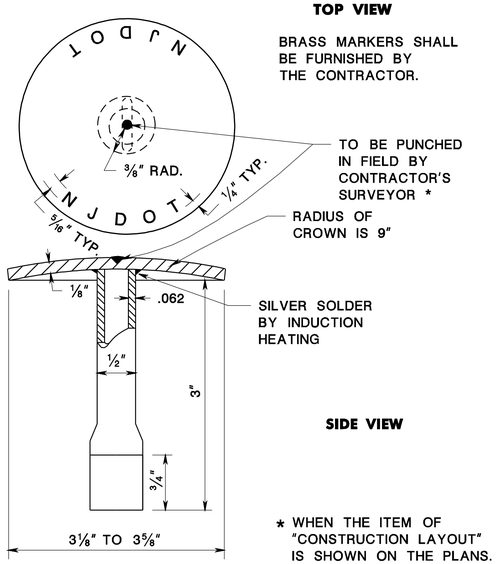
DESCRIPTION	CD





TOP VIEW

BRASS MARKERS SHALL BE FURNISHED BY THE CONTRACTOR.

TO BE PUNCHED IN FIELD BY CONTRACTOR'S SURVEYOR *

RADIUS OF CROWN IS 9"

SILVER SOLDER BY INDUCTION HEATING

SIDE VIEW

* WHEN THE ITEM OF "CONSTRUCTION LAYOUT" IS SHOWN ON THE PLANS.

MONUMENT TO BE SET FLUSH WITH GROUND

GENERAL NOTES:

THE MONUMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH NJDOT SPECIFICATIONS.

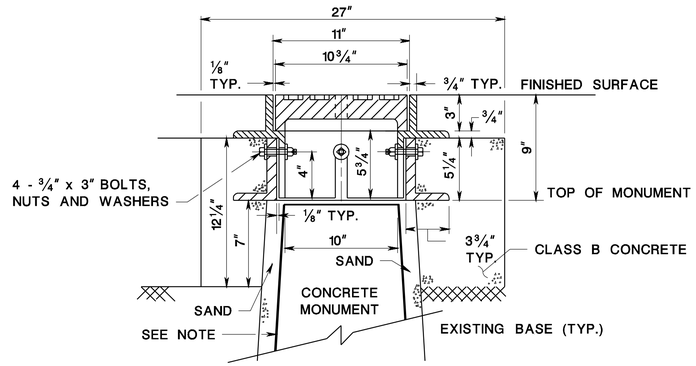
THE MONUMENT IS TO BE POURED IN PLACE AND THE MARKER PLUMBED INTO POSITION AND SET IN THE CONCRETE IN SUCH A MANNER THAT NO AIR WILL BE TRAPPED ON THE UNDERSIDE OF THE MARKER.

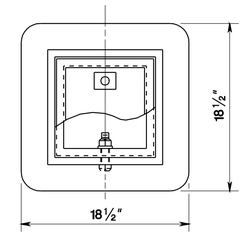
#10 REINFORCEMENT STEEL, 18" LONG, TO BE PLACED AT THE TIME OF CONCRETE POUR.

THE MONUMENT MARKER SHALL BE MADE OF BRASS, CONFORMING TO ASTM B-19.

MONUMENT

CD-157-1.1





TOP VIEW OF CASTING

NOTE:

A LAYER OF FELT OR NYLON OR TAR PAPER NEEDED BETWEEN SAND AND CONCRETE MONUMENT.

MONUMENT BOX FOR NEW MONUMENT

CD-157-1.2

REINFORCEMENT STEEL IS IN METRIC UNITS.

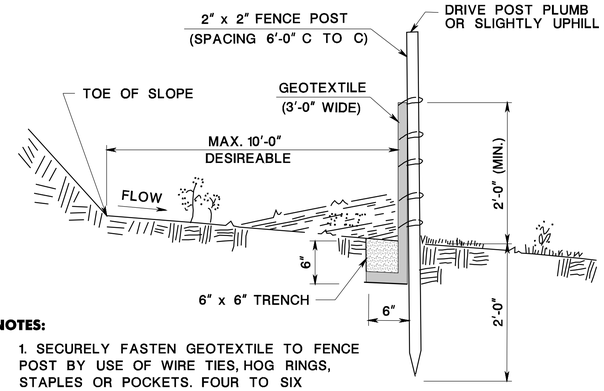
MONUMENT AND MONUMENT BOX

N.T.S.

CD-157-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

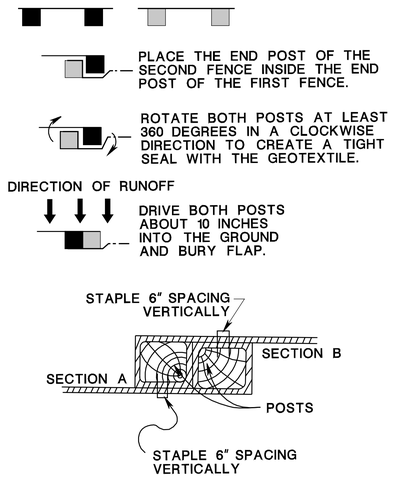


NOTES:

1. SECURELY FASTEN GEOTEXTILE TO FENCE POST BY USE OF WIRE TIES, HOG RINGS, STAPLES OR POCKETS. FOUR TO SIX FASTENERS PER POST.
2. BURY BOTTOM 1'-0" OF GEOTEXTILE AND TAMP IN PLACE.
3. SECURELY FASTEN ENDS OF INDIVIDUAL ROLLS OF GEOTEXTILE TO A POST BY WRAPPING EACH END OF THE GEOTEXTILE AROUND THE POST TWICE AND ATTACHING AS SPECIFIED IN NOTE 1 ABOVE. SPLICING OF INDIVIDUAL ROLLS SHALL NOT OCCUR AT LOW POINTS.
4. SET SILT FENCE WITHIN PROJECT LIMITS. 10'-0" IS DESIREABLE.

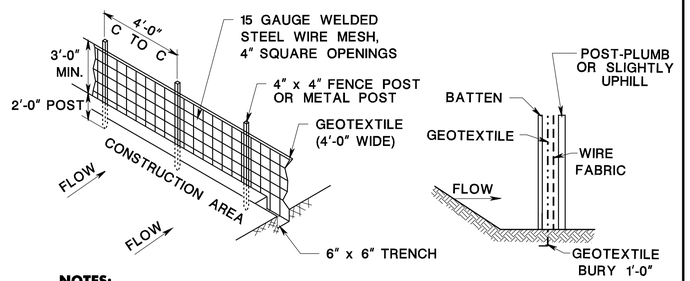
SILT FENCE

CD-158-1.1



ATTACHING TWO SILT FENCES

CD-158-1.2



NOTES:

1. SECURELY FASTEN GEOTEXTILE TO WIRE FABRIC BY USE OF WIRE TIES OR HOG RINGS, THEN SANDWICH BETWEEN A 1" x 3" x 3' BATTEN AND THE POSTS PLACING SCREWS AT 6 INCH INTERVALS STARTING 3 INCHES FROM TOP.
2. BURY 4" X 4" FENCE POST 2'-0" BELOW GROUND.
3. BURY BOTTOM 1 FOOT OF GEOTEXTILE AS PER SILT FENCE AND TAMP IN PLACE.
4. SECURELY FASTEN ENDS OF INDIVIDUAL ROLLS OF GEOTEXTILE TO A COMMON POST BY WRAPPING EACH END OF THE GEOTEXTILE AROUND A BATTEN TWICE AND ATTACHING THE BATTEN TO POST WITH SCREWS AT 6 INCH INTERVALS STARTING 3 INCHES FROM THE TOP. SPLICING OF INDIVIDUAL ROLLS SHALL NOT OCCUR AT LOW POINTS.
5. BURY 6" OF WIRE FABRIC IN TIDAL AREAS.

HEAVY DUTY SILT FENCE

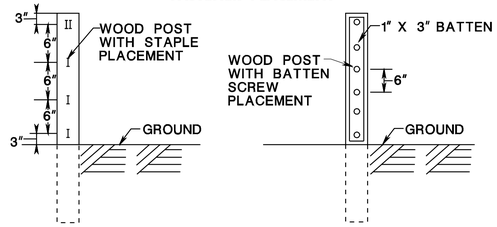
CD-158-1.3

FASTENERS FOR WOOD POSTS

	GAUGE	CROWN	LEGS	STAPLES/POST
WIRE STAPLES	17 MIN.	¾" WIDE	½" LONG	5 MIN.
	LENGTH	**PHILLIPS HEADS**	**SCREW/POST**	
SCREWS	2 "	2"	6 MIN.	

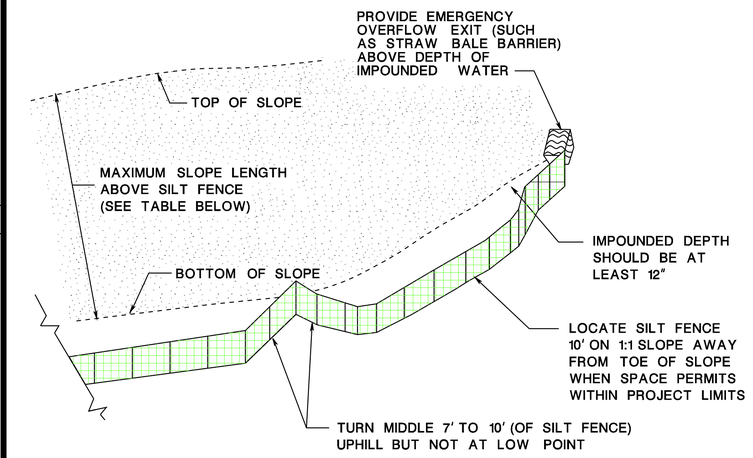
SOURCE: GA SWCC

FASTENER PLACEMENT



SILT FENCE FASTENER REQUIREMENTS

CD-158-1.4



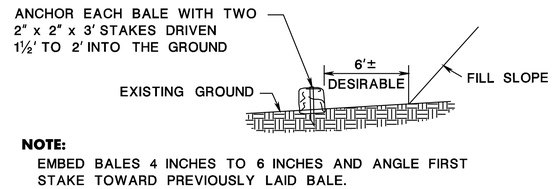
CRITERIA FOR SILT FENCE PLACEMENT

LAND SLOPE (PERCENT)	MAXIMUM SLOPE LENGTH ABOVE FENCE (FEET)
<2	100
2 TO 5	75
5 TO 10	50
10 TO 20	25
>20 *	15

* IN AREAS WHERE THE SLOPE IS GREATER THAN 20%, A FLAT AREA LENGTH OF 10 FEET BETWEEN THE TOE OF THE SLOPE AND THE FENCE SHOULD BE PROVIDED.

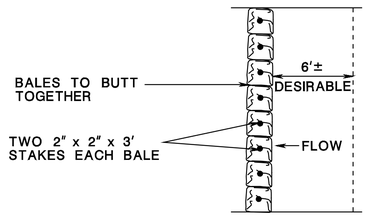
SILT FENCE ON A STEEP OR LONG GRADE

CD-158-1.5



NOTE:
EMBED BALES 4 INCHES TO 6 INCHES AND ANGLE FIRST STAKE TOWARD PREVIOUSLY LAID BALE.

ELEVATION

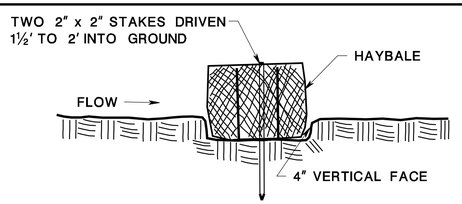


PLAN

NOTE:
TO BE USED WHERE THE EXISTING GROUND SLOPES AWAY FROM THE HIGHWAY EMBANKMENT AS CALLED FOR ON PLANS.

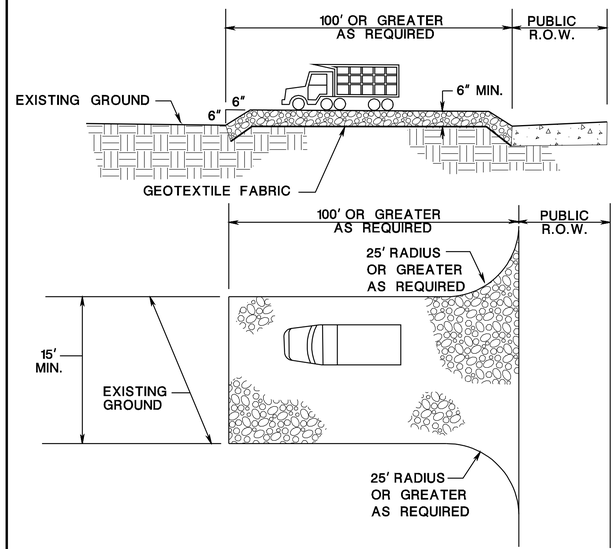
HAYBALES

CD-158-1.6



EMBEDDING DETAIL

CD-158-1.7



NOTE:
PROVIDE TRANSITION BETWEEN THE STABILIZED CONSTRUCTION ENTRANCE AND THE PUBLIC RIGHT OF WAY.

PROFILE AND PLAN VIEW

STABILIZED CONSTRUCTION DRIVEWAY

CD-158-1.8

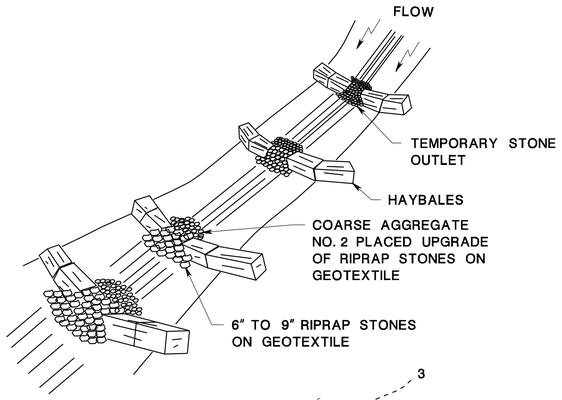
SOIL EROSION AND SEDIMENT CONTROL MEASURES

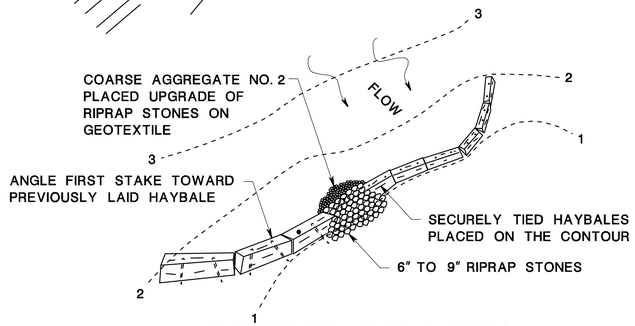
N.T.S.

CD-158-1

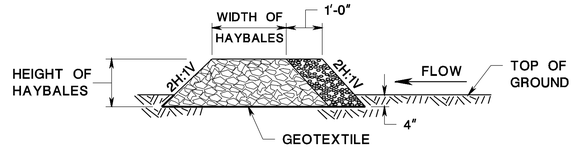
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS





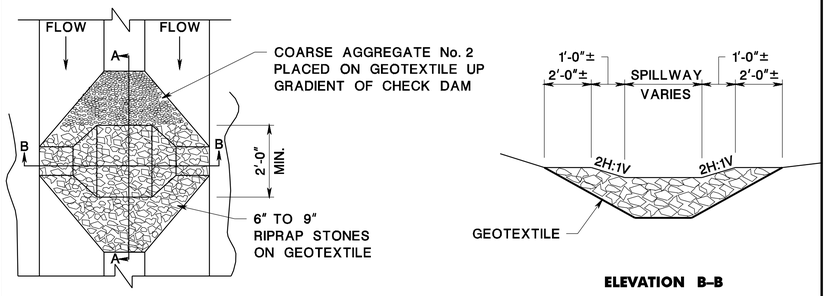
PLACEMENT AND ANCHORING DETAILS



STONE OUTLET SECTION DETAIL

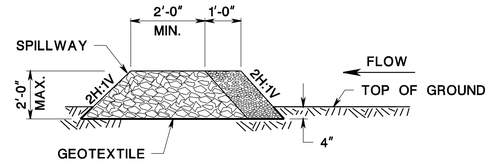
HAYBALE CHECK DAM WITH TEMPORARY STONE OUTLET

CD-158-2.1



PLAN

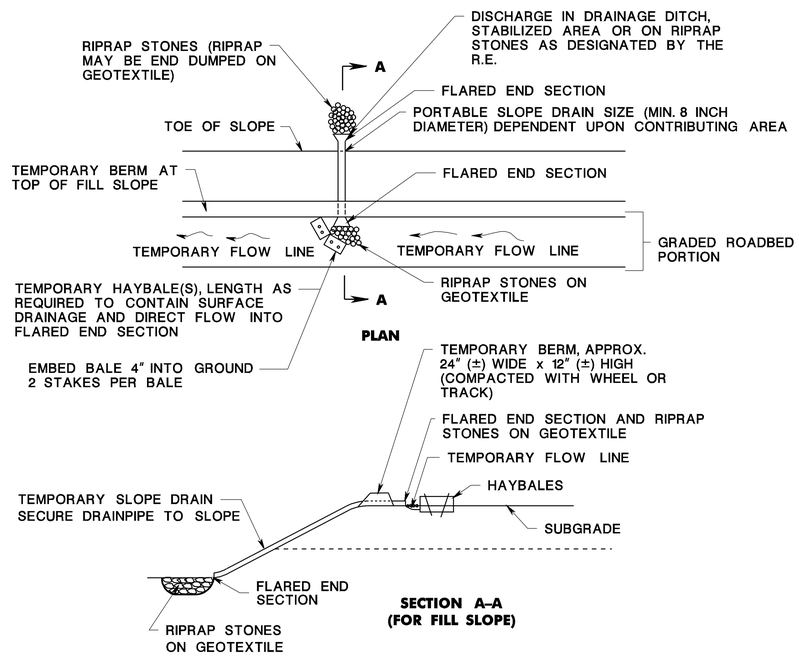
ELEVATION B–B



ELEVATION A–A

STONE CHECK DAM

CD-158-2.2

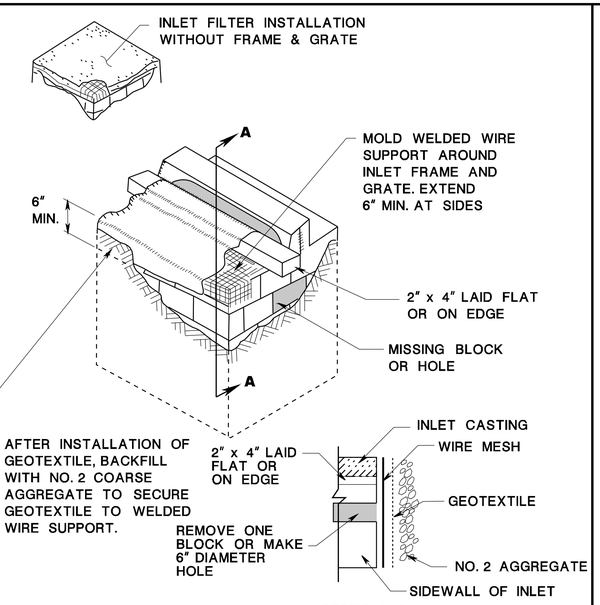


PLAN

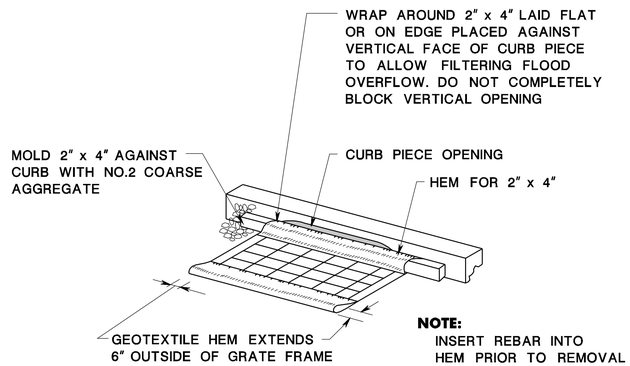
SECTION A–A (FOR FILL SLOPE)

SLOPE DRAIN

CD-158-2.3



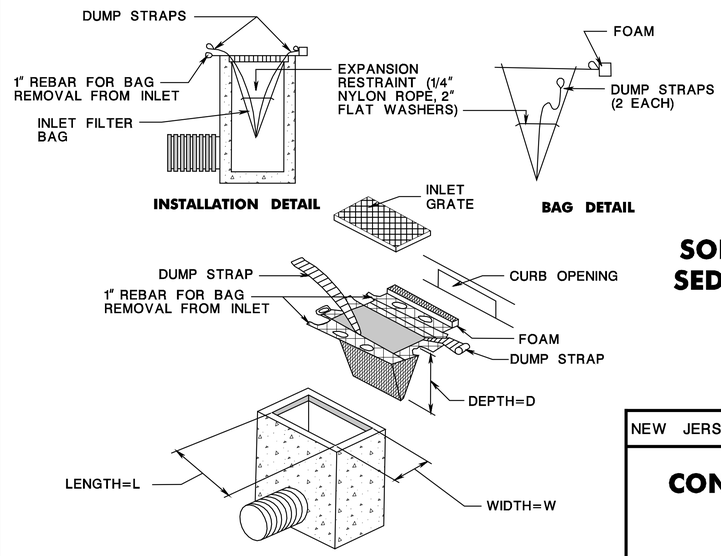
SECTION A–A



EXISTING INLET **NEW CONSTRUCTION**

INLET FILTERS, TYPE 1

CD-158-2.4



INSTALLATION DETAIL **BAG DETAIL**

INLET FILTERS, TYPE 2

CD-158-2.5

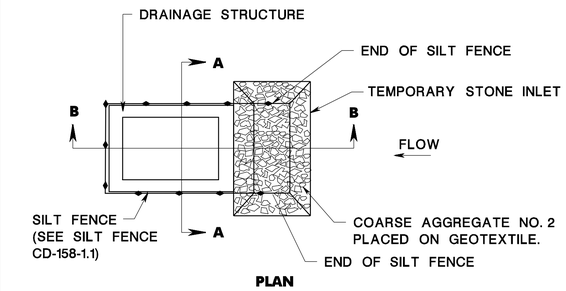
SOIL EROSION AND SEDIMENT CONTROL MEASURES

N.T.S.

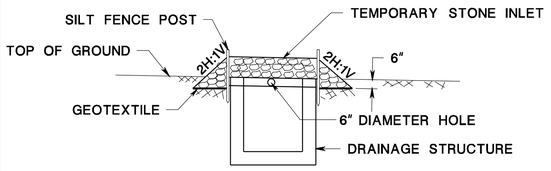
CD-158-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION

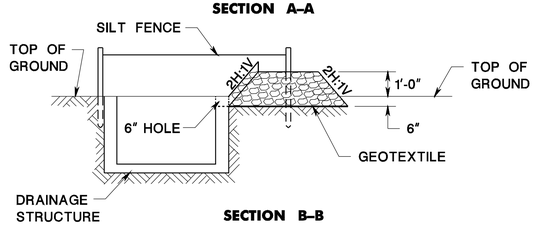
CONSTRUCTION DETAILS



PLAN



SECTION A–A



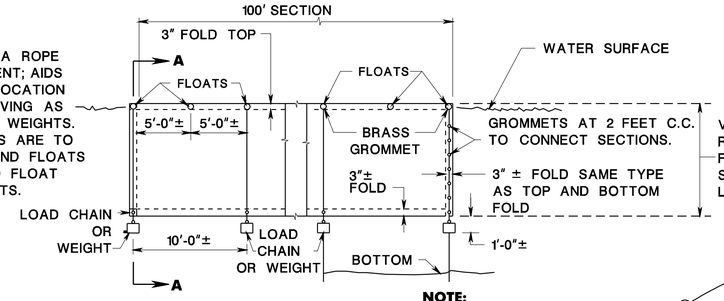
SECTION B–B

NOTE:
REFER TO CD-158-2.4 SECTION A-A FOR TREATMENT OF 6" HOLE.

INLET SEDIMENT TRAP

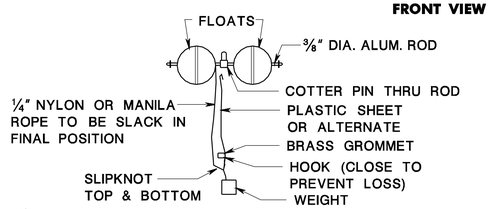
CD-158-3.1

NOTE:
¼" NYLON OR MANILA ROPE FORMS REINFORCEMENT; AIDS IN REMOVAL OR RELOCATION OF BARRIER BY SERVING AS A PICK-UP LINE FOR WEIGHTS. ROPES AND WEIGHTS ARE TO BE ATTACHED TO END FLOATS AND EVERY SECOND FLOAT BETWEEN END FLOATS.



FRONT VIEW

NOTE:
TYPE 1, 2, OR 3 TURBIDITY BARRIER TO FIT EXISTING CONDITION AS APPROVED BY THE R.E..

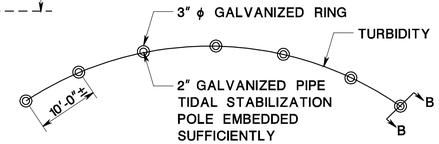


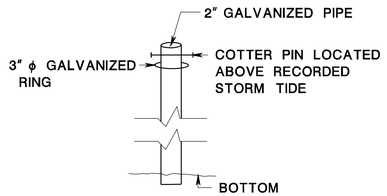
NOTE:
SUITABLE ALTERNATE MAY BE FASTENED TO STAKES DRIVEN INTO THE BOTTOM IN LIEU OF FLOATS AND WEIGHTS

SECTION A–A

SIDE VIEW

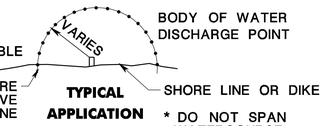
FOLDING DETAIL





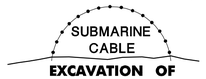
SECTION B–B

NOTE:
KEEP AS CLOSE TO SHORE AS POSSIBLE



TYPICAL APPLICATION

* DO NOT SPAN WATERCOURSE



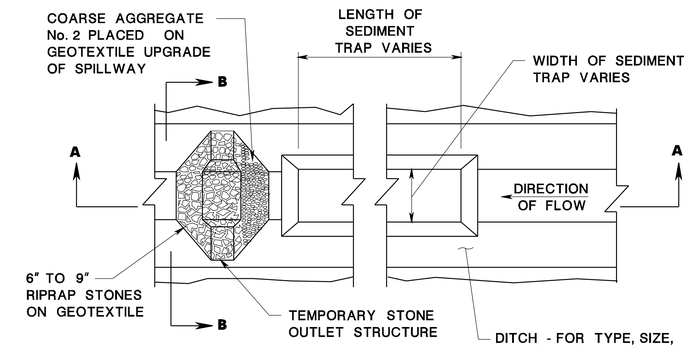
EXCAVATION OF WET AREAS

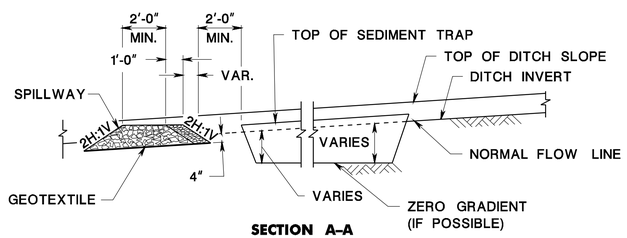
GENERAL NOTES:

1. INSTALL TURBIDITY BARRIER TO PREVENT DRIFTING OF SILT CAUSED BY DISCHARGE OF STORM SEWERS, DEWATERING BASINS, CONSTRUCTION, DREDGING OR FILLING OPERATIONS, OR OTHER ACTIVITIES THAT COULD CAUSE TURBIDITY.
2. EXACT PLACEMENT OF TURBIDITY BARRIER SHALL BE SO AS TO EFFECTIVELY CONTROL SILT DISPERSION UNDER THE CONDITIONS PRESENT ON A PARTICULAR PROJECT.
3. THE DETAILS SHOWN ON THIS SHEET ARE SUGGESTED METHODS ONLY. ALTERNATE SOLUTION AND USAGE OF MATERIALS MAY BE USED AS APPROVED.
4. USE APPROPRIATE NAVIGATIONAL WARNING LIGHTS WHEN USED NEXT TO NAVIGATIONAL CHANNEL.
5. TYPE 1 IS FOR PONDS, SHALLOW LAKES, SMALL STREAMS AND MARSHES WITH CURRENT VELOCITIES LESS THAN 1 FT./SEC AND SHELTERED FROM WINDS.
6. TYPE 2 IS FOR LAKES, STREAMS, INTERCOASTAL & TIDAL AREAS WITH CURRENT VELOCITIES UP TO 5 FT./SEC.
7. TYPE 3 IS FOR LAKES, STREAMS, INTERCOASTAL AND TIDAL AREAS WITH CONSIDERABLE CURRENT VELOCITIES UP TO 5FT./SEC., TIDAL ACTION AND SUBJECT TO WIND AND WAVES.

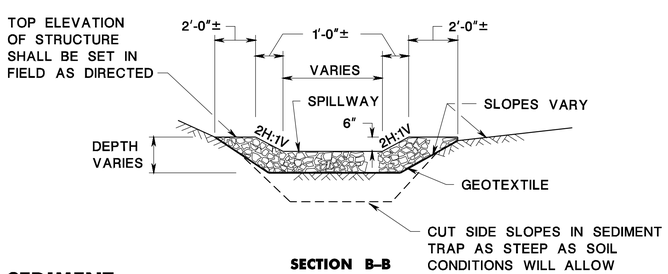
FLOATING TURBIDITY BARRIER

CD-158-3.2





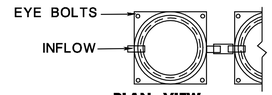
SECTION A–A



SECTION B–B

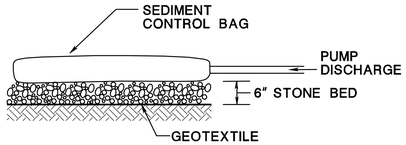
STONE OUTLET SEDIMENT TRAPS, ___' x ___'

CD-158-3.3



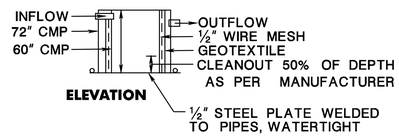
PLAN VIEW

EXAMPLE OF PORTABLE SEDIMENT TANK

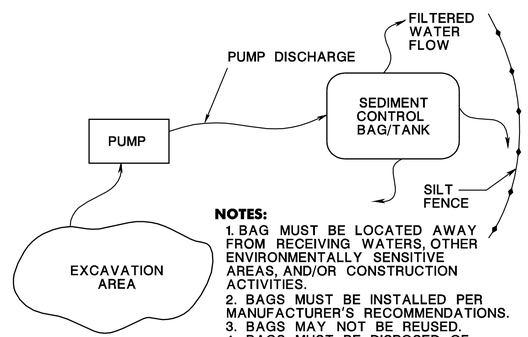


ELEVATION

SEDIMENT CONTROL BAG



ELEVATION



NOTES:
1. BAG MUST BE LOCATED AWAY FROM RECEIVING WATERS, OTHER ENVIRONMENTALLY SENSITIVE AREAS, AND/OR CONSTRUCTION ACTIVITIES.
2. BAGS MUST BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
3. BAGS MAY NOT BE REUSED.
4. BAGS MUST BE DISPOSED OF ACCORDING TO MANUFACTURER'S INSTRUCTIONS.

PLAN VIEW

SEDIMENT CONTROL TANK OR BAG

CD-158-3.4

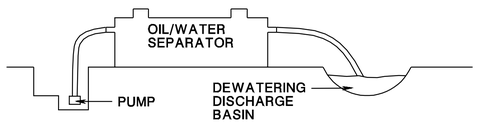
SOIL EROSION AND SEDIMENT CONTROL MEASURES

N.T.S.

CD-158-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

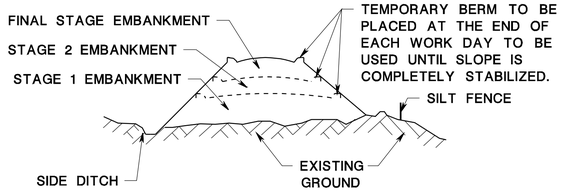


NOTES:

1. THE OIL/WATER SEPARATOR SHALL MEET THE UNDERWRITERS LABORATORY UL-58 STANDARD FOR FLAMMABLE AND COMBUSTIBLE LIQUIDS.
2. THE OIL/WATER SEPARATOR SHALL BE CAPABLE OF ACHIEVING A DISCHARGE QUALITY OF 30 PARTS PER MILLION OF PETROLEUM HYDROCARBONS OR LESS.

USE OF AN OIL/WATER SEPARATOR DURING DEWATERING

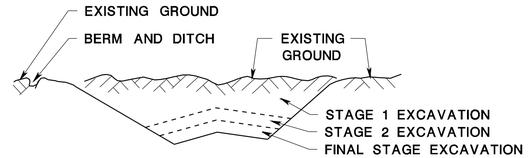
CD-158-4.1



PHASING PLAN-FILL SECTION

CONSTRUCTION SEQUENCE:

1. EXCAVATE AND STABILIZE SIDE DITCHES AND/OR INSTALL PROPOSED CONTROLS AT THE TOE OF SLOPE.
2. PLACE STAGE 1 EMBANKMENT. PLACE TEMPORARY SEEDING AND MULCH, OR TOPSOIL AND PERMANENTLY SEED AND MULCH SLOPE AT THIS STAGE.
3. PLACE STAGE 2 EMBANKMENT. PLACE TEMPORARY SEEDING AND MULCH OR TOPSOIL AND PERMANENTLY SEED AND MULCH SLOPE AT THIS STAGE.
4. PLACE FINAL STAGE EMBANKMENT. PLACE TOPSOIL, PERMANENT SEED AND MULCH ON THE SLOPE AT THIS STAGE AND ON THE ENTIRE SLOPE IF NOT PREVIOUSLY DONE.



PHASING PLAN-CUT SECTION

CONSTRUCTION SEQUENCE:

1. EXCAVATE AND STABILIZE BERM, SIDE AND OUTLET DITCHES.
2. PERFORM STAGE 1 EXCAVATION. TOPSOIL, PERMANENTLY SEED, AND MULCH SLOPE AT THIS STAGE.
3. PERFORM STAGE 2 EXCAVATION. TOPSOIL, PERMANENTLY SEED, AND MULCH SLOPE AT THIS STAGE.
4. PERFORM FINAL STAGE EXCAVATION. TOPSOIL, PERMANENTLY SEED, AND MULCH SLOPE AT THIS STAGE. REPAIR ANY DAMAGE DONE TO PREVIOUS STAGES.

EMBANKMENT

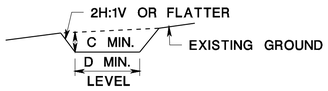
BEFORE BEGINNING ANY EARTHWORK, EXCAVATE AND STABILIZE SIDE DITCHES AND INSTALL PERIMETER CONTROLS (SILT FENCE, ETC.). SLOPES GREATER THAN 25 FEET IN HEIGHT SHALL BE EXCAVATED AND STABILIZED IN STAGES OF EQUAL INCREMENTS NOT TO EXCEED 15 FEET.

AT THE END OF EACH WORK DAY TEMPORARY BERMS (EARTH) AND SLOPE DRAINS SHALL BE CONSTRUCTED ALONG THE TOP EDGE(S) OF THE EMBANKMENT TO INTERCEPT SURFACE RUNOFF.

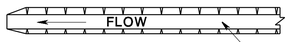
ROADWAY GRADING

CD-158-4.2

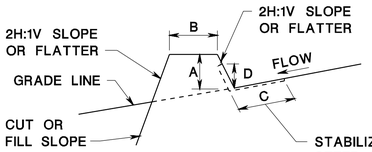
	DITCH A (5 AC OR LESS)	DITCH B (5 – 10 AC)
DITCH DEPTH (C)	1'-0"	1'-0"
DITCH WIDTH (D)	4'-0"	6'-0"



DITCH CROSS SECTION



DITCH PLAN VIEW



BERM CROSS SECTION

	BERM A (5 AC OR LESS)	BERM B (5 – 10 AC)
BERM HEIGHT (A)	18"	36"
BERM WIDTH (B)	24"	36"
FLOW WIDTH (C)	48"	72"
FLOW HEIGHT (D)	8"	15"

NOTE:

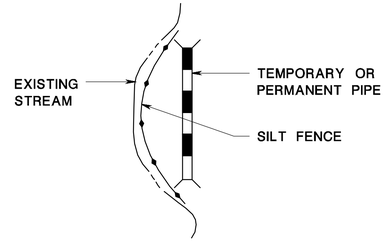
FIELD LOCATION SHOULD BE ADJUSTED AS NEEDED TO UTILIZE A STABILIZED OUTLET.

STABILIZATION FOR DITCH OR BERM

TYPE OF TREATMENT	GRADE	A - (5 AC OR LESS)	B - (5 - 10 AC)
1	0.5 - 5.0%	SEED USED WITH TOPSOIL STABILIZATION MATTING	SEED USED WITH TOPSOIL STABILIZATION MATTING
2	5.1 - 8.0%	SEED USED WITH TOPSOIL STABILIZATION MATTING	LINED 6"- 9" RIPRAP
3	8.1 - 20.0%	LINED 6"- 9" RIPRAP	ENGINEERED DESIGN

TEMPORARY RUNOFF DIVERSION

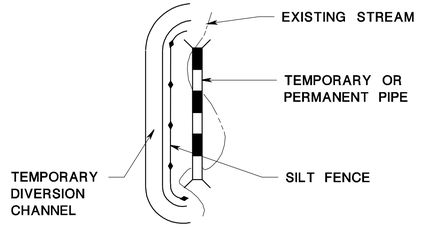
CD-158-4.3



METHOD A

CONSTRUCTION SEQUENCE:

1. INSTALL SILT FENCE ALONG EXISTING STREAM IN AREA OF PROPOSED PIPE CONSTRUCTION.
2. CONSTRUCT PIPE SYSTEM.
3. DIVERT STREAM FLOW INTO PIPE.
4. FOR TEMPORARY DIVERSIONS, RETURN FLOW TO EXISTING STREAM.
5. RESTORE TEMPORARY DIVERSION AREA TO ORIGINAL CONDITION.



METHOD B

CONSTRUCTION SEQUENCE:

1. INSTALL SILT FENCE ALONG EXISTING STREAM IN AREA OF TEMPORARY DIVERSION CHANNEL.
2. CONSTRUCT TEMPORARY DIVERSION CHANNEL AND LINE WITH GEOTEXTILE AND TEMPORARY RIPRAP.
3. DIVERT STREAM FLOW INTO TEMPORARY CHANNEL.
4. CONTINUE SEQUENCE FROM STEP 2, METHOD A.

STREAM DIVERSION

CD-158-4.4

SOIL EROSION AND SEDIMENT CONTROL MEASURES

N.T.S.

CD-158-4

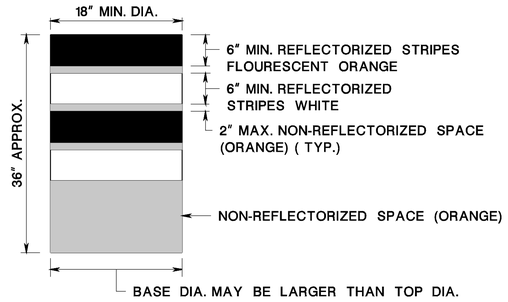
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

DRUMS SHALL BE MADE OF ORANGE PLASTIC WITH A MINIMUM OF FOUR ALTERNATE FLUORESCENT ORANGE AND WHITE RETROREFLECTIVE STRIPES. IF THERE ARE NON-REFLECTORIZED SPACES BETWEEN THE STRIPES, THEY SHALL BE NO MORE THAN 2" WIDE. RETROREFLECTIVE SHEETING FOR STRIPES SHALL CONFORM WITH ASTM D 4956 TYPE VII OR VIII WITH S2 REQUIREMENTS.

THE TOP OF THE DRUM SHALL NOT BE OPEN. DRUMS SHALL BE CONSTRUCTED TO INHIBIT ROLLING IF KNOCKED OVER.

THE REFLECTORIZED AREA OF DRUMS SHALL BE ROUND EXCEPT THAT OTHER SHAPES, WHICH PROVIDE THE SAME VISIBILITY AS AN 18 INCH DIAMETER ROUND DRUM REGARDLESS OF ORIENTATION, MAY BE USED.



WHEN BALLAST IS REQUIRED BY THE R.E., SAND SHALL BE USED. THE MAXIMUM WEIGHT OF THE BALLAST SHALL BE 50 LBS. AND BE LOCATED APPROXIMATELY AT GROUND LEVEL. ALTERNATE TYPES OF BALLAST SHALL BE APPROVED BY THE R.E..

DRUMS

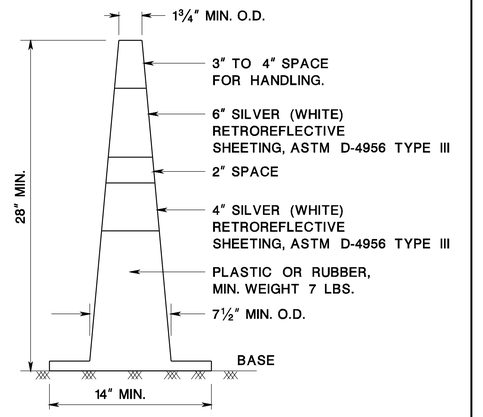
CD-159-1.1

NOTES:

TRAFFIC CONES SHALL BE PREDOMINATELY ORANGE IN COLOR.

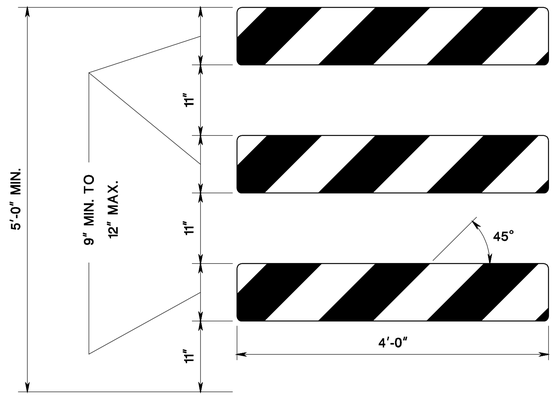
BASES MAY BE OF BREAKAWAY BALLASTED TYPE.

MINOR MANUFACTURER'S VARIATIONS MAY BE ACCEPTABLE UPON APPROVAL OF THE ENGINEER.



TRAFFIC CONES

CD-159-1.2



TYPE III BARRICADE – FRONT VIEW

NOTES:

1. THE 9" MIN. x 48", OR 12" MAX. x 48" BARRICADE RAILS SHALL BE FABRICATED FROM 0.125" MAX. PLASTIC SHEETING AND SHALL BE ATTACHED, 4 PER RAIL, WITH 1 INCH NO. 14 PAN HEAD METAL SCREWS OR PLASTIC RIVETS. ALL CORNERS SHALL BE ROUNDED.

2. ORANGE AND SILVER (WHITE) STRIPES SHALL BE RETROREFLECTIVE SHEETING, ASTM D 4956 TYPE III, AS SHOWN FOR CONSTRUCTION SIGNS. ALTERNATE ORANGE AND SILVER (WHITE) STRIPES 6" WIDE SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION TRAFFIC IS TO PASS.

3. THE FRAMING AND BALLAST FOR BARRICADE PANELS SHALL BE NCHRP-350 CRASHED TESTED AND FHWA APPROVED.

4. IF NECESSARY, THE BALLAST SHALL BE FABRICATED AND PLACED ACCORDING TO THE MANUFACTURE'S RECOMMENDATION.

BREAKAWAY BARRICADES

CD-159-1.3

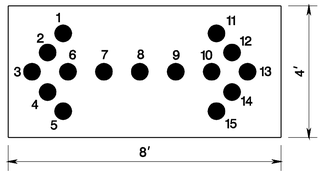
TRAFFIC CONTROL DEVICES

N.T.S.

CD-159-1

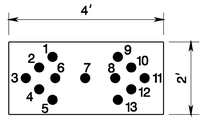
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS



4' x 8' BOARD

FLASHING MESSAGES TO LIGHT AS FOLLOWS
RIGHT ARROW 3, 6, 7, 8, 9, 11, 12, 13, 14 & 15
LEFT ARROW 1, 2, 3, 4, 5, 7, 8, 9, 10 & 13
DOUBLE ARROW 1, 2, 3, 4, 5, 7, 8, 9, 11, 12, 13, 14 & 15
CAUTION MODE 1, 5, 11 & 15



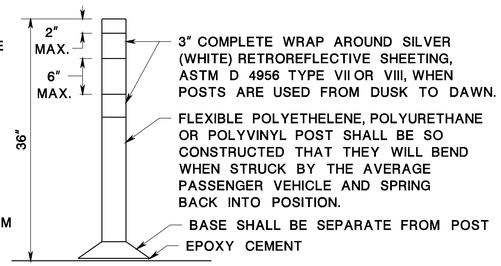
2' x 4' BOARD

RIGHT ARROW 3, 6, 7, 9, 10, 11, 12 & 13
LEFT ARROW 1, 2, 3, 4, 5, 7, 8 & 11
DOUBLE ARROW 1, 2, 3, 4, 5, 7, 9, 10, 11, 12 & 13
CAUTION MODE 1, 5, 9 & 13

ILLUMINATED FLASHING ARROWS, ____ x ____

CD-159-2.1

DELINEATOR GUIDE POSTS SHALL BE PREDOMINATELY ORANGE IN COLOR.



THE BASE SHALL BE REMOVED FROM THE PAVEMENT WHEN THE POST IS NO LONGER NEEDED.

NOTE:

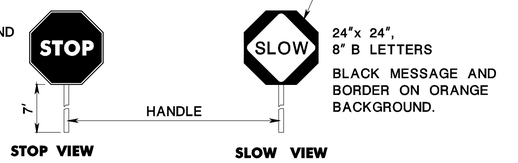
MINOR MANUFACTURER'S VARIATIONS MAY BE ACCEPTABLE UPON APPROVAL OF THE R.E..

DELINEATOR GUIDE POSTS

CD-159-2.2

R 1 - 1
24"x 24",
8" C LETTERS

WHITE MESSAGE AND BORDER ON RED BACKGROUND.



24"x 24",
8" B LETTERS

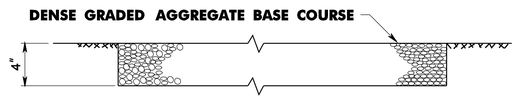
BLACK MESSAGE AND BORDER ON ORANGE BACKGROUND.

NOTE:

SIGN FACES SHALL BE RETROREFLECTIVE SHEETING, ASTM D 4956 TYPE III.

STOP / SLOW PADDLE

CD-159-2.3

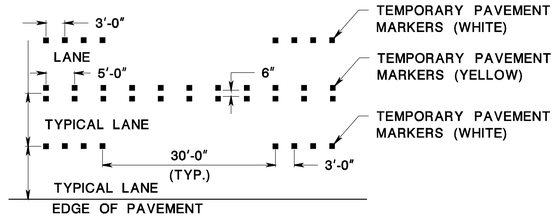


NOTE:

ALL EXCAVATION OR EMBANKMENT REQUIRED TO CONSTRUCT TEMPORARY SIDEWALK SHALL BE INCLUDED IN UNIT PRICE BID FOR PAY ITEM, TEMPORARY SIDEWALK.

TEMPORARY SIDEWALK

CD-159-2.4



NOTES:

1. WHEN TEMPORARY PAVEMENT MARKERS ARE TO SIMULATE LANE LINES ON SHARP CURVES OR IN TRANSITIONS TO EITHER REDUCE THE NUMBER OF LANES OR TO SHIFT TRAFFIC LATERALLY, THE TEMPORARY PAVEMENT MARKERS SHALL BE SPACED 5 FEET APART CONTINUOUSLY THROUGH THE CURVE OR TRANSITION AREA.
2. TEMPORARY PAVEMENT MARKERS SHOULD NOT BE USED TO DELINEATE RIGHT EDGE LINES.

TEMPORARY PAVEMENT MARKERS

CD-159-2.5

TRAFFIC CONTROL DEVICES

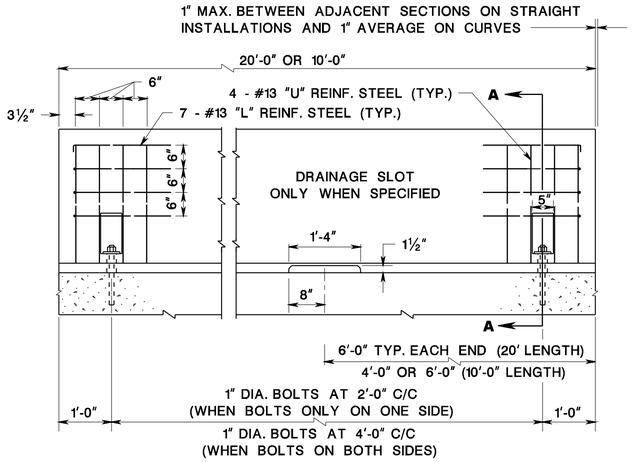
N.T.S.

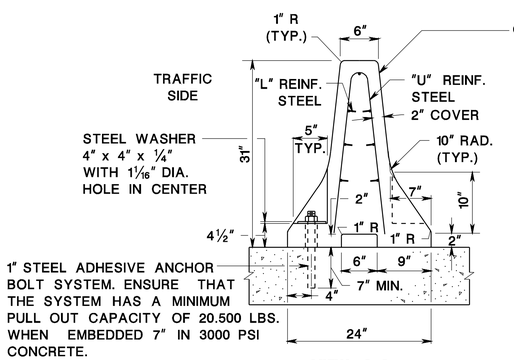
CD-159-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION

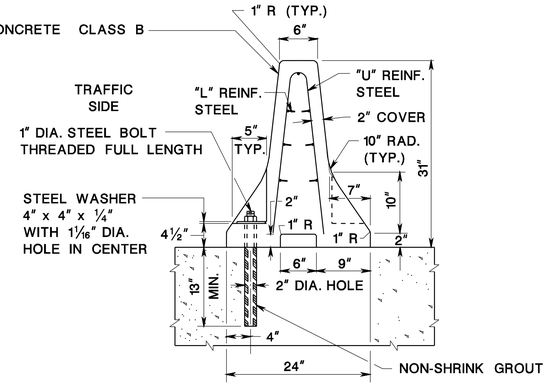
CONSTRUCTION DETAILS

BDC07D-01-ORIGINAL SHEET

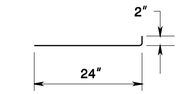




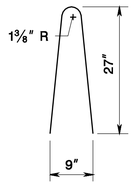
VIEW A–A
CONCRETE PAVEMENT



VIEW A–A
HMA PAVEMENT



"L" REINFORCEMENT STEEL



"U" REINFORCEMENT STEEL

NOTES:

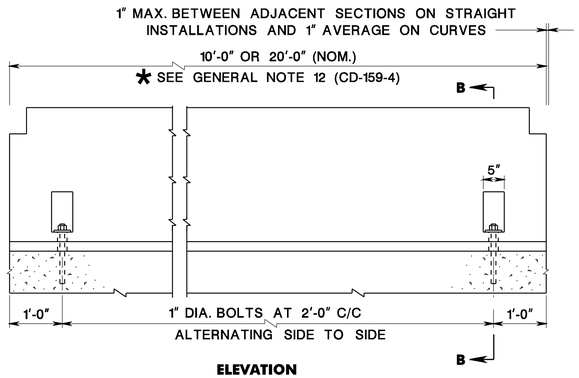
1. THE APPROACH END OF THE PRECAST CONCRETE CURB, CONSTRUCTION BARRIER SHOULD BE FLARED AWAY FROM TRAFFIC AT A RATE OF 20:1. WHERE POSTED SPEEDS ARE LESS THAN 50 M.P.H., A FLARE RATE OF 15:1 MAY BE USED. ON CURVED ROADWAYS, KINKS IN THE BARRIER ALIGNMENT SHOULD BE AVOIDED.
2. REINFORCING SHOWN IS THE MINIMUM REQUIRED. ADDITIONAL REINFORCING NECESSARY FOR HANDLING SHALL BE THE OPTION AND RESPONSIBILITY OF THE CONTRACTOR.
3. IF TRAFFIC WILL BE ON BOTH SIDES OF THE BARRIER, THE CONTRACTOR SHALL PROVIDE BOLT RECESSES SO THE BOLTS CAN BE INSTALLED AT 4 FEET C. TO C. ON EACH SIDE. AT THE OPTION OF THE CONTRACTOR, BOLT RECESSES AND BOLTS MAY BE PROVIDED AT 4 FEET C. TO C. ON EACH SIDE WHEN TRAFFIC IS ONLY ON ONE SIDE OF THE BARRIER.
4. WHEN THE BARRIER HAS BEEN REMOVED, THE BOLTS SHALL BE REMOVED OR CUT OFF TO A LEVEL OF ½" MINIMUM BELOW THE PAVEMENT SURFACE AND THE HOLES SHALL BE FILLED TO THE SATISFACTION OF THE R.E..
5. VARIATIONS TO THE DETAILS SHALL BE SUBJECT TO APPROVAL.
6. FOR INSTALLATION ON BRIDGE DECKS, REFER TO BRIDGE PLANS FOR NECESSARY MODIFICATIONS, AS REQUIRED.

PRECAST CONCRETE CURB, CONSTRUCTION BARRIER, TYPE 1

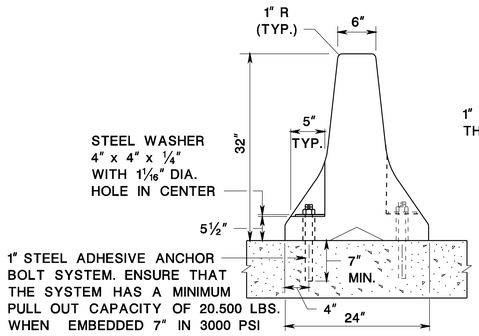
CD-159-3.1

NOTES:

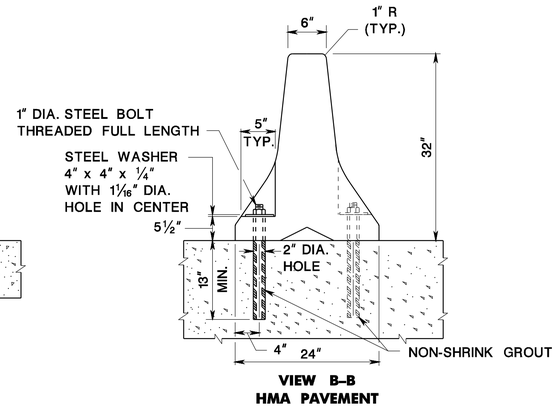
1. BOLTS SHALL BE REQUIRED IN EVERY ANCHOR POCKET HOLE.
2. CONNECTION KEY SHALL BE USED WITH TYPE 1 APPLICATION.
3. WHEN BARRIER HAS BEEN REMOVED, THE BOLTS SHALL BE REMOVED OR CUT OFF TO A LEVEL OF ½" MINIMUM BELOW THE SURFACE AND THE HOLE FILLED TO THE SATIFICATION OF THE R.E..



ELEVATION



VIEW B–B
CONCRETE PAVEMENT



VIEW B–B
HMA PAVEMENT

ANCHORAGE FOR TYPE 4 BARRIER USED AS TYPE 1 AND ANCHORAGE FOR TYPE 4 BARRIER WITH JOINT CLASS D

CD-159-3.2

REINFORCEMENT STEEL IS IN METRIC UNITS.
HMA = HOT MIX ASPHALT

CONSTRUCTION BARRIER CURB, TYPE 1

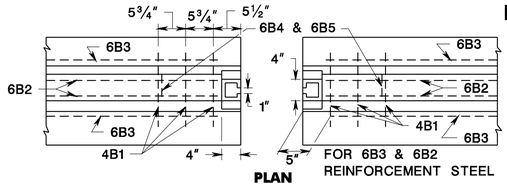
N.T.S.

CD-159-3

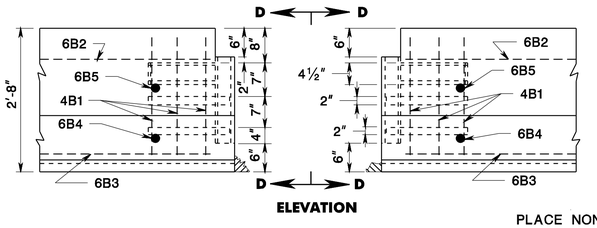
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

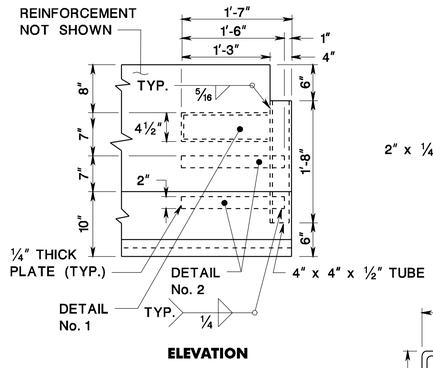
PRECAST CONCRETE CURB, CONSTRUCTION BARRIER JOINT CONNECTION DETAILS



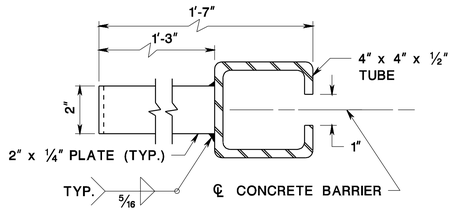
PLAN



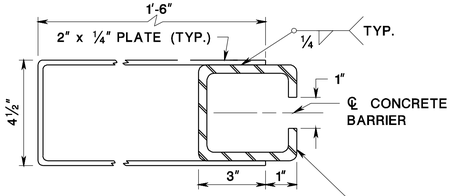
ELEVATION



ELEVATION

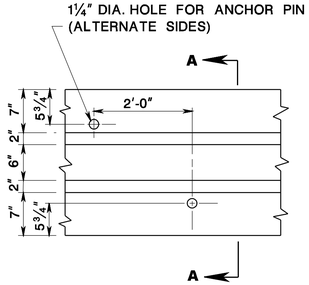


PLAN VIEW
DETAIL No. 1

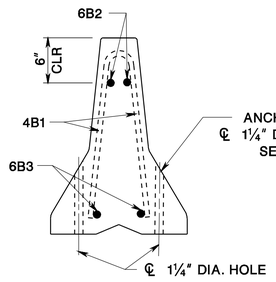


PLAN VIEW
DETAIL No. 2

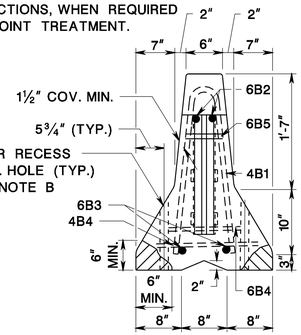
PLACE NON-SHRINK GROUT IN HATCHED AREAS BETWEEN SECTIONS, WHEN REQUIRED BY THE TABLE OF JOINT TREATMENT.



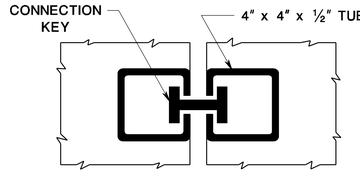
PLAN–ANCHOR RECESS



SECTION A–A

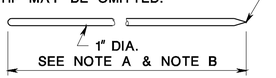


SECTION D–D



KEY IN PLACE

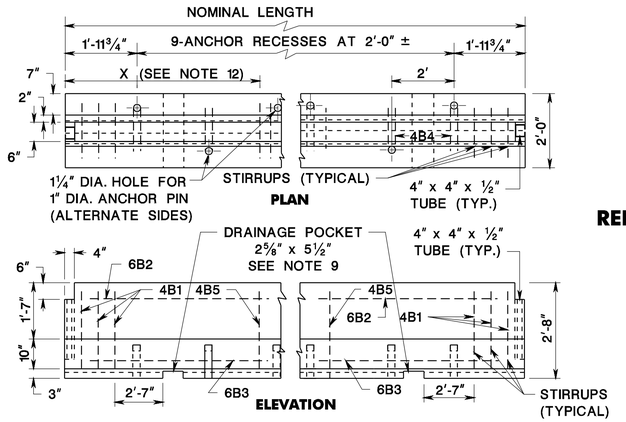
FOR ANCHORING IN CONCRETE SLABS, THE TIP MAY BE OMITTED.



ANCHOR PIN

JOINT CLASS	TABLE OF JOINT AND ANCHORAGE TREATMENTS FOR TYPE 4 APPLICATIONS ONLY JOINT TREATMENT
A	CONNECTION KEY ONLY
B	CONNECTION KEY AND GROUT IN EVERY JOINT
C	CONNECTION KEY AND GROUT IN EVERY JOINT AND PIN EVERY OTHER UNIT. IN UNITS THAT ARE TO BE ANCHORED, PINS SHALL BE REQUIRED IN EVERY ANCHOR PIN RECESS

TABLE OF VARIABLE REINFORCEMENT STEEL			
NOMINAL LENGTH OF BARRIER UNIT	MARK	"X"	NO. EACH SECTION
20′	4B4	N.A.	9
20′	4B5	6′-11″	2
18′	4B4	N.A.	8
18′	4B5	6′-5″	2
16′	4B4	N.A.	7
16′	4B5	5′-11″	2
14′	4B4	N.A.	6
14′	4B5	7′-0″	1
12′	4B4	N.A.	5
12′	4B5	6′-0″	1
10′	4B4	N.A.	4
10′	4B5	5′-0″	1
8′	4B4	N.A.	3
8′	4B5	-	0
"X" DISTANCE FROM END OF BARRIER TO 4B5 REINFORCEMENT STEEL			

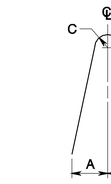


PLAN

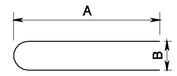
ELEVATION

CONCRETE BARRIER

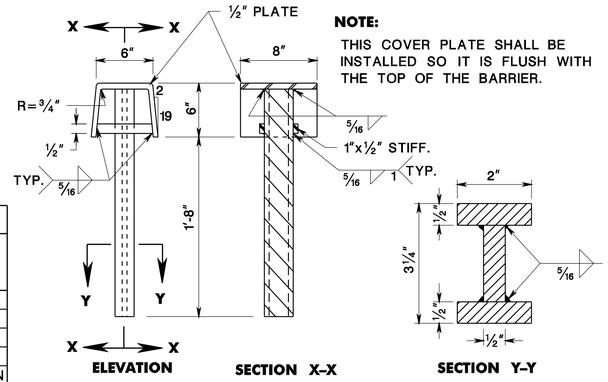
REINFORCEMENT STEEL LIST (EACH BARRIER SECTION)								
MARK	SIZE	NUMBER IN EACH SECTION	LENGTH	TYPE	A	B	C	LOCATION
4B1	#13	6	4′-11″	I	5″	26″	2″	STIRRUPS
4B4	#13	SEE NOTE 12	3′-1″	II	15½″	4″		STIRRUPS
4B5	#13	SEE NOTE 12	4′-11″	I	5″	26″	2″	STIRRUPS
6B2	#19	2	SEE NOTE 12	STR.				LONGITUDINAL (TOP) NORMAL SECTION
6B3	#19	2	SEE NOTE 12	STR.				LONGITUDINAL (BOTTOM) NORMAL SECTION
6B4	#19	2	1′-2″	STR.				TRANSVERSE (BOTTOM) NORMAL SECTION
6B5	#19	2	0′-6″	STR.				TRANSVERSE (TOP) NORMAL SECTION



TYPE "I" REINFORCEMENT STEEL



TYPE "II" REINFORCEMENT STEEL



ELEVATION

SECTION X–X

SECTION Y–Y

CONNECTION KEY

NOTE:
THIS COVER PLATE SHALL BE INSTALLED SO IT IS FLUSH WITH THE TOP OF THE BARRIER.

GENERAL NOTES:

1. STEEL PLATE SHALL BE ASTM A36, A588, A441 OR A572 GRADE 50.
2. REINFORCEMENT STEEL SHALL BE ASTM A615, GRADE 60.
3. CONCRETE SHALL BE CONCRETE CLASS B.
4. CONCRETE CLEAR COVER FOR REINFORCEMENT STEEL SHALL BE 1½″ (MIN.).
5. TUBE STEEL SHALL BE ASTM A500, GRADE B OR C.
6. ANCHOR PINS SHALL BE 1 INCH DIA. ASTM A36.
7. ANCHOR PINS ARE NOT REQUIRED IN EVERY UNIT. SEE TABLE OF JOINT TREATMENTS.
8. ALL END SECTIONS SHALL BE PINNED UNLESS OTHERWISE NOTED.
9. 2⅝″ X 5½″ DRAINAGE POCKETS - TWO REQUIRED IN SECTIONS 12 FEET AND GREATER. ONE REQUIRED IN 8 FOOT AND 10 FOOT SECTIONS.
10. AFTER A BARRIER UNIT HAS BEEN PLACED AND THE CONNECTION KEY INSERTED, REMOVE ANY SLACK IN THE JOINT BY PULLING THE UNIT IN A DIRECTION PARALLEL TO IT'S LONGITUDINAL AXIS.
11. THE PRECAST CONCRETE CURB, CONSTRUCTION BARRIER SHALL BE CAST IN STEEL FORMS.
12. THE PRECAST CONCRETE CURB SHALL BE UNITS OF 20 FEET, HOWEVER, OTHER LENGTHS MAY BE USED TO MEET FIELD CONDITIONS, THE NUMBER AND PLACEMENT OF THE 4B4 AND 4B5 REINFORCEMENT STEEL WILL VARY WITH THE LENGTH OF THE BARRIER UNIT AS SHOWN ON THE TABLE OF VARIABLE REINFORCEMENT STEEL. THE 6B2 AND 6B3 REINFORCEMENT STEEL SHALL BE 10 INCHES SHORTER THAN THE NOMINAL LENGTH OF THE BARRIER UNITS.
13. REINFORCING SHOWN IS THE MINIMUM REQUIRED. ADDITIONAL REINFORCING NECESSARY FOR HANDLING SHALL BE THE OPTION AND RESPONSIBILITY OF THE CONTRACTOR.
14. WELDING AND FABRICATION OF STEEL STRUCTURES SHALL BE IN ACCORDANCE WITH SECTIONS 1 THRU 6 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE AND SECTION 10 OF THE ANSI/AWS D.1 STRUCTURAL WELDING CODE. SURFACES TO BE WELDED SHALL BE FREE OF SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER MATERIAL THAT WILL PREVENT PROPER WELDING OR PRODUCE OBJECTIONAL FUMES. WELDING SHALL BE SHIELDED METAL ARC WELDING USING PROPERLY DRIED 5/32″ DIA. E7018 ELECTRODES.
15. AFTER REMOVAL OF THE BARRIER, THE HOLES IN THE SURFACE ON WHICH THE BARRIER SAT WHICH WERE USED TO ANCHOR THE SYSTEM, SHALL BE FILLED. THE ONLY EXCEPTION IS WHEN THE HOLES ARE IN AN AREA WHICH IS TO BE REMOVED. HOLES IN FLEXIBLE PAVEMENT, OR UNPAVED AREAS SHALL BE FILLED AS DIRECTED. HOLES IN PORTLAND CEMENT CONCRETE PAVEMENTS OR STRUCTURAL DECKS, SHALL BE FILLED WITH NON-SHRINK GROUT MATERIAL MEETING THE REQUIREMENTS OF SECTION 903.07, EXCEPT THAT IN LATEX MODIFIED CONCRETE BRIDGE DECK, A COMPATIBLE NON-SHRINK GROUT MATERIAL SHALL BE USED.

NOTE A

THE LENGTH OF THE ANCHOR PINS SHALL BE SUCH THAT THE FOLLOWING MINIMUM EMBEDMENT LENGTHS ARE OBTAINED:
(a) INTO CONCRETE PAVEMENT 0′-5″.
(b) INTO FLEXIBLE PAVEMENT 1′-6″
(c) INTO UNPAVED AREA 2′-6″

WHEN ANCHOR PINS ARE IN PLACE, THEY SHALL NOT PROJECT ABOVE THE PLANE OF THE CONCRETE SURFACE OF THE BARRIER.

HOLES IN BRIDGE DECKS SHALL BE 1¼″ DIAMETER MAXIMUM AND MADE WITH A CORE DRILL OR ANY OTHER APPROVED ROTARY DRILLING DEVICE THAT DOES NOT IMPART AN IMPACT FORCE.

NOTE B

IN UNITS THAT ARE TO BE ANCHORED, PINS SHALL BE REQUIRED IN EVERY ANCHOR RECESS.

NOTE C

FOR INSTALLATION ON BRIDGE DECKS REFER TO BRIDGE PLANS FOR NECESSARY MODIFICATIONS AS REQUIRED AND GENERAL NOTE 15.

NOTES:
REINFORCEMENT STEEL IS IN METRIC UNITS.

CONSTRUCTION BARRIER CURB, TYPE 4 (ALTERNATE A)

N.T.S.

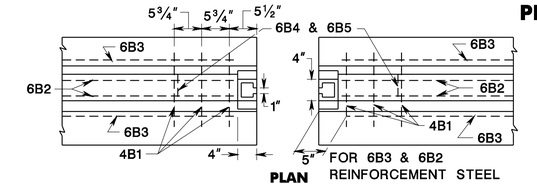
CD-159-4

NEW JERSEY DEPARTMENT OF TRANSPORTATION

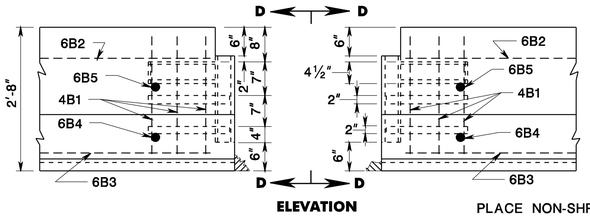
CONSTRUCTION DETAILS

CD-159-4.1

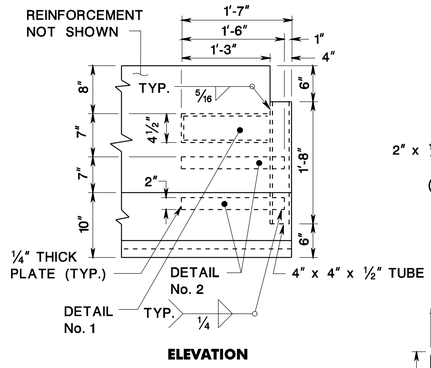
PRECAST CONCRETE CURB, CONSTRUCTION BARRIER JOINT CONNECTION DETAILS



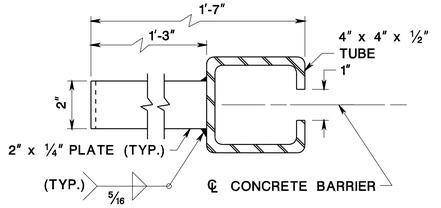
PLAN



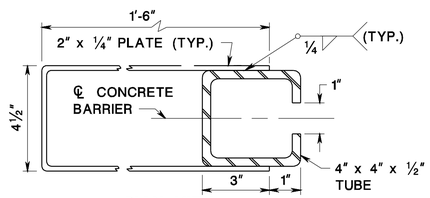
ELEVATION



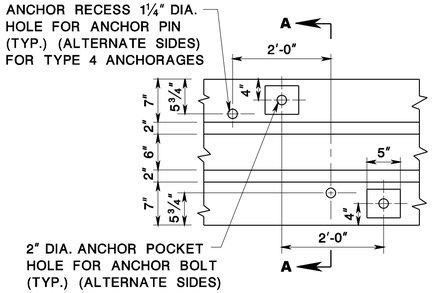
ELEVATION



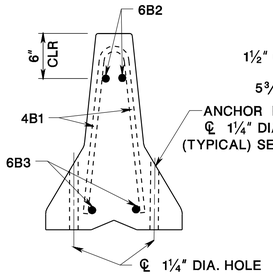
PLAN VIEW
DETAIL No. 1



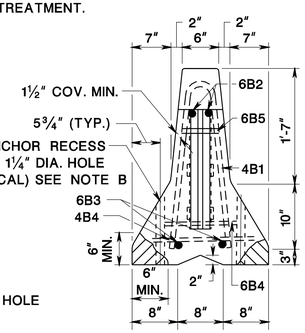
PLAN VIEW
DETAIL No. 2



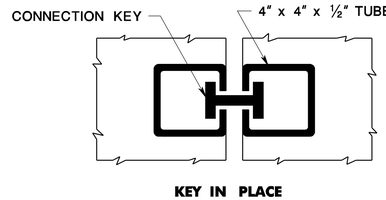
PLACE NON-SHRINK GROUT IN HATCHED AREAS BETWEEN SECTIONS, WHEN REQUIRED BY THE TABLE OF JOINT TREATMENT.



SECTION A–A

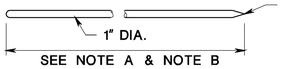


SECTION D–D



KEY IN PLACE

PLAN–ANCHOR RECESS/POCKET



FOR ANCHORING IN CONCRETE SLABS, THE TIP MAY BE OMITTED.

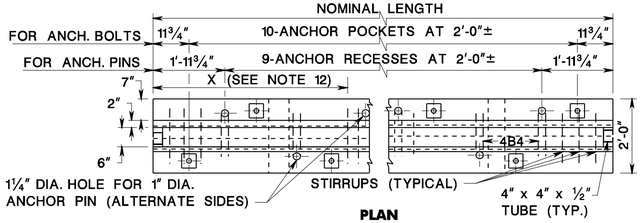
ANCHOR PIN

JOINT CLASS	TABLE OF JOINT AND ANCHORAGE TREATMENTS FOR TYPE 4 APPLICATIONS ONLY JOINT TREATMENT
A	CONNECTION KEY ONLY
B	CONNECTION KEY AND GROUT IN EVERY JOINT
C	CONNECTION KEY AND GROUT IN EVERY JOINT AND PIN EVERY OTHER UNIT. IN UNITS THAT ARE TO BE ANCHORED, PINS SHALL BE REQUIRED IN EVERY ANCHOR PIN RECESS
D	CONNECTION KEY AND GROUT EVERY JOINT, BOLT EVERY ANCHOR POCKET HOLE IN EVERY UNIT.

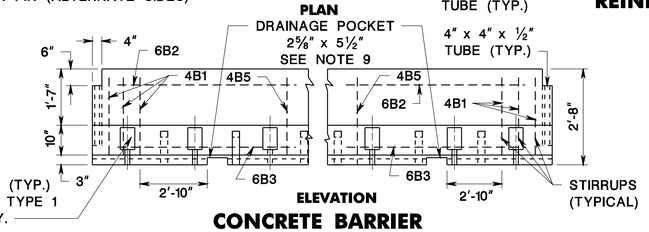
TABLE OF VARIABLE REINFORCEMENT STEEL

NOMINAL LENGTH OF BARRIER UNIT	MARK	"X"	NO. EACH SECTION
20′	4B4	N.A.	9
20′	4B5	6′-11″	2
18′	4B4	N.A.	8
18′	4B5	6′-5″	2
16′	4B4	N.A.	7
16′	4B5	5′-11″	2
14′	4B4	N.A.	6
14′	4B5	7′-0″	1
12′	4B4	N.A.	5
12′	4B5	6′-0″	1
10′	4B4	N.A.	4
10′	4B5	5′-0″	1
8′	4B4	N.A.	3
8′	4B5	-	0

"X" DISTANCE FROM END OF BARRIER TO 4B5 REINFORCEMENT STEEL



PLAN

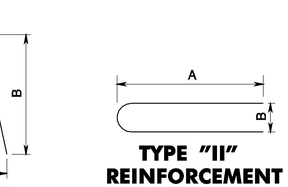


ELEVATION

CONCRETE BARRIER

REINFORCEMENT STEEL LIST (EACH BARRIER SECTION)

MARK	SIZE	NUMBER IN EACH SECTION	LENGTH	TYPE	A	B	C	LOCATION
4B1	#13	6	4′-11″	I	5″	26″	2″	STIRRUPS
4B4	#13	SEE NOTE 12	3′-1″	II	15½″	4″		STIRRUPS
4B5	#13	SEE NOTE 12	4′-11″	I	5″	26″	2″	STIRRUPS
6B2	#19	2	SEE NOTE 12	STR.				LONGITUDINAL (TOP) NORMAL SECTION
6B3	#19	2	SEE NOTE 12	STR.				LONGITUDINAL (BOTTOM) NORMAL SECTION
6B4	#19	2	1′-2″	STR.				TRANSVERSE (BOTTOM) NORMAL SECTION
6B5	#19	2	0′-6″	STR.				TRANSVERSE (TOP) NORMAL SECTION



TYPE "I" REINFORCEMENT STEEL

TYPE "II" REINFORCEMENT STEEL

GENERAL NOTES:

1. STEEL PLATE SHALL BE ASTM A36, A588, A441 OR A572 GRADE 50.
2. REINFORCMENT STEEL SHALL BE ASTM A615, GRADE 60.
3. CONCRETE SHALL BE CONCRETE CLASS B.
4. CONCRETE CLEAR COVER FOR REINFORCMENT STEEL SHALL BE 1½" (MIN.)
5. TUBE STEEL SHALL BE ASTM A500, GRADE B OR C.
6. ANCHOR PINS SHALL BE 1 INCH DIA. ASTM A36.
7. ANCHOR PINS ARE NOT REQUIRED IN EVERY UNIT. SEE TABLE OF JOINT TREATMENTS.
8. ALL END SECTIONS SHALL BE PINNED UNLESS OTHERWISE NOTED.
9. 2⅝" X 5½" DRAINAGE POCKETS - TWO REQUIRED IN SECTIONS 12 FEET AND GREATER. ONE REQUIRED IN 8 FOOT AND 10 FOOT SECTIONS.
10. AFTER A BARRIER UNIT HAS BEEN PLACED AND THE CONNECTION KEY INSERTED, REMOVE ANY SLACK IN THE JOINT BY PULLING THE UNIT IN A DIRECTION PARALLEL TO IT'S LONGITUDINAL AXIS.
11. THE PRECAST CONCRETE CURB, CONSTRUCTION BARRIER SHALL BE CAST IN STEEL FORMS.
12. THE PRECAST CONCRETE CURB SHALL BE UNITS OF 20 FEET, HOWEVER, OTHER LENGTHS MAY BE USED TO MEET FIELD CONDITIONS. THE NUMBER AND PLACEMENT OF THE 4B4 AND 4B5 REINFORCEMENT STEEL WILL VARY WITH THE LENGTH OF THE BARRIER UNIT AS SHOWN ON THE TABLE OF VARIABLE REINFORCEMENT STEEL. THE 6B2 AND 6B3 REINFORCEMENT STEEL SHALL BE 10 INCHES SHORTER THAN THE NOMINAL LENGTH OF THE BARRIER UNITS.
13. REINFORCING SHOWN IS THE MINIMUM REQUIRED. ADDITIONAL REINFORCING NECESSARY FOR HANDLING SHALL BE THE OPTION AND RESPONSIBILITY OF THE CONTRACTOR.
14. WELDING AND FABRICATION OF STEEL STRUCTURES SHALL BE IN ACCORDANCE WITH SECTIONS 1 THRU 6 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE AND SECTION 10 OF THE ANSI/AWS D.1 STRUCTURAL WELDING CODE. SURFACES TO BE WELDED SHALL BE FREE OF SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER MATERIAL THAT WILL PREVENT PROPER WELDING OR PRODUCE OBJECTIONAL FUMES. WELDING SHALL BE SHIELDED METAL ARC WELDING USING PROPERLY DRIED 5/32" DIA. E7018 ELECTRODES.
15. AFTER REMOVAL OF THE BARRIER, THE HOLES IN THE SURFACE ON WHICH THE BARRIER SAT WHICH WERE USED TO ANCHOR THE SYSTEM, SHALL BE FILLED. THE ONLY EXCEPTION IS WHEN THE HOLES ARE IN AN AREA WHICH IS TO BE REMOVED. HOLES IN FLEXIBLE PAVEMENT, OR UNPAVED AREAS SHALL BE FILLED AS DIRECTED. HOLES IN PORTLAND CEMENT CONCRETE PAVEMENTS OR STRUCTURAL DECKS, SHALL BE FILLED WITH NON-SHRINK GROUT MATERIAL MEETING THE REQUIREMENTS OF SECTION 903.07, EXCEPT THAT IN LATEX MODIFIED CONCRETE BRIDGE DECK, A COMPATIBLE NON-SHRINK GROUT MATERIAL SHALL BE USED.
16. ONLY THE TYPE 4, JOINT CLASS D, SHALL BE USED AS BRIDGE PARAPETS.

NOTE A

THE LENGTH OF THE ANCHOR PINS SHALL BE SUCH THAT THE FOLLOWING MINIMUM EMBEDMENT LENGTHS ARE OBTAINED:
- (a) INTO CONCRETE PAVEMENT 0′-5″.
- (b) INTO FLEXIBLE PAVEMENT 1′-6″
- (c) INTO UNPAVED AREA 2′-6″

WHEN ANCHOR PINS ARE IN PLACE, THEY SHALL NOT PROJECT ABOVE THE PLANE OF THE CONCRETE SURFACE OF THE BARRIER.

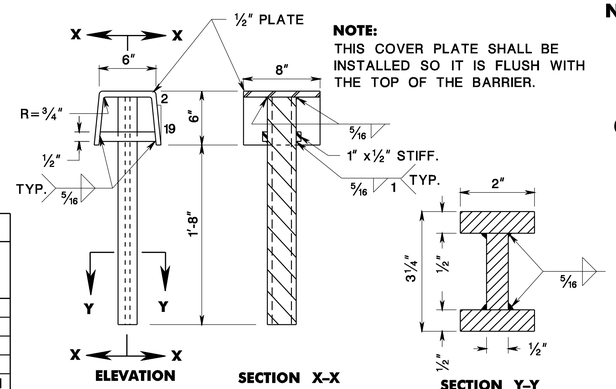
HOLES IN BRIDGE DECKS SHALL BE 1¼" DIAMETER MAXIMUM AND MADE WITH A CORE DRILL OR ANY OTHER APPROVED ROTARY DRILLING DEVICE THAT DOES NOT IMPART AN IMPACT FORCE.

NOTE B

IN UNITS THAT ARE TO BE ANCHORED, PINS SHALL BE REQUIRED IN EVERY ANCHOR RECESS.

NOTE C

FOR INSTALLATION ON BRIDGE DECKS REFER TO BRIDGE PLANS FOR NECESSARY MODIFICATIONS AS REQUIRED AND GENERAL NOTES 15 & 16.



NOTE:
THIS COVER PLATE SHALL BE INSTALLED SO IT IS FLUSH WITH THE TOP OF THE BARRIER.

CONNECTION KEY

NOTES:

REINFORCMENT STEEL IS IN METRIC UNITS.

CONSTRUCTION BARRIER CURB, TYPE 4 (ALTERNATE B)

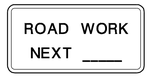
N.T.S.

CD-159-5

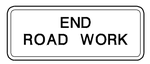
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

CD-159-5.1



G20 - 1 [60″ x 24″]
(10 S.F.)



G20 - 2A [48″ x 24″]
(8 S.F.)

M4 - 9L (LEFT) [30″ x 24″]
M4 - 9R (RIGHT) [30″ x 24″]
(5 S.F.)

M4 - 9 (L or R) (S) [48″ x 36″]
(12 S.F.)

M4 - 9LX (LEFT) [30″ x 24″]
M4 - 9RX (RIGHT) [30″ x 24″]
(5 S.F.)

M4 - 9 (L or R) XS [48″ x 36″]
(12 S.F.)

M4 - 9X [30″ x 24″]
(5 S.F.)

M4 - 9X (S) [48″ x 36″]
(12 S.F.)

M4 - 10L (LEFT) [48″ x 18″]
M4 - 10R (RIGHT) [48″ x 18″]
(6 S.F.)

M4 - 8a [24″ x 18″]
(3 S.F.)

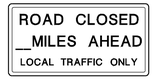
M4 - 11 (S) [48″ x 36″]
(12 S.F.)

R2 - 1 [36″ x 48″]
(12 S.F.)

R2 - 1 (S) [48″ x 60″]
(20 S.F.)

R4 - 1 [24″ x 30″]
(5 S.F.)

R11 - 2 [48″ x 30″]
(10 S.F.)

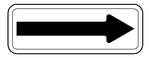


R11 - 3 [60″ x 30″]
(12.5 S.F.)

R11 - 4 [60″ x 30″]
(12.5 S.F.)

(L OR R)

W1 - 4a [48″ x 48″]
(16 S.F.)



(L OR R)

W1- 6 [48″ x 24″]
(8 S.F.)

W1 - 6 (S) [60″ x 30″]
(12.5 S.F.)

(L OR R)

W4 - 2 (S) [48″ x 48″]
(16 S.F.)

W5 - 1 (S) [48″ x 48″]
(16 S.F.)

W6 - 3 [48″ x 48″]
(16 S.F.)

W20 - 7b [48″ x 48″]
(16 S.F.)

W13 - 1 [18″ x 18″]
(2.3 S.F.)

W13 - 1 (S) [24″ x 24″]
(4 S.F.)

W20 - 1A [48″ x 48″]
(16 S.F.)

W20 - 2 [48″ x 48″]
(16 S.F.)

W20 - 3 [48″ x 48″]
(16 S.F.)

W20 - 4 [48″ x 48″]
(16 S.F.)

(L OR R) (CENTER)
W20 - 5 [48″ x 48″]
(16 S.F.)

W20 - 7a [48″ x 48″]
(16 S.F.)

W21 - 5 (S) [48″ x 48″]
(16 S.F.)

M4 - 9N [30″ x 12″ MIN.]
(2.5 S.F.)

(SIZE WILL VARY WITH LENGTH OF STREET NAME)

STREET NAME SIGN TO BE USED IN CONJUNCTION WITH M4 - 9 SIGNS BLACK ON ORANGE

[24″ x 24″]
(4 S.F.)

[30″ x 30″] (S)
(6.3 S.F.)

[24″ x 24″]
(4 S.F.)

[30″ x 30″] (S)
(6.3 S.F.)

W8 - 1 (S) [48″ x 48″]
(16 S.F.)

W8 - 9a [48″ x 48″]
(16 S.F.)

W8 - 14 [48″ x 48″]
(16 S.F.)

W8 - 14A [48″ x 48″]
(16 S.F.)

W99 - 2 [48″ x 48″]
(16 S.F.)

NOTE:

THE BORDER, THE WORDS "GIVE US A", "SLOW DOWN!", AND THE BRAKE PEDAL ARE BLACK; LEAVING THE WORD "BRAKE" ORANGE.

GENERAL NOTES:

1. DIMENSIONS, COLORS AND DETAILS OF VARIOUS SIZE SIGNS, AND ACCESSORY PANELS TO FOLLOW STANDARDS IN THE CURRENT "STANDARD HIGHWAY SIGN PUBLICATION" AND THE CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS".
2. (S) REPRESENTS A SPECIAL SIZE SIGN.
3. LETTERS AND NUMERALS SHALL CONFORM TO THE CURRENT MANUAL, "STANDARD ALPHABETS FOR HIGHWAY SIGNS" U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION.
4. THE CONTRACTOR SHALL OBTAIN THE APPROVAL OF THE ENGINEER FOR THE DISTANCE TO BE USED ON THE ADVANCE WARNING SIGNS, AND FOR THE SPEED LIMIT TO BE USED ON THE R2-1 SIGN.
5. DISTANCE LEGEND: SIGN NUMBER FOLLOWED BY LETTER & DISTANCE

LETTER	DISTANCE
A	1500′
B	1000′
C	500′
D	___MILE
E	___MILES AHEAD
F	AHEAD

BACKING MATERIAL

1. ALUMINUM SHALL BE FLAT SHEET OF ALLOY 5052-H38 OR 6061-T6 ALLOY, 0.10 GAUGE.

TEMPORARY SIGN SUPPORTS

1. SIGN SUPPORTS SHALL BE OF WELL SEASONED LUMBER, S4S, FREE OF SPLITS, KNOTS AND WARPS, OR OF STEEL COMPONENTS.
2. WOOD POSTS SHALL HAVE A UNIFORM CROSS-SECTION AND SHALL NOT EXCEED THE FOLLOWING DIMENSIONS FOR:

   SINGLE POST = 4″ x 6″
   TWO POSTS = 3″ x 6″ OR 4″ x 5″
   THREE POSTS = 3″ x 5″ OR 4″ x 4″

   4″ X 6″ WOOD POSTS SHALL BE MODIFIED BY DRILLING 1½ INCH DIAMETER HOLES 4 INCHES AND 18 INCHES ABOVE THE GROUND LINE AND PERPENDICULAR TO THE ROADWAY CENTERLINE.
3. NO BRACING IS PERMITTED. VERTICAL CLEARANCES FOR SIGNS MOUNTED ON WOOD SUPPORTS SHALL BE 7 FOOT MINIMUM. EMBEDMENT DEPTH FOR THE WOOD POST SHALL NOT EXCEED 3.5 FEET.
4. STEEL POSTS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAIL FOR U-POST SIGN SUPPORT.
5. TEMPORARY SIGN SUPPORTS NOT MEETING THIS CRITERIA SHALL BE SHIELDED BY A LONGITUDINAL BARRIER OR CRASH CUSHIONS.

SIGN FACES

1. SIGN FACES SHALL BE ASTM D 4956 TYPE VII OR VIII FLUORESCENT ORANGE SHEETING.

FASTENING

1. ALL SIGNS SHALL BE SECURELY FASTENED TO THEIR SUPPORTS WITH BOLTS, NUTS AND WASHERS IN ACCORDANCE WITH THE SPECIFICATIONS.

CONSTRUCTION SIGNS

N.T.S.

CD-159-6

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

CD-159-6.1

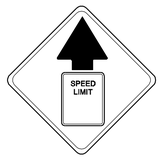
E5 - 1 [60″ x 48″]
(20 S.F.)

W50 - 1C [60″ x 48″]
(20 S.F.)

W5 - 4 [48″ x 48″]
(16 S.F.)

W(NJ)100 - 1(L OR R)
48″ x 48″
(16 S.F.)

W9 - 3 a [48″ X 48″]
(16 S.F.)

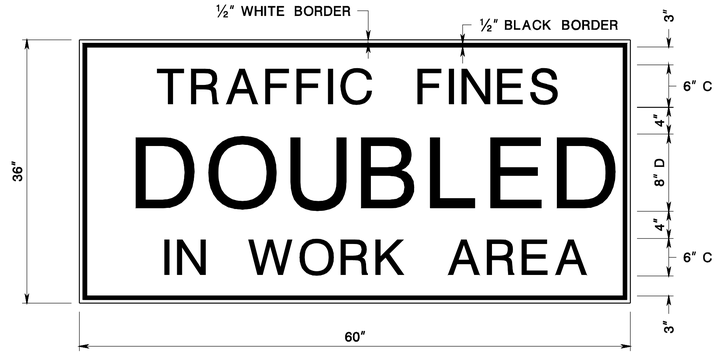


W3-5
48″ x 48″
(16 S.F.)

W20 - 4F(M) [48″ x 48″]
(16 S.F.)

36″ x 12″
(3 S.F.)

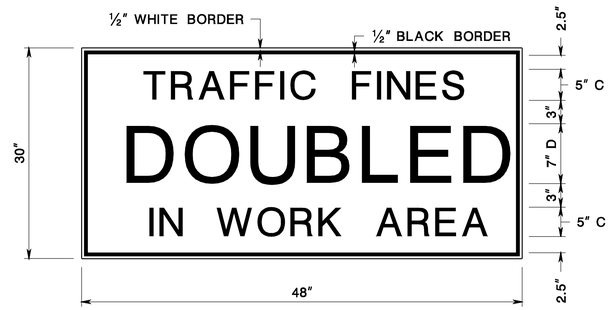
W20 - 10(G) [48″ x 48″]
(16 S.F.)



NOTE:

MESSAGE TO BE BLACK LETTERS
ON WHITE REFLECTIVE BACKGROUND.

R(NJ)5-17 60″ x 36″
(15 S.F.)



NOTE:

MESSAGE TO BE BLACK LETTERS
ON WHITE REFLECTIVE BACKGROUND.

R(NJ)5-17 48″ x 30″
(10 S.F.)

GENERAL NOTES:

1. DIMENSIONS, COLORS AND DETAILS OF VARIOUS SIZE SIGNS, AND ACCESSORY PANELS TO FOLLOW STANDARDS IN THE CURRENT "STANDARD HIGHWAY SIGN PUBLICATION" AND THE CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS".
2. LETTERS AND NUMERALS SHALL CONFORM TO THE CURRENT MANUAL, "STANDARD ALPHABETS FOR HIGHWAY SIGNS" U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION.
3. THE CONTRACTOR SHALL OBTAIN THE APPROVAL OF THE ENGINEER FOR THE DISTANCE TO BE USED ON THE ADVANCE WARNING SIGNS, AND FOR THE SPEED LIMIT TO BE USED ON THE R2-1 SIGN.
4. DISTANCE LEGEND: SIGN NUMBER FOLLOWED BY LETTER & DISTANCE

LETTER	DISTANCE
A	1500′
B	1000′
C	500′
D	___MILE
E	___MILES AHEAD
F	AHEAD

BACKING MATERIAL

1. ALUMINUM SHALL BE FLAT SHEET OF ALLOY 5052-H38 OR 6061-T6 ALLOY, 0.10 GAUGE.

TEMPORARY SIGN SUPPORTS

1. SIGN SUPPORTS SHALL BE OF WELL SEASONED LUMBER, S4S, FREE OF SPLITS, KNOTS AND WARPS, OR OF STEEL COMPONENTS.
2. WOOD POSTS SHALL HAVE A UNIFORM CROSS-SECTION AND SHALL NOT EXCEED THE FOLLOWING DIMENSIONS FOR:

   SINGLE POST = 4″ x 6″
   TWO POSTS = 3″ x 6″ OR 4″ x 5″
   THREE POSTS = 3″ x 5″ OR 4″ x 4″

   4″ X 6″ WOOD POSTS SHALL BE MODIFIED BY DRILLING 1½ INCH DIAMETER HOLES 4 INCHES AND 18 INCHES ABOVE THE GROUND LINE AND PERPENDICULAR TO THE ROADWAY CENTERLINE.
3. NO BRACING IS PERMITTED. VERTICAL CLEARANCES FOR SIGNS MOUNTED ON WOOD SUPPORTS SHALL BE 7 FOOT MINIMUM. EMBEDMENT DEPTH FOR THE WOOD POST SHALL NOT EXCEED 3.5 FEET.
4. STEEL POSTS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAIL FOR U-POST SIGN SUPPORT.
5. TEMPORARY SIGN SUPPORTS NOT MEETING THIS CRITERIA SHALL BE SHIELDED BY A LONGITUDINAL BARRIER OR CRASH CUSHIONS.
6. WOOD POST TO BE USED ONLY ON TEMPORARY SIGN SUPPORT.

SIGN FACES

1. SIGN FACES SHALL BE ASTM D 4956 TYPE VII OR VIII FLUORESCENT ORANGE SHEETING.

FASTENING

1. ALL SIGNS SHALL BE SECURELY FASTENED TO THEIR SUPPORTS WITH BOLTS, NUTS AND WASHERS IN ACCORDANCE WITH THE SPECIFICATIONS.

CONSTRUCTION SIGNS
N.T.S.

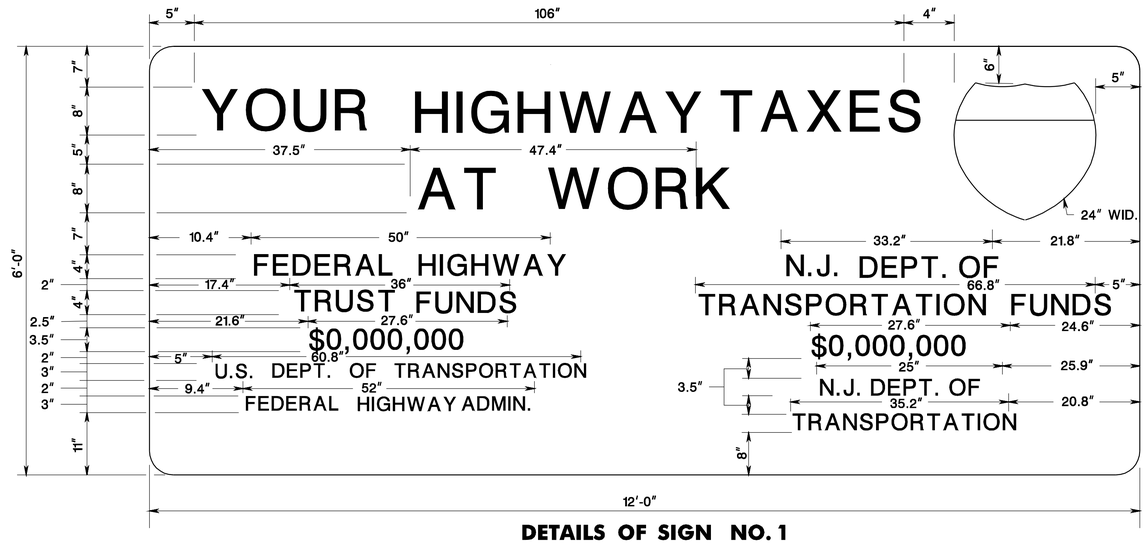
CD-159-7

NEW JERSEY DEPARTMENT OF TRANSPORTATION

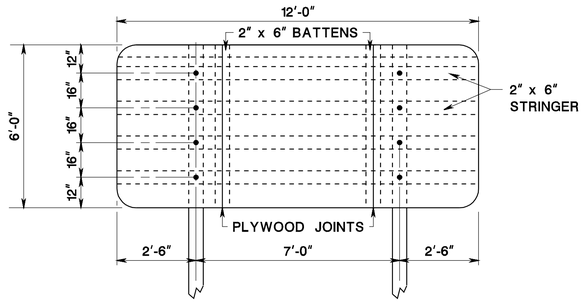
CONSTRUCTION DETAILS

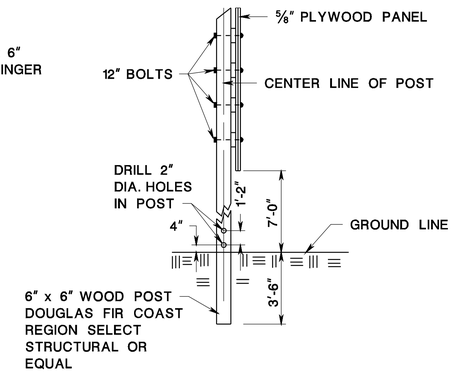
CD-159-7.1

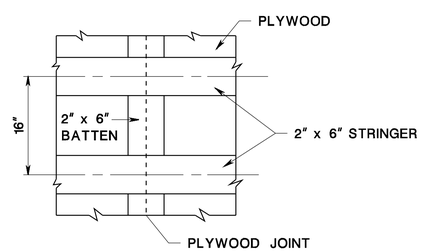
SIGN NO. 1 (INTERSTATE)



DETAILS OF SIGN NO. 1







DETAIL OF BATTEN AT PLYWOOD JOINTS
SIGN NO. 1

NOTES:

PLYWOOD PANELS SHALL COMFORM TO REQUIREMENTS FOR HIGH DENSITY OVERLAY AS SET FORTH IN COMMERCIAL STANDARD CS 45-60 FOR DOUGLAS FIR PLYWOOD AND ALL AMENDMENTS THERETO.

COSTS LISTED ON SIGNS TO BE FURNISHED BY THE DEPARTMENT AFTER AWARD OF CONTRACT.

SIGNS TO BE LOCATED AS SHOWN ON PLANS OR AS DIRECTED BY THE R.E..

SHIELD TO COMFORM TO DETAILS SHOWN IN THE CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

COLOR: GREEN BACKGROUND WITH WHITE MESSAGE AND BORDER NOT REFLECTORIZED.

LEGEND: SERIES "C" LETTERS - "YOUR HIGHWAY TAXES AT WORK"
SERIES "D" LETTERS (BALANCE OF LETTERING).

CORNER RADIUS: 3″

INTERSTATE SHIELD: RED, WHITE, AND BLUE

NOTE:

ON PROJECTS WITH NO FEDERAL FUNDING THE REFERENCE

FEDERAL HIGHWAY TRUST FUNDS
$0,000,000
U.S. DEPT. OF TRANSPORTATION
FEDERAL HIGHWAY ADMIN.

SHALL NOT BE INCLUDED ON THE SIGN.

INTERSTATE CONSTRUCTION IDENTIFICATION SIGN

N.T.S.

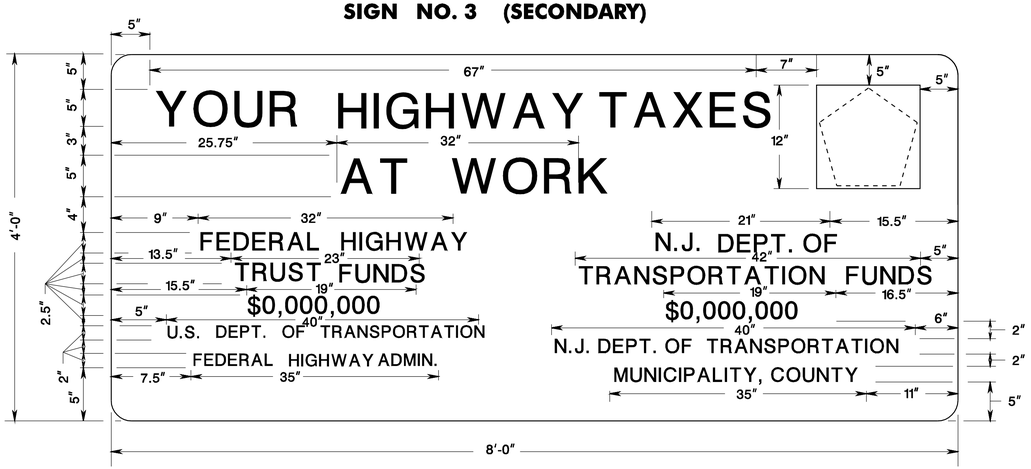
CD-159-8

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

CD-159-8.1

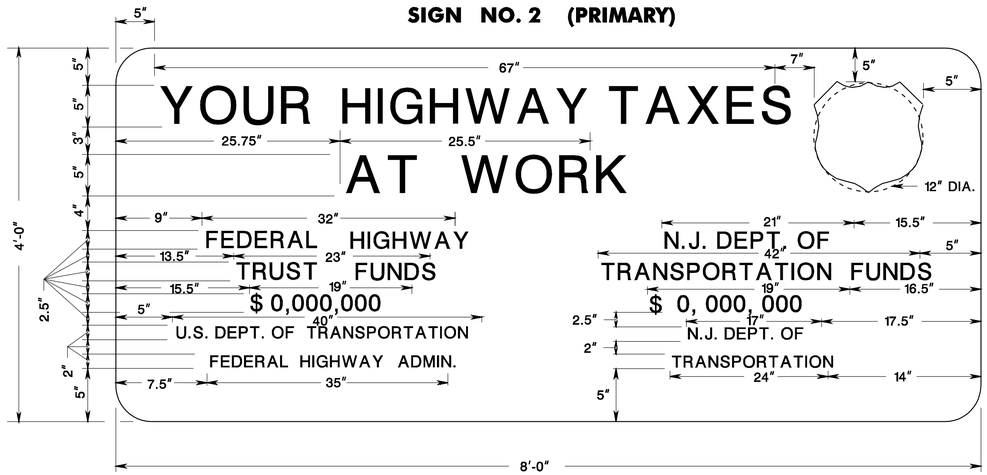
SIGN NO. 3 (SECONDARY)



NOTE:

PENTAGON INSIGNIA TO BE USED WHEN POSTING COUNTY ROUTES.

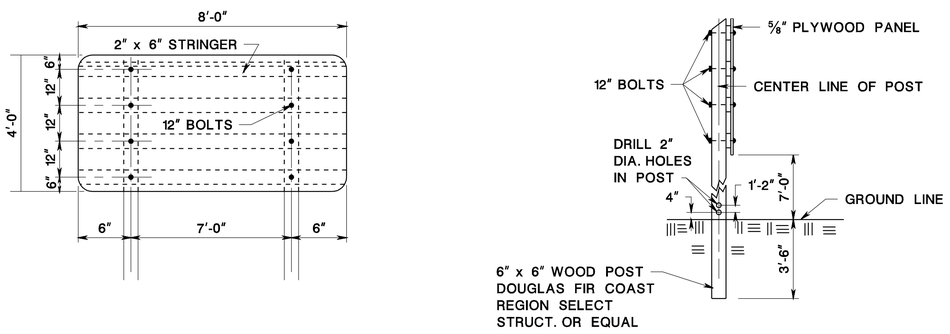
SIGN NO. 2 (PRIMARY)



NOTE:

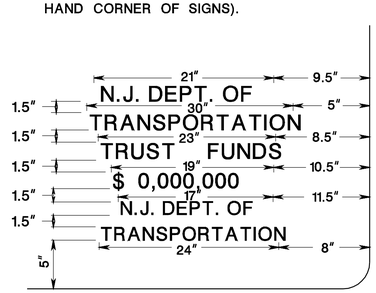
SHIELD INSIGNIA TO BE USED WHEN POSTING U. S. ROUTES.
CIRCLE INSIGNIA TO BE USED WHEN POSTING STATE ROUTES.

DETAILS OF SIGNS NO. 2 & 3



NOTE:

USE MODIFIED DETAIL BELOW WHEN NJDOT TRUST FUNDS ARE APPLICABLE FOR SIGNS #2 AND #3 (LOWER RIGHT HAND CORNER OF SIGNS).



NOTES:

PLYWOOD PANELS SHALL COMFORM TO REQUIREMENTS FOR HIGH DENSITY OVERLAY AS SET FORTH IN COMMERCIAL STANDARD CS 45-60 FOR DOUGLAS FIR PLYWOOD AND ALL AMENDMENTS THERETO.

COSTS LISTED ON SIGNS TO BE FURNISHED BY DEPARTMENT AFTER AWARD OF CONTRACT.

SIGNS TO BE LOCATED AS SHOWN ON PLANS OR AS DIRECTED BY THE R.E..

SHIELD TO COMFORM TO DETAILS SHOWN IN THE CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

COLOR: GREEN BACKGROUND WITH WHITE MESSAGE AND BORDER NOT REFLECTORIZED.

LEGEND: SERIES "C" LETTERS - "YOUR HIGHWAY TAXES AT WORK"
SERIES "D" LETTERS (BALANCE OF LETTERING).

CORNER RADIUS: 3"

INTERSTATE SHIELD: RED, WHITE, AND BLUE

U.S. AND STATE SHIELDS: BLACK ON WHITE

COUNTY SHIELDS: GOLD ON BLUE

NOTE:

ON PROJECTS WITH NO FEDERAL FUNDING THE REFERENCE

FEDERAL HIGHWAY TRUST FUNDS
$0,000,000
U.S. DEPT. OF TRANSPORTATION
FEDERAL HIGHWAY ADMIN.

SHALL NOT BE INCLUDED ON THE SIGN.

CONSTRUCTION IDENTIFICATION SIGNS

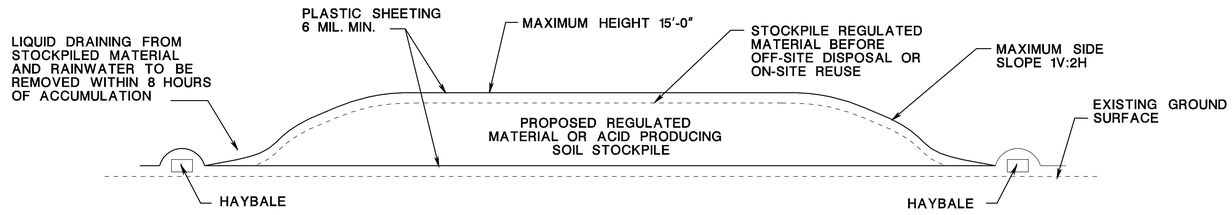
N.T.S.

CD-159-9

NEW JERSEY DEPARTMENT OF TRANSPORTATION

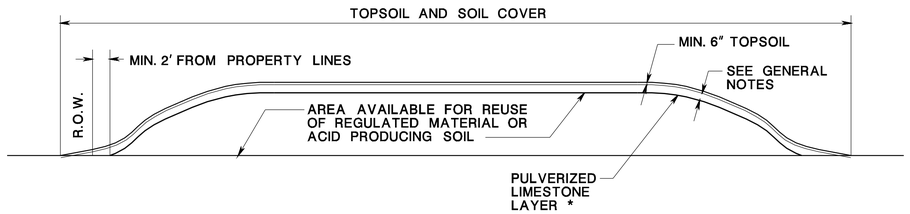
CONSTRUCTION DETAILS

CD-159-9.1



TEMPORARY STOCKPILING OF REGULATED MATERIAL OR ACID PRODUCING SOIL

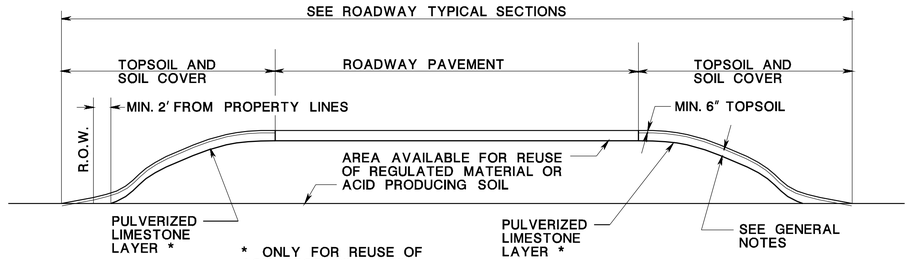
CD-202-1.1



* ONLY FOR REUSE OF ACID PRODUCING SOIL. THICKNESS IS DEFINED IN THE SPECIFICATIONS.

REUSE OF REGULATED MATERIAL OR ACID PRODUCING SOIL IN UNPAVED AREAS TYPICAL CROSS-SECTION

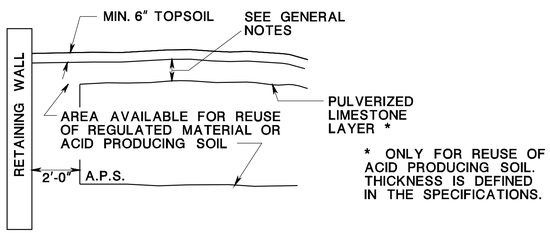
CD-202-1.2



* ONLY FOR REUSE OF ACID PRODUCING SOIL. THICKNESS IS DEFINED IN THE SPECIFICATIONS.

REUSE OF REGULATED MATERIAL OR ACID PRODUCING SOIL IN ROADWAY OR RAMP EMBANKMENT TYPICAL CROSS-SECTION

CD-202-1.3



* ONLY FOR REUSE OF ACID PRODUCING SOIL. THICKNESS IS DEFINED IN THE SPECIFICATIONS.

REUSE OF REGULATED MATERIAL OR ACID PRODUCING SOIL FOR A RETAINING WALL

CD-202-1.4

GENERAL NOTES:

REGULATED MATERIAL SHALL NOT BE PLACED WITHIN 2 FEET OF PROPERTY LINES NOR WITHIN 2 FEET OF LOCAL GROUNDWATER.

ACID PRODUCING SOIL (APS) SHALL NOT BE PLACED WITHIN 2 FEET OF THE SURFACE ALONG A STREAMBANK, STRUCTURE, PIPE OR SLOPE.

BUFFER APS WITH PULVERIZED LIMESTONE LAYER AT A RATE OF 6 TONS PER ACRE (275 LB/1000 SF).

PLACE A MINIMUM OF 12" COMPACTED SOIL OF PH 5 OR HIGHER FOR AREAS OF TURF.

PLACE A MINIMUM OF 24" COMPACTED SOIL OF PH 5 OR HIGHER FOR TREES AND SHRUB AREAS.

PLACE A MINIMUM OF 24" COMPACTED SOIL BETWEEN APS AND SURFACES OF SLOPES, STREAMBANKS, STRUCTURES AND PIPES.

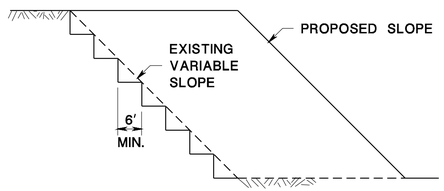
SOIL REUSE

N.T.S.

CD-202-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

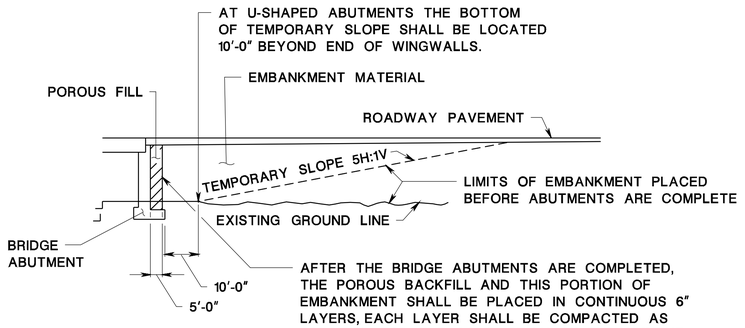
CONSTRUCTION DETAILS



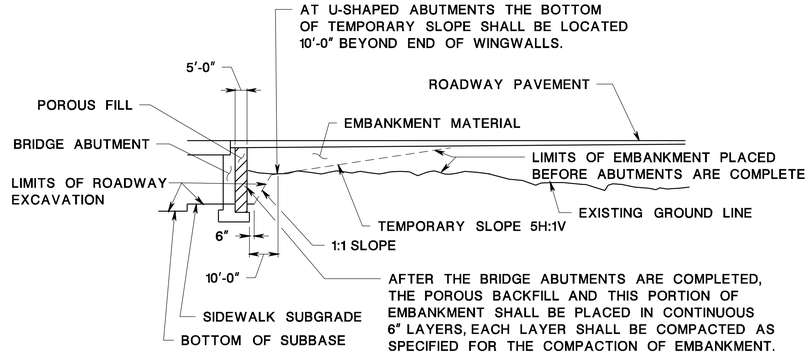
EMBANKMENT ON EXISTING SLOPES

BENCHING DETAIL

CD-203-1.1



METHOD A
OVERPASS ROADWAY COMPLETELY IN FILL



METHOD B
OVERPASS ROADWAY PARTLY IN FILL

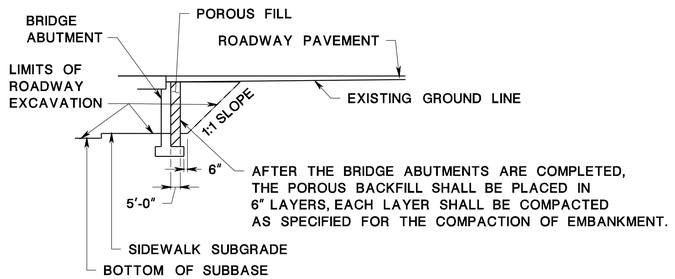
NOTES:

AT U-SHAPED WINGWALLS THE METHODS OF PLACING AND COMPACTING EMBANKMENT AND POROUS BACKFILL AS SHOWN SHALL APPLY. FOR U-SHAPED WINGWALLS EXCAVATION BELOW THE BOTTOM LIMITS OF ROADWAY EXCAVATION SHOWN ON THESE SECTIONS SHALL BE PAID FOR AS BRIDGE FOUNDATION EXCAVATION. POROUS BACKFILL SHALL BE PLACED BETWEEN THE BACKFACES OF U-SHAPED WINGWALLS AND VERTICAL PLANES AS SHOWN FOR ABUTMENTS.

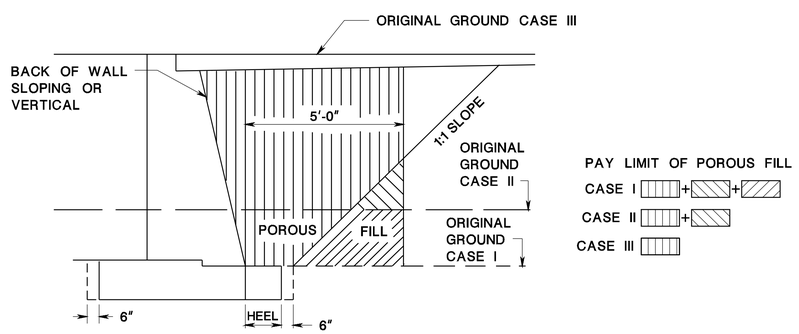
BRIDGE FOUNDATION EXCAVATION. POROUS BACKFILL SHALL BE PLACED BETWEEN THE BACKFACES OF U-SHAPED WINGWALLS AND VERTICAL PLANES AS SHOWN FOR ABUTMENTS.

AT HIGHWAY BRIDGES OVERPASSING RAILROADS AND STREAMS, THE LIMITS AND METHODS OF PLACING AND COMPACTING EMBANKMENTS AS SHOWN SHALL APPLY. WHERE POROUS BACKFILL IS CALLED FOR THE LIMITS AND METHODS OF PLACING AND COMPACTING IT AS SHOWN SHALL ALSO APPLY.

THE LIMITS SHOWN FOR ROADWAY EXCAVATION DO NOT APPLY TO RAILROAD AND STREAM BRIDGES UNLESS SPECIFICALLY PROVIDED ELSEWHERE IN THE CONTRACT. THESE SECTIONS AND REQUIREMENTS DO NOT APPLY TO ARCH BRIDGES.



METHOD C
OVERPASS ROADWAY AT EXISTING GRADE



METHOD D
WHEN HEEL IS LESS THAN 4' – 6"

NOTE:
LIMITS OF ROADWAY EXCAVATION AND METHODS OF PLACING EMBANKMENT, OTHER THAN POROUS FILL, SHALL BE AS SHOWN IN METHODS A, B, OR C, WHICHEVER IS APPLICABLE.

LIMITS AND METHODS OF PLACING EMBANKMENT AND POROUS BACKFILL AND LIMITS OF ROADWAY EXCAVATION ADJACENT TO BRIDGE ABUTMENTS

CD-203-1.2

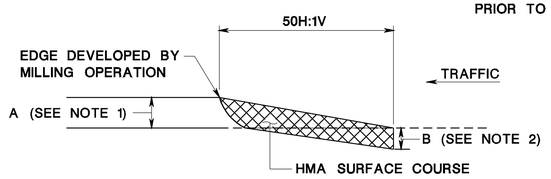
POROUS FILL AND EMBANKMENT

N.T.S.

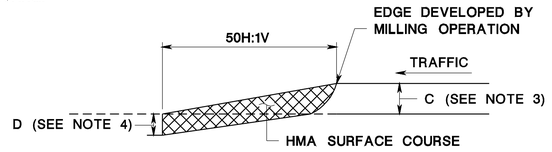
CD-203-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS



HMA SURFACE COURSE TO BE REMOVED AND THE RADIUS CAUSED BY MILLING SQUARED PRIOR TO FINAL PAVING.

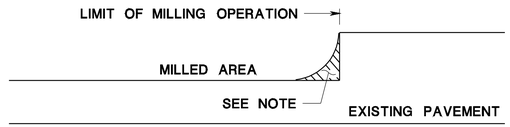


NOTES:

1. USE HMA SURFACE COURSE IN THE MILLING TRANSITION WHEN LEADING EDGE DEVELOPED BY MILLING OPERATION IS EQUAL TO OR GREATER THAN 1 INCH. NONE REQUIRED FOR EDGE LESS THAN 1 INCH.
2. ENSURE THAT THE THICKNESS OF THE HMA SURFACE COURSE IN THE MILLING TRANSITION IS NOT LESS THAN B. B IS EQUAL TO 2 INCHES OR A, WHICHEVER IS LESS.
3. USE HMA SURFACE COURSE IN THE MILLING TRANSITION WHEN TRAILING EDGE DEVELOPED BY MILLING OPERATION IS EQUAL TO OR GREATER THAN 1½ INCHES. NONE REQUIRED FOR EDGE LESS THAN 1½ INCHES.
4. ENSURE THAT THE THICKNESS OF THE HMA SURFACE COURSE IN THE MILLING TRANSITION IS NOT LESS THAN D. D IS EQUAL TO 2 INCHES OR C, WHICHEVER IS LESS

MILLING TRANSITIONS

CD-401-1.1



NOTE:

REMOVE THE HMA MATERIAL LEFT BY THE DRUM RADIUS AT THE LIMITS OF THE MILLING OPERATION. ENSURE THAT THE FACE IS CLEAN AND VERTICAL BY SAWCUTTING OR TRANSVERSE MILLING. THIS END TREATMENT IS NOT APPLICABLE TO TEMPORARY LIMITS OF MILLING (i.e. END OF WORKDAY). IT IS APPLICABLE TO ALL AREAS WHERE THE COMPLETED MILLING OPERATION MATCHES ANY EXISTING PAVEMENT INCLUDING BRIDGES.

END TREATMENT FOR MILLING OPERATIONS

CD-401-1.2

NOTE:

HMA = HOT MIX ASPHALT

MILLING

N.T.S.

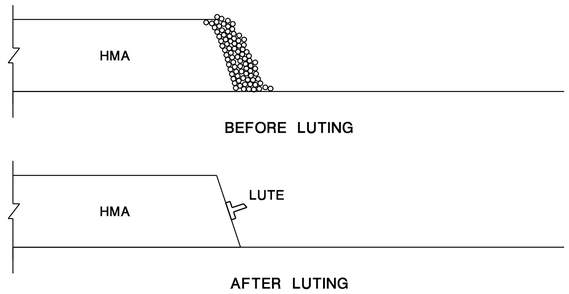
CD-401-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

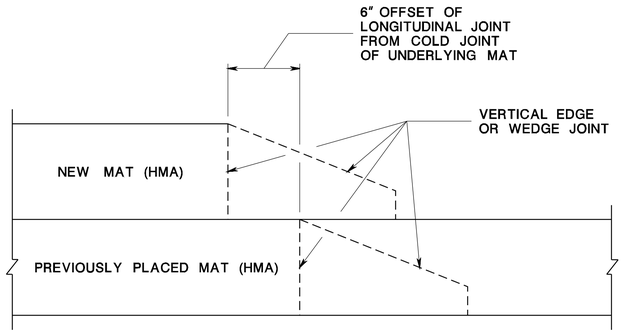
WEDGE JOINT
(NOTE 1)

CD-401-2.1



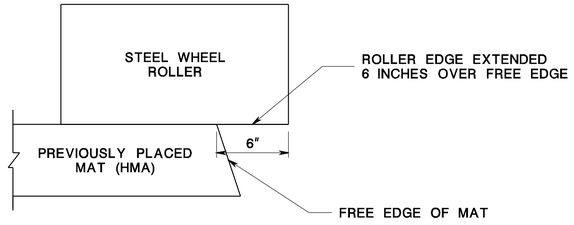
COMPACTION OF UNCONFINED VERTICAL EDGE
(NOTE 3)

CD-401-2.4



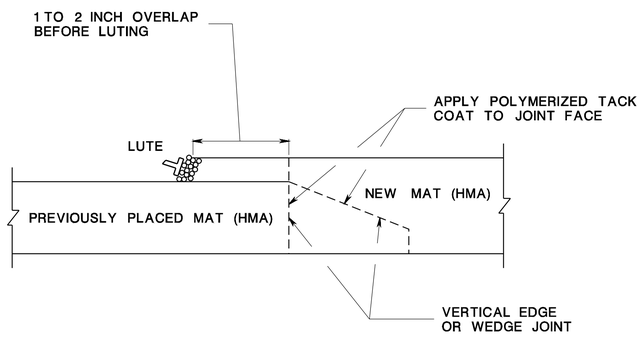
OFFSET OF JOINTS
(NOTE 2)

CD-401-2.2

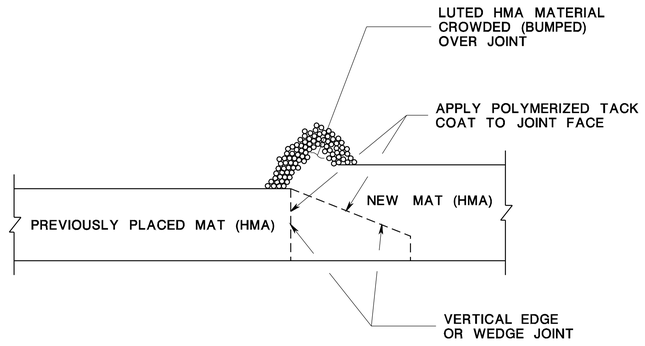


ROLLER PLACEMENT FOR COMPACTING ALONG THE UNCONFINED VERTICAL EDGE
(NOTE 6)

CD-401-2.5



OVERLAPPED HMA BEFORE LUTING
(NOTES 4 & 5)



HMA AFTER LUTING
(NOTE 4)

HMA PAVEMENT

CD-401-2.3

NOTES:

1. WHEN HMA LIFT THICKNESS IS GREATER THEN 2¼ INCHES AND WHEN TRAFFIC IS TO BE MAINTAINED, CONSTRUCT A WEDGE JOINT.
2. ENSURE THAT THE JOINT IN THE HMA SURFACE COURSE IS OFFSET FROM THE LANE LINES BY 6 INCHES. IN THE CENTERLINE OF A ROADWAY, ENSURE THAT THE JOINT FALLS BETWEEN THE DOUBLE YELLOW TRAFFIC STRIPE.
3. ENSURE THE LUTE OPERATOR MANUALLY BUMPS THE EDGE TO OBTAIN A TRUE VERTICAL AND DENSE UNCONFINED EDGE.
4. ENSURE THAT THE OVERLAPPED HMA MATERIAL AT THE JOINT IS TIGHTLY CROWDED (BUMPED) OVER THE JOINT ONTO THE NEWLY PLACED LANE LEAVING A SMALL MOUND OF MIX HUMPED UP FOR THE ROLLERS TO COMPACT.
5. FOR THE WEDGE JOINT, ENSURE THAT COARSE AGGREGATE PARTICLES ARE KEPT AWAY FROM THE POINT WHERE THE WEDGE MEETS THE SURFACE OF THE PREVIOUSLY PLACED LANE.
6. TO PREVENT LATERAL DISPLACEMENT OF THE UNCONFINED EDGE, ENSURE THAT THE EDGE OF THE ROLLER WHEEL EXTENDS OVER THE FREE EDGE OF THE HMA MAT BY AT LEAST 6 INCHES.

