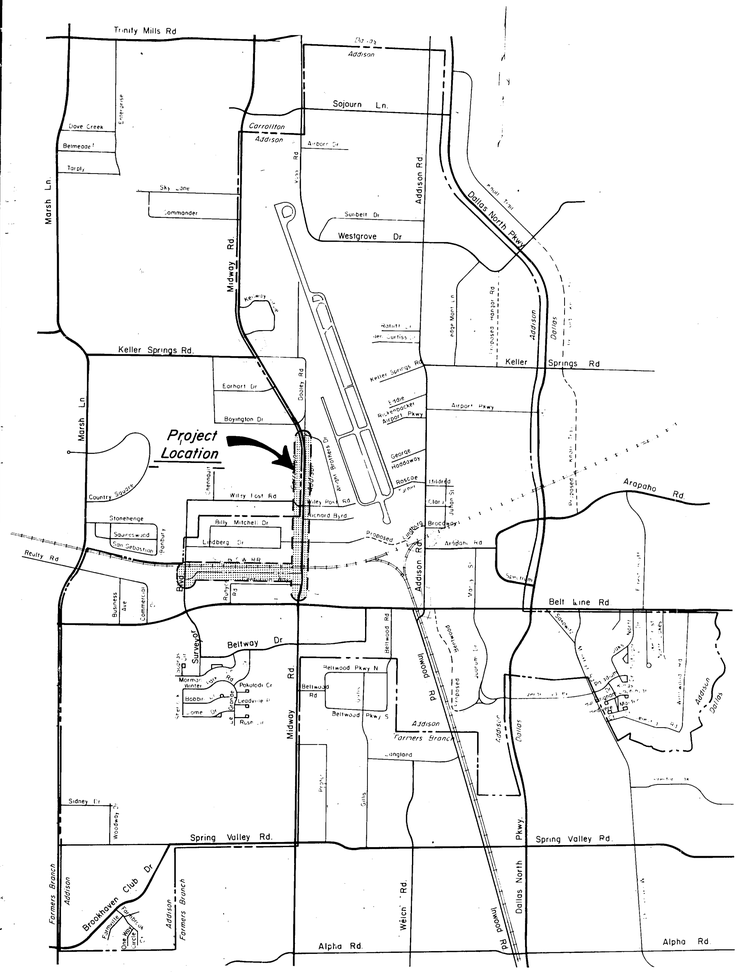
CITY OF ADDISON
DALLAS COUNTY, TEXAS

CONSTRUCTION PLANS FOR:
MIDWAY ROAD

FROM BELT LINE ROAD TO WRIGHT BROTHERS DRIVE
AND DITCH IMPROVEMENTS
FROM MIDWAY ROAD TO SURVEYOR BOULEVARD

PROJECT LENGTH ± 3,548 L.F. (PAVING)
± 2,466 L.F. (DITCH)



CITY OF CARROLLTON

LEDDIE TAYLOR - MAYOR
COUNCIL MEMBERS:
CAROLYN STANDRIDGE
DAVE GILMORE
RICHARD WALKER
PAT ARNOLD
SANDY JACOBS
CLONIS LUALLEN - CITY MANAGER
JIM JENNE - DIRECTOR of COMMUNITY DEVELOPMENT

CITY OF CARROLLTON
Approved By: _____
City Manager
Date: 3-6-81

CITY OF ADDISON

JERRY J. REDDING - MAYOR
COUNCIL MEMBERS:
JOHN B. ALLEN
RICHARD RODER
WILLIAM F. SELLMEYER
BARVO WALKER
TERRY ROBERTS
C.J. WEBSTER - CITY ADMINISTRATOR
GEORGE DOWLING, P.E. - DIRECTOR of COMMUNITY DEVELOPMEN

CITY OF ADDISON
Approved By: _____
Mayor
Date: 3-6-81

STATE OF TEXAS
A. WAYNE GINN
31142
REGISTERED
PROFESSIONAL ENGINEER

GINN INC.
CONSULTING ENGINEERS
DALLAS, TEXAS

SUMMARY OF ESTIMATED QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	PAVING SHEETS 4	5	6	7	8	9	10	11	DRAINAGE SHEETS 15	16	17	18	19	20	21	22	CHANNEL SHEETS 26	27	28	29	30	31	Box Culvert 24	Junction Box 25	S.S. Relocation 23	MISC.	TOTAL
100	Prepare Right-Of-Way	Sta.	3	5	5	5	5	5	5	1																			34
102	Clear & Grubbing (Channel)	Sta.																	5	5	5	5	3.5	1.25					24.75
104.1	Sawed Break-Out Groove	L.F.	79	88	345	366	277	421	345	206																			2,127
104.2	Remove Old Conc. Paving (Where Indicated)	S.Y.	103	377	485		444			92																			1,501
104.3	Remove Old Conc. Curb And Gutter (Where Indicated)	L.F.			92	59	52	60	10	61																			334
* 110.	Unclassified Road Excavation (Density Controlled)	C.Y.	1629	622	1867	2259	1912	2062	2885	908																			14,144
* 120	Unclassified Channel Excavation (Density Controlled)	C.Y.																	480	1229	2406	2027	1070	434					7,646
* 130	Unclassified Borrow (Density Controlled) 25% Shrinkage	C.Y.		1725															311	4	627	61	96	5					2,829
160	Placing 4" Topsoil (In Medians)	S.Y.		558	124		166	234	316																				1,398
248	Flexible Base, Type A, Grade 2, Class III (Density Controlled)	C.Y																										200	200
260.1	Lime Slurry, Type A (6% Max.) (27#/ s.y.)	Ton	40.4	54.35	67.54	61.95	65.79	60.79	58.41	12.61																			424
260.2	Lime Treated Subgrade 6" Thk. (Density Controlled)	S.Y	3180	4025.95	5002.89	4589.01	4873.05	4451.23	4326.89	934.28																			31,384
340.1	5" H.M.A.C.P., Type D, Class A (Driveway Transitions)	S.Y.	50			79.28	25	201.67	40.56																				397
340.2	6" H.M.A.C.P., Type B, Class A (Black Base For Intersections)	S.Y	750		1355		1325																						3,430
340.3	H.M.A.C.P., Type D, Class A	Ton																										300	300
360.1	8" Concrete Pavement (3000 P.S.I.)	S.Y.	2833.91	3803.28	4752.57	4354.34	4643.27	4240.73	4106.01	889.78																			29,624
360.2	6" Monolithic Concrete Curb (3000 P.S.I.)	L.F.	698.13	1717	1781.56	1315.06	1598.70	1189.40	1224.08	343.21																			9,867
360.3	6" Dowel Curb (3000 P.S.I.)	L.F.	280	15	40	45.5	30	130.5	180.5																				722
360.4	4" Non-Reinforced Conc. Median (2000 P.S.I.)	S.Y.	114.73	47.9	114.26	173.34	121.86	80.27	84.3	30.39																			768
360.5	Concrete Railroad Header	L.F.		162																									162
421.1	Class A, 8" Reinforced Concrete Plug Wall	Lump Sum																							1				1
421.2	Class A, Concrete Box Culvert	C.Y.																							109.1				109.1
421.3	Class A, Concrete Wingwalls	C.Y.																							16.1				16.1
421.4	Class A, Concrete Retaining Wall	C.Y.																							11.7				11.7
421.5	Class A, Concrete Junction Box	C.Y.																								13.0			13.0
432.1	Class A, 6" Concrete Riprap (Channel)	C.Y.																	251.5	279.0	275.0	294.5	288.2	112.7	15.4				1,517
432.2	Class A, 4" Concrete Riprap	C.Y.			13.3	5.8																							19.1
440.1	Reinforcing Steel Box Culvert	Lbs.																							19,016				19,016
440.2	Reinforcing Steel Wingwalls	Lbs.																							1,810				1,810
440.3	Reinforcing Steel Retaining Walls	Lbs.																							954				954
440.4	Reinforcing Steel Junction Box	Lbs.																								2,035			2,035
460	48" C.M.P. (14 Gage 2 2/3 x 1/2 Corrugations)	L.F.										270																	270
465.1	18" R.C.P. Class III	L.F.									58		48		34														140
465.2	21" R.C.P. Class III	L.F.									307	55	254	192	311	296	136	57											1608
465.3	24" R.C.P. Class III	L.F.									77	311					414	11											813
465.4	30" R.C.P. Class III	L.F.									38	287				252	86												663
465.5	36" R.C.P. Class III	L.F.														163													163
465.6	42" R.C.P. Class III	L.F.										272	1000	100	302	86													1,760
465.7	48" R.C.P. Class III	L.F.												440	199														639
470.1	Double 10' Recessed Inlet (Complete In Place)	Ea.										1	1																2
470.2	10' Recessed Inlet (Complete In Place)	Ea.									3	2	2	3	3	4	2	1											20
470.3	10' Standard Inlet (Complete In Place)	Ea.											2		2														4
470.4	10' Mod. Recessed Inlet (Complete In Place)	Ea.													1		1												2
470.5	6' Mod. Standard Inlet (Complete In Place)	Ea.														1													1
470.6	Mod. Standard Double Grate Inlet (Complete In Place)	Ea.															1												1
470.7	4' Dia. Manhole (6'-8' Cut) (Complete In Place)	Ea.																		1	2								3
470.8	4' Dia. Manhole (10'-12' Cut) (Complete In Place)	Ea.																									2		2
471	Frame And Cover	Ea.																								1			1
472	Re-Laying 18" Reinforced Concrete Sewer Pipe	L.F.									20						113												133
476	Boring 48" C.M.P. (14 Gage, 2 2/3 x 1/2 Corrugations)	L.F.										185																	185
479.1	Adjust Water Valve	Ea.									2	2	4		3	3	2												16
479.2	Adjust Manhole	Ea.										2	1	1	2														6
479.3	Adjust Water Meter	Ea.											2	1		1	1												5
479.4	Relocate Water Valve	Ea.											1		2	1													4
479.5	Relocate Water Vault	Ea.											1																1
479.6	Relocate Fire Hydrant	Ea.										1	2	1	1	2	1												8
479.7	Relocate Water Meter	Ea.												2		2	2												6
479.8	Relocate / Lower 16" Water Main	L.F.									85	239	185														1		509
479.9	Relocate / Lower 12" Water Main	L.F.									25																		25
479.10	Relocate / Lower 8" Water Main	L.F.											85	90	100	105	30												410
496	Remove Exist. 10'x 4' Box Culvert & Headwalls	Lump Sum		1																									1
522	6" Concrete Curb And Gutter (As shown P/P sheet)	L.F.			117	102	30	57	6	40																			352
524	5" Concrete Driveways (3000 P.S.I.)	S.Y.	132	280		385	156	400	325																				1678
592.1	Constructing Detour A (Class 2)	Lump Sum																									1		1
592.2	Constructing Detour B (Class 2)	Lump Sum																									1		1
592.3	Constructing Detour C (Class 4)	Lump Sum																									1		1
640.1	2-2" P.V.C. Conduit (Sch. 40) (Complete In Place)	L.F.	160	410	395	420	385	370	420	85																			2645
640.2	2-3" P.V.C. Conduit (Sch. 40) (Complete In Place)	L.F.	130	90	105	75	115	130	80	90																			815
640.3	1-3" P.V.C. Conduit (Sch. 40) (Complete In PLace)	L.F.	90		270		275					40				40	40												755
640.4	Pull Box	Ea.	4	4	6	2	6	2	2	3																			29
640.5	6" P.V.C. S.D.R. 35, Sani. Sewer (4'-6' Cut)	L.F.																	190	178							30		398
640.6	12" P.V.C., S.D.R. 35, Sani. Sewer (6'-8' Cut)	L.F.																		20									20
640.7	12" Ductile Iron Sani. Sewer	L.F.																		45									45
640.8	10" P.V.C. Pipe Sani. Sewer Encasement (8'-10' Cut)	L.F.																									24		24
640.9	8" P.V.C., S.D.R. 35, Sani. Sewer, Bored, (4'-6' Cut)	L.F.																									53		53
640.10	5" P.V.C., S.D.R. 35, Sani. Sewer (4'-6' Cut)	L.F																									24		24
640.11	3" P.V.C. (Sch. 40) Conduit, Bored	L.F.										30																	30
640.12	2" Gate Valve W/ Taps	Ea.										1				1	1												3
752.1	4" Traffic Button Single Refl. P-15W	Ea.	44	52	40	52	40	48	52	12																			340
752.2	8" Traffic Button Single Refl. P-18-1W	Ea.	22	3	29	20	25	10	10	8																			127
754.1	4" Traffic Button Non-Refl. P-7-W	Ea.	220	260	200	240	200	240	260	60																			1700
580	FIELD OFFICE, TYPE A	Ea																										1	1

* Cross Section Sheets For Roadway And Drainage Ditch Provided Upon Request.

INDEX TO DRAWINGS

NO.	REVISION	BY	DATE

CITY OF ADDISON
DALLAS COUNTY, TEXAS

MIDWAY ROAD IMPROVEMENTS

SHEET INDEX & SUMMARY OF QUANTITIES

GINN, INC.
Consulting Engineers — Dallas, Texas

DESIGNED-	TABULATED-	DATE- March, 1981	SHEET 1 OF
APPROVED-	CHECKED-		

N

BELT LINE ROAD

Three G Food Corporation
1

60'

℄ Curve Data
Δ = 12°14'20"
R = 954.93'
T = 102.38'
L = 203.98'

CENTURION WAY

3

138.07'
42.56' 21.51' 116.56' R=1004.98' L=205.89' 89.33'
184.95'
95.82'

2230 Corporation
4

Drainage Esmnt.
City Of Dallas Water Esmnt.
50' 30' 100' 50' 50'
6' S.S. Esmnt.
40' R.R. And Utility Esmnt.

301.36'
94.54' R=904.93' L=193.30' 13.52'

SOUTHWESTERN R.R. Co.

Paul Lewis
1
462.99'
22.38'

60'
DRIVE

R/W
20.0'
See Plan
10.0'
R/W
TYPICAL

Houseman Prop. Inc.
1
22.34'
505.77'

City Of Addison
City Of Carrollton
5' Utility Esmnt.
15' Utility Esmnt.
22.36'
194.66'

60'
AER Mfg. Co.
22.37'
672.40'

Forney Eng.

MATCH LINE

BELT LINE

42.56' 22.15' R=904.93' 158.79' L=184.86 26.02'
180.94'
222.48'
100'
475.13'
R=1004.43' L=214.57'
12.01'

17
James S. Miller

℄ Curve Data
Δ = 11°44'20"
R = 954.93'
T = 98.17'
L = 195.65'
100'

16
North Dallas 16 Arena

ST. LOUIS & SOUTHW

463.0'
22.36'
1
Coca Cola Bottling Co.
Ⓓ

LINDBERG

10' 14.14' 10'
270.0'
10
James D. Green

120.0'
9
Maxine Barnett & Charles A. Barnett, Jr.

50.0'
9-A

260.0'
22.37'
8
Forest Way Corp.
Ⓒ

WILEY POST DRIVE

22.36'
189.01'
12
Carl L. Elsaesser

170.76'
13
Thermalloy

135.0'
14
Charles M. Pollan

145.0'
15
Carrollton Development Co.
Ⓑ

MATCH LINE

ADDISON AIRPORT INDUSTRIAL DISTRICT

John R. Immel
165.0'

E.O. Cobb
289.26'

60'

Compass Computer

℄ Curve Data
Δ = 33°17'00"
R = 940.0'
T = 280.97'
L = 546.05'

P.C. Sta. 34+23.25
632.17'

MATCH LINE

City Of Carrollton
100'
City Of Addison

2.9 3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9

135.0'
16
J.D. and Norma Sue Gresham

130.0'
17
Well Reconnaissance, Inc.

130.0'
18

125.0'
19
Mrs. Blanche F. and Raymond E. McKee

115.0'
20
Milton N. Thompson

145.0'
21
Product Engineering Inc.

WRIGHT BROS.
60'

152.42'

Ⓑ

Lewisville ESAI

City Of Addison

MIDWAY ROAD IMPROVEMENTS

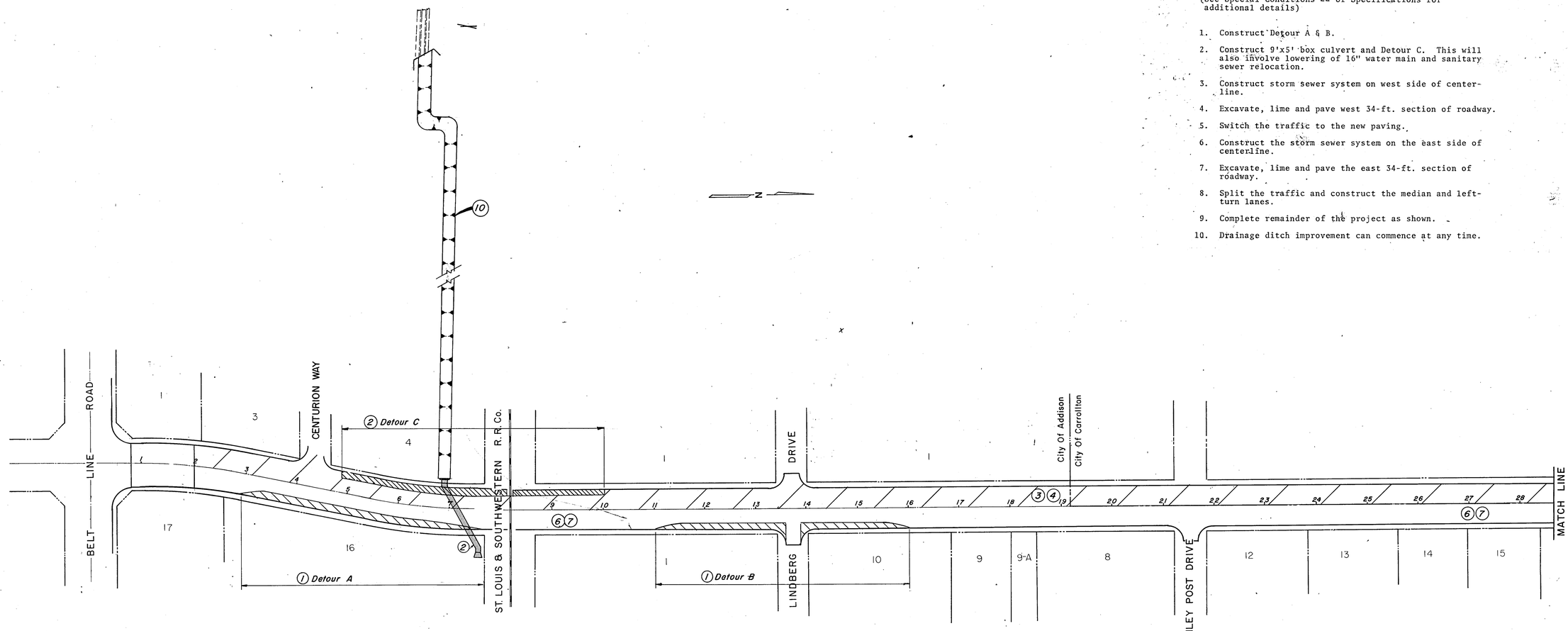
RIGHT OF WAY MAP

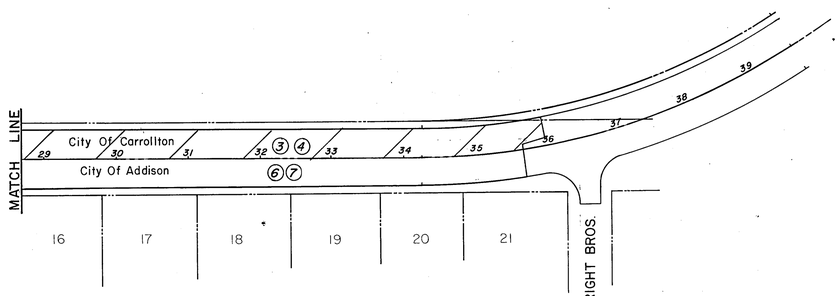
DESIGNED W.K	DRAWN R.G.B.	DATE MARCH, 1981	FILE		
APPROVED H.W.G	CHECKED A.G.F	SCALE 1" = 100'	SHEET 2 OF		

SUMMARY CONSTRUCTION SEQUENCE

(See Special Conditions 22 of Specifications for additional details)

1. Construct Detour A & B.
2. Construct 9'x5' box culvert and Detour C. This will also involve lowering of 16" water main and sanitary sewer relocation.
3. Construct storm sewer system on west side of centerline.
4. Excavate, lime and pave west 34-ft. section of roadway.
5. Switch the traffic to the new paving.
6. Construct the storm sewer system on the east side of centerline.
7. Excavate, lime and pave the east 34-ft. section of roadway.
8. Split the traffic and construct the median and left-turn lanes.
9. Complete remainder of the project as shown.
10. Drainage ditch improvement can commence at any time.





City Of Addison

MIDWAY ROAD IMPROVEMENTS

CONSTRUCTION SEQUENCE

DESIGNED H.B.J	DRAWN R.G.B.	DATE MARCH, 1981	FILE	
APPROVED H.W.G.	CHECKED A.G.F.	SCALE 1" = 100'	SHEET 3A OF	

Centurion Way

N

Estimated Quantities (Pay Item : Lump Sum)

Flexible Base : 105.79 C.Y.
2" Thk. Asphalt : 634.52 S.Y. (70 ton)

2+00 3+00 4+00 Midway Road 5+00 6+00 7+00 8+00

36'

2+81

Wtr. Vault

S.S. M.H.

S.W.B. M.H.

St. Louis & S.W. R.R

Exist. Box Culvert

A

A

36'

6+14 50' Trans. 6+91 7+16.5 95' Trans. 8+11.5

DETOUR "A"

℄

E.P. 36'
Exist. E.P. Varies (21'±)
12"
2" Typ. D Cl. A Asphalt
Exist. Asphalt
Exist. Ditch
6" Flex Base

SECTION A-A

Lindberg Dr. West

Estimated Quantities (Pay Item : Lump Sum)

Flexible Base : 124.19 C.Y.
2" Thk. Asphalt : 745.13 S.Y. (82 ton)

NOTE: Flexible base shall be reused for temporary cross-over with approval of Engineer

N

W.M.

S.W.B. M.H.

F.H

Wtr. Vault

B

B

11+00 12+00 13+00 14+00 15+00 16+00

Midway Road

40'

12"

Exist 24" R.C.P.

S.S. M.H.

F.H

Extend Exist. 24" R.C.P. 200'± As Shown, Match Exist. Ditch ℄'s

Extend Exist. 24" R.C.P. 150'± As Shown, Match Exist. ℄'s

11+00 100' Trans. 12+00 20' 20' 15+00 100' Trans. 16+00

Lindberg Dr. East

DETOUR "B"

℄

E.P. 40'±
Exist. E.P. 21'±
12"
2" Typ. D Cl. A. Asphalt
Exist. Asphalt
6" Flex Base
Select Fill
24" R.C.P.

SECTION B-B

CITY OF ADDISON

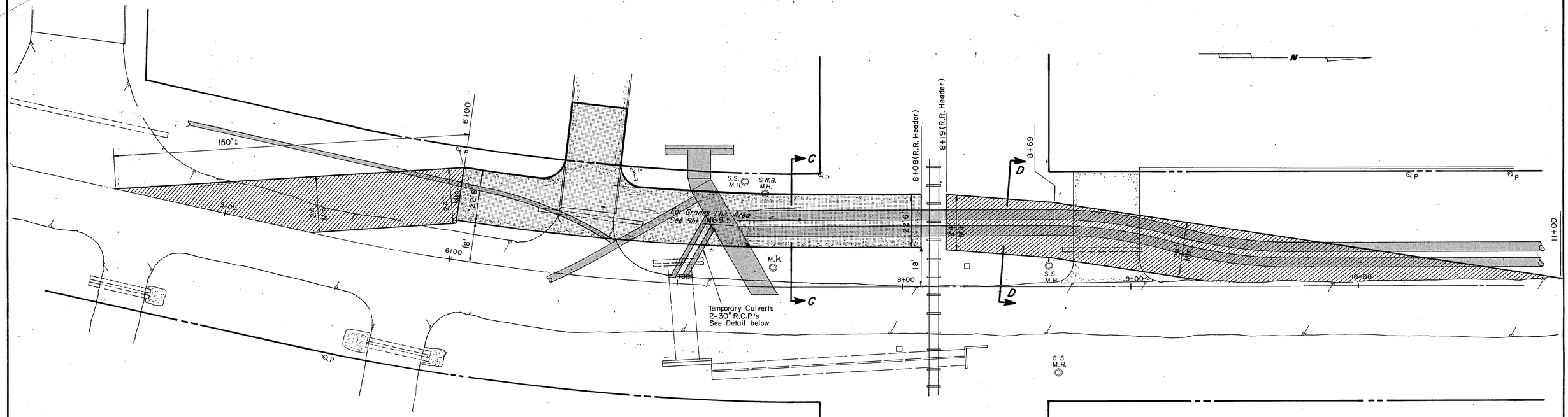
DETOURS A and B

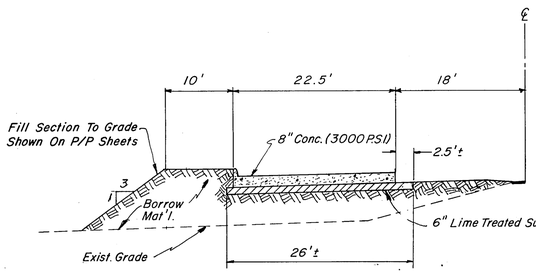
Paving Sta. Sta. 2+81± to 8+11± and 11+00 to 16+00

MIDWAY ROAD IMPROVEMENTS

GINN, INC., Consulting Engineers

DESIGNED-H.B.J	DRAWN-S.M.M.	DATE MARCH, 1981	
APPROVED-H.W.G	CHECK - C.F	SCALE 1"= 20'	SHEET 3B OF





SECTION "C-C"

DETOUR C

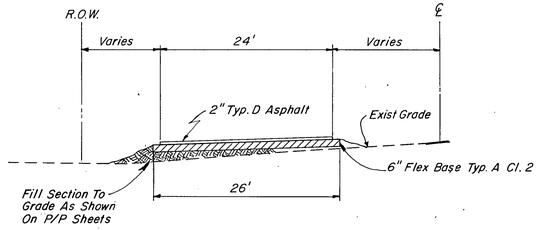
Scale: 1"=20'

Estimated Quantities

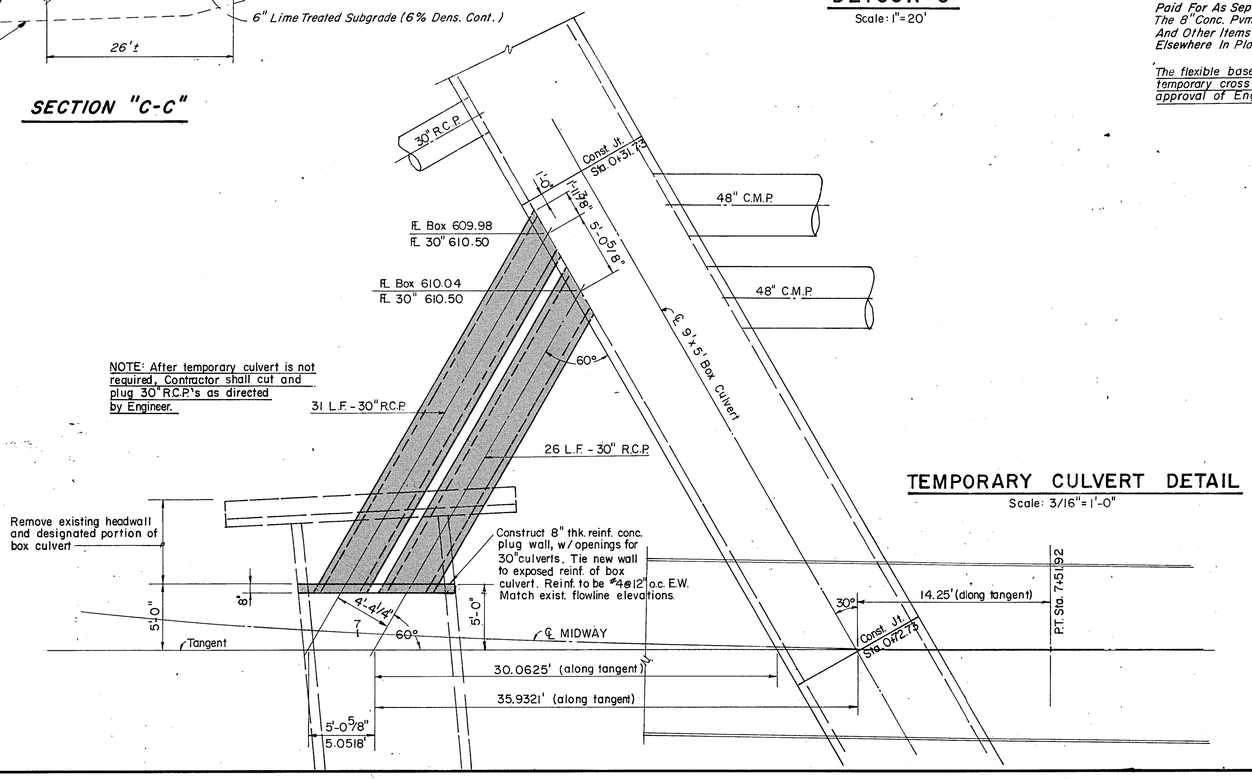
Flexible Base: 135.78 C.Y.
2" Thk. Asphalt: 814.67 S.Y. (90 tons)

NOTE: *The Flexible Base And Asphalt Will Be Paid For As Separate Items As Shown, The 8" Conc. Pvm't, Borrow, Box Culvert, And Other Items Are Shown As Pay Items Elsewhere In Plans.*

The flexible base shall be reused for temporary cross over with approval of Engineer.



SECTION "D-D"



TEMPORARY CULVERT DETAIL

Scale: 3/16"=1'-0"

CITY OF ADDISON

DETOUR C

Paving Sta. 8+50± to 11+00

MIDWAY ROAD IMPROVEMENTS

GINN, INC., Consulting Engineers

DESIGNED-H.B.J.	DRAWN-S.M.M.	DATE MARCH, 1981	
APP'D - H.W.G.	CHECK-C.F.	SCALE: 1"= 20'	SHEET 3C OF

Belt Line Road S.89°37'17"E.

Begin This Project Sta. 0+80.50

℄ Sta. 1+01.19 I.P. Set 100' Lt.

P.C. Sta. 1+01.19

℄ Sta. 1+01.19 I.P. Set 50' Lt.

Match Exist. Conc. Approach

Begin Paving This Project STA. 2+00

Exist. Conc. Parking

25'

10' R.

℄ Sta. 2+96.84 I.P. Set 100' Lt.

P.T. Sta. 2+96.84

℄ Sta. 2+96.84 I.P. Set 50' Lt.

1-10' Recessed Inlet Sta. 3+47.54 T.C. = 620.10

C.R. 3+63.04

30' R.

Pull box

℄ Centurion Way Sta. 4+28.20 (41' Concrete Pvmt.)

Existing 12"

Bldg.

B.M. #2

618.46 617.96

617.79 617.29

Saw & Remove Conc. 81.65' Lt. ℄ Pay Item 104.18.1042

Existing Parking Area

40' R.

C.R. 4+74.17

STA. 5+00

618.23 617.73

619.06 618.56

15" R.C.P.

617.52 617.02

Remove

Pull box 5+00

Sta. 52+44.36 Belt Line Rd. = Sta. 0+00 Midway Road

N 0°16'13" E

90° 06' 30"

Median curbs constructed this project

Conc. Cap

MIDWAY ROAD

P.I. 1+99.36

2+00

3+00

4+00

101° 00' 30"

N 12° 00' 33" E

2-3" P.V.C.

1-3" P.V.C.

3+46

3+98

3+70

619.79 619.29

34' b-b

44' b-b

1-3" P.V.C.

2-2" P.V.C. (By others)

Concrete pavement by others

1-10' Recessed Inlet Sta. 2+25.70 T.C. = 624.11

2+46.5

Varies

X-Section Begin Typical

1+00

1¼" Fl.

1¼" Fl.

W.V.

16"

Existing 8"

Existing 6"

Existing 16"

Existing 12"

10' R.

2-12" R.C.P.

Existing Conc. Drive

Saw & Remove Conc. 57' Rt ℄

Saw & Remove Conc. 61' Rt. ℄

Telephone Comp. Vault

Traffic Signal Control Box

Yoplait's Domestic Water

18" R.C.P.

℄ Sta. 1+01.19 I.P. Set 50' Rt.

℄ Sta. 2+96.84 I.P. Set 50' Rt.

℄ Sta. 2+96.84 I.P. Set 100' Rt.

℄ Sta. 1+01.19 Conc. Nail Set 100' Rt.

Pull box

Water Vault

1-10' Recessed Inlet Sta. 4+12.00 T.C. = 619.97

28.0'

17.5'

2-18" R.C.P.

19.91'

Exist. 60' Asphalt Dr.

Temporary Access

4+84

4+55 ℄ Driveway

CR 4+27.5

C.R. 4+82.50

10

5

Extend Driveway Approach With 5" Typ. D Asphalt 10'x45'

MATCH LINE

B.M. #1 ■ On N.W. Corner Parking To Gulf Gas Station at S.W. Corner Inter. Belt Line & Midway Rd. Elev. 624.32

B.M. #2 ■ On S.E. Corner Of Conc. Walk To Bldg. At 15101 Midway Rd. Elev. 614.84

℄ CURVE DATA

Δ= 11°44' 20"
R= 954.93'
T= 98.17'
L= 195.65'

BY OTHERS | THIS PROJECT

Prop. West T.C.

Existing Elev. West R.O.W.

Proposed West Median T.C.

Proposed East Median T.C.

Proposed East T.C.

Existing Elev. East R.O.W.

Typ. Section See Detail Sh. 12

Typ. Section

-0.95%
-2.63%
-2.00%
-0.91%
2.20%
-2.00%
-0.86%
-2.27%
-2.00%
-1.77%
-2.56%
-2.00%

P.V.I. 1+50
P.V.I. 3+00 NO V.C.
P.V.C. 1+00
P.V.T. 2+00
P.V.C. 4+75
100' V.C. m=-0.21
100' V.C. m=-0.16
100' V.C. m=-0.17
150' V.C.
15.0' V.C.

625.66 625.47 624.79 622.37 621.05 620.05 619.05 618.05 617.55 (617.05) 617.13
626.34 626.16 625.55 623.5 622.41 621.41 620.4 619.41 618.91 (618.41) 618.47
626.60 626.43 625.83 623.79 622.68 621.68 620.68 619.68 619.18 (618.68) 618.74
626.93 626.05 624.77 623.49 622.21 621.21 620.21 619.21 618.71 (618.21) 618.28

STA. 0+80.5 | STA. 0+80.5 627.28

0+00 | 1+00 | 2+00 | 3+00 | 4+00 | 5+00

625 | 620 | 615 | 610

CITY OF ADDISON

PAVING

Paving Sta. 0+00 to Sta. 5+00

MIDWAY ROAD IMPROVEMENTS

GINN, INC., Consulting Engineers

DESIGNED- H.B.J.	DRAWN-SM-G.F.	DATE- March, 1981	FILE
APPROVED- HWG	CHECKED- H.B.J.	SCALE- 1"= 20'H, 1"= 5' V	SHEET 4 OF

℄ CURVE DATA
Δ = 12°14'20"
R = 954.93'
T = 102.38'
L = 203.98'

STA. 5+00

MATCH LINE

℄ Sta. 5+47.94
P.K. Nail Set 100' Lt.

℄ Sta. 5+47.94
I.P. Set 50' Lt.

P.C. Sta. 5+47.94

Existing Parking Area

1-10' Recessed Inlet
Sta. 5+58
T.C. = 616.72

100'

44' b-b

34' b-b

N 12°00'33" E

5+48

6+48

End Conc. Cap

6+00

7+00

2-2" PVC

1-10' Recessed Inlet
Sta. 5+65
T.C. = 617.77

P.I. 6+50.32

18" R.C.P.

10'

5'

C.R. 5+80.5

C.R. 6+25.5

℄ Sta. 5+47.94
I.P. Set 50' Rt.

℄ Sta. 5+47.94
P.K. Nail Set 100' Rt.

Remove

Remove existing culvert and headwall

Existing 4'x10' Box Culvert

Extend Conc. Dr. Approach 55' Rt. ℄ (5'x25')

Saw & Replace Conc. Dr. 75' Lt. ℄ Pay Items 104.1 and 104.2

Remove 2-31'x16' C.M.P.

Existing 25' Conc. Drive

Exist. 18" Conc. C&G.

HMAC

Tele. M.H.

Vault

℄ Sta. 7+51.92
I.P. Set 100' Lt.

℄ Sta. 7+51.92
I.P. Set 50' Lt.

P.T. Sta. 7+51.92

50' Drainage Easement

30' Dallas Water Esm't.

50'

50'

SS

W

G

T

P

MH

Tele. M.H.

2-3" PVC

Relocate Sani. Swr. & M.H. See sht. 23

Exist. Gas 6"

Exist. 16" Water

MIDWAY ROAD

S.S.

M.H.

N 0°13'47" W

8+00

Cont. Box 2'x6'0"

8+00
6.5° R.

8+28
6.5° R.

P.I. Sta. 8+13.84

Concrete R.R. Header 8+08.34

Concrete R.R. Header 8+19.34

27" R.C.P.

C.O.

Petroleum Pipeline Warning Sign

Existing 2-40" C.G.M.P.

5"

℄ Sta. 7+51.92
I.P. Set 50' Rt.

℄ Sta. 7+51.92
I.P. Set 100' Rt.

City of Dallas Existing 60" Water Main

7.5'

℄ Sta. 8+13.84
P.K. Nail Set 100' Lt.

℄ Sta. 8+13.84
I.P. Set 50' Lt.

℄ Sta. 8+13.84
I.P. Set 50' Rt.

℄ Sta. 8+13.84
P.K. Nail Set 100' Rt.

R.R. "X"ing Signal

Underground Petroleum Pipeline

25'±

30'±

Bldg.

B.M. #3

℄ Sta. 10+00
Conc. Nail Set 100' Lt.

Saw & Replace / Pay Items Conc. 70' Lt. ℄ / 104.1 & 104.2

45'

SAW

30'

N.S. 16.75'

6" Dowel curb Pay Item 360.3

℄ Sta. 10+00
I.P. Set 50' Lt.

Petroleum Pipeline Warning Sign

R.R. P.B.

Existing 29' Conc. Drive

Relocate F.H.

89°53'00"

Exist. 10" Sani.

9+00

179°13'01"

NO°33'12" E

Pull Box 6'x10'

2-10' Recessed Inlet
Sta. 9+65
T.C. = 618.91

Existing 10"

℄ Sta. 10+00
I.P. Set 50' Rt.

6' Chain Link w/3 Strand Barbed Wire

℄ Sta. 10+00
I.P. Set 65' Rt.

STA. 10+00

MATCH LINE

B.M. #3 ■ On Conc. Walk At S.E. Corner Of Bldg. At 15201 Midway Rd. Elev. 618.14

620
615
610
615
620
615

Typ. Section See Detail Sht. 12

150' V.C. m = 0.68
P.V.I. 5+50
5+57.64
L.P. 616.72
P.V.C. 7+00
P.V.T. 6+25
100' V.C. m = 0.17
P.V.I. 8+00
P.V.I. 8+50 No V.C.
100' V.C. m = 0.23
P.V.C. 9+50
P.V.I. 10+00

+2.0%
+1.63%
+0.3%
Prop. West T.C.
Top rail 618.97
Existing Elev. West R.O.W.
-1.15%
-0.36%
Proposed West Median T.C.
-2.0%
+1.03%
+0.3%
150' V.C. m = 0.57
P.V.I. 5+50
P.V.I. 6+25
P.V.I. 7+50 No V.C.
P.V.I. 8+50 No V.C.
P.V.C. 9+50
P.V.I. 10+00
100' V.C. m = 0.13
-2.0%
+0.93%
+0.3%
Proposed East Median T.C.
-0.22%
5+68.75
150' V.C. m = 0.55
Existing Elev. East R.O.W.
Proposed East T.C.
+0.50%
+0.3%
Top rail 619.87
-2.0%
+1.20%
32%
+0.7%
Typ. Section
150' V.C. m = 0.60
P.V.I. 5+50
P.V.T. 6+25
P.V.I. 7+50 No V.C.
P.V.I. 8+00 No V.C.
P.V.C.
100' V.C. m = 0.20
P.V.T. 9+00
P.V.I. 9+50
L.P. 618.91
P.V.T. 10+00

5+00
6+00
7+00
8+00
9+00
10+00

CITY OF ADDISON

PAVING

Paving Sta. 5+00 to Sta. 10+00

MIDWAY ROAD IMPROVEMENTS

GINN, INC., Consulting Engineers

DESIGNED- H.B.J	DRAWN- S.M. R.B.	DATE- MARCH, 1981	FILE	
APPROVED- H.W.G	CHECKED- H.B.J	SCALE- 1"=20'H, 1"=5'V	SHEET 5 OF	

℄ Sta. 10+00
I.P. Set 100' Lt.

2-10' Recessed Inlet
Sta. 10+12
T.C.=618.09

℄ Sta. 10+00
I.P. Set 50' Lt.

FOR DETAIL OF WATER VAULT
RELOCATION, SEE SHT. 17

Water Meters

Water Vault (RELOCATE)

STA. 10+00

STA. 15+00

Exist. Telephone

Exist. 16"

2-2" PVC

End Conc. Cap

MIDWAY ROAD

N. 0°33'12"E.

34' b-b.

44' b-b.

100'

111+24

10+24.5

MATCH LINE

℄ Sta. 10+00
I.P. Set 50' Rt.

℄ Sta. 10+00
Conc. Nail Set 65' Rt.

1.5 Story Bldg.

1-10' Std. Inlet
T.C. = 622.11

Saw & Remove Conc. & Replace 6" Dowel Curb, Pay Item 104.1, 104.2 & 360.3

C.R. 13+14.4

45° b-b

Lindberg Drive
℄ Sta. 13+66.90
41' b-b

Joint

8" Gas

Saw & Remove Conc. 70.5' Lt. ℄ Pay Item 104.1 & 104.2

Relocate F.H. See Det. Sht. 12

1-10' Recessed Inlet
Sta. 14+34.9
T.C.= 620.51

℄ Sta. 15+00
Conc. Nail Set 90' Lt.

℄ Sta. 15+00
I.P. Set 50' Lt.

C.R. 14+19.4

1-3" PVC

N. 89°19'48" W.

Bldg.

B.M. #4

620.03 619.93

620.15 619.65

620.33 619.83

620.45 619.95

Gas Valve

24" R.C.P.

89°53'00"

Conc. Cap

2-2" PVC

90°00'55"

Proposed Tele. P.B.

