DEPARTMENT OF PUBLIC WORKS

STANDARD CONSTRUCTION DETAILS

CITY OF DALLAS, TEXAS

REVISED APRIL 1997

UPDATED: SEPT. 2002

UPDATES	
DATE	APPROVAL
7/12/99	David C. Dybala
9/13/02	David C. Dybala

RECOMMENDED FOR APPROVAL:
THIS THE 16th DAY OF April, 1997.
E. Hernandez
ASSISTANT DIRECTOR
OF PUBLIC WORKS
& TRANSPORTATION

APPROVED:
THIS THE 16th DAY OF APRIL, 1997.
David C. Dybala
DIRECTOR OF PUBLIC WORKS
& TRANSPORTATION

FILE 251D-1

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REVISED DRIVEWAY DESIGNS TO INCLUDE TAS APPROVED WALK AREAS (7-99)

APPROVED _____ DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: 7/12/99

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MISCELLANEOUS

REVISIONS

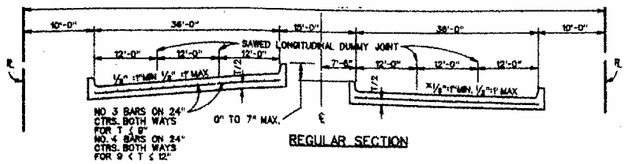
REVISED RAMP DESIGNS TO CONFORM TO TAS REQUIREMENTS (7-99)

APPROVED _____ DIRECTOR OF PUBLIC WORKS & TRANSPORTATION

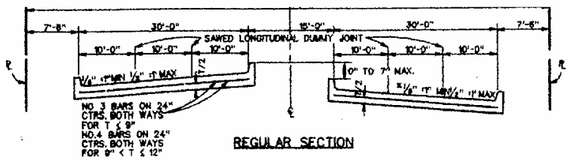
DATE: 7/12/99

FILE 2510-1

T.C. 2 OF 2



REGULAR SECTION



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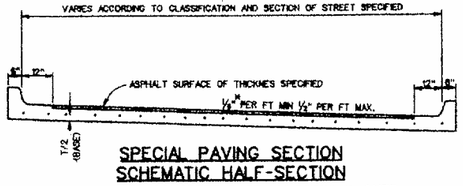


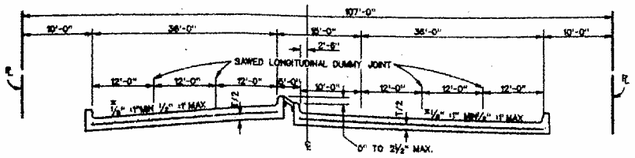
SPECIAL PAVING SECTION SCHEMATIC HALF-SECTION

REINFORCED CONCRETE BASE W/ INTEGRAL CURB AND GUTTER & ASPHALT SURFACE COURSE

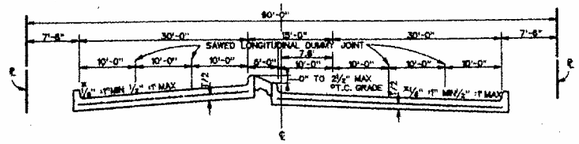
(TO BE USED ONLY WHEN SPECIFICALLY SHOWN ON THE PLAN)

EXCEPT AS INDICATED ABOVE, ALL PLAN AND SECTION DETAILS SHALL BE IDENTICAL TO THOSE SHOWN ELSEWHERE ON THIS SHEET FOR SECTIONS S-6-D, M-6-D(A), M-6-D(B), S-4-D FOR CURB AND GUTTER DETAILS, SEE PAGE 1006

3. FOR SUBSTITUTING FOR #3 BAR REINFORCING, THE SIZE OF THE WIRE FABRIC SHALL BE 12 X 12 - W3.5 X W3.5 WITH A NOMINAL DIAMETER OF 0.211 IN. AND NOMINAL WEIGHT OF 0.119 LBS PER LIN. FT.
4. FOR SUBSTITUTION FOR #4 BAR REINFORCING, THE SIZE OF THE WIRE SHALL BE 12 x 12 - W6 X W6 WITH A NOMINAL DIAMETER OF 0.276 INCHES AND A NOMINAL WEIGHT OF 0.204 LBS/LIN. FT.
5. REDWOOD EXPANSION JOINTS SHALL BE PLACED AT OR NEAR THE RADIUS POINTS OF ALL INTERSECTIONS, AT ALL ABRUPT CHANGES IN ALIGNMENT OR WIDTH, OR AT MAX. DISTANCE OF 150 FT. REDWOOD EXPANSION JOINT WILL CONTINUE THROUGH MEDIAN PAVING AND SIDEWALK AND WALL WHEREVER APPLICABLE.



LEFT TURN SECTION

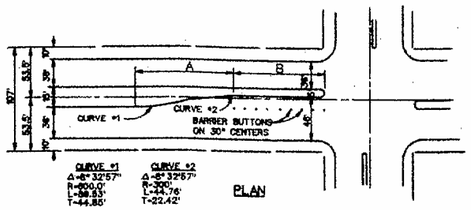


LEFT TURN SECTION

NOTE: (SEE PAGE 1002) MONOLITHIC MEDIAN NOSE IS STANDARD ROUNDED NOSE. IS TO BE USED ONLY AT DIRECTION OF ENGINEER TO MATCH EXISTING FACILITIES).

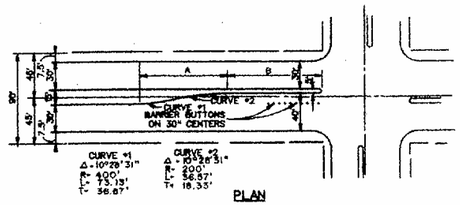
TYPE S-6-D SECTION

CROSS STREET	TRANSITION LENGTH 'A'	MINIMUM STORAGE 'B'	CURVE #1 RADIUS	CURVE #2 RADIUS	LANE WIDTH(S)
LOCAL	109.09'	90'	400'	200'	10'
COLLECTOR	109.09'	100'	400'	200'	10'
MINOR ARTERIAL	133.79'	150'	600'	300'	10'
PRINCIPAL ARTERIAL	133.79'	200'	600'	300'	10'
SPECIAL MOVEMENTS					
STANDARD DOUBLE LEFT TURN	197.78'	150'	600'	300'	2-11'
MINIMUM DOUBLE LEFT TURN	188.68'	150'	600'	300'	2-10'
RIGHT TURN	109.09'	90'	400'	200'	10'



PLAN

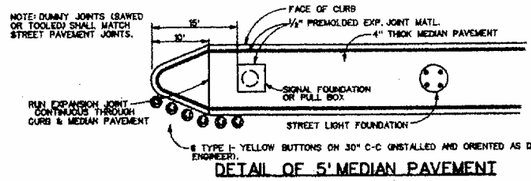
TYPE S-6-D SECTION



PLAN

TYPE M-6-D(B) SECTION

NOTE: DUMMY JOINTS (SAWED OR TOOLED) SHALL MATCH STREET PAVEMENT JOINTS.

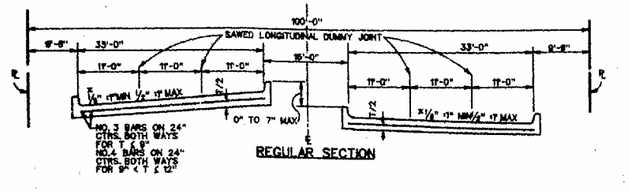


8 TYPE I- YELLOW BUTTONS ON 30" C-C INSTALLED AND ORIENTED AS DIRECTED BY THE ENGINEER).

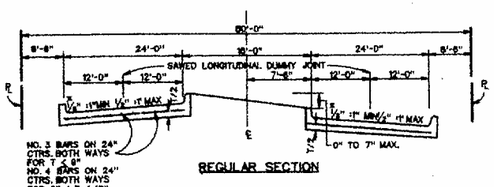
DETAIL OF 5' MEDIAN PAVEMENT

TYPE M-6-D(A) SECTION

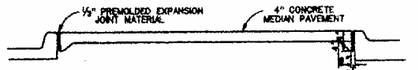
CROSS STREET	TRANSITION LENGTH 'A'	MINIMUM STORAGE 'B'	CURVE #1 RADIUS	CURVE #2 RADIUS	LANE WIDTH(S)
LOCAL	109.09'	90'	400'	200'	10'
COLLECTOR	109.09'	100'	400'	200'	10'
MINOR ARTERIAL	109.09'	150'	400'	200'	10'
PRINCIPAL ARTERIAL	133.79'	200'	600'	300'	10'
SPECIAL MOVEMENTS					
STANDARD DOUBLE LEFT TURN	197.78'	150'	600'	300'	2-11'
MINIMUM DOUBLE LEFT TURN	188.68'	150'	600'	300'	2-10'
RIGHT TURN	109.09'	90'	400'	200'	10'



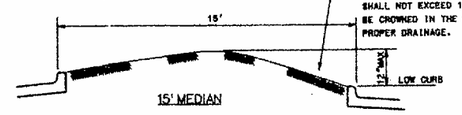
REGULAR SECTION



REGULAR SECTION



NON-REINFORCED MEDIAN PAVEMENT
(IN ALL AREAS LESS THAN 7.5' B.C. TO B.C.)

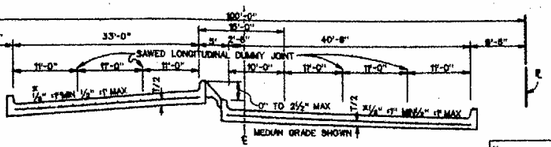


15' MEDIAN

BACKFILL FOR MEDIAN SHALL CONSIST OF EXCESS EXCAVATION. THERE SHALL BE NO PAY ITEM FOR ANY FILL MATERIAL PLACED WITHIN THE MEDIAN. MAX. FILL SHALL NOT EXCEED 12" AND SHALL BE CROWNED IN THE MIDDLE FOR PROPER DRAINAGE.

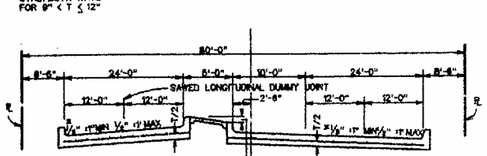
TYPE M-6-D(B) SECTION

CROSS STREET	TRANSITION LENGTH 'A'	MINIMUM STORAGE 'B'	CURVE #1 RADIUS	CURVE #2 RADIUS	LANE WIDTH(S)
LOCAL	94.34'	90'	300'	150'	10'
COLLECTOR	94.34'	100'	300'	150'	10'
MINOR ARTERIAL	94.34'	150'	300'	150'	10'
PRINCIPAL ARTERIAL	109.09'	200'	400'	200'	10'
SPECIAL MOVEMENTS					
STANDARD DOUBLE LEFT TURN	188.68'	150'	600'	300'	2-11'
MINIMUM DOUBLE LEFT TURN	188.68'	150'	600'	300'	2-10'
RIGHT TURN	94.34'	90'	300'	150'	10'



LEFT TURN SECTION

N SEE PAGE 1006 FOR ALTERNATE DESIGN USING PARABOLIC SECTIONS



LEFT TURN SECTION

TYPE S-4-D SECTION

CROSS STREET	TRANSITION LENGTH 'A'	MINIMUM STORAGE 'B'	CURVE #1 RADIUS	CURVE #2 RADIUS	LANE WIDTH(S)
LOCAL	109.09'	90'	400'	200'	10'
COLLECTOR	109.09'	100'	400'	200'	10'
MINOR ARTERIAL	109.09'	150'	400'	200'	10'
PRINCIPAL ARTERIAL	133.79'	150'	600'	300'	10'
SPECIAL MOVEMENTS					
STANDARD DOUBLE LEFT TURN	197.78'	100'	600'	300'	2-11'
MINIMUM DOUBLE LEFT TURN	188.68'	100'	600'	300'	2-10'
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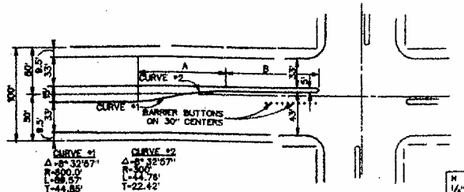
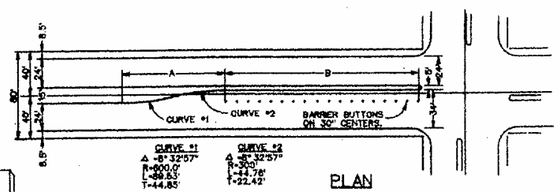


PLAN

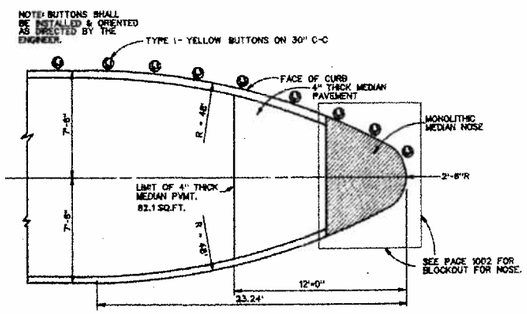
TYPE M-6-D(A) PAVEMENT

N ¼" PER FOOT NORMAL MINIMUM ⅛" PER FOOT ONLY ON STREETS HAVING GRADES OF 1.00% OR MORE.



PLAN

TYPE S-4-D DIVIDED SECTION

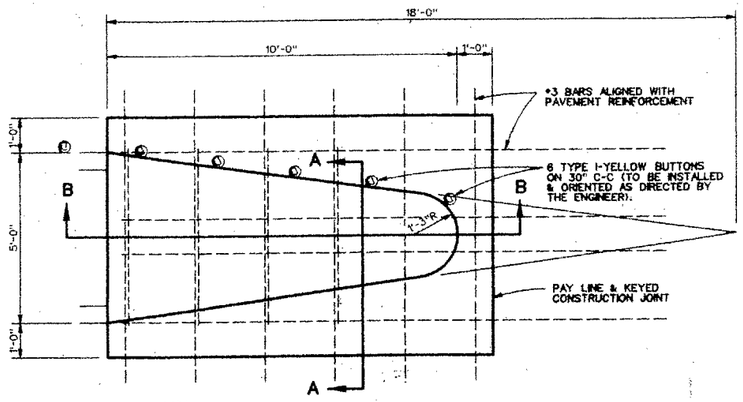


DETAIL OF NOSE FOR 15' WIDTH MEDIAN ISLAND

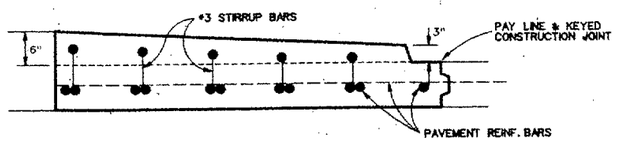
TYPICAL SECTIONS-DIVIDED ARTERIAL STREETS

APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: April 16, 1997

PAVING DETAILS					
PAVING SECTIONS AND STREET LAYOUTS WITH MEDIAN DETAILS					
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION					
CITY OF DALLAS, TEXAS					
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B. & A.	APRIL 1997	251D	1	1001

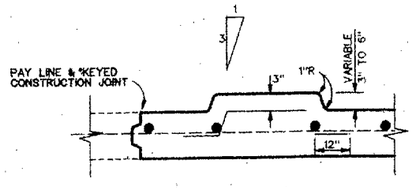


MONOLITHIC MEDIAN NOSE



NOTE: MONOLITHIC MEDIAN NOSE & PAVEMENT WITHIN PAY LINES SHALL BE PAID FOR PER EACH, COMPLETE IN PLACE.

SECTION B-B



SECTION A-A

APPROVED _____ DIRECTOR OF PUBLIC WORKS & TRANSPORTATION

DATE: APRIL 16, 1997

PAVING DETAILS

MONOLITHIC MEDIAN NOSE

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

CITY OF DALLAS, TEXAS

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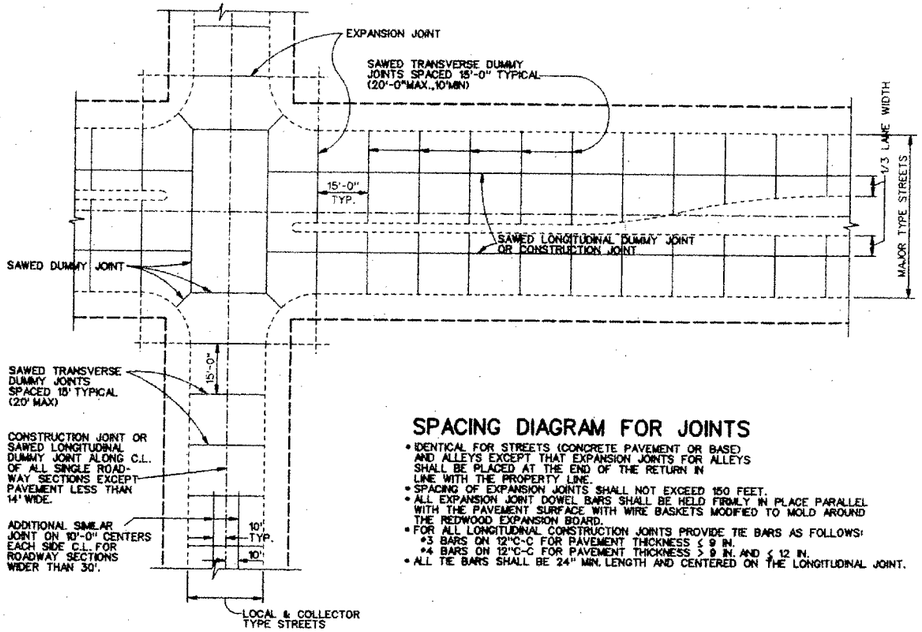
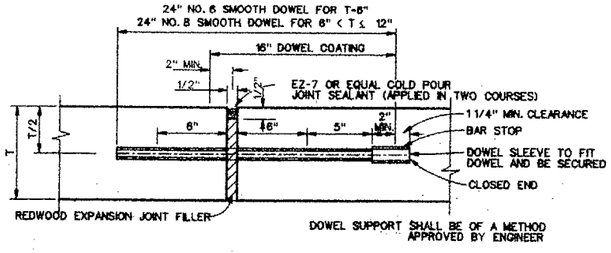


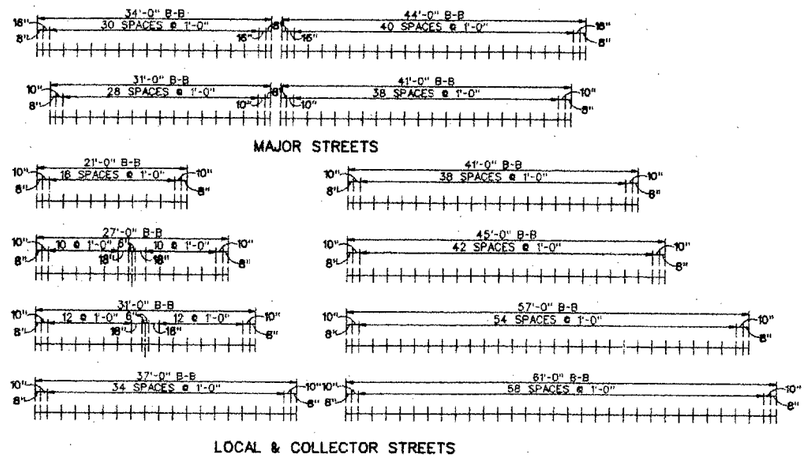
SPACING DIAGRAM FOR JOINTS

- IDENTICAL FOR STREETS (CONCRETE PAVEMENT OR BASE) AND ALLEYS EXCEPT THAT EXPANSION JOINTS FOR ALLEYS SHALL BE PLACED AT THE END OF THE RETURN IN LINE WITH THE PROPERTY LINE.
- SPACING OF EXPANSION JOINTS SHALL NOT EXCEED 150 FEET.
- ALL EXPANSION JOINT DOWEL BARS SHALL BE HELD FIRMLY IN PLACE PARALLEL WITH THE PAVEMENT SURFACE WITH WIRE BASKETS MODIFIED TO MOLD AROUND THE REDWOOD EXPANSION BOARD.
- FOR ALL LONGITUDINAL CONSTRUCTION JOINTS PROVIDE TIE BARS AS FOLLOWS:
  - #3 BARS ON 12"C-C FOR PAVEMENT THICKNESS ≤ 9 IN.
  - #4 BARS ON 12"C-C FOR PAVEMENT THICKNESS > 9 IN. AND ≤ 12 IN.
- ALL TIE BARS SHALL BE 24" MIN. LENGTH AND CENTERED ON THE LONGITUDINAL JOINT.

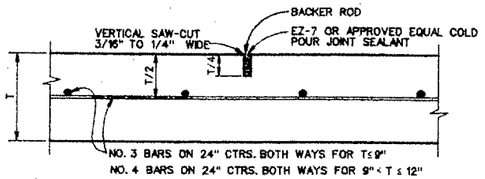


TRANSVERSE EXPANSION JOINT

IDENTICAL FOR STREETS AND ALLEYS

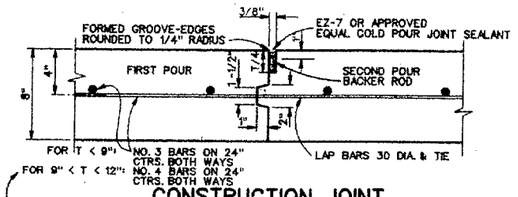


SPACING DIAGRAM FOR DOWELS AT EXPANSION JOINTS



SAWED DUMMY JOINT

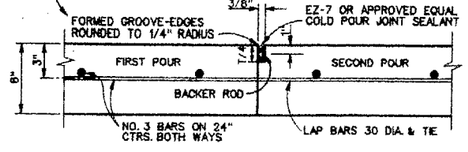
IDENTICAL FOR STREETS AND ALLEYS EXCEPT ALLEY LONGITUDINAL REINFORCEMENT BARS



CONSTRUCTION JOINT

FOR 8" THICKNESS PAVEMENT OR BASE

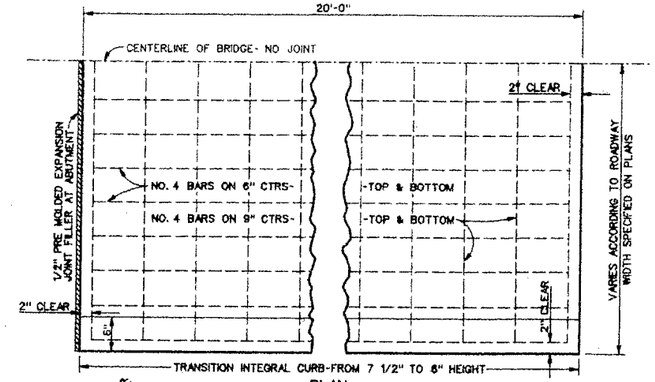
CHANGE BAR SPACING ACROSS JOINTS TO 12" CTRS. FOR LONGITUDINAL JOINTS



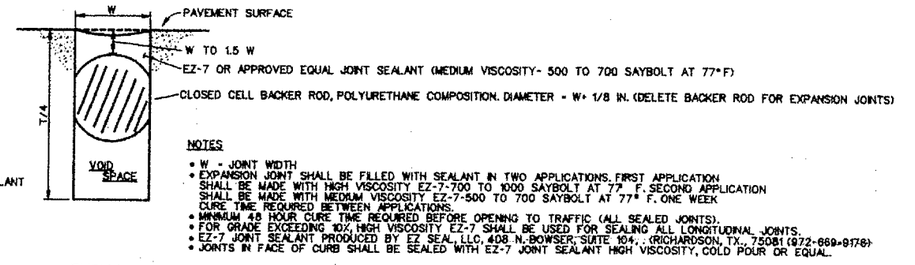
CONSTRUCTION JOINT

FOR 6" MINIMUM THICKNESS PAVEMENT OR BASE

IDENTICAL FOR STREETS AND ALLEYS EXCEPT ALLEY LONGITUDINAL REINFORCEMENT BARS



BRIDGE APPROACH SLAB



NOTES

- W = JOINT WIDTH
- EXPANSION JOINT SHALL BE FILLED WITH SEALANT IN TWO APPLICATIONS. FIRST APPLICATION SHALL BE MADE WITH HIGH VISCOSITY EZ-7-700 TO 1000 SAYBOLT AT 77° F. SECOND APPLICATION SHALL BE MADE WITH MEDIUM VISCOSITY EZ-7-500 TO 700 SAYBOLT AT 77° F. ONE WEEK CURE TIME REQUIRED BETWEEN APPLICATIONS.
- MINIMUM 48 HOUR CURE TIME REQUIRED BEFORE OPENING TO TRAFFIC (ALL SEALED JOINTS).
- FOR GRADE EXCEEDING 10%, HIGH VISCOSITY EZ-7 SHALL BE USED FOR SEALING ALL LONGITUDINAL JOINTS.
- EZ-7 JOINT SEALANT PRODUCED BY EZ SEAL, LLC, 408 N. BOWSER, SUITE 104, . (RICHARDSON, TX., 75081 (972-669-9178)
- JOINTS IN FACE OF CURB SHALL BE SEALED WITH EZ-7 JOINT SEALANT HIGH VISCOSITY, COLD POUR OR EQUAL.

TYPICAL JOINT SEALING DETAIL

*NOTE: PRESENCE OF MANUFACTURER'S REPRESENTATIVE REQUIRED

MANUFACTURER'S REPRESENTATIVE SHALL BE PRESENT AT THE BEGINNING OF THE SEALING OPERATIONS TO MEET WITH THE CONTRACTOR, ENGINEER AND INSPECTOR TO ESTABLISH THE CORRECT PROCEDURES. CONTACT MANUFACTURER'S REPRESENTATIVE AT 972-669-9178.

APPROVED _____ DIRECTOR OF PUBLIC WORKS & TRANSPORTATION

DATE: April 16, 1997

PAVING DETAILS

PAVEMENT JOINTS AND BRIDGE APPROACH SLAB

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

CITY OF DALLAS, TEXAS

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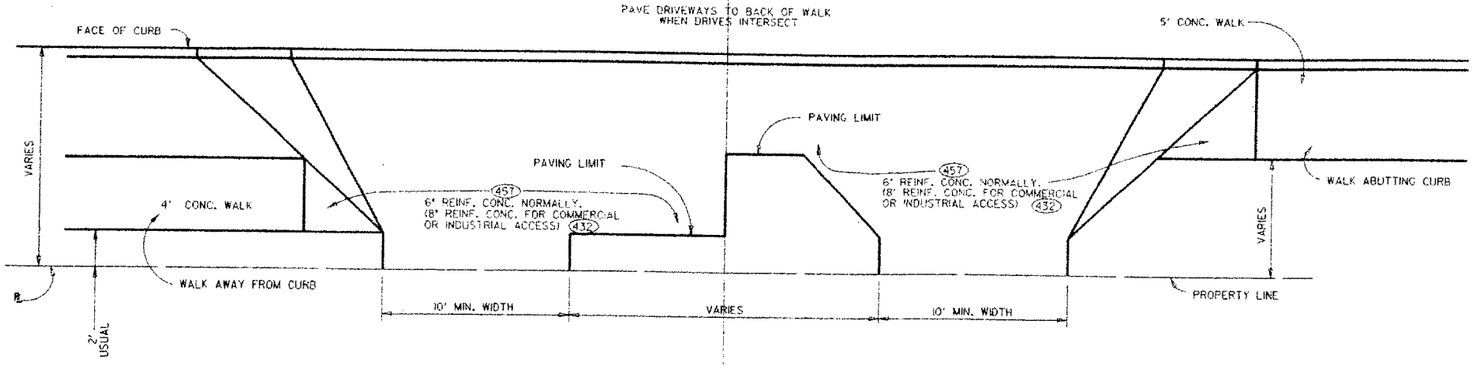
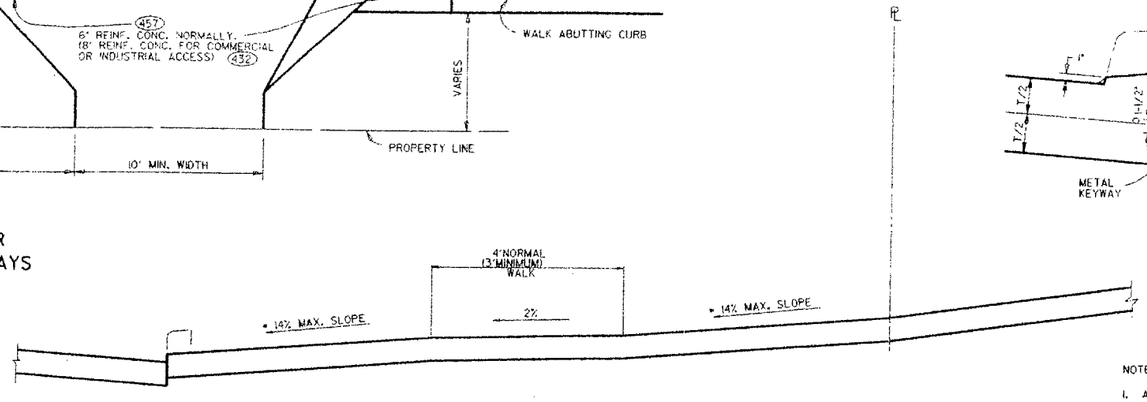
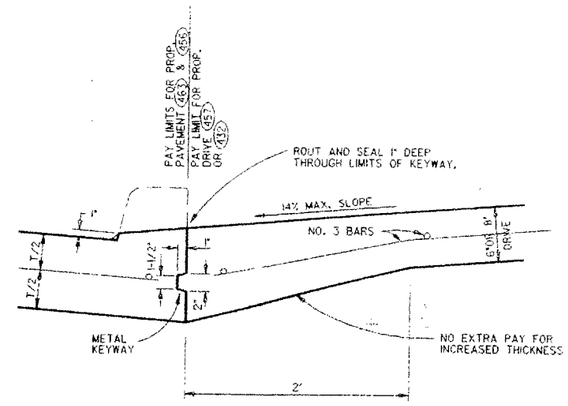
C.O.D.	A.B.&A.	APRIL 1997	251D	1	1003



PAVING LIMITS FOR INTERSECTING DRIVEWAYS



SECTION C-C

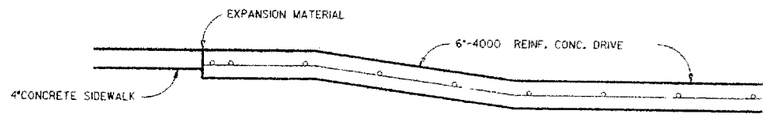


SECTION A-A

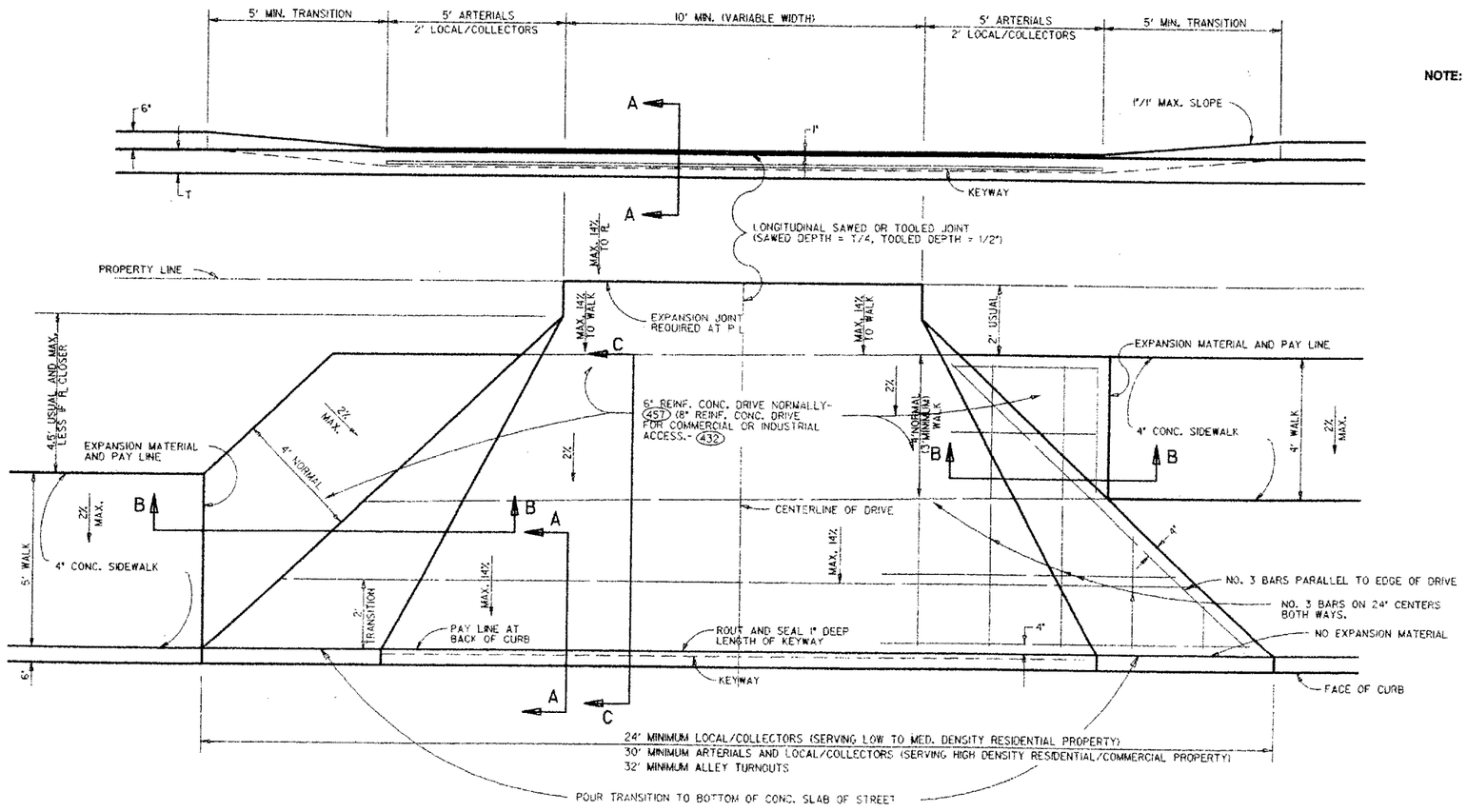
NOTE: THE GRADE BREAK AT THE GUTTER LINE & AT ANY POINT WITHIN 10 FEET OF THE GUTTER LINE MUST NOT EXCEED 12 PERCENT UNLESS A VERTICAL CURVE IS PROVIDED.
DRIVEWAYS BUILT WITH LESS THAN 6 INCHES DIFFERENCE BETWEEN THE ELEVATION OF THE DRIVEWAY AT THE RIGHT-OF-WAY LINE AND THE ELEVATION OF THE DRIVEWAY AT THE GUTTER LINE, SHALL BE APPROVED BY THE DIRECTOR OF PUBLIC WORKS AND TRANSPORTATION PRIOR TO CONSTRUCTION, UNLESS THE DRIVEWAY DESIGNS WERE PREVIOUSLY APPROVED BY THE DEPARTMENT AS PART OF A SET OF CONSTRUCTION PLANS.

NOTES:

1. ALL SAWED DUMMY JOINTS SHALL BE SEALED WITH EZ-7 OR APPROVED EQUAL COLD POUR JOINT SEALANT.
2. TOOLED OR SAWED JOINT WILL BE REQUIRED AT CENTERLINE OF ALL DRIVEWAYS LESS THAN 24' WIDE. ADDITIONAL JOINTS WILL BE REQUIRED AT EQUAL SPACINGS FOR DRIVEWAYS WIDER THAN 24'.
3. OFFSETS IN DRIVES TO MATCH PROPOSED WALKS WILL BE BUILT MONOLITHIC WITH THE DRIVE.
4. PAVEMENT JOINTS WILL NOT EXTEND THROUGH DRIVE EXCEPT AS PROVIDED FOR IN NOTES 9 AND 10 BELOW FOR CENTERLINE DRIVEWAY JOINTS.
5. KEYWAY LIMITS WILL COINCIDE WITH LIMITS OF 1' CURB.
6. REINFORCING STEEL WILL NOT EXTEND THROUGH KEYWAY. DRIVE WILL NOT BE TIED TO PAVEMENT.
7. LENGTH OF TRANSITION FOR CURB AT EACH SIDE OF DRIVE MAY VARY DUE TO STREET GRADES AND REQUIREMENT TO HOLD MAXIMUM SLOPE OF 1"/1'.
8. AN EXPANSION JOINT WILL BE REPLACED AT THE PROPERTY LINE.
9. TRANVERSE SAWED DUMMY JOINTS SHALL BE CONSTRUCTED ON 15' SPACINGS FOR DRIVEWAYS AS MEASURED FROM THE BACK OF CURB.
10. LONGITUDINAL SAWED OR TOOLED DUMMY JOINTS SHALL BE CONSTRUCTED FROM THE GUTTER EDGE TO THE PROPERTY LINE FOR ALL DRIVEWAYS WIDER THAN 15'.
11. STREET JOINTS SHALL BE ADJUSTED IN LOCATIONS TO LINE UP WITH DRIVEWAY CENTERLINES.



SECTION B-B



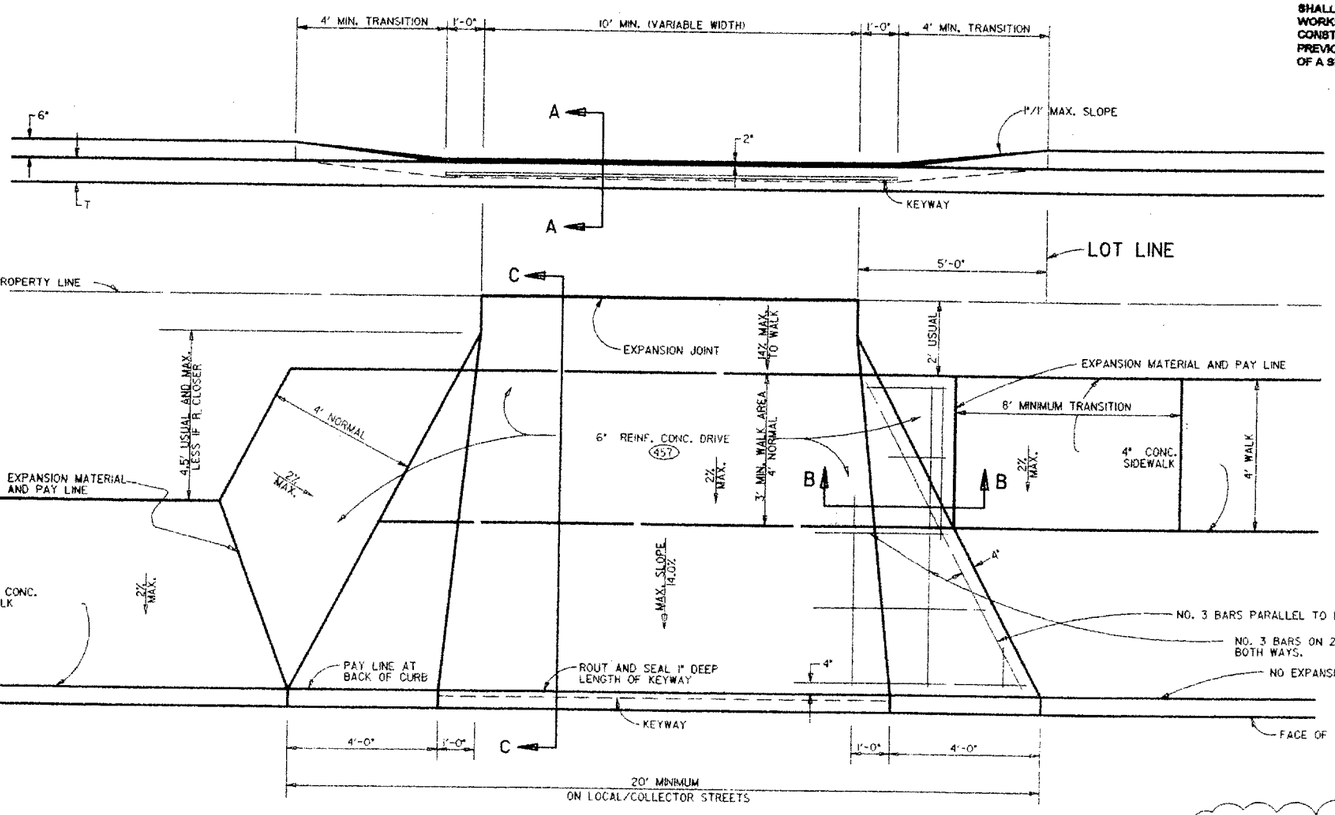
DRIVEWAY TURNOUT DETAIL
ALL STREETS

APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: 7/12/99

PAVING DETAILS
DRIVEWAY TURNOUTS

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CITY OF DALLAS, TEXAS

DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.



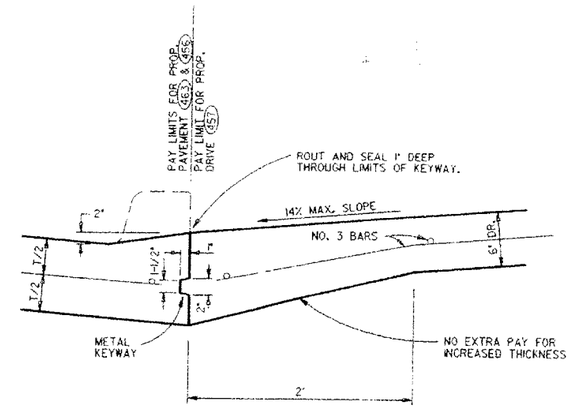
SPECIAL DRIVEWAY TURNOUT DETAIL

LOCAL STREETS

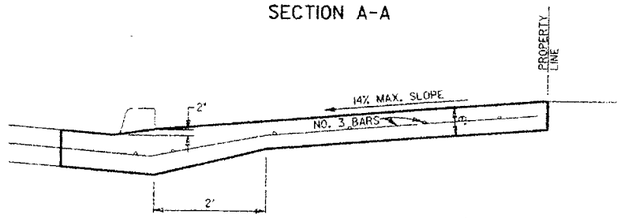
NOTE: THE GRADE BREAK AT THE GUTTER LINE & AT ANY POINT WITHIN 10 FEET OF THE GUTTER LINE MUST NOT EXCEED 12 PERCENT UNLESS A VERTICAL CURVE IS PROVIDED.
DRIVEWAYS BUILT WITH LESS THAN 6 INCHES DIFFERENCE BETWEEN THE ELEVATION OF THE DRIVEWAY AT THE RIGHT-OF-WAY LINE AND THE ELEVATION OF THE DRIVEWAY AT THE GUTTER LINE, SHALL BE APPROVED BY THE DIRECTOR OF PUBLIC WORKS AND TRANSPORTATION PRIOR TO CONSTRUCTION, UNLESS THE DRIVEWAY DESIGNS WERE PREVIOUSLY APPROVED BY THE DEPARTMENT AS PART OF A SET OF CONSTRUCTION PLANS.

NOTE:

THIS DESIGN IS FOR USE ONLY FOR DRIVES CONSTRUCTED 5' OFF THE LOT LINE WHEN APPROVED BY THE CITY.



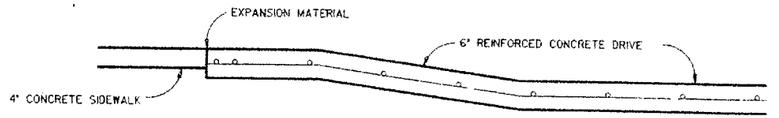
SECTION A-A



SECTION C-C

NOTES:

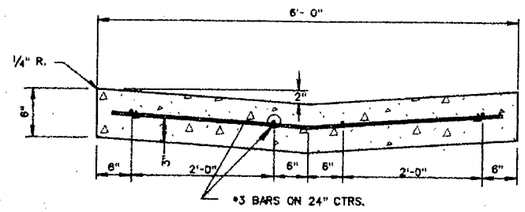
1. OFFSETS IN DRIVES TO MATCH PROPOSED WALKS WILL BE BUILT MONOLITHIC WITH THE DRIVE.
2. PAVEMENT JOINTS WILL NOT EXTEND THROUGH DRIVE.
3. KEYWAY LIMITS WILL COINCIDE WITH LIMITS OF 2" CURB.
4. REINFORCING STEEL WILL NOT EXTEND THROUGH KEYWAY. DRIVE WILL NOT BE TIED TO PAVEMENT.
5. MAXIMUM SLOPE ON DRIVE IN ANY DIRECTION SHOULD BE TO RESPECT PRINCIPLES OF BARRIER FREE CONSTRUCTION.
6. LENGTH OF TRANSITION FOR CURB AT EACH SIDE OF DRIVE MAY VARY DUE TO STREET GRADES AND REQUIREMENT TO HOLD MAXIMUM SLOPE OF 1"/1'.
7. AN EXPANSION JOINT SHALL BE PLACED AT THE PROPERTY LINE.
8. NOTES 1, 2, 4, 10, 11, AND 12 ON PAGE 1004 CONCERNING PAVEMENT JOINTS APPLY TO THIS PAGE ALSO.



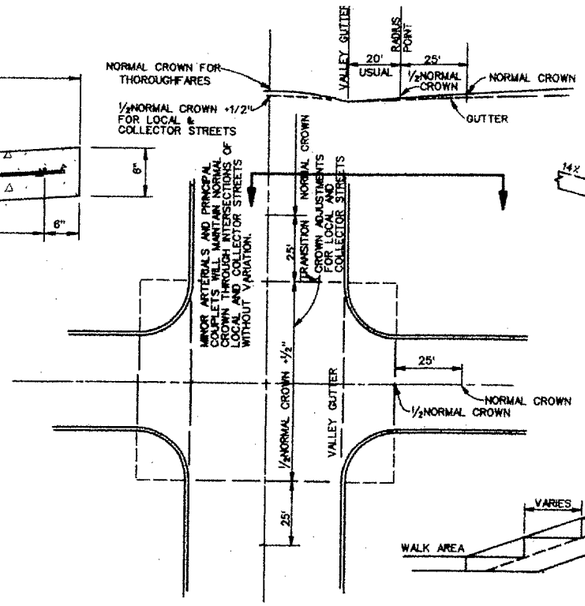
SECTION B-B

APPROVED _____
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: 7/12/99

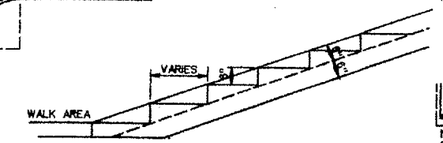
SPECIAL DRIVEWAY TURNOUTS					
ONLY FOR DRIVEWAYS CONSTRUCTED 5 FEET OFF THE LOT LINE					
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION					
CITY OF DALLAS, TEXAS					
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.



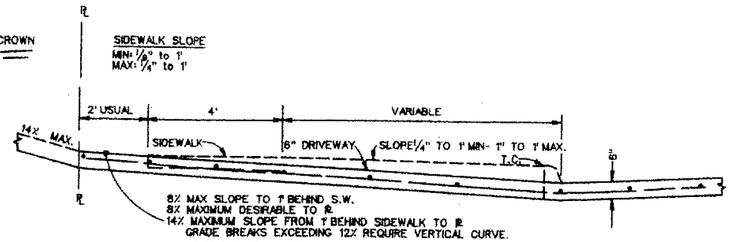
VALLEY GUTTER



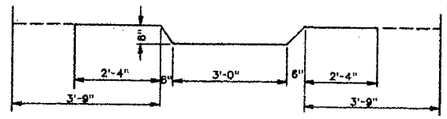
PARABOLIC CROWN
(ADJUSTMENT AT VALLEY GUTTER)



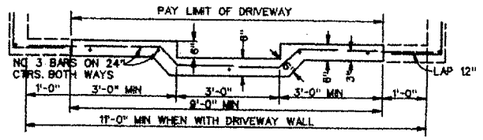
SIDE ELEVATION



SECTION THRU. PRIVATE DRIVE

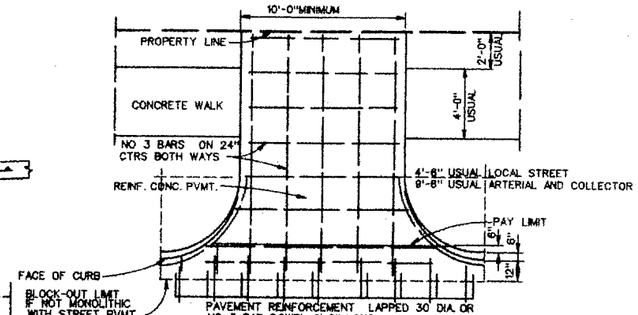


TRANSVERSE BAR DIAGRAM



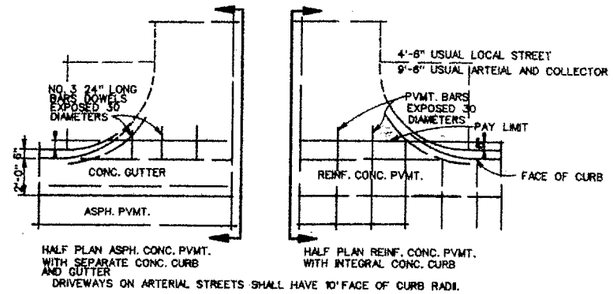
SECTION

DRIVEWAY WITH STEPS IN CENTER



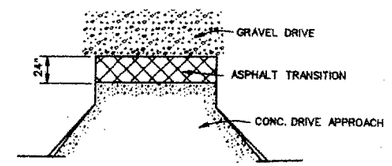
DRIVEWAYS ON ARTERIAL STREETS SHALL HAVE 10' FACE OF CURB RADII.
USE ONLY TO MATCH EXISTING CONDITIONS AS DIRECTED BY THE ENGINEER. DETAIL ON PAGE 1004 STANDARD.

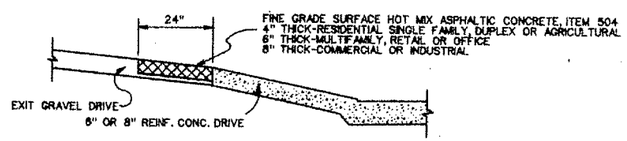
DRIVEWAY PAVING DETAILS



DRIVEWAYS ON ARTERIAL STREETS SHALL HAVE 10' FACE OF CURB RADII.

PLAN





CONCRETE DRIVE APPROACH CONNECTION
TO GRAVEL DRIVE

GENERAL NOTES

1. NOTES 1-12 ON PAGE 1004 ALSO APPLY TO THIS PAGE.
2. BAR LAPS SHALL BE 30 DIAMETERS.
3. ALTERNATE REINFORCEMENT FOR #3 BARS ON 24"C-C :
   - A. APPROVED WELDED WIRE FABRIC SHEETS MAY BE USED IN LIEU OF DEFORMED REINFORCING BARS.
   - B. THE WIRE FABRIC SHALL BE SUPPORTED ON 36" CENTERS BOTH WAYS BY APPROVED BAR CHAIRS.
   - C. THE SIZE OF THE WIRE FABRIC SHALL BE 12X12-W3.5XW3.5 WITH A NOMINAL DIA. OF 0.211 IN. & NOMINAL WT. OF 0.119 LBS/LIN. FT.

APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: April 16 1997

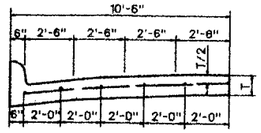
PAVING DETAILS

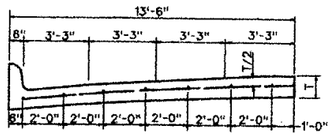
PAVING DETAILS FOR DRIVEWAYS AND INTERSECTIONS

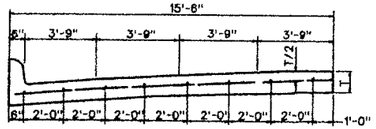
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

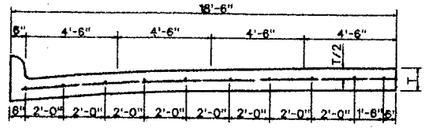
CITY OF DALLAS, TEXAS

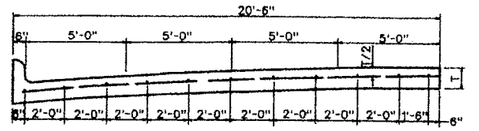
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	1005

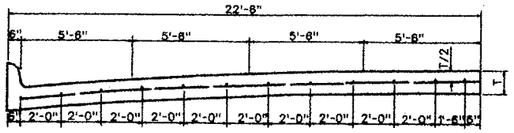


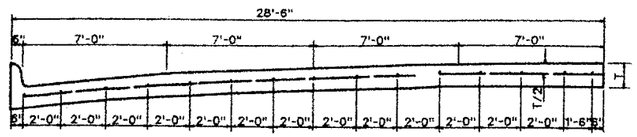


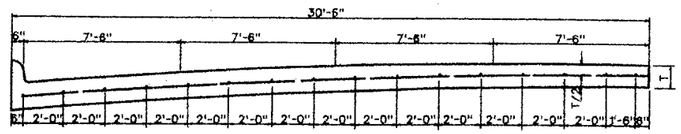








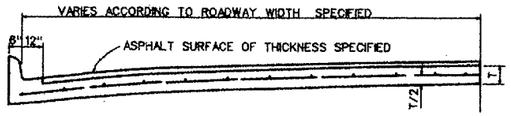




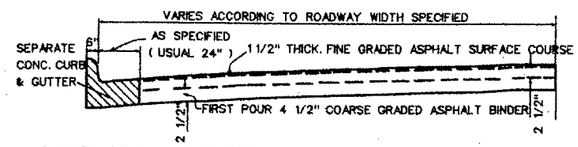
HALF SECTIONS- REINFORCED CONCRETE PAVEMENT AND CURBS

ALL BARS FOR T ≤ 9" TO BE NO. 3 TRANSVERSE BARS TO BE SPACED ON 2'-0" CENTERS. ALL CROWNS TO BE PARABOLIC IN SECTION AND SYMMETRICAL ABOUT CENTERLINE.
ALL BARS TO BE NO. 4 FOR 9" < T ≤ 12"

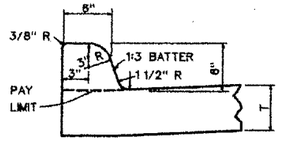
(ALTERNATE DESIGN USING PARABOLIC SECTIONS)



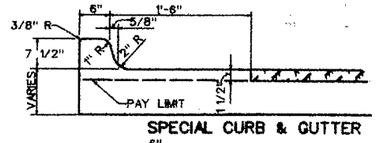
SCHEMATIC HALF SECTION OF REINFORCED CONCRETE BASE WITH INTEGRAL CURB & GUTTER AND ASPHALT SURFACE



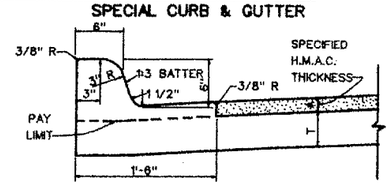
SCHEMATIC HALF SECTION OF ASPHALT PAVEMENT WITH SEPARATE CONCRETE CURB & GUTTER



INTEGRAL CURB



SPECIAL CURB & GUTTER

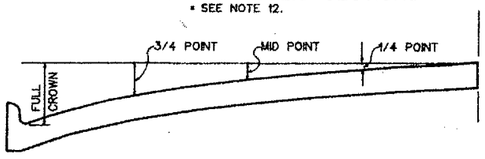


INTEGRAL CURB & GUTTER

EXCEPT AS INDICATED ABOVE, ALL SECTION DETAILS SHALL BE IDENTICAL TO THOSE SHOWN ELSEWHERE ON THIS SHEET FOR COLLECTOR AND LOCAL TYPE STREETS.