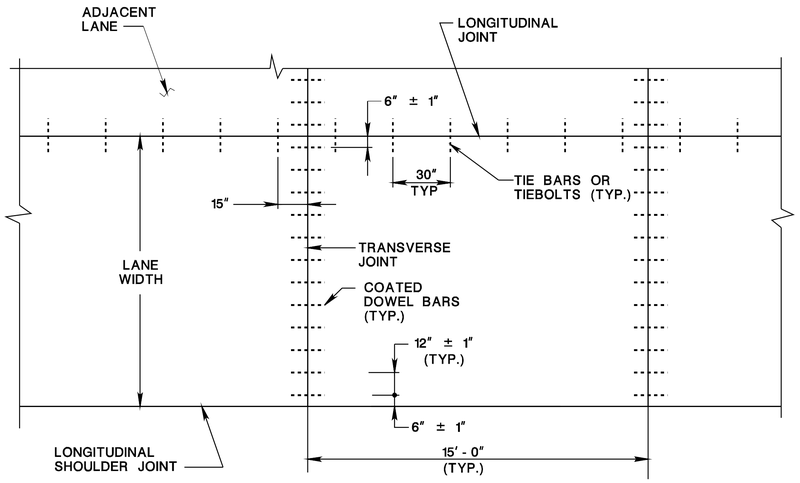
LONGITUDINAL JOINTS IN HMA
N.T.S.

HMA = HOT MIX ASPHALT

CD-401-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS



TYPICAL LAYOUT

CD–405–1.1

EXPANSION JOINTS AT BRIDGES	
DISTANCE BETWEEN BRIDGES *	**NUMBER OF EXPANSION JOINTS**
TO 500′	1
500′ - 704′	2
704′ - 908′	3
908′ - 1111′	4
1111′ - 1315′	5
OVER 1315′	6

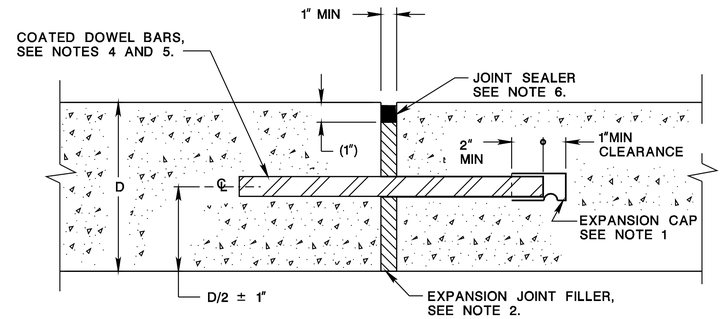
* LENGTH OF PAVEMENT BETWEEN BRIDGES

CD–405–1.2

NOTES

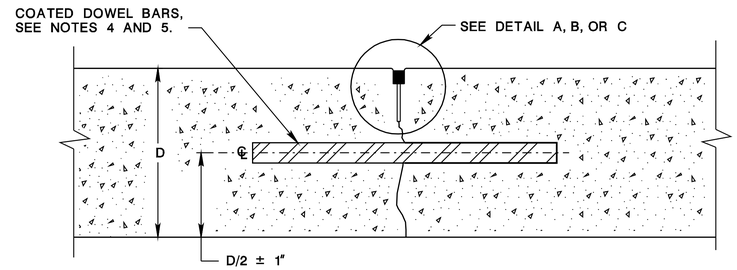
1. PLACE A CLOSED-END EXPANSION CAP OVER THE LUBRICATED END OF ALL DOWEL BARS USED IN TRANSVERSE EXPANSION JOINTS AND PROVIDE A MINIMUM 1" CLEARANCE POCKET ASSURED BY MEANS OF A POSITIVE SPACING DEVICE.
2. CUT EXPANSION JOINT FILLER MATERIAL TO CONFORM TO THE CROSS SECTION OF THE PAVEMENT AND FURNISH IN STRIPS EQUAL TO THE WIDTH OF THE PAVEMENT SLAB. MAKE THE TOP SURFACE SMOOTH AND HAVE HOLES PUNCHED FOR THE DOWEL BARS PROVIDE A SNUG FIT WITHOUT LOSS IN THICKNESS OF THE MATERIAL.
3. CONSTRUCT ALL TRANSVERSE JOINTS PERPENDICULAR TO THE CENTERLINE.
4. USE MINIMUM 1¼"ϕ x18" LONG DOWEL BARS FOR PAVEMENT DEPTHS 10" OR LESS, AND MINIMUM 1½" ϕ X 18" LONG DOWEL BARS FOR PAVEMENT DEPTHS GREATER THAN 10". APPROVED ALTERNATE DOWEL BARS HAVING EQUIVALENT PROPERTIES TO CONVENTIONAL ROUND DOWEL REINFORCEMENT STEEL MAY BE PROPOSED FOR USE.
5. PLACE DOWEL BARS PARALLEL TO THE CENTERLINE AND SURFACE OF THE SLAB.
6. MAKE THE TOP OF THE JOINT SEALING MATERIAL ¼" ±⅛" BELOW THE SURFACE OF THE PAVEMENT.
7. THE INITIAL SAW CUT RELIEF JOINT IS NOT REQUIRED FOR CONSTRUCTION JOINTS.
8. WHEN COLD-POURED JOINT SEALER IS SELECTED FOR USE IN TRANSVERSE JOINTS, USE THE SAME JOINT SEALER IN THE LONGITUDINAL JOINTS.

CD–405–1.3



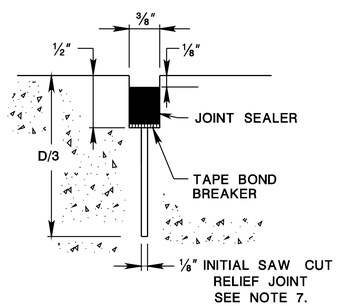
TRANSVERSE EXPANSION JOINT

CD–405–1.4



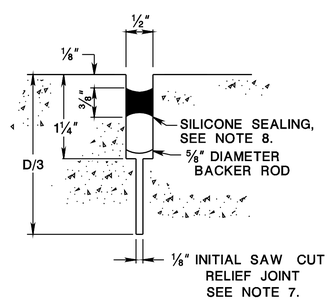
TRANSVERSE CONTRACTION JOINT

CD–405–1.5



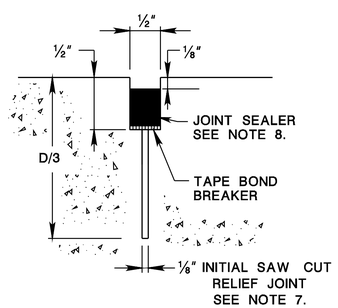
DETAIL A
HOT–POURED JOINT SEALER

CD–405–1.6



DETAIL B
COLD–POURED JOINT SEALER WITH BACKER ROD

CD–405–1.7



DETAIL C
COLD–POURED JOINT SEALER WITHOUT BACKER ROD

CD–405–1.8

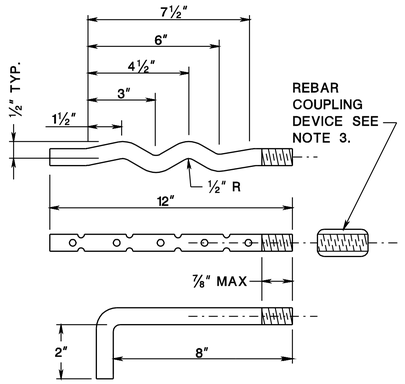
CONCRETE PAVEMENT TRANSVERSE JOINTS

N.T.S.

CD-405-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

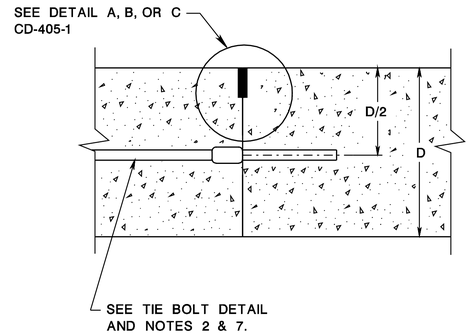
CONSTRUCTION DETAILS



MAKE TIE BOLTS 9/16" ϕ BAR WITH ROLLED THREADS OR ⅝" ϕ BAR WITH CUT THREADS.

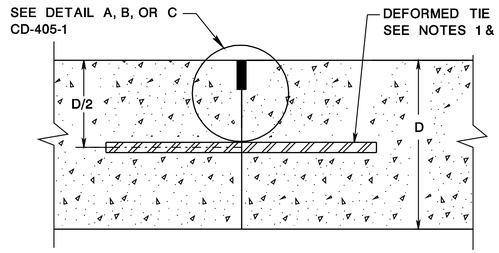
TIE BOLT DETAIL

CD-405-2.1



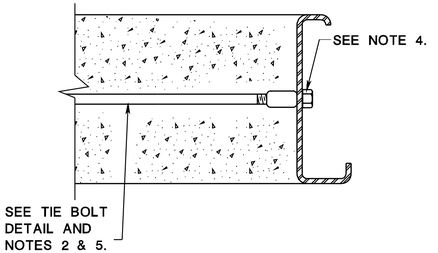
CONSTRUCTION JOINT TIE BOLT

CD-405-2.2



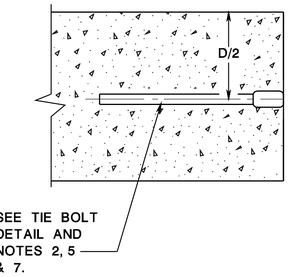
CONSTRUCTION JOINT TIE BAR

CD-405-2.3



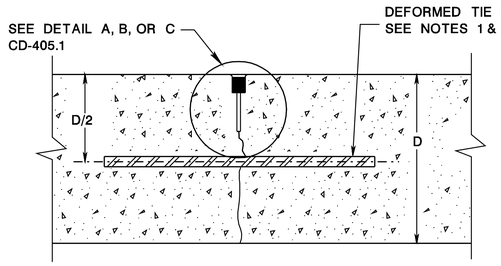
STATIONARY FORMING

CD-405-2.4



SLIP FORMING

CD-405-2.5



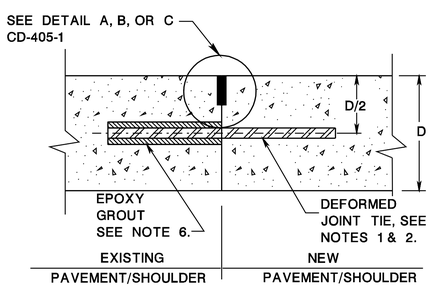
CONTRACTION JOINT

CD-405-2.6

NOTES

1. SPECIFY #6 TIE BARS 30" ±¼" LONG, SPACED 30" CENTER TO CENTER MAXIMUM. FOR JOINT TIES SPECIFY #6 BARS 18" ±¼" LONG, SPACED 30" CENTER TO CENTER MAXIMUM. PLACE PERPENDICULAR TO AND CENTERED OVER THE LONGITUDINAL JOINT ± 1". WHEN ADJOINING TO AN UNEQUAL PAVEMENT OR SHOULDER DEPTH, D IS THE DEPTH OF THE THINNER SECTION.
2. DO NOT FIELD BEND TIE BARS, TIE BOLTS, AND JOINT TIES.
3. USE REBAR COUPLING DEVICE THAT IS LISTED ON THE QPL.
4. TEMPORARILY SECURE THE TIE BOLT TO THE FORM DURING PLACEMENT OF THE CONCRETE USING A METHOD ACCPETABLE TO THE R.E..
5. PLACE TIE BOLTS AT 30" CENTER TO CENTER MAXIMUM SPACING. WHEN ADJOINING TO AN UNEQUAL PAVEMENT OR SHOULDER DEPTH, D IS THE DEPTH OF THE THINNER SECTION. SCREW TIE BOLTS UNTIL SNUG.
6. USE AN APPROVED EPOXY GROUT MATERIAL TO WITHSTAND THE NECESSARY MINIMUM PULL-OUT RESISTANCE. TIE BAR HOLE DIAMETER IN EXISTING PAVEMENT SHOULD BE AS PER MANUFACTURER'S RECOMMENDATION. USE ROTARY IMPACT DRILL TO AVOID IMPACTING FINES INTO HOLE.
7. DO NOT USE THE HOOK COMPONENT OF THE TIE BOLT ASSEMBLY WHEN SLIP FORMING.
8. WHEN COLD-POURED JOINT SEALER IS SELECTED FOR USE IN TRANSVERSE JOINTS, USE THE SAME JOINT SEALING MATERIAL IN THE LONGITUDINAL JOINTS.

CD-405-2.7



LONGITUDINAL JOINT WHEN TYING INTO EXISTING CONCRETE PAVEMENT/SHOULDER

CD-405-2.8

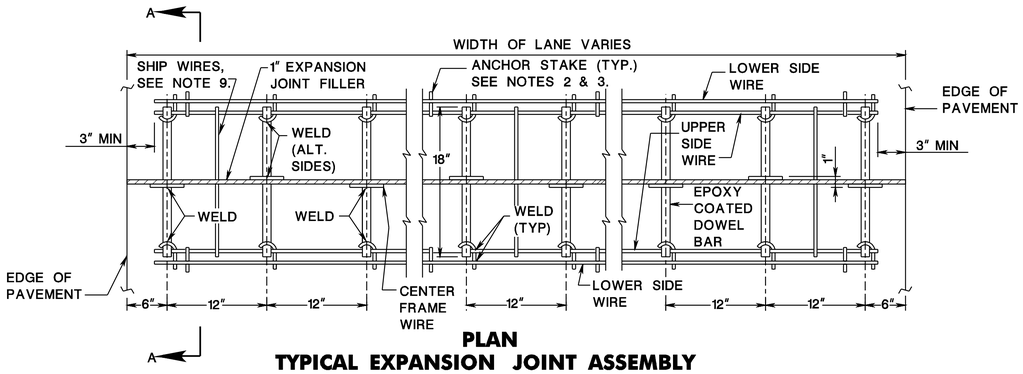
CONCRETE PAVEMENT LONGITUDINAL JOINTS

N.T.S.

CD-405-2

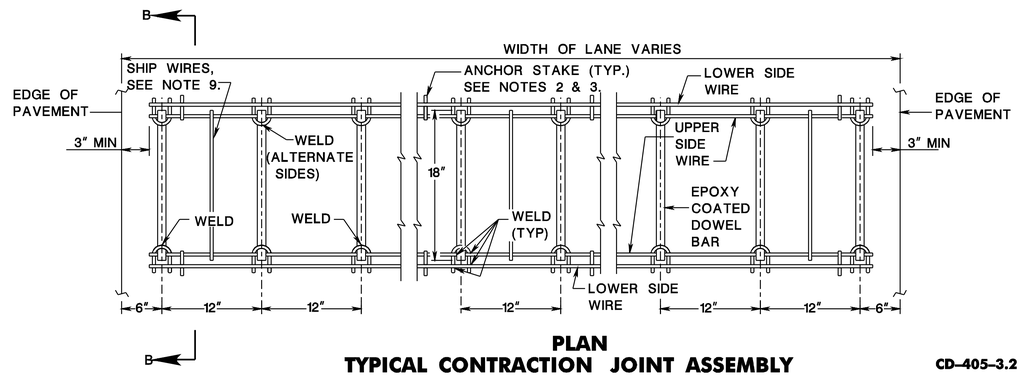
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS



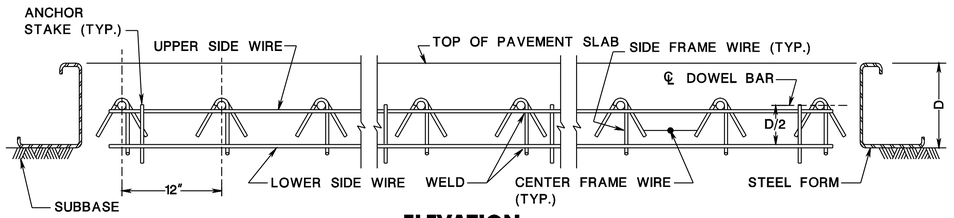
PLAN
TYPICAL EXPANSION JOINT ASSEMBLY

CD–405–3.1



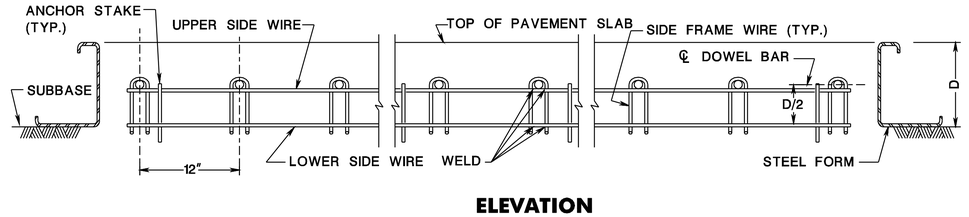
PLAN
TYPICAL CONTRACTION JOINT ASSEMBLY

CD–405–3.2



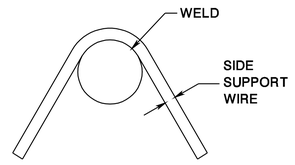
ELEVATION
EXPANSION JOINT ASSEMBLY

CD–405–3.3



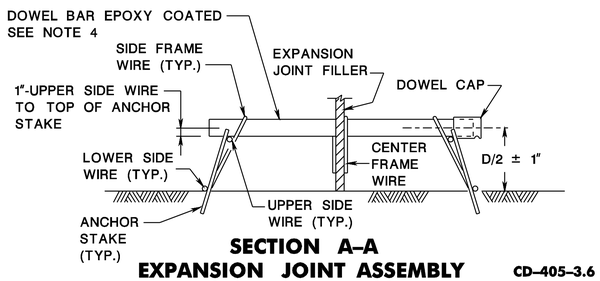
ELEVATION
CONTRACTION JOINT ASSEMBLY

CD–405–3.4



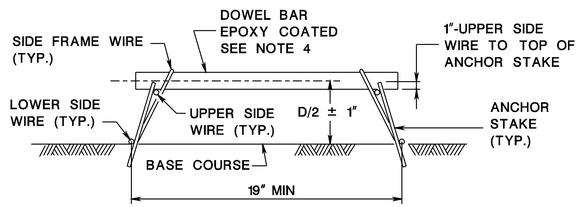
CENTER FRAME WIRE DETAIL

CD–405–3.5



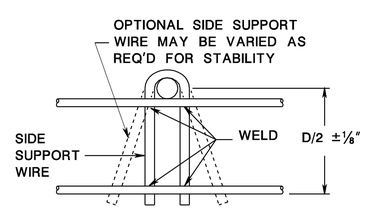
SECTION A–A
EXPANSION JOINT ASSEMBLY

CD–405–3.6



SECTION B–B
CONTRACTION JOINT ASSEMBLY

CD–405–3.7



"A" DESIGN
TYPICAL SIDE FRAME DETAILS

CD–405–3.8

NOTES

1. THIS STANDARD DEPICTS THE DIMENSIONS REQUIRED FOR UNIFORMITY AND COMPATIBILITY. IT DOES NOT INCLUDE ALL THE DETAILS REQUIRED FOR FABRICATION. ANCHOR STAKES SHOULD NOT TOUCH ANY DOWEL BAR AND MAY BE SPACED AS NEEDED TO PROVIDE STABILITY.
2. PROVIDE A MINIMUM OF EIGHT ANCHOR STAKES (FOUR PER SIDE). ANCHOR STAKES SHALL ENGAGE LOWER SIDE FRAME WIRES. USE ADDITIONAL STAKES AS NECESSARY, TO SECURE ASSEMBLIES, AS DIRECTED BY THE R.E..
3. PROVIDE 12 INCH MINIMUM ANCHOR STAKES TO SECURE ASSEMBLIES WHEN SUBBASE IS USED AND 18 INCH MINIMUM ANCHOR STAKES WHEN AN OPEN GRADED DRAINAGE LAYER IS USED.
4. PROVIDE DOWEL BARS PARALLEL TO THE CENTERLINE AND TO THE PAVEMENT SURFACE. TOLERANCE OF THIS PLACEMENT SHALL BE WITHIN ¼ INCH PER DOWEL BAR.
5. PROVIDE FRAME SUPPORT ASSEMBLY WIRES CONFORMING TO THE CURRENT ASTM DESIGNATION A-510 SPECIFICATIONS FOR WIRE RODS AND COURSE ROUND WIRE, CARBON STEEL AND OF A MINIMUM ALLOWABLE SIZE AS FOLLOWS:

PAVEMENT THICKNESS	UPPER AND LOWER SIDE FRAME WIRES	SIDE SUPPORT WIRES
10" OR LESS	0.331"ϕ MIN 2/0 GAUGE	0.331"ϕ MIN 2/0 GAUGE
GREATER THAN 10"	0.362"ϕ MIN 3/0 GAUGE	0.362"ϕ MIN 3/0 GAUGE

6. PROVIDE DOWEL BARS PARALLEL TO THE CENTERLINE AND TO THE PAVEMENT SURFACE. MAKE TOLERANCE OF THIS PLACEMENT WITHIN ±¼" PER DOWEL BAR.
7. WELD REQUIREMENTS AS LISTED BELOW AND TESTED PER MANUFACTURER'S QUALITY CONTROL PLANS FOR WELD SHEAR.

PAVEMENT THICKNESS	UPPER AND LOWER WIRE TO SIDE SUPPORT	DOWEL TO SUPPORT ASSEMBLY
10" OR LESS	794 LBS.	1190 LBS.
> 10"	1190 LBS.	1984 LBS.

8. WIRE TOLERANCES PER ASTM 510M IS 0.003in.
9. AFTER EACH LOAD TRANSFER ASSEMBLY IS SECURED IN PLACE, REMOVE AND PROPERLY DISPOSE OF ALL TIE WIRES OR SHIPPING WIRES.

TYPICAL LOAD TRANSFER ASSEMBLY		
LANE WIDTH	OVERALL UNIT LENGTH	NO. OF DOWELS
9'-0"	8'-6"	9
10'-0"	9'-6"	10
11'-0"	10'-6"	11
12'-0"	11'-6"	12

CD–405–3.9

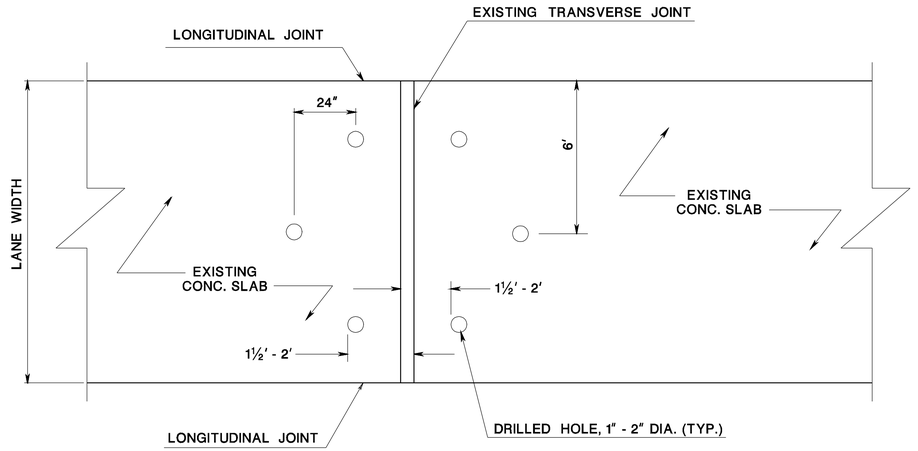
CONCRETE PAVEMENT JOINTS NON-SKEWED LOAD TRANSFER ASSEMBLIES

N.T.S.

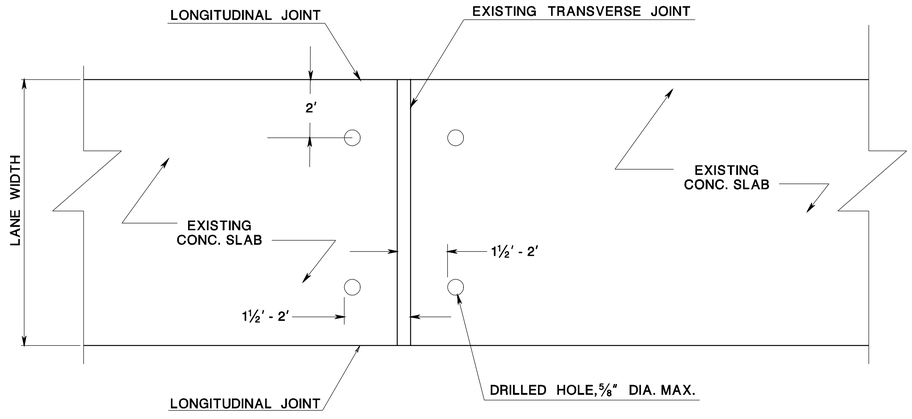
CD-405-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS



TYPICAL HOLE PATTERN
USED FOR SLAB STABILIZATION, POZZOLAN GROUT



SLAB STABILIZATION, POLYURETHANE GROUT

SLAB STABILIZATION

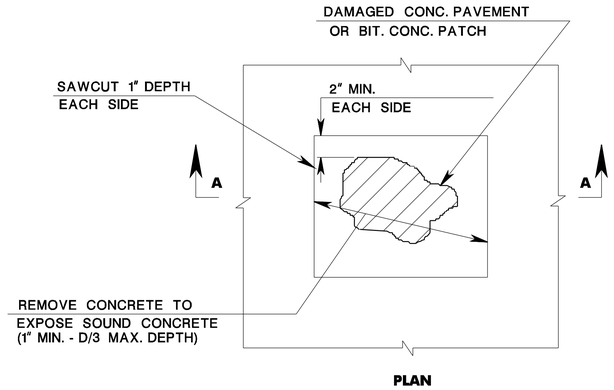
N.T.S.

CD-451-1

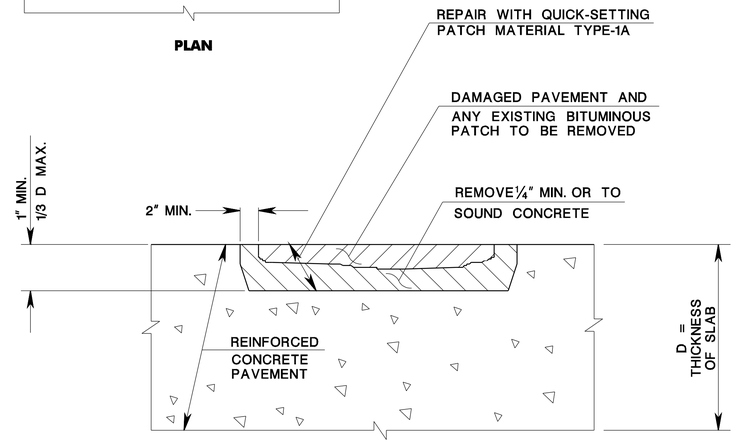
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

CD-451-1



PLAN



SECTION A–A

NOTES:

1. DEPTH OF REPAIR SHALL NOT EXCEED 1/3 SLAB THICKNESS. IF DETERIORATION EXTENDS BELOW 1/3 SLAB THICKNESS, THE ENGINEER SHALL BE NOTIFIED.
2. AT TRANSVERSE EXPANSION JOINTS, MATCH WIDTH OF EXISTING JOINT FILLER WITH PREFORMED JOINT FILLER.

PARTIAL DEPTH CONCRETE PAVEMENT REPAIR

PARTIAL DEPTH CONCRETE PAVEMENT REPAIR

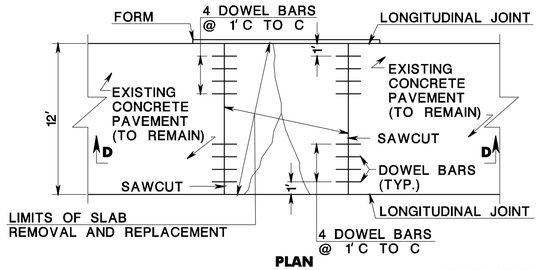
N.T.S.

CD-452-1

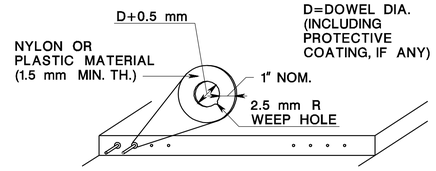
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

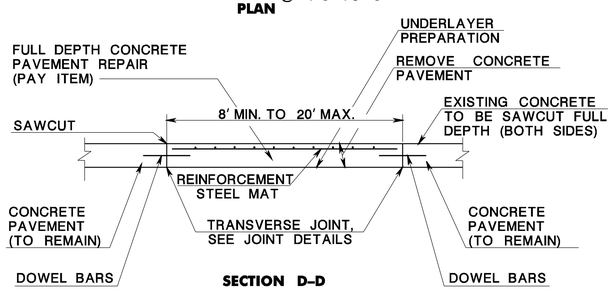
CD-452-1.1



PLAN



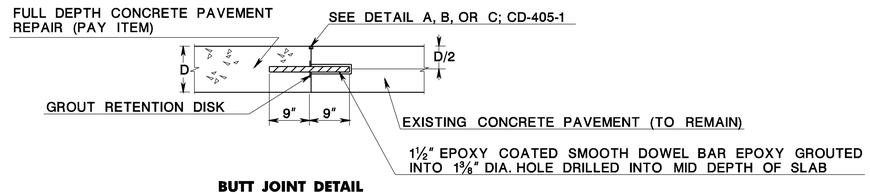
GROUT RETENTION DISK



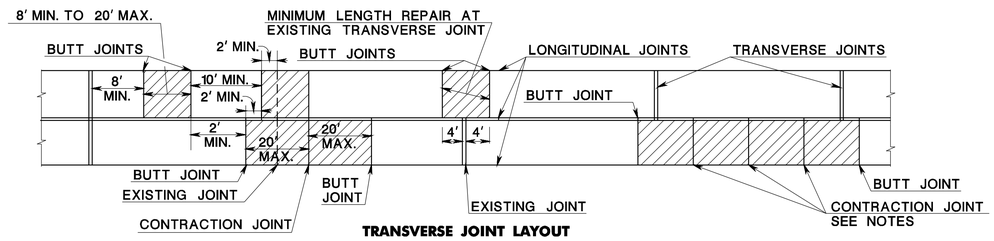
SECTION D–D

NOTES:

1. SAWCUTS SHALL BE MADE PERPENDICULAR TO BASELINE.
2. INITIAL SAWCUT IS NOT REQUIRED FOR BUTT JOINTS.
3. A MINIMUM OF 3" CONCRETE COVER IS REQUIRED OVER REINFORCEMENT STEEL MAT.
4. SPACE CONTRACTION JOINTS AND CONTRACTION/BUTT JOINTS EQUIDISTANT AND NOT MORE THAN 20' APART.



BUTT JOINT DETAIL



TRANSVERSE JOINT LAYOUT

FULL DEPTH CONCRETE PAVEMENT REPAIR

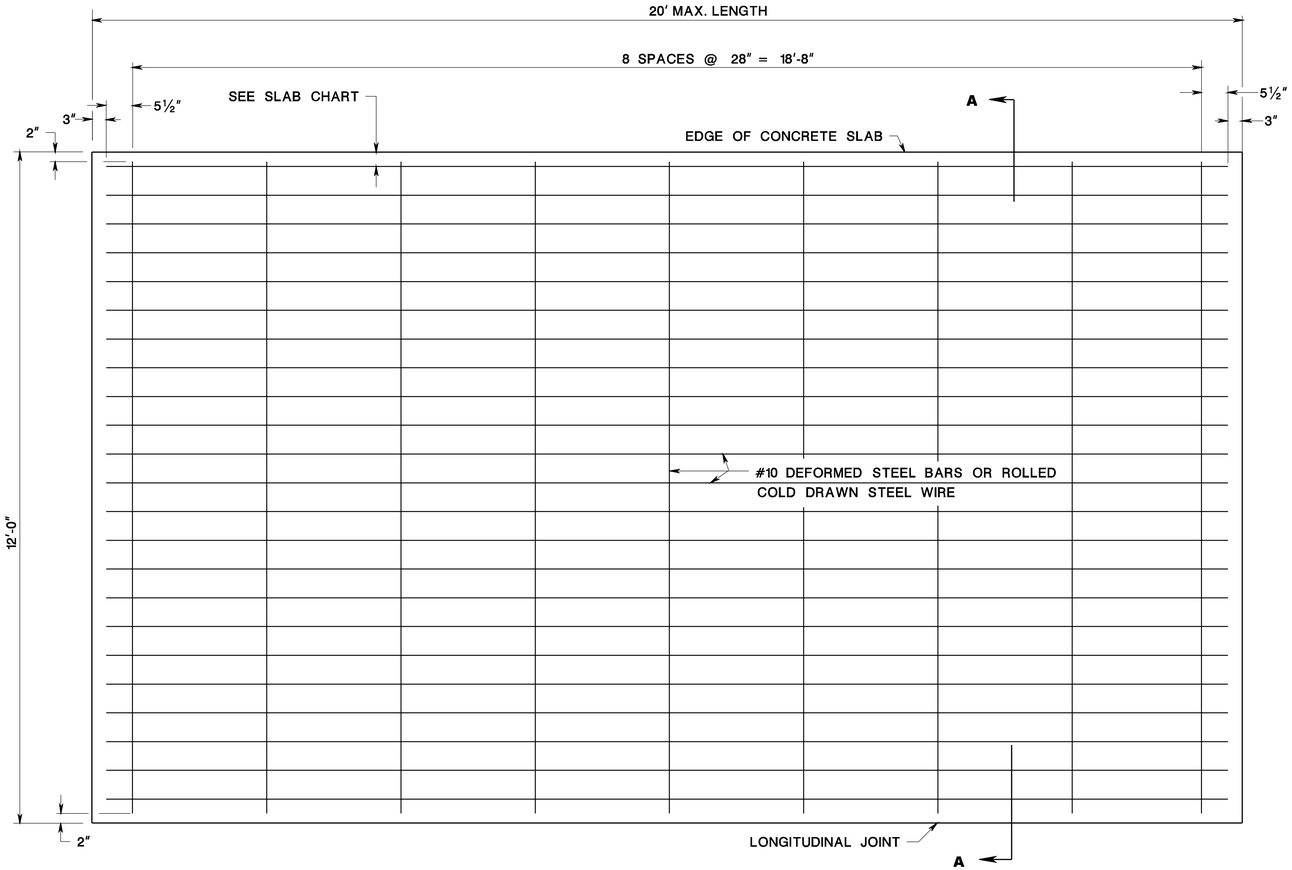
N.T.S.

CD-453-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

CD-453-1.1



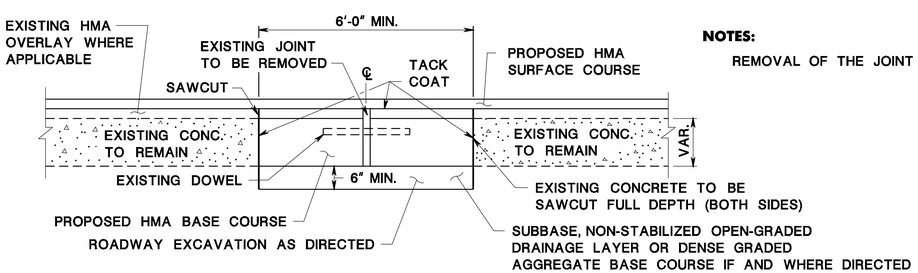
REINFORCEMENT STEEL FOR 12′–0″ WIDTH SLAB

NOTES:

1. REINFORCEMENT STEEL MATS DIFFERING WITH RESPECT TO THEIR LENGTH, SPACING OF TRANSVERSE REINFORCEEMENT STEEL AND TYPE OF FABRICATION FROM THE MAT SHOWN IN THESE DRAWINGS MAY BE USED, PROVIDED THAT (a) THE MATS HAVE THE SAME SIZE AND SPACING OF LONGITUDINAL REINFORCEMENT STEEL, AND PROVIDE AT LEAST THE SAME NUMBER OF TRANSVERSE REINFORCEMENT STEEL PER SLAB, AS CALLED FOR IN THESE DRAWINGS, AND (b) APPROVAL FOR USE HAS BEEN OBTAINED FROM THE DEPARTMENT.

   * SEE SLAB CHART

2. AN EDGE CLEARANCE OF 3″ IS REQUIRED OF OUTSIDE LONGITUDINAL REINFORCEMENT STEEL. SPACE REINFORCEMENT STEEL EVENLY ACROSS WIDTH OF SLAB WITH A MAXIMUM SPACING OF 7½″ FOR SLABS WITH A THICKNESS OF LESS THAN 10″ AND 6″ FOR SLABS WITH A THICKNESS OF 10″ OR GREATER.



NOTES:

REMOVAL OF THE JOINT SHALL BE AS DIRECTED.

FULL DEPTH CONCRETE PAVEMENT REPAIR, HMA

CD-453-2.2

REINFORCEMENT REQUIREMENTS WHEN USING WELDED STEEL WIRE FABRIC

SLABS LESS THAN 10 INCHES THICK:

USE SIZE NO. W8.6 LONGITUDINAL WIRE SPACED 6 INCHES ON CENTER.

USE SIZE NO. W4.7 TRANSVERSE WIRE SPACED 12 INCHES ON CENTER.

ENSURE THAT THE EDGE CLEARANCE IS 3 INCHES FOR OUTSIDE LONGITUDINAL WIRE.

ENSURE THAT THE MAXIMUM EDGE CLEARANCE IS 11 INCHES FOR THE LAST TRANSVERSE WIRE.

ENSURE THAT THE END CLEARANCE IS BETWEEN 1 INCH AND 3 INCHES FOR THE LONGITUDINAL WIRE.

ENSURE THE LONGITUDINAL WIRES ARE LAPPED A MINIMUM OF 12 INCHES.

SLABS 10 INCHES THICK:OR GREATER:

USE SIZE NO. W10.5 LONGITUDINAL WIRE SPACED 6 INCHES ON CENTER.

USE SIZE NO. W5.5 TRANSVERSE WIRE SPACED 12 INCHES ON CENTER.

ENSURE THAT THE EDGE CLEARANCEIS 3 INCHES FOR OUTSIDE LONGITUDINAL WIRE.

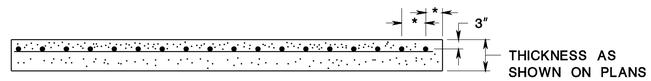
ENSURE THAT THE MAXIMUM EDGE CLEARANCE IS 11 INCHES FOR THE LAST TRANSVERSE WIRE.

ENSURE THAT THE END CLEARANCE IS BETWEEN 1 INCH AND 3 INCHES FOR THE LONGITUDINAL WIRE.

ENSURE THE LONGITUDINAL WIRES ARE LAPPED A MINIMUM OF 12 INCHES.

SLAB CHART FOR THICKNESS LESS THAN 10″														
* WIDTH OF SLAB	3′	4′	5′	6′	7′	8′	9′	10′	11′	12′	13′	14′	15′	16′
NUMBER OF LONGITUDINAL REINF. STEEL	5	6	8	9	11	13	14	16	17	19	21	22	24	25
SLAB CHART FOR 10″ THICKNESS OR GREATER														
* WIDTH OF SLAB	3′	4′	5′	6′	7′	8′	9′	10′	11′	12′	13′	14′	15′	16′
NUMBER OF LONGITUDINAL REINF. STEEL	6	8	10	12	14	16	18	20	22	24	26	28	30	32

* SEE SLAB CHART



SECTION A–A

REINFORCEMENT STEEL FOR FULL DEPTH CONCRETE PAVEMENT REPAIR, CLASS __

NOTE:

REINFORCEMENT STEEL ARE IN METRIC UNITS.

CD-453-2.1

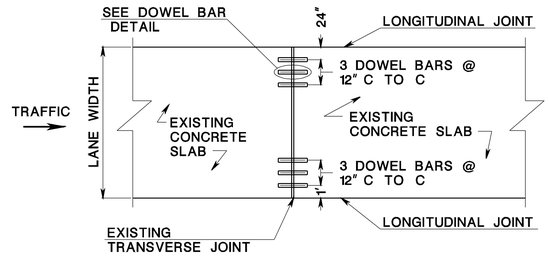
FULL DEPTH CONCRETE PAVEMENT REPAIR

N.T.S.

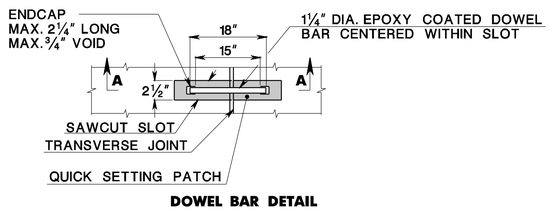
CD-453-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION

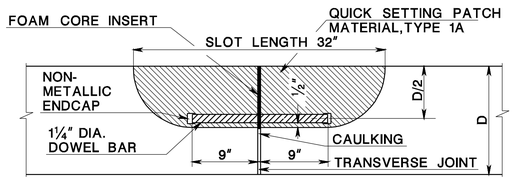
CONSTRUCTION DETAILS



PLAN



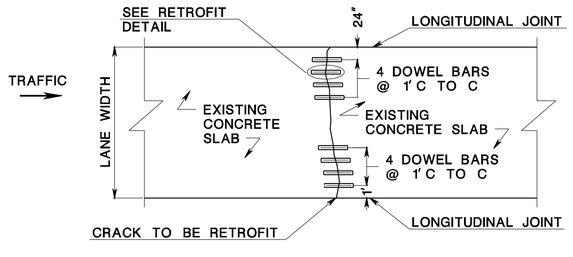
DOWEL BAR DETAIL



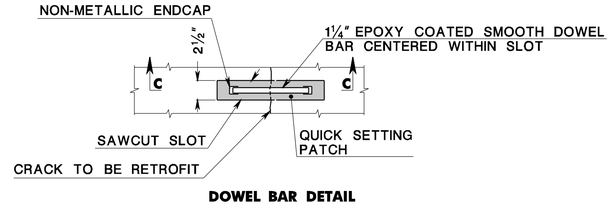
SECTION B–B

RETROFIT DOWEL BARS AT EXISTING JOINT

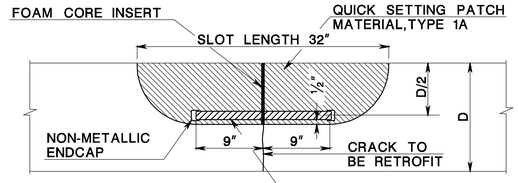
CD-454-1.1



PLAN



DOWEL BAR DETAIL



SECTION C–C

RETROFIT DOWEL BARS AT PAVEMENT CRACK

CD-454-1.2

RETROFIT DOWEL BARS

N.T.S.

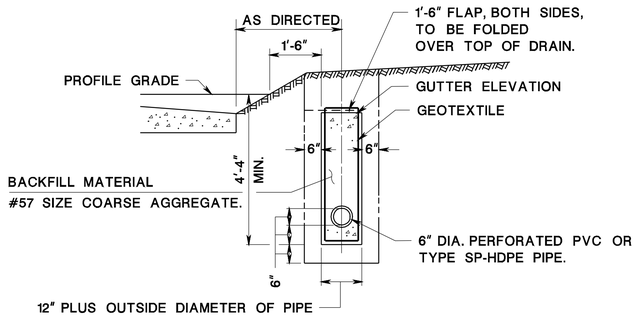
CD-454-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

NOTES:

UNDERDRAIN IS SHOWN PARALLEL TO THE EDGE OF PAVEMENT, BUT MAY BE USED IN OTHER LOCATIONS IF SO DIRECTED BY THE R.E..



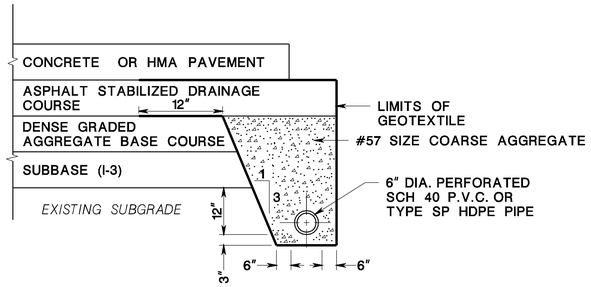
UNDERDRAIN TYPE F

CD-601-1.1

NOTES:

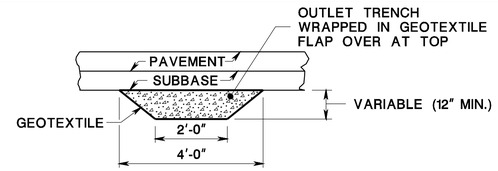
AFTER PLACING ASPHALT STABILIZED DRAINAGE COURSE, OVERLAP WITH GEOTEXTILE TO PROTECT THE EXPOSED SURFACE.

THE 6" DIA. PERFORATED PIPE SHOULD BE AT LEAST 12" BELOW THE LOWEST COURSE EITHER DENSE GRADED AGGREGATE BASE COURSE OR SUBBASE, DESIGNATION I-3.

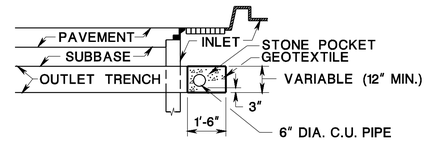


UNDERDRAIN TYPE X

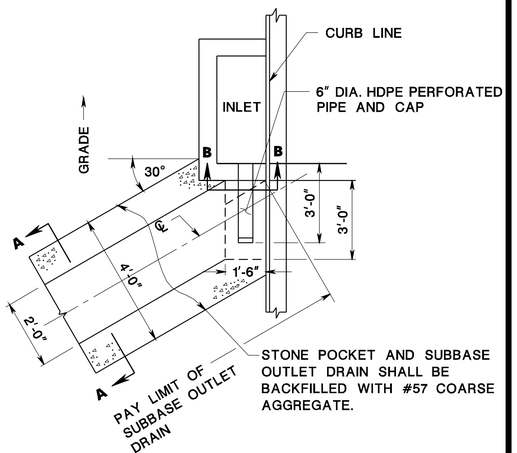
CD-601-1.2



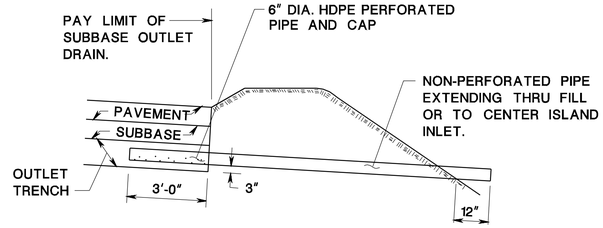
SECTION A–A



SECTION B–B



PLAN



SCHEME FOR WATER DISPOSAL WHERE INLETS ARE IN CENTER ISLAND OR ARE NOT AVAILABLE

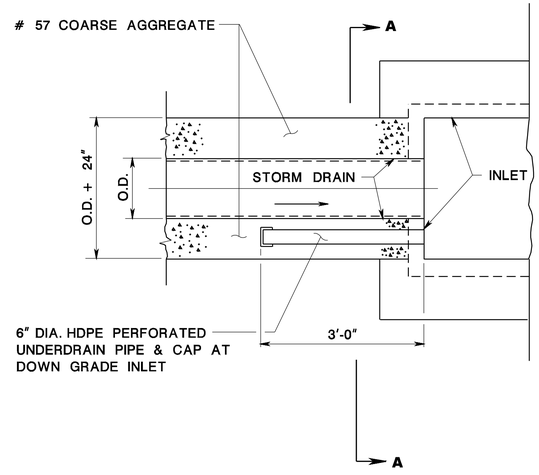
NOTES:

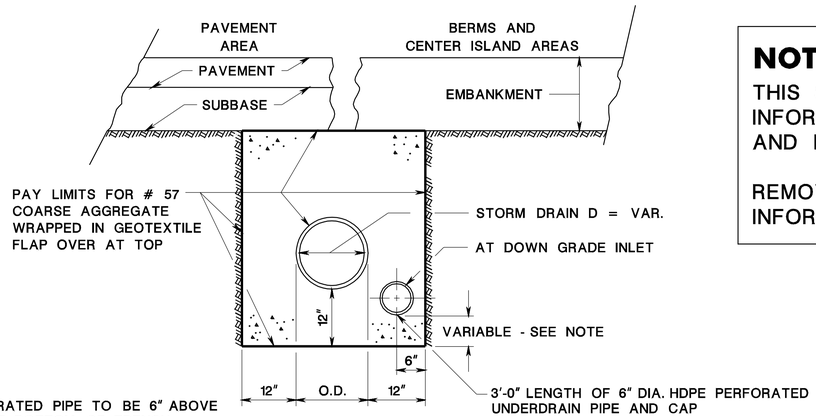
1.) DISCHARGED WATER SHALL IN NO CASE VIOLATE DRAINAGE RIGHTS.

2.) SEE NOTE 2, CD-601-1.3

SUBBASE OUTLET DRAIN WITH 6" HDPE UNDERDRAIN PIPE

CD-601-1.3





SECTION A–A

NOTES:

1.) INVERT OF 6" DIA. HDPE PERFORATED PIPE TO BE 6" ABOVE BOTTOM OF INLET OR 6" ABOVE BOTTOM OF TRENCH WHICHEVER IS HIGHER.

2.) THE SIZE OF PERFORATIONS SHOULD BE SMALLER THAN SIZE OF STONE SPECIFIED OTHERWISE WRAP FILTER FABRIIC AROUND PIPE.

COMBINED STORM DRAIN AND OUTLET TRENCH IN ROCK AREAS

CD-601-1.4

NOTE TO DESIGNER:

THIS SHEET REQUIRES DESIGN SPECIFIC INFORMATION IN CD-601-1.2 TO BE MODIFIED AND INCLUDED IN THE CONTRACT PLANS.

REMOVE THIS NOTE AFTER DESIGN SPECIFIC INFORMATION IS ADDED.

UNDERDRAINS

N.T.S.

CD-601-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

PIPE DIAMETER (INCHES)	STEEL GA.	ALUM. GA.	DIMENSIONS (INCHES)	
			L	C
12	16	16	21	36
15	16	16	26	44
18	16	16	31	52
21	16	16	36	60
24	16	16	41	68
30	14	14	51	84
36	14	12	60	100
42	12	12	69	116
48	12	12	78	126
54	12	12	84	138
60	12	12	87	150
66	12	12	87	156
72	12	12	87	162
78	12	12	87	168
84	12	12	87	174

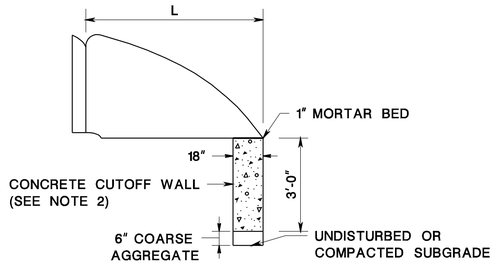
ROUND PIPE

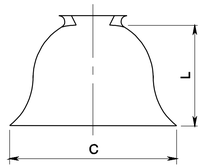
ARCH PIPE DIMENSION (INCHES)		STEEL GA.	ALUM. GA.	DIMENSIONS (INCHES)	
SPAN	RISE			L	C
17	13	16	16	19	44
21	15	16	16	23	50
24	18	16	16	28	58
28	20	16	16	32	66
35	24	14	14	39	80
42	29	14	14	46	99
49	33	12	12	53	111
57	38	12	12	63	126
64	43	12	12	70	138
71	47	12	12	77	150
77	52	12	12	77	162
83	57	12	12	77	174

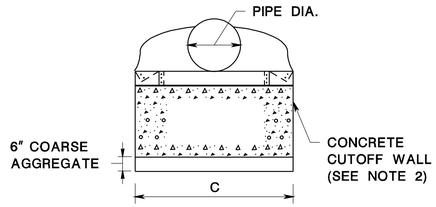
ARCH PIPE

NOTES:

1. MINOR VARIATIONS TO THE ABOVE DIMENSIONS ARE ACCEPTABLE WITH THE EXCEPTION OF THE INSIDE DIAMETER DIMENSION.
2. A 1 INCH THICK MORTAR BED AND A 6 INCH DEEP LAYER OF COURSE AGGREGATE ARE REQUIRED WHEN A PRECAST CONCRETE CUTOFF WALL IS USED.
3. NO SEPARATE PAYMENT WILL BE MADE FOR THE CONCRETE CUTOFF WALL. THE COST OF THE CONCRETE CUTOFF WALL SHALL BE INCLUDED IN THE COST OF THE END SECTION.
4. REFER TO NOTE 4, CD-601-2.2 FOR SIZE OF CONCRETE CUTOFF WALL.





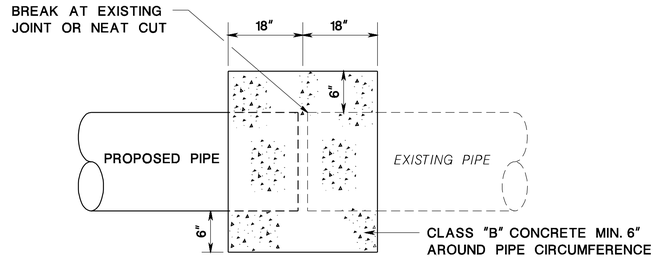


ELEVATION

ELEVATION

END SECTIONS FOR METAL PIPE

CD-601-2.1



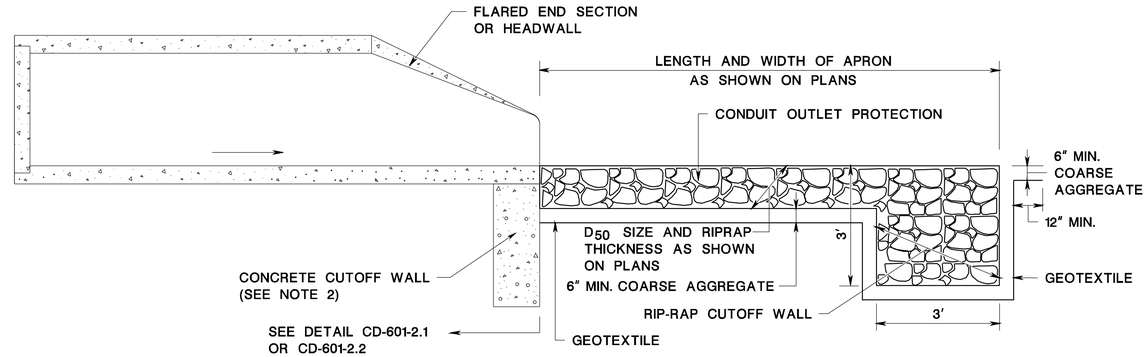
NOTE:

COAT ALL SURFACES TO BE ENCASED IN CONCRETE COLLAR WITH APPROVED EPOXY BONDING COMPOUND. NO SEPARATE PAYMENT WILL BE MADE FOR THE CONCRETE COLLAR. THE COST OF THE CONCRETE COLLAR SHALL BE INCLUDED IN THE COST OF THE VARIOUS PIPE ITEMS ON THE PROJECT.

CONCRETE COLLAR

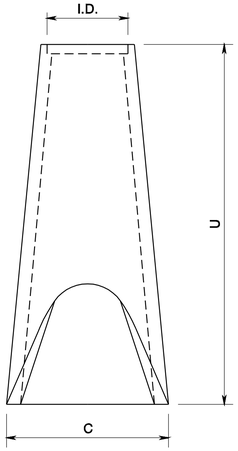
(FOR JOINING PROPOSED PIPE TO EXISTING PIPE)

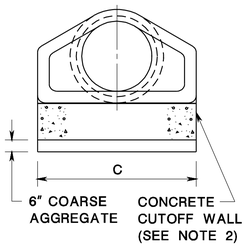
CD-601-2.3

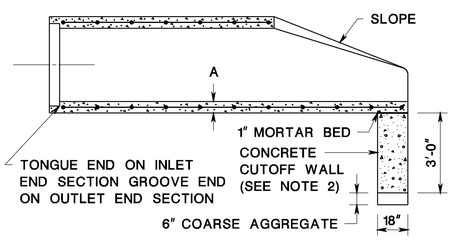


STORMWATER OUTFALL PROTECTION

CD-601-2.4







END SECTIONS FOR CONCRETE PIPE

DIMENSIONS (INCHES)												
I.D.	12	15	18	21	24	27	30	36	42	48	54	60
A	2	2¼	2½	2¾	3	3¼	3½	4	4½	5	5½	6
U	72	72	72	72	72	72	72	96	96	96	96	96
C	28	34.5	41	47.5	54	60.5	67	80	87	94	101	108

NOTES:

1. MINOR VARIATIONS TO THE ABOVE DIMENSIONS ARE ACCEPTABLE WITH THE EXCEPTION OF THE INSIDE DIAMETER DIMENSION.
2. A 1 INCH THICK MORTAR BED AND A 6 INCH DEEP LAYER OF COARSE AGGREGATE ARE REQUIRED WHEN A PRECAST CONCRETE CUTOFF WALL IS USED.
3. NO SEPARATE PAYMENT WILL BE MADE FOR THE CONCRETE CUTOFF WALL. THE COST OF THE CONCRETE CUTOFF WALL SHALL BE INCLUDED IN THE COST OF THE END SECTION.
4. THE WIDTH OF THE CONCRETE CUTOFF WALL SHALL BE EQUAL TO THE MAXIMUM WIDTH OF THE END SECTION AS INDICATED ON THE DETAIL BY DIMENSION "C". HOWEVER, IF THE ACTUAL MAXIMUM WIDTH EXCEEDS THE CHART VALUE OF "C", THE WIDTH OF THE CONCRETE CUTOFF WALL SHALL EQUAL THE ACTUAL MAXIMUM WIDTH OF THE END SECTION.

CD-601-2.2

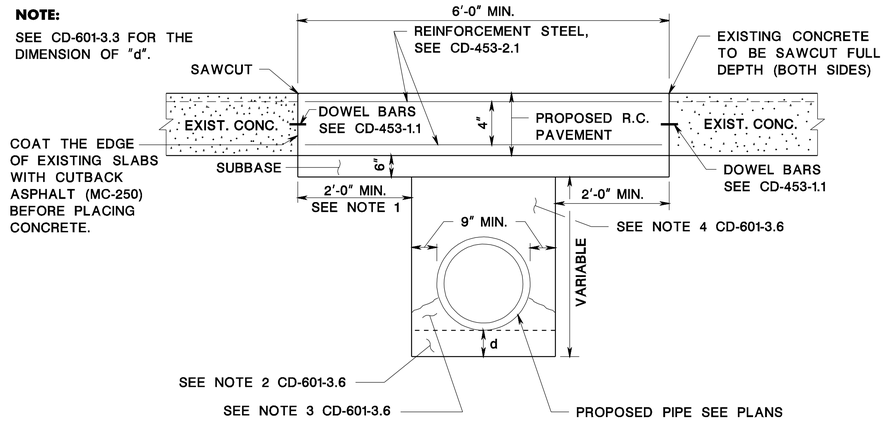
PIPE END SECTIONS

N.T.S.

CD-601-2

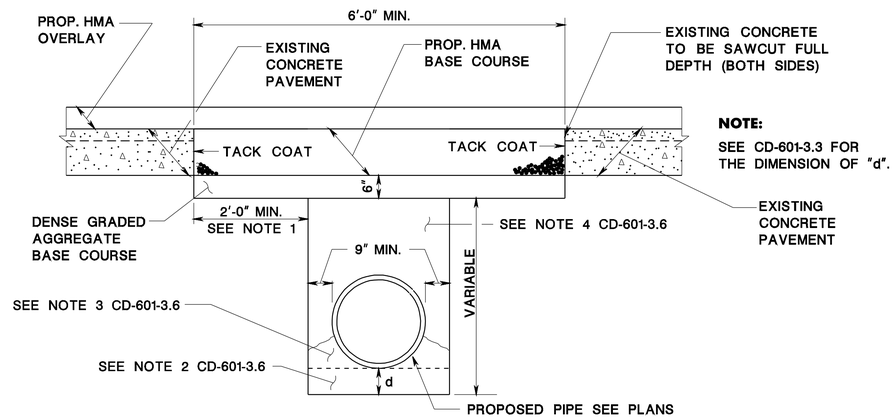
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS



CONCRETE SURFACE COURSE REPLACEMENT AT CROSS DRAIN TRENCH

CD-601-3.1



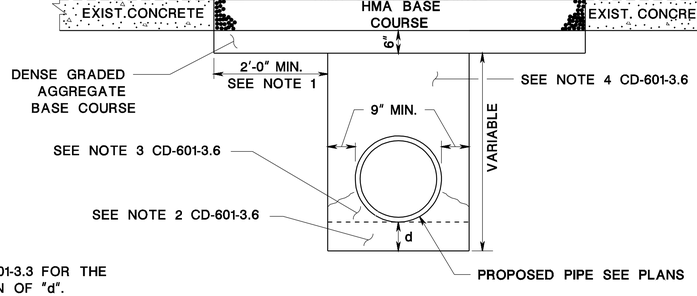
HMA REPLACEMENT WHERE EXISTING CONCRETE COURSE IS REMOVED AT CROSS DRAIN TRENCH WITH PROPOSED RESURFACING

CD-601-3.2

UNDERLYING SOIL	d	
	CONC. PIPE	METAL PIPE OR HDPE PIPE
ROCK OR HARD MATERIAL	6"	12"
OTHER MATERIAL	6"	6"

MINIMUM DEPTH OF ADDITIONAL EXCAVATION OR PIPE BEDDING

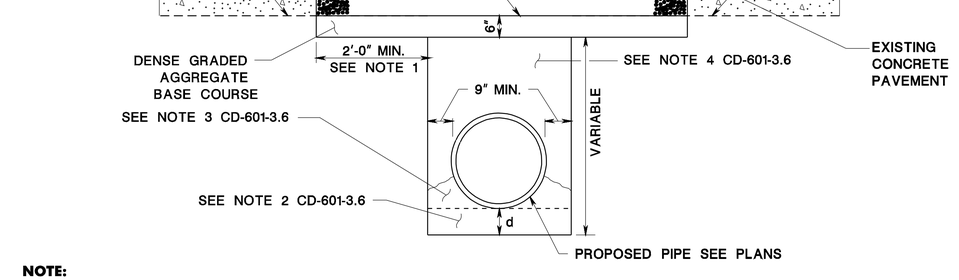
CD-601-3.3



NOTE:
SEE CD-601-3.3 FOR THE DIMENSION OF "d".

HMA REPLACEMENT WHERE CONCRETE COURSE IS REMOVED AT CROSS DRAIN TRENCH

CD-601-3.4



NOTE:
SEE CD-601-3.3 FOR THE DIMENSION OF "d".

HMA REPLACEMENT WHERE EXISTING OVERLAY AND CONCRETE COURSE IS REMOVED AT CROSS DRAIN TRENCH WITH PROPOSED RESURFACING

CD-601-3.5

NOTES:

1. SAWCUT THE EXISTING PAVEMENT A MINIMUM OF 2'-0" FROM THE SIDES OF THE PROPOSED CROSS DRAIN TRENCH EXCAVATION ON BOTH SIDES.

2. ADDITIONAL EXCAVATION REQUIRED WHEN PIPE BEDDING IS DESIGNATED OR WHEN ROCK OR OTHER HARD MATERIAL IS ENCOUNTERED.

3. BACKFILL SHALL BE PLACED SO AS TO ENSURE SUFFICIENT COMPACTION UNDER PIPE HAUNCHES.

4. THE PIPE TRENCH SHALL BE BACKFILLED IN ACCORDANCE WITH THE SPECIFICATIONS FOR BACKFILLING OR WITH AGGREGATE, DESIGNATION I-1, I-2, I-3, OR I-13 IF DIRECTED, WHEN SOIL AGGREGATE IS DIRECTED, THE PAY LIMITS SHALL BE A WIDTH OF A MINIMUM OF 36" OR THE OUTSIDE DIAMETER OF THE PIPE OR CULVERT PLUS 18" AND A DEPTH FROM THE BOTTOM OF THE TRENCH OR TOP OF THE DENSE GRADED AGGREGATE BASE COURSE.

CD-601-3.6

REINFORCEMENT STEEL IS IN METRIC UNITS.
HMA = HOT MIX ASPHALT

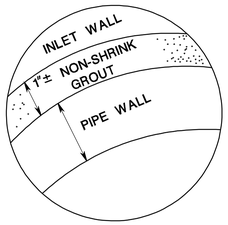
CROSS DRAIN TRENCH CONSTRUCTION

N.T.S.

CD-601-3

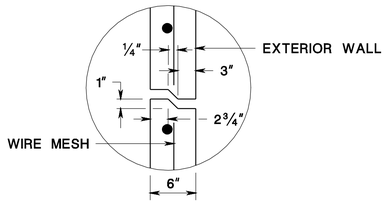
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS



CONNECTION OF PIPE AND INLET FOR PRECAST INLET

CD-602-1.1

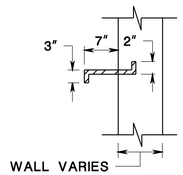


RISER JOINT DETAIL FOR PRECAST INLETS

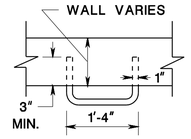
NOTE:

JOINT TO BE GROUTED WITH MORTAR BY CONTRACTOR

CD-602-1.2



ELEVATION



PLAN

NOTE:

LADDER RUNGS FACING TRAFFIC 12" C TO C

LADDER RUNG DETAIL

CD-602-1.3

GENERAL NOTES

1. INLETS MAY BE CONSTRUCTED OF BRICK, CONCRETE, CONCRETE BLOCK OR PRECAST CONCRETE. WALLS SHALL BE 8 INCHES THICK IF BRICK AND 6 INCHES THICK IF CONCRETE, CONCRETE BLOCK OR PRECAST CONCRETE. INLET FOUNDATIONS AND INVERTS SHALL BE CLASS B CONCRETE.
2. CORBELLING OF INLET WALLS WILL BE PERMITTED AT THE RATE OF ½ INCH PER 8 INCHES OF HEIGHT; MAXIMUM CORBEL 6 INCHES PER WALL.
3. EXCEPT FOR INLETS TYPE A AND C, FOUNDATIONS AND INVERTS SHALL BE CONSTRUCTED IN TWO STAGES, AND THE BOTTOM OF THE FOOTINGS SHALL BE 8 INCHES BELOW THE OUTER WALL OF THE LOWEST PIPE IN THE INLET.
4. WHEN THE DEPTH OF AN INLET THAT IS NOT PRECAST EXCEEDS 10 FEET AS MEASURED FROM TOP OF GRATE TO INVERT, WALLS BELOW A DEPTH OF 8 FEET SHALL BE 12 INCHES THICK AND THE DEPTH OF FOUNDATION INCREASED TO 12 INCHES. WHEN ROCK IS ENCOUNTERED, THE DEPTH OF THE FOUNDATION SHALL NOT BE INCREASED.
5. INLET FOUNDATIONS WHICH ARE PRECAST SHALL BE PLACED ON A 6 INCH THICK BED OF COMPACTED COARSE AGGREGATE #57. THE COARSE AGGREGATE SHALL EXTEND 6 INCHES BEYOND THE HORIZONTAL LIMITS OF THE INLET FOUNDATION.
6. CASTINGS FOR PRECAST INLETS SHALL BE ADJUSTED TO GRADE WITH COURSES OF BRICK, AS REQUIRED, 12 INCHES MAXIMUM.
7. WHEN THE DEPTH OF A PRECAST INLET EXCEEDS 10 FEET AS MEASURED FROM TOP OF GRATE TO INVERT, THE FOUNDATION SHALL BE INCREASED TO 12 INCHES. WHEN ROCK IS ENCOUNTERED, THE DEPTH OF THE FOUNDATION SHALL NOT BE INCREASED.
8. MINIMUM WALL REINFORCEMENT FOR PRECAST INLETS TYPES A, B, C, E, D-1, D-2 AND B MODIFIED:

DEPTH BELOW TOP OF GRATE	HORIZONTAL REINF.	VERTICAL REINF.	WALL THK.
0' TO 10'-0"	#13 @ 10" C.C.	#13 @ 18" C.C.	6"
10'-1" TO 15'-0"	#13 @ 8" C.C.	#13 @ 18" C.C.	6"
15'-1" T0 20'-0"	#13 @ 6" C.C.	#13 @ 18" C.C.	6"

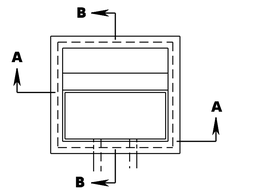
REINFORCING SHOWN FOR PRECAST INLETS IS THE MINIMUM REQUIRED. ADDITIONAL REINFORCING FOR HANDLING IS THE RESPONSIBILITY OF THE CONTRACTOR.

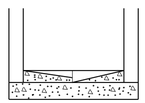
ALTERNATE REINFORCEMENT

DEPTH BELOW TOP OF GRATE	
0' TO 10'-0"	WWF 3 x 6 W6 WIRES SPACED AT 3" TO RUN HORIZONTAL IN ALL CASES.
10'-1" TO 15'-0"	WWF 3 x 6 W6 ADD #10 REINFORCEMENT STEEL @ 18" HORIZONTAL.
15'1" TO 20'0"	WWF 3 x 6 W6 ADD #10 REINFORCEMENT STEEL @ 9" HORIZONTAL OR ADD #13 REINFORCEMENT STEEL AT 15" HORIZONTAL.

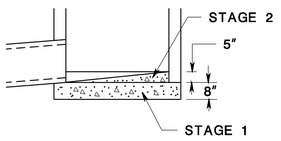
9. ALL INLETS AND MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT NJDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AND ITS AMENDMENTS.
10. DIMENSIONS, WEIGHTS AND OTHER CRITERIA SHOWN ON THESE DETAILS ARE FOR CLASS 30B CAST IRON ONLY.

CD-602-1.6





SECTION A–A



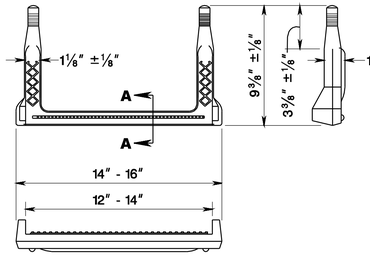
SECTION B–B

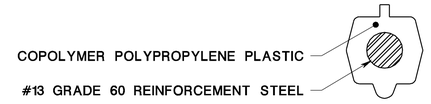
NOTE:

FOUNDATION AND INVERT TO BE CONSTRUCTED IN TWO STAGES. THE TOP SURFACE OF STAGE 1 TO BE LEFT ROUGH.

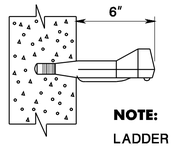
DETAIL OF INVERT FOR INLET WITHOUT CONTINUOUS PIPE

CD-602-1.4





SECTION A–A

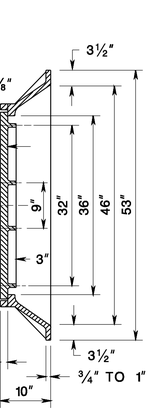


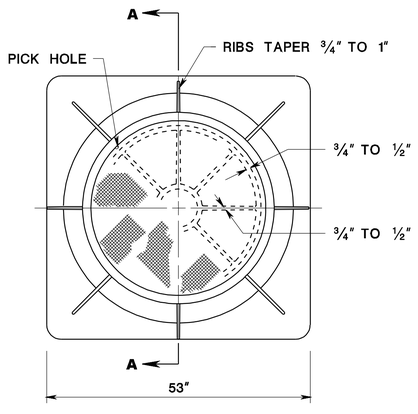
NOTE:

LADDER RUNGS FACING TRAFFIC 12" C TO C

COPOLYMER POLYPROPYLENE PLASTIC LADDER RUNG

CD-602-1.5





NOTE:

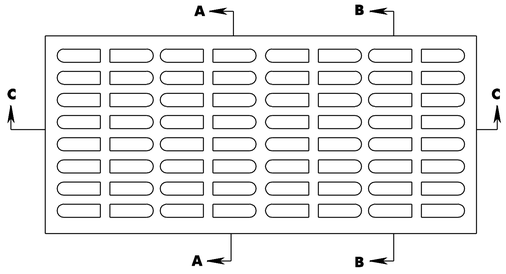
SEE GENERAL NOTE 10, CD-602-1.6

MINIMUM WEIGHTS

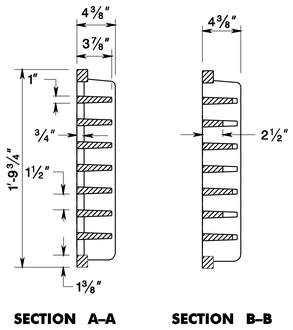
WEIGHT OF FRAME = 630#
WEIGHT OF COVER = 400#

NEW MANHOLE CASTING, SQUARE FRAME, CIRCULAR COVER

CD-602-1.7

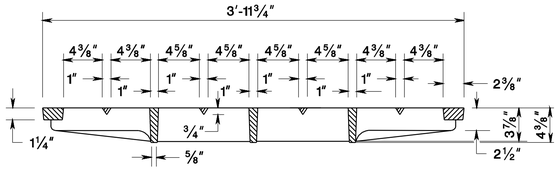


MIN. WEIGHT 325 LBS.



SECTION A–A

SECTION B–B



SECTION C–C

NOTE:

SEE GENERAL NOTE 10, CD-602-1.6

BICYCLE SAFE GRATE (CAST IRON)

CD-602-1.8

REINFORCEMENT STEEL IS IN METRIC UNITS.

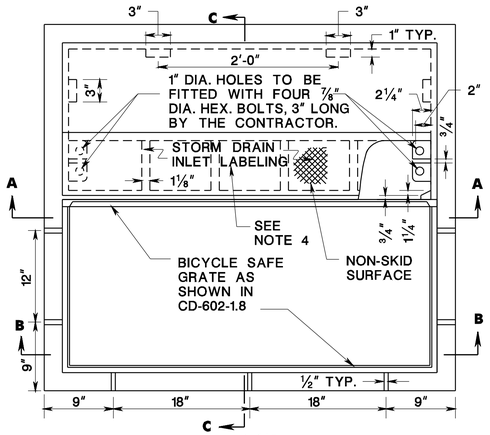
INLET GENERAL DETAILS

N.T.S.

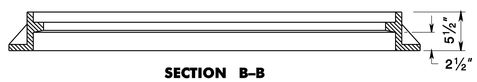
CD-602-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

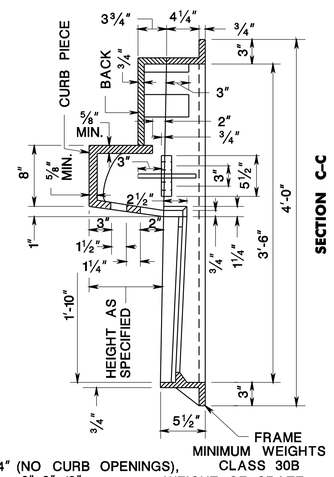
CONSTRUCTION DETAILS



SECTION A–A



SECTION B–B

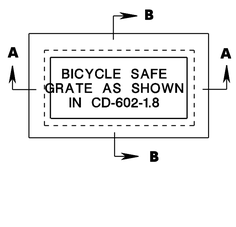


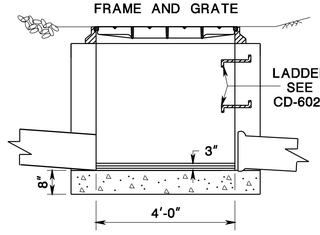
NOTES:

1. SEE ALTERNATE BACK PLATE DETAIL CD-602-2.5
2. SEE GENERAL NOTE 10, CD-602-1.6
3. THE CLEAR SPACE IN THE CURB OPENING (OR EACH INDIVIDUAL CLEAR SPACE, IF THE CURB OPENING HAS TWO OR MORE CLEAR SPACES) MUST HAVE AN AREA OF NO MORE THAN SEVEN (7.0) SQUARE INCHES, OR BE NO GREATER THAN TWO (2.0) INCHES ACROSS THE SMALLEST DIMENSION.
4. STORM DRAIN INLET LABEL SHOULD READ "NO DUMPING, DRAINS TO WATERWAYS" OR OTHERWISE APPROVED BY THE R.E.. FISH LOGOS SHALL ALSO BE INCLUDED ON BOTH SIDES OF LABEL.

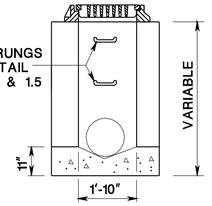
FRAME–BACK–CURB PIECE FOR INLET TYPE B AND TYPE C

CD-602-2.1



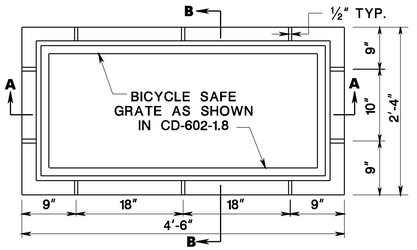


SECTION A–A

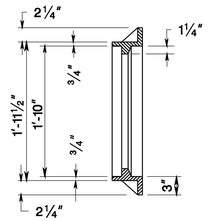


SECTION B–B

INLET, TYPE A



SECTION A–A



SECTION B–B

NOTE:

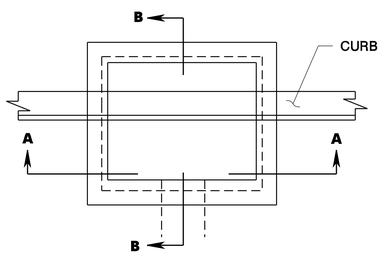
SEE GENERAL NOTE 10, CD-602-1.6

MAXIMUM WEIGHTS

WEIGHT OF FRAME = 240#
WEIGHT OF GRATE = 325#

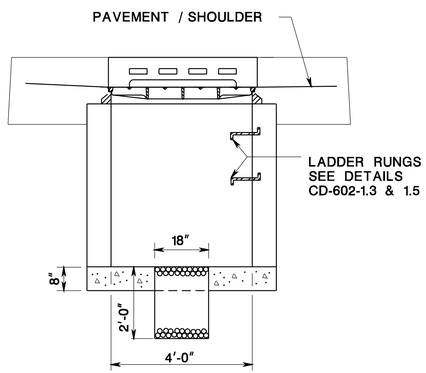
FRAME FOR INLET, TYPE A

CD-602-2.4

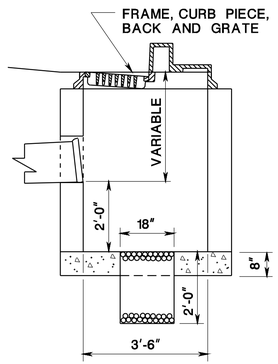


NOTE:

ALTERNATE VERTICAL JOINTS OF BRICK OR BLOCK IN THE FIVE LOWER COURSES SHALL BE LEFT OPEN. WHEN CONSTRUCTED OF CONCRETE A LEACHING BASIN 18" x 18" x 2'-0" DEEP OF COARSE AGGREGATE #57 SHALL BE CONSTRUCTED.



SECTION A–A



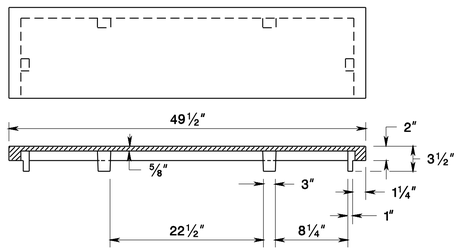
SECTION B–B

INLET, TYPE C WITH C.I. CURB PIECE–BACK–FRAME AND GRATE

CD-602-2.2

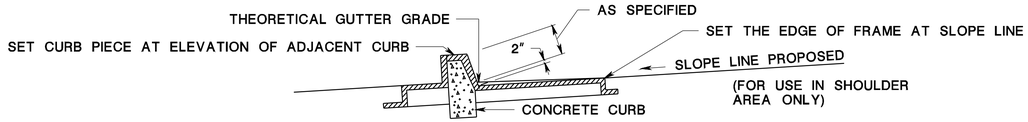
NOTES:

1. MINIMUM WEIGHT = 120#
2. SEE GENERAL NOTE 10, CD-602-1.6



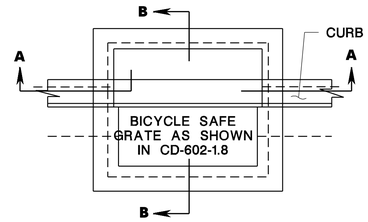
ALTERNATE BACK PLATE

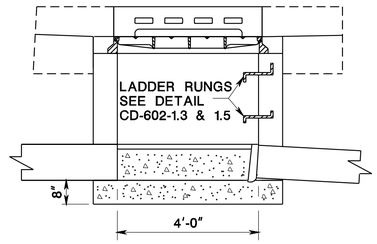
CD-602-2.5



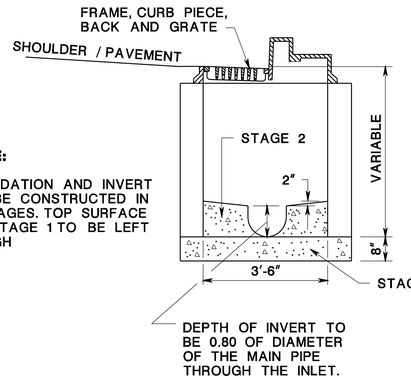
METHOD OF SETTING CASTING FOR B TYPE INLET WHERE CURB PIECE HEIGHT IS 2" GREATER THAN CURB FACE

CD-602-2.3





SECTION A–A



NOTE:

FOUNDATION AND INVERT TO BE CONSTRUCTED IN 2 STAGES. TOP SURFACE OF STAGE 1 TO BE LEFT ROUGH

SECTION B–B

INLET, TYPE B WITH C.I. CURB PIECE–BACK–FRAME AND GRATE

CD-602-2.6

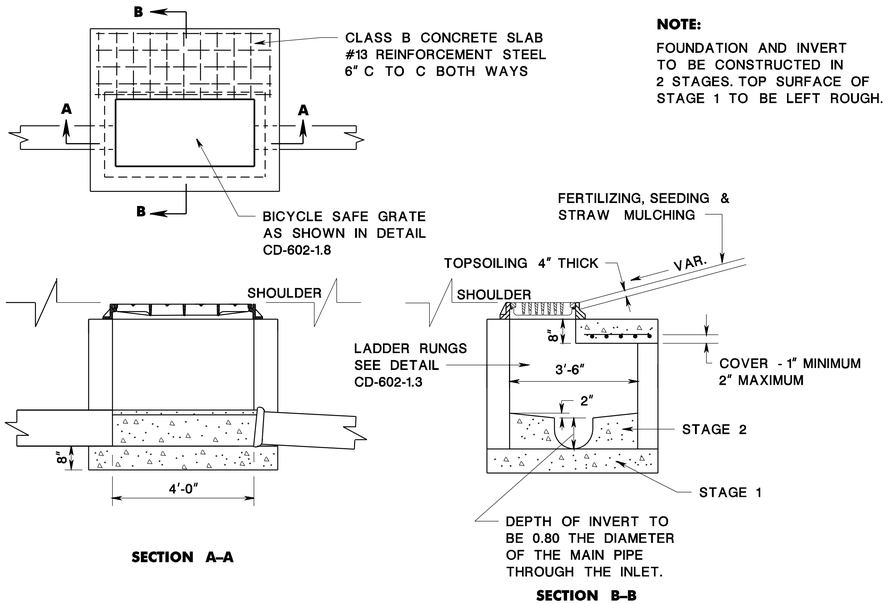
INLETS, TYPE A, B & C

N.T.S.

CD-602-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS



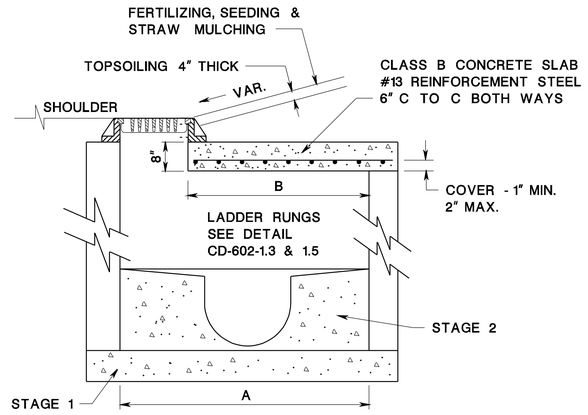
NOTE:

FOUNDATION AND INVERT TO BE CONSTRUCTED IN 2 STAGES. TOP SURFACE OF STAGE 1 TO BE LEFT ROUGH.

INLET, TYPE B MODIFIED

CD-602-3.1

INLETS TYPE B1 MODIFIED OR TYPE B2 MODIFIED SHALL BE OF SAME CONSTRUCTION AND DIMENSIONS AS INLET, TYPE B MODIFIED EXCEPT AS OTHERWISE INDICATED BELOW

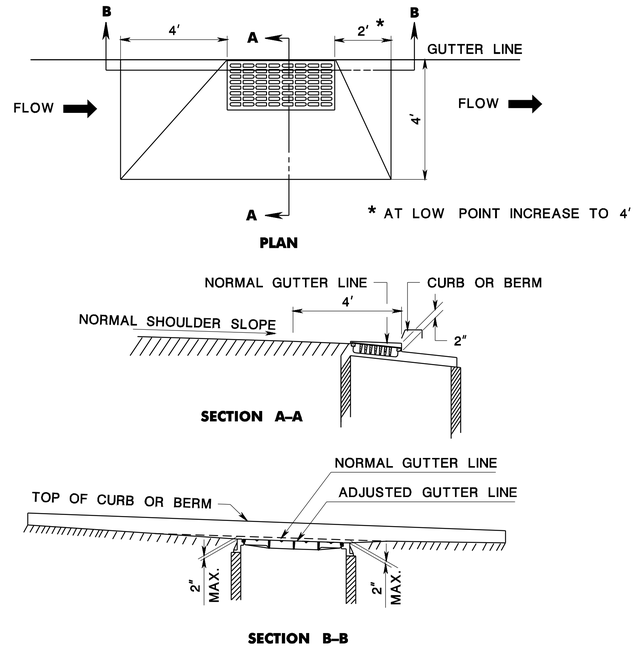


INLET TYPE	DIMENSION A	DIMENSION B
B1 MODIFIED	4'-6"	2'-8"
B2 MODIFIED	5'-6"	3'-8"

FOUNDATION AND INVERT TO BE CONSTRUCTED IN TWO STAGES. TOP SURFACE OF STAGE 1 TO BE LEFT ROUGH.

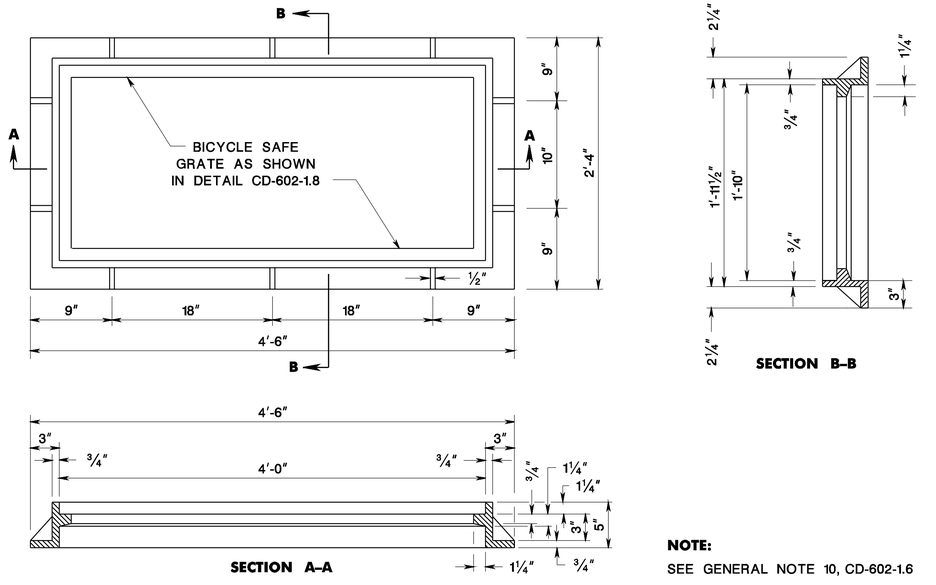
INLETS, TYPE B1 MODIFIED AND TYPE B2 MODIFIED

CD-602-3.2



METHOD OF DEPRESSING INLETS AT SHOULDERS

CD-602-3.3



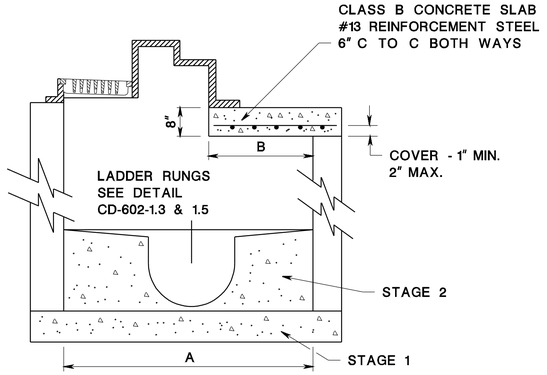
NOTE:

SEE GENERAL NOTE 10, CD-602-1.6

FRAME TO BE USED FOR INLET, TYPE B MODIFIED

CD-602-3.4

INLETS TYPE B1 OR TYPE B2 SHALL BE OF SAME CONSTRUCTION AND DIMENSIONS AS INLET TYPE B, EXCEPT AS OTHERWISE INDICATED BELOW.



INLET TYPE	DIMENSION A	DIMENSION B
B1	4'-6"	1'-0"
B2	5'-6"	2'-0"

FOUNDATION AND INVERT TO BE CONSTRUCTED IN TWO STAGES. TOP SURFACE OF STAGE 1 TO BE LEFT ROUGH.

INLETS, TYPE B1 AND TYPE B2

CD-602-3.5

REINFORCEMENT STEEL IS IN METRIC UNITS.

INLETS, TYPE B1, B2, & B, B1, & B2 MODIFIED

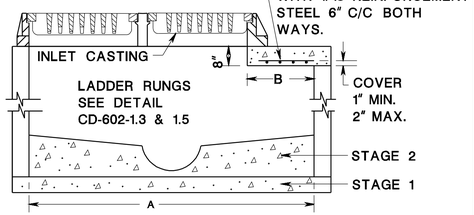
N.T.S.

CD-602-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

INLETS TYPE E1 AND TYPE E2 SHALL BE OF THE SAME CONSTRUCTION AND DIMENSIONS AS INLET TYPE E EXCEPT AS OTHERWISE INDICATED BELOW.

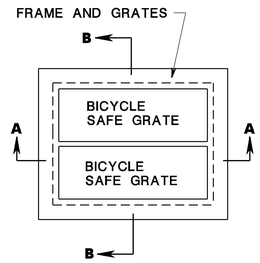


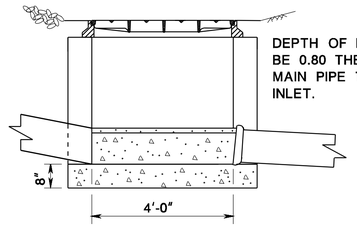
NOTE:
FOUNDATION AND INVERT TO BE CONSTRUCTED IN TWO STAGES. TOP SURFACE OF STAGE 1 TO BE LEFT ROUGH.

INLET TYPE	DIMENSION A	DIMENSION B
E 1	4'-6"	1'-0"
E 2	5'-6"	2'-0"

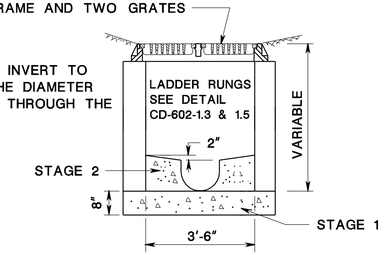
INLETS, TYPE E1 AND TYPE E2

CD-602-4.1





SECTION A–A

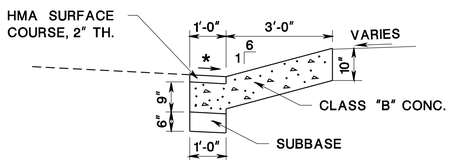


SECTION B–B

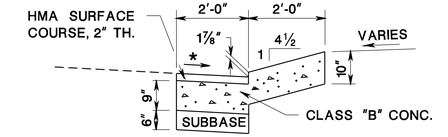
NOTE:
FOUNDATION AND INVERT TO BE CONSTRUCTED IN 2 STAGES. TOP SURFACE OF STAGE 1 TO BE LEFT ROUGH.

INLET, TYPE E

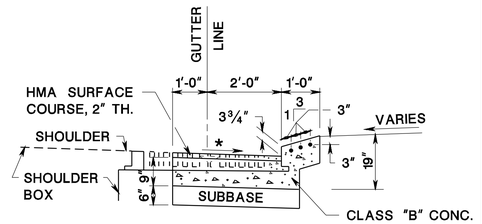
CD-602-4.2



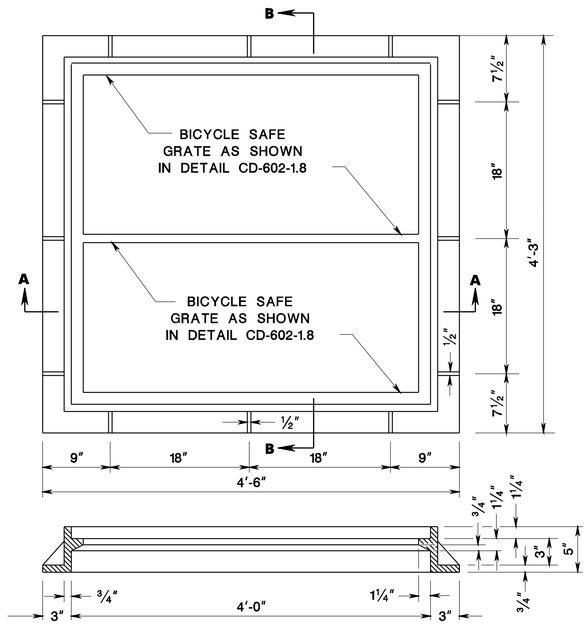
SECTION A–A



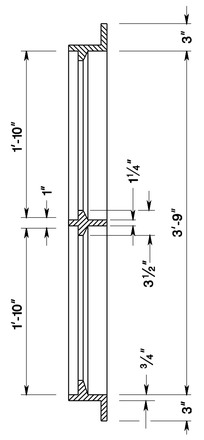
SECTION B–B



SECTION C–C



SECTION A–A



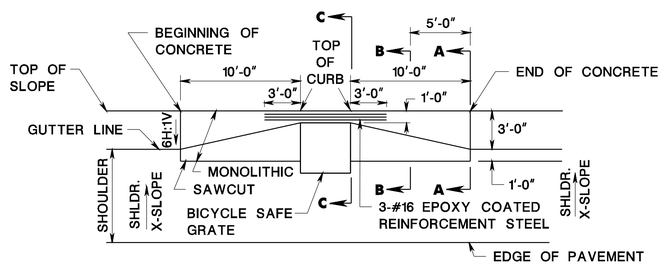
SECTION B–B

WEIGHT OF FRAME = 435#
WEIGHT OF EACH GRATE = 325#

NOTE:
SEE GENERAL NOTE 10, CD-602-1.6

FRAME FOR INLET, TYPE E

CD-602-4.3



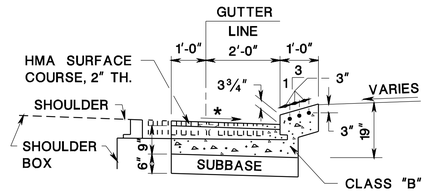
NOTE:
THE UNDERLYING MATERIAL SHALL BE SHAPED AND COMPACTED TO A FIRM, EVEN SURFACE.

PLAN VIEW

NOTE:
ITEM INCLUDES EXCAVATION
SUBBASE SOIL AGGREGATE I-3, 6" TH.
CLASS B CONCRETE (RDWY)
HMA SURFACE COURSE
UNDERLAYER PREPARATION
TACK COAT
INLET, TYPE "E" WITH CASTING, AND REINFORCEMENT STEEL.

INLET, TYPE ES

CD-602-4.4



NOTE:
ITEM INCLUDES EXCAVATION SUBBASE SOIL AGGREGATE I-3, 6 INCHES THICK. CLASS B CONCRETE (RDWY) HMA SURFACE COURSE UNDERLAYER PREPARATION TACK COAT INLET CASTING, TYPE "E" REMOVAL OF EXISTING CLASS B CONCRETE IF REQUIRED.

SECTION C–C

REINFORCEMENT STEEL IS IN METRIC UNITS.
HMA = HOT MIX ASPHALT

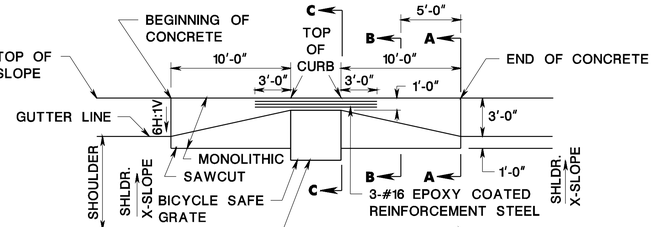
INLETS, TYPE E, E1, E2, & ES

N.T.S.

CD-602-4

NEW JERSEY DEPARTMENT OF TRANSPORTATION

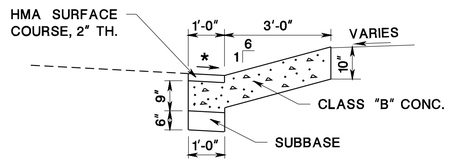
CONSTRUCTION DETAILS



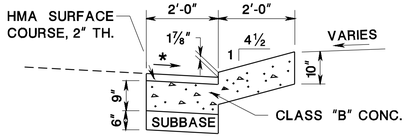
FOR EXIST. INLET TYPE "B", PROVIDE NEW INLET CASTING TYPE "E".
FOR EXIST. INLET TYPE "E" OR "ES" USE EXIST. CASTING.

PLAN VIEW

NOTE:
THE UNDERLYING MATERIAL SHALL BE SHAPED AND COMPACTED TO A FIRM, EVEN SURFACE.



SECTION A–A

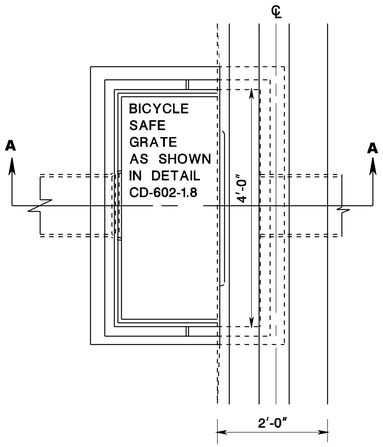


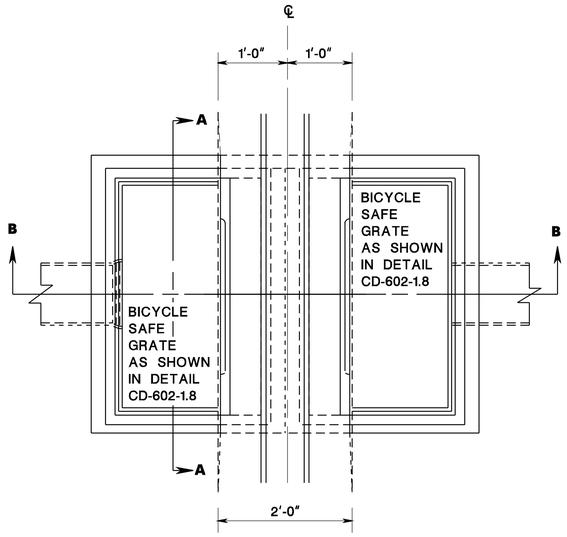
SECTION B–B

* SAME X-SLOPE AS ADJOINING SHOULDER

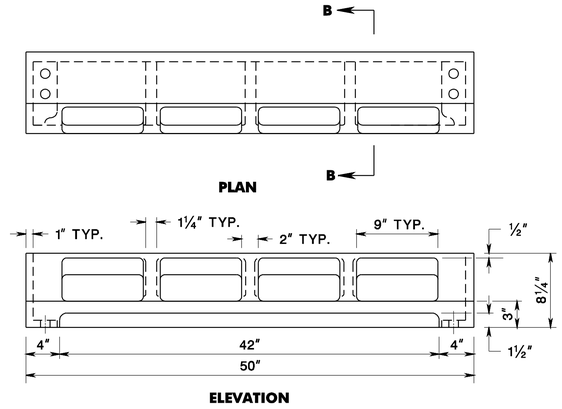
INLET CASTING, TYPE ES

CD-602-4.5





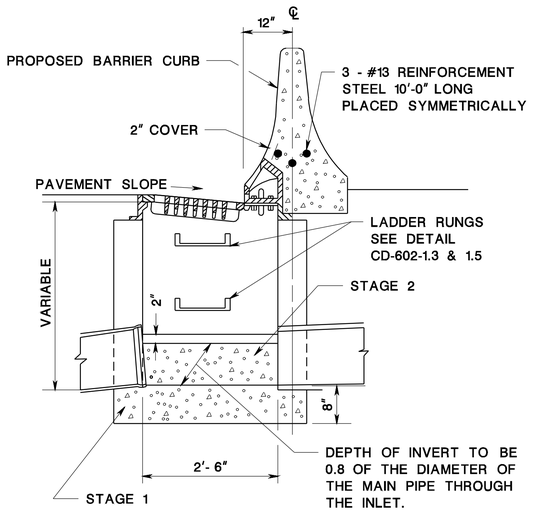
PLAN



NOTE:
SEE GENERAL NOTE 10, CD-602-1.6

CAST IRON CURB PIECE FOR INLETS, TYPE D1 AND D2

CD-602-5.3

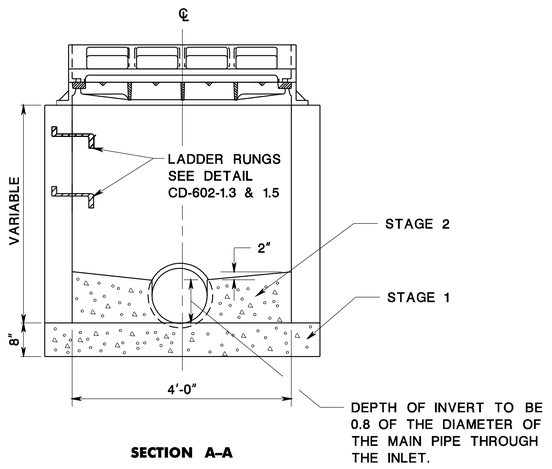


SECTION A–A

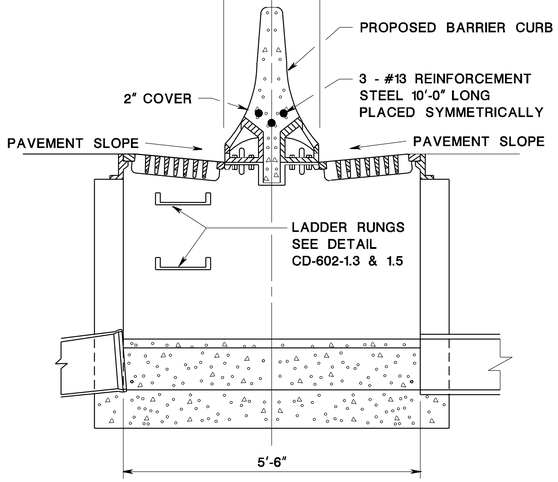
NOTE:
FOUNDATION AND INVERT TO BE CONSTRUCTED IN 2 STAGES
THE TOP SURFACE OF STAGE 1 TO BE LEFT ROUGH.

INLET, TYPE D1

CD-602-5.1



SECTION A–A



SECTION B–B

NOTE:
FOUNDATION AND INVERT TO BE CONSTRUCTED IN 2 STAGES
THE TOP SURFACE OF STAGE 1 TO BE LEFT ROUGH.

INLET, TYPE D2

CD-602-5.2

REINFORCEMENT STEEL IS IN METRIC UNITS.

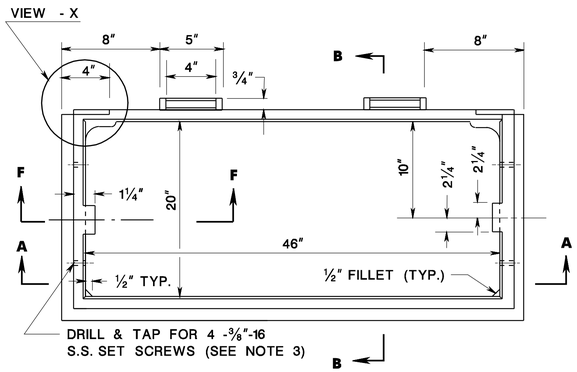
INLETS, TYPE D1 & D2

N.T.S.

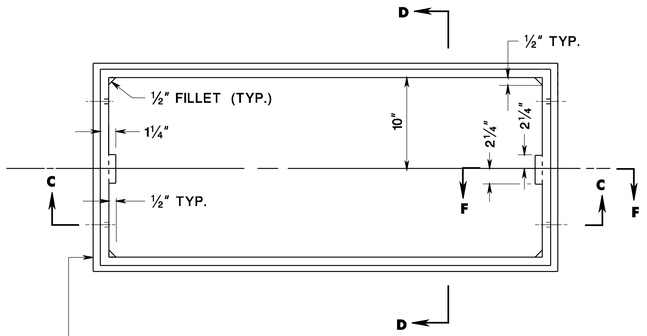
CD-602-5

NEW JERSEY DEPARTMENT OF TRANSPORTATION

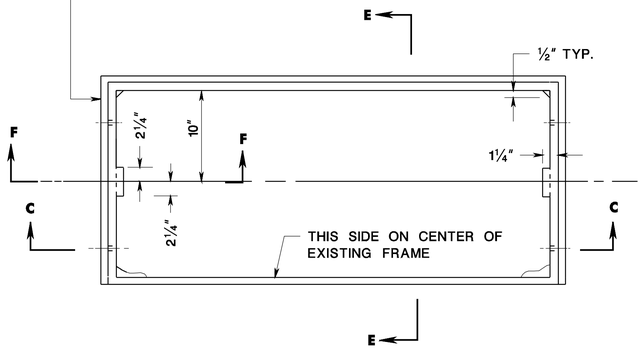
CONSTRUCTION DETAILS



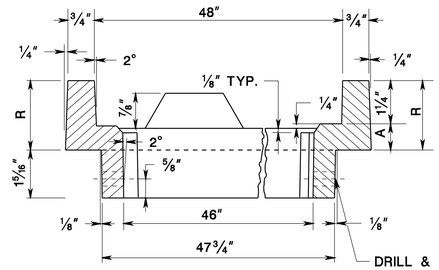
EXTENSION FRAMES FOR INLETS, TYPE B & C AND INLETS, TYPE D1 & D2



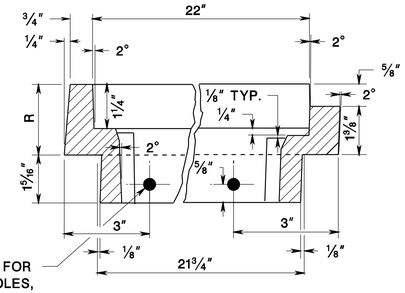
EXTENSION FRAMES FOR INLETS, TYPE A AND B MODIFIED



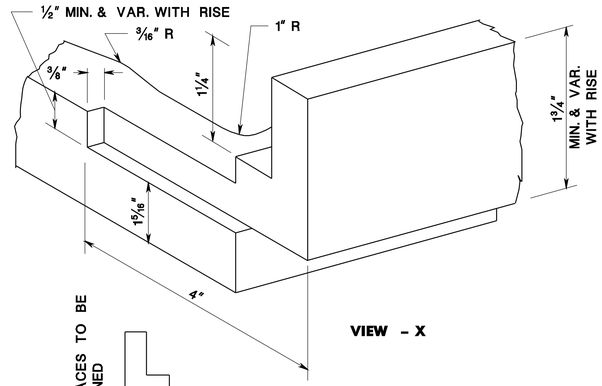
EXTENSION FRAMES FOR INLET, TYPE E (HALF ONLY)



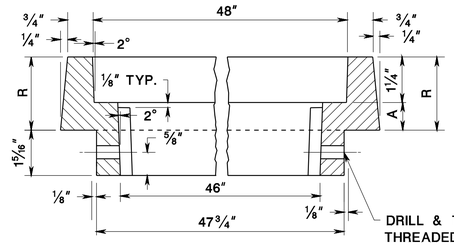
SECTION A–A



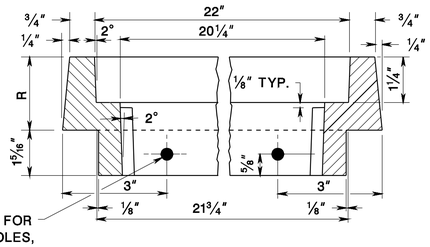
SECTION B–B



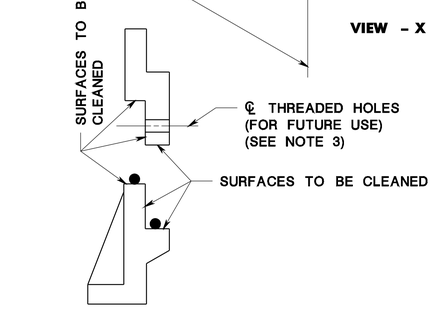
VIEW – X



SECTION C–C

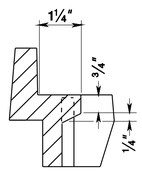


SECTION D–D



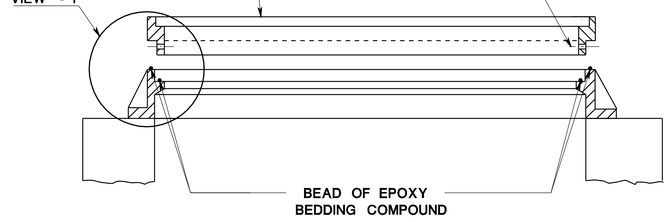
VIEW – Y

SECTION E–E

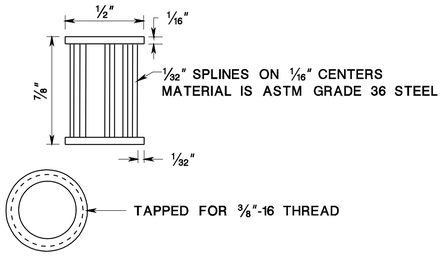


THIS LUG IS ONLY NECESSARY WHEN A BICYCLE SAFE-GRATE (CAST IRON) IS USED

SECTION F–F



METHOD OF ATTACHING EXTENSION FRAMES



THREADED INSERT FOR EXTENSION FRAMES ALTERNATE

NOTES:

1. THE CONTRACTOR SHALL MEASURE THE EXISTING INLET FRAMES AND GRATES TO DETERMINE PROPER DIMENSIONS OF PROPOSED EXTENSION FRAMES BEFORE PLACING ORDER.
2. NOT TO BE USED WITH DISH GRATES.
3. A THREADED INSERT MAY BE USED AS AN ALTERNATE TO DRILLING AND TAPPING.
4. SEE GENERAL NOTE 10, CD-602-1.6

RISE=R	A
1¾″	½″
2″	¾″
2½″	1¼″
3″	1¾″
3½″	2¼″

CD-602-6.1

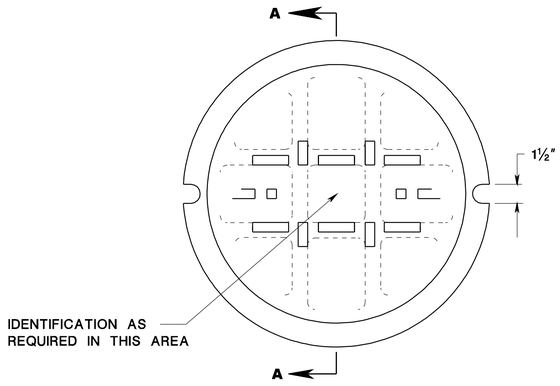
CAST IRON EXTENSION FRAMES FOR EXISTING INLETS

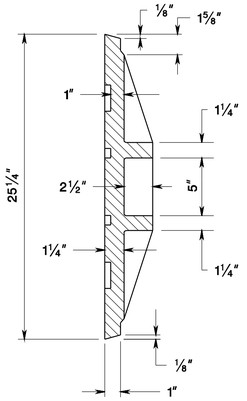
N.T.S.

CD-602-6

NEW JERSEY DEPARTMENT OF TRANSPORTATION

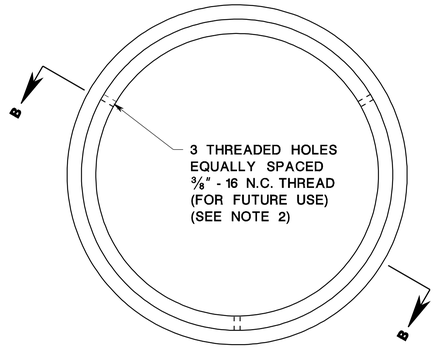
CONSTRUCTION DETAILS

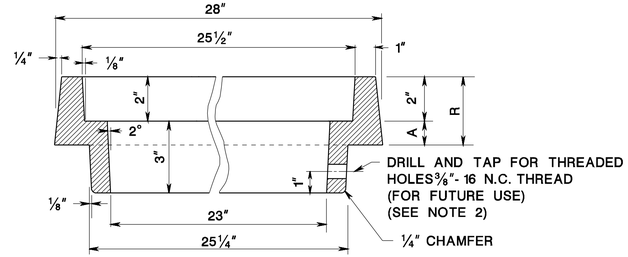




HEAVY DUTY COVER

SECTION A–A

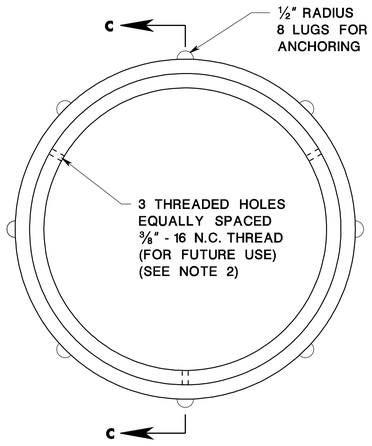


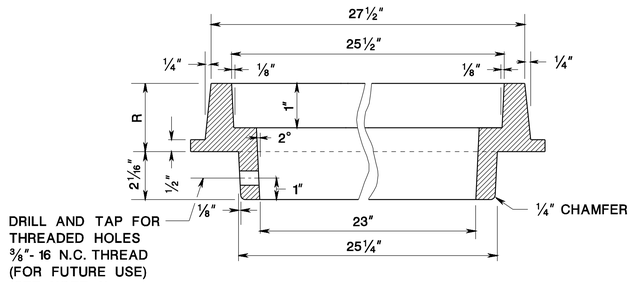


SECTION B–B

R=RISE R=A+2"	A
2½"	½"
3"	1"
3½"	1½"

EXTENSION RING FOR STANDARD COVER

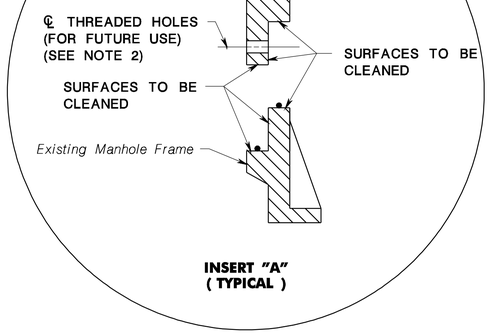




R=RISE
1½"
1¾"
2"

SECTION C–C

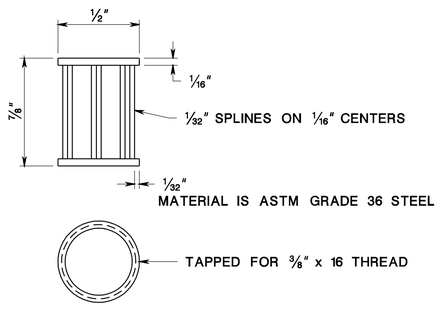
EXTENSION RING FOR HEAVY DUTY COVER
(SEE NOTE 3)



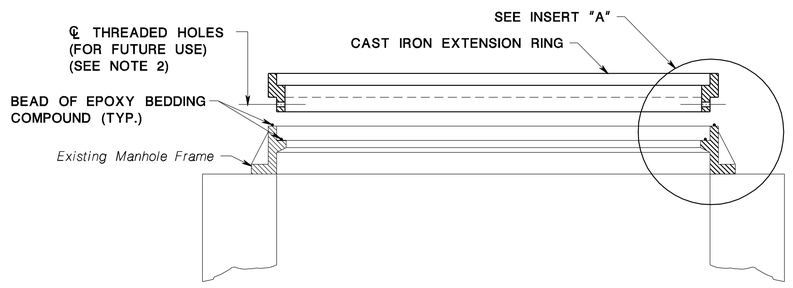
INSERT "A"
(TYPICAL)

NOTES:

1. THE CONTRACTOR SHALL MEASURE THE EXISTING MANHOLE FRAMES AND COVERS TO DETERMINE PROPER DIMENSIONS OF PROPOSED EXTENSION RINGS BEFORE PLACING ORDER.
2. A THREADED INSERT MAY BE USED AS AN ALTERNATE TO DRILLING AND TAPPING.
3. A HEAVY DUTY COVER SHALL BE USED FOR A RISE OF 1½" TO 2¼" INCLUSIVE.
4. SEE GENERAL NOTE 10, CD-602-1.6.



THREADED INSERT FOR EXTENSION RING, ALTERNATE



METHOD OF ATTACHING EXTENSION RING

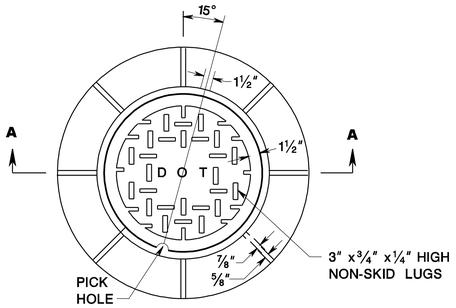
CAST IRON EXTENSION RINGS FOR EXISTING MANHOLES

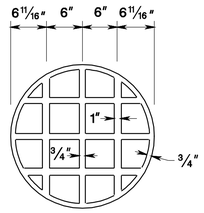
N.T.S.

CD-602-7

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

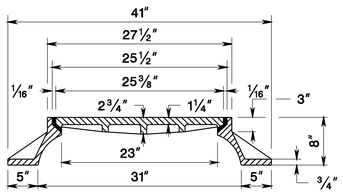




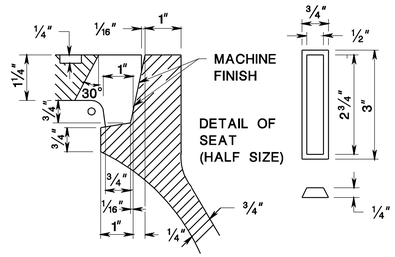
UNDERSIDE OF COVER

MINIMUM WEIGHTS
WEIGHT OF FRAME = 265#
WEIGHT OF COVER = 175#

NOTE:
SEE GENERAL NOTE 10, CD-602-1.6



SECTION A–A



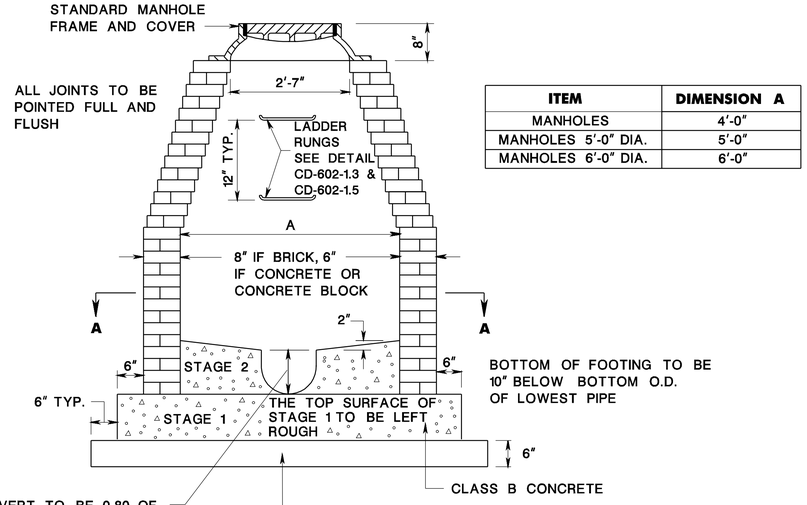
STANDARD MANHOLE FRAME AND COVER

CD-602-8.1

GENERAL NOTES

1. MANHOLES MAY BE CONSTRUCTED OF BRICK, CONCRETE, CONCRETE BLOCK, OR PRECAST CONCRETE.
2. WHEN THE DEPTH OF A MANHOLE EXCEEDS 10 FEET AS MEASURED FROM TOP OF COVER TO INVERT, THE WALLS OF BRICK, CONCRETE, OR CONCRETE BLOCK BELOW A DEPTH OF 8 FEET SHALL BE 12 INCHES THICK. THE OVERALL HORIZONTAL DIMENSIONS SHALL BE INCREASED 12 INCHES AND THE DEPTH OF THE FOUNDATION INCREASED TO 12 INCHES. WHEN ROCK IS ENCOUNTERED THE HORIZONTAL DIMENSION AND DEPTH OF THE FOUNDATION SHALL NOT BE INCREASED. THE THICKNESS OF PRECAST CONCRETE MANHOLE WALLS DOES NOT HAVE TO BE INCREASED IF THE DEPTH OF THE MANHOLE EXCEEDS 10 FEET.
3. CASTINGS OF PRECAST MANHOLES SHALL BE ADJUSTED TO GRADE WITH COURSES OF BRICK OR CONCRETE BLOCK, AS REQUIRED, 12 INCHES MAXIMUM.
4. AS AN ALTERNATE TO THE STANDARD MANHOLE FRAME AND COVER, A 39 INCH DIAMETER FRAME WITH 4 INCH FLANGE MAY BE FURNISHED WITH ALL OTHER DIMENSIONS AND WEIGHTS REMAINING THE SAME.
5. IN A BRICK, CONCRETE, OR CONCRETE BLOCK MANHOLE, THE INVERT SHALL BE CONSTRUCTED IN TWO STAGES.
6. AS AN ALTERNATIVE, COPOLMYER POLYPROPYLENE PLASTIC LADDER RUNGS MY BE FURNISHED IN PRECAST MANHOLES AND INLETS.

CD-602-8.3

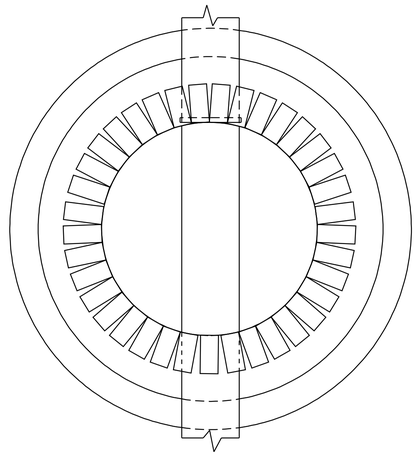


ITEM	DIMENSION A
MANHOLES	4'-0"
MANHOLES 5'-0" DIA.	5'-0"
MANHOLES 6'-0" DIA.	6'-0"

NOTE:
DEPTH OF INVERT TO BE 0.80 OF THE DIAMETER OF THE MAIN SEWER THROUGH THE MANHOLE (TYP)

COARSE AGGREGATE #57 IF FOOTING IS PRECAST

NOTE:
FOUNDATION AND INVERT TO BE CONSTRUCTED IN TWO STAGES.