C.R. 13+13.7

13+24

14+00

14+11

Pull Box 14+20

1-10' Recessed Inlet
Sta. 14+34.20
T.C.= 621.67

621.18 620.68

621.30 620.80

621.48 620.98

621.60 621.10

24" C.G.M.P.

Relocate F.H. See Det. Sht. 12

C.R. 14+18.7

Saw & Remove Conc. 51' Rt. ℄ Pay Item 104.1 & 104.2

4" Conc. riprap Pay Item 432.2

℄ Sta. 15+00
Conc. Nail Set 50' Rt.

℄ Sta. 15+00
Conc. Nail Set 75' Rt.

S. 89°25'53" E.

Lindberg Drive
℄ Sta. 13+66.20
Conc. Pavement
31' b-b

45' b-b.

622.03 621.53

622.22 621.72

621.93 621.43

3' Walk

6" Conc. C&G Pay Item 522

1-10' Std. Inlet
T.C. = 622.00

622.09 621.59

UNIVERSAL PL.BG.

Saw & Remove Conc. 70.5 Rt. ℄ Pay Item 104.1, 104.2

1'-6" Typ.

Temp. Asph. Curb

Saw & Remove C&G Pay Item 104.1 & 1043

℄ E.G. 1.98

B.M. #4 ■ On Conc. Walk At S.E. Corner Of Bldg At 15301 Midway Rd. Elev. 621.43

Exist. Concrete Parking Lot

Select top soil material, grade to drain.

8" Conc. Street

10.5'

SECTION B-B

4" Concrete Riprap w/ 6x6 x 10/10 Mesh, Pay Item 432.2

6" Conc. Curb and Gutter tied to existing conc. paving w/ #3 @ 24 o.c., Pay Item 522

8" Conc. Street

#3 @ 24"

24"

3'

12"

9'-0"

SECTION A-A

625
620
615
610

Typ. Section See Detail, Sh. 12

L.P. 10+12.15
618.09

+0.7%

Proposed T.C.

Existing Elev. West R.O.W.

+0.4%

618.57
618.92
619.27
619.62
620.17
620.37
620.57

P.V.I. 10+00
(617.87)
618.10

P.V.T. 10+50
618.22

100' V.C.
m= 0.23

+0.7%

P.V.I. 10+00
(619.23)
619.36

P.V.T. 10+50
619.58

100' V.C.
m= 0.13

+0.7%

P.V.I. 10+00
619.50
No V.C.

P.V.T. 10+50
619.85

P.V.I. 13+00
619.97
No V.C.

P.V.I. 14+50
620.57

100' V.C.
m= 22

P.V.I. 15+00
(620.77)
620.99

Typ. Section

P.V.T. 10+00
619.03

619.38
619.73
620.08
620.43
620.78
621.13
621.53
621.73

Existing Elev. East R.O.W.

+0.4%

Proposed T.C.

P.V.I. 13+00
621.13
No V.C.

100' V.C.
m= 0.22

P.V.I. 15+00
(621.93)
622.15

10+00
11+00
12+00
13+00
14+00
15+00

CITY OF ADDISON

PAVING

Paving Sta. 10+00 to Sta. 15+00

MIDWAY ROAD IMPROVEMENTS

GINN, INC., Consulting Engineers

DESIGNED- HBJ	DRAWN- SM.- G.F.	DATE- MARCH, 1981	FILE
APPROVED- HWG	CHECKED- HBJ	SCALE- 1"= 20' H, 1"= 5' V	SHEET 6 OF

Hail Lawn Sprinkler

Houseman Properties 3309 Lee Pkwy Suite 210 Dallas, TX 75219 522-6050

15315 Computer Dist.

Bldg.

B.M. #5

℄ Drive 18+80

℄ Sta. Drive 19.50

Saw 1' & G

City Of Addison

City Of Carrollton

℄ Sta. 15+00 Conc. Nail Set 90' Lt.

℄ Sta. 15+00 I.P. Set 50' Lt.

℄ Sta. 15+00 I.P. Set 50' Rt.

℄ Sta. 15+00 I.P. Set 75' Rt.

STA. 15+00

MATCH LINE

Existing 16"

Saw 1'c. Joint 24.46'

Match Exist. Grade

Saw 1'c.

Existing 24' Conc. Drive

6" Dowel curb 45.5 LF Pay Item 360.3

TEMPORARY CROSSING

17+10.50

17+56

30" R.C.P.

MIDWAY ROAD

N 0°33'12" E

Conc. Cap

2-2" PVC

2-3" P.V.C.

Pull Box 17+50

Pull Box 18+25

18+54.5

Conc. Cap

2-2" PVC

19+54

44' b.-b.

34' b.-b.

3'

6"

16+11

Exist. 6" Conc. Retaining Wall

Existing 10"

Existing 8"

18" C.G.M.P.

CR 16+27.5

CR 16+72.5

CR 17+27.5

CR 17+58.5

24" R.C.P.

CR 18+18

CR 18+27.5

CR 18+77.5

CR 19+12

CR 19+62

CR 19+73

Temp. Access

Saw & Remove Conc. 5' Rt. ℄

Saw & Remove Conc. 55' Rt. ℄

6" Curb - 4" Riprap See Detail A-A Sht. 6

Replace 6" C. & G. Pay Item 522 & 1043

I-10' Recessed Inlet Sta. 16+06.5 T.C. = 624.21

I-10' Recessed Inlet Sta. 17+43 T.C. = 626.68

I-10' Recessed Inlet Sta. 18+93 T.C. = 628.33

Existing Asphalt

Extend Dr. Approach With 5" Typ. D Asphalt (5'x35')

Extend Dr. Approach With 5" Typ. D Asphalt (3'x39.5')

Extend Dr. Approach With 5" Typ. D Asphalt (5'x30')

Extend Dr. Approach With 5" Typ. D Asphalt (3'x30')

Extend Dr. Approach With 5" Typ. D Asphalt (3'x40')

Saw 40' Back

Relocate F.H.

Match Exist Grade

No Saw

Existing 36" Conc. Dr.

M.H.

Gas Valve

℄ Sta. 20+00 I.P. Set 50' Lt.

℄ Sta. 20+00 P.K. Nail Set 50' Rt.

℄ Sta. 20+00 P.K. Nail Set 100' Rt.

STA. 20+00

MATCH LINE

Existing 1.5 Story Building

JONES

Existing Building

B.M. #5 ■ On Conc. Walk At N.E. Corner Of Bldg. At 15321 Midway Rd. Elev. 625.55

13'

6.5' 6.5'

Exist. Pvmt.

8" Conc.

2" ASPHALT

6" FLEXIBLE BASE

6" Lime Stabilization

SECTION A-A

DETAIL - TEMPORARY CROSSING

NOTE: Salvaged flexible base mat'l. shall be used with approval of Engineer.

Existing Elev. West R.O.W.

Proposed T.C.

Existing Elev. East R.O.W.

Proposed T.C.

+2.14%

+1.10%

P.V.I. 15+00 <620.77> 620.99

P.V.T. 15+50 621.84

100' V.C. m=0.22

P.V.C. 16+50 623.98

P.V.I. 17+00 <625.05> 624.92

P.V.T. 17+50 625.60

100' V.C. m=0.13

P.V.I. 20+00 628.35 No V.C.

622.91

624.07

626.15

626.70

627.25

629.80

P.V.I. 15+00 <621.93> 622.15

P.V.T. 16+50 623.00

P.V.C. 16+50 625.14

P.V.I. 17+00 <626.21> 626.08

P.V.T. 17+50 626.76

P.V.I. 20+00 629.51 No V.C.

627.31

627.86

628.41

628.96

630

625

620

615

15+00 16+00 17+00 18+00 19+00 20+00

CITY OF ADDISON

PAVING

Paving Sta. 15+00 to Sta. 20+00

MIDWAY ROAD IMPROVEMENTS

GINN, INC., Consulting Engineers

DESIGNED - H.B.J.	DRAWN - SM-GF	DATE - MARCH, 1981	FILE
APPROVED - HWG	CHECKED - HBJ	SCALE - 1"=20' H, 1"=5' V	SHEET 7 OF

Saw & Remove Conc. 70.5' Lt. ℄ Pay Item 104.1 & 104.2
℄ Willey Post Road Sta. 21+46.20 Existing Conc. 41' b.b.
Relocate F.H. See Det. Sht. 12
I-10' Recessed Inlet Sta. 22+12.46 T.C.= 629.90
FORNEY ENG.
℄ Sta. 25+00 I.P. Set 100' Lt.
℄ Sta. 25+00 I.P. Set 50' Lt.
STA. 20+00
STA. 25+00
℄ Sta. 20+00 I.P. Set 50' Lt.
Exist. Lamp Post
B.M. #6
3' Conc. Flume
Elv. 629.10
I-10' Recessed Inlet Sta. 20+05.5 T.C.= 628.39 See Sht. 34
2-2" P.V.C.
Pull box 20+90
MIDWAY ROAD
N 0°33'12" E
N. 89°28'48" W.
S. 89°28'48" E.
2-3" P.V.C.
89°58'00"
Pull box 22+05
2-2" P.V.C.
End Conc. Cap
SEE DETAIL SHEET 7
30 L.F.
6" Doweled on Curb Pay Item 360.3
Temporary X-ing
44' b.-b.
34' b.-b.
100'
18" R.C.P.
24" R.C.P.
21" R.C.P.
MATCH LINE
℄ Sta. 20+00 P.K. Nail Set 50' Rt.
Extend Dr. Approach With 5" Typ. D Asphalt (5'x25')
Sign Posts
Pull box
1-3" P.V.C.
6' High Chain Link Fence w/ 3 Strand Barbed Wire
I-10' Recessed Inlet Sta. 22+17.04 T.C.= 631.10
I-10' Recessed Inlet Sta. 23+93.5 T.C.= 632.81
Saw & Remove Conc. 60' Rt. ℄
Temporary Access
Existing Conc. Drive
℄ Sta. 25+00 I.P. Set 50' Lt.
℄ Sta. 25+00 P.K. Nail Set 80' Rt.
Saw and remove Conc. 80.5' Rt. ℄ Pay Item 104.1 & 104.2
Existing Asphalt
℄ Sta. 20+00 P.K. Nail Set 50' Rt.
I-10' Std. Inlet T.C.=631.09
I-10' Std. Inlet T.C.= 631.35
℄ Existing Conc. 31' b.-b.
Saw & Remove Curb and gutter Pay Item 104.1 & 104.3
MR. SHAW 358-3101
SEE TYP. SECTION SHEET 12
Existing Building
B.M. #7
B.M. #6 On Conc. Base To Lamp Post At S.W. Corner Of Inter. Wiley Post Rd & Midway Rd. Elev. 631.34
B.M. #7 On Bottom Step To Loading Dock At 15502 Midway Rd. Elev. 636.05
Proposed West T.C.
Existing Elev. West R.O.W.
+0.65%
+0.80%
+1.12%
628.35
628.88
629.00
629.40
629.80
630.20
630.60
631.16
631.72
632.28
632.84
P.V.I. 20+00 NO V.C.
P.V.I. 21+00 NO V.C.
P.V.I. 23+00 NO V.C.
Proposed East T.C.
Existing Elev. East R.O.W.
629.51
629.84
630.6
630.56
630.96
631.36
631.76
632.32
632.88
633.44
634.00
635
630
625
620
20+00
21+00
22+00
23+00
24+00
25+00

CITY OF ADDISON

PAVING

Paving Sta. 20+00 to Sta. 25+00

MIDWAY ROAD IMPROVEMENTS

GINN, INC., Consulting Engineers

DESIGNED- HBJ	DRAWN- SM GF	DATE- March, 1981	FILE
APPROVED- HWG	CHECKED- HBJ	SCALE- 1"=20'H, 1"=5'V	SHEET 8 OF


FORNEY ENG.
27+86.5
℄ Sta. 25+00 I.P. Set 100' Lt.
℄ Sta. 25+00 I.P. Set 50' Lt.
℄ Sta. 25+00 I.P. Set 50' Rt.
℄ Sta. 25+00 P.K. Nail Set 80'
℄ Sta. 30+00 I.P. Set 100' Lt.
℄ Sta. 30+00 I.P. Set 50' Lt.
℄ Sta. 30+00 P.K. Nail Set 50' Rt.
℄ Sta. 30+00 P.K. Nail Set 100' Rt.
STA. 25+00
STA. 30+00
MATCH LINE
1'-6"
Replace 6" C.& G. Pay Item 522 & 104.3
Extend Driveway with 5" Type D Asphalt Pay Item 340.1
Exist. Asphalt Drive 25' b-b
Exist. Curb To Be Sawed & Removed
50' Transition
1-10' Recessed Inlet Sta. 27+62.5 T.C.= 635.78
C.R. 27+78
C.R. 28+53
C.R. 28+89
C.R. 29+44
C.R. 29+59
Water Vault
Extend Conc. Approach With 5" Typ. D Asphalt (5'x35')
Temp. Access
Exist. Gravel Drive
Exist. Gravel Dr.
6" Dowel curb, 130.5 L.F., Pay Item 360.3
34' b.-b.
13'
44'
End Conc. Cap
MIDWAY ROAD
Pull Box 27+60.5
27+00
N 0°33'12" E
28+00
29+00
26+00
2-2" PVC
2-3" PVC
A See sht. 7
TEMPORARY CROSSING
Gas Regulator
W.M. Relocate
15" R.C.P.
12" R.C.P.
Conc. Cap
Pull Box 28+80
28+73.5
29+33.5
26+00.5
Relocate F.H.
Temp. Access
Gas meter
Extend Dr. Approach/W 5" Typ. D Asphalt (5'x25')
Extend Dr. Approach/W 5" Typ. D Asphalt (5'x25')
C.R. 25+51.5
C.R. 25+96.5
C.R. 26+30
C.R. 26+75
C.R. 26+80
C.R. 27+30
C.R. 27+65
C.R. 28+20
C.R. 28+75
C.R. 29+53
1-6' Std. Inlet (Mod.) Sta. 26+84 Top=636.24
1-10' Recessed Inlet Sta. 26+14.5 T.C.=635.28
1-10' Recessed Inlet Sta. 27+47.50 T.C.= 636.77
1-10' Recessed Inlet Sta. 29+37.5 T.C.= 640.25
Remove C. & G. Pay Item 104.3, 522
Extend Dr. Approach With 5" Typ. D Asphalt (10'x45')
Extend Dr. Approach With 5" Typ. D Asphalt (3'x35')
Extend Dr. Approach With 5" Typ. D Asphalt (10'x35')
Extend Dr. Approach With 5" Typ. D Asphalt (3'x20')
Saw & Remove Asphalt 50' Rt. ℄
Asphalt Parking
Exist. Asphalt Ramp UP
Exist. Bldg.
B.M. #8
Exist. Asphalt Dr.
10" Pine
C+G 8.7LF
3' Wood Fence
8" Wood Imitation Well
QUALITY FENCE CO. 15504
CITATION AUTO 15508
EDUCATIONAL TOURS 15510
STA. 29+75
B.M. #8 On Bottom Step To Bldg. At 15508 Midway Rd. Elev. 638.57
Proposed West T.C.
+1.12%
Existing Elev. West R.O.W.
+2.10%
632.84
633.40
633.96
634.52
635.08
635.64
636.20
637.25
638.30
639.35
640.40
P.V.I. 28+00 NO V.C.
P.V.I. 30+00 NO V.C.
Proposed East T.C.
Existing Elev. East R.O.W.
634.00
634.56
635.12
635.68
636.24
636.80
637.36
638.41
639.46
640.51
641.56
640
635
630
25+00
26+00
27+00
28+00
29+00
30+00

CITY OF ADDISON

PAVING

Paving Sta. 25+00 to Sta. 30+00

MIDWAY ROAD IMPROVEMENTS

GINN, INC., Consulting Engineers

DESIGNED- HBJ	DRAWN- SM GF	DATE- MARCH, 1981	FILE
APPROVED- HWG	CHECKED- HBJ	SCALE- 1"=20' H, 1"=5' V	SHEET 9 OF

℄ Curve Data
Δ = 33°17'00"
R = 940.0'
T = 280.97'
L = 546.05'

℄ Sta. 30+00 I.P. Set 100' Lt.
℄ Sta. 30+00 I.P. Set 50' Lt.
℄ Sta. 30+00 I.P. Set 50' Rt.
℄ Sta. 30+00 I.P. Set 100' Rt.
℄ Sta. 35+00 I.P. Set 100' Lt.
℄ Sta. 35+00 I.P. Set 50' Lt.
℄ Sta. 35+00 I.P. Set 50' Rt.
℄ Sta. 35+00 I.P. Set 100' Rt.

STA. 30+00
STA. 35+00
MATCH LINE
MATCH LINE

B.M. #9
Bldg.
GLIDDEN PAINT
GEARHART IND. 15660
MINNOLAB INC. 15610

1-10' Recessed Inlet (Mod.) Sta. 30+40 T.C. = 640.93 (See Sht. 34)
Elv. 640.51
Saw and remove conc.
6" Dowel curb, 30 L.F. Pay Item 360.3
Match Grade
Temp. Access
Conc. Pump (Remove)
Existing 35' Conc. Drive
18" R.C.P.
6" Dowel curb, 54 L.F. Pay Item 360.3
2-2" PVC
Pull Box 30+75
TEMPORARY CROSSING
2-3" PVC
Pull Box 31+55
34' b.-b.
TEMPORARY CROSSING See sht. 7
MIDWAY ROAD
N 0° 33' 12" E
End Conc. Cap
Existing 12" W
Existing 8" W
Existing 30" Curb & Gutter
Existing Asphalt
Existing 4'x6' Conc.
12" R.C.P.
24" R.C.P.
Existing Asphalt Drive
1-Conc. Curb
Existing Conc. ROAD DIN
Existing Building
1-10' Recessed Inlet Sta. 31+15 T.C. = 643.08
Remove and replace Curb & gutter, Pay Item 104.3, 522
Extend Dr. Approach With 5" Typ. D Asphalt (3'x10')
Extend Dr. Approach With 5" Typ. D Asphalt (3'x20')
Extend Dr. Approach With 5" Typ. D Asphalt (3'x25')
Extend Dr. Approach With 5" Typ. D Asphalt (5'x30')
Saw & Replace Conc. 30.2x4' 6x25.8'
1-Std. Double Grate Inlet Top = 423.29
46.6' DEEP EXIST. CONST. JT. 34.9'
W Vault
Existing 15' Asph. Drive
6" Dowel curb, 96.6 L.F. Pay Item 18" R.C.P. 360.3
End Conc. Cap
1-10' Recessed Inlet Sta. 35+00 T.C. = 645.28
C.R. 30+14
C.R. 30+85
C.R. 31+40
C.R. 32+10
C.R. 32+85
C.R. 33+74
C.R. 34+29
C.R. 33+65
C.R. 34+15
C.R. 34+60
P.C. Sta. 34+23.25
34+99.5
Existing Asphalt
Temp. Access
W.M.
F.H.
W.V.
Elv. 640.51
30+27
30+81
31+00
31+44
31+55
32+04
32+00
33+03.5
33+00
34+00
34+100
2-2" PVC
2-3" PVC
2-2" PVC

Typ. Section See Detail, Sh. 12
Typ. Section
Existing Elev. West R.O.W.
Existing Elev. East R.O.W.
+1.32%
+1.13%
+0.98%
+0.72%
+1.0%
-0.4%
P.V.I. 30+00 NO V.C. 640.40
641.06
641.72
642.38
643.04
643.70
644.36
P.V.C. 33+50 645.02
P.V.I. 34+00 645.68 645.46
100' V.C. m = 0.22
P.V.T. 34+50 645.48
P.V.I. 35+00 645.28 No V.C.
644.40
644.96
645.53
P.V.C. 33+50 646.09
P.V.I. 646.65 646.46
100' V.C. m = 0.19
P.V.T. 646.45
P.V.I. 35+00 646.25 No V.C.
644.67
645.16
645.65
P.V.C. 33+50 646.14
P.V.I. 646.63 646.46
100' V.C. m = 0.17
P.V.T. 646.43
646.23
641.16
642.22
642.88
643.54
644.20 NO V.C.
644.92 NO V.C.
644.57
P.V.I. 33+00
P.V.C. 33+50 645.42
P.V.I. 34+00 645.92 645.74
100' V.C. m = 0.18
P.V.T. 34+50 645.72
645.52
30+00
31+00
32+00
33+00
34+00
35+00
650
645
640

B.M. # 9 ■ On Conc. Pavement At S.E. Corner Of Bldg. At 15635 Midway Rd. Elev. 642.61

CITY OF ADDISON

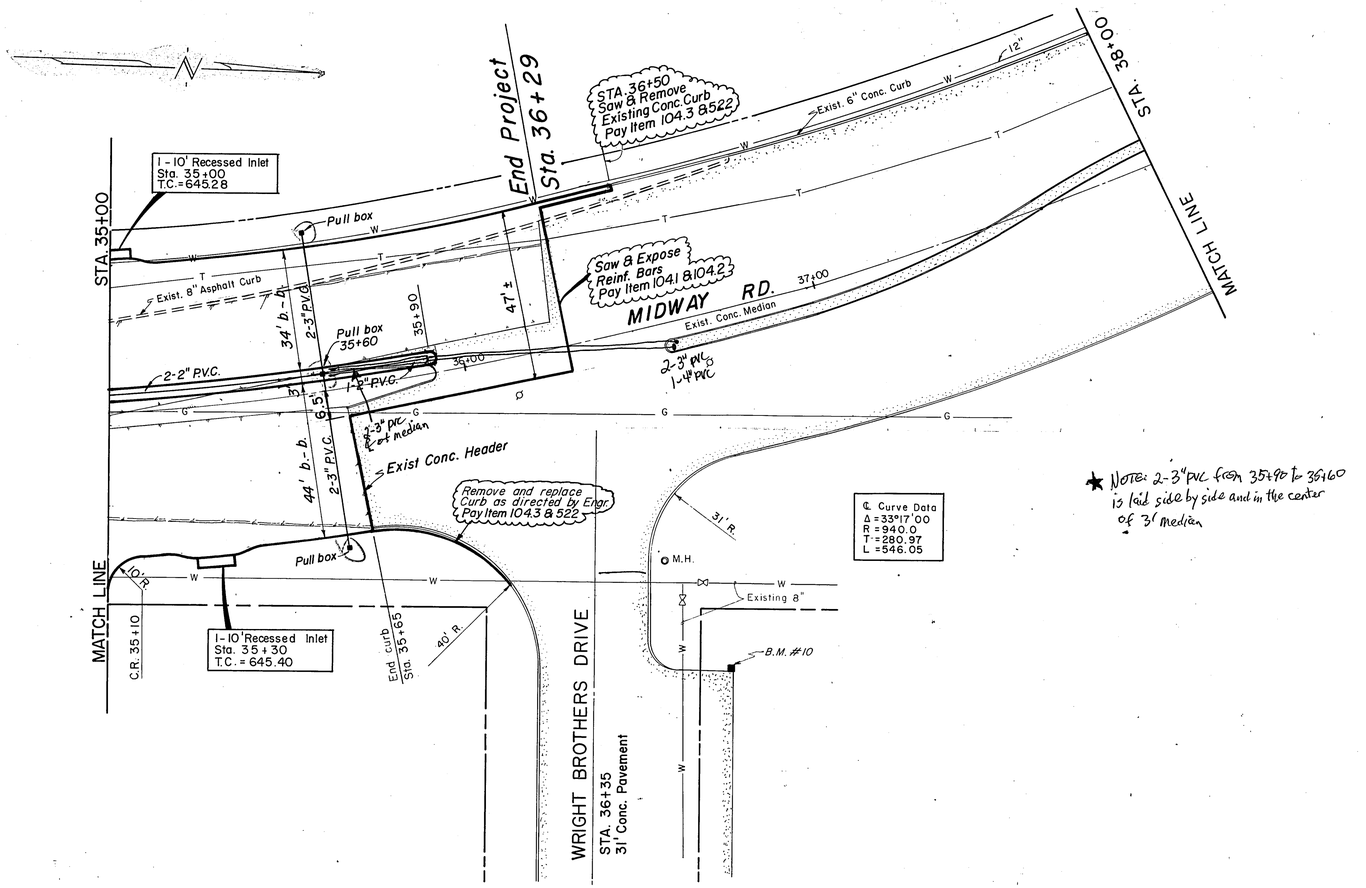
PAVING

Paving Sta. 30+00 to Sta. 35+00

MIDWAY ROAD IMPROVEMENTS

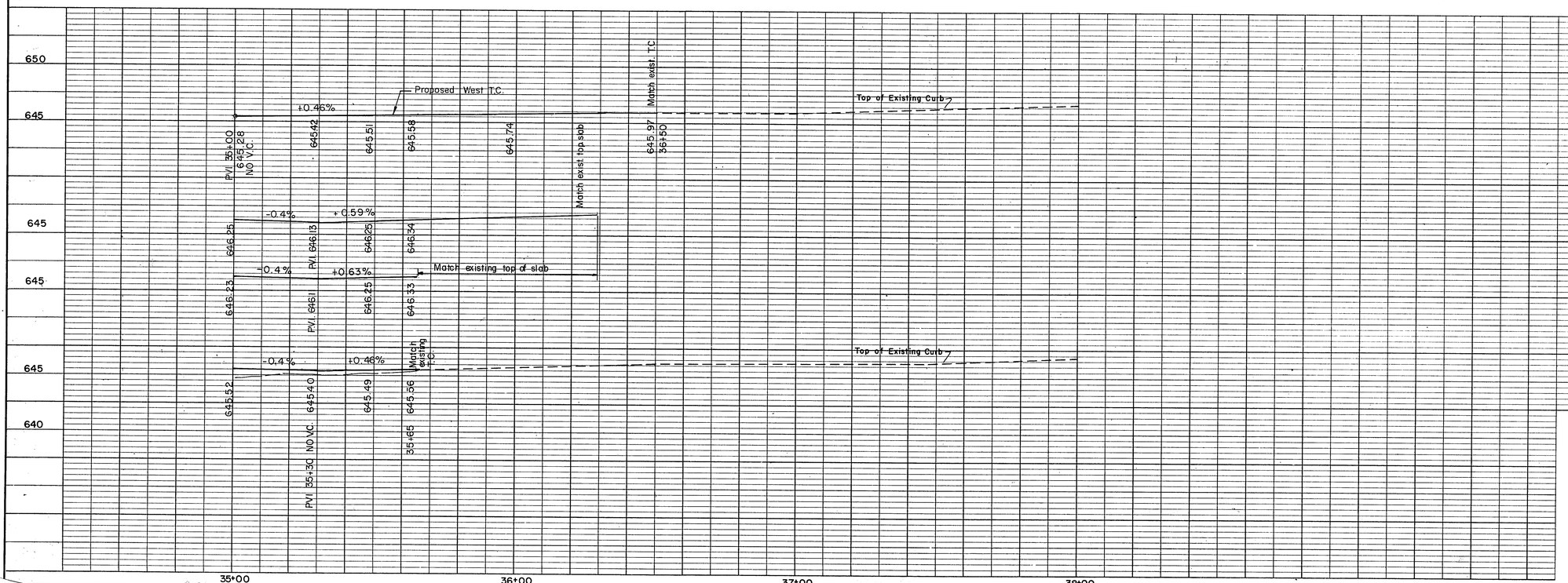
GINN, INC., Consulting Engineers

DESIGNED - HBJ	DRAWN - SMM	DATE - MARCH, 1981	FILE	
APPROVED - HWG	CHECKED - HBJ	SCALE - 1"=20' H, 1"=5' V	SHEET 10	OF



★ NOTE: 2-3" PVC from 35+90 to 36+60 is laid side by side and in the center of 3' median

B.M. #10 On Corner Curb At N.W. Corner Of Parking At Wright Brothers Dr. & 15700 Midway Rd. Elev. 647.28



CITY OF ADDISON

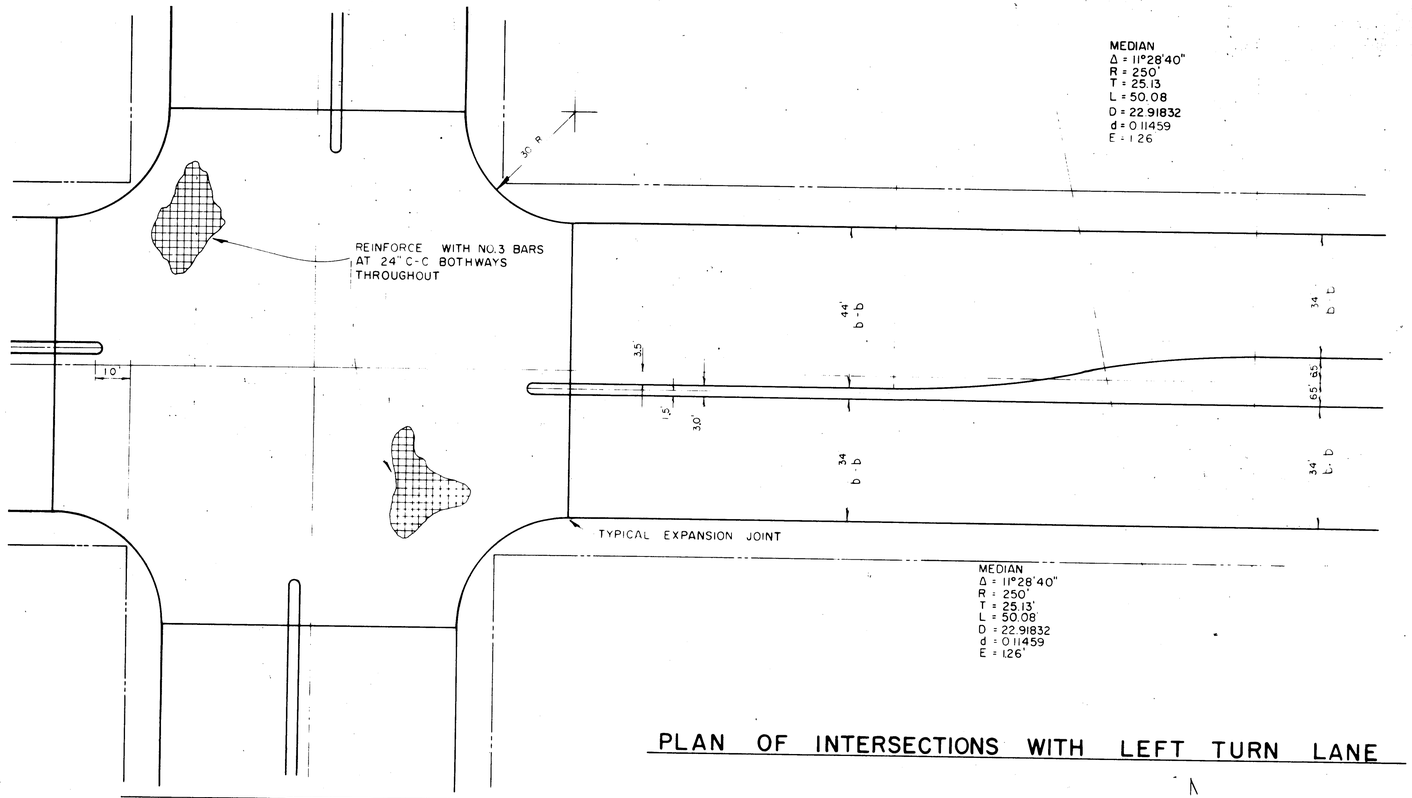
PAVING

Paving Sta. 35+00 to Sta. 36+29

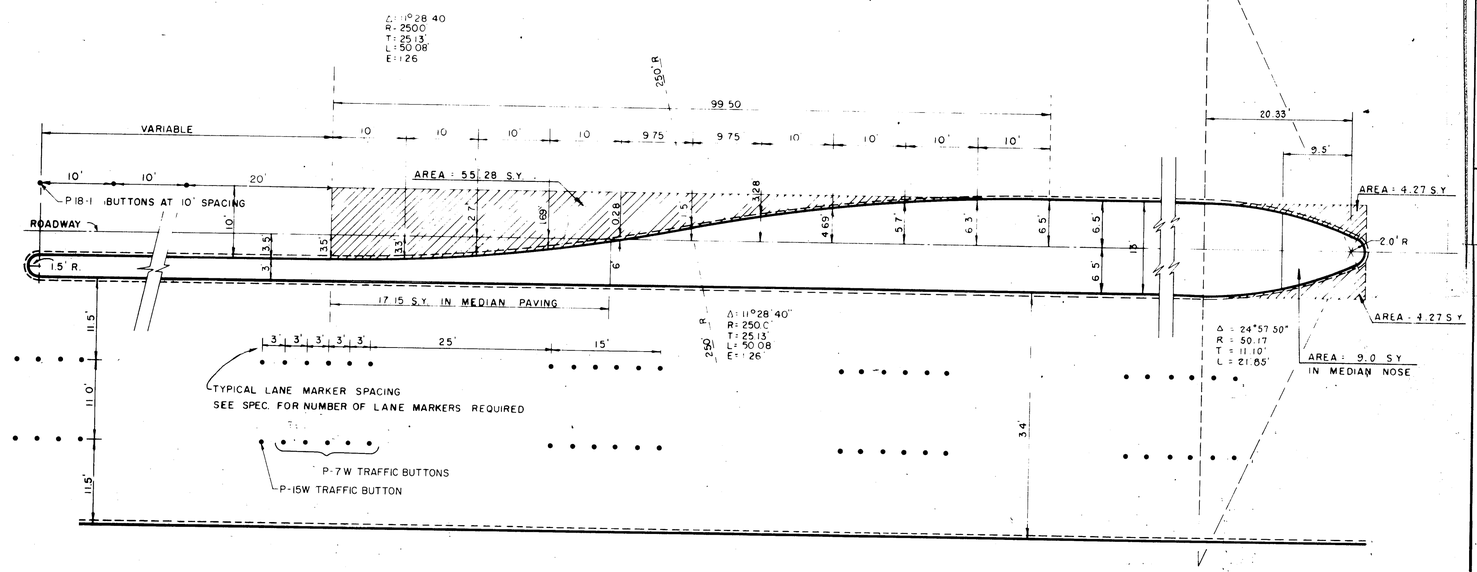
MIDWAY ROAD IMPROVEMENTS

GINN, INC., Consulting Engineers

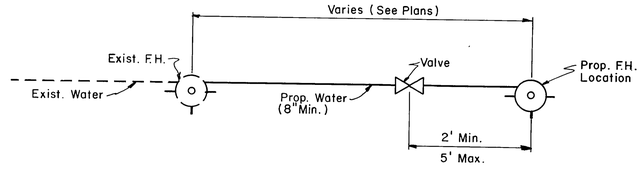
DESIGNED- HBJ	DRAWN- GF-SM	DATE- March, 1981	FILE		
APPROVED- HWG	CHECKED- HBJ	SCALE- 1"=20' H, 1"= 5'V	SHEET 11	OF	



PLAN OF INTERSECTIONS WITH LEFT TURN LANE



LEFT TURN LANE & LANE MARKER DETAIL

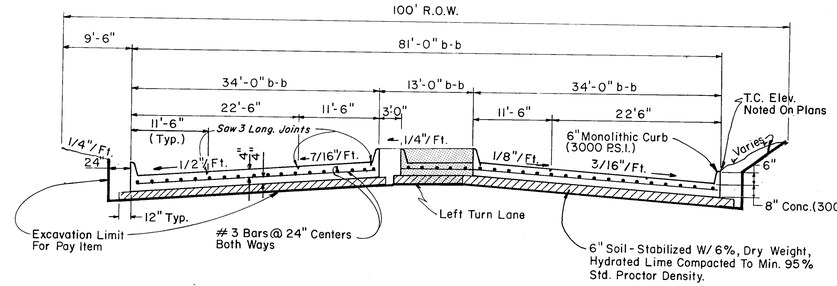


Salvage & Reuse

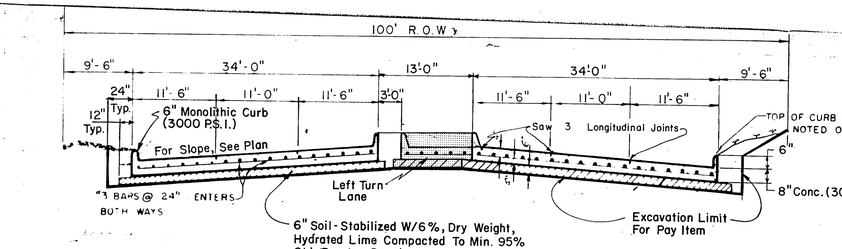
Fire Hydrant
Valve
90° Bend

FIRE HYDRANT RELOCATION DETAIL

Typical Section
Sta. 3+00 to 5+50
Sta. 10+50 to 32+00



PAVING SECTION DETAIL



PAVING SECTION DETAIL

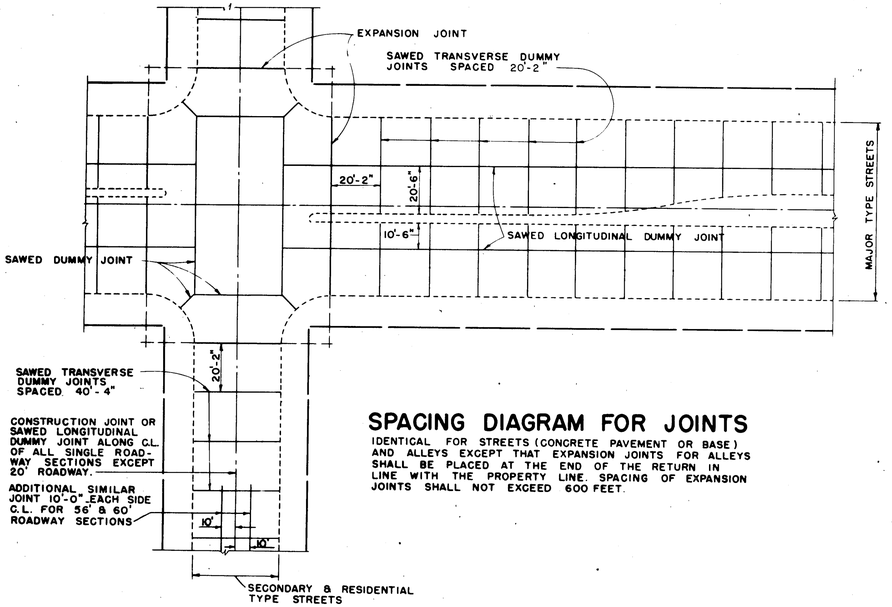
Sta. 0+80.5 to 3+00,
Sta. 5+50 to 10+50,
Sta. 32+00 to 36+50

CITY OF ADDISON
DALLAS COUNTY, TEXAS
MIDWAY ROAD

PAVING DETAILS A

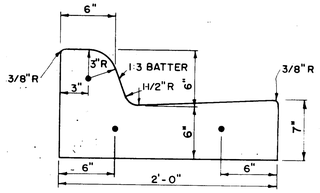
GINN, INC.
Consulting Engineers – Dallas, Texas

Designed - H.B.J.	Drawn - S.M.M.	Date - MARCH, 1981	
Approved - H.W.G.	Checked - G.F.	Scale - NONE	Sheet 12 Of



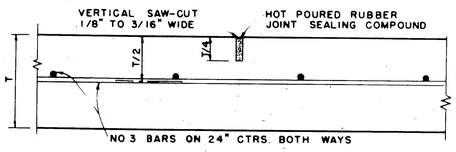
SPACING DIAGRAM FOR JOINTS

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 600 FEET.



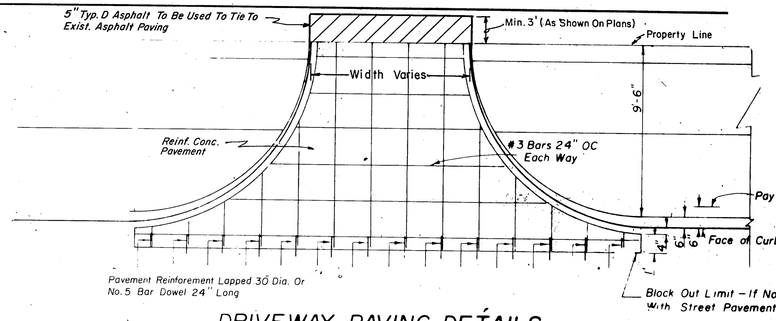
SEPARATE CURB & GUTTER
REINFORCEMENT SHALL BE NO. 5 BARS

CURB AND CURB & GUTTER

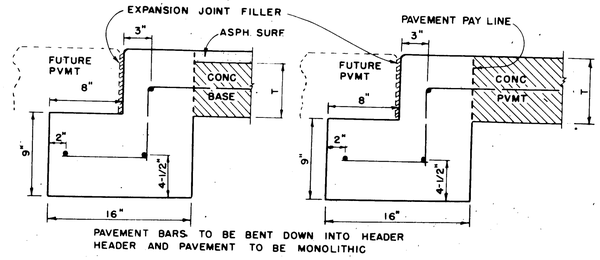


SAWED DUMMY JOINT

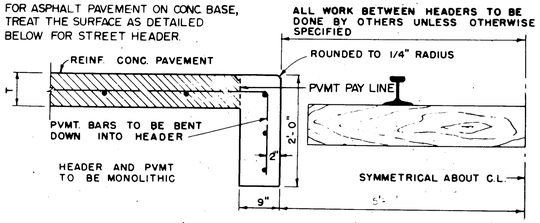
IDENTICAL FOR STREETS AND ALLEYS EXCEPT ALLEY LONGITUDINAL REINFORCEMENT BARS



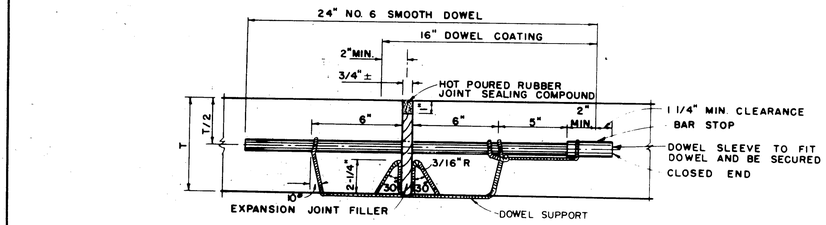
DRIVEWAY PAVING DETAILS



STREET HEADER

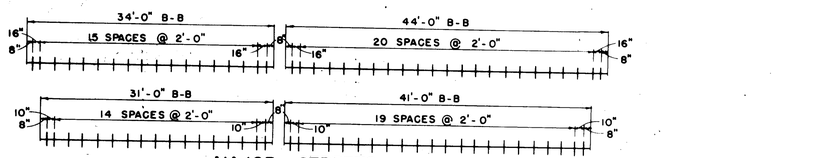


RAILROAD HEADER

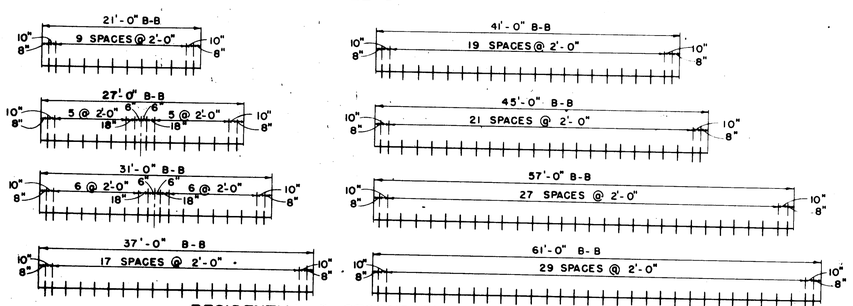


TRANSVERSE EXPANSION JOINT

IDENTICAL FOR STREETS & ALLEYS

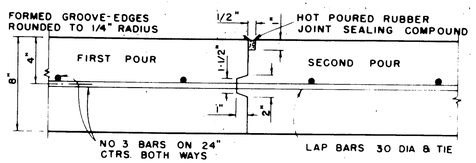


MAJOR STREETS



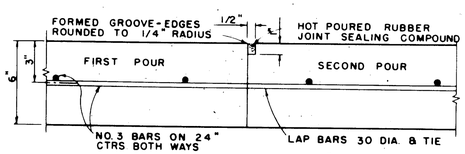
RESIDENTIAL & SECONDARY STREETS

SPACING DIAGRAM FOR DOWELS AT EXPANSION JOINTS



CONSTRUCTION JOINT

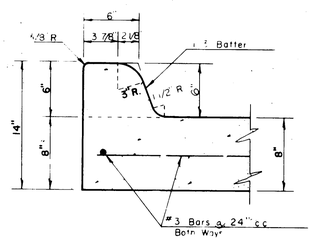
FOR 8" THICKNESS PAVEMENT OR BASE



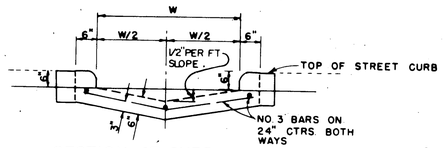
CONSTRUCTION JOINT

FOR 6" THICKNESS PAVEMENT OR BASE

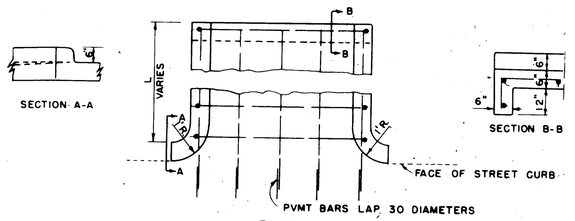
IDENTICAL FOR STREETS AND ALLEYS EXCEPT ALLEY LONGITUDINAL REINFORCEMENT BARS.