TABLE OF CROWN HEIGHTS AND ORDINATES FOR VARIOUS PARABOLIC SECTIONS

* SEE NOTE 12.



ROADWAY WIDTH	TYPE SURFACE	TOTAL CROWN	3/4 POINT	MID POINT	1/4 POINT
20'	CONCRETE	3"	1-11/16"	3/4"	3/16"
20'	ASPHALT	4"	2-1/4"	1"	1/4"
26'	CONCRETE	4"	2-1/4"	1"	1/4"
26'	ASPHALT	5"	2-13/16"	1-1/4"	5/16"
33'	CONCRETE	6"	3-3/8"	1-1/2"	3/8"
33'	ASPHALT	7"	3-15/16"	1-3/4"	7/16"
36'	CONCRETE	6"	3-3/8"	1-1/2"	3/8"
36'	ASPHALT	7"	3-15/16"	1-3/4"	7/16"
40'	CONCRETE	6"	3-3/8"	1-1/2"	3/8"
40'	ASPHALT	7"	3-15/16"	1-3/4"	7/16"
44'	CONCRETE	6"	3-3/8"	1-1/2"	3/8"
44'	ASPHALT	7"	3-15/16"	1-3/4"	7/16"
56'	CONCRETE	8"	4-1/2"	2"	1/2"
56'	ASPHALT	9"	5-1/16"	2-1/4"	9/16"
60'	CONCRETE	8"	4-1/2"	2"	1/2"
60'	ASPHALT	9"	5-1/16"	2-1/4"	9/16"

STANDARD PAVEMENT THICKNESS (T) OF STREETS FOR VARIOUS STREET CLASSIFICATIONS AND TRAFFIC DESIGN LOADING ARE AS FOLLOWS:

CLASSIFICATION	T
-LOCAL STREET, RESIDENTIAL ZONED DISTRICTS	6"
-LOCAL STREET, NONRESIDENTIAL ZONED DIST.	6"
-RESIDENTIAL COLLECTOR	8"
-COMMUNITY COLLECTOR NORMAL TRAFFIC DESIGN LOADING.	9"
-COMMUNITY COLLECTOR HEAVY TRAFFIC DESIGN LOADING.	10"
-PRINCIPAL AND MINOR ARTERIALS, NORMAL TRAFFIC DESIGN LOADING.	9"
-PRINCIPAL AND MINOR ARTERIALS, HEAVY TRAFFIC DESIGN LOADING.	11"
-CBD STREETS	10"ON 4" CTB
-CBD STREETS (ALTERNATE DESIGN)	10"ON 8"CEMENT STABILIZED SUBGRADE (10%)

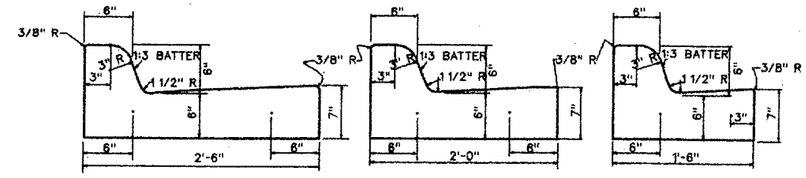
SEE PAVING DESIGN MANUAL, TABLE V-1 FOR DESIGN DETAILS

ALL DETAILS RELATING TO CROWN HEIGHTS AND CONTOUR SHALL BE IDENTICAL TO THOSE SHOWN FOR " REINFORCED CONCRETE BASE WITH ASPHALT SURFACE." ASPHALT SHALL BE PLACED IN LIFTS OF NO MORE THAN 3 INCHES.

GENERAL NOTES FOR ALL TYPES OF REINFORCED CONCRETE PAVEMENT OR BASE -- ARTERIAL, COLLECTOR, & LOCAL.

1. ALL SUBGRADE COMPACTION UNDER STREET PAVEMENT SHALL BE 98% STANDARD PROCTOR DENSITY AT +2% OF OPTIMUM MOISTURE.
2. THE MINIMUM COMPRESSIVE STRENGTH OF CONCRETE AT 28 DAYS SHALL BE AS INDICATED ON THE PLANS AND ON THE SPECIFICATIONS.
3. BARS SHALL CONFORM TO CITY OF DALLAS STANDARD SPECIFICATIONS AND BE GRADE 40 ksi DEFORMED REINFORCING BARS. SIZES AND SPACING SHALL BE AS INDICATED HEREIN EXCEPT SUCH ALTERNATES THAT MAY BE ALLOWED IN THE SPECIFICATIONS.
4. ALL CURB AND CURB & GUTTER SHALL BE INTEGRAL WITH PAVEMENT OR BASE EXCEPT THAT FOR ASPHALT PAVEMENT.
5. AS REFLECTED IN "TABLE OF CROWN HEIGHTS AND ORDINATES FOR VARIOUS PARABOLIC SECTIONS", TOTAL CROWN HEIGHTS FOR ASPHALT PAVEMENT AND CONCRETE BASE WITH ASPHALT SURFACE SHALL BE UNIFORMLY ONE INCH GREATER THAN THOSE INDICATED FOR CONCRETE SURFACES, WIDTH FOR WIDTH OF ROADWAY.
6. CROWNS FOR ALL DIVIDED ARTERIAL STREET TYPE SHALL BE STRAIGHT LINE SLOPES.
7. CROWNS FOR ALL UNDIVIDED ARTERIAL, LOCAL OR COLLECTOR STREET TYPES MAY BE PARABOLIC OR STRAIGHT IN SECTION.
8. DETAIL AND ARRANGEMENT OF JOINTS, ALL TYPES, SHALL BE AS SHOWN ON SHEET 1003.
9. INTEGRAL CONCRETE CURB AND CURB & GUTTER SHALL BE OF THE SAME COMPRESSIVE STRENGTH AS THE PAVEMENT OR BASE.
10. SEPARATE CONCRETE CURB & GUTTER SHALL BE OF THE STRENGTH SPECIFIED ON THE PLANS.
11. SEPARATE CONCRETE CURB & GUTTER SHALL BE MARKED 3/8 " DEEP WITH AN APPROVED TOOL IN 15 FOOT SECTIONS. EACH FOURTH JOINT SHALL BE AN EXPANSION JOINT CONFORMING IN DETAILS TO THOSE SHOWN IN "PART C" FOR PAVEMENT EXCEPT THAT THE FILLER SHALL BE OF 1/2 INCH PRE-MOLDED BITUMINOUS JOINT MATERIAL SHAPED SIMILAR TO THE CROSS SECTION OF CURB & GUTTER. THREE DOWELS SHALL BE EMPLOYED FOR EACH EXPANSION JOINT.
12. BAR LAPS SHALL BE 30 DIAMETERS.
13. SIX INCHES OF LIME STABILIZED SUBGRADE REQUIRED WHEN THE SOIL P.I. IS GREATER THAN 15 FOR LOCAL STREETS.

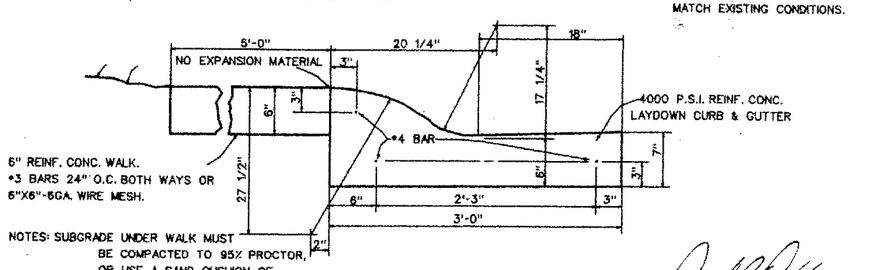
-EIGHT INCHES OF LIME OR CEMENT TREATED SUBGRADE REQUIRED WHEN THE SOIL P.I. IS GREATER THAN 15 FOR COLLECTOR OR ARTERIAL STREETS, NORMAL TRAFFIC DESIGN LOADING.
-EIGHT INCHES OF CEMENT MODIFIED SUBGRADE (AT 4% DRY WEIGHT OF SOIL) FOR ARTERIAL STREETS WHEN SOIL P.I. IS LESS THAN OR EQUAL TO 15, NORMAL TRAFFIC DESIGN LOADING.
-EIGHT INCHES OF CEMENT STABILIZED SUBGRADE FOR COMMUNITY COLLECTOR AND ARTERIAL STREETS REGARDLESS OF SOIL P.I. FOR HEAVY TRAFFIC LOADING DESIGNS. (SEE PAVING DESIGN MANUAL, TABLE V-1)
-CBD STREETS REQUIRE 4" CTB, 650 PSI COMPRESSIVE STRENGTH ON 6" COMPACTED SUBGRADE WITH 10" THICK REINFORCED CONCRETE PAVEMENT, REGARDLESS OF SOIL P.I. OR, IN THE ALTERNATE, 8 INCHES OF CEMENT STABILIZED SUBGRADE (AT 10% OF DRY WEIGHT OF SOIL) WITH 10" THICK REINFORCED CONCRETE PAVEMENT. SEE PAVING DESIGN MANUAL, TABLE V-1 FOR DESIGN DETAILS.



SEPARATE CURB & GUTTER
REINFORCEMENT SHALL BE NO. 4 BARS

NOTE: SEPARATE CURB WITH 12" AND 18" GUTTER SHALL BE USED ONLY AS REPLACEMENT TO MATCH EXISTING CONDITIONS.

CURB AND CURB & GUTTER

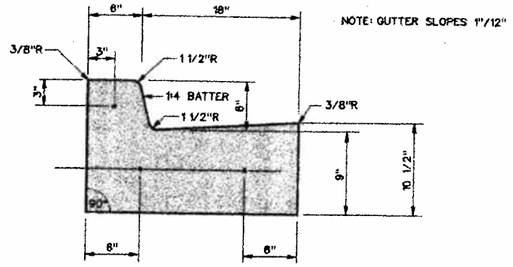


NOTES: SUBGRADE UNDER WALK MUST BE COMPACTED TO 95% PROCTOR, OR USE A SAND CUSHION OF 4" MIN. THICKNESS.

MOUNTABLE CURB AND GUTTER DETAILS
REINF. CONC. WALK DETAILS

APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: April 14, 1997

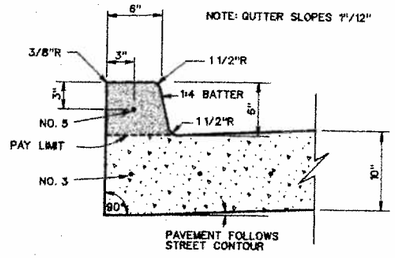
PAVING DETAILS					
PAVEMENT HALF SECTIONS AND CURB SECTIONS					
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION					
CITY OF DALLAS, TEXAS					
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	1006



REINFORCEMENT SHALL BE NO. 5 BARS

CBD SEPARATE CURB & GUTTER

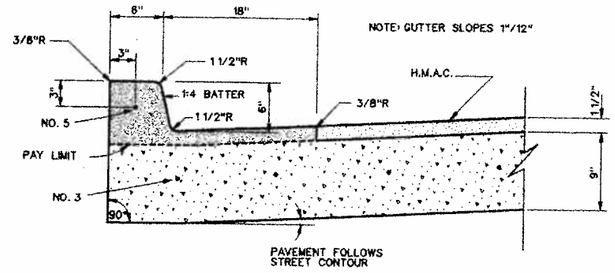
SCALE: 1 1/2" = 1'



REINFORCEMENT SHALL BE AS NOTED

CBD INTEGRAL CURB

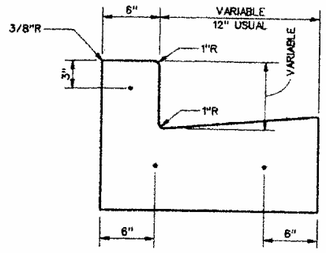
SCALE: 1 1/2" = 1'



REINFORCEMENT SHALL BE AS NOTED

CBD INTEGRAL CURB & GUTTER

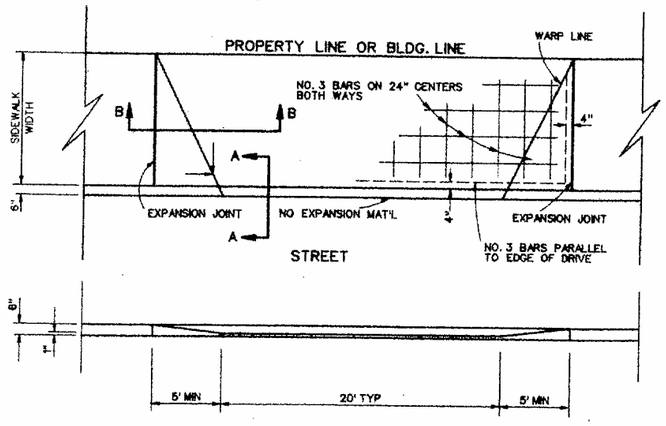
SCALE: 1 1/2" = 1'

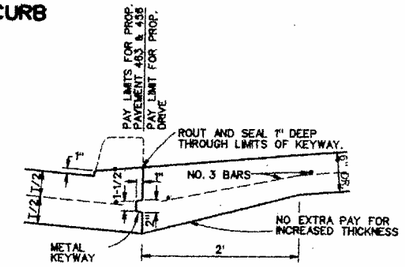


CBD SEPARATE CURB & GUTTER

FOR REPLACEMENT OF MID-BLOCK SECTIONS TO MATCH EXISTING

NO SCALE





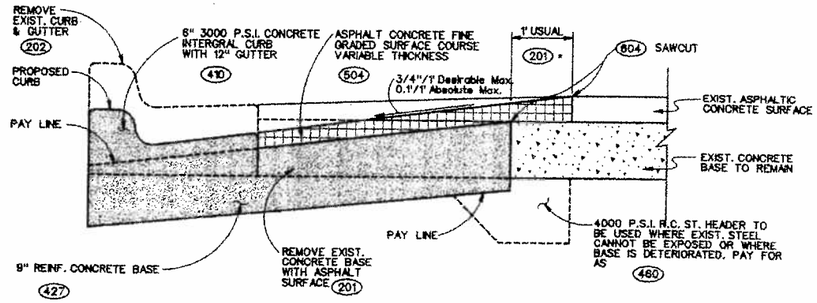
SECTION A-A

NO SCALE

NOTES:

1. STANDARD PAVEMENT FOR CBD STREETS IS INTEGRAL CURB WITH 10" THICK REINFORCED CONCRETE PAVEMENT ON 4" CTB 650 PSI, NO ASPHALT SURFACES. ANY EXCEPTIONS MUST BE PROVIDED FOR IN THE PLANS APPROVED FOR THE PROJECT.
2. 9" BASE USED WITH STANDARD 4" CTB, 650 PSI DESIGN; 9" BASE USED ON ALTERNATE 8" CEMENT STABILIZED SUBGRADE (@10%) DESIGN
3. KEYWAY LIMITS WILL COINCIDE WITH LIMITS OF 1" CURB.
4. REINFORCING STEEL WILL NOT EXTEND THROUGH KEYWAY. DRIVE WILL NOT BE TIED TO PAVEMENT.
5. MAXIMUM SLOPE ON DRIVE IN ANY DIRECTION SHOULD BE 1" PER 1', TO RESPECT PRINCIPLES OF BARRIER FREE CONSTRUCTION.
6. LENGTH OF TRANSITION FOR CURB AT EACH SIDE OF DRIVE MAY VARY DUE TO STREET GRADES AND REQUIREMENT TO HOLD MAXIMUM SLOPE OF 1" PER 1'.

* REMOVAL OF ASPHALT CONCRETE OVER CONCRETE BASE WHICH WILL REMAIN IN PLACE WILL BE PAID FOR AS (201)



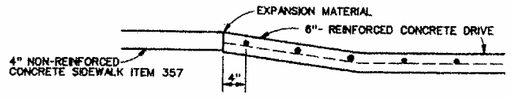
CBD PAVEMENT REPLACEMENT

NO SCALE

7-16-85

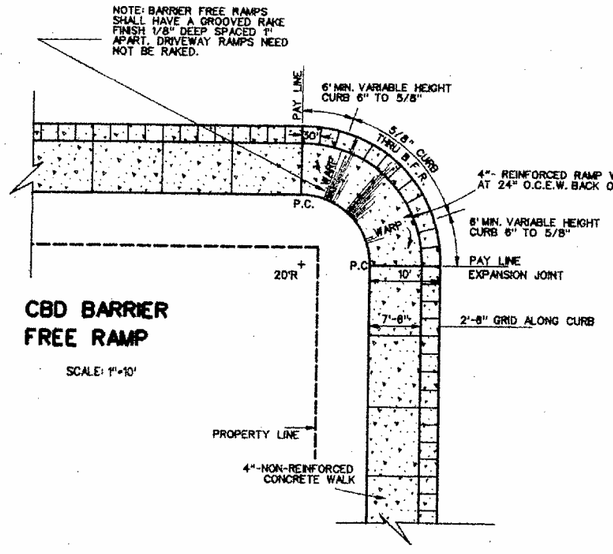
CBD DRIVEWAY TURNOUT DETAIL

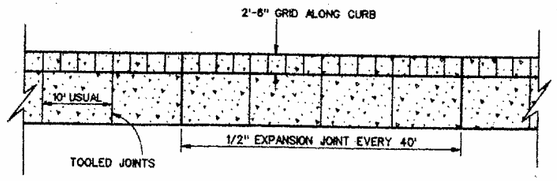
SCALE: 1" = 5'



SECTION B-B

NO SCALE

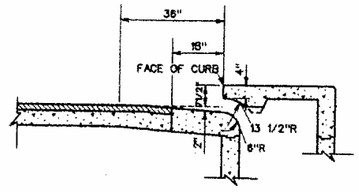




TYPICAL SIDEWALK

SCALE: 1"=10'

NOTE: TOOLED JOINTS FOR SIDEWALKS AGAINST CURB MUST MATCH STREET PAVING JOINTS. EXPANSION JOINTS FOR SIDEWALKS AGAINST CURB MUST ALIGN WITH THE EXPANSION JOINTS IN STREET PAVEMENT.



CBD DETAIL FOR SHALLOW DEPRESSION INLETS

SCALE: 1/2"=1'

NOTE: SEE PAGE 2004 FOR REINFORCEMENT DETAILS

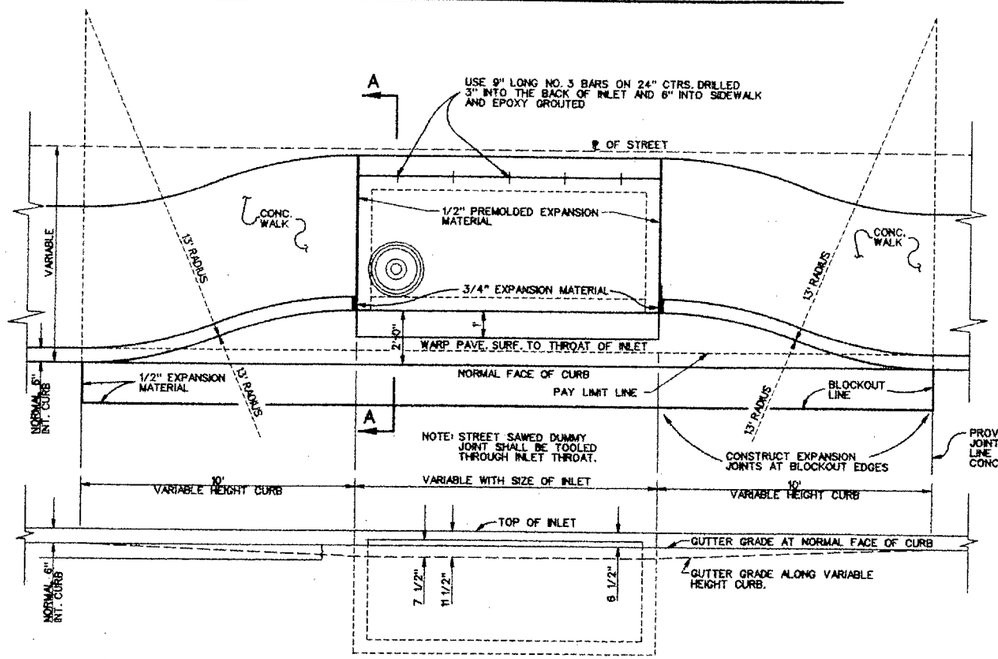
APPROVED

DIRECTOR OF PUBLIC WORKS & TRANSPORTATION

DATE: March 14, 1997

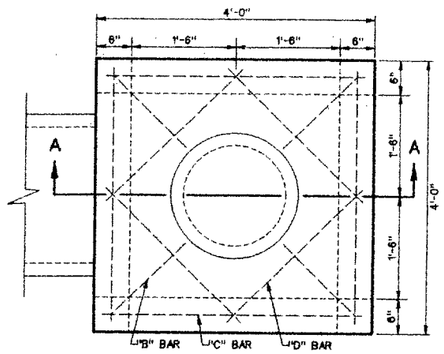
MISCELLANEOUS DETAILS					
CBD					
SPECIAL DETAILS					
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION					
CITY OF DALLAS, TEXAS					
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	1007

STANDARD RECESSED STORM DRAINAGE INLETS & CURBS

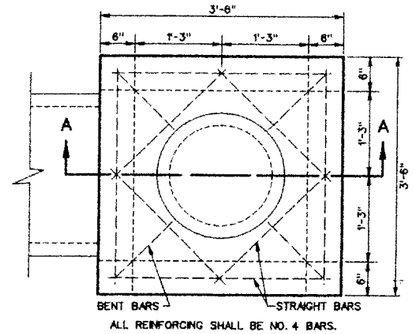


SECTION B-B

SPECIAL "Y" INLET



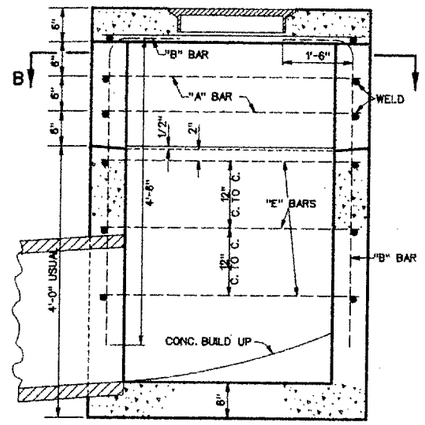
STANDARD TYPE "Y" INLET



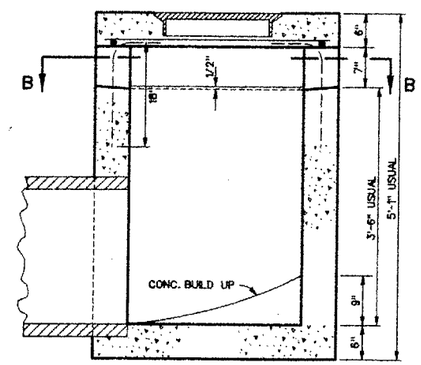
ALL REINFORCING SHALL BE NO. 4 BARS.

NOTES: DEPTH OF INLETS MAY VARY TO SUIT CONDITIONS IN THE FIELD OR AS SPECIFIED ON PLANS.

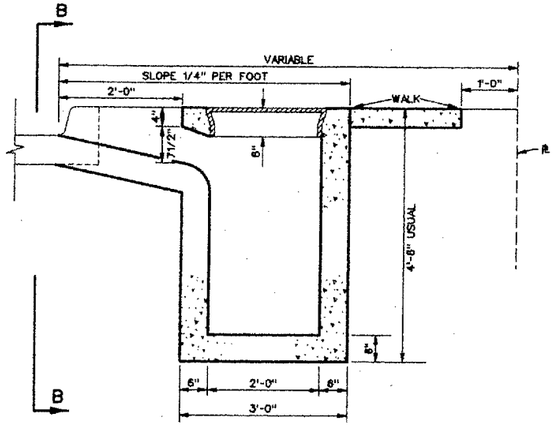
USE CITY OF DALLAS STANDARD INLET FRAME & COVER PAGE 2004 (22 1/8 " FRAME)



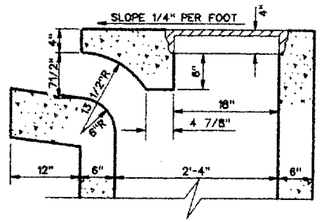
SECTION A-A



SECTION A-A



SECTION A-A
FOR 36", 48" & 60" INLETS

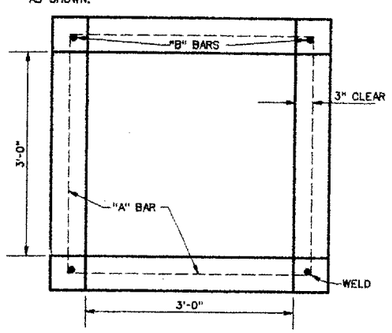


SECTION A-A
FOR 6', 8' & 10' INLETS

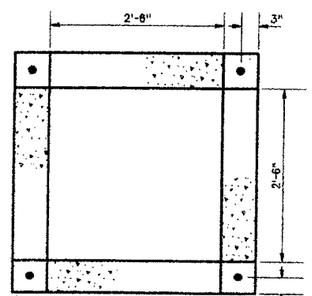
NOTE:
1. SEE PAGE 2004 FOR REINFORCING & BEAM DESIGN.
2. PLASTIC OR NEOPRENE COATED STEEL STEPS SHALL BE PROVIDED FOR ALL EXTRA DEPTH INLETS GREATER THAN 4.5' AND SHALL BE EMBEDDED SECURELY INTO BACK OF INLET ON 15" CENTERS VERTICALLY AND STAGGERED ON 12" CENTERS HORIZONTALLY.
3. SEE DETAIL ABOVE FOR PROPER INLET TIE-IN TO ADJACENT SIDEWALK FOR ALL SIZE INLETS THAT ARE ADJACENT TO SIDEWALKS.
4. GENERAL NOTES 1-10 ON SHEET 2003 ALSO APPLY TO THIS SHEET.
5. EXPANSION JOINTS SHALL BE CONSTRUCTED ALONG EDGES OF ALL STREET INLET PAVEMENT BLOCKOUTS.
6. CONCRETE FOR INLETS TOPS SHALL BE CLASS HAND FINISH CONCRETE (4500 psi) WHEN USED IN STREETS AND ALLEYS.

"A" BARS SHALL BE NO. 8 BARS PLACED AS SHOWN & WELDED AT EACH CORNER OF THE INLET.

ALL OTHER BARS SHALL BE NO. 5 BARS PLACED AS SHOWN.



SECTION B-B

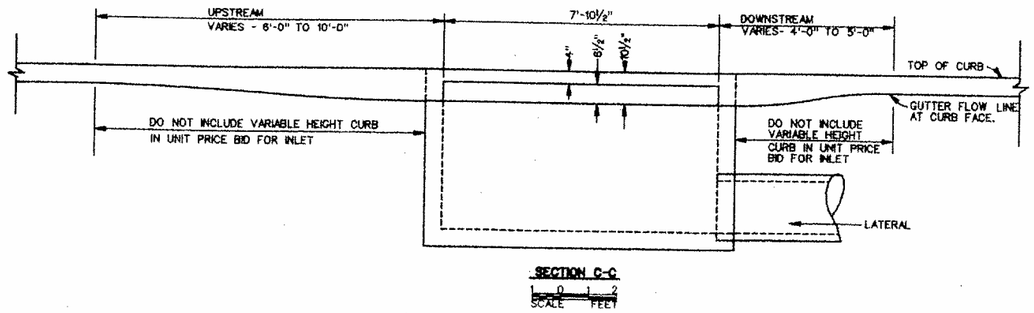


SECTION B-B

APPROVED _____ DIRECTOR OF PUBLIC WORKS & TRANSPORTATION

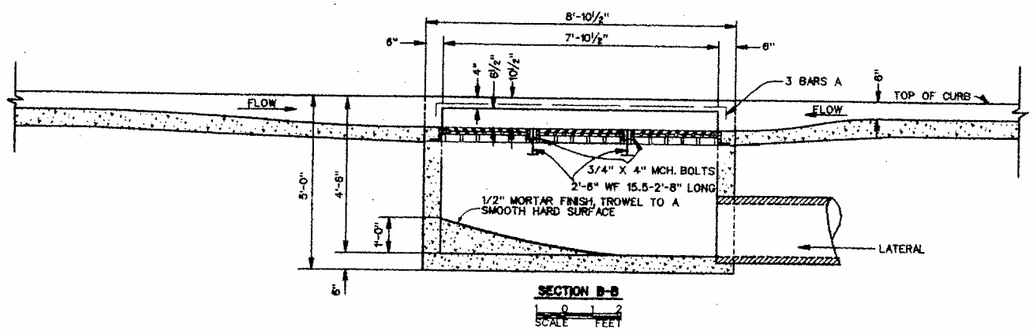
DATE: March 14, 1997

DRAINAGE DETAILS					
STANDARD INLETS & CURBS					
"Y" TYPE INLETS					
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION					
CITY OF DALLAS, TEXAS					
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	2001



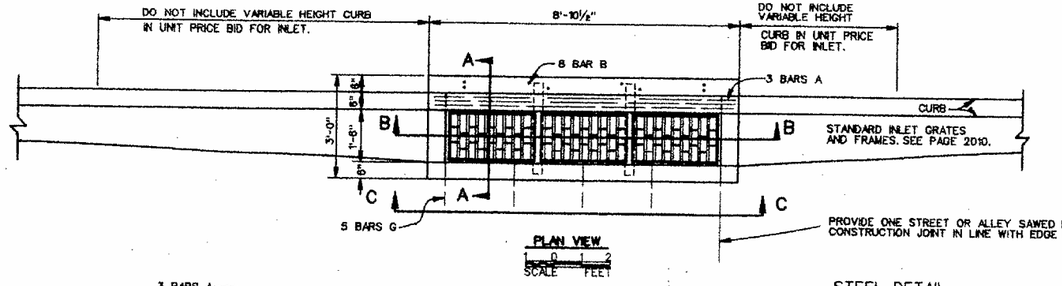
SECTION C-C

SCALE 0 1 2 FEET



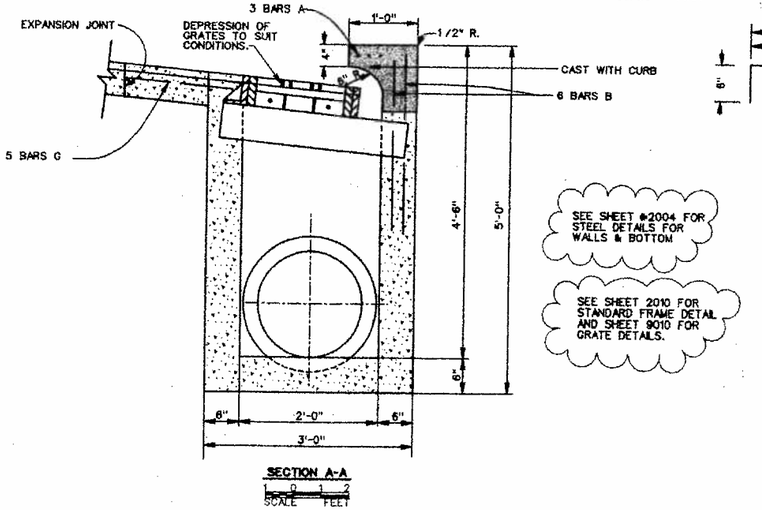
SECTION B-B

SCALE 0 1 2 FEET



PLAN VIEW

SCALE 0 1 2 FEET



SECTION A-A

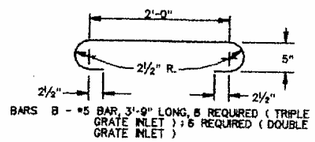
SCALE 0 1 2 FEET

STEEL DETAIL

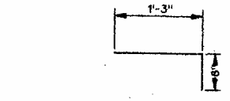
8'-8" - TRIPLE GRATE INLET
5'-11" - DOUBLE GRATE INLET

8"

BARS A - #5 BAR, 9'-8" LONG (TRIPLE GRATE INLET) 6'-11" LONG (DOUBLE GRATE INLET), 3 REQUIRED.



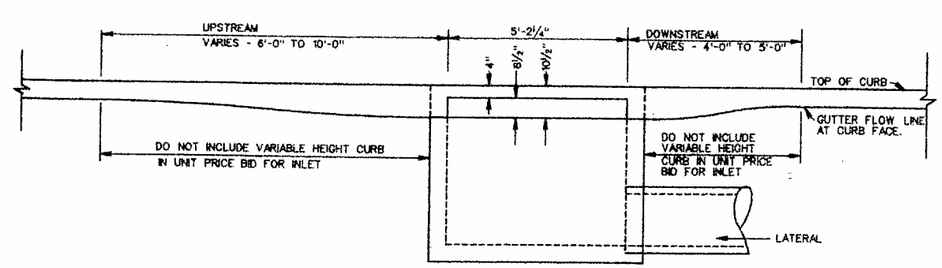
BARS B - #5 BAR, 3'-9" LONG, 8 REQUIRED (TRIPLE GRATE INLET) ; 6 REQUIRED (DOUBLE GRATE INLET)



BARS G - #3 BAR, 1'-3" LONG, 5 REQUIRED (TRIPLE GRATE INLET) ; 3 REQUIRED (DOUBLE GRATE INLET)

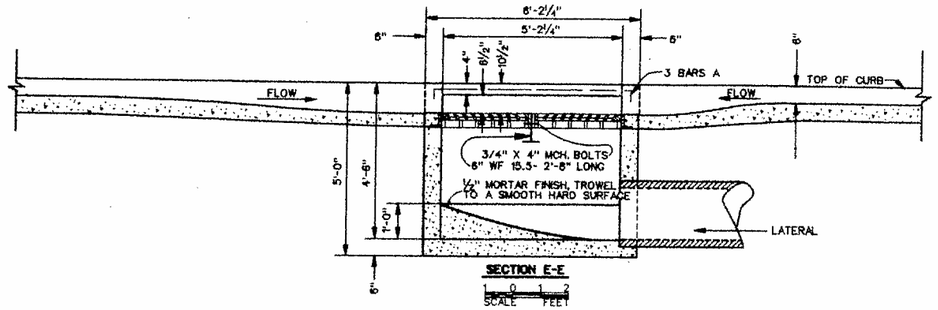
SEE SHEET #2004 FOR STEEL DETAILS FOR WALLS & BOTTOM

SEE SHEET 2010 FOR STANDARD FRAME DETAIL AND SHEET 9010 FOR GRATE DETAILS.



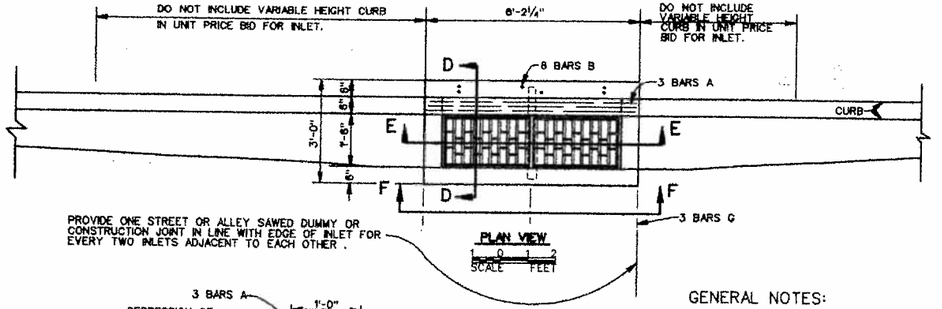
SECTION F-F

SCALE 0 1 2 FEET



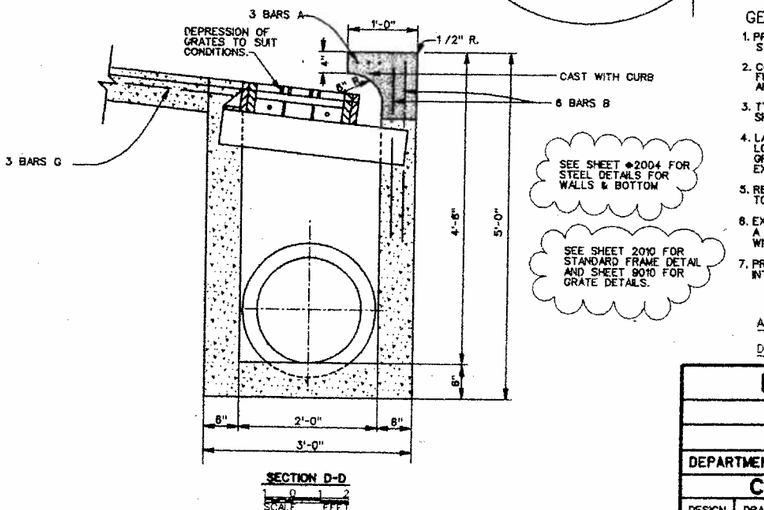
SECTION E-E

SCALE 0 1 2 FEET



PLAN VIEW

SCALE 0 1 2 FEET



SECTION D-D

SCALE 0 1 2 FEET

SEE SHEET #2004 FOR STEEL DETAILS FOR WALLS & BOTTOM

SEE SHEET 2010 FOR STANDARD FRAME DETAIL AND SHEET 9010 FOR GRATE DETAILS.

GENERAL NOTES:

1. PROVIDE EXPANSION JOINTS ALONG EDGES OF ALL STREET PAVEMENT BLOCKOUTS.
2. CONCRETE FOR INLET TOPS SHALL BE CLASS A HAND FINISH CONCRETE (4500 psi) WHEN USED IN STREETS AND ALLEYS.
3. TYPE " L " GRATES SHALL BE USED AS SHOWN ON SHEET 9010.
4. LATERAL MAY ENTER INLET AT ANY GRADE, ANGLE OR LOCATION. INCLUDE IN UNIT PRICE BID FOR STANDARD GRATE INLET COMPLETE IN PLACE ALL ITEMS, INCLUDING EXCAVATION.
5. REINFORCING STEEL AND CASTING SHALL CONFORM TO THE SPECIFICATIONS.
6. EXTRA DEPTH OF INLETS WILL BE DIMENSIONED ON PLANS. A SEPARATE BID ITEM PER FOOT OF EXTRA DEPTH WILL BE PROVIDED. STEPS WILL BE REQUIRED.
7. PROVIDE STREET AND ALLEY JOINTS AS SHOWN FOR INTEGRAL CONCRETE PAVEMENT.

APPROVED

DIRECTOR OF PUBLIC WORKS & TRANSPORTATION

DATE: April 16, 1997

DRAINAGE DETAILS

DOUBLE GRATE INLET

TRIPLE GRATE INLET

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

CITY OF DALLAS, TEXAS

DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	2002

STEEL SCHEDULE FOR 14-FOOT INLETS

BAR CODE	NO. REQ'D	BAR SIZE	LENGTH	SPACE	WEIGHT (LBS.)	DESCRIPTION AND REMARKS	
A	12	4	18'-1"	*	129	SEE DETAILS	* WALLS 13" CTR. * BOTTOM 12" CTR.
B	10	4	11'-2"	21½"	79	SEE DETAILS	SEE SECTION "EE"
C	14	4	4'-9¼"	18"	45	SEE DETAILS	SEE SECTION "BB"
D	2	4	14'-1½"	8"	19	SEE DETAILS	
F	7	4	16'-1"	*	75	SEE DETAILS	* SEE SECTION "CC"
G	15	3	3'-9"	12"	28	SEE DETAILS	* SEE SECTION "BB"
H	4	4	4'-7"	* 4½"	13	SEE DETAILS	* SEE SECTION "EE"
J	12	3	3'-0"	18"	14	SEE DETAILS	
K	2	4	3'-0"	*	4.00	STRAIGHT BARS,	* SEE SECTION "BB"
U	5	3	3'-9"	9⅜"	8	SEE DETAILS	

TOTAL STEEL FOR 4'-6" STANDARD DEPTH INLET. 415 LBS.

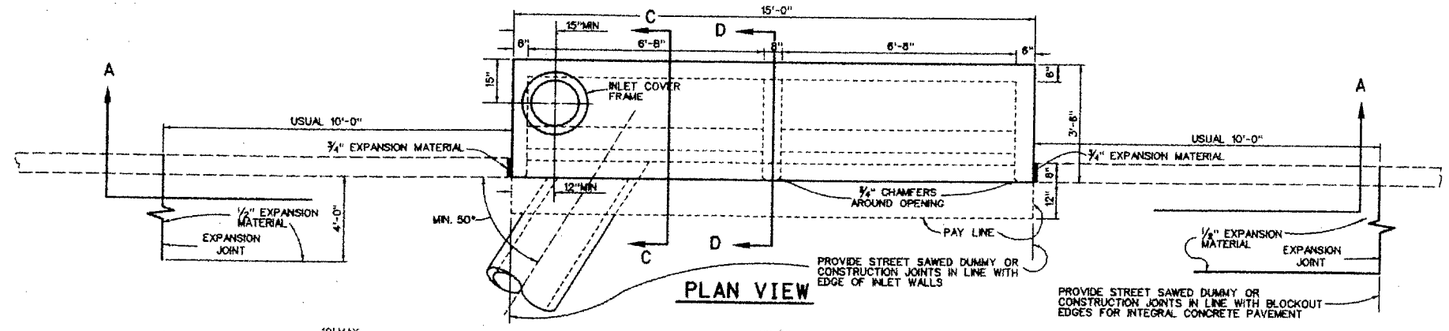
WEIGHT OF STEEL MAY VARY WITH INCREASED DEPTH OF INLET BY AN AVERAGE OF 17.5 LBS PER EACH ½ FOOT OF EXTRA DEPTH.

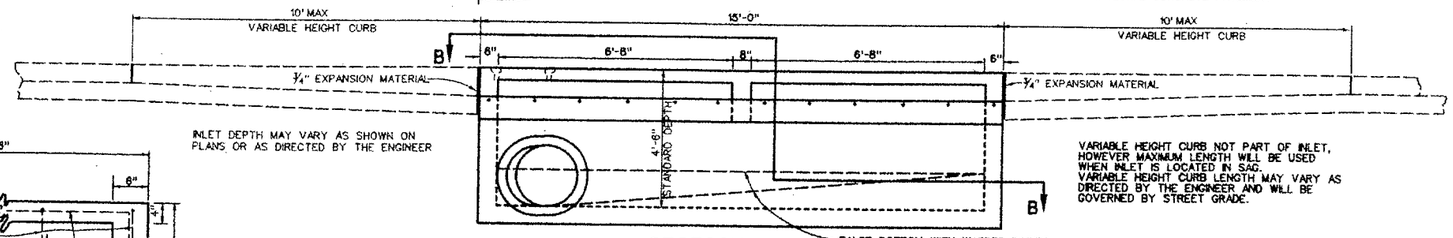
5.25 CUBIC YARDS OF 3000 P.S.I. CONCRETE REQUIRED PER STANDARD INLET

CONCRETE FOR EACH ADDITIONAL ½ FOOT OF DEPTH 0.32 CU. YD.

ALTERNATE CONSTRUCTION

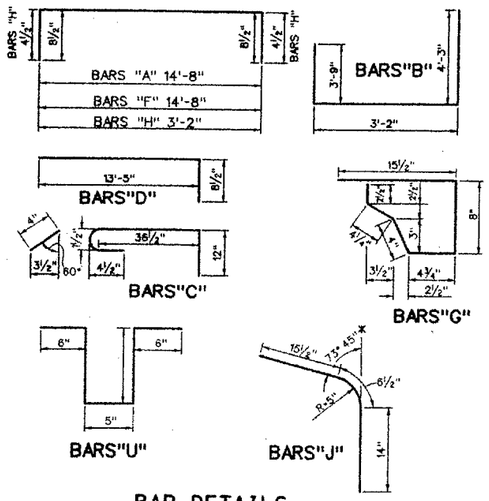
ALTERNATE PRECAST INLET BOTTOMS MAY BE APPROVED ON A INDIVIDUAL BASIS FOR INLETS IN STREETS AND ALLEYS ONLY. PRE-CAST INLETS SHALL BE OF EQUAL OR BETTER STRENGTH, MATERIAL AND WORKMANSHIP, AND SHALL MEET THE STANDARD DESIGN CRITERIA OF THE CAST IN PLACE INLETS SHOWN IN THESE DETAILS.



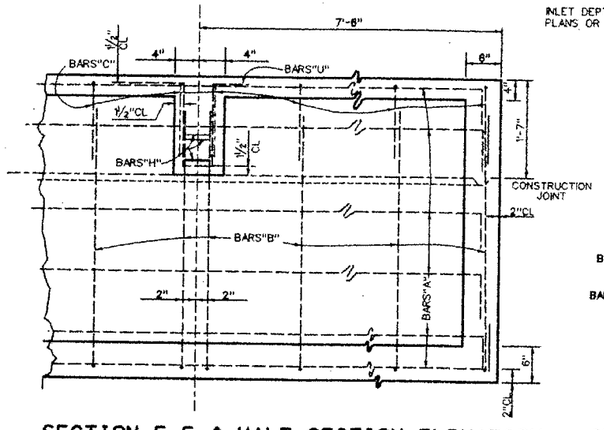


INLET DEPTH MAY VARY AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER

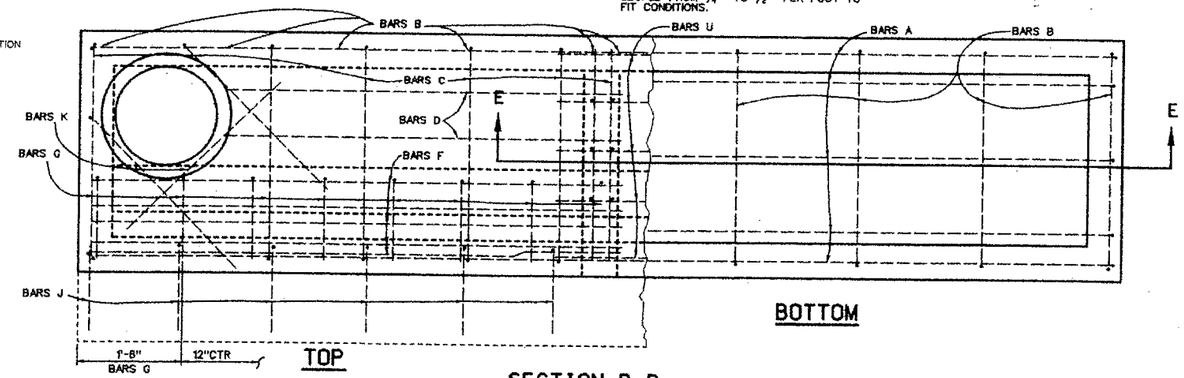
VARIABLE HEIGHT CURB NOT PART OF INLET, HOWEVER MAXIMUM LENGTH WILL BE USED WHEN INLET IS LOCATED IN SAG. VARIABLE HEIGHT CURB LENGTH MAY VARY AS DIRECTED BY THE ENGINEER AND WILL BE GOVERNED BY STREET GRADE.



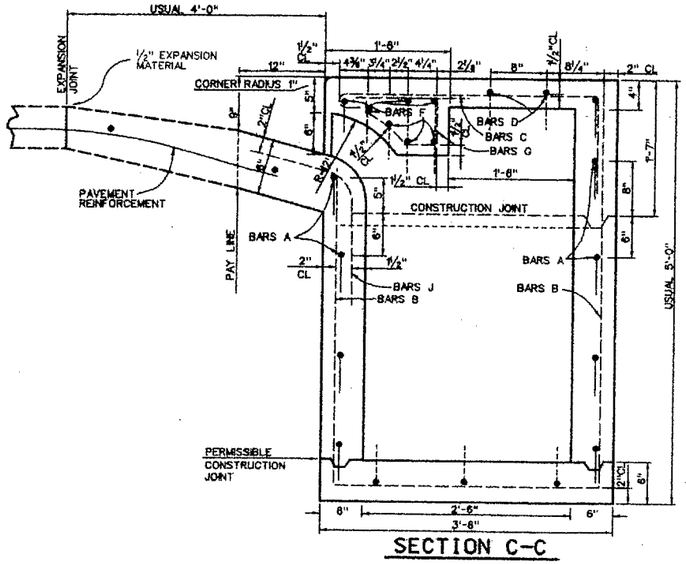
BAR DETAILS



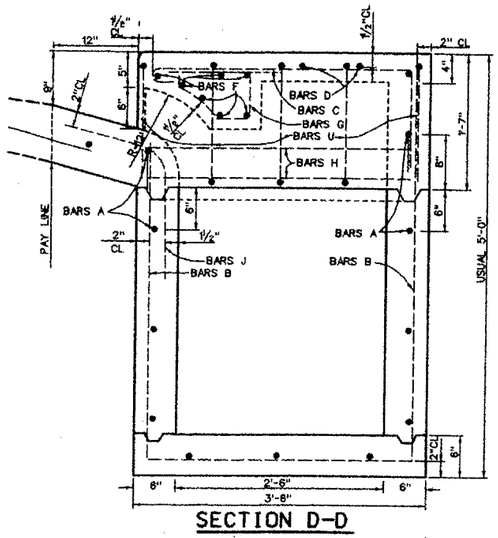
SECTION E-E & HALF SECTION ELEVATION



SECTION B-B PLAN



SECTION C-C



SECTION D-D

GENERAL NOTES

1. CONCRETE FOR INLET CONSTRUCTION SHALL BE CLASS HAND FINISH CONCRETE (4500 psi) WHEN USED IN STREETS AND ALLEYS.
2. DIMENSIONS RELATING TO PLACEMENT OF REINFORCING BARS ARE FROM CENTER TO CENTER OF BARS UNLESS OTHERWISE NOTED. BAR SPLICES ARE PERMISSIBLE IF BARS ARE TIED AND OVERLAPPED 30 DIAMETERS.
3. PIPE LATERALS MAY ENTER INLET AT SIDES OR ENDS.
4. STRUCTURAL EXCAVATION WILL NOT BE A SEPARATE PAY ITEM.
5. CHAMFER ALL EXPOSED EDGES AROUND INLET OPENINGS ¾".
6. INLET COVER & FRAME SHALL BE AT THE SAME END OF INLET AS PIPE LATERAL.
7. SEE SHEET 2001 FOR SIDEWALK ADJACENT TO INLET DETAIL.
8. PROVIDE STREET JOINTS AS SHOWN FOR INTEGRAL CONCRETE PAVEMENT.
9. PROVIDE EXPANSION JOINTS ALONG EDGES OF ALL STREET PAVEMENT BLOCKOUTS.
10. EXTRA DEPTH INLETS WILL BE DIMENSIONED ON PLANS. A SEPARATE BID ITEM PER FOOT OF EXTRA DEPTH WILL BE PROVIDED. STEPS WILL BE REQUIRED IN THIS CASE.