SECTION A–A

MANHOLES, MANHOLES 5 FOOT DIAMETER, MANHOLES 6 FOOT DIAMETER

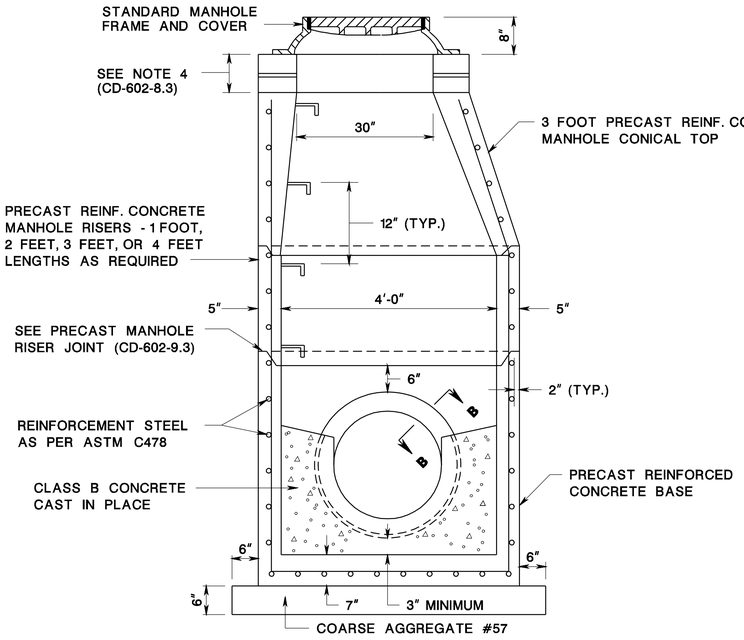
CD-602-8.2

MANHOLES
N.T.S.

CD-602-8

NEW JERSEY DEPARTMENT OF TRANSPORTATION

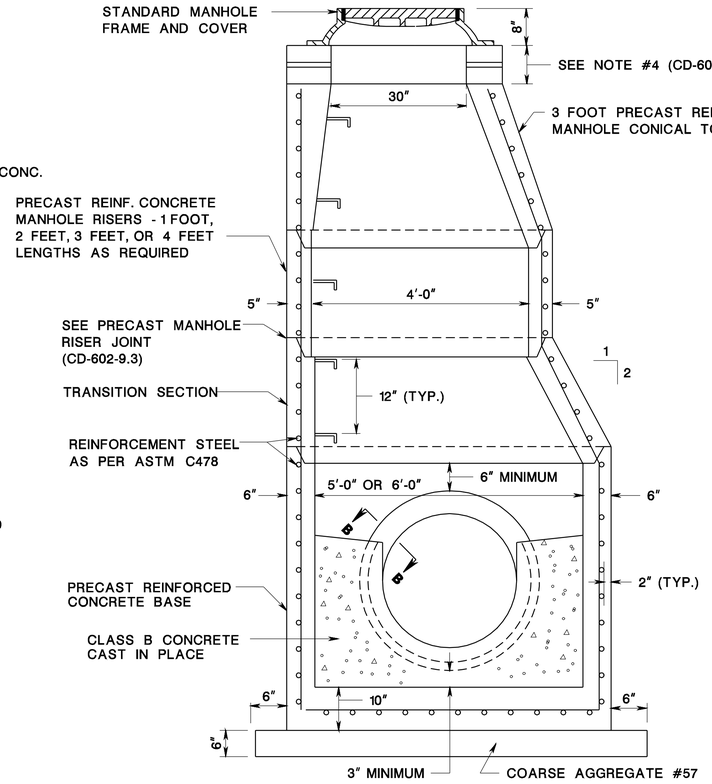
CONSTRUCTION DETAILS



PRECAST REINFORCED CONCRETE MANHOLE SECTIONS SHALL CONFORM TO ASTM C478

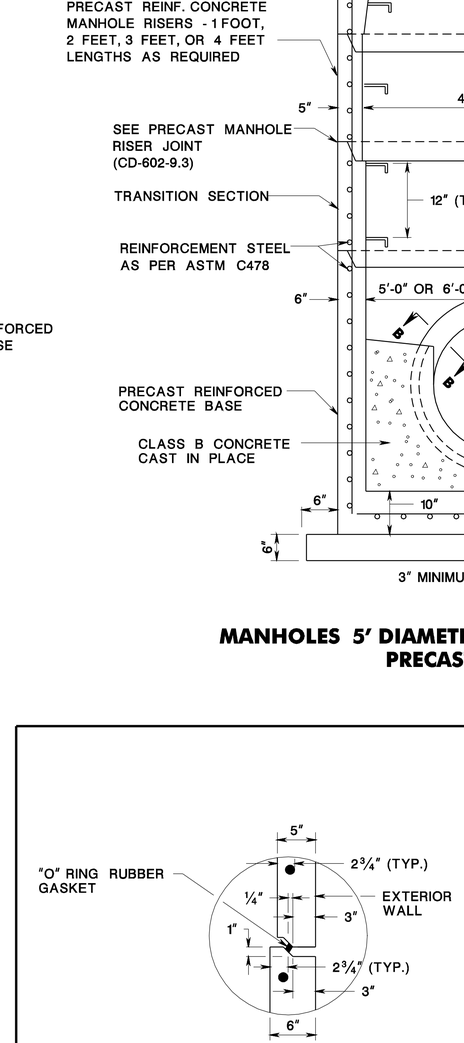
MANHOLES PRECAST CONCRETE

SECTION B–B



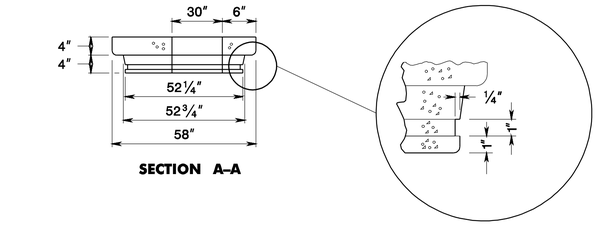
MANHOLES 5′ DIAMETER, MANHOLES 6′ DIAMETER PRECAST CONCRETE

CD-602-9.1



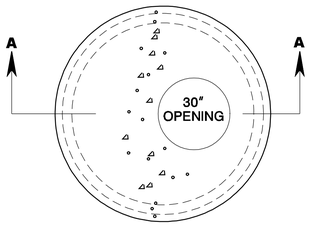
PRECAST MANHOLE RISER JOINT

CD-602-9.3



SECTION A–A

GROOVE FOR "O" RING RUBBER GASKET



PLAN

NOTE:

USE IN LIEU OF CONICAL SECTION WHEN HEIGHT OF MANHOLE IS LESS THAN 4 FEET

48" PRECAST REINFORCED CONCRETE MANHOLE FLAT TOP

CD-602-9.2

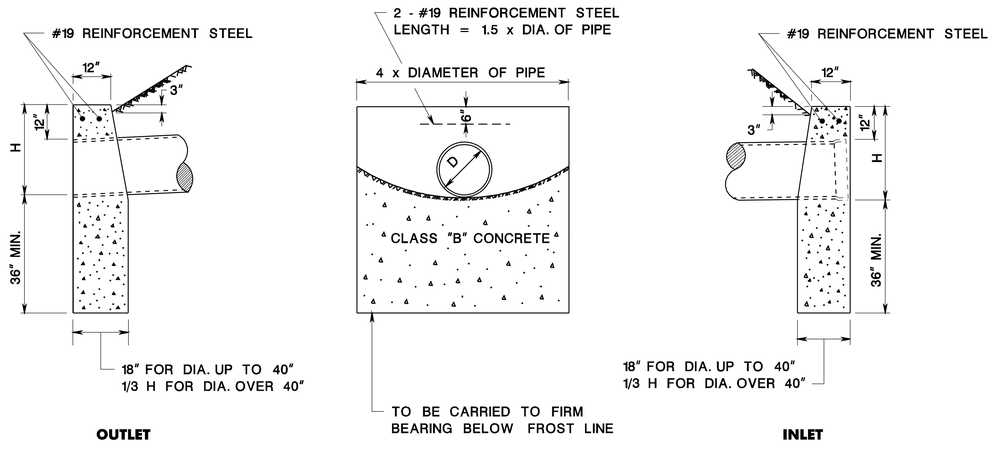
PRECAST MANHOLES

N.T.S.

CD-602-9

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS



CONCRETE HEADWALL

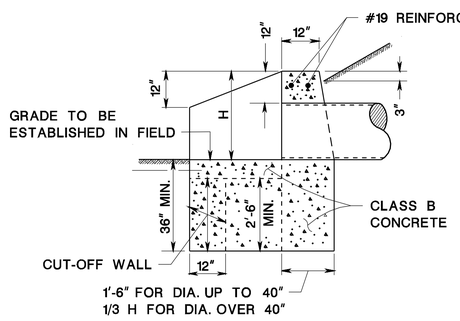
HEADWALL QUANTITY IN CUBIC YARDS

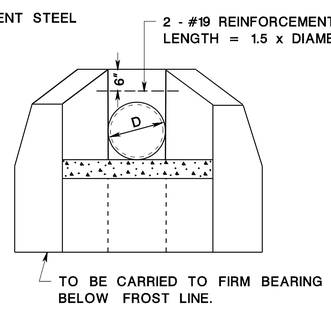
PIPE DIA.	CORR. STEEL PIPE	REINF. CONC. PIPE
12"	1.0	1.1
15"	1.3	1.4
18"	1.7	1.7
21"	2.0	2.1
24"	2.3	2.5
27"	2.7	2.8
30"	3.1	3.3
36"	3.9	4.2
42"	4.8	5.8
48"	6.3	7.6
54"	8.1	9.7
60"	10.1	12.1
66"	12.3	14.9
72"	14.5	18.0

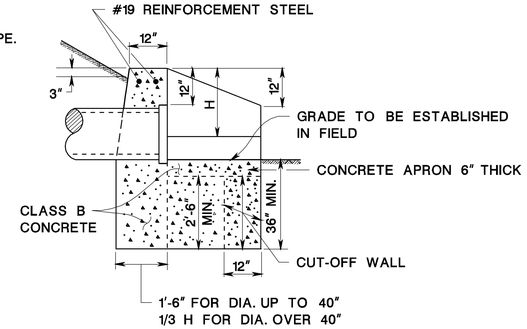
GENERAL NOTES:

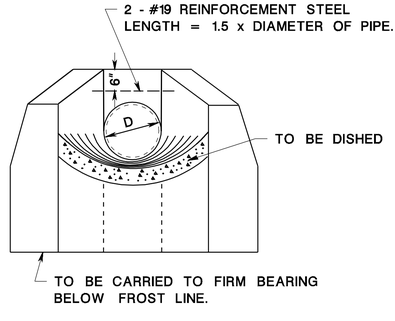
1. THE RUBBING OF HEADWALLS TO REMOVE FORM MARKS AS REQUIRED IN THE NJDOT SPECIFICATIONS FOR CONCRETE STRUCTURES, WILL NOT BE REQUIRED FOR HEADWALLS AT THE BOTTOM OF EMBANKMENT IN RURAL AREAS.
2. ALL EDGES TO BE CHAMFERED 1 INCH.
3. FOR ARCH PIPE USE LENGTH OF HEADWALL AS 3H + SPAN.
4. FOR MORE THAN ONE PIPE, SET THE PIPE A MINIMUM OF ONE FOOT APART (OUTSIDE BARREL TO OUTSIDE BARREL); THE ENDS OF THE HEADWALL SHALL BE SET 2 x DIAMETER OFF THE CENTERLINE OF THE CONTROLLING PIPE.

CD-602-10.1



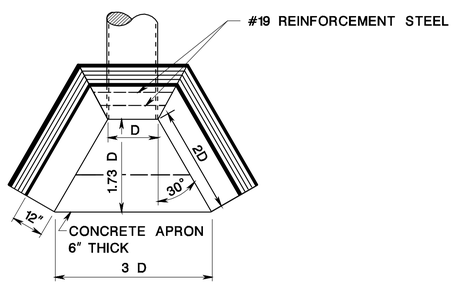






VOLUME OF CONCRETE IN HEADWALLS AND APRONS IN CUBIC YARDS

PIPE DIA.	CORR. STEEL PIPE	REIN. CONC. PIPE	APRONS
12"	1.6	1.7	0.4
15"	2.0	2.1	0.5
18"	2.4	2.5	0.6
21"	2.8	3.0	0.8
24"	3.3	3.4	0.9
27"	3.7	4.0	1.1
30"	4.2	4.5	1.2
36"	5.3	5.6	1.5
42"	7.2	7.9	1.9
48"	9.4	10.4	2.3
54"	12.0	13.3	2.7
60"	15.0	16.6	3.2
66"	18.5	20.5	3.7
72"	22.4	24.8	4.2



CONCRETE HEADWALL AND APRON

GENERAL NOTES:

1. ALL EDGES TO BE CHAMFERED 1 INCH.
2. THE RUBBING OF HEADWALLS TO REMOVE FORM MARKS AS REQUIRED IN THE NJDOT SPECIFICATIONS FOR CONCRETE STRUCTURES, WILL NOT BE REQUIRED FOR HEADWALLS AT THE BOTTOM OF EMBANKMENTS IN RURAL AREAS.
3. FOR SLOPE DRAIN HEADWALLS, DIMENSIONS AND APRON GRADES SHALL BE SET BY THE DEPARTMENT.
4. FOR MORE THAN ONE PIPE, SET THE PIPES A MINIMUM OF ONE FOOT APART (OUTSIDE BARREL TO OUTSIDE BARREL); THERE SHALL BE 12 INCHES ABOVE THE TOP OF A PIPE IN A WING-WALL: THE TERMINUS OF THE WINGWALL SHALL BE 2 X DIAMETER FROM THE CENTERLINE OF THE PIPE IN A WINGWALL.
5. THE TERMINUS FOR OUTLET AND INLET APRONS SHALL BE SET BY EXTENDING THE PIPE GRADE AHEAD AND BACK, RESPECTIVELY.
6. FOR ARCH PIPE, THE SPAN SHALL BE SUBSTITUTED FOR D.

CD-602-10.2

REINFORCEMENT STEEL IS IN METRIC UNITS.

CONCRETE HEADWALL AND APRON

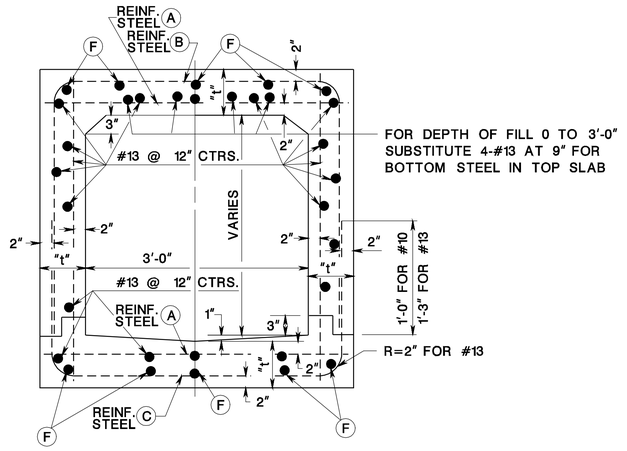
N.T.S.

CD-602-10

NEW JERSEY DEPARTMENT OF TRANSPORTATION

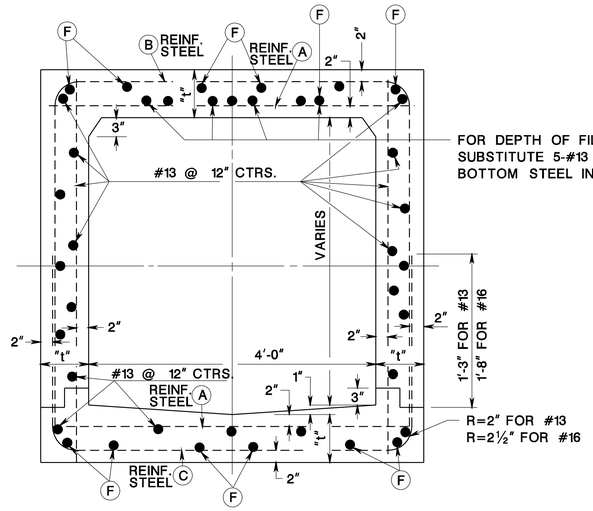
CONSTRUCTION DETAILS

STANDARD 3′–0″ CONCRETE CULVERT



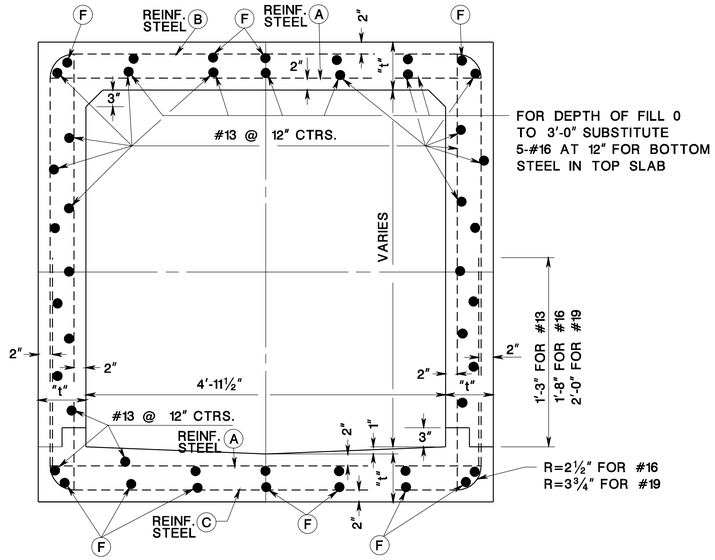
DEPTH OF FILL		REINF. STEEL	SPAN 3 FT.		THICKNESS "t"
MIN.	MAX.		REINF. STEEL	SPACING	
0	3′-0″	A	#13	5″	8″
		B&C	#13	12″	
3′-1″	10′-0″	A	#13	12″	8″
		B&C	#13	12″	
10′-1″	15′-0″	A	#13	9″	8″
		B&C	#13	10″	
15′-1″	20′-0″	A	#13	7″	8″
		B&C	#13	9″	
20′-1″	25′-0″	A	#13	6″	8″
		B&C	#13	7″	

STANDARD 4′–0″ CONCRETE CULVERT



DEPTH OF FILL		REINF. STEEL	SPAN 4 FT.		THICKNESS "t"
MIN.	MAX.		REINF. STEEL	SPACING	
0	3′-0″	A	#13	4″	8″
		B&C	#13	10″	
3′-1″	10′-0″	A	#13	9″	8″
		B&C	#13	12″	
10′-1″	15′-0″	A	#13	6″	8″
		B&C	#13	9″	
15′-1″	20′-0″	A	#16	7″	8″
		B&C	#16	10″	
20′-1″	25′-0″	A	#16	6″	9″
		B&C	#16	10″	

STANDARD 4′ –11 1⁄2″ CONCRETE CULVERT



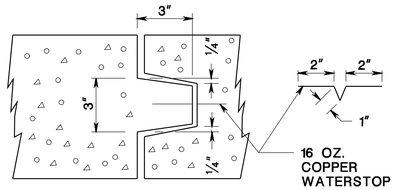
DEPTH OF FILL		REINF. STEEL	SPAN 4′-11 1⁄2″		THICKNESS "t"
MIN.	MAX.		REINF. STEEL	SPACING	
0	3′-0″	A	#16	5″	8″
		B&C	#16	12″	
3′-1″	10′-0″	A	#13	6″	8″
		B&C	#13	9″	
10′-1″	15′-0″	A	#16	7″	9″
		B&C	#16	12″	
15′-1″	20′-0″	A	#16	7″	10″
		B&C	#16	10″	
20′-1″	25′-0″	A	#16	5″	10″
		B&C	#16	8″	
25′-1″	40′-0″	A	#19	6″	11″
		B&C	#19	9″	

NOTES:

TOP AND BOTTOM LAYER OF LONGITUDINAL REINFORCEMENT STEEL (F) TO BE SAME SIZE AS REINFORCEMENT STEEL A, B & C AND SPACED 12″ CTRS.

FOR BACKFILLING AND EMBANKMENT SEE NJDOT STANDARD SPECIFICATIONS.

REINFORCEMENT STEEL SHALL CONFORM TO ASTM A615, GRADE 60.



SECTION THRU KEY OF CONSTRUCTION JOINT

TO BE CONSTRUCTED IN TOP, WALLS AND BASE OF CULVERT NOT MORE THAN 35′- 0″ APART

CONSTRUCTION JOINT OF CULVERT

CD-602-11.2

VOLUME OF CONCRETE AND WEIGHT OF REINFORCEMENT PER LINEAR FOOT OF CULVERT

SIZE OF CULVERT OPENING IN FEET	3′–0″ x 3′–0″					4′–0″ x 3′–0″					4′–0″ x 4′–0″					4′ –11 1⁄2″ x 3′–0″					4′ –11 1⁄2″ x 4′–0″					4′ –11 1⁄2″ x 5′–0″					
MAX DEPTH OF FILL FT.	3	10	15	20	25	3	10	15	20	25	3	10	15	20	25	3	10	15	20	25	3	10	15	20	25	3	10	15	20	25	40
VOLUME OF CONCRETE CU. YD. PER FT.	0.37	0.37	0.37	0.37	0.37	0.42	0.42	0.42	0.42	0.48	0.47	0.47	0.47	0.47	0.54	0.47	0.47	0.54	0.61	0.61	0.52	0.52	0.60	0.67	0.67	0.57	0.57	0.65	0.73	0.73	0.82
REINFORCEMENT LB. PER FT.	53	43	48	53	59	66	50	60	75	79	70	54	63	84	89	88	74	84	89	105	94	81	90	96	114	99	85	95	102	122	150

NOTE:

FIRST DIMENSION OF CULVERT SIZE INDICATES THE SPAN. CULVERT TO BE CONSTRUCTED OF CLASS "A" CONCRETE.

CONCRETE CULVERT

CD-602-11.1

REINFORCEMENT STEEL IS IN METRIC UNITS.

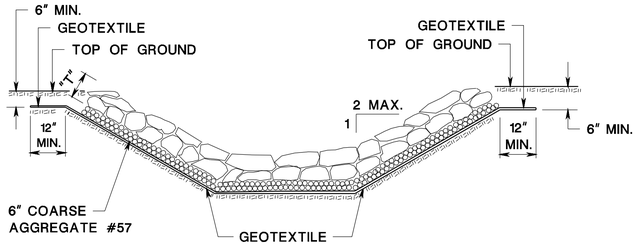
CONCRETE CULVERT

N.T.S.

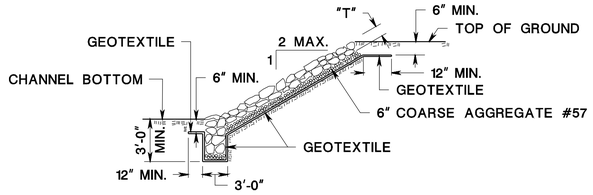
CD-602-11

NEW JERSEY DEPARTMENT OF TRANSPORTATION

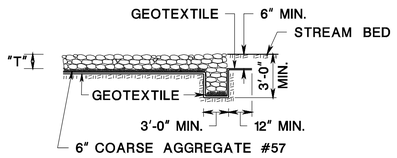
CONSTRUCTION DETAILS



CHANNEL PROTECTION



SLOPE PROTECTION



END TREATMENT FOR CHANNEL PROTECTION

NOTE:

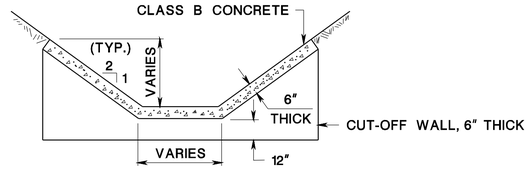
FOR WIDTHS AND SLOPES REFER TO CONSTRUCTION PLANS

"T" = $2d_{50}$

d_{50} = DESIGNATED MEDIAN STONE SIZE, 6" MIN.

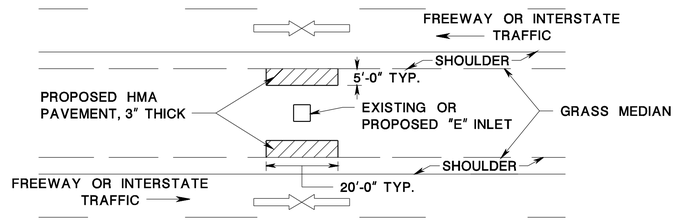
RIPRAP STONE CHANNEL /SLOPE PROTECTION

CD-603-1.1



CONCRETE SLOPE GUTTER, 6" THICK

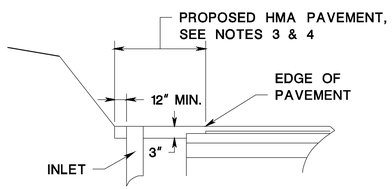
CD-603-1.3



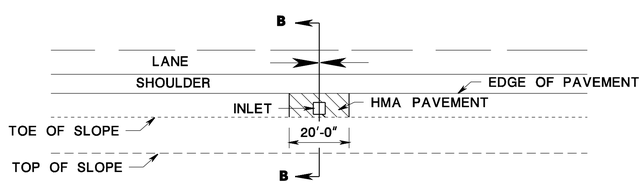
MEDIAN EDGE OF MAINLINE PAVEMENT

NOTES:

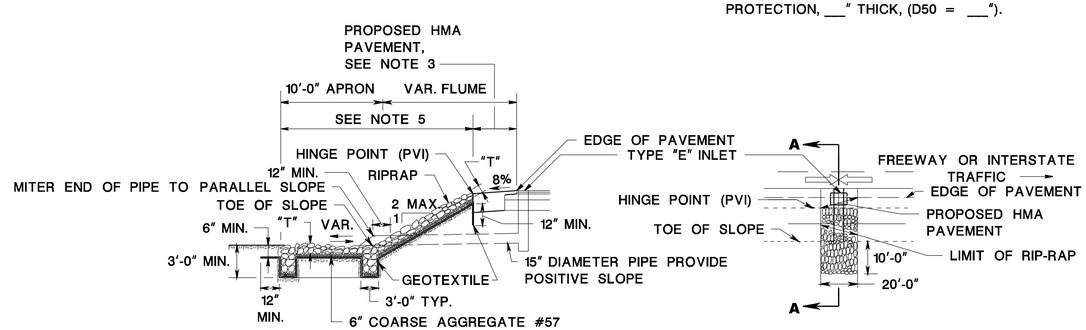
1. FOR SLOPES, REFER TO PLANS.
2. WHERE GUIDE RAIL EXISTS AT THE LOW POINT, THE PROPOSED HMA PAVEMENT HAS PREFERENCE OVER NON-VEGETATIVE SURFACE.
3. HMA PAVEMENT SHALL BE THE SAME AS THE SURFACE COURSE. IF THERE IS NO SURFACE COURSE ON THE PROJECT, USE A 9.5MM NOMINAL MAXIMUM SIZE HMA.
4. IN CUT SECTIONS THE HMA PAVEMENT SHALL BE GRADED TO DRAIN TOWARD THE INLET.
5. THE RIPRAP AND GEOTEXTILE MATERIALS SHALL BE PAID FOR UNDER THE ITEM RIPRAP STONE SLOPE PROTECTION, ___" THICK, (D50 = ___").



SECTION B–B



EDGE OF RAMP OR OUTSIDE EDGE OF MAINLINE PAVEMENT IN CUT



SECTION A–A **PLAN VIEW**

"T" = $2d_{50}$

D_{50} = DESIGNATED MEDIAN STONE SIZE (8" MIN")

EDGE OF RAMP OR OUTSIDE EDGE OF MAINLINE PAVEMENT IN FILL

SLOPE PROTECTION AT LOW POINTS OF UMBRELLA SECTIONS

CD-603-1.2

SLOPE AND CHANNEL PROTECTION

N.T.S.

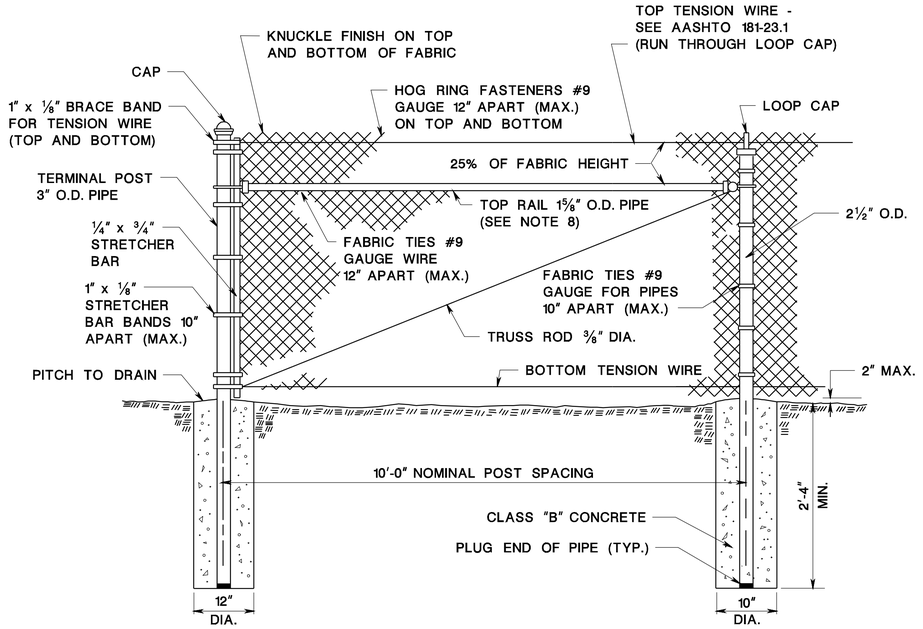
HMA = HOT MIX ASPHALT

CD-603-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

BDC07D-01-ORIGINAL SHEET



CHAIN–LINK FENCE, ___ ' HIGH

CD-605-1.1

GENERAL NOTES

1. CHAIN-LINK FENCE FABRIC, POSTS, RAILS, TIES, BANDS, BARS, RODS, AND OTHER FITTINGS AND HARDWARE SHALL CONFORM TO AASHTO M 181 FOR TYPES, GRADES AND CLASSES, AND AS NOTED BELOW.

2. POSTS:

	TERMINAL, CORNER AND GATE POSTS	LINE POSTS	TOP OR BRACE RAIL
	3" O.D. PIPE	2 1/2" O.D. PIPE	1 5/8" O.D. PIPE
AASHTO TYPE	I OR II	I OR II	I OR II
AASHTO GRADE	1 OR 2	1 OR 2	1 OR 2
MINIMUM LENGTH OF POST FOR			
4' FABRIC	6'-8"	6'-8"	NA
5' FABRIC	7'-8"	7'-8"	NA
6' FABRIC	8'-8"	8'-8"	NA
ACTUAL OUTSIDE DIAMETER (IN.)	2.875	2.375	1.660
WALL THICKNESS (IN.)	GRADE 1 = .203 GRADE 2 = .160	GRADE 1 = .154 GRADE 2 = .120	GRADE 1 = .140 GRADE 2 = .111

3. FABRIC:

   TYPE II AND TYPE IV SHALL BE 9 GAUGE CORE WIRE, 2 INCH MESH
   TYPE IV FABRIC SHALL BE CLASS A OR B.
   TYPE IV FABRIC SHALL BE GREY IN COLOR, AND SHALL MATCH FEDERAL STANDARD 595A, COLOR CHIP NO. 26493 (SEMI-GLOSS), UNLESS OTHERWISE SPECIFIED IN THE SPECIAL PROVISIONS.

4. THE CENTERLINE OF ALL POSTS SHALL NOT BE LESS THAN 8" INSIDE R.O.W.

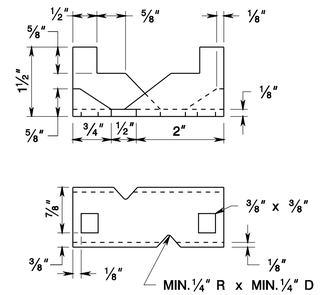
5. THE DEPTH OF CONCRETE FOOTINGS IN SOLID ROCK MAY BE REDUCED TO ONE FOOT BELOW THE TOP OF ROCK AND THE DIAMETER OF THE HOLE IN ROCK MAY BE REDUCED TO 3 1/2".

6. BRACE BANDS AND STRETCHER BAR BANDS SHALL BE FURNISHED WITH 5/16" DIA. CARRIAGE BOLTS AND ELASTIC STOP NUTS.

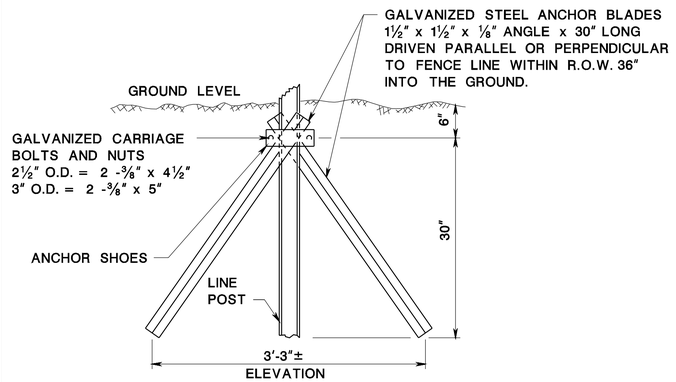
7. DRIVE ANCHOR SHOE ASSEMBLY ONLY TO BE USED IN WET AREAS AND WITH PRIOR APPROVAL OF THE R.E..

8. WHEN THE PLANS INDICATE A TERMINAL OR CORNER POST DESIGNATED TYPE "NR", THE TOP RAIL SHALL BE ELIMINATED FROM THIS SECTION OF FENCE.

CD-605-1.4



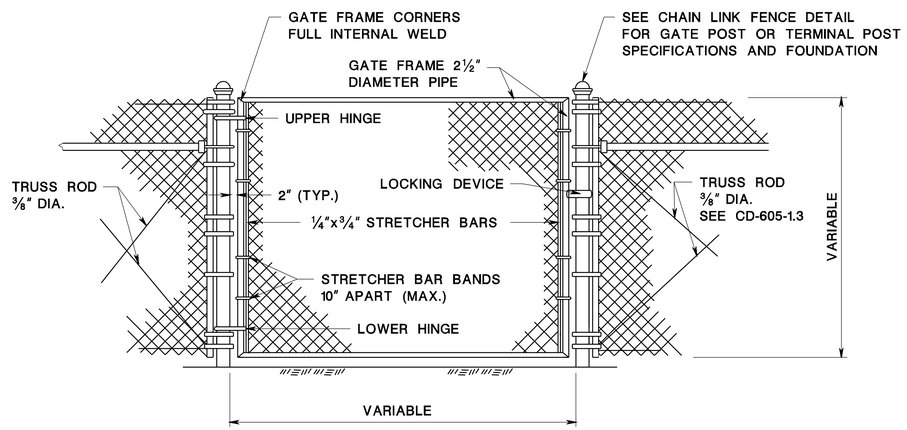
ANCHOR SHOE



DRIVE ANCHOR SHOE ASSEMBLY

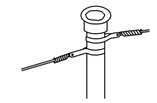
(SEE NOTE 7)

CD-605-1.2

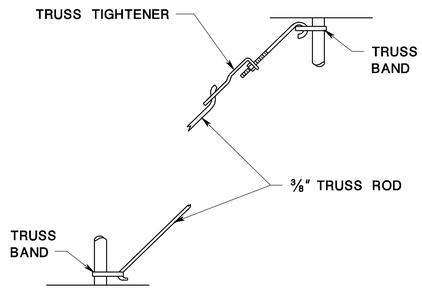


GATES, CHAIN–LINK FENCE, ___ ' WIDE

CD-605-1.5



TENSION WIRE CONNECTION AT ROUND INTERMEDIATE OR CORNER POST



3/8" TRUSS ROD ASSEMBLY

CHAIN–LINK FENCE ASSEMBLIES

CD-605-1.3

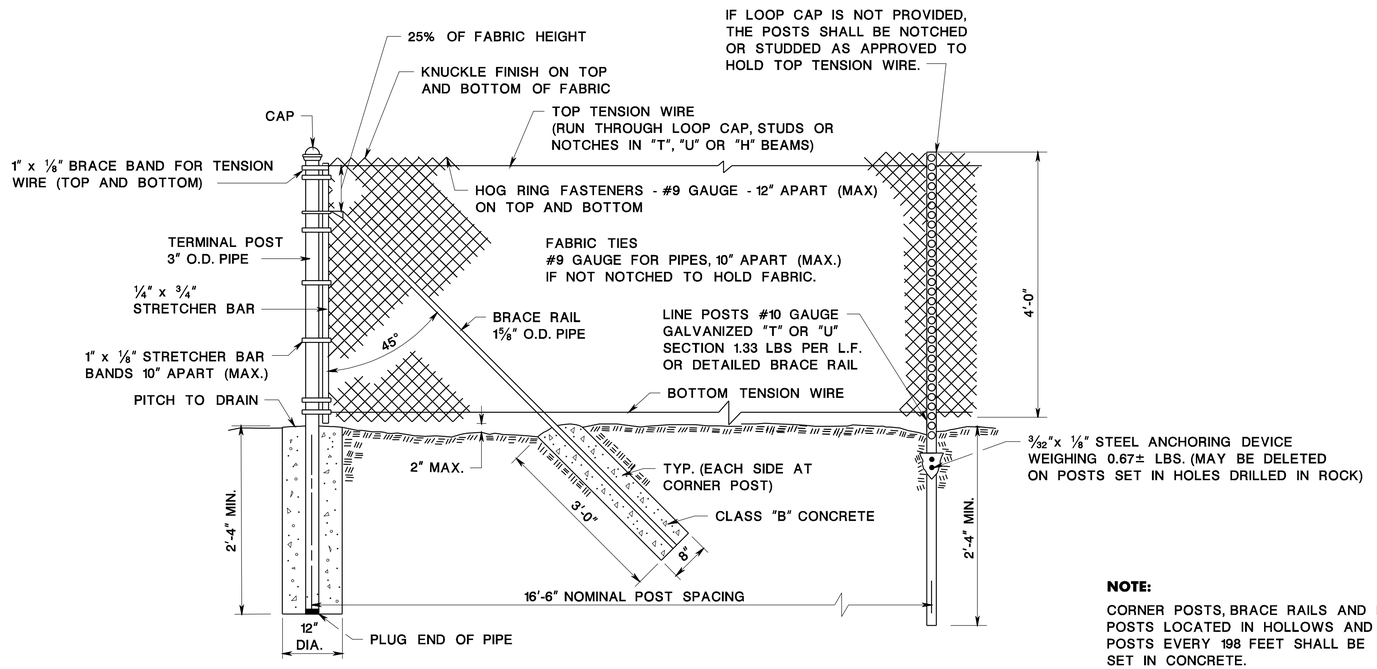
CHAIN–LINK FENCE

N.T.S.

CD-605-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS



NOTE:

CORNER POSTS, BRACE RAILS AND LINE POSTS LOCATED IN HOLLOWS AND LINE POSTS EVERY 198 FEET SHALL BE SET IN CONCRETE.

CHAIN–LINK FARM–TYPE FENCE

CHAIN–LINK FENCE

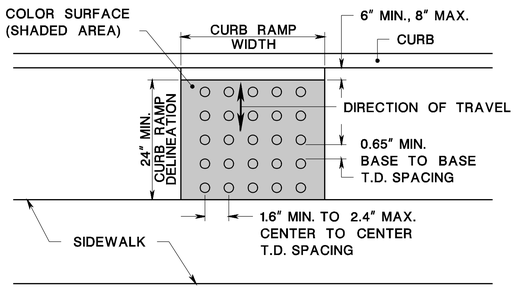
N.T.S.

CD-605-2

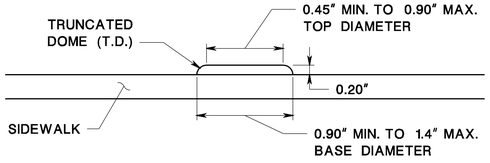
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

CD-605-2.1



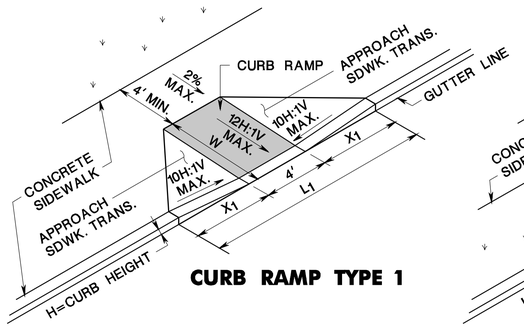
PLAN VIEW



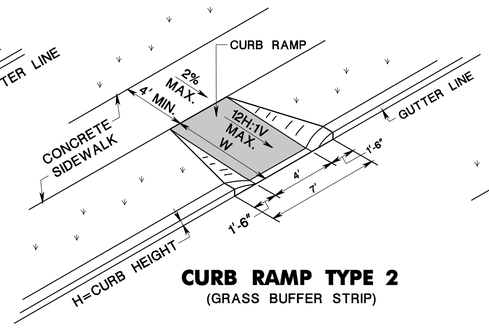
ELEVATION

DETECTABLE WARNING SURFACE

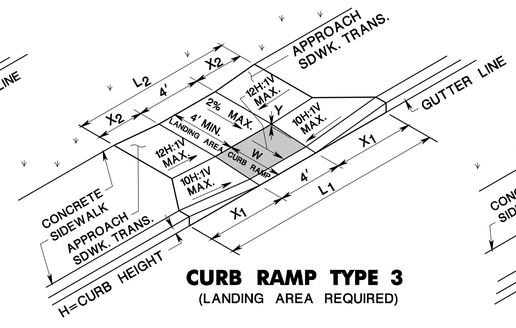
CD-606-1.1



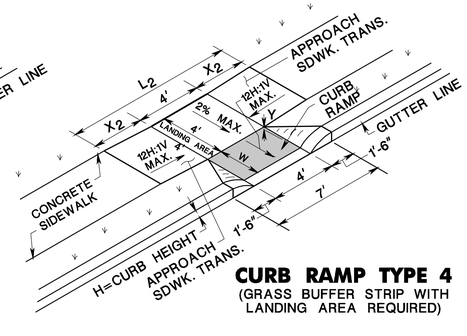
CURB RAMP TYPE 1



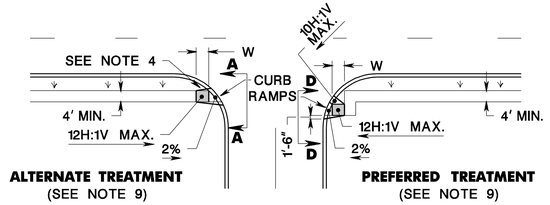
CURB RAMP TYPE 2
(GRASS BUFFER STRIP)



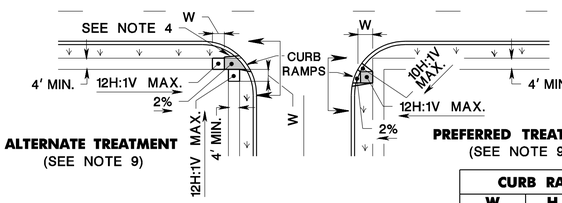
CURB RAMP TYPE 3
(LANDING AREA REQUIRED)



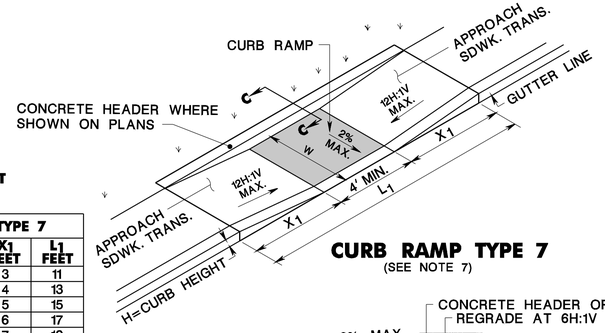
CURB RAMP TYPE 4
(GRASS BUFFER STRIP WITH LANDING AREA REQUIRED)



CURB RAMP TYPE 5
(CROSSING PARALLEL TO HIGHWAY ONLY)

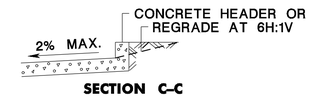


CURB RAMP TYPE 6
(CROSSING PARALLEL TO HIGHWAY ONLY)

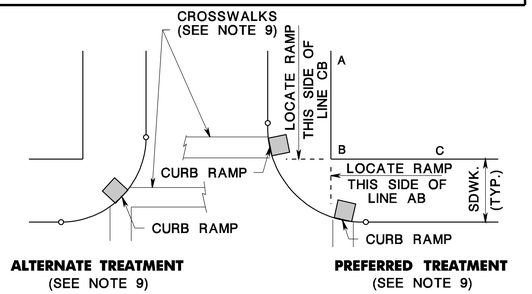


CURB RAMP TYPE 7
(SEE NOTE 7)

CURB RAMP TYPE 7			
W FEET	H INCHES	X_1 FEET	L_1 FEET
4 MIN. 6 MAX.	3	3	11
	4	4	13
	5	5	15
	6	6	17
	7	7	19
	8	8	21
	9	9	23



SECTION C–C

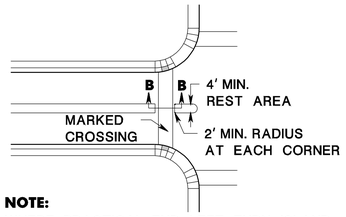


ALTERNATE TREATMENT
(SEE NOTE 9)

PREFERRED TREATMENT
(SEE NOTE 9)

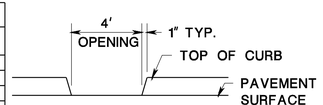
CURB RAMP TYPE 1			
H INCHES	X_1 FEET	L_1 FEET	W FEET
3	2.5	9.0	3
4	3.3	10.6	4
5	4.2	12.4	5
6	5.0	14.0	6
7	5.8	15.6	7
8	6.7	17.4	8
9	7.5	19.0	9

CURB RAMP TYPE 2, 5 OR 6	
H INCHES	W FEET
3	3
4	4
5	5
6	6
7	7
8	8
9	9



NOTE:
WHERE PRACTICAL, END LEFT TURN ISLAND OR DIVISIONAL ISLAND BEFORE CROSSWALK TO ELIMINATE CUT-THROUGH

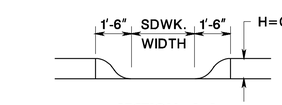
ISLAND WALKWAY OPENING AT INTERSECTIONS



SECTION B–B

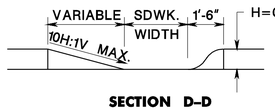
NOTE:
4' WIDE OPENING TO BE FLUSH WITH ROADWAY PAVEMENT

1. LANDING AREA, APPROACH SIDEWALK TRANSITIONS, AND CURB RAMP SHALL BE KEPT CLEAR OF OBSTRUCTIONS.
2. DIMENSIONS SHOWN IN TABLES ARE FOR RELATIVELY FLAT SIDEWALK AREAS. CARE SHOULD BE TAKEN WHEN DETERMINING CURB RAMP SIZE BASED ON CURB HEIGHT (H) WHERE ELEVATION OF CURB AND SIDEWALK VARY DRASTICALLY IN AREA OF PROPOSED CURB RAMP.
3. CURB (DROPPED CURB) GUTTERLINE TO BE FLUSH WITH ROADWAY PAVEMENT A MINIMUM OF 4 FEET AT ALL CURB RAMPS.
4. FOR CURB RAMP TYPES 5 AND 6, IF A GRASS BUFFER DOES NOT EXIST, SLOPE CURB TO EQUAL SLOPE OF ADJACENT CURB RAMP.
5. SIDEWALK AND CURB RAMP WITHIN AREA ENCLOSED BY HEAVY LINES TO BE PAID FOR AS CONCRETE SIDEWALK OF THE APPROPRIATE ADJACENT THICKNESS.
6. CURB AND HEADER WITHIN AREA ENCLOSED BY HEAVY LINES TO BE PAID FOR AS VERTICAL CURB OR SLOPING CURB OF THE APPROPRIATE ADJACENT SIZE AND KIND.
7. WHERE THE DISTANCE FROM THE GUTTER LINE TO THE OUTSIDE EDGE OF SIDEWALK IS 6 FEET OR LESS, CURB RAMP TYPE 7 SHOULD BE USED, INSTEAD OF CURB RAMP TYPE 1 THROUGH 4.
8. CROSSWALKS AND STOP LINES MAY BE MARKED OR UNMARKED, SEE PLANS.
9. PREFERRED AND ALTERNATE TREATMENTS SHOULD NOT BE INTERMIXED WITHIN THE SAME INTERSECTION.
10. DIMENSIONS SHOWN IN TABLES ARE FOR 3 INCH TO 9 INCH CURB HEIGHTS. WHERE THE CURB HEIGHTS ARE OTHER THAN WHAT IS PROVIDED IN THE TABLES, THE DIMENSIONS OF THE RAMPS WILL HAVE TO BE CALCULATED BASED ON CROSS SLOPES SHOWN.

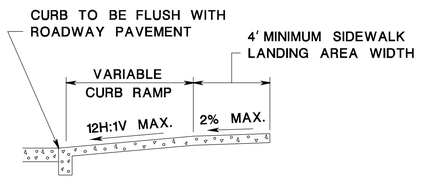


SECTION A–A

NOTE:
CURB RAMP OPENING TO BE FLUSH WITH ROADWAY PAVEMENT (CURB RAMP TYPES 5 & 6).



SECTION D–D



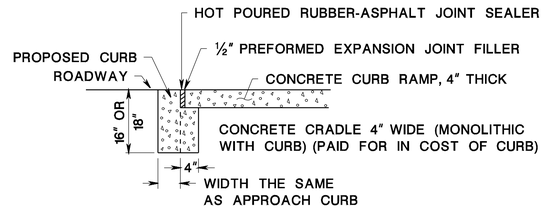
SECTION THROUGH CURB RAMPS 1 THROUGH 6

CURB RAMP TYPE 3						
W FEET	H INCHES	X_1 FEET	L_1 FEET	Y INCHES	X_2 FEET	L_2 FEET
2.5	3	2.5	9	2.5	0.5	5
	4	3.3	10.6	2.5	1.5	7
	5	4.2	12.4	2.5	2.5	9
	6	5.0	14.0	2.5	3.5	11
	7	5.8	15.6	2.5	4.5	13
	8	6.7	17.4	2.5	5.5	15
	9	7.5	19.0	2.5	6.5	17
3.0	3	*	*	*	*	*
	4	3.3	10.6	3.0	1	6
	5	4.2	12.4	3.0	2	8
	6	5.0	14.0	3.0	3	10
	7	5.8	15.6	3.0	4	12
	8	6.7	17.4	3.0	5	14
	9	7.5	19.0	3.0	6	16
3.5	3	*	*	*	*	*
	4	3.3	10.6	3.5	0.5	5
	5	4.2	12.4	3.5	1.5	7
	6	5.0	14.0	3.5	2.5	9
	7	5.8	15.6	3.5	3.5	11
	8	6.7	17.4	3.5	4.5	13
	9	7.5	19.0	3.5	5.5	15
4.0	3	*	*	*	*	*
	4	*	*	*	*	*
	5	4.2	12.4	4.0	1	6
	6	5.0	14.0	4.0	2	8
	7	5.8	15.6	4.0	3	10
	8	6.7	17.4	4.0	4	12
	9	7.5	19.0	4.0	5	14

CURB RAMP TYPE 4				
W FEET	H INCHES	Y INCHES	X_2 FEET	L_2 FEET
2.5	3	2.5	0.5	5
	4	2.5	1.5	7
	5	2.5	2.5	9
	6	2.5	3.5	11
	7	2.5	4.5	13
	8	2.5	5.5	15
	9	2.5	6.5	17
3.0	3	**	**	**
	4	3.0	1	6
	5	3.0	2	8
	6	3.0	3	10
	7	3.0	4	12
	8	3.0	5	14
	9	3.0	6	16
3.5	3	**	**	**
	4	3.5	0.5	5
	5	3.5	1.5	7
	6	3.5	2.5	9
	7	3.5	3.5	11
	8	3.5	4.5	13
	9	3.5	5.5	15
4.0	3	**	**	**
	4	**	**	**
	5	4.0	1	6
	6	4.0	2	8
	7	4.0	3	10
	8	4.0	4	12
	9	4.0	5	14

* TYPE 3 RAMP IS NOT APPLICABLE, USE TYPE 1.

** TYPE 4 RAMP IS NOT APPLICABLE, USE TYPE 2.



CURB RAMPS

CD-606-1.2

PUBLIC SIDEWALK CURB RAMP DETECTABLE WARNING SURFACE

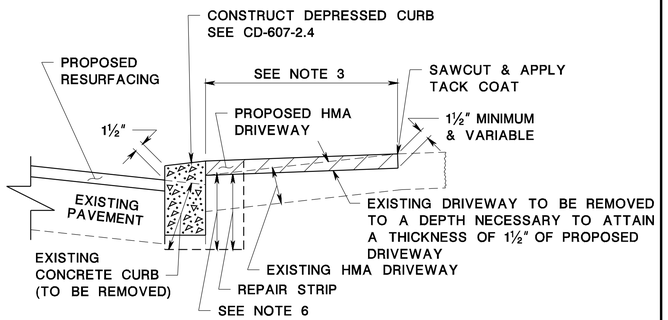
N.T.S.

HMA = HOT MIX ASPHALT

CD-606-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

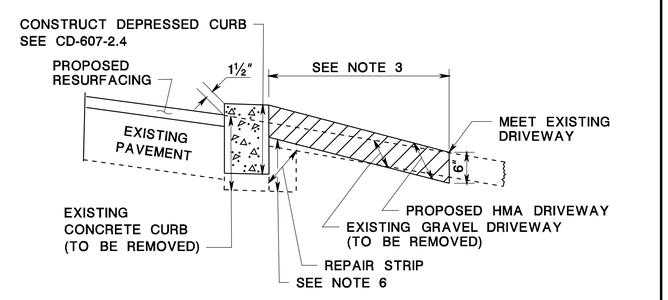
CONSTRUCTION DETAILS



TYPE A

RESURFACING OF EXISTING HMA DRIVEWAY (WITH DEPRESSED CURB)

CD-606-2.1



TYPE B

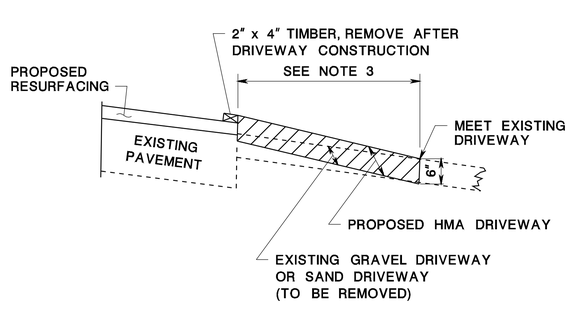
RESURFACING OF EXISTING HMA DRIVEWAY (WITHOUT DEPRESSED CURB)

CD-606-2.2

TYPE C

CONSTRUCTION OF HMA DRIVEWAY OR CONVERSION OF EXISTING GRAVEL DRIVEWAY (WITH DEPRESSED CURB)

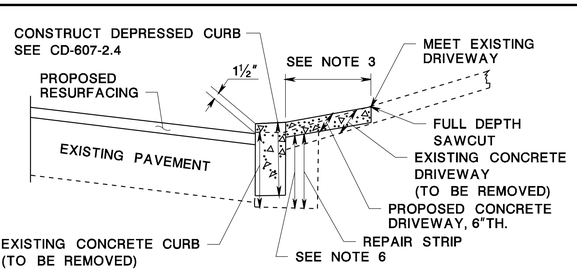
CD-606-2.3



TYPE D

CONSTRUCTION OF HMA DRIVEWAY OR CONVERSION OF EXISTING GRAVEL DRIVEWAY (WITHOUT DEPRESSED CURB)

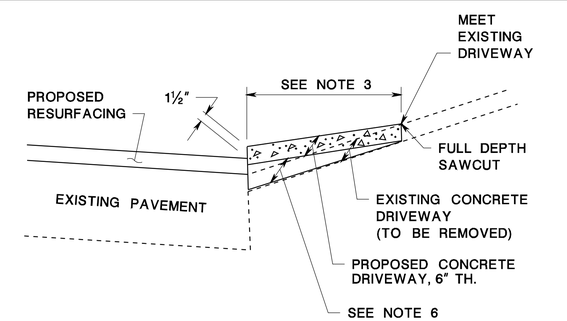
CD-606-2.4



TYPE E

RECONSTRUCTION OF CONCRETE DRIVEWAY (WITH DEPRESSED CURB)

CD-606-2.5



TYPE F

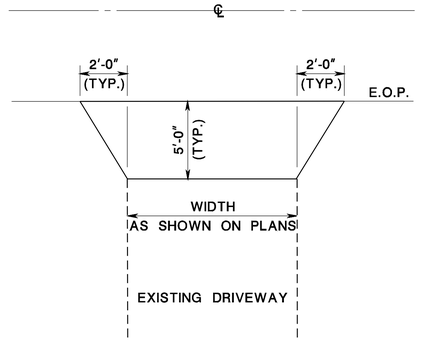
RECONSTRUCTION OF CONCRETE DRIVEWAY (WITHOUT DEPRESSED CURB)

CD-606-2.6

GENERAL NOTES

1. ALL MATERIAL, REPAIR STRIPS AND EXCAVATION FOR DRIVEWAY CONSTRUCTION TO BE INCLUDED IN THE BID PRICE FOR HMA DRIVEWAY, CONCRETE DRIVEWAY OR CONCRETE CURB.
2. USE HMA SURFACE COURSE FOR HMA DRIVEWAY
3. LENGTH OF DRIVEWAY WORK SHALL BE 5 FEET UNLESS OTHERWISE SHOWN ON PLANS OR AS DIRECTED.
4. MAINTAIN EXISTING DIRECTION OF FLOW ON DRIVEWAY.
5. DENSE GRADED AGGREGATE BASE COURSE SHALL BE USED TO PROVIDE TEMPORARY ACCESS DURING DRIVEWAY CONSTRUCTION.
6. DENSE GRADED AGGREGATE BASE COURSE.

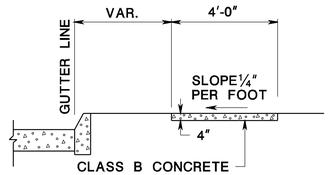
CD-606-2.7



TYPICAL DRIVEWAY TREATMENT

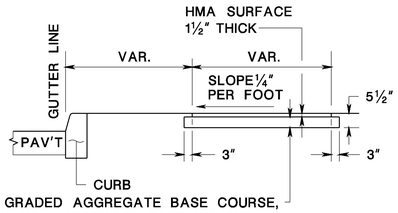
PLAN VIEW

CD-606-2.8



CONCRETE SIDEWALK, 4" THICK

CD-606-2.9



DENSE GRADED AGGREGATE BASE COURSE, 4" THICK OR AGGREGATE BASE COURSE. 4" THICK AGGREGATE BASE COURSE IS SOIL AGGREGATE, DESIGNATION I-5

HMA SIDEWALK, 5 1/2" THICK

CD-606-2.10

CONCRETE AND HMA DRIVEWAY AND SIDEWALK

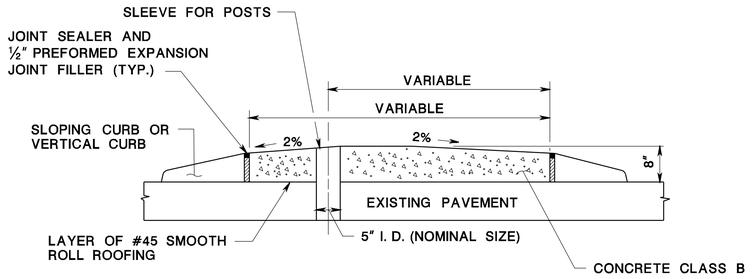
N.T.S.

HMA = HOT MIX ASPHALT

CD-606-2

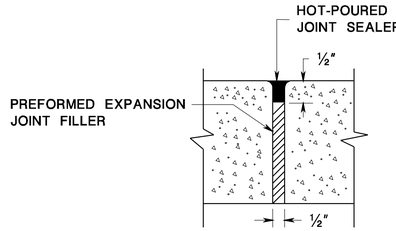
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS



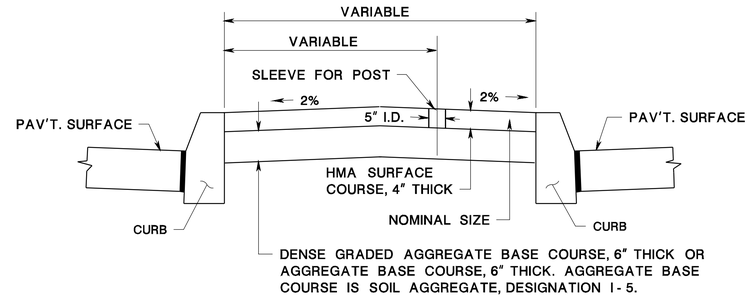
CONCRETE ISLAND ON EXISTING PAVEMENT

CD-606-3.1



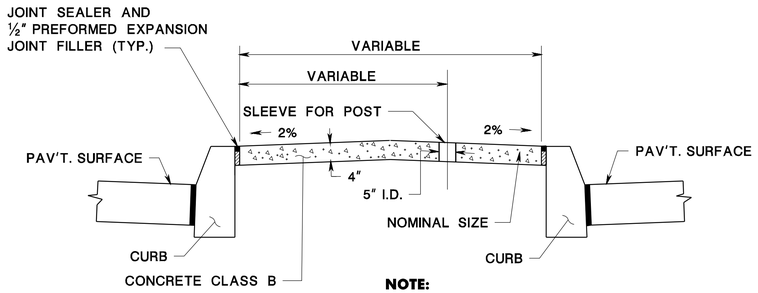
LONGITUDINAL & TRANSVERSE JOINT TREATMENT FOR CONCRETE ISLAND

CD-606-3.2



HMA ISLAND, 10" THICK

CD-606-3.3



NOTE:

TRANSVERSE JOINTS SHALL BE AS CONSTRUCTED FOR CONCRETE VERTICAL CURB.

CONCRETE ISLAND, 4" THICK

CD-606-3.4

CONCRETE AND HMA ISLAND

N.T.S.

HMA = HOT MIX ASPHALT

CD-606-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

GENERAL NOTES APPLYING TO ALL TYPES OF DOWELLED CURBS

THE TRANSVERSE JOINTS SHALL BE CONSTRUCTED AS SPECIFIED FOR THE CURB, EXCEPT THAT THE THICKNESS OF THE JOINT FILLER IN THE CURB SHALL BE AS FOLLOWS:

½ INCH FOR INTERMEDIATE JOINTS AND JOINTS OVER DEFINITE CRACKS.

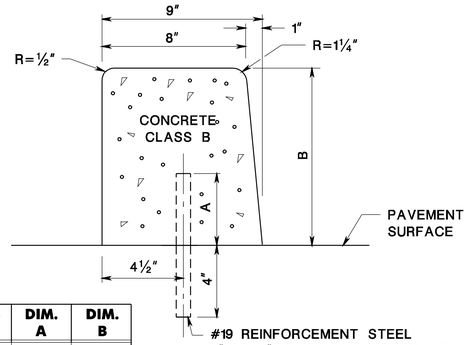
½ INCH OVER PAVEMENT JOINTS WHERE SLAB LENGTH IS 50 FEET OR LESS.

1 INCH OVER PAVEMENT JOINTS WHERE SLAB LENGTH IS MORE THAN 50 FEET VARIABLE IN MULTIPLES OF ½ INCH BUT NOT LESS THAN THE EXISTING WIDTH OF THE TRANSVERSE JOINTS IN BRIDGES AND THE JOINTS BETWEEN THE APPROACH SLABS AND BRIDGES.

FOR THICKNESS OF 1 INCH OR MORE, LAYERS OF ½ INCH MATERIAL MAY BE GLUED OR OTHERWISE FASTENED TOGETHER BY A MEANS SATISFACTORY TO THE R.E.. WHERE THE REQUIRED JOINT OPENING EXCEEDS 1 INCH, THE CONTRACTOR MAY CONSTRUCT OPEN JOINTS, IF DESIRED.

WHERE DOWELLED CURB IS TO BE CONSTRUCTED ACROSS A LONGITUDINAL JOINT IN THE EXISTING PAVEMENT, THE DOWELS IN THE SHORTER PORTION OF THE CURB PANEL SHALL BE OMITTED AND THE CURB IN THE PORTION OF THE PANEL SHALL BE CONSTRUCTED WITH 45# SMOOTH ROLL ROOFING BETWEEN IT AND THE EXISTING PAVEMENT.

CD-607-1.1

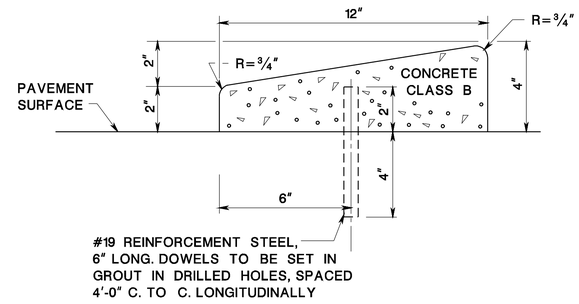


CURB SIZE	DIM. A	DIM. B
9″x4″	2″	4″
9″x6″	4″	6″

#19 REINFORCEMENT STEEL 6″ OR 8″ LONG. DOWELS TO BE SET IN GROUT IN DRILLED HOLES, SPACED 4′-0″ C. TO C. LONGITUDINALLY.

9″ x __ CONCRETE VERTICAL CURB, DOWELLED

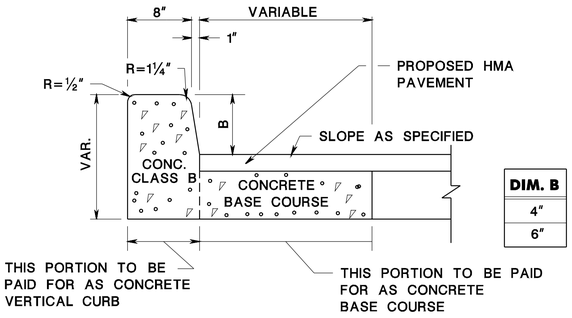
CD-607-1.2



#19 REINFORCEMENT STEEL, 6″ LONG. DOWELS TO BE SET IN GROUT IN DRILLED HOLES, SPACED 4′-0″ C. TO C. LONGITUDINALLY

12″ x 3″ CONCRETE SLOPING CURB, DOWELLED

CD-607-1.3



DIM. B
4″
6″

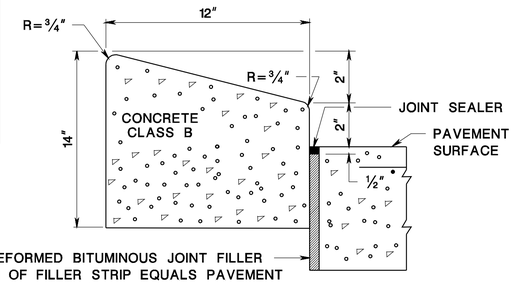
NOTES:

EXPANSION JOINTS ½ INCH WIDE IN THE CURB, AND EXPANSION JOINT ASSEMBLY IN THE MONOLITHIC PAVEMENT STRIP SHALL BE DIRECTLY OPPOSITE EVERY TRANSVERSE JOINT IN THE CENTRAL PAVEMENT STRIPS.

JOINT MATERIAL IN THE CURB SHALL BE AS SPECIFIED FOR CONCRETE VERTICAL CURB. THE TRANSVERSE EXPANSION JOINT MATERIAL SHALL NOT EXTEND THRU THE CURB.

CONCRETE VERTICAL CURB MONOLITHIC WITH CONCRETE BASE COURSE

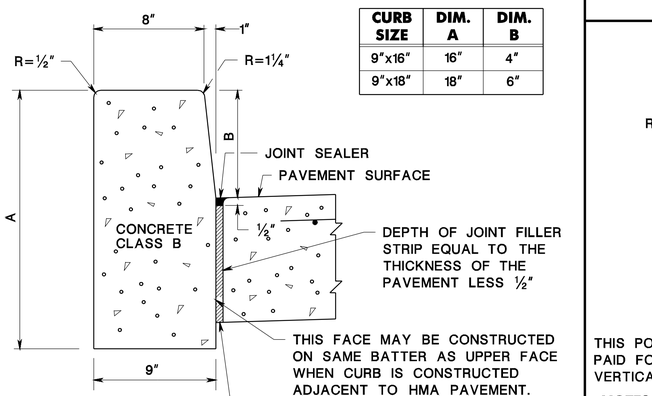
CD-607-1.4



½″ PREFORMED BITUMINOUS JOINT FILLER DEPTH OF FILLER STRIP EQUALS PAVEMENT THICKNESS LESS ½″. TO BE INSTALLED BETWEEN CURB AND CONCRETE PAVEMENT OR CONCRETE BASE COURSE

12″ x 13″ CONCRETE SLOPING CURB

CD-607-1.5



CURB SIZE	DIM. A	DIM. B
9″x16″	16″	4″
9″x18″	18″	6″

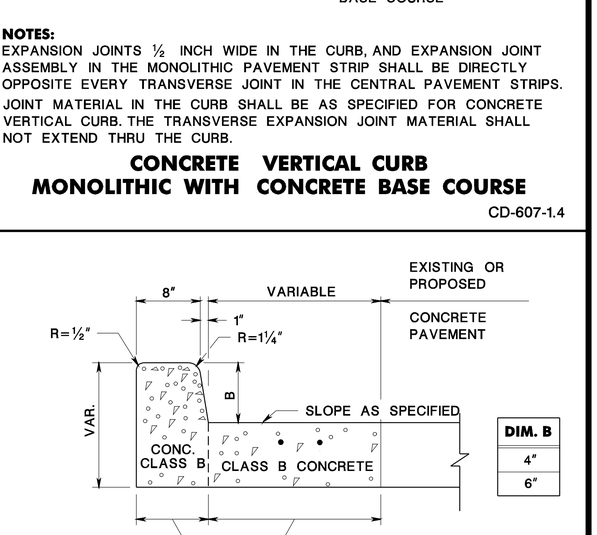
DEPTH OF JOINT FILLER STRIP EQUAL TO THE THICKNESS OF THE PAVEMENT LESS ½″

THIS FACE MAY BE CONSTRUCTED ON SAME BATTER AS UPPER FACE WHEN CURB IS CONSTRUCTED ADJACENT TO HMA PAVEMENT.

½″ PREFORMED EXPANSION JOINT FILLER, BITUMINOUS TYPE, TO BE INSTALLED BETWEEN CURB AND CONCRETE PAVEMENT OR CONCRETE BASE COURSE.

CONCRETE VERTICAL CURB

CD-607-1.6



DIM. B
4″
6″

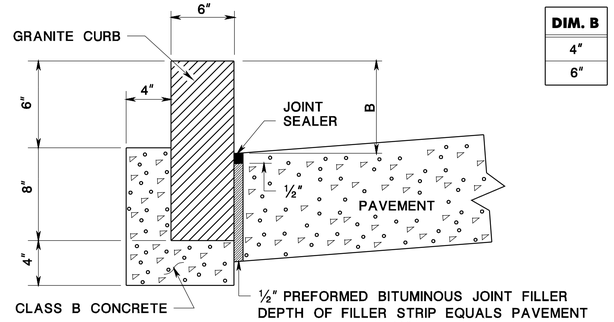
NOTES:

EXPANSION JOINTS ½ INCH WIDE IN THE CURB, AND EXPANSION JOINT ASSEMBLY IN THE MONOLITHIC PAVEMENT STRIP SHALL BE DIRECTLY OPPOSITE EVERY TRANSVERSE JOINT IN THE CENTRAL PAVEMENT STRIPS.

JOINT MATERIAL IN THE CURB SHALL BE AS SPECIFIED FOR CONCRETE VERTICAL CURB. THE TRANSVERSE EXPANSION JOINT MATERIAL SHALL NOT EXTEND THRU THE CURB.

CONCRETE VERTICAL CURB MONOLITHIC WITH CONCRETE PAVEMENT

CD-607-1.7



DIM. B
4″
6″

½″ PREFORMED BITUMINOUS JOINT FILLER DEPTH OF FILLER STRIP EQUALS PAVEMENT THICKNESS LESS ½″. TO BE INSTALLED BETWEEN CURB AND CONCRETE PAVEMENT OR CONCRETE BASE COURSE

NOTE:

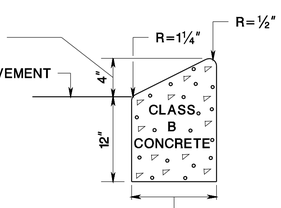
FOUNDATION TO BE INSTALLED THE ENTIRE LENGTH OF THE GRANITE CURB.

NEW OR RESET GRANITE CURB

CD-607-1.8

ATTACHMENT TABLE		
CD NO.	ATTACH. TYPE	WIDTH
609-13	B	11¼″
609-15	A	7″
609-15	B	11¼″
609-16	A	7″
609-16	B	11¼″

AT END OF CURB, TRANSITION TO 0″ OVER 3′-4″ (TOTAL LENGTH OF CURB 14′-0″)

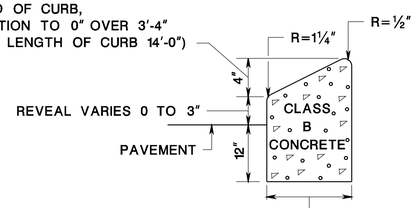


WIDTH VARIES (SEE ATTACHMENT TABLE)

NOTE:

PAYMENT FOR LIP CURB WILL BE MADE UNDER 9″ x 16″ CONCRETE VERTICAL CURB.

AT END OF CURB, TRANSITION TO 0″ OVER 3′-4″ (TOTAL LENGTH OF CURB 14′-0″)



WIDTH IS 10½″ FOR CD-609-13, TYPE (A) ATTACHMENT ONLY

LIP CURB FOR BEAM GUIDE RAIL ATTACHMENTS

CD-607-1.9

CONCRETE AND GRANITE CURB

N.T.S.

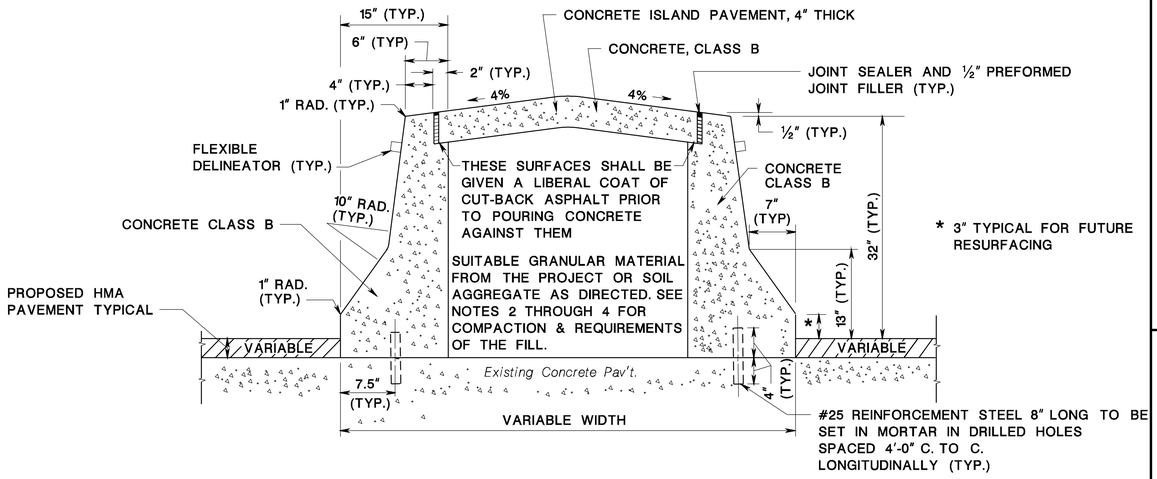
REINFORCEMENT STEEL IS IN METRIC UNITS.

HMA = HOT MIX ASPHALT

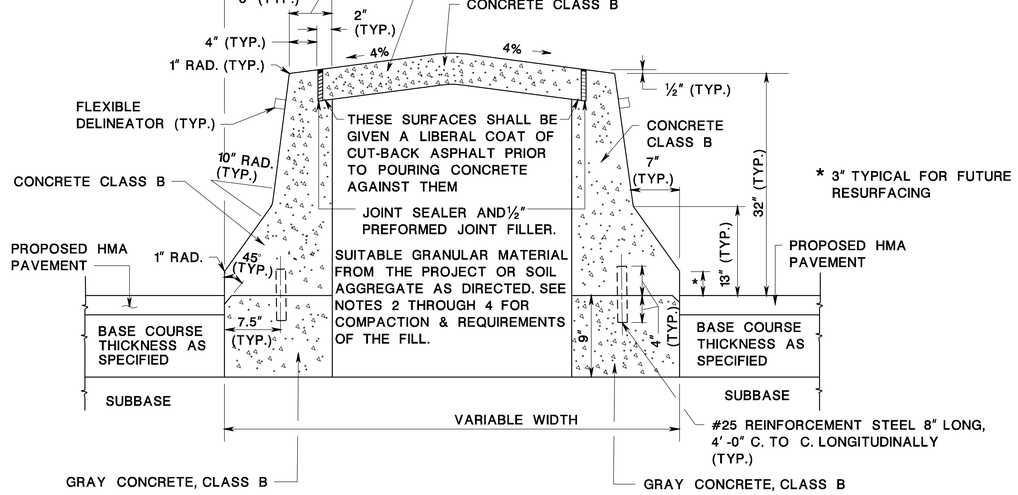
CD-607-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS



15" x VARIABLE HEIGHT CONCRETE BARRIER CURB, DOWELLED

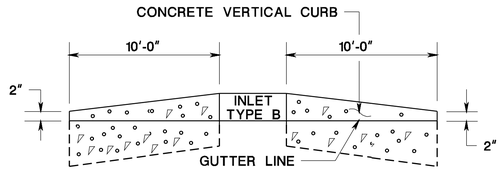


15" x 41" CONCRETE BARRIER CURB

NOTES:

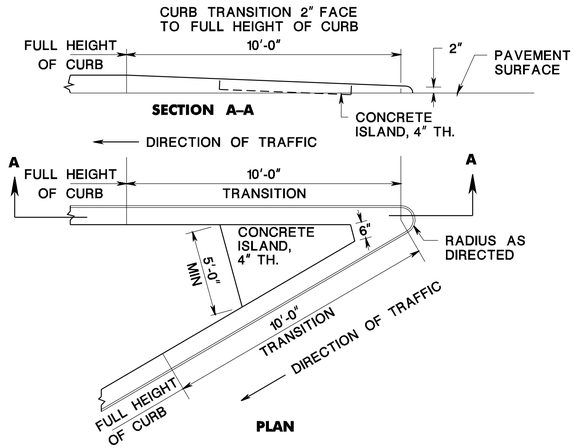
1. SEE GENERAL NOTES APPLYING TO ALL BARRIER CURB CD-607-3.2.
2. COMPACTION SHALL BE IN ACCORDANCE WITH THE DIRECTED METHOD OF THE NJDOT STANDARD SPECIFICATIONS AND ITS SUPPLEMENTS.
3. THE FILL BETWEEN THE CURBS SHALL BE SHAPED AND COMPACTED TO A FIRM EVEN SURFACE. UNSTABLE MATERIAL SHALL BE REMOVED AND REPLACED WITH ACCEPTABLE MATERIAL WHICH SHALL BE COMPACTED.
4. SOIL LIFTS SHALL BE LIMITED TO 12 INCHES AND EACH LIFT SHALL BE COMPACTED.

CD-607-2.1



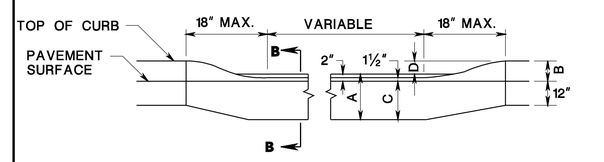
CURB TREATMENT AT BERM SECTION AND ALL CURB ENDS

CD-607-2.2



CURB TRANSITION

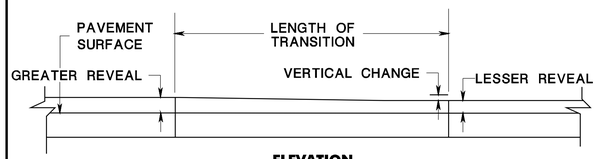
CD-607-2.3



CURB SIZE	DIM. A	DIM. B	DIM. C	DIM. D
9" x 16"	16"	4"	14"	2"
9" x 18"	18"	6"	16"	4"

METHOD OF DEPRESSING CURB AT DRIVEWAYS

CD-607-2.4



VERTICAL CHANGE	LENGTH OF TRANSITION
1"	10'
2"	10'
3"	15'
4"	20'
5"	25'
6"	30'
7"	35'
8"	40'

LINEAR CURB TRANSITION

CD-607-2.5

REINFORCEMENT STEEL IS IN METRIC UNITS

HMA = HOT MIX ASPHALT

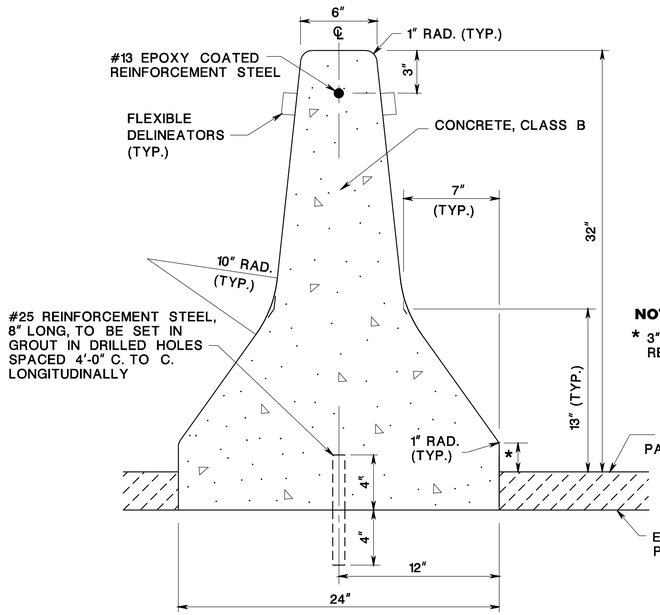
BARRIER CURB AND VERTICAL CURB

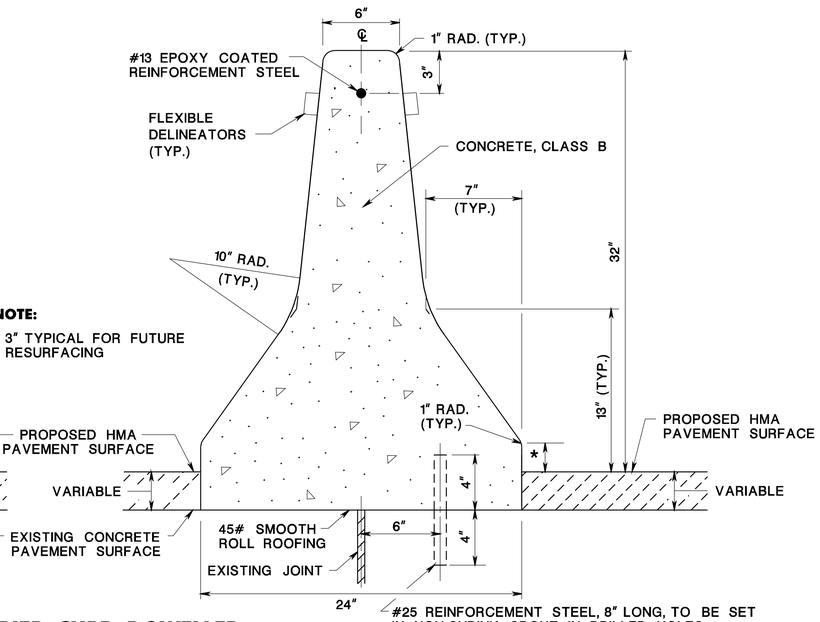
N.T.S.

CD-607-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS





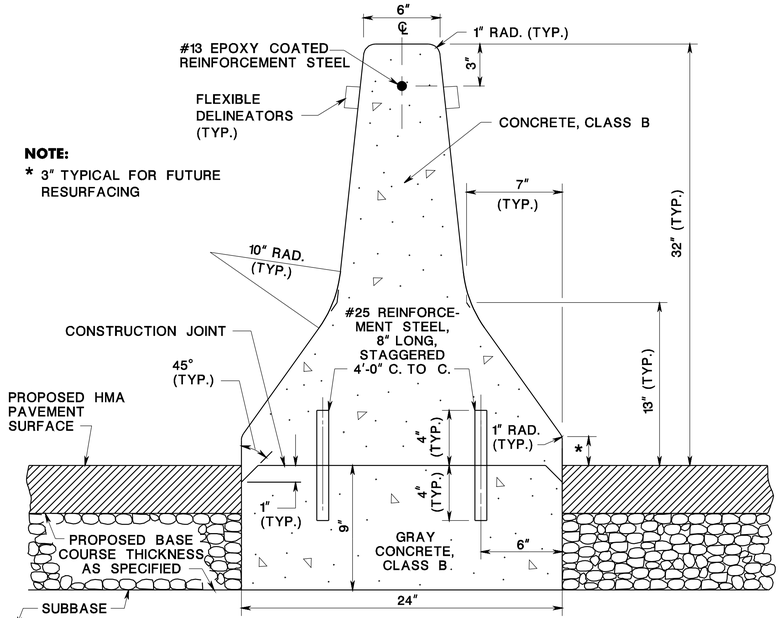
NOTE:

* 3" TYPICAL FOR FUTURE RESURFACING

#25 REINFORCEMENT STEEL, 8" LONG, TO BE SET IN NON-SHRINK GROUT IN DRILLED HOLES SPACED 4'-0" C. TO C. LONGITUDINALLY

24" x ___ " CONCRETE BARRIER CURB, DOWELLED

CD-607-3.1



NOTE:

* 3" TYPICAL FOR FUTURE RESURFACING

24" x 41" CONCRETE BARRIER CURB

CD-607-3.4

GENERAL NOTES

(A) WHERE BARRIER CURB, DOWELLED, IS TO BE CONSTRUCTED ON EXISTING CONCRETE PAVEMENT OR EXISTING CONCRETE BASE COURSE

TRANSVERSE JOINTS SHALL BE INSTALLED IN THE CURBS AT AND DIRECTLY OVER TRANSVERSE JOINTS IN THE PAVEMENT. DEFINITE CRACKS THROUGH THE PAVEMENT SHALL ALSO BE TREATED AS JOINTS. ADDITIONAL JOINTS SHALL ALSO BE CONSTRUCTED IN THE CURB SO SPACED AS TO MAKE EQUAL SECTIONS NOT OVER 15'-0" IN LENGTH.

THE TRANSVERSE JOINTS SHALL BE FILLED WITH PREFORMED BITUMINOUS-IMPREGNATED FIBER JOINT FILLER, COMPLYING WITH THE REQUIREMENTS OF AASHTO M-213 SPECIFICATION, RECESSED ¼" IN FROM FACES AND TOP OF CURB. THE COST OF THE TRANSVERSE EXPANSION JOINTS IN THE CURB SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE BARRIER CURB. THE THICKNESS OF THE TRANSVERSE EXPANSION JOINT FILLER SHALL BE AS FOLLOWS:

½" FOR IMMEDIATE JOINTS AND JOINTS OVER DEFINITE CRACKS.
½" OVER PAVEMENT JOINTS WHERE SLAB LENGTH IS 50 FEET OR LESS.
1" OVER PAVEMENT JOINTS WHERE SLAB LENGTH IS MORE THAN 50 FEET.

VARIABLE IN MULTIPLES OF ½" BUT NOT LESS THAN THE EXISTING WIDTH OF THE TRANSVERSE JOINTS IN BRIDGES AND JOINTS BETWEEN THE APPROACH SLABS AND BRIDGES.

THE THICKNESS OF 1 INCH OR MORE, LAYERS OF ½" MATERIAL MAY BE GLUED OR OTHERWISE FASTENED TOGETHER BY A MEANS SATISFACTORY TO THE R.E.. WHERE THE REQUIRED JOINT OPENING EXCEEDS 1 INCH, THE CONTRACTOR MAY CONSTRUCT OPEN JOINTS.

THE SURFACE OF THE EXISTING CONCRETE PAVEMENT OR CONCRETE BASE COURSE SHALL BE CLEANED IN ACCORDANCE WITH THE NJDOT SPECIFICATIONS PRIOR TO THE CONSTRUCTION OF THE CURB THEREON.

(A) CONT.
WHERE DOWELLED CURB IS TO BE CONSTRUCTED ACROSS A LONGITUDINAL JOINT IN THE EXISTING CONCRETE OR BASE COURSE.THE DOWELS IN THE SHORTER PORTION OF THE CURB PANEL SHALL BE OMITTED AND THE CURB IN THIS PORTION OF THE PANEL SHALL BE CONSTRUCTED WITH 45# SMOOTH ROLL ROOFING BETWEEN IT AND THE EXISTING PAVEMENT.

(B) WHERE BARRIER CURB IS TO BE CONSTRUCTED ON PROPOSED CONCRETE BASE.

TRANSVERSE JOINTS ½" WIDE SHALL BE INSTALLED IN THE BASE 20'-0" APART AND IN THE BARRIER CURB DIRECTLY OVER JOINTS IN THE BASE. THE JOINTS SHALL BE FILLED WITH PREFORMED BITUMINOUS-IMPREGNATED FIBER JOINT FILLER, COMPLYING WITH THE REQUIREMENTS OF AASHTO M-213 SPECIFICATION, RECESSED ¼" IN FROM FACES AND TOP OF CURB. THE COST OF THE TRANSVERSE EXPANSION JOINTS IN THE BASE AND IN THE CURB SHALL BE INCLUDED IN THE UNIT PRICE FOR THE BARRIER CURB.

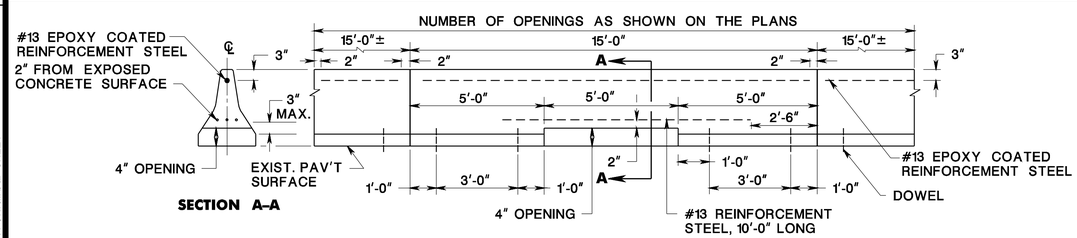
(C) GENERAL

THE FINISHED SURFACE OF THE BARRIER CURB SHALL BE SMOOTH, DENSE UNPITTED AND FREE FROM AIR BUBBLE POCKETS, DEPRESSIONS, AND HONEYCOMBS. IF THE R.E. DEEMS IT NECESSARY, THE CURB SHALL BE GIVEN A WOOD FLOAT FINISH RUBBED WITH A MIXTURE OF CEMENT, SAND, AND WATER TO OBTAIN THE ABOVE-MENTIONED FINISHED SURFACE.

(D) DELINEATORS

FLEXIBLE DELINEATORS, BARRIER CURB MOUNTED SHALL BE INSTALLED ON ALL BARRIER CURB.

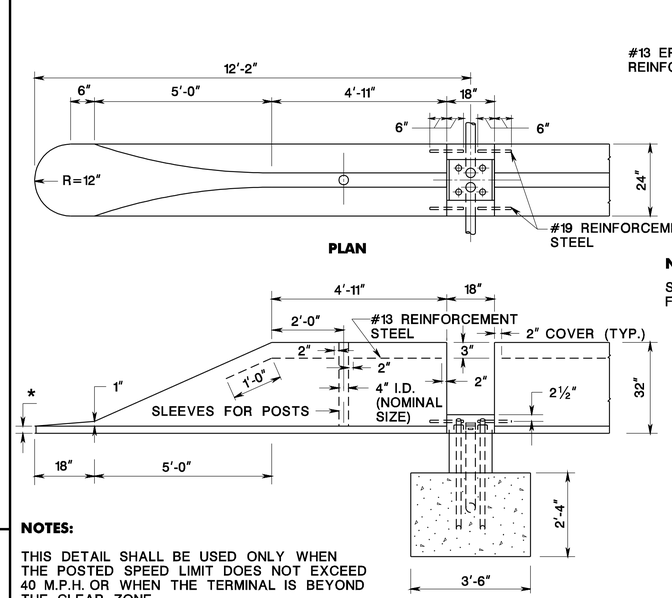
CD-607-3.2



SECTION A–A

OPENINGS TO BE CONSTRUCTED IN BARRIER CURB

CD-607-3.3

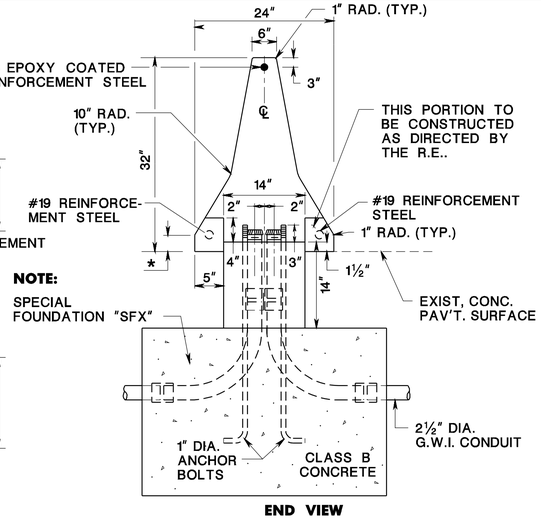


NOTES:

THIS DETAIL SHALL BE USED ONLY WHEN THE POSTED SPEED LIMIT DOES NOT EXCEED 40 M.P.H. OR WHEN THE TERMINAL IS BEYOND THE CLEAR ZONE.

* 3" TYPICAL FOR FUTURE RESURFACING

ELEVATION



NOTE:

SPECIAL FOUNDATION "SFX"

END VIEW

BARRIER CURB AT LIGHTING POLE BASE INSTALLATION

REINFORCEMENT STEEL IS IN METRIC UNITS.
HMA = HOT MIX ASPHALT

CD-607-3.5

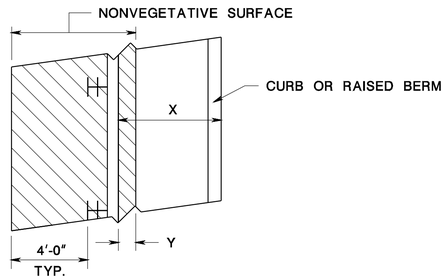
BARRIER CURB

N.T.S.

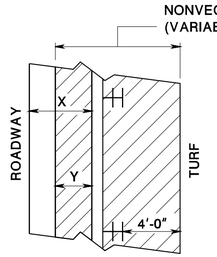
CD-607-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION

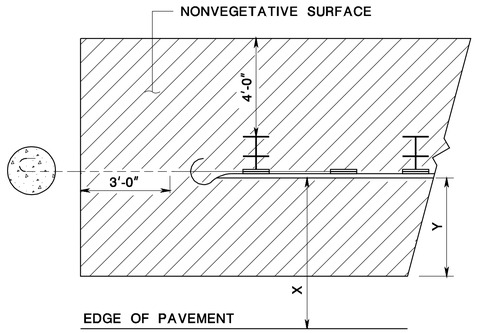
CONSTRUCTION DETAILS



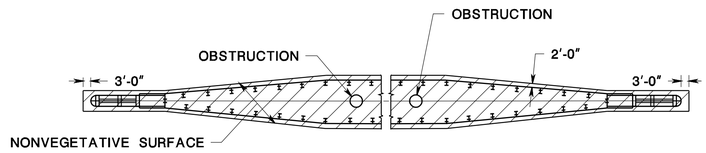
PLAN VIEW



PLAN VIEW



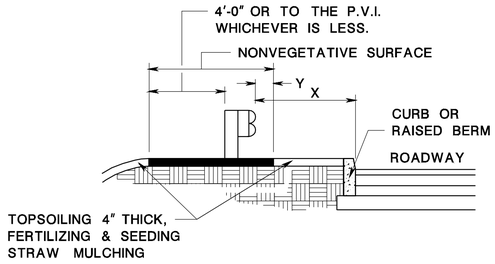
PLAN VIEW



PLAN VIEW

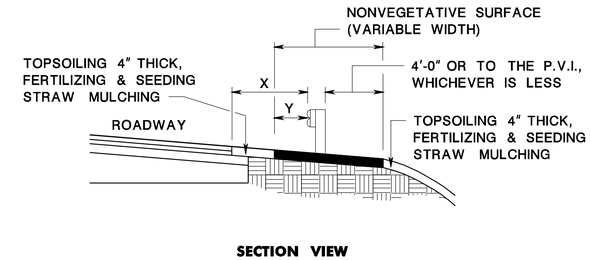
NONVEGETATIVE SURFACE AT MEDIAN GUIDE RAIL

X	Y
GUIDE RAIL OFFSET FROM EDGE OF PAVEMENT	WIDTH OF NONVEGETATIVE SURFACE IN FRONT OF GUIDE RAIL
7'-0" OR GREATER	2'-0"
4'-0"	4'-0"
0'-0"	0'-0"



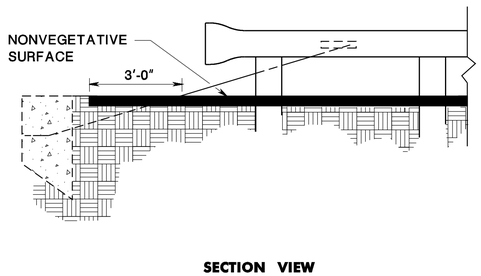
SECTION VIEW

NONVEGETATIVE SURFACES AROUND GUIDE RAIL BEHIND CURB OR RAISED BERM



SECTION VIEW

NONVEGETATIVE SURFACE AT EDGE OF PAVEMENT ON UMBRELLA SECTION WHERE GUIDE RAIL IS USED



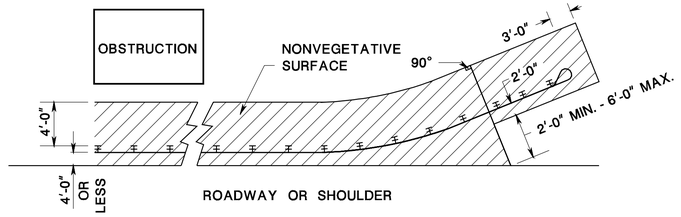
SECTION VIEW

NONVEGETATIVE SURFACES AROUND GUIDE RAIL ANCHORAGE

GENERAL NOTES:

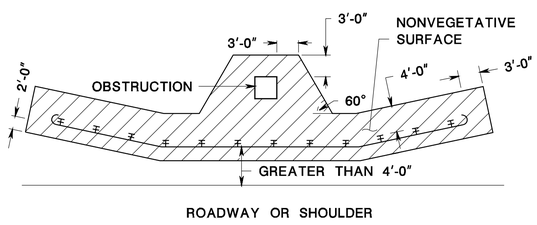
1. IF THE END OF THE GUIDE RAIL IS BURIED IN THE SLOPE, THE LIMIT OF NONVEGETATIVE SURFACE RELATIVE TO THE BURIED GUIDE RAIL WILL BE DETERMINED BY THE RE.

2. SEE TYPICAL SECTIONS FOR CROSS SLOPES IN ROADSIDE (BORDER OR SIDEWALK AREA).



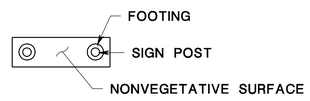
PLAN VIEW

NONVEGETATIVE SURFACE AROUND FLARED GUIDE RAIL WHERE GUIDE RAIL OFFSET FROM EDGE OF PAVEMENT IS 4'–0" OR LESS



PLAN VIEW

NONVEGETATIVE SURFACE AROUND FLARED GUIDE RAIL WHERE GUIDE RAIL OFFSET FROM EDGE OF PAVEMENT IS GREATER THAN 4'–0"



THE NONVEGETATIVE SURFACE SHALL FORM A RECTANGULAR PAD WHOSE OUTSIDE LIMITS EXTEND A MINIMUM OF 3' -0" BEYOND THE POST FOOTING.

PLAN VIEW

NONVEGETATIVE SURFACE AROUND OVERHEAD SIGN FOUNDATIONS AND UNDER LARGE GROUND MOUNTED SIGNS

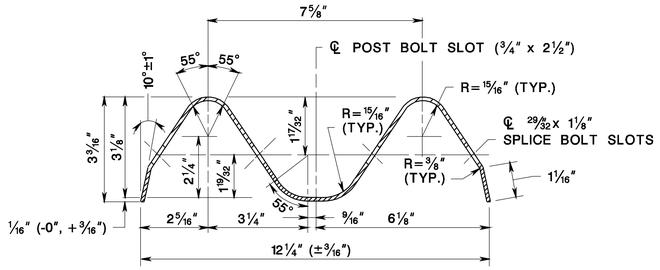
NONVEGETATIVE SURFACE

N.T.S.

CD-608-1

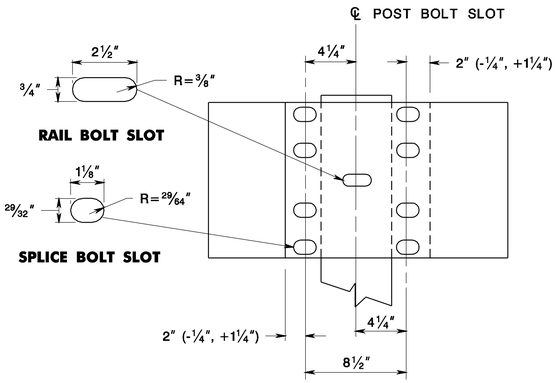
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

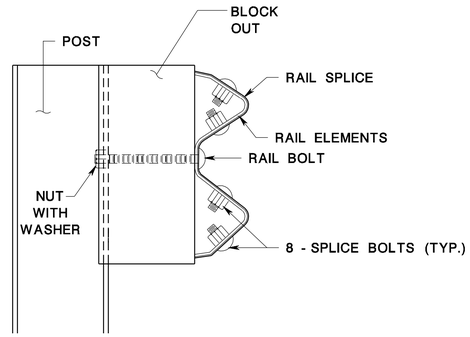


RAIL ELEMENT SHALL BE SUPPLIED IN LENGTHS OF 13'- 6½" OR 26'-½"

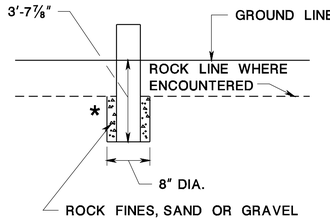
W-BEAM RAIL ELEMENT



RAIL SPLICE



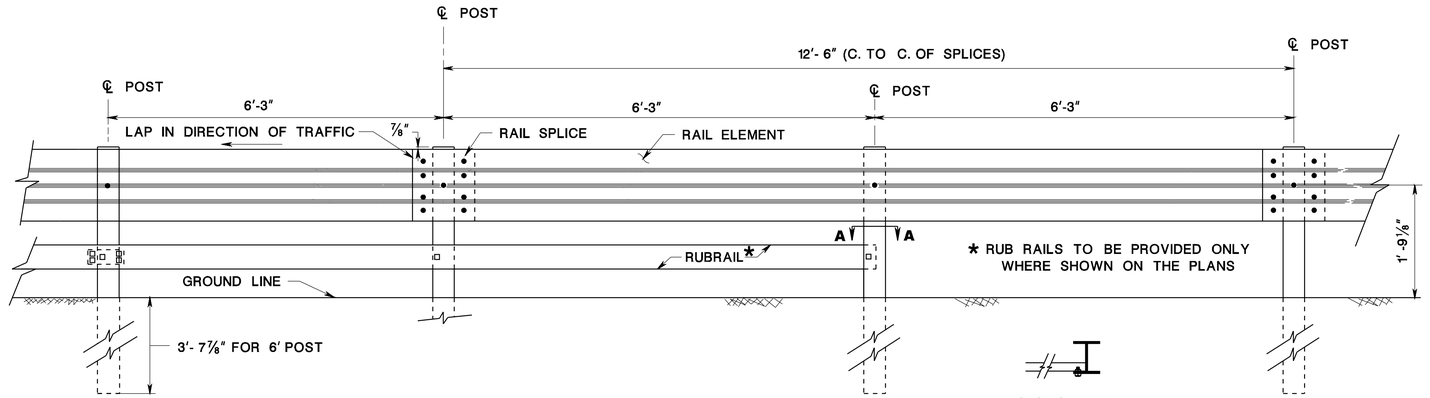
BEAM GUIDE RAIL POST ASSEMBLY



* ALTERNATE CONSTRUCTION METHOD: PLACE POST IN 8" DIA. HOLE AND BACKFILL WITH CLASS "B" CONCRETE

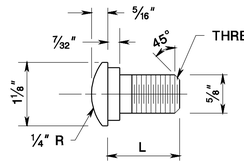
GUIDE RAIL POST INSTALLATION IN ROCK

CD-609-1.2

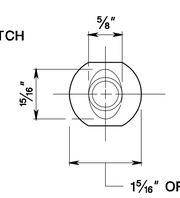


BEAM GUIDE RAIL

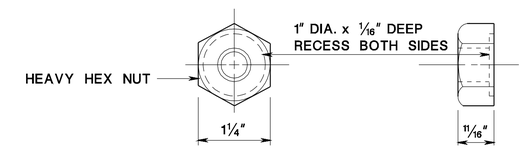
SECTION A-A



TYPE	L	MIN. THREAD LENGTH
SPLICE	1¼"	FULL LENGTH THREAD
RAIL	9½"	1¾"

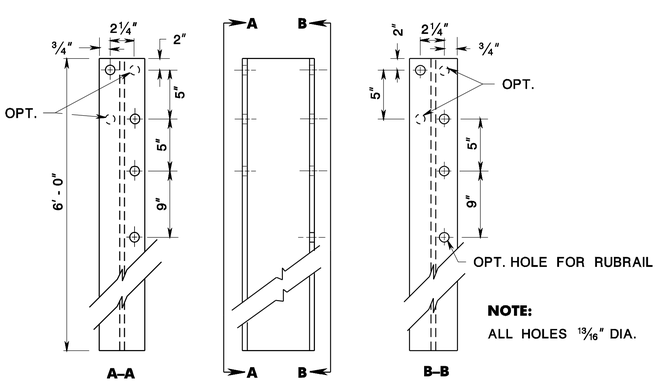


5/8" DIA. BUTTON HEAD BOLT



5/8" DIA. RECESS NUT

SPLICE & RAIL NUT & BOLT

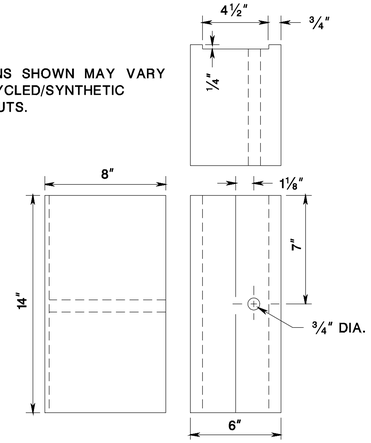


NOTE:
ALL HOLES 13/16" DIA.

6" x 4" Steel, 8.5# or 9# per FOOT

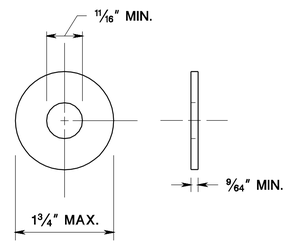
6' POST

NOTE:
DIMENSIONS SHOWN MAY VARY FOR RECYCLED/SYNTHETIC BLOCK OUTS.



APPROVED RECYCLED/ SYNTHETIC MATERIALS

14" BLOCK OUT



STEEL WASHER

GENERAL NOTES:

1. ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
2. RAIL ELEMENTS SHALL BE FURNISHED SHOPCURVED, CONCAVE OR CONVEX, FOR RADII BETWEEN 20 AND 150 FEET.
3. THE STEEL FOR RAIL ELEMENTS AND BOLTS SHALL CONFORM TO NJDOT STANDARD SPECIFICATIONS AND ITS AMENDMENTS.

CD-609-1.1

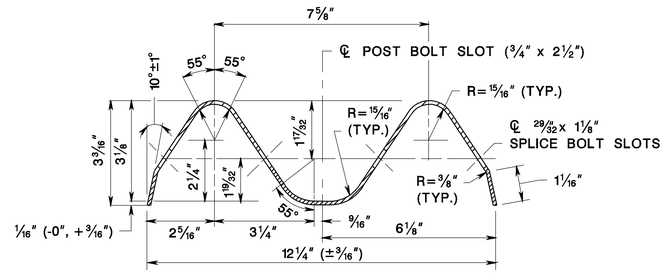
BEAM GUIDE RAIL

N.T.S.

CD-609-1

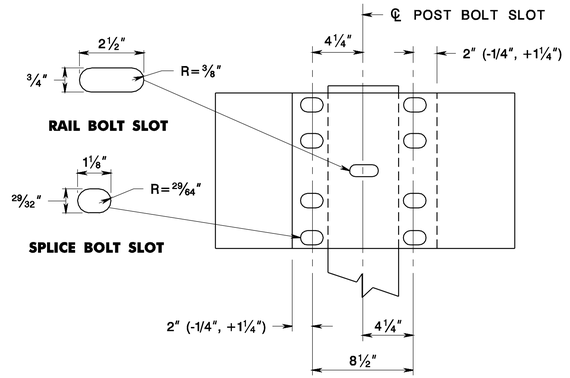
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

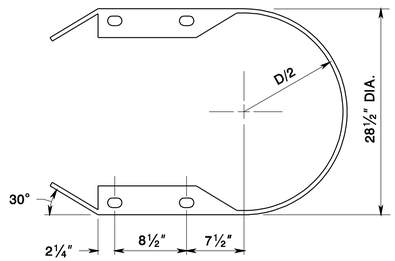


RAIL ELEMENT SHALL BE SUPPLIED IN LENGTHS OF 13'-6½" OR 26'-½"

W-BEAM RAIL ELEMENT



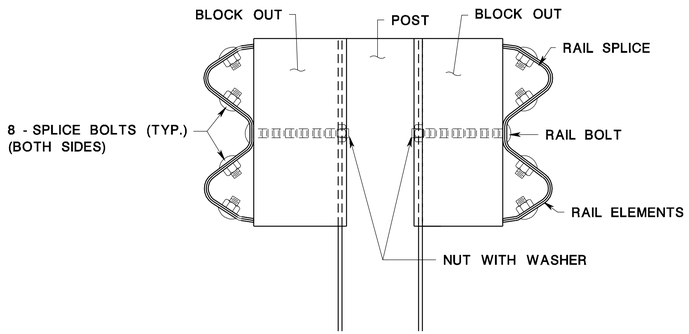
RAIL SPLICE



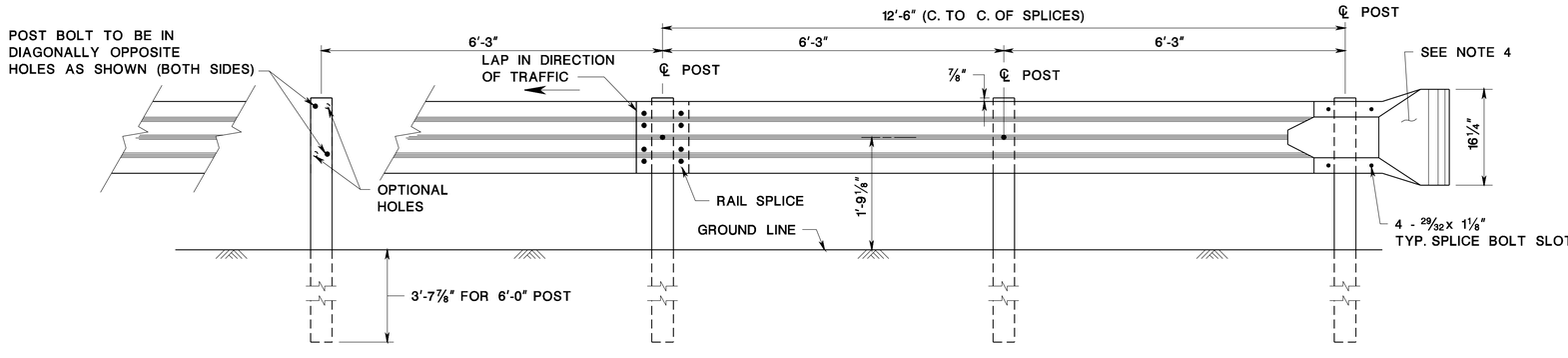
END SECTION (BUFFER)

GENERAL NOTES:

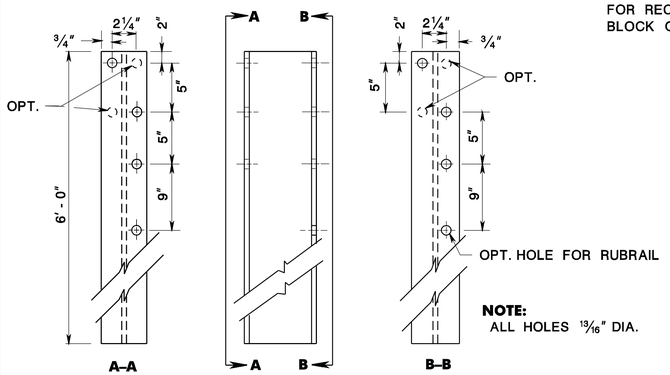
1. ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
2. RAIL ELEMENTS SHALL BE FURNISHED SHOPCURVED, CONCAVE OR CONVEX. FOR RADII BETWEEN 20 FEET AND 150 FEET.
3. THE STEEL FOR RAIL ELEMENTS AND BOLTS SHALL CONFORM TO NJDOT STANDARD SPECIFICATIONS AND IT'S AMENDMENTS.
4. USE END SECTION (BUFFER) UNLESS THE CONSTRUCTION PLANS CALL FOR ANOTHER TYPE OF END TREATMENT.



POST ASSEMBLY, DUAL-FACED



BEAM GUIDE RAIL, DUAL-FACED

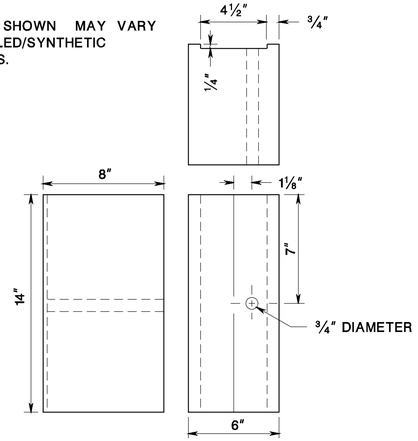


NOTE:
ALL HOLES 13/16" DIA.

6" x 4" STEEL I, 8.5# OR 9# PER FOOT

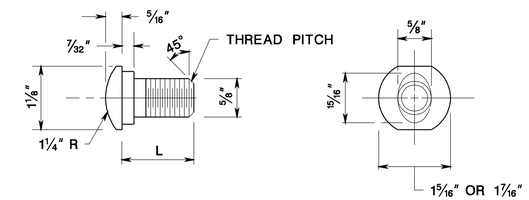
6' POST

NOTE:
DIMENSIONS SHOWN MAY VARY FOR RECYCLED/SYNTHETIC BLOCK OUTS.



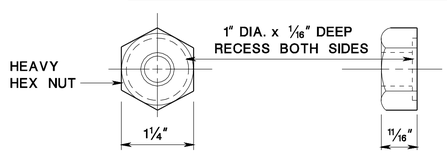
APPROVED RECYCLED/ SYNTHETIC MATERIALS

14" BLOCK OUT



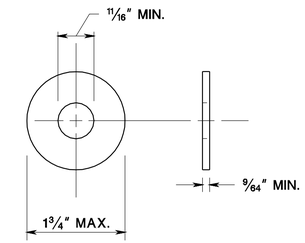
⅝" DIA. BUTTON HEAD BOLT

TYPE	L	MIN. THREAD LENGTH
SPLICE	1¼"	FULL LENGTH THREAD
RAIL	9½"	1¾"



⅝" DIA. RECESS NUT

SPLICE & RAIL NUT & BOLT



STEEL WASHER

BEAM GUIDE RAIL, DUAL-FACED

N.T.S.

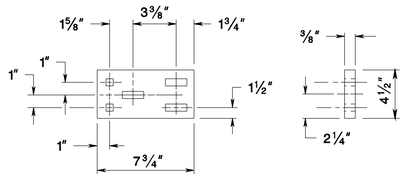
CD-609-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION

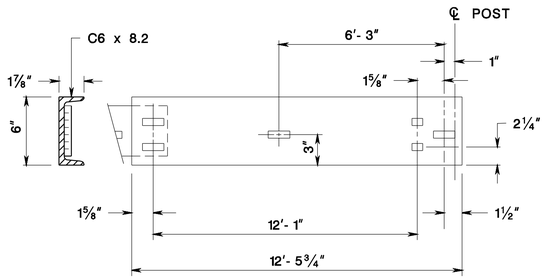
CONSTRUCTION DETAILS

CD-609-2.1

59
146



SPLICE PLATE



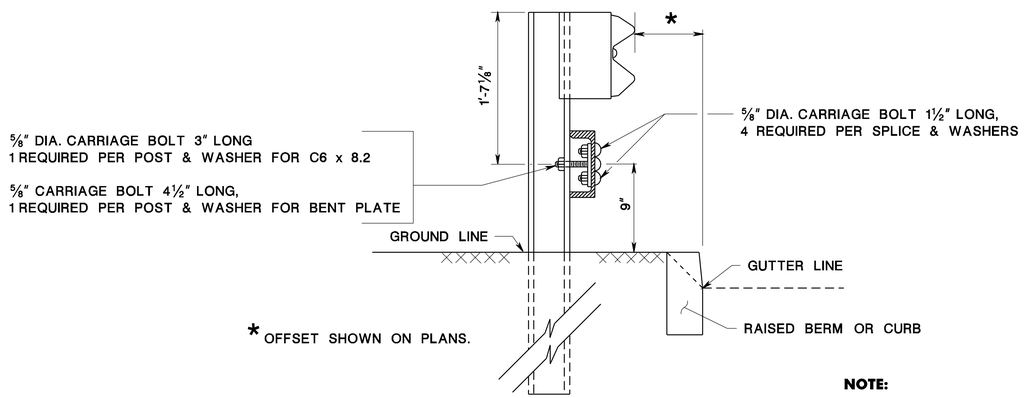
RUB RAIL MAY BE SUPPLIED IN
LENGTHS OF 12'- 5¾" OR 24'- 11¾"

NOTE:
ALL RECTANGULAR SLOTS ARE 11⁄16" x 2"
ALL SQUARE HOLES ARE 11⁄16"

NOTE:
USE EITHER C6 x 8.2 OR
BENT PLATE FOR RUB RAIL

C6 x 8.2

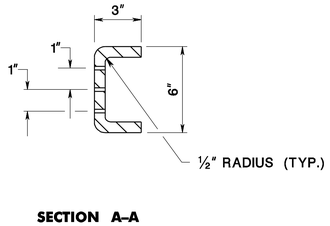
CD-609-3.1



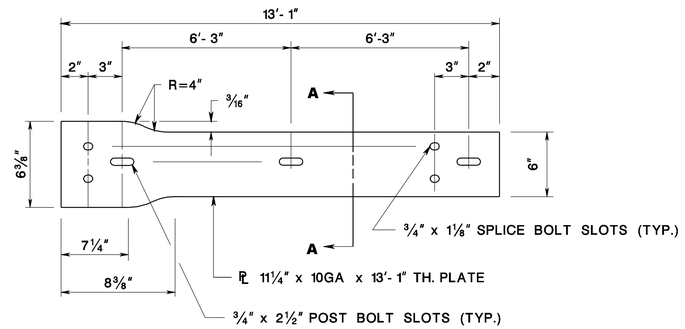
NOTE:
USE EITHER C6 x 8.2 OR
BENT PLATE FOR RUB RAIL

RUB RAIL SECTION

CD-609-3.2



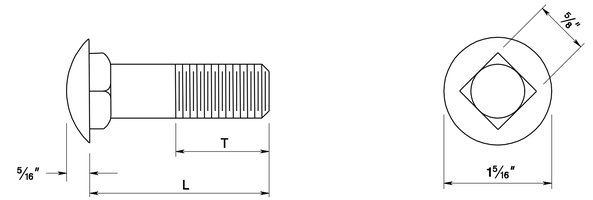
SECTION A–A



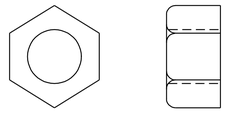
NOTE:
USE EITHER C6 x 8.2 OR
BENT PLATE FOR RUB RAIL

BENT PLATE

CD-609-3.3



⅝" DIA. CARRIAGE BOLT

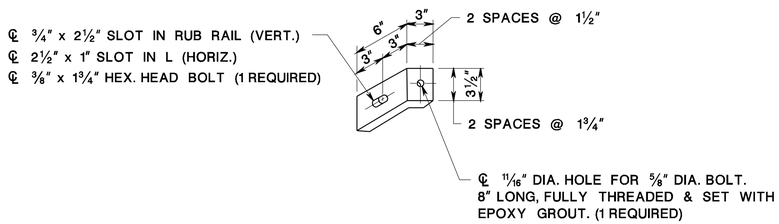


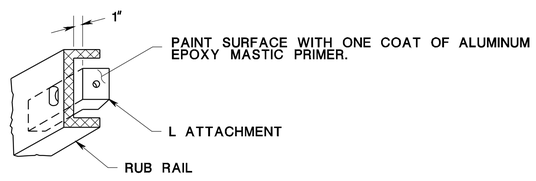
⅝" DIA. HEX NUT

L	THREAD LENGTH (T)
1½"	FULL LENGTH
3"	1½" MIN.
4½"	1½" MIN.

CARRIAGE BOLT DETAIL

CD-609-3.4





RUB RAIL ANGLE ATTACHMENT

SEE CD-609-11.2 FOR GENERAL NOTES

CD-609-3.5

RUB RAIL

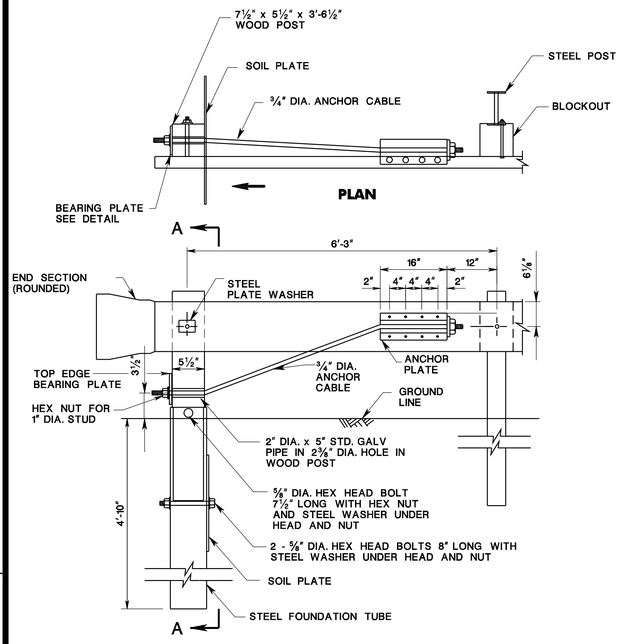
N.T.S.