6" INTEGRAL CURB DETAIL



SECTION AT CURB FACE



PLAN

FLUME

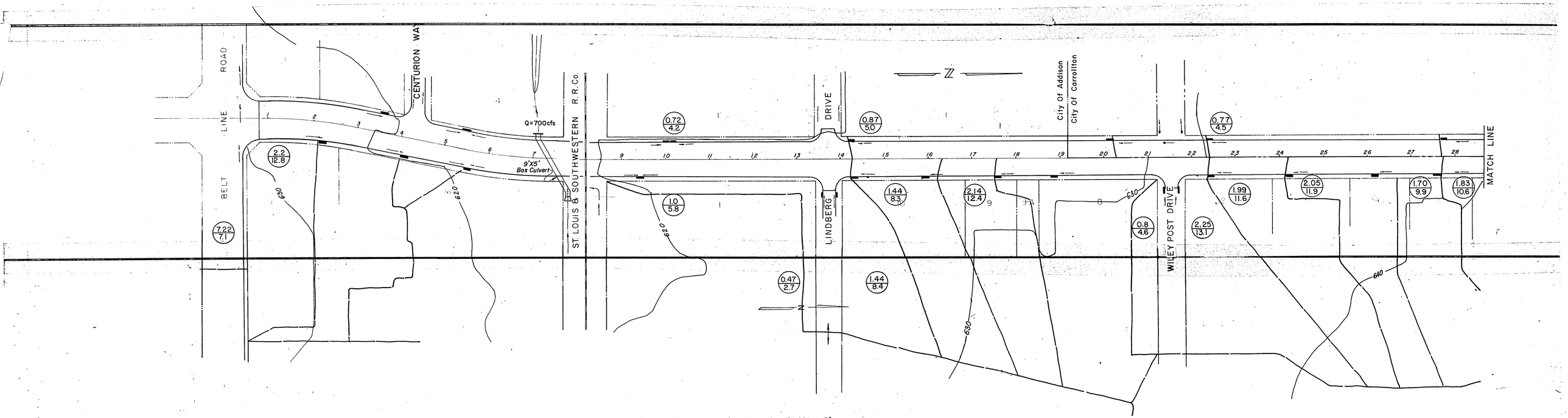
CITY OF ADDISON
DALLAS COUNTY, TEXAS

MIDWAY ROAD

PAVING DETAILS B

GINN, INC.
Consulting Engineers – Dallas, Texas

DESIGNED-H.B.J.	DRAWN-S.M.	DATE MARCH, 1981	FILE
APPROVED-H.W.G.	CHECKED-B.H.	SCALE- NONE	SHEET: 13



Drainage Calculations (T.H.D. Hydraulic Manual)

Rolling Terrain 1%-3.5%

Impervious Soils

Commercial C = 0.6-0.9 (use C=0.75)

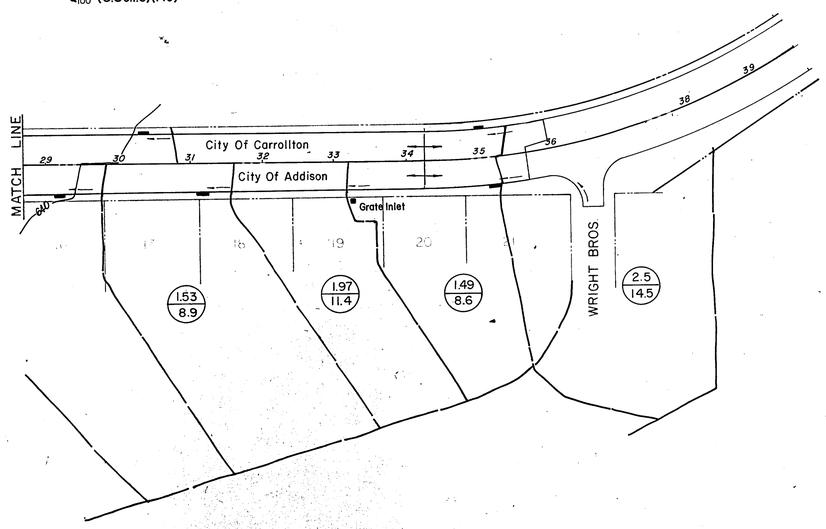
For Dallas County

$T_{100} = 7.8^{-18}$

$Q_{100} = (C)(I)(A) = (0.75)(7.8)(Ac.)$

$Q_{100} = (5.8 c.f.s)(Ac)$

2.5 / 14.5 — ACRES / Q_{100}



City Of Addison

MIDWAY ROAD IMPROVEMENTS

Drainage Area Map

DESIGNED | DRAWN R.G.B. | DATE MARCH, 1981 | FILE

APPROVED | CHECKED | SCALE 1"=100' | SHEET 14 OF

℄ Belt Line Road

Begin This Project Sta. 0+80.50

℄ Sta. 1+01.19 I.P. Set 100' Lt.

P.C. Sta. 1+01.19

℄ Sta. 1+01.19 I.P. Set 50' Lt.

Sta. 52+44.36 Belt Line Rd. = Sta. 0+00 Midway Road

90° 06' 30"

P.I. 1+99.36

MIDWAY ROAD

Relocate 25 L.F. 16" Water Line

10 L.F. 18" R.C.P.

P.T. 4+96.0 Plug end for future development

P.I. 4+63.03

2+46.5

DELETED

P.C. 4+30.03

2-18" R.C.P.

Existing Conc. Drive

Saw & Remove Conc. 57' Rt. ℄

Saw & Remove Conc. 61' Rt. ℄

℄ Sta. 1+01.19 Conc. Nail Set 50' Rt.

Telephone Comp. Vault

Traffic Signal Control Box

Existing 6" G

℄ Sta. 1+01.19 I.P. Set 100' Rt.

1-10' Recessed Inlet Sta. 2+22.70 T.C. = 624.11 I.E. = 620.11

DELETED

℄ CURVE DATA

Δ = 11° 44' 20"
R = 954.93'
T = 98.17'
L = 195.65'

℄ Sta. 2+96.84 I.P. Set 100' Lt.

P.T. Sta. 2+96.84

℄ Sta. 2+96.84 I.P. Set 50' Lt.

1" Poly Gas

CAUTION UNDERGROUND TELEPHONE

1-10' Recessed Inlet Sta. 3+47.54 T.C. = 620.10 I.E. = 616.10

P.I. 3+63.04

30' R.

7.5'

10 L.F. - 18" R.C.P.

LINE B

21" R.C.P.

15" R.C.P.

3+46

3+25

Plug end

2-75

1-6

3+86

Lower 25 L.F. 12" Water main

24" R.C.P.

STA. 5+00

1+72.09

℄ Centurion Way Sta. 4+28.20 (41' Concrete Pvmt.)

Saw & Remove Conc. 81.65' Lt. ℄

Existing Parking Area

B.M. #2

Bldg.

40' R.

C.R. 4+74.17

35'

101° 00' 30"

Relocate 60 L.F. 16" Water Line

DELETED

LINE A

3+14

28 L.F. - 18" R.C.P.

30" R.C.P.

2+26.87

MATCH LINE

℄ Sta. 2+96.84 I.P. Set 50' Rt.

Remove and relay 20 L.F.

18" R.C.P. FILLME TO BACK OF 2-10' INLET

20'

CAUTION LONE STAR GAS

Water Vault

1-10' Recessed Inlet Sta. 4+1.12 T.C. = 619.97 I.E. = 615.97

10 L.F. 18" R.C.P.

C.R. 4+27.5

19.91'

Existing 20' Asphalt Dr.

4+55 ℄ Driveway

C.R. 4+82.50

℄ Sta. 2+96.84 I.P. Set 100' Rt.

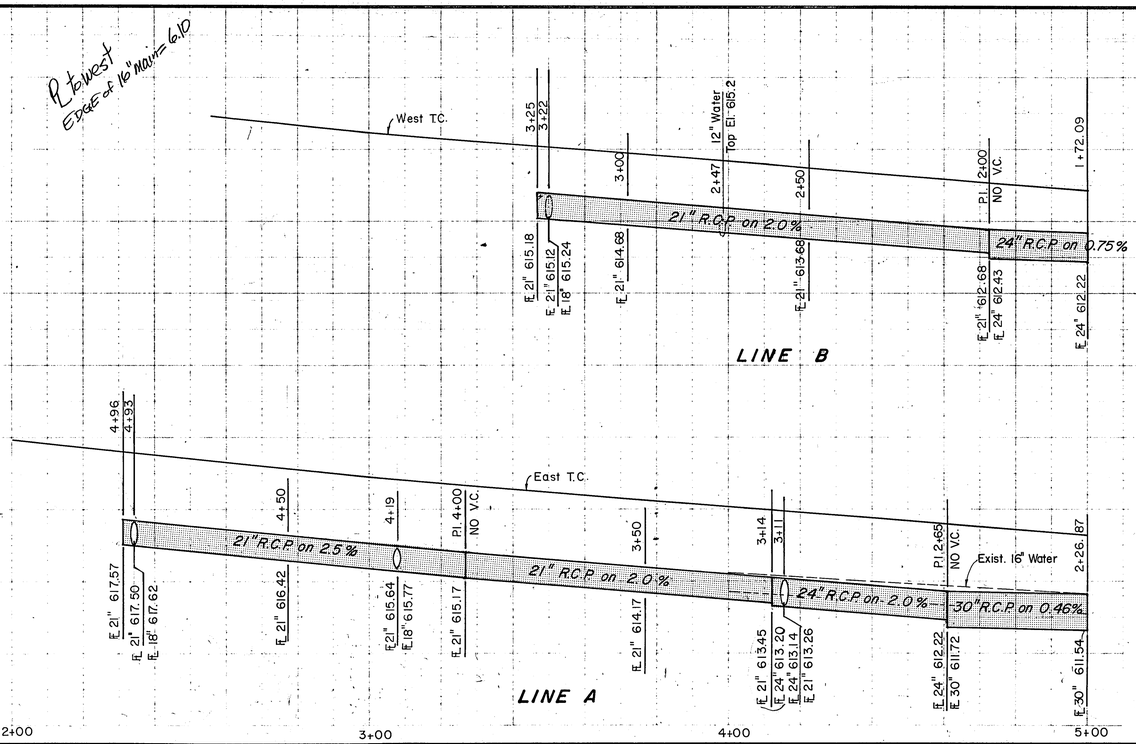
PIPE CURVE DATA LINE A

Δ = 4° 06' 32"
R = 919.93'
T = 33.0'
L = 65.97'

NOTE:
Contractor to verify location and depth of 16" water line. To be relocated as directed by the Engineer if relocation required. Cost of verification to be negotiated by Engineer and should not be included in price for relocation.

B.M. #1 ■ On N.W. Corner Parking To Gulf Gas Station at S.W. Corner Inter. Belt Line ℄ Midway Rd. Elev. 624.32

B.M. #2 ■ On S.E. Corner Of Conc. Walk To Bldg. At 15101 Midway Rd. Elev. 614.84



CITY OF ADDISON

DRAINAGE LINE A, LINE B

PAVING STA. 0+00 to STA. 5+00

MIDWAY ROAD IMPROVEMENTS

GINN, INC., Consulting Engineers

DESIGNED - ACF	DRAWN - GF	DATE - MARCH, 1981	FILE
APPROVED - HWG	CHECKED - HBJ	SCALE - 1"=20' H, 1"=5' V	SHEET 15 OF

℄ CURVE DATA
Δ = 12°14'20"
R = 954.93'
T = 102.38'
L = 203.98'

℄ PIPE CURVE DATA LINE B
Δ = 17°15'40"
R = 175.0'
T = 26.56'
L = 52.72'

℄ PIPE CURVE DATA LINE A
Δ = 42°14'20"
R = 200'
T = 77.25'
L = 147.44'

℄ PIPES CURVE DATA LINES C1 & C2
Δ = 15°44'30"
R = 200'
T = 27.65'
L = 54.95'

CAUTION
PETROLEUM LINE TO BE UNCOVERED BEFORE BORING

CAUTION
LONE GAS LINE

CAUTION - CONTRACTOR
Before Boring 5-48" C.M.P.
Contact Shall Be Made With
Cotton Belt's Engr. Dept. -
Don Coldwell - (214) 980-1596
Ken Draft - (214) 242-5320

B.M. #3 ■ On Conc. Walk At S.E. Corner Of Bldg. At 15201 Midway Rd. Elev. 618.14

CITY OF ADDISON
DRAINAGE
LINE A, B, C1, C2, D
PAVING STA. 5+00 to STA. 10+00
MIDWAY ROAD IMPROVEMENTS

GINN, INC., Consulting Engineers
DESIGNED - A.C.F. | DRAWN - S.M.M. | DATE - March, 1981 | FILE
APPROVED - H.W.G | CHECKED - A.G.F. | SCALE - Horz. 1"=20' Vert. 1"=5' | SHEET 16 OF


NOTE: ALL EXISTING VALVES, FITTINGS, AND METER MAY BE RE-USED (IF REMOVED IN GOOD CONDITION) AS APPROVED BY ENGR.
WATER VAULT DETAIL
6" Gate valve
1 1/2" Check valve
1 1/2" Union
Water meter
6" Check valve
1 1/2" Gate valve
6" Deep - Pre-cast conc. box w/ steel cover
Exist. 6" line
R.O.W.
Curb
2'-10" x 3'-10"
Cover (2 req'd.)
4" Strap hinge (continuous) Weld to ℄ and cover
DETAIL
CAUTION: Underground Telephone
℄ Sta. 10+00 I.P. Set 100' Lt.
2-10' Recessed Inlet Sta. 10+12 T.C. = 618.09 FL = 614.09
℄ Sta. 10+00 I.P. Set 50' Lt.
Relocate Water Vault
2-21" R.C.P. 62 L.F.
Relocate 185 L.F. 16" Water
LINE C1
42" R.C.P.
MIDWAY ROAD
LINE C2
See Detail for Equalizer Construction
MATCH LINE
STA. 10+00
STA. 15+00
℄ Sta. 10+00 I.P. Set 50' Rt.
℄ Sta. 10+00 Conc. Nail Set 65' Rt.
1.5 Story Bldg.
Lindberg Drive ℄ Sta. 13+66.90 41' b-b
Lindberg Drive ℄ Sta. 13+66.20 Conc. Pavement 31' b-b
Saw & Remove Conc. 70.5' Lt. ℄
Relocate F.H.
1-10' Recessed Inlet Sta. 14+34.90 T.C. = 620.51 FL = 616.51
℄ Sta. 15+00 Conc. Nail Set 90' Lt.
℄ Sta. 15+00 I.P. Set 50' Lt.
Lower 30 L.F. 8" Water
21" R.C.P. 31 L.F.
21" R.C.P.
18" R.C.P. 48 L.F.
100 L.F.
Adjust M.H.
Relocate W.V.
Lower 30 L.F. 8" Water
Relocate F.H.
Saw & Remove Conc. 51' Rt. ℄
6" Conc. C. & G.
4" Conc. riprap
℄ Sta. 15+00 Conc. Nail Set 50' Rt.
℄ Sta. 15+00 Conc. Nail Set 75' Rt.
Relocate 25 L.F. 8" Water
1-10' Std. Inlet T.C. = 622.00 FL = 618.00
1-10' Recessed Inlet Sta. 14+34.20 T.C. = 621.67 FL = 617.67
1-10' Std. Inlet T.C. = 622.11 FL = 618.11
Saw & Remove Conc. 70.5 Rt. ℄
Temporary Asph. Curb See Paving Sht
B.M. # 4 On Conc. Walk At S.E. Corner Of Bldg At 15301 Midway Rd. Elev. 621.43
EQUALIZER DETAIL
42" R.C.P. / 36" Std. Branch
Pour Conc. collar and Grout inside of Pipe
6.25'
SECTION A-A
4" Concrete Riprap w/ 6 x 6 x 10/10 Mesh
6" Conc. Curb and Gutter tied to existing conc. paving w/ #3 @ 24 o.c.
8" Conc. Street
2-42" R.C.P. on 0.50%
Proposed T.C.
Existing Elev West R.O.W.
Verify Depth of 8" Water Line Before laying Storm Sewer Laterals
21" on 2.31%
21" R.C.P. on 2.94%
21" R.C.P. on 3.76%
21" on 3.43%
18" R.C.P. on 2.92%
Sta. 2+77.58
Sta. 6+15.46
Sta. 6+79.13
Sta. 6+94.98
Lateral at 0+52 Sta. 6+15.46
10+00
11+00
12+00
13+00
14+00
15+00

CITY OF ADDISON

DRAINAGE
LINE C1, LINE C2

PAVING STA. 10+00 to STA. 15+00

MIDWAY ROAD IMPROVEMENTS

GINN, INC., Consulting Engineers

DESIGNED- ACF	DRAWN- RGB	DATE- March, 1981	FILE
APPROVED- HWG	CHECKED- HBJ	SCALE- 1" = 20' H, 1" = 5' V	SHEET 17 OF

Houseman Properties 522-6050
Bldg.
1" Gas Svc Tie in 30' S. Edge of Bldg
6" Poly Gas 4' B.C. of parking lot 3.5' Deep from T/C
B.M. #5
City Of Addison
City Of Carrollton
℄ Sta. 15+00 Conc. Nail Set 90' Lt.
℄ Sta. 15+00 I.P. Set 50' Lt.
STA. 15+00
8+25 = Paving Sta. 15+49.76
For Details of Junction Box See Sheet 25
42" R.C.P.
48" R.C.P.
LINE C1 & C2
MIDWAY ROAD
LINE C3
Existing 24' Conc. Drive
Relocate F.H. See Paving for loc.
CAUTION LONE STAR GAS
Existing 36' Conc. Dr.
℄ Sta. 20+00 I.P. Set 50' Lt.
STA. 20+00
7+75.24
12+75.24
Lower 30 L.F. 8" Water
Lower 30 L.F. 8" Wtr.
Adjust W.M.
21" R.C.P. 64 L.F.
MATCH LINE
℄ Sta. 15+00 I.P. Set 50' Rt.
℄ Sta. 15+00 I.P. Set 75' Rt.
Saw & Remove Conc. 51' Rt. ℄
6" Curb - 4" Riprap See Detail A-A Sht. 6
1-10' Rec. Inlet Sta. 16+06.5 T.C. = 624.21 FL = 620.21
35' Box
1-10' Rec. Inlet Sta. 17+43 T.C. = 626.68 FL = 622.68
3.5' Box
Relocate W.M.
Adjust M.H.
1¼" Service 20' S. of MH
1-10' Rec. Inlet Sta. 18+93 T.C. = 628.33 FL = 624.33
3.5' Box
℄ Sta. 20+00 P.K. Nail Set 50' Rt.
℄ Sta. 20+00 P.K. Nail Set 100' Rt.
Match Exiting Paving
Existing Asphalt
Existing 1.5 Story Building
Existing Building
B.M. #5 On Conc. Walk At N.E. Corner Of Bldg. At 15321 Midway Rd. Elev. 625.55
Existing Elev. West R.O.W.
Proposed T.C.
2-42" R.C.P. on 0.5%
48" R.C.P. on 1.25%
Verify Depth Of 8" Water Line Before Laying Storm Sewer Laterals
21" R.C.P. 5.31%
21" R.C.P. on 6.49%
21" R.C.P. on 6.16%
21" R.C.P. on 7.08%
Sta. 8+49.70
Sta. 9+86.20
Sta. 11+36.20
Sta. 12+63.71
Junction Box Sta. 8+25
620.50
615.25

CITY OF ADDISON

DRAINAGE
LINE C3

PAVING STA 15+00 to STA. 20+00

MIDWAY ROAD IMPROVEMENTS

GINN, INC., Consulting Engineers

DESIGNED- ACF	DRAWN- SMM	DATE- March, 1981	FILE
APPROVED- HWG	CHECKED- HBJ	SCALE- 1"= 20'H, 1"= 5'V	SHEET 18 OF

1-10' Recessed Inlet (Mod.)
Sta. 20+05.5
T.C. = 628.39
FL = 624.39 (See Sht.34)
Exist. Lamp Post
B.M. # 6
STA 20+00
C.R. 20+95.96
℄ Wiley Post Road
Sta. 21+46.20
Existing Conc. 41' b.b.
C.R. 21+96.96
1-10' Recessed Inlet
Sta. 22+12.46
T.C. = 629.90
FL = 625.90
Relocate F.H.
Relocate W.V.
21" R.C.P. - 34 L.F.
℄ Sta. 25+00
I.P. Set 100' Lt.
℄ Sta. 25+00
I.P. Set 50' Lt.
STA. 25+00
LINE C3
12+75.24
48" R.C.P.
42" R.C.P.
MIDWAY ROAD
LINE C3
17+75.24
21" R.C.P.
115 L.F.
Lower 40 L.F. 8" Water Line
21" R.C.P. - 64 L.F.
21" R.C.P. - 64 L.F.
Adjust M.H. as required
Lower 30 L.F. 8" Water line
Adjust M.H. as required
Lower 30 L.F. - 8" Water line
Relocate W.V.
MATCH LINE
℄ Sta. 20+00
P.K. Nail Set 50' Rt.
18" R.C.P.
34 L.F.
6' High Chain Link Fence w/ 3 Strand Barbed Wire
1-10' Recessed Inlet
Sta. 22+17.04
T.C. = 631.10
FL = 627.60
1-10' Recessed Inlet
Sta. 23+93.5
T.C. = 632.81
FL = 628.81
℄ Sta. 25+00
I.P. Set 50' Lt.
℄ Sta. 25+00
P.K. Nail Set 80' Rt.
MATCH LINE
Existing Asphalt
℄ Sta. 20+00
P.K. Nail Set 50' Rt.
1-10' Std. Inlet
T.C. = 631.09
FL = 627.09
1-10' Std. Inlet
T.C. = 631.35
FL = 627.35
Existing Building
Existing Conc. Drive
Existing Building
B.M. # 7
B.M. #6 ■ On Conc. Base To Lamp Post At S.W. Corner Of Inter. Wiley Post Rd & Midway Rd. Elev. 631.34
B.M. #7 ■ On Bottom Step To Loading Dock At 15502 Midway Rd. Elev. 636.05
Existing Elev West R.O.W.
48" R.C.P. on 1.25 %
42" R.C.P. on 1.0 %
LINE C3
Verify depth of 8" water line before laying storm sewer laterals.
21" R.C.P. on 5.0%
21" R.C.P. on 1.96%
18" R.C.P. on 0.81%
21" R.C.P. on 4.93%
21" R.C.P. on 3.90%
21" R.C.P. on 3.62 %
50' V.C.
m = 0.19
STA. 13+80.79
Lat. 0+81
STA. 13+80.79
STA. 14+60.24
STA. 14+73.67
STA. 16+36.70

CITY OF ADDISON

DRAINAGE
LINE C3

PAVING STA. 20+00 to STA. 25+00

MIDWAY ROAD IMPROVEMENTS

GINN, INC., Consulting Engineers

DESIGNED- ACF	DRAWN- GF	DATE- March, 1981	FILE
APPROVED- HWG	CHECKED- HBJ	SCALE- 1"=20'H, 1"=5'V	SHEET 19 OF


EXISTING CARROLLTON WATER MAIN
INLET
℄ Sta. 25+00 I.P. Set 100' Lt.
℄ Sta. 25+00 I.P. Set 50' Lt.
STA. 25+00
LINE C3 17+75.24
42" R.C.P.
LINE C3
36" R.C.P.
MIDWAY ROAD
1-10' Recessed Inlet Sta. 27+62.5 T.C.= 635.78 FL = 631.78
21" R.C.P.-34 L.F.
30" R.C.P.
15" R.C.P.
Exist. Asphalt Drive 25' b-b
Exist. Curb To Be Removed & Widened
50' Transition
Why Relocate? NO
Gas Regulator
Relocate
Exist. Gravel Drive
Exist. Gravel Dr.
℄ Sta. 30+00 I.P. Set 100' Lt.
℄ Sta. 30+00 I.P. Set 50' Lt.
STA. 30+00
LINE C3 22+75.24
21" R.C.P.-70 L.F.
21" R.C.P.-64 L.F.
Relocate F.H., provide 2" gate valve w/ tap
1-3" PVC-40 L.F.
Lower 30 L.F. 8" Water
Lower 15 L.F. 8" Water
Relocate
Relocate F.H.
To be abandoned
Lower 30 L.F. 8" Water
Gas meter
W.M.
MATCH LINE
℄ Sta. 25+00 I.P. Set 50' Rt.
℄ Sta. 25+00 P.K. Nail Set 80'
1-10' Recessed Inlet Sta. 26+14.5 T.C.= 635.28 FL = 631.28
1-6' Standard Inlet (Mod.) Sta. 26+84 Top = 636.24 FL = 632.24 Face opening away from curb, provide 1'-0" throat
QUALITY FENCE
1-10' Recessed Inlet Sta. 27+47.5 T.C.= 636.77 FL = 632.77
Saw & Remove Asphalt 50' Rt. ℄
Asphalt Parking
B.M. #8
Exist. Bldg.
15508 MIDWAY
15510 MIDWAY
1-10' Recessed Inlet Sta. 29+37.5 T.C.= 640.25 FL = 636.25
℄ Sta. 30+00 P.K. Nail Set 50' Rt.
Exist. Asphalt Dr.
℄ Sta. 30+00 P.K. Nail Set 100' Rt.
B.M. #8 On Bottom Step To Bldg. At 15508 Midway Rd. Elev. 638.57
Existing Elev. West R.O.W.
42" R.C.P. on 1.0%
36" R.C.P. on 1.0%
30" R.C.P. on 1.56%
LINE C3
NOTE: Verify depth of water lines before laying storm sewer laterals
21" R.C.P. on 4.03%
STA. 18+57.7
21" R.C.P. on 3.77%
1'-0" Opening
STA. 19+24.50
21" R.C.P. on 3.89%
STA. 19+90.70
21" R.C.P. on 3.52%
STA. 20+20.7
21" R.C.P. on 4.59%
STA. 21+80.7
CITY OF ADDISON
DRAINAGE
LINE C3
PAVING STA. 25+00 to STA. 30+00
MIDWAY ROAD IMPROVEMENTS
GINN, INC., Consulting Engineers
DESIGNED- ACF DRAWN- GF DATE- MARCH, 1981
APPROVED- HWG CHECKED- HBJ SCALE- 1"=20'H, 1"=5'V SHEET 20

CAUTION: Underground Telephone
B.M. #9
Bldg
℄ Sta. 30+00 I.P. Set 100' Lt.
℄ Sta. 30+00 I.P. Set 50' Lt.
℄ Sta. 30+00 I.P. Set 50' Rt.
℄ Sta. 30+00 I.P. Set 100' Rt.
℄ Sta. 35+00 I.P. Set 100' Lt.
℄ Sta. 35+00 I.P. Set 50' Lt.
℄ Sta. 35+00 I.P. Set 50' Rt.
℄ Sta. 35+00 I.P. Set 100' Rt.
STA. 30+00
STA. 35+00
MATCH LINE
LINE C3
1-10' Rec. Inlet (Mod) Sta. 30+40 T.C. = 640.93 FL = 636.93 See Sht. 34
1-10' Rec. Inlet Sta. 35+00 T.C. = 645.28 FL = 641.28
1-10' Rec. Inlet Sta. 31+15 T.C. = 643.08 FL = 639.08
Lower 30 L.F. 8" Water
Install 113 L.F.± Of Salvaged 12"/18" R.C.P.
Relocate F.H. and Provide 2" Gate Valve w/tap
Std. Double Grate inlet (mod.) Elevation & Location to be set in field by Engineer.
Saw & Replace Conc.
Existing 30" Curb & Gutter
Existing Asphalt
Existing Asphalt Drive
Existing 35' Conc. Drive
Existing 15' Asph. Drive
Existing Building
Existing 12"
Existing 8"
24" R.C.P.
30" R.C.P.
21" R.C.P.
21" R.C.P. 64 L.F.
21" R.C.P. 38 L.F.
3" P.V.C. Sch. 40 40 L.F.
P.C. Sta. 34+23.25 = ℄ Line C-3 Sta. 26+98.49
Line C-3 22+75.24
Line C-3 27+74.35
B.M. #9 On Conc. Pavement At S.E. Corner Of Bldg. At 15635 Midway Rd. Elev. 642.61
30" R.C.P. on 1.56%
24" R.C.P. on 1.32%
24" R.C.P. on 0.80%
Existing Elev. West R.O.W.
21" RCP on 5.26%
21" R.C.P. on 4.71%
21" RCP on 1.44%
12"/18" R.C.P. on 0.50%
Elevation 643.29 (Set in field)
Sta. 22+98.21
Sta. 23+58.20
Sta. 27+52.84
Sta. 25+58.88

CITY OF ADDISON

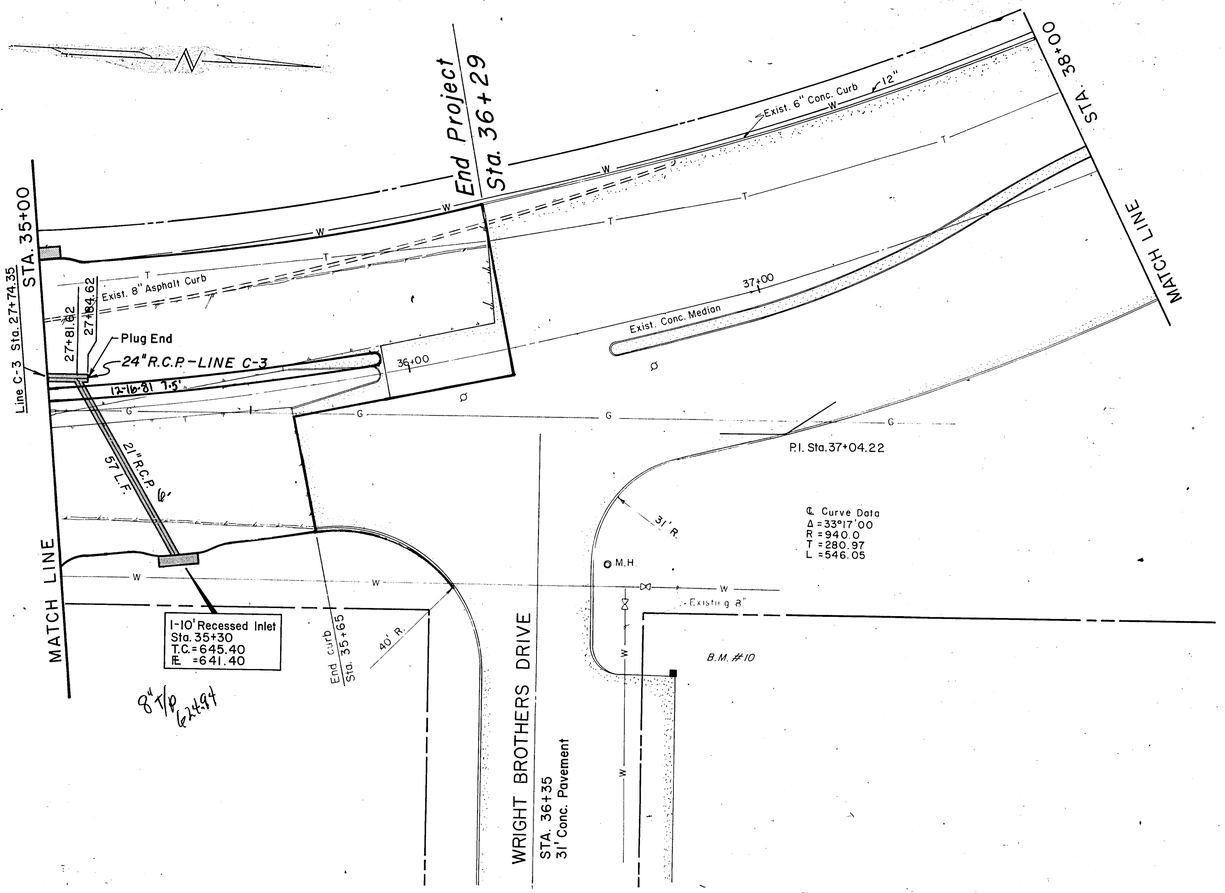
DRAINAGE
LINE C3

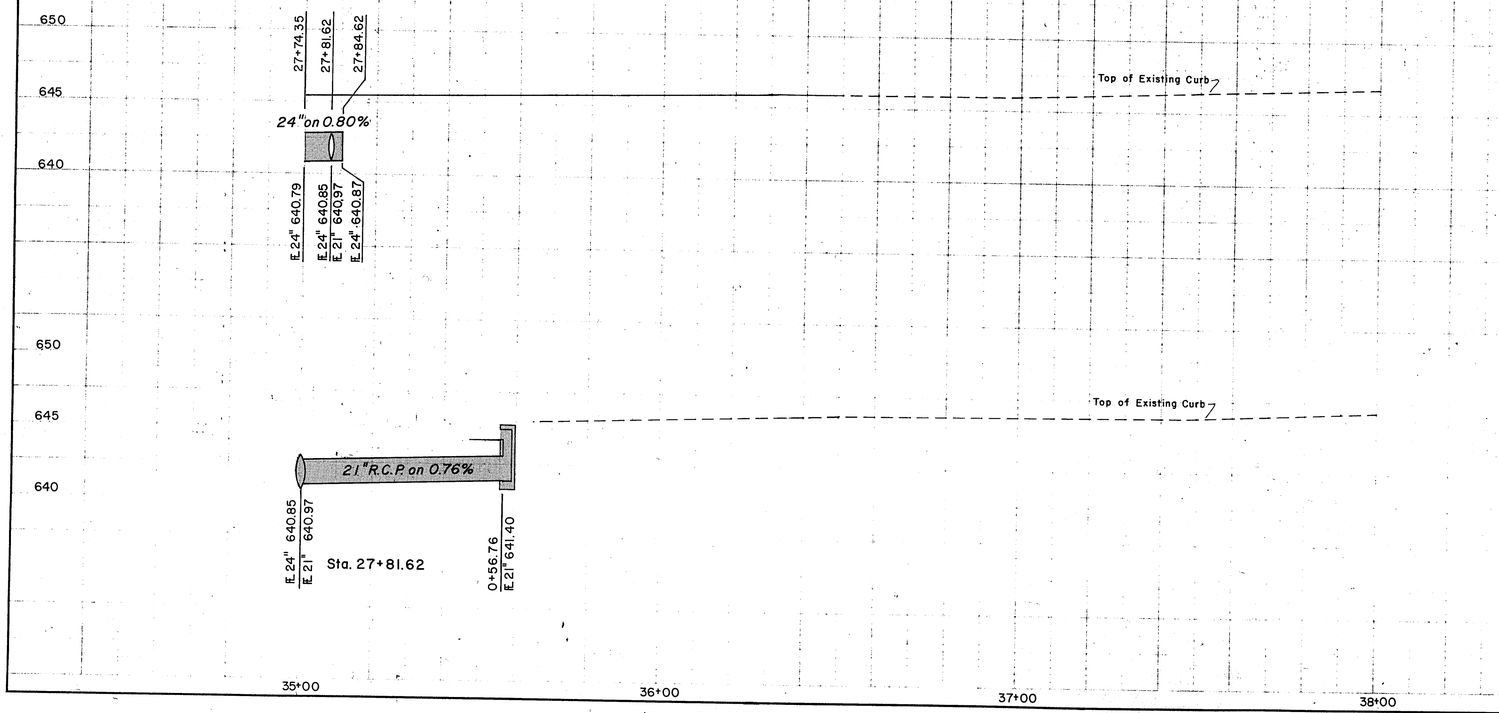
PAVING STA. 30+00 to STA. 35+00

MIDWAY ROAD IMPROVEMENTS

GINN, INC., Consulting Engineers

DESIGNED- ACF	DRAWN- SM RB	DATE- March, 1981	FILE
APPROVED- HWG	CHECKED- HBJ	SCALE- 1"=20' H, 1"=5' V	SHEET 21 OF





B.M. #10 On Corner Curb At N.W. Corner Of Parking At Wright Brothers Dr. & 15700 Midway Rd. Elev. 647.28

CITY OF ADDISON

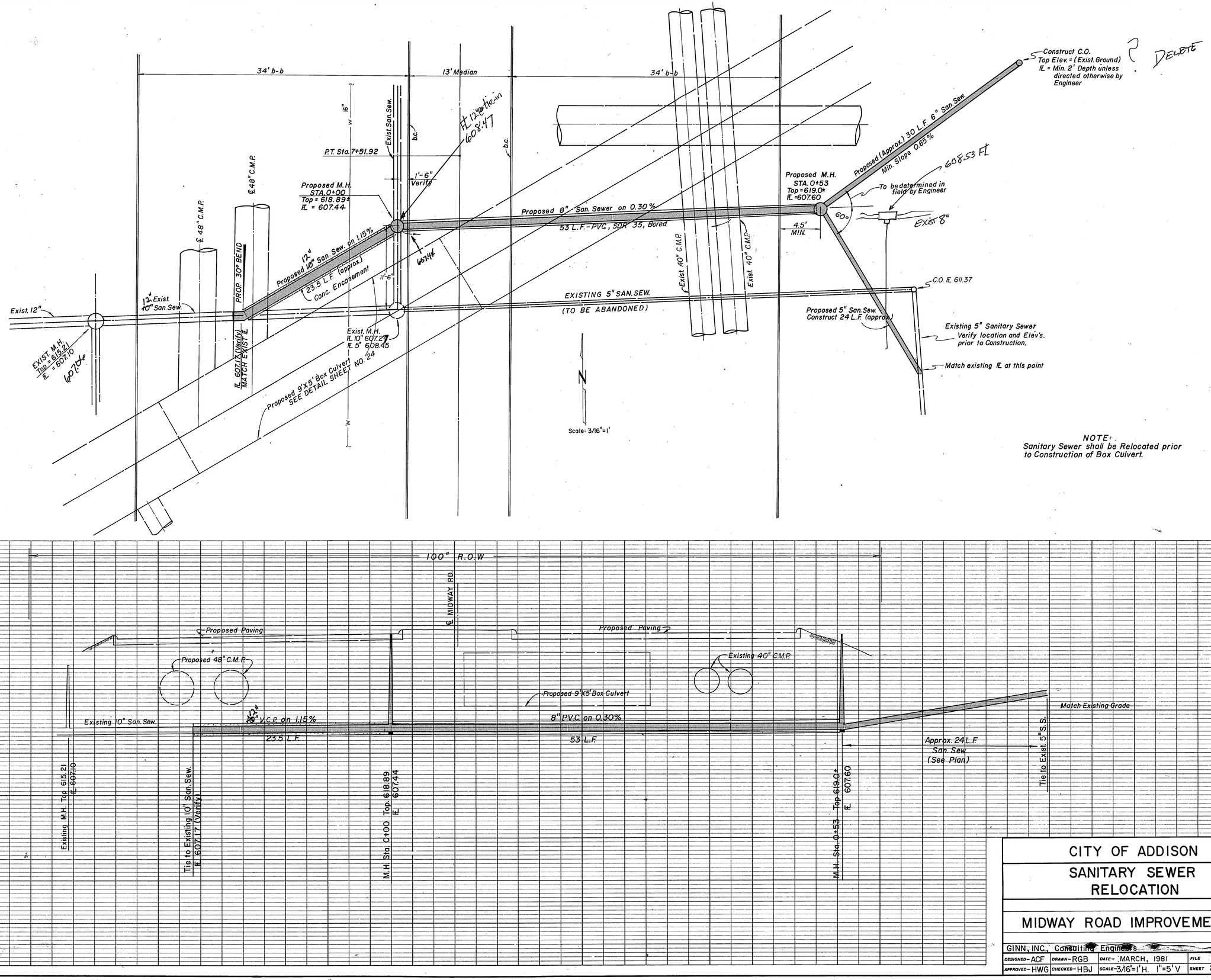
DRAINAGE LINE C3

PAVING STA. 35+00 to STA. 36+29

MIDWAY ROAD IMPROVEMENTS

GINN, INC., Consulting Engineers

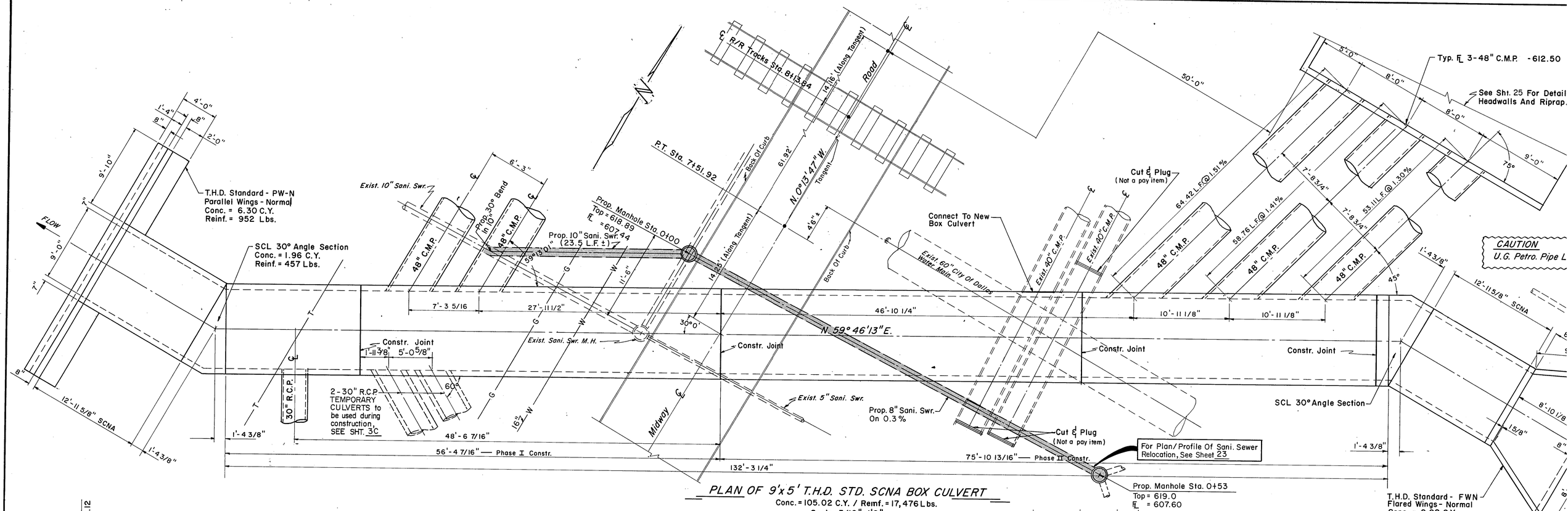
DESIGNED- ACF	DRAWN- RGB	DATE- MARCH, 1981	FILE
APPROVED- HWG	CHECKED- HBJ	SCALE- 1"= 20'H, 1"= 5'V	SHEET 22 OF



CITY OF ADDISON
SANITARY SEWER RELOCATION
MIDWAY ROAD IMPROVEMENTS

GINN, INC., Consulting Engineers

DESIGNED - ACF	DRAWN - RGB	DATE - MARCH, 1981	FILE
APPROVED - HWG	CHECKED - HBJ	SCALE - 3/16"=1' H. 1"=5' V	SHEET 23 OF 1



PLAN OF 9'x5' T.H.D. STD. SCNA BOX CULVERT

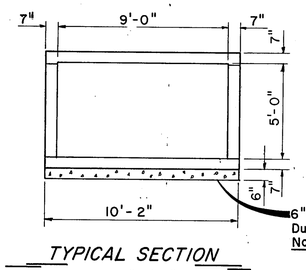
Conc. = 105.02 C.Y. / Remf. = 17,476 Lbs.