NO SCALE

APPROVED _____ DIRECTOR OF PUBLIC WORKS & TRANSPORTATION

DATE: March 14, 1997

DRAINAGE DETAILS

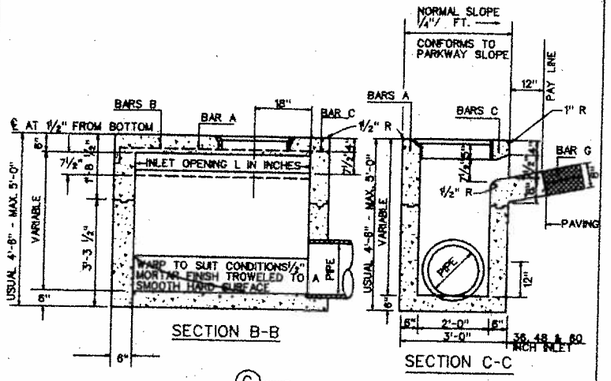
"14-FOOT" CURB INLET

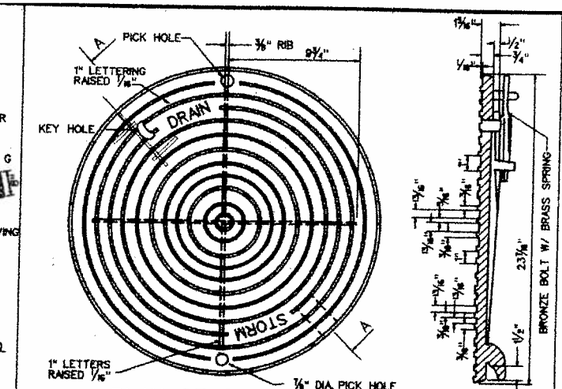
STANDARD DEPTH 4-FEET 6-INCHES

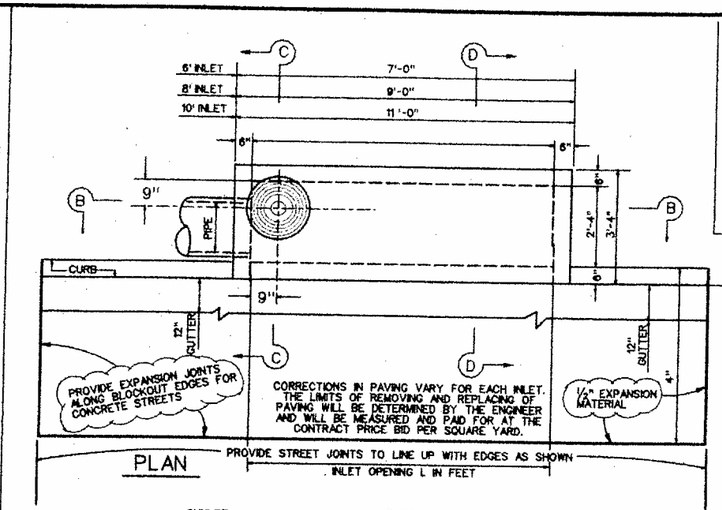
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

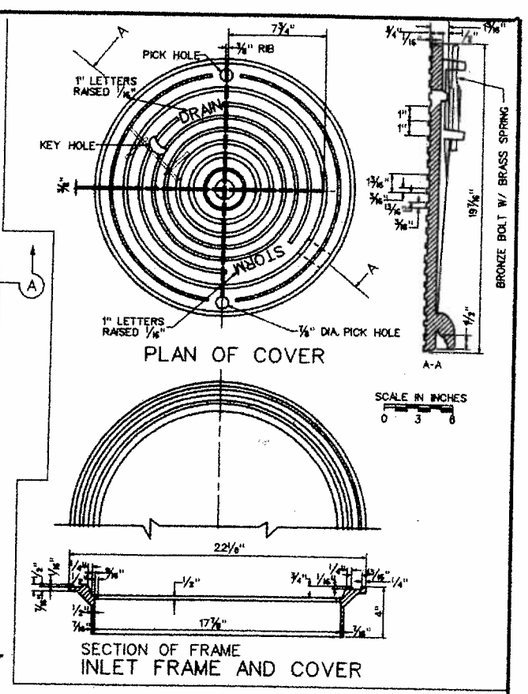
CITY OF DALLAS, TEXAS

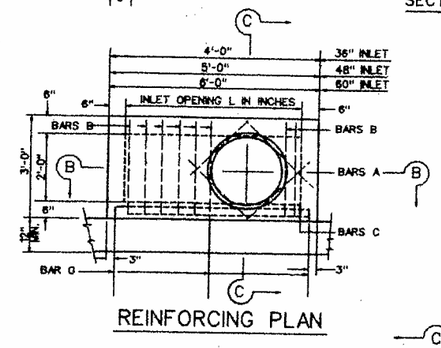
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	2003

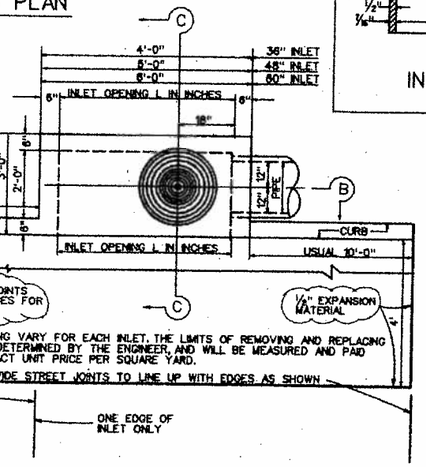


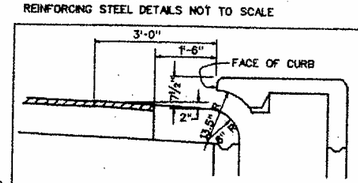


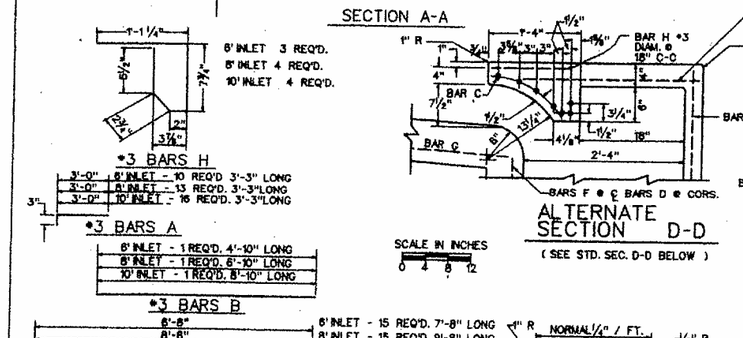


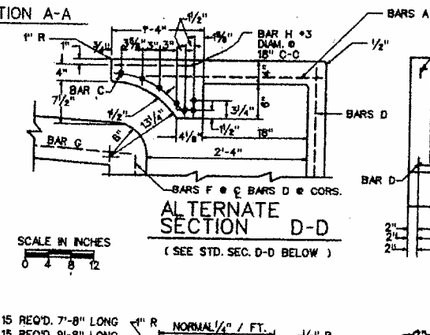


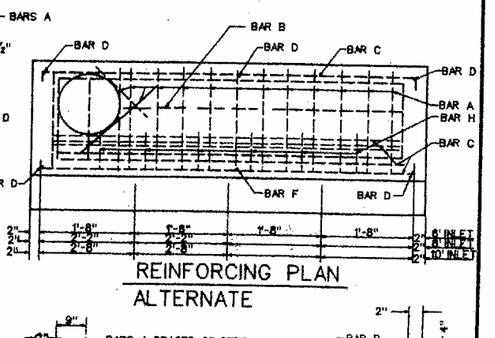


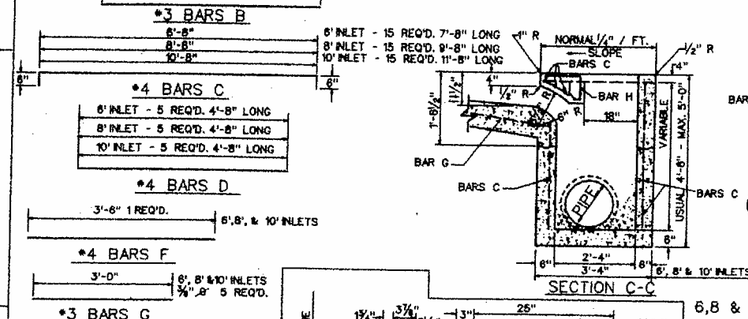


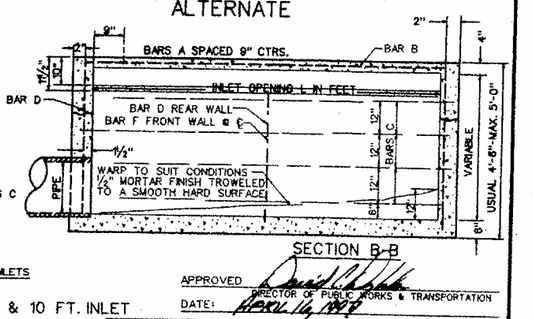


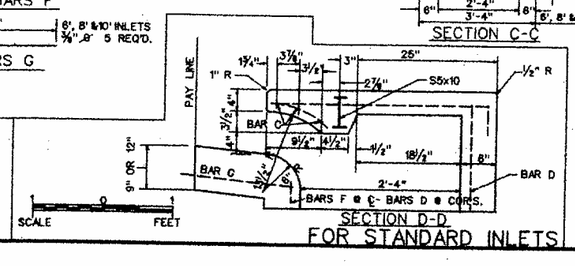












APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: March 14, 1997

6,8 & 10 FT. INLET

SCALE IN FEET
0 1 2 3

NOTES APPLICABLE TO ALL INLETS:

1. LATERAL PIPE MAY ENTER INLET AT ANY LOCATION. REINFORCEMENT, STRUCTURAL STEEL AND CASTINGS SHALL CONFORM TO THE SPECIFICATIONS.
2. GENERAL NOTES 1-10 ON SHEET 2003 ALSO APPLY.
3. TOP OF INLET SLOPE SHALL CONFORM TO ADJACENT PARKWAY NORMAL 1/4" / FT. SLOPE.
4. CONCRETE FOR INLET TOPS SHALL BE CLASS HAND FINISH CONCRETE (4500 psi) WHEN USED IN STREETS AND ALLEYS.
5. ALTERNATE CONSTRUCTION. ALTERNATE PRECAST INLETS MAY BE APPROVED ON AN INDIVIDUAL BASIS PRECAST INLETS SHALL BE OF EQUAL OR BETTER STRENGTH MATERIAL AND WORKMANSHIP AND SHALL MEET THE STANDARD DESIGN CRITERIA OF THE CAST-IN-PLACE INLETS SHOWN IN THESE DETAILS.
6. THE INLET FRAME & COVER SHALL BE AT THE SAME END OF INLET AS PIPE LATERAL.
7. PROVIDE SHEET JOINTS IN INTEGRAL CONCRETE STREET PAVEMENT AS SHOWN.

36, 48 AND 60 INCH INLETS

FOR STANDARD INLETS

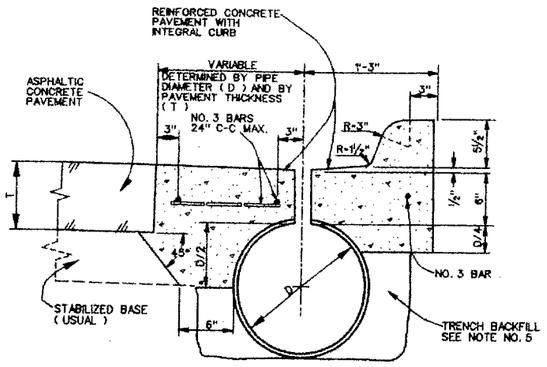
DRAINAGE DETAILS

36, 48, AND 60 INCH INLETS
6, 8 AND 10 FOOT INLETS

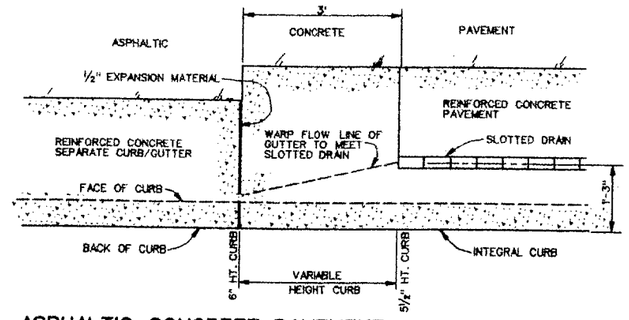
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

CITY OF DALLAS, TEXAS

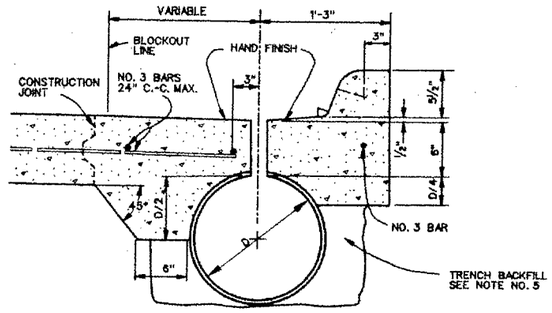
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B. & A.	APRIL 1997	251D	1	2004



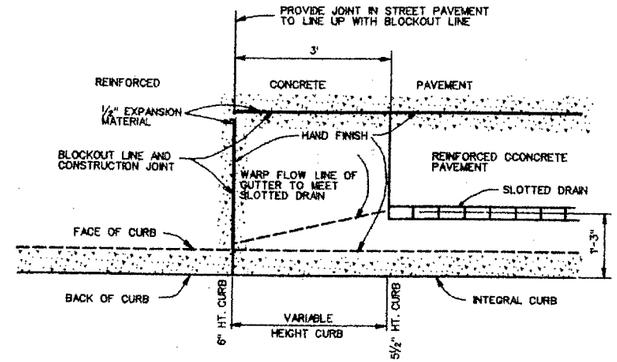
SECTION WITH ASPHALTIC CONCRETE PAVEMENT



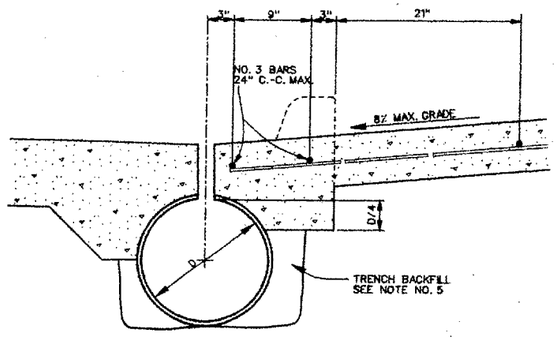
ASPHALTIC CONCRETE PAVEMENT
PAVEMENT TRANSITION AT END OF SLOTTED DRAIN



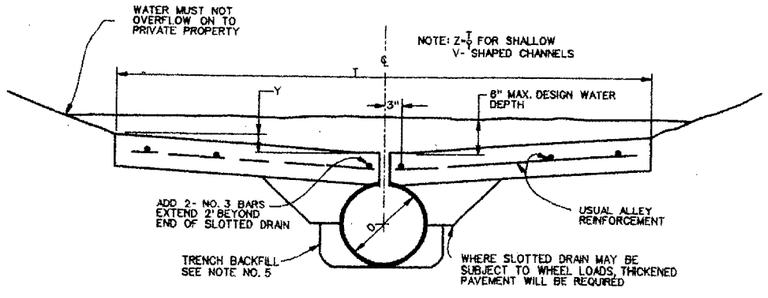
SECTION WITH REINFORCED CONCRETE PAVEMENT



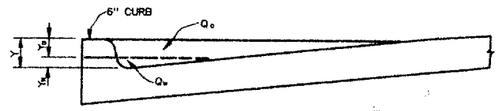
REINFORCED CONCRETE PAVEMENT
PAVEMENT TRANSITION AT END OF SLOTTED DRAIN



SECTION THROUGH DRIVE



SECTION THROUGH VALLEY
ALLEYS, PARKING LOTS, ETC.



Q = GUTTER CAPACITY = $Q_o + Q_w$

$Q = 0.56 \left(\frac{Z}{N}\right) S^{1/2} Y^{8/3}$ OR USE TRIANGULAR CHANNEL FLOW NOMOGRAPH

Z = RECIPROCAL OF CROSS SLOPE
N = ROUGHNESS COEFFICIENT IN MANNING FORMULA (USE N = 0.0175)
Y = DEPTH OF FLOW. MAX. = HEIGHT OF CURB (USUALLY 6")
S = GRADE OF GUTTER IN FT./ FT.

Q_w = PORTION OF WATER DRAINED BY WEIR FLOW

$Q_w = 0.56 \left(\frac{Z}{N}\right) S^{1/2} Y_w^{8/3}$

Y_w = DEPTH OF WATER CONSIDERED AS WEIR FLOW /< 0.2'

Q_o = PORTION OF WATER DRAINED BY ORIFICE FLOW = $Q - Q_w$

Y_o = DEPTH OF WATER CONSIDER AS ORIFICE FLOW > 0.2'

L_w = LENGTH OF SLOTTED DRAIN NECESSARY TO PICK UP WEIR FLOW (Q_w)

$$L_w = \frac{Q_w}{C_w H_w^{3/2}} = \frac{Q_w}{0.103} = 9.7\, Q_w \quad (Y_w = 0.2')$$

C_w = WEIR COEFFICIENT = 3.26

H_w = AVERAGE DEPTH OF FLOW IN FEET = 0.1'

L_o = LENGTH OF SLOTTED DRAIN NECESSARY TO PICK UP ORIFICE FLOW (Q_o)

$$L_o = \frac{Q_o}{C_o A_o \sqrt{2 g H_o}} = \frac{Q_o}{0.399} = 2.5\, Q_o \quad (\text{FOR } Y = 6")$$

C_o = ORIFICE COEFFICIENT = 0.60
A_o = AREA OF ORIFICE = 0.14 SQ. FT. / LN. FT.
g = ACCELERATION OF GRAVITY = 32.2 FT. / SEC. / SEC.
H_o = AVERAGE DEPTH OF FLOW IN FEET = 0.35' FOR Y = 6"

L = ADJUSTED LENGTH OF SLOTTED DRAIN DUE TO GUTTER GRADE

S/< 1% : NO ADJUSTMENT

$S > 1\% : L = \frac{L_o + L_w}{1 - 4S}$

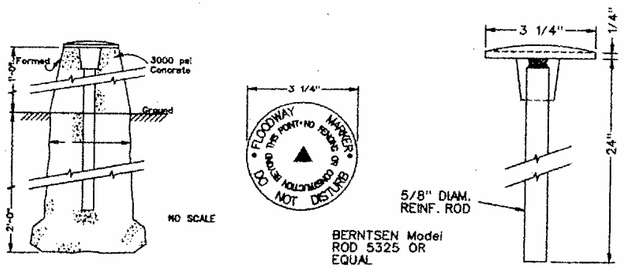
GENERAL NOTES :

1. ECONOMICAL INSTALLATION ON GRADE SHOULD BE DESIGNED TO PICK UP ORIFICE FLOW ONLY AND BYPASS WEIR FLOW. FOR Y=6", USE $Q_D = 0.9Q$.
2. SLOTTED DRAIN IS MANUFACTURED IN 20' LENGTHS. INSTALLATIONS SHOULD BE MULTIPLES OF 20' OR HALF-LENGTH SECTIONS OF 10'.
3. SPECIAL PERMISSION IS REQUIRED FOR SLOTTED DRAIN INSTALLATION IN SAGS.
4. SLOTTED DRAINS WILL BE CONNECTED TO MAIN STORM DRAIN BY STANDARD BENDS, CONNECTING BANDS AND THE REQUIRED LENGTH AND SIZE OF CORRUGATED METAL PIPE.
5. TRENCH BACKFILL MUST BE TAMPED TO 95% OF MAXIMUM DENSITY, OR A CEMENT - SAND CONCRETE SLURRY OR LEAN GROUT MAY BE USED.
6. THE EXTRA CONCRETE FOR THE THICKENED PAVEMENT WILL BE INCLUDED IN THE COST OF THE DRAIN.
7. SLOTTED DRAIN PIPE WILL HAVE A MINIMUM DIAMETER OF 15" AND A MAXIMUM OF 24".
8. PAVING DETAILS SHOWN ARE FOR USE WITH 8" DEEP GRATE ON SLOTTED DRAIN. SPECIAL DESIGN MUST BE APPROVED FOR USE OF 2½" DEEP GRATE.
9. HEEL PLATE WILL BE INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS WHERE SPECIFIED IN PEDESTRIAN AREAS. DESIGN LENGTH MUST BE ADJUSTED ACCORDINGLY.

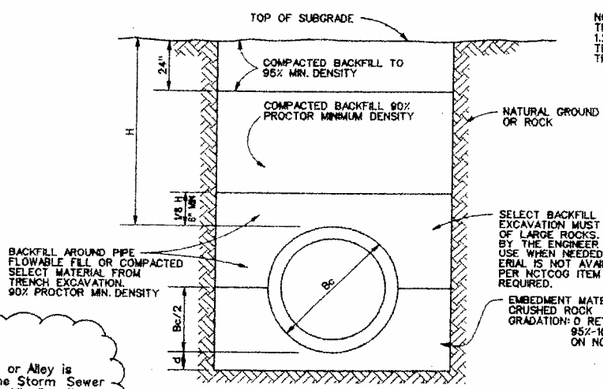
APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: March 6, 1997

DRAINAGE DETAILS
SLOTTED DRAINS
IN STREETS AND ALLEYS
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CITY OF DALLAS, TEXAS

DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	2005



FLOOD MANAGEMENT MONUMENT
IN NATURAL GROUND



NOTE:
TRENCH WIDTHS BASED ON 1.25 Bc+1.0 WHERE Bc IS THE OUTSIDE DIAMETER OF THE PIPE IN FEET.

PIPE DIAMETER (INCHES)	TRENCH WIDTH (FEET)
15	3.0
18	3.4
21	3.8
24	4.1
27	4.5
33	5.2
36	5.6
42	6.3
48	7.0
54	7.8
60	8.5
66	9.2
72	10.0
78	10.7
84	11.4
90	12.1
96	12.9

DEPTH OF BEDDING MATERIAL BELOW PIPE	
D (Inside Diameter)	d (Min)
27" OR SMALLER	3"
30" TO 60"	4"
66" & LARGER	6"

NOTE:
Where Street or Alley is crossed by the Storm Sewer a 95% Proctor Min. Density will be required up to bottom of proposed subgrade.

d=DEPTH OF BEDDING MATERIAL BELOW PIPE.
H=BACKFILL COVER ABOVE TOP OF PIPE.

TRENCH WIDTHS SHOWN ARE MINIMUM FOR PROPER PLACEMENT AND COMPACTION OF EMBEDMENT AND BACKFILL.

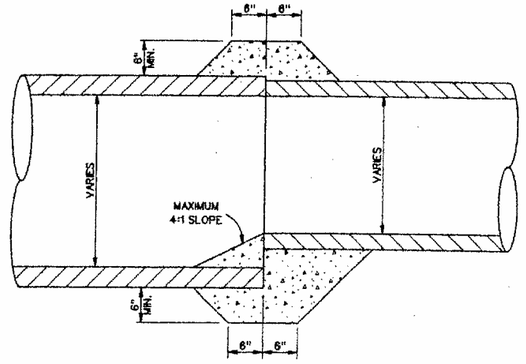
TRENCH WIDTHS SHOWN WILL BE USED FOR CALCULATION OF ROCK EXCAVATION WHEN DESIGNATED AS A PAY ITEM.

REINFORCED CONCRETE CLASS III PIPE INSTALLATION

INSTALLATION WILL BE AS SHOWN OR AS DESCRIBED IN THE GENERAL SPECIFICATIONS FOR CONSTRUCTION

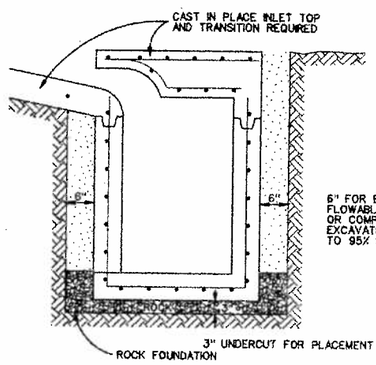
NOTE:
FOR H>10' DESIGN MUST BE CHECKED. UNLIMITED TRENCH WIDTH WILL NOT BE PERMITTED FOR CLASS III PIPE AND HIGHER TYPE PIPE EMBEDMENT MAY BE REQUIRED.

TOP 24" OF BACKFILL MUST BE COMPACTEDTO 95% DENSITY UNDER PAVEMENT. SUBGRADE STABILIZATION UNDER STREET PAVEMENT SHALL BE COMPACTED TO 98% STANDARD PROCTOR DENSITY AT ± 2% OF OPTIMUM MOISTURE TO THE DEPTH SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE SPECIFICATIONS.



DETAIL OF CONCRETE COLLAR
FOR END TO END EXTENSIONS

PREFAB. INLET BOX INSTALLATION



APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: April 16, 1997

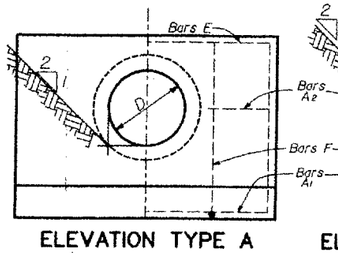
DRAINAGE DETAILS					
CONCRETE PIPE INSTALLATION					
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION					
CITY OF DALLAS, TEXAS					
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	2006

REINFORCING STEEL AND QUANTITIES FOR TWO HEADWALLS

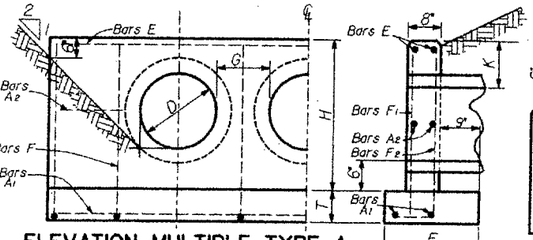
NO. OF PIPES	DIAM. OF PIP	TABLE OF DIMENSIONS G	K	T	E	H	W	BARS A1 4 ~ #3 Lgth.	Wt.	BARS A2 #3 @ 18"± No.	Lgth.	Wt.	BARS E 4 ~ #5 No.	Lgth.	Wt.	BARS F1 @ 12"± No.	Size	Lgth.	Wt.	BARS F2 @ 12"± No.	Lgth.	Wt.	TOTAL QUANTITIES STEEL LBS.	CONC. CY.
1	12"	~	12"	9"	1'-9"	2'-6"	7'-0"	6'-8"	10	8	2'-6"	8	6'-8"	28	12	#4	2'-11"	23	12	#4	3'-8"	29	98	1.48
2	"	10"	"	"	"	"	"	8'-6"	13	"	"	"	8'-6"	35	14	"	"	27	14	"	"	34	117	1.81
3	"	"	"	"	"	"	"	10'-4"	16	"	"	"	10'-4"	43	16	"	"	31	16	"	"	39	137	2.15
4	"	"	"	"	"	"	"	12'-2"	18	"	"	"	12'-2"	51	18	"	"	35	18	"	"	44	156	2.48
1	15"	~	12"	9"	1'-9"	2'-9"	8'-3"	7'-11"	12	8	3'-0"	9	7'-11"	33	12	#4	3'-2"	25	12	#4	3'-11"	31	110	1.82
2	"	1'-0"	"	"	"	"	10'-6"	10'-2"	15	"	"	"	10'-2"	42	14	"	"	30	14	"	"	37	133	2.24
3	"	"	"	"	"	"	12'-9"	12'-5"	19	"	"	"	12'-5"	52	16	"	"	34	16	"	"	42	156	2.66
4	"	"	"	"	"	"	15'-0"	14'-8"	22	"	"	"	14'-8"	61	18	"	"	38	18	"	"	47	177	3.09
1	18"	~	12"	9"	1'-9"	3'-0"	9'-6"	9'-2"	14	8	3'-6"	11	9'-2"	38	20	#4	3'-5"	46	20	#4	4'-2"	56	165	2.19
2	"	1'-2"	"	"	"	"	12'-2"	11'-10"	18	"	"	"	11'-10"	49	22	"	"	50	22	"	"	61	189	2.70
3	"	"	"	"	"	"	14'-10"	14'-6"	22	"	"	"	14'-6"	60	24	"	"	55	24	"	"	67	215	3.21
4	"	"	"	"	"	"	17'-6"	17'-2"	26	"	"	"	17'-2"	72	26	"	"	59	26	"	"	72	240	3.73
1	24"	~	12"	9"	2'-0"	3'-6"	12'-0"	11'-8"	18	8	4'-6"	14	11'-8"	49	24	#4	3'-11"	63	24	#4	4'-11"	79	223	3.17
2	"	1'-5"	"	"	"	"	15'-5"	15'-1"	23	"	"	"	15'-1"	63	26	"	"	68	26	"	"	85	253	3.89
3	"	"	"	"	"	"	18'-10"	18'-6"	28	"	"	"	18'-6"	77	28	"	"	73	28	"	"	92	284	4.62
4	"	"	"	"	"	"	22'-3"	21'-11"	33	"	"	"	21'-11"	91	30	"	"	79	30	"	"	99	316	5.35
1	30"	~	12"	9"	2'-3"	4'-0"	14'-6"	14'-2"	21	16	5'-6"	33	14'-2"	59	28	#4	4'-5"	83	28	#4	5'-8"	106	302	4.31
2	"	1'-8"	"	"	"	"	18'-6"	18'-2"	28	"	"	"	18'-2"	76	32	"	"	94	32	"	"	121	352	5.28
3	"	"	"	"	"	"	22'-10"	22'-6"	34	"	"	"	22'-6"	94	36	"	"	106	36	"	"	136	403	6.26
4	"	"	"	"	"	"	27'-0"	26'-8"	40	"	"	"	26'-8"	111	40	"	"	118	40	"	"	152	454	7.24
1	36"	~	12"	12"	2'-6"	4'-6"	17'-0"	16'-8"	25	16	6'-6"	39	16'-8"	70	32	#4	5'-2"	111	32	#4	6'-8"	143	388	6.40
2	"	1'-11"	"	"	"	"	21'-11"	21'-7"	32	"	"	"	21'-7"	90	36	"	"	124	36	"	"	160	445	7.89
3	"	"	"	"	"	"	26'-10"	26'-6"	40	"	"	"	26'-6"	111	40	"	"	138	40	"	"	178	506	9.37
4	"	"	"	"	"	"	31'-5"	31'-5"	47	"	"	"	31'-5"	131	44	"	"	152	44	"	"	196	565	10.85
1	42"	~	12"	12"	2'-9"	5'-0"	19'-6"	19'-2"	29	16	7'-6"	45	19'-2"	80	36	#4	5'-8"	136	36	#4	7'-5"	178	468	8.10
2	"	2'-2"	"	"	"	"	25'-2"	24'-10"	37	"	"	"	24'-10"	104	40	"	"	152	40	"	"	198	536	9.96
3	"	"	"	"	"	"	30'-10"	30'-6"	46	"	"	"	30'-6"	127	44	"	"	167	44	"	"	218	603	11.80
4	"	"	"	"	"	"	36'-6"	36'-2"	54	"	"	"	36'-2"	151	48	"	"	182	48	"	"	238	670	13.68
1	48"	~	15"	12"	3'-0"	5'-9"	23'-0"	22'-8"	34	24	8'-9"	79	22'-8"	95	40	#5	6'-5"	268	40	#5	8'-5"	351	827	10.74
2	"	2'-5"	"	"	"	"	29'-5"	29'-1"	44	"	"	"	29'-1"	121	44	"	"	295	44	"	"	386	925	13.08
3	"	"	"	"	"	"	35'-10"	35'-6"	53	"	"	"	35'-6"	148	48	"	"	321	48	"	"	422	1023	15.43
4	"	"	"	"	"	"	42'-3"	41'-11"	63	"	"	"	41'-11"	175	52	"	"	348	52	"	"	457	1122	17.77
1	54"	~	15"	12"	3'-3"	6'-3"	25'-6"	25'-2"	38	24	9'-9"	88	25'-2"	105	44	#5	6'-11"	318	44	#5	9'-2"	421	970	12.87
2	"	2'-10"	"	"	"	"	32'-6"	32'-6"	49	"	"	"	32'-6"	136	50	"	"	361	50	"	"	478	1112	15.77
3	"	"	"	"	"	"	40'-2"	39'-10"	60	"	"	"	39'-10"	166	56	"	"	404	56	"	"	536	1254	18.66
4	"	"	"	"	"	"	47'-6"	47'-2"	71	"	"	"	47'-2"	197	62	"	"	447	62	"	"	593	1396	21.55
1	60"	~	15"	12"	3'-6"	6'-9"	28'-0"	27'-8"	42	24	10'-9"	97	27'-8"	115	48	#5	7'-5"	371	48	#5	9'-11"	497	1122	15.20
2	"	3'-0"	"	"	"	"	36'-0"	35'-8"	54	"	"	"	35'-8"	149	54	"	"	478	54	"	"	559	1227	18.55
3	"	"	"	"	"	"	44'-0"	43'-8"	66	"	"	"	43'-8"	182	60	"	"	464	60	"	"	621	1430	21.89
4	"	"	"	"	"	"	52'-0"	51'-8"	78	"	"	"	51'-8"	216	66	"	"	511	66	"	"	683	1585	25.24
1	66"	~	15"	12"	3'-9"	7'-3"	30'-6"	30'-2"	45	32	11'-9"	141	30'-2"	126	52	#5	7'-11"	430	52	#5	10'-8"	579	1321	17.72
2	"	3'-1"	"	"	"	"	39'-1"	38'-9"	58	"	"	"	38'-9"	162	58	"	"	479	58	"	"	645	1485	21.49
3	"	"	"	"	"	"	47'-8"	47'-4"	78	"	"	"	47'-4"	196	64	"	"	529	64	"	"	712	1651	25.27
4	"	"	"	"	"	"	56'-3"	55'-11"	84	"	"	"	55'-11"	233	70	"	"	578	70	"	"	779	1815	29.05
1	72"	~	15"	12"	4'-0"	7'-9"	33'-0"	32'-8"	49	32	12'-9"	153	32'-8"	136	56	#5	8'-5"	492	56	#5	11'-5"	667	1497	20.42
2	"	3'-2"	"	"	"	"	42'-2"	41'-10"	63	"	"	"	41'-10"	175	62	"	"	544	62	"	"	738	1673	24.66
3	"	"	"	"	"	"	51'-4"	51'-0"	77	"	"	"	51'-0"	213	68	"	"	597	68	"	"	810	1850	28.89
4	"	"	"	"	"	"	60'-6"	60'-2"	90	"	"	"	60'-2"	251	74	"	"	650	74	"	"	881	2025	33.12

REINFORCING STEEL AND QUANTITIES FOR TWO HEADWALLS

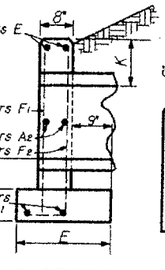
NO. OF PIPES	DIAM. OF PIPES	TABLE OF DIMENSIONS G	K	X	H	Y	W	BARS A1 - Ax #4 @ 12"± No.	Av. Lgth.	Wt.	BARS B #3 @ 18"± No.	Lgth.	Wt.	BARS B1 - Bx #3 @ 18"± No.	Av. Lgth.	Wt.	C = 2'-0" #4 @ 12" No.	Wt.	BARS D1 - Dx #3 @ 12"± No.	Av. Lgth.	Wt.	BARS E 8 ~ #5 Lgth.	Wt.	BARS F No.	Size	Lgth.	Wt.	BARS G 4 ~ #3 Lgth.	Wt.	BARS S 12 ~ #4 Lgth.	Wt.	BARS V1 - Vx #4 @ 12"± No.	Av. Lgth.	Wt.	BARS W 4 ~ #5 Lgth.	Wt.	TOTAL QUANTITIES STEEL LBS.	CONC. CY.
1	12"	~	12"	2'-4"	2'-0"	1'-0"	2'-4"	2	2'-8"	4	6	2'-6"	6	~	~	~	4	5	~	~	~	2'-0"	17	8	#4	2'-2"	12	2'-8"	4	8"	5	4	2'-11"	8	1'-8"	7	68	.52
2	"	10"	"	4'-2"	"	"	4'-2"	"	4'-6"	6	8	"	8	~	~	~	"	"	~	~	~	3'-10"	32	12	"	"	17	4'-6"	7	"	"	"	"	"	"	"	"	95	.82
3	"	"	"	6'-0"	"	"	6'-0"	"	6'-4"	8	10	"	9	~	~	~	"	"	~	~	~	5'-8"	47	16	"	"	23	6'-4"	10	"	"	"	"	"	"	"	"	122	1.11
4	"	"	"	7'-10"	"	"	7'-10"	"	8'-2"	11	12	"	11	~	~	~	"	"	~	~	~	7'-6"	63	20	"	"	29	8'-2"	12	"	"	"	"	"	"	"	"	151	1.40
1	15"	~	12"	2'-7½"	2'-3"	1'-6"	3'-2½"	4	3'-0"	8	6	3'-0"	7	4	1'-10"	3	8	11	~	~	~	2'-3"	19	8	#4	2'-5"	13	3'-7"	5	1'-3"	10	8	3'-0"	16	2'-3"	9	101	.75
2	"	1'-0"	"	4'-10½"	"	"	5'-5½"	"	5'-3"	14	8	"	9	"	"	"	"	"	~	~	~	4'-6"	38	12	"	"	19	5'-10"	9	"	"	"	"	"	"	"	"	138	1.16
3	"	"	"	7'-6½"	"	"	7'-8½"	"	7'-6"	20	10	"	11	~	~	~	"	"	~	~	~	6'-9"	56	16	"	"	26	8'-1"	12	"	"	"	"	"	"	"	"	174	1.57
4	"	"	"	9'-11½"	"	"	9'-11½"	"	9'-9"	26	14	"	16	~	~	~	"	"	~	~	~	9'-0"	75	20	"	"	32	10'-4"	16	"	"	"	"	"	"	"	"	214	1.98
1	18"	~	12"	2'-11"	2'-6"	2'-0"	4'-0⅛"	4	3'-10"	10	6	3'-6"	8	4	1'-10"	3	8	11	4	1'-0"	2	2'-7"	22	8	#4	2'-8"	14	4'-5"	7	1'-10"	15	12	3'-2"	25	2'-11"	12	129	1.00
2	"	1'-2"	"	5'-7"	"	"	6'-8⅛"	"	6'-6"	17	8	"	11	"	"	"	"	"	"	"	"	5'-3"	44	12	"	"	21	7'-1"	11	"	"	"	"	"	"	"	"	172	1.55
3	"	"	"	8'-3"	"	"	9'-4⅛"	"	9'-2"	25	12	"	16	"	"	"	"	"	"	"	"	7'-11"	66	16	"	"	29	9'-9"	15	"	"	"	"	"	"	"	"	219	2.11
4	"	"	"	10'-11"	"	"	12'-0⅛"	"	11'-10"	32	16	"	21	"	"	"	"	"	"	"	"	10'-7"	88	20	"	"	36	12'-5"	19	"	"	"	"	"	"	"	"	264	2.65
1	24"	~	12"	3'-6"	3'-0"	3'-0"	5'-9¾"	6	5'-0"	20	6	4'-6"	10	4	1'-10"	3	8	11	4	1'-0"	2	3'-2"	26	8	#4	3'-2"	17	6'-2"	9	3'-0"	24	16	3'-5"	37	4'-2"	17	176	1.62
2	"	1'-5"	"	6'-11"	"	"	9'-2¾"	"	8'-5"	34	10	"	17	"	"	"	"	"	"	"	"	6'-7"	55	12	"	"	25	9'-7"	14	"	"	"	"	"	"	"	"	239	2.46
3	"	"	"	10'-4"	"	"	12'-7¾"	"	11'-10"	47	16	"	27	"	"	"	"	"	"	"	"	9'-10"	82	16	"	"	34	13'-0"	20	"	"	"	"	"	"	"	"	304	3.32
4	"	"	"	13'-9"	"	"	16'-0¾"	"	15'-3"	61	20	"	34	"	"	"	"	"	"	"	"	13'-5"	112	20	"	"	42	16'-5"	25	"	"	"	"	"	"	"	"	368	4.18
1	30"	~	12"	4'-1"	3'-6"	4'-0"	7'-6⅝"	8	6'-2"	33	6	5'-6"	12	8	3'-1"	9	12	16	8	2'-2"	7	3'-9"	31	8	#4	3'-8"	20	7'-1"	12	4'-2"	33	20	3'-8"	49	5'-5"	23	245	2.34
2	"	1'-8"	"	8'-3"	"	"	11'-8⅝"	"	10'-4"	55	12	"	25	"	"	"	"	"	"	"	"	7'-11"	66	16	"	"	39	12'-1"	18	"	"	"	"	"	"	"	"	340	3.58
3	"	"	"	12'-5"	"	"	15'-10⅝"	"	14'-6"	77	18	"	37	"	"	"	"	"	"	"	"	12'-1"	101	24	"	"	59	16'-3"	24	"	"	"	"	"	"	"	"	435	4.80
4	"	"	"	16'-7"	"	"	20'-0⅝"	"	18'-8"	100	24	"	50	"	"	"	"	"	"	"	"	16'-3"	136	32	"	"	78	20'-5"	31	"	"	"	"	"	"	"	"	532	6.04
1	36"	~	12"	4'-8"	4'-0"	5'-0"	9'-3½"	10	7'-4"	49	8	6'-6"	20	8	3'-1"	9	12	16	8	2'-2"	7	4'-4"	36	8	#4	4'-2"	22	9'-8"	15	5'-4"	43	24	3'-11"	63	6'-8"	28	308	3.23
2	"	1'-11"	"	9'-7"	"	"	14'-2½"	"	12'-3"	62	14	"	34	"	"	"	"	"	"	"	"	9'-3"	77	16	"	"	45	14'-7"	22	"	"	"	"	"	"	"	"	426	4.89
3	"	"	"	14'-6"	"	"	19'-1½"	"	17'-2"	115	20	"	49	"	"	"	"	"	"	"	"	14'-2"	118	24	"	"	67	19'-6"	29	"	"	"	"	"	"	"	"	544	6.55
4	"	"	"	19'-5"	"	"	24'-0½"	"	22'-1"	147	28	"	68	"	"	"	"	"	"	"	"	19'-1"	159	32	"	"	89	24'-5"	37	"	"	"	"	"	"	"	"	666	8.22
1	42"	~	12"	5'-3"	4'-6"	6'-0"	11'-0¼"	12	8'-6"	68	8	7'-6"	23	12	4'-5"	20	16	21	12	3'-3"	15	4'-11"	41	8	#4	4'-8"	25	11'-5"	17	6'-5"	51	28	4'-2"	78	7'-11"	33	392	4.23
2	"	2'-2"	"	10'-11"	"	"	16'-8¼"	"	14'-2"	114	16	"	45	"	"	"	"	"	"	"	"	10'-7"	88	16	"	"	50	11'-1"	26	"	"	"	"	"	"	"	"	541	6.40
3	"	"	"	16'-7"	"	"	22'-4¼"	"	19'-10"	159	24	"	68	"	"	"	"	"	"	"	"	16'-3"	136	24	"	"	75	22'-9"	34	"	"	"	"	"	"	"	"	690	8.56
4	"	"	"	22'-3"	"	"	28'-0¼"	"	25'-6"	204	32	"	90	"	"	"	"	"	"	"	"	21'-11"	183	32	"	"	100	28'-5"	43	"	"	"	"	"	"	"	"	838	10.74
1	48"	~	15"	5'-10"	5'-3"	7'-0"	12'-3½"	14	9'-8"	90	10	8'-6"	32	12	4'-5"	20	16	21	12	3'-4"	15	5'-6"	46	8	#5	5'-5"	45	13'-2"	20	7'-7"	61	32	4'-5"	94	9'-3"	39	483	5.43
2	"	2'-5"	"	12'-3"	"	"	16'-1½"	"	16'-1"	150	18	"	58	"	"	"	"	"	"	"	"	11'-11"	99	16	"	"	90	19'-7"	29	"	"	"	"	"	"	"	"	676	8.25
3	"	"	"	18'-8"	"	"	22'-6"	"	22'-6"	200	26	"	83	"	"	"	"	"	"	"	"	18'-6"	153	24	"	"	136	26'-0"	39	"	"	"	"	"	"	"	"	871	11.07
4	"	"	"	25'-1"	"	"	28'-11"	"	28'-11"	270	36	"	115	"	"	"	"	"	"	"	"	24'-9"	207	32	"	"	181	32'-5"	49	"	"	"	"	"	"	"	"	1072	13.89
1	54"	~	15"	6'-5"	5'-3"	8'-0"	14'-6"	16	10'-10"	116	10	9'-6"	36	12	4'-5"	20	20	27	16	4'-5"	27	6'-1"	51	8	#5	5'-11"	49	14'-10"	22	8'-9"	70	40	4'-8"	125	10'-5"	43	586	6.71
2	"	2'-10"	"	13'-9"	"	"	19'-10"	"	18'-5"	194	20	"	71	"	"	"	"	"	"	"	"	13'-5"	112	20	"	"	123	22'-2"	33	"	"	"	"	"	"	"	"	845	10.28
3	"	"	"	21'-1"	"	"	25'-6"	"	25'-6"	273	30	"	107	"	"	"	"	"	"	"	"	20'-9"	173	32	"	"	198	29'-6"	44	"	"	"	"	"	"	"	"	1107	13.84
4	"	"	"	28'-5"	"	"	32'-0"	"	32'-10"	351	40	"	143	"	"	"	"	"	"	"	"	28'-1"	234	44	"	"	272	36'-10"	55	"	"	"	"	"	"	"	"	1367	17.42
1	60"	~	15"	7'-0"	6'-3"	9'-0"	16'-2⅞"	18	12'-0"	144	10	10'-6"	39	16	5'-9"	35	20	27	16	4'-5"	27	6'-8"	56	8	#5	6'-5"	54	16'-7"	25	9'-11"	80	44	4'-11"	145	11'-8"	49	681	8.11
2	"	3'-0"	"	15'-0"	"	"	24'-2⅞"	"	20'-0"	240	22	"	87	"	"	"	"	"	"	"	"	14'-8"	122	20	"	"	134	25'-7"	38	"	"	"	"	"	"	"	"	984	12.34
3	"	"	"	23'-0"	"	"	32'-2⅞"	"	28'-0"	337	32	"	126	"	"	"	"	"	"	"	"	22'-6"	189	32	"	"	214	32'-7"	49	"	"	"	"	"	"	"	"	1278	16.57
4	"	"	"	31'-0"	"	"	40'-2⅞"	"	36'-5"	438	44	"	174	"	"	"	"	"	"	"	"	30'-6"	256	44	"	"	318	40'-6"	61	"	"	"	"	"	"	"	"	1587	20.82
1	66"	~	15"	7'-7"	6'-9"	10'-0"	17'-4¾"	20	13'-2"	176	12	11'-6"	52	16	5'-9"	35	24	32	20	5'-7"	42	7'-3"	60	8	#5	6'-11"	58	18'-4"	28	11'-1"	89	48	5'-2"	166	13'-0"	54	792	9.65
2	"	3'-1"	"	18'-2"	"	"	26'-6¾"	"	21'-9"	291	24	"	104	"	"	"	"	"	"	"	"	15'-10"	132	20	"	"	144	26'-11"	40	"	"	"	"	"	"	"	"	1129	14.54
3	"	"	"	24'-9"	"	"	35'-1¾"	"	30'-4"	405	34	"	147	"	"	"	"	"	"	"	"	24'-5"	204	32	"	"	231	35'-6"	53	"	"	"	"	"	"	"	"	1458	19.42
4	"	"	"	33'-4"	"	"	43'-9¾"	"	39'-8"	530	46	"	199	"	"	"	"	"	"	"	"	33'-0"	275	44	"	"	318	44'-2"	67	"	"	"	"	"	"	"	"	1807	24.31
1	72"	~	15"	8'-2"	7'-3"	11'-0"	19'-6⅝"	22	14'-4"	211	12	12'-6"	56	16	5'-9"	35	24	32	20	5'-7"	42	7'-10"	65	8	#5	7'-5"	62	20'-1"	30	12'-3"	98	52	5'-5"	188	14'-3"	59	878	11.32
2	"	3'-2"	"	21'-4"	"	"	28'-10⅝"	"	23'-6"	345	24	"	113	"	"	"	"	"	"	"	"	17'-1"	142	20	"	"	155	29'-3"	44	"	"	"	"	"	"	"	"	1253	16.91
3	"	"	"	26'-6"	"	"	38'-0⅝"	"	32'-10"	482	38	"	179	"	"	"	"	"	"	"	"	26'-5"	218	32	"	"	248	38'-5"	58	"	"	"	"	"	"	"	"	1639	22.52
4	"	"	"	35'-8"	"	"	47'-2⅝"	"	41'-10"	615	50	"	235	"	"	"	"	"	"	"	"	35'-4"	295	44	"	"	341	47'-8"	72	"	"	"	"	"	"	"	"	2017	28.11



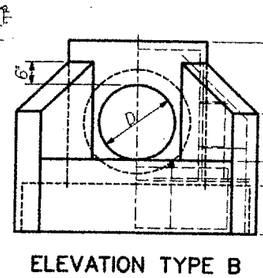
ELEVATION TYPE A



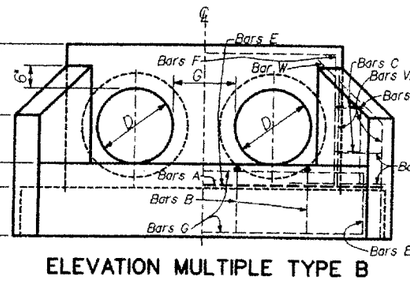
ELEVATION MULTIPLE TYPE A



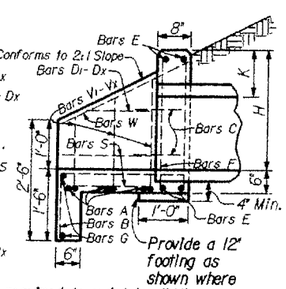
℄ SECTION



ELEVATION TYPE B

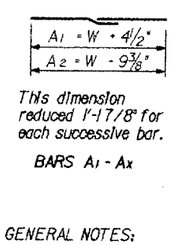


ELEVATION MULTIPLE TYPE B



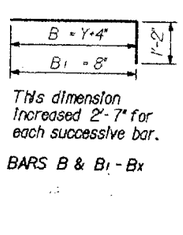
Provide a 12" footing as shown where required to maintain 4" Min. cover for pipes. Concrete for footing shall be added to total quantities shown

TYPICAL WING ELEVATION



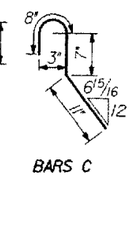
This dimension reduced 1'-1 7/8" for each successive bar.

BARS A1 - Ax



This dimension increased 2'-7" for each successive bar.

BARS B & B1 - Bx

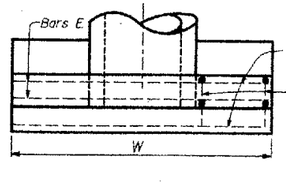


BARS C

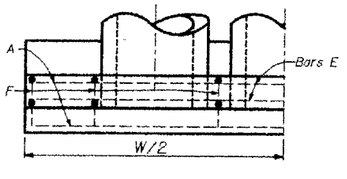
GENERAL NOTES:

All exposed corners shall be chamfered 3/4".

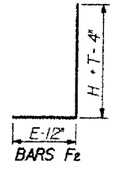
Reinforcing steel shall be placed with the center of the outside layer of bars 2" from the surface of the concrete. Total Quantities include one 20 diameter lap for all bars over 60'-0" in length.



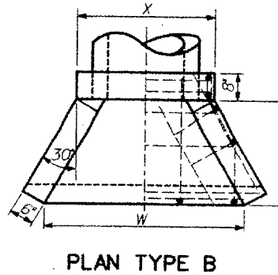
PLAN TYPE A



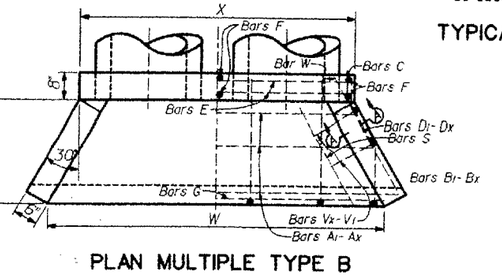
PLAN MULTIPLE TYPE A



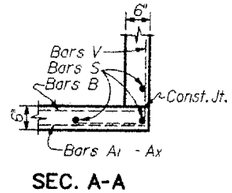
BARS F2



PLAN TYPE B



PLAN MULTIPLE TYPE B



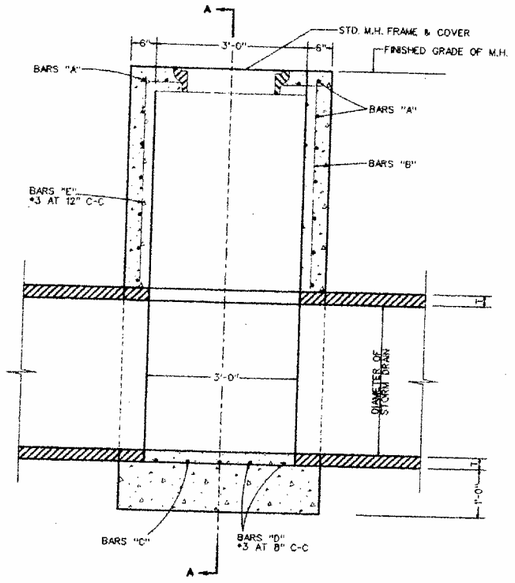
SEC. A-A

* Concrete quantities increase slightly for metal pipe installations

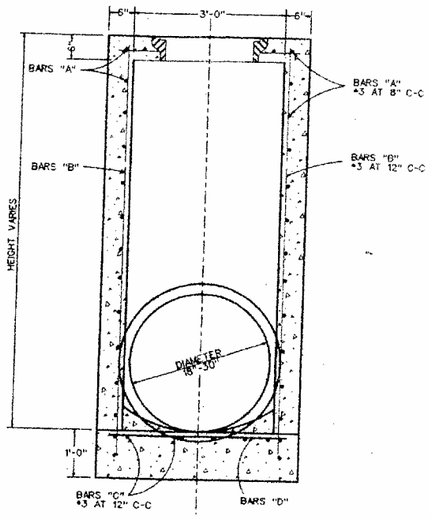
APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: March 14, 1997

DRAINAGE DETAILS
CONCRETE HEADWALLS
FOR PIPE CULVERTS
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CITY OF DALLAS, TEXAS

DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	2007



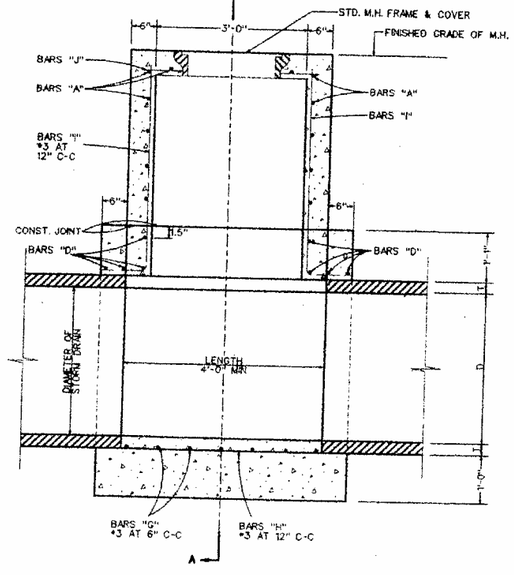
ELEVATION



SECTION A-A

TYPE A STORM SEWER MANHOLE

(FOR PIPE 18" TO 30" IN DIAMETER)



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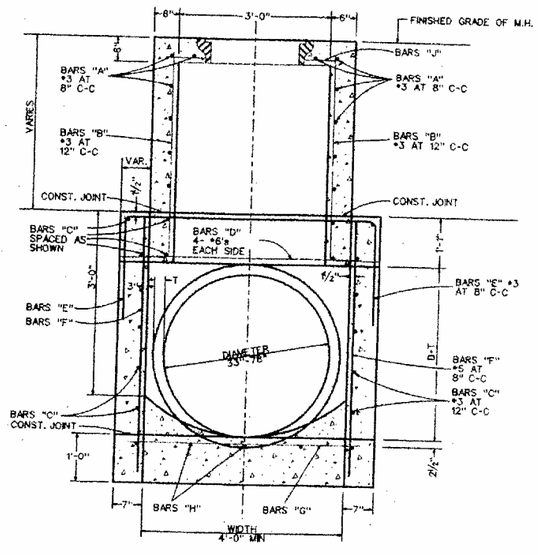
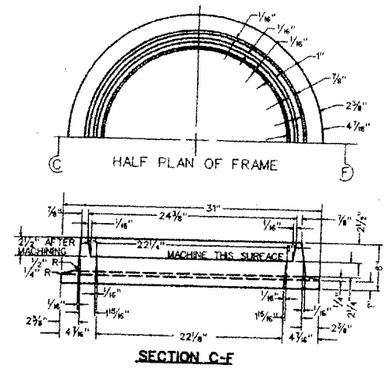


SECTION A-A

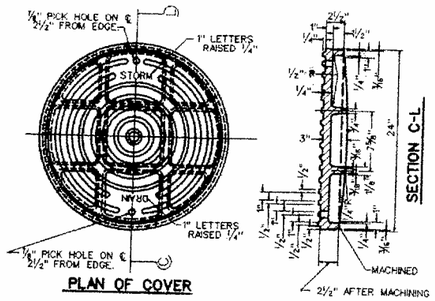
TYPE B STORM SEWER MANHOLE

(FOR PIPE 33" TO 78" IN DIAMETER)



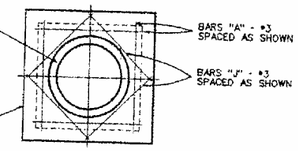
SECTION C-F

CAST IRON MANHOLE FRAME AND COVER



PLAN OF COVER

NOTE:
FRAME AND COVER SHALL BE BASS & HAYES PATTERN NO. 380-24 OR EQUAL AND SHALL BE OF GRAY CAST IRON CONFORMING TO A.S.T.M. SPEC. A-48 FOR CLASS 30 CAST IRON.



TOP PLAN

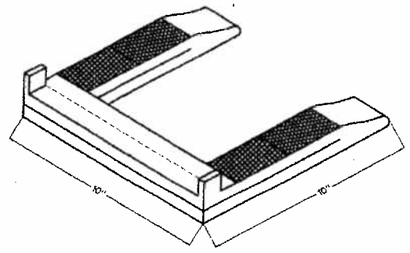
TYPE A & TYPE B STORM SEWER MANHOLE

NOTE: MAX. PIPE SIZE 78"

NOTES: APPLICABLE TO ALL MANHOLES

1. PREFABRICATED MANHOLES OF EQUIVALENT STRENGTH AND DESIGN MAY BE SUBSTITUTED WITH THE APPROVAL OF AN ENGINEER.
2. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 LBS. PER SQUARE INCH AT 28 DAYS.
3. MANHOLES SHALL BE BUILT ON THE MAIN SEWER LINE, LATERAL PIPES MAY ENTER MANHOLES AT ANY LOCATION.
4. MANHOLES WILL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER EACH REGARDLESS OF MANHOLE DEPTH.
5. CYLINDRICAL SHAPED MANHOLES MAY BE USED AS DIRECTED BY ENGINEER IN LIEU OF MANHOLE DESIGN SHOWN ON THIS PAGE.
6. CONCRETE FOR PAVEMENT BLOCKOUTS SHALL BE CLASS HAND FINISH CONCRETE (4500 P.S.I.).

NOTE:
BASS & HAYES PLASTIC COATED STEEL, NEOPRENE COATED STEEL STEPS OR EQUAL SHALL BE PLACED SECURELY INTO MANHOLE WALLS ON 15" CENTERS VERTICALLY AND STAGGERED ON 12" CENTERS HORIZONTALLY.