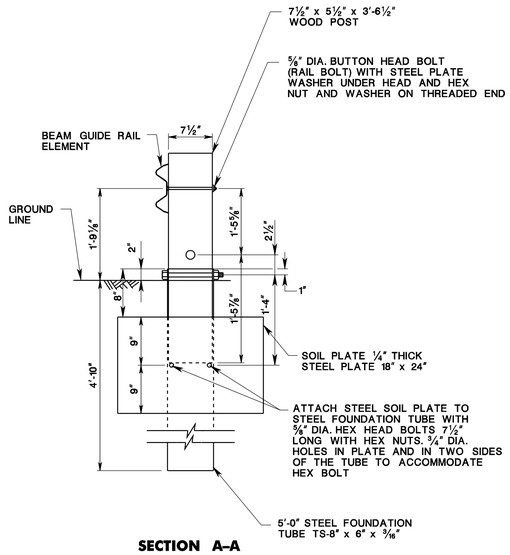
HMA = HOT MIX ASPHALT

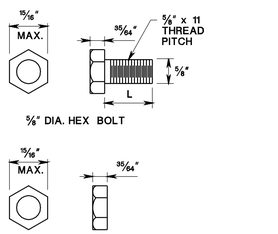
CD-609-3

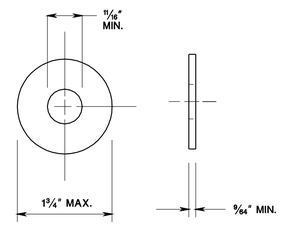
NEW JERSEY DEPARTMENT OF TRANSPORTATION

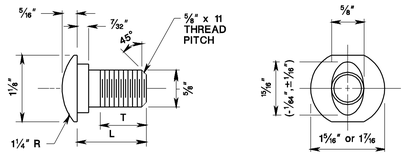
CONSTRUCTION DETAILS



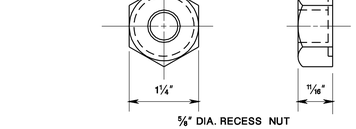


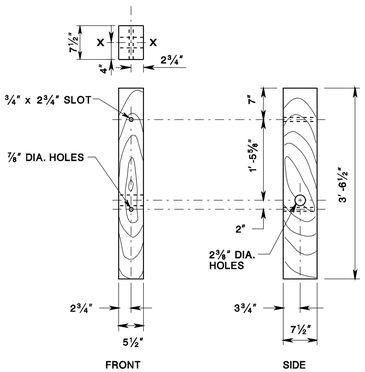


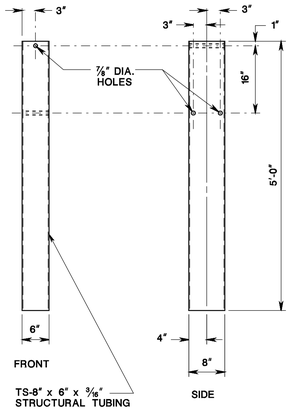


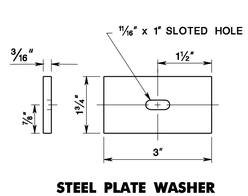


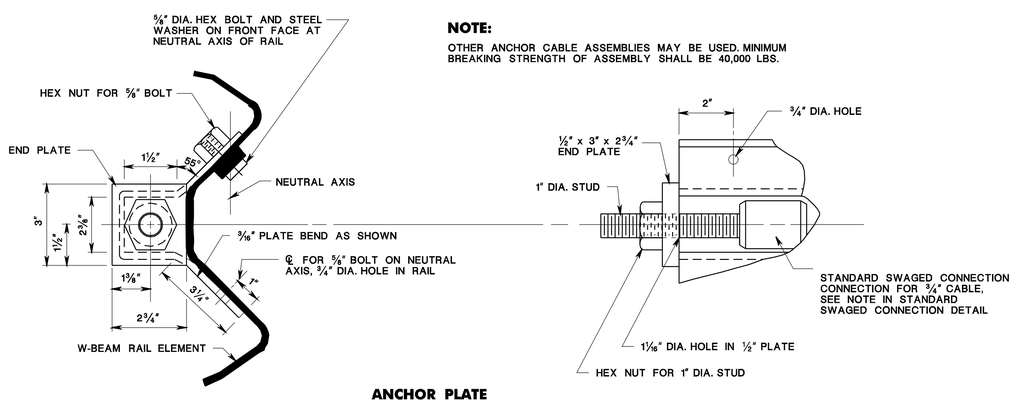
TYPE	L	MIN. THREAD LENGTH (T)
RAIL	10"	4"
SPLICE	1¼"	1¼"





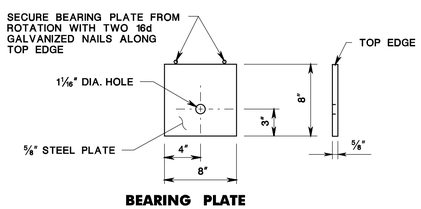


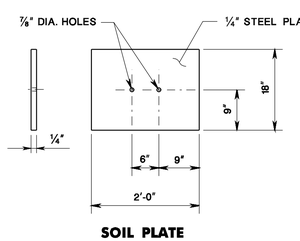




NOTE:

OTHER ANCHOR CABLE ASSEMBLIES MAY BE USED. MINIMUM BREAKING STRENGTH OF ASSEMBLY SHALL BE 40,000 LBS.





PAYMENT FOR ITEM ANCHORAGE SHALL INCLUDE THE ANCHOR PLATE, CABLE ASSEMBLY, WOOD POST, FOUNDATION TUBE AND SOIL PLATE

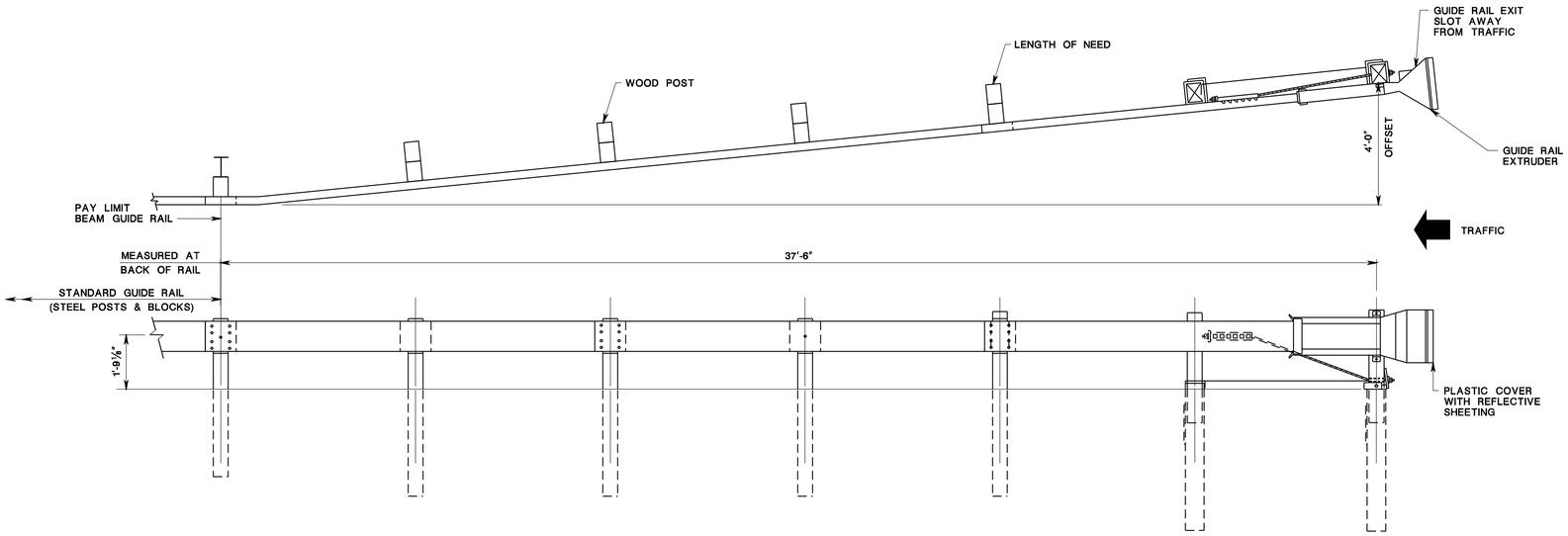
BEAM GUIDE RAIL ANCHORAGE

N.T.S.

CD-609-4

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

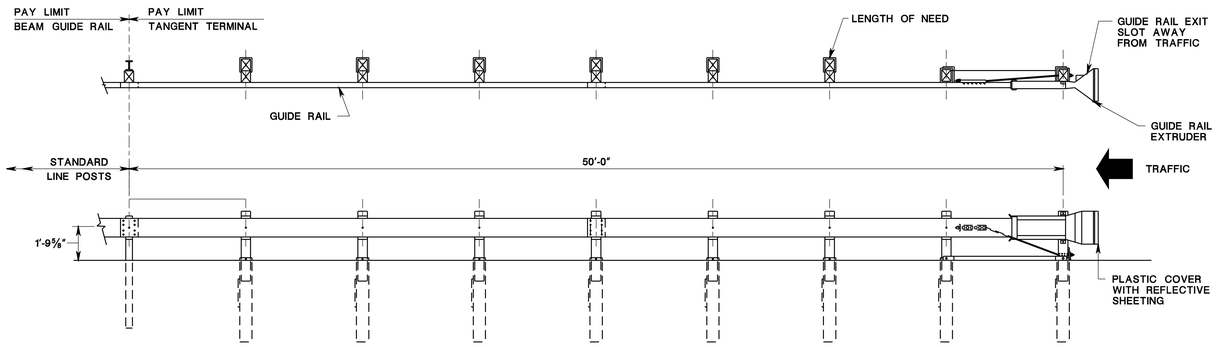


FLARED GUIDE RAIL TERMINAL

NOTE:

NUMBER OF POSTS, TYPE OF POST, POST SPACING, FLARE RATE AND MATERIALS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION AND THE DEPARTMENT'S QUALIFIED PRODUCTS LIST

CD-609-5.1



NOTE:

WOOD POSTS SHALL BE CONSTRUCTED USING FOUNDATION TUBES.

TANGENT GUIDE RAIL TERMINAL

NOTE:

NUMBER OF POSTS, TYPE OF POST, POST SPACING AND MATERIALS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION AND THE DEPARTMENT'S QUALIFIED PRODUCTS LIST

CD-609-5.2

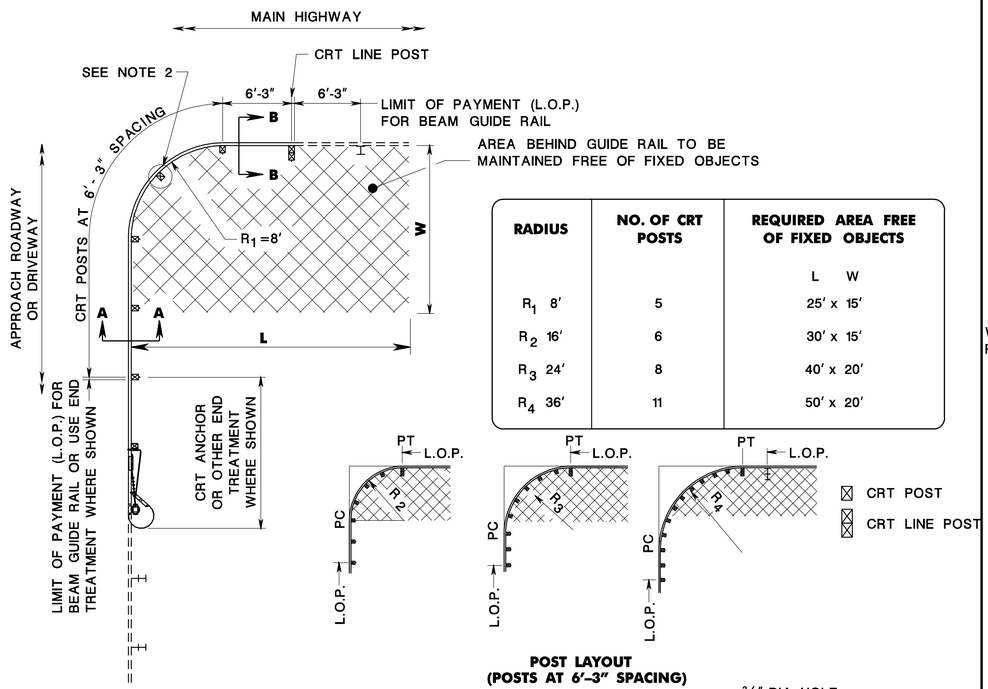
FLARED GUIDE RAIL TERMINAL AND TANGENT TERMINAL

N.T.S.

CD-609-5

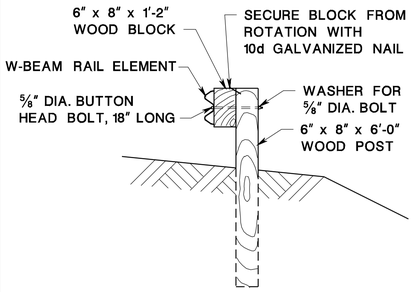
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

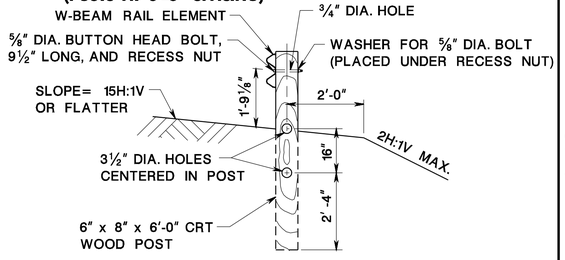


RADIUS	NO. OF CRT POSTS	REQUIRED AREA FREE OF FIXED OBJECTS
		L W
R_1 8′	5	25′ x 15′
R_2 16′	6	30′ x 15′
R_3 24′	8	40′ x 20′
R_4 36′	11	50′ x 20′

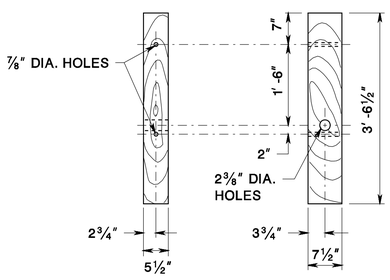
POST LAYOUT
(POSTS AT 6′–3″ SPACING)



SECTION B–B
CRT LINE POST



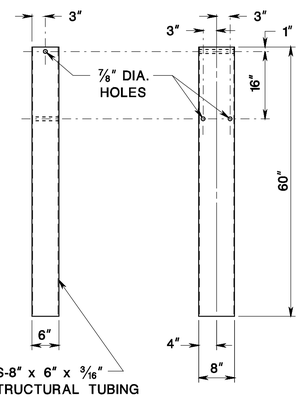
SECTION A–A
CRT POST



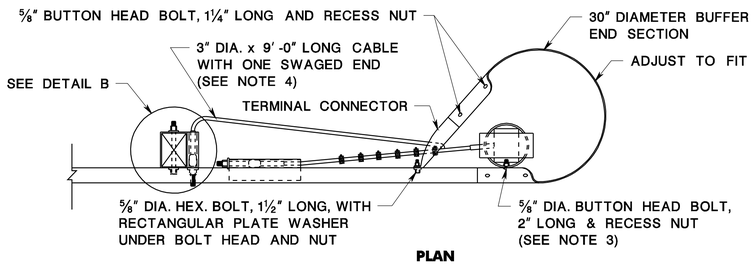
WOOD BREAKAWAY POST

CONTROLLED RELEASE TERMINALS

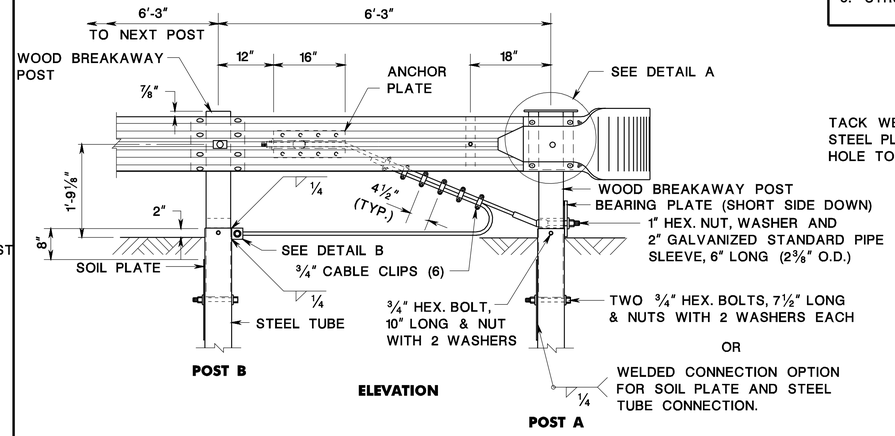
CD-609-6.1



STEEL TUBE

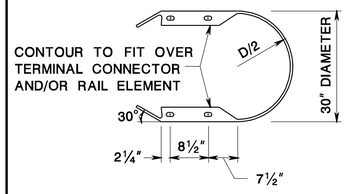


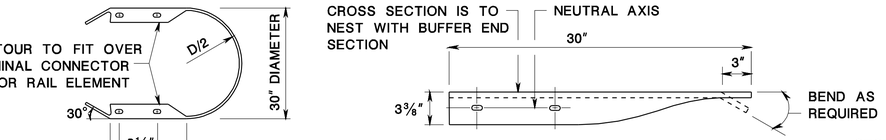
PLAN

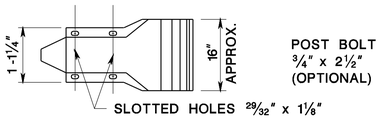


POST B **ELEVATION** **POST A**

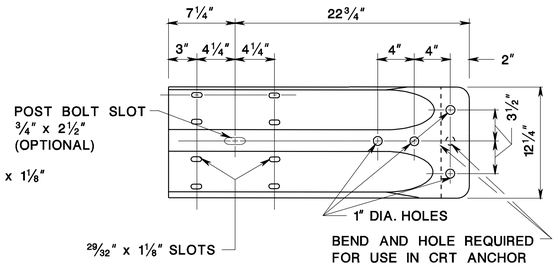
CRT ANCHOR







30" DIA. BUFFER END SECTION



TERMINAL CONNECTOR

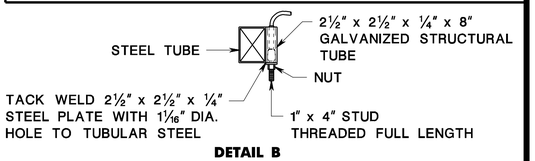
CONTROLLED RELEASE TERMINAL ANCHORAGE

CD-609-6.2

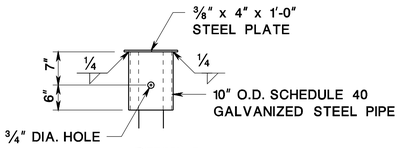
GENERAL NOTES

1. NO WASHERS ARE USED ON THE 5/8" DIA. BUTTON HEAD BOLTS CONNECTING THE RAIL TO THE CONTROLLED RELEASE TERMINAL (CRT) POSTS.
2. FOR 8 FOOT RADIUS, THE RAIL ELEMENT SHALL NOT BE BOLTED TO THE CRT POST AT THE CENTER OF THE NOSE AS SHOWN.
3. ATTACH W-BEAM TO STEEL PIPE WITH BUTTON HEAD BOLT WITH NO WASHER. NO CONNECTION TO POST IS REQUIRED.
4. WIRE ROPE CABLE SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M30 AND SHALL BE 3/4" DIAMETER PREFORMED, 6 x 19, WIRE STRAND CORE OR INDEPENDENT WIRE ROPE CORE, GALVANIZED, RIGHT REGULAR LAY, MANUFACTURED OF IMPROVED PLOW STEEL WITH A MINIMUM BREAKING STRENGTH OF 42,800 POUNDS.
5. STRUCTURAL TUBING SHALL CONFORM TO ASTM A500.

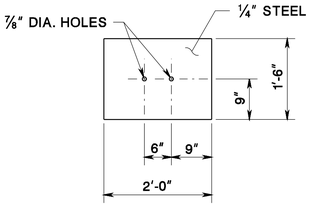
CD-609-6.3



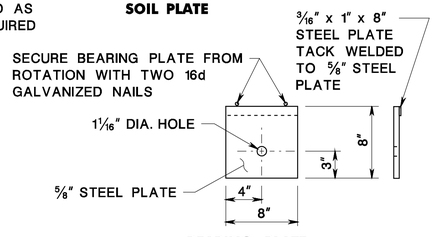
DETAIL B



DETAIL A



SOIL PLATE



BEARING PLATE

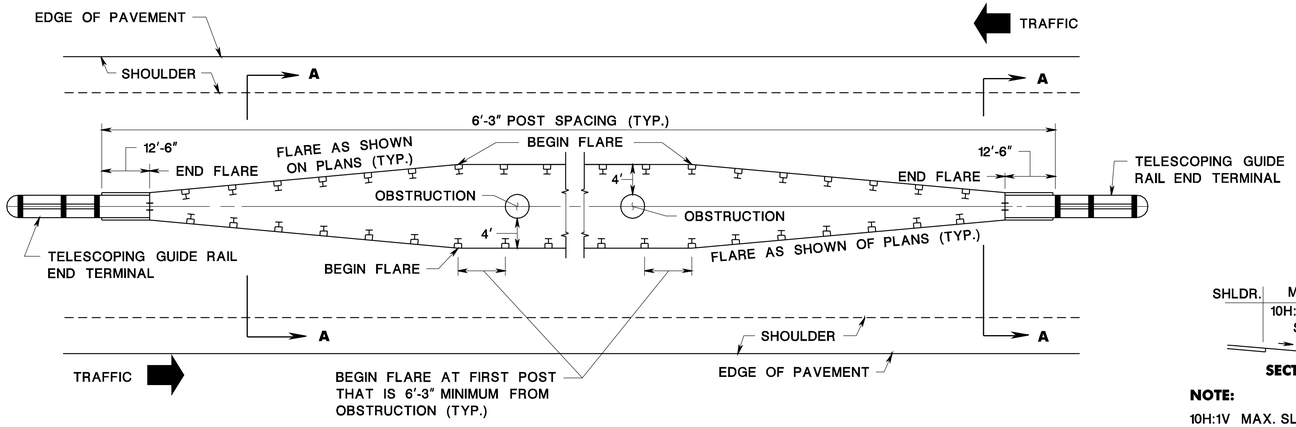
CONTROLLED RELEASE TERMINALS

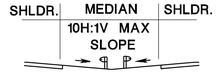
N.T.S.

CD-609-6

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS



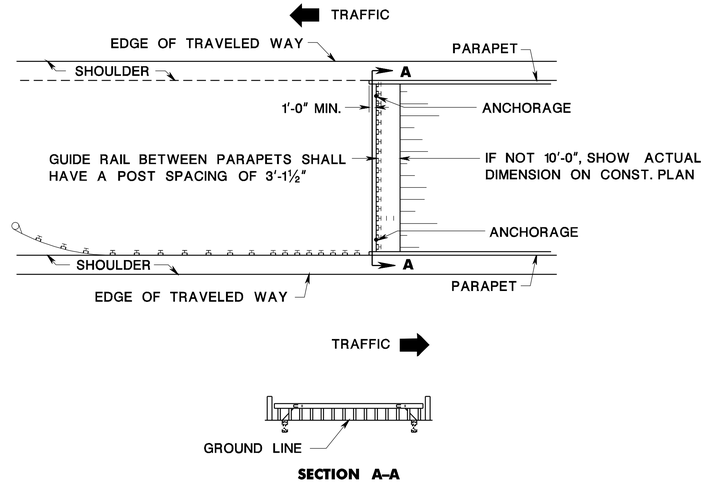


SECTION A–A

NOTE:
10H:1V MAX. SLOPES TO BEGIN 100'-0" IN ADVANCE OF GUIDE RAIL TERMINALS.

MEDIAN GUIDE RAIL WHEN CLEARANCE FROM BACK OF RAIL TO OBSTRUCTION IS 4' OR GREATER

CD-609-7.1

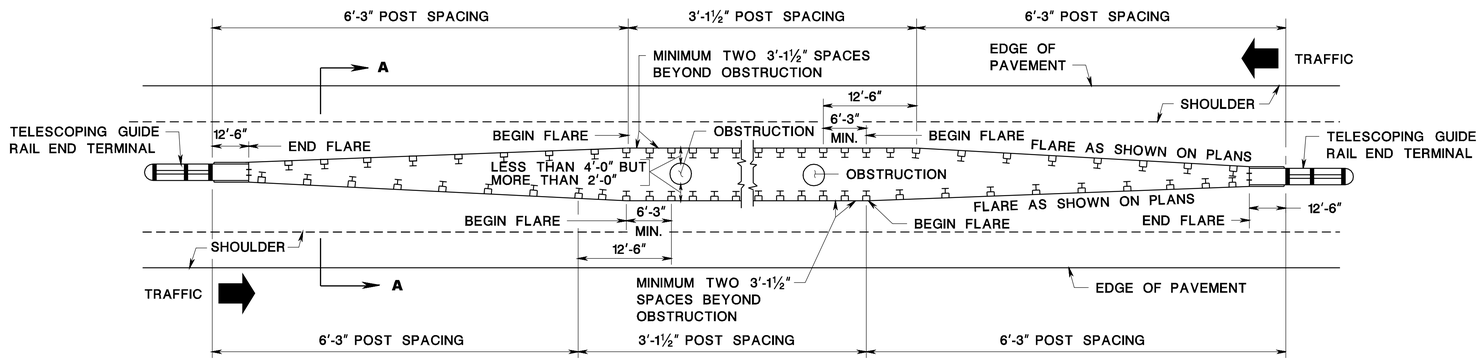


SECTION A–A

MEDIAN GUIDE RAIL TREATMENT AT ADJACENT BRIDGES

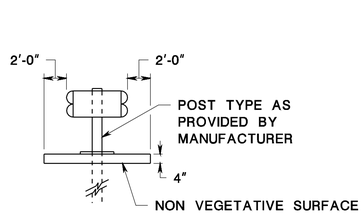
CD-609-7.4

NOTE:
REFER TO DETAIL CD-612-7.1 FOR SECTION A-A

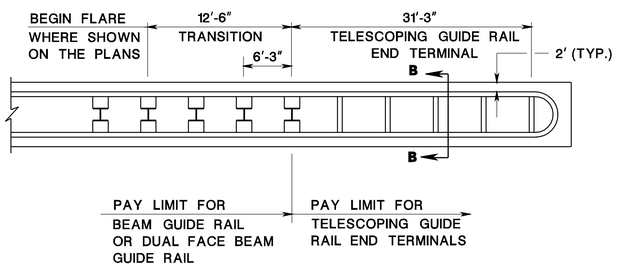


MEDIAN GUIDE RAIL WHEN CLEARANCE FROM BACK OF RAIL TO OBSTRUCTION IS MORE THAN 2' BUT LESS THAN 4'

CD-609-7.2



SECTION B–B



NOTE:
12'-6" OR 6'-3" TRANSITION AS RECOMMENDED BY THE MANUFACTURER- GUIDE RAIL SHALL NOT BEGIN TO FLARE WITHIN 12'-6" OF TELESCOPING GUIDE RAIL END TREATMENT.

TELESCOPING GUIDE RAIL END TERMINALS

CD-609-7.3

MEDIAN GUIDE RAIL TREATMENT

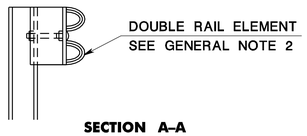
N.T.S.

HMA = HOT MIX ASPHALT

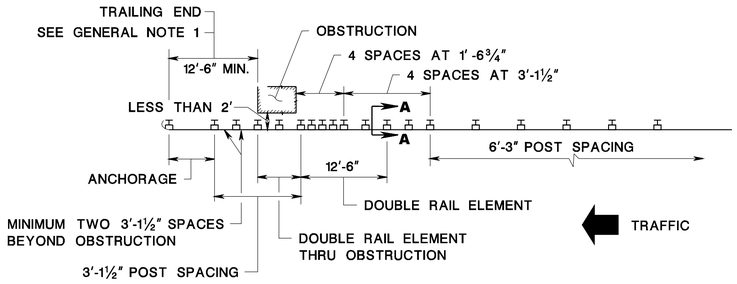
CD-609-7

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

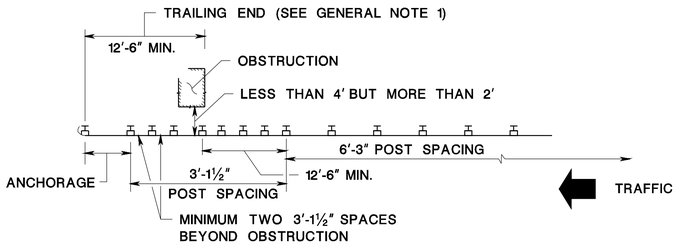


SECTION A–A



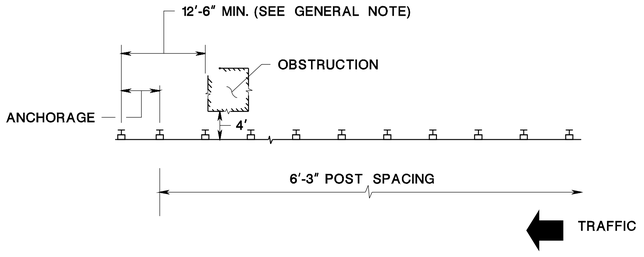
WHERE CLEARANCE FROM BACK OF RAIL TO OBSTRUCTION IS LESS THAN 2'

CD-609-8.1



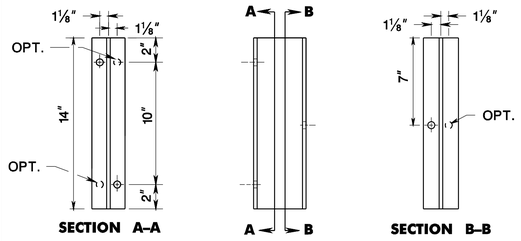
WHERE CLEARANCE FROM BACK OF RAIL TO OBSTRUCTION IS MORE THAN 2' BUT LESS THAN 4'

CD-609-8.2



WHERE CLEARANCE FROM BACK OF RAIL TO OBSTRUCTION IS 4' OR GREATER

CD-609-8.3

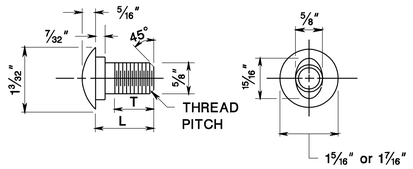


SECTION A–A **SECTION B–B**

ALL HOLES 13⁄16" DIA.

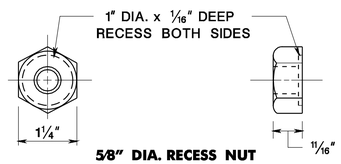
6" x 4" STEEL I 8.5# OR 9#

14" SPACER



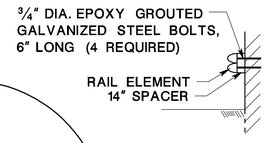
5⁄8" BUTTON HEAD BOLT

TYPE	L	MIN. THREAD LENGTH
SPLICE	1⅜"	13⁄16"
RAIL	2"	1½"

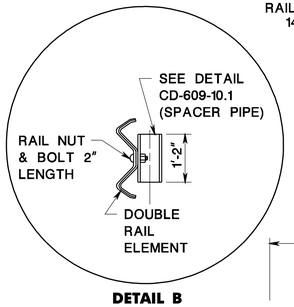


5⁄8" DIA. RECESS NUT

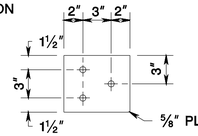
SPLICE & RAIL NUT & BOLT



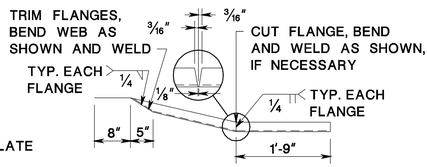
SECTION C–C

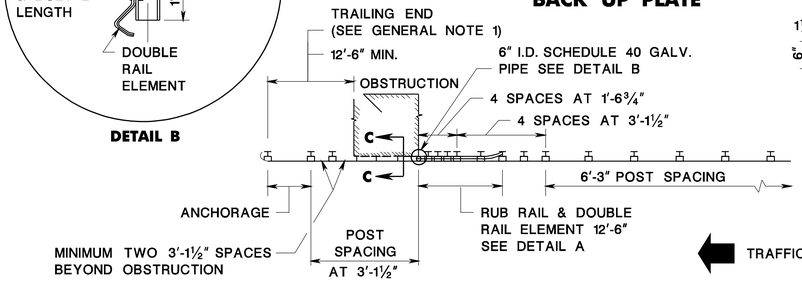


DETAIL B



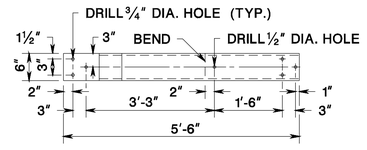
RUB RAIL BACK UP PLATE





WHERE RAIL ELEMENT WITH SPACER IS ATTACHED TO OBSTRUCTION

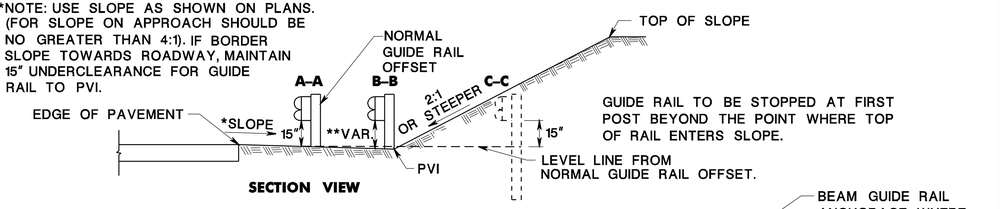
CD-609-8.6



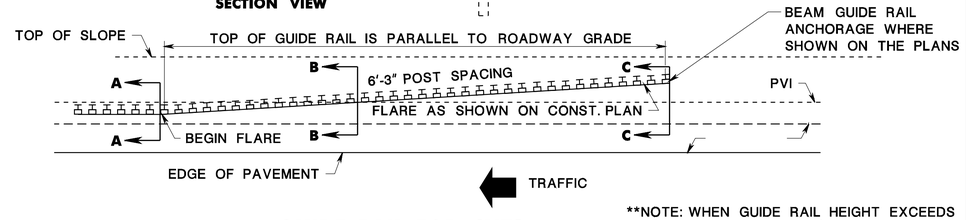
DETAIL A

C6 x 8.2 RUB RAIL

*NOTE: USE SLOPE AS SHOWN ON PLANS. (FOR SLOPE ON APPROACH SHOULD BE NO GREATER THAN 4:1). IF BORDER SLOPE TOWARDS ROADWAY, MAINTAIN 15" UNDERCLEARANCE FOR GUIDE RAIL TO PVI.



SECTION VIEW



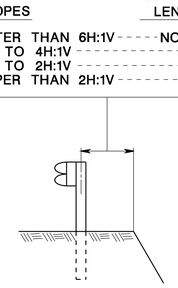
GUIDE RAIL FOR CUTS (END BURIED IN SLOPE)

**NOTE: WHEN GUIDE RAIL HEIGHT EXCEEDS 18", ADD RUBRAIL AND 7' LONG POSTS.

CD-609-8.4

IF LESS THAN 2'

SLOPES	ADDITIONAL POST LENGTH FEET
FLATTER THAN 6H:1V	NO CHANGE
6H:1V TO 4H:1V	1'
3H:1V TO 2H:1V	2'
STEEPER THAN 2H:1V	4'



ADDITIONAL LENGTH BEAM GUIDE RAIL POSTS

CD-609-8.5

GENERAL NOTES

1. WHERE A CRASHWORTHY END TREATMENT IS SHOWN AT THE TRAILING END ON THE PLANS, THE POST SPACING AND DOUBLE RAIL ELEMENT FOR THE GUIDE RAIL SHALL BE THE SAME AS THE APPROACH END.
2. WHERE DOUBLE RAIL ELEMENT IS REQUIRED, THE ADDITIONAL RAIL ELEMENT SHOULD BE ADDED BEHIND THE CONTINUOUS FRONT RAIL.

CD-609-8.7

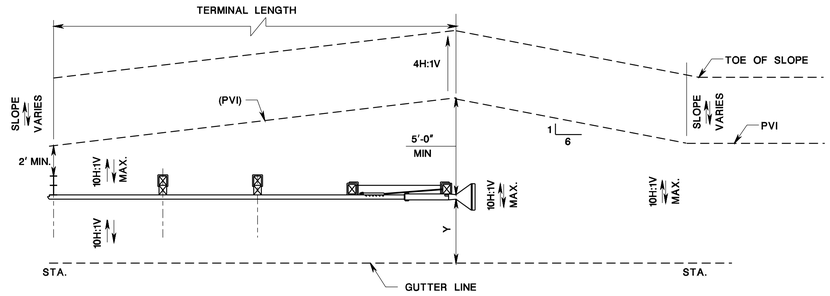
BEAM GUIDE RAIL END TREATMENT

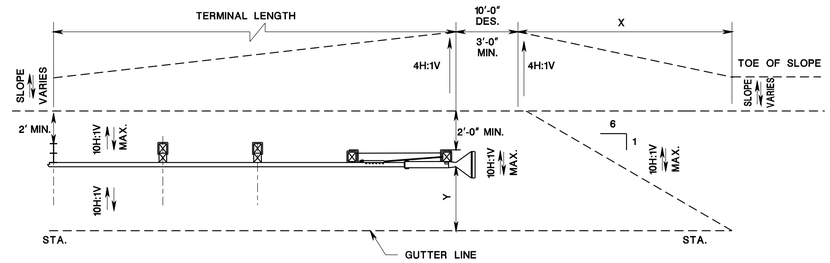
N.T.S.

CD-609-8

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS





STANDARD GRADING

ALTERNATE GRADING

GRADING	STANDARD/ALTERNATE
STATION TO STATION	

Y = OFFSET FROM GUTTER LINE	X	X + 10' (DES.)
* 1'-0"	24'-0"	34'-0"
4'-0"	42'-0"	52'-0"
7'-0"	60'-0"	70'-0"
10'-0"	78'-0"	88'-0"

GRADING TREATMENT AT FLARED AND TANGENT TERMINALS

*** NOTE:**

WHERE GUIDE RAIL IS INSTALLED FLUSH WITH THE GUTTER LINE, THE TANGENT TERMINAL SHALL BE CONSTRUCTED WITH A 50:1 STRAIGHT FLARE FOR ITS ENTIRE LENGTH SO THAT THE EXTRUDER HEAD DOES NOT PROTRUDE INTO THE ROADWAY.

CD-609-9.2

ROADSIDE RECOVERY AREA		
STATION	**A**	**B**

NOTE:

THERE SHALL BE NO FIXED OBJECTS IN FRONT OF THE GUIDE RAIL FOR ITS ENTIRE LENGTH.

RECOVERY AREA AT FLARED AND TANGENT TERMINALS

CD-609-9.1

GRADING AND ROADSIDE RECOVERY AREA AT FLARED AND TANGENT TERMINALS

NOTE TO DESIGNER:

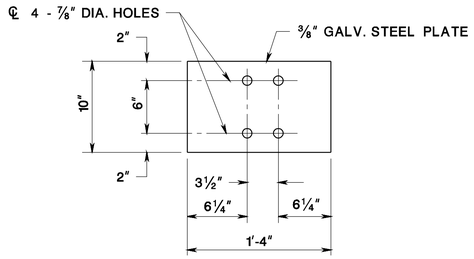
THIS SHEET REQUIRES DESIGN SPECIFIC INFORMATION TO BE ADDED AND INCLUDED IN THE CONTRACT PLANS.

REMOVE THIS NOTE AFTER DESIGN SPECIFIC INFORMATION IS ADDED.

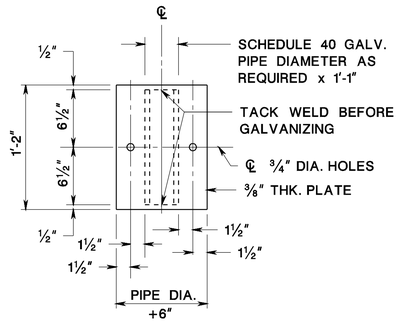
CD-609-9

NEW JERSEY DEPARTMENT OF TRANSPORTATION

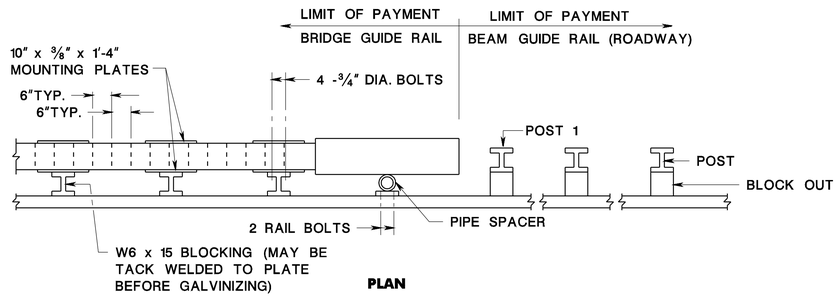
CONSTRUCTION DETAILS



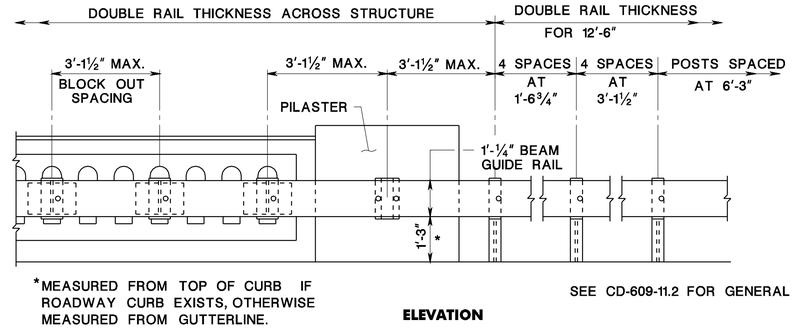
MOUNTING PLATE



PIPE SPACER



PLAN

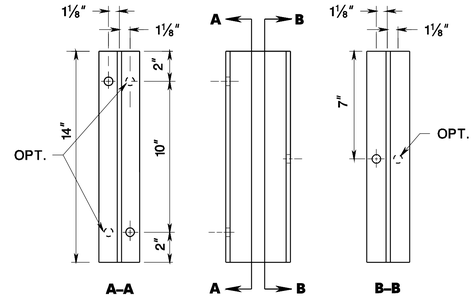


*MEASURED FROM TOP OF CURB IF ROADWAY CURB EXISTS, OTHERWISE MEASURED FROM GUTTERLINE.

ELEVATION

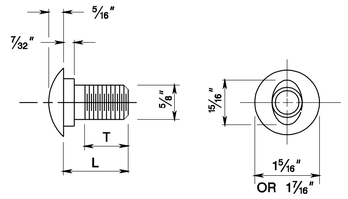
SEE CD-609-11.2 FOR GENERAL NOTES

GUIDE RAIL ATTACHMENT TO BALUSTRADE



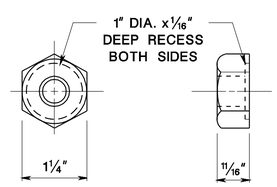
ALL HOLES 13/16" DIA.

14" ROUTED SPACER
6" x 4" STEEL I 8.5# OR 9#



5/8" BUTTON HEAD BOLT

TYPE	L	T
SPLICE	1 1/4"	1 1/4"
RAIL	2"	1 1/2"

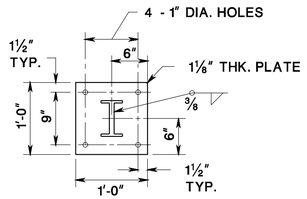


5/8" DIA. RECESS NUT

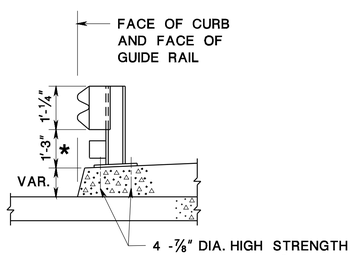
SPLICE & RAIL NUT & BOLT

NOTE 1: WHEN THE CONFIGURATION OF BRIDGE ABUTMENTS AND WINGWALLS DO NOT ACCOMMODATE THE INSTALLATION OF POST 1, THE POST MAY BE ATTACHED TO THE ABUTMENT HEADER WITH THE USE OF A BASE PLATE.

CD-609-10.1



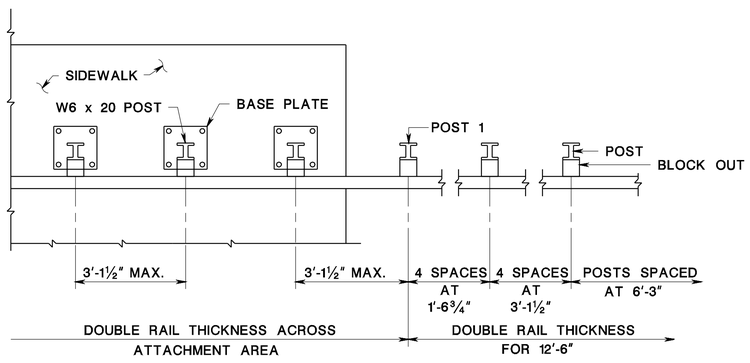
BASE PLATE



* MEASURED FROM TOP OF CURB IF ROADWAY CURB EXISTS, OTHERWISE MEASURED FROM GUTTER LINE.

SECTION

SEE CD-609-11.2 FOR GENERAL NOTES



PLAN

GUIDE RAIL ATTACHMENT TO SIDEWALK

NOTE 1: USE "BEAM GUIDE RAIL BRIDGE" ITEM IF SIDEWALK IS ON A STRUCTURE. IF SIDEWALK IS NOT ON A STRUCTURE, USE "BEAM GUIDE RAIL" ITEM AND SIDEWALK SHALL BE MINIMUM 8 INCHES THICK

NOTE 2: WHEN THE CONFIGURATION OF BRIDGE ABUTMENTS AND WINGWALLS DO NOT ACCOMMODATE THE INSTALLATION OF POST 1, THE POST MAY BE ATTACHED TO THE ABUTMENT HEADER WITH THE USE OF A BASE PLATE.

CD-609-10.2

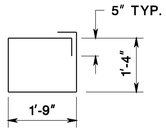
BEAM GUIDE RAIL ATTACHMENTS

N.T.S.

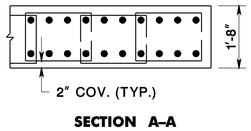
CD-609-10

NEW JERSEY DEPARTMENT OF TRANSPORTATION

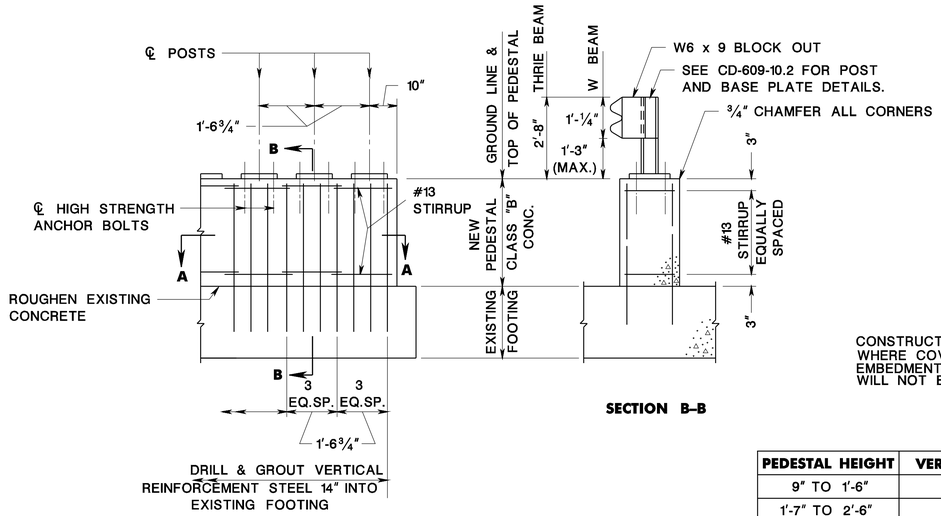
CONSTRUCTION DETAILS



STIRRUP



SECTION A–A



SECTION B–B

CONSTRUCT PEDESTAL ON EXISTING FOOTING WHERE COVER IS INSUFFICENT FOR POST EMBEDMENT IN SOIL. SEPARATE PAYMENT WILL NOT BE MADE FOR PEDESTAL.

PEDESTAL HEIGHT	VERTICAL REINFORCEMENT STEEL	STIRRUPS
9" TO 1'-6"	#16	2 - #13
1'-7" TO 2'-6"	#16	3 - #13
2'-7" TO 3'-6"	#16	4 - #13
3'-7" TO 4'-0"	#16	5 - #13

GUIDE RAIL ATTACHMENT TO FOOTING

SEE CD-609-11.2 FOR GENERAL NOTES

CD-609-11.1

GENERAL NOTES

STRUCTURAL STEEL PLATES AND SHAPES SHALL CONFORM TO ASTM A36 AND SHALL BE GALVANIZED PER ASTM A123.

STEEL BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A307, UNLESS DESIGNATED AS HIGH STRENGTH. HIGH STRENGTH BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A325. HARDWARE SHALL BE GALVANIZED PER ASTM A153.

REINFORCEMENT SHALL CONFORM TO ASTM A 615, GRADE 60.

FOR CD-609-10.2 HIGH STRENGTH BOLTS FOR BASE PLATE ANCHORAGE SHALL BE FULLY THREADED AND INSTALLED IN CORED HOLES NO GREATER THAN THE BOLT DIAMETER PLUS ¼". CARE SHALL BE EXERCISED TO AVOID DAMAGE TO EXISTING REINFORCEMENT AND CONDUITS. MINIMUM EMBEDMENT LENGTH SHALL BE 6" BOLTS SHALL BE EPOXY GROUTED IN PLACE PER MANUFACTURER'S RECOMMENDATIONS TO ATTAIN A MINIMUM PULLOUT STRENGTH OF 24,000 POUNDS AT THE CONSTRUCTION SITE AS CERTIFIED BY THE CONTRACTOR.

FOR CD-609-11.1, HIGH STRENGTH BOLTS FOR BASE PLATE ANCHORAGE MAY BE CAST IN PLACE IN FRESH CONCRETE WITH A MINIMUM EMBEDMENT LENGTH OF 20".

WELDING OF POSTS TO BASE PLATES SHALL CONFORM TO THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

CD-609-11.2

REINFORCEMENT STEEL IS IN METRIC UNITS.

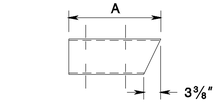
BEAM GUIDE RAIL ATTACHMENTS

N.T.S.

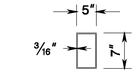
CD-609-11

NEW JERSEY DEPARTMENT OF TRANSPORTATION

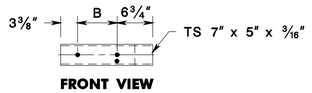
CONSTRUCTION DETAILS



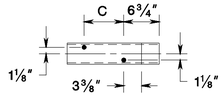
SIDE VIEW



TOP VIEW

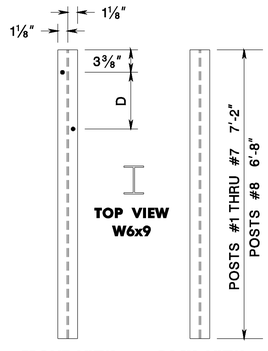


FRONT VIEW



BACK VIEW

SPACER TUBE

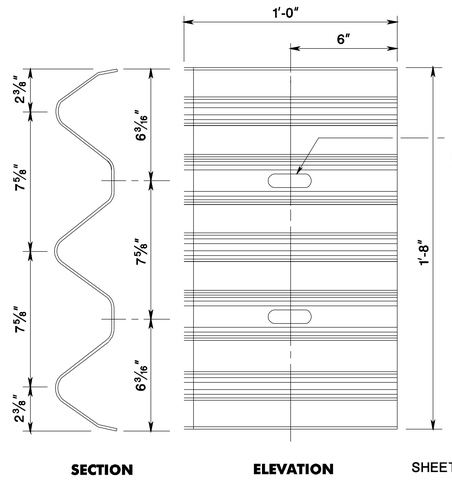


FRONT VIEW BACK VIEW

Post and Spacer Tube Dim.		
DIM.	POSTS #1 – #7	POST #8
A	1′-5¾″	1′-1⅞″
B	7⅝″	3¾″
C	7⅝″	3¾″
D	7⅝″	3¾″

NOTES:

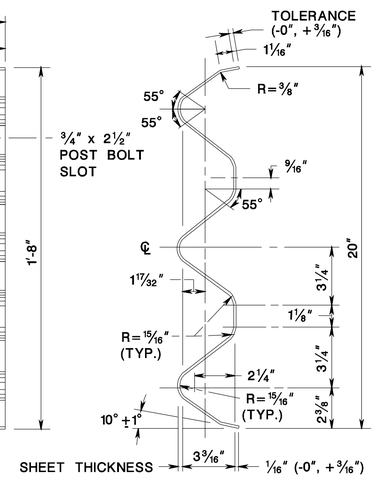
1. STEEL FOR SPACER TUBE SHALL MEET ASTM A500 GRADE B.
2. STEEL FOR WIDE-FLANGE SHALL MEET ASTM A36.
3. GALVANIZED
4. ALL HOLES DRILLED OR PUNCHED TO ¾″ DIA.
5. WELDING OF SPACER TUBE SHALL BE DONE ACCORDING TO THE ANSI/AWS D1.1 STRUCTURAL WELDING CODE.



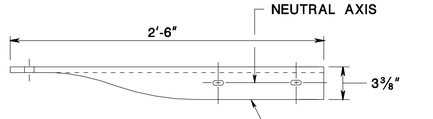
SECTION ELEVATION

(AASHTO M180, CLASS A, TYPE 1)

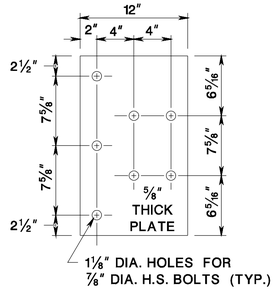
BACKUP PLATE AT NON SPLICE POSTS



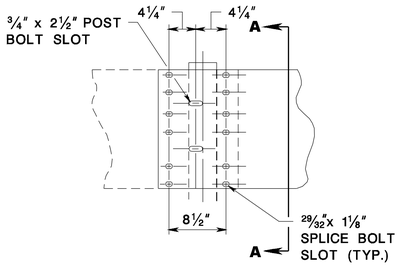
SECTION A–A



POSTS

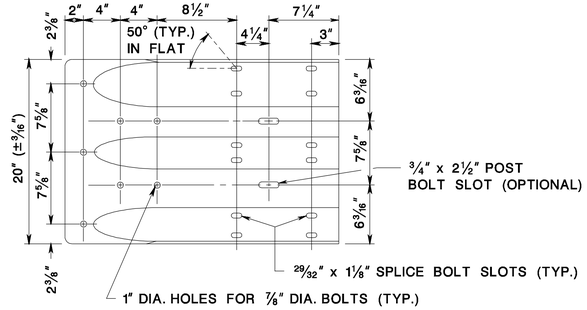


BACKUP PLATE FOR TERMINAL CONNECTOR



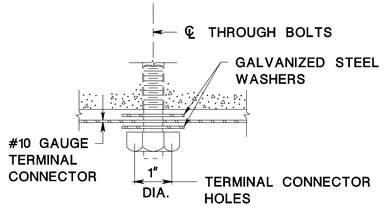
(AASHTO M180, CLASS A, TYPE 1)

ELEVATION THRIE BEAM SPLICE



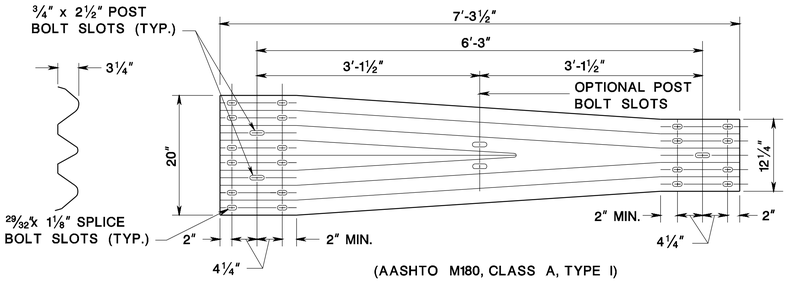
(AASHTO M180, CLASS B, TYPE 1)

TERMINAL CONNECTOR



TERMINAL ANCHORAGE

SEE CD-609-11.2 FOR GENERAL NOTES



THRIE BEAM

(AASHTO M180, CLASS A, TYPE I)

W – THRIE BEAM TRANSITION SECTION

CD-609-12.1

NOTES:

* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

(**) THREADED STEEL INSERT WITH SOLID BOTTOM TAPPED TO A MINIMUM THREADED DEPTH OF 2½″ FOR USE WITH ⅞″ - 9 x 2½″ GALVANIZED H.S. HEX BOLT & A 15/16″ I.D., 2¼″ O.D., 5/32″ THICK, TYPE A, PLAIN WASHER.

FOUR (4) BOLTS AND FOUR (4) WASHERS TO BE PROVIDED WITH EACH ASSEMBLY.

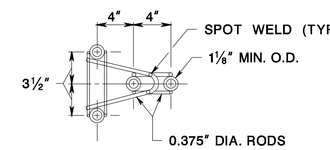
WIRES SHOWN ARE MINIMUM ALLOWABLE SIZE AND SHALL CONFORM TO THE REQUIREMENT OF ASTM A510, GRADE 1030 AND HAVE A MINIMUM TENSILE STRENGTH OF 100,000 P.S.I..

FERRULES SHALL BE MADE OF STEEL MEETING THE REQUIREMENTS OF ASTM A108, GRADE 12L14. INSERTS SHALL BE TAPPED TO THE DIMENSIONAL REQUIREMENTS SPECIFIED IN ASTM A563 FOR NUTS RECEIVING GALVANIZED BOLTS.

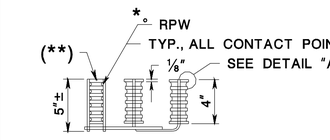
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A325 OR A449 AND SHALL BE THREADED FULL LENGTH. WASHERS SHALL BE MADE OF STEEL AND SHALL MEET THE DIMENSIONAL REQUIREMENTS OF ASTM B272 TYPE A PLAIN WASHERS. BOTH SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.

WIRE DIAMETERS, MATERIALS REQUIREMENTS, FERRULE MATERIALS REQUIREMENTS AND EXTERNAL DIAMETERS MAY BE ALTERED PROVIDED MANUFACTURER DEMONSTRATES REVISED DESIGN IS EQUIVALENT TO THE DESIGN SHOWN IN THIS STANDARD.

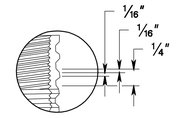
DIMENSIONAL TOLERANCE NOT SHOWN OR IMPLIED ARE INTENDED TO BE THOSE CONSISTENT WITH THE PROPER FUNCTIONING OF THE PART, INCLUDING ITS APPEARANCE, AND ACCEPTED MANUFACTURING PRACTICE.



PLAN



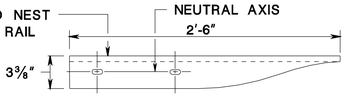
ELEVATION

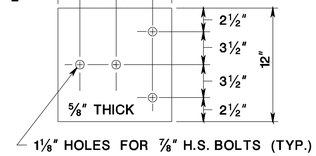


DETAIL "A"

SEE CD-609-12.1 FOR TERMINAL ANCHORAGE

CROSS SECTION IS TO NEST WITH W BEAM GUIDE RAIL

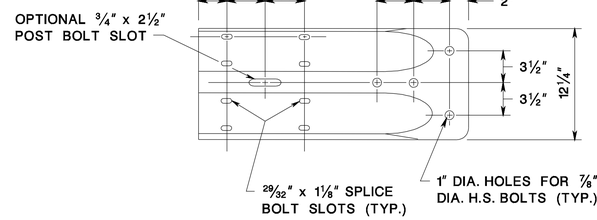




1⅛″ HOLES FOR ⅞″ H.S. BOLTS (TYP.)

BACKUP PLATE FOR TERMINAL CONNECTOR

SEE CD-609-11.2 FOR GENERAL NOTES



(AASHTO M180, CLASS B, TYPE 1)

TERMINAL CONNECTOR

W BEAM TERMINAL CONNECTOR

CD-609-12.2

THRIE BEAM AND W BEAM TERMINAL CONNECTOR

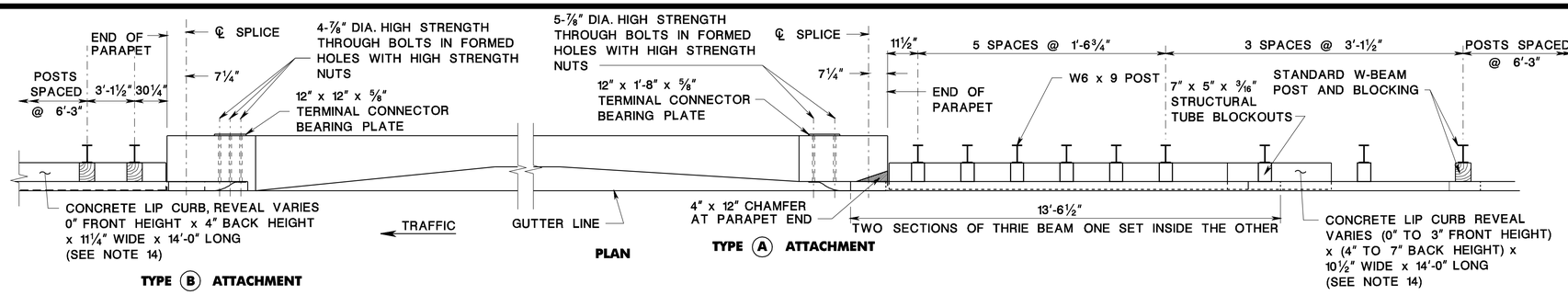
N.T.S.

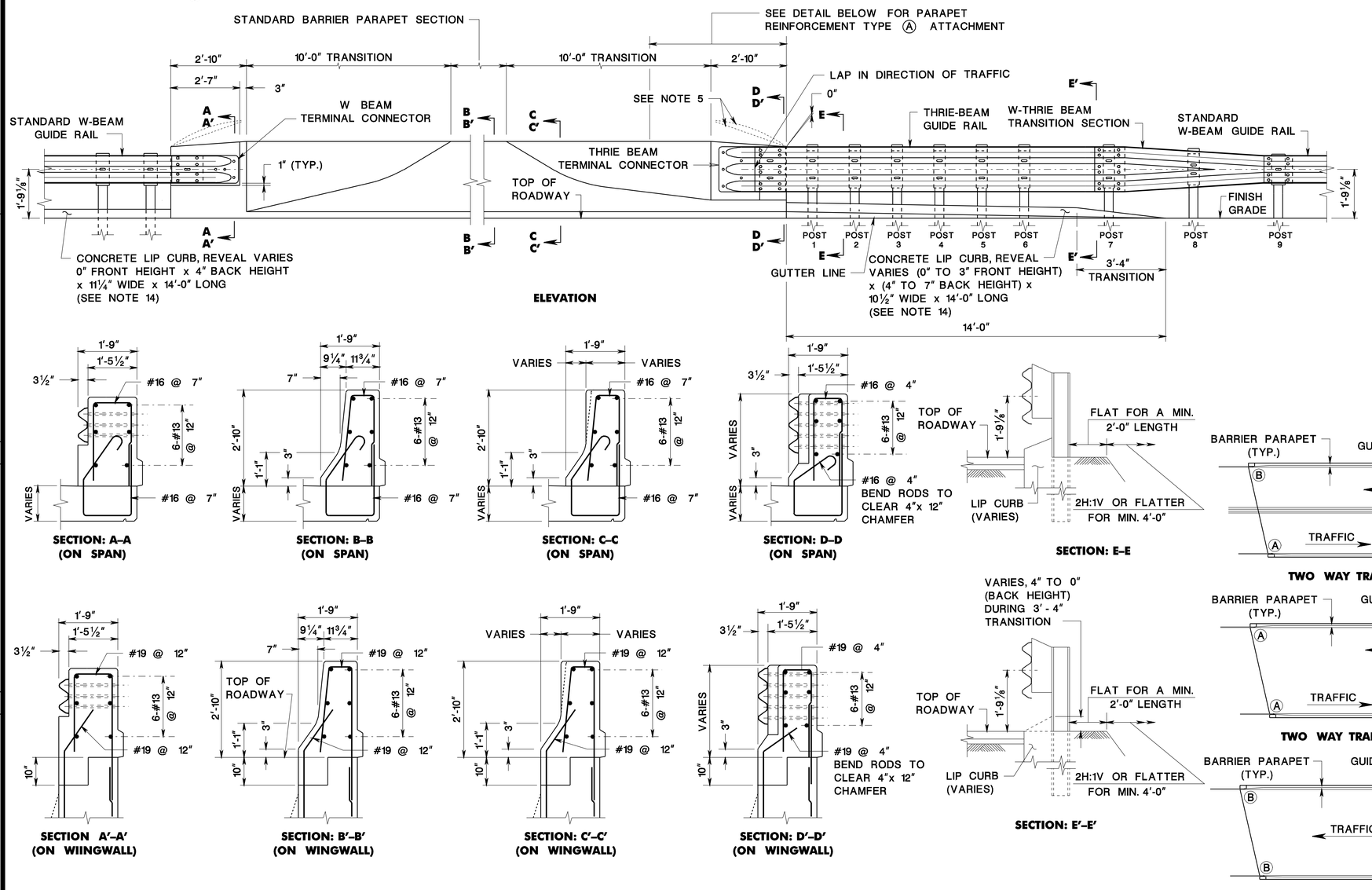
CD-609-12

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

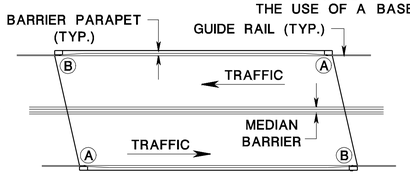
BDC07D-01-ORIGINAL SHEET

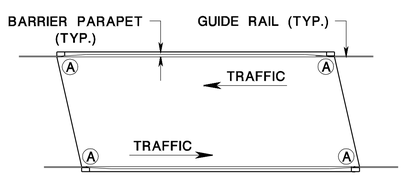


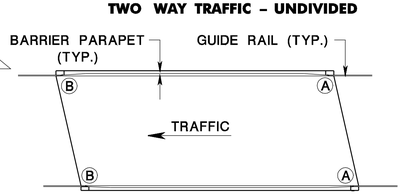


NOTES:

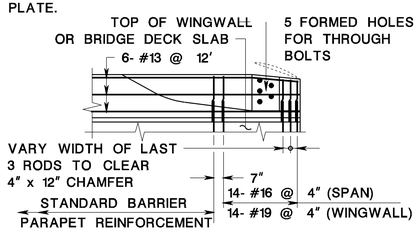
1. THIS GUIDE RAIL TRANSITION IS APPROPRIATE FOR CONNECTION TO A VERTICAL CONCRETE SHAPE AND SHOULD NOT BE CONNECTED DIRECTLY TO A CONCRETE SAFETY SHAPE. CONCRETE SAFETY BARRIER SHOULD BE TRANSITIONED TO A VERTICAL SHAPE AT THE GUIDE RAIL CONNECTION.
2. FOR RECOMMENDED ATTACHMENT, REFER TO "BRIDGE ATTACHMENT TYPES", THIS SHEET.
3. ALL CROSS SLOPES BETWEEN THE PAVEMENT EDGE AND POSTS SHALL BE 10H:1V OR FLATTER.
4. EMBANKMENT MATERIAL CONFORMING TO THE NJDOT STANDARD SPECIFICATIONS SECTION 203 SHALL EXTEND FLAT BEHIND THE POSTS AT LEAST 2'-0" AT WHICH POINT A SLOPE OF NO STEEPER THAN 2H:1V SHOULD EXTEND A MINIMUM OF 4'-0" FURTHER.
5. BARRIER PARAPET END MAY HAVE TO BE RECONFIGURED TO ACCEPT DIFFERENT TYPES OF RAILING OR FENCING THAT MAY BE MOUNTED ON TOP OF THE PARAPET.
6. AT TYPE (A) ATTACHMENTS, THRIE BEAM RAIL ELEMENT WILL REQUIRE ADDITIONAL POST MOUNTING HOLES FOR POST #1, #3 AND #5. CAUTION, HOLES ARE TO BE SHOP PUNCHED OR DRILLED BEFORE GALVANIZATION. NO FIELD DRILLING IS PERMITTED.
7. POSTS 1 THRU 7 SHALL BE 7'-2" LONG WITH 4'-10" POST EMBEDMENT. POST 8 SHALL BE 6'-8" LONG WITH 4'-6" POST EMBEDMENT. POST 9 SHALL BE 6'-8" LONG WITH 4'-4" POST EMBEDMENT.
8. LOCATE CONDUIT AT END OF BARRIER PARAPETS SO AS NOT TO INTERFERE WITH GUIDE RAIL POST SPACING.
9. LOCATE DRAINAGE INLETS AND ELECTRICAL JUNCTION BOXES ON APPROACHES SO AS NOT TO INTERFERE WITH GUIDE RAIL POST SPACING.
10. STRUCTURAL STEEL PLATES AND SHAPES SHALL CONFORM TO AASHTO M270 AND SHALL BE GALAVANIZED PER AASHTO M111.
11. HIGH STRENGTH STEEL BOLTS, NUTS AND WASHERS SHALL CONFORM TO AASHTO M164. ZINC COATED BOLTS, NUTS AND WASHERS SHALL BE TREATED ACCORDING TO AASHTO M232M.
12. THE THICKNESS OF THRIE-BEAM, W-BEAM AND W-THRIE BEAM TRANSITION SHALL BE 12-GAUGE.
13. FOR ADDITIONAL THRIE BEAM, AND W-BEAM DETAILS REFER TO CD-609-1, CD-609-3, AND CD-609-12.
14. CONCRETE LIP CURB TO BE PAID UNDER 9"X16" CONCRETE VERTICAL CURB,SEE CD-607-1.9. CONCRETE LIP CURB MAY BE OMITTED AT UNDERPASS, WHERE EROSION CONTROL IS NOT NECESSARY.
15. WHEN THE CONFIGURATION OF BRIDGE ABUTMENTS AND WINGWALLS DO NOT ACCOMMODATE THE INSTALLATION OF POST 1, THE POST MAY BE ATTACHED TO THE ABUTMENT HEADER WITH THE USE OF A BASE PLATE.







BRIDGE ATTACHMENT TYPES
CD-609-13.1



INTERIOR ELEVATION
PARAPET REINFORCEMENT
TYPE (A) ATTACHMENT

REINFORCEMENT STEEL IS IN METRIC UNITS.

BEAM GUIDE RAIL ATTACHMENTS

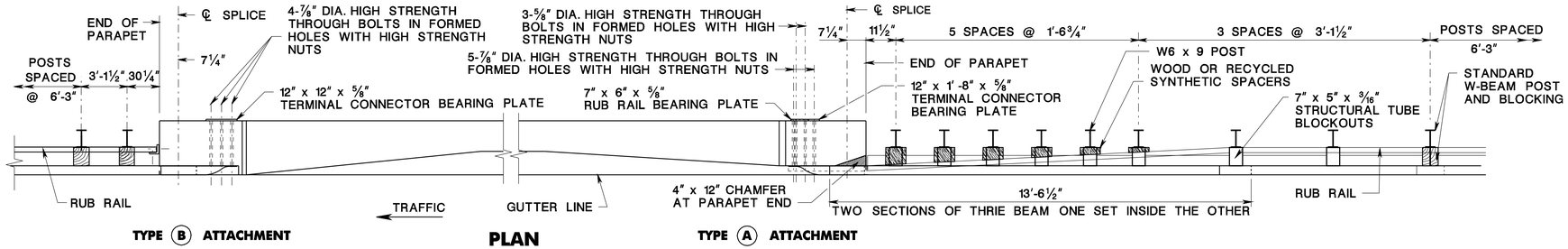
N.T.S.

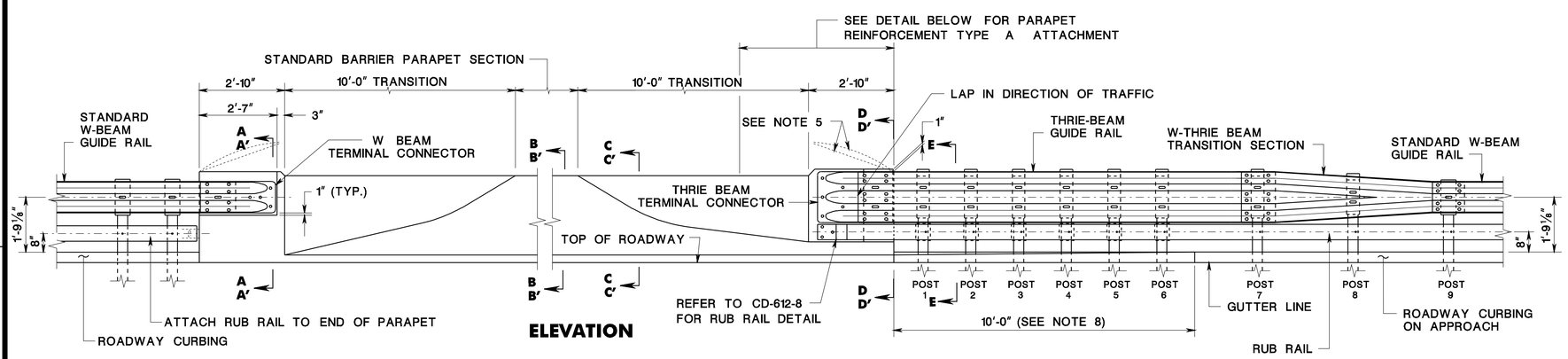
CD-609-13

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

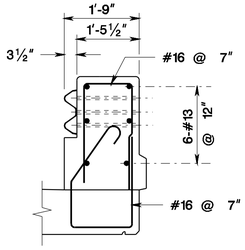
GUIDE RAIL ATTACHMENT – NEW CONSTRUCTION
NEW JERSEY BARRIER SHAPE PARAPET (NO ROADWAY CURBING ON APPROACH)



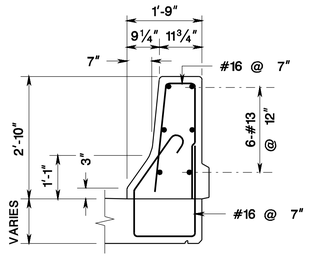


NOTES:

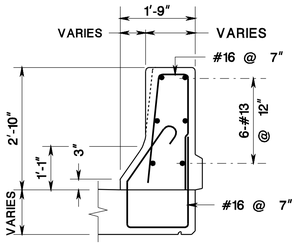
1. THIS GUIDE RAIL TRANSITION IS APPROPRIATE FOR CONNECTION TO A VERTICAL CONCRETE SHAPE AND SHOULD NOT BE CONNECTED DIRECTLY TO A CONCRETE SAFETY SHAPE. CONCRETE SAFETY BARRIER SHOULD BE TRANSITIONED TO A VERTICAL SHAPE AT THE GUIDE RAIL CONNECTION.
2. FOR RECOMMENDED ATTACHMENT, REFER TO "BRIDGE ATTACHMENT TYPES", THIS SHEET.
3. ALL CROSS SLOPES BETWEEN THE PAVEMENT EDGE AND POSTS SHALL BE 1V:10H OR FLATTER.
4. EMBANKMENT MATERIAL CONFORMING TO THE NJDOT STANDARD SPECIFICATIONS SECTION 203 SHALL EXTEND FLAT BEHIND THE POSTS AT LEAST 2'-0" AT WHICH POINT A SLOPE OF NO STEEPER THAN 1V:2H SHOULD EXTEND A MINIMUM OF 4'-0" FURTHER.
5. BARRIER PARAPET END MAY HAVE TO BE RECONFIGURED TO ACCEPT DIFFERENT TYPES OF RAILING OR FENCING THAT MAY BE MOUNTED ON TOP OF THE PARAPET.
6. AT TYPE A ATTACHMENTS, THRIE BEAM RAIL ELEMENT WILL REQUIRE ADDITIONAL POST MOUNTING HOLES FOR POST #1, #3 AND #5. CAUTION, HOLES ARE TO BE SHOP PUNCHED OR DRILLED BEFORE GALVANIZATION. NO FIELD DRILLING IS PERMITTED.
7. POSTS 1 THRU 7 SHALL BE 7'-2" LONG WITH 4'-10" POST EMBEDMENT. POST 8 SHALL BE 6'-8" LONG WITH 4'-6" POST EMBEDMENT. POST 9 SHALL BE 6'-8" LONG WITH 4'-4" POST EMBEDMENT.
8. TRANSITION LAST 10 FEET OF ROADWAY CURBING TO MATCH BARRIER PARAPET SHAPE.
9. LOCATE CONDUIT AT END OF BARRIER PARAPETS SO AS NOT TO INTERFERE WITH GUIDE RAIL POST SPACING.
10. LOCATE DRAINAGE INLETS AND ELECTRICAL JUNCTION BOXES ON APPROACHES SO AS TO NOT INTERFERE WITH GUIDE RAIL POST SPACING.
11. STRUCTURAL STEEL PLATES AND SHAPES SHALL CONFORM TO AASHTO M270 AND SHALL BE GALAVANIZED PER AASHTO M111.
12. HIGH STRENGTH STEEL BOLTS, NUTS AND WASHERS SHALL CONFORM TO AASHTO M164. ZINC COATED BOLTS, NUTS AND WASHERS SHALL BE TREATED ACCORDING TO AASHTO M232M.
13. THE THICKNESS OF THRIE-BEAM, W-BEAM AND W-THRIE BEAM TRANSITION SHALL BE 12-GAUGE.
14. FOR ADDITIONAL THRIE BEAM AND W-BEAM DETAILS REFER TO CD-609-1, CD-609-3, AND CD-609-12.
15. WHEN THE CONFIGURATION OF BRIDGE ABUTMENTS AND WINGWALLS DO NOT ACCOMMODATE THE INSTALLATION OF POST 1, THE POST MAY BE ATTACHED TO THE ABUTMENT HEADER WITH THE USE OF A BASE PLATE.



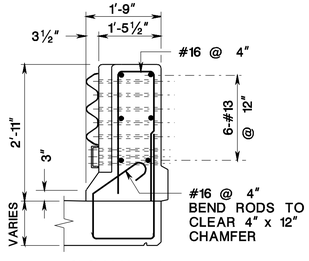
SECTION: A–A (ON SPAN)



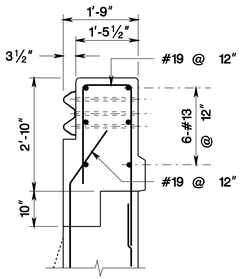
SECTION: B–B (ON SPAN)



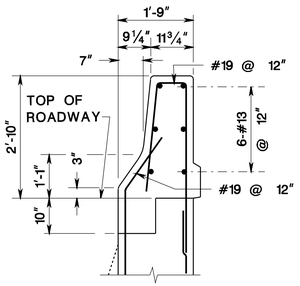
SECTION: C–C (ON SPAN)



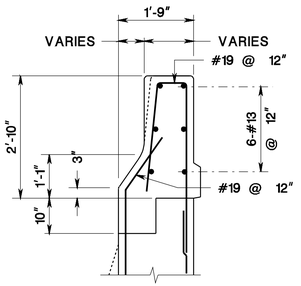
SECTION: D–D (ON SPAND)



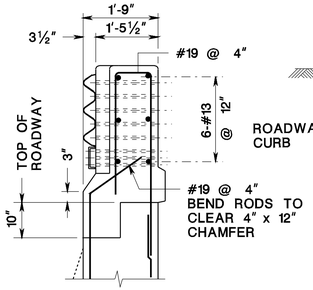
SECTION A'–A' (ON WIINGWALL)



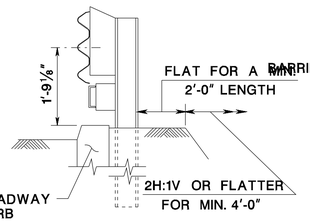
SECTION: B'–B' (ON WINGWALL)



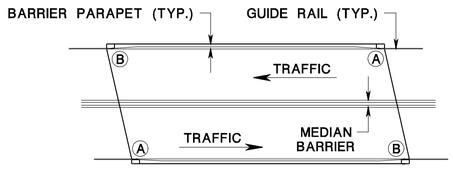
SECTION: C'–C' (ON WINGWALL)



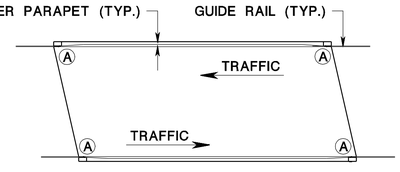
SECTION: D'–D' (ON WINGWALL)



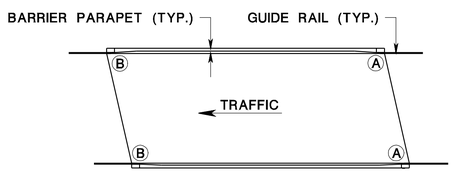
SECTION: E–E



TWO WAY TRAFFIC – DIVIDED



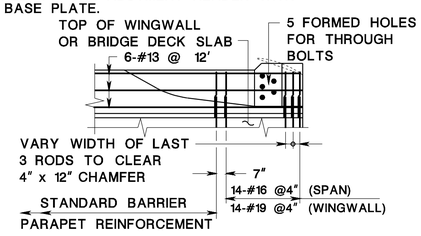
TWO WAY TRAFFIC – UNDIVIDED



ONE WAY TRAFFIC

BRIDGE ATTACHMENT TYPES

CD-609-14.1



INTERIOR ELEVATION PARAPET REINFORCEMENT TYPE (A) ATTACHMENT

REINFORCEMENT STEEL IS IN METRIC UNITS.

GUIDE RAIL ATTACHMENT – NEW CONSTRUCTION
NEW JERSEY BARRIER SHAPE PARAPET (WITH ROADWAY CURBING ON APPROACH)

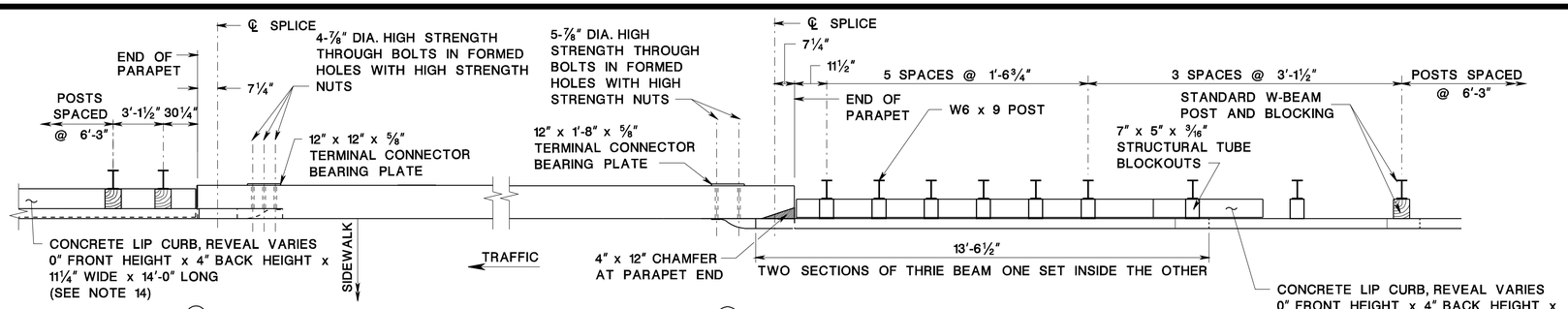
BEAM GUIDE RAIL ATTACHMENTS

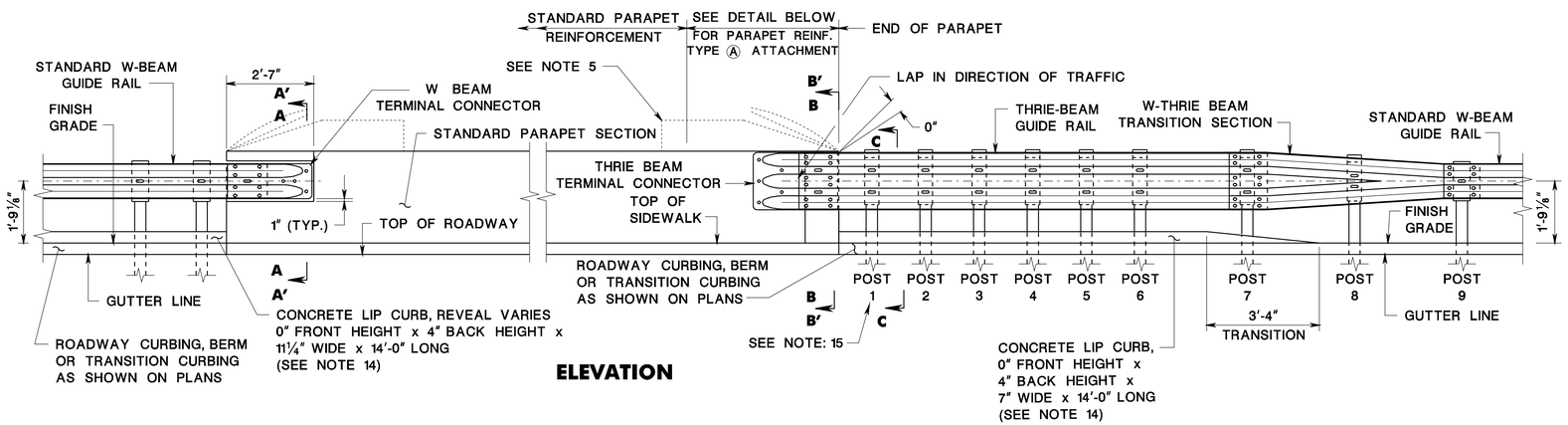
N.T.S.

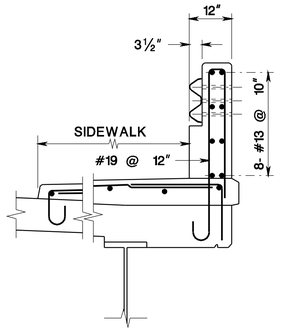
CD-609-14

NEW JERSEY DEPARTMENT OF TRANSPORTATION

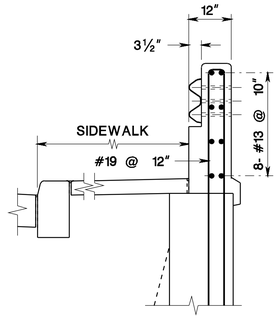
CONSTRUCTION DETAILS



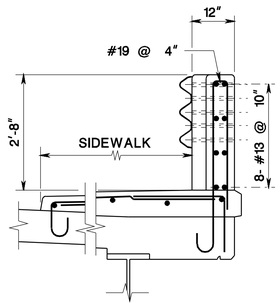




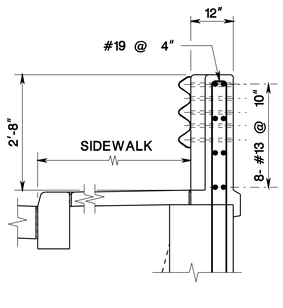
SECTION: A–A
(ON SPAN)



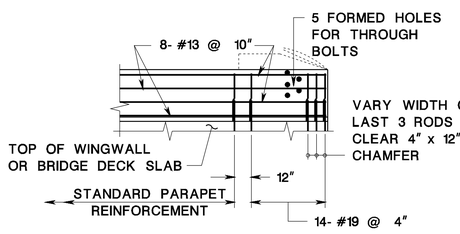
SECTION: A′–A′
(ON WINGWALL)



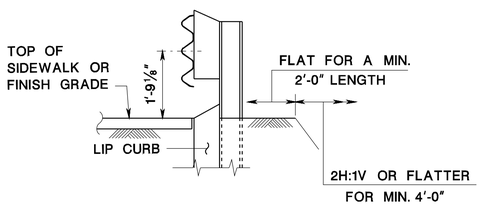
SECTION: B–B
(ON SPAN)



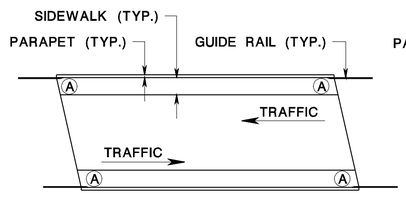
SECTION: B′–B′
(ON WINGWALL)



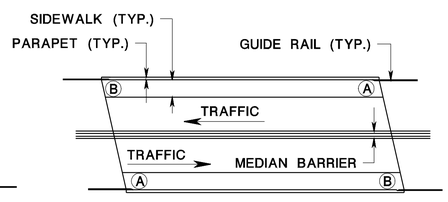
INTERIOR ELEVATION
PARAPET REINFORCEMENT
TYPE (A) ATTACHMENT



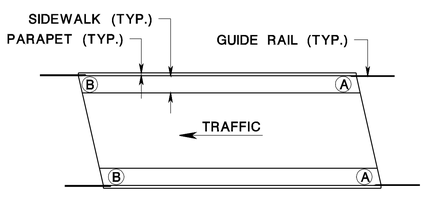
SECTION: C–C



TWO WAY TRAFFIC – UNDIVIDED



TWO WAY TRAFFIC – DIVIDED



ONE WAY TRAFFIC

BRIDGE ATTACHMENT TYPES

NOTES:

1. THIS GUIDE RAIL TRANSITION IS APPROPRIATE FOR CONNECTION TO A VERTICAL CONCRETE SHAPE.
2. FOR RECOMMENDED ATTACHMENT TYPE, REFER TO "BRIDGE ATTACHMENT TYPES", THIS SHEET.
3. ALL CROSS SLOPES BETWEEN THE PAVEMENT EDGE AND POSTS SHALL BE 10H:1V OR FLATTER.
4. EMBANKMENT MATERIAL CONFORMING TO THE NJDOT STANDARD SPECIFICATIONS SECTION 203 SHALL EXTEND FLAT BEHIND THE POSTS AT LEAST 2′-0″ AT WHICH POINT A SLOPE OF NO STEEPER THAN 2H:1V SHOULD EXTEND A MINIMUM OF 4′-0″ FURTHER.
5. WHEN RAILING IS INSTALLED ON TOP OF PARAPET, PARAPET END SHALL BE MODIFIED TO ACCOMODATE HORIZONTAL RAIL ATTACHMENT TO PARAPET. REFER TO STANDARD RAILING PLATE FOR ATTACHMENT DETAILS.
6. AT TYPE (A) ATTACHMENTS, THRIE BEAM RAIL ELEMENT WILL REQUIRE ADDITIONAL POST MOUNTING HOLES FOR POST #1, 3 & 5. CAUTION, HOLES ARE TO BE SHOP PUNCHED OR DRILLED BEFORE GALVANIZATION. NO FIELD DRILLING IS PERMITTED.
7. POSTS 1 THRU 7 SHALL BE 7′-2″ LONG WITH 4′-10″ POST EMBEDMENT. POST 8 SHALL BE 6′-8″ LONG WITH 4′-6″ POST EMBEDMENT. POST 9 SHALL BE 6′-8″ LONG WITH 4′-4″ POST EMBEDMENT.
8. LOCATE CONDUIT AT END OF PYLON SO AS NOT TO INTERFERE WITH GUIDE RAIL POST SPACING.
9. LOCATE DRAINAGE INLETS AND ELECTRIC JUNCTION BOXES ON APPROACHES SO AS NOT TO INTERFERE WITH GUIDE RAIL POST SPACING.
10. STRUCTURAL STEEL PLATES AND SHAPES SHALL CONFORM TO AASHTO M270 AND SHALL BE GALVANIZED AS PER AASHTO M111.
11. HIGH STRENGTH STEEL BOLTS, NUTS AND WASHERS SHALL CONFORM TO AASHTO M164. ZINC COATED BOLTS, NUTS AND WASHERS SHALL BE TREATED ACCORDING TO AASHTO M232M.
12. THE THICKNESS OF THRIE-BEAM, W-BEAM AND W-THRIE BEAM TRANSITION SHALL BE 12-GAUGE.
13. FOR ADDITIONAL THRIE BEAM, AND W-BEAM DETAILS REFER TO CD-609-1, CD-609-3, AND CD-609-12.
14. CONCRETE LIP CURB TO BE PAID UNDER 9"X16" CONCRETE VERTICAL CURB, SEE CD-607-1.9. CONCRETE LIP CURB MAY BE OMITTED AT UNDERPASS, WHERE EROSION CONTROL IS NOT NECESSARY.
15. WHEN THE CONFIGURATION OF BRIDGE ABUTMENTS AND WINGWALLS DO NOT ACCOMMODATE THE INSTALLATION OF POST 1, THE POST MAY BE ATTACHED TO THE ABUTMENT HEADER WITH THE USE OF A BASE PLATE.

GUIDE RAIL ATTACHMENT – NEW CONSTRUCTION (SIDEWALK WITH PARAPET)

NOTE:

REINFORCEMENT STEEL IS IN METRIC UNITS.

BEAM GUIDE RAIL ATTACHMENTS

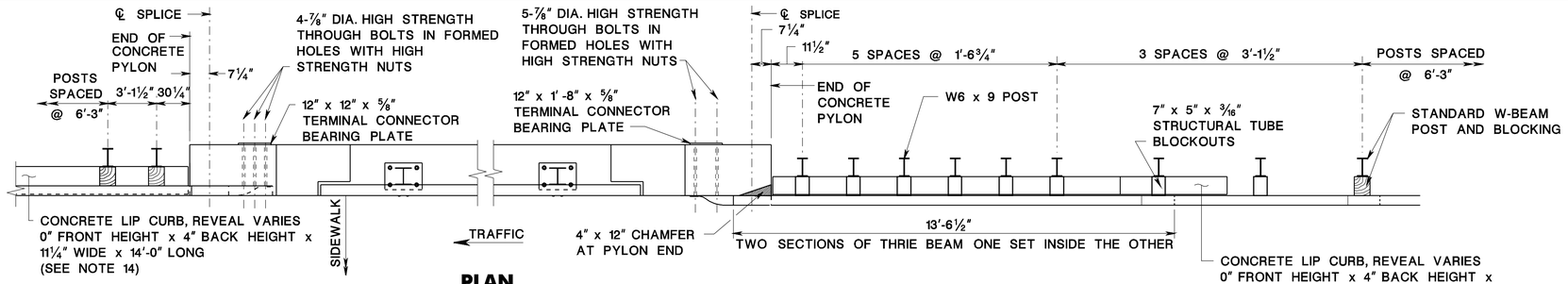
N.T.S.

CD-609-15

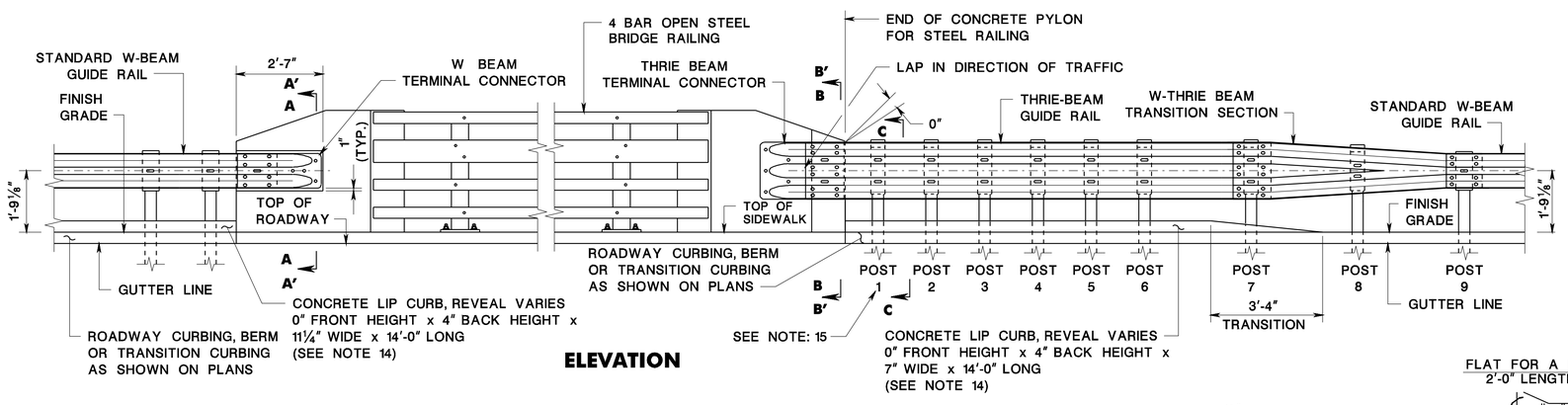
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

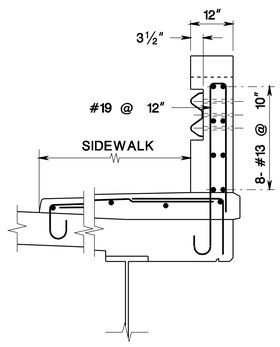
CD-609-15.1



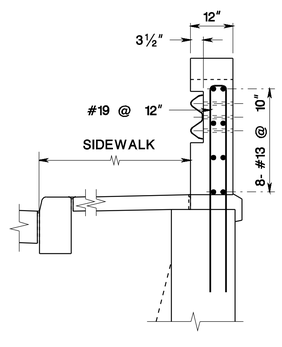
PLAN



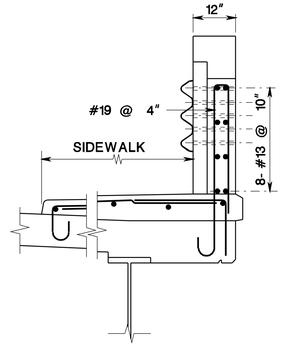
ELEVATION



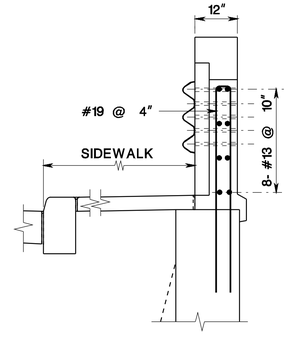
SECTION: A–A (ON SPAN)



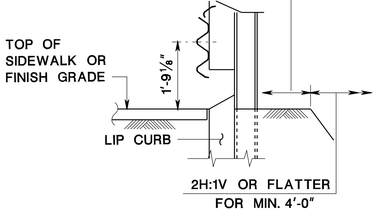
SECTION: A'–A' (ON WINGWALL)



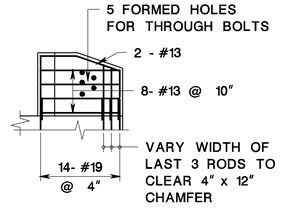
SECTION: B–B (ON SPAN)



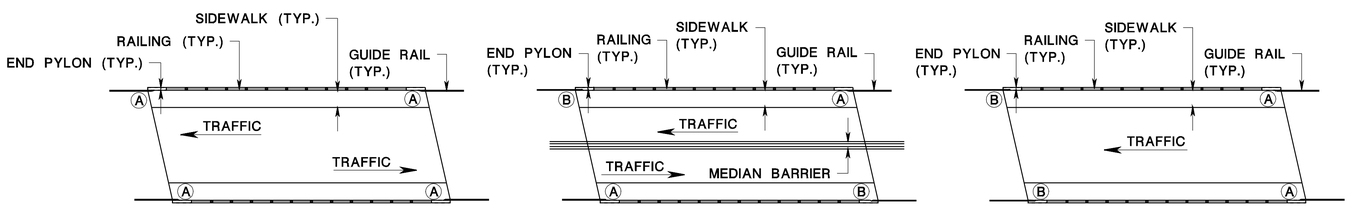
SECTION: B'–B' (ON WINGWALL)



SECTION: C–C



INTERIOR ELEVATION PYLON REINFORCEMENT TYPE (A) ATTACHMENT



TWO WAY TRAFFIC – UNDIVIDED

TWO WAY TRAFFIC – DIVIDED

ONE WAY TRAFFIC

BRIDGE ATTACHMENT TYPES

NOTES:

1. THIS GUIDE RAIL TRANSITION IS APPROPRIATE FOR CONNECTION TO A VERTICAL CONCRETE SHAPE.
2. FOR RECOMMENDED ATTACHMENT TYPE, REFER TO "BRIDGE ATTACHMENT TYPES", THIS SHEET.
3. ALL CROSS SLOPES BETWEEN THE PAVEMENT EDGE AND POSTS SHALL BE 10H:1V OR FLATTER.
4. EMBANKMENT MATERIAL CONFORMING TO THE NJDOT STANDARD SPECIFICATIONS SECTION 203 SHALL EXTEND FLAT BEHIND THE POSTS AT LEAST 2'-0" AT WHICH POINT A SLOPE OF NO STEEPER THAN 2H:1V SHOULD EXTEND A MINIMUM OF 4'-0" FURTHER.
5. CONCRETE PYLONS TO BE CONSTRUCTED AT ALL ENDS OF STEEL RAILING. ATTACH GUIDE RAIL TO THE PYLONS.
6. AT TYPE (A) ATTACHMENTS, THRIE BEAM RAIL ELEMENT WILL REQUIRE ADDITIONAL POST MOUNTING HOLES FOR POST #1, 3 & 5. CAUTION, HOLES ARE TO BE SHOP PUNCHED OR DRILLED BEFORE GALVANIZATION. NO FIELD DRILLING IS PERMITTED.
7. POSTS 1 THRU 7 SHALL BE 7'-2" LONG WITH 4'-10" POST EMBEDMENT. POST 8 SHALL BE 6'-8" LONG WITH 4'-6" POST EMBEDMENT. POST 9 SHALL BE 6'-8" LONG WITH 4'-4" POST EMBEDMENT.
8. LOCATE CONDUIT AT END OF PYLON SO AS NOT TO INTERFERE WITH GUIDE RAIL POST SPACING.
9. LOCATE DRAINAGE INLETS AND ELECTRIC JUNCTION BOXES ON APPROACHES SO AS NOT TO INTERFERE WITH GUIDE RAIL POST SPACING.
10. STRUCTURAL STEEL PLATES AND SHAPES SHALL CONFORM TO AASHTO M270 AND SHALL BE GALVANIZED AS PER AASHTO M111.
11. HIGH STRENGTH STEEL BOLTS, NUTS AND WASHERS SHALL CONFORM TO AASHTO M164. ZINC COATED BOLTS, NUTS AND WASHERS SHALL BE TREATED ACCORDING TO AASHTO M232M.
12. THE THICKNESS OF THRIE-BEAM, W-BEAM AND W-THRIE BEAM TRANSITION SHALL BE 12-GAUGE.
13. FOR ADDITIONAL THRIE BEAM, AND W-BEAM DETAILS REFER TO CD-609-1, CD-609-3, AND CD-609-12
14. CONCRETE LIP CURB TO BE PAID UNDER 9"X16" CONCRETE VERTICAL CURB, SEE CD-607-1.9. CONCRETE LIP CURB MAY BE OMITTED AT UNDERPASS, WHERE EROSION CONTROL IS NOT NECESSARY.
15. WHEN THE CONFIGURATION OF BRIDGE ABUTMENTS AND WINGWALLS DO NOT ACCOMMODATE THE INSTALLATION OF POST 1, THE POST MAY BE ATTACHED TO THE ABUTMENT HEADER WITH THE USE OF A BASE PLATE.

GUIDE RAIL ATTACHMENT – NEW CONSTRUCTION (SIDEWALK WITH STEEL RAILING)

NOTE:

REINFORCEMENT STEEL IS IN METRIC UNITS.

BEAM GUIDE RAIL ATTACHMENTS

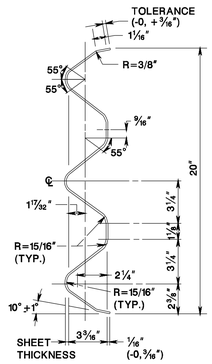
N.T.S.

CD-609-16

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

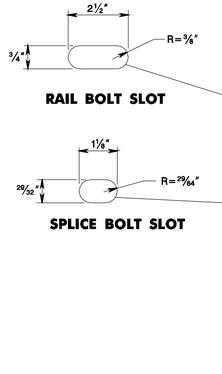
CD-609-16.1

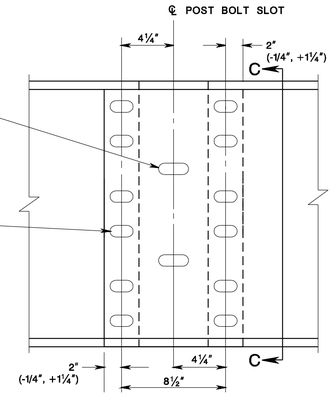


SECTION C–C

THRIE–BEAM RAIL ELEMENT

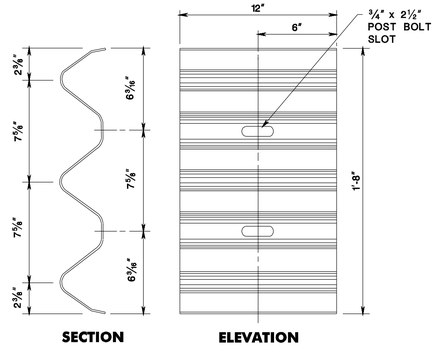
RAIL ELEMENT SHALL BE SUPPLIED IN LENGTHS OF 13'-6½" OR 25'-0¼"





ELEVATION

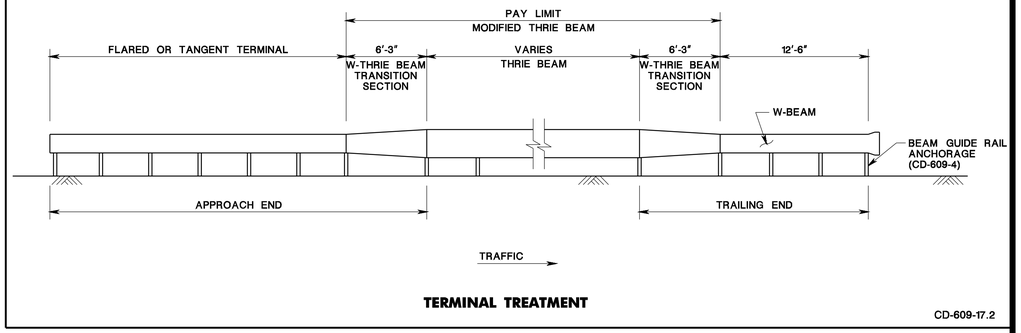
THRIE BEAM RAIL SPLICE



SECTION

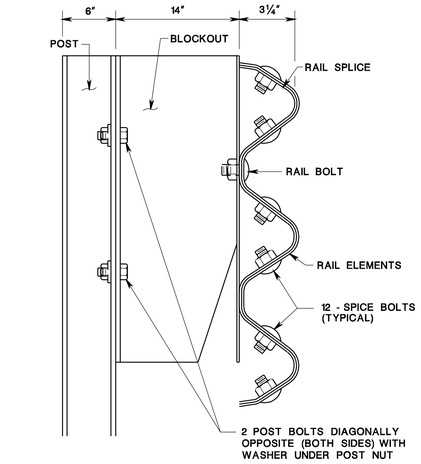
ELEVATION

BACK–UP PLATE AT NON–SPLICE POSTS

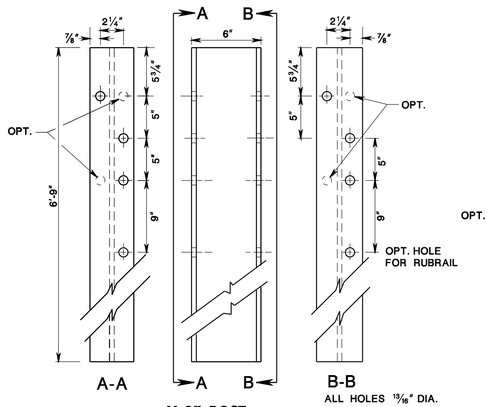


TERMINAL TREATMENT

CD-609-17.2

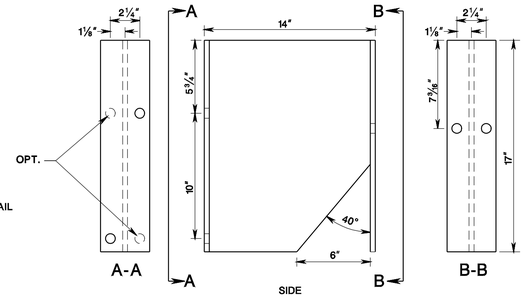


POST ASSEMBLY



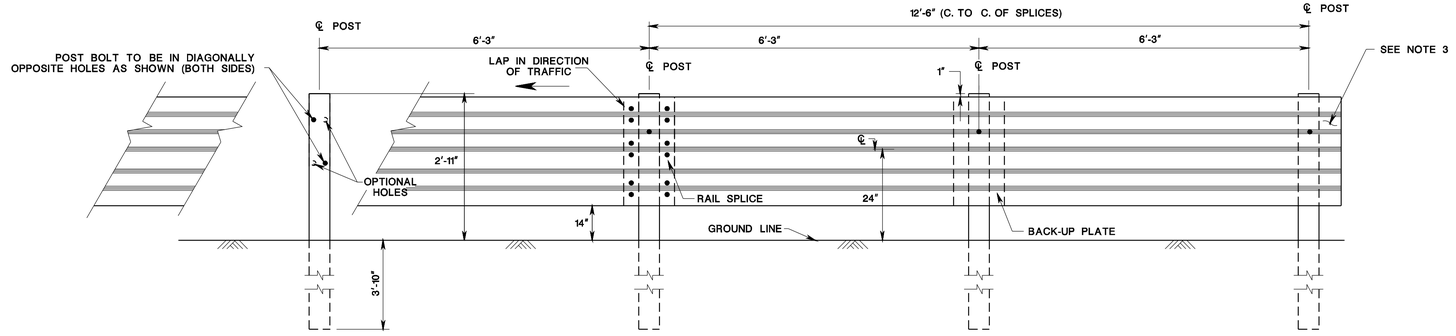
6'–9" POST

W6X9 OR W6X8.5 STRUCTURAL SHAPE

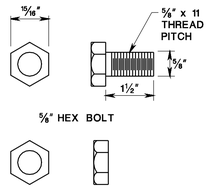


17" BLOCKOUT

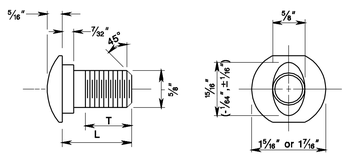
M14X18 STRUCTURAL SHAPE
or
W14X22 STRUCTURAL SHAPE



MODIFIED THRIE BEAM GUIDE RAIL

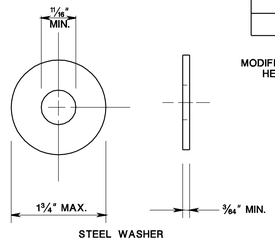


POST NUT & BOLT



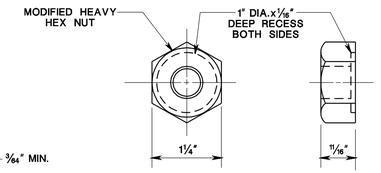
5/8" BUTTON HEAD BOLT

TYPE	L	MIN. THREAD LENGTH (T)
SPLICE	1¼"	FULL LENGTH THREAD
RAIL	2"	



STEEL WASHER

WASHER



5/8" RECESS NUT

SPLICE & RAIL NUT & BOLT

NOTES:

1. ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES
2. RAIL ELEMENTS SHALL BE FURNISHED SHOPCURVED, CONCAVE OR CONVEX, FOR RADII BETWEEN 20 FEET AND 150 FEET
3. SEE CD-609.17.2 FOR TERMINAL TREATMENT

MODIFIED THRIE BEAM GUIDE RAIL

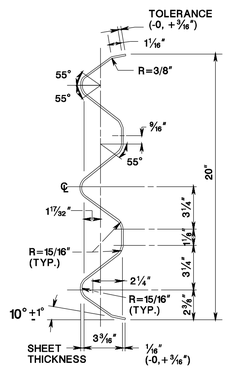
N.T.S.

CD-609-17

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

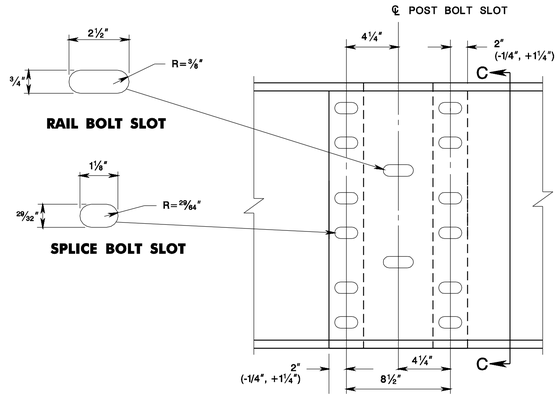
CD-609-17.1



SECTION C–C

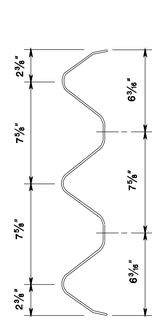
THRIE–BEAM RAIL ELEMENT

RAIL ELEMENT SHALL BE SUPPLIED IN LENGTHS OF 13'-6½" OR 25'-0¼"

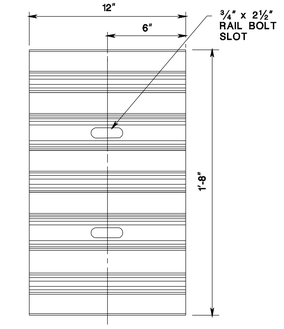


ELEVATION

THRIE BEAM RAIL SPLICE

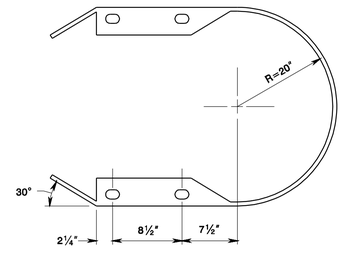


SECTION

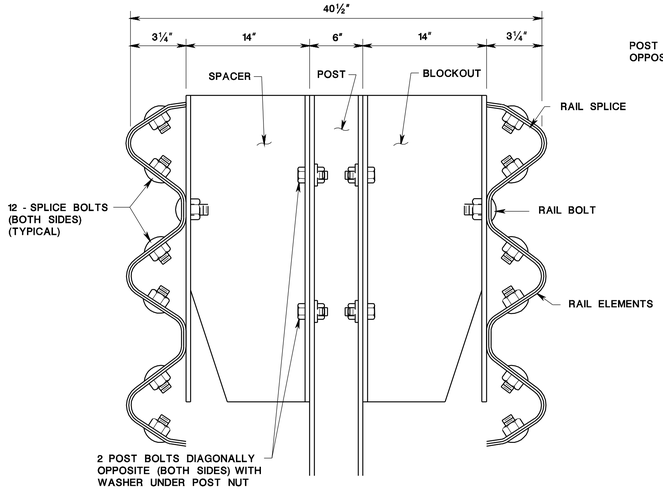


ELEVATION

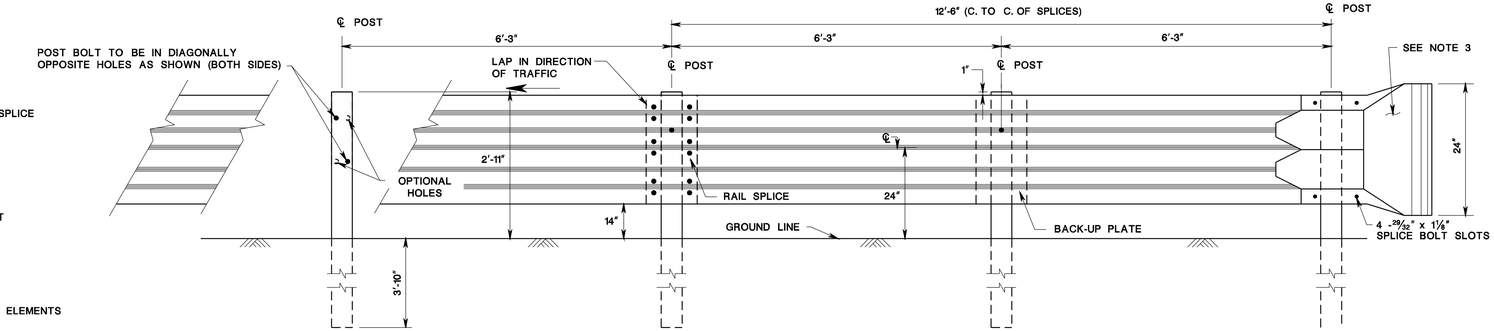
BACK–UP PLATE AT NON–SPLICE POSTS



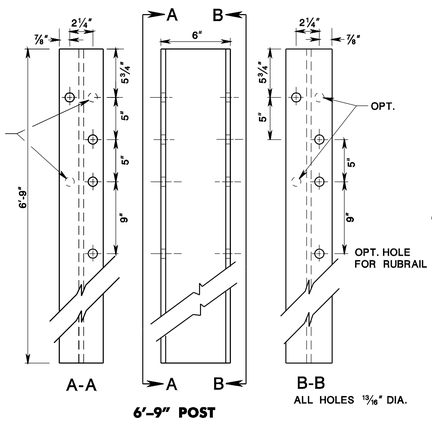
END SECTION (BUFFER)



DUAL – FACED POST ASSEMBLY

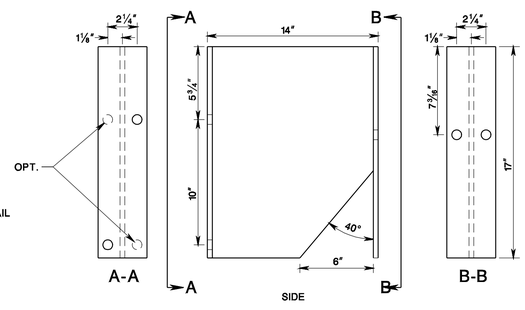


MODIFIED THRIE BEAM GUIDE RAIL, DUAL–FACED



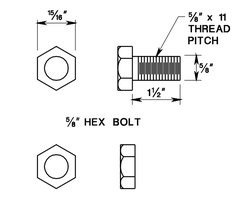
6'–9" POST

W6X9 OR W6X8.5 STRUCTURAL SHAPE

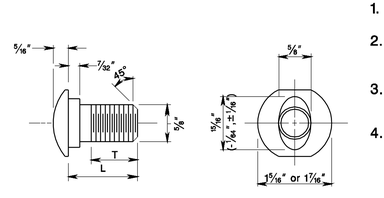


17" BLOCKOUT

M14X18 STRUCTURAL SHAPE
or
W14X22 STRUCTURAL SHAPE

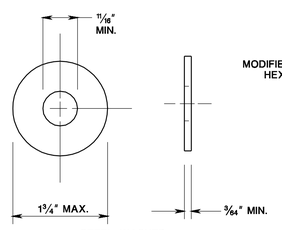


POST NUT & BOLT



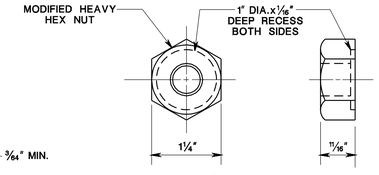
⅝" BUTTON HEAD BOLT

TYPE	L	MIN. THREAD LENGTH (T)
SPLICE	1¼"	FULL LENGTH THREAD
RAIL	2"	1½"



STEEL WASHER

WASHER



⅝" RECESS NUT

SPLICE & RAIL NUT & BOLT

NOTES:

1. ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES
2. RAIL ELEMENTS SHALL BE FURNISHED SHOPCURVED, CONCAVE OR CONVEX, FOR RADII BETWEEN 20 FEET AND 150 FEET
3. USE END SECTION (BUFFER) UNLESS THE CONSTRUCTION PLANS CALL FOR ANOTHER TYPE OF END TREATMENT
4. USE A 25' GUIDE RAIL TRANSITION WHERE A TELESCOPING GUIDE RAIL END TREATMENT IS TO BE ATTACHED TO THE END OF MODIFIED THRIE BEAM DUAL-FACED

MODIFIED THRIE BEAM GUIDE RAIL, DUAL–FACED

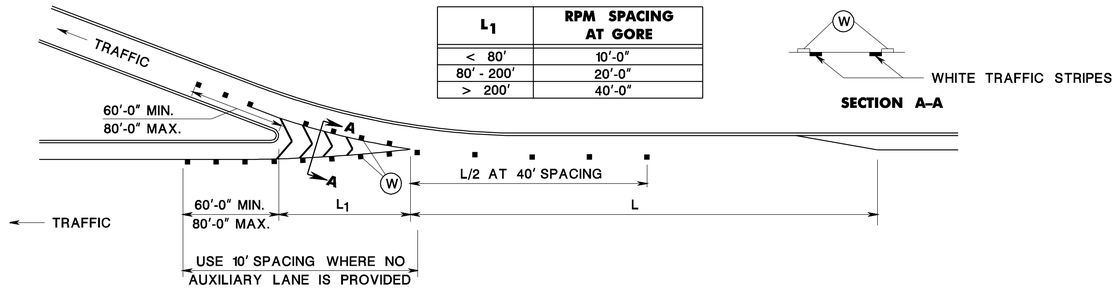
N.T.S.

CD-609-18

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

CD-612-18.1



L_1	RPM SPACING AT GORE
< 80'	10'-0"
80' - 200'	20'-0"
> 200'	40'-0"

SECTION A–A

TYPICAL DECELERATION LANE TREATMENT

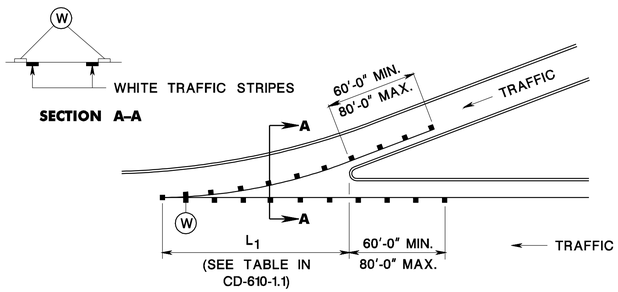
CD-610-1.1

LEGEND

(W) TWO-WAY WHITE LENS RPM

(A) TWO-WAY AMBER LENS RPM

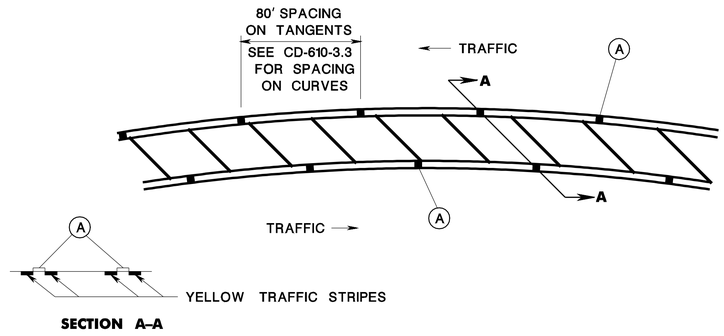
CD-610-1.2



SECTION A–A

TYPICAL ACCELERATION LANE TREATMENT

CD-610-1.3



SECTION A–A

TYPICAL PAVED MEDIAN TREATMENT

CD-610-1.4

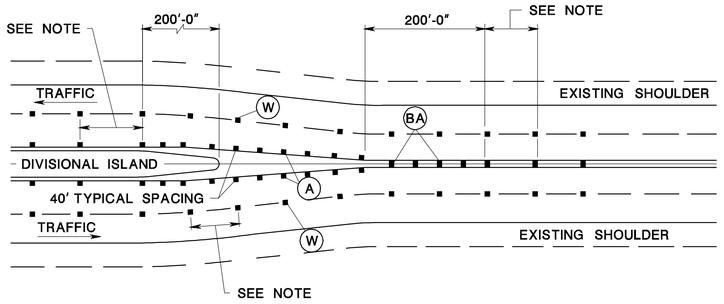
RAISED PAVEMENT MARKER, (RPM) LOCATION

N.T.S.

CD-610-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

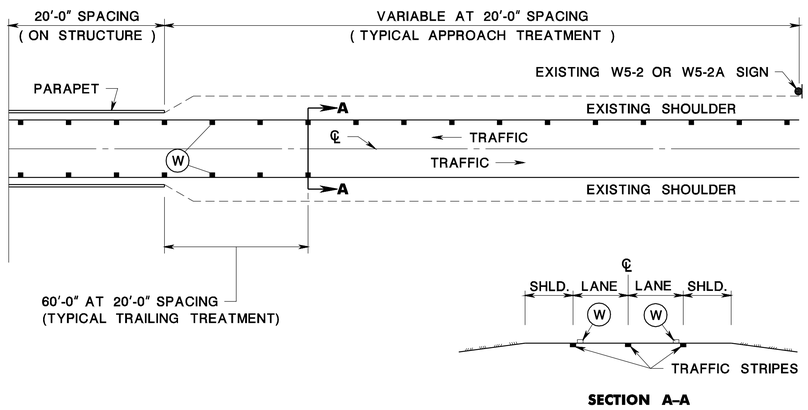
CONSTRUCTION DETAILS



NOTE:
80 FOOT SPACING ON TANGENT FOR SPACING ON CURVES SEE CD-610-3.3

TYPICAL DIVISIONAL ISLAND TREATMENT

CD-610-2.1



SECTION A–A

NARROW BRIDGE OR CULVERT TREATMENT

CD-610-2.2

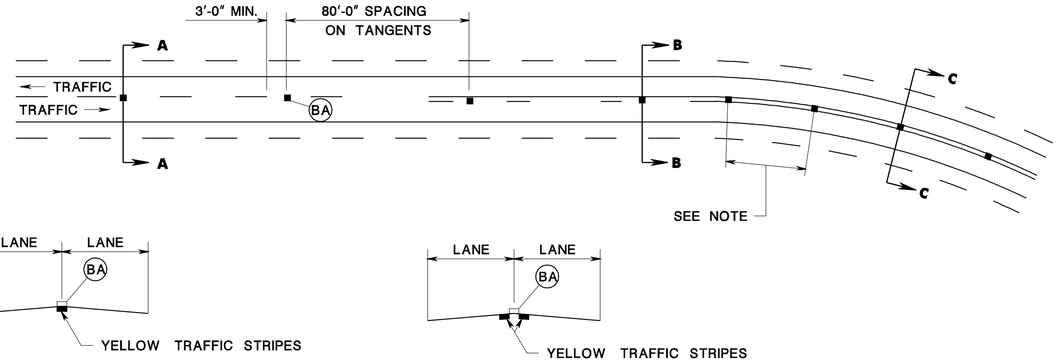
LEGEND

(W) TWO-WAY MONO-DIRECTIONAL WHITE LENS, RPM

(A) TWO-WAY MONO-DIRECTIONAL AMBER LENS, RPM

(BA) TWO-WAY BI-DIRECTIONAL AMBER LENS, RPM

CD-610-2.3



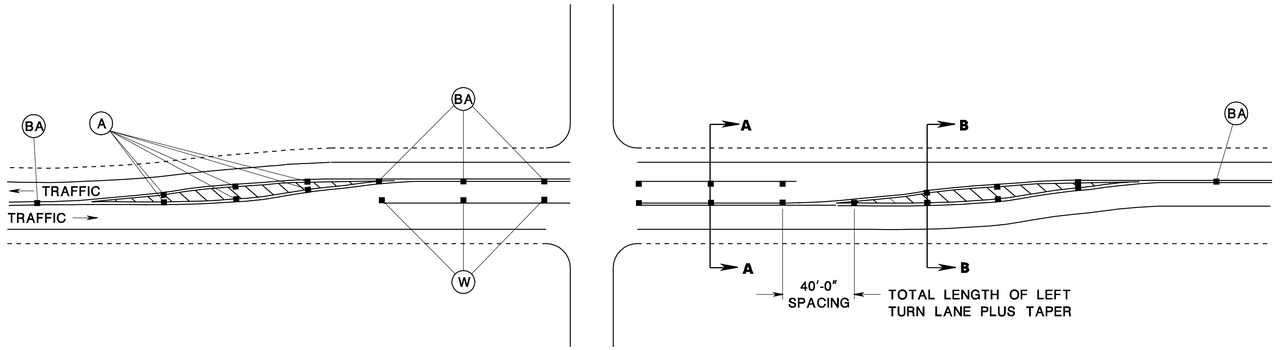
SECTION A–A

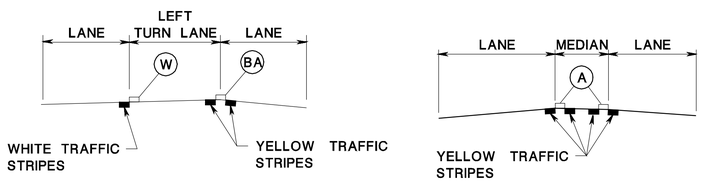
SECTION B–B & SECTION C–C

NOTE:
FOR SPACING ON CURVES SEE CD-610-3.3

TYPICAL TWO LANE SECTION

CD-610-2.4





SECTION A–A

SECTION B–B

TYPICAL LEFT TURN LANE SECTION

CD-610-2.5

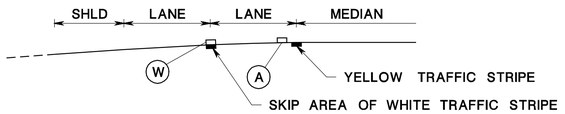
RAISED PAVEMENT MARKER, (RPM) LOCATION

N.T.S.

