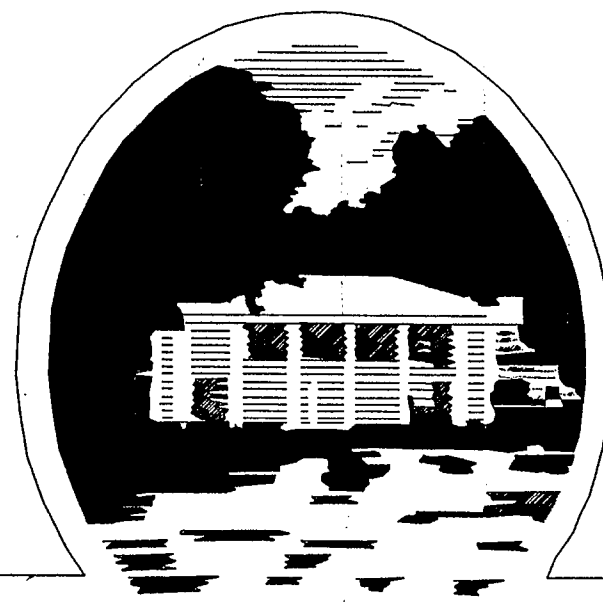


PLANS FOR THE CONSTRUCTION OF
PAVING, STORM WATER, WATER,
SIGNALIZATION AND STREETScape IMPROVEMENTS FOR

ARAPAHO ROAD – PHASE II

FROM MARSH LANE TO SURVEYOR BOULEVARD

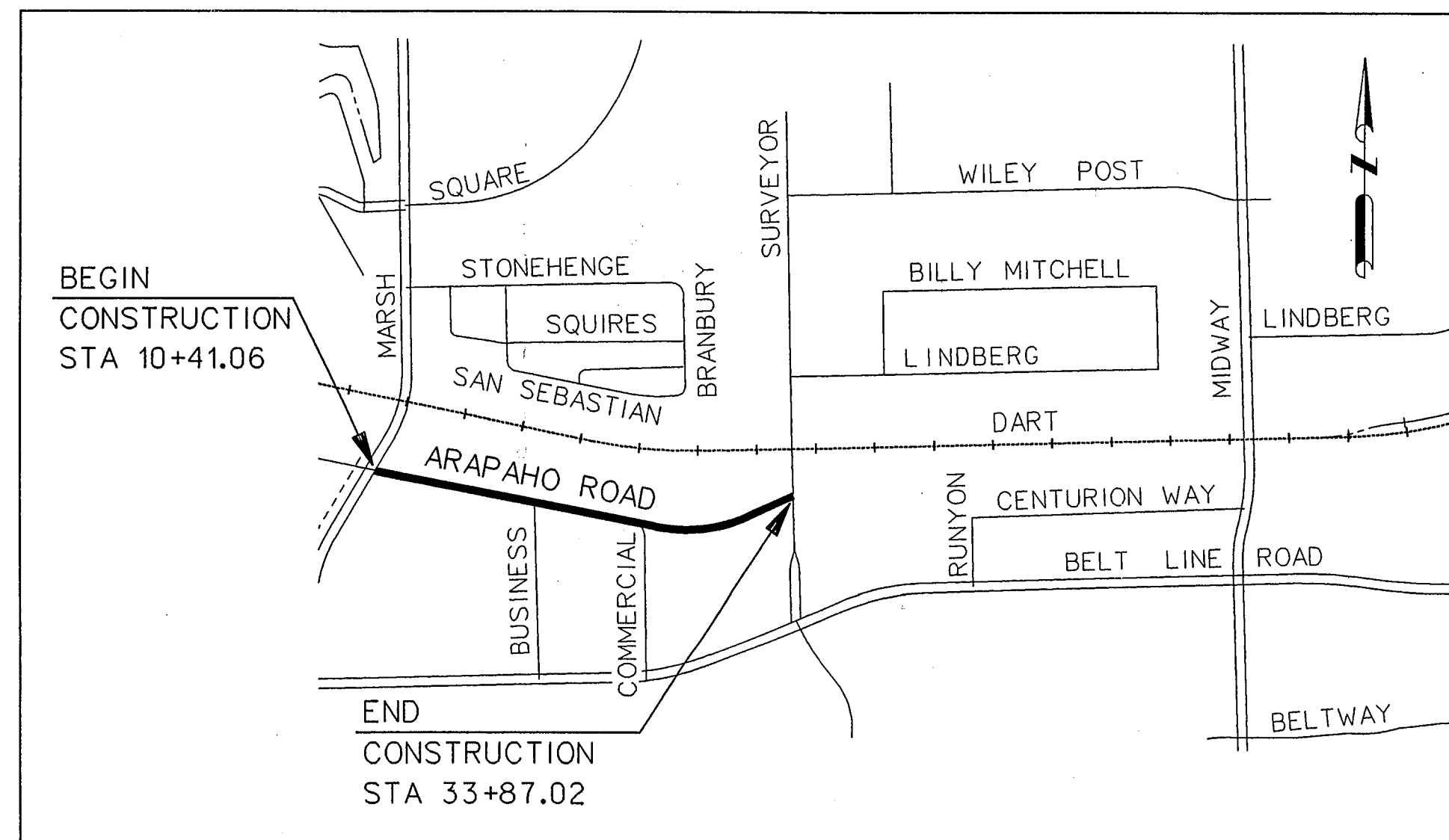
STATION 10+41.06 TO STATION 33+87.02 (LENGTH = 2,345.96 FT = 0.444 MILES)



T O W N O F
ADDISON

SHEET ID	INDEX OF SHEETS	SHEET NO.
	COVER SHEET	
N-1	NOTES AND LEGEND	2
Q-1 TO Q-3	QUANTITY SHEETS	3-5
RW-1 TO RW-4	RIGHT-OF-WAY PLANS	6-9
R-1 TO R-4	REMOVAL PLANS	10-13
CS-1 TO CS-11	CONSTRUCTION SEQUENCING PLANS	14-24
PT-1 TO PT-4	PAVING TYPICAL SECTIONS	25-28
SC-1	SURVEY CONTROL PLAN	29
PP-1 TO PP-8	PAVING PLAN AND PROFILE	30-37
JL-1	JOINT LAYOUTS FOR INTERSECTIONS & DRIVEWAYS	37A
DP-1 TO DP-2	DRIVEWAY PROFILES	38-39
IG-1 TO IG-2	INTERSECTION GRADING	40-40A
WL-1 TO WL-4	RETAINING WALL PLAN, PROFILE & DETAILS	41-44
PD-1 TO PD-2	PAVING DETAILS	45-46
S-1 TO S-3	SIGNING PLANS	47-49
ST-1 TO ST-5	STRIPING PLANS	50-51C
EC-1 TO EC-2	EROSION CONTROL PLANS	52-53
D-1 TO D-2	DRAINAGE AREA MAP	54-55
SW-1 TO SW-8	STORM WATER PLANS, PROFILES & DETAILS	56-62
W-1 TO W-5	WATER PLAN, PROFILE AND DETAILS	63-67
* TS-1 TO TS-21	SIGNALIZATION PLAN & DETAILS	68-80A
X-1 TO X-11	CROSS-SECTIONS	81-91
IL-1 TO IL-7	ILLUMINATION PLANS AND DETAILS	92-98
L-1 TO L-5	LAYOUT AND PLANTING PLAN	99-103
L-6	ENLARGED INTERSECTION PLANS AND DETAILS	104
I-1 TO I-6	IRRIGATION PLANS	105-110
PL-1	PLANTING DETAILS	111

* SHEET TS-15 INTENTIONALLY OMITTED



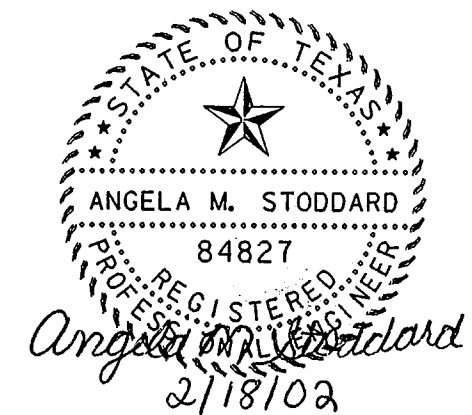
LOCATION MAP

OWNER:

TOWN OF ADDISON
DEPARTMENT OF PUBLIC WORKS
16801 WESTGROVE
P.O. BOX 9010
ADDISON, TEXAS 75001-9010
(972) 450-2871

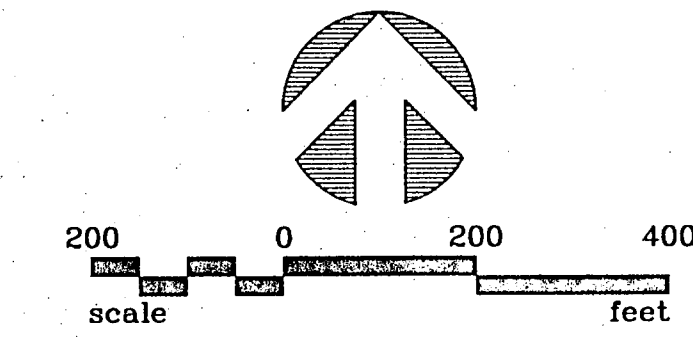
ENGINEER:

HNTB CORPORATION
5910 WEST PLANO PARKWAY, SUITE 200
PLANO, TEXAS 75093
(972) 661-5626



FF-17

NO.	DATE	REVISION	APPROV.
1	7/19/02	ADDED LINE 'D'	BRG
2			
3			



DRAINAGE AREA CALCULATIONS

AREA NO.	AREA (acres)	C ₁₀₀	T _c (min)	I ₁₀₀ (in/hr)	Q ₁₀₀ (cfs)	COMMENTS
1d1/1d2						(1) SEE INLET CALCULATIONS
2	1.36	0.90	10	8.74	10.7	EXISTING STORM SEWER SYSTEM
3d1/3d2						(1) SEE INLET CALCULATIONS
4	3.59	0.90	10	8.74	28.2	(1) PROPOSED 10' CURB INLET
5	1.00	0.90	10	8.74	7.9	PROPOSED 10' CURB INLET
6	0.82	0.90	10	8.74	6.5	PROPOSED 10' CURB INLET
7	4.24	0.90	10	8.74	33.4	(2) EXISTING STORM SEWER SYSTEM
8	9.44	0.90	10	8.74	74.3	(2) EXISTING STORM SEWER SYSTEM
8B	0.92	0.90	10	8.74	7.2	PROPOSED 10' CURB INLET
9	2.25	0.90	10	8.74	17.7	(2) EXISTING STORM SEWER SYSTEM
10A	2.24	0.90	10	8.74	17.6	PROPOSED 10' CURB INLET
10B	1.16	0.90	10	8.74	9.1	PROPOSED 10' CURB INLET
11A	1.01	0.90	10	8.74	7.9	PROPOSED 10' CURB INLET
11B	0.75	0.90	10	8.74	5.9	PROPOSED 10' CURB INLET
11C	4.28	0.90	10	8.74	33.7	PROPOSED 10' CURB INLET
11D	0.85	0.90	10	8.74	6.7	PROPOSED 10' CURB INLET
12	67.57	0.90	13.7	7.9	480.4	(2) EXISTING STORM SEWER SYSTEM
13	7.82	0.90	10	8.74	61.5	(3) PROPOSED 10' CURB INLET
14	0.53	0.90	10	8.74	4.2	PROPOSED 10' CURB INLET
15	1.20	0.90	10	8.74	9.4	(2) EXISTING STORM SEWER SYSTEM
16	17.53	0.90	11.2	8.4	132.5	(2) EXISTING STORM SEWER SYSTEM
17	0.94	0.90	10	8.74	7.4	PROPOSED 10' CURB INLET
18	0.94	0.90	10	8.74	7.4	PROPOSED 10' CURB INLET

NOTES:
 (1) EXISTING SYSTEM IS UNDERSIZED. DETENTION OF UNDEVELOPED TRACT IS RECOMMENDED.
 (2) EXISTING SYSTEM CONTRIBUTES TO PRIMARY CULVERTS
 (3) FLOWS UNDER PROPOSED ARAPAHO OVERPASS

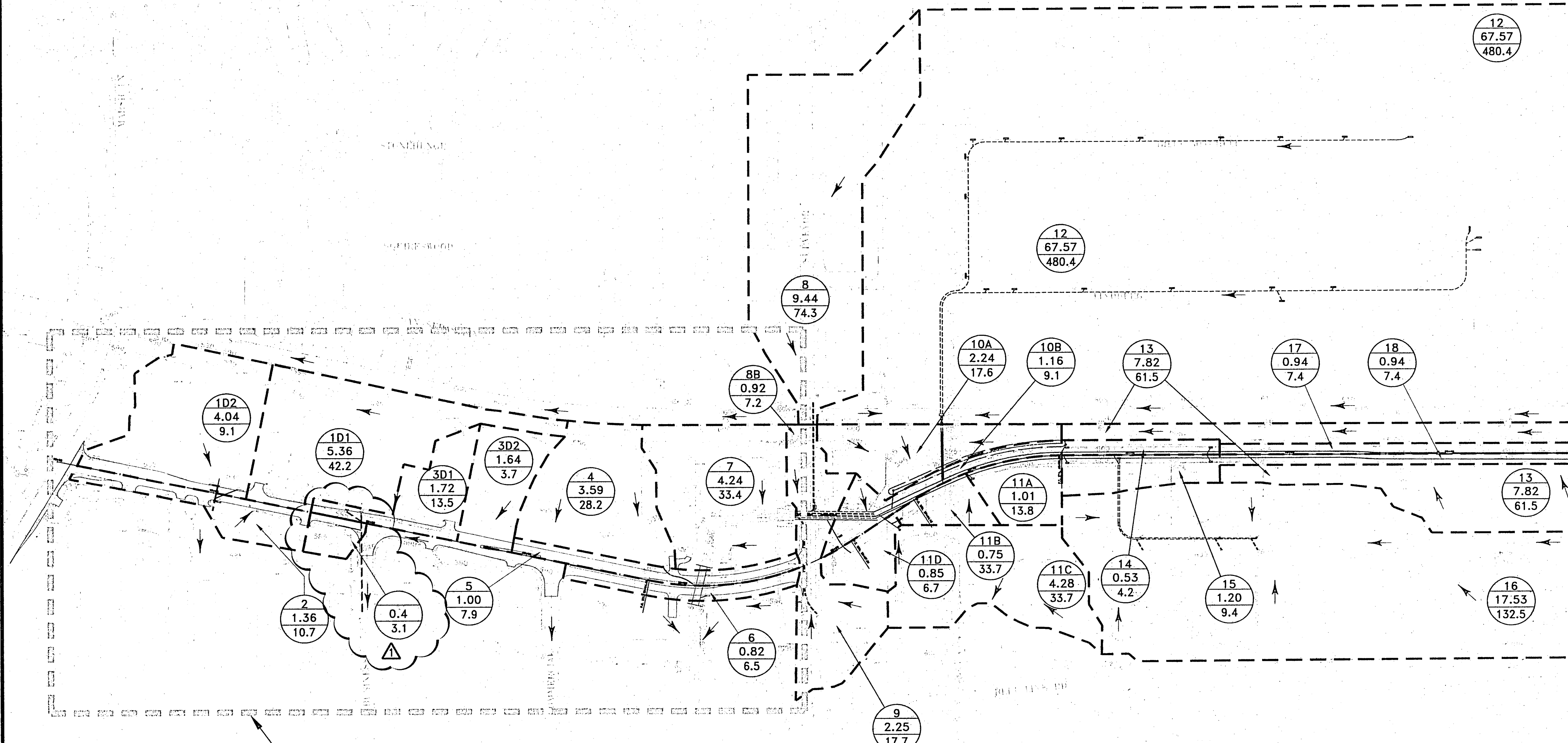
RAINFALL INTENSITY CALCULATIONS (FOR LARGE AREAS)

AREA NO.	OVERLAND/DITCH FLOW			PIPE FLOW			TOTAL TIME (min)	INTENSITY I ₁₀₀ (in/hr)	COMMENTS
	Length (ft)	Average Velocity (fps)	Time (min)	Length (ft)	Average Velocity (fps)	Time (min)			
12	-	-	10	2200	10	3.7	13.7	7.9	
16	-	-	10	700	10	1.2	11.2	8.4	

FLOW CALCULATIONS (FOR PRIMARY CULVERTS)

AREA NO.	AREA (acres)	C ₁₀₀	ICA	T _c (min)	I ₁₀₀ (in/hr)	Q ₁₀₀ (cfs)
19	171.70	0.70	120.19	33.1	5.5	661.0
20-29C	(SEE SHEET 2)		200.94	33.1	5.5	1105.2
17,18	1.88	0.90	202.63	35.3	5.3	1073.9
16	17.53	0.90	219.41	35.8	5.2	1135.7
13,14,15	9.55	0.90	227.00	36.1	5.1	1157.7
12	67.57	0.90	287.81	36.8	5.1	1467.8
10A,11A,11B	8.28	0.90	295.26	37.2	5.1	1505.8
10B,11C	2.01	0.90	297.07	37.5	5.1	1515.0
8,9	12.61	0.90	309.42	37.6	5.1	1572.9
4,5,6,7	9.65	0.90	317.11	38.4	5.0	1585.8

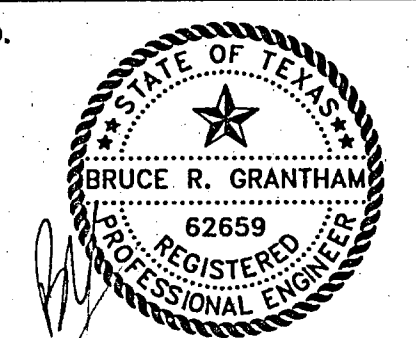
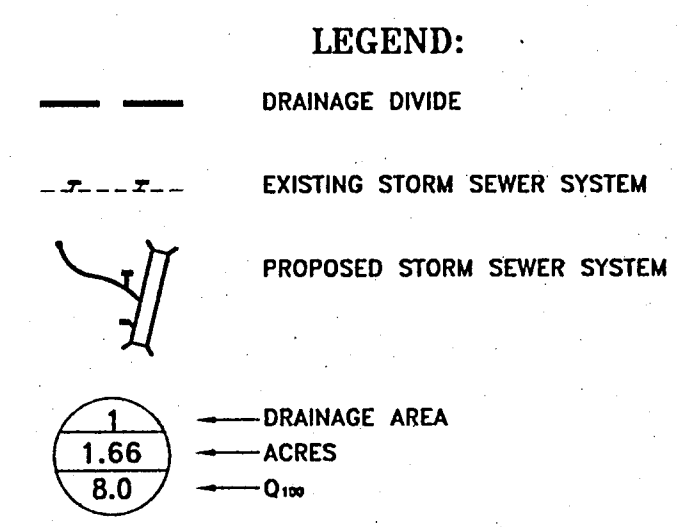
NOTES:
 1. AREAS 1, 2, AND 3 DRAIN TO EXISTING STORM SYSTEMS WHICH ARE UNDERSIZED
 2. AREAS 1 AND 2 DRAIN TO A STORM SEWER WHICH EXTENDS THROUGH DOWNSTREAM DEVELOPMENTS TO A TRUNK LINE IN BELT LINE ROAD.
 3. AREA 3 DRAINS TO A STORM SEWER WHICH EXTENDS DOWNSTREAM UNDER BUSINESS AVENUE TO A TRUNK LINE IN BELT LINE ROAD.
 4. AREAS 1 AND 3 ARE NOT FULLY DEVELOPED, CONSEQUENTLY, DETENTION IS RECOMMENDED WHEN THESE SITES DEVELOP TO LIMIT FUTURE RUNOFF TO NOT EXCEED EXISTING CONDITIONS.
 5. THE TABLE SHOWN BELOW PROVIDES RUNOFF CALCULATIONS FOR AREAS 1 & 3 WITH DETENTION.
 6. AREAS 1 AND 2: Q₁₀₀ = 62.0 c.f.s. (WITH FUTURE DETENTION FOR AREA 1) CAPACITY OF 36" ON 0.8% = 59.7 c.f.s. (DOWNSTREAM)
 7. AREA 3: Q₁₀₀ = 15.3 c.f.s. (WITH FUTURE DETENTION) CAPACITY OF 24" ON 1.2% = 24.8 c.f.s. (DOWNSTREAM)
 8. AREA 8 DRAINS TO EXISTING 10' SAG INLETS NORTH OF THE RAILROAD. SOME PONDING WILL OCCUR AT THESE INLETS IN A MAJOR STORM EVENT, HOWEVER, IT APPEARS UNLIKELY THAT RUNOFF WILL SPILL OVER THE ROAD CREST AND CONTRIBUTE TO AREA 8B.
 9. NEW 10' INLETS HAVE BEEN LOCATED TO DRAIN RUNOFF FROM AREA 8B PRIOR TO THE INTERSECTION OF SURVEYOR AND ARAPAHO.



INLET CALCULATIONS-ARAPAHO ROAD

AREA NO.	AREA (acres)	T _c (min)	I ₁₀₀ (in/hr)	C ₁₀₀	Q ₁₀₀ (cfs)	CROSS SLOPE	STREET SLOPE	WATER DEPTH IN GUTTER (ft)	ALLOWABLE DEPTH (ft)	DEPTH EXCEEDS ALLOWABLE	CAPACITY PER FOOT OF INLET (cfs/ft)	LENGTH OF INLET REQUIRED (ft)	EXISTING INLET LENGTH (ft)	OVER-CAPACITY FLOW (cfs)
1d1	5.36	10	8.74	0.9	42.2	2.083	0.011	0.50	0.42	YES	1.06	39.79	20	21.0
1d2	4.04	15	7.52	0.3	9.1									
2	1.36	10	8.74	0.9	10.7	2.083	SAG		0.42	NO	1.06	10.09	20	0.0
3d1	1.72	10	8.74	0.9	13.5									
3d2	1.64	15	7.52	0.3	3.7									
3D (TOTAL)	15	7.52	0.61	15.3	2.083	0.0112	0.40	0.42	NO	0.95	16.22	2-10	0.0	
4	3.59	10	8.74	0.9	28.2	2.083	SAG		0.42	NO	1.06	26.64	Y	0.0
5	1	10	8.74	0.9	7.9	2.083	SAG		0.42	NO	1.06	7.42	10	0.0
6	0.82	10	8.74	0.9	6.5	2.083	SAG		0.42	NO	1.06	6.09	10	0.0
7	4.24	10	8.74	0.9	33.4	2.083	N/A		0.42	NO				
8B	0.92	10	8.74	0.9	7.2	1.562	0.005	0.31	0.16	YES	0.53	13.65	2-10	0.0

- ON-SITE DETENTION WILL BE REQUIRED WHEN THE UNDEVELOPED PORTIONS OF AREAS 1D2 AND 3D2 ARE DEVELOPED.
- A 18" STUBOUT IS PROVIDED FOR AREA 1d2 WHERE 9.1 cfs OF CAPACITY IS PROVIDED FOR FUTURE DEVELOPMENT.
- WHEN 1D2 DEVELOPS, THE 9.1 c.f.s. OF OVERLAND FLOW WILL BE ROUTED THROUGH A DETENTION POND TO THE 18" STUBOUT.
- DIRECT RUNOFF TO ARAPAHO ROAD VIA FUTURE DRIVEWAY FROM DEVELOPMENT OF AREA 1d2 SHOULD BE MINIMIZED.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: BRUCE R. GRANTHAM ON 01/19/02
 ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DATE: DECEMBER, 2001 SCALE: 1"=200' JOB NO.: 00-249
 DRAWN: GBW DESIGN: BRG REVIEWED: JFW DWG: 249DRNAREA
ARAPAHO ROAD PHASE II
DRAINAGE AREA MAP - SHEET 1
TOWN OF ADDISON
 Grantham, Burge & Waldbauer
 SHT. D-1 OF D-2
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042 (972) 840-1916 (TEL) (972) 840-2156 (FAX)

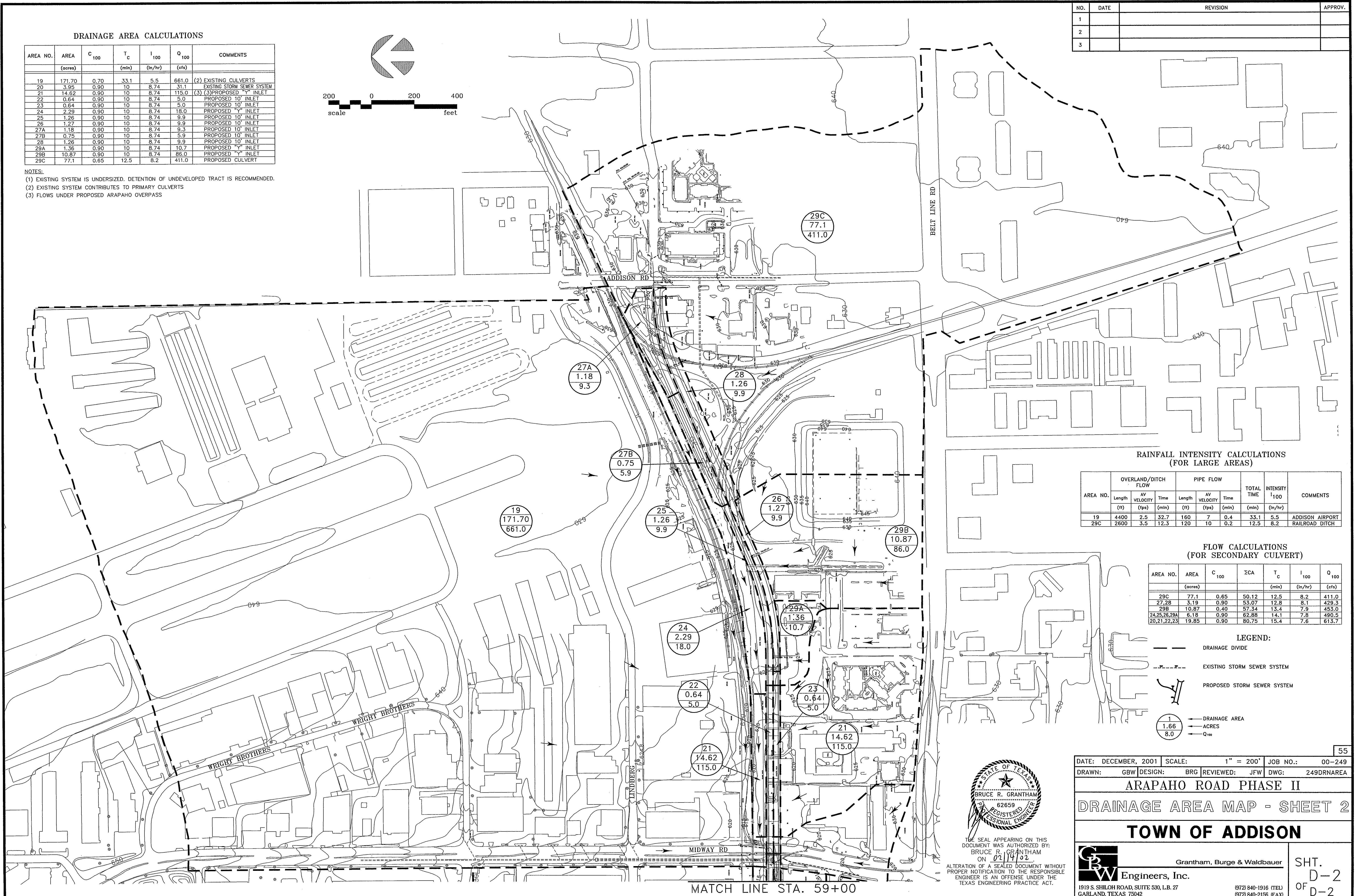
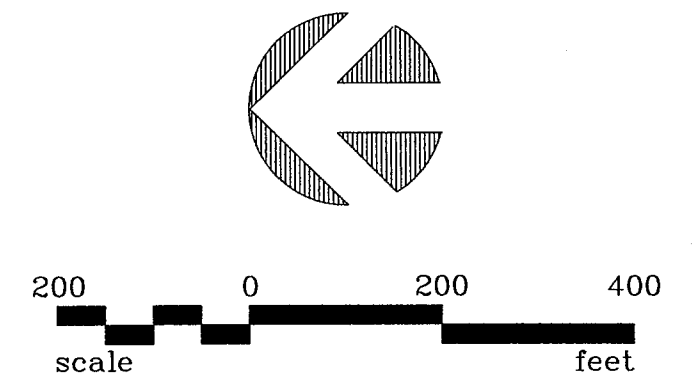
ARAPAHO PHASE II Drainage Addendum 7/02

NO.	DATE	REVISION	APPROV.
1			
2			
3			

DRAINAGE AREA CALCULATIONS

AREA NO.	AREA (acres)	C ₁₀₀	T _c (min)	I ₁₀₀ (in/hr)	Q ₁₀₀ (cfs)	COMMENTS
19	171.70	0.70	33.1	5.5	661.0	(2) EXISTING CULVERTS
20	3.95	0.90	10	8.74	31.1	EXISTING STORM SEWER SYSTEM
21	14.62	0.90	10	8.74	115.0	(3) PROPOSED "Y" INLET
22	0.64	0.90	10	8.74	5.0	PROPOSED 10" INLET
23	0.64	0.90	10	8.74	5.0	PROPOSED 10" INLET
24	2.29	0.90	10	8.74	18.0	PROPOSED "Y" INLET
25	1.26	0.90	10	8.74	9.9	PROPOSED 10" INLET
26	1.27	0.90	10	8.74	9.9	PROPOSED 10" INLET
27A	1.18	0.90	10	8.74	9.3	PROPOSED 10" INLET
27B	0.75	0.90	10	8.74	5.9	PROPOSED 10" INLET
28	1.26	0.90	10	8.74	9.9	PROPOSED 10" INLET
29A	1.36	0.90	10	8.74	10.7	PROPOSED "Y" INLET
29B	10.87	0.90	10	8.74	86.0	PROPOSED "Y" INLET
29C	77.1	0.65	12.5	8.2	411.0	PROPOSED CULVERT

NOTES:
 (1) EXISTING SYSTEM IS UNDERSIZED. DETENTION OF UNDEVELOPED TRACT IS RECOMMENDED.
 (2) EXISTING SYSTEM CONTRIBUTES TO PRIMARY CULVERTS
 (3) FLOWS UNDER PROPOSED ARAPAHO OVERPASS



RAINFALL INTENSITY CALCULATIONS (FOR LARGE AREAS)

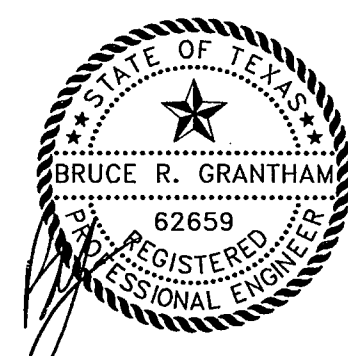
AREA NO.	OVERLAND/DITCH FLOW			PIPE FLOW			TOTAL TIME (min)	INTENSITY I ₁₀₀ (in/hr)	COMMENTS
	Length (ft)	AV VELOCITY (fps)	Time (min)	Length (ft)	AV VELOCITY (fps)	Time (min)			
19	4400	2.5	32.7	160	7	0.4	33.1	5.5	ADDISON AIRPORT
29C	2600	3.5	12.3	120	10	0.2	12.5	8.2	RAILROAD DITCH

FLOW CALCULATIONS (FOR SECONDARY CULVERT)

AREA NO.	AREA (acres)	C ₁₀₀	ΣCA	T _c (min)	I ₁₀₀ (in/hr)	Q ₁₀₀ (cfs)
29C	77.1	0.65	50.12	12.5	8.2	411.0
27,28	3.19	0.90	53.07	12.8	8.1	429.3
29B	10.87	0.40	57.34	13.4	7.9	453.0
24,25,26,29A	6.18	0.90	62.88	14.1	7.8	490.5
20,21,22,23	19.85	0.90	80.75	15.4	7.6	613.7

LEGEND:

- DRAINAGE DIVIDE
- - - - EXISTING STORM SEWER SYSTEM
- PROPOSED STORM SEWER SYSTEM
- ① DRAINAGE AREA
- ② ACRES
- ③ Q₁₀₀



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: BRUCE R. GRANTHAM ON 02/14/02. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DATE: DECEMBER, 2001 | SCALE: 1" = 200' | JOB NO.: 00-249
 DRAWN: GBW | DESIGN: BRG | REVIEWED: JFW | DWG: 249DRNAREA

ARAPAHO ROAD PHASE II
DRAINAGE AREA MAP - SHEET 2
TOWN OF ADDISON

Grantham, Burge & Waldbauer
Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042 | (972) 840-1916 (TEL) | (972) 840-2156 (FAX)

SHT. D-2 OF D-2

MATCH LINE STA. 59+00

ROADWAY CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL SCHEDULE OPERATIONS TO MINIMIZE POTENTIAL DROP-OFF HAZARDS. ANY DEVIATION TO THE CONSTRUCTION SEQUENCING PLANS CONTAINED IN THESE PLANS MUST BE APPROVED BY THE ENGINEER.
2. PRIOR TO FINAL ACCEPTANCE, ALL CURB SURFACES SHALL BE CLEARED OF ALL DISCOLORATION SUCH AS TIRE MARKS OR OTHER DISFIGUREMENT.
3. TREES OUTSIDE OF TOE OF SLOPES SHALL NOT BE DISTURBED EXCEPT WITH APPROVAL OF THE OWNER. ONLY A MINIMUM AMOUNT OF TREE REMOVAL SHALL BE DONE. CONTRACTOR SHALL FLAG ALL TREES TO BE REMOVED FOR OWNER'S APPROVAL BEFORE REMOVAL.
4. THE CONTRACTOR SHALL BEGIN CONSTRUCTION WITHIN FIVE (5) CALENDAR DAYS OF THE ISSUANCE OF THE NOTICE TO PROCEED AND GIVE NOTICE TO THE TOWN, IN WRITING, BEFORE WORK BEGINS ON THE PROJECT.
5. THE CONTRACTOR SHALL SEQUENCE CONSTRUCTION AROUND BUSINESS DRIVEWAYS SO THAT ACCESS TO THE BUSINESS CAN BE OBTAINED DURING BUSINESS HOURS. NO PARKING LOT WILL BE SHUT OFF FROM ACCESS WITHOUT APPROVAL OF THE TOWN OF ADDISON.
6. ALL UTILITY CONSTRUCTION (WATER AND STORM WATER) SHALL BE COMPLETED PRIOR TO SUBGRADE PREPARATION.
7. SUBGRADES SHALL BE PROOF ROLLED. NO ADDITIONAL COMPENSATION SHALL BE PAID FOR PROOF ROLLING, IT SHALL BE CONSIDERED SUBSIDIARY TO OTHER BID ITEMS.
8. THE CONTRACTOR SHALL FURNISH, AT HIS OWN COST, THE FOLLOWING TESTING SERVICES BY A REPUTABLE INDEPENDENT TESTING LABORATORY APPROVED BY THE TOWN.
 - A. FIELD DENSITY TESTS OF EMBANKMENT, SUBGRADE, OR BASE, AT LOCATIONS SPECIFIED BY THE INSPECTOR.
 - B. PAVEMENT TESTING SHALL BE DONE ACCORDING TO SECTION 5.8.6, PAVEMENT TESTING, OF THE NCTCOG SPECS (COMPRESSIVE STRENGTH).
9. THE CONTRACTOR SHALL ADJUST ALL VALVE BOXES, METER BOXES, MANHOLES, AND OTHER UTILITY STRUCTURES TO GRADE AS NEEDED PRIOR TO AND AFTER STREET PAVING HAS BEEN COMPLETED.
10. EROSION CONTROL SHALL START WITH INITIAL CONSTRUCTION AND BE PRACTICED THROUGHOUT THE PROJECT.
11. IT IS THE INTENT OF THESE PLANS TO MAINTAIN TRAFFIC FLOW THROUGHOUT THE PROJECT LIMITS AT ALL TIMES DURING CONSTRUCTION. IF A SITUATION ARISES THAT WARRANTS A ROAD CLOSURE, THIS WILL ONLY BE PERMITTED WITH THE WRITTEN PERMISSION FROM THE PUBLIC WORKS DIRECTOR.
12. PROJECT SIGNS SHALL BE MAINTAINED AT INTERSECTIONS WITH MARSH LANE AND SURVEYOR BLVD, RESPECTIVELY, THROUGHOUT DURATION OF PROJECT.
13. MAINTAIN/REPAIR EXISTING IRRIGATION SYSTEMS TO INSURE WATERING OCCURS ON PRIVATE LANDSCAPING, NO EXTRA PAY.
14. THE CONTRACTOR SHALL PAY EXTRA ATTENTION TO ITEM 6.2.9 "BACKFILL" OF THE NCTCOG SPECIFICATIONS. THE OWNER WILL EXPECT ALL TRENCHES TO BE BACKFILLED WITH PROPER CARE AND ANY SETTLEMENT TO BE REMEDIED IN A TIMELY FASHION.
15. CONTRACTOR SHALL KEEP PROJECT SITE CLEAN AND ORDERLY. IT WILL BE UNACCEPTABLE TO ALLOW TRASH TO BLOW ONTO ADJACENT PROPERTIES. STRICT ATTENTION WILL BE PAID TO THIS ITEM. IF CONTRACTOR FAILS TO ADHERE TO THIS STIPULATION, OWNER RESERVES THE RIGHT TO STOP WORK UNTIL TRASH IS CLEANED UP. THIS STOPPAGE OF WORK WILL NOT EXTEND THE ORIGINAL CONTRACT TIME.
16. FLYASH MAY BE USED PER NCTCOG SPECIFICATIONS ITEM 2.2.2.(D)
17. THE CONTRACTOR MAY USE THE PROPERTY JUST WEST OF SURVEYOR BLVD., SHOWN ON SHEET R-4, UNTIL NOVEMBER 23, 2002 AS A STAGING AREA. AFTER THIS TIME, IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO FIND A STAGING AREA IN THE IMMEDIATE AREA. SEE SPECIAL PROVISION 53 IN THE CONTRACT DOCUMENTS FOR MORE DETAILS.

18. SHOP DRAWINGS AND SPECIFICATIONS SHALL BE SUBMITTED TO THE OWNER FOR APPROVAL PRIOR TO INSTALLATION OF THE FOLLOWING ITEMS: TRAFFIC SIGNALS, REINFORCED CONCRETE BOX WITH WINGS, IRRIGATION EQUIPMENT AND CONTROLLERS, RETAINING WALLS, SEALANTS, HAND RAIL, PAINTS, AND OTHER ITEMS DEEMED NECESSARY BY THE OWNER.

UTILITY CONTACTS

THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OR HER OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL MAINTAIN THE UTILITY LOCATION MARKINGS UNTIL THEY ARE NO LONGER NECESSARY.

CONTRACTOR SHALL CONTACT 1-800-DIG-TESS (344-8377) PRIOR TO ANY EXCAVATION.

TYPICAL IRRIGATION NOTES:

1. THE CONTRACTOR SHALL HIRE A LICENSED IRRIGATOR AS A SUBCONTRACTOR TO OVERSEE ALL ACTIVITIES THAT IMPACT EXISTING OR PROPOSED IRRIGATION SYSTEMS.
2. PRIOR TO DEMOLITION OR CONSTRUCTION ACTIVITIES, EXISTING IRRIGATION SYSTEMS SHALL BE TURNED ON. THE LOCATION OF HEADS, VALVES, AND PIPE SHALL BE MARKED WHERE DEMOLITION AND CONSTRUCTION WILL IMPACT THE SYSTEM. DEFICIENCIES IN THE SYSTEM SHALL BE NOTED AND REPORTED TO THE SYSTEM OWNER. A PHOTOGRAPHIC OR VIDEO RECORD SHALL BE MADE IF APPROPRIATE.
3. PIPING SHALL BE CUT, CAPPED AND MARKED AT THE LIMITS OF CONSTRUCTION.
4. AT THE COMPLETION OF CONSTRUCTION, THE LICENSED IRRIGATOR SHALL RESTORE AND TEST THE IRRIGATION SYSTEM FOR PROPER FUNCTION. THE TEST SHALL BE CONDUCTED IN THE PRESENCE OF THE TOWN'S PUBLIC WORKS INSPECTOR, AND THE SYSTEM OWNER.

GENERAL NOTES:

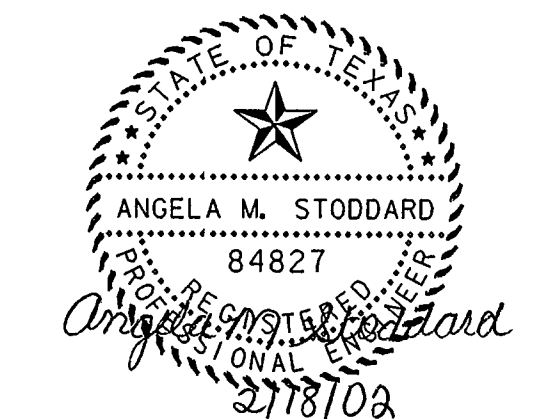
1. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE TOWN OF ADDISON STANDARDS AND SPECIFICATIONS AND THE NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENT (NCTCOG) STANDARDS AND SPECIFICATIONS, EXCEPT AS NOTED. IN THE EVENT OF A CONFLICT, THE TOWN OF ADDISON STANDARDS AND SPECIFICATIONS SHALL GOVERN.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PUBLIC SAFETY DURING CONSTRUCTION AND WILL PROVIDE THE NECESSARY TRAFFIC BARRICADES AND WARNING SIGNAGE TO PROTECT THE CONSTRUCTION SITE. ALL BARRICADES, WARNING SIGNS, LIGHTS, DEVICES, ETC. FOR THE GUIDANCE AND PROTECTION OF TRAFFIC AND PEDESTRIANS MUST CONFORM TO THE 1980 TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, AS CURRENTLY AMENDED, BY THE TEXAS DEPARTMENT OF TRANSPORTATION.
3. NO PERSON SHALL OPEN, TURN OFF, INTERFERE WITH, ATTACH ANY PIPE OR HOSE TO OR TAP ANY WATER MAIN BELONGING TO THE TOWN UNLESS DULY AUTHORIZED TO DO SO BY THE TOWN OF ADDISON PUBLIC WORKS DEPARTMENT. ARRANGEMENTS FOR CONSTRUCTION WATER SHALL BE MADE THROUGH CITY OF ADDISON PUBLIC WORKS DEPARTMENT.
4. CONTRACTOR SHALL MAINTAIN ADEQUATE SANITARY FACILITIES FOR USE BY WORKERS THROUGHOUT CONSTRUCTION.
5. NO TRAFFIC SIGNS ARE TO BE RELOCATED OR REMOVED WITHOUT PRIOR APPROVAL OF THE TOWN OF ADDISON PUBLIC WORKS DEPARTMENT.
6. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING FACILITIES FROM DAMAGE. ANY DAMAGE TO EXISTING FACILITIES RESULTING FROM CONSTRUCTION WORK SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
7. THESE PLANS DO NOT EXTEND TO OR INCLUDE DESIGNS OR SYSTEMS PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR ITS EMPLOYEES, AGENT OR REPRESENTATIVES IN PERFORMANCE OF THE WORK. THE SEAL OF GBW ENGINEERS, INC. REGISTERED PROFESSIONAL ENGINEER(S) HEREON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED IN THESE PLANS. THE CONSTRUCTION CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS, INCLUDING THE PLANS AND SPECIFICATIONS.

8. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN NEAT AND ACCURATE PLANS OF RECORD.
9. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ADEQUATE SITE DRAINAGE THROUGHOUT THE DURATION OF THIS PROJECT.
10. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS BEFORE CONSTRUCTION BEGINS.
11. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO ENSURE THAT ELECTRIC POWER AND TELEPHONE POLES ARE NOT DISTURBED DURING CONSTRUCTION.
12. THE CONTRACTOR SHALL KEEP EXCAVATED TRENCHES FREE OF GROUNDWATER DURING CONSTRUCTION. IF NECESSARY, THE CONTRACTOR SHALL UTILIZE DEWATERING IN ORDER TO CONTROL GROUNDWATER DURING CONSTRUCTION SUCH THAT IT DOES NOT AFFECT HIS CONSTRUCTION WORK. (NO SEPARATE PAY ITEM)
13. EXISTING FACILITIES ARE SHOWN IN APPROXIMATE LOCATIONS PER INFORMATION AND RECORDS AVAILABLE. CONTRACTOR SHALL UNCOVER AND VERIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING FACILITIES PRIOR TO CONSTRUCTION.
14. ALL STORM SEWERS SHALL BE RCP CLASS III UNLESS OTHERWISE NOTED.
15. INSTALL CONCRETE COLLAR AT CONNECTION OF NEW RCP'S TO EXIST. RCP'S.
16. CONTRACTOR SHALL FIELD VERIFY FLOWLINE OF EXIST. RCP'S AND CONTACT ENGINEER IF A DISCREPANCY IS FOUND.
17. CONTRACTOR SHALL PROVIDE ALL MATERIALS TESTING REQUIRED FOR THIS PROJECT, INCLUDING BUT NOT LIMITED TO, CONCRETE MIX DESIGNS, AND SUBGRADE AND UTILITY TRENCH COMPACTION.

GENERAL STREET LIGHTING SEQUENCE NOTES:

1. THE CONTRACTOR SHALL INSTALL CONDUIT, SECONDARY BOXES, AND STREET LIGHT BASES FOR THE LIGHTING ON THE NORTH SIDE OF THE PROPOSED ROADWAY.
 2. UPON NOTIFICATION BY THE CONTRACTOR, TXU WILL FOLLOW WITH THE INSTALLATION OF THE STREET LIGHT STANDARDS (TO BE FURNISHED BY TXU), ELECTRIC CABLE AND NECESSARY TERMINATIONS TO PLACE THE NEW STREET LIGHTS ON THE NORTH SIDE INTO OPERATION.
 3. UPON NOTIFICATION BY THE TOWN, TXU WILL REMOVE ELECTRIC CABLE AND STREET LIGHT STANDARDS FROM THE SOUTH SIDE OF THE PROPOSED ROADWAY.
 4. THE CONTRACTOR SHALL REMOVE THE EXISTING CONDUIT AND STREET LIGHT BASES FROM THE SOUTH SIDE OF THE PROPOSED ROADWAY.
 5. THE CONTRACTOR SHALL INSTALL THE NEW CONDUIT, SECONDARY BOXES, AND STREET LIGHT BASES FOR THE LIGHTING ON THE SOUTH SIDE OF THE PROPOSED ROADWAY.
 6. UPON NOTIFICATION BY THE CONTRACTOR, TXU WILL FOLLOW WITH THE INSTALLATION OF THE STREET LIGHT STANDARDS, ELECTRIC CABLE AND NECESSARY TERMINATIONS TO PLACE THE NEW STREET LIGHTS ON THE SOUTH SIDE INTO OPERATION.
- NOTE: PEDESTRIAN LIGHTS AND CABLE SHALL BE ORDERED AND INSTALLED BY THE CONTRACTOR.

LEGEND	
	EXISTING CURB
	PROPOSED CURB
	TOP OF PAVEMENT ELEVATION
	TOP OF CURB ELEVATION
	CURB RETURN
	CONTROL POINT
	FENCE
	FIRE HYDRANT
	LIGHT POLE
	POWER POLE
	SAN. SEWER MANHOLE
	SIGN
	TRAFFIC SIGNAL
	VEGETATION
	TREE
	WATER LINE
	PROPOSED ROW
	EXISTING ROW
	PROPOSED ROW
	TEMPORARY CONSTRUCTION EASEMENT
	PROPOSED PAVING
	PROPOSED GRAVEL



										2	
2	1-02	ADD NOTES									AMS
NO.	DATE	REVISION									APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS The HNTB Companies											
ARAPAHO ROAD - PHASE II											
MARSH LANE TO SURVEYOR BOULEVARD											
PAVING PLAN AND PROFILE NOTES AND LEGEND											
TOWN OF ADDISON, TEXAS											
Design	GFS	Drawn	GFS	DATE	SCALE	PROJECT NO.	SHEET ID				
Check	AMS	Check	JDH	DEC 01		25768	N-1				

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ITEM NO.	DESCRIPTION	UNIT	EST. QTY.
ROADWAY IMPROVEMENTS			
101	MOBILIZATION	L.S.	1
102	PREPARE RIGHT-OF-WAY	STA.	26.4
103	FULL DEPTH SAWCUT EXISTING CONCRETE	L.F.	825
104	REMOVE AND DISPOSE OF EXISTING CONCRETE PAVEMENT, INCLUDING CURB	S.Y.	9,380
105	REMOVE AND DISPOSE OF EXISTING CONCRETE SIDEWALK	S.Y.	590
106	UNCLASSIFIED STREET EXCAVATION	C.Y.	4,200
107	BORROW ³	C.Y.	2,700 ³
108	6" THICK LIME STABILIZED SUBGRADE, INCLUDING PROOFROLLING	S.Y.	17,400
109	HYDRATED LIME (33 LBS/SY)	TON	287
110	8" THICK REINFORCED CONCRETE PAVEMENT, 4000 PSI @ 28 DAYS	S.Y.	13,950
111	6" THICK INTEGRAL CONCRETE CURB, 4000 PSI @ 28 DAYS	L.F.	7,075
112	MONOLITHIC MEDIAN NOSE, 4000 PSI @ 28 DAYS	EA.	3
113	6" THICK REINFORCED CONCRETE DRIVEWAY, 4000 PSI @ 28 DAYS	S.Y.	950
114	REINFORCED CONCRETE ISLAND, 4000 PSI @ 28 DAYS	S.Y.	175
115	4" THICK REINFORCED CONCRETE SIDEWALK, 4000 PSI @ 28 DAYS	S.Y.	210
116	FURNISH, PLACE AND MAINTAIN TRAFFIC CONTROL DEVICES	L.S.	1
117	ADA RAMP ²	EA.	11 ²
118	REMOVE AND RELOCATE ROADSIDE SIGN	EA.	7
119	GRAVEL FOR DRIVEWAY	S.Y.	400
120	STOP SIGN (R1-1)	EA.	2
121	SPEED LIMIT SIGN (R2-1)	EA.	6
122	LEFT LANE MUST TURN LEFT SIGN (R3-7L)	EA.	6
123	RIGHT LANE MUST TURN RIGHT SIGN (R3-7R)	EA.	3
124	MERGE RIGHT SIGN (R4-7)	EA.	3
125	STOP AHEAD SIGN (W3-1)	EA.	1
126	YIELD SIGN (R1-2)	EA.	2
127	4" WHITE REFLECTIVE SQUARE ACRYLIC BUTTONS	EA.	335 ²
128	4" WHITE NON-REFLECTIVE RAISED CERAMIC BUTTONS	EA.	318
129	4" YELLOW DOUBLE-REFLECTIVE SQUARE ACRYLIC BUTTONS	EA.	270 ²
130	TEMPORARY 4" YELLOW DOUBLE REFLECTIVE ACRYLIC SQUARE BUTTONS	EA.	472
131	6" X 6" WHITE JIGGLE BAR TILES	EA.	83
132	PAVEMENT DIRECTIONAL MARKERS	EA.	17
133	WHITE THERMOPLASTIC REFLECTIVE PAVEMENT MARKING ("STOP")	EA.	2
134	WHITE THERMOPLASTIC REFLECTIVE PAVEMENT MARKING ("ONLY")	EA.	4
135	4" SOLID WHITE THERMOPLASTIC STRIPE	L.F.	563 ²

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.
ROADWAY IMPROVEMENTS CONT'D			
136	6" SOLID WHITE THERMOPLASTIC STRIPE	L.F.	995
137	24" SOLID WHITE THERMOPLASTIC STOP BAR	L.F.	242
138	TEMPORARY 24" SOLID WHITE THERMOPLASTIC STOP BAR	L.F.	120
139	4" SOLID YELLOW THERMOPLASTIC STRIPE	L.F.	335 ²
140	TEMPORARY SPECIAL SHORING (TXDOT ITEM 403)	S.F.	1,250
141	CONCRETE RETAINING WALL, INCLUDES FOOTING CAPS	C.Y.	152 ³
142	DRILLED SHAFTS (18" DIA.)	L.F.	560
143	6' INTERNALLY ILLUMINATED SIGN	EA.	2
144	8' INTERNALLY ILLUMINATED SIGN	EA.	6
145	REMOVE AND DISPOSE OF CONCRETE PARKING LOT	S.Y.	3,775

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3	1-02	CHANGE QUANTITY OR WORDING	AMS
2	1-02	CHANGE QUANTITY OR WORDING	AMS
NO.	DATE	REVISION	APPROV.

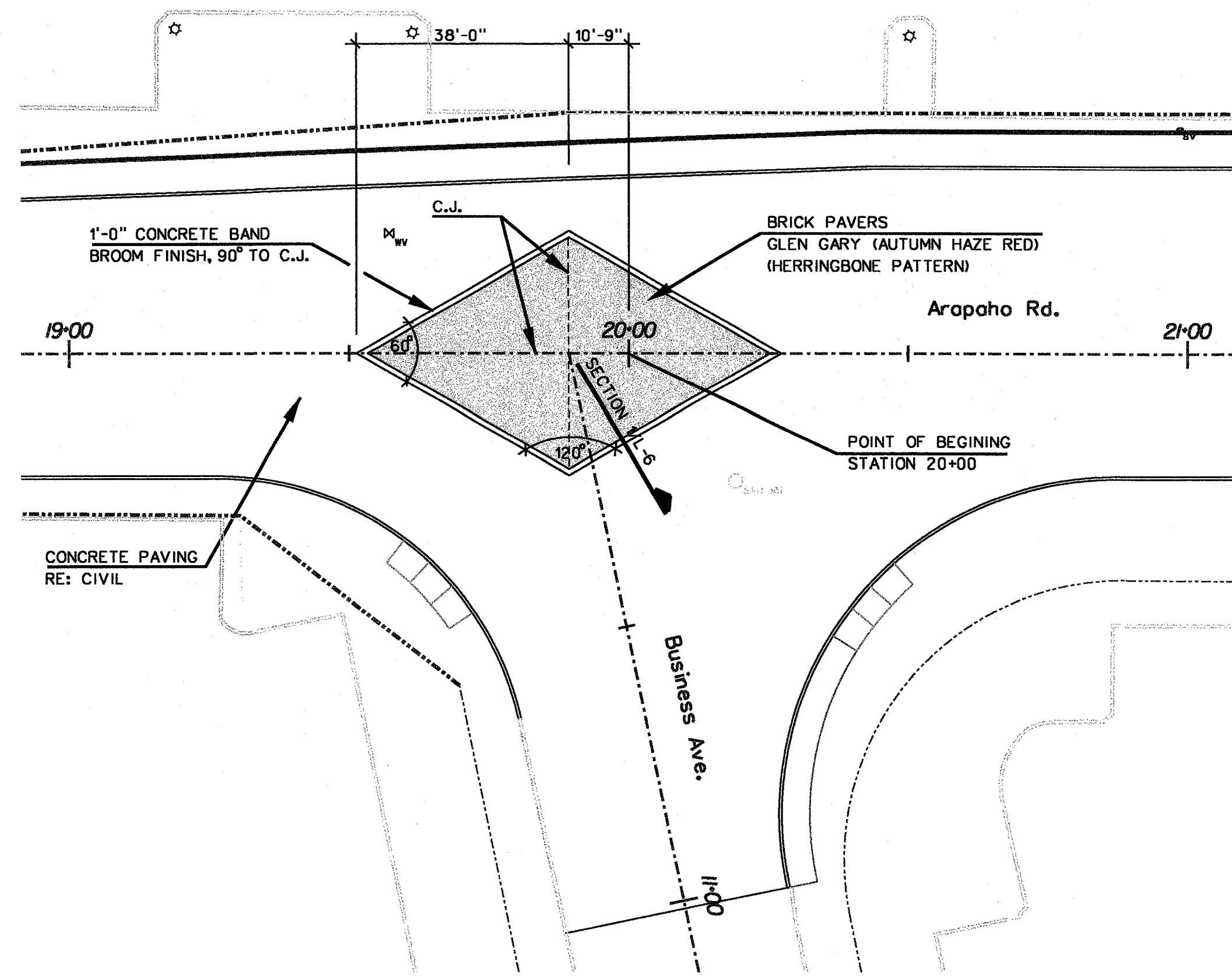
HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

ARAPAHO ROAD - PHASE II
MARSH LANE TO SURVEYOR BOULEVARD

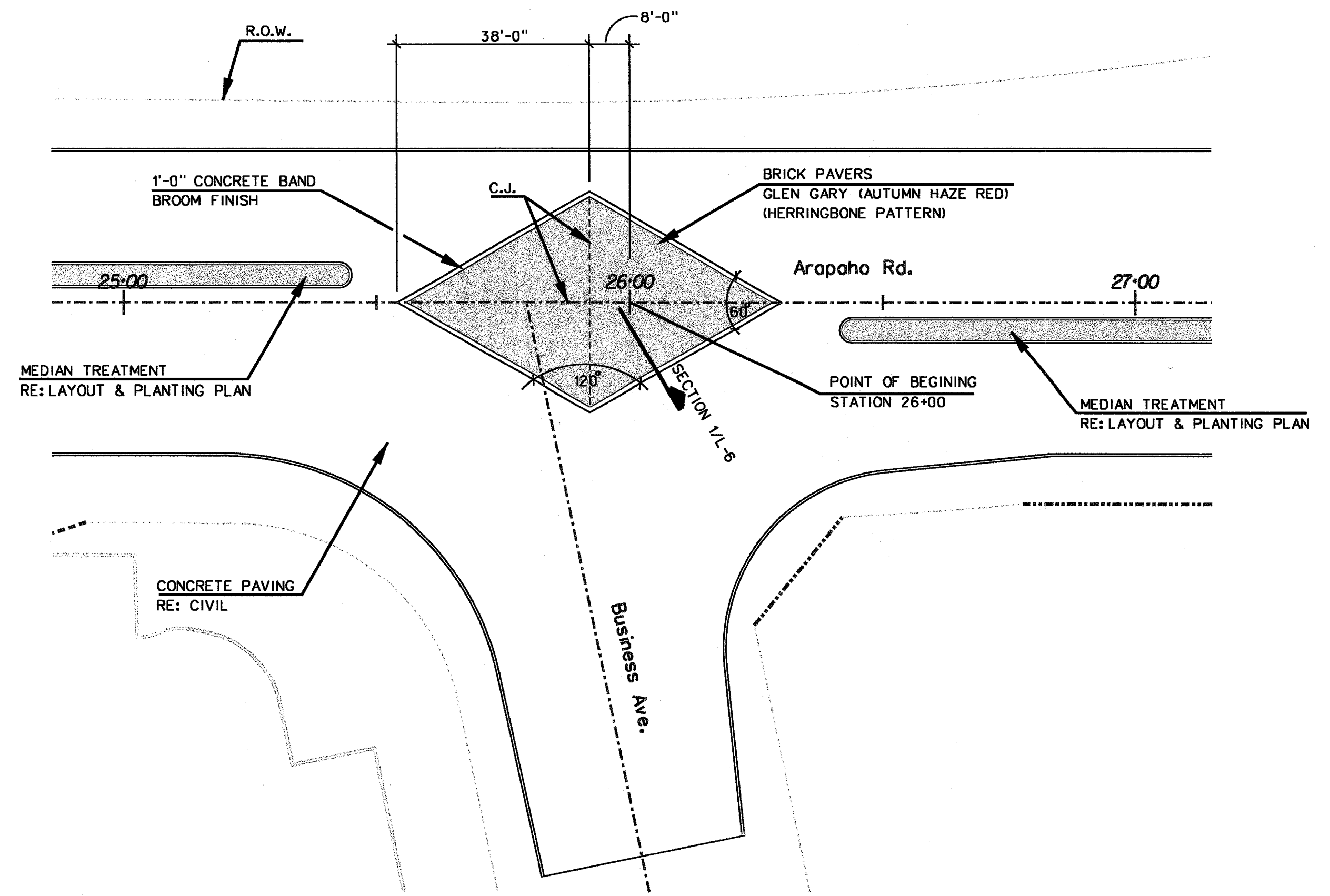
ROADWAY QUANTITIES

TOWN OF ADDISON, TEXAS

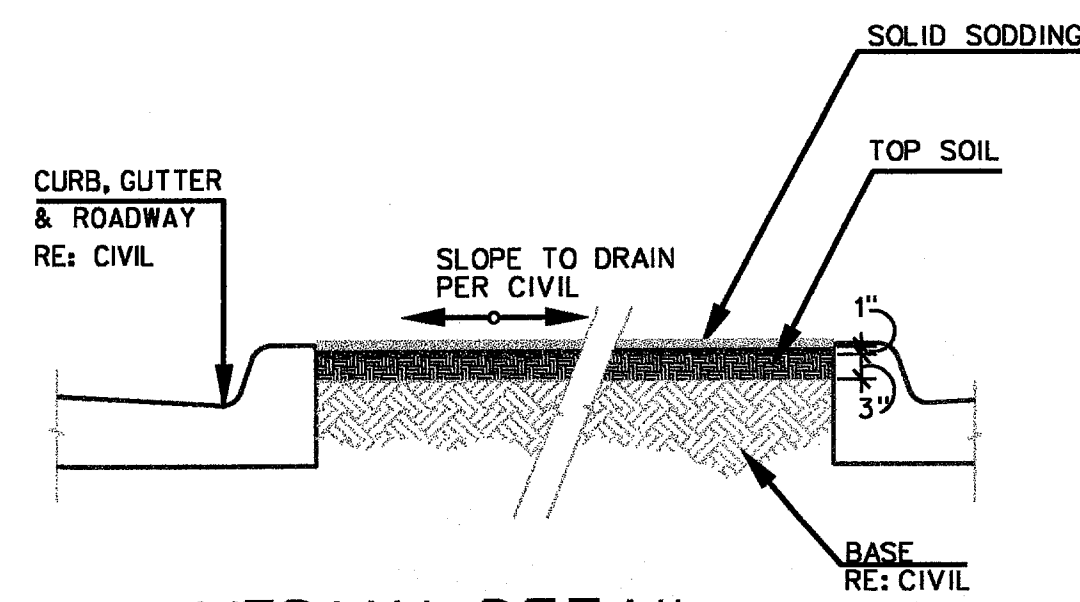
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Check AMS	Check AMS	DEC 01		25768	Q-1



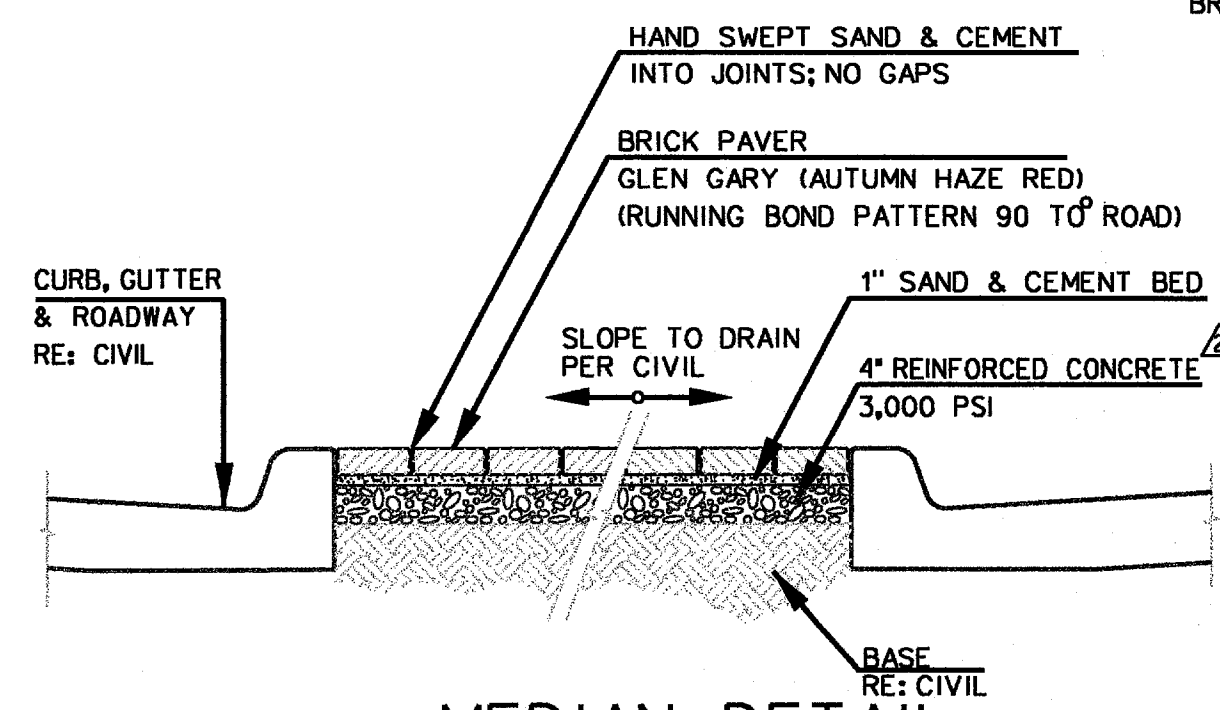
03 INTERSECTION PAVING PLAN . ARAPAHO & BUSINESS
1" = 20'-0"



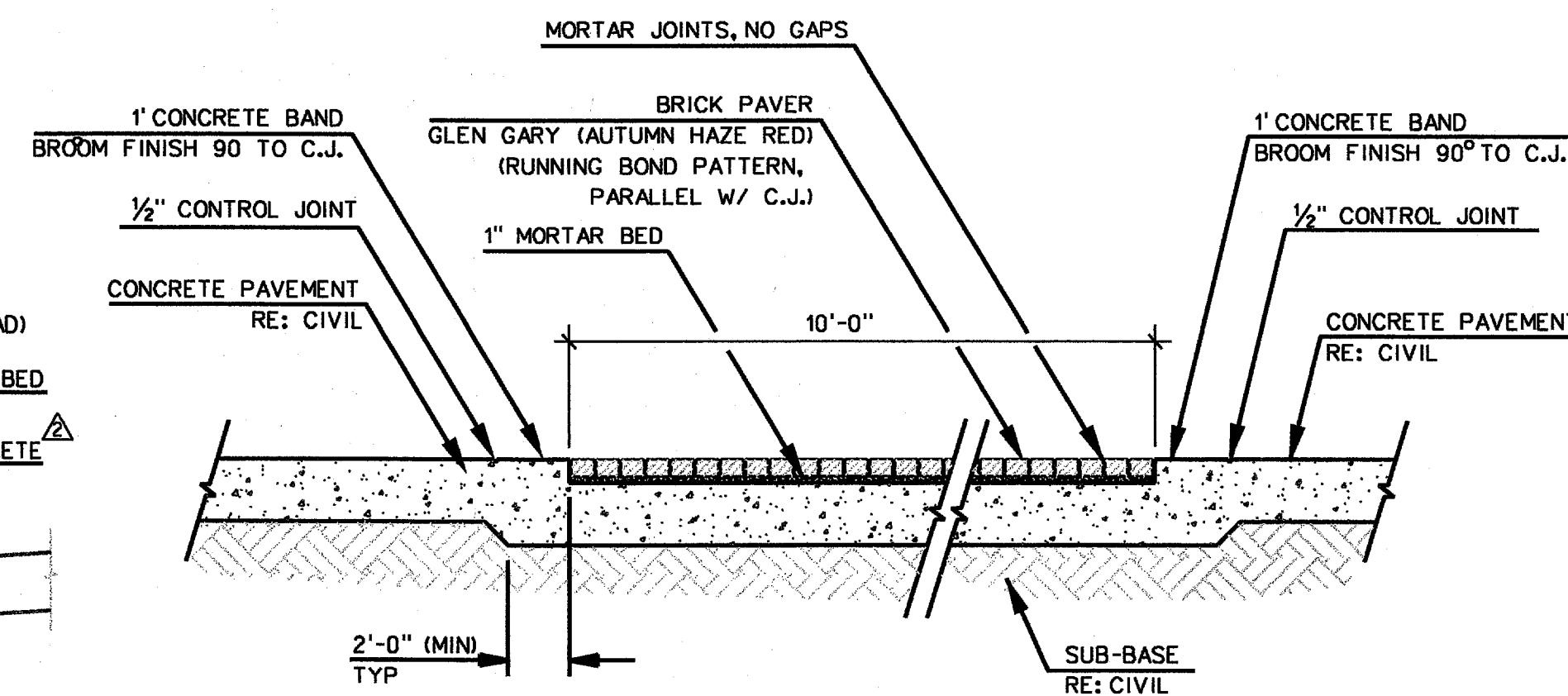
02 INTERSECTION PAVING PLAN . ARAPAHO & COMMERCIAL
1" = 20'-0"



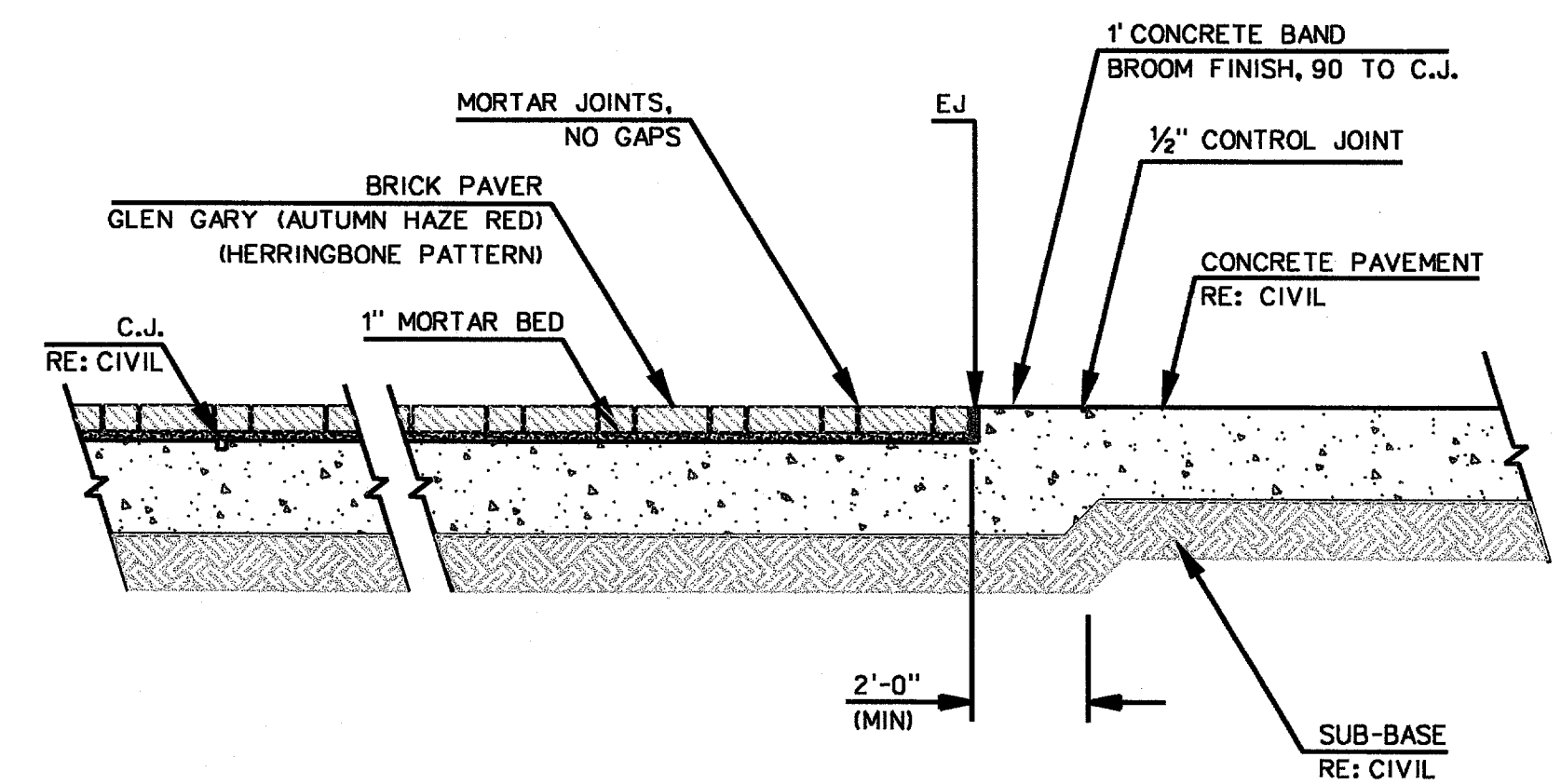
06 MEDIAN DETAIL
NTS



05 MEDIAN DETAIL
NTS



04 CROSSWALK DETAIL
NTS



01 INTERSECTION PAVING DETAIL
NTS



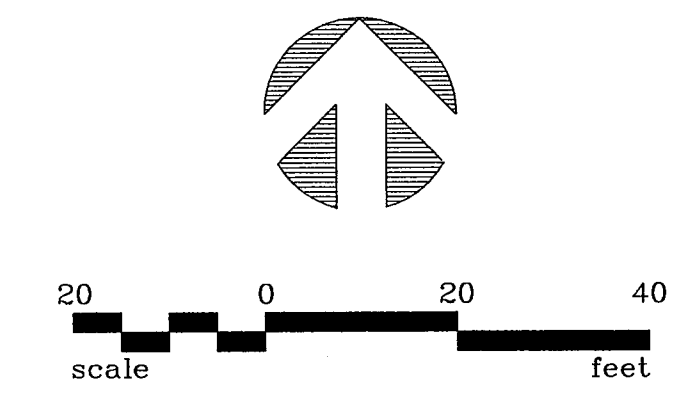
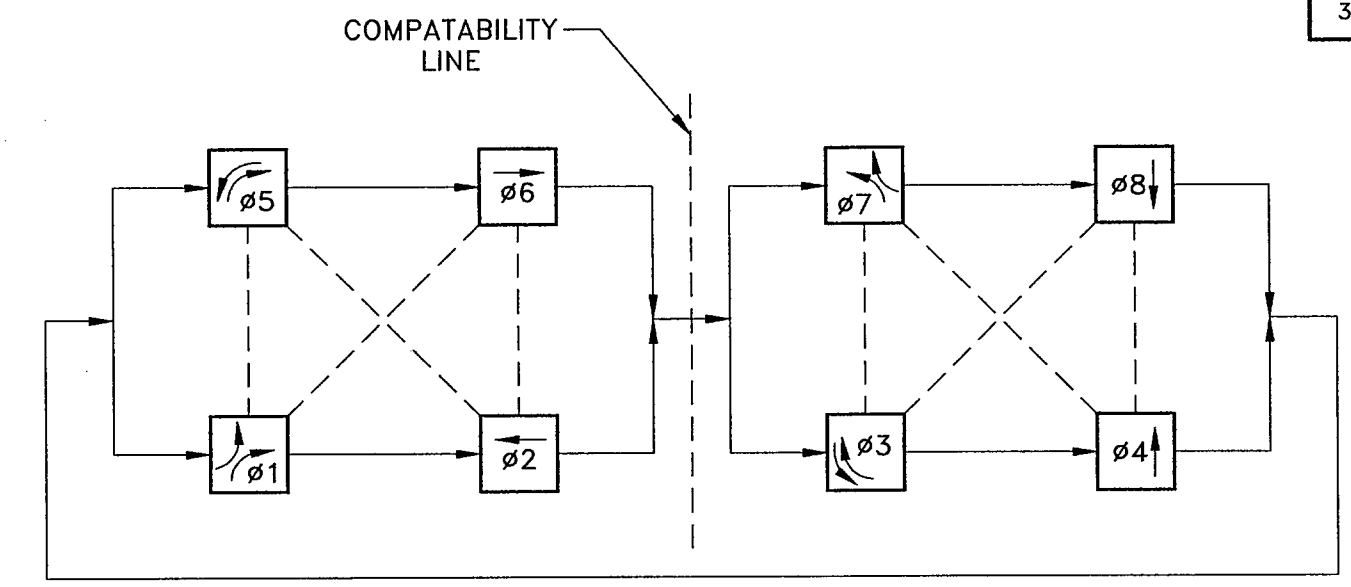
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NO.	DATE	NOTE CHANGE REVISION	MP APPROV.
1/02			
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>			
ARAPAHO ROAD - PHASE II			
MARSH LANE TO SURVEYOR BOULEVARD			
ENLARGED INTERSECTION PLANS AND DETAILS SITEWORK DETAILS			
TOWN OF ADDISON, TEXAS			
Design	DAB	Drawn	DAB
Check	MP	Check	DAB
DATE	JUN 15	SCALE	1" = 20'
PROJECT NO.	25768	SHEET NO.	L-6

NO.	DATE	REVISION	APPROV.
1	2/06/02	PER ADDENDUM No.2	BRG
2			
3			

SIGNAL PLACEMENT STATION & OFFSET
T-1 PAV. STA. 10+77.73, 55.38' LT.
T-2 PAV. STA. 10+64.58, 42.23' RT.

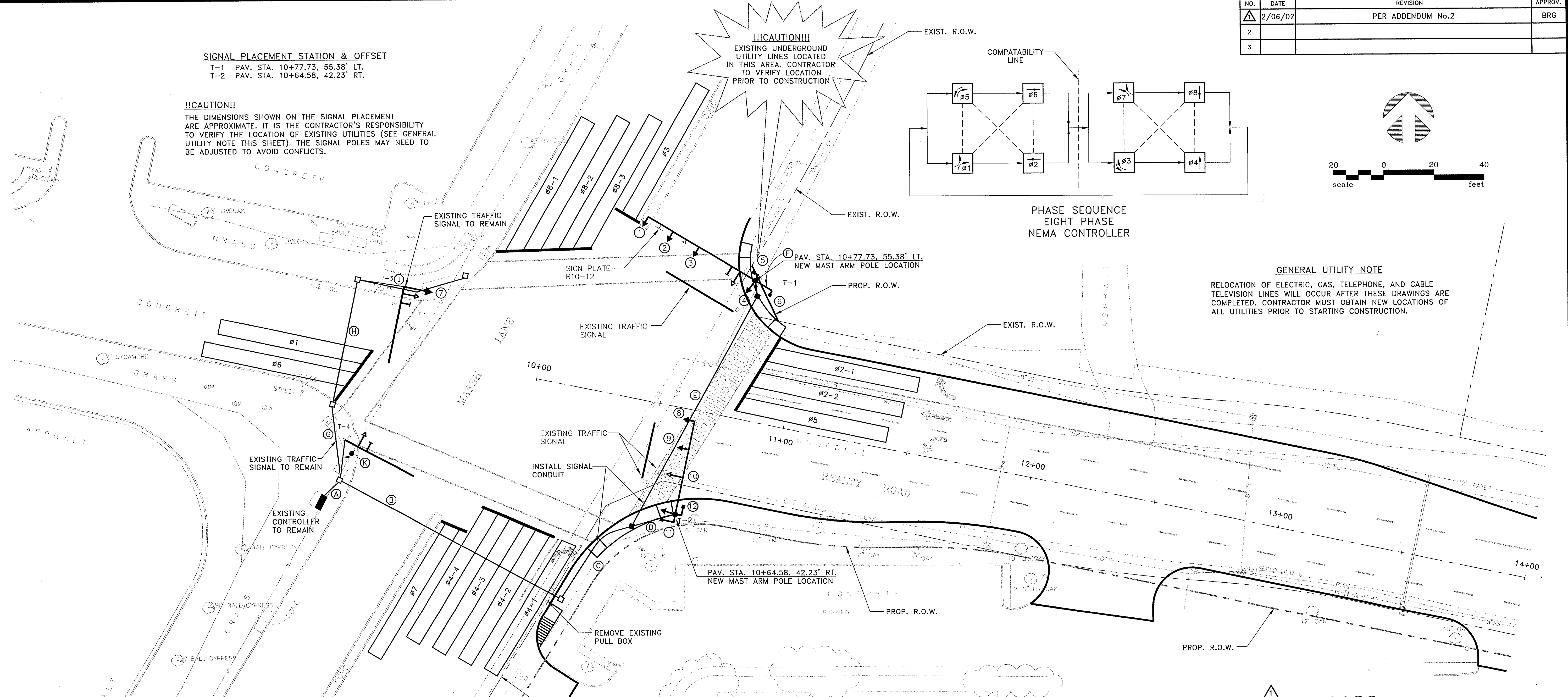
!!CAUTION!!
THE DIMENSIONS SHOWN ON THE SIGNAL PLACEMENT ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION OF EXISTING UTILITIES (SEE GENERAL UTILITY NOTE THIS SHEET). THE SIGNAL POLES MAY NEED TO BE ADJUSTED TO AVOID CONFLICTS.

!!CAUTION!!
EXISTING UNDERGROUND UTILITY LINES LOCATED IN THIS AREA. CONTRACTOR TO VERIFY LOCATION PRIOR TO CONSTRUCTION



PHASE SEQUENCE
EIGHT PHASE
NEMA CONTROLLER

GENERAL UTILITY NOTE
RELOCATION OF ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION LINES WILL OCCUR AFTER THESE DRAWINGS ARE COMPLETED. CONTRACTOR MUST OBTAIN NEW LOCATIONS OF ALL UTILITIES PRIOR TO STARTING CONSTRUCTION.



GENERAL TRAFFIC NOTE:

- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH TOWN OF ADDISON AND TXDOT STANDARDS AND SPECIFICATIONS. IN THE EVENT OF A CONFLICT, TOWN OF ADDISON STANDARDS SHALL GOVERN.
- ALL TRAFFIC SIGNAL WORK SHALL BE BID UNDER THE LUMP SUM BID ITEMS.

NOTES:

- SIGNAL HEAD 6, 7 AND 8 SHALL BE ORDERED BUT NOT INSTALLED IN THIS CONTRACT. DELIVER TO TOWN OF ADDISON STORAGE YARD.
- ALL PEDESTRIAN SIGNAL HEADS SHALL BE "COUNTDOWN" TYPE.
- TRAFFIC SIGNAL CONTROLLER SHALL BE WIRED FOR RAILROAD PRECEDENCE.
- ALL TRAFFIC SIGNAL AND PEDESTRIAN HEADS SHALL BE LED.
- CONTRACTOR SHALL INSTALL 2" CONDUIT (PVC) FROM CLOSEST PULL BOX TO CONTROLLER FOR TWO TELEPHONE LINES.
- NO ILSN CLAMPS SHALL BE ALLOWED. PELCO MOUNTS SHALL BE USED.

LEGEND

FIRE HYDRANT	⊙	TRAFFIC SIGNAL ON ARM W/POLE	⊙
POWER POLE	○	COMB. ST. LIGHT/SIGNAL POLE	⊙
LIGHT STANDARD WITH PHOTOCELL	⊙	SIGNAL HEAD IDENTIFIER	①
RIGHT-OF-WAY	—	SIGNAL CONDUIT	—
VIDEO DETECTION CAMERA	→	CONDUIT IDENTIFIER	⊙
ZONE DETECTOR (VIDEO)	▭	INSTALL PULL BOX TYPE A	■
OPTICOM DETECTOR	≡	INSTALL PULL BOX TYPE C	■
INSTALL SIGN PLATE	— OR —	PEDESTRIAN SIGNAL WITH BUTTONS, AND R10-4b SIGNS	⊕
PROPOSED SIGNAL POLE IDENTIFIER	T-3	PEDESTAL POLE W/SIGNALS WITH BUTTONS, AND R10-4b SIGNS	⊕
SIGN PLATE AND POLE TO BE INSTALLED	⊕	INSTALL CONTROLLER FOUNDATION/CABINET	⊕
		INTERNALLY ILLUMINATED STREET NAME SIGN	⊕
		EXISTING PULL BOX	□

BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE SPECIALTIES INC. PROJECT COORDINATOR: [Signature]



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: WILLIAM J. HATCHELL ON 2/15/12. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DATE: DECEMBER, 2001	SCALE: 1"=20'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: JFW	REVIEWED: [Signature]
DWG: TRFLITE0120.DWG		

**ARAPAHO ROAD PHASE II
ARAPAHO AT MARSH LANE
TRAFFIC SIGNAL PLAN**

TOWN OF ADDISON

Grantham, Burge & Waldbauer
Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27
GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

SHT. TS-1
OF TS-21

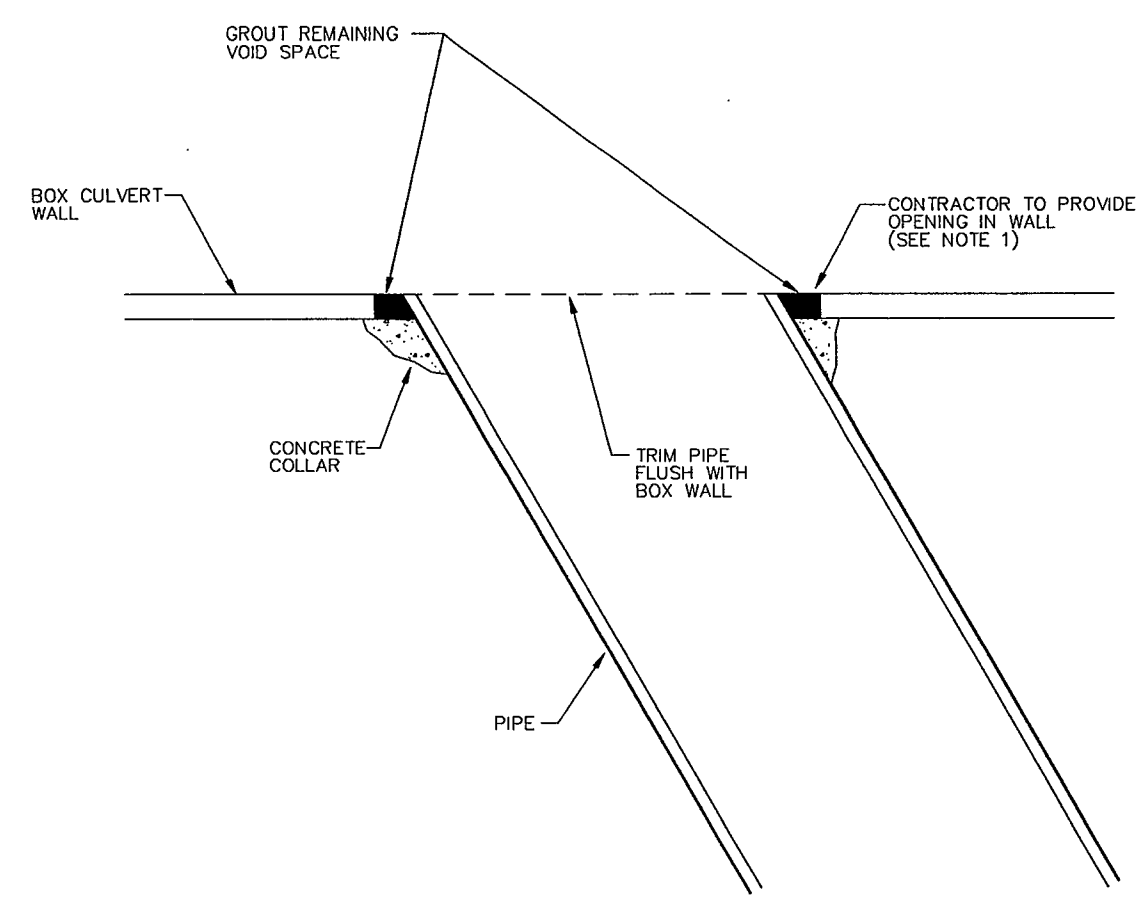
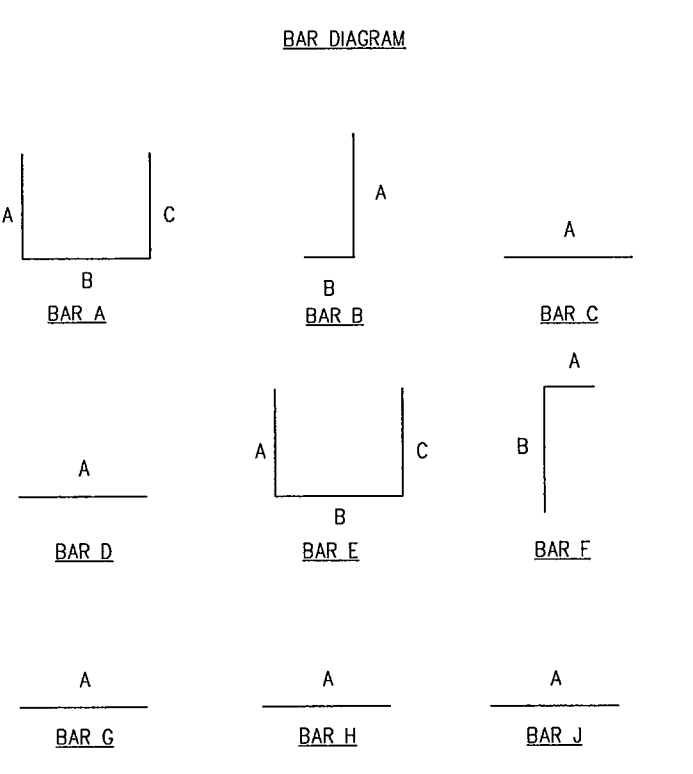
NO.	DATE	REVISION	APPROV.
1			
2			
3			

REINFORCING BAR SCHEDULE							
INLET LENGTH	BAR MARK NUMBER	BAR DIAGRAM TYPE	BAR SIZE	NUMBER REQUIRED	BAR BENDING DIMENSIONS		
					A	B	C
8	A	I	#3	9	3'-2"	6"	--
	B	I	#3	2	8'-8"	6"	--
	C	II	#4	VARIES	8'-8"	6"	--
	D	IV	#3	12	8'-8"	6"	--
	E	IV	#3	7	4'-0"	--	--
	F	III	#3	2	3'-2"	3'-2"	**
	G	V	#4	10	3'-2"	3'-2"	**
	H	III	#4	4	**	--	--
10	A	I	#3	14	3'-2"	6"	--
	B	I	#3	2	10'-8"	6"	--
	C	II	#4	VARIES	10'-8"	6"	--
	D	IV	#3	8	10'-8"	6"	--
	E	IV	#3	6	4'-0"	--	--
	F	III	#3	2	3'-2"	3'-2"	**
	G	V	#4	12	3'-2"	3'-2"	**
	H	III	#4	4	**	--	--
12	A	I	#3	10	3'-2"	6"	--
	B	I	#3	2	10'-8"	6"	--
	C	II	#4	VARIES	12'-8"	6"	--
	D	IV	#3	8	12'-8"	6"	--
	E	IV	#3	6	4'-0"	--	--
	F	III	#3	2	3'-2"	3'-2"	**
	G	V	#4	10	3'-2"	3'-2"	**
	H	III	#4	4	**	--	--
14	A	I	#3	14	3'-2"	6"	--
	B	I	#3	2	12'-8"	6"	--
	C	II	#4	VARIES	14'-8"	6"	--
	D	IV	#3	8	14'-8"	6"	--
	E	IV	#3	6	4'-0"	--	--
	F	III	#3	2	3'-2"	3'-2"	**
	G	V	#4	14	3'-2"	3'-2"	**
	H	III	#4	4	**	--	--

* SEE BAR DIAGRAM FOR DIMENSIONS.
** LENGTH VARIES DUE TO DEPTH OF INLET.

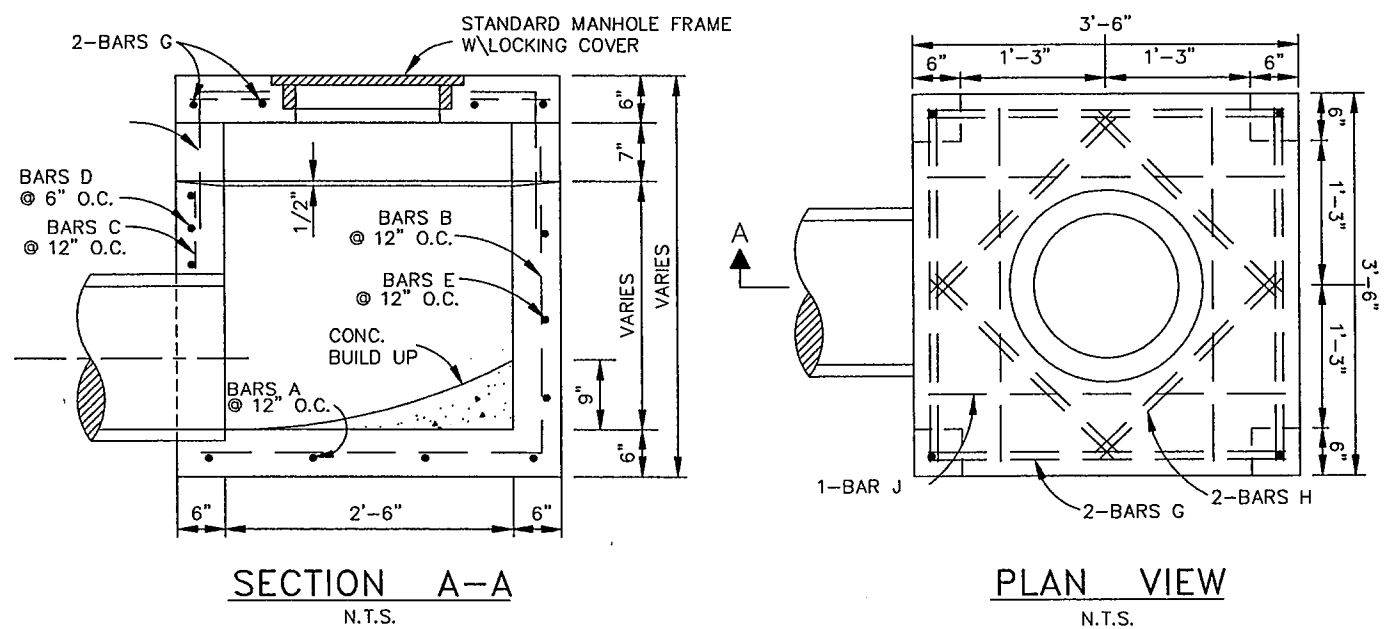
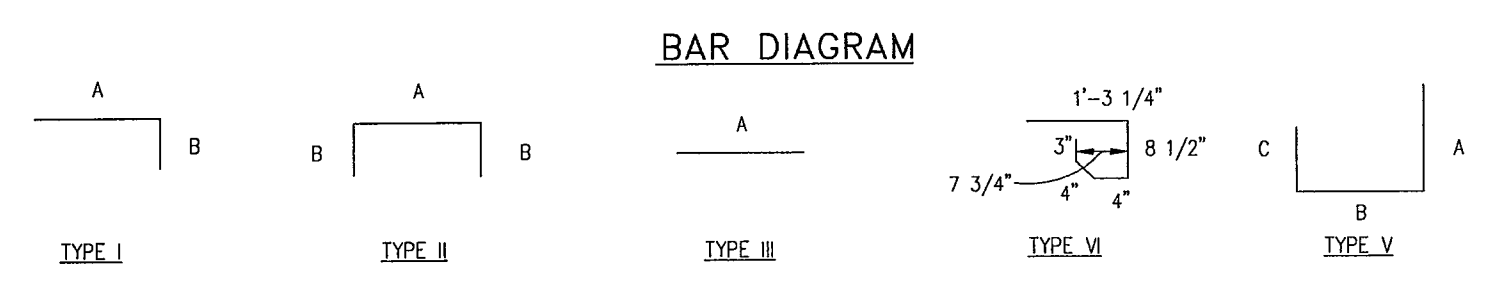
REINFORCING BAR SCHEDULE					
BAR	NO. REQ'D	BAR SIZE	BAR BENDING DIMENSIONS		
			A	B	C
A	4	#4	VARIES	3'-0"	VARIES
B	4	#4	3'-0"	VARIES	--
C	2	#4	VARIES	--	--
D	VARIES	#4	3'-0"	3'-0"	3'-0"
E	4	#4	1'-0"	2'-0"	--
G	8	#4	3'-2"	--	--
H	4	#4	2'-1"	--	--
J	4	#4	3'-2"	--	--

NOTE:
BARS "A" & "E" ARE USED IN THE WALLS PARALLEL TO THE R.C.P.
BARS "B" ARE IN THE WALL OPPOSITE THE R.C.P.

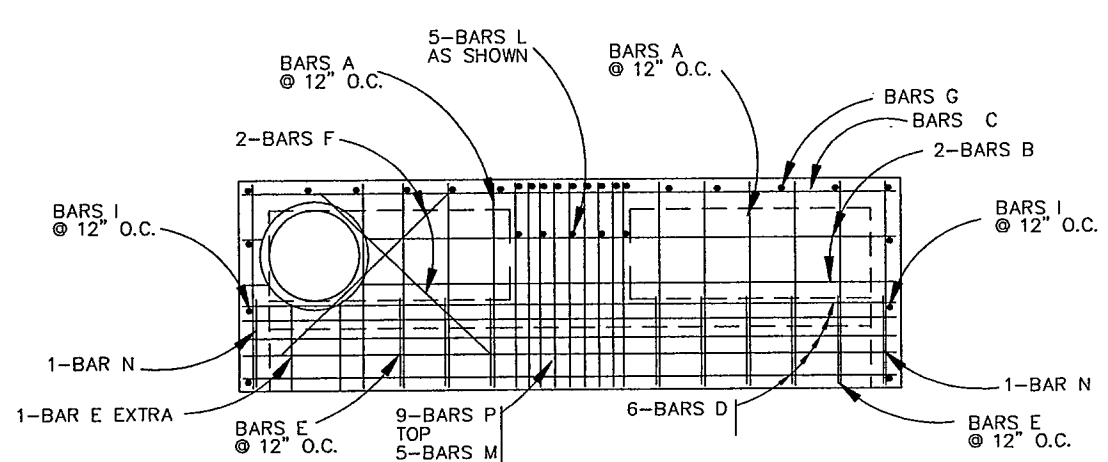


NOTE:
1. IF CAST-IN-PLACE BOX IS USED, CONTRACTOR TO SET PIPE IN WALL FORMS PRIOR TO PLACEMENT OF CONCRETE.
2. CONCRETE COLLAR AROUND PIPE AT WALL CONNECTION

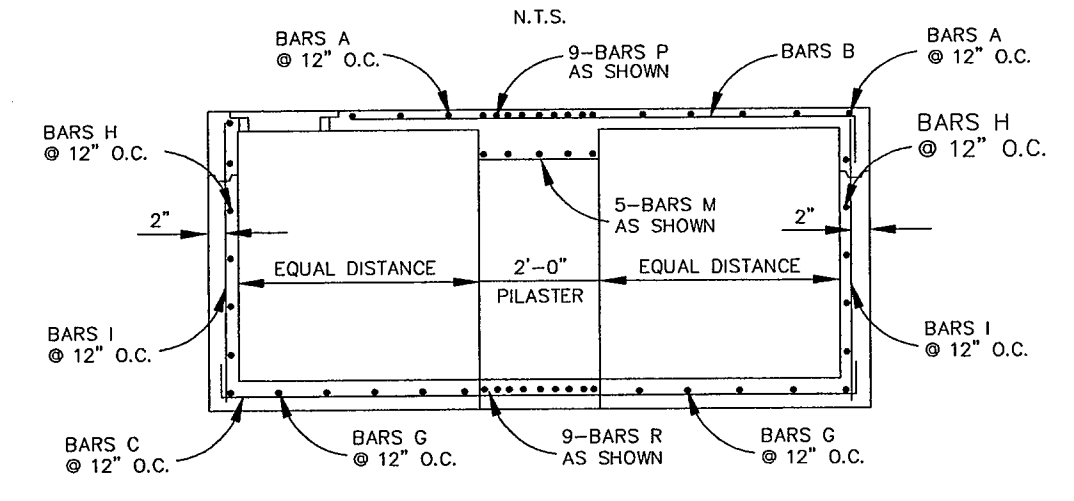
PIPE TO BOX CONNECTION
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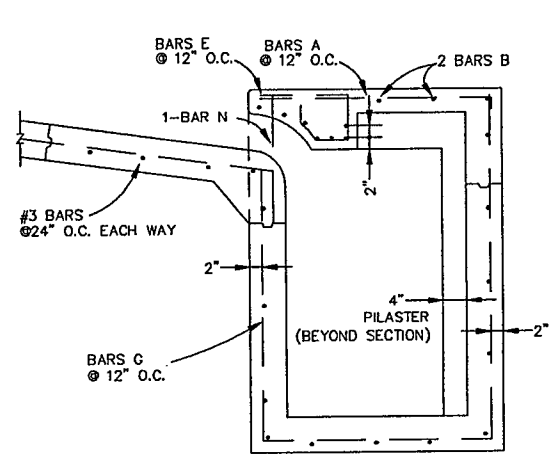
"Y" TYPE INLET DETAILS
N.T.S.



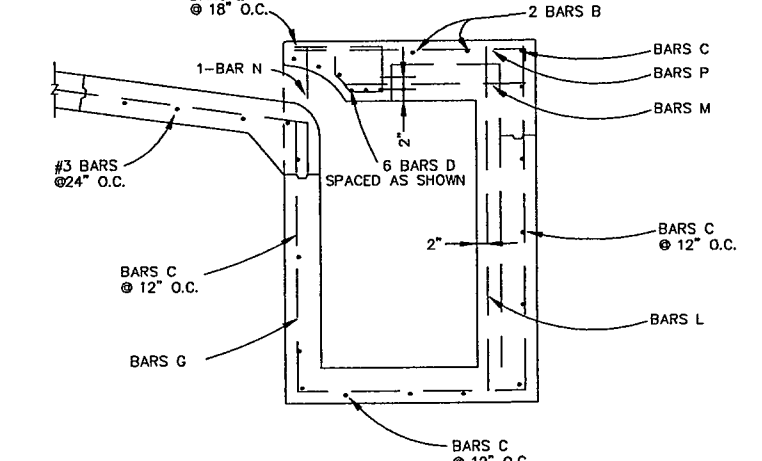
PLAN VIEW (12 AND 14 FOOT INLET)
N.T.S.



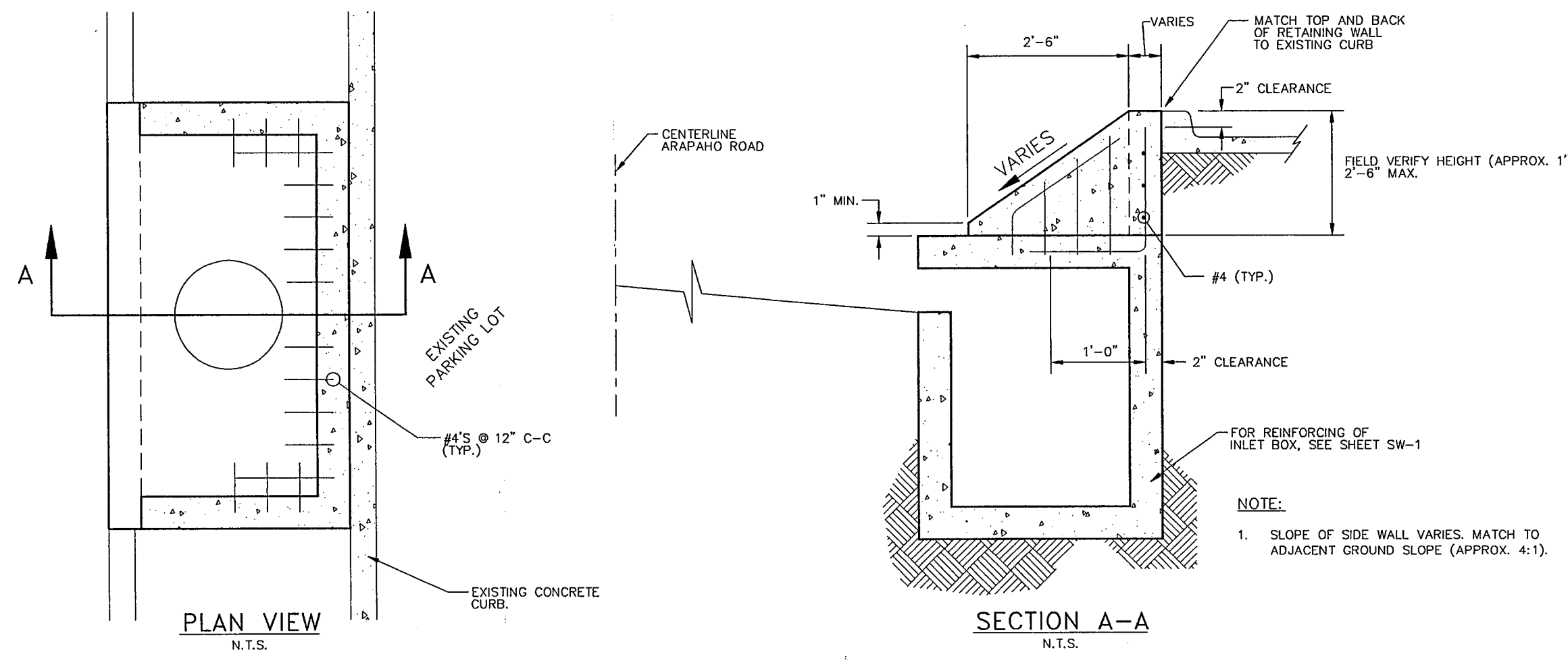
SECTION A-A
N.T.S.



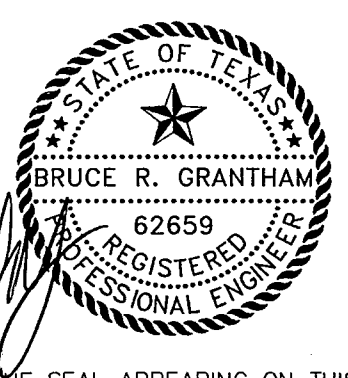
SECTION C-C
N.T.S.



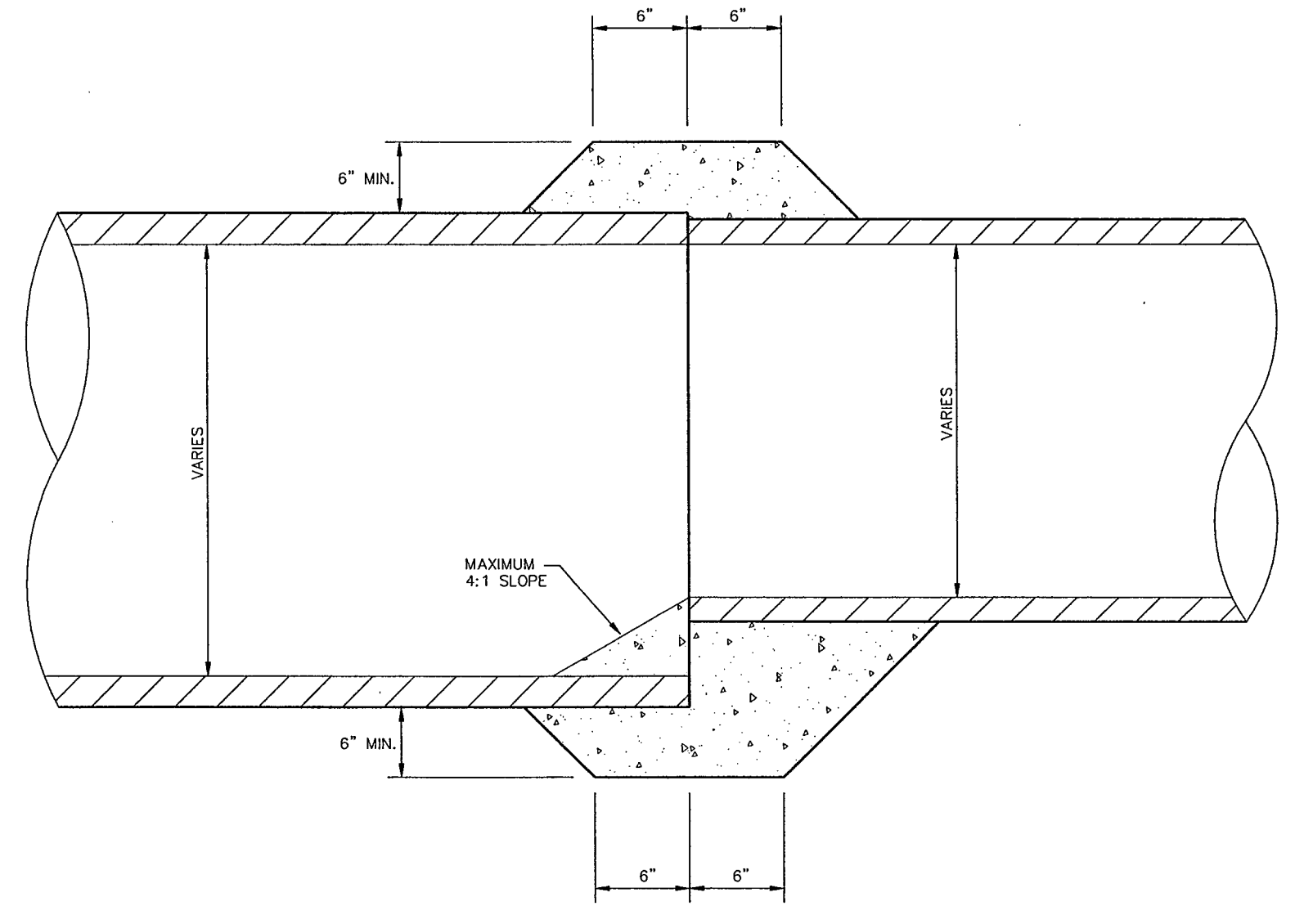
SECTION D-D
N.T.S.



RETAINING WALL DETAIL FOR INLET @ PAV. STA. 15+20±
N.T.S.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: BRUCE R. GRANTHAM ON 02/14/02 ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.



DETAIL OF CONCRETE COLLAR FOR END TO END EXTENSIONS
N.T.S.

DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: BRG	REVIEWED: JFW
DWG: 249DETAILS		

ARAPAHO ROAD PHASE II
STANDARD CONSTRUCTION DETAILS
DRAINAGE - SHEET 2 OF 2

TOWN OF ADDISON

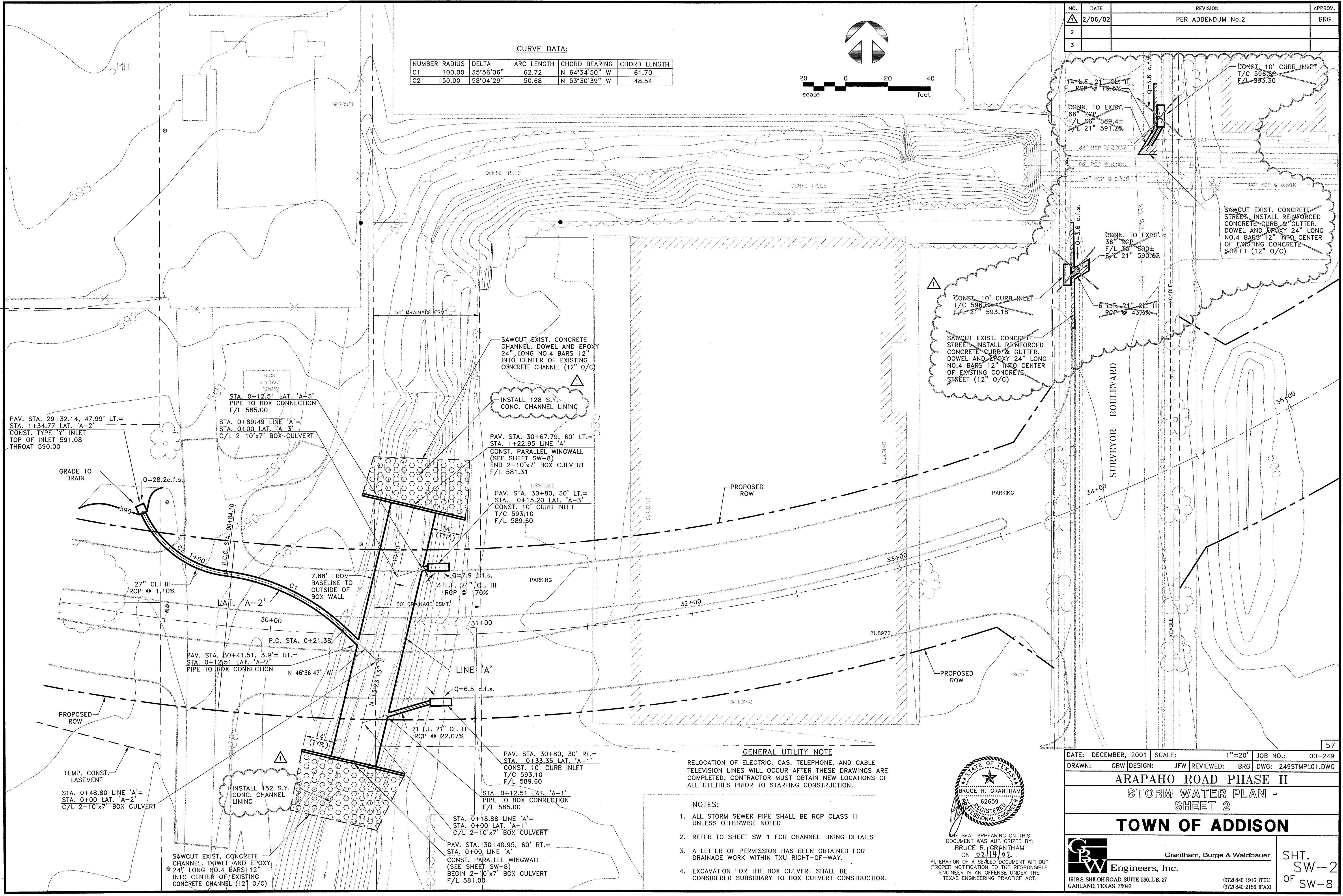
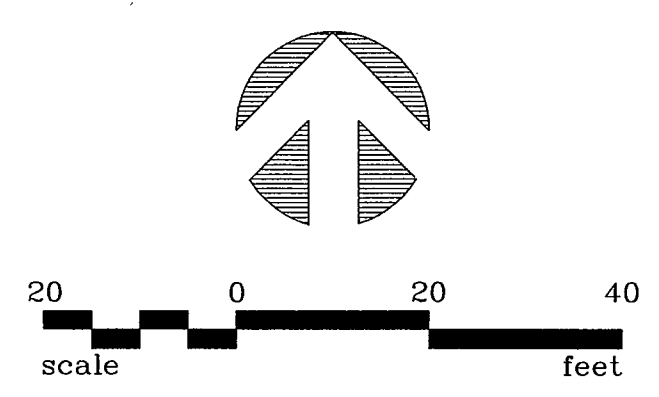
Grantham, Burge & Waldbauer
Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

SHT. SW-6
OF SW-8

NO.	DATE	REVISION	APPROV.
1	2/06/02	PER ADDENDUM No.2	BRG
2			
3			

CURVE DATA:

NUMBER	RADIUS	DELTA	ARC LENGTH	CHORD BEARING	CHORD LENGTH
C1	100.00	35°56'06"	62.72	N 64°34'50" W	61.70
C2	50.00	58°04'29"	50.68	N 53°30'39" W	48.54



SAWCUT EXIST. CONCRETE CHANNEL DOWEL AND EPOXY 24" LONG NO.4 BARS 12" INTO CENTER OF EXISTING CONCRETE CHANNEL (12" O/C)

INSTALL 128 S.Y. CONC. CHANNEL LINING

PAV. STA. 30+67.79, 60' LT.= STA. 1+22.95 LINE 'A'
CONST. PARALLEL WINGWALL (SEE SHEET SW-8)
END 2-10'x7' BOX CULVERT
F/L 581.31

PAV. STA. 30+80, 30' LT.= STA. 0+15.20 LAT. 'A-3'
CONST. 10' CURB INLET
T/C 593.10
F/L 589.60

PAV. STA. 30+80, 30' RT.= STA. 0+35.35 LAT. 'A-1'
CONST. 10' CURB INLET
T/C 593.10
F/L 589.60

STA. 0+12.51 LAT. 'A-1'
PIPE TO BOX CONNECTION
F/L 585.00

PAV. STA. 30+40.95, 60' RT.= STA. 0+00 LINE 'A'
CONST. PARALLEL WINGWALL (SEE SHEET SW-8)
BEGIN 2-10'x7' BOX CULVERT
F/L 581.00

PAV. STA. 29+32.14, 47.99' LT.= STA. 1+34.77 LAT. 'A-2'
CONST. TYPE 'Y' INLET
TOP OF INLET 591.08
THROAT 590.00

STA. 0+12.51 LAT. 'A-3'
PIPE TO BOX CONNECTION
F/L 585.00

STA. 0+89.49 LINE 'A'
STA. 0+00 LAT. 'A-3'
C/L 2-10'x7' BOX CULVERT

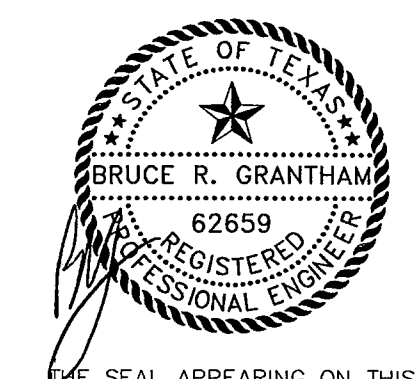
PAV. STA. 50+41.51, 3.9'± RT.= STA. 0+12.51 LAT. 'A-2'
PIPE TO BOX CONNECTION
N 46°36'47" W

INSTALL 152 S.Y. CONC. CHANNEL LINING

SAWCUT EXIST. CONCRETE CHANNEL DOWEL AND EPOXY 24" LONG NO.4 BARS 12" INTO CENTER OF EXISTING CONCRETE CHANNEL (12" O/C)

GENERAL UTILITY NOTE
RELOCATION OF ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION LINES WILL OCCUR AFTER THESE DRAWINGS ARE COMPLETED. CONTRACTOR MUST OBTAIN NEW LOCATIONS OF ALL UTILITIES PRIOR TO STARTING CONSTRUCTION.

- NOTES:**
1. ALL STORM SEWER PIPE SHALL BE RCP CLASS III UNLESS OTHERWISE NOTED
 2. REFER TO SHEET SW-1 FOR CHANNEL LINING DETAILS
 3. A LETTER OF PERMISSION HAS BEEN OBTAINED FOR DRAINAGE WORK WITHIN TXU RIGHT-OF-WAY.
 4. EXCAVATION FOR THE BOX CULVERT SHALL BE CONSIDERED SUBSIDIARY TO BOX CULVERT CONSTRUCTION.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY:
BRUCE R. GRANTHAM
ON 02/14/02
ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

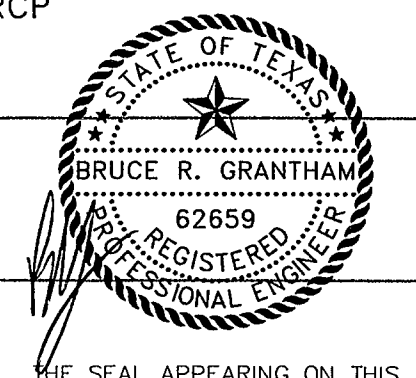
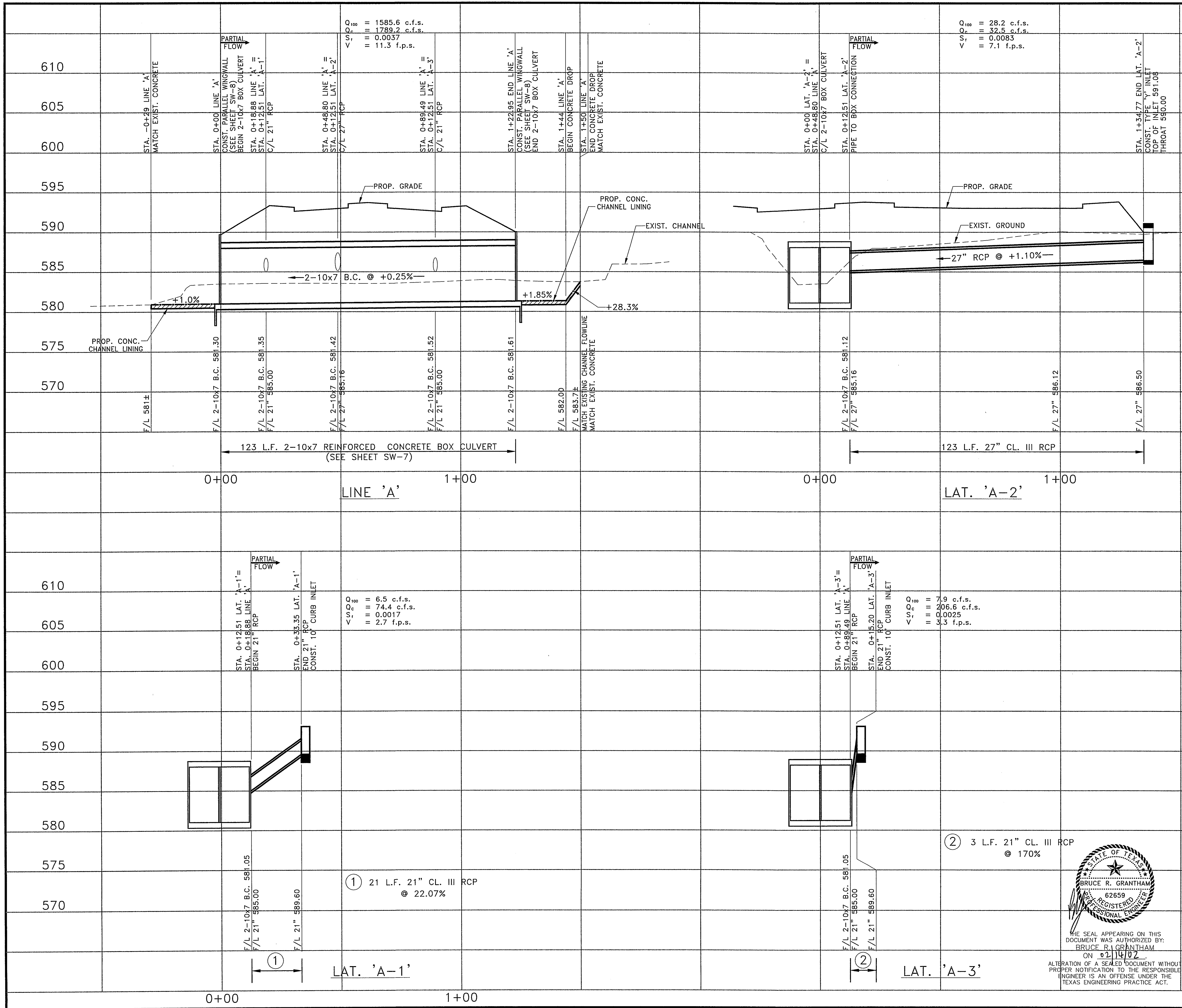
DATE: DECEMBER, 2001 SCALE: 1"=20' JOB NO.: 00-249
DRAWN: GBW DESIGN: JFW REVIEWED: BRG DWG: 249STMPLO1.DWG

**ARAPAHO ROAD PHASE II
STORM WATER PLAN -
SHEET 2**

TOWN OF ADDISON
Grantham, Burge & Waldbauer
Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

SHT. SW-2
OF SW-8

NO.	DATE	REVISION	APPROV.
1			
2			
3			



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: BRUCE R. GRANTHAM ON 02/14/07
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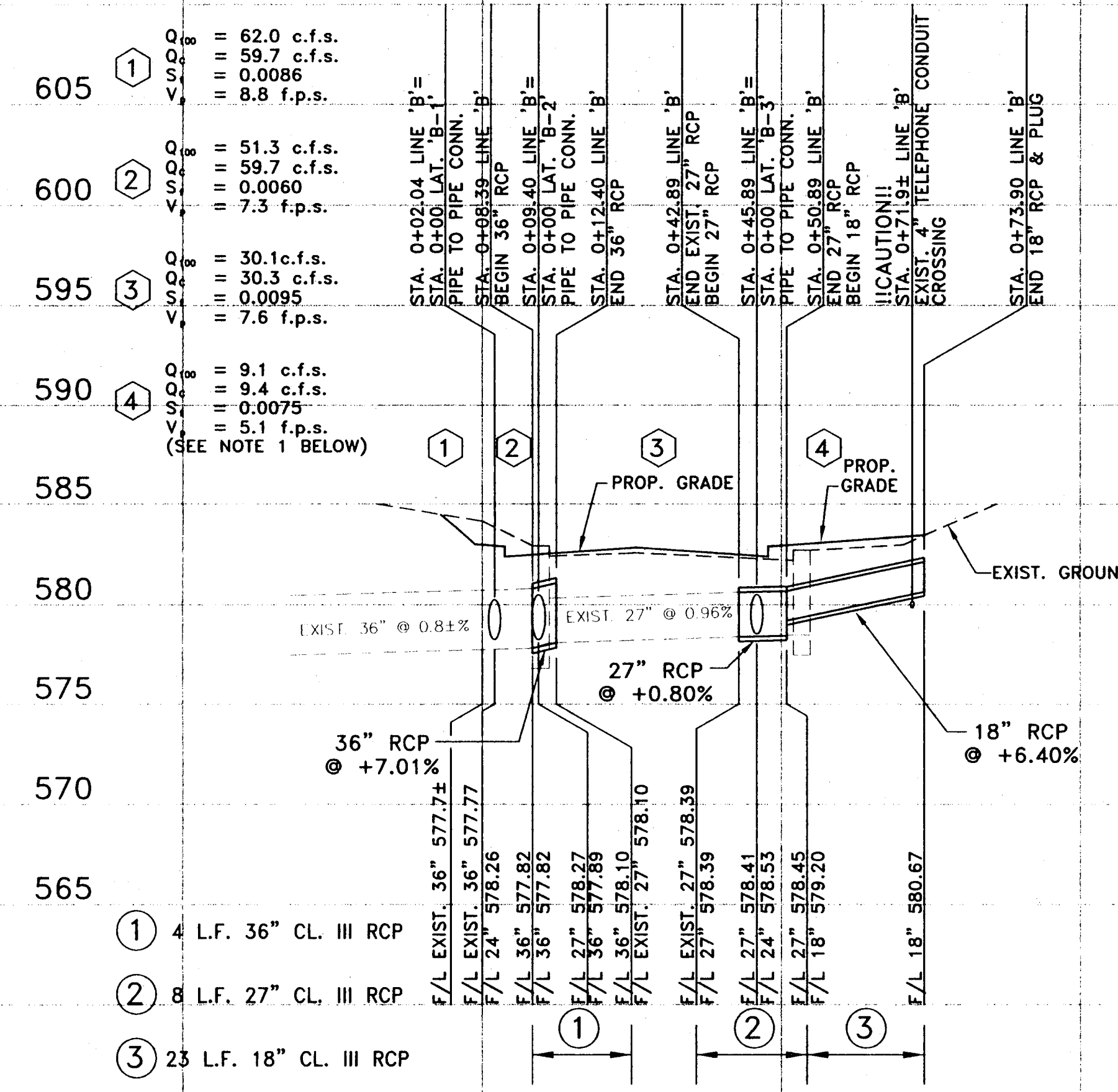
DATE: DECEMBER, 2001 SCALE: (H)1"=20', (V)1"=6' JOB NO.: 00-249
 DRAWN: GBW DESIGN: BRG REVIEWED: JFW DWG: STMPRF01.DWG

ARAPAHO ROAD PHASE II
STORM WATER PROFILES - SHEET 1
TOWN OF ADDISON

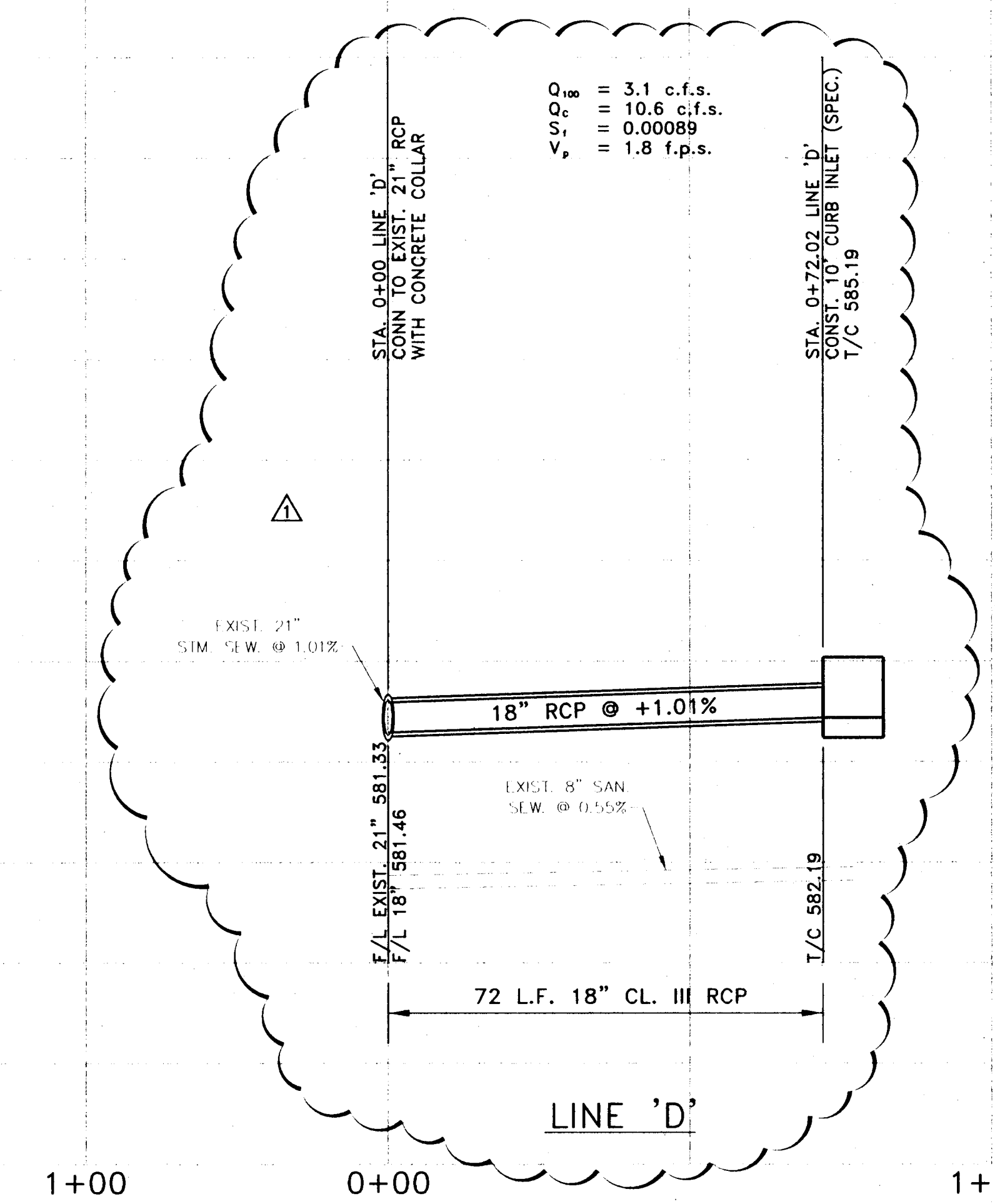
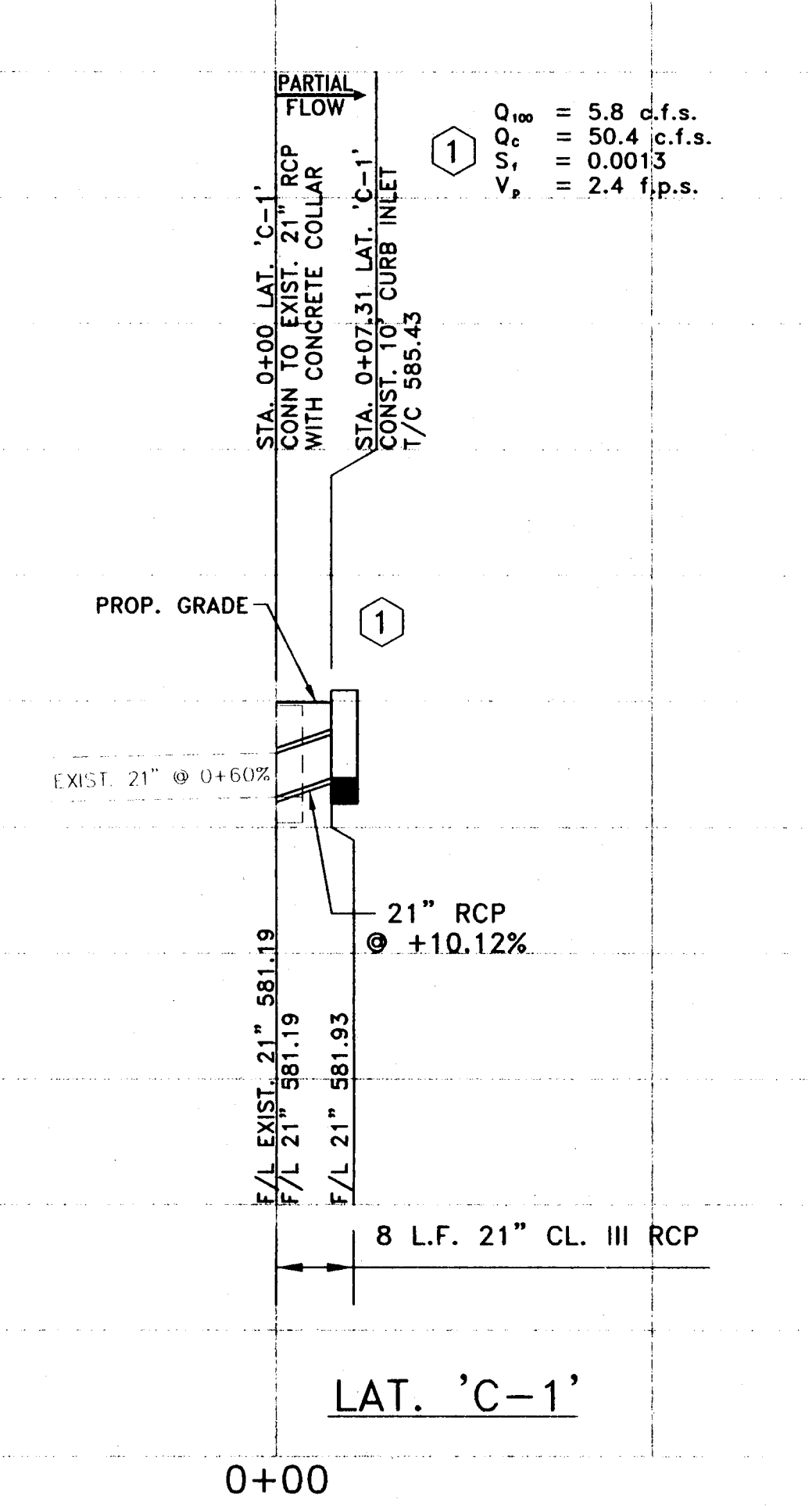
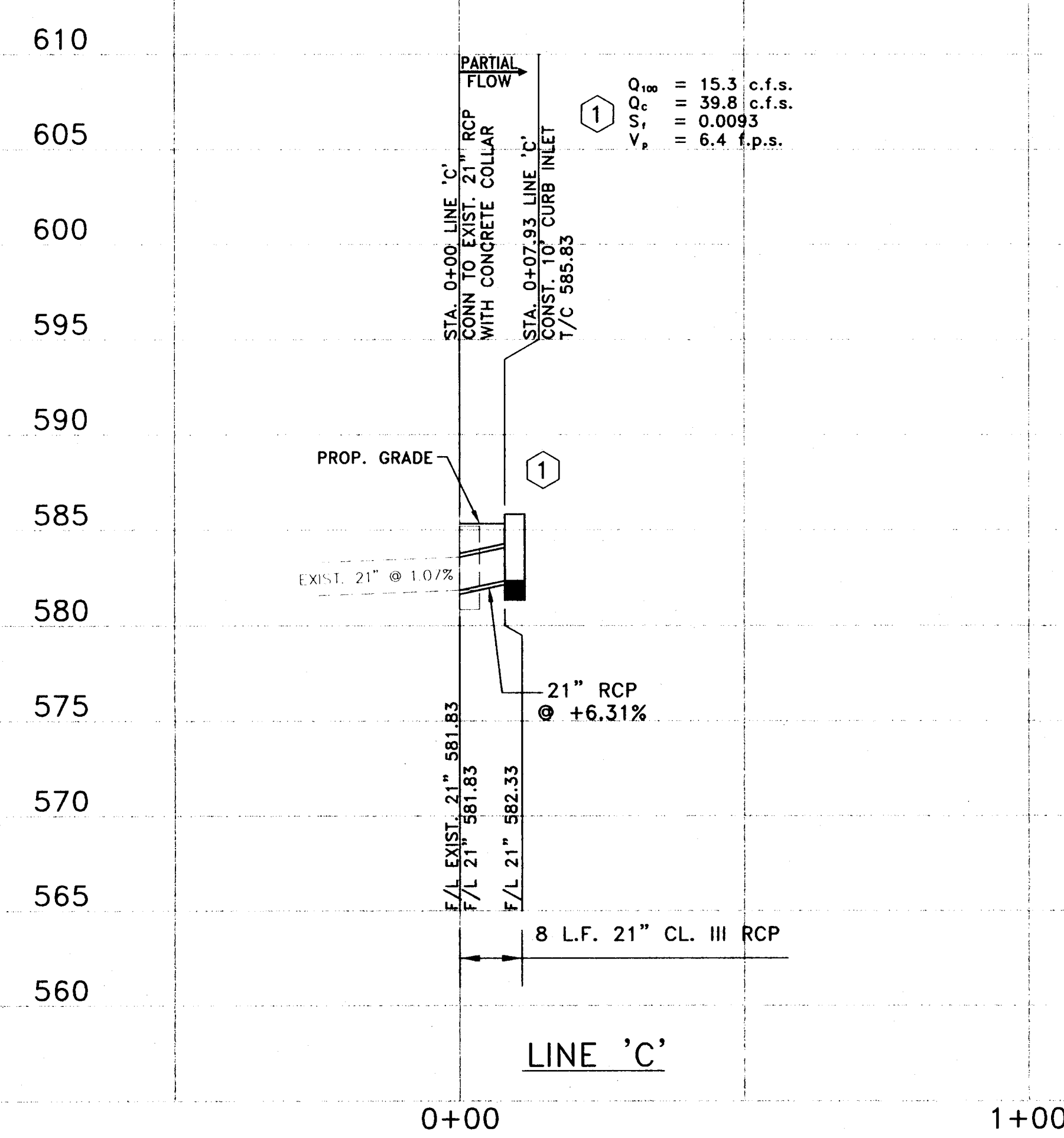
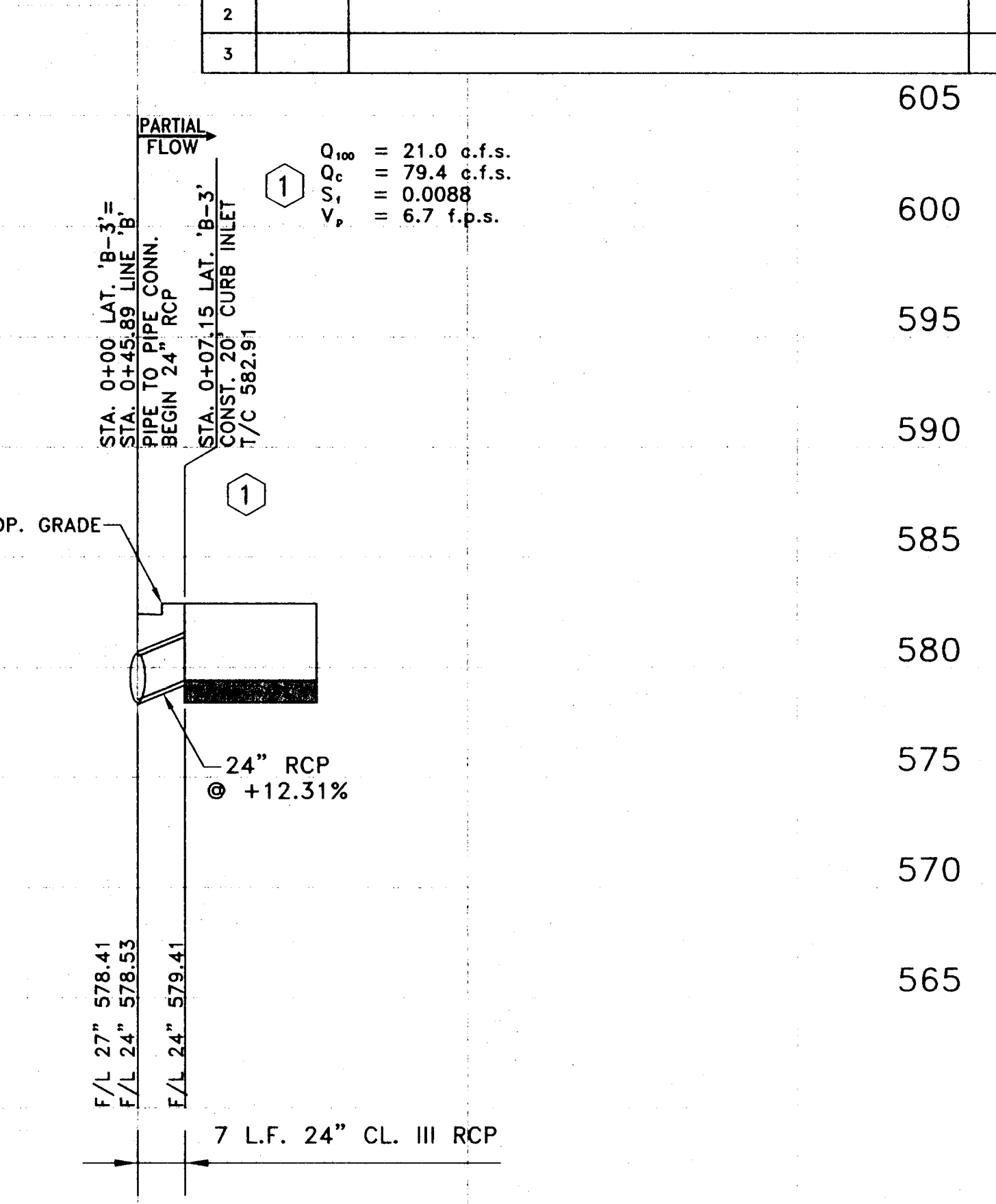
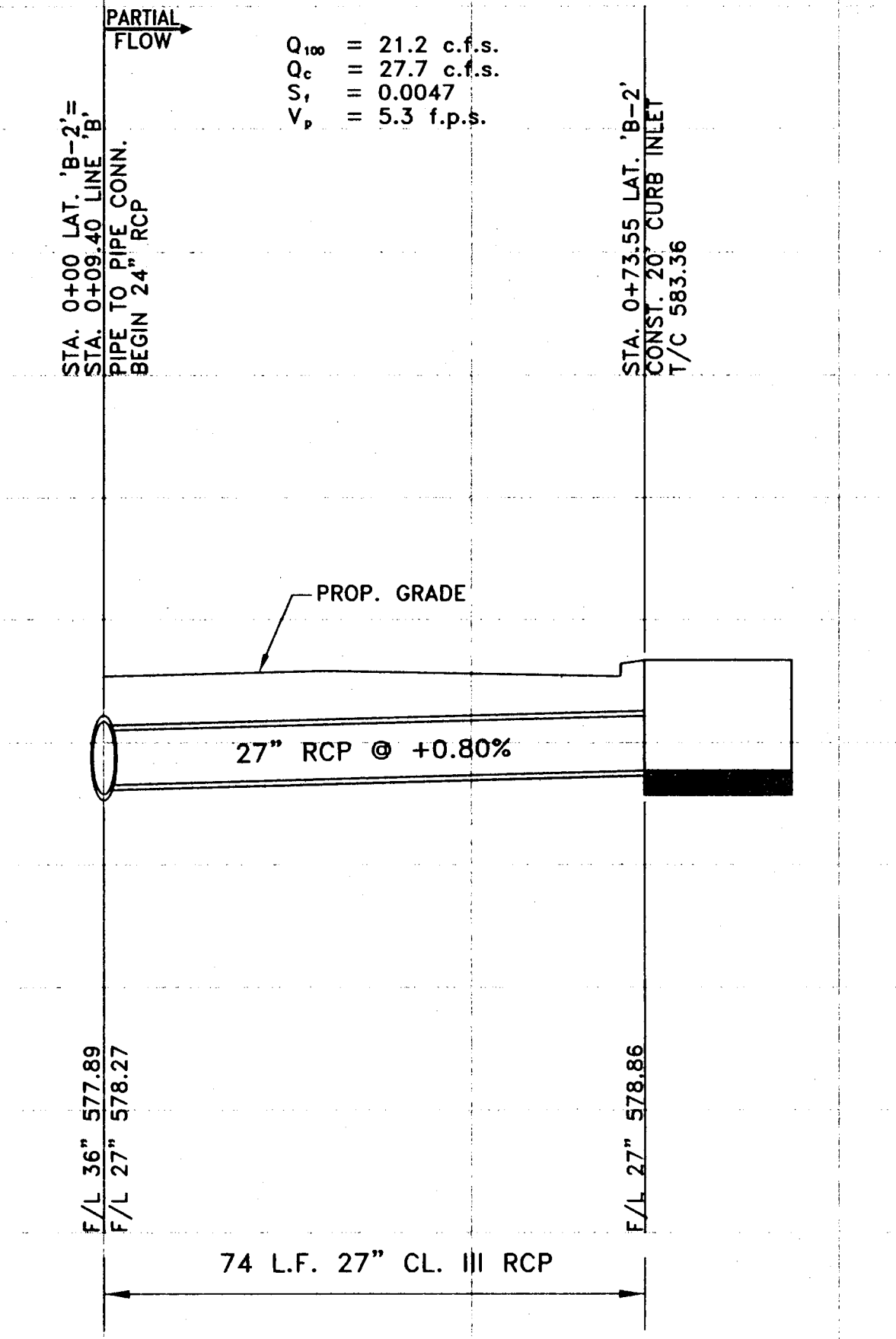
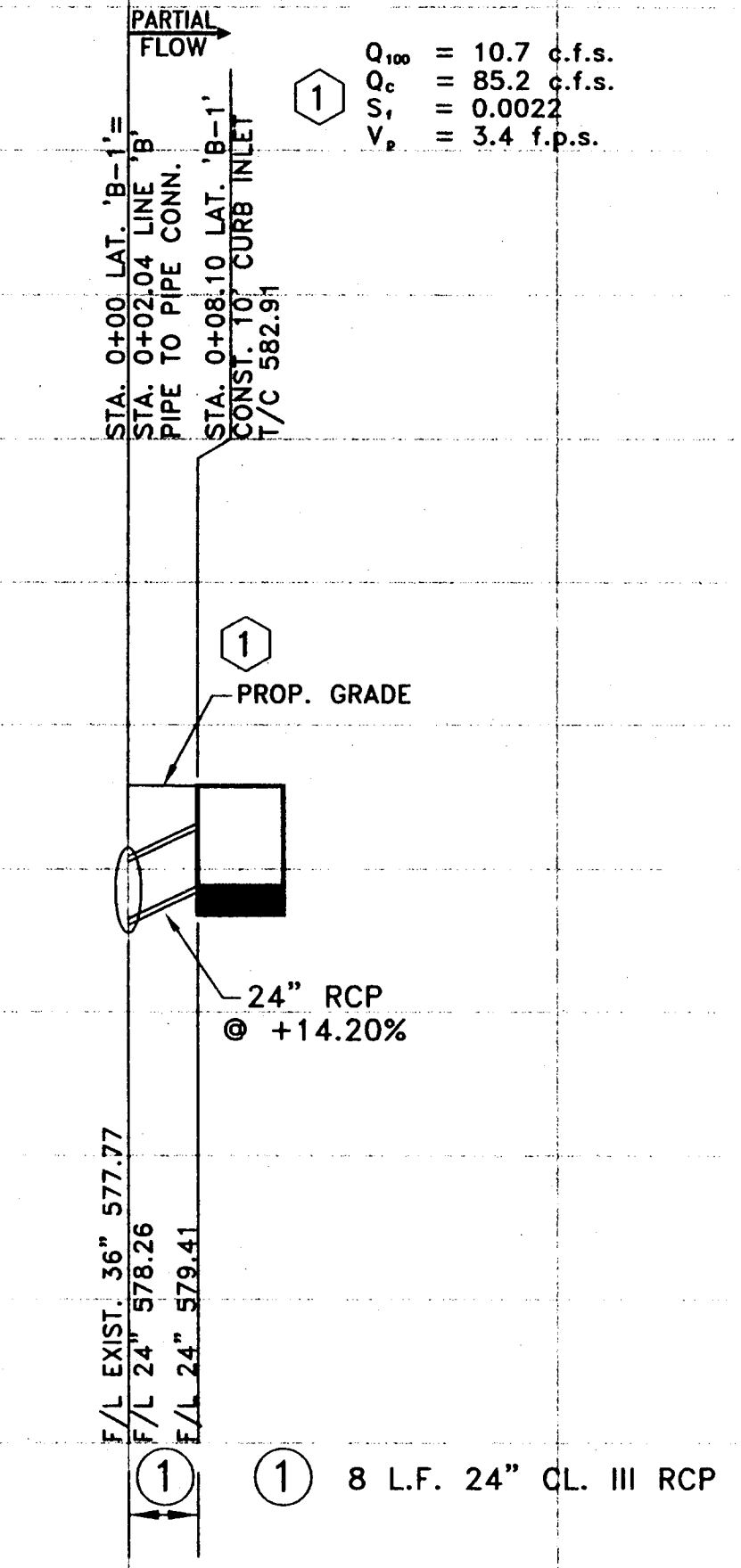
Grantham, Burge & Waldbauer
Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
 (972) 840-1916 (TEL)
 (972) 840-2156 (FAX)

SHT. SW-3
 OF SW-8

NO.	DATE	REVISION	APPROV.
1	7/19/02	ADDED LINE 'D'	BRG
2			
3			



NOTE:
1. CALCULATIONS FOR LINE 'B' ARE BASED ON THE FUTURE DEVELOPMENT AND DETENTION OF DRAINAGE AREA 1D2.



610
605
600
595
590
585
580
575
570
565
560

PARTIAL FLOW
 $Q = 15.3$ c.f.s.
 $V = 39.8$ c.f.s.
 $S = 0.0093$
 $f.p.s. = 6.4$

STA. 0+00.00 LINE 'C'=
 CONN TO EXIST. 21" RCP
 WITH CONCRETE COLLAR
 STA. 0+07.93 LINE 'C'=
 CONST. TO CURB INLET
 T/C 585.65

8 L.F. 21" CL. III RCP

LINE 'C'

PARTIAL FLOW
 $Q = 5.8$ c.f.s.
 $V = 50.4$ c.f.s.
 $S = 0.0013$
 $f.p.s. = 2.4$

STA. 0+00.00 LAT. 'C-1'=
 CONN TO EXIST. 21" RCP
 WITH CONCRETE COLLAR
 STA. 0+07.31 LAT. 'C-1'=
 CONST. TO CURB INLET
 T/C 585.45

8 L.F. 21" CL. III RCP

LAT. 'C-1'

$Q = 3.1$ c.f.s.
 $V = 10.6$ c.f.s.
 $S = 0.00089$
 $f.p.s. = 1.8$

STA. 0+00.00 LINE 'D'=
 CONN TO EXIST. 21" RCP
 WITH CONCRETE COLLAR
 STA. 0+72.02 LINE 'D'=
 CONST. TO CURB INLET (SPEC.)
 T/C 585.19

72 L.F. 18" CL. III RCP

LINE 'D'

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY:
 BRUCE R. GRANTHAM
 ON 03/19/02

ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DATE: DECEMBER, 2001	SCALE: (H)1"=20', (V)1"=6'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: BRG	REVIEWED: JFW
DWG: STMPF02.DWG		

ARAPAHO ROAD PHASE II

STORM WATER PROFILES - SHEET 2

TOWN OF ADDISON

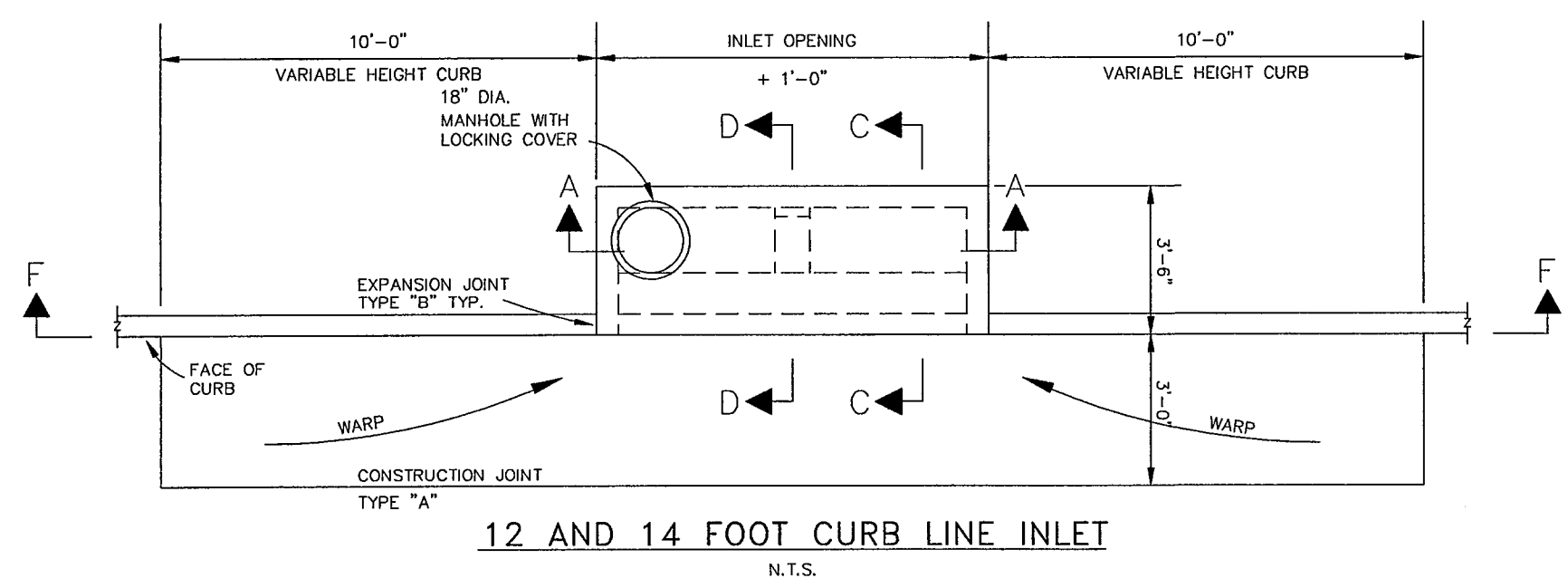
Grantham, Burge & Waldbauer
Engineers, Inc.

1919 S. SHILOH ROAD, SUITE 530, LB 27
 GARLAND, TEXAS 75042

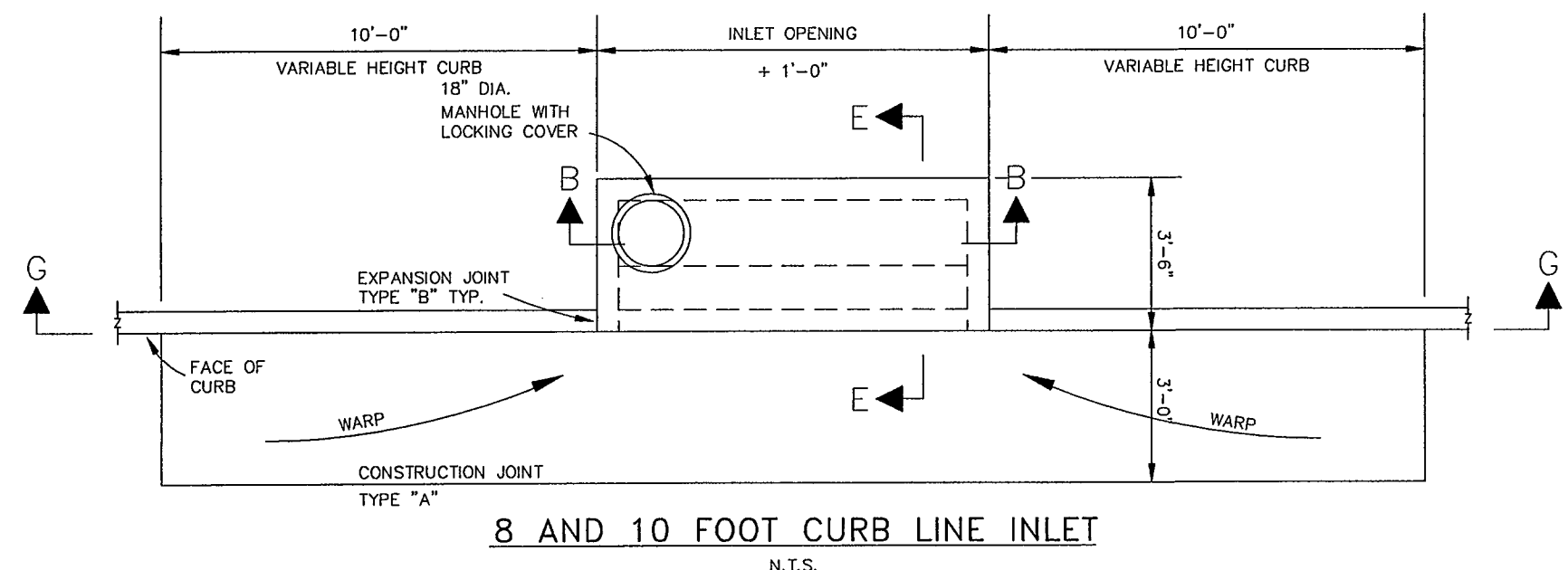
(972) 840-1916 (TEL)
 (972) 840-2156 (FAX)

SHT. SW-4
 OF SW-8

NO.	DATE	REVISION	APPROV.
1			
2			
3			

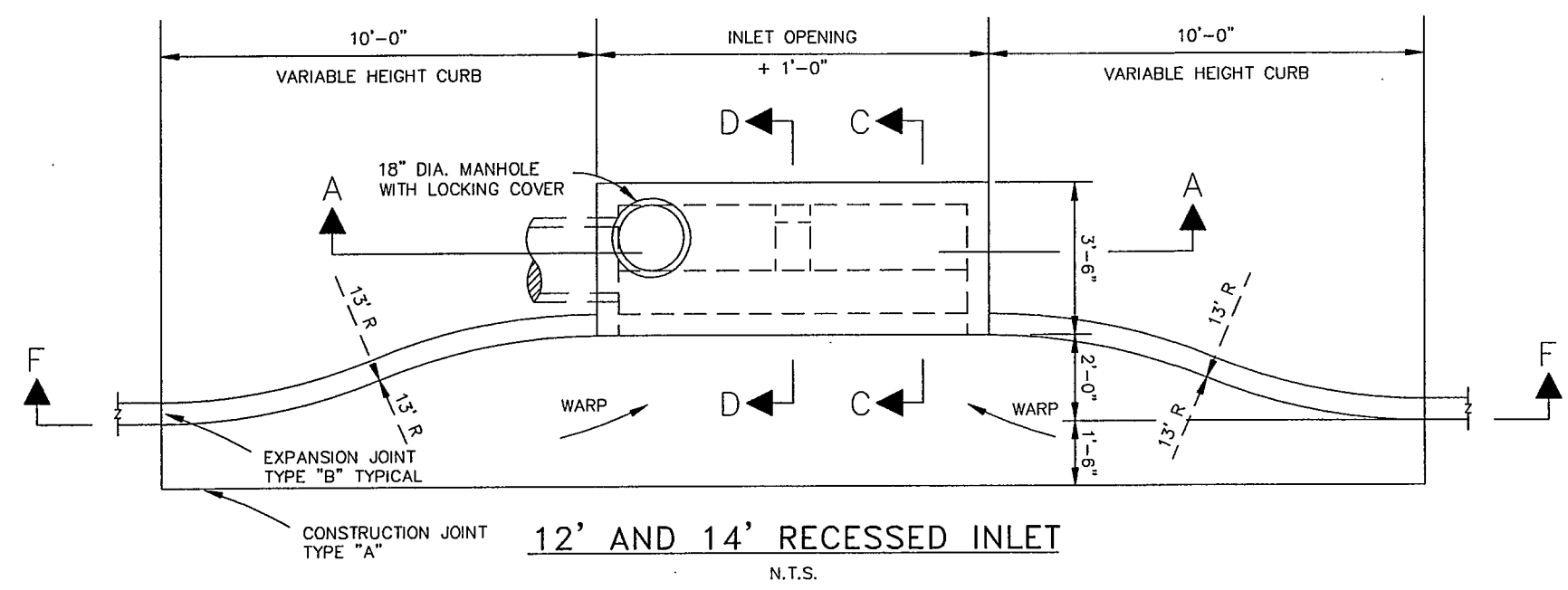


12 AND 14 FOOT CURB LINE INLET
N.T.S.

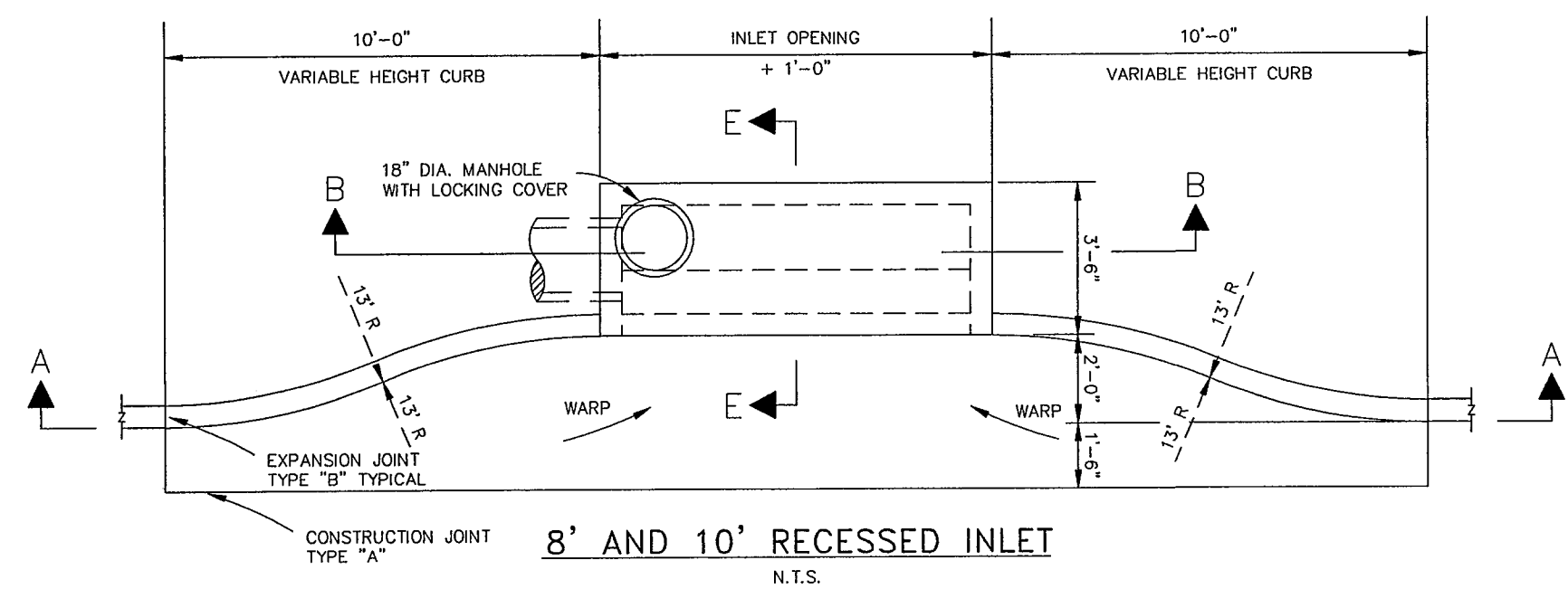


8 AND 10 FOOT CURB LINE INLET
N.T.S.

GENERAL NOTES:
1. OUTLET PIPE MAY BE LOCATED IN ANY WALL BUT SHALL NOT BE LOCATED AT ANY CORNER OR PILASTER.
2. MANHOLE RING WITH LOCKING COVER SHALL BE PLACED OVER THE OUTLET PIPE. REINFORCING BARS ARE TO BE ADJUSTED ACCORDINGLY.
3. ALL INLET WALLS SHALL BE FORMED UP, BACK AND FRONT.



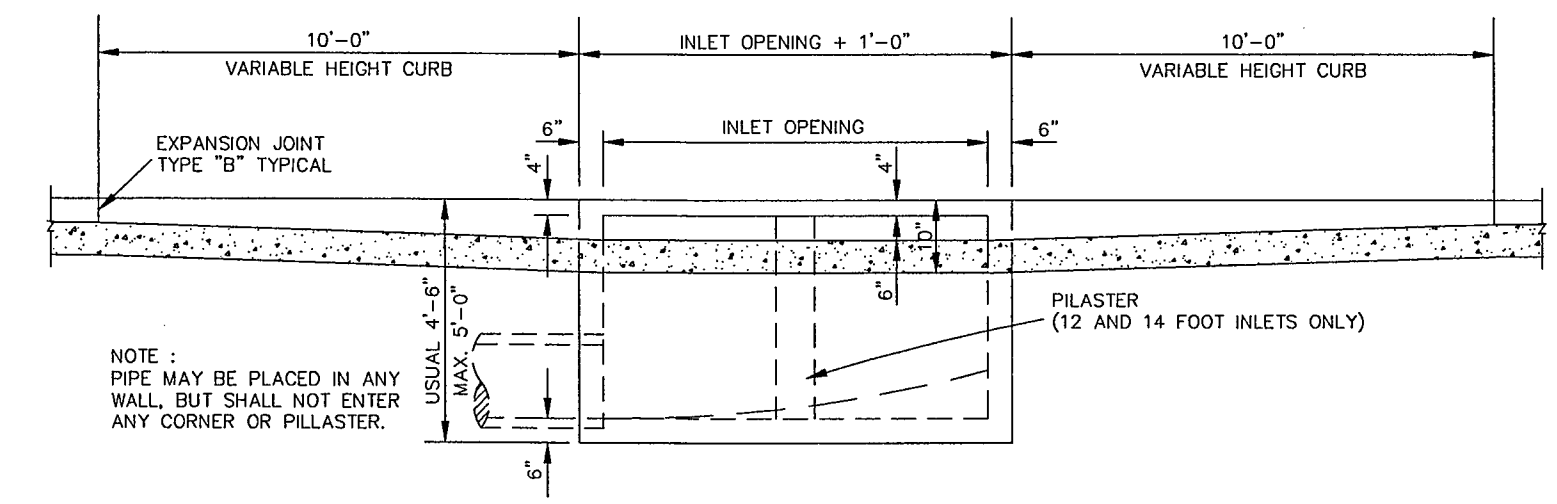
12' AND 14' RECESSED INLET
N.T.S.



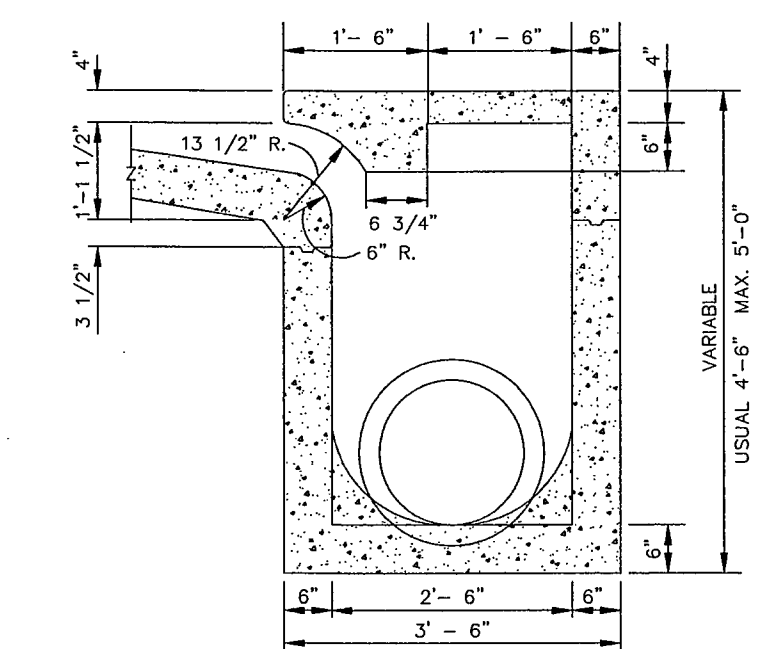
8' AND 10' RECESSED INLET
N.T.S.

GENERAL NOTES:
1. OUTLET PIPE MAY BE LOCATED IN ANY WALL BUT SHALL NOT BE LOCATED AT ANY CORNER AT THE PILASTER.
2. MANHOLE RING WITH LOCKING COVER SHALL BE PLACED OVER THE OUTLET PIPE. REINFORCING BARS ARE TO BE ADJUSTED ACCORDINGLY.

CURB LINE INLET
PLAN VIEW

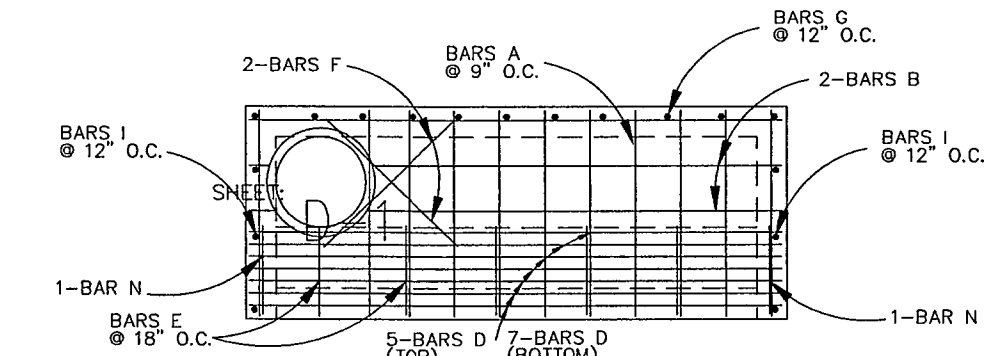


SECTION F-F (12 AND 14 FOOT INLETS)
SECTION G-G (8 AND 10 FOOT INLETS)
N.T.S.

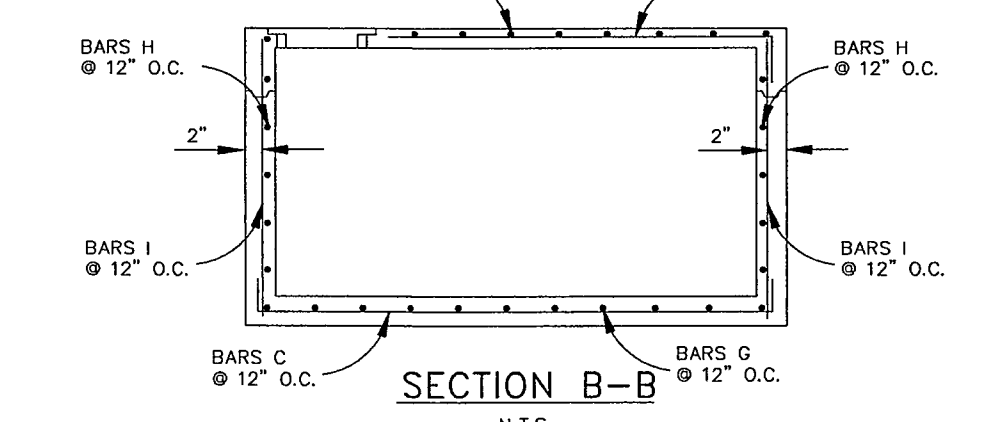


TYPICAL CROSS SECTION
N.T.S.

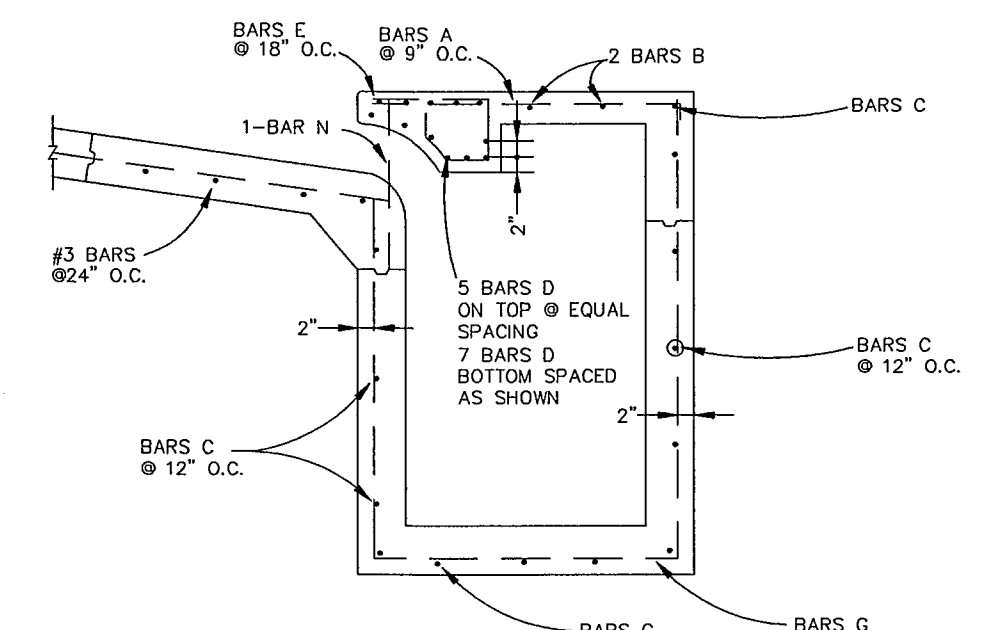
CURB LINE INLET
CROSS SECTIONS



PLAN VIEW (8 AND 10 FOOT INLET)
N.T.S.

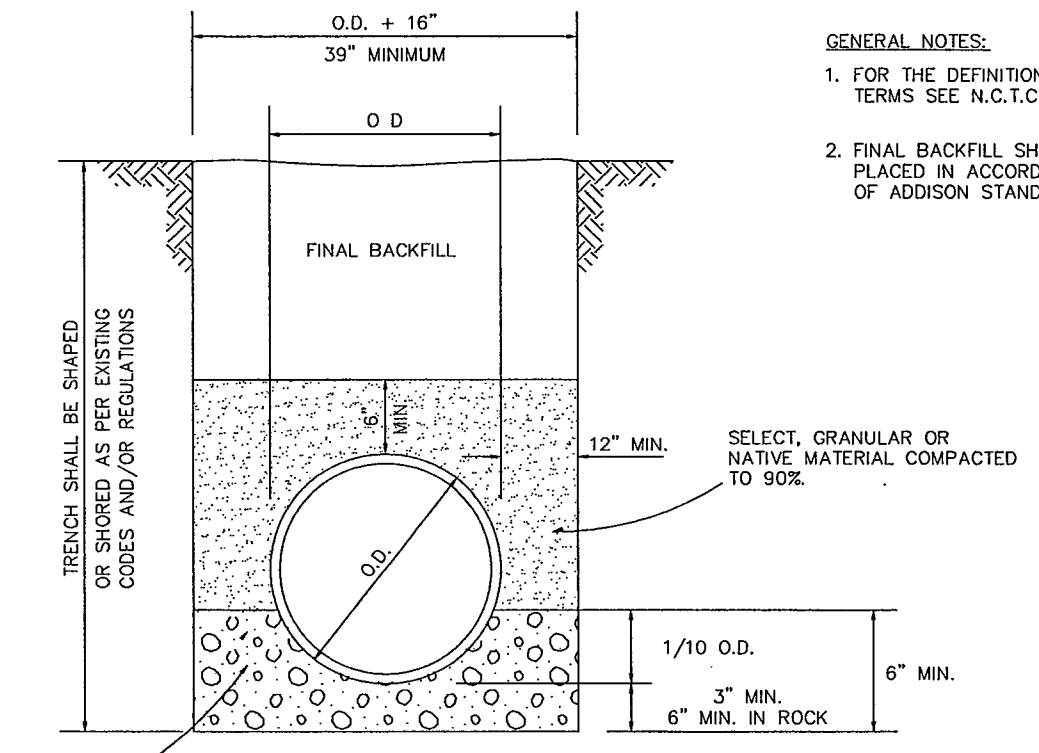


SECTION B-B
N.T.S.



SECTION E-E
N.T.S.

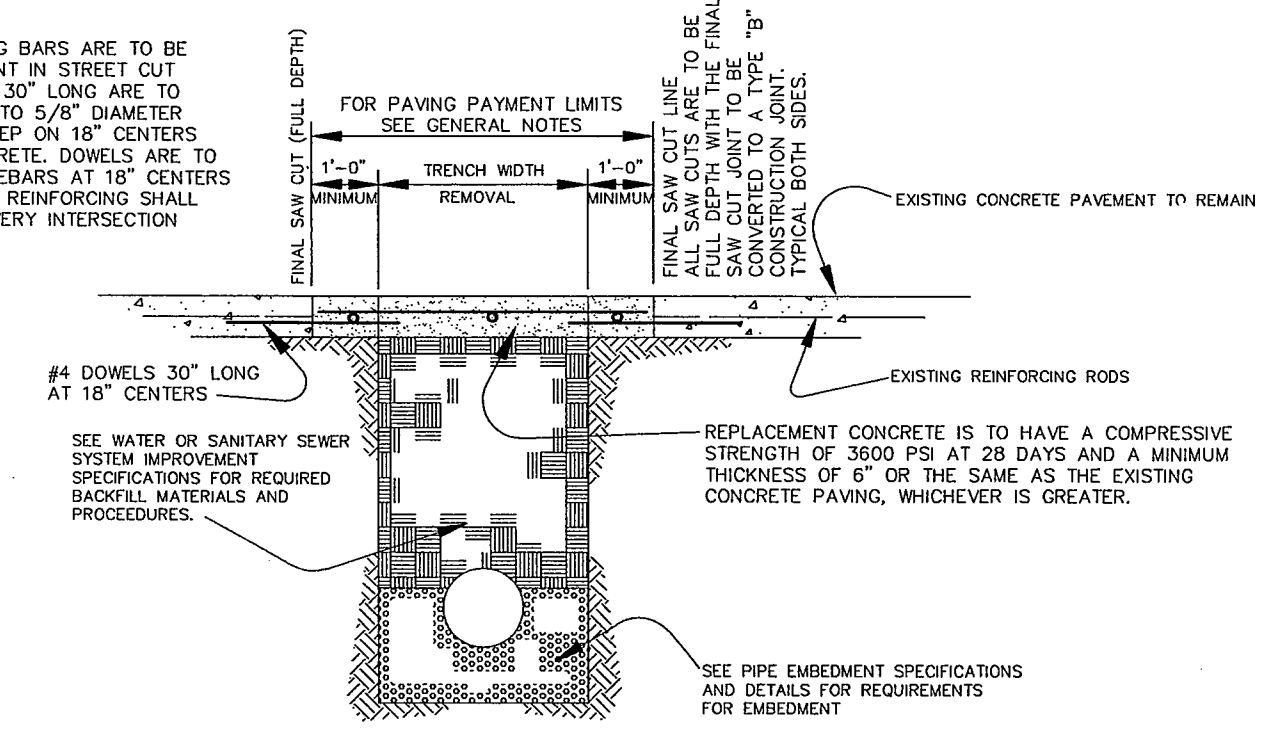
CURB INLET REINFORCING



STORM DRAIN INSTALLATION
R.C.P. TYPE PIPE AND BOX CULVERT EMBEDMENT
N.T.S.

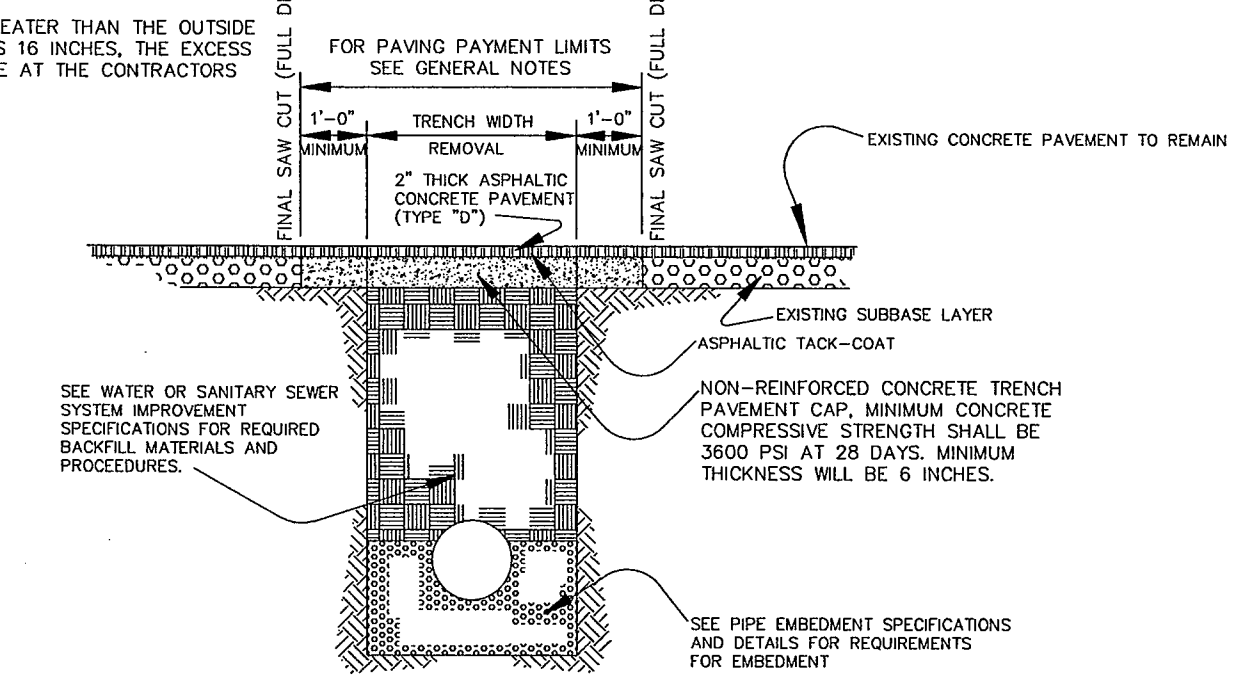
GENERAL NOTES:
1. FOR THE DEFINITION OF THE BACKFILL MATERIAL TERMS SEE A.C.T.O.G. SPECIFICATIONS ITEM 2.1.8.
2. FINAL BACKFILL SHALL CONSIST OF AND BE PLACED IN ACCORDANCE WITH THE TOWN OF ADDISON STANDARDS AND SPECIFICATIONS.

REINFORCING NOTES:
ONLY NEW REINFORCING BARS ARE TO BE USED FOR REPLACEMENT IN STREET CUT REPAIRS. #4 DOWELS 30" LONG ARE TO BE EPOXY GROUTED INTO 5/8" DIAMETER DRILLED HOLES 15" DEEP ON 18" CENTERS IN THE EXISTING CONCRETE. DOWELS ARE TO BE LAPPED WITH #4 REBARS AT 18" CENTERS BOTH DIRECTIONS. ALL REINFORCING SHALL HAVE WIRE TIES AT EVERY INTERSECTION (100% TIE).



REINFORCED CONCRETE PAVEMENT
N.T.S.

GENERAL NOTES:
PAVEMENT REPLACEMENT WIDTH TO BE A MAXIMUM OF TRENCH WIDTH PLUS 2'-0" (WITH A MINIMUM TRENCH WIDTH OF 39 INCHES). IF THE TRENCH WIDTH IS GREATER THAN THE OUTSIDE DIAMETER OF THE PIPE PLUS 16 INCHES, THE EXCESS REPLACEMENT WIDTH WILL BE AT THE CONTRACTORS EXPENSE.



FLEXIBLE BASE AND
ASPHALTIC CONCRETE SURFACE
N.T.S.

STREET CUT REPAIRS



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY:
BRUCE R. GRANTHAM
ON 02/14/02
ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: BRG	REVIEWED: JFW
		DWG: 249DETAILS

ARAPAHO ROAD PHASE II
STANDARD CONSTRUCTION DETAILS
DRAINAGE - SHEET 1 OF 2
TOWN OF ADDISON

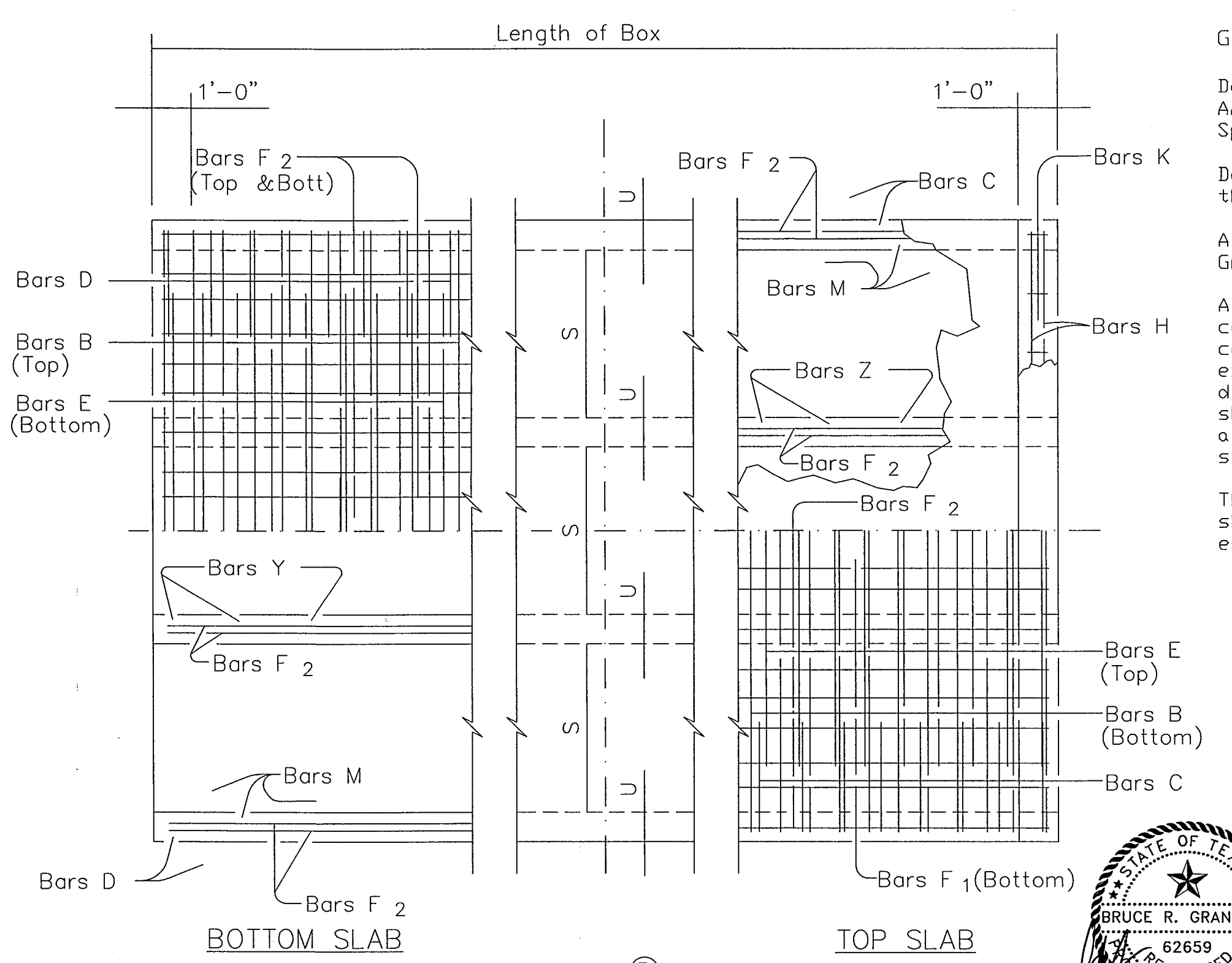
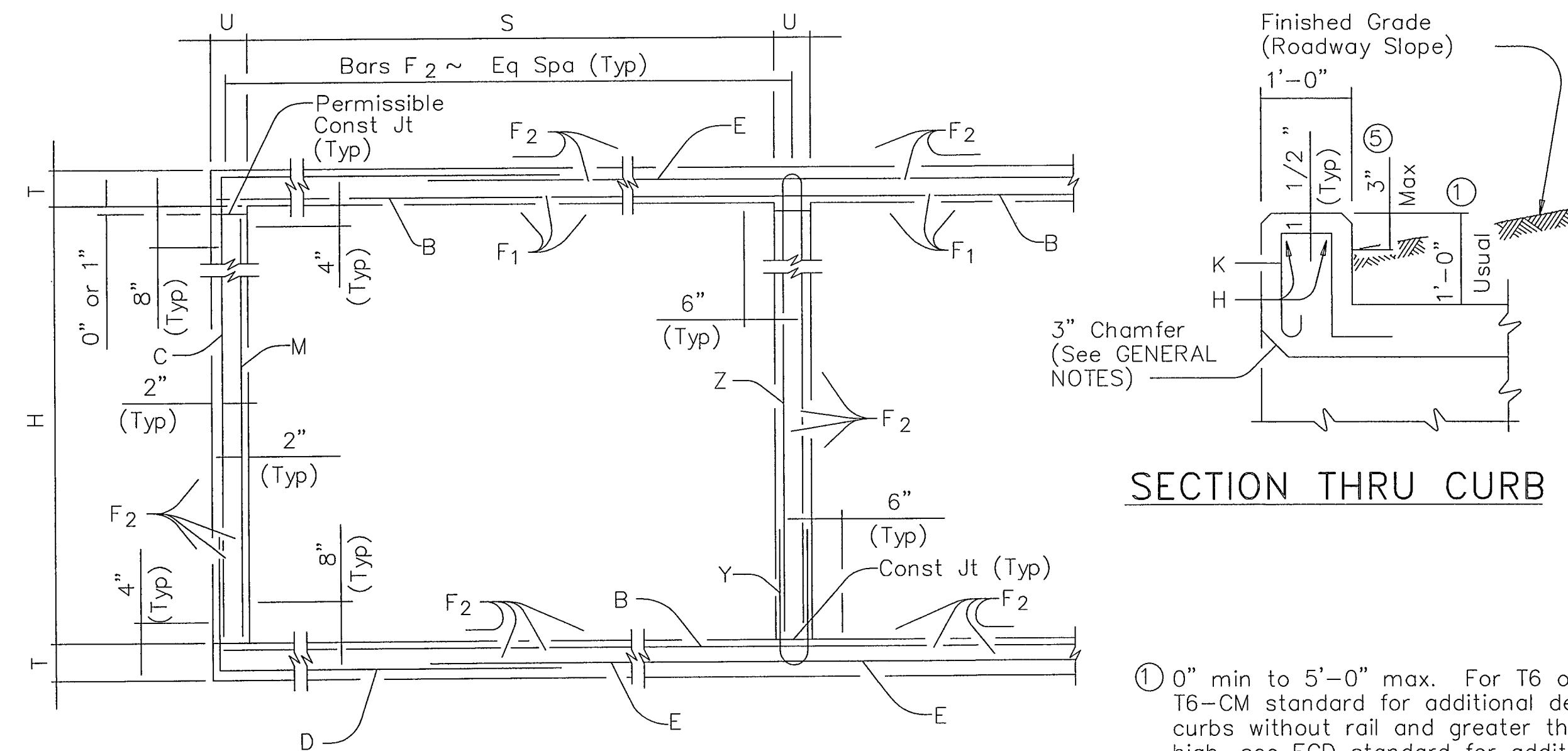
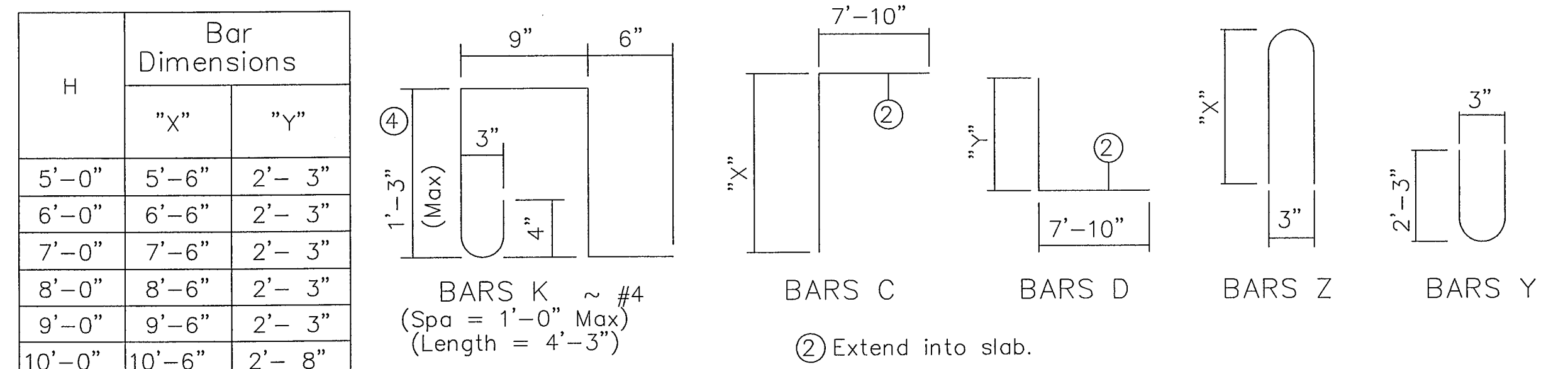
Grantham, Burge & Waldbauer
Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27
GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

SHT. SW-5
OF SW-8

BILLS OF REINFORCING STEEL (For Box Length = 40 feet)

Table with columns for NO., DATE, REVISION, and APPROV. Includes a sub-table for QUANTITIES with columns for Per foot of Barrel, Curb, and Total.

Main table containing columns for NUMBER OF SPANS, SECTION DIMENSIONS (S, H, T, U), and various bar types (Bars B, C & D, E, F #4, F #4 at 1'-6" Max, M #4 at 1'-6" Max, Y & Z #4 at 8" Max, H 4-#4, K, and Concrete quantities).