MANHOLE STEP DETAIL

BASS & HAYES FOUNDRY
* MA (PLASTIC)

APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: April 14, 1997

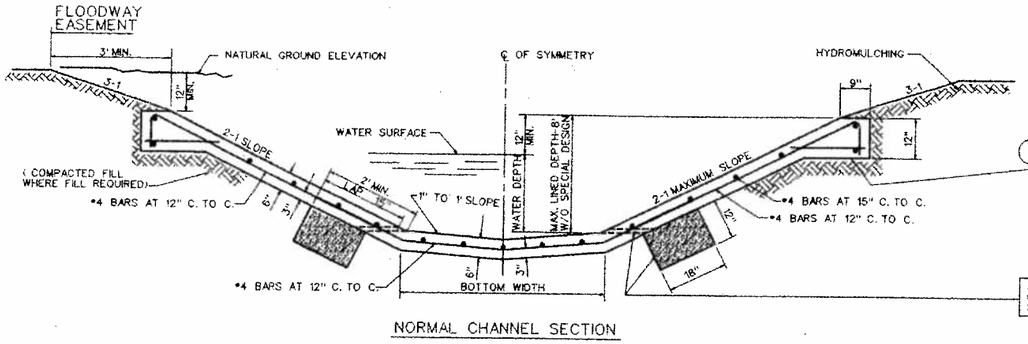
DRAINAGE DETAILS

MANHOLES AND FITTINGS

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

CITY OF DALLAS, TEXAS

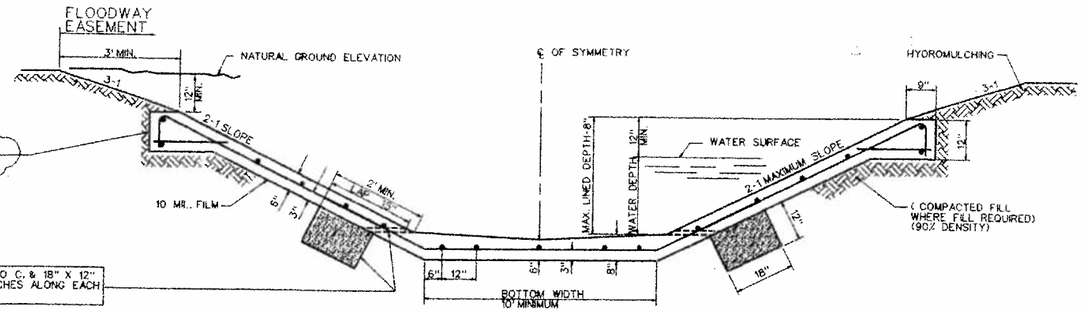
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	2008



NORMAL CHANNEL SECTION

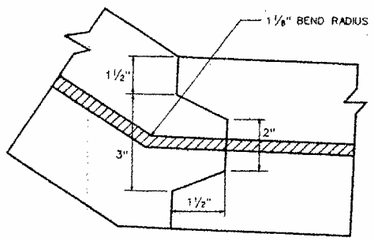
SEE DETAIL "A"

3" WEEPHOLES AT 15' C. TO C. & 18" X 12" CONTINUOUS GRAVEL TRENCHES ALONG EACH SIDE OF THE CHANNEL.

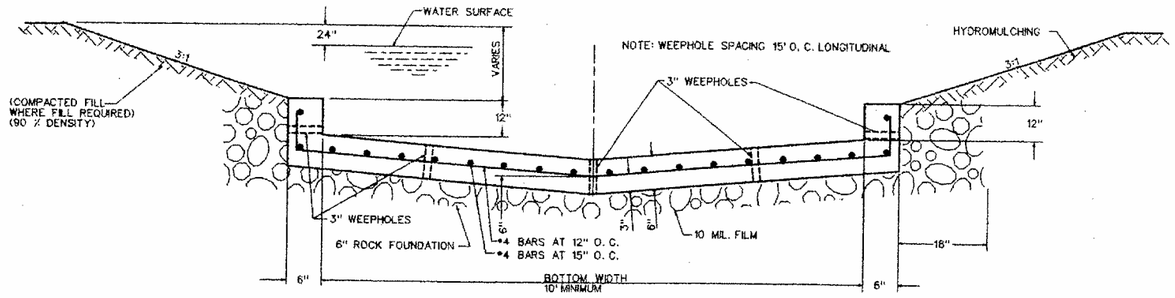


PAVED ALLEY SECTION

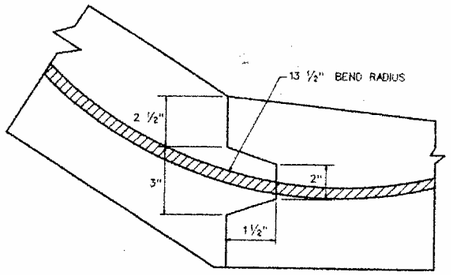
NORMAL CHANNEL SECTION MAY BE USED IN ROCK



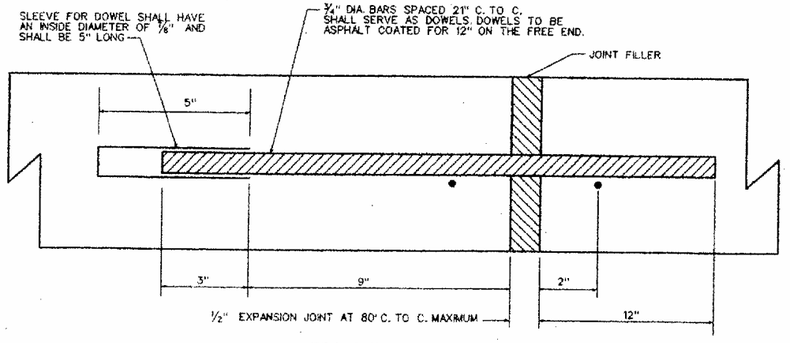
CONSTRUCTION JOINT
FOR NORMAL CHANNEL



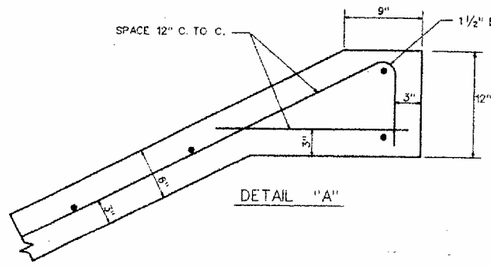
PARTIAL CHANNEL LINING SECTION



CONSTRUCTION JOINT
FOR PAVED ALLEY SECTION



TRANSVERSE EXPANSION JOINT



DETAIL "A"

NOTES:

1. ALL CONSTRUCTION SHALL BE IN CONFORMITY WITH CURRENT CITY OF DALLAS GENERAL SPECIFICATIONS.
2. CONSTRUCTION JOINT SHOWN FOR CONVENIENCE ONLY - MONOLITHIC CONSTRUCTION MAY BE USED
3. ALL REINFORCING STEEL SHALL BE #4 AND SPACED 12" C. TO C. BOTH WAYS UNLESS OTHERWISE SPECIFIED.
4. CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 3000# AT 28 DAYS AND SHALL CONTAIN A MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD.
5. SIDE SLOPES SHALL BE NO STEEPER THAN 2-1.
6. TOP OF CURB OF ADJACENT ALLEY OR STREET IS MINIMUM OF 2' ABOVE 100 YEAR W. S.
7. USE A SMOOTH TROWEL FINISH ON BOTTOM AND SLOPED SURFACES. USE ORDINARY SURFACE FINISH ON VERTICAL SURFACES.
8. WHEN SOLID ROCK IS ENCOUNTERED BY NORMAL CHANNEL SECTION, REMOVE 6" DEPTH OF SOLID ROCK AND REPLACE WITH 6" DEPTH OF CRUSHED ROCK FOUNDATION BELOW PROPOSED CHANNEL STRUCTURE.

APPROVED

DIRECTOR OF PUBLIC WORKS & TRANSPORTATION

DATE: March 14, 1997

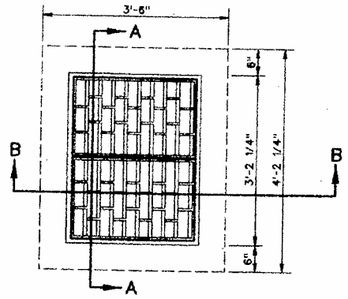
DRAINAGE DETAILS

LINED CHANNELS

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

CITY OF DALLAS, TEXAS

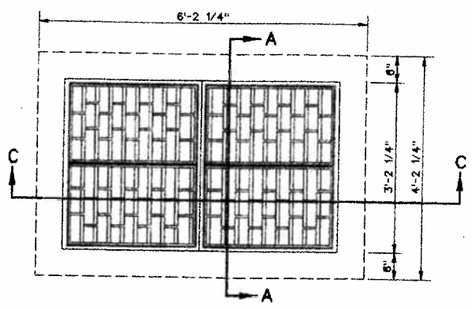
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	2009



PLAN VIEW

TWO GRATE INLET

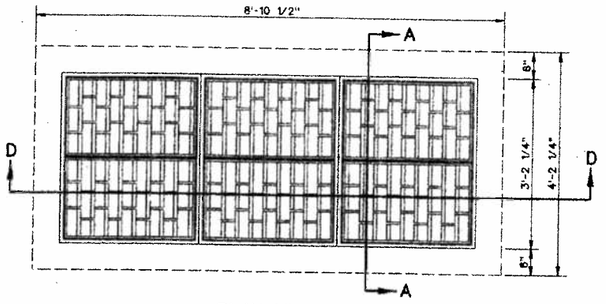
NO SCALE



PLAN VIEW

FOUR GRATE INLET

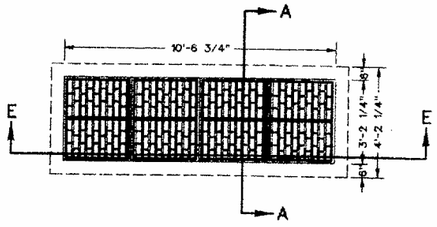
NO SCALE



PLAN VIEW

SIX GRATE INLET

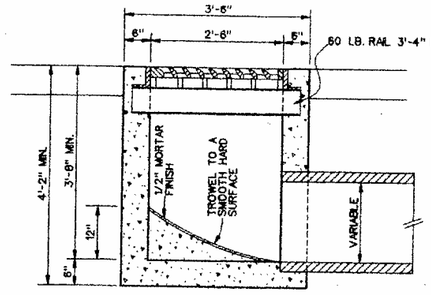
NO SCALE



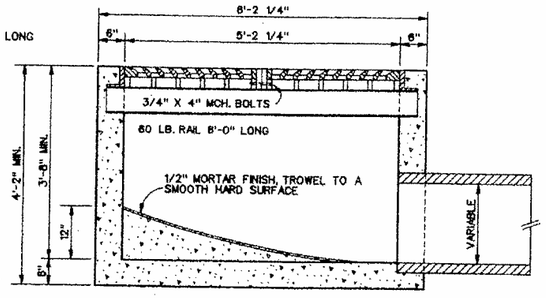
PLAN VIEW

EIGHT GRATE INLET

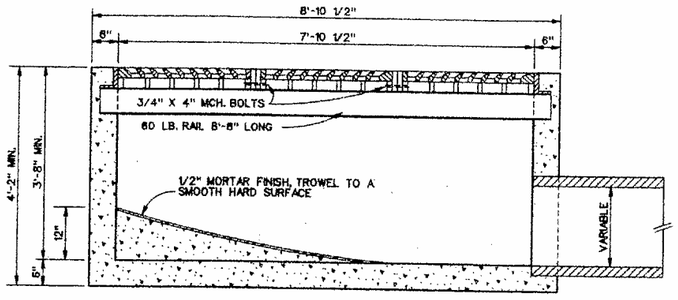
NO SCALE



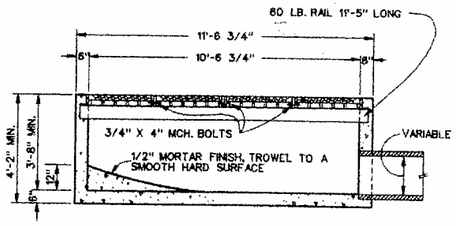
SECTION B-B



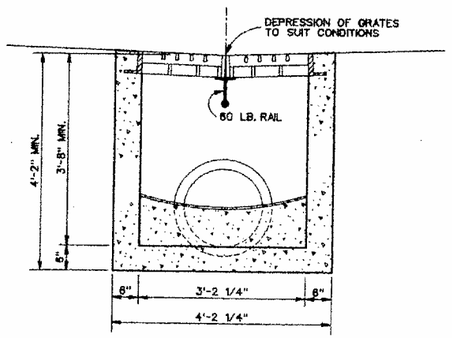
SECTION C-C



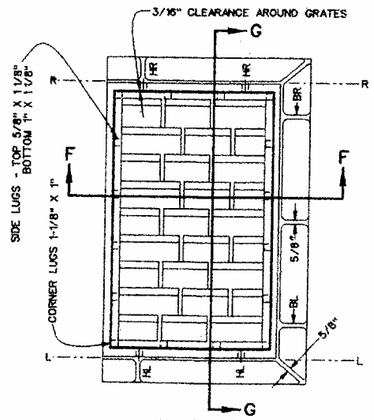
SECTION D-D



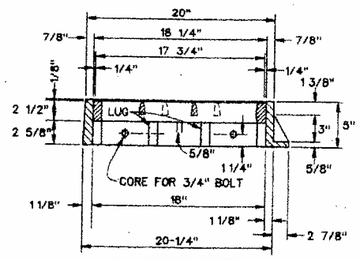
SECTION E-E



SECTION A-A

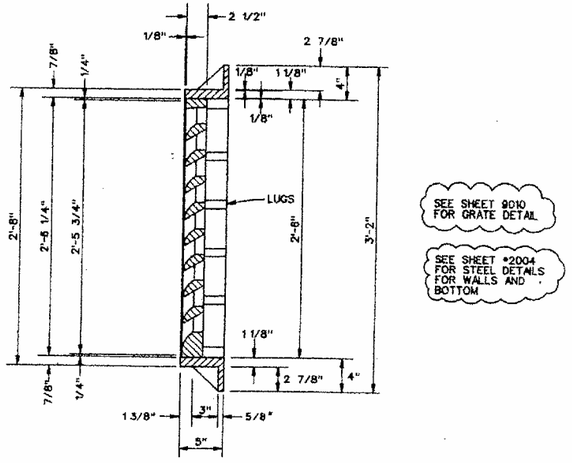


PLAN VIEW



SECTION F-F

TYPE "L" GRATE R-3076



SECTION G-G

TYPE "L" GRATE R-3076

SEE SHEET 9010 FOR GRATE DETAIL

SEE SHEET #2004 FOR STEEL DETAILS FOR WALLS AND BOTTOM

MODIFICATIONS FOR DOUBLE AND TRIPLE GRATE INLETS (PAGE 2002)

FOR STANDARD DOUBLE GRATE INLETS: ON RIGHT FRAME OMIT FLANGE ON LINE "L/L" AND ADD BRACKET "BL" AND CORE HOLES "HL". ON LEFT FRAME OMIT FLANGE ON LINE "R/R" AND ADD BRACKET "BR" AND CORE HOLES "HR". FOR STANDARD TRIPLE GRATE INLETS: USE ONE RIGHT FRAME AND ONE LEFT FRAME AND ONE FRAME OMITTING BOTH END FLANGES, ADD BRACKETS "BR" AND "BL" AND CORE HOLES "HR" AND "HL".

THE AVERAGE WEIGHT OF ALL GRATE INLETS SHALL NOT BE LESS THAN 153 LBS. THE AVERAGE WEIGHT OF SINGLE GRATE INLET FRAME SHALL NOT BE LESS THAN 155 LBS., THE DOUBLE GRATE INLET FRAMES SHALL NOT BE LESS THAN 177 LBS. EACH, AND THE CENTER FRAMES SHALL NOT BE LESS THAN 170 LBS. EACH.

FRAME DETAIL

NO SCALE

1. LATERAL MAY ENTER INLET AT ANY GRADE, ANGLE OR LOCATION.
2. EXCAVATION, FRAMES, GRATES AND COVERS SHALL BE INCLUDED IN UNIT PRICE.
3. EXTRA DEPTH INLETS WILL BE DIMENSIONED ON PLANS. A SEPARATE BID ITEM PER FOOT OF EXTRA DEPTH MAY BE PROVIDED.
4. TYPE "L" GRATES SHALL BE USED AS SHOWN ON SHEET 9010.
5. PROVIDE EXPANSION JOINTS AT EDGE OF ALL BLOCKOUTS FOR STREETS AND ALLEYS

APPROVED

DIRECTOR OF PUBLIC WORKS & TRANSPORTATION

DATE: April 16, 1997

DRAINAGE DETAILS

TWO, FOUR, SIX & EIGHT

GRATE INLETS, GRATE DETAILS

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

CITY OF DALLAS, TEXAS

DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	2010

WALL HEIGHT "H"

PROPERTIES

SURCHARGE LEVEL	SLOPED NONE	UP TO 7:1	WALL DIMENSIONS FW	TW	SW	HW	FT	KW	MAX. SOIL PRESS. T/SF	MAX. REQ'D A'S 0"/FT. STEM	TOE	HEEL
1	NONE	1'	0	0	1'-0"	0	0	0	0	.125	0	0
2	1	2'	1'-4"	4"	1'-0"	0	9"	9"	.235	.125	.125	.125
3	2	3'	1'-8"	8"	1'-0"	0	9"	9"	.325	.125	.125	.125
4	3	4'	2'-0"	8"	1'-0"	4"	1'-0"	9"	.236	.125	.125	.125
5	4	5'	2'-7½"	10½"	1'-0"	9"	1'-0"	9"	.320	.125	.125	.125
6	5	6'	3'-1½"	1'-1"	1'-0"	1'-0½"	1'-0"	9"	.403	.125	.125	.125
7	6	7'	3'-9"	1'-3"	1'-0"	1'-6"	1'-0"	9"	.485	.125	.125	.125
8	7	8'	4'-3"	1'-5"	1'-0"	1'-10"	1'-0"	9"	.576	.154	.125	.125
9	8	9'	4'-9"	1'-7"	1'-0"	2'-2"	1'-0"	9"	.666	.229	.125	.158
10	9	10'	5'-3"	1'-9"	1'-0"	2'-6"	1'-0"	9"	.755	.327	.173	.280
11	10	11'	5'-10"	1'-11½"	1'-0"	2'-10½"	1'-0"	9"	.817	.448	.234	.401
12	11	12'	6'-4½"	2'-1½"	1'-0"	3'-3"	1'-0"	9"	.895	.596	.302	.553
13	12	13'	6'-10½"	2'-3½"	1'-0"	3'-7"	1'-0"	9"	.980	.774	.384	.722
14	13	14'	7'-4½"	2'-5½"	1'-0"	3'-11"	1'-0"	9"	1.064	.985	.480	.924
15	14	15'	7'-10½"	2'-7½"	1'-1⅛"	4'-1⅞"	1'-0"	9"	1.148	1.086	.591	1.113
16	15	16'	8'-4½"	2'-9½"	1'-2"	4'-5"	1'-3"	1'-0"	1.250	1.173	.538	.971
17	16	17'	8'-10½"	2'-11½"	1'-3⅛"	4'-7⅞"	1'-3"	1'-0"	1.333	1.297	.844	1.148
18	17	18'	9'-4½"	3'-1½"	1'-3⅝"	4'-11⅞"	1'-6"	1'-3"	1.434	1.383	.613	1.057
19	18	19'	9'-11½"	3'-4"	1'-5⅛"	5'-2⅞"	1'-6"	1'-3"	1.489	1.513	.724	1.246
20	19	20'	10'-4½"	3'-5½"	1'-6⅜"	5'-4⅞"	1'-6"	1'-3"	1.601	1.650	.835	1.414
21	20	21'	10'-10½"	3'-7½"	1'-7"	5'-8"	1'-9"	1'-6"	1.702	1.758	.811	1.336
22	21	22'	11'-4½"	3'-9½"	1'-8⅛"	5'-10⅞"	1'-9"	1'-6"	1.785	1.939	.931	1.521
23	22	23'	12'-0"	4'-0"	1'-9¼"	6'-2⅜"	1'-9"	1'-6"	1.832	2.068	1.063	1.767
24	23	24'	12'-4½"	4'-1½"	1'-10⅛"	6'-4⅞"	2'-0"	1'-6"	1.986	2.189	1.046	1.648
25	24	25'	12'-11½"	4'-4"	1'-11¼"	6'-8¼"	2'-0"	1'-6"	2.025	2.359	1.177	1.870
26	25	26'	13'-5½"	4'-6"	2'-0⅛"	6'-11⅜"	2'-3"	1'-6"	2.133	2.408	1.187	1.813
27	26	27'	13'-11½"	4'-8"	2'-1¼"	7'-2¼"	2'-3"	1'-6"	2.208	2.672	1.299	2.028
28	27	28'	14'-5½"	4'-10"	2'-2⅜"	7'-5⅜"	2'-3"	1'-9"	2.291	2.862	1.448	2.235
29	28	29'	14'-11½"	5'-0"	2'-3½"	7'-8"	2'-3"	1'-9"	2.374	3.057	1.603	2.468
30	29	30'	15'-5½"	5'-2"	2'-4⅝"	7'-10⅞"	2'-3"	1'-9"	2.456	3.261	1.771	2.717
31	30	31'	15'-11½"	5'-4"	2'-5¾"	8'-1¾"	2'-3"	1'-9"	2.539	3.470	1.951	2.992
32	31	32'	16'-5½"	5'-6"	2'-6⅞"	8'-4⅛"	2'-6"	1'-9"	2.639	3.631	1.983	2.888
	A	B	C	D	E	F	G	K	DESIGN			

REINFORCING STEEL FOR 32'-0" PANEL (DESIGN A)

HEIGHT PLUS SURCHARGE	* A1 26~#5 @ 15" LGTH.	WT.	* A2 25~#6 @ 15" LGTH.	WT.	* A3 25~#7 @ 15" LGTH.	WT.	** A4 26~#8 @ 15" LGTH.	WT.	** A5 25~#9 @ 15" LGTH.	WT.	A6 25~#11 @ 15" LGTH.	WT.	A7 26~#11 @ 15" LGTH.	WT.	B 26~#5 @ 15" LGTH.	WT.	C NO.	SIZE	SPA.	LGTH.	WT.	D #5 X 31'-6" @ 12" & 16" NO.	WT.	E #8 X 31'-0" @ 12" NO.	WT.	F #5 X 31'-6" @ 12" NO.	WT.	G #5 X 31'-6" @ 12" NO.	WT.	K ***U 26~#5 @ 15" LGTH.	WT.
1																															1'-4"	36
2																	2	66	2	16											1'-4"	36
3																	2	66	3	24							2	66			3'-4"	90
4																	4	131	4	32	2	66	2	66			2	66			5'-4"	145
5																															7'-4"	199
6																															8'-4"	226
7																															8'-4"	226
8																															8'-4"	226
9																															8'-4"	226
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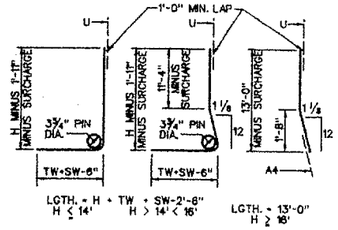
30																															8'-4"	226
31																															8'-4"	226
32																															8'-4"	226
	A		B		C		D		E		F		G		K																	

DESIGN

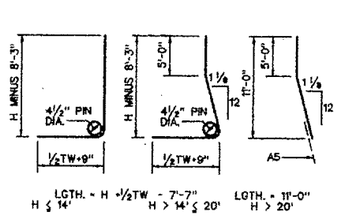
QUANTITIES FOR 32'-0" PANEL

SURCHARGE NONE CONC. C.Y.	NONE REINF. L.B.	1' OR 7:1 CONC. C.Y.	1' OR 7:1 REINF. L.B.	2' OR 5:1 CONC. C.Y.	2' OR 5:1 REINF. L.B.	3' OR 3½:1 CONC. C.Y.	3' OR 3½:1 REINF. L.B.	4' OR 2½:1 CONC. C.Y.	4' OR 2½:1 REINF. L.B.	5' OR 2:1 CONC. C.Y.	5' OR 2:1 REINF. L.B.	6' OR 1¾:1 CONC. C.Y.	6' OR 1¾:1 REINF. L.B.	7' OR 1½:1 CONC. C.Y.	7' OR 1½:1 REINF. L.B.
1.2	118														
3.3	246	2.1	184												
4.7	440	3.5	312	2.3	184										
6.6	748	5.4	472	4.2	344	3.0	282								
8.5	917	7.3	762	6.1	479	5.0	351	3.8	289						
10.3	1089	9.1	961	7.9	711	6.7	519	5.6	391	4.4	329				
12.2	1195	11.0	1100	9.9	972	8.7	817	7.5	525	6.3	397	5.1	335		
14.0	1366	12.8	1239	11.6	1143	10.4	1015	9.3	880	8.1	564	6.9	436	5.7	374
15.8	1472	14.6	1376	13.4	1249	12.2	1154	11.0	1026	9.9	871	8.7	570	7.5	442
17.6	1800	16.4	1672	15.2	1576	14.0	1449	12.8	1353	11.6	1225	10.4	1070	9.3	708
19.4	2119	18.2	1980	17.1	1862	15.9	1766	14.7	1639	13.5	1544	12.3	1416	11.1	1261
21.3	2349	20.1	2222	18.9	2094	17.7	1966	16.5	1870	15.3	1743	14.1	1648	13.0	1520
23.0	2876	21.9	2781	20.7	2854	19.5	2526	18.3	2398	17.1	2302	15.9	2174	14.7	2078
24.8	3255	23.6	3134	22.4	3039	21.3	2912	20.1	2784	18.9	2656	17.7	2580	16.5	2433
26.6	3722	25.5	3594	24.3	3473	23.1	3378	21.9	3251	20.7	3123	19.5	2995	18.4	2899
31.2	4236	30.1	4141	28.9	4013	27.7	3893	26.5	3798	25.3	3671	24.1	3543	22.9	3415
33.4	4637	32.2	4508	31.0	4414	29.9	4286	28.7	4166	27.5	4071	26.3	3944	25.1	3816
38.8	4970	37.6	4840	36.4	4712	35.2	4618	34.0	4490	32.8	4370	31.6	4275	30.5	4148
41.4	5285	40.2	5197	39.1	5068	37.9	4940	36.7	4846	35.5	4718	34.3	4598	33.1	4503
43.9	6092	42.7	6964	41.5	5877	40.3	5748	39.2	5620	38.0	5526	36.8	5398	35.6	5278
50.2	6665	49.0	6536	47.8	6409	46.7	6322	45.5	8193	44.3	6065	43.1	5971	41.8	5843
53.2	7038	52.0	6942	50.8	8814	49.8	8687	48.4	6600	47.3	6471	46.1	6343	44.9	6249
56.5	8081	55.3	7952	54.1	7857	53.0	7729	51.8	7602	50.6	7515	49.4	7388	48.2	7258
62.6	8503	61.4	8375	60.2	8247	59.0	8152	57.8	8024	56.6	7897	55.5	7810	54.3	7681
66.2	8976	65.0	8880	63.8	8753	62.6	8625	61.4	8530	60.3	8402	59.1	8275	57.9	8188
73.1	9505	71.9	9375	70.7	9280	69.6	9153	68.4	9025	67.2	8930	66.0	8802	64.8	8675
76.9	10538	75.7	10409	74.5	10280	73.3	10185	72.1	10058	71.0	9930	69.8	9835	68.6	9707
81.7	11614	80.5	11519	79.4	11391	78.2	11262	77.0	11167	75.8	11040	74.6	10912	73.4	10817
85.7	11949	84.5	11820	83.3	11726	82.2	11598	81.0	11469	79.8	11374	78.6	11247	77.4	11119
89.8	13792	88.6	13663	87.4	13535	86.3	13441	85.1	13313	83.9	13184	82.7	13089	81.5	12952
94.0	14449	92.8	14345	91.7	14217	90.5	14089	89.3	13995	88.1	13867	86.9	13738	85.7	13643
102.5	18064	101.3	15936	100.1	15833	98.9	15705	97.7	15577	96.5	15483	95.4	15355	94.2	15226
A		B		C		D		E		F		G		K	



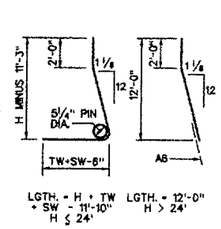
LGTH. = H + TW + SW-2'-6" H ≤ 14' | H > 14' < 16' | LGTH. = 13'-0" H ≥ 16'

BARS A1



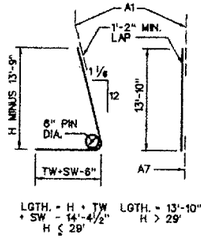
LGTH. = H +½TW - 7'-7" H ≤ 14' | H > 14' ≤ 20' | LGTH. = 11'-0" H > 20'

BARS A2



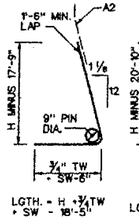
LGTH. = H + TW + SW - 11'-10" H ≤ 24' | LGTH. = 12'-0" H > 24'

BARS A3



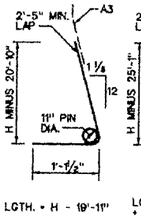
LGTH. = H + TW + SW - 14'-4½" H ≤ 29' | LGTH. = 13'-10" H > 29'

BARS A4



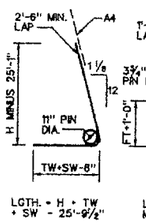
LGTH. = H +¾TW + SW - 18'-5"

BARS A5



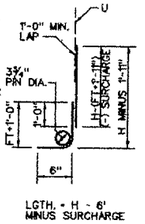
LGTH. = H - 19'-11"

BARS A6



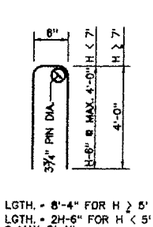
LGTH. = H + TW + SW - 25'-9½"

BARS A7



LGTH. = H - 6' MINUS SURCHARGE

BARS B



LGTH. = 8'-4" FOR H ≥ 5' *** LGTH. = 2H-6" FOR H < 5' @ MAX. 8'-4"

BARS U

GENERAL NOTES:

① REINFORCING STEEL BAR LENGTHS TABULATED ARE FOR NO SURCHARGE DESIGN A. TO MODIFY BAR LENGTHS FOR DIFFERENT SURCHARGE DESIGN, SUBTRACT THE AMOUNT OF LEVEL SURCHARGE FROM BARS A1 AND B. TAKE BARS D AND F FOR DESIGN B THRU K WALLS FROM DESIGN A WALL OF THE SAME HEIGHT. LENGTHS AND NUMBER OF OTHER BARS WILL BE UNCHANGED EXCEPT BAR A2 FOR H < 14'-0" WHEN SURCHARGE EXCEEDS 6 FT.

② WALLS ARE DESIGNED USING 40* EQUAL FLUID PRESSURE AND WITH WEIGHT OF EARTH AT 120* / CU. FT.

[1] ③ ALL CONCRETE TO BE CLASS C; f'c = 3600 PSI; fc = 1440 PSI.

[1] ④ ALL REINFORCING STEEL TO BE GRADE 60; fs = 24,000 PSI.

⑤ FOR NOTES AND DETAILS NOT SHOWN ON THIS SHEET SEE SHEETS 2, AND 3.

⑥ 3¾ INCH TO 11 INCH DIAMETER PINS ARE FOR BAR BENDING ONLY.

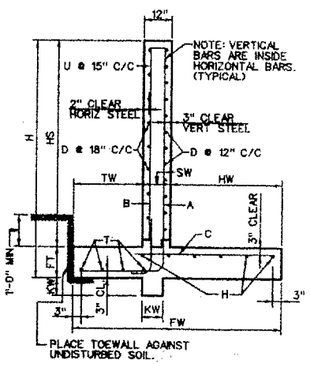
⑦ QUANTITIES ARE BASED ON "H" BEING AVERAGE HEIGHT OF PANEL.

⑧ RETAINING WALLS ARE DESIGNED TO BE CODED AS FOLLOWS ON RETAINING WALL LAYOUT SHEETS.

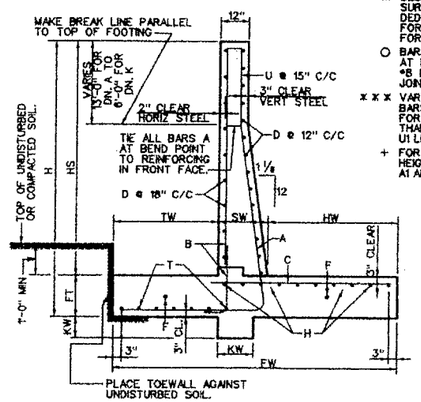
LC - 21 - 28
HA - 28 - 32

- LENGTH OF PANEL {28' REQUIRES SPECIAL QUANTITIES {32' IS STANDARD
- AVERAGE HEIGHT "H" OF PANEL.
- DESIGN C = 2' LEVEL SURCHARGE OR SLOPED SURCHARGE UP THROUGH 5:1. A = NO SURCHARGE.
- FOOTING PRESSURE DESIGN. H = HIGH, L = LOW

[1] USE 1993 TEXAS STATE HIGHWAY DEPARTMENT SPECIFICATIONS.

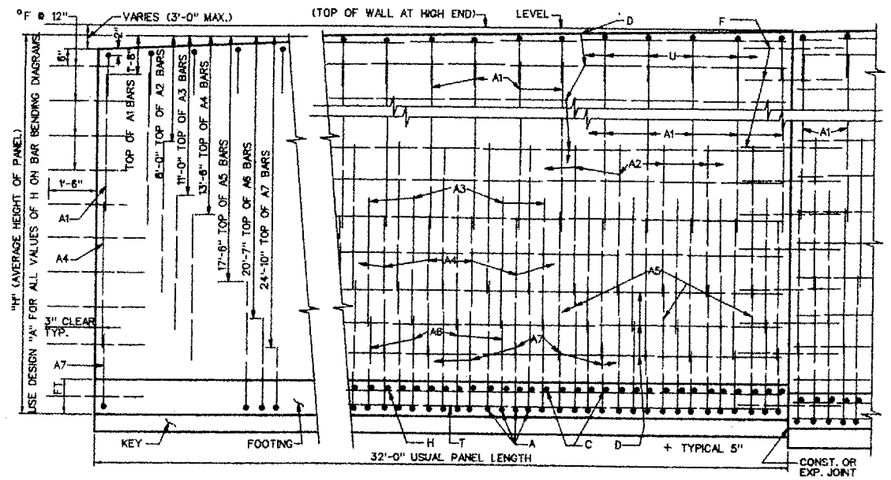


SECTION
H ≤ 14'



SECTION
H > 14'

- X DESIGN "A" WALL WITH ZERO SURCHARGE SHOWN AT RIGHT. DEDUCT AMOUNT OF SURCHARGE FOR DISTANCE TO TOP OF BAR FOR OTHER DESIGNS.
- O BARS F TO BE #8 SMOOTH AT EXPANSION JOINTS AND #8 DEFORMED AT CONSTRUCTION JOINTS.
- XXX VARY LENGTH OF LEGS OF BARS U TO FIT SLOPE OF PANEL FOR ALL VALUES OF H LESS THAN 8'-0" I.E. FOR 10X GRADE U1 LEGS = 1'-0", U26 = 4'-0".
- \+ FOR WALLS LESS THAN 13' IN HEIGHT, SPACING BETWEEN BARS A1 AND A2 = 7½".



REAR ELEVATION

APPROVED _____ DIRECTOR OF PUBLIC WORKS & TRANSPORTATION

DATE: APRIL 14, 1997

STANDARD RETAINING WALL

DESIGNS A TO K

HIGH FOOTING PRESSURE (H.F.P.)

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

CITY OF DALLAS, TEXAS

DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	3001

PROPERTIES

WALL HEIGHT "H"

Surcharge Level: None / Sloped: None (A)	1' / up to 7:1 (B)	2' / 5:1 (C)	3' / 3½:1 (D)	4' / 2½:1 (E)	5' / 2:1 (F)	6' / 1¾:1 (G)	7' / 1½:1 (K)	FW	TW	SW	HW	FT	KW	Max. Soil Press. T/O'	Max. Req'd. A'S 0"/FT. Stem	Toe	Heel
1								0	0	1'-0"	0	0	0	0	.125	0	0
2	1							1'-8"	8"	1'-0"	0	9"	9"	.113	.125	.125	.125
3	2	1						2'-0"	1'-0"	1'-0"	0	9"	9"	.141	.125	.125	.125
4	3	2	1					2'-8"	1'-4"	1'-0"	4"	1'-0"	9"	.110	.125	.125	.125
5	4	3	2	1				3'-6"	1'-9"	1'-0"	9"	1'-0"	9"	.143	.125	.125	.125
6	5	4	3	2	1			4'-3"	2'-1½"	1'-0"	1'-1½"	1'-0"	9"	.176	.125	.125	.125
7	6	5	4	3	2	1		5'-0"	2'-6"	1'-0"	1'-6"	1'-0"	9"	.207	.125	.125	.125
8	7	6	5	4	3	2	1	5'-8"	2'-10"	1'-0"	1'-10"	1'-0"	9"	.238	.154	.128	.125
9	8	7	6	5	4	3	2	6'-4"	3'-2"	1'-0"	2'-2"	1'-0"	9"	.269	.229	.181	.158
10	9	8	7	6	5	4	3	7'-0"	3'-6"	1'-0"	2'-6"	1'-0"	9"	.300	.327	.247	.280
11	10	9	8	7	6	5	4	7'-9"	3'-10½"	1'-0"	2'-10½"	1'-0"	9"	.346	.448	.325	.401
12	11	10	9	8	7	6	5	8'-6"	4'-3"	1'-0"	3'-3"	1'-0"	9"	.361	.596	.438	.553
13	12	11	10	9	8	7	6	9'-2"	4'-7"	1'-0"	3'-7"	1'-0"	9"	.391	.774	.552	.722
14	13	12	11	10	9	8	7	9'-10"	4'-11"	1'-0"	3'-11"	1'-0"	9"	.422	.965	.686	.924
15	14	13	12	11	10	9	8	10'-6"	5'-3"	1'-1⅛"	4'-1⅞"	1'-0"	9"	.465	1.086	.862	1.113
16	15	14	13	12	11	10	9	11'-2"	5'-7"	1'-2"	4'-5"	1'-3"	1'-0"	.513	1.173	.785	.971
17	16	15	14	13	12	11	10	11'-10"	5'-11"	1'-3⅛"	4'-7 15/16"	1'-3"	1'-0"	.544	1.291	.946	1.148
18	17	16	15	14	13	12	11	12'-6"	6'-3"	1'-3 13/16"	4'-11⅛"	1'-6"	1'-3"	.593	1.383	.913	1.057
19	18	17	16	15	14	13	12	13'-3"	6'-7½"	1'-5⅛"	5'-2⅞"	1'-6"	1'-3"	.623	1.513	1.081	1.246
20	19	18	17	16	15	14	13	13'-10"	6'-11"	1'-6⅜"	5'-4 13/16"	1'-6"	1'-3"	.652	1.650	1.229	1.414
21	20	19	18	17	16	15	14	14'-6"	7'-3"	1'-7"	5'-8"	1'-9"	1'-6"	.702	1.758	1.205	1.336
22	21	20	19	18	17	16	15	15'-2"	7'-7"	1'-8⅛"	5'-10⅞"	1'-9"	1'-6"	.731	1.939	1.373	1.621
23	22	21	20	19	18	17	16	16'-0"	8'-0"	1'-9¼"	6'-2¾"	1'-9"	1'-6"	.781	2.066	1.590	1.767
24	23	22	21	20	19	18	17	16'-6"	8'-3"	1'-10⅛"	6'-4⅞"	2'-0"	1'-6"	.810	2.189	1.537	1.648
25	24	23	22	21	20	19	18	17'-3"	8'-7½"	1'-11¼"	6'-8¼"	2'-0"	1'-6"	.840	2.359	1.742	1.870
26	25	24	23	22	21	20	19	17'-11"	8'-11½"	2'-0⅛"	6'-11⅜"	2'-3"	1'-6"	.889	2.408	1.735	1.813
27	26	25	24	23	22	21	20	18'-7"	9'-3½"	2'-1¼"	7'-2¼"	2'-3"	1'-6"	.919	2.672	1.929	2.028
28	27	26	25	24	23	22	21	19'-3"	9'-7½"	2'-2⅜"	7'-5⅛"	2'-3"	1'-9"	.949	2.862	2.138	2.235
29	28	27	26	25	24	23	22	19'-11"	9'-11½"	2'-3½"	7'-8"	2'-3"	1'-9"	.979	3.057	2.361	2.468
30	29	28	27	26	25	24	23	20'-7"	10'-3½"	2'-4⅝"	7'-10⅞"	2'-3"	1'-9"	1.009	3.261	2.599	2.717
31	30	29	28	27	26	25	24	21'-3"	10'-7½"	2'-5¾"	8'-1¾"	2'-3"	1'-9"	1.039	3.470	2.852	2.992
32	31	30	29	28	27	26	25	21'-11"	10'-11½"	2'-6⅞"	8'-4⅝"	2'-6"	1'-9"	1.068	3.631	2.817	2.888
A	B	C	D	E	F	G	K	← DESIGN									

REINFORCING STEEL FOR 32'-0" PANEL (DESIGN A)

H (Design A)	* A1 26~#5 @ 15" LGTH.	WT.	* A2 25~#6 @ 15" LGTH.	WT.	A3 25~#7 @ 15" LGTH.	WT.	** A4 26~#8 @ 15" LGTH.	WT.	** A5 25~#9 @ 15" LGTH.	WT.	A6 25~#11 @ 15" LGTH.	WT.	A7 26~#11 @ 15" LGTH.	WT.	B 26~#5 @ 15" LGTH.	WT.
1																
2																
3																
4	3'-10"	104													3'-6"	95
5	5'-3"	142													4'-6"	122
6	6'-8"	181													5'-6"	149
7	8'-0"	217													6'-6"	176
8	9'-4"	253													7'-6"	203
9	10'-8"	289													8'-6"	231
10	12'-0"	325	4'-2"	156											9'-6"	258
11	13'-5"	364	5'-4"	200											10'-6"	285
12	14'-9"	400	6'-7"	247											11'-6"	312
13	16'-1"	436	7'-8"	288	6'-9"	345									12'-6"	339
14	17'-5"	472	8'-11"	335	8'-1"	413									13'-6"	366
15	18'-10"	511	10'-1"	379	9'-6"	485									14'-6"	393
16	13'-0"	353	11'-2"	419	10'-11"	558	8'-5"	584							15'-6"	420
17	13'-0"	353	12'-5"	466	12'-4"	630	9'-10"	683							16'-6"	447
18	13'-0"	353	13'-7"	510	13'-9"	703	11'-2"	775							17'-6"	475
19	13'-0"	353	14'-9"	554	15'-3"	779	12'-8"	879							18'-6"	502
20	13'-0"	353	15'-11"	598	16'-7"	847	14'-1"	1245							19'-6"	529
21	13'-0"	353	11'-0"	413	18'-0"	920	15'-5"	1070	9'-7"	815					20'-6"	556
22	13'-0"	353	11'-0"	413	19'-5"	992	16'-11"	1174	10'-11"	928					21'-6"	583
23	13'-0"	353	11'-0"	413	20'-11"	1069	18'-5"	1278	12'-4"	1327					22'-6"	610
24	13'-0"	353	11'-0"	413	22'-3"	1137	19'-9"	1371	13'-7"	1461					23'-6"	637
25	13'-0"	353	11'-0"	413	12'-0"	613	21'-2"	1469	15'-0"	1275	5'-1"	675			24'-6"	664
26	13'-0"	353	11'-0"	413	12'-0"	613	22'-7"	1568	16'-4"	1388	6'-1"	808			25'-6"	692
27	13'-0"	353	11'-0"	413	12'-0"	613	24'-0"	1666	17'-8"	1502	7'-1"	941			26'-6"	719
28	13'-0"	353	11'-0"	413	12'-0"	613	25'-5"	1764	19'-0"	2044	8'-1"	1074			27'-6"	746
29	13'-0"	353	11'-0"	413	12'-0"	613	26'-11"	1869	20'-4"	2187	9'-1"	1206			28'-6"	773
30	13'-0"	353	11'-0"	413	12'-0"	613	13'-10"	960	21'-8"	1842	10'-1"	1339	18'-11"	2337	29'-6"	800
31	13'-0"	353	11'-0"	413	12'-0"	613	13'-10"	960	23'-0"	1955	11'-1"	1472	18'-4"	2533	30'-6"	827
32	13'-0"	353	11'-0"	413	12'-0"	613	13'-10"	960	24'-4"	3232	12'-1"	1605	19'-9"	2728	31'-6"	854

** FOR H=20' USE #9 BARS A4

** FOR FOLLOWING HEIGHTS USE #10 BARS A5 H=23', H=24', H=28', H=29'

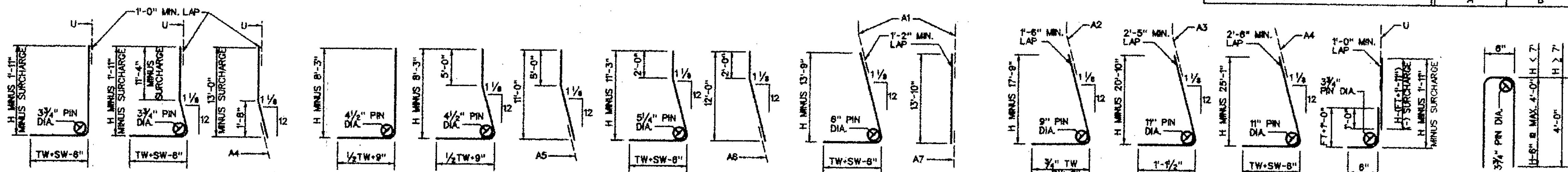
** FOR WALLS 32' HIGH USE #11 BARS A5

H (Design A)	C NO.	SIZE	SPA.	LGTH.	WT.	D #5 X 31'-6" @ 12" & 18" NO.	WT.	F° #8 X 3'-0" @ 12" NO.	WT.	H #5 X 31'-6" @ 12" NO.	WT.	T #5 X 31'-6" @ 12" NO.	WT.	***U 26~#5 @ 15" LGTH.	WT.
1						2	66	2	16					1'-4"	36
2						2	66	3	24			2	66	3'-4"	90
3						4	131	4	32	2	66	2	66	5'-4"	145
4	26	#4	15"	1'-10"	32	5	164	5	40	2	66	2	66	7'-4"	199
5	26	#4	15"	2'-3"	39	7	230	6	48	2	66	3	99	8'-4"	226
6	26	#4	15"	2'-8"	45	9	296	7	56	3	99	3	99	8'-4"	226
7	26	#4	15"	3'-0"	52	10	329	8	64	3	99	3	99	8'-4"	226
8	26	#4	15"	3'-4"	58	12	394	9	72	3	99	4	131	8'-4"	226
9	26	#4	15"	3'-8"	64	13	427	10	80	3	99	4	131	8'-4"	226
10	38	#4	10"	4'-0"	102	15	493	11	88	4	131	4	131	8'-4"	226
11	38	#6	10"	4'-4"	247	17	559	12	96	4	131	5	164	8'-4"	226
12	38	#6	10"	4'-9"	271	19	624	13	104	4	131	5	164	8'-4"	226
13	38	#7	10"	5'-1"	395	20	657	14	112	5	164	6	197	8'-4"	226
14	38	#8	10"	5'-5"	550	22	723	14	112	5	164	6	197	8'-4"	226
15	38	#9	10"	5'-9"	743	24	789	15	120	6	197	6	197	8'-4"	226
16	38	#9	10"	6'-1"	786	25	821	16	128	6	197	7	230	8'-4"	226
17	38	#9	10"	6'-5"	829	27	887	17	136	7	230	7	230	8'-4"	226
18	38	#9	10"	6'-9"	872	29	953	18	144	7	230	8	263	8'-4"	226
19	38	#9	10"	7'-2"	926	30	986	18	144	7	230	8	263	8'-4"	226
20	38	#10	10"	7'-5"	1213	32	1051	19	152	8	263	8	263	8'-4"	226
21	38	#10	10"	7'-9"	1267	34	1117	20	160	8	263	9	296	8'-4"	226
22	38	#10	10"	8'-1"	1322	35	1150	21	168	8	263	9	296	8'-4"	226
23	76	#8	5"	8'-6"	1725	37	1216	22	176	9	296	10	329	8'-4"	226
24	76	#8	5"	8'-9"	1776	39	1281	23	184	9	296	10	329	8'-4"	226
25	76	#8	5"	9'-2"	1860	40	1314	24	192	9	296	10	329	8'-4"	226
26	76	#8	5"	9'-6"	1928	42	1380	25	200	10	329	11	361	8'-4"	226
27	76	#9	5"	9'-10"	2541	44	1446	26	208	10	329	11	361	8'-4"	226
28	76	#9	5"	10'-1"	2606	45	1478	27	216	10	329	12	394	8'-4"	226
29	76	#9	5"	10'-5"	2692	47	1544	28	224	11	361	12	394	8'-4"	226
30	76	#10	5"	10'-9"	3516	49	1610	29	232	11	361	12	394	8'-4"	226
31	76	#10	5"	11'-2"	3652	50	1643	31	248	11	361	13	427	8'-4"	226
32	76	#10	5"	11'-6"	3761	52	1708	32	256	12	394	13	427	8'-4"	226

QUANTITIES FOR 32'-0" PANEL

SURCHARGE

Height plus Surcharge	None (A) Conc. C.Y.	Reinf. L.B.	1' or 7:1 (B) Conc. C.Y.	Reinf. L.B.	2' or 5:1 (C) Conc. C.Y.	Reinf. L.B.	3' or 3½:1 (D) Conc. C.Y.	Reinf. L.B.	4' or 2½:1 (E) Conc. C.Y.	Reinf. L.B.	5' or 2:1 (F) Conc. C.Y.	Reinf. L.B.	6' or 1¾:1 (G) Conc. C.Y.	Reinf. L.B.	7' or 1½:1 (K) Conc. C.Y.	Reinf. L.B.
1	1.2	118														
2	3.6	246	2.4	184												
3	5.1	440	3.9	312	2.7	184										
4	7.4	768	6.2	472	5.0	344	3.8	282								
5	9.6	972	8.4	817	7.2	512	6.0	384	4.8	322						
6	11.6	1152	10.4	1024	9.3	774	8.1	552	6.9	424	5.7	362				
7	13.7	1262	12.5	1187	11.3	1039	10.1	884	9.0	558	7.8	430	6.6	368		
8	15.7	1436	14.5	1309	13.3	1214	12.1	1086	10.9	931	9.8	596	8.6	468	7.4	406
9	17.7	1547	16.5	1451	15.3	1324	14.1	1229	12.9	1101	11.7	946	10.5	602	9.4	474
10	19.6	1910	18.4	1782	17.3	1686	16.1	1559	14.9	1464	13.7	1336	12.5	1181	11.3	672
11	21.7	2272	20.5	2144	19.3	2016	18.1	1919	17.0	1792	15.8	1697	14.6	1569	13.4	1414
12	23.8	2479	22.6	2352	21.4	2224	20.2	2096	19.0	2000	17.9	1872	16.7	1777	15.5	1649
13	25.8	3159	24.6	3064	23.4	2937	22.2	2809	21.0	2681	19.8	2585	18.6	2457	17.5	2362
14	27.7	3558	26.5	3438	25.4	3343	24.2	3216	23.0	3088	21.8	2960	20.6	2864	19.4	2736
15	29.8	4040	28.6	3912	27.4	3791	26.2	3696	25.0	3569	23.8	3441	22.6	3313	21.5	3217
16	35.4	4722	34.2	4627	33.0	4499	31.8	4379	30.6	4284	29.5	4157	28.3	4029	27.1	3901
17	37.8	5117	36.6	4988	35.4	4894	34.2	4786	33.1	4646	31.9	4551	30.7	4424	29.5	4296
18	44.3	5504	43.1	5374	41.9	5246	40.8	5152	39.6	5024	38.4	4904	37.2	4809	38.0	4682
19	47.3	5842	46.1	5754	44.9	5625	43.7	5497	42.5	5403	41.3	5275	40.2	5155	39.0	5060
20	50.0	6740	48.9	6612	47.7	6525	46.5	6396	45.3	6288	44.1	6174	42.9	6040	41.8	5326
21	57.7	7456	56.5	7327	55.4	7200	54.2	7113	53.0	6984	51.8	6856	50.6	6762	49.4	6634
22	61.0	7868	59.9	7772	58.7	7644	57.5	7517	56.3	7430	55.1	7301	53.9	7173	52.7	7079
23	64.8	9016	63.6	8989	62.4	8794	61.3	8666	60.1	8539	58.9	8452	57.7	8323	56.5	8195
24	72.3	9464	71.2	9336	70.0	9206	68.8	9113	67.6	8985	66.4	8853	65.2	8771	64.1	8642
25	76.4	9679	75.2	9583	74.0	9456	72.8	9328	71.6	9233	70.4	9105	69.3	8978	68.1	8891
26	85.0	10259	83.8	10129	82.6	10034	81.5	9907	80.3	9779	79.1	9684	77.9	9556	76.7	9429
27	89.2	11318	88.0	14189	86.9	11060	85.7	10965	84.5	10838	83.3	10710	82.1	10615	80.9	10487
28	94.5	12256	93.3	12161	92.1	12053	91.0	11904	89.8	11809	88.6	11682	87.4	11554	86.2	11459
29	98.9	12855	97.8	12726	96.6	12632	95.4	12504	94.2	12375	93.0	12290	91.8	12153	90.6	12025
30	103.5	14996	102.3	14867	101.1	14739	99.9	14645	98.7	14517	97.6	14388	96.4	14293	95.2	14166
31	108.1	15683	107.0	15579	105.8	15451	104.6	15323	103.4	15229	102.2	15101	101.0	14972	99.8	14877
32	118.6	17530	117.5	17402	116.3	17299	115.1	17171	113.9	17043	112.7	16949	111.5	16821	110.3	16692



LGTH. = H + TW + SW-2'-6" H ≤ 14' H > 14' < 16' — LGTH. = 13'-0" H ≥ 16'

BARS A1

LGTH. = H + ½TW - 7'-7" H ≤ 14' H > 14' ≤ 20' — LGTH. = 11'-0" H > 20'

BARS A2

LGTH. = H + TW + SW - 11'-10" H ≤ 24' — LGTH. = 12'-0" H > 24'

BARS A3

LGTH. = H + TW + SW - 14'-4½" H ≤ 29' — LGTH. = 13'-10" H > 29'

BARS A4

LGTH. = H + ¾TW + SW - 18'-5"

BARS A5

LGTH. = H - 19'-11"

BARS A6

LGTH. = H + TW + SW - 25'-9½"

BARS A7

LGTH. = H - 6' MINUS SURCHARGE

BARS B

LGTH. = 8'-4" FOR H ≥ 5'
*** LGTH. = 2H-8" FOR H < 5' @ MAX. 8'-4"

BARS U

GENERAL NOTES:

① REINFORCING STEEL BAR LENGTHS TABULATED ARE FOR NO SURCHARGE DESIGN A. TO MODIFY BAR LENGTHS FOR DIFFERENT SURCHARGE DESIGN, SUBTRACT THE AMOUNT OF LEVEL SURCHARGE FROM BARS A1 AND B. TAKE BARS D AND F FOR DESIGN B THRU K WALLS FROM DESIGN A WALL OF THE SAME HEIGHT. LENGTHS AND NUMBER OF OTHER BARS WILL BE UNCHANGED EXCEPT BAR A2 FOR H < 14'-0" WHEN SURCHARGE EXCEEDS 6 FT.

② WALLS ARE DESIGNED USING 40# EQUAL FLUID PRESSURE AND WITH WEIGHT OF EARTH AT 120# / CU. FT.

[1] ③ ALL CONCRETE TO BE CLASS C; f'c = 3600 PSI; fc = 1440 PSI.

[1] ④ ALL REINFORCING STEEL TO BE GRADE 60; fs = 24,000 PSI.