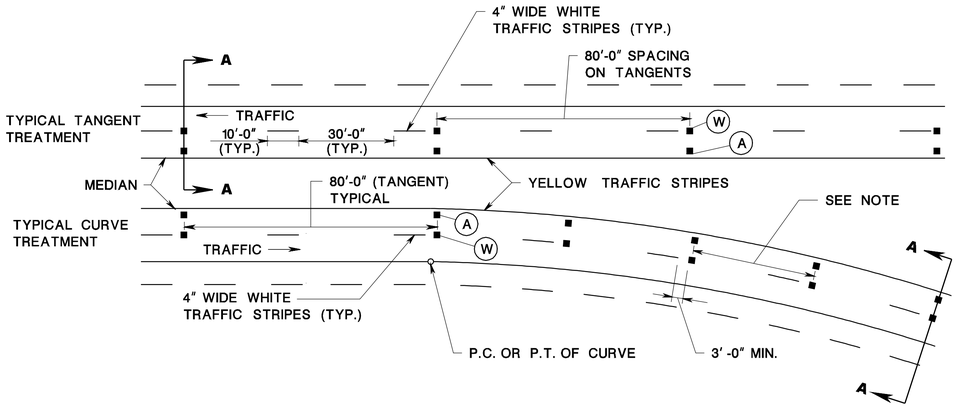
CD-610-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS



SECTION A–A (TYP.)

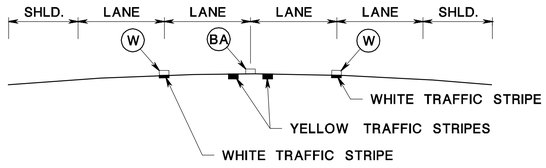


TYPICAL MULTI–LANE DIVIDED SECTION

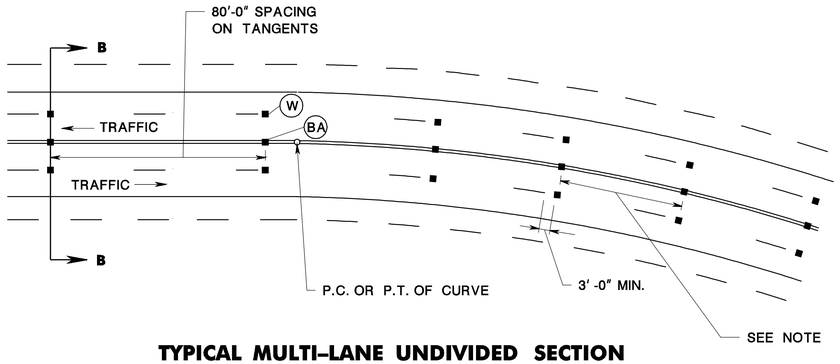
NOTE:

FOR SPACING ON CURVES SEE CD-610-3.3

CD-610-3.1



SECTION B–B

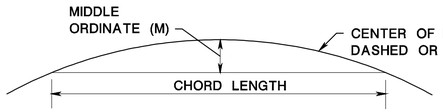


TYPICAL MULTI–LANE UNDIVIDED SECTION

NOTE:

FOR SPACING ON CURVES SEE CD-610-3.3

CD-610-3.2



1. USE 200 FOOT TAPE.
2. ESTABLISH 200 FOOT CHORD.
3. MEASURE MIDDLE ORDINATE PERPENDICULAR TO CHORD 100 FOOT FROM EITHER END.
4. DETERMINE SPACING FROM TABLE 1.
5. WHEN DIFFICULT TO DETERMINE MIDDLE ORDINATE, 80 FOOT OR 40 FOOT SPACING WILL BE AS DIRECTED BY THE DEPARTMENT.

TABLE 1

CHORD LENGTH	MIDDLE ORDINATE	RADIUS	REFLECTOR SPACING
200'-0"	M ≥ 2'-7"	R ≤ 1910'	40'-0"
200'-0"	M < 2'-7"	R > 1910'	80'-0"

< LESS THAN

≤ EQUAL TO OR LESS THAN

> GREATER THAN

≥ EQUAL TO OR GREATER THAN

METHOD FOR DETERMINING RPM SPACING ON HORIZONTAL CURVES

CD-610-3.3

LEGEND

(W) TWO-WAY MONO-DIRECTIONAL WHITE LENS, RPM

(A) TWO-WAY MONO-DIRECTIONAL AMBER LENS, RPM

(BA) TWO-WAY BI-DIRECTIONAL AMBER LENS, RPM

CD-610-3.4

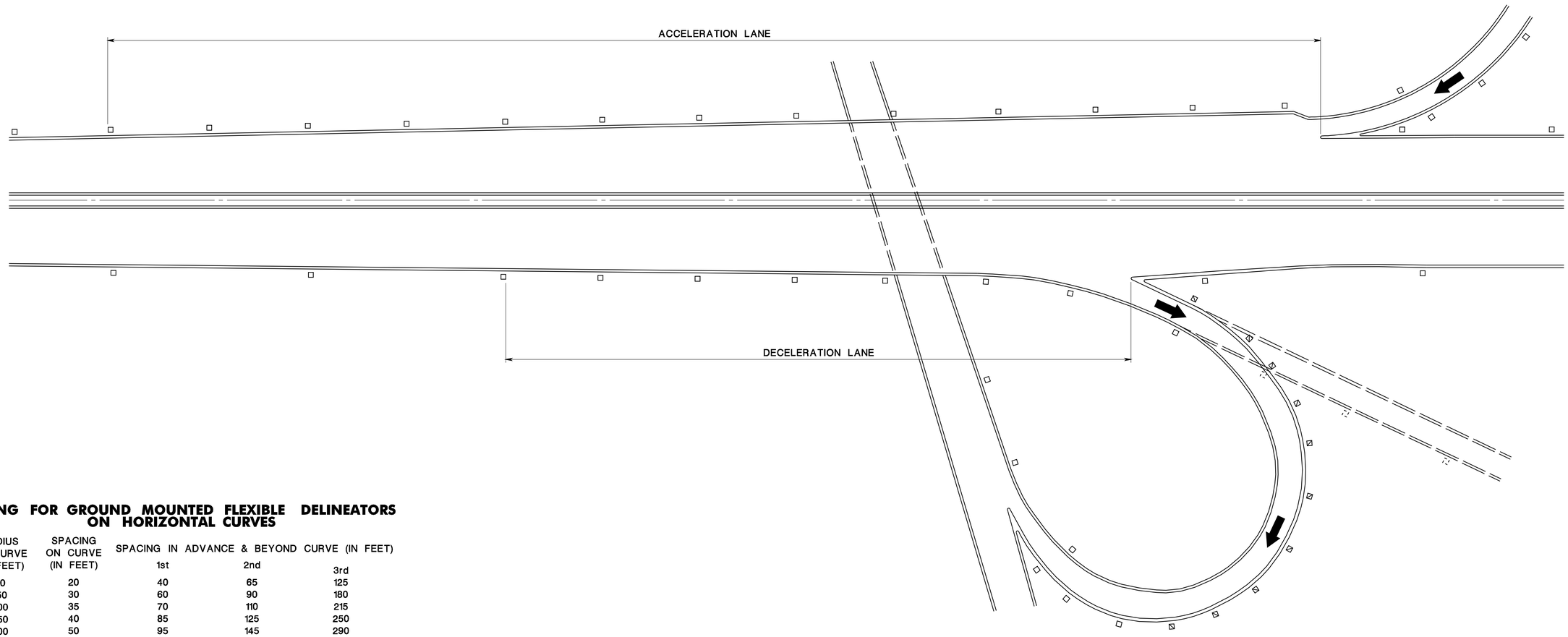
RAISED PAVEMENT MARKER, (RPM) LOCATION

N.T.S.

CD-610-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS



SPACING FOR GROUND MOUNTED FLEXIBLE DELINEATORS ON HORIZONTAL CURVES

RADIUS OF CURVE (IN FEET)	SPACING ON CURVE (IN FEET)	SPACING IN ADVANCE & BEYOND CURVE (IN FEET)		
		1st	2nd	3rd
50	20	40	65	125
150	30	60	90	180
200	35	70	110	215
250	40	85	125	250
300	50	95	145	290
400	55	110	170	300
500	65	125	190	300
600	70	140	210	300
700	75	150	230	300
800	80	165	245	300
900	85	175	260	300
1000	90	185	275	300

SPACING FOR SPECIFIC RADII NOT SHOWN MAY BE INTERPOLATED FROM TABLE. THE MINIMUM SPACING SHALL BE 20 FEET. THE SPACING ON CURVES SHALL NOT EXCEED 300 FEET. IN ADVANCE OF OR BEYOND A CURVE, AND PROCEEDING AWAY FROM THE END OF THE CURVE, THE SPACING OF THE FIRST DELINEATOR IS 2S, THE SECOND 3S, AND THE THIRD 6S BUT NOT TO EXCEED 300 FEET. S REFERS TO THE DELINEATOR SPACING FOR SPECIFIC RADII COMPUTED FROM THE FORMULA $S = 3\sqrt{R - 50}$

LEGEND

□ WHITE FLEXIBLE DELINEATORS ON MAINLINE AT 200 FEET SPACING, ON RAMPS, ACCELERATION AND DECELERATION LANES 100 FEET MAXIMUM SPACING.

▨ YELLOW FLEXIBLE DELINEATORS ON RAMPS 100 FEET MAXIMUM SPACING.

INSTALLATION, DIMENSIONS, COLOR AND DETAILS TO FOLLOW STANDARDS IN THE CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS".

GROUND MOUNTED FLEXIBLE DELINEATORS

N.T.S.

CD-610-4

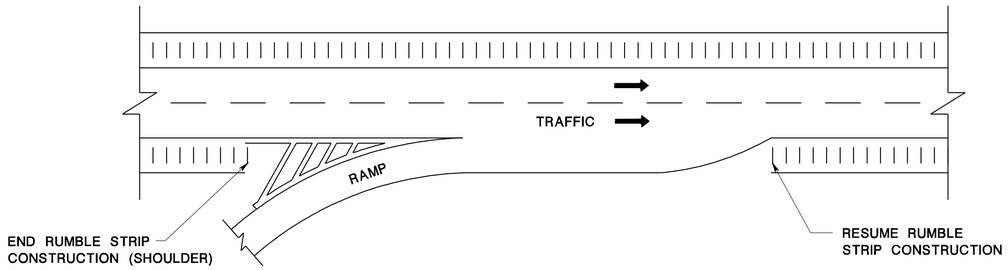
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

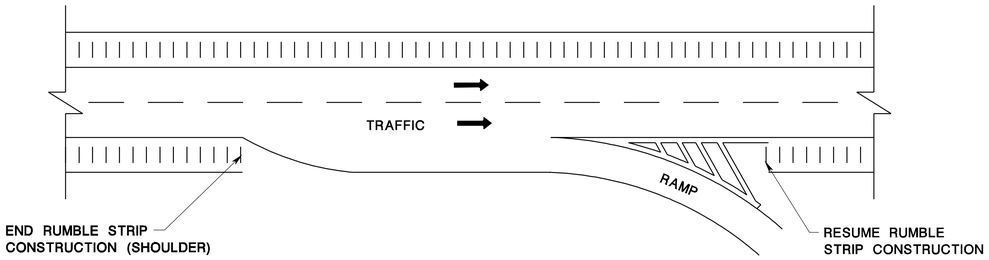
CD-610-4.1

79
146

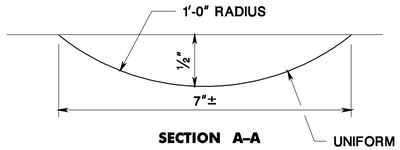
BDC07D-01-ORIGINAL SHEET



TYPICAL ACCELERATION LANE (RUMBLE STRIP CONSTRUCTION)

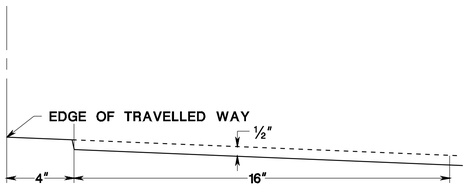


TYPICAL DECELERATION LANE (RUMBLE STRIP CONSTRUCTION)

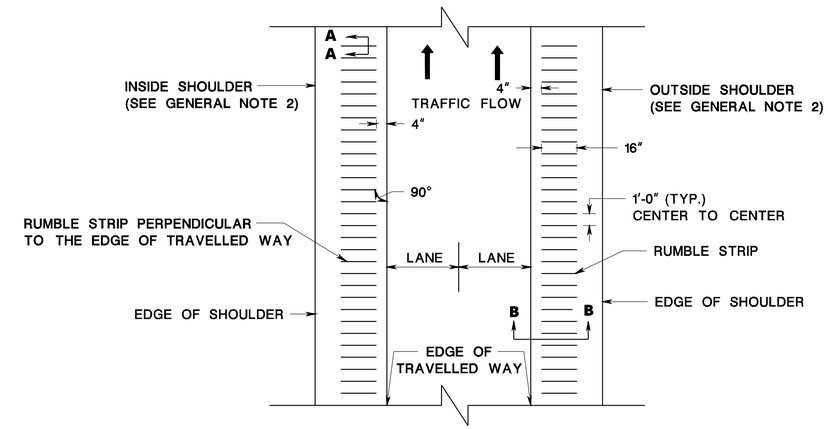


SECTION A–A

UNIFORM DEPTH THROUGHOUT WIDTH OF CUT, ⅛" TOLERANCE BETWEEN PEAKS & VALLEYS.



SECTION B–B



RUMBLE STRIPS

GENERAL NOTES:

1. THE MINIMUM LENGTH OF RUMBLE STRIPS MEASURED LONGITUDINALLY ALONG THE SHOULDER SHALL BE 100 FEET.
2. RUMBLE STRIPS SHALL BE CONSTRUCTED ON 3 FEET OR WIDER INSIDE SHOULDERS AND 8 FEET OR WIDER OUTSIDE SHOULDERS.
3. RUMBLE STRIPS SHALL NOT BE CONSTRUCTED ACROSS BRIDGE DECKS.
4. RUMBLE STRIPS SHALL NOT BE CONSTRUCTED WITHIN 100 FEET BEFORE AND 100 FEET AFTER THE P.C. OF INTERSECTING ROADWAYS AND DRIVEWAYS.

NOTE:
HMA = HOT MIX ASPHALT

RUMBLE STRIPS

N.T.S.

CD-610-5

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

CD-610-5.1

M1 - 1 [1, 2 DIGITS - 24″ x 24″]
(4 S.F.)
[3 DIGITS - 30″ x 24″]
(5 S.F.)

M1 - 1 (S) [1, 2 DIGITS - 36″ x 36″]
(9 S.F.)
[3 DIGITS - 45″ x 36″]
(11.3 S.F.)

M1 - 4 [1, 2 DIGITS - 24″ x 24″]
(4 S.F.)
[3 DIGITS - 30″ x 24″]
(5 S.F.)

M1 - 4 (S) [1, 2 DIGITS - 36″ x 36″]
(9 S.F.)
[3 DIGITS - 45″ x 36″]
(11.3 S.F.)

M1 - 5 [1, 2 DIGITS - 24″ x 24″]
(4 S.F.)
[3 DIGITS - 30″ x 24″]
(5 S.F.)

M1 - 5 (S) [1, 2 DIGITS - 36″ x 36″]
(9 S.F.)
[3 DIGITS - 45″ x 36″]
(11.3 S.F.)

M1 - 6 [1, 2, 3 DIGITS - 24″ x 24″]
(4 S.F.)

M1 - 6 (S) [1, 2, 3 DIGITS - 36″ x 36″]
(9 S.F.)

NJTP - 1 [24″ x 24″]
(4 S.F.)

NJTP - 1 (S) [36″ x 36″]
(9 S.F.)

M2 - 1 [21″ x 15″]
(2.2 S.F.)

M2 - 1 (S) [32″ x 23″]
(5.1 S.F.)

M3 - 1 [24″ x 12″]
(2 S.F.)

M3 - 1 (S) [36″ x 18″]
(4.5 S.F.)

M3 - 2 [24″ x 12″]
(2 S.F.)

M3 - 2 (S) [36″ x 18″]
(4.5 S.F.)

M3 - 3 [24″ x 12″]
(2 S.F.)

M3 - 3 (S) [36″ x 18″]
(4.5 S.F.)

M3 - 4 [24″ x 12″]
(2 S.F.)

M3 - 4 (S) [36″ x 18″]
(4.5 S.F.)

M4 - 5 [24″ x 12″]
(2 S.F.)

M4 - 5 (S) [30″ x 15″]
(3 S.F.)

(L or R)

M5 - 1 [21″ x 15″]
(2.2 S.F.)

M5 - 1 (S) [32″ x 23″]
(5.1 S.F.)

(L or R)

M5 - 2 [21″ x 15″]
(2.2 S.F.)

M5 - 2 (S) [32″ x 23″]
(5.1 S.F.)

(L or R)

M6 - 1 [21″ x 15″]
(2.2 S.F.)

M6 - 1 (S) [32″ x 23″]
(5.1 S.F.)

(L or R)

M6 - 2 [21″ x 15″]
(2.2 S.F.)

M6 - 2 (S) [32″ x 23″]
(5.1 S.F.)

M6 - 3 [21″ x 15″]
(2.2 S.F.)

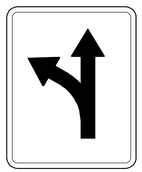
M6 - 3 (S) [32″ x 23″]
(5.1 S.F.)

M6 - 4 [21″ x 15″]
(2.2 S.F.)

M6 - 4 (S) [32″ x 23″]
(5.1 S.F.)

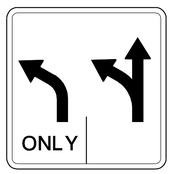
R3 - 5 [30″ x 36″]
(7.5 S.F.)
OVERHEAD

R3 - 5 [30″ x 30″]
(6.3 S.F.)
GROUND MOUNT



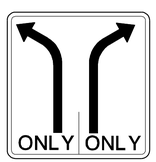
R3 - 6 [30″ x 36″]
(7.5 S.F.)
OVERHEAD

R3 - 6 [30″ x 36″]
(6.3 S.F.)
GROUND MOUNT

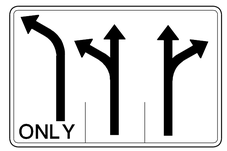


R3 - 8 [30″ x 30″]
(6.3 S.F.)

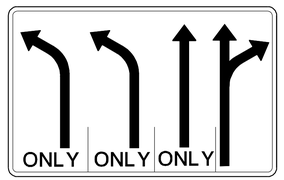
R(NJ)3 - 8A [36″ x 30″]
(7.5 S.F.)



R(NJ)3 - 8B [30″ x 30″]
(6.3 S.F.)



R(NJ)3 - 8C [48″ x 30″]
(10 S.F.)



R(NJ)3 - 8D [60″ x 30″]
(12.5 S.F.)

R3 - 9a [30″ x 36″]
(7.5 S.F.)

R3 - 9b [24″ x 36″]
(6 S.F.)

R4 - 7 [24″ x 30″]
(5 S.F.)

R4 - 7 (S) [36″ x 48″]
(12 S.F.)

R4 - 8 [24″ x 30″]
(5 S.F.)

R4 - 8 (S) [36″ x 48″]
(12 S.F.)

GSP - 1 24″ DIA.
(3.1 S.F.)

GSP - 1 (S) 36″ DIA.
(7.1 S.F.)

GENERAL NOTES:

DIMENSIONS, COLORS, AND DETAILS OF VARIOUS SIZE SIGNS, SHIELDS AND ACCESSORY PANELS TO FOLLOW STANDARDS IN THE CURRENT "STANDARD HIGHWAY SIGNS PUBLICATION" AND THE CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS".

(S) DENOTES A SPECIAL SIZE SIGN.

ALL SIGNS SHALL BE ASTM D 4956
TYPE III SHEETING

SIGNS
N.T.S.

CD-612-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

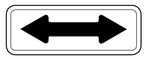
CONSTRUCTION DETAILS

CD-612-1.1

R1 - 1 [30″x 30″]
(5.5 S.F.)

R1 - 2
[36″ x 36″ x 36″]
(3.9 S.F.)

(L OR R)
W1 - 1 [30″x30″]
(6.3 S.F.)
W1 - 1 (S) [36″ x 36″]
(9 S.F.)



W1 - 7 [48″ X 24″]
(8 S.F.)
W1 - 7 (S) [60″ X 30″]
(12.5 S.F.)

W3 - 1a [30″ x 30″]
(6.3 S.F.)
W3 - 1a (S) [48″ X 48″]
(16 S.F.)

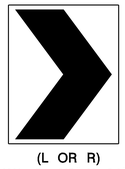
R3 - 1 [24″ X 24″]
(4 S.F.)

R3 -1 (S) [30″ X 30″]
(6.3 S.F.)

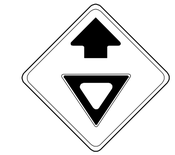
R3 - 2 [24″ X 24″]
(4 S.F.)

R3 -2 (S) [30″ X 30″]
(6.3 S.F.)

(L OR R)
W1 - 2 [30″ X30″]
(6.3 S.F.)
W1 - 2 (S) [36″ X 36″]
(9 S.F.)



(L OR R)
W1 - 8 [18″ X 24″]
(3 S.F.)
W1 - 8 (S) [24″ X 30″]
(5 S.F.)



W3 - 2a [30″ X 30″]
(6.3 S.F.)
W3 - 2a (S) [48″ X 48″]
(16 S.F.)

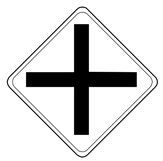
R3 - 3 [24″ X 24]″
(4 S.F.)

R3 -3 (S) [30″ X 30″]
(6.3 S.F.)

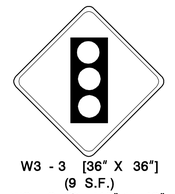
R3 - 4 [24″ X 24″]
(4 S.F.)

R3 -4 (S) [30″ X 30″]
(6.3 S.F.)

(L OR R)
W1 - 3 [30″ X 30″]
(6.3 S.F.)
W1 - 3 (S) [36″ X 36″]
(9 S.F.)



W2 - 1 [30″ X 30″]
(6.3 S.F.)
W2 - 1 (S) [36″ X36″]
(9.S.F.)

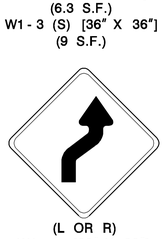


W3 - 3 [36″ X 36″]
(9 S.F.)
W3 - 3 (S) [48″ X 48″]
(16 S.F.)

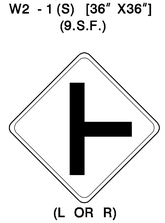
(L or R)
R3 - 7 [30″ X 30″]
(6.3 S.F.)

R5 - 1 [30″ X 30″]
(6.3 S.F.)

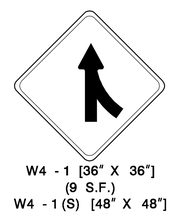
R5 -1 (S) [36″ X 36″]
(9 S. F.)



(L OR R)
W1 - 4 [30″ X 30″]
(6.3 S.F.)
W1 - 4 (S) [36″ X 36″]
(9 S.F.)



(L OR R)
W2 - 2 [30″ X 30″]
(6.3 S.F.)
W2 - 2 (S) [36″ X 36″]
(9 S.F.)



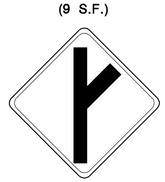
W4 - 1 [36″ X 36″]
(9 S.F.)
W4 - 1 (S) [48″ X 48″]
(16 S.F.)
W4 - 1 (EXPWY) [36″ X 36″]
(9 S.F.)

R5 - 1a [36″ X 24″]
(6 S.F.)

R5 - 1a (S) [30″ X 18″]
(3.8 S.F.)

(L or R)
R6 - 1 [36″ X 12″]
(3 S.F.)

(L OR R)
W1 - 5 [30″ X 30″]
(6.3 S.F.)
W1 - 5 (S) [36″ X 36″]
(9 S.F.)

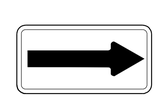


(L OR R)
W2 - 3 [30″ X 30″]
(6.3 S.F.)
W2 - 3 (S) [36″ X 36″]
(9 S.F.)

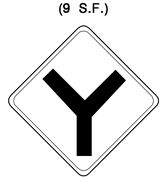
(L OR R)
W4 - 2 [36″ X 36″]
(9 S.F.)
W4 - 2 (S) [48″ X 48″]
(16 S.F.)

R10 - 11a [24″ X 30″]
(5 S.F.)

R2 - 1 [24″ X 30″]
(5 S.F.)
R2 - 1 (EXPWY) [36″ X 48″]
(12 S.F.)
R2 - 1 (S) [48″ X 60″]
(20 S.F.)



(L OR R)
W1 - 6 [48″ X 24″]
(8 S.F.)
W1 - 6 (S) [60″ X 30″]
(12.5 S.F.)



W2 - 5 [30″ X 30″]
(6.3 S.F.)
W2 - 5 (S) [36″ X36″]
(9 S.F.)

(L OR R)
W4 - 3 [36″ X 36″]
(9 S.F.)
W4 - 3 (S) [48″ X 48″]
(16 S.F.)

GENERAL NOTES:

DIMENSIONS, COLORS, AND DETAILS OF VARIOUS SIZE SIGNS, SHIELDS AND ACCESSORY PANELS TO FOLLOW STANDARDS IN THE CURRENT "STANDARD HIGHWAY SIGNS PUBLICATION" AND THE CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS".

(S) DENOTES A SPECIAL SIZE SIGN.

ALL SIGNS SHALL BE ASTM D 4956 TYPE III SHEETING.

SIGNS

N.T.S.

CD-612-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

CD-612-2.1

W5 - 1 [36″ x 36″]
(9 S.F.)

W5 - 1 (S) [48″ x 48″]
(16 S.F.)

W6 - 1 [36″ x 36″]
(9 S.F.)

W6 - 1 (S) [48″ x 48″]
(16 S.F.)

W8 - 5 [30″ x 30″]
(6.3 S.F.)

W8 - 5 (S) [36″ x 36″]
(9 S.F.)

W10 - 1 [36″ DIA.]
(7.1 S.F.)

W13 - 1 [18″ x 18″]
(2.3 S.F.)

W13 - 1 (S) [24″ x 24″]
(4 S.F.)

W14 - 1 [30″ x 30″]
(6.3 S.F.)

W14 - 1 (S) [36″ x 36″]
(9 S.F.)

W5 - 2 [30″ x 30″]
(6.3 S.F.)

W5 - 2 (S) [36″ x 36″]
(9 S.F.)

W6 - 2 [36″ x 36″]
(9 S.F.)

W6 - 2 (S) [48″ x 48″]
(16 S.F.)

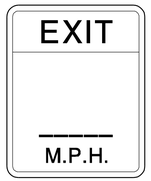
(L OR R)

W9 - 1 [36″ x 36″]
(9 S.F.)

W9 - 1 (S) [48″ x 48″]
(16 S.F.)

W12 - 1 [24″ x 24″]
(4 S.F.)

W12 - 1 (S) [30″ x 30″]
(6.3 S.F.)



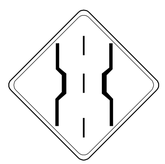
W13 - 2 [48″ x 60″]
(20 S.F.)

W13 - 2 (EXPWY) [36″ x 48″]
(12 S.F.)

W13 - 2 (S) [24″ x 30″]
(5 S.F.)

W14 - 2 [30″ x 30″]
(6.3 S.F.)

W14 - 2 (S) [36″ x 36″]
(9 S.F.)



W5 - 2a [30″ x 30″]
(6.3 S.F.)

W5 - 2a (S) [36″ x 36″]
(9 S.F.)

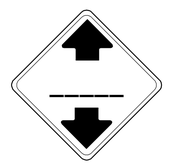
W6 - 3 [30″ x 30″]
(6.3 S.F.)

W6 - 3 (S) [36″ x 36″]
(9 S.F.)

(L OR R)

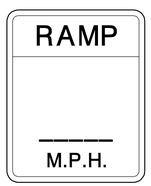
W9 - 2 [36″ x 36″]
(9 S.F.)

W9 - 2 (S) [48″ x 48″]
(16 S.F.)



W12 - 2 [36″ x 36″]
(9 S.F.)

W12 - 2 (S) [48″ x 48″]
(16 S.F.)



W13 - 3 [48″ x 60″]
(20 S.F.)

W13 - 3 (EXPWY) [36″ x 48″]
(12 S.F.)

W13 - 3 (S) [24″ x 30″]
(5 S.F.)

W14 - 3 [36″ x 48″ x 48″]
(6 S.F.)

W14 - 3 (S) [48″ x 64″ x 64″]
(10.7 S.F.)

GENERAL NOTES:

DIMENSIONS, COLORS, AND DETAILS OF VARIOUS SIZE SIGNS, SHIELDS AND ACCESSORY PANELS TO FOLLOW STANDARDS IN THE CURRENT "STANDARD HIGHWAY SIGNS PUBLICATION" AND THE CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS".

(S) DENOTES A SPECIAL SIZE SIGN.

ALL SIGNS SHALL BE ASTM D 4956 TYPE III SHEETING.

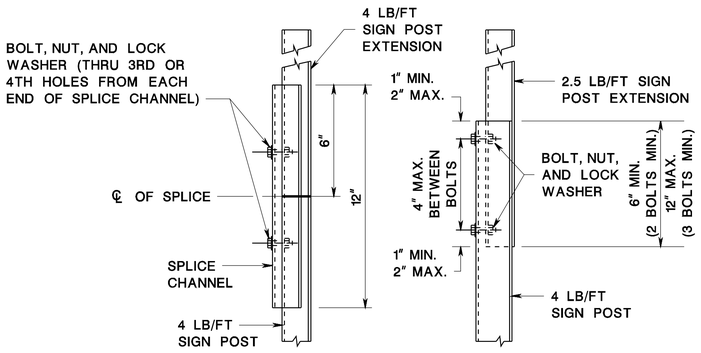
SIGNS

N.T.S.

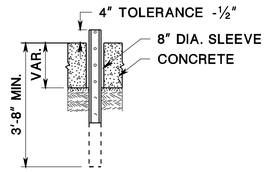
CD-612-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION

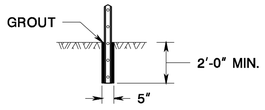
CONSTRUCTION DETAILS



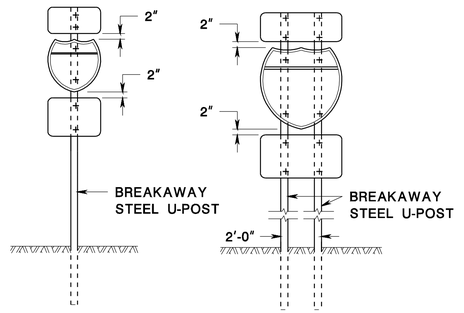
SIGN POST EXTENSION SPLICE DETAILS



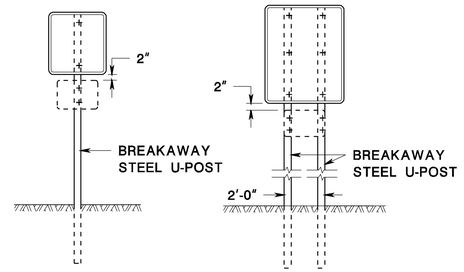
CONCRETE INSTALLATION



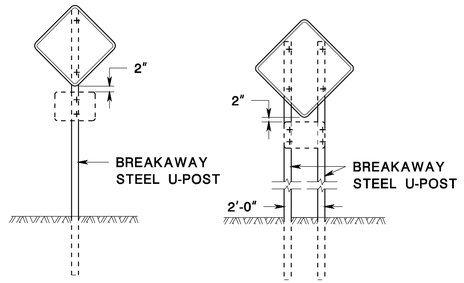
ROCK INSTALLATION



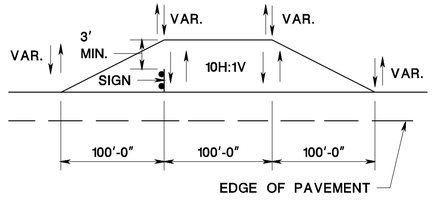
24" x 24" SHIELD **36" x 36" SHIELD**



30" x 30" OR SMALLER **36" x 36" OR LARGER**

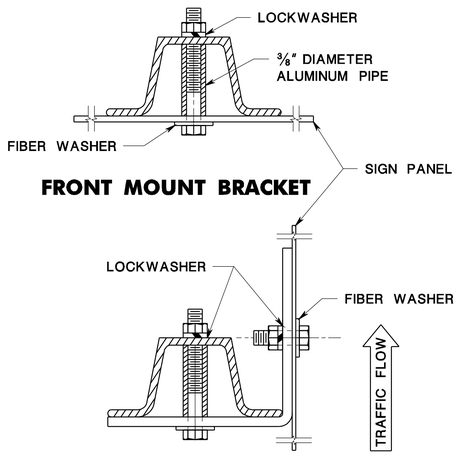


30" x 30" OR SMALLER **36" x 36" OR LARGER**



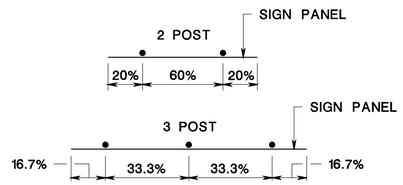
STEEL U-POST GRADING DETAIL

STEEL POSTS, POST CLIPS, SPACING, ETC. AND TWO PIECE STEEL U-POSTS.

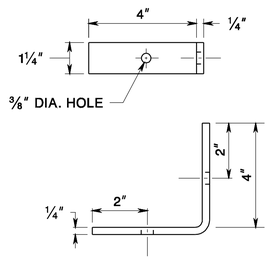


FRONT MOUNT BRACKET

SIDE MOUNT BRACKET



STEEL U-POST SPACING



DETAIL OF BRACKET FOR SIDE MOUNTED SIGNS

PANEL SIZE (W x H)	# OF POSTS	POST SIZE (LB/FT)
18" x 18"	1	2.5
18" x 24"	1	2.5
24" x 24"	1	2.5
24" x 30"	1	2.5
24" x 36"	1	2.5
30" x 24"	1	2.5
30" x 30"	1	2.5
36" x 12"	2	2.5
36" x 36" x 36"	2	2.5
30" x 36"	1	4.0

PANEL SIZE (W x H)	# OF POSTS	POST SIZE (LB/FT)
36" x 36"	2	2.5
36" x 48"	2	2.5
45" x 36"	2	2.5
48" x 24"	2	2.5
48" x 36"	2	2.5
48" x 48"	2	4.0
48" x 64" x 64"	2	2.5
60" x 36"	2	4.0
48" x 60"	2	4.0
60" x 30"	2	4.0

U-POST SELECTION TABLE
BREAKAWAY SIGN SUPPORT

GENERAL NOTES:

1. ALL POSTS SHALL BE OF ADEQUATE LENGTH TO MEET THE REQUIREMENTS FOR ERECTION AS STATED IN THE CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" AND AS INDICATED BELOW.
2. ALL SMALL SIGN SUPPORTS SHALL BE OF THE BREAKAWAY TYPE WITH EXCEPTION OF THOSE INSTALLED BEHIND GUIDE RAIL OR OTHER ROADSIDE BARRIER.
3. ALL STEEL POSTS AND BRACKETS SHALL BE CUT, BENT, AND HOLES PUNCHED AND DRILLED BEFORE GALVANIZING. GALVINIZING SHALL BE IN CONFORMANCE WITH ASTM A123.
4. ALL STEEL U-POST SIGN SUPPORTS MUST BE INSTALLED FACING THE PREDOMINANT TRAFFIC FLOW. A MOUNTING BRACKET SHOULD BE USED ON SIDE MOUNTED SIGNS SUCH AS "ONE WAY" SIGNS INSTALLED IN MEDIANS.
5. SIGN PANEL SIZES SHALL DETERMINE POST TYPE AND NUMBER AS SHOWN ON THIS DETAIL.
6. BOLTS SHALL NOT PROTRUDE MORE THAN ¾" BEYOND THE NUT WHEN TIGHT, BUT SHALL ENGAGE ALL THREADS IN THE NUT.
7. WHEN SIGNS ARE INSTALLED ON SLOPES 10H:1V OR FLATTER, THE MINIMUM VERTICAL CLEARANCE REQUIREMENTS FOR SIGNS ARE:

   FOR SINGLE POST INSTALLATIONS - THE MINIMUM DISTANCE BETWEEN THE EDGE OF THE PAVEMENT AND THE BOTTOM OF ANY PANEL MUST BE 7 FEET, AND THE MINIMUM DISTANCE FROM EDGE OF PAVEMENT TO THE TOP OF ANY SIGN PANEL MUST BE 9 FEET.

   FOR MULTI-POST INSTALLATIONS - THE MINIMUM DISTANCE BETWEEN THE EDGE OF PAVEMENT AND THE BOTTOM OF A MAJOR SIGN PANEL MUST BE 7 FEET.

   SECONDARY SIGN PANELS (LAND SERVICE HIGHWAYS) - THE MINIMUM DISTANCE BETWEEN THE EDGE OF PAVEMENT AND THE BOTTOM OF A SECONDARY SIGN PANEL IS 6 FEET.

   SECONDARY SIGN PANELS (INTERSTATE AND FREEWAYS) - THE BOTTOM OF THE MAJOR SIGN SHALL BE A MINIMUM OF 8 FEET AND THE SECONDARY SIGN PANEL A MINIMUM OF 5 FEET ABOVE THE EDGE OF PAVEMENT.

   WHERE GRADING OF 10H:1V OR FLATTER CANNOT BE OBTAINED, OR WHERE CURB OR BERM IS GREATER THAN 4 INCHES, THE MINIMUM VERTICAL CLEARANCE WILL BE MEASURED FROM THE GROUND LINE TO THE BOTTOM OF THE SIGN.
8. PERMANENT SIGN SUPPORTS SHOULD NOT BE INSTALLED ON SLOPES GREATER THAN 10H:1V, EXCEPT WHERE GRADING OF 10H:1V CANNOT BE OBTAINED OR THE SIGN SUPPORTS WILL BE BEHIND A TRAFFIC BARRIER. THE SLOPE SHALL EXTEND A MINIMUM OF 3 FEET BEYOND THE OUTSIDE EDGE OF SIGN (SEE GRADING DETAIL FOR SLOPE TREATMENT).
9. EXTRUDED ALUMINUM SIGN PANELS ARE NOT PERMITTED FOR USE WITH STEEL U-POST SIGN SUPPORTS.
10. STEEL U-POST SIGN SUPPORTS SHALL NOT BE PLACED IN FRONT OF GUIDE RAIL AND THE POSTS MUST NOT STRADDLE GUIDE RAIL.
11. TO EXTEND THE HEIGHT OF A SIGN POST, A MAXIMUM OF ONE SPLICE MAY BE MADE AND MUST BE A MINIMUM OF 9 FEET FROM THE GROUNDLINE TO CENTER LINE OF SPLICE.

STEEL U-POST SIGN SUPPORTS

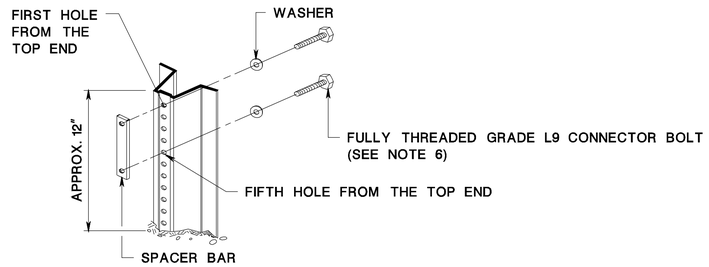
N.T.S.

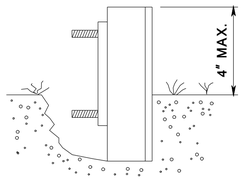
CD-612-4

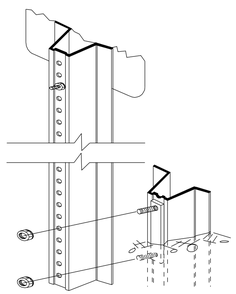
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

CD-612-4.1



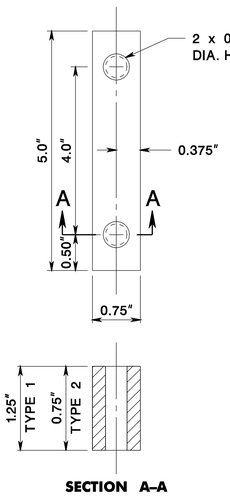




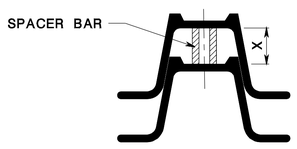
NOTES:

1. DRIVE ANCHOR POST ASSEMBLY TO WITHIN APPROXIMATELY 12 INCHES ABOVE GROUND LEVEL. PLACE BOLT AND WASHER IN FIRST AND FIFTH HOLES FROM THE TOP END, AND SECURE BOLTS ONTO SPACER.
2. DRIVE ANCHOR POST ASSEMBLY TO WITHIN A MAXIMUM OF 4 INCHES ABOVE GROUND LEVEL.
3. DIG OUT AROUND BACK OF ANCHOR POST ASSEMBLY TO ALLOW ROOM FOR TOP POST TO BE ATTACHED.
4. NEST TOP POST ASSEMBLY ONTO PROTRUDING ANCHOR POST ASSEMBLY BOLTS, THROUGH THE FIRST AND FIFTH HOLES FROM THE BOTTOM OF THE TOP POST.
5. PLACE AND TIGHTEN A SELF-LOCKING FLANGE NUT ON EACH BOLT. WHEN INSTALLATION IS COMPLETE, TOP OF GROUND POST SHALL NOT EXCEED 4 INCHES ABOVE GROUND LEVEL.
6. SIZE OF CONNECTOR BOLT FOR TYPE 1, $\frac{5}{16}$" x $1\frac{1}{2}$" SIZE OF CONNECTOR BOLT FOR TYPE 2, $\frac{5}{16}$" x 2"
7. THE CONNECTOR BOLTS SHALL BE FULLY THREADED. EACH CONNECTOR BOLT AND NUT SHALL BE CLEARLY STAMPED WITH MANUFACTURER'S IDENTIFYING MARK.

ANCHOR POST ASSEMBLY SIGN SUPPORTS



SECTION A–A



WHEN X IS GREATER THAN 0.75", USE TYPE 1 SPACER BAR
WHEN X IS 0.75" OR LESS, USE TYPE 2 SPACER BAR

SPACER BAR

CD-612-5.1

WEIGHT * LBS./FT.	DIMENSIONS (IN)				AREA IN.^{2}	X–X AXIS **		Y–Y AXIS	
	"A"	"B"	"C"	"D"		I(IN.^{4})	S(IN.^{3})	I(IN.^{4})	S(IN.^{3})
2.50	1.516	3.062	1.278	0.669	0.760	0.228	0.313	0.539	0.352
4.00	1.968	3.500	1.336	0.834	1.187	0.611	0.707	1.161	0.664

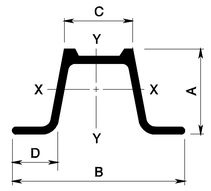
* ± 5%
** GOVERNING SECTION

TYPE 1 STEEL U–POST PROPERTIES

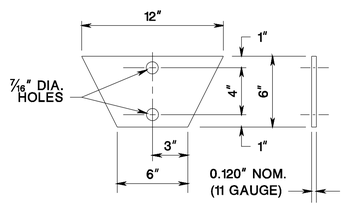
WEIGHT * LBS./FT.	DIMENSIONS (IN)				AREA IN.^{2}	X–X AXIS **		Y–Y AXIS	
	"A"	"B"	"C"	"D"		I(IN.^{4})	S(IN.^{3})	I(IN.^{4})	S(IN.^{3})
2.50	1.549	3.125	1.250	0.625	0.748	0.233	0.289	0.551	0.353
4.00	1.845	3.500	1.625	0.718	1.190	0.500	0.560	1.190	0.690

* ± 5%
** GOVERNING SECTION

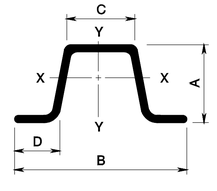
TYPE 2 STEEL U–POST PROPERTIES



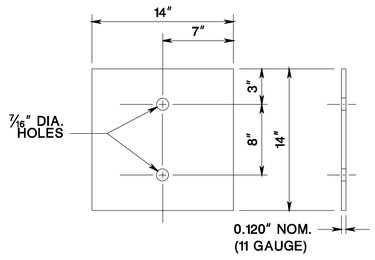
TYPE 1 STEEL U–POST



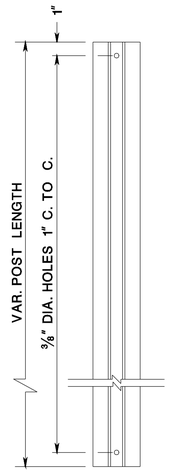
TYPE 1 SOIL ANCHOR PLATE



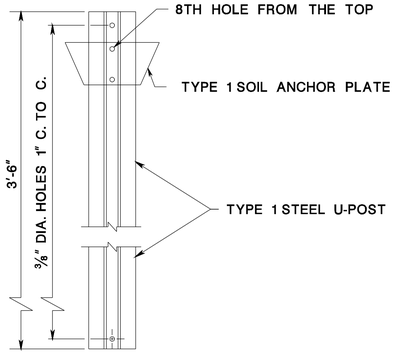
TYPE 2 STEEL U–POST



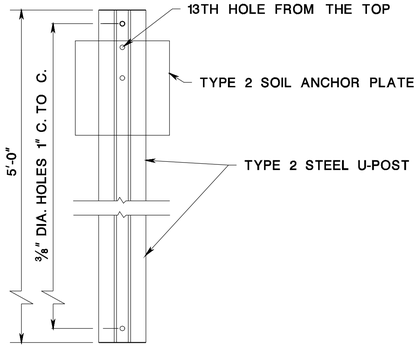
TYPE 2 SOIL ANCHOR PLATE



TOP POST U–POST



TYPE 1 ANCHOR POST ASSEMBLY



TYPE 2 ANCHOR POST ASSEMBLY

STEEL POSTS, POST CLIPS, SPACING, ETC. AND TWO PIECE STEEL U–POSTS.

NOTES:

1. ANCHOR POST AND TOP POST SHALL BE OF EQUAL WEIGHT/FEET.
2. SOIL ANCHOR PLATE SHALL BE ATTACHED TO ALL ANCHOR POSTS.
3. THE MATERIAL FOR THE SOIL ANCHOR PLATES SHALL BE CARBON SHEET STEEL.
4. THE STEEL "U" POST SHALL BE GRADE 60.

CD-612-5.2

STEEL U–POST SIGN SUPPORTS

N.T.S.

CD-612-5

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

STEEL U–POST SIGN SUPPORT DATA TABLE

IDENTIFICATION		OFFSET	PANEL SIZE		NO. OF POSTS	POST HEIGHT			POST SIZE	POST TYPE
NO.	STATION	X_1	W	B_1		P_1	P_2	P_3		

NOTE TO DESIGNER:

THIS SHEET REQUIRES DESIGN SPECIFIC INFORMATION TO BE ADDED AND INCLUDED IN THE CONTRACT PLANS.

REMOVE THIS NOTE AFTER DESIGN SPECIFIC INFORMATION IS ADDED.

STEEL POSTS, POST CLIPS, SPACING, ETC. AND TWO PIECE STEEL U–POSTS.

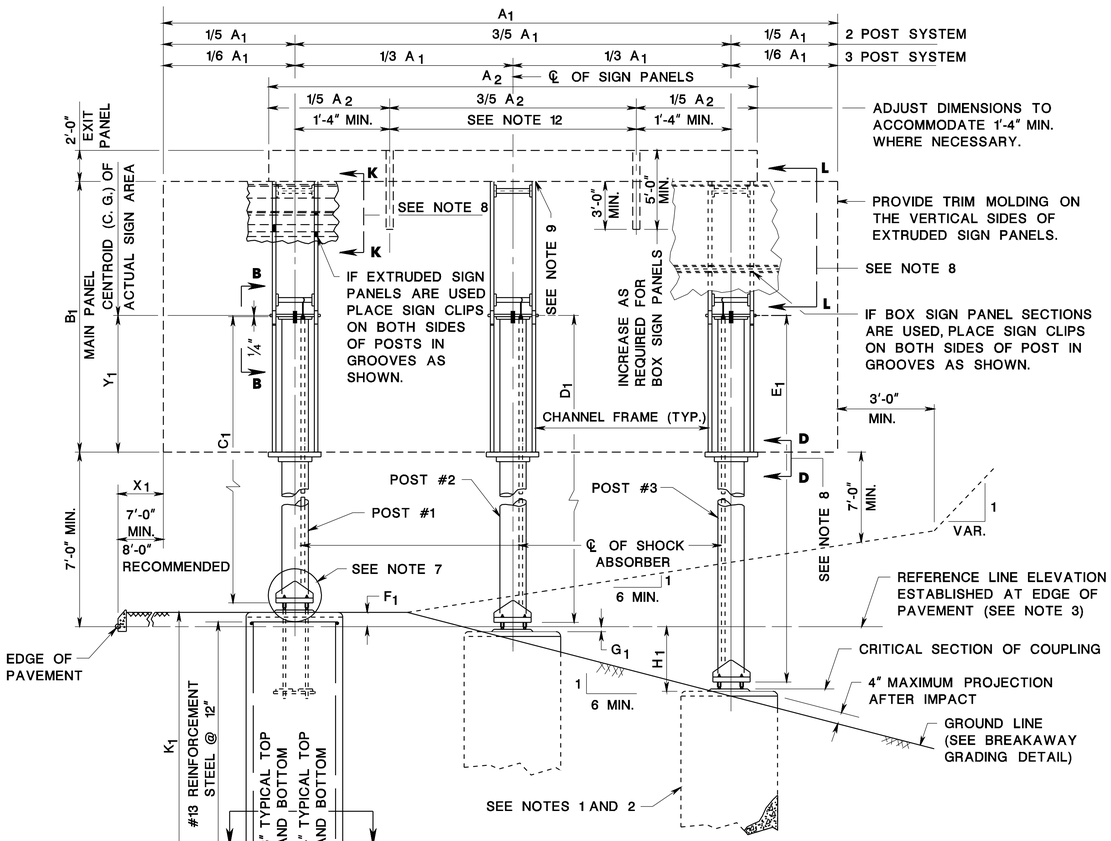
CD-612-6.1

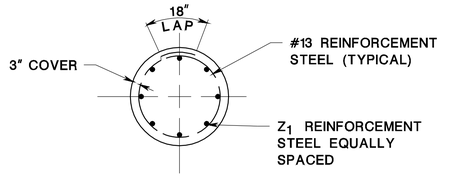
STEEL U–POST SIGN SUPPORTS

CD-612-6

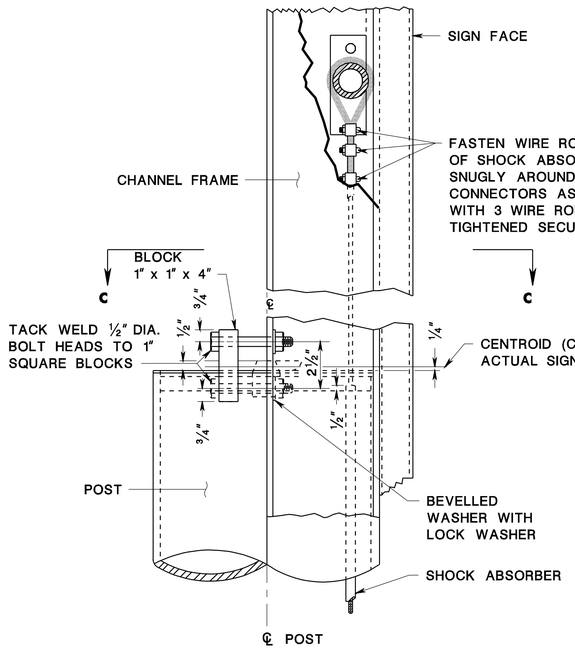
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS





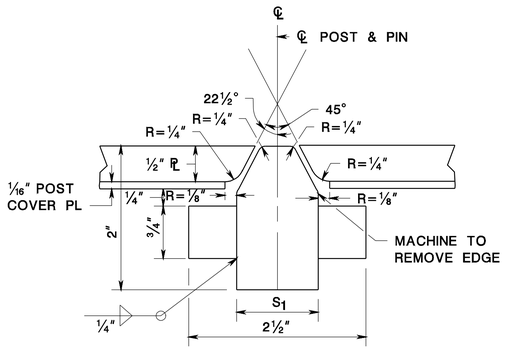
SECTION A–A

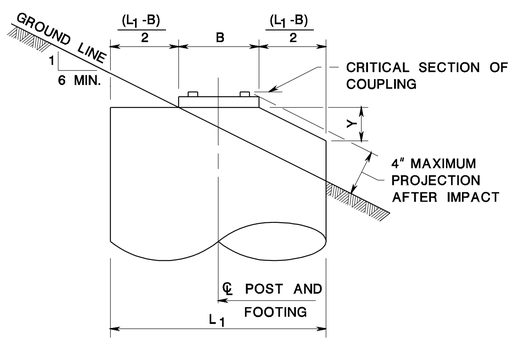


SECTION B–B

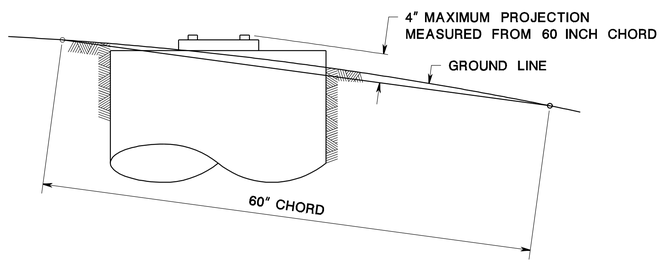
GENERAL NOTES :

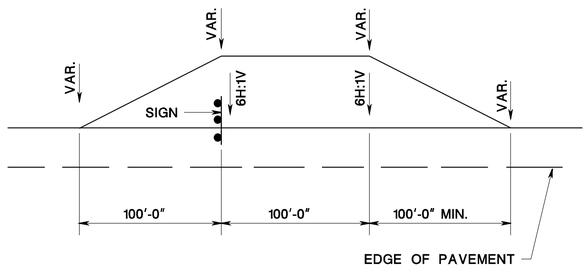
1. USE CLASS B CONCRETE IN ALL FOOTINGS, AS SPECIFIED IN SECTION 903 OF THE STANDARD SPECIFICATIONS.
2. ALL FOOTINGS SHALL BE PLACED AGAINST UNDISTURBED EARTH, EXCEPT FOR FOOTING TOPS WHICH SHALL BE FORMED TO A DEPTH OF 3 INCHES BELOW GROUND LINE.
3. TOPS OF FOOTINGS ABOVE REFERENCE LINE ARE INDICATED BY PLUS (+) VALUE, AND BELOW BY MINUS (-) VALUE.
4. ALL MATERIAL SHALL BE ALUMINUM ALLOY 6061-T6 UNLESS OTHERWISE NOTED.
5. NUTS, BOLTS AND FLAT WASHERS SHALL BE MADE FROM ALUMINUM ALLOY ALCLAD 2024-T4. SPRING LOCK WASHERS SHALL BE MADE FROM ALUMINUM ALLOY 7075-T6.
6. WELDING OF ALUMINUM SHALL BE AS SPECIFIED IN THE CONSTRUCTION SPECIFICATIONS.
7. FOR DETAIL OF POST BASE AND INSTALLATION REFER TO "BREAKAWAY SIGN SUPPORTS FOR GROUND MOUNTED SIGNS-CD-612-9".
8. FOR DETAILS OF SECTIONS "C-C", "D-D", "K-K" AND "L-L" REFER TO "BREAKAWAY SIGN SUPPORTS FOR GROUND MOUNTED SIGNS-CD-612-8".
9. SIGNS WITHOUT EXIT PANELS OR SIGNS WITH PARTIAL WIDTH EXIT PANELS SHALL BE PROVIDED WITH CHANNEL FRAMES EXTENDING TO THE TOP OF THE MAIN PANEL AS SHOWN. CHANNEL FRAMES SHALL BE EXTENDED TO THE TOP OF THE EXIT PANEL WHEN FULL WIDTH EXIT PANELS ARE EMPLOYED.
10. UNUSUAL FOUNDATION CONDITIONS MAY REQUIRE RE-DESIGNING OF FOOTINGS AND SUCH CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE DEPARTMENT.
11. FOR Z_1, L_1 & K_1, REFER TO CD-612-12 "SIGN SUPPORT DATA TABLE".
12. PROVIDE 4[5.4 FOR PARTIAL WIDTH EXIT PANELS ONLY. USE CONNECTION DETAILS AS EMPLOYED FOR CHANNEL FRAME.
13. FOR S_1, SEE CD-612-8.





(BEND REINFORCEMENT STEEL TO FIT)





REINFORCEMENT STEEL IS IN METRIC UNITS.

BREAKAWAY SIGN SUPPORTS FOR GROUND MOUNTED SIGNS

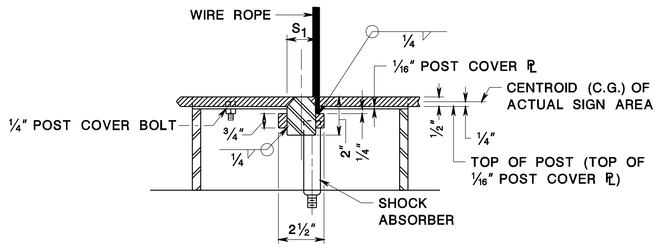
N. T. S.

CD-612-7

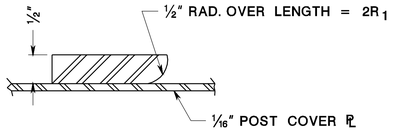
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

CD-612-7.1

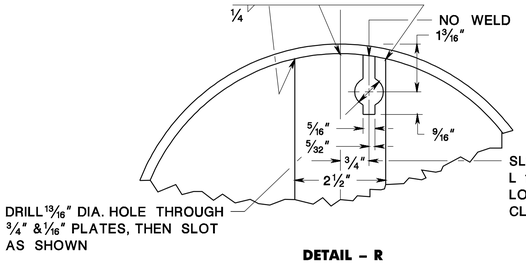


SECTION E–E

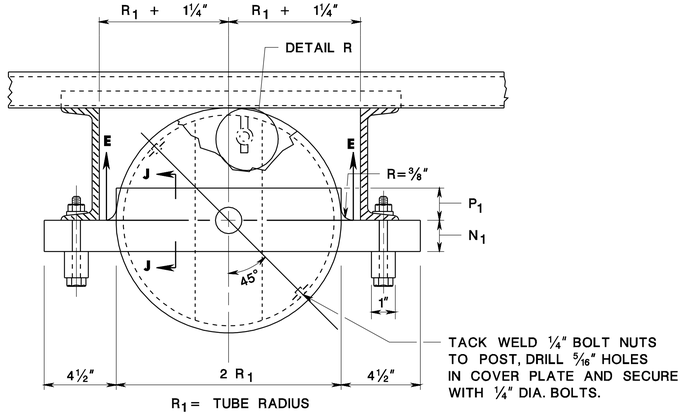


SECTION J–J

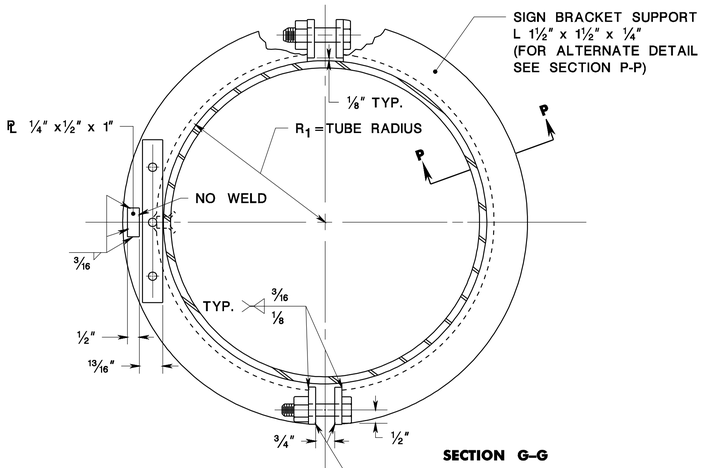
BASE TYPE	ALL DIMENSIONS IN IN.		
	N_1	P_1	S_1
2	1⅛	1⅛	1
3	1½	1½	1¼
4	1⅞	1¾	1⅜
5	2	2¼	1½



DETAIL – R

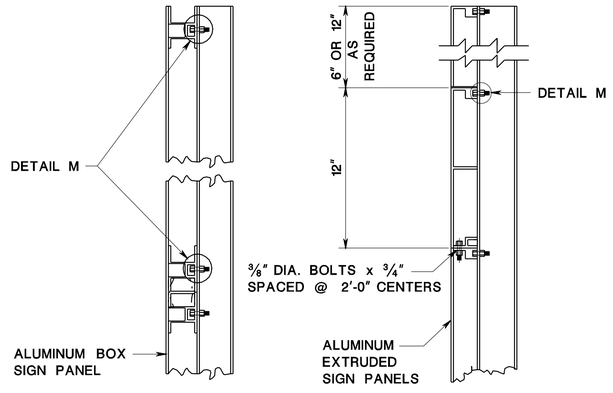


SECTION C–C



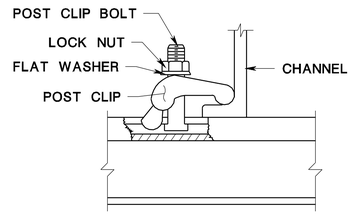
SECTION G–G

SECTION D–D

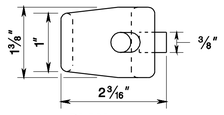


SECTION L–L **SECTION K–K**

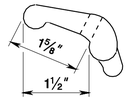
(EXIT PANEL NOT SHOWN IN SECTIONS L-L & K-K)



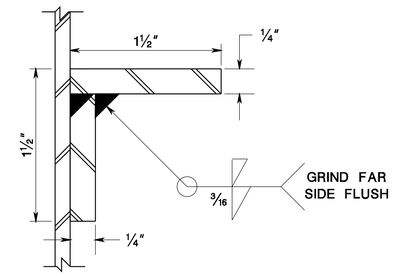
DETAIL – M
SIGN ATTACHMENT



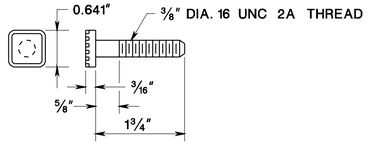
PLAN



ELEVATION
POST CLIP



SECTION P–P
(ALTERNATE DETAIL)



POST CLIP BOLT

BREAKAWAY SIGN SUPPORTS FOR GROUND MOUNTED SIGNS

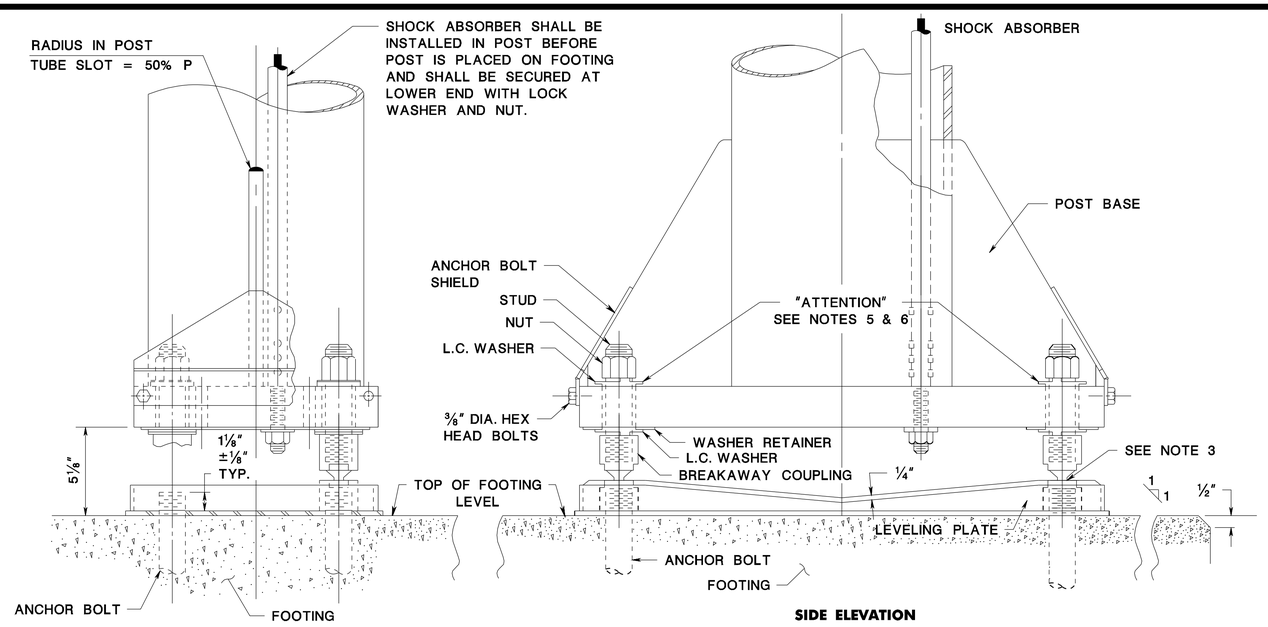
N.T.S.

CD-612-8

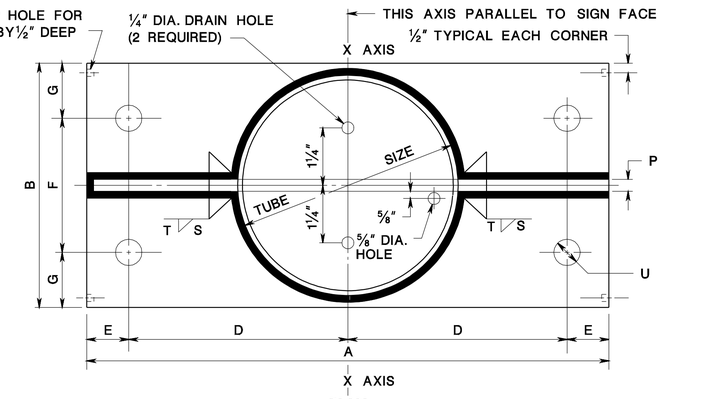
NEW JERSEY DEPARTMENT OF TRANSPORTATION

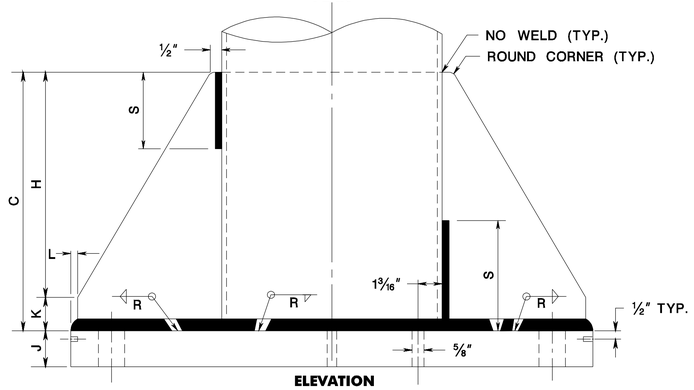
CONSTRUCTION DETAILS

CD-612-8.1

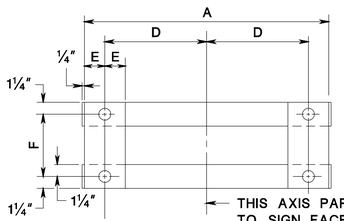


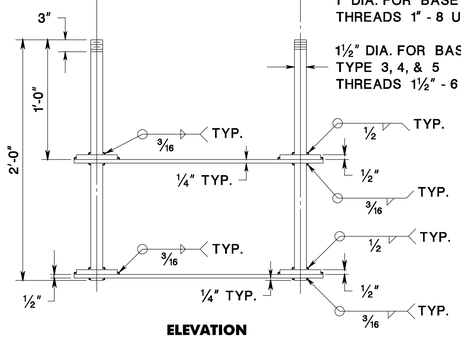
BREAKAWAY COUPLING INSTALLATION



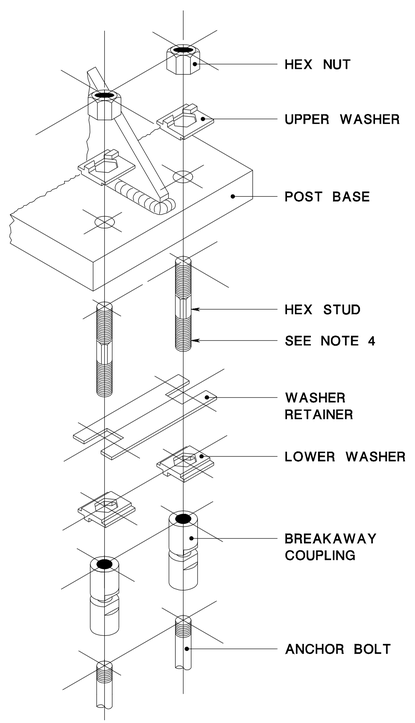


POST BASE

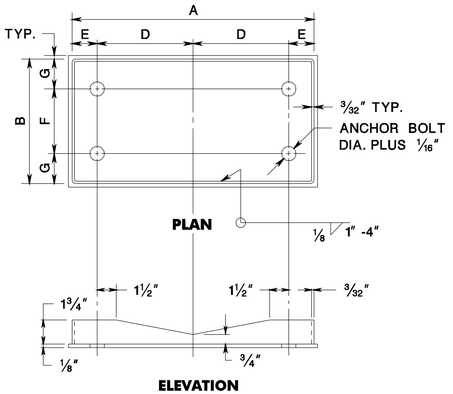




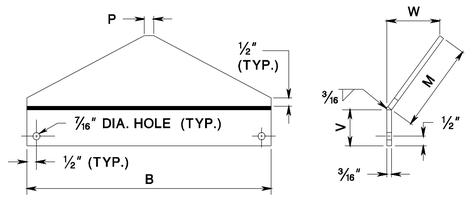
ANCHOR BOLT DETAIL



BREAKAWAY COUPLING ASSEMBLY (TYPICAL)



LEVELING PLATE DETAIL



ANCHOR BOLT SHIELD
(BENT PLATE MAY BE USED)

GENERAL NOTES:

1. ANCHOR BOLT ASSEMBLY & LEVELING PLATE SHALL BE STRUCTURAL STEEL CONFORMING TO ASTM SPECIFICATION A36. NUTS, WASHERS AND BOLTS SHALL BE HOT DIP GALVANIZED. TOP 3" OF ALL ANCHOR BOLTS SHALL BE THREADED.
2. THE CONCRETE FOOTINGS FOR BREAKAWAY SIGNS SHALL BE POURED TO WITHIN APPROXIMATELY 1" OF THE BOTTOM OF THE LEVELING PLATE. THE LEVELING PLATE SHALL BE PLACED ON TOP, SET TO THE PROPER ELEVATION AND MADE COMPLETELY LEVEL. THE ANCHOR BOLTS AND LEVELING PLATE CAN BE PROPERLY POSITIONED.
3. THE BREAKAWAY COUPLINGS SHALL BE SCREWED TO THE ANCHOR BOLTS, WITH CARE TAKEN THAT THE SMALLER END OF THE TAPER POINTS DOWNWARD. WHILE TIGHTENING THE COUPLINGS TO THE ANCHOR BOLTS, ONLY THE LOWER SET OF WRENCHING FLATS SHALL BE USED.
4. THE HEX STUD END WITH THE SMALLER THREAD DEPTH (1⅛") SHALL BE SCREWED INTO TOP OF BREAKAWAY COUPLING.
5. THE PROPER WASHER NUMBER (STAMPED ON WASHER) MUST BE USED FOR EACH POST AS INDICATED ON CD-612-12, "SIGN SUPPORT DATA TABLE".
6. RAISED PORTION OF LC WASHERS MUST BE POSITIONED AS INDICATED. CENTER OF RAISED PORTION MUST BE TOWARD ℄ OF POST.
7. WASHER RETAINERS SHALL BE PLACED IN THE GROOVES OF THE LC WASHER, AS SHOWN. IT MAY BE NECESSARY TO BACK OFF ON EACH STUD A MAXIMUM OF 30 DEGREES TO ALLOW THE WASHER RETAINER TO FIT.
8. THE POST BASE SHALL BE PLACED OVER THE STUDS ON TOP OF THE WASHER RETAINERS, AFTER WHICH THE TOP WASHER SHALL BE PLACED OVER EACH HEX STUD. AGAIN, IT IS IMPORTANT THAT THE RAISED PORTION OF THE WASHER CONTACT THE LOWER SURFACE OF THE NUT WHEN IT IS TIGHTENED ON THE STUD AND THAT THE ARROW, APPEARING ON THE TOP SURFACE OF THE WASHER, POINT TOWARD THE CENTERLINE OF THE POST.
9. THE HEAVY HEX NUT SHALL BE PLACED ON EACH HEX STUD AND TIGHTENED HOLDING THE UPPER WRENCHING FLATS OF THE COUPLING. THESE NUTS SHALL BE TIGHTENED BY THE TURN OF NUT METHOD.

POST BASE DATA

DIMENSIONS IN INCHES

BASE TYPE	**A	**B	C	**D	**E	**F	**G	H	*, ** J	K	L	M	P	R	S	**T	U	**V	W
2	13¼	7½	9¼	5	1⅝	4	1¾	7	1¼	1	¼	5½	½	⅜	3½	⅜	1¼	1	1⅞
3	18	9½	12	7	2	5	2¼	9⅛	1½	1⅜	½	6½	⅝	½	4¾	½	1¾	1¼	2⅝
4	22	11½	12¾	9	2	6	2¾	9½	1¾	1½	½	5	⅝	⅝	10⅜	⅜	1¾	1⅝	2½
5	28	13½	15	12	2	7	3¼	11¼	2	1¾	½	5	¾	½	12½	⅜	1¾	2	3⅛

* THE BASE PLATE THICKNESS "J" MUST CORRESPOND EXACTLY WITH THE BASE TYPE AS SHOWN IN THE TABLE ABOVE. SUBSTITUTION OF ANY OTHER BASE PLATE THICKNESS IS NOT PERMITTED.

** SAFETY DESIGNED ITEMS.

BREAKAWAY SIGN SUPPORTS FOR GROUND MOUNTED SIGNS

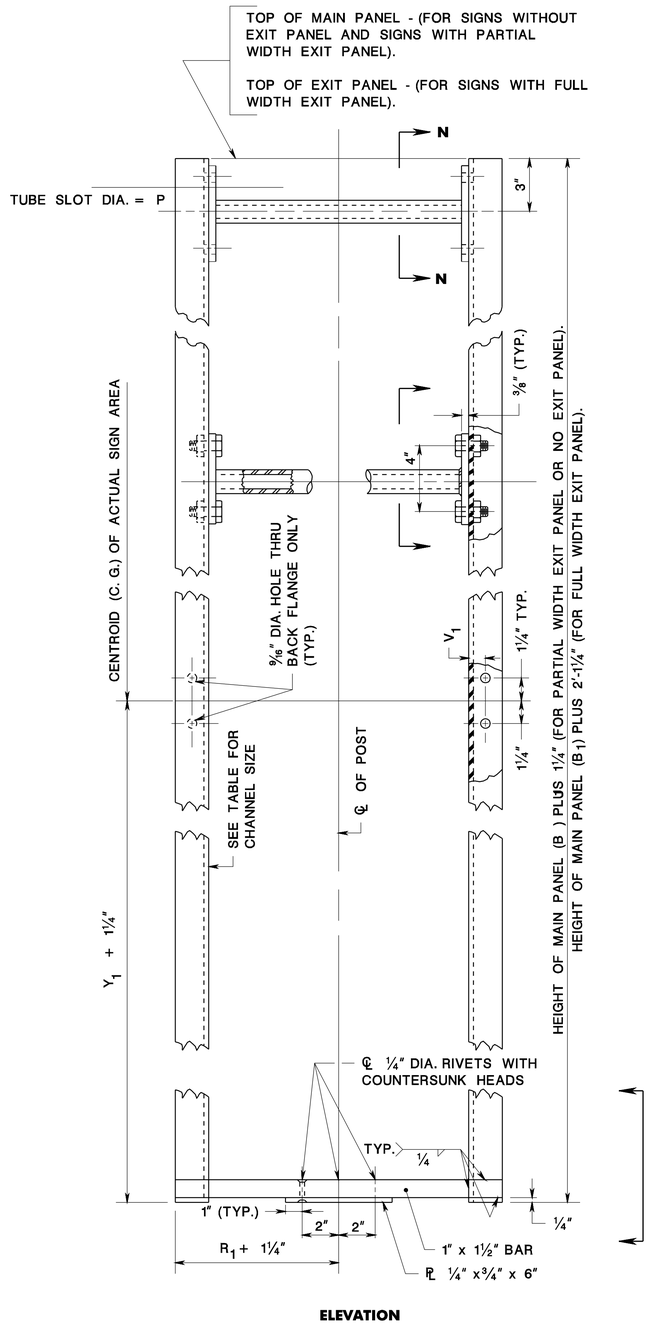
N.T.S.

CD-612-9

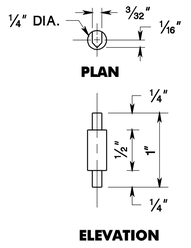
NEW JERSEY DEPARTMENT OF TRANSPORTATION

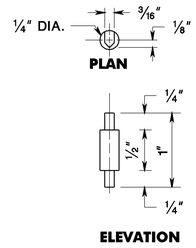
CONSTRUCTION DETAILS

CD-612-9.1

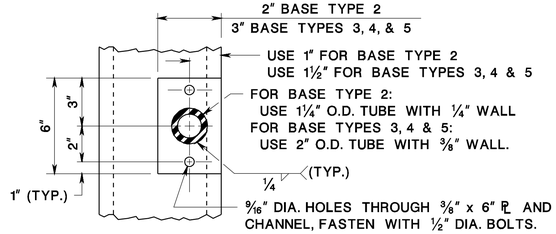


ELEVATION

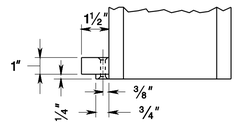




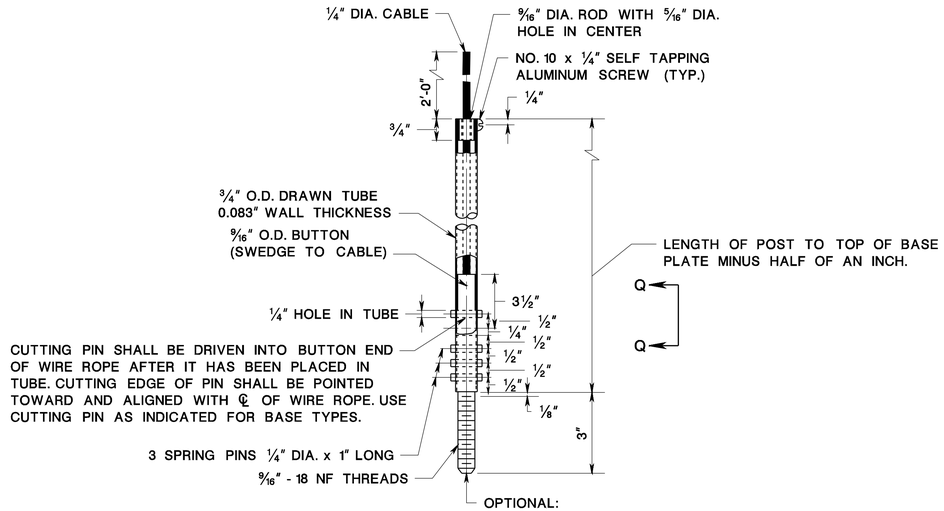
BASE TYPE	CHANNEL SIZE	V_1 IN
2	3[1.42	⅞
3	4[2.50	1
4	5[3.11	1⅛
5	6[2.83	1⅛

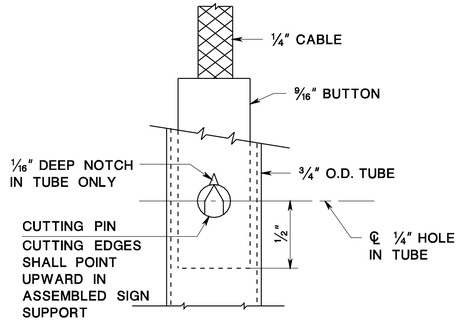


SECTION N-N



VIEW F-F





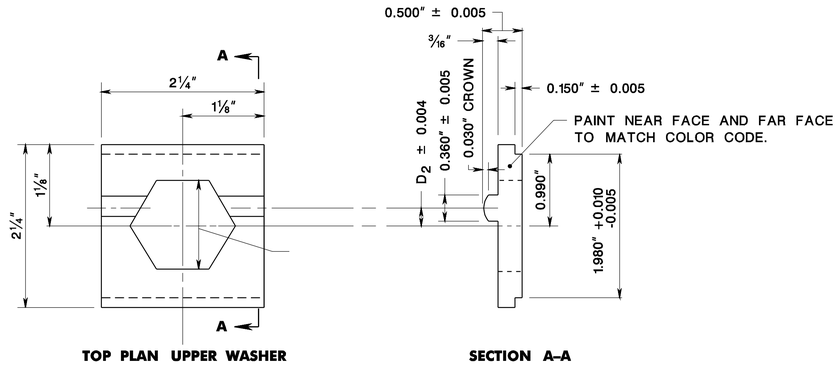
BREAKAWAY SIGN SUPPORTS FOR GROUND MOUNTED SIGNS

CD-612-10

NEW JERSEY DEPARTMENT OF TRANSPORTATION

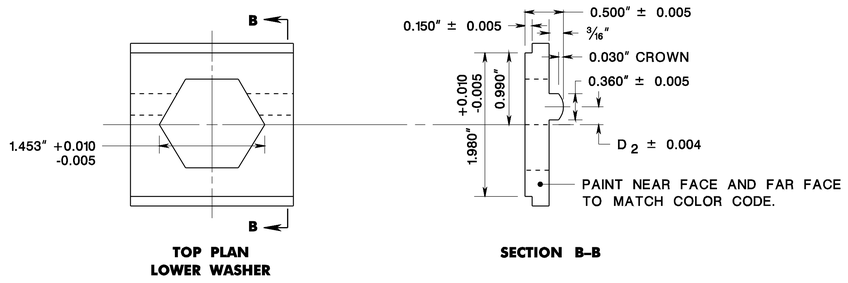
CONSTRUCTION DETAILS

CD-612-10.1



TOP PLAN UPPER WASHER

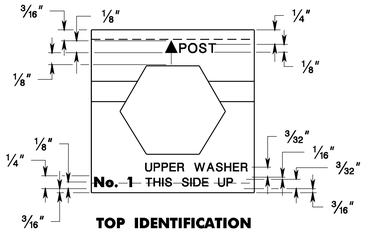
SECTION A–A



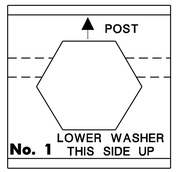
TOP PLAN
LOWER WASHER

SECTION B–B

LOAD CONCENTRATING WASHER DETAIL



TOP IDENTIFICATION
PLAN
UPPER WASHER



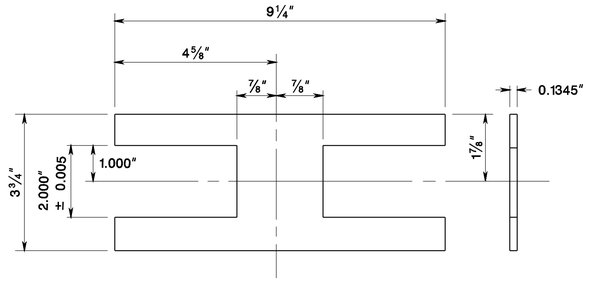
TOP IDENTIFICATION
PLAN
LOWER WASHER

LOAD CONCENTRATING WASHER IDENTIFICATION DETAIL

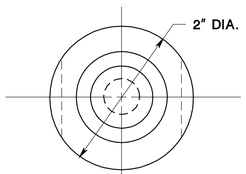
NOTE:

ALL LOAD CONCENTRATING WASHERS SHALL BE PERMANENTLY LABELED WITH APPROPRIATE WASHER NUMBER AND IDENTIFICATION AS SHOWN

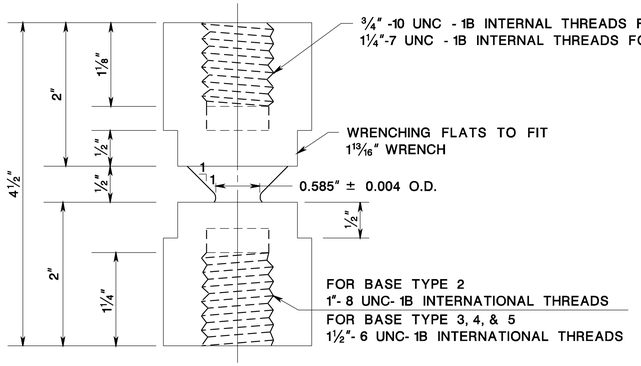
WASHER NUMBER	D_2 INCHES	FACE COLOR CODE
1	0.100	ORANGE
2	1.150	YELLOW
3	0.200	BLUE
4	0.250	GREEN



WASHER RETAINER



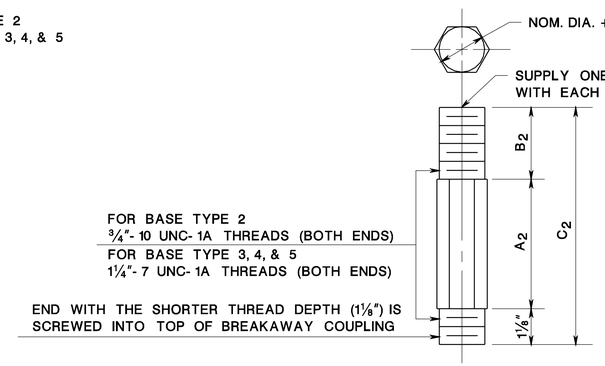
PLAN



ELEVATION

BREAKAWAY COUPLING *

* SHOWN FOR INFORMATION ONLY. COUPLINGS SHALL BE SUPPLIED BY N.J.D.O.T.



BASE TYPE	A_2 IN.	B_2 IN.	C_2 IN.	HEX SIZE
2	2	1½	4⅝	¾
3	2¼	2⅛	5½	1¼
4	2½	2⅛	5¾	1¼
5	2¾	2⅛	6	1¼

HEX STUD LENGTHS & SIZES

BREAKAWAY SIGN SUPPORTS FOR GROUND MOUNTED SIGNS

N.T.S.

CD-612-11

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

CD-612-11.1

SIGN SUPPORT DATA TABLE

IDENTIFICATION		OFFSET	SIGN SIZE			C.G. SIGN	NO. OF POSTS	TUBE SIZE		POST HEIGHT			BASE TYPE	DIMENSIONS TO TOP OF FOOTING			FOOTING DIMENSIONS		REINF. STEEL	L. C. WASHER NUMBER		
NO.	STATION	X_1	A_1	B_1	A_2	Y_1		O.D.	THK.	C_1	D_1	E_1		F_1	G_1	H_1	K_1	L_1	Z_1	POST #1	POST #2	POST #3

FOOTING BEVEL TABLE

IDENT. NO.	$\frac{(L_1 - B)}{2}$	Y		
		POST #1	POST #2	POST #3

GENERAL NOTES:

1. AN ASTERISK (*) IN COLUMN L_1 INDICATES THAT THE EXPOSED EDGE OF FOOTING MUST BE BEVELLED TO MEET THE 4 INCH MAXIMUM PROJECTION REQUIREMENT.
2. LOAD CONCENTRATING WASHER FACE COLOR CODE SHALL BE AS FOLLOWS:
   L.C. WASHER # 1 ORANGE
   L.C. WASHER # 2 YELLOW
   L.C. WASHER # 3 BLUE
   L.C. WASHER # 4 GREEN
3. FOR IDENTIFICATION OF TABULAR ITEMS AND DETAILS RELATING THERETO, REFER TO BREAKAWAY SIGN SUPPORTS FOR GROUND MOUNTED SIGNS (CD-612-7)

NOTE TO DESIGNER:
THIS SHEET REQUIRES DESIGN SPECIFIC INFORMATION TO BE ADDED AND INCLUDED IN THE CONTRACT PLANS.

REMOVE THIS NOTE AFTER DESIGN SPECIFIC INFORMATION IS ADDED.

BREAKAWAY SIGN SUPPORTS FOR GROUND MOUNTED SIGNS

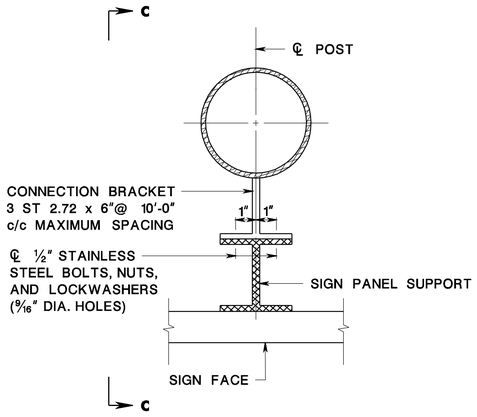
N.T.S.

CD-612-12

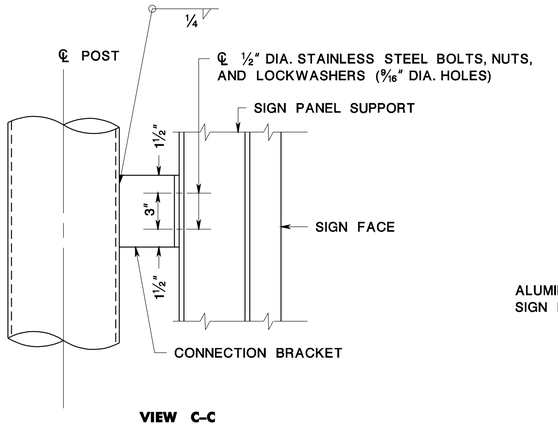
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

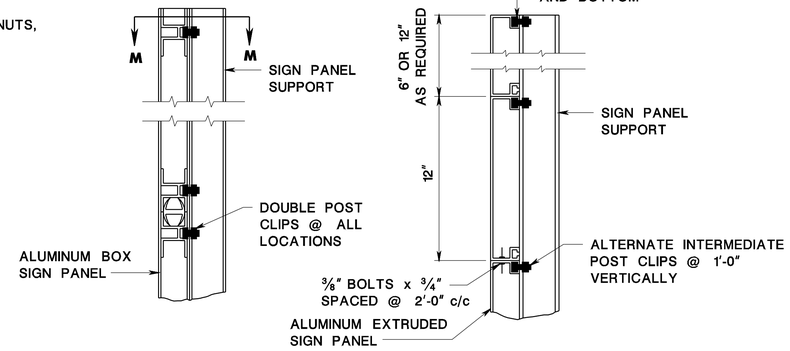
CD-612-12.1

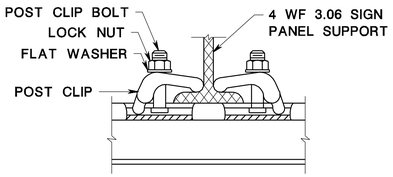


SECTION B–B



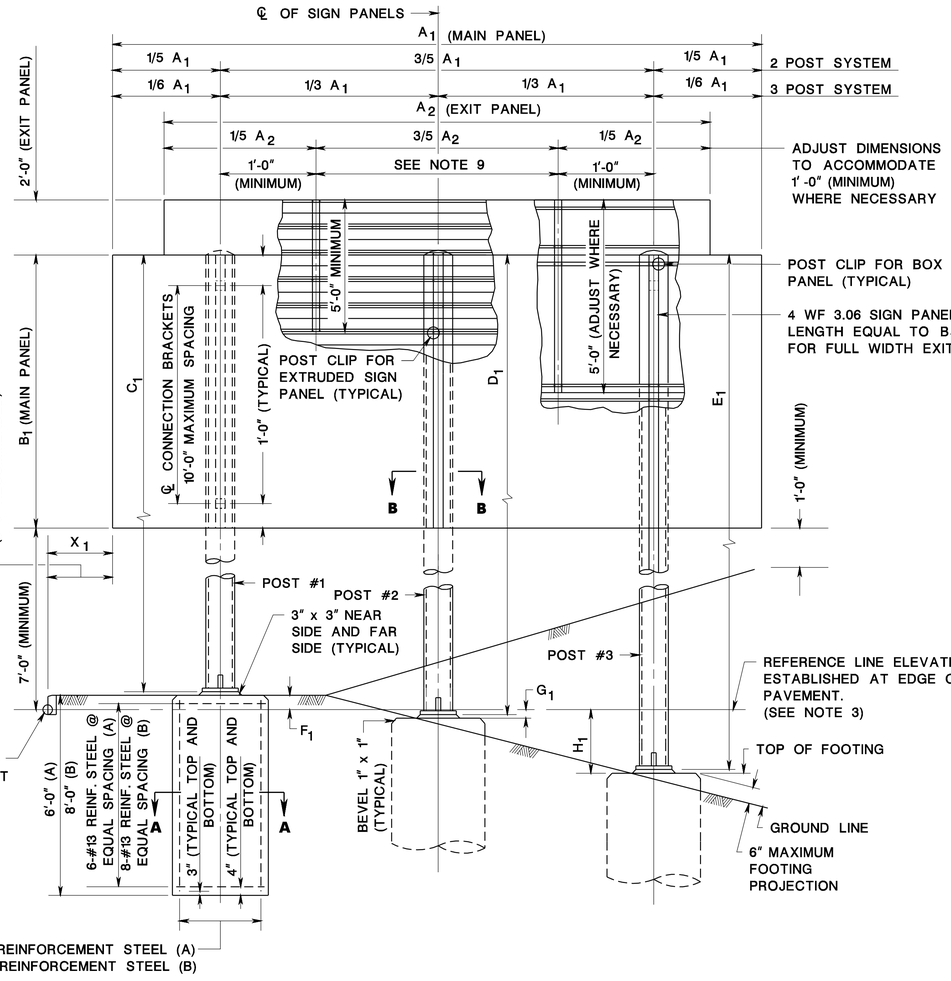
VIEW C–C

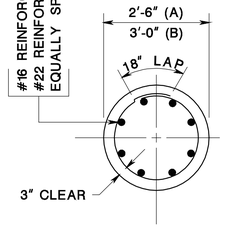




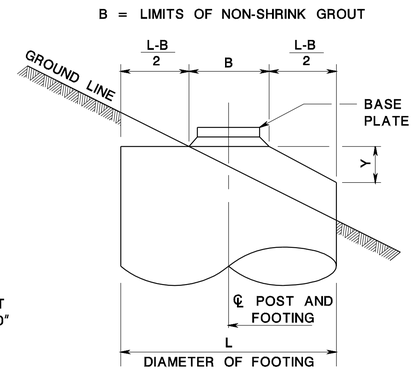
SECTION M–M

(BOX SIGN PANEL SHOWN.
EXTRUDED SIGN PANEL SIMILAR.)

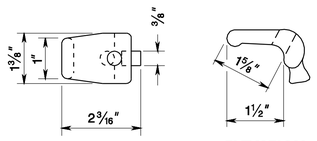




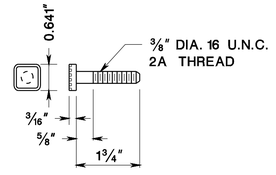
SECTION A–A



(BEND REINFORCEMENT STEEL TO FIT)



PLAN **ELEVATION**



GENERAL NOTES:

1. USE CLASS "B" CONCRETE IN ALL FOOTINGS.
2. ALL FOOTINGS SHALL BE PLACED AGAINST UNDISTURBED OR ADEQUATELY COMPACTED EARTH, EXCEPT FOR FOOTING TOPS WHICH SHALL BE FORMED TO A DEPTH OF 3 INCHES BELOW GROUND LINE.
3. TOPS OF FOOTINGS ABOVE REFERENCE LINE ARE INDICATED BY PLUS (+) VALUE; AND BELOW REFERENCE LINE BY MINUS (-) VALUE.
4. MATERIAL FOR STRUCTURAL SHAPES AND PLATES SHALL BE ALUMINUM ALLOY 6061-T6.
5. ANCHOR BOLT ASSEMBLY SHALL BE STRUCTURAL STEEL CONFORMING TO ASTM SPECIFICATION F1554. NUTS, WASHERS AND BOLTS SHALL BE HOTDIP GALVANIZED CONFORMING TO ASTM A153 CLASS C. THE TOP 6 INCHES OF ALL ANCHOR BOLTS SHALL BE THREADED.
6. WELDING OF ALUMINUM SHALL BE AS SPECIFIED IN THE CONSTRUCTION SPECIFICATIONS
7. UNUSUAL FOUNDATION CONDITIONS MAY REQUIRE REDESIGN OF FOOTING AND SUCH CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE DEPARTMENT.
8. DIMENSIONS FOR BASE TYPE A ARE DESIGNATED (A). DIMENSIONS FOR BASE TYPE B ARE DESIGNATED (B).
9. PROVIDE 4 WF 3.06 EXIT PANEL BRACE FOR PARTIAL WIDTH EXIT PANELS ONLY.

REINFORCMENT STEEL IS IN METRIC UNITS.

NON–BREAKAWAY SIGN SUPPORTS FOR GROUND MOUNTED SIGNS

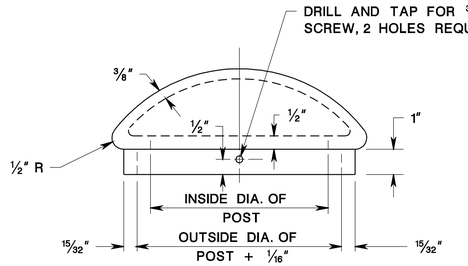
N.T.S.

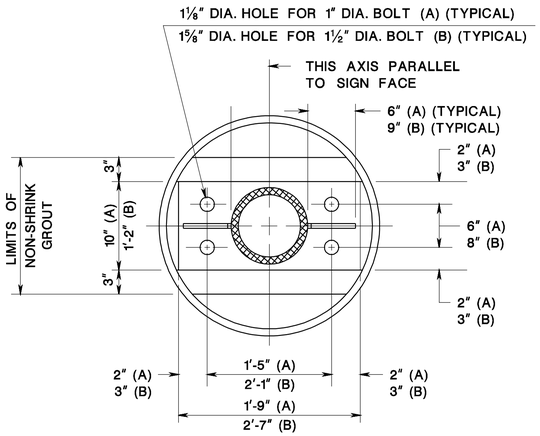
CD-612-13

NEW JERSEY DEPARTMENT OF TRANSPORTATION

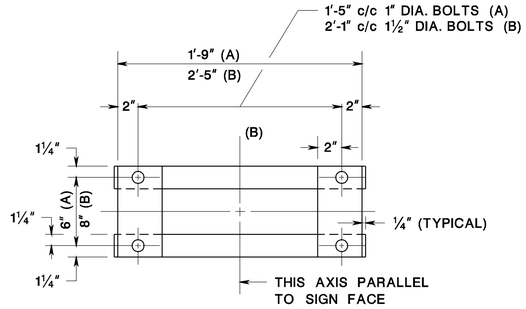
CONSTRUCTION DETAILS

CD-612-13.1

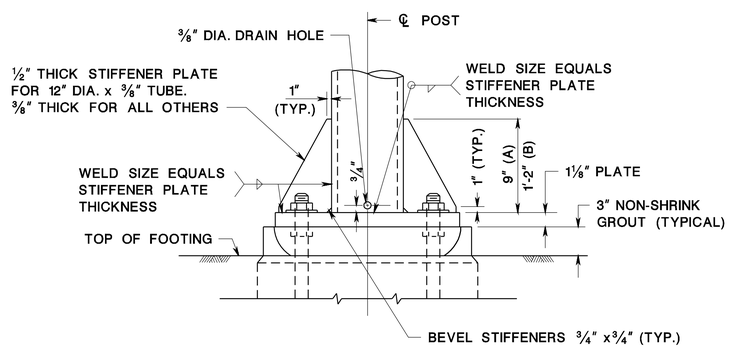




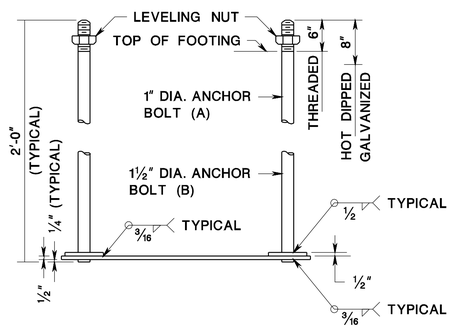
PLAN



PLAN



ELEVATION



ELEVATION

GENERAL NOTES:

1. USE CLASS "B" CONCRETE IN ALL FOOTINGS.
2. ALL FOOTINGS SHALL BE PLACED AGAINST UNDISTURBED OR ADEQUATELY COMPACTED EARTH, EXCEPT FOR FOOTING TOPS WHICH SHALL BE FORMED TO A DEPTH OF 3 INCHES BELOW GROUND LINE.
3. TOPS OF FOOTINGS ABOVE REFERENCE LINE ARE INDICATED BY PLUS (+) VALUE; AND BELOW REFERENCE LINE BY MINUS (-) VALUE.
4. MATERIAL FOR STRUCTURAL SHAPES AND PLATES SHALL BE ALUMINUM ALLOY 6061-T6.
5. ANCHOR BOLT ASSEMBLY SHALL BE STRUCTURAL STEEL CONFORMING TO ASTM SPECIFICATION A36 NUTS, WASHERS AND BOLTS SHALL BE HOT DIP GALVANIZED. THE TOP 6 INCHES OF ALL ANCHOR BOLTS SHALL BE THREADED.
6. WELDING OF ALUMINUM SHALL BE AS SPECIFIED IN THE SPECIFICATIONS.
7. UNUSUAL FOUNDATION CONDITIONS MAY REQUIRE REDESIGN OF FOOTING AND SUCH CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE DEPARTMENT.
8. DIMENSIONS FOR BASE TYPE A ARE DESIGNATED (A). DIMENSIONS FOR BASE TYPE B ARE DESIGNATED (B).

NON-BREAKAWAY SIGN SUPPORTS FOR GROUND MOUNTED SIGNS

N.T.S.

CD-612-14

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

CD-612-14.1

SIGN SUPPORT DATA TABLE

IDENTIFICATION		OFFSET	SIGN SIZE			NO. OF POSTS	TUBE SIZE		POST HEIGHT			BASE TYPE	DIMENSIONS TO TOP OF FOOTING		
NO.	STATION	X_1	A_1	B_1	A_2		O.D.	THK.	C_1	D_1	E_1		F_1	G_1	H_1

FOOTING BEVEL TABLE

IDENT. NO.	$\frac{(L - B)}{2}$	Y		
		POST #1	POST #2	POST #3

GENERAL NOTES:

1. AN ASTERISK (*) IN COLUMN BASE TYPE INDICATES THAT THE EDGE OF FOOTING MUST BE BEVELLED TO MEET THE 6" MAXIMUM PROJECTION REQUIREMENT.
2. FOR IDENTIFICATION OF TABULAR ITEMS, AND DETAILS RELATING THERETO, REFER TO NON-BREAKAWAY SIGN SUPPORTS FOR GROUND MOUNTED SIGNS (CD-612-13).

NOTE TO DESIGNER:

THIS SHEET REQUIRES DESIGN SPECIFIC INFORMATION TO BE ADDED AND INCLUDED IN THE CONTRACT PLANS.

REMOVE THIS NOTE AFTER DESIGN SPECIFIC INFORMATION IS ADDED.

NON–BREAKAWAY SIGN SUPPORTS FOR GROUND MOUNTED SIGNS

N.T.S.

CD-612-15

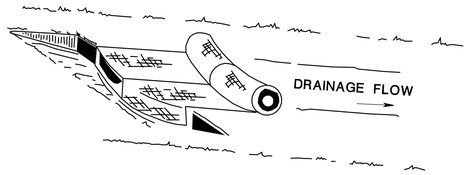
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

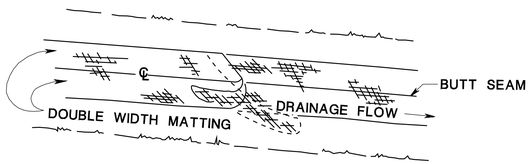
CD-612-15.1

SWALE OR DITCH

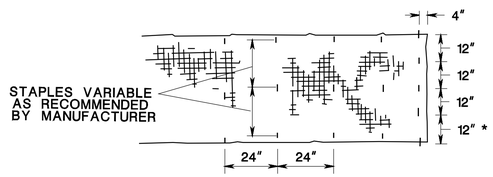
DOUBLE WIDTH MATTING AND BLANKETS IN SWALE, USE 3'-6" OVERLAP WHERE TWO OR MORE STRIPS ARE REQUIRED, AND STAPLE ON 2'-0" CENTERS



BURY TOP END OF MATTING AND BLANKETS IN A 6" TRENCH TAMP TRENCH FULL OF SOIL. SECURE WITH ROW OF STAPLES, 12" MAXIMUM SPACING 4" DOWN FROM TRENCH.

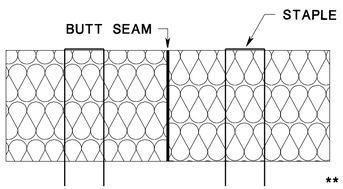


OVERLAP: BURY UPPER END OF LOWER STRIP AS PER ABOVE DETAIL. OVERLAP END OF TOP STRIP 6" AND STAPLE EITHER SIDE OF JOINT.



* DEPENDANT ON WIDTH OF PRODUCT

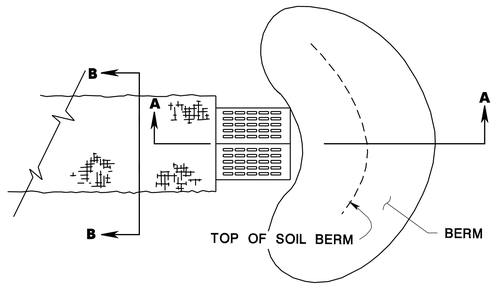
SECURE MATTING AND BLANKETS WITH STAPLES SPACED 24" APART ALONG THE SIDES AND DOWN THE CENTER. AT THE ENDS OF THE MATTING AND AT 50 FOOT INTERVALS STAPLES SHALL BE PLACED 12" APART ACROSS THE WIDTH.

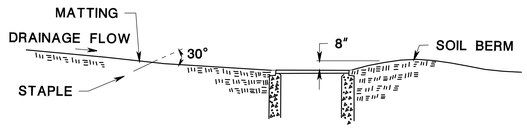


EXCELSIOR BUTT SEAM

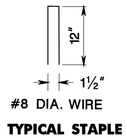
** REFER TO SE&SC MANUAL CHAPTER 3.9 FOR WHERE THIS TREATMENT IS TO BE USED.

INLET AND MOUND

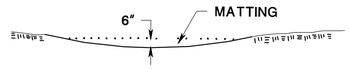




SECTION A–A



TYPICAL STAPLE



SECTION B–B

TOPSOIL STABILIZATION MATTING

CD-807-1.1

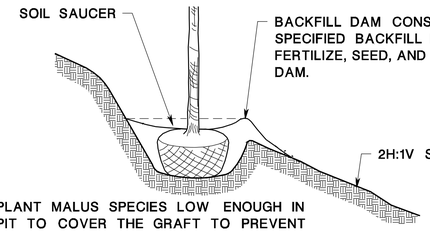
TOPSOIL STABILIZATION

N.T.S.

CD-807-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS



PLANT MALUS SPECIES LOW ENOUGH IN PIT TO COVER THE GRAFT TO PREVENT SPROUTING FROM THE ROOT STOCK.

TREE PLANTING – 2H:1V SLOPE

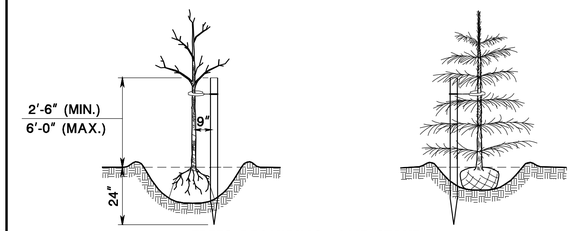
CD-811-1.1

IMMEDIATELY PRIOR TO PLANTING, MAKE 3 VERTICAL CUTS EQUIDISTANT AND ½" DEEP INTO ROOT MASS.

CONTAINERIZED PLANTING DETAIL

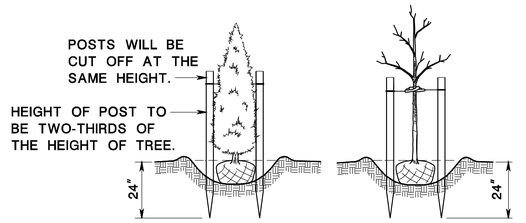
CD-811-1.3

POSTS - 2" x 2" x 8 FOOT LUMBER, STAINED DARK BROWN, OR 8 FOOT WHITE CEDAR POST 2" TO 3" DIAMETER AT THE THINNER (LOWER) END OF THE POST.



TREES REQUIRING ONE STAKE

DECIDUOUS TREES (EXCEPT SALIX) 1" TO 1½" CALIPER, INCLUSIVE. CONE TYPE (PYRAMIDAL) TREES 3 FEET TO 5 FEET HIGH, AND COLUMNAR EVERGREEN TREES 4 FEET TO 7 FEET HIGH, INCLUSIVE.



TREES REQUIRING TWO STAKES

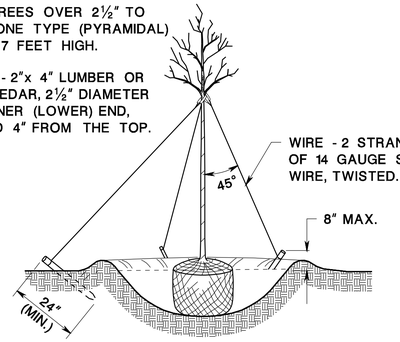
DECIDUOUS TREES OVER 1½" TO 2½" CALIPER, INCLUSIVE. ALL SALIX REGARDLESS OF HEIGHT, CALIPER, BARE ROOT OR BALLED AND BURLAPPED. CONE TYPE (PYRAMIDAL) TREES 5 FEET TO 7 FEET HIGH AND COLUMNAR EVERGREEN TREES 7 FEET TO 9 FEET HIGH, INCLUSIVE.

STAKING DETAILS

CD-811-1.5

DECIDUOUS TREES OVER 2½" TO 4" CALIPER, CONE TYPE (PYRAMIDAL) TREES OVER 7 FEET HIGH.

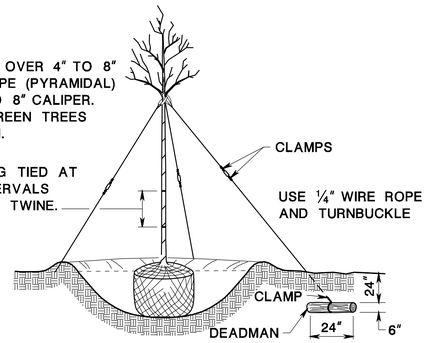
STAKES - 2"x 4" LUMBER OR WHITE CEDAR, 2½" DIAMETER AT THINNER (LOWER) END, NOTCHED 4" FROM THE TOP.



TREES REQUIRING THREE GUYS & STAKES

DECIDUOUS TREES OVER 4" TO 8" CALIPER. CONE TYPE (PYRAMIDAL) TREES OVER 4" TO 8" CALIPER. COLUMNAR EVERGREEN TREES OVER 9 FEET HIGH.

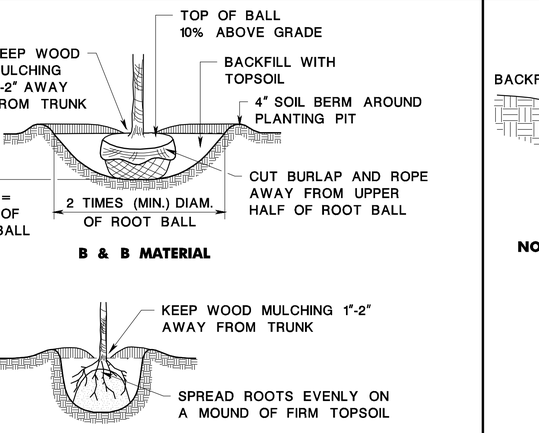
BURLAP WRAPPING TIED AT MAXIMUM 24" INTERVALS WITH 2 PLY JUTE TWINE.



TREES REQUIRING THREE GUYS & DEADMEN

GUYING DETAILS

CD-811-1.6

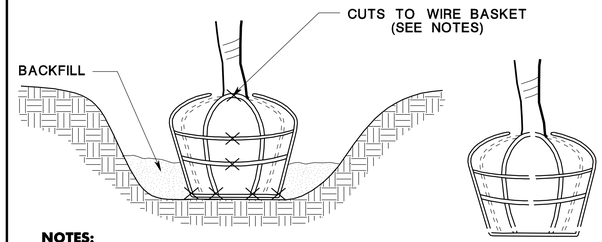


B & B MATERIAL

BARE ROOT MATERIAL

TREE & SHRUB PLANTING DETAIL

CD-811-1.2

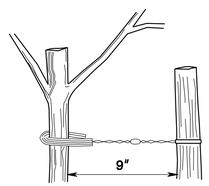


NOTES:

1. CUT OUT BOTTOM LOOPS PRIOR TO SETTING PLANT IN PLANTING PIT.
2. SET PLANT AND BACKFILL HALFWAY UP THE BALL. TAMP AND WATER BACKFILL.
3. CUT REMAINING HORIZONTAL BAND DOWN ONE SIDE.
4. REMOVE REMAINDER OF WIRE BASKET.
5. COMPLETE BACKFILLING AND PROVIDE INITIAL WATERING.

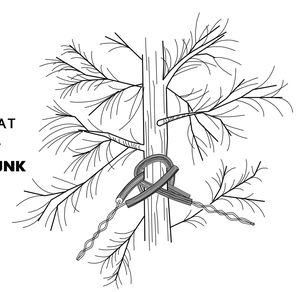
WIRE BASKET REMOVAL

CD-811-1.4



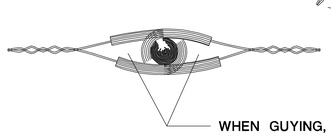
ANCHOR TREE TO POST(S) USING 14 GAUGE STEEL WIRE AND ⅜" MIN INSIDE DIAMETER CORDED RUBBER.

DETAIL OF POST AND GUY WIRE



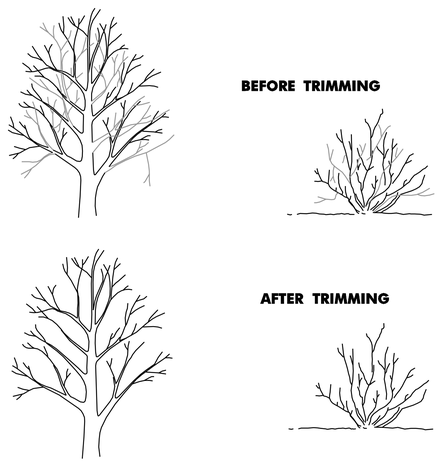
GUY WIRES SHOULD BE PLACED AT LEAST HALF WAY UP THE TRUNK.

DETAIL OF GUY WIRES AROUND TRUNK



FASTENING DETAIL

CD-811-1.7

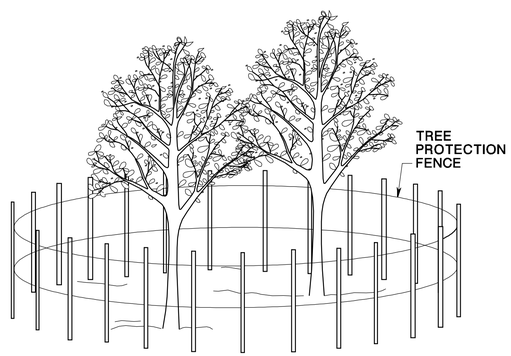


DAMAGED BRANCHES SHALL BE TRIMMED OFF BELOW THE POINT OF INJURY. THE CENTRAL TRUNK OR "LEADER" SHOULD BE LEFT INTACT. BROKEN ROOTS SHALL BE CUT OFF ABOVE THE BREAK AND BRUISED ENDS CUT OFF CLEANLY.

WHEN PLANTING A YOUNG SHRUB, PRUNE JUST ABOVE A BUD AND RETAIN THE NATURAL SHAPE OF THE SHRUB.

PRUNING AT TIME OF PLANTING

CD-811-1.8



NOTE:
PLACE FENCE A MINIMUM OF 1'-0" OUTSIDE DRIP LINE OF EXISTING TREE

TREE PROTECTION DETAIL

CD-811-1.9

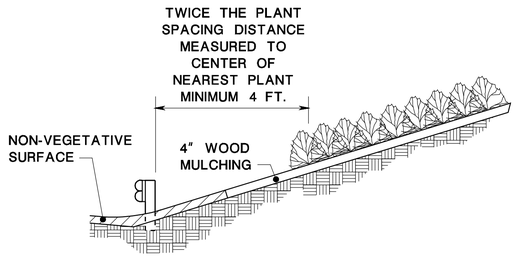
PLANTING

N.T.S.

CD-811-1

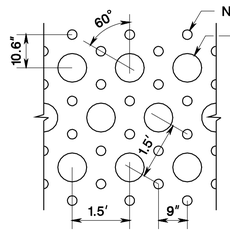
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS



SHRUB PLANTING BEHIND GUIDE RAIL

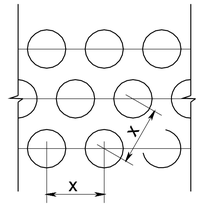
CD-811-2.1



NOTE:
THERE ARE 4.6 HEMEROCALLIS AND 10 NARCISSUS IN A SQUARE YARD.

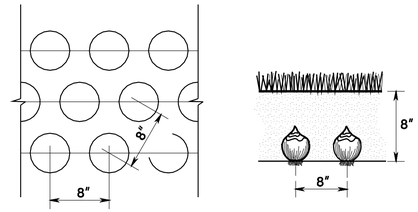
HEMEROCALLIS AND NARCISSUS BED PLANTING DETAIL

CD-811-2.2



SHRUB BED PLANTING DETAIL

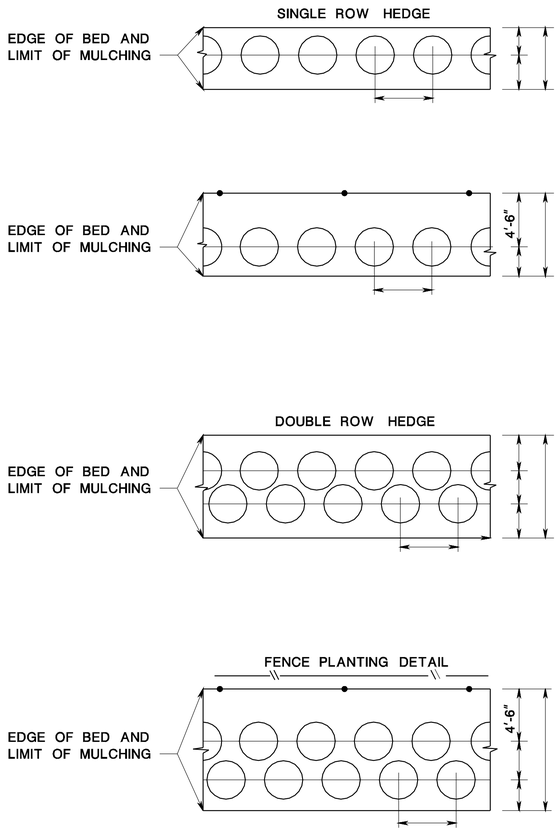
CD-811-2.3



NOTE:
NARCISSUS TO BE PLANTED IN TURF AREAS AND SHALL NOT RECEIVE WOOD MULCHING.

NARCISSUS IN TURF DETAIL

CD-811-2.4



HEDGE PLANTING DETAILS

CD-811-2.5

NOTE TO DESIGNER:
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REMOVE THIS NOTE AFTER DESIGN SPECIFIC INFORMATION IS ADDED.

PLANTING

N.T.S.

CD-811-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

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BDC07D-01- ORIGINAL SHEET

LEGEND

BREAKAWAY BARRICADES

BREAKAWAY BARRICADES WITH SIGN

CONSTRUCTION SIGNS

DRUMS

CONE

PRECAST CONCRETE CURB CONSTRUCTION BARRIER (TYPE SPECIFIED)

DIRECTION OF TRAFFIC FLOW

TRAFFIC DIRECTOR, FLAGGER

TRAILER MOUNTED MOUNTED ARROW BOARD SHOWING CAUTION MODE

LEFT RIGHT BOTH

ILLUMINATED FLASHING ARROW MOUNTED ON TOWING VEHICLE SHOWING ARROW PATTERN (Left, Right, Both)

TRAFFIC CONTROL TRUCK WITH MOUNTED CRASH CUSHION AND ARROW BOARD SHOWING CAUTION MODE

LEFT RIGHT BOTH

TRAFFIC CONTROL TRUCK WITH MOUNTED CRASH CUSHION AND ARROW BOARD SHOWING ARROW PATTERN (Left, Right, Both)

TEMPORARY CRASH CUSHION, INERTIAL BARRIER SYSTEM

TEMPORARY CRASH CUSHION, (all other approved)

BUFFER ZONE

WORK AREA

PAINT STRIPING TRUCK OR OTHER OPERATING VEHICLE

GENERAL NOTES:

1. ADVANCE WARNING SIGNS DISTANCES, AND TAPER LENGTHS MAY BE EXTENDED, AT DIRECTION OF THE DEPARTMENT, TO ADJUST FOR REDUCED VISIBILITY DUE TO HORIZONTAL AND VERTICAL CURVATURE OF THE ROADWAY.

2. THE APPROXIMATE LOCATIONS OF THE ILLUMINATED FLASHING ARROW BOARDS ARE SHOWN ON THE TRAFFIC CONTROL PLANS. THESE LOCATIONS MAY BE MODIFIED AS APPROVED BY RE TO ADJUST FOR VISIBILITY DUE TO HORIZONTAL OR VERTICAL CURVATURE OF THE ROADWAY OR TO POSITION AT A SAFER LOCATION. ILLUMINATED FLASHING ARROW BOARDS ARE TO BE USED FOR TEMPORARY LANE CLOSINGS AND AT LOCATIONS SHOWN ON THE TRAFFIC CONTROL PLANS.

3. PRIOR TO ANY ROAD CONSTRUCTION, TRAFFIC CONTROL SIGNS AND DEVICES SHALL BE IN PLACE.

4. RAMPS AND/OR SIDE STREETS ENTERING THE ROADWAY AFTER THE FIRST ADVANCE WARNING SIGN SHALL BE PROVIDED WITH AT LEAST ONE W20-IF SIGN (ROAD WORK AHEAD) AS A MINIMUM.

5. ALL EXISTING ROAD SIGNS, PAVEMENT MARKINGS AND/OR PLOWABLE PAVEMENT REFLECTORS WHICH CONFLICT WITH THE PROPOSED TRAFFIC CONTROL PLAN SHALL BE COVERED, REMOVED OR RELOCATED AS DIRECTED BY THE RE.