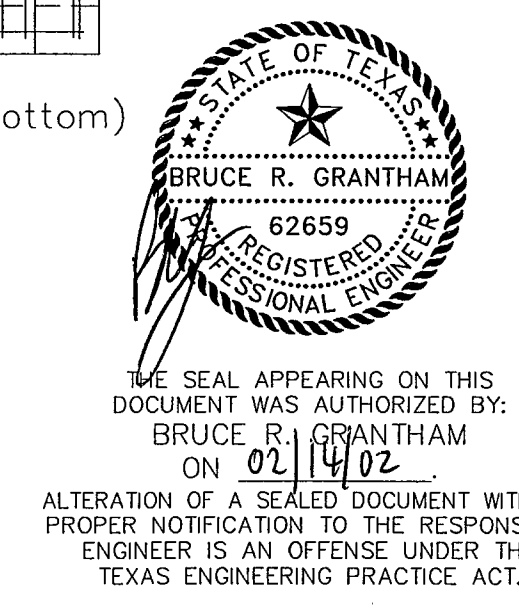


GENERAL NOTES: Designed according to current AASHTO Standard and Interim Specifications. Designed for HS20 Loading and to the maximum fill height shown. All reinforcing steel shall be Grade 60. All concrete shall be Class 'C' concrete with a minimum 28 day compressive strength of 3600 psi; except for the top slab of direct traffic culverts, which shall be Class 'S' concrete with a minimum 28 day compressive strength of 4000 psi. The bottom edge of the top slab shall be chamfered 3" at the entrance. Reinforcing bars shall be adjusted to provide a minimum of 1 1/4" clear cover. Construction joints shown at the flow line may be raised a maximum of 6" at the Contractor's option. If this option is used, Bars M may be cut off or raised, Bars C and D may be reversed, and Bars Y and Z may be reversed. See standard MC-MD for skewed ends, angle sections and lengthening details. For Direct Traffic, construct top slab to conform to crown of roadway while maintaining constant thickness of slab. Bar Dimensions "X" and "Y" shall be adjusted as necessary. The maximum permissible variation in dimension H is 6 inches.

TYPICAL SECTION ③ Reinforcing shown for orientation purposes only. See table for number and spacing of bars.

SECTION THRU CURB ① 0" min to 5'-0" max. For T6 or C6 Rail, see T6-CM standard for additional details. For curbs without rail and greater than 1'-0" high, see ECD standard for additional details. ② Extend into slab. ③ Reinforcing shown for orientation purposes only. See table for number and spacing of bars.

PART PLANS ③ ⑤ For vehicle safety, curb heights shall be reduced, if necessary, to provide a maximum 3" projection above finished grade. No changes will be made in quantities and no additional compensation will be allowed for this work. ⑥ Bar lengths over 60' include one bar lap as follows: #4 = 1'-9", #5 = 2'-2", & #6 = 2'-7". For Epoxy coated reinforcing, bar laps shall be as follows: #4 = 2'-7", #5 = 3'-3", & #6 = 3'-10"



Project information including DATE: DECEMBER, 2001, SCALE: NOT TO SCALE, JOB NO.: 00-249, DRAWN: GBW, DESIGN: BRG, REVIEWED: JFW, DWG: 249DETAILS. Project name: ARAPAHO ROAD PHASE II BOX CULVERT DETAIL. TOWN OF ADDISON. Grantham, Burge & Waldbauer Engineers, Inc. 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042. (972) 840-1916 (TEL), (972) 840-2156 (FAX). SHEET SW-7 OF SW-8.

THIS DETAIL SHEET WAS OBTAINED FROM TXDOT

TABLE OF DIMENSIONS & REINFORCING STEEL
(Wings for One Structure End)

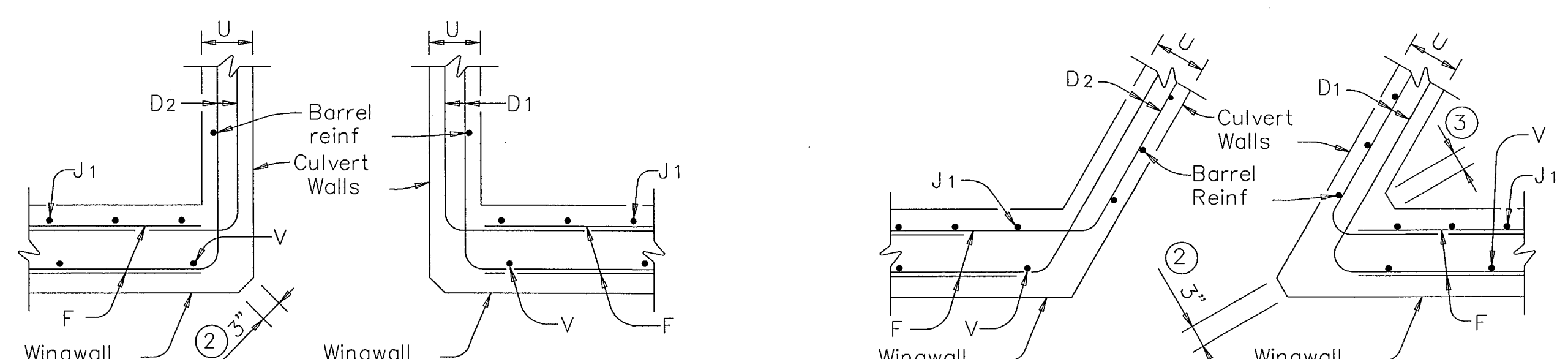
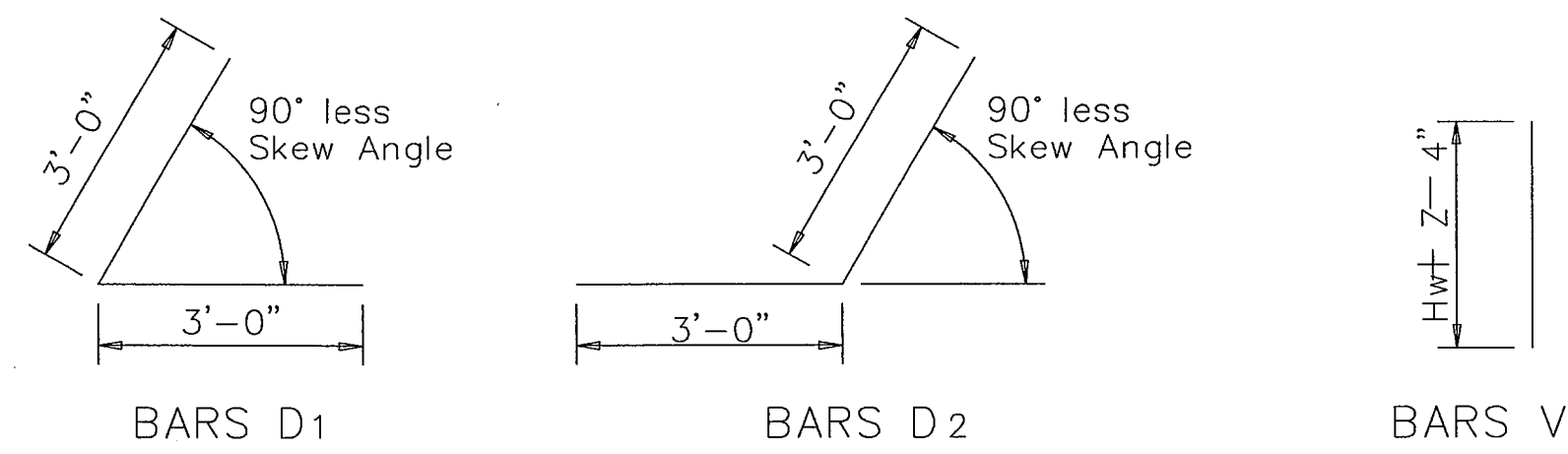
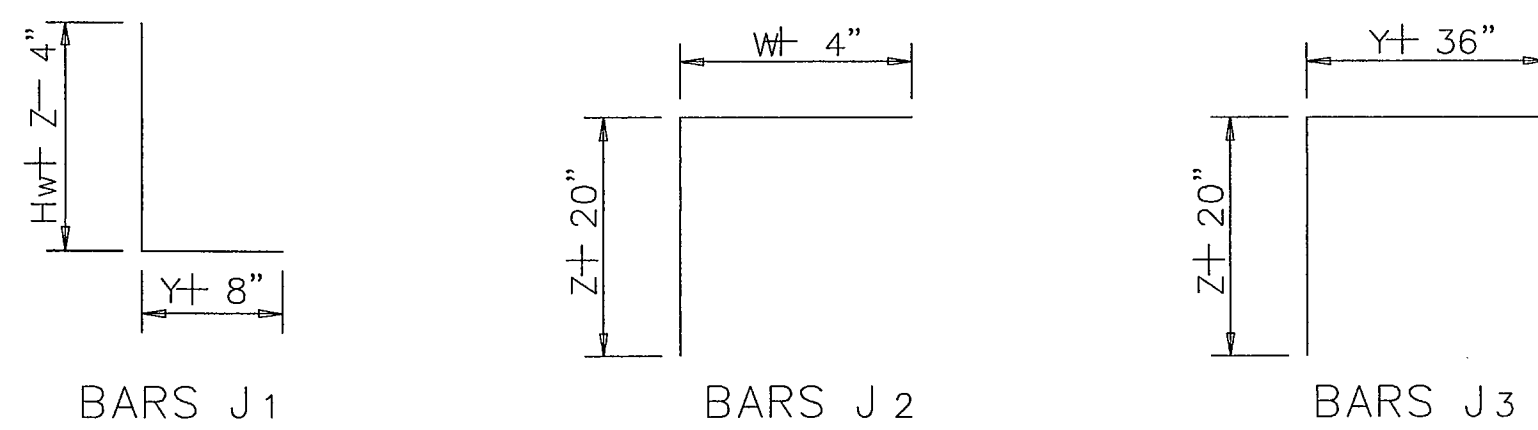
Maximum Wingwall Height Hw	Dimensions				Variable Reinforcing				④ Estimated Quantities per ft of wing (2~Wings)		Estimated Quantities per ft of Toewall (1~Toewall)	
	W	X	Y	Z	Bars J1	Bars J2	Reinf (Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)		
2'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	43.13	0.406	6.85	0.071		
2'-9"	2'-10"	10"	1'-0"	7"	#4	1'-0"	43.80	0.424	6.85	0.071		
3'-0"	2'-10"	10"	1'-0"	7"	#4	1'-0"	44.47	0.444	6.85	0.071		
3'-3"	2'-10"	10"	1'-0"	7"	#4	1'-0"	47.81	0.462	6.85	0.071		
3'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	48.48	0.480	6.85	0.071		
4'-0"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	50.26	0.532	6.85	0.071		
4'-6"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	54.27	0.568	6.85	0.071		
5'-0"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	57.94	0.632	6.96	0.075		
5'-6"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	61.95	0.668	6.96	0.075		
6'-0"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	75.16	0.730	7.07	0.078		
6'-6"	4'-14"	2'-0"	1'-4"	7"	#5	1'-0"	79.54	0.768	7.07	0.078		
7'-0"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	86.65	0.864	8.07	0.093		
7'-6"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	91.03	0.902	8.07	0.093		
8'-0"	5'-6"	2'-8"	1'-10"	8"	#5	6"	133.54	0.962	8.13	0.095		
8'-6"	5'-6"	2'-8"	1'-10"	8"	#5	6"	138.96	1.000	8.13	0.095		
9'-6"	6'-0"	2'-10"	2'-2"	9"	#5	6"	151.43	1.136	8.41	0.110		
10'-6"	6'-5"	3'-0"	2'-5"	9"	#6	6"	190.76	1.234	8.57	0.117		
11'-6"	7'-2"	3'-6"	2'-8"	11"	#6	6"	224.62	1.438	9.52	0.140		
12'-6"	7'-8"	3'-9"	2'-11"	1'-0"	#7	6"	277.90	1.592	9.74	0.157		
13'-6"	8'-2"	4'-0"	3'-2"	1'-2"	#8	6"	343.21	1.804	10.02	0.186		
14'-6"	8'-10"	4'-5"	3'-5"	1'-4"	#9	6"	427.43	2.046	10.30	0.218		
15'-6"	9'-6"	4'-10"	3'-8"	1'-6"	#9	6"	484.01	2.302	11.24	0.253		
16'-0"	9'-11"	5'-0"	3'-11"	1'-7"	#9	6"	500.21	2.448	11.47	0.279		

TABLE OF WINGWALL REINFORCING (2~Wings)

Bar Size	No.	Spa
D1	#5	~ 1'-0"
D2	#5	~ 1'-0"
E1	#4	~ 1'-0"
F	#4	~ 1'-0"
G	#5	~ 1'-0"
M1	#4	4 ~
P	#4	~ 1'-0"
V	#4	~ 1'-0"

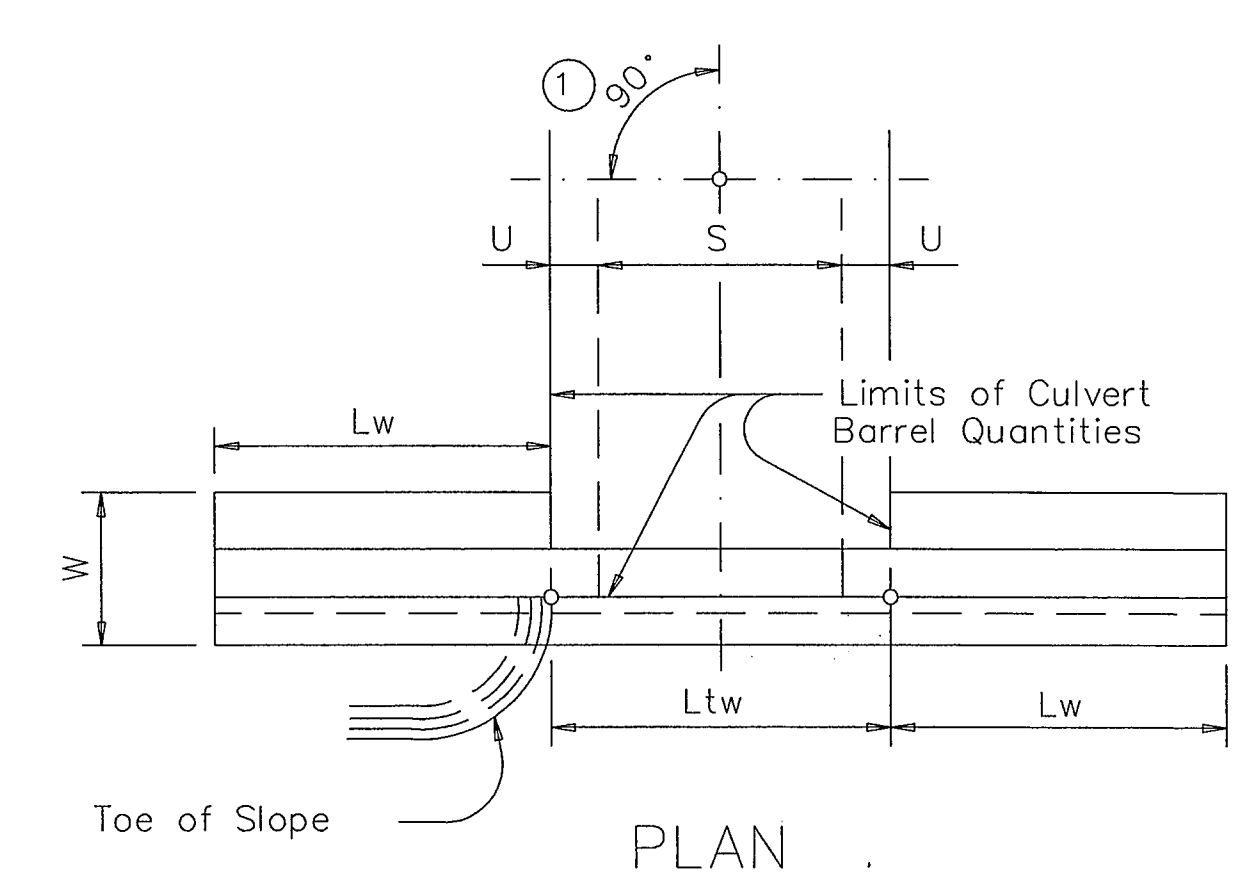
TABLE OF TOEWALL REINFORCING

Bar Size	No.	Spa
J3	#4	~ 1'-0"
M2	#4	2 ~
E2	#4	~ 1'-0"

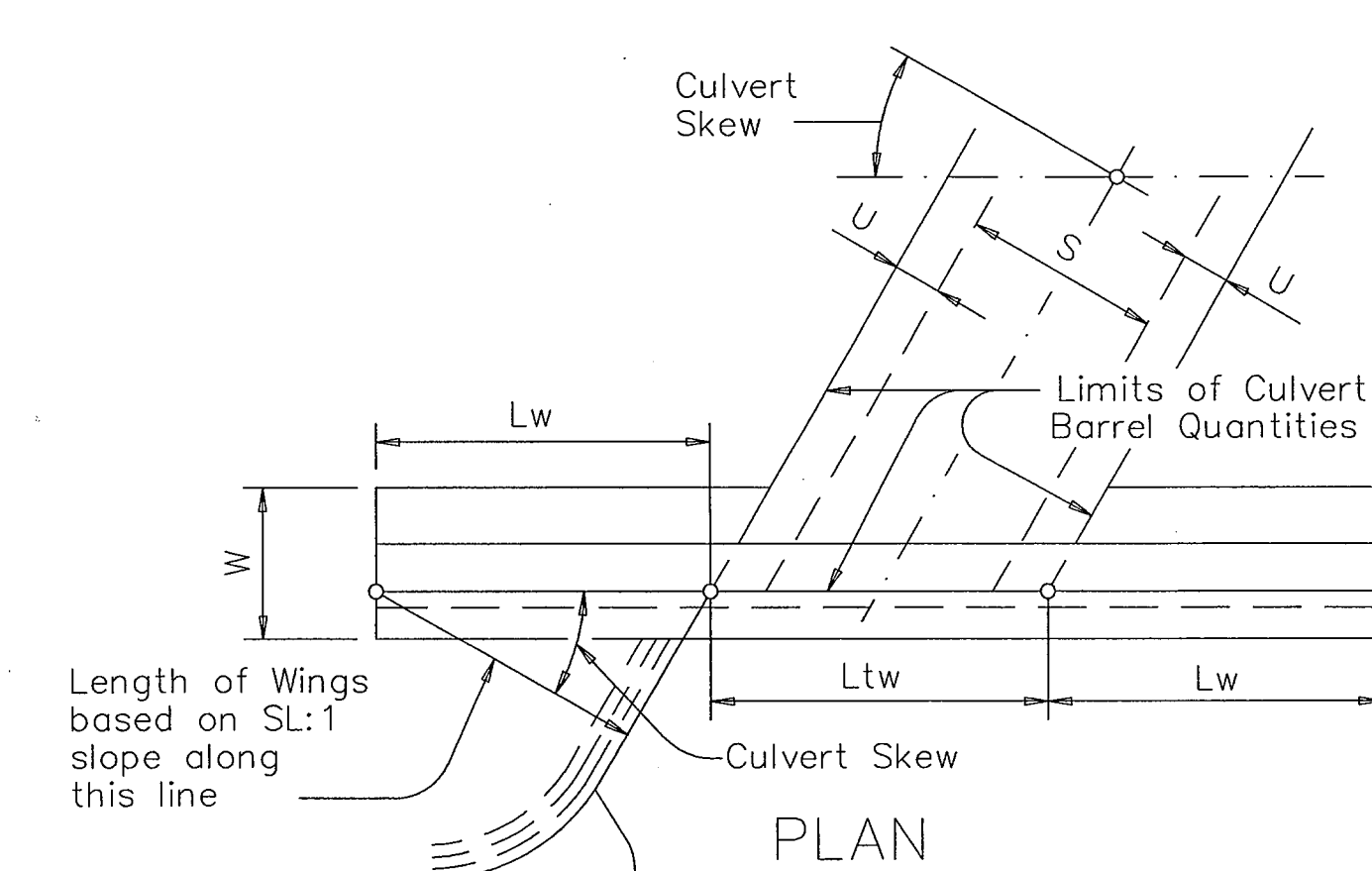


SECTION C-C

SECTION C-C



DETAILS FOR NON-SKEWED BOX CULVERTS



DETAILS FOR SKEWED BOX CULVERTS (Showing 30° Skew)

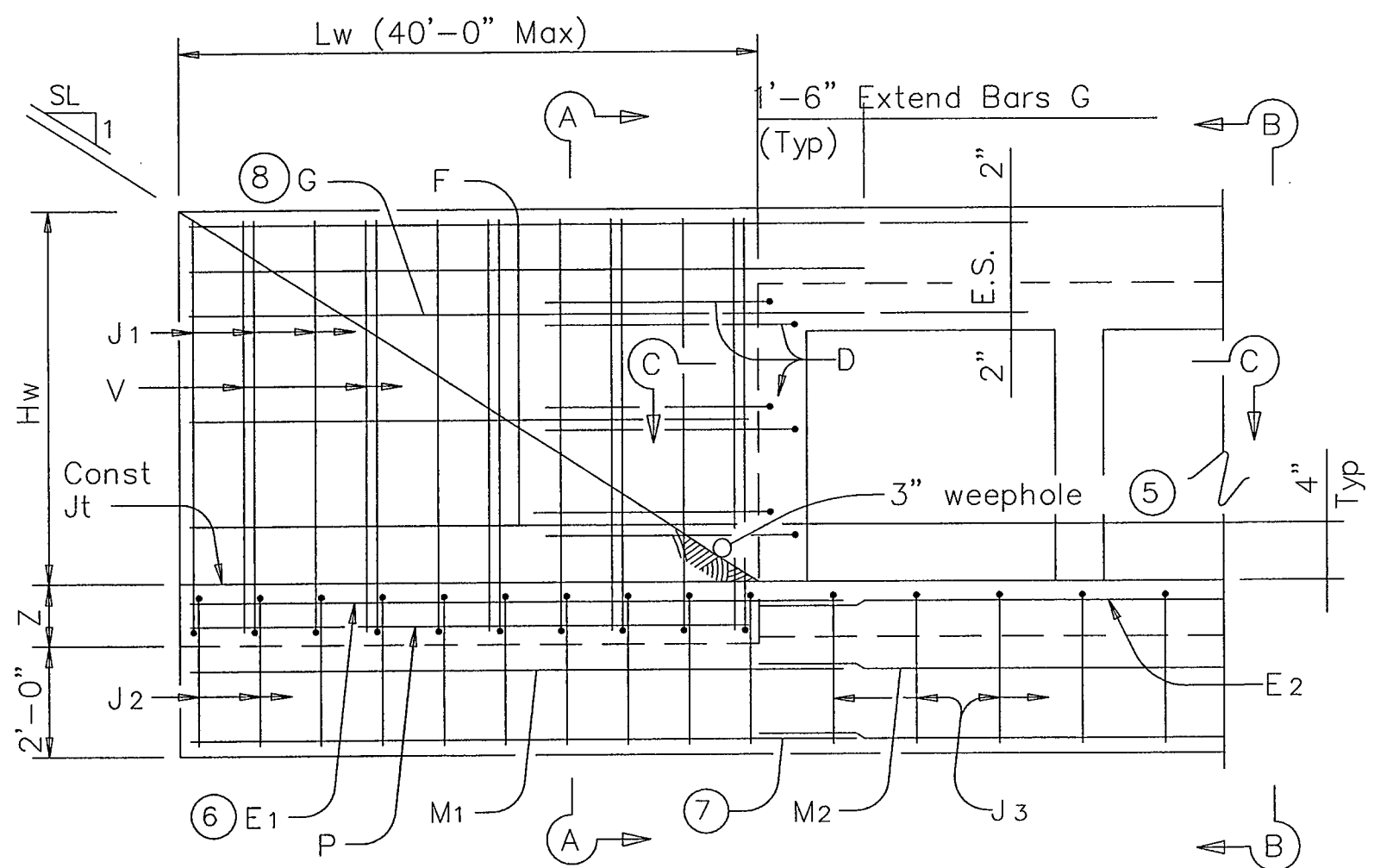
NO.	DATE	REVISION	APPROV.
1			
2			
3			

WING DIMENSION CALCULATIONS:
Formulas: (All values are in Feet)
Hw = H + T + C
Lw = (Hw) (SL) ÷ Cosine (€)
For Cast-in-place culverts:
Ltw = [(N) (S) + (N + 1) (U)] ÷ (Cosine €)
For Precast culverts:
Ltw = [(N) (2 U + S) + (N - 1) (0.5')] ÷ (Cosine €)
Total Wingwall Area (Two Wings ~ S.F.) = (2) (Hw) (Lw)

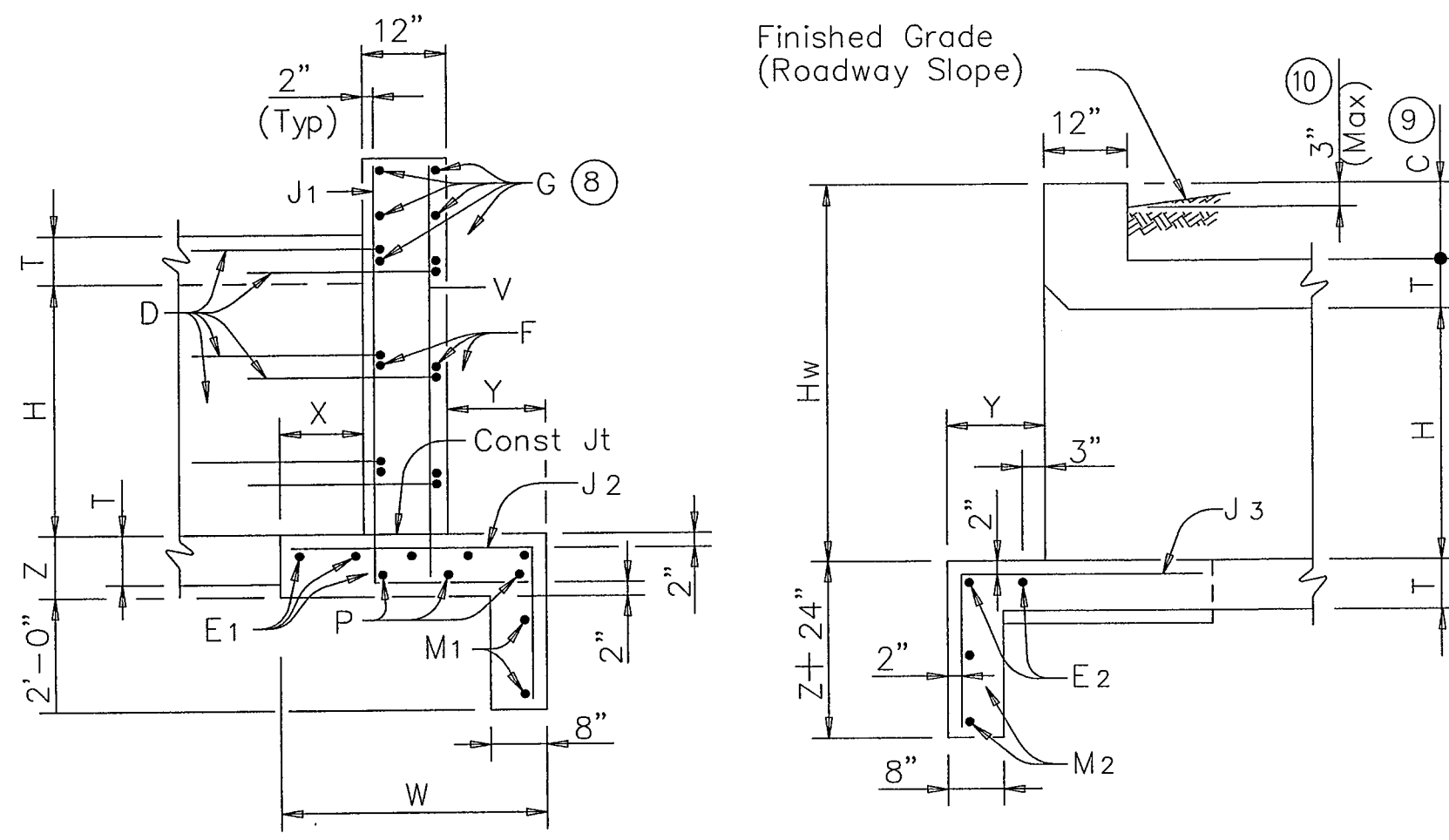
Hw = Height of Wingwall
Lw = Length of Wingwall
Ltw = Culvert Toewall Length
N = Number of Culvert Spans
SL:1 = Channel Slope ratio. (Horizontal: 1 Vertical, Usual value is 2:1)
€ = Culvert Skew

See applicable box culvert standard for S, H, T and U values.

GENERAL NOTES:
Designed according to current AASHTO Standard and Interim Specifications.
All reinforcing steel shall be Grade 60.
All concrete shall be Class "C" and shall have a minimum 28 day compressive strength of 3600 psi.
All reinforcing bars shall be adjusted to provide a minimum of 1 1/4" clear cover.
When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
See BCS sheet for additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.



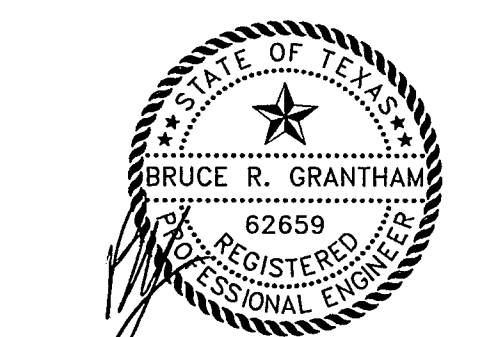
PARTIAL ELEVATION



SECTION A-A (Showing Wing Reinf)

SECTION B-B (Showing Toewall Reinf)

- Skew Angle = 0°
- At discharge end, chamfer may be 3/4"
- For 15° Skew ~ 1"
For 30° Skew ~ 2"
For 45° Skew ~ 3"
- Quantities shown are for two wings. To determine total quantities for two wings, multiply the tabulated values by Lw.
- Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
- Extend Bars E 1'-6" minimum into the bottom slab of the culvert.
- Lap Bars M 11'-6" minimum with Bars M . 2
- Bars G shall be equally spaced at 1'-0" maximum, placed as shown. There shall be at least 4 Bars G per wing.
- 0" min to 5'-0" max. For T6 or C6 Rail, see T6-CM standard for additional details. For curbs without rail and greater than 1'-0" high, see ECD standard for additional details. Estimated curb heights are shown elsewhere in the plans.
- For vehicle safety, curb heights and wall heights shall be reduced, if necessary, to provide a maximum 3" projection above finished grade. No changes will be made in quantities and no additional compensation will be allowed for this work.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: BRUCE R. GRANTHAM ON 02/14/02. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: BRG	REVIEWED: JFW
DWG: 249DETAILS		

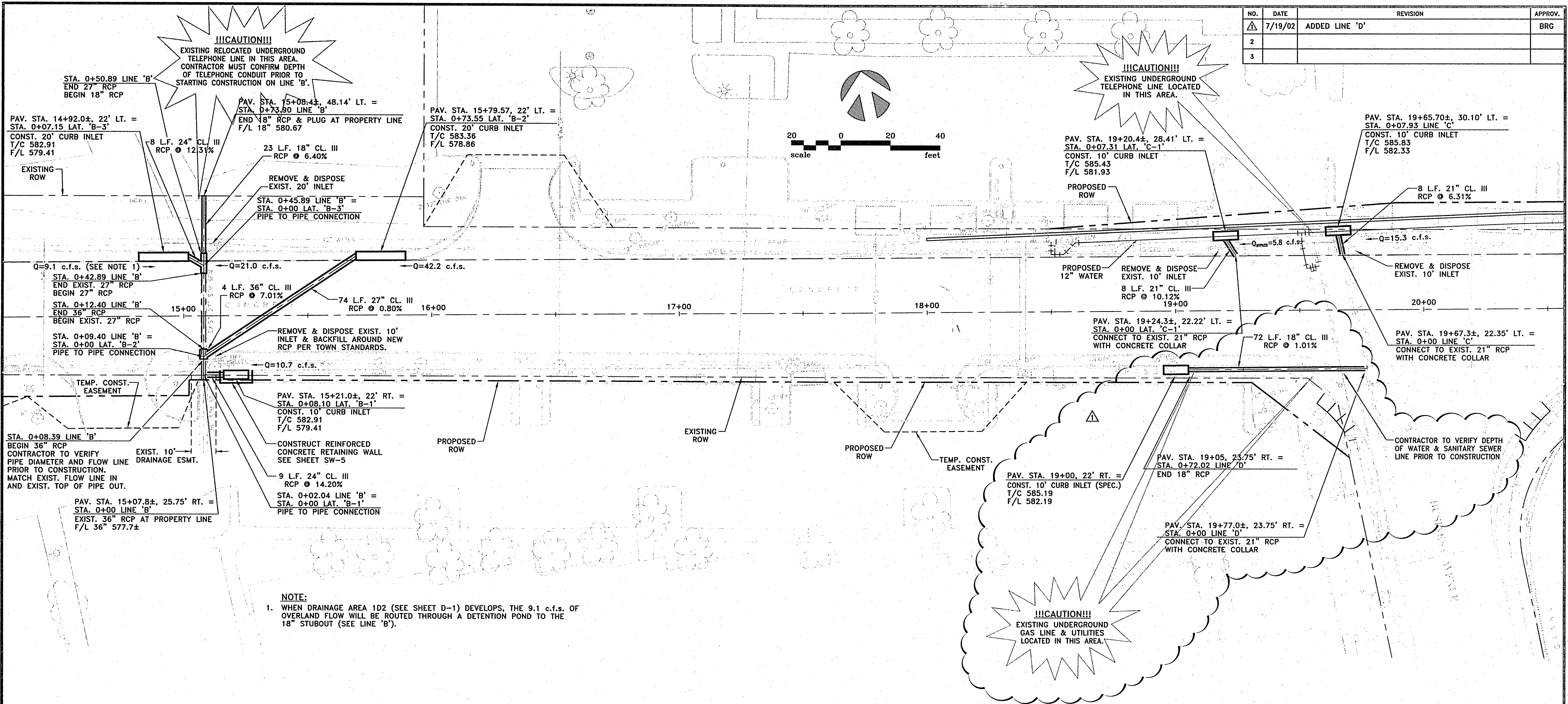
ARAPAHO ROAD PHASE II
PARALLEL WINGS FOR NON-SKEWED BOX CULVERT DETAIL
TOWN OF ADDISON

Grantham, Burge & Waldbauer
Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

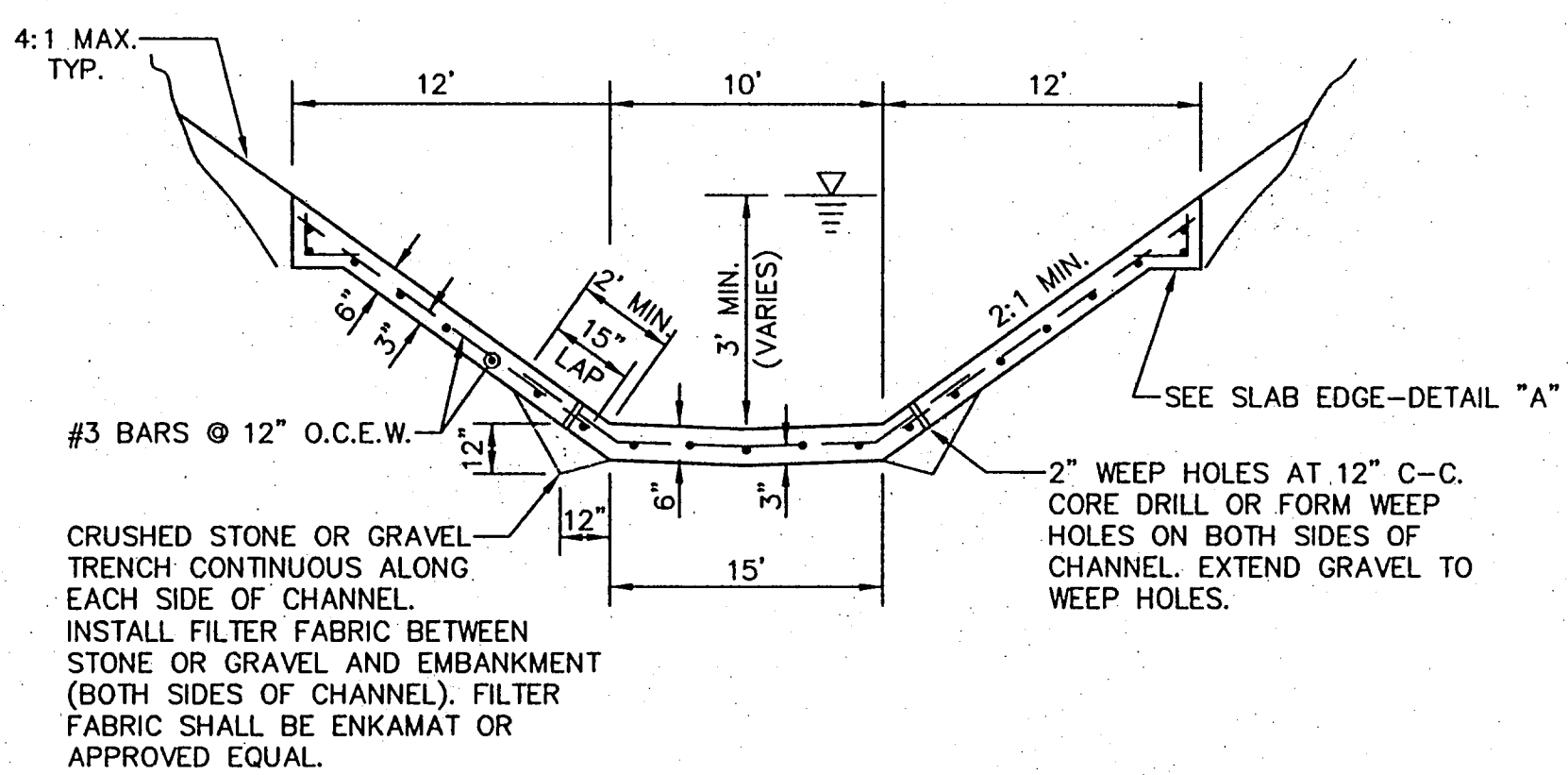
THIS DETAIL SHEET WAS OBTAINED FROM TXDOT

SHT. SW-8 OF SW-8

NO.	DATE	REVISION	APPROV.
1	7/19/02	ADDED LINE 'D'	BRG
2			
3			



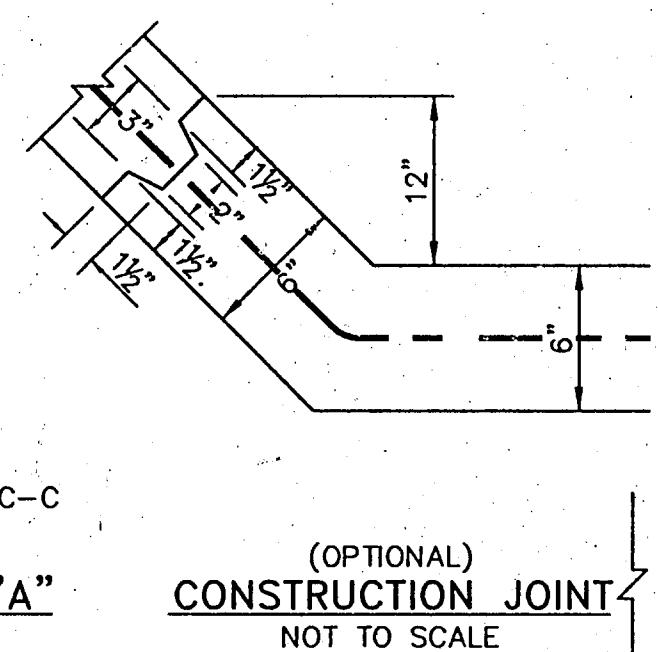
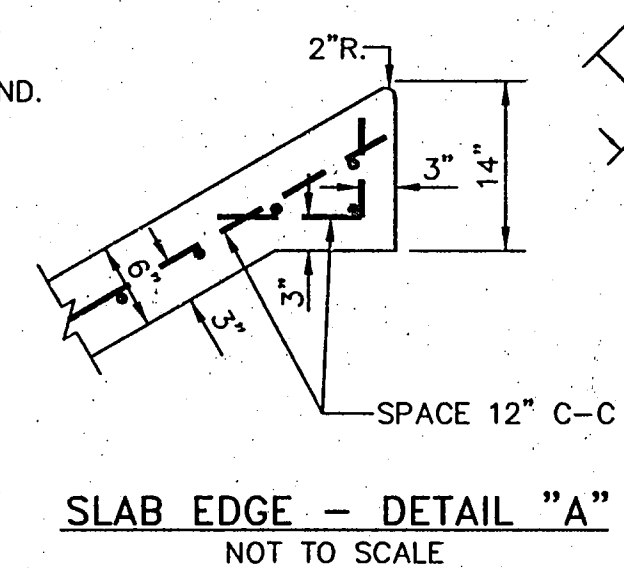
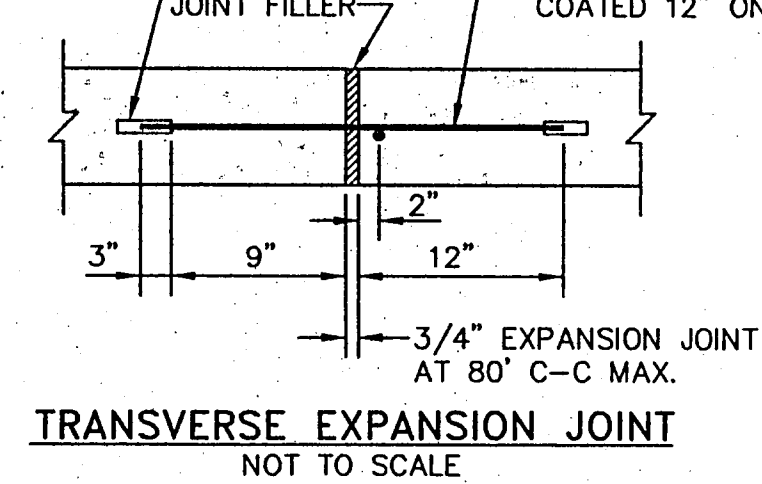
NOTE:
1. WHEN DRAINAGE AREA 1D2 (SEE SHEET D-1) DEVELOPS, THE 9.1 c.f.s. OF OVERLAND FLOW WILL BE ROUTED THROUGH A DETENTION POND TO THE 18" STUBOUT (SEE LINE 'B').



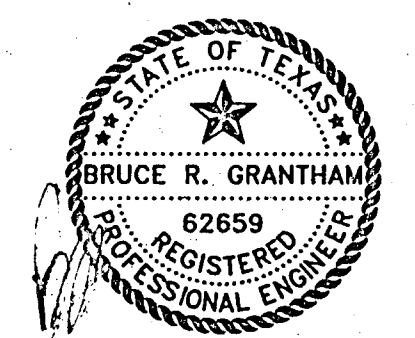
- NOTES:**
1. PROPOSED CHANNEL LINING SHALL MATCH EXISTING CHANNEL LINING.
 2. DOWEL 18" LONG #3 BARS @ 12" CENTERS FROM CHANNEL LINING 9" INTO PARALLEL BOX CULVERT WINGWALLS (SEE SHEETS SW-2 AND SW-8).

SLEEVE FOR DOWEL SHALL HAVE AN INSIDE DIAMETER OF 7/8" AND SHALL BE 5" LONG.

#6 BARS SPACED 24" C-C SHALL SERVE AS DOWELS. DOWELS SHALL BE ASPHALT COATED 12" ON THE FREE END.



GENERAL UTILITY NOTE
RELOCATION OF ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION LINES WILL OCCUR AFTER THESE DRAWINGS ARE COMPLETED. CONTRACTOR MUST OBTAIN NEW LOCATIONS OF ALL UTILITIES PRIOR TO STARTING CONSTRUCTION.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY BRUCE R. GRANTHAM ON 07/19/02. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DATE: DECEMBER, 2001	SCALE: 1"=20'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: JFW	REVIEWED: BRG
DWG: 249STMPLO2.DWG		

**ARAPAHO ROAD PHASE II
STORM WATER PLAN -
SHEET 1
TOWN OF ADDISON**

GBW Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, LB. 27
GARLAND, TEXAS 75042

Grantham, Burge & Waldbauer
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

SHT. SW-1
OF SW-8

ITEM NO.	DESCRIPTION & UNIT PRICE IN WORDS	UNIT	EST. QTY.
SIGNALIZATION AND LIGHTING IMPROVEMENTS			
301	TRAFFIC SIGNALS - ARAPAHO ROAD AT MARSH LANE	L.S.	1
302	TRAFFIC SIGNALS - ARAPAHO ROAD AT SURVEYOR BLVD.	L.S.	1
303	CONDUIT, 2" SCHEDULE 40 PVC	L.F.	4,790
304	CABLE, INSULATED, #4 AWG	L.F.	190
305	CABLE, INSULATED, #8 AWG	L.F.	3,240
306	BARE GROUND, #4 AWG	L.F.	95
307	BARE GROUND, #8 AWG	L.F.	1,620
308	FOUNDATION, 40' STREET LIGHT POLE	EA.	19
309	FOUNDATION, PEDESTRIAN LIGHT POLE	EA.	20
310	GROUND MOUNTED PULLBOX, TYPE A	EA.	17
311	PEDESTRIAN LIGHTING CONTROL CABINET	EA.	3
312	CONDUIT, 2" SCHEDULE 40 PVC (TRAFFIC SIGNAL)	L.F.	2275
313	GROUND MOUNTED PULLBOX, TYPE A (TRAFFIC SIGNAL)	EA.	16
314	BORE 4" CONDUIT FOR TRAFFIC SIGNAL CABLES	L.F.	120

NOTES:

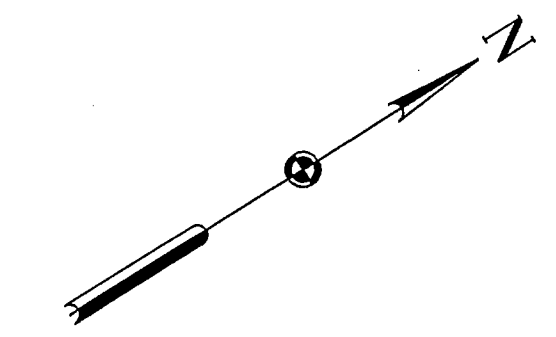
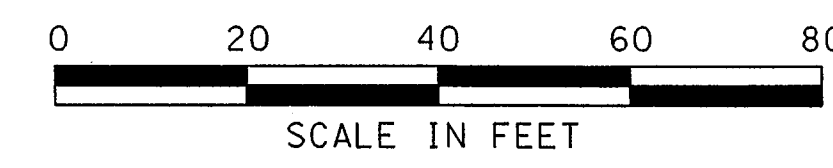
PEDESTRIAN LIGHTING CONTROL CABINET INCLUDES FOUNDATION, CABINET, INTERNAL CONTROL DEVICES, INTERNAL WIRING, AND ALL INCIDENTALS NECESSARY TO COMPLETE THE WORK.

TRAFFIC SIGNAL LUMP SUM BID ITEMS INCLUDE ALL TRAFFIC SIGNAL IMPROVEMENTS AT MARSH AND ARAPAHO AND SURVEYOR AND ARAPAHO INTERSECTIONS (AS SHOWN ON SHEETS TS-1, TS-2, TS-3, TS-4, AND DETAILS) INCLUDING CONDUIT AND PULL BOXES.


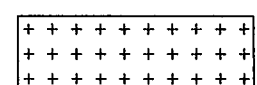
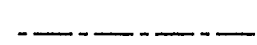

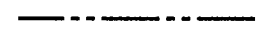
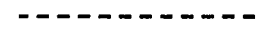
ITEM NO.	DESCRIPTION & UNIT PRICE IN WORDS	UNIT	EST. QTY.
STREETSCAPE IMPROVEMENTS			
401	LIVE OAK (6" CAL.)	EA.	56
402	FOSTER HOLLY (30 GAL. SPECIMEN)	EA.	28
403	CRAPE MYRTLE (30 GAL.)	EA.	18
404	DWARF BURFORD HOLLY (5 GAL.)	EA.	80
405	FRINGE FLOWER (5 GAL.)	EA.	65
406	ASIAN JASMINE (4" POTS)	EA.	5,115
407	REMOVE AND DISPOSE OF TREES	EA.	44
408	TREE PROTECTION	EA.	57
409	SOLID SOD	S.F.	65,150
410	STEEL EDGING	L.F.	75
411	BED PREPARATION	S.F.	4,550
412	IRRIGATION SYSTEM, TURNKEY	S.F.	61,500
413	STREET BRICK PAVERS	S.F.	5,000
414	MEDIAN PAVERS	S.F.	2,600
415	BRICK VENEER	S.F.	2,600
416	CAST STONE CAP	L.F.	655
417	HANDRAIL ON RETAINING WALL	L.F.	350

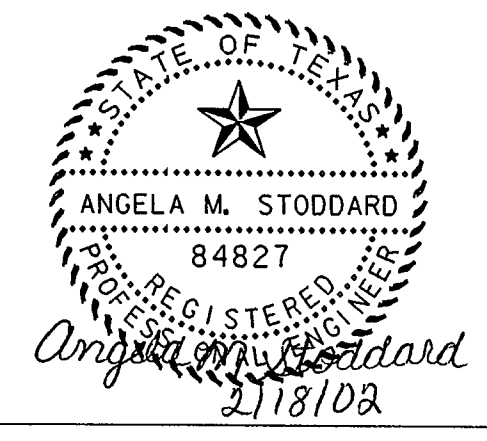
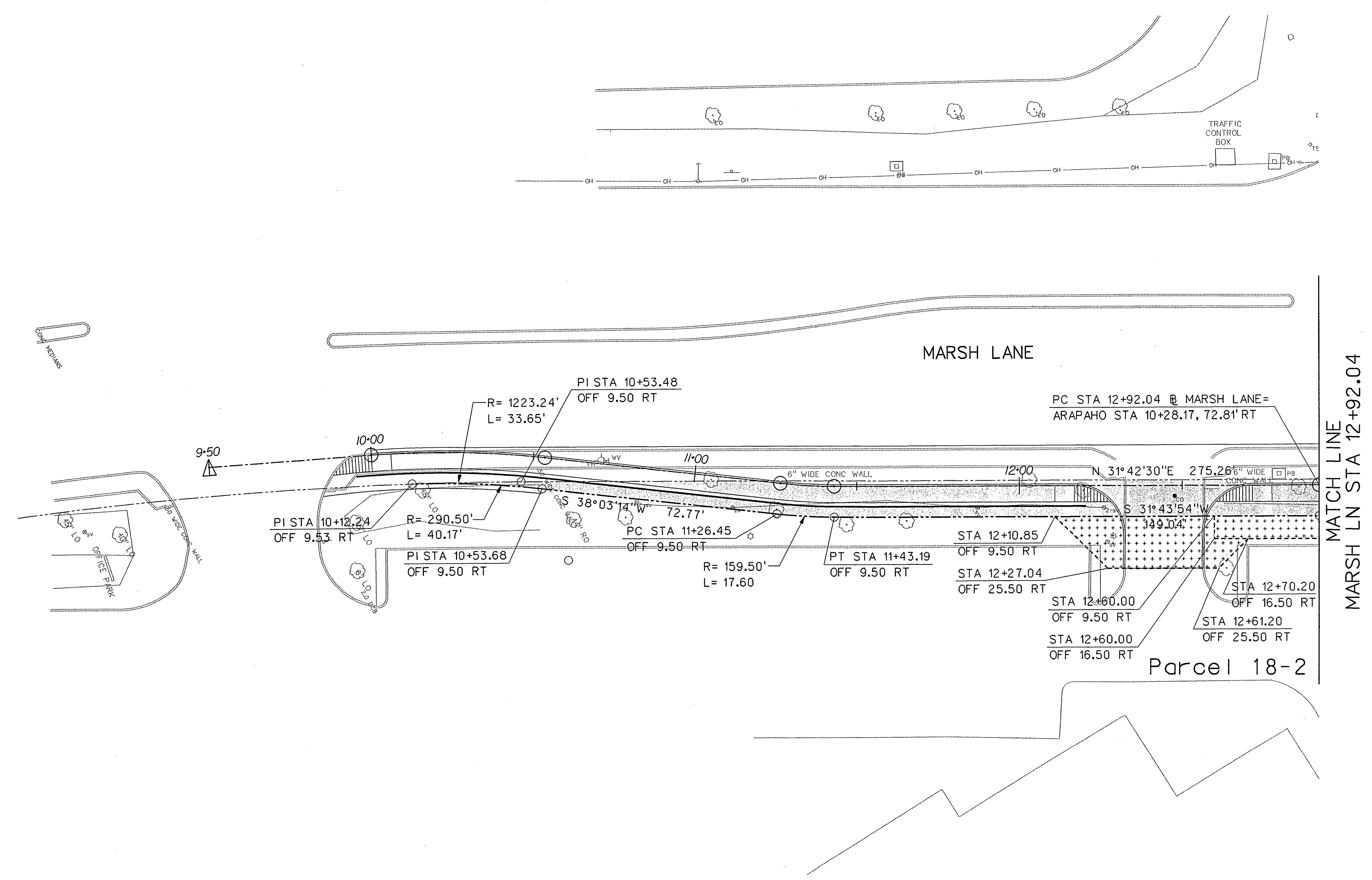


					5
2	1-02	ADD ITEM, CHANGE NOTE		AMS	
NO.	DATE	REVISION		APPROV.	
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>					
ARAPAHO ROAD - PHASE II					
MARSH LANE TO SURVEYOR BOULEVARD					
SIGNALIZATION & LIGHTING AND STREETSCAPE QUANTITIES					
TOWN OF ADDISON, TEXAS					
Design	AMS	Drawn	GFS	DATE	SCALE
Check	AMS	Check	AMS	DEC 01	
PROJECT NO.	25768	SHEET NO.	Q-3		



LEGEND

-  ADDITIONAL ROW
-  TEMPORARY CONSTRUCTION EASEMENT
-  PROPOSED @
-  EXISTING ROW
-  PROPOSED ROW
-  TEMPORARY CONSTRUCTION EASEMENT



NO.	DATE	REVISION	APPROV.

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

ARAPAHO ROAD - PHASE II

MARSH LANE TO SURVEYOR BOULEVARD

RIGHT-OF-WAY MAP
MARSH LANE STA 10+00.00
TO MARSH LANE STA 12+92.04

TOWN OF ADDISON, TEXAS

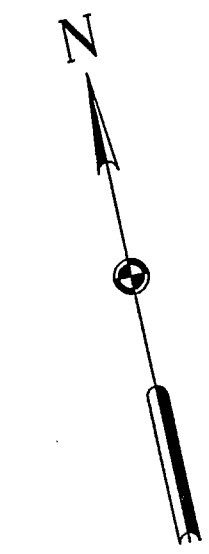
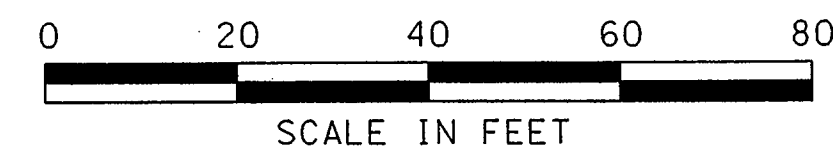
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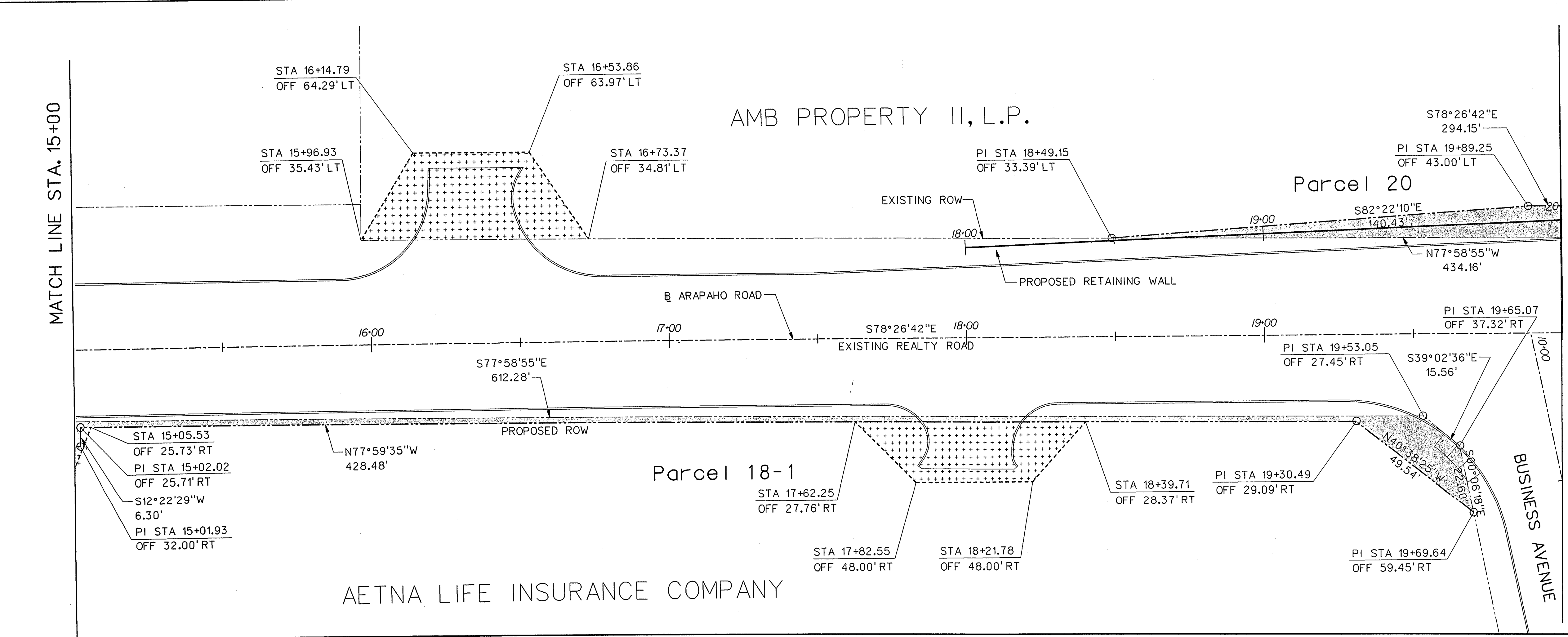
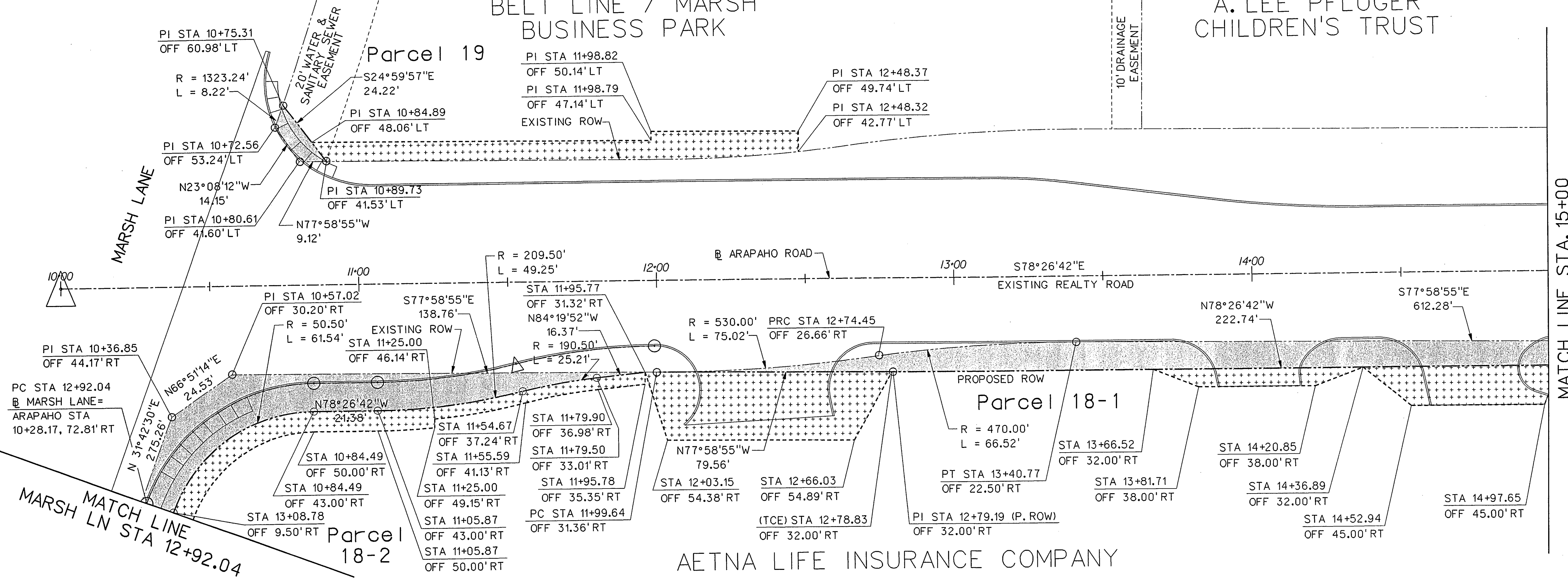
BELT LINE / MARSH BUSINESS PARK

A. LEE PFLUGER CHILDREN'S TRUST



LEGEND

- ADDITIONAL ROW
- TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED @
- EXISTING ROW
- PROPOSED ROW
- TEMPORARY CONSTRUCTION EASEMENT



NO.	DATE	REVISION	APPROV.

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

ARAPAHO ROAD - PHASE II
MARSH LANE TO SURVEYOR BOULEVARD

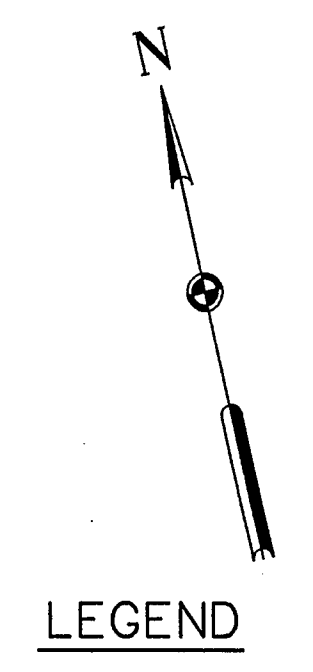
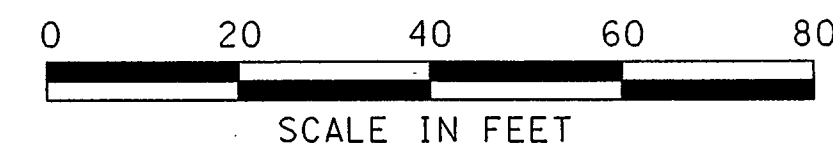
RIGHT-OF-WAY MAP
MARSH LANE STA 12+92.04
TO STA 20+00

TOWN OF ADDISON, TEXAS

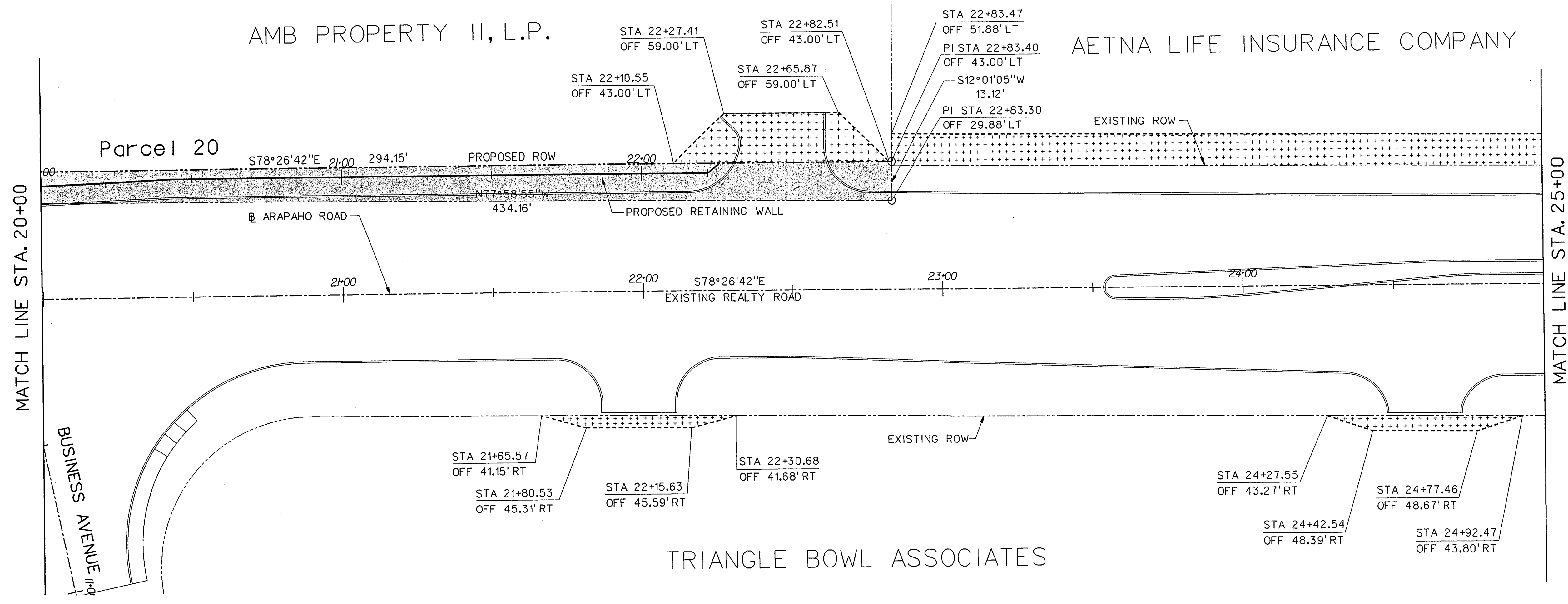
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AMB PROPERTY II, L.P.

AETNA LIFE INSURANCE COMPANY

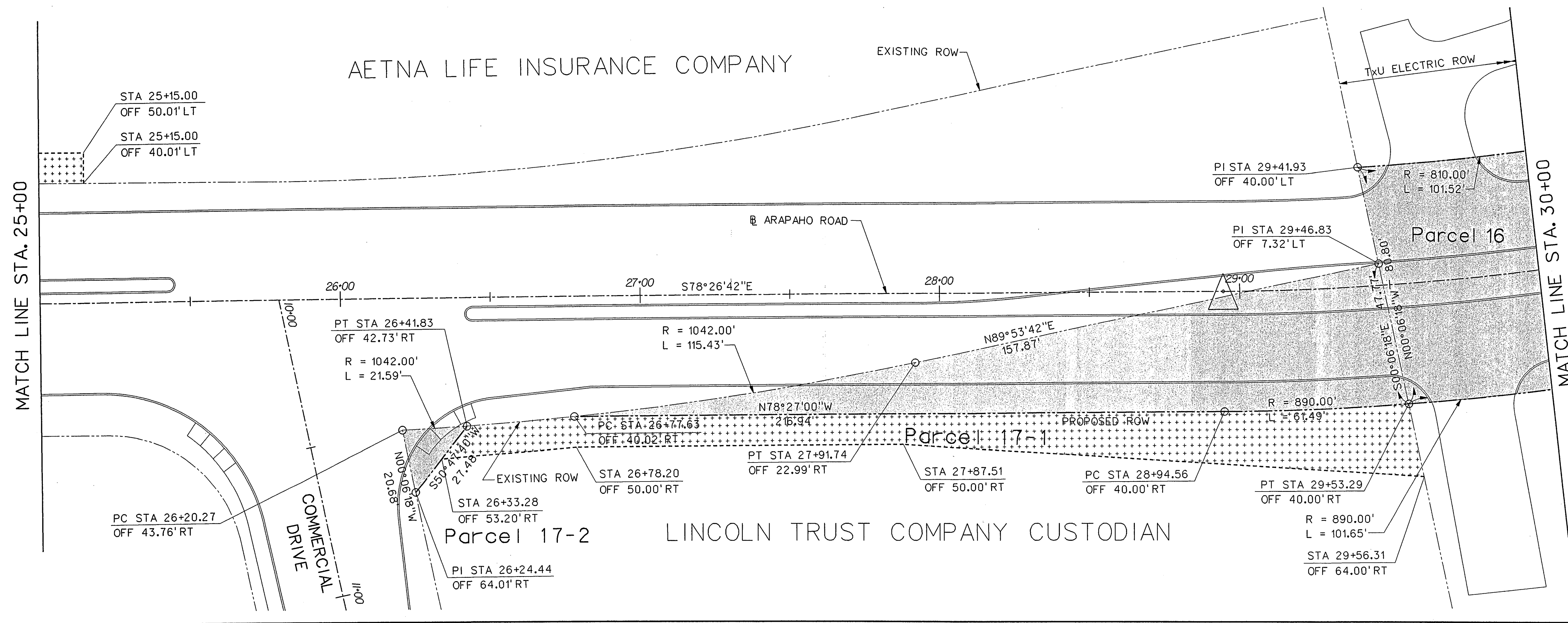


- LEGEND**
- ADDITIONAL ROW
 - TEMPORARY CONSTRUCTION EASEMENT
 - PROPOSED R/W
 - EXISTING ROW
 - PROPOSED ROW
 - TEMPORARY CONSTRUCTION EASEMENT



TRIANGLE BOWL ASSOCIATES

AETNA LIFE INSURANCE COMPANY



LINCOLN TRUST COMPANY CUSTODIAN



NO.	DATE	REVISION	APPROV.

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

ARAPAHO ROAD - PHASE II

MARSH LANE TO SURVEYOR BOULEVARD

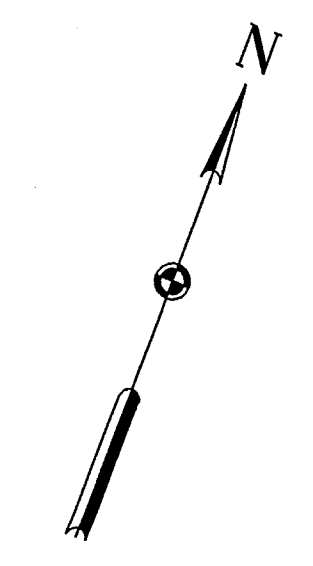
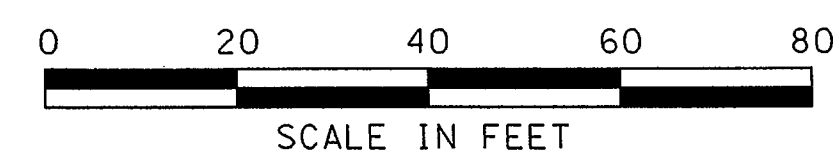
RIGHT-OF-WAY MAP

STA 20+00 TO STA 30+00


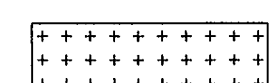

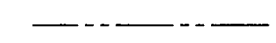

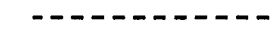
TOWN OF ADDISON, TEXAS

Design RAS	Drawn AGF	DATE	SCALE	PROJECT NO.	SHEET ID
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LEGEND

-  ADDITIONAL ROW
-  TEMPORARY CONSTRUCTION EASEMENT
-  PROPOSED \square
-  EXISTING ROW
-  PROPOSED ROW
-  TEMPORARY CONSTRUCTION EASEMENT

PRAEDIUM II LONE STAR, L.P.

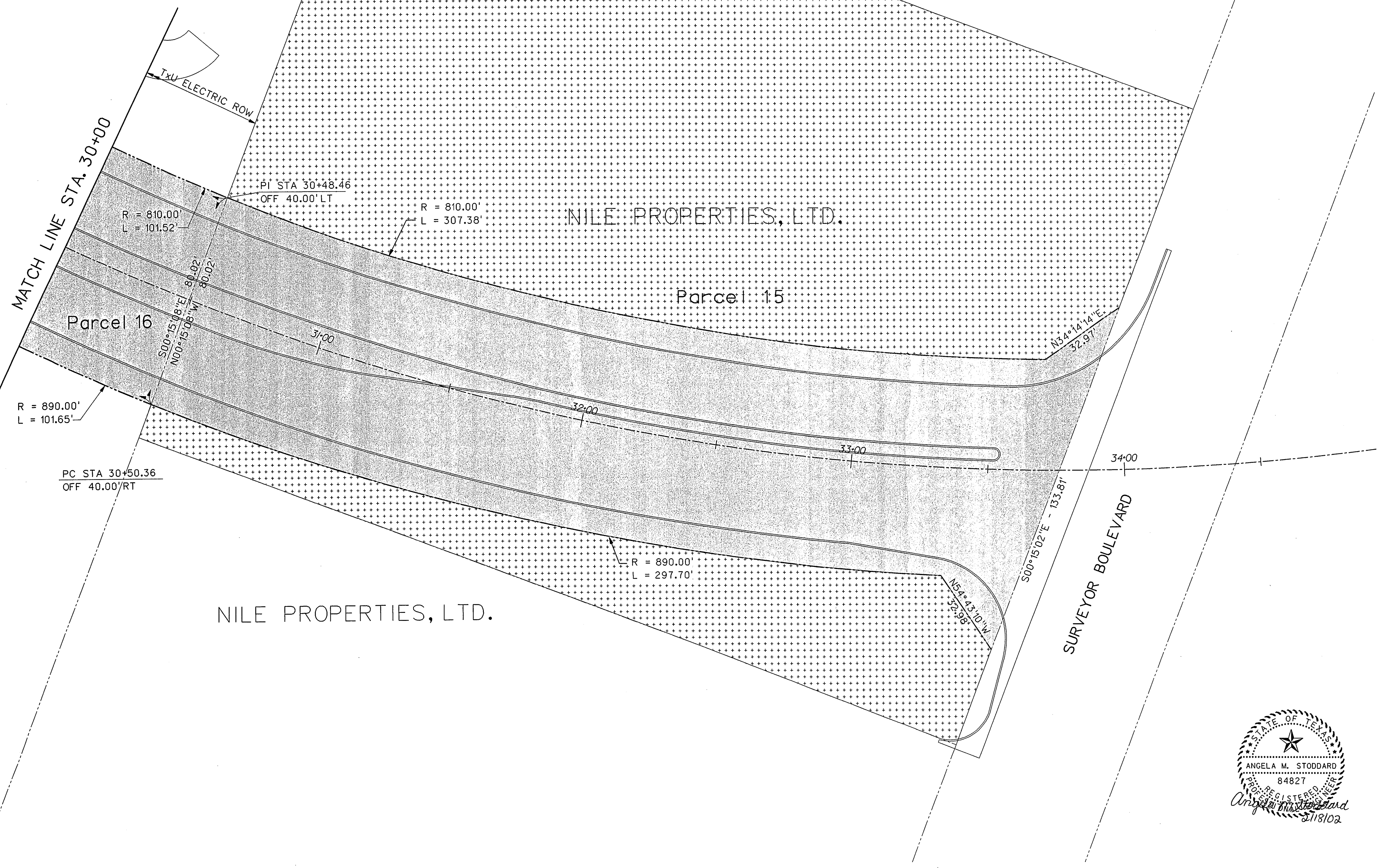
NILE PROPERTIES, LTD.

Parcel 15

NILE PROPERTIES, LTD.

Parcel 16

SURVEYOR BOULEVARD



			9
NO.	DATE	REVISION	APPROV.



HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

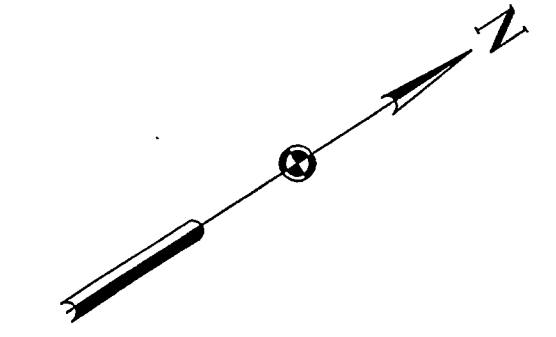
ARAPAHO ROAD - PHASE II
MARSH LAKE TO SURVEYOR BOULEVARD

RIGHT-OF-WAY MAP
STA 30+00 TO END

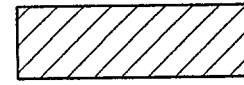




TOWN OF ADDISON, TEXAS

Design RAS	Drawn AGF	DATE	SCALE	PROJECT NO.	SHEET ID
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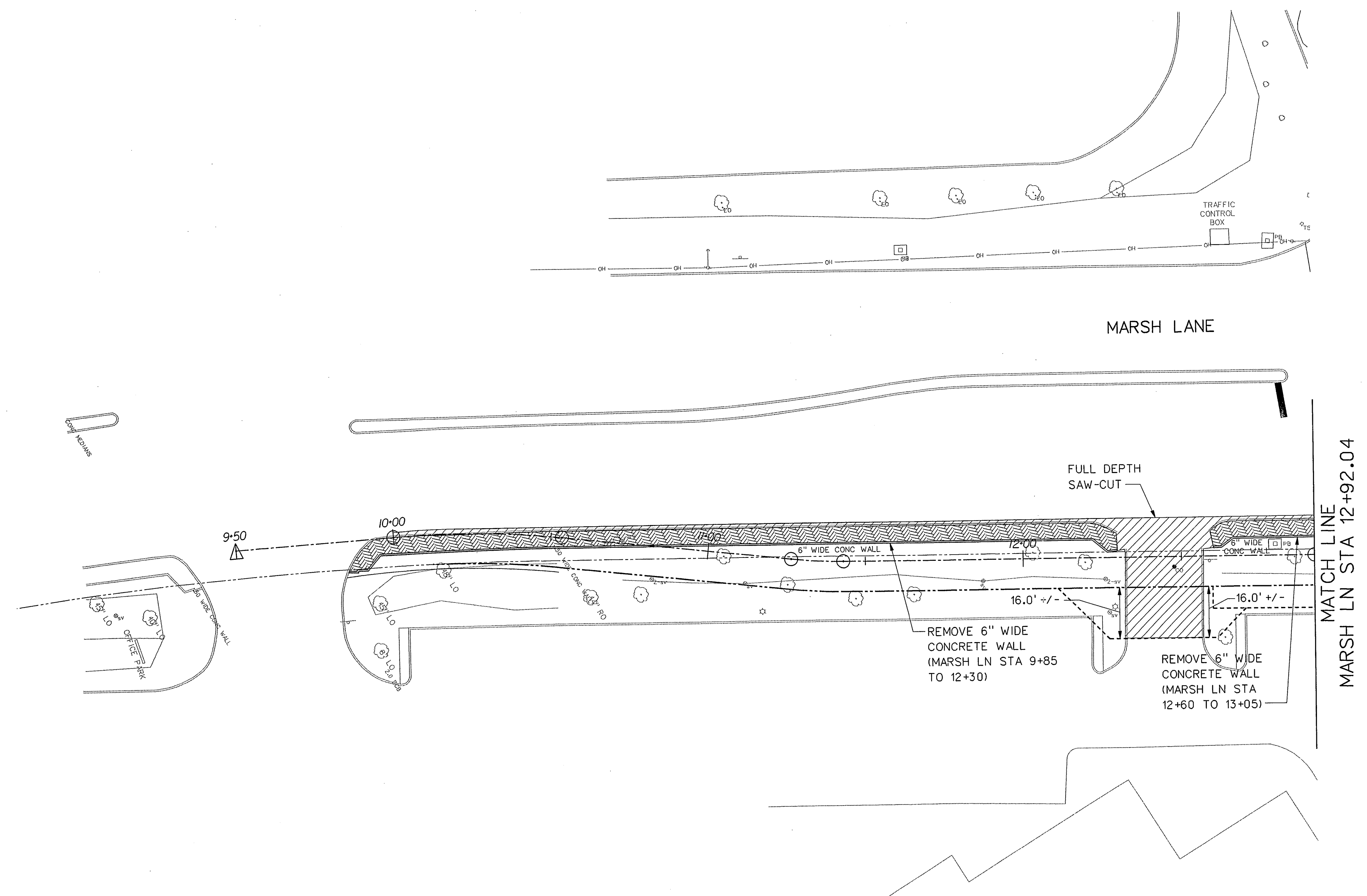


LEGEND

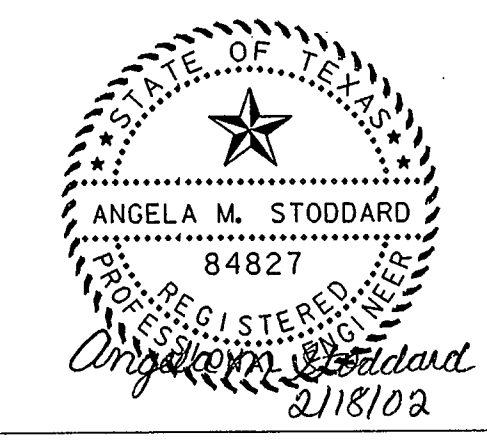
-  PAVEMENT REMOVAL
-  GRAVEL REMOVAL
-  SIDEWALK REMOVAL
-  CONCRETE CHANNEL REMOVAL
- PROPOSED 
- EXISTING ROW
- PROPOSED ROW
- TEMPORARY CONSTRUCTION EASEMENT

NOTE:

1. REMOVAL OF WALL SHALL INCLUDE FOOTING.



MATCH LINE
MARSH LN STA 12+92.04



NO.	DATE	REVISION	APPROV.

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

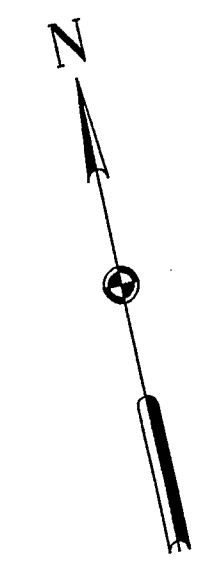
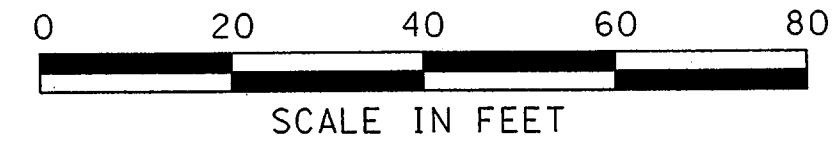
ARAPAHO ROAD - PHASE II

MARSH LANE TO SURVEYOR BOULEVARD

REMOVAL PLAN
MARSH LANE
STA 10+00 TO 12+92.04

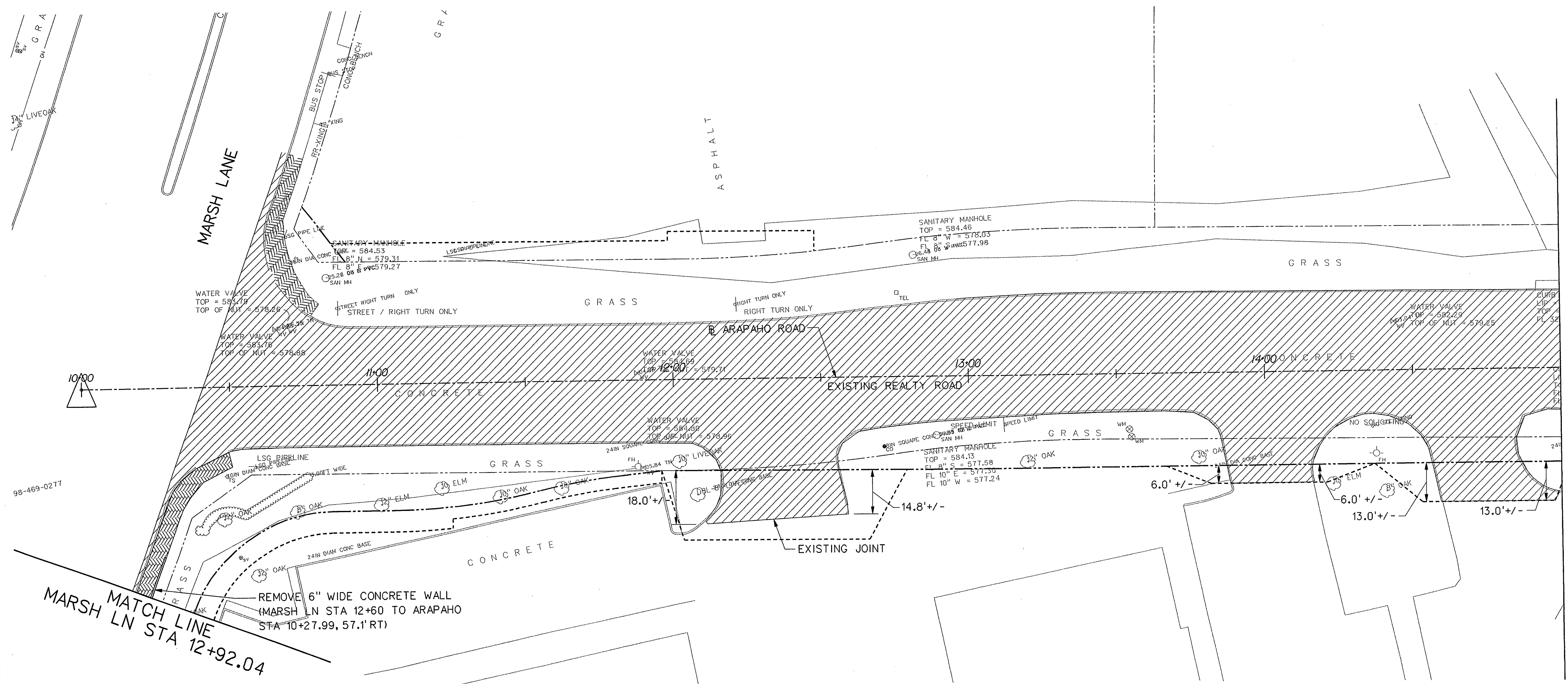
TOWN OF ADDISON, TEXAS

Design THN	Drawn THN	DATE	SCALE	PROJECT NO.	SHEET ID
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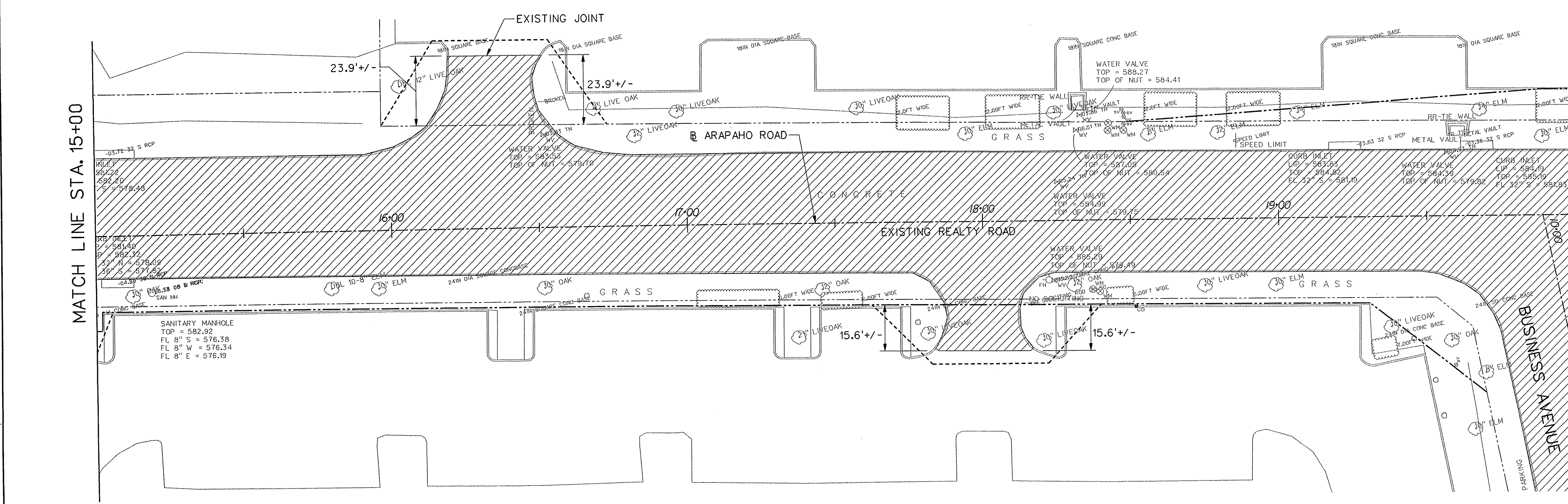


LEGEND

- PAVEMENT REMOVAL
- GRAVEL REMOVAL
- SIDEWALK REMOVAL
- CONCRETE CHANNEL REMOVAL
- PROPOSED ROW
- EXISTING ROW
- PROPOSED ROW
- TEMPORARY CONSTRUCTION EASEMENT



MATCH LINE STA. 15+00

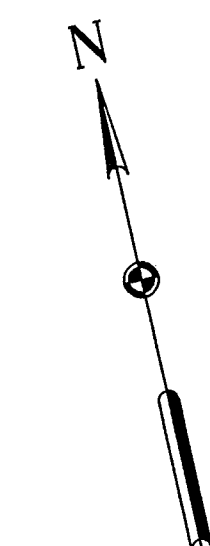
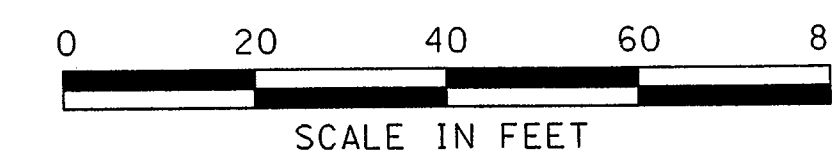


MATCH LINE STA. 20+00



NO.	DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>			
ARAPAHO ROAD - PHASE II			
MARSH LANE TO SURVEYOR BOULEVARD			
REMOVAL PLAN MARSH LANE STA 12+92.04 TO STA 20+00			
TOWN OF ADDISON, TEXAS			
Design AMS	Drawn AGF	DATE	SCALE
Check JDH	Check AMS	DEC 01	1" = 20'
PROJECT NO. 25768		SHEET ID R-2	

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LEGEND

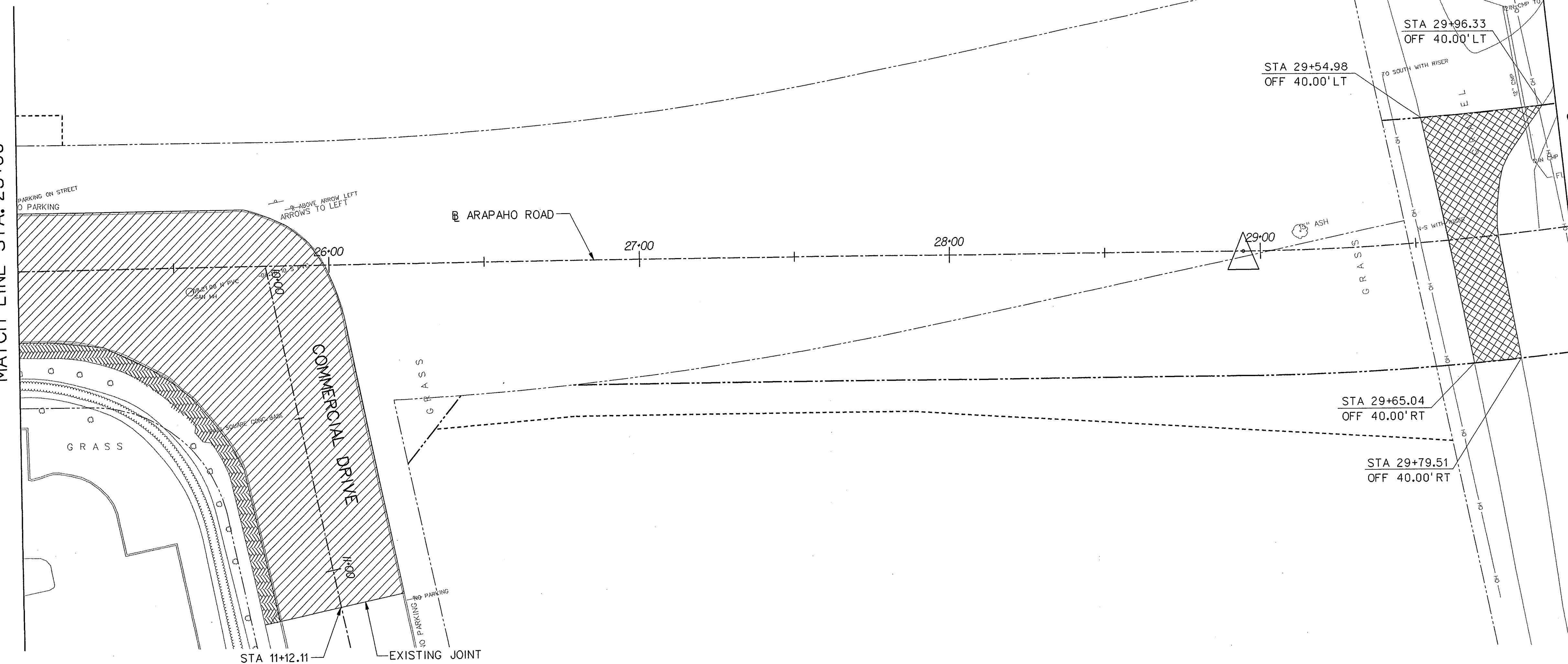
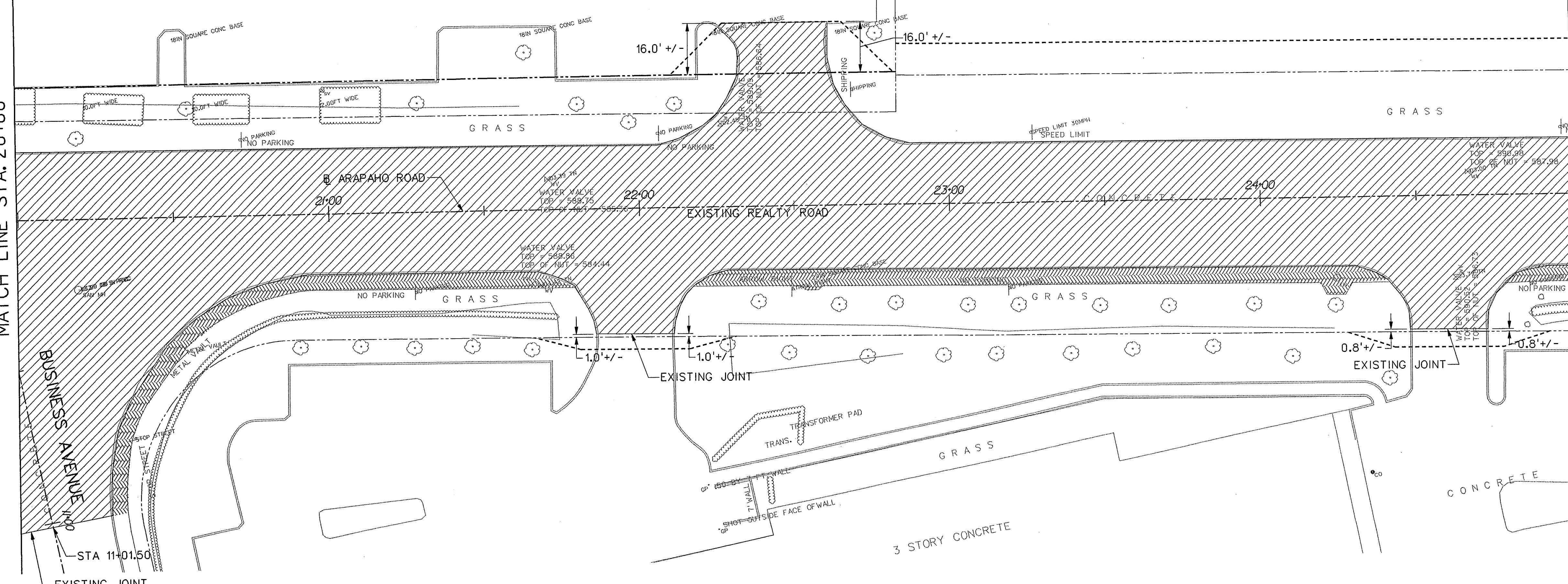
- PAVEMENT REMOVAL
- GRAVEL REMOVAL
- SIDEWALK REMOVAL
- CONCRETE CHANNEL REMOVAL
- PROPOSED ROW
- EXISTING ROW
- PROPOSED ROW
- TEMPORARY CONSTRUCTION EASEMENT

MATCH LINE STA. 20+00

MATCH LINE STA. 25+00

MATCH LINE STA. 25+00

MATCH LINE STA. 30+00



NO.	DATE	REVISION	APPROV.

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

ARAPAHO ROAD - PHASE II
MARSH LANE TO SURVEYOR BOULEVARD

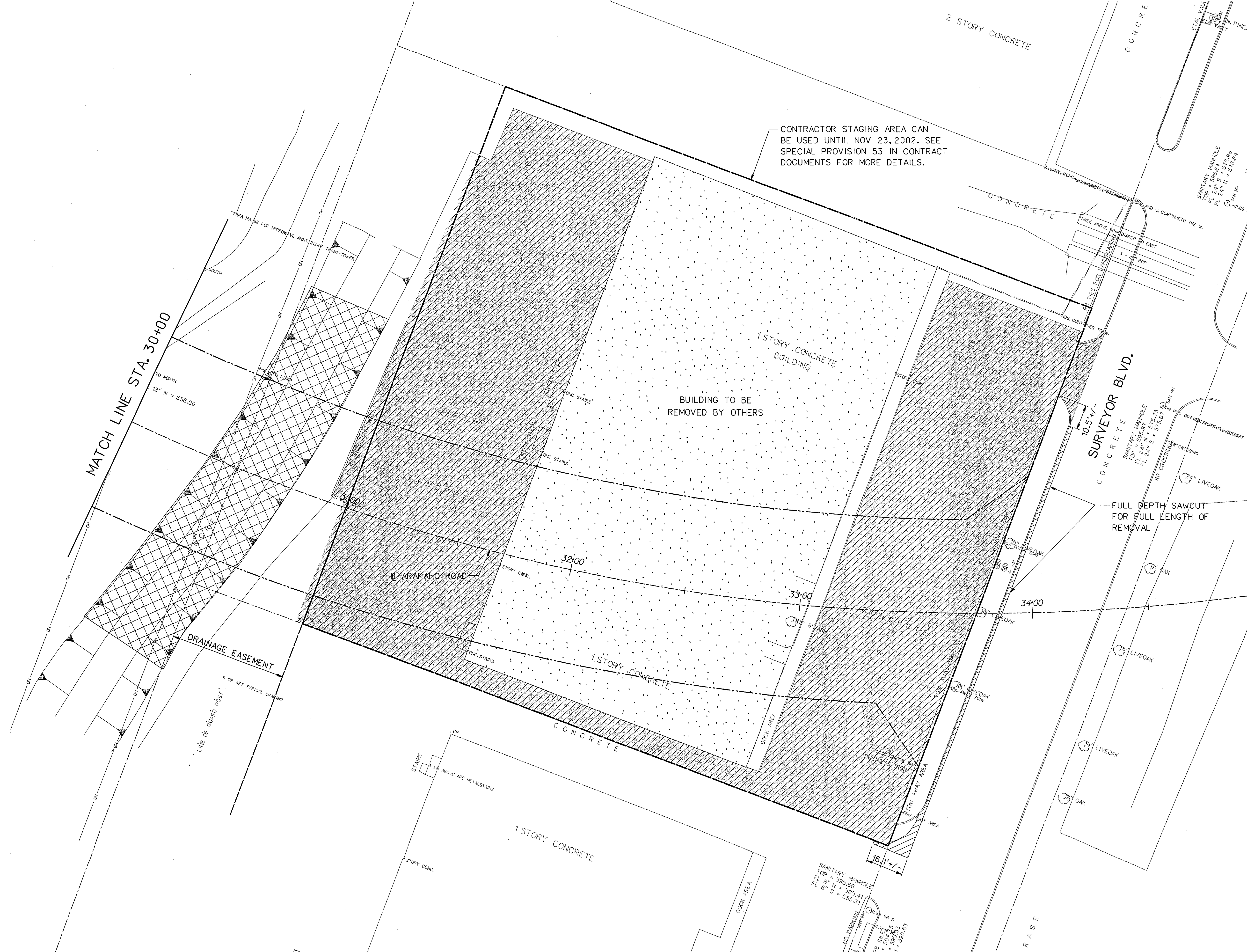
REMOVAL PLAN
STA 20+00 TO STA 30+00

TOWN OF ADDISON, TEXAS

Design AMS	Drawn AGF	DATE	SCALE	PROJECT NO.	SHEET ID
Check JDH	Check AMS	DEC 01	1" = 20'	25768	R-3

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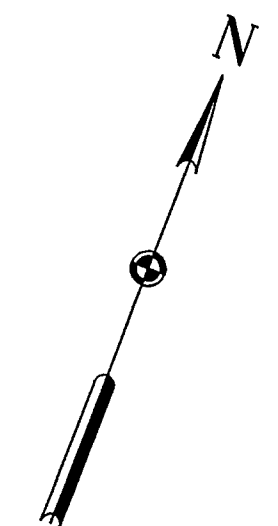
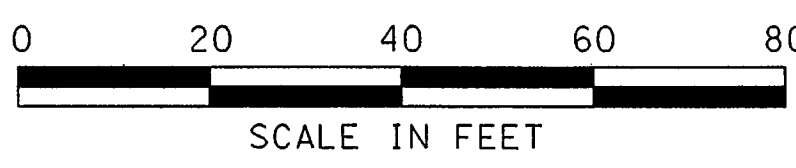
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CONTRACTOR STAGING AREA CAN BE USED UNTIL NOV 23, 2002. SEE SPECIAL PROVISION 53 IN CONTRACT DOCUMENTS FOR MORE DETAILS.

BUILDING TO BE REMOVED BY OTHERS

FULL DEPTH SAWCUT FOR FULL LENGTH OF REMOVAL



LEGEND

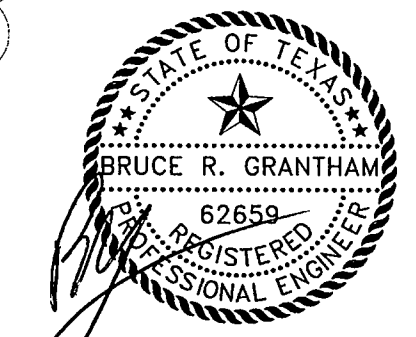
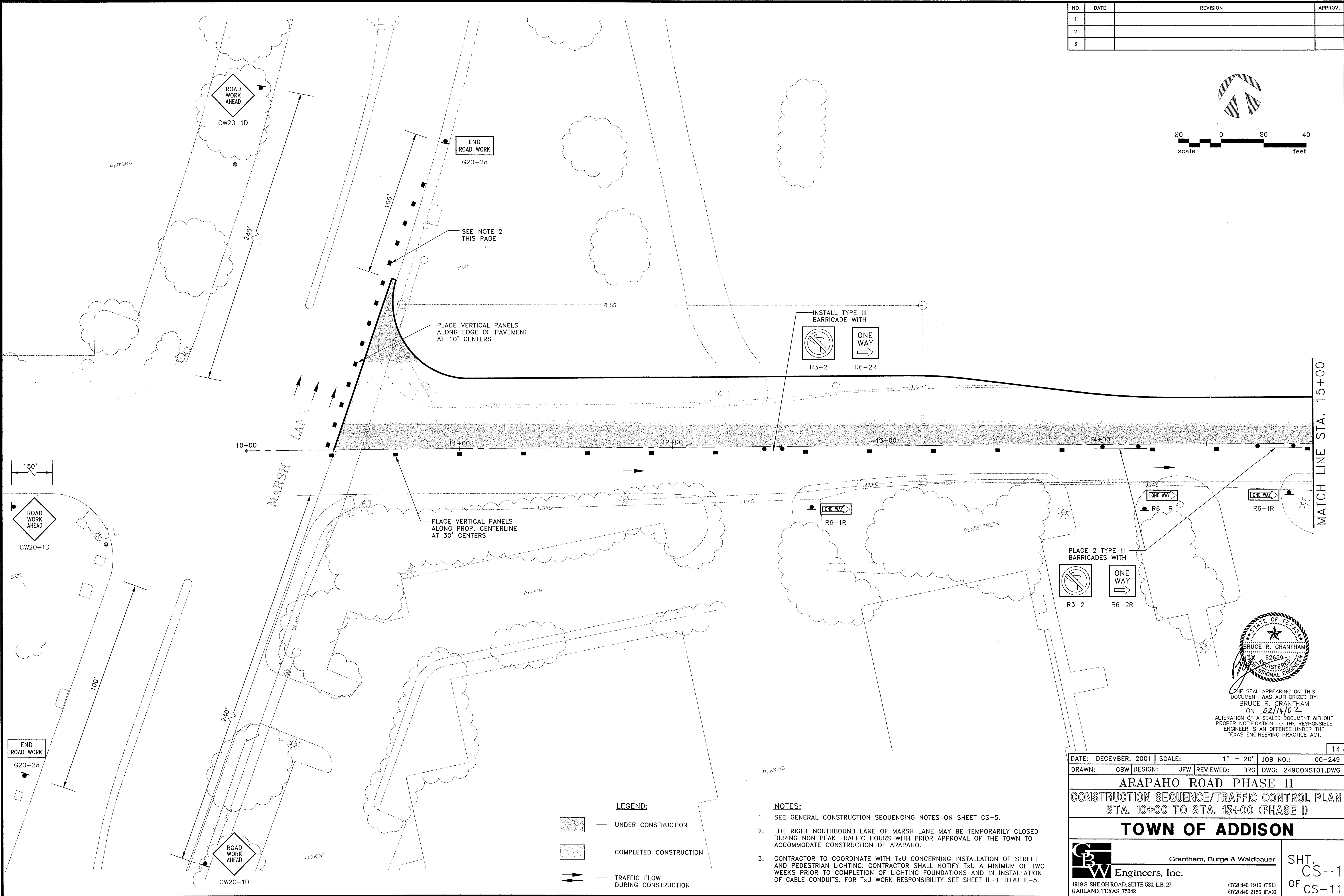
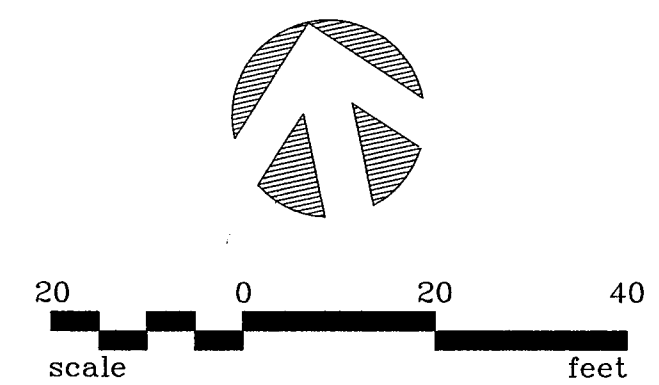
- PAVEMENT REMOVAL
- GRAVEL REMOVAL
- SIDEWALK REMOVAL
- CONCRETE CHANNEL REMOVAL
- PROPOSED
- EXISTING ROW
- PROPOSED ROW
- TEMPORARY CONSTRUCTION EASEMENT

NOTE
CONTRACTOR STAGING AREA CAN BE USED UNTIL NOV 23, 2002. SEE SPECIAL PROVISION 53 IN CONTRACT DOCUMENTS FOR MORE DETAILS.



NO.		DATE	REVISION	APPROV.	13
ARCHITECTS ENGINEERS PLANNERS The HNTB Companies					
ARAPAHO ROAD - PHASE II MARSH LANE TO SURVEYOR BOULEVARD REMOVAL PLAN STA 30+00 TO END TOWN OF ADDISON, TEXAS					
Design	AMS	Drawn	GFS	DATE	SCALE
Check	JDH	Check	AMS	DEC 01	1" = 20'
PROJECT NO.	25768	SHEET ID	R-4		

NO.	DATE	REVISION	APPROV.
1			
2			
3			



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 ON 02/14/02
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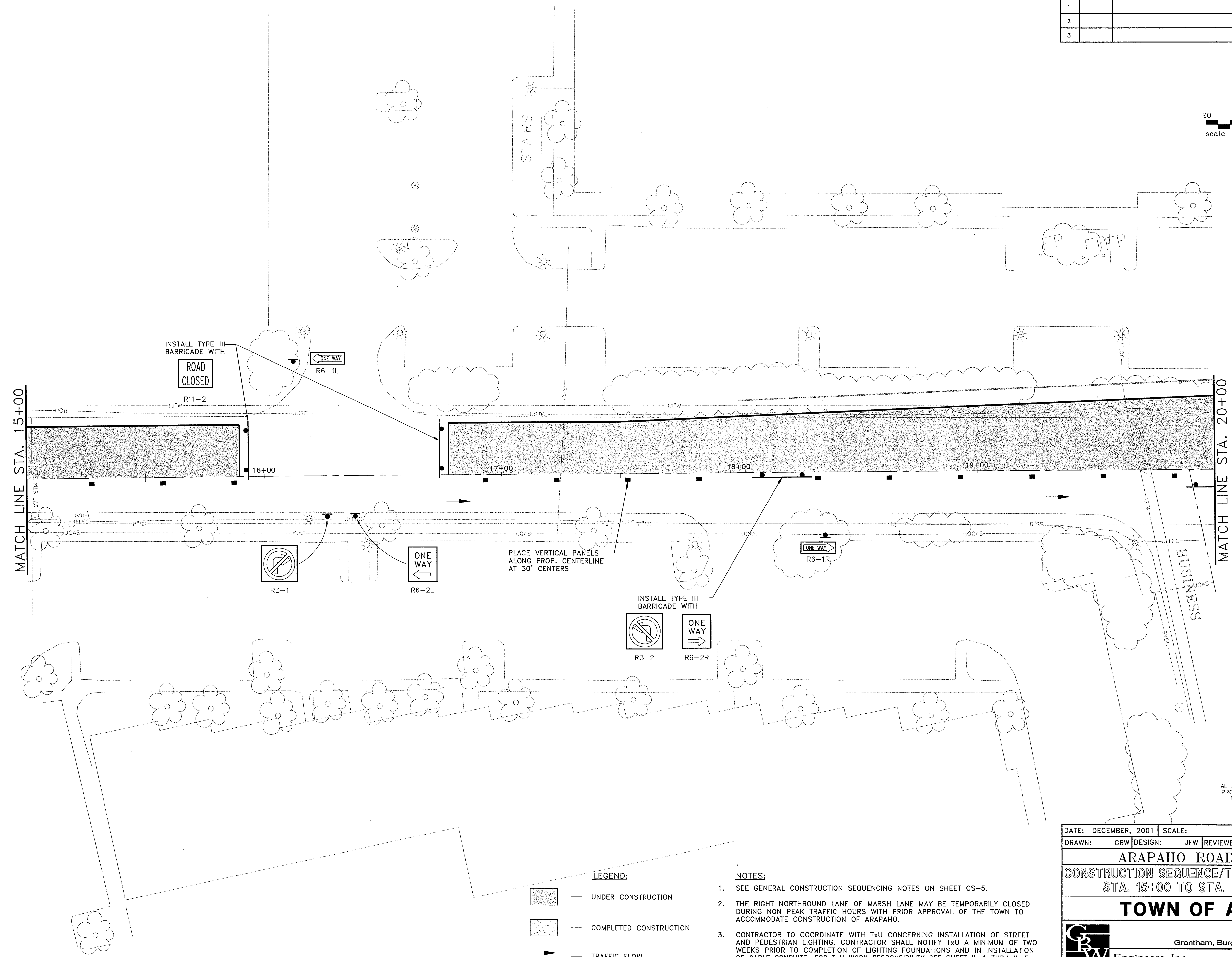
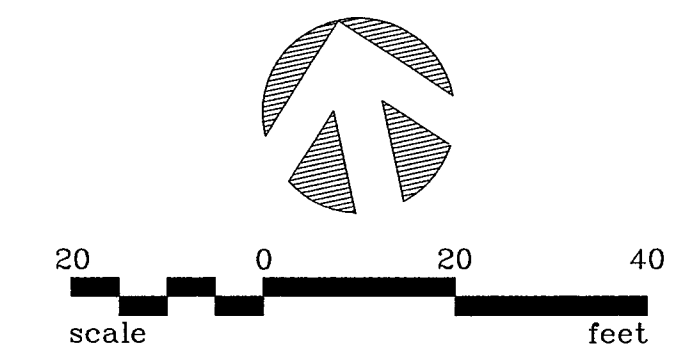
DATE: DECEMBER, 2001	SCALE: 1" = 20'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: JFW	REVIEWED: BRG
DWG: 249CONST01.DWG		

ARAPAHO ROAD PHASE II
 CONSTRUCTION SEQUENCE/TRAFFIC CONTROL PLAN
 STA. 10+00 TO STA. 15+00 (PHASE I)

TOWN OF ADDISON

 Grantham, Burge & Waldbauer Engineers, Inc.	SHT. CS-1 OF CS-11
	1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042 (972) 840-1916 (TEL) (972) 840-2156 (FAX)

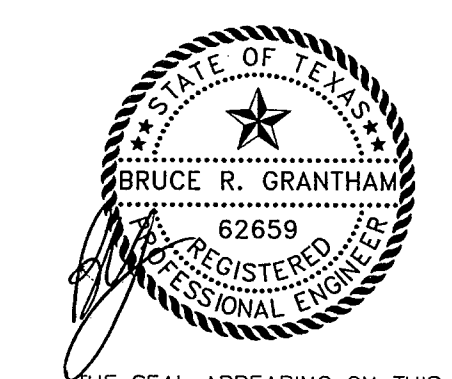
NO.	DATE	REVISION	APPROV.
1			
2			
3			



PLACE VERTICAL PANELS
ALONG PROP. CENTERLINE
AT 30' CENTERS

- LEGEND:**
- UNDER CONSTRUCTION
 - COMPLETED CONSTRUCTION
 - TRAFFIC FLOW DURING CONSTRUCTION

- NOTES:**
- SEE GENERAL CONSTRUCTION SEQUENCING NOTES ON SHEET CS-5.
 - THE RIGHT NORTHBOUND LANE OF MARSH LANE MAY BE TEMPORARILY CLOSED DURING NON PEAK TRAFFIC HOURS WITH PRIOR APPROVAL OF THE TOWN TO ACCOMMODATE CONSTRUCTION OF ARAPAHO.
 - CONTRACTOR TO COORDINATE WITH TXU CONCERNING INSTALLATION OF STREET AND PEDESTRIAN LIGHTING. CONTRACTOR SHALL NOTIFY TXU A MINIMUM OF TWO WEEKS PRIOR TO COMPLETION OF LIGHTING FOUNDATIONS AND IN INSTALLATION OF CABLE CONDUITS. FOR TXU WORK RESPONSIBILITY SEE SHEET IL-1 THRU IL-5.



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DATE: DECEMBER, 2001	SCALE: 1" = 20'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: JFW	REVIEWED: BRG
DWG: 249CONST02.DWG		

ARAPAHO ROAD PHASE II
CONSTRUCTION SEQUENCE/TRAFFIC CONTROL PLAN
STA. 15+00 TO STA. 20+00 (PHASE I)

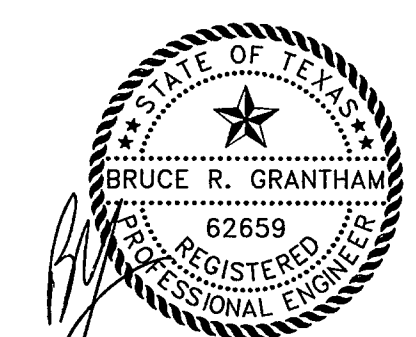
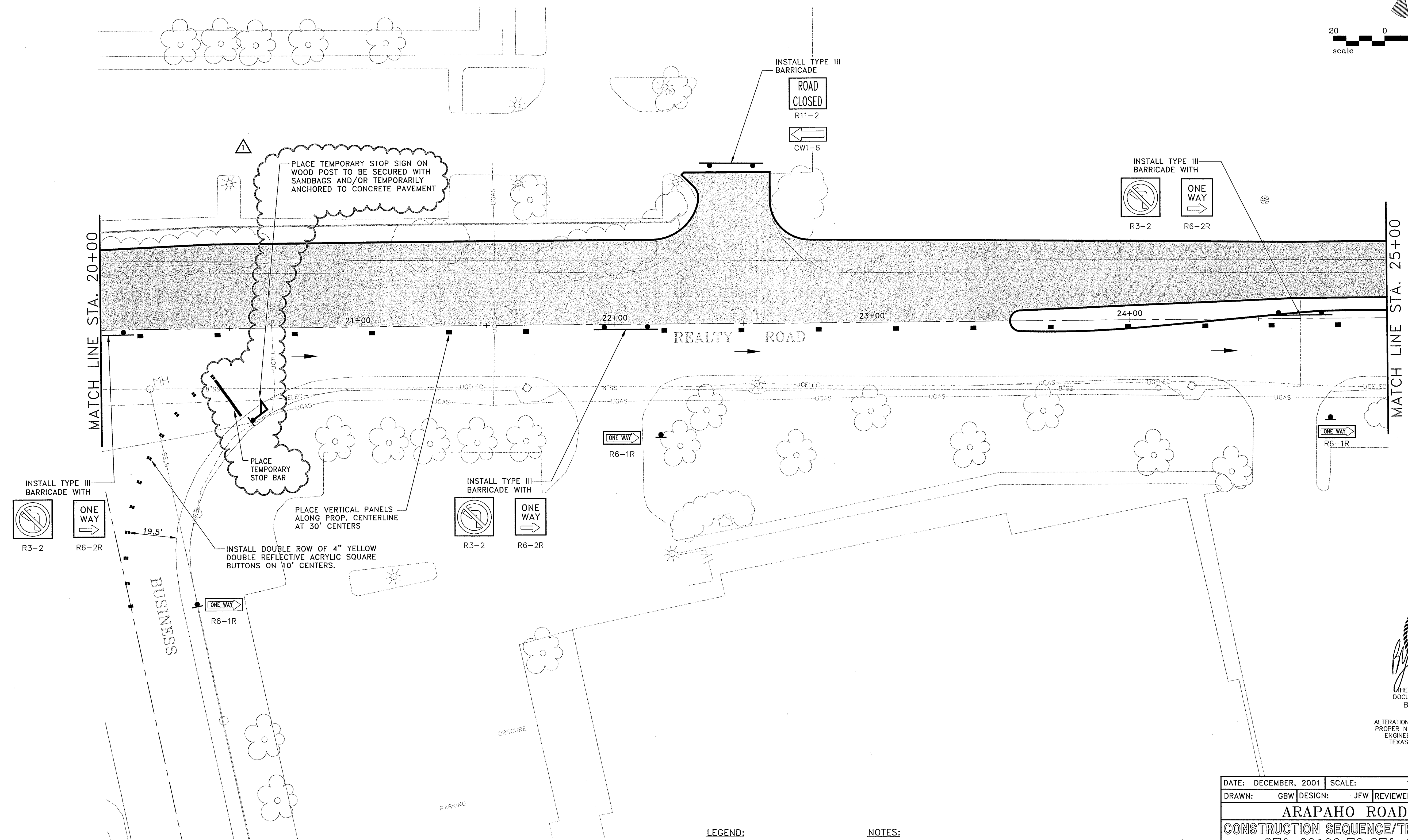
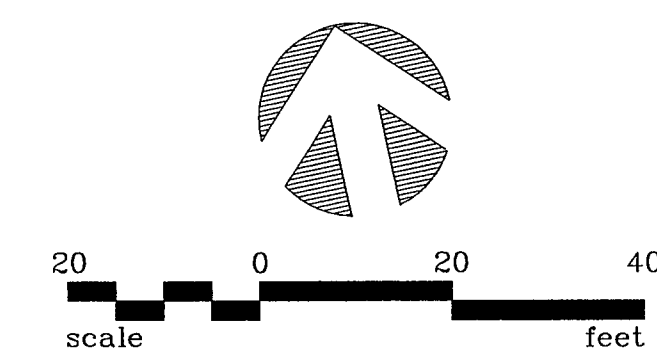
TOWN OF ADDISON

GBW Engineers, Inc.
Grantham, Burge & Waldbauer
1919 S. SHILOH ROAD, SUITE 530, L.B. 27
GARLAND, TEXAS 75042

SHT. CS-2
OF CS-11

(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

NO.	DATE	REVISION	APPROV.
1	2/06/02	PER ADDENDUM No.2	BRG
2			
3			



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- LEGEND:**
- UNDER CONSTRUCTION
 - COMPLETED CONSTRUCTION
 - TRAFFIC FLOW DURING CONSTRUCTION

- NOTES:**
- SEE GENERAL CONSTRUCTION SEQUENCING NOTES ON SHEET CS-5.
 - THE RIGHT NORTHBOUND LANE OF MARSH LANE MAY BE TEMPORARILY CLOSED DURING NON PEAK TRAFFIC HOURS WITH PRIOR APPROVAL OF THE TOWN TO ACCOMMODATE CONSTRUCTION OF ARAPAHO.
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DATE: DECEMBER, 2001	SCALE: 1" = 20'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: JFW	REVIEWED: BRG
DWG: 249CONST03.DWG		

ARAPAHO ROAD PHASE II
CONSTRUCTION SEQUENCE/TRAFFIC CONTROL PLAN
 STA. 20+00 TO STA. 25+00 (PHASE I)

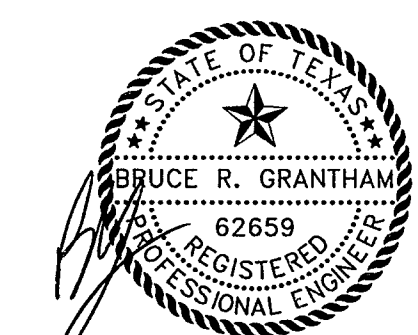
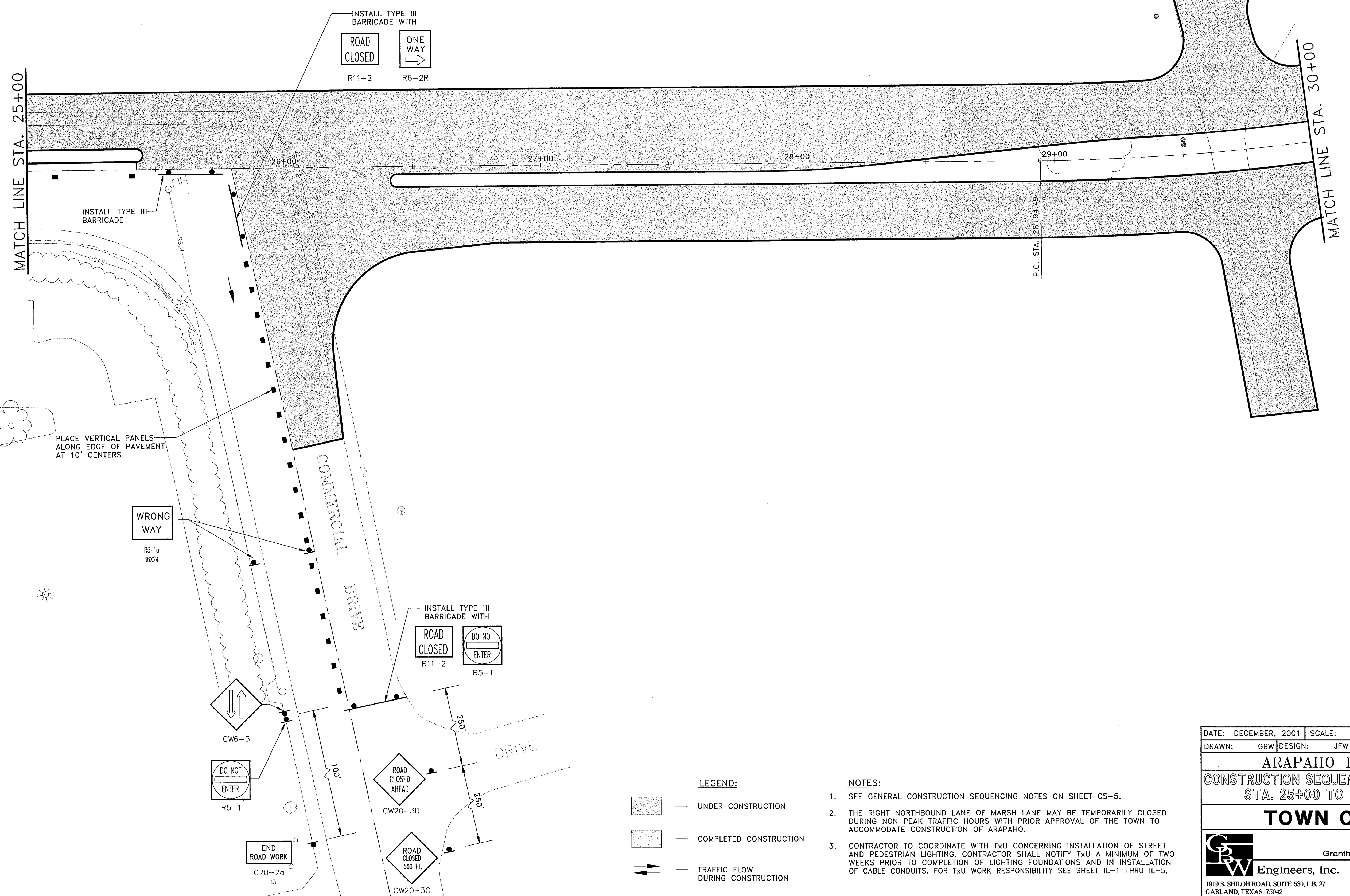
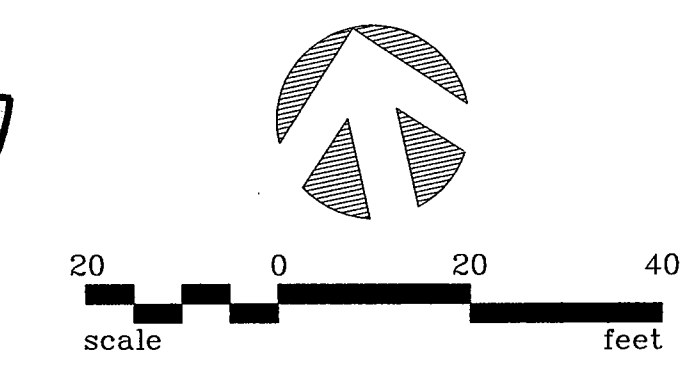
TOWN OF ADDISON

GBW Engineers, Inc.
 Grantham, Burge & Waldbauer
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27
 GARLAND, TEXAS 75042

SHT. CS-3
 OF CS-11

(972) 840-1916 (TEL)
 (972) 840-2156 (FAX)

NO.	DATE	REVISION	APPROV.
1			
2			
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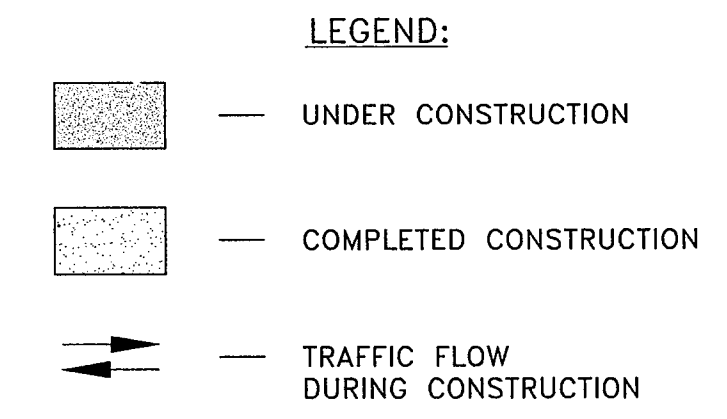
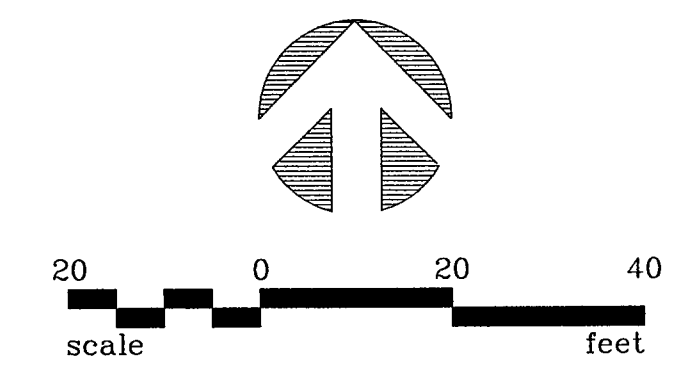
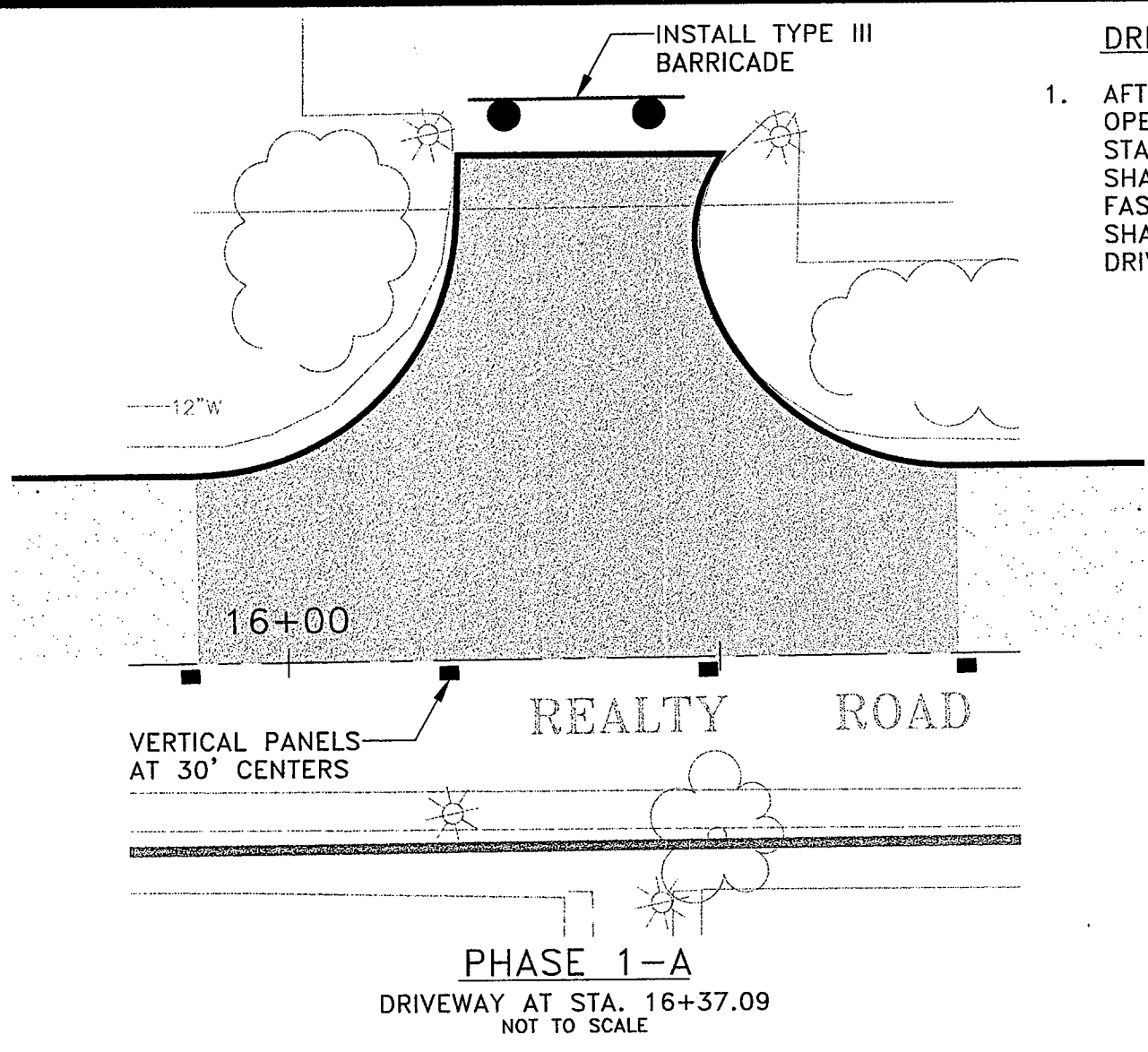
- LEGEND:**
- UNDER CONSTRUCTION
 - COMPLETED CONSTRUCTION
 - TRAFFIC FLOW DURING CONSTRUCTION

- NOTES:**
- SEE GENERAL CONSTRUCTION SEQUENCING NOTES ON SHEET CS-5.
 - THE RIGHT NORTHBOUND LANE OF MARSH LANE MAY BE TEMPORARILY CLOSED DURING NON PEAK TRAFFIC HOURS WITH PRIOR APPROVAL OF THE TOWN TO ACCOMMODATE CONSTRUCTION OF ARAPAHO.
 - CONTRACTOR TO COORDINATE WITH TXU CONCERNING INSTALLATION OF STREET AND PEDESTRIAN LIGHTING. CONTRACTOR SHALL NOTIFY TXU A MINIMUM OF TWO WEEKS PRIOR TO COMPLETION OF LIGHTING FOUNDATIONS AND IN INSTALLATION OF CABLE CONDUITS. FOR TXU WORK RESPONSIBILITY SEE SHEET IL-1 THRU IL-5.

DATE: DECEMBER, 2001	SCALE: 1" = 20'	JOB NO.: 00-249	17
DRAWN: GBW	DESIGN: JFW	REVIEWED: BRG	DWG: 249CONST04.DWG
ARAPAHO ROAD PHASE II			
CONSTRUCTION SEQUENCE/TRAFFIC CONTROL PLAN			
STA. 25+00 TO STA. 30+00 (PHASE I)			
TOWN OF ADDISON			
Grantham, Burge & Waldbauer Engineers, Inc.		SHT. CS-4 OF CS-11	
1919 S. SHILOH ROAD, SUITE 530, LB. 27 GARLAND, TEXAS 75042		(972) 840-1916 (TEL) (972) 840-2156 (FAX)	

NO.	DATE	REVISION	APPROV.
1			
2			
3			

DRIVEWAY NOTE:
 1. AFTER COMPLETION OF PHASE 1 CONSTRUCTION CONTRACTOR SHALL OPEN THE DRIVEWAY AT STA. 22+46.86 AND CLOSE DRIVEWAY AT STA. 16+37.09. ALL APPROPRIATE BARRICADES AND WARNING SIGNAGE SHALL BE RELOCATED TO THE DRIVEWAY AT STA. 16+37.09 IN SIMILAR FASHION AS DURING PHASE 1 CONSTRUCTION. DRIVEWAY AT STA. 22+46.86 SHALL BECOME ACCESS TO PROPERTY. CONTRACTOR MUST CONSTRUCT DRIVEWAY AT STA. 16+37.09 PRIOR TO BEGINNING PHASE 2 CONSTRUCTION.



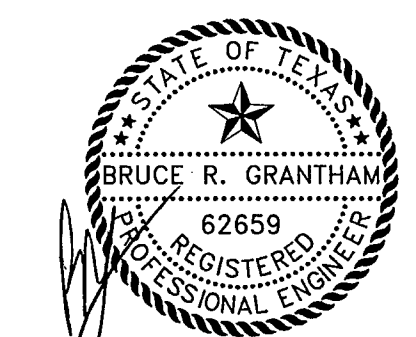
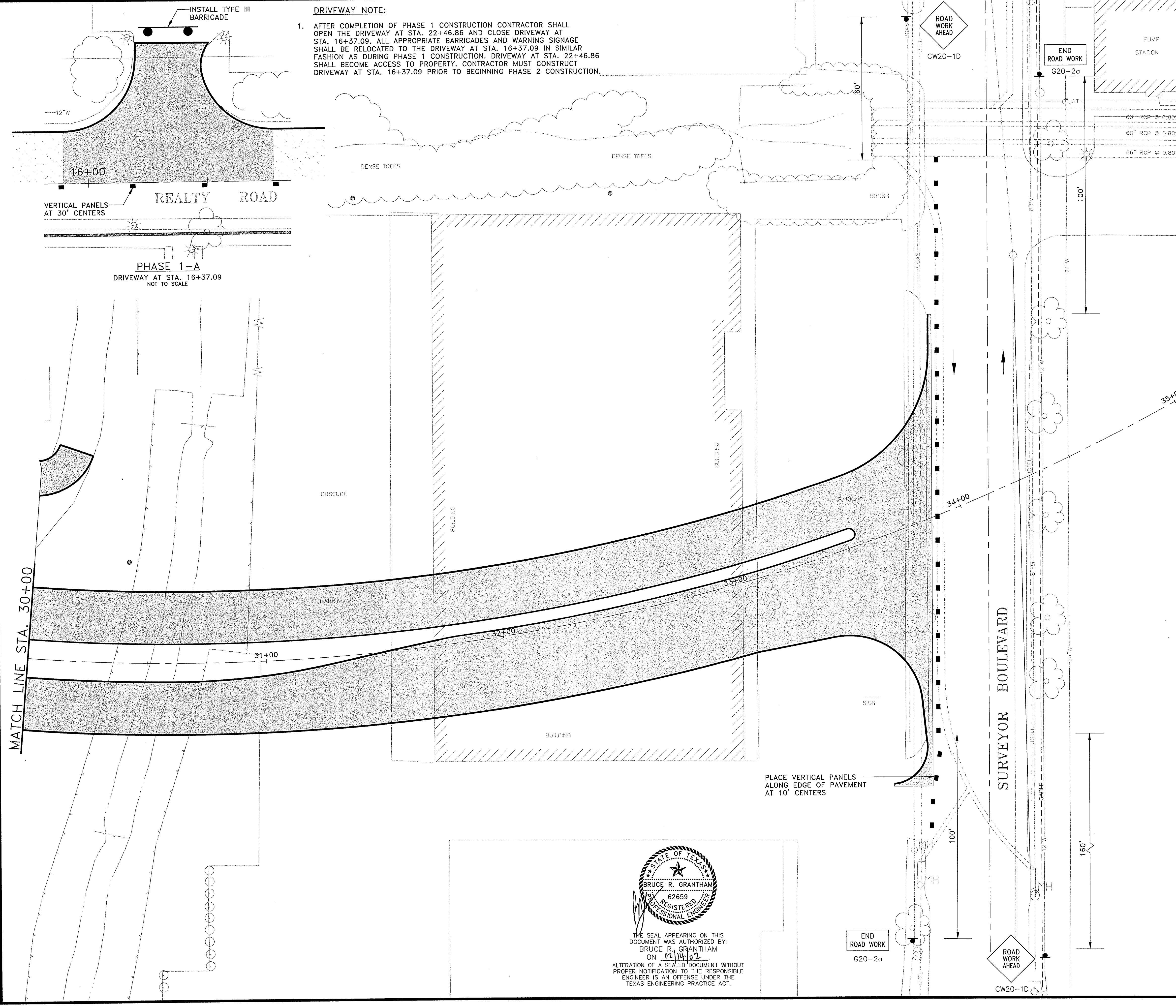
GENERAL CONSTRUCTION SEQUENCING NOTES:

- THE SEQUENCE OF CONSTRUCTION SHOWN ON THESE PLANS IS FOR THE PREPARATION AND COMPARISON OF BIDS ONLY. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL DEVELOP AND SUBMIT FOR TOWN OF ADDISON APPROVAL, IN DETAIL, A CONSTRUCTION SCHEDULE AND SEQUENCE OF CONSTRUCTION THAT SHALL CAUSE MINIMUM INTERFERENCE WITH TRAFFIC ALONG, ACROSS AND ADJACENT TO THE PROJECT DURING CONSTRUCTION. IF THE SCHEDULE OR SEQUENCE BECOMES UNWORKABLE OR UNSATISFACTORY AS WORK PROCEEDS, ADJUSTMENTS SHALL BE MADE.
- ACCESS TO ALL SIDE STREETS AND PRIVATE DRIVEWAYS MUST BE MAINTAINED AT ALL TIMES UNLESS OTHERWISE AUTHORIZED IN WRITING BY THE TOWN OF ADDISON.
- LIGHTED BARRICADES, TEMPORARY PAVEMENT MARKINGS AND CHANNELIZING DEVICES CONFORMING TO THE CURRENT EDITION OF THE M.U.T.C.D. SHALL BE USED DURING ALL STAGES OF CONSTRUCTION TO CONTROL TRAFFIC FLOW THROUGH THE WORK ZONES.
- TEMPORARY LANE LINE MARKINGS APPROVED BY THE TOWN OF ADDISON WILL BE REQUIRED DURING PHASE 2 CONSTRUCTION TO DELINEATE TWO LANES (TWO DIRECTIONS) OF TRAFFIC UTILIZING THE PHASE 1 PAVEMENT. OTHER TEMPORARY LANE LINE MARKINGS MAY BE REQUIRED BY THE TOWN OF ADDISON IN VARIOUS LOCATIONS TO FACILITATE SMOOTH TRAFFIC OPERATIONS.
- MAINTAIN A MINIMUM RADIUS OF 20 FEET ON ALL STREET CONNECTIONS AND 10 FEET ON ALL DRIVEWAY CONNECTIONS DURING CONSTRUCTION TO ACCOMMODATE THE TRAFFIC USING THE ROADWAY.
- STORM WATER POLLUTION PREVENTION DEVICES MUST BE PROPERLY INSTALLED AND MAINTAINED DURING ALL STAGES OF CONSTRUCTION.
- DRIVEWAY CONSTRUCTION MAY BE DONE DURING ONE PHASE OF CONSTRUCTION INSTEAD OF TWO PHASES (1/2 DRIVE - 1/2 DRIVE) WITH THE PERMISSION OF THE AFFECTED PROPERTY OWNER. CONTACT THE AFFECTED PROPERTY OWNER A MINIMUM OF 48 HOURS PRIOR TO BEGINNING ANY DRIVEWAY CONSTRUCTION.
- THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND NOTIFY THE TOWN OF ADDISON AND RELATED UTILITY COMPANY IMMEDIATELY IF A CONFLICT IS FOUND TO EXIST.
- INSTALL TRAFFIC SIGNAL IMPROVEMENTS AT SURVEYOR BOULEVARD WITH PHASE 1 BUT DO NOT ACTIVATE UNTIL END OF PHASE 2. CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY MARKINGS AND SCREENING OF SIGNAL HEADS, ETC. UNTIL SUCH TIME SIGNALS CAN BE ACTIVATED.
- AT END OF ALL PHASES OF CONSTRUCTION, CONTRACTOR SHALL COMPLETE FINAL PAVEMENT MARKINGS, REMOVE TEMPORARY PAVEMENT MARKINGS AND ACTIVATE TRAFFIC SIGNALS AT SURVEYOR BOULEVARD. (NO SEPARATE PAY)

NOTES:

- THE RIGHT NORTHBOUND LANE OF MARSH LANE MAY BE TEMPORARILY CLOSED DURING NON PEAK TRAFFIC HOURS WITH PRIOR APPROVAL OF THE TOWN TO ACCOMMODATE CONSTRUCTION OF ARAPAHO.
- CONTRACTOR TO COORDINATE WITH TXU CONCERNING INSTALLATION OF STREET AND PEDESTRIAN LIGHTING. CONTRACTOR SHALL NOTIFY TXU A MINIMUM OF TWO WEEKS PRIOR TO COMPLETION OF LIGHTING FOUNDATIONS AND IN INSTALLATION OF CABLE CONDUITS. FOR TXU WORK RESPONSIBILITY SEE SHEET IL-1 THRU IL-5.

MATCH LINE STA. 30+00



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DATE: DECEMBER, 2001	SCALE: 1" = 20'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: JFW	REVIEWED: BRG
DWG: 249CONST05.DWG		

**ARAPAHO ROAD PHASE II
 CONSTRUCTION SEQUENCE/TRAFFIC CONTROL PLAN
 STA. 30+00 TO END (PHASE I)**

TOWN OF ADDISON

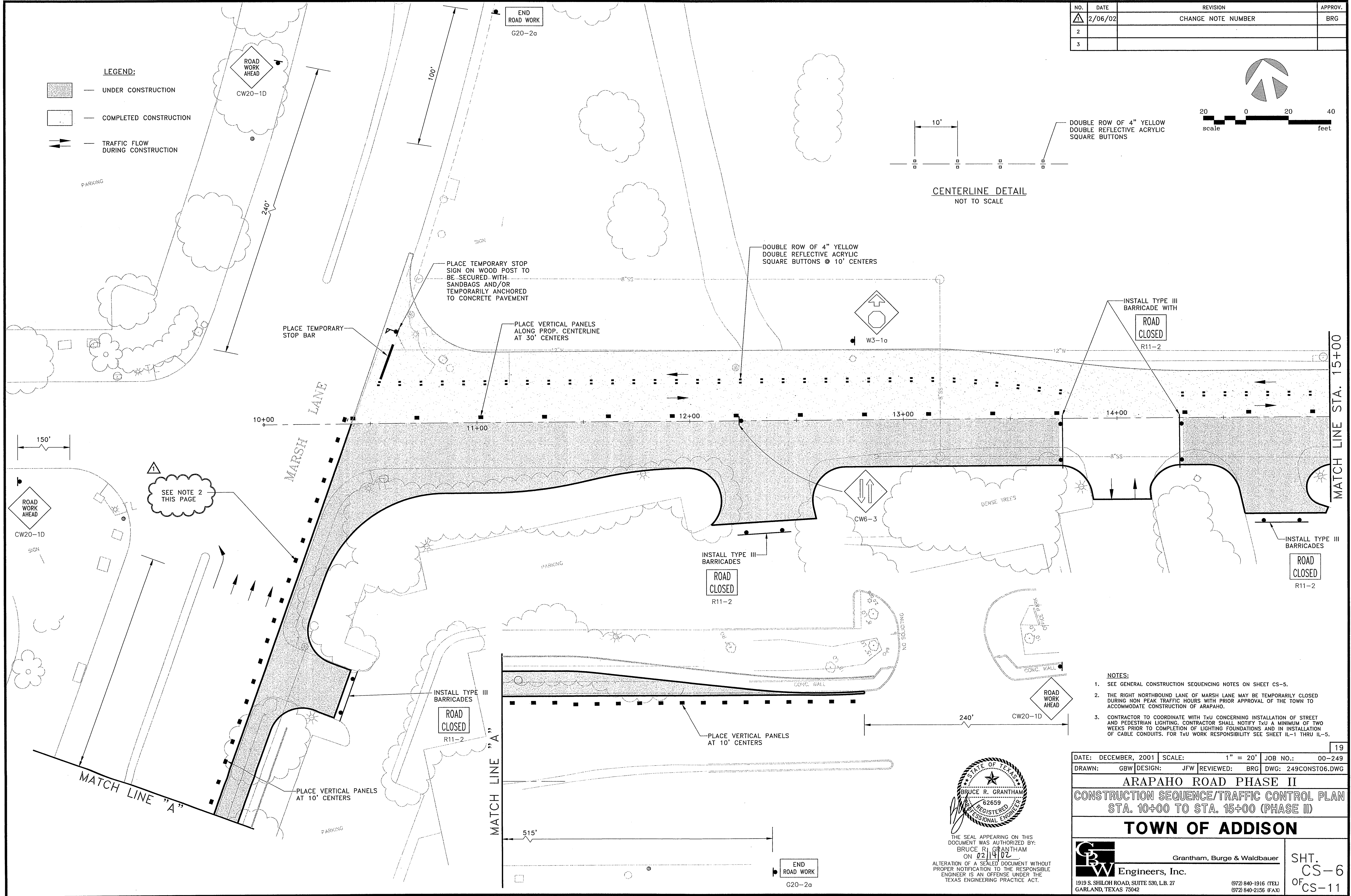
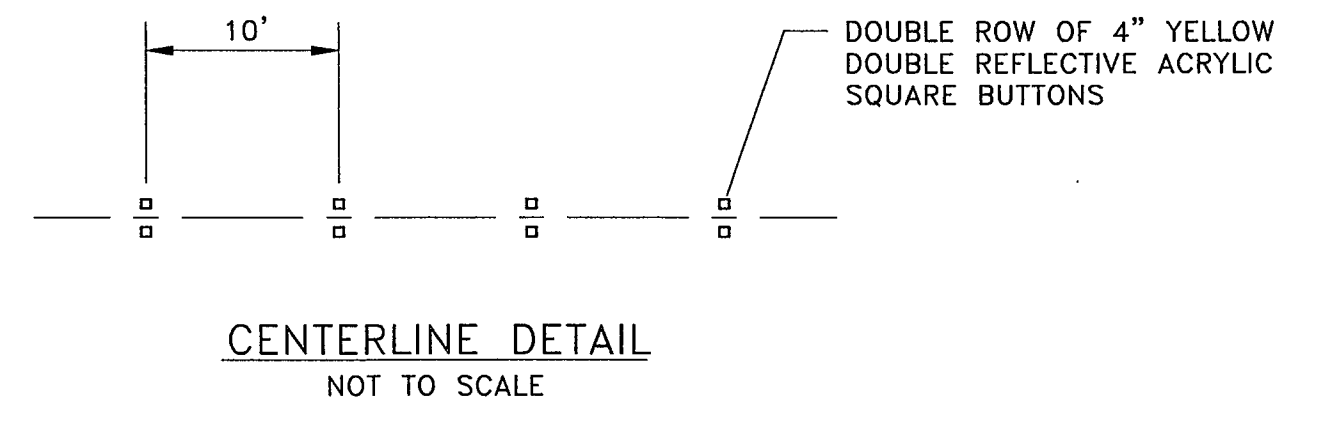
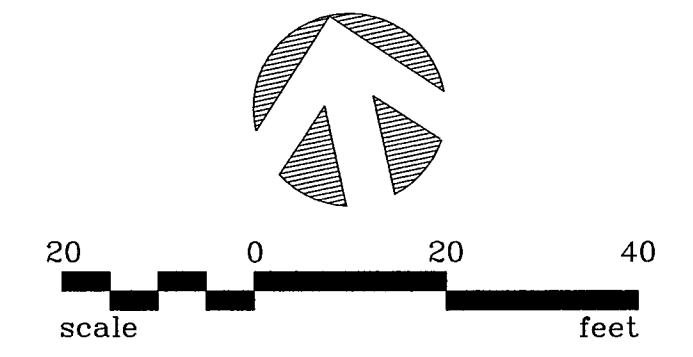
GW Grantham, Burge & Waldbauer
 Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
 (972) 840-1916 (TEL)
 (972) 840-2156 (FAX)

SHT. CS-5 OF CS-11

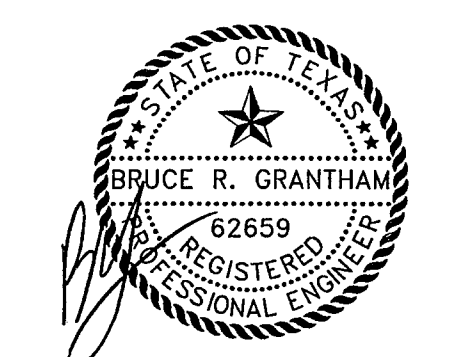
NO.	DATE	REVISION	APPROV.
1	2/06/02	CHANGE NOTE NUMBER	BRG
2			
3			

LEGEND:

- UNDER CONSTRUCTION
- COMPLETED CONSTRUCTION
- TRAFFIC FLOW DURING CONSTRUCTION



- NOTES:**
- SEE GENERAL CONSTRUCTION SEQUENCING NOTES ON SHEET CS-5.
 - THE RIGHT NORTHBOUND LANE OF MARSH LANE MAY BE TEMPORARILY CLOSED DURING NON PEAK TRAFFIC HOURS WITH PRIOR APPROVAL OF THE TOWN TO ACCOMMODATE CONSTRUCTION OF ARAPAHO.
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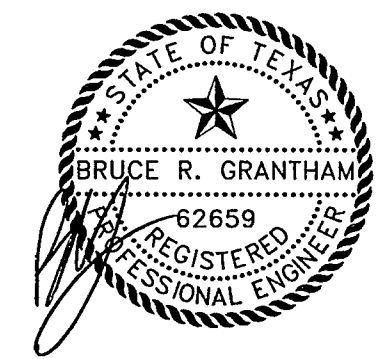
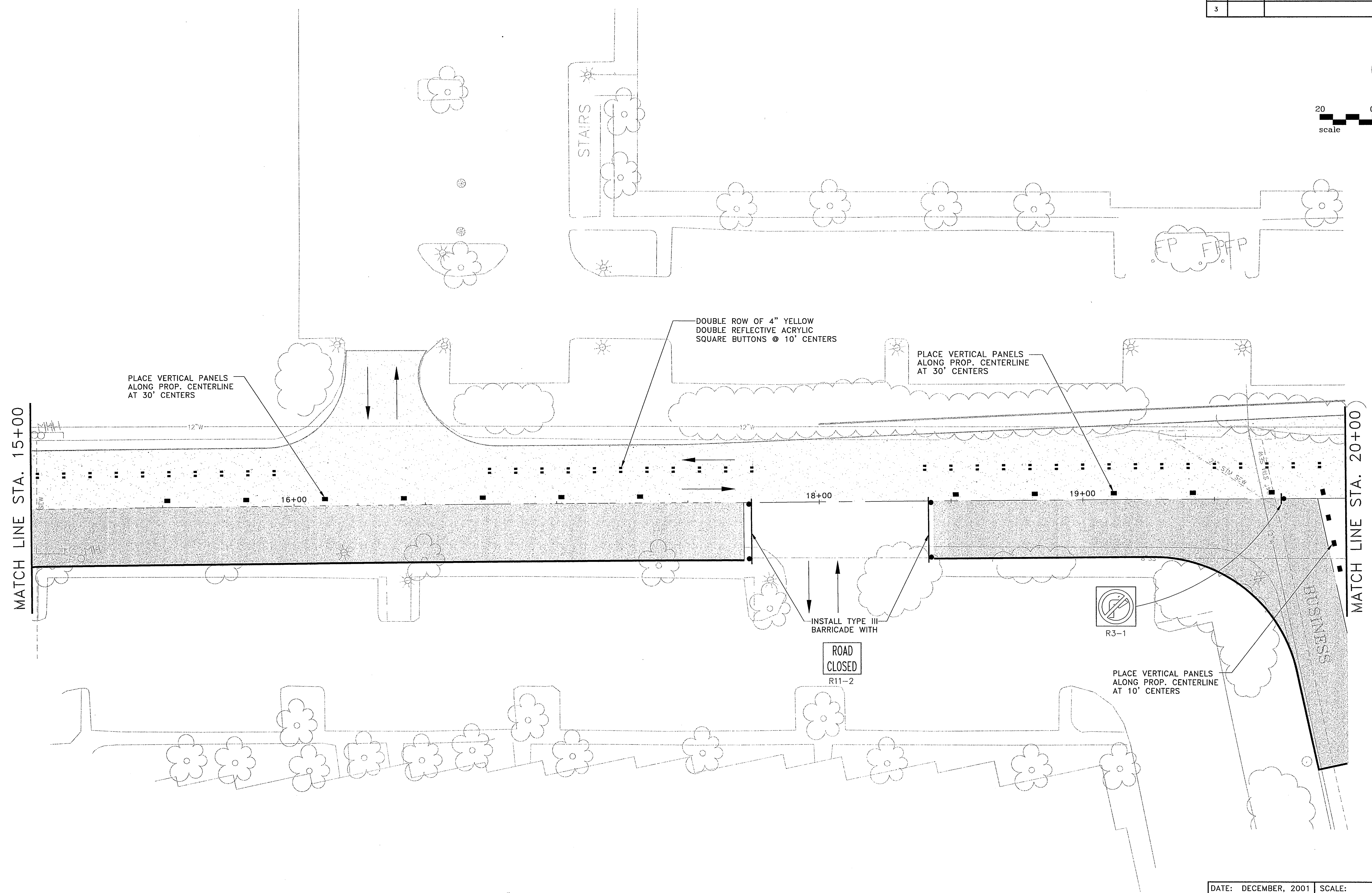
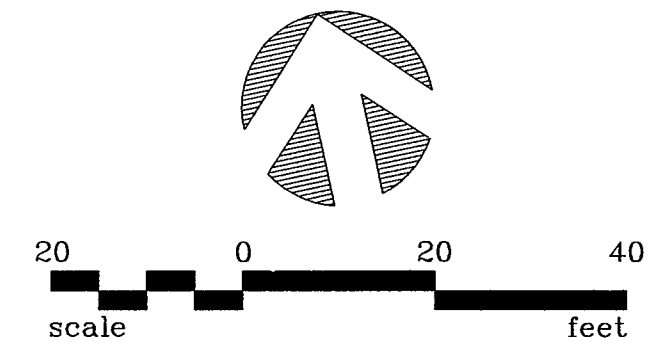
DATE: DECEMBER, 2001	SCALE: 1" = 20'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: JFW	REVIEWED: BRG
DWG: 249CONST06.DWG		

**ARAPAHO ROAD PHASE II
CONSTRUCTION SEQUENCE/TRAFFIC CONTROL PLAN
STA. 10+00 TO STA. 15+00 (PHASE II)**

TOWN OF ADDISON

<p>Grantham, Burge & Waldbauer Engineers, Inc.</p> <p>1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042</p> <p>(972) 840-1916 (TEL) (972) 840-2156 (FAX)</p>	<p>SHT. CS-6 OF CS-11</p>
	<p>19</p>

NO.	DATE	REVISION	APPROV.
1			
2			
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 ON 02/14/02
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20

DATE: DECEMBER, 2001	SCALE: 1" = 20'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: JFW	REVIEWED: BRG
DWG: 249CONST07.DWG		

ARAPAHO ROAD PHASE II
CONSTRUCTION SEQUENCE/TRAFFIC CONTROL PLAN
STA. 15+00 TO STA. 20+00 (PHASE II)

TOWN OF ADDISON

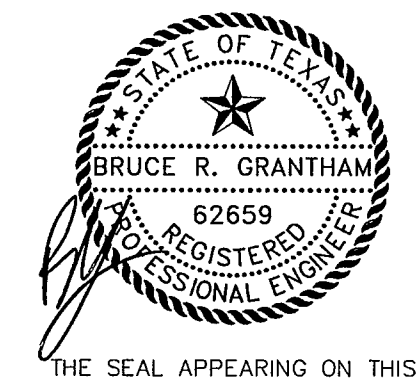
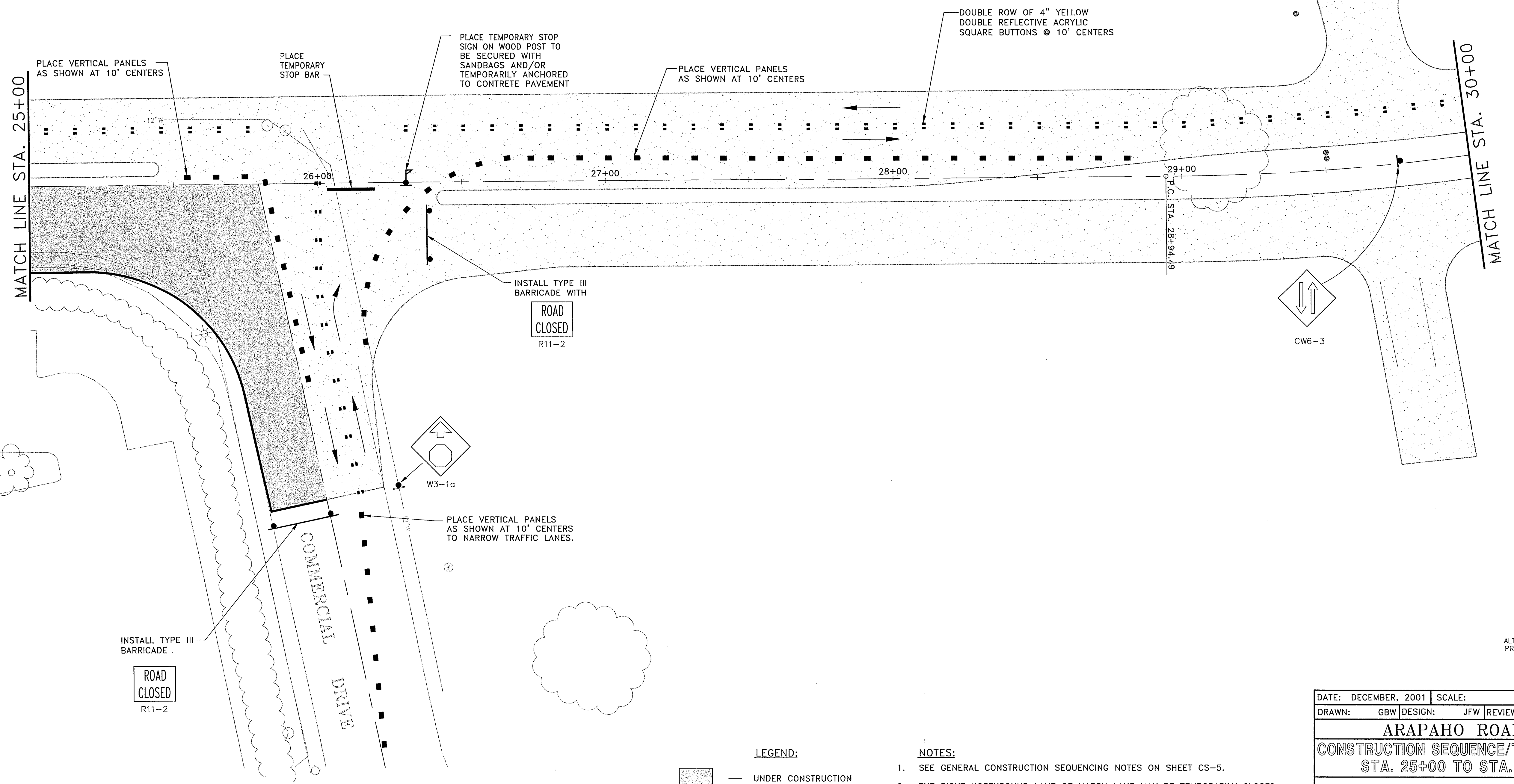
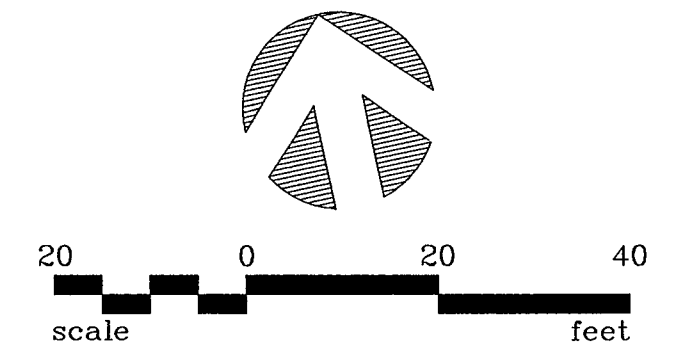
GBW Grantham, Burge & Waldbauer
 Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
 (972) 840-1916 (TEL)
 (972) 840-2156 (FAX)

SHT. CS-7
 OF CS-11

- LEGEND:**
- UNDER CONSTRUCTION
 - COMPLETED CONSTRUCTION
 - TRAFFIC FLOW DURING CONSTRUCTION

- NOTES:**
- SEE GENERAL CONSTRUCTION SEQUENCING NOTES ON SHEET CS-5.
 - THE RIGHT NORTHBOUND LANE OF MARSH LANE MAY BE TEMPORARILY CLOSED DURING NON PEAK TRAFFIC HOURS WITH PRIOR APPROVAL OF THE TOWN TO ACCOMMODATE CONSTRUCTION OF ARAPAHO.
 - CONTRACTOR TO COORDINATE WITH TXU CONCERNING INSTALLATION OF STREET AND PEDESTRIAN LIGHTING. CONTRACTOR SHALL NOTIFY TXU A MINIMUM OF TWO WEEKS PRIOR TO COMPLETION OF LIGHTING FOUNDATIONS AND IN INSTALLATION OF CABLE CONDUITS. FOR TXU WORK RESPONSIBILITY SEE SHEET IL-1 THRU IL-4.

NO.	DATE	REVISION	APPROV.
1			
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22

DATE: DECEMBER, 2001	SCALE: 1" = 20'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: JFW	REVIEWED: BRG
DWG: 249CONST09.DWG		

ARAPAHO ROAD PHASE II
CONSTRUCTION SEQUENCE/TRAFFIC CONTROL PLAN
STA. 25+00 TO STA. 30+00 (PHASE II)

TOWN OF ADDISON

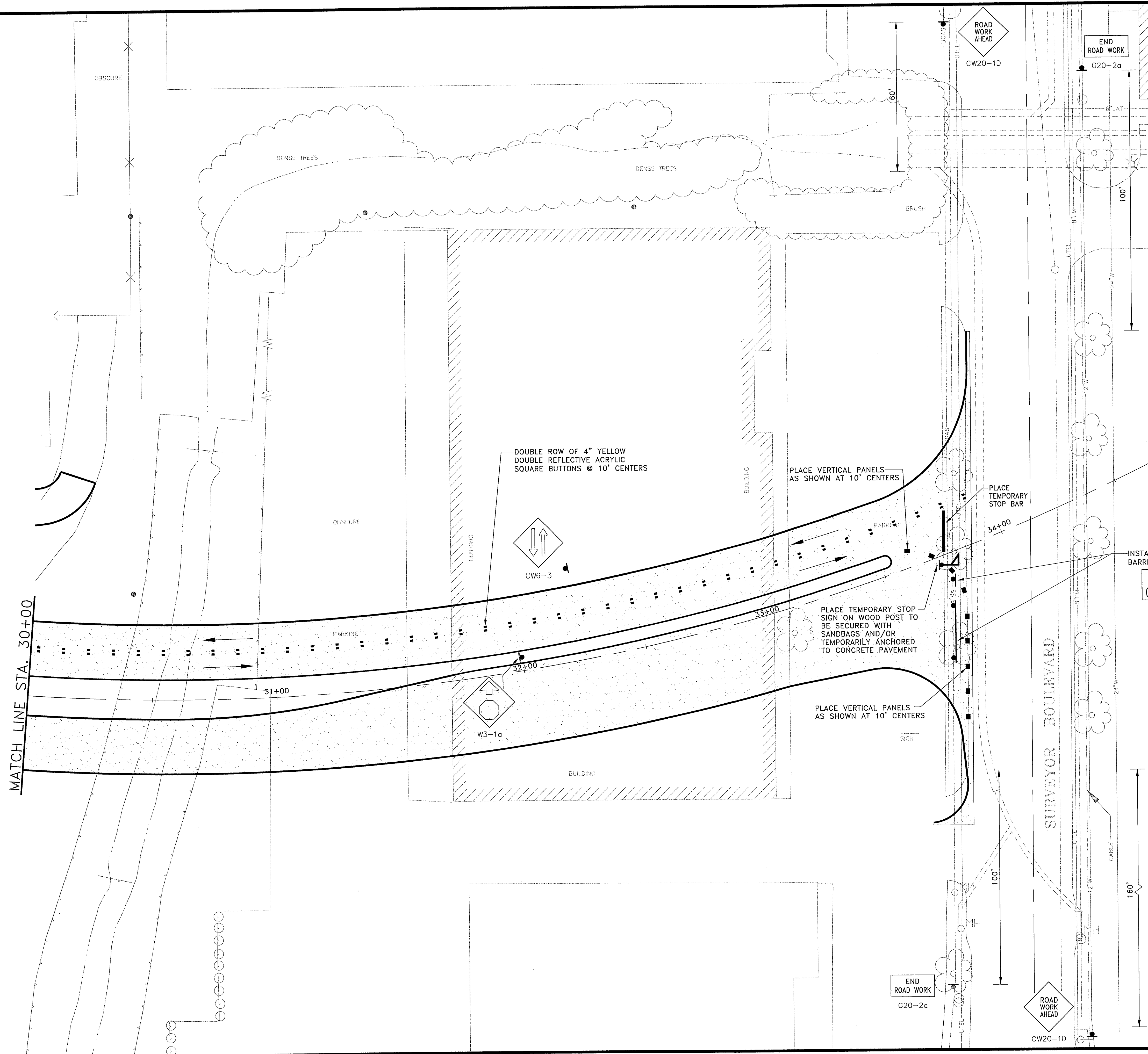
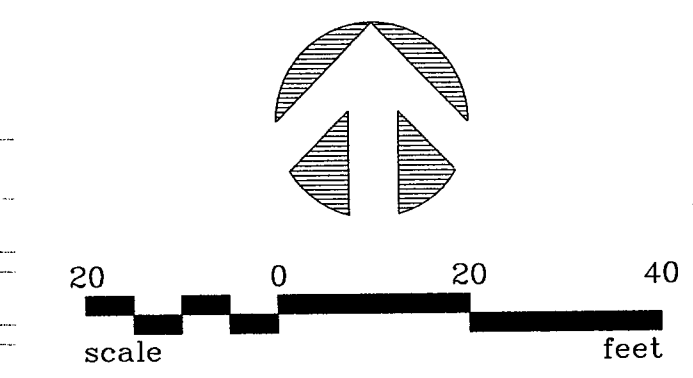
GBW Engineers, Inc.
 Grantham, Burge & Waldbauer
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
 (972) 840-1916 (TEL)
 (972) 840-2156 (FAX)

SHT. CS-9
 OF CS-11

- LEGEND:**
- UNDER CONSTRUCTION
 - COMPLETED CONSTRUCTION
 - TRAFFIC FLOW DURING CONSTRUCTION

- NOTES:**
- SEE GENERAL CONSTRUCTION SEQUENCING NOTES ON SHEET CS-5.
 - THE RIGHT NORTHBOUND LANE OF MARSH LANE MAY BE TEMPORARILY CLOSED DURING NON PEAK TRAFFIC HOURS WITH PRIOR APPROVAL OF THE TOWN TO ACCOMMODATE CONSTRUCTION OF ARAPAHO.
 - CONTRACTOR TO COORDINATE WITH TXU CONCERNING INSTALLATION OF STREET AND PEDESTRIAN LIGHTING. CONTRACTOR SHALL NOTIFY TXU A MINIMUM OF TWO WEEKS PRIOR TO COMPLETION OF LIGHTING FOUNDATIONS AND IN INSTALLATION OF CABLE CONDUITS. FOR TXU WORK RESPONSIBILITY SEE SHEET IL-1 THRU IL-5.

NO.	DATE	REVISION	APPROV.
1			
2			
3			



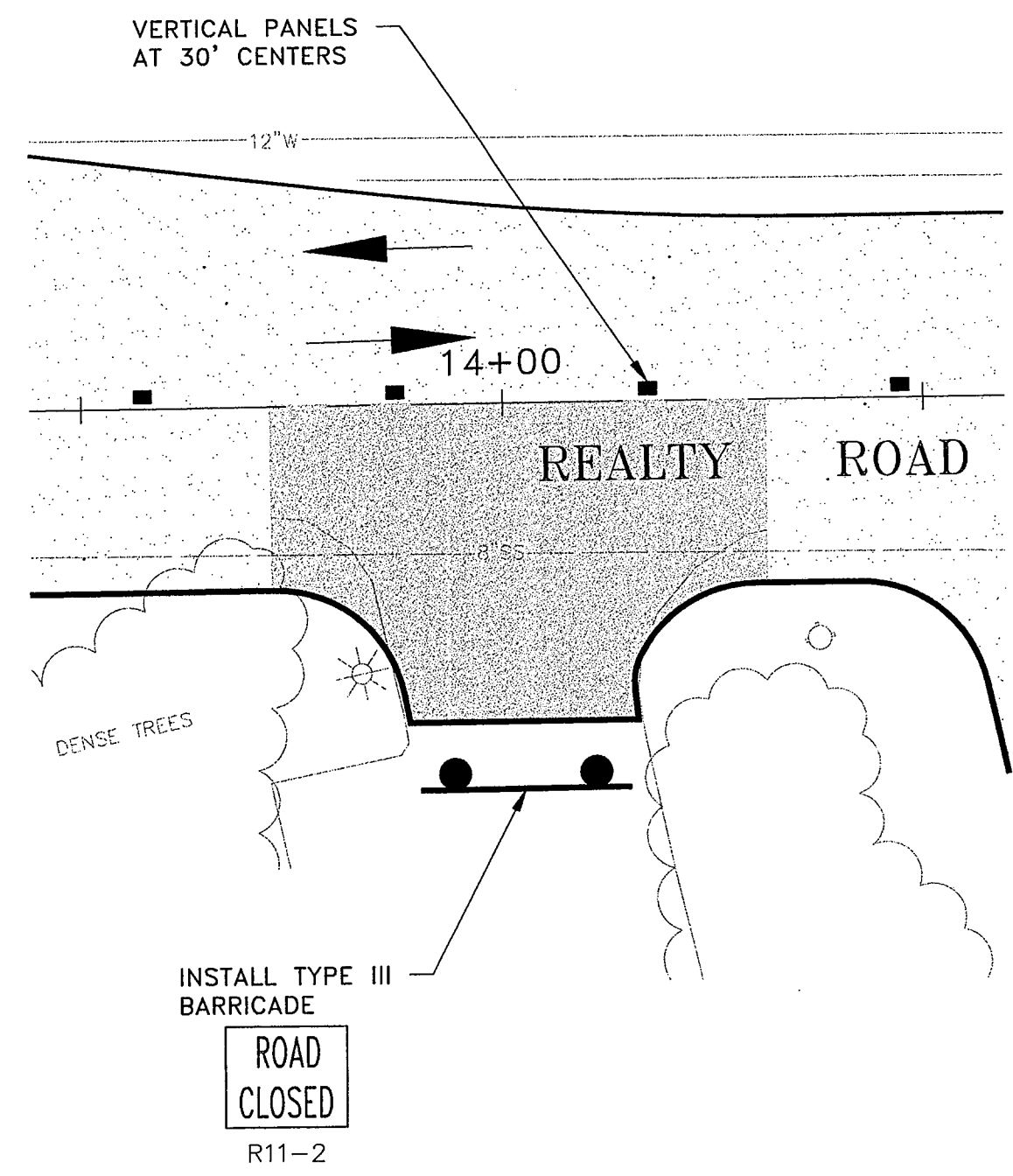
- LEGEND:**
- UNDER CONSTRUCTION
 - COMPLETED CONSTRUCTION
 - TRAFFIC FLOW DURING CONSTRUCTION

- NOTES:**
- SEE GENERAL CONSTRUCTION SEQUENCING NOTES ON SHEET CS-5.
 - THE RIGHT NORTHBOUND LANE OF MARSH LANE MAY BE TEMPORARILY CLOSED DURING NON PEAK TRAFFIC HOURS WITH PRIOR APPROVAL OF THE TOWN TO ACCOMMODATE CONSTRUCTION OF ARAPAHO.
 - CONTRACTOR TO COORDINATE WITH TXU CONCERNING INSTALLATION OF STREET AND PEDESTRIAN LIGHTING. CONTRACTOR SHALL NOTIFY TXU A MINIMUM OF TWO WEEKS PRIOR TO COMPLETION OF LIGHTING FOUNDATIONS AND IN INSTALLATION OF CABLE CONDUITS. FOR TXU WORK RESPONSIBILITY SEE SHEET IL-1 THRU IL-5.

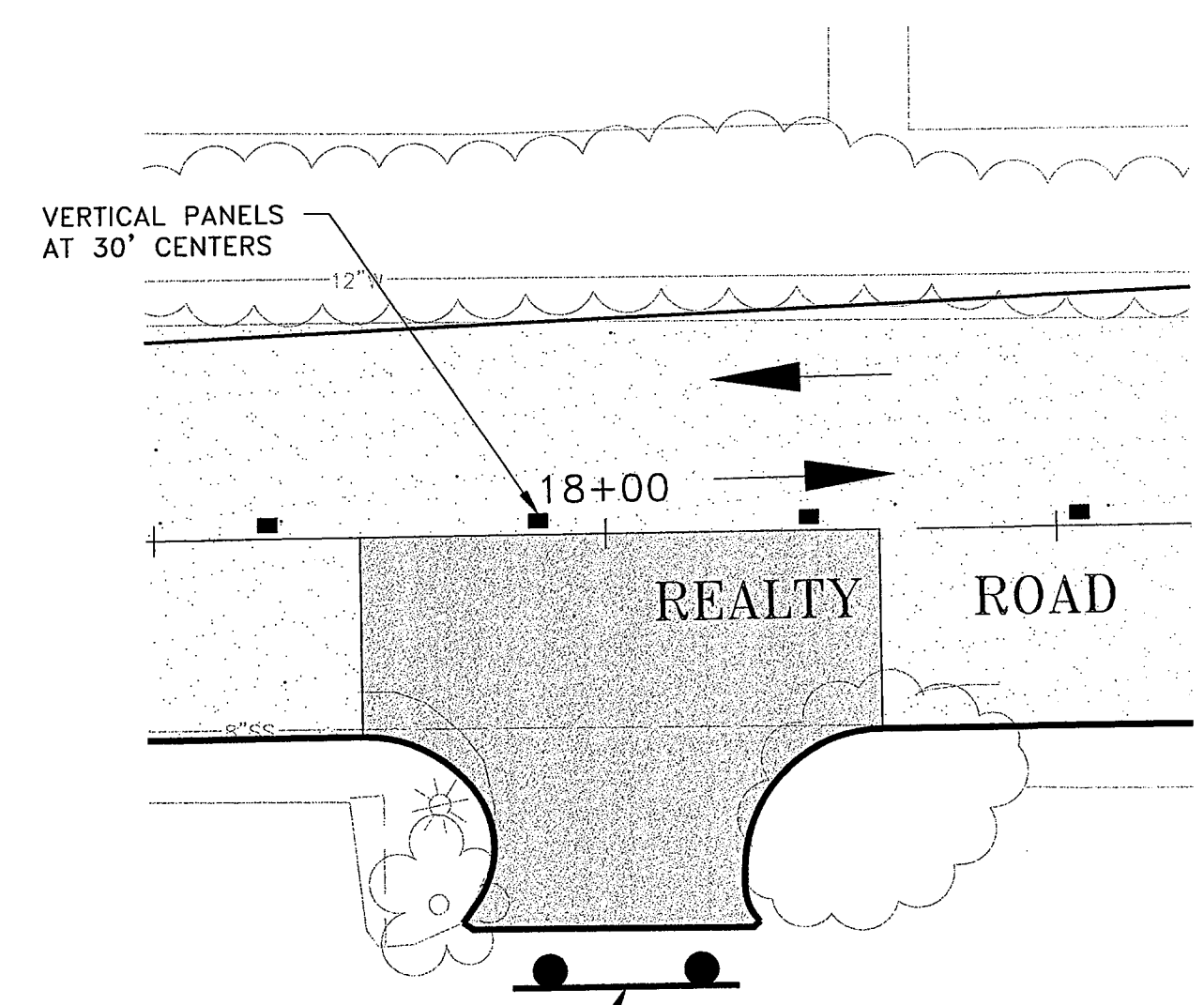
THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY:
 BRUCE R. GRANTHAM
 ON 02/14/02
 ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DATE: DECEMBER, 2001	SCALE: 1" = 20'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: JFW	REVIEWED: BRG
ARAPAHO ROAD PHASE II		
CONSTRUCTION SEQUENCE/TRAFFIC CONTROL PLAN		
STA. 30+00 TO END (PHASE II)		
TOWN OF ADDISON		
 Grantham, Burge & Waldbauer Engineers, Inc. 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042		SHT. CS-10 OF CS-11
(972) 840-1916 (TEL) (972) 840-2156 (FAX)		23

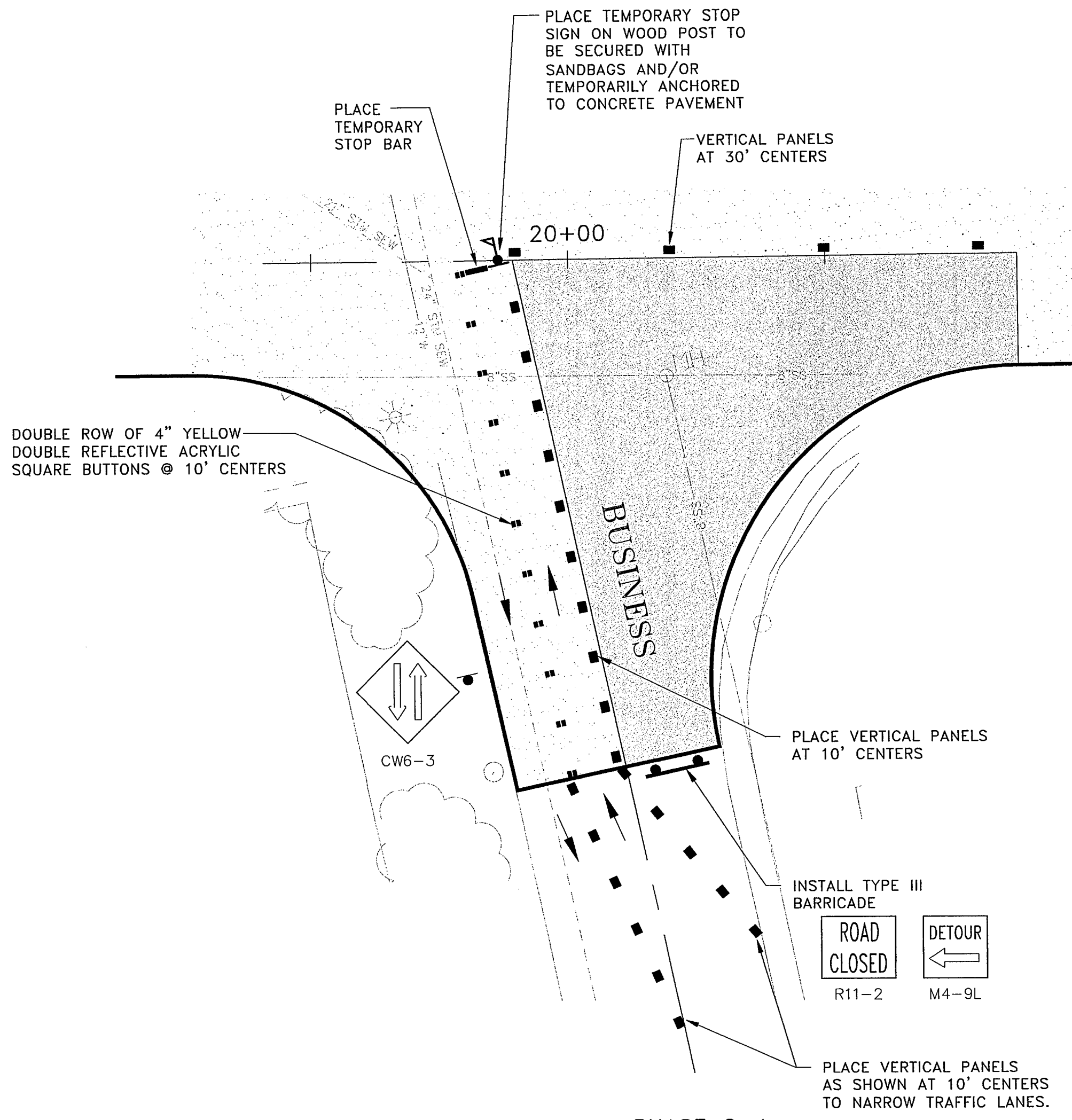
NO.	DATE	REVISION	APPROV.
1			
2			
3			



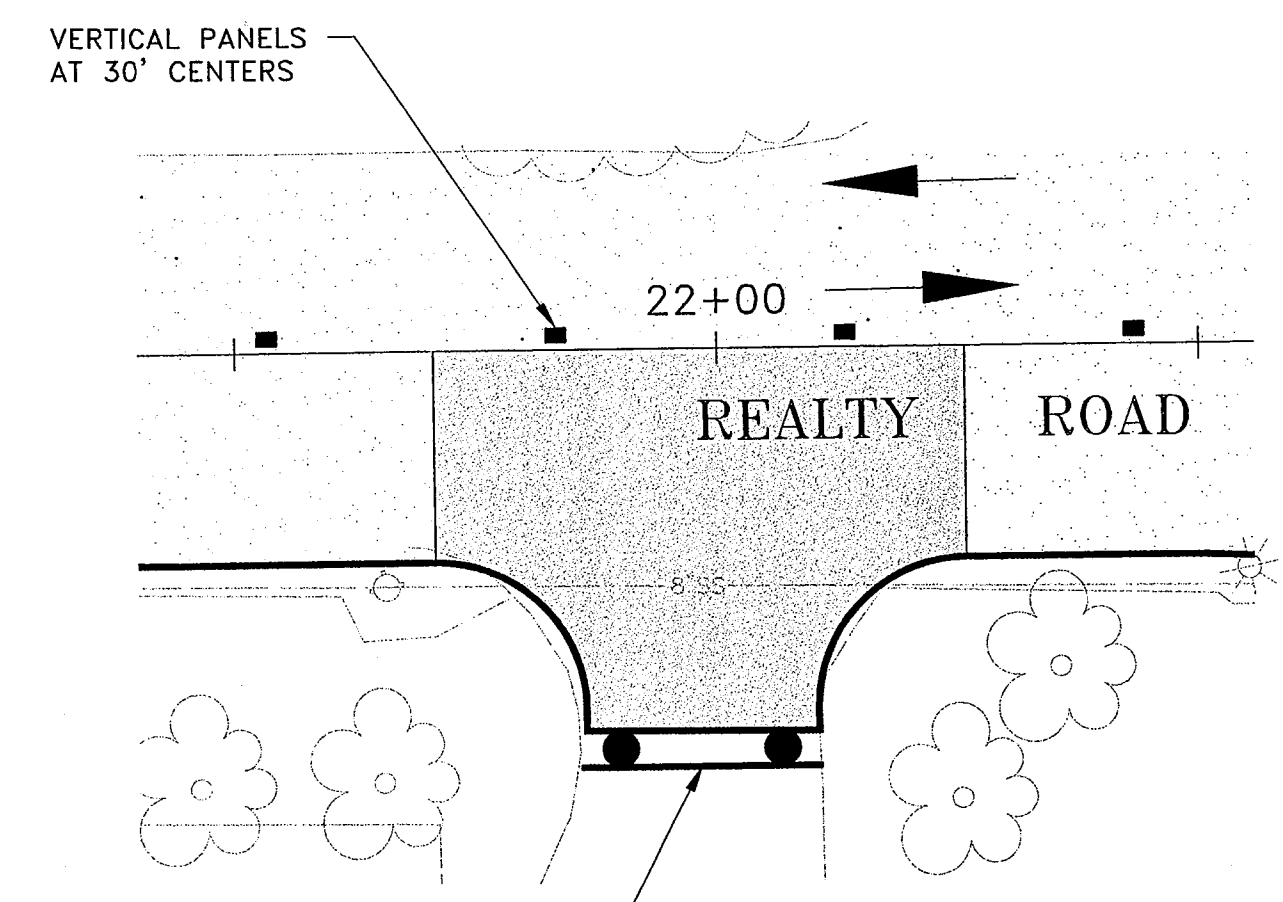
PHASE 2-A
DRIVEWAY AT STA. 14+01.44
NOT TO SCALE



PHASE 2-A
DRIVEWAY AT STA. 17+99.96
NOT TO SCALE



PHASE 2-A
BUSINESS AVENUE
NOT TO SCALE

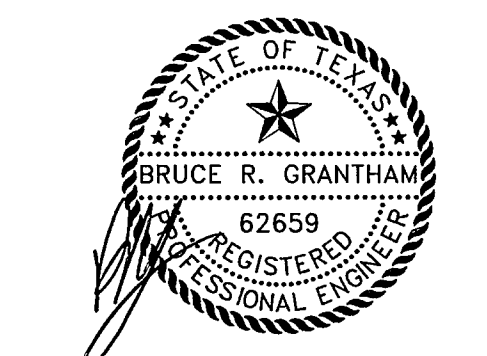


PHASE 2-A
DRIVEWAY AT STA. 21+98.12
NOT TO SCALE

LEGEND:

- UNDER CONSTRUCTION
- COMPLETED CONSTRUCTION
- TRAFFIC FLOW DURING CONSTRUCTION

- NOTES:**
- SEE GENERAL CONSTRUCTION SEQUENCING NOTES ON SHEET CS-5.
 - THE RIGHT NORTHBOUND LANE OF MARSH LANE MAY BE TEMPORARILY CLOSED DURING NON PEAK TRAFFIC HOURS WITH PRIOR APPROVAL OF THE TOWN TO ACCOMMODATE CONSTRUCTION OF ARAPAHO.
 - CONTRACTOR TO COORDINATE WITH TXU CONCERNING INSTALLATION OF STREET AND PEDESTRIAN LIGHTING. CONTRACTOR SHALL NOTIFY TXU A MINIMUM OF TWO WEEKS PRIOR TO COMPLETION OF LIGHTING FOUNDATIONS AND IN INSTALLATION OF CABLE CONDUITS. FOR TXU WORK RESPONSIBILITY SEE SHEET IL-1 THRU IL-5.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY:
BRUCE R. GRANTHAM
ON 02/14/02
ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: JFW	REVIEWED: BRG
DWG: 249CONST11.DWG		

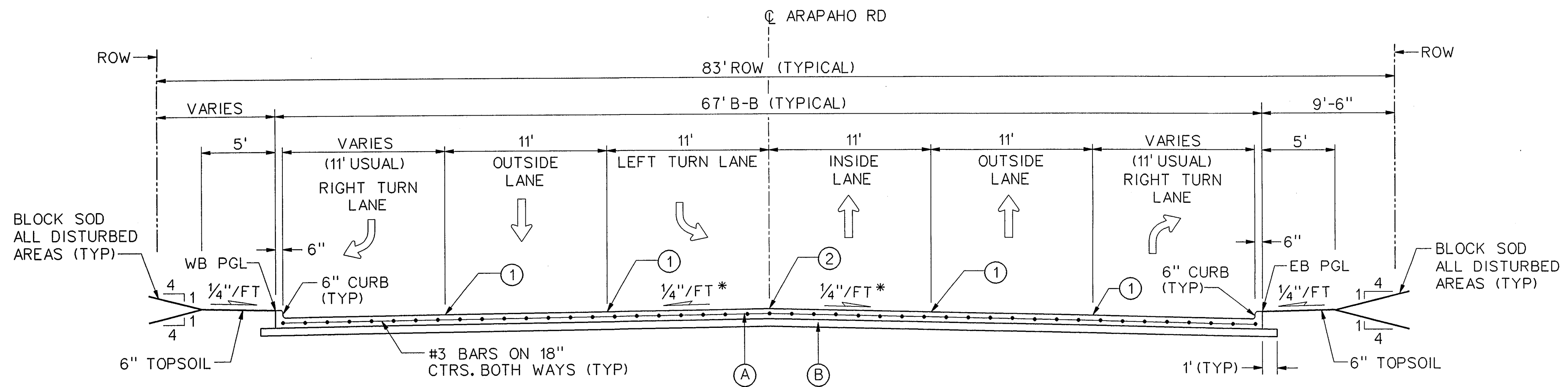
**ARAPAHO ROAD PHASE II
CONSTRUCTION SEQUENCE/TRAFFIC CONTROL PLAN
DRIVEWAY DETAILS - PHASE 2A**

TOWN OF ADDISON

**Grantham, Burge & Waldbauer
Engineers, Inc.**
1919 S. SHILOH ROAD, SUITE 530, L.B. 27
GARLAND, TEXAS 75042

(972) 840-1916 (TEL)
(972) 840-2155 (FAX)

SHT.
CS-11
OF
CS-11



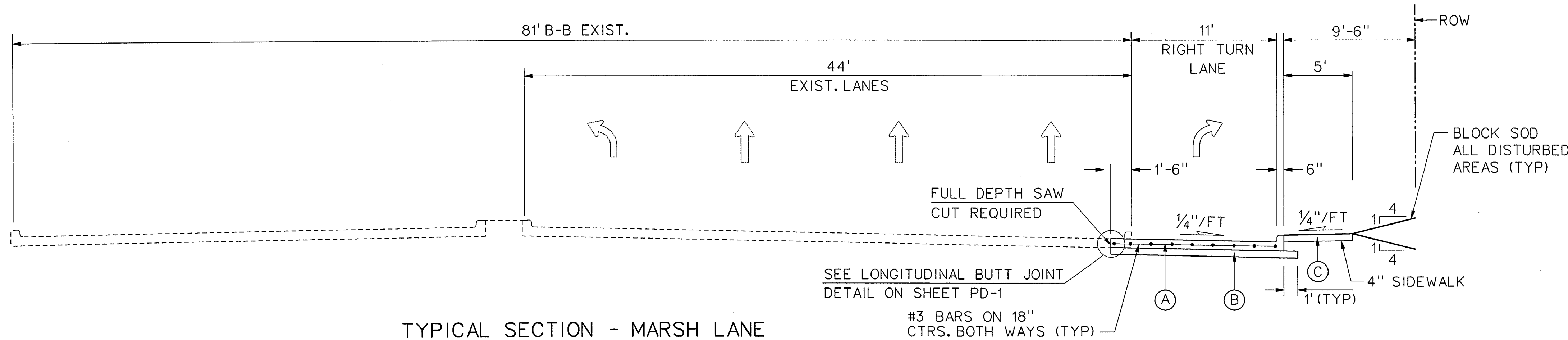
TYPICAL SECTION - ARAPAHO ROAD
4 LANE UNDIVIDED W/ WB AND EB RIGHT TURN LANE
 STA 10+41.06 TO STA 11+99.03

- NOTES:
1. INTEGRAL CURB & GUTTER SHALL CONFORM TO NCTCOG STD DWG NO. 2120.
 2. ALL TRANSVERSE JOINTS SHALL BE ON 11' CENTERS MAX.
 3. PROFILE GRADES SHOWN ON THE PAVING PLAN & PROFILE SHEETS ARE TOP OF CURB AT BACK OF CURB UNLESS NOTED OTHERWISE ON THE PLANS.
 4. SEE PAVING PLAN & PROFILE SHEETS FOR MEDIAN AND RIGHT TURN LANE TOP OF CURB GRADES.
 5. THE FINAL FINISH ON THE CONCRETE STREET PAVEMENT SHALL CONSIST OF A COMBINATION OF A LONGITUDINAL CARPET DRAG AND TRANSVERSE METAL TINE FINISH AS DESCRIBED IN TxDOT STANDARD SPECIFICATIONS FOR ITEM 360 - CONCRETE PAVEMENT UNLESS SPECIFIED OTHERWISE IN THE PLANS.