⑤ FOR NOTES AND DETAILS NOT SHOWN ON THIS SHEET SEE SHEETS 2, AND 3.

⑥ 3¾ INCH TO 11 INCH DIAMETER PINS ARE FOR BAR BENDING ONLY.

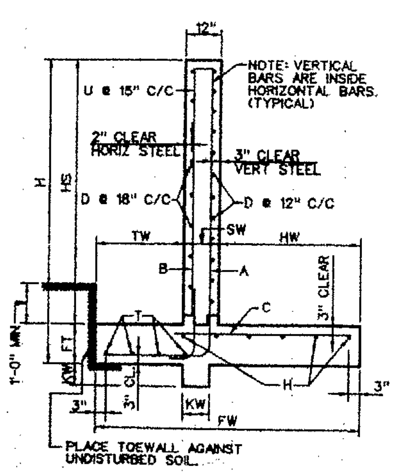
⑦ QUANTITIES ARE BASED ON "H" BEING AVERAGE HEIGHT OF PANEL.

⑧ RETAINING WALLS ARE DESIGNED TO BE CODED AS FOLLOWS ON RETAINING WALL LAYOUT SHEETS.

LC - 21 - 28
HA - 28 - 32

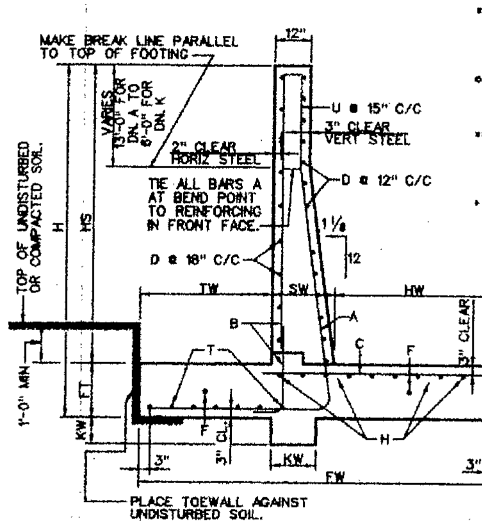
- LENGTH OF PANEL {28' REQUIRES SPECIAL QUANTITIES; 32' IS STANDARD}
- AVERAGE HEIGHT "H" OF PANEL.
- DESIGN C = 2' LEVEL SURCHARGE OR SLOPED SURCHARGE UP THROUGH 5:1. A = NO SURCHARGE.
- FOOTING PRESSURE DESIGN. H = HIGH, L = LOW

[1] USE 1993 TEXAS STATE HIGHWAY DEPARTMENT SPECIFICATIONS.



SECTION

H ≤ 14'



SECTION

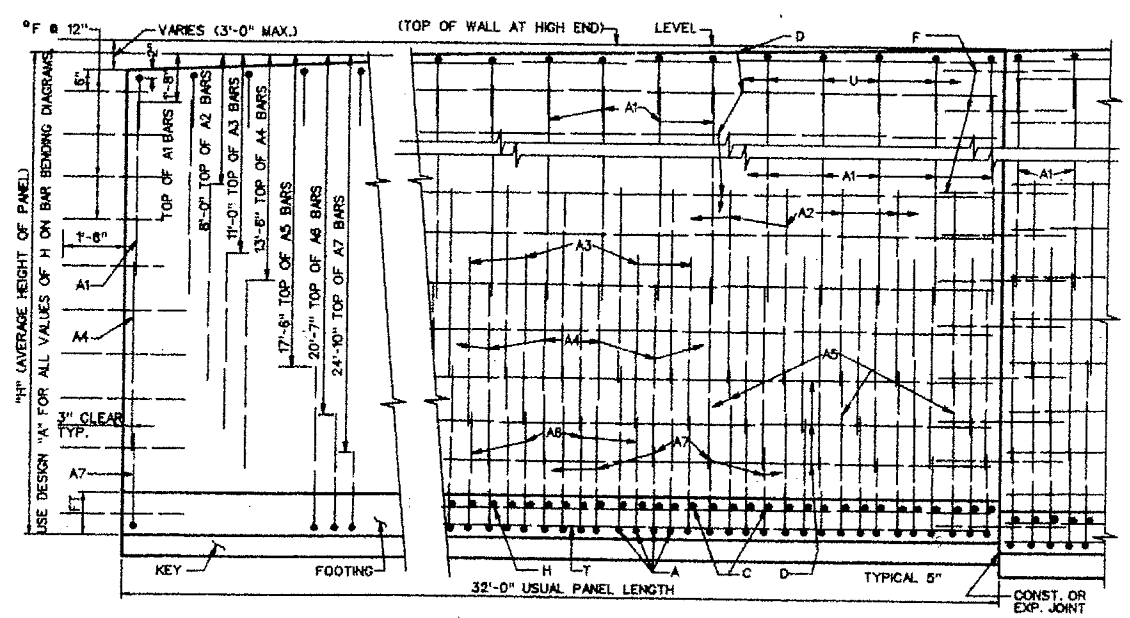
H > 14'

* DESIGN "A" WALL WITH ZERO SURCHARGE SHOWN AT RIGHT. DEDUCT AMOUNT OF SURCHARGE FOR DISTANCE TO TOP OF BAR FOR OTHER DESIGNS.

° BARS F TO BE #8 SMOOTH AT EXPANSION JOINTS AND #8 DEFORMED AT CONSTRUCTION JOINTS.

*** VARY LENGTH OF LEGS OF BARS U TO FIT SLOPE OF PANEL FOR ALL VALUES OF H LESS THAN 8'-0" I.E. FOR 10% GRADE U1 LEGS = 1'-0", U26 = 4'-0".

+ FOR WALLS LESS THAN 13' IN HEIGHT, SPACING BETWEEN BARS A1 AND A2 = 7½".



REAR ELEVATION

APPROVED: [signature] DIRECTOR OF PUBLIC WORKS & TRANSPORTATION

DATE: April 16, 1997

STANDARD RETAINING WALL					
DESIGNS A TO K					
LOW FOOTING PRESSURE (L.F.P.)					
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION					
CITY OF DALLAS, TEXAS					
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
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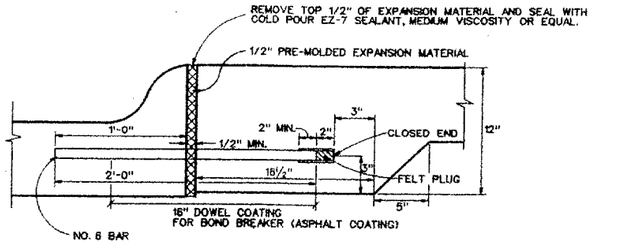
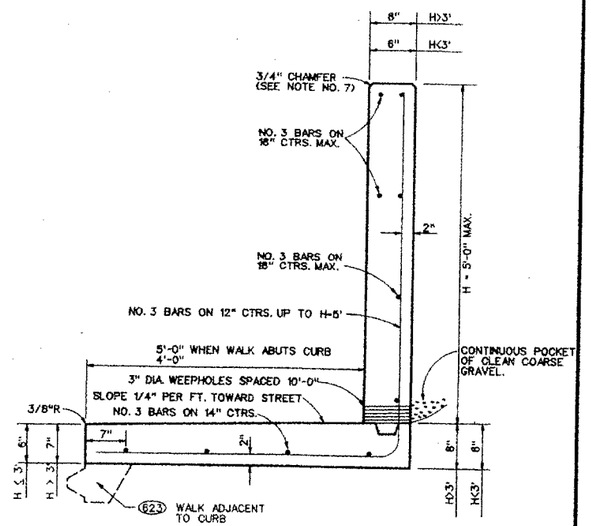


EXPANSION JOINT DETAIL AGAINST CURB

(FOR WALLS OVER 5 FEET IN HEIGHT WITH FOOTING ABUTING BACK OF CURB.)

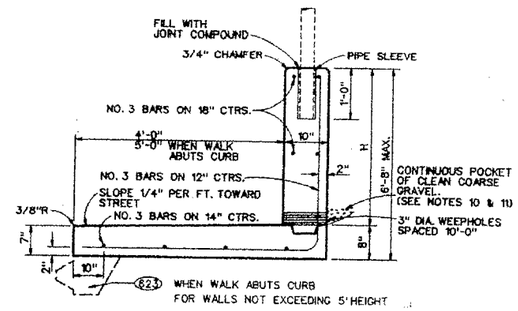
1. DOWELS SHALL BE COATED WITH BOND BREAKER ON WALL FOOTING SIDE AS SHOWN.
2. SPACING SHALL BE 12" ON CENTER, NO. 6 DOWEL BARS.
3. THE SLEEVE FOR DOWEL SHALL HAVE AN INSIDE DIAMETER OF 7/8" AND BE OF A QUALITY AND DESIGN TO PROVIDE FREE MOVEMENT OF THE DOWEL.
4. ENTIRE DOWEL AND SLEEVE ASSEMBLY WITH JOINT FILLER MATERIAL SHALL BE SECURED IN POSITION PARALLEL WITH THE FOOTING SURFACE BY A METHOD APPROVED BY THE ENGINEER PRIOR TO POURING OPERATION.



TYPE 6 RETAINING WALL

COMBINATION CANTILEVER & WALK

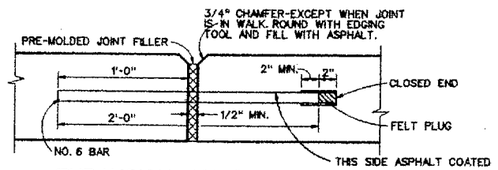
WALL GREATER THAN H-5'-0" REQUIRES SPECIAL ENGINEERING ANALYSIS



TYPE 7 RETAINING WALL

COMBINATION CANTILEVER & WALK WITH FENCE

FENCE TO BE A SEPARATE PAY ITEM

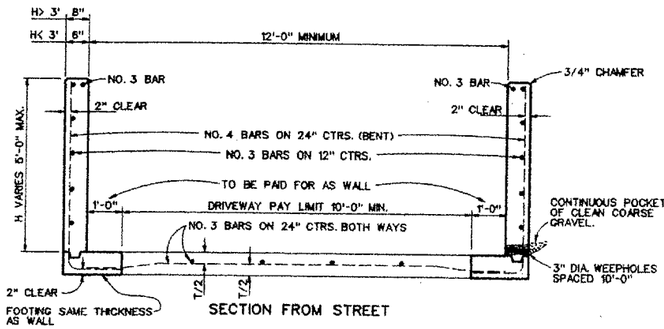


EXPANSION JOINT DETAIL IN WALL

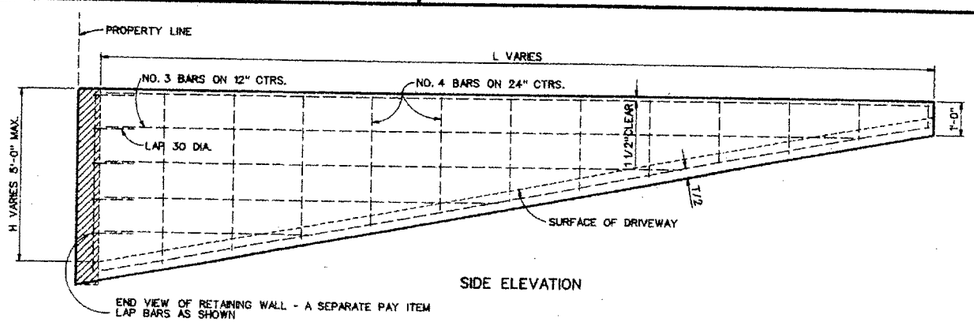
THE DOWELS SHALL BE SPACED 1'-0" MAXIMUM BEGINNING 1'-0" ABOVE FOOTING. A MINIMUM OF 2 DOWELS TO BE USED IN EACH JOINT, THE SLEEVE FOR DOWEL SHALL HAVE AN INSIDE DIAMETER OF 7/8" AND BE OF A QUALITY AND DESIGN TO PROVIDE FREE MOVEMENT OF THE DOWEL. THE ENTIRE DOWEL AND SLEEVE ASSEMBLY SHALL BE SECURED IN POSITION PRIOR TO POURING OPERATIONS.

THE EXPANSION JOINT SHALL EXTEND THROUGHOUT THE STEM AND WALK SECTION IN CONTINUOUS VERTICAL PLANE. ALL OTHER DETAILS TO BE AS ABOVE.

SPACING OF JOINTS SHALL BE 45' MAXIMUM FOR TYPES 6 THRU 8.



SECTION FROM STREET



SIDE ELEVATION

TYPE 8 RETAINING WALL

FOR DRIVEWAY THROUGH PROPERTY LINE RETAINING WALL

GENERAL NOTES FOR RETAINING WALLS, ALL TYPES (U.N.O.)

1. RETAINING WALLS SHALL BE BUILT WITH PERFORATED DRAIN SYSTEM INSTEAD OF WEEP HOLES WHENEVER FEASIBLE.
2. BARS SHALL CONFORM TO ITEM 2.2.6 OF NCTCOG SPECIFICATIONS.
3. BAR LAPS SHALL BE 30 DIAMETERS.
4. ALL EXPOSED SURFACES EXCEPT DRIVEWAY AND WALK SHALL RECEIVE A CARBORUNDUM OR APPROVED PAINTED FINISH.
5. DRIVEWAY AND WALK SHALL RECEIVE A NON-SKID WOOD FLOAT FINISH.
6. EXPOSED EDGES AND CORNERS TO BE ROUNDED OR CHAMFERED AS INDICATED HEREIN. (CHAMFER ON BACK OF WALL MAY BE ELIMINATED TO PERMIT MOWING)
7. WEEP HOLES SHALL BE FORMED BY FIBER DUCT 3" O.D.
8. FOR WALL TYPES 6 & 7, THE WALKWAY WIDTH MAY BE INCREASED WHEN SPECIFIED ON THE PLANS, BUT SHALL NOT BE DECREASED UNLESS A SPECIAL DETAILED DESIGN IS PROVIDED IN THE PLANS AND SPECIFICATIONS.
9. WEEP HOLES OR PERFORATED DRAIN SYSTEM MAY BE DELETED FOR RETAINING WALLS NOT EXCEEDING 3' IN HEIGHT WHEN APPROVED BY THE ENGINEER.
10. EXPANSION JOINTS SHALL BE CONSTRUCTED BETWEEN STREET CURB AND RETAINING WALL FOOTINGS ABUTTING BACK OF CURBS WHEN RETAINING WALL HEIGHT EXCEEDS 5' (SEE DETAIL ABOVE). FOR WALLS LESS THAN OR EQUAL TO 5' IN HEIGHT, SIDEWALK LUGS SHALL SHALL BE CONSTRUCTED AT BACK OF CURB INTEGRAL WITH THE RETAINING WALL FOOTING (NO EXPANSION MATERIAL).

APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: March 14, 1997

STANDARD RETAINING WALLS

TYPES 6-8

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

CITY OF DALLAS, TEXAS

DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
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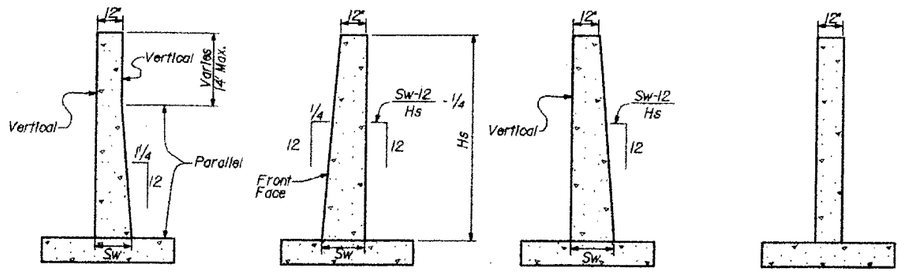


AS DETAILED ALL HEIGHTS
(Basis for Payment)

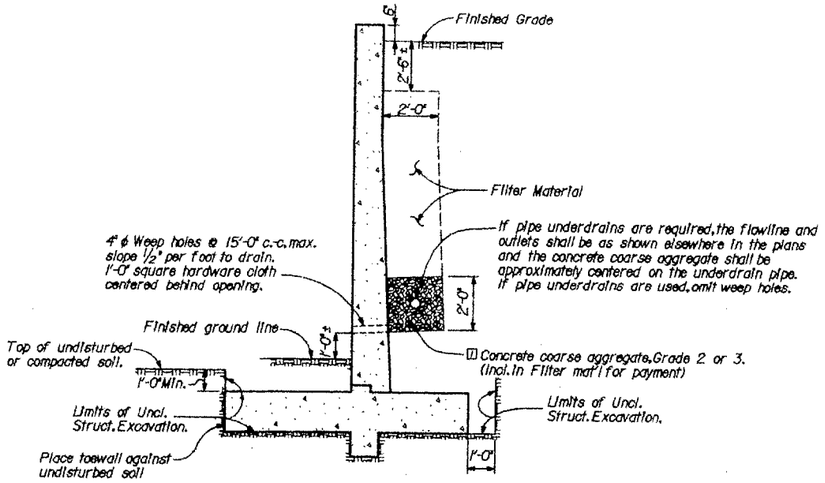
BOTH FRONT & BACK FACES SLOPING
Other slopes may be used on either front or back face of wall.

FRONT FACE VERTICAL BACK FACE SLOPED
(For "H" > 14')

BOTH FACES VERTICAL
(As detailed for "H" ≤ 14')

ALTERNATE STEM SLOPE DETAILS

Walls with slopes other than these may be used after approval by the Engineer. Sw shall not be less than shown in Table on page 3001 or 3002. No payment will be made for excess concrete due to changing of slope of wall face.



DRAINAGE DETAILS & EXCAVATION

GENERAL NOTES :

Walls are designed to provide a minimum factor of safety against sliding of 1.5. The undisturbed or compacted soil depth in front of walls, from bottom of key up shall not be less than Kw * Fr * 1'-0". The angle of internal friction (ϕ) of this soil must be greater than 20°.

The bearing capacity of the soil must be equal to or greater than the wall footing pressure.

Retaining walls with heights up to 15'-0" are detailed to be placed on grades up thru 10 % with footing level, with no changes in reinforcing steel. Steeper grades can be accomodated by shortening Bars A, & B and increasing length of legs of Bars U by the same amount. No change in Quantities will be involved. Walls over 15'-0" in height can be placed on steeper grades with no revisions.

Retaining walls may be placed on Horizontal Curves by adjusting lengths of footing Bars T & H. Minor revisions of Concrete Quantities may be required when maximum footing pressure walls are used.

Designed in accordance with A.A.S.H.T.O. 1973 Standard Specifications.

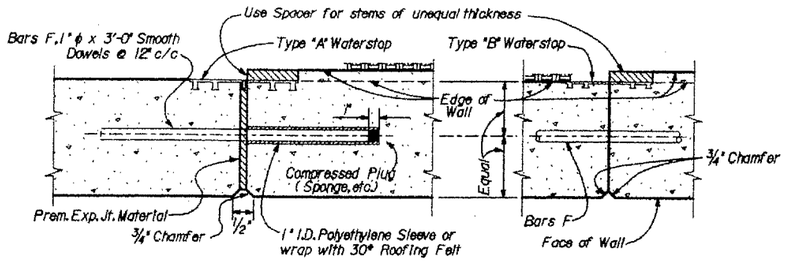
[1] All concrete to be Class C, f'c = 3600 psi, fc = 1440 psi

Reinforcing bar laps and splices shall conform to City of Dallas Specifications.

[1] Cost of Furnishing and Installing expansion joint material and waterstops shall be included in price bid for Class C Concrete (Retaining Walls)

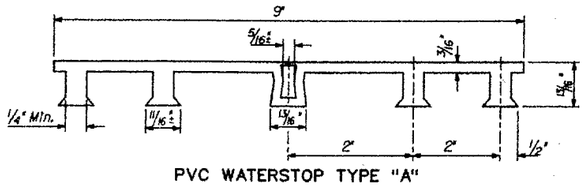
For notes and details not shown on this sheet, see sheets 3001 & 3002

[1] Use 1993 Texas State Highway Department Specifications.

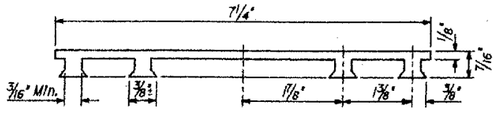


EXPANSION JOINT

CONSTRUCTION JOINT

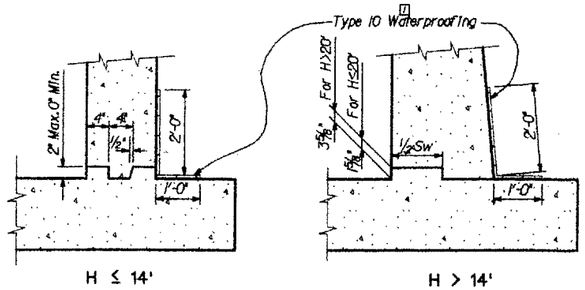


PVC WATERSTOP TYPE "A"



PVC WATERSTOP TYPE "B"

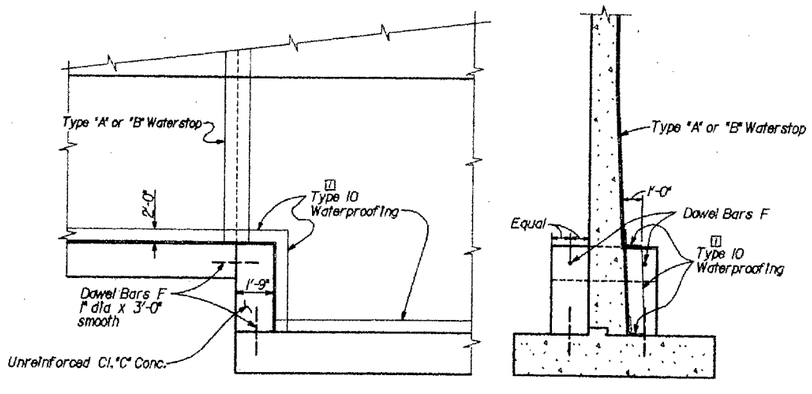
Note : Dimensions & shapes may vary slightly depending on manufacturer.



H ≤ 14'

H > 14'

JOINT AND WATERSTOP DETAILS



PART ELEVATION

PART SECTION

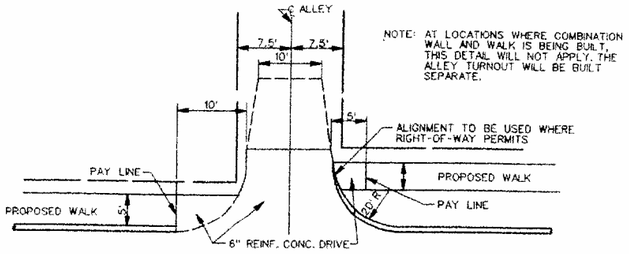
SHOWING WATERSTOP @ FOOTING JOINT

APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: March 14, 1997

STANDARD RETAINING WALLS
MISCELLANEOUS DETAILS

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CITY OF DALLAS, TEXAS

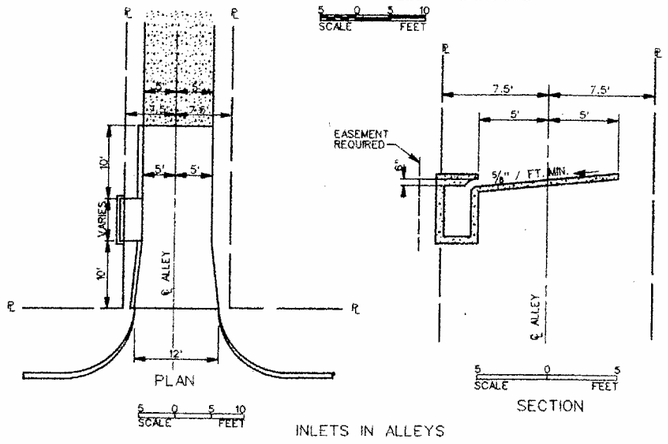
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	3004



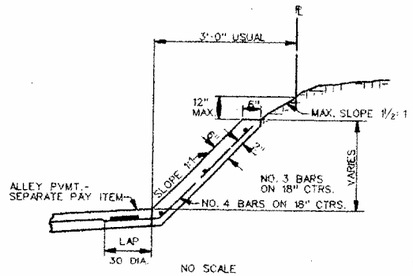
NOTE: AT LOCATIONS WHERE COMBINATION WALL AND WALK IS BEING BUILT, THIS DETAIL WILL NOT APPLY. THE ALLEY TURNOUT WILL BE BUILT SEPARATE.

WALK ADJACENT TO ALLEY TURNOUTS IS TO BE BUILT MONOLITHIC WITH THE TURNOUT AND TO THE SAME STANDARDS.

TYPICAL PLAN - ALLEY TURNOUTS

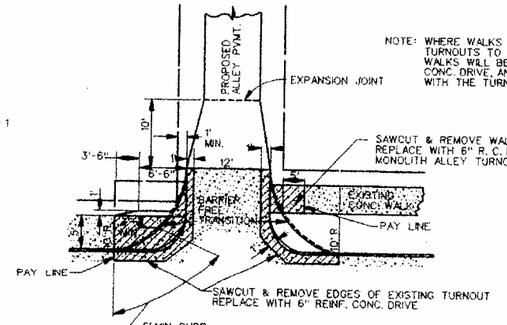


INLETS IN ALLEYS



NO SCALE

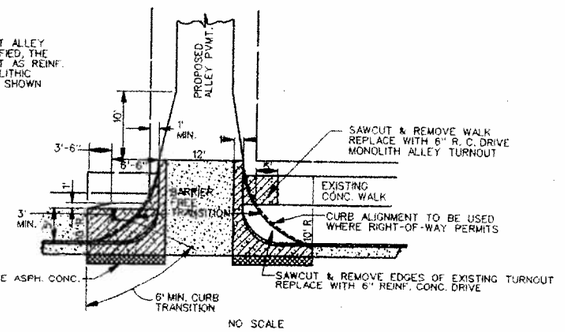
ALLEY SLOPE PROTECTION



NOTE: WHERE WALKS EXIST AT ALLEY TURNOUTS TO BE MODIFIED, THE WALKS WILL BE REBUILT AS REINF. CONC. DRIVE, AND MONOLITHIC WITH THE TURNOUT AS SHOWN

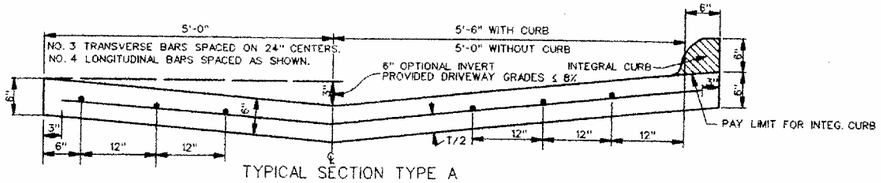
NO SCALE

DETAIL FOR WIDENING INTERSECTION OF PROPOSED ALLEY WITH EXISTING ALLEY PAVEMENT



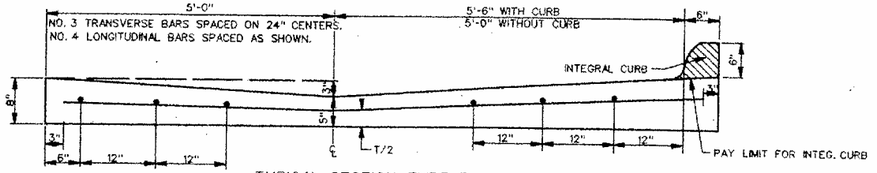
NO SCALE

DETAIL SHOWING MODIFICATION OF EXISTING TURNOUT AT ASPHALT STREET WITH CONCRETE CURB & GUTTER



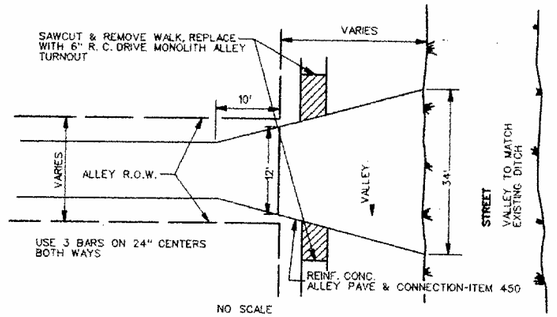
TYPICAL SECTION TYPE A

CURB OR CURBS NOT INCLUDED UNLESS SPECIFIED



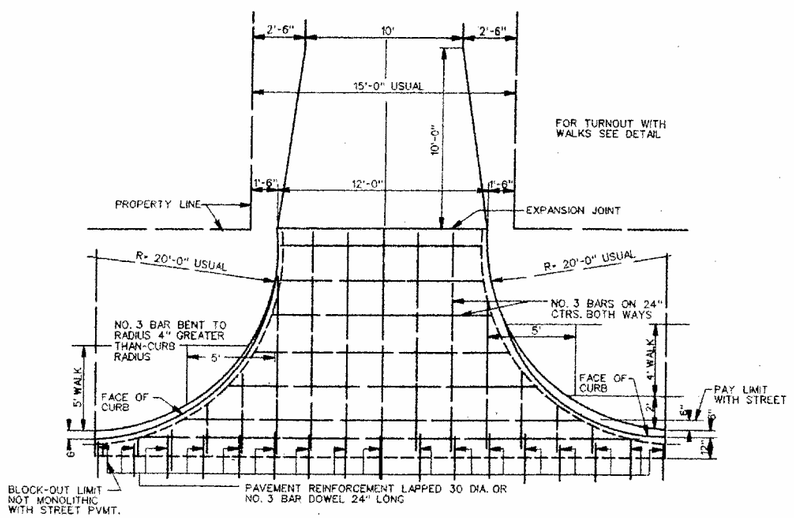
TYPICAL SECTION TYPE B

CURB OR CURBS NOT INCLUDED UNLESS SPECIFIED



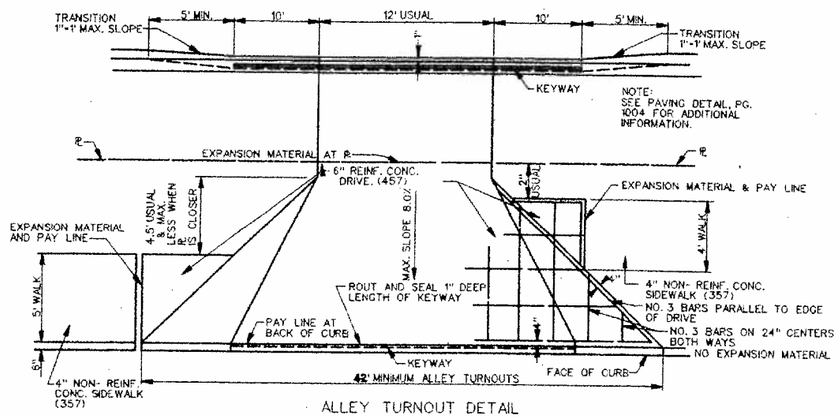
NO SCALE

DETAIL OF CONCRETE CONNECTION TO STREETS WITHOUT CURBS



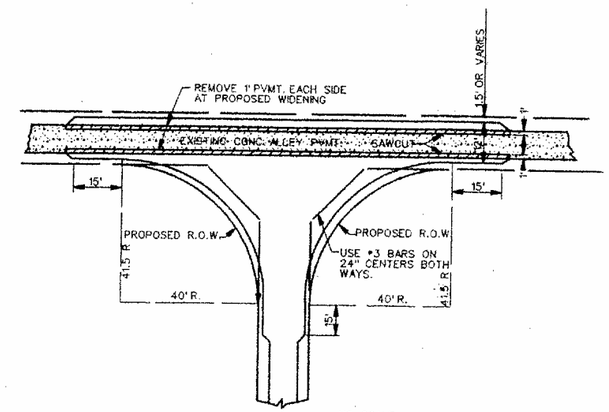
ALTERNATE ALLEY PAVING TURNOUT DETAIL

SCALE 10 0 5 10 FEET



ALLEY TURNOUT DETAIL

NO SCALE



NO SCALE

DETAIL FOR WIDENING INTERSECTION OF PROPOSED ALLEY WITH EXISTING ALLEY PAVEMENT

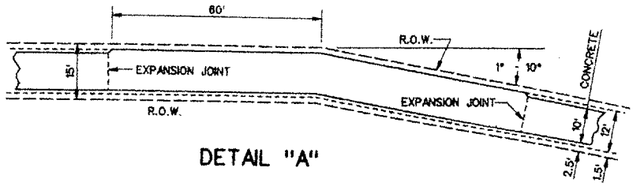
NOTE:
1. REDWOOD EXPANSION JOINTS SHALL BE PLACED AT ALL ABRUPT CHANGES IN ALIGNMENT OR WIDTH OR AT A MAXIMUM DISTANCE OF 150 FEET.
2. SUBGRADE PREPARATION SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS AND SPECIAL PROVISIONS BEFORE PAVEMENT IS PLACED. SUBGRADE SHALL BE CUT TO DESIGN BOTTOM OF PAVEMENT ELEVATION, SCARIFIED TO A DEPTH OF 8" TO A WIDTH ONE FOOT OUTSIDE OF THE PAVEMENT LIMITS AND COMPACTED TO A DENSITY OF 98% STANDARD PROCTOR DENSITY AT A MOISTURE CONTENT BETWEEN(-) 2% TO (+) 4% OF OPTIMUM MOISTURE.

NOTE: ALTERNATE REINFORCEMENT
1. APPROVED WELDED WIRE FABRIC IN SHEETS MAY BE USED IN LIEU OF DEFORMED REINFORCING BARS.
2. THE WIRE FABRIC SHALL BE SUPPORTED ON 36" CENTERS BOTH WAYS BY APPROVED BAR CHAIRS.
3. THE SIZE OF THE WIRE FABRIC SHALL BE 12 X 12 - W3.5 X W3.5 WITH A NORMINAL DIAMETER OF 0.211 INCHES AND A NOMINAL WEIGHT OF 0.119 LBS / LIN. FT.

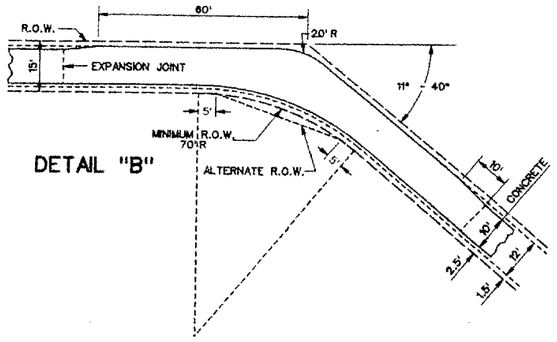
APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: March 14, 1997

STANDARD ALLEY PAVING
TURNOUTS AND SLOPE PROTECTION DETAILS
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CITY OF DALLAS, TEXAS

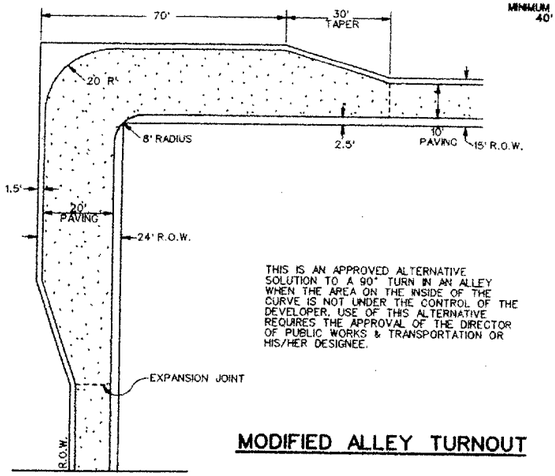
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	4001



DETAIL "A"

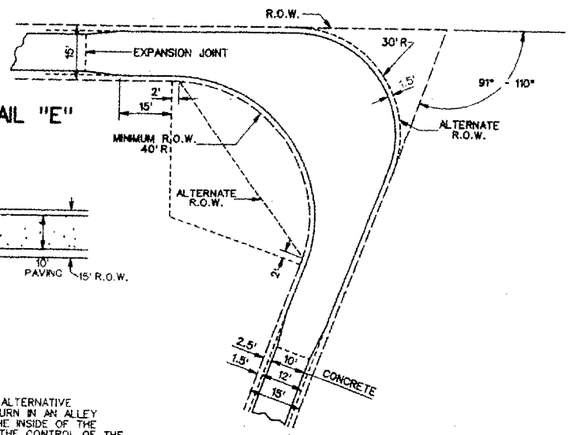


DETAIL "B"

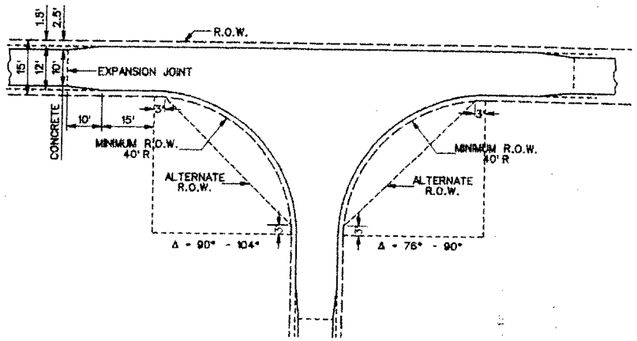


THIS IS AN APPROVED ALTERNATIVE SOLUTION TO A 90° TURN IN AN ALLEY WHEN THE AREA ON THE INSIDE OF THE CURVE IS NOT UNDER THE CONTROL OF THE DEVELOPER. USE OF THIS ALTERNATIVE REQUIRES THE APPROVAL OF THE DIRECTOR OF PUBLIC WORKS & TRANSPORTATION OR HIS/HER DESIGNEE.

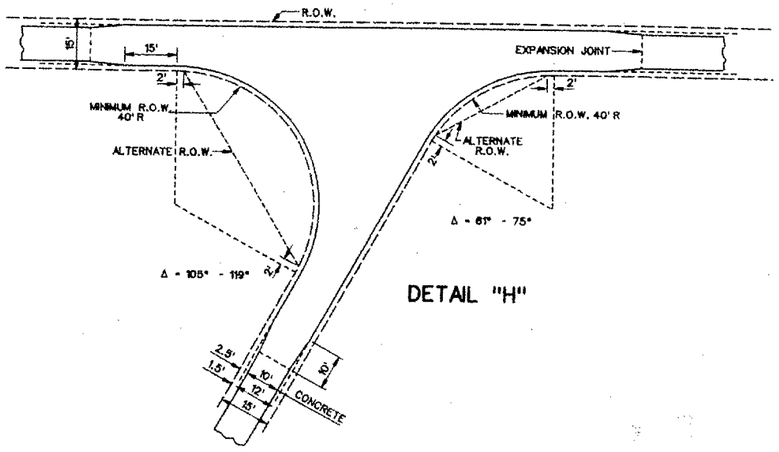
MODIFIED ALLEY TURNOUT



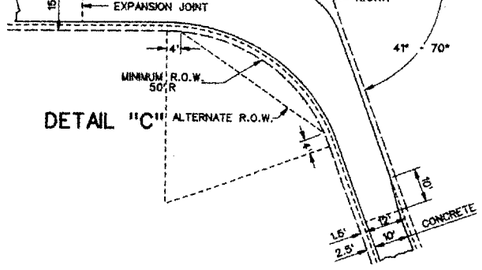
DETAIL "E"



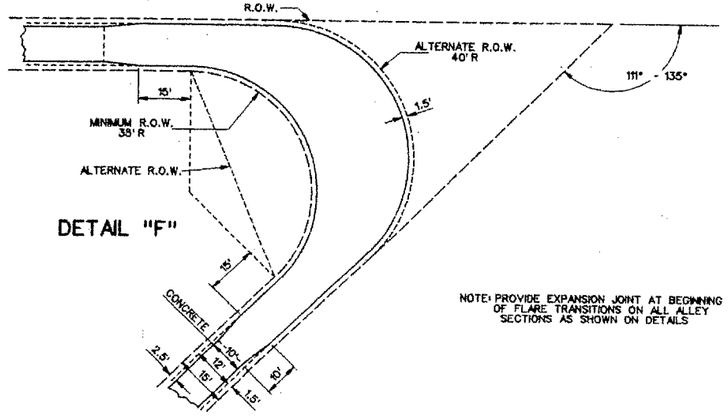
DETAIL "G"



DETAIL "H"

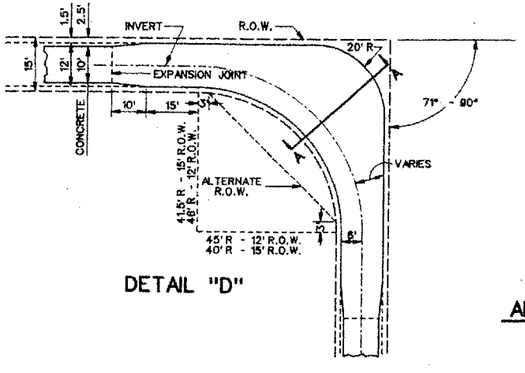


DETAIL "C"

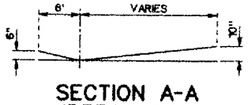


DETAIL "F"

NOTE: PROVIDE EXPANSION JOINT AT BEGINNING OF FLARE TRANSITIONS ON ALL ALLEY SECTIONS AS SHOWN ON DETAILS

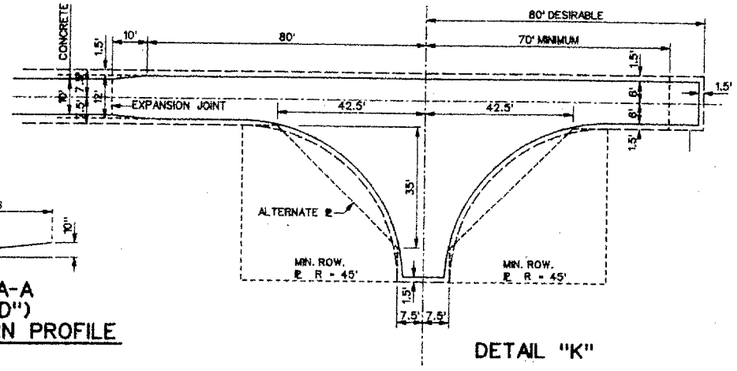


DETAIL "D"



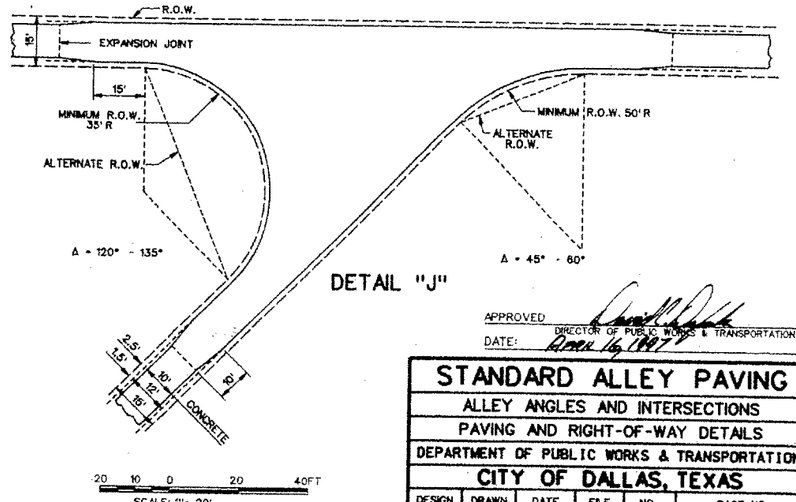
SECTION A-A
(DETAIL "D")
ALLEY AT A TURN PROFILE

HORIZ.: 1"=10'
VERT.: 1"=4'



DETAIL "K"

STANDARD ALLEY TURNAROUND
FOR GARBAGE TRUCKS



DETAIL "J"

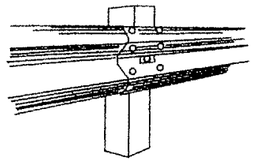
20 10 0 20 40FT
SCALE: 1"= 20'

APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: June 16, 1997

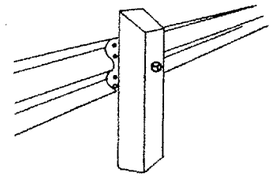
STANDARD ALLEY PAVING

ALLEY ANGLES AND INTERSECTIONS
PAVING AND RIGHT-OF-WAY DETAILS
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CITY OF DALLAS, TEXAS

DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	4002

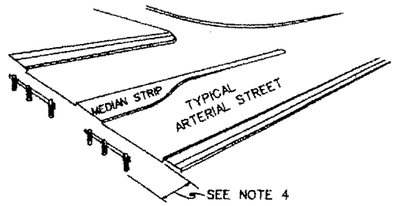


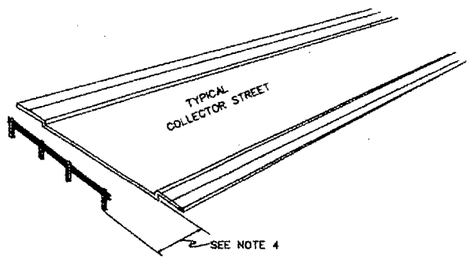
TRAFFIC FACE



REAR FACE

GUARD RAIL CONNECTION AT POST

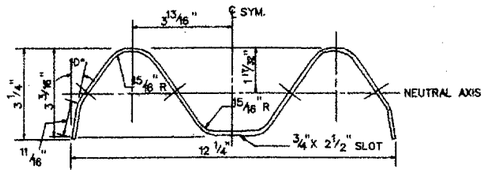




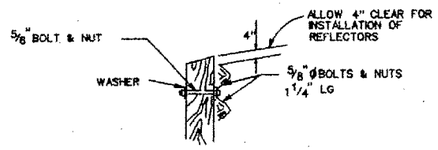
GENERAL NOTES

1 METAL FLEX-BEAM GUARD RAIL SHALL BE 10 GAGE, GALVANIZED AS PER ASTM A93.
2 AT THE OPTION OF THE CONTRACTOR THE RAIL ELEMENT OF THE GUARD FENCE MAY BE FURNISHED IN EITHER 12½OR 25 FEET NOMINAL LENGTHS. RAIL SHALL BE FURNISHED WITH POST BOLT SLOTS FOR 5/8" DIAMETER BOLT CONNECTION TO POSTS.
3 BOLTS USED IN ATTACHING RAIL TO POST SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT.
4 LOCATION OF BARRICADES SHALL BE DETERMINED BY THE ENGINEER.
5 WHERE ROCK IS ENCOUNTERED OR WHERE SHOWN ON THE PLANS, THE DIAMETER OF HOLES AND THE MATERIAL FOR BACKFILLING SHALL BE AS DIRECTED BY THE ENGINEER.
6 TIMBER POSTS MAY BE BEVELED AT APPROX. 10° ON THE TOP OR BOTH ENDS WITH HIGH SIDE PLACED TOWARD THE ROADWAY OR THEY MAY BE DOMED.
7 THE CONTRACTOR HAS THE OPTION OF USING 7" DIA ROUND POST INSTEAD OF SQUARE POST
8 UPON INSTALLATION OF BARRICADE, THE CONTRACTOR SHALL NOTIFY THE TRAFFIC CONTROL DEPARTMENT THAT THE BARRICADE IS READY FOR THE SIGN TO BE INSTALLED

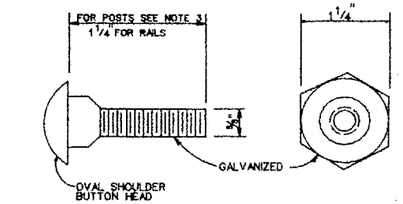
STREET TYPE	LANE WIDTH FT.	BARRICADE LENGTH FT.
ARTERIAL	2-33	26
COLLECTOR	1-44	38.5
APARTMENT	1-36	26
RESIDENTIAL	1-26	26



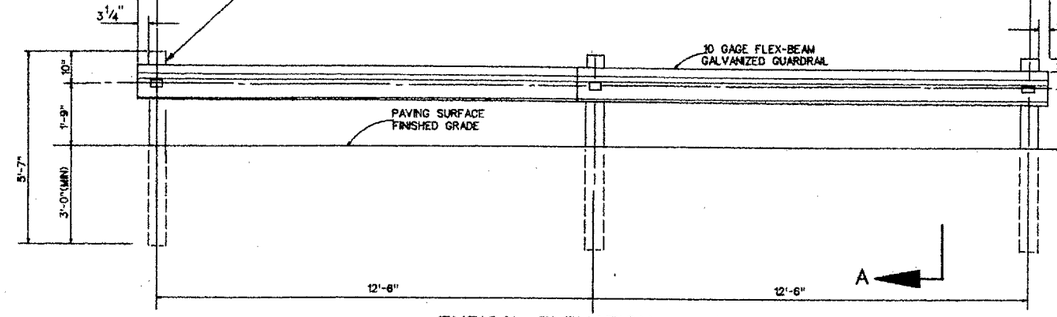
GUARD RAIL SECTION
NO SCALE



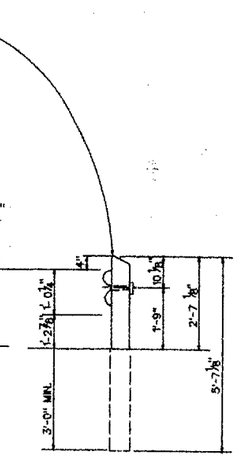
ARRANGEMENT AT POST



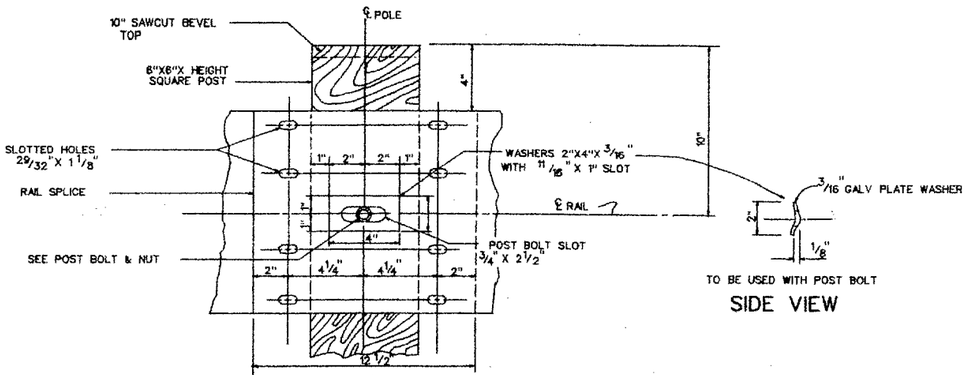
BOLT & NUT FOR POST & RAIL
SCALE: 3"=1'-0"



TYPICAL ELEVATION
SCALE: 1/2 "=1'-0"



SECTION A-A
SCALE: 1 1/2 "=1'-0"



SIDE VIEW

WOOD POST CONNECTION
SCALE: 3" - 1'-0"

6"X6"X8'-0" SQUARE POST
ALL POSTS SHALL BE TREATED WITH A WOOD PRESERVATIVE OR CREOSOTE BEFORE INSTALLATION

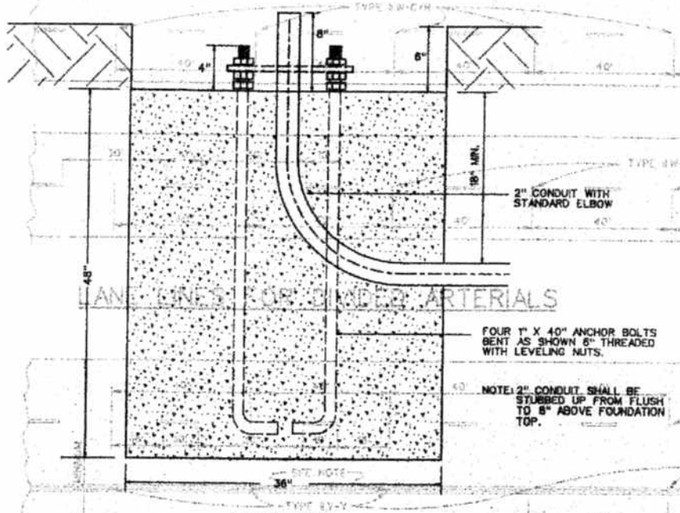
APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: April 14, 1997

TRAFFIC CONTROL DETAILS

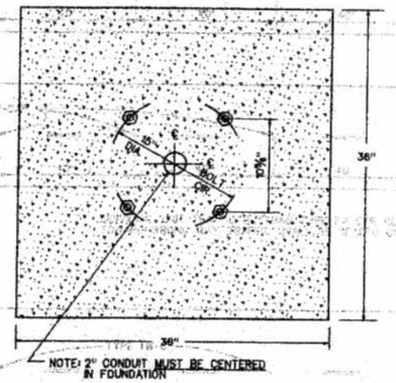
DEAD END STREET
BARRICADE
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CITY OF DALLAS, TEXAS

DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	5001

SINGLE LEG STREETSCAPE SIGNAL FOUNDATION

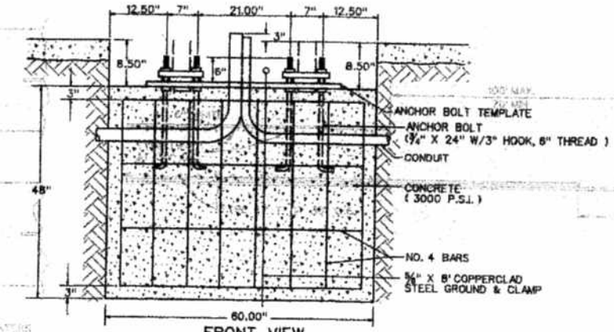


FRONT VIEW

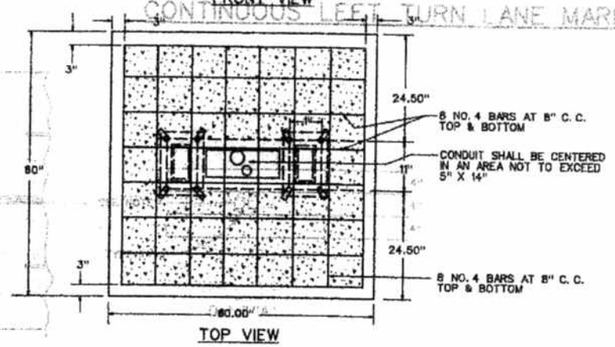


TOP VIEW

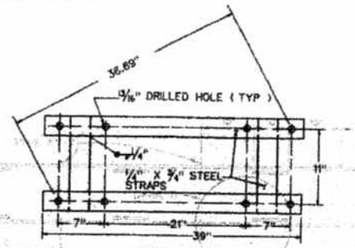
DOUBLE LEG STREETSCAPE SIGNAL FOUNDATION



FRONT VIEW



TOP VIEW



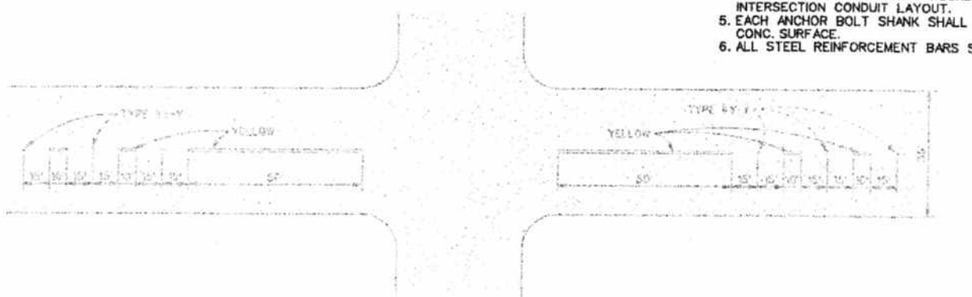
TOP VIEW
ANCHOR BOLT TEMPLATE

NOTE: ANCHOR BOLTS SHALL BE PROVIDED BY CITY OF DALLAS ALL OTHER MATERIAL, INCLUDING ANCHOR BOLT TEMPLATES, SHALL BE PROVIDED BY THE CONTRACTOR.