6. CONFLICTING OR NON-OPERATING SIGNAL INDICATIONS ON EITHER THE EXISTING, TEMPORARY,OR PROPOSED TRAFFIC SIGNAL SYSTEMS SHALL BE BAGGED OR COVERED.

7. MAINTENANCE AND PROTECTION OF TRAFFIC SHALL BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES - PART VI "STANDARDS AND GUIDES FOR TRAFFIC CONTROL FOR STREET AND HIGHWAY CONSTRUCTION, MAINTENANCE, UTILITY, AND INCIDENT MANAGEMENT OPERATIONS", UNLESS OTHERWISE NOTED IN THE PLANS AND SPECIFICATIONS.

8. CONSTRUCTION SIGN W99-2 (GIVE US A BRAKE) SHALL BE LOCATED 200 FEET IN ADVANCE OF PROJECT LIMITS.

9. A W1-6 (ARROW) SIGN MOUNTED ON A BREAKAWAY BARRICADE AND CENTERED ON THE CLOSED WIDTH SHALL BE LOCATED 100 FEET BEYOND EACH INTERSECTION OR MAIN ACCESS POINT WITHIN THE AREA OF A LANE OR SHOULDER CLOSURE.

10. CONSTRUCTION SIGNS R11-4 (ROAD CLOSED TO THRU TRAFFIC) SHALL BE PLACED AT THE INTERSECTING STREETS WHICH ARE CLOSED TO TRAFFIC BECAUSE OF CONSTRUCTION.

11. CONSTRUCTION SIGNS W8-9A (SYMBOL FOR UNEVEN PAVEMENT) AND W8-14A (GROOVED PAVEMENT) SHALL BE USED WHEN SUCH PAVEMENT CONDITIONS EXIST. THE PLACEMENT OF THESE SIGNS SHALL BE AS DIRECTED BY THE RE.

12. MOVING WORK AREAS IN A LANE CLOSURE REQUIRE A TRAILER MOUNTED ILLUMINATED FLASHING ARROW TO REMAIN AT THE END OF THE TAPER, THE TRAFFIC CONTROL TRUCK WITH MOUNTED CRASH CUSHION THAT SHALL MOVE WITH THE WORK AREAS TO KEEP A 70 FEET MIN. AND 150 FEET MAX. BUFFER IN ADVANCE OF EACH WORK AREA.

13. THE CONTRACTOR SHALL SUBMIT A PLAN FOR THE SAFE ACCESS OF CONSTRUCTION VEHICLES THROUGHOUT THE WORK SITE WHERE SPACE CONSTRAINTS PREVENT THE USE OF LANE CLOSURES. THE PLAN SHALL BE SUBMITTED TO THE RE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

14. TRAFFIC SAFETY SERVICES SHALL BE USED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR TRAFFIC CONTROL.

15. ALL EXCAVATED AREAS WITHIN OR ADJACENT TO THE ROADWAY SHALL BE BACKFILLED AND PLACED ON AT LEAST 6H : 1V SLOPE BEFORE THE END OF EACH WORK DAY. OTHER EXCAVATED AREA WITHIN THE CLEAR ZONE SHALL BE BACKFILLED.

16. WHERE REQUIRED, THE CONTRACTOR SHALL MAKE PROVISIONS FOR MAINTAINING PEDESTRIAN CROSSING LOCATIONS AND TYPE AS DIRECTED BY THE RE.

17. BITUMINOUS CONCRETE PLACED DURING THE VARIOUS CONSTRUCTION STAGES SHALL BE TRANSITIONED ON A MINIMUM 20H : 1V SLOPE TO MEET THE ADJACENT EXISTING GRADE AT THE LONGITUDINAL AND TRANSVERSE LIMITS OF THE STAGE CONSTRUCTION AREAS UNLESS OTHERWISE NOTED ON THE STAGE CONSTRUCTION PLANS.

18. THE PLACEMENT AND OR RELOCATION OF PRECAST CONCRETE CURB, CONSTRUCTION BARRIER SHALL BE DONE DURING APPROVED OFF-PEAK HOURS WHEN TRAFFIC MAY BE REDUCED TO ONE LANE IN EACH DIRECTION.

19. CONSTRUCTION ZONE SPEED LIMIT WILL BE DETERMINED BY THE TRAFFIC SIGNAL & SAFETY ENGINEERING, REGIONAL TRAFFIC ENGINEER - WORK ZONE, AT THE TIME OF OR DURING CONSTRUCTION, AS REQUESTED BY THE R.E..

20. THE SPEED LIMIT, R2-1 (BLACK ON WHITE) WITH ADDED WORK ZONE PLATE (BLACK ON ORANGE) SIGNS SHALL BE LOCATED THROUGH WORK AREAS AS DIRECTED BY THE TRAFFIC SIGNAL & SAFETY ENGINEERING REGIONAL TRAFFIC ENGINEER - WORK ZONE.

21. THE REDUCED SPEED AHEAD SIGN, W3-5(S) (BLACK ON ORANGE) SHALL BE LOCATED IN ADVANCE OF SPEED LIMIT R2-1 SIGNS WHICH REDUCE THE NORMAL POSTED SPEED LIMIT THROUGH THE CONSTRUCTION ZONE.

22. TRAFFIC FINES DOUBLED IN WORK AREA R(NJ)5-17(S) , 4 FEET BY 2.5 FEET SIGN SHALL BE LOCATED 500 FEET AFTER THE FIRST ADVANCE WARNING SIGN, (W20 SERIES) AT EACH WORK AREA LOCATED WITHIN URBAN AREAS. THIS SIGN SHALL ALSO BE USED ON PROJECTS REQUIRING MOVING OPERATIONS IN WHICH CASE THE SIGN SHALL BE MOUNTED ON A SLOW MOVING CONSTRUCTION VEHICLE.

23. THE FINAL HMA SURFACE PAVEMENT SHALL NOT BE CONSTRUCTED UNTIL THE FINAL STAGE OF THE PROJECT UNLESS OTHERWWISE DIRECTED BY THE RE OR INDICATED ON THE PLANS. MANHOLES AND INLETS SHALL BE SET TO FINISHED GRADE AND TEMPORARY PAVEMENT RAMPS ARE TO BE CONSTRUCTED AROUND THEM WITH A MINIMUM 20H : 1V SLOPE IN ALL DIRECTIONS USING HOT MIX ASPHALT PAVEMENT. THIS TEMPORARY MATERIAL WILL BE REMOVED IMMEDIATELY PRIOR TO PLACING THE SURFACE COURSE.

24. TRAFFIC CONTROL DEVICES FOR LANE CLOSURES INCLUDING SIGNS, CONES, BARRICADES, ETC. SHALL BE PLACED AS SHOWN ON PLANS. SIGNS SHALL NOT BE PLACED WITHOUT ACTUAL LANE CLOSURES AND SHALL BE IMMEDIATELY REMOVED UPON REMOVAL OF THE CLOSURES.

25. CONES MAY BE SUBSTITUTED FOR DRUMS AND INSTALLED UPON THE APPROVAL OF THE RE.

26. TRAFFIC IMPACT NOTICES AND CHANGES

A. TERMS:
WHEN THE FOLLOWING TERMS ARE USED, THE INTENT AND MEANING SHALL BE AS FOLLOWS:

i. IMPACTS TO NORMAL TRAFFIC FLOW - WORK THAT REQUIRES A PORTION OF THE PAVED ROADWAY BEING BLOCKED OR CLOSED WITH SAFETY DEVICES OR VEHICLES, INCLUDING, BUT NOT LIMITED TO, FULL OR PARTIAL LANE CLOSURES, FULL OR PARTIAL RAMP CLOSURES, SHOULDER CLOSURES, MOVING OPERATIONS SUCH AS TRAFFIC STRIPING OR SWEEPING, LANE SHIFTS, OR ALTERNATING TRAFFIC. THIS APPLIES EVEN WHEN DETOURS ARE PROVIDED.

ii. TEMPORARY LANE CLOSURES - WORK DESCRIBED UNDER "IMPACTS TO NORMAL TRAFFIC FLOW" WHICH IS ROUTINELY SET UP AND REMOVED ON A DAILY BASIS.

iii. PERMANENT LANE CLOSURES - WORK DESCRIBED UNDER "IMPACTS TO NORMAL TRAFFIC FLOW" WHICH REMAINS IN PLACE CONTINUOUSLY FOR 24 HOURS OR MORE.

B. ADVANCE NOTICES

FOR THE INITIAL START OF WORK THAT REQUIRES "IMPACTS TO NORMAL TRAFFIC FLOW", THE CONTRACTOR SHALL NOTIFY THE RE IN WRITING, ON THE ADVANCE FORM TO-103 PROVIDED BY THE DEPARTMENT, OF THE PROPOSED DATE. THE NOTICE SHALL BE SUBMITTED AT LEAST TWENTY-EIGHT CALENDAR DAYS, BUT NOT MORE THAN SIXTY CALENDAR DAYS, BEFORE THE PROPOSED DATE. START OF WORK THAT IMPACTS NORMAL TRAFFIC FLOW WILL NOT BE PERMITTED PRIOR TO THE DATE STATED IN THE NOTICE. THE CONTRACTOR SHALL CONFIRM, IN WRITING TO THE RE, THE PROPOSED DATE SEVEN (AND/OR FOURTEEN) CALENDAR DAYS BEFORE STARTING THE ESTABLISHMENT OF THE TRAFFIC CONTROL MEASURES FOR THE TRAFFIC IMPACT. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE RE IF THE PROPOSED ESTABLISHMENT CAN NOT BE COMPLETED ON THE PROPOSED DATE.

FOR A "PERMANENT LANE CLOSURE", THE CONTRACTOR SHALL NOTIFY THE RE IN WRITING, ON ADVANCE FORM TO-103, OF THE PROPOSED DATE A NEW TRAFFIC PATTERN WILL BE ESTABLISHED. THE NOTICE SHALL BE SUBMITTED AT LEAST TWENTY-EIGHT CALENDAR DAYS, BUT NOT MORE THAN SIXTY CALENDAR DAYS, IN ADVANCE OF THE PROPOSED DATE. START OF A NEW TRAFFIC PATTERN WILL NOT BE PERMITTED PRIOR TO THE DATE STATED IN THE NOTICE. THE CONTRACTOR SHALL CONFIRM, IN WRITING TO THE RE, THE PROPOSED DATE OF THE NEW TRAFFIC PATTERN SEVEN (AND/OR FOURTEEN) DAYS BEFORE STARTING TRAFFIC CONTROL MEASURES FOR THE ESTABLISHMENT OF THE NEW PATTERN. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE RE IF THE PROPOSED ESTABLISHMENT CAN NOT BE COMPLETED ON THE PROPOSED DATE.

STARTING THE ESTABLISHMENT OF A NEW PERMANENT TRAFFIC PATTERN SHALL BEGIN NO EARLIER THAN 11:00 PM FRIDAY AND SHALL BE COMPLETED AND READY FOR OPERATIONS BY 6:00 PM THE FOLLOWING SUNDAY. THE ESTABLISHMENT SHALL BE COMPLETED IN ACCORDANCE WITH THE LANE CLOSURE HOURS SPECIFIED IN THE CONTRACT.

ADVANCE NOTICES SENT PRIOR TO THE PRE-CONSTRUCTION MEETING SHALL BE ADDRESSED TO THE CONTACT PERSON AS SPECIFIED IN SUBSECTION 101.04 OF THE SPECIAL PROVISIONS.

C. PROGRESS NOTICES

ALL "IMPACTS TO NORMAL TRAFFIC FLOW" SCHEDULED FOR THE SEVEN DAY PERIOD STARTING ON THE FOLLOWING MONDAY SHALL BE SUBMITTED TO THE RE BY 9:00 AM OF EACH FRIDAY ON WEEKLY FORM TO-101 PROVIDED BY THE DEPARTMENT.

EACH DAY OF "TEMPORARY LANE CLOSURES" SHALL BE SUBMITTED TO THE RE BY 9:00 AM THE DAY IN ADVANCE OF THE START OF THOSE OPERATIONS ON DAILY FORM TO-102 PROVIDED BY THE DEPARTMENT.

"TEMPORARY LANE CLOSURES" FOR WEEKENDS SHALL BE SUBMITTED TO THE RE BY 9:00 AM ON THE IMMEDIATELY PRECEDING FRIDAY ON THE DAILY FORM TO-102 PROVIDED BY THE DEPARTMENT.

D. CHANGES TO THE SCHEDULED CLOSURES
REQUEST FOR A CHANGE TO THE TRAFFIC CONTROL REQUIREMENTS IN THE CONTRACT DOCUMENTS SHALL BE SUBMITTED IN WRITING TO THE RE AS FOLLOWS:

CHANGES TO THE SCHEDULED HOURS FOR "TEMPORARY LANE CLOSURES" SHALL BE SUBMITTED TO THE R.E. AT LEAST EIGHT CALENDAR DAYS IN ADVANCE OF WHEN THE CHANGE IS PROPOSED TO START.

OTHER PROPOSED CHANGES TO "TEMPORARY LANE CLOSURES" AND ALL CHANGES TO "PERMANENT LANE CLOSURES" SHALL BE SUBMITTED TO THE RE AS SPECIFIED IN THE SPECIFICATIONS.

NOTE TO DESIGNER:

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REMOVE THIS NOTE AFTER DESIGN SPECIFIC INFORMATION IS ADDED.

TCD-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS

BDC07D-01- ORIGINAL SHEET

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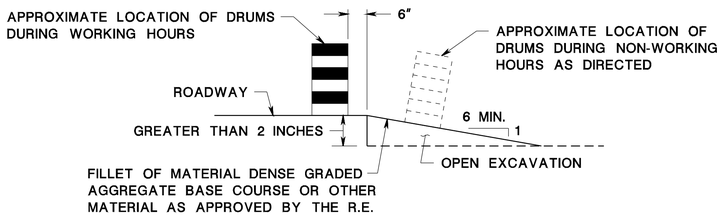
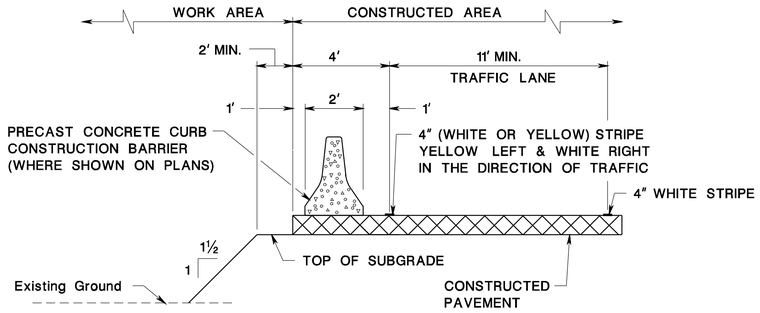


NOTE:

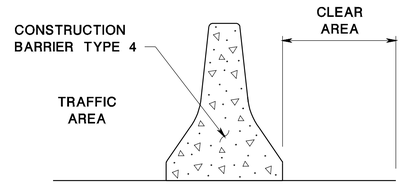
ESCAPE RAMPS MUST BE CONSTRUCTED AND MAINTAINED DURING NON-WORKING HOURS WHERE A VERTICAL DROP GREATER THAN 2 INCHES EXISTS ADJACENT TO TRAVELED LANE.

ESCAPE RAMP DETAIL



TYPICAL SECTION

PLACEMENT OF PRECAST CONCRETE CONSTRUCTION BARRIER



NOTES:

1. CHANGES TO THE PROPOSED JOINT CLASS AT ANY LOCATION MUST BE APPROVED BY THE DEPT.
2. NO ROADWAY DROP OFFS, OBSTRUCTIONS, STORAGE OF MATERIALS OR WORK WILL BE PERMITTED IN THE CLEAR AREA UNLESS APPROVED BY THE R.E.

STAGE	LOCATION	JOINT CLASS
	RTE. STA. TO STA.	

JOINT CLASS	CLEAR AREA
A	20 INCHES
B	16 INCHES
C	11 INCHES

CONSTRUCTION BARRIER, TYPE 4 JOINT CLASS AND CLEAR AREA

REGULATORY APPROACH SPEED OF TRAFFIC MILES/HOUR	RECOMMENDED SIGHT DISTANCE TO BEGINNING OF CHANNELIZING TAPERS		
	DESIRABLE		MINIMUM
	RURAL FEET	URBAN FEET	RURAL AND URBAN FEET
25	375	525	150
30	450	625	200
35	525	725	250
40	600	825	325
45	675	925	400
50	750	1025	475
55	875	1150	550
60	1000	1275	650
65	1050		725

NOTES:

1. AVOIDANCE MANEUVER IS FOR A SPEED, PATH, AND/OR DIRECTION CHANGE PRIOR TO THE BEGINNING OF CHANNELIZING TAPERS.
2. RECOMMENDED DISTANCES BETWEEN TWO SEPARATE LANE CLOSURES SHALL BE DOUBLE THE VALUES SHOWN ABOVE.
3. RURAL AND URBAN ROAD DESIGNATIONS SHALL BE AS DEFINED IN THE NJDOT STATE HIGHWAY STRAIGHT LINE DIAGRAMS.
4. DESIRABLE VALUES SHALL BE PROVIDED WHEREVER POSSIBLE. IF IT IS NOT FEASIBLE OR PRACTICAL TO PROVIDE DESIRABLE VALUES BECAUSE OF HORIZONTAL OR VERTICAL CURVATURE OR IF RELOCATION OF THE TAPER IS NOT POSSIBLE, THEN MINIMUM VALUES CAN BE APPLIED. WHEN MINIMUM VALUES ARE USED, SPECIAL ATTENTION SHOULD BE GIVEN TO THE USE OF SUITABLE TRAFFIC CONTROL DEVICES FOR PROVIDING ADVANCED WARNING OF THE CONDITIONS THAT ARE LIKELY TO BE ENCOUNTERED.
5. TAPERS SHALL BE LOCATED TO MAXIMIZE THE VISIBILITY OF THEIR TOTAL LENGTH.

REGULATORY APPROACH SPEED OF TRAFFIC MILES/HOUR	RECOMMENDED TAPER LENGTH AND SPACING FOR CHANNELIZING TAPERS					RECOMMENDED SPACING ALONG TANGENTS
	MINIMUM TAPER RATIO IN LENGTH PER FOOT OF WIDTH	MINIMUM TAPER LENGTH L – FOR LANE WIDTHS			MAXIMUM DEVICE (B) SPACING ALONG TAPERS IN FEET	MAXIMUM DEVICE (D) SPACING ALONG TANGENTS IN FEET
		10′	11′	12′		
25	10.5:1	105	115	125	25	50
30	15:1	150	165	180	30	60
35	20.5:1	205	225	245	35	70
40	27:1	270	300	325	40	80
45	45:1	450	495	540	45	90
50	50:1	500	550	600	50	100
55	55:1	550	605	660	55	110
60	60:1	600	660	720	60	120
65	65:1	650	715	780	65	130

NOTE:

THE MAXIMUM DEVICE SPACING ALONG CURVES SHALL BE AS DEFINED FOR TAPERS (B) IN THE ABOVE TABLE.

NOTE TO DESIGNER:

THIS SHEET REQUIRES DESIGN SPECIFIC INFORMATION TO BE ADDED AND INCLUDED IN THE CONTRACT PLANS.

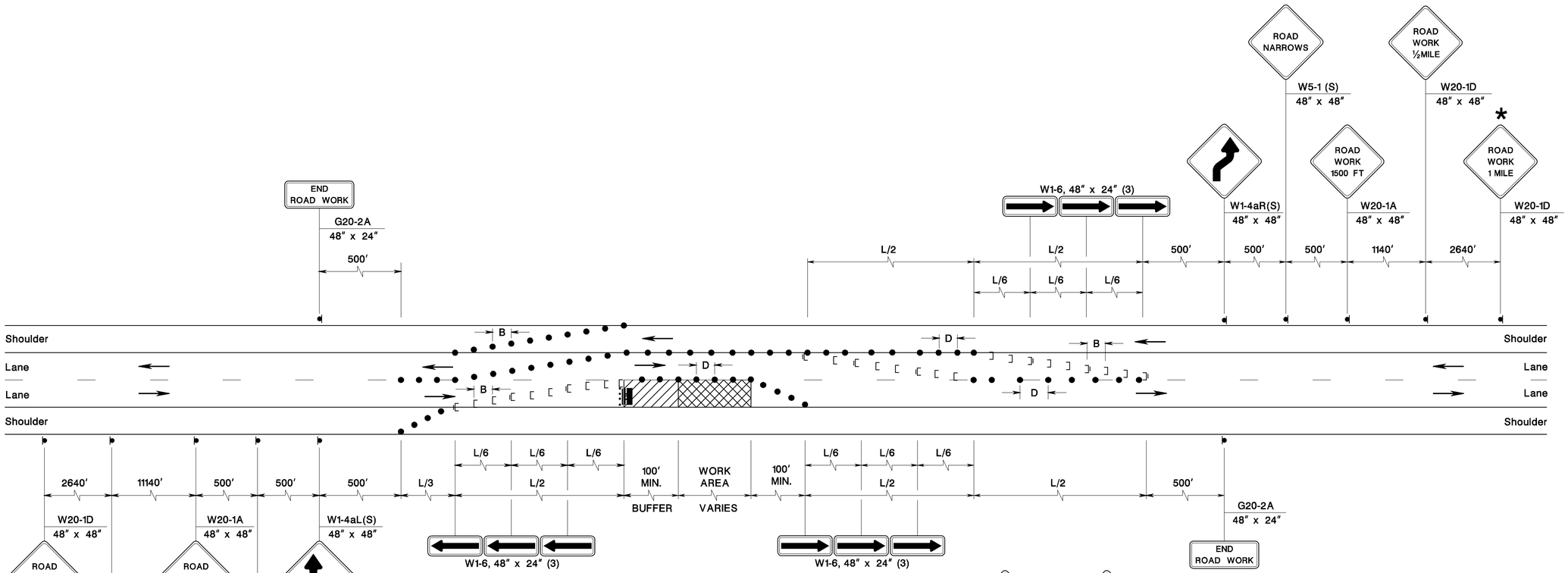
REMOVE THIS NOTE AFTER DESIGN SPECIFIC INFORMATION IS ADDED.

N.T.S.

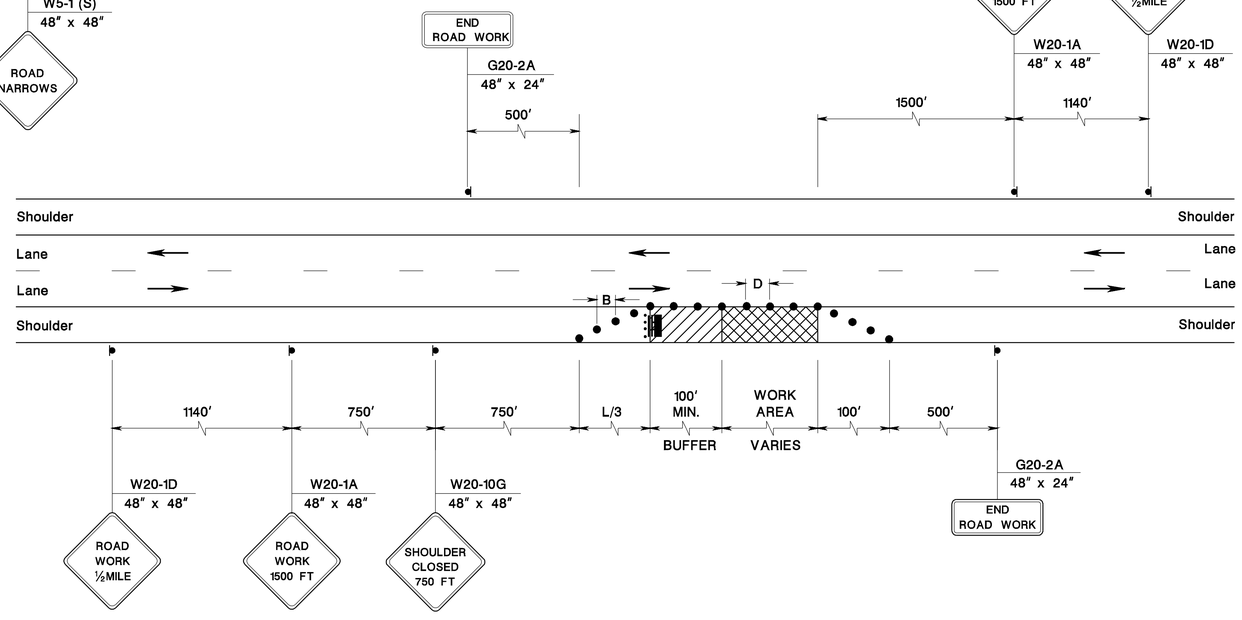
TCD-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS



2 LANES, UNDIVIDED, LANE & SHOULDER CLOSING



2 LANES, UNDIVIDED, SHOULDER CLOSING

* THIS SIGN SHALL BE INSTALLED FOR ROADS WITH A SPEED LIMIT OF 45 M.P.H. OR GREATER UNLESS OTHERWISE DIRECTED BY THE RE.

NOTE:

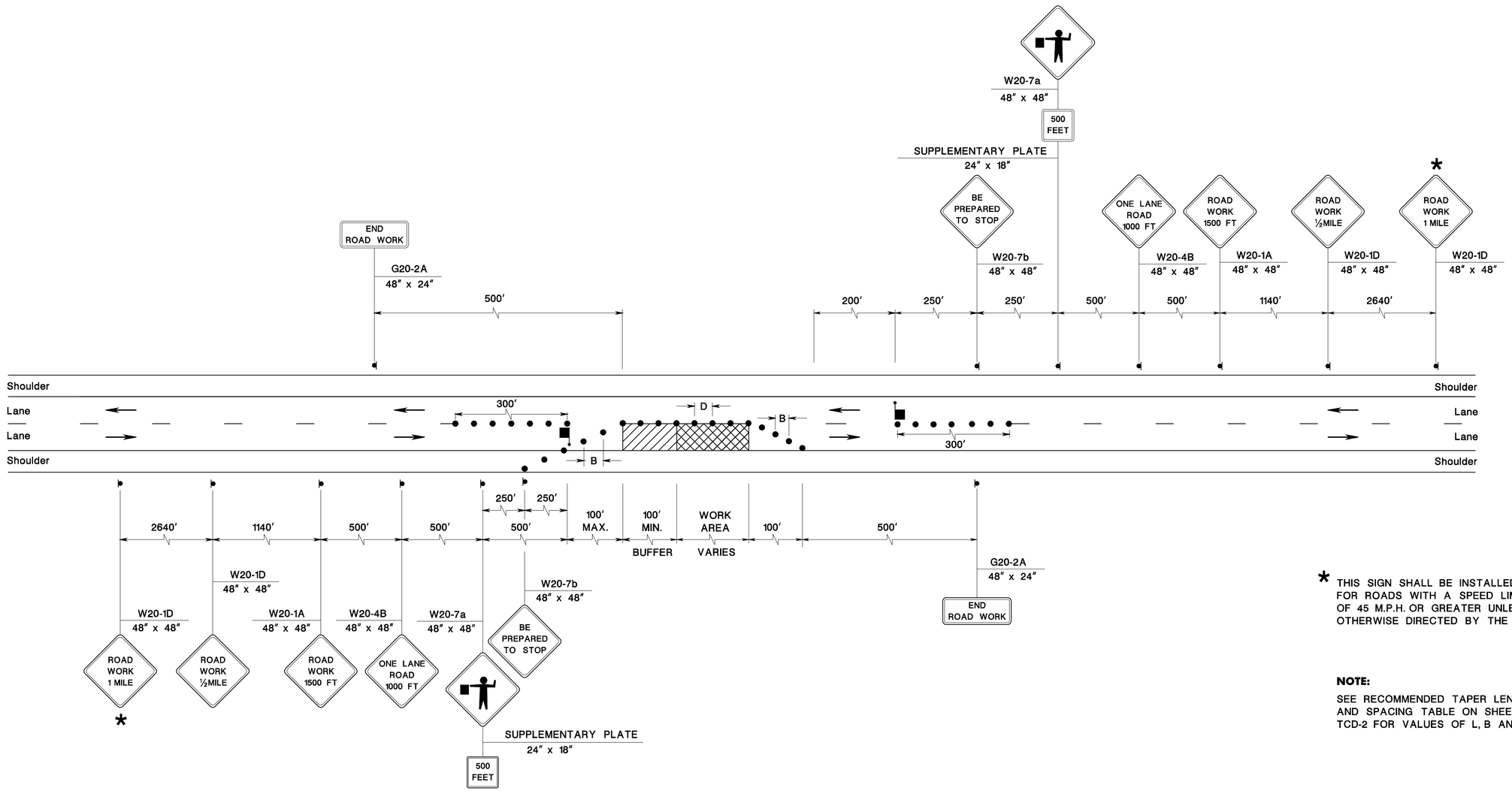
SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

N.T.S.

TCD-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS



* THIS SIGN SHALL BE INSTALLED FOR ROADS WITH A SPEED LIMIT OF 45 M.P.H. OR GREATER UNLESS OTHERWISE DIRECTED BY THE RE.

NOTE:

SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

2 LANES, UNDIVIDED, LANE & SHOULDER CLOSING W/FLAGGING

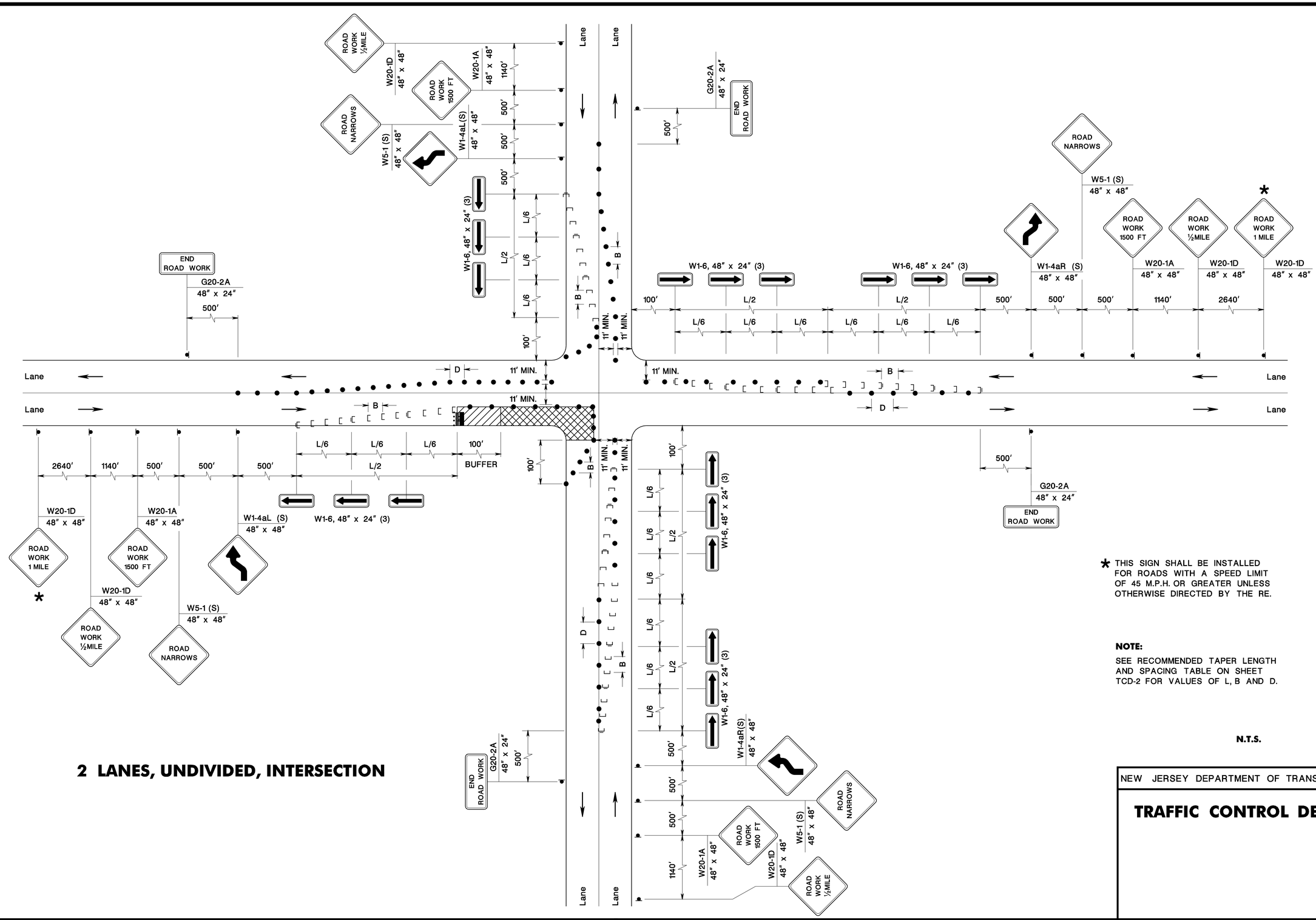
N.T.S.

TCD-4

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS

BDC07D-01- ORIGINAL SHEET



2 LANES, UNDIVIDED, INTERSECTION

* THIS SIGN SHALL BE INSTALLED FOR ROADS WITH A SPEED LIMIT OF 45 M.P.H. OR GREATER UNLESS OTHERWISE DIRECTED BY THE RE.

NOTE:

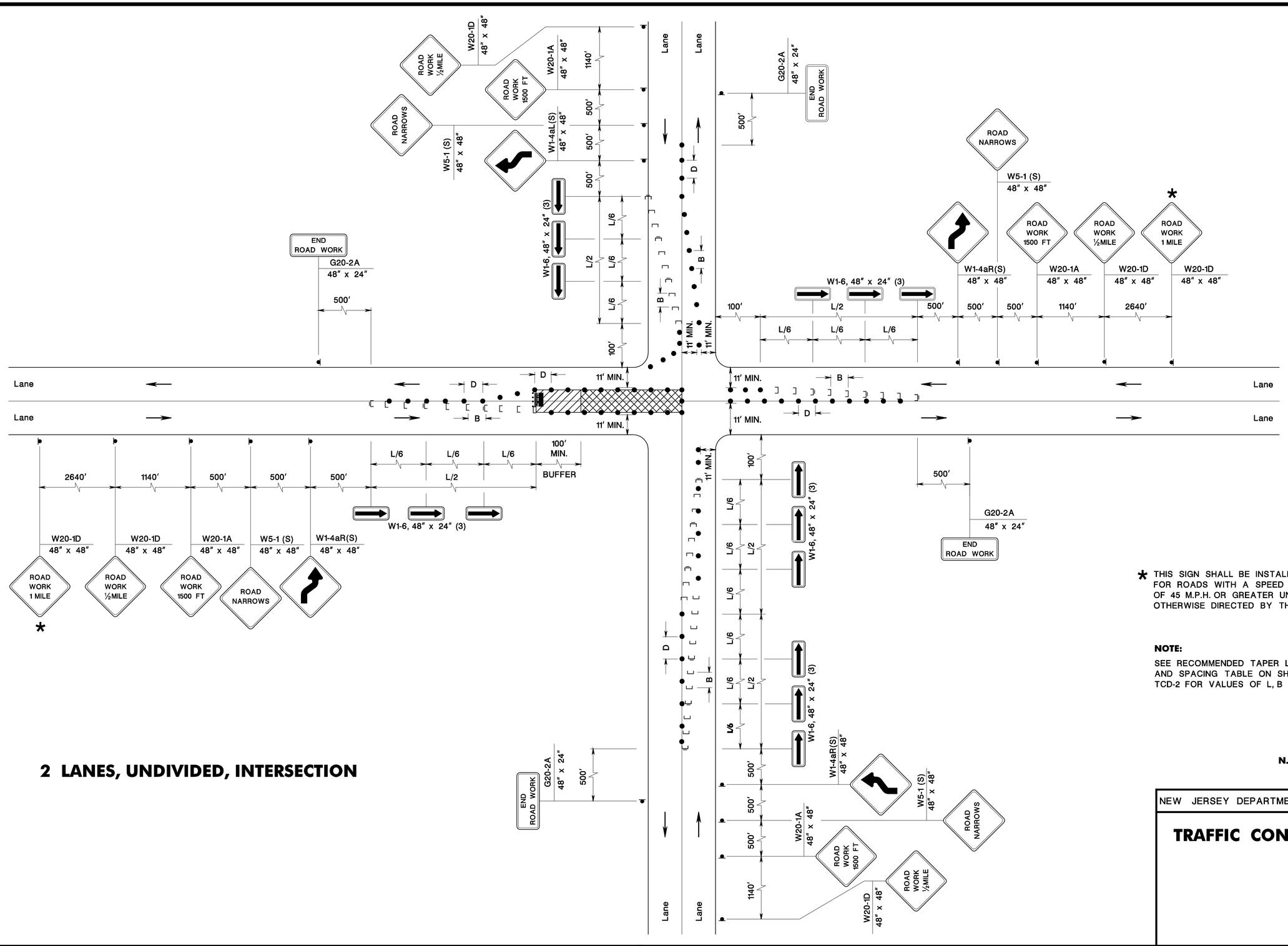
SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

N.T.S.

TCD-5

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS



2 LANES, UNDIVIDED, INTERSECTION

* THIS SIGN SHALL BE INSTALLED FOR ROADS WITH A SPEED LIMIT OF 45 M.P.H. OR GREATER UNLESS OTHERWISE DIRECTED BY THE RE.

NOTE:

SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

N.T.S.

TCD-6

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS

105
146

BDC07D-01-ORIGINAL SHEET

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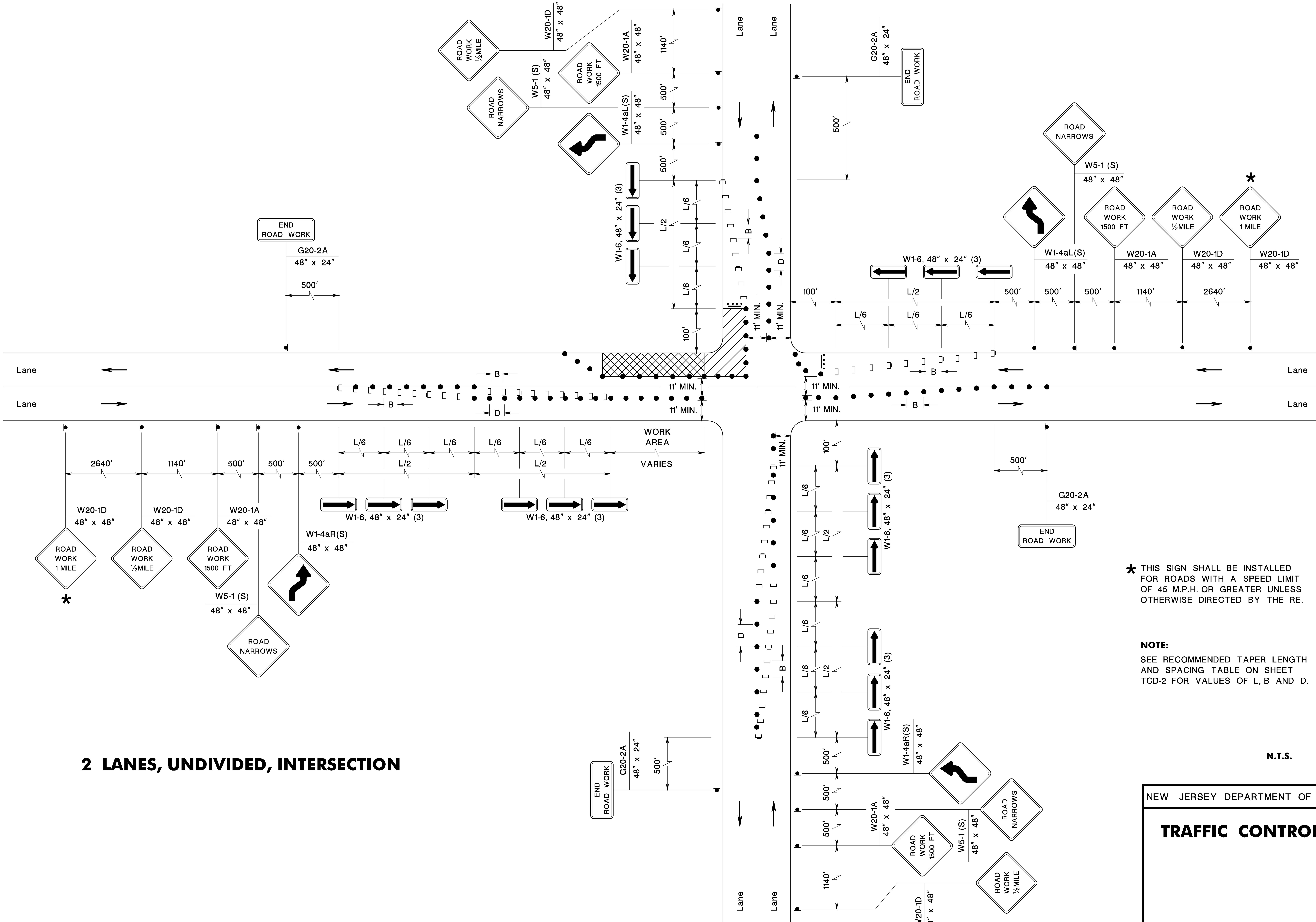

2 LANES, UNDIVIDED, INTERSECTION

* THIS SIGN SHALL BE INSTALLED FOR ROADS WITH A SPEED LIMIT OF 45 M.P.H. OR GREATER UNLESS OTHERWISE DIRECTED BY THE RE.

NOTE:

SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

N.T.S.

TCD-7

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS

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BDC07D-01-ORIGINAL SHEET
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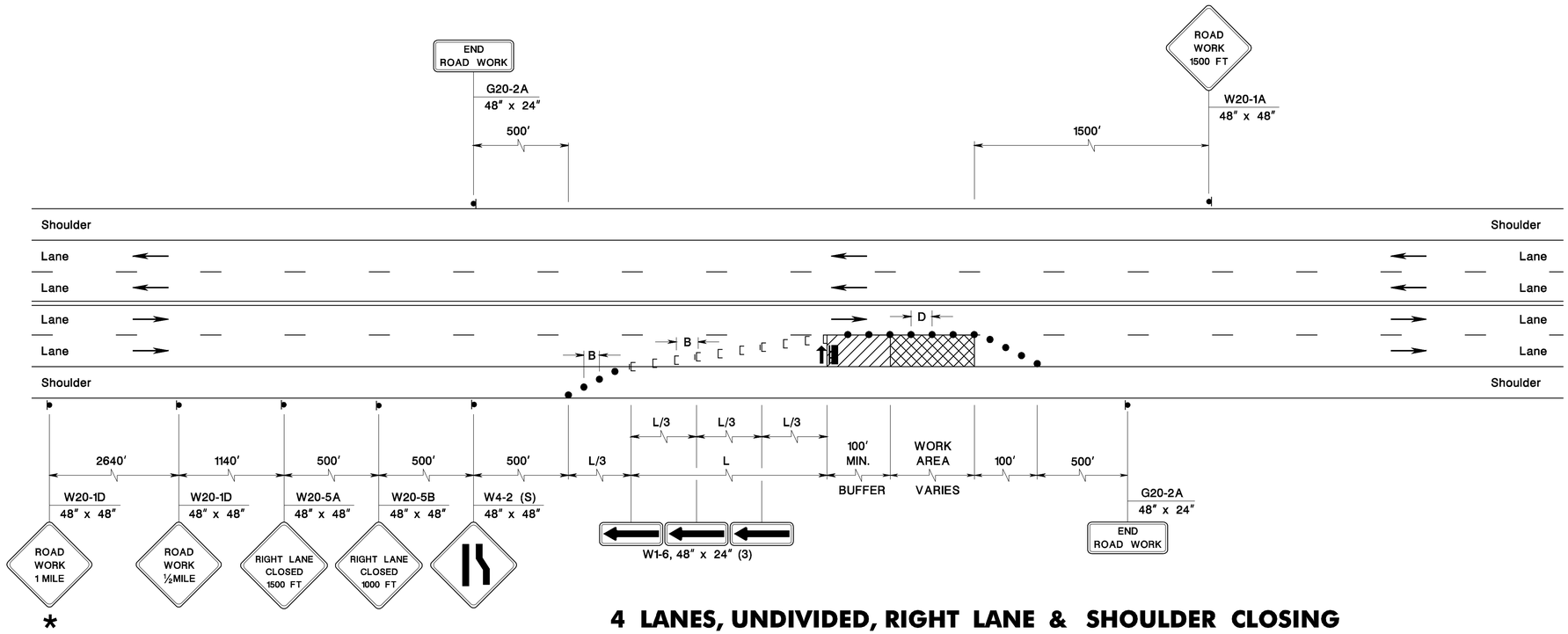
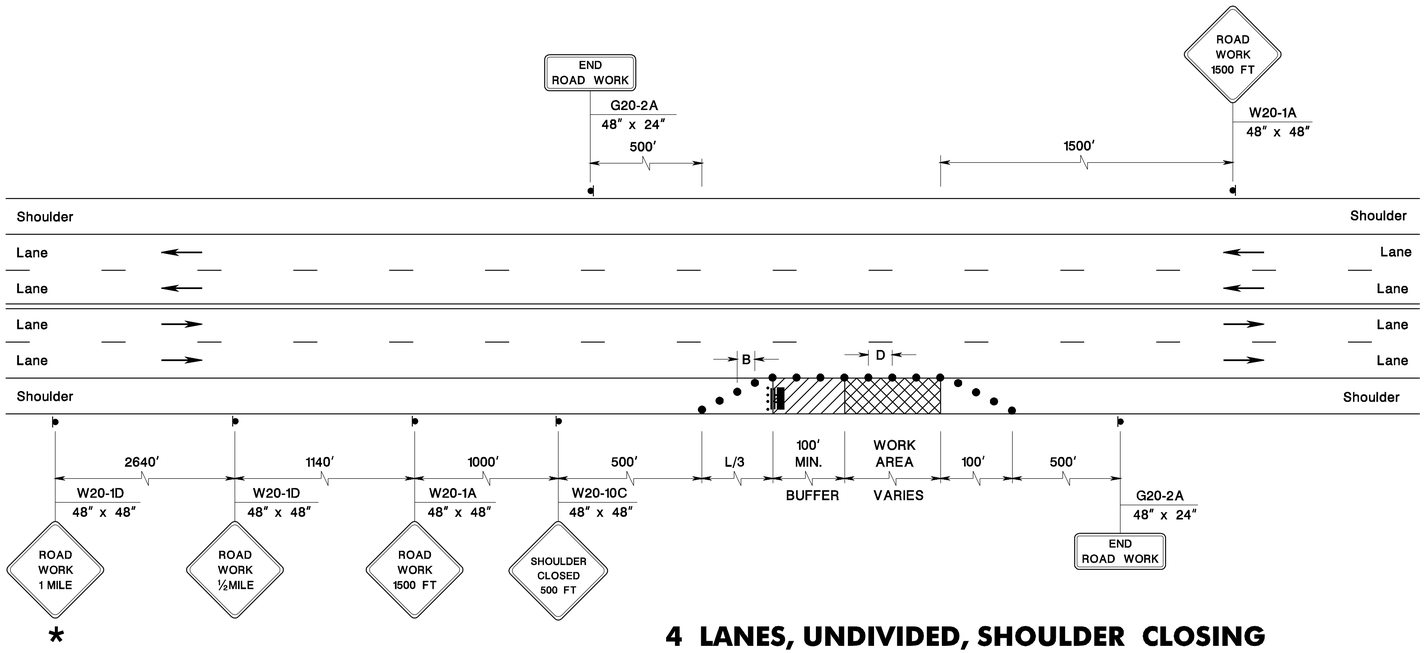


4 LANES, UNDIVIDED, RIGHT LANE & SHOULDER CLOSING



4 LANES, UNDIVIDED, SHOULDER CLOSING

* THIS SIGN SHALL BE INSTALLED FOR ROADS WITH A SPEED LIMIT OF 45 M.P.H. OR GREATER UNLESS OTHERWISE DIRECTED BY THE RE.

NOTE:

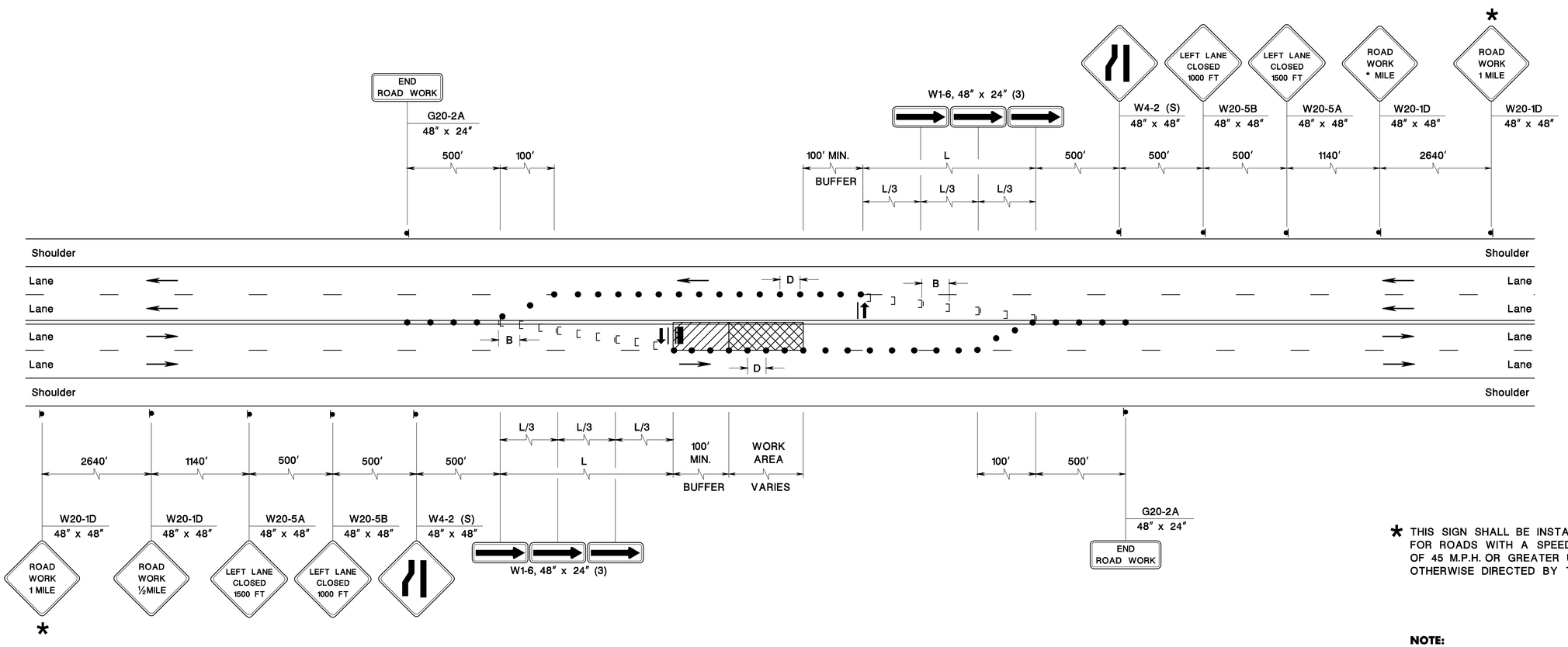
SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

N.T.S.

TCD-8

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS



* THIS SIGN SHALL BE INSTALLED FOR ROADS WITH A SPEED LIMIT OF 45 M.P.H. OR GREATER UNLESS OTHERWISE DIRECTED BY THE RE.

NOTE:

SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

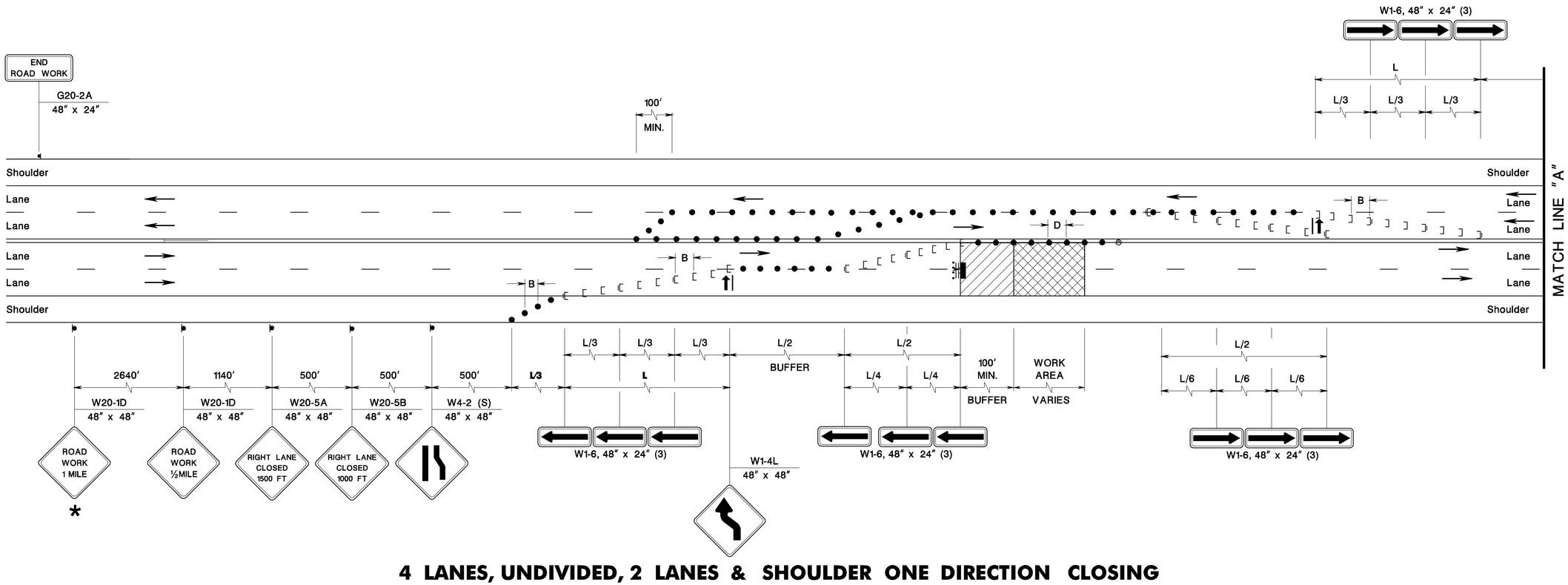
4 LANES, UNDIVIDED, LEFT LANE CLOSING

N.T.S.

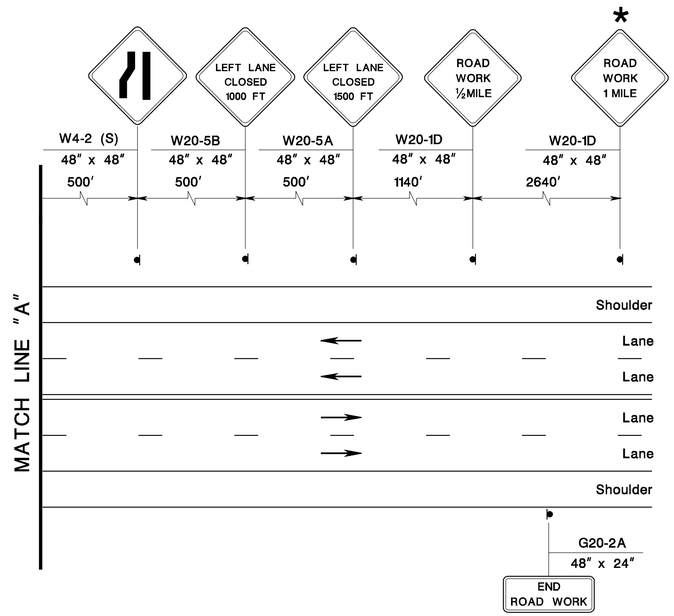
TCD-9

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS



4 LANES, UNDIVIDED, 2 LANES & SHOULDER ONE DIRECTION CLOSING



* THIS SIGN SHALL BE INSTALLED FOR ROADS WITH A SPEED LIMIT OF 45 M.P.H. OR GREATER UNLESS OTHERWISE DIRECTED BY THE RE.

NOTE:

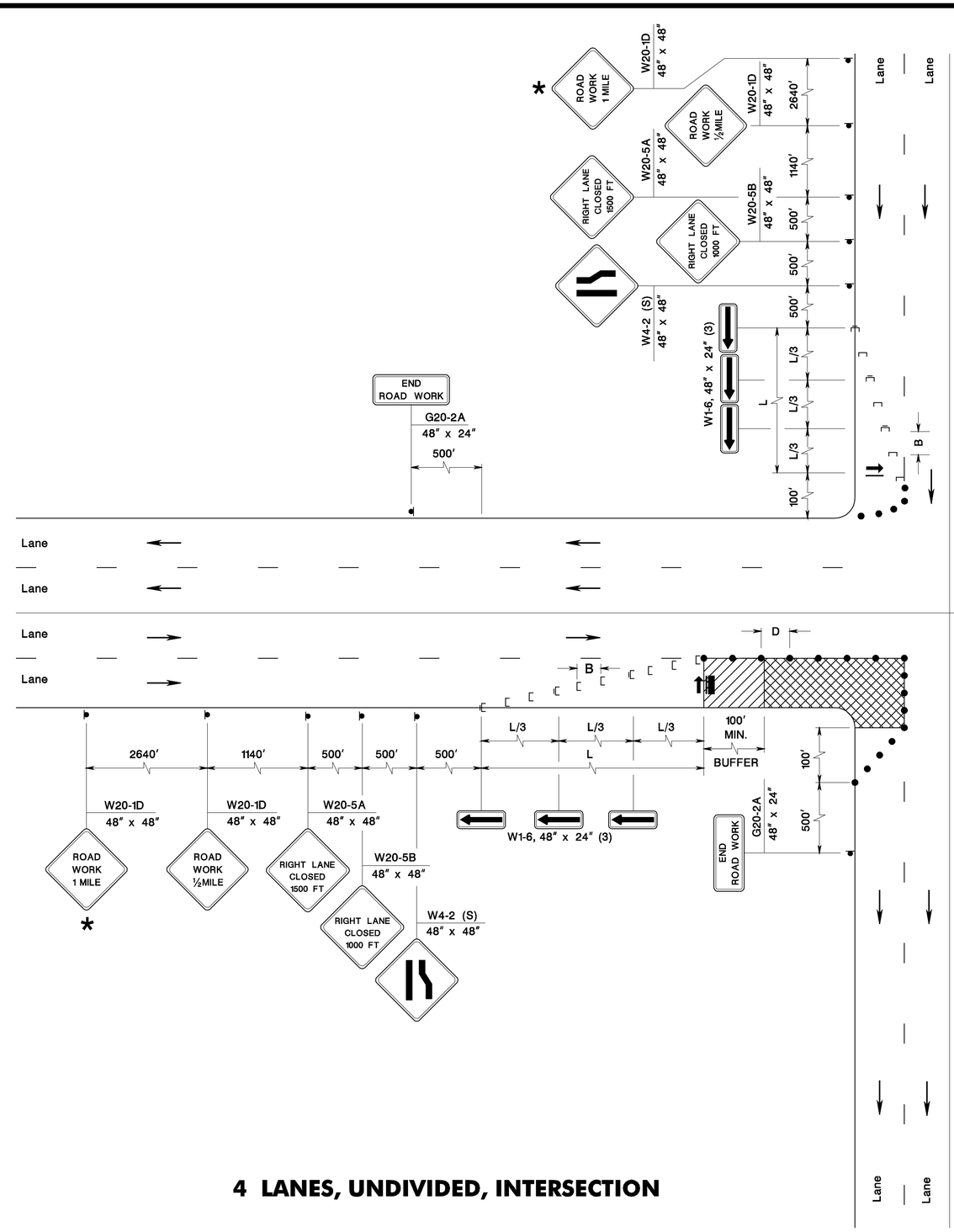
SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

N.T.S.

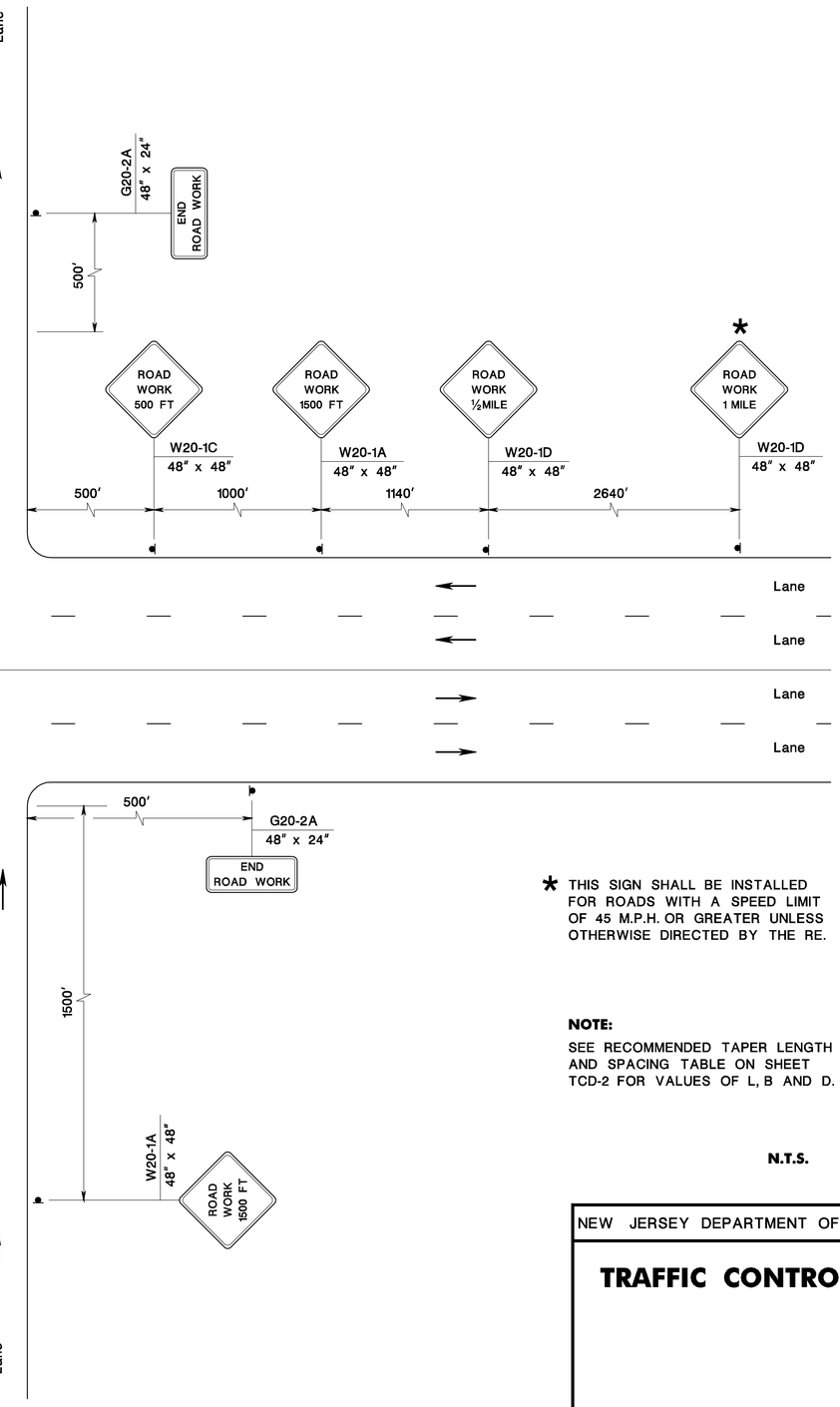
TCD-10

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS



4 LANES, UNDIVIDED, INTERSECTION



* THIS SIGN SHALL BE INSTALLED FOR ROADS WITH A SPEED LIMIT OF 45 M.P.H. OR GREATER UNLESS OTHERWISE DIRECTED BY THE RE.

NOTE:

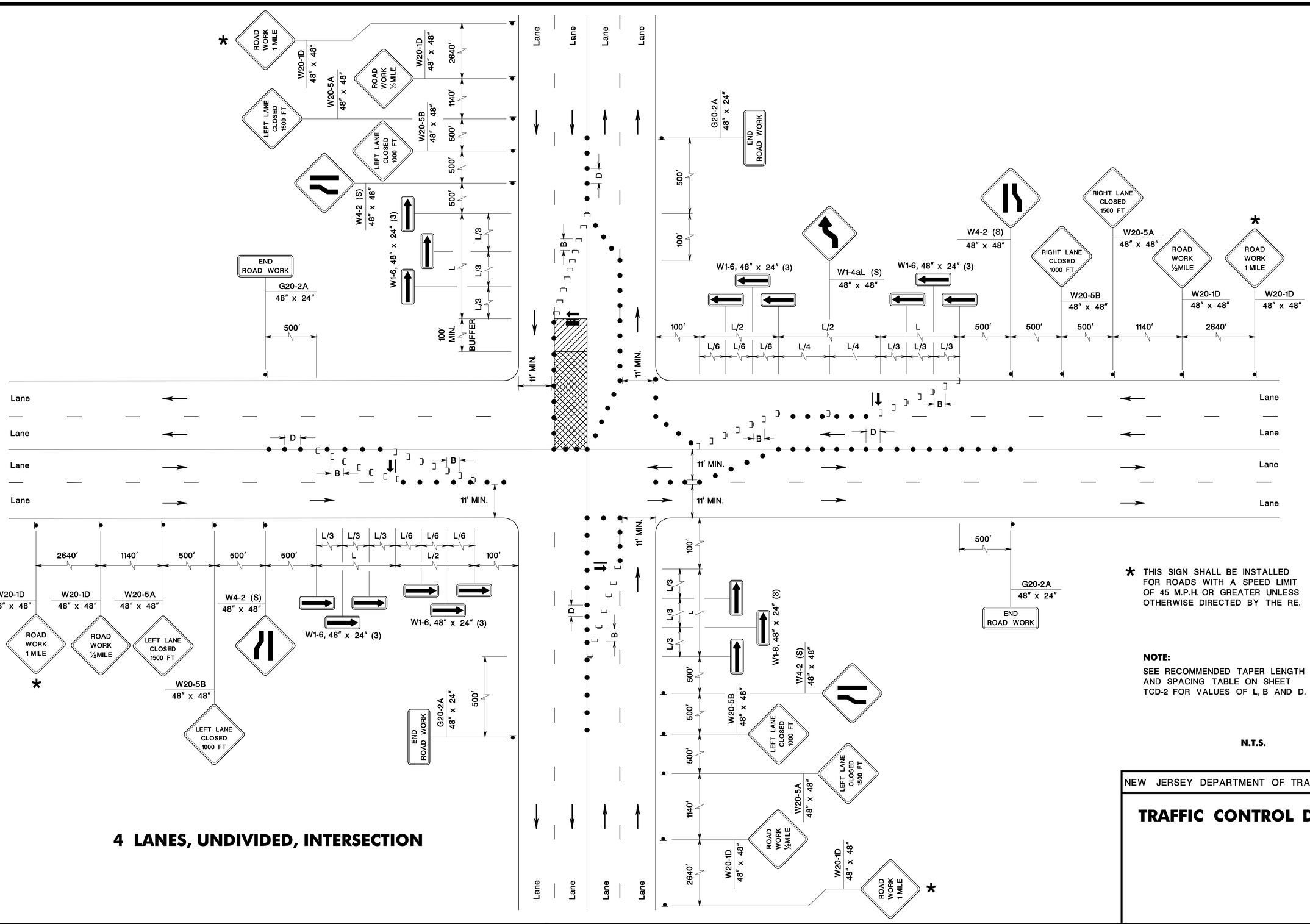
SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

N.T.S.

TCD-11

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS



* THIS SIGN SHALL BE INSTALLED FOR ROADS WITH A SPEED LIMIT OF 45 M.P.H. OR GREATER UNLESS OTHERWISE DIRECTED BY THE RE.

NOTE:

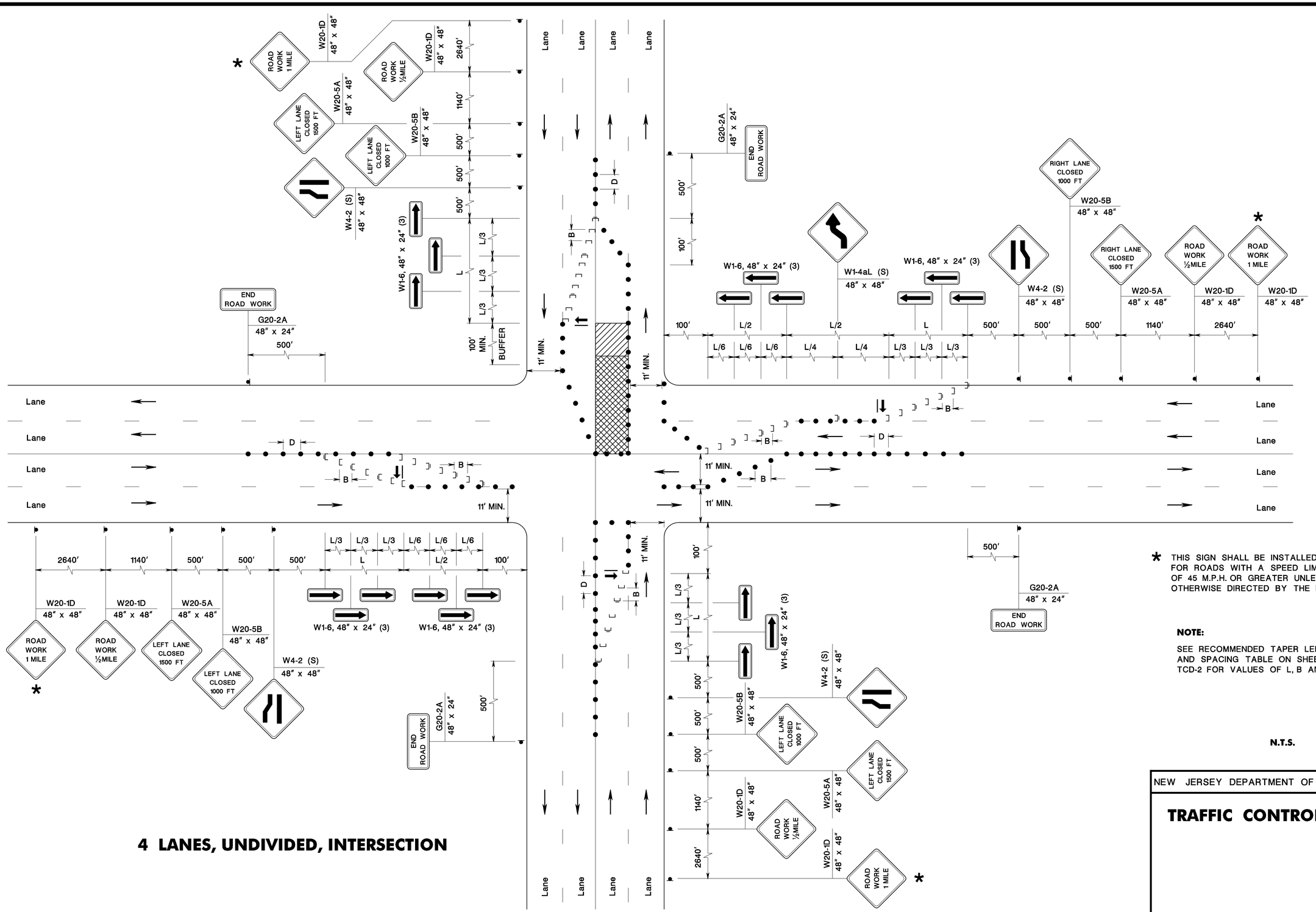
SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

N.T.S.

TCD-12

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS



*THIS SIGN SHALL BE INSTALLED FOR ROADS WITH A SPEED LIMIT OF 45 M.P.H. OR GREATER UNLESS OTHERWISE DIRECTED BY THE RE.

NOTE:

SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

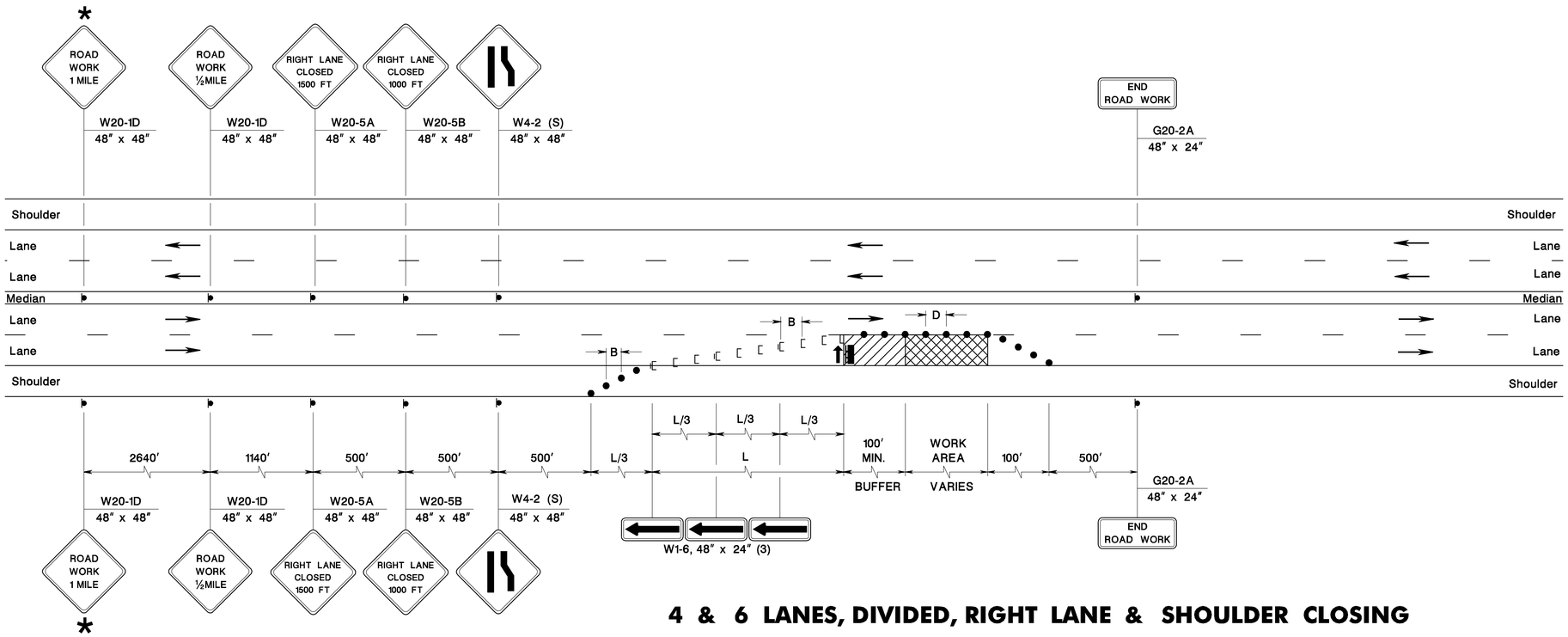
4 LANES, UNDIVIDED, INTERSECTION

N.T.S.

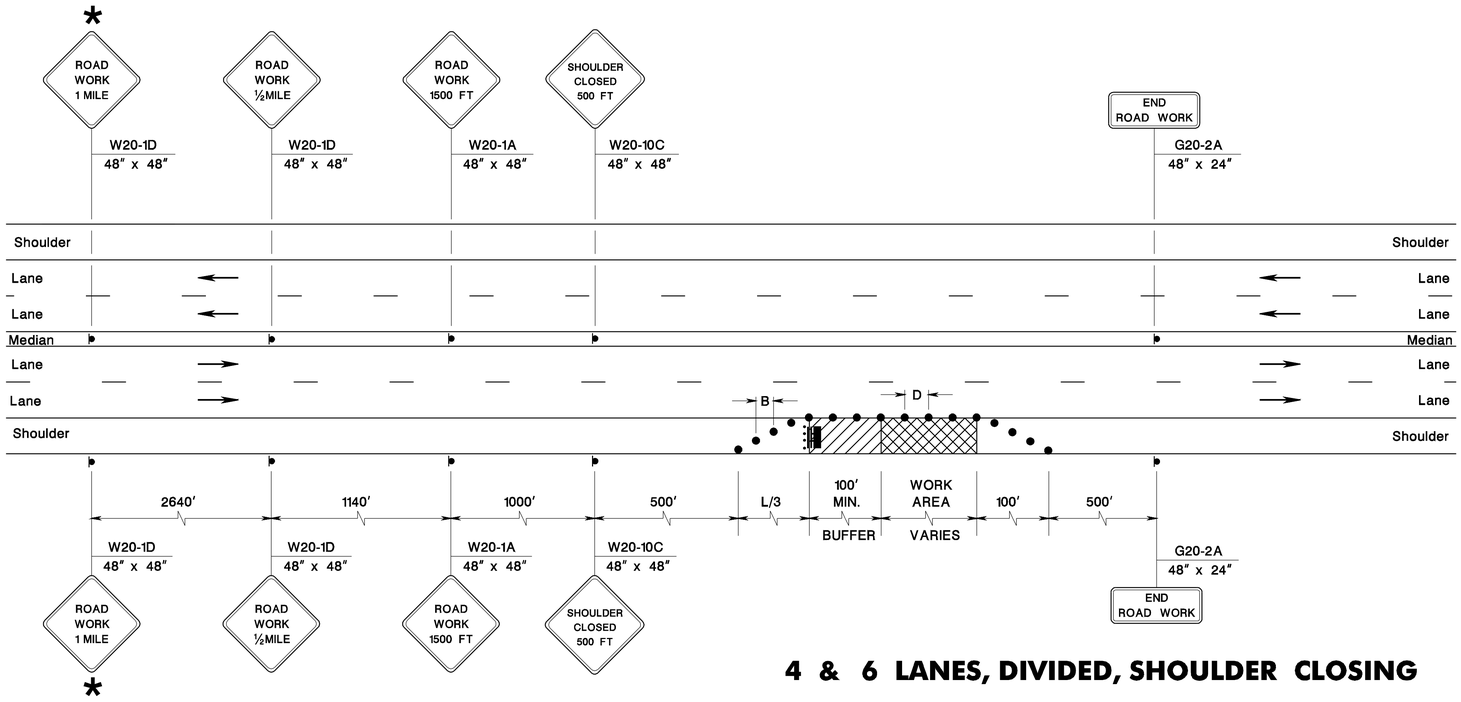
TCD-13

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS



4 & 6 LANES, DIVIDED, RIGHT LANE & SHOULDER CLOSING



4 & 6 LANES, DIVIDED, SHOULDER CLOSING

* THIS SIGN SHALL BE INSTALLED FOR ROADS WITH A SPEED LIMIT OF 45 M.P.H. OR GREATER UNLESS OTHERWISE DIRECTED BY THE RE.
FOR ROADS WITH A SPEED LIMIT GREATER THAN 55 M.P.H., A "ROAD WORK 2 MILES" SIGN SHALL ALSO BE INSTALLED 2 MILES IN ADVANCE OF LANE CLOSING UNLESS OTHERWISE DIRECTED BY THE RE.

NOTES:

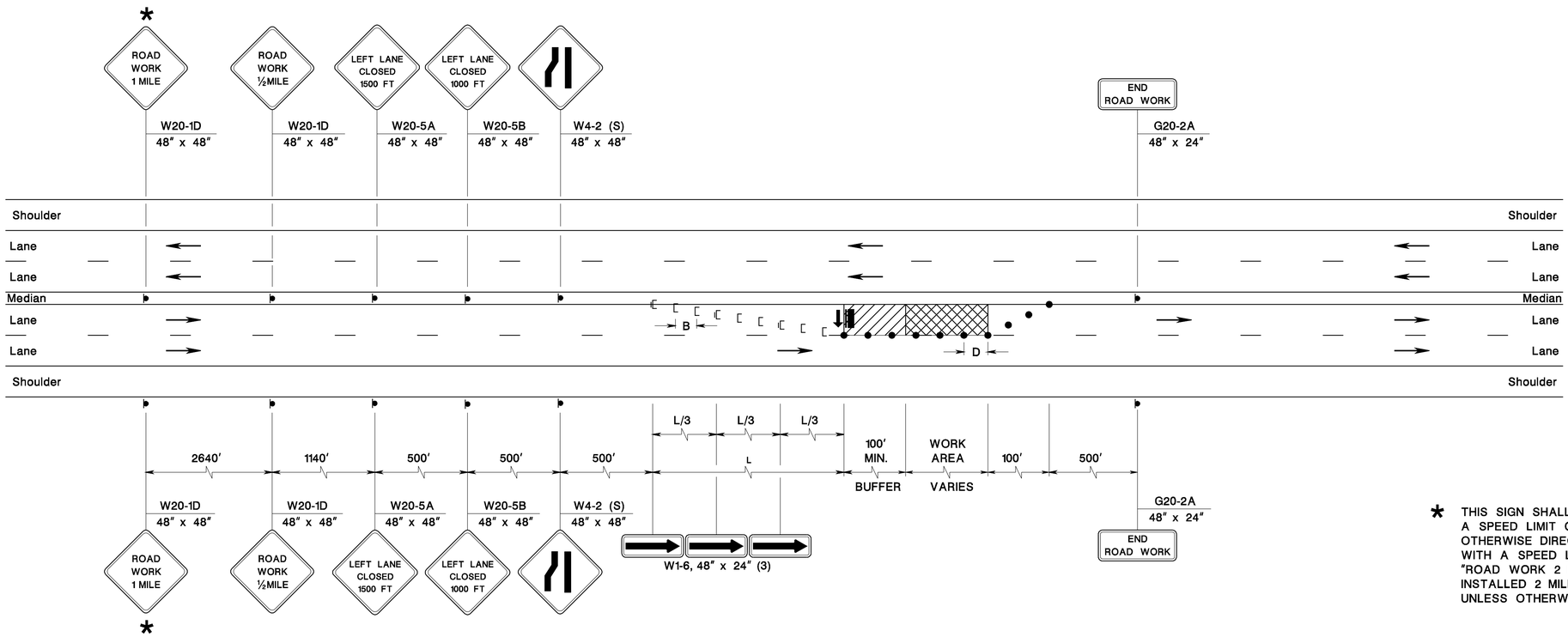
1. IF MEDIAN IS NARROWER THAN WIDTH OF SIGN PLUS 2 FEET, OMIT MEDIAN SIGNING.
2. SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

N.T.S.

TCD-14

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS



* THIS SIGN SHALL BE INSTALLED FOR ROADS WITH A SPEED LIMIT OF 45 M.P.H. OR GREATER UNLESS OTHERWISE DIRECTED BY THE RE. FOR ROADS WITH A SPEED LIMIT GREATER THAN 55 M.P.H., A "ROAD WORK 2 MILES" SIGN SHALL ALSO BE INSTALLED 2 MILES IN ADVANCE OF LANE CLOSING UNLESS OTHERWISE DIRECTED BY THE RE.

4 & 6 LANES, DIVIDED, LEFT LANE CLOSING

NOTES:

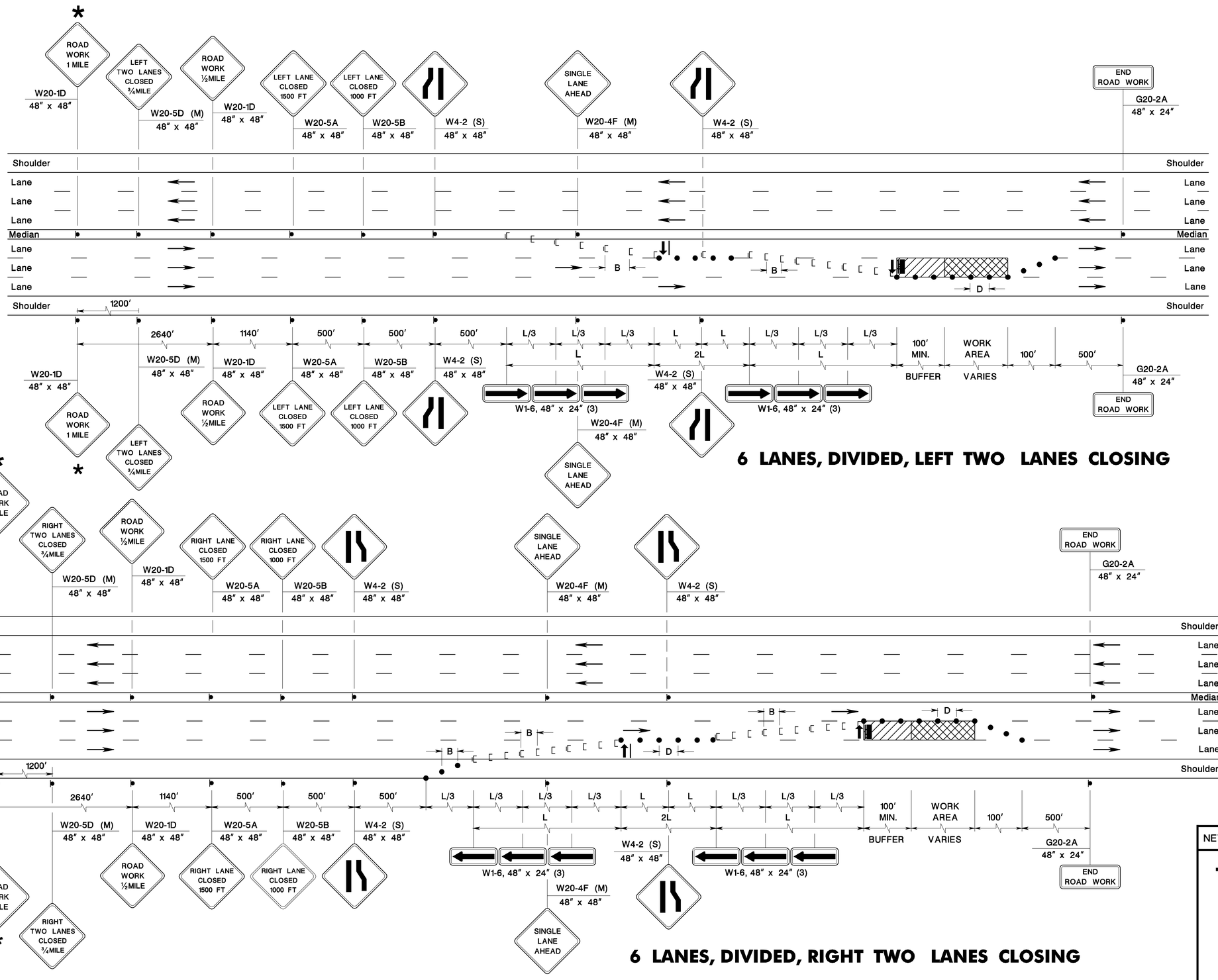
1. IF MEDIAN IS NARROWER THAN WIDTH OF SIGN PLUS 2 FEET, OMIT MEDIAN SIGNING.
2. IF WORK INTERFERS WITH OPPOSING TRAFFIC, CLOSE OPPOSITE LEFT LANE USING SAME CONFIGUATION.
3. SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

N.T.S.

TCD-15

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS



6 LANES, DIVIDED, LEFT TWO LANES CLOSING

6 LANES, DIVIDED, RIGHT TWO LANES CLOSING

★ THIS SIGN SHALL BE INSTALLED FOR ROADS WITH A SPEED LIMIT OF 45 M.P.H. OR GREATER UNLESS OTHERWISE DIRECTED BY THE RE. FOR ROADS WITH A SPEED LIMIT GREATER THAN 55 M.P.H., A "ROAD WORK 2 MILES" SIGN SHALL ALSO BE INSTALLED 2 MILES IN ADVANCE OF LANE CLOSING UNLESS OTHERWISE DIRECTED BY THE RE.

NOTES:

1. IF MEDIAN IS NARROWER THAN WIDTH OF SIGN PLUS 2 FEET, OMIT MEDIAN SIGNING.
2. SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

N.T.S.

TCD-16

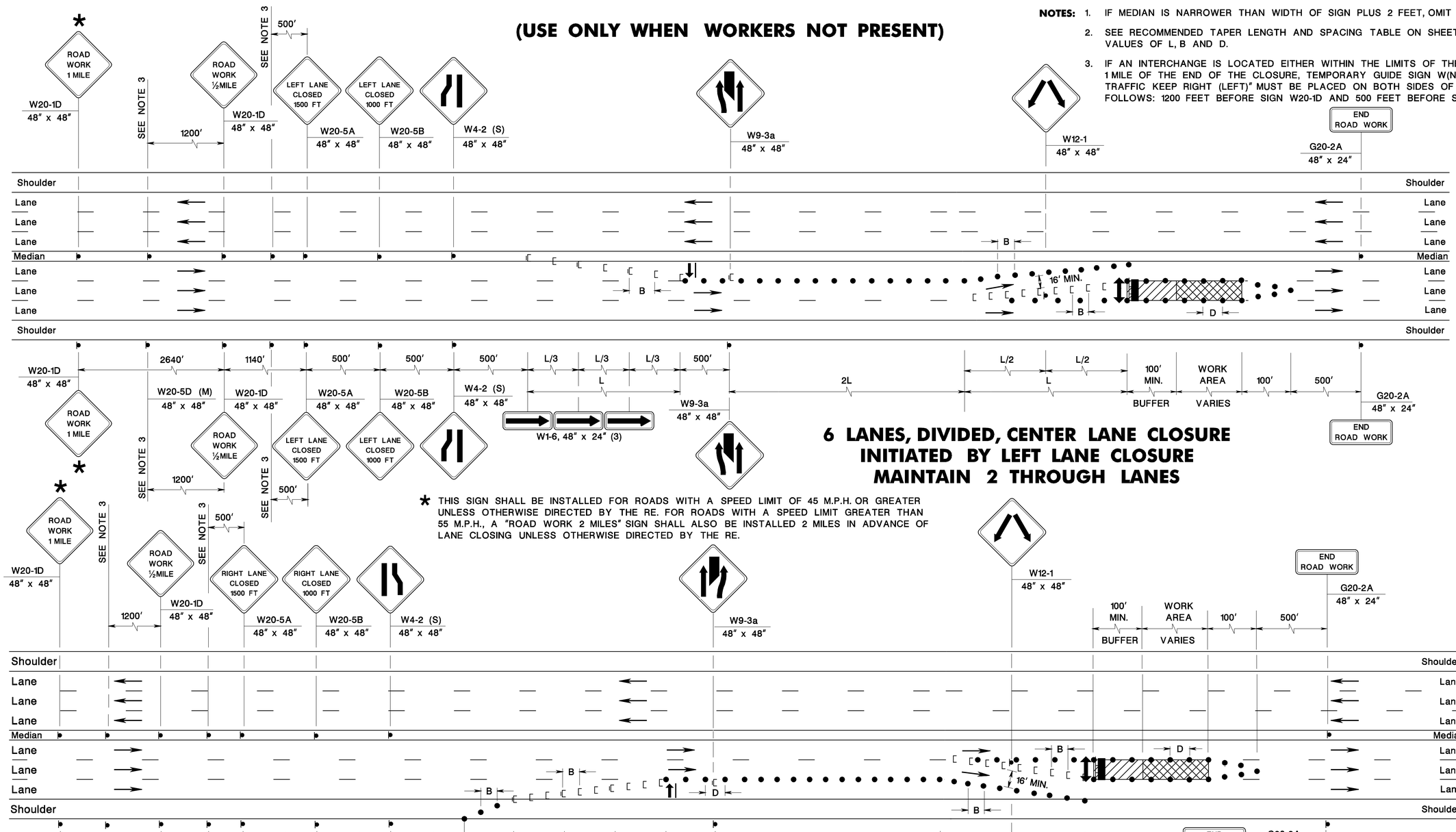
NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS

(USE ONLY WHEN WORKERS NOT PRESENT)

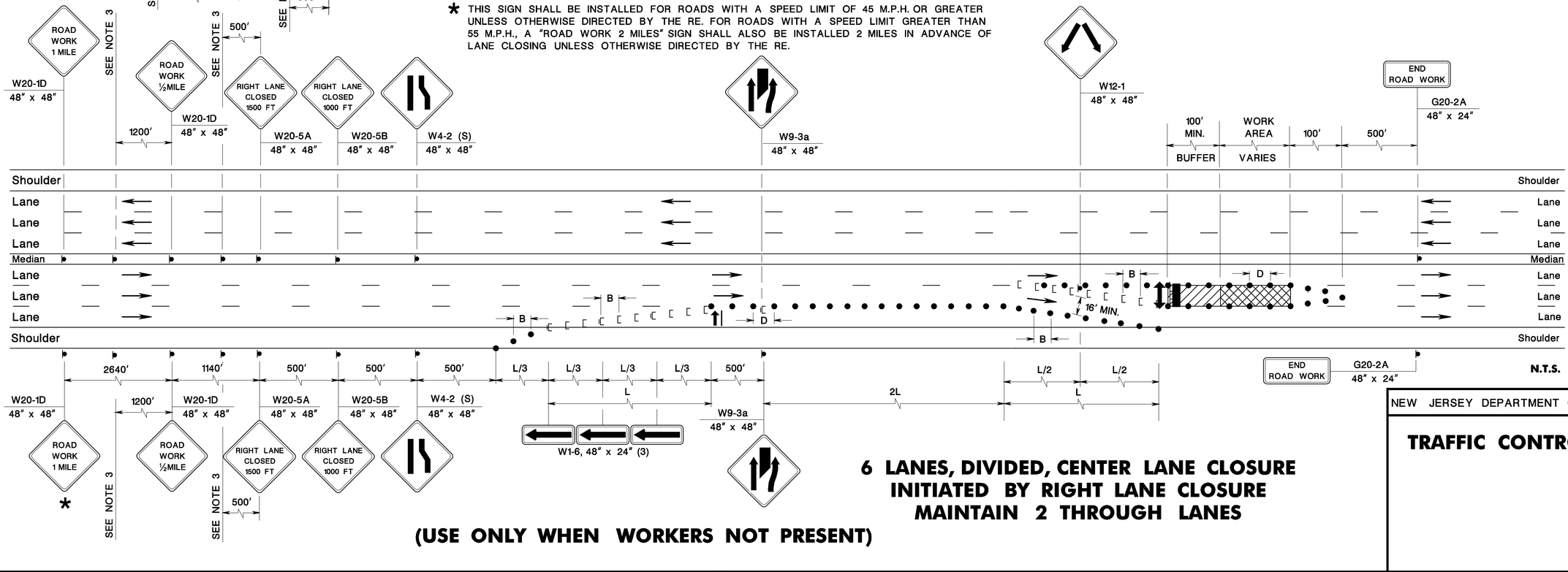
NOTES:

1. IF MEDIAN IS NARROWER THAN WIDTH OF SIGN PLUS 2 FEET, OMIT MEDIAN SIGNING.
2. SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.
3. IF AN INTERCHANGE IS LOCATED EITHER WITHIN THE LIMITS OF THE CLOSURE OR WITHIN 1 MILE OF THE END OF THE CLOSURE, TEMPORARY GUIDE SIGN W(NJ) 100-1(L), "ALL EXITING TRAFFIC KEEP RIGHT (LEFT)" MUST BE PLACED ON BOTH SIDES OF THE ROADWAY AS FOLLOWS: 1200 FEET BEFORE SIGN W20-1D AND 500 FEET BEFORE SIGN W20-5A.



6 LANES, DIVIDED, CENTER LANE CLOSURE INITIATED BY LEFT LANE CLOSURE MAINTAIN 2 THROUGH LANES

★ THIS SIGN SHALL BE INSTALLED FOR ROADS WITH A SPEED LIMIT OF 45 M.P.H. OR GREATER UNLESS OTHERWISE DIRECTED BY THE RE. FOR ROADS WITH A SPEED LIMIT GREATER THAN 55 M.P.H., A "ROAD WORK 2 MILES" SIGN SHALL ALSO BE INSTALLED 2 MILES IN ADVANCE OF LANE CLOSING UNLESS OTHERWISE DIRECTED BY THE RE.



6 LANES, DIVIDED, CENTER LANE CLOSURE INITIATED BY RIGHT LANE CLOSURE MAINTAIN 2 THROUGH LANES

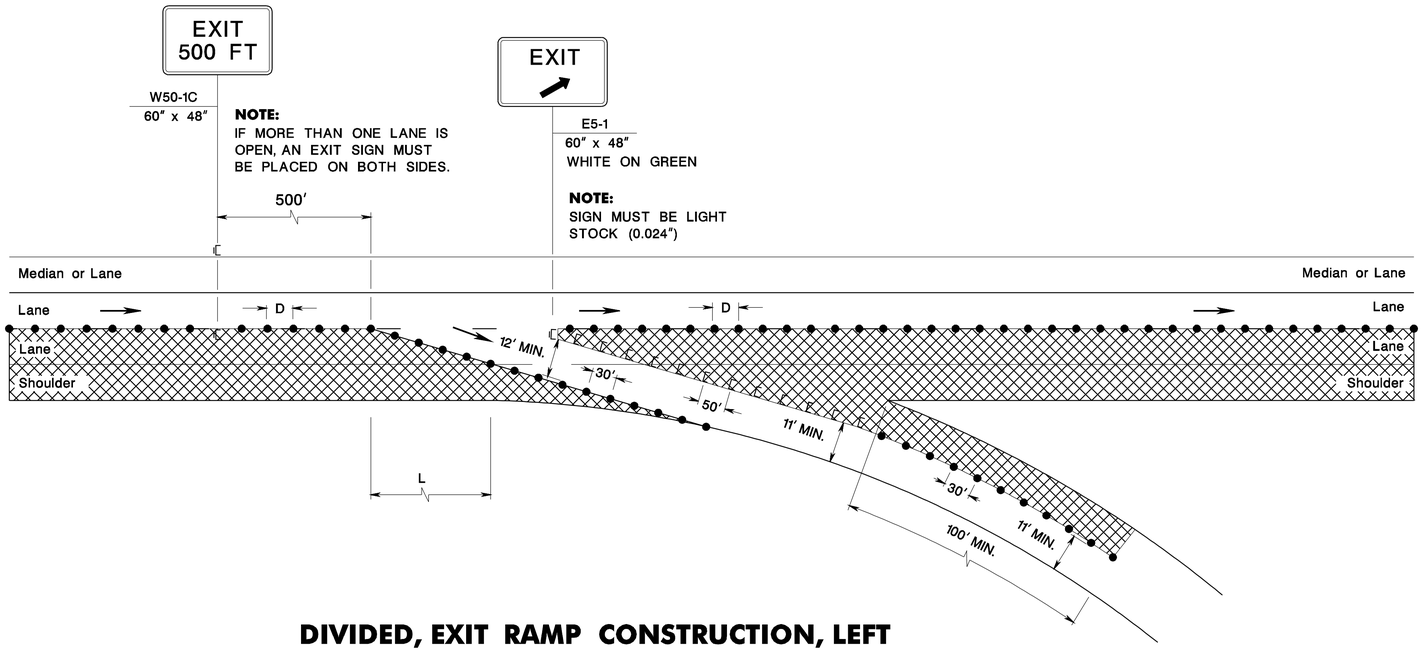
(USE ONLY WHEN WORKERS NOT PRESENT)

N.T.S.

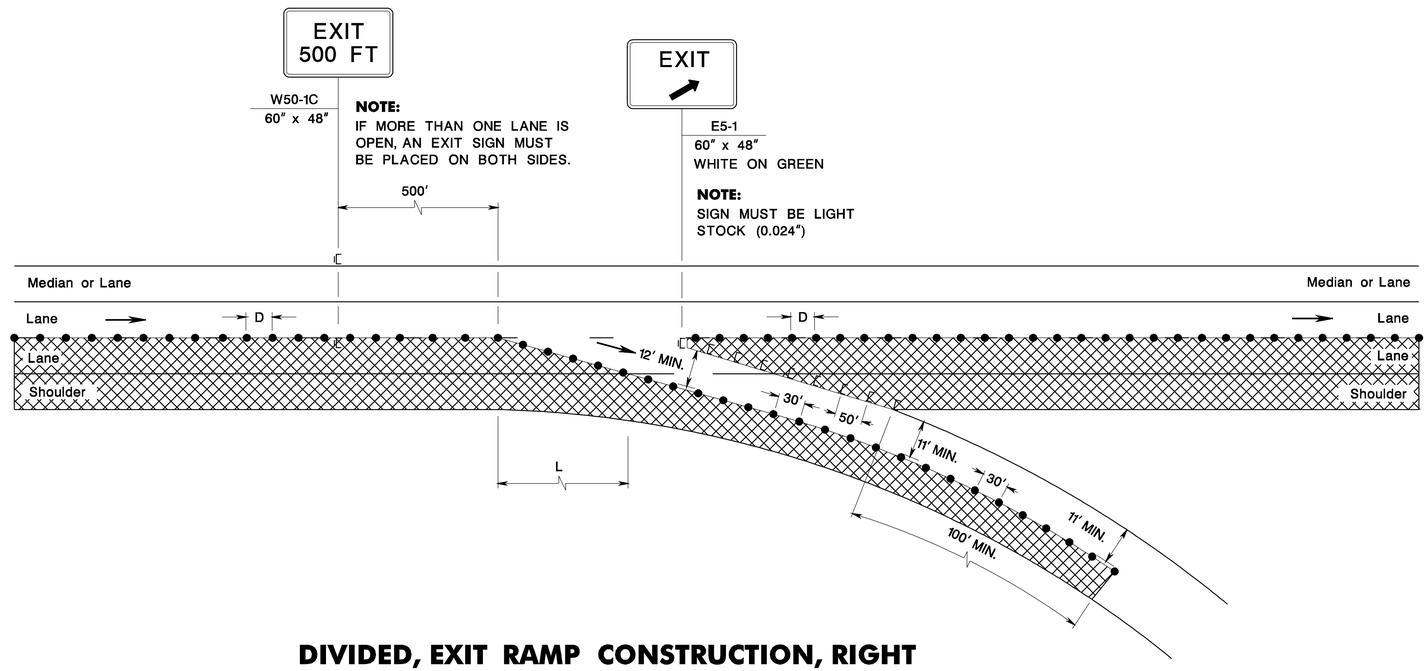
TCD-17

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS



DIVIDED, EXIT RAMP CONSTRUCTION, LEFT



DIVIDED, EXIT RAMP CONSTRUCTION, RIGHT

NOTE:

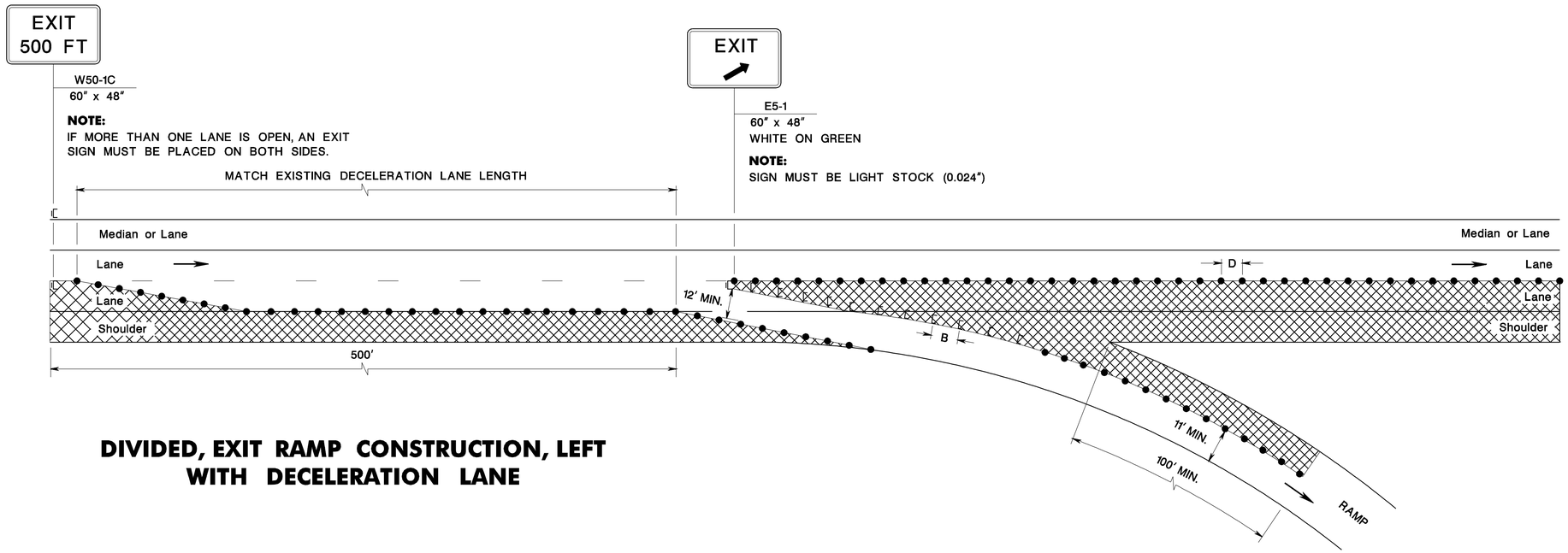
SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

N.T.S.

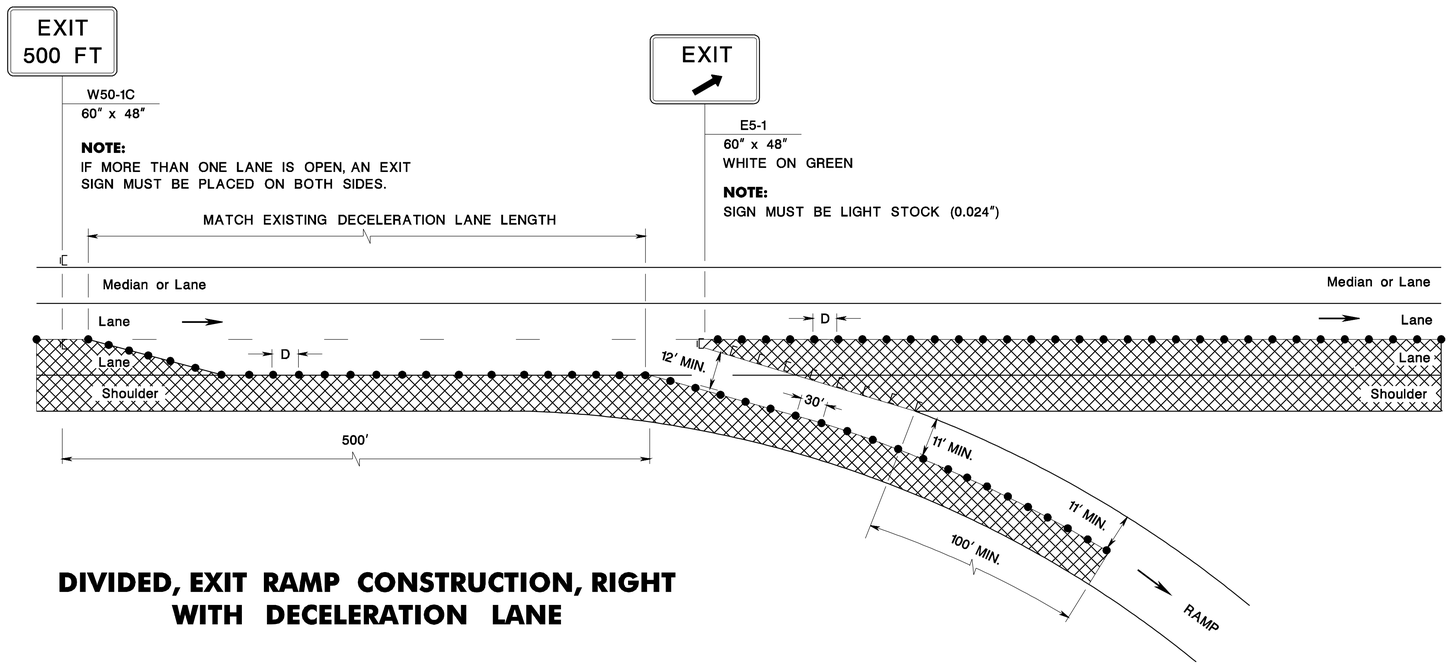
TCD-18

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS



DIVIDED, EXIT RAMP CONSTRUCTION, LEFT WITH DECELERATION LANE



DIVIDED, EXIT RAMP CONSTRUCTION, RIGHT WITH DECELERATION LANE

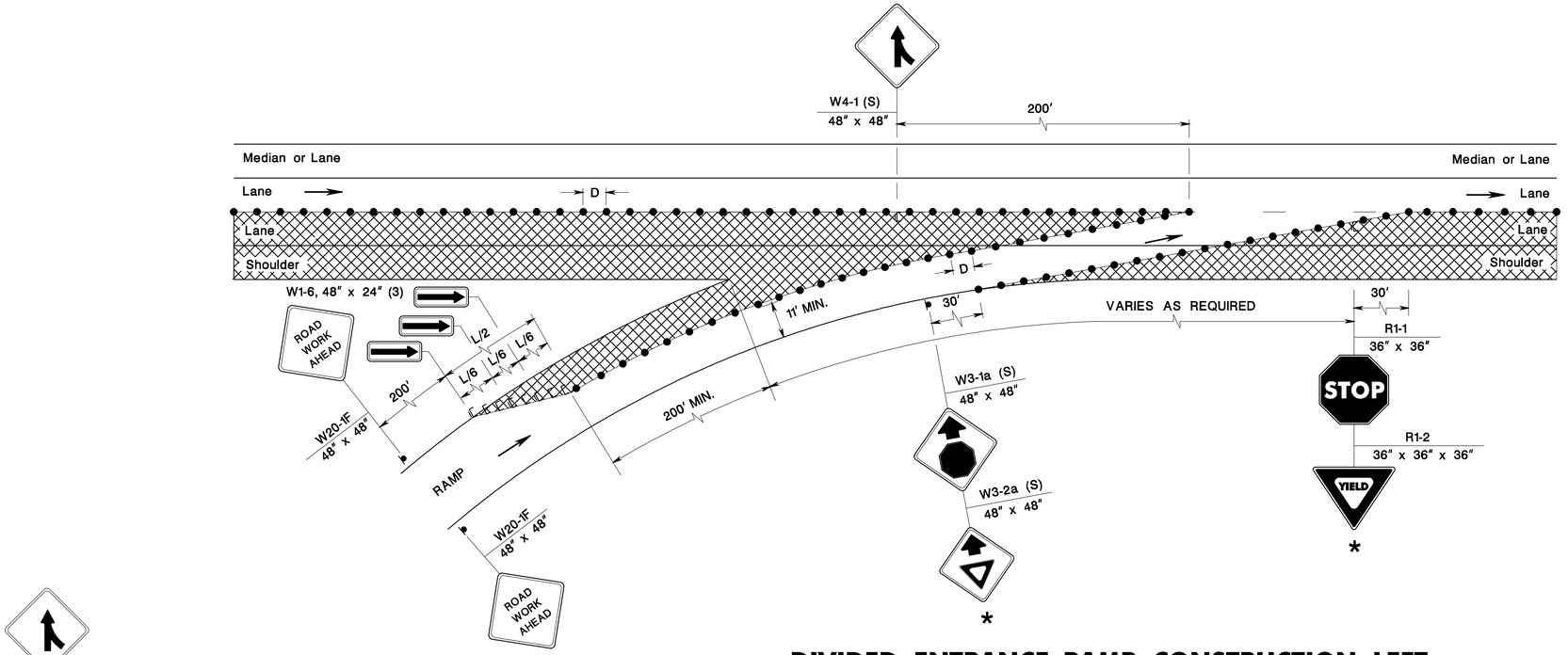
NOTE:
SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

N.T.S.

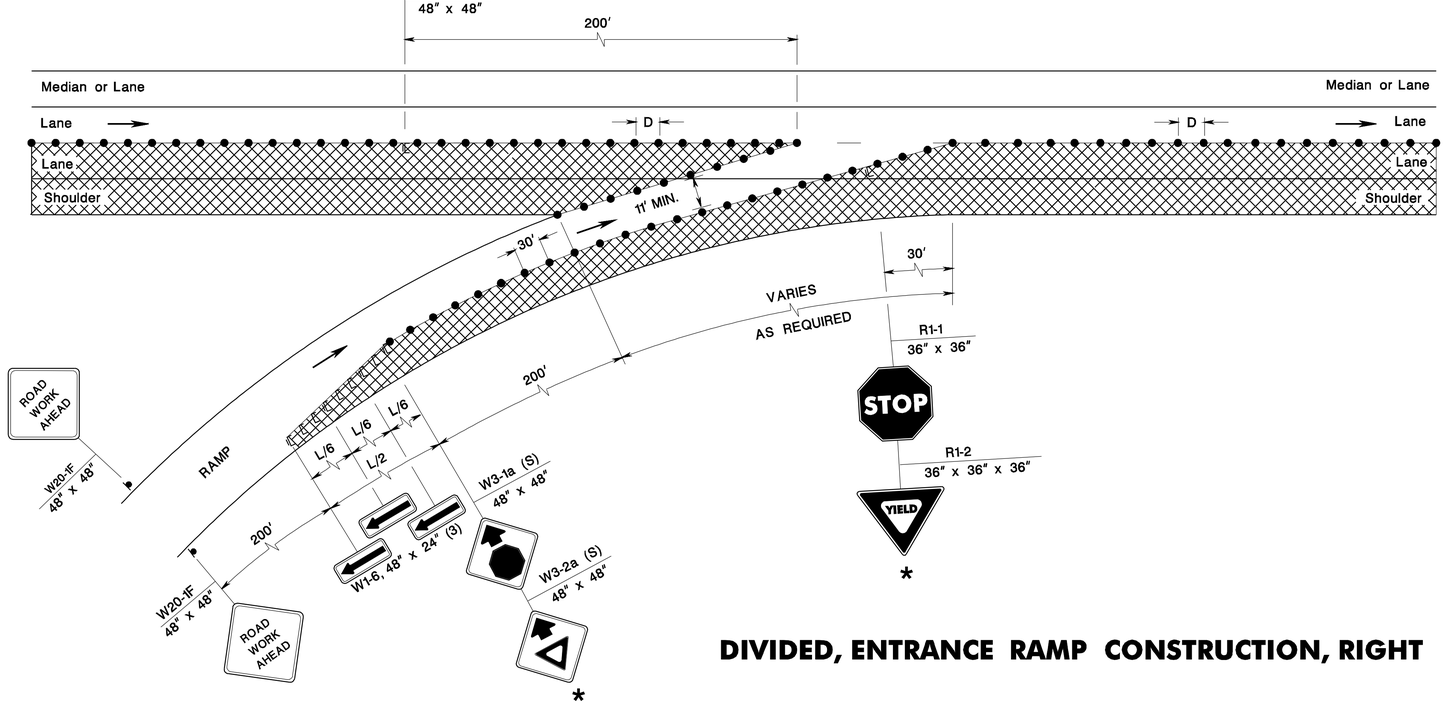
TCD-19

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS



DIVIDED, ENTRANCE RAMP CONSTRUCTION, LEFT



DIVIDED, ENTRANCE RAMP CONSTRUCTION, RIGHT

* STOP SIGN OR YIELD SIGN TO BE DETERMINED BY REGIONAL TRAFFIC ENGINEER. SIGNS MUST BE LIGHT STOCK (0.024")

NOTE:

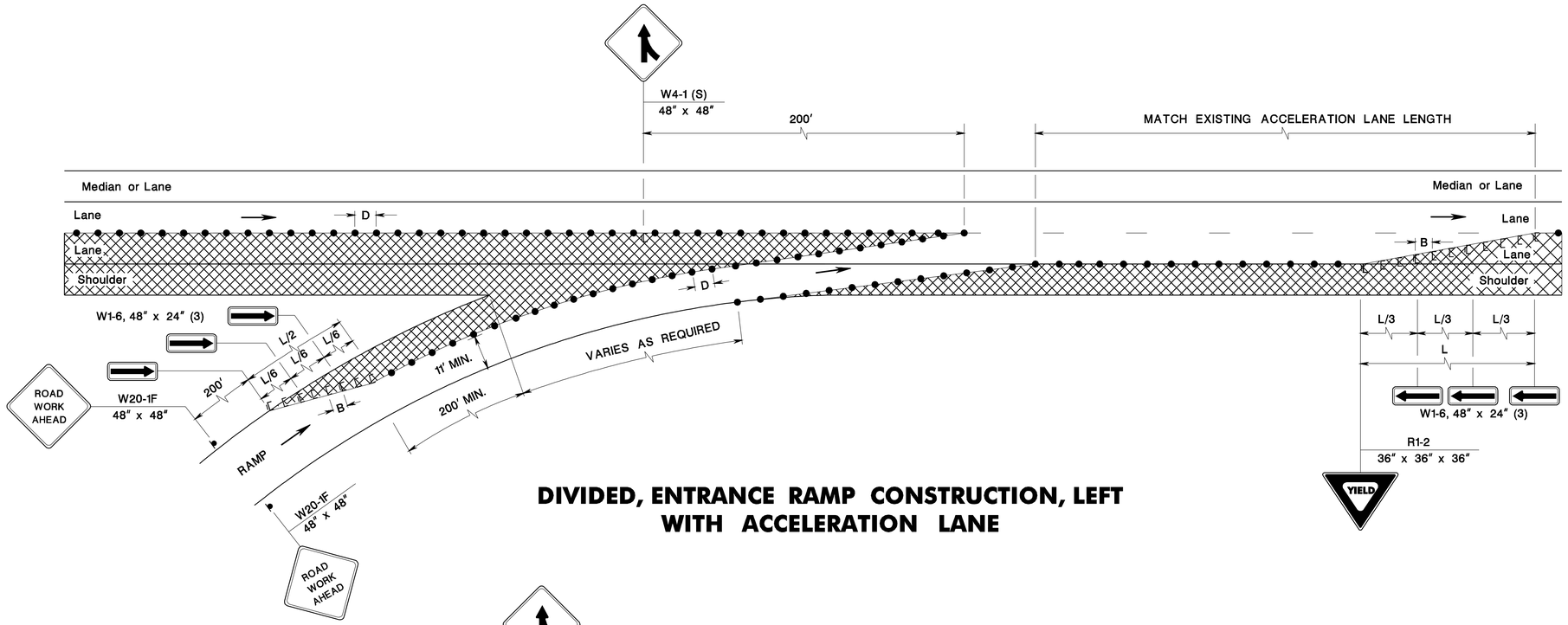
1. PROVIDE AN ACCELERATION LANE WHERE POSSIBLE. SEE TCD-21.
2. SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

N.T.S.

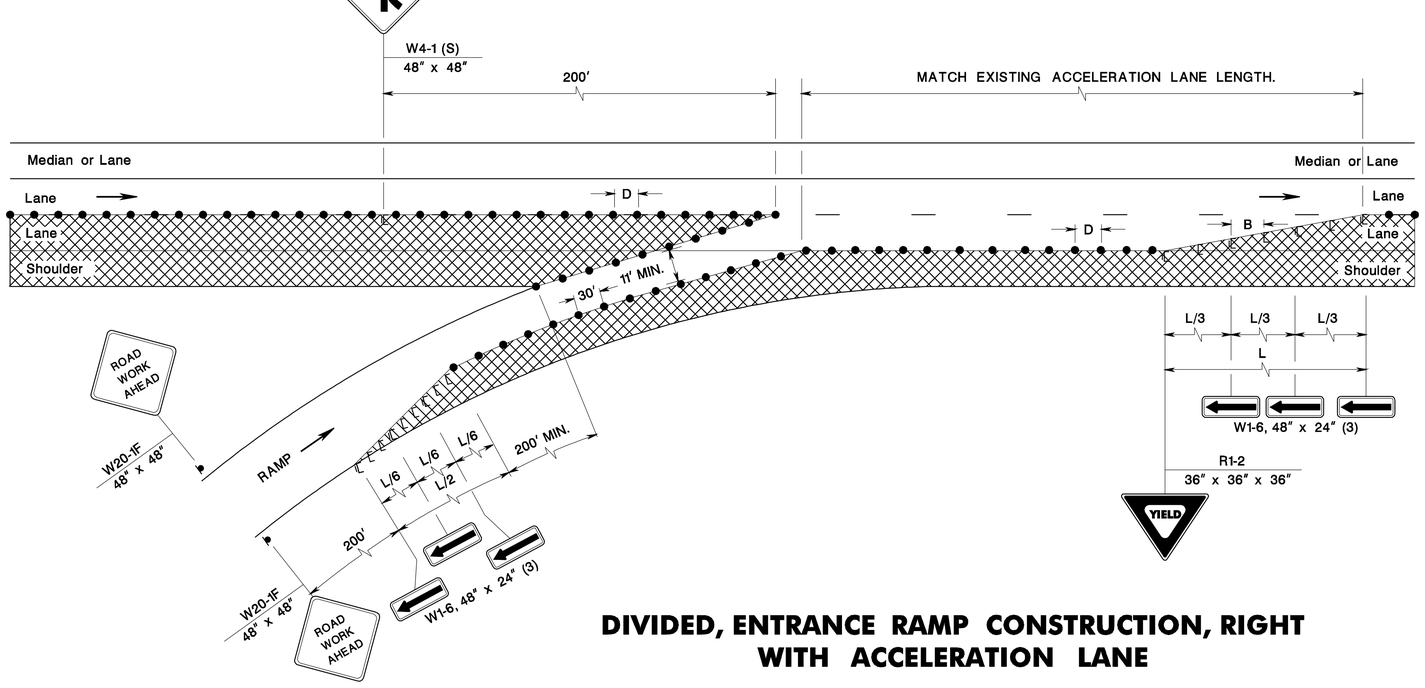
TCD-20

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS



DIVIDED, ENTRANCE RAMP CONSTRUCTION, LEFT WITH ACCELERATION LANE



DIVIDED, ENTRANCE RAMP CONSTRUCTION, RIGHT WITH ACCELERATION LANE

NOTE:

SEE RECOMMENDED TAPER LENGTH AND SPACING TABLE ON SHEET TCD-2 FOR VALUES OF L, B AND D.

N.T.S.

TCD-21

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS

LEGEND

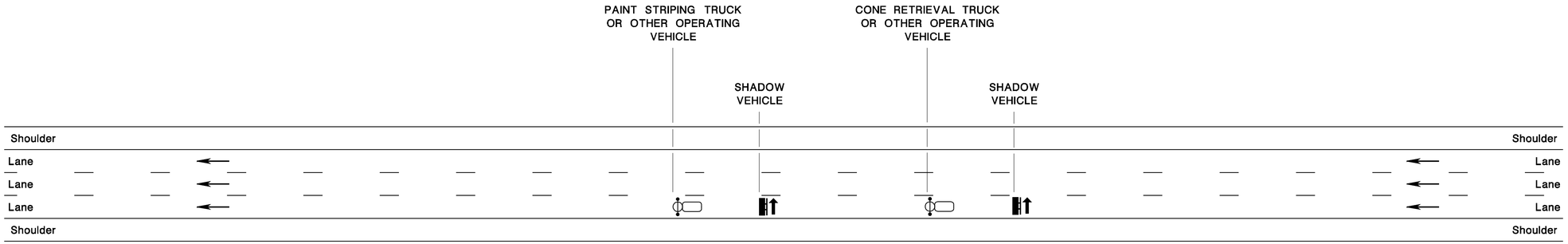
"W" IS THE WIDTH OF LANE CLOSURE IN FEET

"L" IS THE LENGTH OF TAPER

"#" IS NUMBER OF CONES IN TAPER AT 40' SPACING

LENGTH OF TAPER CHART FOR MOVING OPERATIONS

W	25 M.P.H.		30 M.P.H.		35 M.P.H.		40 M.P.H.		45 M.P.H.		50 M.P.H.		55 M.P.H.	
	L	#	L	#	L	#	L	#	L	#	L	#	L	#
1	10	2	15	2	20	2	30	2	45	3	50	3	55	3
2	25	2	30	2	45	3	55	3	90	4	100	4	110	4
3	35	2	45	3	65	3	80	3	135	5	150	5	165	5
4	45	3	60	3	85	4	110	4	180	6	200	6	220	7
5	55	3	75	3	105	4	135	5	225	7	250	7	275	8
6	65	3	90	4	125	5	160	5	270	8	300	9	330	9
10	105	4	150	5	205	6	270	8	450	13	500	14	550	15
11	115	4	165	5	225	7	295	9	495	14	550	15	605	16
12	125	5	180	6	245	7	320	9	540	15	600	16	660	18



MULTI-LANE ROAD MOVING OPERATION

NOTE:

SHADOW VEHICLE SHALL MAINTAIN A DISTANCE OF 70 FEET MINIMUM TO A MAXIMUM OF 150 FEET BEHIND THE OPERATING VEHICLE.

N.T.S.