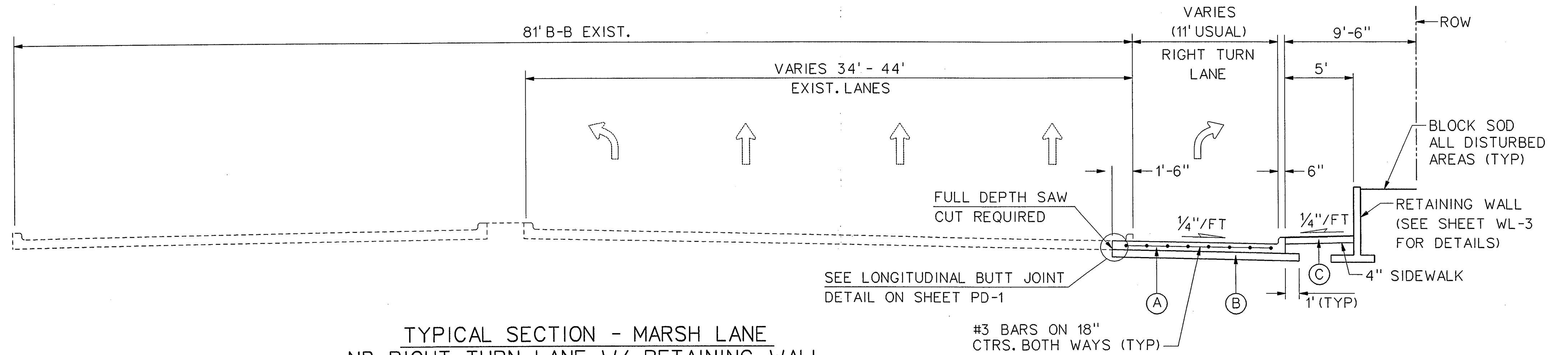
* PAVEMENT CROSS SLOPES VARY FROM THE TYPICAL 1/4"/FT. SEE PAVING PLANS FOR PROPOSED GRADES.

LEGEND

- (A) 8" 4000 p.s.i. REINFORCED PORTLAND CEMENT CONCRETE PVMT.
- (B) 6" LIME STABILIZED SUBGRADE
- (C) 4" SIDEWALK
- (1) SAWED LONGITUDINAL DUMMY JOINT.
- (2) CONSTRUCTION JOINT (FULL WIDTH PAVING IS ALLOWED WHERE APPROVED BY THE TOWN OF ADDISON) IF FULL WIDTH PAVING IS APPROVED, SAWED JOINT



TYPICAL SECTION - MARSH LANE
NB RIGHT TURN LANE
 MARSH LN STA 12+20.00 TO MARSH LN STA 13+16.79



TYPICAL SECTION - MARSH LANE
NB RIGHT TURN LANE W/ RETAINING WALL
 MARSH LN STA 10+00.00 TO MARSH LN STA 12+20.00



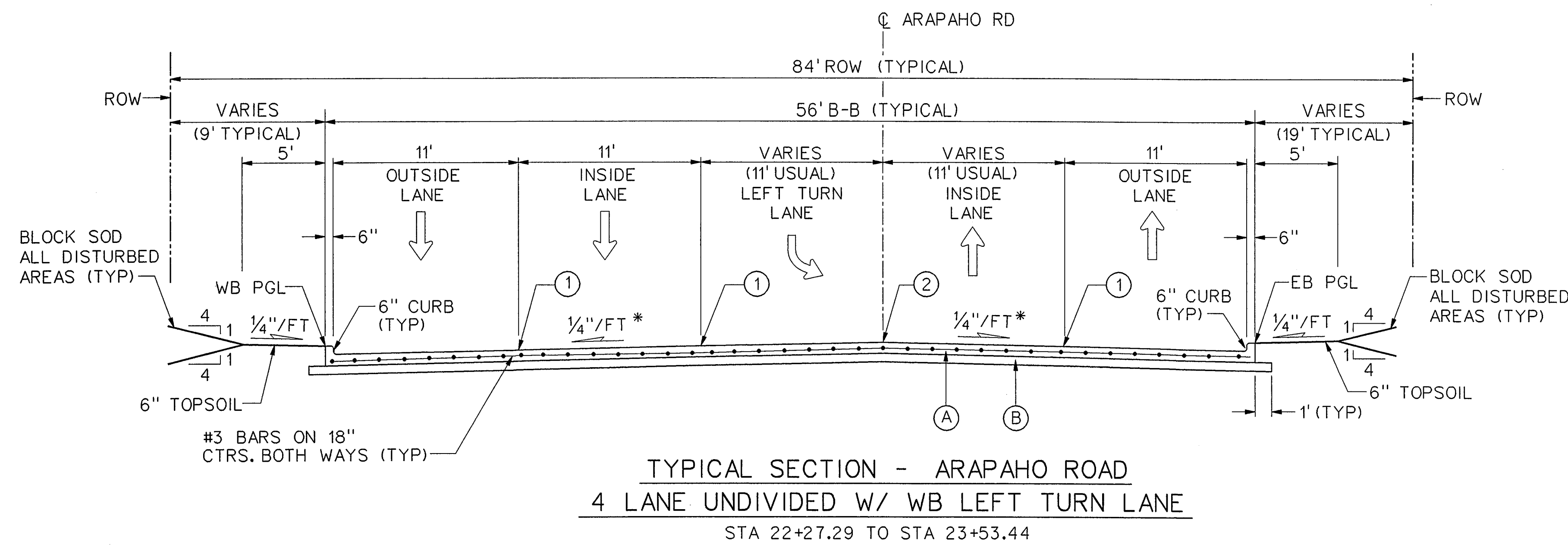
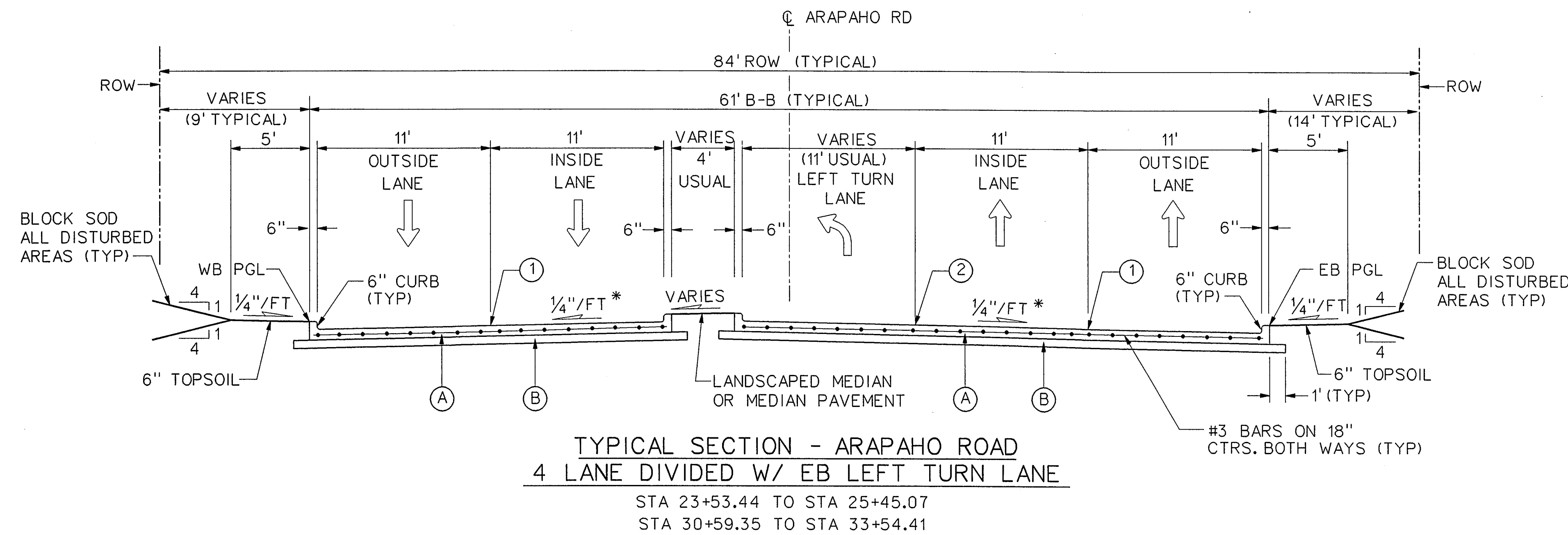
NO.		DATE		REVISION		APPROV.	
HNTB ARCHITECTS ENGINEERS PLANNERS The HNTB Companies							
ARAPAHO ROAD - PHASE II MARSH LANE TO SURVEYOR BOULEVARD PAVING TYPICAL SECTIONS SHEET 1 OF 4							
TOWN OF ADDISON, TEXAS							
Design	AMS	Drawn	GFS	DATE	SCALE	PROJECT NO.	SHEET ID
Check	JDH	Check	AMS	DEC 01	1" = 5'	25768	PT-1

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NOTES:

1. INTEGRAL CURB & GUTTER SHALL CONFORM TO NCTCOG STD DWG NO. 2120.
2. ALL TRANSVERSE JOINTS SHALL BE ON 11' CENTERS MAX.
3. PROFILE GRADES SHOWN ON THE PAVING PLAN & PROFILE SHEETS ARE TOP OF CURB AT BACK OF CURB UNLESS NOTED OTHERWISE ON THE PLANS.
4. SEE PAVING PLAN & PROFILE SHEETS FOR MEDIAN AND RIGHT TURN LANE TOP OF CURB GRADES.
5. THE FINAL FINISH ON THE CONCRETE STREET PAVEMENT SHALL CONSIST OF A COMBINATION OF A LONGITUDINAL CARPET DRAG AND TRANSVERSE METAL TINE FINISH AS DESCRIBED IN TxDOT STANDARD SPECIFICATIONS FOR ITEM 360 - CONCRETE PAVEMENT UNLESS SPECIFIED OTHERWISE IN THE PLANS.

* PAVEMENT CROSS SLOPES VARY FROM THE TYPICAL 1/4"/FT. SEE PAVING PLANS FOR PROPOSED GRADES.



LEGEND

- (A) 8" 4000 p.s.i. REINFORCED PORTLAND CEMENT CONCRETE PVMT.
- (B) 6" LIME STABILIZED SUBGRADE
- (C) 4" SIDEWALK
- (1) SAWED LONGITUDINAL DUMMY JOINT.
- (2) CONSTRUCTION JOINT (FULL WIDTH PAVING IS ALLOWED WHERE APPROVED BY THE TOWN OF ADDISON) IF FULL WIDTH PAVING IS APPROVED, SAWED JOINT



NO.	DATE	REVISION	APPROV.

HNTB ARCHITECTS ENGINEERS PLANNERS
 The HNTB Companies

ARAPAHO ROAD - PHASE II
 MARSH LANE TO SURVEYOR BOULEVARD

PAVING TYPICAL SECTIONS
 SHEET 3 OF 4

TOWN OF ADDISON, TEXAS

Design	AMS	Drawn	GFS	DATE	SCALE	PROJECT NO.	SHEET ID
Check	JDH	Check	AMS	DEC 01	1" = 5'	25768	PT-3

NOTES:

1. INTEGRAL CURB & GUTTER SHALL CONFORM TO NCTCOG STD DWG NO. 2120.

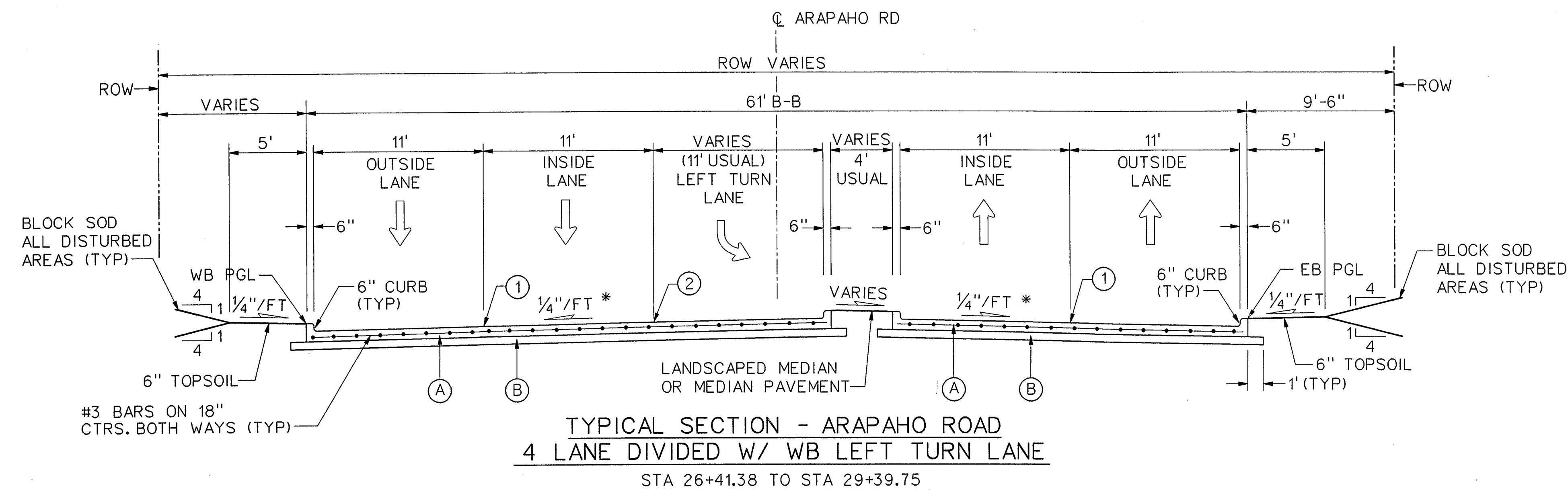
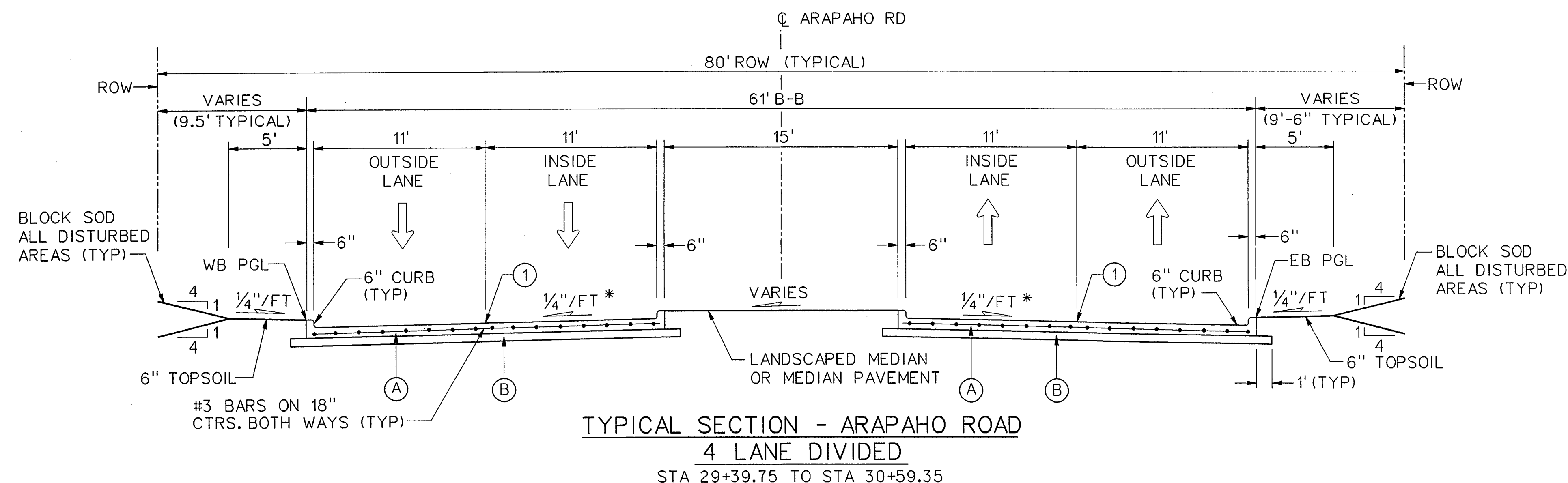
2. ALL TRANSVERSE JOINTS SHALL BE ON 11' CENTERS MAX.

3. PROFILE GRADES SHOWN ON THE PAVING PLAN & PROFILE SHEETS ARE TOP OF CURB AT BACK OF CURB UNLESS NOTED OTHERWISE ON THE PLANS.

4. SEE PAVING PLAN & PROFILE SHEETS FOR MEDIAN AND RIGHT TURN LANE TOP OF CURB GRADES.

5. THE FINAL FINISH ON THE CONCRETE STREET PAVEMENT SHALL CONSIST OF A COMBINATION OF A LONGITUDINAL CARPET DRAG AND TRANSVERSE METAL TINE FINISH AS DESCRIBED IN TxDOT STANDARD SPECIFICATIONS FOR ITEM 360 - CONCRETE PAVEMENT UNLESS SPECIFIED OTHERWISE IN THE PLANS.

* PAVEMENT CROSS SLOPES VARY FROM THE TYPICAL 1/4"/FT. SEE PAVING PLANS FOR PROPOSED GRADES.



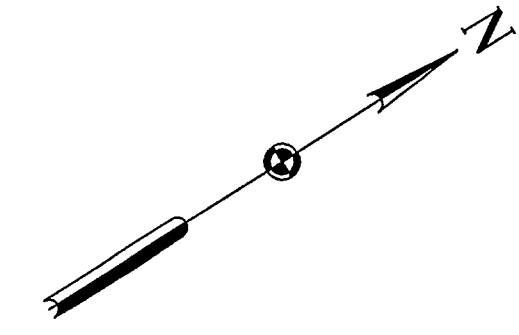
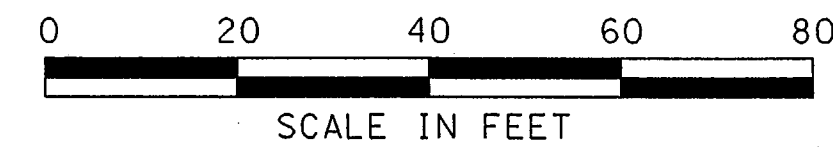
LEGEND

- (A) 8" 4000 p.s.i. REINFORCED PORTLAND CEMENT CONCRETE PVMT.
- (B) 6" LIME STABILIZED SUBGRADE
- (C) 4" SIDEWALK
- (1) SAWED LONGITUDINAL DUMMY JOINT.
- (2) CONSTRUCTION JOINT (FULL WIDTH PAVING IS ALLOWED WHERE APPROVED BY THE TOWN OF ADDISON) IF FULL WIDTH PAVING IS APPROVED, SAWED JOINT

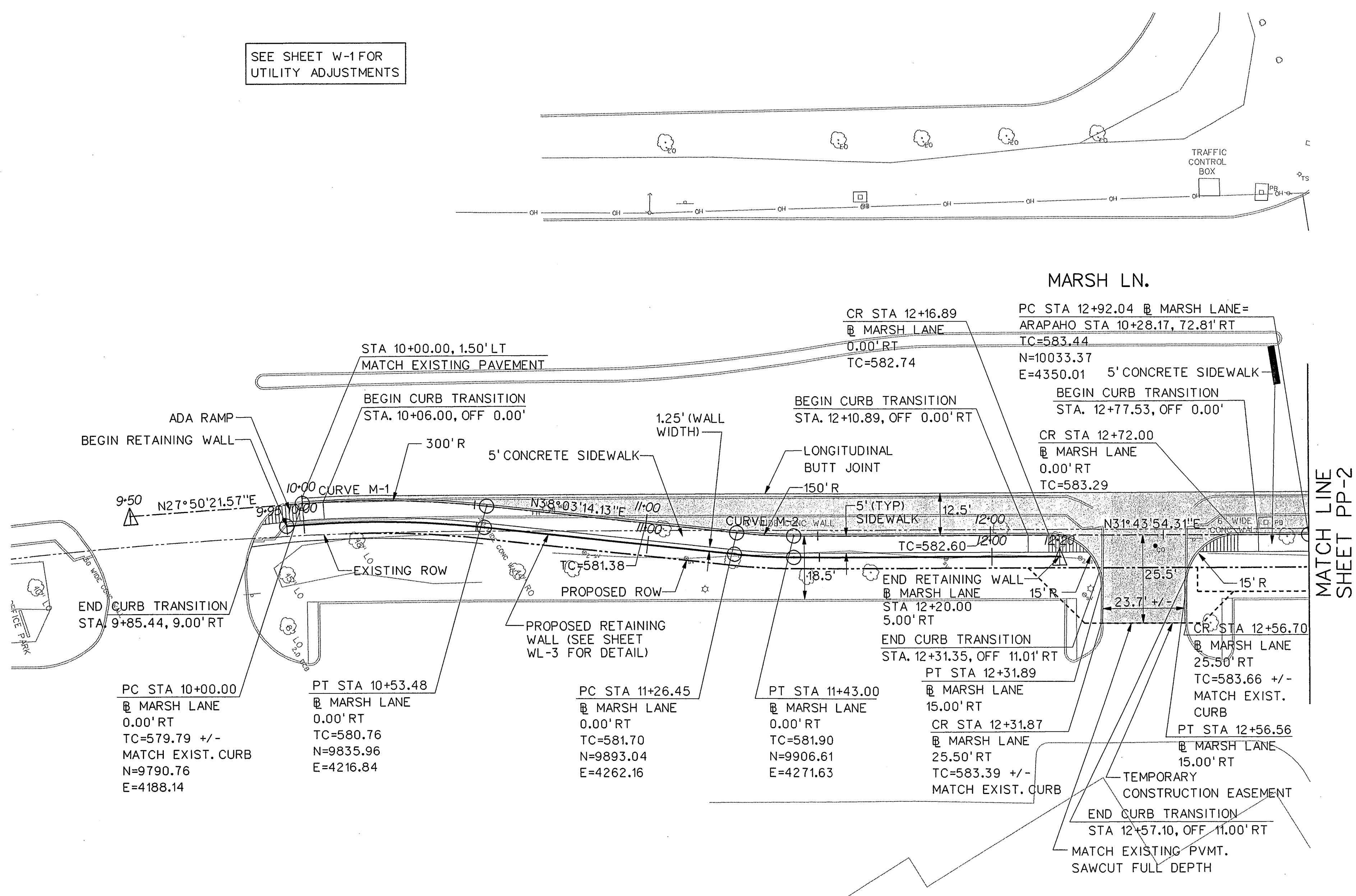


				28
NO.	DATE	REVISION	APPROV.	
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>				
ARAPAHO ROAD - PHASE II				
MARSH LANE TO SURVEYOR BOULEVARD				
PAVING TYPICAL SECTIONS				
SHEET 4 OF 4				
TOWN OF ADDISON, TEXAS				
Design	AMS	Drawn	GFS	DATE
Check	JDH	Check	AMS	DEC 01
SCALE	PROJECT NO.	SHEET ID		
1" = 5'	25768	PT-4		

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SEE SHEET W-1 FOR
UTILITY ADJUSTMENTS



LEGEND

- EXISTING CURB
- PROPOSED CURB
- TP=XXX.XX TOP OF PAVEMENT ELEVATION
- TC=XXX.XX TOP OF CURB ELEVATION
- CR CURB RETURN
- CP XXX CONTROL POINT
- X — FENCE
- ⊙ FIRE HYDRANT
- ☀ LIGHT POLE
- POWER POLE
- MH SAN. SEWER MANHOLE
- TT SIGN
- ✱ TL TRAFFIC SIGNAL
- ☁ VEGETATION
- ⊙ TREE
- W — WATER LINE
- - - PROPOSED @
- - - EXISTING ROW
- - - PROPOSED ROW
- - - TEMPORARY CONSTRUCTION EASEMENT
- ▨ PROPOSED PAVING
- ▩ PROPOSED GRAVEL

MARSH LANE BASELINE CURVE DATA

② CURVE M-1 DATA	② CURVE M-2 DATA
PI STA 10+26.81	STA 11+34.73
Δ = 10°12'52.56"	Δ = 06°19'19.81"
R = 300.00	R = 150.00
T = 26.81'	T = 8.28'
L = 53.48'	L = 16.55'

- NOTES:**
- ② FOR MARSH LANE IS ALONG BACK OF CURB OF NEW RIGHT TURN LANE.
 - ALL MEASUREMENTS SHOWN ON THIS SHEET ARE FROM BACK OF CURB.
 - SEE SHEET PT-1 FOR TYPICAL SECTIONS.



NO.	DATE	REVISION	APPROV.

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

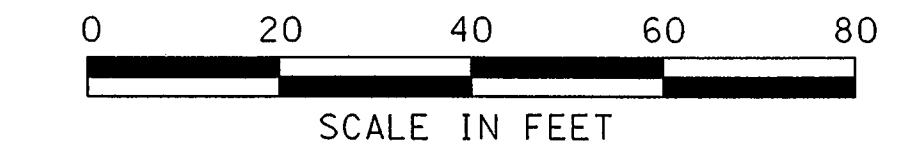
ARAPAHO ROAD - PHASE II
MARSH LANE TO SURVEYOR BOULEVARD

PAVING PLAN
MARSH LANE
STA 10+00.00 TO STA 12+92.04
TOWN OF ADDISON, TEXAS

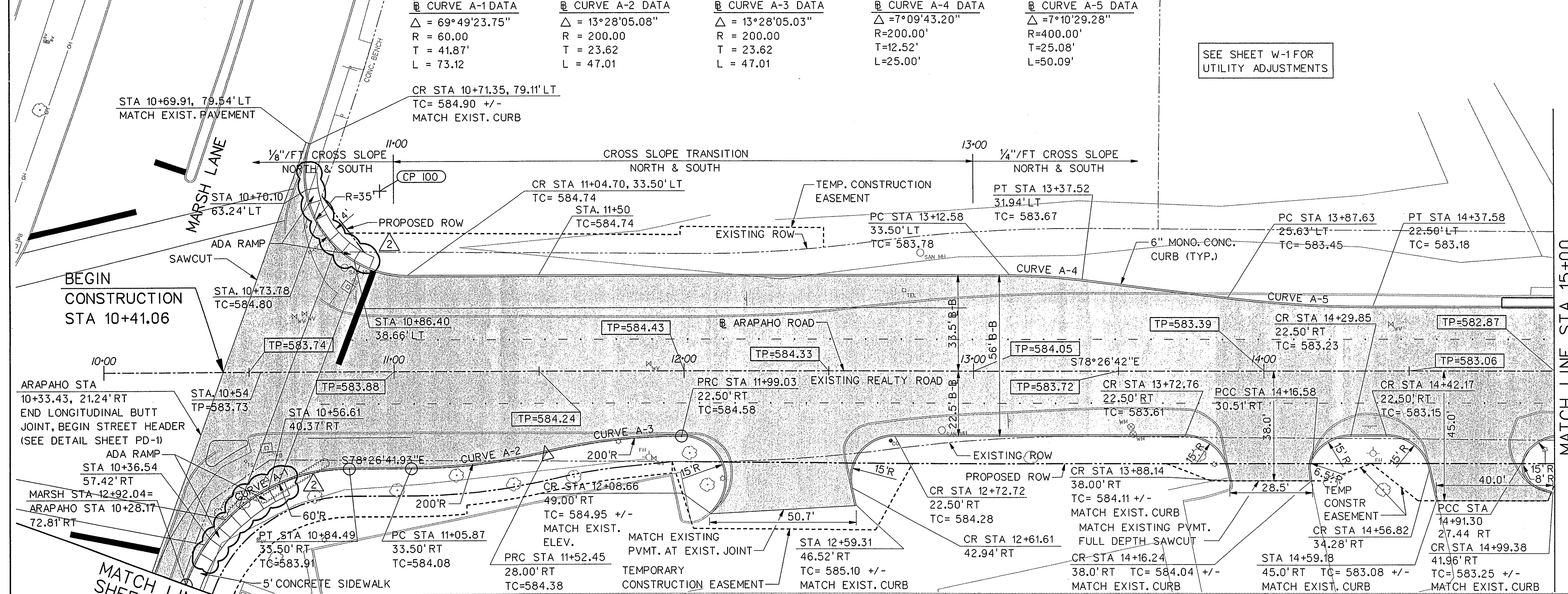
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Check AMS	Check AMS	DEC 01	1" = 20'	25768	PP-1

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CURVE A-1 DATA	CURVE A-2 DATA	CURVE A-3 DATA	CURVE A-4 DATA	CURVE A-5 DATA
$\Delta = 69^{\circ}49'23.75''$	$\Delta = 13^{\circ}28'05.08''$	$\Delta = 13^{\circ}28'05.03''$	$\Delta = 7^{\circ}09'43.20''$	$\Delta = 7^{\circ}10'29.28''$
R = 60.00	R = 200.00	R = 200.00	R = 200.00'	R = 400.00'
T = 41.87'	T = 23.62	T = 23.62	T = 12.52'	T = 25.08'
L = 73.12	L = 47.01	L = 47.01	L = 25.00'	L = 50.09'

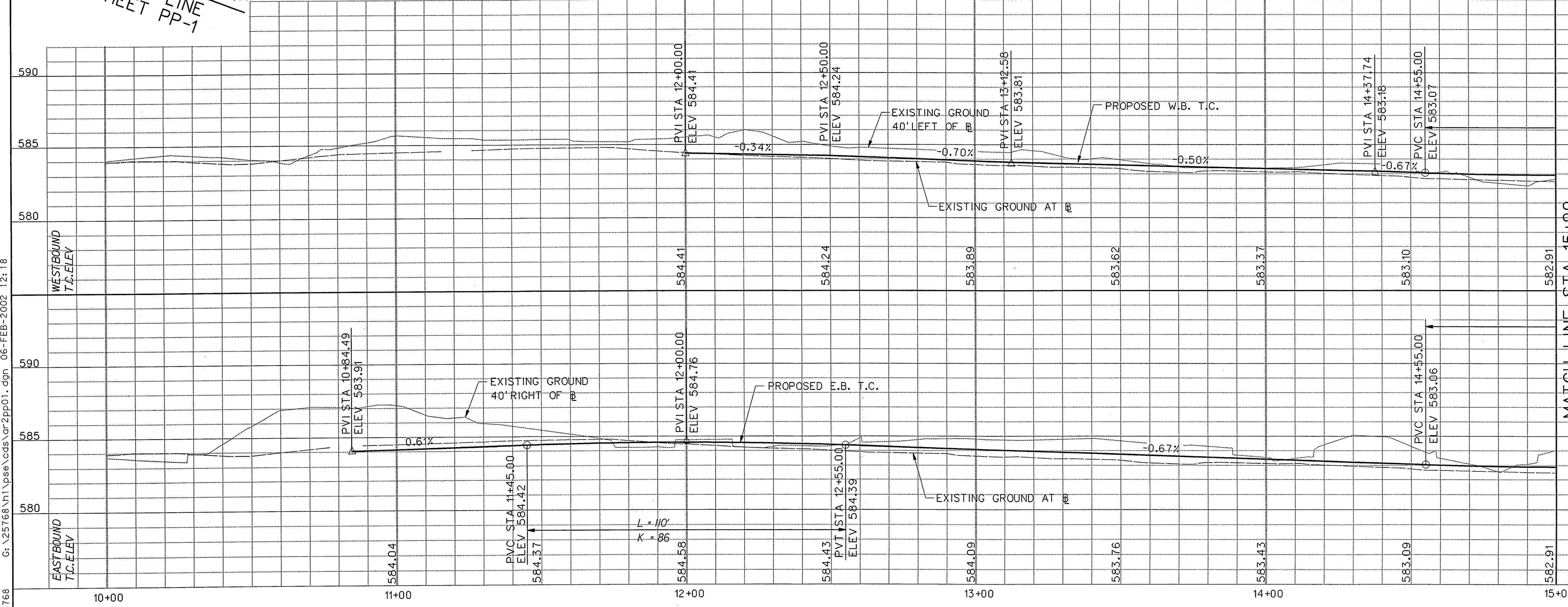


SEE SHEET W-1 FOR UTILITY ADJUSTMENTS



MATCH LINE STA. 15+00

- LEGEND**
- EXISTING CURB
 - PROPOSED CURB
 - TP=XXX.XX TOP OF PAVEMENT ELEVATION
 - TC=XXX.XX TOP OF CURB ELEVATION
 - CR CURB RETURN
 - CP XXX CONTROL POINT
 - FENCE
 - FIRE HYDRANT
 - ⊙ LIGHT POLE
 - POWER POLE
 - MH SAN. SEWER MANHOLE
 - ⊕ SIGN
 - ⊙ TL TRAFFIC SIGNAL
 - ⊞ VEGETATION
 - ⊙ TREE
 - W WATER LINE
 - - - PROPOSED
 - - - EXISTING ROW
 - - - PROPOSED ROW
 - - - TEMPORARY CONSTRUCTION EASEMENT
 - ▨ PROPOSED PAVING
 - ▩ PROPOSED GRAVEL



2	1-02	CHANGE ADA RAMP	AMS
NO.	DATE	REVISION	APPROV.

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

ARAPAHO ROAD - PHASE II
MARSH LANE TO SURVEYOR BOULEVARD

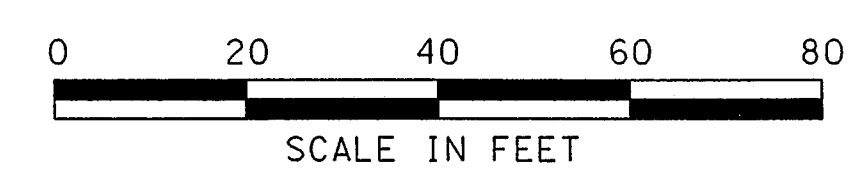
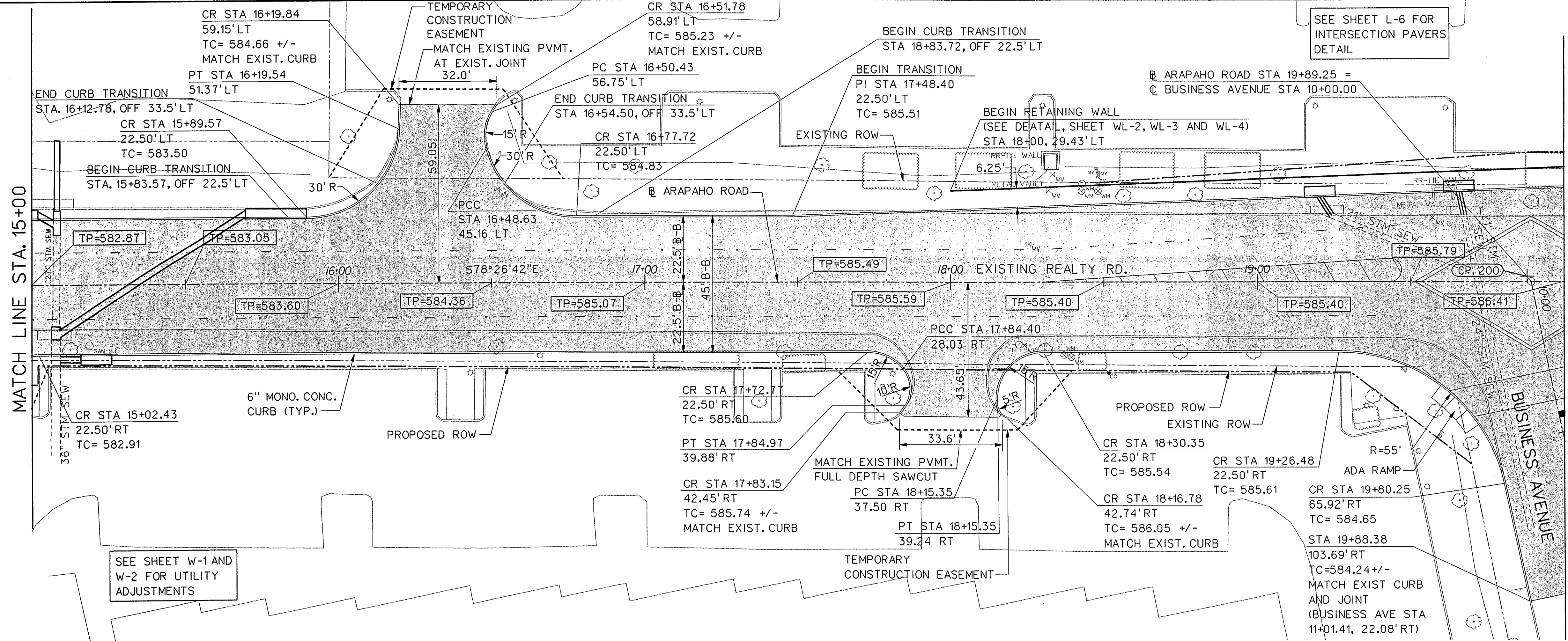
PAVING PLAN AND PROFILE
STA 10+41.06 TO STA 15+00

TOWN OF ADDISON, TEXAS

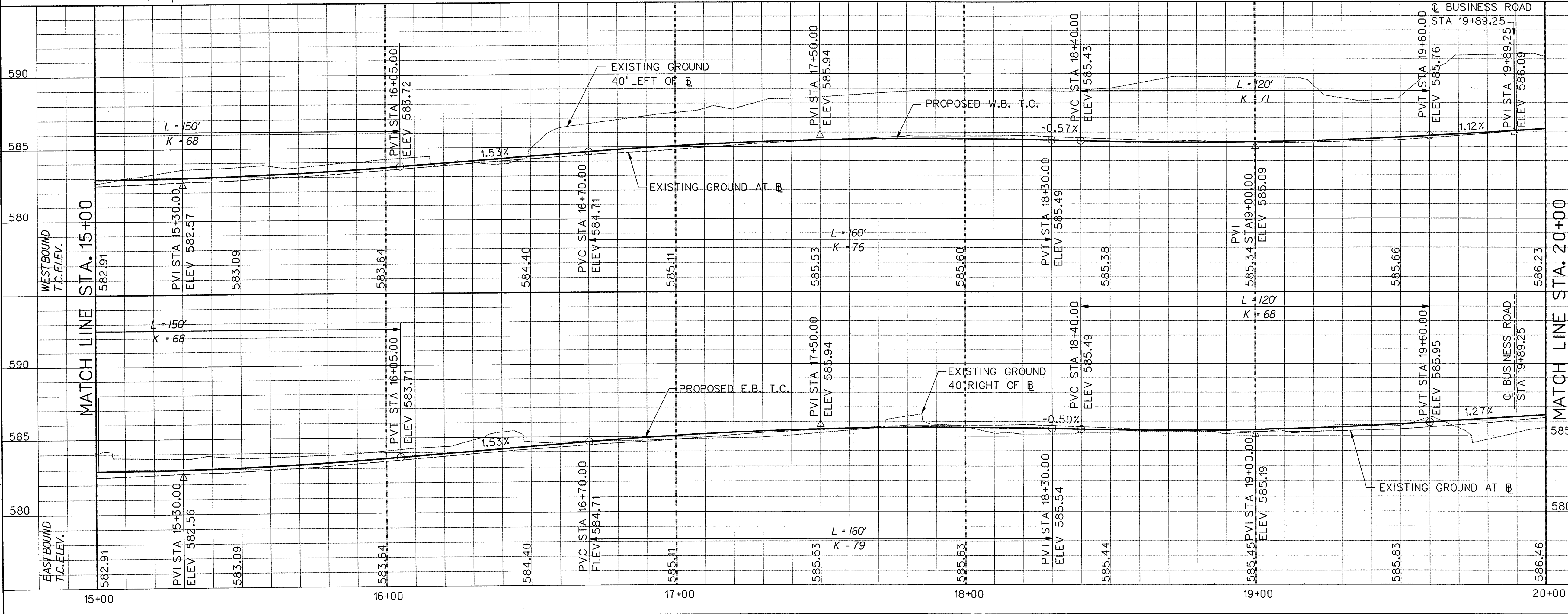
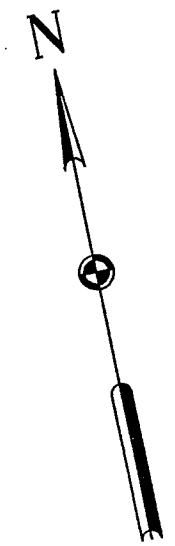
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Check	JDH	Check	AMS	DEC 01	H: 1"=20' V: 1"=4'	25768	PP-2

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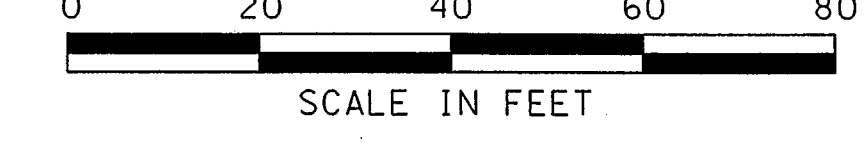
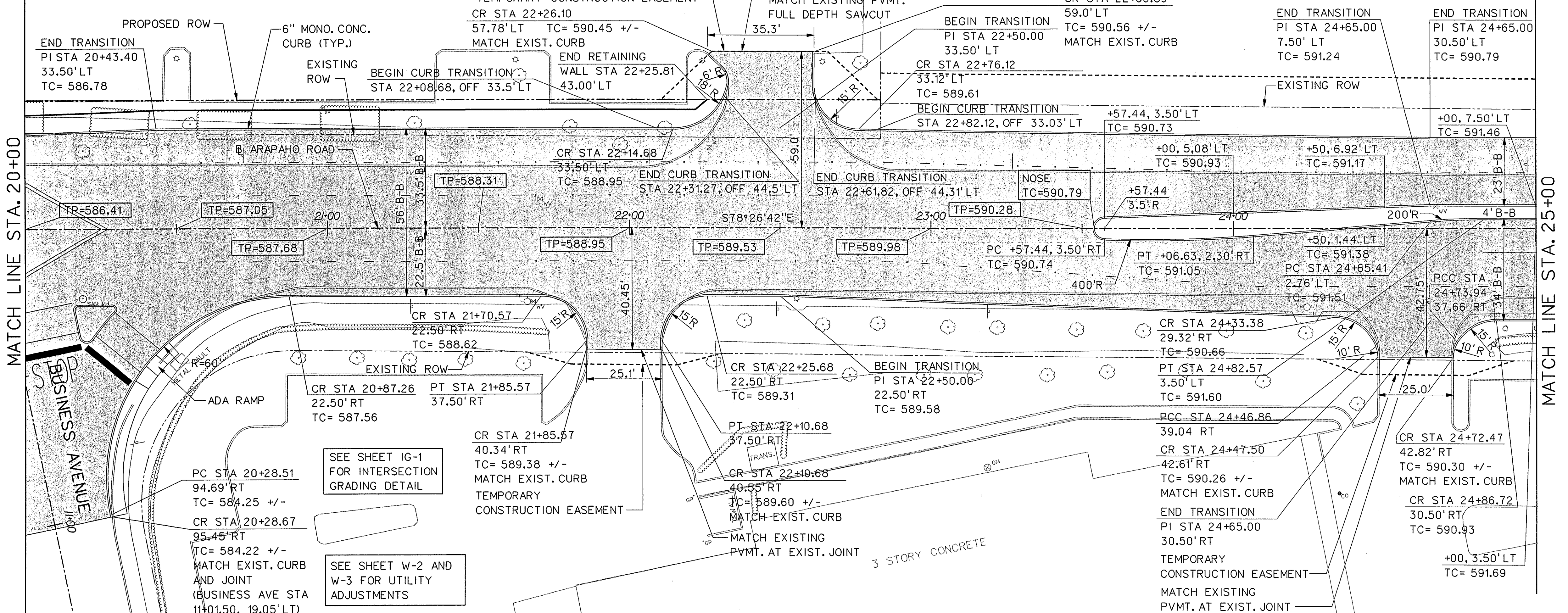


- LEGEND**
- EXISTING CURB
 - PROPOSED CURB
 - TP=XXX.XX TOP OF PAVEMENT ELEVATION
 - TC=XXX.XX TOP OF CURB ELEVATION
 - CR CURB RETURN
 - CP XXX CONTROL POINT
 - FENCE
 - FIRE HYDRANT
 - ⊙ LIGHT POLE
 - POWER POLE
 - MH SAN. SEWER MANHOLE
 - ⊥ SIGN
 - ⊗ TL TRAFFIC SIGNAL
 - ⊞ VEGETATION
 - ⊙ TREE
 - W WATER LINE
 - PROPOSED
 - EXISTING ROW
 - PROPOSED ROW
 - TEMPORARY CONSTRUCTION EASEMENT
 - ▨ PROPOSED PAVING
 - ▩ PROPOSED GRAVEL

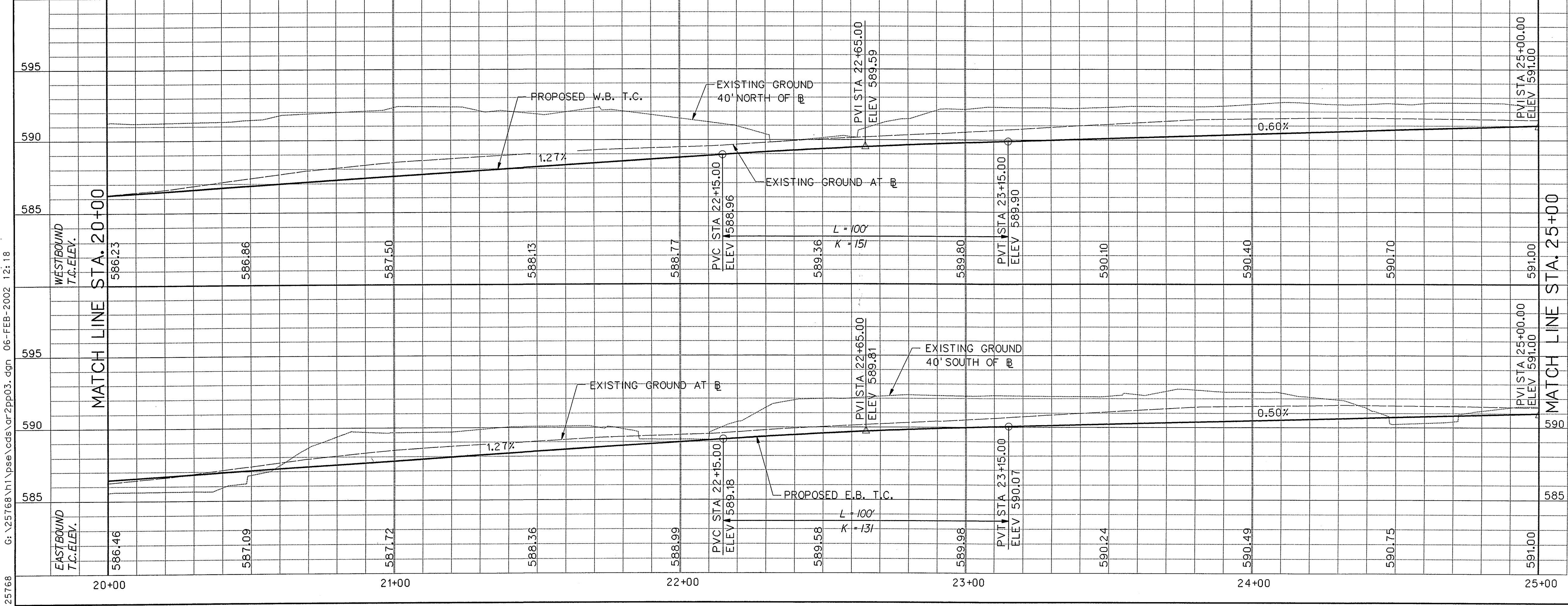


NO.	DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS The HNTB Companies			
ARAPAHO ROAD - PHASE II MARSH LANE TO SURVEYOR BOULEVARD PAVING PLAN AND PROFILE STA 15+00 TO STA 20+00 TOWN OF ADDISON, TEXAS			
Design AMS	Drawn AGF	DATE	SCALE
Check JDH	Check AMS	DEC 01	H: 1"= 20' V: 1"= 4'
PROJECT NO. 25768		SHEET ID PP-3	

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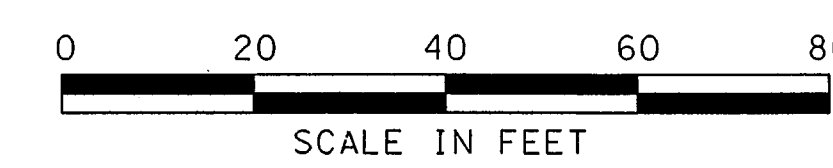
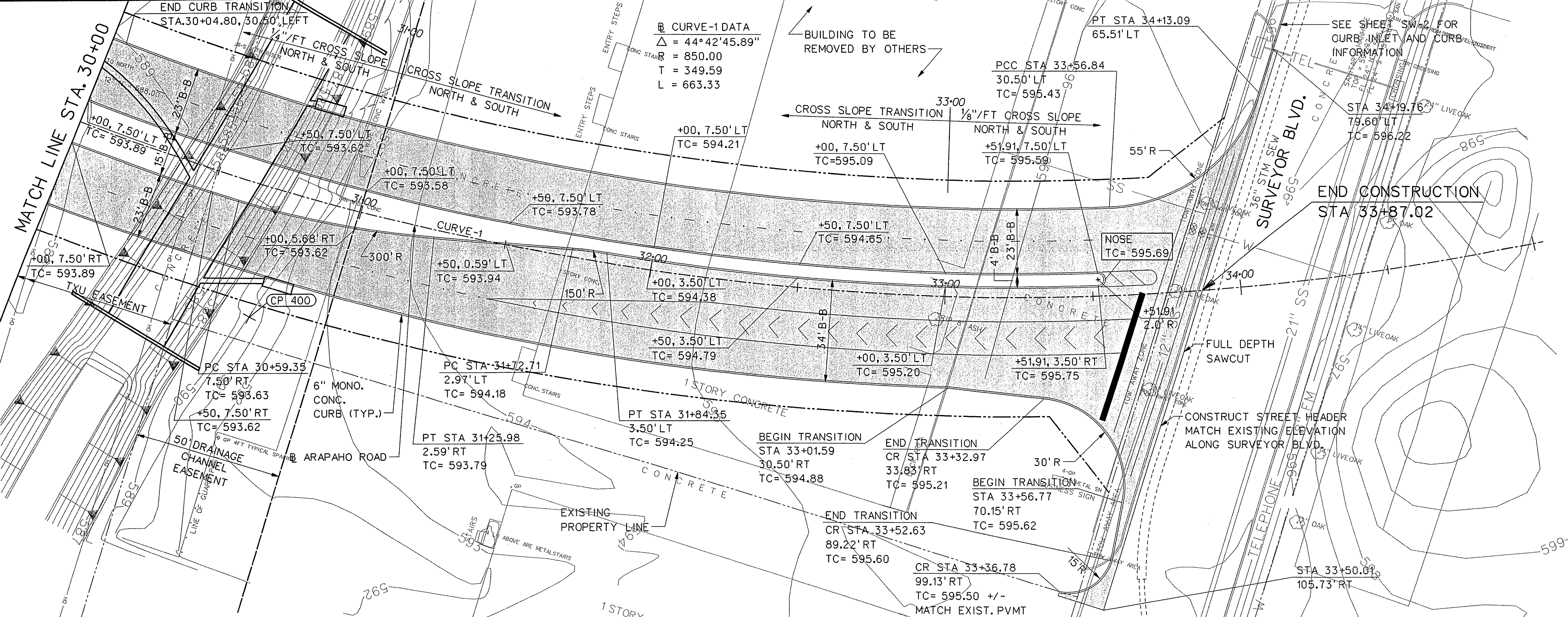


- LEGEND**
- EXISTING CURB
 - PROPOSED CURB
 - TP=XXX.XX TOP OF PAVEMENT ELEVATION
 - TC=XXX.XX TOP OF CURB ELEVATION
 - CR CURB RETURN
 - CP XXX CONTROL POINT
 - FENCE
 - FIRE HYDRANT
 - ☼ LIGHT POLE
 - POWER POLE
 - MH SAN. SEWER MANHOLE
 - SIGN
 - ☼ TL TRAFFIC SIGNAL
 - ☁ VEGETATION
 - TREE
 - W WATER LINE
 - - - PROPOSED
 - - - EXISTING ROW
 - - - PROPOSED ROW
 - - - TEMPORARY CONSTRUCTION EASEMENT
 - ▨ PROPOSED PAVING
 - ▨ PROPOSED GRAVEL

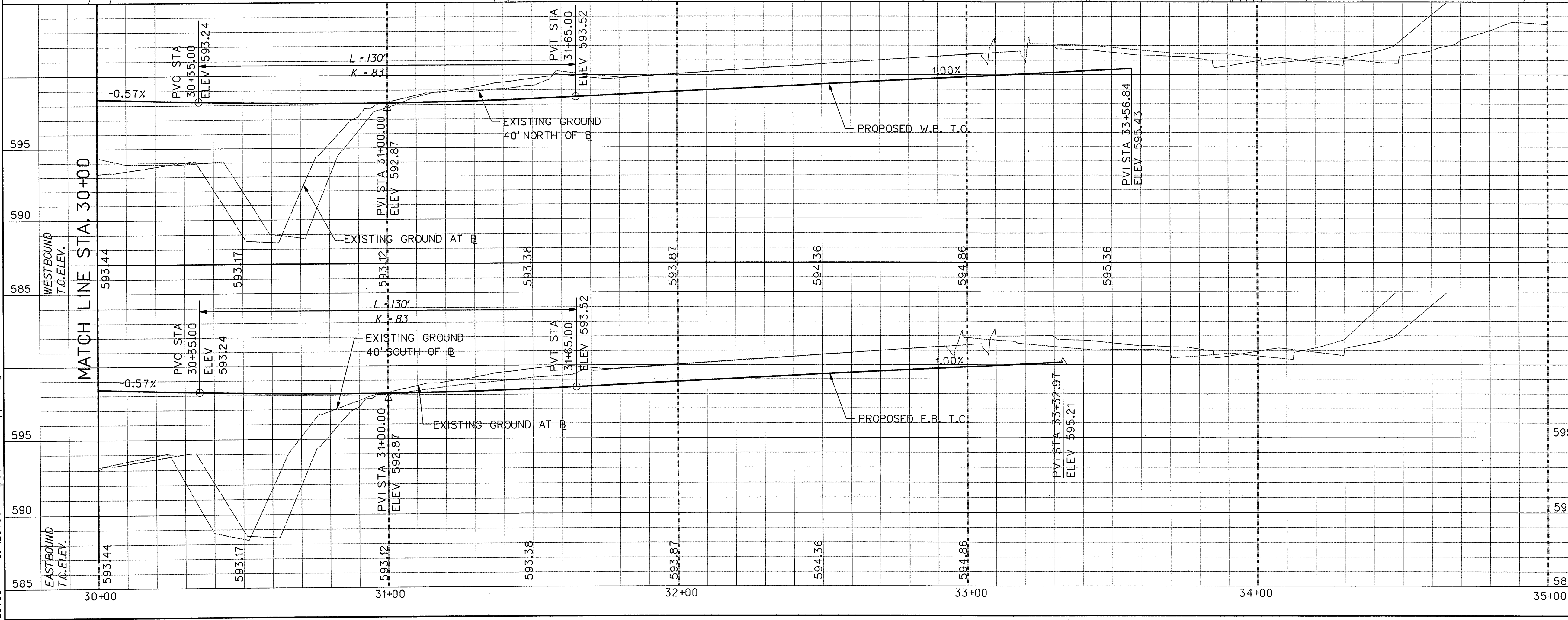


NO.	DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS The HNTB Companies ARAPAH0 ROAD - PHASE II MARSH LANE TO SURVEYOR BOULEVARD PAVING PLAN AND PROFILE STA 20+00 TO STA 25+00 TOWN OF ADDISON, TEXAS			
Design	AMS	Drawn	AGF
DATE	DEC 01	SCALE	H: 1"=20'
Check	JDH	Check	AMS
PROJECT NO.	25768	SHEET ID	PP-4

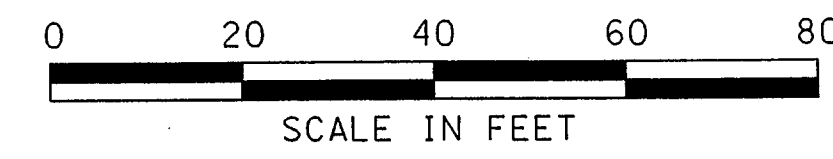
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LEGEND	
	EXISTING CURB
	PROPOSED CURB
	TOP OF PAVEMENT ELEVATION
	TOP OF CURB ELEVATION
	CURB RETURN
	CONTROL POINT
	FENCE
	FIRE HYDRANT
	LIGHT POLE
	POWER POLE
	SAN. SEWER MANHOLE
	SIGN
	TRAFFIC SIGNAL
	VEGETATION
	TREE
	WATER LINE
	PROPOSED E
	EXISTING ROW
	PROPOSED ROW
	TEMPORARY CONSTRUCTION EASEMENT
	PROPOSED PAVING
	PROPOSED GRAVEL

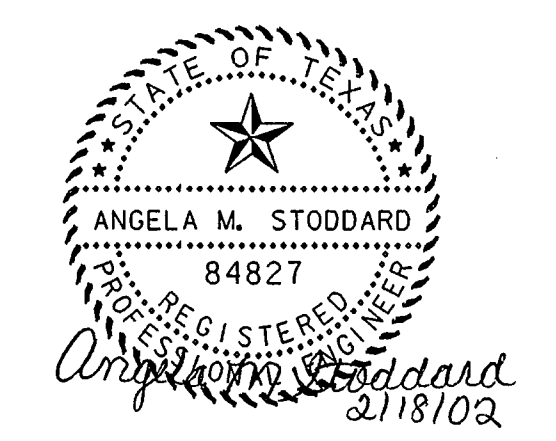
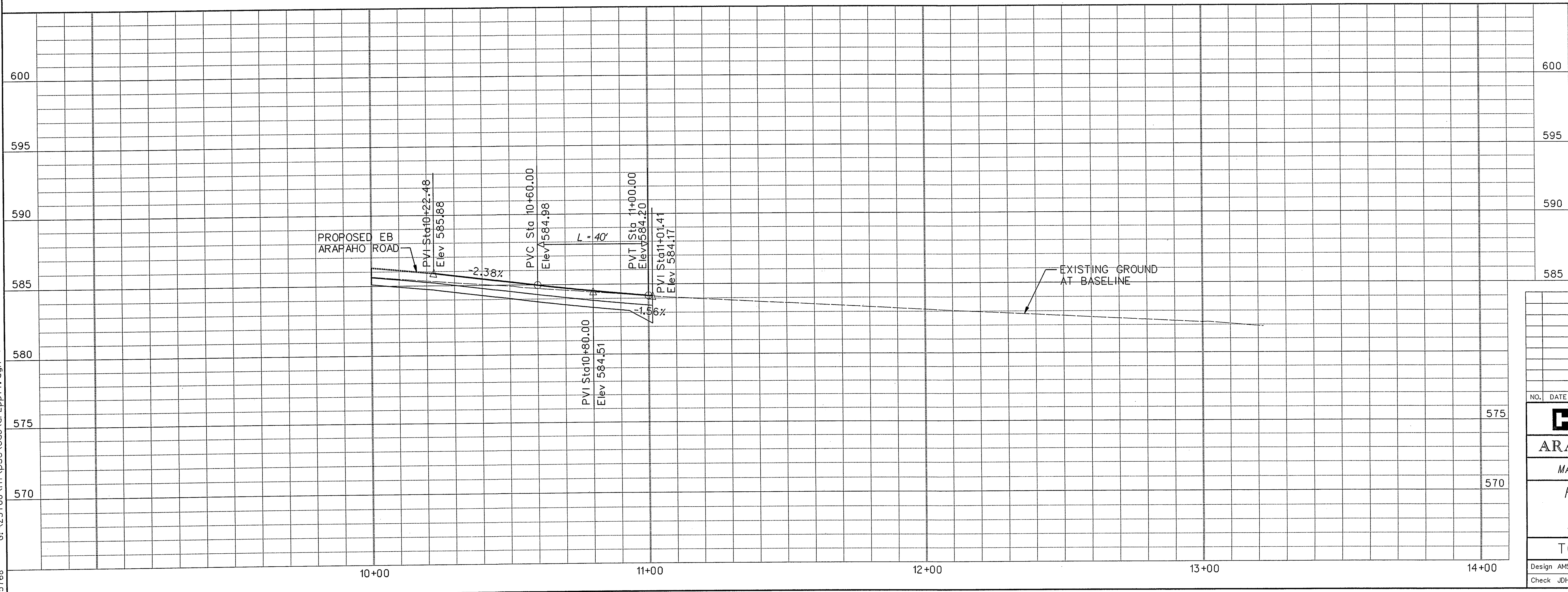
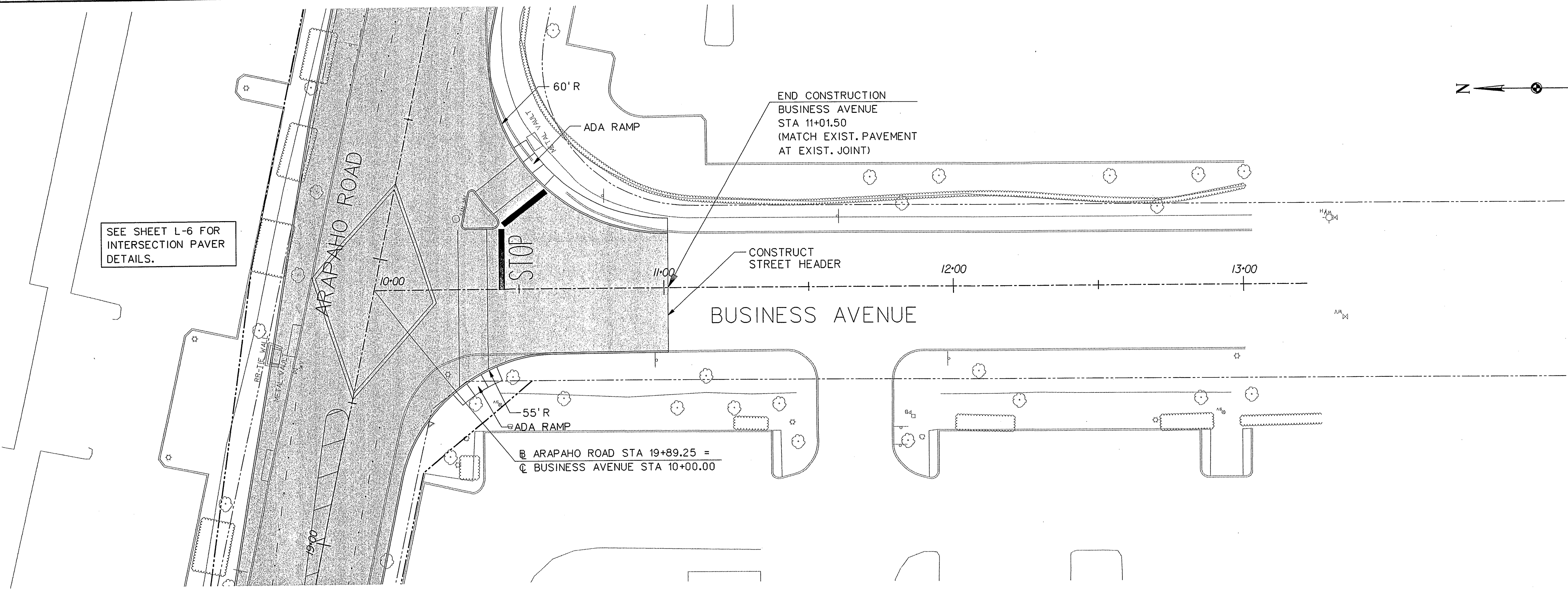


NO.	DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS The HNTB Companies			
ARAPAHO ROAD - PHASE II			
MARSH LANE TO SURVEYOR BOULEVARD			
PAVING PLAN AND PROFILE			
STA 30+00 TO STA 33+87.02			
TOWN OF ADDISON, TEXAS			
Design	AMS	Drawn	AGF
Check	JDH	Check	AMS
DATE	DEC 01	SCALE	H: 1"=20' V: 1"=4'
PROJECT NO.	25768	SHEET ID	PP-6



LEGEND

- EXISTING CURB
- PROPOSED CURB
- TP=XXX.XX TOP OF PAVEMENT ELEVATION
- TC=XXX.XX TOP OF CURB ELEVATION
- CR CURB RETURN
- CP XXX CONTROL POINT
- FENCE
- FIRE HYDRANT
- ☼ LIGHT POLE
- POWER POLE
- MH SAN. SEWER MANHOLE
- ⊥ SIGN
- ☼ TL TRAFFIC SIGNAL
- ☼ VEGETATION
- TREE
- W — WATER LINE
- PROPOSED Ⓜ
- EXISTING ROW
- PROPOSED ROW
- TEMPORARY CONSTRUCTION EASEMENT
- ▨ PROPOSED PAVING
- ▩ PROPOSED GRAVEL



NO.	DATE	REVISION	APPROV.

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

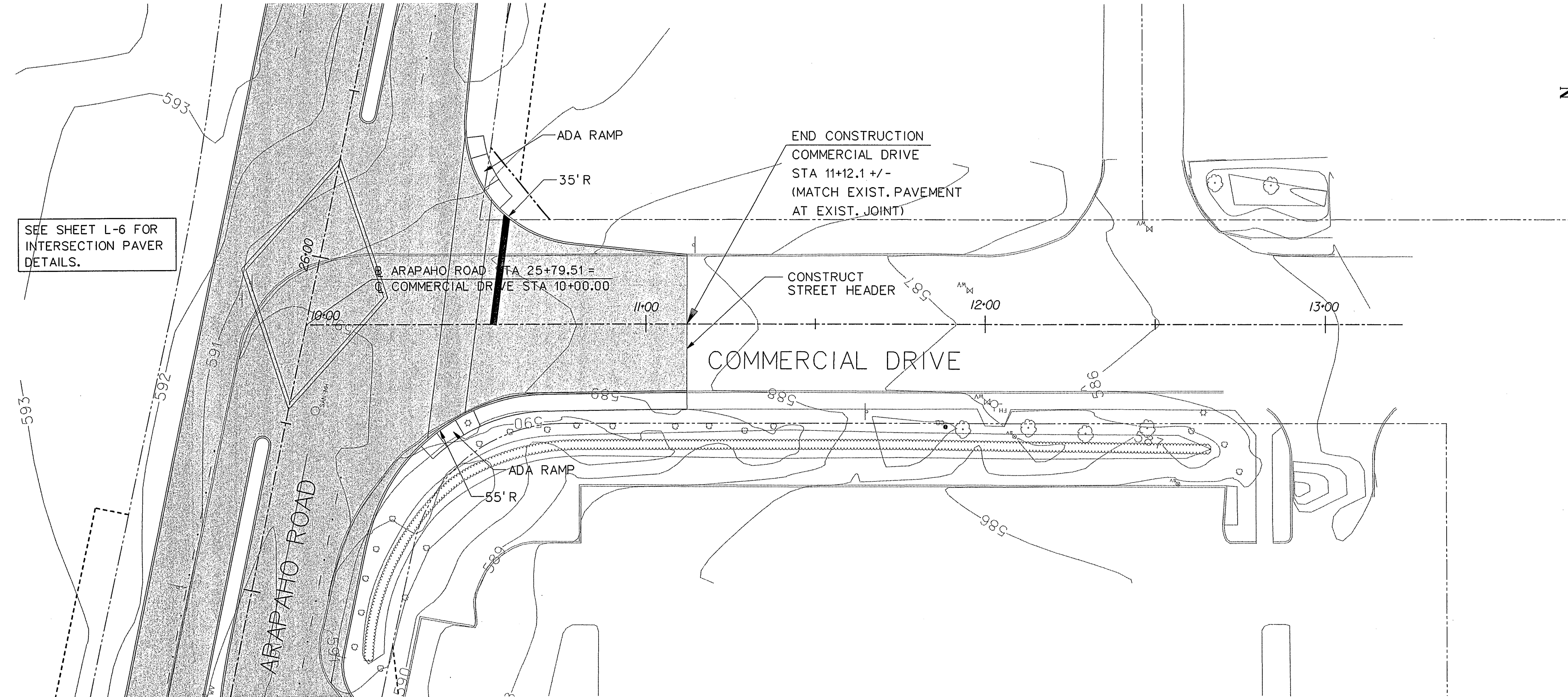
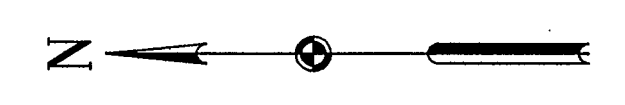
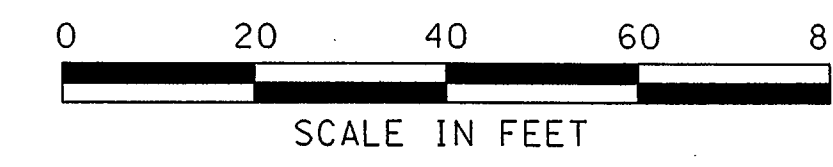
ARAPAHO ROAD - PHASE II
MARSH LANE TO SURVEYOR BOULEVARD

PAVING PLAN AND PROFILE
BUSINESS AVENUE
STA 10+00 TO STA 11+01.50

TOWN OF ADDISON, TEXAS

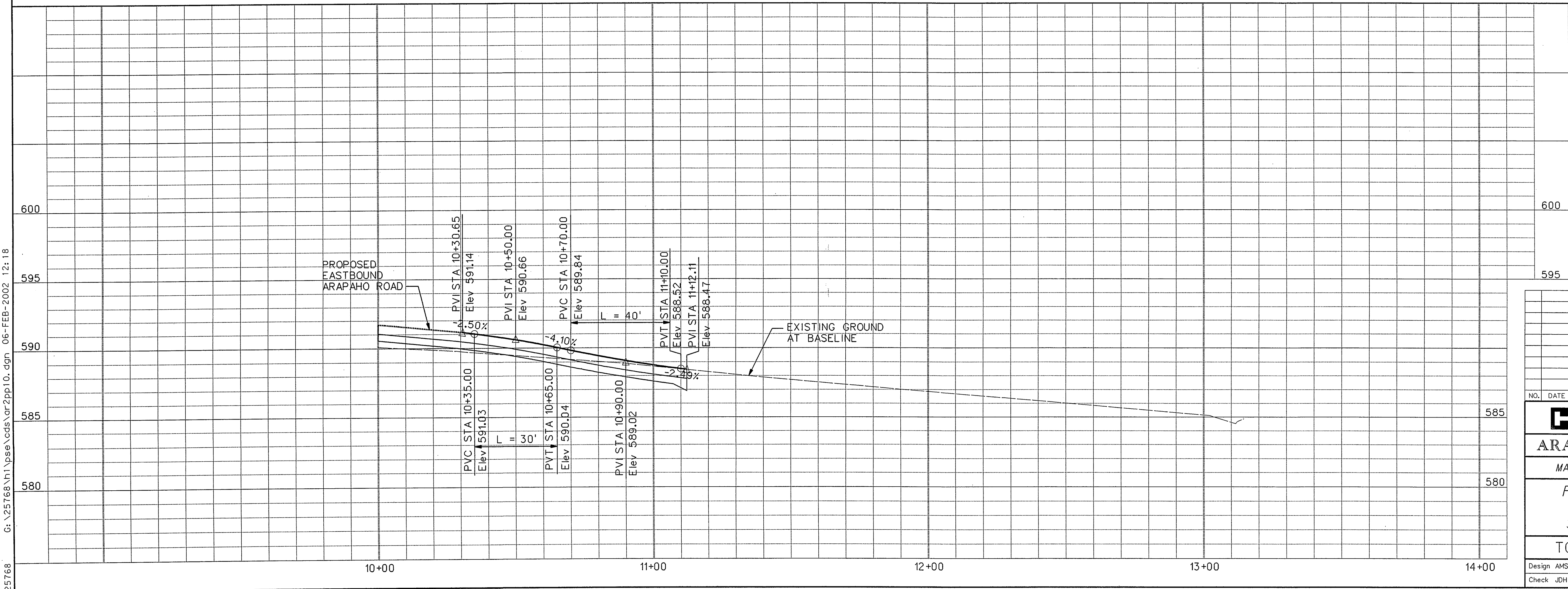
Design AMS	Drawn GFS	DATE	SCALE	PROJECT NO.	SHEET ID
Check JDH	Check AMS	DEC 01	H: 1" = 20' V: 1" = 4'	25768	PP-7

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SEE SHEET L-6 FOR INTERSECTION PAVEMENT DETAILS.

LEGEND	
	EXISTING CURB
	PROPOSED CURB
	TOP OF PAVEMENT ELEVATION
	TOP OF CURB ELEVATION
	CURB RETURN
	CONTROL POINT
	FENCE
	FIRE HYDRANT
	LIGHT POLE
	POWER POLE
	SAN. SEWER MANHOLE
	SIGN
	TRAFFIC SIGNAL
	VEGETATION
	TREE
	WATER LINE
	PROPOSED ROW
	EXISTING ROW
	PROPOSED ROW
	TEMPORARY CONSTRUCTION EASEMENT
	PROPOSED PAVING
	PROPOSED GRAVEL



NO.	DATE	REVISION	APPROV.

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

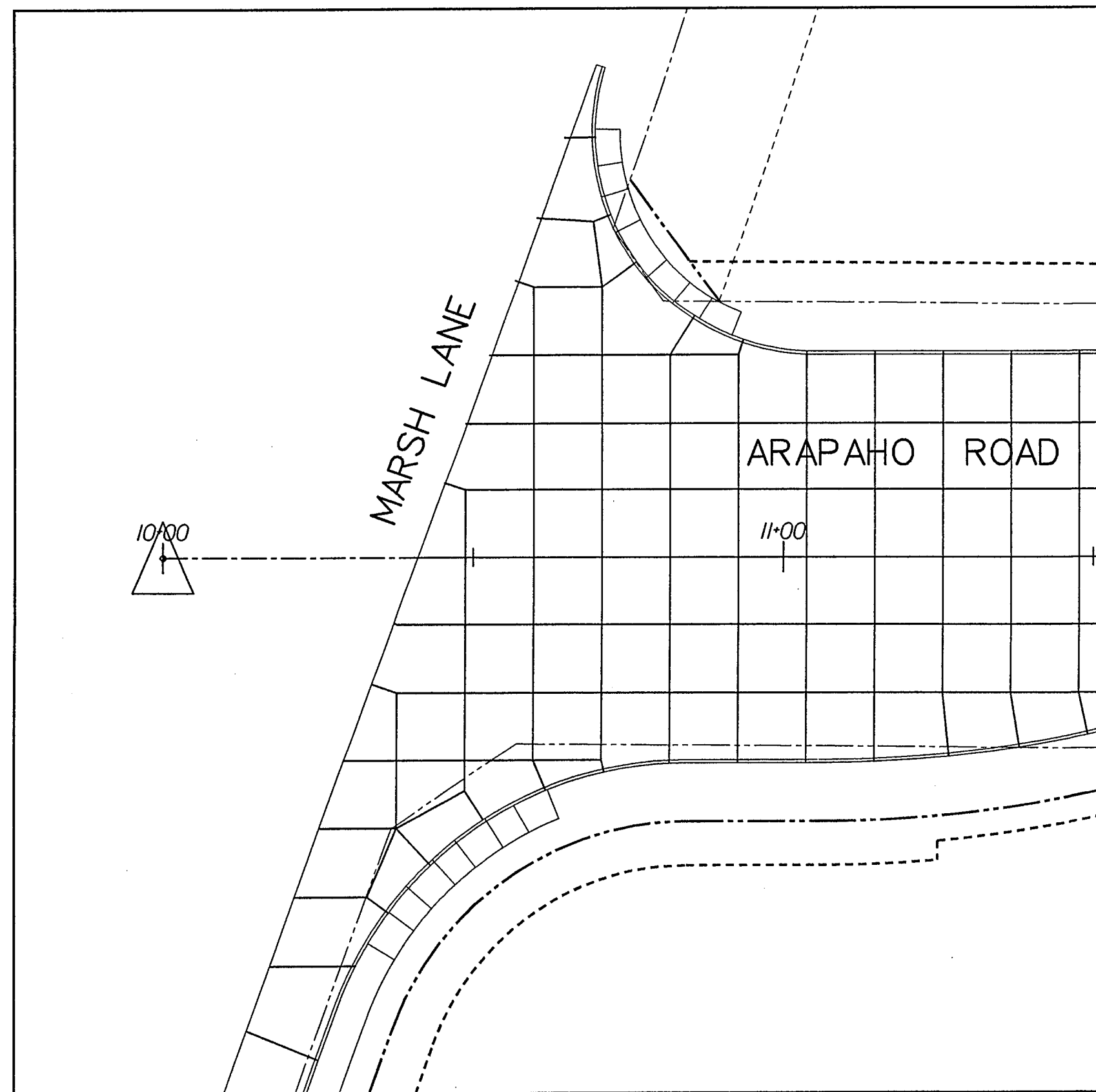
ARAPAHO ROAD - PHASE II
MARSH LANE TO SURVEYOR BOULEVARD

PAVING PLAN AND PROFILE
COMMERCIAL DRIVE
STA 10+00 TO STA 11+12.11

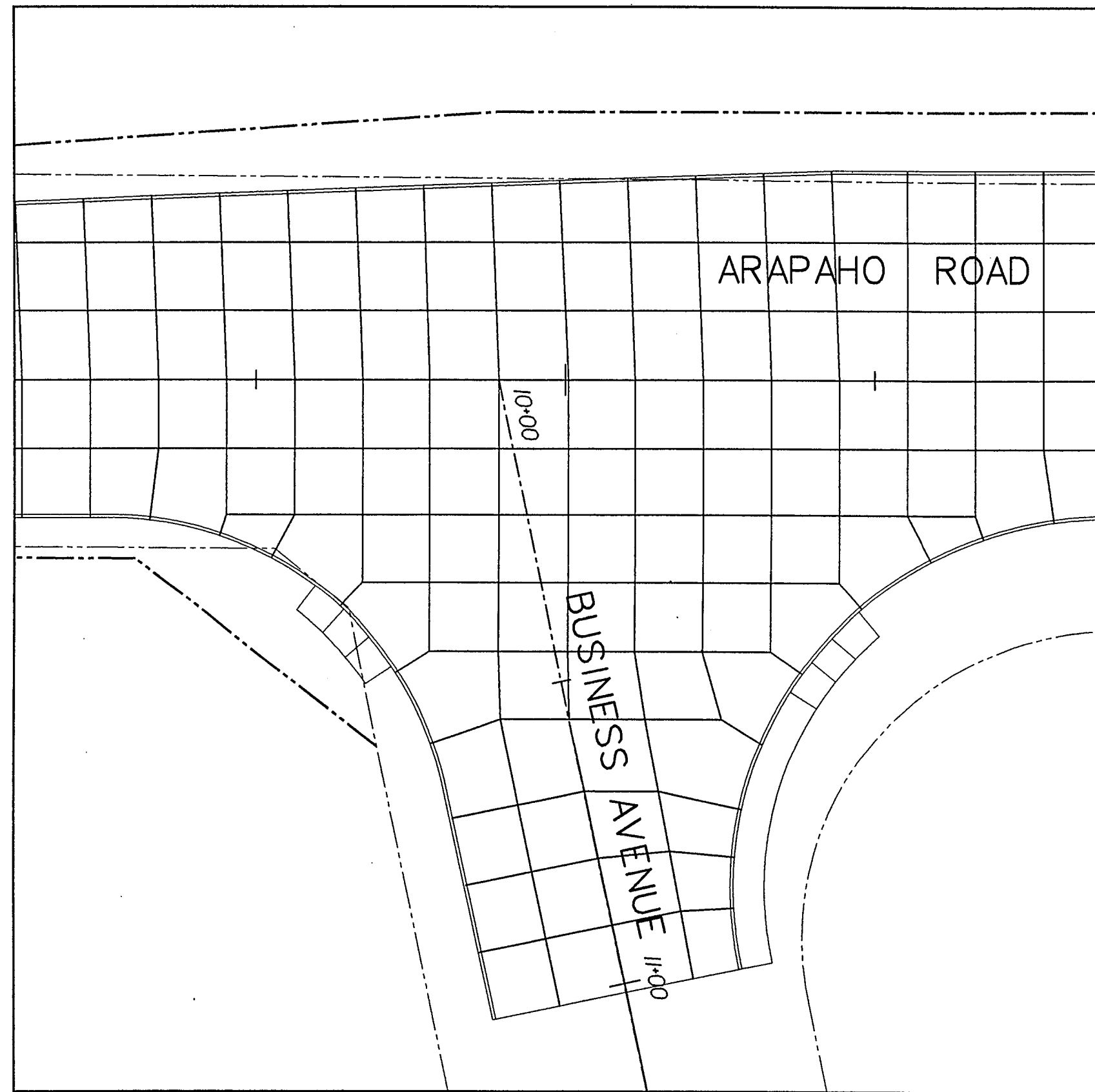
TOWN OF ADDISON, TEXAS

Design AMS	Drawn GFS	DATE	SCALE	PROJECT NO.	SHEET ID
Check JDH	Check AMS	DEC 01	H: 1"= 20' V: 1"= 4'	25768	PP-8

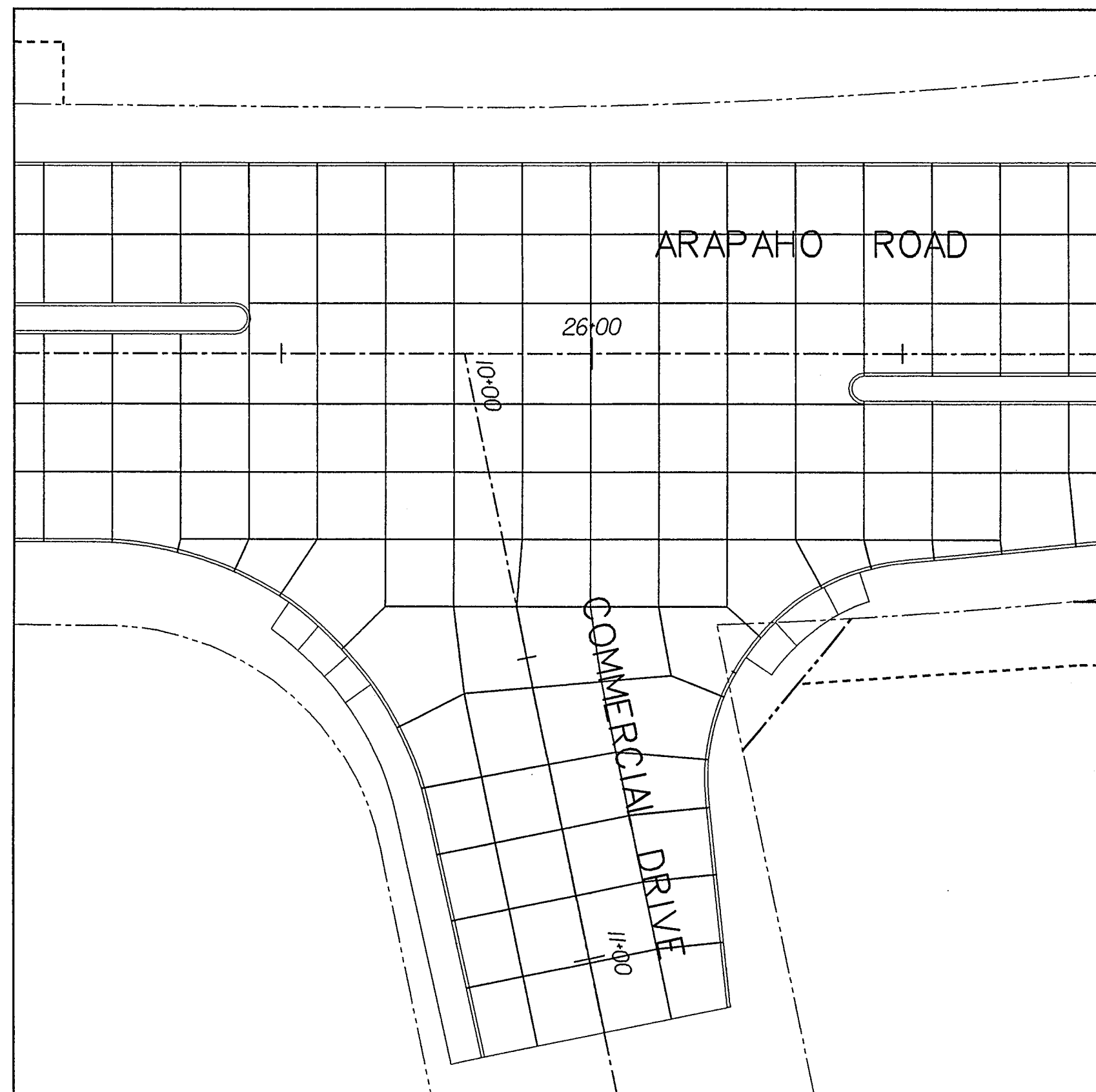
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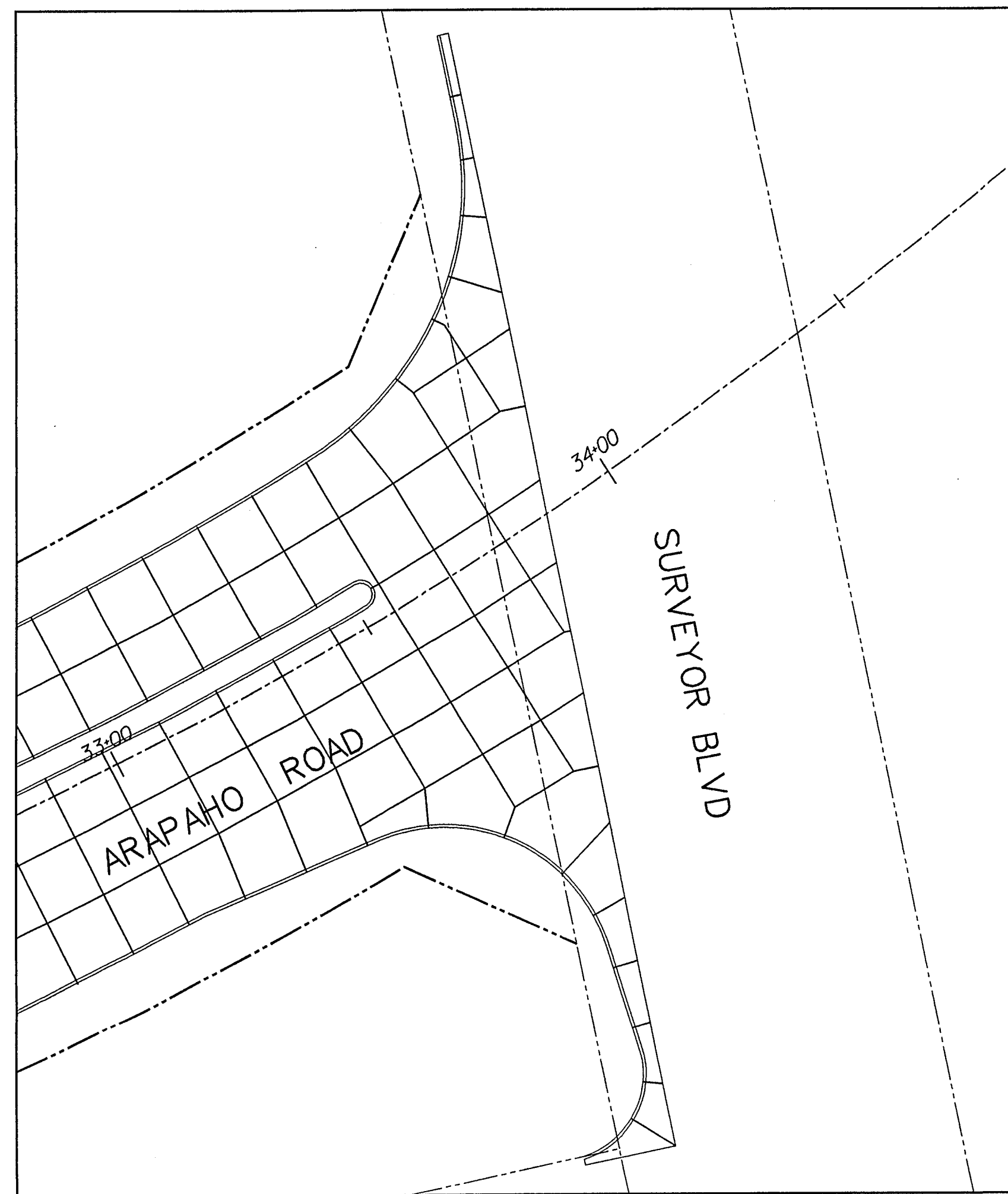
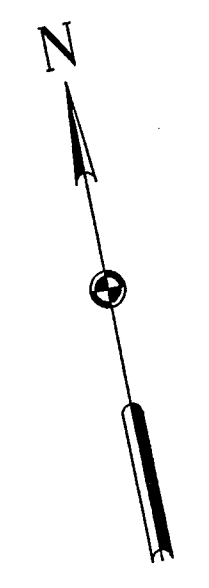
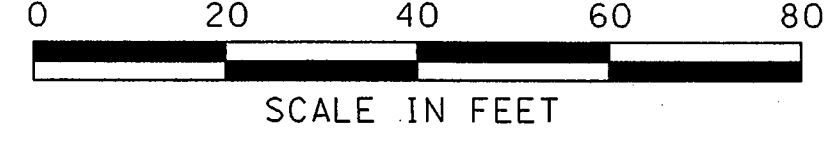
MARSH LANE JOINT LAYOUT



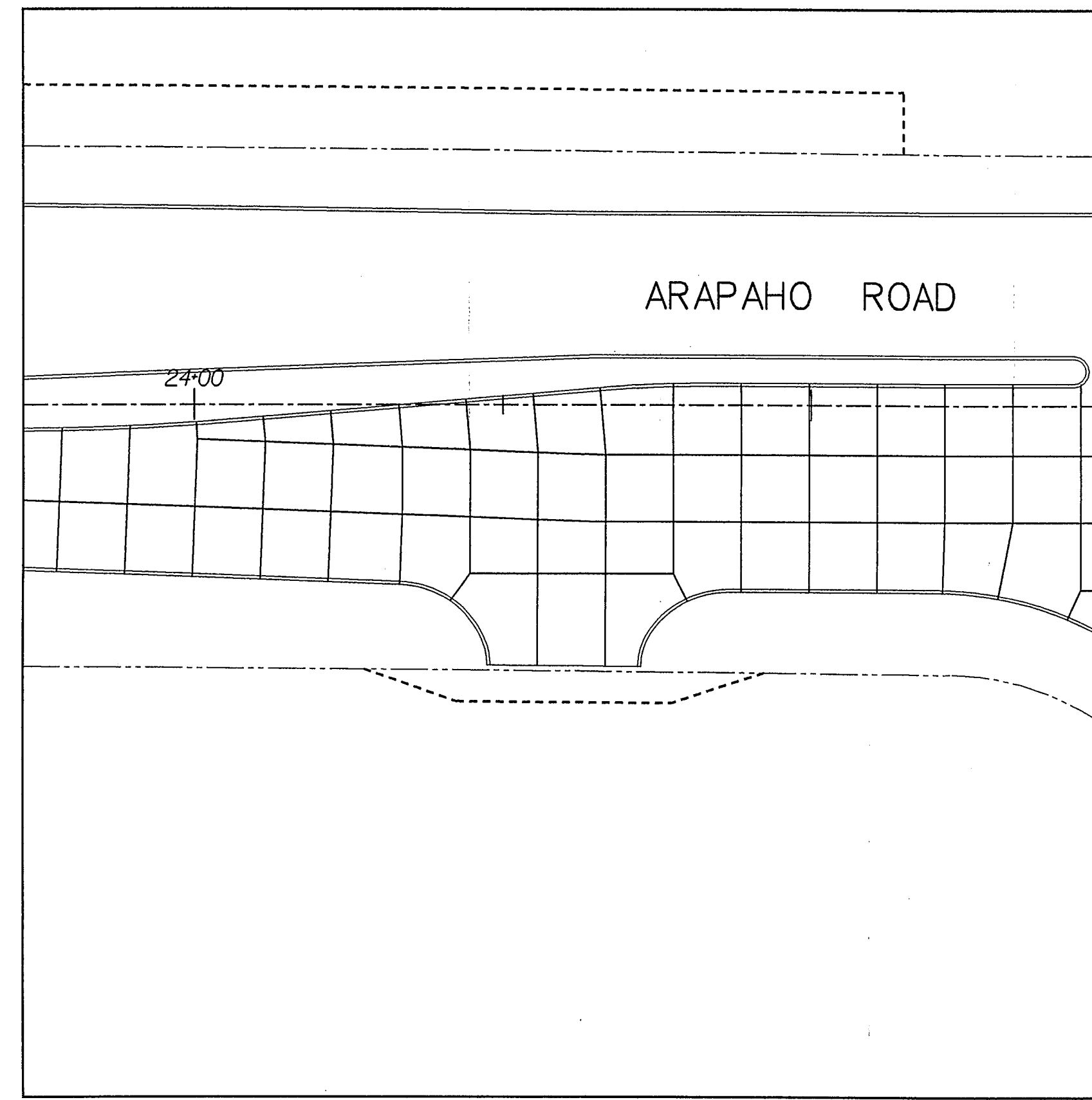
BUSINESS AVENUE JOINT LAYOUT



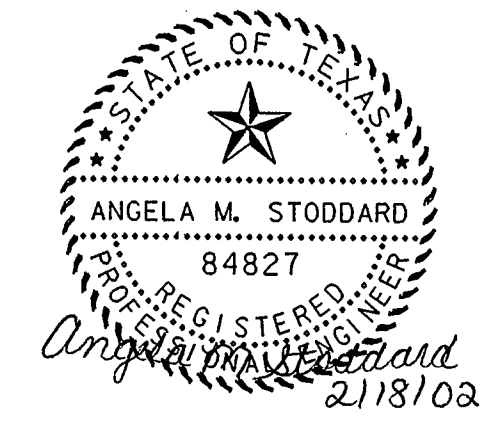
COMMERCIAL DRIVE JOINT LAYOUT



SURVEYOR BLVD JOINT LAYOUT



TYPICAL DRIVEWAY JOINT LAYOUT



37A

NO.	DATE	REVISION	APPROV.

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

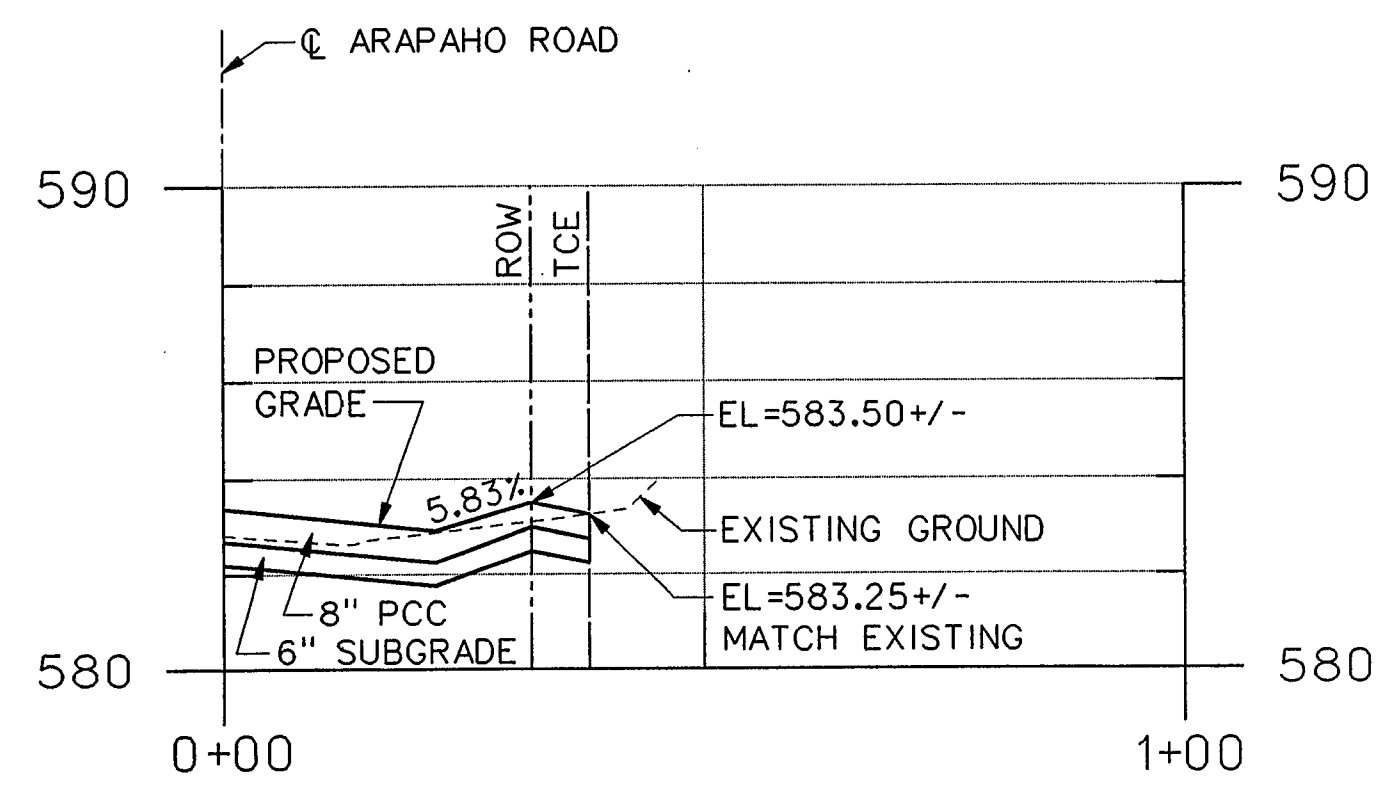
ARAPAHO ROAD - PHASE II
MARSH LANE TO SURVEYOR BOULEVARD

JOINT LAYOUTS
FOR INTERSECTIONS AND
DRIVEWAYS

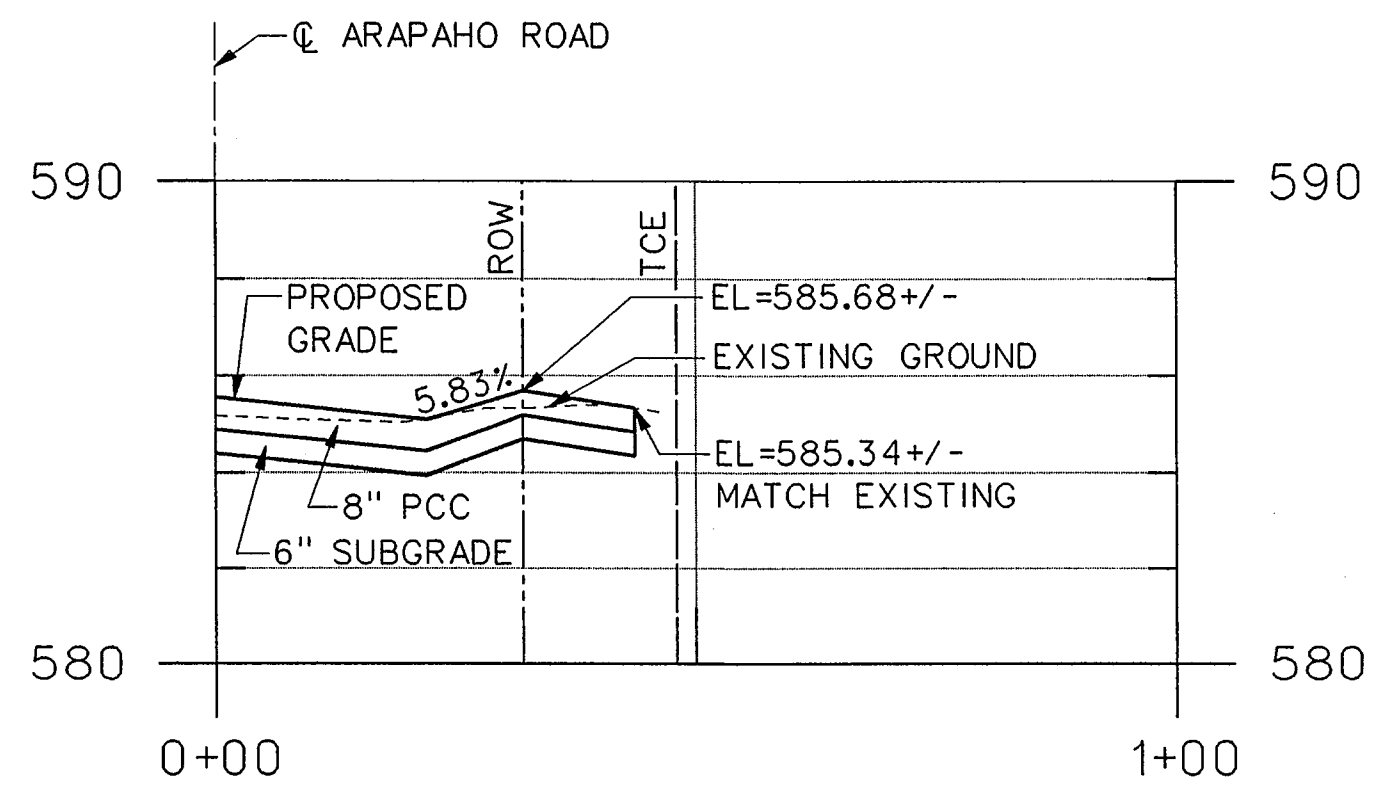
TOWN OF ADDISON, TEXAS

Design GFS	Drawn GFS	DATE	SCALE	PROJECT NO.	SHEET ID
Check AMS	Check AMS	DEC 01	1" = 20'	25768	JL-1

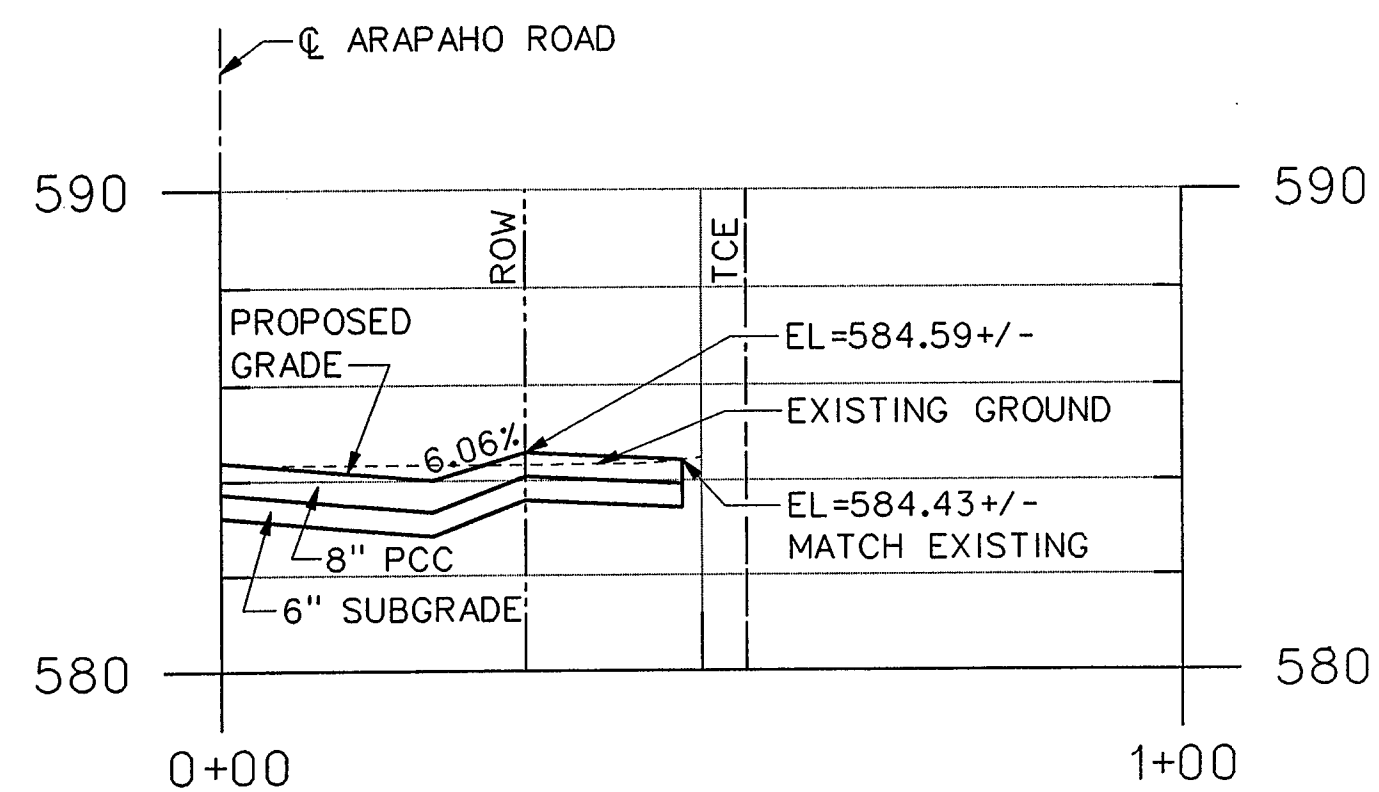
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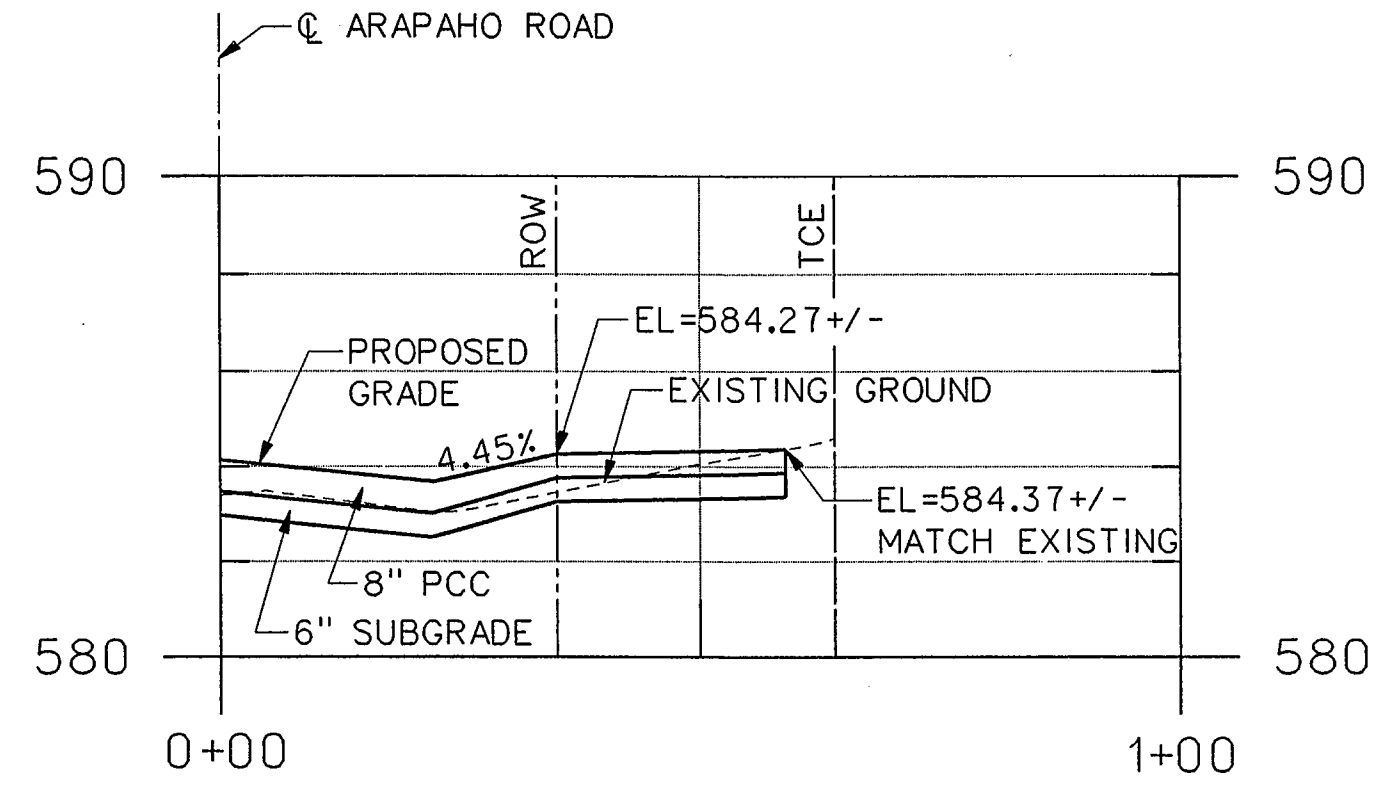
DRIVEWAY PROFILE
STA 14+01.44, RIGHT



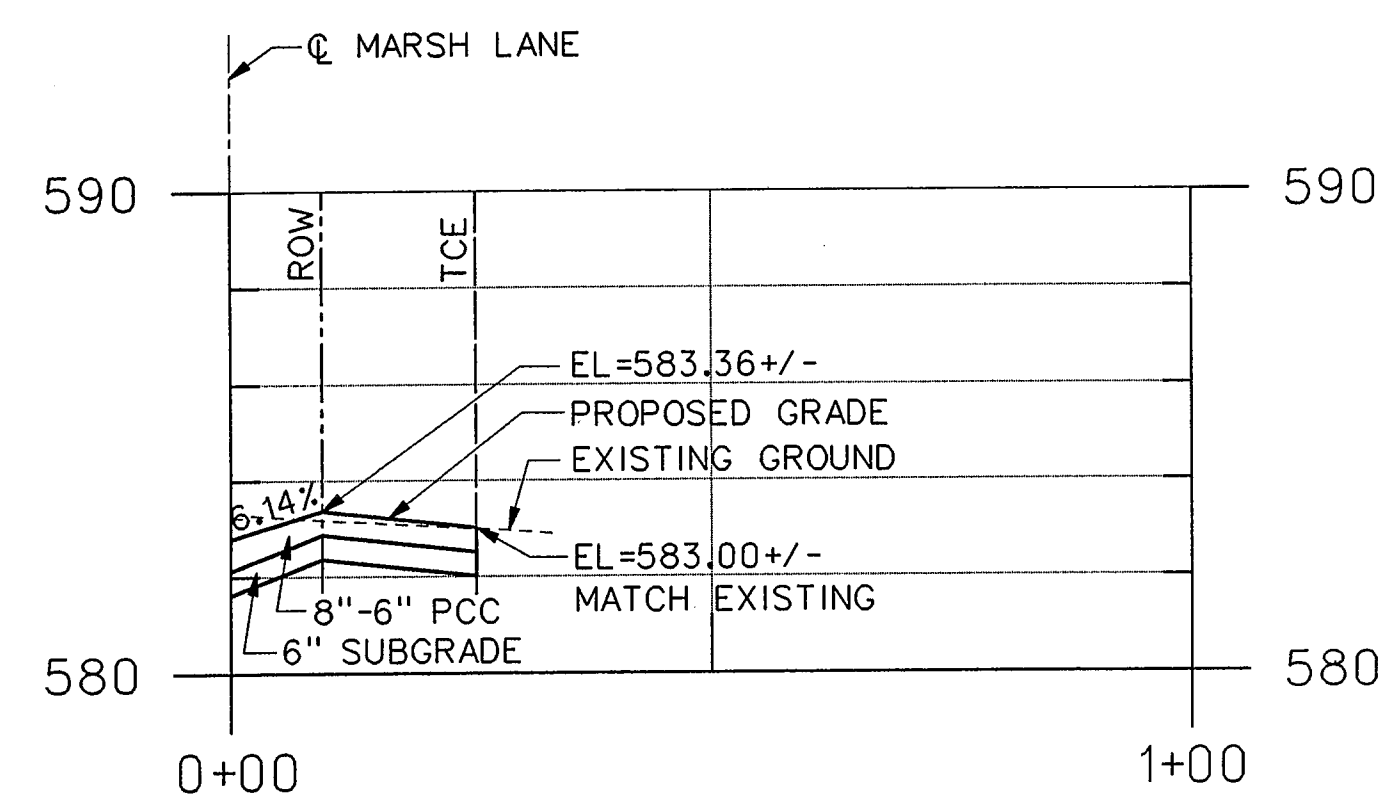
DRIVEWAY PROFILE
STA 17+99.96, RIGHT



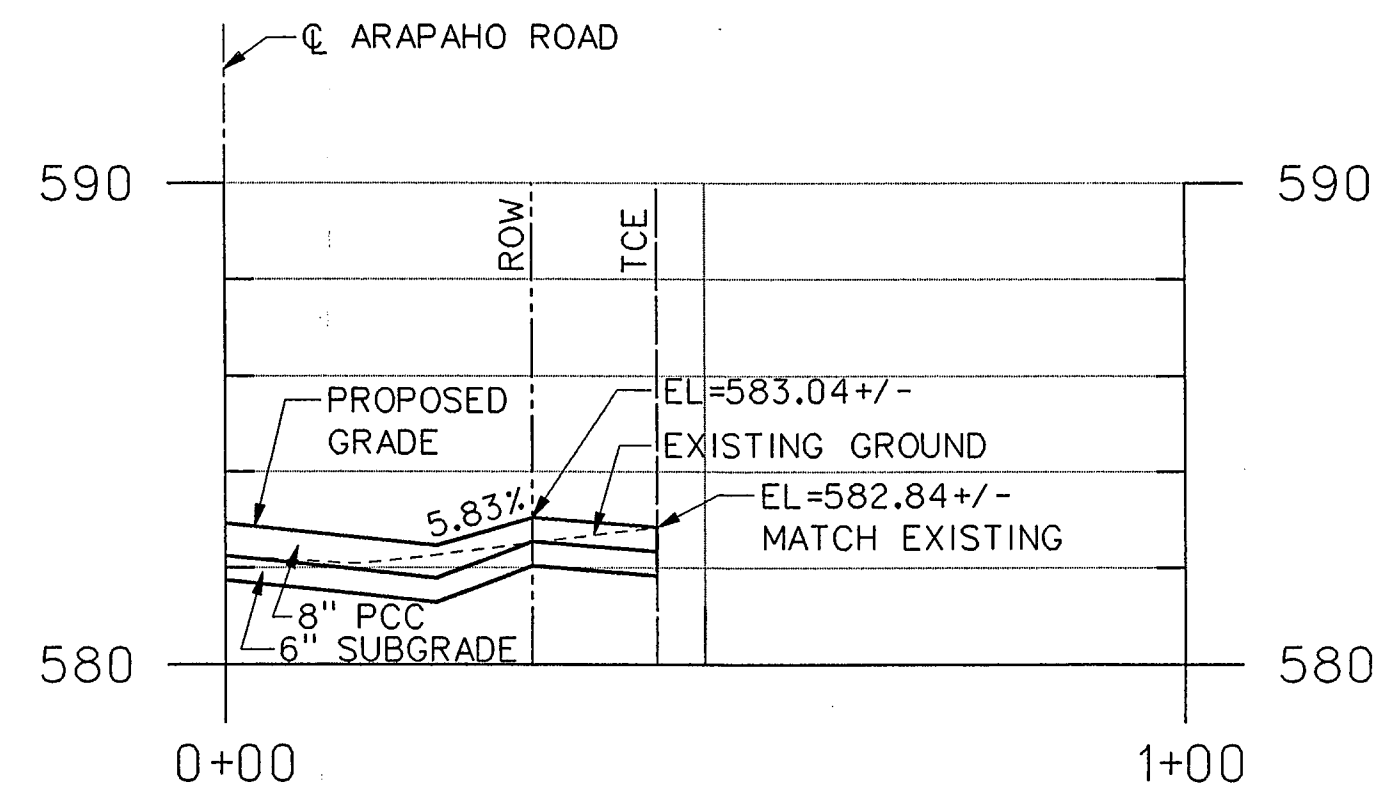
DRIVEWAY PROFILE
STA 12+33.90, RIGHT



DRIVEWAY PROFILE
STA 16+37.09, LEFT



DRIVEWAY PROFILE
MARSH LANE STA 12+44.54, RIGHT



DRIVEWAY PROFILE
STA 14+75.30, RIGHT

NOTES:

1. 10' ROUNDING AT DRIVEWAY GRADE BREAKS.
2. REINFORCED PCC PAVEMENT TRANSITIONS FROM 8" AT EDGE OF ROADWAY TO 6" AT ROW.



38

NO.	DATE	REVISION	APPROV.

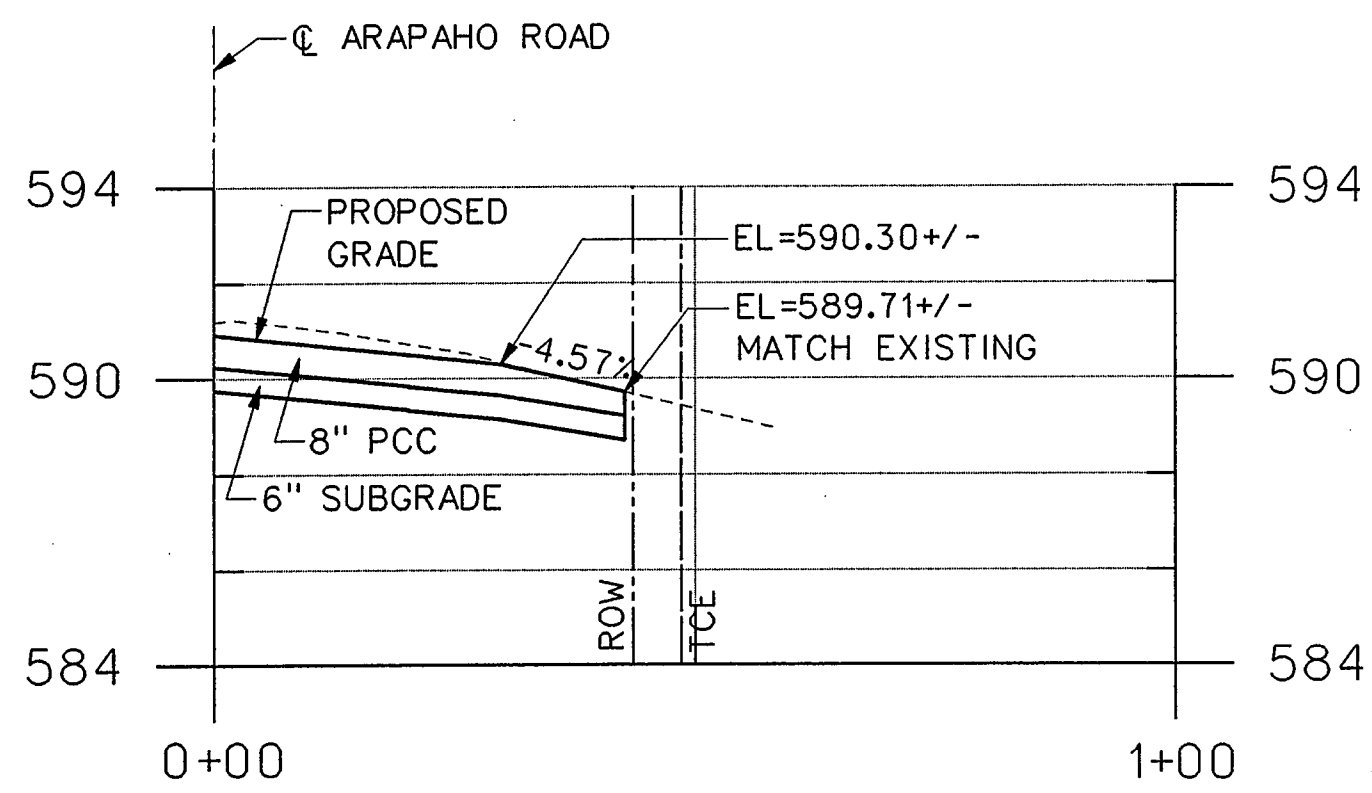
HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

ARAPAHO ROAD - PHASE II
MARSH LANE TO SURVEYOR BOULEVARD

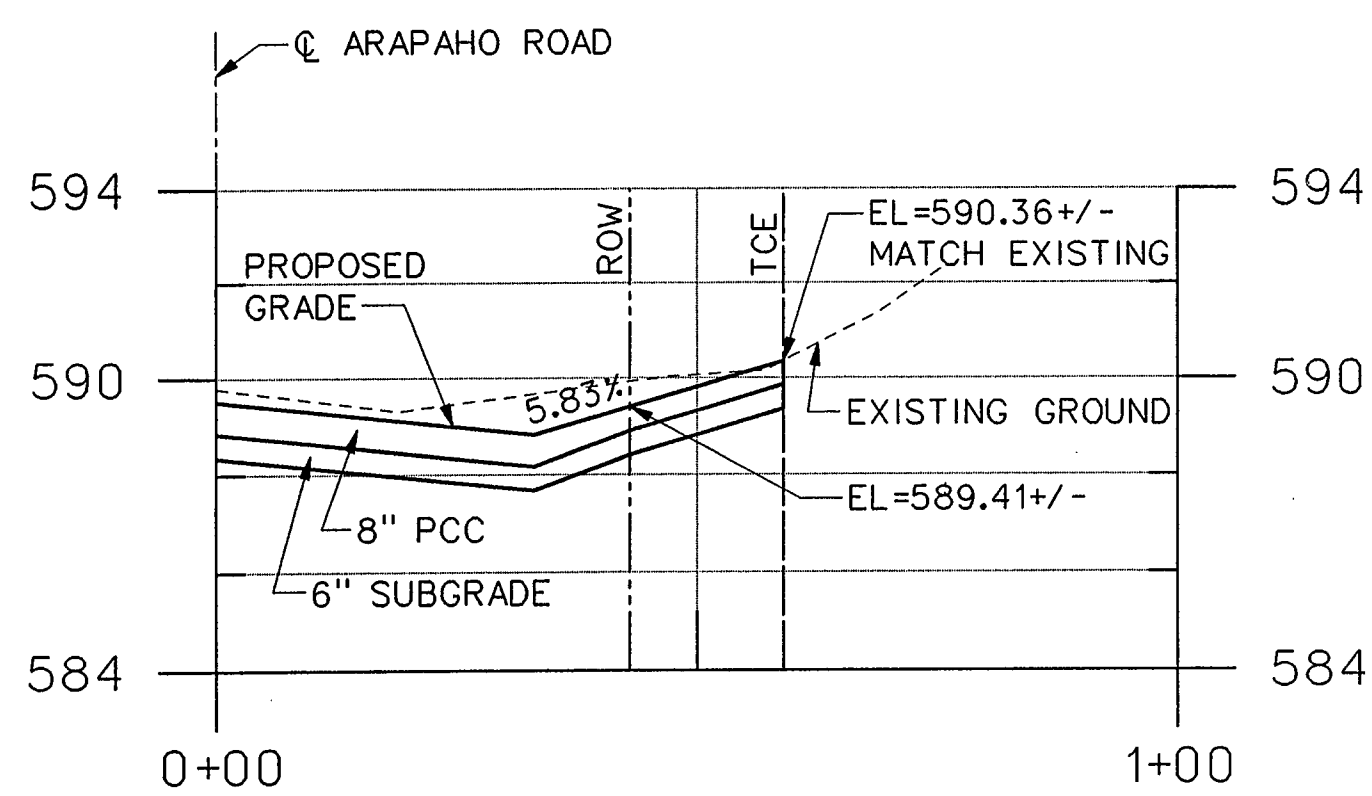
DRIVEWAY PROFILES

TOWN OF ADDISON, TEXAS

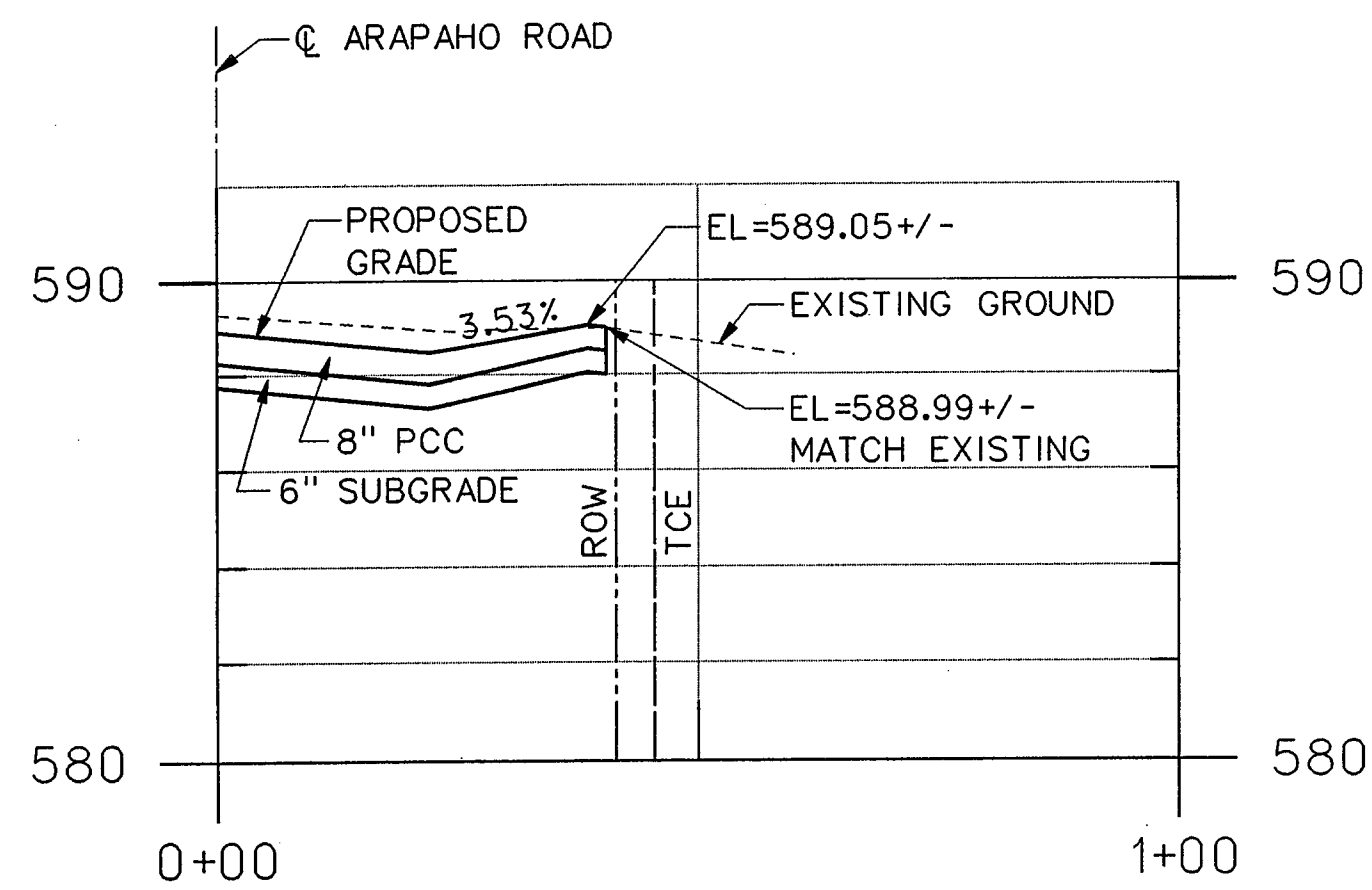
Design AMS	Drawn GFS	DATE	SCALE	PROJECT NO.	SHEET ID
Check JDH	Check AMS	DEC 01	H: 1"= 20' V: 1"= 4"	25768	DP-1



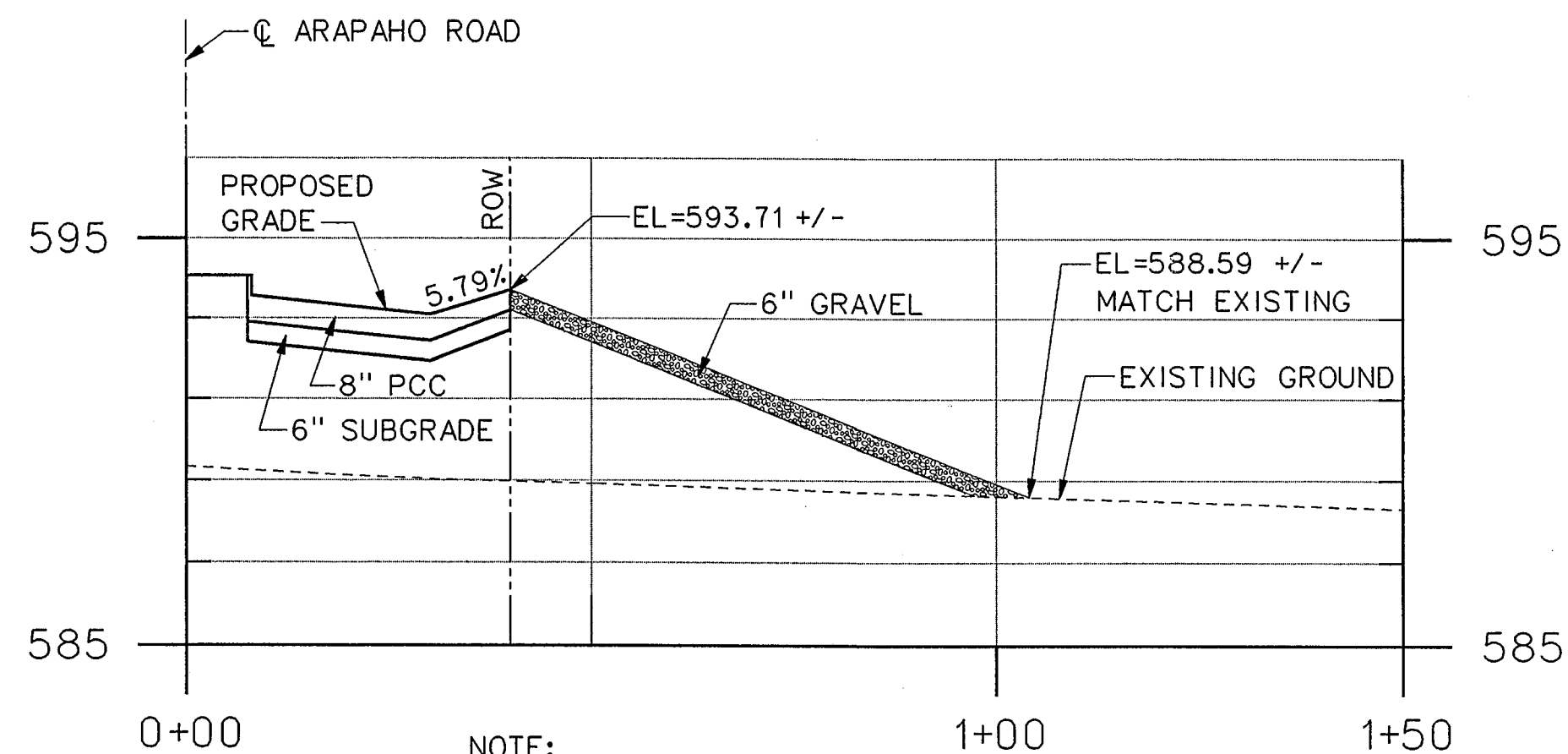
DRIVEWAY PROFILE
STA 24+60.01, RIGHT



DRIVEWAY PROFILE
STA 22+46.86, LEFT

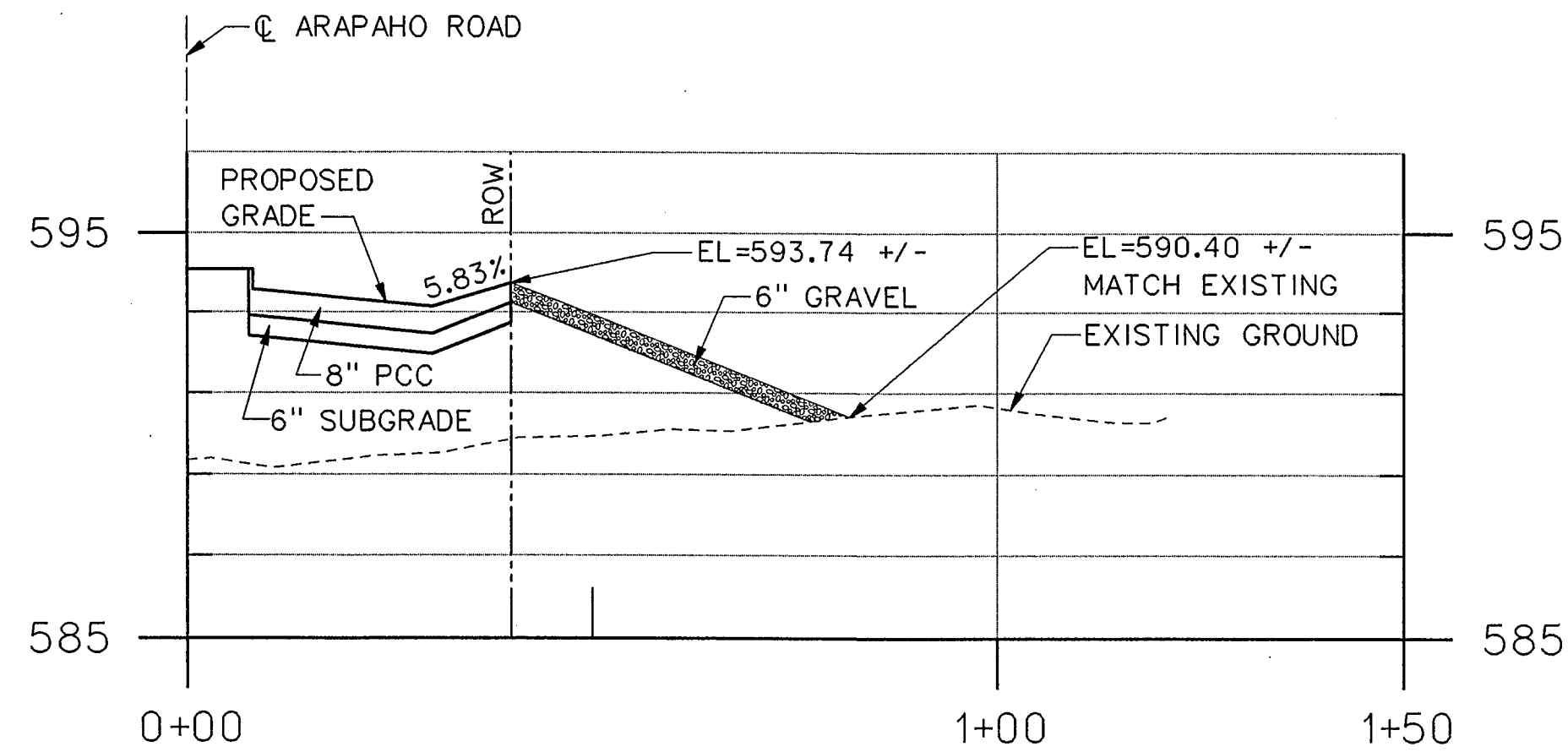


DRIVEWAY PROFILE
STA 21+98.12, RIGHT



NOTE:
NO TCE REQUIRED DUE TO TXU AGREEMENT
IN LETTER DATED NOVEMBER 30, 2001

DRIVEWAY PROFILE
STA 29+68.34, RIGHT



NOTE:
NO TCE REQUIRED DUE TO TXU AGREEMENT
IN LETTER DATED NOVEMBER 30, 2001

DRIVEWAY PROFILE
STA 29+68.34, LEFT

NOTES:

1. 10' ROUNDING AT DRIVEWAY GRADE BREAKS.
2. REINFORCED PCC PAVEMENT TRANSITIONS FROM 8" AT EDGE OF ROADWAY TO 6" AT ROW.



NO.	DATE	REVISION	APPROV.

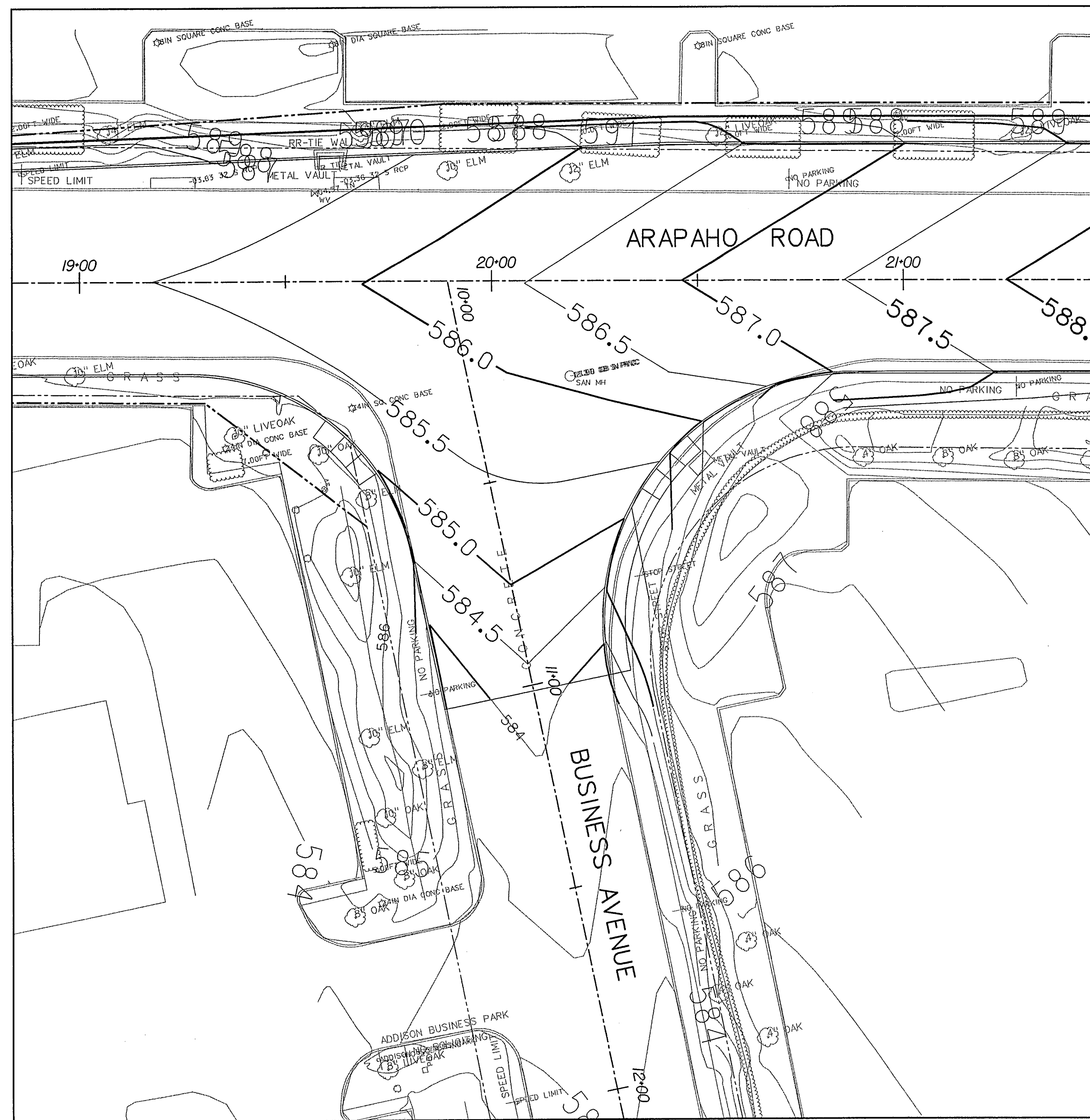
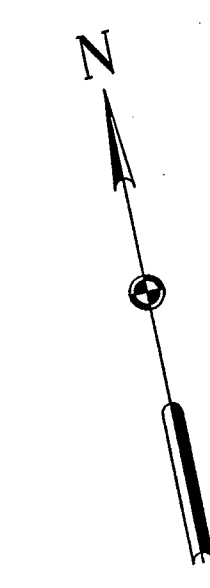
HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

ARAPAHO ROAD - PHASE II
MARSH LANE TO SURVEYOR BOULEVARD

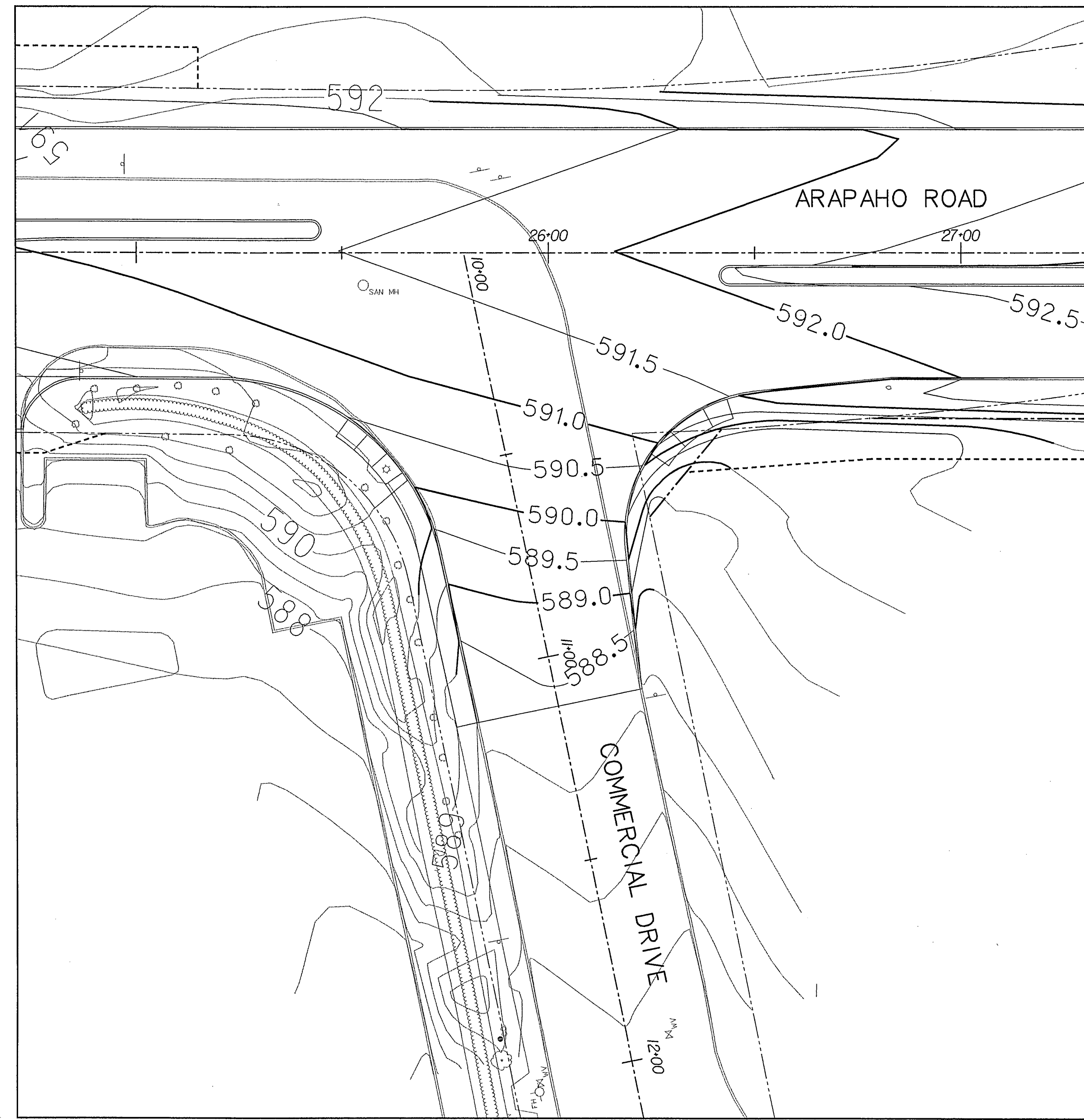
DRIVEWAY PROFILES

TOWN OF ADDISON, TEXAS

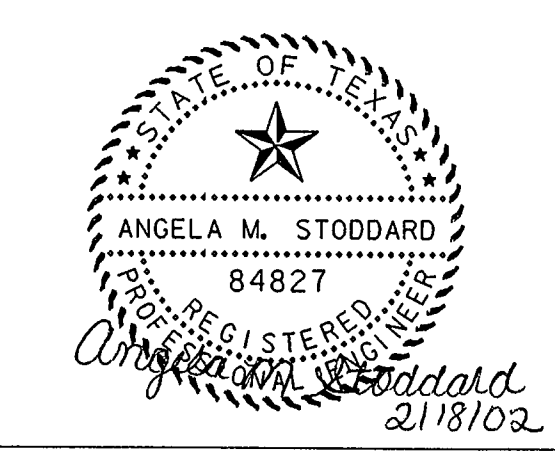
Design AMS	Drawn GFS	DATE	SCALE	PROJECT NO.	SHEET ID.
Check JDH	Check AMS	DEC 01	H: 1"=20' V: 1"=4'	25768	DP-2



BUSINESS AVENUE INTERSECTION GRADING



COMMERCIAL DRIVE INTERSECTION GRADING



40

NO.	DATE	REVISION	APPROV.

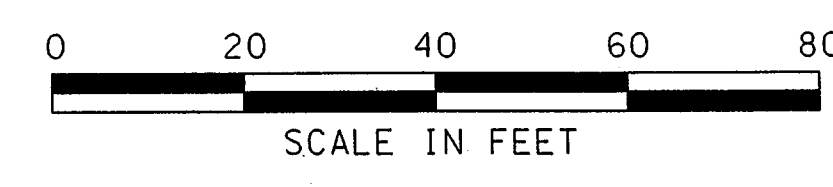
HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

ARAPAHO ROAD - PHASE II
MARSH LANE TO SURVEYOR BOULEVARD

INTERSECTION GRADING

TOWN OF ADDISON, TEXAS

Design GFS	Drawn GFS	DATE	SCALE	PROJECT NO.	SHEET ID
Check AMS	Check AMS	DEC 01	1" = 20'	25768	IG-1



BEGIN RETAINING WALL
 RETAINING WALL STA 9+95.0 =
 MARSH RIGHT TURN STA. 9+95.0
 TOP OF WALL = 581.97

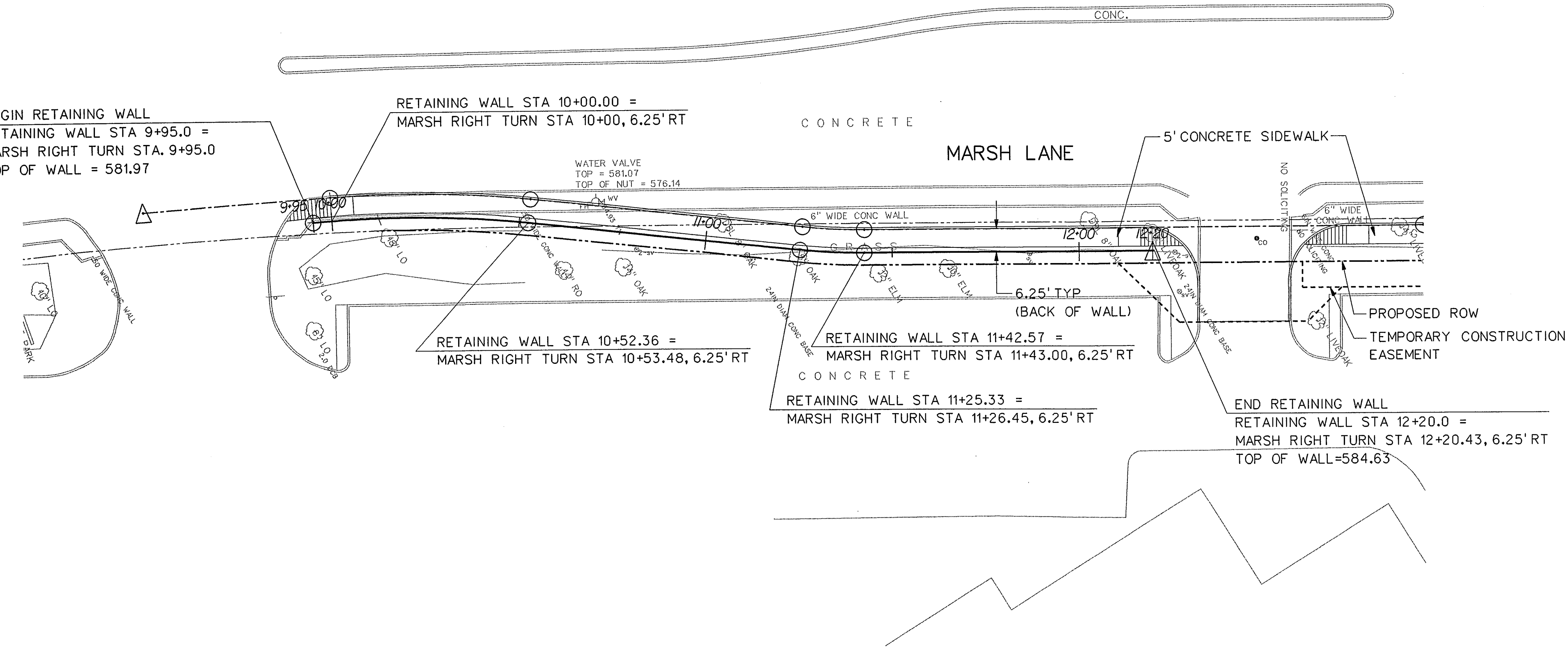
RETAINING WALL STA 10+00.00 =
 MARSH RIGHT TURN STA 10+00, 6.25' RT

RETAINING WALL STA 10+52.36 =
 MARSH RIGHT TURN STA 10+53.48, 6.25' RT

RETAINING WALL STA 11+42.57 =
 MARSH RIGHT TURN STA 11+43.00, 6.25' RT

RETAINING WALL STA 11+25.33 =
 MARSH RIGHT TURN STA 11+26.45, 6.25' RT

END RETAINING WALL
 RETAINING WALL STA 12+20.0 =
 MARSH RIGHT TURN STA 12+20.43, 6.25' RT
 TOP OF WALL=584.63



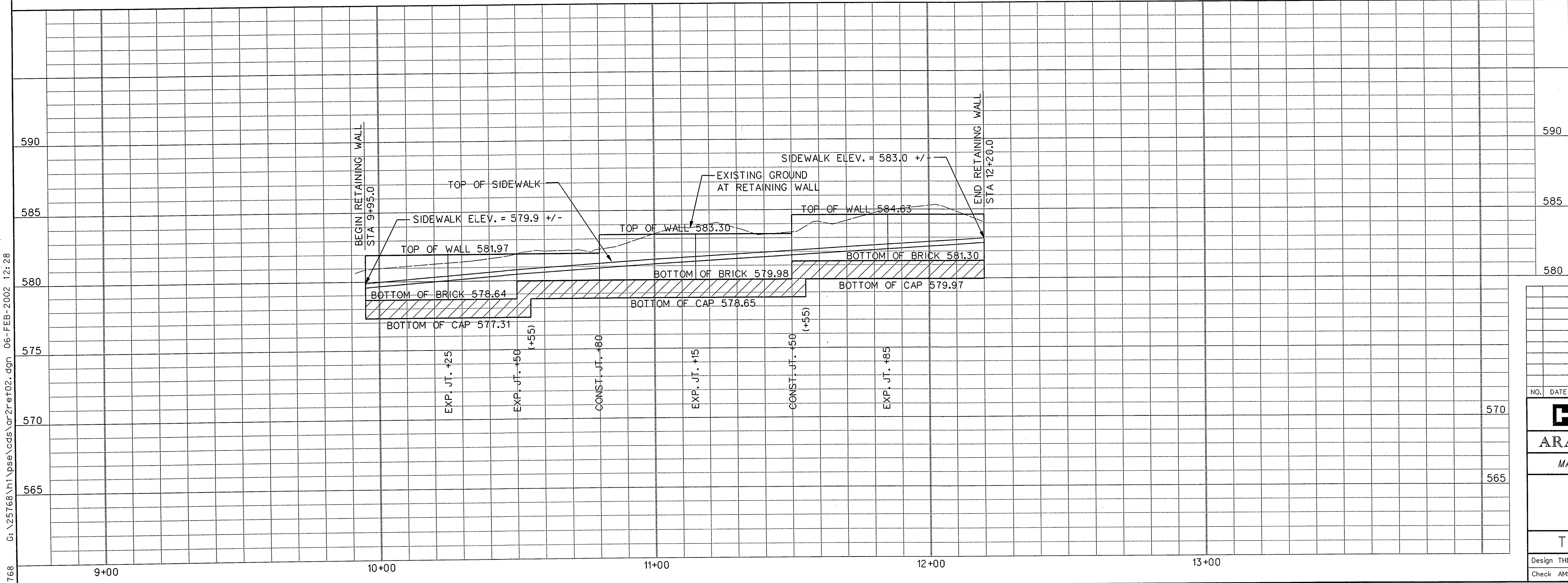
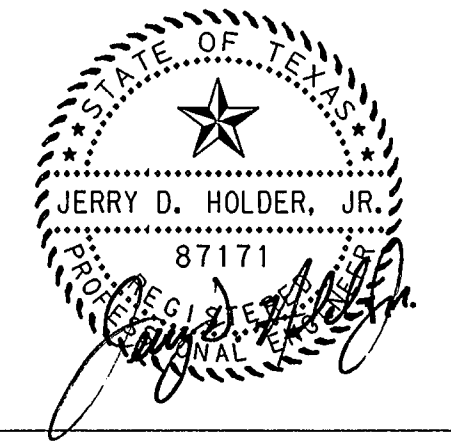
NOTE:
 1. SEE SHEET WL-3 AND WL-4 FOR
 RETAINING WALL DETAILS
 2. RETAINING WALL DIMENSIONS
 TO BACK OF RETAINING WALL.

LEGEND

- EXISTING CURB
- PROPOSED CURB
- TP=XXX.XX TOP OF PAVEMENT ELEVATION
- TC=XXX.XX TOP OF CURB ELEVATION
- CR CURB RETURN
- CP XXX CONTROL POINT
- X FENCE
- FIRE HYDRANT
- ☼ LIGHT POLE
- POWER POLE
- MH SAN. SEWER MANHOLE
- ⊥ SIGN
- ☼ TL TRAFFIC SIGNAL
- ☁ VEGETATION
- ☼ TREE
- W — WATER LINE
- PROPOSED ROW
- EXISTING ROW
- PROPOSED ROW
- TEMPORARY CONSTRUCTION EASEMENT
- ▨ PROPOSED PAVING
- ▩ PROPOSED GRAVEL

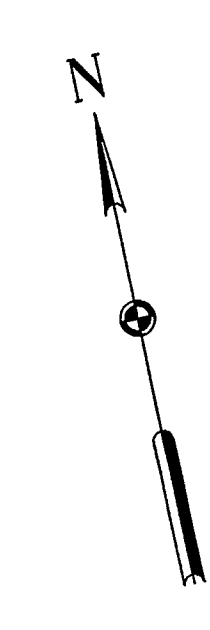
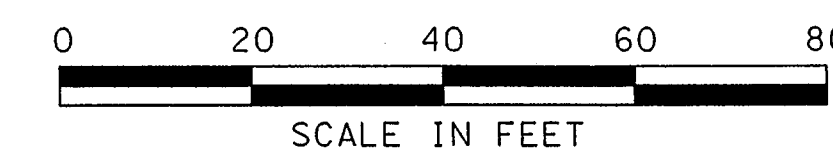
LEGEND - PROFILE

▨ FOOTING

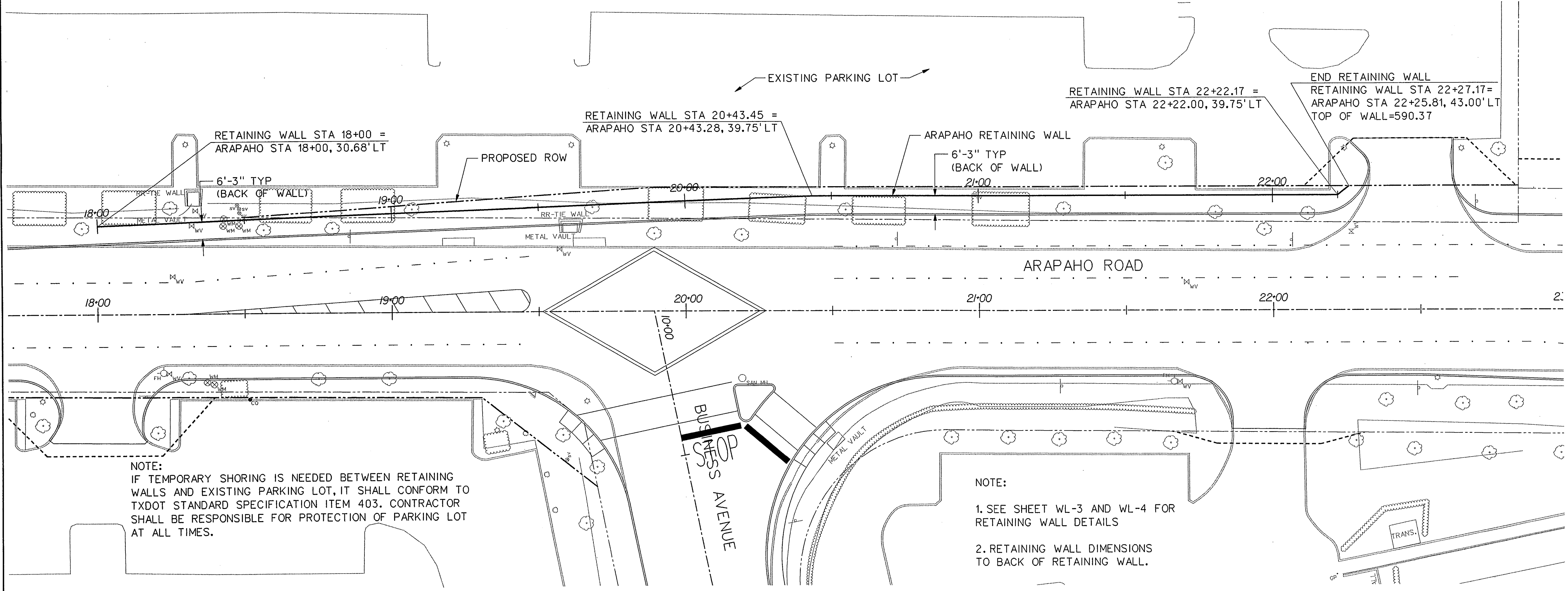


NO.	DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS The HNTB Companies ARAPAHO ROAD - PHASE II MARSH LANE TO SURVEYOR BOULEVARD MARSH RETAINING WALL PLAN AND PROFILE TOWN OF ADDISON, TEXAS			
Design THN	Drawn THN	DATE	SCALE
Check AMS	Check AMS	DEC 01	H: 1" = 20' V: 1" = 4'
PROJECT NO.	SHEET ID	25768	WL-1

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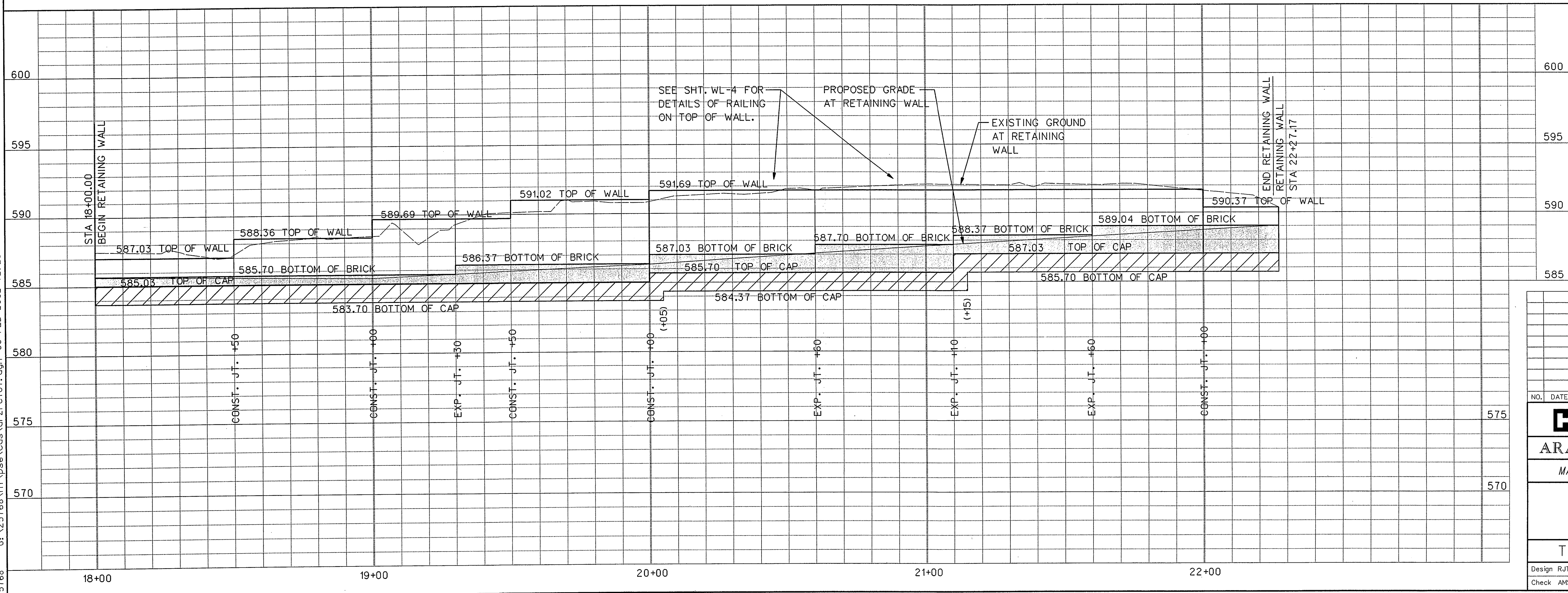


- LEGEND**
- EXISTING CURB
 - PROPOSED CURB
 - TP=XXX.XX TOP OF PAVEMENT ELEVATION
 - TC=XXX.XX TOP OF CURB ELEVATION
 - CR CURB RETURN
 - CP XXX CONTROL POINT
 - FENCE
 - FIRE HYDRANT
 - ☼ LIGHT POLE
 - POWER POLE
 - MH SAN. SEWER MANHOLE
 - ⊥ SIGN
 - ☼ TL TRAFFIC SIGNAL
 - ☼ VEGETATION
 - TREE
 - W WATER LINE
 - PROPOSED
 - EXISTING ROW
 - PROPOSED ROW
 - TEMPORARY CONSTRUCTION EASEMENT
 - ▨ PROPOSED PAVING
 - ▩ PROPOSED GRAVEL

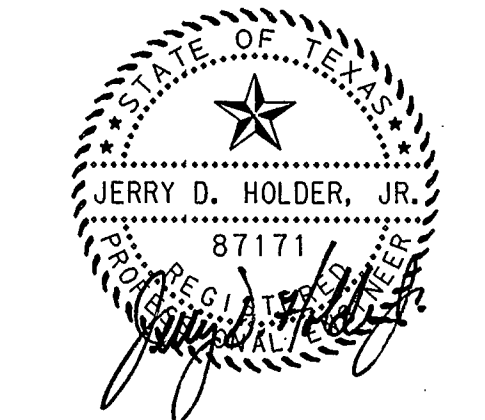


NOTE:
IF TEMPORARY SHORING IS NEEDED BETWEEN RETAINING WALLS AND EXISTING PARKING LOT, IT SHALL CONFORM TO TXDOT STANDARD SPECIFICATION ITEM 403. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF PARKING LOT AT ALL TIMES.

NOTE:
1. SEE SHEET WL-3 AND WL-4 FOR RETAINING WALL DETAILS
2. RETAINING WALL DIMENSIONS TO BACK OF RETAINING WALL.



- LEGEND - PROFILE**
- ▨ FOOTING
 - ▩ WALL WITHOUT BRICK VENEER



NO.	DATE	REVISION	APPROV.

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

ARAPAHO ROAD - PHASE II
MARSH LANE TO SURVEYOR BOULEVARD

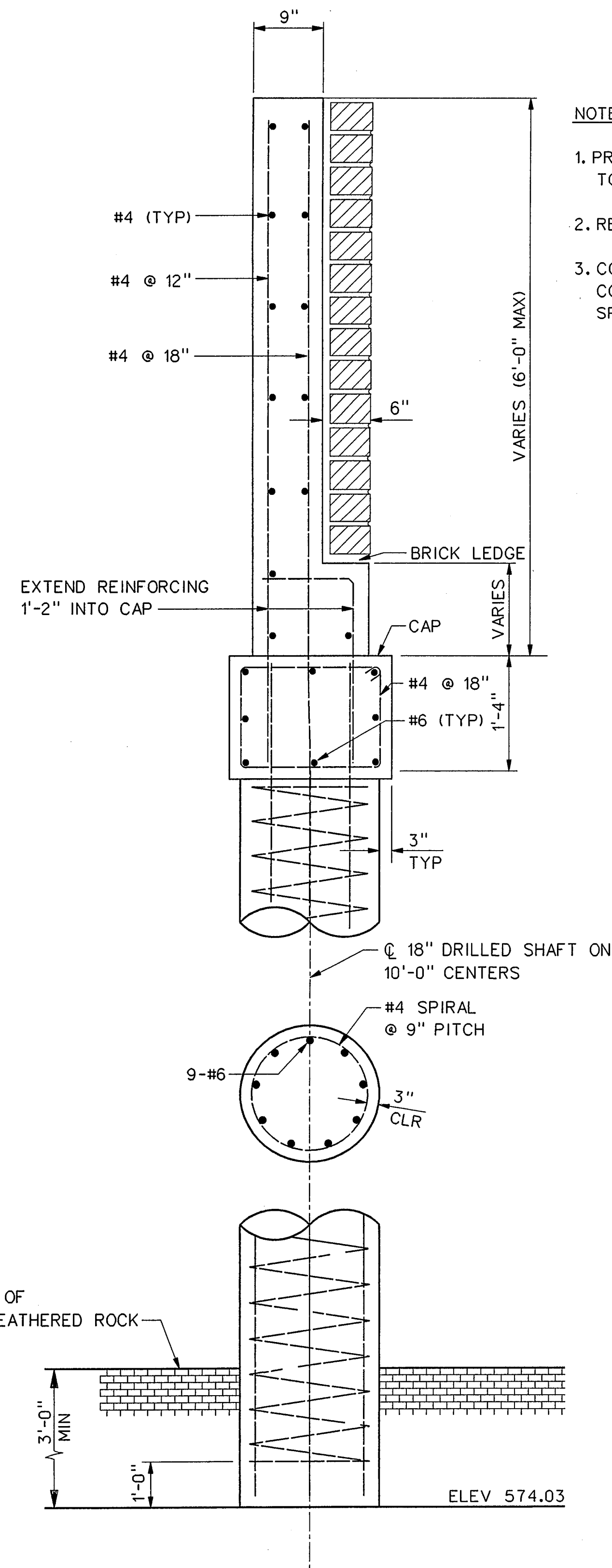
ARAPAHO RETAINING WALL
PLAN AND PROFILE

TOWN OF ADDISON, TEXAS

Design RJT	Drawn JDH	DATE	SCALE	PROJECT NO.	SHEET ID
Check AMS	Check AMS	DEC 01	H: 1"= 20' V: 1"= 4'	25768	WL-2

25768 G:\25768\h1\pse\cds\or2\ret01.dgn 06-FEB-2002 12:28

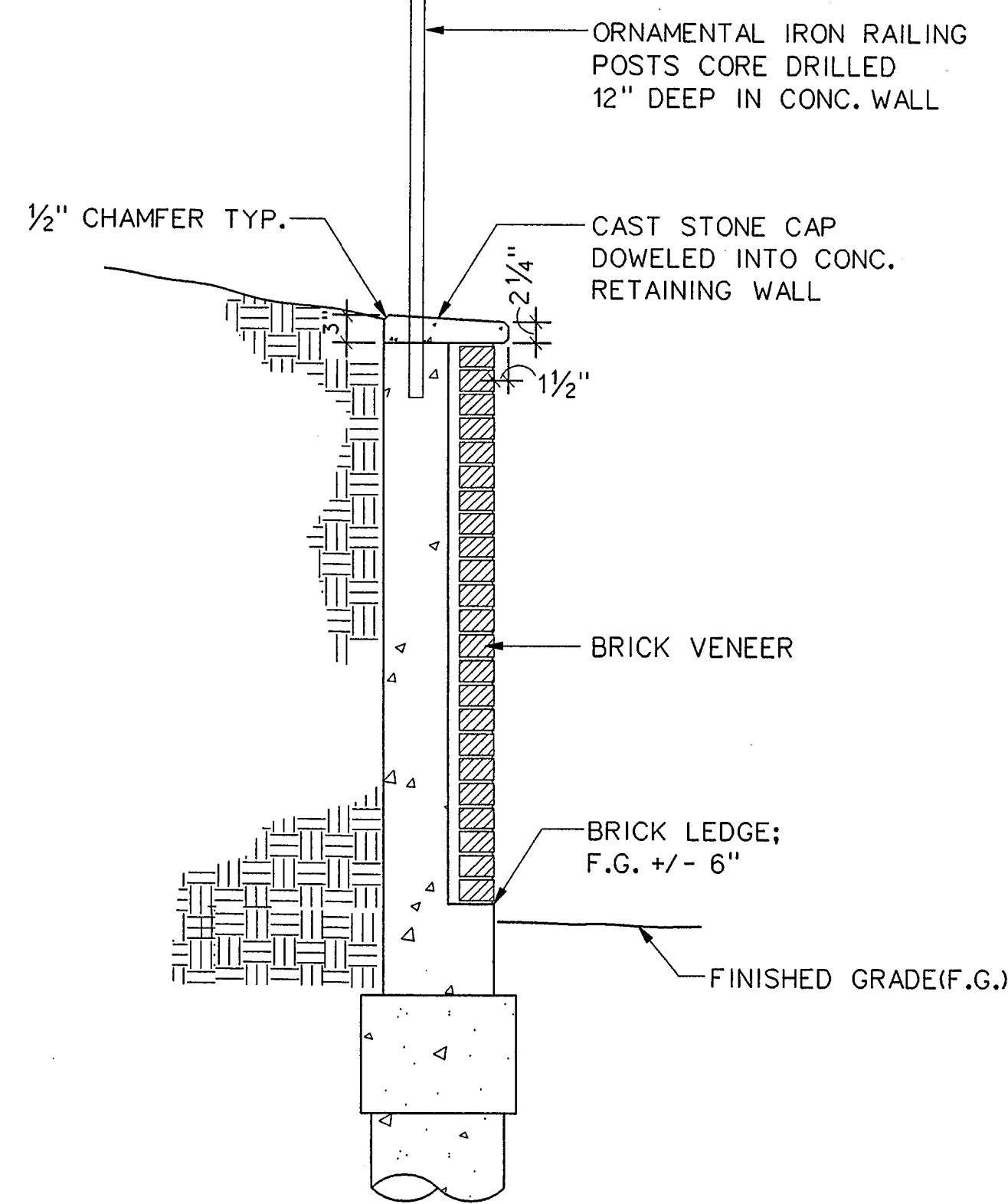
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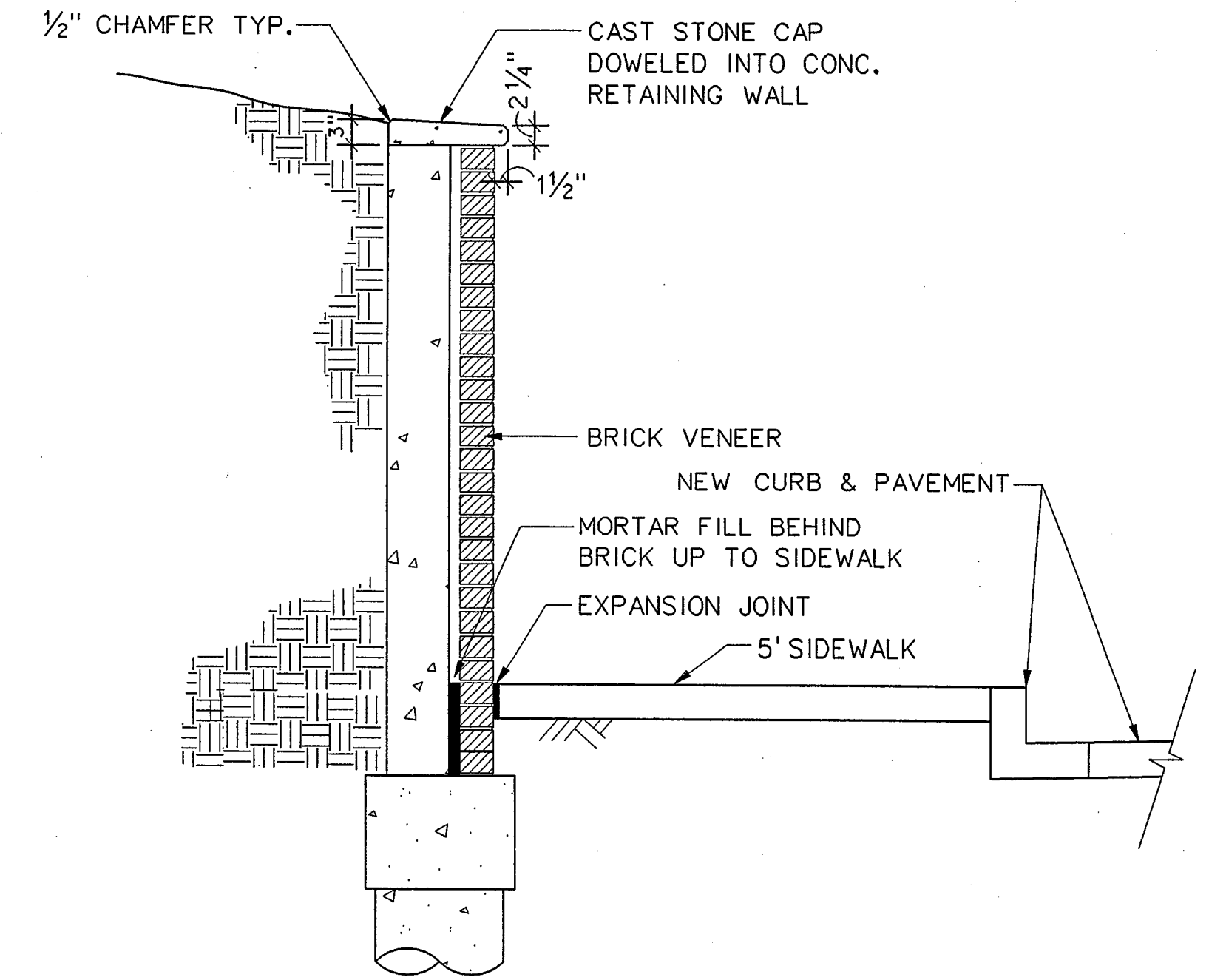
REINFORCING WALL DETAIL
NOT TO SCALE

NOTES:

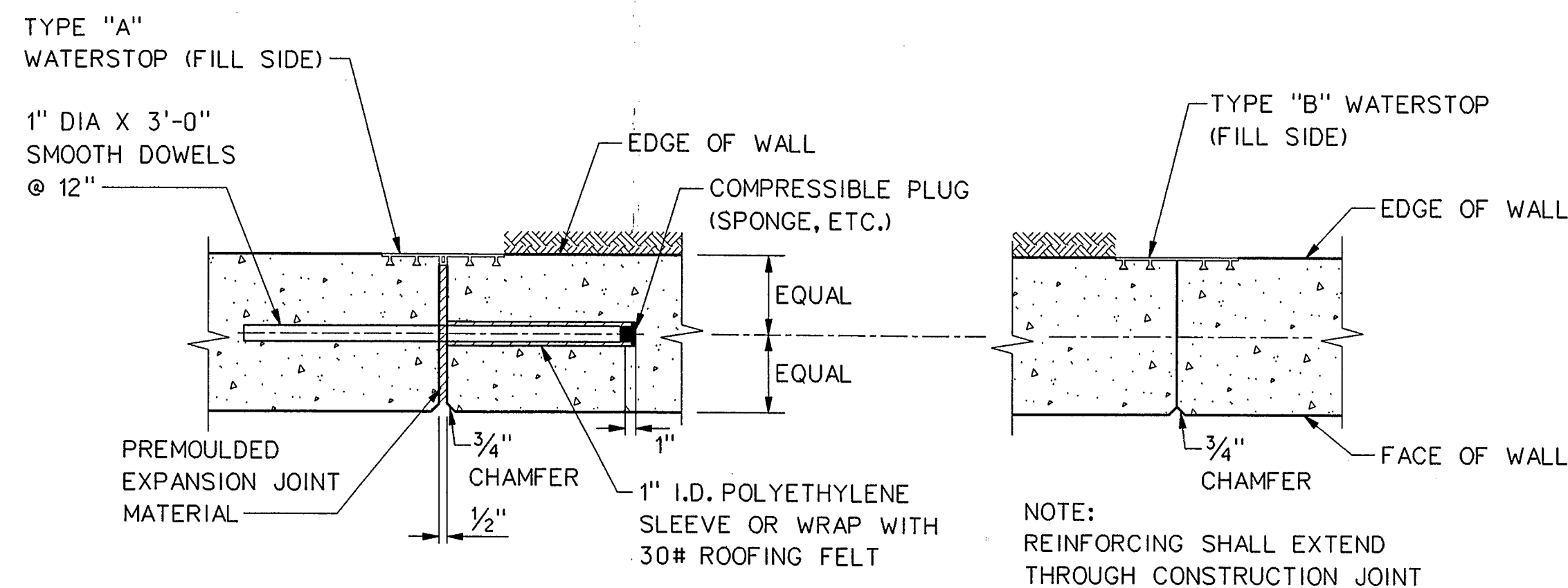
1. PROVIDE 2 INCHES MINIMUM CLEAR COVER TO ALL REINFORCING STEEL UNLESS NOTED
2. REINFORCING STEEL SHALL BE GRADE 60
3. CONCRETE SHALL CONFORM TO CLASS C CONCRETE, ACCORDING TO "TEXAS STANDARD SPECIFICATIONS 1993".



ARAPAHO RETAINING WALL DETAIL
NOT TO SCALE

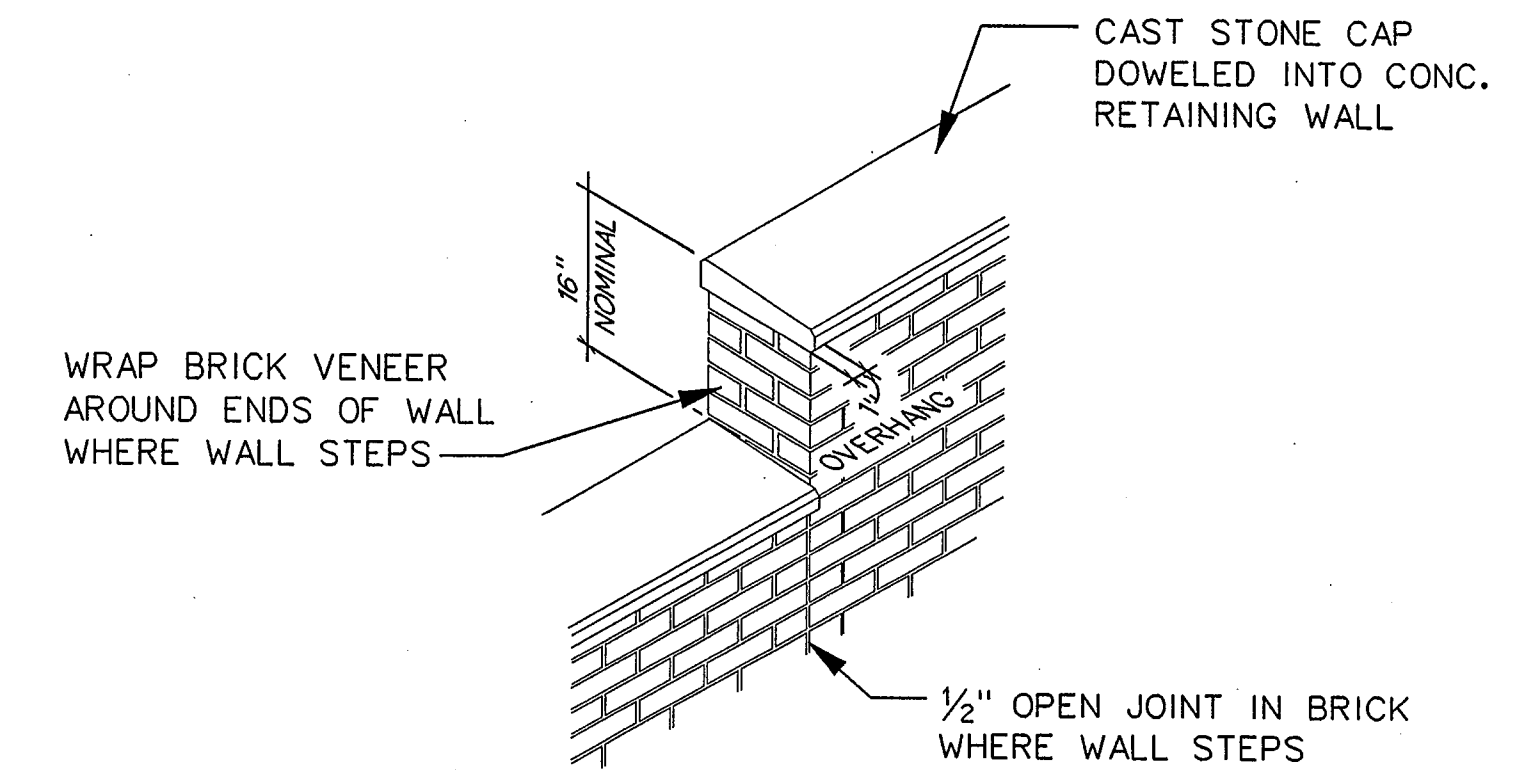


MARSH RETAINING WALL DETAIL
NOT TO SCALE

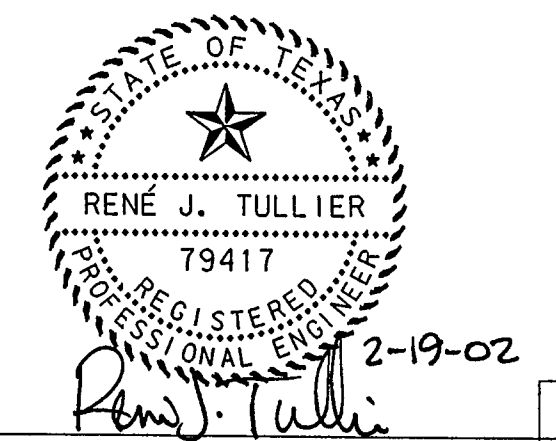


EXPANSION JOINT
NOT TO SCALE

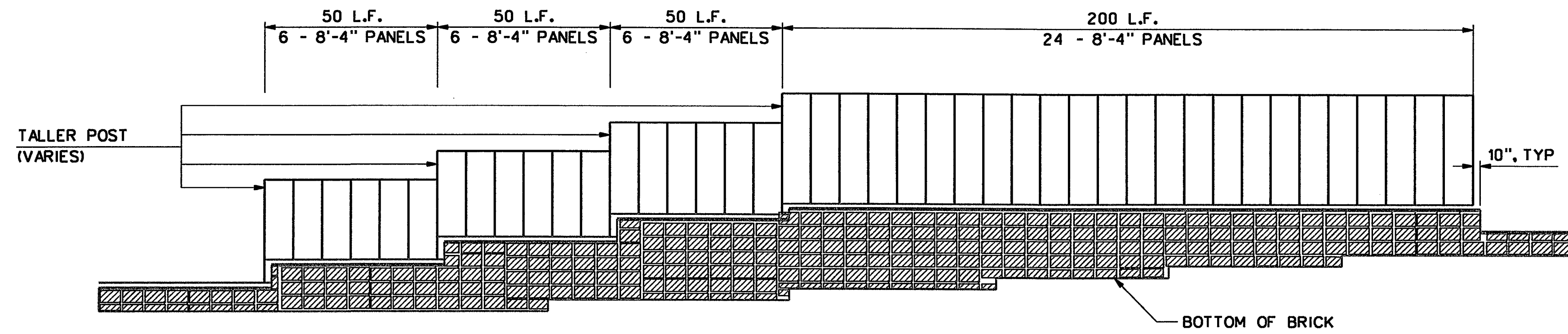
CONSTRUCTION JOINT
NOT TO SCALE



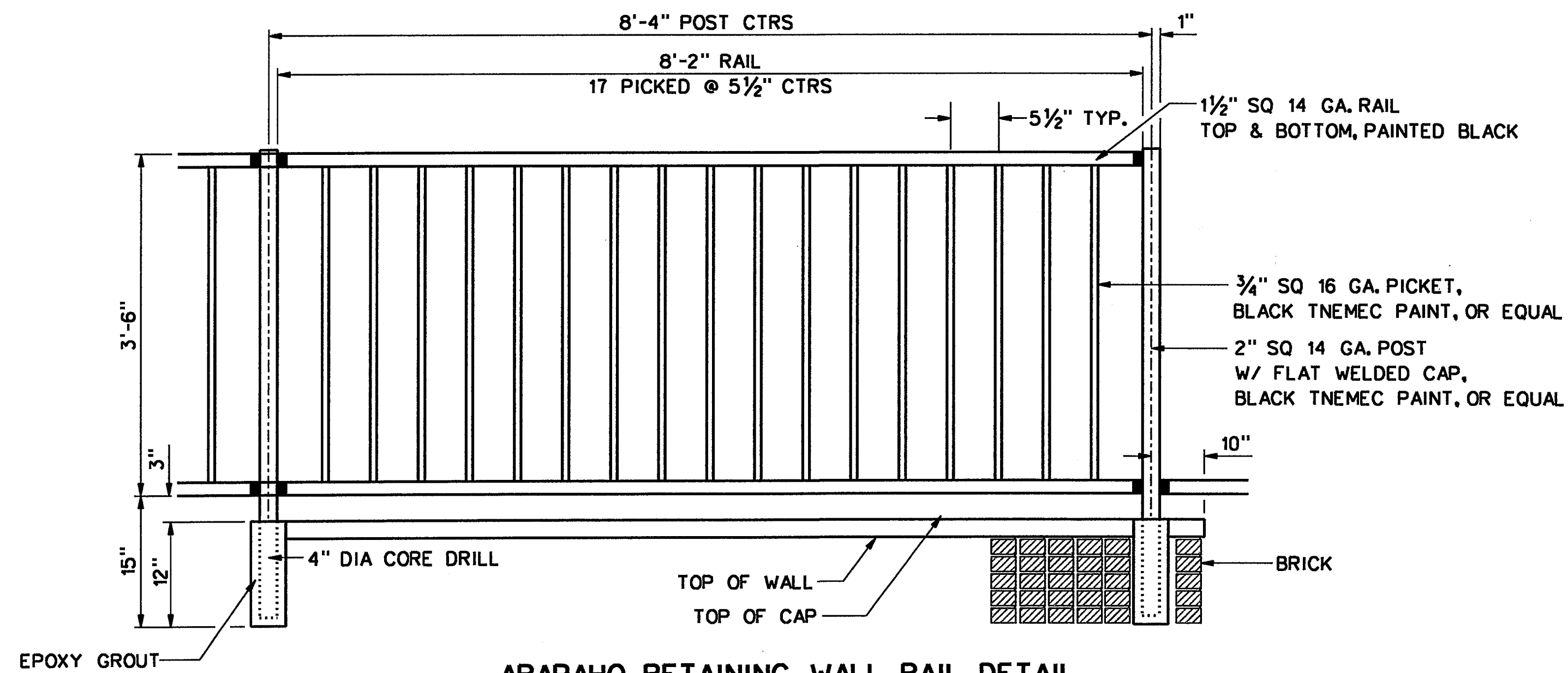
RETAINING WALL DETAIL
NOT TO SCALE



NO.	DATE	REVISION	APPROV.	43			
HNTB ARCHITECTS ENGINEERS PLANNERS The HNTB Companies ARAPAHO ROAD - PHASE II MARSH LANE TO SURVEYOR BOULEVARD RETAINING WALL DETAILS TOWN OF ADDISON, TEXAS							
Design	RJT	Drawn	LER	DATE	SCALE	PROJECT NO.	SHEET ID
Check	AMS	Check	AMS	DEC 01	NTS	25768	WL-3

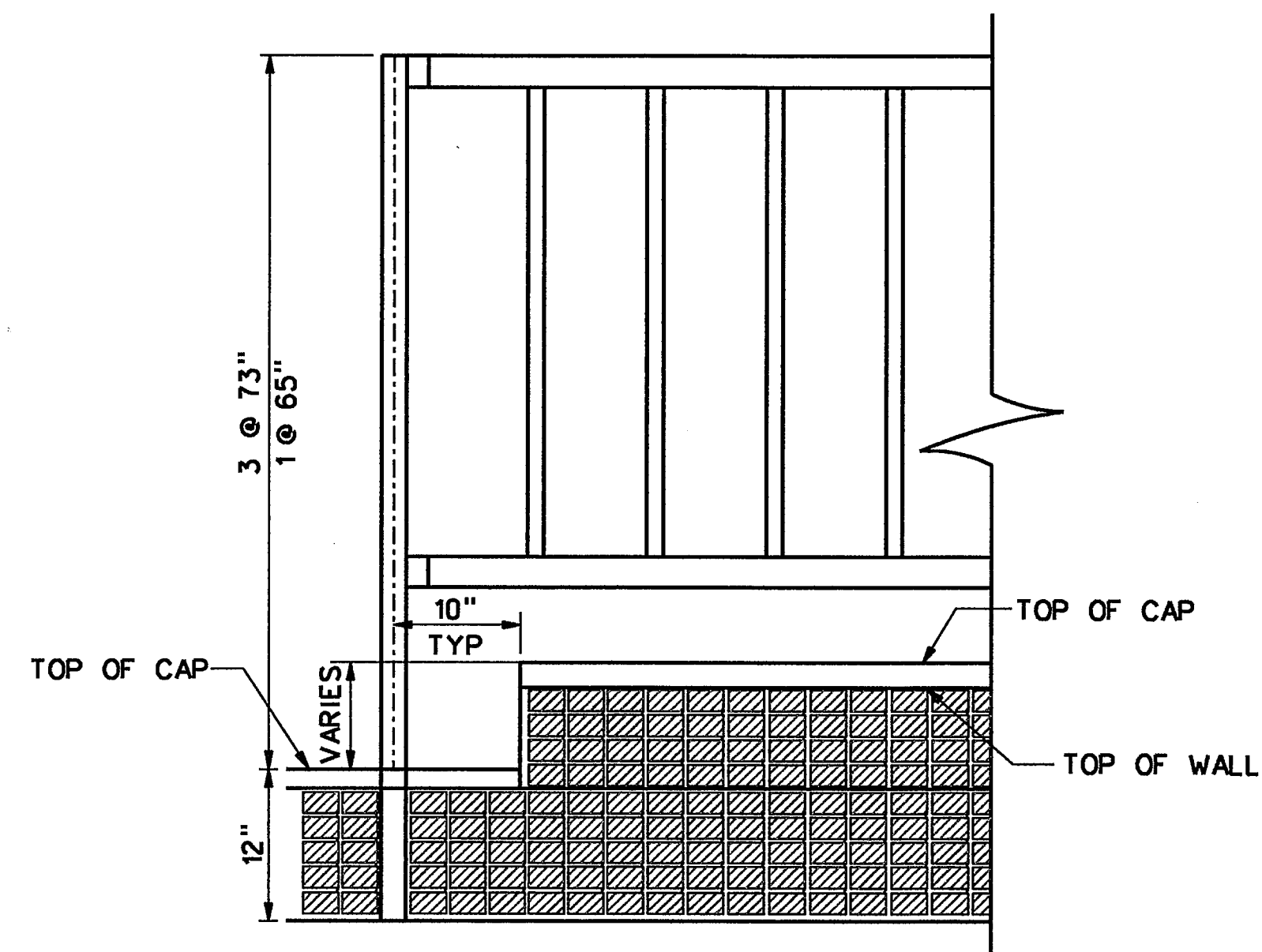


ARAPAHO RETAINING WALL RAIL LAYOUT
NTS



ARAPAHO RETAINING WALL RAIL DETAIL
NTS

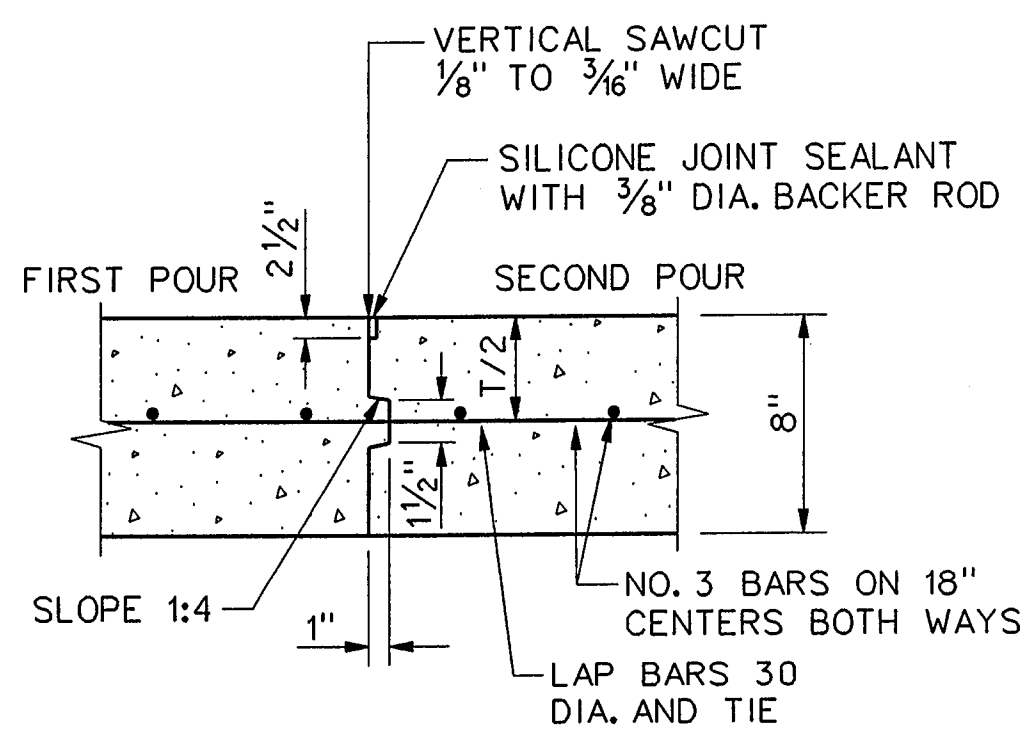
ALL WELDS WILL BE GROUND SMOOTH; STEEL TUBING WILL BE PREPPED TO REMOVE MILL SCALE OR RUST; ALL RAILINGS WILL BE PRIMED AND THEN PAINTED WITH 2 COATS OF BLACK PAINT. PAINT SHALL BE A MINIMUM OF 5 MILS THICK.