LANE LINES FOR UNDIVIDED ARTERIALS

CONTINUOUS LEFT TURN LANE MARKINGS

LANE LINES & CENTER LINES FOR
UNDIVIDED MINOR ARTERIALS (44' or more in width)



PAVEMENT MARKINGS
36' LOCAL & COLLECTOR STREETS

NOTES

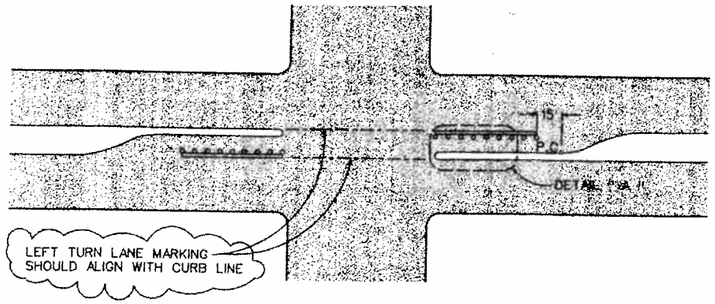
1. A ¼" THICK STEEL PLATE TEMPLATE WITH HOLES ⅛" GREATER THAN ANCHOR BOLT DIA. SHALL BE USED TO ACCURATELY POSITION ANCHOR BOLTS.
2. CONCRETE USED FOR FOUNDATIONS SHALL BE EITHER CLASS A OR CLASS C AS DEFINED IN THE NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" ITEM 7.4.5.
3. ALL ANCHOR BOLT HOOKS SHALL BE POINTED TOWARDS THE CENTER OF THE FOUNDATIONS.
4. ALL CONDUITS PLACED IN A FOUNDATION SHALL BE ORIENTED AS INDICATED ON THE INTERSECTION CONDUIT LAYOUT.
5. EACH ANCHOR BOLT SHANK SHALL PROJECT ¼" TO ½" ABOVE THE FOUNDATIONS CONC. SURFACE.
6. ALL STEEL REINFORCEMENT BARS SHALL BE OF INTERMEDIATE GRADE.

TRAFFIC LANE LINE MARKINGS (Typical)

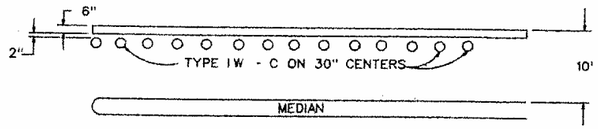
APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: April 16, 1997

TYPICAL TRAFFIC SIGNALS
FOUNDATION DETAILS
CITY STREETS
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CITY OF DALLAS, TEXAS

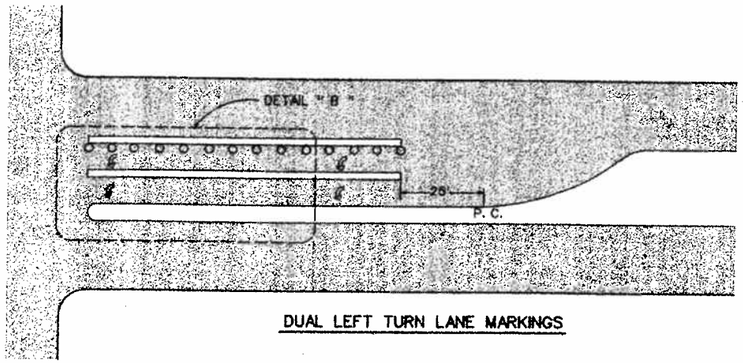
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.M.	APRIL 1997	251D	1	5002



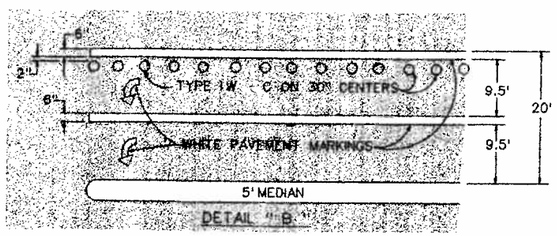
STANDARD LEFT TURN LANE MARKINGS



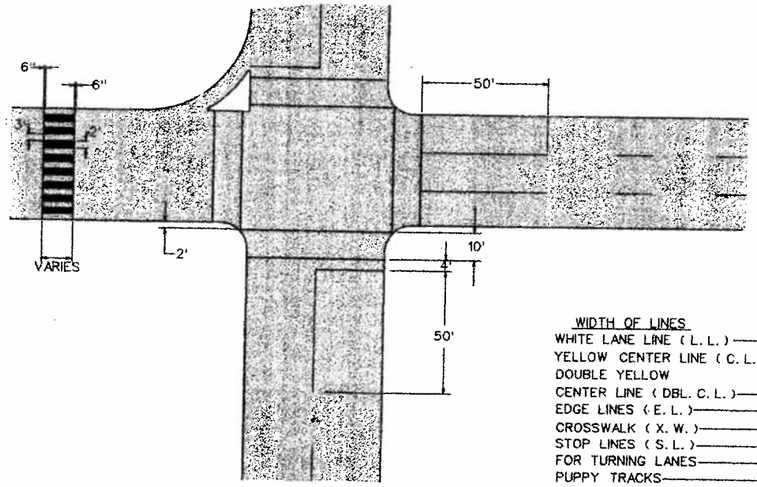
DETAIL " A "



DUAL LEFT TURN LANE MARKINGS



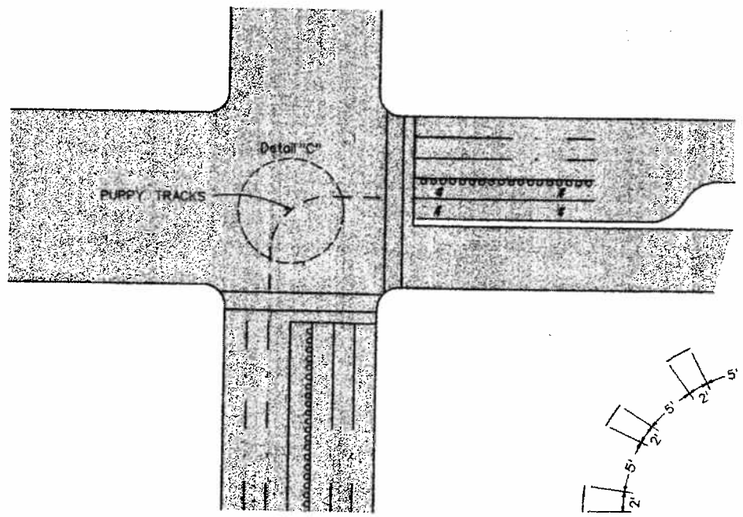
DETAIL " B "



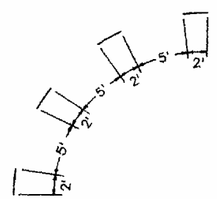
TYPICAL CROSSWALK LAYOUT

WIDTH OF LINES

WHITE LANE LINE (L. L.)	4"
YELLOW CENTER LINE (C. L.)	4"
DOUBLE YELLOW CENTER LINE (DBL. C. L.)	4" - 4" GAP - 4"
EDGE LINES (E. L.)	4" WHITE - YELLOW
CROSSWALK (X. W.)	6" WHITE
STOP LINES (S. L.)	18" WHITE
FOR TURNING LANES	6" WHITE
PUPPY TRACKS	4"
R.R. STOP BARS	24"



TYPICAL " PUPPY TRACK " PVM'T. MARKING LAYOUT



DETAIL " C "

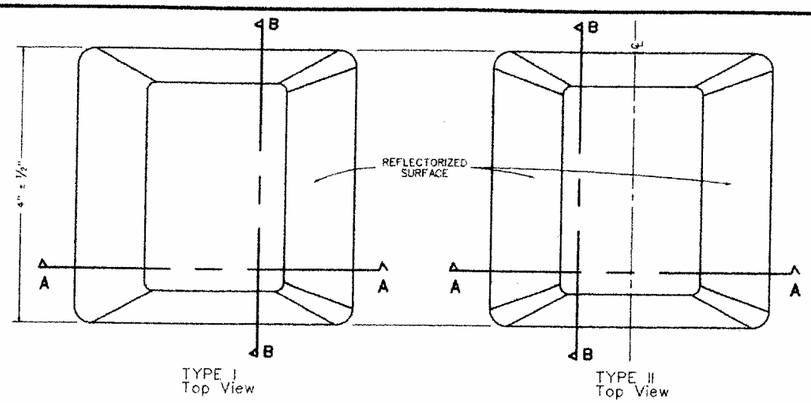
NO SCALE

APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: May 1997

TYPICAL PAVEMENT MARKING DETAILS

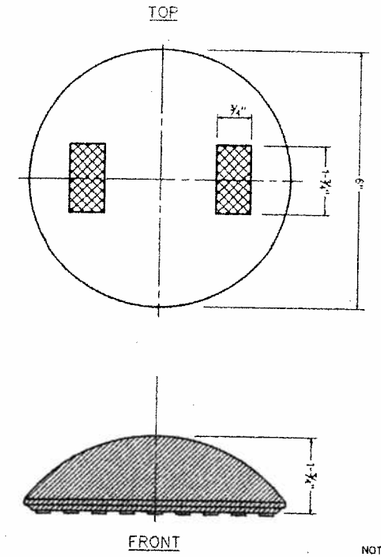
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CITY OF DALLAS, TEXAS

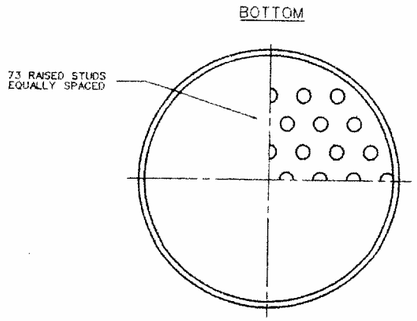
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	5004



(708) TYPE I W · C
(709) TYPE I Y · Y
(710) TYPE II W · C/R
(711) TYPE II Y · Y

PAVEMENT LANE MARKERS
(REFLECTORIZED)



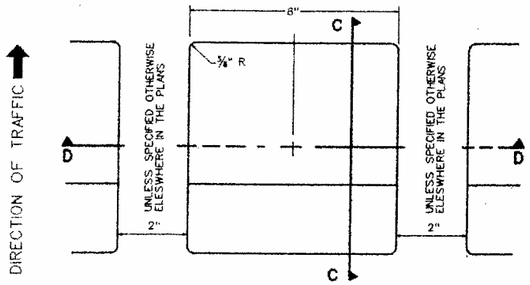


NOTE: TOLERANCES ± ⅛" UNLESS OTHERWISE SPECIFIED

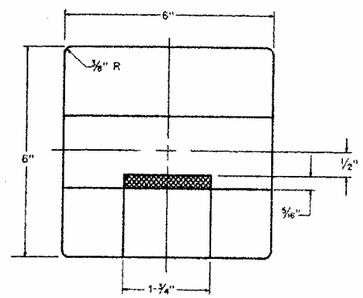
TWO-WAY REFLECTIVE CERAMIC CHANNEL MARKER, YELLOW COLOR W/ YELLOW REFLECTORS
NO SCALE

ONE-WAY REFLECTIVE CERAMIC CHANNEL MARKER, YELLOW OR WHITE COLOR
NO SCALE

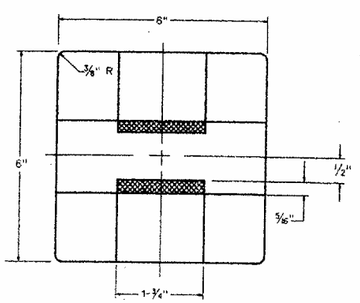
6" CERAMIC CHANNEL MARKERS



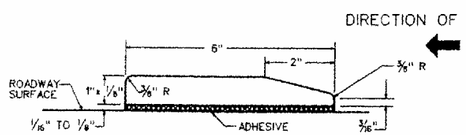
JIGGLE BAR IN PLACE
TOP VIEW



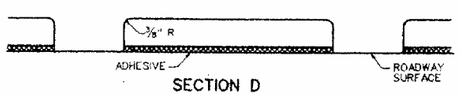
TYPE I
TOP VIEW



TYPE II
TOP VIEW



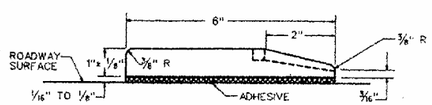
SECTION C



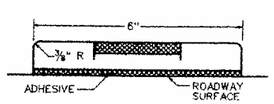
SECTION D

JIGGLE BAR TILES
(NONREFLECTIVE) ITEM (714)

"JIGGLE BARS" CONSIST OF A NUMBER OF JIGGLE BAR TILES PLACED IN A LINEAR CONFIGURATION

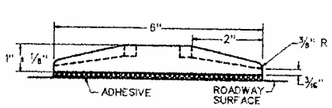


(715) TYPE I W · C
(716) TYPE I Y · Y
SIDE VIEW



TYPES I & II
FRONT VIEW

JIGGLE BAR TILES
(REFLECTORIZED)



(717) TYPE II W · C/R
(718) TYPE II Y · Y
SIDE VIEW

NOTE

ALL DIMENSIONS ARE ± ⅛" UNLESS OTHERWISE SHOWN.

GENERAL NOTES:

THE PAVEMENT UPON WHICH THE LANE AND CHANNEL MARKERS, AND JIGGLE BAR TILE ARE TO BE PLACED SHALL BE PREPARED SUBJECT TO THE APPROVAL OF THE ENGINEER TO INSURE PROPER CLEANING OF THE PAVEMENT SURFACE.

RPM"S SHALL BE BONDED TO THE ROADWAY SURFACE WITH ADHESIVE CONFORMING WITH THE SPECIFICATION.

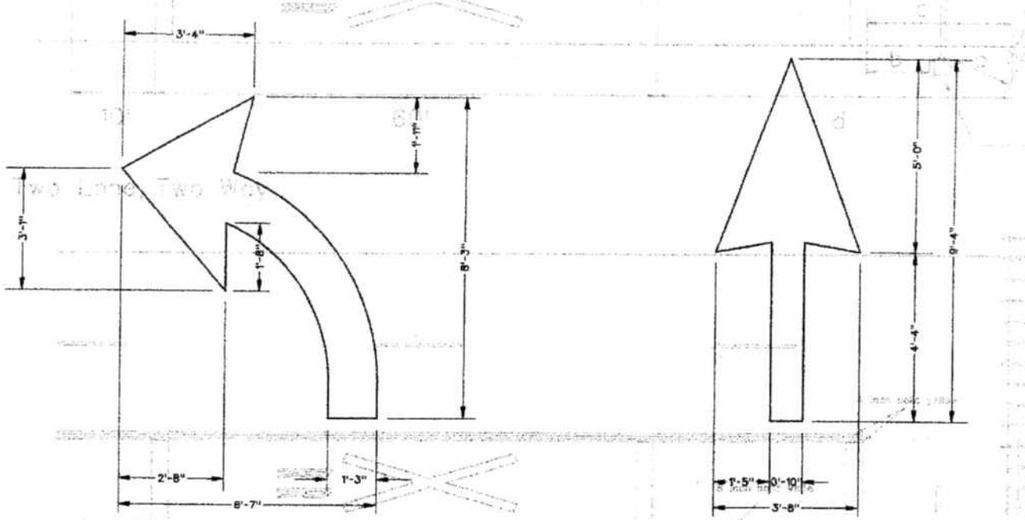
JIGGLE BARS SHALL BE PLACED AT SUCH OTHER LOCATIONS AS SHOWN ON THE PLAN AND PROFILE SHEETS OR WHERE DIRECTED BY THE ENGINEER.

MARKERS SHOWN ARE FOR ILLUSTRATION PURPOSES ONLY. THEY ARE NOT INTENDED TO SPECIFY ANY PARTICULAR PRODUCT.

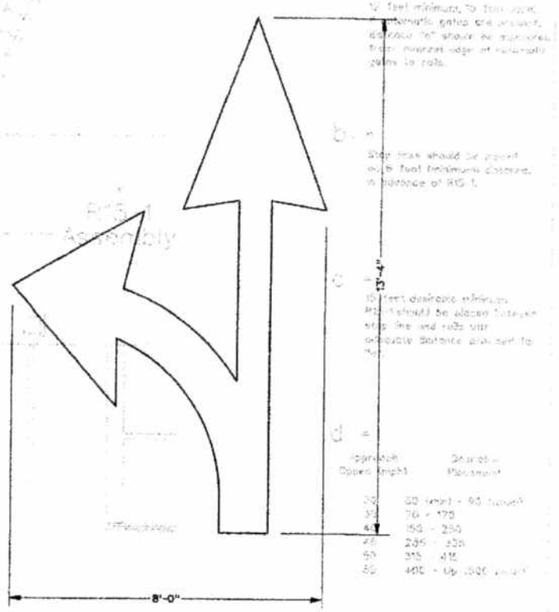
APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: April 14, 1997

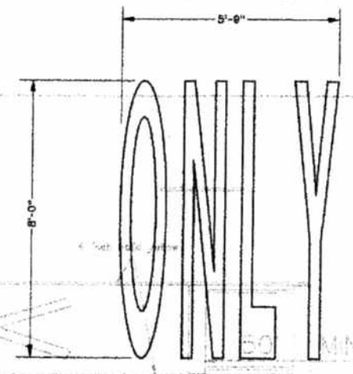
INDIVIDUAL UNIT PAVEMENT MARKINGS
REFLECTIVE PAVEMENT MARKERS,
TRAFFIC BUTTONS & JIGGLE BAR TILE
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CITY OF DALLAS, TEXAS

DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	5005



ELONGATED ARROWS FOR PAVEMENT MARKINGS



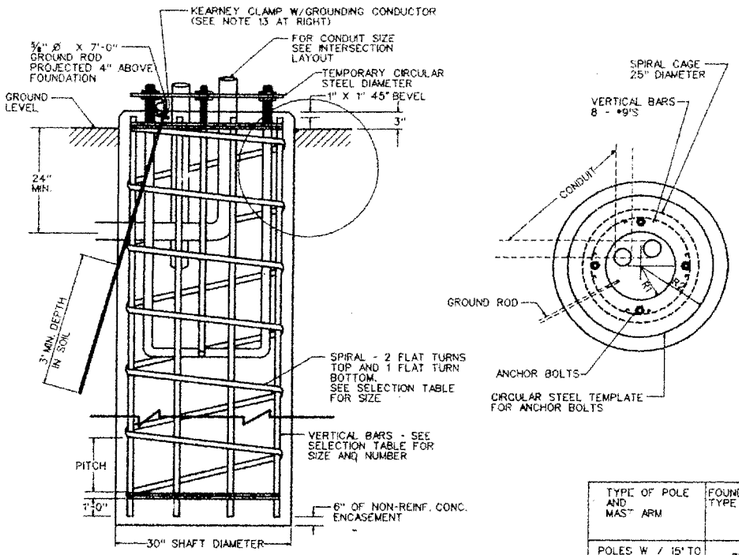


ELONGATED LETTERS FOR PAVEMENT MARKINGS

APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE:

TYP. PAVEMENT MARKINGS					
RAILROAD CROSSING					
CITY STREETS					
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION					
CITY OF DALLAS, TEXAS					
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	5006

POLE FOUNDATION DETAILS FOR TRAFFIC SIGNAL STRUCTURES

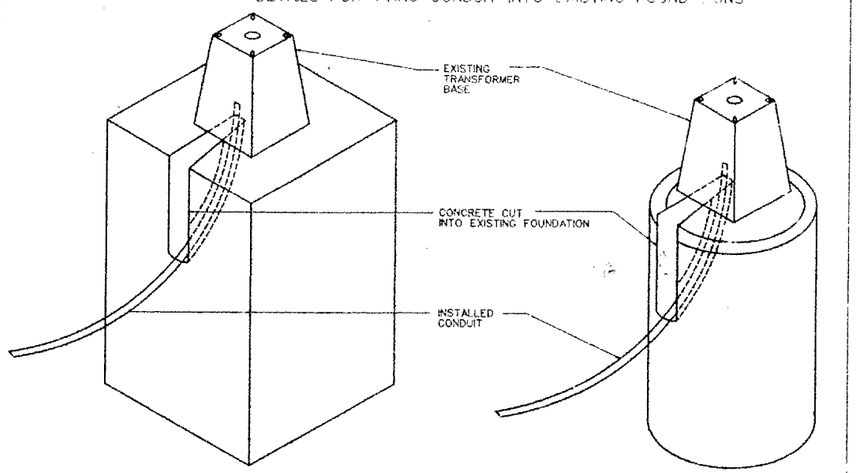


NOTES:
1. A ¼" THICK STEEL PLATE TEMPLATE WITH HOLES 1/16" GREATER THAN THE ANCHOR BOLT DIAMETER SHALL BE USED TO ACCURATELY POSITION ANCHOR BOLTS.
2. CONCRETE USED FOR FOUNDATIONS SHALL BE EITHER CLASS A OR CLASS C AS DEFINED IN THE NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENT'S " STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION " ITEM 7.4.5
3. ALL ANCHOR BOLT HOOKS SHALL BE POINTED TOWARDS THE CENTER OF THE FOUNDATION.
4. ALL CONDUITS PLACED IN THE FOUNDATION SHALL BE ORIENTED AS INDICATED ON THE INTERSECTION CONDUIT LAYOUT.
5. 7 INCHES OF THE THREADED PORTION OF EACH ANCHOR BOLT SHALL PROJECT ABOVE THE TOP SURFACE OF THE FOUNDATION.
6. A ⅝" Ø X 7'-0" COPPER CLAD STEEL GROUND ROD SHALL BE PLACED IN THE FOUNDATION WITH A MINIMUM OF 4 INCHES OF THE ROD PROJECTING ABOVE THE FOUNDATION'S TOP SURFACE.
7. EACH GROUND ROD SHALL BE DRIVEN INTO THE SOIL FOR A MINIMUM OF 3 FEET AS INDICATED ON THE DRAWING AT THE LEFT.
8. WHEN SOLID ROCK IS ENCOUNTERED DURING DRILLING, THE DRILLED SHAFT SHALL EXTEND 5'-0" INTO SOLID ROCK, OR TO A DEPTH DETERMINED BY THE ENGINEER.
9. THE CONFIGURATION FOR ANCHOR BOLTS AND VERTICAL BARS INSIDE THE SPIRAL CAGE SHALL BE AS INDICATED ON DRAWING AT THE LEFT.
10. SEE SELECTION TABLE FOR APPROPRIATE DRILLED SHAFT DEPTH FOR A GIVEN TYPE OF POLE AND ARM.
11. ALL STEEL REINFORCEMENT BARS SHALL BE OF INTERMEDIATE GRADE.
12. A 2" DEEP CIRCULAR FORM SHALL BE PLACED TO ENCASE THE TOP PORTION OF ALL CIRCULAR FOUNDATIONS.
13. CONNECT #6 AWG STRANDED UNINSULATED COPPER GROUNDING CONDUCTOR TO GROUND ROD WITH A KEARNEY CLAMP.

FOUNDATION SELECTION TABLE

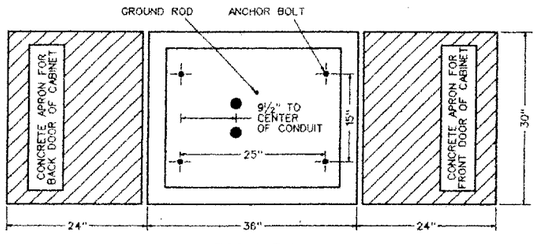
TYPE OF POLE AND MAST ARM	FOUNDATION TYPE	DRILLED SHAFT DIAMETER	REINFORCEMENT STEEL		DRILLED SHAFT DEPTH	ANCHOR BOLT-QUANTITY AND DIMENSION	ANCHOR BOLT CIRCLE DIAMETER	TEMPLATE	
			VERT BARS	SPIRAL & PITCH				INSIDE RADIUS R1	OUTSIDE RADIUS R2 (MIN.)
POLES W / 15' TO 50' MAST ARMS	786	30"	8-#9's	#3 AT 9"	12'-0"	(4) - 1½" X 54" X 6" HOOK	22"	7"	13"
PEDESTAL POLE, NO MAST ARM	787	30"	8-#9's	#2 AT 12"	5'-0"	(4) - 1" X 36" X 4" HOOK	12"	4 ½"	8"

DETAILS FOR TYING CONDUIT INTO EXISTING FOUNDATIONS

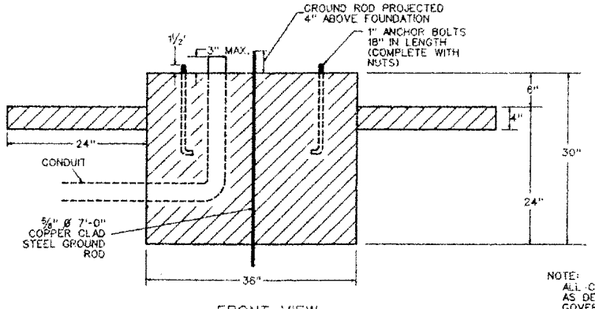


NOTES:
1. CONCRETE CUTS SHALL NOT BE MORE THAN 1" GREATER THAN THE DIAMETER OF THE CONDUIT BEING INSTALLED.
2. FILL ALL CONDUIT CUTS WITH GROUT.
3. ALL WORK ASSOCIATED WITH TYING CONDUIT INTO AN EXISTING FOUNDATION SHALL BE DONE WITHOUT INTERFERING WITH THE OPERATION OF THE SIGNAL.

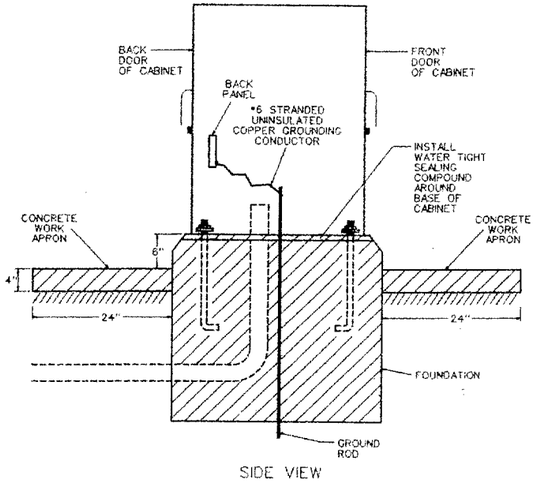
BASE MOUNTED CONTROLLER CABINET FOUNDATION DETAILS (FOR TYPE 170 CABINET)



TOP VIEW



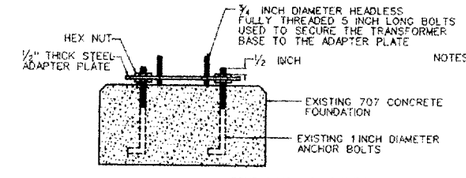
FRONT VIEW

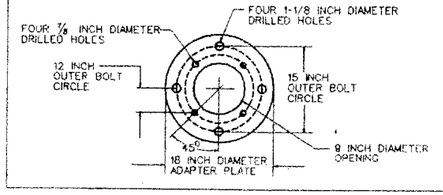


SIDE VIEW

NOTE:
ALL CONCRETE SHALL BE EITHER CLASS A OR CLASS C AS DEFINED IN THE NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS' "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" ITEM 7.4.5

DETAILS FOR ADAPTER PLATE FOR INSTALLATION OF PEDESTAL POLES ON EXISTING 707 FOUNDATIONS





NOTES:
1. ALL SURFACES OF THE ADAPTER PLATE SHALL BE COVERED WITH TWO COATS OF THE GRAY ENAMEL PAINT DESCRIBED IN THE SPECIFICATIONS UNDER PAINTING OF EXISTING NON-GALVANIZED TRAFFIC SIGNAL STRUCTURES.
2. THE EXPOSED PORTION OF EACH EXISTING ANCHOR SHALL BE CUT SO THAT IT EXTENDS ONLY ½ INCH FROM THE TOP OF THE HEX NUT AFTER INSTALLATION OF THE ADAPTER PLATE AS SHOWN AT LEFT.
3. THE ¾ INCH DIAMETER HEADLESS FULLY THREADED 9 INCH LONG BOLTS USED TO SECURE THE TRANSFORMER BASE TO THE ADAPTER PLATE CAN BE CONSTRUCTED FROM THE ANCHOR BOLTS SUPPLIED WITH THE PEDESTAL STRUCTURES.
4. WHERE CONDUITS FROM THE EXISTING FOUNDATION REQUIRE AN OPENING IN THE ADAPTER PLATE LARGER THAN THE 9 INCH DIAMETER CIRCLE SHOWN, NECESSARY MEASURES (ENLARGEMENT OF THE PLATE OPENING, CUTTING EXCESS CONDUIT EXTENDING FROM THE FOUNDATION, ETC.) SHALL BE TAKEN TO SECURE FREE PASSAGE OF WIRES THROUGH THE ADAPTER PLATE TO THE TRANSFORMER BASE.
5. THE ADAPTER PLATE SHALL BE LEVELED & SECURELY TIGHTENED TO THE EXISTING FOUNDATION PRIOR TO THE INSTALLATION OF THE NEW TRANSFORMER BASE.
6. SPRING WASHERS SHALL BE USED BETWEEN THE ADAPTER PLATE AND HEX NUTS ON THE ¾ INCH THREADED BOLTS.
7. ALL WASHERS AND HEX NUTS NECESSARY TO COMPLETE THE INSTALLATION SHALL BE PROVIDED BY THE CONTRACTOR.

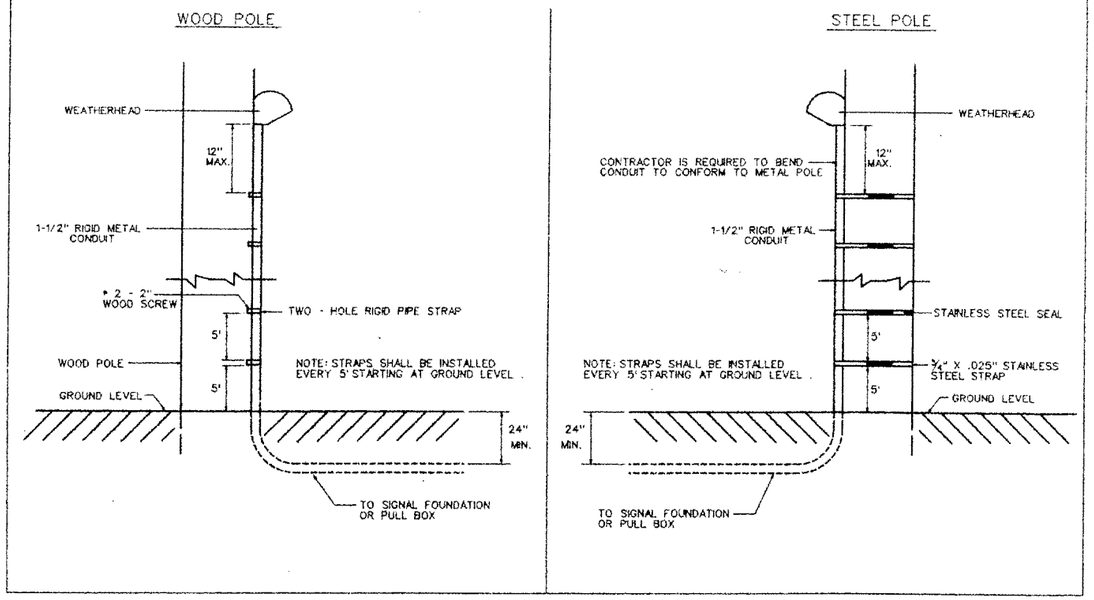
APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: June 16, 1997

TRAFFIC SIGNAL DETAILS

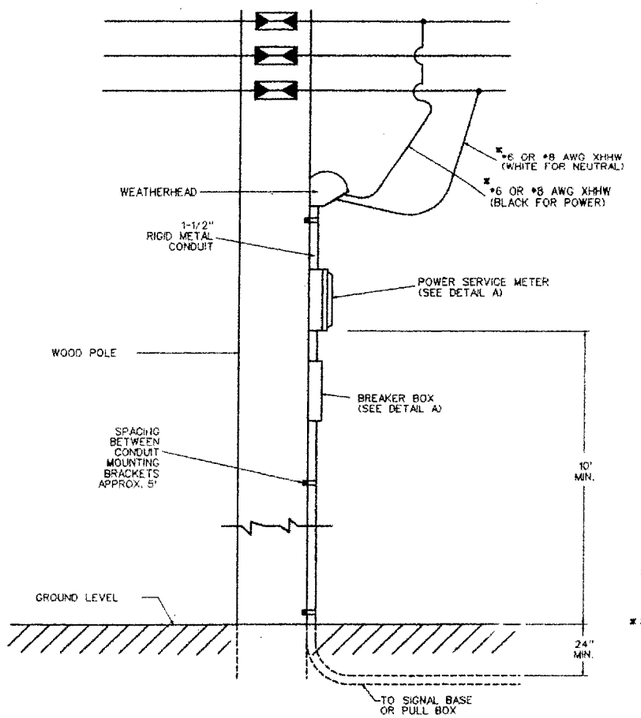
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CITY OF DALLAS, TEXAS

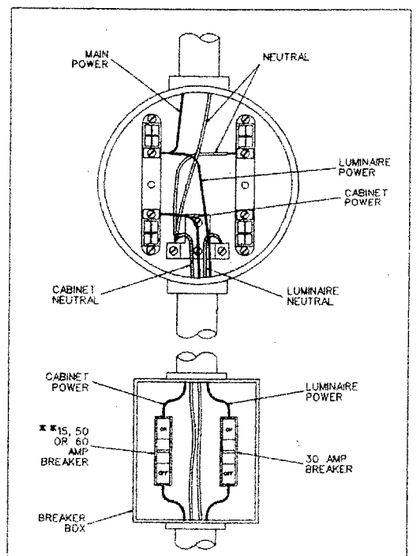
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
CSB	ABAA	APRIL	3510	1	5008

DETAILS FOR MOUNTING CONDUITS ON POLES



POWER SERVICE CONNECTION DETAILS



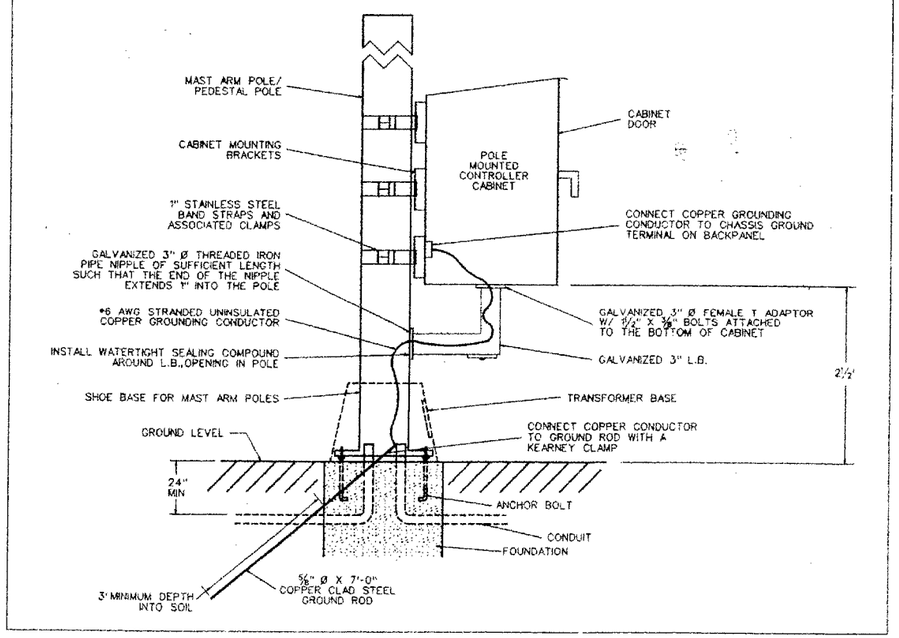


DETAIL A | POWER SERVICE METER WIRING DIAGRAM

*USE *6 AWG WIRE WHEN PROVIDING POWER FOR A BASE-MOUNTED (TYPE 332) CABINET. USE *8 AWG WIRE WHEN PROVIDING POWER FOR ALL OTHER TYPES OF SIGNAL CONTROLLER AND SCHOOL FLASHER CABINETS. ALL WIRING FOR LUMINAIRES SHALL BE *8 AWG XHHW WIRE

**USE A 60 AMP BREAKER FOR POWER CONNECTIONS TO A BASE MOUNTED (TYPE 332) CONTROLLER CABINET. USE A 50 AMP BREAKER FOR POWER CONNECTIONS TO ALL OTHER TYPES OF SIGNAL CONTROLLER CABINETS. USE A 15 AMP BREAKER FOR POWER CONNECTIONS TO SCHOOL FLASHERS.

DETAILS FOR INSTALLING POLE MOUNTED CONTROLLER CABINET

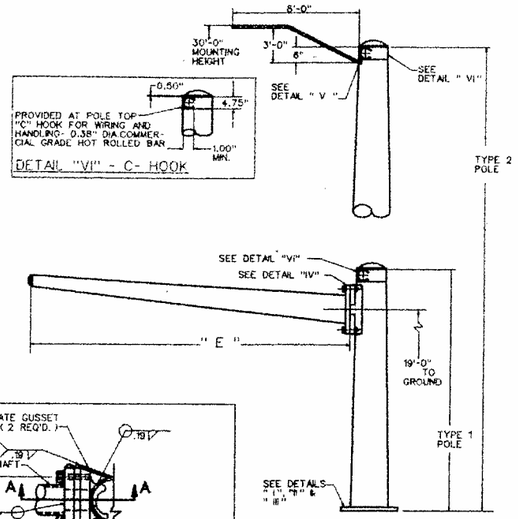


APPROVED _____
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: April 16, 1997

TRAFFIC SIGNAL DETAILS

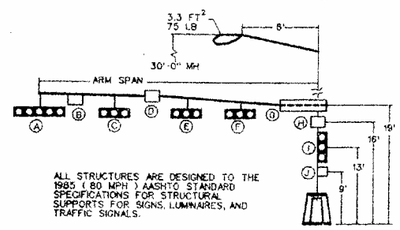
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CITY OF DALLAS, TEXAS

DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	25ID	1	5009



COMPONENT PART	ASTM OR PIPE MATERIAL	MIN. YIELD (KS I)
TUBE-7&3 GAUGE	A595 GR. A	55
TUBE-ALL OTHERS	A572 GR. 60	60
LUMINAIRE ARM ATTACH.	A27GR. 85-35	N.A.
LUMINAIRE ARM PIPE	2" SCHED. 40	36
POLE BASE-7&3 GAUGE	A36	36
POLE BASE-ALL OTHERS	A572 GR. 42	42
ANCHOR BOLTS	A36 MOD	55
SINGLE ARM ATTACHMENT	A3	36
SINGLE ARM BOLTS	A325	92
GALVANIZING	A123 SHAFTS A153 ACCESSORIES	N. A.
LUMINAIRE ARM BOLTS	SAE GR 5	N.A.

LOADING INFORMATION

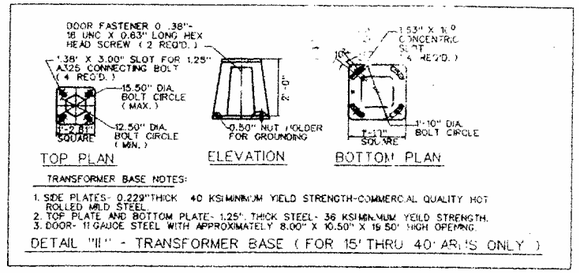


ALL STRUCTURES ARE DESIGNED TO THE 1985 (80 MPH) AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR SIGNS, LUMINARES, AND TRAFFIC SIGNALS.

ARM SPAN	DISTANCE FROM POLE TO DEVICE (FT.)						
	A	B	C	D	E	F	G
15	14	9	N. A.	N. A.	N. A.	N. A.	2
20	19	14	N. A.	N. A.	N. A.	N. A.	2
25	24	19	12	N. A.	N. A.	N. A.	2
30	29	24	14	N. A.	N. A.	N. A.	2
35	34	29	23	12	N. A.	N. A.	2
40	39	34	26	13	N. A.	N. A.	2
45	44	39	28	20	12	N. A.	2
50	49	44	36	29	23	10	2

N. A. = NOT APPLICABLE

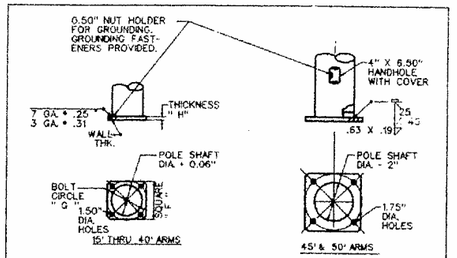
DEVICE	DESCRIPTION	PROJ. AREA (FT²)	WEIGHT (LBS.)
Ⓐ SIGNAL	12"-5 SEC WITH BACKPLATES	13.33	55
Ⓑ & Ⓓ SIGN	REGULATORY 30" X 30"	6.25	15
Ⓒ & Ⓔ & Ⓕ SIGNAL	12"-3 SEC WITH BACKPLATES	8.67	40
Ⓖ SIGN	STREET NAME 24" X 96"	16.00	50
Ⓗ SIGN	REGULATORY 24" X 24"	4.00	10
Ⓘ SIGNAL	DUAL-12"-3 SEC WITH BACKPLATES	17.34	80
Ⓙ SIGNAL	DUAL - PEDESTRIAN SIGNAL	8.00	60



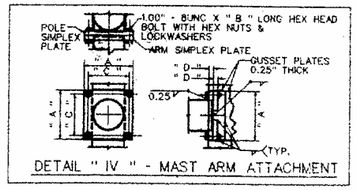
TRANSFORMER BASE NOTES:

1. SIDE PLATES- 0.229"THICK 40 KSI MINIMUM YIELD STRENGTH-COMMERCIAL QUALITY HOT ROLLED MILD STEEL.
2. TOP PLATE AND BOTTOM PLATE- 1.25". THICK STEEL- 36 KSI MINIMUM YEILD STRENGTH.
3. DOOR- 11 GAUGE STEEL WITH APPROXIMATELY 8.00" X 10.50" X 15 50" HIGH OPENING.

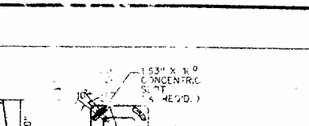
DETAIL "II" - TRANSFORMER BASE (FOR 15' THRU 40' ARMS ONLY)



DETAIL " I " - POLE BASE



DETAIL " IV " - MAST ARM ATTACHMENT

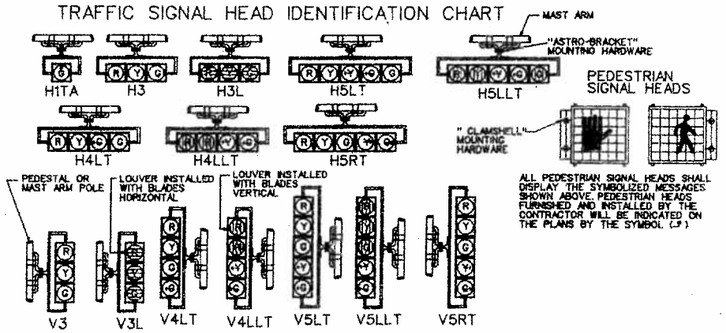


DETAIL " III" - ANCHOR BOLTS

POLE & MAST ARM SCHEDULE

DESIGNATION KEY			POLE DATA				MAST ARM DATA				MAST ARM ATTACHMENT DATA			
POLE SERIES	POLE TYPE	SIGNAL ARM SPAN	BASE DIA.	TOP DIA.	LENGTH	GAUGE (THK.)	FIXED END DIA.	FREE END DIA.	LENGTH " E "	GAUGE	PLATE SQUARE " A "	PLATE THICKNESS " D "	BOLT LENGTH " B "	BOLT SPACING " C "
DAL	1	15'	11.00"	8.20"	20'	7	7.00"	4.90"	15'	7	15.25"	1.50"	4.50"	12.50"
DAL	1	20'	11.00"	8.20"	20'	7	7.00"	4.20"	20'	7	15.25"	1.50"	4.50"	12.50"
DAL	1	25'	11.00"	8.20"	20'	7	7.00"	3.50"	25'	7	15.25"	1.50"	4.50"	12.50"
DAL	1	30'	13.00"	10.20"	20'	7	8.00"	3.80"	30'	7	16.25"	1.50"	4.50"	13.50"
DAL	1	35'	13.00"	10.20"	20'	7	8.00"	4.10"	35'	7	16.25"	1.50"	4.50"	13.50"
DAL	1	40'	13.00"	10.20"	20'	7	9.00"	3.40"	40'	7	16.25"	1.50"	4.50"	13.50"
DAL	1	45'	15.00"	12.20"	20'	0.188"	10.00"	3.70"	45'	7	16.75"	1.75"	5.00"	16.00"
DAL	1	50'	15.00"	12.20"	20'	0.188"	11.50"	4.50"	50'	7	16.75"	1.75"	5.00"	16.00"
DAL	2	15'	11.00"	7.22"	27'	7	7.00"	4.90"	15'	7	15.25"	1.50"	4.50"	12.50"
DAL	2	20'	11.00"	7.22"	27'	7	7.00"	4.20"	20'	7	15.25"	1.50"	4.50"	12.50"
DAL	2	25'	11.00"	7.22"	27'	7	7.00"	3.50"	25'	7	15.25"	1.50"	4.50"	12.50"
DAL	2	30'	12.00"	8.22"	27'	3	8.00"	3.80"	30'	7	16.25"	1.50"	4.50"	13.50"
DAL	2	35'	12.00"	8.22"	27'	3	9.00"	4.10"	35'	7	16.25"	1.50"	4.50"	13.50"
DAL	2	40'	12.00"	8.22"	27'	3	9.00"	3.40"	40'	7	16.25"	1.50"	4.50"	13.50"
DAL	2	45'	15.00"	11.22"	27'	0.188"	10.00"	3.70"	45'	7	16.75"	1.75"	5.00"	16.00"
DAL	2	50'	15.00"	11.22"	27'	0.188"	11.50"	4.50"	50'	7	16.75"	1.75"	5.00"	16.00"

TRAFFIC SIGNAL HEAD IDENTIFICATION CHART



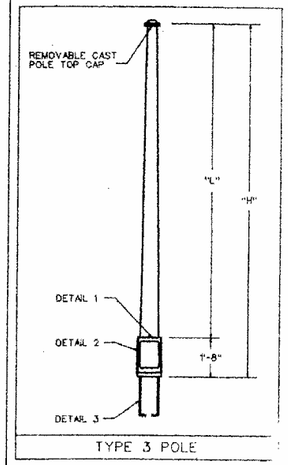
ALL PEDESTRIAN SIGNAL HEADS SHALL DISPLAY THE SYMBOLIZED MESSAGES SHOWN ABOVE. PEDESTRIAN HEADS FURNISHED AND INSTALLED BY THE CONTRACTOR WILL BE INDICATED ON THE PLANS BY THE SYMBOL (↗)

NOTES: 1. ALL SIGNAL HEAD LENSES SHALL BE 12" IN DIAMETER, UNLESS OTHERWISE STATED.
2. VEHICLE SIGNAL HEADS SHALL BE MOUNTED WITH " ASTRO-BRACKETS" AND APPROPRIATE TUBING.
3. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH "CLAMSHELL" MOUNTING HARDWARE.
4. ALL VISORS SHALL BE TUNNEL VISORS, UNLESS OTHERWISE STATED.
5. ALL PEDESTRIAN SIGNAL HEADS AND POLE MOUNTED VEHICLE HEADS SHALL BE INSTALLED ON THE AWAY FROM TRAFFIC SIDE OF THE PEDESTAL OR MAST ARM POLE.

PEDESTRIAN PUSHBUTTON SIGN DETAILS

ALL PEDESTRIAN PUSHBUTTON SIGNS SHALL DISPLAY THE MESSAGE SHOWN ABOVE.

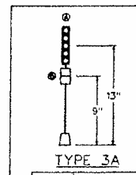
TRAFFIC SIGNAL PEDESTRIAN POLE DETAILS



TYPE 3 POLE

DESCRIPTION	ASTM DESIGNATION	M. Y. YIELD (KSI)
POLE TUBE	A595 GR.A	55
ANCHOR BOLTS	A36-MOD.	55
CONNECTING BOLTS	A325	92

TYPE 3 POLE DATA						
DESIGNATION KEY		POLE DATA				
POLE SERIES	POLE TYPE	HEIGHT " H "	BASE DIA.	TOP DIA.	LENGTH " L "	GAUGE
DAL	3A	15'-0"	5.53"	3.66"	13'-4"	11
DAL	3B	10'-0"	4.96"	3.79"	8'-4"	11

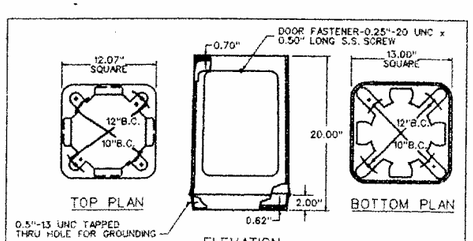


TYPE 3A TYPE 3B

ALL STRUCTURES ARE DESIGNED TO THE 1985 (80 MPH) AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR SIGNS, LUMINARES AND TRAFFIC SIGNALS.

DEVICE	DESCRIPTION	PROJ. AREA (FT²)	WEIGHT (LBS)
Ⓐ	SIGNAL 12"-5 SEC WITH BACKPLATES	13.33	55
Ⓒ	DUAL PEDESTRIAN SIGNAL	8.00	60

LOADING INFORMATION



TRANSFORMER-BASE NOTES

DOOR OPENING APPROXIMATELY 8.75" X 9.25" X 13". TOP BOLT HOLES WILL ACCOMODATE MAXIMUM 1.00" DIA. BOLTS.

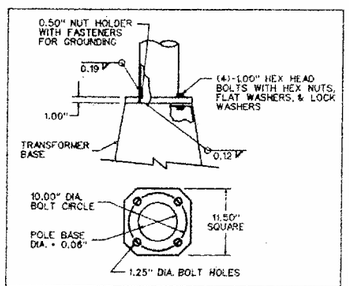
(4)-2.75" O.D. X 0.500" THK. HOLDDOWN WASHERS FINISHED TO ASTM B695 CLASS 50 PROVIDED FOR INSTALLATION UNDER ANCHOR BOLT HEX NUTS.

(4)-2.50" O.D. X 0.375" THK. HOLDDOWN WASHERS FINISHED TO ASTM B695 CLASS 50 PROVIDED FOR INSTALLATION UNDER THE TRANSFORMER BASE TOP PLATE.

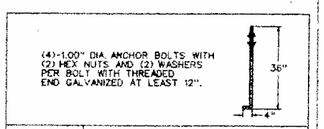
MATERIAL SHALL CONFORM TO COMMERCIAL DESIGNATION 356-T6 ALLOY.

BASE CONFORMS TO BREAKAWAY CRITERIA OF AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS, FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS (1975).

DETAIL 2 | TRANSFORMER BASE



DETAIL 1 | POLE BASE



DETAIL 3 | ANCHOR BOLT

APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: March 14, 1997

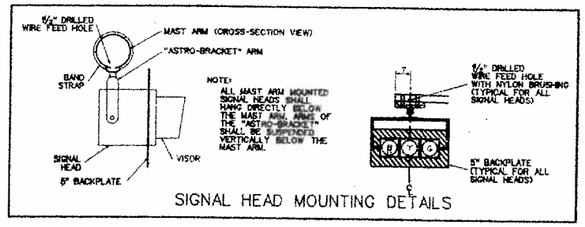
TRAFFIC SIGNAL DETAILS

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

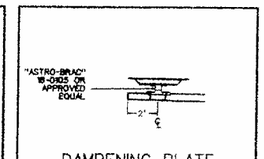
CITY OF DALLAS, TEXAS

DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	5010

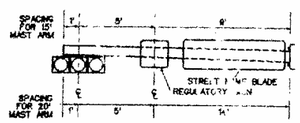
DETAILS FOR MOUNTING SIGNAL AND SIGN HARDWARE ON MAST ARMS



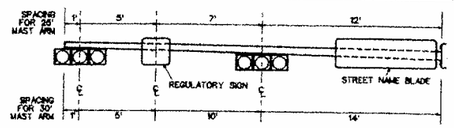
SIGNAL HEAD MOUNTING DETAILS



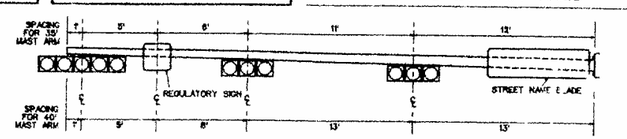
DAMPENING PLATE MOUNTING DETAILS



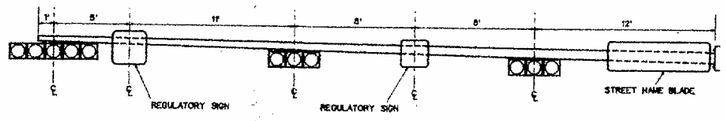
SIGNAL HEAD AND SIGN SPACING FOR 15' AND 20' MAST ARMS



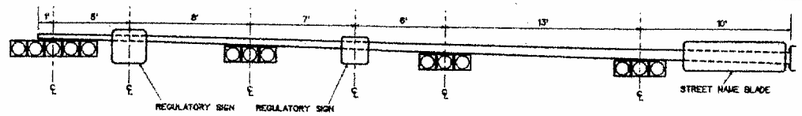
SIGNAL HEAD AND SIGN SPACING FOR 25' AND 30' MAST ARMS



SIGNAL HEAD AND SIGN SPACING FOR 35' AND 40' MAST ARMS



SIGNAL HEAD AND SIGN SPACING FOR 45' MAST ARM

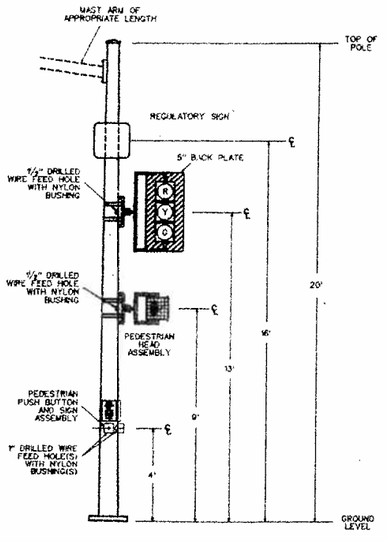


SIGNAL HEAD AND SIGN SPACING FOR 50' MAST ARM

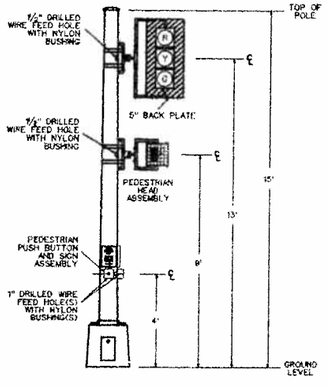
1. ALL WIRE FEED HOLES SHALL BE DRILLED IN THE FIELD BY THE VENDOR. TORCHING WILL NOT BE PERMITTED. DRILLED HOLES SHALL BE TOUCHED UP WITH ONE COAT OF COLD GALVANIZING COMPOUND, ALLOWING ADEQUATE DRYING TIME BEFORE MOUNTING ANY SIGNAL OR SIGN HARDWARE.
2. SIGNAL AND SIGN HARDWARE SHALL BE MOUNTED AT THE LOCATIONS SHOWN ON THE DIAGRAMS ABOVE UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER.
3. IF THE VEHICLE SIGNAL HEAD IS SHOWED WITH REPECT TO THE MAST ARM, THE VENDOR MAY BE REQUIRED TO PROVIDE EXTENDED (12") "ASTRO-BRACKET" ARMS SO THAT THE BACKPLATE CLEARS THE MAST ARM.
4. 9/16" DIAMETER HOLES SHALL BE DRILLED ON THE BOTTOM FACE OF NEW GALVANIZED MAST ARMS WHEN MOUNTING HORIZONTAL SIGNAL HEADS. WHEN MOUNTING VERTICAL SIGNAL HEADS ON THE MAST ARM, THE HOLES SHALL BE DRILLED ON THE FRONT FACE OF THE ARM.)
5. NYLON BUSHINGS SHALL BE INSTALLED IN ALL WIRE FEED HOLES TO PROTECT THE WIRE INSULATION.