Scale : 3/16"= 1'0"

ELEVATION

Scale : 3/16"= 1'0"

Approx. Elev. Top Of 60" City Of Dallas Water Main 608.5. CONTRACOR TO VERIFY DEPTH AT EAST R.O.W. LINE PRIOR TO START OF CULVERT CONSTRUCTION



TYPICAL SECTION

Scale : 1/4"= 1'-0"

Note:

Subgrade material below 6" gravel base must be of a compactible nature. All undesirable material must be removed and replaced by dry embankment material compacted as directed by the Engineer. Cost of subgrade excavation to be considered subsidiary to cost of box culvert. Areas of concern fall within old channel both ends.

ESTIMATED QUANTITIES

Class A Concrete (Box Culvert)	109.1 C.Y.
Reinf. (Box Culvert)	19,016.0 Lbs.
Gravel Base (6")	35.0 C.Y.
Class A Concrete (Wingwalls)	16.1 C.Y.
Reinf. (Wingwalls)	1,810.0 Lbs.

GENERAL NOTES:

For notes and details not shown see the following Texas Highway Department Standards:

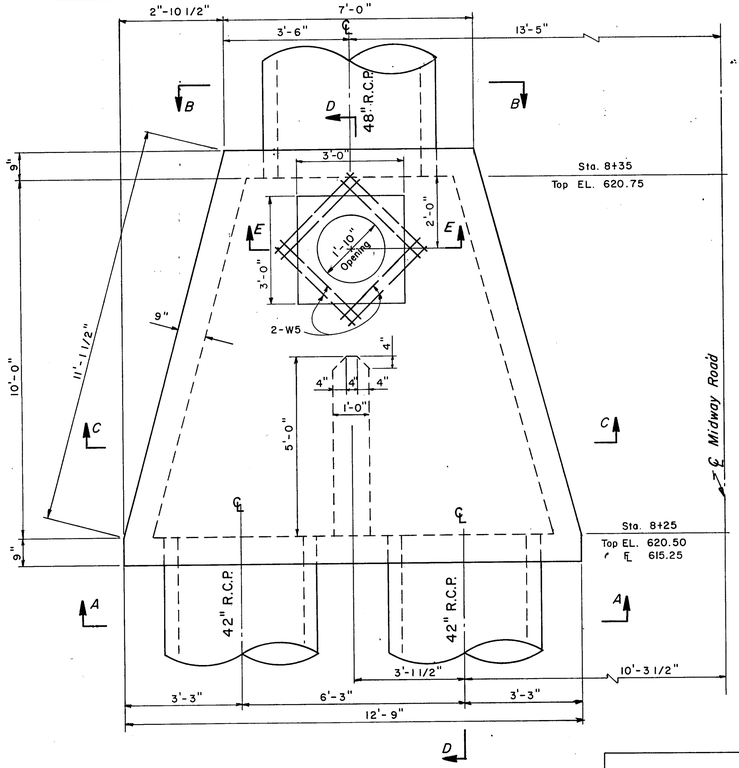
Single Culverts - Normal SC-NA Direct Traffic to 10'-0" Fill
Lengthening Details 30° Skew SCL 30°
Parallel Wings - Normal Single Box Culverts PW-N
Flared Wings - Normal Single Box Culverts FW-N

CITY OF ADDISON
DALLAS COUNTY, TEXAS
MIDWAY ROAD

9'x5' BOX CULVERT DET.

GINN, INC.
Consulting Engineers — Dallas, Texas

Designed-C.F.	Drawn- S.M.M	Date- MARCH, 1981	
Approved- H.W.G.	Checked- G.F.	Scale- AS SHOWN	Sheet



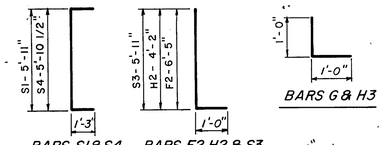
PLAN
Scale: 1/2"= 1'-0"

BAR SCHEDULE					
BAR	TYPE	SIZE	NO.	LENGTH	WEIGHT
B1	Str.	#5	11	9'-8"Avg.	111
B2	do	5	10	9'-8"Avg.	101
B3	do	5	1	12'-6"	13
B4	do	5	1	6'-9"	7
B5	do	5	12	11'-4"Avg.	142
B6	do	5	12	11'-4"Avg.	142
B7	Bt.	5	2	11'-7"	24
S1	Bt.	5	26	8'-5"	228
S2	Str.	4	32	5'-2"	110
S3	Bt.	5	12	7'-2"	90
S4	do	5	6	8'-4"	52
H1	Bt.	4	16	11'-7"	124
H2	do	4	8	6'-2"	33
H3	do	4	16	2'-0"	21
W1	Str.	5	8	4'-0"	33
W2	do	5	8	3'-0"	25
W3	do	5	4	3'-6"	15
W4	do	5	4	3'-9"	16
W5	do	5	16	4'-6"	75
T1	Str.	5	11	9'-8"Avg.	111
T2	do	7	15	9'-8"Avg.	293
T3	do	5	1	12'-6"	13
T4	do	5	1	6'-9"	7
T5	do	4	12	11'-4"Avg.	91
T6	do	5	12	11'-4"Avg.	142
T7	Bt.	4	2	11'-7"	16
Total					2035

BAR SCHEDULE RET. WALL 'A' ℄ 'B'					
BAR	TYPE	SIZE	NO.	LENGTH	WEIGHT
A1	Str.	#4	2	31'-1"	42
A2	do	4	2	17'-1"	23
E1	do	5	2	30'-4"	63
E2	do	5	8	16'-4"	136
E3	do	5	6	-6'-6"	41
E4	do	5	12	3'-4"	42
E5	do	5	6	2'-11"	18
F1	do	5	40	6'-5"	267
F2	Bt.	5	40	7'-5"	309
G	do	5	4	3'-0"	13
Total For Walls 'A' ℄ 'B'					954

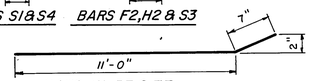
B1 & T1- 7'-0" To 12'-5" In 10 Equal Steps
B2 - 7'4" To 12'-1" In 9 Equal Steps
B5 & T5 - 11'-2" To 11'-7" In 5 Equal Steps
B6 & T6 - 11'-2" To 11'-7" In 5 Equal Steps
T2 - 7'4" To 12'-1" In 14 Equal Steps

BARS B1, T1, B2, T2, B5, T5, B6, & T6

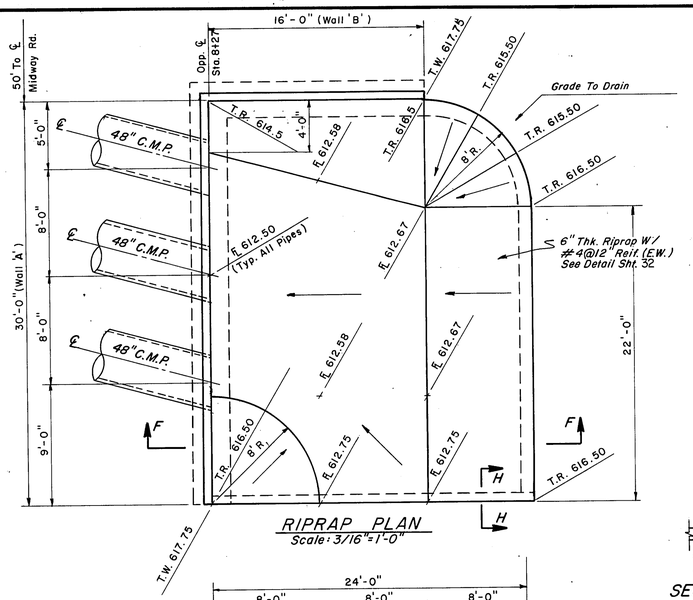


BARS S1 & S4 BARS F2, H2 & S3

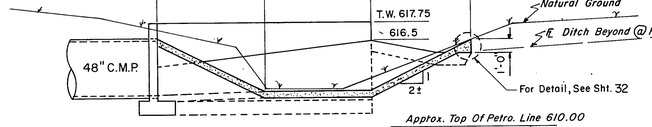
BARS G & H3



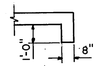
BARS H1, B7 & T7



RIPRAP PLAN
Scale: 3/16"=1'-0"

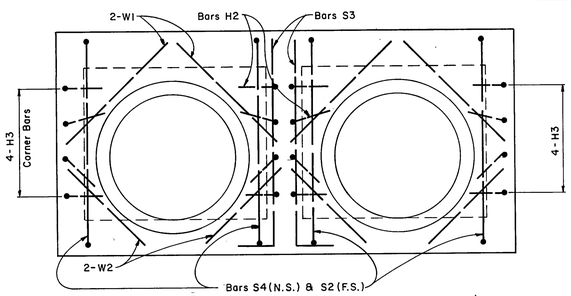


SECTION F-F
Scale: 3/16"=1'-0"

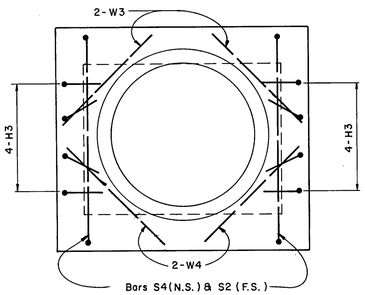


SECTION H-H
TOE WALL DET.
Scale: 1/4"=1'-0"

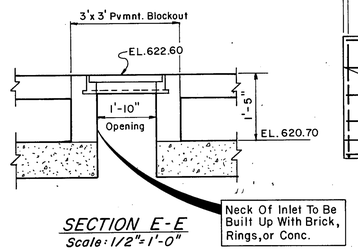
ESTIMATED QUANTITIES	
Class A Concrete (Spec. Manhole)	13.0 C.Y.
Reinforced Steel (Spec. Manhole)	2035.0 LBS.
Frame and Cover	1.0 EA.



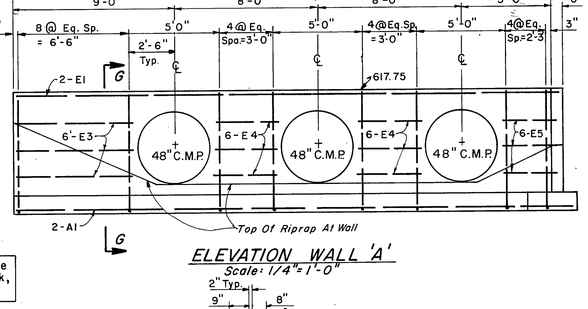
ELEV. A-A
Scale: 1/2"=1'-0"



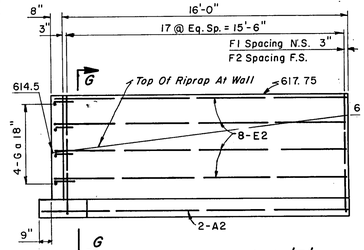
ELEV. B-B
Scale: 1/2"=1'-0"



SECTION E-E
Scale: 1/2"=1'-0"

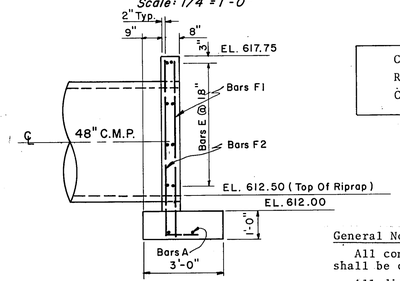


ELEVATION WALL 'A'
Scale: 1/4"=1'-0"



ELEVATION WALL 'B'
Scale: 1/4"=1'-0"

Class A. Concrete (Retaining Walls)	11.7 c.y.
Reinf. Steel (Retaining Walls)	954.0 lbs.
Class A Concrete (Riprap)	15.35 c.y.

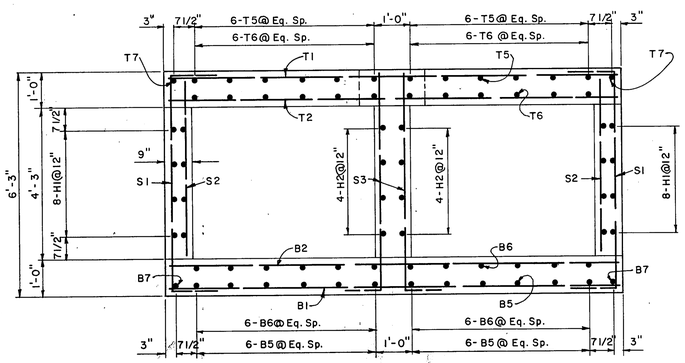


SECTION G-G
Scale: 3/8"=1'-0"

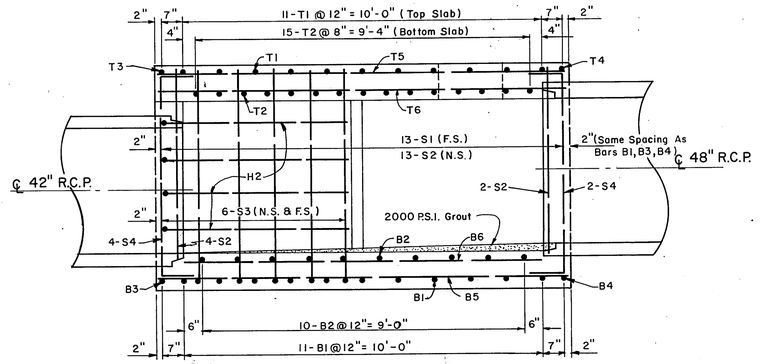
General Notes:

All concrete shall be Class A. All exposed corners of Walls 'A' & 'B' shall be chamfered 3/4".

All dimensions relating to reinforcing steel are to centers of bars. Reinforcing bars to be A.S.T.M. Grade 40.



SECTION C-C
Scale: 1/2"=1'-0"



SECTION D-D
Scale: 1/2"=1'-0"

CITY OF ADDISON
DALLAS COUNTY, TEXAS
MIDWAY ROAD

JUNCTION BOX DETAIL

GINN, INC.
Consulting Engineers — Dallas, Texas

Designed - A.C.F.	Drawn - S.M.M	Date - MARCH, 1981	
Approved - H.W.G.	Checked - A.G.F.	Scale - As Shown	Sheet 25 Of


B.M. 3 - "□" on concrete walk @ S.E. corner of building @ 15201 Midway. (Elev. 618.14)
R-R
Petrol Line
60" Water Line
MATCH LINE STA. 5+00
NOTE 1 :
No excavation will be permitted within limits of City of Dallas easement. Fill material may be placed only with approval of Engineer.
BEGIN 8' WIDE DITCH BOTTOM 1+50 608.66
BEGIN DITCH STA. 0+64 609.54
Landscaping this area to be by others
℄ MIDWAY RD.
PROPOSED TOP BANK
FLOW
PROPOSED HEADWALL
30' Esm't.
50'
20'
25'
Drainage Esm't.
612.66
612.2
612.5
613.5
610.4
612.36
Top 615.21
Fl. 607.10
M.H.
Tel. M.H.
BASELINE= 7+38.94 MIDWAY
C.O.
FOR DETAILS DRAINAGE THIS AREA, SEE SHT. 16
4' Conc. Flume
7' Conc. Walk
Asphalt Parking
Warehouse
Exist Curb
CAUTION
Encase existing 6" sanitary sewer line w/ concrete. VERIFY LOCATION AND DEPTH PRIOR TO BEGINNING CONSTRUCTION.
Remove existing conc. flume, REPLACE with new 4' wide conc. flume to grades shown. Tie riprap to new flume as shown. Match existing grade at curb. See Sht. 30
PLAN
1" = 20'
610.2 EXISTING GRADES
600 PROPOSED GRADES
FOR SECTION A-A, B-B, SEE SHT. 32


℄ MIDWAY ROAD
0+64 Ditch
PROPOSED MIDWAY RD. CONSTRUCTION
TW. 616.12
PROPOSED BOX CULVERT
Fl. 609.54
APPROX. EXISTING ℄ GRADE
-1.02%
PROPOSED DITCH BOTTOM GRADE
3+26 Top Pipe 606.9 (Verify)
NOTE: ENCASE EXIST. PIPE W/ CONC. ALL AROUND
620
615
610
605
605.09
606.11
607.13
608.15
609.17
5+00
4+0
3+00
2+00
1+00
0+00

NO.	REVISION	BY	DATE

CITY OF ADDISON

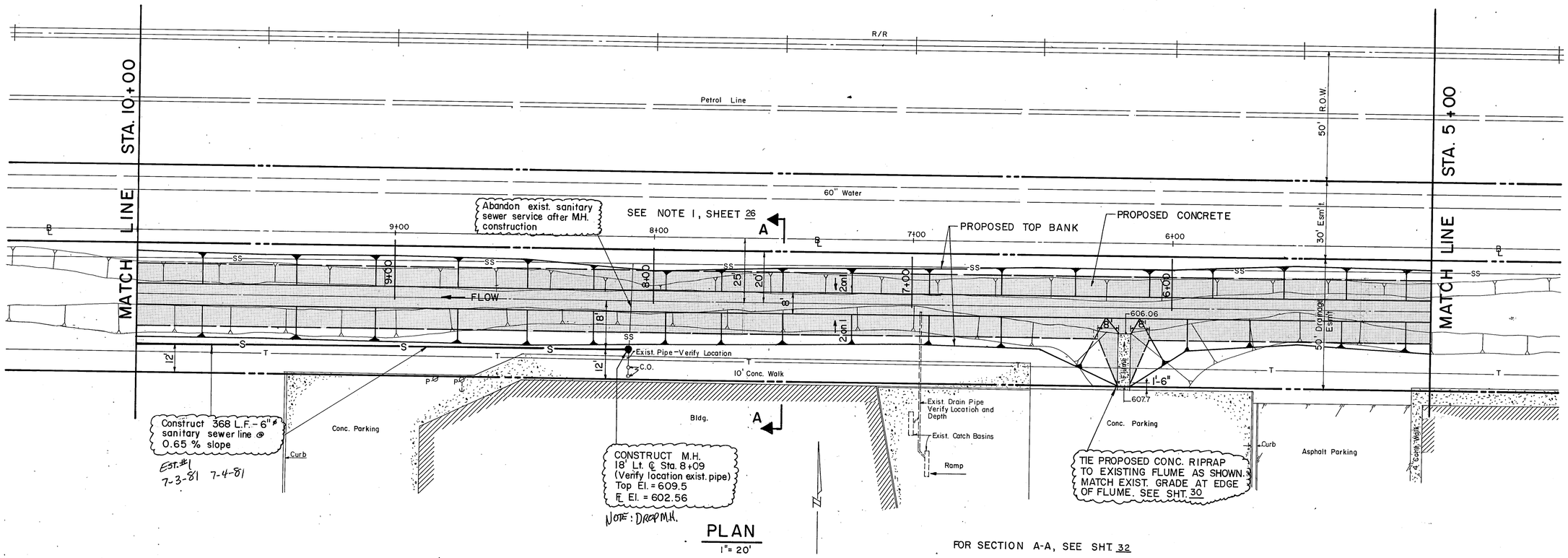
DRAINAGE DITCH

MIDWAY ROAD IMPROVEMENTS

STA. 0+00 to STA. 5+00

GINN, INC. Consulting Engineers, Dallas, Texas

DESIGNED- G.F.	DRAWN- G.F.	DATE- MARCH, 1981	FILE
APPROVED-	CHECKED-	SCALE- AS SHOWN.	SHEET 26 OF



NO.	REVISION	BY	DATE

CITY OF ADDISON

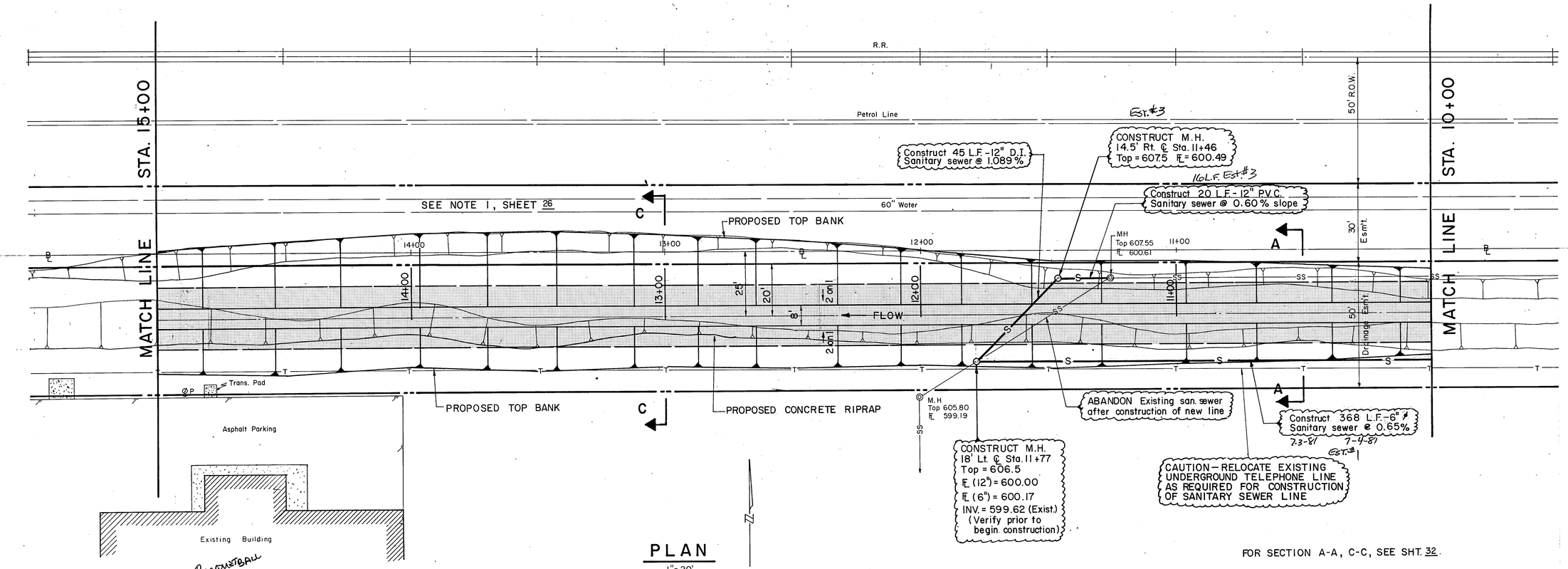
DRAINAGE DITCH

MIDWAY ROAD IMPROVEMENTS

STA. 5+00 to STA. 10+00

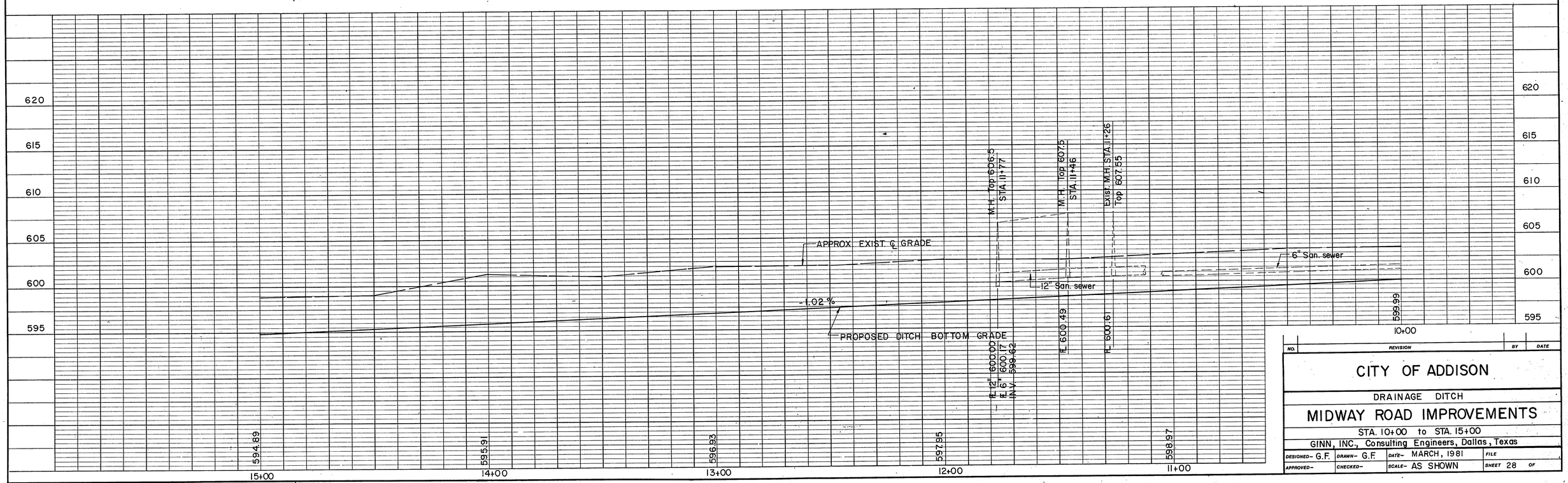
GINN, INC., Consulting Engineers, Dallas, Texas

DESIGNED- G.F.	DRAWN- G. F.	DATE- MARCH, 1981	FILE
APPROVED-	CHECKED-	SCALE- AS SHOWN	SHEET 27 OF



FOR SECTION A-A, C-C, SEE SHT. 32.

PLAN
1"= 20'



NO.	REVISION	BY	DATE

CITY OF ADDISON

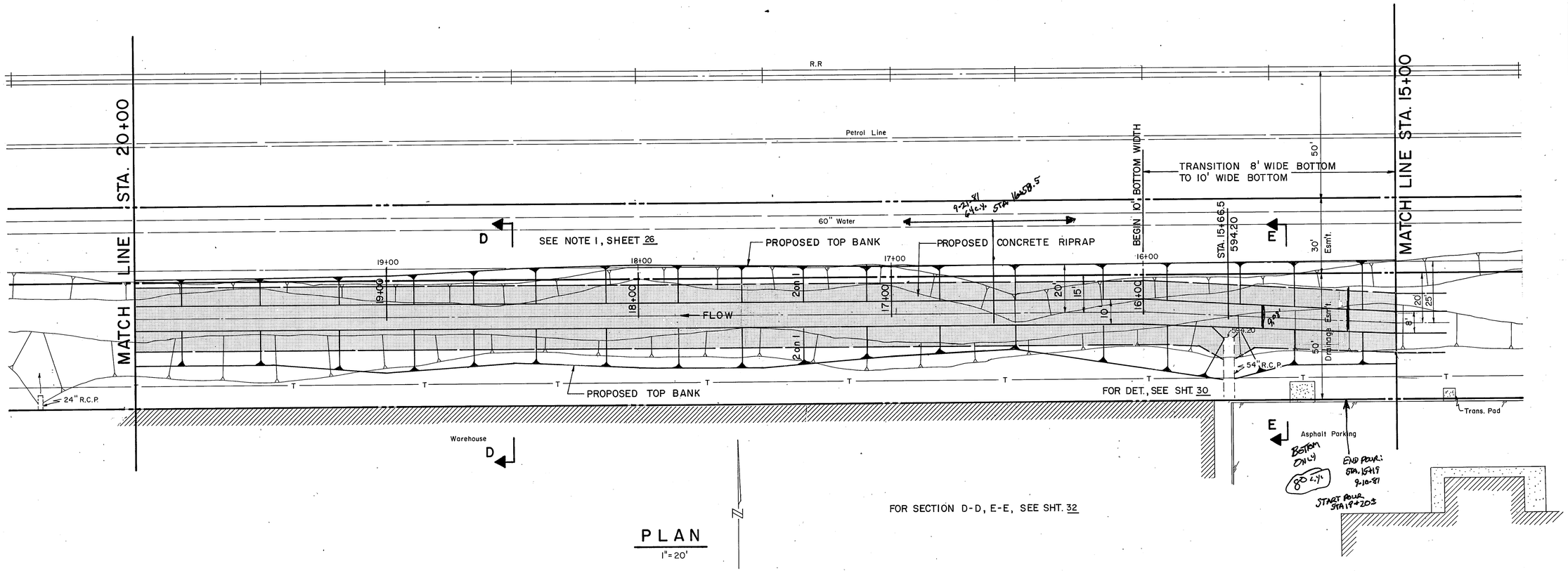
DRAINAGE DITCH

MIDWAY ROAD IMPROVEMENTS

STA. 10+00 to STA. 15+00

GINN, INC., Consulting Engineers, Dallas, Texas

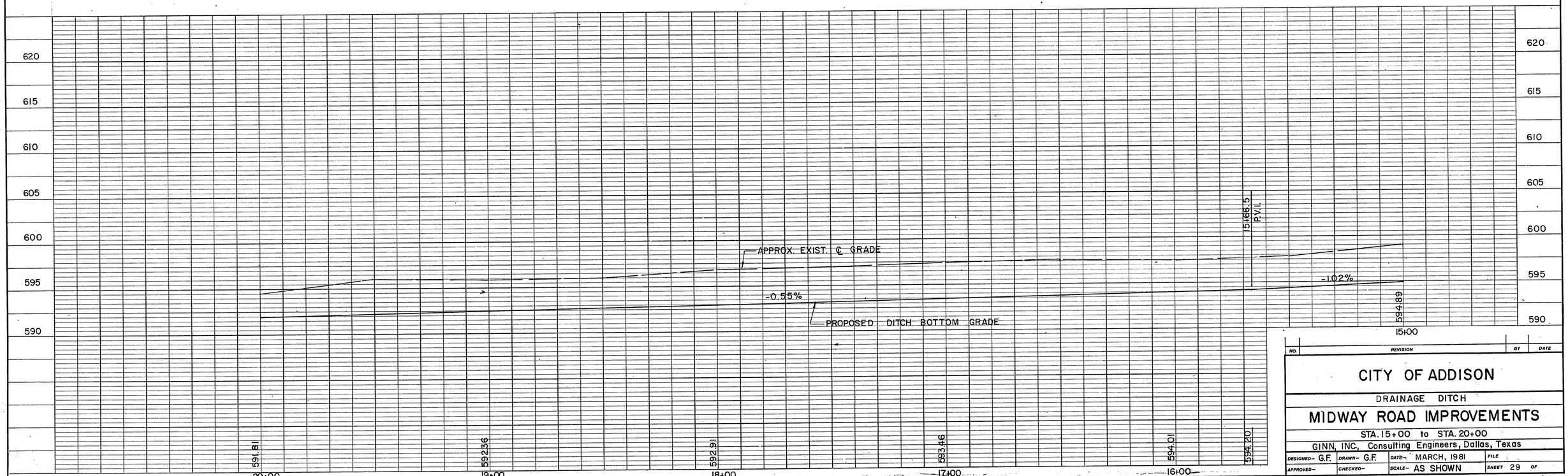
DESIGNED- G.F.	DRAWN- G.F.	DATE- MARCH, 1981	FILE	
APPROVED-	CHECKED-	SCALE- AS SHOWN	SHEET 28	OF



FOR SECTION D-D, E-E, SEE SHT. 32

PLAN

1" = 20'



NO.	REVISION	BY	DATE

CITY OF ADDISON

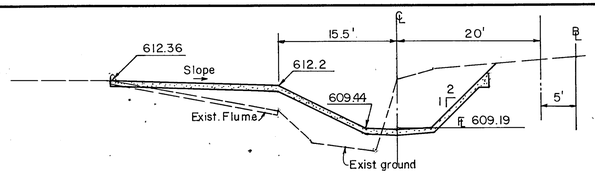
DRAINAGE DITCH

MIDWAY ROAD IMPROVEMENTS

STA. 15+00 to STA. 20+00

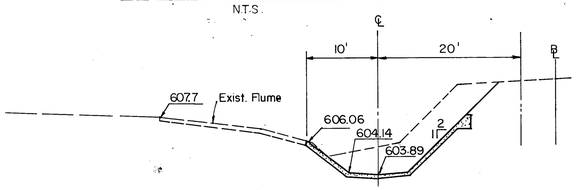
GINN, INC., Consulting Engineers, Dallas, Texas

DESIGNED- G.F.	DRAWN- G.F.	DATE- MARCH, 1981	FILE
APPROVED-	CHECKED-	SCALE- AS SHOWN	SHEET 29 OF



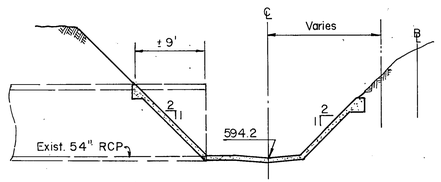
FLUME AT STA. 0+98.5

N.T.S.



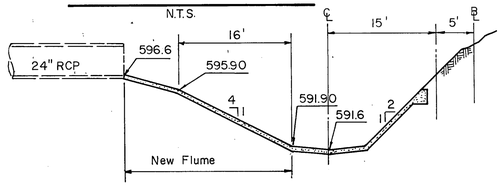
FLUME AT STA. 6+18.0

N.T.S.



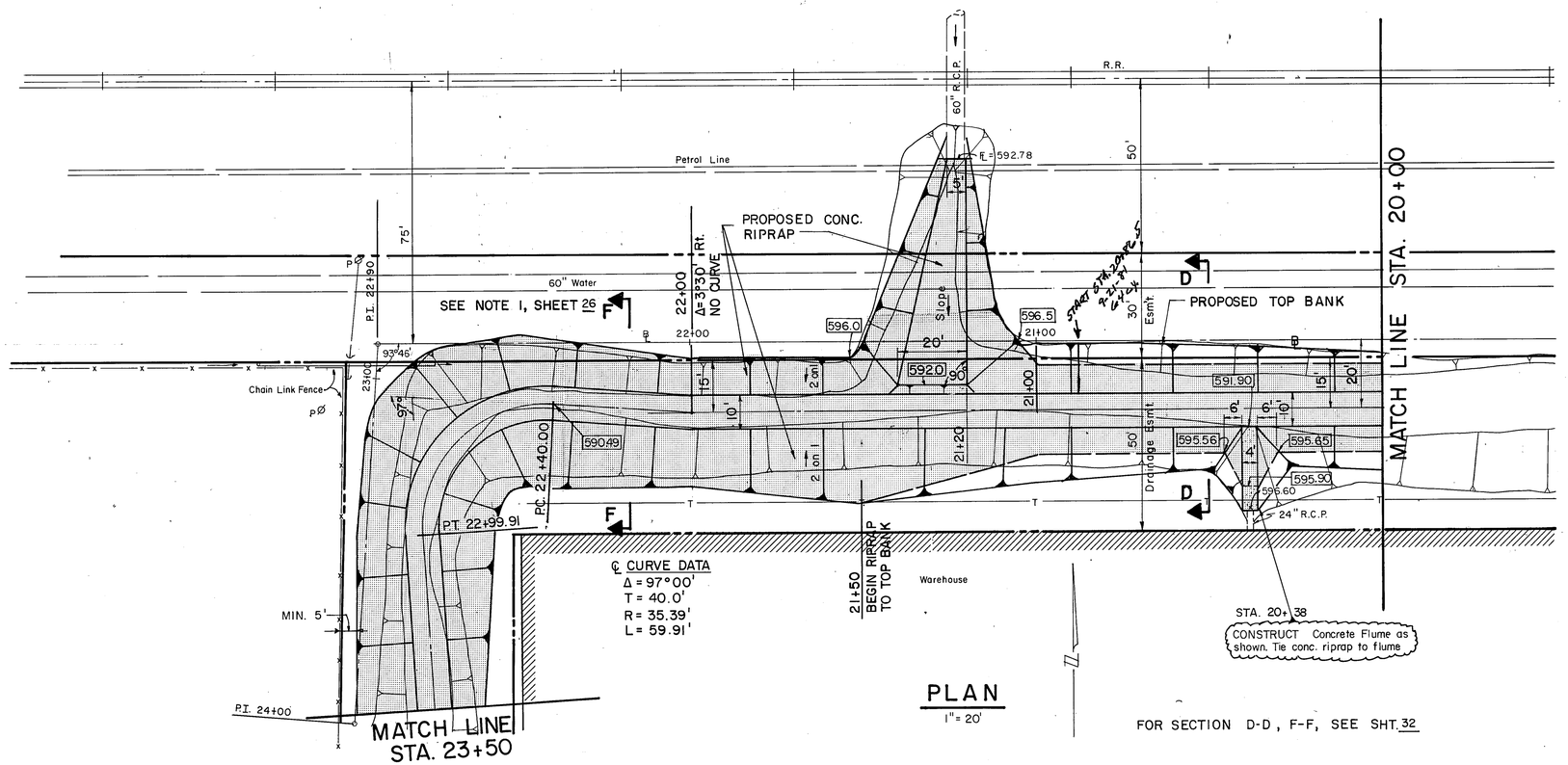
PIPE AT STA. 15+66.5

N.T.S.



FLUME AT STA. 20+38

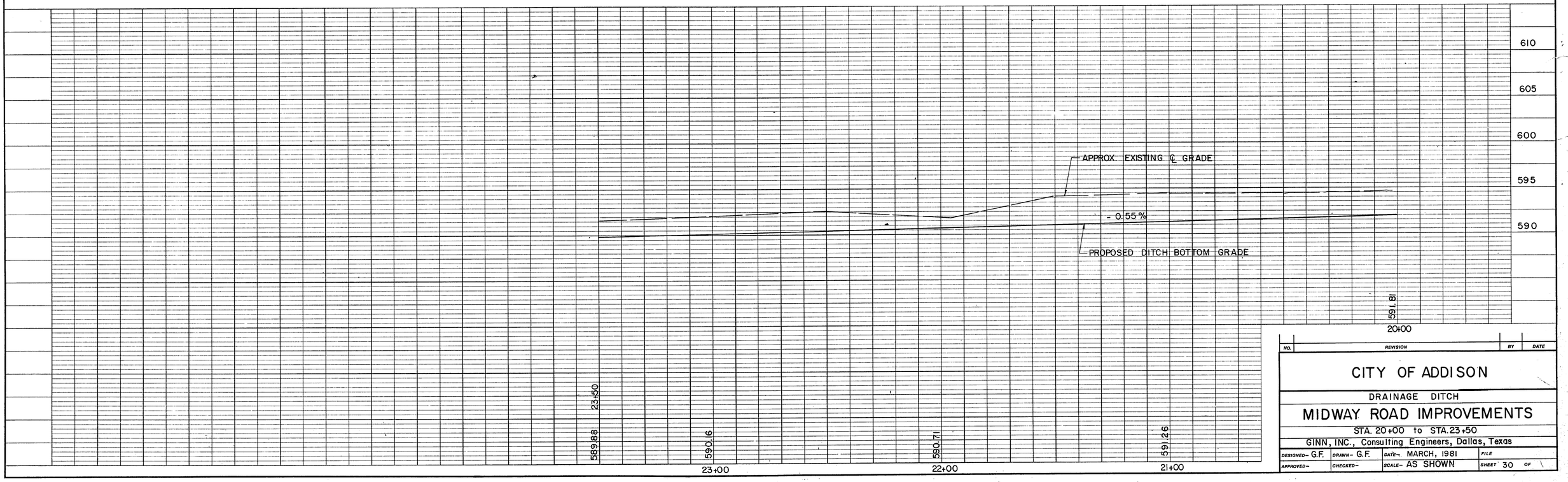
N.T.S.