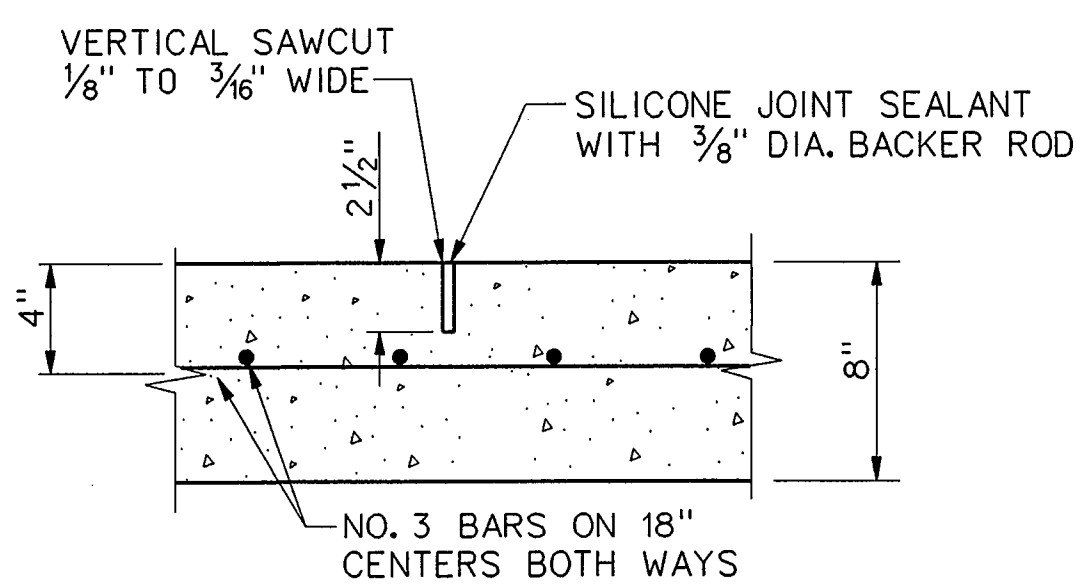
ARAPAHO RETAINING WALL RAIL STEP DETAIL, NTS



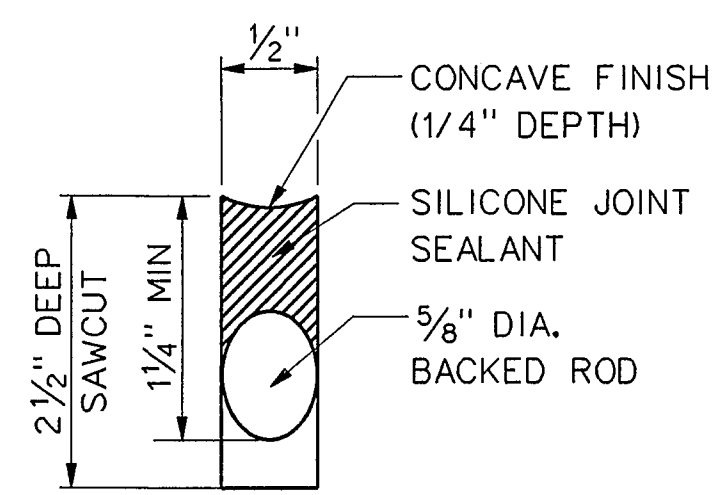
				44
2	1-02	ADD NOTE		MP
NO.	DATE	REVISION		APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>				
ARAPAHO ROAD - PHASE II				
MARSH LANE TO SURVEYOR BOULEVARD				
RETAINING WALL DETAILS				
TOWN OF ADDISON, TEXAS				
Design	MP	Drawn	LER	DATE
Check	AMS	Check	GFS	DEC 01
SCALE	NTS	PROJECT NO.	25768	SHEET ID
				WL-4



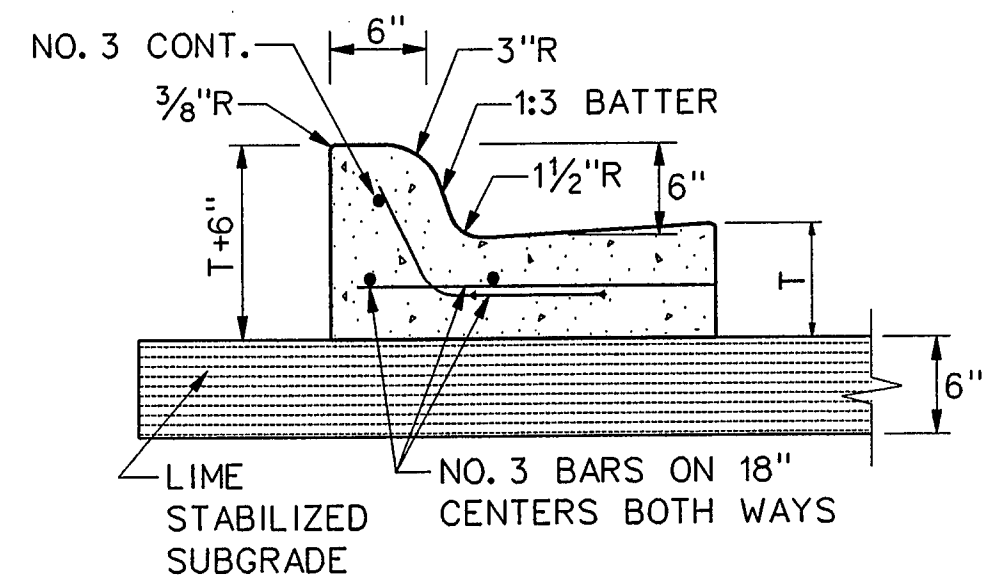
KEYED CONSTRUCTION JOINT
NOT TO SCALE



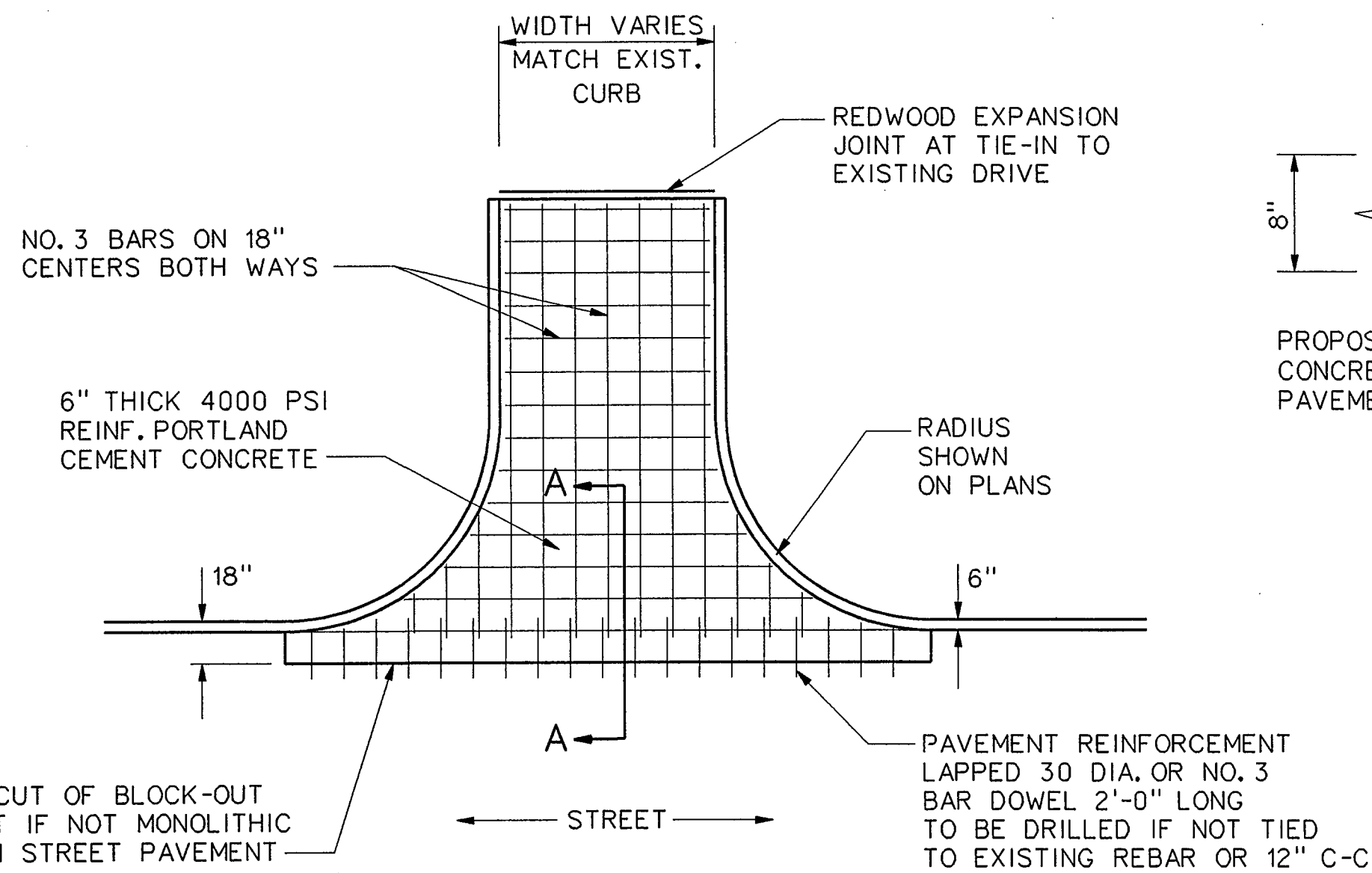
SAWED DUMMY JOINT
NOT TO SCALE



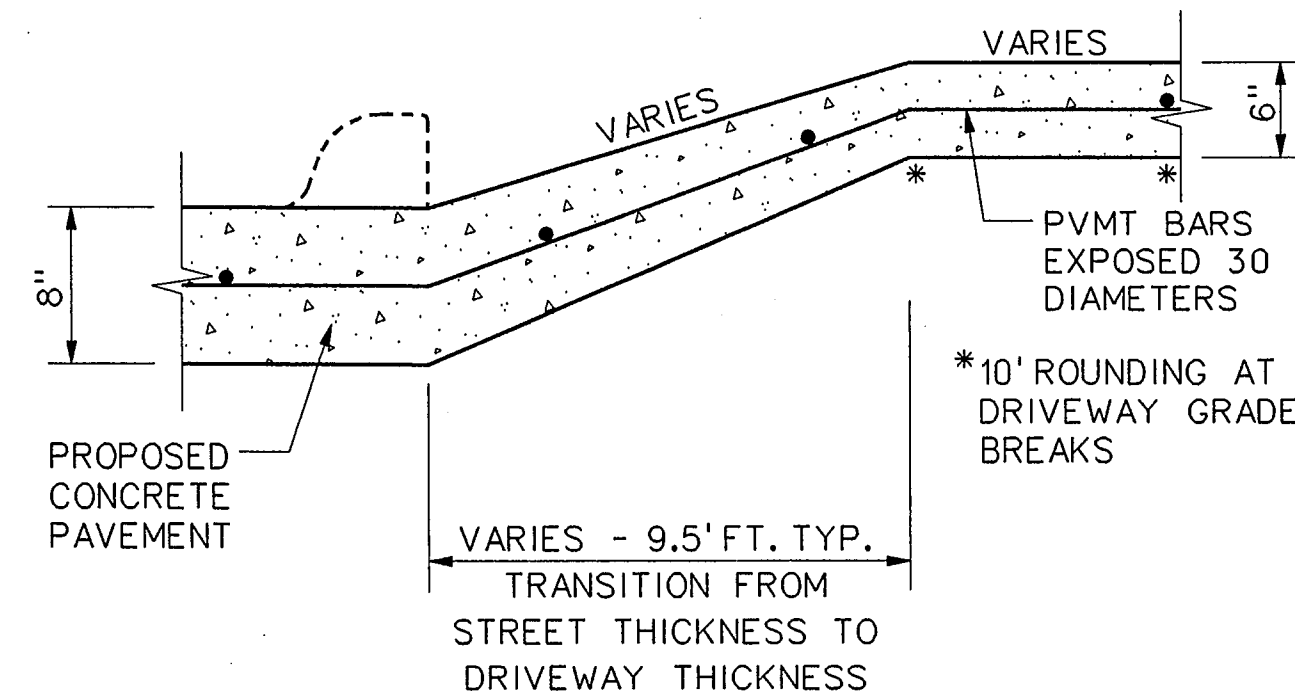
TYPICAL JOINT DETAIL
NOT TO SCALE



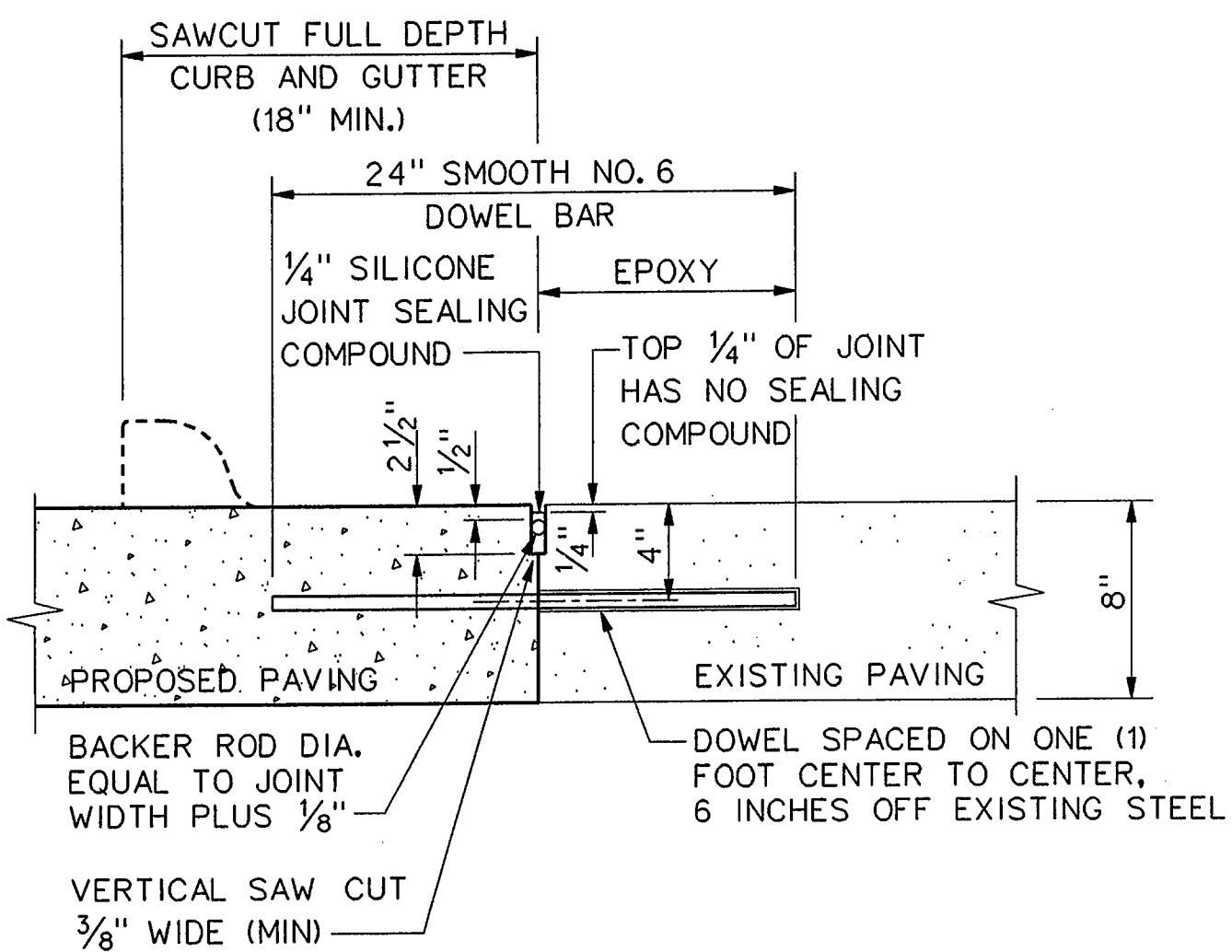
INTEGRAL CURB AND GUTTER
NOT TO SCALE



DRIVE APPROACH
NOT TO SCALE

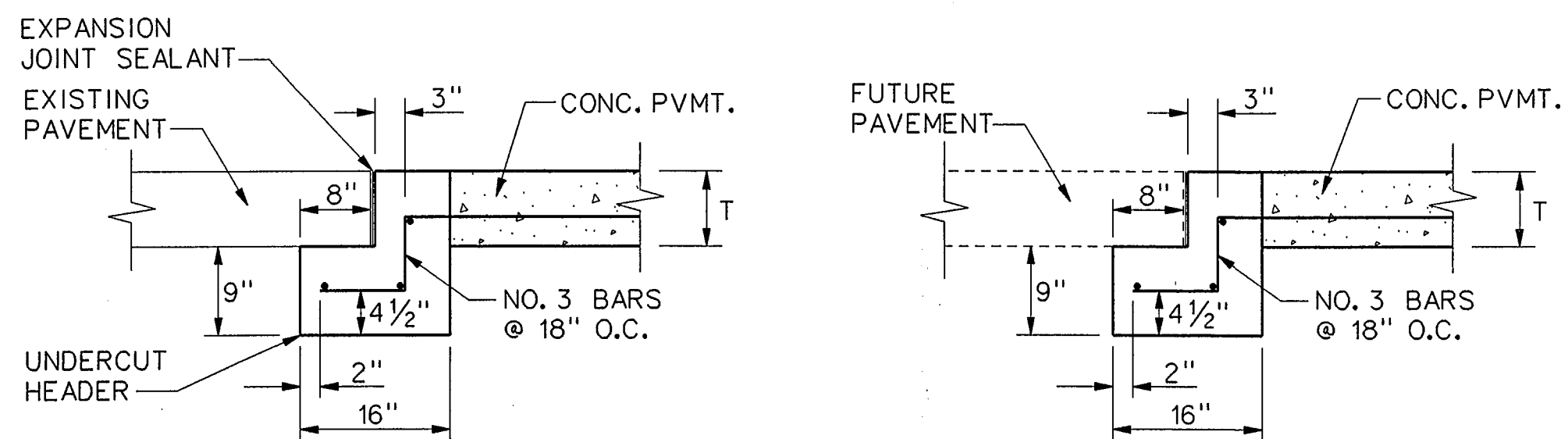


SECTION A-A
NOT TO SCALE



LONGITUDINAL BUTT JOINT
NOT TO SCALE

NOTE:
DOWEL BARS SHALL BE DRILLED INTO EXIST. PAVEMENT HORIZONTALLY BY USE OF A MECHANICAL RIG. DRILLING BY HAND IS NOT ACCEPTABLE. PUSHING DOWEL BARS INTO GREEN CONCRETE IS NOT ACCEPTABLE.



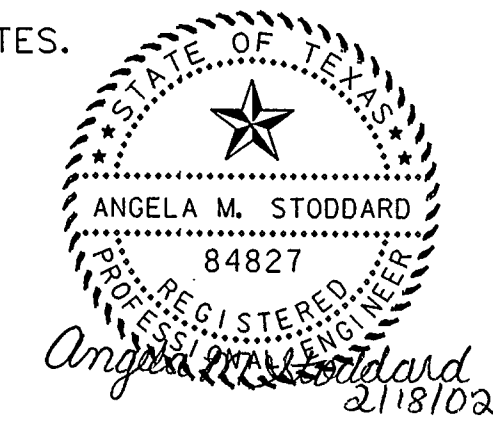
PAVEMENT BARS TO BE BENT DOWN INTO HEADER, HEADER AND PAVEMENT TO BE MONOLITHIC.

STREET HEADER
NOT TO SCALE

NOTE:
STEEL DOWELS WILL BE USED FOR LOAD TRANSFER AT ALL TRAVERSE CONTRACTION JOINTS (SAWED DUMMY JOINTS). THE DOWELS WILL BE 24 INCHES LONG, PLACED 12 O-C AND LOCATED MID-HEIGHT IN THE SLAB. NO. 6 SMOOTH DOWELS WILL BE USED. NO SEPERATE PAY ITEM WILL BE ESTABLISHED FOR THIS ITEM.

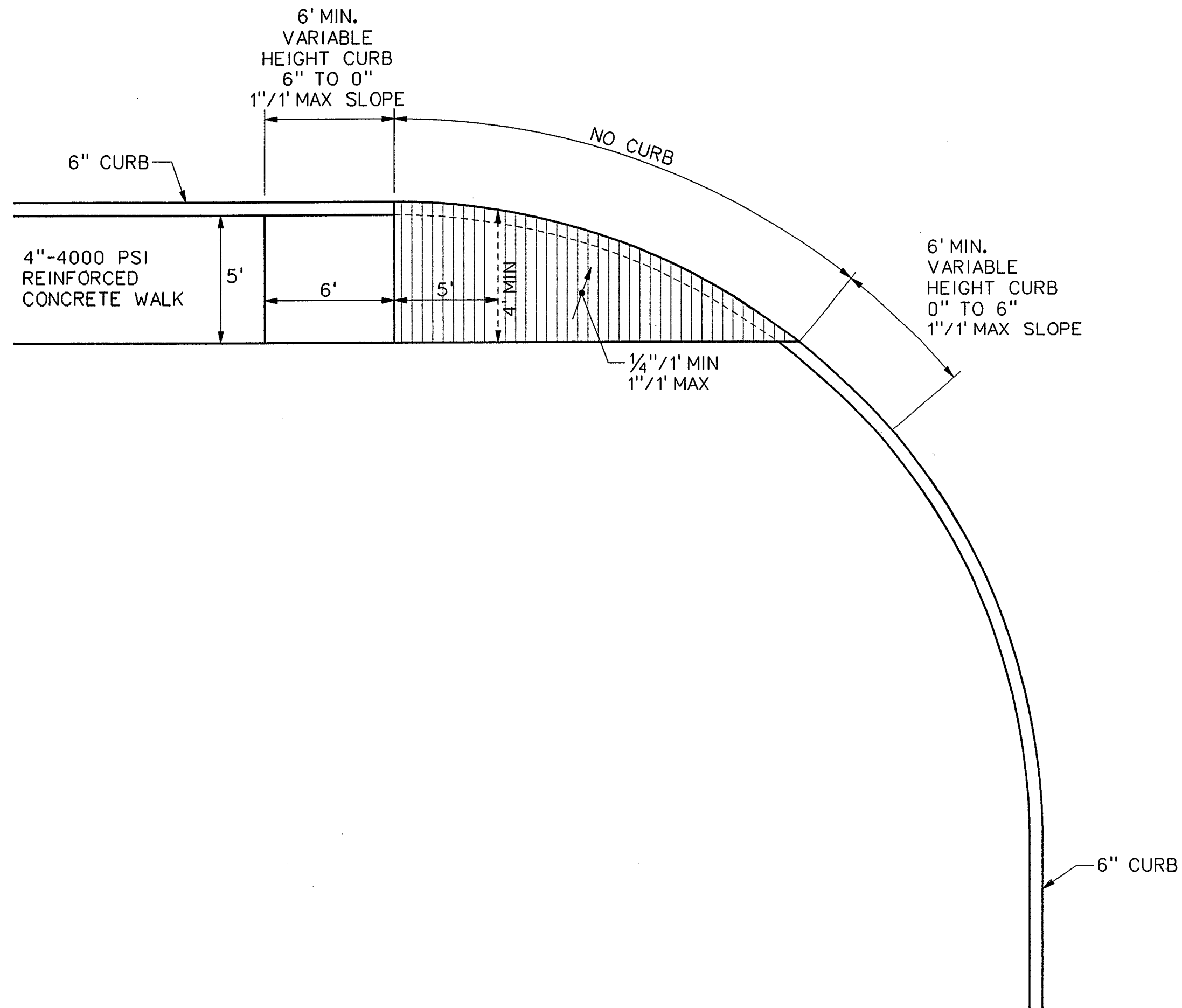
NOTES:

- UNLESS SPECIFICALLY STATED OTHERWISE IN PLANS OR CONTRACT DOCUMENTS, THE CONTROLLING SPECIFICATIONS FOR ALL WORK WITHIN PUBLIC RIGHT-OF-WAY AND EASEMENTS SHALL BE THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, THIRD EDITION 1998, AS AMENDED BY THE NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS (THE "STANDARD SPECIFICATIONS"). COPIES OF THE STANDARD SPECIFICATIONS MAY BE PURCHASED BY MAIL OR OVER THE COUNTER FROM THE NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS, 616 SIX FLAGS DRIVE, P.O. BOX DRAWER COG, ARLINGTON, TEXAS 76005-5888. PHONE METRO 817/640-3300. BULK DISCOUNTS ARE AVAILABLE. THIS DOCUMENT IS COPYRIGHTED.
- ROUGH GRADING SHALL BE ACCOMPLISHED TO WITHIN +/- 0.10 FEET OF PLAN ELEVATION.
- ALL TRAFFIC CONTROL NECESSARY FOR THE WORK SHALL BE PROVIDED BY THE CONTRACTOR. ALL BARRICADES, WARNING SIGNS, LIGHTS, DEVICES, ETC. FOR THE GUIDANCE AND PROTECTION OF TRAFFIC AND PEDESTRIANS MUST CONFORM TO THE INSTALLATIONS SHOWN IN THE LATEST ISSUE OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", AS CURRENTLY AMENDED, TEXAS DEPARTMENT OF TRANSPORTATION.
- ALL FILL SHALL BE PLACED IN MAXIMUM 8-INCH LIFTS COMPACTED TO 95% OF STANDARD PROCTOR DENSITY BETWEEN 0% AND +3% OF OPTIMUM MOISTURE CONTENT.
- ALL TREES, STUMPS, BRUSH, GRASSES AND SURFACE ORGANICS WITHIN PROPOSED RIGHT-OF-WAY ARE TO BE REMOVED AND PROPERLY DISPOSED OF OFF-SITE. TREE REMOVAL PERMITS, IF REQUIRED, WILL BE OBTAINED BY THE OWNER.
- EXISTING UTILITY POLES, IF ANY, WILL BE REMOVED OR RELOCATED BY THE UTILITY COMPANIES THROUGH COORDINATION BY THE OWNER. CONTRACTOR SHALL BRING TO THE OWNER'S ATTENTION ANY FACILITIES THAT APPEAR TO BE IN CONFLICT SO THAT THE OWNER HAS SUFFICIENT TIME TO ACCOMPLISH THE NECESSARY RELOCATIONS.
- WHERE DEEP VERTICAL EXCAVATIONS (IN EXCESS OF 3 FEET) ARE INDICATED, CUTS SHALL BE LAID BACK AT A STABLE SLOPE (ON OWNER'S PROPERTY) UNTIL WALLS ARE CONSTRUCTED. BACKFILL MATERIAL SHALL BE STOCKPILED ON-SITE AT THE DIRECTION OF THE OWNER.
- ALL REINFORCING STEEL AND DOWEL BARS IN PAVEMENT SHALL BE SUPPORTED AND MAINTAINED AT THE CORRECT CLEARANCES BY THE USE OF BAR CHAIRS OR OTHER APPROVED SUPPORT.
- THE USE OF WOOD FORMS FOR PAVEMENT CONSTRUCTION WILL BE PERMITTED.
- DUMMY JOINTS SHALL BE SAWED IN THE PAVEMENT IN THIS PROJECT. DUMMY JOINTS WILL BE SPACED APPROXIMATELY 11 FEET ON CENTERS UNLESS DIRECTED OTHERWISE BY THE TOWN. SPACING VARIATIONS SHALL BE MADE AT BLOCKOUTS, CONSTRUCTION JOINTS, AND STREET INTERSECTIONS TO LINE UP WITH EXISTING PAVING JOINTS AS SHOWN ON THE PLANS. THE SPACING BETWEEN ANY JOINT SHALL NOT BE LESS THAN 10 FEET NOR MORE THAN 15 FEET. ALL DUMMY JOINTS SHALL BE SAWED NO SOONER THAN 4 HOURS AND NO LATER THAN 12 HOURS AFTER THE PLACEMENT OF THE PAVEMENT.
- MONOLITHIC CONCRETE MEDIAN NOSE SHALL CONFORM TO NCTCOG STANDARD DRAWING NO. 2140.
- BARRIER-FREE RAMPS SHALL BE BUILT WITH THIS PROJECT. LOCATIONS MAY BE ADJUSTED AS DIRECTED BY THE TOWN TO CLEAR OBSTRUCTIONS.
- VARIABLE HEIGHT CURB AT INTERSECTIONS AND SLOPING CURBS AT DRIVES SHALL BE BUILT TO MATCH FUTURE BARRIER-FREE RAMPS PER PLANS. NO SEPERATE PAY ITEMS ARE PROVIDED.
- TWO-WAY TRAFFIC MUST BE MAINTAINED AT ALL TIMES ON PUBLIC STREETS ADJACENT TO THIS PROJECT UNLESS SPECIFIED OTHERWISE IN THE PLANS AND SPECIFICATIONS, OR DIRECTED BY THE ENGINEER. THE TRAVELWAY WIDTH SHALL NOT BE LESS THAN 10 FEET.
- SEE TYPICAL SECTIONS SHEET FOR ADDITIONAL DETAILS AND NOTES.
- ALL CURBS SHALL BE PLACED INTEGRAL WITH PAVEMENT.
- CURBS SHALL MEET THE SAME COMPRESSIVE STRENGTH AS SPECIFIED FOR THE CONCRETE PAVEMENT.
- BAR LAPS SHALL BE 30 DIAMETERS.



NO.	DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>			
ARAPAHO ROAD - PHASE II MARSH LANE TO SURVEYOR BOULEVARD			
PAVING DETAILS			
TOWN OF ADDISON, TEXAS			
Design AMS	Drawn GFS	DATE	SCALE
Check JDH	Check AMS	DEC 01	NTS
PROJECT NO.	25768	SHEET ID	PD-1

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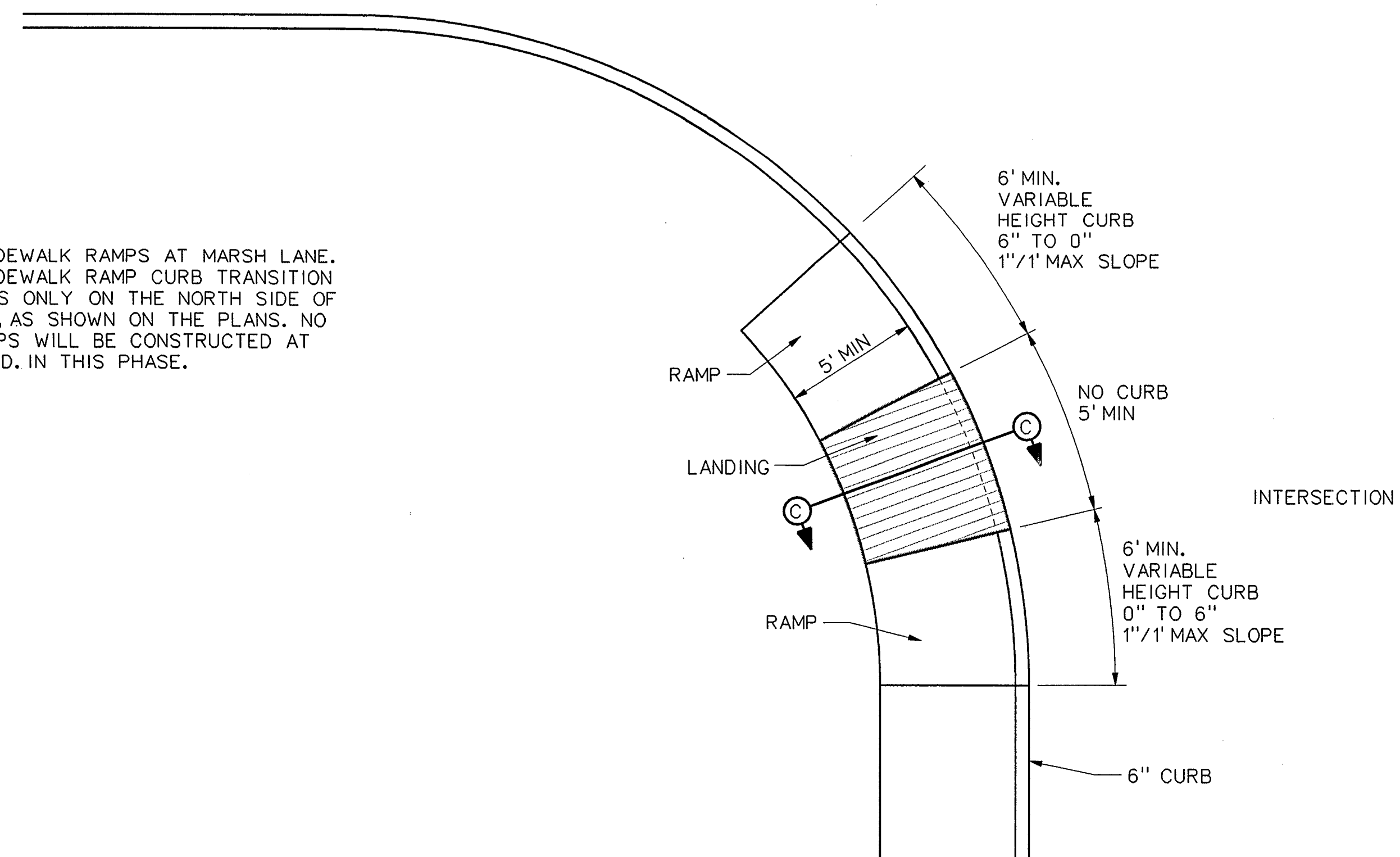


BARRIER FREE RAMP AT CURBED DRIVE
NOT TO SCALE

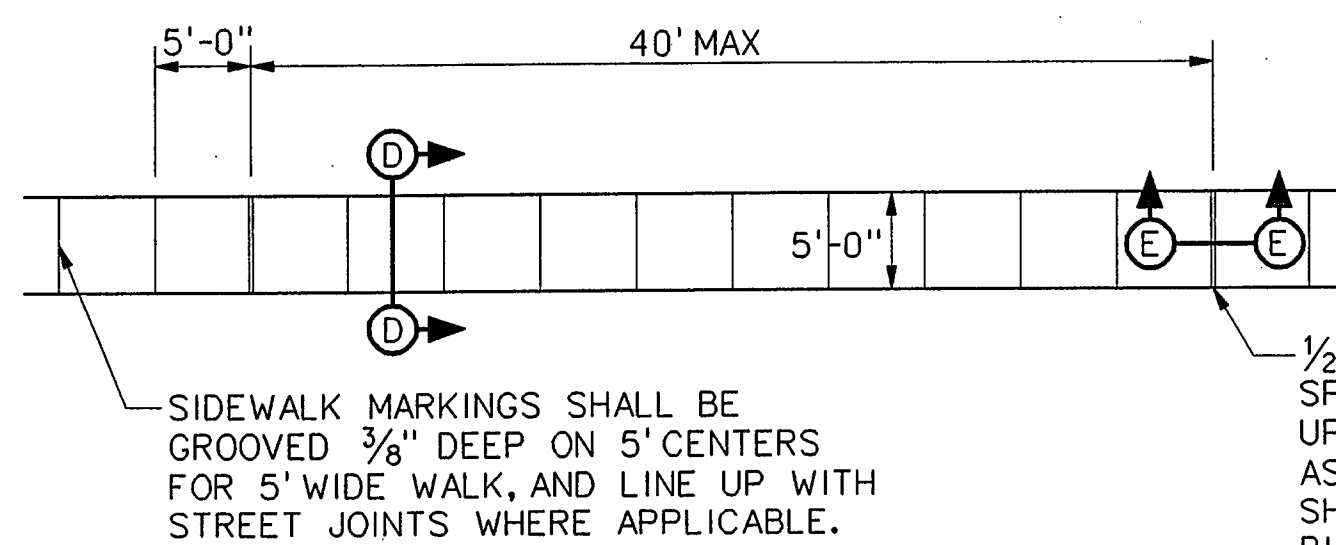
NOTES:

CONSTRUCT SIDEWALK RAMPS AT MARSH LANE. CONSTRUCT SIDEWALK RAMP CURB TRANSITION FOR DRIVEWAYS ONLY ON THE NORTH SIDE OF ARAPAHO ROAD, AS SHOWN ON THE PLANS. NO SIDEWALK RAMPS WILL BE CONSTRUCTED AT SURVEYOR BLVD. IN THIS PHASE.

DRIVEWAY

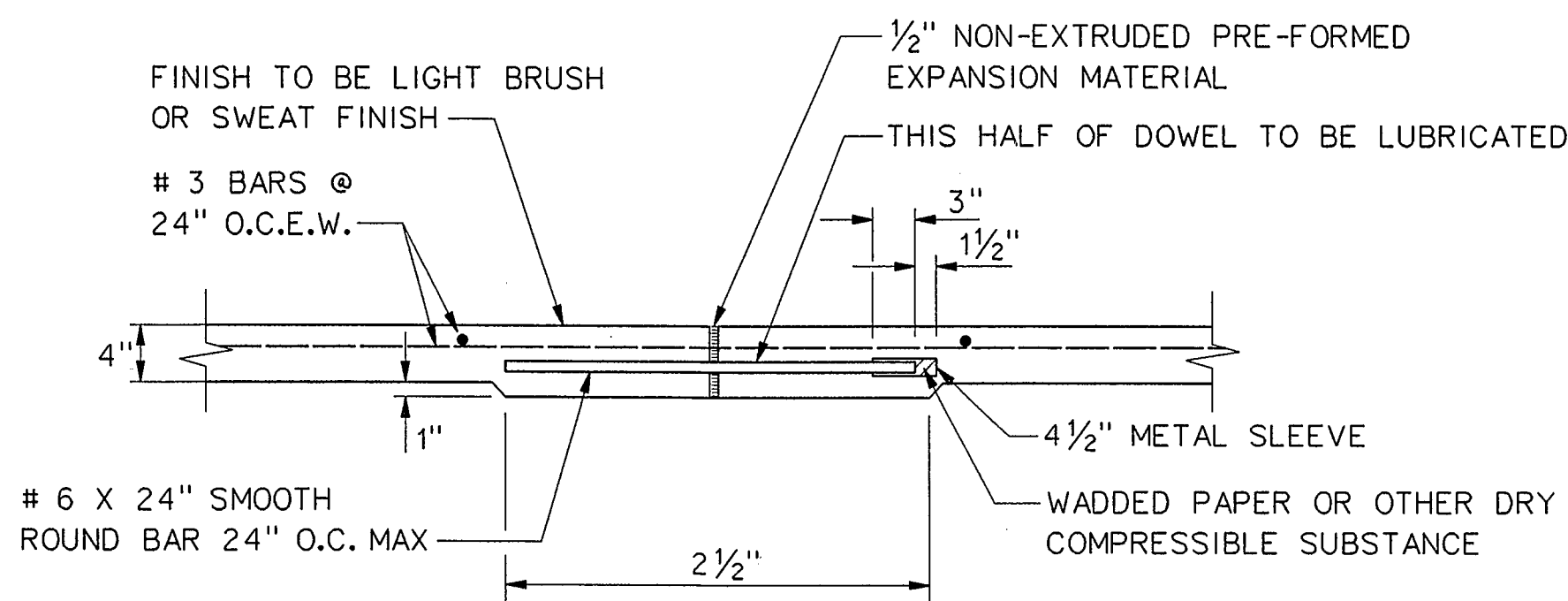


BARRIER FREE RAMP AT INTERSECTION
NOT TO SCALE

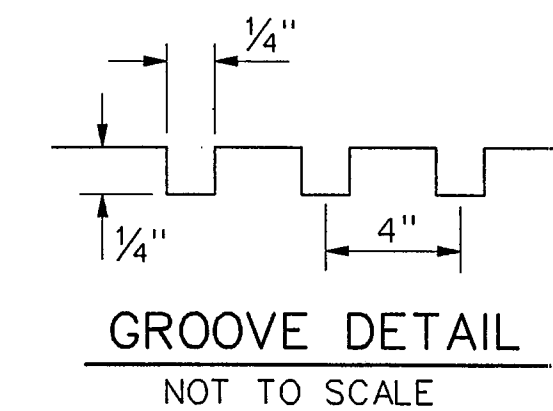


NOTE: CONCRETE TO HAVE MINIMUM 4000 PSI COMPRESSIVE STRENGTH AT 28 DAYS AND MINIMUM CEMENT CONTENT OF 5 SACKS PER CUBIC YARD OF CONCRETE.

REINFORCED CONCRETE SIDEWALK - PLAN VIEW
NOT TO SCALE



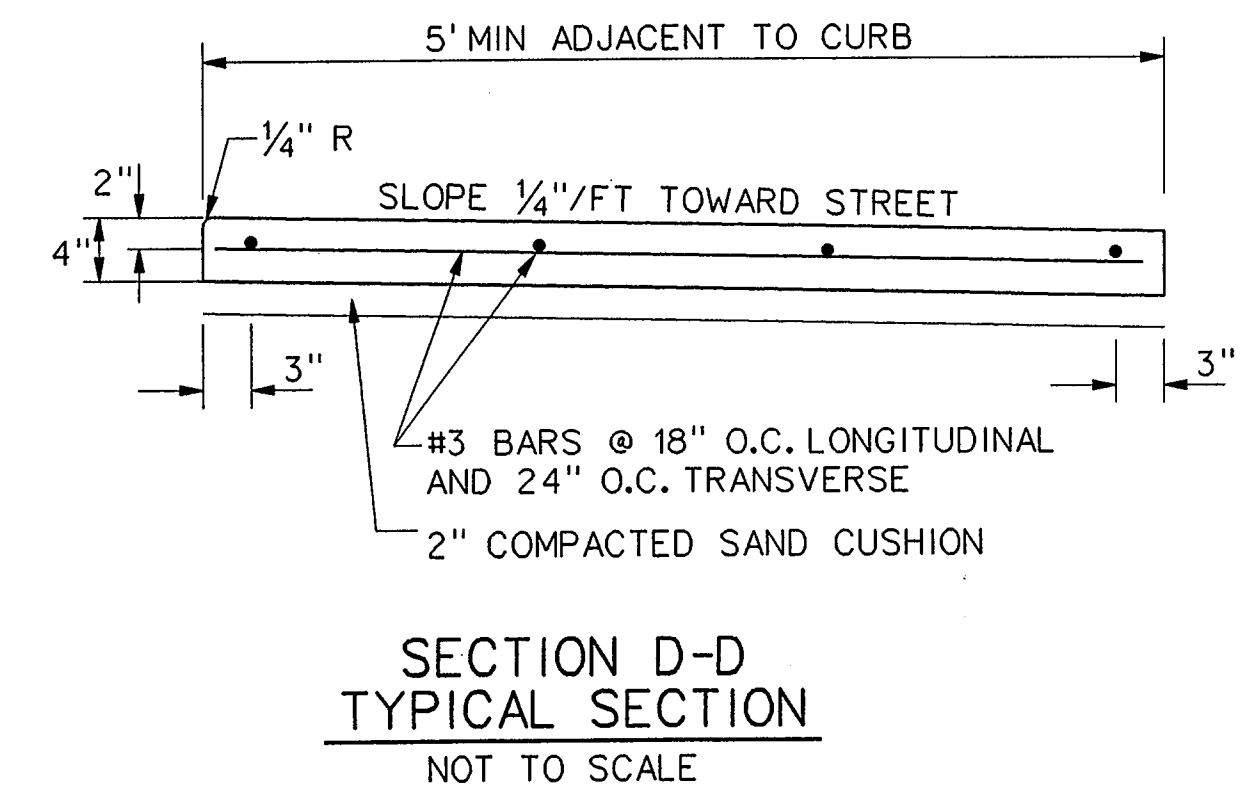
**SECTION E-E
EXPANSION JOINT DETAIL**
NOT TO SCALE



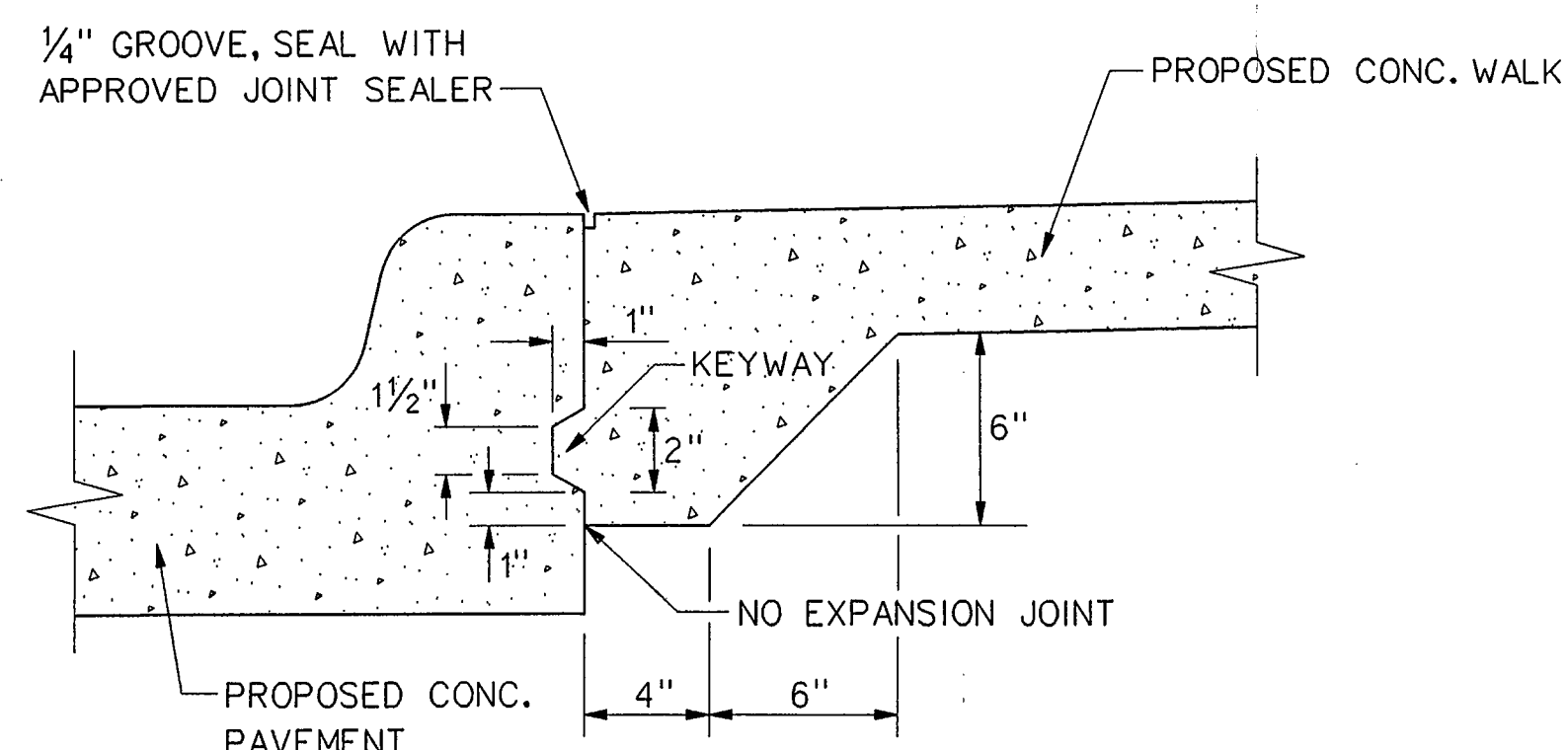
GROOVE DETAIL
NOT TO SCALE

BARRIER FREE RAMP GENERAL NOTES:

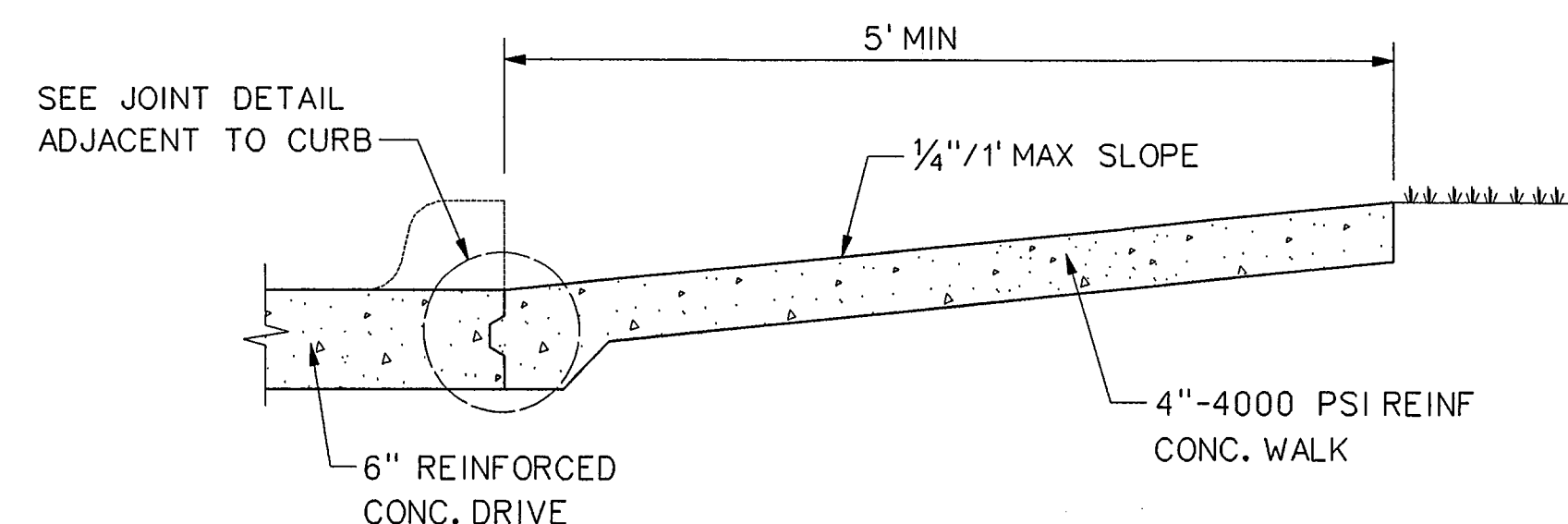
1. MAXIMUM SLOPE ON BARRIER FREE RAMPS MUST NOT EXCEED ONE INCH PER FOOT AT ANY LOCATION.
2. DESIGNS SHOWN ARE FOR 6" CURBS. FOR CURBS WITH HEIGHT GREATER THAN 6" DIMENSIONS MUST BE INCREASED PROPORTIONATELY.
3. STREETS ON STEEP GRADE WILL REQUIRE LONGER TRANSITION ON UPGRADE SIDE.
4. LOCATION OF BARRIER FREE RAMP MAY BE SHIFTED TO CLEAR OBSTRUCTIONS.
5. CONCRETE TO HAVE MINIMUM 4000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
6. GROOVES MUST BE CLEAN AND STRAIGHT FOR CLEAR DETECTION BY TOUCH WITH A CANE AND PARALLEL TO CROSSWALK.
7. CURBS AT ALL STREET AND DRIVEWAY INTERSECTIONS SHALL BE CONSTRUCTED TO ALLOW FOR BARRIER FREE RAMP ACCESS.



**SECTION D-D
TYPICAL SECTION**
NOT TO SCALE

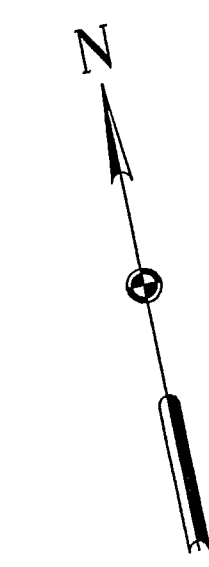
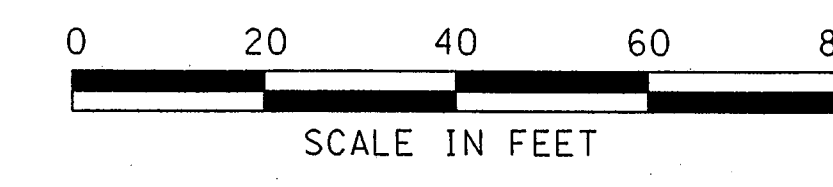


**JOINT DETAIL FOR SIDEWALK
ADJACENT TO PROPOSED PAVEMENT**
NOT TO SCALE



SECTION C-C
NOT TO SCALE

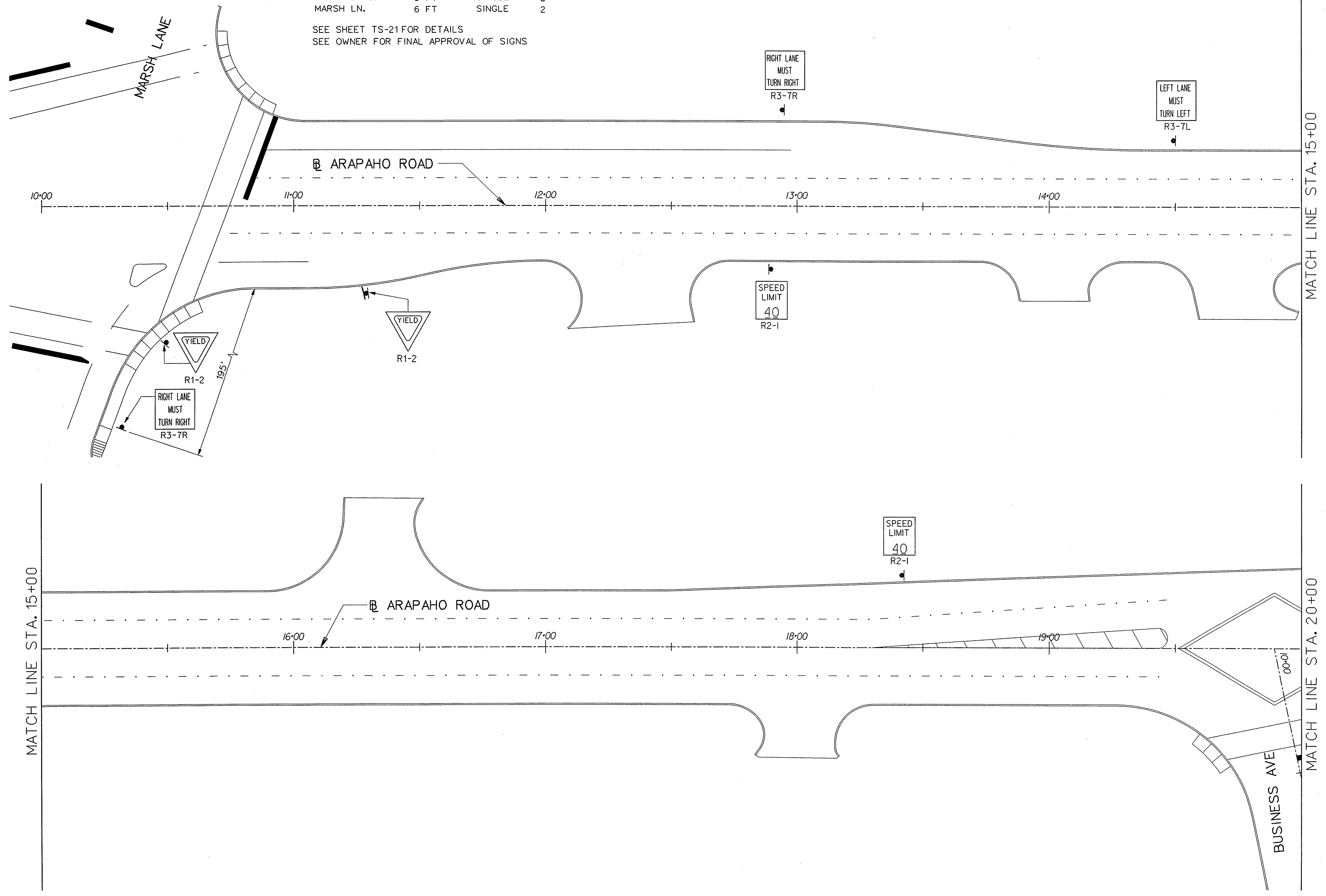
NO.		DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>				
ARAPAHO ROAD - PHASE II				
MARSH LANE TO SURVEYOR BOULEVARD				
PAVING DETAILS				
TOWN OF ADDISON, TEXAS				
Design	AMS	Drawn	GFS	DATE
Check	JDH	Check	AMS	DEC 01
SCALE	PROJECT NO.		SHEET ID	
NTS	25768	PD-2		



INTERNALLY ILLUMINATED SIGNS AT MARSH INTERSECTION

SIGN	SIGN LENGTH	FACE	QUANTITY
ARAPAHO RD.	8 FT	SINGLE	2
MARSH LN.	6 FT	SINGLE	2

SEE SHEET TS-21 FOR DETAILS
SEE OWNER FOR FINAL APPROVAL OF SIGNS



NOTES:

1. ALL SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.



NO.	DATE	REVISION	APPROV.

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

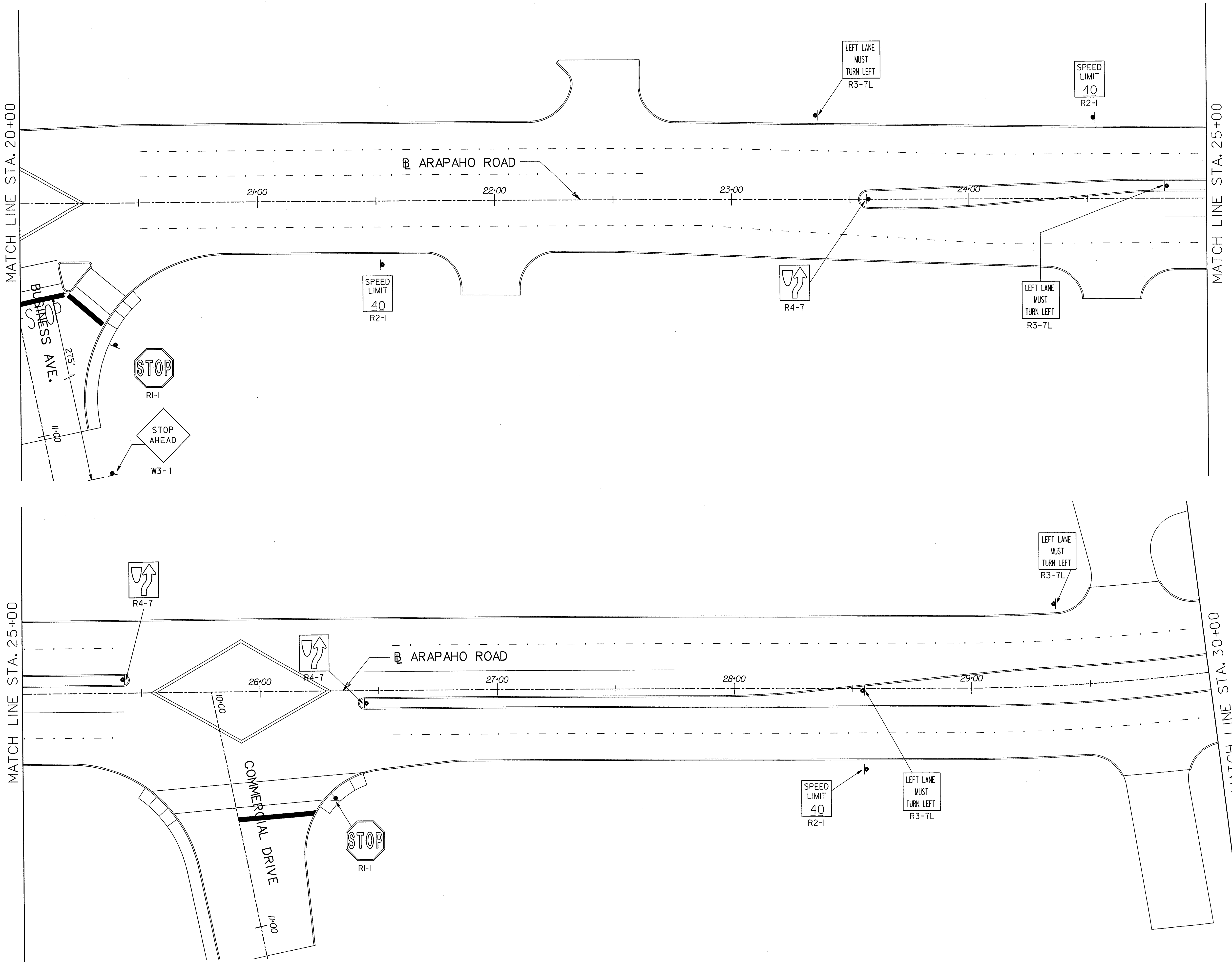
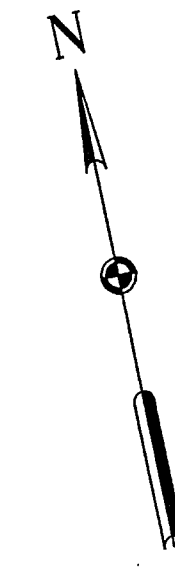
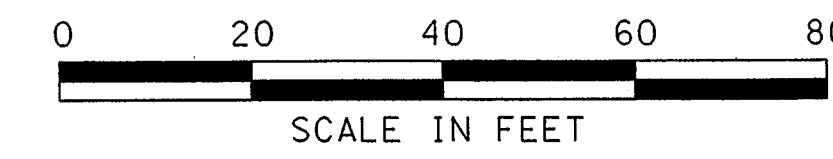
ARAPAHO ROAD - PHASE II
MARSH LANE TO SURVEYOR BOULEVARD

SIGNING PLANS
STA 10+41.06 TO STA 20+00

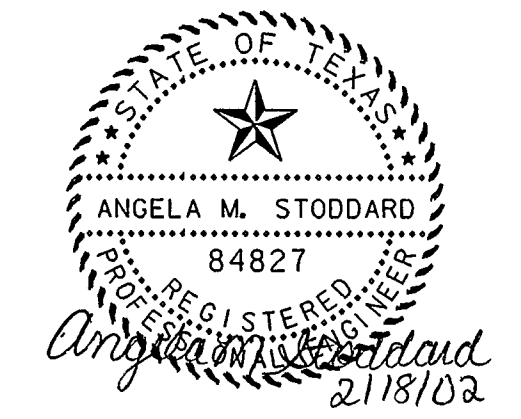
TOWN OF ADDISON, TEXAS

Design	AMS	Drawn	GFS	DATE	SCALE	PROJECT NO.	SHEET ID
Check	JDH	Check	AMS	DEC 01	1" = 20'	25768	S-1

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1. ALL SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.



NO.	DATE	REVISION	APPROV.

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

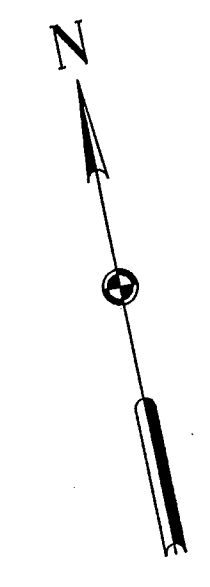
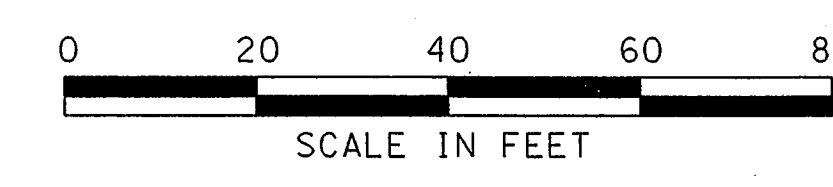
ARAPAHO ROAD - PHASE II
MARSH LANE TO SURVEYOR BOULEVARD

SIGNING PLANS
STA 20+00 TO STA 30+00

TOWN OF ADDISON, TEXAS

Design	AMS	Drawn	GFS	DATE	SCALE	PROJECT NO.	SHEET ID
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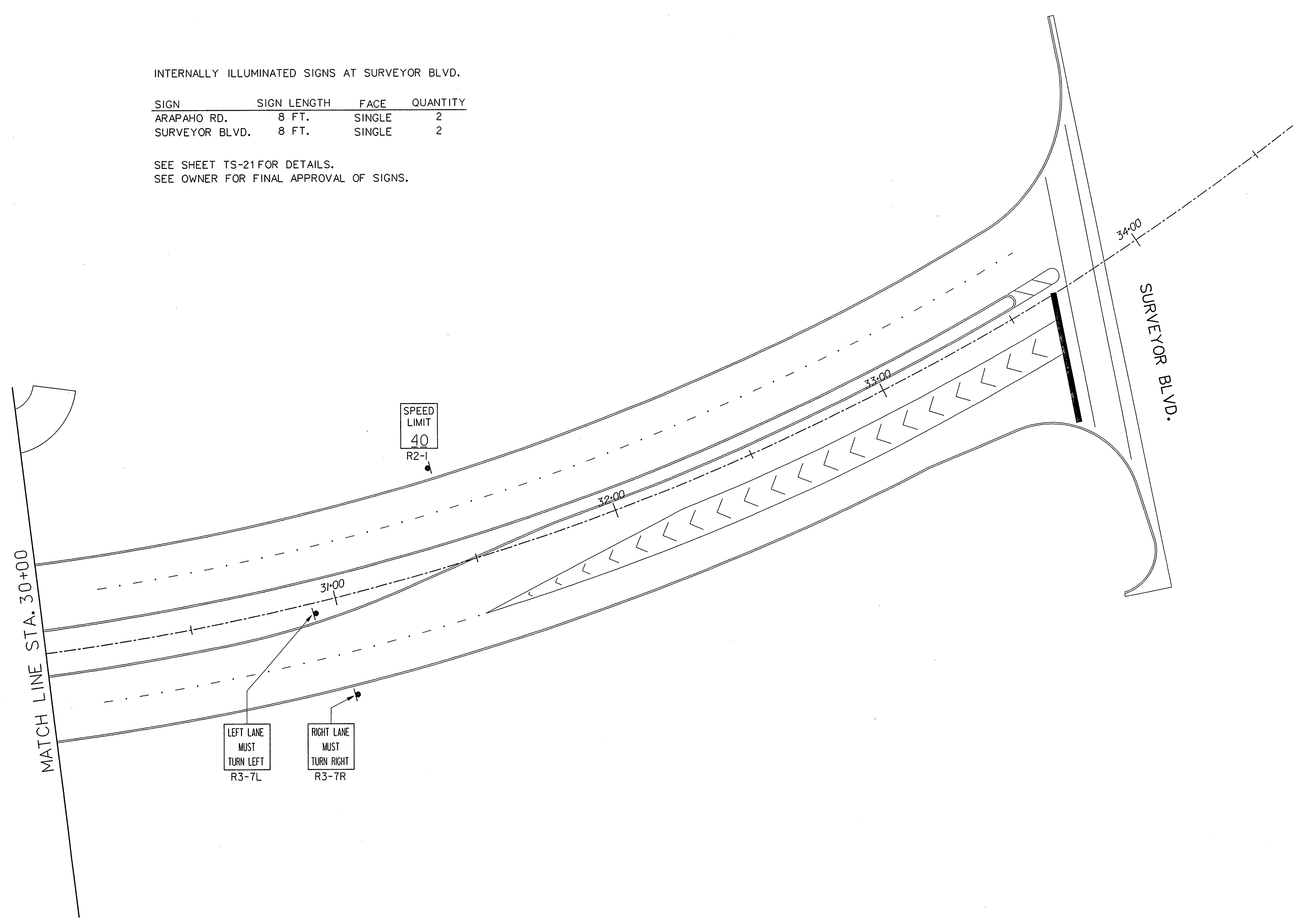
INTERNALLY ILLUMINATED SIGNS AT SURVEYOR BLVD.

SIGN	SIGN LENGTH	FACE	QUANTITY
ARAPAHO RD.	8 FT.	SINGLE	2
SURVEYOR BLVD.	8 FT.	SINGLE	2

SEE SHEET TS-21 FOR DETAILS.
SEE OWNER FOR FINAL APPROVAL OF SIGNS.

NOTES:

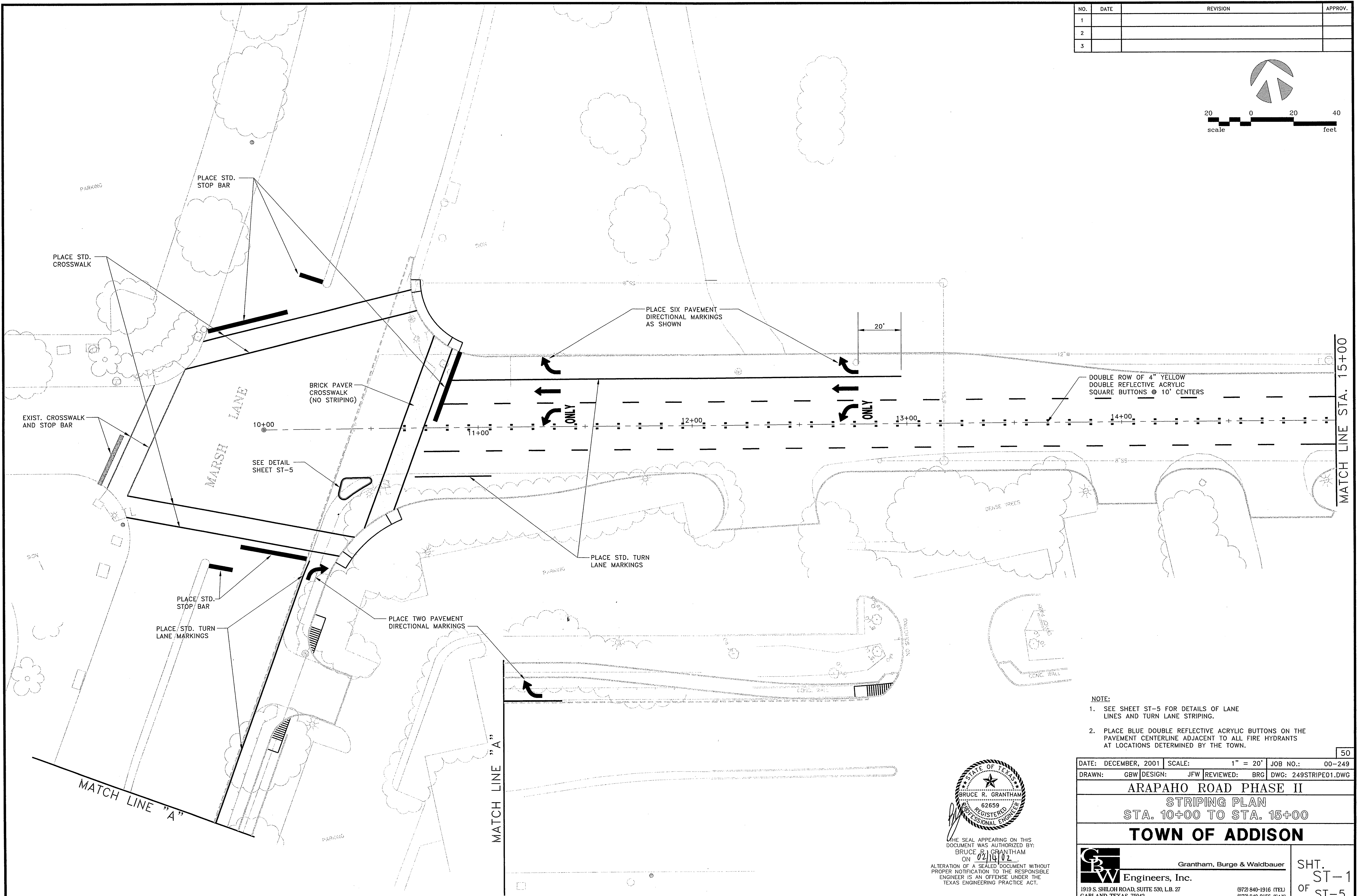
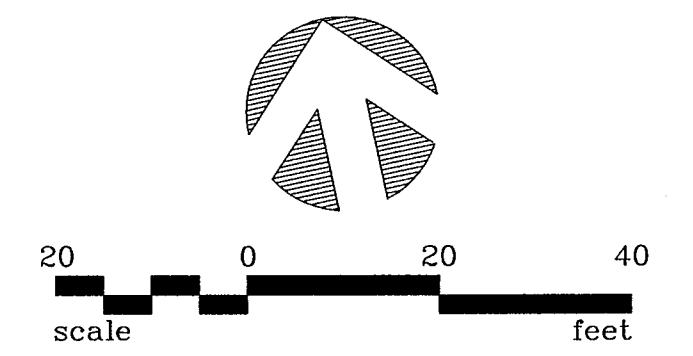
1. ALL SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.



NO.		DATE	REVISION	APPROV.	49
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>					
ARAPAHO ROAD - PHASE II					
MARSH LANE TO SURVEYOR BOULEVARD					
SIGNING PLANS					
STA 30+00 TO STA 33+87.02					
TOWN OF ADDISON, TEXAS					
Design	AMS	Drawn	GFS	DATE	SCALE
Check	JDH	Check	AMS	DEC 01	1" = 20'
PROJECT NO.	25768	SHEET ID	S-3		

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NO.	DATE	REVISION	APPROV.
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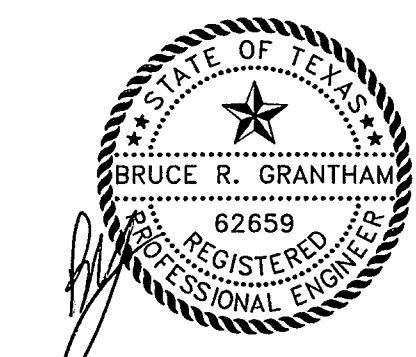


- NOTE:**
- SEE SHEET ST-5 FOR DETAILS OF LANE LINES AND TURN LANE STRIPING.
 - PLACE BLUE DOUBLE REFLECTIVE ACRYLIC BUTTONS ON THE PAVEMENT CENTERLINE ADJACENT TO ALL FIRE HYDRANTS AT LOCATIONS DETERMINED BY THE TOWN.

50

DATE: DECEMBER, 2001	SCALE: 1" = 20'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: JFW	REVIEWED: BRG
DWG: 249STRPE01.DWG		

**ARAPAHO ROAD PHASE II
STRIPING PLAN
STA. 10+00 TO STA. 15+00
TOWN OF ADDISON**

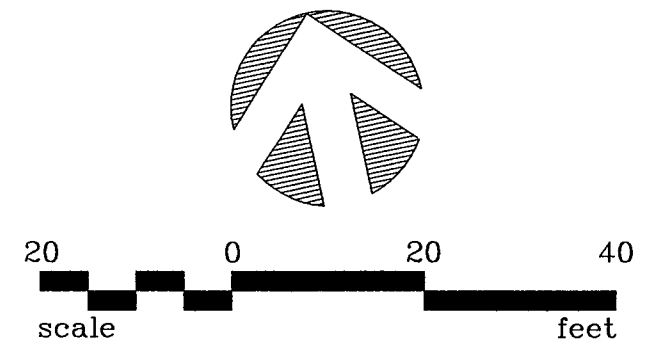


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BRUCE R. GRANTHAM
ON 02/14/02
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GBW Engineers, Inc.
Grantham, Burge & Waldbauer
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

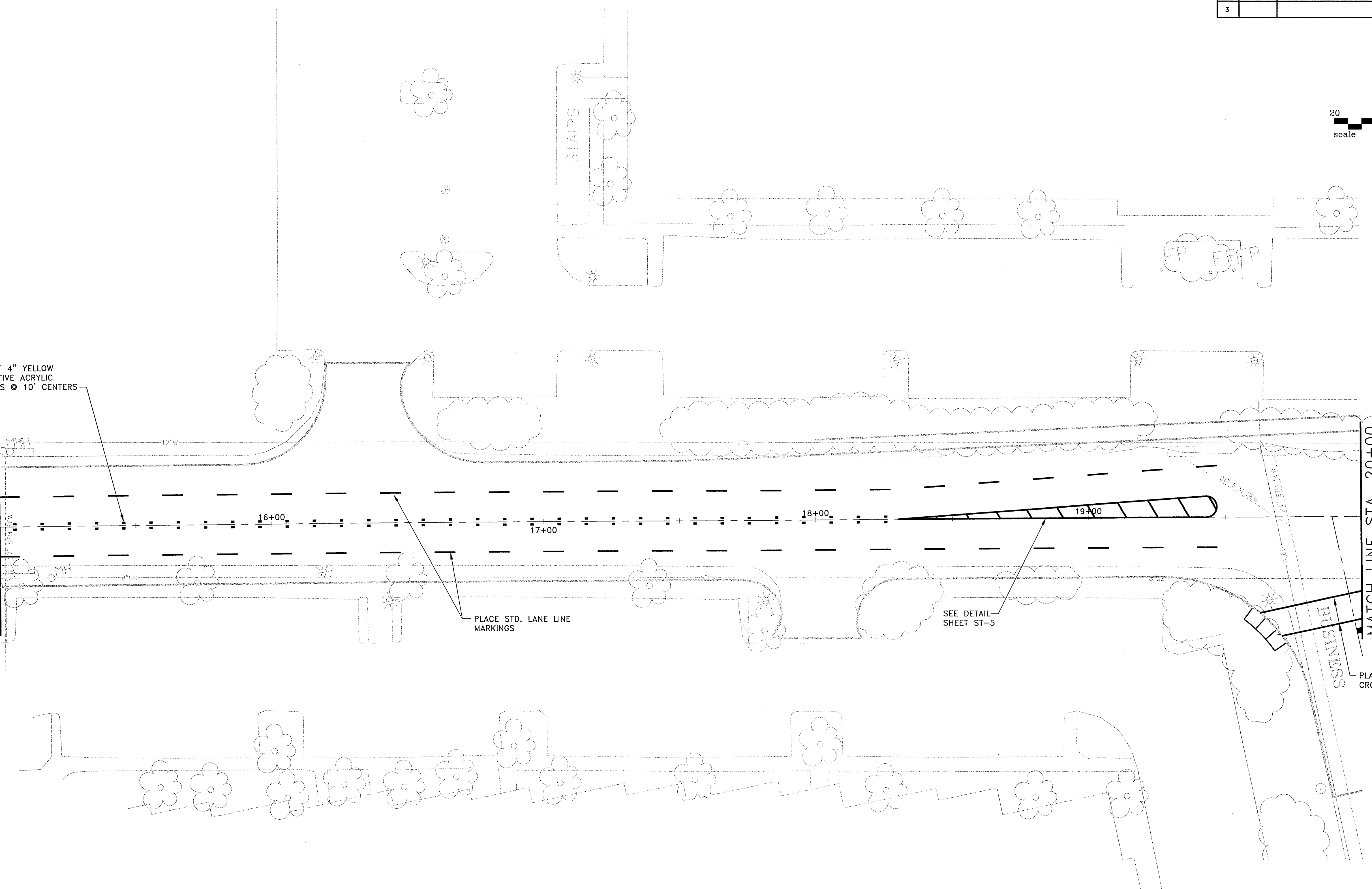
SHT. ST-1
OF ST-5

NO.	DATE	REVISION	APPROV.
1			
2			
3			



DOUBLE ROW OF 4" YELLOW
DOUBLE REFLECTIVE ACRYLIC
SQUARE BUTTONS @ 10' CENTERS

MATCH LINE STA. 15+00



PLACE STD. LANE LINE
MARKINGS

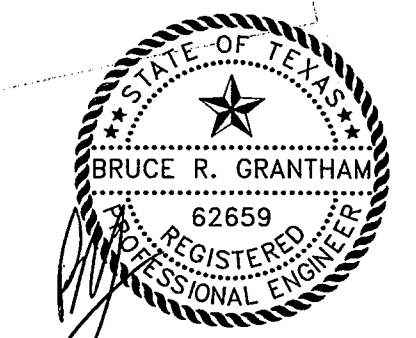
SEE DETAIL—
SHEET ST-5

PLACE STD.
CROSSWALK

MATCH LINE STA. 20+00

RAMP

- NOTE:
- SEE SHEET ST-5 FOR DETAILS OF LANE LINES AND TURN LANE STRIPING.
 - PLACE BLUE DOUBLE REFLECTIVE ACRYLIC BUTTONS ON THE PAVEMENT CENTERLINE ADJACENT TO ALL FIRE HYDRANTS AT LOCATIONS DETERMINED BY THE TOWN.



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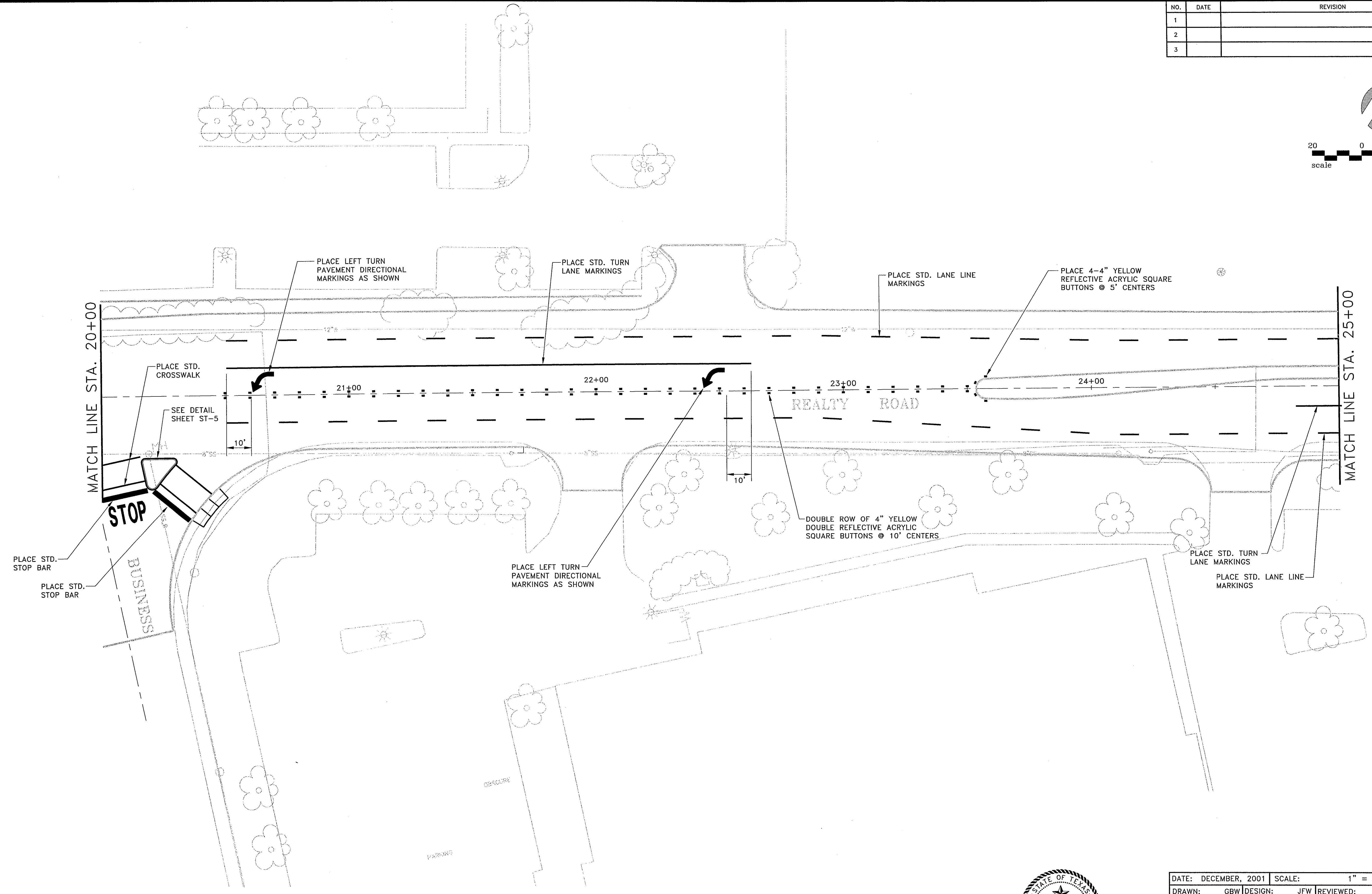
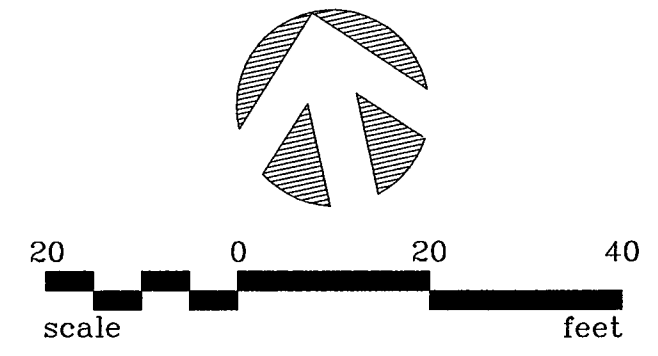
DATE: DECEMBER, 2001	SCALE: 1" = 20'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: JFW	REVIEWED: BRG
DWG: 249STRPE02.DWG		

ARAPAHO ROAD PHASE II
STRIPING PLAN
STA. 15+00 TO 20+00

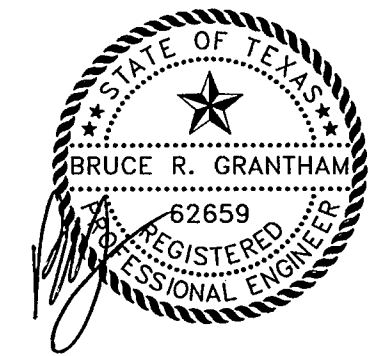
TOWN OF ADDISON

SHT. ST-2
OF ST-5

NO.	DATE	REVISION	APPROV.
1			
2			
3			



- NOTE:**
- SEE SHEET ST-5 FOR DETAILS OF LANE LINES AND TURN LANE STRIPING.
 - PLACE BLUE DOUBLE REFLECTIVE ACRYLIC BUTTONS ON THE PAVEMENT CENTERLINE ADJACENT TO ALL FIRE HYDRANTS AT LOCATIONS DETERMINED BY THE TOWN.



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 REGISTERED PROFESSIONAL ENGINEER
 ON 02/19/02
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DATE: DECEMBER, 2001	SCALE: 1" = 20'	JOB NO.: 00-249	51A
DRAWN: GBW	DESIGN: JFW	REVIEWED: BRG	DWG: 249STRPE03.DWG

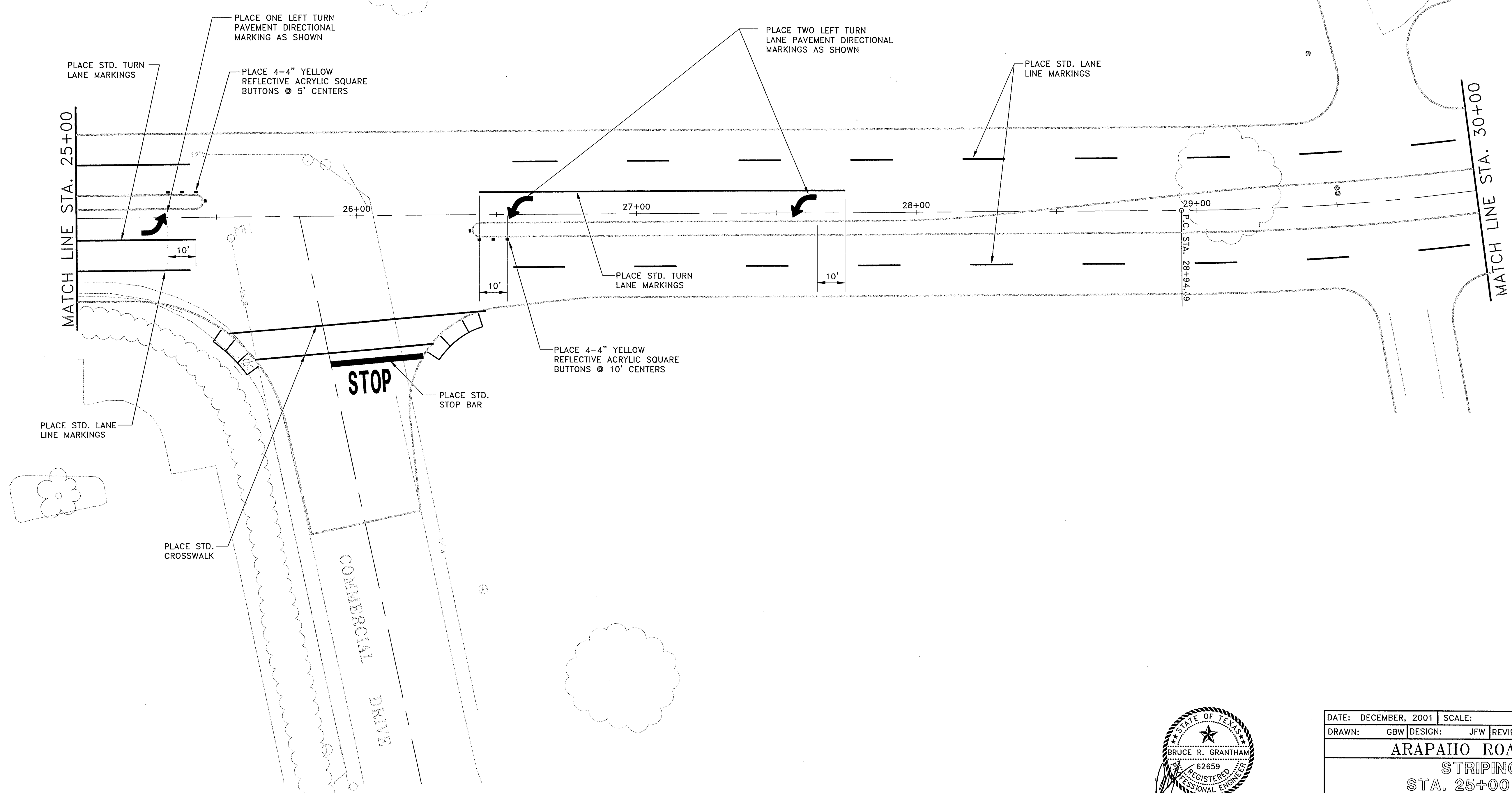
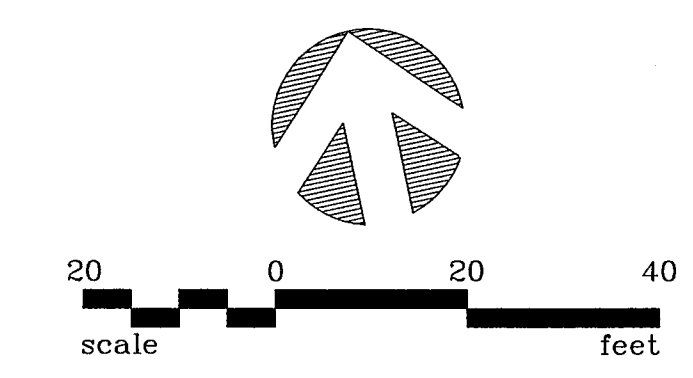
**ARAPAHO ROAD PHASE II
 STRIPING PLAN
 STA. 20+00 TO STA. 25+00
 TOWN OF ADDISON**

Grantham, Burge & Waldbauer
Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27
 GARLAND, TEXAS 75042

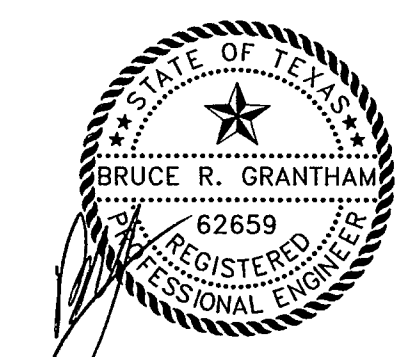
SHT. ST-3
 OF ST-5

(972) 840-1916 (TEL)
 (972) 840-2156 (FAX)

NO.	DATE	REVISION	APPROV.
1			
2			
3			



- NOTE:**
- SEE SHEET ST-5 FOR DETAILS OF LANE LINES AND TURN LANE STRIPING.
 - PLACE BLUE DOUBLE REFLECTIVE ACRYLIC BUTTONS ON THE PAVEMENT CENTERLINE ADJACENT TO ALL FIRE HYDRANTS AT LOCATIONS DETERMINED BY THE TOWN.



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 BRUCE R. GRANTHAM
 ON 02/14/02
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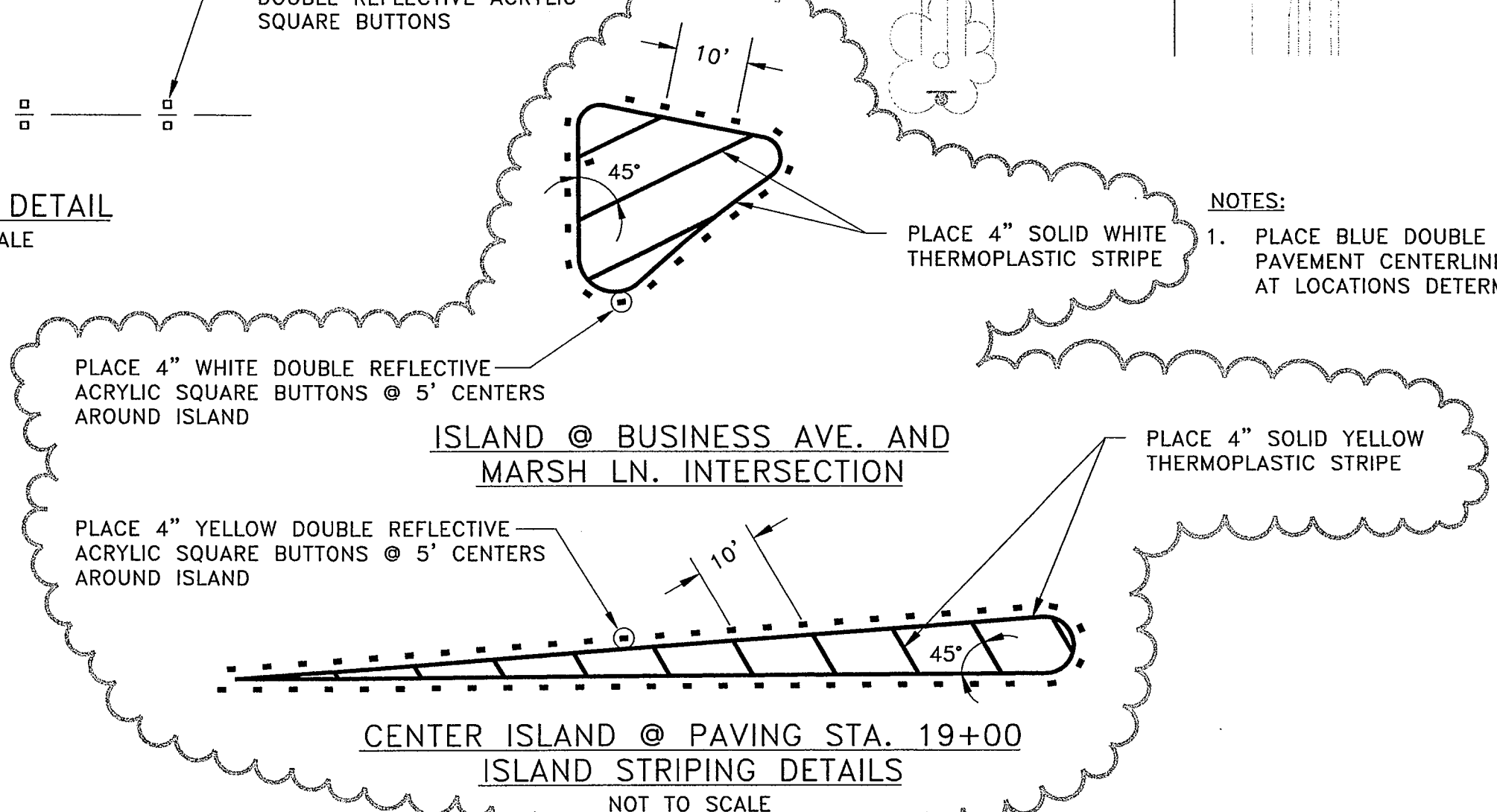
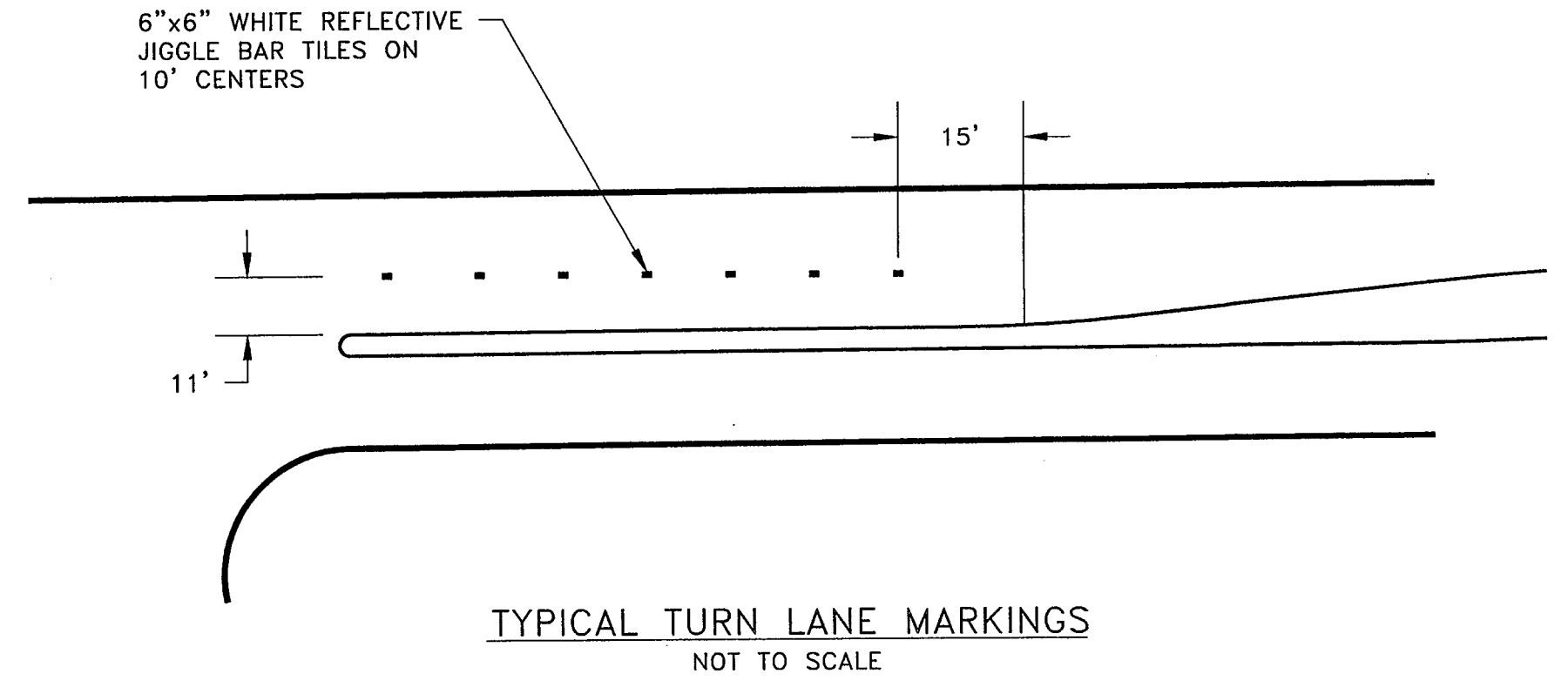
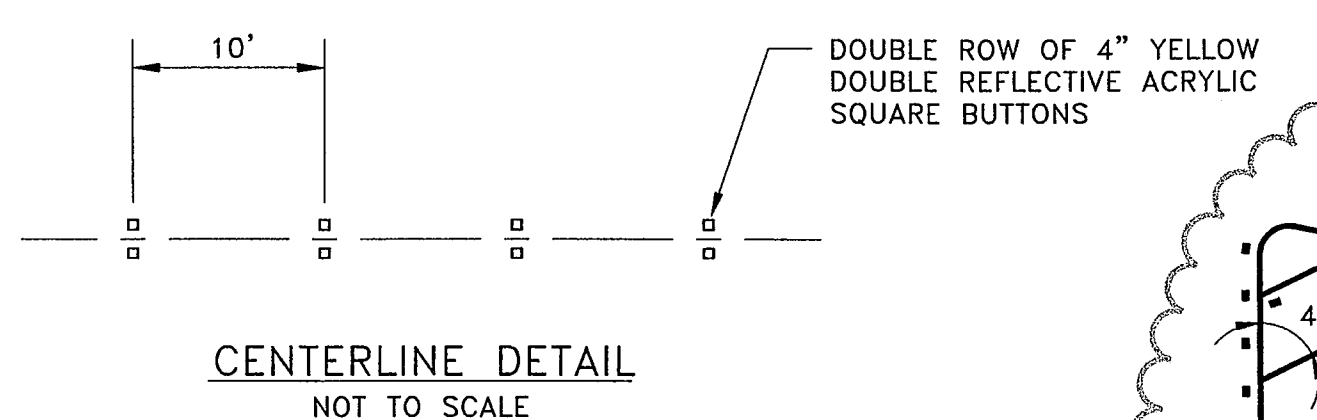
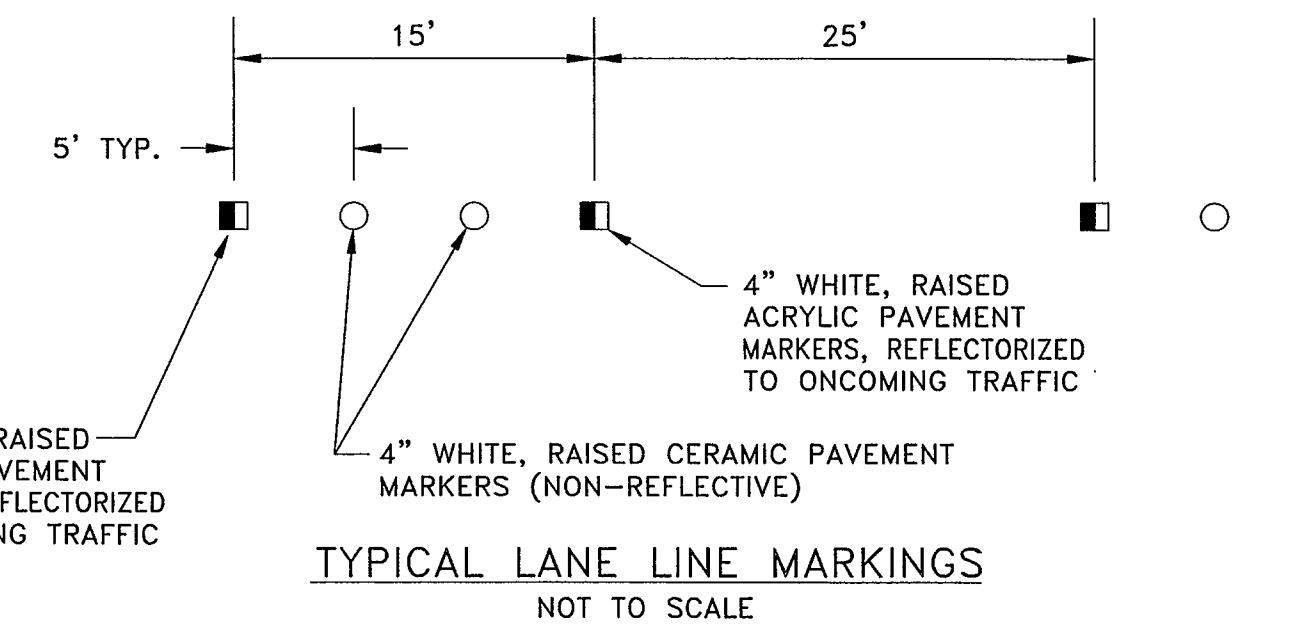
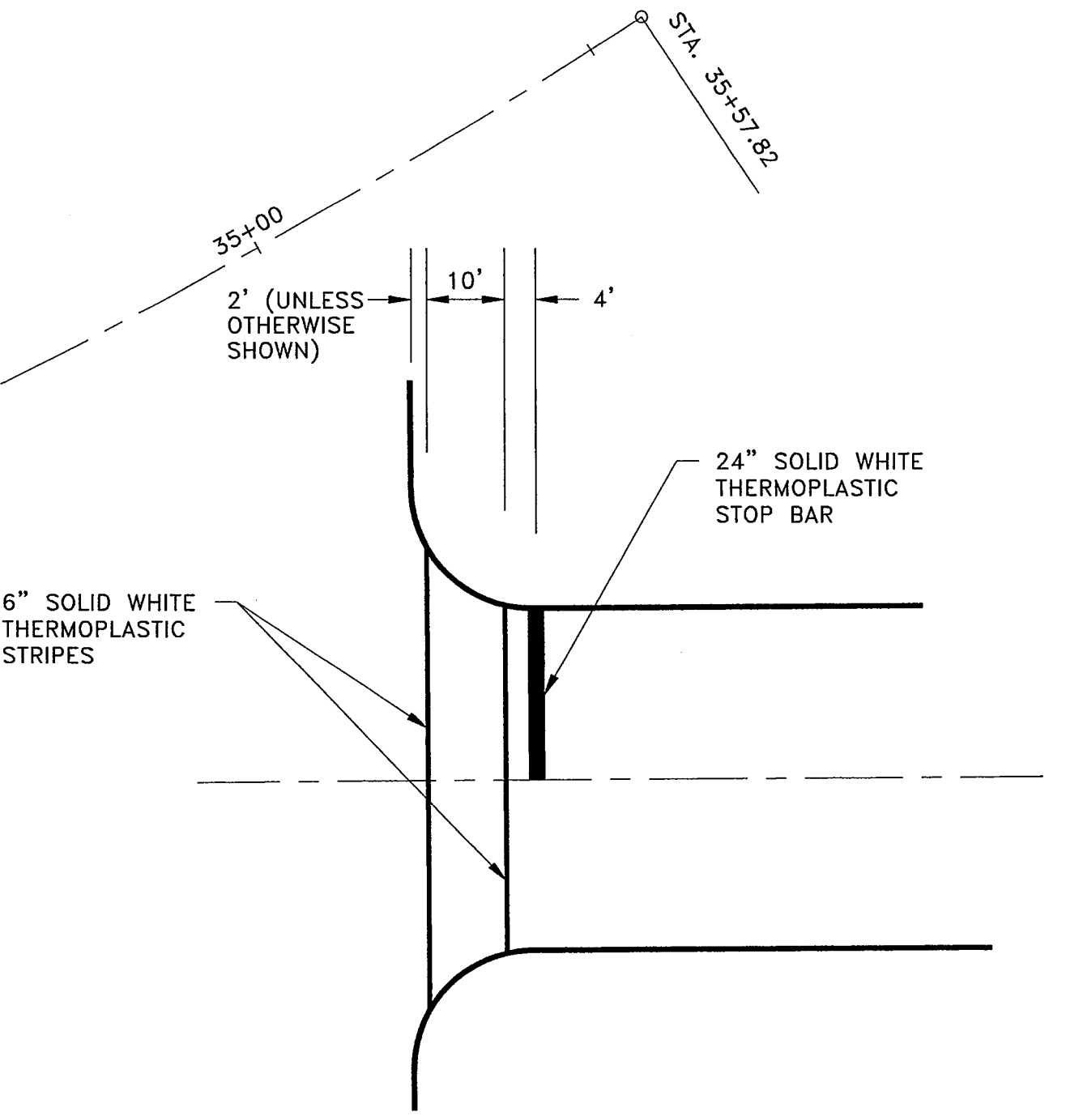
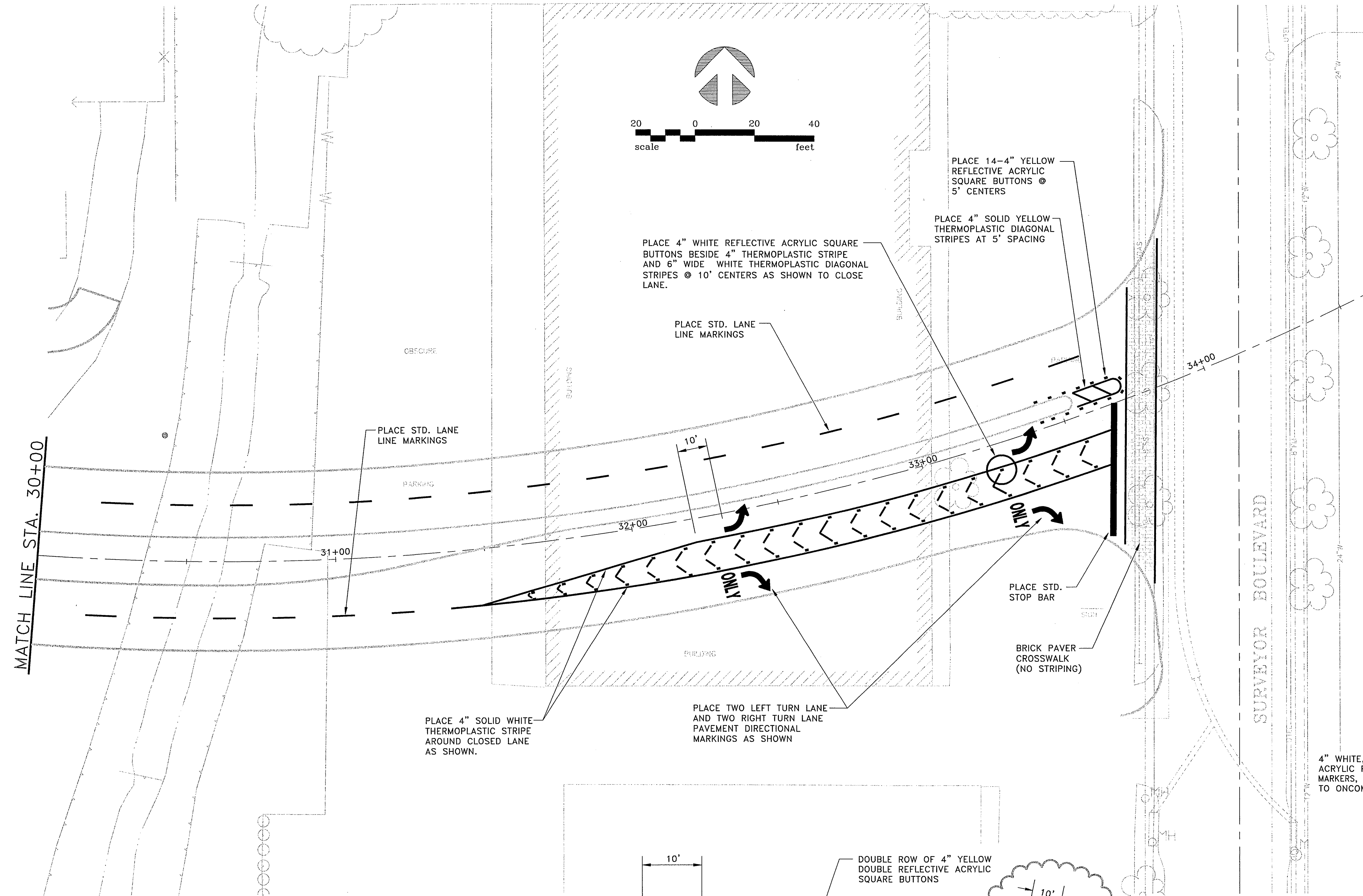
DATE: DECEMBER, 2001	SCALE: 1" = 20'	JOB NO.: 00-249	51B
DRAWN: GBW	DESIGN: JFW	REVIEWED: BRG	DWG: 249STRPE04.DWG

**ARAPAHO ROAD PHASE II
 STRIPING PLAN
 STA. 25+00 TO 30+00
 TOWN OF ADDISON**

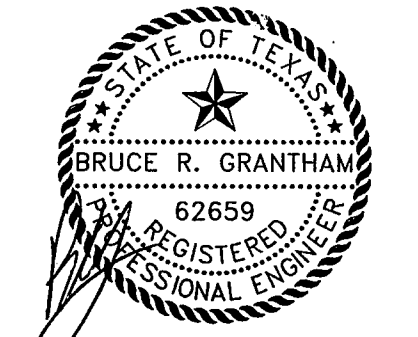
GRW Engineers, Inc.
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 1919 S. SHILOH ROAD, SUITE 530, L.B. 27
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 ST-4
 OF
 ST-5

NO.	DATE	REVISION	APPROV.
1	2/06/02	PER ADDENDUM No.2	BRG
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- NOTES:
- PLACE BLUE DOUBLE REFLECTIVE ACRYLIC BUTTONS ON THE PAVEMENT CENTERLINE ADJACENT TO ALL FIRE HYDRANTS AT LOCATIONS DETERMINED BY THE TOWN.

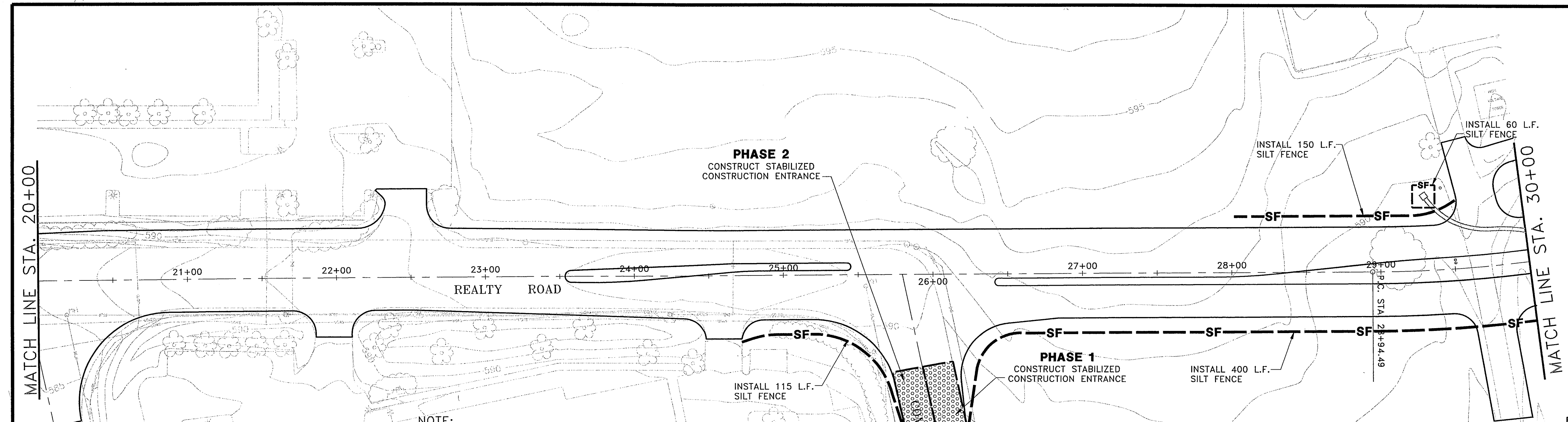
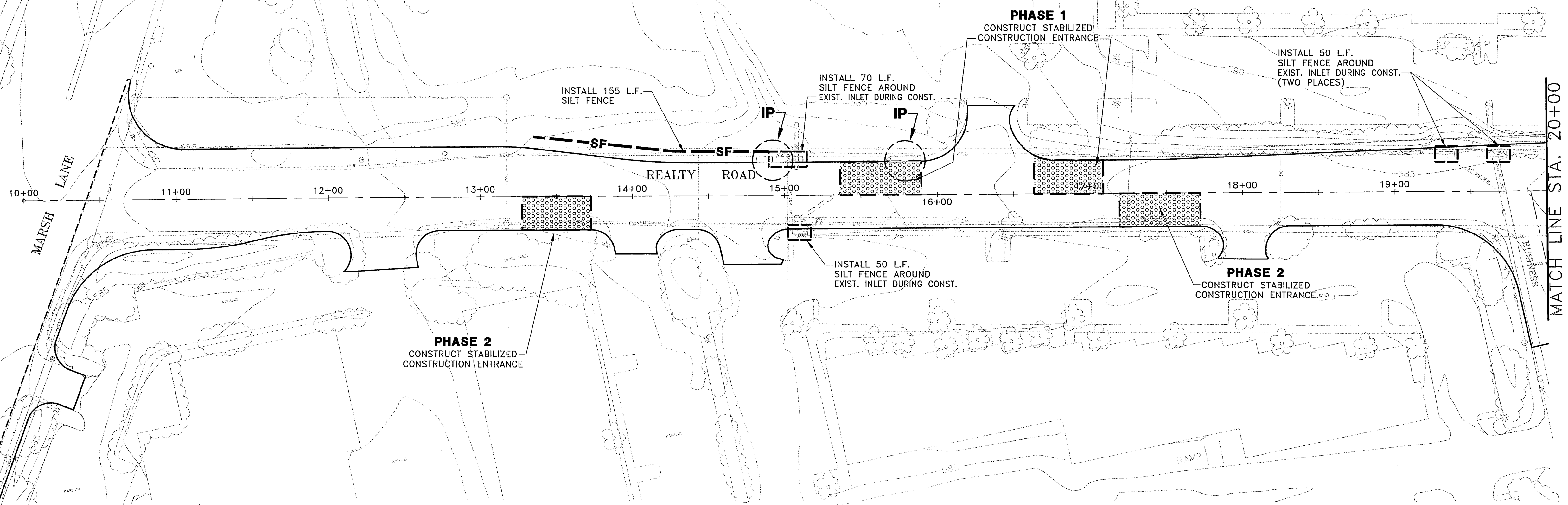
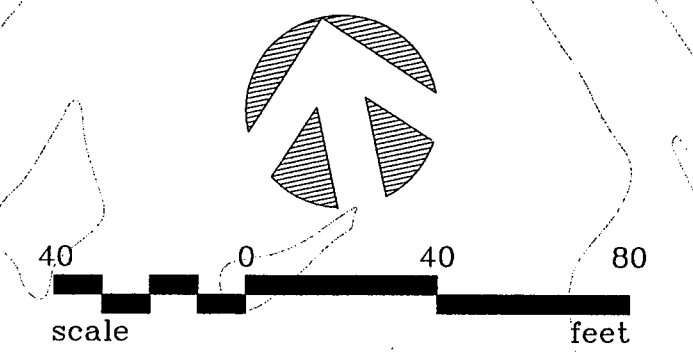


THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY:
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 ON 02/14/02
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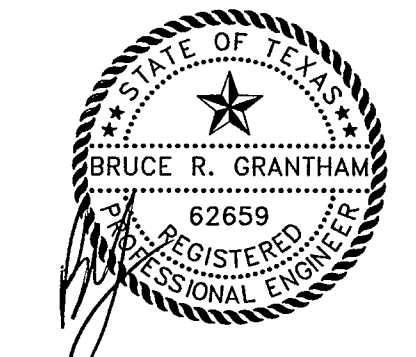
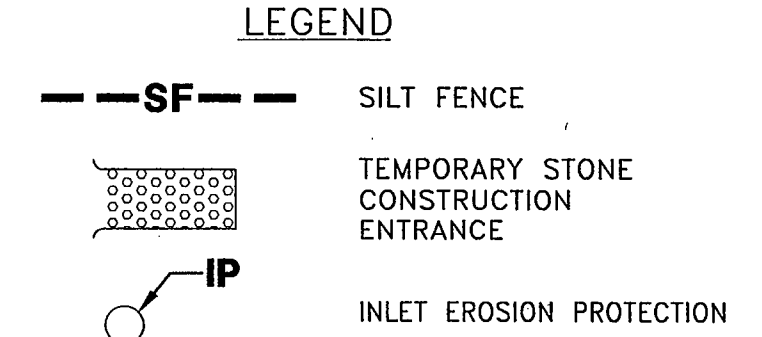
DATE: DECEMBER, 2001 SCALE: 1" = 20' JOB NO.: 00-249
 DRAWN: GBW DESIGN: JFW REVIEWED: BRG DWG: 249STRIP05.DWG
ARAPAHO ROAD PHASE II STRIPING PLAN
 STA. 25+00 TO 35+57.82
TOWN OF ADDISON
 Grantham, Burge & Waldbauer
Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042 (972) 840-1916 (TEL) (972) 840-2156 (FAX)

SHT. ST-5
 OF ST-5

NO.	DATE	REVISION	APPROV.
1			
2			
3			



- NOTE:**
- REFER TO SHEET EC-2 OF EC-2 FOR EROSION CONTROL DETAILS & NOTES.
 - EXISTING DOWNSTREAM INLETS ON BUSINESS AVENUE OR COMMERCIAL DRIVE SHALL BE PROTECTED USING THE SPECIFIED INLET EROSION PROTECTION (SEE SHEET EC-2 FOR DETAILS)



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: BRUCE R. GRANTHAM ON 02/14/02. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DATE: DECEMBER, 2001	SCALE: 1"=40'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: JFW	REVIEWED: DWG: 249EROSN01

**ARAPAHO ROAD PHASE II
EROSION CONTROL PLAN
STA. 10+00 TO STA. 30+00
TOWN OF ADDISON**

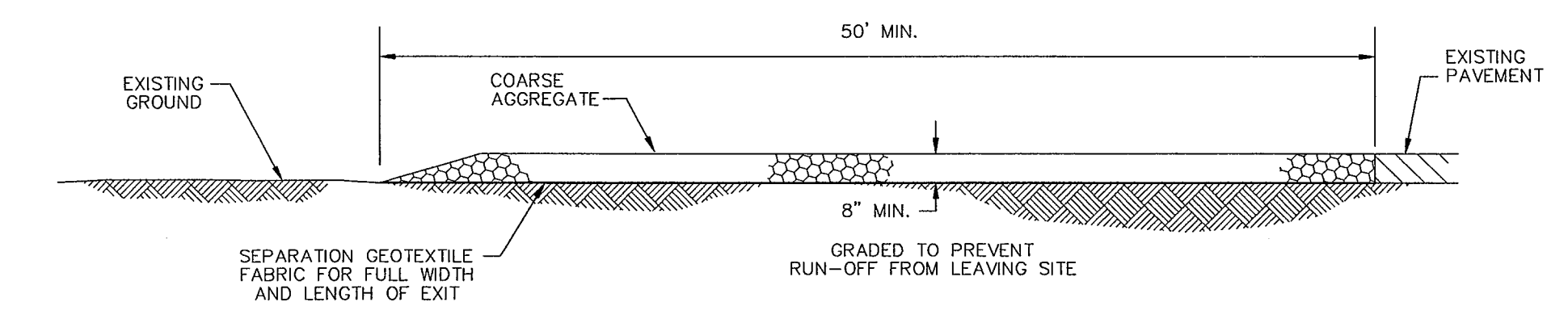
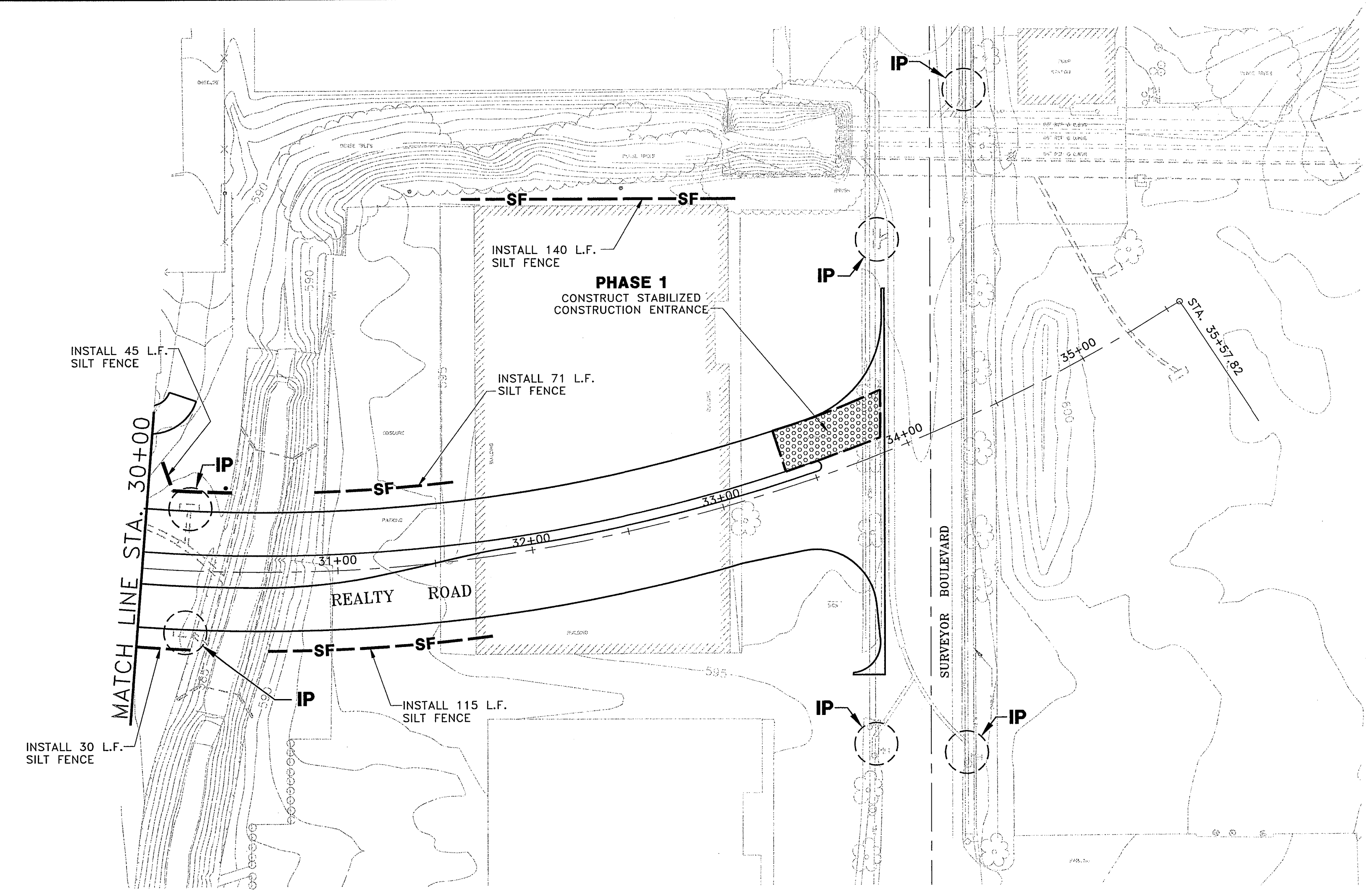
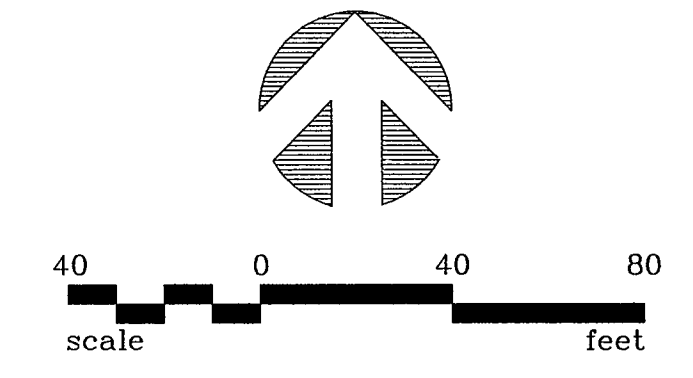
**Grantham, Burge & Waldbauer
Engineers, Inc.**
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

SHT. EC-1
OF EC-2

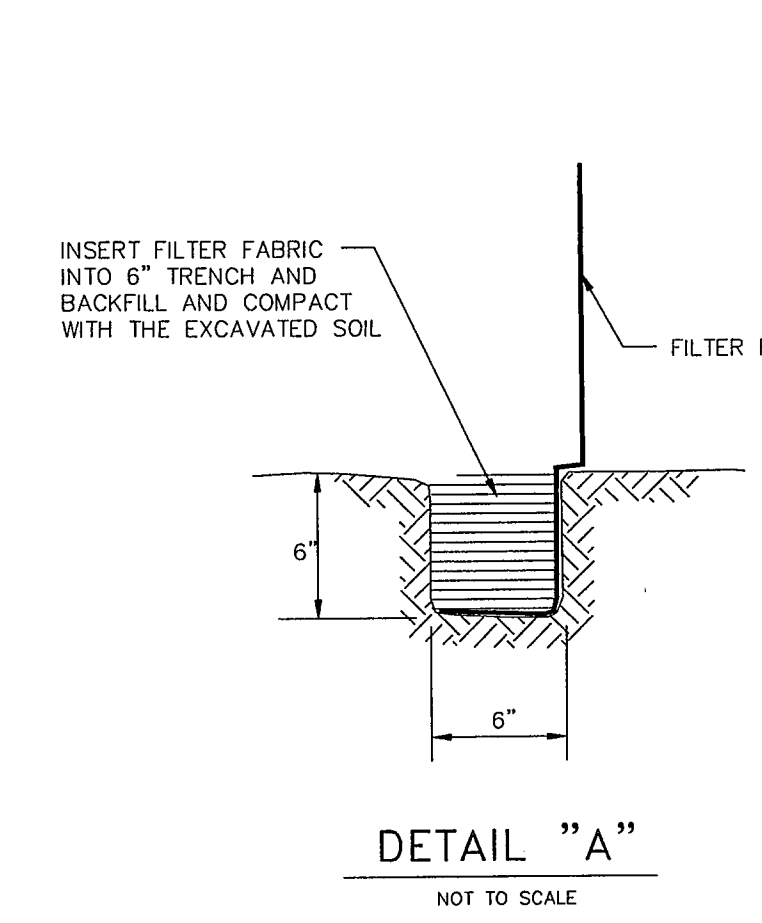
NO.	DATE	REVISION	APPROV.
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GENERAL EROSION NOTES:

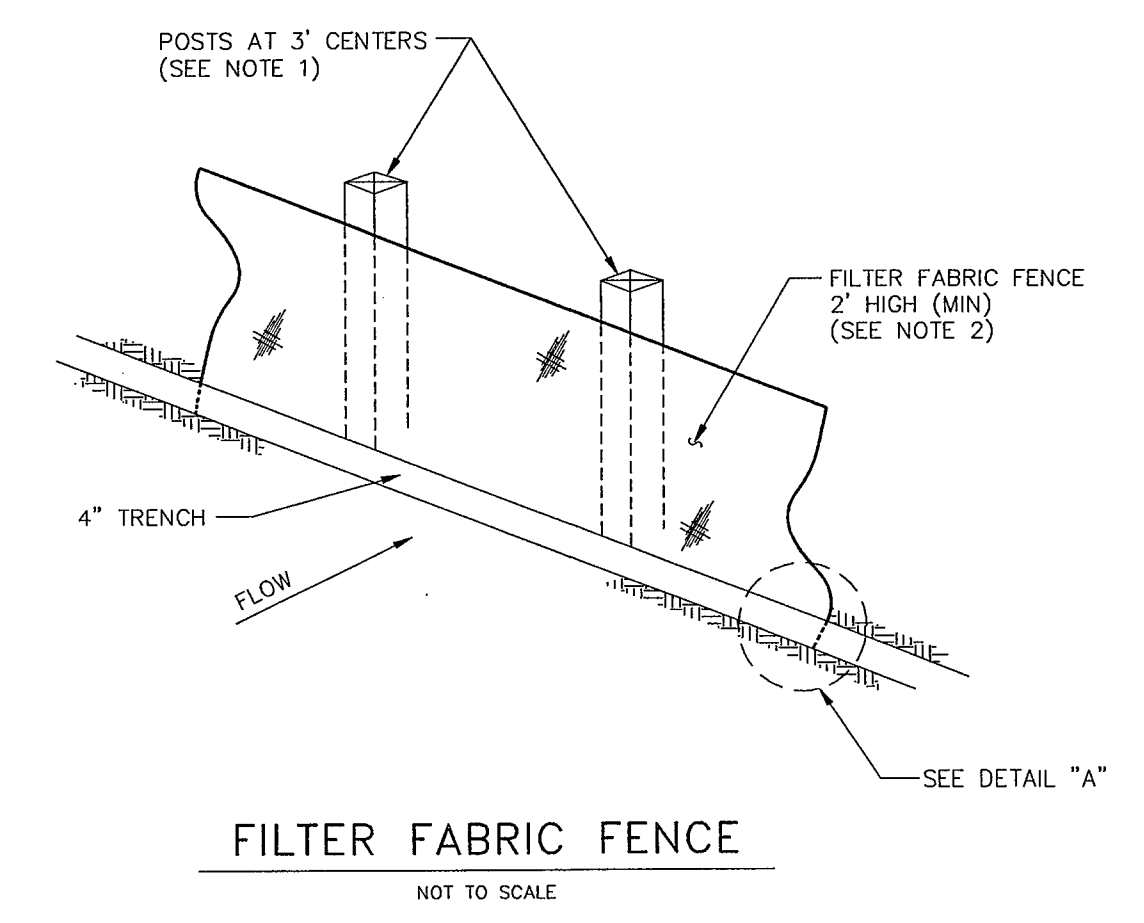
1. EROSION CONTROL DEVICES SHOWN ARE TYPICAL FOR CONSTRUCTION PHASES. CONTRACTOR WILL BE REQUIRED TO RELOCATE EROSION CONTROL DEVICES TO ACCOMMODATE EACH PHASE OF CONSTRUCTION. ADDITIONAL EROSION CONTROL DEVICES MAY ALSO BE REQUIRED IN OTHER VARIOUS LOCATIONS IN ORDER TO ADDRESS SPECIFIC EROSION CONCERNS THAT MAY DEVELOP AFTER CONSTRUCTION BEGINS.



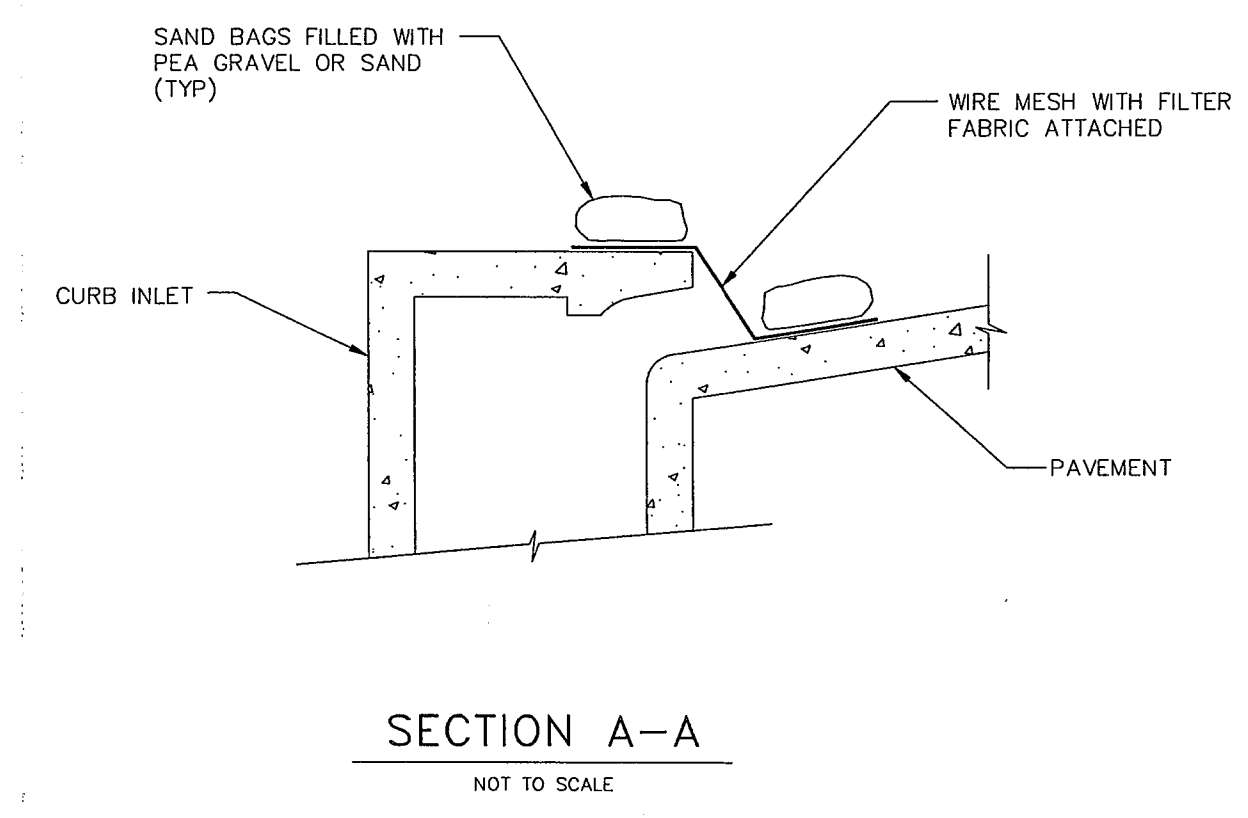
CONSTRUCTION ENTRANCE SECTION
NOT TO SCALE



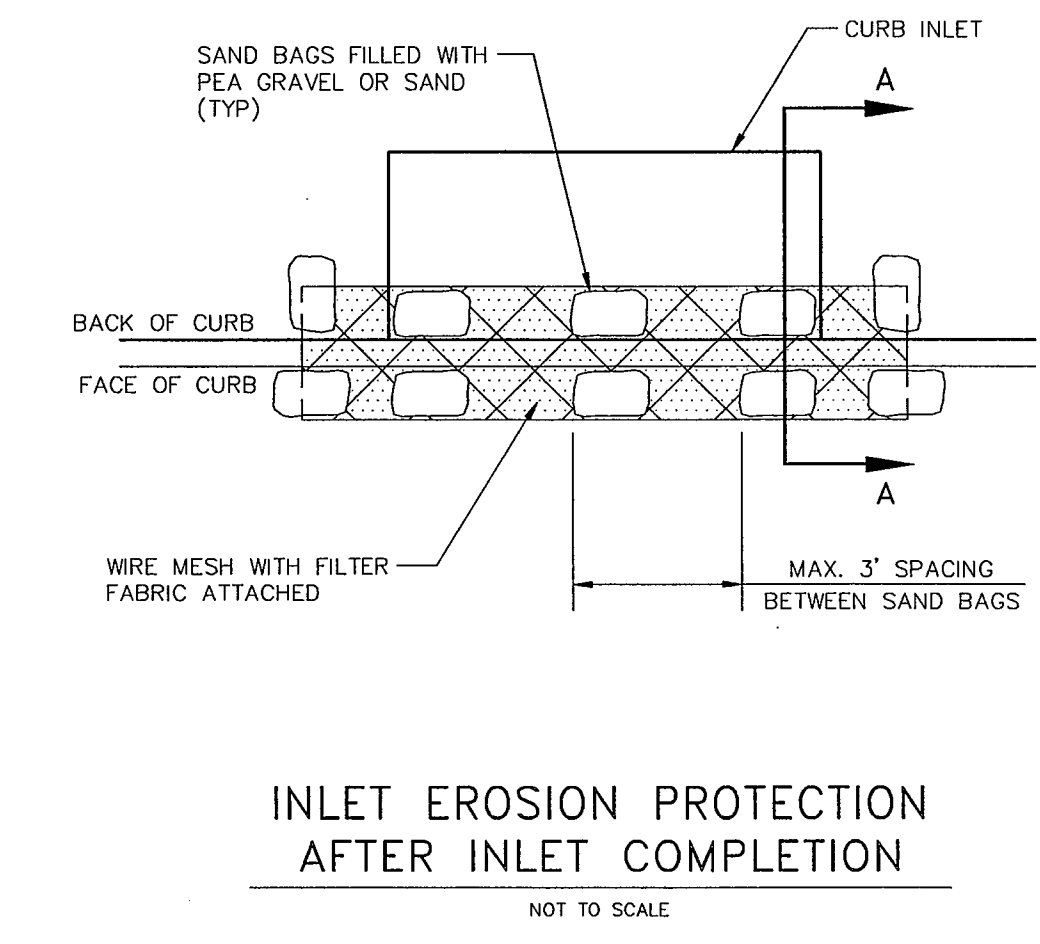
DETAIL "A"
NOT TO SCALE



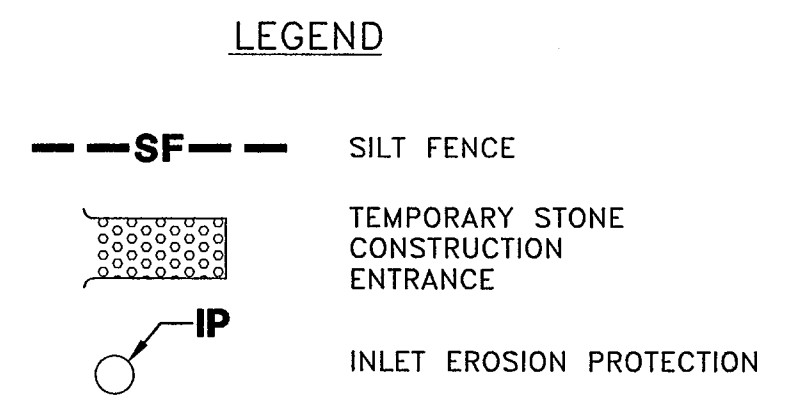
FILTER FABRIC FENCE
NOT TO SCALE



SECTION A-A
NOT TO SCALE



INLET EROSION PROTECTION AFTER INLET COMPLETION
NOT TO SCALE

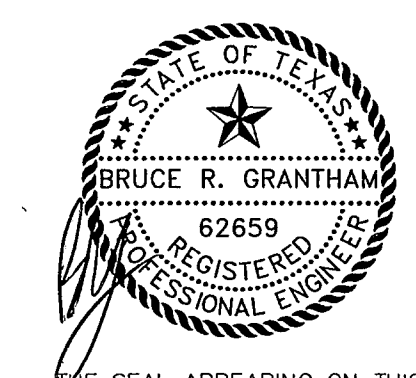


FILTER FABRIC FENCE NOTES:

1. IF FACTORY PRE ASSEMBLED FENCE WITH SUPPORT NETTING IS USED, SPACING OF POSTS MAY INCREASE TO 8' MAXIMUM. BURY POST 1" (MIN) BELOW EXISTING GROUND.
2. FILTER FABRIC SHALL BE AS PER ASTM D4833. (ADD HOG WIRE WITH MAX. 6"X6" OPENING, IF REQUIRED)
3. WHEN TWO SECTIONS OF FILTER FABRIC ADJOIN EACH OTHER, PROVIDE 6" OF OVERLAP AT THE POST AND FOLD.

INLET PROTECTION NOTES:

1. WIRE MESH PER ASTM D4632 W/OPENING NOT TO EXCEED 1".
2. FILTER FABRIC SHALL BE AS PER ASTM D4833. FILTER FABRIC TO BE SECURED TO WIRE MESH WITH WIRE OR PLASTIC CABLE TIES.
3. SAND BAGS SHALL BE POLYETHYLENE OR COTTON BURLAP FABRIC 24" TO 30" IN LENGTH AND 15" TO 18" IN WIDTH. BAGS TO BE FILLED WITH PEA GRAVEL OR COARSE GRADE SAND TO APPROXIMATELY 40 POUNDS.



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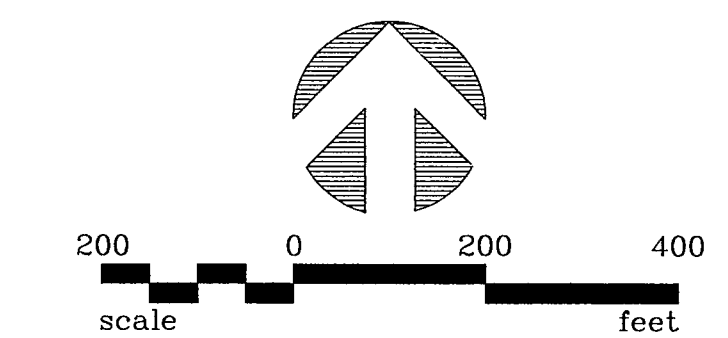
DATE: DECEMBER, 2001	SCALE: 1"=40'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: JFW	REVIEWED: DWG: 249EROSN02

ARAPAHO ROAD PHASE II
EROSION CONTROL PLAN
STA. 30+00 TO END
TOWN OF ADDISON

GBW Engineers, Inc.
Grantham, Burge & Waldbauer
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

SHT. EC-2
OF EC-2

NO.	DATE	REVISION	APPROV.
1			
2			
3			



DRAINAGE AREA CALCULATIONS

AREA NO.	AREA (acres)	C ₁₀₀	T _c (min)	I ₁₀₀ (in/hr)	Q ₁₀₀ (cfs)	COMMENTS
1d1/1d2						(1) SEE INLET CALCULATIONS
3d1/3d2	1.36	0.90	10	8.74	10.7	(1) SEE INLET CALCULATIONS
4	3.59	0.90	10	8.74	28.2	(1) PROPOSED 10' INLET
5	1.00	0.90	10	8.74	7.9	PROPOSED 10' CURB INLET
6	0.82	0.90	10	8.74	6.5	PROPOSED 10' CURB INLET
7	4.24	0.90	10	8.74	33.4	(2) EXISTING STORM SEWER SYSTEM
8	9.44	0.90	10	8.74	74.3	(2) EXISTING STORM SEWER SYSTEM
8B	0.92	0.90	10	8.74	7.2	PROPOSED 10' CURB INLET
9	2.25	0.90	10	8.74	17.7	(2) EXISTING STORM SEWER SYSTEM
10A	2.24	0.90	10	8.74	17.6	PROPOSED 10' INLET
10B	1.16	0.90	10	8.74	9.1	PROPOSED 10' CURB INLET
11A	1.01	0.90	10	8.74	7.9	PROPOSED 10' CURB INLET
11B	0.75	0.90	10	8.74	5.9	PROPOSED 10' CURB INLET
11C	4.28	0.90	10	8.74	33.7	PROPOSED 10' INLET
11D	0.85	0.90	10	8.74	6.7	PROPOSED 10' CURB INLET
12	67.57	0.90	13.7	7.9	480.4	(2) EXISTING STORM SEWER SYSTEM
13	7.82	0.90	10	8.74	61.5	(3) PROPOSED 10' INLET
14	0.53	0.90	10	8.74	4.2	PROPOSED 10' CURB INLET
15	1.20	0.90	10	8.74	9.4	(2) EXISTING STORM SEWER SYSTEM
16	17.53	0.90	11.2	8.4	132.5	(2) EXISTING STORM SEWER SYSTEM
17	0.94	0.90	10	8.74	7.4	PROPOSED 10' CURB INLET
18	0.94	0.90	10	8.74	7.4	PROPOSED 10' CURB INLET

- NOTES:
 (1) EXISTING SYSTEM IS UNDERSIZED. DETENTION OF UNDEVELOPED TRACT IS RECOMMENDED.
 (2) EXISTING SYSTEM CONTRIBUTES TO PRIMARY CULVERTS
 (3) FLOWS UNDER PROPOSED ARAPAHO OVERPASS

RAINFALL INTENSITY CALCULATIONS (FOR LARGE AREAS)

AREA NO.	OVERLAND/DITCH FLOW			PIPE FLOW			TOTAL TIME (min)	INTENSITY I ₁₀₀ (in/hr)	COMMENTS
	Length (ft)	Average Velocity (fps)	Time (min)	Length (ft)	Average Velocity (fps)	Time (min)			
12	-	-	-	10	2200	10	3.7	13.7	7.9
16	-	-	-	10	700	10	1.2	11.2	8.4

FLOW CALCULATIONS (FOR PRIMARY CULVERTS)

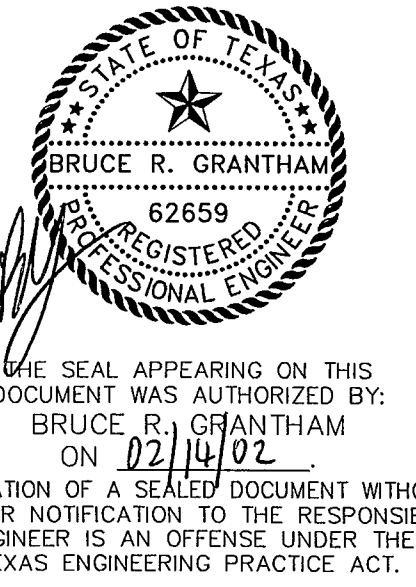
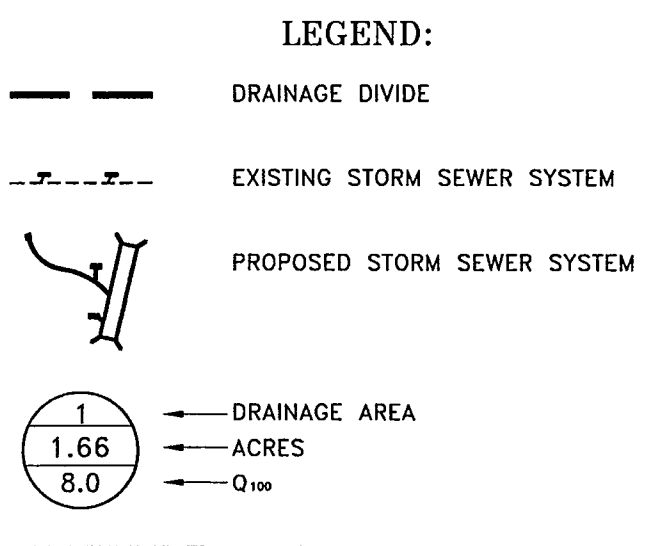
AREA NO.	AREA (acres)	C ₁₀₀	ΣCA	T _c (min)	I ₁₀₀ (in/hr)	Q ₁₀₀ (cfs)
19	171.70	0.70	120.19	33.1	5.5	661.0
Σ20-29C (SEE SHEET 2)			200.94	33.1	5.5	1105.2
17,18	1.88	0.90	202.63	35.3	5.3	1073.9
16	17.53	0.90	218.41	35.8	5.2	1135.7
13,14,15	9.55	0.90	227.00	36.1	5.1	1157.7
12	67.57	0.90	287.81	36.8	5.1	1467.8
10A,11A,11B	8.28	0.90	295.26	37.2	5.1	1505.8
10B,11C	2.01	0.90	297.07	37.5	5.1	1515.0
8,9	12.61	0.90	308.42	37.6	5.1	1572.9
4,5,6,7	9.65	0.90	317.11	38.4	5.0	1585.6

- NOTES:
 1. AREAS 1, 2, AND 3 DRAIN TO EXISTING STORM SYSTEMS WHICH ARE UNDERSIZED
 2. AREAS 1 AND 2 DRAIN TO A STORM SEWER WHICH EXTENDS THROUGH DOWNSTREAM DEVELOPMENTS TO A TRUNK LINE IN BELT LINE ROAD.
 3. AREA 3 DRAINS TO A STORM SEWER WHICH EXTENDS DOWNSTREAM UNDER BUSINESS AVENUE TO A TRUNK LINE IN BELT LINE ROAD.
 4. AREAS 1 AND 3 ARE NOT FULLY DEVELOPED, CONSEQUENTLY, DETENTION IS RECOMMENDED WHEN THESE SITES DEVELOP TO LIMIT FUTURE RUNOFF TO NOT EXCEED EXISTING CONDITIONS.
 5. THE TABLE SHOWN BELOW PROVIDES RUNOFF CALCULATIONS FOR AREAS 1 & 3 WITH DETENTION.
 6. AREAS 1 AND 2: Q₁₀₀ = 62.0 c.f.s. (WITH FUTURE DETENTION FOR AREA 1) CAPACITY OF 36" ON 0.8% = 59.7 c.f.s. (DOWNSTREAM)
 7. AREA 3: Q₁₀₀ = 15.3 c.f.s. (WITH FUTURE DETENTION) CAPACITY OF 24" ON 1.2% = 24.8 c.f.s. (DOWNSTREAM)
 8. AREA 8 DRAINS TO EXISTING 10' SAG INLETS NORTH OF THE RAILROAD. SOME PONDING WILL OCCUR AT THESE INLETS IN A MAJOR STORM EVENT, HOWEVER, IT APPEARS UNLIKELY THAT RUNOFF WILL SPILL OVER THE ROAD CREST AND CONTRIBUTE TO AREA 8B.
 9. NEW 10' INLETS HAVE BEEN LOCATED TO DRAIN RUNOFF FROM AREA 8B PRIOR TO THE INTERSECTION OF SURVEYOR AND ARAPAHO.

INLET CALCULATIONS-ARAPAHO ROAD

AREA NO.	AREA (acres)	T _c (min)	I ₁₀₀ (in/hr)	C ₁₀₀	Q ₁₀₀ (cfs)	CROSS SLOPE	STREET SLOPE	WATER DEPTH IN GUTTER (ft)	ALLOWABLE DEPTH (ft)	DEPTH EXCEEDS ALLOWABLE	CAPACITY PER FOOT OF INLET (cfs/ft)	LENGTH OF INLET REQUIRED (ft)	EXISTING INLET LENGTH (ft)	OVER-CAPACITY FLOW (cfs)
1d1	5.36	10	8.74	0.9	42.2	2.083	0.011	0.50	0.42	YES	1.06	39.79	20	21.0
1d2	4.04	15	7.52	0.3	9.1									
2	1.36	10	8.74	0.9	10.7	2.083	SAG		0.42	NO	1.06	10.09	20	0.0
3d1	1.72	10	8.74	0.9	13.5									
3d2	1.64	15	7.52	0.3	3.7									
3D (TOTAL)	15	15	7.52	0.61	15.3	2.083	0.0112	0.40	0.42	NO	0.95	16.22	2-10	0.0
4	3.59	10	8.74	0.9	28.2	2.083	SAG		0.42	NO	1.06	26.64	7	0.0
5	1	10	8.74	0.9	7.9	2.083	SAG		0.42	NO	1.06	7.42	10	0.0
6	0.82	10	8.74	0.9	6.5	2.083	SAG		0.42	NO	1.06	6.09	10	0.0
7	4.24	10	8.74	0.9	33.4	2.083	N/A		0.42	NO	1.06			
8B	0.92	10	8.74	0.9	7.2	1.562	0.005	0.31	0.16	YES	0.53	13.65	2-10	0.0

1. ON-SITE DETENTION WILL BE REQUIRED WHEN THE UNDEVELOPED PORTIONS OF AREAS 1D2 AND 3D2 ARE DEVELOPED.
 2. A 18" STUBOUT IS PROVIDED FOR AREA 1d2 WHERE 9.1 cfs OF CAPACITY IS PROVIDED FOR FUTURE DEVELOPMENT.
 3. WHEN 1D2 DEVELOPS, THE 9.1 c.f.s. OF OVERLAND FLOW WILL BE ROUTED THROUGH A DETENTION POND TO THE 18" STUBOUT.
 4. DIRECT RUNOFF TO ARAPAHO ROAD VIA FUTURE DRIVEWAY FROM DEVELOPMENT OF AREA 1d2 SHOULD BE MINIMIZED.



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DATE: DECEMBER, 2001 | SCALE: 1"=200' | JOB NO.: 00-249
 DRAWN: GBW | DESIGN: BRG | REVIEWED: JFW | DWG: 249DRNAREA

ARAPAHO ROAD PHASE II

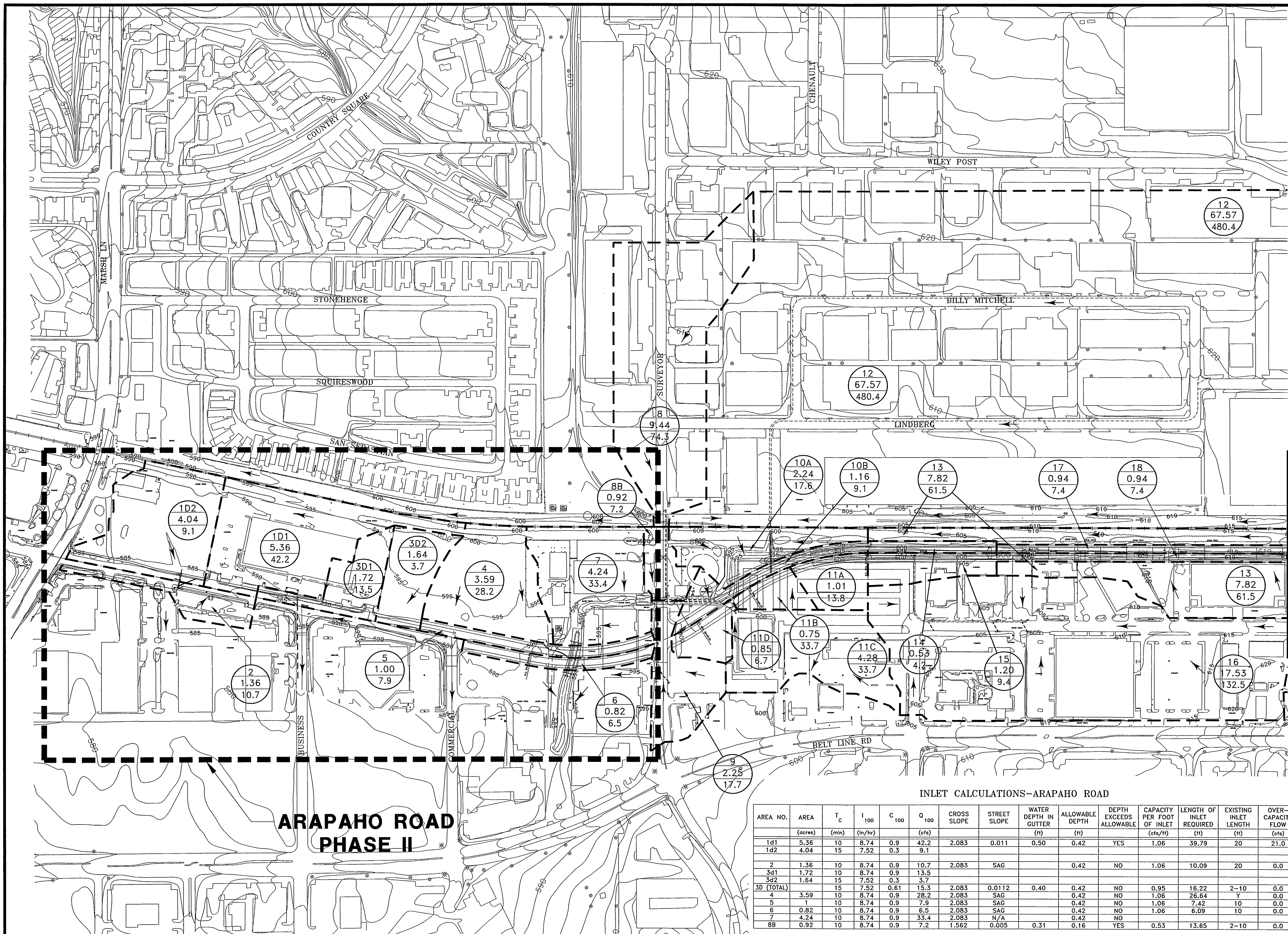
DRAINAGE AREA MAP - SHEET 1

TOWN OF ADDISON

Grantham, Burge & Waldbauer
Engineers, Inc.

1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042 | (972) 840-1916 (TEL) | (972) 840-2156 (FAX)

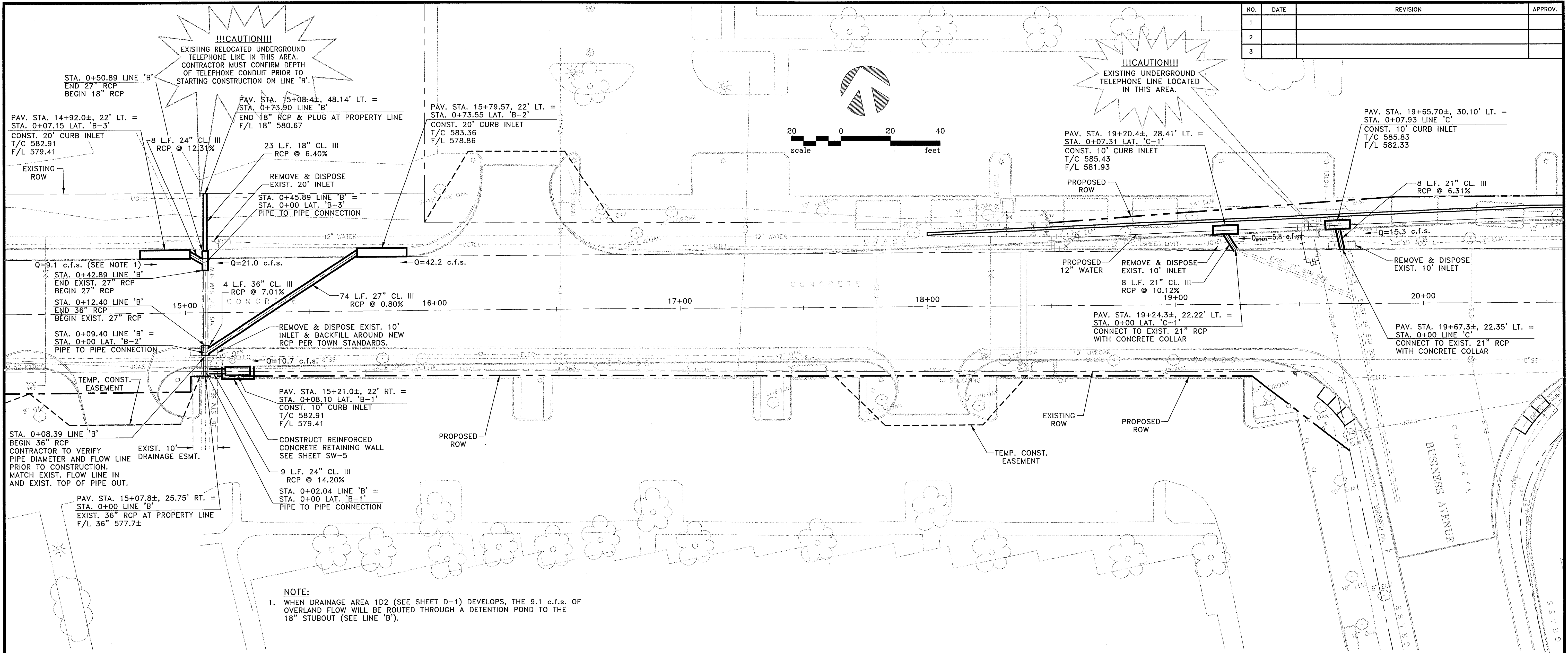
SHT. OF 1 OF 2



ARAPAHO ROAD PHASE II

MATCH LINE STA. 59+00

NO.	DATE	REVISION	APPROV.
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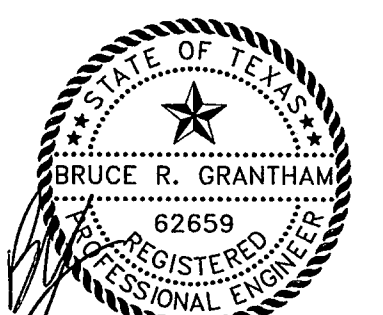


!!!CAUTION!!!
EXISTING RELOCATED UNDERGROUND TELEPHONE LINE IN THIS AREA. CONTRACTOR MUST CONFIRM DEPTH OF TELEPHONE CONDUIT PRIOR TO STARTING CONSTRUCTION ON LINE 'B'.

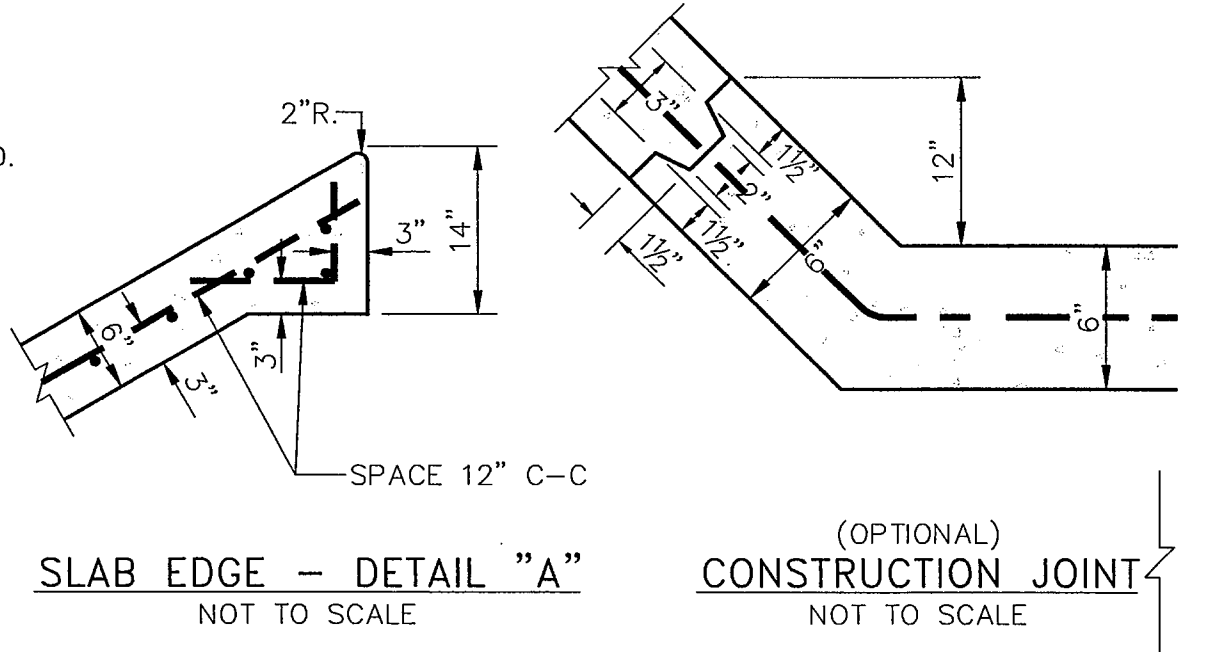
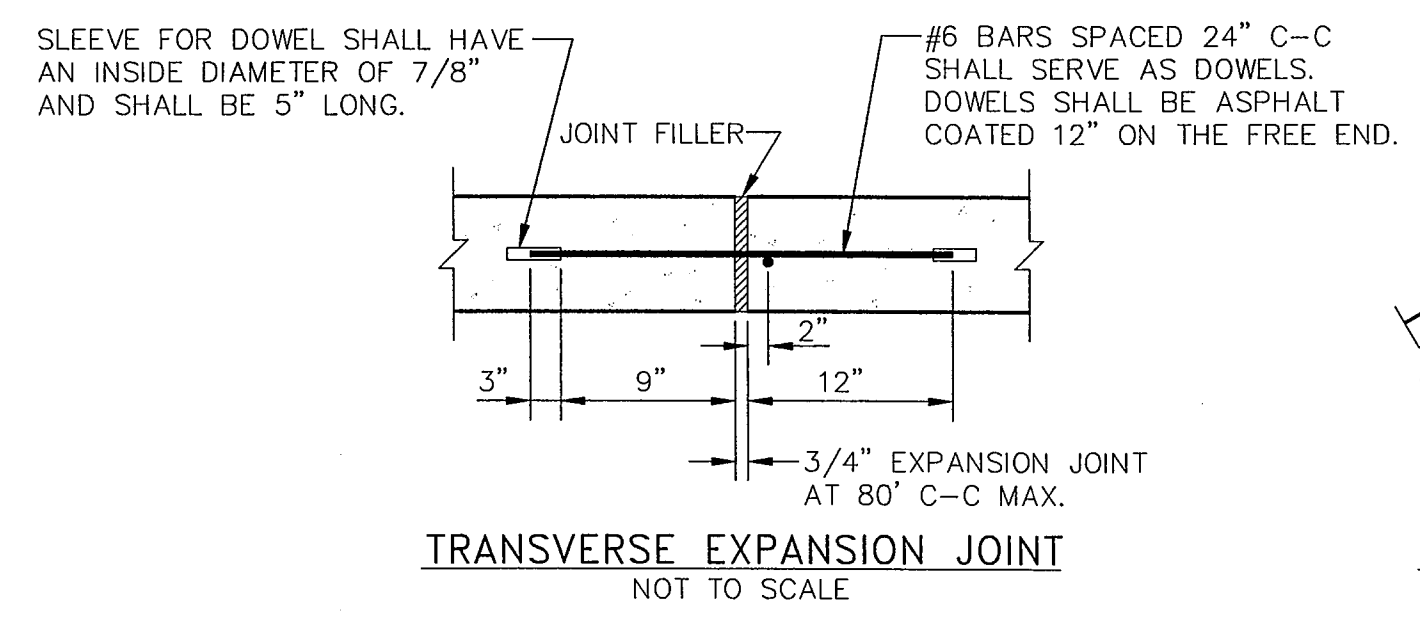
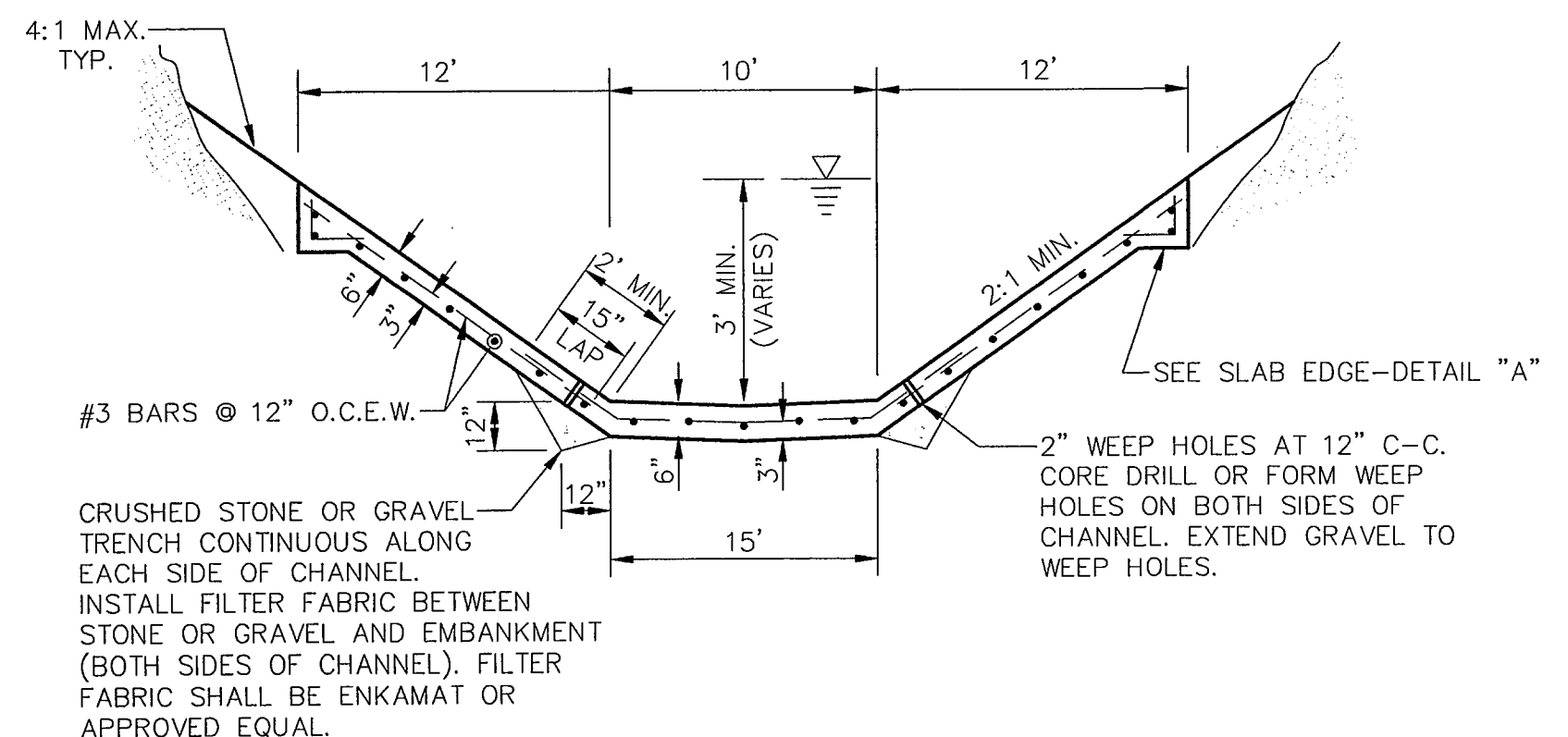
!!!CAUTION!!!
EXISTING UNDERGROUND TELEPHONE LINE LOCATED IN THIS AREA.



NOTE:
1. WHEN DRAINAGE AREA 1D2 (SEE SHEET D-1) DEVELOPS, THE 9.1 c.f.s. OF OVERLAND FLOW WILL BE ROUTED THROUGH A DETENTION POND TO THE 18" STUBOUT (SEE LINE 'B').



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ON 02/14/02
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CHANNEL LINING DETAIL
NOT TO SCALE

GENERAL UTILITY NOTE

RELOCATION OF ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION LINES WILL OCCUR AFTER THESE DRAWINGS ARE COMPLETED. CONTRACTOR MUST OBTAIN NEW LOCATIONS OF ALL UTILITIES PRIOR TO STARTING CONSTRUCTION.

- NOTES:**
1. PROPOSED CHANNEL LINING SHALL MATCH EXISTING CHANNEL LINING.
 2. DOWEL 18" LONG #3 BARS @ 12" CENTERS FROM CHANNEL LINING 9" INTO PARALLEL BOX CULVERT WINGWALLS (SEE SHEETS SW-2 AND SW-8).

DATE: DECEMBER, 2001	SCALE: 1"=20'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: JFW	REVIEWED: BRG
DWG: 249STMPL02.DWG		

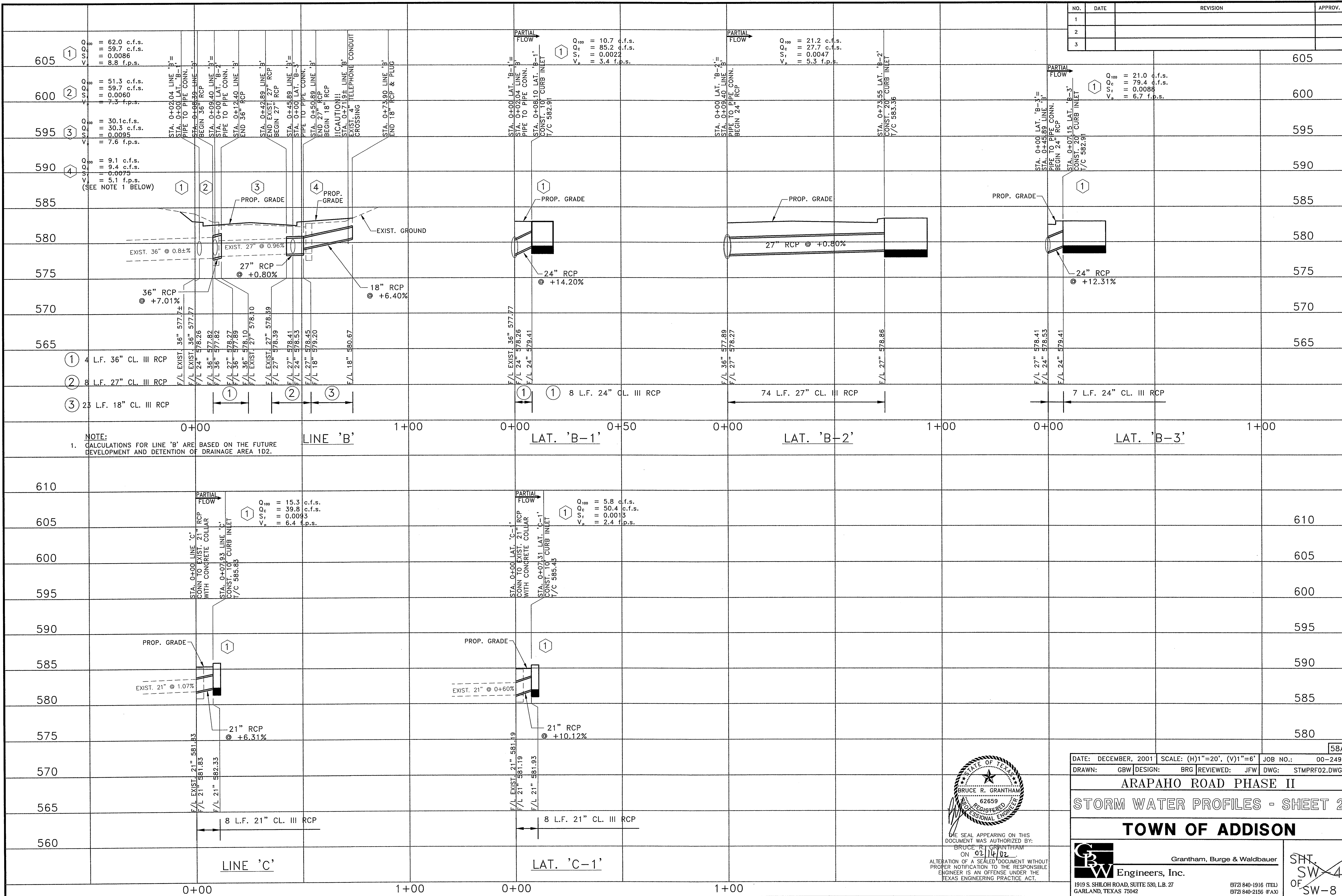
ARAPAHO ROAD PHASE II
STORM WATER PLAN - SHEET 1

TOWN OF ADDISON

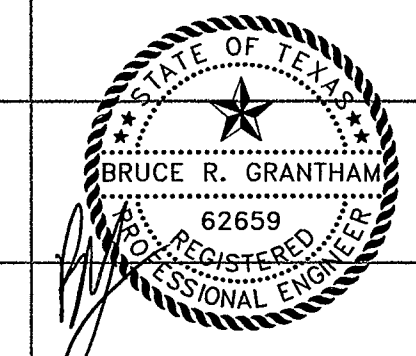
GBW Engineers, Inc.
Grantham, Burge & Waldbauer
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
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SHT. SW-1
OF SW-8

NO.	DATE	REVISION	APPROV.
1			
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NOTE:
1. CALCULATIONS FOR LINE 'B' ARE BASED ON THE FUTURE DEVELOPMENT AND DETENTION OF DRAINAGE AREA 1D2.



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ON 02/14/02
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DATE: DECEMBER, 2001 SCALE: (H)1"=20', (V)1"=6' JOB NO.: 00-249
DRAWN: GBW DESIGN: BRG REVIEWED: JFW DWG: STMPRF02.DWG

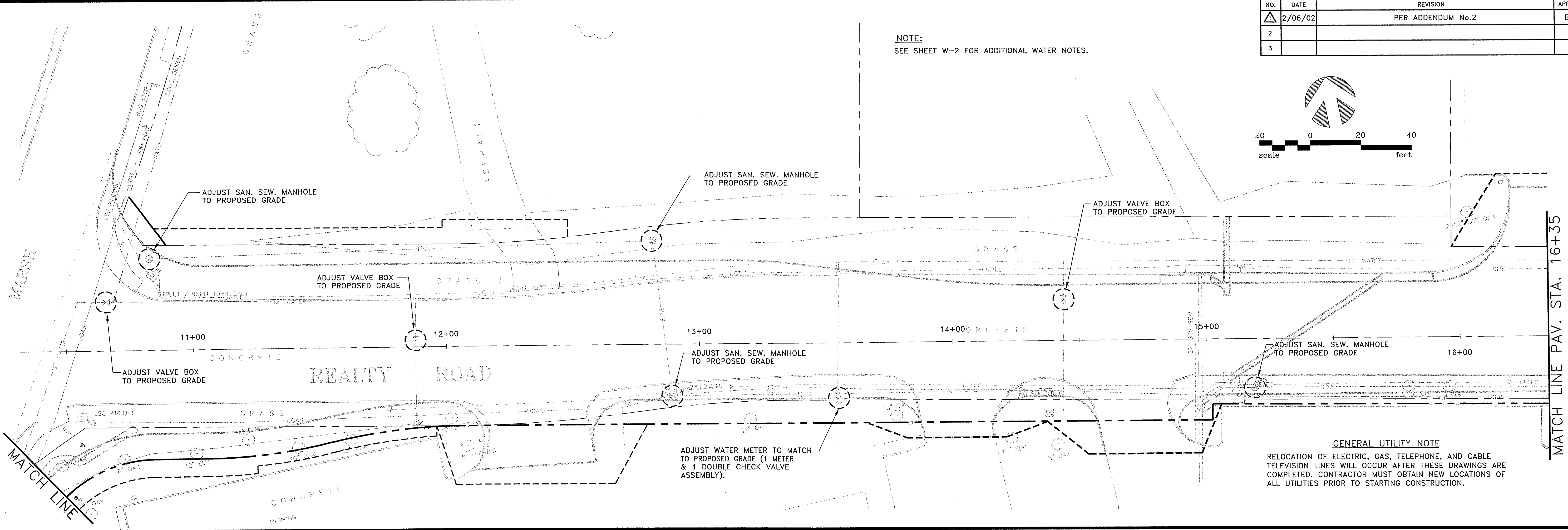
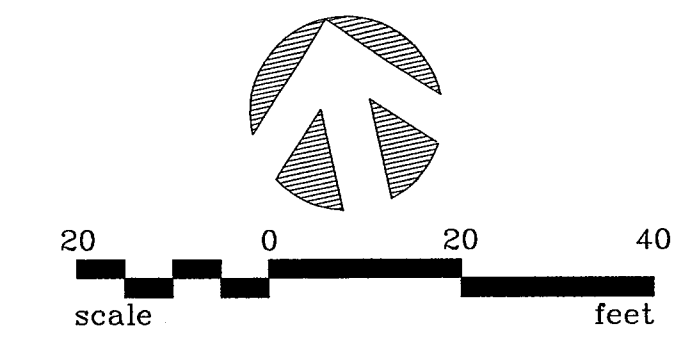
ARAPAHO ROAD PHASE II
STORM WATER PROFILES - SHEET 2
TOWN OF ADDISON

Grantham, Burge & Waldbauer
Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
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SHT. SW-4
OF SW-8

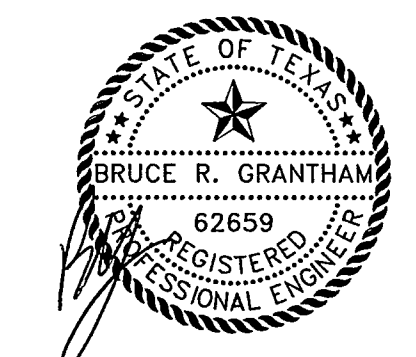
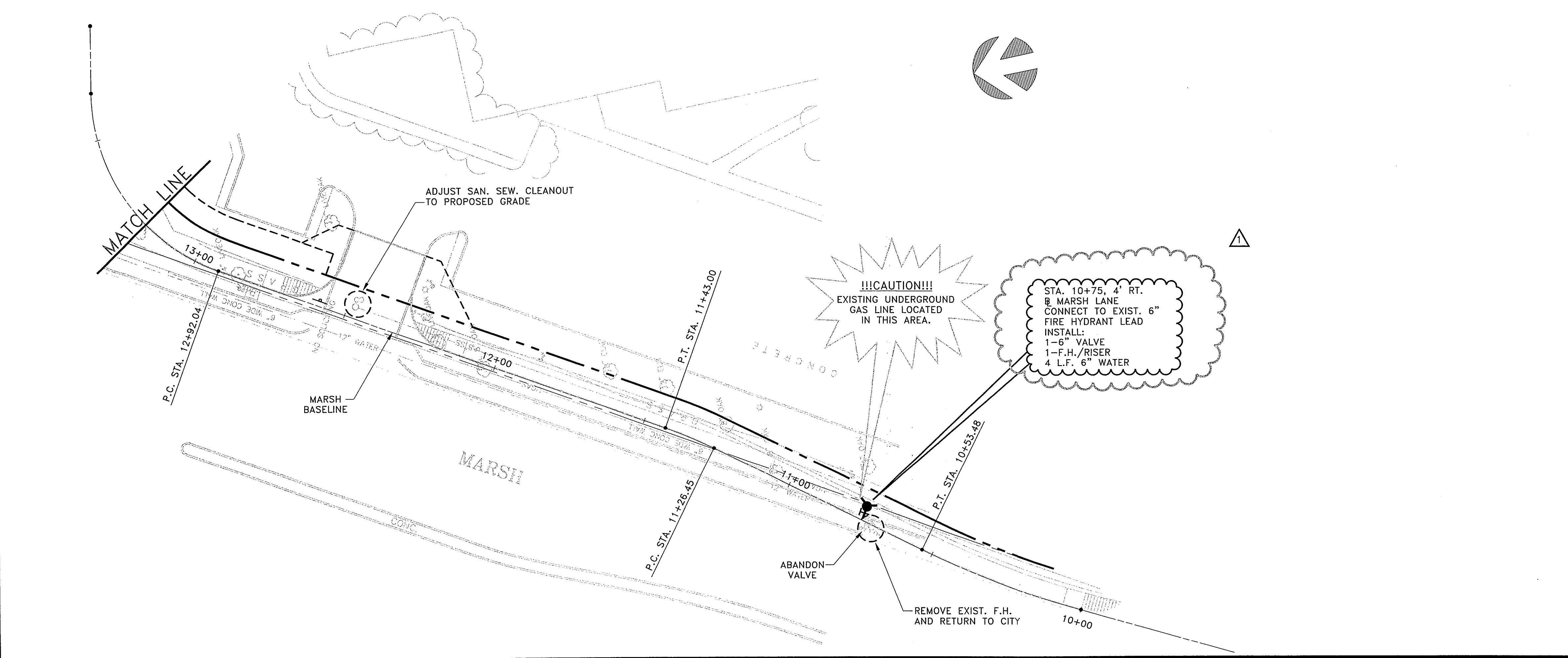
NO.	DATE	REVISION	APPROV.
1	2/06/02	PER ADDENDUM No.2	BRG
2			
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NOTE:
SEE SHEET W-2 FOR ADDITIONAL WATER NOTES.



GENERAL UTILITY NOTE
RELOCATION OF ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION LINES WILL OCCUR AFTER THESE DRAWINGS ARE COMPLETED. CONTRACTOR MUST OBTAIN NEW LOCATIONS OF ALL UTILITIES PRIOR TO STARTING CONSTRUCTION.

NOTE:
SEE SHEET W-2 FOR ADDITIONAL WATER NOTES.



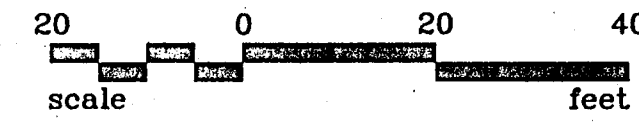
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ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DATE: DECEMBER, 2001	SCALE: 1" = 20'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: JFW	REVIEWED: BRG
DWG: 249WAT01		

ARAPAHO ROAD PHASE II
PLAN VIEW
UTILITY ADJUSTMENT PLAN
TOWN OF ADDISON

Grantham, Burge & Waldbauer
Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

SHT. W-1
OF W-5



- NOTES:**
- CONTRACTOR SHALL COORDINATE WITH THE TOWN ON TEMPORARY SHUTDOWN OF EXISTING 12" WATER TO MAKE DRY CONNECTION AT PAV. STA. 18+50, 28'± LT.
 - EXISTING 12" WATER TO BE ABANDONED IN PLACE AFTER NEW 12" WATER IS OPERATIONAL.
 - PRIOR TO CONSTRUCTION CONTRACTOR SHALL CONTACT THE TOWN'S UTILITY STAFF FOR ASSISTANCE IN LOCATING ALL EXISTING WATER SERVICES CONNECTIONS TO 12" WATER LINE BEING ABANDONED. THESE WATER SERVICES SHALL BE RECONNECTED TO NEW 12" WATER LINE.
 - VALVE STACKS ON WATER LINE BEING ABANDONED SHALL BE REMOVED WITHIN PAVING LIMITS. VALVES MAY BE ABANDONED.
 - ALL WATER IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH TOWN OF ADDISON AND M.C.T.C.O.C. STANDARDS AND SPECIFICATIONS (LATEST ADDITION). IN THE EVENT OF A CONFLICT, TOWN OF ADDISON STANDARDS AND SPECIFICATIONS SHALL GOVERN.
 - CONTRACTOR SHALL LOCATE ALL EXISTING SPRINKLER SYSTEMS AND CONFIRM WITH THE TOWN THOSE SYSTEMS THAT ARE TO REMAIN IN SERVICE AFTER CONSTRUCTION. ANY REQUIRED ADJUSTMENT OF EXISTING SPRINKLER SYSTEMS SHALL BE CONSIDERED SUBSIDIARY TO OTHER BID ITEMS.

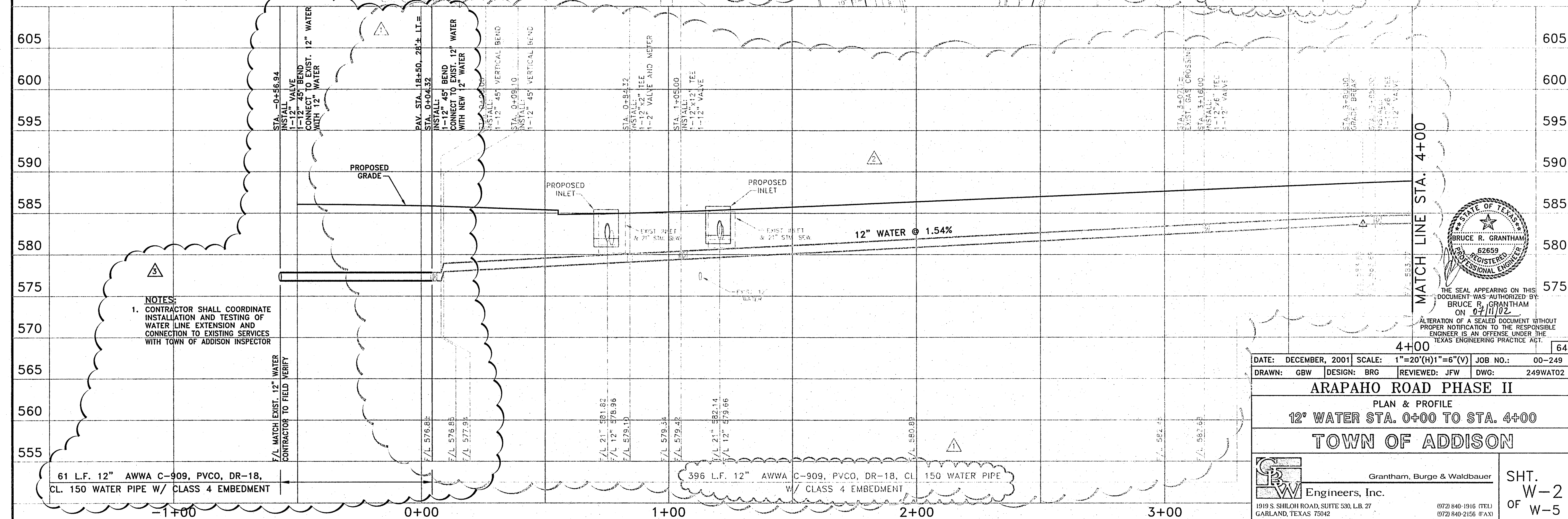
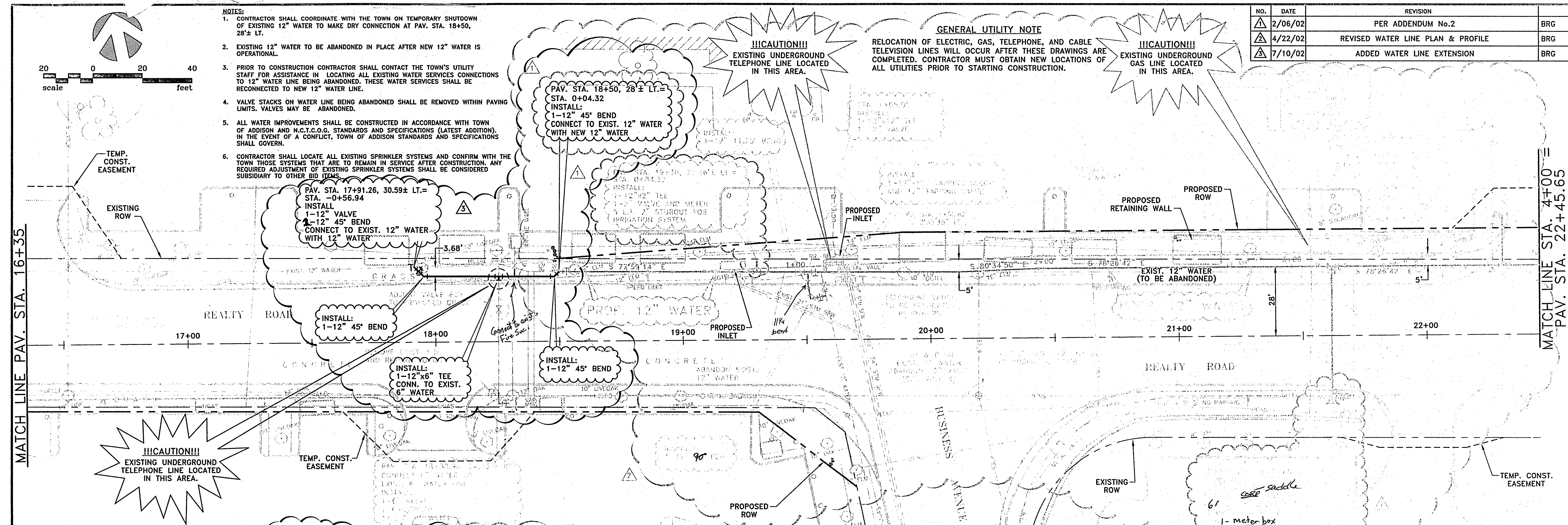
GENERAL UTILITY NOTE

RELOCATION OF ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION LINES WILL OCCUR AFTER THESE DRAWINGS ARE COMPLETED. CONTRACTOR MUST OBTAIN NEW LOCATIONS OF ALL UTILITIES PRIOR TO STARTING CONSTRUCTION.

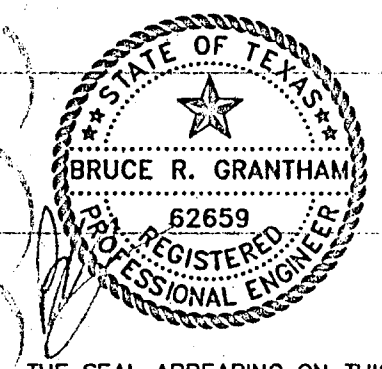
!!!CAUTION!!!
EXISTING UNDERGROUND GAS LINE LOCATED IN THIS AREA.

!!!CAUTION!!!
EXISTING UNDERGROUND TELEPHONE LINE LOCATED IN THIS AREA.