GENERAL NOTES

DETAILS FOR MOUNTING SIGNAL AND SIGN HARDWARE ON POLES

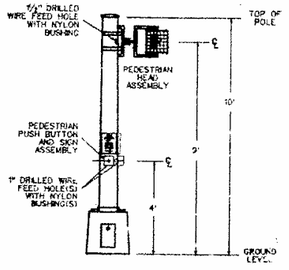


MAST ARM POLE



15' PEDESTAL POLE

1. ALL HOLES SHALL BE DRILLED IN THE FIELD BY THE VENDOR. TORCHING WILL NOT BE PERMITTED. DRILLED HOLES SHALL BE TOUCHED UP WITH ONE COAT OF COLD GALVANIZED COMPOUND, ALLOWING ADEQUATE DRYING TIME BEFORE MOUNTING ANY SIGNAL OR SIGN HARDWARE.
2. ALL SIGNAL AND SIGN HARDWARE SHALL BE MOUNTED AT THE DISTANCES SHOWN ON THE DIAGRAMS BELOW UNLESS OTHERWISE INSTRUCTURED BY THE ENGINEER.
3. IF THE DISTANCE BETWEEN THE SIDE MOUNT VEHICLE SIGNAL HEAD AND THE MAST ARM POLE IS NOT SUFFICIENT TO INSTALL A BACK PLATE THE CONTRACTOR MAY BE REQUIRED TO PROVIDE EXTENDED (12") "ASTRO-BRACKET" ARMS.
4. A TWO-WAY UNIVERSAL MOUNTING BRACKET SHALL BE USED WHENEVER TWO PEDESTRIAN SIGNAL HEADS ARE TO BE INSTALLED ON THE SAME POLE AND A ONE-WAY UNIVERSAL MOUNTING BRACKET SHALL BE USED WHENEVER A SINGLE PEDESTRIAN HEAD IS MOUNTED ON A POLE.
5. ALL PEDESTRIAN PUSH BUTTON SIGNS SHALL DISPLAY THE MESSAGE SHOWN BELOW (WITH ARROW POINTING IN APPROPRIATE DIRECTION)



10' PEDESTAL POLE

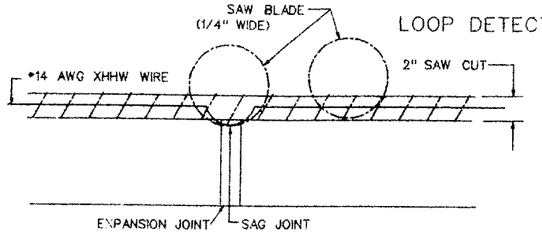
APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: March 14, 1997

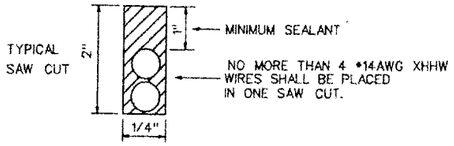
TRAFFIC SIGNAL DETAILS

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CITY OF DALLAS, TEXAS

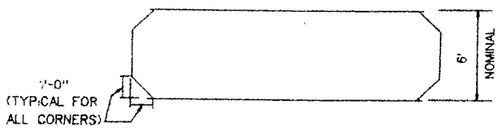
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	5011

LOOP DETECTOR INSTALLATION DETAILS

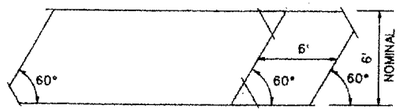




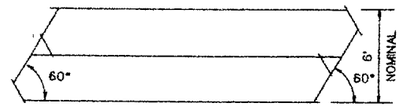
TYPE 1 LOOP



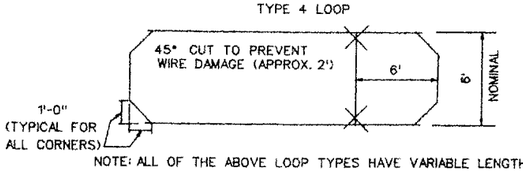
TYPE 2 LOOP



TYPE 3 LOOP

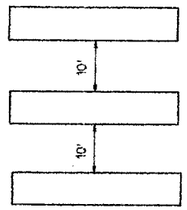


TYPE 4 LOOP

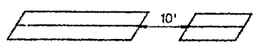


NOTE: ALL OF THE ABOVE LOOP TYPES HAVE VARIABLE LENGTHS

WHEN INDIVIDUAL LATERAL LOOP SECTIONS ARE TIED TOGETHER ON THE SAME DETECTOR HARNESS TO FORM A DETECTOR PAD. THE SPACING BETWEEN INDIVIDUAL LOOP SECTIONS SHALL BE AS SHOWN BELOW.

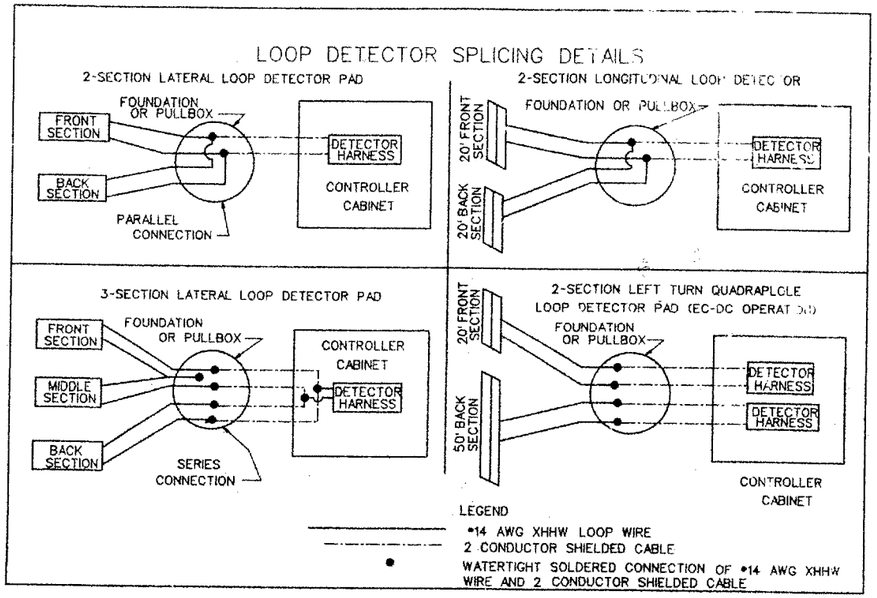


LONGITUDINAL EC-DC TYPE QUADRAPOLE LEFT TURN LOOP DETECTOR PADS SHALL HAVE A 10' SPACING BETWEEN INDIVIDUAL LOOP SECTIONS

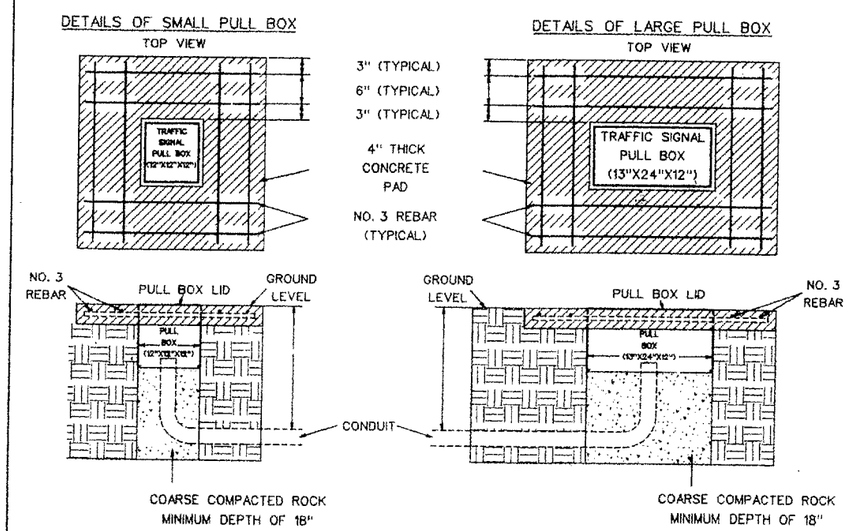


1. INSTALLATION OF LOOP DETECTORS IS TO BE MADE IN THE SHORTEST TIME PRACTICAL (NOT TO EXCEED 4 HOURS MAX) AND SCHEDULED DURING OFF PEAK HOURS TO MINIMIZE DELAY TO TRAFFIC.
2. SAW CUTS ARE TO BE MADE WITH A CONCRETE SAW , FORMING STRAIGHT LINES WITH LOOSE MATERIAL REMOVED. THE CUT SHALL BE CLEAN AND DRY WHEN THE SEALING COMPOUND IS PLACED. WHEN A SAWCUT CROSSES A TRANVERSE EXPANSION JOINT, LOWER THE DEPTH BY 2" WHEN THE SAW IS CENTERED OVER THE EXPANSION JOINT.
3. WIRING OF TYPE 1, 2 AND 4 LOOPS ONLY -- LOOPS SMALLER THAN 6' X 20' SHALL HAVE 3 TURNS OF #14 AWG XHHW WIRE. POWERHEADS OF TYPE 2 AND TYPE 4 LOOPS SHALL HAVE 2 ADDITIONAL TURNS.
4. WIRING OF TYPE 3 LOOPS ONLY -- QUADRAPOLE LOOPS 6'X20' & SMALLER SHALL HAVE 2 TURNS (2-4-2) OF #14 XHHW WIRE. QUADRAPOLE LOOPS WITH NOMINAL LENGTHS OVER 20' SHALL HAVE 1 TURN (1-2-1) OF #14 AWG XHHW WIRE.
5. SEALANT SHALL NOT EXTEND MORE THAN 1 1/2" ON EITHER SIDE OF SAW CUT. CONTRACTOR SHALL BE REQUIRED TO REMOVE EXCESS SEALANT BEFORE LOOP WILL BE CONSIDERED COMPLETE.

LOOP DETECTOR SPLICING DETAILS



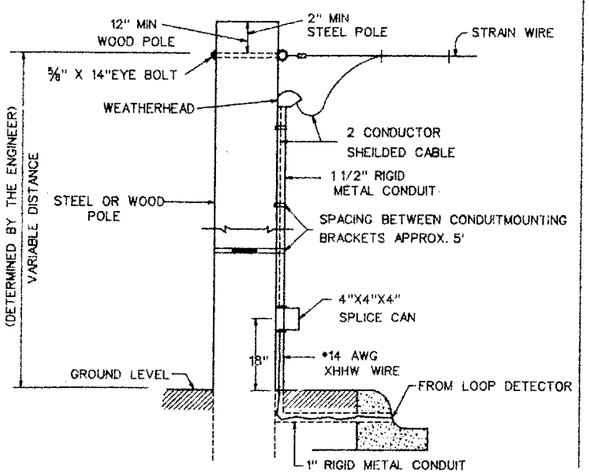
PULL BOX INSTALLATION DETAILS



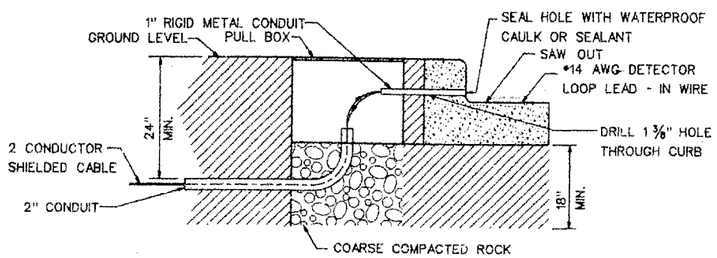
NOTE:
ALL CONCRETE SHALL BE EITHER CLASS A OR CLASS C AS DEFINED IN THE NORTH CENTRAL TEXAS COUNCIL OF GOVERMENTS' "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" ITEM 7.4.5.

LOOP DETECTOR RUN DETAILS

OVERHEAD DETECTOR RUN DETAIL



DETECTOR RUN INTO PULL BOX DETAIL



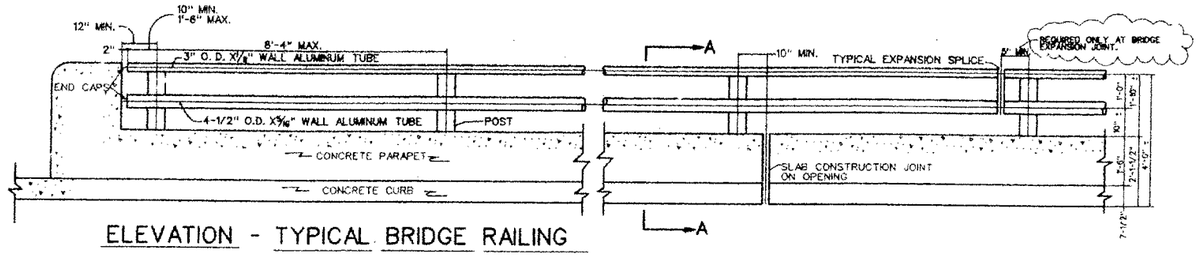
NOTE: SOLDER ALL CONNECTIONS AND SEAL THEM WITH A WATERTIGHT WRAPPING

APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: March 14, 1997

TRAFFIC SIGNAL DETAILS

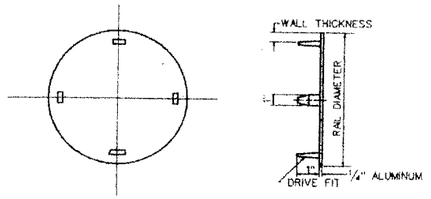
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CITY OF DALLAS, TEXAS

DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	5012



ELEVATION - TYPICAL BRIDGE RAILING

SCALE: 1/2" = 1'-0"

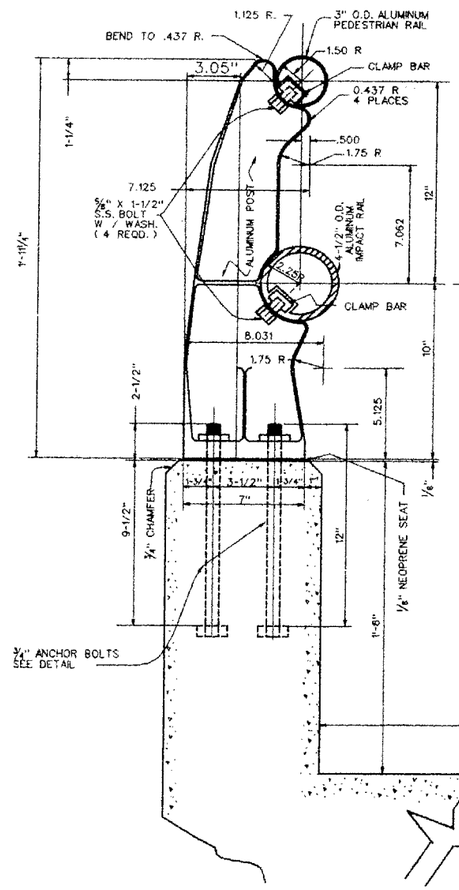


END CAP DETAIL

NO SCALE

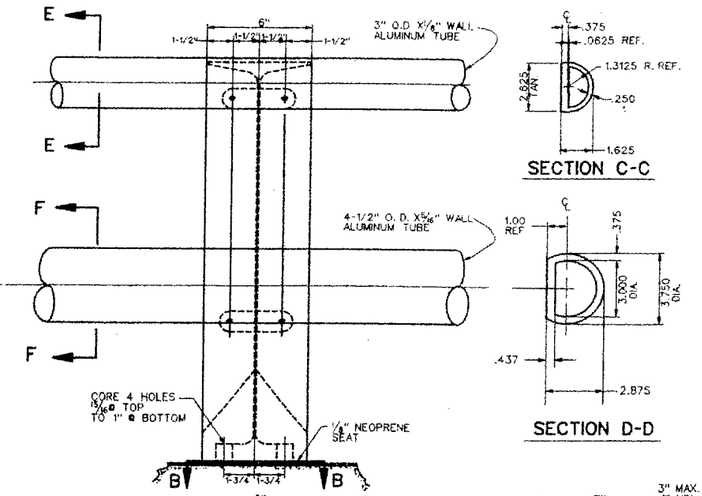
GENERAL CONSTRUCTION NOTES:

1. RAIL POSTS SHALL BE CAST ALUMINUM ALLOY 356-T6 PERMANENT MOLD. MAXIMUM ALLOWABLE POST SPACING SHALL BE 8'-4" C-C.
2. ALL SQUARE EDGES OF POST CASTINGS SHALL BE GROUND, SANDED, BUFFED OR CAST TO A 1/32" INCH RADIUS, AND ALL GATES, RISERS AND SEAMS SHALL BE GROUND, SANDED AND BUFFED TO A SMOOTH, FLUSH FINISH.
3. ALL POSTS SHALL BE INSTALLED NORMAL TO THE FINISHED GRADE AND SHALL BE SEATED ON A 1/8 INCH THICK, 70 DUROMETER NEOPRENE RUBBER PAD.
4. CLAMP BAR BOLTS & WASHERS SHALL BE STAINLESS STEEL 5/16" X 1 1/2" AS PER ASTM A-302 OR A-304 TAMPER RESISTANT BOLTS CONFORMING TO GORDON'S SPECIALTIES INC. "S.S.T.R." BOLTS, OR EQUAL.
5. RAILS AND SPLICE TUBES SHALL BE EXTRUDED ALUMINUM PIPE ALLOY 6061-T6 AS PER ASTM B-221-71 AND SHALL BE FURNISHED IN THE MILL FINISH.
6. ALL OPEN ENDS OF RAIL MEMBERS SHALL BE CAPPED-SEE END CAP DETAIL.
7. POST, RAILS, & FASTENERS SHALL CONFORM TO GORDON'S SPECIALTIES INC. ALUMINUM COMBINATION RAIL CA 2-1 OR EQUAL. (SEE NOTE 4.)
8. SECTIONS OF RAIL TUBING SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS WHEREVER PRACTICAL.
9. A RAIL SPLICE IS REQUIRED AT EACH BRIDGE EXPANSION JOINT. THE GAP AT RAIL SPLICES SHALL BE A MINIMUM OF ONE INCH OR EQUAL TO BRIDGE EXPANSION JOINT GAP PLUS 1/2 INCH. WITH THREE (3") MAXIMUM OPENING.
10. POST ANCHOR BOLTS SHALL BE GALVANIZED STEEL 3/4" DIA WITH 3/4" HEAVY HEX HEADNUT & 3/4" WASHER AS PER ASTM A-325. BOLTS, NUTS AND WASHERS GALVANIZED AS PER ASTM A-153.
11. RAIL MEMBERS SHALL BE INSTALLED PARALLEL TO THE FINISHED PARAPET WALL GRADE & SHALL BE FABRICATED TO FOLLOW THE CURVATURE OF THE ROADWAY. THIS DESIGN DOES NOT LEND ITSELF TO RADIUSING. SUBSTITUTION OF STANDARD ROUND TUBES WITH TOGGLE BOLT MOUNTING, OR CHORDING OF RAILS & PARAPET WALLS IS REQUIRED ON BRIDGES WITH LESS THAN 250' RADIUS.
12. AFTER TIGHTENING ANCHOR BOLTS WILL BE " SHOT " WITH A STEEL PIN, PROVIDING COMPLETE PENETRATION OF THE NUT AND IMBEDMENT INTO THE ANCHOR BOLT. PIN IS TO CONFORM TO HILTI PIN NO. ENK 16 S 12 OR EQUAL. RECOMMENDED GUN IS HILTI DX 450.



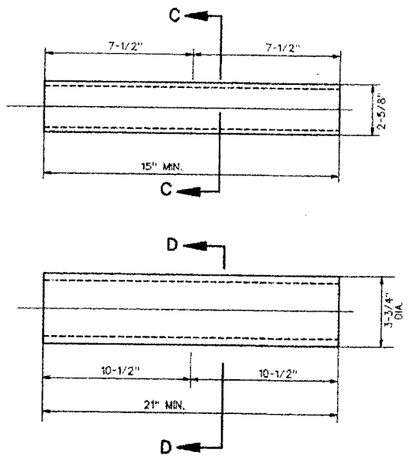
SECTION A-A

SCALE: 3" = 1'-0"



SECTION B-B

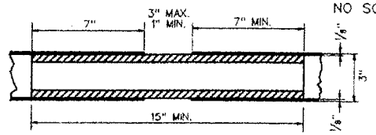
SECTION C-C

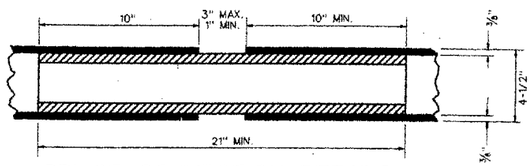


SPLICE TUBE DETAILS

NO SCALE

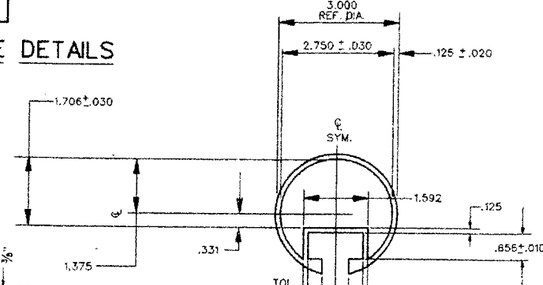
SECTION D-D



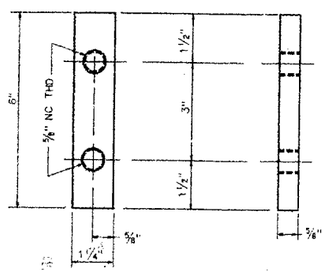


SPLICE CONNECTION DETAILS

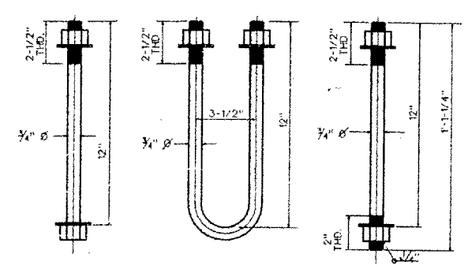
SCALE: 3" = 1'-0"



SECTION E-E

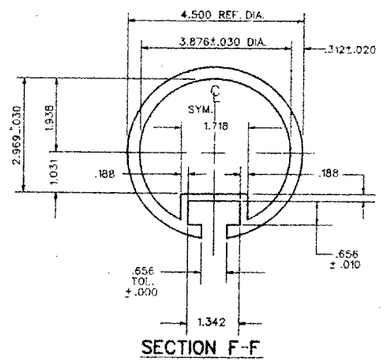


CLAMP BAR DETAIL



ANCHOR BOLT DETAILS

SCALE: 3" = 1'-0"



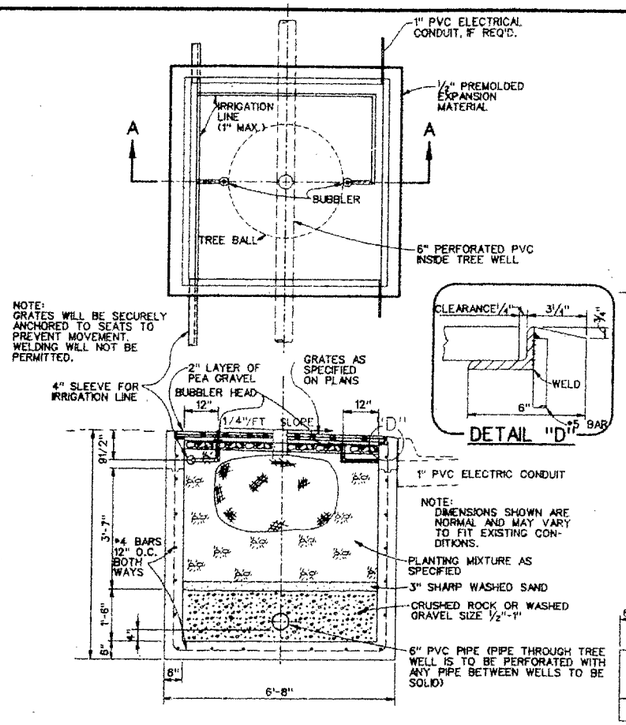
SECTION F-F

APPROVED

DIRECTOR OF PUBLIC WORKS & TRANSPORTATION

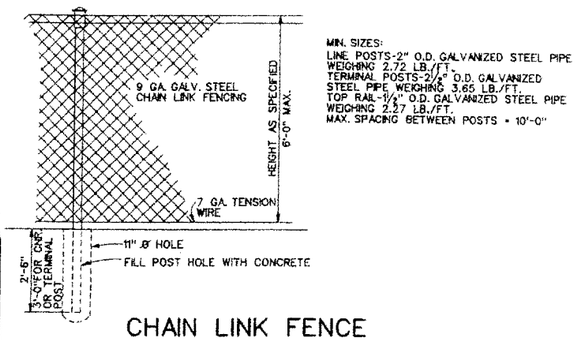
DATE: April 16 1997

STANDARD DETAIL FOR					
ALUMINUM BRIDGE RAILING DETAILS					
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION					
CITY OF DALLAS, TEXAS					
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	9001



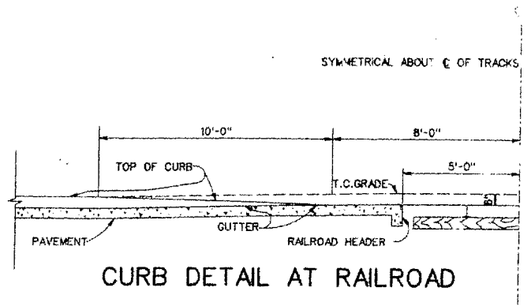
SECTION A-A

REINFORCED CONCRETE TREE WELLS

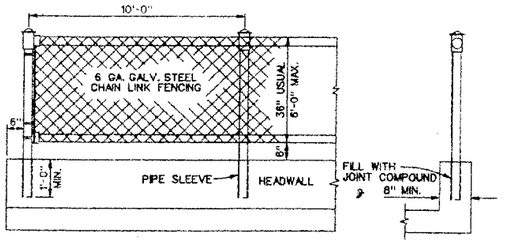


MIN. SIZES:
LINE POSTS-2" O.D. GALVANIZED STEEL PIPE WEIGHING 2.72 LB./FT.
TERMINAL POSTS-2½" O.D. GALVANIZED STEEL PIPE WEIGHING 3.65 LB./FT.
TOP RAIL-1¼" O.D. GALVANIZED STEEL PIPE WEIGHING 2.27 LB./FT.
MAX. SPACING BETWEEN POSTS = 10'-0"

CHAIN LINK FENCE

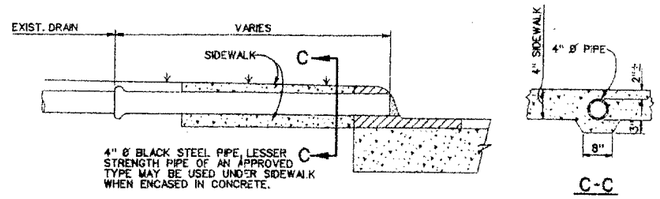


CURB DETAIL AT RAILROAD



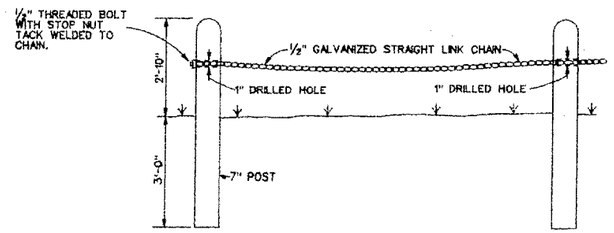
GUARD FENCE FOR CULVERTS & WALLS

POSTS-2½" O.D. STEEL PIPE WEIGHING 3.65 LB./FT.
RAILINGS-2" O.D. STEEL PIPE WEIGHING 2.72 LB./FT.
ALL POSTS AND FITTINGS TO BE GALVANIZED

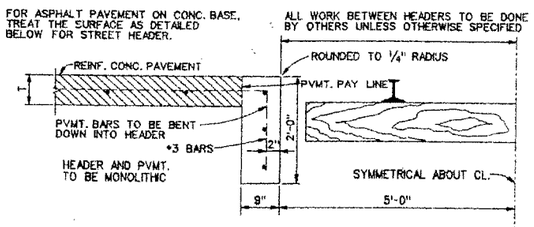


C-C

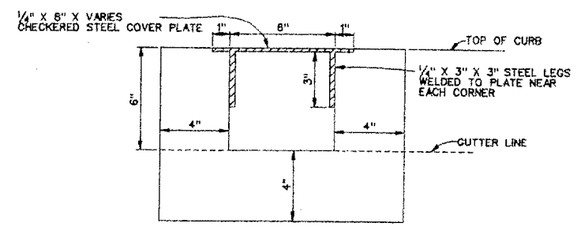
CURB DRAIN-TYPE 2



WOOD GUARD POST



RAILROAD HEADER

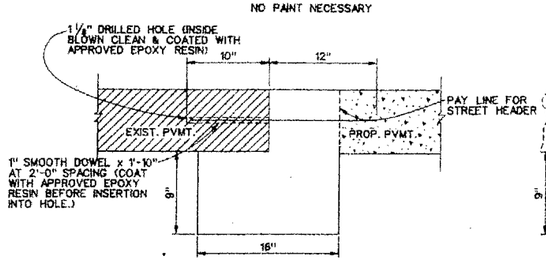


FRONT ELEVATION AT CURB FACE

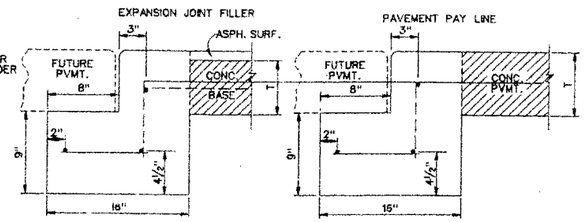
CURB DRAIN-TYPE 1

WOOD POSTS MUST BE TREATED WITH PRESERVATIVE TO MEET AMERICAN WOOD PRESERVERS ASSOCIATION STANDARD SPECIFICATIONS.

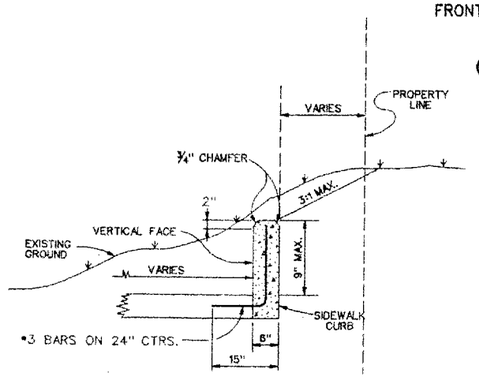
NO PAINT NECESSARY



STREET HEADER WITH DOWEL



PAVEMENT BARS TO BE BENT DOWN INTO HEADER. HEADER AND PAVEMENT TO BE MONOLITHIC

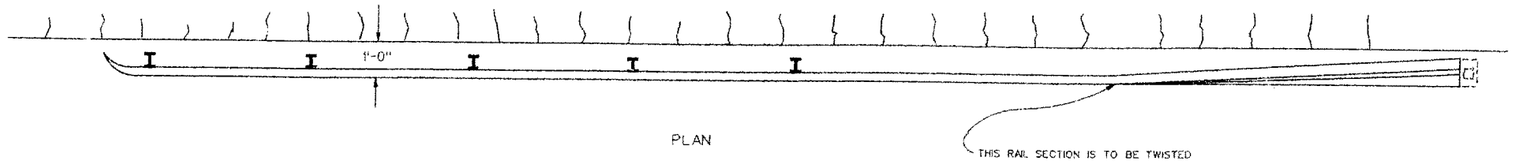


DETAIL FOR ITEM 320

SIDEWALK CURB

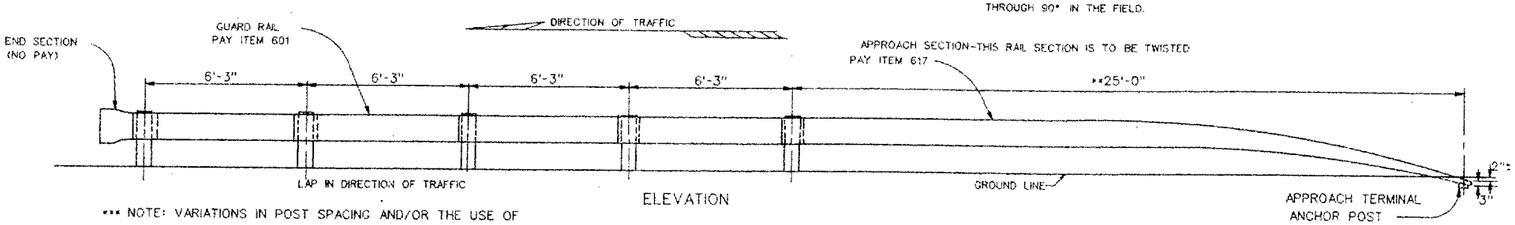
APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: March 16 1987

MISCELLANEOUS DETAILS
MISCELLANEOUS
CONSTRUCTION ITEMS
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CITY OF DALLAS, TEXAS



PLAN

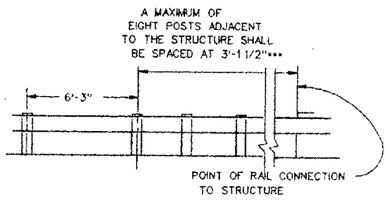
THIS RAIL SECTION IS TO BE TWISTED THROUGH 90° IN THE FIELD.



ELEVATION

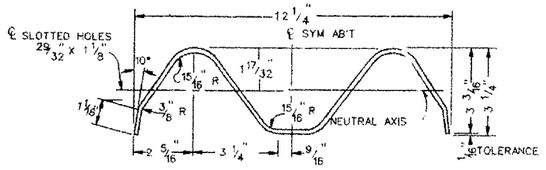
*** NOTE: VARIATIONS IN POST SPACING AND/OR THE USE OF SPACER BLOCKS OR SHIMS, MAY BE REQUIRED BY THE ENGINEER, IN ORDER TO ACCOMMODATE THE REQUIRED RAIL CONNECTION TO STRUCTURES.

**NOTE: THIS DIMENSION MEASURED TO CENTER OF SPLICE WHEN SPECIAL END SHOE IS USED

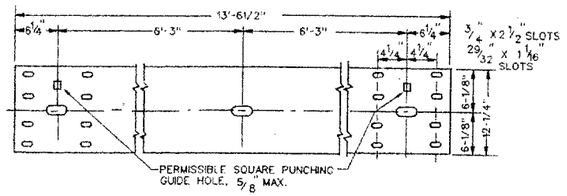


POST TREATMENT AT STRUCTURES

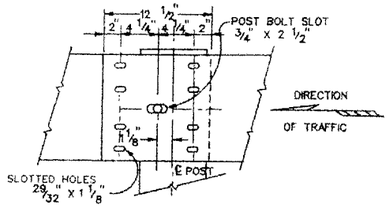
NOTE: ACTUAL SECTION MAY BE SLIGHTLY DIFFERENT DEPENDING UPON THE MANUFACTURER.



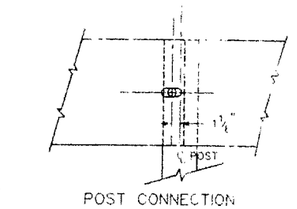
SECTION THRU RAIL ELEMENT



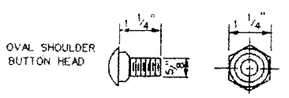
ELEVATION OF NOMINAL 121/2 FOOT GUARD RAIL



RAIL SPLICE



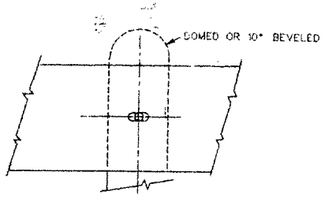
POST CONNECTION STEEL POST



ANCHOR OR SPLICE BOLT 5/8 NUT

POST BOLT: SIMILAR EXCEPT LENGTH.

(7/8" HEX BOLTS REQUIRED FOR SPECIAL END SHOE)

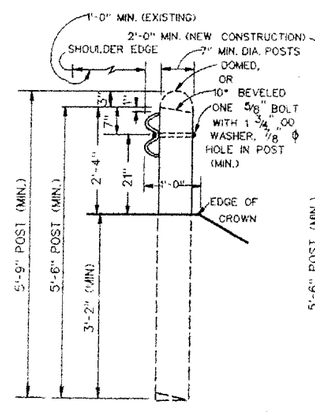


POST CONNECTION WOOD POST

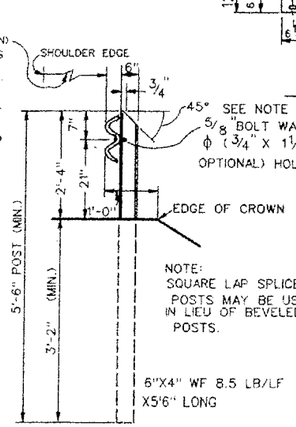
WOOD POST MAY BE DOMED, OR BEVELED

GENERAL NOTES

1. EXCEPT WHERE USED AT STRUCTURES THAT ARE NARROWER THAN CROWN WIDTH OR WHERE OTHERWISE INDICATED ON THE PLANS, THE GUARD RAIL SHALL BE LOCATED A MINIMUM OF ONE FOOT FROM THE SHOULDER EDGE ON EXISTING ROADWAYS AND A MINIMUM OF TWO FEET FROM THE SHOULDER EDGE ON NEW CONSTRUCTION. THE EXACT POSITION SHALL BE AS SHOWN ELSEWHERE ON THE PLANS OR AS DIRECTED BY THE ENGINEER. RAIL SHALL BE TRANSITIONED TO A SMOOTH CONNECTION WITH OTHER STRUCTURE OR RAIL AS SHOWN ELSEWHERE ON PLANS.
2. AT THE OPTION OF THE CONTRACTOR THE RAIL ELEMENTS FOR THE GUARD FENCE MAY BE FURNISHED IN EITHER 12½' OR 25 NOMINAL LENGTHS. RAIL SHALL BE FURNISHED WITH POST BOLT SLOTS FOR 5/8 " DIAMETER BOLT CONNECTION TO POSTS.
3. BOLTS SHALL BE OF SUFFICIENT LENGTH TO EXTEND THE FULL THICKNESS OF THE NUT AND NO MORE THAN ¾" BEYOND IT.
4. THE TOP OF THE TERMINAL ANCHOR POST ASSEMBLY AND ALL STEEL FITTINGS THEREON SHALL BE GALVANIZED AS SHOWN.
5. WHERE ROCK IS ENCOUNTERED OR WHERE SHOWN ON THE PLANS , THE DIAMETER OF THE HOLES AND THE MATERIAL FOR BACKFILLING SHALL BE AS DIRECTED BY THE ENGINEER, TIMBER POST SHALL NOT BE SET IN CONCRETE.
6. THE TERMINAL ANCHOR POST SHALL BE SET IN 3000 PSI CONCRETE . CONCRETE SHALL BE SUBSIDIARY TO THE BID ITEM "METAL BEAM GUARD FENCE".
7. TIMBER POST MAY BE BEVELED AT APPROXIMATELY 10 DEGREES ON THE TOP OF BOTH ENDS WITH HIGH SIDE OF TOP OF POST PLACED TOWARD THE ROADWAY OR THEY MAY BE DOMED.
8. AN ANCHOR OTHER THAN TO A TERMINAL ANCHOR POST SHALL CONSIST OF A CONNECTION SIMILAR TO THE RAIL SPLICE OR SIMILAR TO THE SPECIAL END SHOE.
9. SPECIAL FABRICATION WILL BE REQUIRED IN INSTALLATIONS HAVING A CURVATURE OF LESS THAN 150' RADIUS.
10. WOOD POST MUST BE TREATED IN MANNER APPROVED BY THE ENGINEER.
11. THE SPECIAL END SHOE ANCHOR MAY BE USED WITH THE 18" X 5'-0" CONCRETE FOOTING OR THE ANGLE ANCHOR MAY BE USED WITH THE 2'-6" SQUARE OR EQUIVALENT FOOTING.
12. ALL RAIL SECTIONS WILL BE 12 GAUGE STEEL UNLESS STATED OTHERWISE ON PLANS.



WOOD LINE POST

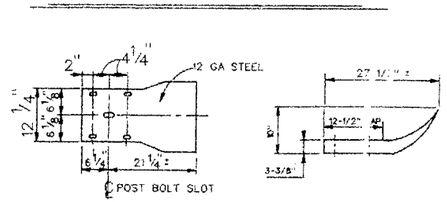


NOTE:
SQUARE LAP SPLICE POSTS MAY BE USED IN LIEU OF BEVELED POSTS.

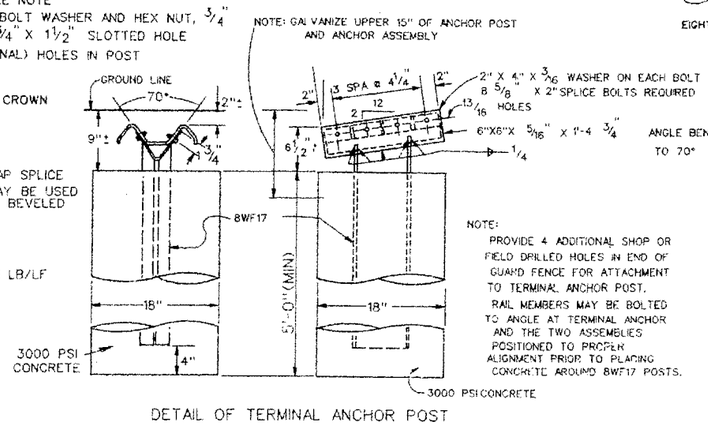
6"X4" WF 8.5 LB/LF X5'6" LONG

STEEL LINE POST

NOTE:
WHEN UNDISTURBED SOLID ROCK IS ENCOUNTERED THE MINIMUM DEPTH OF THE HOLE SHALL BE 1'-6".

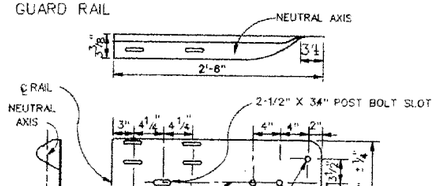


END TERMINAL SECTION - 12 GAUGE



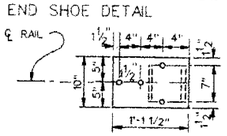
NOTE:
PROVIDE 4 ADDITIONAL SHOP OR FIELD DRILLED HOLES IN END OF GUARD FENCE FOR ATTACHMENT TO TERMINAL ANCHOR POST.
RAIL MEMBERS MAY BE BOLTED TO ANGLE AT TERMINAL ANCHOR AND THE TWO ASSEMBLIES POSITIONED TO PROPER ALIGNMENT PRIOR TO PLACING CONCRETE AROUND 8WF17 POSTS.

DETAIL OF TERMINAL ANCHOR POST

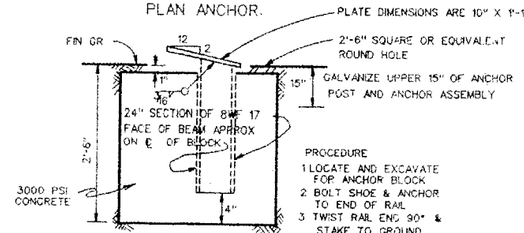


EIGHT 5/8" SPLICE BOLTS REQ FOUR 7/8" ANCHOR BOLTS WITH NUTS AND WASHERS REQUIRED.

SPECIAL END SHOE DETAIL



PLAN ANCHOR.



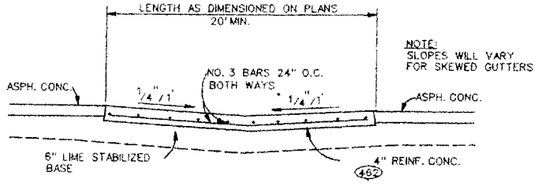
ELEV: ANCHOR & END BLOCK

OPTIONAL TERMINAL ANCHOR POST

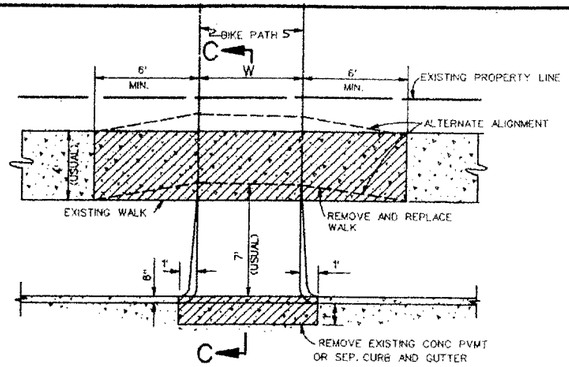
PROCEDURE
1 LOCATE AND EXCAVATE FOR ANCHOR BLOCK
2 BOLT SHOE & ANCHOR TO END OF RAIL
3 TWIST RAIL END 90° & STAKE TO GROUND
4 PLACE CONCRETE

APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: March 14, 1997

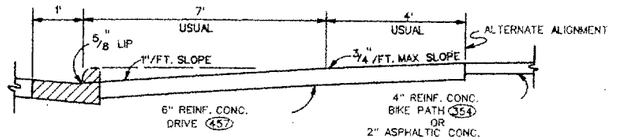
MISCELLANEOUS DETAILS					
METAL BEAM GUARD FENCE					
DETAILS -GF(TD)-74					
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION					
CITY OF DALLAS, TEXAS					
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	9003



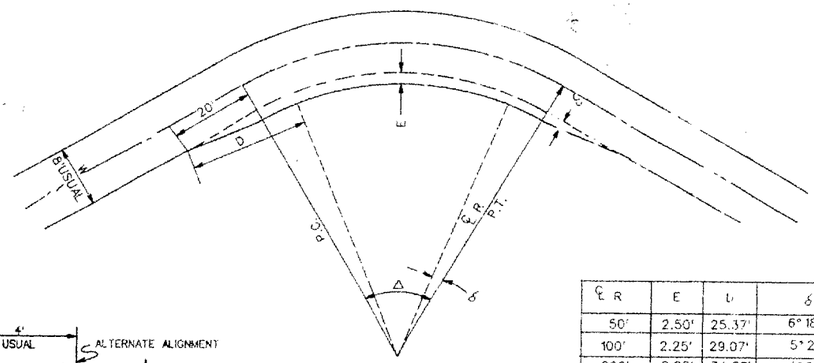
VALLEY GUTTER DETAIL



BIKE PATH RAMP AT PAVED STREET
(NO WALK ABUTTING CURB)



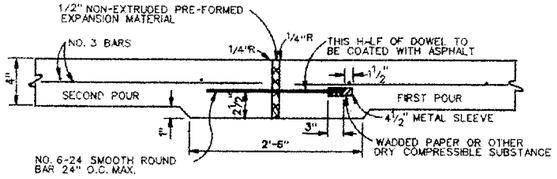
SECTION C-C



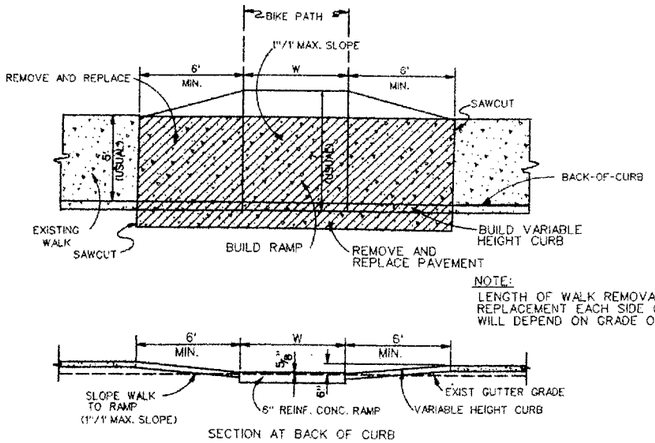
TRAIL WIDENING DETAIL

FOR Δ >10°
NO WIDENING NESESSARY
WHERE : Δ< 10°
R > 700'

℄ R	E	L	δ
50'	2.50'	25.37'	6°18'
100'	2.25'	29.07'	5°20'
200'	2.00'	34.58'	4°03'
300'	1.75'	38.04'	3°27'
400'	1.50	39.97'	2°52'
500'	1.25'	40.60'	2°22'
600'	1.00'	39.99'	1°55'
700'	1.00'	42.42'	1°50'

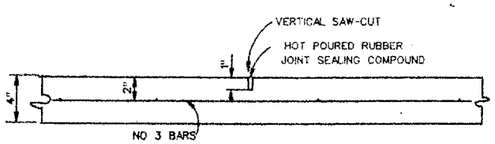


EXPANSION JOINT DETAIL
(FOR CONCRETE VALLEY GUTTERS)

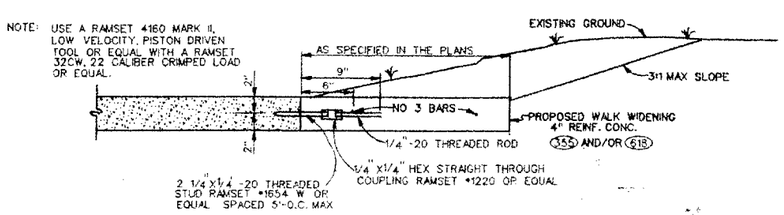


SECTION AT BACK OF CURB

BIKE PATH RAMP AT PAVED STREET
(WALK ABUTTING CURB)

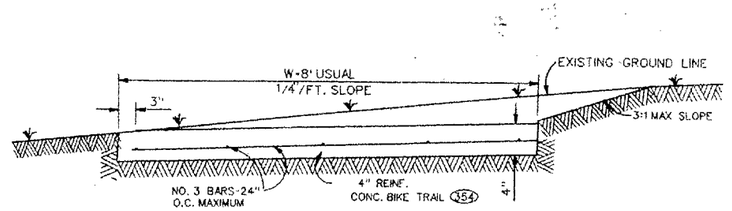


SAWED DUMMY JOINT
(SPACED 15' CENTERLINE MEASURE)

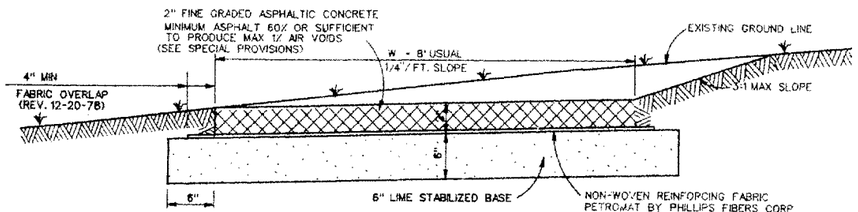


355 AND/OR 618, FOR TYING TO EXISTING WALK, WILL BE PAID FOR PER LINEAR FOOT MEASURED LONGITUDINALLY WITH THE WALK, AND WILL INCLUDE ALL MATERIAL SHOWN COMPLETE IN PLACE.

DETAIL AT WIDENED WALK



BICYCLE TRAIL
TYPICAL CONCRETE SECTION



BICYCLE TRAIL
TYPICAL ASPHALT SECTION

CONSTRUCTION PROCEDURES: **

1. PREPARE LIME STABILIZED BASE 25#/S.Y. (5%)USUAL.
2. SHOOT PRIME COAT 0.10 GAL./S.Y. RC-70. ALLOW TO CURE.
3. * APPLY 0.25 GAL./S.Y. AC-10 BINDER.
4. IMMEDIATELY SPREAD FABRIC AND BROOM OR ROLL INTO ASPHALT
5. * LAY 2" LIFT OF ASPH. CONC. IN ONE APPLICATION IMMEDIATELY IF POSSIBLE. (SEE SPECIAL PROVISION)
6. QUANTITIES OF ASPHALT AND LIME MAY BE VARIED AS DIRECTED BY THE ENGINEER AT TIME OF CONSTRUCTION.

* CATONIC EMULSION CRS-2 MAY BE USED, BUT FABRIC CAN NOT BE LAID UNTIL EMULSION CURES. QUANTITY MUST BE ADJUSTED TO PROVIDE SUFFICIENT RESIDUAL ASPHALT TO SATURATE THE REINFORCING FABRIC.

** ASPHALT MAY VARY ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

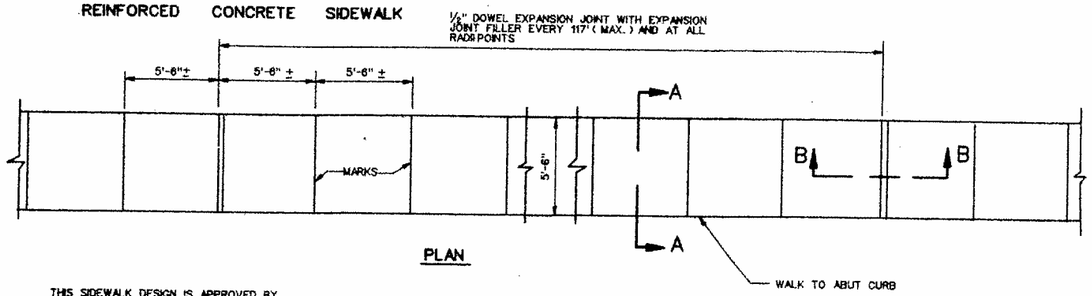
APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: March 19, 1997

MISCELLANEOUS DETAILS
BICYCLE PATHS

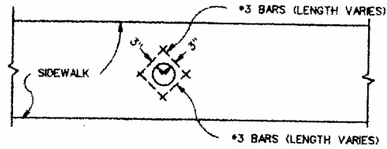
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CITY OF DALLAS, TEXAS

DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	9004

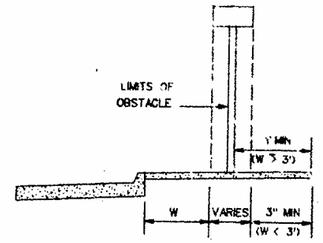
REINFORCED CONCRETE SIDEWALK



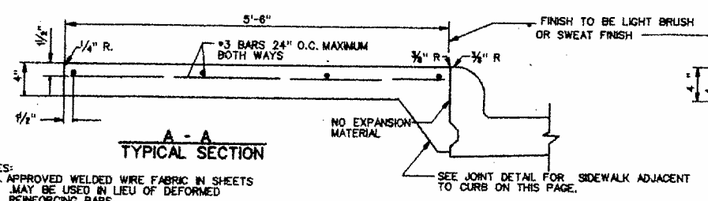
PLAN



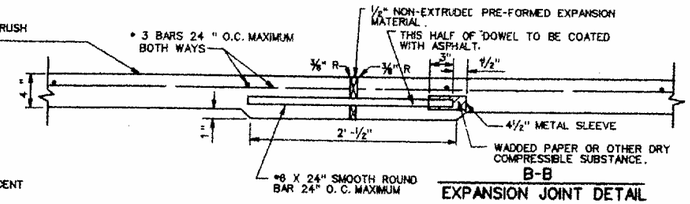
REINFORCING DETAIL AT WATER METERS IN SIDEWALK



THIS SIDEWALK DESIGN IS APPROVED BY THE PARK DEPARTMENT FOR USE ALONG CITY PARK PROPERTY.