PLAN

1" = 20'

FOR SECTION D-D, F-F, SEE SHT. 32



NO.	REVISION	BY	DATE

CITY OF ADDISON

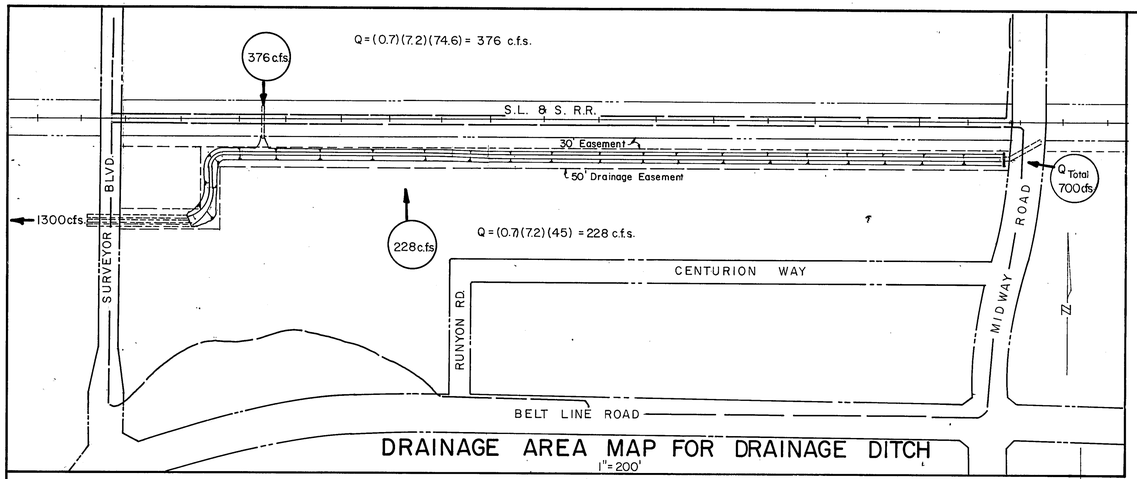
DRAINAGE DITCH

MIDWAY ROAD IMPROVEMENTS

STA. 20+00 to STA. 23+50

GINN, INC., Consulting Engineers, Dallas, Texas

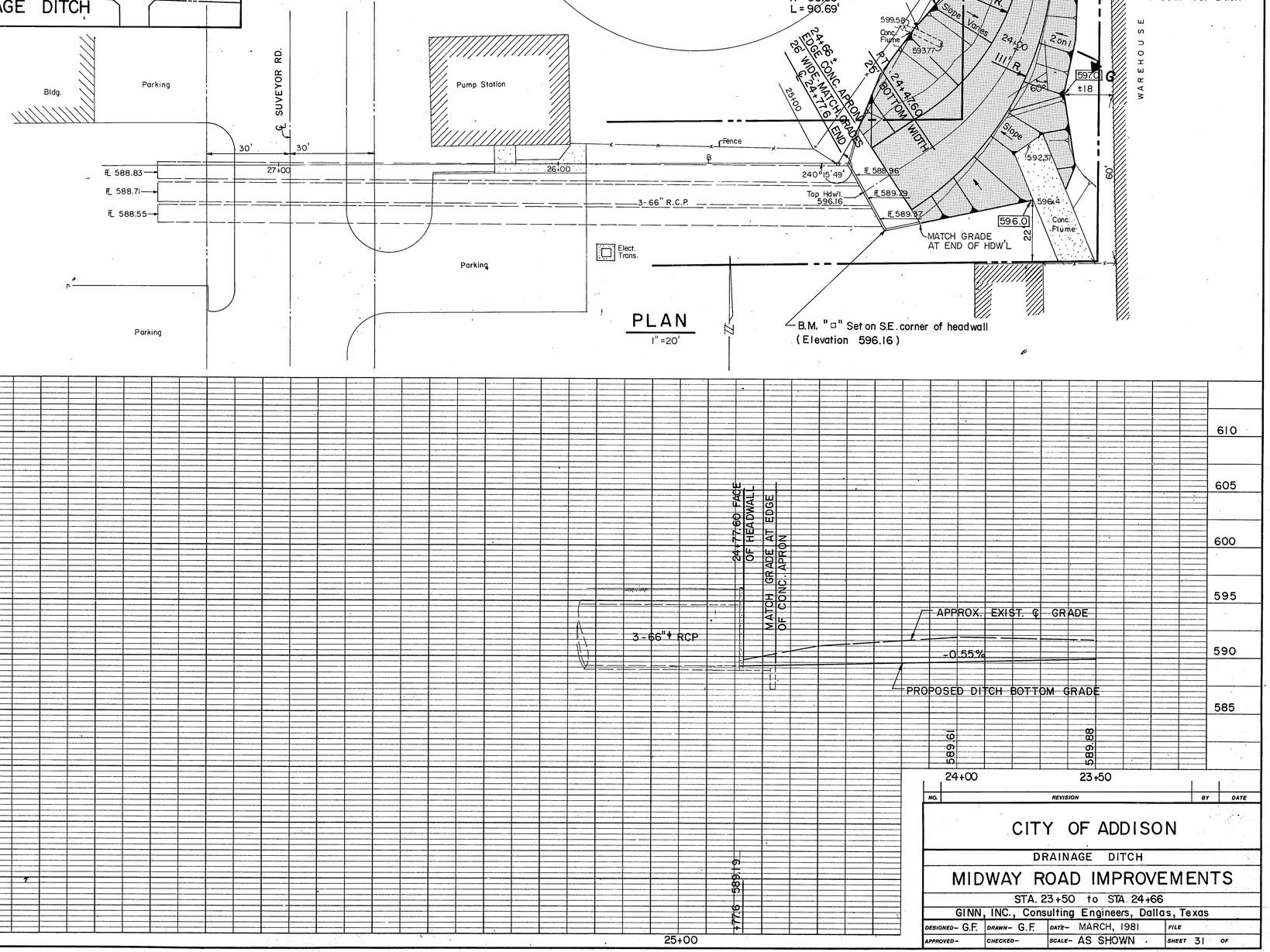
DESIGNED- G.F.	DRAWN- G.F.	DATE- MARCH, 1981	FILE
APPROVED-	CHECKED-	SCALE- AS SHOWN	SHEET 30 OF



DRAINAGE AREA MAP FOR DRAINAGE DITCH
1" = 200'

NOTE:
FROM APPROX. STA. 23+57 TO HEADWALL; BOTTOM DITCH GRADE AND WIDTH SHALL BE AS SHOWN. SIDE SLOPES SHALL BE GRADED, SHAPED AND CONSTRUCTED OF CONCRETE RIPRAP FROM EXISTING TOP BANK TO DITCH BOTTOM, OR TO ELEVATIONS AND DIMENSIONS INDICATED.

REMOVE EXIST. DISPLACED CONC. FLUME TO WITHIN 3' OF FENCE. (Verify location of displaced portion of flume); TIE NEW SIDE SLOPE TO REMAINING PORTION OF FLUME (After displaced portion is removed).



PLAN
1" = 20'

NO.	REVISION	BY	DATE

CITY OF ADDISON

DRAINAGE DITCH

MIDWAY ROAD IMPROVEMENTS

STA. 23+50 to STA. 24+66

GINN, INC., Consulting Engineers, Dallas, Texas

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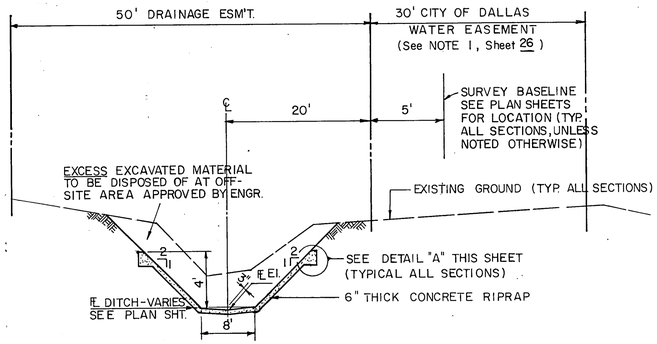
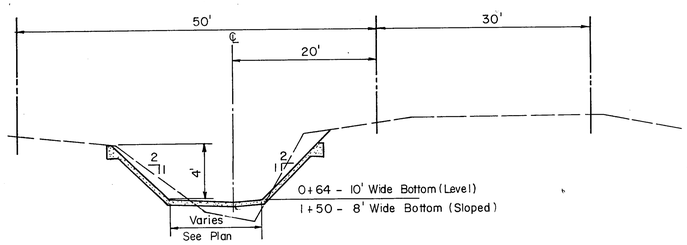
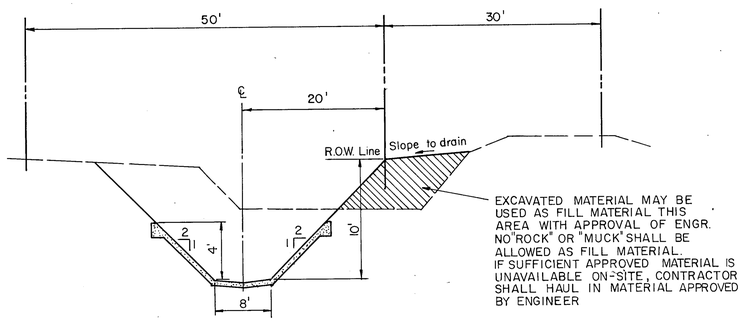
APPROVED-	CHECKED-	SCALE- AS SHOWN	SHEET 31 OF



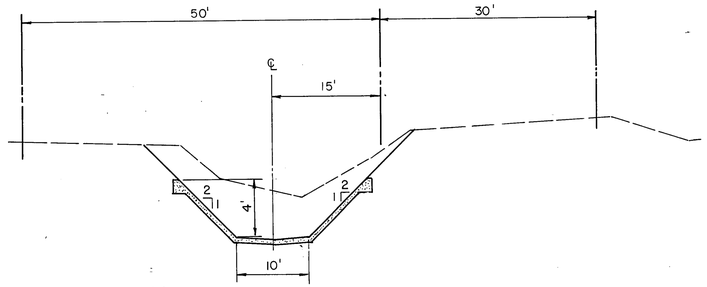
SECTION A-A TYPICAL STA. 1+50 to 11+50



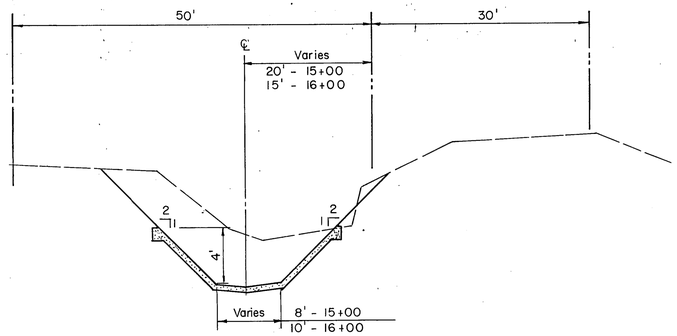
SECTION B-B TYPICAL STA. 0+64 to 1+50



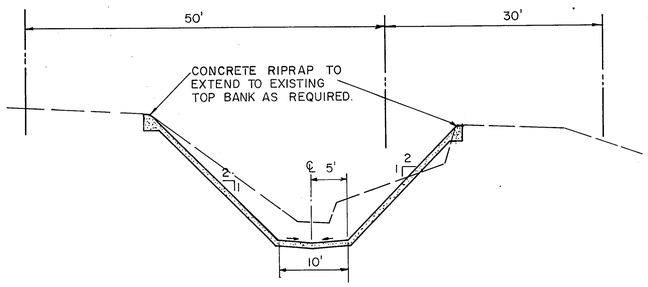
SECTION C-C TYPICAL STA. 11+50 to 15+00



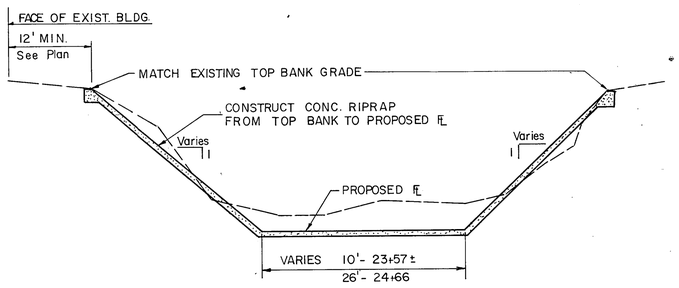
SECTION D-D TYPICAL STA. 16+00 to 21+00



SECTION E-E TYPICAL STA. 15+00 to 16+00



SECTION F-F TYPICAL STA. 21+00 to 23+57

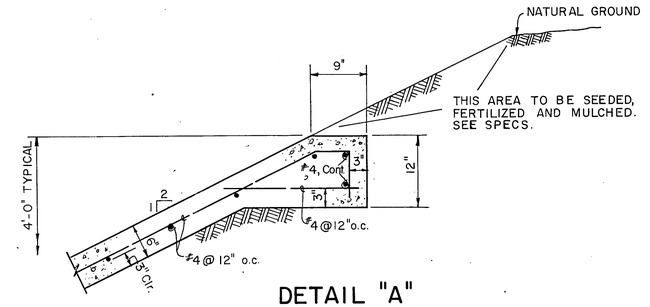


SECTION G-G TYPICAL STA. 23+57 to 24+66

TYPICAL DITCH SECTIONS

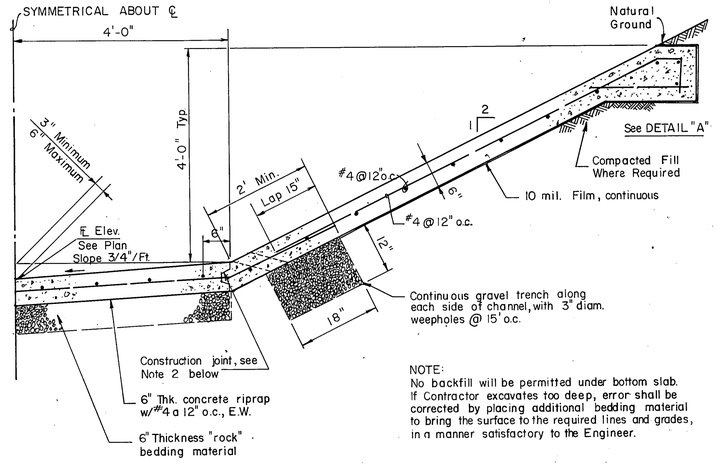
Scale: 1"= 10' Horiz, 1"= 5' Vert.

1. CONCRETE SHALL ATTAIN A MINIMUM COMPESSIVE STRENGTH OF 3000 psi @ 28 DAYS.
2. CONSTRUCTION JOINTS WHERE BOTTOM SLOPE MEETS SIDE SLOPE IS OPTIONAL; MONOLITHIC CONSTRUCTION MAY BE USED.
3. USE A FLOAT FINISH ON BOTTOM AND SLOPED SURFACES (TO BE EXPOSED).
4. ALL REINF. STEEL SHALL BE #4 @ 12" o.c., E.W. UNLESS OTHERWISE NOTED.
5. PROVIDE TRANSVERSE EXPANSION JOINTS AT 80' o.c., TOOLED JOINTS AT 20' o.c.. CONSTRUCTION JOINTS MAY BE USED IN LIEU OF TOOLED JOINTS. JOINTS SHALL EXTEND UP SIDE SLOPES.
6. DESIGNATION OF TYPICAL SECTIONS BY STATIONS IS APPROXIMATE AND MAY BE MODIFIED AS FIELD CONDITIONS DICTATE.



DETAIL "A"

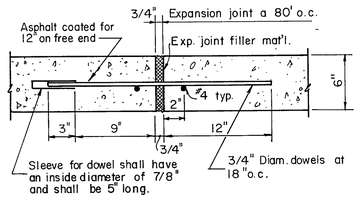
1"= 1'-0"



NOTE:
No backfill will be permitted under bottom slab. If Contractor excavates too deep, error shall be corrected by placing additional bedding material to bring the surface to the required lines and grades, in a manner satisfactory to the Engineer.

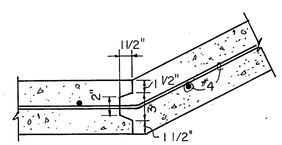
TYPICAL CHANNEL SECTION

3/4"=1'-0"



TRANSVERSE EXPANSION JOINT

1 1/2"= 1'-0"



CONSTRUCTION JOINT

1 1/2"= 1'-0"

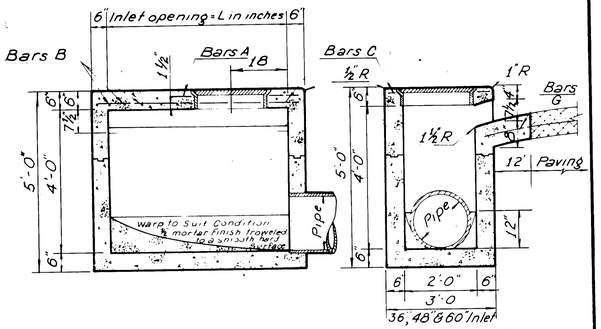
CITY OF ADDISON

DRAINAGE DITCH DETAILS

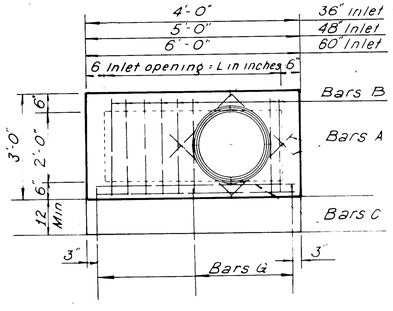
MIDWAY ROAD IMPROVEMENTS

GINN, INC., Consulting Engineers, Dallas, Texas

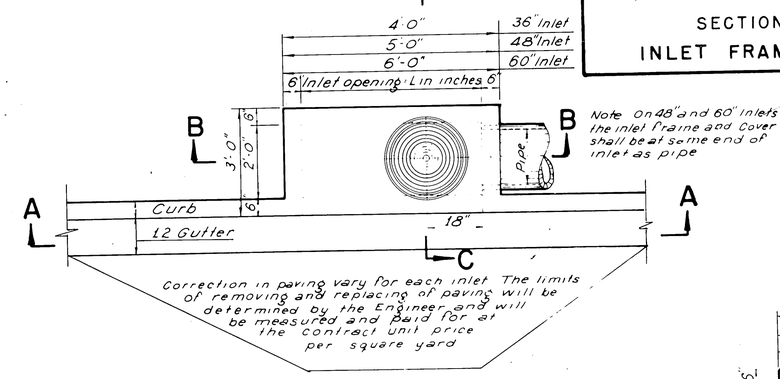
Designed- G.F.	Drawn- G.F.	Date- MARCH, 1981	
Approved-	Checked-	Scale- AS SHOWN	Sheet 32 of



SECTION B-B SECTION C-C



REINFORCING PLAN



PLAN

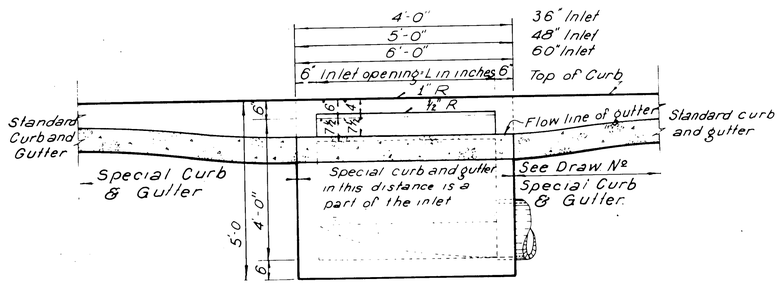
Note: On 48" and 60" inlets the inlet frame and cover shall be at same end of inlet as pipe

BARS A	
2'-9"	36" Inlet - #5-4 required
2'-9"	48" Inlet - #5-6 required
2'-9"	60" Inlet - #5-8 required

BARS B	
3'-3"	36" Inlet - #5-2 required
4'-8"	48" Inlet - #5-2 required
5'-9"	60" Inlet - #5-2 required

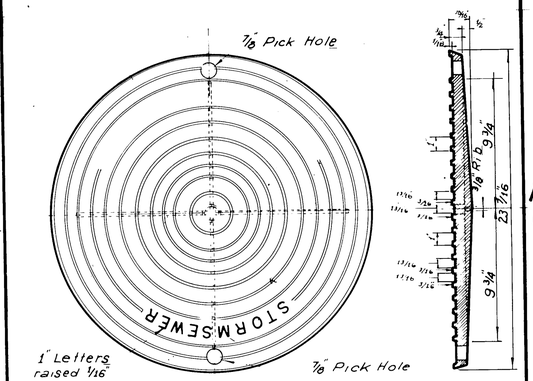
BARS C	
2'-6"	36" Inlet - #5-4 required
2'-6"	48" Inlet - #5-4 required
2'-6"	60" Inlet - #5-4 required

BARS G	
3'-0"	36", 48" & 60" Inlets #3-3 required

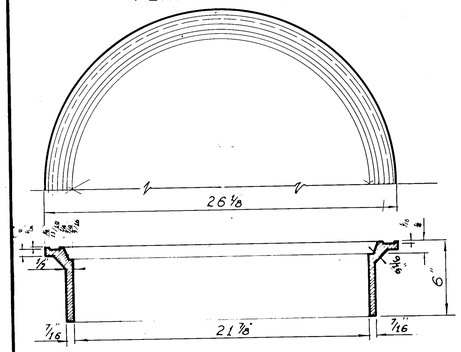


SECTION A-A

36, 48 AND 60 INCH INLETS

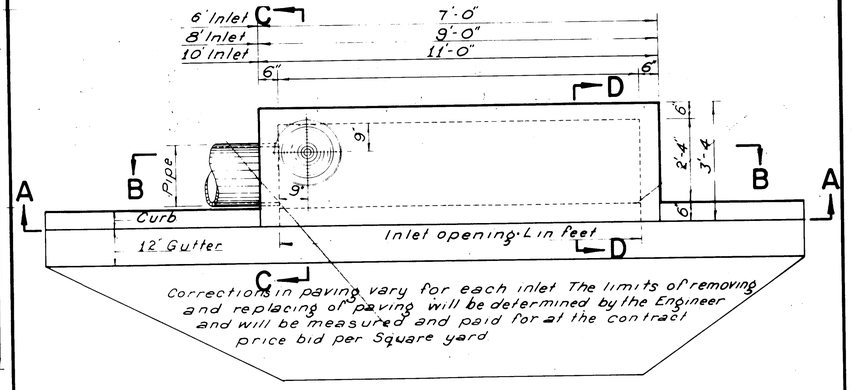


PLAN OF COVER

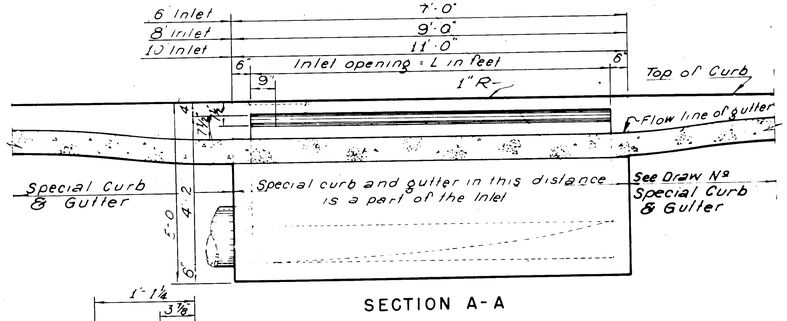


SECTION OF FRAME

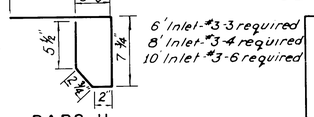
INLET FRAME AND COVER



PLAN



SECTION A-A



BARS H	
6' Inlet	#3-3 required
8' Inlet	#3-4 required
10' Inlet	#3-6 required

BARS A	
3'-0"	6' Inlet - #3-10 required
3'-0"	8' Inlet - #3-13 required
3'-0"	10' Inlet - #3-16 required

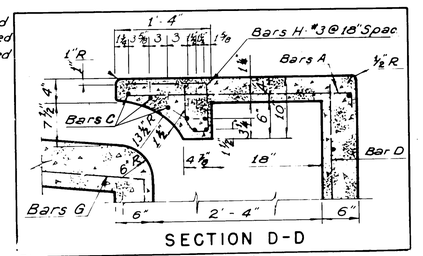
BARS B	
4'-10"	6' Inlet - #3-1 required
6'-10"	8' Inlet - #3-1 required
8'-10"	10' Inlet - #3-1 required

BARS C	
6'-8"	6' Inlet - #4-15 required
8'-8"	8' Inlet - #4-15 required
10'-8"	10' Inlet - #4-15 required

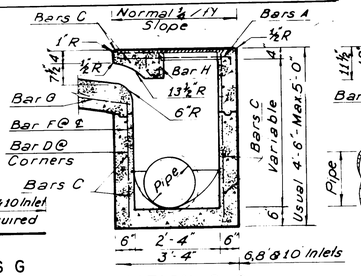
BARS D	
4'-8"	6, 8 & 10' Inlet #4-5 required

BARS F	
3'6"	6, 8 & 10 Inlet #4-1 required

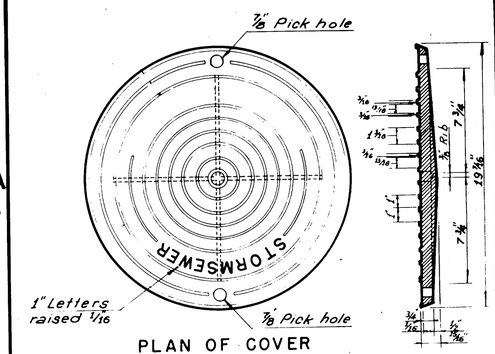
BARS G	
3'-0"	6, 8 & 10 Inlet #3-5 required



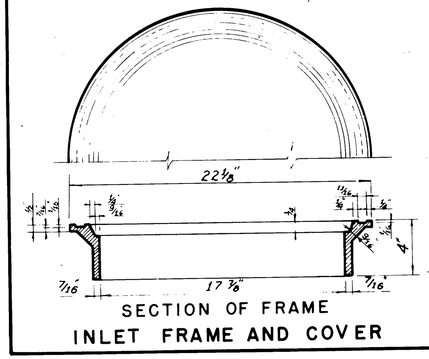
SECTION D-D



SECTION C-C

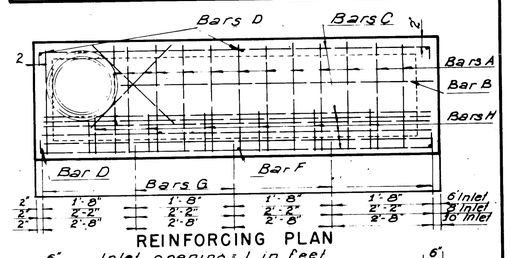


PLAN OF COVER

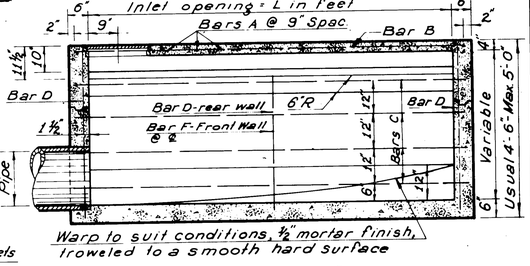


SECTION OF FRAME

INLET FRAME AND COVER



REINFORCING PLAN



SECTION B-B

6, 8 AND 10 FOOT INLETS

NOTES:

Concrete shall have a minimum compressive of 3000 psi at 28 days
Lateral pipe may enter inlet at any location.
The 12' gutter in front of inlet is a part of the inlet and shall be built with the inlet.
Top of inlet slope shall conform to adjacent parkway normal ¼"/ft Slope

COUNTY OF DALLAS
DEPARTMENT OF PUBLIC WORKS

STANDARD CURB INLET

36, 48 & 60 INCH INLET
6, 8 & 10 FOOT INLET

FROM CITY OF DALLAS DRAWING No. 424 Q

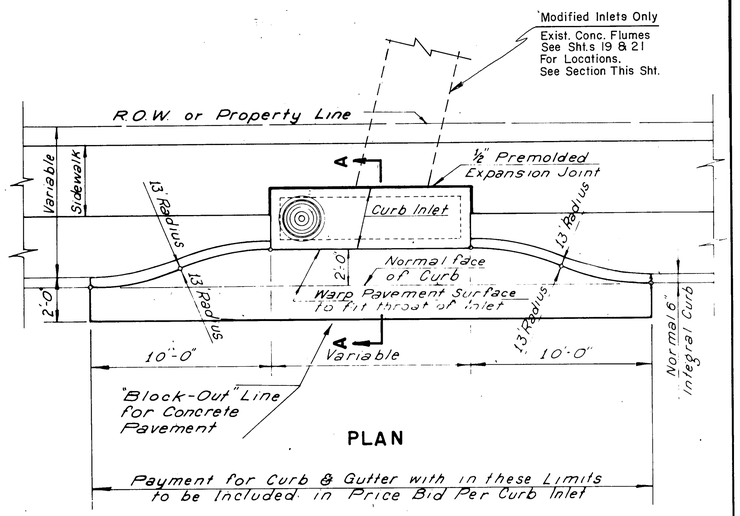
CITY OF ADDISON

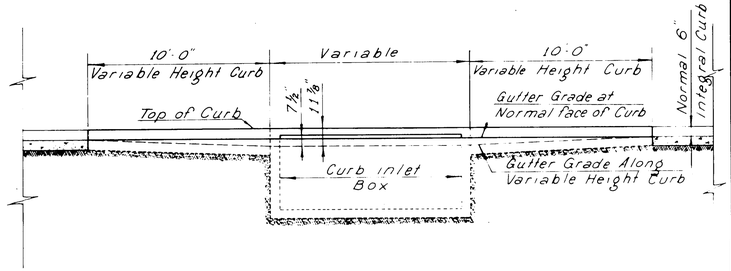
MIDWAY ROAD IMPROVEMENTS

STANDARD CURB INLET DETAILS

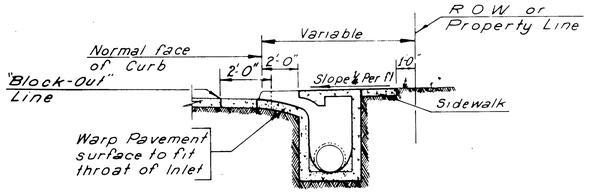
GINN, INC., Consulting Engineers

DESIGNED -	DRAWN - S.M.M	DATE 11-20-1980	SHEET 33 OF
APPROVED -	CHECKED - G.F.	SCALE - NONE	



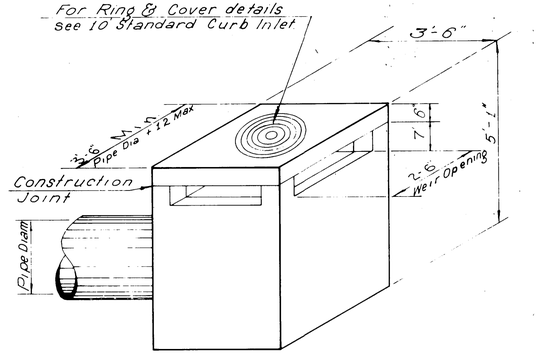


ELEVATION



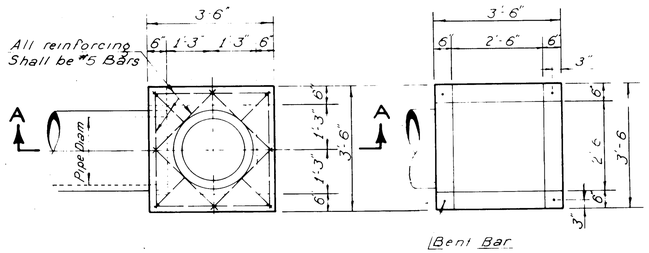
SECTION A-A

RECESSED STORM SEWER
CURB INLET
SCALE 1/4" = 1'-0"



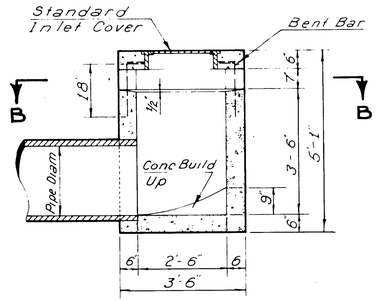
NOTE
Type "X" Inlet - Weir opening are required on four sides
Type "Y" Inlet - Weir opening are required on two opposite sides

ISOMETRIC DETAIL



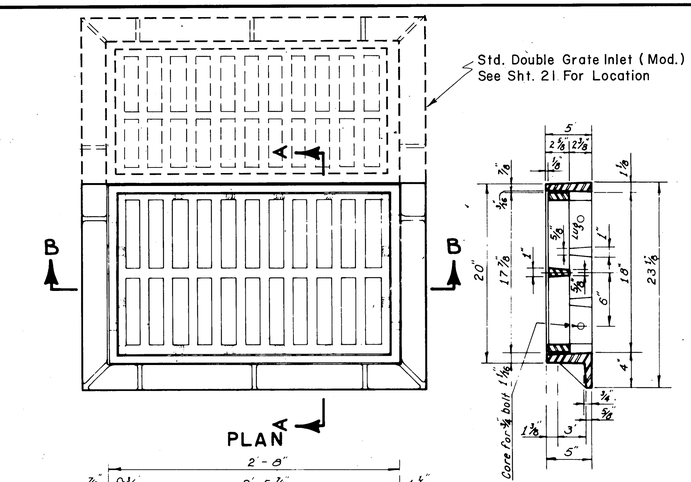
PLAN

SECTION B-B



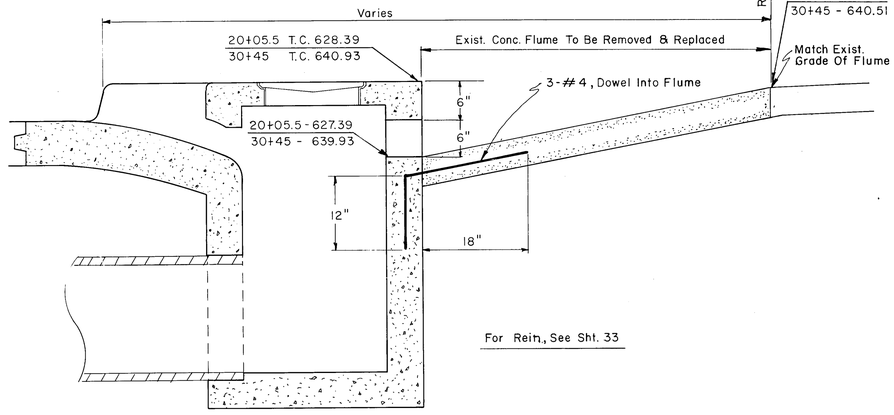
SECTION A-A

STANDARD
TYPE "X" & "Y" INLETS
SCALE 1/2" = 1'-0"
NOT IN CONTRACT



SECTION B-B

INLET GRATE & FRAME
SCALE 1 1/2" = 1'-0"



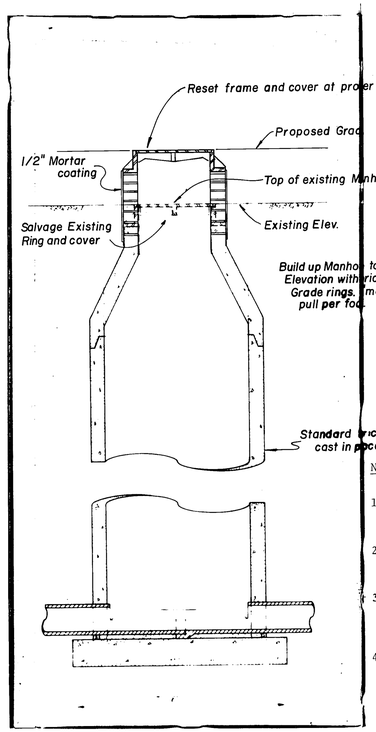
10' MODIFIED RECESSED INLET
(STA. 20+05.5 AND STA. 30+45)

CITY OF ADDISON

MIDWAY ROAD IMPROVEMENTS

RECESSED CURB INLET DETAILS

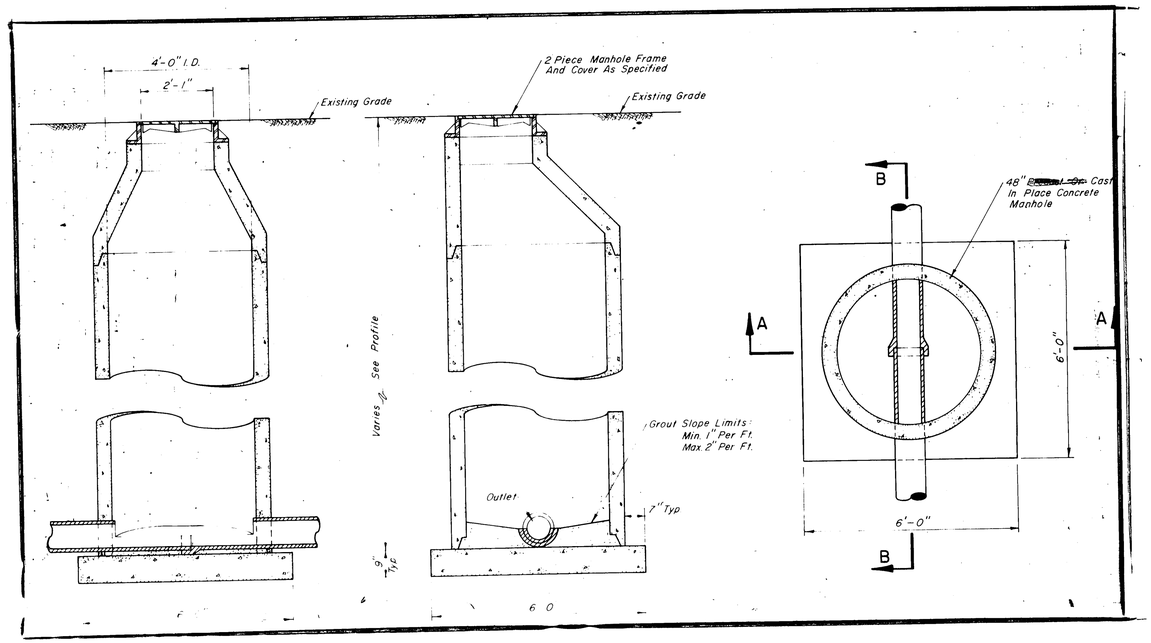
BINN, INC., Consulting Engineers			
DESIGNED -	DRAWN - S.M.M.	DATE - 11-20-1980	
APPROVED -	CHECKED G.F.	SCALE - NONE	SHEET 34 OF



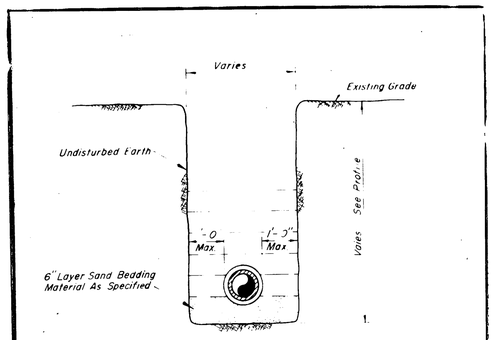
NOTE

1. Sanitary sewer shall be kept clear of broken concrete, dirt, or any other debris resulting from construction operations.
2. Pipe to be extended or replaced will be of the same type as the existing unless alternate type is approved by the Engineer.
3. Castings, covers or any other material parts which may be damaged or lost by the contractor's operations will be replaced at the contractor's expense with City standard appurtenances.
4. The adjusted facilities must be clean, fully operational and equal in quality with new construction at the time of final inspection of the project.

TYPICAL MANHOLE ADJUSTMENT

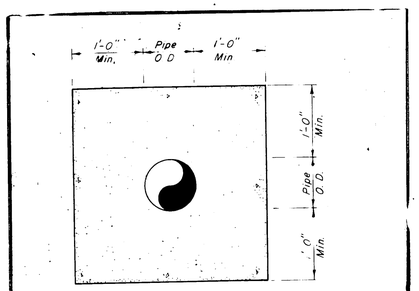


TYPICAL MANHOLE DETAIL



TYPICAL SEWER EMBEDMENT

No Scale

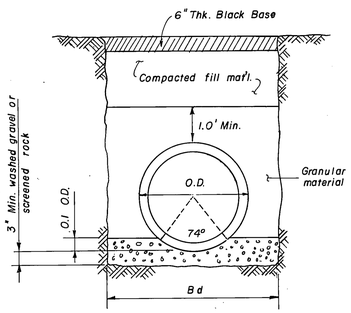


NOTE:
Length Varies See Profile For Required Length

TYPICAL CONCRETE ENCASEMENT

No Scale

PIPE DIA.		Bd	CUBIC YARDS PER 100 L.F.	
I.D.	O.D.		GRAVEL	GRANULAR MATERIAL
15"	19"	39"	4.53	22.28
18"	22.5"	42"	5.13	25.15
21"	26"	45"	5.76	28.03
24"	29.5"	48"	6.42	30.94
27"	33"	51"	7.11	33.86
30"	37"	54"	7.85	36.72
33"	40.5"	57"	8.59	39.64
36"	44"	60"	9.36	42.58
39"	47.5"	63"	10.16	45.53
42"	51"	66"	10.99	48.51
48"	58"	72"	12.72	54.51



STORM SEWER EMBEDMENT

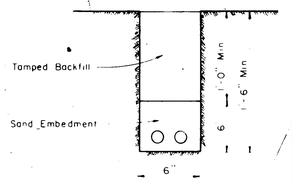
CITY OF ADDISON

MIDWAY ROAD IMPROVEMENTS

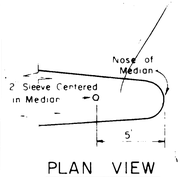
TYPICAL MANHOLE STANDARD DET.