NO.	DATE	REVISION	
1	2/06/02	PER ADDENDUM No.2	BRG
2	4/22/02	REVISED WATER LINE PLAN & PROFILE	BRG
3	7/10/02	ADDED WATER LINE EXTENSION	BRG



- NOTES:**
- CONTRACTOR SHALL COORDINATE INSTALLATION AND TESTING OF WATER LINE EXTENSION AND CONNECTION TO EXISTING SERVICES WITH TOWN OF ADDISON INSPECTOR



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY BRUCE R. GRANTHAM ON 07/11/02. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

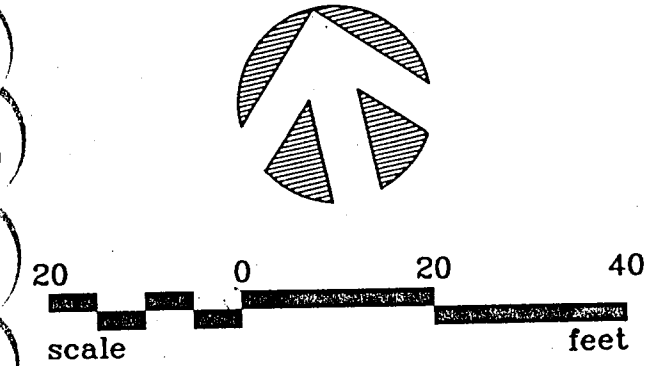
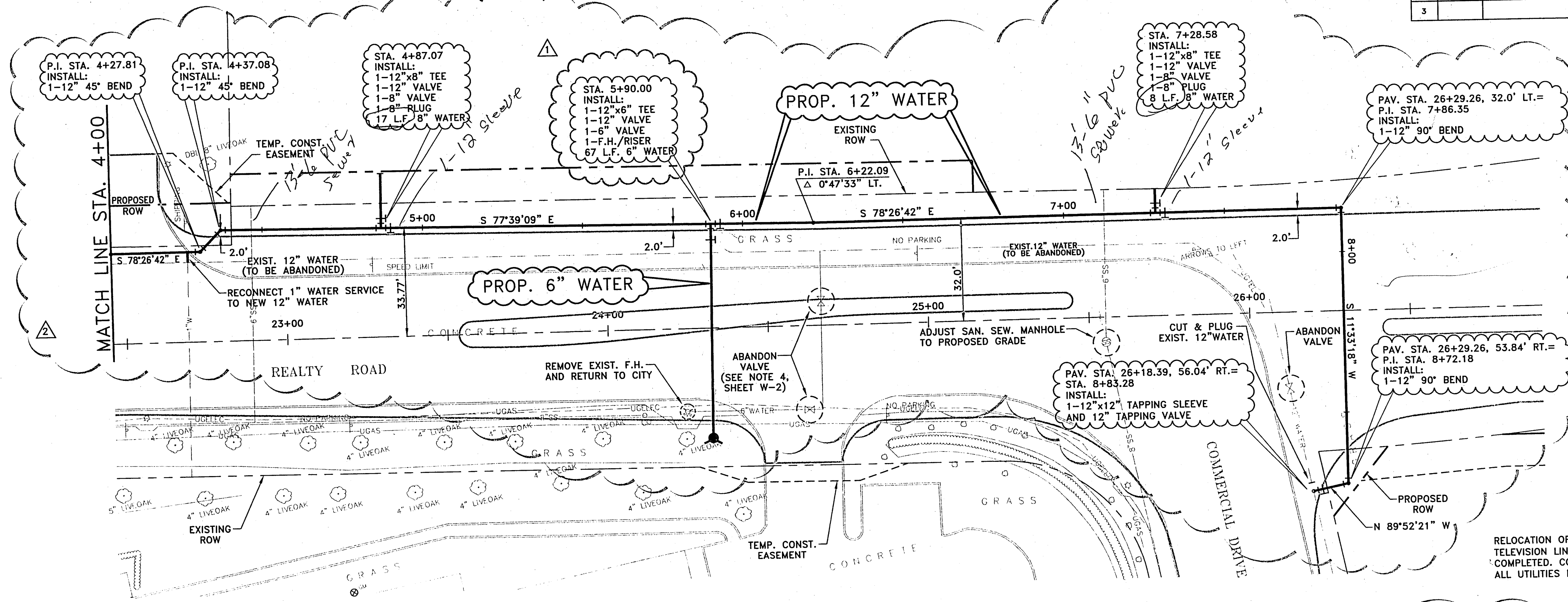
DATE: DECEMBER, 2001	SCALE: 1"=20'(H)1"=6"(V)	JOB NO.: 00-249
DRAWN: GBW	DESIGN: BRG	REVIEWED: JFW
		DWG: 249WAT02

ARAPAHO ROAD PHASE II
PLAN & PROFILE
12" WATER STA. 0+00 TO STA. 4+00
TOWN OF ADDISON

Grantham, Burge & Waldbauer
Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
SHT. W-2 OF W-5

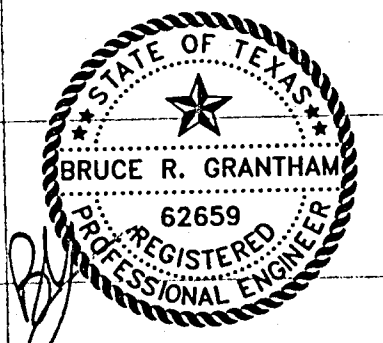
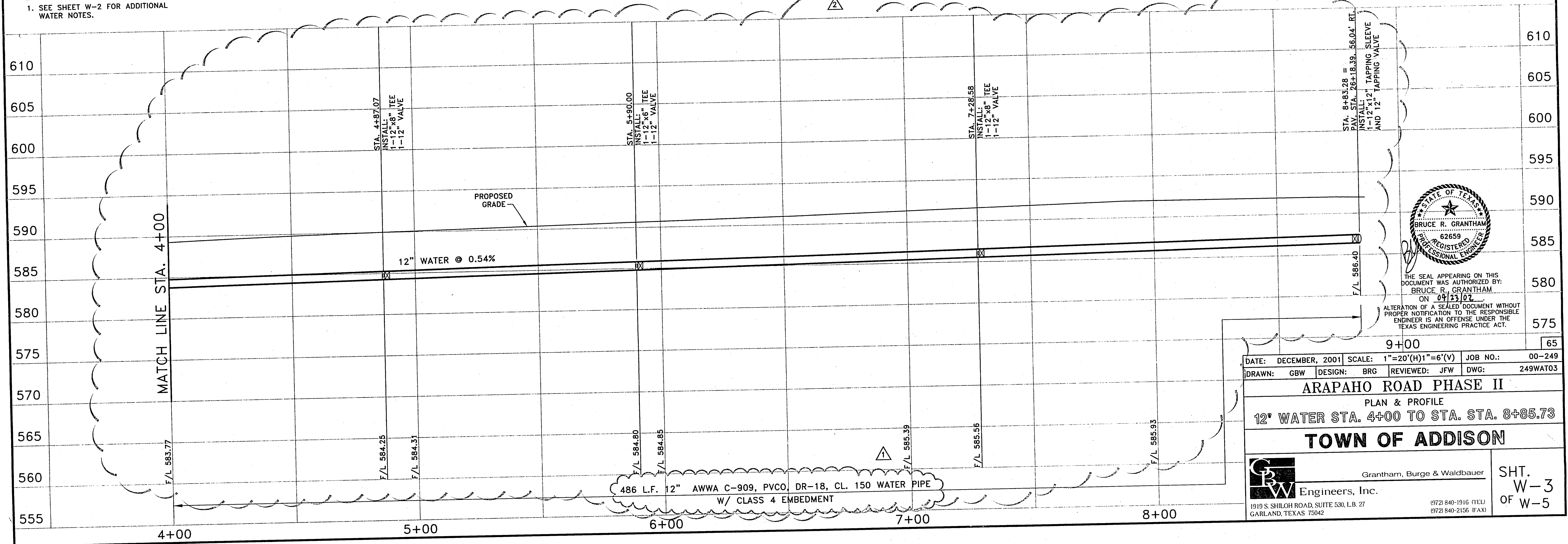
ARAPAHO II
12" WA WEND EXTENSION

NO.	DATE	REVISION	BRG
2	2/06/02	PER ADDENDUM No.2	BRG
3	4/22/02	REVISED WATER LOCATION, ADD STUBOUTS	BRG



GENERAL UTILITY NOTE
 RELOCATION OF ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION LINES WILL OCCUR AFTER THESE DRAWINGS ARE COMPLETED. CONTRACTOR MUST OBTAIN NEW LOCATIONS OF ALL UTILITIES PRIOR TO STARTING CONSTRUCTION.

NOTES:
 1. SEE SHEET W-2 FOR ADDITIONAL WATER NOTES.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY:
 BRUCE R. GRANTHAM
 ON 04/23/02
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DATE: DECEMBER, 2001 SCALE: 1"=20'(H)1"=6'(V) JOB NO.: 00-249
 DRAWN: GBW DESIGN: BRG REVIEWED: JFW DWG: 249WAT03

ARAPAHO ROAD PHASE II
 PLAN & PROFILE
 12" WATER STA. 4+00 TO STA. STA. 8+85.73
TOWN OF ADDISON

Grantham, Burge & Waldbauer
Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
 (972) 840-1916 (TEL)
 (972) 840-2156 (FAX)

SHT.
 W-3
 OF W-5

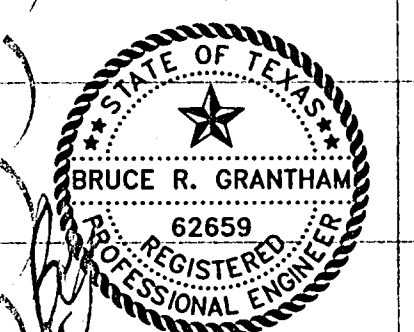
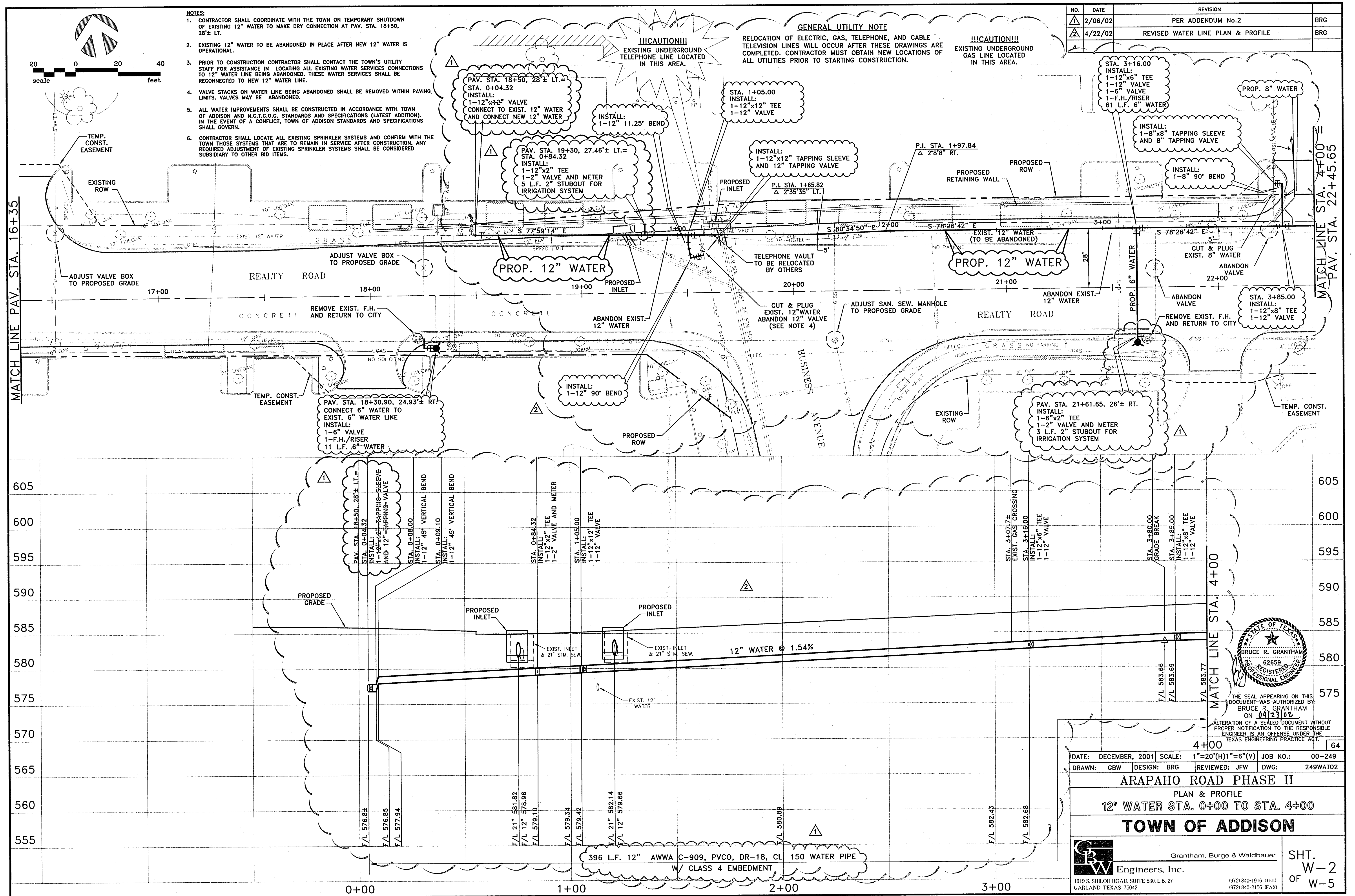
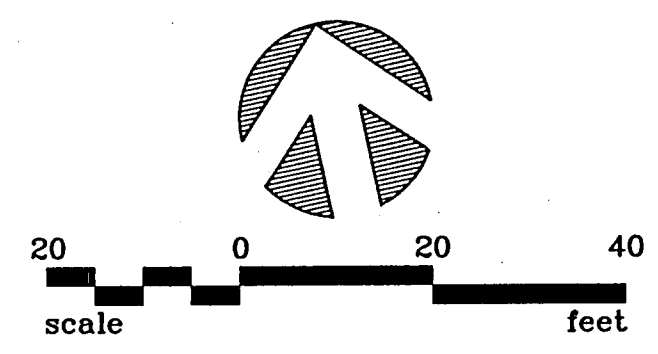
NO.	DATE	REVISION	
△	2/06/02	PER ADDENDUM No.2	BRG
△	4/22/02	REVISED WATER LINE PLAN & PROFILE	BRG

- NOTES:**
- CONTRACTOR SHALL COORDINATE WITH THE TOWN ON TEMPORARY SHUTDOWN OF EXISTING 12" WATER TO MAKE DRY CONNECTION AT PAV. STA. 18+50, 28'± LT.
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GENERAL UTILITY NOTE
 RELOCATION OF ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION LINES WILL OCCUR AFTER THESE DRAWINGS ARE COMPLETED. CONTRACTOR MUST OBTAIN NEW LOCATIONS OF ALL UTILITIES PRIOR TO STARTING CONSTRUCTION.

!!!CAUTION!!!
 EXISTING UNDERGROUND TELEPHONE LINE LOCATED IN THIS AREA.

!!!CAUTION!!!
 EXISTING UNDERGROUND GAS LINE LOCATED IN THIS AREA.



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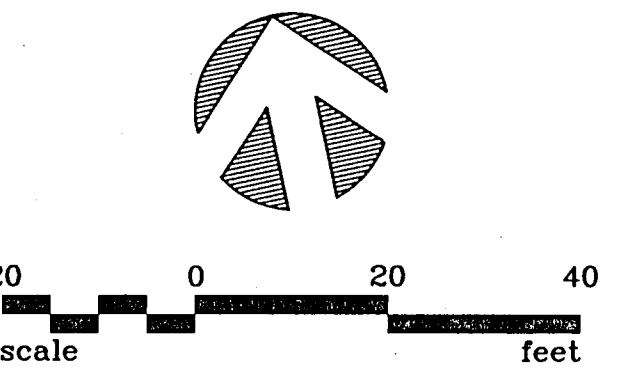
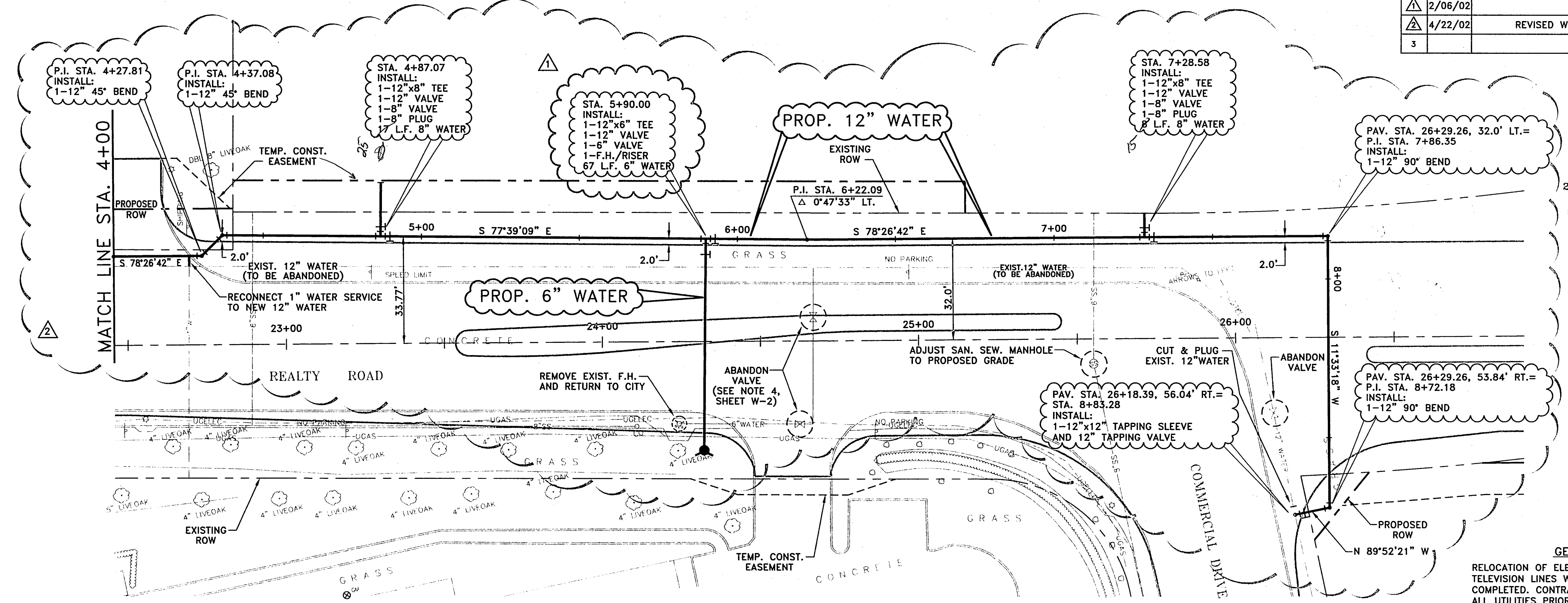
DATE: DECEMBER, 2001 SCALE: 1"=20'(H)1"=6'(V) JOB NO.: 00-249
 DRAWN: GBW DESIGN: BRG REVIEWED: JFW DWG: 249WAT02

ARAPAHO ROAD PHASE II
 PLAN & PROFILE
 12" WATER STA. 0+00 TO STA. 4+00
TOWN OF ADDISON

GBW Grantham, Burge & Waldbauer
 Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042 (972) 840-1916 (TEL) (972) 840-2156 (FAX)

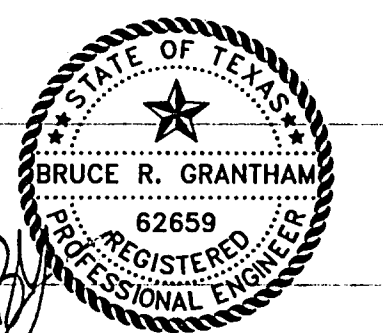
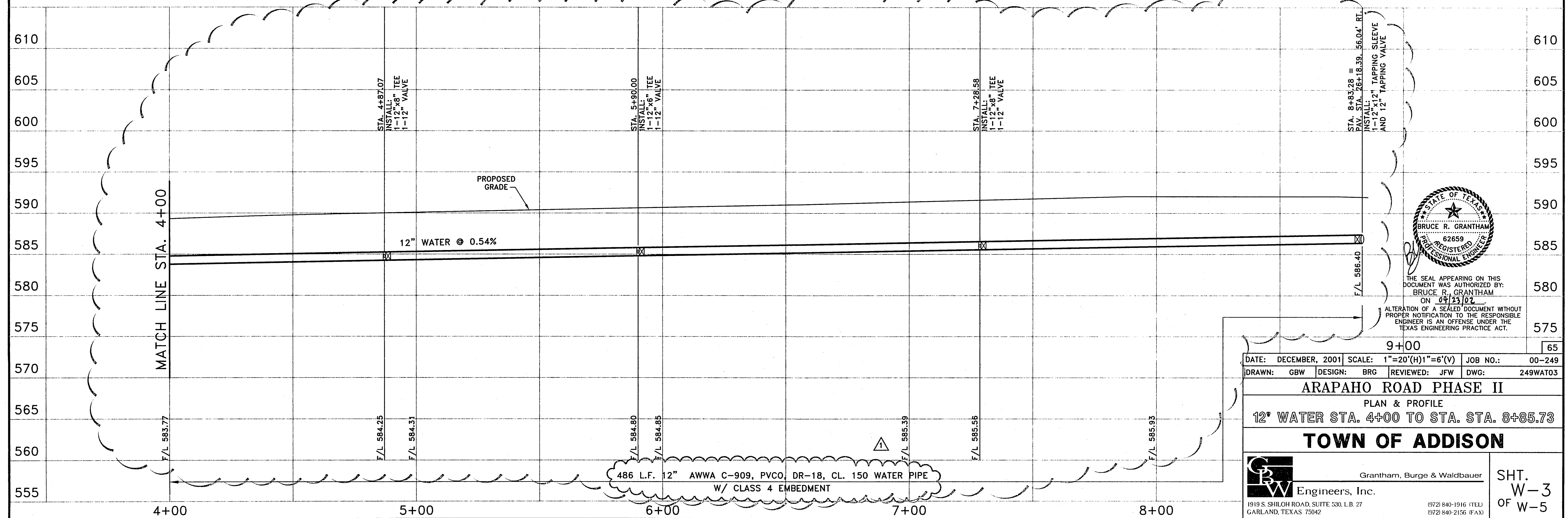
SHT. W-2 OF W-5

NO.	DATE	REVISION	BRG
1	2/06/02	PER ADDENDUM No.2	BRG
2	4/22/02	REVISED WATER LOCATION, ADD STUBOUTS	BRG
3			



NOTES:
 1. SEE SHEET W-2 FOR ADDITIONAL WATER NOTES.

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DRAWN:	GBW	DESIGN:	BRG	REVIEWED:	JFW
DWG:	249WAT03				
ARAPAHO ROAD PHASE II					
PLAN & PROFILE					
12" WATER STA. 4+00 TO STA. STA. 8+85.73					
TOWN OF ADDISON					
Grantham, Burge & Waldbauer				SHT. W-3 OF W-5	
Engineers, Inc.					
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042					
				(972) 840-1916 (TEL) (972) 840-2156 (FAX)	

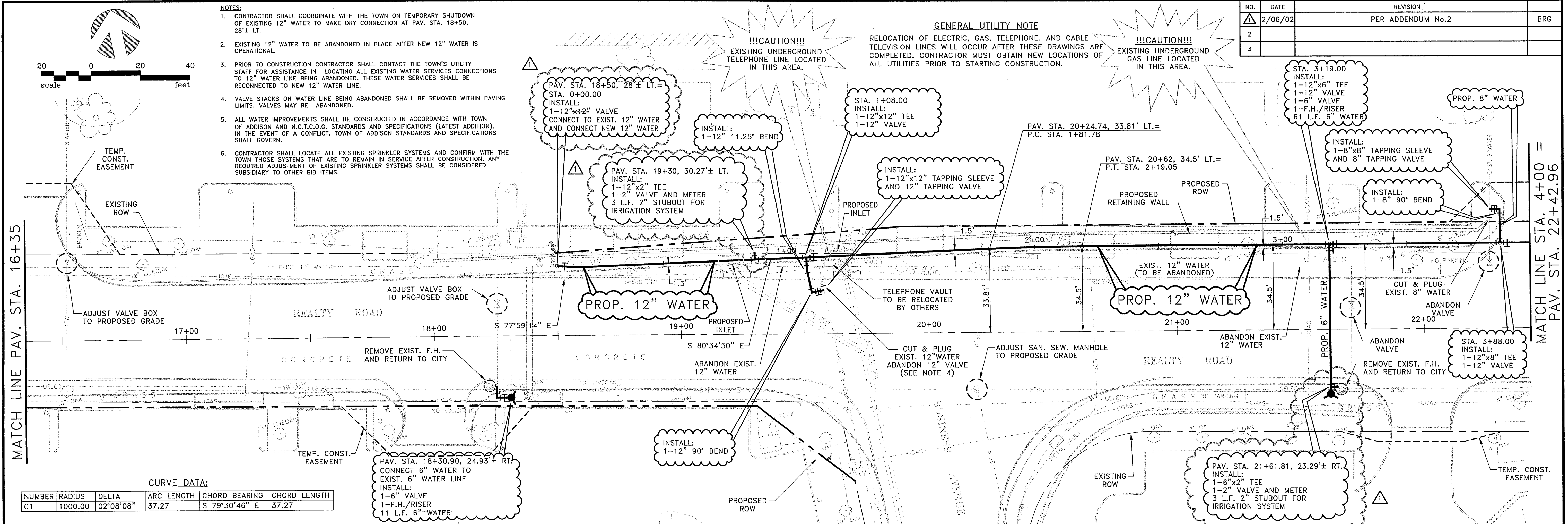
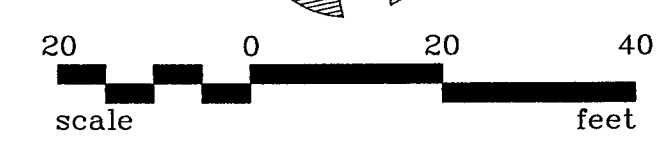
NO.	DATE	REVISION
1	2/06/02	PER ADDENDUM No.2
2		
3		

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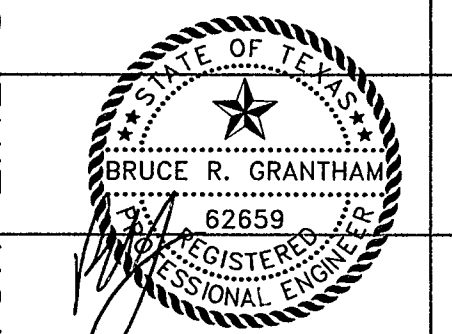
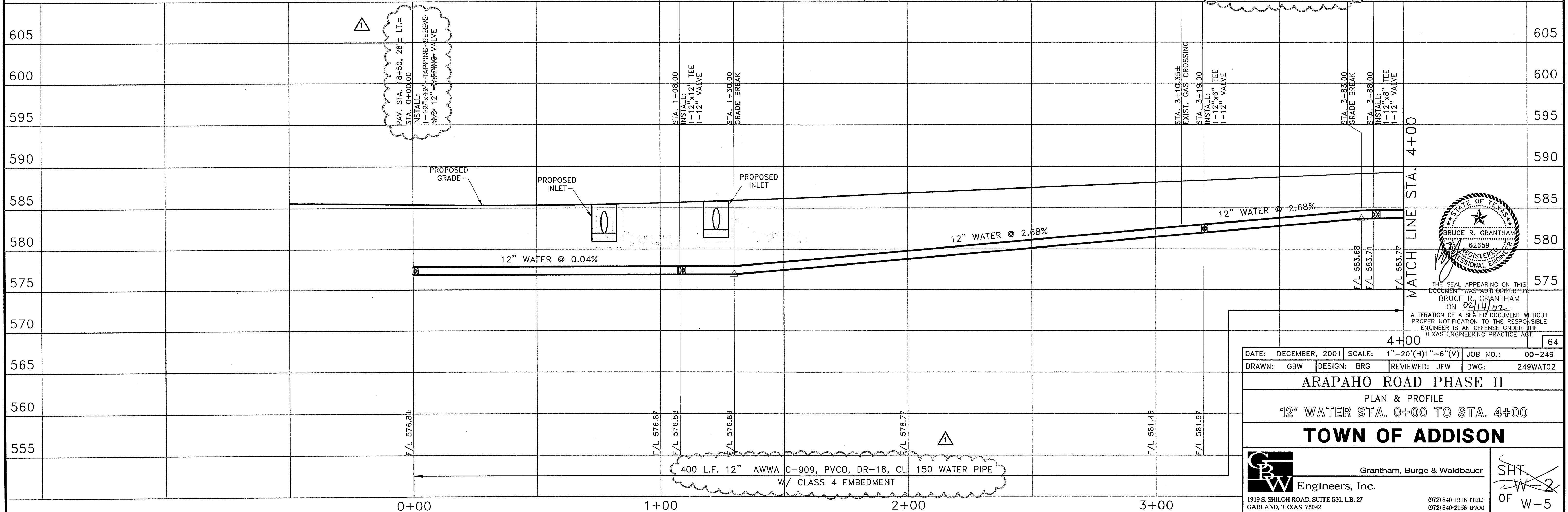
!!!CAUTION!!!
 EXISTING UNDERGROUND GAS LINE LOCATED IN THIS AREA.

!!!CAUTION!!!
 EXISTING UNDERGROUND TELEPHONE LINE LOCATED IN THIS AREA.



CURVE DATA:

NUMBER	RADIUS	DELTA	ARC LENGTH	CHORD BEARING	CHORD LENGTH
C1	1000.00	02°08'08"	37.27	S 79°30'46" E	37.27

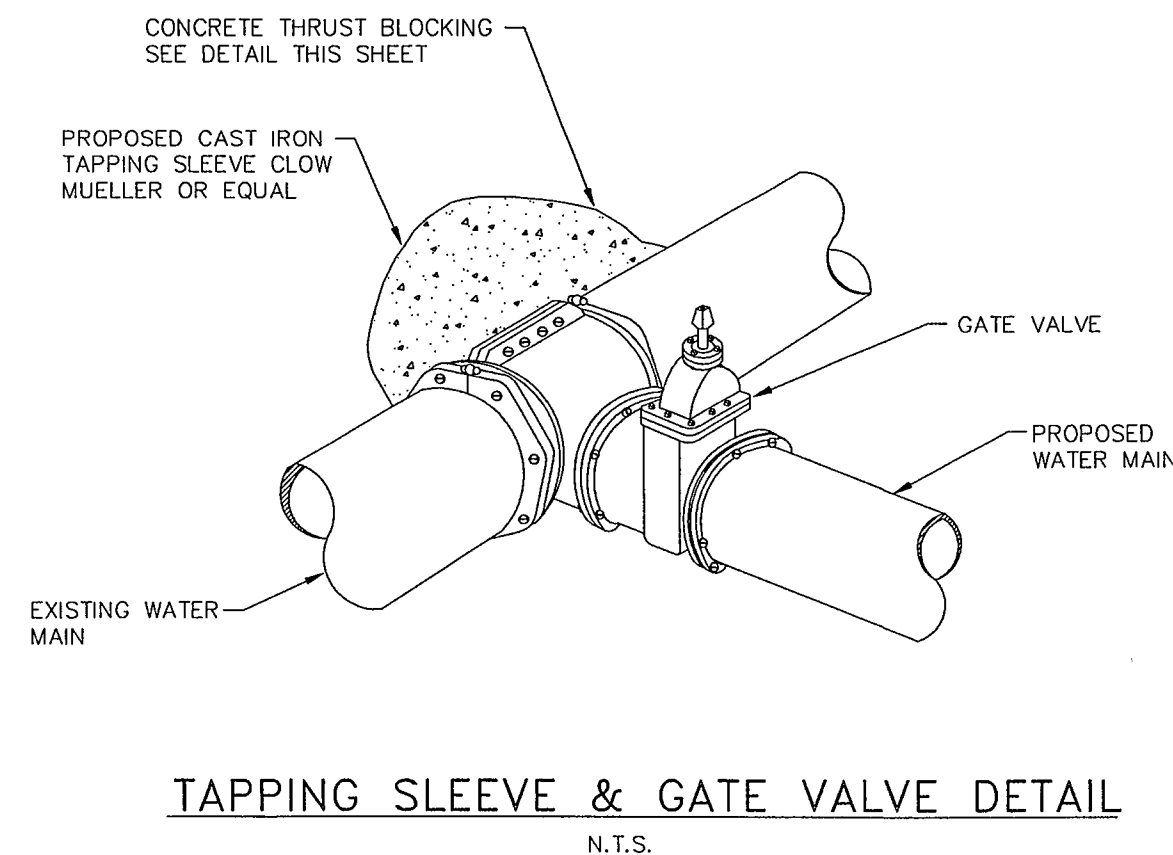
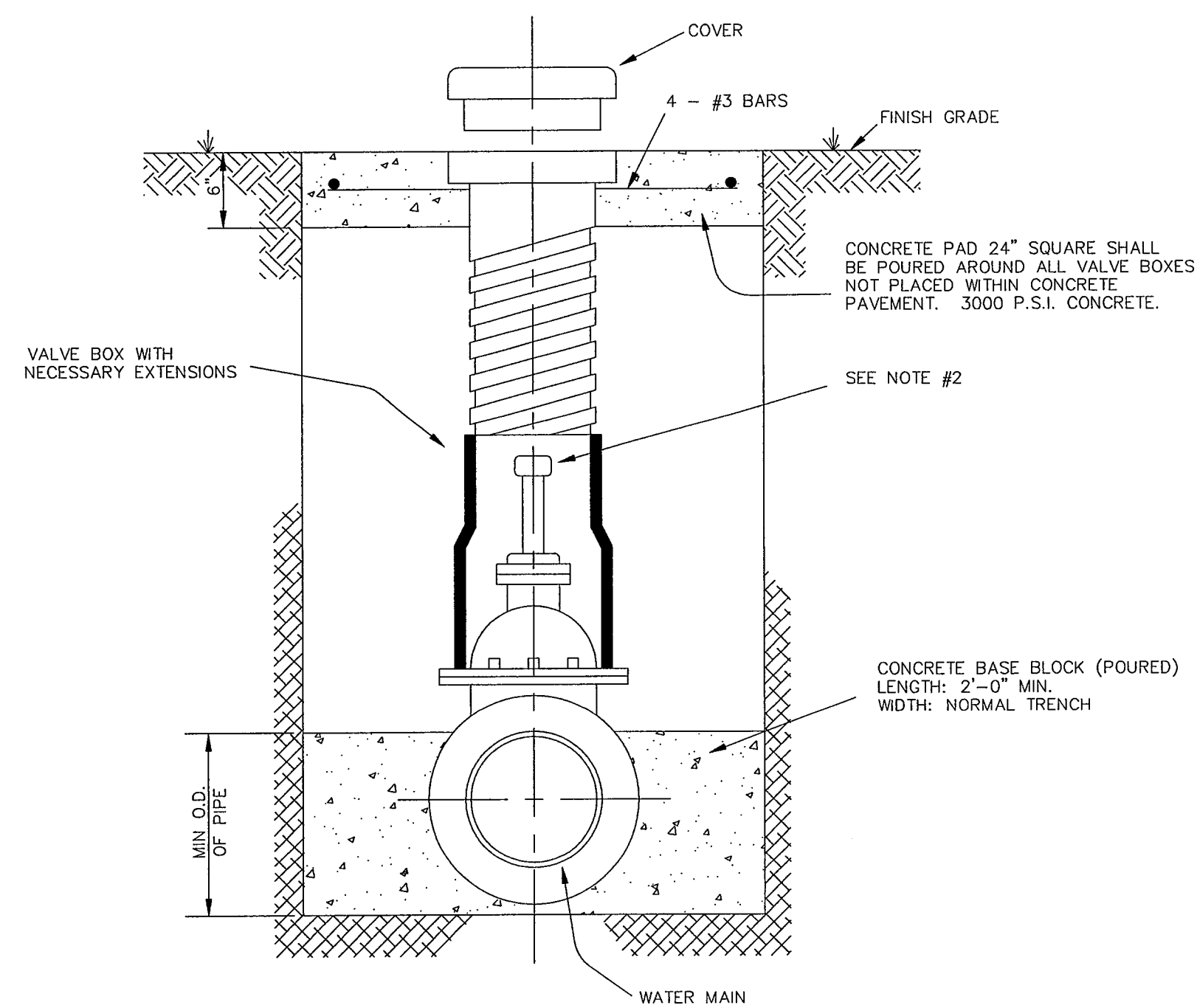


DATE: DECEMBER, 2001 SCALE: 1"=20'(H)1"=6"(V) JOB NO.: 00-249
 DRAWN: GBW DESIGN: BRG REVIEWED: JFW DWG: 249WAT02

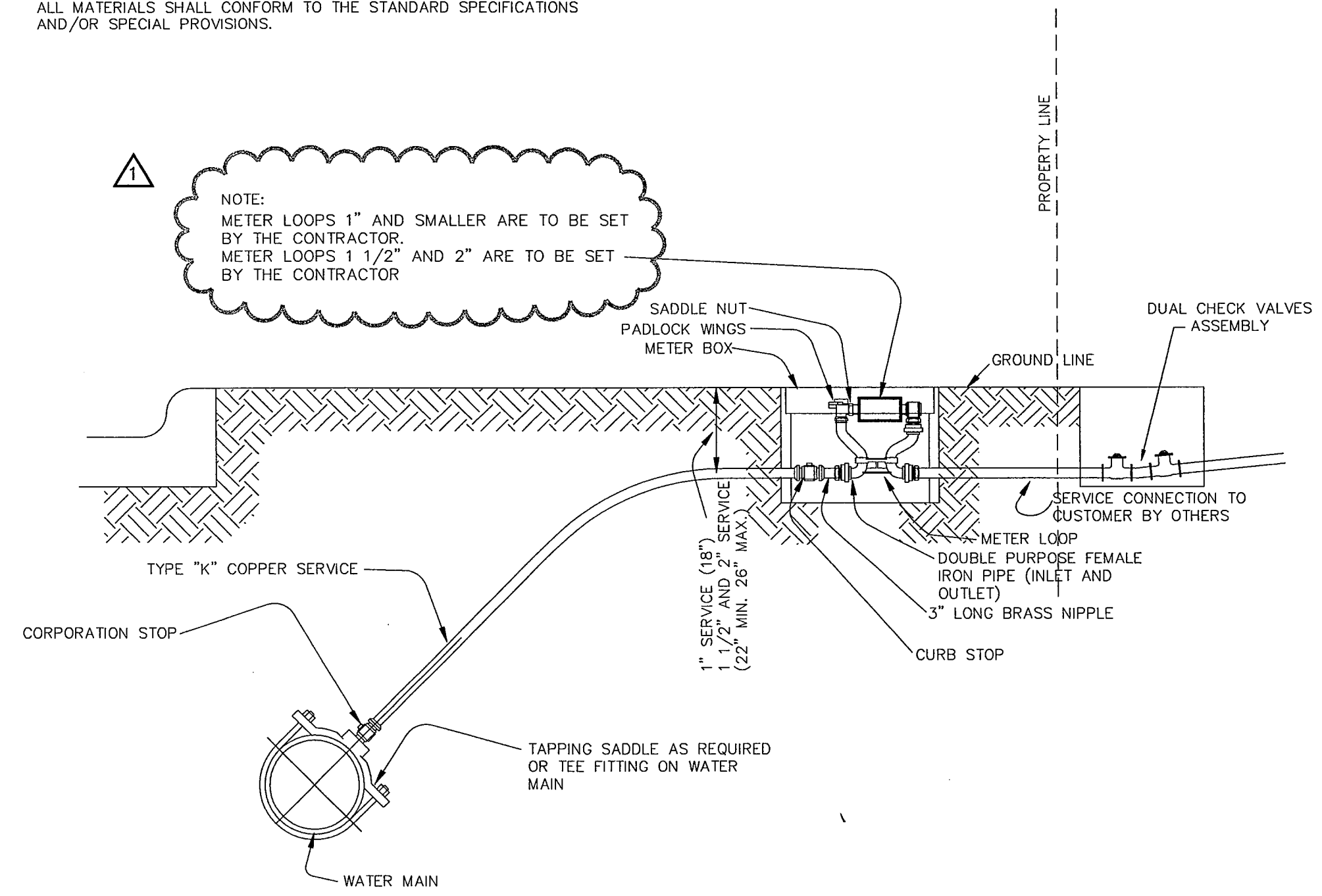
ARAPAHO ROAD PHASE II
 PLAN & PROFILE
 12" WATER STA. 0+00 TO STA. 4+00
TOWN OF ADDISON

Grantham, Burge & Waldbauer
GBW Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042 (972) 840-1916 (TEL) (972) 840-2156 (FAX)
 SHT W-5 OF W-5

NO.	DATE	REVISION	APPROV.
1	2/06/02	PER ADDENDUM No.2	BRG
2			
3			



NOTE:
DOMESTIC WATER SERVICES SHALL NOT BE CONNECTED TO FIRE HYDRANT LINES.
ALL MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATIONS
AND/OR SPECIAL PROVISIONS.



NOTE:
METER LOOPS 1\"/>

- NOTE:
- GATE VALVES SHALL BE IN ACCORDANCE WITH AWWA STANDARD C-509-80 OR LATEST. ALL VALVE SHALL BE "MUELLER OR APPROVED EQUAL.
 - A PERMANENTLY ATTACHED VALVE EXTENSION STEM SHALL BE REQUIRED FOR ANY VALVE THAT OPERATING NUT IS LOCATED IN EXCESS OF 4 FEET BELOW THE TOP OF VALVE BOX. THIS EXTENSION SHALL BE OF SUFFICIENT LENGTH TO INSURE THAT ITS TOP IS WITHIN 4 FEET OF VALVE BOX LID. MANUFACTURED VALVE STACK DUCTILE IRON PIPE TO BE USED FOR EXTENSION GREATER THAN 4'-0". BELL END OF STACK TO BE FITTED OVER VALVE. VALVE AND VALVE STACK ARE TO BE POLYWRAPPED.
 - VALVE SHALL BE OF DUCTILE IRON WITH RUBBER ENCAPSULATED DISK. BODY BOLTS SHALL BE STAINLESS STEEL OF SAME SIZE ON EACH VALVE.
 - ALL VALVE COVERS SHALL BE MARKED "WATER".
"V" SYMBOL POINTING TOWARDS THE VALVE LOCATION.

TYPICAL VALVE SETTING AND BOX
N.T.S.

NOTE:
THE MUELLER "CENTURIAN" OR EQUAL, IN GENERAL, ALL FIRE HYDRANTS SHALL CONFORM TO AWWA STANDARD SPECIFICATIONS FOR FIRE HYDRANTS FOR ORDINARY WATER WORKS SERVICE FOR WATER AND SANITARY SEWER IMPROVEMENTS. FIRE HYDRANTS WITH A BARREL APPROXIMATELY 7" INSIDE DIAMETER. ALL HYDRANTS SHALL BE EQUIPPED WITH A BREAKAWAY FLANGE. ALL HYDRANTS SHALL BE APPROVED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.

GENERAL INSTALLATION NOTES:

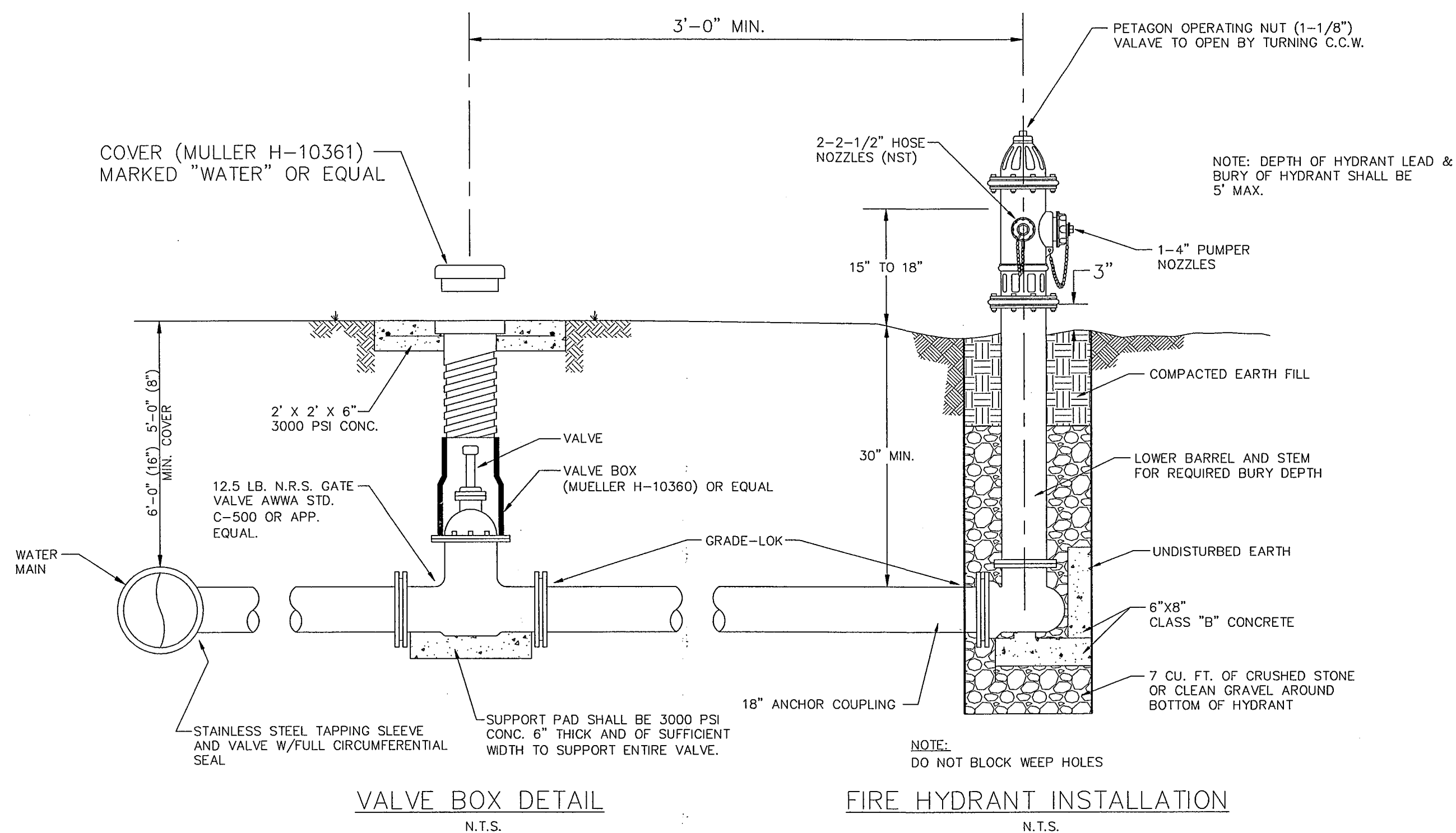
WATER METER SHALL BE PLACED IN CENTER OF LOT WITH THE SANITARY SEWER HOUSE CONNECTION TO BE LOCATED 10 FEET DOWNSTREAM. ALL TAPS SHALL BE MADE AT A 45° ANGLE TO THE CENTERLINE OF THE PIPE.

THE CONTRACTOR SHALL SET THE METER BOX IN ALL CASES.

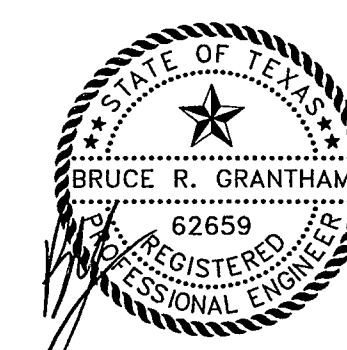
THE METER BOX SHALL BE SET WITHIN THE RIGHT-OF-WAY OR A DEDICATED UTILITY EASEMENT. IN ALL CASES THE METER BOX SHALL BE PROTECTED FROM VEHICULAR TRAFFIC.

SEE SHEET NOS. 2 OF 3 AND 3 OF 3 FOR METER ASSEMBLY APPROVED MATERIAL LIST.

TYPICAL SERVICE CONNECTION WITH METER BOX
N.T.S.



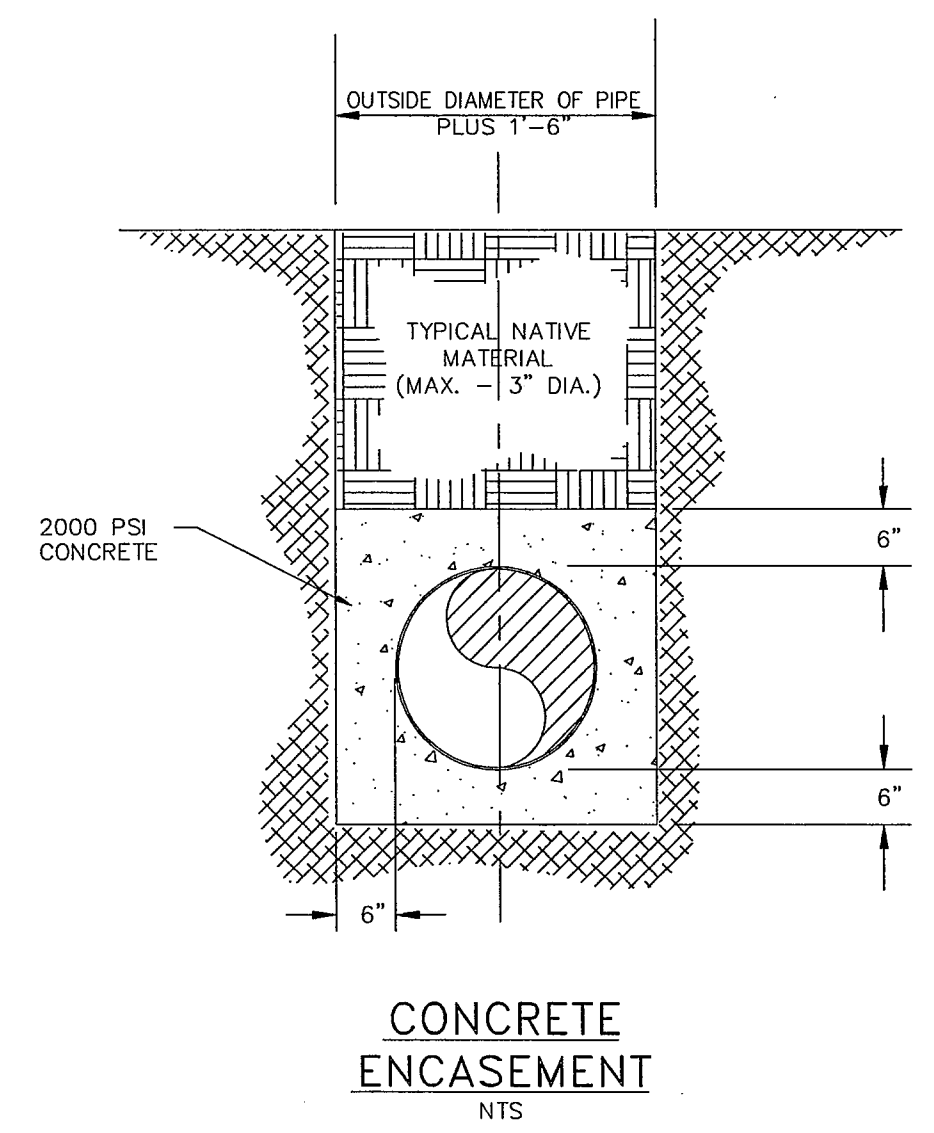
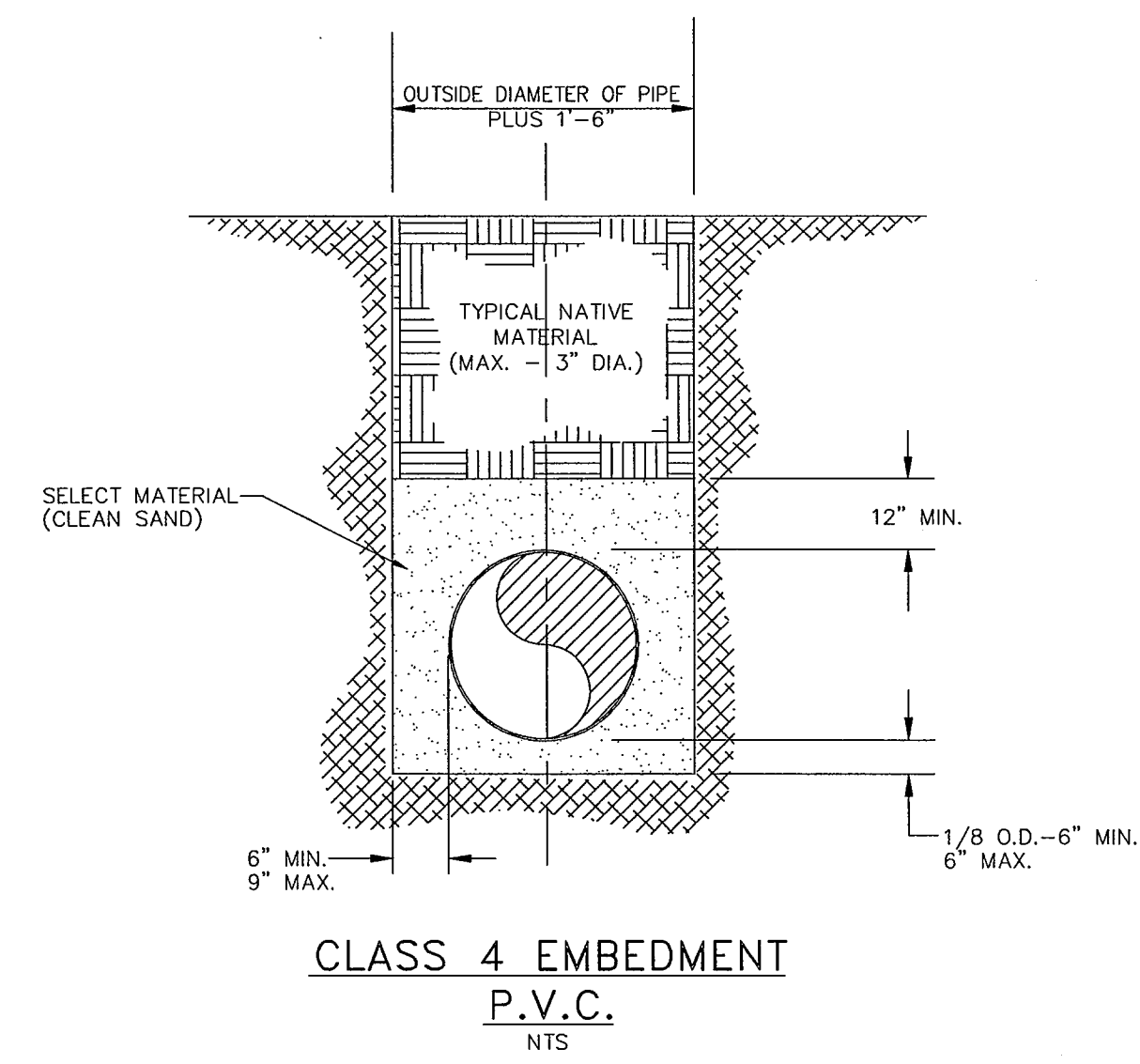
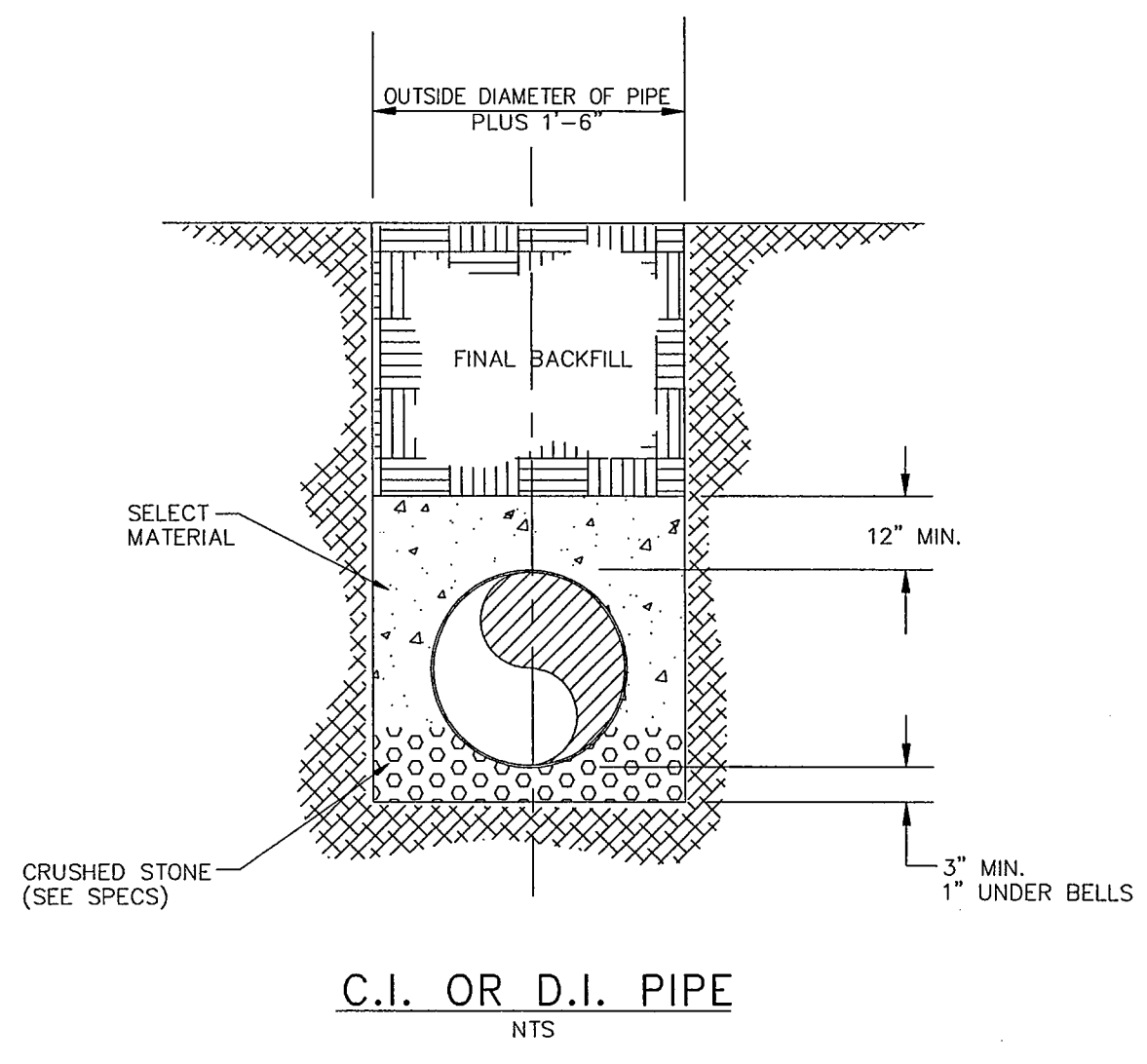
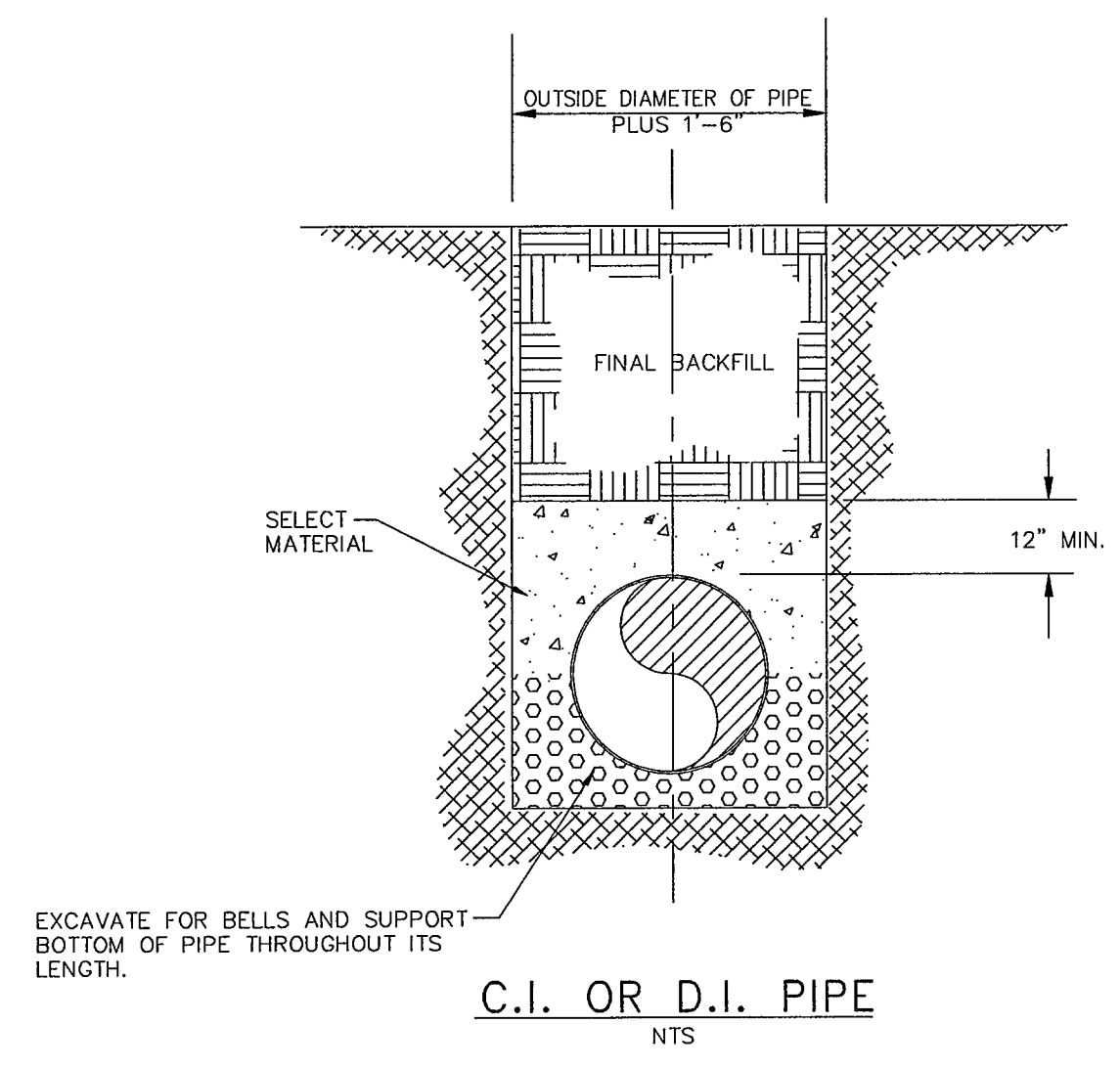
- GATE VALVES AND VALVE BOXES:
- REFER TO SPECIFICATION #GV-95.1
 - VALVE BOXES SHALL BE CAST IRON AND SHALL BE OF SUFFICIENT LENGTH AND DIAMETER TO OPERATE ALL VALVES BURIED IN THE GROUND. COVERS SHALL BE MARKED "WATER" THE BOXES SHALL REST ON THE VALVE AND BE ADJUSTED SO THAT THE COVER MAY BE SET FLUSH WITH THE FINISHED GRADE.



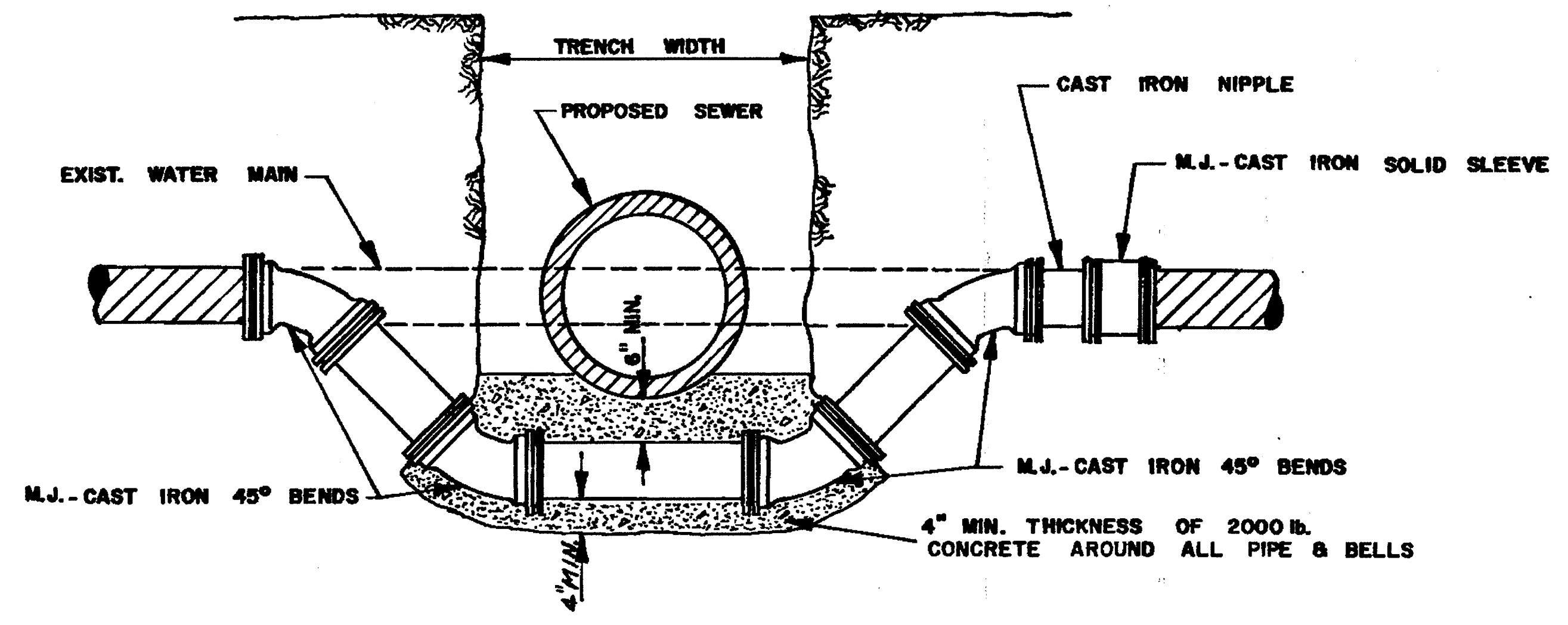
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ON 02/14/02
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DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: BRG	REVIEWED: JFW
DWG: 249DETAIL-WATER		
ARAPAHO ROAD PHASE II		
STANDARD CONSTRUCTION DETAILS		
WATER - SHEET 1 OF 2		
TOWN OF ADDISON		
Grantham, Burge & Waldbauer Engineers, Inc.		SHT. W-4 OF W-5
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042		(972) 840-1916 (TEL) (972) 840-2156 (FAX)

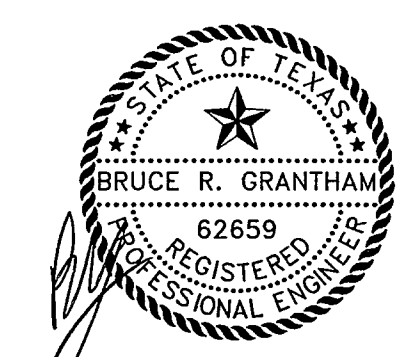
NO.	DATE	REVISION	APPROV.
1			
2			
3			



EMBEDMENT DETAILS FOR WATER MAIN



DETAIL FOR WATER MAIN LOWERING



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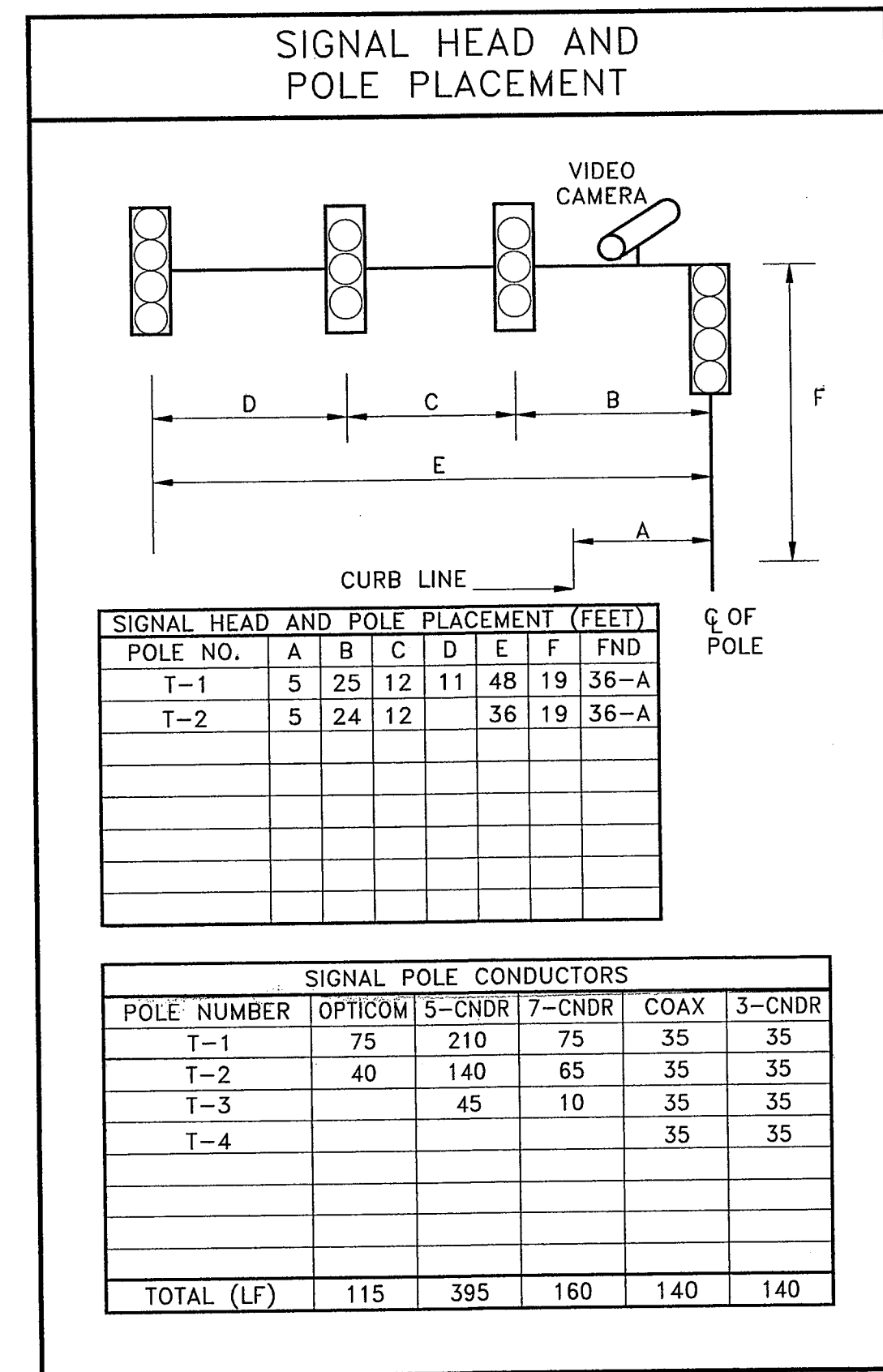
DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: BRG	REVIEWED: JFW
DWG: 249DETAIL-WATER		

ARAPAHO ROAD PHASE II
STANDARD CONSTRUCTION DETAILS
WATER - SHEET 2 OF 2
TOWN OF ADDISON

Grantham, Burge & Waldbauer
Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27
GARLAND, TEXAS 75042

SHT. W-5
OF W-5

NO.	DATE	REVISION	APPROV.
1			
2			
3			



CABLE TERMINATION CHART

CABLE CONDUCTOR	T-1 (20 CNDR)	T-2 (16 CNDR)	T-3 (7 CNDR)
	S.H. NO.	S.H. NO.	S.H. NO.
BLACK	SPARE	SPARE	7 Y
WHITE	COMMON	COMMON	COMMON
RED	1-4 R	8-10 R	7 R
GREEN	1-4 G	8-10 G	7 G
ORANGE	1-4 Y	8-10 Y	7 Y
BLUE	PB 5 Ø6	PB 12 Ø8	7 G
WHT/BLK	PB COMMON	PB COMMON	SPARE
RED/BLK	5 DW	12 DW	
GRN/BLK	5 W	12 W	
ORN/BLK	1 →Y	8 →Y	
BLU/BLK	1 →G	8 →G	
BLK/WHT	PB 6 Ø4	PB 11 Ø6	
RED/WHT	6 DW	11 DW	
GRN/WHT	6 W	11 W	
BLU/WHT	PB COMMON	PB COMMON	
BLK/RED	SPARE	SPARE	
WHT/RED	4 →		
ORN/RED	4 →		
BLU/RED	SPARE		
RED/GRN	SPARE		

SIGNAL POLE CONDUCTORS

POLE NUMBER	OPTICOM	5-CNDR	7-CNDR	COAX	3-CNDR
T-1	75	210	75	35	35
T-2	40	140	65	35	35
T-3		45	10	35	35
T-4				35	35
TOTAL (LF)	115	395	160	140	140

SIGNAL HEADS*

NO.	TYPE	PHASE	BACKPLATE		SIGNAL HEAD		PED. SIG. SEC.
			3 SEC.	4 SEC.	3 SEC.	4 SEC.	
1	V4 LT	4+7		1		1	
2-3	V3	4	2		2		
4	V4RT	4		1		1	
5	PED	6					1
6	PED	4					1
7	V4RT	2		1		1	
8	V3	1+6	1		1		
9	V3	1+6	1		1		
10	V3	1+6	1		1		
11	PED	6					1
12	PED	8					1
TOTALS			5	3	5	3	4

* ALL SIGNAL HEADS TO BE LED
 * ALL PEDESTRIAN SIGNAL HEADS TO BE "COUNTDOWN" TYPE.

CONDUIT RUNS

RUN NO.	QUANTITY	SIZE	TYPE	METHOD	*4 XHHW	*12 XHHW	*6 BARE	COAX CABLE	4 CNDR OPTICOM	3 CNDR (VIDEO)	7 CNDR	9 CNDR	16 CNDR	CONDUIT LENGTH	CABLE LENGTH	RUN NO.
A	EXISTING									4	1				15'	A
B	1	4"	PVC	BORE			1	1	1	2		1	1	100'	105'	B
C	1	4"	PVC	TRENCH			1	1	1	2		1	1	45'	50'	C
D	1	3"	PVC	TRENCH			1	1	1	1				20'	25'	D
E	1	4"	PVC	BORE			1	1	1	1			1	110'	115'	E
F	1	3"	PVC	TRENCH			1	1	1	1			1	5'	10'	F
G	EXISTING									1	1				35'	G
H	EXISTING									1	1				55'	H
J	EXISTING									1	1				20'	J
K	EXISTING									1	1				20'	K
TOTAL(LF)								305	435	305	650	125	170	305		

CONDUIT SUMMARY

SIZE	TYPE	LENGTH(LF)
3"	TRENCH	25'
4"	BORE	210'
4"	TRENCH	45'

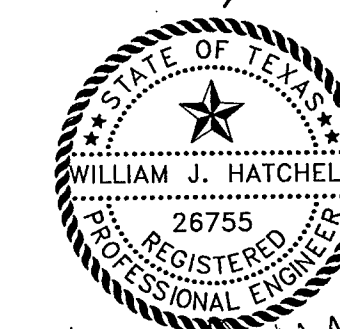
GROUND BOX SUMMARY

TYPE	EA.
A	3

GENERAL TRAFFIC NOTE:

- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH TOWN OF ADDISON AND TXDOT STANDARDS AND SPECIFICATIONS. IN THE EVENT OF A CONFLICT, TOWN OF ADDISON STANDARDS SHALL GOVERN.
- ALL TRAFFIC SIGNAL WORK SHALL BE BID UNDER THE LUMP SUM BID ITEMS.

BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE SPECIALTIES INC. PROJECT COORDINATOR *[Signature]*



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: WILLIAM J. HATCHELL ON 2/18/02 ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

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DATE: DECEMBER, 2001 SCALE: NOT TO SCALE JOB NO.: 00-249
 DRAWN: GBW DESIGN: WJH REVIEWED: DWG: SIG-LAY2.DWG

ARAPAHO ROAD PHASE II
ARAPAHO ROAD AT MARSH LANE
SIGNAL LAYOUT TABLE

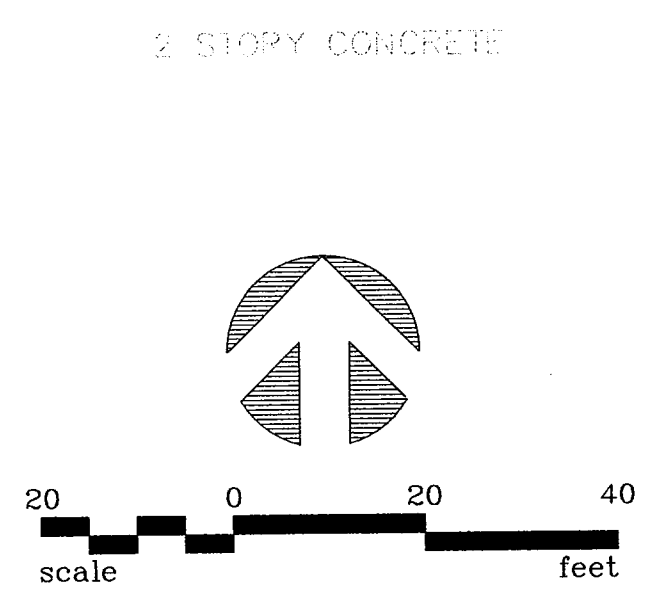
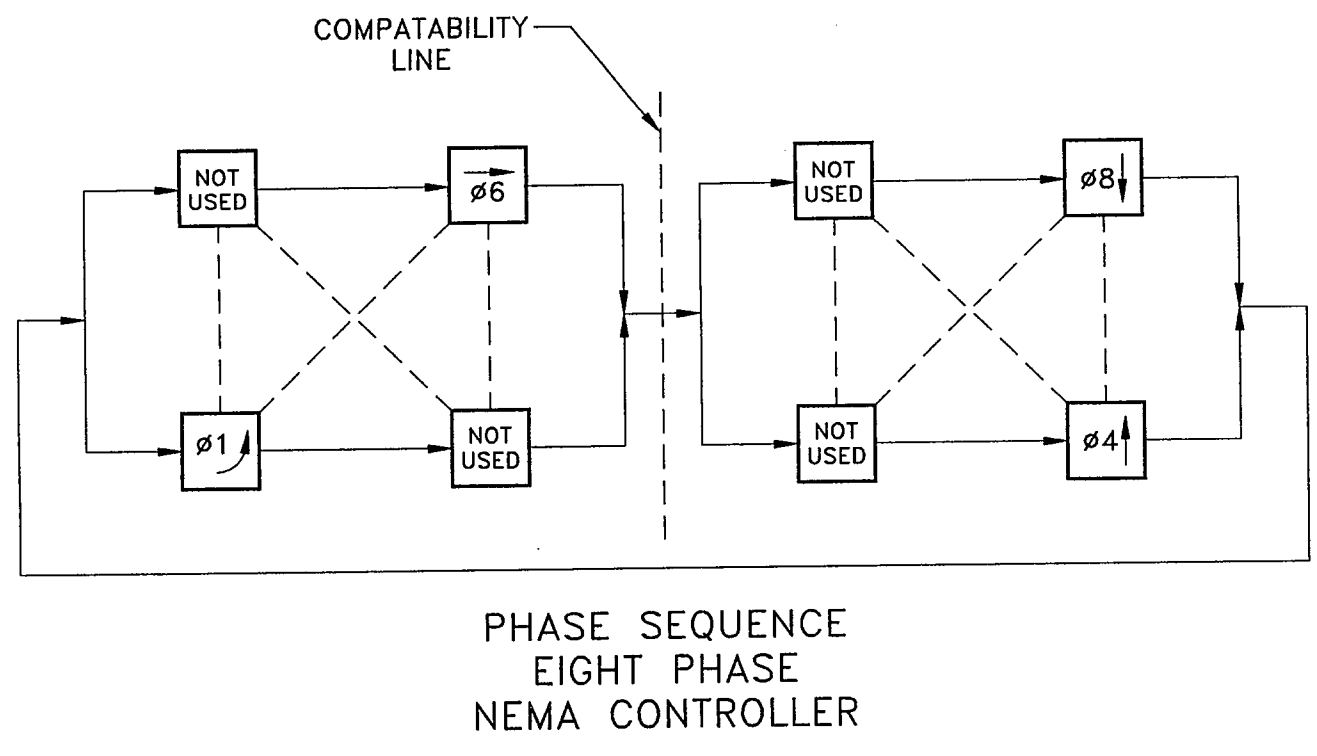
TOWN OF ADDISON

Grantham, Burge & Waldbauer
Engineers, Inc.

1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042 (972) 840-1916 (TEL) (972) 840-2156 (FAX)

SHT. TS-2 OF TS-21

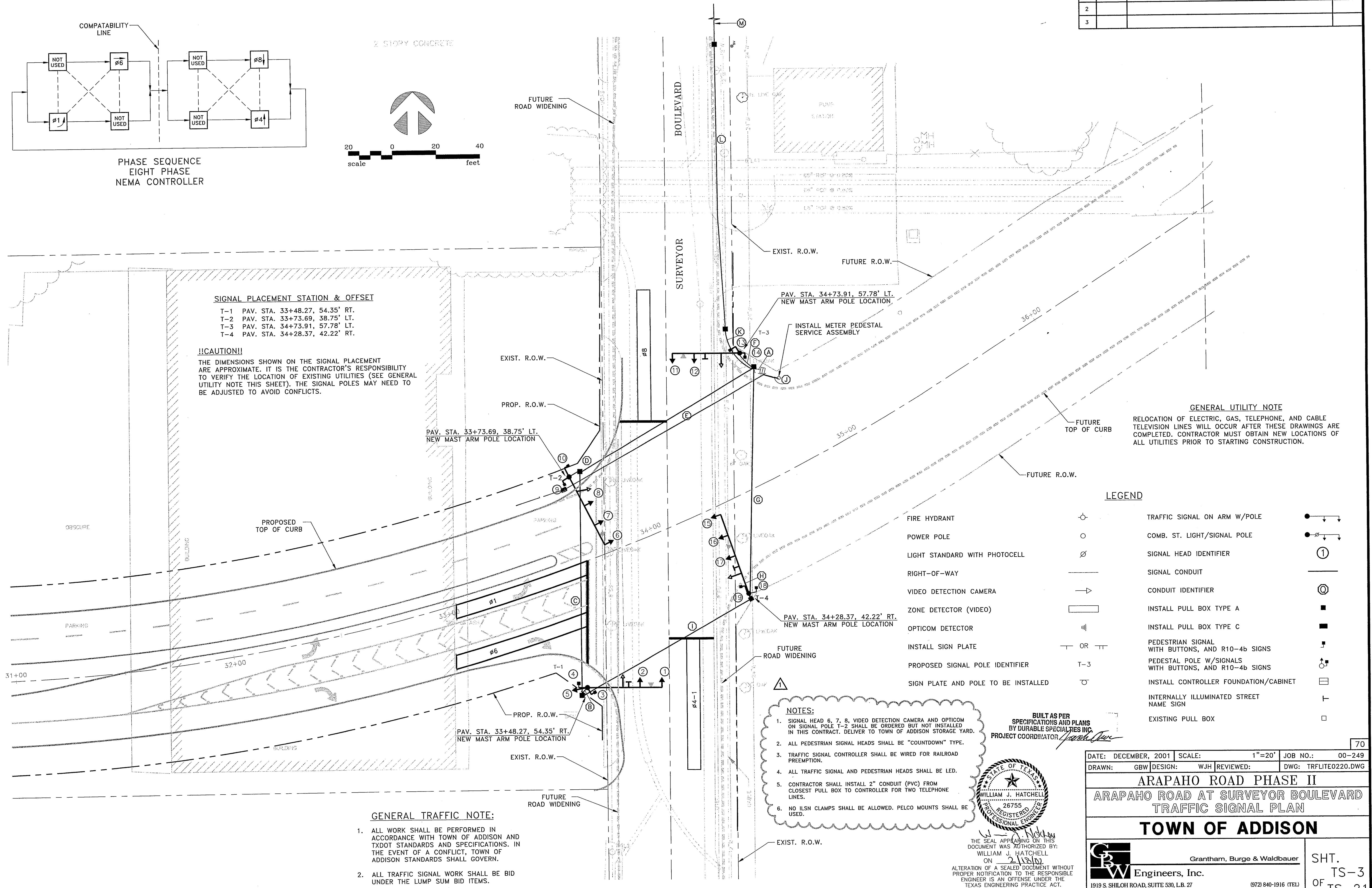
NO.	DATE	REVISION	APPROV.
1	2/06/02	PER ADDENDUM No.2	BRG
2			
3			



SIGNAL PLACEMENT STATION & OFFSET

- T-1 PAV. STA. 33+48.27, 54.35' RT.
- T-2 PAV. STA. 33+73.69, 38.75' LT.
- T-3 PAV. STA. 34+73.91, 57.78' LT.
- T-4 PAV. STA. 34+28.37, 42.22' RT.

!!CAUTION!!
THE DIMENSIONS SHOWN ON THE SIGNAL PLACEMENT ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION OF EXISTING UTILITIES (SEE GENERAL UTILITY NOTE THIS SHEET). THE SIGNAL POLES MAY NEED TO BE ADJUSTED TO AVOID CONFLICTS.



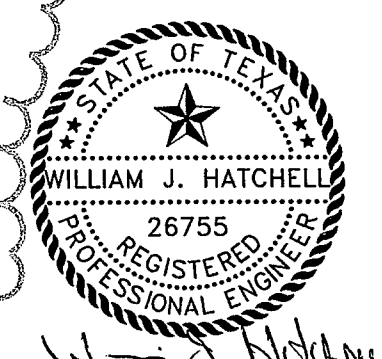
GENERAL UTILITY NOTE
RELOCATION OF ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION LINES WILL OCCUR AFTER THESE DRAWINGS ARE COMPLETED. CONTRACTOR MUST OBTAIN NEW LOCATIONS OF ALL UTILITIES PRIOR TO STARTING CONSTRUCTION.

LEGEND

FIRE HYDRANT		TRAFFIC SIGNAL ON ARM W/POLE	
POWER POLE		COMB. ST. LIGHT/SIGNAL POLE	
LIGHT STANDARD WITH PHOTOCELL		SIGNAL HEAD IDENTIFIER	
RIGHT-OF-WAY		SIGNAL CONDUIT	
VIDEO DETECTION CAMERA		CONDUIT IDENTIFIER	
ZONE DETECTOR (VIDEO)		INSTALL PULL BOX TYPE A	
OPTICOM DETECTOR		INSTALL PULL BOX TYPE C	
INSTALL SIGN PLATE		PEDESTRIAN SIGNAL WITH BUTTONS, AND R10-4b SIGNS	
PROPOSED SIGNAL POLE IDENTIFIER		PEDESTAL POLE W/SIGNALS WITH BUTTONS, AND R10-4b SIGNS	
SIGN PLATE AND POLE TO BE INSTALLED		INSTALL CONTROLLER FOUNDATION/CABINET	
		INTERNALLY ILLUMINATED STREET NAME SIGN	
		EXISTING PULL BOX	

- NOTES:**
- SIGNAL HEAD 6, 7, 8, VIDEO DETECTION CAMERA AND OPTICOM ON SIGNAL POLE T-2 SHALL BE ORDERED BUT NOT INSTALLED IN THIS CONTRACT. DELIVER TO TOWN OF ADDISON STORAGE YARD.
 - ALL PEDESTRIAN SIGNAL HEADS SHALL BE "COUNTDOWN" TYPE.
 - TRAFFIC SIGNAL CONTROLLER SHALL BE WIRED FOR RAILROAD PREEMPTION.
 - ALL TRAFFIC SIGNAL AND PEDESTRIAN HEADS SHALL BE LED.
 - CONTRACTOR SHALL INSTALL 2" CONDUIT (PVC) FROM CLOSEST PULL BOX TO CONTROLLER FOR TWO TELEPHONE LINES.
 - NO ILSN CLAMPS SHALL BE ALLOWED. PELCO MOUNTS SHALL BE USED.

BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE SPECIALTIES INC. PROJECT COORDINATOR *[Signature]*



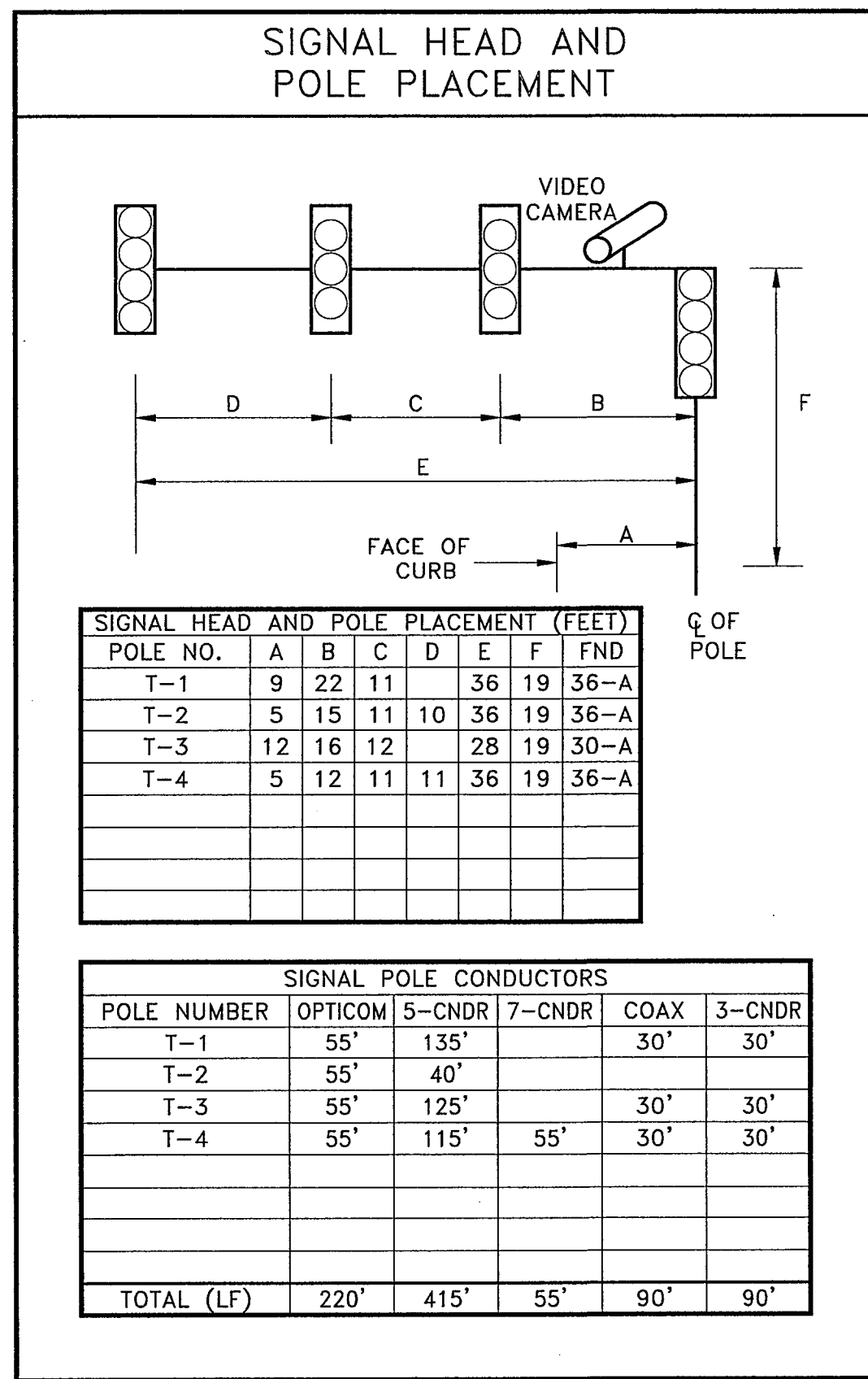
THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: WILLIAM J. HATCHELL ON 2/13/02 ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

GENERAL TRAFFIC NOTE:

- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH TOWN OF ADDISON AND TXDOT STANDARDS AND SPECIFICATIONS. IN THE EVENT OF A CONFLICT, TOWN OF ADDISON STANDARDS SHALL GOVERN.
- ALL TRAFFIC SIGNAL WORK SHALL BE BID UNDER THE LUMP SUM BID ITEMS.

DATE: DECEMBER, 2001	SCALE: 1"=20'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: WJH	REVIEWED: [Signature]
DWG: TRFLITE0220.DWG		
ARAPAHO ROAD PHASE II		
ARAPAHO ROAD AT SURVEYOR BOULEVARD		
TRAFFIC SIGNAL PLAN		
TOWN OF ADDISON		
Grantham, Burge & Waldbauer Engineers, Inc.		SHT. TS-3 OF TS-21
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042		(972) 840-1916 (TEL) (972) 840-2156 (FAX)

NO.	DATE	REVISION	APPROV.
1			
2			
3			



SIZE	TYPE	LENGTH(LF)
3"	TRENCH	28'
4"	TRENCH	214'
4"	BORE	180'
2"	TRENCH	295'

TYPE	EA.
A	6

CABLE TERMINATION CHART

CABLE CONDUCTOR	T-1 (16 CNDR)		T-2 (16 CNDR)		T-3 (16 CNDR)		T-4 (16 CNDR)	
	S.H. NO.	INDICATION	S.H. NO.	INDICATION	S.H. NO.	INDICATION	S.H. NO.	INDICATION
BLACK	5	Y	6	→Y			15	→Y
WHITE		COMMON		COMMON		COMMON		COMMON
RED	1-2	R	6-8	R	11-12	R	15-17	R
GREEN	1-2	G	6-8	G	11-12	G	15-17	G
ORANGE	1-2	Y	6-8	Y	11-12	Y	15-17	Y
BLUE	4	W	6	→G			15	→G
WHT/BLK		PB COMMON		PB COMMON		PB COMMON		PB COMMON
RED/BLK	3	DW	9	DW	13	DW	18	DW
GRN/BLK	3	W	9	W	13	W	18	W
ORN/BLK		SPARE		SPARE		SPARE		SPARE
BLUE/BLK		SPARE		SPARE		SPARE		SPARE
BLK/WHT	PB 4		PB 10		PB 14		PB 19	
RED/WHT	5	R	10	DW	14	DW	19	DW
GRN/BLK	5	G	10	W	14	W	19	W
BLU/WHT	PB 3		PB 9		PB 13		PB 18	
BLK/RED	4	DW		SPARE		SPARE		SPARE

SIGNAL HEADS*

NO.	TYPE	PHASE	BACKPLATE		SIGNAL HEAD		PED. SIG. SEC.
			3 SEC.	4 SEC.	3 SEC.	4 SEC.	
1-2	V3	#8	2		2		
3		#2					1
4		#8					1
5	V3	#6	1		1		
6	V4LT	#5		1		1	
7-8	V3	#2	2		2		
9		#4					1
10		#2					1
11-12	V3	#4	2		2		
13		#6					1
14		#4					1
15	V4LT	#1		1		1	
16-17	V3	#6	2		2		
18		#8					1
19		#6					1
TOTALS							

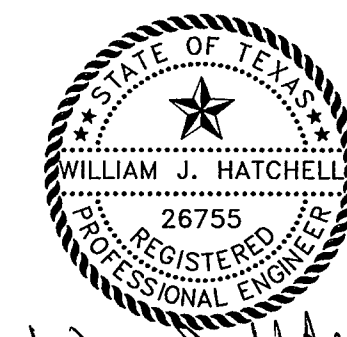
* ALL SIGNAL HEADS SHALL BE LED.
 * ALL PEDESTRIAN SIGNAL SHALL BE "COUNTDOWN" TYPE.

CONDUIT RUNS

RUN NO.	QUANTITY	SIZE	TYPE	METHOD	4 XHHW	12 XHHW	6 BARE	COAX CABLE	4 CNDR OPTICOM	3 CNDR (VIDEO)	6 CNDR	9 CNDR	16 CNDR	CONDUIT LENGTH	CABLE LENGTH	RUN NO.
A	2	4"	PVC	TRENCH	2		1	4	4	4	1	1	4	4'	10'	A
B	1	3"	PVC	TRENCH			1	1	1	1			1	5'	10'	B
C	1	4"	PVC	TRENCH			1	1	1	1			1	105'	115'	C
D	1	3"	PVC	TRENCH			1	1	1	1			1	5'	10'	D
E	1	4"	PVC	BORE			1	2	2	2			2	90'	100'	E
F	1	3"	PVC	TRENCH			1	1	1	1			1	10'	15'	F
G	1	4"	PVC	TRENCH			1	1	1	1		1	1	105'	115'	G
H	1	3"	PVC	TRENCH			1	1	1	1			1	8'	12'	H
I	1	4"	PVC	BORE			1					1		90'	100'	I
J	1	2"	PVC	TRENCH	2							1		10'	15'	J
K	1	2"	PVC	TRENCH								1		20'	25'	K
L	1	2"	PVC	TRENCH								1		135'	140'	L
M	1	2"	PVC	TRENCH								1		130'	135'	M
TOTAL(LF)					50'		482'	517'	517'	517'	310'	225'	517'			

- #### RAILROAD PRE-EMPTION SEQUENCE
- NOTES:**
- UPON TRACK CLOSURE, THE CONTROLLER WILL IMMEDIATELY TIME THE APPROPRIATE YELLOW INTERVAL AND TRANSFER TO THE PRE-EMPTION SEQUENCE.
 - THE PRE-EMPTION SEQUENCE WILL DISPLAY THE FOLLOWING SIGNAL HEAD COLORS.
 - SIGNAL HEADS 11, 12, 15, 16, AND 17 RED
 - SIGNAL HEADS 1 & 2 GREEN
 - WHEN THE TRACK CIRCUIT RELEASES, THE CONTROLLER WILL PLACE A CALL ON ALL PHASES, TIME THE AMBER FOR # 8, RETURN TO # 1+6 AND RESUME NORMAL OPERATION.

BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE SPECIALTIES INC.
 PROJECT COORDINATOR *Jack Owen*



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: WILLIAM J. HATCHELL
 ON 2/15/01
 ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: WJH	REVIEWED: DWG: SIG-LAY1.DWG

ARAPAHO ROAD PHASE II
ARAPAHO ROAD AT SURVEYOR BOULEVARD
SIGNAL LAYOUT TABLE

TOWN OF ADDISON

Grantham, Burge & Waldbauer
Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
 (972) 840-1916 (TEL)
 (972) 840-2156 (FAX)

SHT. TS-4
 OF TS-21

NO.	DATE	REVISION	APPROV.
1			
2			
3			

I. GENERAL REQUIREMENTS FOR ALL ELECTRICAL WORK

The location of all conductors, conduits, junction boxes, ground boxes, and electrical services is diagrammatic only and may be shifted by the Engineer to accommodate local conditions.

Materials shall be new and unused. Materials and installation shall comply with the applicable provisions of the National Electrical Code (NEC), National Electrical Manufacturers Association (NEMA) standards, and shall be Underwriters Laboratories (UL) Listed unless otherwise shown on the plans or specifications or approved by the Engineer in writing. Faulty fabrication or poor workmanship in any material, equipment, or installation shall be justification for rejection. When reference is made to UL, it can be considered to mean a Nationally Recognized Independent Testing Lab (NRTL). Comparable standards of Canadian Standard Association, Electrical Testing Laboratories or Factory Mutual can be equal to the referenced UL standard. Where reference is made to NEMA listed devices, IEC listed devices shall not be considered to be an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing.

Unless high strength bolts are specified stainless steel hardware and miscellaneous nuts and bolts may be provided when galvanized is specified by the plans provided that bolts are 1/2 inch or less in diameter. The Contractor shall provide the following electrical test instruments as required by the Engineer to confirm compliance with the contract and the NEC. Those test instruments are voltmeter, amp probe, megger (1000 volt DC) and torque wrenches. All meters shall have been properly calibrated within one year. Calibration certification shall be provided to the Engineer upon request. Calibration certification tag shall also be applied to the meter. The Contractor shall operate meters during inspection as requested by the Engineer. Grounding shall be as shown on the plans and in accordance with the NEC. Metallic conduit, light poles, luminaires on bridge structures, and all metal enclosures shall be bonded to the system-grounding conductor. The ground rod in each ground box or junction box at the bridge ends, and in each ground box installed for underpass lighting will also be bonded to the system grounding conductor. The grounding conductor shall be bare or, if insulated, shall be green. Ground rods, connectors, and bonding jumpers will not be paid for separately, but will be subsidiary to the various bid items.

SUBMITTALS:

The contractor will submit for approval six (6) copies of catalog cut sheets for each of the following three (3) categories.
 Category 1. Electrical services including photocell.
 Category 2. Breakaway disconnects, heat shrink tubing, heat shrink filler tape and ground boxes which will include loading capacity certification.
 Category 3. Highmast assembly kits, when applicable. See Item 614 "Texas Standard Specifications". Submittals shall be legible and shall be marked to indicate which product on a cut sheet is to be supplied. Where manufacturers provide warranties and guarantees as a customary trade practice, the Contractor shall furnish to the Owners such warranties and guarantees.

Any deviation from plans or specifications, including deviations due to plan error should be prominently displayed on the submittal. Any changes not prominently noted in submittal and incorporated into the work without proper authorization will constitute grounds for rejection of that portion of the work.

II. CONDUIT

A. MATERIALS

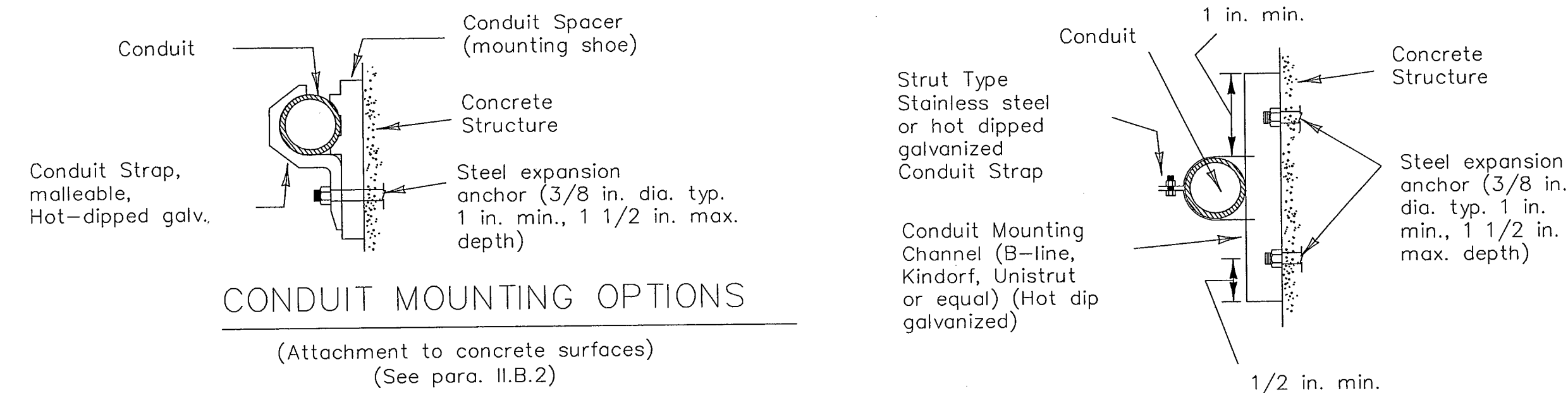
- Conduit and fittings shall be UL Listed for the intended use shown on plan sheets.
- Conduit shall be the type shown by descriptive code or shown elsewhere on the plans. Substitution of the various types of conduits will not be permitted. All flexible conduit in rigid metallic conduit systems shall be Liquidtight Flexible Metal (LFMC) conduit. All flexible conduit in PVC systems shall be Liquidtight Flexible Non-metallic conduit. Neither aluminum conduit, electrical metallic tubing (EMT), nor intermediate metal conduit (IMC) shall be permitted.
- All exposed conduits shall be RMC, unless otherwise specifically shown on the plans. All metal conduit shall be properly grounded.
- Couplings, connectors, conduit bodies, grounding bushings, and offset nipples for RMC shall be electro-zinc plated steel or hot dipped galvanized malleable iron, threaded or threadless compression type, rain-tight and shall be UL listed for the intended use.
- Expansion joints for metal conduit shall be provided with an internal or external bonding jumper and shall be UL listed.
- Unless otherwise shown on the plans, junction box minimum sizes shall be in accordance with the following table which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes are present, the conductors shall be counted as if all are of the larger size. Situations not applicable to the table shall be sized in accordance with NEC 370-28.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

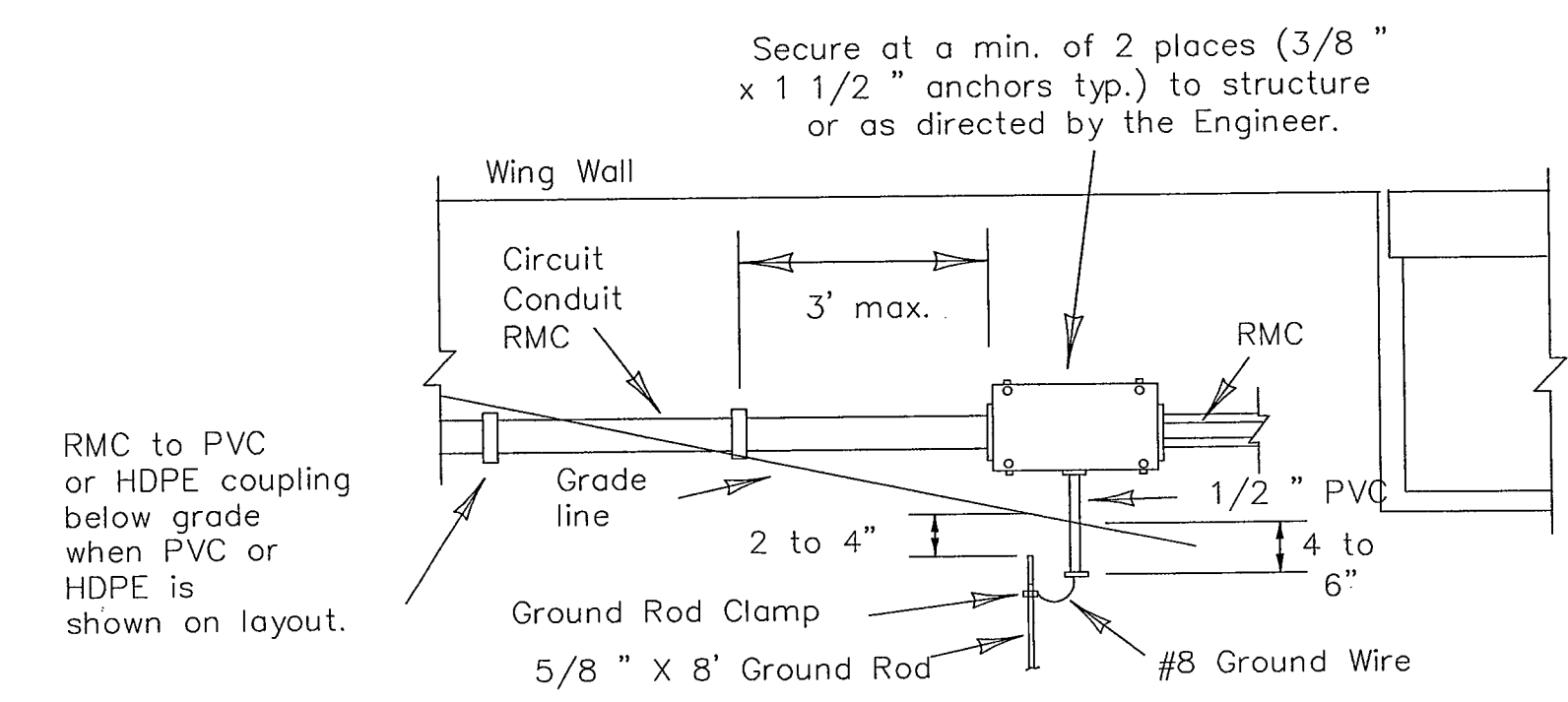
- RMC system junction boxes equal to or smaller, in any dimension, than 12 x 12 x 6 (HxWxD), surface mounted and containing conductors #8 or larger, shall be hot dipped galvanized cast iron with minimum wall thickness of 3/16 inch, shall have external mounting lugs, and shall be UL listed Crouse-Hinds Type WAB, OZ/Gedney Type YS or approved equal. Unless otherwise shown elsewhere on the plans, RMC system junction boxes larger than the aforementioned boxes but equal to or smaller, in any dimension, than 18 x 18 x 6 (HxWxD) shall be 14-ga. stainless steel; RMC system junction boxes larger than 18 x 18 x 6 (HxWxD) shall be 12-ga. stainless steel. All metal junction boxes shall be equipped with a threaded hole or lug for grounding. Stainless steel boxes 12 x 12 x 6 and larger need not be UL Listed but shall meet the other requirements of the NEC and shall have ribs, stiffeners, or thicker metal and shall have external mounting feet. Junction boxes with an internal volume of more than 100 cu. in. may be supported by connection of two or more rigid metal conduits, where specifically shown on the plans or where approved by the Engineer.
- Junction boxes containing only #10 or #12 AWG conductors shall be Crouse Hinds Type GRFX, Appleton Type JBOX, two-gang FD, or similar approved cast iron box. Boxes shall be sized according to NEC Table 370-16(a).
- IMC and EMT conduit shall not be used unless specifically required by the plan layout sheets. Junction boxes in EMT conduit systems shall be made from galvanized sheeting and shall be UL listed and approved for outdoor use, unless otherwise noted on the plans. Sheet metal junction boxes shall be sized in accordance with the NEC. Junction boxes for IMC conduit systems shall meet the requirements of boxes used with RMC systems.
- Junction boxes in PVC conduit systems shall be PVC, intended for outdoor use, unless otherwise noted on plans.
- Elbows in PVC conduit systems one inch and larger shall be rigid metal, with the exception of traffic signal systems which may have PVC elbows instead of rigid. If any part of the rigid metal elbow is buried less than 18 inches underground the elbow and rigid metal extension will be grounded. Grounding will be accomplished by means of a grounding bushing installed on the extension. Unless specifically shown on the plans, rigid metal elbows containing, or entering ground boxes containing only communications conductors, loop detectors, or other low voltage power limited circuits need not be grounded unless a ground wire is present in the conduit or ground box. The rigid metal elbows located in concrete foundations may be extended with PVC conduit and need not be grounded provided that the end of the elbow nearest the end of the conduit run exiting the foundation is at least 2 inches below the concrete. RMC elbows will not be eliminated.
- HDPE conduit shall meet the requirements of Item 622, Duct Cable, except that the HDPE conduit, when bid under Item 618, Conduit, shall not contain factory installed conductors. Fittings for HDPE conduit shall be UL listed as an electrical conduit connector or shall be thermally fused using an electrically heated wound wire resistance welding method. HDPE conduit may be substituted for bored schedule 40 or schedule 80 PVC conduit. When such substitution is made, bored HDPE shall be schedule 40 of the size PVC being replaced. The HDPE conduit shall transition back to PVC (or RMC elbow when required) of the size and schedule shown on the plans at the bore pit. Substituted conduit may not be extended to ground boxes or foundations; RMC elbows shall be installed at ground boxes and foundations. RMC elbows will not be eliminated.
- All conduit support hardware including straps, nuts, bolts, screws, retaining anchors and washers shall be hot dipped galvanized or stainless steel. Strut type conduit straps shall be stainless steel or hot dipped galvanized. Strut type straps need not be made of malleable type material. Stamped-cadmium plated straps will not be allowed. Straps having only one mounting hole shall not be allowed for use on conduits 2 inches and larger. Two piece conduit straps designed to be used with a mounting shoe shall be installed only with the correctly sized shoe.

B. CONSTRUCTION METHODS

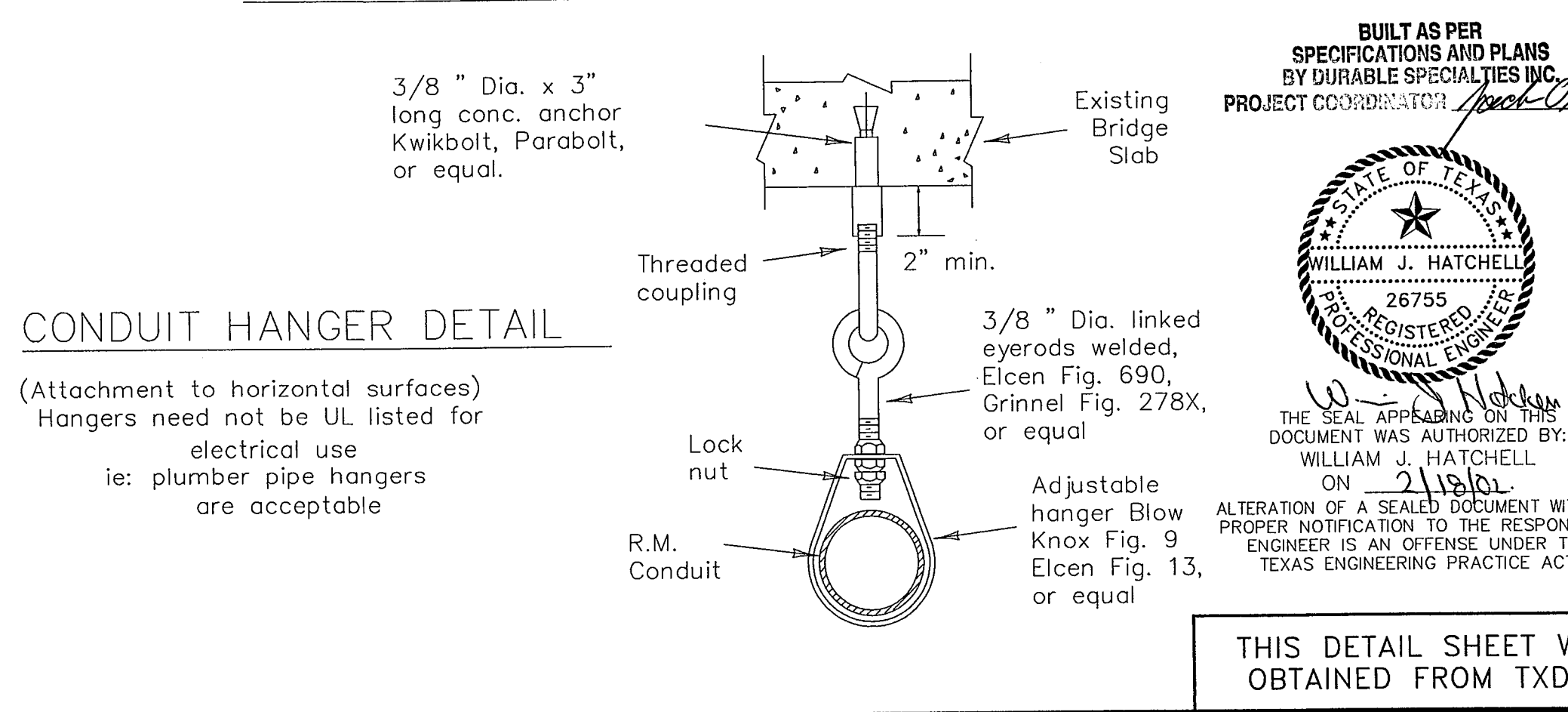
- Conduit in structures shall have expansion fittings at structure expansion joints. All straight runs of RMC conduit exposed on structures such as bridges shall have expansion joints installed at maximum intervals of 150 feet. Expansion joints shall be installed so they allow for movement of the conduit. Installation of the joint in such a manner that will not allow for movement shall be repaired at no expense to the state. The method of determining the final setting length of the expansion joint shall be provided to the Engineer upon request.
- Conduit supports shall be spaced at maximum intervals of 5 feet. Conduit spacers shall be used with metal conduit placed on surfaces of concrete structures (See conduit mounting options).
- Conduit supports shall not be attached directly to prestressed concrete beams except as shown specifically in the plans and approved by the Engineer.
- Unless otherwise shown on the plans, conduit placed beneath existing roadways, driveways, or sidewalks, or after the base or surfacing operation has begun, shall be accomplished by jacking or boring. The Contractor shall back fill and compact the bore pits to the bottom of the conduit prior to installing connecting conduit or duct cable to prevent bending of the connection.
- Conduit trenched in the subgrade of new roadways shall be back filled with excavated material, unless otherwise noted on the plans. Conduit trenched in the sub-base of new roadways shall be back filled with cement-stabilized base.
- Open ends of all conduit and raceways shall be fitted with temporary caps or plugs to prevent entry of dirt, debris and rodents during construction. The temporary cap may be constructed of duct tape, but in all cases shall be tightly fixed to the conduit and shall be durable. The contractor shall clean out the conduit and prove it clear in accordance with Standard Specifications Item 618.3 prior to installing any conductors.
- Conduit entry into the top of enclosures such as safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes shall be made weatherproof using conduit sealing hubs, or threaded bosses.
- A bonding jumper shall be installed from each grounding bushing to the nearest grounding rod, grounding lug, and/or equipment grounding conductor. All jumpers shall be the same size as equipment grounding conductor. Conduit used as casing under roadways for duct cable need not be grounded if duct extends full length through the casing. At electrical services, grounding electrode conductor shall be a solid Copper #6 AWG.
- Metal junction boxes shall be bonded to the grounding conductor in accordance with the NEC.
- Conduits entering ground boxes shall be placed so that the conduit ends shall be not less than 5 inches nor more than 9 inches from the box cover (See ground box detail on sheet TS-7).
- Conduit ends shall be sealed with heat shrink boots with waterproof sealant, urethane foam, or by other methods approved by the Engineer. Sealing shall be done after completion of any required pull tests. Duct tape shall not be used as a permanent conduit sealant. Silicone caulking shall not be used as a sealant.
- All strut mounting material and hardware shall be hot-dip galvanized or shall be stainless steel. The cut ends of strut and non-galvanized rigid metal conduit threads shall be coated with a zinc rich paint (90% or more zinc content). Zinc rich paint may only be used to touch up galvanized material as allowed under item 445.6 galvanizing. The painting of non-galvanized material with a zinc rich paint shall not be considered as an approved alternative for galvanized materials.



CONDUIT MOUNTING OPTIONS
 (Attachment to concrete surfaces)
 (See para. II.B.2)



TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL



CONDUIT HANGER DETAIL
 (Attachment to horizontal surfaces)
 Hangers need not be UL listed for electrical use
 ie: plumber pipe hangers are acceptable

BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE SPECIALTIES INC.
 PROJECT COORDINATOR *[Signature]*

STATE OF TEXAS
 REGISTERED PROFESSIONAL ENGINEER
 26755
 WILLIAM J. HATCHELL
 ON 2/15/01
 THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY WILLIAM J. HATCHELL
 ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

THIS DETAIL SHEET WAS OBTAINED FROM TXDOT

- NOTES**
- Ground rod clamp to be Blackburn GG 5/8H, Weaver W5/8 or equal.
 - Surface mounting shown, for conduit to be placed in structure, use flush-mounted box.
 - Bond junction box and metal conduits to equipment grounding conductor and grounding electrode conductor using listed connector.
 - Seal all conduits entering the junction box from underground.
 - Install bell end or bushing on 1/2" PVC conduit both ends.
 - Ground rod to be driven within 8 inches of 1/2 inch PVC conduit end.

71A

DATE: DECEMBER, 2001 SCALE: NOT TO SCALE JOB NO.: 00-249
 DRAWN: GBW DESIGN: WJH REVIEWED: DWG: 249DETAILS-ELEC

ARAPAHO ROAD PHASE II
STANDARD CONSTRUCTION DETAILS
ELECTRICAL - SHEET 6

TOWN OF ADDISON

Grantham, Burge & Waldbauer
Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042 (972) 840-1916 (TEL) (972) 840-2155 (FAX)

SHT. TS-5 OF TS-21

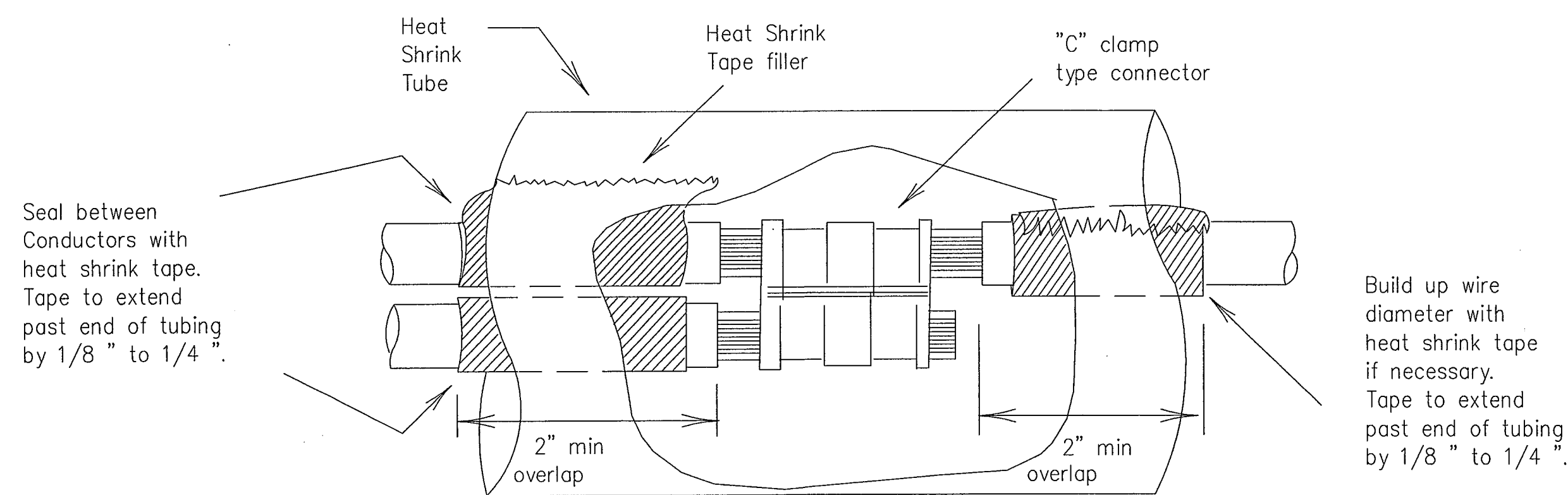
I. ELECTRICAL CONDUCTORS

A. MATERIALS

- Insulated conductors shall be NEC Type XHHW. Conductors shall be color coded in accordance with the NEC, articles 200, 250, and 310; i.e. Grounded conductors (neutrals) shall be white, Grounding conductors (ground wires) shall be bare or green, Ungrounded conductors (hots) shall be any color except green, white, or gray. Identification of conductors #10 AWG and smaller shall be by continuous jacket color. Color coding of electrical conductors #8 AWG and larger shall be either by continuous color jacket or by colored tape. Colored tape marker shall consist of a half-lap of tape covering a 6-inch length of conductor.
- Where two or more circuits are present in one conduit or enclosure, the conductors of each circuit shall be identified by a permanent non-metallic tag at each accessible location. The tag shall be fastened to the conductors by two plastic straps. Each tag shall indicate circuit number, letter, or other identification shown in the plans.
- Grounding electrode conductor #6 AWG for bonding to ground rod at electrical service, shall be solid. Connection of conductor to ground rod shall be made using UL Listed connectors designed for such purposes.
- Heat Shrink Tape filler shall be used to seal the ends of heat shrink tubing around two or more conductors that are insulated with heat shrink tubing. Tape material shall have a minimum dielectric strength of 225 volts per mil and may be either cross-linked butyl rubber. Tape shall be supplied in rolls and shall have a backing (release paper) to prevent the tape from sticking to itself.
- Heat shrink tubing shall be heavy wall, UL listed for 600 volts or greater and shall have factory applied internal sealant.
- Splicing materials, insulating materials, breakaway disconnects and fuse holders will not be paid for directly but shall be subsidiary to various bid items.

B. CONSTRUCTION METHODS

- After conductors have been installed in conduit, a pull test will be made on conductors. When any length of conductor cannot be freely pulled, the Contractor shall make any needed alterations or repairs at no expense to the Town.
- The Contractor shall make insulation resistance tests in accordance with Item 620, Conductors. The contractor shall coordinate with the Town to witness the tests.
- A sufficient length of conductor for making up connections shall be left in ground boxes (2 feet minimum, 3 feet maximum, to point of splice, 3 feet minimum, 4 feet maximum, when conductor is pulled through with no splice), enclosures, weatherheads and pole bases (1 foot minimum and typical, 1.5 feet maximum).
- Splices shall be made only in junction boxes, ground boxes, pole bases, or electrical enclosures and shall be made with listed compression or screw type pressure connectors, terminal blocks, bolted lugs, or split bolt connectors. Splices shall be insulated with heavy wall heat shrink tubing and shall be made so as to provide a watertight splice. Heat shrink sleeve shall overlap conductor insulation a minimum of 2 inches on both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, the contractor shall build up the conductors insulation using heat shrink filler tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Tape shall be visible after completion of all splices. Where filler tape is used but not visible, the Town shall approve each individual splice by conducting a physical inspection of each splice. Heat shrink tape shall be either butyl rubber. When it appears the tubing has been burned, or overheated the tubing shall be considered to be defective.
- No wire nuts may be used for #8 AWG or smaller conductors in above-ground junction boxes, nor in pole bases or ground boxes.
- Conductors in illumination poles shall be supported by a J-hook in the top of the pole.
- All conductors bid under Item 620 shall have breakaway electrical disconnects installed anytime conductors pass through a break-away support.
- For terminating the conductors, insulation-jacketing material shall be removed in such a manner as to not nick any of the individual strands of the conductor. When individual conductor strands are removed, the conductor shall be considered to be damaged.
- When a conductor or cable has been damaged, or fails to pass an insulation resistance test, the conductor will be replaced.
- Duct tape, black electrical tape, or wire nuts shall not be allowed to repair a damaged conductor.
- For terminations, no more than one wire may be installed under a single pressure connector unless the device is listed for more than one wire.
- Conductors connected to break-away in line fuse holders must be installed in accordance with the specific manufactures installation instructions. Where threaded connections are made, they shall be properly torqued. Where crimp type connections are made, crimps shall be made using properly sized crimping pliers. Proper conductor terminations are critical to the safe operation of break-away devices.
- Waterproofing boots shall be properly trimmed to fit snugly around the conductor so as to provide a water proof connection. No more than one wire may enter a single opening in any one boot. Water proofing boots must provide the correct number of openings. Where only one wire is to be connected to a boot, the boot may not be a two wire type.

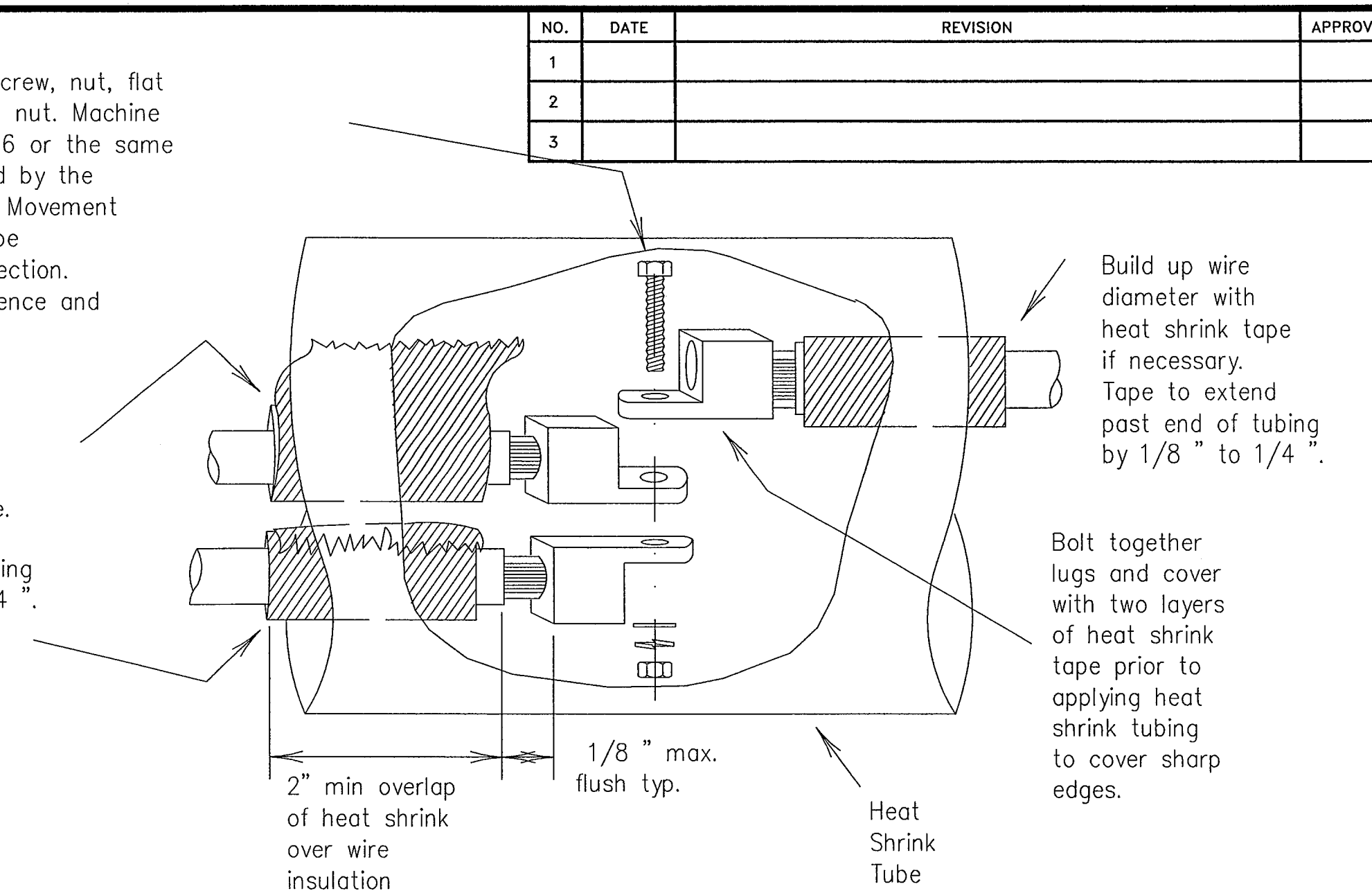


SPLICE OPTION 1
C-CLAMP

Stainless steel or brass machine screw, nut, flat washer, lock washer or self locking nut. Machine screw to be a min. of 10-24, 3/16 or the same size as the mounting hole provided by the manufacture. Secure wrench tight. Movement of lugs after final assembly shall be considered to be a defective connection. Assemble components in the sequence and position as shown.

SPLICE OPTION 2
BOLTED WIRE LUGS

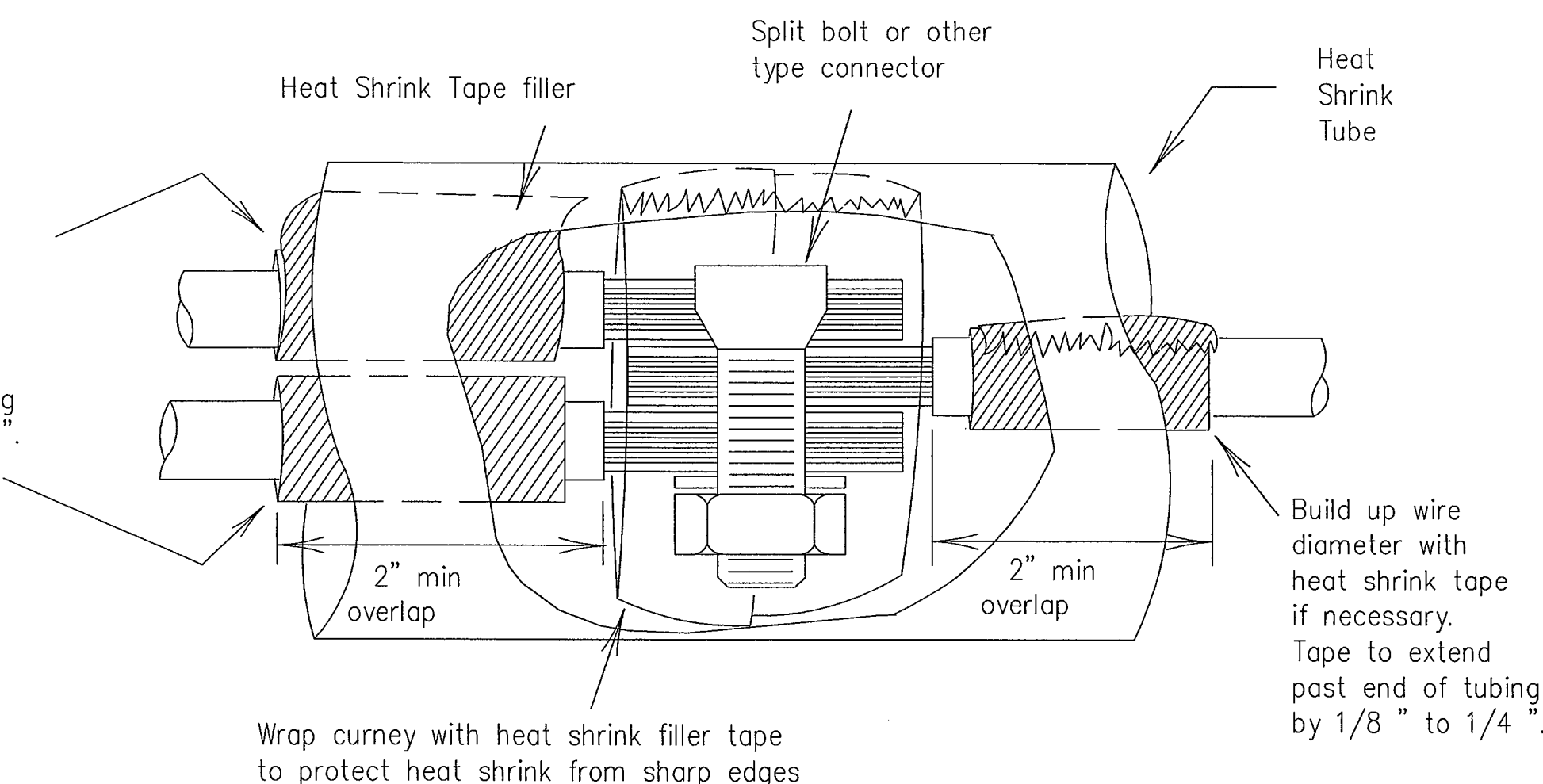
Seal between Conductors with heat shrink tape. Tape to extend past end of tubing by 1/8" to 1/4".



Seal between Conductors with heat shrink tape. Tape to extend past end of tubing by 1/8" to 1/4".

SPLICE OPTION 3
SPLIT BOLT

Wrap curney with heat shrink filler tape to protect heat shrink from sharp edges



C. TEMPORARY WIRING

- Temporary conductors and electrical equipment to provide power for utilization equipment, shall be installed in accordance with the NEC article 305. All temporary wiring materials and methods shall comply with the standard sheets. All power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located out doors at grade, supplied from a utility power source, shall be provided with a ground fault circuit interrupter.
- Residual current protective devices (GFCI) may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.
- Where wire nuts are approved for temporary wiring, they shall be of the self-sealing type.
- All conductor splices must be contained within a listed enclosure, ground box or be more than ten feet above grade vertically and more than five feet horizontally from any metal structure. Where temporary conductors are installed in any area that is likely to be subjected to vehicle traffic, or mobile construction equipment, the vertical clearance to ground shall be a least 18 feet when measured at the lowest point. Where power conductors are to be supported by a span wire, the span wire shall be properly grounded.

BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE SPECIALTIES INC. PROJECT COORDINATOR *[Signature]*



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THIS DETAIL SHEET WAS OBTAINED FROM TXDOT

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DRAWN: GBW	DESIGN: WJH	REVIEWED:	DWG: 249DETAILS-ELEC

ARAPAHO ROAD PHASE II
STANDARD CONSTRUCTION DETAILS
ELECTRICAL - SHEET 1
TOWN OF ADDISON

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SHT. TS-6 OF TS-21

NO.	DATE	REVISION	APPROV.
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II. GROUND RODS

A. MATERIALS

- All ground rods installed at electrical services, including supplemental lightning protection ground rods specified by the plans in other locations such as pole bases, shall be copper coated steel and listed by a NRTL. Rods shall be a minimum diameter of 5/8 inch. The length shall be a minimum of 8 feet. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets.
- Ground rod clamps shall be listed to be in direct contact with the soil. Where concrete encasement is required, the clamp shall be listed for concrete encasement.

B. CONSTRUCTION METHODS

- Ground rods installed in locations such as pole bases, to provide supplemental lightning protection need not be totally in contact with the soil. Where called for by the plans, rods may be encased in soil or concrete or any combination of soil and concrete. When concrete encased, the connection of the conductor to the rod shall be readily accessible for inspection or repairs. When driven into the soil the upper end shall be between 2 to 4 inches below finished grade. Ground rods shall not be placed in the same drilled hole as a timber pole.
- Ground rods shall be installed such that the end imprinted with the rod's part number is installed as being the upper end.
- Non-conductive coatings such as concrete splatter shall be removed from the rod at the clamp location.
- Routing of lightning protection ground rod wires shall be run as short and straight as possible. Where bends are required they shall have a minimum radius of four inches.
- Unless specifically called for by the plans, conduits used for ground rod wires shall be non-metallic. Where metal conduits are specified, a grounding bushing and properly sized bonding jumper shall be provided and properly installed on each end.
- Where rocky soil or a solid rock bottom is encountered when driving a ground rod and the horizontal trench placement method is the only viable solution, written authorization from the Town must be aquired.

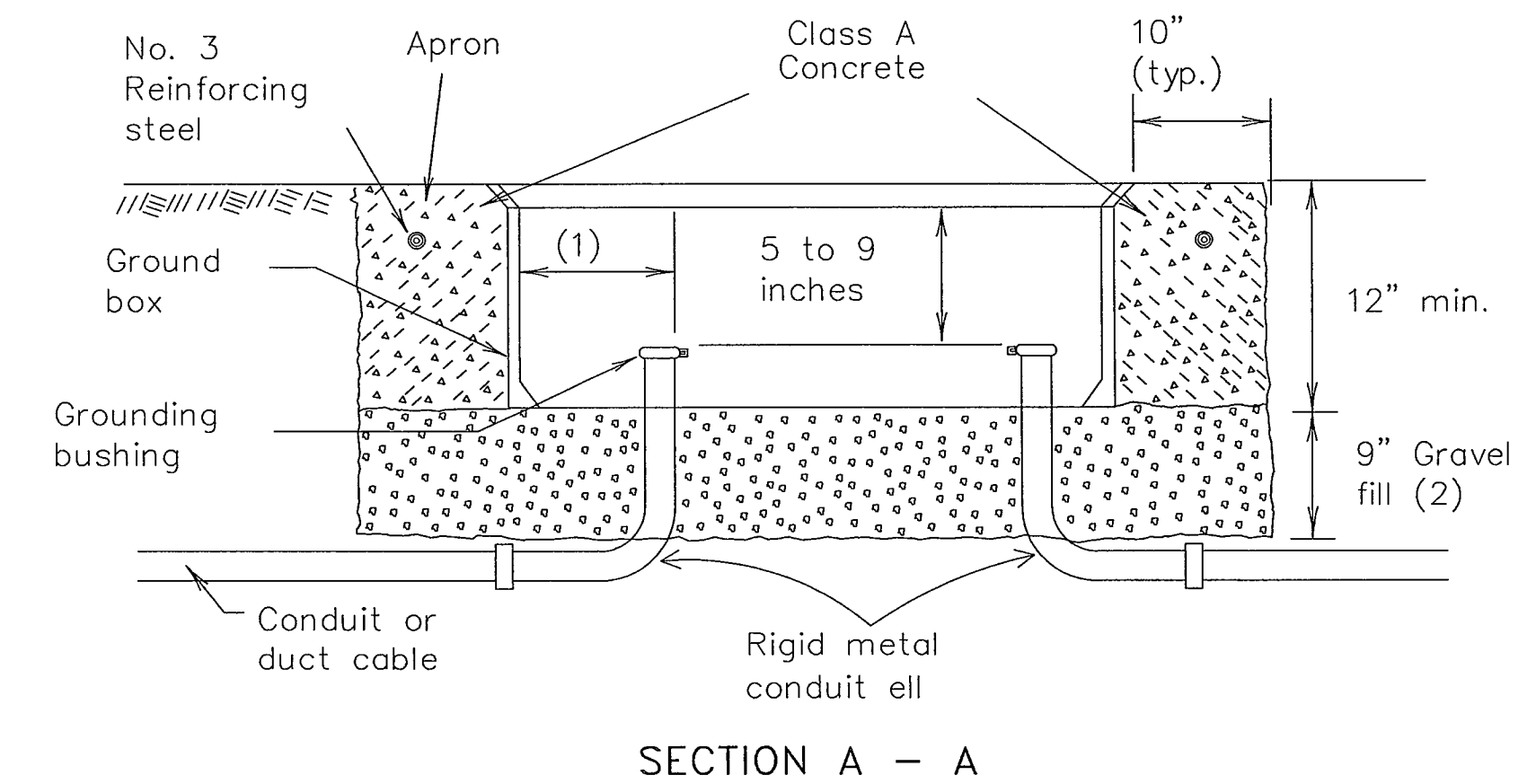
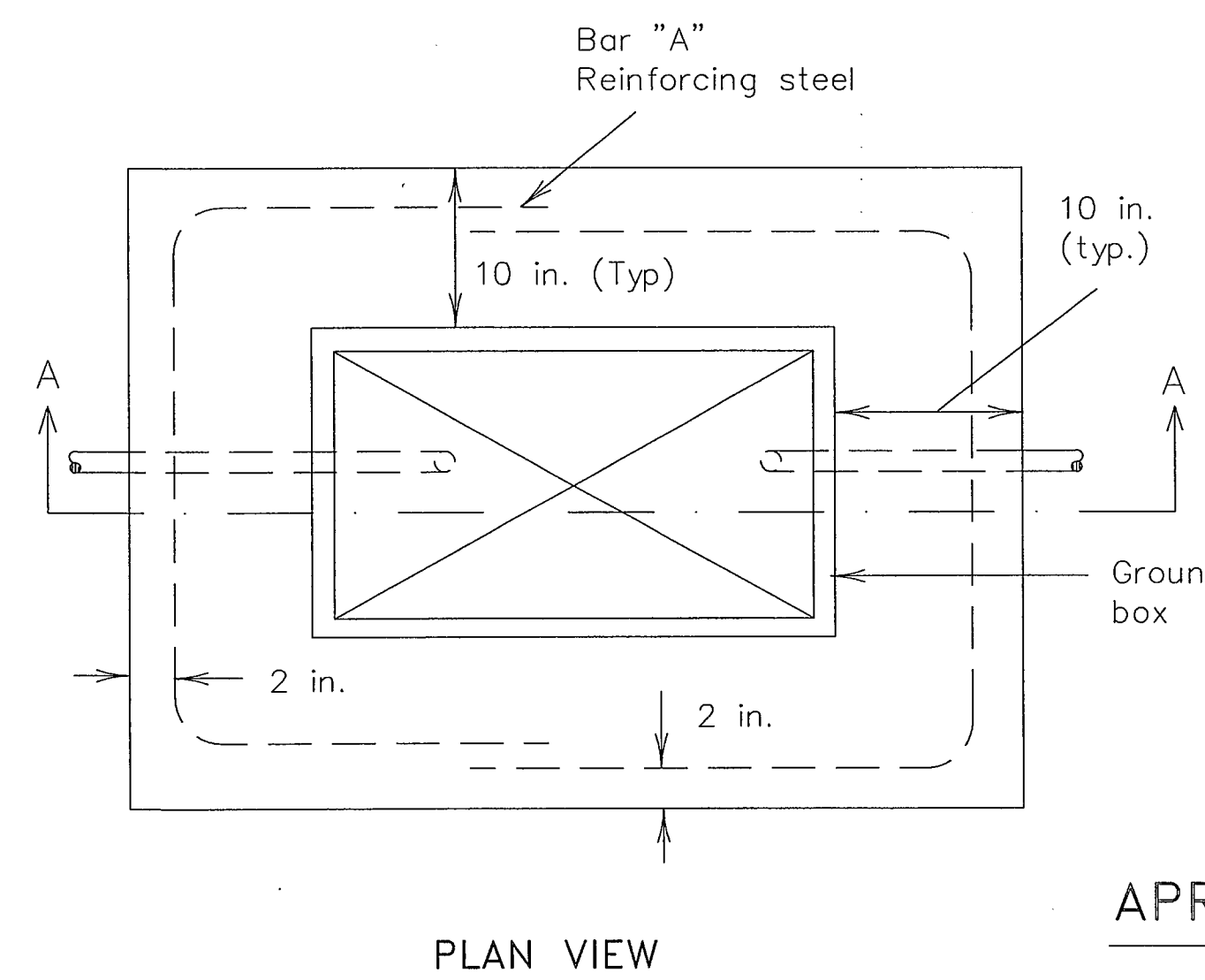
III. GROUND BOX

A. MATERIALS

- Ground boxes 16x30x24 inches (WxLxD) or smaller shall be polymer concrete of the type required by the descriptive code shown elsewhere. Larger ground boxes shall be as shown elsewhere in the plans.
- All ground boxes and covers shall be permanently marked either by impress or by permanent ink, with manufacturer's model number and manufacturer's name or logo.
- Covers shall be bolted down, and bolt holes in the box shall be arranged to drain dirt.
- Ground box Types A, B, C, D & E shall meet the following requirements:
 - Ground boxes and covers will be manufactured from polymer concrete reinforced with continuous strands of woven or stitched borosilicate fiberglass cloth. The polymer concrete shall be made from catalyzed polyester resin, sand and aggregate, and shall have a minimum compressive strength of 11,000 psi. Polymer concrete containing chopped fiberglass or fiberglass reinforced plastic is not acceptable.
 - Minimum inside dimensions shall be as follows (width x length x depth):
 - Type A shall be 11.5 inches x 21 inches x 10 inches, (122311)
 - Type B shall be 11.5 inches x 21 inches x 20 inches, (122322)
 - Type C shall be 15.25 inches x 28.25 inches x 10 inches, (162911)
 - Type D shall be 15.25 inches x 28.25 inches x 20 inches, (162922)
 - Type E shall be 11.5 inches x 21 inches x 16 inches, (122317)
 - Bottom edge of box or extension shall be footed with a minimum 1 1/4 inch flange.
 - Ground boxes shall withstand 600 lbs. per sq. ft. applied over the entire sidewall with less than 1/4 inch deflection per foot length of box. Ground boxes and covers shall withstand a test loading of 20,000 lbs. over a 10 inch by 10 inch area centered on the cover with less than 1/2 inch deflection. Ground boxes and covers shall meet Western Underground Standards 3.6. Manufacturer shall supply certification by an independent laboratory or sealed by a Texas-Licensed Professional Engineer.
 - Covers shall be 2 inch (nominal) thick polymer concrete. All hardware shall be stainless steel. Cover shall be secured with two 1/2 inch stainless steel bolts. Bolts shall be self-retaining and shall withstand a minimum of 70 ft-lbs. torque and shall have a minimum 750 lbs. straight pull out strength. Nuts shall be floating and shall provide a minimum of 1/2 inch movement from the center of the nut. Covers shall be skid resistant, minimum 0.5 coefficient of friction. Covers shall be interchangeable between manufacturers and shall conform to the dimensions shown herein. Unless otherwise approved by the Engineer, cover shall be legibly imprinted with the following words in minimum 1 inch letters:
 - Ground Boxes containing wiring for traffic signals shall be labeled, Danger High Voltage Traffic Signals.
 - Ground boxes containing wiring for illumination systems shall be labeled, Danger High Voltage Illumination.
 - Ground boxes containing wiring for traffic management systems shall be labeled, Danger High Voltage Traffic Management.
 - Ground boxes containing wiring for sign illumination systems shall be labeled, Danger High Voltage Sign Illumination.
 - Ground boxes containing wiring for traffic signals that also contain illumination, powered by the signal electrical service, shall be labeled, Danger High Voltage Traffic Signal.

B. CONSTRUCTION METHODS

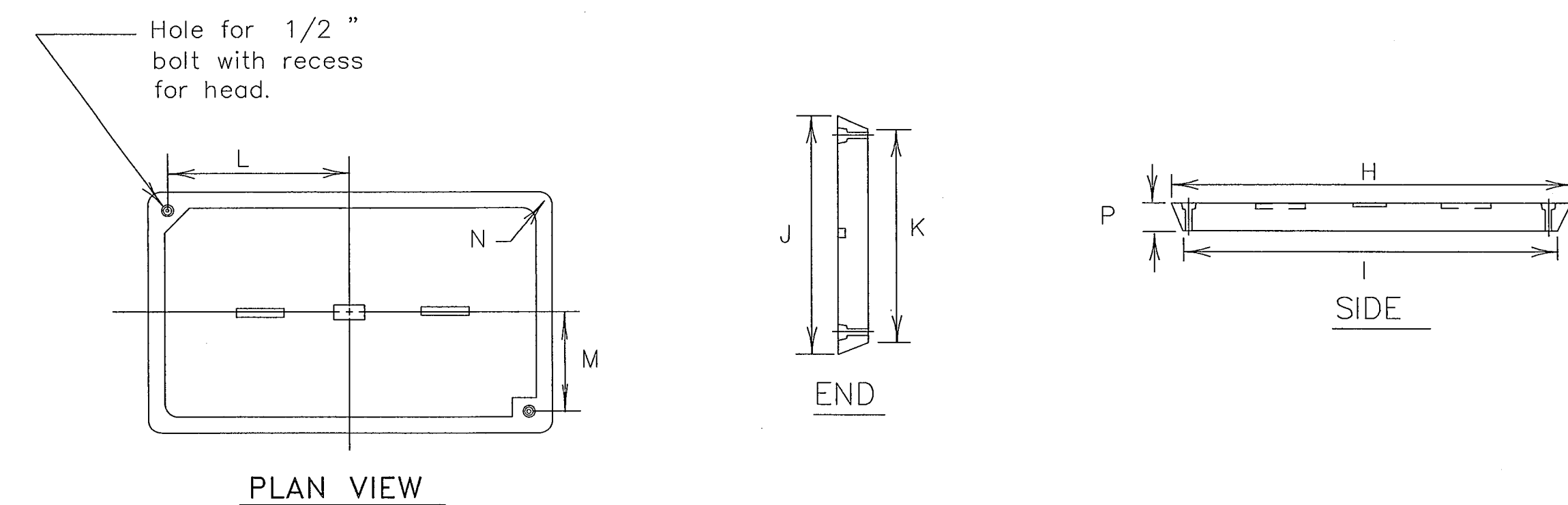
- Ground boxes shall be set on a 9 inch (minimum) bed of coarse No. 1 aggregate as defined by Item 421. Gravel shall be in place prior to setting box and conduits shall be capped. Any gravel or dirt in conduit shall be removed.
- When required by Item descriptive code, construction of an apron encasing a ground box including concrete and reinforcing steel shall not be paid for directly but shall be subsidiary to the ground box. Reinforcing steel may be field bent. Concrete for aprons shall be considered miscellaneous concrete for testing purposes. Aprons shall be cast in place. Conduit holes may be cut in the walls of type B & D boxes at least 18 inches beneath the cover.
- If, within the limits of this project, the Contractor must utilize an existing ground box equipped with a metal cover, the Contractor shall bond the cover to the grounding conductor with a 3 foot long flexible stander jumper the same size as the grounding conductor. Connection of bonding jumper to metal ground cover shall not be paid for directly but shall be subsidiary to various bid items. The box(es) must be clearly shown on the plans with plan notes fully describing the work required.
- If there are other ground boxes with metal Covers within the project limits but not involved in the contract, the Engineer may direct the Contractor to ground the covers, designating and identifying the specific boxes in writing. This work will be paid for separately.
- Termination to metal ground box covers shall be made using a tank ground type lug.



APRON FOR GROUND BOXES

(Where required)

- Final position of end of conduit shall not exceed one-half the distance to the side of box opposite the conduit entry.
- Place gravel "under" the box, not "in" the box. Gravel should not encroach on the interior volume of the box.
- Install bushing on the upper end of all ells.
- Where a ground rod is present in the ground box, connect it to any and all equipment grounding conductors using a listed connector.
- Maintain sufficient space between all conduits so as to allow for proper installation of bushings.
- All conduits shall be installed in a neat and workmanlike manner.

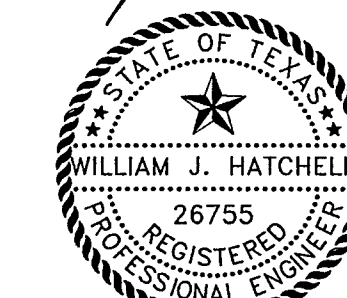


PLAN VIEW

GROUND BOX COVER

GROUND BOX COVER DIMENSIONS								
BOX SIZE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2

BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE SPECIALTIES INC. PROJECT COORDINATOR



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ARAPAHO ROAD PHASE II
STANDARD CONSTRUCTION DETAILS
ELECTRICAL - SHEET 2

TOWN OF ADDISON

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1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
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SHT. TS-7
OF TS-21

ELECTRICAL SERVICES NOTES:

All work, materials, services, and incidentals, whether or not specifically shown on the plans, which may be necessary for a complete and proper electrical service installation as specified in the plans to obtain electrical power (except extending primary lines to electrical service) shall be paid for, performed, furnished and installed by the Contractor. The Contractor shall contact the Utility for metering and shall comply with all Utility requirements.

Primary line extensions, when required, shall be paid for under Force Account work. The Contractor shall consult with the appropriate Utility to determine costs and requirements, and shall coordinate the Utility's work as approved by the Engineer. The contractor shall be reimbursed only the amount billed by the Utility. No additional amount for supervision of the Utility's work will be paid.

Materials shall be new and unused, materials and installation shall comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards and shall be Underwriters Laboratories (UL) Listed. Electrical Service conduits, conductors, disconnects, contactors, circuit breaker panel sizes, and branch circuit breakers, shall be as shown in the Electrical Service Data elsewhere in the plans. Faulty fabrication or poor workmanship in any material, equipment, or installation shall be justification for rejection.

The Contractor shall submit for approval no less than six (6) copies of catalog cut sheets on electrical service materials. Submittals shall be legible and shall be marked to indicate which product on a cut-sheet is to be supplied. Where manufacturer's provide warranties and guarantees as a customary trade practice, Contractor shall furnish to the State such warranties or guarantees.

The Contractor shall provide locks keyed with Master #2195 for all lockable electrical enclosures. Unless otherwise approved by the Town, enclosures shall not be energized until locks are provided and all bolts are installed.

Circuit directories, where provided, shall be filled out. All breakers and components in shop built panels and enclosures shall be labeled with duo-colored plastic labels. Color shall be white letters with red background. Letters shall be a minimum 3/8" in height.

Enclosures with external disconnects that de-energize all equipment inside the enclosure, need not have dead front trim, except that incoming line terminations shall be protected from incidental contact.

Stainless steel nuts, screws, bolts and miscellaneous hardware may be used when galvanized is specified. All wiring and components shall be rated for 75 degrees C. Minimum size for service entrance conductors shall be #6XHHW.

I. Safety Switch. A safety switch, placed ahead of the meter, shall only be used when specified by the Utility and when shown on the Electrical Service Data. The switch shall be UL Listed, heavy duty type, 600 volt, unfused, with a UL type 3R enclosure and equipped with a solid neutral (s/n) assembly. The switch shall be padlockable in the "on" position.

II. Service Type. Electrical service types A, C, D, and T shall be as schematically detailed on TS-8 or TS-9. Other service types shall be as detailed elsewhere on the plans.

III. Branch Circuit Breakers. Circuit breakers shall be thermal magnetic and have a minimum interrupting capacity of 10,000 amps and a voltage rating compatible with their use. Circuit breakers shall be sized as shown in the electrical service data. Circuit breakers in panelboards and load centers shall be full size and designed exclusively for the panelboard or load center in use. Tandem and half-width breakers shall not be used. All circuit breakers shall be permanently and clearly marked identifying the circuit or device attached. Circuit breakers shall be UL Listed to UL489.

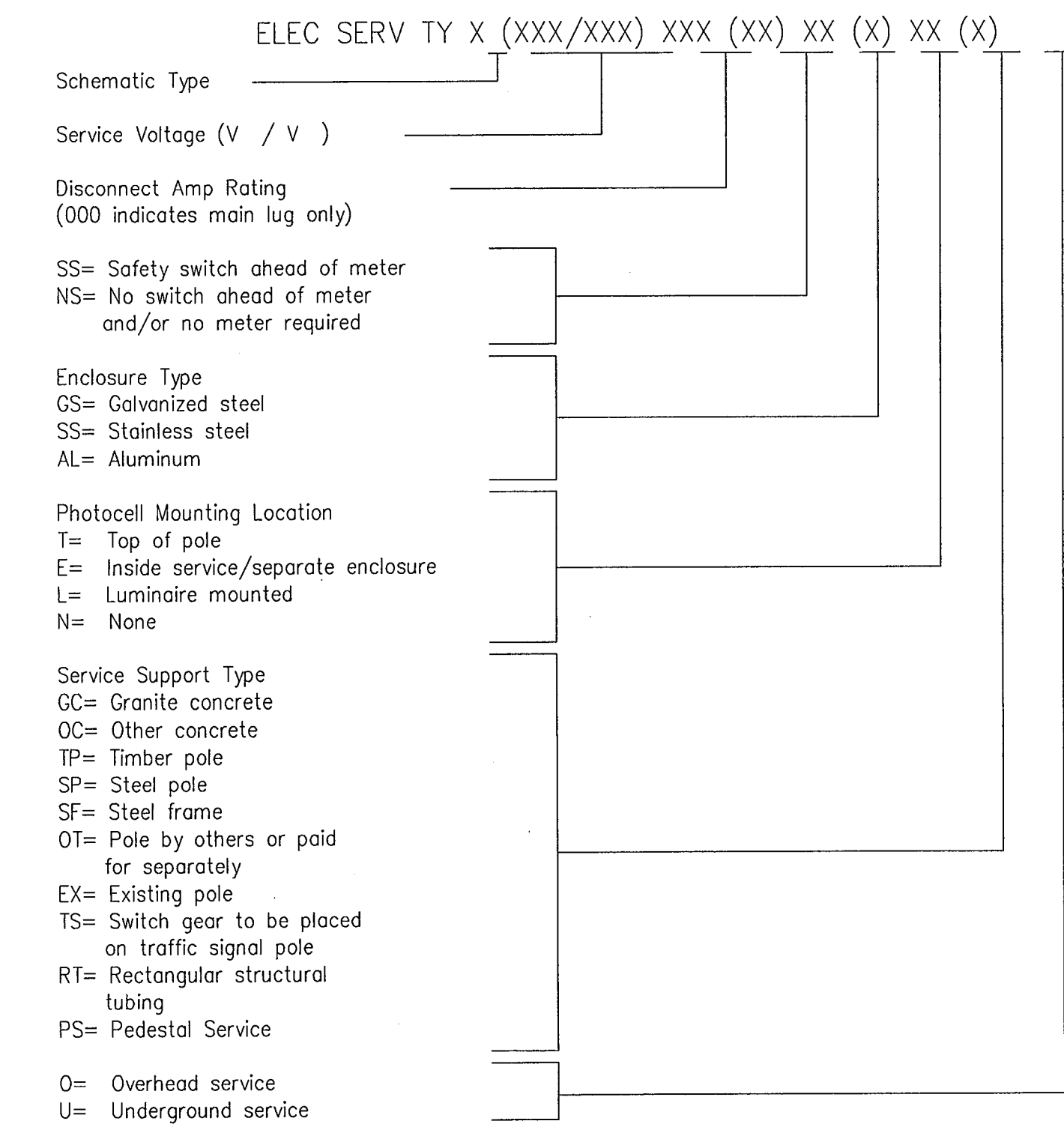
IV. Circuit Breaker Panelboard. Panelboards shall be UL Listed and shall meet Federal Specification W-P-115b, Type 1, Class 1 requirements. Panelboards shall have copper busses, a minimum of 6 one-pole spaces or as required in the electrical service data, and when required will be rated for service equipment. Enclosure shall meet UL type 3R classification. Panelboards shall have a threaded hub conduit entry for conduit entering the top of the enclosure. Circuit breakers shall be bolt-in type only.

V. Circuit Breaker Load Center. Load centers shall be UL Listed, and shall meet Federal Specification W-P-115c, Type 1, Class 2 requirements. Load centers shall have copper busses, a minimum of 4 one-pole spaces, and shall be rated for service equipment. Enclosure shall meet UL type 3R classification. Load centers shall have a threaded hub conduit entry for conduit entering the top of the enclosure. Circuit breakers shall be plug-in type only. Load centers for type T services shall accommodate a maximum of 6 one-pole breakers.

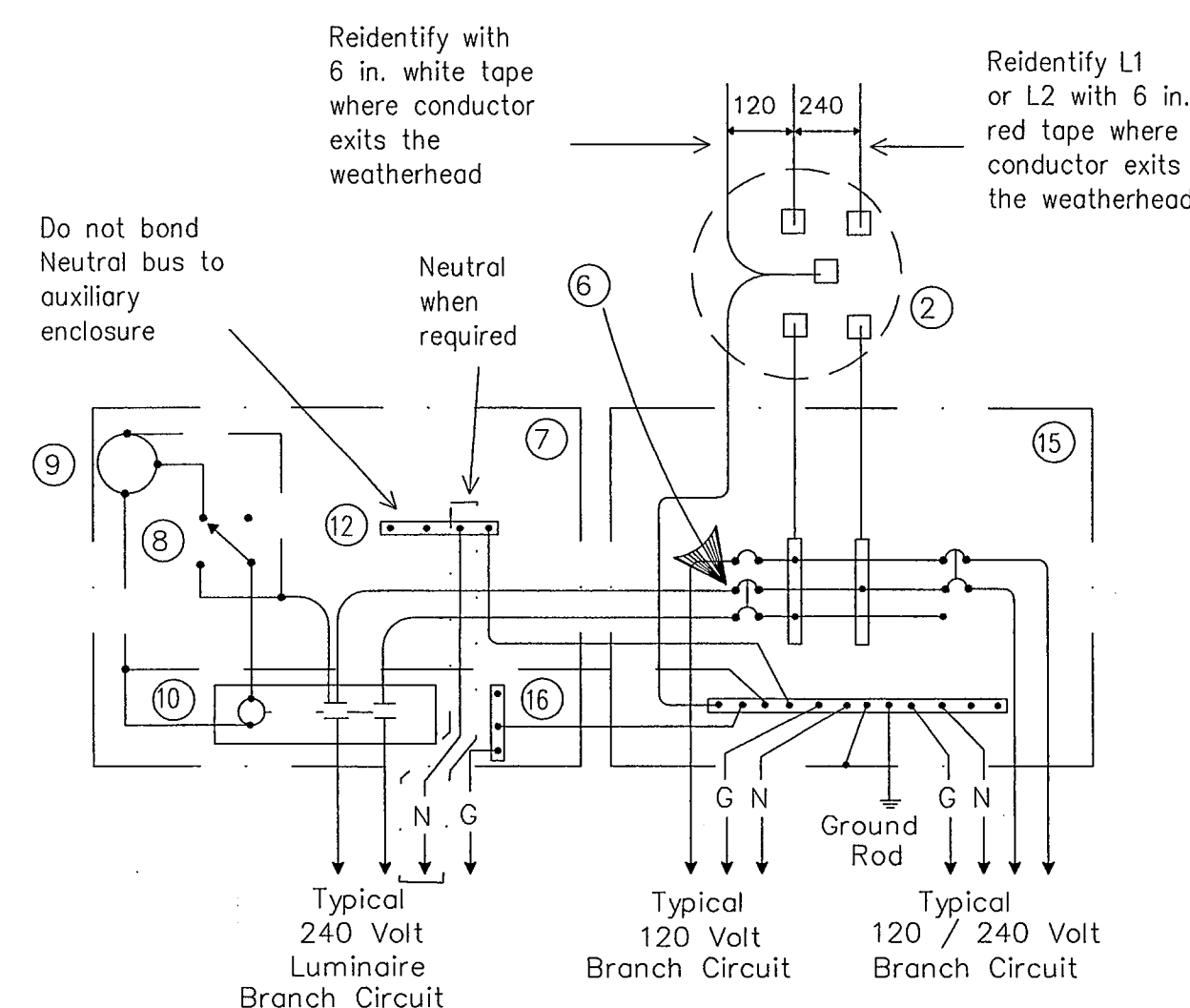
VI. Separate or Auxiliary Enclosure. Separate enclosures for HOA, photocell and lighting contactors for types D & T Services shall be a UL Listed assembly and shall have dead front trim. HOA switch operator shall extend through the dead front trim. Photocell shall be mounted inside the enclosure as described in paragraph XIII, when required by descriptive code. Separate enclosures shall meet the construction requirements of paragraph VII. E. except that separate enclosure shall not have external operating handle, need not have a data pocket and door may latch at only one point. Contractor may install all equipment in one enclosure instead of two, when approved by the Engineer.

VII. Where a Type D or T service is provided, laminated "as built" drawings are required as shown on TS-9 VIII E; shall be delivered before completion of the work, to the Engineer in lieu of placement within these smaller enclosures. Conduit may not enter the back wall of a service enclosure penetrating the equipment mounting panel. Provide grounding bushings on all metal conduits, terminate bonding jumper to grounding bus. Grounding bushing is not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss such as a meter base.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

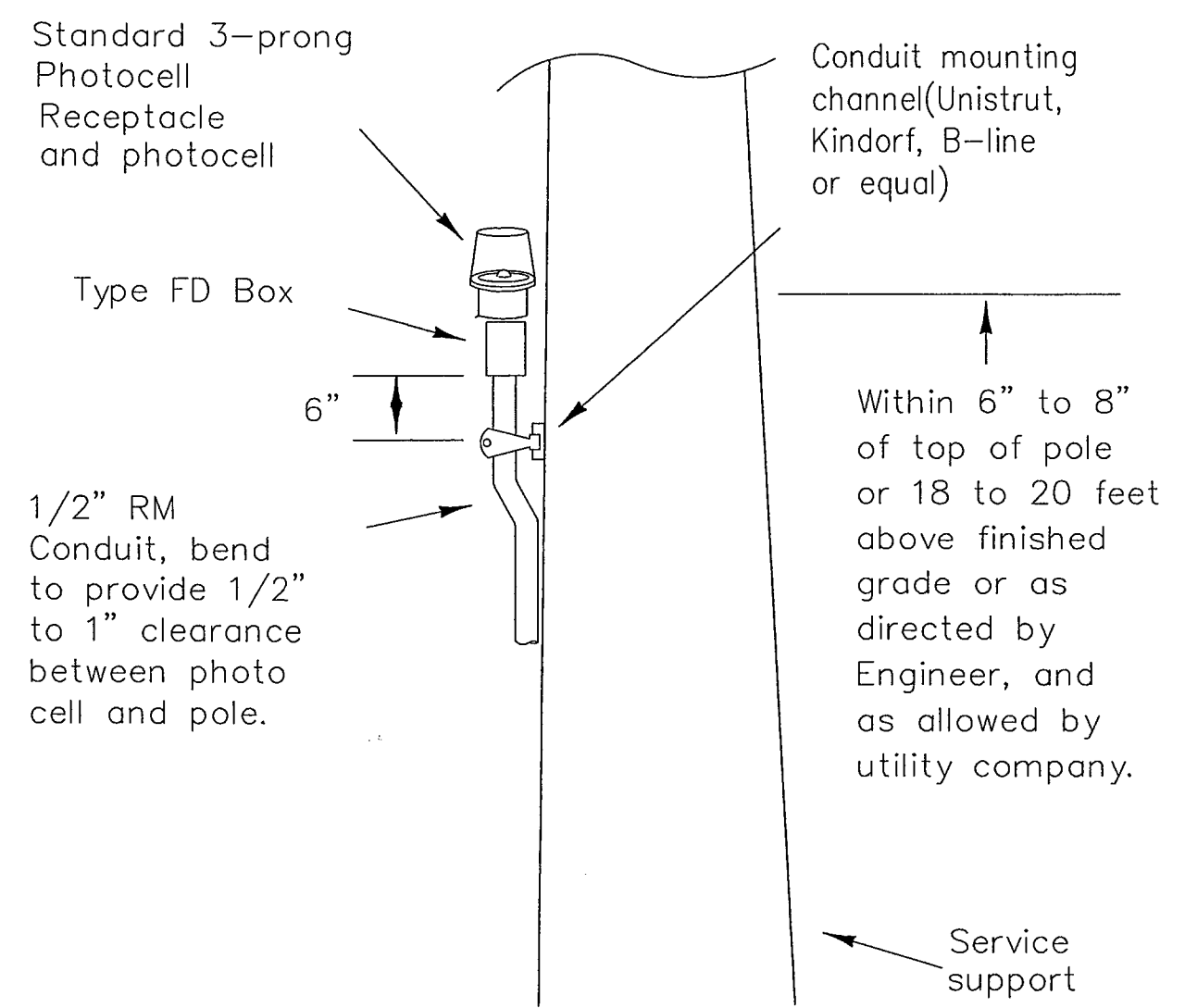


Example: ELEC SERV TY D(120/240)070(NS)GS(T)TP(O)



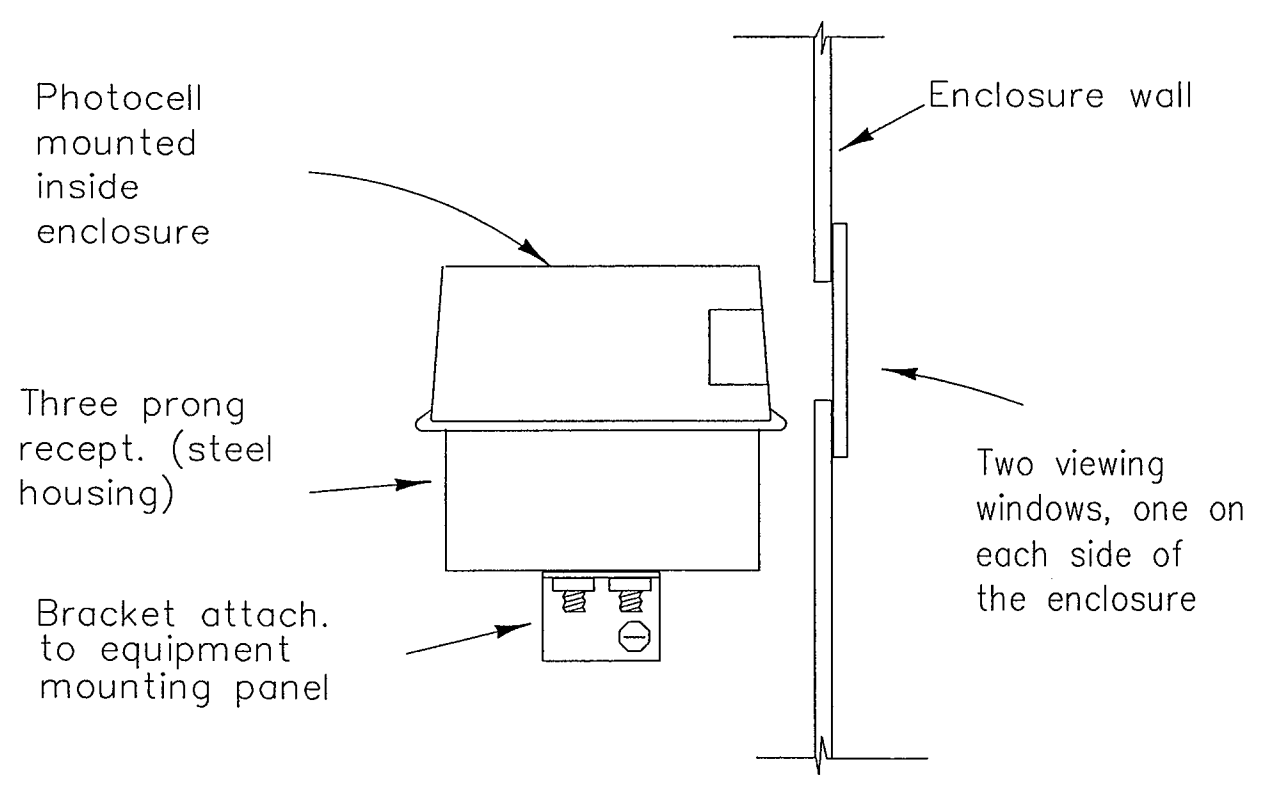
SCHEMATIC TYPE T
120/240 VOLTS -THREE WIRE

Install photocell and lighting contactor when shown on Electrical Service Data.



TOP MOUNTED PHOTOCCELL

Conduit support spacing 3 feet from enclosure; 5 feet max.



ENCLOSURE MOUNTED PHOTOCCELL

For photocell specifications see ED(5),XIII.

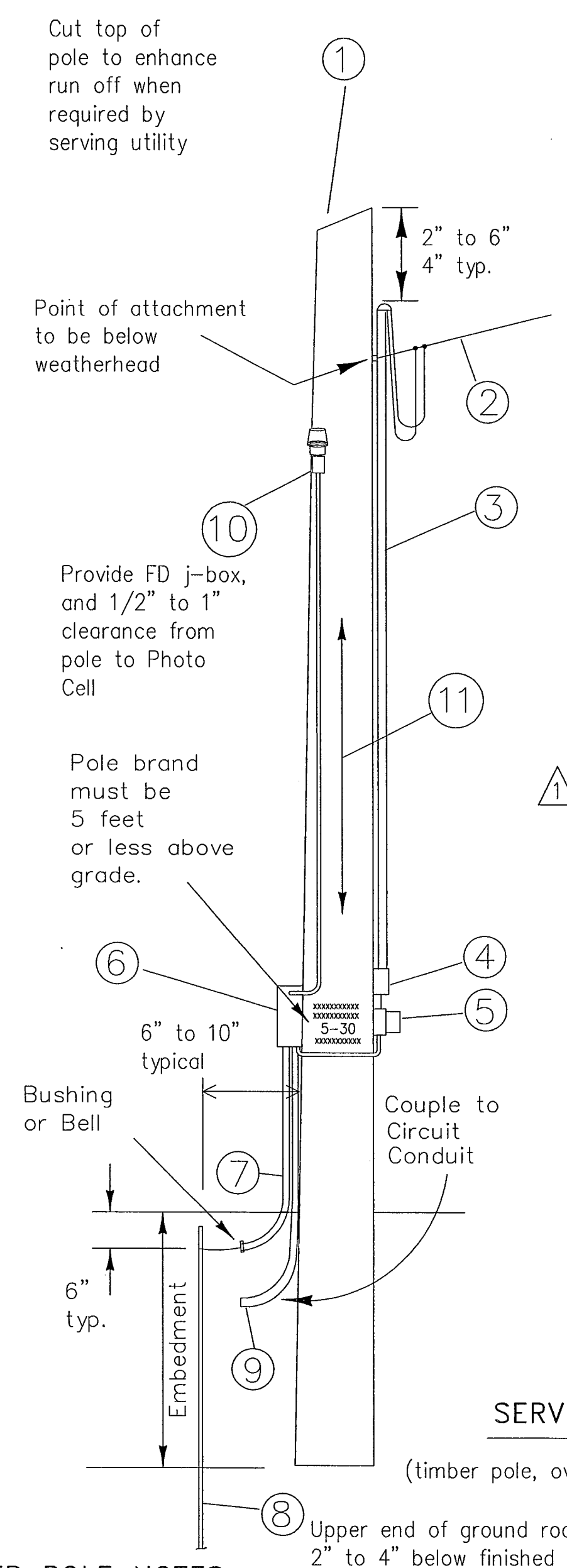
SCHEMATIC LEGEND

- 1 - omitted
 - 2 - Meter (when required)
 - 3 - Service Assembly Enclosure
 - 4 - Main Disconnect Breaker (See Electrical Service Data)
 - 5 - omitted
 - 6 - Circuit Breaker, 15A typical and max. for control circuit wiring
 - 7 - Auxiliary Enclosure
 - 8 - Control Station ("H-O-A" Switch)
 - 9 - Photo Electric Control (enclosure-mounted shown)
 - 10 - Lighting Contactor
 - 11 - Power Distribution Terminal Blocks
 - 12 - Neutral Bus required when 120 v. lights are controlled by lighting contactor
 - 13 - Branch Circuit Breaker (See Electrical Service Data)
 - 14 - Circuit Breaker Panelboard (See Electrical Service Data)
 - 15 - Load Center
 - 16 - Ground Bus
- Power Wiring
Control Wiring
Neutral Conductor (when required-to serve 120 v. loads only)
Equipment grounding conductor-always required

12-22-00 Revision
Modify legend numbers

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1			
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- 1 - Class 5 pole, height as required
- 2 - Service drop from utility company (attached below weatherhead)
- 3 - Service conduit and service entrance conductors(RMC) (See Electrical Service Data)
- 4 - Safety switch (when required)
- 5 - Meter (when required)
- 6 - Service enclosure
- 7 - No. 6 bare grounding electrode conductor in 1/2" PVC to ground rod - extend 1/2" PVC 6" underground.
- 8 - 5/8" x 8' Copper clad ground rod - drive ground rod completely underground unless otherwise approved by the Engineer.
- 9 - RM conduit - same size as branch circuit conduit.
- 10 - Photocell and conduit - if top mounted. (See Electrical Service Data)
- 11 - When required by the serving utility provide bare #6 awg copper conductor. Run wire from pole top to butt wrap or copper butt plate. Protect conductor to a height of 8 ft above finish grade.

LIQUIDTIGHT FLEXIBLE METAL CONDUIT (If applicable)

- Liquidtight flexible metal conduit, may be used when meter and service enclosure are mounted 90 to 180 degrees to each other.
- LFMC shall not exceed 3 ft. and shall be securely supported within one ft. of each end.
- Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting.
- A neutral conductor must be installed within the LFMC.
- Bend in liquidtight flexible metal conduit shall not exceed 180 degrees.
- A pull test is required on all installed conductors, at least six inches of free conductor movement shall be demonstrated to the satisfaction of the Engineer.

SERVICE SUPPORT TYPE TP (O)

(timber pole, overhead service, typical arrangement)

TIMBER POLE NOTES

- 1. Conduit and conductors attached to service pole and underground within 12 inches of service pole shall not be paid for directly but shall be subsidiary to the service pole.
- 2. Pole top mounted photocell, install on north side of pole or in service enclosure as required. See Electrical Service Data.
- 3. Attach meter and service equipment with stainless steel or galvanized channel (Unistrut, Kindorf, or equal). Gain pole as required to provide flat surfaces for each strut. Point ends of galvanized channel with zinc rich paint. Gain depth 5/8" max. Gain height 1 7/8" max. Strut to be 1" max. deep, and 1 5/8" wide max. Secure each strut section to timber pole with two galvanized or SS lag bolts, 1/4" diameter min. by 1 1/2" length min. Place flat cut galvanized or SS washer on each lag bolt. Gain pole in a neat and workman-like manner.
- 4. Embedment depth shall be as required in Item 627 Treated Timber Poles.
- 5. Poles trimmed for excess length shall be trimmed from the top end only.

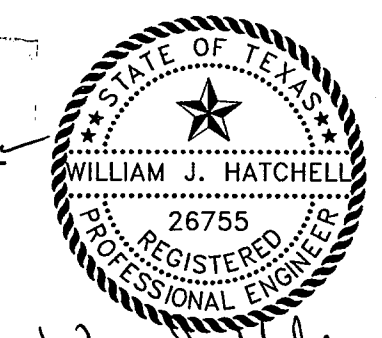
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DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
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ARAPAHO ROAD PHASE II
STANDARD CONSTRUCTION DETAILS
ELECTRICAL - SHEET 4

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SHT. TS-8 OF TS-21

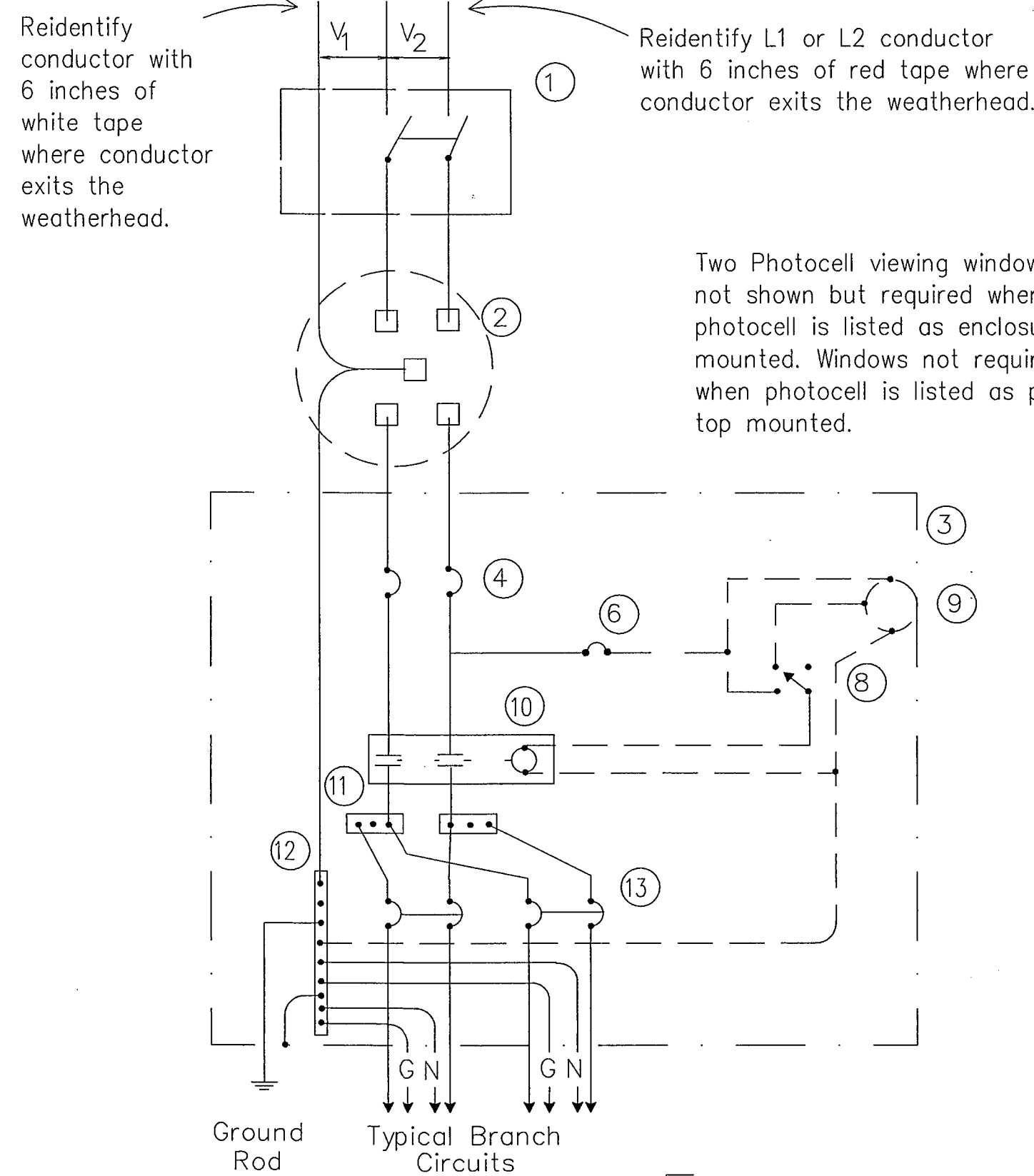
SERVICE ENCLOSURE NOTES:

VIII. Service Assembly Enclosures. All service assemblies and enclosures shall be UL Listed for the intended purpose.

- A. Shop built or shop assembled service assemblies (all types except Type T and Type D without lighting contactor) and all auxiliary equipment enclosures mounted with service equipment and paid for as part of Item 628, "Electrical Services", shall be built or assembled by a UL Listed Industrial Control Panel shop and shall have a unique serial numbered UL Label with the words "LISTED ENCLOSURE INDUSTRIAL CONTROL PANEL". The same or an additional label shall have the name, location, and phone number of the shop, the UL file number of the shop, the shop order or drawing number, date of manufacture or assembly, and the line voltage. The enclosure shall also be labeled "SUITABLE ONLY FOR USE AS SERVICE EQUIPMENT".
- B. Conduit entries into the top of all enclosures shall have threaded hubs. No conduit entries through the equipment mounting back plate will be allowed.
- C. All service enclosure front doors shall be permanently labeled "DANGER HIGH VOLTAGE". Label shall be a self sticking type, intended for outdoor installation. Lettering style, layout and colors of red, black and white shall be as required by OSHA. Label letters shall be 1 to 1 1/2 inches high or as high as the enclosure door width will permit for smaller Type T services. Separate or auxiliary lighting enclosures need not be OSHA labeled when mounted in the same viewing plane as the service enclosure front door. Where only one type of load is served by the service, the service door shall be marked using spray painted stenciled letters or self adhesive vinyl weather resistant labels, minimum of 1 inch high; applied in a neat and workman like manner, identifying the load served specifically such as lighting, landscaping, signals, traffic management or other wording as directed by the Engineer. Safety switches need not be OSHA labeled unless specifically required by the serving utility.
- D. Type GS enclosures for service types D, T, and the circuit breaker panelboard of service type C shall be made from pre-galvanized steel sheeting, hot dipped galvanized steel, or powder coat painted steel. Painted enclosures shall be painted inside and outside; galvanized enclosures may be painted. Unless otherwise approved by the Engineer, painted enclosures shall be gray, beige, or white. Panelboard/loadcenter enclosures shall be UL type 3R, 4, 4X or 12 modified or built as shown in paragraph E (below), shall have a dead front trim, and shall have a door with provisions for padlocking. Types D and T shall not have a loadcenter exterior "can" mounted inside another enclosure meeting these specifications. The loadcenter shall be interior mounted in an enclosure with properly adapted dead front trim.
- E. Type GS enclosures for service types A and C shall be a UL type 3R, 4, 4X or 12 enclosure and shall meet additional requirements of this paragraph. UL type 12 enclosures marked for indoor use only are approved for outdoor use when a drip shield or rolled lip is provided and drain fitting is supplied as specified. The enclosure door shall have a rolled lip around all sides of the enclosure opening and a padlock handle. All enclosures may have a continuous stainless steel piano hinge with stainless steel pin, enclosures less than 30 inches may have two heavy duty hinges, those over 30 inches must have three. Heavy duty two and three point hinges shall have a 3/8" minimum diameter electro-zinc plated steel pin or a stainless steel pin. Two point hinged doors shall be rated for 56 lbs of loading. Three point hinged doors shall be rated for 90 lbs of loading. The door shall have a mechanically attached data pocket constructed of either thermoplastic or metal. Pocket shall be 12" x 12", unless that size will not fit in enclosure. The pocket shall then be as large as possible, as approved by the Engineer, and mechanically attached with stainless steel nuts and bolts, or stainless steel or aluminum rivets. The main disconnect remote operator shall be flange-mounted, shall interlock the door when in the "on" position, and shall be pad lockable in both the "on" or the "off" positions. Enclosure shall include an equipment mounting panel installed inside the enclosure on collar studs or tapped bosses, and constructed of either 12-gauge steel or 0.10"-thick aluminum. Equipment mounting panels shall not be painted, but shall be hot-dipped galvanized or made from pre-galvanized sheeting. Enclosure shall have factory installed external mounting feet. Enclosure door shall be capable of opening at least 130 degrees, with arm to hold the door open. Door latch shall latch at two or more points, operate by a handle separate from disconnect switch and be capable of being locked. Lock must be keyed to Master #2195. Door shall be bonded with a #8 ground wire to the grounding bus or from door to enclosure grounding point if one is provided in enclosure. Enclosure shall be either hot dip galvanized, pre-galvanized sheeting or prime and painted. Paint shall be powder coat paint as shown below. Color shall be white or gray. Condensation drainage shall be provided by installation of a drain fitting (Crouse-Hinds CH-ECD11, Appleton ECDB or equal) in the bottom of the enclosure. The Contractor shall place in the service enclosure a laminated copy of the "as built" electrical plans showing the equipment supplied for that electrical service and all applicable wiring diagrams, layouts, and TS-8, TS-9, and TS-10 when standard sheets are in the plan set.
- F. Type SS Stainless steel enclosure shall meet all the requirements above for the respective type GS except that the enclosure shall be UL type 4X conforming to UL 50. Type GS circuit breaker panel interiors and load center interiors housed in a stainless steel UL type 4X enclosure conforming to UL 50 shall be considered complying with the Type SS requirements for service types D & T.
- IX. Powder Coat Paint. Powder coating shall be either a polyester thermosetting resin, a zinc rich primer with a TGIC (triglycidyl isocyanurate) powder overcoating, or a zinc-rich epoxy powder, applied by either electrostatic spray or fluidized bed immersion, high temperature oven cured, high density, low gloss, 4 mil thick (minimum), coating. Adhesion shall meet the 5A or 5B classifications of ASTM D3359. Finish shall be uniform in appearance and free of scratches.
- X. Main Disconnect. Main disconnect device shall be a circuit breaker, as specified in the Electrical Service Data, shall be two or three pole, and rated for the voltage and amperage specified. Circuit breaker shall be a UL Listed thermal-magnetic circuit breaker with flange-mounted remote operator in the service assembly enclosure. Circuit breakers shall have a minimum interrupting rating of 10,000 Amps. When the utility company provides a transformer larger than 50 KVA, Contractor shall verify that the available fault current is less than the circuit breaker amps interrupting capacity (AIC) rating and shall provide documentation from the Utility to the Engineer. Documentation shall be submitted at the same time as other electrical submittals. Circuit breaker shall be UL Listed to UL489. No backed breakers as main disconnects will be allowed.
- XI. Control Circuit. Control circuit protection shall be either a 10 or 15 amp circuit breaker.
- XII. Control Station ("H-O-A" Switch). Control station shall be a maintained-contact, three position selector switch in a UL type enclosure. Switch shall be rated 600 volts and shall be fitted with "Hand-Off-Auto" legend.
- XIII. Photo Electric Control. Photo electric control shall consist of a photocell, internal lightning arrester, and relay or bimetallic switch mounted inside a weatherproof enclosure with standard 3-prong twist lock photocell plug and receptacle. The enclosure shall be made of poly-acrylic with clear acrylic window. Enclosure chassis shall be molded thermosetting plastic. The photocell shall have a polyethylene gasket, and shall have a hermetically sealed cadmium sulfide cell. The arrester shall have an enclosed type expulsion arrester rated 2.0 kV sparkover with 5,000 amps follow-through. Relay or switch shall be time delay type with normally closed contacts. Photo electric control shall be rated a minimum of 1800 VA, voltage as required. Enclosure mounted photocells shall be the same as above except that the photocell shall be mounted inside the enclosure. The enclosure shall have two acrylic paneled windows, or other material approved by the Engineer, one on each side of the enclosure. Each window shall be rectangular approximately one inch by two inches, round 2 inch diameter, or as otherwise approved by the Engineer. The photocell shall be mounted in a position to receive light from one window. Top of pole mounted photocells shall be mounted as shown on ED(4). The Contractor shall be responsible for proper operation of the photo-electric control. The Contractor shall move and/or adjust or shield the photocell from stray or ambient nighttime light or shall make any other adjustments required for proper operation. The photocell shall face North when practicable. Unless otherwise shown on the plans, the photocell shall turn on the illumination system at 1.0 +(-) 0.5 footcandle and turn off the illumination system at two footcandles higher than turn on.
- XIV. Lighting Contactor. Lighting contactor shall be a UL Listed NEMA rated lighting contactor, two-pole or multipole as required, electrically held type designed to control high pressure sodium lighting loads, with silver alloy double break contacts rated at 240 volts, 480 volts or 600 volts as required. Lighting contactor shall not be the DIN rail mounted type.
- XV. Power Distribution Terminal Blocks. Power distribution terminal blocks shall be rated for 600 volts and shall be used for line side connections to branch circuit breakers where more than one circuit breaker is required. Lugs on blocks shall be properly sized for conductors being used. Only one conductor shall be placed under each lug.
- XVI. Neutral/Ground Bus. Neutral/ground bus shall be a factory made bus permanently bonded to the enclosure with properly sized lugs for grounding and neutral conductors.