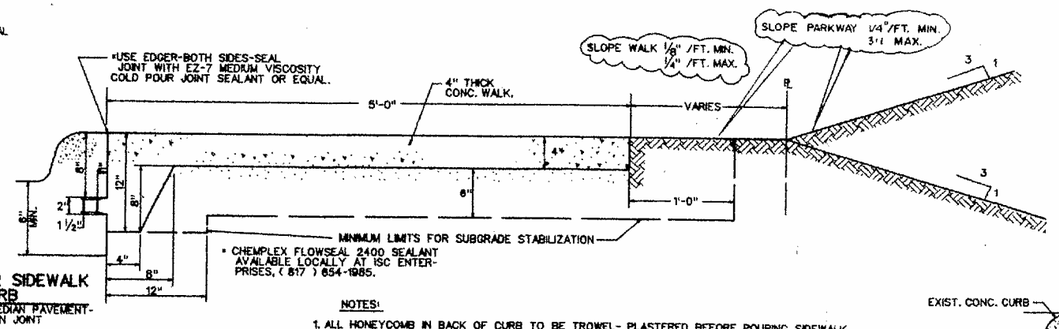


A - A
TYPICAL SECTION



B-B
EXPANSION JOINT DETAIL

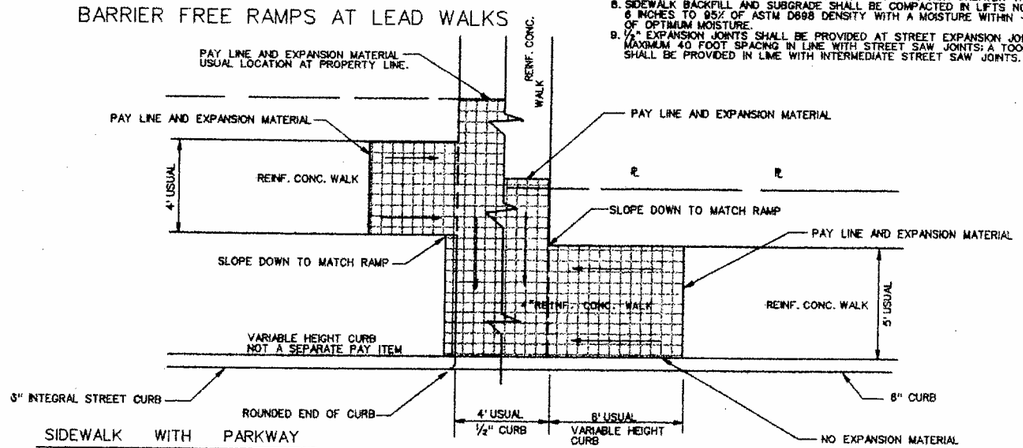
NOTES:
1. APPROVED WELDED WIRE FABRIC IN SHEETS MAY BE USED IN LIEU OF DEFORMED REINFORCING BARS.
2. THE WIRE FABRIC SHALL BE SUPPORTED BY APPROVED BAR CHAIRS ON 36" CENTERS.
3. THE SIZE OF THE WIRE FABRIC SHALL BE 12 X 12-W4 X W4 WITH A NOMINAL DIAMETER OF 0.225 INCHES AND A NOMINAL WEIGHT OF 0.136 LBS./LIN. FT.



JOINT DETAIL FOR SIDEWALK ADJACENT TO CURB
SAME DETAIL (LUG) FOR MEDIAN PAVEMENT-USE PREMOLDED EXPANSION JOINT

NOTES:
1. ALL HONEYCOMB IN BACK OF CURB TO BE TROWEL-PLASTERED BEFORE POURING SIDEWALK
2. LUG MAY BE FORMED BY SHAPING SUBGRADE TO APPROXIMATE DIMENSIONS SHOWN.
3. FOR SIDEWALKS AGAINST EXISTING CURB, KEYWAY SHALL BE REPLACED WITH 6" LONG *3 BARS DRILLED 4" INTO EXISTING BACK CURB AND EPOXY GROUTED ON 24" CENTERS.
4. PAYMENT FOR KEYWAY SUBSIDIARY TO SIDEWALK LUG PAY ITEM.
5. PAYMENT FOR EXCAVATION, BORROW, SUBGRADE STABILIZATION, AND COMPACTION IS SUBSIDIARY TO CONCRETE SIDEWALK PAY ITEM.
6. LIME STABILIZATION OR SELECT BORROW MATERIAL FOR SUBGRADE IS REQUIRED WHEN SOIL P.I. IS GREATER THAN 18. LIMITS OF SUBGRADE STABILIZATION ARE MINIMUM REQUIRED.
7. BACKFILL FOR SIDEWALK SUBGRADE SHALL BE LIME STABILIZED SOIL OR SELECT BORROW MATERIAL HAVING A P.I. NOT LESS THAN 10 NOR GREATER THAN 18.
8. SIDEWALK BACKFILL AND SUBGRADE SHALL BE COMPACTED IN LIFTS NOT TO EXCEED 6 INCHES TO 95% OF ASTM D698 DENSITY WITH A MOISTURE WITHIN -2% TO +4% OF OPTIMUM MOISTURE.
9. ½" EXPANSION JOINTS SHALL BE PROVIDED AT STREET EXPANSION JOINTS AND AT A MAXIMUM 40 FOOT SPACING IN LINE WITH STREET SAW JOINTS; A TOOL MARKED GROOVE SHALL BE PROVIDED IN LINE WITH INTERMEDIATE STREET SAW JOINTS.

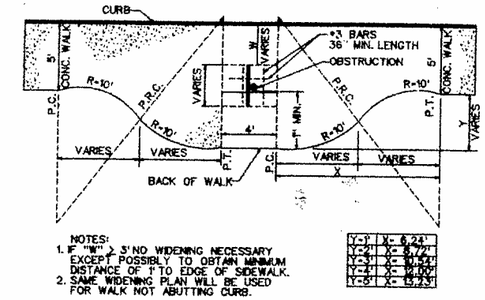
BARRIER FREE RAMPS AT LEAD WALKS



SIDEWALK WITH PARKWAY

SIDEWALK ABUTTING CURB

NOTES:
1. NO SLOPE TO EXCEED 1" PER 1' & ONLY AT RAMPS
2. ACTUAL LOCATIONS OF RAMP LIMITS WILL BE DETERMINED BY SLOPE OF RAMP AND GRADE OF STREET.
3. WALK REINFORCEMENT WILL BE *3 BARS SPACED 24" O.C. MAX. BOTH WAYS OR 6 GA. 8" X 8" WIRE MESH.
4. BROOM OR RAKE FINISH NEEDED.

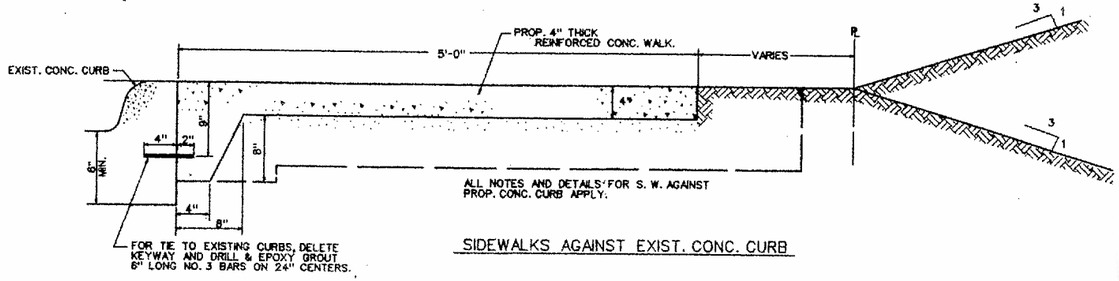


NOTES:
1. IF "W" ≥ 5' NO WIDENING NECESSARY EXCEPT POSSIBLY TO OBTAIN MINIMUM DISTANCE OF 1' TO EDGE OF SIDEWALK.
2. SAME WIDENING PLAN WILL BE USED FOR WALK NOT ABUTTING CURB.

Y=1'	X= 6.24'
Y=2'	X= 8.72'
Y=3'	X= 10.44'
Y=4'	X= 11.66'
Y=5'	X= 12.53'

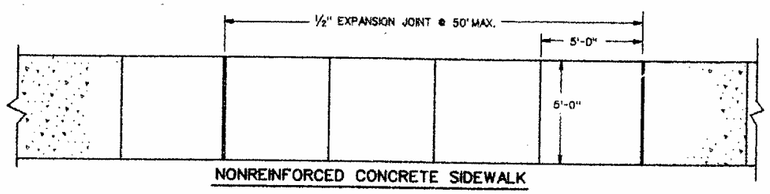
SIDEWALK WIDENING REQUIRED AROUND OBSTACLES IN SIDEWALK

* EXPANSION MATERIAL MUST BE PLACED ADJACENT THE BUILDING, STRUCTURE, WALL OR POLE WHEN SIDEWALK IS POURED ADJACENT THESE ITEMS.



SIDEWALKS AGAINST EXIST. CONC. CURB

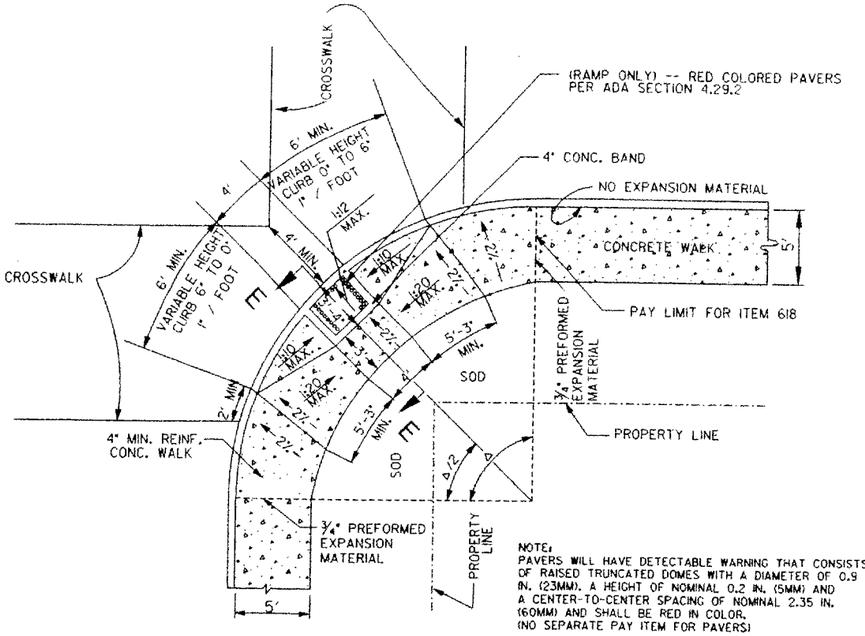
* SEE PAGE 2001 FOR DETAIL OF SIDEWALK ADJACENT TO INLET.



NONREINFORCED CONCRETE SIDEWALK

APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: June 16, 1997

MISCELLANEOUS DETAILS					
REINFORCED SIDEWALKS AND BARRIER FREE RAMPS					
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION					
CITY OF DALLAS, TEXAS					
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	9005



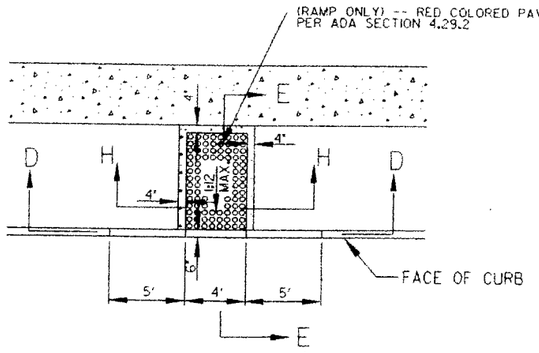
BARRIER FREE RAMP DETAIL

AT INTERSECTING STREET

(WALK ABUTTING CURB)

N.T.S.

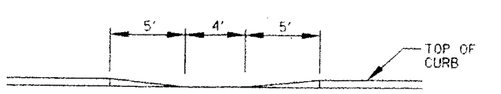
NOTE:
PAVERS WILL HAVE DETECTABLE WARNING THAT CONSISTS OF RAISED TRUNCATED DOMES WITH A DIAMETER OF 0.9 IN. (23MM). A HEIGHT OF NOMINAL 0.2 IN. (5MM) AND A CENTER-TO-CENTER SPACING OF NOMINAL 2.35 IN. (60MM) AND SHALL BE RED IN COLOR.
(NO SEPARATE PAY ITEM FOR PAVERS)



BARRIER FREE RAMP

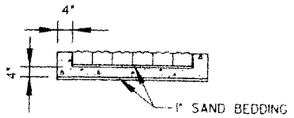
(STRAIGHT CURB)

N.T.S.



SECTION D-D

N.T.S.



SECTION H-H

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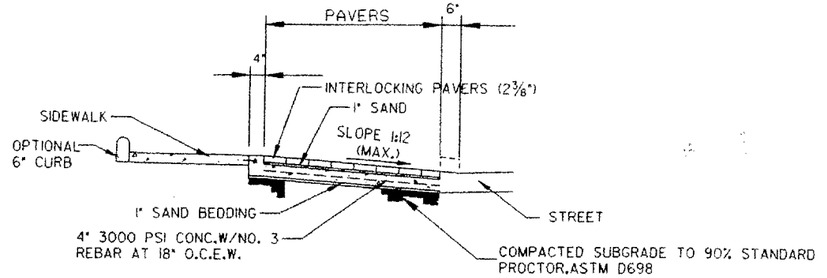

SECTION E-E

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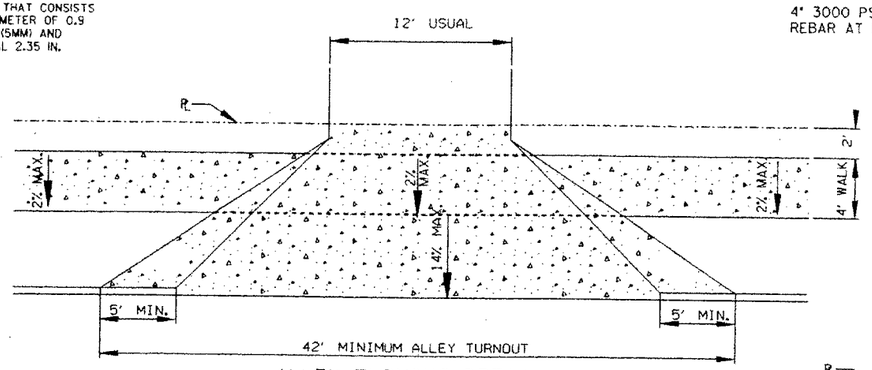
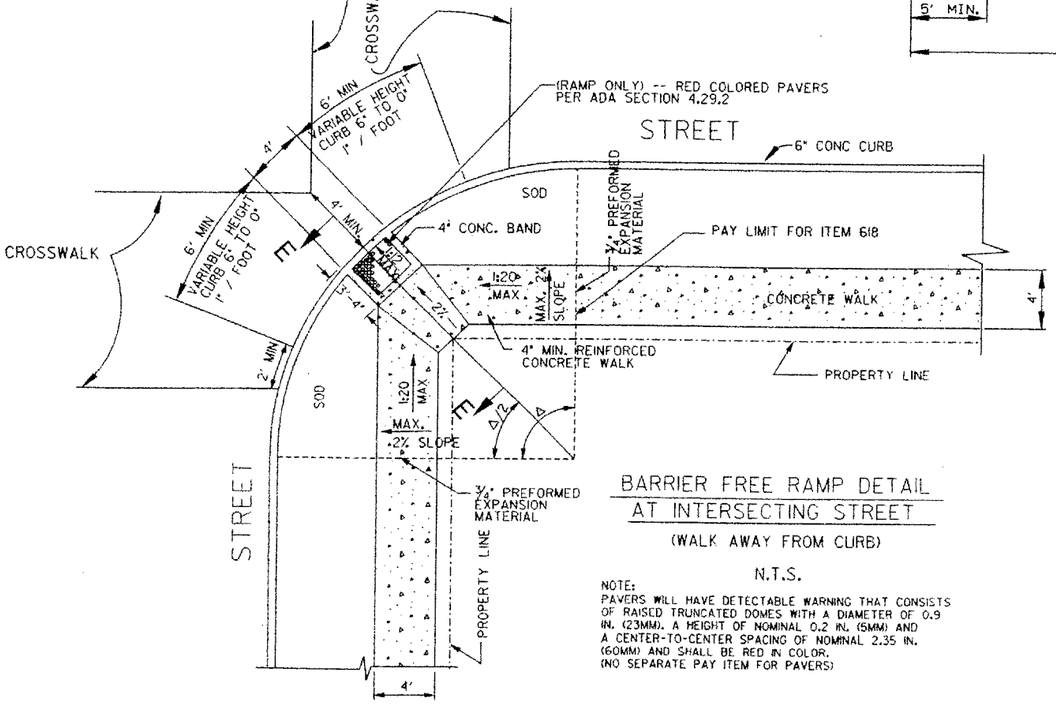


ALLEY TURNOUT DETAIL

(WALK AWAY FROM CURB)

N.T.S.



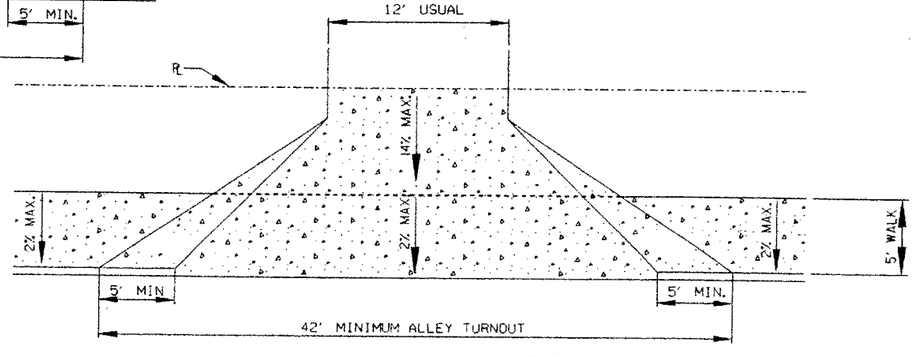
BARRIER FREE RAMP DETAIL

AT INTERSECTING STREET

(WALK AWAY FROM CURB)

N.T.S.

NOTE:
PAVERS WILL HAVE DETECTABLE WARNING THAT CONSISTS OF RAISED TRUNCATED DOMES WITH A DIAMETER OF 0.9 IN. (23MM). A HEIGHT OF NOMINAL 0.2 IN. (5MM) AND A CENTER-TO-CENTER SPACING OF NOMINAL 2.35 IN. (60MM) AND SHALL BE RED IN COLOR.
(NO SEPARATE PAY ITEM FOR PAVERS)



ALLEY TURNOUT DETAIL

(WALK ABUTTING CURB)

N.T.S.

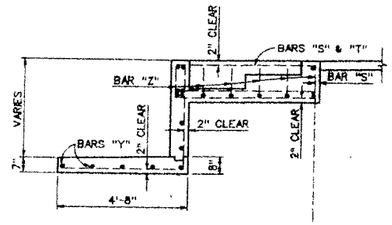
NOTES:

1. SIDEWALK LUGS, KEYWAYS AND SUBGRADE STABILIZATION SHALL BE REQUIRED WITH ALL BARRIER FREE RAMPS AGAINST STREET CURBS. SEE PAGE 9005 FOR DETAIL SHOWING SIDEWALK LUG DIMENSIONS.
2. DESIGNS SHOWN ARE FOR 6" CURBS. DIMENSIONS MUST BE INCREASED PROPORTIONATELY FOR CURBS WITH HEIGHT GREATER THAN 6'.
3. STREETS ON STEEP GRADE WILL REQUIRE LONGER TRANSITION ON UPGRADE SIDE.
4. LOCATION OF BARRIER FREE RAMP MAY BE SHIFTED TO CLEAR OBSTRUCTIONS.
5. IN CBD AREA, MARKING PATTERN ON EXISTING SIDEWALK SHALL BE FOLLOWED ON NEW SIDEWALK EXCEPT THRU THE RAMP AREA OR UNLESS OTHERWISE SPECIFIED ON THE PLANS.

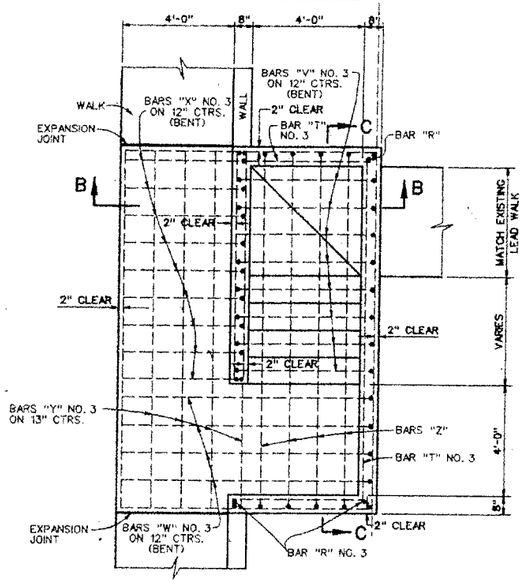
APPROVED _____ DIRECTOR OF PUBLIC WORKS & TRANSPORTATION

DATE: 9/5/02

MISCELLANEOUS DETAILS					
BARRIER FREE RAMPS					
PAVING DETAILS					
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION					
CITY OF DALLAS, TEXAS					
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	M.M.M.	AUG	2510	1	9005

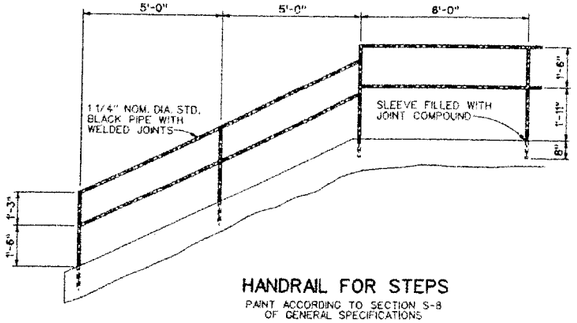


SECTION B-B TYPE 1



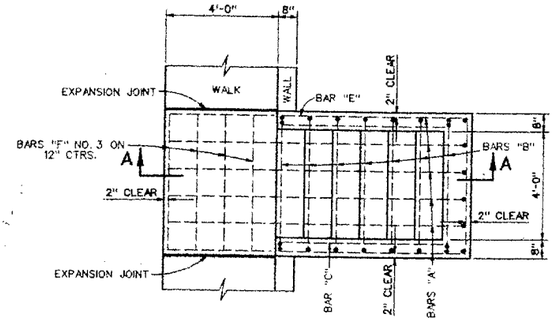
PLAN - TYPE 1

STEPS	CONCRETE C.Y.	STEEL LBS.
4	3.58	138.03
5	3.99	161.57
6	4.54	174.99
7	5.11	188.75
8	5.70	210.37
9	6.32	225.75
10	6.96	236.17



HANDRAIL FOR STEPS

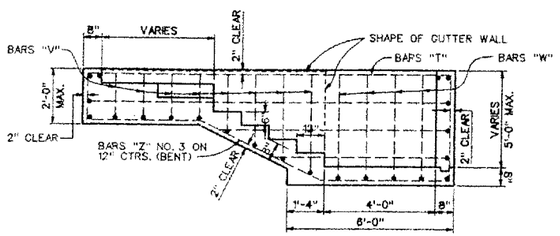
PAINT ACCORDING TO SECTION S-8 OF GENERAL SPECIFICATIONS



PLAN - TYPE 2

STEPS	CONCRETE C.Y.*	STEEL LBS.*
3	1.19	41.45
4	1.42	50.01
5	1.67	59.00
6	1.93	68.18
7	2.20	78.87
8	2.46	89.74
9	2.79	100.80
10	3.09	112.42

* QUANTITIES INCLUDE WALK PORTION BETWEEN EXPANSION JOINTS.

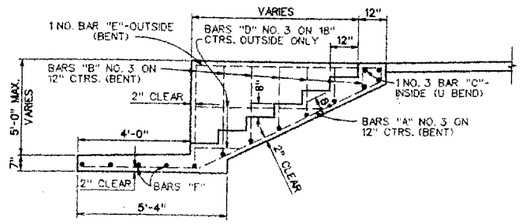


SECTION C-C

TYPE 1 STEPS

PARALLEL TO STREET

WALL HEIGHT GREATER THAN 5 FT. REQUIRES SPECIAL ANALYSIS



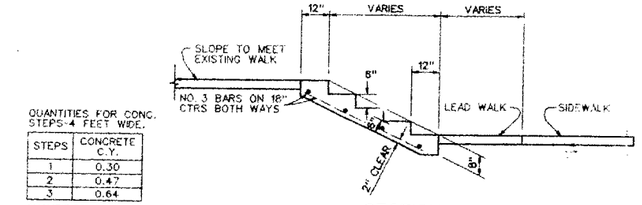
SECTION A-A

TYPE 2 STEPS

PERPENDICULAR TO STREET

INCHES 12 0 FEET 9 10

SCALE

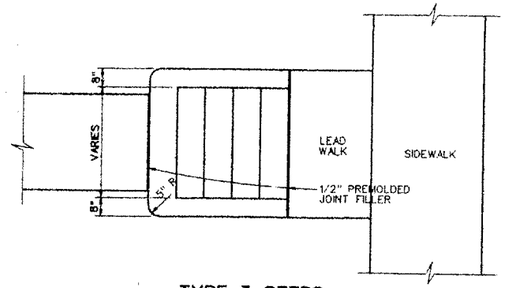


SECTION

QUANTITIES FOR CONC. STEPS-4 FEET WIDE.

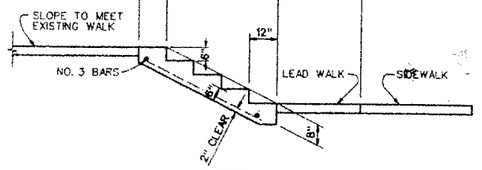
STEPS	CONCRETE C.Y.
1	0.30
2	0.47
3	0.64

QUANTITIES OF CONCRETE INCREASE BY 0.17 CU. YDS. FOR EACH ADDITIONAL STEP

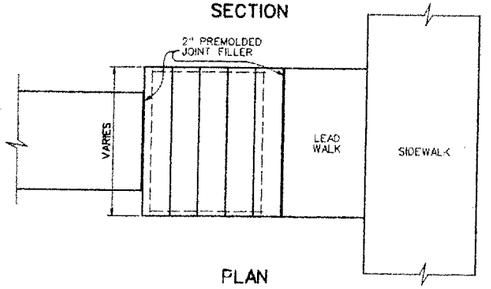


TYPE 3 STEPS

WITH BUTTRESS WALLS



SECTION



PLAN

TYPE 4 STEPS

WITHOUT BUTTRESS WALLS

GENERAL NOTES

1. CONCRETE FOR STEPS TO BE CLASS A CONCRETE.
2. BARS SHALL CONFORM TO SECTION 2.2.6 OF THE NCTCOG SPECIFICATIONS.
3. BAR LAPS SHALL BE 30 DIAMETERS.
4. ALL EXPOSED SURFACES EXCEPT STEP TREADS AND WALK SHALL RECEIVE A RUBBED FINISH.
5. STEP TREADS AND WALK SHALL RECEIVE A NON-SKID WOOD FLOAT FINISH.
6. STEP EDGES SHALL BE ROUNDED TO 3/8" DIAMETER.
7. THE HEIGHT OF RISE OF THE BOTTOM STEP MAY BE LESS THAN 7 1/2".
8. WIDTH OF TREAD AND/OR DEPTH OF RISE OF ALL STEPS MAY BE MODIFIED IF SO INDICATED ON THE PLANS.
9. EXPANSION JOINTS SHALL BE COMPOSED OF 1/2" PREMOLDED JOINT FILLER.
10. QUANTITIES ARE BASED ON STEPS HAVING 6" RISERS, 12" TREADS AND LEAD WALKS 4' WIDE.

APPROVED

DIRECTOR OF PUBLIC WORKS & TRANSPORTATION

DATE: April 16, 1997

MISCELLANEOUS DETAILS

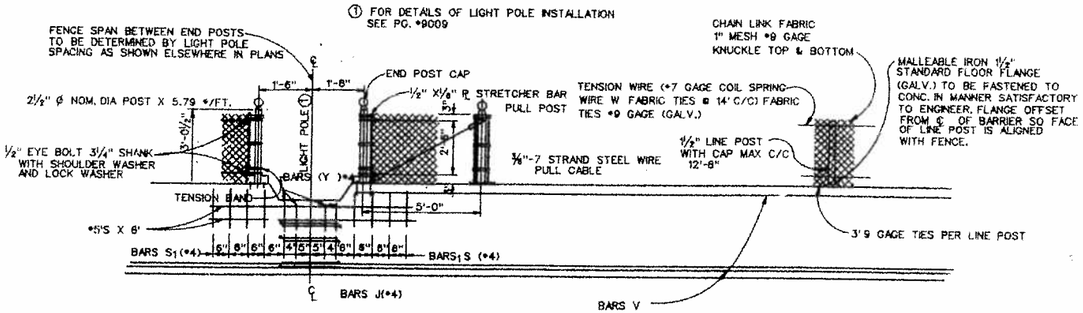
STEPS AND HANDRAIL

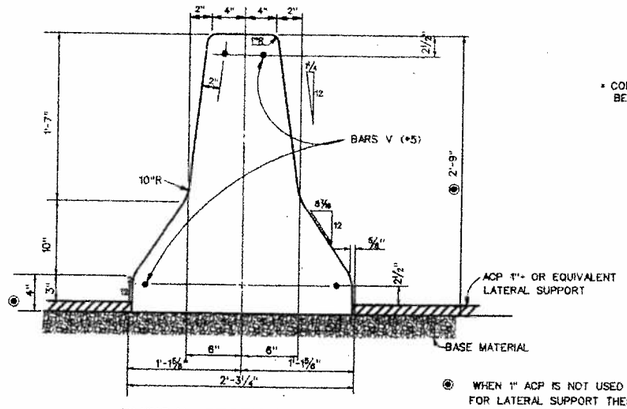
FOR STEPS

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

CITY OF DALLAS, TEXAS

DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	9007

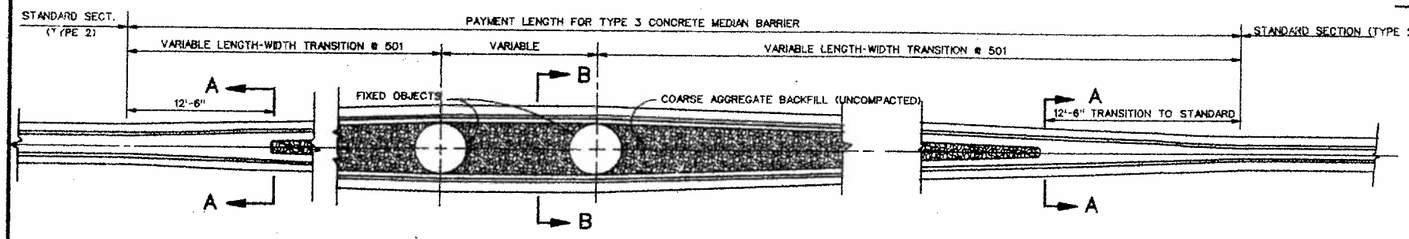




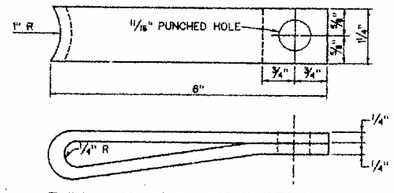
* CONCRETE MEDIAN BARRIER WALL SHALL BE "HAND FINISHED" CLASS CONCRETE.

TYPICAL SECTION TYPE 2
(ROADWAY BARRIER)

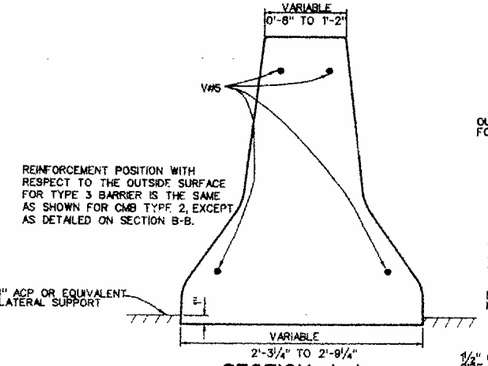
◉ WHEN 1" ACP IS NOT USED FOR LATERAL SUPPORT THESE DIMENSIONS SHALL BE ADJUSTED ACCORDINGLY.



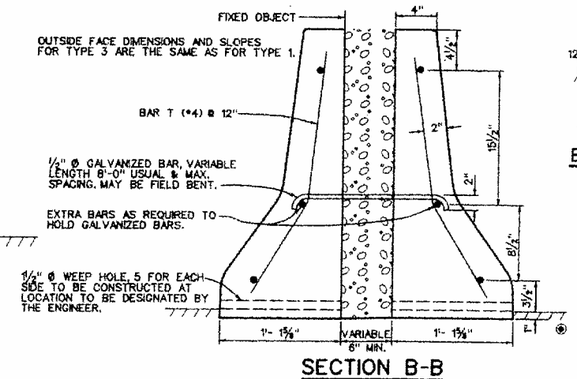
TYPE 3 BARRIER PLAN



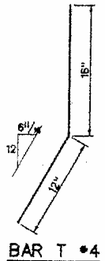
PULL CABLE SHACKLE DETAIL



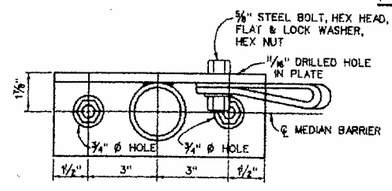
SECTION A-A
TYPE 3 BARRIER

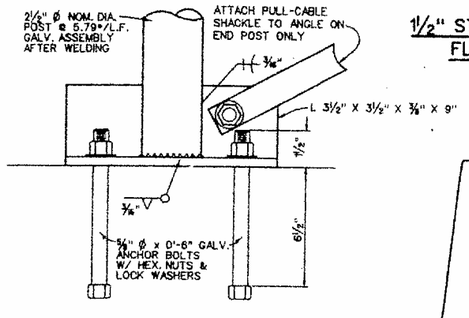


SECTION B-B
TYPE 3 BARRIER



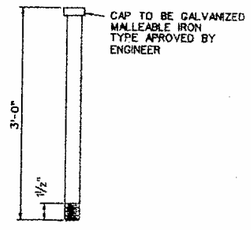
BAR T #4





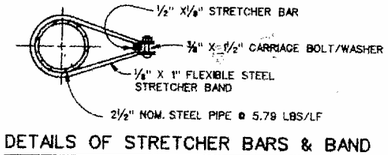
ELEVATION END & PULL POST

1½" STANDARD FLOOR FLANGE PLAN

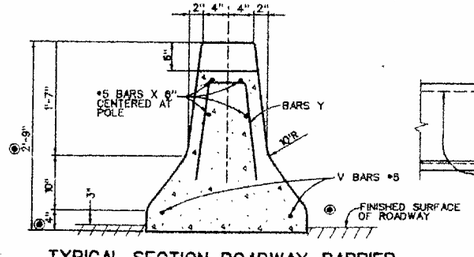


1½" NOM. DIA. LINE POST X 2.72 #/FT. & CAP ELEVATION

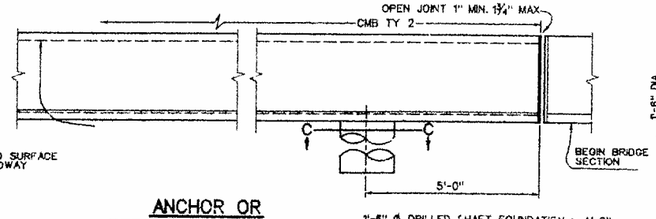
BARS S1 (#4)



DETAILS OF STRETCHER BARS & BAND

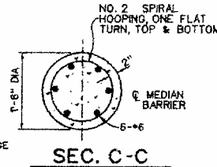


TYPICAL SECTION ROADWAY BARRIER
(CAST IN PLACE) AT LIGHT POLE

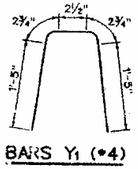


ANCHOR OR TERMINAL ELEVATION

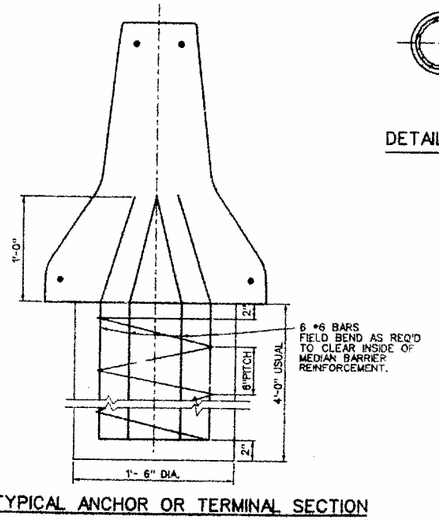
1'-6" ø DRILLED SHAFT FOUNDATION x 4'-0" UNLESS SHOWN OTHERWISE IN THE PLANS.



SEC. C-C



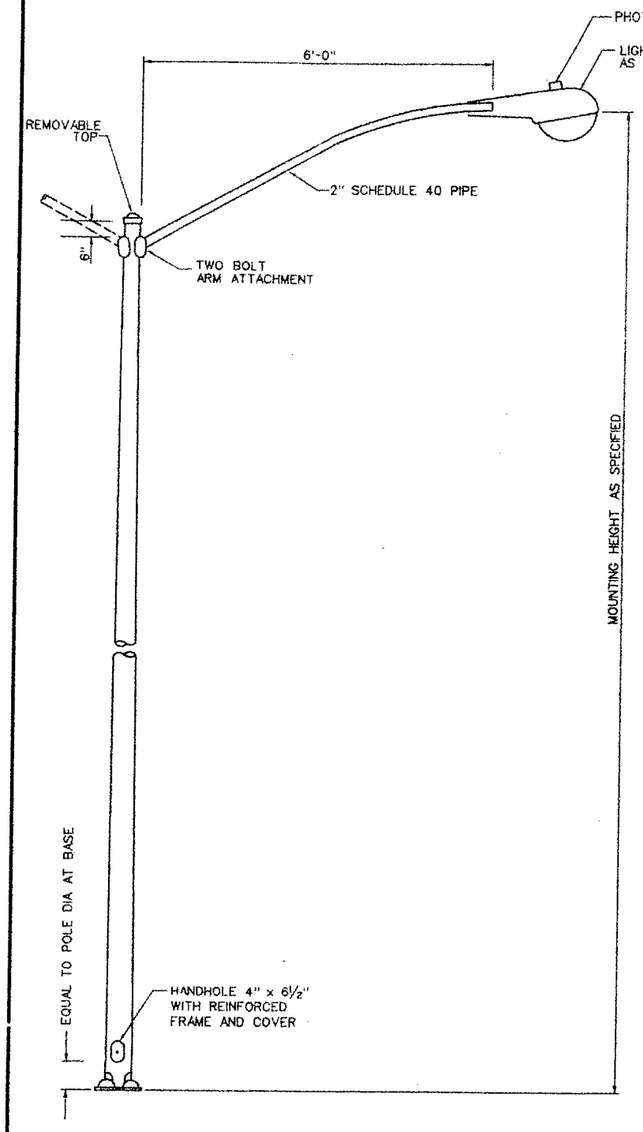
BARS Y1 (#4)



TYPICAL ANCHOR OR TERMINAL SECTION

APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: APRIL 16, 1997

MISCELLANEOUS DETAILS					
CONCRETE MEDIAN					
BARRIER DETAILS					
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION					
CITY OF DALLAS, TEXAS					
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.&A.	APRIL 1997	251D	1	9008



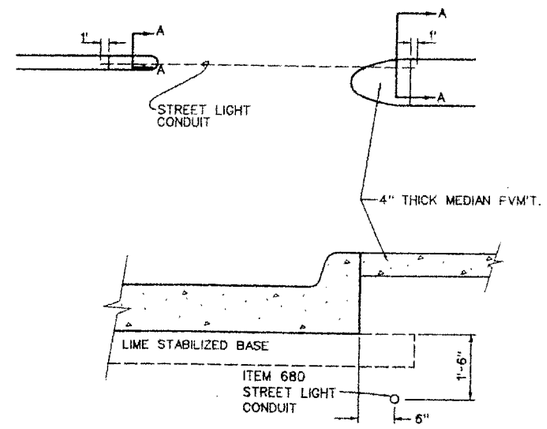
STREET LIGHT DETAIL

NO SCALE

SINGLE OR DOUBLE STREET LIGHT WITH 150 WATT HPS FIXTURE(S) AND 32.5 NOMINAL MOUNTING HEIGHT

LUMINAIRE SHALL BE GENERAL ELECTRIC M-250R CAT. NO. C760N545, OR EQUAL. PHOTOELECTRIC CONTROL SHALL BE INCLUDED.

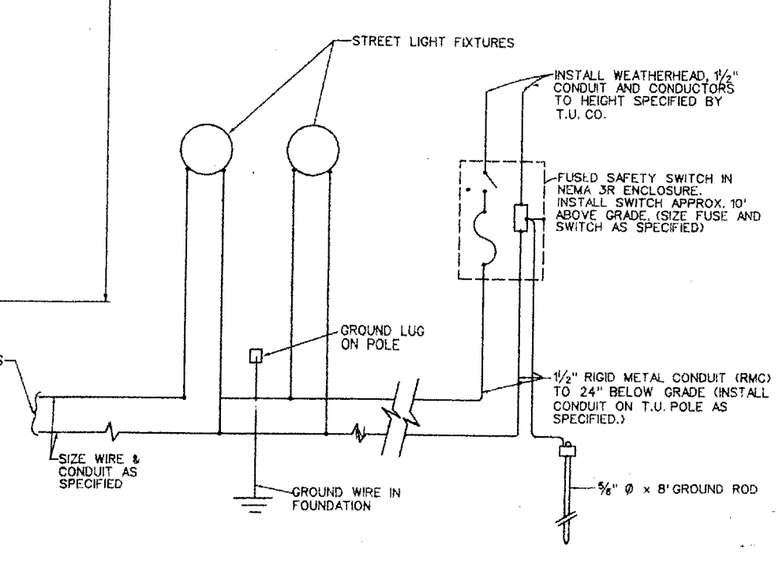
POLE SHALL BE UNION METAL DESIGN 1400A, CAT. NO. H-286-82 OR EQUAL. POLES FOR SINGLE LIGHTS SHOULD BE ORDERED WITH DOUBLE MOUNTING ATTACHMENTS. (ALLOWS FOR FUTURE INSTALLATION OF ADDITIONAL ARM AND FIXTURE.)



SECTION A-A

STREET LIGHT CONDUIT INSTALLATION DETAIL

INSTALL CONDUIT ADJACENT TO NORTH CURB OF MEDIAN ON STREETS THAT RUN EAST AND WEST.
INSTALL CONDUIT ADJACENT TO THE WEST CURB OF MEDIAN ON STREETS THAT RUN NORTH AND SOUTH.



TYPICAL DOUBLE STREET LIGHT RISER DETAIL

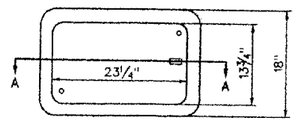
INSULATED CONDUCTOR USED FOR THE HOT LEG SHALL BE SUITABLE FOR DIRECT BURIAL.

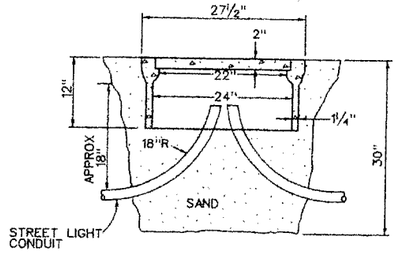
A BARE CONDUCTOR MAY BE USED FOR THE NEUTRAL.

TYPICAL SERVICE RISER DETAIL

ONLY RIGID METAL CONDUIT SHALL BE USED ABOVE GRADE.

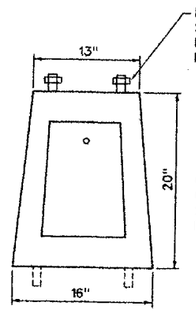
CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR SERVICE WITH T.U. CO.





FLUSH MOUNTED PULL BOX DETAIL

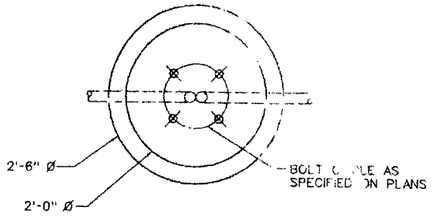
ITEM 688

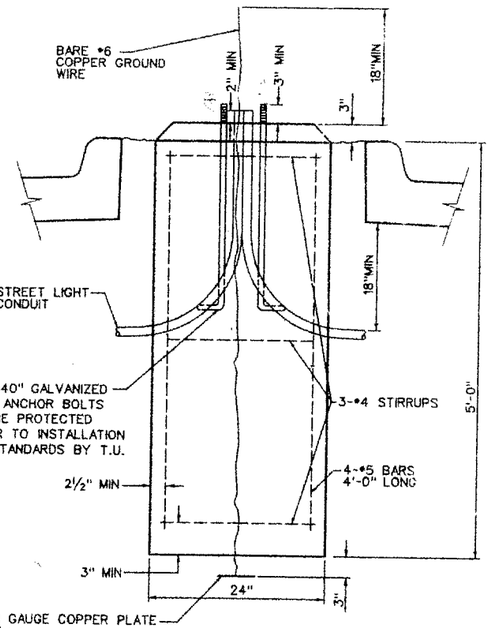


CONTRACTOR TO FURNISH BOLT CIRCLE TEMPLATE, ANCHOR BOLTS, 2"PVC, GROUNDING PLATE, AND PULL STRING.

TRANSFORMER BASE DETAIL

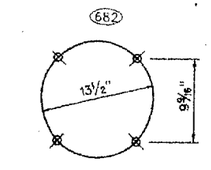
TRANSFORMER BASE SHALL BE MOUNTED ON FOUNDATION WITH A 15" DIA. BOLT CIRCLE.



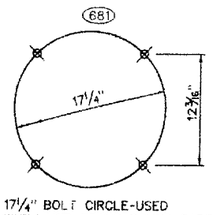


3000 P.S.I. REINFORCED CONCRETE FOUNDATION

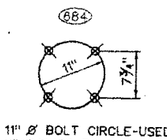
FOUNDATION FOR STREET LIGHT ONLY OR FOR COMBINATION STREET LIGHT AND TRAFFIC SIGNAL SEE DETAIL FOR ANCHOR BOLT CIRCLE REQUIREMENTS.



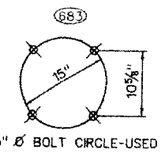
13½" BOLT CIRCLE-USED WHENEVER STANDARD IS MOUNTED DIRECTLY ON FOUNDATION.



17¼" BOLT CIRCLE-USED WHENEVER TRANSFORMER BASE IS MOUNTED DIRECTLY ON FOUNDATION.



11" Ø BOLT CIRCLE-USED WHENEVER POLE IS MOUNTED DIRECTLY ON FOUNDATION.



15" Ø BOLT CIRCLE-USED WHENEVER TRANSFORMER BASE IS MOUNTED ON FOUNDATION.

FOR 40' STANDARD

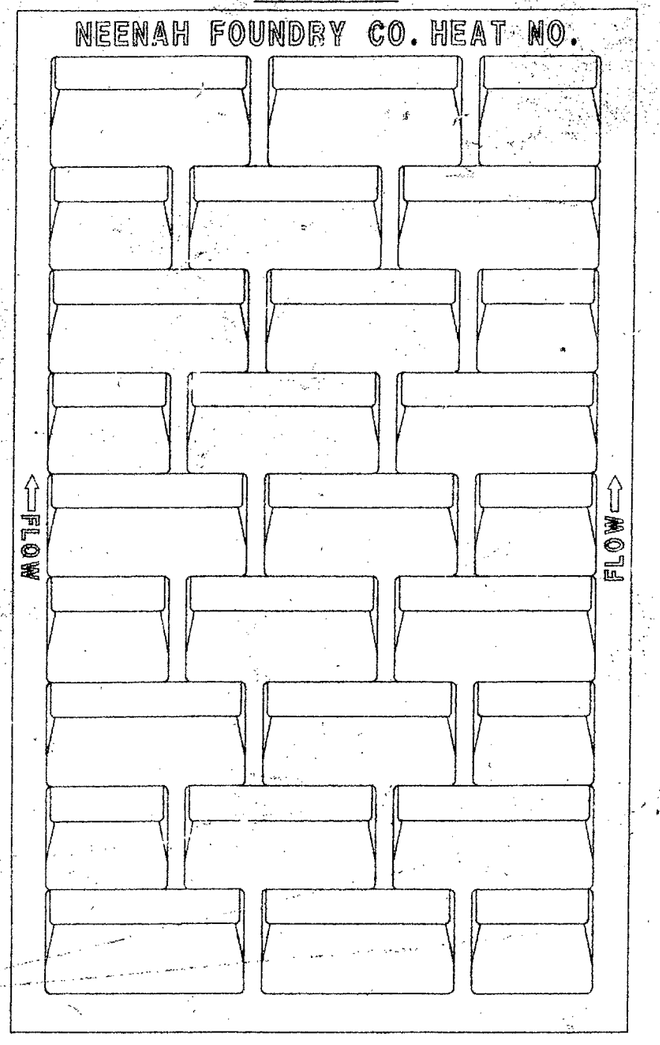
FOR 30' STANDARD

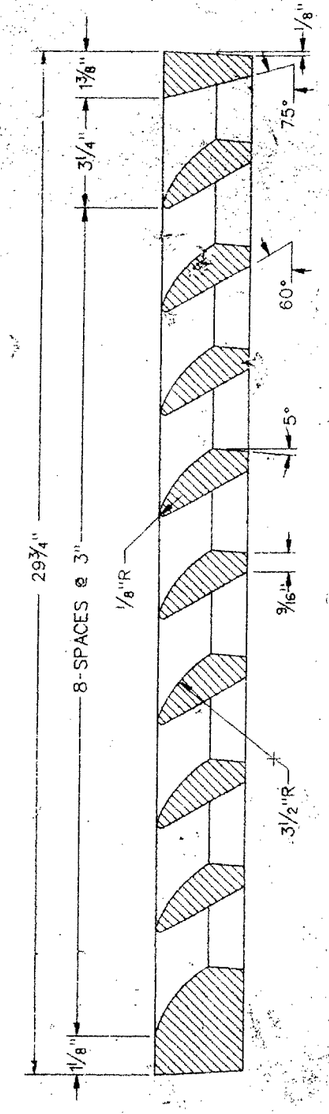
ANCHOR BOLT CIRCLE REQUIREMENTS

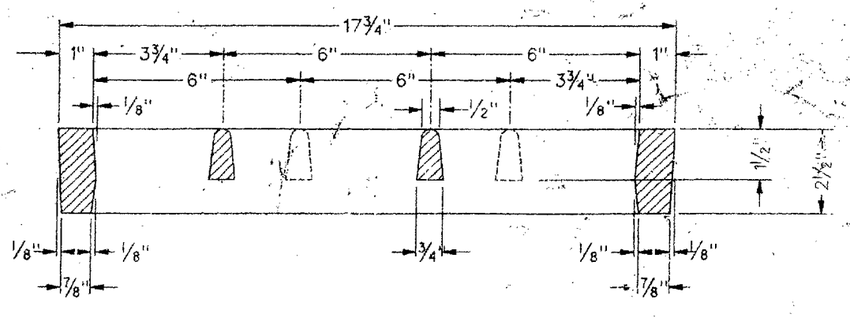
APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: APRIL 14, 1977

MISCELLANEOUS DETAILS					
STREET LIGHT EQUIPMENT DETAILS					
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION					
CITY OF DALLAS, TEXAS					
DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.

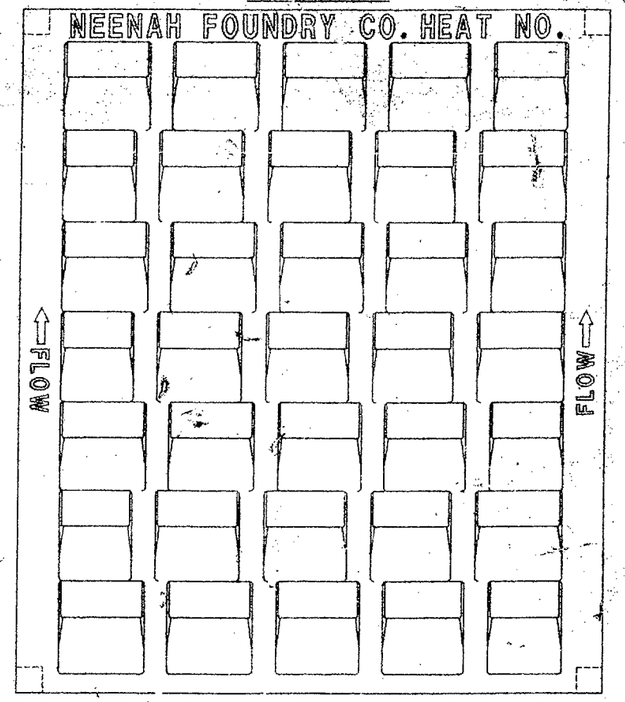
R - 3076

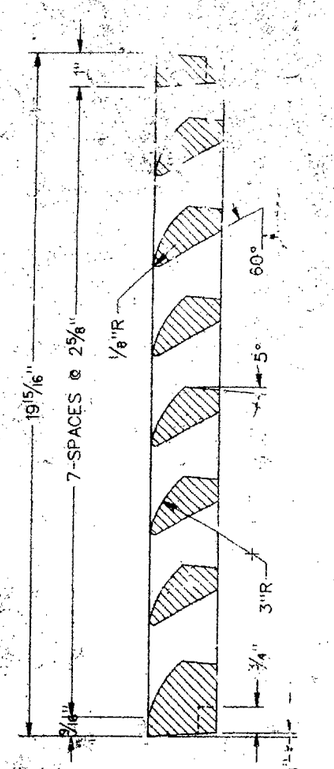


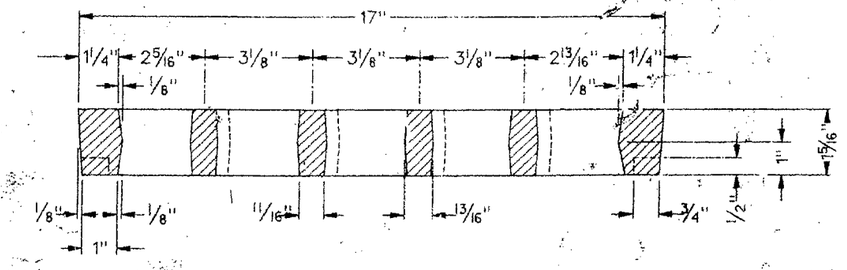




R - 3065







MATERIAL - CAST GRAY IRON
ASTM A-48-83 CLASS 35B
NO PAINT

SEE SHEET 2010
FOR FRAME DETAIL

APPROVED
DIRECTOR OF PUBLIC WORKS & TRANSPORTATION
DATE: March 16, 1987

R-3076 & R-3065
TYPE "L" GRATES

MISC. DETAILS
VANE TYPE
CAST IRON GRATE

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CITY OF DALLAS, TEXAS

DESIGN	DRAWN	DATE	FILE	NO.	PAGE NO.
C.O.D.	A.B.M.	APRIL 1987	2510	1	2010