GINN, INC., Consulting Engineers

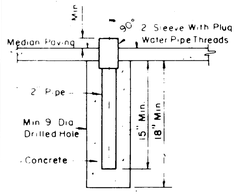
DESIGNED -	DRAWN - R.G.B.	DATE - March, 1981	
APPROVED -	CHECKED -	SCALE - None	SHEET 35 OF



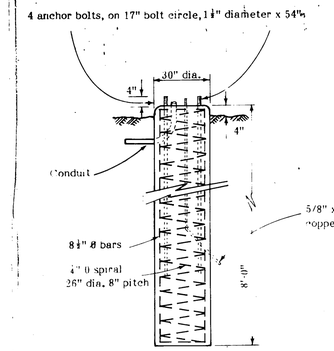
CONDUIT EMBEDMENT



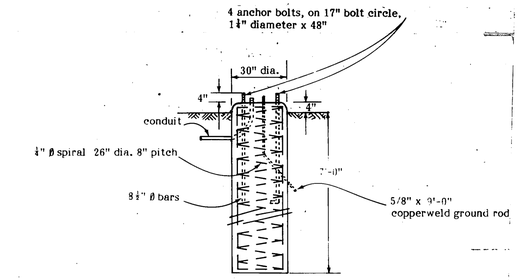
PLAN VIEW



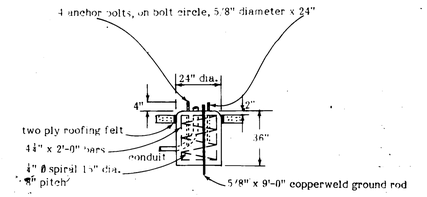
2" CONDUIT STUB
FOR TRAFFIC SIGN



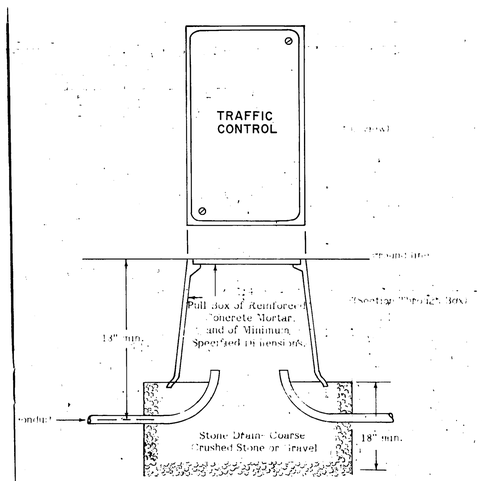
CONCRETE FOUNDATION
TYPE A



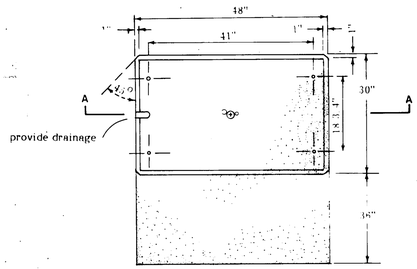
CONCRETE FOUNDATION
TYPE B



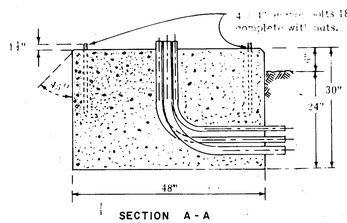
CONCRETE FOUNDATION
TYPE C



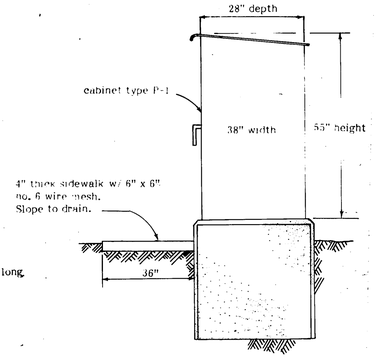
TYPICAL PULL BOX AND CONDUIT INSTALLATION



TOP VIEW



SECTION A - A



NOTE: All conduit shall be stubbed up from flush to 2" max. above foundation top

NOT IN CONTRACT
CONTROLLER CABINET FOUNDATION

CITY OF ADDISON
DALLAS COUNTY, TEXAS

TYPICAL PULL BOX DETAILS

GINN, INC.
Consulting Engineers — Dallas, Texas

DESIGNED - H.K.	DRAWN - S.M.M.	DATE - March, 1981	
APPROVED - H.W.G.	CHECKED - H.B.J.	SCALE - NONE	SHEET 36 OF

Culvert Size S × H	Slab Depth "T"	Max Fill FT	Wing Height "Z"	Wing Length "L"	Total Quant. 4 Wingwalls Conc. CY	Total Quant. 4 Wingwalls Reinf. LB	Table of Dimensions "R"	"W"	"V"	"D"	"Y"
3 × 2	6"	14'	3'-6"	5'-3"	4.10	558	6½"	2'-6"	8"	10	1'-0"
3 × 3	6"	14'	4'-6"	6'-9"	6.11	818	7"	2'-10"	8"	1'-2"	1'-0"
4 × 2	6"	12'	3'-6"	5'-3"	4.21	564	6½"	2'-6"	8"	10"	1'-0"
4 × 3	6"	12'	4'-6"	6'-9	6.23	824	7"	2'-10"	8"	1'-2"	1'-0"
4 × 4	6"	12'	5'-6"	8'-3"	8.75	1322	7"	3'-5"	8"	1'-7"	1'-2
5 × 2	6"	8'	3'-6"	5'-3"	4.33	569	7"	2'-6"	8"	10"	1'-0"
5 × 3	6"	8'	4'-6"	6'-9"	6.34	829	7"	2'-10"	8"	1'-2"	1'-0"
5 × 4	6"	8'	5'-6"	8'-3"	8.87	1328	7"	3'-5"	8"	1'-7"	1'-2"
5 × 5	6"	8'	6'-6"	9'-9"	11.86	1876	7"	4'-0"	8"	2'-0"	1'-4"
6 × 3	6"	8'	4'-6"	6'-9"	6.46	835	7"	2'-10"	8"	1'-2"	1'-0"
6 × 4	6"	8'	5'-6"	8'-3"	8.90	1334	7"	3'-5"	8"	1'-7"	1'-2"
6 × 5	6"	8'	6'-6"	9'-9"	11.99	1883	7"	4'-0"	8"	2'-0"	1'-4"
6 × 6	6"	8'	7'-6"	11'-3"	15.56	2616	7"	4'-8"	8"	2'-5"	1'-9"
7 × 3	6½"	8'	4'-6½"	6'-10"	6.68	841	7"	2'-10"	8"	1'-2"	1'-0"
7 × 4	6½"	8'	5'-6½"	8'-4"	9.24	1341	7"	3'-5"	8"	1'-7"	1'-2"
7 × 5	6½"	8'	6'-6½"	9'-10"	12.27	1890	7"	4'-0	8"	2'-0"	1'-4"
7 × 6	6½"	8'	7'-6½"	11'-4"	15.89	2624	7"	4'-8"	8"	2'-3"	1'-9"
7 × 7	6½"	8'	8'-6½"	12'-10	21.55	3650	8"	5'-2"	9½"	2'-6½"	1'-10"
8 × 4	6½"	4'	5'-6½"	8'-4"	9.36	1341	7"	3'-5"	8"	1'-7"	1'-2"
8 × 5	6½"	4'	6'-6½"	9'-10"	12.40	1897	7"	4'-0"	8"	2'-0"	1'-4
8 × 6	6½"	4'	7'-6½"	11'-4"	16.03	2632	7"	4'-8"	8"	2'-3"	1'-9"
8 × 7	6½"	4'	8'-6½"	12'-10"	21.70	3659	8"	5'-2"	9½"	2'-6½"	1'-10"
8 × 8	6½"	4'	9'-6½"	14'-4"	28.49	5222	9"	5'-9"	10½"	2'-8½"	2'-2
8 × 4	7"	6'	5'-7"	8'-4"	9.41	1347	7"	3'-5"	8"	1'-7"	1'-2"
8 × 5	7"	6'	6'-7"	9'-10"	12.46	1897	7"	4'-0"	8"	2'-0"	1'-4"
8 × 6	7"	6'	7'-7"	11'-4"	16.11	2632	7"	4'-8"	8"	2'-3"	1'-9"
8 × 7	7"	6'	8'-7"	12'-10"	21.79	3659	8"	5'-2"	9½"	2'-6½"	1'-10"
8 × 8	7"	6'	9'-7"	14'-4"	28.60	5222	9"	5'-9"	10½"	2'-8½"	2'-2"
8 × 4	7½"	8'	5'-7½"	8'-5"	9.54	1347	7"	3'-5"	8"	1'-7"	1'-2"
8 × 5	7½"	8'	6'-7½"	9'-11"	12.61	1897	7"	4'-0"	8"	2'-0"	1'-4"
8 × 6	7½"	8'	7'-7½"	11'-5"	16.30	2632	7"	4'-8"	8"	2'-3"	1'-9"
8 × 7	7½"	8'	8'-7½"	12'-11"	22.02	3659	8"	5'-2"	9½"	2'-6½"	1'-10"
8 × 8	7½"	8'	9'-7½"	14'-5"	28.88	5222	9"	5'-9"	10½"	2'-8½"	2'-2
9 × 5	7"	6'	6'-7"	9'-10"	12.59	1904	7"	4'-0"	8"	2'-0"	1'-4"
9 × 6	7"	6'	7'-7"	11'-4"	16.26	2640	7"	4'-8"	8"	2'-3"	1'-9"
9 × 7	7"	6'	8'-7"	12'-10"	21.95	3668	8"	5'-2"	9½"	2'-6½"	1'-10"
9 × 8	7"	6'	9'-7"	14'-4"	28.78	5232	9"	5'-9"	10½"	2'-8½"	2'-2"
9 × 9	7"	6'	10'-7"	15'-10"	37.26	6874	9½"	6'-4"	12½"	2'-10½"	2'-5"
9 × 5	8"	8'	6'-8"	10'-0"	12.90	1904	7"	4'-0"	8"	2'-0"	1'-4"
9 × 6	8"	8'	7'-8"	11'-6"	17.35	2640	7½"	4'-9"	8½"	2'-3½"	1'-9"
9 × 7	8"	8'	8'-8"	13'-0"	23.11	3668	8½"	5'-4"	9½"	2'-7½"	1'-11"
9 × 8	8"	8'	9'-8"	14'-6"	30.73	5232	9½"	6'-0"	11"	2'-11"	2'-2"
9 × 9	8"	8'	10'-8"	16'-0	38.93	6874	10"	6'-6"	12½"	2'-11½"	2'-6"
10 × 5	7"	4'	6'-7"	9'-10"	12.72	1911	7"	4'-0"	8"	2'-0"	1'-4"
10 × 6	7"	4'	7'-7"	11'-4"	16.41	2648	7"	4'-8"	8	2'-3"	1'-9"
10 × 7	7"	4'	8'-7"	12'-10"	22.11	3677	8"	5'-2"	9½"	2'-6½"	1'-10"
10 × 8	7"	4'	9'-7	14'-4"	28.96	5241	9"	5'-9"	10½	2'-8½"	2'-2"
10 × 9	7"	4'	10'-7"	15'-10"	37.45	6885	9½"	6'-4"	12½"	2'-10½"	2'-5"
10 × 10	7"	4'	11'-7"	17'-4"	46.02	8740	11"	7'-0"	13½"	3'-2½"	2'-8"
10 × 5	8"	6'	6'-8"	10'-0"	13.04	1911	7"	4'-0"	8"	2'-0"	1'-4"
10 × 6	8"	6'	7'-8"	11'-6"	17.51	2648	7½"	4'-9"	8½"	2'-3½"	1'-9"
10 × 7	8"	6'	8'-8"	13'-0"	23.26	3677	8½"	5'-4"	9½"	2'-7½"	1'-11"
10 × 8	8"	6'	9'-8"	14'-6"	30.91	5241	9½"	6'-0"	11"	2'-11"	2'-2"
10 × 9	8"	6'	10'-8"	16'-0"	39.14	6885	10"	6'-6"	12½"	2'-11½"	2'-6"
10 × 10	8	6'	11'-8"	17'-6"	48.80	8740	11"	7'-0"	13½	3'-2½"	2'-8"
10 × 5	8½"	8'	6'-8½"	10'-1"	13.20	1911	7"	4'-0"	8"	2'-0"	1'-4"
10 × 6	8½"	8'	7'-8½"	11'-7"	17.71	2648	7½"	4'-9"	8½"	2'-3½"	1'-9"
10 × 7	8½"	8'	8'-8½"	13'-1"	23.52	3677	8½"	5'-4"	9½"	2'-7½"	1'-11"
10 × 8	8½"	8'	9'-8½"	14'-7"	31.20	5241	9½"	6'-0"	11"	2'-11"	2'-2"
10 × 9	8½"	8'	10'-8½"	16'-1"	39.50	6885	10"	6'-6"	12½"	2'-11½"	2'-6"
10 × 10	8½"	8'	11'-8½"	17'-7"	49.18	8740	11"	7'-0"	13½"	3'-2½"	2'-8"

BILL OF #4 BARS S2 @12"± FOR 2 CULVERT APRONS

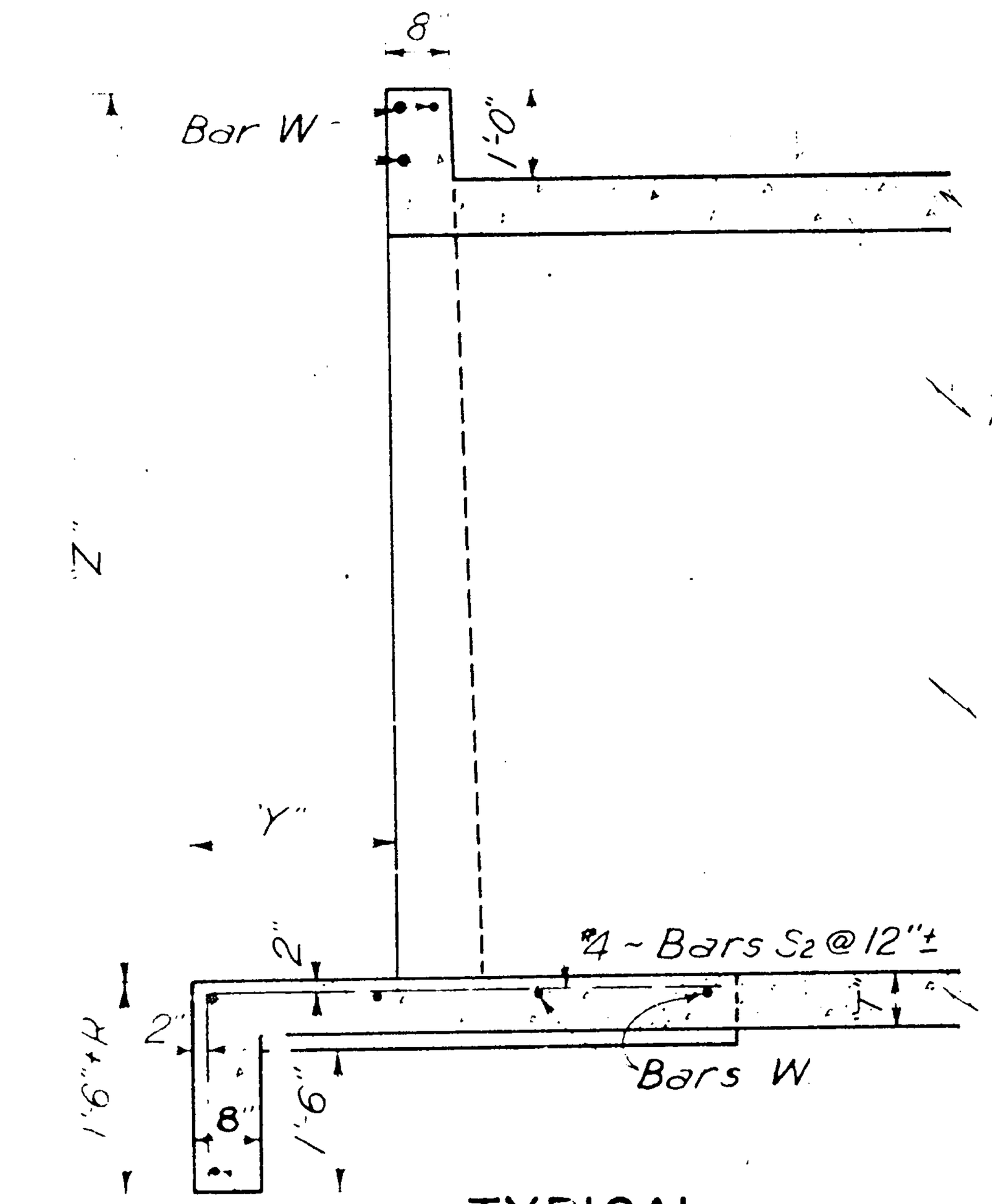
"Z"	Span	No	Lgth	Weight	"Z"	Span	No	Lgth	Weight
3'-6"	3'-0"	8	3'-10"	20	6'-6"	9'-0"	20	5'-4"	71
	4'-0"	10	3'-10"	26		10'-0"	22	5'-4"	78
	5'-0"	12	3'-10"	31	7'-6"	6'-0"	14	6'-0"	56
4'-6"	3'-0"	8	4'-2"	22		7'-0"	16	6'-0"	64
	4'-0"	10	4'-2	28		8'-0"	18	6'-0"	72
	5'-0"	12	4'-2"	33		9'-0"	20	6'-0"	80
	6'-0"	14	4'-2"	39		10'-0"	22	6'-0"	88
	7'-0"	16	4'-2"	45	8'-6½"	7'-0"	16	6'-6"	69
5'-6"	4'-0"	10	4'-9"	32		8'-0"	18	6'-6"	78
	5'-0"	12	4'-9"	38		9'-0"	20	6'-6"	87
	6'-0"	14	4'-9"	44		10'-0"	22	6'-6"	96
	7'-0"	16	4'-9"	51	9'-6½"	8'-0"	18	7'-1"	85
	8'-0	18	4'-9"	57		9'-0"	20	7'-1"	95
6'-6"	5'-0"	12	5'-4"	43		10'-0"	22	7'-1"	104
	6'-0"	14	5'-4"	50	10'-7"	9'-0"	20	7'-8"	102
	7'-0"	16	5'-4"	57		10'-0"	22	7'-8"	113
	8'-0"	18	5'-4"	64	11'-7"	10'-0"	22	8'-4"	122

TABLE OF REINFORCING STEEL FOR 4 WING WALLS

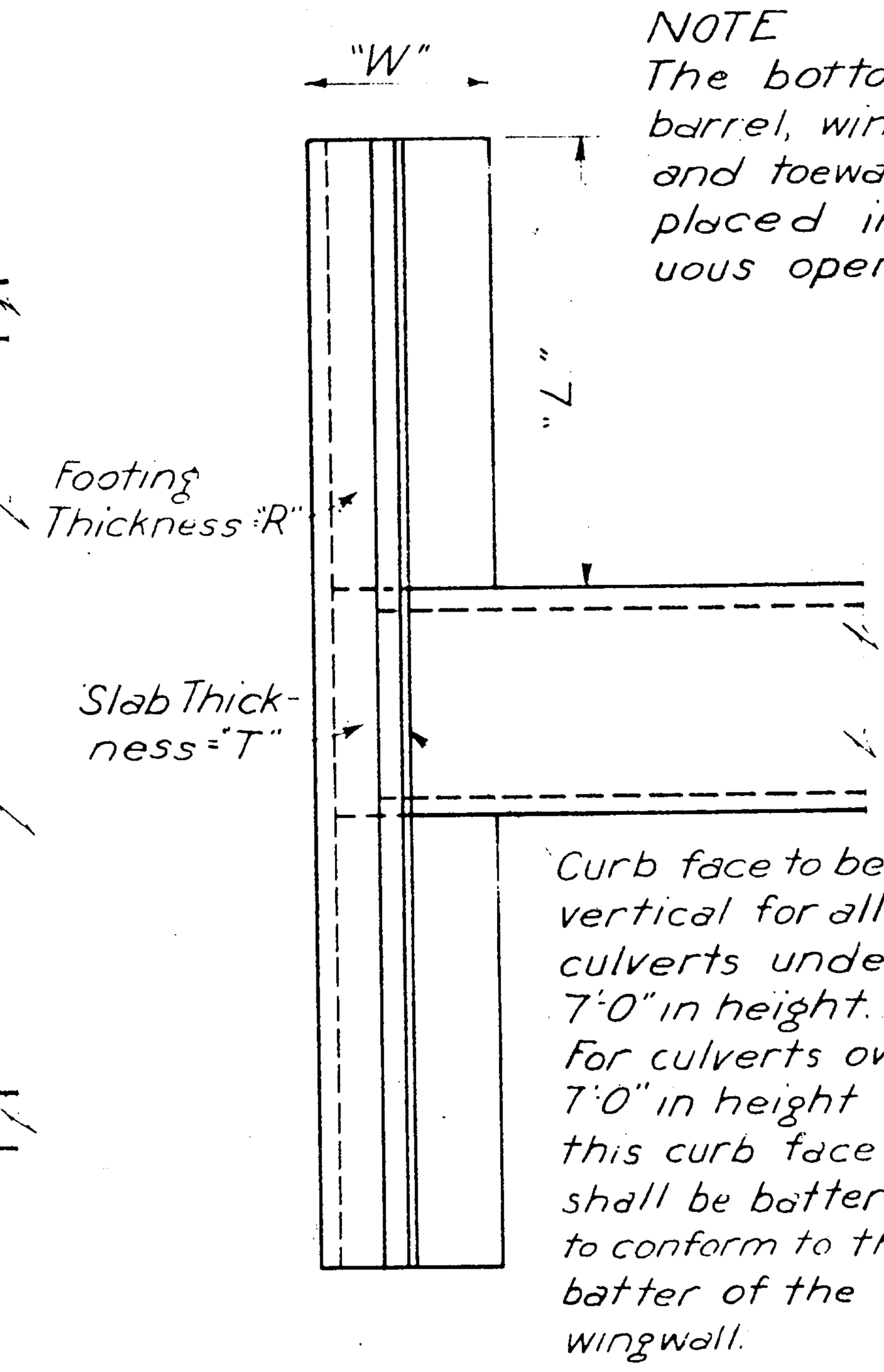
Wing Size "Z"	Wing Size "L"	Bars R No	Bars R Size	Bars R Spac	Bars R Length	Bars R Weight	Bars S1 No	Bars S1 Size	Bars S1 Spac	Bars S1 Length	Bars S1 Weight
3'-6"	5'-3"	24	#4	12"	5'-1"	81	24	#4	12"	3'-11"	63
4'-6"	6'-9"	32	#4	11"	6'-1"	130	32	#4	11"	4'-3	91
5'-6"	8'-3"	60	#4	7"	7'-3"	291	60	#4	7"	4'-10"	194
6'-6"	9'-9"	56	#5	8½"	8'-5"	492	60	#5	8"	5'-5"	339
7'-6"	11'-3"	80	#5	7"	9'-10"	820	80	#5	7"	6'-1"	507
8'-6½"	12'-10"	112	#5	5½"	11'-4"	1,324	104	#5	6"	6'-7"	714
9'-6½"	14'-4"	108	#6	6½"	12'-9"	2068	116	#6	6"	7'-4"	1277
10'-7"	15'-10"	140	#6	5½"	14'-4"	3,013	140	#6	5½"	7'-11"	1665
11'-7"	17'-4"	168	#6	5"	15'-9"	3974	168	#6	5"	8'-7"	2165

Wing Size "Z"	#4 Bars T1 @18"± No	Length	Weight	#4 Bars T2 @12"± No	Length	Weight	Bars U No	Size	Spac	Length	Weight	#4 Bars P @18" c.c. Spac	Length	Weight	#4 Bars W @12"± No	Length	Weight	Total Weight
3'-6"	16	5'-0"	53	8	5'-0"	27	16	#5	18"	6'-0"	100	20	3'-9"	50	28	8'-9"	164	538
4'-6"	24	6'-6"	104	8	6'-6"	35	24	#5	18"	6'-0"	150	24	4'-9"	76	28	11'-3"	210	796
5'-6"	32	8'-0"	171	8	8'-0	43	32	#5	18"	6'-0"	200	28	5'-9"	108	32	13'-3'	283	1290
6'-6"	32	9'-6"	203	12	9'-6"	76	32	#5	18"	6'-0"	200	32	6'-9"	144	36	15'-9"	379	1833
7'-6"	40	11'-0"	294	12	11'-0"	88	40	#5	18"	6'-0"	250	36'	7'-9"	186	36	17'-3"	415	2560
8'-6½"	48	12'-7"	403	12	12'-7"	101	48	·5	18"	6'-0"	300	40"	8'-9"	234	40	18'-11"	505	3581
9'-6½"	48	14'-1"	452	16	14'-1"	150	48	·5	18"	6'-0"	300	44	9'-9"	287	44	20'-6"	603	5137
10'-7"	56	15'-7"	583	16	15'-7"	167	56	·5	18"	6'-0"	350	48	10'-10"	347	44	22'-0"	647	6772
11'-7"	64	17'-1"	730	16	17'-1"	183	64	·5	18"	6'-0"	401	52	11'-10"	411	48	23'-6"	754	8618

NOTE
The bottom slab of the barrel, wing footings and toewalls shall be placed in one continuous operation.

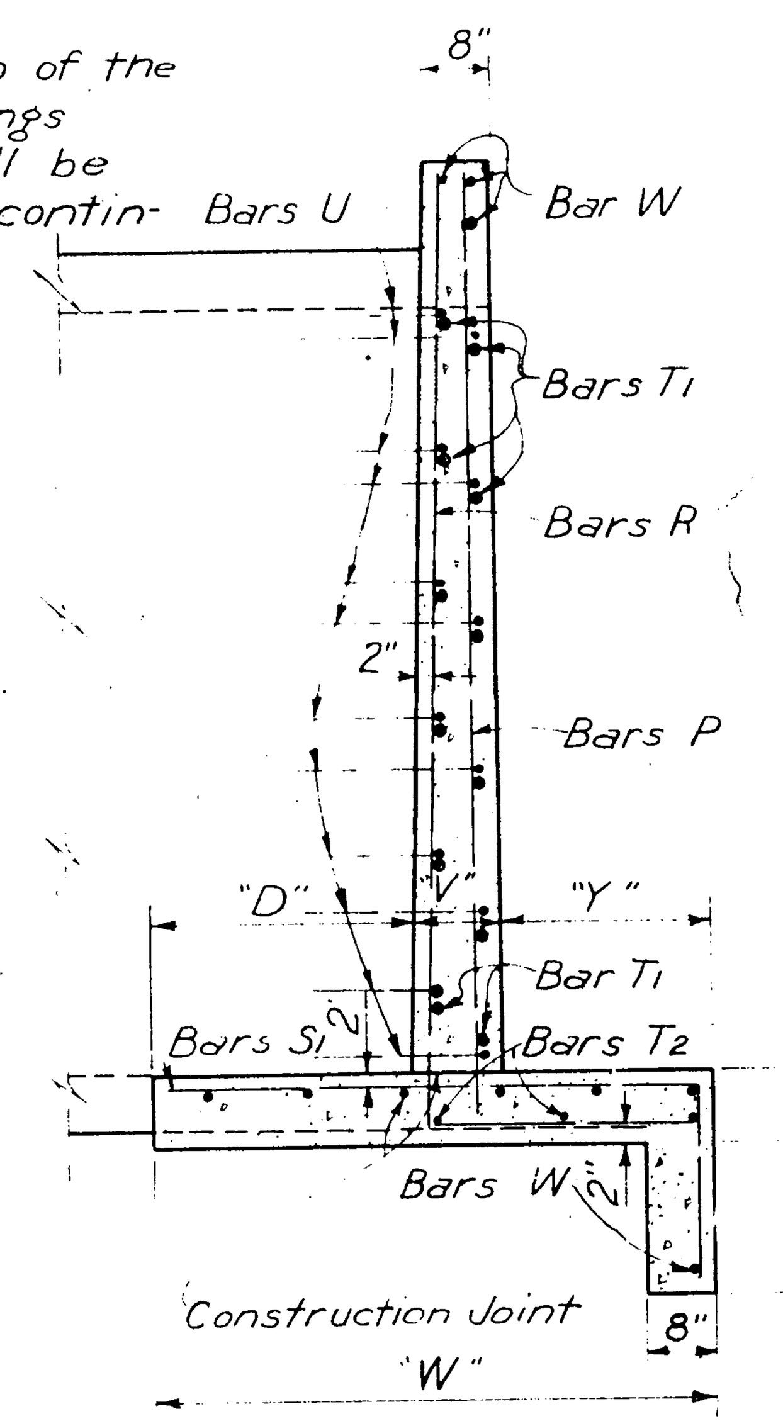


TYPICAL LONGITUDINAL SECTION THRU BOX SHOWING DETAIL OF APRON



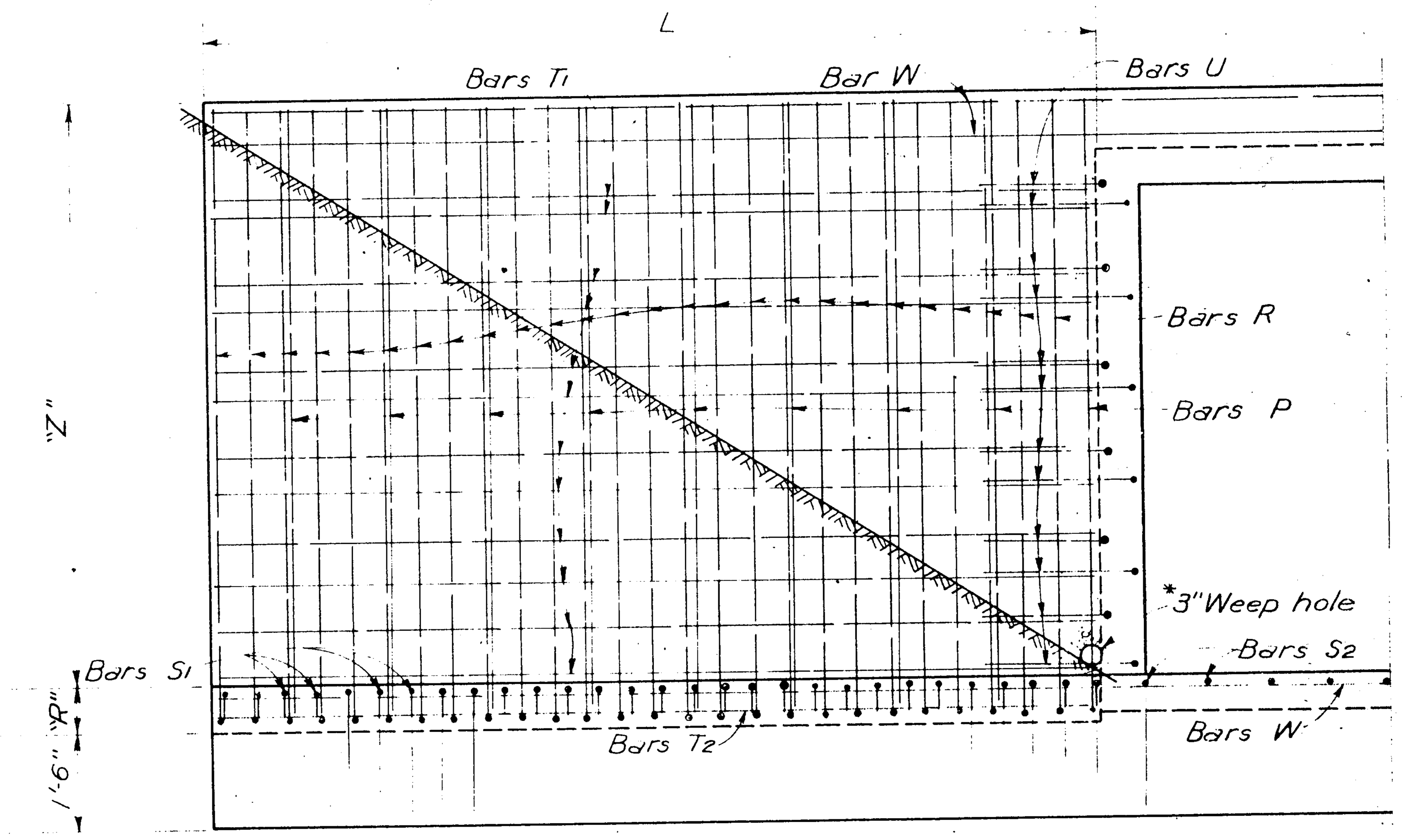
Curb face to be vertical for all culverts under 7'-0" in height. For culverts over 7'-0" in height this curb face shall be battered to conform to the batter of the wingwall.

PLAN VIEW OF WING WALL



SECTION

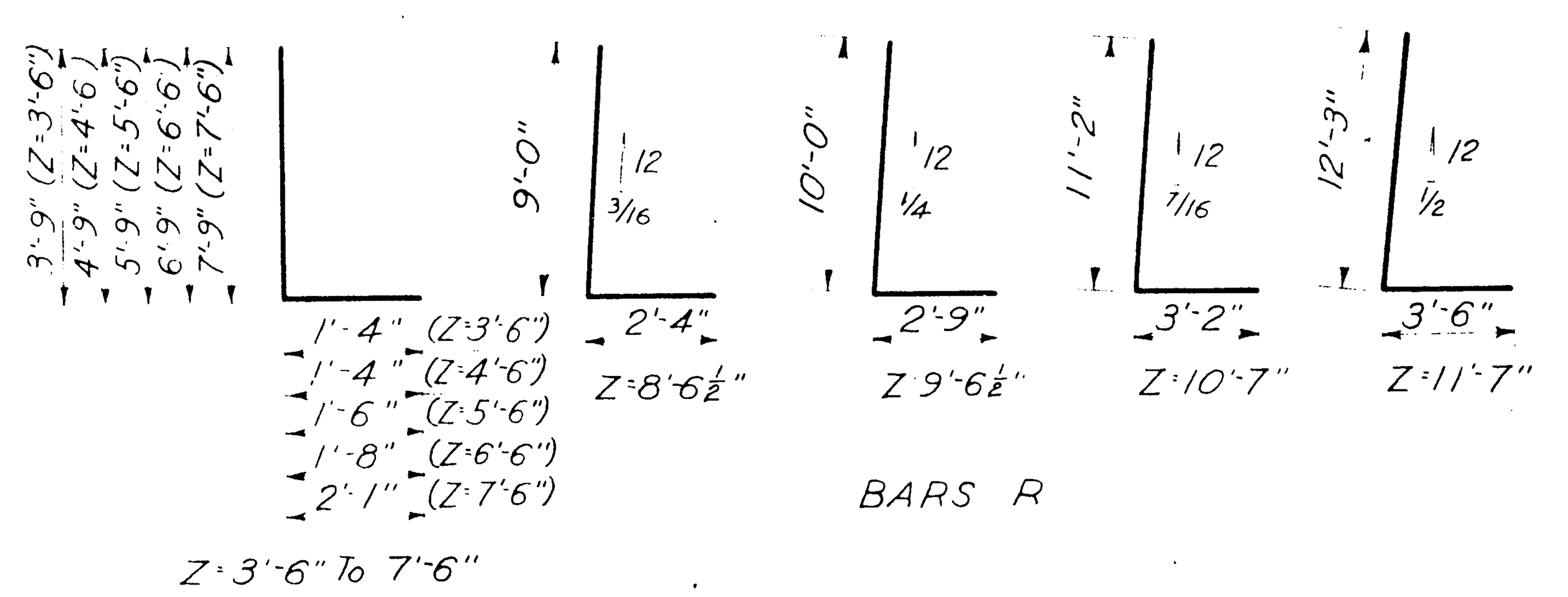
DETAIL OF WING WALL



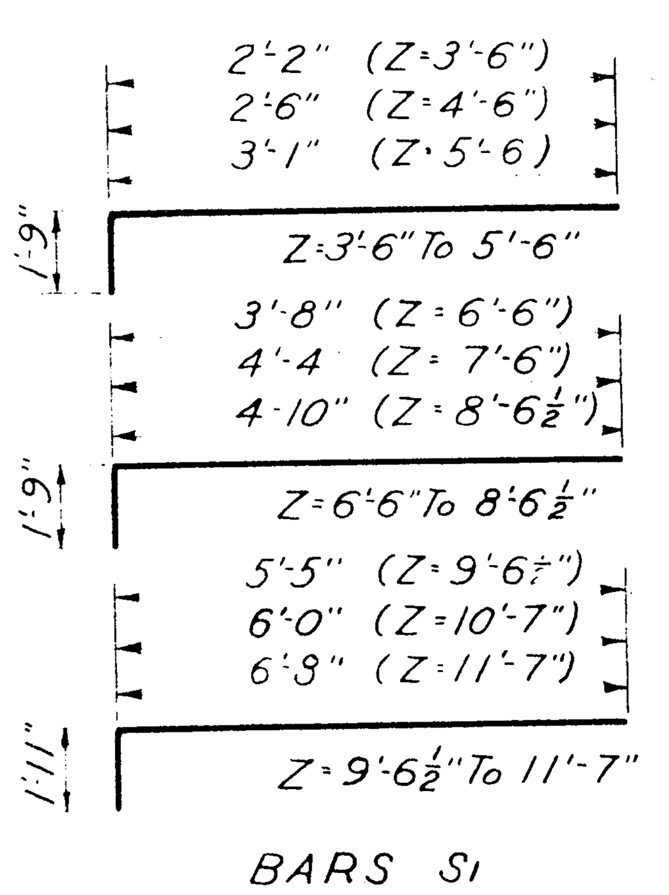
HALF ELEVATION

*Place one weep hole per wing at approximate earth line as shown. Fill around inlet of drains with broken stone or coarse gravel to permit free passage of water. Weep holes required for Z = 6'-6" and greater.

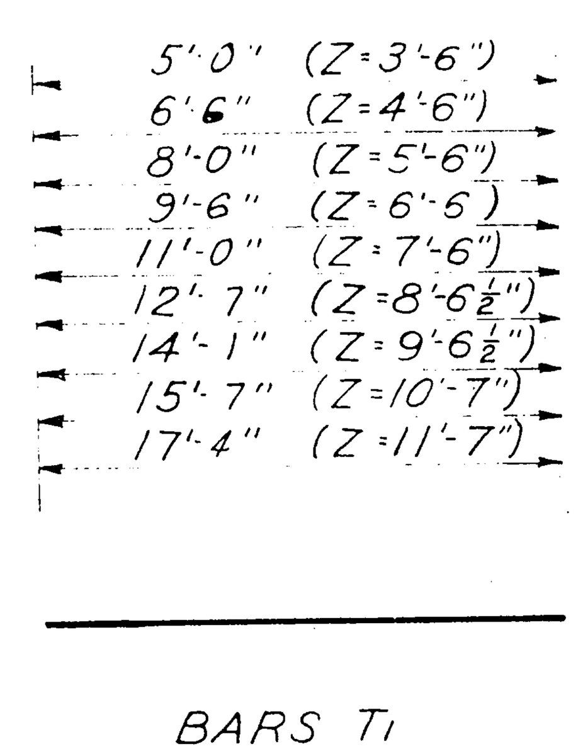
GENERAL NOTES
All concrete shall be Class C. Chamfer all exposed corners ¾" unless specified otherwise.
All dimensions relating to reinforcing steel are to centers of bars.



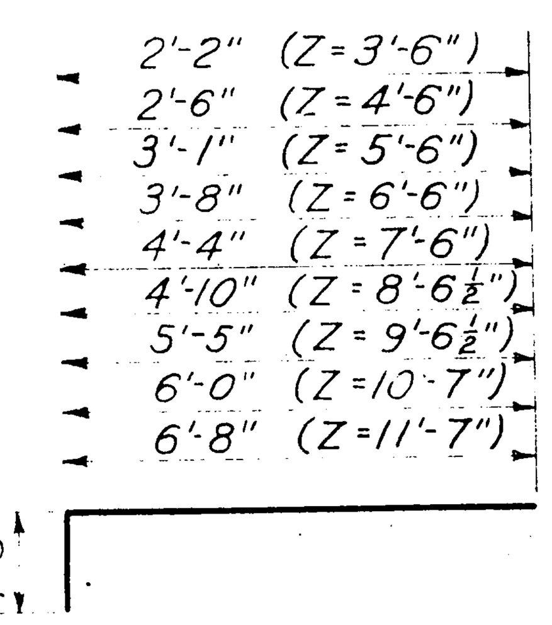
BARS R



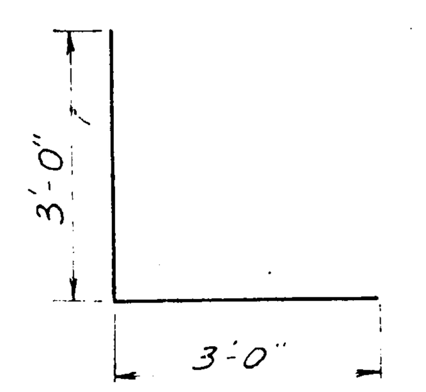
BARS S1



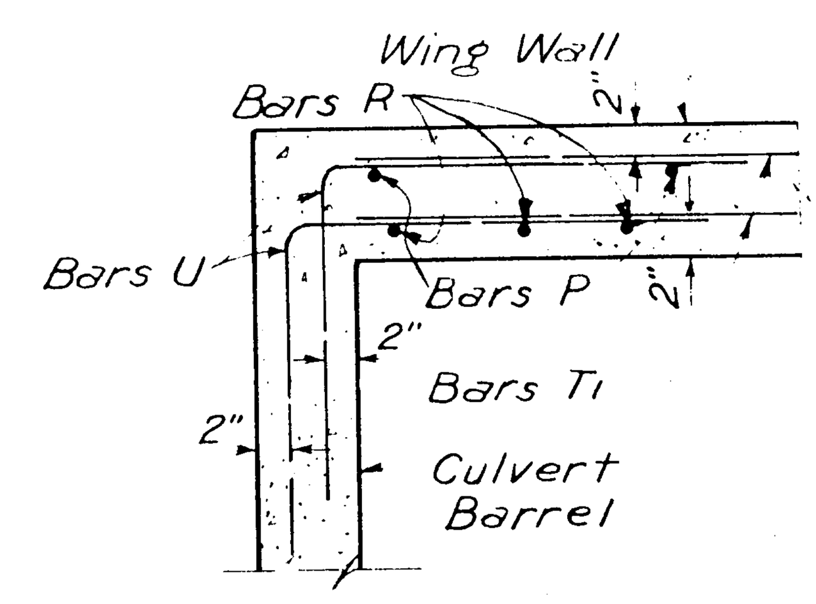
BARS T1



BARS S2 (Culvert Apron)



BARS U



ARRANGEMENT OF WING WALL REINF. AT CULVERT WALL

TEXAS HIGHWAY DEPARTMENT

PARALLEL WINGS-NORMAL

FOR SINGLE BOX CULVERTS
3 × 2 TO 10 × 10

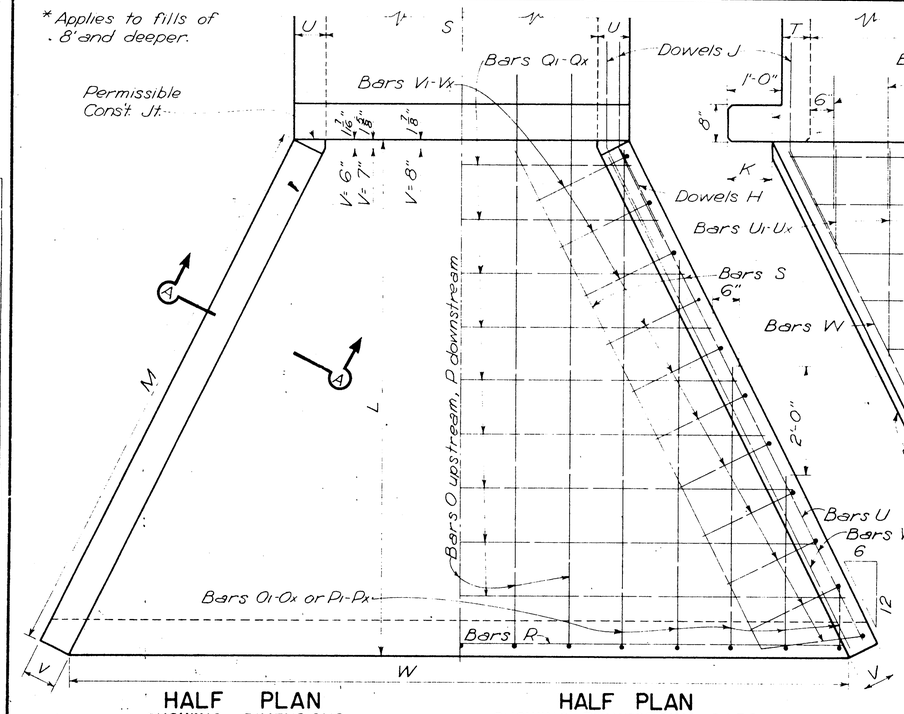
PW-N

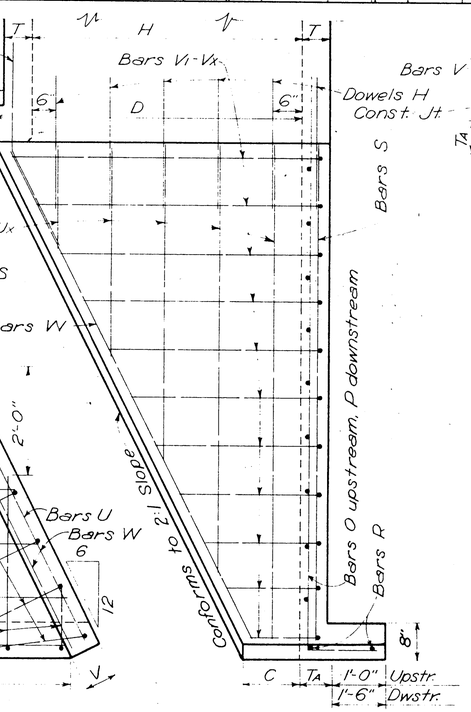
	Drawing	Date	Fed. Road Div. No.	State	Federal Aid Project No.	Sheet No.
Dn C.L.S. & W.H.	Original	June 1948	6	TEXAS		
Ck. Dn W.H.	Rev Oct 1958		Dist. No.	County	Control No. / Section No. / Job No.	Highway No.
Dw. A.B.L.	Rev Jan 1959			DALLAS		
Ck. Dw. W.H.	Rev. Nov 1964					
Tr. A.C.B.						
Ck. Tr. W.H.						