TCD-22

NEW JERSEY DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL DETAILS

BDC07D-01 ORIGINAL SHEET

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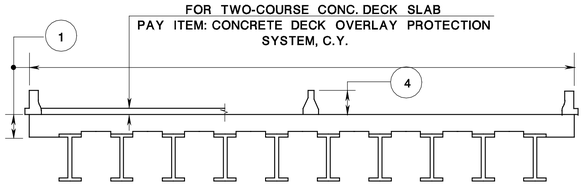
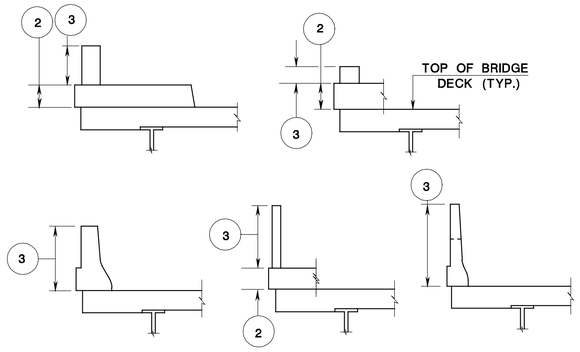
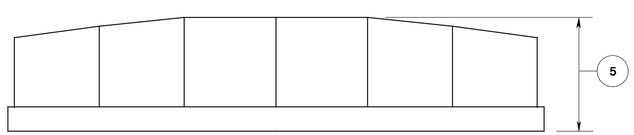


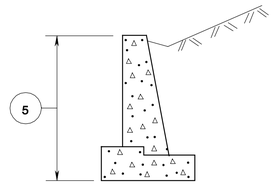
TYPICAL SECTION – BRIDGE DECK



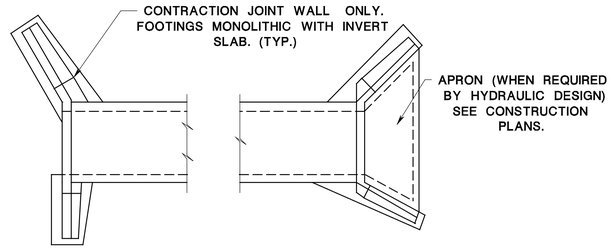
TYPICAL SECTION – BRIDGE PARAPETS



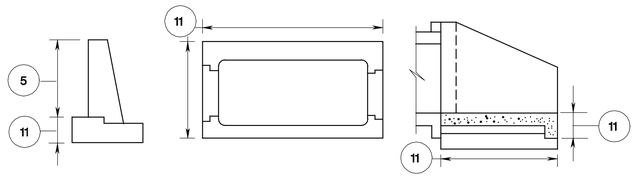
TYPICAL ELEVATION – RETAINING WALL



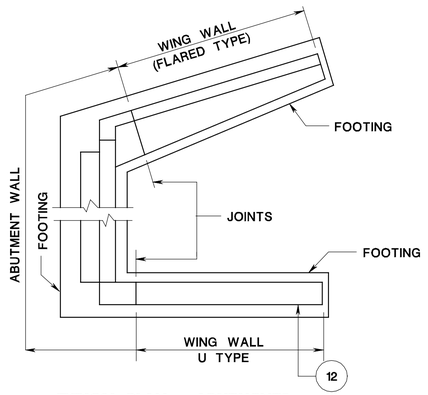
TYPICAL SECTION – RETAINING WALL



TYPICAL PLAN – CULVERT AND HEADWALLS

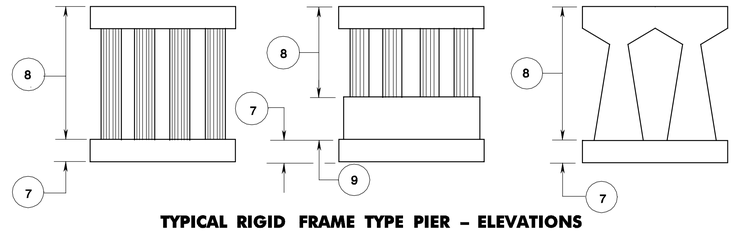


TYPICAL SECTION – CULVERT AND HEADWALLS

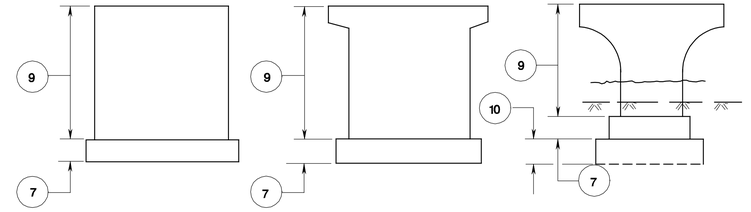


TYPICAL PLAN – ABUTMENTS

TYPICAL SECTION



TYPICAL RIGID FRAME TYPE PIER – ELEVATIONS



TYPICAL SOLID SHAFT TYPE PIER – ELEVATIONS

ITEM	CONCRETE CLASS	PAY ITEM	UNIT
(1)	A	CONCRETE DECK	C.Y.
(2)	A	CONCRETE BRIDGE SIDEWALK	C.Y.
(3)	A	CONCRETE BRIDGE PARAPET	L.F.
(4)	B	__" X __" CONCRETE BARRIER CURB	L.F.
(5)	B	RETAINING WALL, LOCATION NO._____	C.Y.
(6)	B	CONCRETE ABUTMENT WALL	C.Y.
(7)	B	CONCRETE FOOTING	C.Y.
(8)	A	CONCRETE PIER COLUMNS AND CAP	C.Y.
(9)	B	CONCRETE PIER SHAFT	C.Y.
(10)	B	PERMAMENT COFFERDAM	C.Y.
(11)	A	PRECAST CONCRETE CULVERT	C.Y.
(12)	B	CONCRETE WINGWALL	C.Y.

CONCRETE CLASSES AND PAY ITEMS

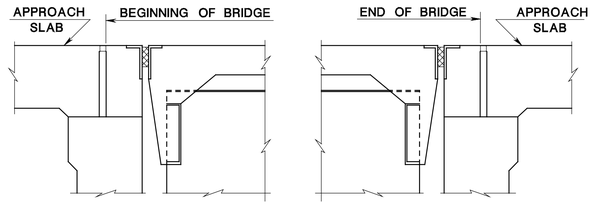
N.T.S.

BCD-504-1

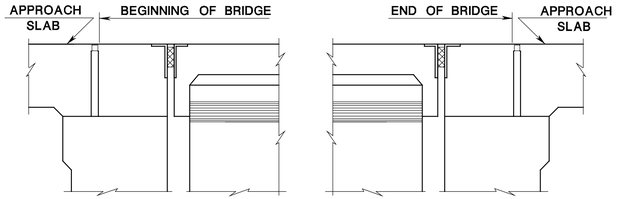
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS

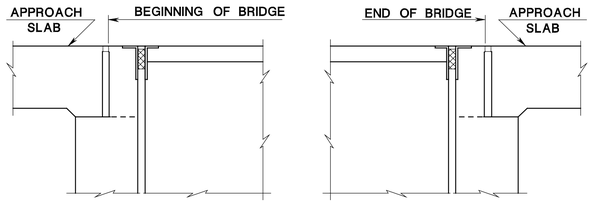
BDC07B-01-ORIGINAL SHEET



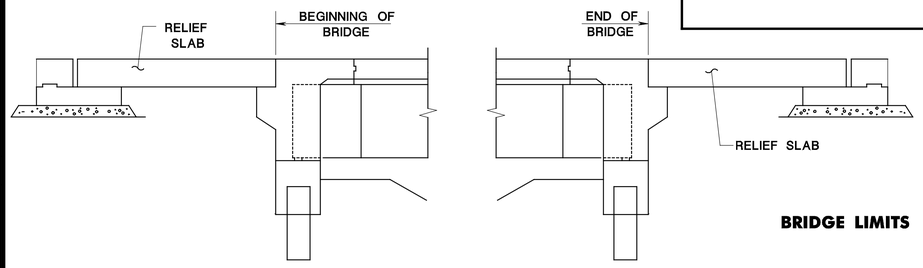
STEEL STRINGERS



P.C.I. BEAMS



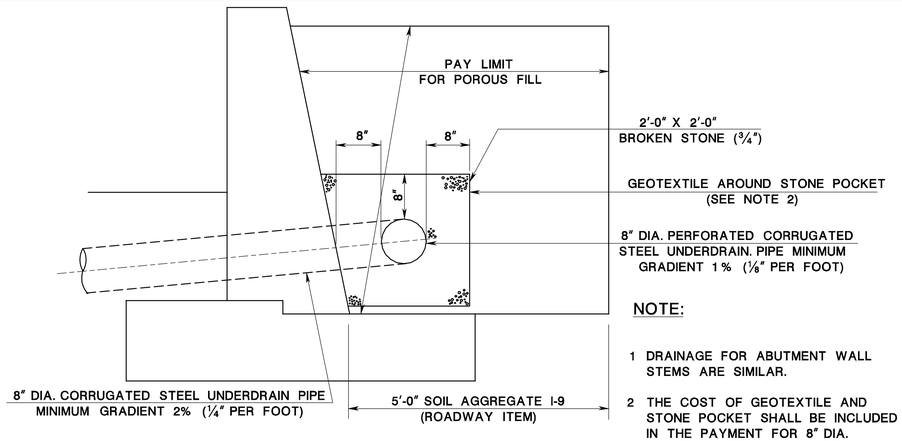
P.C. SLAB AND BOX BEAMS



BRIDGE LIMITS

INTEGRAL ABUTMENT

BCD-504-2.1



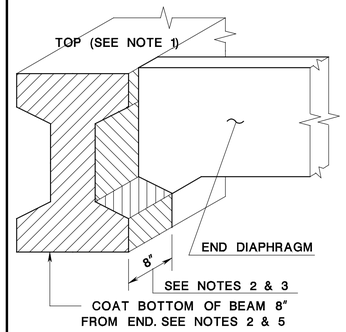
NOTE:

1 DRAINAGE FOR ABUTMENT WALL STEMS ARE SIMILAR.

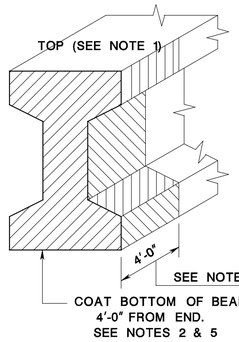
2 THE COST OF GEOTEXTILE AND STONE POCKET SHALL BE INCLUDED IN THE PAYMENT FOR 8" DIA. PERFORATED UNDERDRAIN.

DRAINAGE BACK OF WALL

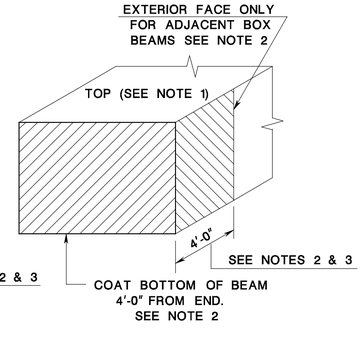
BCD-504-2.4



INTERIOR FACE OF BEAMS



EXTERIOR FACE OF FASCIA BEAMS



EXTERIOR FACE OF FASCIA BOX BEAMS

NOTES:

1 NO SEALER SHALL BE APPLIED TO THE TOP SURFACE OF ANY BEAM.

2 SEALER SHALL BE APPLIED TO THE ENDS, BOTTOMS AND EXTERIOR SIDES OF FASCIA BEAMS FOR ALL ADJACENT BOX BEAMS. SIDES OF INTERIOR BOX BEAMS SHALL NOT BE COATED. SEALER SHALL BE APPLIED TO THE ENDS, SIDES AND BOTTOMS OF ALL I-BEAMS.

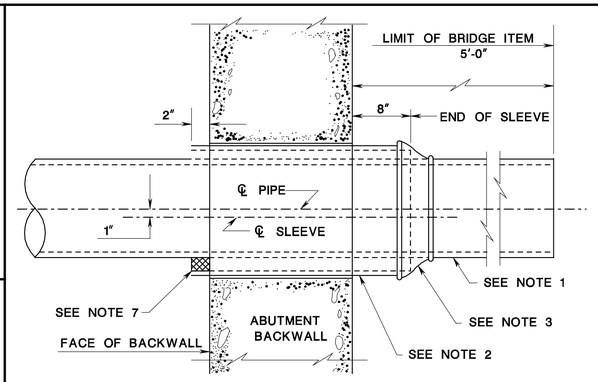
3 THE SEAL COAT SHALL ONLY BE APPLIED TO BEAM ENDS UNDER DECK JOINTS.

4 VOIDED SLAB BEAMS SIMILAR TO BOX BEAM DETAILS FOR EPOXY WATERPROOFING LIMITS.

5 EPOXY WATERPROOFING SEAL COAT SHALL BE OMITTED FROM THE BEARING CONTACT AREAS FOR VARIOUS TYPES OF BEARINGS, CHECK BEARING MANUFACTURER'S RECOMMENDATIONS.

PRESTRESSED CONCRETE I-BEAMS, VOIDED SLAB AND BOX BEAMS EPOXY WATERPROOFING WITH GRIT LIMITS

BCD-504-2.2



SLEEVE DETAIL FOR STEEL GAS MAINS

NOTES:

1 GAS MAIN FURNISHED AND INSTALLED BY UTILITY COMPANY.

2 GALVANIZED SLEEVE FURNISHED AND INSTALLED BY CONTRACTOR.

3 CASING SEAL FURNISHED AND INSTALLED BY UTILITY COMPANY.

4 ENDS OF SLEEVE SHALL BE CUT SQUARE AND FREE FROM BURRS.

5 GRADE (SLOPE) OF SLEEVE SHALL BE SAME AS GRADE OF GAS MAIN.

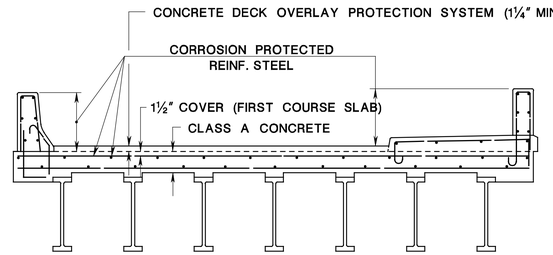
6 ℄ OF GAS MAIN SHALL BE INSTALLED 1" HIGHER THAN ℄ OF SLEEVE.

7 BLOCK INSTALLED TO INITIALLY POSITION THE PIPE AND SHALL BE REMOVED AFTER GAS MAIN APPROACH ROAD HAS BEEN CONNECTED AND BACKFILLED AND COMPACTED FOR BOTTOM HALF OF THE PIPE.

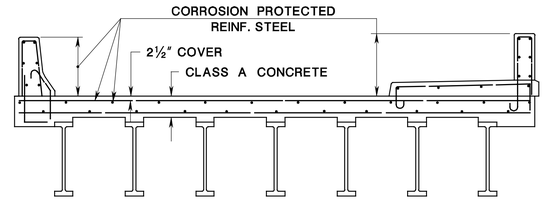
8 PIPE AND SLEEVE SHALL BE TEMPORARILY PLUGGED.

9 THE OPENING BETWEEN THE PIPE AND THE SLEEVE SHALL BE PACKED WITH HEMP, JUTE OR SIMILAR MATERIAL TO PREVENT LEAKAGE THROUGH THE BACKWALL.

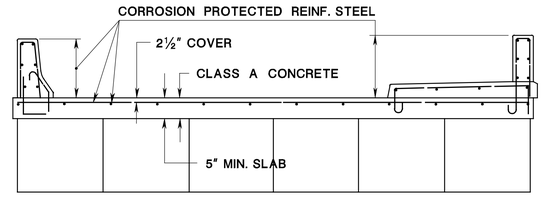
BCD-504-2.5



TWO-COURSE CONCRETE DECK SLAB



ONE-COURSE CONCRETE DECK SLAB



CONCRETE OVERLAY SLAB ON PRESTRESSED CONCRETE VOIDED SLAB OR BOX BEAMS

NOTE:

ALL REINFORCEMENT STEEL IN PARAPETS AND SIDEWALKS SHALL BE CORROSION PROTECTED.

BRIDGE DECK CONSTRUCTION PROTECTIVE SYSTEMS (NEW BRIDGE DECKS)

BCD-504-2.3

MISCELLANEOUS BRIDGE ITEMS

N.T.S.

BCD-504-2

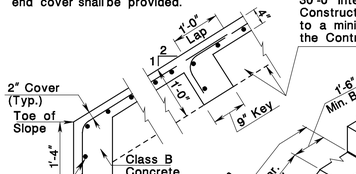
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS

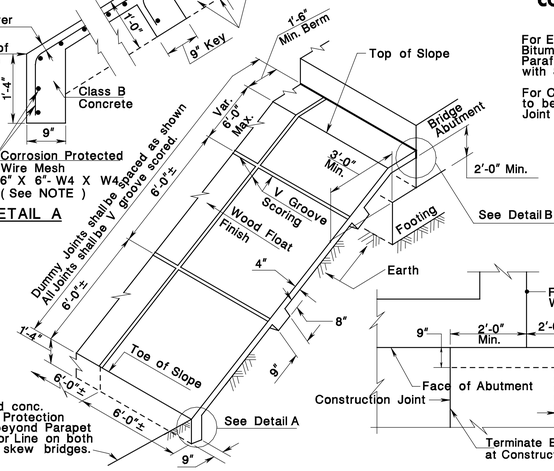
BDC07D-01-ORIGINAL SHEET

Welded wire fabric shall pass through construction joints. Splices where necessary, shall overlap a minimum of 1'-0". Reinforcement shall not pass through expansion and contraction joints and a minimum of 2" concrete end cover shall be provided.

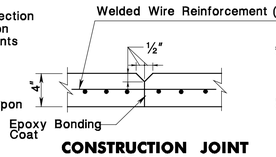
Edge Beams required at Slope Protection limits & on both sides of Contraction and Expansion Joints. Expansion Joints required at 90'-0" intervals. Contraction Joints required at 30'-0" intervals. The number of Construction Joints shall be kept to a minimum and shall be based upon the Contractor's pouring procedure.



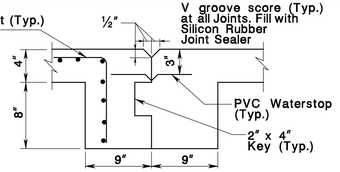
DETAIL A



ISOMETRIC SLOPE SKETCH



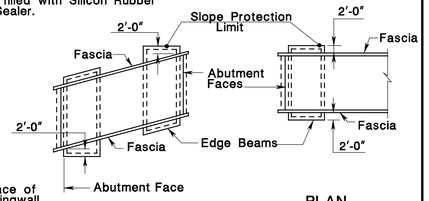
CONSTRUCTION JOINT SECTION



EXPANSION AND CONTRACTION JOINT SECTION

For Expansion Joints use ½" Preformed Bituminous Joint Filler. Contraction Joints Paraffin coated. Upper ½" to be filled with Silicon Rubber Joint Sealer.

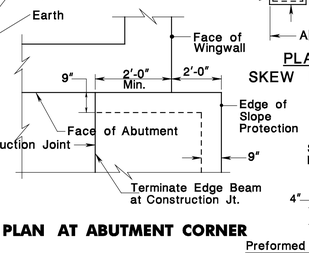
For Construction Joints V Groove to be filled with Silicon Rubber Joint Sealer.



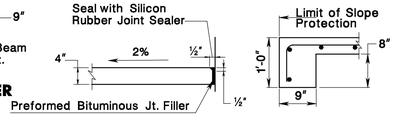
PLAN SKEW BRIDGE

PLAN 90° BRIDGE

SLOPE PROTECTION LIMITS



PLAN AT ABUTMENT CORNER

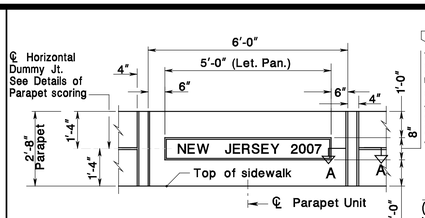


DETAIL B

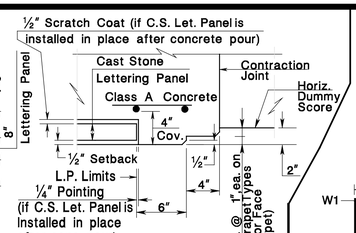
SECTION – EDGE BEAM

DETAILS OF CONCRETE SLOPE PROTECTION

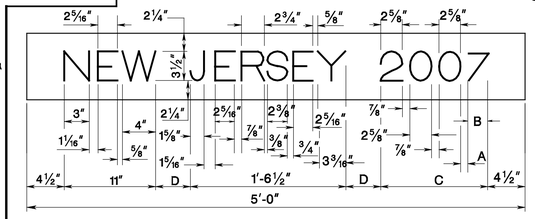
BCD-504-3.1



INTERIOR ELEVATION–PARAPET PANEL



SECTION A–A

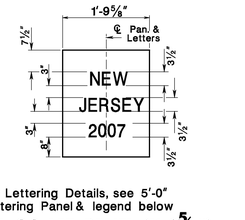


DETAIL – C.S. LET. PANEL (5'–0")

All Dimensions shown are in inches

LEGEND				
YEAR	A (IN.)	B (IN.)	C (IN.)	D (IN.)
2004	⅞	2⅝	13⅛	4⅝
2005	⅞	2⅜	12⅞	4⅝16
2006	⅞	2½	13	3¾
2007	⅞	2½	13	4⅝
2008	⅞	2½	13	3¾
2009	⅞	2⅝	13⅛	3¾

Panel to be approved by the Engineer, before incorporating panel in the work.



For Lettering Details, see 5'-0" Lettering Panel & legend below

DETAIL–C.S. LET. PANEL (1'–9⅝")

All Dimensions shown are in inches

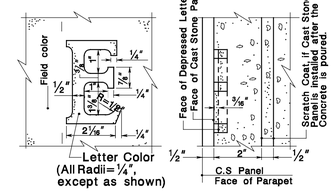
(Note: Panel Date shall be year of Bridge completion.)

LETTERING PANEL NOTES:

Lettering panels shall be precast reinforced concrete in one piece with the exposed aggregate as per Specifications. Surface Finish for the Field shall be a medium feature exposed aggregate with a reddish-brown coloration. Surface Finish for Letters and Numbers shall be a light green crushed quartz. Samples showing desired coloration, aggregate and textures may be examined in the office of the Engineer. Care shall be used to prevent mortar discoloration of exposed surfaces of the panel. Cost of panel shall be included in price bid for concrete containing it.

DATE PANEL

BCD-504-3.2

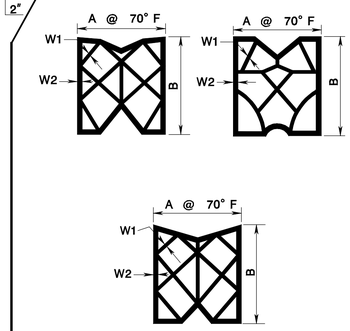


Letter Color (All Radii=¼", except as shown)

ELEVATION

SECTION

DETAILS – LETTERING



A = Compressed width of sealer at 70° F.
B = Compressed height of sealer at 70° F.
W1 = Interior membrane minimum thickness.
W2 = Exterior membrane minimum thickness.

PREFOR. ELASTOMERIC COMPRESSION SEALER NOMINAL SIZE (IN.)		A (IN.)	B (IN.)	W1 (min.) (IN.)	W2 (min.) (IN.)
1¾" X 1¾"	(1)	1	(2)	1⁄16	3⁄32
2½" X 2½"	(1)	1⅝	(2)	3⁄32	3⁄16
4" X 4"	(1)	2⅝	(2)	3⁄16	¼

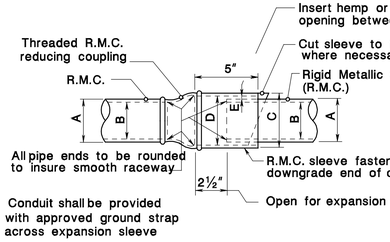
Notes:

1. The nominal height of compression seals may vary based on manufacturers specifications. The height may exceed the nominal manufacturers sealer height by not more than ¼".
2. Dimension "B" varies depending on the joint manufacturer. The depth of embedment of the compression seal in the joint shall be set by the fabricator and is equal to the compressed seal height plus ½" (± ⅛").
3. All preformed elastomeric compression seals shall conform * to the material requirements of the NJDOT Standard Specifications for Road and Bridge Construction with current Supplemental Specifications, as modified by the Special Provisions.

* The note should be modified to reflect applicable year and updated Specifications.

DETAILS OF PREFORMED ELASTOMERIC JOINT SEALER

BCD-504-3.5



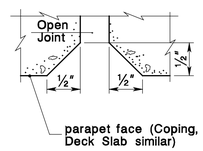
ELEVATION

R. M. C.			SLEEVE			Nominal Reducing Coupling	Clearance
Nom.Dia.	Ext.Dia. A	Int.Dia. B	Nom.Dia.	Ext.Dia. C	Int.Dia. D		E
1½"	1.900	1.610	2½"	2.875	2.469	2½" to 1½"	9⁄32"
2"	2.375	2.067	3"	3.500	3.068	3" to 2"	11⁄32"
3"	3.500	3.068	4"	4.500	4.026	4" to 3"	¼"
4"	4.500	4.026	5"	5.563	5.047	5" to 4"	¼"

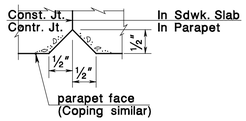
Expansion sleeves shall be installed at all Fixed and Expansion joints and elsewhere as shown or approved. R.M.C. and all fittings shall be hot-dip galvanized.

DETAILS OF R.M.C. EXPANSION SLEEVE

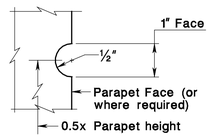
BCD-504-3.3



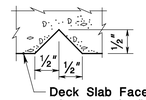
OPEN JOINT



CONTR. OR CONST. JOINT
(Contraction joint paraffin coated)



HORIZONTAL DUMMY JOINT



VERTICAL DUMMY JOINT

DETAILS OF PARAPET SCORING

BCD-504-3.4

TYPICAL DETAILS NO. 1

N.T.S.

BCD-504-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS

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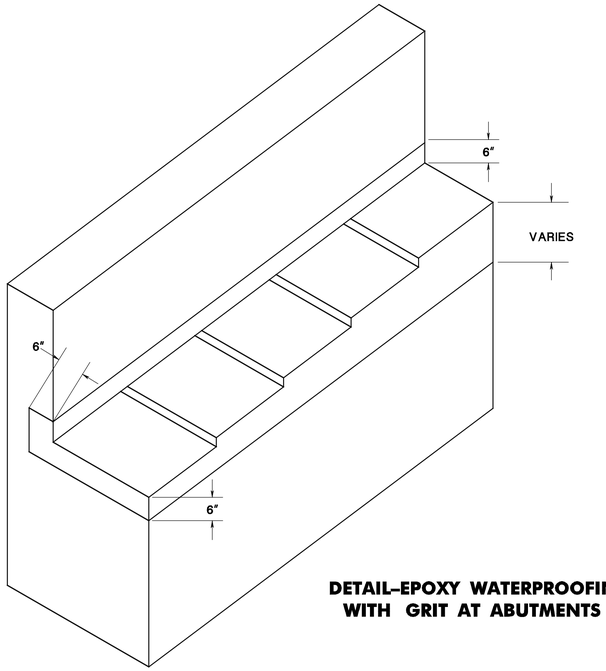
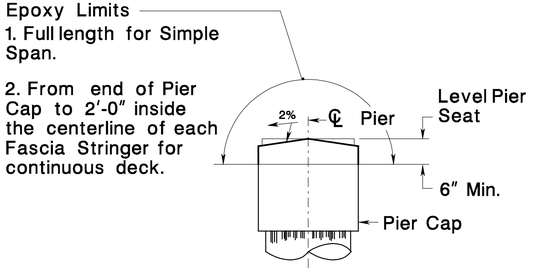
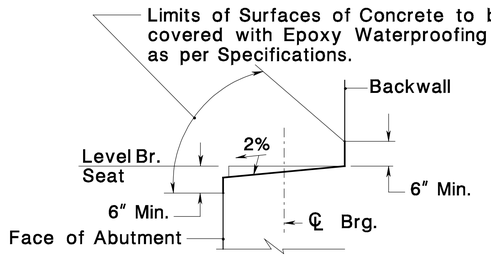


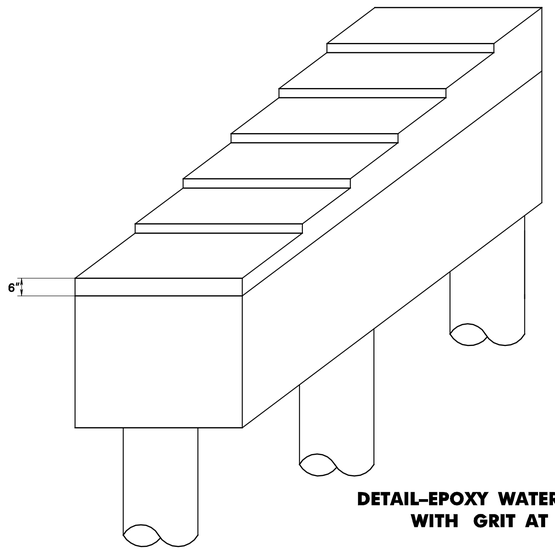
DETAIL–EPOXY WATERPROOFING WITH GRIT AT ABUTMENTS



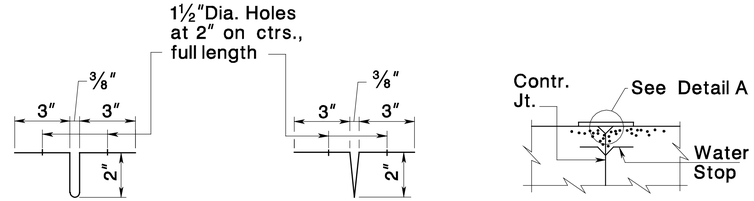
LIMITS AT PIER



LIMITS AT ABUTMENT

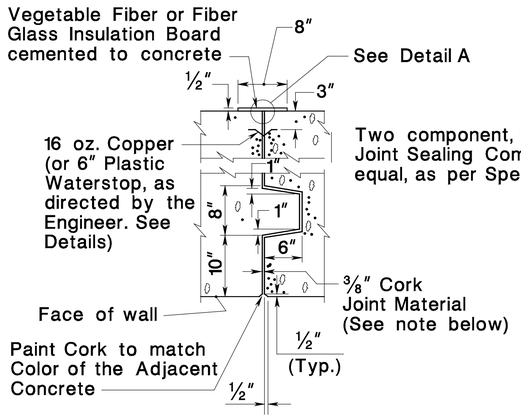


DETAIL–EPOXY WATERPROOFING WITH GRIT AT PIERS



16 OZ. COPPER WATERSTOP–10" WIDE

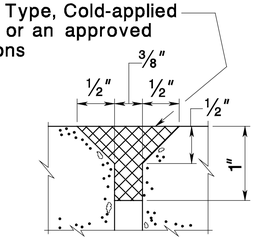
BCD-504-4.2



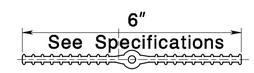
SECTION – WALL JOINT

Cork Joint Material: conforming to AASHTO Specifications, Designation M153, Type 2, where joint is noted as Expansion Joint. Contraction Joints shall be tight and shall be paraffin coated.

DETAILS OF WATERSTOP



DETAIL A SEALER



DETAIL 6" PLASTIC WATERSTOP

BCD-504-4.3

TYPICAL DETAILS NO. 2

N.T.S.

BCD-504-4

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS

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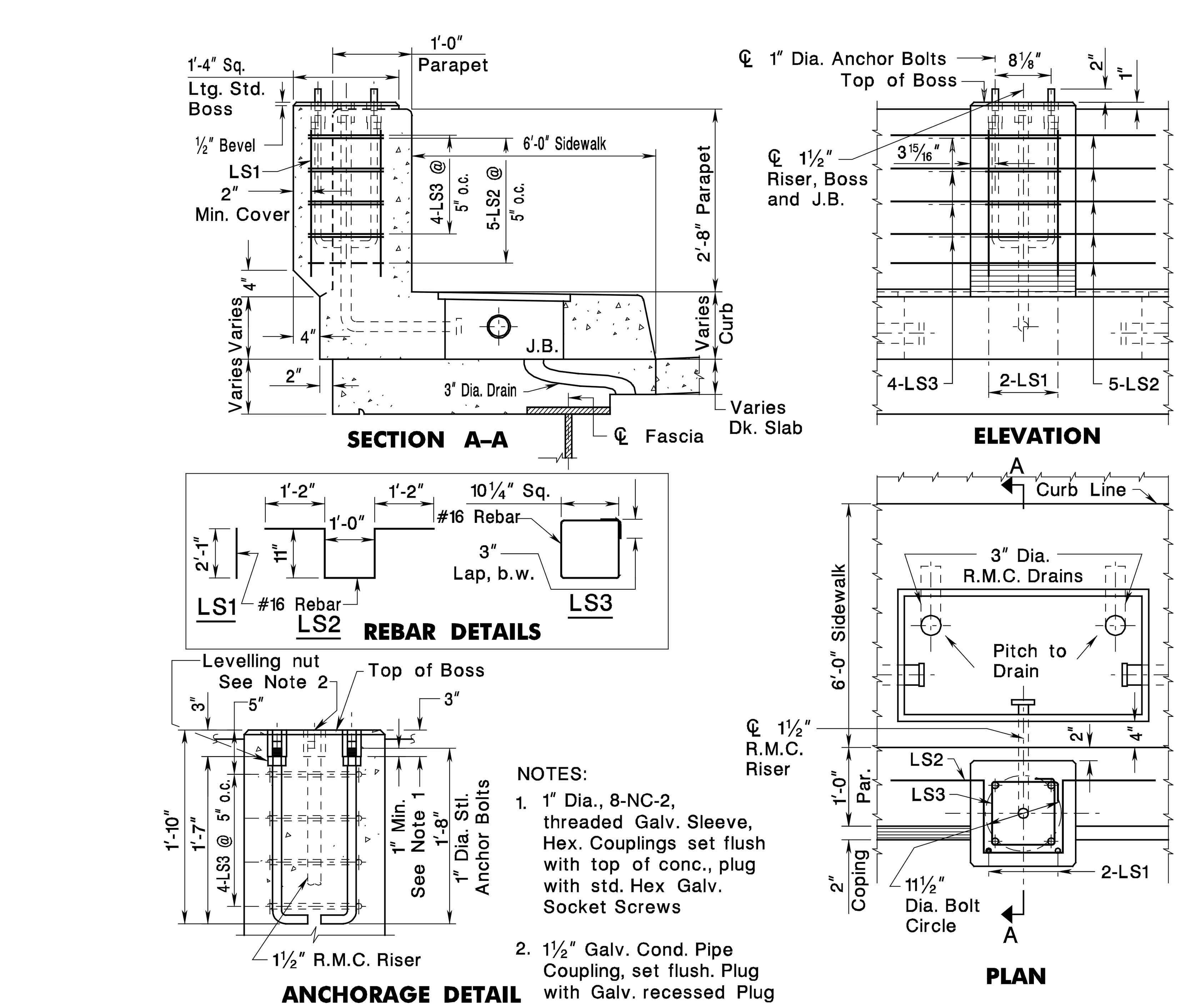
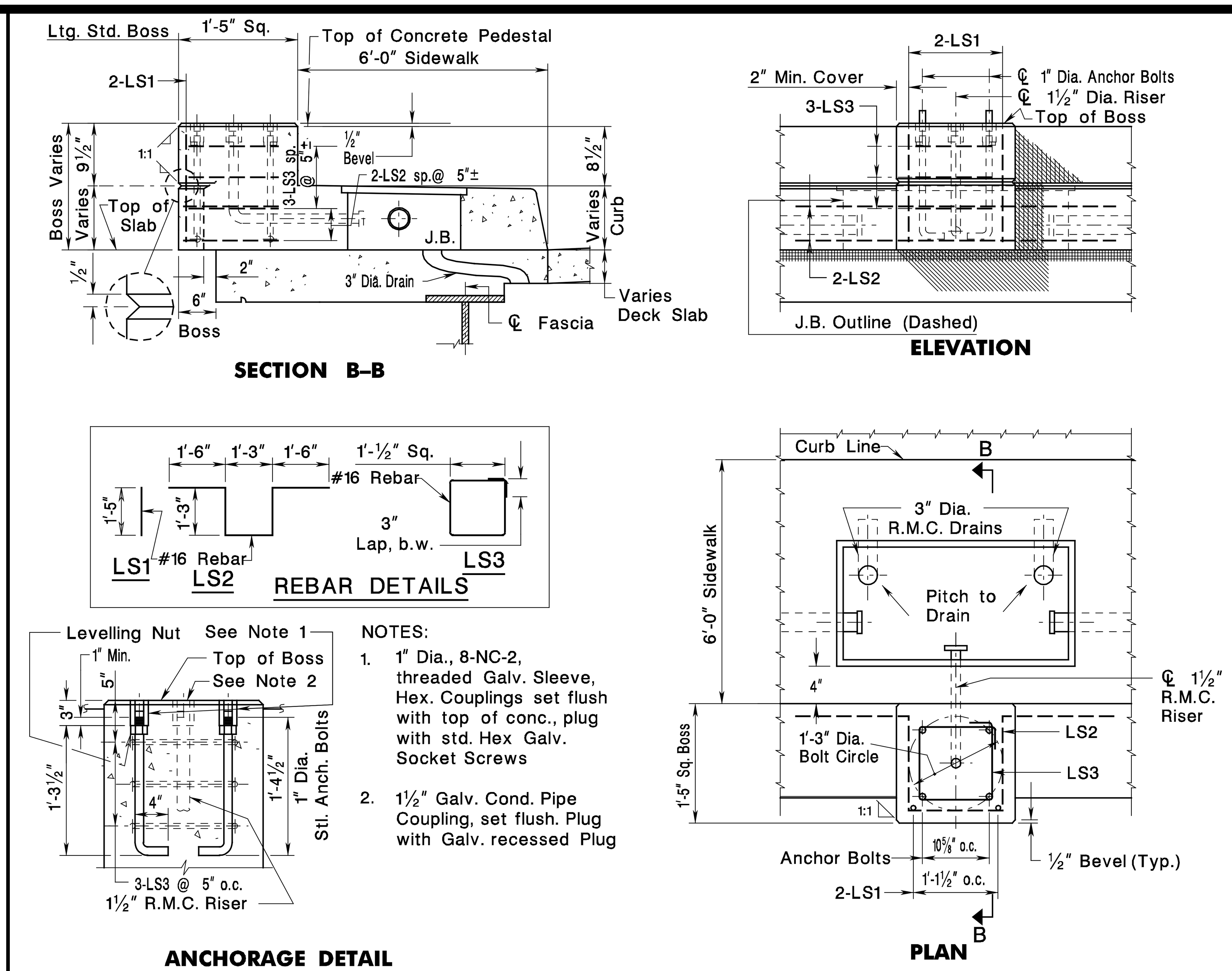
BCD-504-4.1



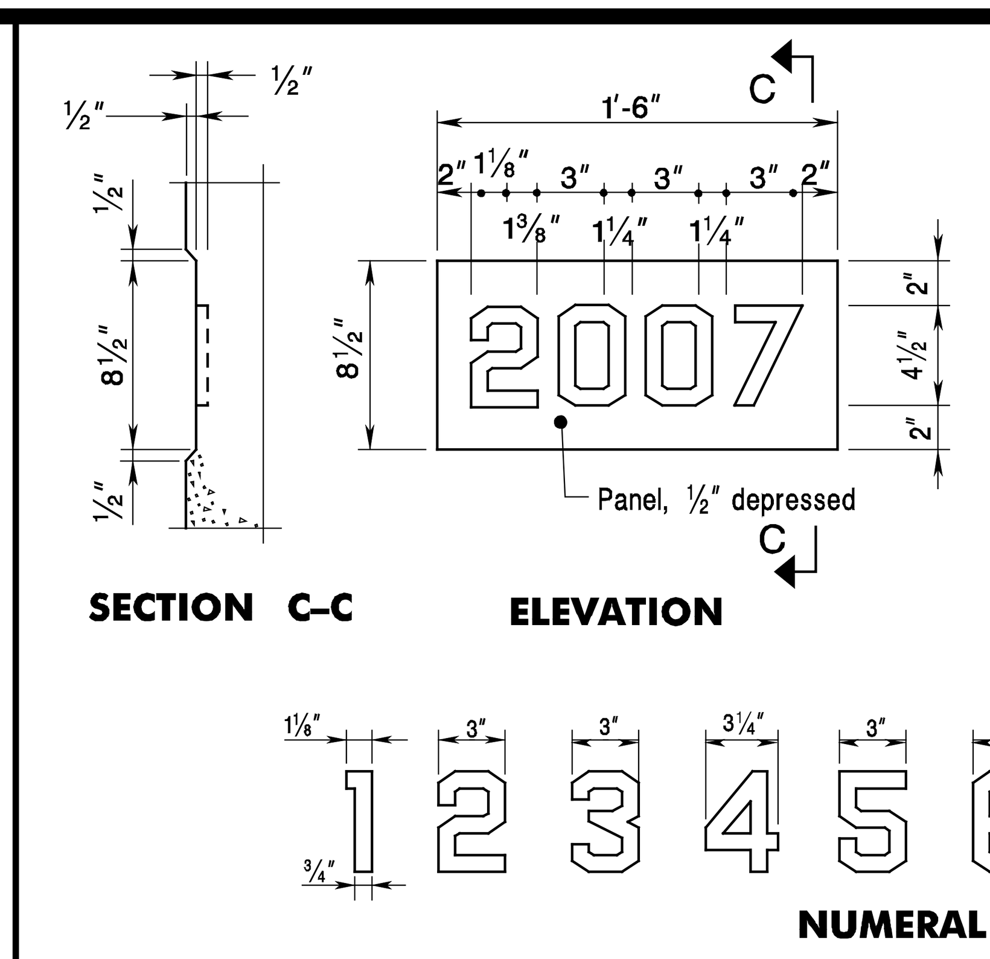
DETAILS OF LIGHTING STANDARD BOSS ON 2'–8" PARAPET

BCD-504-5.1



DETAILS OF LIGHTING STANDARD BOSS ON 8 1/2 " PEDESTAL

BCD-504-5.2

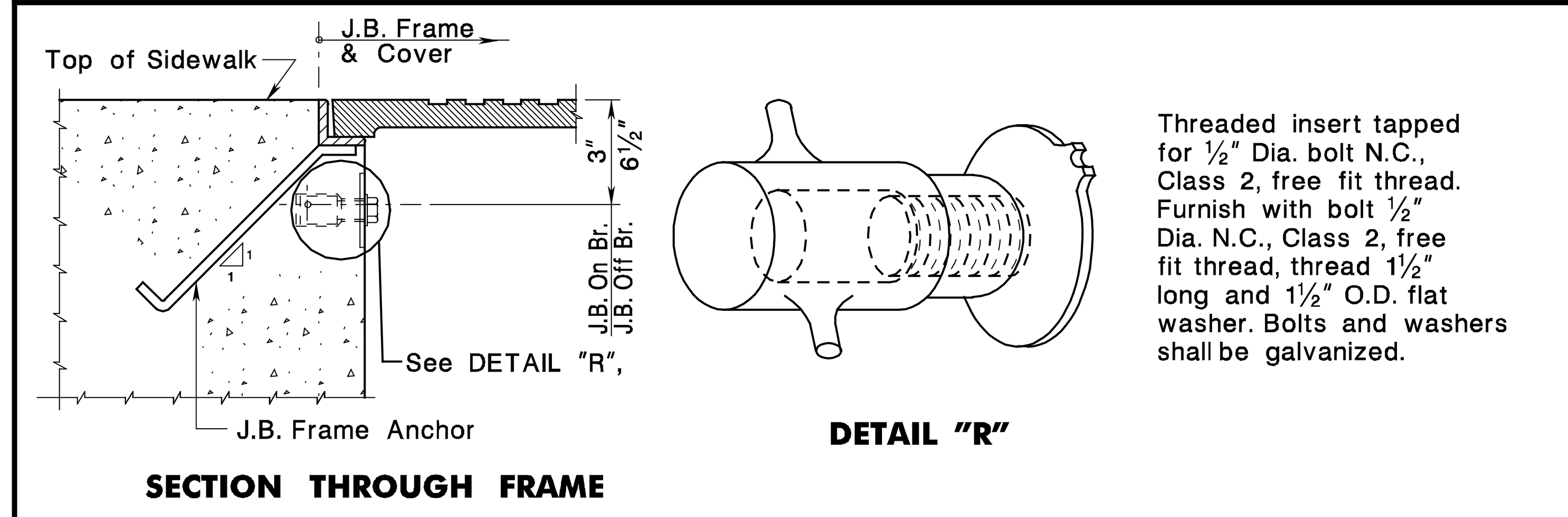


NOTES:

1. DATE shall be Year of Completion of Structure.
2. NUMERALS proposed for use shall be approved by the Engineer.
3. COST of the Panel shall be included in the Price bid for Concrete containing the Panel.
4. Two (2) Panels required.

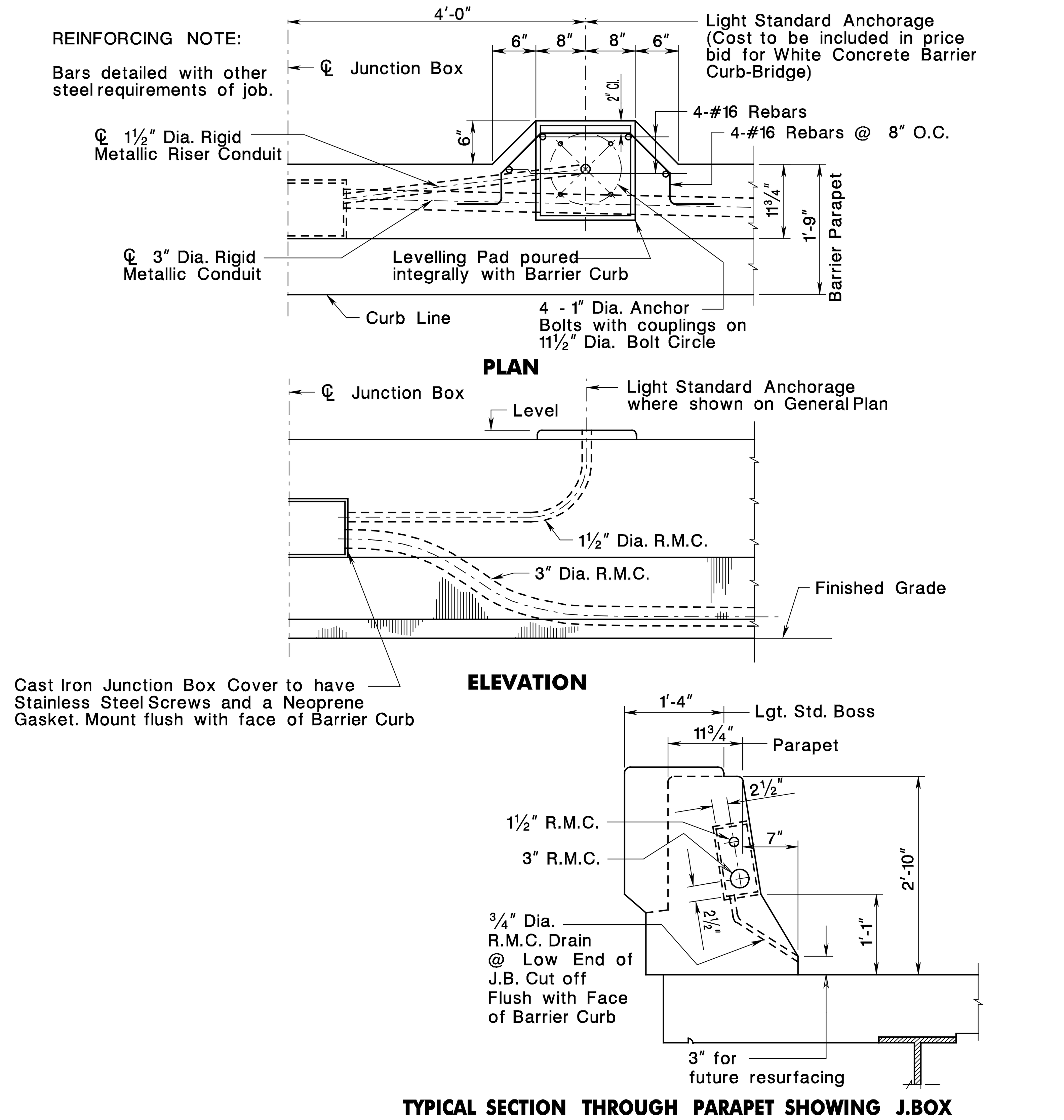
DETAILS OF NUMERAL PANEL

BCD-504-5.3



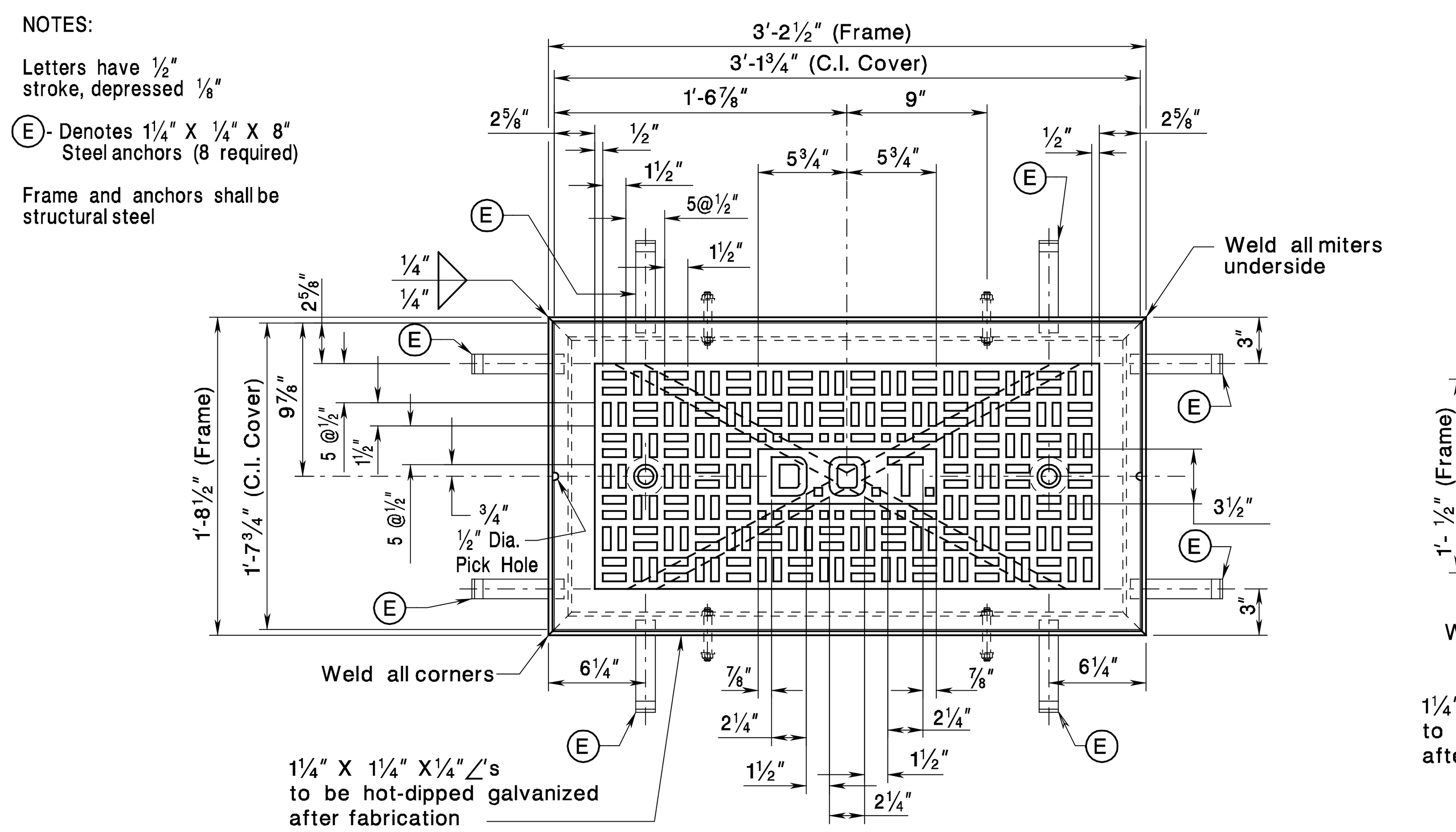
DETAILS OF ALTERNATE CABLE RACK SUPPORT

BCD-504-5.4

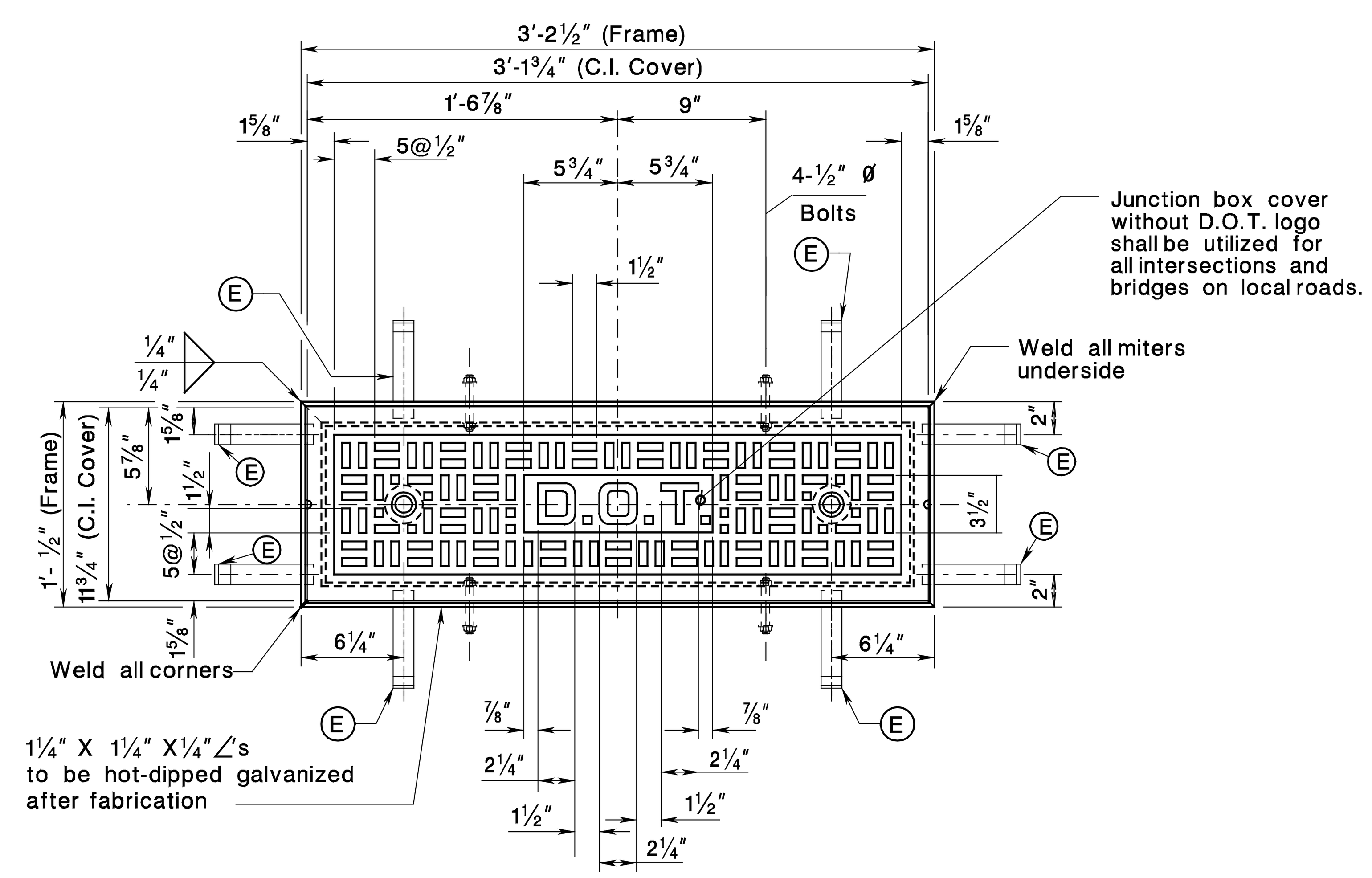


DETAIL OF LIGHTING STANDARD BOSS FOR 2'–10" BARRIER PARAPET

BCD-504-5.5



PLAN–FRAME AND COVER FOR 18" X 36" JUNCTION BOX

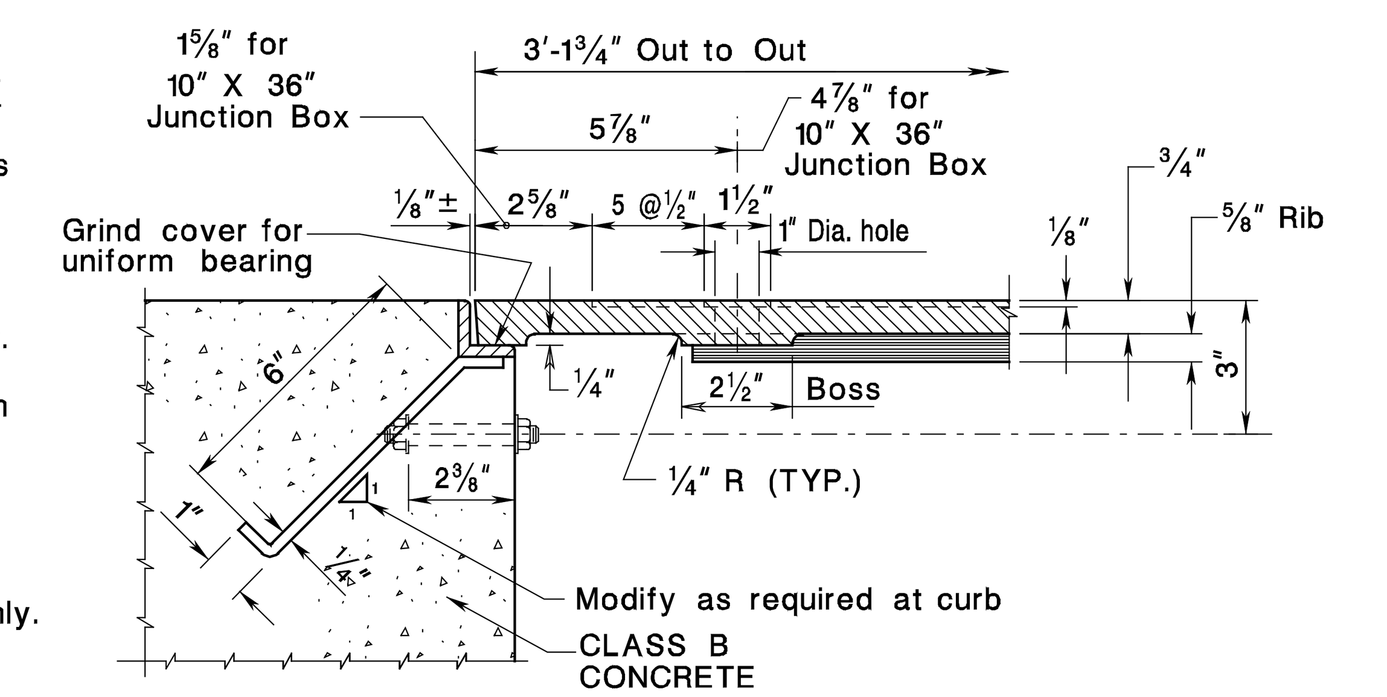


PLAN–FRAME AND COVER FOR 10" X 36" JUNCTION BOX

CABLE RACK SUPPORT

Coupling, bolts & washers shall be galvanized. Coupling shall be hexagonal shaped, threaded continuously with ½" Dia. N.C. Class 2 Free Fit. Bolts shall be ½" Dia. N.C. Class 2 Free Fit with hexagonal heads ½" long. Flat washers shall be 1½" O.D.

NOTE:
Supports in side walls only.



END SECTION THROUGH JUNCTION BOXES

18" X 36" SHOWN, 10" X 36" SIMILAR EXCEPT AS NOTED

JUNCTION BOX SIZES ARE NOMINAL DIMENSIONS TO BE USED FOR REFERENCE PURPOSES AND FOR DESCRIPTION OF THE PAY ITEM. REFER TO DETAILS ON THIS SHEET FOR ACTUAL DIMENSIONS.

DETAILS OF JUNCTION BOX

BCD-504-5.6

TYPICAL DETAILS NO.3

N.T.S.

BCD-504-5

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS

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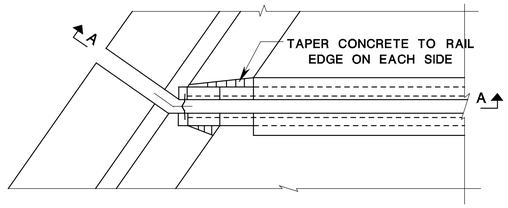
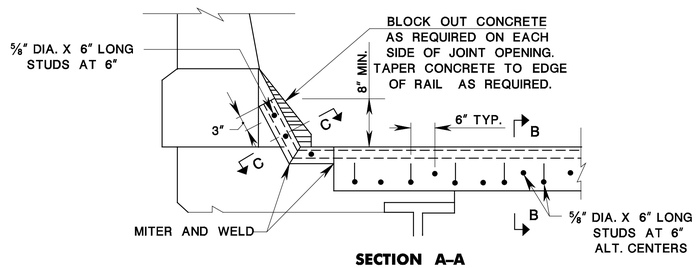
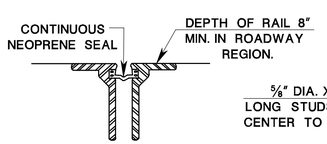
BDC07D-01ORIGINAL SHEET



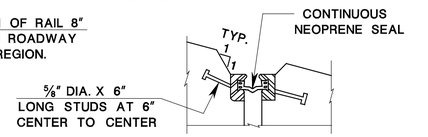
PARAPET PLAN FOR SKEWS ≥ 30°



SECTION A–A



SECTION B–B



SECTION C–C

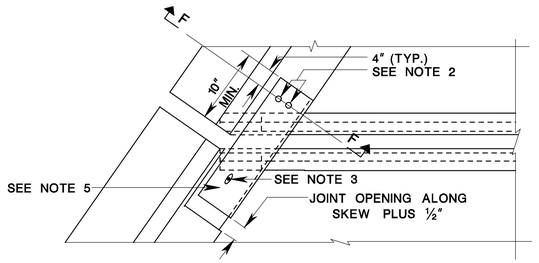
NOTES:

1 THE DETAIL ABOVE IS INTENDED AS A GENERAL GUIDE TO A TYPICAL GLANDULAR TYPE STRIP SEAL SYSTEM. VARIATIONS TO THE GLAND SHAPE, RAIL SHAPE, STUD ARRANGEMENT, AND SUPPORT DETAILS SHALL BE SUBMITTED ACCORDING TO THE NJDOT WORKING DRAWING SPECIFICATIONS.

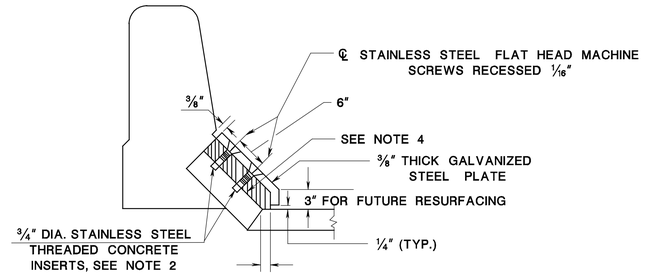
2 DETAILS FOR MEDIAN BARRIER ARE SIMILAR.

3 THE JOINT OPENING IN THE PARAPET SHALL BE PARALLEL TO THE SKEW FOR SKEWS LESS THAN 30 DEGREES.

BCD-507-1.1



PARAPET PLAN



SECTION F–F

NOTES:

1 THE DETAIL ABOVE IS INTENDED AS A GENERAL GUIDE TO A TYPICAL GLANDULAR TYPE STRIP SEAL SYSTEM. VARIATIONS TO THE GLAND SHAPE, RAIL SHAPE, STUD ARRANGEMENT, AND SUPPORT DETAILS SHALL BE SUBMITTED ACCORDING TO THE NJDOT WORKING DRAWING SPECIFICATIONS.

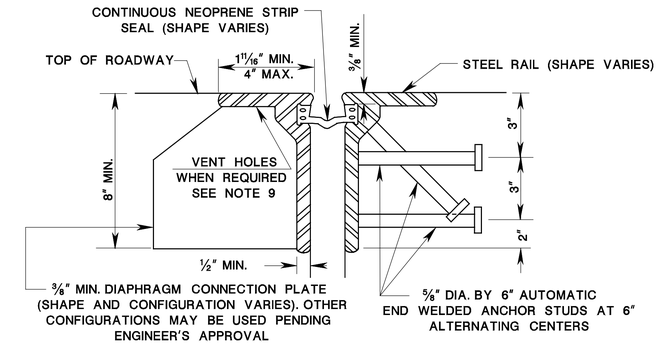
2 2 - ¾" DIA. X 1½" STAINLESS STEEL FLAT HEAD MACHINE SCREWS WITH 2 - ¾" DIA. CAST-IN-PLACE STAINLESS STEEL THREADED CONCRETE INSERTS. RECESS 1/16" BELOW PLATE SURFACE.

3 1" X 5" SLOTTED HOLE FOR SKEWS TO 45°; 1" X 6" SLOTTED HOLE FOR SKEWS OVER 45°. HOLE SLOTTED PARALLEL TO DIRECTION OF MOVEMENT WITH 1 - ¾" X 1½" STAINLESS STEEL FLAT HEAD MACHINE SCREW RECESSED 1/16" BELOW PLATE SURFACE IN ¾" CAST-IN-PLACE STAINLESS STEEL THREADED CONCRETE INSERT. DO NOT OVER TIGHTEN MACHINE SCREWS.

4 BLOCK OUT CONCRETE AS REQUIRED ABOVE JOINT OPENING.

5 ⅜" THICK BY 1'-2" WIDE X (2'-0" LONG FOR SKEWS TO 45° AND 3'-0" LONG FOR SKEWS LARGER THAN 45°) GRADE 36 GALVANIZED STEEL PLATE BENT WITH HOLES AS SHOWN.

BCD-507-1.2



TYPICAL SECTION

NOTES:

1 THE DETAIL ABOVE IS INTENDED AS A GENERAL GUIDE TO A TYPICAL GLANDULAR TYPE STRIP SEAL SYSTEM. VARIATIONS TO THE GLAND SHAPE, RAIL SHAPE, STUD ARRANGEMENT, AND SUPPORT DETAILS SHALL BE SUBMITTED ACCORDING TO THE NJDOT WORKING DRAWING SPECIFICATIONS.

2 STEEL RAILS SHALL CONFORM TO AASHTO M270, GRADE 36 OR 50.

3 AUTOMATIC END WELDED STUDS SHALL CONFORM TO AASHTO M169 (ASTM A108), GRADES 1015, 1018 OR 1020.

4 PLATES, SHAPES AND OTHER STRUCTURAL STEEL MATERIAL USED IN THE DECK JOINT SYSTEM WITH THE STEEL RAILS SHALL CONFORM TO AASHTO M183.

5 ALL STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION PER ASTM A123.

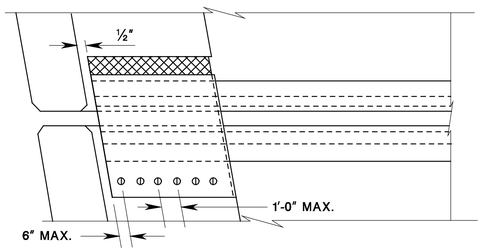
6 FIELD SPLICES FOR STEEL RAILS SHALL BE PLACED AT GRADE BREAKS AND LONGITUDINAL BREAKS IN THE DECK.

7 NEOPRENE STRIP SEAL SHALL BE INSTALLED IN A CONTINUOUS LENGTH OVER THE ENTIRE WIDTH OF THE SUPERSTRUCTURE WITH NO FIELD SPLICES PERMITTED. AN APPROVED LUBRICANT/ADHESIVE FOR THE INSTALLATION AND PERMANENT BONDING TO THE STEEL RAIL SHALL BE PLACED PRIOR TO THE STRIP SEAL INSTALLATION.

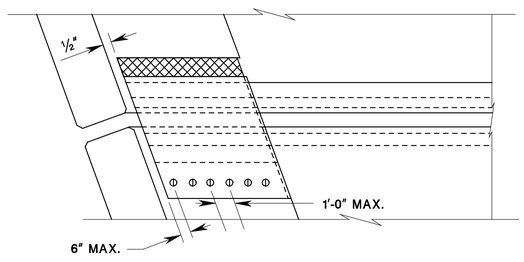
8 WHERE A LONGITUDINAL AND TRANSVERSE JOINT INTERSECT, THE JOINT SUBJECTED TO THE GREATER MOVEMENT SHALL BE MADE CONTINUOUS AND THE OTHER SEAL SHALL BUTT UP AGAINST IT. ALL JOINT INTERSECTIONS SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER.

9 9/16" DIA. VENT HOLES SPACED BETWEEN STUDS AT 1'-0" CENTER TO CENTER MAX. ARE REQUIRED WHEN TOP OF STEEL RAIL IS WIDER THAN 3".

BCD-507-1.3

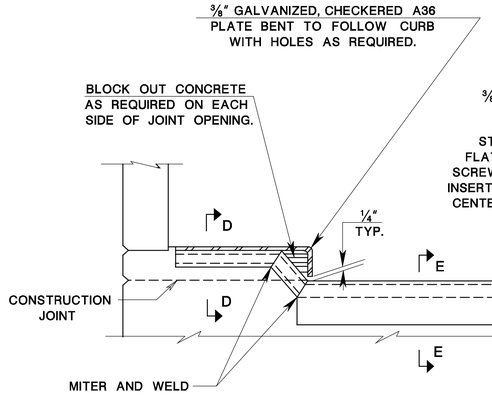


SIDEWALK PLAN
SKEW < 15°

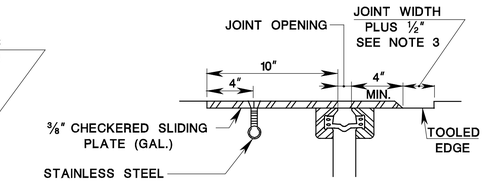


SIDEWALK PLAN
SKEW ≥ 15°

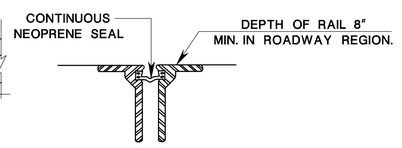
BCD-507-1.4



SIDEWALK ELEVATION



SECTION D–D



SECTION E–E

NOTES:

1 THE DETAIL SHOWN HERE IS INTENDED AS A GENERAL GUIDE TO A TYPICAL GLANDULAR TYPE STRIP SEAL SYSTEM. VARIATIONS TO THE GLAND SHAPE, RAIL SHAPE, STUD ARRANGEMENT, AND SUPPORT DETAILS SHALL BE SUBMITTED ACCORDING TO THE NJDOT WORKING DRAWING SPECIFICATIONS.

2 ¾" DIA. X 1½" STAINLESS STEEL FLAT HEAD MACHINE SCREWS WITH ¾" DIA. CAST-IN-PLACE STAINLESS STEEL THREADED CONCRETE INSERTS. RECESS 1/16" BELOW PLATE SURFACE.

3 UPON COMPLETION, FILL JOINT OPENING WITH A LOW MODULUS SILICON RUBBER JOINT SEALER CONFORMING TO ASTM D 5893 WITH A MIN. ULTIMATE ELOGATION OF 1200 PERCENT. THE JOINT FILLER SHALL MATCH THE COLOR OF THE CONCRETE.

BCD-507-1.5

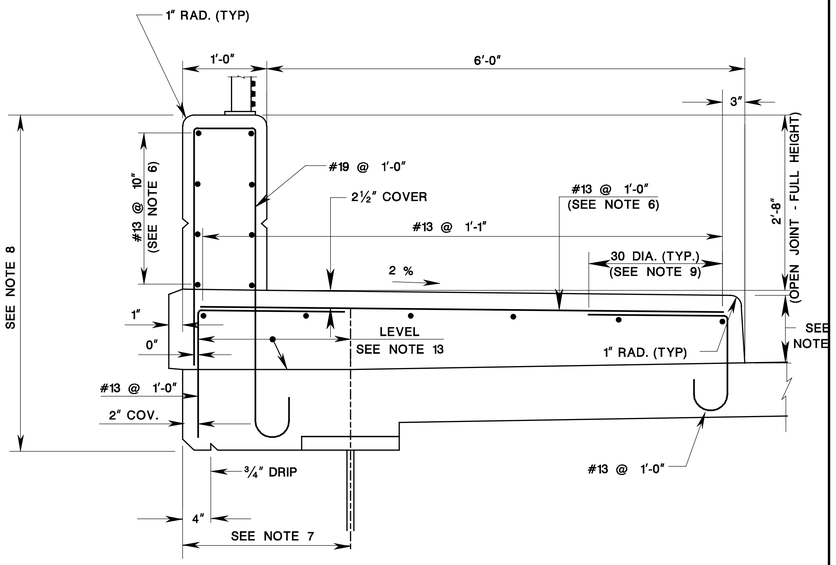
STRIP SEAL DECK JOINTS

N.T.S.

BCD-507-1

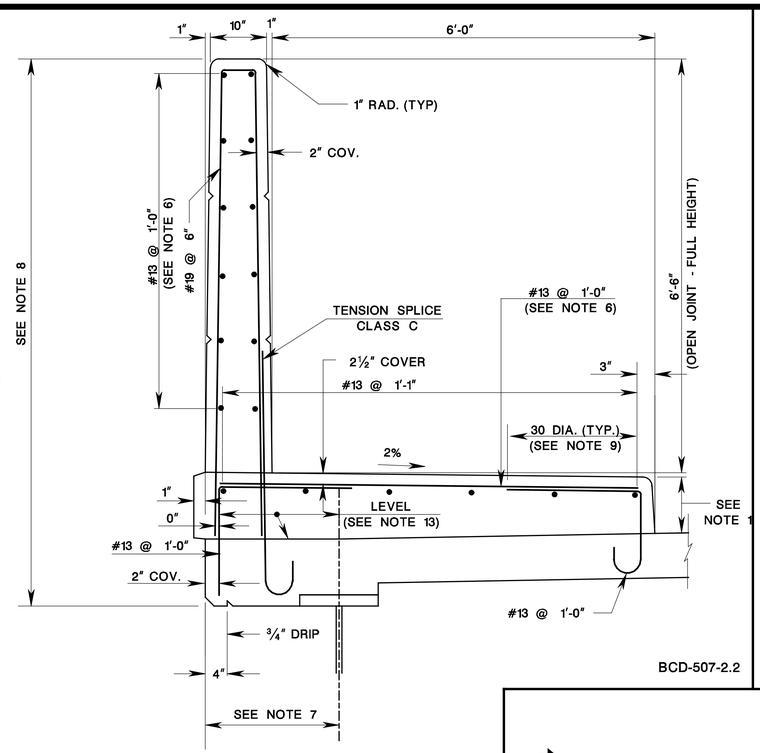
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS



2'–8" HIGH PARAPET WITH SIDEWALK

BCD-507-2.1



6'–6" HIGH PARAPET WITH SIDEWALK OVER ELECTRIFIED RAILROAD

BCD-507-2.2

NOTES:

1 CURB HEIGHT TO MATCH ROADWAY APPROACH CURB.

2 3/16" OPEN DEFLECTION JOINT SHALL BE PROVIDED IN PARAPETS AT INTERVALS NOT EXCEEDING 20'-0" AND CONTRACTION JOINTS SHALL BE PROVIDED AT THE MIDPOINT BETWEEN THE OPEN JOINTS.

3 THE 3/16" OPEN JOINT SHALL STOP AT THE LINE INDICATED AND A CONTRACTION JOINT SHALL BE PROVIDED BELOW THAT LINE.

4 CONTRACTION JOINTS SHALL BE PROVIDED IN SIDEWALKS AT LOCATIONS OF 3/16" OPEN PARAPET DEFLECTION JOINTS.

5 FULL DEPTH JOINTS SHALL BE PROVIDED AT LOCATION OF TRANSVERSE DECK JOINTS. THE FULL DEPTH JOINT OPENING WIDTH SHALL EQUAL THE TRANSVERSE DECK JOINT OPENING WIDTH.

6 ALL REINFORCEMENT STEEL IN PARAPET AND SIDEWALK SHALL BE CORROSION PROTECTED.

7 PREFERRED MAXIMUM OVERHANG 2'-6". PERMANENT METAL STAY-IN-PLACE FORMS NOT PERMITTED IN THIS AREA.

8 FASCIA RUSTICATION AND CONFIGURATION AS PER NJDOT STANDARD SPECIFICATIONS.

9 AS AN OPTION, THE CONTRACTOR MAY ELIMINATE SPLICES AT EACH END OF THE TOP TRANSVERSE REINFORCEMENT STEEL IN SIDEWALKS BY PROVIDING A SINGLE BAR OF THE SAME CONFIGURATION WITH HOOKS AT EACH END, EMBEDDED IN THE DECK SLAB.

10 IF CONDUITS ARE USED WITHIN THE PARAPET, PROVIDE A SLEEVE OF SUFFICIENT LENGTH TO ACCOMODATE MAXIMUM EXPANSION AND CONTRACTION OF THE EXPANSION JOINT.

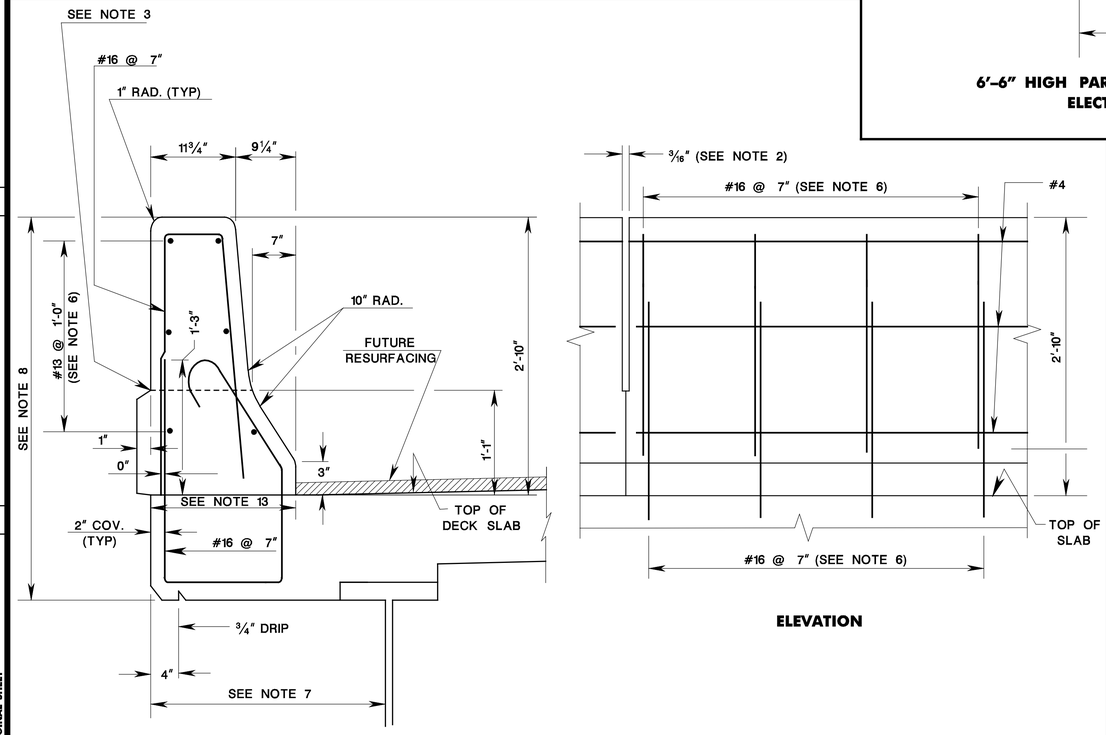
11 IN CONSIDERING THE HEIGHT OF THE PARAPET AND RAILING COMBINATION, THE MINIMUM HEIGHT SHALL BE 4'-6" FOR BICYCLE TRAFFIC AND 3'-6" FOR PEDESTRIAN TRAFFIC.

12 FOR ADDITIONAL REINFORCEMENT STEEL THAT IS REQUIRED IN THE VICINITY OF PARAPET JOINTS TO PREVENT CONCRETE CRACKING IN THE OVERHANG PORTIONS OF THE DECK SLAB, SEE "DETAIL 1."

13 THE BRIDGE DECK PORTION UNDER THE PARAPET SHALL BE POURED LEVEL.

14 ALL REINFORCEMENT STEEL IS DESIGNATED IN METRIC UNITS.

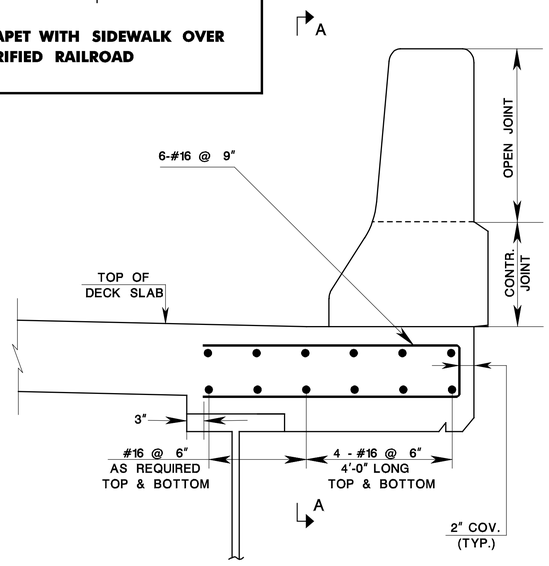
BCD-507-2.3



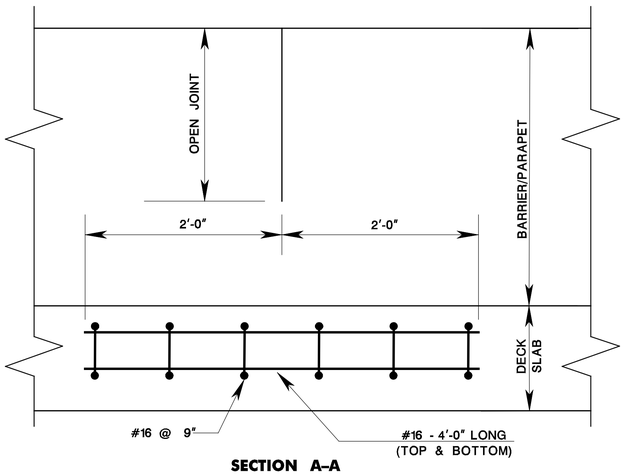
2'–10" HIGH PARAPET WITH BARRIER CURB

ELEVATION

BCD-507-2.4



DETAIL 1



SECTION A–A

DECK REINFORCEMENT STEEL AT BARRIER/PARAPET JOINTS

BCD-507-2.5

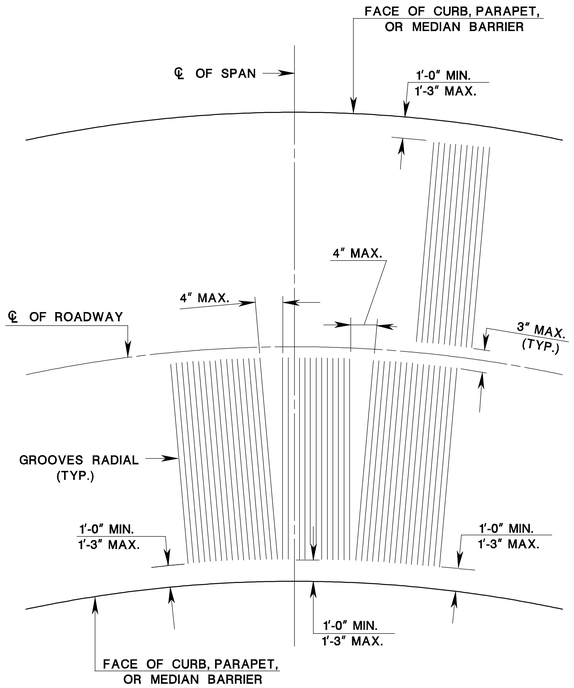
2'–8", 2'–10" AND 6'–6" PARAPETS

N.T.S.

BCD-507-2

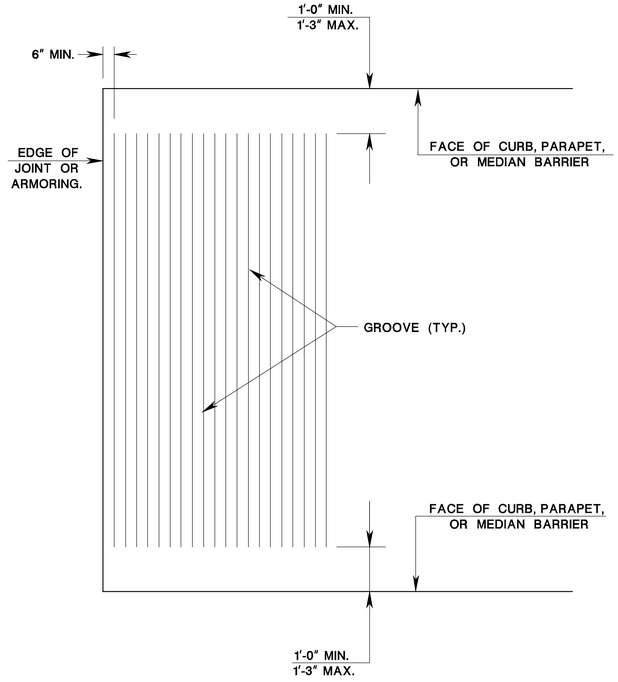
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS



SAWCUT GROOVING FOR BRIDGE DECKS ON CURVED ALIGNMENT

BCD-507-3.1

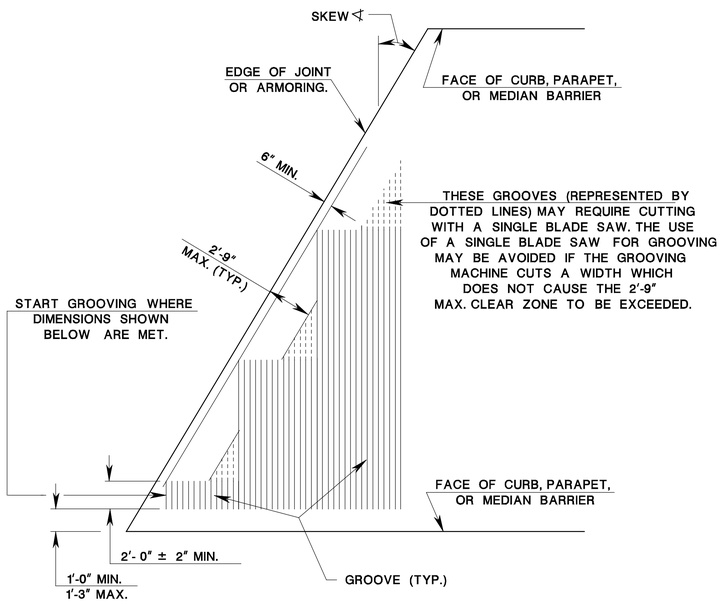


SAWCUT GROOVING FOR BRIDGE DECKS

BCD-507-3.2

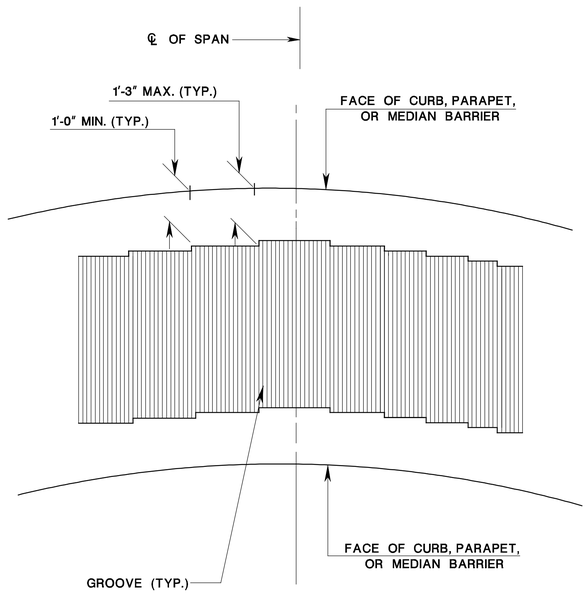
NOTES:

SAWCUT GROOVES SHALL BE RECTANGULAR IN CROSS SECTION.



SAWCUT GROOVING FOR SKEWED BRIDGE DECKS

BCD-507-3.3



SAWCUT GROOVING FOR BRIDGE DECKS ON TIGHT CURVED ALIGNMENT

BCD-507-3.4

SAWCUT GROOVING FOR BRIDGE DECKS

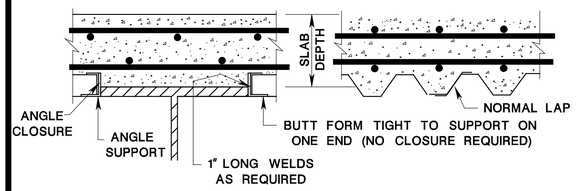
N.T.S.

BCD-507-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

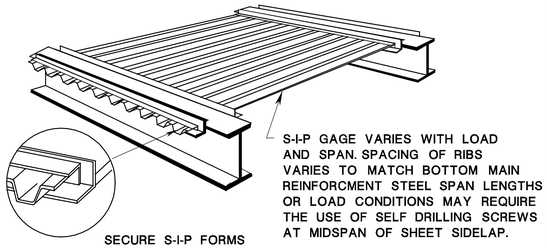
BRIDGE CONSTRUCTION DETAILS

BDC07D-01-ORIGINAL SHEET



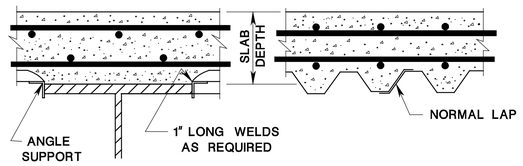
SECTION THROUGH STRINGER

SLAB SECTION



S–I–P FORMS BETWEEN STRINGERS VARIABLE SLAB ELEVATION NORMAL L SUPPORTS

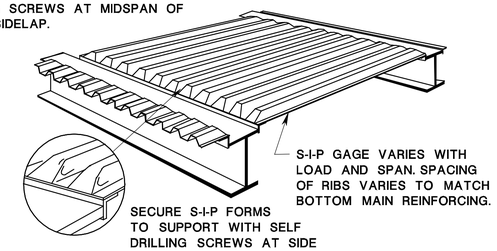
BCD-507-4.1



SECTION THROUGH STRINGER

SLAB SECTION

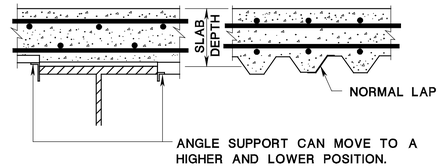
SPAN LENGTHS OR LOAD CONDITIONS MAY REQUIRE THE USE OF SELF DRILLING SCREWS AT MIDSPAN OF SHEET SIDELAP.



S–I–P FORMS BETWEEN STRINGERS VARIABLE SLAB ELEVATION INVERTED L SUPPORTS

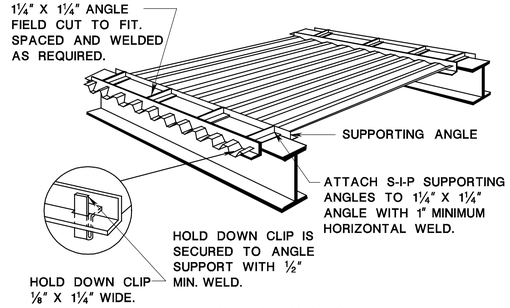
BCD-507-4.2

(TO BE USED IN THE TENSION ZONE OF CONTINUOUS SPAN BRIDGES)



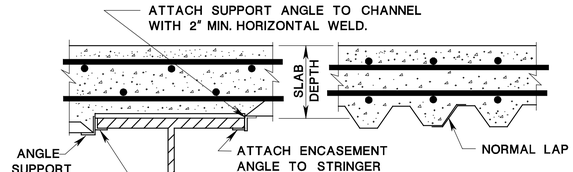
SECTION THROUGH STRINGER

SLAB SECTION



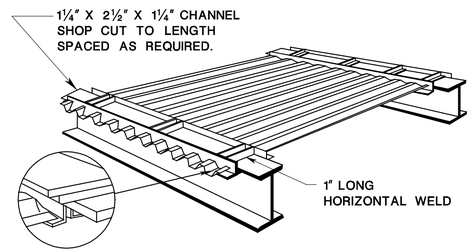
S–I–P FORMS WITH ADJUSTABLE SUPPORTS NOT WELDED TO STRINGERS

BCD-507-4.3



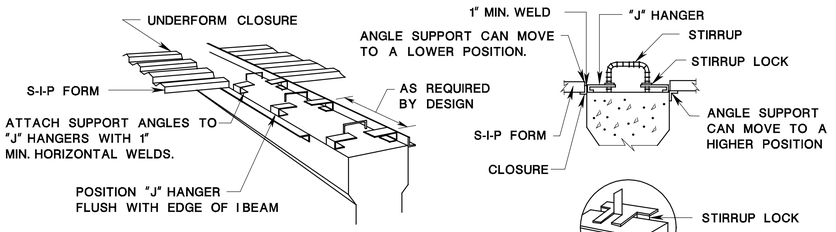
SECTION THROUGH STRINGER

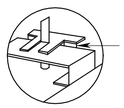
SLAB SECTION

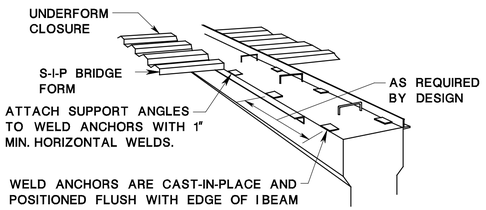


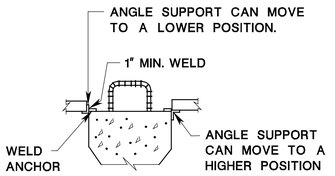
S–I–P FORMS WITH ADJUSTABLE L SUPPORTS STRINGER FLANGE ENCASEMENT PROVIDED

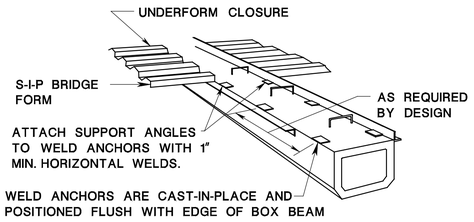
BCD-507-4.4

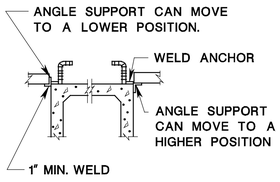






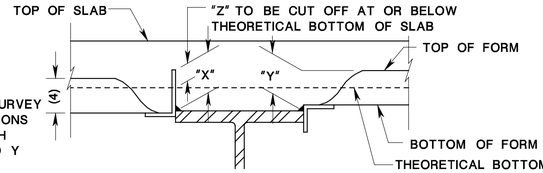






S–I–P FORMS BETWEEN PRECAST CONCRETE STRINGERS

BCD-507-4.5

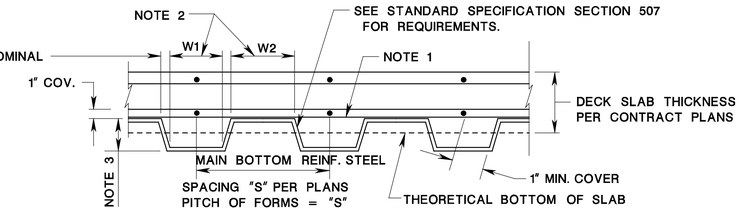


NOTE:

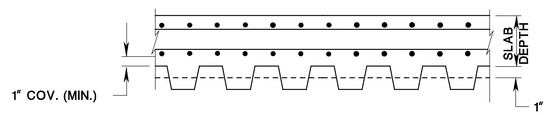
THE CONTRACTOR SHALL SURVEY THE TOP OF BEAM ELEVATIONS AS REQUIRED TO ESTABLISH HAUNCH DIMENSIONS X AND Y AND CUT-OFF DIMENSION Z.

COMPRESSION FLANGE

THE ABOVE SKETCH AND NOTE SHALL APPEAR ON THE SHOP PLANS FOR STAY-IN-PLACE DECK FORMS SUBMITTED BY THE FABRICATOR. ANY SHOP DRAWING SUBMITTED WITHOUT THE SKETCH AND NOTE SHALL BE RETURNED FOR REVISION AND RESUBMISSION.



GENERALLY, THE SPACING (PITCH) OF RIBS (FLUTES) SHALL MATCH SPACING OF BOTTOM MAIN REINFORCEMENT STEEL AND BOTTOM MAIN REINFORCEMENT STEEL SHALL BE PLACED AT THE CENTER OF EACH RIB TO PROVIDE MAXIMUM CONCRETE COVER. OCCASIONALLY, THE DECK FORMS MUST BE DROPPED WHEN RIBS AND BOTTOM MAIN REINFORCEMENT STEEL CAN NOT BE ALIGNED. REFER TO THE ALTERNATE BELOW FOR MORE DETAILS ON THIS CONDITION.



LONGITUDINAL SLAB SECTION

NOTES:

1 ½" CORROSION PROTECTED STEEL BARS MAY BE USED AS REINFORCEMENT STEEL SUPPORTS.

2 W1 SHALL BE EQUAL TO OR LESS THAN W2.

3 RIBS ARE ASSUMED TO BE 2" DEEP. SPECIAL DESIGN CONSIDERATIONS ARE REQUIRED FOR DEEPER FORMS.

BCD-507-4.6

GENERAL NOTE:

1. THE DETAILS SHOWN ARE GENERAL. WORKING DRAWINGS ACCORDING TO THE NJDOT SPECIFICATIONS SHALL BE SUBMITTED FOR ACTUAL DETAILS .

2. LAP S.I.P. FORM PLACEMENT IN DIRECTION OF CONCRETE POUR.

STAY–IN–PLACE FORMS

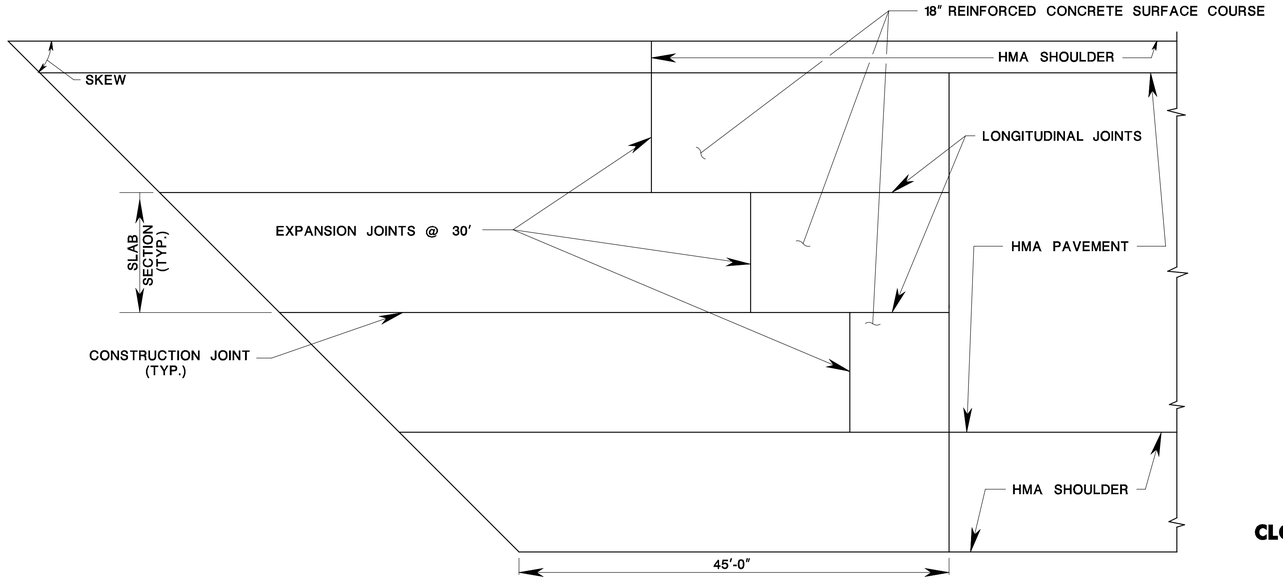
N.T.S.

BCD-507-4

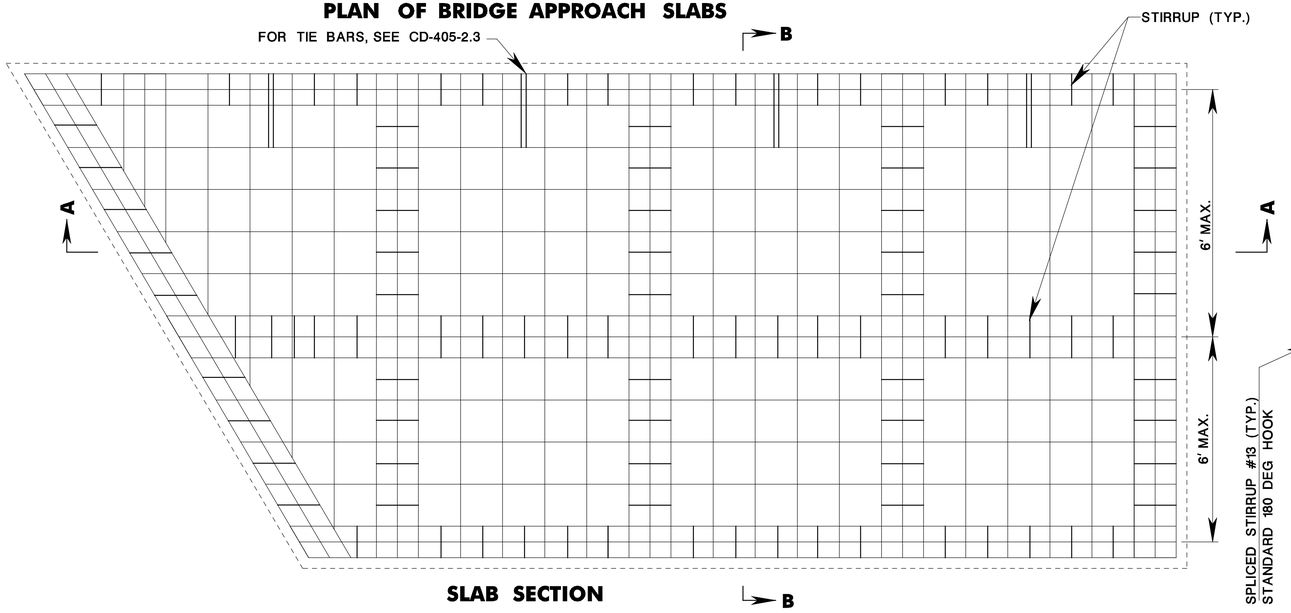
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS

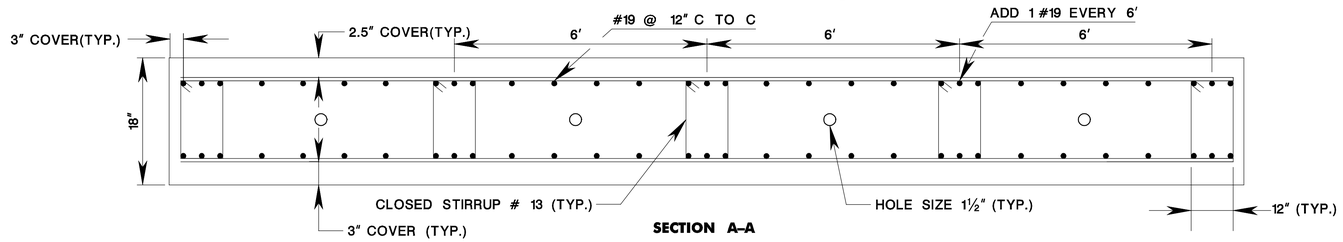
BDC07D-01-ORIGINAL SHEET



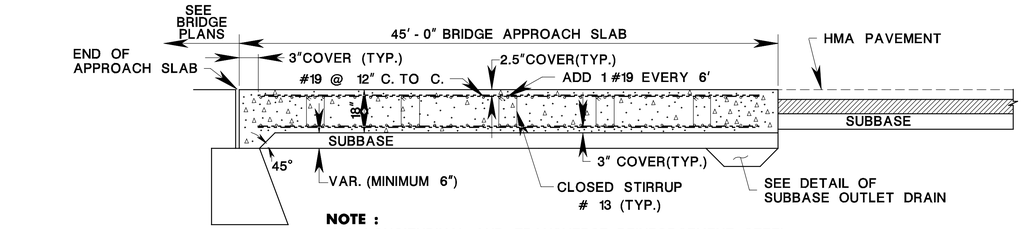
PLAN OF BRIDGE APPROACH SLABS



SLAB SECTION

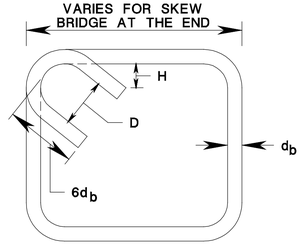


SECTION A–A

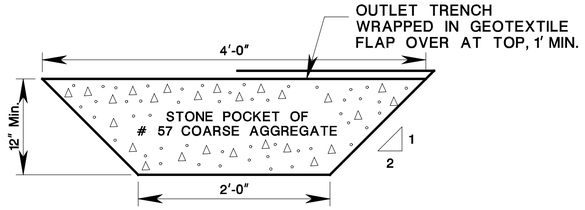


NOTE :
ALL LONGITUDINAL AND TRANSVERSE REINFORCEMENT STEEL TO BE SECURELY WIRED TOGETHER.

SECTION OF BRIDGE APPROACH SLABS



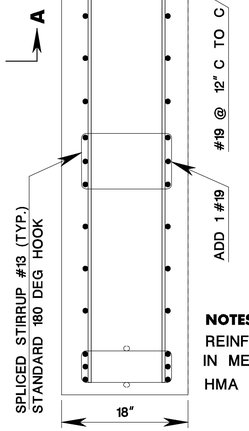
CLOSED STIRRUP # 13 (TYP.)



SUBBASE OUTLET DRAIN

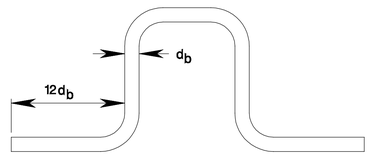
NOTES:

1. EXTRA REINFORCEMENT STEEL FOR EMBEDDED BEAM (EB) PATTERN TO BE SPACED NOT MORE THAN 6 FEET ON CENTERS.
2. INSTALL REINFORCEMENT STEEL CHAIRS TO SEPARATE TOP AND BOTTOM MATS (AS SHOWN).
3. WIDER/LONGER SLABS MAY BE CONSTRUCTED PROVIDED THE C TO C SPACING OF EB EXTRA REINFORCEMENT STEEL IS NOT MORE THAN 6 FEET.
4. ALTERNATE DESIGN WITH STIRRUPS:
   CLOSED STIRRUPS SUBSTITUTED FOR REINFORCEMENT STEEL CHAIRS.
   SPACING NOT MORE THAN 3 FEET C TO C.
   STIRRUP MUST ENCLOSE TOP 3 AND BOTTOM 3 BARS.
5. ALL REINFORCEMENT STEEL TO BE CORROSION PROTECTED.
6. CONSTRUCT APPROACH SLABS WITH CLASS A CONCRETE. BASIS OF PAYMENT SHALL BE CUBIC YARDS. THE DEPARTMENT WILL MAKE PAYMENT FOR REINFORCEMENT STEEL UNDER REINFORCEMENT STEEL, EPOXY COATED OR REINFORCEMENT STEEL, GALVANIZED. APPROPRIATE PAY ITEM AS SPECIFIED IN THE STANDARD SPECIFICATION SHOULD BE USED.
7. THE APPROACH SLAB SHALL BE SAWCUT GROOVED FINISHED. THE METHODS USED SHALL BE ACCORDING TO THE REQUIREMENTS SPECIFIED IN THE NJDOT STANDARD SPECIFICATIONS FOR CONCRETE DECK SLABS.
8. BENDS IN STIRRUPS SHALL CONFORM TO CRSI STANDARDS.
9. REFER TO BCD-507-6 FOR EXPANSION JOINT DETAILS.



SECTION B–B

NOTES:
REINFORCEMENT STEEL IS DESIGNATED IN METRIC UNITS.
HMA = HOT MIX ASPHALT



ALTERNATE # 13 STIRRUP SPLICED IN PAIRS

BCD-507-5.1

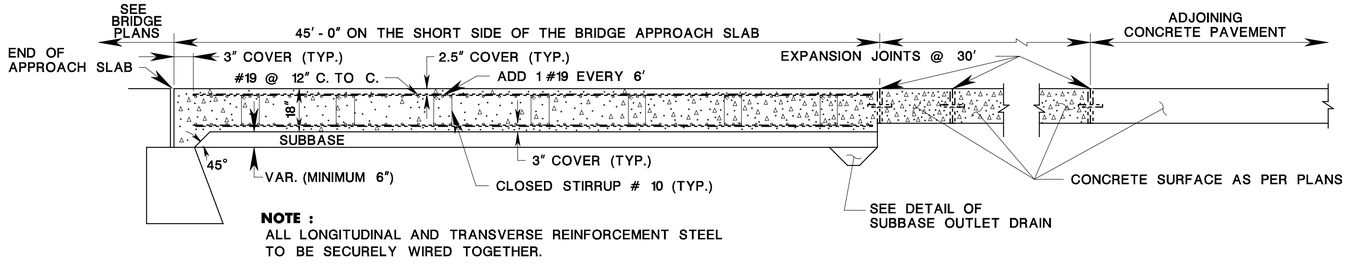
BRIDGE APPROACH SLABS ADJOINING HMA PAVEMENT

N.T.S.

BCD-507-5

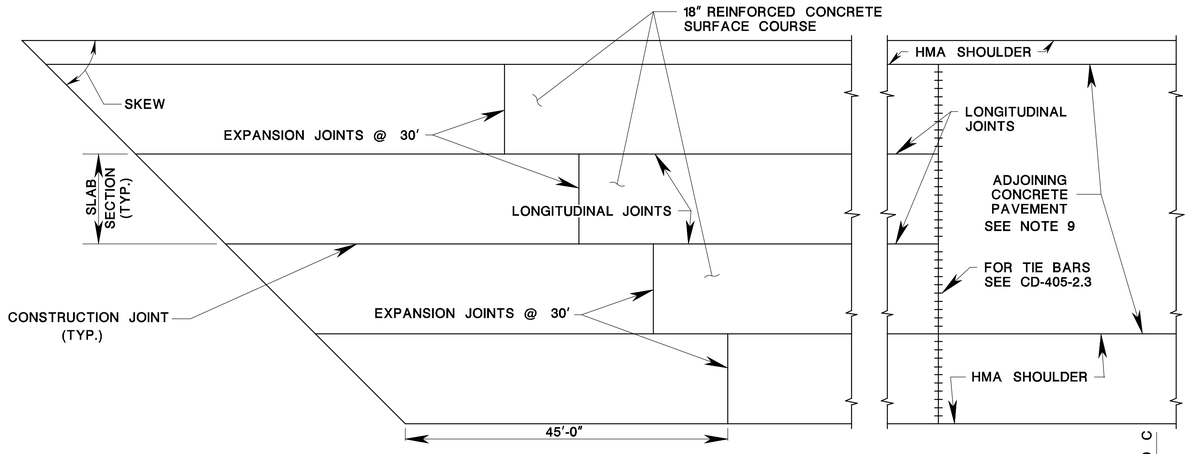
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS

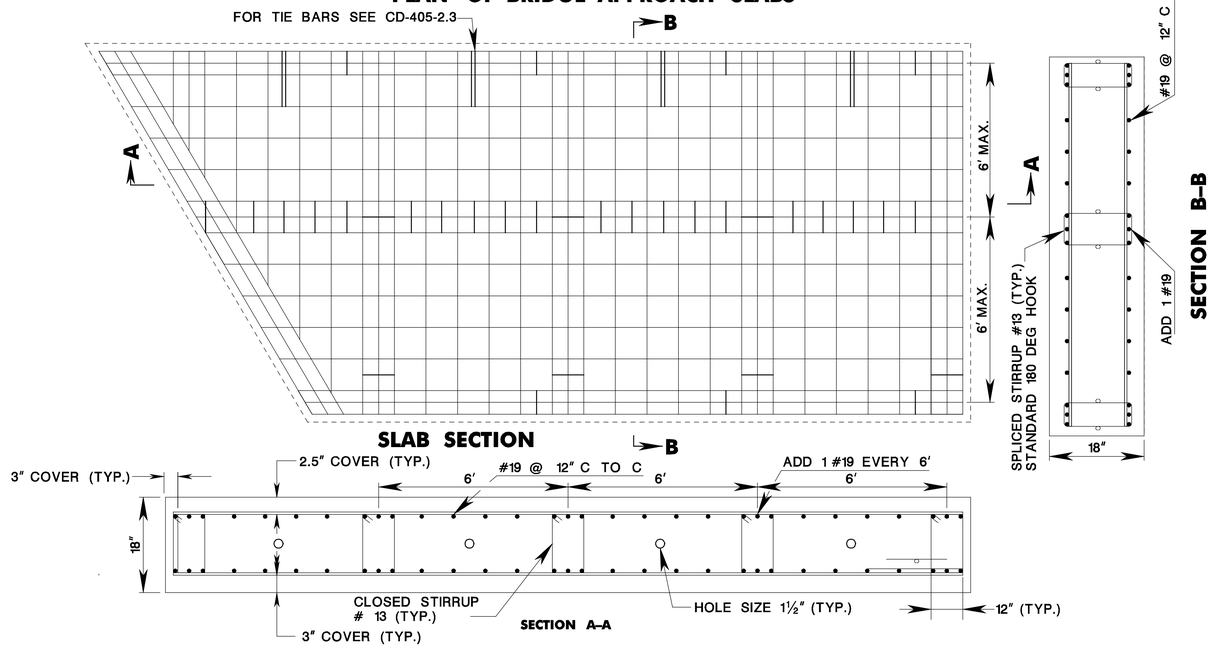


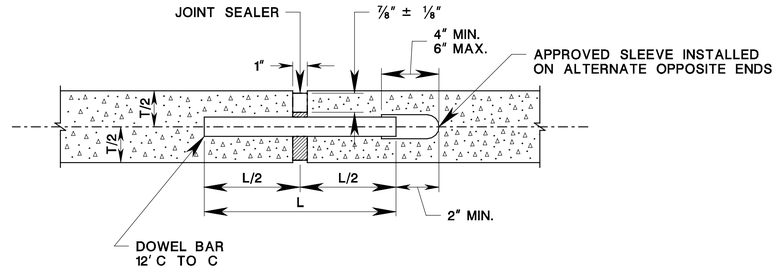
NOTE :
ALL LONGITUDINAL AND TRANSVERSE REINFORCEMENT STEEL TO BE SECURELY WIRED TOGETHER.

SECTION OF BRIDGE APPROACH SLABS

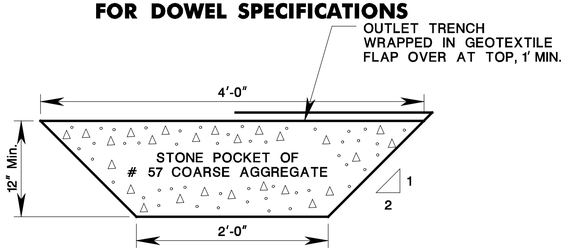


PLAN OF BRIDGE APPROACH SLABS





EXPANSION JOINT DETAIL–REFER TO CD–405–1.4 FOR DOWEL SPECIFICATIONS



SUBBASE OUTLET DRAIN

NOTES:

1. EXTRA REINFORCEMENT STEEL FOR EMBEDDED BEAM (EB) PATTERN TO BE SPACED NOT MORE THAN 6′-0″ ON CENTERS.
2. INSTALL REINFORCEMENT STEEL CHAIRS TO SEPARATE TOP AND BOTTOM MATS (AS SHOWN).
3. WIDER/LONGER SLABS MAY BE CONSTRUCTED PROVIDED THE C TO C SPACING OF EB EXTRA REINFORCEMENT STEEL IS NOT MORE THAN 6 FEET.
4. ALTERNATE DESIGN WITH STIRRUPS: CLOSED STIRRUPS SUBSTITUTED FOR REINFORCEMENT STEEL CHAIRS. SPACING NOT MORE THAN 3 FEET C TO C. STIRRUP MUST ENCLOSE TOP 3 AND BOTTOM 3 BARS.
5. ALL REINFORCEMENT STEEL TO BE CORROSION PROTECTED.
6. CONSTRUCT APPROACH SLABS WITH CLASS A CONCRETE. BASIS OF PAYMENT SHALL BE CUBIC YARDS. THE DEPARTMENT WILL MAKE PAYMENT FOR REINFORCEMENT STEEL UNDER REINFORCEMENT STEEL, EPOXY COATED OR REINFORCEMENT STEEL, GALVANIZED. APPROPRIATE PAY ITEM AS SPECIFIED IN THE STANDARD SPECIFICATION SHOULD BE USED.
7. THE APPROACH SLAB SHALL BE SAWCUT GROOVED FINISHED. THE METHODS USED SHALL BE ACCORDING TO THE REQUIREMENTS SPECIFIED IN THE NJDOT STANDARD SPECIFICATIONS FOR CONCRETE DECK SLABS.
8. FOR STIRRUP DETAILS SEE BCD-507-5.1.
9. PAVEMENT SLABS SHALL BE 23′-7″ LONG WITH STANDARD REINFORCEMENT. SLAB JOINTS SHALL BE DOWELLED TOGETHER. JOINT FILLER SHALL BE PREFORMED BITUMINOUS FIBER, 1″ THICK.

NOTES:
REINFORCMENT STEEL IS DESIGNATED IN METRIC UNITS.
HMA = HOT MIX ASPHALT

BRIDGE APPROACH SLABS ADJOINING CONCRETE PAVEMENT

N.T.S.

BCD-507-6

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS

BCD-507-6.1

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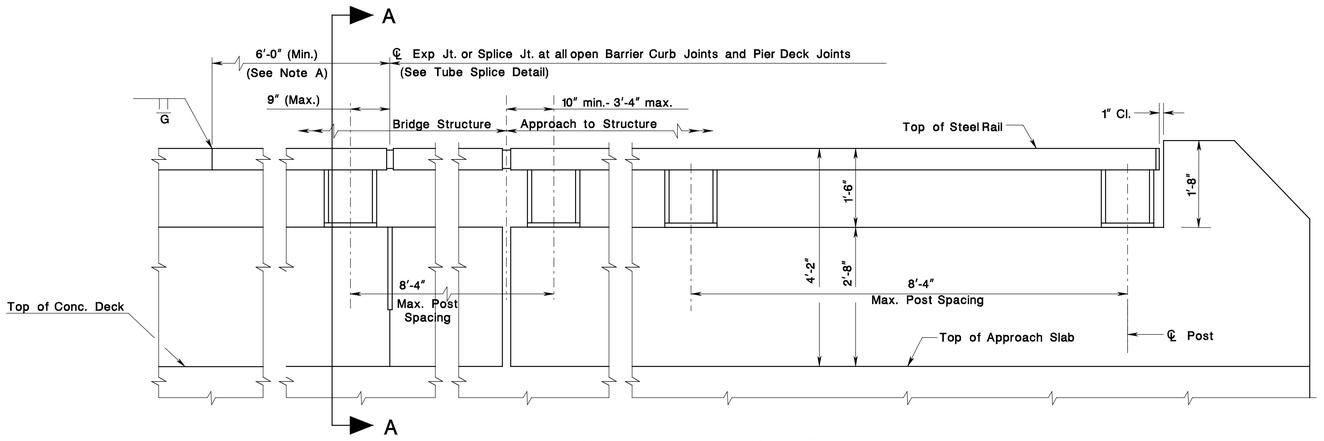
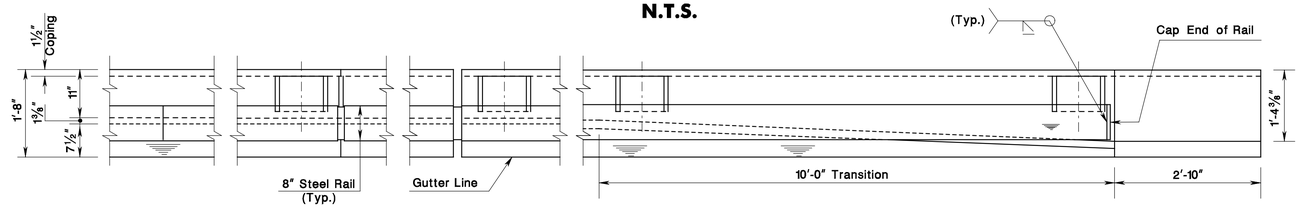


PARAPET ELEVATION VIEW

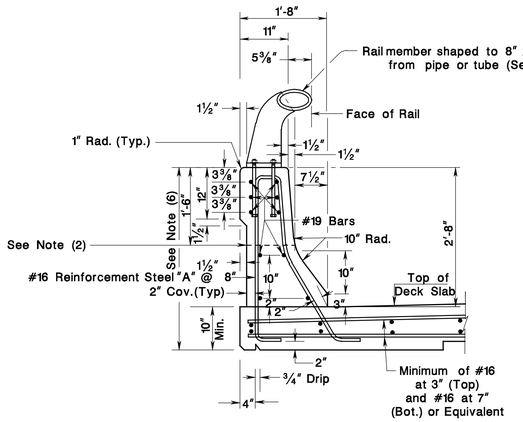
N.T.S.



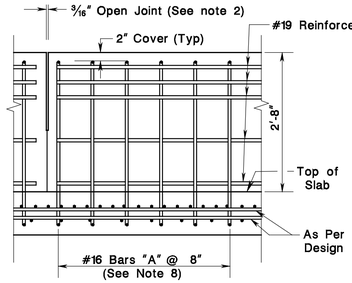
PARAPET PLAN VIEW

NOTE:

A. One shop splice per panel is permitted with minimum 85 percent penetration. Weld flaws resulting in no less than 60 percent penetration are permissible in the upper and lower 90 degree quadrants of the members. The weld may be square groove, double vee groove, or single groove and shall be ground smooth.

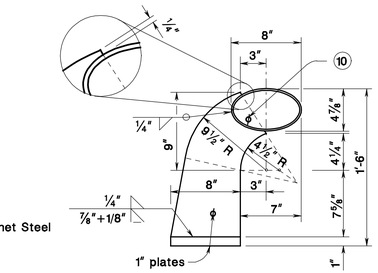


SECTION A–A

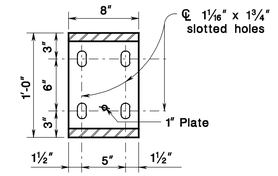


ELEVATION

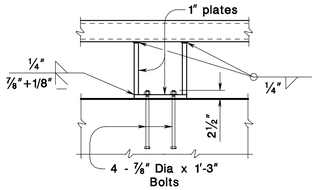
(Showing Reinforcement)



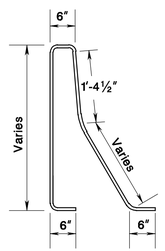
END VIEW OF POST



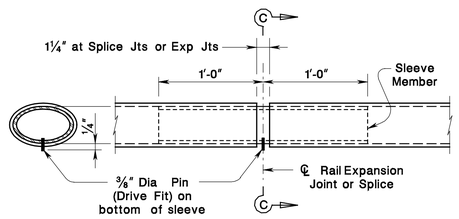
BASE PLATE DETAIL



POST ELEVATION



REINFORCEMENT STEEL "A" BENDING DETAIL



SECTION C–C AT SPLICE OR EXPANSION JOINTS

TUBE SPLICE DETAIL

GENERAL NOTES:

1. 3⁄16" open deflection joint shall be provided in parapets at intervals not exceeding 20'-0" and contraction joints shall be provided at the midpoint between the open joints.
2. The 3⁄16" open joint shall stop at the line indicated and a contraction joint shall be provided below that line.
3. Full depth joints shall be provided at location of transverse deck joints. The full depth joint opening width shall equal the transverse deck joint opening width.
4. All reinforcement steel in parapet shall be corrosion protected.
5. Permanent metal stay-in-place forms not permitted in the deck overhang area.
6. Fascia rustication and/or configuration as per specifications.
7. All steel components including bolts, nuts, and washers shall be galvanized unless otherwise shown on the plans.
8. Anchor bolts shall be ⅞" dia. ASTM F1554 bolts with one hex nut and one 2¼" O.D. washer (3/16" min. thickness) plus one 1¾" O.D. hardened steel washer (1/8" Min. thickness) at each bolt. Nuts shall conform to A563 requirements.
9. The pipe may be slotted to fit plates in lieu of cutting plates to fit pipe, except plates adjacent to tube splice.
10. The plates shall be AASHTO M 270, Grade 36 or 50.

TUBE & SLEEVE MEMBERS		
8" x 4⅞" Ellipse	Splice Member	
Material	Material	Thickness
6" Dia Std Pipe ASTM-A53 E or S Gr B)	ASTM-A53-B	0.353"
	A36 or A500 Gr B	0.339"
	API-5LX52	0.224"
6⅝" O.D. x 0.188" Tube API-5LX52	ASTM-A53-B	0.339"
	A36 or A500 Gr B	0.325"
	API-5LX52	0.216"

NOTES:

1. Other sections of equal or greater strength are acceptable for sleeves.
2. The major and minor diameters of the rail member may vary +/- 0.1875 inches from plan dimension. However, the difference between the outside diameters of the sleeve and the inside diameters of the rail shall not exceed 0.125 inches along the major or minor axis. Gaps exceeding this amount up to 0.25 inches are permissible along the 45° axes of the sleeves.