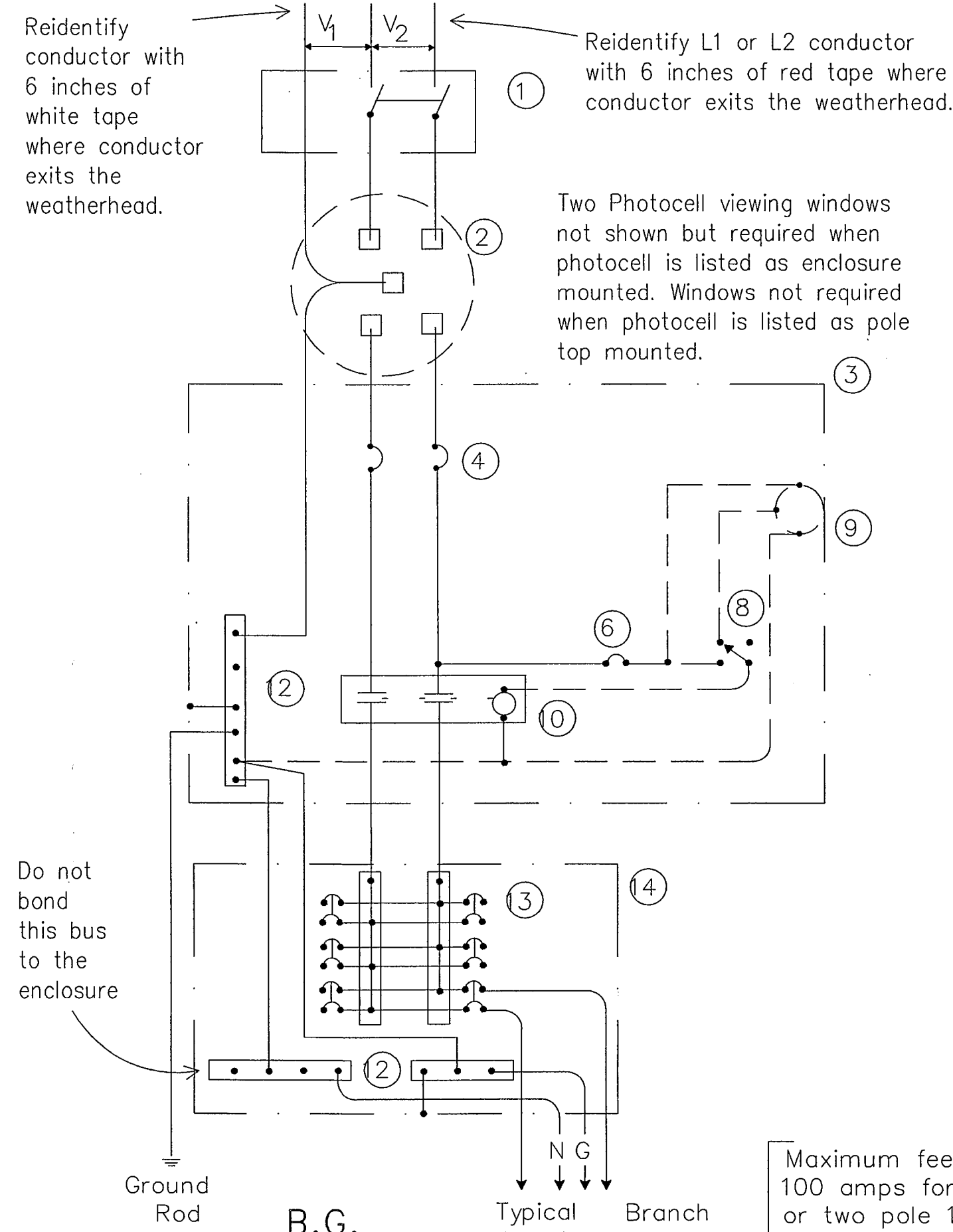
SCHEMATIC LEGEND

- 1 - Safety Switch (when required)
- 2 - Meter (when required)
- 3 - Service Assembly Enclosure
- 4 - Main Disconnect Breaker (See Electrical Service Data)
- 5 - Omit
- 6 - Circuit Breaker, 15A Typical for control wiring
- 7 - Auxiliary Enclosure
- 8 - Control Station ("H-O-A" Switch)
- 9 - Photo Electric Control (enclosure-mounted shown)
- 10 - Lighting Contactor
- 11 - Power Distribution Terminal Blocks
- 12 - Neutral/Ground Bus
- 13 - Branch Circuit Breaker (See Electrical Service Data)
- 14 - Circuit Breaker Panelboard (See Electrical Service Data)
- 15 - Load Center
- Power Wiring
- Control Wiring
- N Neutral Conductor (when required)
- G Equipment grounding conductor—always required



SCHEMATIC TYPE A
THREE WIRE

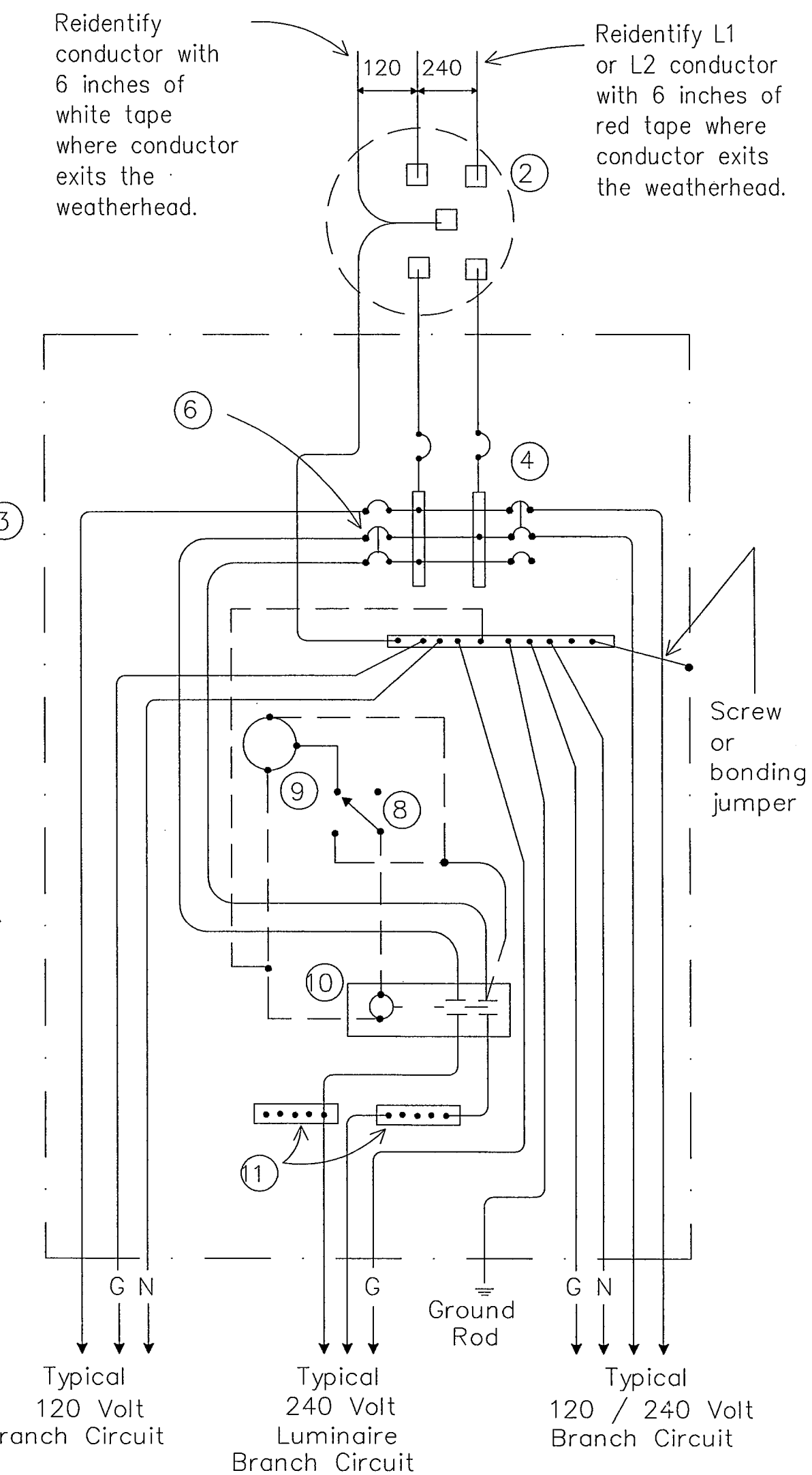
Maximum feeder circuit size (High Mast Poles):
100 amps for two pole 480V, 125 amps for one
or two pole 120V or 240V. Maximum branch
circuit size: 50 amps.



SCHEMATIC TYPE C
THREE WIRE

Maximum feeder circuit size (High Mast Poles):
100 amps for two pole 480V, 125 amps for one
or two pole 120V or 240V. Maximum branch
circuit size: 50 amps.

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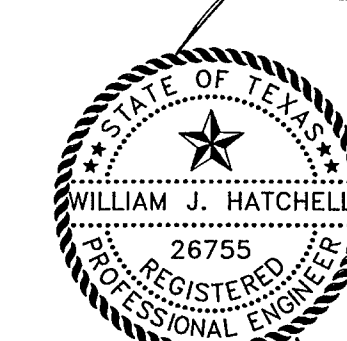
SCHEMATIC TYPE D
120/240 VOLTS - THREE WIRE

Install photocell and lighting
contactor when shown on Electrical
Service Data. See Type D service
notes.

TYPE D SERVICE NOTES

Photocell and lighting contactor shall be located either in the same UL type 3R enclosure with load center or, if approved by Engineer, in separate enclosure. Photocells shall have a window on each side of enclosure to allow operation. Both photocell contactor and breaker area shall have dead front trim. Enclosure, except for RT and PS supports, shall not exceed 36 inches in height or 16 inches in width unless approved by the Town. Ty D load center with lighting controls or TY D separate lighting control enclosure shall have power distribution blocks for a minimum of 4, #8 conductors per phase.

BUILT AS PER
SPECIFICATIONS AND PLANS
BY DURABLE SPECIALTIES INC.
PROJECT COORDINATOR



THE SEAL APPEARING ON THIS
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WILLIAM J. HATCHELL
ON 2/13/10
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PROPER NOTIFICATION TO THE RESPONSIBLE
ENGINEER IS AN OFFENSE UNDER THE
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DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: WJH	REVIEWED: DWG: 249DETAILS-ELEC

ARAPAHO ROAD PHASE II
STANDARD CONSTRUCTION DETAILS
ELECTRICAL - SHEET 5

TOWN OF ADDISON

Grantham, Burge & Waldbauer
Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27
GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

SHT.
TS-9
OF
TS-21

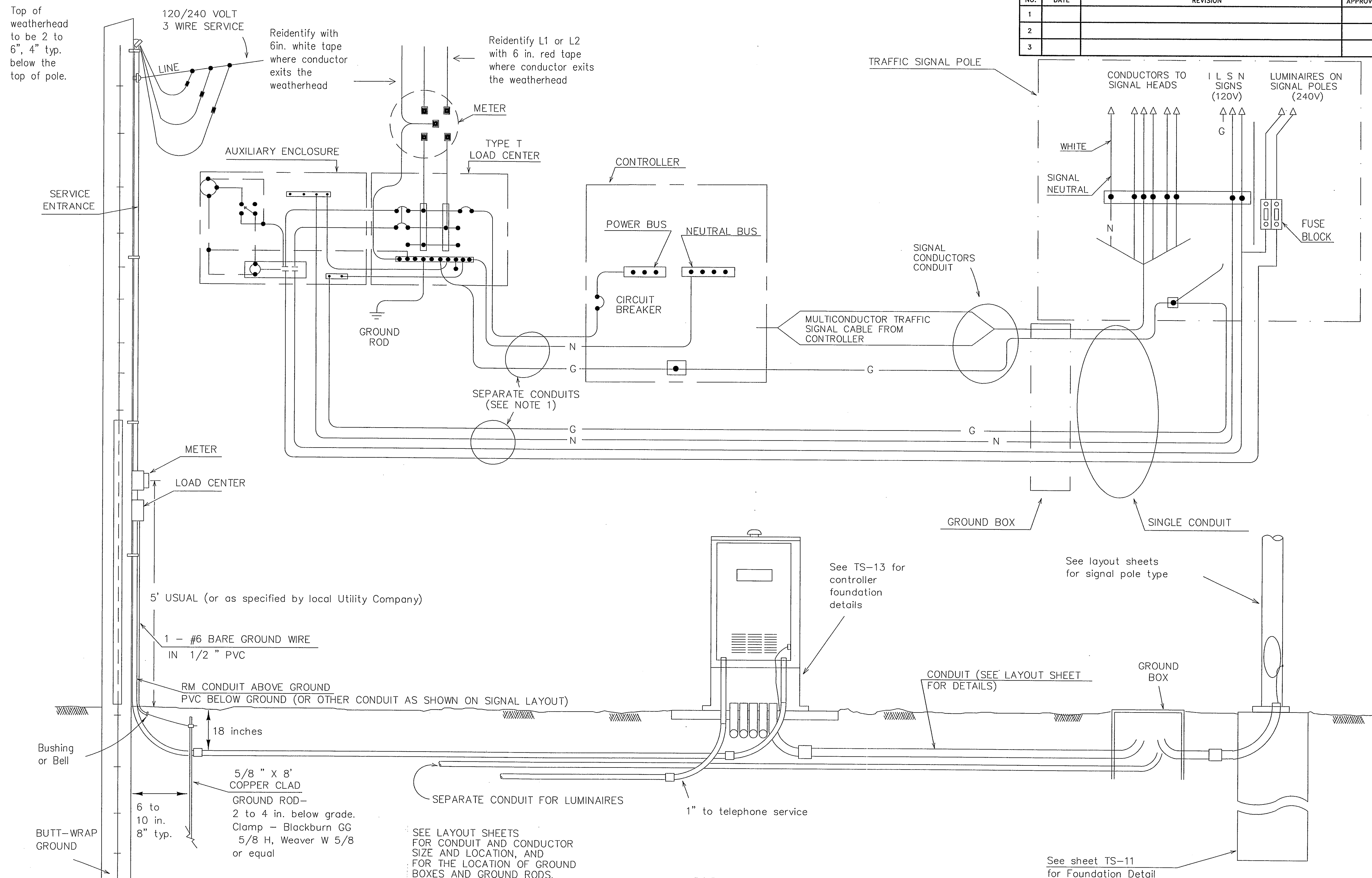
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NOTES:

- Luminaire conductors shall not be looped through controller cabinet.
- Electrical system to include an equipment grounding conductor noted here as "G". All exposed metal parts are to be bonded to grounding conductor.
- Photocell, when required, shall be mounted at top of pole or in enclosure as shown on TS-8 and TS-9 and as required by descriptive code.
- Roadway lighting fixtures, when required, shall be in accordance with the material and construction methods of the Item, "Roadway Illumination Assemblies" except for the test period for proper operation of the luminaires. Installed roadway lighting luminaires and internally lighted street name signs shall be tested for proper operation as a part of the associated traffic signal system.
- Internally lighted street name signs (ILSN), when required, shall be in accordance with the Item "Internally Lighted Street Name Signs". Because of the electrical isolation of ILSN hinges, a #12 green grounding conductor shall be run to the ILSN fixture.
- Install ground rod at alternate location when directed by the Town. Maintain a minimum of 8 ft in contact with the earth.
- Liquidtight flexible metal conduit, may be used when meter and service enclosure are mounted 90 to 180 degrees to each other. LFMC shall not exceed 3 ft. and shall be securely supported within one ft. of each end. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. A neutral conductor must be installed within the LFMC. Bend in liquidtight flexible metal conduit shall not exceed 180 degrees.
- Minimum embedment depth as per item 627 Treated Timber Poles.
- Pole to be set plumb.
- Back fill thoroughly tamped in 6 in. lifts. Place 6 inches additional backfill above grade around pole base to allow for settling, as per Item 627.
- Excess pole length shall be trimmed from the top at a slope to aid water run off.
- Gain pole two places for each meter, service, separate or auxiliary enclosure. See ED(4) for details.
- All illumination and power conductors to be pulled tested and megged. Do not meg traffic signal cable.
- Enclosures are to be locked, and ground box covers are to be bolted before power is applied to the circuit.
- Conduits entering top of enclosures to be fitted with conduit sealing hub or threaded boss, such as meter hub. Off-set nipple, when required, shall not be zinc-die-pressure cast. All metal conduits not connected to conduit sealing hub, or threaded boss must have a grounding bushing. Terminate bonding jumper to ground bus. All conduits entering enclosures shall be sealed. Silicone shall not be allowed.

ELECTRICAL SERVICE

(TYPE T TIMBER POLE SHOWN AS EXAMPLE, SEE ELECTRICAL DETAILS, LAYOUT SHEETS, AND ELECTRICAL SERVICE DATA SHEET FOR SERVICE REQUIRED AND FOR DETAILS.)



Unless shown elsewhere in the plans, electrical service data for Types D and T shall be as follows.

ELECTRICAL SERVICE DATA									
ELECTRICAL SERVICE DESCRIPTION(SEE ED(4))	SERVICE CONDUIT SIZE (RMC)	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT. BRK. POLE/AMP	TWO-POLE CONTACTOR AMPS ***	PANELBD./LOADCENTER AMP RATING (MIN)	CIRCUIT NO.	BRANCH CKT. BRK. POLE/AMPS	KVA LOAD
TY D (120/240)070(NS)GS(E)**(*)	1 1/2	3/#4	N/A	2P/70	30	70	T.S. Lighting	1P/50 2P/15	<7.1
TY T (120/240)000(NS)GS(E)**(*)	1 1/2	3/#4	N/A	None	30	70	T.S. Lighting	1P/50 2P/15	<7.1

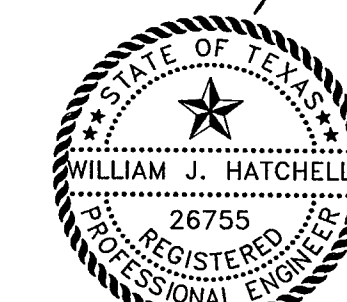
*** Eliminate photocell, contactor and separate enclosure if lighting, or internally lighted signs are not required by plans

** See descriptive code in estimate for service support type.

* See descriptive code in estimate for overhead or underground service.

SIGNAL CONTROLLER

BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE SPECIALTIES INC. PROJECT COORDINATOR *John Lee*



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: WILLIAM J. HATCHELL ON 2/18/10 ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

THIS DETAIL SHEET WAS OBTAINED FROM TXDOT

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DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249	76
DRAWN: GBW	DESIGN: WJH	REVIEWED:	DWG: 249DETAILS-ELEC

**ARAPAHO ROAD PHASE II
STANDARD CONSTRUCTION DETAILS
ELECTRICAL - SHEET 3**

TOWN OF ADDISON

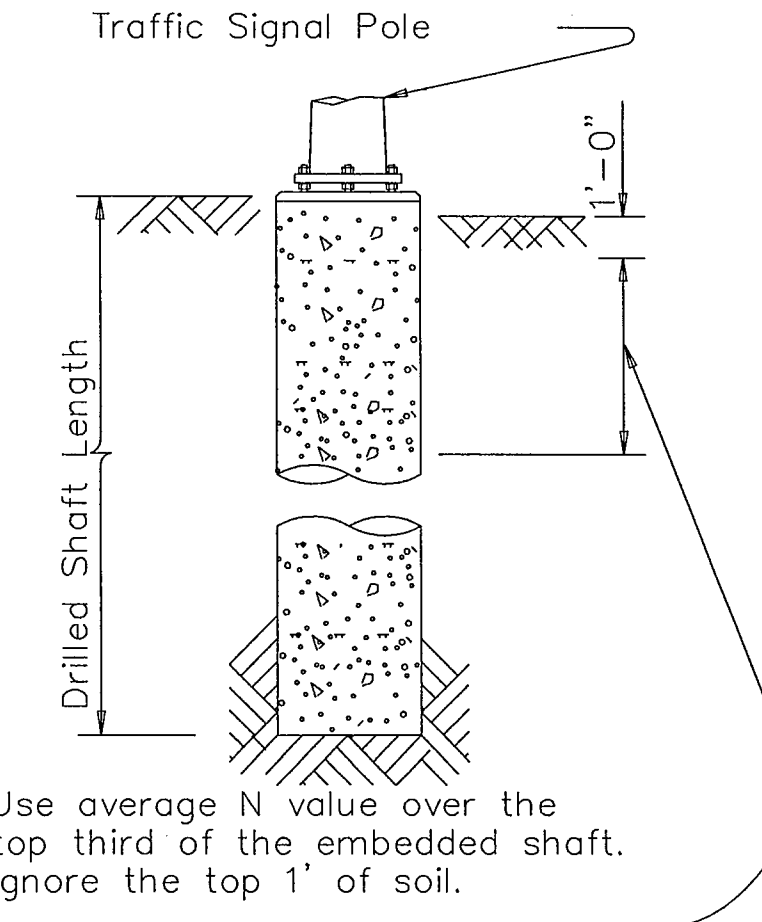
Grantham, Burge & Waldbauer
GBW Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
 (972) 840-1916 (TEL)
 (972) 840-2156 (FAX)

SHT. TS-10 OF TS-21

NO.	DATE	REVISION	APPROV.
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FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		DRILLED SHAFT LENGTH-ft			ANCHOR BOLT DESIGN				FOUNDATION DESIGN LOAD		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft			ANCHOR BOLT DIA	F _y (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
				10	15	40							
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	3/4"	36	12 3/4"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 1/2"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 3/4"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 1/4"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)					
		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'		32' X 32'	
				36' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	36'	44'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 24'		32' X 32'	
				36' X 36'	

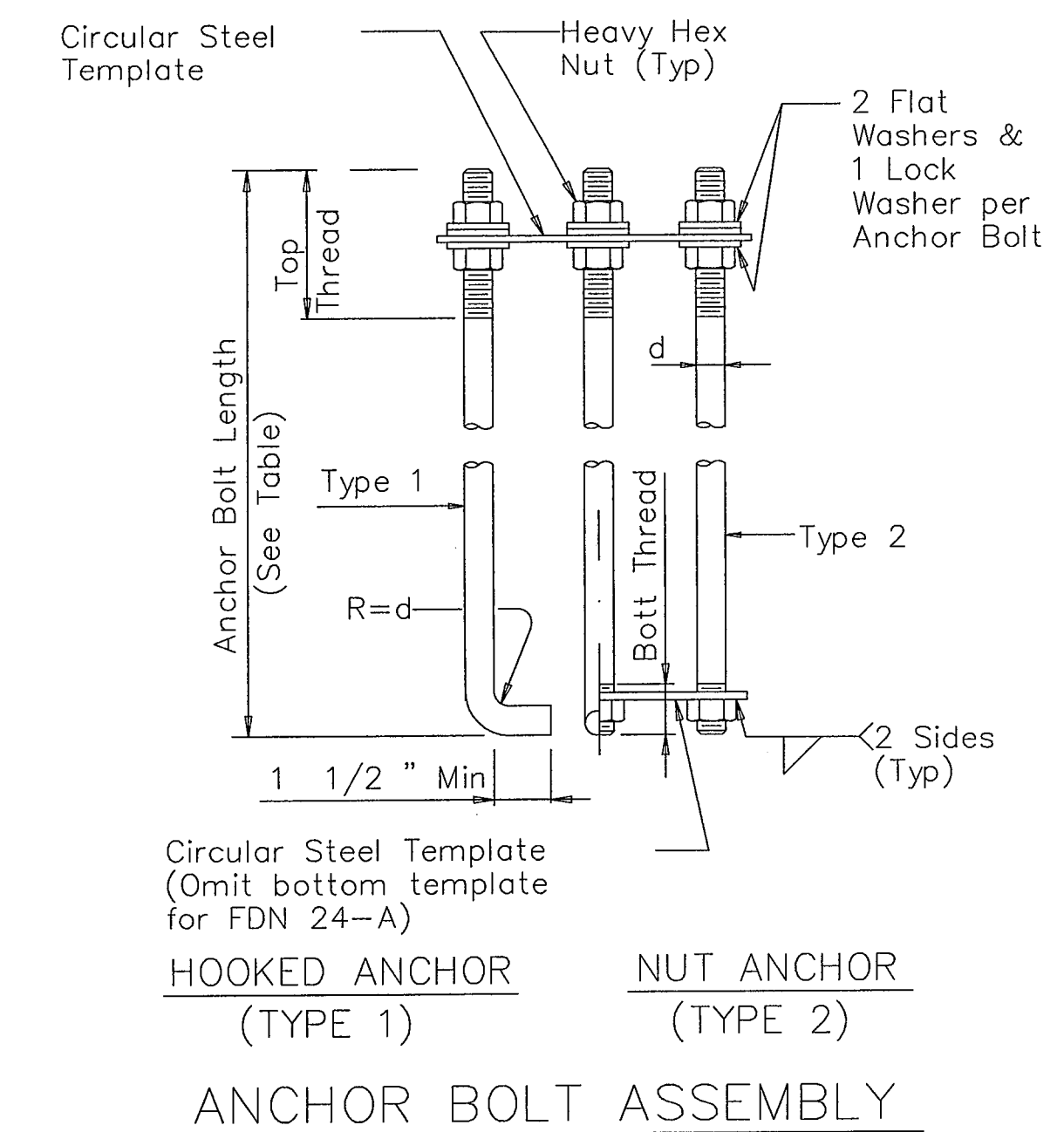
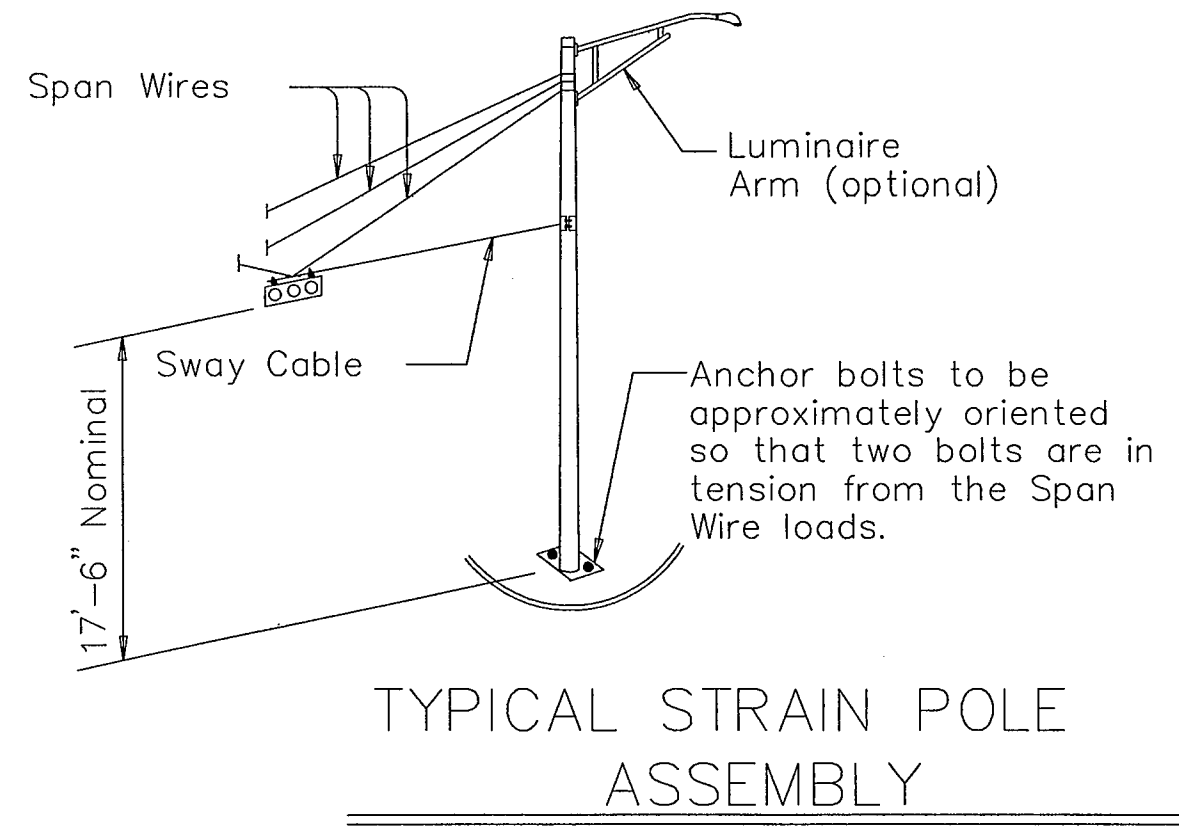


ANCHOR BOLT & TEMPLATE SIZES						
BOLT DIA IN.	BOLT LENGTH	TOP THREAD	BOTT THREAD	BOLT CIRCLE	R ₂	R ₁
3/4"	1'-6"	3"	—	12 3/4"	7 1/8"	5 5/8"
1 1/2"	3'-4"	6"	2"	17"	10"	7"
1 3/4"	3'-10"	7"	2 1/4"	19"	11 1/4"	7 3/4"
2"	4'-3"	8"	2 1/2"	21"	12 1/2"	8 1/2"
2 1/4"	4'-9"	9"	3"	23"	13 3/4"	9 1/4"

EXAMPLE:

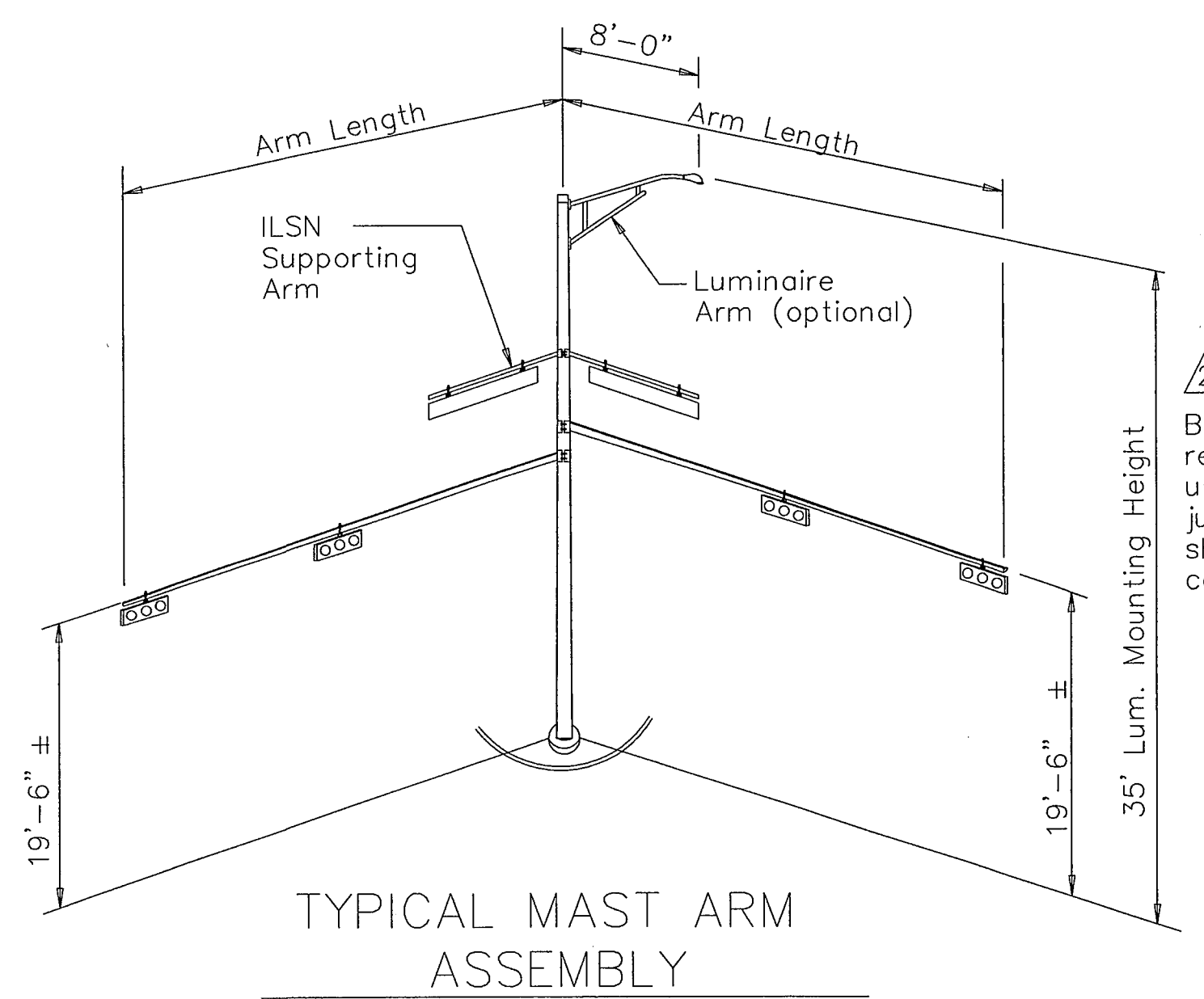
1. For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'

2. For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.



INSTALLATION PROCEDURE:

Threads of anchor bolts shall be coated with pipe joint compound prior to installation of upper nuts when erecting pole. After pole is plumbed and in permanent alignment, the exposed threads of painted bolts shall be cleaned and an additional coating of zinc-rich paint applied to seal the bolt thread-nut joint.



Conduit (See Layout Sheets for diameter. Orient as directed by the Engineer. 1 or 2 required)

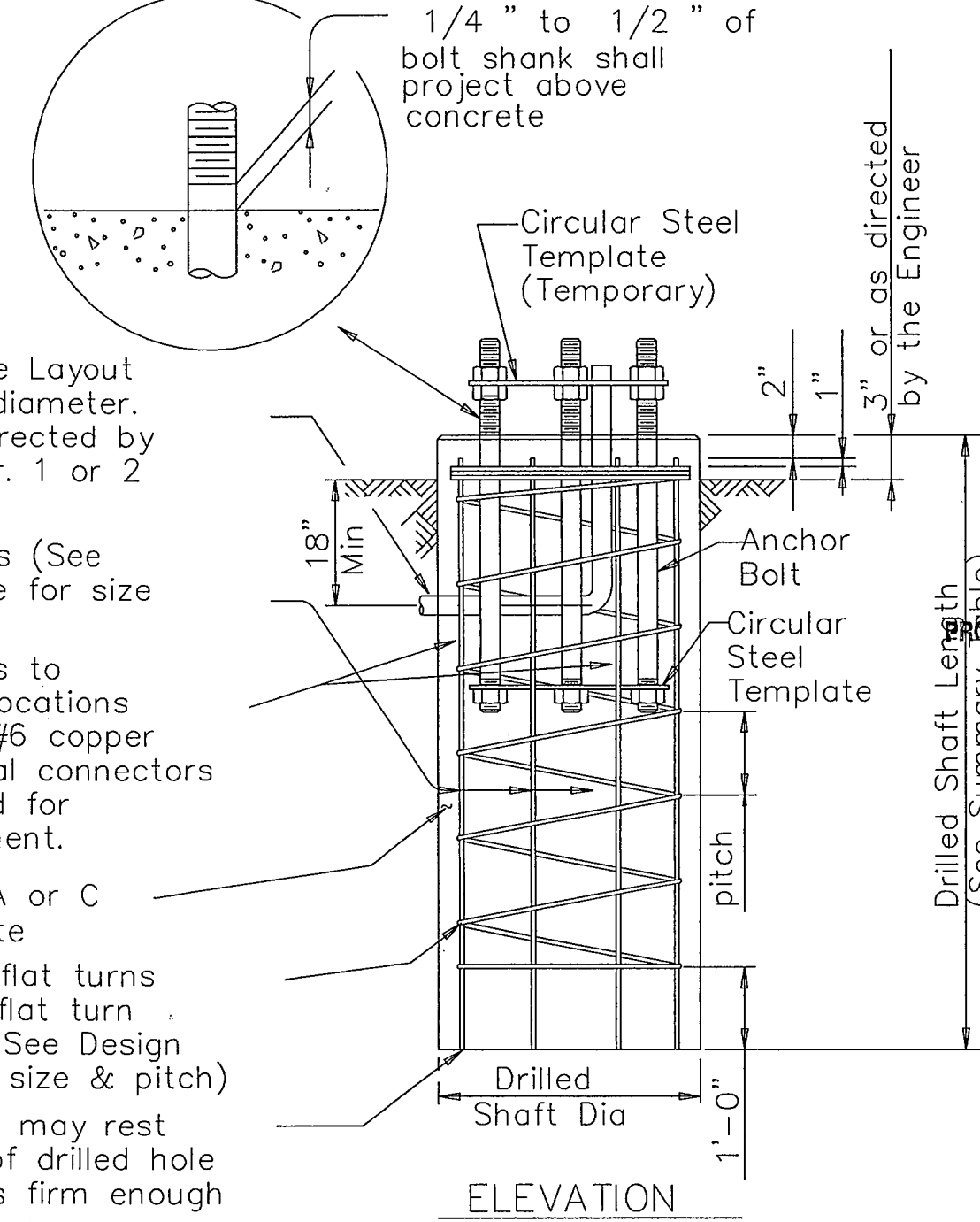
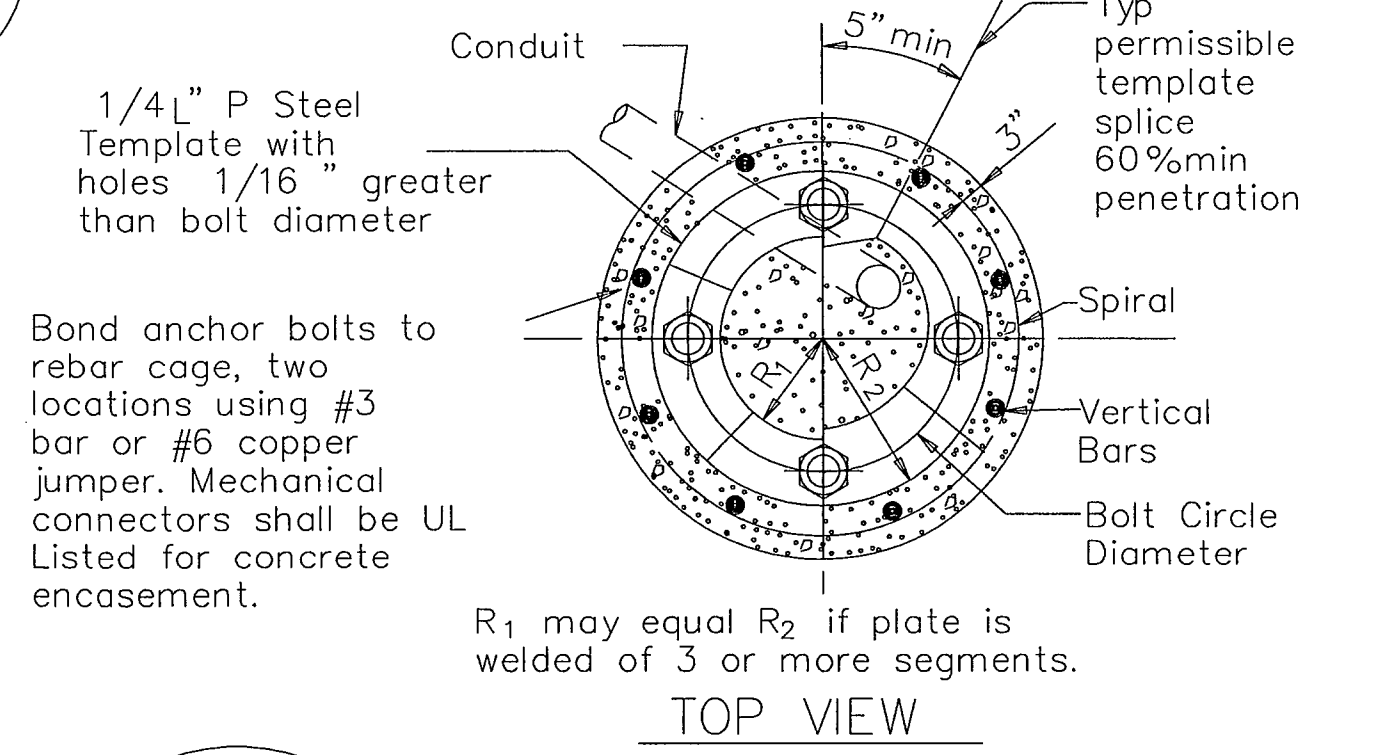
Vertical Bars (See Design Table for size & number)

Bond anchor bolts to rebar cage, two locations using #3 bar or #6 copper jumper. Mechanical connectors shall be UL Listed for concrete encasement.

Class A or C Concrete

Spiral, 3 flat turns top & 1 flat turn bottom. (See Design Table for size & pitch)

Vertical bars may rest on bottom of drilled hole if material is firm enough to do so when concrete is placed.



FOUNDATION DETAILS

- NOTES:
- Anchor bolt design develops the foundation capacity given under Foundation Design Loads.
 - Foundation Design Loads are the allowable moments and shears at the base of the structure.
 - Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.
 - Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.
 - If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.
 - Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

FOUNDATION SUMMARY TABLE									
LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH (FEET)					
				24-A	30-A	36-A	36-B	42-A	
MARSH									
T-1		36-A				12.0			
T-2		36-A				12.0			
SURVEYOR									
T-1		36-A				12.0			
T-2		36-A				12.0			
T-3		36-A				10.0			
T-4		36-A				12.0			
TOTAL DRILLED SHAFT LENGTHS									

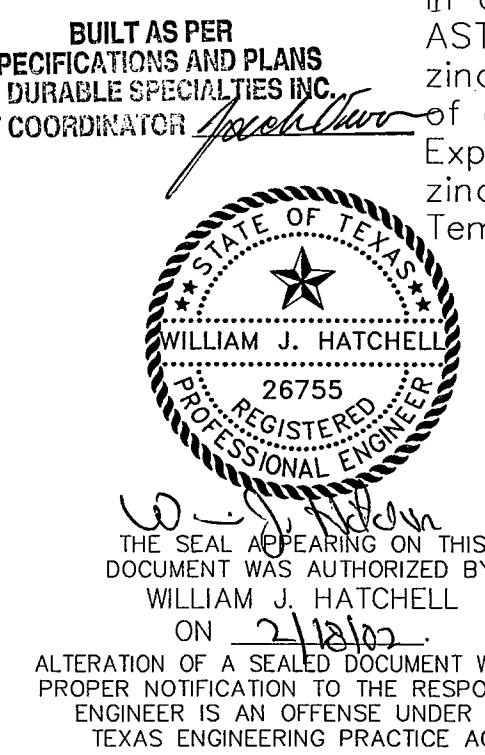
GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.

Reinforcing steel shall conform to Item 440. Concrete shall be Class A or C.

Threads for anchor bolts and nuts shall be rolled or cut threads of unified national coarse thread series except for A193B7 bolts which shall have 8 pitch thread series. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.

Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Anchor bolts larger than 1" in diameter shall conform to A36M55 in accordance with the item, "Anchor Bolts" or ASTM A193B7 or A687. Galvanize or coat with zinc-rich paint a minimum of the upper 14 inches of all anchor bolts unless otherwise noted. Exposed nuts shall be galvanized or coated with zinc-rich paint. Washers shall be galvanized. Templates and embedded nuts need not be galvanized.



DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: WJH	REVIEWED: DWG: 249DETAILS-TRAF

ARAPAHO ROAD PHASE II

TRAFFIC SIGNAL POLE FOUNDATION

TOWN OF ADDISON

Granham, Burge & Waldbauer

Engineers, Inc.

1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042

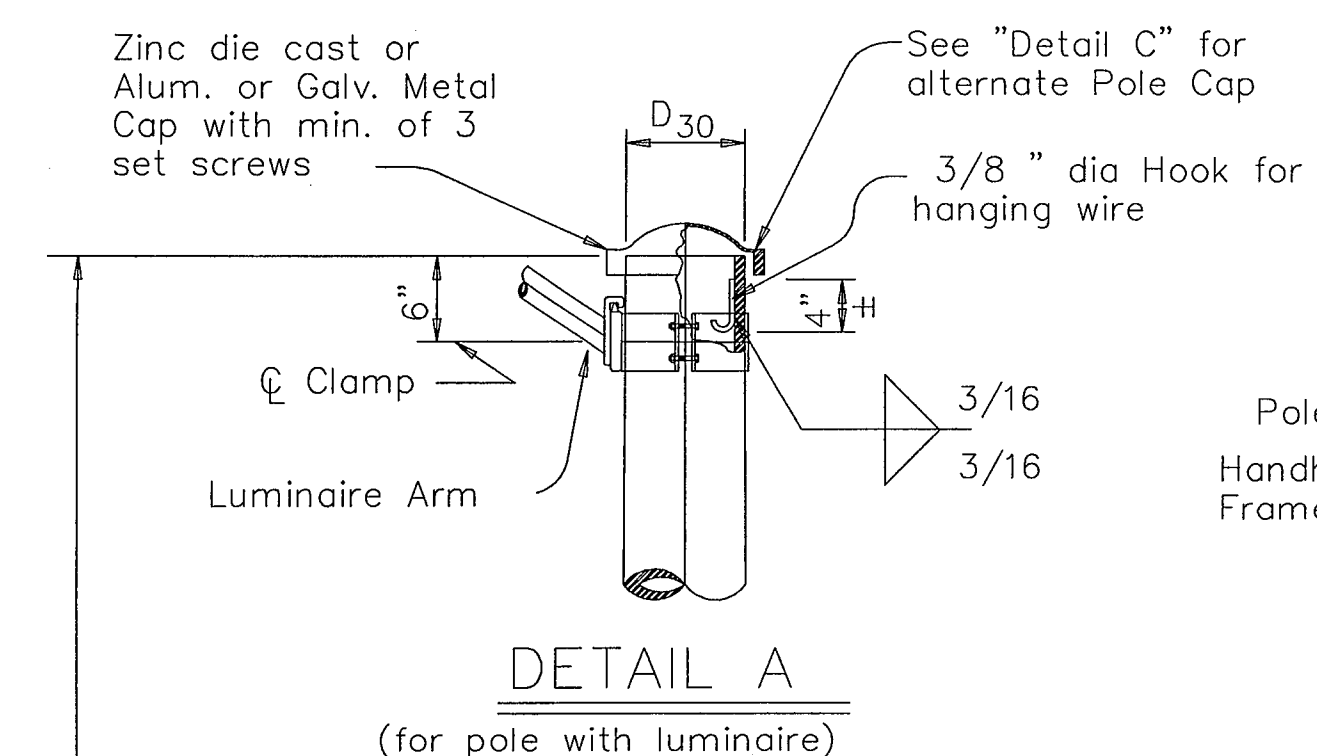
(972) 840-1916 (TEL)

(972) 840-2156 (FAX)

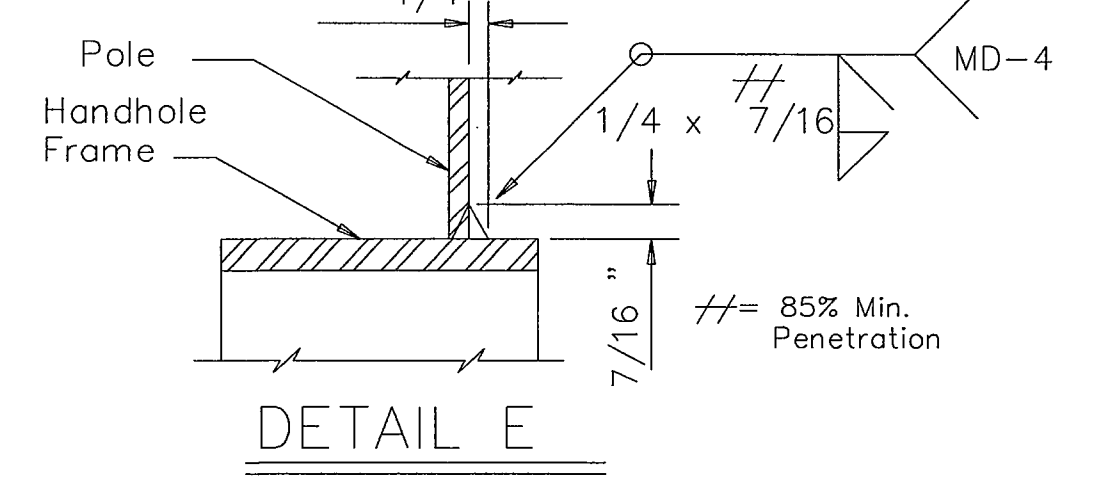
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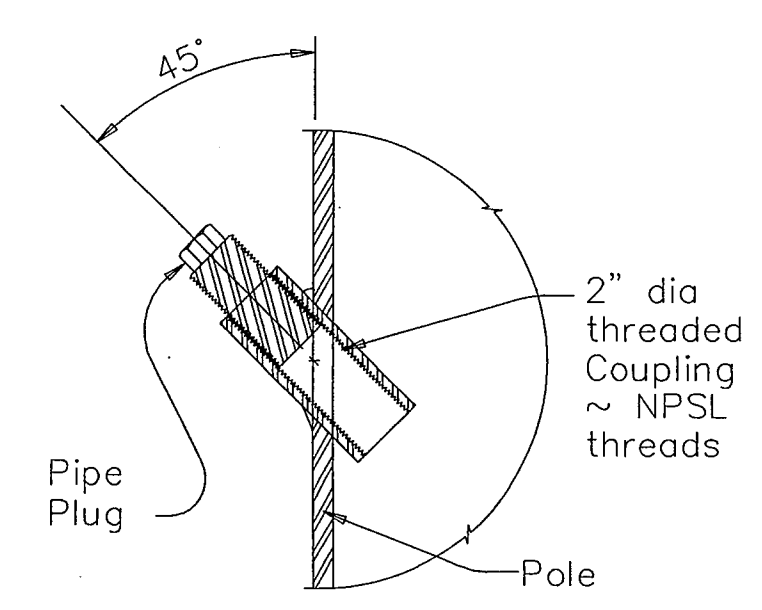
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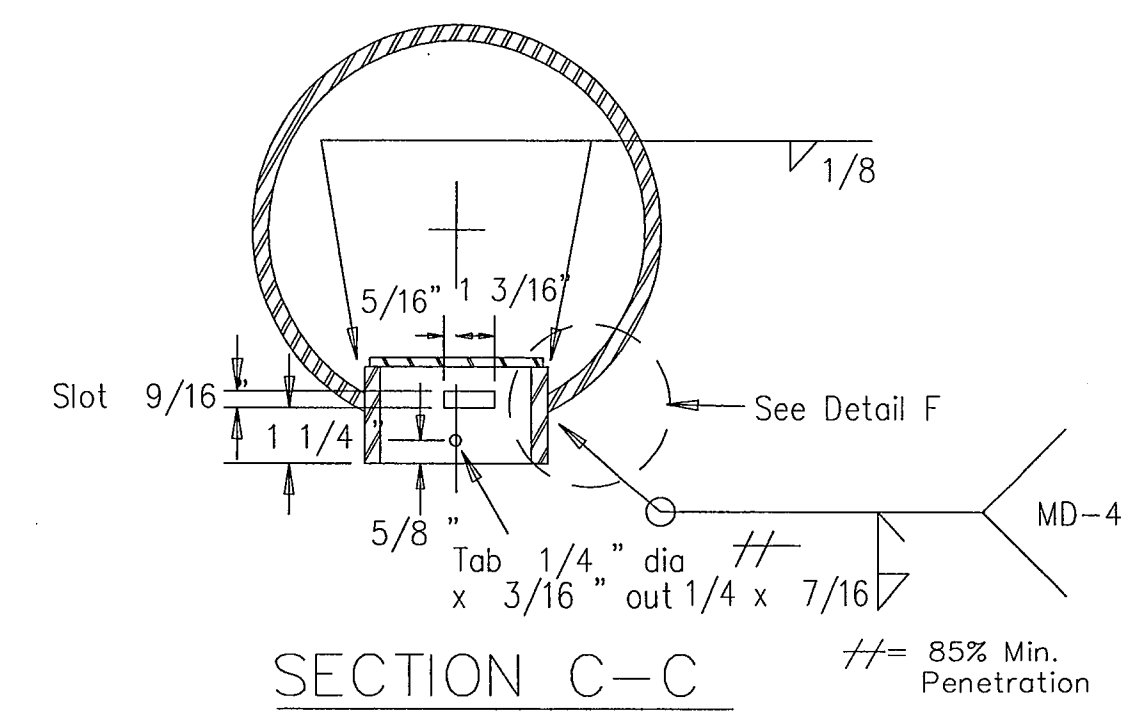
DETAIL A
(for pole with luminaire)



DETAIL E

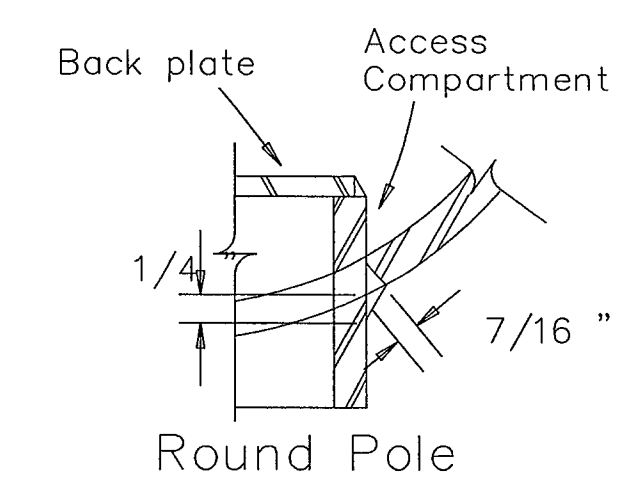


COUPLING DETAIL

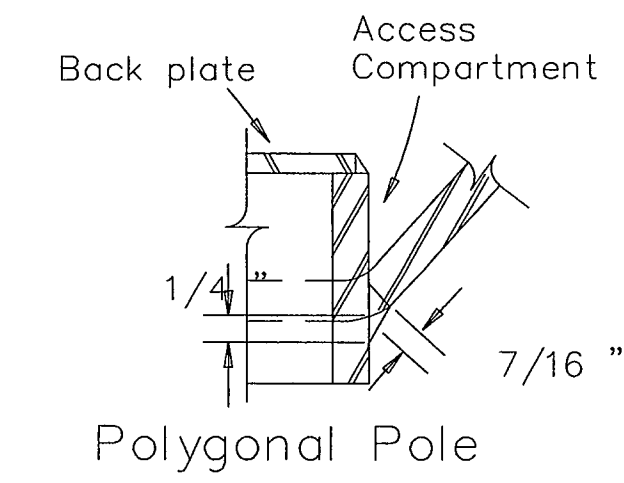


SECTION C-C

Opening for access compartment shall be no more than 1/16 inch wider than the access compartment itself.

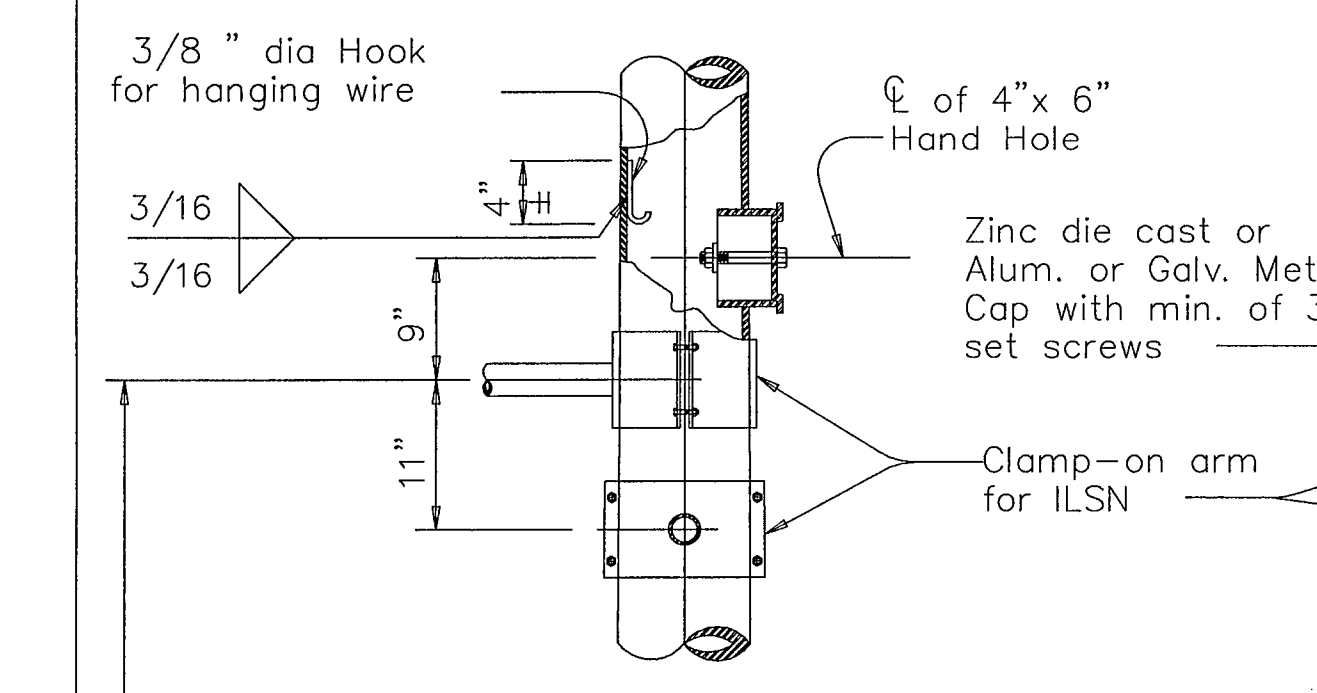


Round Pole

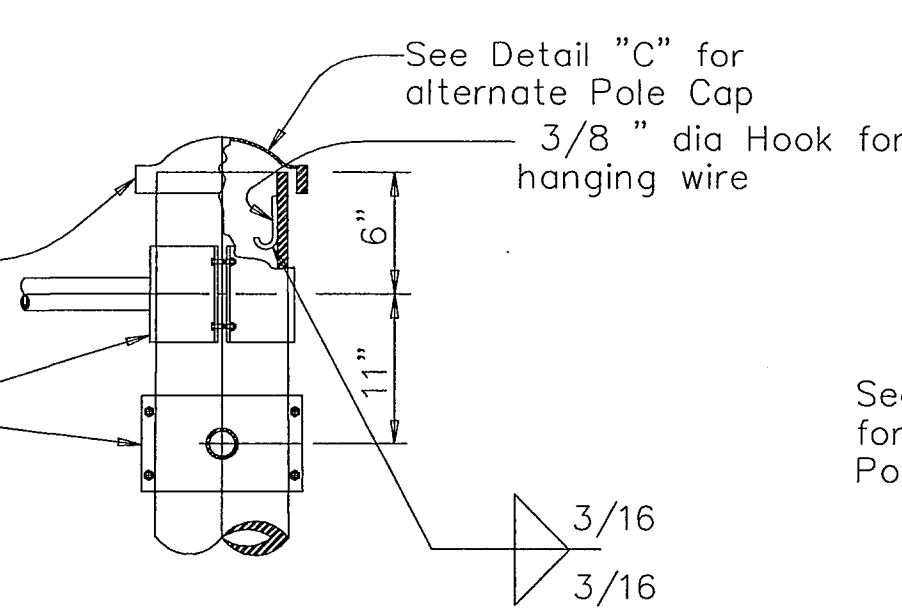


Polygonal Pole

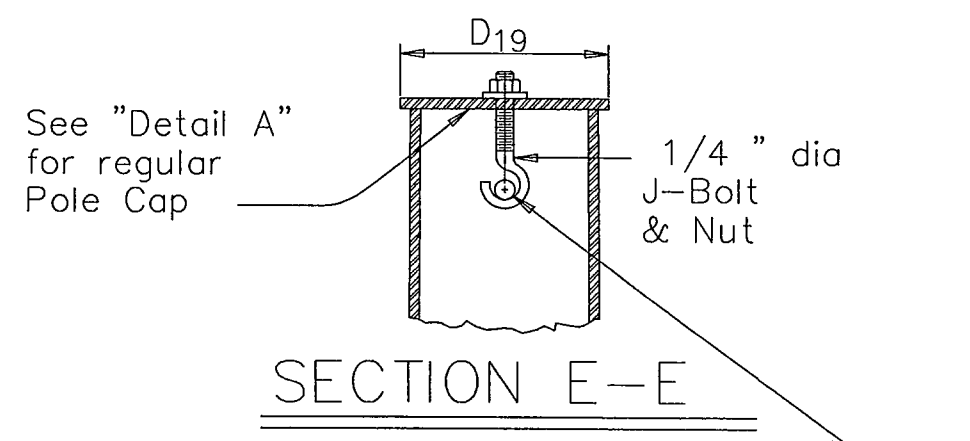
DETAIL F



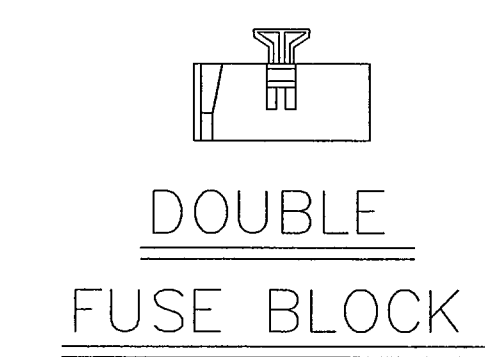
DETAIL J
(if ILSN applied)



DETAIL K
(for 24' pole with ILSN sign and no luminaire)

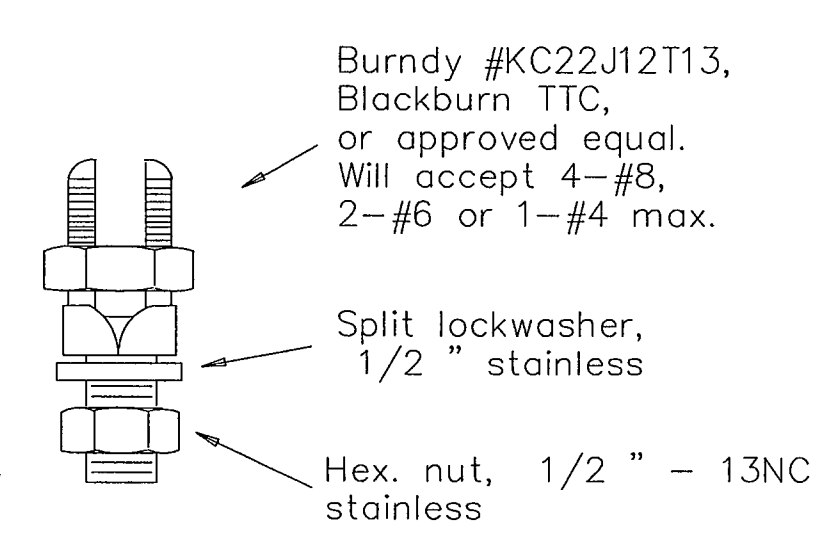


SECTION E-E

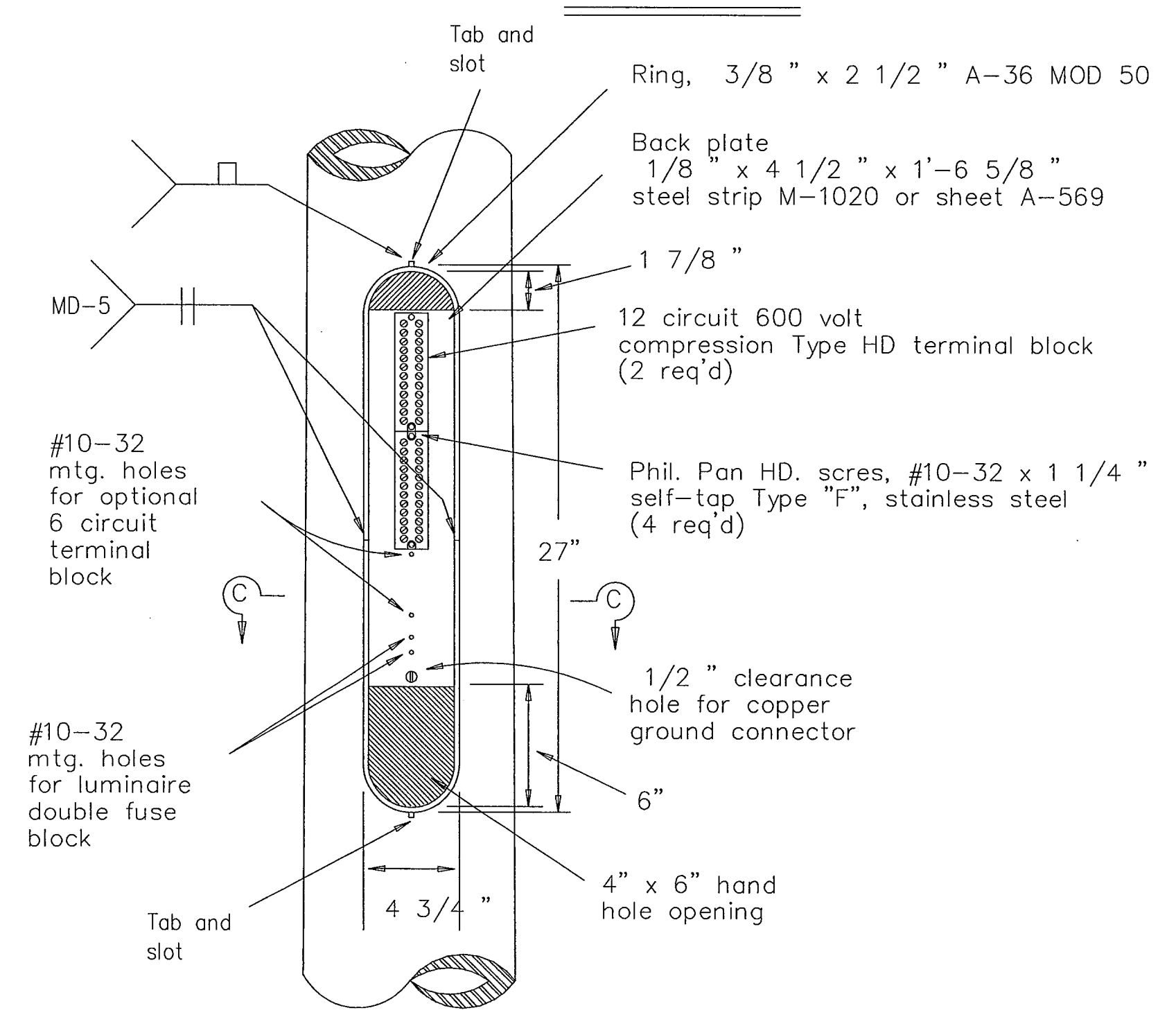


DOUBLE FUSE BLOCK

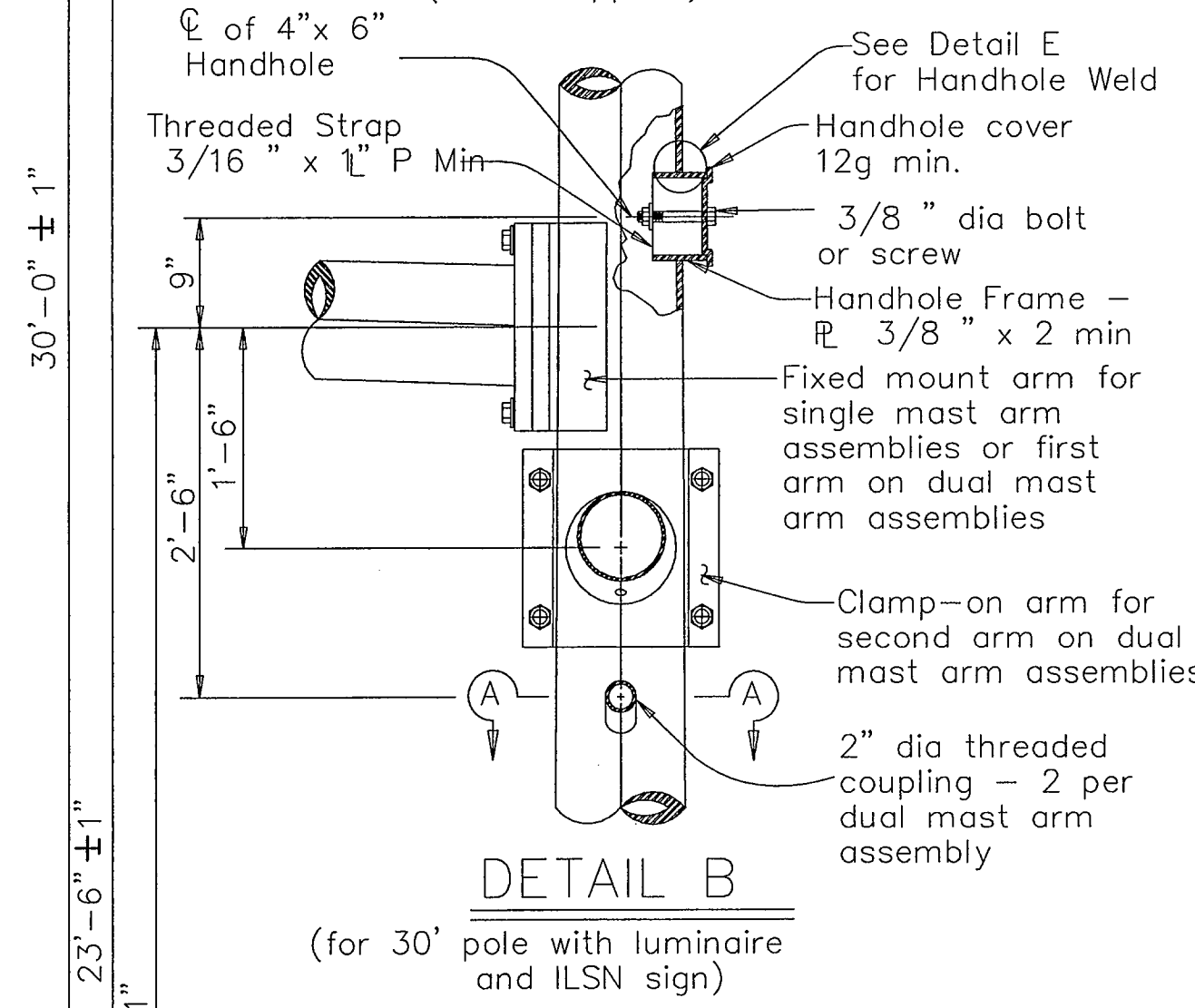
For luminaire fuses Littelfuse #L60030M-2SQ or equal, supplied and installed by field contractor when required.



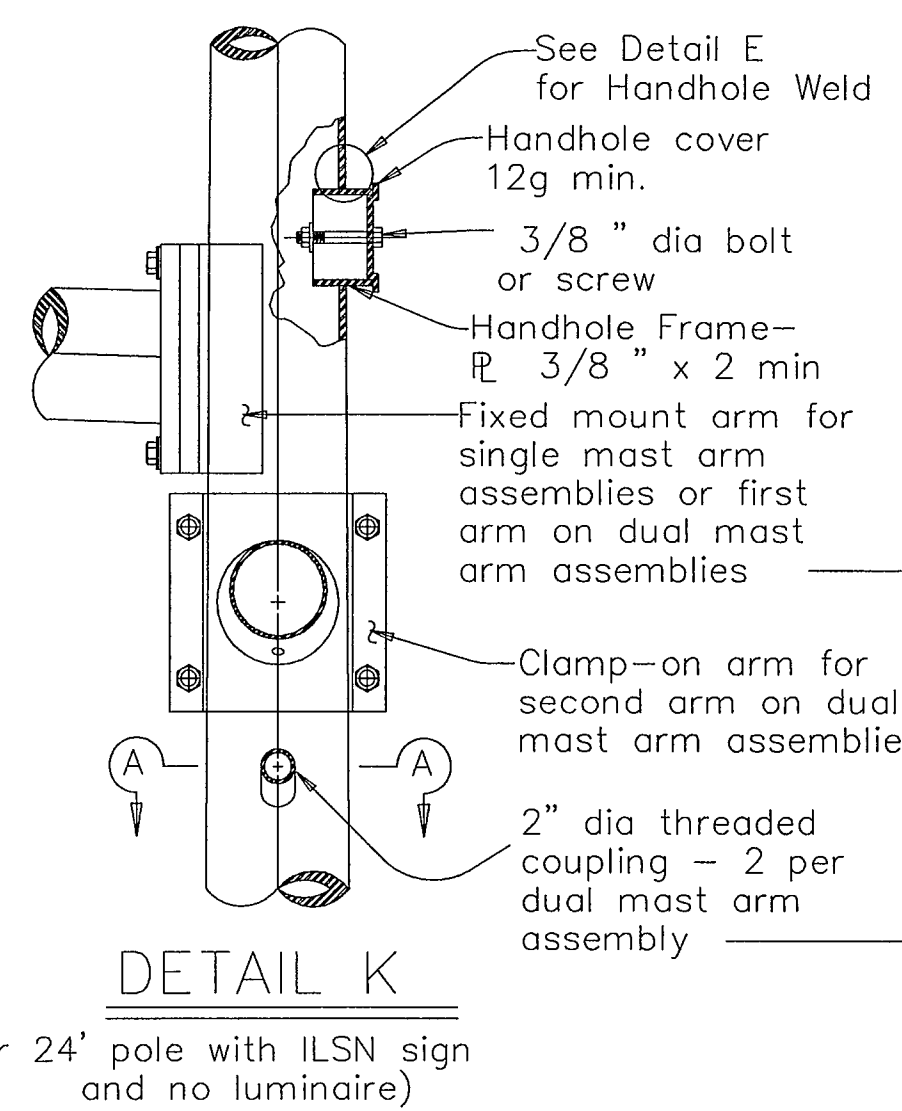
COPPER GROUND CONNECTOR



ACCESS COMPARTMENT

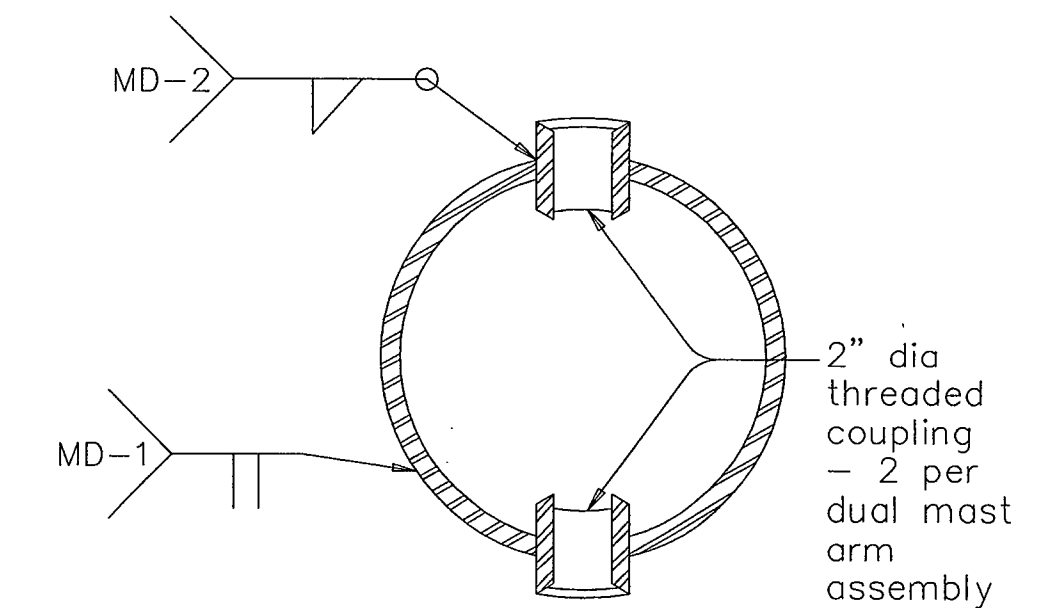


DETAIL B
(for 30' pole with luminaire and ILSN sign)



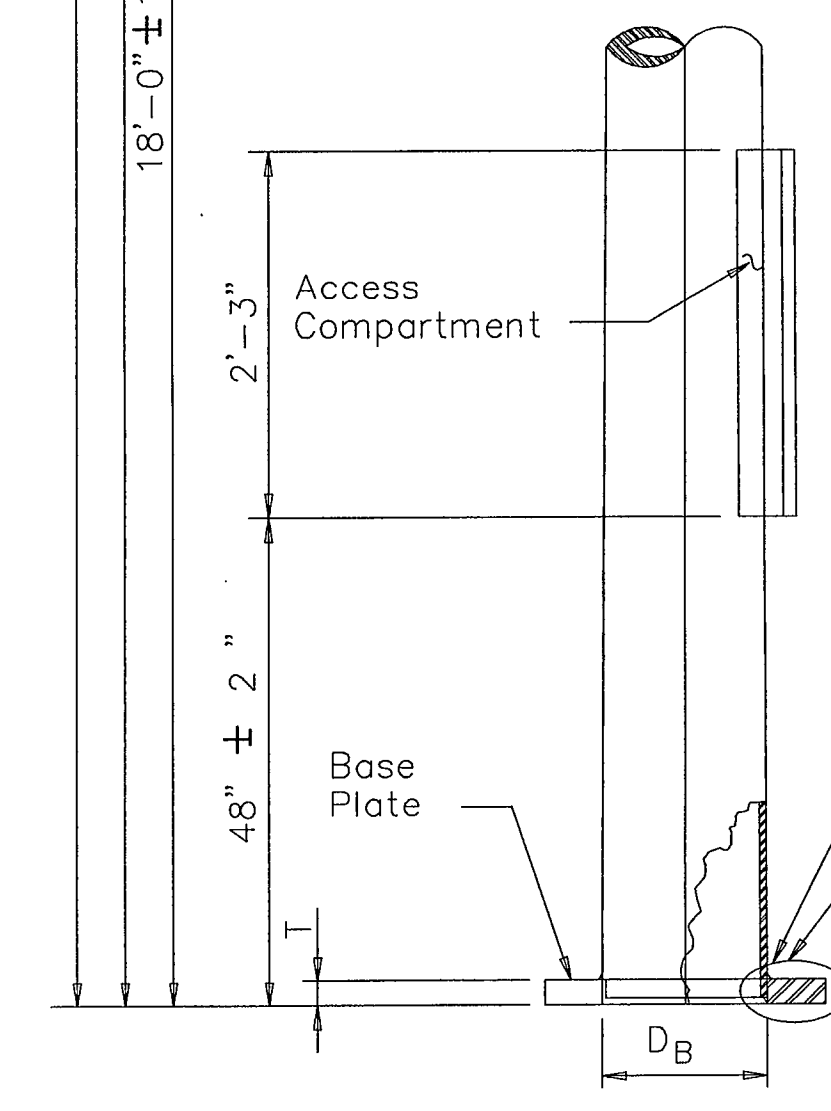
DETAIL C
(for 19' pole with no ILSN sign and no luminaire)

- The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
- The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #10-32 x 1 1/4 self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or IlSCO SSS-5). The traffic signal contractor shall install the kit items in the field.
- The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Littelfuse #L60030M-2SQ fuse block. Arrangement of the items shall be as shown in the Access Compartment detail.

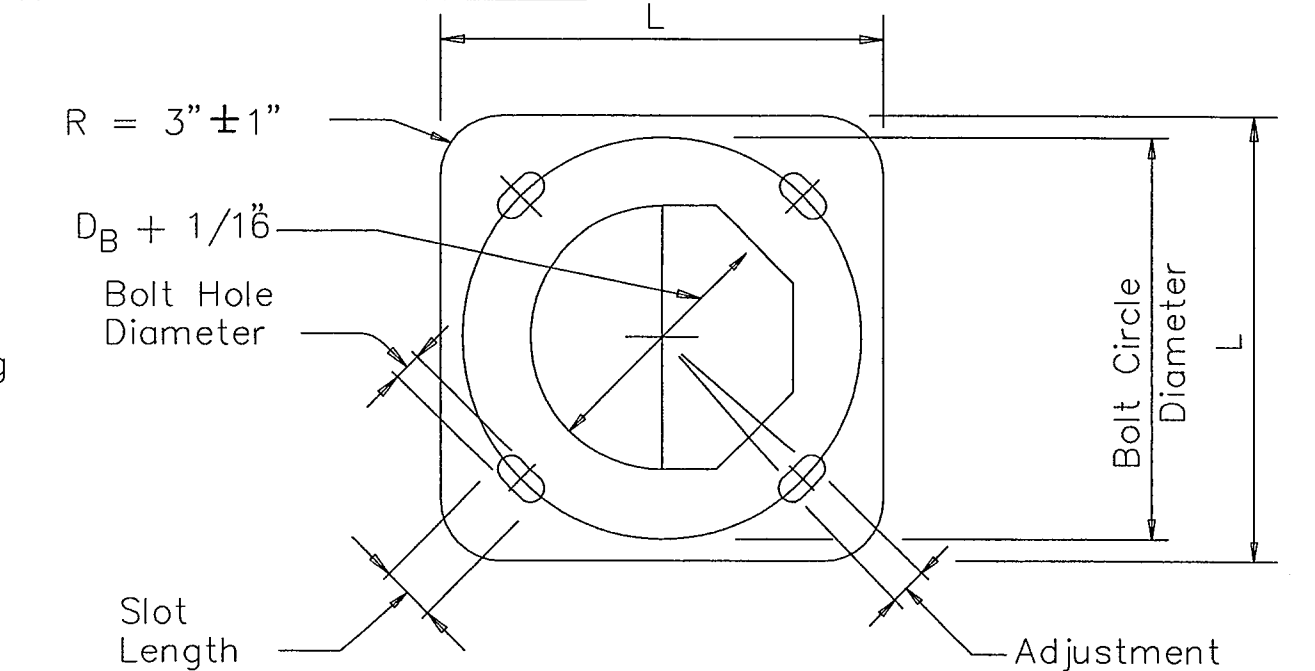


SECTION A-A

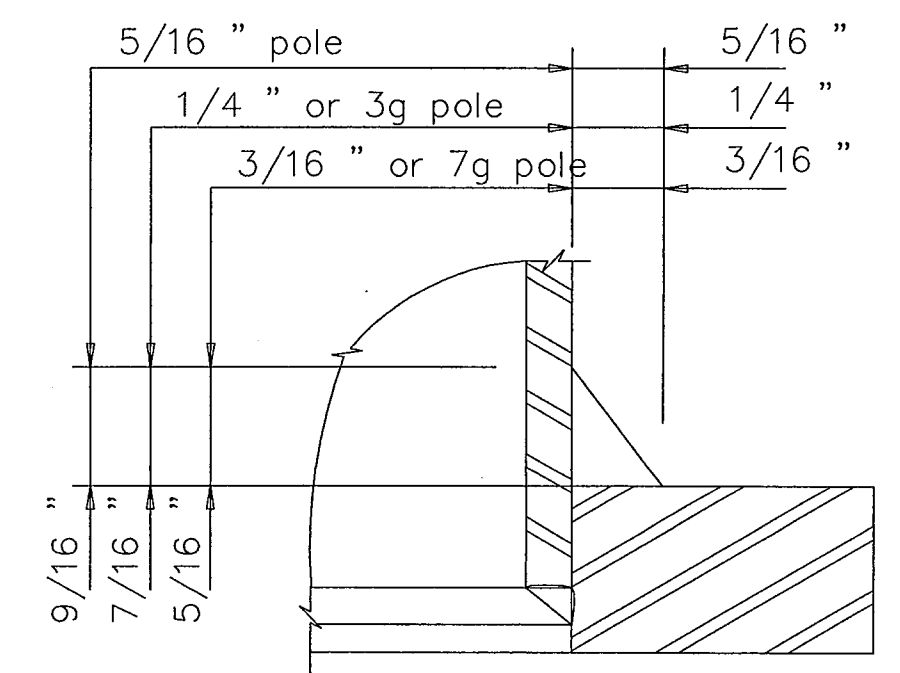
Anchor Bolt Diameter	Bolt Hole Diameter	Slot Length	Bolt Circle Diameter	Base PL Dim. L x T	Adjust. Range
1 1/2 "	1 3/4 "	3 1/2 "	17"	18" x 1 1/2 "	13.4'
1 3/4 "	2"	4"	19"	20" x 1 3/4 "	13.5'
2"	2 1/4 "	4 1/2 "	21"	22" x 2"	13.6'
2 1/4 "	2 1/2 "	5"	23"	24" x 2 1/4 "	13.7'



POLE ELEVATION



BASE PLATE PLAN



DETAIL D

BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE SPECIALTIES INC. PROJECT COORDINATOR *[Signature]*

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY WILLIAM J. HATCHELL ON 2/16/02. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

THIS DETAIL SHEET WAS OBTAINED FROM TXDOT

DATE: DECEMBER, 2001 SCALE: NOT TO SCALE JOB NO.: 00-249
 DRAWN: GBW DESIGN: WJH REVIEWED: DWG: 249DETAILS-ELEC

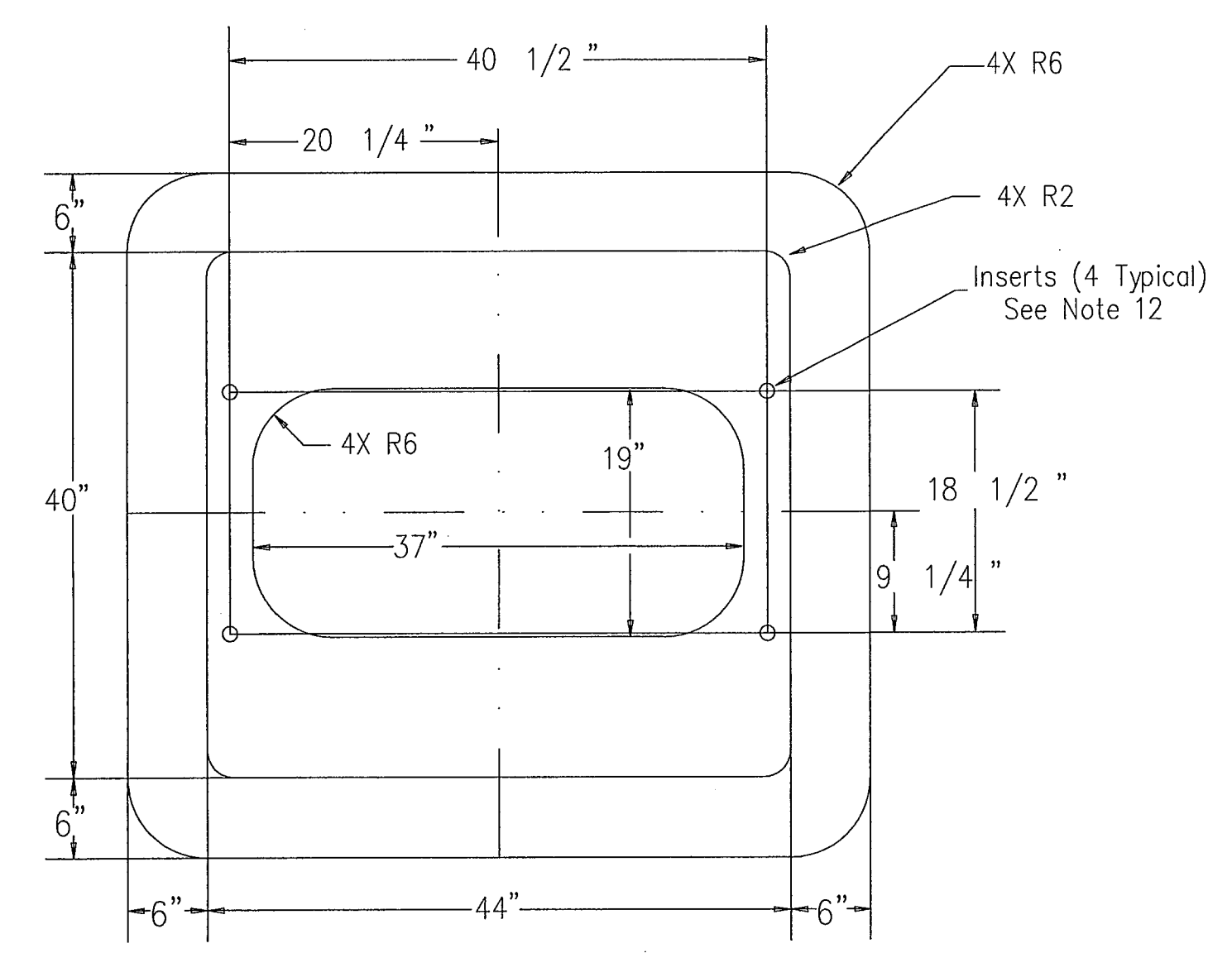
ARAPAHO ROAD PHASE II
TRAFFIC SIGNAL - SUPPORT STRUCTURES
MAST ARM POLE DETAILS

TOWN OF ADDISON

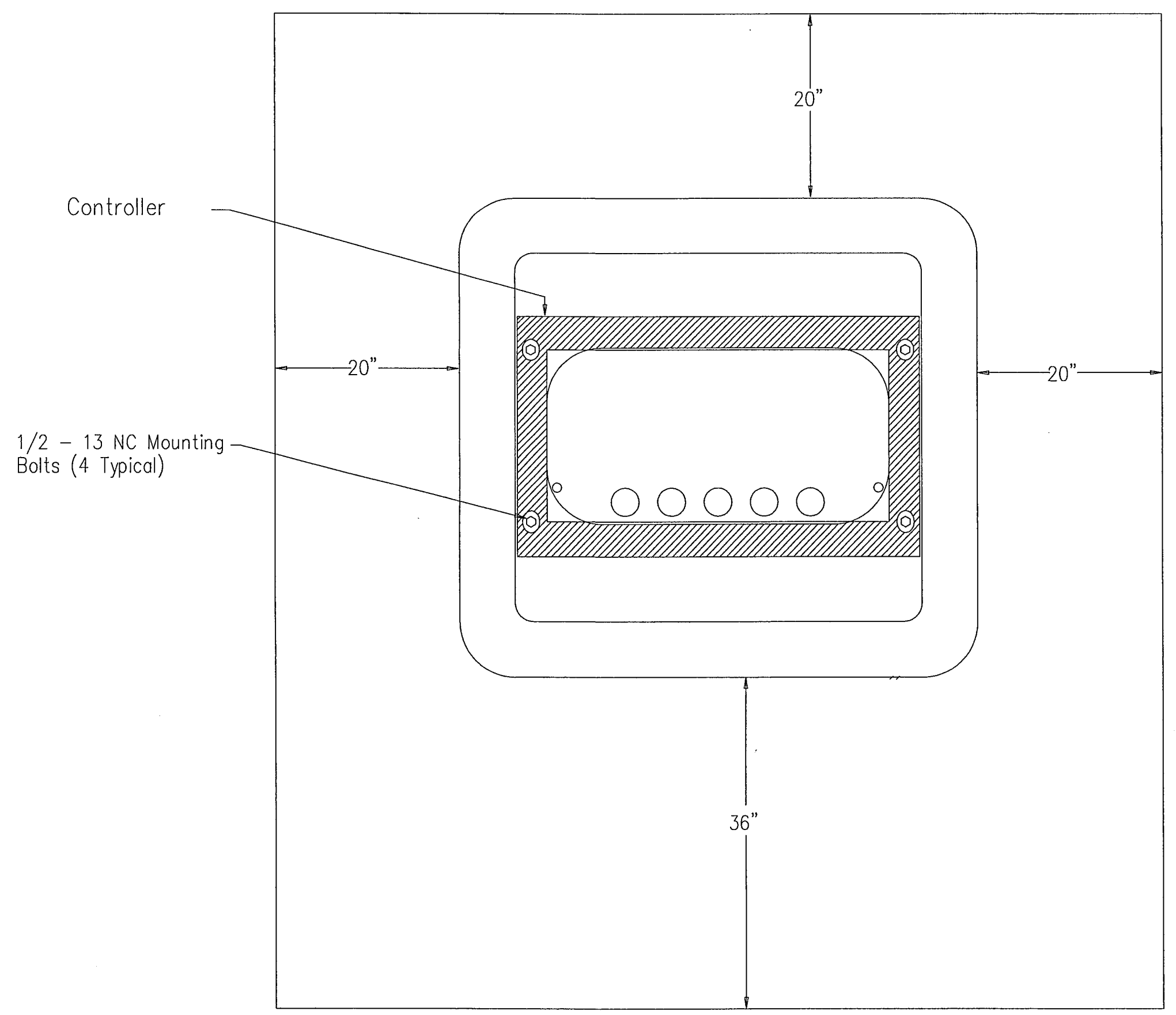
Grantham, Burge & Waldbauer
Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042 (972) 840-1916 (TEL) (972) 840-2156 (FAX)

SHT. TS-12 OF TS-21

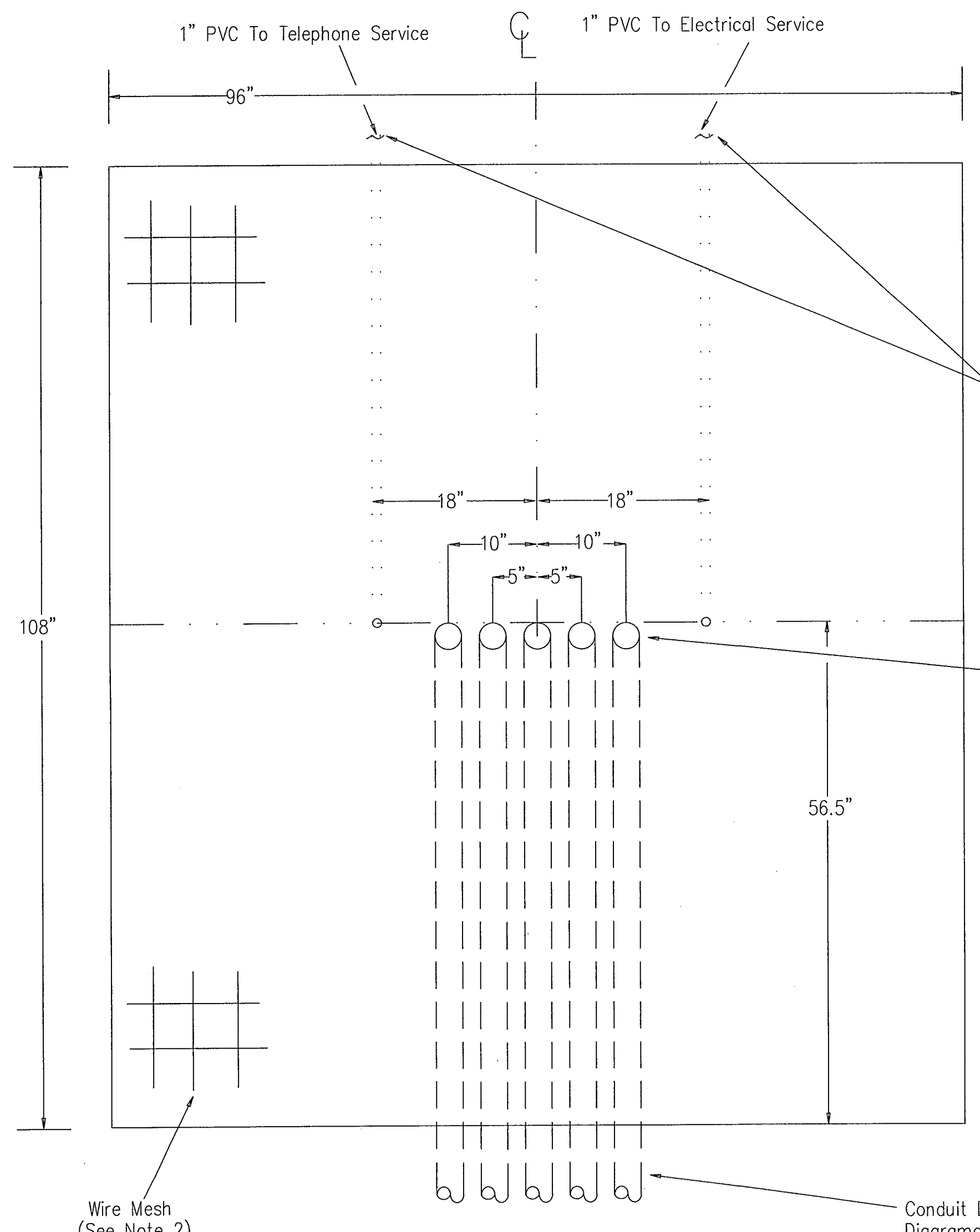
NO.	DATE	REVISION	APPROV.
1			
2			
3			



TOP VIEW
(Base Only)



TOP VIEW
(Slab & Base)

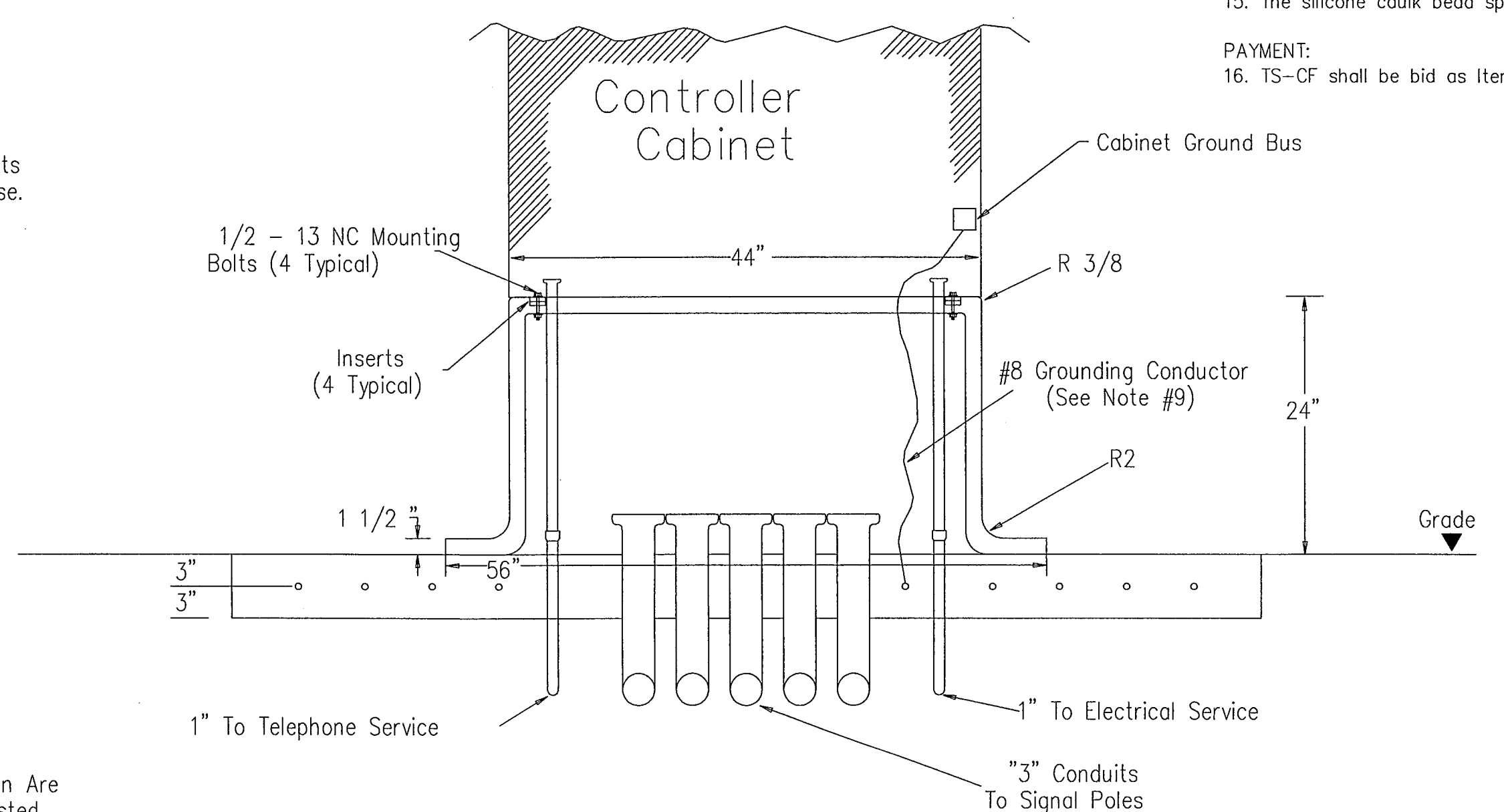


TOP VIEW
(Slab Only)

Conduit Direction Leaving Foundation Are Diagramatic Only And May Be Adjusted As Shown On Layouts.

Number of Conduits To Be As Shown on Layouts Plus Two For Future Use.

Conduit Direction Leaving Foundation Are Diagramatic Only And May Be Adjusted As Shown On Layouts.

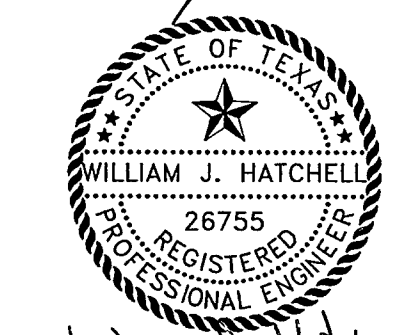


SIDE VIEW
(Slab & Base)

GENERAL NOTES

- CONCRETE:
- Concrete shall be class B minimum in accordance with Item 421. Slab shall be constructed in accordance with Item 531.
 - Reinforcement shall be welded wire mesh 6X6-W2.9 X W2.9. Joints and splices in the mesh shall have a minimum 6-inch overlap.
 - Mesh shall have a minimum 3 inch cover on the edges and shall be centered between top and bottom.
- CONDUITS:
- 3-inch conduits shall be stubbed up through the slab and run to the various traffic signal poles and ground boxes as shown on the layouts. Contractor shall install the number of conduits as shown on layouts plus two additional 3 inch conduits for future use. Conduits shall be terminated with a bushing between 2 and 4-inches above the slab.
 - Future use conduits shall be extended at least 18-inches from the edge of the slab, shall be terminated underground with a coupling, and shall be capped and sealed so that the seal can be removed without damaging the coupling.
 - Two separate 1-inch conduits shall be stubbed up through the slab from the electrical and telephone services. The conduit for the electrical feed shall be run directly to the electrical service enclosure.
 - The conduit for the telephone line shall be run directly to the telephone service, usually located on the same pole as the electrical service. Telephone shall not under any circumstance share a conduit with any other function. Telephone conduit not used at this time shall be capped and sealed, the same as the 3" future use conduits.
 - Electric and telephone conduits shall terminate above the slab with a coupling. After the base is installed, the conduits shall be extended above the top of the base and shall be secured to the base using a steel one-hole strap or similar suitable substitute.
 - A #8 AWG copper ground wire shall be bonded to the reinforcing mesh by a suitable clamp UL Listed for encasement in concrete and terminated to the cabinet grounding bus for the purpose of providing a local ground for the electrical grounding conductor. The electrical grounding conductor specified in Item 680-4(4) is still required and shall be terminated to the cabinet ground bus.
- BASE:
- The base shall be constructed of reinforced polymer concrete reinforced with continuous strands of borosilicate fiberglass cloth. Concrete shall be made from catalyzed polyester resin and aggregate, and shall have a minimum comprehensive strength of 11,000 psi. Polymer concrete containing chopped fiber or fiber reinforced plastic shall not be acceptable.
 - The base shall be permanently marked either by impress or by permanent ink with the manufacturer's model number and name or logo.
 - The base shall conform to the dimensions shown. Four (4) 1/2-13 NC stainless steel self cleaning inserts shall be provided to secure the controller to the base. Inserts shall withstand a minimum torque of 50 ft-lb and a minimum straight pull out strength of 750 lbs. The base, secured to the concrete slab per the manufacturer's instructions and with a controller cabinet attached, shall withstand a minimum wind load of 125 mph. Manufacturer shall supply certification sealed by a Texas Licensed Professional Engineer.
 - The base shall be sealed to the concrete with a silicone caulk bead and fastened to the slab per manufacturer's instructions.
- CONTROLLER CABINET:
- The controller cabinet shall be anchored to the base using four 1/2-13 NC bolts.
 - The silicone caulk bead specified in Item 680.5 shall be RTV 133.
- PAYMENT:
- TS-CF shall be bid as Item 656.

BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE SPECIALTIES INC. PROJECT COORDINATOR *Joseph Allen*



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: WILLIAM J. HATCHELL ON 2/18/01 ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: WJH	REVIEWED: DWG: 249DETAILS-ELEC

ARAPAHO ROAD PHASE II
TRAFFIC SIGNAL - CONTROLLER
SLAB AND BASE

TOWN OF ADDISON

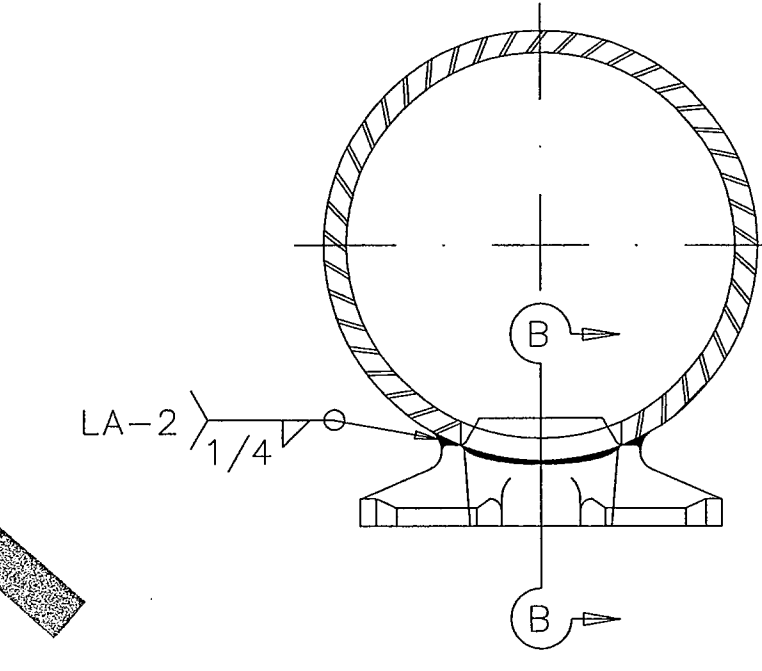
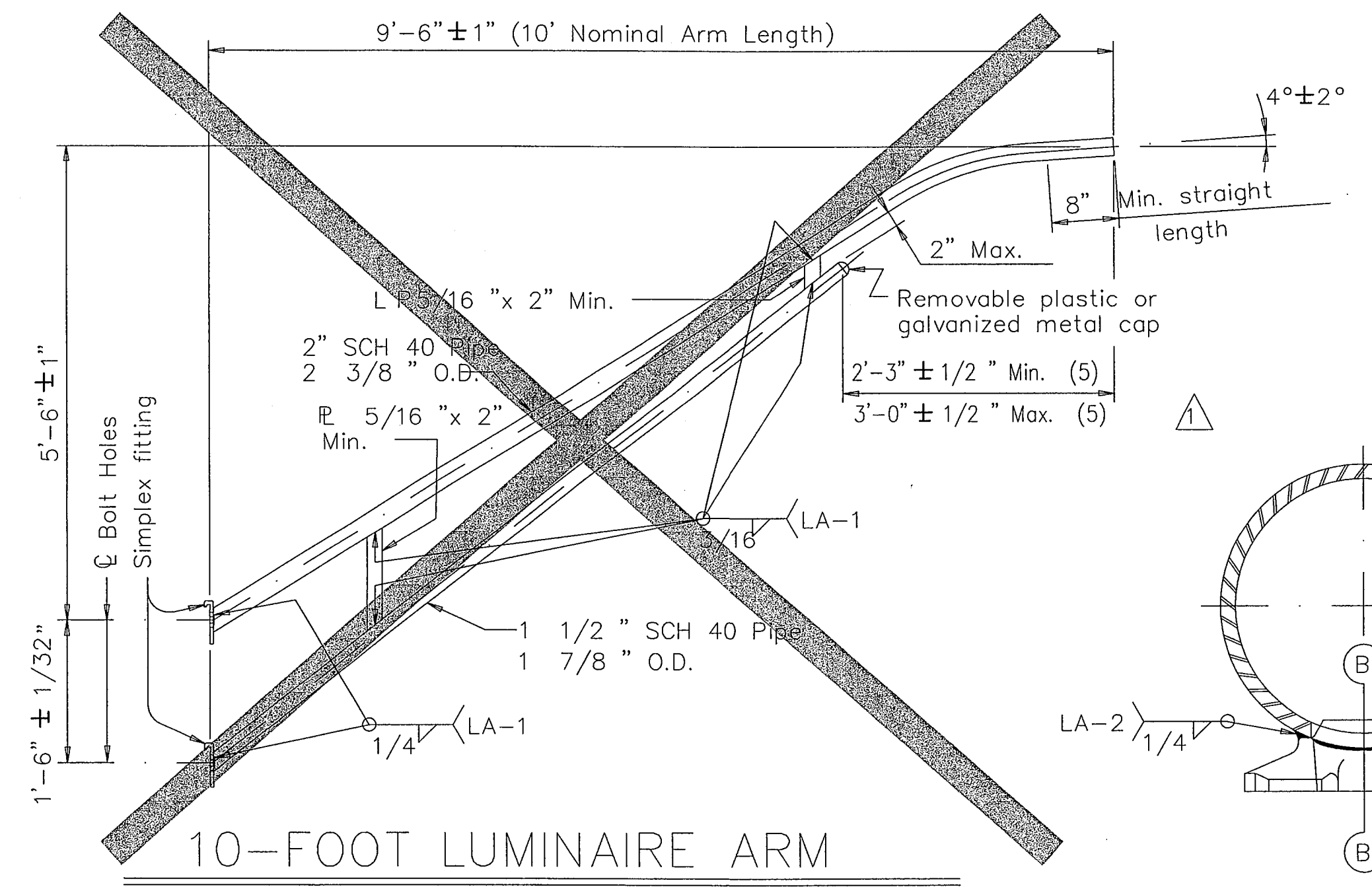
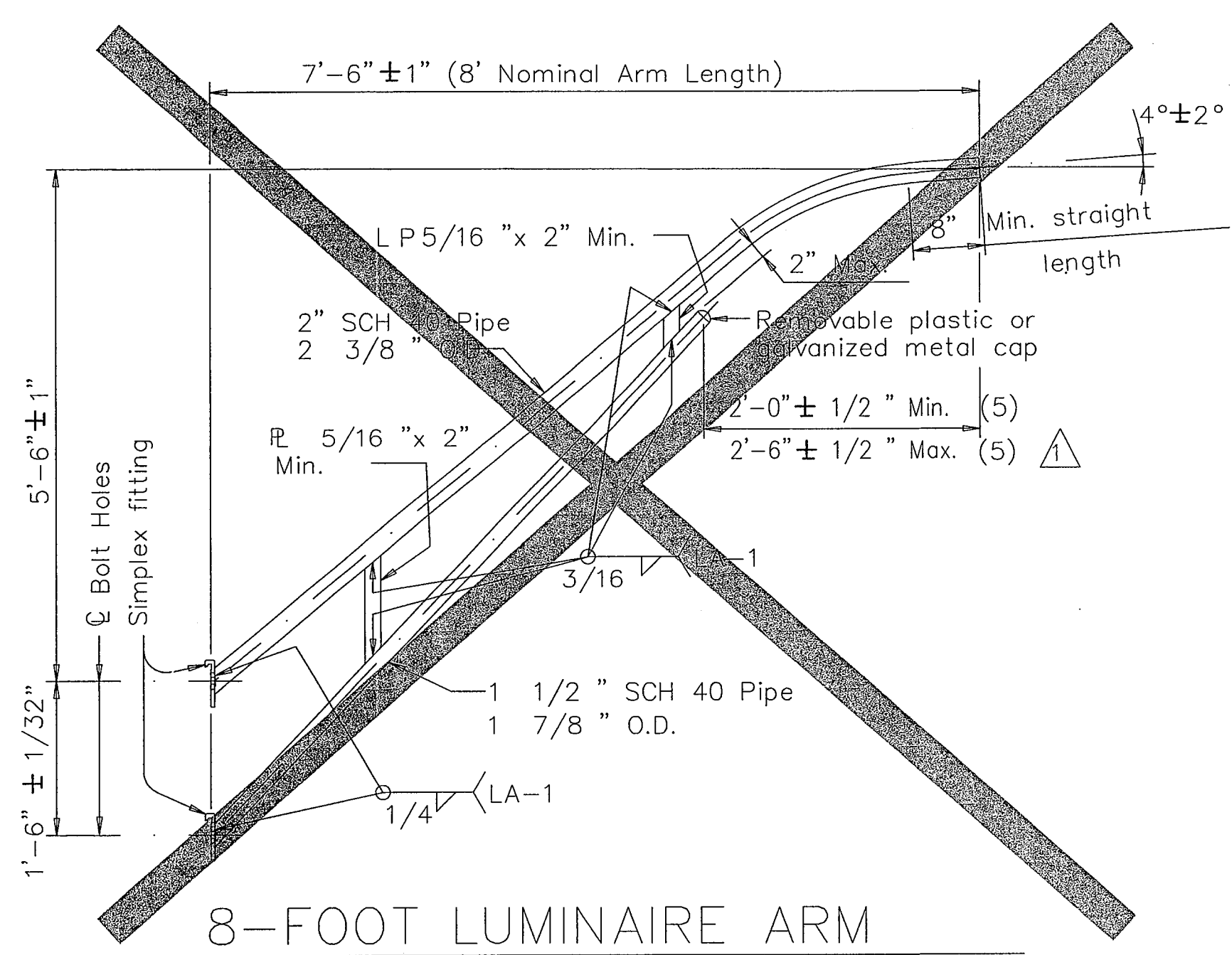
Grantham, Burge & Waldbauer
Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

SHT. TS-13 OF TS-21

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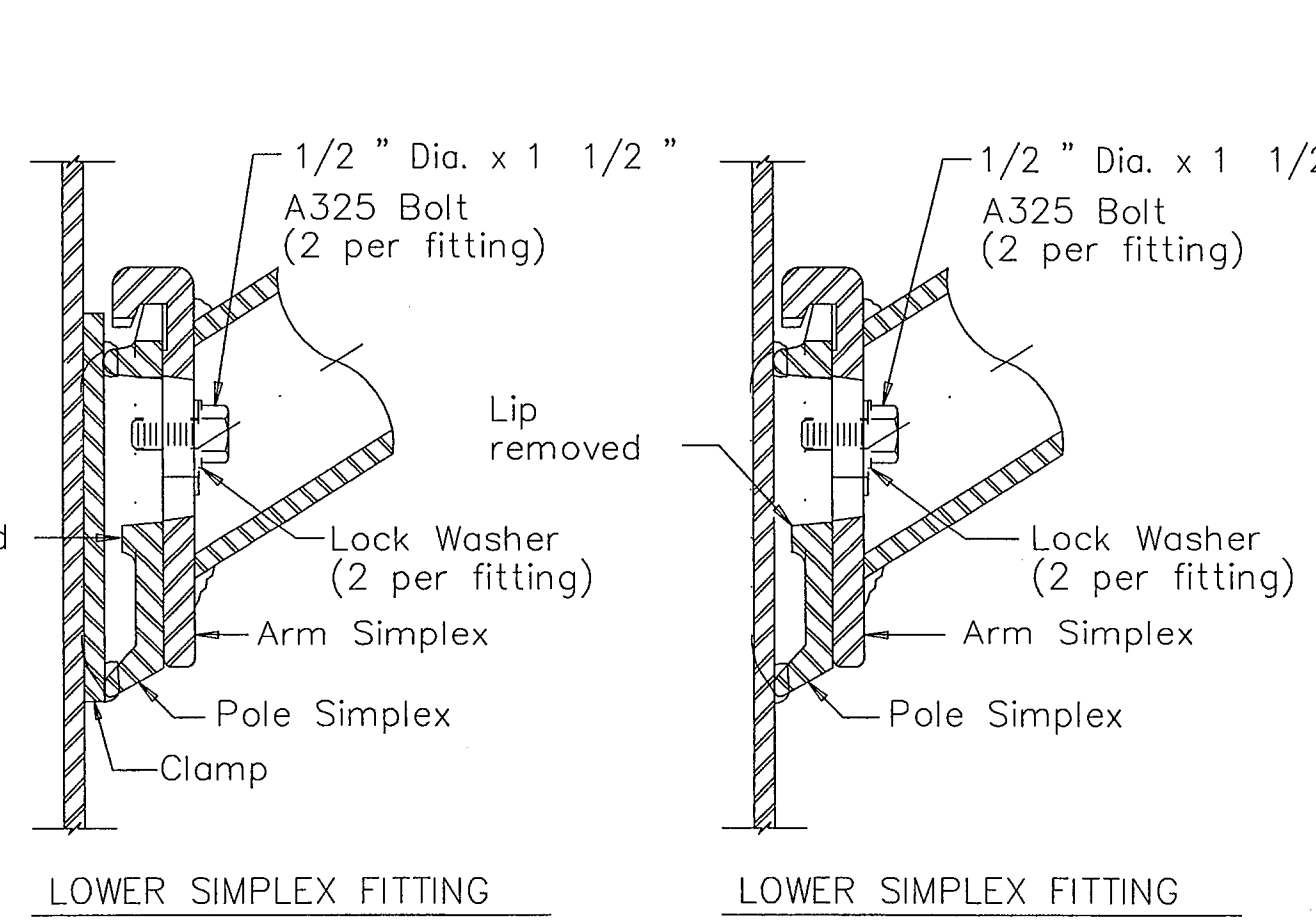
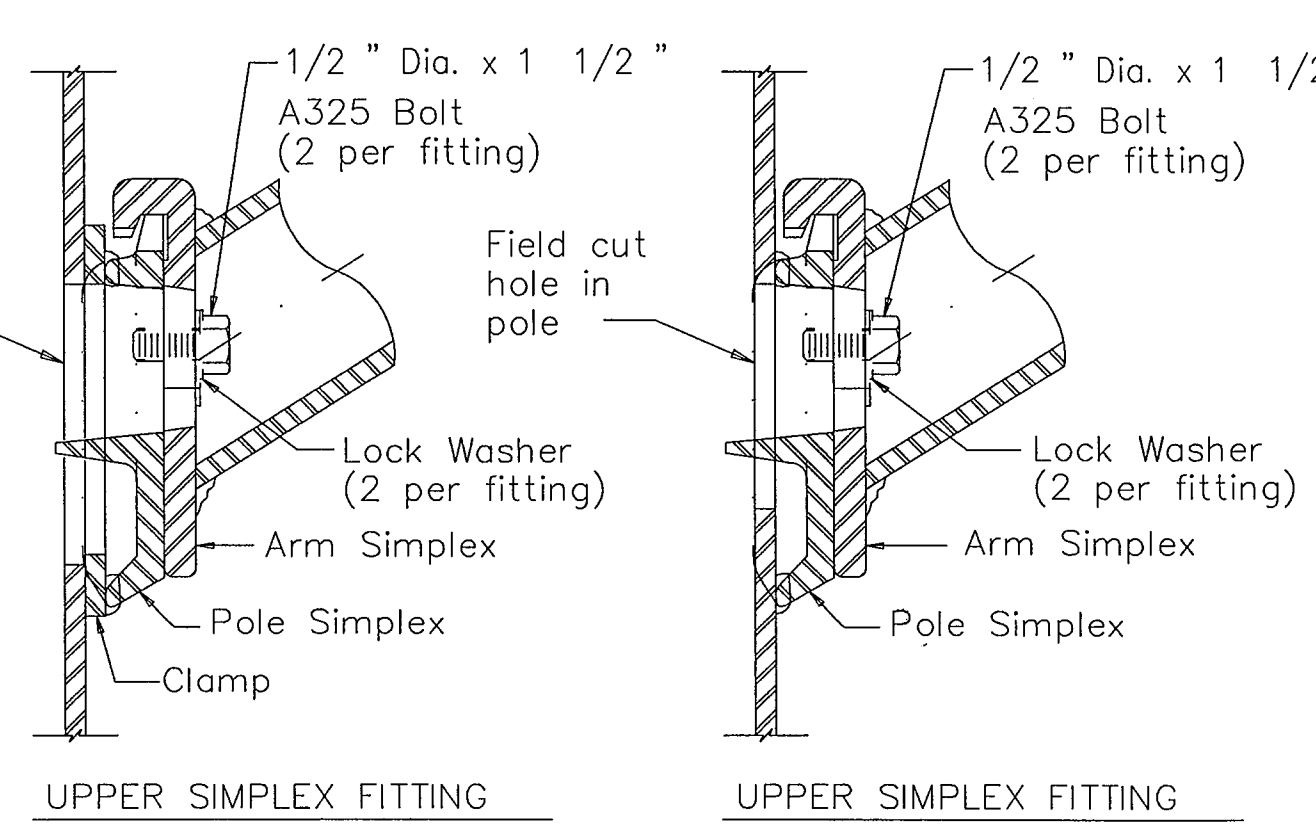
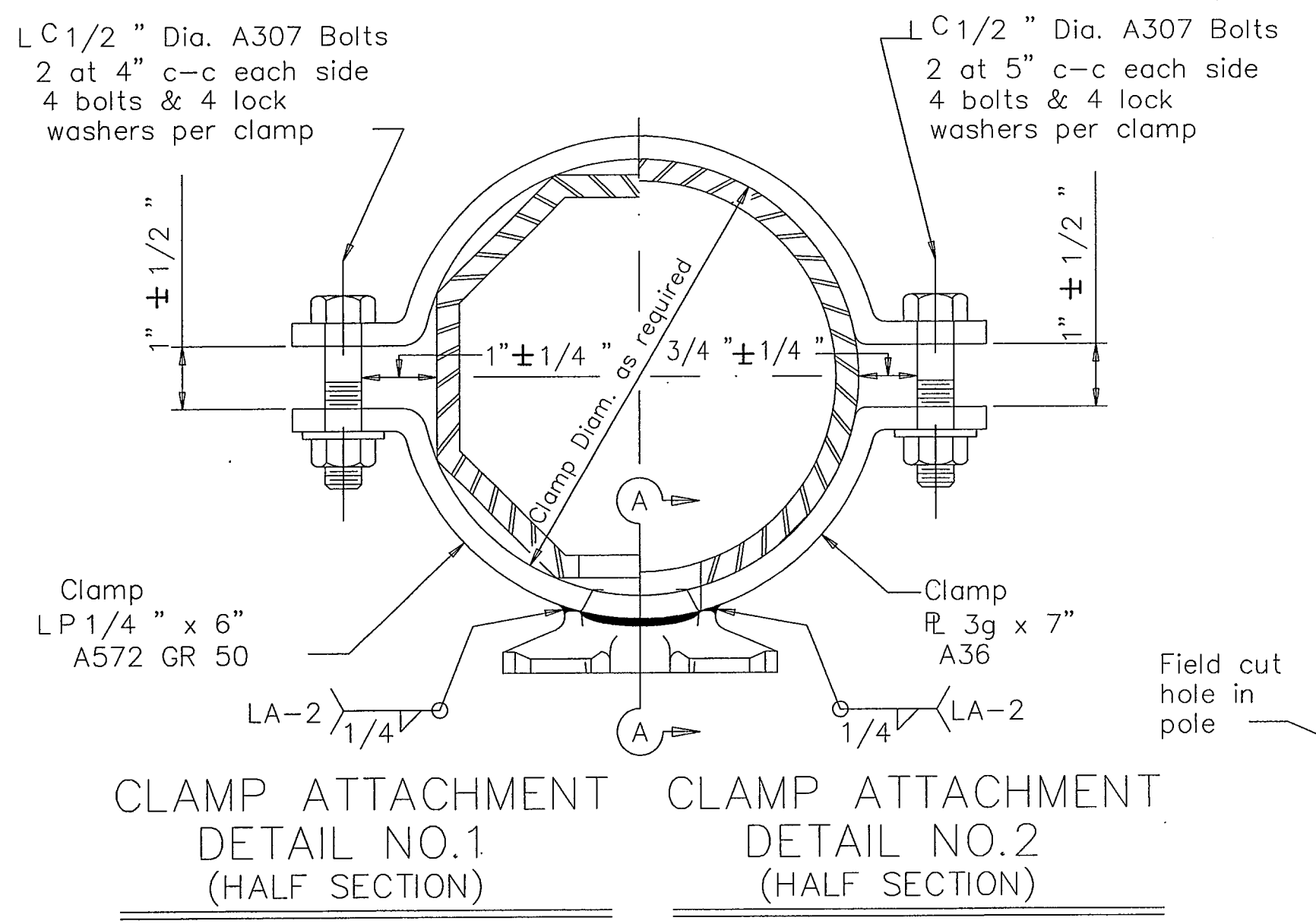
NO.	DATE	REVISION	APPROV.
1			
2			
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MATERIALS	
Pole or Arm Simplex	ASTM A27 GR 65-35 or A148 GR 80-50 or A576 GR 1021 (4) or A36 (Arm only)
Arm Pipes	ASTM A53 GR A or B or A500 GR B or A501 or A595 (2) or A715 GR 50
Arm Plates (3)	ASTM A36 or A572 GR50 (1) or A595 GR A or A588
Misc.	ASTM designations as noted

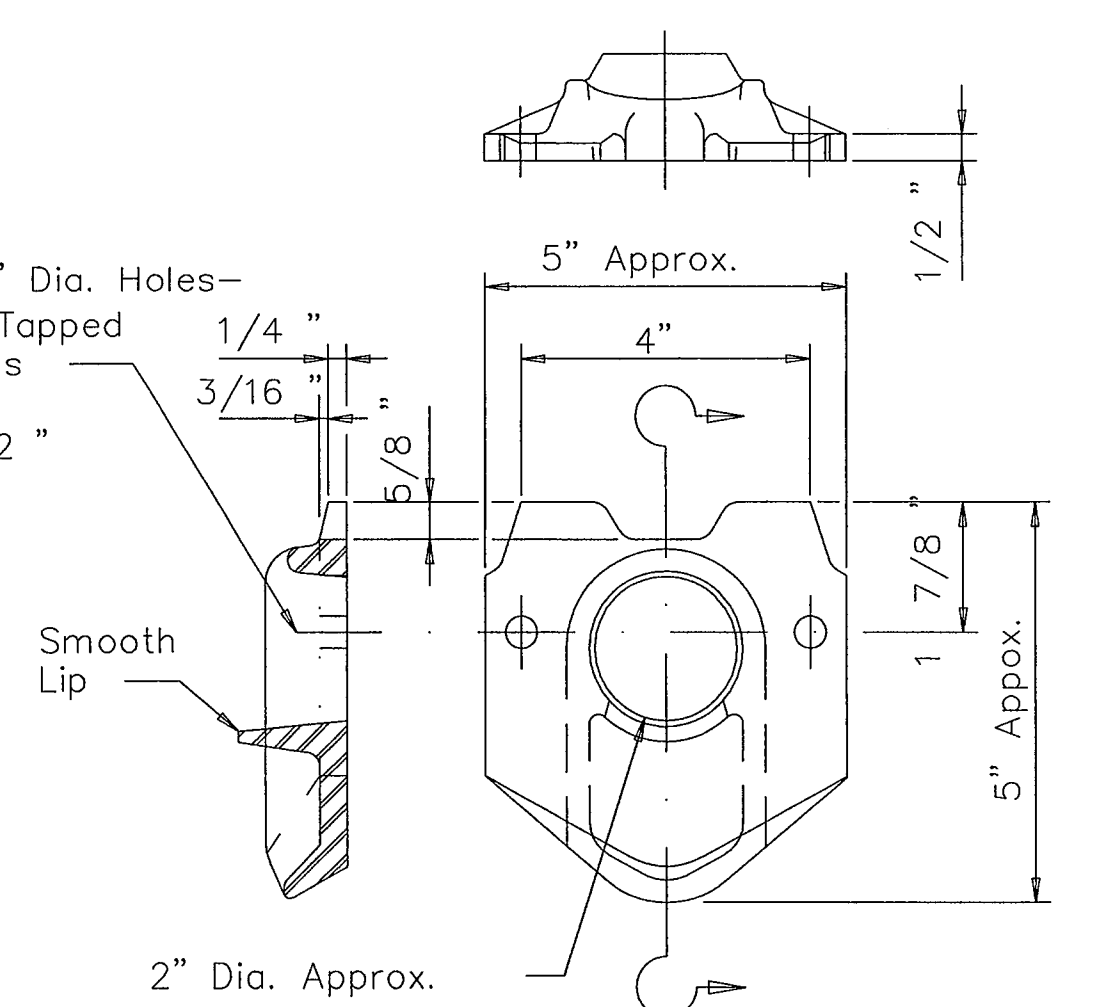


DIRECT ATTACHMENT DETAIL

- (1) ASTM A36M50 steel as described in Item 442 "Metal for Structures" may be used in lieu of A 572 GR 50.
- (2) If A595 GR A material is used, arm need not be cold worked to A595 requirements, but material must have 40 ksi minimum yield prior to fabrication.
- (3) Either of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.
- (4) A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.
- (5) Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.



SECTION A-A SECTION B-B



POLE SIMPLEX DETAIL

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. Design Wind Speed equals 90 mph plus a 1.3 gust factor. Arms are designed to support a 75 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.5 sq. ft.

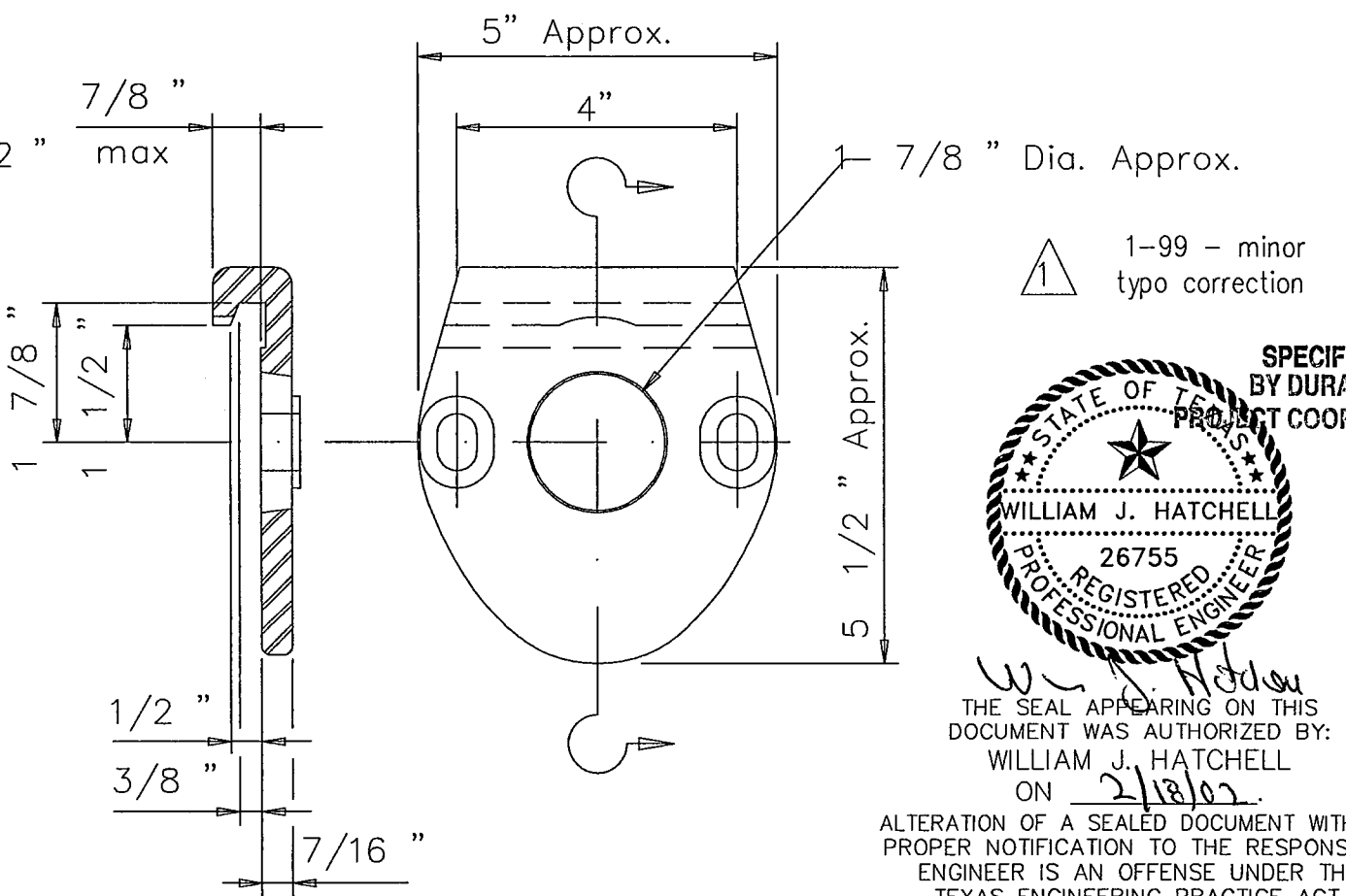
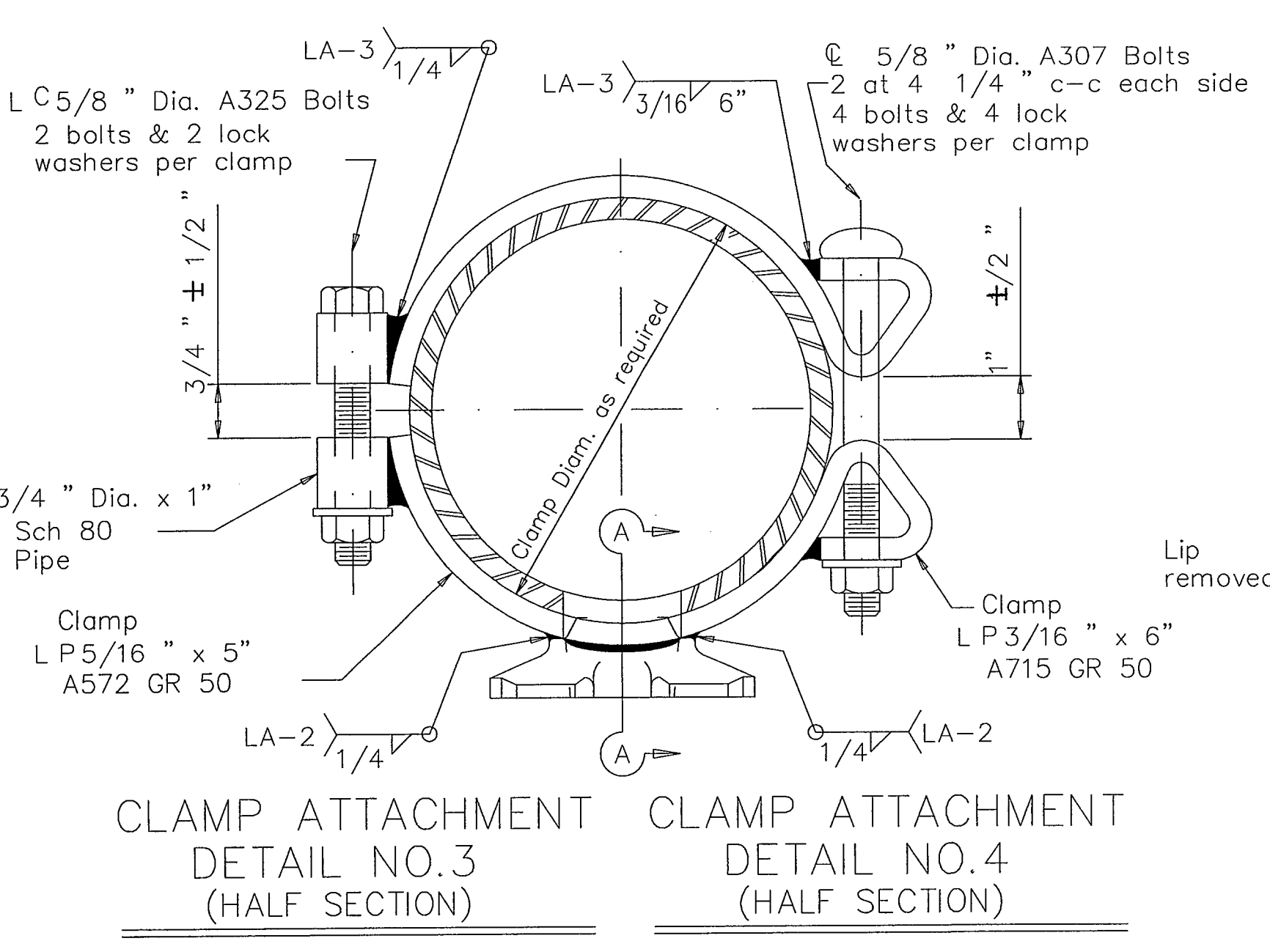
Materials and fabrication shall be in accordance with the Specifications and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absence of specified Fabricator tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.

Unless otherwise noted, all parts shall be galvanized after fabrication in accordance with the Specifications.

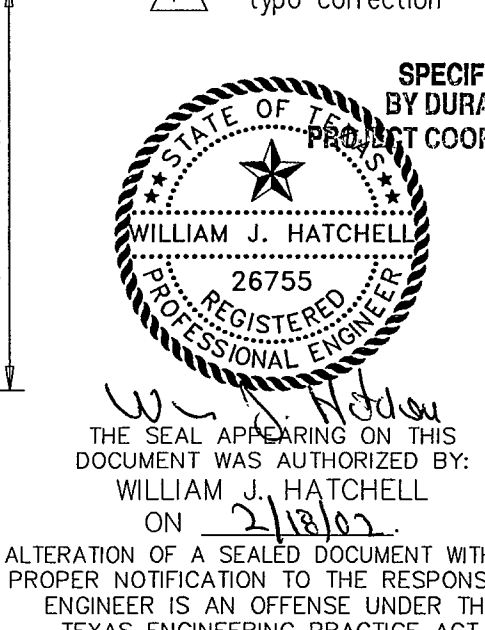
Special designs require submission of shop drawings in accordance with the item "Steel Structures".

Each pole simplex fitting shall be supplied with 2 A325 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans. When clamp attachment is specified, the Fabricator shall ship the clamp assembly securely attached to the pole at the location shown on the plans.

If clamp assemblies are ordered without poles, the Fabricator shall ship one upper and one lower clamp assembly together in a single package, including all nuts and washers required for the clamps and simplex fittings.



ARM SIMPLEX DETAIL



THIS DETAIL SHEET WAS OBTAINED FROM TXDOT

BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE SPECIALTIES INC. PROJECT COORDINATOR

DATE: DECEMBER, 2001 SCALE: NOT TO SCALE JOB NO.: 00-249
 DRAWN: GBW DESIGN: WJH REVIEWED: DWG: 249DETAILS-ELEC

ARAPAHO ROAD PHASE II
STANDARD CONSTRUCTION DETAILS
SUPPORT STRUCTURES - ARM DETAILS

TOWN OF ADDISON

Grantham, Burge & Waldbauer
 Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042 (972) 840-1916 (TEL) (972) 840-2156 (FAX)

SHT. TS-14 OF TS-21

ARM SIZE		A	B	C	D	E	CONN BOLT DIA.
D ₁	±	in.	in.	in.	in.	in.	in.
6.5	.179	12	9	9	6	1	1
7.5	.179	13	9	10	6	1	1
8.0	.179	14	10	11	7	1 1/4	1 1/4
9.0	.179	16	11	13	8	1 1/4	1 1/4
9.5	.179	17	12	14	9	1 1/4	1 1/4
9.5	.239	18	12	15	9	1 1/4	1 1/4
10.0	.239	18	12	15	9	1 1/4	1 1/4
10.5	.239	18	13	15	10	1 1/2	1 1/2
11.0	.239	18	13	15	10	1 1/2	1 1/2

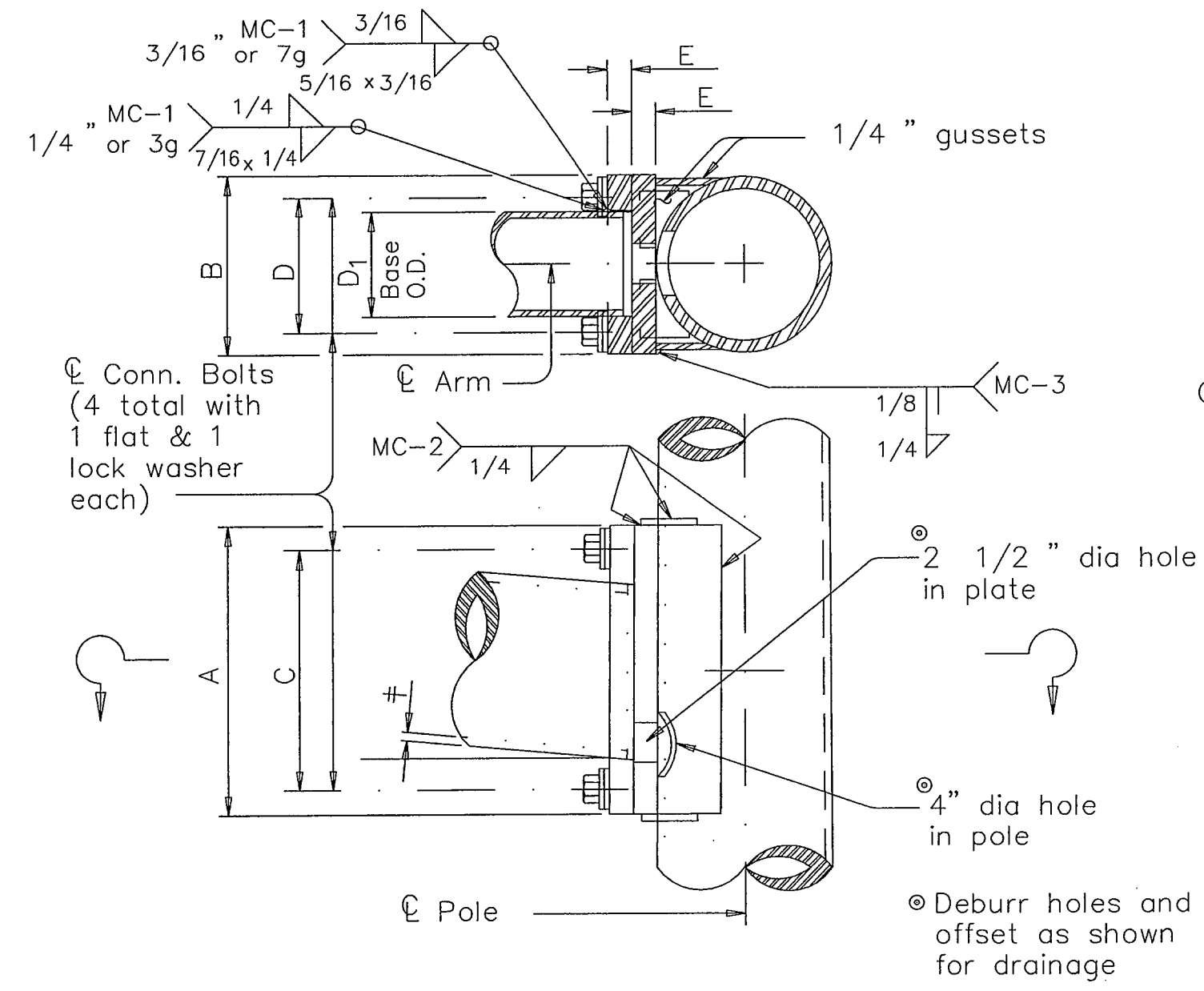
ARM SIZE		A	B	C	D	E	CONN BOLT DIA.
D ₁	±	in.	in.	in.	in.	in.	in.
7.0	.179	11	11	8	8	1 1/4	1 1/4
7.5	.179	11	11	8	8	1 1/4	1 1/4
8.0	.179	11	11	8	8	1 1/4	1 1/4
9.0	.179	13	13	10	10	1 1/4	1 1/4
10.0	.179	13	13	10	10	1 1/4	1 1/4
9.5	.239	13	13	10	10	1 1/4	1 1/4
10.0	.239	14	14	11	11	1 1/2	1 1/2
11.0	.239	14	14	11	11	1 1/2	1 1/2
11.5	.239	14	14	11	11	1 1/2	1 1/2

NO.	DATE	REVISION	APPROV.
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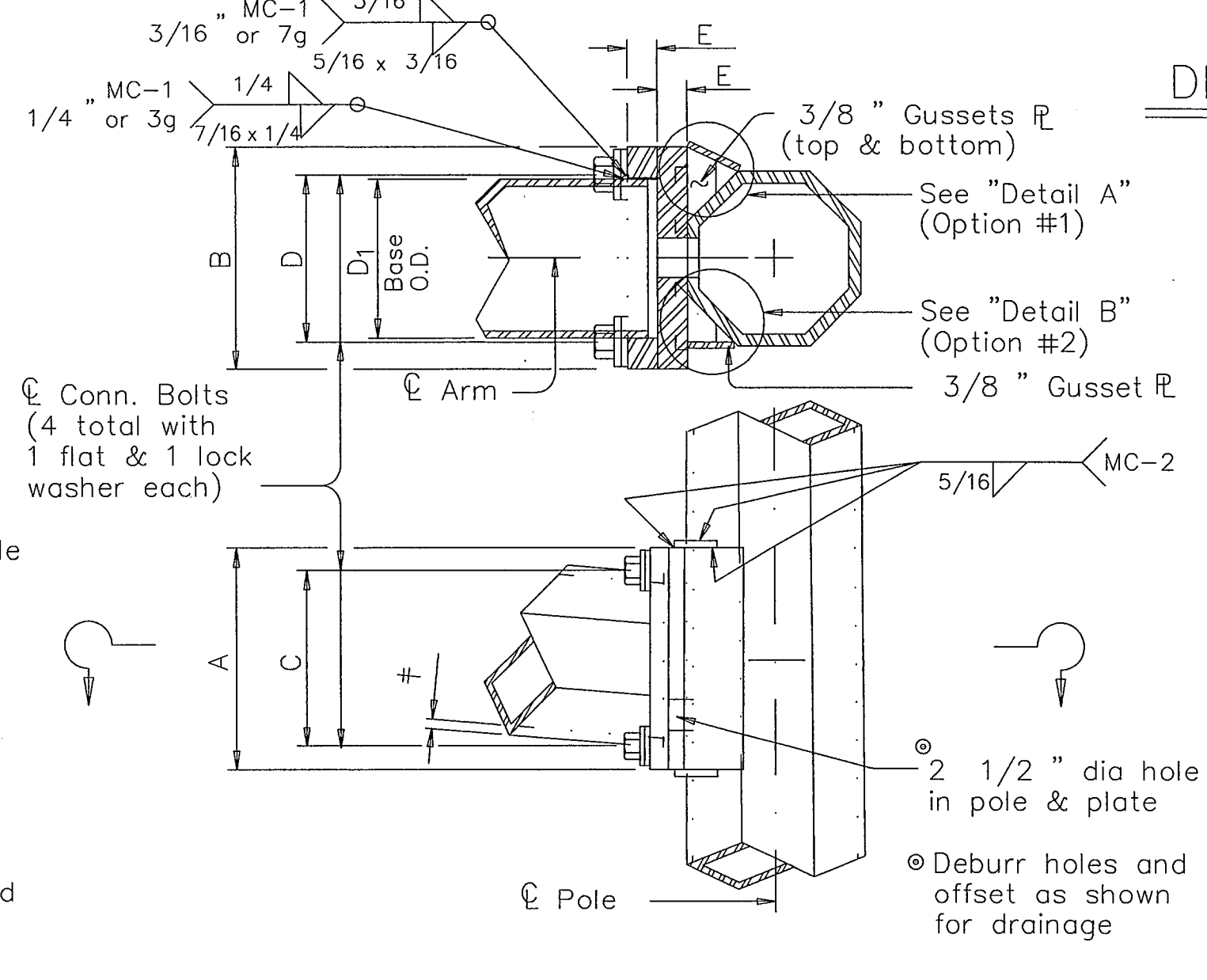
MATERIALS	
Round Shafts or Polygonal Shafts	ASTM A595 GR A, ASTM A570 GR 50, ASTM A607 GR 50, ASTM A572 GR 50 or A36M50
Plates (1)	ASTM A36 OR A572 GR 50 or A595 (2) or A36M50
Connection Bolts	ASTM A325 except where noted
Pin Bolts	ASTM A325
Pipe	ASTM A53 GR A or B, or A501
Misc. Hardware	Galvanized steel or stainless steel or as noted

(1) Any of the materials listed for plates may be used where the drawings do not specify a particular Grade designation.

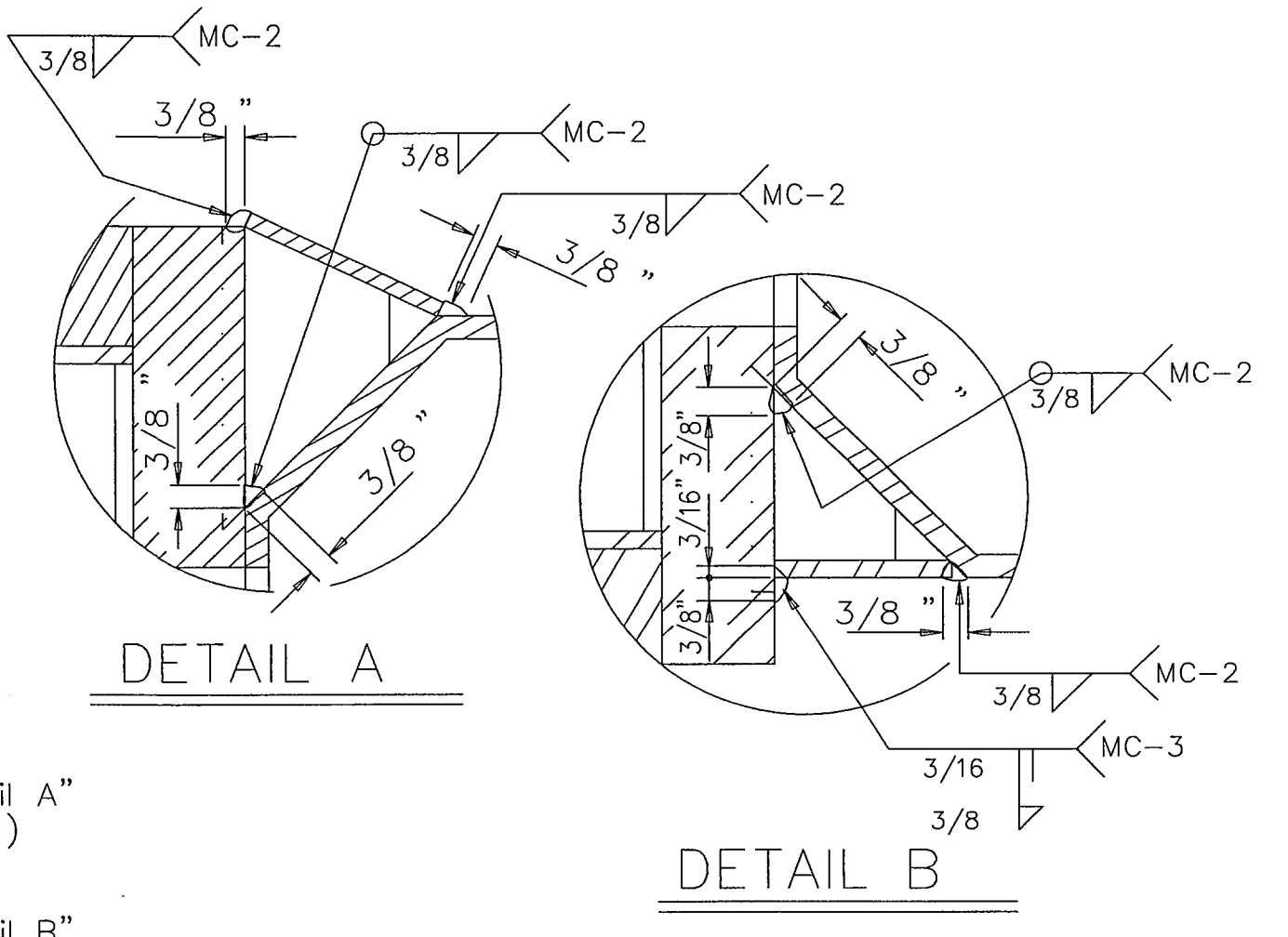
(2) If A595 material is used, it need not be cold worked to A595 requirements, but material must have 40 ksi minimum yield prior to fabrication.



FIXED MOUNT DETAIL 1

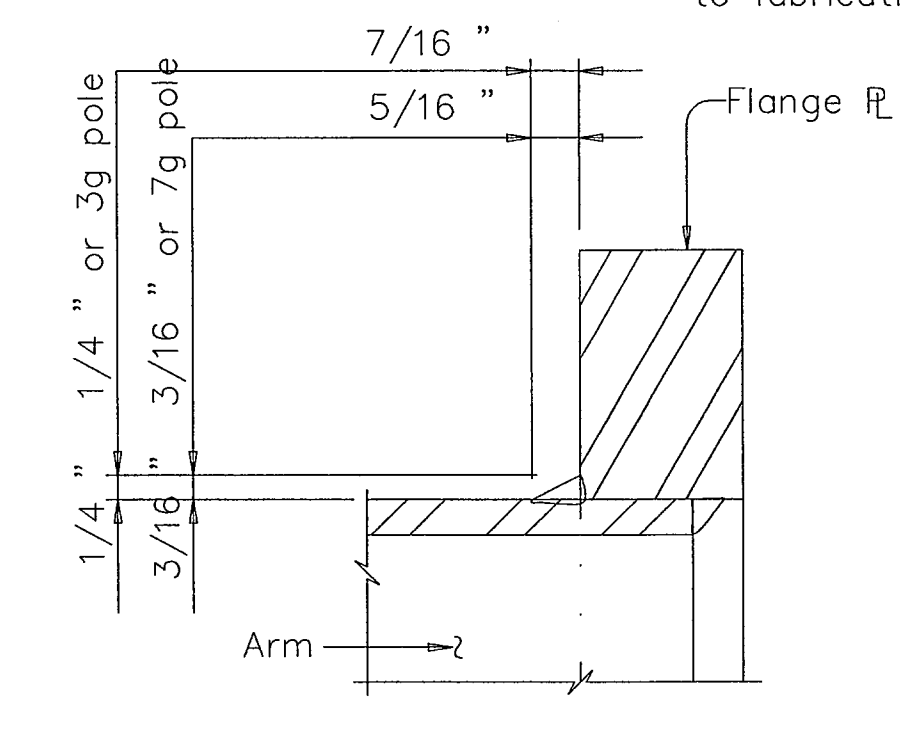


FIXED MOUNT DETAIL 2

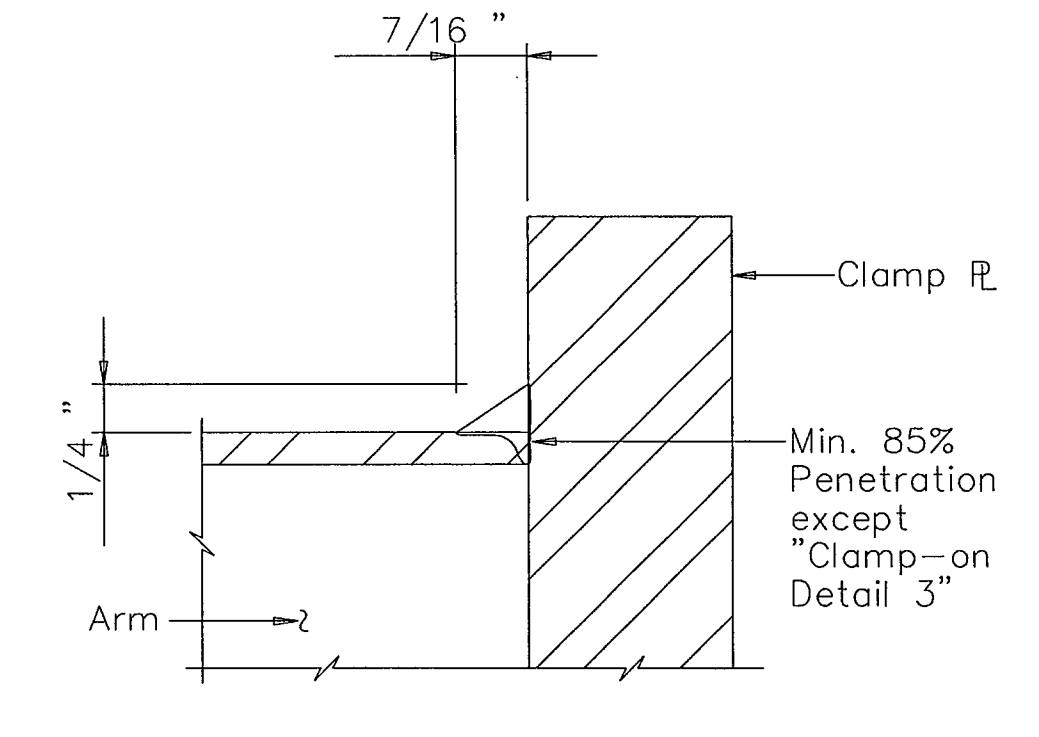


DETAIL A

DETAIL B



FIXED MOUNT ARM



CLAMP-ON ARM

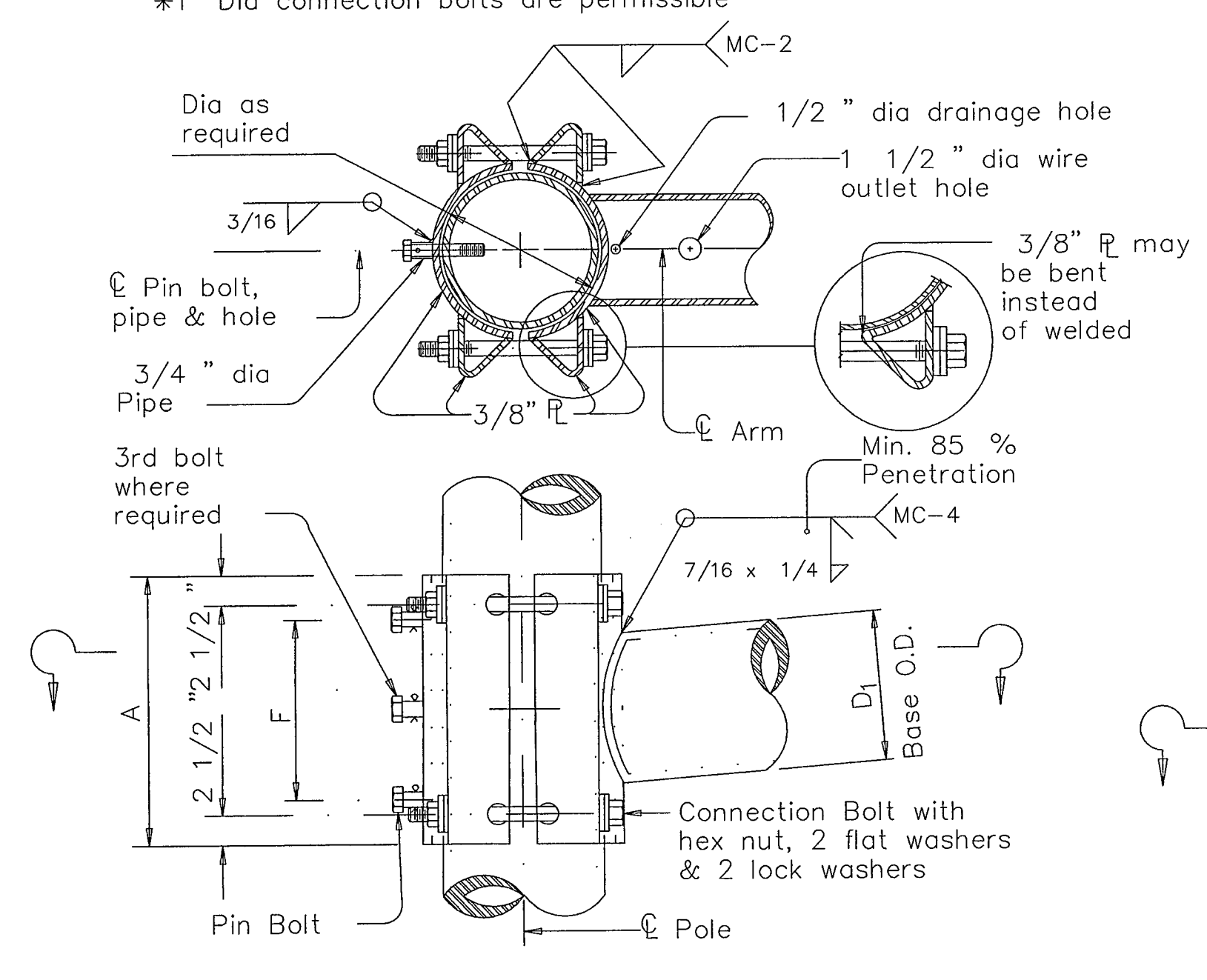
ARM BASE WELD DETAILS

ARM SIZE		A	F	CONN. BOLTS		PIN BOLTS	
D ₁	±	in.	in.	No.	Dia	No.	Dia
6.5	.179	12	8	4	*7/8	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	4	1 1/4	3	5/8
9.5	.239	18	12	4	1 1/4	3	5/8
10.0	.239	18	12	4	1 1/4	3	5/8

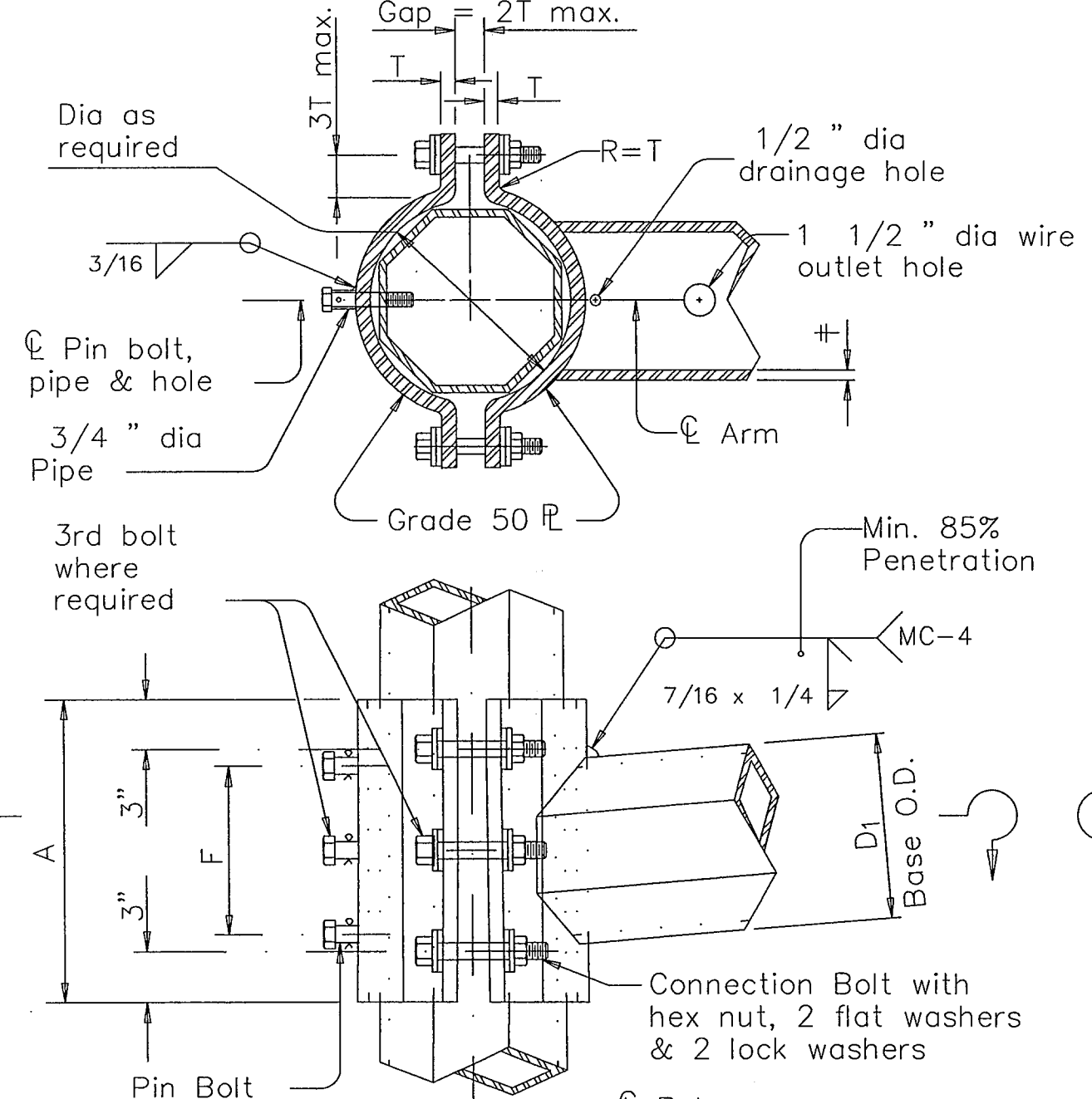
*1" Dia connection bolts are permissible

ARM SIZE		A	F	T	CONN. BOLTS		PIN BOLTS	
D ₁	±	in.	in.	in.	No.	Dia	No.	Dia
7.0	.179	12	8	3/4	4	3/4	2	5/8
7.5	.179	14	8	3/4	4	3/4	2	5/8
8.0	.179	14	8	3/4	4	3/4	2	5/8
9.0	.179	16	10	7/8	4	1	2	5/8
10.0	.179	18	10	7/8	4	1	2	5/8
9.5	.239	18	10	1	6	1	3	5/8
10.0	.239	18	10	1	6	1	3	5/8

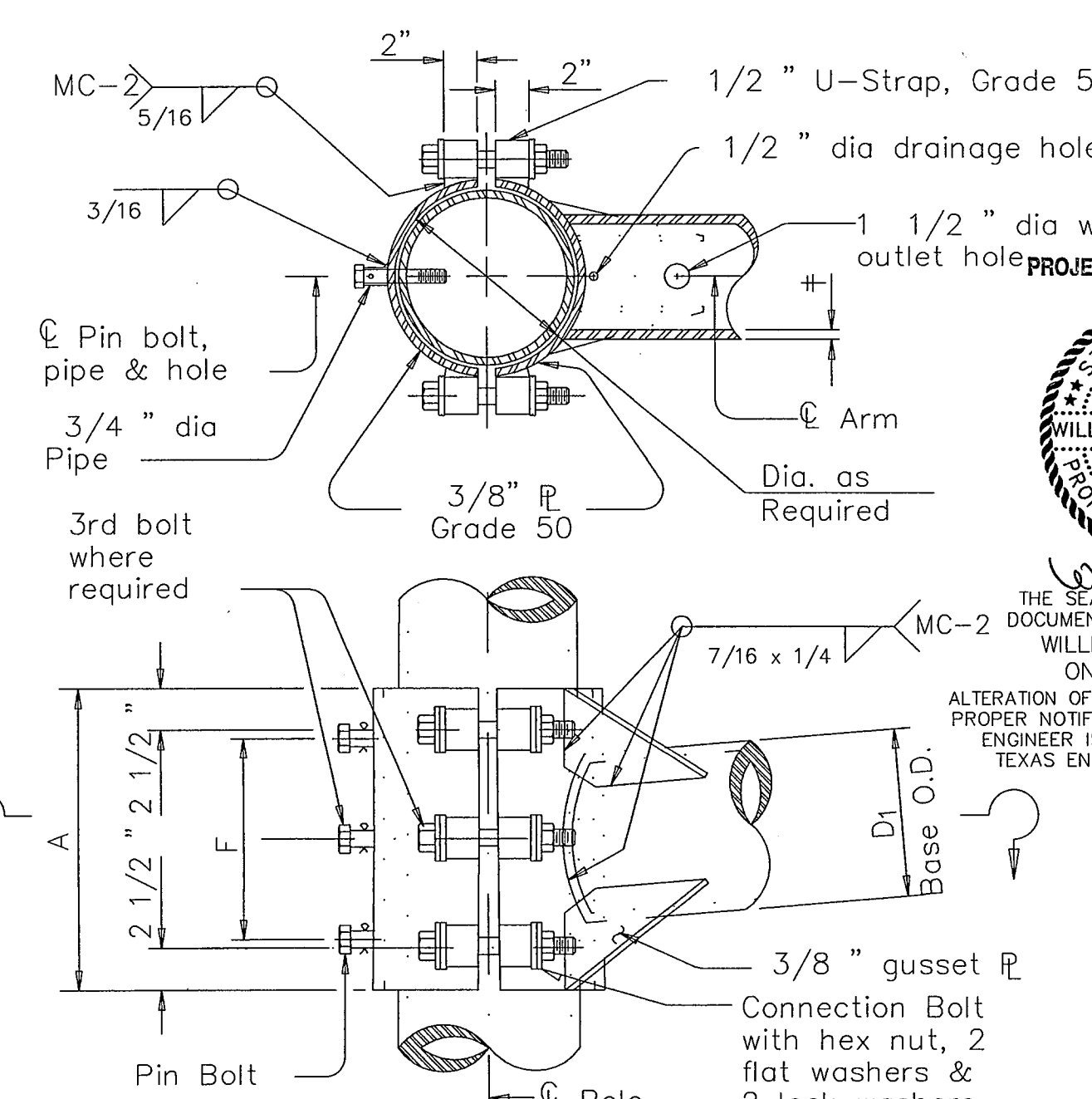
ARM SIZE		A	F	CONN. BOLTS		PIN BOLTS	
D ₁	±	in.	in.	No.	Dia	No.	Dia
6.5	.179	12	8	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	6	1	3	5/8
9.5	.239	18	12	6	1	3	5/8
10.0	.239	18	12	6	1	3	5/8



CLAMP-ON DETAIL 1



CLAMP-ON DETAIL 2



CLAMP-ON DETAIL 3

GENERAL NOTES:

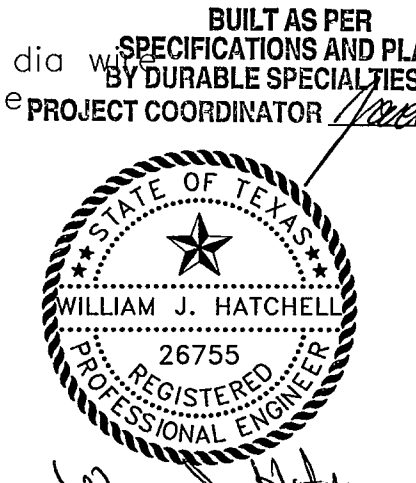
Clamp-on details are used for the second arm on dual mast arm assemblies. A Maximum 1 1/2" wide vertical slotted hole may be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1"

Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast arm assemblies.

Where duplicate parts occur on a detail, welds shown for one part shall apply to all similar parts on the detail.

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces.

NOTE: Pin bolts shall be A325 with threads excluded from the shear plane. Pin bolt and 3/4" dia pipe shall have 3/16" dia holes for a 1/8" dia galvanized cotter pin. Back clamp plate shall be furnished with a 3/4" dia hole for each pin bolt. An 11/16" dia hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: WILLIAM J. HATCHELL ON 2/18/12

DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: WJH	REVIEWED: DWG: 249DETAILS-TRAF

ARAPAHO ROAD PHASE II
TRAFFIC SIGNAL SUPPORT STRUCTURES
STANDARD DETAIL

TOWN OF ADDISON

Grantham, Burge & Waldbauer
Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2155 (FAX)

SHT. TS-16
OF TS-21

THIS DETAIL SHEET WAS OBTAINED FROM TXDOT

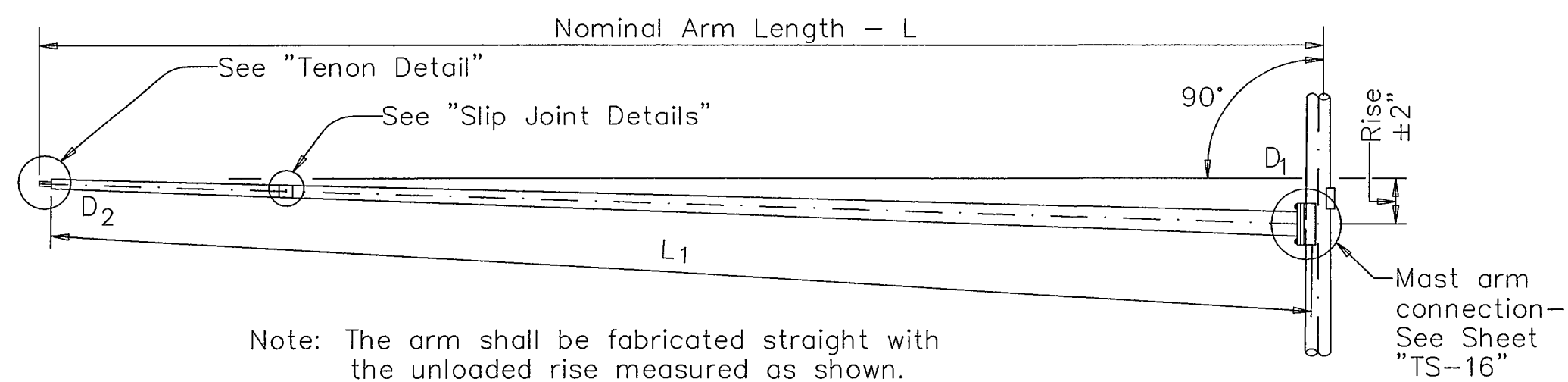
NO.	DATE	REVISION	APPROV.
1			
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3			

Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D _B	D ₁₉	D ₂₄	D ₃₀	① thk	D _B	D ₁₉	D ₂₄	D ₃₀	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	10.5	7.8	7.1	6.3	.179	11.5	8.5	7.7	6.8	.179	30-A
24	11.0	8.3	7.6	6.8	.179	12.0	9.0	8.2	7.3	.179	30-A
28	11.5	8.8	8.1	7.3	.179	12.5	9.5	8.7	7.8	.179	30-A
32	12.5	9.8	9.1	8.3	.179	12.0	9.0	8.2	7.3	.239	30-A
36	12.0	9.3	8.6	7.8	.239	12.5	9.5	8.7	7.8	.239	36-A
40	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
44	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
48	13.0	10.3	9.6	8.8	.239	15.0	12.0	11.2	10.3	.239	36-A

Arm Length	ROUND ARMS					POLYGONAL ARMS				
	L ₁	D ₁	D ₂	① thk	Rise	L ₁	D ₁	② D ₂	① thk	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	6.5	3.8	.179	1'-9"	19.1	7.0	3.5	.179	1'-8"
24	23.1	7.5	4.3	.179	1'-10"	23.1	7.5	3.5	.179	1'-9"
28	27.1	8.0	4.2	.179	1'-11"	27.1	8.0	3.5	.179	1'-10"
32	31.0	9.0	4.7	.179	2'-1"	31.0	9.0	3.5	.179	2'-0"
36	35.0	9.5	4.6	.179	2'-4"	35.0	10.0	3.5	.179	2'-1"
40	39.0	9.5	4.1	.239	2'-8"	39.0	9.5	3.5	.239	2'-3"
44	43.0	10.0	4.1	.239	2'-11"	43.0	10.0	3.5	.239	2'-6"
48	47.0	10.5	4.1	.239	3'-4"	47.0	11.0	3.5	.239	2'-9"

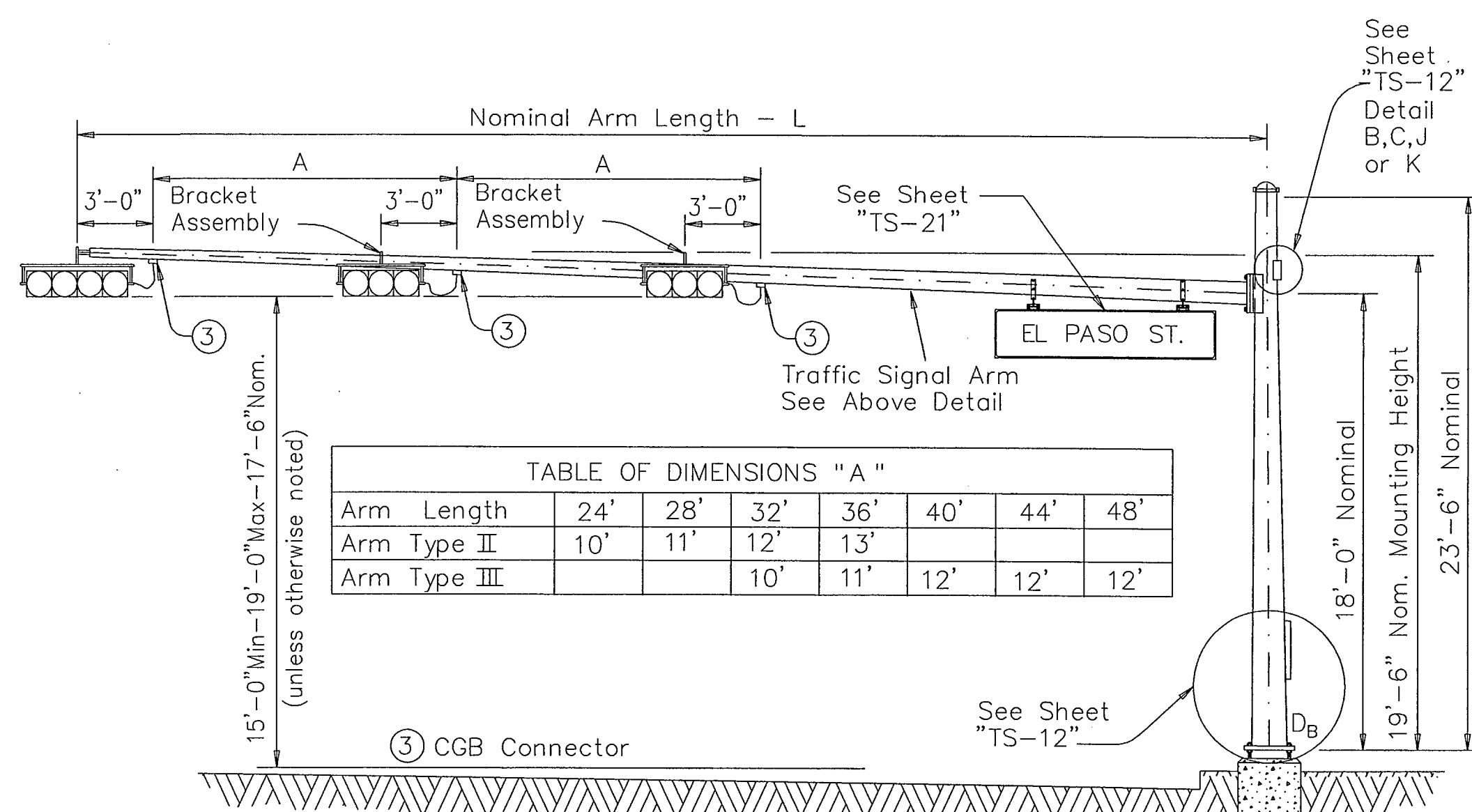
D_B = Pole Base O.D.
D₁₉ = Pole Top O.D. with no Luminaire and no ILSN
D₂₄ = Pole Top O.D. with ILSN w/out Luminaire
D₃₀ = Pole Top O.D. with Luminaire
D₁ = Arm Base O.D.
D₂ = Arm End O.D.
L₁ = Shaft Length
L = Nominal Arm Length

① Thickness shown are minimums, thicker materials may be used.
② D₂ may be increased by up to 1" for polygonal arms.



Note: The arm shall be fabricated straight with the unloaded rise measured as shown.

TRAFFIC SIGNAL ARM
(Fixed Mount)



Arm Length	24'	28'	32'	36'	40'	44'	48'
Arm Type II	10'	11'	12'	13'			
Arm Type III			10'	11'	12'	12'	12'

STRUCTURE ASSEMBLY

VIBRATION WARNING

Mast Arms of approximately 40' or longer are subject to possible harmonic vertical vibrations in light wind conditions due to unusual combinations of signal numbers, weights or positions, arm-wind orientation, and arm-pole stiffness. Arms shall be visually inspected in 5 to 20 mph wind conditions after signal head installation and, if vertical movements with a total excursion (max positive to max negative) of more than approximately 8" are observed at arm tip, damping devices or other means shall be fitted to the arm(s). The necessary damping device(s) or other remedial measures shall be as recommended by the fabricator. Excessive vibrations shall not be allowed to continue for more than two days.

SHIPPING PARTS LIST

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed-arm connection bolts and washers and any additional hardware listed in the table.

Nominal Arm Length	30' Poles With Luminaire		24' Poles With ILSN		19' Poles With No Luminaire and No ILSN	
	Above hardware plus: One (or two if ILSN attached) small hand hole, clamp-on simplex		Above hardware plus one small hand hole		See note above	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20L-80		20S-80		20-80	
24	24L-80		24S-80		24-80	
28	28L-80		28S-80		28-80	1
32	32L-80		32S-80		32-80	
36	36L-80		36S-80		36-80	4
40	40L-80		40S-80		40-80	
44	44L-80		44S-80		44-80	
48	48L-80		48S-80		48-80	1

Traffic Signal Arms (1 per Pole)

Ship each arm with the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	1 CGB connector		1 Bracket Assembly and 2 CGB Connectors		2 Bracket Assemblies and 3 CGB Connectors	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80	1		
32			32II-80		32III-80	
36			36II-80	2	36III-80	2
40					40III-80	
44					44III-80	
48					48III-80	1

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	

④ Supply Option "A" unless otherwise noted

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

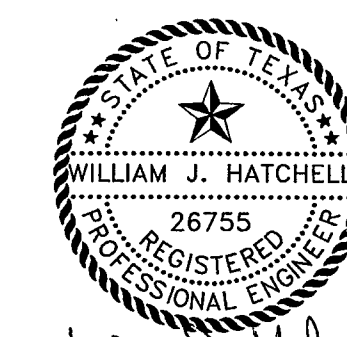
Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 1/2"	3'-4"	1
1 3/4"	3'-10"	5

Each anchor bolt assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, 4 lock washers and 4 nut anchor devices (Type 2) per Standard Drawing "TS-11".

Templates may be removed for shipment.



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BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE SPECIALTIES INC. PROJECT COORDINATOR

DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: WJH	REVIEWED: DWG: 249DETAILS-SIGN

ARAPAHO ROAD PHASE II
TRAFFIC SIGNAL SUPPORT STRUCTURES
SIGNAL MAST ARM ASSEMBLY - 1 of 2

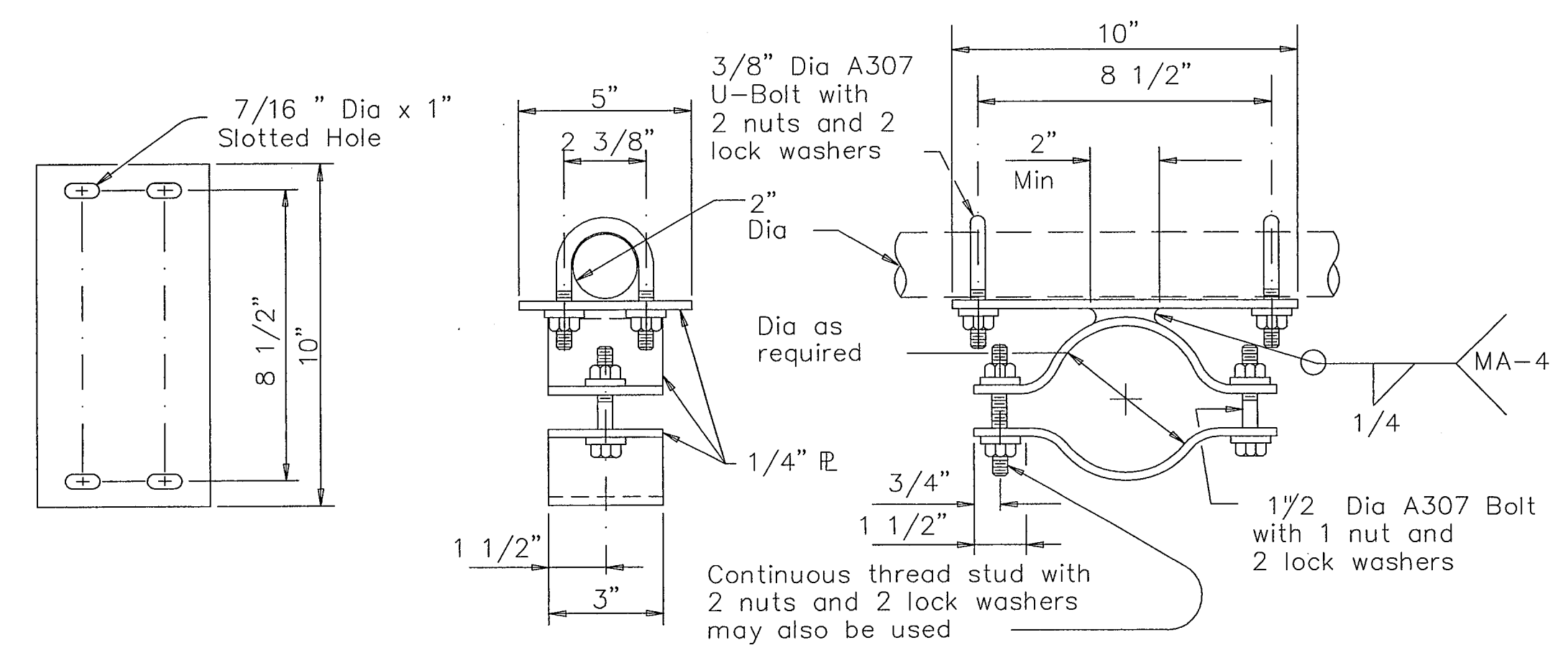
TOWN OF ADDISON

GBW Engineers, Inc.
Grantham, Burge & Waldbauer
1919 S. SHILOH ROAD, SUITE 530, LB. 27
GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

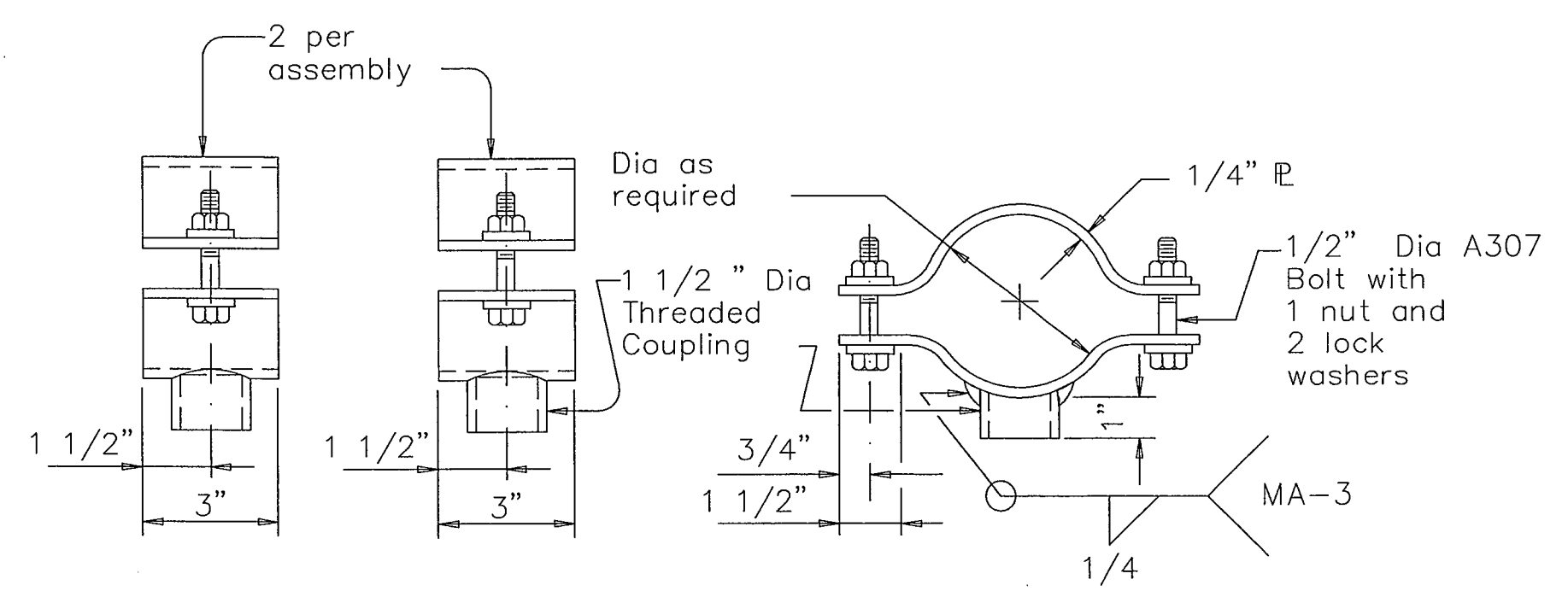
SHT. TS-17 OF TS-21

78B

NO.	DATE	REVISION	APPROV.
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BRACKET ASSEMBLY DETAILS OPTION A

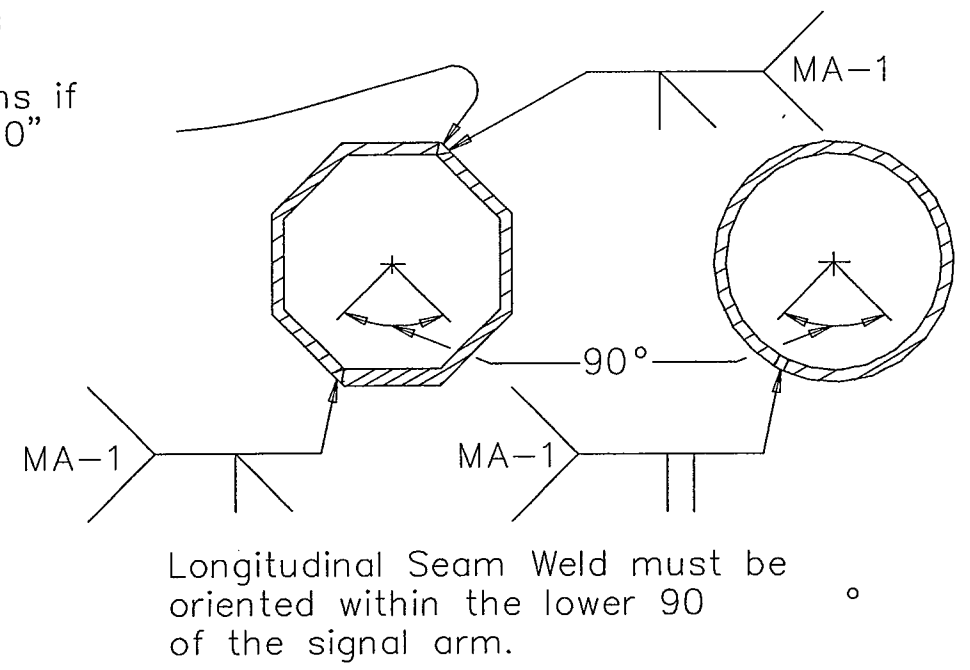


BRACKET ASSEMBLY DETAILS OPTION B

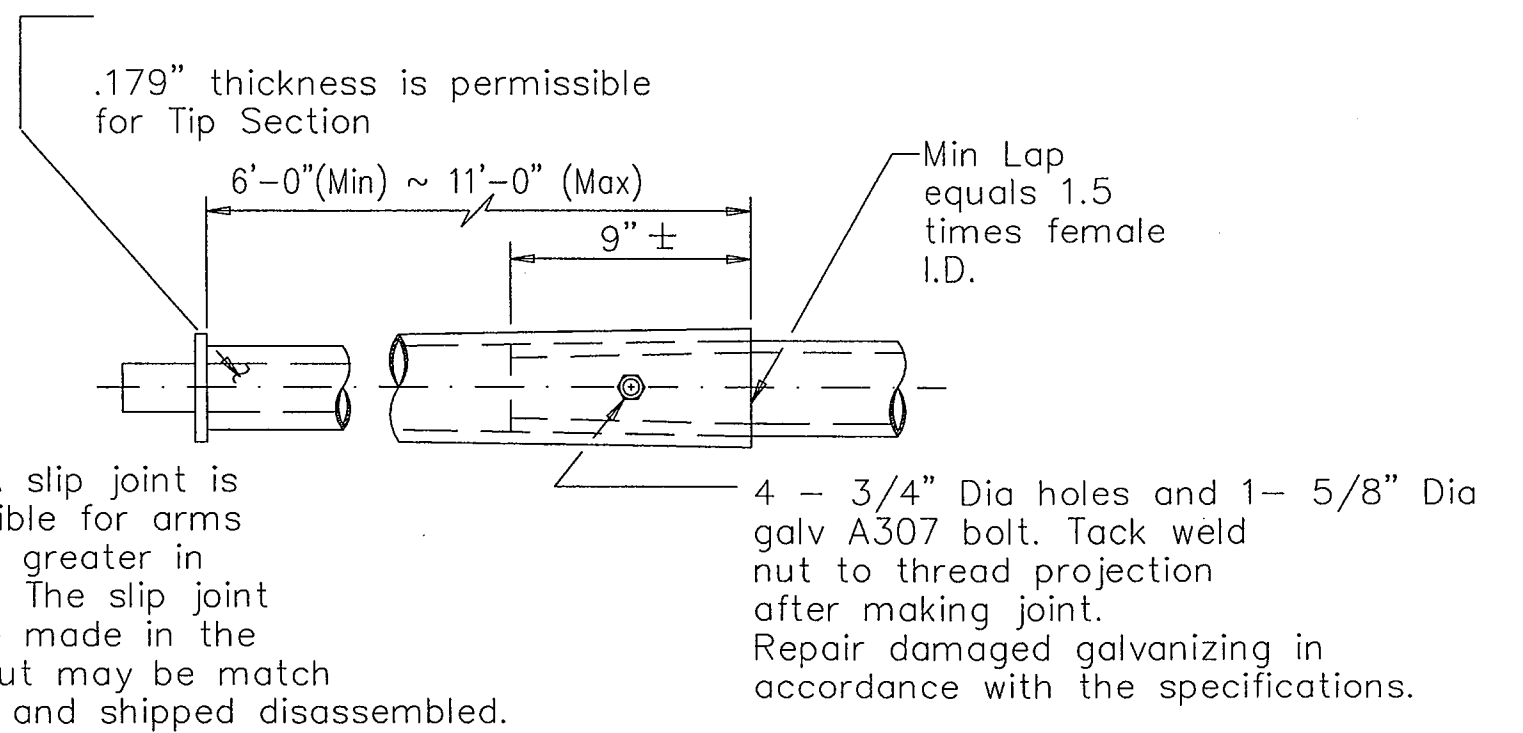
BRACKET ASSEMBLY OPTION C

Stainless steel bands and cast bracket as in "Astro-Brac" with 1 1/2" Dia Threaded Coupling.

Second longitudinal Seam Weld is permitted for polygonal arms if D₁ exceeds 10"



ARM WELD DETAIL



SLIP JOINT DETAIL

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor.

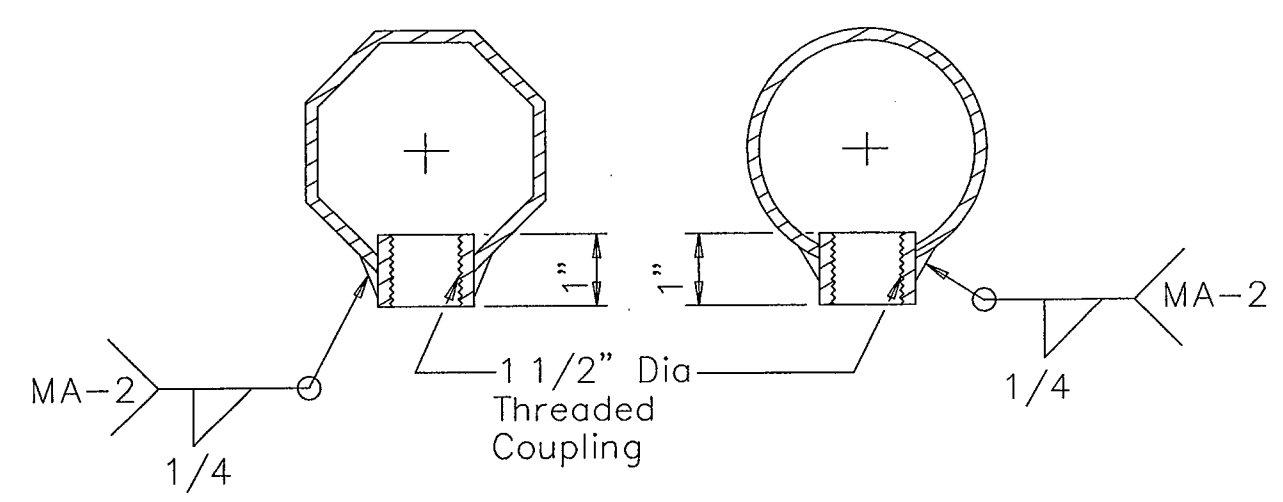
Poles are designed to support one 8'-0" luminaire arm, one 9'-0" internally lighted street name sign and one traffic signal arm with a length as tabulated. The specified luminaire load applied at the end of the luminaire arm equals 75 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.5 sq ft. The specified internally lighted street name sign load applied 4.5 ft from the centerline of the pole equals 85 lbs vertical dead load plus horizontal wind load on an effective projected area of 11.5 sq ft. The specified signal load applied at the end of the traffic signal arm equals 180 lbs vertical dead load plus the horizontal wind load on an effective projected area of 32.4 sq ft (actual area times drag coefficient).