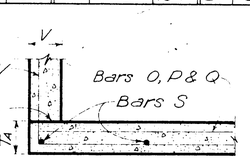
CULVERT SIZE		TABLE OF DIMENSIONS						MAX. FILL 1'	MAX. FILL 6'	MAX. FILL 8'*	TOTAL QUANTITIES	
S	H	L	M	V	W	C	D	TA	K	K	K	Conc. Cu. Yds.	Steel Lbs.
3	2	3'-6⅜"	3'-0⅜"	6"	6'-5½"	1'-0"	2'-8"	6"	-	-	10"	1.73	241
3	3	5'-6⅜"	5'-11½"	6"	8'-5½"	1'-0"	3'-8"	6"	-	-	10"	3.03	371
4	2	3'-6⅜"	3'-0⅜"	6"	7'-5½"	1'-0"	2'-8"	6"	-	-	10"	1.93	256
4	3	5'-6⅜"	5'-11½"	6"	9'-5½"	1'-0"	3'-8"	6"	-	-	10"	3.29	390
4	4	7'-6⅜"	8'-2⅜"	6"	11'-5½"	1'-0"	4'-8"	6"	-	-	10"	4.98	558
5	2	3'-6⅜"	3'-0⅜"	6"	8'-5½"	1'-0"	2'-8"	6"	-	-	10"	2.12	271
5	3	5'-6⅜"	5'-11½"	6"	10'-5½"	1'-0"	3'-8"	6"	-	-	10"	3.56	410
5	4	7'-6⅜"	8'-2⅜"	6"	12'-5½"	1'-0"	4'-8"	6"	-	-	10"	5.32	583
5	5	8'-7⅛"	9'-3⅜"	7"	13'-5½"	1'-6"	5'-8"	6"	-	-	10"	7.17	723
6	3	5'-6⅜"	5'-11½"	6"	11'-5½"	1'-0"	3'-8"	6"	-	10"	10"	3.83	432
6	4	7'-6⅜"	8'-2⅜"	6"	13'-5½"	1'-0"	4'-8"	6"	-	10"	10"	5.66	610
6	5	8'-7⅛"	9'-3⅜"	7"	14'-5½"	1'-6"	5'-8"	6"	-	10"	10"	7.55	757
6	6	10'-7⅛"	11'-6⅜"	7"	16'-5½"	1'-6"	6'-8"	6"	-	10"	10"	10.13	972
7	3	5'-7⅜"	6'-0⅜"	6"	12'-6⅛"	1'-0"	3'-8½"	6½"	10"	10"	10"	4.36	465
7	4	7'-7⅜"	8'-3½"	6"	14'-6⅛"	1'-0"	4'-8½"	6½"	10"	10"	10"	6.37	642
7	5	8'-8⅛"	9'-4⅜"	7"	15'-6½"	1'-6"	5'-8½"	6½"	10"	10"	10"	8.37	792
7	6	10'-8⅛"	11'-7⅜"	7"	17'-6⅛"	1'-6"	6'-8½"	6½"	10"	10"	10"	11.15	1014
7	7	12'-8⅛"	13'-10⅜"	7"	19'-6½"	1'-6"	7'-8½"	6½"	10"	10"	10"	14.28	1372
8	4	7'-8⅜"	8'-4⅜"	6"	15'-7¼"	1'-0"	4'-9"	7"	9½"	10"	10½"	7.14	671
8	5	8'-9⅛"	9'-6"	7"	16'-7⅛"	1'-6"	5'-9"	7"	9½"	10"	10½"	9.26	828
8	6	10'-9⅛"	11'-8⅜"	7"	18'-7⅛"	1'-6"	6'-9"	7"	9½"	10"	10½"	12.25	1053
8	7	12'-9⅛"	13'-11⅜"	7"	20'-7⅛"	1'-6"	7'-9"	7"	9½"	10"	10½"	15.60	1335
8	8	13'-9⅜"	15'-1⅛"	8"	21'-7⅜"	2'-0"	8'-9"	7"	9½"	10"	10½"	19.25	1818
9	5	8'-10⅛"	9'-7⅛"	7"	17'-8½"	1'-6"	5'-9½"	7"	9½"	9½"	10"	9.82	858
9	6	10'-10⅛"	11'-10⅞"	7"	19'-8½"	1'-6"	6'-9½"	7"	9½"	9½"	10"	12.91	1106
9	7	12'-10⅛"	14'-0⅛"	7"	21'-8½"	1'-6"	7'-9½"	7"	9½"	9½"	10"	16.36	1428
9	8	13'-10⅜"	15'-2¼"	8"	22'-8⅜"	2'-0"	8'-9½"	7"	9½"	9½"	10"	20.09	1894
9	9	15'-10⅜"	17'-5⅛"	8"	24'-8⅜"	2'-0"	9'-9½"	7"	9½"	9½"	10"	24.47	2563
10	5	8'-11⅛"	9'-8¼"	7"	18'-9½"	1'-6"	5'-10"	7⅛"	9"	10"	10½"	10.82	894
10	6	10'-11⅛"	11'-11⅛"	7"	20'-9½"	1'-6"	6'-10"	7⅛"	9"	10"	10½"	14.14	1149
10	7	12'-11⅛"	14'-1⅜"	7"	22'-9½"	1'-6"	7'-10"	7⅛"	9"	10"	10½"	17.84	1479
10	8	13'-11⅜"	15'-3⅜"	8"	23'-9⅜"	2'-0"	8'-10"	7⅛"	9"	10"	10½"	21.72	1849
10	9	15'-11⅜"	17'-6⅛"	8"	25'-9⅜"	2'-0"	9'-10"	7⅛"	9"	10"	10½"	26.36	2626
10	10	17'-11⅜"	19'-9"	8"	27'-9⅜"	2'-0"	10'-10"	7⅛"	9"	10"	10½"	31.41	3744

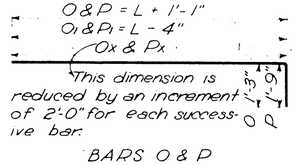
CULVERT SIZE	TABLE OF REINFORCING STEEL FOR 2 WINGS																																CULVERT SIZE
	Bars H-#4 2'-6" Long @12"		Bars J-#6 4'-0" Long		Bars O #4 @ 12"			Bars O1-Ox #4 @ 12"			Bars P #4 @ 12"			Bars P1-Px #4 @ 12"			Bars Q1-Qx #4 @ 12"			Bars R 4-#4		Bars S 8-#4		Bars U #4			Bars V1-Vx			8 Bars W			
S	No.	Wt.	No.	Wt.	No.	Lgth.	Wt.	No.	Av. Lgth.	Wt.	No.	Lgth.	Wt.	No.	Av. Lgth.	Wt.	No.	Av. Lgth.	Wt.	Lgth.	Wt.	Lgth.	Wt.	No.	Av. Lgth.	Wt.	No.	Size	Spac.	Av. Lgth.	Wt.	Size	Length	Wt.	S
3	12	20	8	48	3	5'-11"	12	4	3'-6"	9	3	6'-5"	13	4	4'-0"	11	6	5'-0"	20	6'-6"	17	3'-5"	18	8	3'-1"	16	16	#4	12"	3'-6"	37	#4	3'-9"	20	3
3	16	27	8	48	3	7'-11"	16	6	4'-6"	18	4	6'-5"	17	4	4'-0"	11	6	6'-0"	24	7'-6"	20	3'-5"	18	8	3'-1"	16	16	#4	12"	3'-6"	37	#4	3'-9"	33	3
4	12	20	8	48	4	5'-11"	16	4	3'-6"	9	4	6'-5"	17	4	4'-0"	11	6	6'-0"	24	7'-6"	20	3'-5"	18	8	3'-1"	16	16	#4	12"	3'-6"	37	#4	3'-9"	20	4
4	16	27	8	48	4	7'-11"	21	6	4'-6"	18	4	8'-5"	22	6	5'-0"	20	10	7'-0"	47	9'-6"	25	5'-8"	30	12	4'-4"	35	24	#4	12"	4'-0"	64	#4	6'-3"	33	4
5	20	33	8	48	4	9'-11"	26	8	5'-6"	29	4	10'-5"	28	8	6'-0"	32	14	8'-0"	75	11'-6"	31	7'-10"	42	16	5'-7"	60	36	#4	12"	4'-6"	108	#4	8'-7"	46	4
5	12	20	8	48	5	5'-11"	20	4	3'-6"	9	5	6'-5"	21	4	4'-0"	11	6	7'-0"	28	8'-6"	23	3'-5"	18	8	3'-1"	16	16	#4	12"	3'-6"	37	#4	3'-9"	20	5
5	16	27	8	48	5	7'-11"	26	6	4'-6"	18	5	8'-5"	28	6	5'-0"	20	10	8'-0"	53	10'-6"	28	5'-8"	30	12	4'-4"	35	24	#4	12"	4'-0"	64	#4	6'-3"	33	5
5	20	33	8	48	5	9'-11"	33	8	5'-6"	29	5	10'-5"	35	8	6'-0"	32	14	9'-0"	84	12'-6"	33	7'-10"	42	16	5'-7"	60	36	#4	12"	4'-6"	108	#4	8'-7"	46	5
6	16	27	8	48	6	7'-11"	32	6	4'-6"	18	6	8'-5"	34	6	5'-0"	20	10	9'-0"	60	11'-6"	31	5'-8"	30	12	4'-4"	35	24	#4	12"	5'-3"	140	#5	9'-8"	81	5
6	20	33	8	48	6	9'-11"	40	8	5'-6"	29	6	10'-5"	42	8	6'-0"	32	14	10'-0"	94	13'-6"	36	7'-10"	42	16	5'-7"	60	36	#4	12"	4'-6"	108	#4	8'-7"	46	6
6	24	40	8	48	6	10'-11"	44	8	6'-6"	35	6	11'-5"	46	8	7'-0"	37	16	10'-6"	112	14'-6"	39	9'-0"	48	20	6'-6"	87	40	#4	12"	5'-3"	140	#5	9'-8"	81	6
7	20	33	8	48	7	8'-0"	37	6	4'-7"	18	7	8'-6"	40	6	5'-1"	20	10	10'-0"	67	12'-7"	34	5'-8"	30	12	4'-4"	35	28	#4	12"	4'-1"	76	#4	6'-3"	33	7
7	24	40	8	48	7	10'-0"	47	8	5'-7"	30	7	10'-6"	49	8	6'-1"	33	14	11'-0"	103	14'-7"	39	8'-0"	43	16	5'-7"	60	36	#4	12"	4'-7"	110	#4	8'-9"	47	7
7	28	47	8	48	7	11'-0"	51	8	6'-7"	35	7	11'-6"	54	8	7'-1"	38	16	11'-6"	123	15'-7"	42	9'-1"	49	20	6'-6"	87	40	#4	12"	5'-4"	142	#5	9'-11"	83	7
7	32	53	8	48	7	13'-0"	61	10	7'-7"	51	7	13'-6"	63	10	8'-1"	54	20	12'-6"	167	17'-7"	47	11'-4"	61	24	7'-9"	124	48	#4	12"	5'-10"	187	#5	12'-5"	104	7
8	20	33	8	48	8	10'-1"	54	8	5'-8"	30	8	10'-7"	57	8	6'-2"	33	14	12'-0"	112	15'-8"	42	8'-1"	43	16	5'-7"	60	36	#4	12"	4'-8"	112	#4	8'-10"	47	8
8	24	40	8	48	8	11'-1"	59	8	6'-8"	36	8	11'-7"	62	8	7'-2"	38	16	12'-6"	134	16'-8"	45	9'-2"	49	20	6'-7"	88	40	#4	12"	5'-5"	145	#5	10'-1"	84	8
8	28	47	8	48	8	13'-1"	70	10	7'-8"	51	8	13'-7"	73	10	8'-2"	55	20	13'-6"	180	18'-8"	50	10'-5"	61	24	7'-9"	124	48	#4	12"	5'-11"	190	#5	12'-6"	104	8
8	32	53	8	48	8	15'-1"	81	12	8'-8"	69	8	15'-7"	83	12	9'-2"	73	24	14'-6"	232	20'-8"	55	13'-8"	73	28	8'-11"	167	76	#4	9"	6'-5"	326	#5	15'-0"	125	8
9	36	60	8	48	8	16'-2"	86	12	9'-9"	75	8	16'-8"	89	12	10'-3"	82	26	15'-0"	261	21'-8"	58	14'-9"	79	32	9'-9"	208	120	#4	6"	7'-2"	575	#6	16'-2"	194	8
9	24	40	8	48	9	11'-2"	67	8	6'-9"	36	9	11'-8"	70	8	7'-3"	39	16	13'-6"	144	17'-9"	47	9'-3"	49	20	6'-7"	88	40	#4	12"	5'-5"	145	#5	10'-2"	85	9
9	28	47	8	48	9	13'-2"	79	10	7'-9"	52	9	13'-8"	82	10	8'-3"	55	20	14'-6"	194	19'-9"	53	11'-6"	61	24	7'-9"	124	52	#4	12"	5'-11"	206	#5	12'-7"	105	9
9	32	53	8	48	9	15'-2"	91	12	8'-9"	70	9	15'-8"	94	12	9'-3"	74	24	15'-6"	248	21'-9"	58	13'-9"	73	28	8'-11"	167	76	#4	9"	6'-5"	326	#5	15'-1"	126	9
9	36	60	8	48	9	16'-3"	98	14	8'-10"	83	9	16'-9"	101	14	9'-4"	87	26	16'-0"	278	22'-9"	61	14'-10"	79	32	9'-10"	210	124	#4	6"	7'-2"	594	#6	16'-3"	195	9
10	40	67	8	48	9	18'-3"	110	16	9'-10"	105	9	18'-9"	113	16	10'-4"	110	30	17'-0"	341	24'-9"	66	17'-1"	91	36	11'-0"	265	120	#5	7"	8'-2"	1022	#6	18'-9"	225	9
10	24	40	8	48	10	11'-3"	75	8	6'-10"	37	10	11'-9"	78	8	7'-4"	39	16	14'-6"	155	18'-10"	50	9'-4"	50	20	6'-8"	89	40	#4	12"	5'-6"	147	#5	10'-3"	86	10
10	28	47	8	48	10	13'-3"	89	10	7'-10"	52	10	13'-9"	92	10	8'-4"	56	20	15'-6"	207	20'-10"	56	11'-7"	62	24	7'-10"	126	52	#4	12"	6'-0"	208	#5	12'-8"	106	10
10	32	53	8	48	10	15'-3"	102	12	8'-10"	71	10	15'-9"	105	12	9'-4"	75	24	16'-6"	265	22'-10"	61	13'-10"	74	28	9'-0"	168	76	#4	9"	6'-6"	330	#5	15'-2"	127	10
10	36	60	8	48	10	16'-4"	109	14	8'-11"	83	10	16'-10"	112	14	9'-5"	88	26	17'-0"	295	23'-10"	64	14'-11"	80	32	9'-10"	210	104	#4	7"	7'-3"	504	#6	16'-4"	196	10
10	40	67	8	48	10	18'-4"	122	16	9'-11"	106	10	18'-10"	126	16	10'-5"	111	30	18'-0"	361	25'-10"	69	17'-2"	92	36	11'-0"	265	120	#5	7"	8'-3"	1033	#6	18'-10"	226	10
10	44	73	8	48	10	20'-4"	136	18	10'-11"	131	10	20'-10"	139	18	11'-5"	137	34	19'-0"	432	27'-10"	74	19'-5"	104	40	12'-2"	325	136	#6	7"	9'-3"	1890	#6	21'-3"	255	10

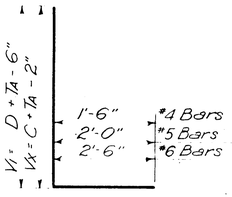
* Applies to fills of 8' and deeper.

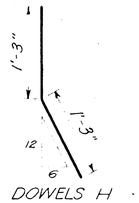


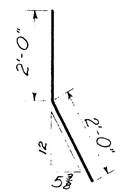












GENERAL NOTES:

All concrete shall be Class C.

Dimensions relating to reinforcing steel are to centers of bars.

Steel cover to be 2" from center of outside layer of steel to face of concrete.

Chamfer exposed corners ¾" except as otherwise noted.

TEXAS HIGHWAY DEPARTMENT

FLARED WINGS - NORMAL FOR SINGLE BOX CULVERTS

SIZES 3 × 2 to 10 × 10

FW-N

Dn. - RMM	DRAWING	DATE	FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
Ck. Dn. - VVH	Original	April 1, 1948	6	TEXAS		
Dw. - RMM	Rev. Oct. 1955					
Ck. Dw. - ABL	Rev. Jan. 1959		STATE DIST. NO.	COUNTY	CONTROL NO. / SECTION NO. / JOB NO.	HIGHWAY NO.
Tr. - ABP	Rev. Nov. 1961					
Ck. Tr. - RMM	Rev. Nov. 1967					

	CULVERT SIZE		TYPE SECTION	DIMENSIONS		MAX FILL	TOTAL QUANTITIES 44' CLEAR WIDTH		QUANTITIES P.L.F. OF BARREL		BILLS OF REINFORCING STEEL FOR 44'-0" CLEAR WIDTH																																												
											BARS A IN TOP SLAB					BARS B IN BOTTOM SLAB					BARS C WALLS AND TOP CORNER						BARS D IN BOTTOM CORNERS						62-½"φ BARS E @ 18" C to C		½"φ BARS F Length = 46'-4"								BARS H 4-½"φ		½"φ BARS K @ 12"± 3'-11" Lg.		½"φ BARS M IN TOP SLAB						½"φ BARS N IN BOTTOM SLAB				
	S	H		T	U		Conc	Reinf	Conc	Reinf	No	Size	Spac	Length	Weight	No	Size	Spac	Length	Weight	No	Size	Spac	Length	Weight	Dim "X"	No	Size	Spac	Length	Weight	Dim "X"	Length	Weight	F1	Spac	F2	Spac	F3	Spac	Total	Weight	Length	Weight	No	Weight	No	Spac	Length	Weight	"X"	"Y"	No	Spac	Length	Weight	"X"
SC-NA	3	2	1	6"	6"	14'	10.27	1,271	0.222	26.92	78	½"φ	7"	3'-8"	191																				7	12"±	3	20½"±	4	10"	14	433	3'-9"	10	10	26	61	9"	8'-4"	339	3'-8"	2'-4"	61	9"	6'-8"	272	3'-8"
		3	1	6"	6"	14'	11.95	1,353	0.259	28.70	78	½"φ	7"	3'-8"	191																				7	12"±	3	20½"±	4	14"	14	433	3'-9"	10	10	26	61	9"	10'-4"	421	3'-8"	3'-4"	61	9"	6'-8"	272	3'-8"
	4	2	1	6"	6"	12'	12.00	1,740	0.259	37.06	91	½"φ	6"	4'-8"	284																				9	12"±	4	18"±	4	10"	17	526	4'-9"	13	12	31	78	7"	9'-4"	486	4'-8"	2'-4"	78	7"	7'-8"	400	4'-8"
		3	1	6"	6"	12'	13.68	1,844	0.296	39.35	91	½"φ	6"	4'-8"	284																				9	12"±	4	18"±	4	14"	17	526	4'-9"	13	12	31	78	7"	11'-4"	590	4'-8"	3'-4"	78	7"	7'-8"	400	4'-8"
		4	1	6"	6"	12'	15.36	2,011	0.333	42.98	91	½"φ	6"	4'-8"	284																				9	12"±	4	18"±	6	15"	19	588	4'-9"	13	12	31	78	7"	13'-4"	695	4'-8"	4'-4"	78	7"	7'-8"	400	4'-8"
	5	2	2	6"	6"	8'	13.73	2,103	0.296	44.87	68	⅝"φ	8"	5'-8"	402	58	½"φ	9½"	5'-8"	220	136	½"φ	8"	4'-10"	439	2'-4"	136	½"φ	8"	4'-1"	371	1'-7"			9	12"±	7	18"±	4	10"	20	619	5'-9"	15	14	37											
		3	2	6"	6"	8'	15.41	2,194	0.333	46.87	68	⅝"φ	8"	5'-8"	402	58	½"φ	9½"	5'-8"	220	136	½"φ	8"	5'-10"	530	3'-4"	136	½"φ	8"	4'-1"	371	1'-7"			9	12"±	7	18"±	4	14"	20	619	5'-9"	15	14	37											
		4	2	6"	6"	8'	17.09	2,346	0.370	50.21	68	⅝"φ	8"	5'-8"	402	58	½"φ	9½"	5'-8"	220	136	½"φ	8"	6'-10"	620	4'-4"	136	½"φ	8"	4'-1"	371	1'-7"			9	12"±	7	18"±	6	15"	22	681	5'-9"	15	14	37											
		5	3	6"	7"	8'	20.45	2,968	0.444	63.66	68	⅝"φ	8"	5'-10"	413	58	½"φ	9½"	5'-10"	226	136	½"φ	8"	7'-10"	711	5'-4"	136	½"φ	8"	4'-1"	371	1'-7"	4'-11"	204	9	12"±	7	18"±	16	13"	32	990	5'-11"	16	14	37											
	6	3	2	6"	6"	6'	17.14	2,523	0.370	53.75	78	⅝"φ	7"	6'-8"	543	61	½"φ	9"	6'-8"	272	146	½"φ	7½"	5'-10"	569	3'-4"	146	½"φ	7½"	4'-1"	398	1'-7"			10	12"±	8	18"±	4	14"	22	681	6'-9"	18	16	42											
		4	2	6"	6"	6'	18.81	2,682	0.407	57.22	78	⅝"φ	7"	6'-8"	543	61	½"φ	9"	6'-8"	272	146	½"φ	7½"	6'-10"	666	4'-4"	146	½"φ	7½"	4'-1"	398	1'-7"			10	12"±	8	18"±	6	15"	24	743	6'-9"	18	16	42											
		5	3	6"	7"	6'	22.13	3,312	0.481	70.85	78	⅝"φ	7"	6'-10"	556	61	½"φ	9"	6'-10"	278	146	½"φ	7½"	7'-10"	764	5'-4"	146	½"φ	7½"	4'-1"	398	1'-7"	4'-11"	204	10	12"±	8	18"±	16	13"	34	1,052	6'-11"	18	16	42											
		6	3	6"	7"	6'	24.14	3,450	0.525	73.88	78	⅝"φ	7"	6'-10"	556	61	½"φ	9"	6'-10"	278	146	½"φ	7½"	8'-10"	861	6'-4"	146	½"φ	7½"	4'-1"	398	1'-7"	5'-11"	245	10	12"±	8	18"±	16	16"	34	1,052	6'-11"	18	16	42											
	7	3	2	6½"	6"	4'	19.98	2,934	0.432	62.69	78	⅝"φ	7"	7'-8"	624	91	½"φ	6"	7'-8"	466	156	½"φ	7"	5'-10"	608	3'-4"	156	½"φ	7"	4'-1"	425	1'-7"			11	12"±	9	18"±	4	14"	24	743	7'-9"	21	18	47											
		4	2	6½"	6"	4'	21.66	3,100	0.469	66.32	78	⅝"φ	7"	7'-8"	624	91	½"φ	6"	7'-8"	466	156	½"φ	7"	6'-10"	712	4'-4"	156	½"φ	7"	4'-1"	425	1'-7"			11	12"±	9	18"±	6	15"	26	805	7'-9"	21	18	47											
		5	3	6½"	7"	4'	25.05	3,581	0.544	76.76	78	⅝"φ	7"	7'-10"	637	91	½"φ	6"	7'-10"	476	136	½"φ	8"	7'-10"	711	5'-4"	136	½"φ	8"	4'-1"	371	1'-7"	4'-11"	204	11	12"±	9	18"±	16	14"	36	1114	7'-11"	21	18	47											
		6	3	6½"	7"	4'	27.01	3,713	0.587	79.65	78	⅝"φ	7"	7'-10"	637	91	½"φ	6"	7'-10"	476	136	½"φ	8"	8'-10"	802	6'-4"	136	½"φ	8"	4'-1"	371	1'-7"	5'-11"	245	11	12"±	9	18"±	16	16"	36	1114	7'-11"	21	18	47											
		7	3	6½"	7"	4'	28.97	3,970	0.630	85.22	78	⅝"φ	7"	7'-10"	637	91	½"φ	6"	7'-10"	476	136	½"φ	8"	9'-10"	893	7'-4"	136	½"φ	8"	4'-1"	371	1'-7"	6'-11"	287	11	12"±	9	18"±	20	15"	40	1238	7'-11"	21	18	47											
	8	4	2	6½"	6"	4'	23.53	3,588	0.509	76.92	78	⅝"φ	7"	8'-8"	705	68	⅝"φ	8"	8'-8"	615	182	½"φ	6"	6'-10"	830	4'-4"	182	½"φ	6"	4'-1"	496	1'-7"			12	12"±	10	18"±	6	14"	28	867	8'-9"	23	20	52											
		5	3	6½"	7"	4'	26.92	4,248	0.584	90.94	78	⅝"φ	7"	8'-10"	718	68	⅝"φ	8"	8'-10"	626	182	½"φ	6"	7'-10"	952	5'-4"	182	½"φ	6"	4'-1"	496	1'-7"	4'-11"	204	12	12"±	10	18"±	16	14"	38	1176	8'-11"	24	20	52											
		6	3	6½"	7"	4'	28.88	4,411	0.627	94.50	78	⅝"φ	7"	8'-10"	718	68	⅝"φ	8"	8'-10"	626	182	½"φ	6"	8'-10"	1,074	6'-4"	182	½"φ	6"	4'-1"	496	1'-7"	5'-11"	245	12	12"±	10	18"±	16	16"	38	1176	8'-11"	24	20	52											
		7	3	6½"	7"	4'	30.84	4,698	0.670	100.74	78	⅝"φ	7"	8'-10"	718	68	⅝"φ	8"	8'-10"	626	182	½"φ	6"	9'-10"	1,195	7'-4"	182	½"φ	6"	4'-1"	496	1'-7"	6'-11"	287	12	12"±	10	18"±	20	15"	42	1300	8'-11"	24	20	52											
		8	3	6½"	8"	4'	35.35	5,046	0.770	108.74	78	⅝"φ	7"	9'-0"	732	68	⅝"φ	8"	9'-0"	638	198	½"φ	5½"	10'-10"	1,432	8'-4"	198	½"φ	5½"	4'-1"	540	1'-7"	7'-11"	328	12	12"±	10	18"±	20	17"	42	1300	9'-1"	24	20	52											
	9	5	3	7"	7"	4'	30.21	5,060	0.655	108.99	64	¾"φ	8½"	9'-10"	945	84	⅝"φ	6½"	9'-10"	861	128	⅝"φ	8½"	8'-3"	1,101	5'-5"	128	⅝"φ	8½"	4'-11"	657	2'-1"	4'-11"	204	13	12"±	10	18"±	16	14"	39	1207	9'-11"	27	22	58											
		6	3	7"	7"	4'	32.17	5,235	0.693	112.83	64	¾"φ	8½"	9'-10"	945	84	⅝"φ	6½"	9'-10"	861	128	⅝"φ	8½"	9'-3"	1,235	6'-5"	128	⅝"φ	8½"	4'-11"	657	2'-1"	5'-11"	245	13	12"±	10	18"±	16	16"	39	1207	9'-11"	27	22	58											
		7	3	7"	7"	4'	34.13	5,534	0.742	119.33	64	¾"φ	8½"	9'-10"	945	84	⅝"φ	6½"	9'-10"	861	128	⅝"φ	8½"	10'-3"	1,368	7'-5"	128	⅝"φ	8½"	4'-11"	657	2'-1"	6'-11"	287	13	12"±	10	18"±	20	15"	43	1331	9'-11"	27	22	58											
		8	3	7"	8"	4'	38.65	5,985	0.842	128.47	61	¾"φ	9"	10'-0"	916	61	¾"φ	9"	10'-0"	916	122	⅝"φ	9"	11'-3"	1,432	8'-5"	122	¾"φ	9"	5'-4"	977	2'-4"	7'-11"	328	13	12"±	10	18"±	20	17"	43	1331	10'-1"	27	22	58											
		9	3	7"	8"	4'	40.90	6,277	0.891	134.81	61	¾"φ	9"	10'-0"	916	61	¾"φ	9"	10'-0"	916	122	⅝"φ	9"	12'-3"	1,559	9'-5"	122	¾"φ	9"	5'-4"	977	2'-4"	8'-11"	369	13	12"±	10	18"±	24	16½"	47	1455	10'-1"	27	22	58											
	10	5	3	7"	7"	4'	32.22	5,920	0.699	127.67	68	¾"φ	8"	10'-10"	1,106	68	¾"φ	8"	10'-10"	1,106	156	⅝"φ	7"	8'-3"	1,342	5'-5"	156	⅝"φ	7"	4'-11"	801	2'-1"	4'-11"	204	14	12"±	11	18"±	16	14"	41	1269	10'-11"	29	24	63											
		6	3	7"	7"	4'	34.18	6,124	0.742	132.13	68	¾"φ	8"	10'-10"	1,106	68	¾"φ	8"	10'-10"	1,106	156	⅝"φ	7"	9'-3"	1,505	6'-5"	156	⅝"φ	7"	4'-11"	801	2'-1"	5'-11"	245	14	12"±	11	18"±	16	16"	41	1269	10'-11"	29	24	63											
		7	3	7"	7"	4'	36.14	6,453	0.785	139.27	68	¾"φ	8"	10'-10"	1,106	68	¾"φ	8"	10'-10"	1,106	156	⅝"φ	7"	10'-3"	1,668	7'-5"	156	⅝"φ	7"	4'-11"	801	2'-1"	6'-11"	287	14	12"±	11	18"±	20	15"	45	1393	10'-11"	29	24	63											
		8	3	7"	8"	4'	40.67	7,108	0.885	153.15	73	¾"φ	7½"	11'-0"	1,206	73	¾"φ	7½"	11'-0"	1,206	146	⅝"φ	7½"	11'-3"	1,713	8'-5"	146	¾"φ	7½"	5'-4"	1,169	2'-4"	7'-11"	328	14	12"±	11	18"±	20	17"	45	1393	11'-1"	30	24	63											
		9	3	7"	8"	4'	42.91	7,424	0.934	160.05	73	¾"φ	7½"	11'-0"	1,206	73	¾"φ	7½"	11'-0"	1,206	146	⅝"φ	7½"	12'-3"	1,865	9'-5"	146	¾"φ	7½"	5'-4"	1,169	2'-4"	8'-11"	369	14	12"±	11	18"±	24	16½"	49	1516	11'-1"	30	24	63											
		10	3	7"	8"	4'	45.15	7,743	0.984	166.95	73	¾"φ	7½"	11'-0"	1,206	73	¾"φ	7½"	11'-0"	1,206	146	⅝"φ	7½"	13'-3"	2,018	10'-5"	146	¾"φ	7½"	5'-4"	1,169	2'-4"	9'-11"	411	14	12"±	11	18"±	28	16"	53	1640	11'-1"	30	24	63											
SC-NB	6	3	2	6"	6"	8'	17.14	2,830	0.370	60.70	68	⅝"φ	8"	6'-8"	473	68	⅝"φ	8"	6'-8"	473	182	½"φ	6"	5'-10"	709	3'-4"	182	½"φ	6"	4'-1"	496	1'-7"			8	18"±	8	18"±	4	14"	20	619	6'-9"	18	16	42											
		4	2	6"	6"	8'	18.81	3,013	0.407	64.12	68	⅝"φ	8"	6'-8"	473	68	⅝"φ	8"	6'-8"	473	182	½"φ	6"	6'-10"	830	4'-4"	182	½"φ	6"	4'-1"	496	1'-7"			8	18"±	8	18"±	6	15"	22	681	6'-9"	18	16	42											
		5	3	6"	7"	8'	22.13	3,670	0.481	78.95	68	⅝"φ	8"	6'-10"	484	68	⅝"φ	8"	6'-10"	484	182	½"φ	6"	7'-10"	952	5'-4"	182	½"φ	6"	4'-1"	496	1'-7"	4'-11"	204	8	18"±	8	18"±	16	14"	32	990	6'-11"	18	16	42											
		6	3	6"	7"	8'	24.14	3,971	0.525	85.65	68	⅝"φ	8"	6'-10"	484	68	⅝"φ	8"	6'-10"	484	198	½"φ	5½"	8'-10"	1,168	6'-4"	198	½"φ	5½"	4'-1"	540	1'-7"	5'-11"	245	8	18"±	8	18"±	16	16"	32	990	6'-11"	18	16	42											
	7	3	2	6½"	6"	6'	19.98	3,148	0.432	67.58	68	⅝"φ	8"	7'-8"	544	68	⅝"φ	8"	7'-8"	544	198	½"φ	5½"	5'-10"	771	3'-4"	198	½"φ	5½"	4'-1"	540	1'-7"			9	18"±	9	18"±	4	14"	22	681	7'-9"	21	18	47											
		4	2	6½"	6"	6'	21.66	3,123	0.469	66.94	68	⅝"φ	8"	7'-8"	544	68	⅝"φ	8"	7'-8"	544	168	½"φ	6½"	6'-10"	766	4'-4"	168	½"φ	6½"	4'-1"	458	1'-7"			9	18"±	9	18"±	6	14"	24	743	7'-9"	21	18	47											
		5	3	6½"	7"	6'	25.05	3,771	0.544	80.97	68	⅝"φ	8"	7'-10"	555	68	⅝"φ	8"	7'-10"	555	168	½"φ	6½"	7'-10"	879	5'-4"	168	½"φ	6½"	4'-1"	458	1'-7"	4'-11"	204	9	18"±	9	18"±	16	14"	34	1052	7'-11"	21	18	47											
		6	3	6½"	7"	6'	27.01	4,127	0.587	88.61	73	⅝"φ	7½"	7'-10"	596	73	⅝"φ	7½"	7'-10"	596	182	½"φ	6"	8'-10"	1,074	6'-4"	182	½"φ	6"	4'-1"	496	1'-7"	5'-11"	245	9	18"±	9	18"±	16	16"	34	1052	7'-11"	21	18	47											
		7	3	6½"	7"	6'	28.97	4,563	0.630	98.23	73	⅝"φ	7½"	7'-10"	596	73	⅝"φ	7½"	7'-10"	596	198	½"φ	5½"	9'-10"	1,300	7'-4"	198	½"φ	5½"	4'-1"	540	1'-7"	6'-11"	282	9	18"±	9	18"±	20	15"	38	1176	7'-11"	21	18	47											
	8	4	2	7"	6"	6'	24.79	3,867	0.537	83.08	84	⅝"φ	6½"	8'-8"	760	84	⅝"φ	6½"	8'-8"	760	198	½"φ	5½"	6'-11"	915	4'-5"	198	½"φ	5½"	4'-2"	552	1'-8"			10	18"±	10	18"±	6	14½"	26	805	8'-9"	23	20	52											
		5	3	7"	7"	6'	28.20	4,412	0.612	94.74	84	⅝"φ	6½"	8'-10"	774	84	⅝"φ	6½"	8'-10"	774	182	½"φ	6"	7'-11"	963	5'-5"	182	½"φ	6"	4'-2"	507	1'-8"	4'-11"	204	10	18"±	10	18"±	16	14"	36	1114	8'-11"	24	20	52											
		6	3	7"	7"	6'	30.16	4,574	0.655	98.30	84	⅝"φ	6½"	8'-10"	774	84	⅝"φ	6½"	8'-10"	774	182	½"φ	6"	8'-11"	1,084	6'-5"	182	½"φ	6"	4'-2"	507	1'-8"	5'-11"	245	10	18"±	10	18"±	16	16½"	36	1114	8'-11"	24	20	52											
		7	3	7"	7"	6'	32.12	5,013	0.699	107.98	84	⅝"φ	6½"	8'-10"	774	84	⅝"φ	6½"	8'-10"	774	198	½"φ	5½"	9'-11"	1,312	7'-5"	198	½"φ	5½"	4'-2"	552	1'-8"	6'-11"	287	10	18"±	10	18"±	20	16"	40	1238	8'-11"	24	20	52											
		8	3	7"	8"	6'	33.65	5,417	0.798	116.82	84	⅝"φ	6½"	9'-0"	789	84	⅝"φ	6½"	9'-0"	789	218	½"φ	5"	10'-11"	1,590	8'-5"	218	½"φ	5"	4'-2"	607	1'-8"	7'-11"	328	10	18"±	10	18"±	20	18"	40	1238	9'-1"	24	20	52											
	9	5	3	7"	7"	6'	30.21	5,554	0.655	119.82	68	¾"φ	8"	9'-10"	1,004	68	¾"φ	8"	9'-10"	1,004	156	⅝"φ	7"	8'-3"	1,342	5'-5"	156	⅝"φ	7"	4'-11"	801	2'-1"	4'-11"	204	10	18"±	10	18"±	16	14"	36	1114	9'-11"	27	22	58											
		6	3	7"	7"	6'	32.17	5,758	0.693	124.29	68	¾"φ	8"	9'-10"	1,004	68	¾"φ	8"	9'-10"	1,004	156	⅝"φ	7"	9'-3"	1,505	6'-5"	156	⅝"φ	7"	4'-11"	801	2'-1"	5'-11"	245	10	18"±	10	18"±	16	16½"	36	1114	9'-11"	27	22	58											
		7	3	7"	7"	6'	34.13	6,087	0.742	131.42	68	¾"φ	8"	9'-10"	1,004	68	¾"φ	8"	9'-10"	1,004	156	⅝"φ	7"	10'-3"	1,668	7'-5"	156	⅝"φ	7"	4'-11"	801	2'-1"	6'-11"	287	10	18"±	10	18"±	20	16"	40	1238	9'-11"	27	22	58											
		8	3	7"	8"	6'	38.66	6,526	0.842	141.10	68	¾"φ	8"	10'-0"	1,021	68	¾"φ	8"	10'-0"	1,021	168	⅝"φ	6½"	11'-3"	1,971	8'-5"	168	⅝"φ	6½"	4'-11"	862	2'-1"	7'-11"	328	10	18"±	10	18"±	20	18"	40	1238	10'-1"	27	22	58											
		9	3	7"	8"	6'	40.90	6,866	0.891	148.52	68	¾"φ	8"	10'-0"	1,021	68	¾"φ	8"	10'-0"	1,021	168	⅝"φ	6½"	12'-3"	2,146	9'-5"	168	⅝"φ	6½"	4'-11"	862	2'-1"	8'-11"	369	10	18"±	10	18"±	24	17"	44	1362	10'-1"	27	22	58											
	10	5	3	8"	7"	6'	35.35	6,182	0.768	133.15	73	¾"φ	7½"	10'-10"	1,187	73	¾"φ	7½"	10'-10"	1,187	168	⅝"φ	6½"	8'-4"	1,460	5'-6"	168	⅝"φ	6½"	5'-0"	876	2'-2"	4'-11"	204	11	18"±	11	18"±	16	14"	38	1176	10'-11"	29	24	63											
		6	3	8"	7"	6'	37.30	6,562	0.811	141.61	78	¾"φ	7"	10'-10"	1,269	78	¾"φ	7"	10'-10"	1,269	168	⅝"φ	6½"	9'-4"	1,635	6'-6"	168	⅝"φ	6½"	5'-0"	876	2'-2"	5'-11"	245	11	18"±	11	18"±	16	16½"	38	1176	10'-11"	29	24	63											
		7	3	8"	7"	6'	39.26	6,903	0.854	149.03	78	¾"φ	7"	10'-10"	1,269	78	¾"φ	7"	10'-10"	1,269	168	⅝"φ	6½"	10'-4"	1,810	7'-6"	168	⅝"φ	6½"	5'-0"	876	2'-2"	6'-11"	287	11	18"±	11	18"±	20	16"	42	1300	10'-11"	29	24	63											
		8	3	8"	8"	6'	43.84	7,399	0.955	159.89	78	¾"φ	7"	11'-0"	1,289	78	¾"φ	7"	11'-0"	1,289	182	⅝"φ	6"	11'-4"	2,151	8'-6"	182	⅝"φ	6"	5'-0"	949	2'-2"	7'-11"	328	11	18"±	11	18"±	20	18"	42	1300	11'-1"	30	24	63											
		9	3	8"	8"	6'	46.03	7,754	1.004	167.62	78	¾"φ	7"	11'-0"	1,289	78	¾"φ	7"	11'-0"	1,289	182	⅝"φ	6"	12'-4"	2,341	9'-6"	182	⅝"φ	6"	5'-0"	949	2'-2"	8'-11"	369	11	18"±	11	18"±	24	17"	46	1424	11'-1"	30	24	63											
		10	3	8"	8"	6'	48.32	8,613	1.054	186.66	84	¾"φ	6½"	11'-0"	1,388	84	¾"φ	6½"	11'-0"	1,388	198	⅝"φ	5½"	13'-4"	2,753	10'-6"	198	⅝"φ	5½"	5'-0"	1,033	2'-2"	9'-11"	411	11	18"±	11	18"±	28	16"	50	1547	11'-1"	30	24	63											
SC-NC	7	3	2	6½"	6"	8'	19.98	3,673	0.432	78.64	78	⅝"φ	7"	7'-8"	624	78	⅝"φ	7"	7'-8"	624	146	⅝"φ	7½"	6'-2"	940	3'-4"	146	⅝"φ	7½"	4'-10"	736	2'-0"			9	18"±	9	18"±	4	14"	22	681	7'-9"	21	18	47											
		4	2	6½"	6"	8'	21.66	3,657	0.469	83.12	84	⅝"φ	6½"	7'-8"	672	84	⅝"φ	6½"	7'-8"	672	136	⅝"φ	8"	7'-2"	1,017	4'-4"	136	⅝"φ	8"	4'-10"	685	2'-0"			9	18"±	9	18"±	6	14"	24	743	7'-9"	21	18	47											
		5	3	6½"	7"	8'	25.05	4,540	0.544	97.92	84	⅝"φ	6½"	7'-10"	686	84	⅝"φ	6½"	7'-10"	686	136	⅝"φ	8"	8'-2"	1,159	5'-4"	136	⅝"φ	8"	4'-10"	685	2'-0"	4'-11"	204	9	18"±	9	18"±	16	14"	34	1052	7'-11"	21	18	47											
		6	3	6½"	7"	8'	27.01	4,723	0.587	101.94	84	⅝"φ	6½"	7'-10"	686	84	⅝"φ	6½"	7'-10"	686	136	⅝"φ	8"	9'-2"	1,301	6'-4"	136	⅝"φ	8"	4'-10"	685	2'-0"	5'-11"	245	9	18"±	9	18"±	16	16"	34	1052	7'-11"	21	18	47											
		7	3	6½"	7"	8'	28.97	5,188	0.630	111.76	84	⅝"φ	6½"	7'-10"	686	84	⅝"φ	6½"	7'-10"	686	146	⅝"φ	7½"	10'-2"	1,549	7'-4"	146	⅝"φ	7½"	4'-10"	736	2'-0"	6'-11"	287	9	18"±	9	18"±	20	15"	38	1176	7'-11"	21	18	47											
	8	4	2	7½"	6"	8'	26.05	4,505	0.565	97.05	68	¾"φ	8"	8'-8"	886	68	¾"φ	8"	8'-8"	886	146	⅝"φ	7½"	7'-3"	1,104	4'-5"	146	⅝"φ	7½"	4'-11"	749	2'-1"			10	18"±	10	18"±	6	14½"	26	805	8'-9"	23	20	52											
		5	3	7½"	7"	8'	29.49	5,066	0.640	109.43	68	¾"φ	8"	8'-10"	902	68	¾"φ	8"	8'-10"	902	136	⅝"φ	8"	8'-3"	1,170	5'-5"	136	⅝"φ	8"	4'-11"	698	2'-1"	4'-11"	204	10	18"±	10	18"±	16	14"	36	1114	8'-11"	24	20	52											
		6	3	7½"	7"	8'	31.44	5,249	0.684	113.45	68	¾"φ	8"	8'-10"	902	68	¾"φ	8"	8'-10"	902	136	⅝"φ	8"	9'-3"	1,312	6'-5"	136	⅝"φ	8"	4'-11"	698	2'-1"	5'-11"	245	10	18"±	10	18"±	16	16½"	36	1114	8'-11"	24	20	52											
		7	3	7½"	7"	8'	33.40	5,715	0.727	123.30	68	¾"φ	8"	8'-10"	902	68	¾"φ	8"	8'-10"	902	146	⅝"φ	7½"	10'-3"	1,561	7'-5"	146	⅝"φ	7½"	4'-11"	749	2'-1"	6'-11"	287	10	18"±	10	18"±	20	16"	40	1238	8'-11"	24	20	52											
		8	3	7½"	8"	8'	37.96	6,111	0.827	132.15	68	¾"φ	8"	9'-0"	919	68	¾"φ	8"	9'-0"	919	156	⅝"φ	7"	11'-3"	1,830	8'-5"	156	⅝"φ	7"	4'-11"	801	2'-1"	7'-11"	328	10	18"±	10	18"±	20	18"	40	1238	9'-1"	24	20	52											
	9	5	3	8"	7"	8'	33.06	6,043	0.718	130.39	78	¾"φ	7"	9'-10"	1,152	78	¾"φ	7"	9'-10"	1,152	168	⅝"φ	6½"	8'-4"	1,460	5'-6"	168	⅝"φ	6½"	5'-0"	876	2'-2"	4'-11"	204	10	18"±	10	18"±	16	14"	36	1114	9'-11"	27	22	58											
		6	3	8"	7"	8'	35.02	6,259	0.761	135.13	78	¾"φ	7"	9'-10"	1,152	78	¾"φ	7"	9'-10"	1,152	168	⅝"φ	6½"	9'-4"	1,635	6'-6"	168	⅝"φ	6½"	5'-0"	876	2'-2"	5'-11"	245	10	18"±	10	18"±	16	16½"	36	1114	9'-11"	27	22	58											
		7	3	8"	7"	8'	36.97	6,776	0.805	146.43	84	¾"φ	6½"	9'-10"	1,240	84	¾"φ	6½"	9'-10"	1,240	168	⅝"φ	6½"	10'-4"	1,810	7'-6"	168	⅝"φ	6½"	5'-0"	876	2'-2"	6'-11"	287	10	18"±	10	18"±	20	16"	40	1238	9'-11"	27	22	58											
		8	3	8"	8"	8'	41.55	7,036	0.905	152.12	84	¾"φ	6½"	10'-0"	1,262	84	¾"φ	6½"	10'-0"	1,262	168	⅝"φ	6½"	11'-4"	1,985	8'-6"	168	⅝"φ	6½"	5'-0"	876	2'-2"	7'-11"	328	10	18"±	10	18"±	20	18"	40	1238	10'-1"	27	22	58											
		9	3	8"	8"	8'	43.79	7,630	0.955	165.09	84	¾"φ	6½"	10'-0"	1,262	84	¾"φ	6½"	10'-10"	1,262	182	⅝"φ	6"	12'-4"	2,341	9'-6"	182	⅝"φ	6"	5'-0"	949	2'-2"	8'-11"	369	10	18"±	10	18"±	24	17"	44	1362	10'-1"	27	22	58											
	10	5	3	8½"	7"	8'	36.90	7,149	0.802	154.99	64	⅞"φ	8½"	10'-10"	1,417	64	⅞"φ	8½"	10'-10"	1,417	136	¾"φ	8"	8'-6"	1,736	5'-6"	136	¾"φ	8"	5'-5"	1,107	2'-5"	4'-11"	204	11	18"±	11	18"±	16	14"	38	1176	10'-11"	29	24	63											
		6	3	8½"	7"	8'	38.86	7,571	0.845	164.30	68	⅞"φ	8"	10'-10"	1,505	68	⅞"φ	8"	10'-10"	1,505	136	¾"φ	8"	9'-6"	1,941	6'-6"	136	¾"φ	8"	5'-5"	1,107	2'-5"	5'-11"	245	11	18"±	11	18"±	16	16½"	38	1176	10'-11"	29	24	63											
		7	3	8½"	7"	8'	40.82	7,941	0.888	172.36	68	⅞"φ	8"	10'-10"	1,505	68	⅞"φ	8"	10'-10"	1,505	136	¾"φ	8"	10'-6"	2,145	7'-6"	136	¾"φ	8"	5'-5"	1,107	2'-5"	6'-11"	287	11	18"±	11	18"±	20	16"	42	1300	10'-11"	29	24	63											
		8	3	8½"	8"	8'	45.43	8,235	0.930	178.60	68	⅞"φ	8"	11'-0"	1,529	68	⅞"φ	8"	11'-0"	1,529	136	¾"φ	8"	11'-6"	2,349	8'-6"	136	¾"φ	8"	5'-5"	1,107	2'-5"	7'-11"	328	11	18"±	11	18"±	20	18"	42	1300	11'-1"	30	24	63											
		9	3	8½"	8"	8'	47.67	8,874	1.039	185.81	68	⅞"φ	8"	11'-0"	1,529	68	⅞"φ	8"	11'-0"	1,529	146	¾"φ	7½"	12'-6"	2,741	9'-6"	146	¾"φ	7½"	5'-5"	1,189	2'-5"	8'-11"	369	11	18"±	11	18"±	24	17"	46	1424	11'-1"	30	24	63											
		10	3	8½"	8"	8'	49.90	9,766	1.088	211.62	73	⅞"φ	7½"	11'-0"	1,641	73	⅞"φ	7½"	11'-0"	1,641	156	¾"φ	7"	13'-6"	3,163	10'-6"	156	¾"φ	7"	5'-5"	1,210	2'-5"	9'-11"	411	11	18"±	11	18"±	28	16"	50	1547	11'-1"	30	24	63											