4'–2" HIGH HEAVY TRUCK PARAPET

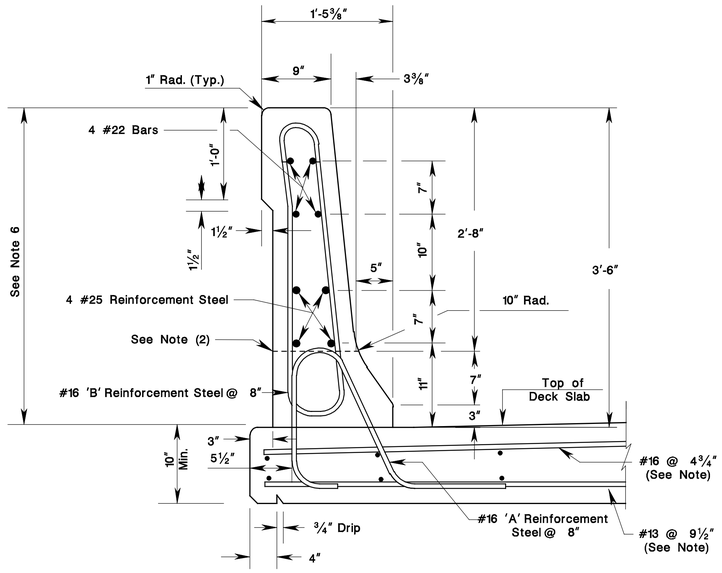
N.T.S.

BCD-507-7

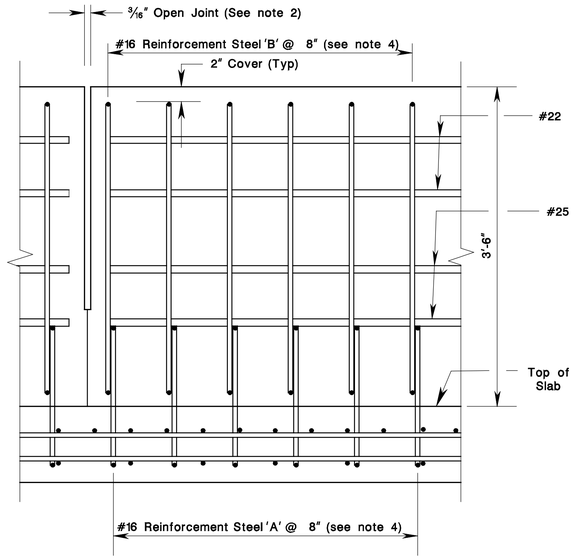
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS

BCD-507-7.1



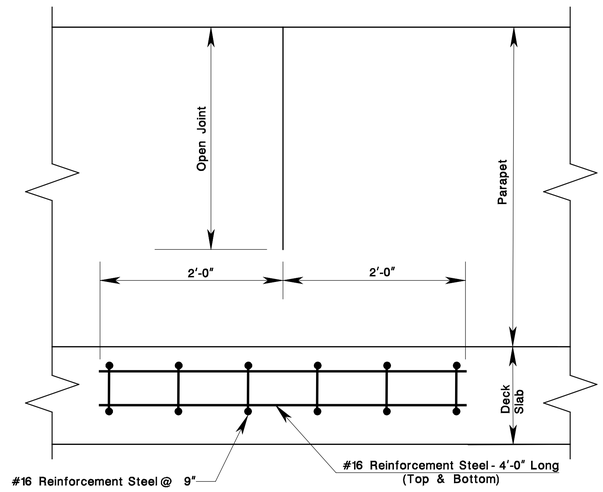
3'–6" HIGH F–SHAPE PARAPET



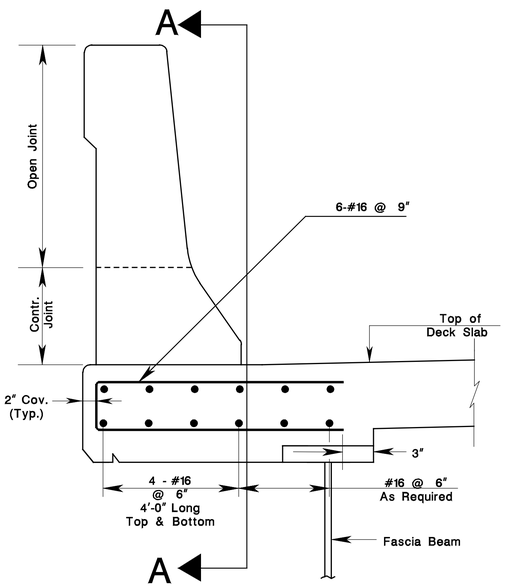
ELEVATION
(Showing Reinforcement steel)

GENERAL NOTES:

1. 3⁄16" open deflection joint shall be provided in parapets at intervals not exceeding 20'-0" and contraction joints shall be provided at the midpoint between the open joints.
2. The 3⁄16" open joint shall stop at the line indicated and a contraction joint shall be provided below that line.
3. Full depth joints shall be provided at location of transverse deck joints. The full depth joint opening width shall equal the transverse deck joint opening width.
4. All reinforcement steel in parapet shall be corrosion protected.
5. Permanent metal stay-in-place forms not permitted in the deck overhang area.
6. Fascia rustication and configuration as per Specifications.
7. For additional reinforcement steel that is required in the vicinity of parapet joints to prevent concrete cracking in the overhang portions of the deck slab see Detail 1.

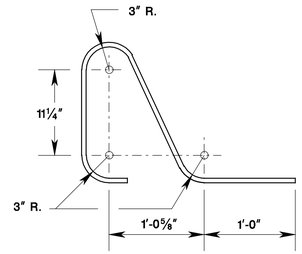


SECTION A–A

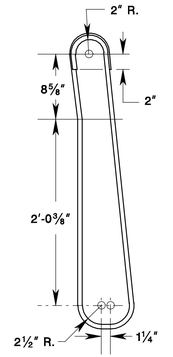


DETAIL 1

DECK REINFORCEMENT STEEL AT PARAPET JOINTS



REINFORCEMENT STEEL A (#16)



REINFORCEMENT STEEL BAR B (#16)

REINFORCEMENT STEEL BENDING DETAILS

3'–6" HIGH F–SHAPE PARAPET DETAILS

N.T.S.

BCD-507-8

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS

BCD-507-8.1

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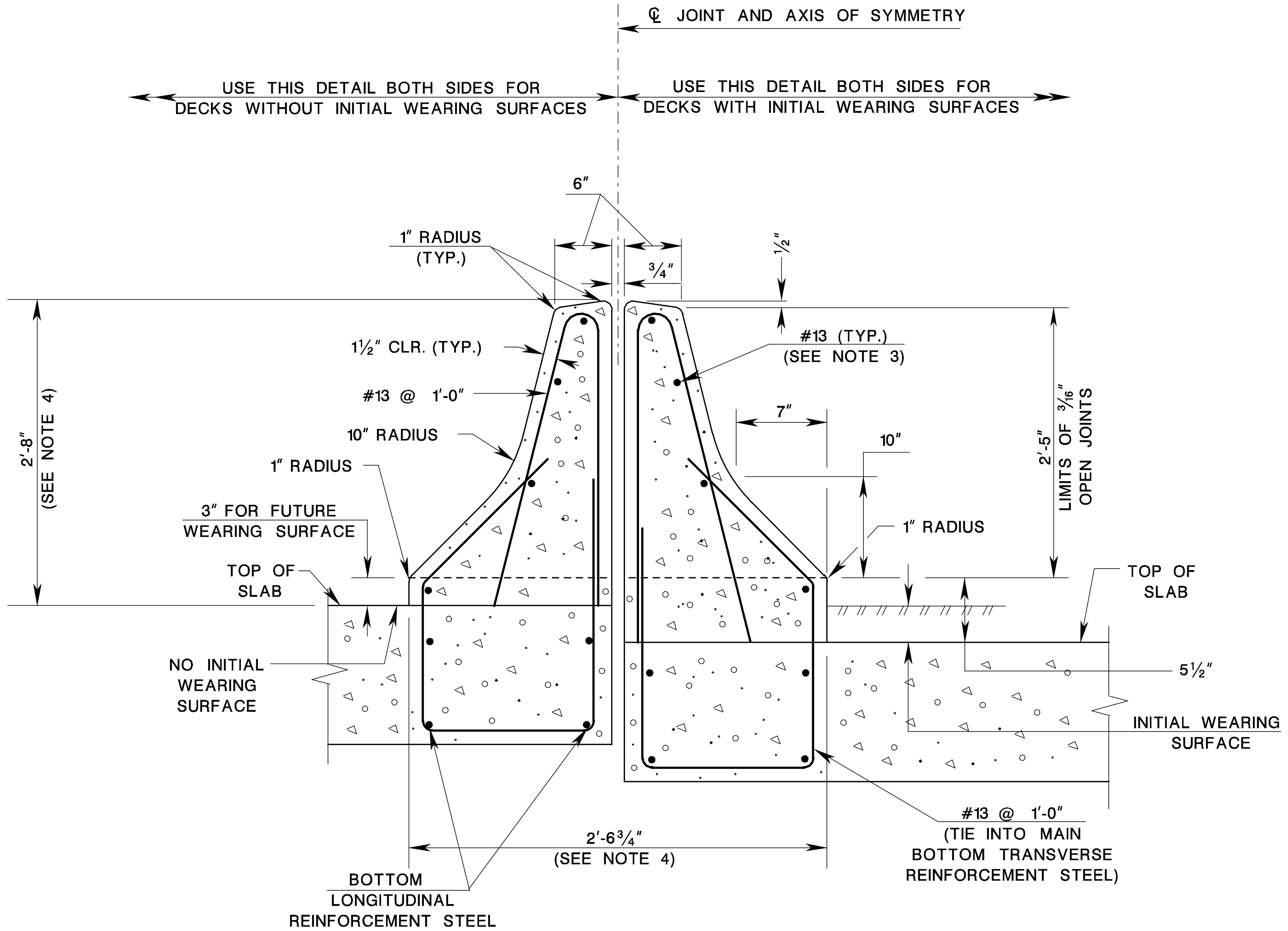
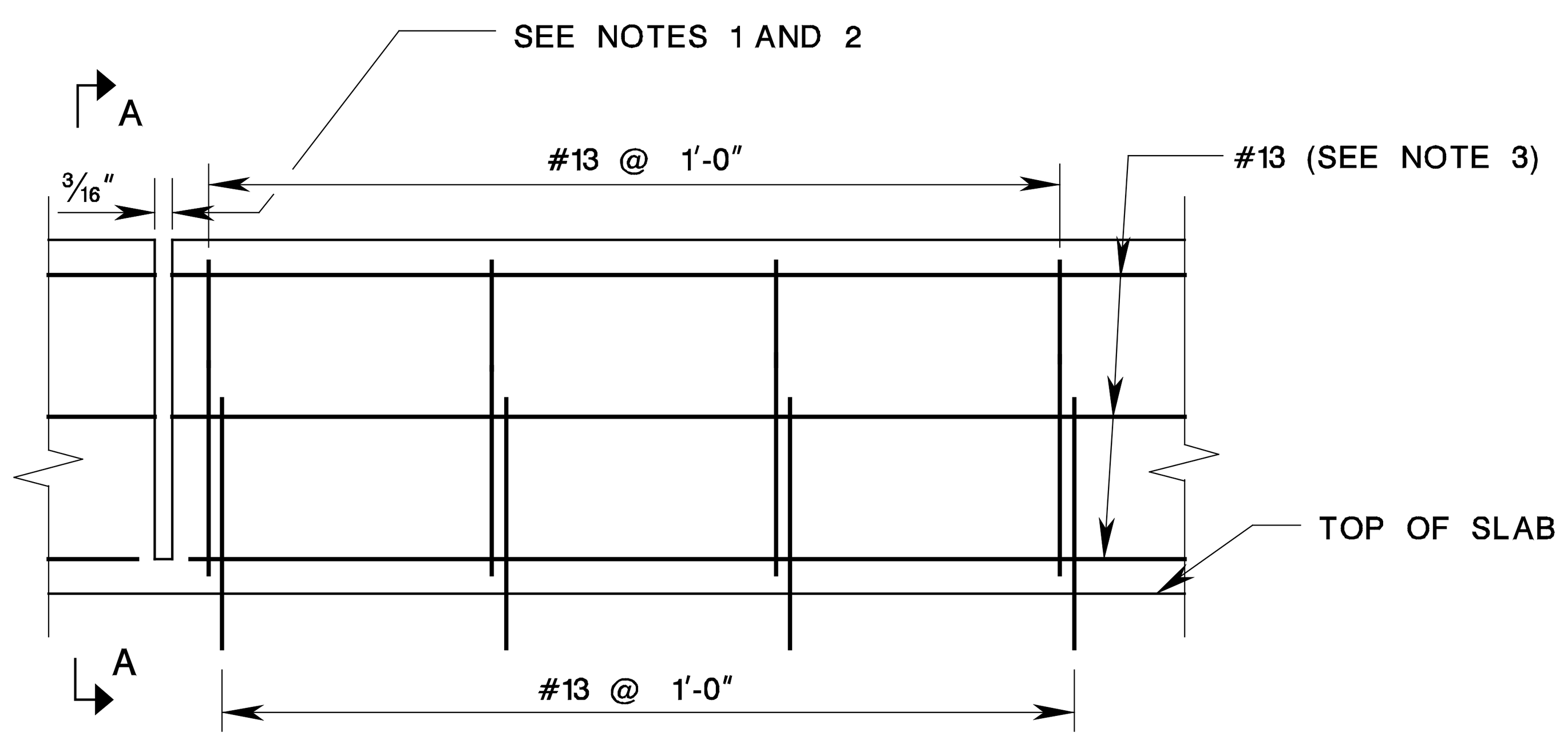


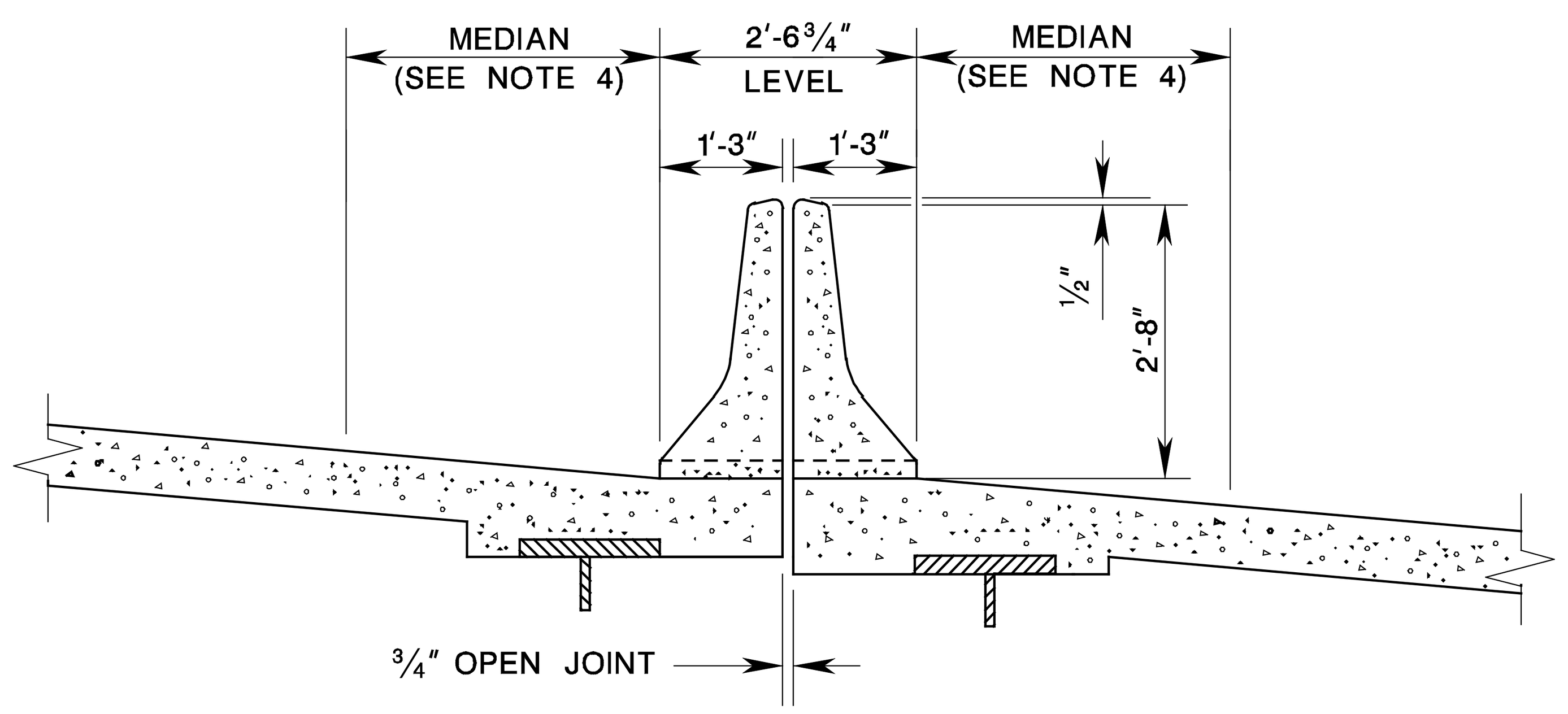
TYPICAL SECTION

NOTES:

1. 3/16" OPEN DEFLECTION JOINT SHALL BE PROVIDED AT INTERVALS NOT EXCEEDING 15'-0". THERE SHALL BE NO CONTRACTION JOINTS BETWEEN THE OPEN JOINTS AND NO CONTRACTION JOINTS LOCATED BELOW THE OPEN DEFLECTION JOINTS.
2. FULL DEPTH JOINTS SHALL BE PROVIDED AT LOCATION OF TRANSVERSE DECK JOINTS. THE FULL DEPTH JOINT OPENING WIDTH SHALL EQUAL THE TRANSVERSE DECK JOINT OPENING WIDTH.
3. ALL REINFORCEMENT STEEL IN MEDIAN BARRIER IS DESIGNATED IN METRIC UNITS AND SHALL BE CORROSION PROTECTED.
4. WIDTH AND HEIGHT TO BE DETERMINED BY ROADWAY APPROACH BARRIER. REINFORCEMENT STEEL MUST BE ADJUSTED ACCORDINGLY.
5. IF CONDUITS ARE USED WITHIN THE MEDIAN BARRIER, PROVIDE A SLEEVE OF SUFFICIENT LENGTH TO ACCOMODATE MAXIMUM EXPANSION OF THE EXPANSION JOINT. (REFER TO STANDARD ELECTRICAL DETAILS FOR CONDUIT EXPANSION FITTINGS.)

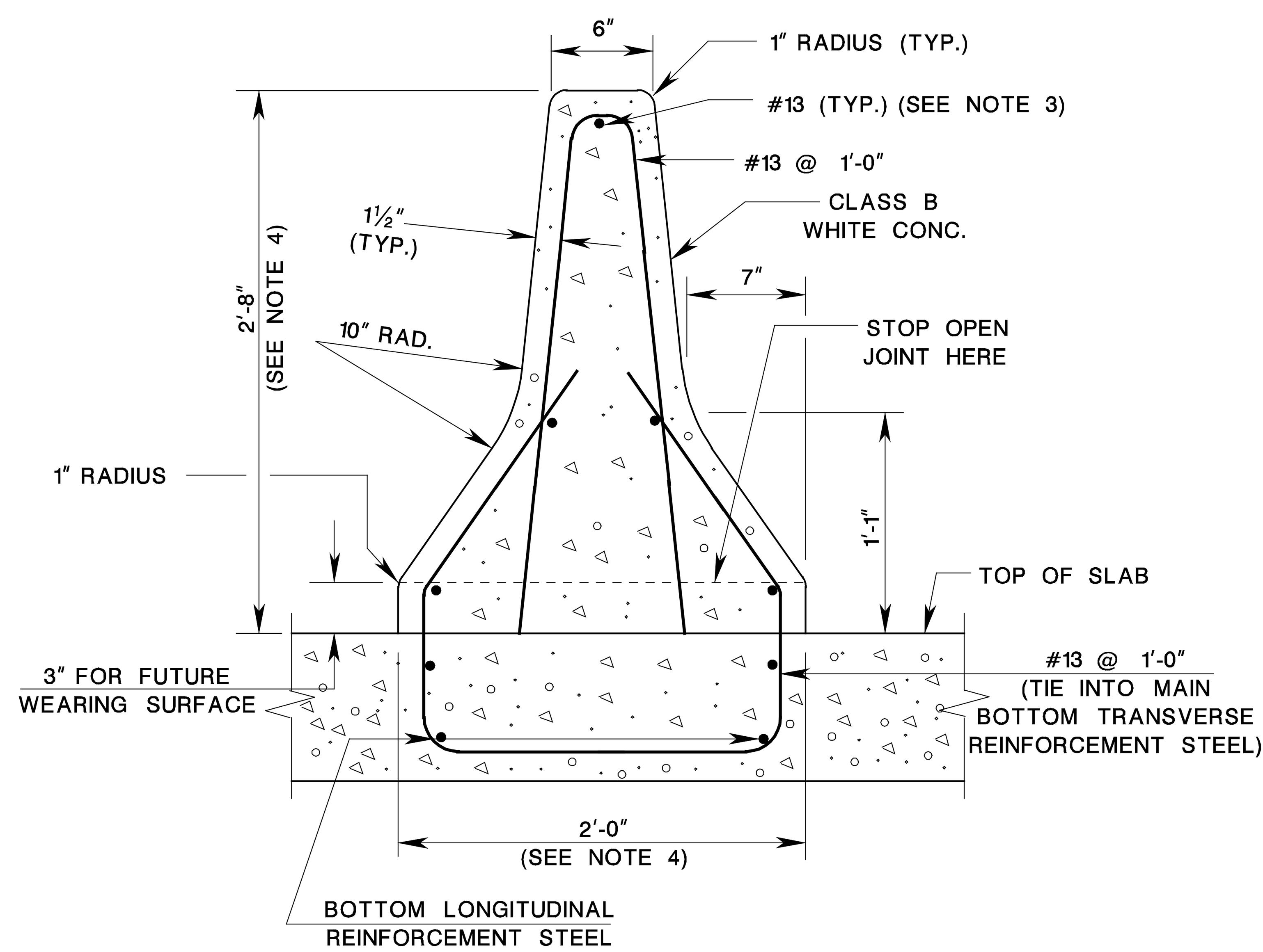


ELEVATION



CROSS SECTION

2'-8" HIGH SPLIT MEDIAN BARRIER ON BRIDGE



SECTION A–A

2'-8" HIGH MEDIAN BARRIER ON BRIDGE

BRIDGE MEDIAN BARRIER

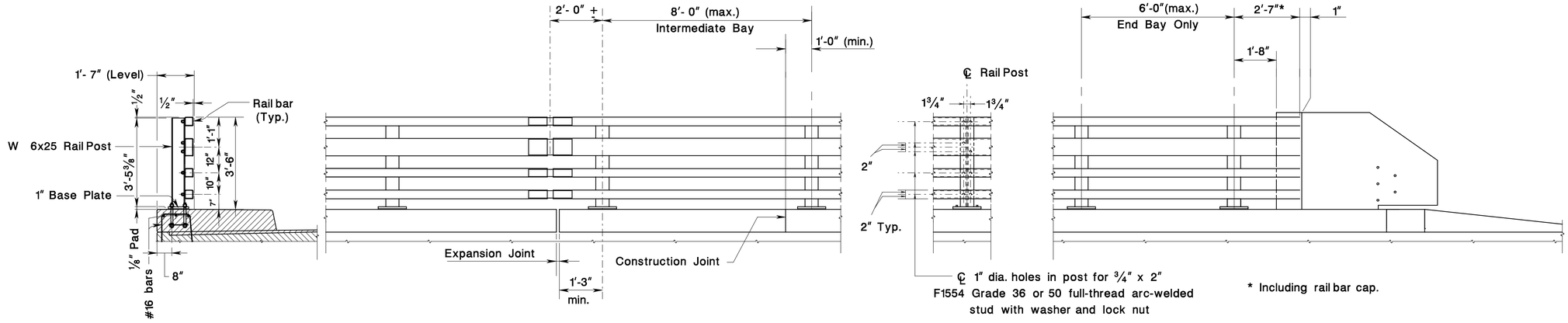
N.T.S.

BCD-507-9

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS

BCD-507-9.1

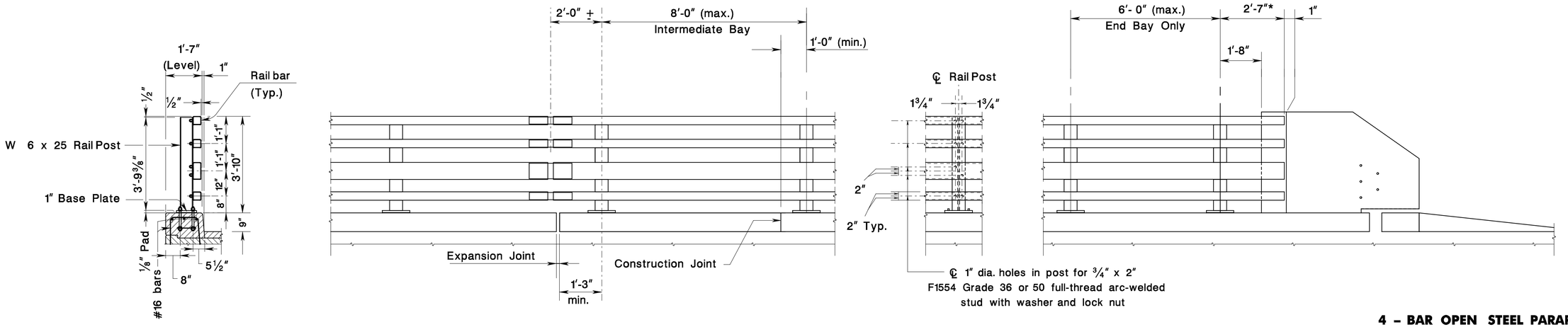


TYPICAL SECTION **ELEVATION**

Rail Bars
TS 8 x 4 x5⁄16″(1)
TS 4 x 4 x¼″ (3)

Vehicular Traffic/Pedestrian Traffic Configuration

BCD-507-10.1



TYPICAL SECTION **ELEVATION**

* Including rail bar cap.

4 – BAR OPEN STEEL PARAPET
TYPICAL SECTION AND ELEVATIONS

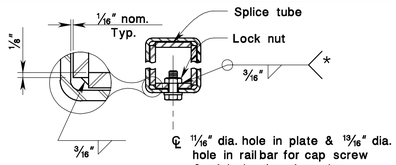
Vehicular Traffic/Bicycle Traffic Configuration

BCD-507-10.2

BCD-507-10

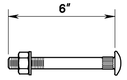
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS



* Weld nuts to plate before assembling splice tube

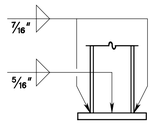
RAIL BAR SPLICE SECTION



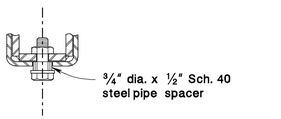
RIBBED NECK BOLT

(with washer & lock nut)

(See Note No. 9)

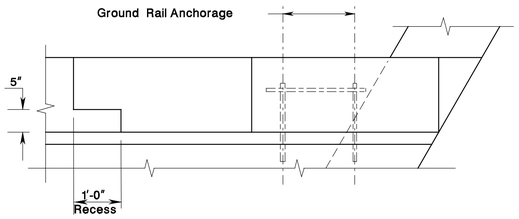


BASE WELD DETAIL



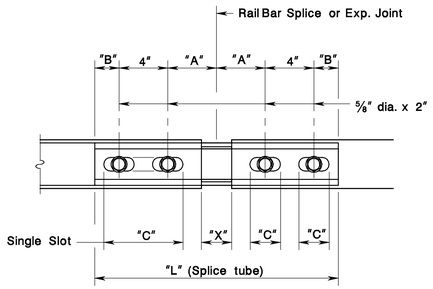
EXPANSION JOINT SECTION

For details not shown, see "Rail Bar Splice Section"



TRANSITION BARRIER PLAN

(Typical all transition barrier types)



RAIL BAR SPLICE & EXPANSION JOINT DETAIL

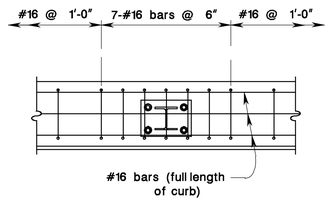
(Bottom View)

SPLICE TUBE DIMENSIONS		
	TS 8" X 4"	TS 4" X 4"
Top & Bot. Plates	2½" X 3/8" "L"	2 5/8" X 3/8" "L"
Side Plates	6¾" X 3/8" "L"	2 7/8" X 3/8" "L"

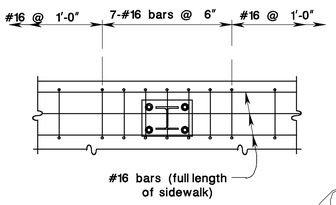
SPLICE & EXPANSION JOINT TABLE					
"T"	"A"	"B"	"C"	"L"	"X"
Splice	4"	2"	--	1'-8"	¾"
≤ 4"	4"	2"	2½"	1'-8"	2½"
> 4" ≤ 6½"	5½"	2½"	3½"	2'-0"	3¾"
> 6½" ≤ 9"	6½"	3½"	9" *	2'-4"	5"
> 9" ≤ 13"	8½"	4½"	11" *	2'-10"	7"

T = Total Movement

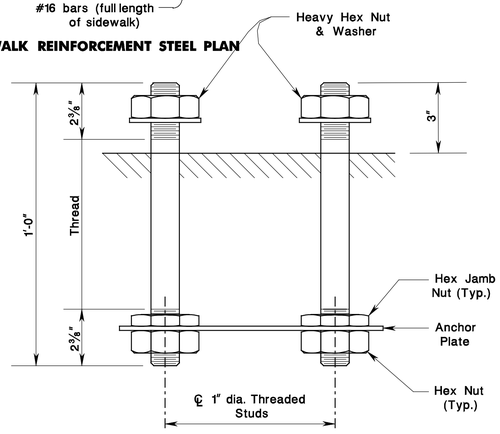
* = Single Slot



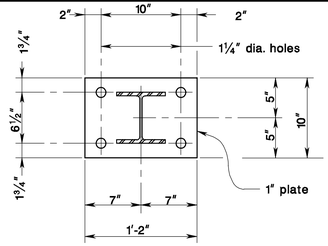
CURB REINFORCEMENT STEEL PLAN



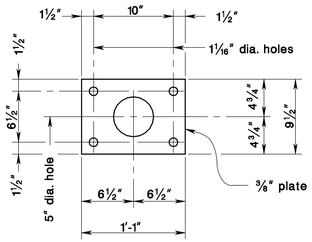
SIDEWALK REINFORCEMENT STEEL PLAN



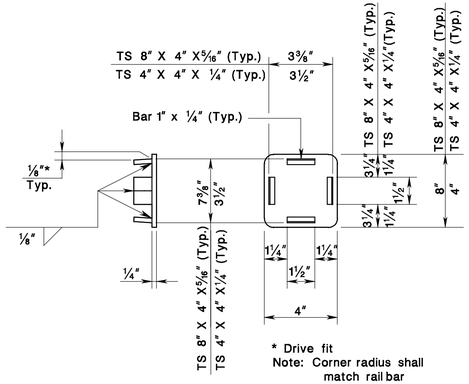
RAIL POST ANCHORAGE



POST & BASE PLATE PLAN



ANCHOR PLATE PLAN



* Drive fit

Note: Corner radius shall match rail bar

RAIL BAR CAP

NOTES:

1. All work and materials shall conform to the provisions of the Standard Specifications for Road and Bridge Construction.
2. Twenty five percent of the post-to-base welds in a production lot shall be tested by the Magnetic Particle Method. If rejectable discontinuities are found, another twenty five percent of that production lot shall be tested. If rejectable discontinuities are found in the second twenty five percent, all post-to-base welds in that lot shall be tested. Acceptance criteria shall be in accordance with the latest edition of the AWS D1.5, Bridge Welding Code.
3. All exposed cut or sheared edges shall be rounded and free of burrs. The inside weld flash of tubing shall be removed at splices and expansion joints.
4. Rail posts shall be set normal to grade unless otherwise shown.
5. Lengths of rail bar shall be attached to a minimum of two rail posts and to at least four posts whenever possible.
6. Rail bar expansion joints shall be provided in any rail bay spanning a superstructure expansion joint. Expansion joint width shall be "X" at 45° F and will be adjusted in the field by the RE. Refer to detail and table for dimension "X".
7. All parts shall be galvanized after fabrication in accordance with AASHTO M111, except that hardware shall meet the requirements of either ASTM A153 or ASTM B695, Class 50, Type 1. Parts except hardware shall be blast- cleaned prior to galvanizing in accordance with SSPC - SP6.
8. Anchor bolts or anchor bolt sleeves shall be set with a template and shall be securely placed in their final position prior to the placement of the embedding concrete. Post anchor assemblies shall be installed to within 3/16 inch of theoretical horizontal and vertical location. Post bearing areas shall be dressed smooth and true to grade. Prior to post erection, each rail post location shall be finished to the theoretical elevation determined from profile grade, cross slope and curb height and will not be acceptable until it is within 3/16 inch of theoretical elevation, as measured at the top of concrete. Preformed pads shall be used to adjust the rail posts for height and alignment. The number of preformed pads supplied shall be 10 % in excess of the theoretical minimum number required. Nuts securing the post base plate shall be tightened to a snug fit and given an additional 1/8 turn. After erection of the railing, the contractor shall clean the whole assembly, to present a neat and uniform appearance.
9. Rail bars shall alternatively be attached to posts using 5/8" dia. - ASTM F1554, Grade 36 or 50 bolts (5/8" dia. - ASTM A325 bolts may be substituted) inserted through the face of the rail bar. Bolts shall be round or dome head and may be rib neck, slotted, wrench head or tension control (TC or twist-off). Holes in posts shall be 1/16" larger than the diameter of the bolt. Holes in rail bars shall be drilled to size as follows:

    Slotted, wrench head or TC bolts --------1/16" larger than bolt diameter
    Rib neck bolts ----- size appropriate to accommodate an interference fit

    All bolts for fastening the rail bars to the posts shall be 6" in length and shall include a flat washer under the nut.
10. Holes in rail bars shall be field - drilled and shall be coated with an approved zinc-rich paint prior to erection.
11. Bolts in expansion joints shall be tightened only to a point that will allow rail movement.
12. If there is a conflict between these Standard Details and the Working Drawings, the Contractor shall notify the RE immediately.
13. 1/8" pads under post base plate shall be fabric pads conforming to the Standard Specifications.

MATERIALS:

Rail bars ---------- ASTM A500, Grade B

Rail posts ---------- AASHTO M223 (ASTM A572), Grade 50

All other shapes & plates ---------- AASHTO M270 (ASTM A709), Grade 36

Anchor studs, washers & exposed nuts ---- ASTM F1554, Grade 55

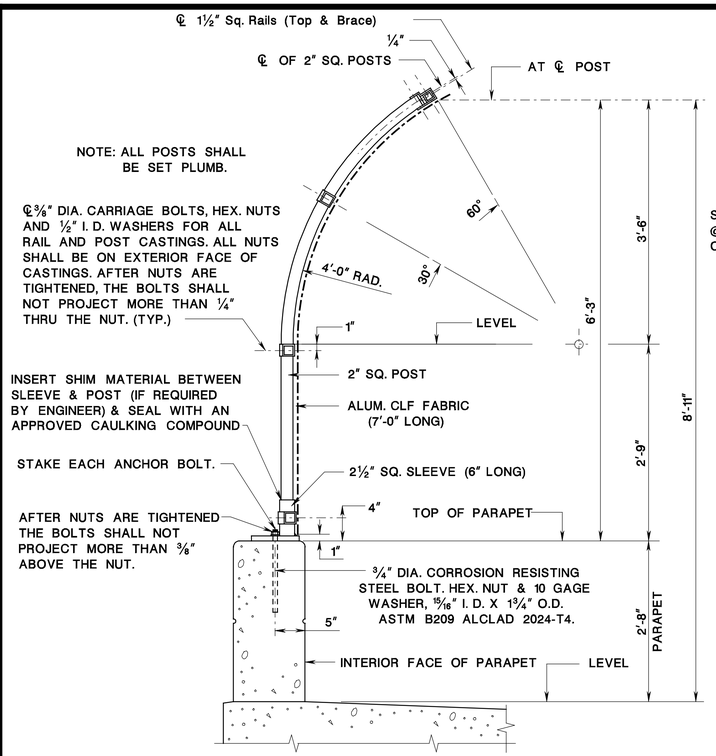
All other bolts & nuts (unless noted) ------ ASTM F1554, Grade 36 or 50

4 – BAR OPEN STEEL PARAPET DETAILS

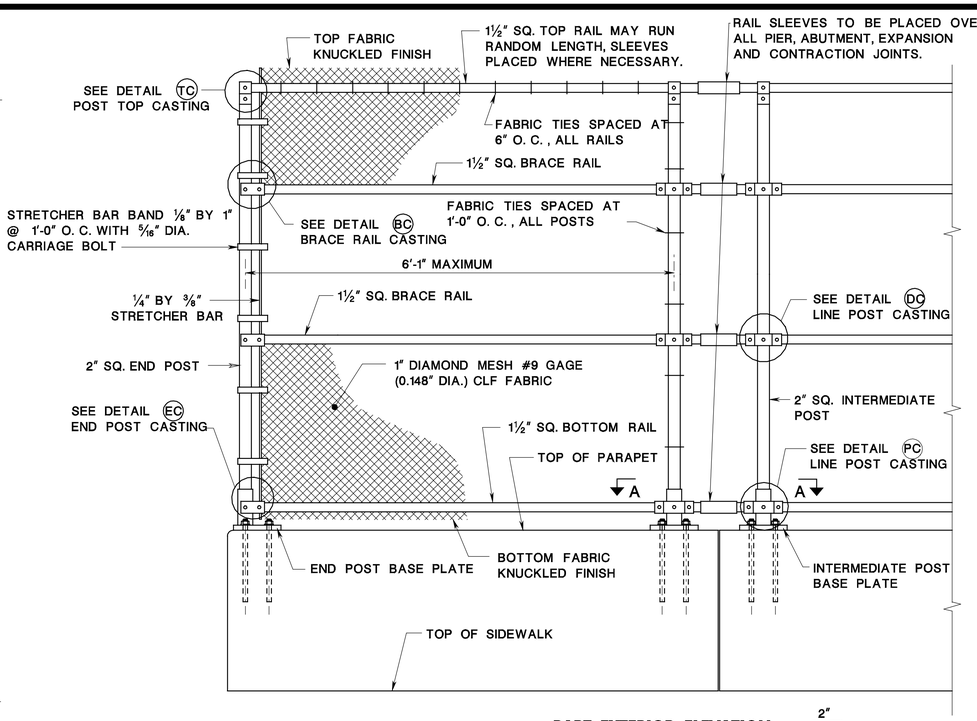
BCD-507-11

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS



TYPICAL SECTION



PART EXTERIOR ELEVATION

GENERAL NOTES:

1 DESIGN CRITERIA: AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS.

2 MAXIMUM DESIGN WIND VELOCITY: 80 MPH.

3 FENCING FABRIC SHALL CONFORM TO AASHTO M181, TYPE 3.

4 WIND PRESSURE DRAG COEFFICIENT FOR MESH FROM FIG. 1-13, "WIND LOAD ON SCREENS", NAVDOCKS DM-2; DESIGN MANUAL, STRUCTURAL ENGINEERING.

5 THE COMPONENT PARTS OF THE CHAIN LINK FENCING SHALL CONFORM TO THE MATERIAL REQUIREMENTS OF THE SPECIFICATIONS.

6 ANCHOR BOLTS SHALL BE ASTM A 276, TYPE 302. ANCHOR BOLTS SHALL BE SET BY THE CONTRACTOR WITH 2" OF CLEAR THREADS, SET CLEAN.

ALUMINUM SURFACES PLACED IN CONTACT WITH CONCRETE SHALL BE GIVEN A HEAVY COAT OF NON ALUMINUM EPOXY MASTIC PRIMER.

7 BASE PLATES FOR ALL CLF SHALL BE AS SHOWN, ⅞" THICK. (ALUMINUM ALLOY 6061-T6)

8 FILLET WELD MATERIAL SHALL BE FILLER ALLOY ER 5356 OR ER 5556.

9 POST SLEEVES SHALL BE 2½" SQ., 7/32" WALL THICKNESS, ASTM B 221, AND SHALL BE WELDED TO BASE PLATE. (ALUMINUM ALLOY 6061-T6)

10 POSTS SHALL BE 2" SQ.,¼" WALL THICKNESS, ASTM B 221, TO BE SET PLUMB AND SPACED AS SHOWN ON PLANS FOR EACH STRUCTURE. (ALUMINUM ALLOY 6061-T6)

11 SHIM MATERIAL SHALL BE USED WHERE NECESSARY FOR POST ALIGNMENT, ASTM B 209. (ALUMINUM ALLOY 1100-0)

12 ALL HORIZONTAL RAILS (TOP, BOTTOM, BRACE) SHALL BE 1½" SQ.,⅛" WALL THICKNESS. (ALUMINUM ALLOY 6061-T6)

13 DAM PLATES, ⅜" THICK, WELDED TO CLOSE ALL EXPOSED ENDS OF RAIL TUBES AND TOP OF CHAIN LINK FENCE POSTS. (ALUMINUM ALLOY 6061-T6)

14 BRACE RAILS SHALL BE INSTALLED AT END UNITS WHERE CLF FABRIC IS TENSIONED.

15 RAILING EXPANSION SLEEVES SHALL BE 2" SQ. X 7" LONG, WITH HOT-DIP GALVANIZED SPRING IN SLEEVE, SPRING NOT TO EXCEED 1½" FULLY COMPRESSED. RAIL ENDS TO BE 3" APART IN SLEEVE AT ℄ SLEEVE "V" CRIMP, (ALUMINUM ALLOY 6061-T6) ASTM B 221.

16 STRETCHER BARS TO BE ¼" BY ⅜". (ALUMINUM ALLOY 6061-T6)

17 STRETCHER BAR BANDS TO BE ⅛" X 1" BEVELLED EDGES. (ALUMINUM ALLOY 6063-T6)

18 FABRIC TIES SHALL BE #9 GAGE (0.148" DIA.). A MINIMUM OF ONE (1) COMPLETE TURN IS REQUIRED AT ENDS OF ALL TIES. (ALUMINUM ALLOY 6061-T6)

19 CLF FABRIC SHALL BE #9 GAGE (0.148" DIA.) HAVING A 1" DIAMOND MESH, TOP AND BOTTOM SELVAGE TO BE KNUCKLED. FABRIC SHALL BE CONTINUOUS ACROSS ALL JOINTS.

20 STRETCHER BAR BAND FASTENERS TO BE 5/16" DIA. BY 1¼" CARRIAGE BOLTS. (ALUMINUM ALLOY 2024-T4)

21 STAKE EACH ANCHOR BOLT AT ONE (1) POINT ONLY.

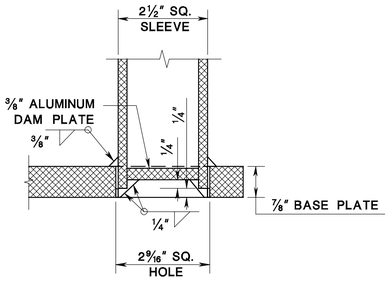
22 ALL HOLES IN CASTINGS SHALL BE 7/16" DIA. CASTINGS SHALL BE ALUMINUM TENZALOY ALLOY ZC81A, CONDITION T5. ALL CASTINGS SHALL BE DESIGNED TO ACCOMMODATE RAILS AT GRADES AS REQUIRED.

23 AFTER ERECTION, ALL ANCHOR BOLT HOLES & SPACES BETWEEN BASE PLATES & CONCRETE SHALL BE THOROUGHLY CAULKED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND CONFORMING TO FEDERAL SPECIFICATIONS TT-C-598B(2).

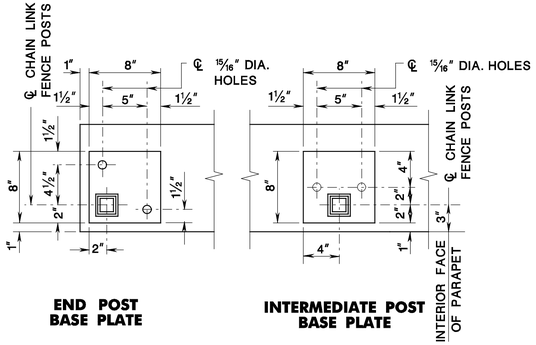
24 AFTER ERECTION OF POSTS, DRILL ⅜" DIA. HOLE THROUGH POST SLEEVE AND POST, ½" ABOVE BASE PLATE FOR DRAINAGE. LOCATE HOLE PARALLEL TO FENCING.

25 THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS & CONDITIONS IN THE FIELD.

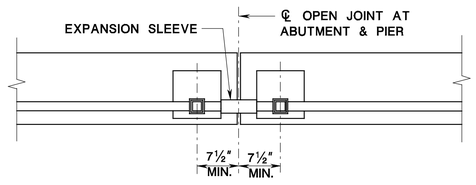
26 WORKING DRAWINGS SHALL BE SUBMITTED ACCORDING TO THE NJDOT STANDARD SPECIFICATIONS.



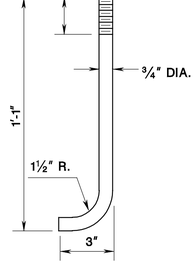
DETAIL OF SLEEVE ATTACHMENT



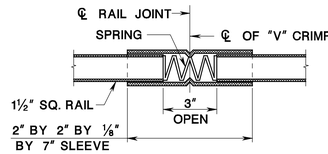
END POST BASE PLATE **INTERMEDIATE POST BASE PLATE**



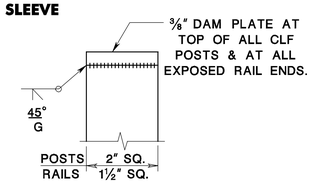
SECTION A–A



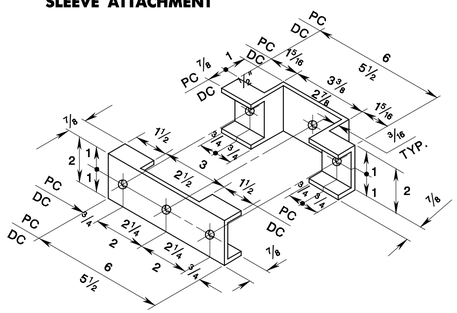
ANCHOR BOLT



RAIL SLEEVE

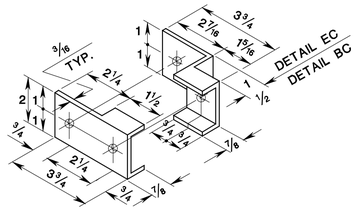


DAM PLATE



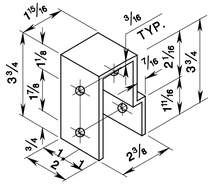
ALL DIMENSIONS ARE IN INCHES

DETAIL PC & DETAIL DC



ALL DIMENSIONS ARE IN INCHES

DETAIL EC & DETAIL BC



ALL DIMENSIONS ARE IN INCHES

DETAIL TC

BCD-509-1.1

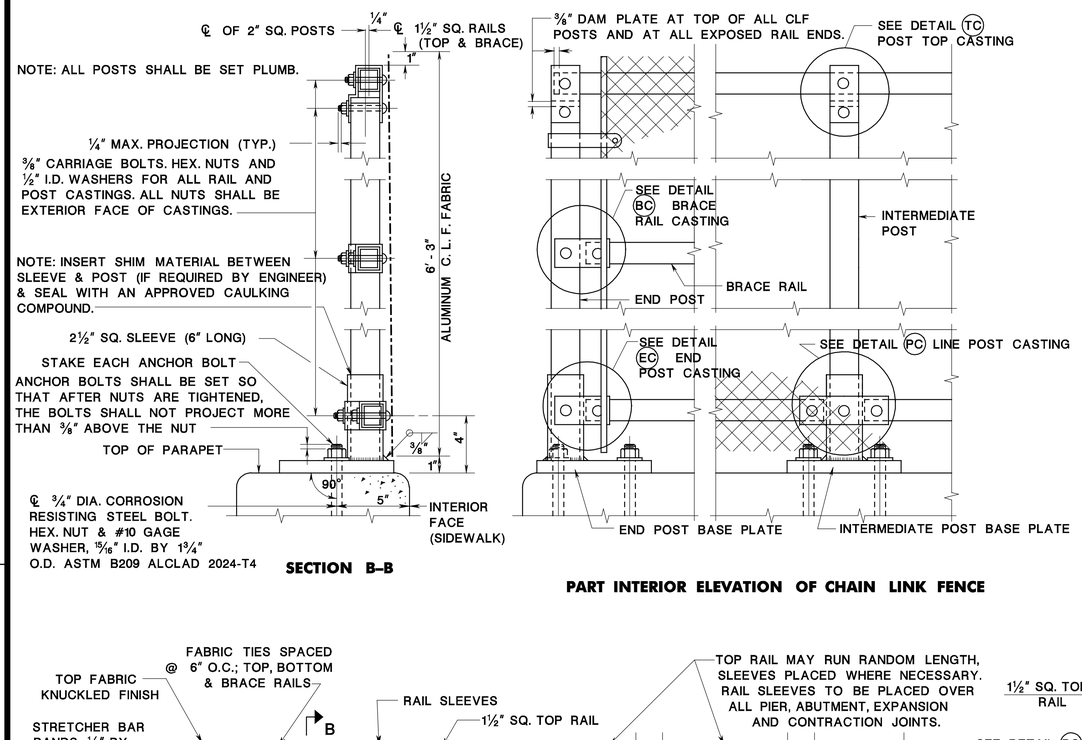
BRIDGE CHAIN LINK FENCE (CURVED TOP)

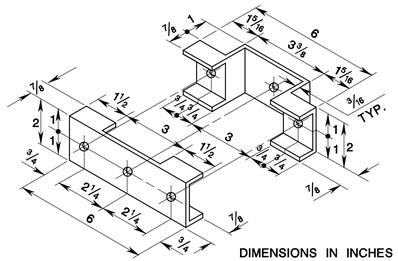
N.T.S.

BCD-509-1

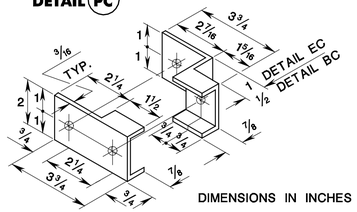
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS

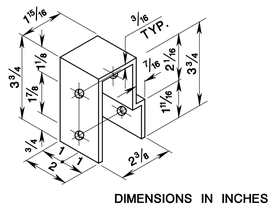




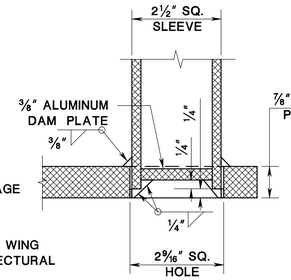
DETAIL (PC)



DETAIL (EC) & DETAIL (BC)



DETAIL (TC)



DETAIL OF SLEEVE ATTACHMENT

GENERAL NOTES:

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7 BASE PLATES FOR ALL CLF SHALL BE AS SHOWN, ⅞" THICK. (ALUMINUM ALLOY 6061-T6)

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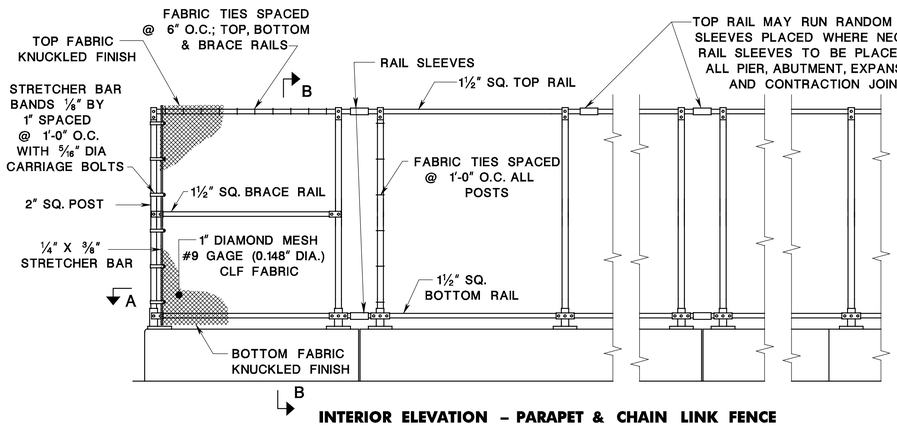
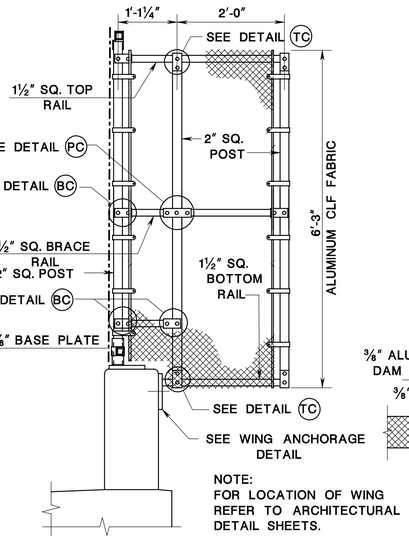
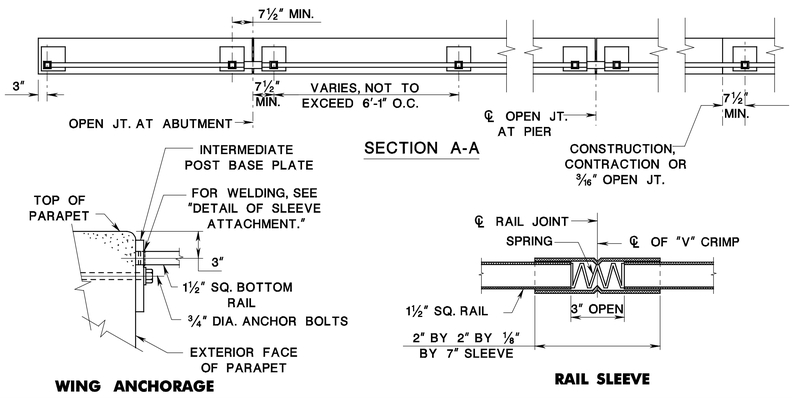
24 AFTER ERECTION OF POSTS, DRILL ⅜" DIA. HOLE THROUGH POST SLEEVE AND POST, ½" ABOVE BASE PLATE FOR DRAINAGE. LOCATE HOLE PARALLEL TO FENCING.

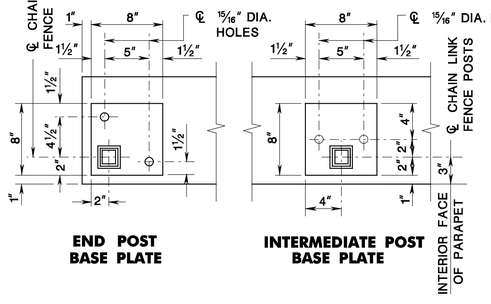
25 THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS & CONDITIONS IN THE FIELD.

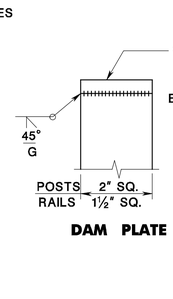
26 WORKING DRAWINGS SHALL BE SUBMITTED ACCORDING TO THE NJDOT STANDARD SPECIFICATIONS.











BRIDGE CHAIN LINK FENCE (6'–3" HIGH)

N.T.S.

BCD-509-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS

BCD-509-2.1

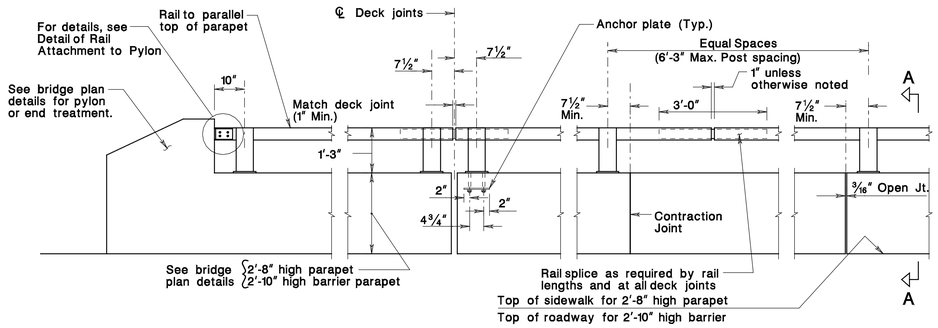
140
146

BDC07S-01-ORIGINAL SHEET

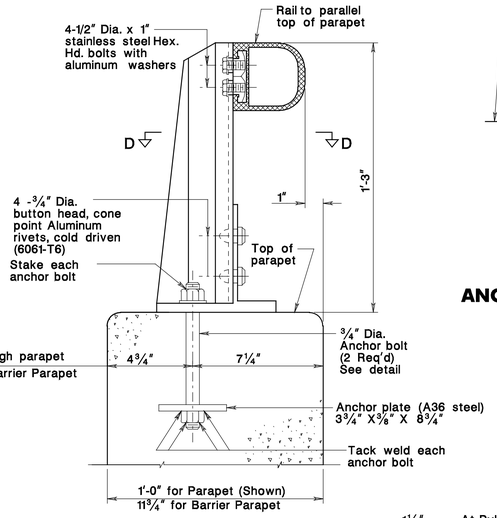
STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			

STRUCTURE NO.

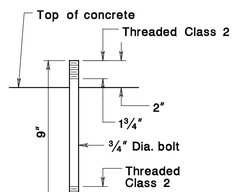
STRUCTURE NAME



TYPICAL EXTERIOR ELEVATION OF CONTINUOUS RAILING SYSTEM



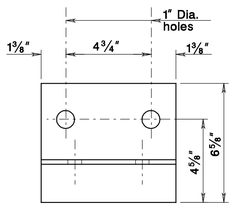
SECTION A–A



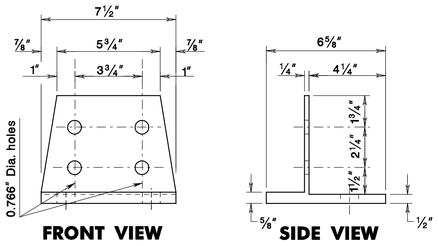
ANCHOR BOLT DETAIL

GENERAL NOTES

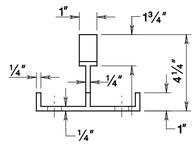
1. Material for posts, bases, rails, and rail clamps shall be ASTM B221. Aluminum Alloy 6061-T6.
2. Washers shall be ASTM B209 Alclad 2024-T3 and nuts shall be ASTM B211, Aluminum Alloy 6061-T6.
3. Anchor bolts shall be ASTM A276 stainless steel, Type 302, Type 304 or Type 430. Top nuts shall be Aluminum thick nuts ASTM B211 or B316 Alloy 6061-T6 Class 2 thread. Bottom nuts shall be ASTM A325.
4. Dam Plates shall be used to close all open railing ends. Material shall be ASTM B209 Aluminum Alloy 6061-T6. As an alternate, drive-in end caps may be used. Caps shall be alluminum alloy sand mold astings complying with ASTM B26, Alloy SG 356.6-T6.
5. End caps shall be welded to the rails.
6. Where necessary for post alignment, Aluminum Alloy shim material shall be used where required by the Engineer. Shim material shall be ASTM B209, Alloy 1100-0.
7. Paint underside of base with a heavy coat of Aluminum pigmented bituminous paint complying with ASTM D2824, Type I.
8. All anchor bolt holes and spaces between base plates and concrete shall be thoroughly caulked with a caulking compound conforming to Federal Specifications A-A-272A, Type III or Type IV.



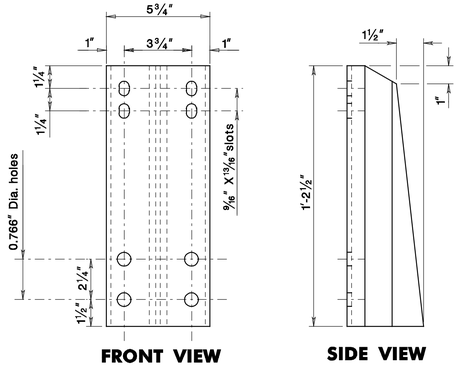
TOP VIEW



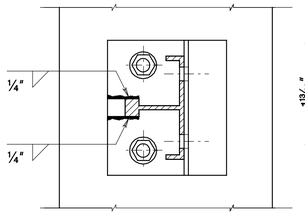
POST BASE



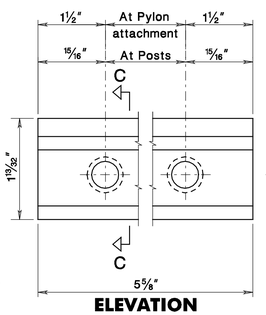
TOP VIEW



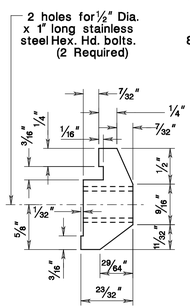
POST STEM



SECTION D–D

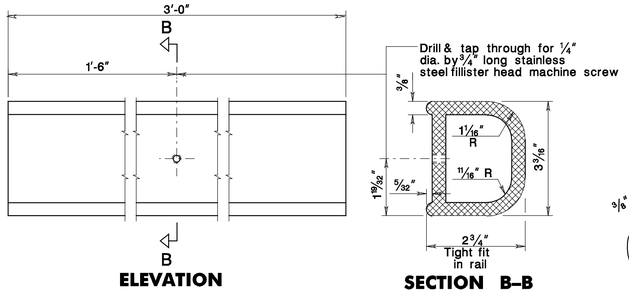


ELEVATION



SECTION C–C

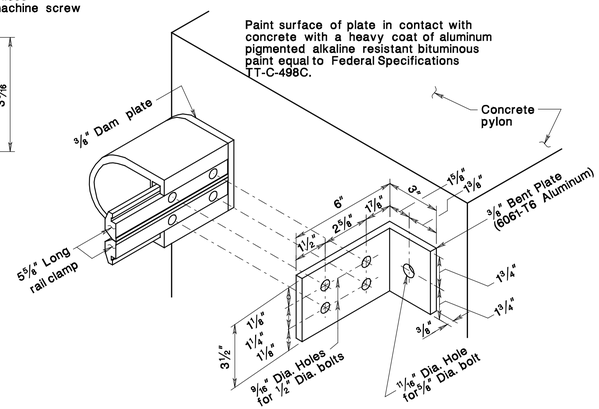
DETAILS OF RAIL CLAMP



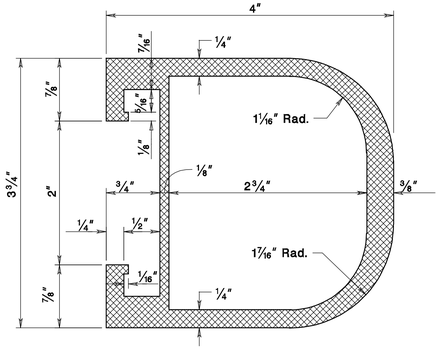
ELEVATION

SECTION B–B

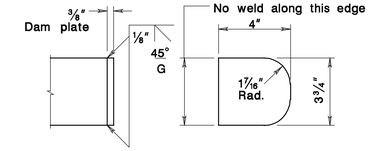
DETAIL OF RAIL SPLICE



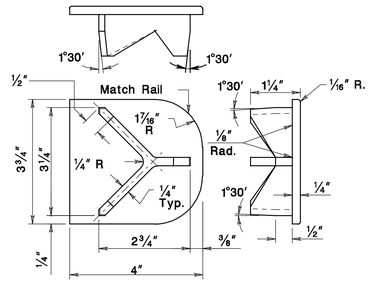
DETAIL OF RAIL ATTACHMENT TO PYLON



SECTION THRU RAIL



DAM PLATE DETAIL



ALTERNATE DETAIL – END CAP

1–RAIL ALUMINUM RAILING

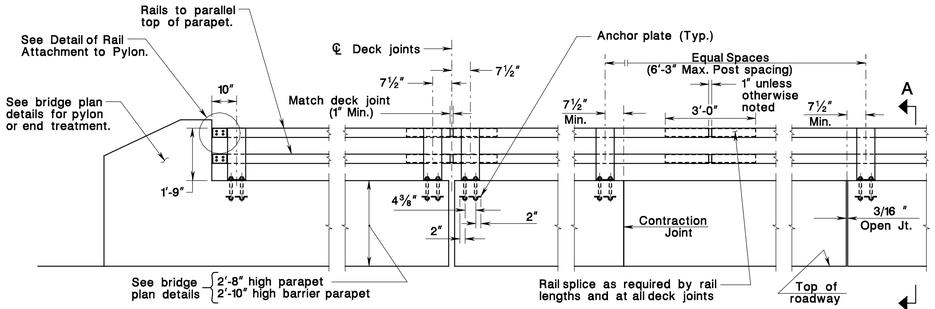
N.T.S.

BCD-509-3

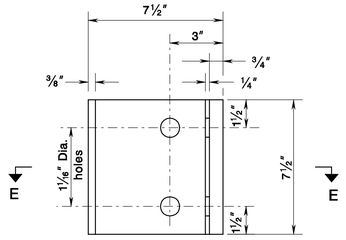
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS

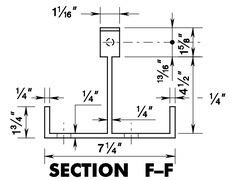
BCD-509-3.1



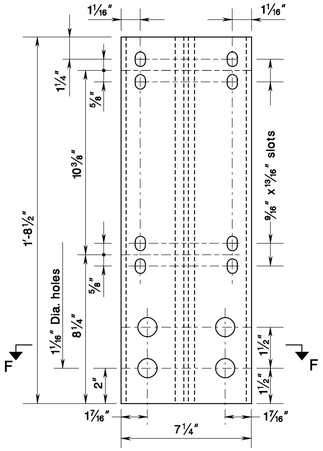
TYPICAL EXTERIOR ELEVATION OF CONTINUOUS RAILING SYSTEM



TOP VIEW

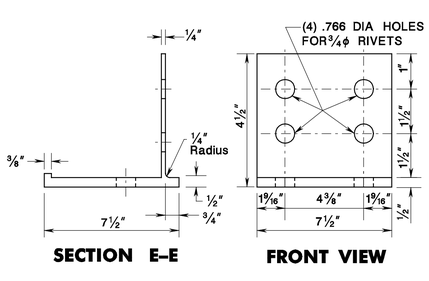


SECTION F–F



FRONT VIEW

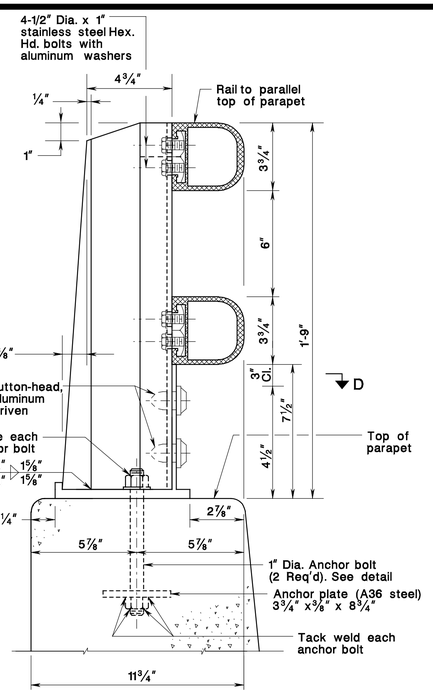
POST STEM



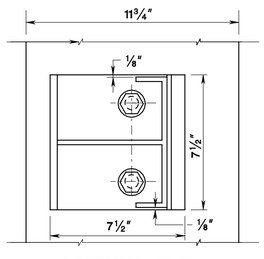
SECTION E–E

FRONT VIEW

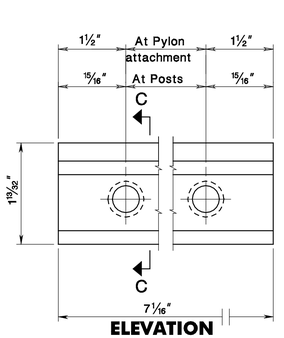
POST BASE



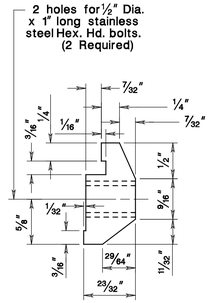
SECTION A–A



SECTION D–D

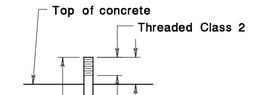


ELEVATION

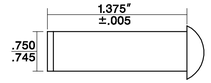


SECTION C–C

DETAILS OF RAIL CLAMP



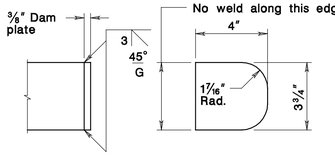
ANCHOR BOLT DETAIL



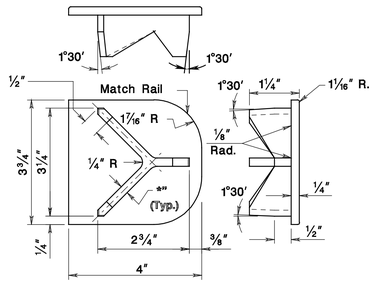
RIVET DETAIL

GENERAL NOTES

1. Material for posts, bases, rails, and rail clamps shall be ASTM B221. Aluminum Alloy 6061-T6.
2. Washers shall be ASTM B209 Alclad 2024-T3 and nuts shall be ASTM B211, Aluminum Alloy 6061-T6.
3. Anchor bolts shall be ASTM A320, Type 1 Class B8. Top nuts shall be Aluminum thick nuts ASTM B211 Alloy 6061-T6 Class 2 thread. Bottom nuts shall be ASTM A184.
4. Dam Plates shall be used to close all open railing ends. Material shall be ASTM B209 Aluminum Alloy 6061-T6. As an alternate, drive-in end caps may be used. Caps shall be alluminum alloy sand mold astings comlpying with ASTM B26, Alloy SG 356.0-T6.
5. End caps shall be welded to the rails.
6. Where necessary for post alignment, Aluminum Alloy shim material shall be used where required by the Engineer. Shim material shall be ASTM B209, Alloy 1100-0.
7. Paint underside of base with a heavy coat of Non Aluminum Epoxy Mastic Primer.
8. All anchor bolt holes and spaces between base plates and concrete shall be thoroughly caulked with a caulking compound conforming to Federal Specifications A-A-272A, Type III or Type IV.



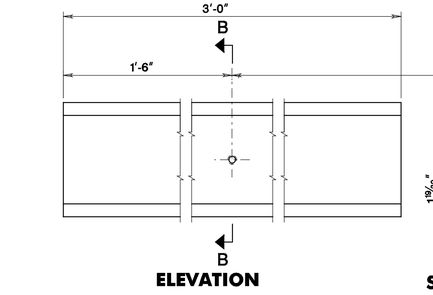
DAM PLATE DETAIL



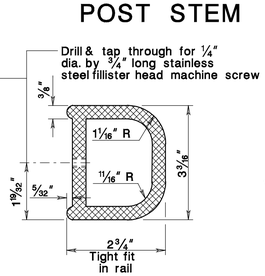
ALTERNATE DETAIL – END CAP

2–RAIL ALUMINUM RAILING

N.T.S.

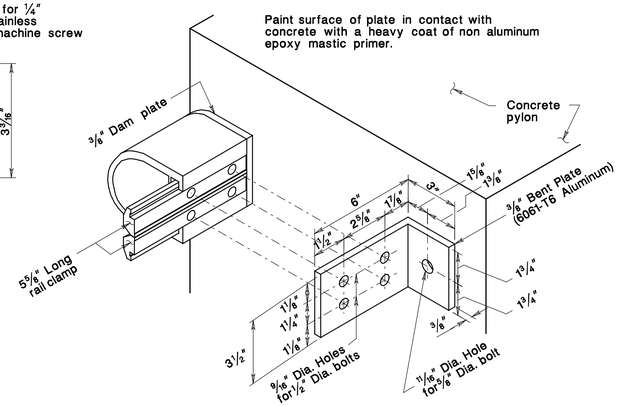


ELEVATION

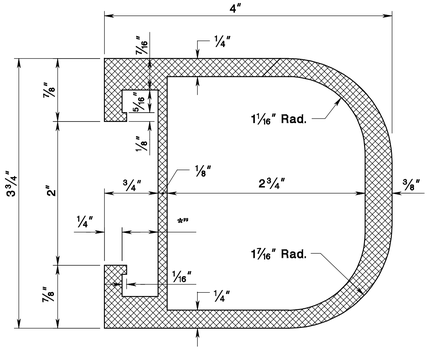


SECTION B–B

DETAIL OF RAIL SPLICE



DETAIL OF RAIL ATTACHMENT TO PYLON



SECTION THRU RAIL

BCD-509-4.1

BCD-509-4

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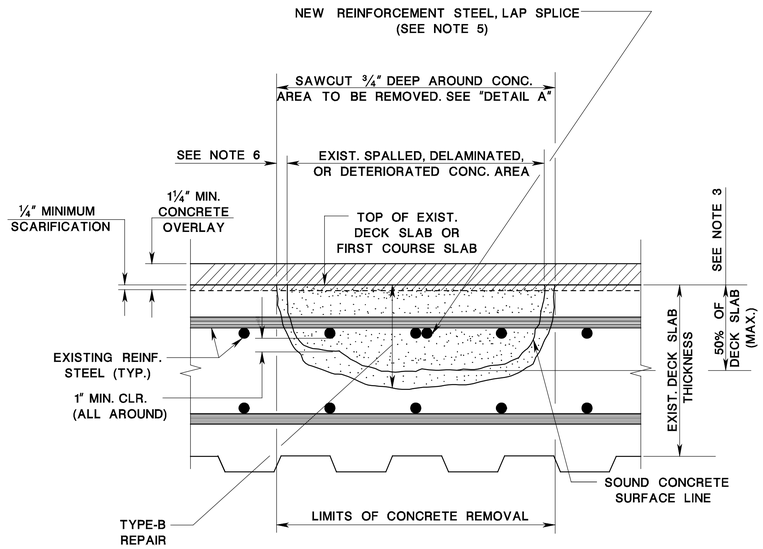
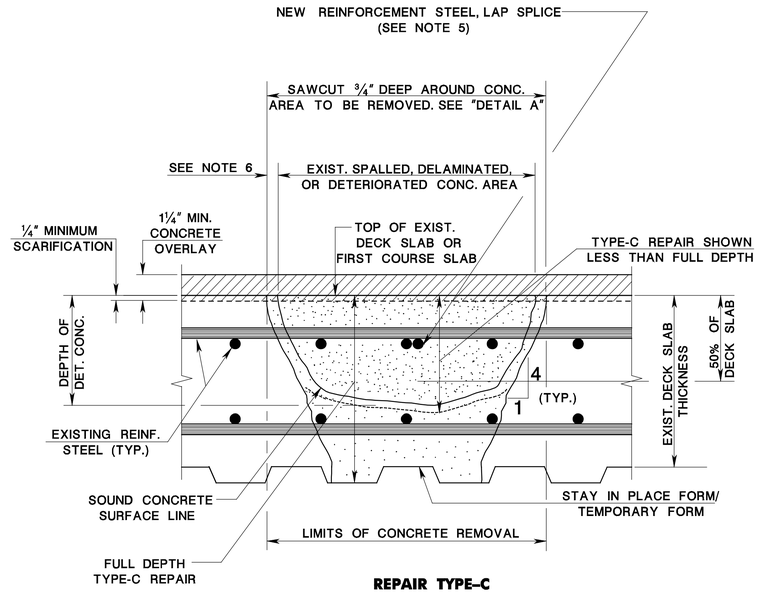
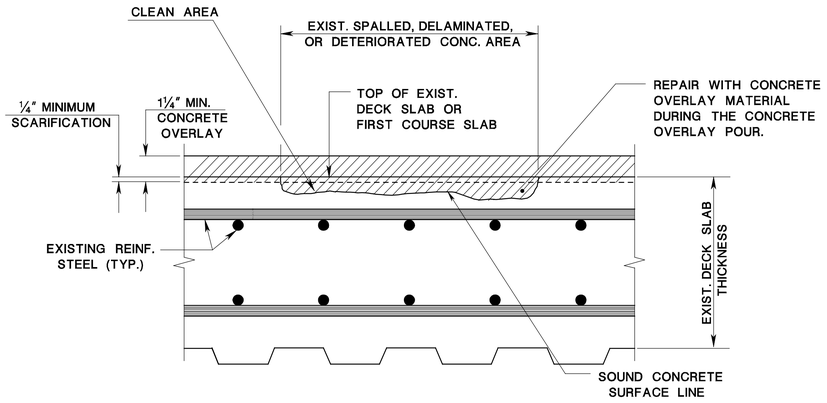


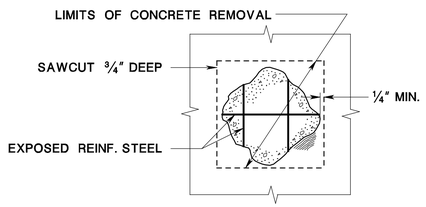
REPAIR TYPE-B
(SEE NOTE 2)



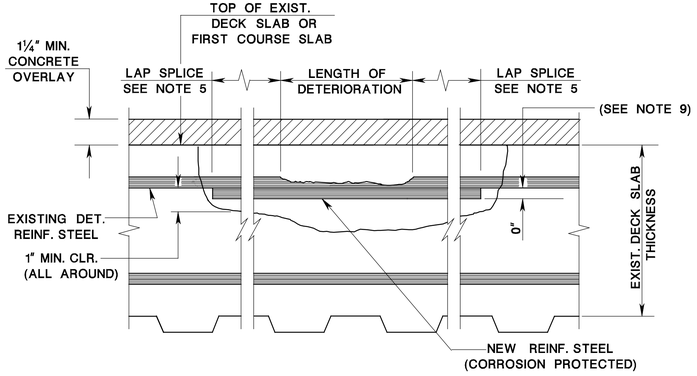
REPAIR TYPE-C
(SEE NOTE 3)



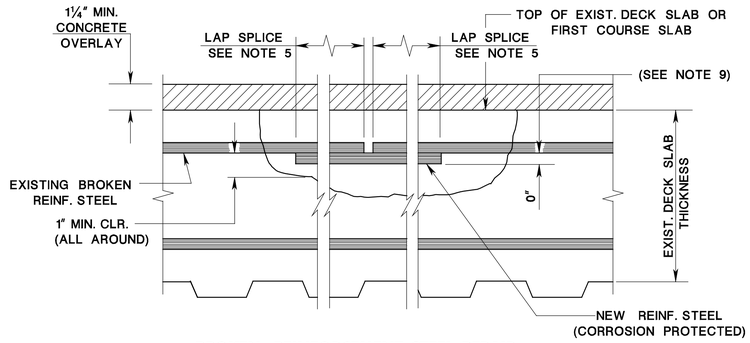
TYPICAL REPAIR DETAIL FOR MINOR SPALLED AREAS
(SEE NOTE 1)



LIMITS OF REPAIR AREA (PLAN VIEW)
(SEE NOTE 7)



DETERIORATED REINFORCEMENT STEEL REPAIR



BROKEN REINFORCEMENT STEEL REPAIR

GENERAL NOTES:

1 SPALLED, DELAMINATED, AND DETERIORATED CONCRETE AREAS SHALL BE CLEANED AND REPAIRED WITH THE CONCRETE OVERLAY TYPE THAT IS TO BE USED FOR THE OVERLAY PLACEMENT, OR CLASS A CONCRETE MAY BE USED.

2 REPAIR TYPE-B:
ALL DETERIORATED AND DELAMINATED CONCRETE SHALL BE REMOVED TO A MINIMUM DEPTH OF 1" BELOW THE BOTTOM OF THE TOP LAYER OF EXISTING REINFORCEMENT STEEL TO A MAXIMUM OF 50% OF THE THICKNESS OF THE EXISTING CONCRETE DECK.

3 REPAIR TYPE-C:
ALL DETERIORATED AND DELAMINATED CONCRETE SHALL BE REMOVED, AND IF THE SOUND CONCRETE SURFACE IS LOCATED AT A DEPTH GREATER THAN 50% OF THE DECK THICKNESS WHEN MEASURED FROM THE TOP OF THE DECK, PERFORM TYPE-C REPAIR UPON APPROVAL OF THE RE, AS SHOWN IN THE DETAIL "REPAIR TYPE-C". IF THE BOTTOM MAT OF THE DECK REINFORCEMENT STEEL IS EXPOSED, THE DECK SLAB SHALL BE REPLACED TO FULL DEPTH IN THIS AREA OF EXPOSURE.

4 THE TOP SURFACE OF THE CONCRETE FOR TYPE-B AND TYPE-C REPAIRS SHALL BE EVEN WITH THE ADJACENT TOP OF EXISTING DECK SLAB AND SHALL MAINTAIN THE EXISTING GRADES AND CROSS SLOPES.

5 NEW CORROSION PROTECTED REINFORCEMENT STEEL SHALL BE PLACED TO SUPPLEMENT AN EXISTING REINFORCEMENT STEEL WHEN AN EXISTING ONE HAS A SECTION LOSS OF 25% OR MORE OF THE ORIGINAL CROSS SECTION, AS DETERMINED BY THE RE, OR THE EXISTING REINFORCEMENT STEEL IS BROKEN. THE NEW ONE SHALL EXTEND 30 BAR DIAMETERS IN EACH DIRECTION FROM WHERE THE SECTION LOSS OR BREAK ENDS. MODIFY THE LIMITS OF THE REPAIR AREA TO MEET THE REINFORCEMENT STEEL SPLICE LAP REQUIREMENTS.

6 FOR REPAIR TYPE-B AND TYPE-C SOUND CONCRETE SHALL BE REMOVED TO A DEPTH OF ¼" MINIMUM TO 1" MAXIMUM IN ALL DIRECTIONS, EXCEPT THAT THE MAXIMUM LIMIT MAY BE MODIFIED UPON APPROVAL OF THE RE.

7 UPON APPROVAL OF THE RE, MODIFY THE LIMITS OF CONCRETE REMOVAL AS SHOWN IN THE "LIMITS OF REPAIR AREA (PLAN VIEW)" WHEN SUPPLEMENTARY REINFORCEMENT STEEL IS REQUIRED.

8 DECK REINFORCEMENT STEEL DETAILS SHOWN ARE GENERAL. ACTUAL REINFORCEMENT STEEL SPACINGS AND LOCATIONS WILL VARY FROM BRIDGE TO BRIDGE.

9 NEW REINFORCEMENT STEEL SHALL BE PLACED AT THE SAME LEVEL ALONGSIDE THE EXISTING DETERIORATED OR BROKEN REINFORCEMENT STEEL.

10 BEFORE PLACEMENT OF THE OVERLAY, ALL PREVIOUSLY PATCHED AREAS SHALL BE COMPLETELY REMOVED.

BRIDGE DECK REHABILITATION WITH CONCRETE OVERLAY

N.T.S.

BCD-551-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION
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BCD-551-1.1

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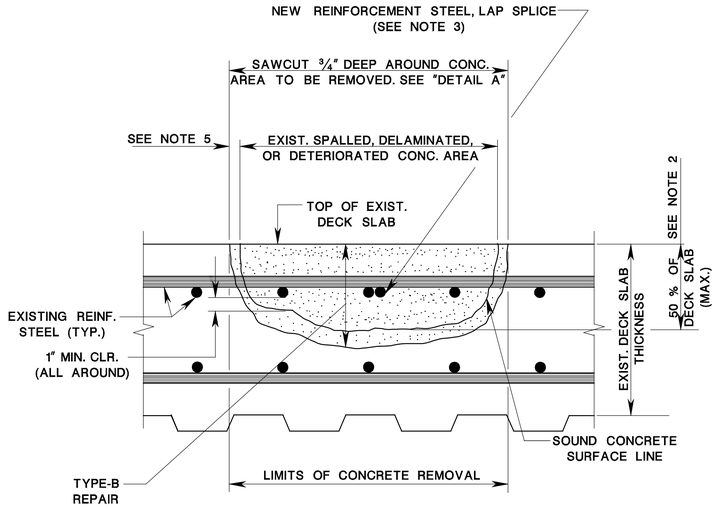
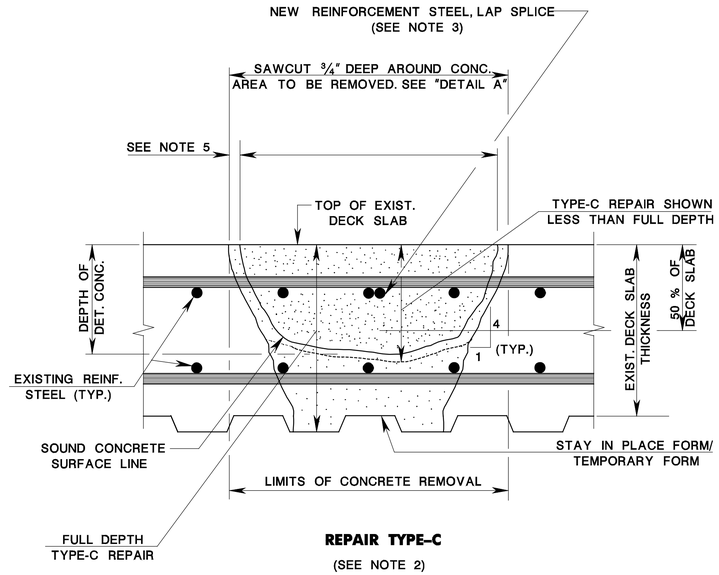


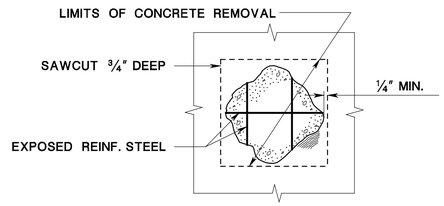
REPAIR TYPE-B

(SEE NOTE 1)



REPAIR TYPE-C

(SEE NOTE 2)



LIMITS OF REPAIR AREA (PLAN VIEW)

(SEE NOTE 6)

BCD-551-2.1

GENERAL NOTES

1 REPAIR TYPE-B:
ALL DETERIORATED AND DELAMINATED CONCRETE SHALL BE REMOVED TO A MINIMUM DEPTH OF 1" BELOW THE BOTTOM OF THE TOP LAYER OF EXISTING REINFORCEMENT STEEL OR UP TO A MAXIMUM OF 50% OF THE THICKNESS OF THE EXISTING CONCRETE DECK.

2 REPAIR TYPE-C:
ALL DETERIORATED AND DELAMINATED CONCRETE SHALL BE REMOVED. IF THE SOUND CONCRETE SURFACE IS LOCATED AT A DEPTH GREATER THAN 50% OF THE DECK THICKNESS WHEN MEASURED FROM THE TOP OF THE DECK, PERFORM TYPE-C REPAIR UPON APPROVAL OF THE RE, AS SHOWN IN THE DETAIL "REPAIR TYPE-C". IF THE BOTTOM MAT OF THE DECK REINFORCEMENT STEEL IS EXPOSED, THE DECK SLAB SHALL BE REPLACED TO FULL DEPTH IN THIS AREA OF EXPOSURE.

3 NEW CORROSION PROTECTED REINFORCEMENT STEEL SHALL BE PLACED TO SUPPLEMENT AN EXISTING REINFORCEMENT STEEL WHEN AN EXISTING ONE HAS A SECTION LOSS OF 25% OR MORE OF THE ORIGINAL CROSS SECTION, AS DETERMINED BY THE RE, OR THE EXISTING REINFORCEMENT STEEL IS BROKEN. THE NEW ONE SHALL EXTEND 30 BAR DIAMETERS IN EACH DIRECTION FROM WHERE THE SECTION LOSS OR BREAK ENDS. MODIFY THE LIMITS OF THE REPAIR AREA TO MEET THE REINFORCEMENT STEEL SPLICE LAP REQUIREMENTS.

4 THE TOP SURFACE OF THE CONCRETE FOR TYPE-B AND TYPE-C REPAIRS SHALL BE EVEN WITH THE ADJACENT TOP OF EXISTING DECK SLAB AND SHALL MAINTAIN THE EXISTING GRADES AND CROSS SLOPES.

5 FOR REPAIR TYPE-B AND TYPE-C SOUND CONCRETE SHALL BE REMOVED TO A DEPTH OF ¼" MINIMUM TO 1" MAXIMUM IN ALL DIRECTIONS, EXCEPT THAT THE MAXIMUM LIMIT MAY BE MODIFIED UPON APPROVAL OF THE RE.

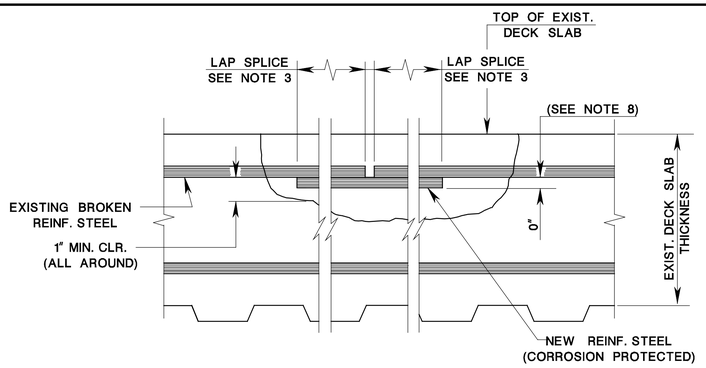
6 UPON APPROVAL OF THE RE, MODIFY THE LIMITS OF CONCRETE REMOVAL AS SHOWN IN THE "LIMITS OF REPAIR AREA (PLAN VIEW)" WHEN SUPPLEMENTARY REINFORCEMENT STEEL ARE REQUIRED.

7 DECK REINFORCEMENT STEEL DETAILS SHOWN ARE GENERAL. ACTUAL REINFORCEMENT STEEL SPACINGS AND LOCATIONS WILL VARY FROM BRIDGE TO BRIDGE.

8 THE NEW REINFORCEMENT STEEL SHALL BE PLACED AT THE SAME LEVEL ALONGSIDE THE EXISTING DETERIORATED OR BROKEN REINFORCEMENT STEEL.

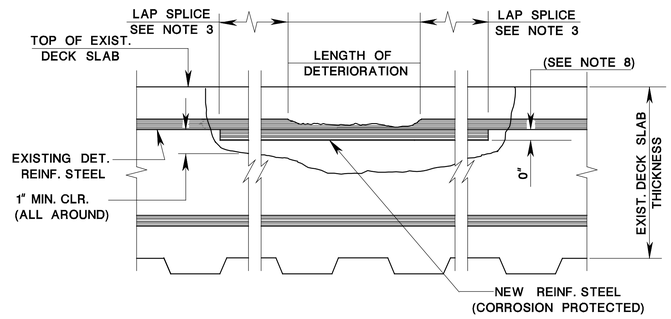
9 REFER TO THE NJDOT STANDARD SPECIFICATIONS FOR GUIDANCE AS TO THE SELECTION OF A QUICK-SETTING PATCH MATERIAL PRODUCT.

BCD-551-2.2



BROKEN REINFORCEMENT STEEL REPAIR

BCD-551-2.3



DETERIORATED REINFORCEMENT STEEL REPAIR

BCD-551-2.4

BRIDGE DECK REHABILITATION WITHOUT CONCRETE OVERLAY

N.T.S.

BCD-551-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION
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BDC07D-01-ORIGINAL SHEET

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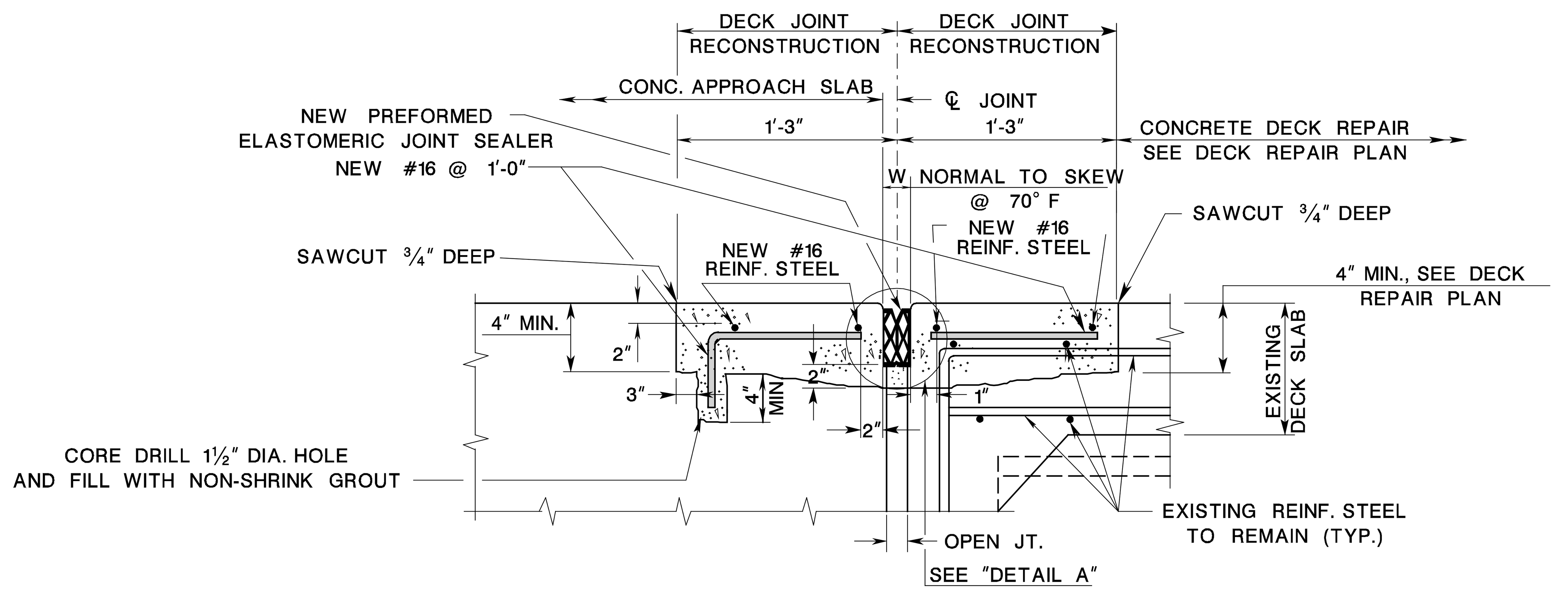
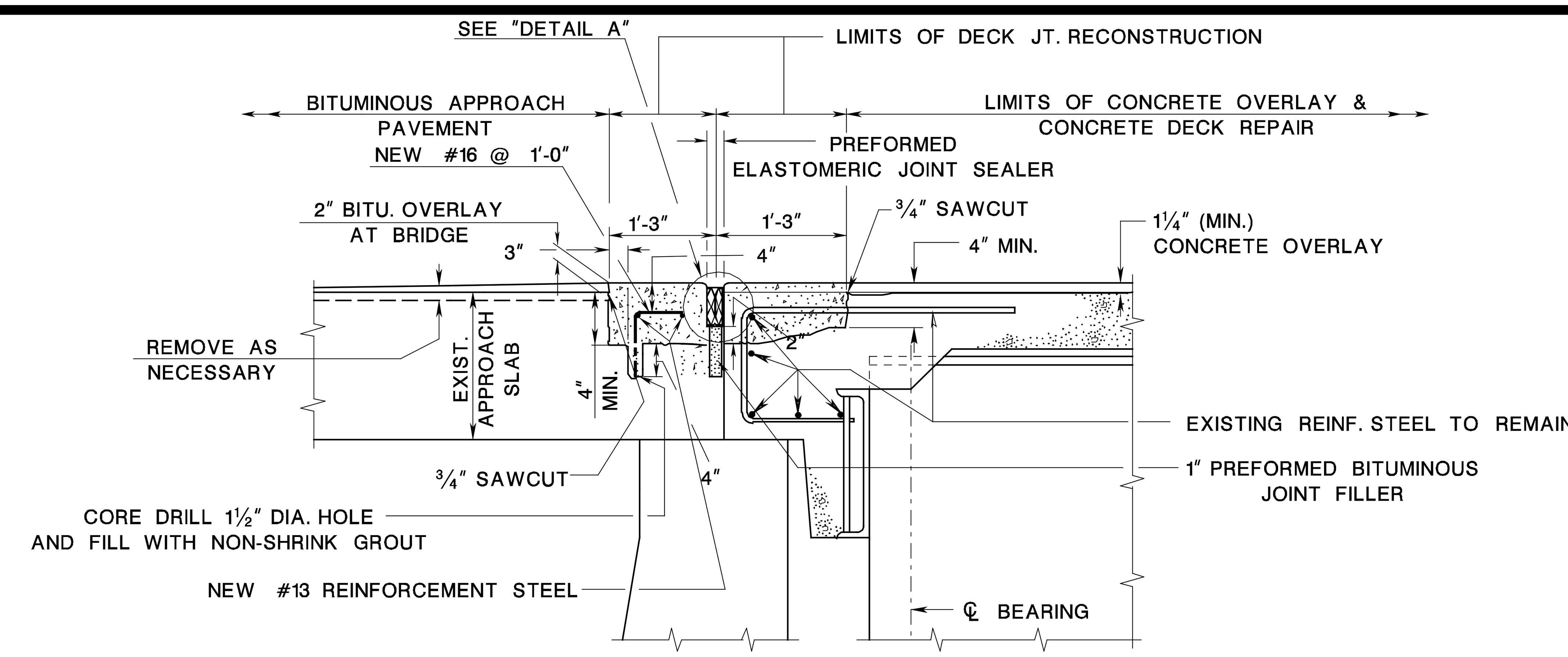
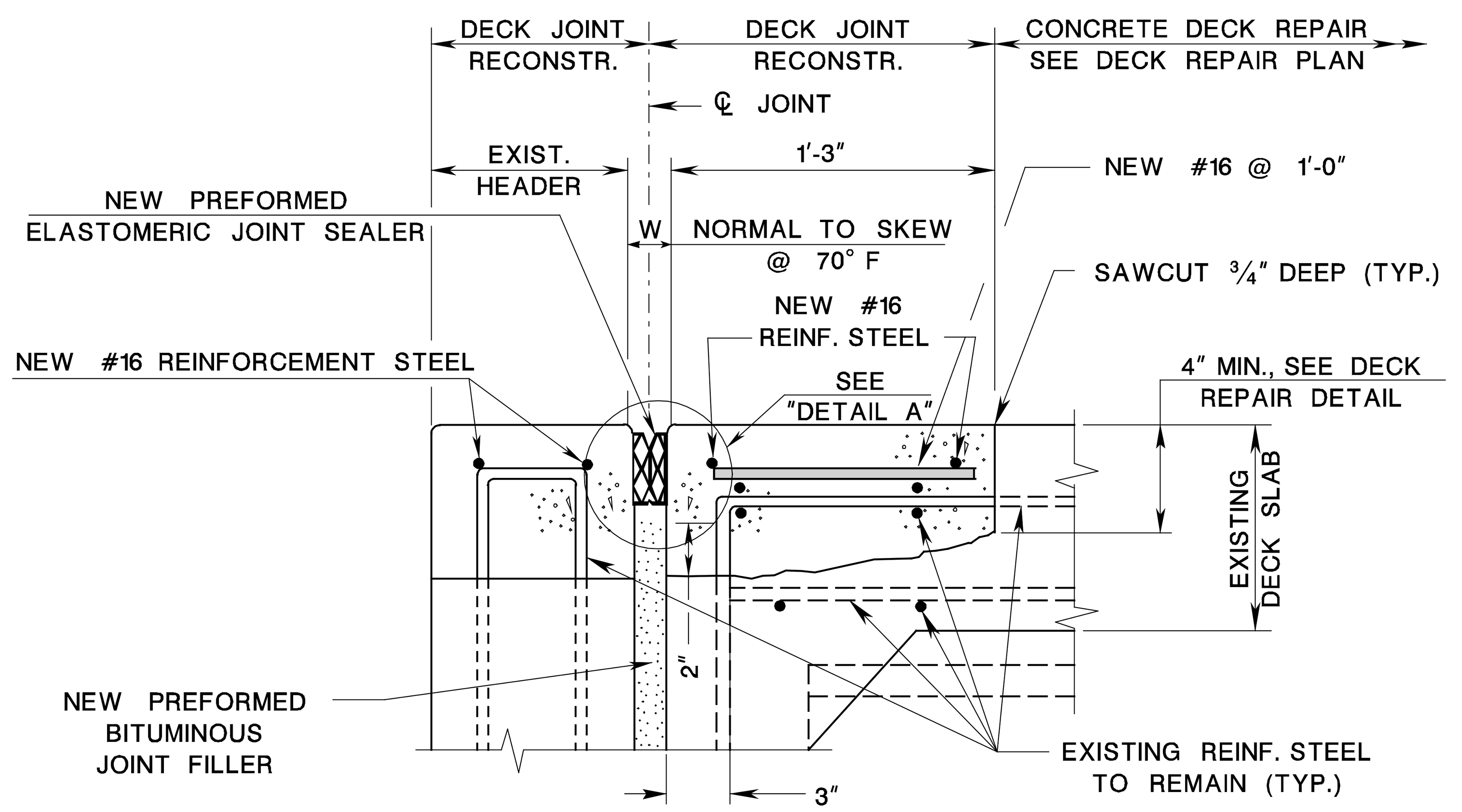


DECK JOINT AT ABUTMENT WITH APPROACH SLAB



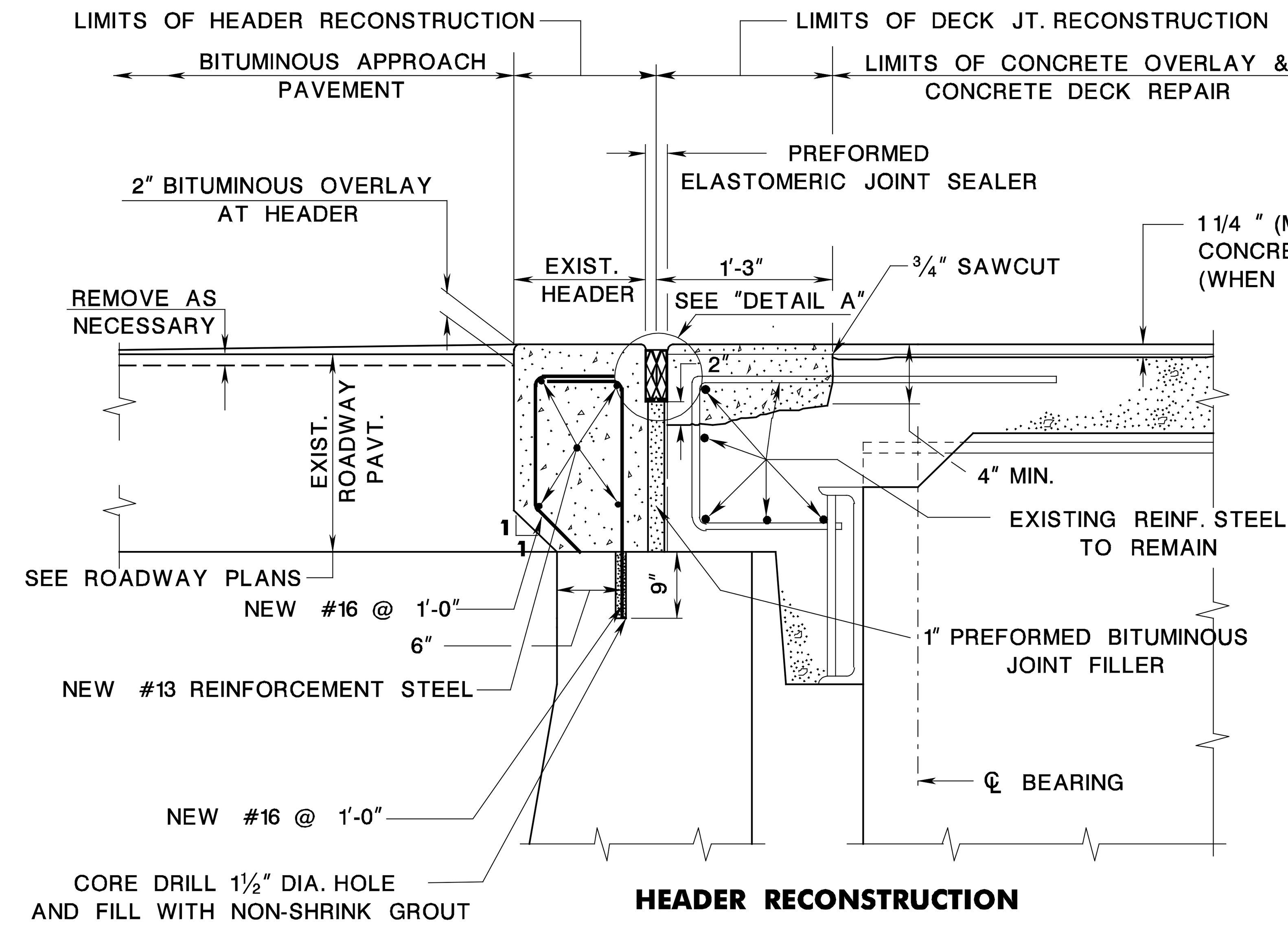
DECK JOINT AT ABUTMENT (WITH APPROACH SLAB AND CONCRETE OVERLAY)

BCD-551-3.3

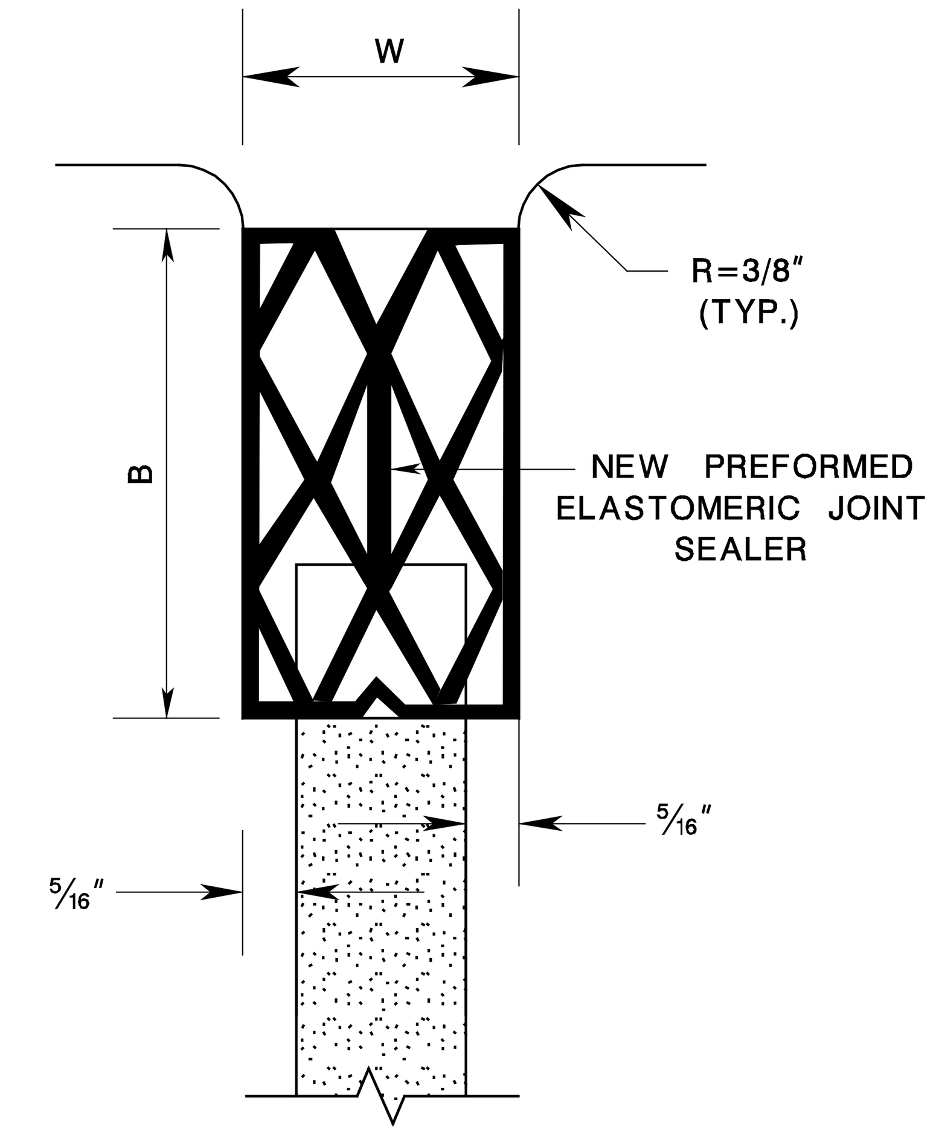


DECK JOINT AT ABUTMENT WITH HEADER

BCD-551-3.1



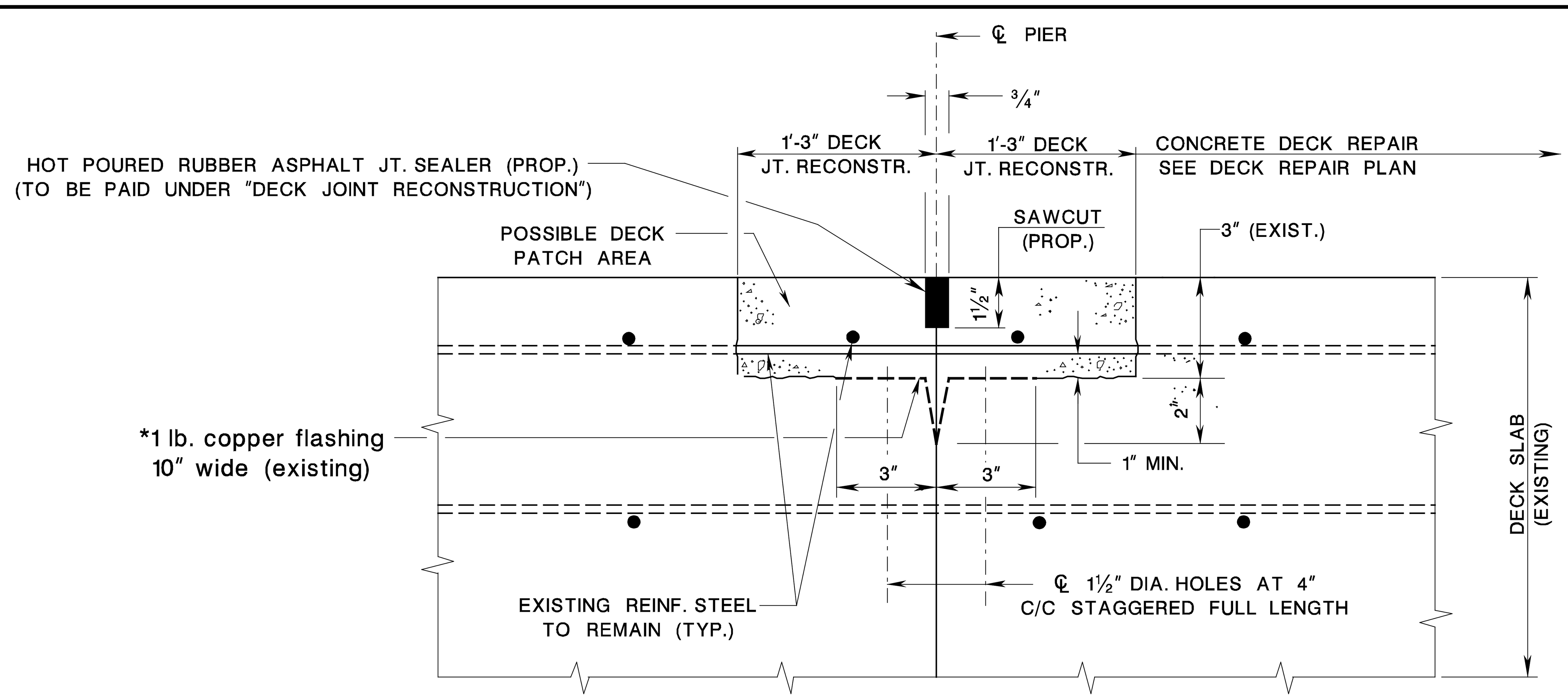
HEADER RECONSTRUCTION



DIMENSIONS W AND B VARY DEPENDING ON THE JOINT SEALER MANUFACTURER.

BCD-551-3.4

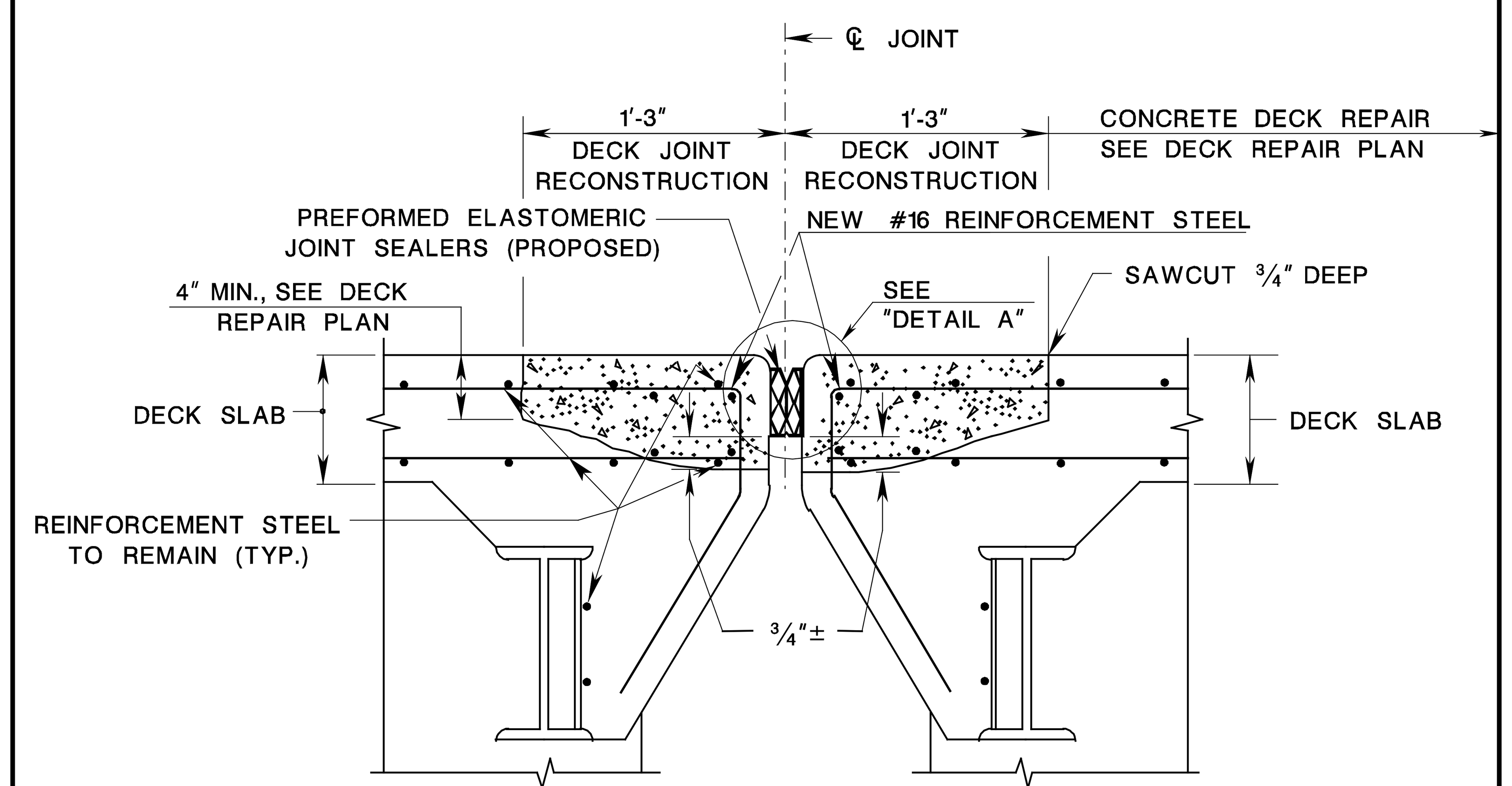
DETAIL A



*THE CONTRACTOR SHALL REPLACE THE EXISTING COPPER FLASHING DURING DECK JOINT RECONSTRUTION ONLY IF THE AREA OF REPAIR WARRANTS IT BELOW COPPER FLASHING, OR IF EXISTING REINFORCEMENT STEEL IS LESS THAN 1" ABOVE TOP OF FLASHING. PAY UNDER ITEM "DECK JOINT RECONSTRUCTION".

FIXED DECK JOINT AT PIER

BCD-551-3.2



EXP. DECK JOINT AT PIER

BCD-551-3.5

GENERAL NOTES:

1 ALL NEW REINFORCEMENT STEEL IS DESIGNATED IN METRIC UNITS AND SHALL BE CORROSION PROTECTED.

2 MECHANICAL COUPLERS MAY BE NECESSARY IF CONSTRUCTION IS STAGED.

3 PROVIDE AS REQUIRED ARMORED JOINT.

BRIDGE DECK REHABILITATION DECK JOINT REPAIR (SHEET 1 OF 2)

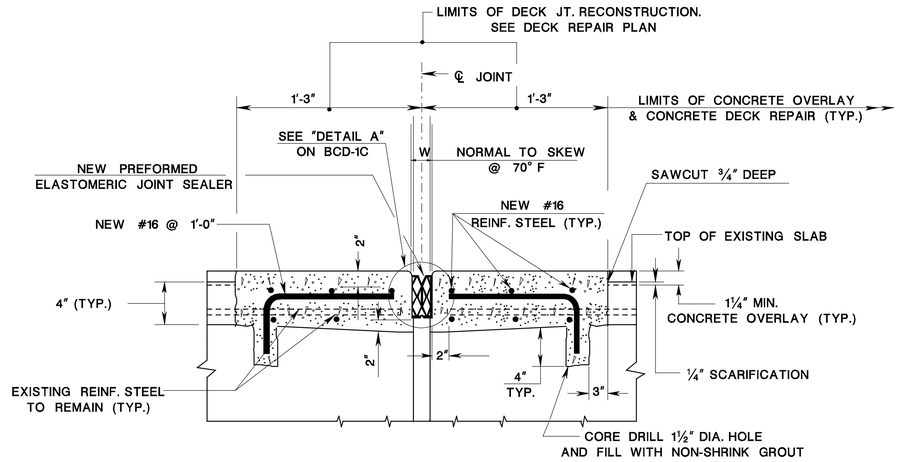
N.T.S.

BCD-551-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

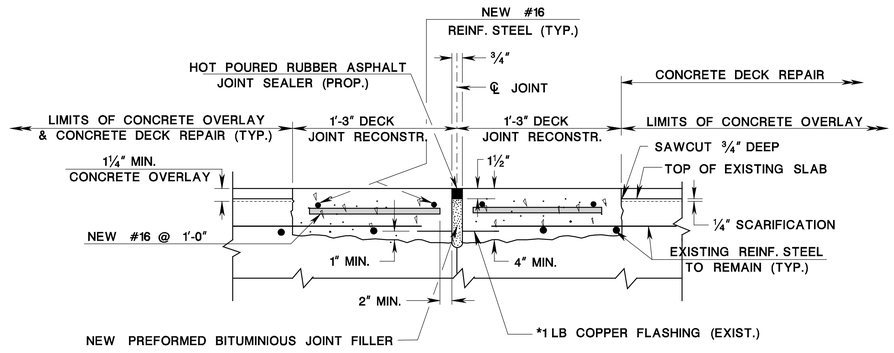
BRIDGE CONSTRUCTION DETAILS

BDC07D-01-ORIGINAL SHEET



EXPANSION DECK JOINT AT PIER WITH CONCRETE OVERLAY

BCD-551-4.1



BCD-551-4.2

*THE CONTRACTOR SHALL REPLACE THE EXISTING COPPER FLASHING DURING DECK JOINT RECONSTRUCTION ONLY IF THE CONCRETE BELOW COPPER FLASHING IS DETERIORATED OR IF EXISTING REINFORCEMENT STEEL IS LESS THAN 1" ABOVE TOP OF FLASHING. PAY UNDER ITEM "DECK JOINT RECONSTRUCTION".

FIXED JOINT AT PIER WITH CONRETE OVERLAY.

GENERAL NOTES:

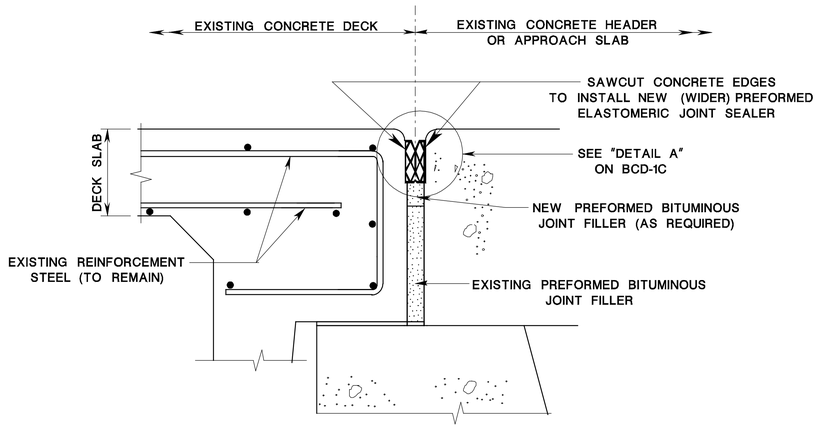
1. ALL NEW REINFORCEMENT STEEL IS DESIGNATED IN METRIC UNITS AND SHALL BE CORROSION PROTECTED.

2. "DECK JOINT RECONSTRUCTION" AND "HEADER RECONSTRUCTION" SHALL INCLUDE:
   A. ¾" SAWCUT AS SHOWN IN JOINT DETAILS.
   B. REMOVE CONCRETE AND DISPOSE OF MATERIALS TO LIMITS SHOWN AND REPLACE WITH CONCRETE.
   C. REMOVE PREFORMED BITUMINOUS JOINT FILLER (IF ANY) TO DEPTH SHOWN OR AS DIRECTED BY THE RE.
   D. BLOCKING FOR PROPOSED PREFORMED ELASTOMERIC JOINT SEALER.
   E. REPLACEMENT OF CORROSION PROTECTED REINFORCEMENT STEEL.
   F. PROPOSED PREFORMED BITUMINOUS JOINT FILLER WHERE REQUIRED.
   G. DRILL AND FILL HOLES WITH NON-SHRINK GROUT.
   H. SAWCUTTING THE CURB AND SIDEWALK TO INSTALL THE SEALER.

3. EPOXY BONDING COMPOUND SHALL BE USED BETWEEN NEW AND EXISTING CONCRETE. REFER TO NJDOT STANDARD SPECIFICATIONS CRITERIA .

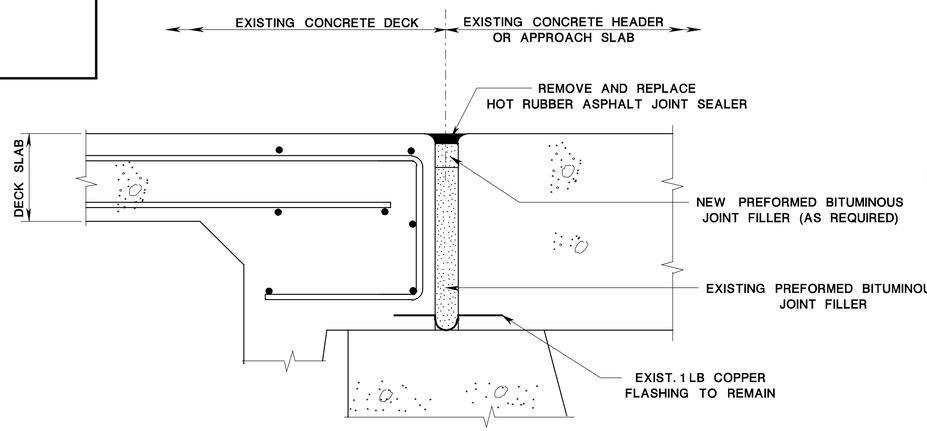
4. PROVIDE AS REQUIRED ARMORED JOINT.

BCD-551-4.3



SAWCUT JOINT RECONSTRUCTION AT ABUTMENT

BCD-551-4.4



DECK JOINT RE-SEAL AT ABUTMENT

BCD-551-4.5

BRIDGE DECK REHABILITATION
DECK JOINT REPAIR (SHEET 2 OF 2)
N.T.S.

BCD-551-4

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BRIDGE CONSTRUCTION DETAILS