See Standard Sheet "TS-12" for pole details, "TS-16" for traffic signal arm connection details, "TS-15" for internally lighted street name sign arm connection details, "TS-14" for luminaire arm and connection details, "TS-21" for internally lighted street name sign details, and "TS-11" for anchor bolt and foundation details. See "TS-16" for material specifications.

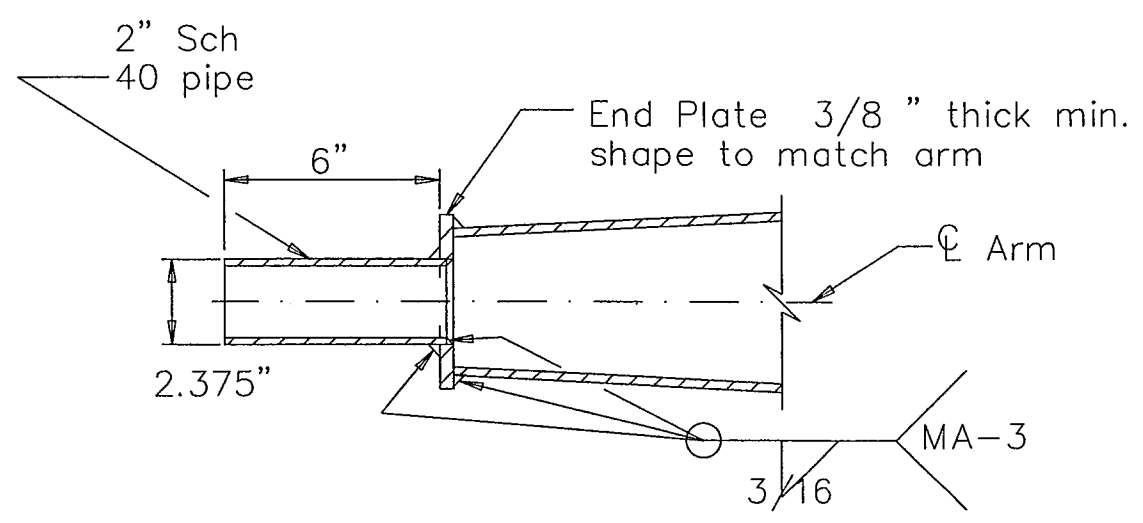
Fabrication shall be in accordance with the Specifications and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Miscellaneous welds which do not call for preapproved weld procedures are nevertheless subject to rejection for poor workmanship. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and the Specifications.

Unless otherwise noted, all parts shall be galvanized in accordance with the Specifications.

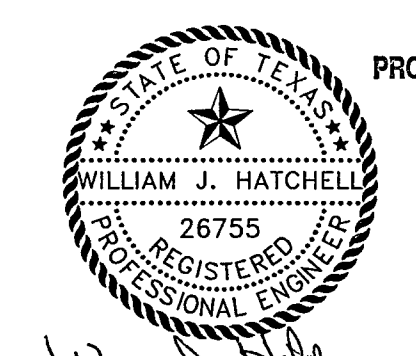
Special design require submission of shop drawings in accordance with the item "Steel Structures".



COUPLING DETAILS



TENON DETAIL



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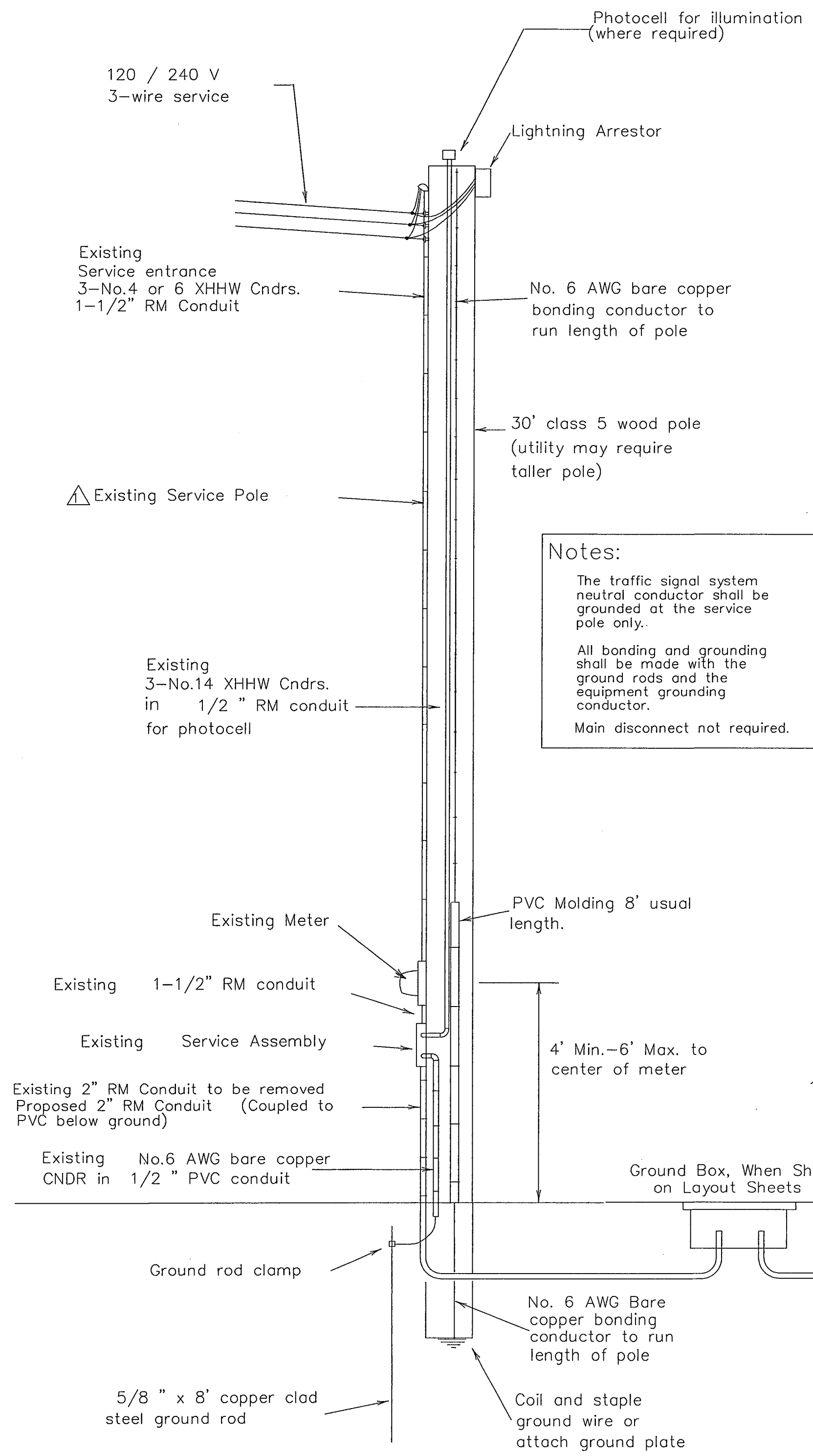
ARAPAHO ROAD PHASE II
TRAFFIC SIGNAL SUPPORT STRUCTURES
SIGNAL MAST ARM ASSEMBLY - 2 of 2

TOWN OF ADDISON

GBW Gratham, Burge & Waldbauer
Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
 (972) 840-1916 (TEL)
 (972) 840-2156 (FAX)

SHT. TS-18 OF TS-21

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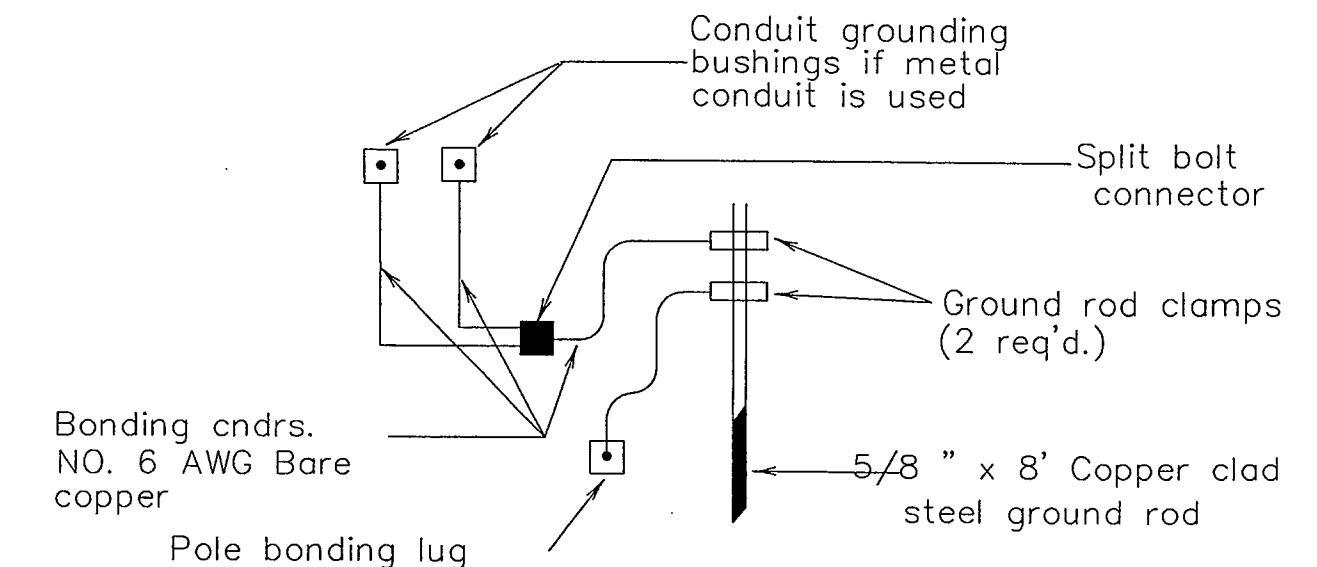
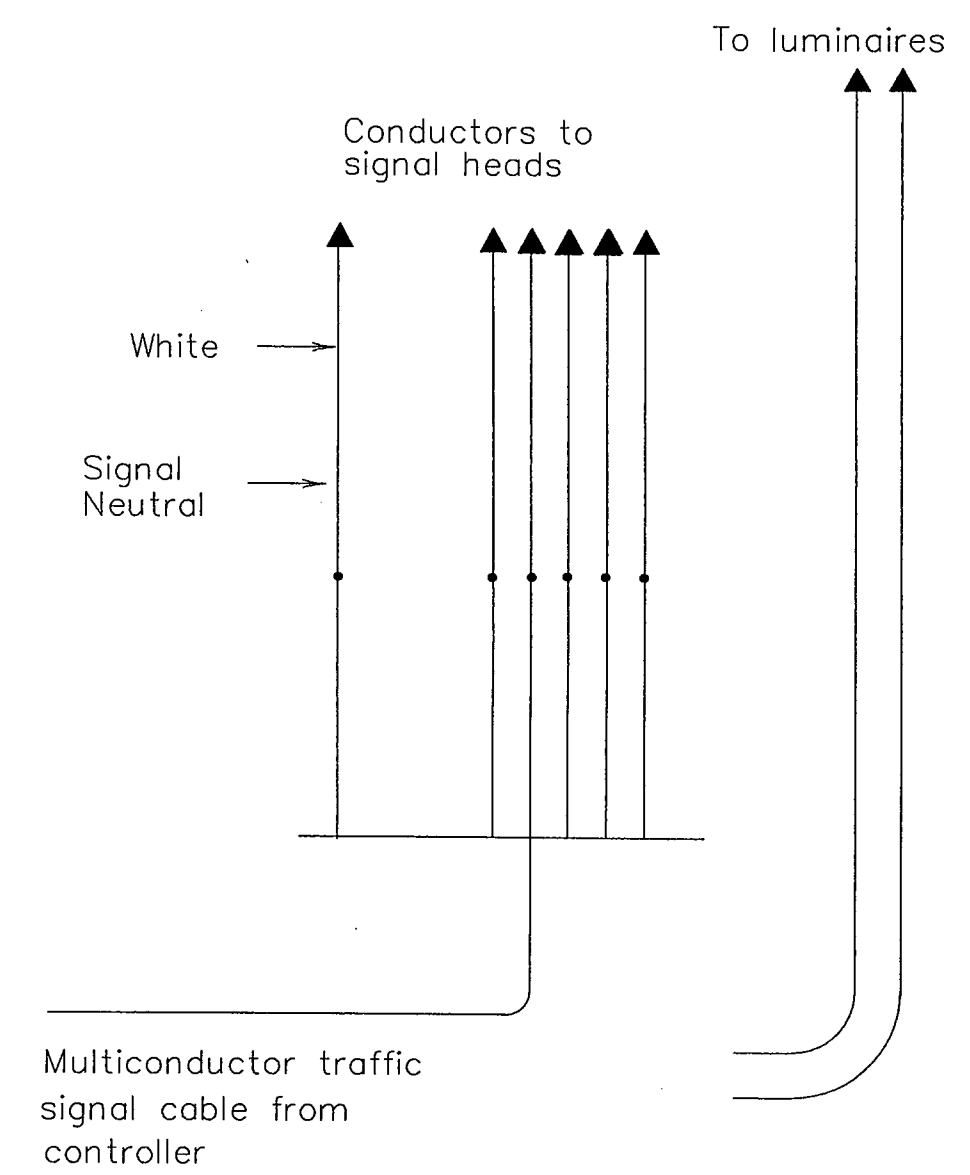


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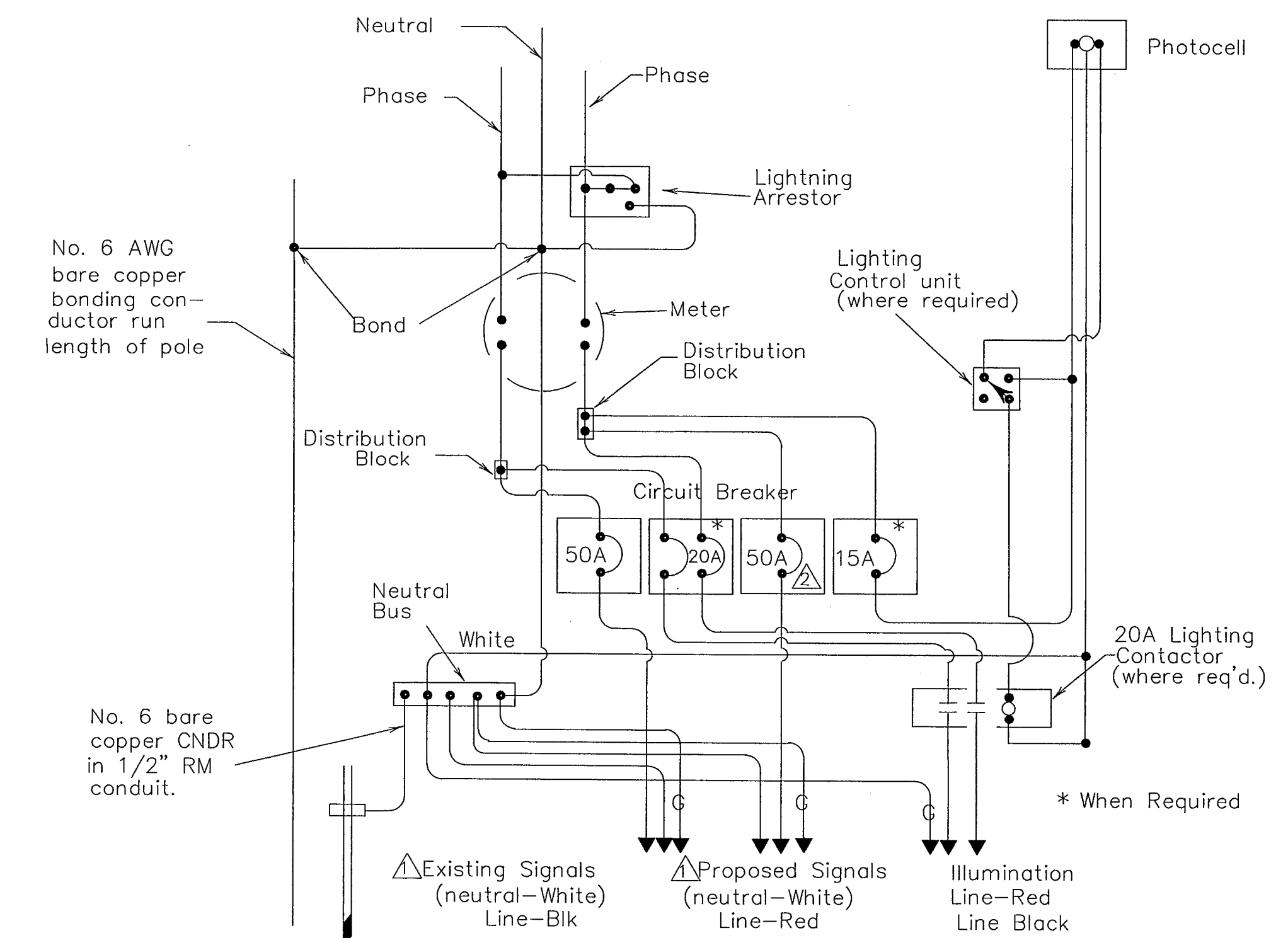
The traffic signal system
neutral conductor shall be
grounded at the service
pole only.

All bonding and grounding
shall be made with the
ground rods and the
equipment grounding
conductor.

Main disconnect not required.

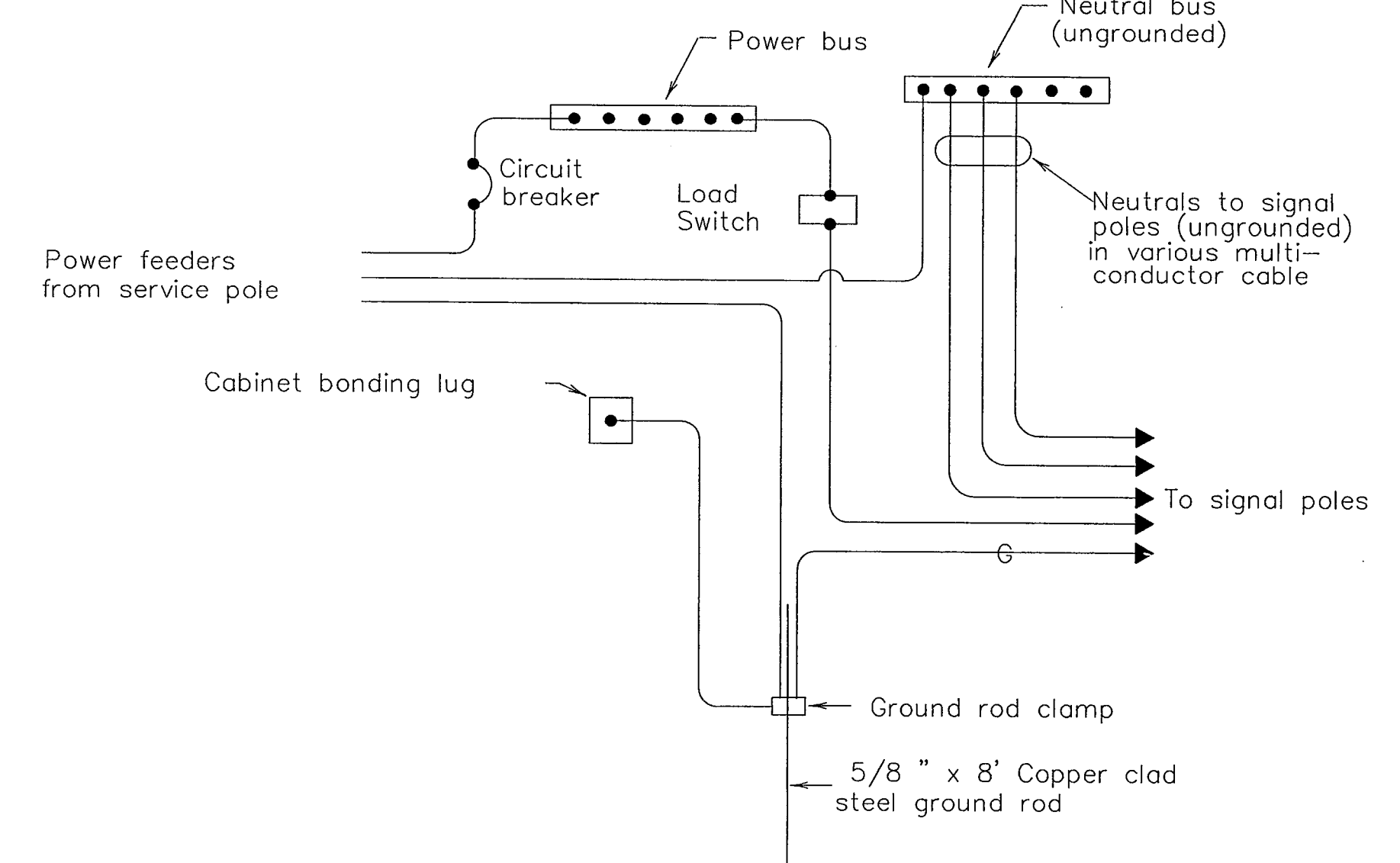


CONNECTION AT STEEL POLE BASE

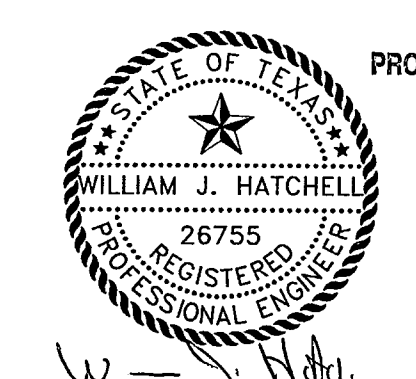


**CONNECTIONS AT SERVICE SCHEMATIC TY SE
120/240 VOLT - THREE WIRE SERVICE**

All circuit breakers are existing. The contractor shall install a new 50 AMP breaker for the new controller and remove the existing 50 AMP breaker for the existing controller after signals are operational.



CONNECTIONS AT SIGNAL CONTROLLERS



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**ARAPAHO ROAD PHASE II
SERVICE POLE
DETAILS**

TOWN OF ADDISON

**Grantham, Burge & Waldbauer
Engineers, Inc.**

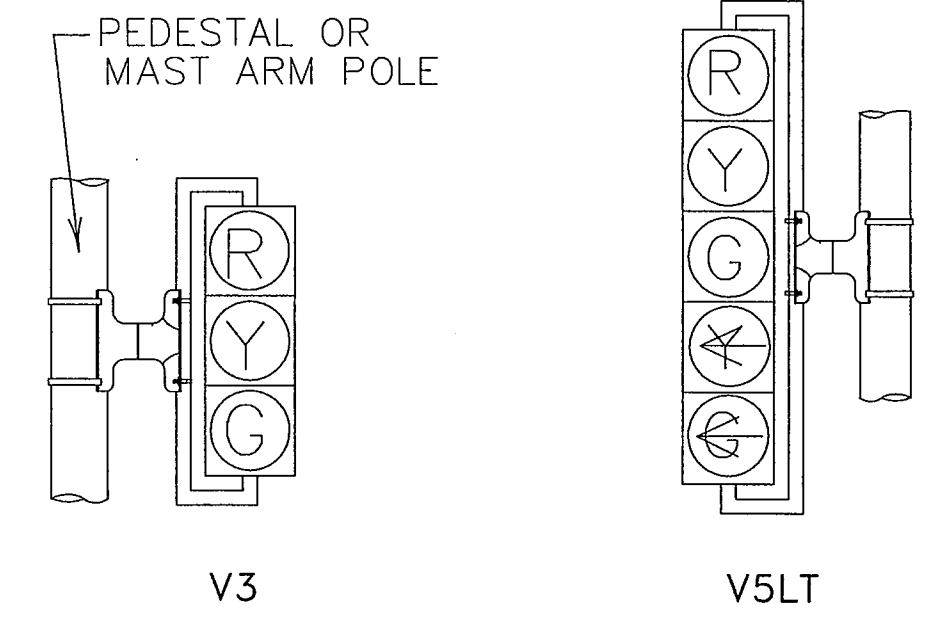
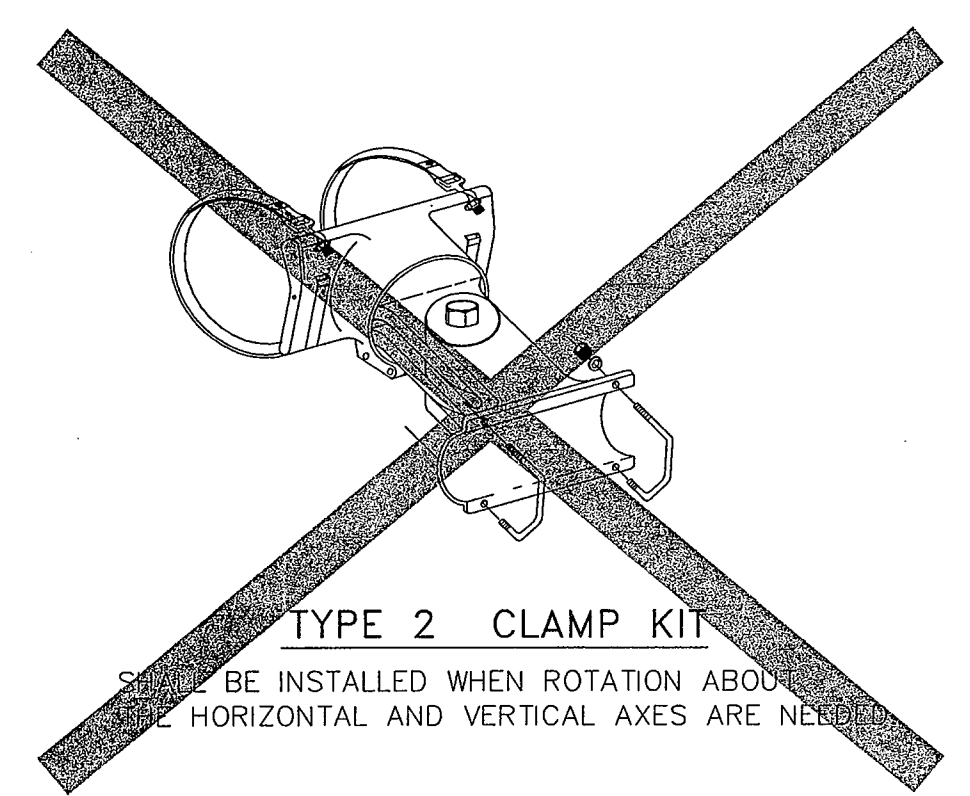
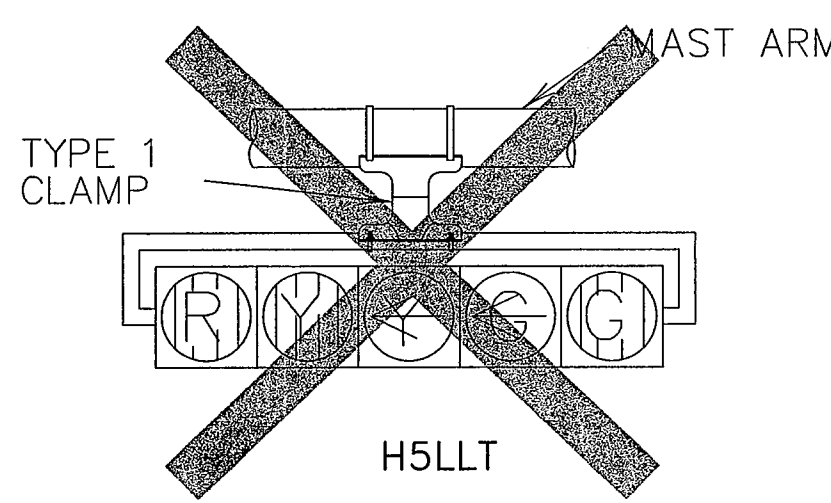
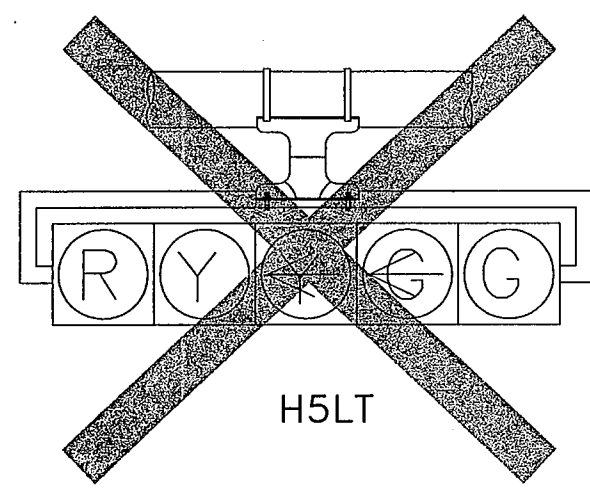
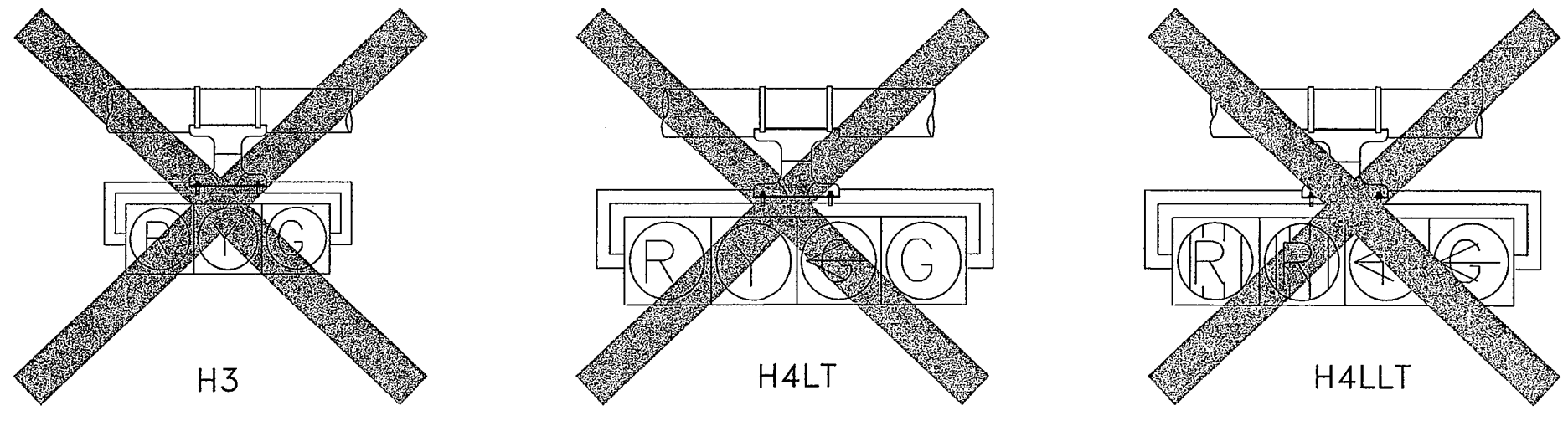
1919 S. SHILOH ROAD, SUITE 530, L.B. 27
GARLAND, TEXAS 75042

(972) 840-1916 (TELE)
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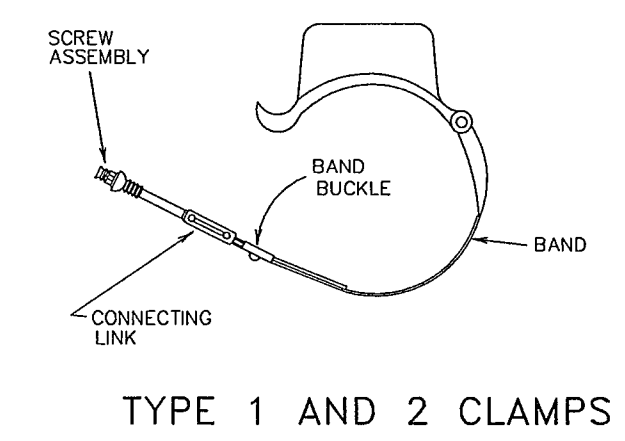
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OF
TS-21

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NOTE:
ALL SIGNAL HEADS TO BE MOUNTED VERTICALLY ON MAST ARM PER MANUFACTURERS SPECIFICATIONS.

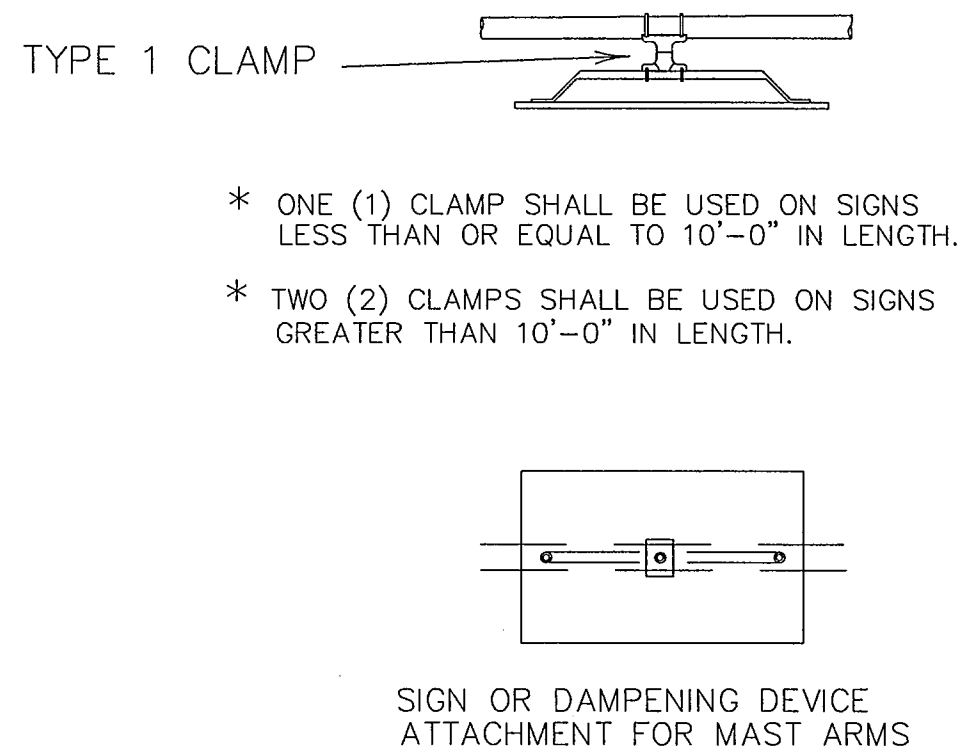
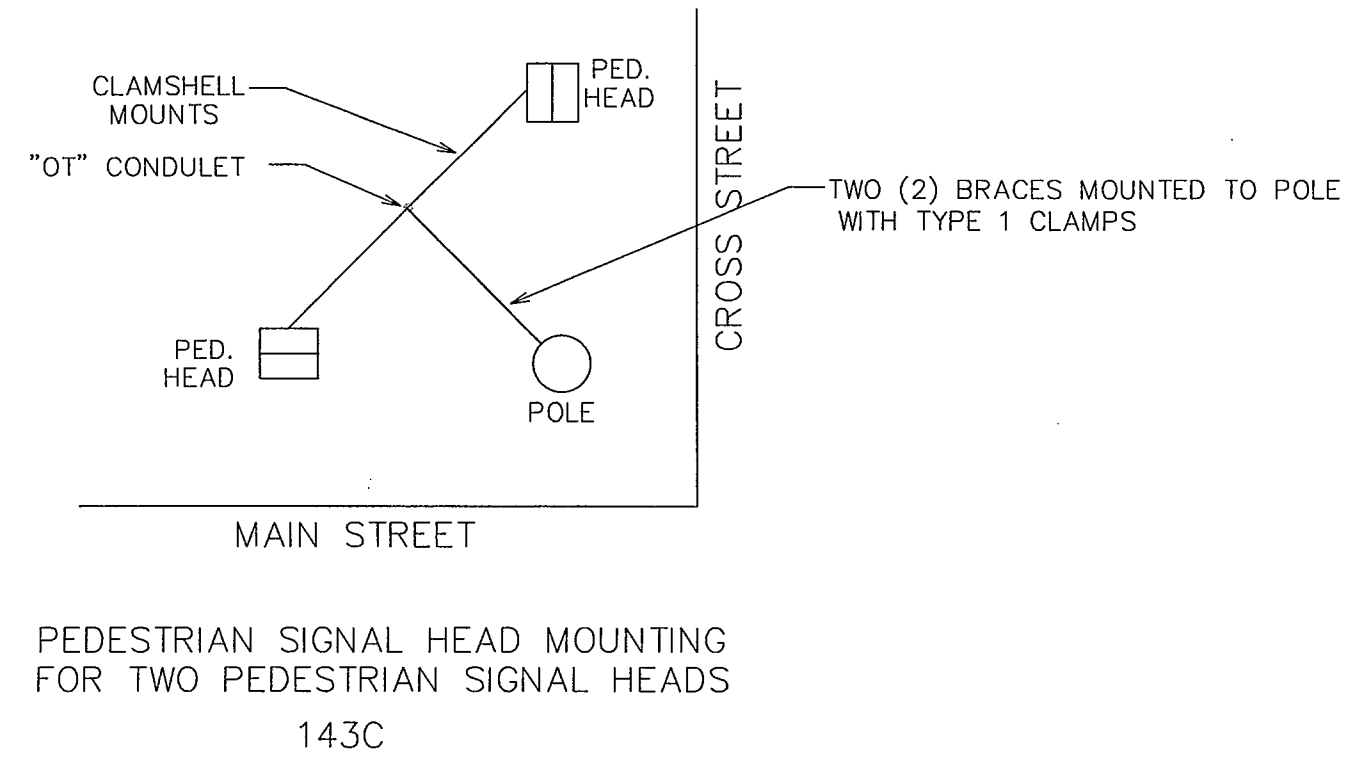
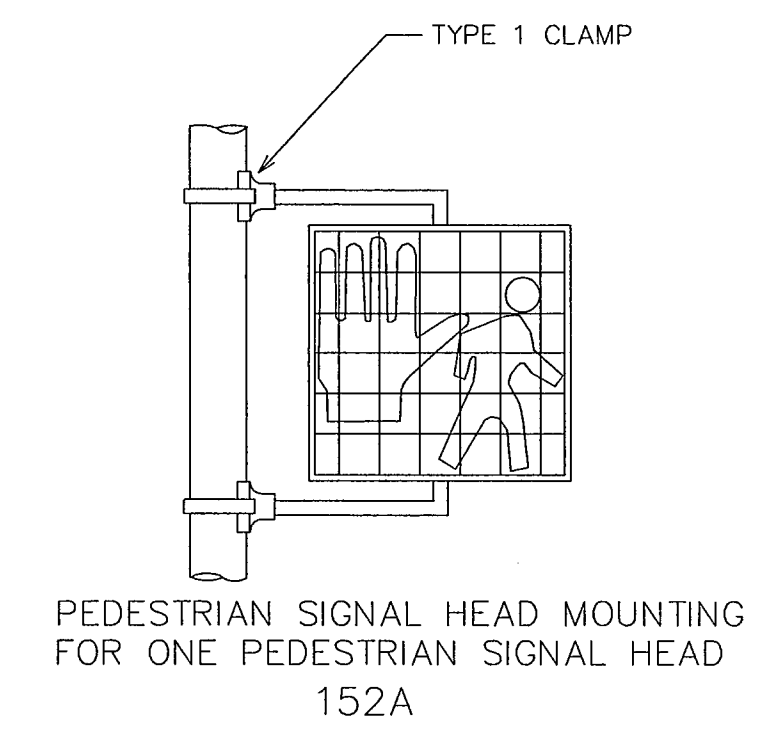


NOTE:
VERTICAL LOUVERS SHALL BE INSTALLED ON HORIZONTAL MOUNTED SIGNALS, HORIZONTAL LOUVERS SHALL BE INSTALLED ON VERTICAL MOUNTED SIGNAL WHEN NEEDED.



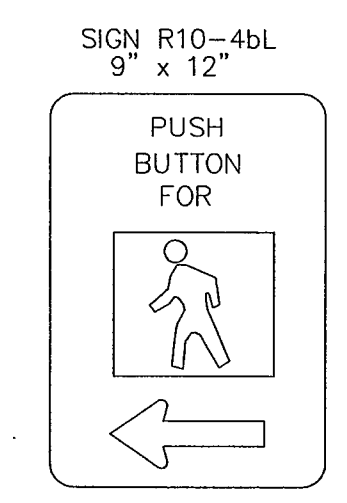
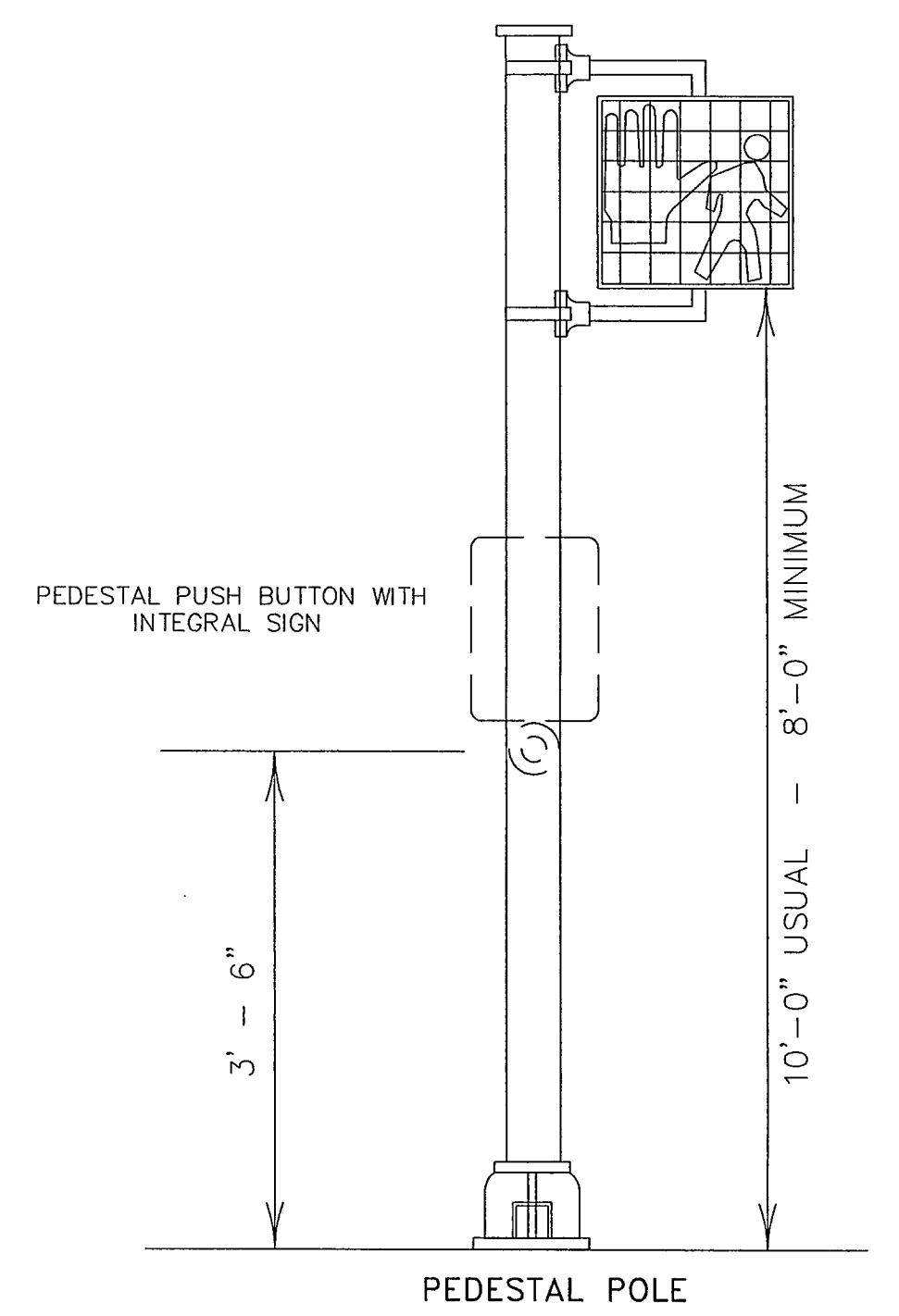
NOTE: CLAM SHELL MOUNTING HARDWARE MAY BE USED INSTEAD OF MOUNTING HARDWARE SHOWN ABOVE, AS APPROVED BY THE ENGINEER. ICC P/N 4805 OR MCCAIN QUICKMOUNT OR APPROVED EQUAL.

- NOTES:**
1. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH TYPE 1 CLAMPS AND APPROPRIATE TUBING.
 2. ALL PEDESTRIAN SIGNAL HEADS SHALL BE INSTALLED ON THE AWAY-FROM-TRAFFIC SIDE OF THE PEDESTAL OR MAST ARM POLE.
 3. ALL WIRING FOR PEDESTRIAN SIGNALS SHALL BE TOTALLY ENCLOSED WITHIN THE SIGNAL MOUNTING HARDWARE.
 4. ALL PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON SIGNS SHALL DISPLAY THE SYMBOLIZED MESSAGES SHOWN ABOVE.

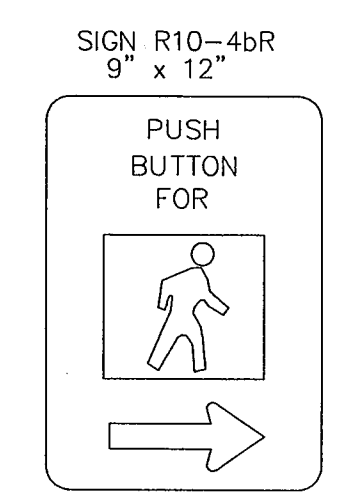


- * ONE (1) CLAMP SHALL BE USED ON SIGNS LESS THAN OR EQUAL TO 10'-0" IN LENGTH.
- * TWO (2) CLAMPS SHALL BE USED ON SIGNS GREATER THAN 10'-0" IN LENGTH.

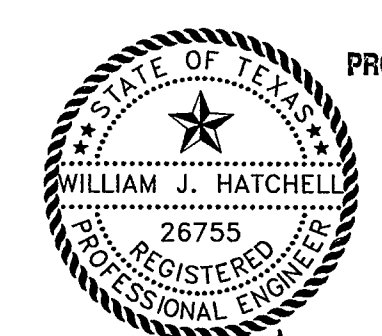
NOTE:
THE POLE ON THIS DRAWING IS SHOWN AS AN EXAMPLE ONLY. POLES OF SIMILAR DESIGN FOR ANY CROSS SECTION WHICH MEET THE SPECIFICATIONS AND REQUIREMENTS SHOWN ON THESE DRAWINGS AND ARE APPROVED BY THE TOWN WILL BE DEEMED ACCEPTABLE.



PEDESTRIAN PUSHBUTTON SIGN DETAILS



PEDESTRIAN PUSHBUTTON SIGN DETAILS



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ARAPAHO ROAD PHASE II
TRAFFIC AND PEDESTRIAN SIGNAL HEAD IDENTIFICATION

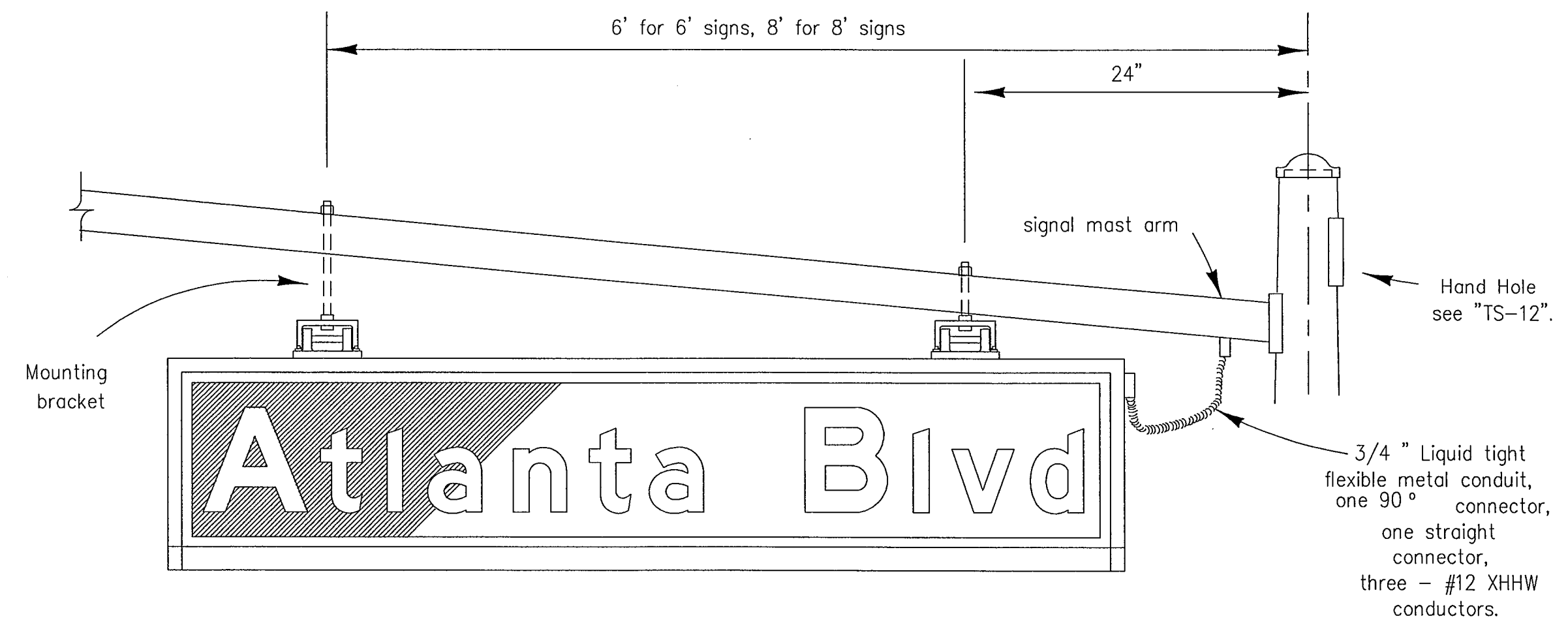
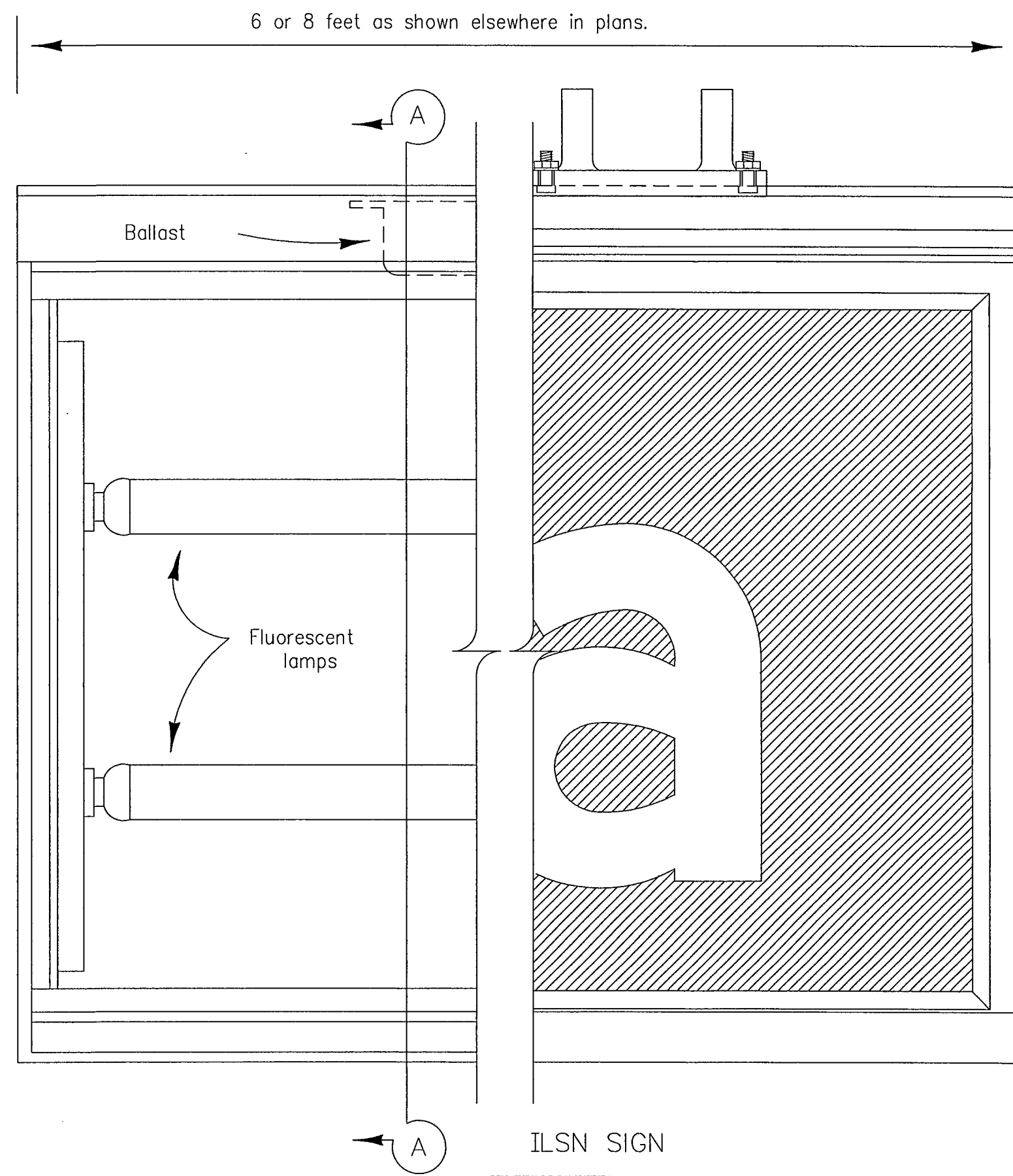
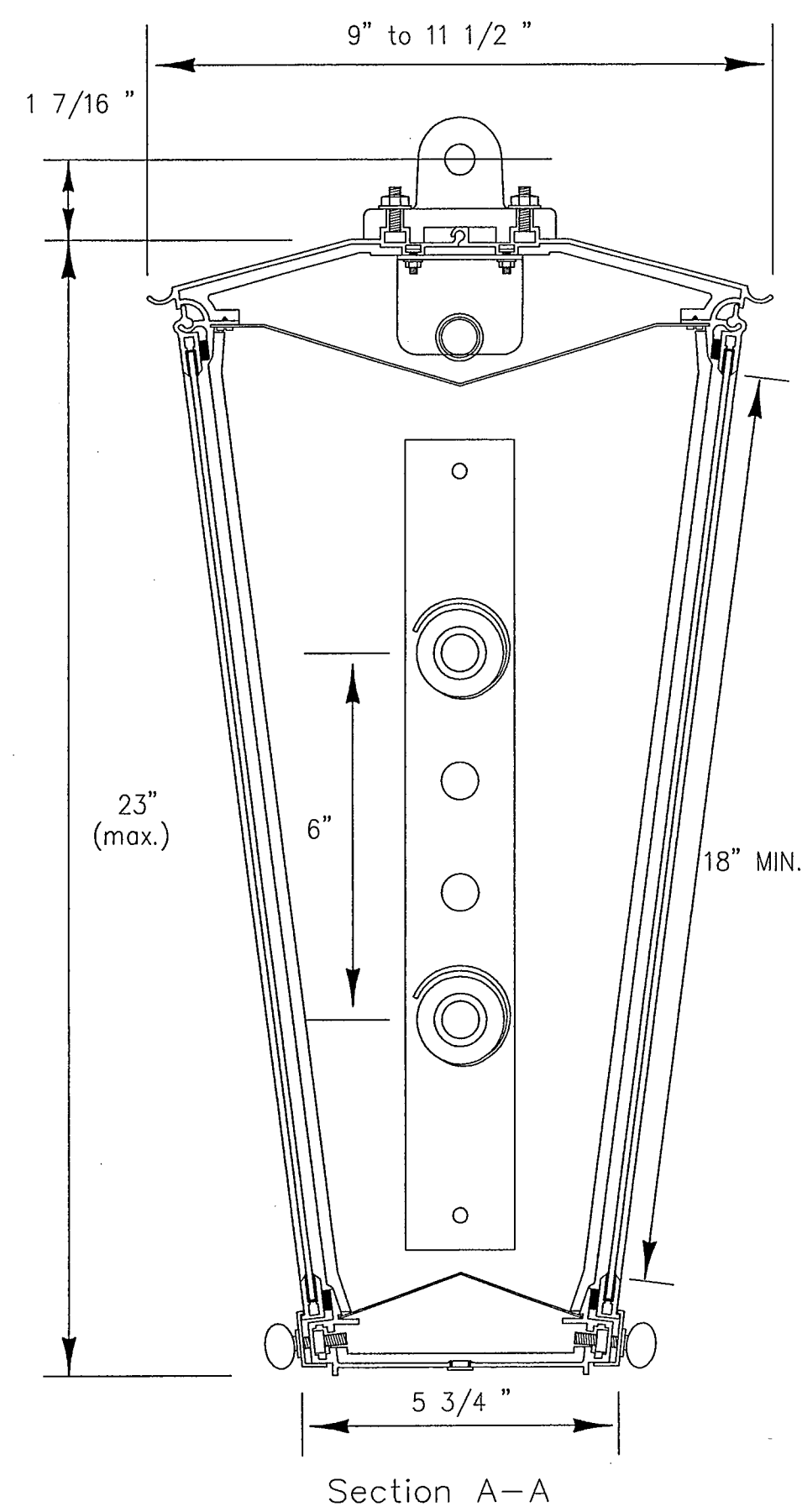
TOWN OF ADDISON

SHT. TS-20 OF TS-21

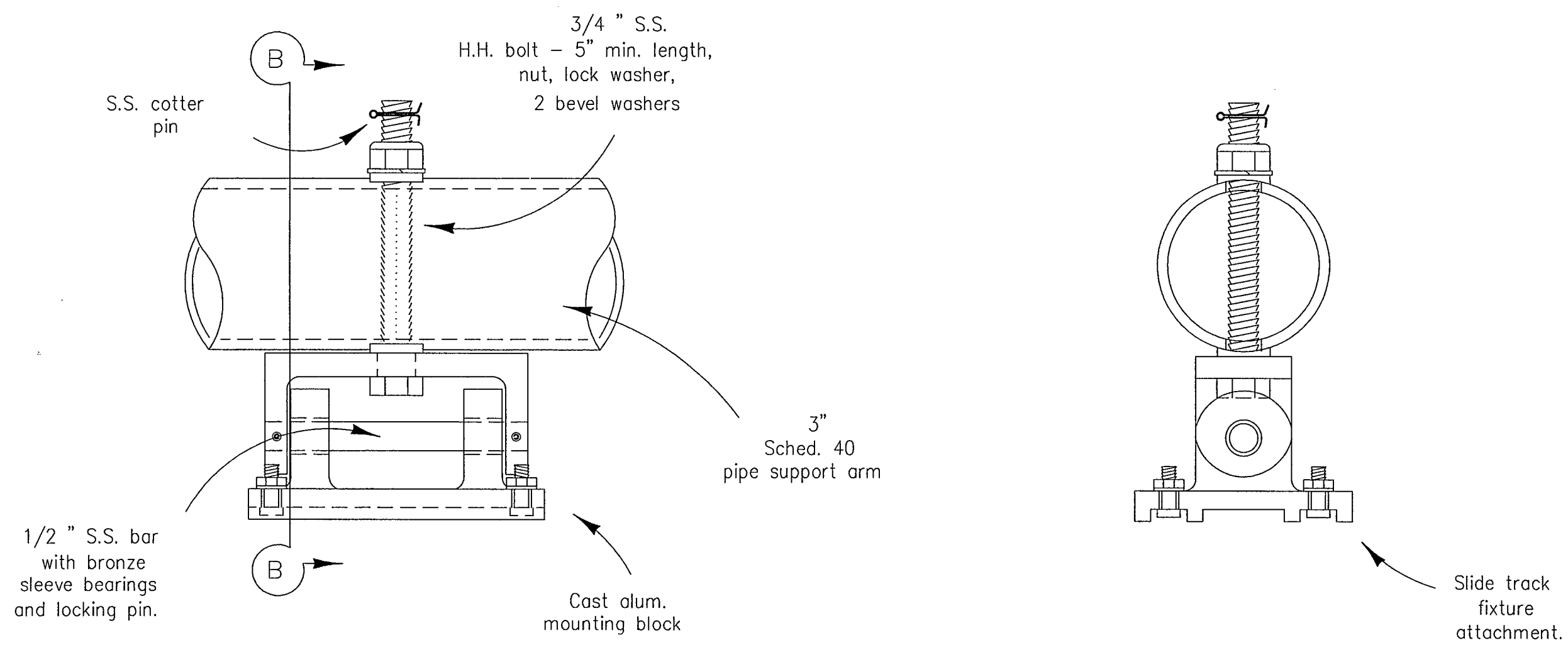
Grantham, Burge & Waldbauer
Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

INTERNALLY LIGHTED STREET NAME SIGN DETAILS

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SIGN MOUNTING



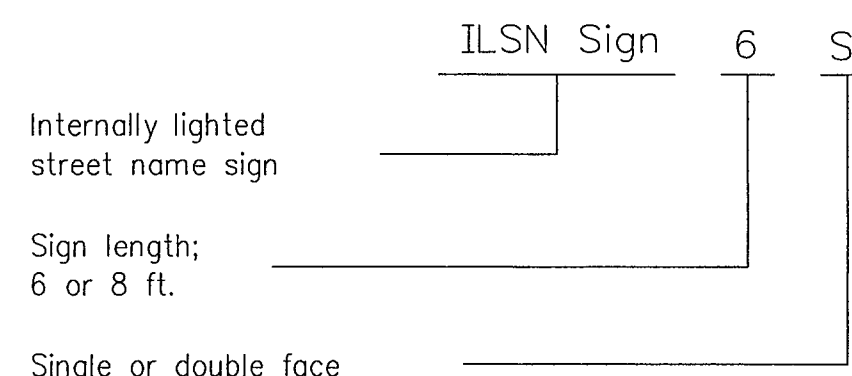
MOUNTING BRACKET

Section B-B

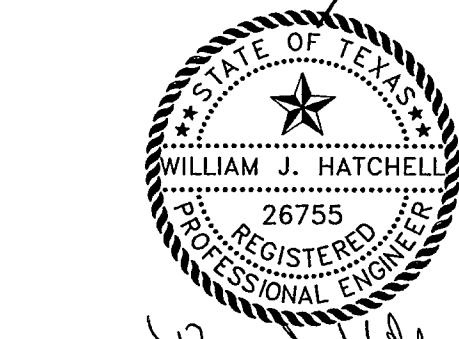
ILSN SIGN NOTES:

1. Eight foot ILSN sign shall not exceed 11.5 sq.ft. effective projected area (EPA) and shall not exceed a weight of 85 lbs.
Six foot ILSN sign shall not exceed 8.7 sq.ft. EPA and shall not exceed a weight of 70 lbs.
2. Sign message shall be as shown elsewhere in the plans.
3. See Special Specification, "Internally Lighted Street Name Signs" for additional details.

EXPLANATION OF DESCRIPTION



BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE SPECIALTIES INC. PROJECT COORDINATOR *[Signature]*



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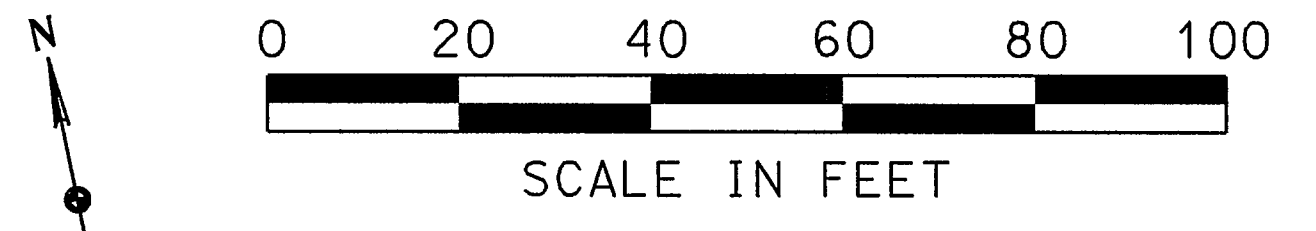
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DRAWN: GBW	DESIGN: WJH	REVIEWED:	DWG: 249DETAILS-SIGN

ARAPAHO ROAD PHASE II
STREET NAME SIGN DETAIL
(ILLUMINATED)
TOWN OF ADDISON

GBW Grantham, Burge & Waldbauer
Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
 (972) 840-1916 (TEL)
 (972) 840-2156 (FAX)

SHT. TS-21 OF TS-21



BORED CONDUIT BY OTHERS
 SEE NOTE 3
 2#4, 1#4 GND. SEE NOTE 3
 PEDESTRIAN LIGHTING CONTROL CABINET. SEE NOTE 4

2#8, 1#8 GND.

STA. 10+77.2
 77.4' LT. ϕ ARAPAHO

STA. 10+80
 70.94' LT. ϕ ARAPAHO

2#8, 1#8 GND.
 STA. 10+98
 39.07' LT. ϕ ARAPAHO

R.O.W.

STA. 12+53
 39.33' LT. ϕ ARAPAHO

2#8, 1#8 GND.

10+80

11+00

12+00

14+97

13+00

14+00

MATCH LINE STA. 15+00

MARSH LANE

STA. 10+80
 39.72' RT. ϕ ARAPAHO

STA. 10+70
 41.51' RT. ϕ ARAPAHO

2#8, 1#8 GND.
 STA. 10+40
 64.00' RT. ϕ ARAPAHO

R.O.W.

STA. 14+30
 28.48' RT. ϕ ARAPAHO

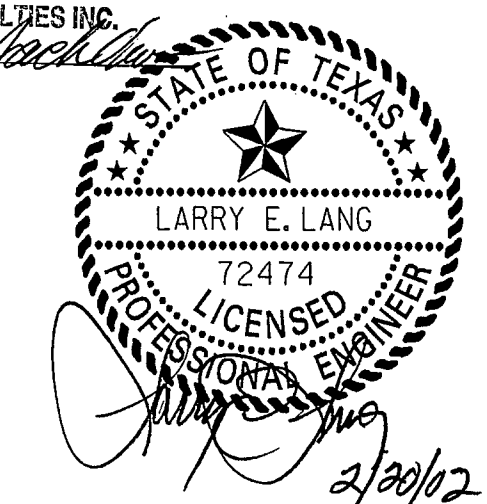
NOTES:

1. CONTRACTOR TO INSTALL POLE FOUNDATIONS AND CONDUIT; TXU TO INSTALL CIRCUIT CONDUCTORS AND 40 FT. RECTANGULAR STYLE STREET LIGHTING STANDARDS.
2. ALL STREET LIGHTING FOUNDATIONS SHALL BE SET 6 FEET BEHIND CURB.
3. CONTRACTOR TO CONNECT CONDUIT TO EXISTING TXU STUB OUT.
4. SERVICE FOR THE PEDESTRIAN LIGHTING CONTROL CABINET SHALL COME FROM THE GROUND MOUNTED PULLBOX. CONTRACTOR SHALL COORDINATE WITH TXU FOR ALL SERVICE REQUIREMENTS.

LEGEND

- STREET LIGHTING STANDARD. SEE NOTE 1
- PEDESTRIAN LIGHTING STANDARD, BEGA 9801MH-175ED-17MH-906H 240 VOLT BALLAST
- CONDUIT, 2" SCH 40 PVC
- GROUND MOUNTED PULLBOX, TYPE A

BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE SPECIALTIES INC. PROJECT COORDINATOR *Jacob...*



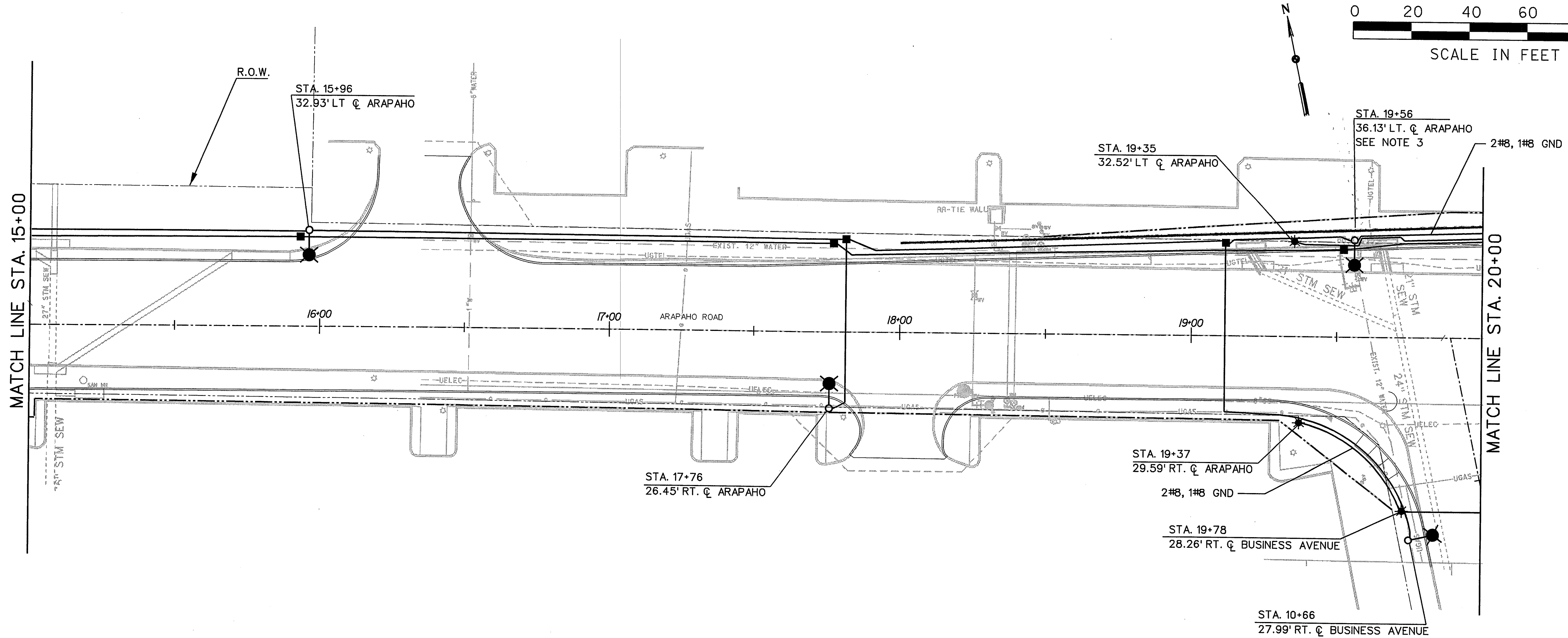
NO.		DATE		REVISION		APPROV.	
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>							
ARAPAHO ROAD - PHASE II							
MARSH LANE TO SURVEYOR BOULEVARD							
ILLUMINATION PLAN STA. 10+00 TO STA. 15+00							
TOWN OF ADDISON, TEXAS							
Design	JGS	Drawn	TGM	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	LEL	Check	JGS	OCT 11		25768	1L-1

92

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0 20 40 60 80 100

SCALE IN FEET



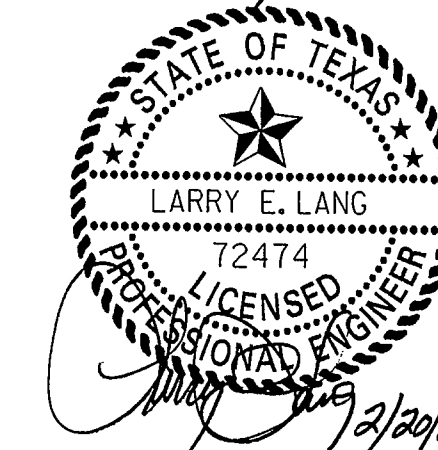
NOTES:

1. CONTRACTOR TO INSTALL POLE FOUNDATIONS AND CONDUIT; TXU TO INSTALL CIRCUIT CONDUCTORS AND 40 FT. RECTANGULAR STYLE STREET LIGHTING STANDARDS.
2. ALL STREET LIGHTING FOUNDATIONS SHALL BE SET 6 FEET BEHIND CURB.
3. COORDINATE LOCATION OF POLE FOUNDATION WITH RETAINING WALL.

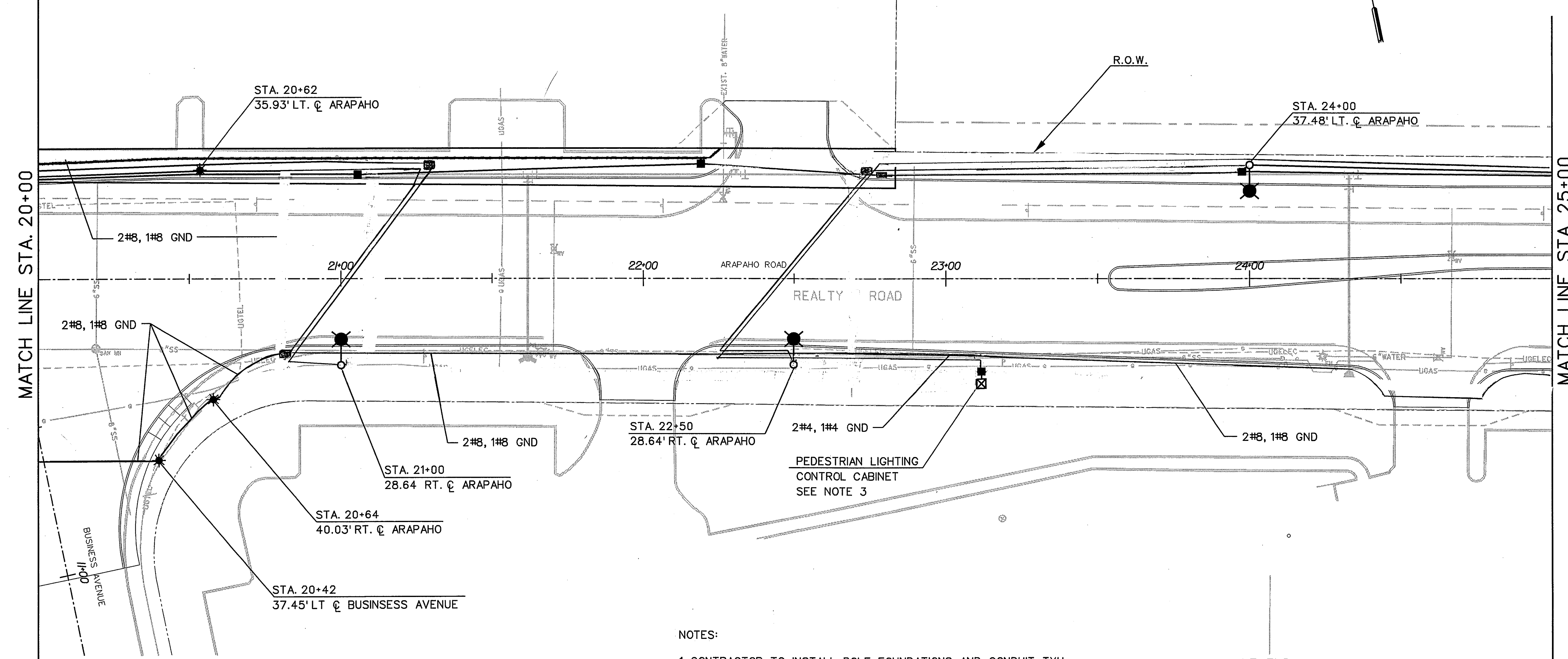
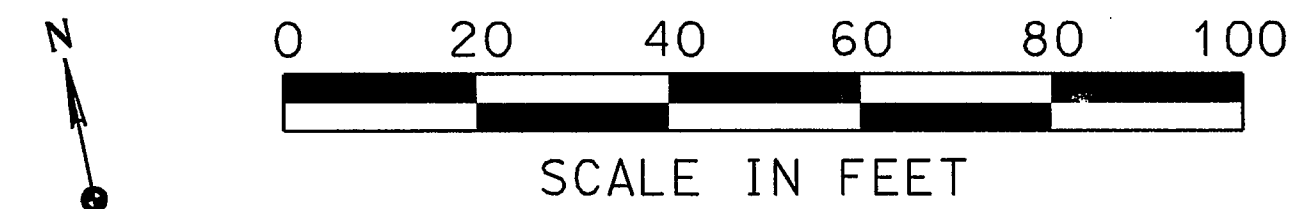
LEGEND

- STREET LIGHTING STANDARD. SEE NOTE 1
- PEDESTRIAN LIGHTING STANDARD, BEGA 9801MH-175ED-17MH-906H
- CONDUIT, 2" SCH 40 PVC
- GROUND MOUNTED PULLBOX, TYPE A

BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE SPECIALTIES INC. PROJECT COORDINATOR *[Signature]*



NO. DATE		REVISION		APPROV.	
HNTB ARCHITECTS ENGINEERS PLANNERS <small>The HNTB Companies</small>					
ARAPAHO ROAD - PHASE II					
MARSH LANE TO SURVEYOR BOULEVARD					
ILLUMINATION PLAN STA 15+00 TO STA 20+00					
TOWN OF ADDISON, TEXAS					
Design	JGS	Drawn	TGM	DATE	SCALE
Check	LEL	Check	JGS	OCT 11	
				PROJECT NO.	SHEET NO.
				25768	IL-2



NOTES:

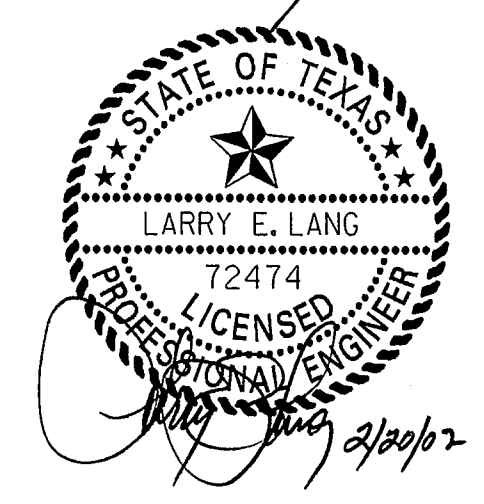
1. CONTRACTOR TO INSTALL POLE FOUNDATIONS AND CONDUIT; TXU TO INSTALL CIRCUIT CONDUCTORS AND 40 FT. RECTANGULAR STYLE STREET LIGHTING STANDARDS.
2. ALL STREET LIGHTING FOUNDATIONS SHALL BE SET 6 FEET BEHIND CURB.
3. SERVICE FOR THE PEDESTRIAN LIGHTING CONTROL CABINET SHALL COME FROM THE NEARBY STREET LIGHTING CIRCUIT. CONTRACTOR SHALL COORDINATE WITH TXU FOR ALL SERVICE REQUIREMENTS.

LEGEND

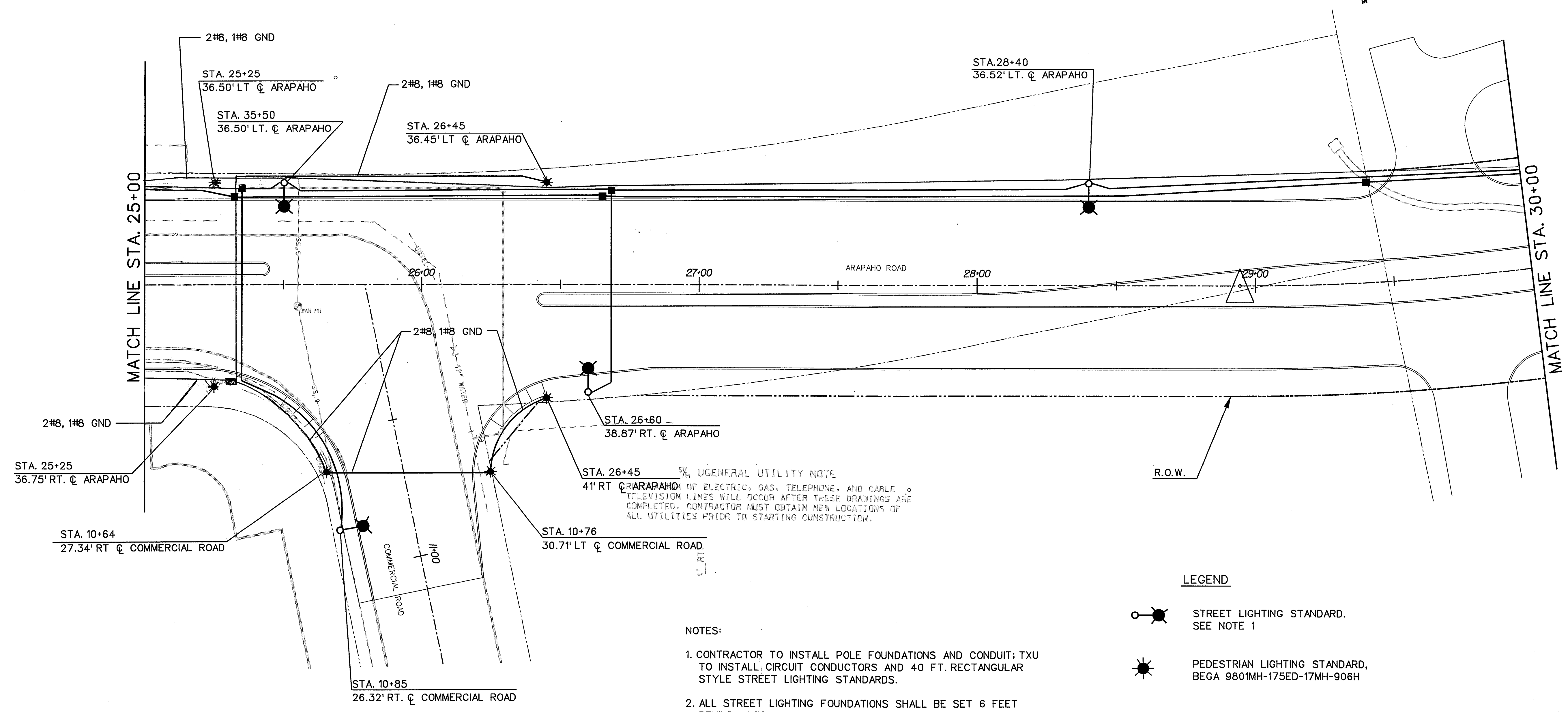
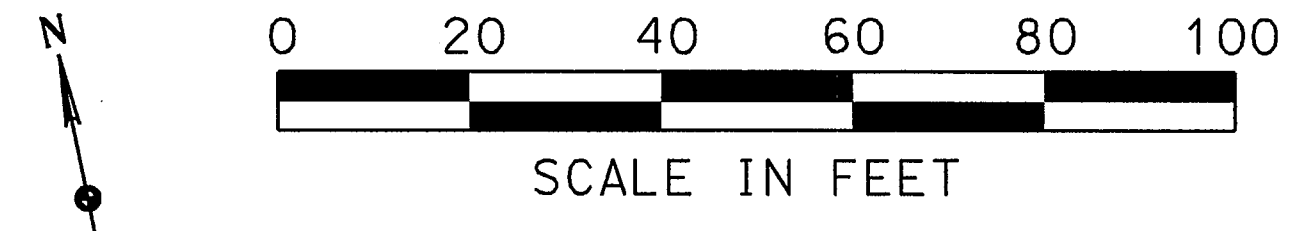
- STREET LIGHTING STANDARD. SEE NOTE 1
- PEDESTRIAN LIGHTING STANDARD, BEGA 9801MH-175ED-17MH-906H
- CONDUIT, 2" SCH 40 PVC
- GROUND MOUNTED PULLBOX, TYPE A

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BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE SPECIALTIES INC PROJECT COORDINATOR *[Signature]*



NO.		DATE		REVISION		APPROV.	
94							
HNTB ARCHITECTS ENGINEERS PLANNERS <small>The HNTB Companies</small>							
ARAPAHO ROAD - PHASE II							
MARSH LANE TO SURVEYOR BOULEVARD							
ILLUMINATION PLAN STA 20+00 TO STA 25+00							
TOWN OF ADDISON, TEXAS							
Design	JGS	Drawn	TGM	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	LEL	Check	JGS	OCT 11		25768	IL-3



GENERAL UTILITY NOTE
 4' RT. Q ARAPAHO OF ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION LINES WILL OCCUR AFTER THESE DRAWINGS ARE COMPLETED. CONTRACTOR MUST OBTAIN NEW LOCATIONS OF ALL UTILITIES PRIOR TO STARTING CONSTRUCTION.

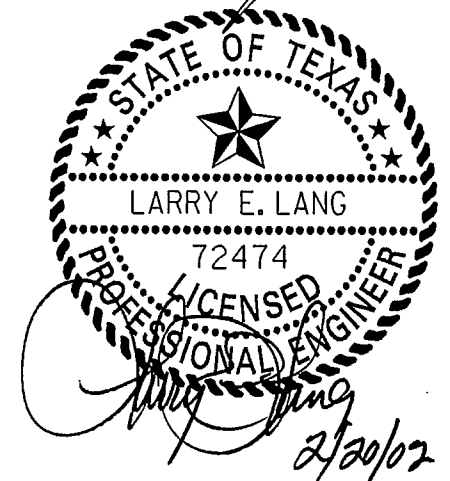
NOTES:

1. CONTRACTOR TO INSTALL POLE FOUNDATIONS AND CONDUIT; TXU TO INSTALL CIRCUIT CONDUCTORS AND 40 FT. RECTANGULAR STYLE STREET LIGHTING STANDARDS.
2. ALL STREET LIGHTING FOUNDATIONS SHALL BE SET 6 FEET BEHIND CURB.

LEGEND

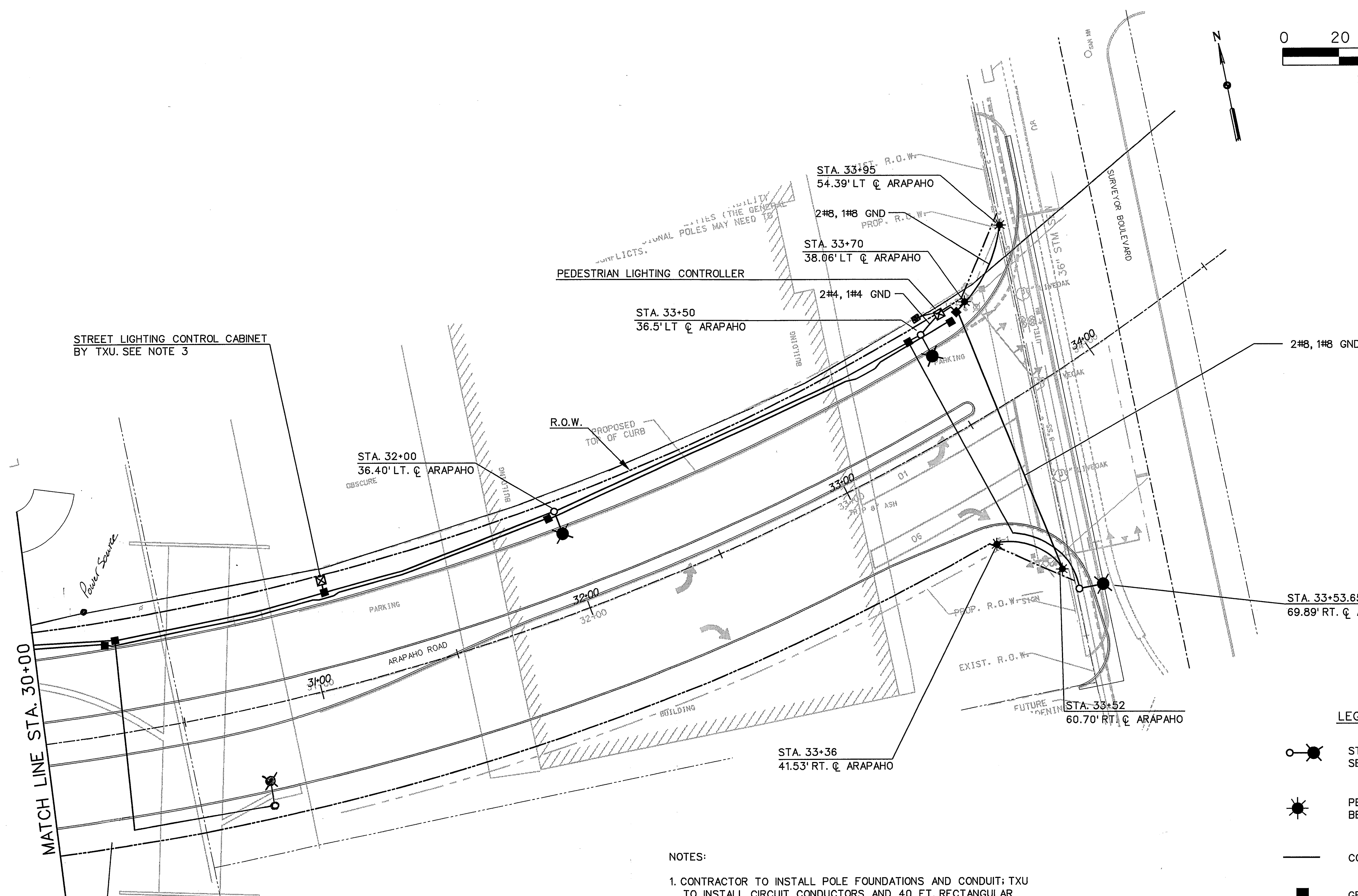
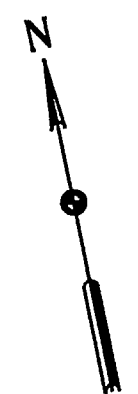
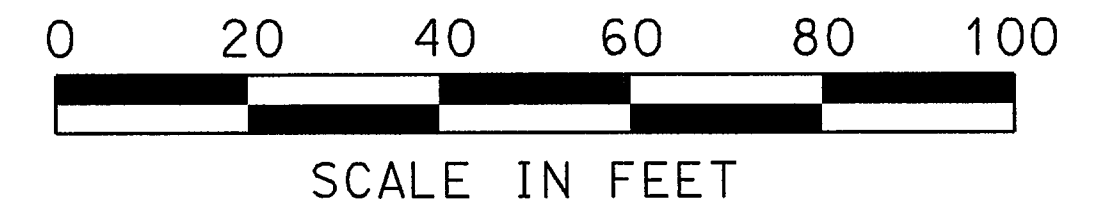
- STREET LIGHTING STANDARD. SEE NOTE 1
- PEDESTRIAN LIGHTING STANDARD, BEGA 9801MH-175ED-17MH-906H
- CONDUIT, 2" SCH 40 PVC
- GROUND MOUNTED PULLBOX, TYPE A

BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE SPECIALTIES INC. PROJECT COORDINATOR



NO. DATE		REVISION		APPROV.
95				
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>				
ARAPAHO ROAD - PHASE II				
MARSH LANE TO SURVEYOR BOULEVARD				
ILLUMINATION PLAN STA. 25+00 TO STA. 30+00				
TOWN OF ADDISON, TEXAS				
Design JGS	Drawn TGM	DATE	SCALE	PROJECT NO. SHEET NO.
Check LEL	Check JGS	OCT 11		25768 IL-4

19-FEB-2002 J:\25768\DWGS\LL-103.dgn 25768



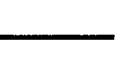



STREET LIGHTING CONTROL CABINET
BY TXU. SEE NOTE 3

MATCH LINE STA. 30+00

PEDESTRIAN LIGHTING CONTROLLER

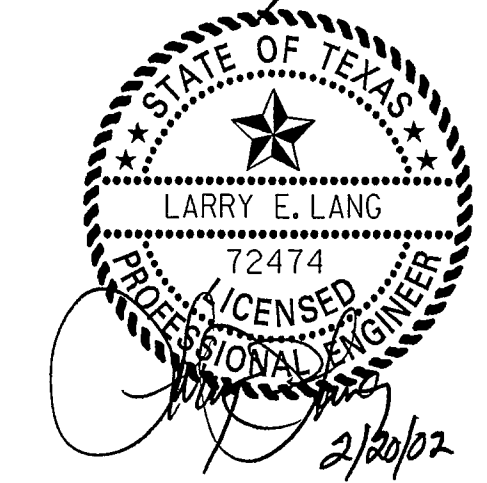
LEGEND

-  STREET LIGHTING STANDARD.
SEE NOTE 1
-  PEDESTRIAN LIGHTING STANDARD,
BEGA 9801MH-175ED-17MH-906H
-  CONDUIT, 2" SCH 40 PVC
-  GROUND MOUNTED PULLBOX, TYPE A

NOTES:

1. CONTRACTOR TO INSTALL POLE FOUNDATIONS AND CONDUIT; TXU TO INSTALL CIRCUIT CONDUCTORS AND 40 FT. RECTANGULAR STYLE STREET LIGHTING STANDARDS.
2. ALL STREET LIGHTING FOUNDATIONS SHALL BE SET 6 FEET BEHIND CURB.
3. TXU TO PROVIDE AND INSTALL CONDUIT FROM CONTROL CENTER TO PULLBOX.
4. SERVICE FOR THE PEDESTRIAN LIGHTING CONTROL CABINET SHALL COME FROM THE NEARBY STREET LIGHTING CIRCUIT. CONTRACTOR SHALL COORDINATE WITH TXU FOR ALL SERVICE REQUIREMENTS.

BUILT AS PER
SPECIFICATIONS AND PLANS
BY DURABLE SPECIALTIES INC
PROJECT COORDINATOR



NO. DATE		REVISION		APPROV.	
96					
HNTB ARCHITECTS ENGINEERS PLANNERS <small>The HNTB Companies</small>					
ARAPAHO ROAD - PHASE II					
MARSH LANE TO SURVEYOR BOULEVARD					
ILLUMINATION PLAN					
STA. 30+00 TO SURVEYOR BLVD.					
TOWN OF ADDISON, TEXAS					
Design JGS	Drawn TGM	DATE	SCALE	PROJECT NO.	SHEET NO.
Check LEL	Check JGS	OCT 11		25768	IL-5

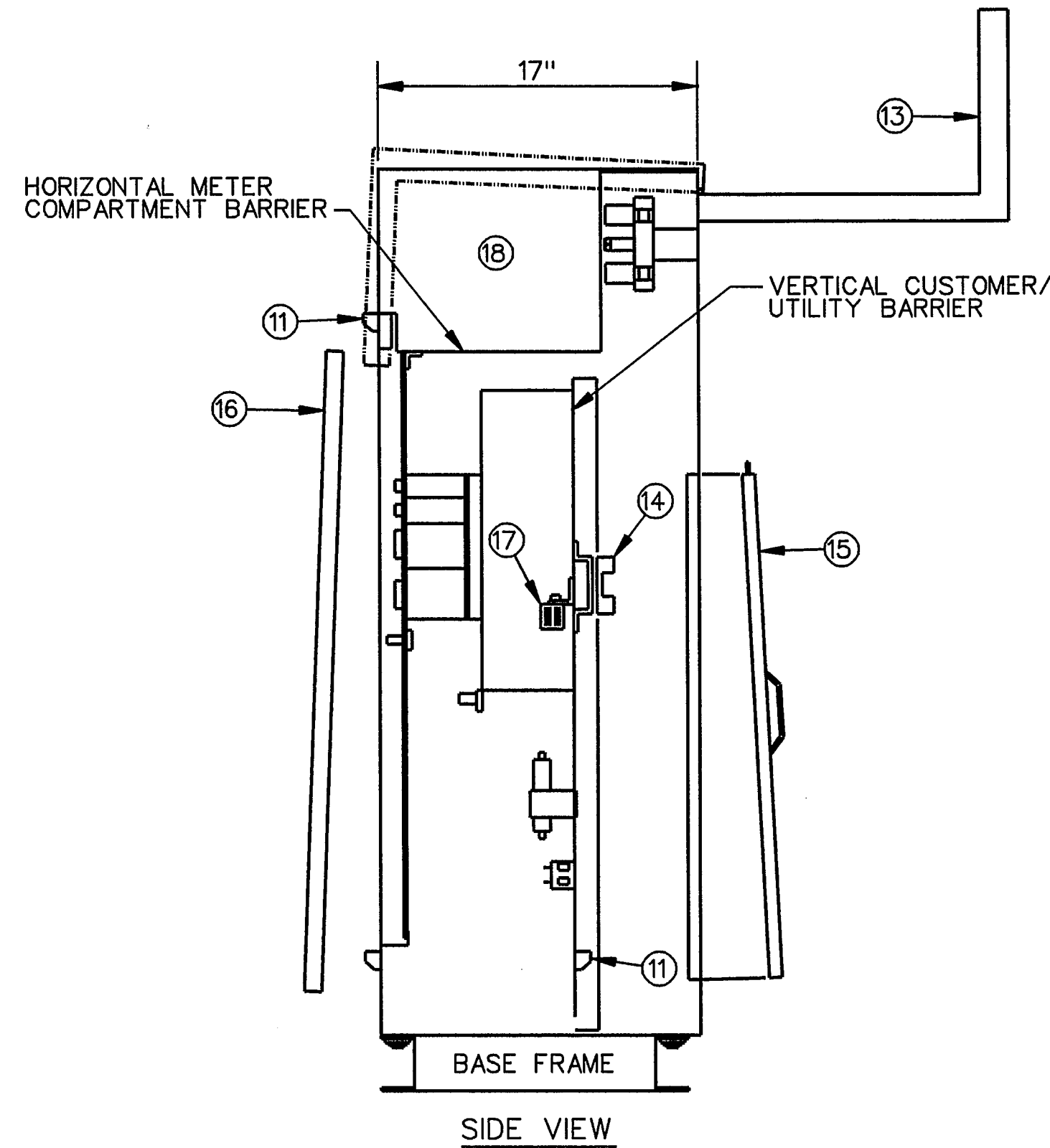
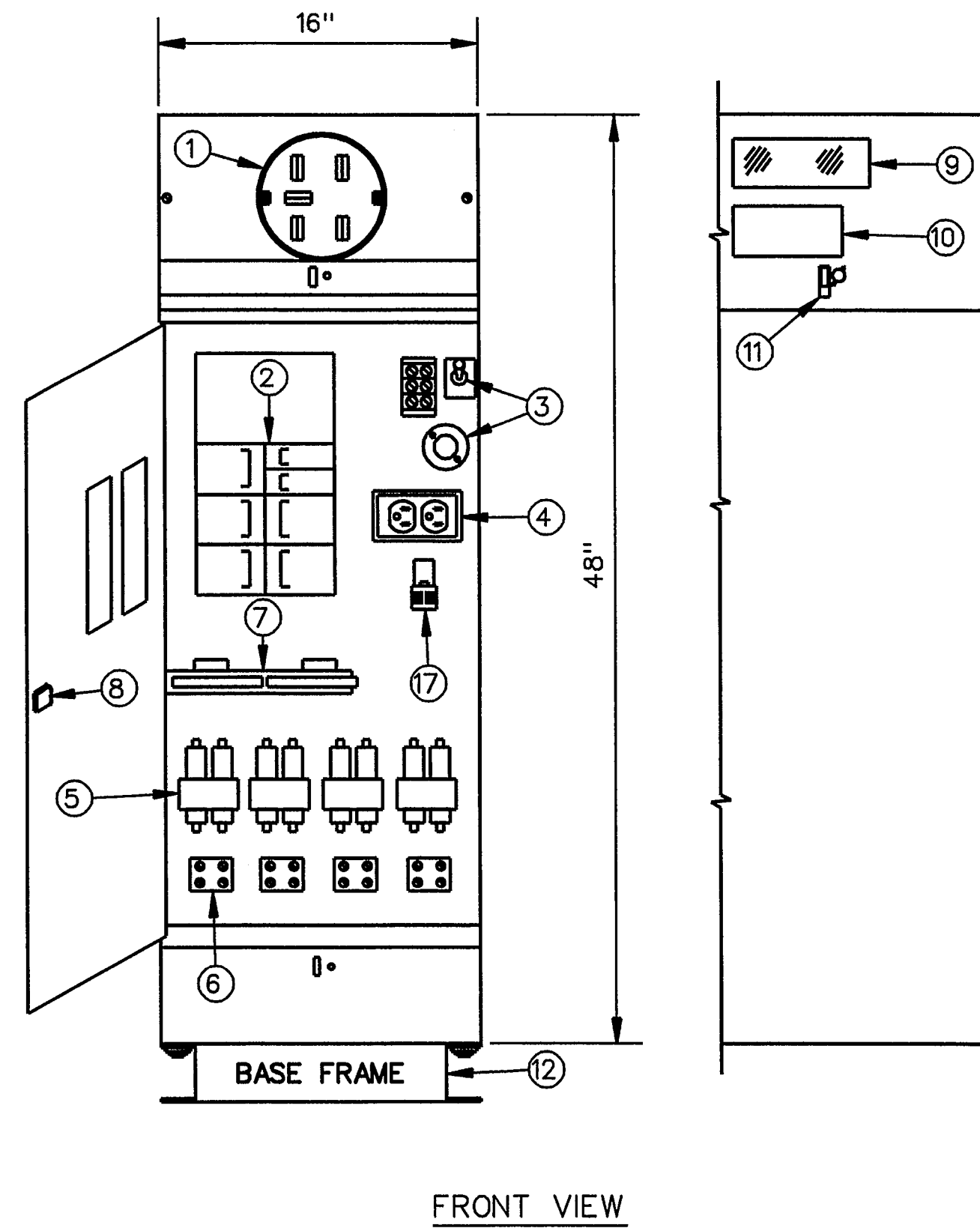
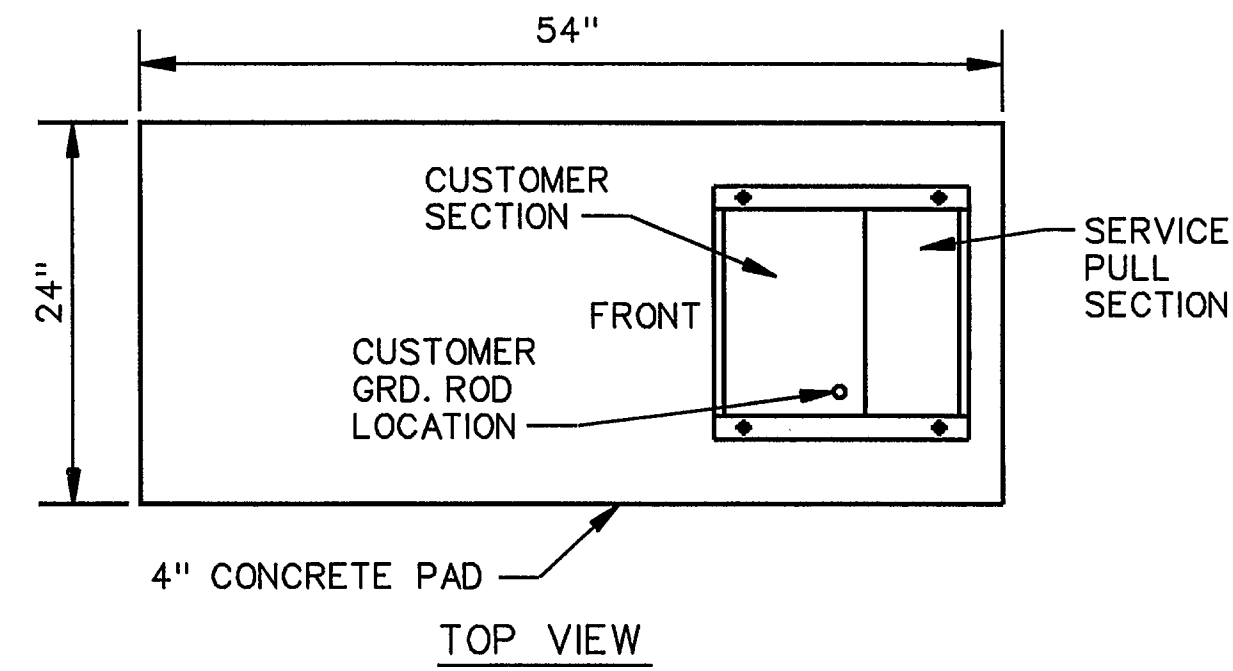
19-FEB-2002

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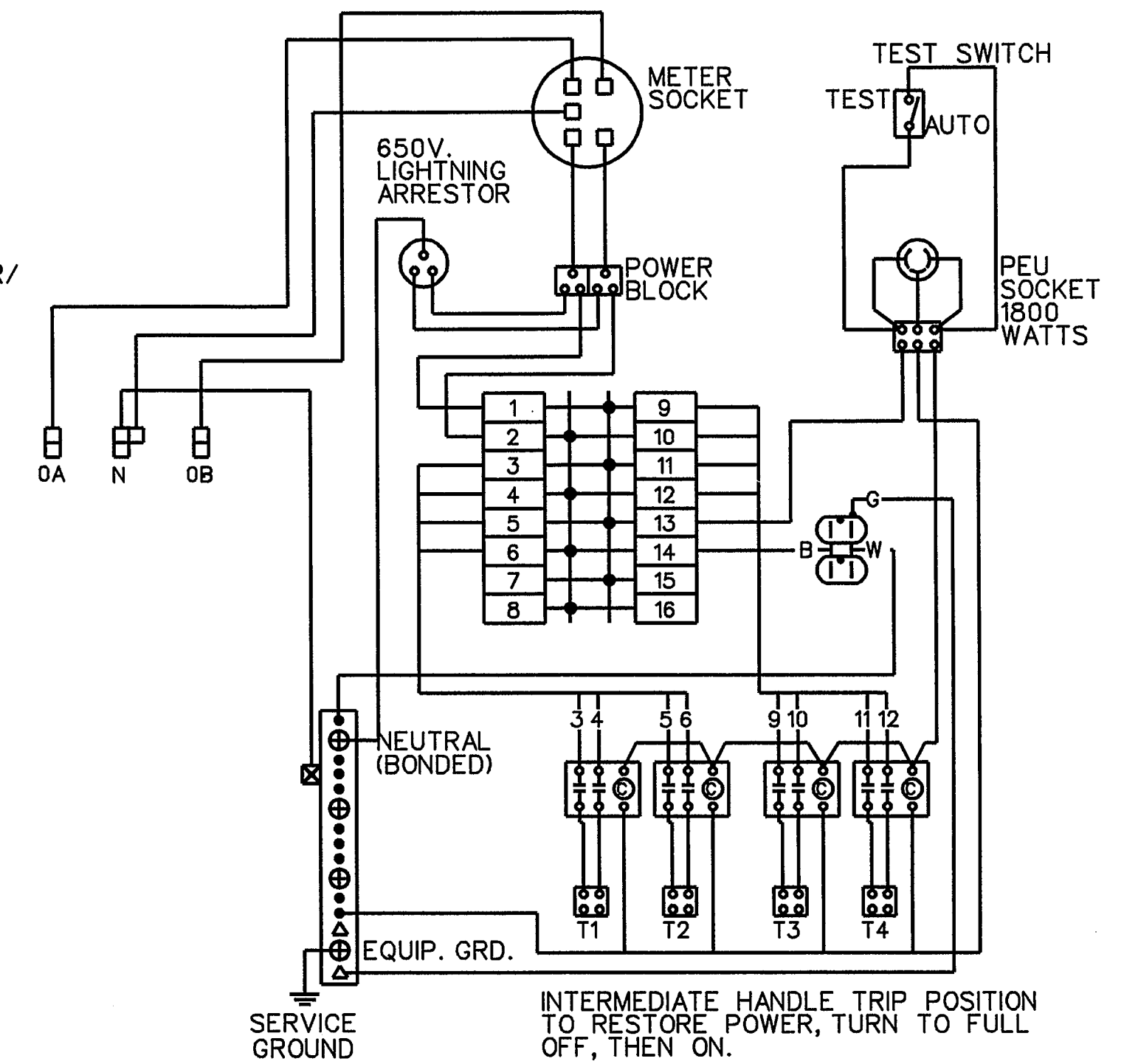
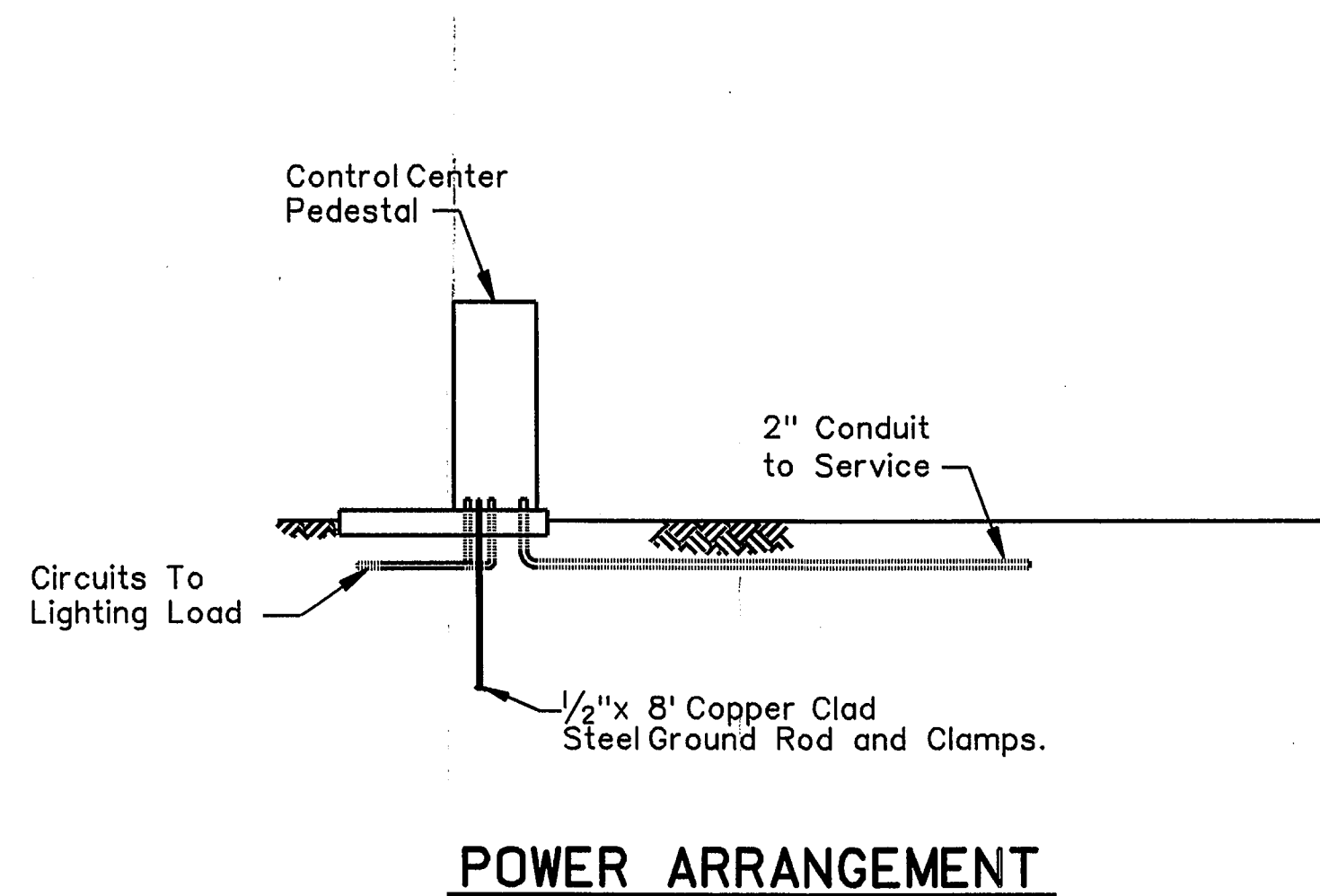
25768

NOTES TO CABINET DETAILS

- 1 U.L. RECOGNIZED METER SOCKET AS PER UTILITY REQUIREMENTS.
- 2 U.L. RECOGNIZED 16 CIRCUIT COPPER PLUG-ON INTERIOR SUPPLIED WITH U.L. LISTED 100 AMP TWO-POLE SERVICE DISCONNECT.
- 3 U.L. RECOGNIZED PHOTO ELECTRIC RECEPTACLE FACTORY WIRED TO U.L. RECOGNIZED TERMINAL BLOCK. U.L. LISTED TWO POSITION TEST SWITCH CONNECTED IN SERIES WITH PHOTO ELECTRIC RECEPTACLE.
- 4 U.L. LISTED 20 AMP DUPLEX RECEPTACLE PROTECTED BY A G.F.C.I. CIRCUIT BREAKER.
- 5 U.L. LISTED 30 AMP LIGHTING RELAYS FACTORY WIRED FROM 30 AMP TWO POLE CIRCUIT BREAKERS.
- 6 U.L. RECOGNIZED TWO POSITION 175 AMP, 600 VOLT, TERMINAL BLOCKS FACTORY WIRED FROM LOAD TERMINALS OF LIGHTING RELAYS. TERMINAL BLOCKS SHALL ACCEPT A MAXIMUM OF #2/0 AWG CONDUCTORS.
- 7 FACTORY BONDED NEUTRAL ASSEMBLY SHALL CONSIST OF U.L. RECOGNIZED MULTI-POSITION TERMINAL BARS. ADDITIONAL POSITIONS PROVIDE FOR SERVICE GROUND AND EQUIPMENT GROUND CONDUCTORS. NEUTRAL TERMINALS SHALL ACCEPT A MAXIMUM OF #1/0 AWG CONDUCTORS.
- 8 FULLY HINGED 16 GAUGE ZINC COATED DEADFRONT, PROVIDED WITH A HALF TURN LATCH FOR QUICK ACCESS TO THE CUSTOMER SECTION.
- 9 METER READING WINDOW CONSISTS OF 3/16" THICK BY 2 1/2" HIGH BY 6" WIDE HEAT-TREATED GLASS.
- 10 OUTSIDE NAMEPLATE OF .025" THICK ALUMINUM. STAMPED WITH CATALOG NUMBER, AMPERAGE AND VOLTAGE INFORMATION.
- 11 PADLOCK BRACKET WITH 7/16" DIAMETER HOLE FOR ADDED SECURITY PROVIDED FOR THE METER HINGED COVER, THE CUSTOMER COVER AND THE UTILITY PULL SECTION COVER.
- 12 BASE FRAME CONSTRUCTED OF TWELVE GAUGE ZINC COATED STEEL, FINISHED WITH THE SAME GREEN POWDER AS THE ENCLOSURE. BASE PROVIDED WITH WELD NUT AND THE APPROPRIATE HARDWARE FOR ATTACHING THE PEDESTAL TO THE BASE. HARDWARE ACCESSIBLE ONLY FROM INSIDE THE CUSTOMER AND UTILITY COMPARTMENTS. BASE HAS PROVISIONS FOR OPTIONAL GALVANIZED 5/8-11 X 18" LONG ANCHOR BOLT KIT, CATALOG NUMBER CP-ABK-5/8.
- 13 PERMANENTLY ATTACHED HINGED METER COVER SHALL OPEN 180 DEGREES TO REST POSITION ALLOWING FULL ACCESS TO METER SOCKET AREA.
- 14 U.L. RECOGNIZED 200 AMP RATED SERVICE TERMINATION LANDING ASSEMBLY SHALL BE U.L. LISTED WIRING TERMINALS MOUNTED ON 1/4" THICK ELECTRO TIN PLATED ALUMINUM BUS, SUPPORTED BY A 600 VOLT RATED GLASS REINFORCED INSULATING MOUNTING CHANNEL. TERMINALS SHALL BE 1 3/4" AWAY FROM THE STEEL BARRIER WHICH SEPARATES THE UTILITY AND CUSTOMER SECTIONS. WIRING TERMINALS SHALL BE FASTENED FROM THE FRONT FOR EASE OF REMOVAL.
- 15 UTILITY SERVICE TERMINATION COMPARTMENT COVER PROVIDED WITH A HANDLE FOR SAFE HANDLING, AND SECURED BY A TAMPER-RESISTANT SCREW AND PROVISION FOR PADLOCK.
- 16 CUSTOMER SECTION COVER SHALL HAVE A PRODUCT WIRING DIAGRAM ATTACHED ON THE INSIDE SURFACE WITH A PLASTIC POCKET AND CLEAR ADHESIVE TAPE. DIAGRAM CONTAINS PRODUCT RATING, CATALOG NUMBER AND WIRING SCHEMATIC ILLUSTRATION.
- 17 U.L. LISTED "LIGHTNING PROTECTIVE DEVICE" FACTORY WIRED TO SERVICE ENTRANCE LANDING.
- 18 WRENCH FOR TAMPER RESISTANT SCREW STORED IN METER COMPARTMENT.



CONTROL CENTER CABINET DETAILS



CONTROL CENTER WIRING DIAGRAM

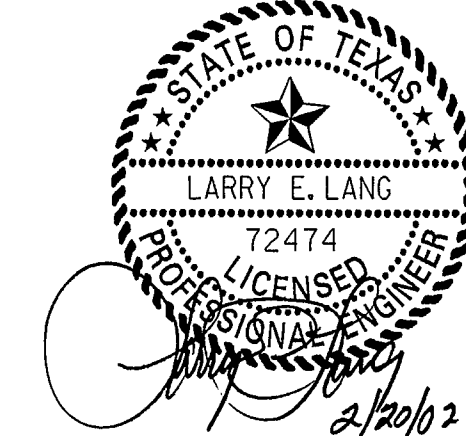
- NOTES:
1. The secondary breaker for the photo-cell circuit shall be 15 Amp. single pole.
 2. The wiring for the load and line side of the power block shall be #2 AWG.
 3. The wiring for the control circuit shall be #12 AWG.
 4. The power center enclosure shall be Meyer, Unicorn or approved equal.

19-FEB-2002

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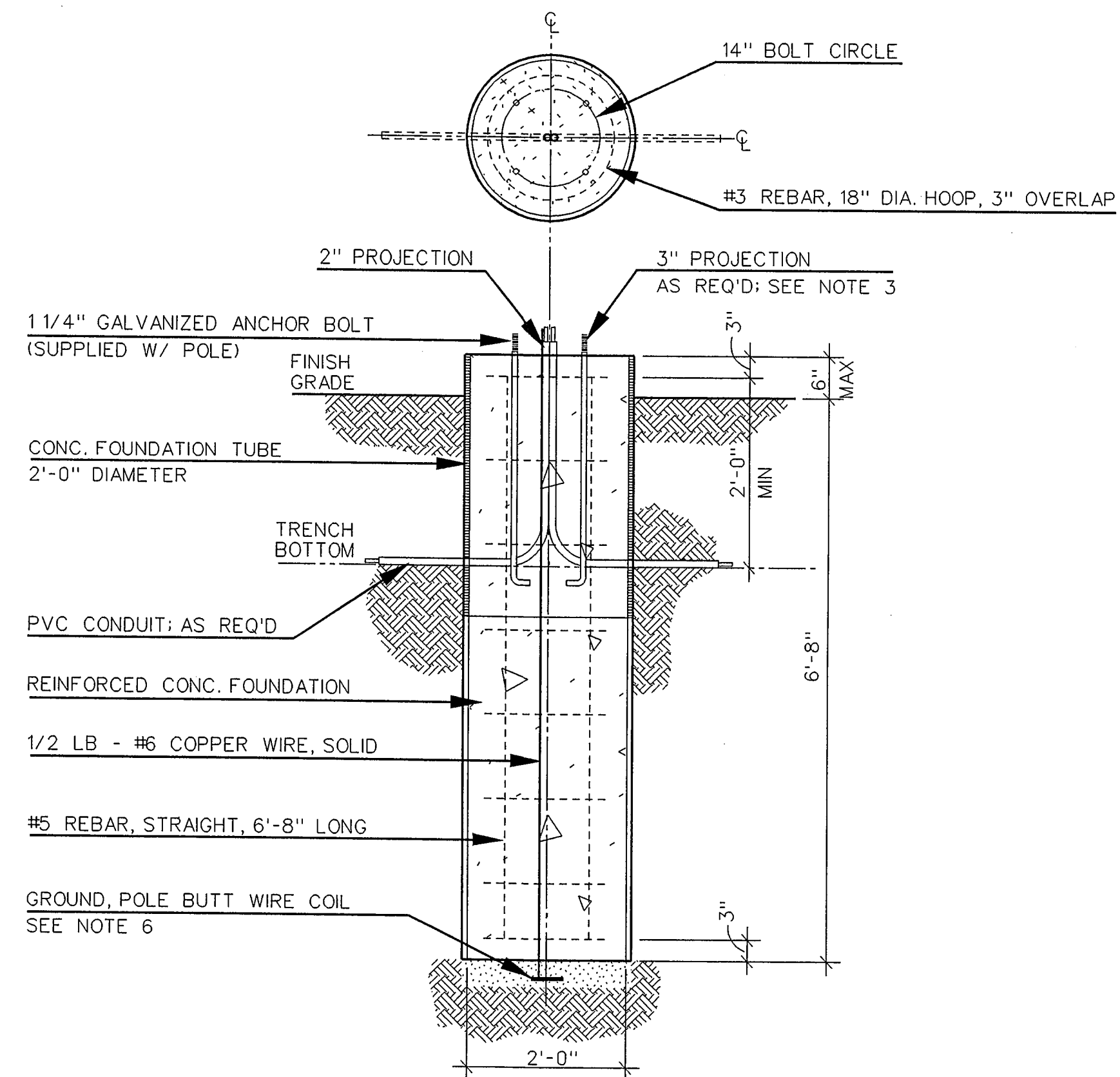
BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE CONCRETE SYSTEMS INC. PROJECT COORDINATOR: *[Signature]*



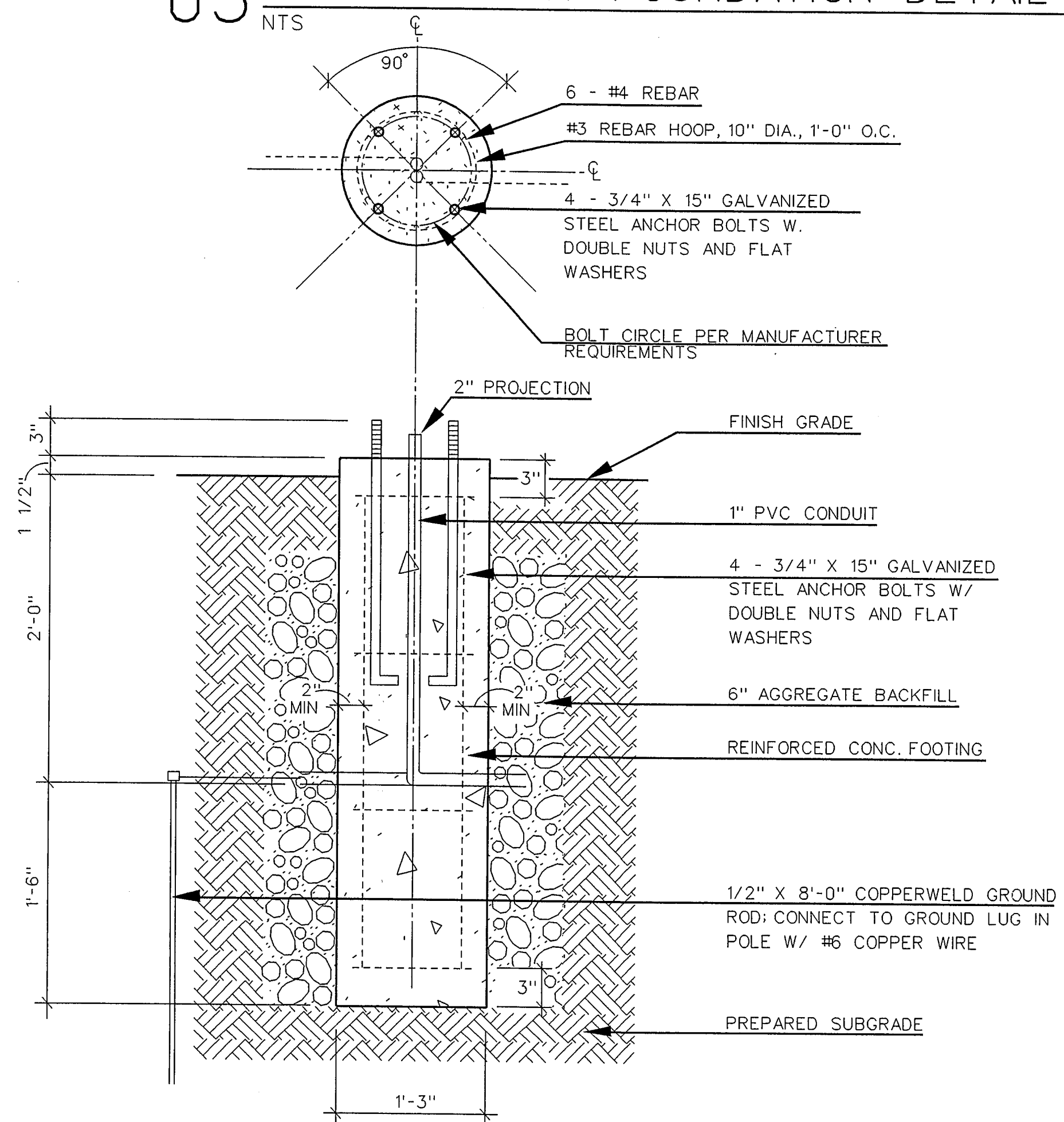
NO.	DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>			
ARAPAHO ROAD - PHASE II			
MARSH LANE TO SURVEYOR BOULEVARD			
ELECTRICAL DETAILS			
TOWN OF ADDISON, TEXAS			
Design JGS	Drawn TGM	DATE	SCALE
Check LEL	Check JGS	OCT 11	
PROJECT NO.	25768	SHEET NO.	97
		IL-6	

NOTES:

1. CONCRETE TO BE MINIMUM 3000 PSI AT 28 DAYS. MAXIMUM AGGREGATE 3/4" TOP OF FOUNDATION TO BE TROWELED TO A FLAT AND LEVEL SURFACE. AVOID EXCESSIVE TROWELING. CONCRETE TO SET A MINIMUM OF 72 HOURS BEFORE POLE INSTALLATION.
2. REBAR HOOPS ARE TIED BEGINNING 3" BELOW TOP OF CONCRETE FORM AND ARE REPEATED AT APPROX. 1' INTERVALS TO BOTTOM OF FOUNDATION.
3. ANCHOR BOLTS TO BE SUPPLIED WITH POLE. USE TEMPLATE FURNISHED BY POLE MANUFACTURER FOR ALIGNING ANCHOR BOLTS. PROJECTION OF 3" ON 25' & 30' SQUARE AND 3 1/2" ON 40' SQUARE AND 37' ROUND POLES.
4. CONCRETE FORM OF SONOTUBE TO EXTEND TO BOTTOM OF TRENCH OR AS NEEDED.
5. PROVIDE 2'-0" PIGTAIL FOR CONNECTION OF GROUND WIRE TO POLE.
6. A MINIMUM OF 12" OF BARE #6 SD CU WIRE TO BE PLACED IN BOTTOM OF HOLE AND COVERED W/ 2" OF DIRT.
7. IF SOIL HAS BEEN DISTURBED, EXTEND FOUNDATION BY DEPTH OF DISTURBED SOIL.
8. TXU WILL REMOVE THE EXISTING COBRA HEAD LIGHTS WHEN THE NEW LIGHTS ARE INSTALLED.

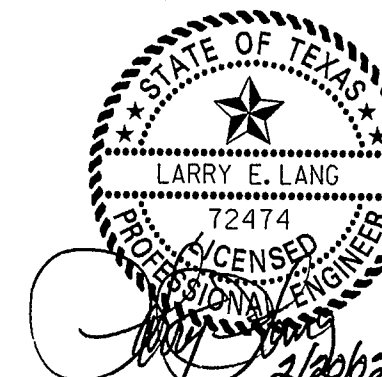


05 STREET LIGHT FOUNDATION DETAIL



04 PEDESTRIAN LIGHT FOUNDATION DETAIL

BUILT AS PER SPECIFICATIONS AND PLANS BY DURABLE SPECIALTIES INC. PROJECT COORDINATOR *[Signature]*



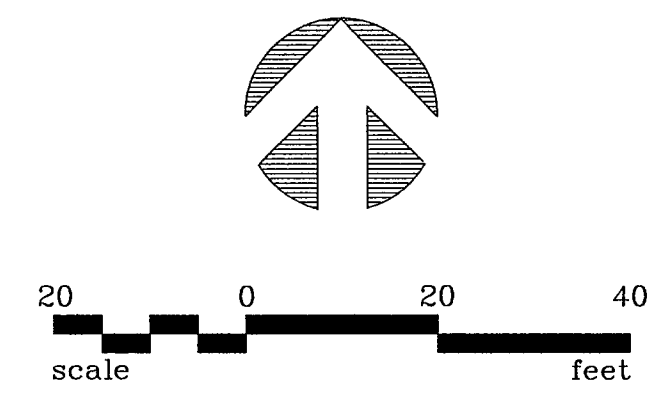
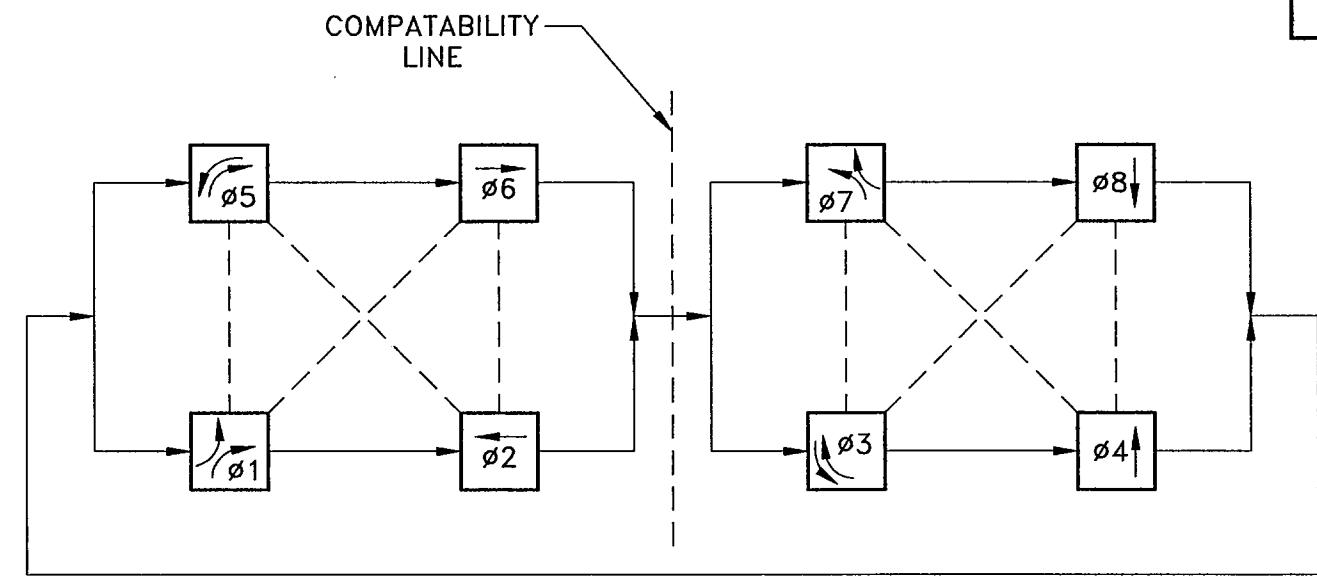
NO.	DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS <small>The HNTB Companies</small>			
ARAPAHO ROAD - PHASE II			
MARSH LANE TO SURVEYOR BOULEVARD			
SITE WORK DETAILS			
TOWN OF ADDISON, TEXAS			
Design	JGS	Drawn	TGM
Check	LEL	Check	JGS
DATE	OCT 11	SCALE	
PROJECT NO.	25768	SHEET NO.	IL-7

NO.	DATE	REVISION	APPROV.
1	2/06/02	PER ADDENDUM No.2	BRG
2			
3			

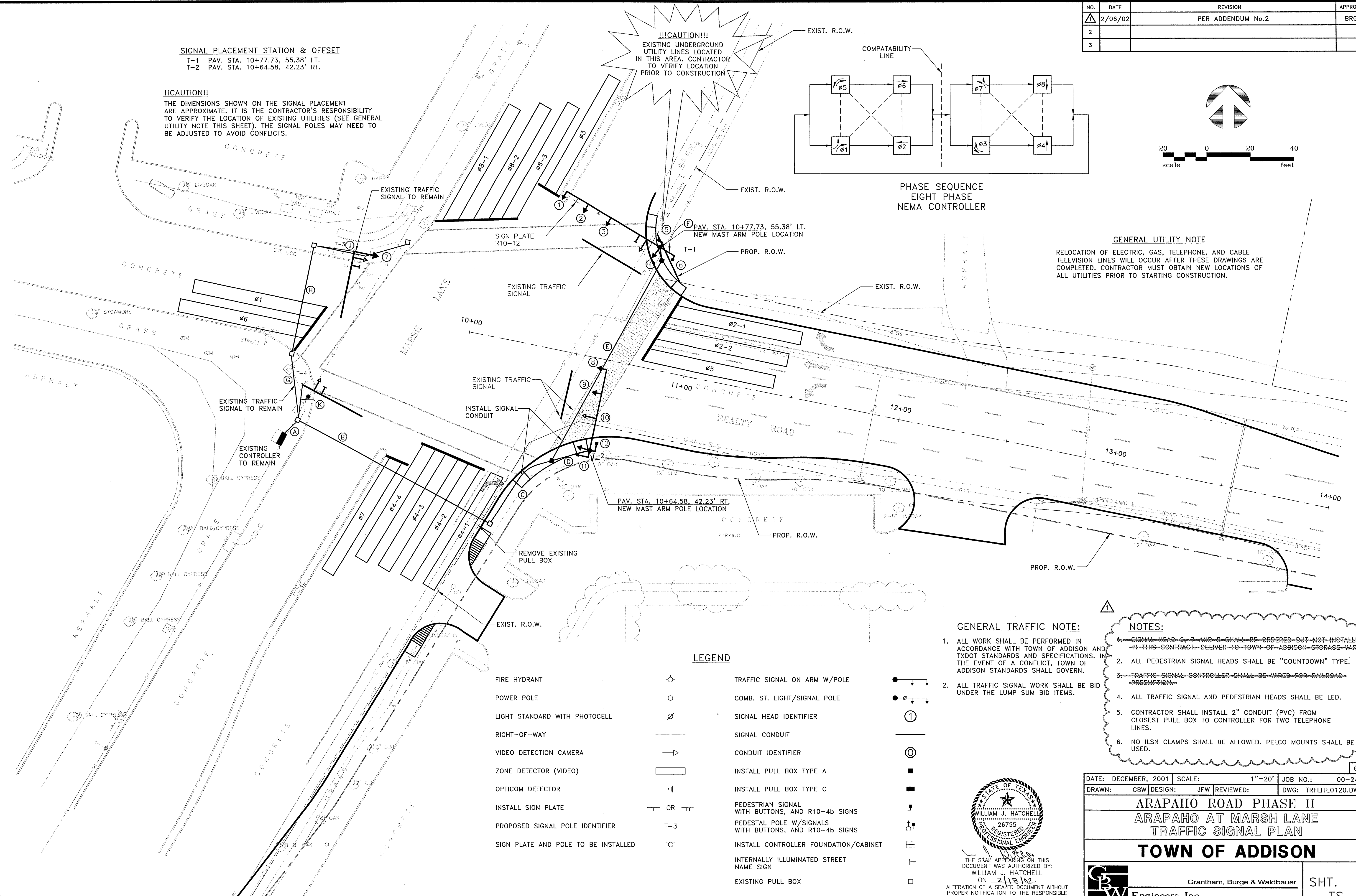
SIGNAL PLACEMENT STATION & OFFSET
T-1 PAV. STA. 10+77.73, 55.38' LT.
T-2 PAV. STA. 10+64.58, 42.23' RT.

!!!CAUTION!!!
THE DIMENSIONS SHOWN ON THE SIGNAL PLACEMENT ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION OF EXISTING UTILITIES (SEE GENERAL UTILITY NOTE THIS SHEET). THE SIGNAL POLES MAY NEED TO BE ADJUSTED TO AVOID CONFLICTS.

!!!CAUTION!!!
EXISTING UNDERGROUND UTILITIES LOCATED IN THIS AREA. CONTRACTOR TO VERIFY LOCATION PRIOR TO CONSTRUCTION



GENERAL UTILITY NOTE
RELOCATION OF ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION LINES WILL OCCUR AFTER THESE DRAWINGS ARE COMPLETED. CONTRACTOR MUST OBTAIN NEW LOCATIONS OF ALL UTILITIES PRIOR TO STARTING CONSTRUCTION.



GENERAL TRAFFIC NOTE:

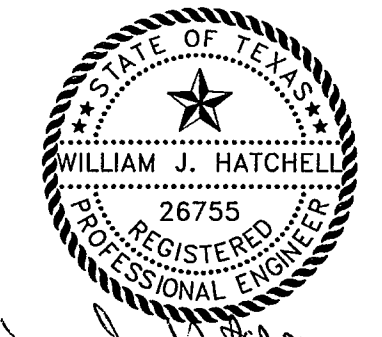
- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH TOWN OF ADDISON AND TXDOT STANDARDS AND SPECIFICATIONS. IN THE EVENT OF A CONFLICT, TOWN OF ADDISON STANDARDS SHALL GOVERN.
- ALL TRAFFIC SIGNAL WORK SHALL BE BID UNDER THE LUMP SUM BID ITEMS.

NOTES:

- SIGNAL HEAD 6, 7 AND 8 SHALL BE ORDERED BUT NOT INSTALLED. IN THIS CONTRACT DELIVER TO TOWN OF ADDISON STORAGE YARD.
- ALL PEDESTRIAN SIGNAL HEADS SHALL BE "COUNTDOWN" TYPE.
- TRAFFIC SIGNAL CONTROLLER SHALL BE WIRED FOR RAILROAD PREEMPTION.
- ALL TRAFFIC SIGNAL AND PEDESTRIAN HEADS SHALL BE LED.
- CONTRACTOR SHALL INSTALL 2" CONDUIT (PVC) FROM CLOSEST PULL BOX TO CONTROLLER FOR TWO TELEPHONE LINES.
- NO ILSN CLAMPS SHALL BE ALLOWED. PELCO MOUNTS SHALL BE USED.

LEGEND

FIRE HYDRANT	⊙	TRAFFIC SIGNAL ON ARM W/POLE	⊙
POWER POLE	○	COMB. ST. LIGHT/SIGNAL POLE	⊙
LIGHT STANDARD WITH PHOTOCELL	⊙	SIGNAL HEAD IDENTIFIER	①
RIGHT-OF-WAY	---	SIGNAL CONDUIT	---
VIDEO DETECTION CAMERA	→	CONDUIT IDENTIFIER	⊙
ZONE DETECTOR (VIDEO)	▭	INSTALL PULL BOX TYPE A	■
OPTICOM DETECTOR		INSTALL PULL BOX TYPE C	■
INSTALL SIGN PLATE	— OR —	PEDESTRIAN SIGNAL WITH BUTTONS, AND R10-4b SIGNS	⊕
PROPOSED SIGNAL POLE IDENTIFIER	T-3	PEDESTAL POLE W/SIGNALS WITH BUTTONS, AND R10-4b SIGNS	⊕
SIGN PLATE AND POLE TO BE INSTALLED	⊕	INSTALL CONTROLLER FOUNDATION/CABINET	⊕
		INTERNALLY ILLUMINATED STREET NAME SIGN	⊕
		EXISTING PULL BOX	□



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: WILLIAM J. HATCHELL ON 2/15/12. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DATE: DECEMBER, 2001	SCALE: 1"=20'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: JFW	REVIEWED: DWG: TRFLITE0120.DWG

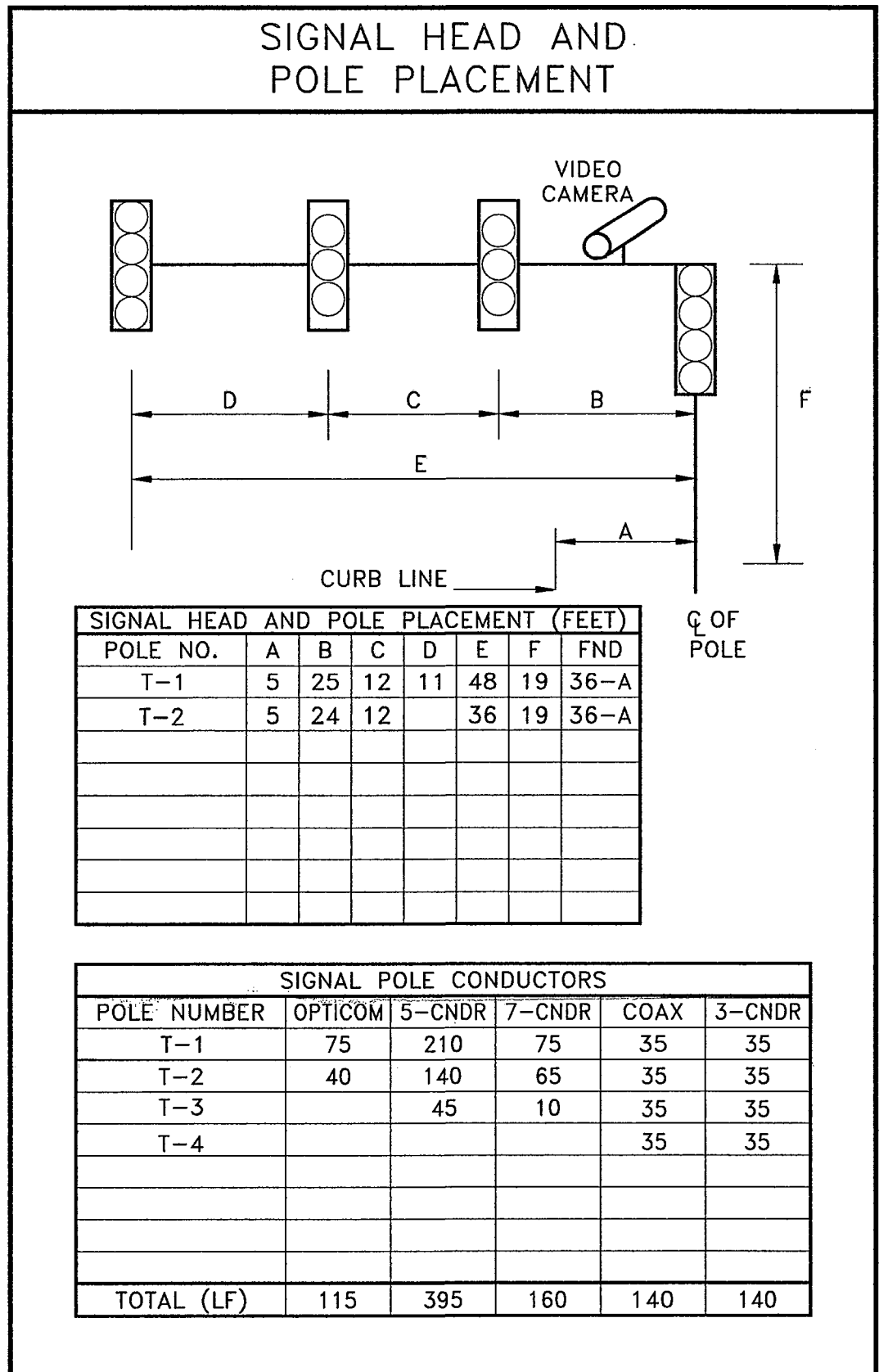
**ARAPAHO ROAD PHASE II
ARAPAHO AT MARSH LANE
TRAFFIC SIGNAL PLAN**

TOWN OF ADDISON

GBW Engineers, Inc.
Grantham, Burge & Waldbauer
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

SHT. TS-1 OF TS-21

NO.	DATE	REVISION	APPROV.
1			
2			
3			



CABLE TERMINATION CHART

CABLE CONDUCTOR	T-1 (20 CNDR)	T-2 (16 CNDR)	T-3 (7 CNDR)
	S.H. NO.	S.H. NO.	S.H. NO.
BLACK	SPARE	SPARE	7 Y←
WHITE	COMMON	COMMON	COMMON
RED	1-4 R	8-10 R	7 R
GREEN	1-4 G	8-10 G	7 G
ORANGE	1-4 Y	8-10 Y	7 Y
BLUE	PB 5 Ø6	PB 12 Ø8	7 G←
WHT/BLK	PB COMMON	PB COMMON	SPARE
RED/BLK	5 DW	12 DW	
GRN/BLK	5 W	12 W	
ORN/BLK	1 →Y	8 →Y	
BLUE/BLK	1 →G	8 →G	
BLK/WHT	PB 6 Ø4	PB 11 Ø6	
RED/WHT	6 DW	11 DW	
GRN/WHT	6 W	11 W	
BLUE/WHT	PB COMMON	PB COMMON	
BLK/RED	SPARE	SPARE	
WHT/RED	4 →G		
ORN/RED	4 →Y		
BLUE/RED	SPARE		
RED/GRN	SPARE		

SIGNAL POLE CONDUCTORS

POLE NUMBER	OPTICOM	5-CNDR	7-CNDR	COAX	3-CNDR
T-1	75	210	75	35	35
T-2	40	140	65	35	35
T-3		45	10	35	35
T-4				35	35
TOTAL (LF)	115	395	160	140	140

SIGNAL HEADS*

NO.	TYPE	PHASE	BACKPLATE		SIGNAL HEAD		PED. SIG. SEC.
			3 SEC.	4 SEC.	3 SEC.	4 SEC.	
1	V4 LT *	4+7		1		1	
2-3	V3	4	2		2		
4	V4RT	4		1		1	
5	PED	6					1
6	PED	4					1
7	V4RT	2		1		1	
8	V3	1+6	1		1		
9	V3	1+6	1		1		
10	V3	1+6	1		1		
11	PED	6					1
12	PED	8					1
TOTALS			5	3	5	3	4

CONDUIT RUNS

RUN NO.	QUANTITY	SIZE	TYPE	METHOD	*4 XHHW	*12 XHHW	*6 BARE	COAX CABLE	4 CNDR OPTICOM	3 CNDR (VIDEO)	7 CNDR	9 CNDR	16 CNDR	CONDUIT LENGTH	CABLE LENGTH	RUN NO.
A	EXISTING									4	1	1	1		15'	A
B	1	4"	PVC	BORE			1	1	1	2				100'	105'	B
C	1	4"	PVC	TRENCH			1	1	1	2		1	1	45'	50'	C
D	1	3"	PVC	TRENCH			1	1	1	1				20'	25'	D
E	1	4"	PVC	BORE			1	1	1	1			1	110'	115'	E
F	1	3"	PVC	TRENCH			1	1	1	1			1	5'	10'	F
G	EXISTING							1		1	1				35'	G
H	EXISTING							1		1	1				55'	H
J	EXISTING							1		1	1				20'	J
K	EXISTING							1		1					20'	K
TOTAL(LF)							305	435	305	650	125	170	305			

CONDUIT SUMMARY

SIZE	TYPE	LENGTH(LF)
3"	TRENCH	25'
4"	BORE	210'
4"	TRENCH	45'

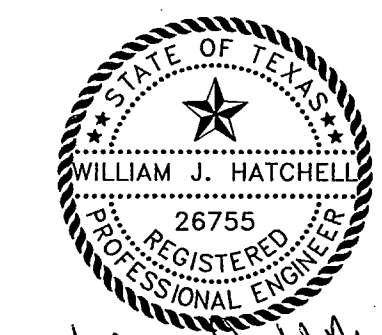
GROUND BOX SUMMARY

TYPE	EA.
A	3

* ALL SIGNAL HEADS TO BE LED
 * ALL PEDESTRIAN SIGNAL HEADS TO BE "COUNTDOWN" TYPE.

GENERAL TRAFFIC NOTE:

- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH TOWN OF ADDISON AND TXDOT STANDARDS AND SPECIFICATIONS. IN THE EVENT OF A CONFLICT, TOWN OF ADDISON STANDARDS SHALL GOVERN.
- ALL TRAFFIC SIGNAL WORK SHALL BE BID UNDER THE LUMP SUM BID ITEMS.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY:
 WILLIAM J. HATCHELL
 ON 2/18/02
 ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DATE: DECEMBER, 2001 SCALE: NOT TO SCALE JOB NO.: 00-249
 DRAWN: GBW DESIGN: WJH REVIEWED: DWG: SIG-LAY2.DWG

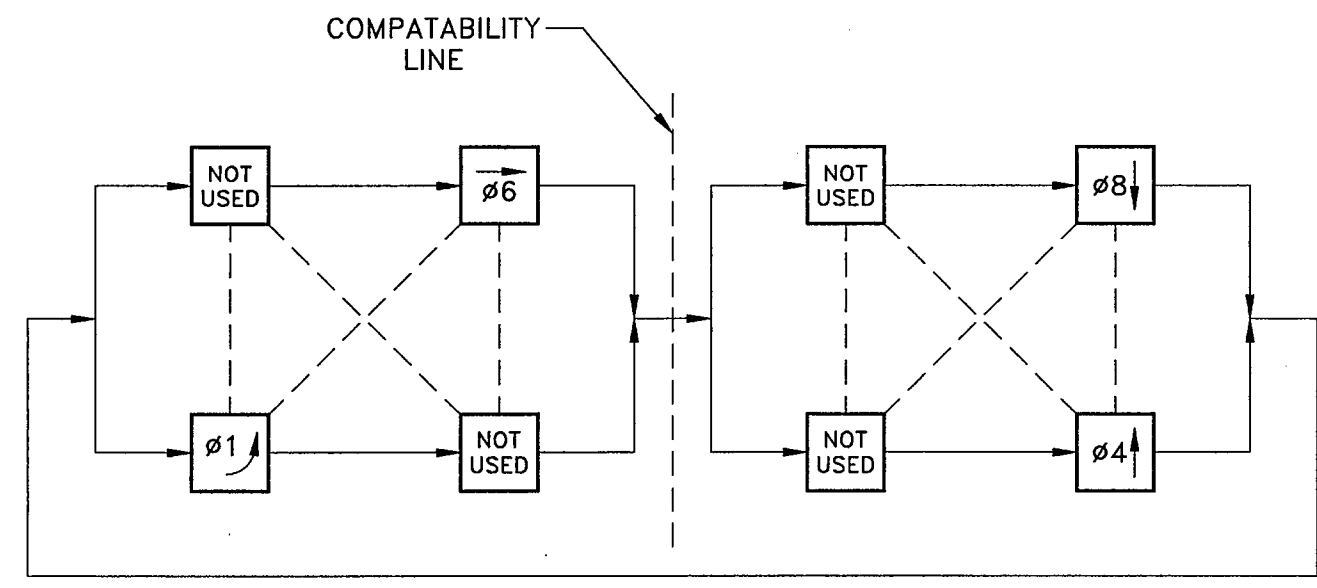
ARAPAHO ROAD PHASE II ARAPAHO ROAD AT MARSH LANE SIGNAL LAYOUT TABLE

TOWN OF ADDISON

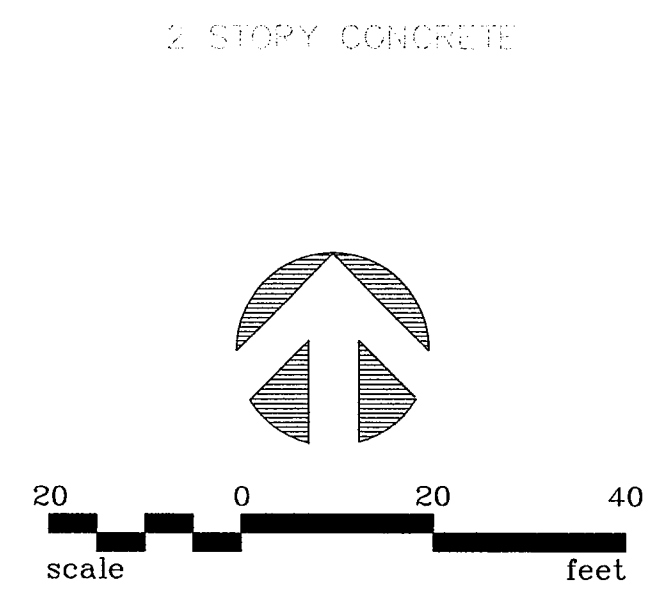
GBW Grantham, Burge & Waldbauer
 Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27
 GARLAND, TEXAS 75042
 (972) 840-1916 (TEL)
 (972) 840-2156 (FAX)

SHT. TS-2
 OF TS-21

NO.	DATE	REVISION	APPROV.
1	2/06/02	PER ADDENDUM No.2	BRG
2			
3			



PHASE SEQUENCE
EIGHT PHASE
NEMA CONTROLLER



SIGNAL PLACEMENT STATION & OFFSET

- T-1 PAV. STA. 33+48.27, 54.35' RT.
- T-2 PAV. STA. 33+73.69, 38.75' LT.
- T-3 PAV. STA. 34+73.91, 57.78' LT.
- T-4 PAV. STA. 34+28.37, 42.22' RT.

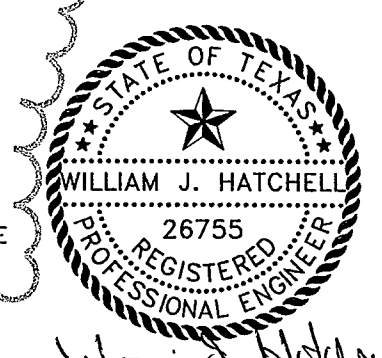
!!CAUTION!!
THE DIMENSIONS SHOWN ON THE SIGNAL PLACEMENT ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION OF EXISTING UTILITIES (SEE GENERAL UTILITY NOTE THIS SHEET). THE SIGNAL POLES MAY NEED TO BE ADJUSTED TO AVOID CONFLICTS.

GENERAL UTILITY NOTE
RELOCATION OF ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION LINES WILL OCCUR AFTER THESE DRAWINGS ARE COMPLETED. CONTRACTOR MUST OBTAIN NEW LOCATIONS OF ALL UTILITIES PRIOR TO STARTING CONSTRUCTION.

LEGEND

FIRE HYDRANT		TRAFFIC SIGNAL ON ARM W/POLE	
POWER POLE		COMB. ST. LIGHT/SIGNAL POLE	
LIGHT STANDARD WITH PHOTOCELL		SIGNAL HEAD IDENTIFIER	
RIGHT-OF-WAY		SIGNAL CONDUIT	
VIDEO DETECTION CAMERA		CONDUIT IDENTIFIER	
ZONE DETECTOR (VIDEO)		INSTALL PULL BOX TYPE A	
OPTICOM DETECTOR		INSTALL PULL BOX TYPE C	
INSTALL SIGN PLATE		PEDESTRIAN SIGNAL WITH BUTTONS, AND R10-4b SIGNS	
PROPOSED SIGNAL POLE IDENTIFIER		PEDESTAL POLE W/SIGNALS WITH BUTTONS, AND R10-4b SIGNS	
SIGN PLATE AND POLE TO BE INSTALLED		INSTALL CONTROLLER FOUNDATION/CABINET	
		INTERNALLY ILLUMINATED STREET NAME SIGN	
		EXISTING PULL BOX	

- NOTES:**
- SIGNAL HEAD 6, 7, 8, VIDEO DETECTION CAMERA AND OPTICOM ON SIGNAL POLE T-2 SHALL BE ORDERED BUT NOT INSTALLED IN THIS CONTRACT. DELIVER TO TOWN OF ADDISON STORAGE YARD.
 - ALL PEDESTRIAN SIGNAL HEADS SHALL BE "COUNTDOWN" TYPE.
 - TRAFFIC SIGNAL CONTROLLER SHALL BE WIRED FOR RAILROAD PREEMPTION.
 - ALL TRAFFIC SIGNAL AND PEDESTRIAN HEADS SHALL BE LED.
 - CONTRACTOR SHALL INSTALL 2" CONDUIT (PVC) FROM CLOSEST PULL BOX TO CONTROLLER FOR TWO TELEPHONE LINES.
 - NO ILSN CLAMPS SHALL BE ALLOWED. PELCO MOUNTS SHALL BE USED.



ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

GENERAL TRAFFIC NOTE:

- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH TOWN OF ADDISON AND TxDOT STANDARDS AND SPECIFICATIONS. IN THE EVENT OF A CONFLICT, TOWN OF ADDISON STANDARDS SHALL GOVERN.
- ALL TRAFFIC SIGNAL WORK SHALL BE BID UNDER THE LUMP SUM BID ITEMS.

DATE: DECEMBER, 2001	SCALE: 1"=20'	JOB NO.: 00-249
DRAWN: GBW	DESIGN: WJH	REVIEWED: [Signature]
DWG: TRFLITE0220.DWG		

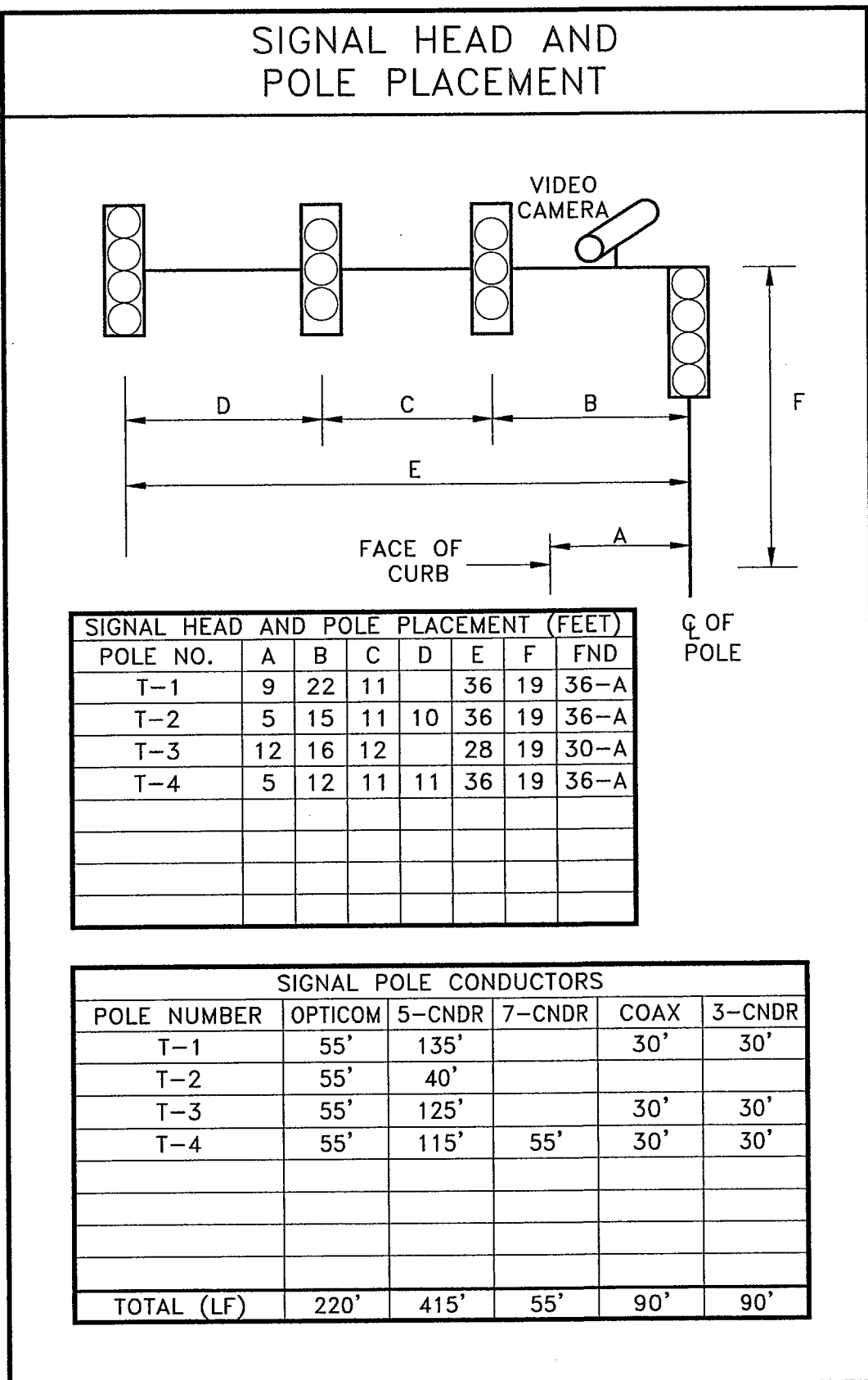
ARAPAHO ROAD PHASE II
ARAPAHO ROAD AT SURVEYOR BOULEVARD
TRAFFIC SIGNAL PLAN

TOWN OF ADDISON

GBW Grantham, Burge & Waldbauer
Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

SHT. TS-3
OF TS-21

NO.	DATE	REVISION	APPROV.
1			
2			
3			



SIZE	TYPE	LENGTH(LF)
3"	TRENCH	28'
4"	TRENCH	214'
4"	BORE	180'
2"	TRENCH	295'

TYPE	EA.
A	6

CABLE TERMINATION CHART

CABLE CONDUCTOR	T-1 (16 CNDR)		T-2 (16 CNDR)		T-3 (16 CNDR)		T-4 (16 CNDR)	
	S.H. NO.	INDICATION	S.H. NO.	INDICATION	S.H. NO.	INDICATION	S.H. NO.	INDICATION
BLACK	5	Y	6	→Y	SPARE	COMMON	15	→Y
WHITE		COMMON		COMMON		COMMON		COMMON
RED	1-2	R	6-8	R	11-12	R	15-17	R
GREEN	1-2	G	6-8	G	11-12	G	15-17	G
ORANGE	1-2	Y	6-8	Y	11-12	Y	15-17	Y
BLUE	4	W	6	→G	SPARE		15	→G
WHT/BLK		PB COMMON		PB COMMON		PB COMMON		PB COMMON
RED/BLK	3	DW	9	DW	13	DW	18	DW
GRN/BLK	3	W	9	W	13	W	18	W
ORN/BLK	SPARE		SPARE		SPARE		SPARE	
BLUE/BLK	SPARE		SPARE		SPARE		SPARE	
BLK/WHT	PB 4		PB 10		PB 14		PB 19	
RED/WHT	5	R	10	DW	14	DW	19	DW
GRN/BLK	5	G	10	W	14	W	19	W
BLUE/WHT	PB 3		PB 9		PB 13		PB 18	
BLK/RED	4	DW	SPARE		SPARE		SPARE	

SIGNAL HEADS*

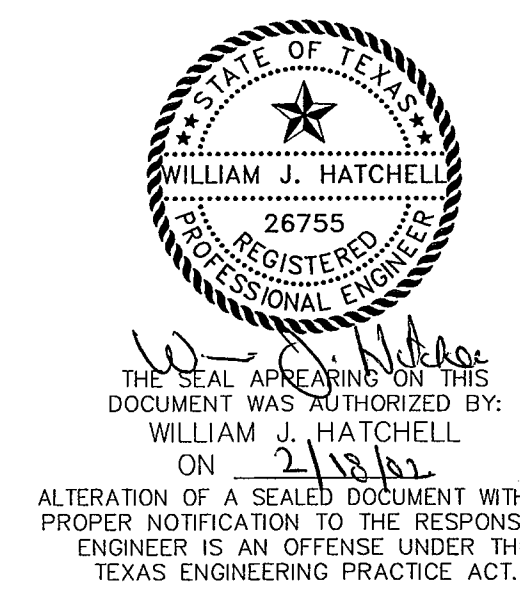
NO.	TYPE	PHASE	BACKPLATE		SIGNAL HEAD		PED. SIG. SEC.
			3 SEC.	4 SEC.	3 SEC.	4 SEC.	
1-2	V3	Ø8	2		2		
3		Ø2					1
4		Ø8					1
5	V3	Ø6	1		1		
6	V4LT	Ø5		1		1	
7-8	V3	Ø2	2		2		
9		Ø4					1
10		Ø2					1
11-12	V3	Ø4	2		2		
13		Ø6					1
14		Ø4					1
15	V4LT	Ø1		1		1	
16-17	V3	Ø6	2		2		
18		Ø8					1
19		Ø6					1

CONDUIT RUNS

RUN NO.	QUANTITY	SIZE	TYPE	METHOD	*4 XHHW	*12 XHHW	*6 BARE	COAX CABLE	4 CNDR OPTICOM	3 CNDR (VIDEO)	6 CNDR	9 CNDR	16 CNDR	CONDUIT LENGTH	CABLE LENGTH	RUN NO.
A	2	4"	PVC	TRENCH	2		1	4	4	4	1	1	4	4'	10'	A
B	1	3"	PVC	TRENCH			1	1	1	1			1	5'	10'	B
C	1	4"	PVC	TRENCH			1	1	1	1			1	105'	115'	C
D	1	3"	PVC	TRENCH			1	1	1	1			1	5'	10'	D
E	1	4"	PVC	BORE			1	2	2	2			2	90'	100'	E
F	1	3"	PVC	TRENCH			1	1	1	1			1	10'	15'	F
G	1	4"	PVC	TRENCH			1	1	1	1		1	1	105'	115'	G
H	1	3"	PVC	TRENCH			1	1	1	1			1	8'	12'	H
I	1	4"	PVC	BORE			1					1		90'	100'	I
J	1	2"	PVC	TRENCH	2						1			10'	15'	J
K	1	2"	PVC	TRENCH							1			20'	25'	K
L	1	2"	PVC	TRENCH							1			135'	140'	L
M	1	2"	PVC	TRENCH							1			130'	135'	M

* ALL SIGNAL HEADS SHALL BE LED.
 * ALL PEDESTRIAN SIGNAL SHALL BE "COUNTDOWN" TYPE.

- #### RAILROAD PRE-EMPTION SEQUENCE
- NOTES:
- UPON TRACK CLOSURE, THE CONTROLLER WILL IMMEDIATELY TIME THE APPROPRIATE YELLOW INTERVAL AND TRANSFER TO THE PRE-EMPTION SEQUENCE.
 - THE PRE-EMPTION SEQUENCE WILL DISPLAY THE FOLLOWING SIGNAL HEAD COLORS.
 - SIGNAL HEADS 11, 12, 15, 16, AND 17 RED
 - SIGNAL HEADS 1 & 2 GREEN
 - WHEN THE TRACK CIRCUIT RELEASES, THE CONTROLLER WILL PLACE A CALL ON ALL PHASES, TIME THE AMBER FOR Ø 8, RETURN TO Ø 1+6 AND RESUME NORMAL OPERATION.



DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: WJH	REVIEWED: DWG: SIG-LAY1.DWG
ARAPAHO ROAD PHASE II		
ARAPAHO ROAD AT SURVEYOR BOULEVARD		
SIGNAL LAYOUT TABLE		
TOWN OF ADDISON		
Grantham, Burge & Waldbauer Engineers, Inc.		SHT. TS-4 OF TS-21
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042		(972) 840-1916 (TEL) (972) 840-2156 (FAX)

I. GENERAL REQUIREMENTS FOR ALL ELECTRICAL WORK

The location of all conductors, conduits, junction boxes, ground boxes, and electrical services is diagrammatic only and may be shifted by the Engineer to accommodate local conditions.

Materials shall be new and unused. Materials and installation shall comply with the applicable provisions of the National Electrical Code (NEC), National Electrical Manufacturers Association (NEMA) standards, and shall be Underwriters Laboratories (UL) Listed unless otherwise shown on the plans or specifications or approved by the Engineer in writing. Faulty fabrication or poor workmanship in any material, equipment, or installation shall be justification for rejection! When reference is made to UL, it can be considered to mean a Nationally Recognized Independent Testing Lab (NRTL). Comparable standards of Canadian Standard Association, Electrical Testing Laboratories or Factory Mutual can be equal to the referenced UL standard. Where reference is made to NEMA listed devices, IEC listed devices shall not be considered to be an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing.

Unless high strength bolts are specified stainless steel hardware and miscellaneous nuts and bolts may be provided when galvanized is specified by the plans provided that bolts are 1/2 inch or less in diameter. The Contractor shall provide the following electrical test instruments as required by the Engineer to confirm compliance with the contract and the NEC. Those test instruments are voltmeter, amp probe, megger (1000 volt DC) and torque wrenches. All meters shall have been properly calibrated within one year. Calibration certification shall be provided to the Engineer upon request. Calibration certification tag shall also be applied to the meter. The Contractor shall operate meters during inspection as requested by the Engineer. Grounding shall be as shown on the plans and in accordance with the NEC. Metallic conduit, light poles, luminaires on bridge structures, and all metal enclosures shall be bonded to the system-grounding conductor. The ground rod in each ground box or junction box at the bridge ends, and in each ground box installed for underpass lighting will also be bonded to the system grounding conductor. The grounding conductor shall be bare or, if insulated, shall be green. Ground rods, connectors, and bonding jumpers will not be paid for separately, but will be subsidiary to the various bid items.

SUBMITTALS:

The contractor will submit for approval six (6) copies of catalog cut sheets for each of the following three (3) categories.

Category 1. Electrical services including photocell.

Category 2. Breakaway disconnects, heat shrink tubing, heat shrink filler tape and ground boxes which will include loading capacity certification.

Category 3. Highmast assembly kits, when applicable. See Item 614 "Texas Standard Specifications". Submittals shall be legible and shall be marked to indicate which product on a cut sheet is to be supplied. Where manufacturers provide warranties and guarantees as a customary trade practice, the Contractor shall furnish to the Owners such warranties and guarantees.

Any deviation from plans or specifications, including deviations due to plan error should be prominently displayed on the submittal. Any changes not prominently noted in submittal and incorporated into the work without proper authorization will constitute grounds for rejection of that portion of the work.

II. CONDUIT

A. MATERIALS

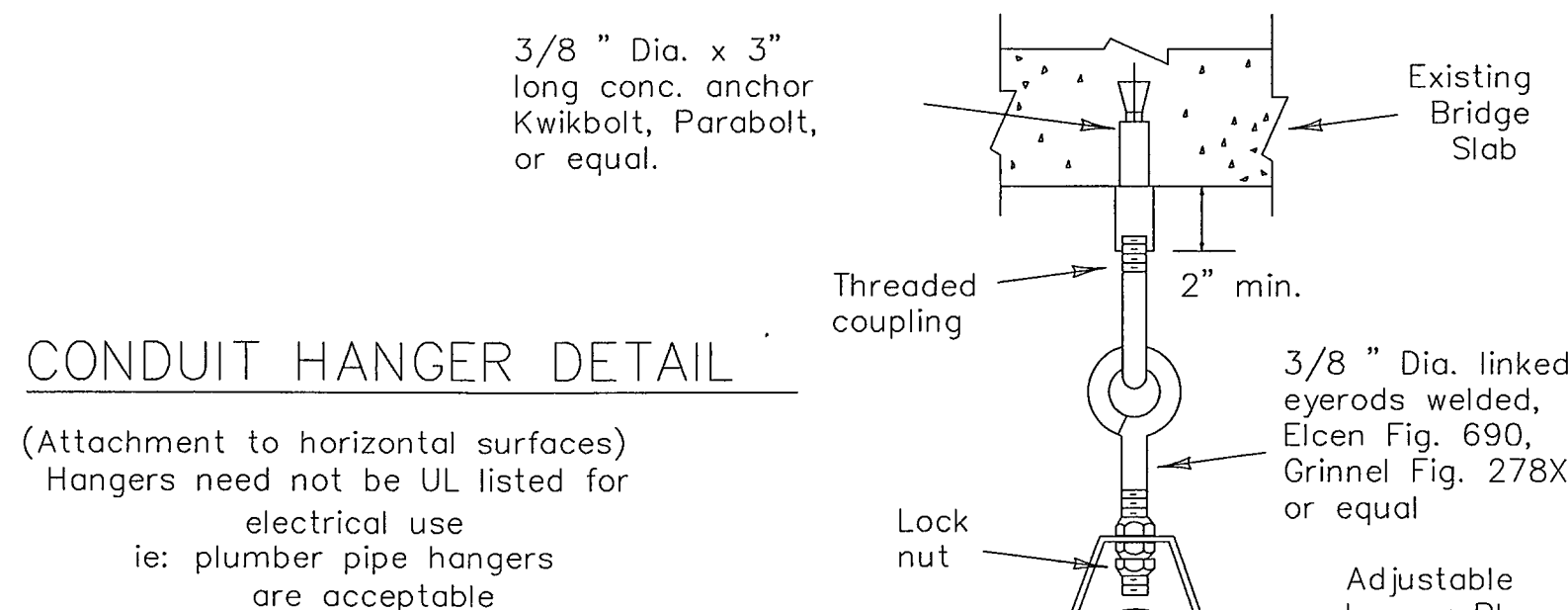
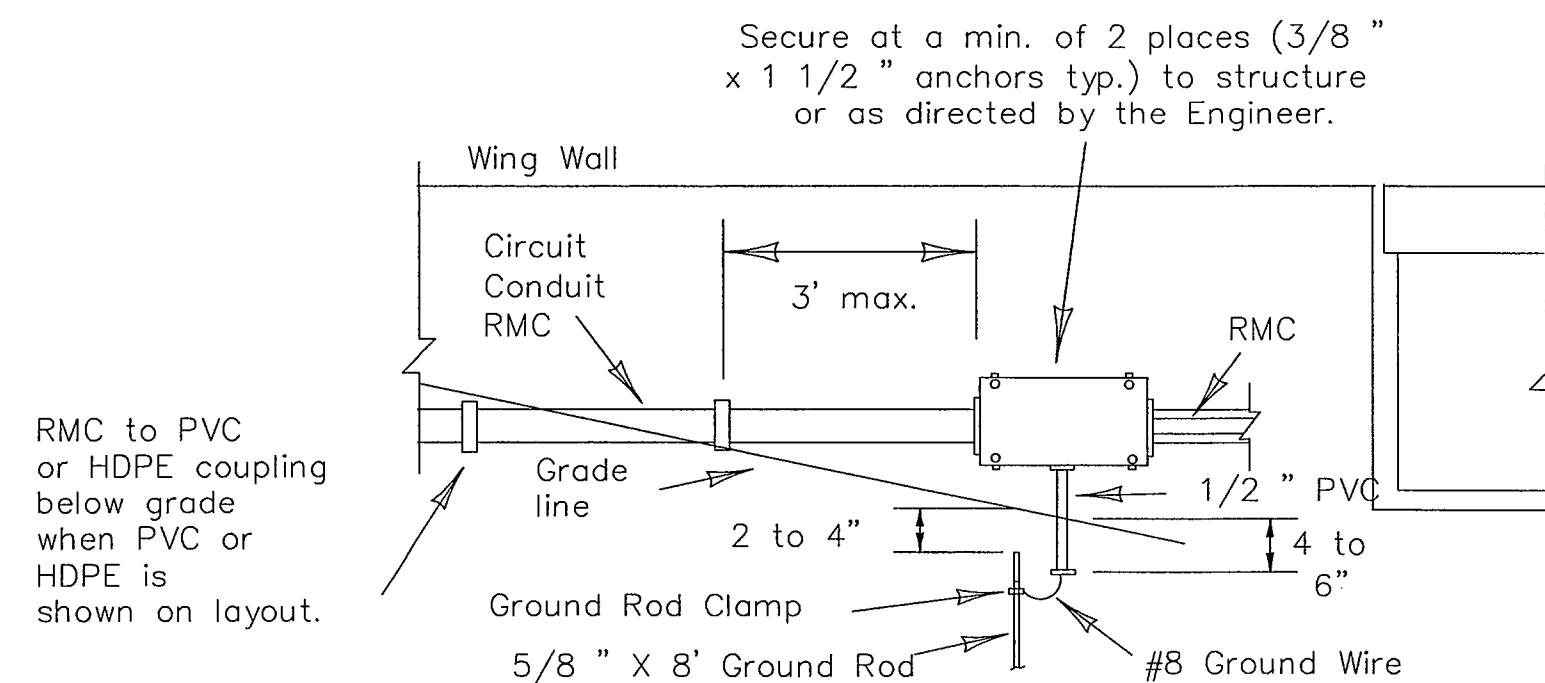
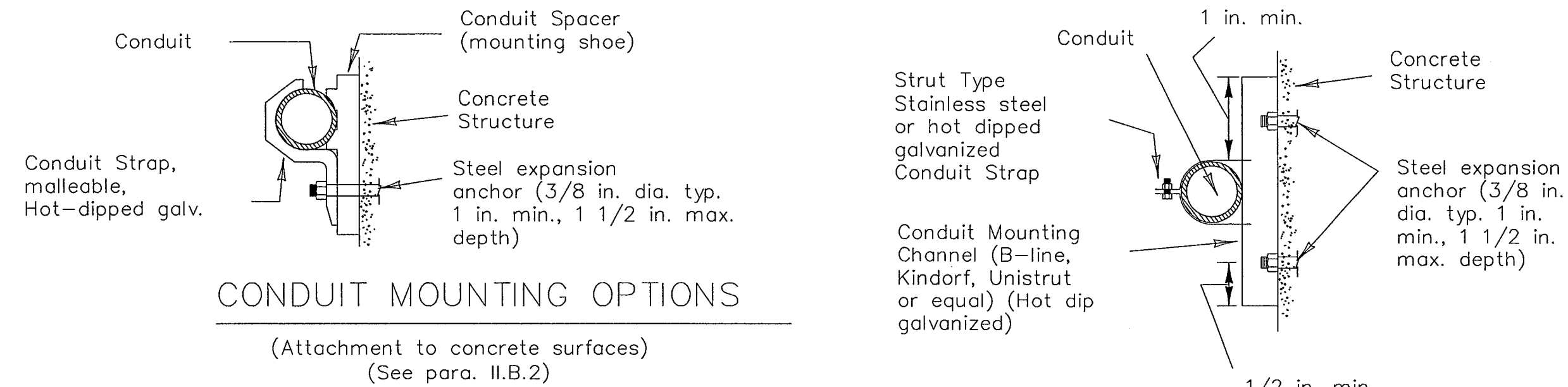
- Conduit and fittings shall be UL Listed for the intended use shown on plan sheets.
- Conduit shall be the type shown by descriptive code or shown elsewhere on the plans. Substitution of the various types of conduits will not be permitted. All flexible conduit in rigid metallic conduit systems shall be Liquidtight Flexible Metal (LFMC) conduit. All flexible conduit in PVC systems shall be Liquidtight Flexible Non-metallic conduit. Neither aluminum conduit, electrical metallic tubing (EMT), nor intermediate metal conduit (IMC) shall be permitted.
- All exposed conduits shall be RMC, unless otherwise specifically shown on the plans. All metal conduit shall be properly grounded.
- Couplings, connectors, conduit bodies, grounding bushings, and offset nipples for RMC shall be electro-zinc plated steel or hot dipped galvanized malleable iron, threaded or threadless compression type, rain-tight and shall be UL listed for the intended use.
- Expansion joints for metal conduit shall be provided with an internal or external bonding jumper and shall be UL listed.
- Unless otherwise shown on the plans, junction box minimum sizes shall be in accordance with the following table which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes are present, the conductors shall be counted as if all are of the larger size. Situations not applicable to the table shall be sized in accordance with NEC 370-28.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

- RMC system junction boxes equal to or smaller, in any dimension, than 12 x 12 x 6 (HxWxD), surface mounted and containing conductors #8 or larger, shall be hot dipped galvanized cast iron with minimum wall thickness of 3/16 inch, shall have external mounting lugs, and shall be UL listed Crouse-Hinds Type WAB, OZ/Gedney Type YS or approved equal. Unless otherwise shown elsewhere on the plans, RMC system junction boxes larger than the aforementioned boxes but equal to or smaller, in any dimension, than 18 x 18 x 6 (HxWxD) shall be 14-ga. stainless steel; RMC system junction boxes larger than 18 x 18 x 6 (HxWxD) shall be 12-ga. stainless steel. All metal junction boxes shall be equipped with a threaded hole or lug for grounding. Stainless steel boxes 12 x 12 x 6 and larger need not be UL Listed but shall meet the other requirements of the NEC and shall have ribs, stiffeners, or thicker metal and shall have external mounting feet. Junction boxes with an internal volume of more than 100 cu. in. may be supported by connection of two or more rigid metal conduits, where specifically shown on the plans or where approved by the Engineer.
- Junction boxes containing only #10 or #12 AWG conductors shall be Crouse Hinds Type GRFX, Appleton Type JBOX, two-gang FD, or similar approved cast iron box. Boxes shall be sized according to NEC Table 370-16(a).
- IMC and EMT conduit shall not be used unless specifically required by the plan layout sheets. Junction boxes in EMT conduit systems shall be made from galvanized sheeting and shall be UL listed and approved for outdoor use, unless otherwise noted on the plans. Sheet metal junction boxes shall be sized in accordance with the NEC. Junction boxes for IMC conduit systems shall meet the requirements of boxes used with RMC systems.
- Junction boxes in PVC conduit systems shall be PVC, intended for outdoor use, unless otherwise noted on plans.
- Elbows in PVC conduit systems one inch and larger shall be rigid metal, with the exception of traffic signal systems which may have PVC elbows instead of rigid. If any part of the rigid metal elbow is buried less than 18 inches underground the elbow and rigid metal extension will be grounded. Grounding will be accomplished by means of a grounding bushing installed on the extension. Unless specifically shown on the plans, rigid metal elbows containing, or entering ground boxes containing only communications conductors, loop detectors, or other low voltage power limited circuits need not be grounded unless a ground wire is present in the conduit or ground box. The rigid metal elbows located in concrete foundations may be extended with PVC conduit and need not be grounded provided that the end of the elbow nearest the end of the conduit run exiting the foundation is at least 2 inches below the concrete. RMC elbows will not be eliminated.
- HDPE conduit shall meet the requirements of Item 622, Duct Cable, except that the HDPE conduit, when bid under Item 618, Conduit, shall not contain factory installed conductors. Fittings for HDPE conduit shall be UL listed as an electrical conduit connector or shall be thermally fused using an electrically heated wound wire resistance welding method. HDPE conduit may be substituted for bored schedule 40 or schedule 80 PVC conduit. When such substitution is made, bored HDPE shall be schedule 40 of the size PVC being replaced. The HDPE conduit shall transition back to PVC (or RMC elbow when required) of the size and schedule shown on the plans at the bore pit. Substituted conduit may not be extended to ground boxes or foundations; RMC elbows shall be installed at ground boxes and foundations. RMC elbows will not be eliminated.
- All conduit support hardware including straps, nuts, bolts, screws, retaining anchors and washers shall be hot dipped galvanized or stainless steel. Strut type conduit straps shall be stainless steel or hot dipped galvanized. Strut type straps need not be made of malleable type material. Stamped-cadmium plated straps will not be allowed. Straps having only one mounting hole shall not be allowed for use on conduits 2 inches and larger. Two piece conduit straps designed to be used with a mounting shoe shall be installed only with the correctly sized shoe.

B. CONSTRUCTION METHODS

- Conduit in structures shall have expansion fittings at structure expansion joints. All straight runs of RMC conduit exposed on structures such as bridges shall have expansion joints installed at maximum intervals of 150 feet. Expansion joints shall be installed so they allow for movement of the conduit. Installation of the joint in such a manner that will not allow for movement shall be repaired at no expense to the state. The method of determining the final setting length of the expansion joint shall be provided to the Engineer upon request.
- Conduit supports shall be spaced at maximum intervals of 5 feet. Conduit spacers shall be used with metal conduit placed on surfaces of concrete structures (See conduit mounting options).
- Conduit supports shall not be attached directly to prestressed concrete beams except as shown specifically in the plans and approved by the Engineer.
- Unless otherwise shown on the plans, conduit placed beneath existing roadways, driveways, or sidewalks, or after the base or surfacing operation has begun, shall be accomplished by jacking or boring. The Contractor shall back fill and compact the bore pits to the bottom of the conduit prior to installing connecting conduit or duct cable to prevent bending of the connection.
- Conduit trenched in the subgrade of new roadways shall be back filled with excavated material, unless otherwise noted on the plans. Conduit trenched in the sub-base of new roadways shall be back filled with cement-stabilized base.
- Open ends of all conduit and raceways shall be fitted with temporary caps or plugs to prevent entry of dirt, debris and rodents during construction. The temporary cap may be constructed of duct tape, but in all cases shall be tightly fixed to the conduit and shall be durable. The contractor shall clean out the conduit and prove it clear in accordance with Standard Specifications Item 618.3 prior to installing any conductors.
- Conduit entry into the top of enclosures such as safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes shall be made weatherproof using conduit sealing hubs, or threaded bosses.
- A bonding jumper shall be installed from each grounding bushing to the nearest grounding rod, grounding lug, and/or equipment grounding conductor. All jumpers shall be the same size as equipment grounding conductor. Conduit used as casing under roadways for duct cable need not be grounded if duct extends full length through the casing. At electrical services, grounding electrode conductor shall be a solid Copper #6 AWG.
- Metal junction boxes shall be bonded to the grounding conductor in accordance with the NEC.
- Conduits entering ground boxes shall be placed so that the conduit ends shall be not less than 5 inches nor more than 9 inches from the box cover (See ground box detail on sheet TS-7).
- Conduit ends shall be sealed with heat shrink boots with waterproof sealant, urethane foam, or by other methods approved by the Engineer. Sealing shall be done after completion of any required pull tests. Duct tape shall not be used as a permanent conduit sealant. Silicone caulking shall not be used as a sealant.
- All strut mounting material and hardware shall be hot-dip galvanized or shall be stainless steel. The cut ends of strut and non-galvanized rigid metal conduit threads shall be coated with a zinc rich paint (90% or more zinc content). Zinc rich paint may only be used to touch up galvanized material as allowed under item 445.6 galvanizing. The painting of non-galvanized material with a zinc rich paint shall not be considered as an approved alternative for galvanized materials.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: WILLIAM J. HATCHELL ON 2/15/10. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

THIS DETAIL SHEET WAS OBTAINED FROM TXDOT

NO.	DATE	REVISION	APPROV.
1			
2			
3			

- NOTES
- Ground rod clamp to be Blackburn GG 5/8H, Weaver W5/8 or equal.
 - Surface mounting shown, for conduit to be placed in structure, use flush-mounted box.
 - Bond junction box and metal conduits to equipment grounding conductor and grounding electrode conductor using listed connector.
 - Seal all conduits entering the junction box from underground.
 - Install bell end or bushing on 1/2 inch PVC conduit both ends.
 - Ground rod to be driven within 8 inches of 1/2 inch PVC conduit end.

71A

DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: WJH	REVIEWED: DWG: 249DETAILS-ELEC

ARAPAHO ROAD PHASE II
STANDARD CONSTRUCTION DETAILS
ELECTRICAL - SHEET 6

TOWN OF ADDISON

Grantham, Burge & Waldbauer
Engineers, Inc.

1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042 (972) 840-1916 (TEL) (972) 840-2156 (FAX)

SHT. TS-5 OF TS-21

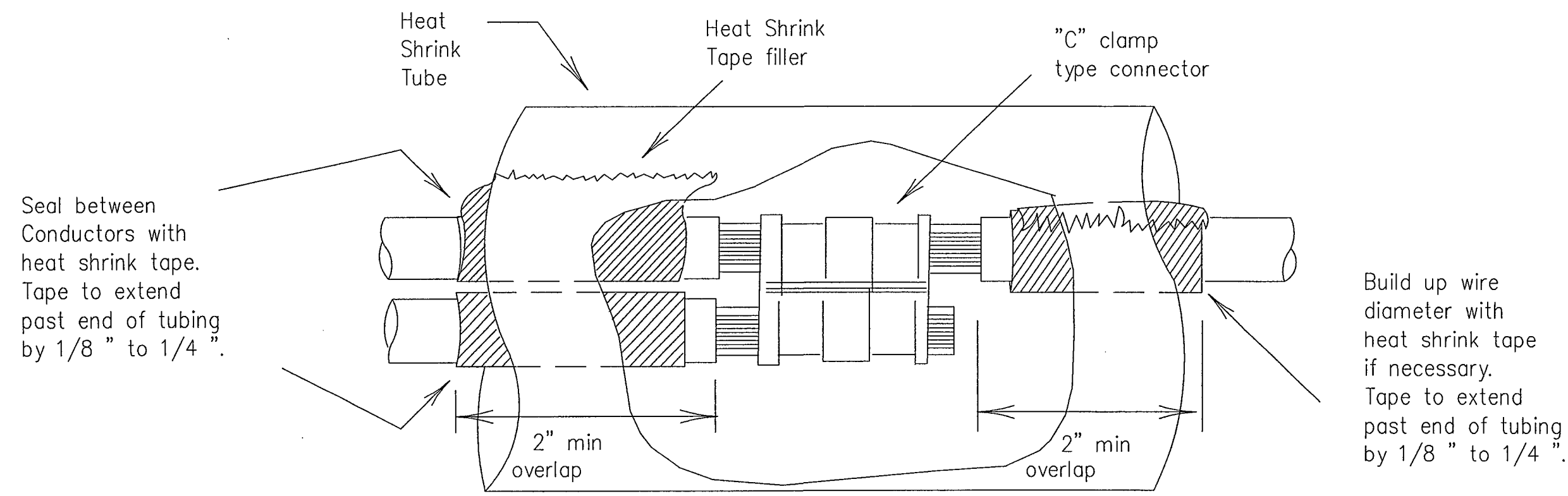
I. ELECTRICAL CONDUCTORS

A. MATERIALS

- Insulated conductors shall be NEC Type XHHW. Conductors shall be color coded in accordance with the NEC, articles 200, 250, and 310; i.e. Grounded conductors (neutrals) shall be white, Grounding conductors (ground wires) shall be bare or green, Ungrounded conductors (hots) shall be any color except green, white, or gray. Identification of conductors #10 AWG and smaller shall be by continuous jacket color. Color coding of electrical conductors #8 AWG and larger shall be either by continuous color jacket or by colored tape. Colored tape marker shall consist of a half-lap of tape covering a 6-inch length of conductor.
- Where two or more circuits are present in one conduit or enclosure, the conductors of each circuit shall be identified by a permanent non-metallic tag at each accessible location. The tag shall be fastened to the conductors by two plastic straps. Each tag shall indicate circuit number, letter, or other identification shown in the plans.
- Grounding electrode conductor. #6 AWG for bonding to ground rod at electrical service, shall be solid. Connection of conductor to ground rod shall be made using UL Listed connectors designed for such purposes.
- Heat Shrink Tape filler shall be used to seal the ends of heat shrink tubing around two or more conductors that are insulated with heat shrink tubing. Tape material shall have a minimum dielectric strength of 225 volts per mil and may be either cross-linked butyl rubber. Tape shall be supplied in rolls and shall have a backing (release paper) to prevent the tape from sticking to itself.
- Heat shrink tubing shall be heavy wall, UL listed for 600 volts or greater and shall have factory applied internal sealant.
- Splicing materials, insulating materials, breakaway disconnects and fuse holders will not be paid for directly but shall be subsidiary to various bid items.

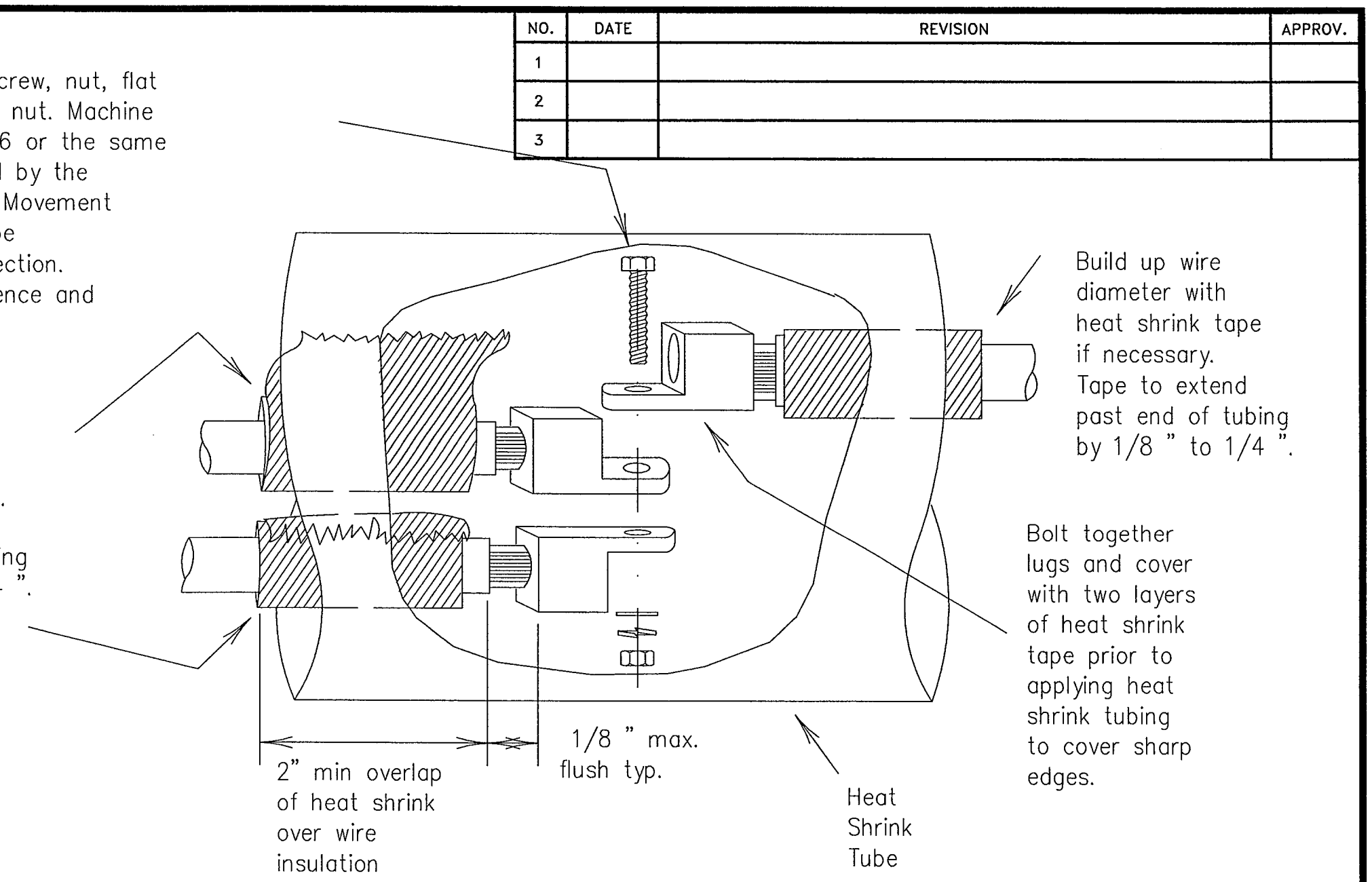
B. CONSTRUCTION METHODS

- After conductors have been installed in conduit, a pull test will be made on conductors. When any length of conductor cannot be freely pulled, the Contractor shall make any needed alterations or repairs at no expense to the Town.
- The Contractor shall make insulation resistance tests in accordance with Item 620, Conductors. The contractor shall coordinate with the Town to witness the tests.
- A sufficient length of conductor for making up connections shall be left in ground boxes (2 feet minimum, 3 feet maximum, to point of splice, 3 feet minimum, 4 feet maximum, when conductor is pulled through with no splice), enclosures, weatherheads and pole bases (1 foot minimum and typical, 1.5 feet maximum).
- Splices shall be made only in junction boxes, ground boxes, pole bases, or electrical enclosures and shall be made with listed compression or screw type pressure connectors, terminal blocks, bolted lugs, or split bolt connectors. Splices shall be insulated with heavy wall heat shrink tubing and shall be made so as to provide a watertight splice. Heat shrink sleeve shall overlap conductor insulation a minimum of 2 inches on both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, the contractor shall build up the conductors insulation using heat shrink filler tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Tape shall be visible after completion of all splices. Where filler tape is used but not visible, the Town shall approve each individual splice by conducting a physical inspection of each splice. Heat shrink tape shall be either butyl rubber. When it appears the tubing has been burned, or overheated the tubing shall be considered to be defective.
- No wire nuts may be used for #8 AWG or smaller conductors in above-ground junction boxes, nor in pole bases or ground boxes.
- Conductors in illumination poles shall be supported by a J-hook in the top of the pole.
- All conductors bid under Item 620 shall have breakaway electrical disconnects installed anytime conductors pass through a break-away support.
- For terminating the conductors, insulation-jacketing material shall be removed in such a manner as to not nick any of the individual strands of the conductor. When individual conductor strands are removed, the conductor shall be considered to be damaged.
- When a conductor or cable has been damaged, or fails to pass an insulation resistance test, the conductor will be replaced.
- Duct tape, black electrical tape, or wire nuts shall not be allowed to repair a damaged conductor.
- For terminations, no more than one wire may be installed under a single pressure connector unless the device is listed for more than one wire.
- Conductors connected to break-away in line fuse holders must be installed in accordance with the specific manufactures installation instructions. Where threaded connections are made, they shall be properly torqued. Where crimp type connections are made, crimps shall be made using properly sized crimping pliers. Proper conductor terminations are critical to the safe operation of break-away devices.
- Waterproofing boots shall be properly trimmed to fit snugly around the conductor so as to provide a water proof connection. No more than one wire may enter a single opening in any one boot. Waterproofing boots must provide the correct number of openings. Where only one wire is to be connected to a boot, the boot may not be a two wire type.