BARS C

BARS D

BARS M

BARS N

BARS K

SECTION THRU CURB

* Construction Joint shown at flow line on Sections 1, 2 & 3 may be raised a maximum of 6" if desired.

HALF SEC. TYPE 1

HALF SEC.-TYPE 2

HALF SEC. TYPE 3

PART PLAN OF REINF. STEEL
3 X 2 TO 4 X 4

PART PLAN OF REINF. STEEL
5 X 2 TO 10 X 10

GENERAL NOTES:-

Design: H20 or H20-S16 Loading in accordance with A.A.S.H.O. 1944 Standard Specifications and revisions thereto.

All concrete shall be Class C. Chamfer exposed corners ¾".

All dimensions relating to reinforcing steel are to centers of bars.

Quantities of reinforcing steel shown hereon are for 44'-0" clear width between head walls and include one 30 diameter lap for all bars exceeding 40 feet in length. Barrels having a length over 80 feet shall have quantities recalculated to include an additional 30 diameter lap for all longitudinal bars.

TEXAS HIGHWAY DEPARTMENT

SINGLE CULVERTS-NORMAL

3' X 2' TO 10' X 10'

DIRECT TRAFFIC TO 8'-0" FILL

SC-NA SC-NB SC-NC

DN. WH	DRAWING	DATE	
CK DN RMM	Original -	May 1948	
DW LBA			
CK DW WH			
TR OCK			
CK TR RMM			

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.			SHEET NO.
6	TEXAS				
STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.

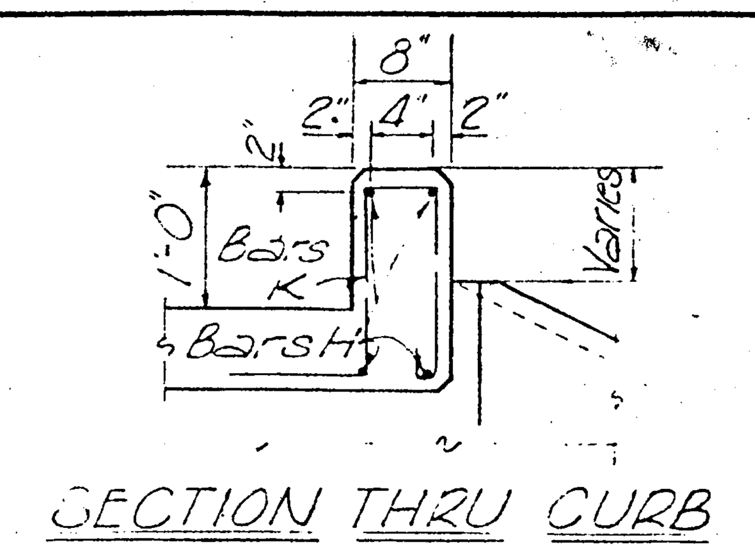
BILL OF STEEL ~ END SECTION

Culvert Size S	H	Dim b	Total Quantities Conc	Total Quantities Steel	Bars A1–Ax In Top & Bottom Slab No	Size	Spa	A1	Ax	Av. Lgth	Wt	Bars C Walls & Top Corner No	Size	Spa	Lgth	Wt	Bars D In Bottom Corner No	Size	Spa	Lgth	Wt
3	2	1'-1⅞"	.37	27	3*	4	7"	1'-3"	3'-3"	2'-3"	5										
	3	1'-1⅞"	.37	29	3*	4	7"	1'-3"	3'-3"	2'-3"	5										
4	2	1'-5 5/16"	.52	92	4*	4	6"	1'-3"	3'-10"	2'-6"	7										
	3	1'-5 5/16"	.57	95	4*	4	6"	1'-3"	3'-10"	2'-6"	7										
	4	1'-5 5/16"	.62	101	4*	4	6"	1'-3"	3'-10"	2'-6"	7										
5	2	1'-8 13/16"	.68	144	8	5	8"	1'-3"	4'-8"	2'-11"	24	6	4	8"	4'-10"	19	6	4	8	4'-1"	16
	3	1'-8 13/16"	.75	149	8	5	8"	1'-3"	4'-8"	2'-11"	24	6	4	8"	5'-10"	23	6	4	8	4'-1"	16
	4	1'-8 13/16"	.81	157	8	5	8"	1'-3"	4'-8"	2'-11"	24	6	4	8"	6'-10"	27	6	4	8	4'-1"	16
	5	1'-9⅜"	.97	186	8	5	8"	1'-3"	4'-8"	2'-11"	24	6	4	8"	7'-10"	31	6	4	8	4'-1"	16
6	3	2'-0¼"	.95	188	10	5	8"	1'-3"	5'-8"	3'-6"	37	8	4	6"	5'-10"	31	8	4	6	4'-1"	22
	4	2'-0¼"	1.02	199	10	5	8"	1'-3"	5'-8"	3'-6"	37	8	4	6"	6'-10"	37	8	4	6	4'-1"	22
	5	2'-0 3/16"	1.20	230	10	5	8"	1'-3"	5'-9"	3'-6"	37	8	4	6"	7'-10"	42	8	4	6	4'-1"	22
	6	2'-0 3/16"	1.29	247	10	5	8"	1'-3"	5'-9"	3'-6"	37	9	4	5½	8'-10"	53	9	4	5½	4'-1"	25
7	3	2'-3 11/16"	1.23	261	14	5	7"	1'-3"	7'-0"	4'-2"	61	8	5	7½"	6'-2"	51	8	5	7½	4'-10"	40
	4	2'-3 11/16"	1.31	260	14	5	6½	1'-3"	6'-8"	4'-0"	58	7	5	8"	7'-2"	52	7	5	8	4'-10"	35
	5	2'-4 5/16"	1.51	312	16	5	6½	1'-3"	7'-3"	4'-3"	71	7	5	8"	8'-2"	60	7	5	8	4'-10"	35
	6	2'-4 5/16"	1.62	323	16	5	6½	1'-3"	7'-3"	4'-3"	71	7	5	8"	9'-2"	67	7	5	8	4'-10"	35
	7	2'-4 5/16"	1.72	357	16	5	6½"	1'-3"	7'-3"	4'-3"	71	8	5	7½"	10'-2"	85	8	5	7½"	4'-10"	40
8	4	2'-7 3/16"	1.72	329	14	6	8"	1'-3"	7'-10"	4'-7"	96	8	5	7½"	7'-3"	60	8	5	7½"	4'-11"	41
	5	2'-7¾"	1.96	371	14	6	8"	1'-3"	7'-11"	4'-7"	96	8	5	8"	8'-3"	69	8	5	8"	4'-11"	41
	6	2'-7¾"	2.07	383	14	6	8"	1'-3"	7'-11"	4'-7"	96	8	5	8"	9'-3"	77	8	5	8"	4'-11"	41
	7	2'-7¾"	2.18	421	14	6	8"	1'-3"	7'-11"	4'-7"	96	9	5	7½"	10'-3"	96	9	5	7½"	4'-11"	46
	8	2'-8 5/16"	2.49	457	14	6	8"	1'-3"	8'-0"	4'-8"	98	9	5	7"	11'-3"	106	9	5	7"	4'-11"	46
9	5	2'-11 3/16"	2.40	476	18	6	7"	1'-3"	9'-0"	5'-2"	140	11	5	6½"	8'-4"	96	11	5	6½"	5'-0"	57
	6	2'-11 3/16"	2.52	491	18	6	7"	1'-3"	9'-0"	5'-2"	140	11	5	6½"	9'-4"	107	11	5	6½"	5'-0"	57
	7	2'-11 3/16"	2.65	534	20	6	6½	1'-3"	9'-2"	5'-3"	158	11	5	6½"	10'-4"	119	11	5	6½"	5'-0"	57
	8	2'-11 3/16"	3.00	550	20	6	6½	1'-3"	9'-3"	5'-3"	158	11	5	6½"	11'-4"	130	11	5	6½"	5'-0"	57
	9	2'-11 3/16"	3.14	593	20	6	6½"	1'-3"	9'-3"	5'-3"	158	12	5	6"	12'-4"	154	12	5	6"	5'-0"	63
10	5	3'-2 11/16"	2.90	598	16	7	8½	1'-3"	9'-11"	5'-7"	182	10	6	8"	8'-6"	128	10	6	8	5'-5"	81
	6	3'-2 11/16"	3.04	644	18	7	8"	1'-3"	10'-1"	5'-8"	209	10	6	8"	9'-6"	143	10	6	8"	5'-5"	81
	7	3'-2 11/16"	3.18	673	18	7	8"	1'-3"	10'-1"	5'-8"	209	10	6	8"	10'-6"	158	10	6	8"	5'-5"	81
	8	3'-3¼"	3.56	699	18	7	8"	1'-3"	10'-2"	5'-9"	212	10	6	8"	11'-6"	173	10	6	8"	5'-5"	81
	9	3'-3¼"	3.72	753	18	7	8"	1'-3"	10'-2"	5'-9"	212	11	6	7½"	12'-6"	207	11	6	7½"	5'-5"	89
	10	3'-3¼"	3.88	778	18	7	7½"	1'-3"	9'-11"	5'-7"	205	11	6	7"	13'-6"	223	11	6	7"	5'-5"	89

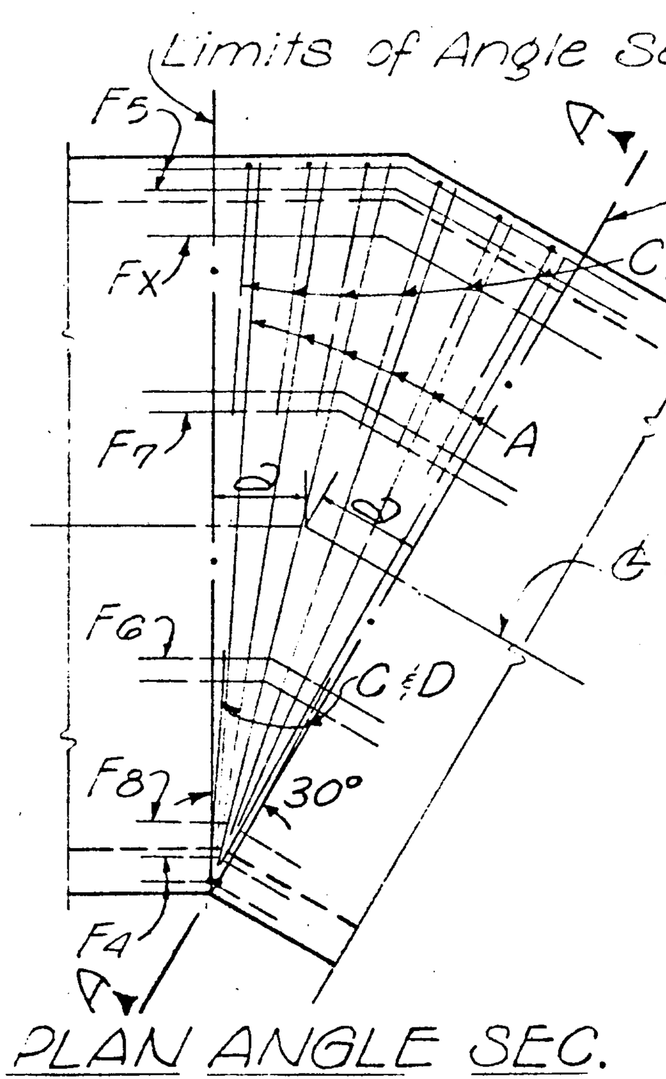
S	H	#4 Bars E @ 18" C to C No	Lgth	Wt	Number of #4 Bars F (Length Shown in Table) F15	F16	F17	F18-x	Wt	4 ~ #5 Bars H Lgth	Wt	#4 Bars K @ 12" C to C 3'-11" Long No	Wt	#4 Bars M3–Mx In Top Slab & Walls No	Spa	Lgth M3	Lgth Mx	Av Lgth	Wt	#4 Bars N3–Nx In Bottom Slab No	Spa	Lgth N3	Lgth Nx	Av Lgth	Wt
3	2	1	1'-11"	1	4	1	1	6	19	4'-4"	18	5	13	2	9"	3'-7"	4'-11"	4'-3"	6	2	9"	2'-9"	4'-1"	3'-5"	5
	3	1	2'-11"	2	4	1	1	6	19	4'-4"	18	5	13	2	9"	4'-7"	5'-11"	5'-3"	7	2	9"	2'-9"	4'-1"	3'-5"	5
4	2	1	1'-11"	1	4	1	1	8	20	5'-6"	23	6	16	4	7"	3'-7"	6'-7"	5'-1"	14	4	7"	2'-9"	5'-9"	4'-3"	11
	3	1	2'-11"	2	4	1		8	20	5'-6"	23	6	16	4	7"	4'-7"	7'-7"	6'-1"	16	4	7"	2'-9"	5'-9"	4'-3"	11
	4	1	3'-11"	3	[illegible]	1		8	22	[illegible]	23	6	16	4	7"	5'-7"	[illegible]	7'-1"	19	4	7"	2'-9"	[illegible]	4'-3"	11
5	2	1	1'-11"	1	4	2	2	10	35	6'-8"	28	8	21												
	3	1	2'-11"	2	4	2	2	10	35	6'-8"	28	8	21												
	4	1	3'-11"	3	5	2	2	10	38	6'-8"	28	8	21												
	5	4	4'-11"	13	10	2	2	10	52	6'-10"	29	8	21												
6	3	1	2'-11"	2	4	2	2	10	39	7'-10"	33	9	24												
	4	1	3'-11"	3	5	2	2	10	43	7'-10"	33	9	24												
	5	4	4'-11"	13	10	2	2	10	59	8'-0"	33	9	24												
	6	4	5'-11"	16	10	2	2	10	59	8'-0"	33	9	24												
7	3	1	2'-11"	2	4	2	2	10	43	9'-0"	38	10	26												
	4	1	3'-11"	3	5	2	2	10	48	9'-0"	38	10	26												
	5	5	4'-11"	16	10	2	2	10	66	9'-2"	38	10	26												
	6	5	5'-11"	20	10	2	2	10	66	9'-2"	38	10	26												
	7	5	6'-11"	23	12	2	2	10	74	9'-2"	38	10	26												
8	4	1	3'-11"	3	5	2	2	12	58	10'-2"	42	11	29												
	5	5	4'-11"	16	10	2	2	12	77	10'-4"	43	11	29												
	6	5	5'-11"	20	10	2	2	12	77	10'-4"	43	11	29												
	7	5	6'-11"	23	12	2	2	12	88	10'-4"	43	11	29												
	8	5	7'-11"	26	12	2	2	12	88	10'-6"	44	11	29												
9	5	6	4'-11"	20	10	2	2	12	84	11'-6"	48	12	31												
	6	6	5'-11"	24	10	2	2	12	84	11'-6"	48	12	31												
	7	6	6'-11"	28	12	2	2	12	93	11'-6"	48	12	31												
	8	6	7'-11"	32	12	2	2	12	93	11'-8"	49	12	31												
	9	6	8'-11"	36	14	2	2	12	102	11'-8"	49	12	31												
10	5	6	4'-11"	20	10	2	2	14	100	12'-8"	53	13	34												
	6	6	5'-11"	24	10	2	2	14	100	12'-8"	53	13	34												
	7	6	6'-11"	28	12	2	2	14	110	12'-8"	53	13	34												
	8	6	7'-11"	32	12	2	2	14	110	12'-10"	54	14	37												
	9	6	8'-11"	36	14	2	2	14	116	12'-10"	54	14	37												
	10	6	9'-11"	40	16	2	2	14	130	12'-10"	54	14	37												

*Bars A in top Slab only

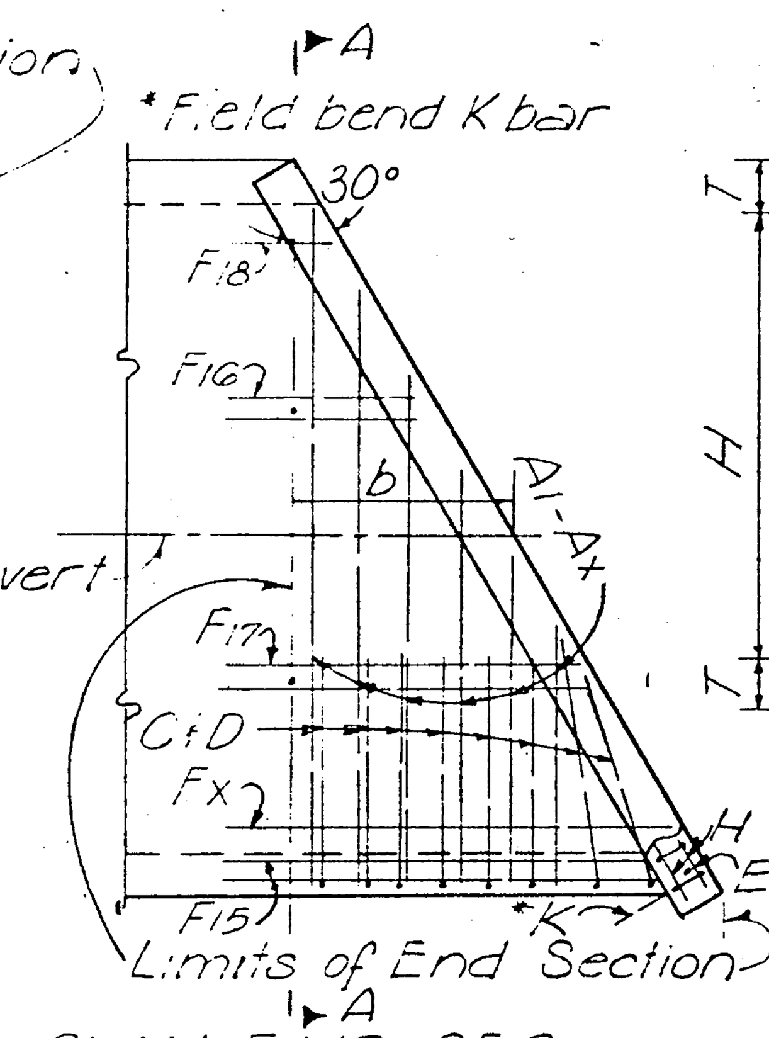
Note: It is desirable to have at least one foot of straight extension before beginning Angle Section. Bars F may be eliminated from this one foot section



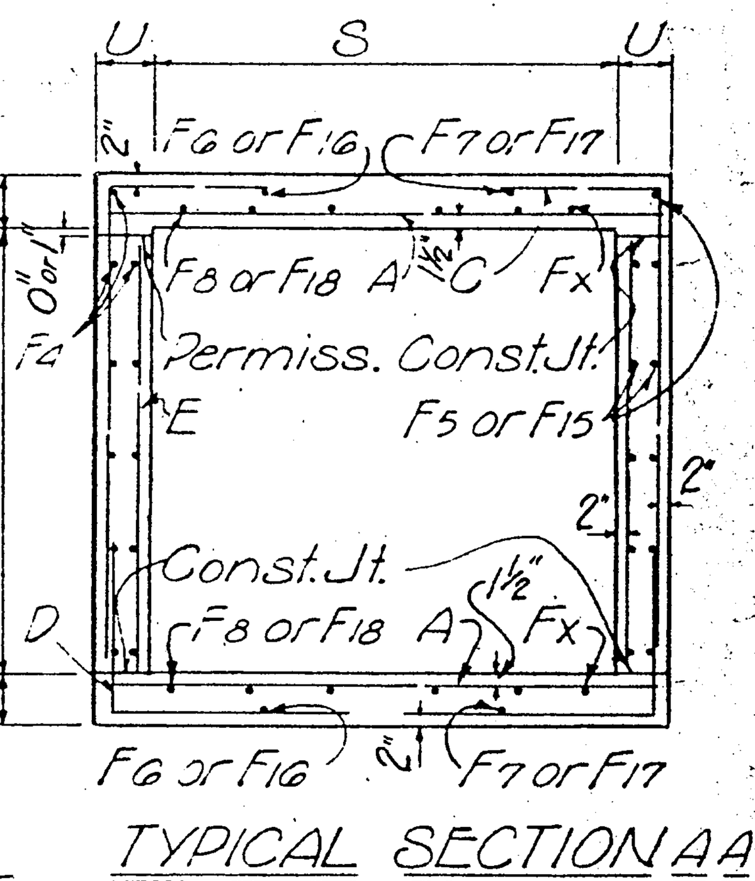
SECTION THRU CURB



PLAN ANGLE SEC.



PLAN END SEC.



TYPICAL SECTION AA

BILL OF STEEL ~ ANGLE SECTION

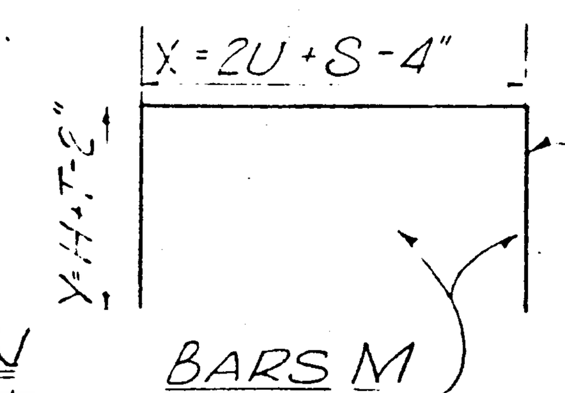
Culvert Size S	H	Dim a	Total Quantities Conc.	Total Quantities Steel	Bars A In Top & Bottom Slab No	Size	Spa	Lgth	Wt	Bars C Walls & Top Corner No.	Size	Spa.	Lgth.	Wt.	Bars D In Bottom Corner No	Size	Spa	Lgth	Wt
3	2	6 7/16"	.24	78	*4	4	7"	3'-8"	10										
	3	6 7/16"	.28	82	*4	4	7"	3'-8"	10										
4	2	8 1/16"	.35	99	*5	4	6"	4'-8"	16										
	3	8 1/16"	.40	103	*5	4	6"	4'-8"	16										
	4	8 1/16"	.45	112	*5	4	6"	4'-8"	16										
5	2	9⅝"	.48	125	10	5	8"	5'-8"	59	7	4	8"	4'-10"	23	7	4	8"	4'-1"	19
	3	9⅝"	.54	129	10	5	8"	5'-8"	59	7	4	8"	5'-10"	27	7	4	8"	4'-1"	19
	4	9⅝"	.60	139	10	5	8"	5'-8"	59	7	4	8"	6'-10"	32	7	4	8"	4'-1"	19
	5	9 15/16"	.73	177	10	5	8"	5'-10"	61	7	4	8"	7'-10"	37	7	4	8"	4'-1"	19
6	3	11¼"	.69	165	12	5	8"	6'-8"	83	10	4	6"	5'-10"	39	10	4	6"	4'-1"	27
	4	11¼"	.76	177	12	5	8"	6'-8"	83	10	4	6"	6'-10"	46	10	4	6"	4'-1"	27
	5	11½"	.92	221	12	5	8"	6'-10"	85	10	4	6"	7'-10"	52	10	4	6"	4'-1"	27
	6	11½"	1.01	239	12	5	8"	6'-10"	85	11	4	5½"	8'-10"	65	11	4	5½"	4'-1"	30
7	3	1'-0⅞"	.93	229	14	5	7"	7'-8"	112	9	5	7½"	6'-2"	58	9	5	7½"	4'-10"	45
	4	1'-0⅞"	1.01	244	14	5	6½"	7'-8"	112	9	5	8"	7'-2"	67	9	5	8"	4'-10"	45
	5	1'-1⅛"	1.19	302	14	5	6½"	7'-10"	114	9	5	8"	8'-2"	77	9	5	8"	4'-10"	45
	6	1'-1⅛"	1.28	313	14	5	6½"	7'-10"	114	9	5	8"	9'-2"	86	9	5	8"	4'-10"	45
	7	1'-1⅛"	1.38	352	14	5	6½"	7'-10"	114	10	5	7½"	10'-2"	106	10	5	7½"	4'-10"	50
8	4	1'-2½"	1.36	309	14	6	8"	8'-8"	182	10	5	7½"	7'-3"	76	10	5	7½"	4'-11"	51
	5	1'-2¾"	1.57	364	14	6	8"	8'-10"	186	10	5	8"	8'-3"	86	10	5	8"	4'-11"	51
	6	1'-2¾	1.68	377	14	6	8"	8'-10"	186	10	5	8"	9'-3"	96	10	5	8"	4'-11"	51
	7	1'-2¾	1.79	402	14	6	8"	8'-10"	186	10	5	7½"	10'-3"	107	10	5	7½"	4'-11"	51
	8	1'-3"	2.07	434	14	6	8"	9'-0"	189	11	5	7"	11'-3"	129	11	5	7"	4'-11"	56
9	5	1'-4⅜"	1.96	457	18	6	7"	9'-10"	266	13	5	6½"	8'-4"	113	13	5	6½"	5'-0"	68
	6	1'-4⅜"	2.07	474	18	6	7"	9'-10"	266	13	5	6½"	9'-4"	127	13	5	6½"	5'-0"	68
	7	1'-4⅜"	2.19	514	20	6	6½"	9'-10"	295	13	5	6½"	10'-4"	140	13	5	6½"	5'-0"	68
	8	1'-4⅝"	2.51	534	20	6	6½"	10'-0"	300	13	5	6½"	11'-4"	154	13	5	6½"	5'-0"	68
	9	1'-4⅝"	2.64	582	20	6	6½"	10'-0"	300	14	5	6"	12'-4"	180	14	5	6"	5'-0"	73
10	5	1'-5 15/16	2.40	570	16	7	8½"	10'-10"	354	11	6	8"	8'-6"	140	11	6	8"	5'-5"	89
	6	1'-5 15/16	2.53	590	16	7	8"	10'-10"	354	11	6	8"	9'-6"	157	11	6	8"	5'-5"	89
	7	1'-5 15/16"	2.66	622	16	7	8"	10'-10"	354	11	6	8"	10'-6"	173	11	6	8"	5'-5"	89
	8	1'-6¼"	3.01	699	18	7	8"	11'-0"	404	12	6	8"	11'-6"	207	12	6	8"	5'-5"	98
	9	1'-6¼	3.16	734	18	7	8"	11'-0"	404	12	6	7½"	12'-6"	225	12	6	7½"	5'-5"	98
	10	1'-6¼"	3.31	798	18	7	7½"	11'-0"	404	13	6	7"	13'-6"	264	13	6	7"	5'-5"	106

S	H	#4 Bars E 18" C to C No	Lgth.	Wt	Number of #4 Bars (Length Shown in Table) F4	F5	F6	F7	F8-x	Wt.	#4 Bars M In Top Slab & Walls No	Lgth M1	No	Lgth M2	Tot Wt.	#4 Bars N In Bottom Slab No	Lgth N1	No	Lgth N2	Tot Wt.
3	2				4	4	1	1	6	33	2	8'-4"	2	6'-0"	19	2	6'-8"	2	5'-2"	16
	3				4	4	1	1	6	33	2	10'-4"	2	7'-0"	23	2	6'-8"	2	5'-2"	16
4	2				4	4	1	1	8	40	2	9'-4"	2	7'-0"	22	2	7'-8"	2	6'-2"	18
	3				4	4	1	1	8	40	2	11'-4"	2	8'-0"	26	2	7'-8"	2	6'-2"	18
	4				5	5	1	1	8	45	2	13'-4"	2	9'-0"	30	2	7'-8"	2	6'-2"	18
5	2				4	4	2	2	10	53										
	3				4	4	2	2	10	53										
	4				5	5	2	2	10	58										
	5	3	4'-11"	10	10	10	2	2	10	82										
6	3				4	4	2	2	10	57										
	4				5	5	2	2	10	62										
	5	3	4'-11"	10	10	10	2	2	10	89										
	6	3	5'-11"	12	10	10	2	2	10	89										
7	3				4	4	2	2	10	62										
	4				5	5	2	2	10	68										
	5	3	4'-11"	10	10	10	2	2	10	96										
	6	3	5'-11"	12	10	10	2	2	10	96										
	7	3	6'-11"	14	12	12	2	2	10	108										
8	4				5	5	2	2	12	78										
	5	4	4'-11"	13	10	10	2	2	12	108										
	6	4	5'-11"	16	10	10	2	2	12	108										
	7	4	6'-11"	18	12	12	2	2	12	120										
	8	4	7'-11"	21	12	12	2	2	12	120										
9	5	4	4'-11"	13	10	10	2	2	12	115										
	6	4	5'-11"	16	10	10	2	2	12	115										
	7	4	6'-11"	18	12	12	2	2	12	126										
	8	4	7'-11"	21	12	12	2	2	12	126										
	9	4	8'-11"	24	14	14	2	2	12	140										
10	5	4	4'-11"	13	10	10	2	2	14	129										
	6	4	5'-11"	16	10	10	2	2	14	129										
	7	4	6'-11"	18	12	12	2	2	14	143										
	8	5	7'-11"	26	12	12	2	2	14	143										
	9	5	8'-11"	30	14	14	2	2	14	156										
	10	5	9'-11"	33	16	16	2	2	14	170										

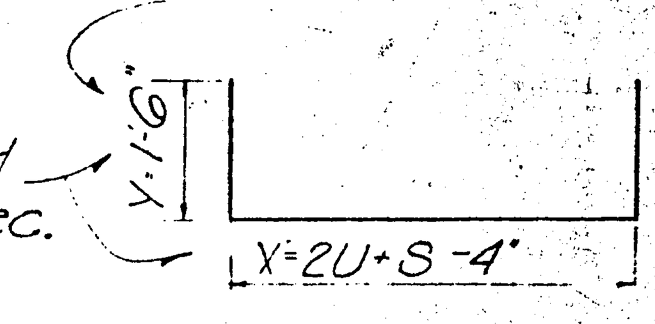
M & N Bars @ Spacing Shown for End. Sec.

*Bars A in top Slab only

Bars M & N replace Bars C & D when shown.
Bars F6, F7, F16 & F17 are not used in bottom slab when Bars M & N are used. When only 1-Bar E is shown it shall be placed in wall at end of barrel.



BARS M



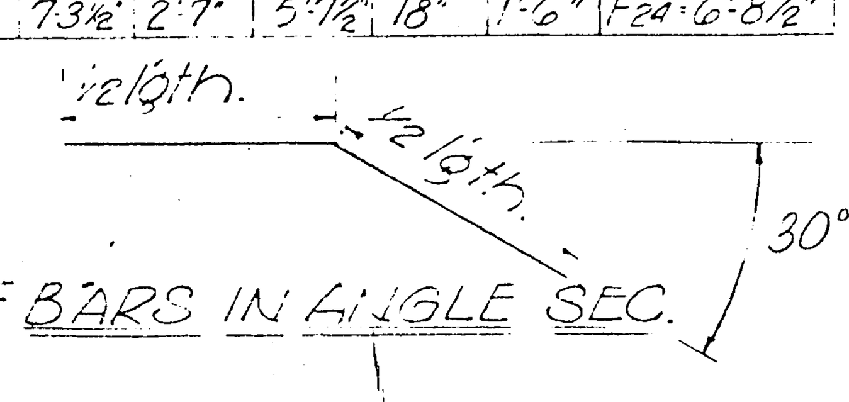
BARS N

LENGTH OF F BARS IN ANGLE SECTION

Culvert S	F4 Lgth	F5 Lgth	F6 Lgth	F7 Lgth	Spa. F8-Fx	F8 Lgth	Fx Lgth
3	2'-2"	4'-0½"	2'-6½"	3'-7½"	12"	2'-6½"	F10 = 3'-7½"
4	2'-2"	4'-7"	2'-9½"	3'-10½"	12"	2'-6½"	F11 = 4'-1½"
5	2'-2"	5'-1½"	3'-4"	3'-10½"	12"	2'-6½"	F12 = 4'-8"
6	2'-2"	5'-8"	3'-4"	4'-5"	16"	2'-5½"	F12 = 5'-3½"
7	2'-2½"	6'-4"	3'-6"	4'-10½"	18"	2'-7"	F12 = 5'-9½"
8	2'-2½"	6'-10"	3'-6"	5'-4½"	18"	2'-5½"	F13 = 6'-5½"
9	2'-2½"	7'-4½"	3'-6"	5'-11"	18"	2'-8½"	F13 = 6'-5½"
10	2'-3"	8'-0"	3'-7½"	6'-5½"	18"	2'-7½"	F14 = 7'-5½"

LENGTH OF F BARS IN END SECTION

Culvert S	F15 Lgth	F16 Lgth	F17 Lgth	SPA F18-Fx	F18 Lgth	Fx Lgth
3	3'-0½"	1'-5"	2'-7"	12"	1'-5"	F20 = 2'-7"
4	3'-7½"	1'-8½"	2'-10"	12"	1'-5"	F21 = 3'-1½"
5	4'-2½"	2'-3½"	2'-10"	12"	1'-5"	F22 = 3'-8½"
6	4'-9½"	2'-3½"	3'-5"	16"	1'-4"	F22 = 4'-4½"
7	5'-5½"	2'-5½"	3'-11"	18"	1'-5½"	F22 = 4'-11"
8	6'-3½"	2'-5½"	4'-6"	18"	1'-4"	F23 = 5'-7½"
9	6'-7½"	2'-5½"	5'-1"	18"	1'-7"	F23 = 5'-11"
10	7'-3½"	2'-7"	5'-7½"	18"	1'-6"	F24 = 6'-8½"



F BARS IN ANGLE SEC.

GENERAL NOTES:
This Design is adopted from Texas Highway Department Standard for Lengthening Details Single Box Culverts SCL. Refer to this Standard for details not shown on this sheet.
Chamfer exposed corners ¾".
Refer to Standard SCL for straight sections of culvert.
All dimensions relating to reinforcing steel are to centers of bars.

TEXAS HIGHWAY DEPARTMENT
· BRIDGE DIVISION ·

LENGTHENING DETAILS
SINGLE BOX CULVERTS
30° SKEW
SCL 30°

ORIGINAL DRAWING DATE: 4 - '62	FED. RD. DIV. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
DN: T.H.D. / CK: T.H.D. / DW: R.D.K. / CK: H.W.	REVISIONS: Rev. 1964; Rev. Nov. 1967; REV. JAN. 1973	6 / TEXAS	STATE DIST. NO. / COUNTY / CONT. / SECT. / JOB	HIGHWAY NO.