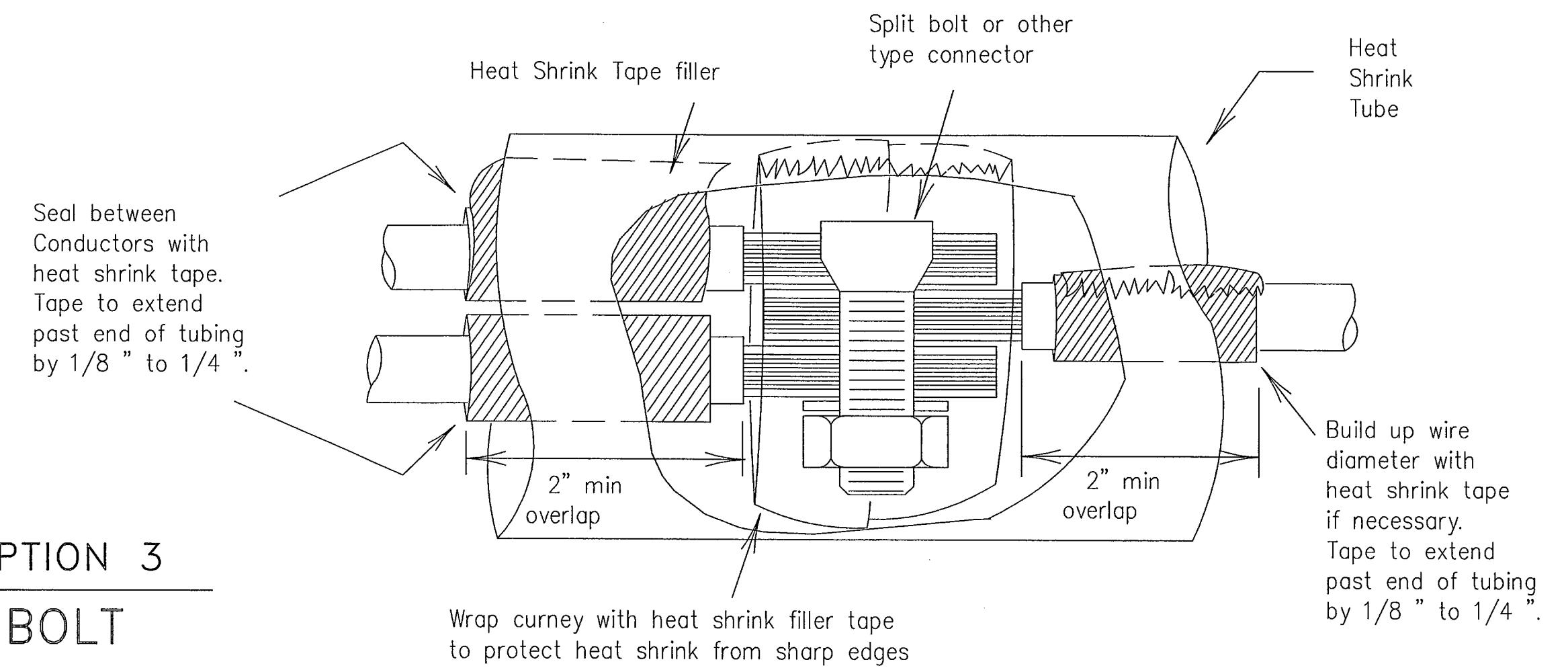


SPLICE OPTION 1
C-CLAMP

Stainless steel or brass machine screw, nut, flat washer, lock washer or self locking nut. Machine screw to be a min. of 10-24, 3/16 or the same size as the mounting hole provided by the manufacture. Secure wrench tight. Movement of lugs after final assembly shall be considered to be a defective connection. Assemble components in the sequence and position as shown.



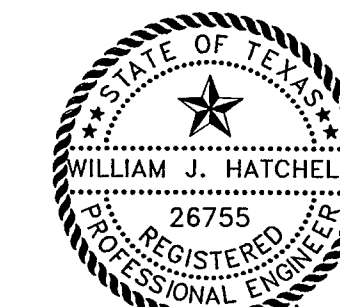
SPLICE OPTION 2
BOLTED WIRE LUGS



SPLICE OPTION 3
SPLIT BOLT

C. TEMPORARY WIRING

- Temporary conductors and electrical equipment to provide power for utilization equipment, shall be installed in accordance with the NEC article 305. All temporary wiring materials and methods shall comply with the standard sheets. All power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located out doors at grade, supplied from a utility power source, shall be provided with a ground fault circuit interrupter.
- Residual current protective devices (GFCI) may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.
- Where wire nuts are approved for temporary wiring, they shall be of the self-sealing type.
- All conductor splices must be contained within a listed enclosure, ground box or be more than ten feet above grade vertically and more than five feet horizontally from any metal structure. Where temporary conductors are installed in any area that is likely to be subjected to vehicle traffic, or mobile construction equipment, the vertical clearance to ground shall be a least 18 feet when measured at the lowest point. Where power conductors are to be supported by a span wire, the span wire shall be properly grounded.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY:
WILLIAM J. HATCHELL
ON 2/13/12
ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

THIS DETAIL SHEET WAS OBTAINED FROM TXDOT

DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249	72
DRAWN: GBW	DESIGN: WJH	REVIEWED:	DWG: 249DETAILS-ELEC
ARAPAHO ROAD PHASE II			
STANDARD CONSTRUCTION DETAILS			
ELECTRICAL - SHEET 1			
TOWN OF ADDISON			
Grantham, Burge & Waldbauer GBW Engineers, Inc.			SHT. TS-6
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042			OF TS-21
(972) 840-1916 (TEL) (972) 840-2156 (FAX)			

NO.	DATE	REVISION	APPROV.
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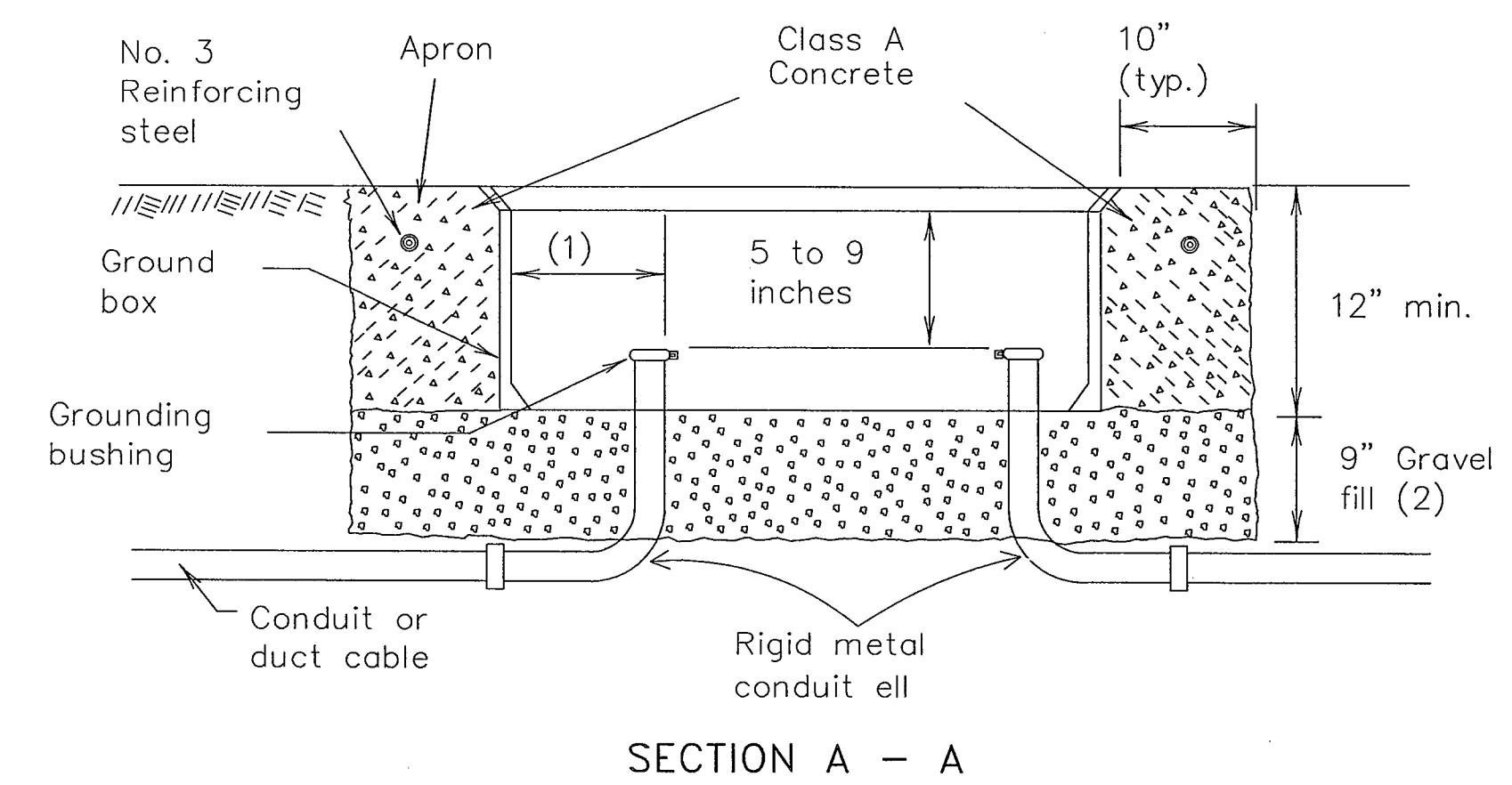
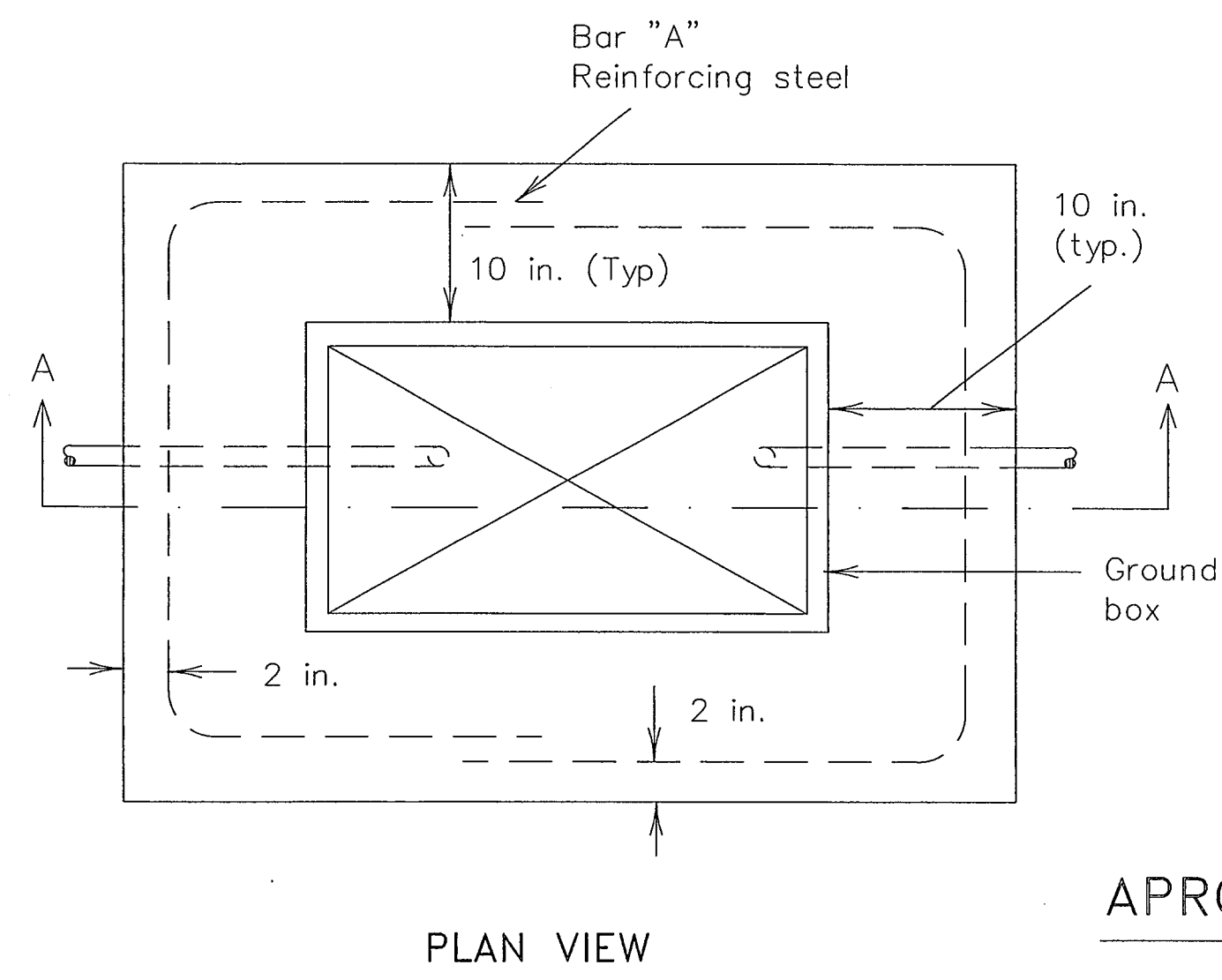
II. GROUND RODS

A. MATERIALS

- All ground rods installed at electrical services, including supplemental lightning protection ground rods specified by the plans in other locations such as pole bases, shall be copper coated steel and listed by a NRTL. Rods shall be a minimum diameter of 5/8 inch. The length shall be a minimum of 8 feet. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets.
- Ground rod clamps shall be listed to be in direct contact with the soil. Where concrete encasement is required, the clamp shall be listed for concrete encasement.

B. CONSTRUCTION METHODS

- Ground rods installed in locations such as pole bases, to provide supplemental lightning protection need not be totally in contact with the soil. Where called for by the plans, rods may be encased in soil or concrete or any combination of soil and concrete. When concrete encased, the connection of the conductor to the rod shall be readily accessible for inspection or repairs. When driven into the soil the upper end shall be between 2 to 4 inches below finished grade. Ground rods shall not be placed in the same drilled hole as a timber pole.
- Ground rods shall be installed such that the end imprinted with the rod's part number is installed as being the upper end.
- Non-conductive coatings such as concrete splatter shall be removed from the rod at the clamp location.
- Routing of lightning protection ground rod wires shall be run as short and straight as possible. Where bends are required they shall have a minimum radius of four inches.
- Unless specifically called for by the plans, conduits used for ground rod wires shall be non-metallic. Where metal conduits are specified, a grounding bushing and properly sized bonding jumper shall be provided and properly installed on each end.
- Where rocky soil or a solid rock bottom is encountered when driving a ground rod and the horizontal trench placement method is the only viable solution, written authorization from the Town must be acquired.



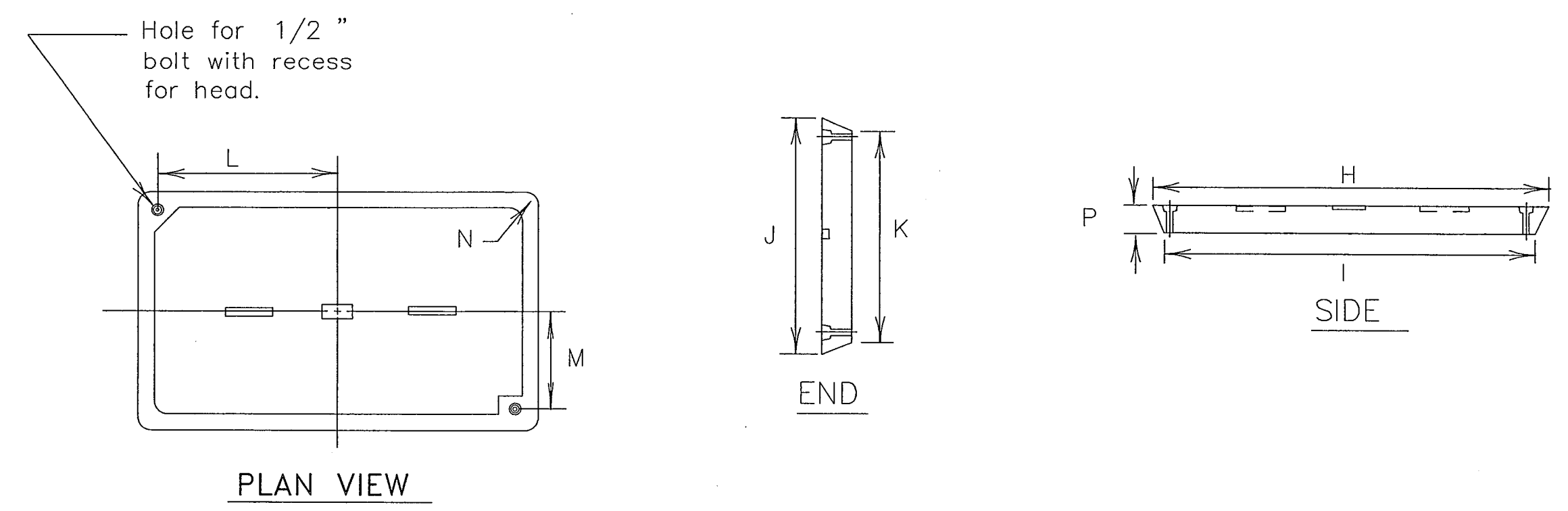
APRON FOR GROUND BOXES
(Where required)

III. GROUND BOX

A. MATERIALS

- Ground boxes 16x30x24 inches (WxLxD) or smaller shall be polymer concrete of the type required by the descriptive code shown elsewhere. Larger ground boxes shall be as shown elsewhere in the plans.
- All ground boxes and covers shall be permanently marked either by impress or by permanent ink, with manufacturer's model number and manufacturer's name or logo.
- Covers shall be bolted down, and bolt holes in the box shall be arranged to drain dirt.
- Ground box Types A, B, C, D & E shall meet the following requirements:
 - Ground boxes and covers will be manufactured from polymer concrete reinforced with continuous strands of woven or stitched borosilicate fiberglass cloth. The polymer concrete shall be made from catalyzed polyester resin, sand and aggregate, and shall have a minimum compressive strength of 11,000 psi. Polymer concrete containing chopped fiberglass or fiberglass reinforced plastic is not acceptable.
 - Minimum inside dimensions shall be as follows (width x length x depth):
 - Type A shall be 11.5 inches x 21 inches x 10 inches, (122311)
 - Type B shall be 11.5 inches x 21 inches x 20 inches, (122322)
 - Type C shall be 15.25 inches x 28.25 inches x 10 inches, (162911)
 - Type D shall be 15.25 inches x 28.25 inches x 20 inches, (162922)
 - Type E shall be 11.5 inches x 21 inches x 16 inches, (122317)
 - Bottom edge of box or extension shall be footed with a minimum 1 1/4 inch flange.
 - Ground boxes shall withstand 600 lbs. per sq. ft. applied over the entire sidewall with less than 1/4 inch deflection per foot length of box. Ground boxes and covers shall withstand a test loading of 20,000 lbs. over a 10 inch by 10 inch area centered on the cover with less than 1/2 inch deflection. Ground boxes and covers shall meet Western Underground Standards 3.6. Manufacturer shall supply certification by an independent laboratory or sealed by a Texas-Licensed Professional Engineer.
 - Covers shall be 2 inch (nominal) thick polymer concrete. All hardware shall be stainless steel. Cover shall be secured with two 1/2 inch stainless steel bolts. Bolts shall be self-retaining and shall withstand a minimum of 70 ft-lbs. torque and shall have a minimum 750 lbs. straight pull out strength. Nuts shall be floating and shall provide a minimum of 1/2 inch movement from the center of the nut. Covers shall be skid resistant, minimum 0.5 coefficient of friction. Covers shall be interchangeable between manufacturers and shall conform to the dimensions shown herein. Unless otherwise approved by the Engineer, cover shall be legibly imprinted with the following words in minimum 1 inch letters:
 - Ground Boxes containing wiring for traffic signals shall be labeled, Danger High Voltage Traffic Signals.
 - Ground boxes containing wiring for illumination systems shall be labeled, Danger High Voltage Illumination.
 - Ground boxes containing wiring for traffic management systems shall be labeled, Danger High Voltage Traffic Management.
 - Ground boxes containing wiring for sign illumination systems shall be labeled, Danger High Voltage Sign Illumination.
 - Ground boxes containing wiring for traffic signals that also contain illumination, powered by the signal electrical service, shall be labeled, Danger High Voltage Traffic Signal.

- Final position of end of conduit shall not exceed one-half the distance to the side of box opposite the conduit entry.
- Place gravel "under" the box, not "in" the box. Gravel should not encroach on the interior volume of the box.
- Install bushing on the upper end of all ells.
- Where a ground rod is present in the ground box, connect it to any and all equipment grounding conductors using a listed connector.
- Maintain sufficient space between all conduits so as to allow for proper installation of bushings.
- All conduits shall be installed in a neat and workmanlike manner.

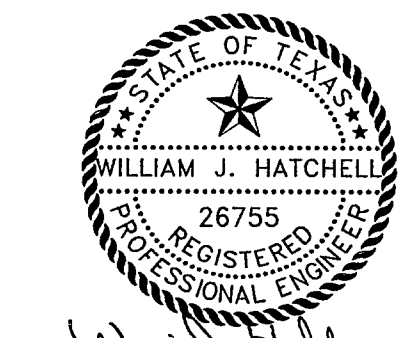


GROUND BOX COVER

B. CONSTRUCTION METHODS

- Ground boxes shall be set on a 9 inch (minimum) bed of coarse No. 1 aggregate as defined by Item 421. Gravel shall be in place prior to setting box and conduits shall be capped. Any gravel or dirt in conduit shall be removed.
- When required by item descriptive code, construction of an apron encasing a ground box including concrete and reinforcing steel shall not be paid for directly but shall be subsidiary to the ground box. Reinforcing steel may be field bent. Concrete for aprons shall be considered miscellaneous concrete for testing purposes. Aprons shall be cast in place.
- Conduit holes may be cut in the walls of type B & D boxes at least 18 inches beneath the cover.
- If, within the limits of this project, the Contractor must utilize an existing ground box equipped with a metal cover, the Contractor shall bond the cover to the grounding conductor with a 3 foot long flexible standed jumper the same size as the grounding conductor. Connection of bonding jumper to metal ground cover shall not be paid for directly but shall be subsidiary to various bid items. The box(es) must be clearly shown on the plans with plan notes fully describing the work required.
- If there are other ground boxes with metal Covers within the project limits but not involved in the contract, the Engineer may direct the Contractor to ground the covers, designating and identifying the specific boxes in writing. This work will be paid for separately.
- Termination to metal ground box covers shall be made using a tank ground type lug.

GROUND BOX COVER DIMENSIONS								
BOX SIZE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



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DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249	73
DRAWN: GBW	DESIGN: WJH	REVIEWED:	DWG: 249DETAILS-ELEC

ARAPAHO ROAD PHASE II
STANDARD CONSTRUCTION DETAILS
ELECTRICAL - SHEET 2
TOWN OF ADDISON

Grantham, Burge & Waldbauer
Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

SHT. TS-7
OF
TS-21

ELECTRICAL SERVICES NOTES:

All work, materials, services, and incidentals, whether or not specifically shown on the plans, which may be necessary for a complete and proper electrical service installation as specified in the plans to obtain electrical power (except extending primary lines to electrical service) shall be paid for, performed, furnished and installed by the Contractor. The Contractor shall contact the Utility for metering and shall comply with all Utility requirements.

Primary line extensions, when required, shall be paid for under Force Account work. The Contractor shall consult with the appropriate Utility to determine costs and requirements, and shall coordinate the Utility's work as approved by the Engineer. The contractor shall be reimbursed only the amount billed by the Utility. No additional amount for supervision of the Utility's work will be paid.

Materials shall be new and unused, materials and installation shall comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards and shall be Underwriters Laboratories (UL) Listed. Electrical Service conduits, conductors, disconnects, contactors, circuit breaker panel sizes, and branch circuit breakers, shall be as shown in the Electrical Service Data elsewhere in the plans. Faulty fabrication or poor workmanship in any material, equipment, or installation shall be justification for rejection.

The Contractor shall submit for approval no less than six (6) copies of catalog cut sheets on electrical service materials. Submittals shall be legible and shall be marked to indicate which product on a cut-sheet is to be supplied. Where manufacturer's provide warranties and guarantees as a customary trade practice, Contractor shall furnish to the State such warranties or guarantees.

The Contractor shall provide locks keyed with Master #2195 for all lockable electrical enclosures. Unless otherwise approved by the Town, enclosures shall not be energized until locks are provided and all bolts are installed.

Circuit directories, where provided, shall be filled out. All breakers and components in shop built panels and enclosures shall be labeled with duo-colored plastic labels. Color shall be white letters with red background. Letters shall be a minimum 3/8" in height.

Enclosures with external disconnects that de-energize all equipment inside the enclosure, need not have dead front trim, except that incoming line terminations shall be protected from incidental contact.

Stainless steel nuts, screws, bolts and miscellaneous hardware may be used when galvanized is specified. All wiring and components shall be rated for 75 degrees C. Minimum size for service entrance conductors shall be #6XHHW.

I. Safety Switch. A safety switch, placed ahead of the meter, shall only be used when specified by the Utility and when shown on the Electrical Service Data. The switch shall be UL Listed, heavy duty type, 600 volt, unfused, with a UL type 3R enclosure and equipped with a solid neutral (s/n) assembly. The switch shall be padlockable in the "on" position.

II. Service Type. Electrical service types A, C, D, and T shall be as schematically detailed on TS-8 or TS-9. Other service types shall be as detailed elsewhere on the plans.

III. Branch Circuit Breakers. Circuit breakers shall be thermal magnetic and have a minimum interrupting capacity of 10,000 amps and a voltage rating compatible with their use. Circuit breakers shall be sized as shown in the electrical service data. Circuit breakers in panelboards and load centers shall be full size and designed exclusively for the panelboard or load center in use. Tandem and half-width breakers shall not be used. All circuit breakers shall be permanently and clearly marked identifying the circuit or device attached. Circuit breakers shall be UL Listed to UL489.

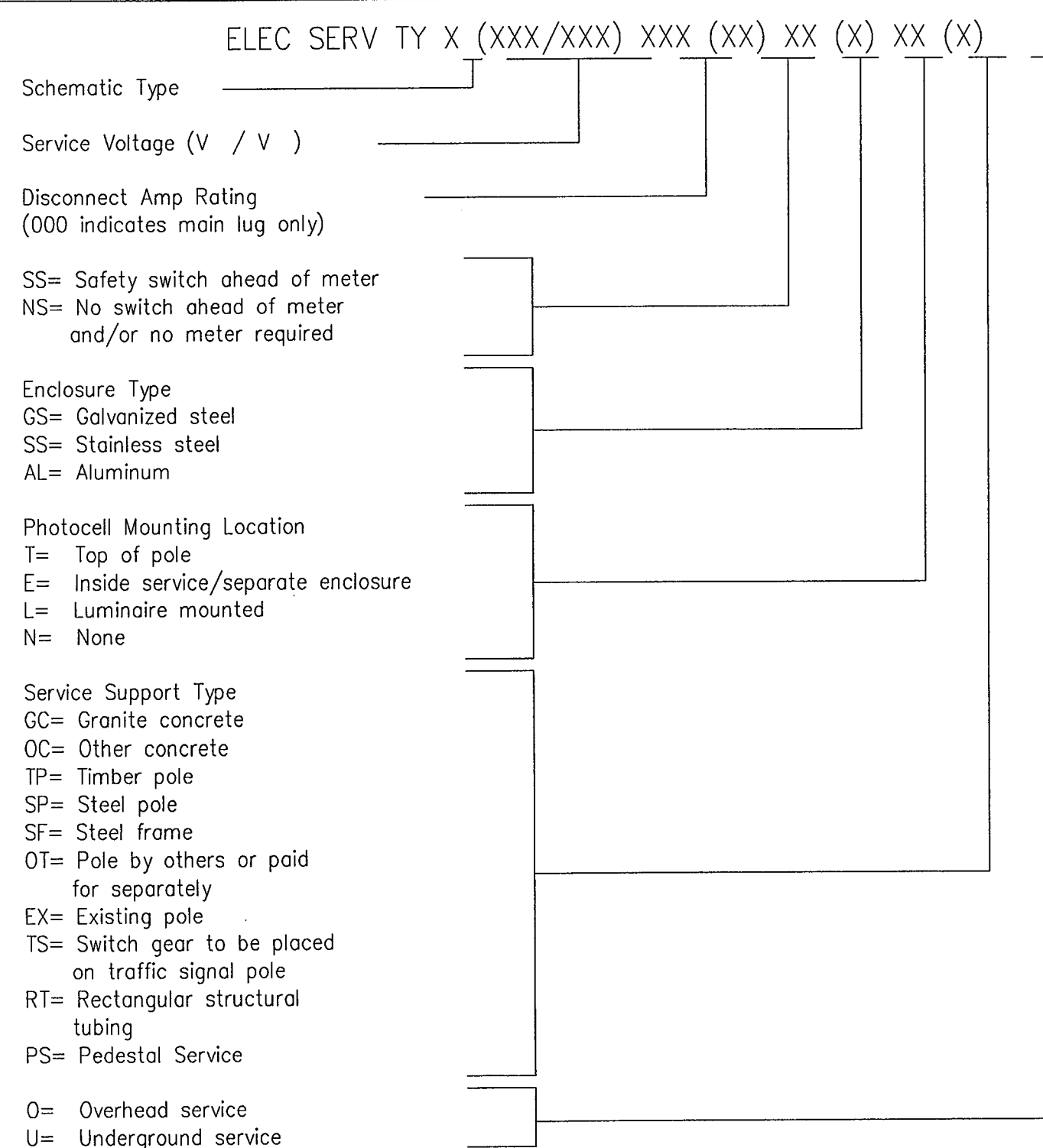
IV. Circuit Breaker Panelboard. Panelboards shall be UL Listed and shall meet Federal Specification W-P-115b, Type 1, Class 1 requirements. Panelboards shall have copper busses, a minimum of 6 one-pole spaces or as required in the electrical service data, and when required will be rated for service equipment. Enclosure shall meet UL type 3R classification. Panelboards shall have a threaded hub conduit entry for conduit entering the top of the enclosure. Circuit breakers shall be bolt-in type only.

V. Circuit Breaker Load Center. Load centers shall be UL Listed, and shall meet Federal Specification W-P-115c, Type 1, Class 2 requirements. Load centers shall have copper busses, a minimum of 4 one-pole spaces, and shall be rated for service equipment. Enclosure shall meet UL type 3R classification. Load centers shall have a threaded hub conduit entry for conduit entering the top of the enclosure. Circuit breakers shall be plug-in type only. Load centers for type T services shall accommodate a maximum of 6 one-pole breakers.

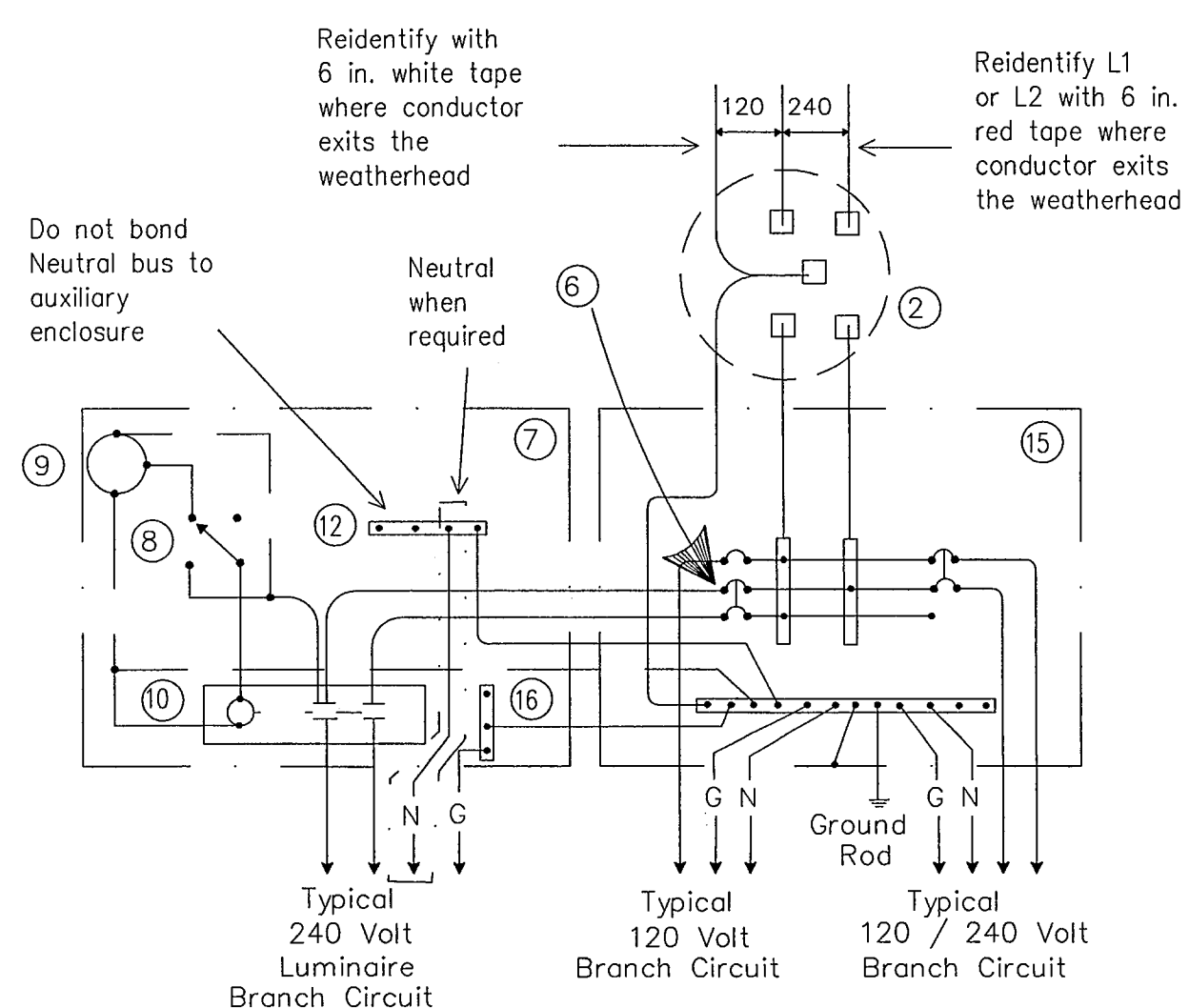
VI. Separate or Auxiliary Enclosure. Separate enclosures for HOA, photocell and lighting contactors for types D & T Services shall be a UL Listed assembly and shall have dead front trim. HOA switch operator shall extend through the dead front trim. Photocell shall be mounted inside the enclosure as described in paragraph XIII, when required by descriptive code. Separate enclosures shall meet the construction requirements of paragraph VII. E. except that separate enclosure shall not have external operating handle, need not have a data pocket and door may latch at only one point. Contractor may install all equipment in one enclosure instead of two, when approved by the Engineer.

VII. Where a Type D or T service is provided, laminated "as built" drawings are required as shown on TS-9 VIII E; shall be delivered before completion of the work, to the Engineer in lieu of placement within these smaller enclosures. Conduit may not enter the back wall of a service enclosure penetrating the equipment mounting panel. Provide grounding bushings on all metal conduits, terminate bonding jumper to grounding bus. Grounding bushing is not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss such as a meter base.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

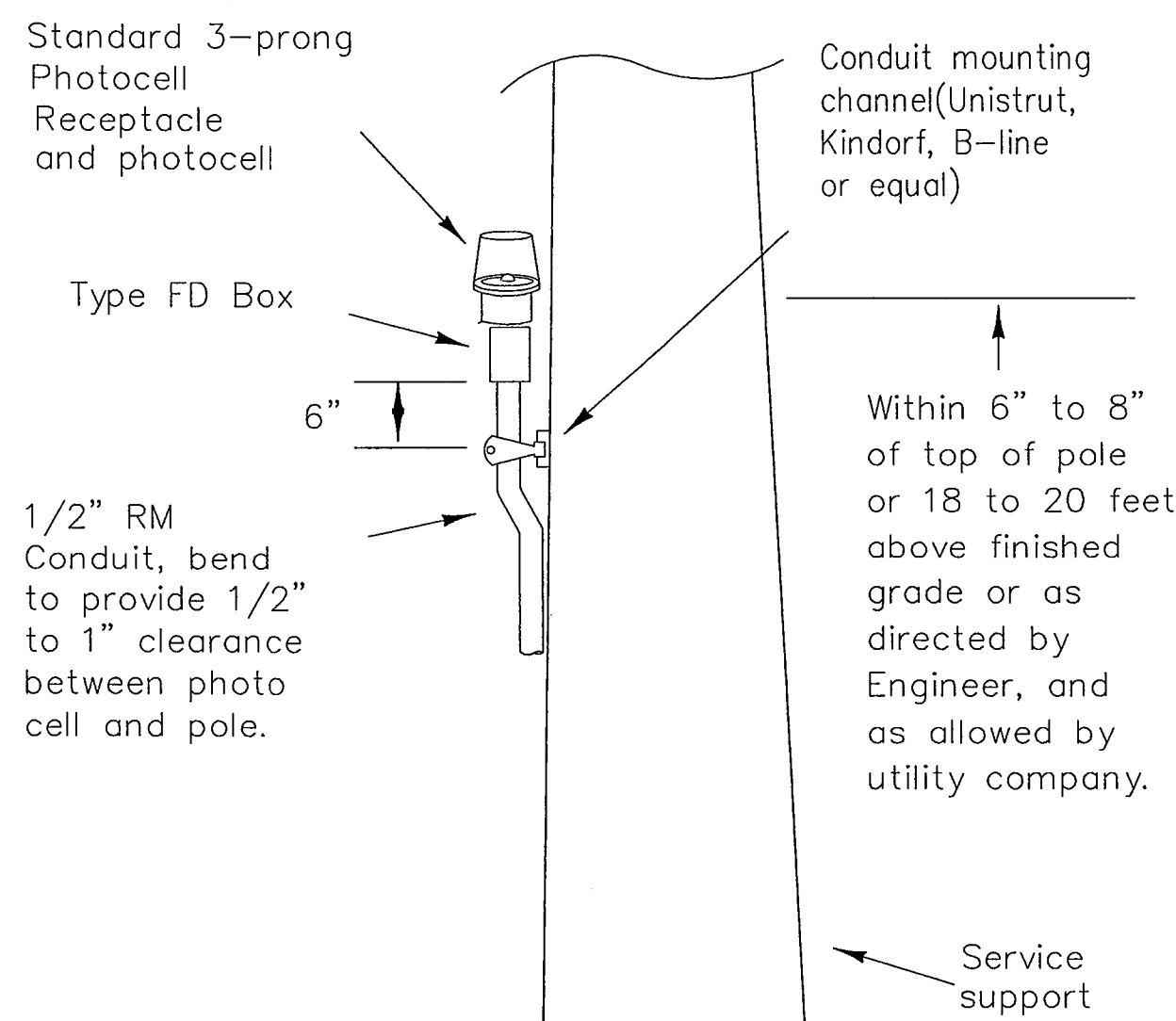


Example: ELEC SERV TY D(120/240)070(NS)GS(T)TP(O)



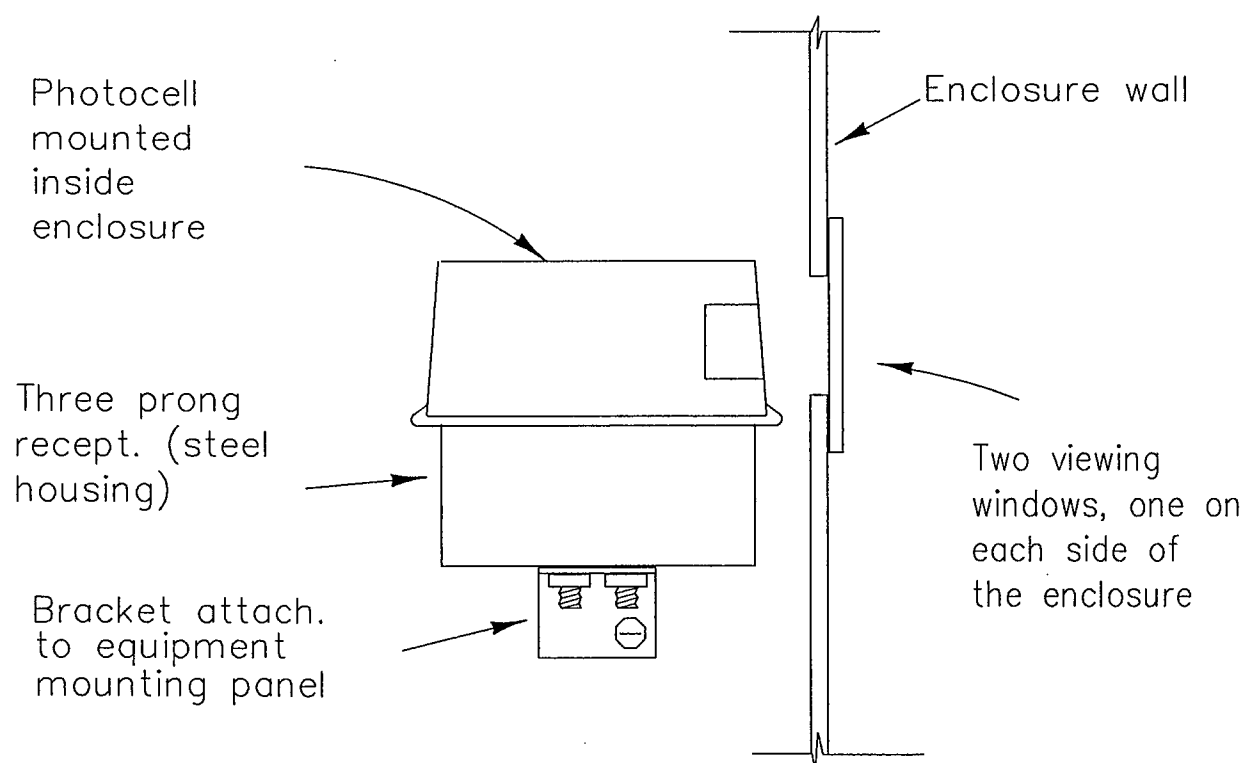
SCHMATIC TYPE I
120/240 VOLTS -THREE WIRE

Install photocell and lighting contactor when shown on Electrical Service Data.



TOP MOUNTED PHOTOCCELL

Conduit support spacing 3 feet from enclosure; 5 feet max.



ENCLOSURE MOUNTED PHOTOCCELL

For photocell specifications see ED(5),XIII.

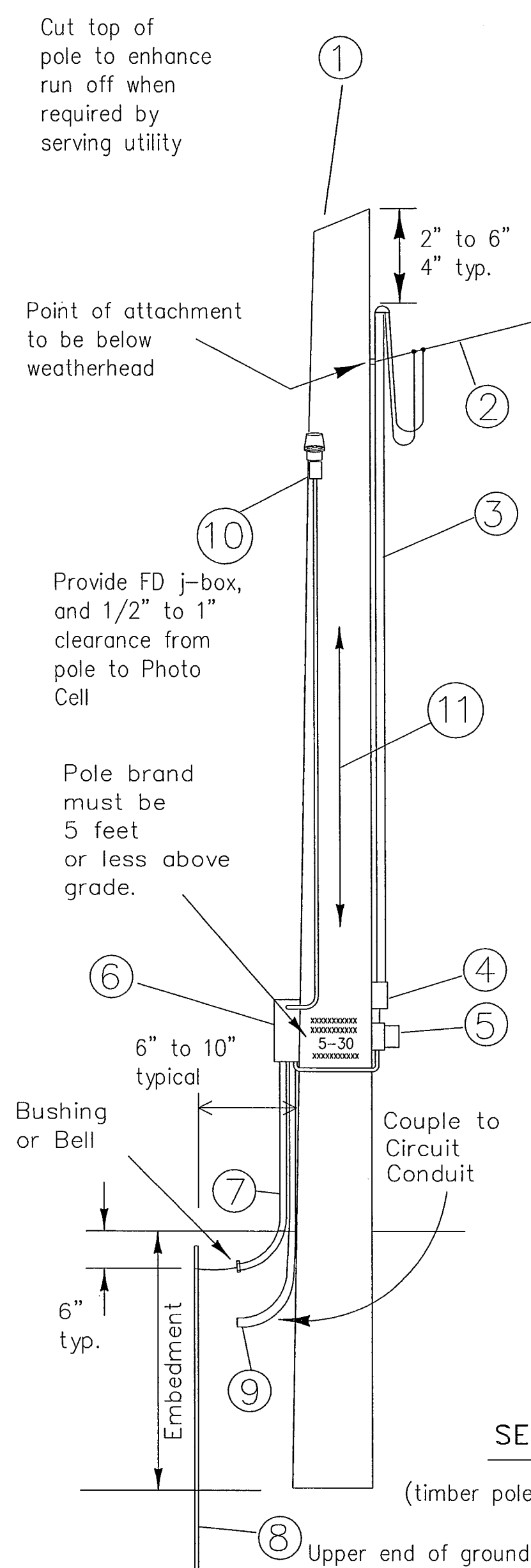
SCHMATIC LEGEND

- 1 - omitted
 - 2 - Meter (when required)
 - 3 - Service Assembly Enclosure
 - 4 - Main Disconnect Breaker (See Electrical Service Data)
 - 5 - omitted
 - 6 - Circuit Breaker, 15A typical and max. for control circuit wiring
 - 7 - Auxiliary Enclosure
 - 8 - Control Station ("H-O-A" Switch)
 - 9 - Photo Electric Control (enclosure-mounted shown)
 - 10 - Lighting Contactor
 - 11 - Power Distribution Terminal Blocks
 - 12 - Neutral Bus required when 120 v. lights are controlled by lighting contactor
 - 13 - Branch Circuit Breaker (See Electrical Service Data)
 - 14 - Circuit Breaker Panelboard (See Electrical Service Data)
 - 15 - Load Center
 - 16 - Ground Bus
- Power Wiring
- Control Wiring
- Neutral Conductor (when required-to serve 120 v. loads only)
- Equipment grounding conductor-always required

12-22-00 Revision
Modify legend numbers

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SERVICE SUPPORT TYPE TP (O)

(timber pole, overhead service, typical arrangement)

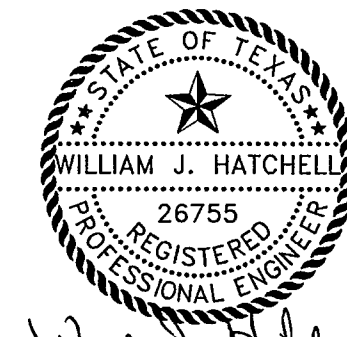
- 1 - Class 5 pole, height as required
- 2 - Service drop from utility company (attached below weatherhead)
- 3 - Service conduit and service entrance conductors(RMC) (See Electrical Service Data)
- 4 - Safety switch (when required)
- 5 - Meter (when required)
- 6 - Service enclosure
- 7 - No. 6 bare grounding electrode conductor in 1/2" PVC to ground rod - extend 1/2" PVC 6" underground.
- 8 - 5/8" x 8' Copper clad ground rod - drive ground rod completely underground unless otherwise approved by the Engineer.
- 9 - RM conduit - same size as branch circuit conduit.
- 10 - Photocell and conduit - if top mounted. (See Electrical Service Data)
- 11 - When required by the serving utility provide bare #6 awg copper conductor. Run wire from pole top to butt wrap or copper butt plate. Protect conductor to a height of 8 ft above finish grade.

LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- (If applicable)
- Liquidtight flexible metal conduit, may be used when meter and service enclosure are mounted 90 to 180 degrees to each other.
- LFMC shall not exceed 3 ft. and shall be securely supported within one ft. of each end.
- Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting.
- A neutral conductor must be installed within the LFMC.
- Bend in liquidtight flexible metal conduit shall not exceed 180 degrees.
- A pull test is required on all installed conductors, at least six inches of free conductor movement shall be demonstrated to the satisfaction of the Engineer.

TIMBER POLE NOTES

- 1. Conduit and conductors attached to service pole and underground within 12 inches of service pole shall not be paid for directly but shall be subsidiary to the service pole.
- 2. Pole top mounted photocell, install on north side of pole or in service enclosure as required. See Electrical Service Data.
- 3. Attach meter and service equipment with stainless steel or galvanized channel (Unistrut, Kindorf, or equal). Gain pole as required to provide flat surfaces for each strut. Paint ends of galvanized channel with zinc rich paint. Gain depth 5/8" max. Gain height 1 7/8" max. Strut to be 1" max. deep, and 1 5/8" wide max. Secure each strut section to timber pole with two galvanized or SS lag bolts, 1/4" diameter min. by 1 1/2" length min. Place flat cut galvanized or SS washer on each lag bolt. Gain pole in a neat and workman-like manner.
- 4. Embedment depth shall be as required in Item 627 Treated Timber Poles.
- 5. Poles trimmed for excess length shall be trimmed from the top end only.



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ARAPAHO ROAD PHASE II
STANDARD CONSTRUCTION DETAILS
ELECTRICAL - SHEET 4
TOWN OF ADDISON

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SHT. TS-8
OF TS-21

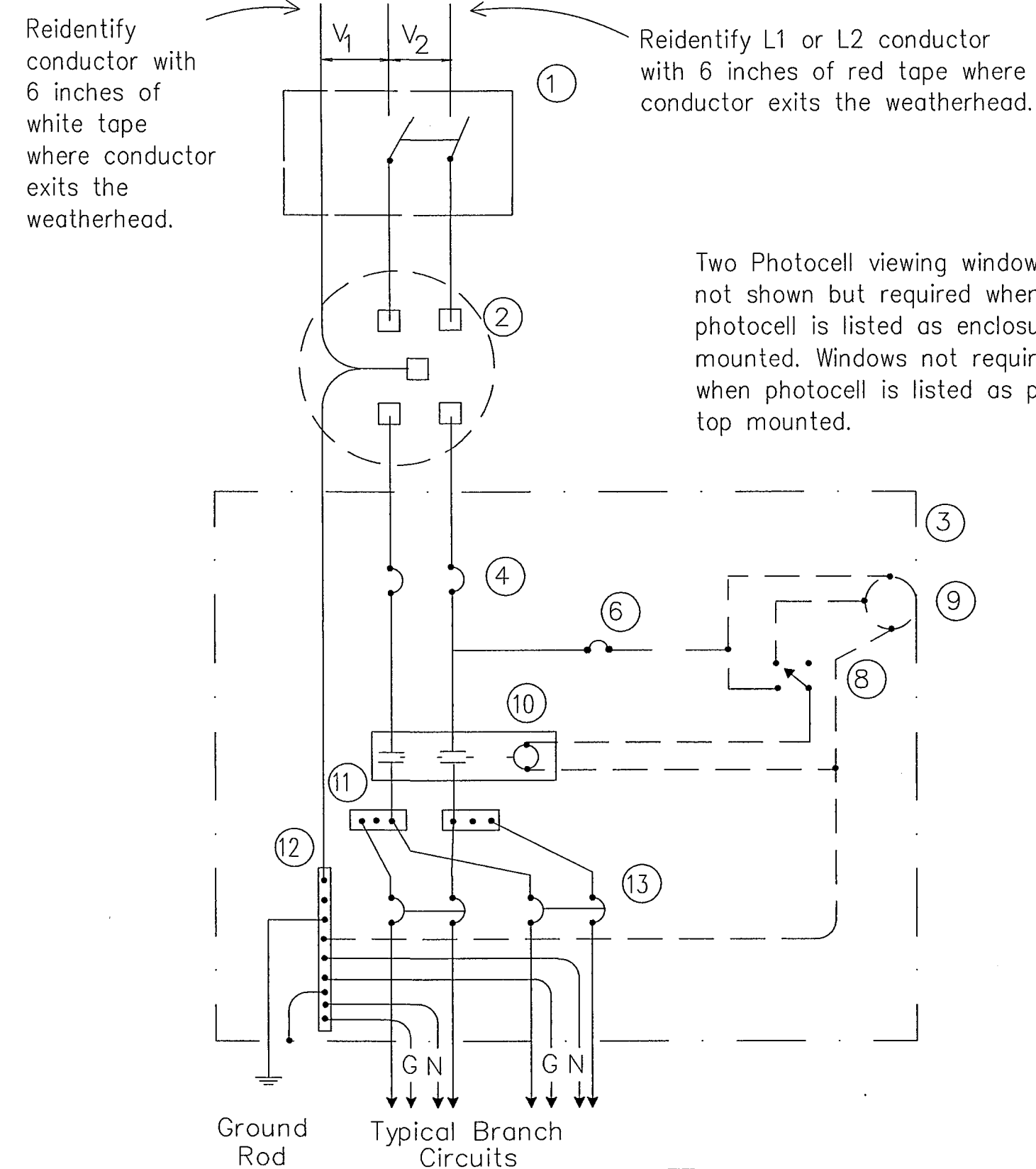
SERVICE ENCLOSURE NOTES:

VIII. Service Assembly Enclosures. All service assemblies and enclosures shall be UL Listed for the intended purpose.

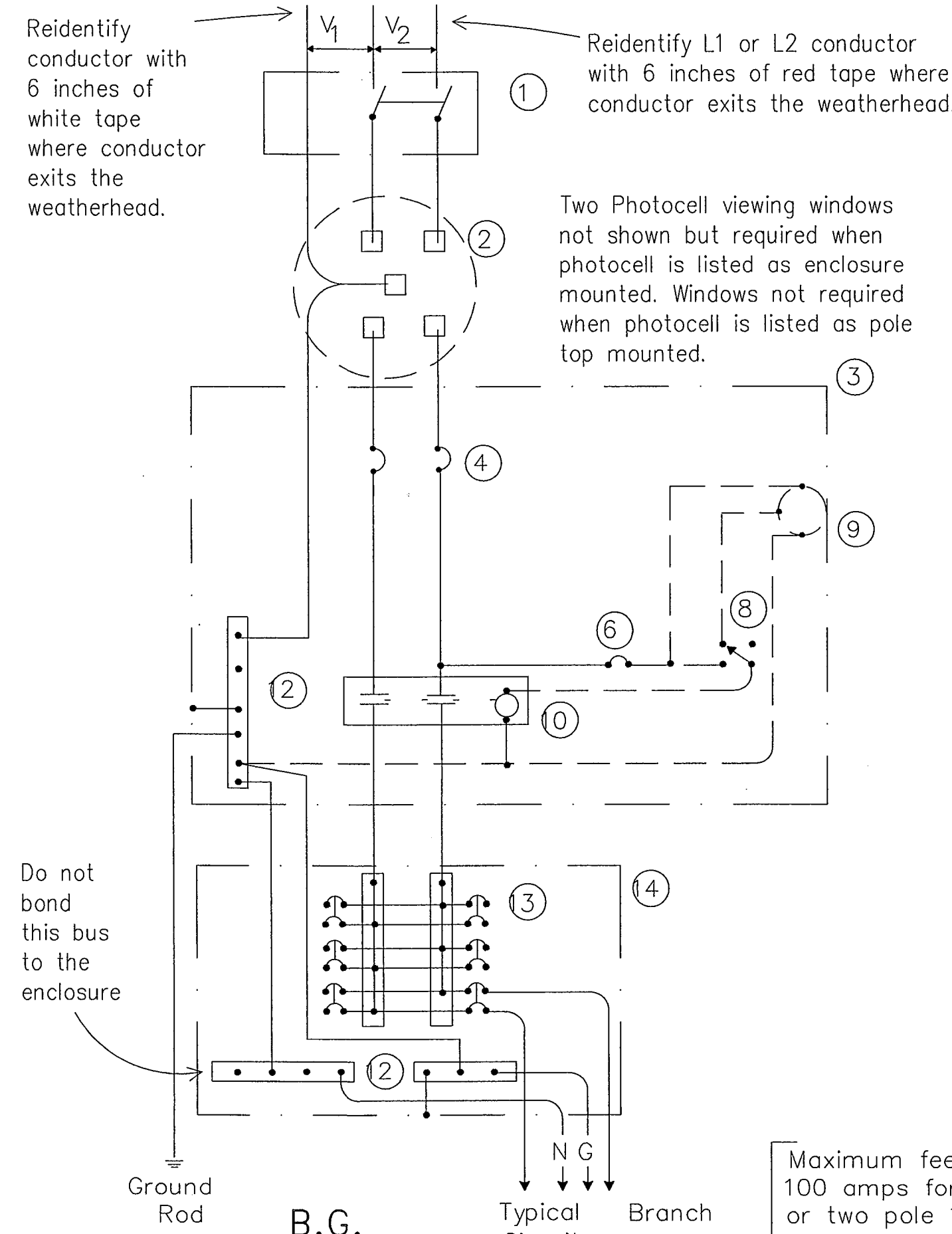
- A. Shop built or shop assembled service assemblies (all types except Type T and Type D without lighting contactor) and all auxiliary equipment enclosures mounted with service equipment and paid for as part of Item 628, "Electrical Services", shall be built or assembled by a UL Listed Industrial Control Panel shop and shall have a unique serial numbered UL Label with the words "LISTED ENCLOSED INDUSTRIAL CONTROL PANEL". The same or an additional label shall have the name, location, and phone number of the shop, the UL file number of the shop, the shop order or drawing number, date of manufacture or assembly, and the line voltage. The enclosure shall also be labeled "SUITABLE ONLY FOR USE AS SERVICE EQUIPMENT".
- B. Conduit entries into the top of all enclosures shall have threaded hubs. No conduit entries through the equipment mounting back plate will be allowed.
- C. All service enclosure front doors shall be permanently labeled "DANGER HIGH VOLTAGE". Label shall be a self sticking type, intended for outdoor installation. Lettering style, layout and colors of red, black and white shall be as required by OSHA. Label letters shall be 1 to 1 1/2 inches high or as high as the enclosure door width will permit for smaller Type T services. Separate or auxiliary lighting enclosures need not be OSHA labeled when mounted in the same viewing plane as the service enclosure front door. Where only one type of load is served by the service, the service door shall be marked using spray painted stenciled letters or self adhesive vinyl weather resistant labels, minimum of 1 inch high; applied in a neat and workman like manner, identifying the load served specifically such as lighting, landscaping, signals, traffic management or other wording as directed by the Engineer. Safety switches need not be OSHA labeled unless specifically required by the serving utility.
- D. Type GS enclosures for service types D, T, and the circuit breaker panelboard of service type C shall be made from pre-galvanized steel sheeting, hot dipped galvanized steel, or powder coat painted steel. Painted enclosures shall be painted inside and outside; galvanized enclosures may be painted. Unless otherwise approved by the Engineer, painted enclosures shall be gray, beige, or white. Panelboard/loadcenter enclosures shall be UL type 3R, 4, 4X or 12 modified or built as shown in paragraph E (below), shall have a dead front trim, and shall have a door with provisions for padlocking. Types D and T shall not have a loadcenter exterior "can" mounted inside another enclosure meeting these specifications. The loadcenter shall be interior mounted in an enclosure with properly adapted dead front trim.
- E. Type GS enclosures for service types A and C shall be a UL type 3R, 4, 4X or 12 enclosure and shall meet additional requirements of this paragraph. UL type 12 enclosures marked for indoor use only are approved for outdoor use when a drip shield or rolled lip is provided and drain fitting is supplied as specified. The enclosure door shall have a rolled lip around all sides of the enclosure opening and a padlock handle. All enclosures may have a continuous stainless steel piano hinge with stainless steel pin, enclosures less than 30 inches may have two heavy duty hinges, those over 30 inches must have three. Heavy duty two and three point hinges shall have a 3/8" minimum diameter electro-zinc plated steel pin or a stainless steel pin. Two point hinged doors shall be rated for 56 lbs of loading. Three point hinged doors shall be rated for 90 lbs of loading. The door shall have a mechanically attached data pocket constructed of either thermoplastic or metal. Pocket shall be 12" x 12", unless that size will not fit in enclosure. The pocket shall then be as large as possible, as approved by the Engineer, and mechanically attached with stainless steel nuts and bolts, or stainless steel or aluminum rivets. The main disconnect remote operator shall be flange-mounted, shall interlock the door when in the "on" position, and shall be pad lockable in both the "on" or the "off" positions. Enclosure shall include an equipment mounting panel installed inside the enclosure on collar studs or tapped bosses, and constructed of either 12-gauge steel or 0.10"-thick aluminum. Equipment mounting panels shall not be painted, but shall be hot-dipped galvanized or made from pre-galvanized sheeting. Enclosure shall have factory installed external mounting feet. Enclosure door shall be capable of opening at least 130 degrees, with arm to hold the door open. Door latch shall latch at two or more points, operate by a handle separate from disconnect switch and be capable of being locked. Lock must be keyed to Master #2195. Door shall be bonded with a #8 ground wire to the grounding bus or from door to enclosure grounding point if one is provided in enclosure. Enclosure shall be either hot dip galvanized, pre-galvanized sheeting or prime and painted. Paint shall be powder coat paint as shown below. Color shall be white or gray. Condensation drainage shall be provided by installation of a drain fitting (Crouse-Hinds CH-ECD11, Appleton ECDB or equal) in the bottom of the enclosure. The Contractor shall place in the service enclosure a laminated copy of the "as built" electrical plans showing the equipment supplied for that electrical service and all applicable wiring diagrams, layouts, and TS-8, TS-9, and TS-10 when standard sheets are in the plan set.
- F. Type SS Stainless steel enclosure shall meet all the requirements above for the respective type GS except that the enclosure shall be UL type 4X conforming to UL 50. Type GS circuit breaker panel interiors and load center interiors housed in a stainless steel UL type 4X enclosure conforming to UL 50 shall be considered complying with the Type SS requirements for service types D & T.
- IX. Powder Coat Paint. Powder coating shall be either a polyester thermosetting resin, a zinc rich primer with a TGIC (triglycidyl isocyanurate) powder overcoating, or a zinc-rich epoxy powder, applied by either electrostatic spray or fluidized bed immersion, high temperature oven cured, high density, low gloss, 4 mil thick (minimum), coating. Adhesion shall meet the 5A or 5B classifications of ASTM D3359. Finish shall be uniform in appearance and free of scratches.
- X. Main Disconnect. Main disconnect device shall be a circuit breaker, as specified in the Electrical Service Data, shall be two or three pole, and rated for the voltage and amperage specified. Circuit breaker shall be a UL Listed thermal-magnetic circuit breaker with flange-mounted remote operator in the service assembly enclosure. Circuit breakers shall have a minimum interrupting rating of 10,000 Amps. When the utility company provides a transformer larger than 50 KVA, Contractor shall verify that the available fault current is less than the circuit breaker amps interrupting capacity (AIC) rating and shall provide documentation from the Utility to the Engineer. Documentation shall be submitted at the same time as other electrical submittals. Circuit breaker shall be UL Listed to UL489. No backfed breakers as main disconnects will be allowed.
- XI. Control Circuit. Control circuit protection shall be either a 10 or 15 amp circuit breaker.
- XII. Control Station ("H-O-A" Switch). Control station shall be a maintained-contact, three position selector switch in a UL type enclosure. Switch shall be rated 600 volts and shall be fitted with "Hand-Off-Auto" legend.
- XIII. Photo Electric Control. Photo electric control shall consist of a photocell, internal lightning arrester, and relay or bimetallic switch mounted inside a weatherproof enclosure with standard 3-prong twist lock photocell plug and receptacle. The enclosure shall be made of poly-acrylic with clear acrylic window. Enclosure chassis shall be molded thermosetting plastic. The photocell shall have a polyethylene gasket, and shall have a hermetically sealed cadmium sulfide cell. The arrester shall have an enclosed type expulsion arrester rated 2.0 kV sparkover with 5,000 amps follow-through. Relay or switch shall be time delay type with normally closed contacts. Photo electric control shall be rated a minimum of 1800 VA, voltage as required. Enclosure mounted photocells shall be the same as above except that the photocell shall be mounted inside the enclosure. The enclosure shall have two acrylic paned windows, or other material approved by the Engineer, one on each side of the enclosure. Each window shall be rectangular approximately one inch by two inches, round 2 inch diameter, or as otherwise approved by the Engineer. The photocell shall be mounted in a position to receive light from one window. Top of pole mounted photocells shall be mounted as shown on ED(4). The Contractor shall be responsible for proper operation of the photo-electric control. The Contractor shall move and/or adjust or shield the photocell from stray or ambient nighttime light or shall make any other adjustments required for proper operation. The photocell shall face North when practicable. Unless otherwise shown on the plans, the photocell shall turn on the illumination system at 1.0 +(-) 0.5 footcandle and turn off the illumination system at two footcandles higher than turn on.
- XIV. Lighting Contactor. Lighting contactor shall be a UL Listed NEMA rated lighting contactor, two-pole or multipole as required, electrically held type designed to control high pressure sodium lighting loads, with silver alloy double break contacts rated at 240 volts, 480 volts or 600 volts as required. Lighting contactor shall not be the DIN rail mounted type.
- XV. Power Distribution Terminal Blocks. Power distribution terminal blocks shall be rated for 600 volts and shall be used for line side connections to branch circuit breakers where more than one circuit breaker is required. Lugs on blocks shall be properly sized for conductors being used. Only one conductor shall be placed under each lug.
- XVI. Neutral/Ground Bus. Neutral/ground bus shall be a factory made bus permanently bonded to the enclosure with properly sized lugs for grounding and neutral conductors.

SCHEMATIC LEGEND

- 1 - Safety Switch (when required)
- 2 - Meter (when required)
- 3 - Service Assembly Enclosure
- 4 - Main Disconnect Breaker (See Electrical Service Data)
- 5 - Omit
- 6 - Circuit Breaker, 15A Typical for control wiring
- 7 - Auxiliary Enclosure
- 8 - Control Station ("H-O-A" Switch)
- 9 - Photo Electric Control (enclosure-mounted shown)
- 10 - Lighting Contactor
- 11 - Power Distribution Terminal Blocks
- 12 - Neutral/Ground Bus
- 13 - Branch Circuit Breaker (See Electrical Service Data)
- 14 - Circuit Breaker Panelboard (See Electrical Service Data)
- 15 - Load Center
- Power Wiring
- Control Wiring
- N — Neutral Conductor (when required serve 120 v. loads only)
- G — Equipment grounding conductor—always required

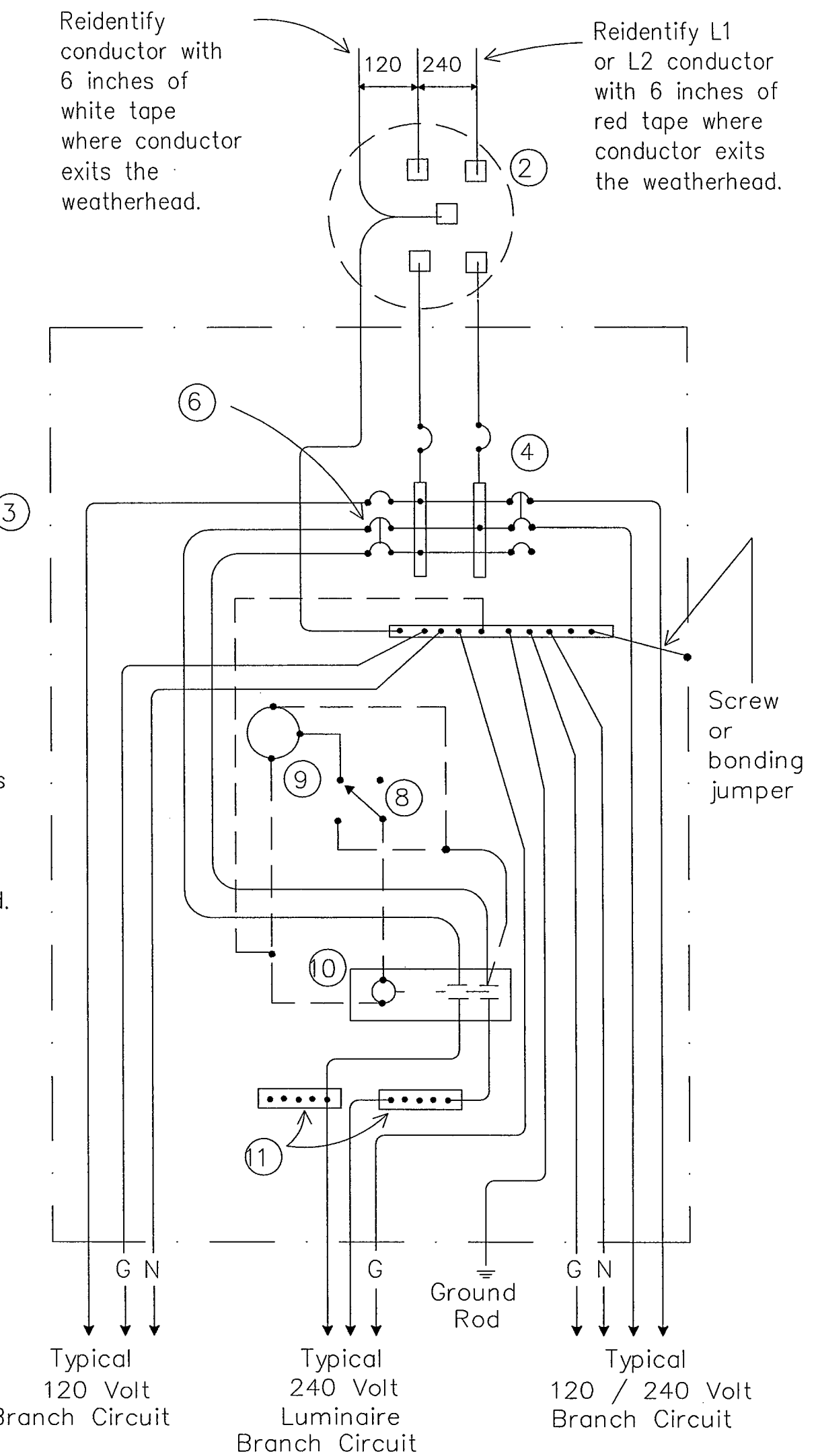


SCHEMATIC TYPE A
THREE WIRE



SCHEMATIC TYPE C
THREE WIRE

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SCHEMATIC TYPE D
120/240 VOLTS -THREE WIRE

Install photocell and lighting contactor when shown on Electrical Service Data. See Type D service notes.

TYPE D SERVICE NOTES

Photocell and lighting contactor shall be located either in the same UL type 3R enclosure with load center or, if approved by Engineer, in separate enclosure. Photocells shall have a window on each side of enclosure to allow operation. Both photocell contactor and breaker area shall have dead front trim. Enclosure, except for RT and PS supports, shall not exceed 36 inches in height or 16 inches in width unless approved by the Town. Ty D load center with lighting controls or TY D separate lighting control enclosure shall have power distribution blocks for a minimum of 4, #8 conductors per phase.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: WILLIAM J. HATCHELL ON 2/13/10 ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

Maximum feeder circuit size (High Mast Poles): 100 amps for two pole 480V, 125 amps for one or two pole 120V or 240V. Maximum branch circuit size: 50 amps.

THIS DETAIL SHEET WAS OBTAINED FROM TXDOT

DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: WJH	REVIEWED: DWG: 249DETAILS-ELEC

ARAPAHO ROAD PHASE II
STANDARD CONSTRUCTION DETAILS
ELECTRICAL - SHEET 5

TOWN OF ADDISON

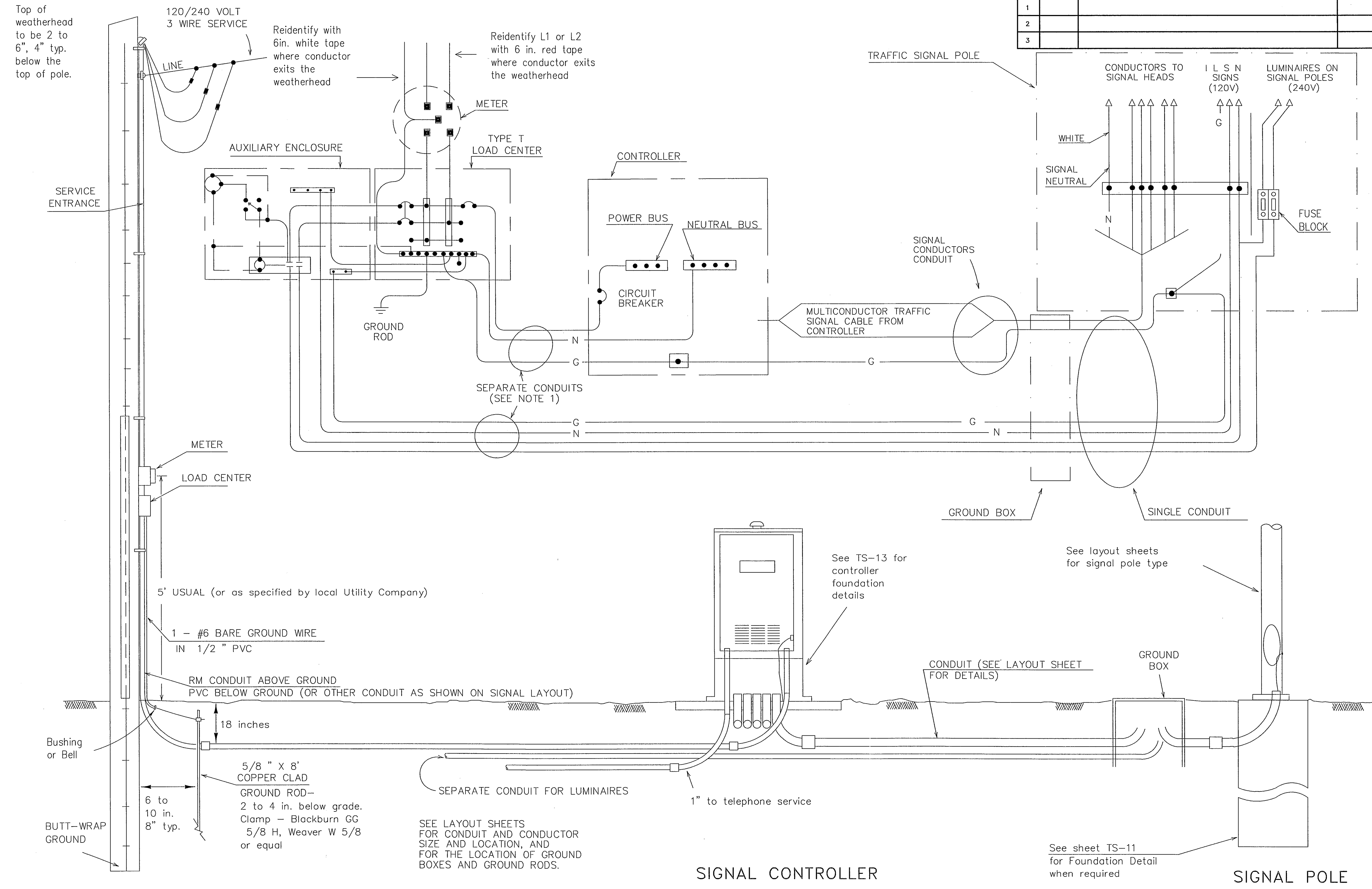
GBW Grantham, Burge & Waldbauer
Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

SHT. TS-9
OF TS-21

NO.	DATE	REVISION	APPROV.
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NOTES:

- Luminaire conductors shall not be looped through controller cabinet.
- Electrical system to include an equipment grounding conductor noted here as "G". All exposed metal parts are to be bonded to grounding conductor.
- Photocell, when required, shall be mounted at top of pole or in enclosure as shown on TS-8 and TS-9 and as required by descriptive code.
- Roadway lighting fixtures, when required, shall be in accordance with the material and construction methods of the Item, "Roadway Illumination Assemblies" except for the test period for proper operation of the luminaires. Installed roadway lighting luminaires and internally lighted street name signs shall be tested for proper operation as a part of the associated traffic signal system.
- Internally lighted street name signs (ILSN), when required, shall be in accordance with the Item "Internally Lighted Street Name Signs". Because of the electrical isolation of ILSN hinges, a #12 green grounding conductor shall be run to the ILSN fixture.
- Install ground rod at alternate location when directed by the Town. Maintain a minimum of 8 ft in contact with the earth.
- Liquidtight flexible metal conduit, may be used when meter and service enclosure are mounted 90 to 180 degrees to each other. LFMC shall not exceed 3 ft. and shall be securely supported within one ft. of each end. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. A neutral conductor must be installed within the LFMC. Bend in liquidtight flexible metal conduit shall not exceed 180 degrees.
- Minimum embedment depth as per item 627 Treated Timber Poles.
- Pole to be set plumb.
- Back fill thoroughly tamped in 6 in. lifts. Place 6 inches additional backfill above grade around pole base to allow for settling, as per Item 627.
- Excess pole length shall be trimmed from the top at a slope to aid water run off.
- Gain pole two places for each meter, service, separate or auxiliary enclosure. See ED(4) for details.
- All illumination and power conductors to be pull tested and megged. Do not meg traffic signal cable.
- Enclosures are to be locked, and ground box covers are to be bolted before power is applied to the circuit.
- Conduits entering top of enclosures to be fitted with conduit sealing hub or threaded boss, such as meter hub. Off-set nipple, when required, shall not be zinc-die-pressure cast. All metal conduits not connected to conduit sealing hub, or threaded boss must have a grounding bushing. Terminate bonding jumper to ground bus. All conduits entering enclosures shall be sealed. Silicone shall not be allowed.



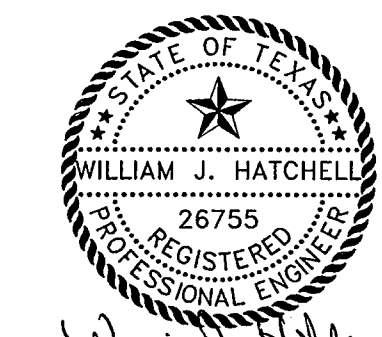
ELECTRICAL SERVICE

(TYPE T TIMBER POLE SHOWN AS EXAMPLE, SEE ELECTRICAL DETAILS, LAYOUT SHEETS, AND ELECTRICAL SERVICE DATA SHEET FOR SERVICE REQUIRED AND FOR DETAILS.)

Unless shown elsewhere in the plans, electrical service data for Types D and T shall be as follows.

ELECTRICAL SERVICE DESCRIPTION(SEE ED(4))	SERVICE CONDUIT SIZE (RMC)	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT. BRK. POLE/AMP	TWO-POLE CONTACTOR AMPS ***	PANELBD./LOADCENTER AMP RATING (MIN)	CIRCUIT NO.	BRANCH CKT. BRK. POLE/AMPS	KVA LOAD
TY D (120/240)070(NS)GS(E)**(*)	1 1/2	3/#4	N/A	2P/70	30	70	T.S. Lighting	1P/50 2P/15	<7.1
TY T (120/240)000(NS)GS(E)**(*)	1 1/2	3/#4	N/A	None	30	70	T.S. Lighting	1P/50 2P/15	<7.1

*** Eliminate photocell, contactor and separate enclosure if lighting, or internally lighted signs are not required by plans
 ** See descriptive code in estimate for service support type.
 * See descriptive code in estimate for overhead or underground service.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: WILLIAM J. HATCHELL ON 2/18/01 ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

THIS DETAIL SHEET WAS OBTAINED FROM TXDOT

DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249	76
DRAWN: GBW	DESIGN: WJH	REVIEWED:	DWG: 249DETAILS-ELEC

**ARAPAHO ROAD PHASE II
STANDARD CONSTRUCTION DETAILS
ELECTRICAL - SHEET 3**

TOWN OF ADDISON

Grantham, Burge & Waldbauer
GBW Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
 (972) 840-1916 (TEL)
 (972) 840-2156 (FAX)

SHT. TS-10 OF TS-21

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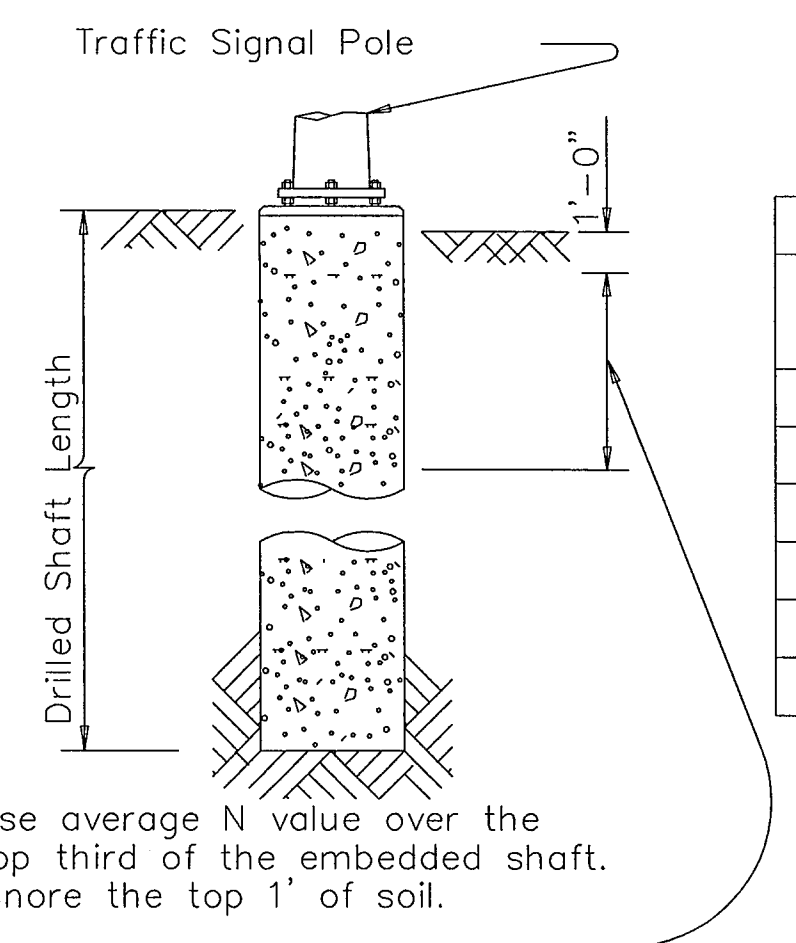
FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		DRILLED SHAFT LENGTH-ft (4), (5), (6)			ANCHOR BOLT DESIGN (1)				FOUNDATION DESIGN LOAD (2)		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft	ANCHOR BOLT DIA	F _y (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips			
											10	15	
24-A	24"	4-#5	#2 at 12"	5.7	5.3	4.5	3/4"	36	12 3/4"	"1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8-#9	#3 at 6"	11.3	10.3	8.0	1 1/2"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10-#9	#3 at 6"	13.2	12.0	9.4	1 3/4"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30" strain pole with or without luminaire.
36-B	36"	12-#9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30" & strain pole with mast arm
42-A	42"	14-#9	#3 at 6"	17.4	15.6	11.9	2 1/4"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

- NOTES:**
- Anchor bolt design develops the foundation capacity given under Foundation Design Loads.
 - Foundation Design Loads are the allowable moments and shears at the base of the structure.
 - Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.
 - Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.
 - If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.
 - Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH (FEET) (6)				
				24-A	30-A	36-A	36-B	42-A
MARSH								
T-1		36-A				12.0		
T-2		36-A				12.0		
SURVEYOR								
T-1		36-A				12.0		
T-2		36-A				12.0		
T-3		36-A				10.0		
T-4		36-A				12.0		
TOTAL DRILLED SHAFT LENGTHS								

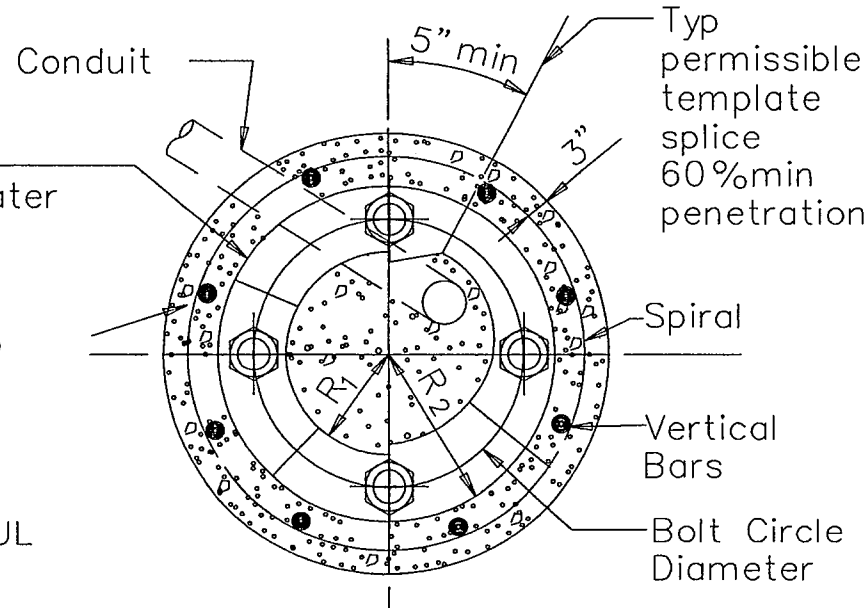
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A	
		24' X 24'				
MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	28' X 28'					
	32' X 28'		32' X 32'			
			36' X 36'			
			40' X 36'			
100 MPH DESIGN WIND SPEED			44' X 28'	44' X 36'		
	MAX SINGLE ARM LENGTH		36'	44'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'				
		28' X 28'				
		32' X 24'		32' X 32'		
			36' X 36'			
			40' X 24'	40' X 36'		
				44' X 36'		

- EXAMPLE:**
- For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
 - For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.

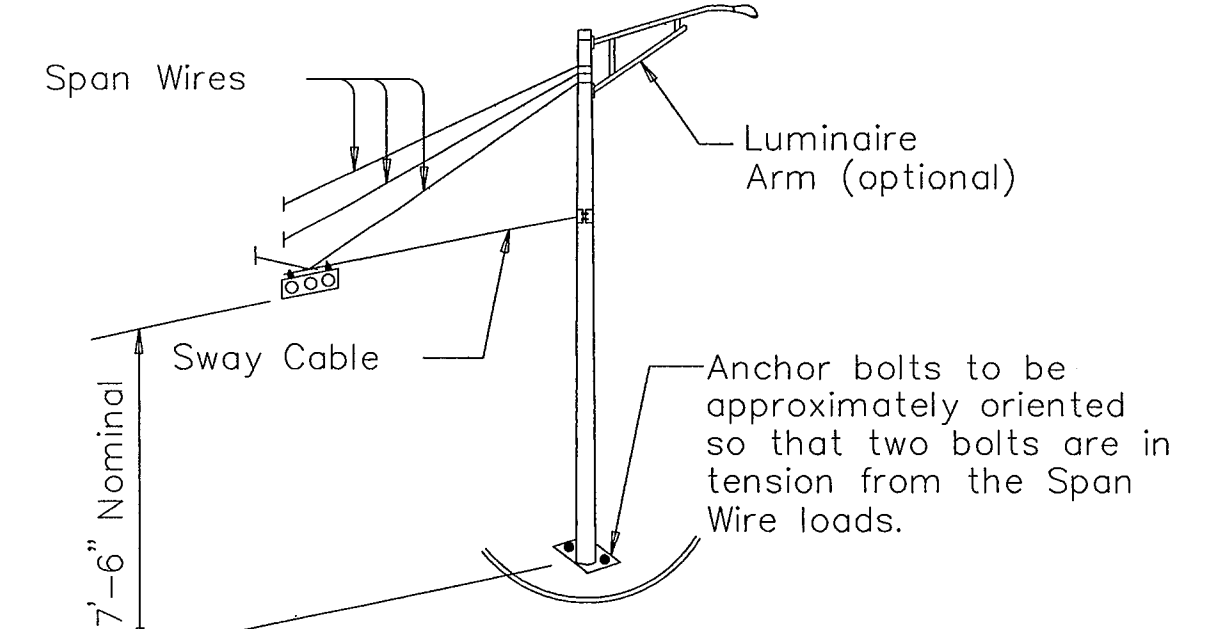


BOLT DIA IN.	(7) BOLT LENGTH	TOP THREAD	BOTT THREAD	BOLT CIRCLE	R ₂	R ₁
3/4"	1'-6"	3"	—	12 3/4"	7 1/8"	5 5/8"
1 1/2"	3'-4"	6"	2"	17"	10"	7"
1 3/4"	3'-10"	7"	2 1/4"	19"	11 1/4"	7 3/4"
2"	4'-3"	8"	2 1/2"	21"	12 1/2"	8 1/2"
2 1/4"	4'-9"	9"	3"	23"	13 3/4"	9 1/4"

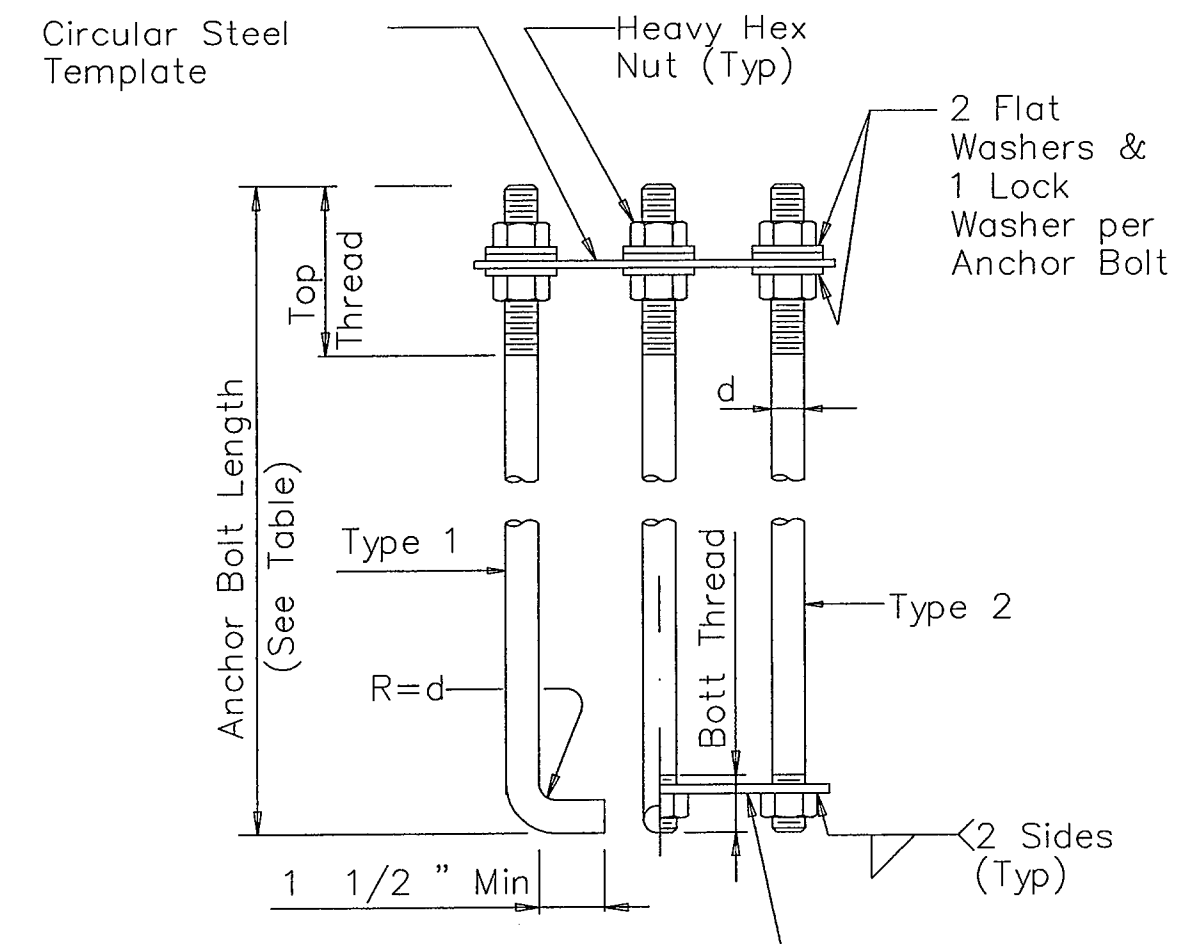
(7) Min dimensions given, longer bolts are acceptable.



R₁ may equal R₂ if plate is welded of 3 or more segments.



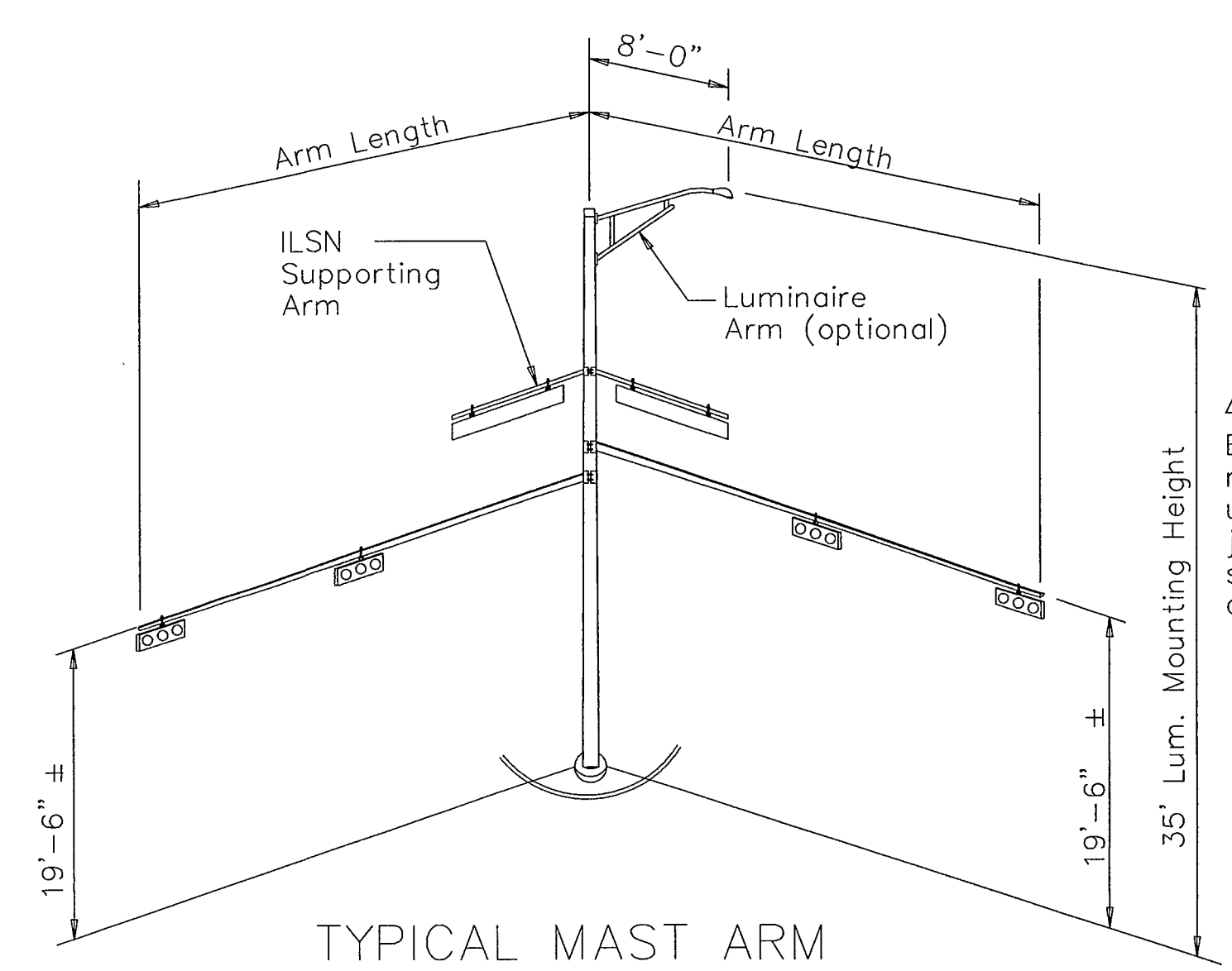
TYPICAL STRAIN POLE ASSEMBLY



ANCHOR BOLT ASSEMBLY

INSTALLATION PROCEDURE:

Threads of anchor bolts shall be coated with pipe joint compound prior to installation of upper nuts when erecting pole. After pole is plumbed and in permanent alignment, the exposed threads of painted bolts shall be cleaned and an additional coating of zinc-rich paint applied to seal the bolt thread-nut joint.



TYPICAL MAST ARM ASSEMBLY

Conduit (See Layout Sheets for diameter. Orient as directed by the Engineer. 1 or 2 required)

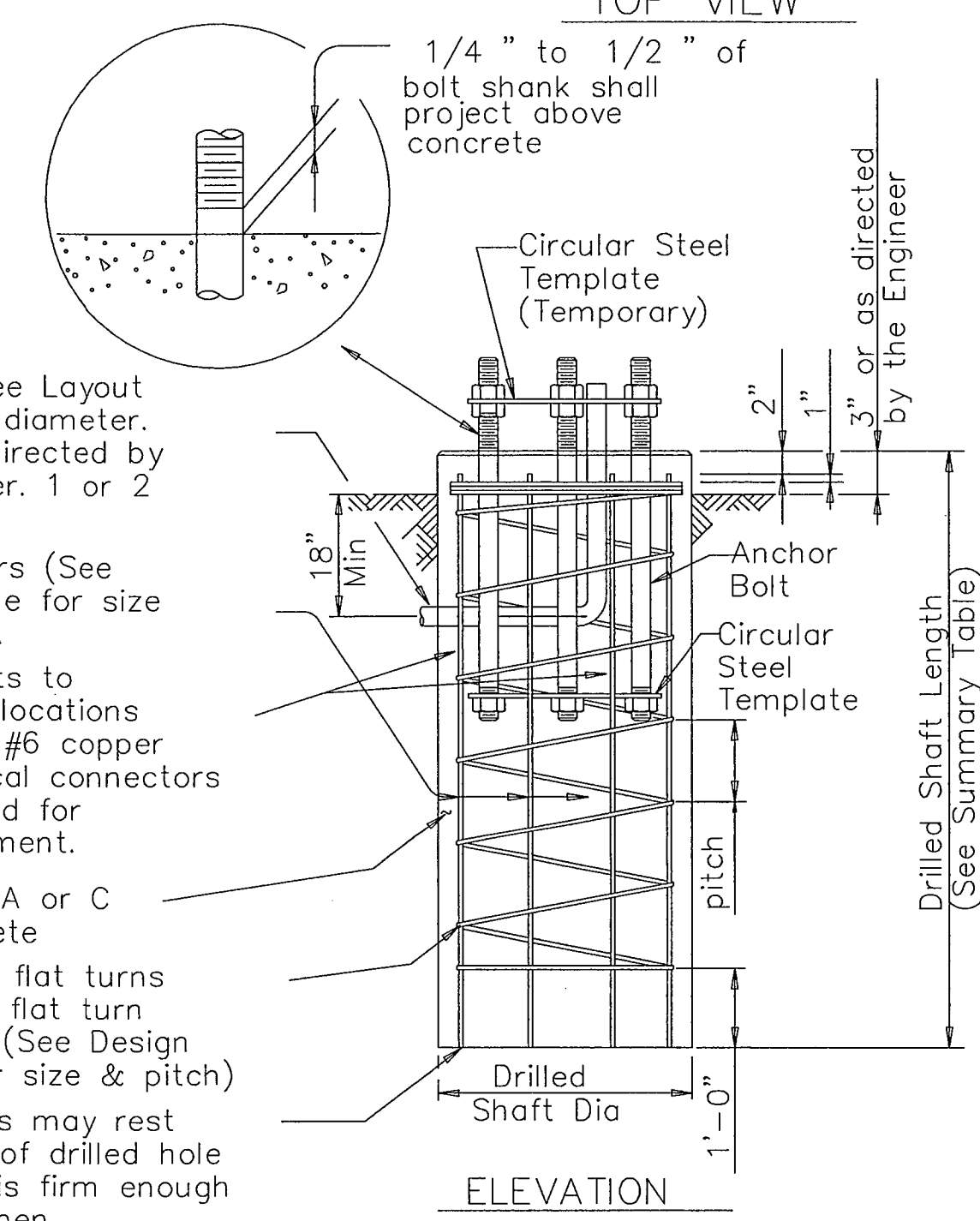
Vertical Bars (See Design Table for size & number).

Bond anchor bolts to rebar cage, two locations using #3 bar or #6 copper jumper. Mechanical connectors shall be UL Listed for concrete encasement.

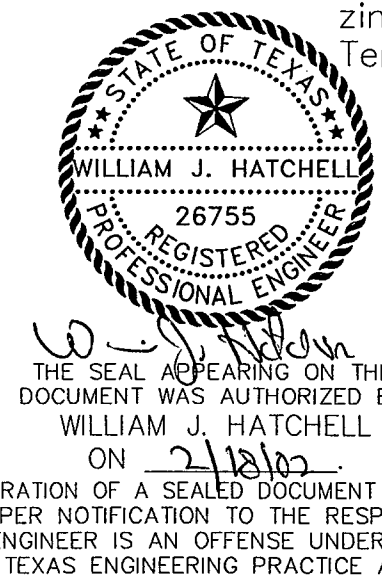
Class A or C Concrete

Spiral, 3 flat turns top & 1 flat turn bottom. (See Design Table for size & pitch)

Vertical bars may rest on bottom of drilled hole if material is firm enough to do so when concrete is placed.



FOUNDATION DETAILS



ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

THIS DETAIL SHEET WAS OBTAINED FROM TXDOT

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.

Reinforcing steel shall conform to Item 440. Concrete shall be Class A or C.

Threads for anchor bolts and nuts shall be rolled or cut threads of unified national coarse thread series except for A193B7 bolts which shall have 8 pitch thread series. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.

Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Anchor bolts larger than 1" in diameter shall conform to A36M55 in accordance with the Item, "Anchor Bolts" or ASTM A193B7 or A687. Galvanize or coat with zinc-rich paint a minimum of the upper 14 inches of all anchor bolts unless otherwise noted. Exposed nuts shall be galvanized or coated with zinc-rich paint. Washers shall be galvanized. Templates and embedded nuts need not be galvanized.

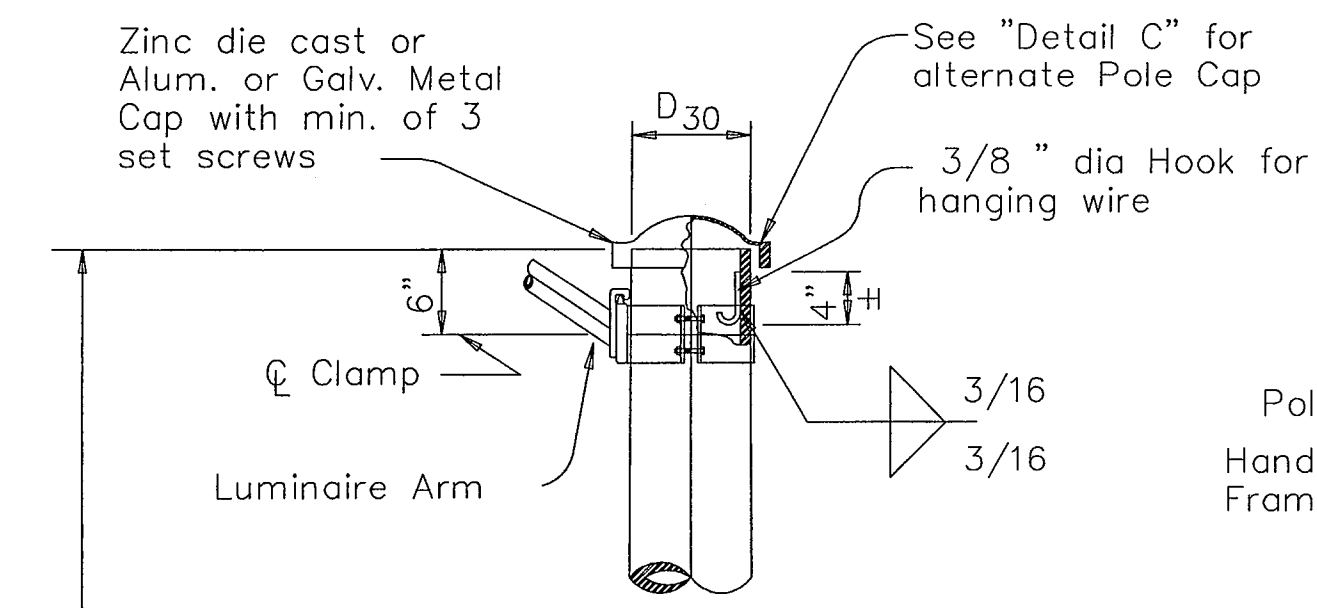
DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: WJH	REVIEWED: DWG: 249DETAILS-TRAF

ARAPAHO ROAD PHASE II
TRAFFIC SIGNAL
POLE FOUNDATION
TOWN OF ADDISON

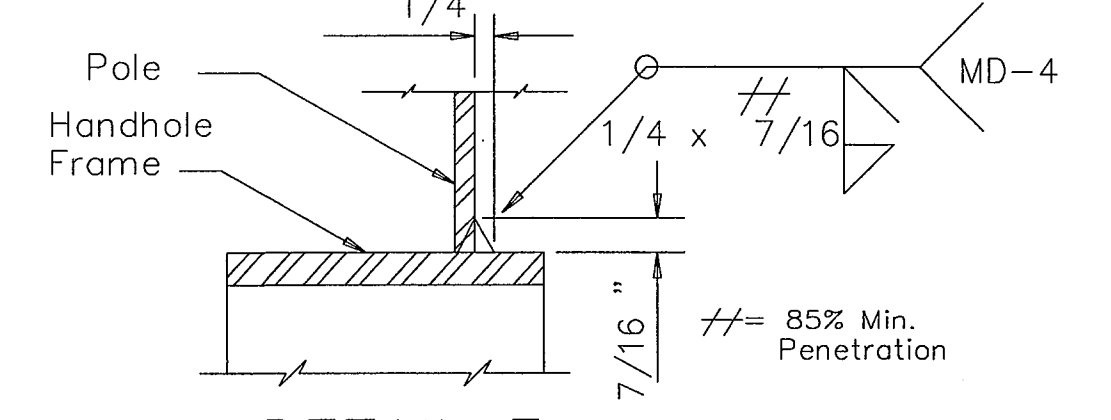
Grantham, Burge & Waldbauer
Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27
 GARLAND, TEXAS 75042

SHT. TS-11
 OF
 TS-21

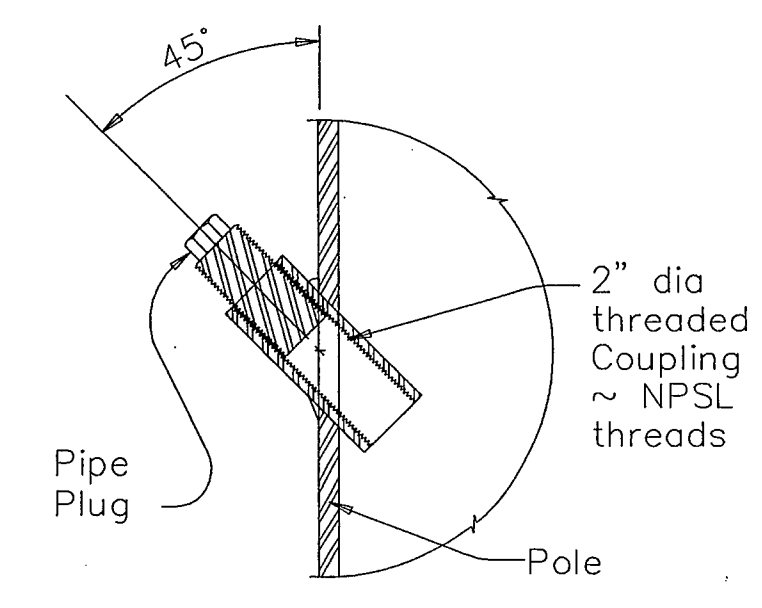
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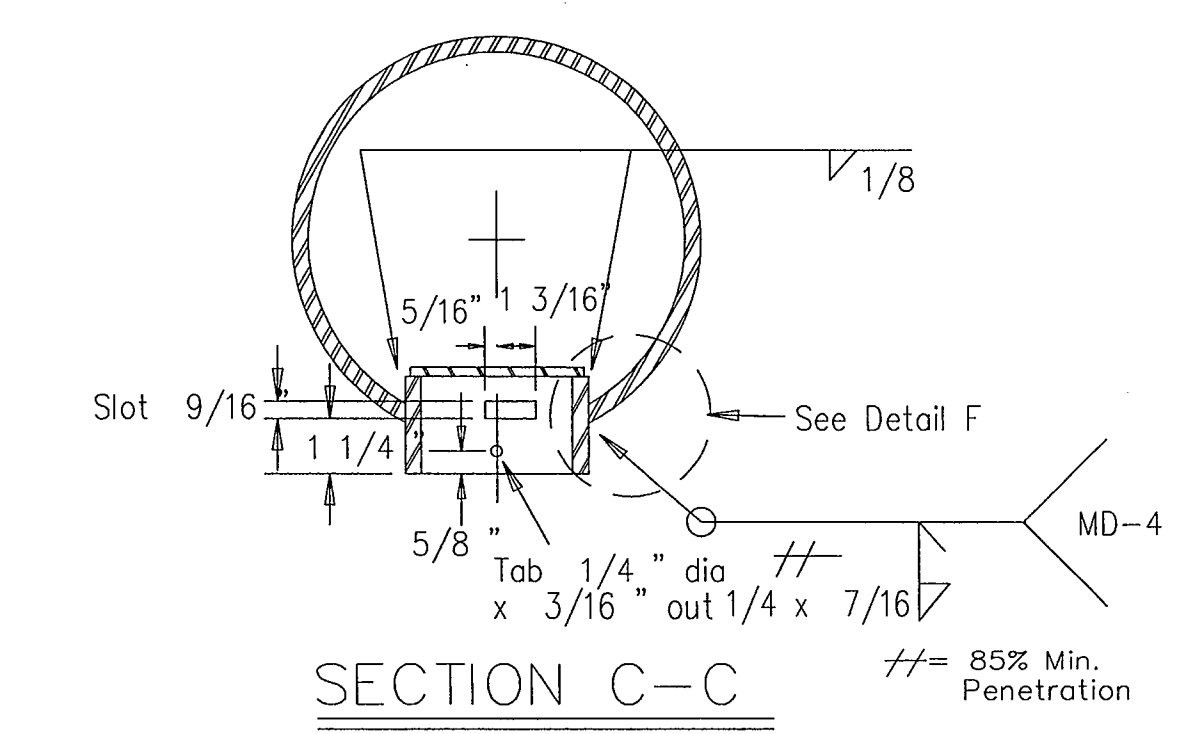
DETAIL A
(for pole with luminaire)



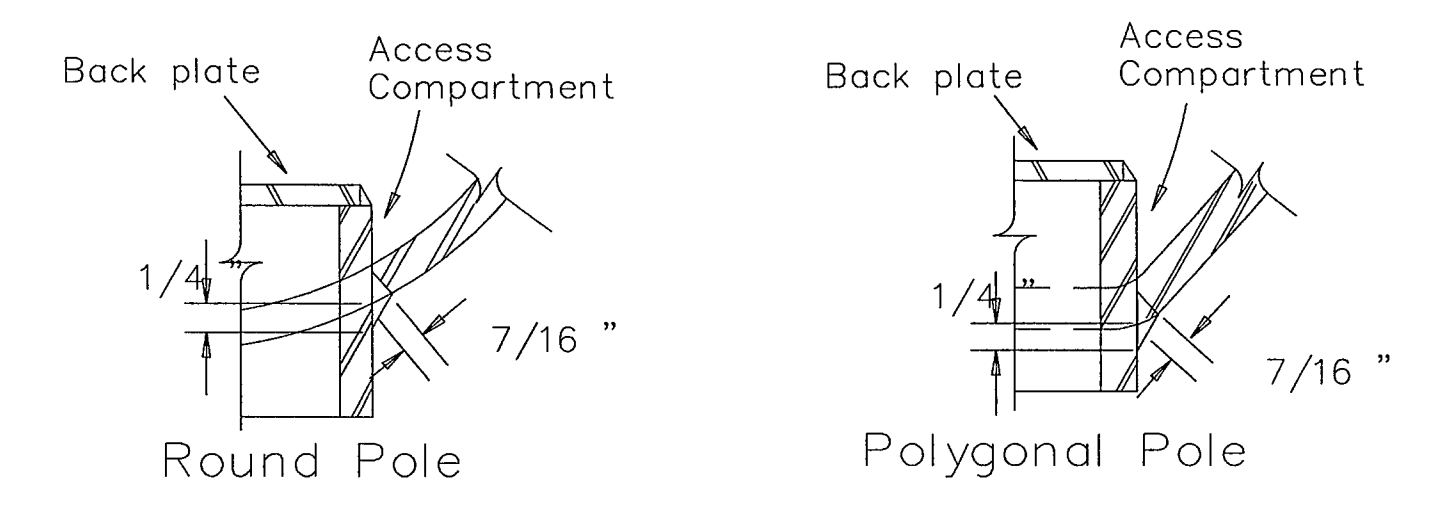
DETAIL E



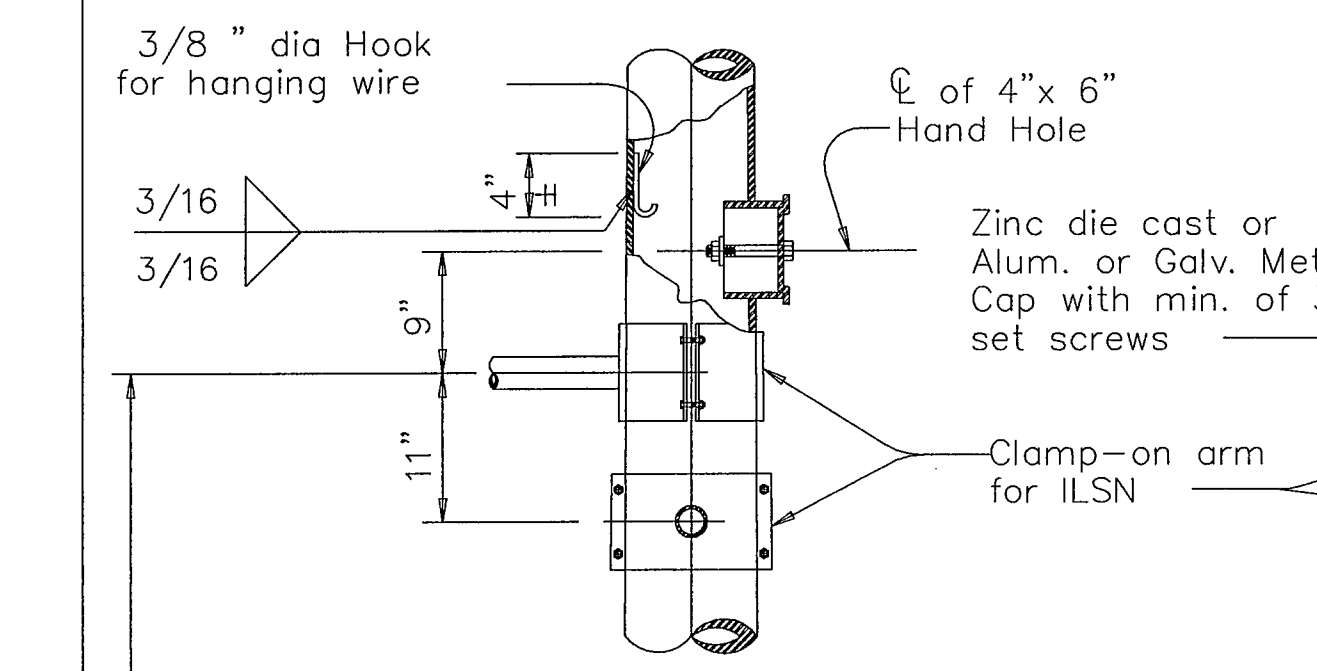
COUPLING DETAIL



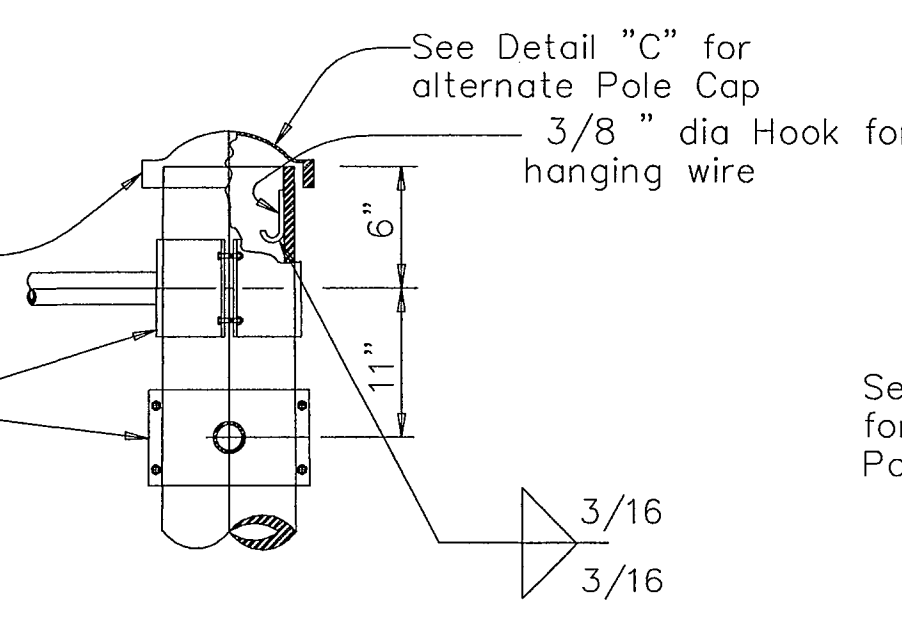
SECTION C-C



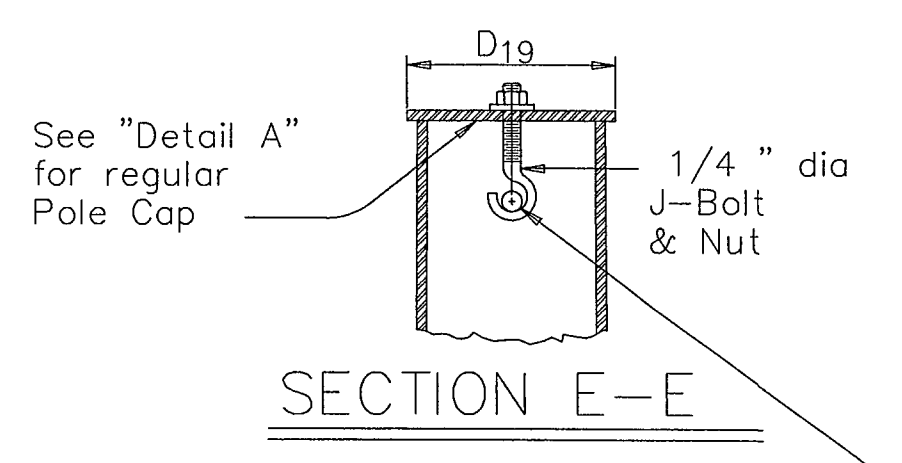
DETAIL F



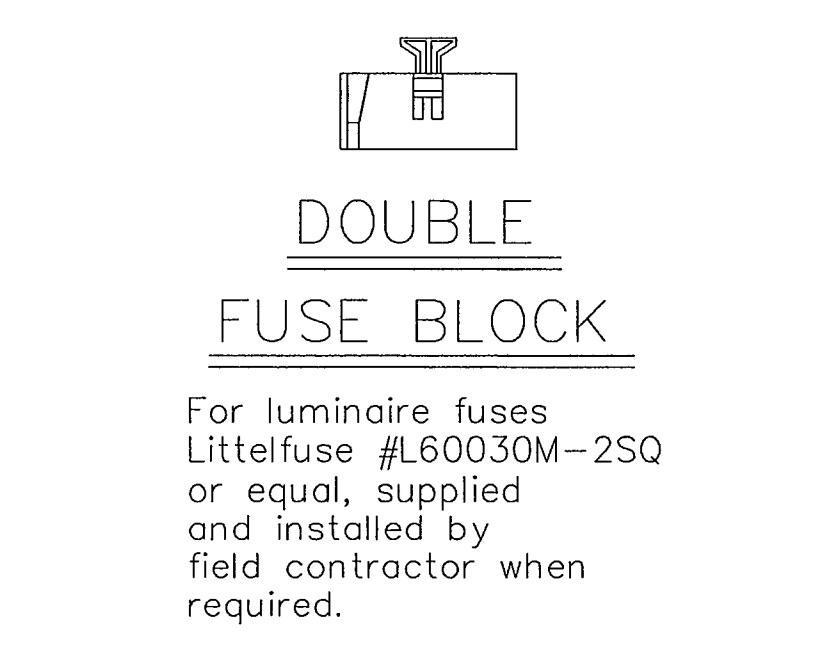
DETAIL J
(If ILSN applied)



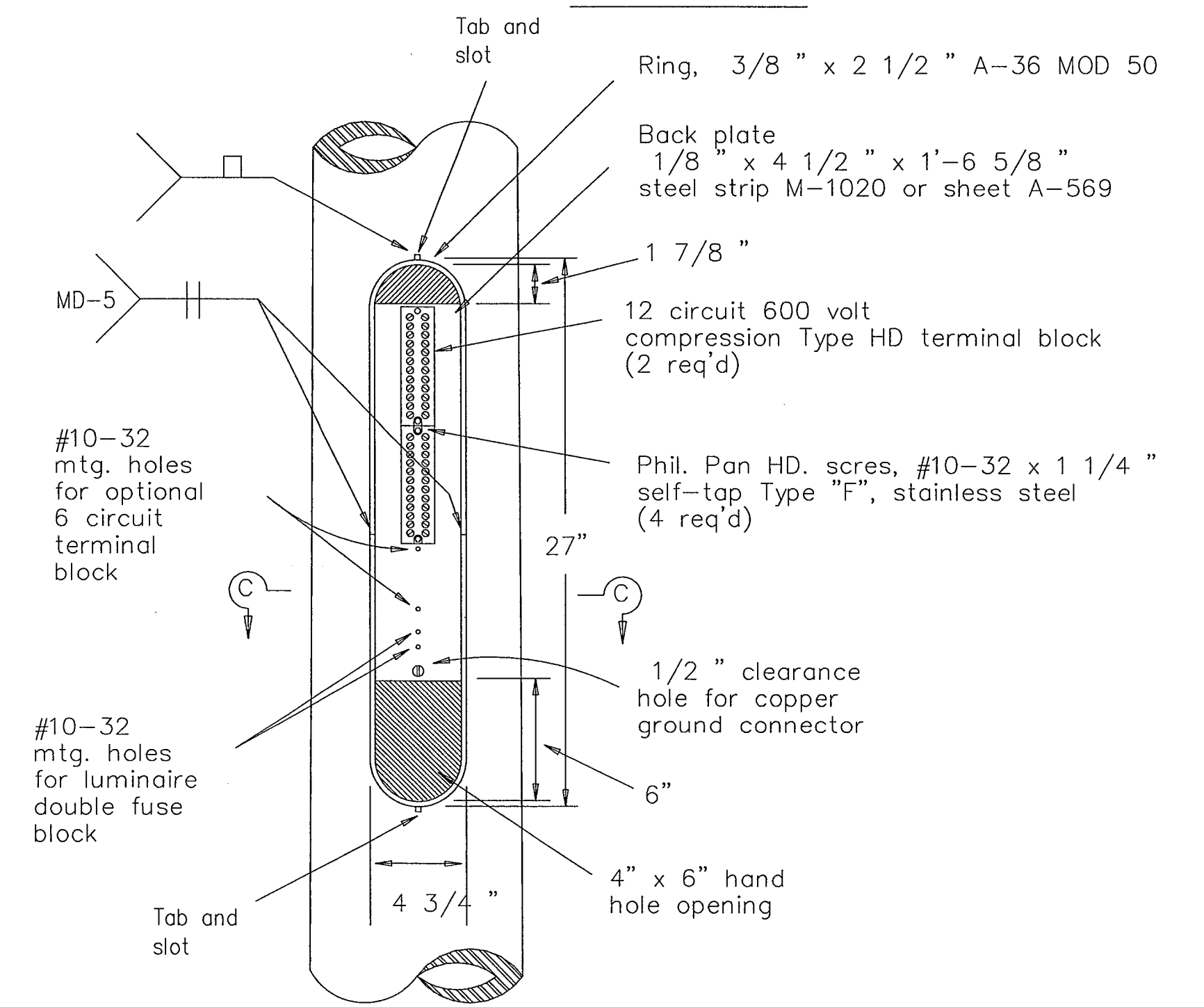
DETAIL K
(for 24' pole with ILSN sign and no luminaire)



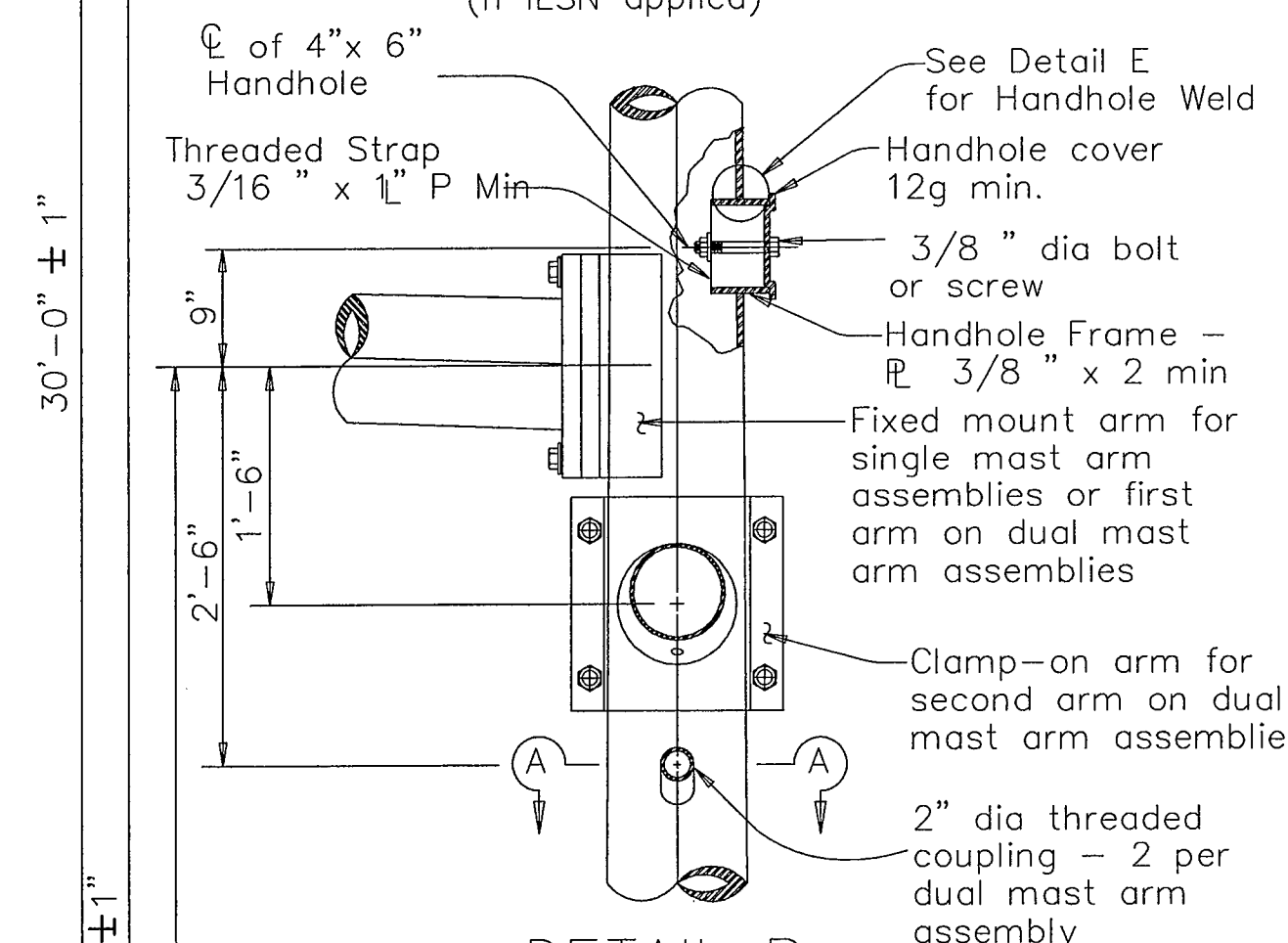
SECTION E-E



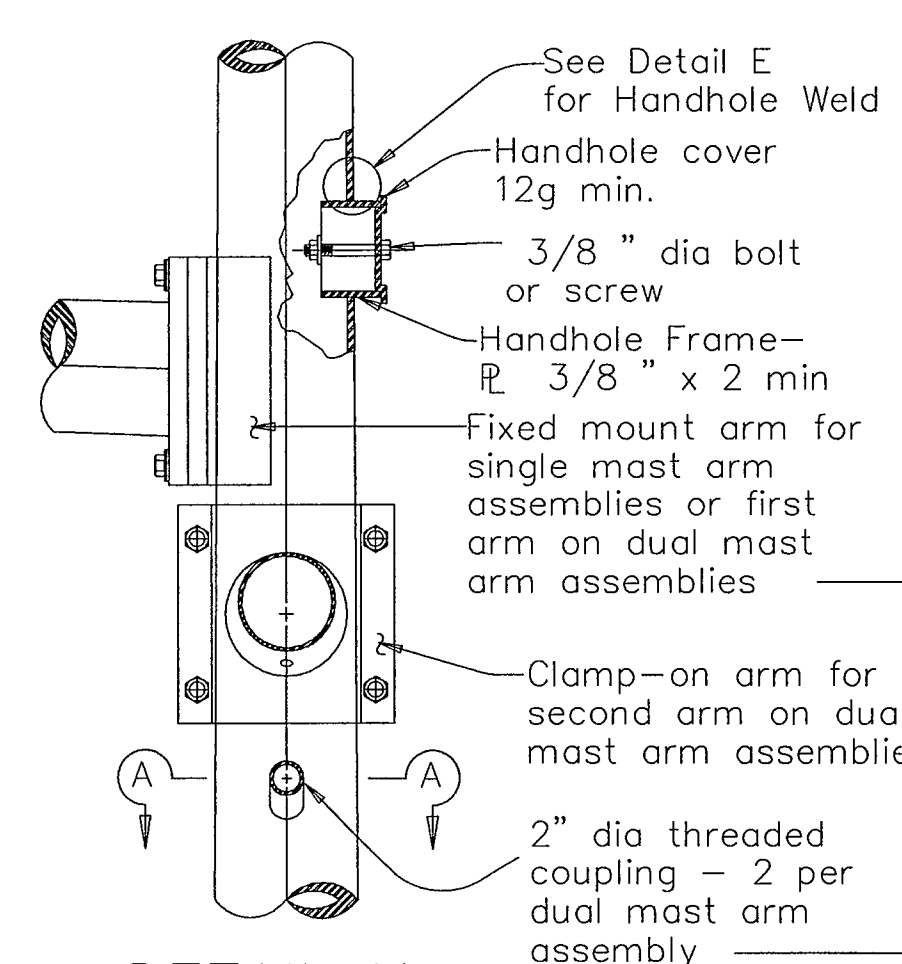
DOUBLE FUSE BLOCK



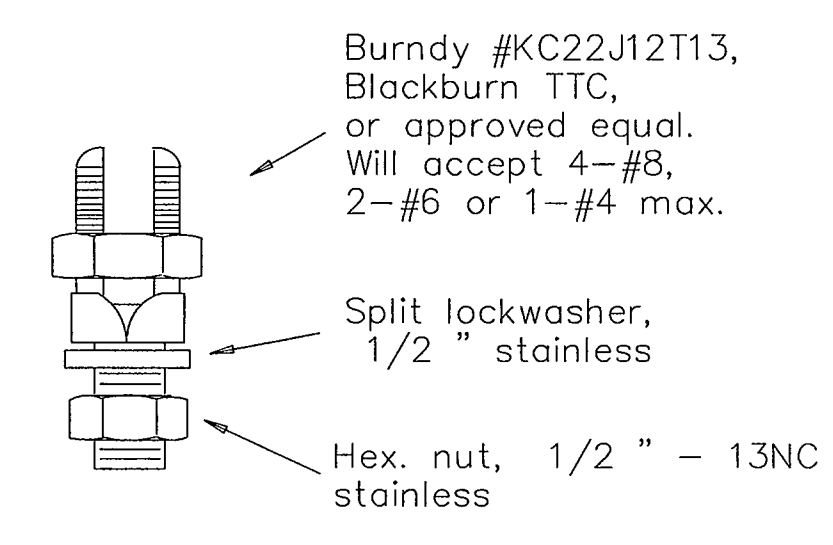
ACCESS COMPARTMENT



DETAIL B
(for 30' pole with luminaire and ILSN sign)

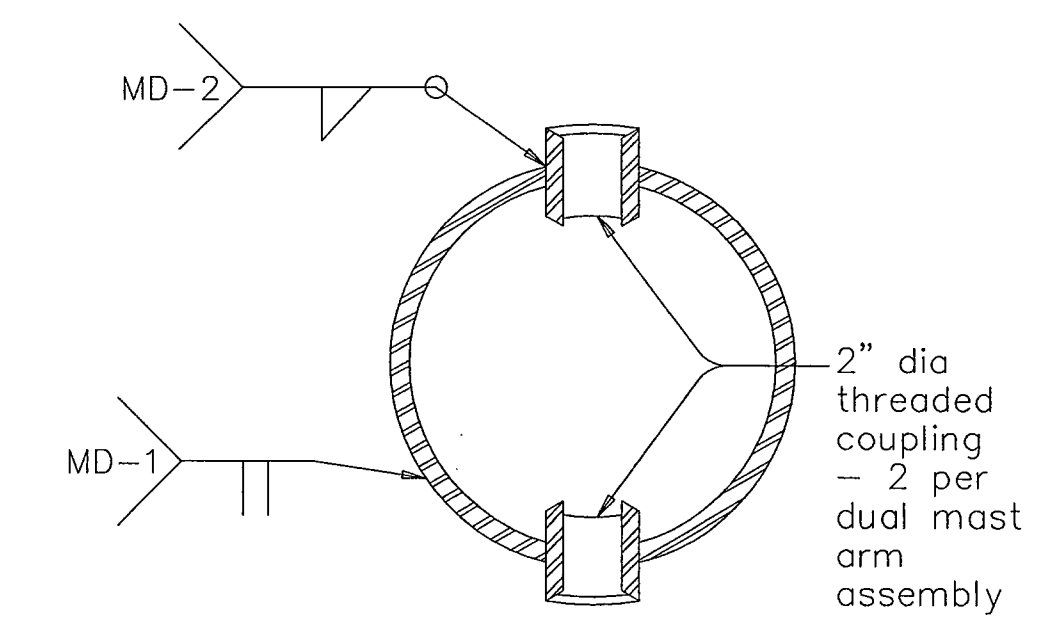


DETAIL C
(for 19' pole with no ILSN sign and no luminaire)



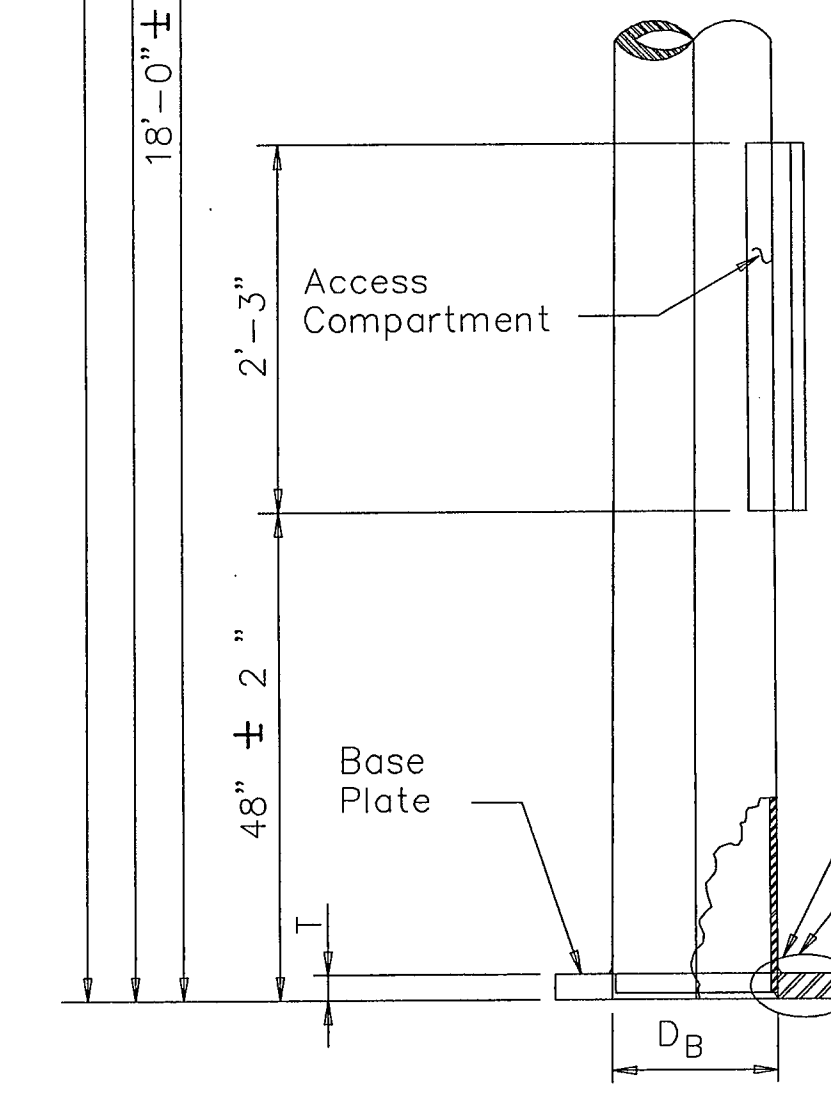
COPPER GROUND CONNECTOR

- The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
- The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #10-32 x 1 1/4 inch self tapping type 'F' stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or IlSCO SSS-5). The traffic signal contractor shall install the kit items in the field.
- The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Littelfuse #L60030M-2SQ fuse block. Arrangement of the items shall be as shown in the Access Compartment detail.

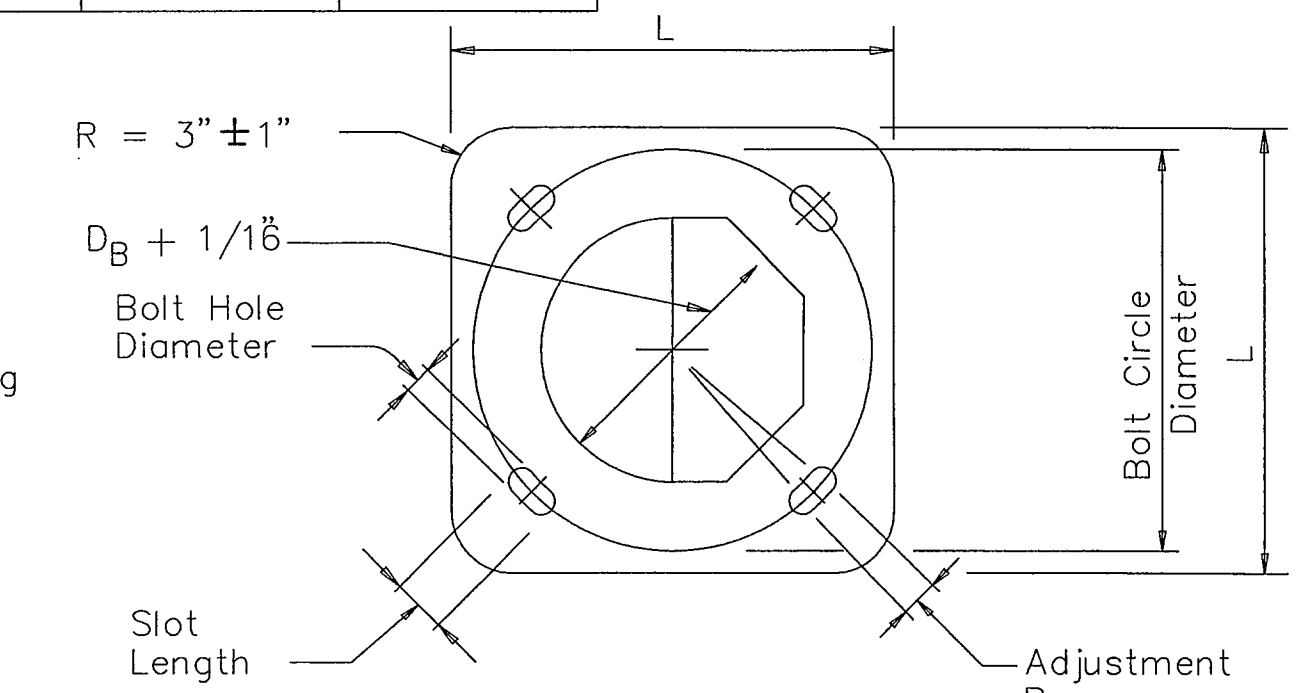


SECTION A-A

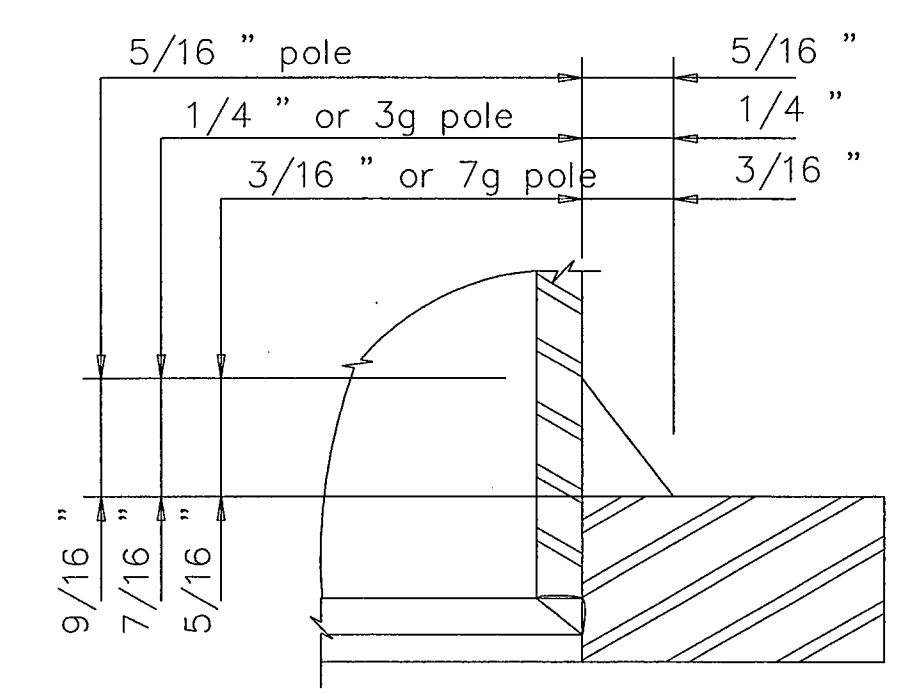
Anchor Bolt Diameter	Bolt Hole Diameter	Slot Length	Bolt Circle Diameter	Base PL Dim. L x T	Adjust. Range
1 1/2 "	1 3/4 "	3 1/2 "	17"	18" x 1 1/2 "	13.4'
1 3/4 "	2"	4"	19"	20" x 1 3/4 "	13.5'
2"	2 1/4 "	4 1/2 "	21"	22" x 2"	13.6'
2 1/4 "	2 1/2 "	5"	23"	24" x 2 1/4 "	13.7'



POLE ELEVATION



BASE PLATE PLAN



DETAIL D



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THIS DETAIL SHEET WAS OBTAINED FROM TXDOT

DATE: DECEMBER, 2001 SCALE: NOT TO SCALE JOB NO.: 00-249
 DRAWN: GBW DESIGN: WJH REVIEWED: DWG: 249DETAILS-ELEC

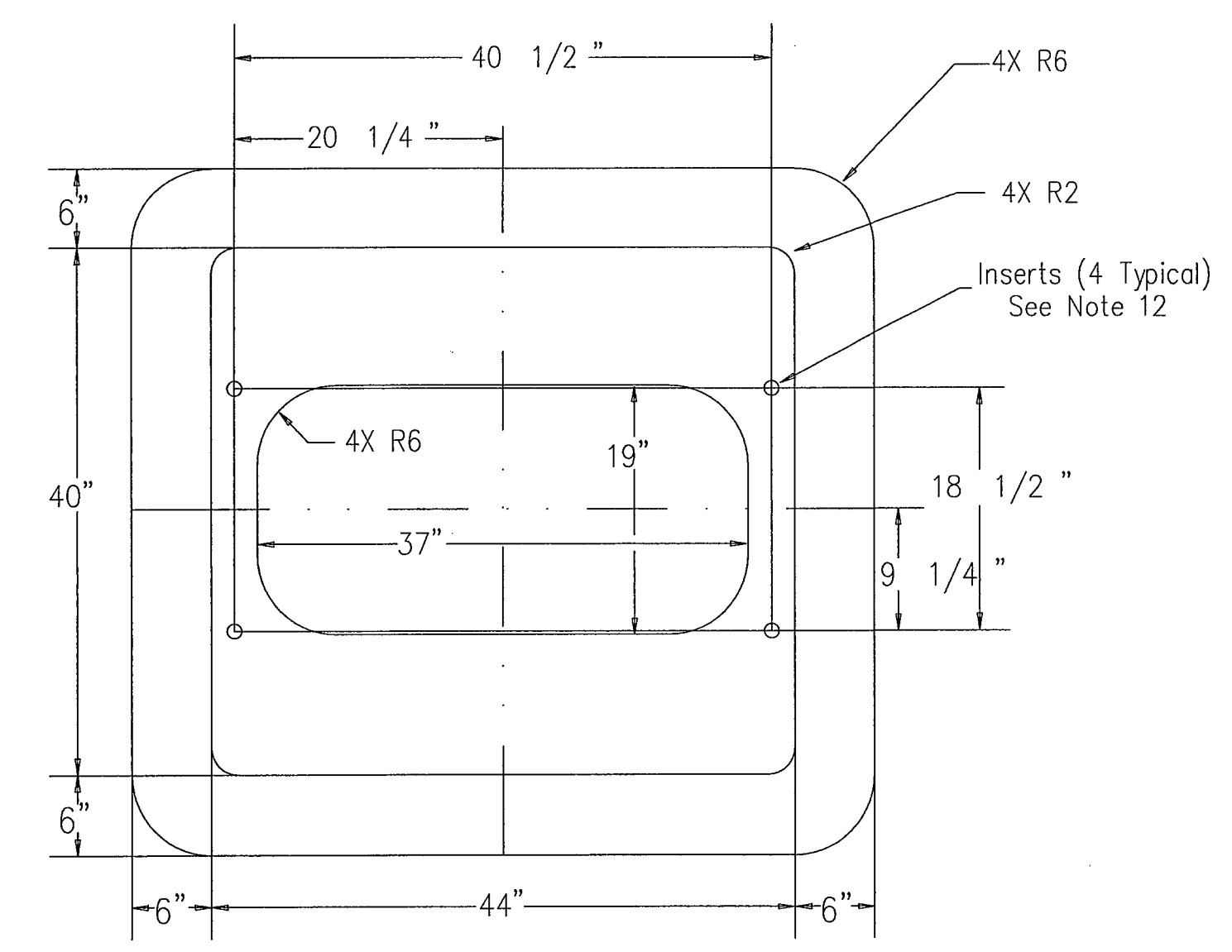
ARAPAHO ROAD PHASE II
TRAFFIC SIGNAL - SUPPORT STRUCTURES
MAST ARM POLE DETAILS

TOWN OF ADDISON

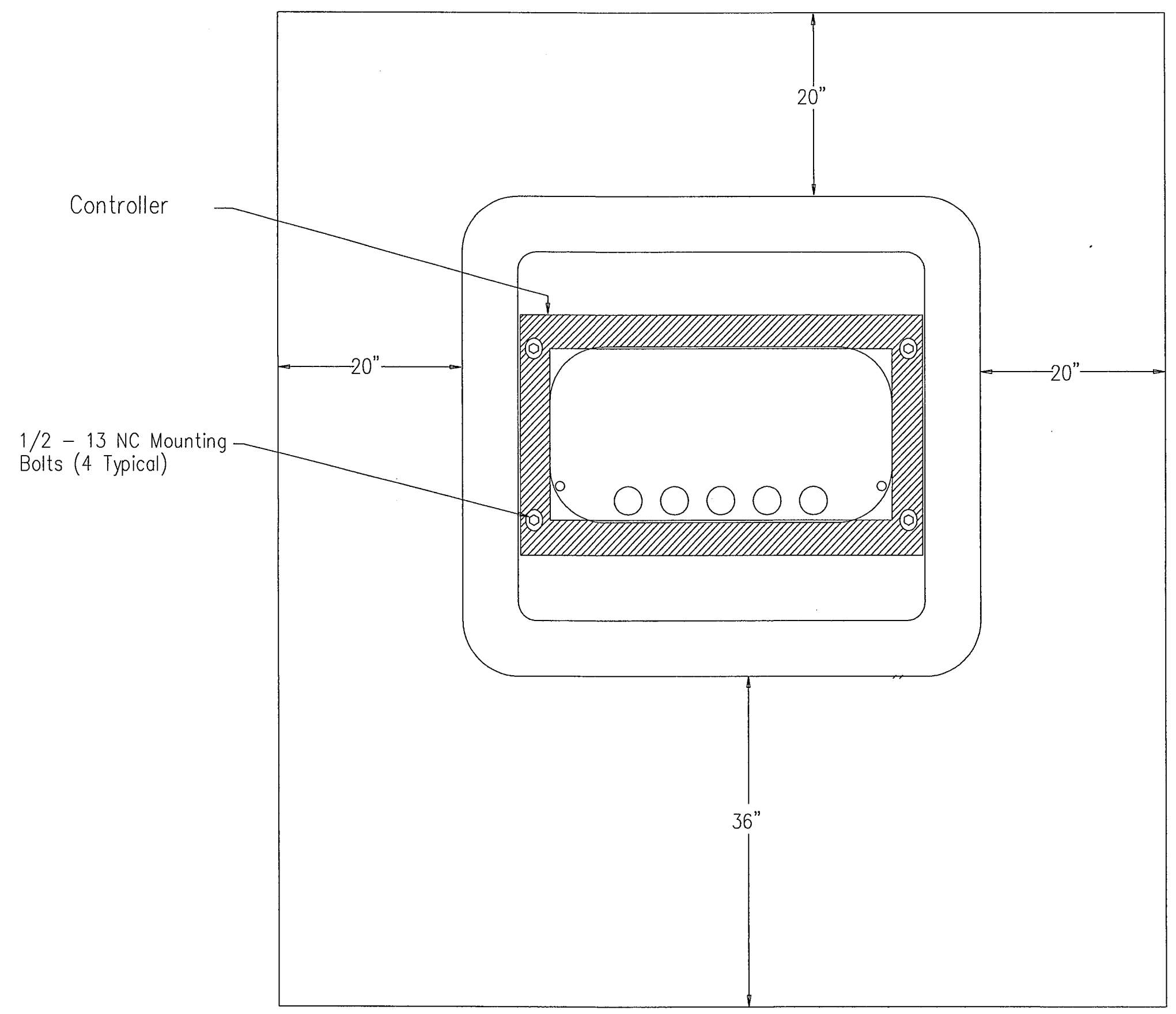
Grantham, Burge & Waldbauer
Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
 (972) 840-1916 (TEL)
 (972) 840-2156 (FAX)

SHT. TS-12 OF TS-21

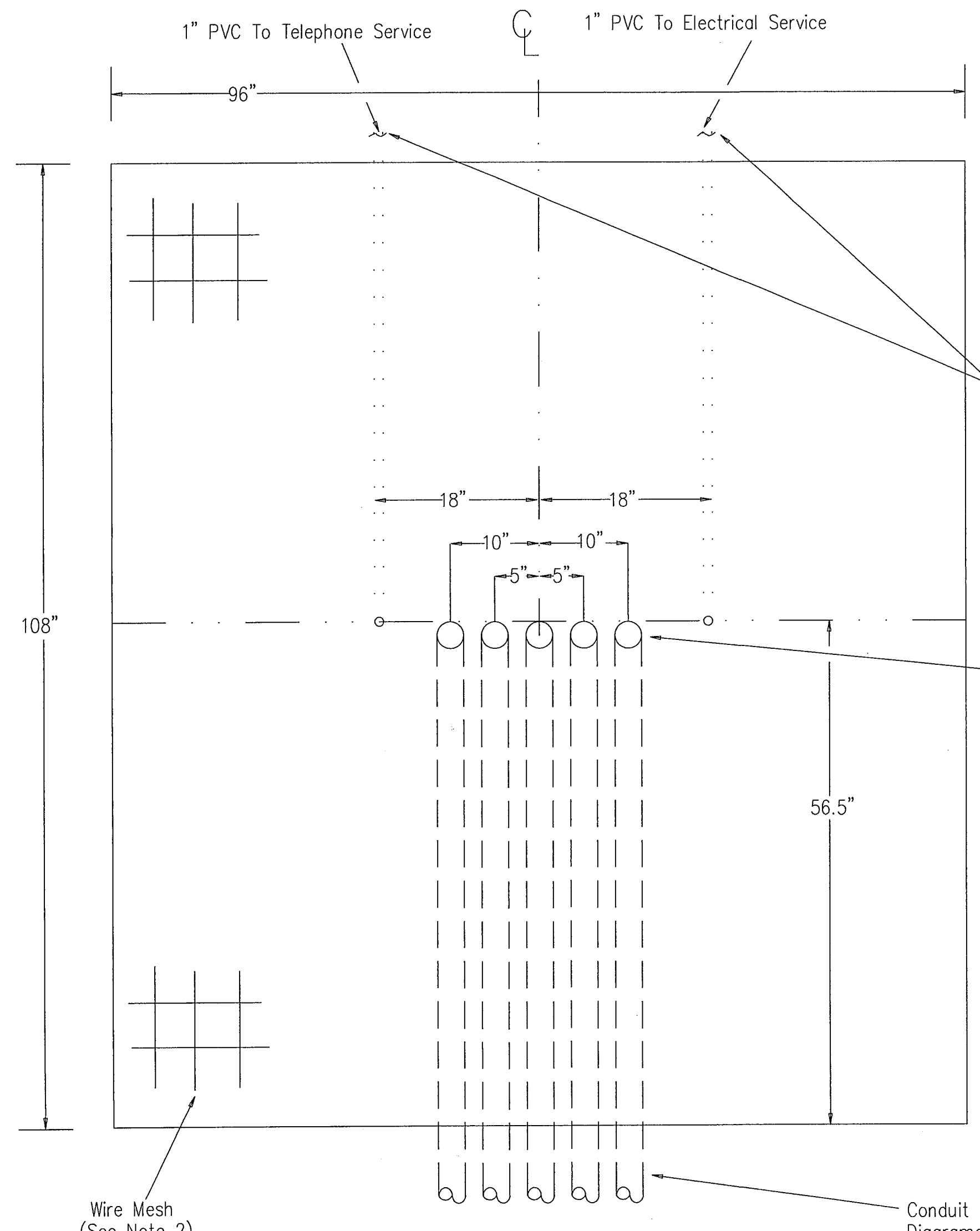
NO.	DATE	REVISION	APPROV.
1			
2			
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TOP VIEW
(Base Only)



TOP VIEW
(Slab & Base)



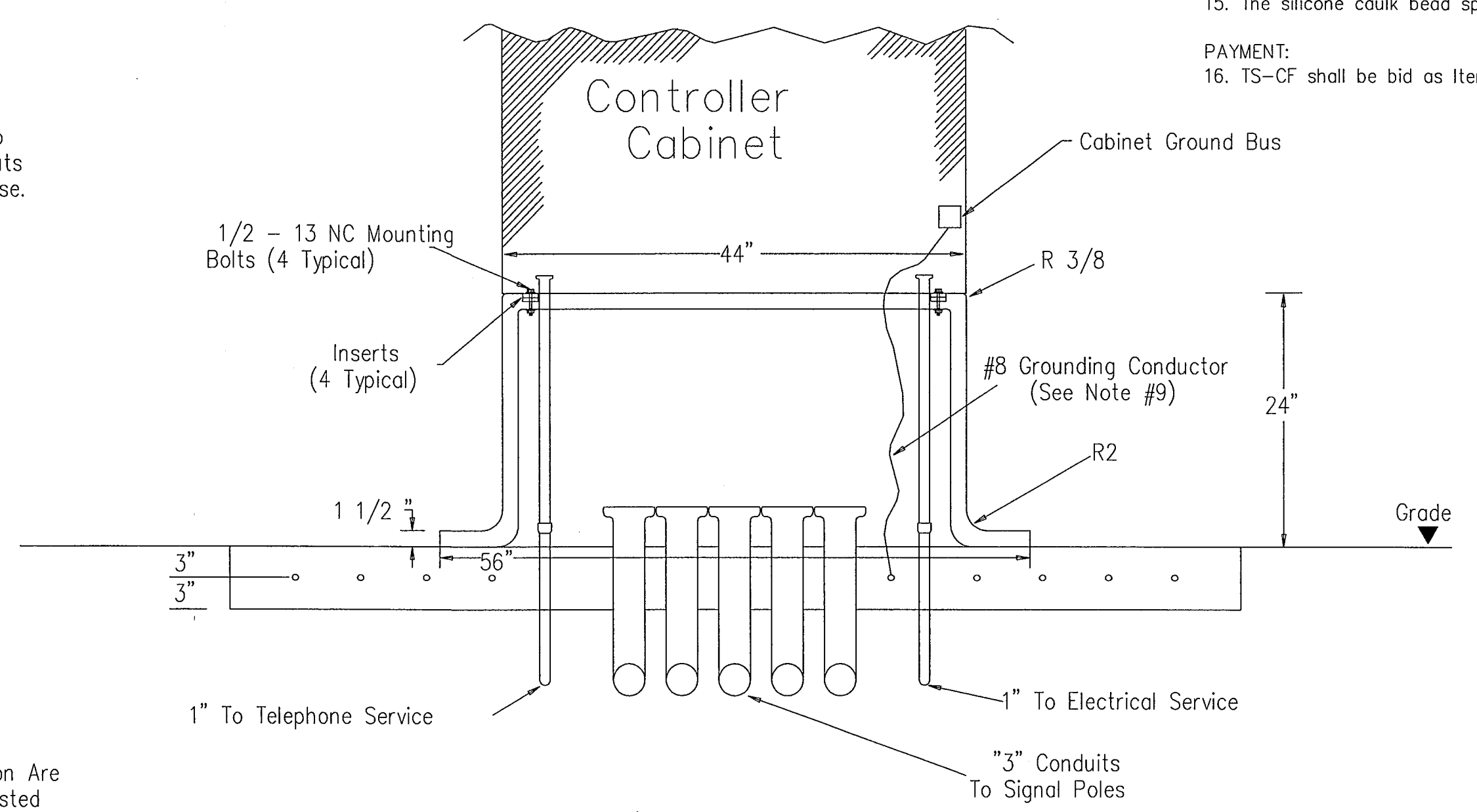
TOP VIEW
(Slab Only)

Conduit Direction Leaving Foundation Are Diagramatic Only And May Be Adjusted As Shown On Layouts.

Number of Conduits To Be As Shown on Layouts Plus Two For Future Use.

Conduit Direction Leaving Foundation Are Diagramatic Only And May Be Adjusted As Shown On Layouts.

Wire Mesh (See Note 2)



SIDE VIEW
(Slab & Base)

GENERAL NOTES

- CONCRETE:
- Concrete shall be class B minimum in accordance with Item 421. Slab shall be constructed in accordance with Item 531.
 - Reinforcement shall be welded wire mesh 6X6-W2.9 X W2.9. Joints and splices in the mesh shall have a minimum 6-inch overlap.
 - Mesh shall have a minimum 3 inch cover on the edges and shall be centered between top and bottom.
- CONDUITS:
- 3-inch conduits shall be stubbed up through the slab and run to the various traffic signal poles and ground boxes as shown on the layouts. Contractor shall install the number of conduits as shown on layouts plus two additional 3 inch conduits for future use. Conduits shall be terminated with a bushing between 2 and 4-inches above the slab.
 - Future use conduits shall be extended at least 18-inches from the edge of the slab, shall be terminated underground with a coupling, and shall be capped and sealed so that the seal can be removed without damaging the coupling.
 - Two separate 1-inch conduits shall be stubbed up through the slab from the electrical and telephone services. The conduit for the electrical feed shall be run directly to the electrical service enclosure.
 - The conduit for the telephone line shall be run directly to the telephone service, usually located on the same pole as the electrical service. Telephone shall not under any circumstance share a conduit with any other function. Telephone conduit not used at this time shall be capped and sealed, the same as the 3" future use conduits.
 - Electric and telephone conduits shall terminate above the slab with a coupling. After the base is installed, the conduits shall be extended above the top of the base and shall be secured to the base using a steel one-hole strap or similar suitable substitute.
 - A #8 AWG copper ground wire shall be bonded to the reinforcing mesh by a suitable clamp UL Listed for encasement in concrete and terminated to the cabinet grounding bus for the purpose of providing a local ground for the electrical grounding conductor. The electrical grounding conductor specified in Item 680-4(4) is still required and shall be terminated to the cabinet ground bus.
- BASE:
- The base shall be constructed of reinforced polymer concrete reinforced with continuous strands of borosilicate fiberglass cloth. Concrete shall be made from catalyzed polyester resin and aggregate, and shall have a minimum compressive strength of 11,000 psi. Polymer concrete containing chopped fiber or fiber reinforced plastic shall not be acceptable.
 - The base shall be permanently marked either by impress or by permanent ink with the manufacturer's model number and name or logo.
 - The base shall conform to the dimensions shown. Four (4) 1/2-13 NC stainless steel self cleaning inserts shall be provided to secure the controller to the base. Inserts shall withstand a minimum torque of 50 ft-lb and a minimum straight pull out strength of 750 lbs. The base, secured to the concrete slab per the manufacturer's instructions and with a controller cabinet attached, shall withstand a minimum wind load of 125 mph. Manufacturer shall supply certification sealed by a Texas Licensed Professional Engineer.
 - The base shall be sealed to the concrete with a silicone caulk bead and fastened to the slab per manufacturer's instructions.
- CONTROLLER CABINET:
- The controller cabinet shall be anchored to the base using four 1/2-13 NC bolts.
 - The silicone caulk bead specified in Item 680.5 shall be RTV 133.
- PAYMENT:
- TS-CF shall be bid as Item 656.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: WILLIAM J. HATCHELL ON 2/12/02. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: WJH	REVIEWED: DWG: 249DETAILS-ELEC

ARAPAHO ROAD PHASE II
TRAFFIC SIGNAL - CONTROLLER
SLAB AND BASE
TOWN OF ADDISON

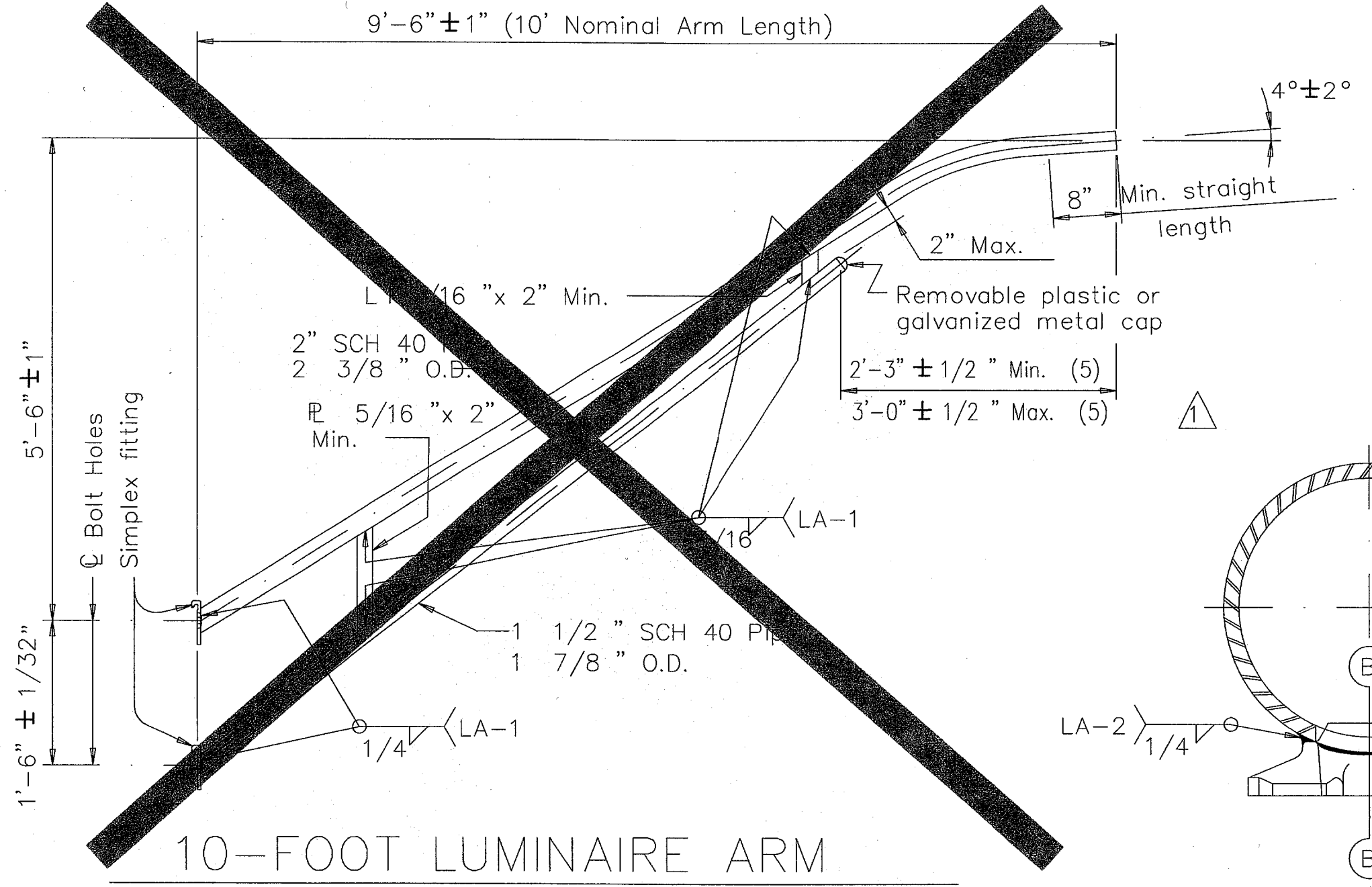
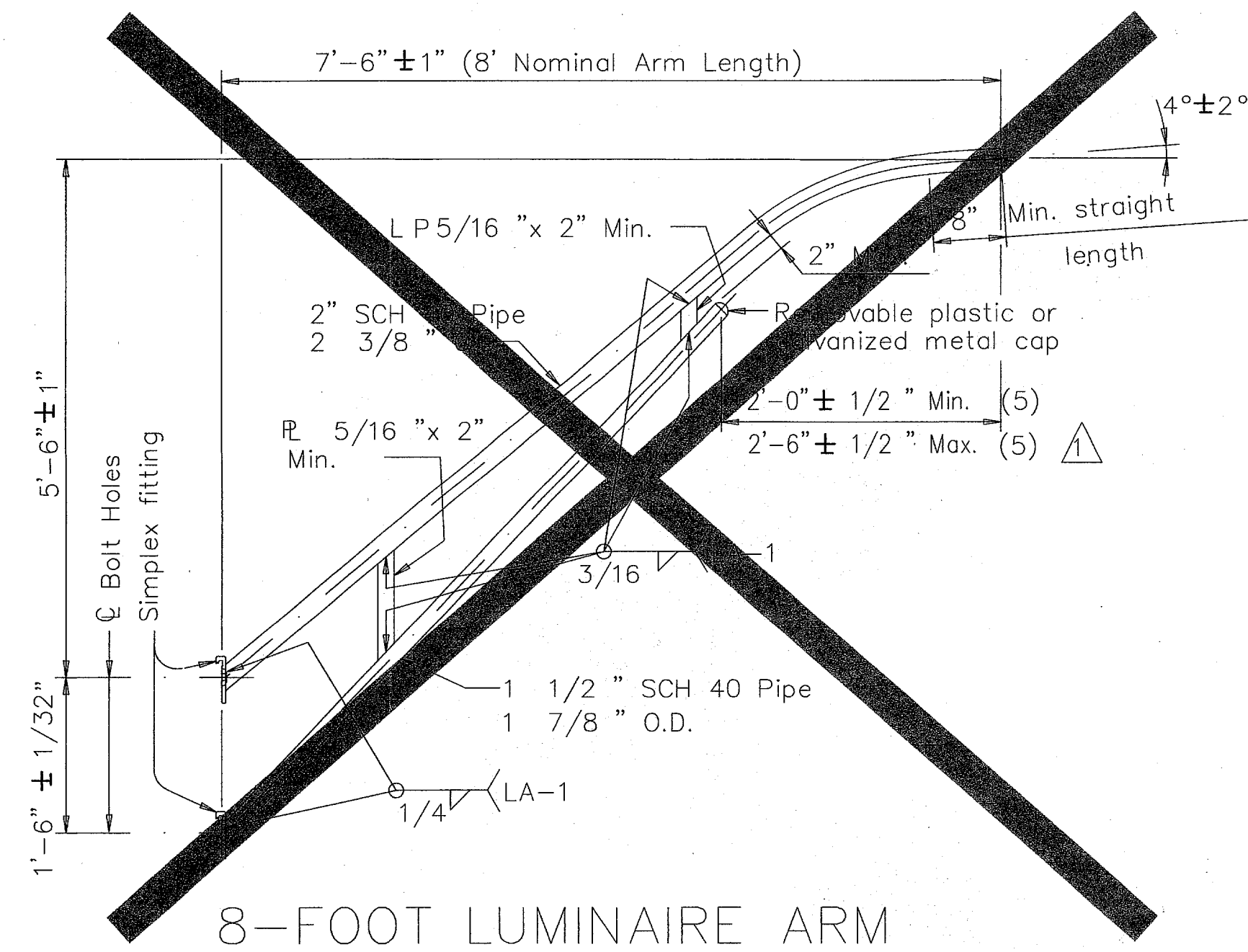
Grantham, Burge & Waldbauer
GBW Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

SHT. TS-13 OF TS-21

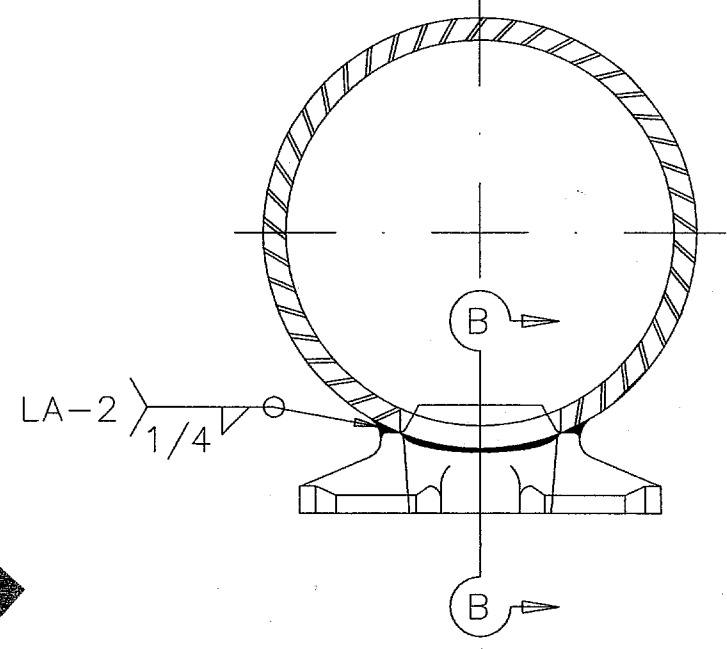
THIS DETAIL SHEET WAS OBTAINED FROM TXDOT

77B

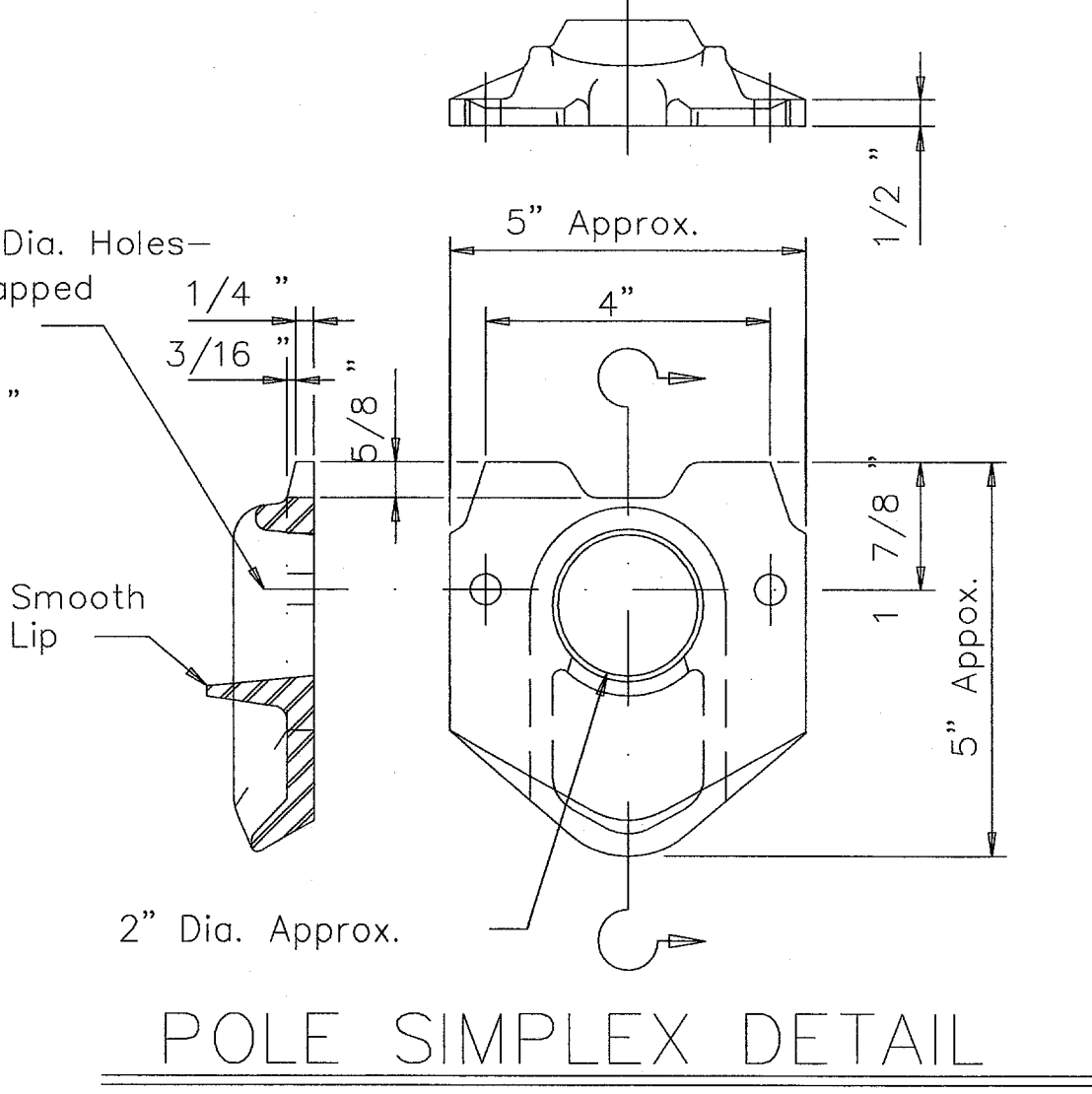
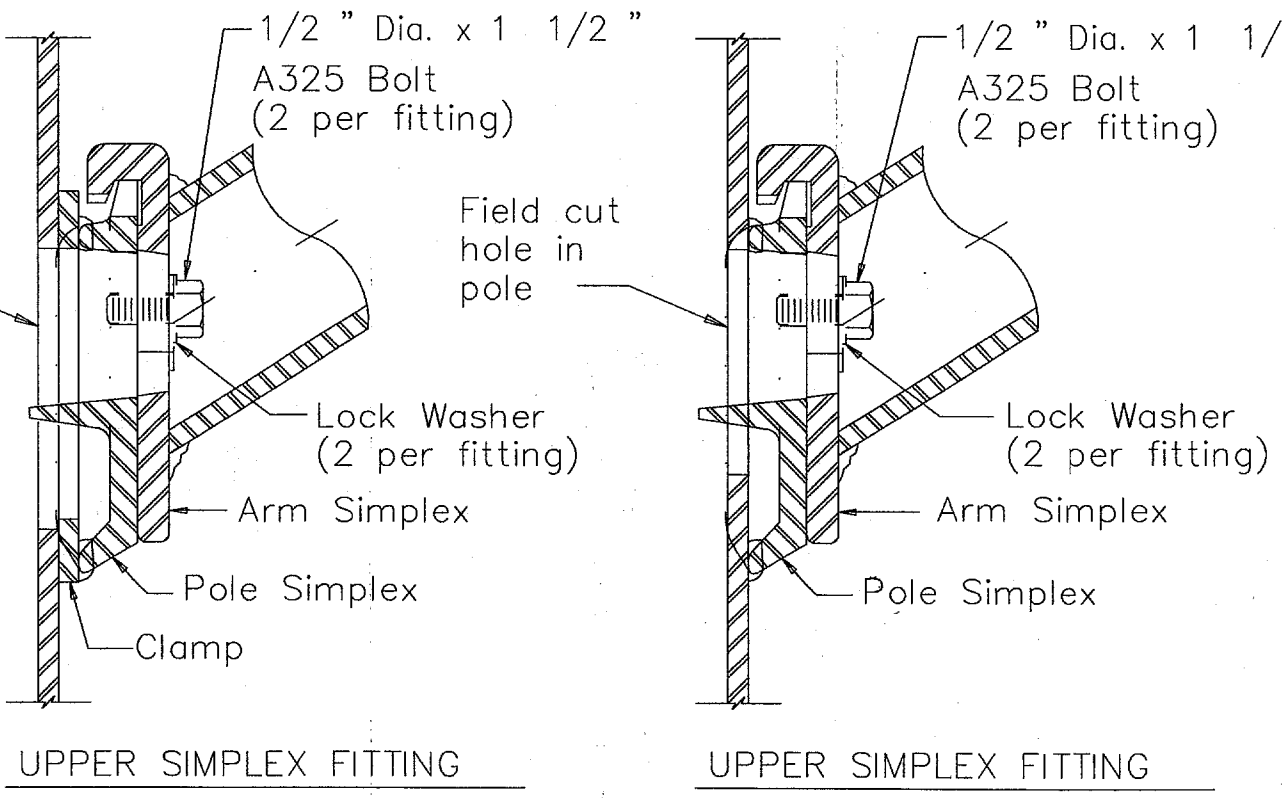
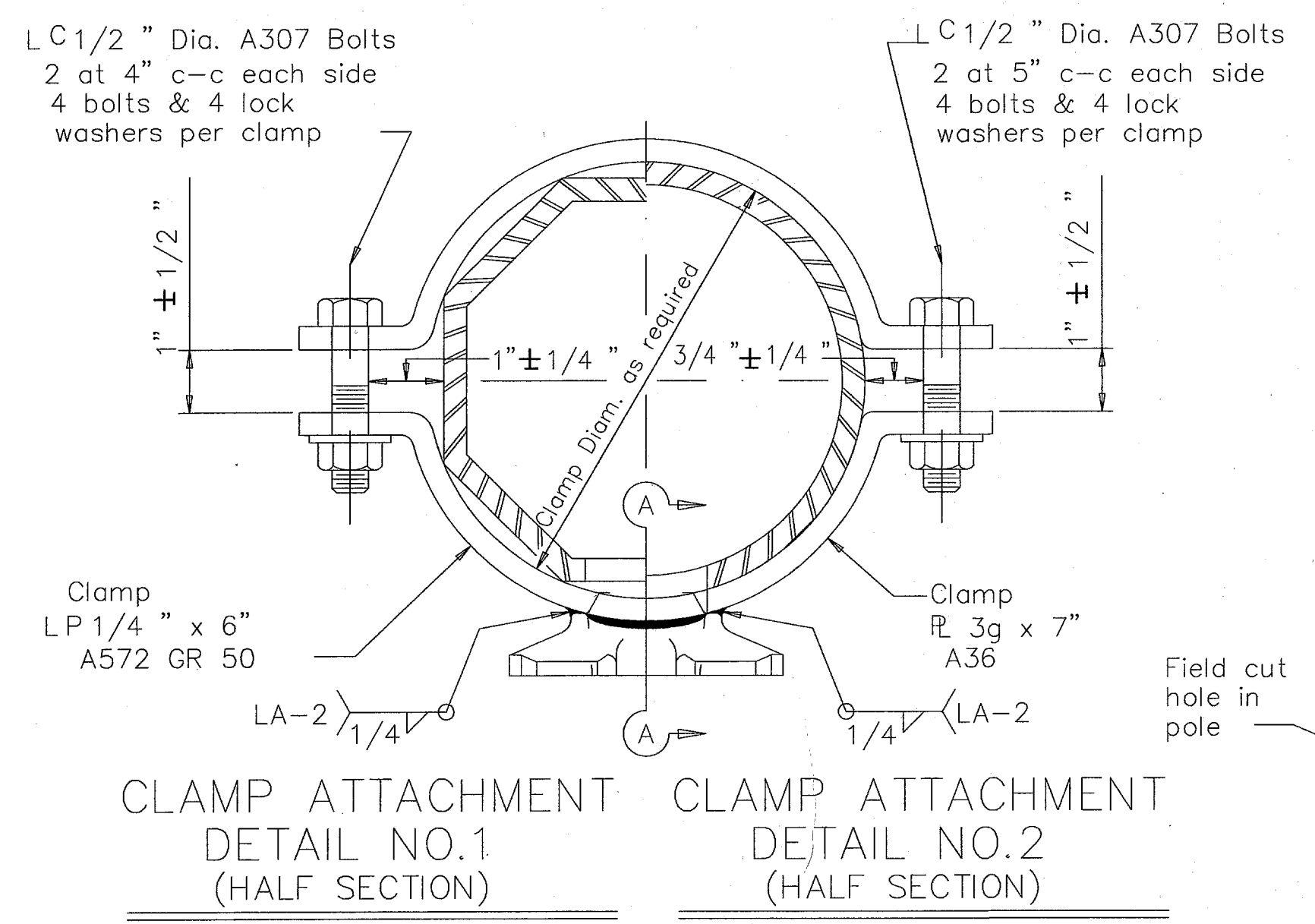
NO.	DATE	REVISION	APPROV.
1			
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MATERIALS	
Pole or Arm Simplex	ASTM A27 GR 65-35 or A148 GR 80-50 or A576 GR 1021 (4) or A36 (Arm only)
Arm Pipes	ASTM A53 GR A or B or A500 GR B or A501 or A595 (2) or A715 GR 50
Arm Plates (3)	ASTM A36 or A572 GR50 (1) or A595 GR A or A588
Misc.	ASTM designations as noted



- (1) ASTM A36M50 steel as described in Item 442 "Metal for Structures" may be used in lieu of A 572 GR 50.
- (2) If A595 GR A material is used, arm need not be cold worked to A595 requirements, but material must have 40 ksi minimum yield prior to fabrication.
- (3) Either of the materials listed for poles may be used where the drawings do not specify a particular ASTM designation.
- (4) A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.
- (5) Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.



GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. Design Wind Speed equals 90 mph plus a 1.3 gust factor. Arms are designed to support a 75 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.5 sq. ft.

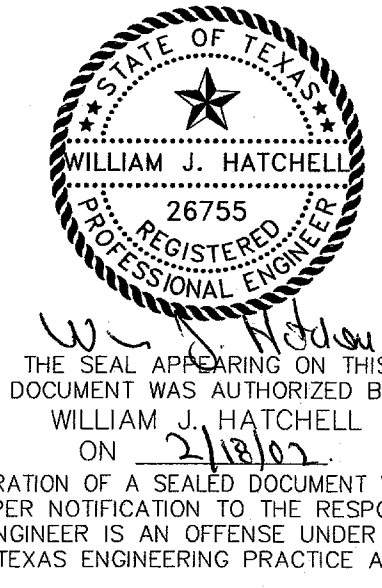
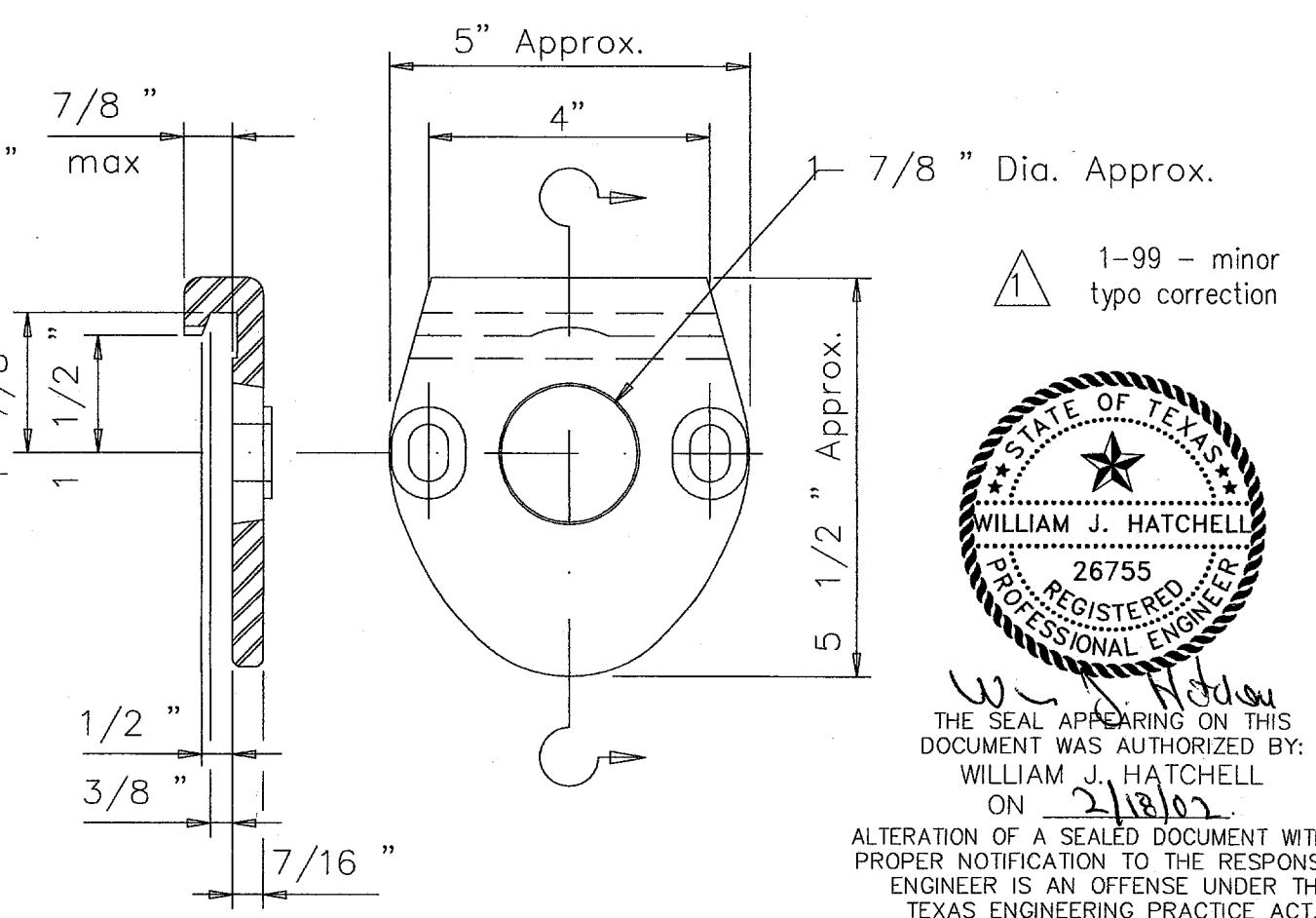
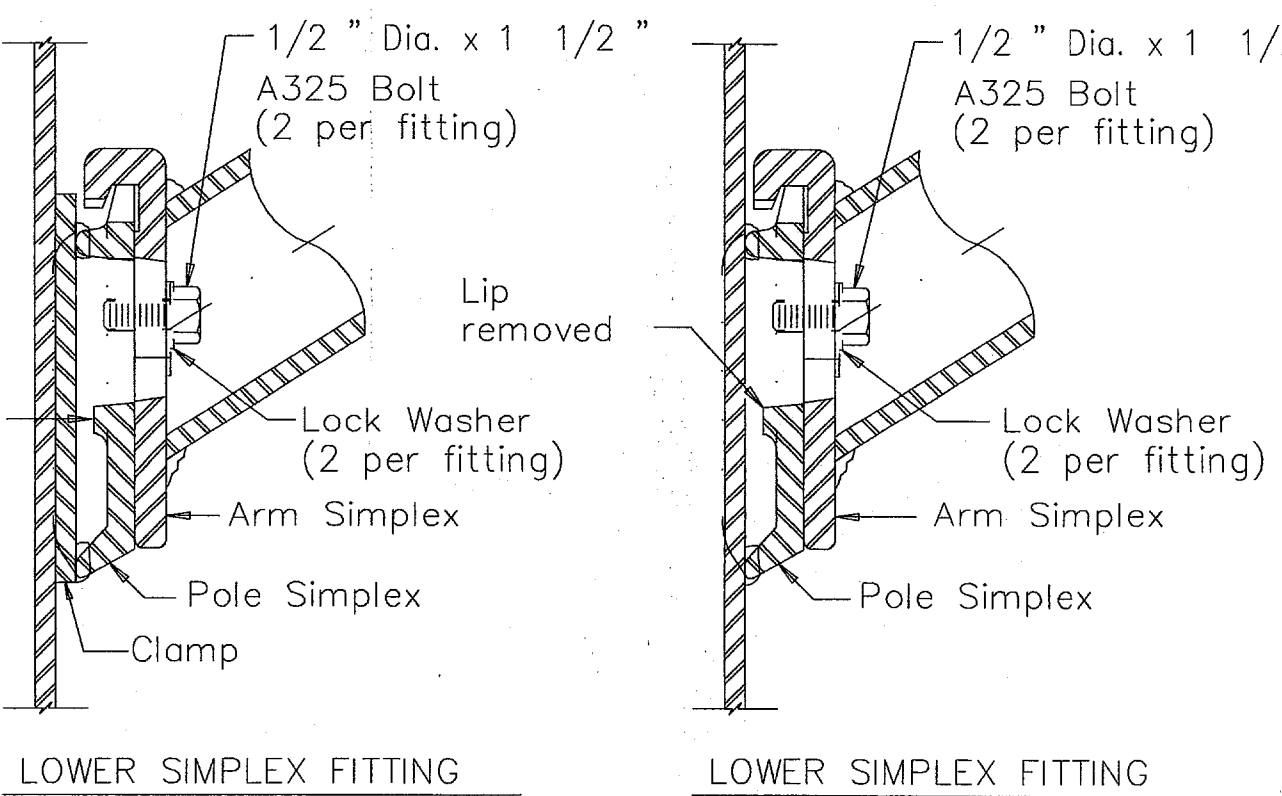
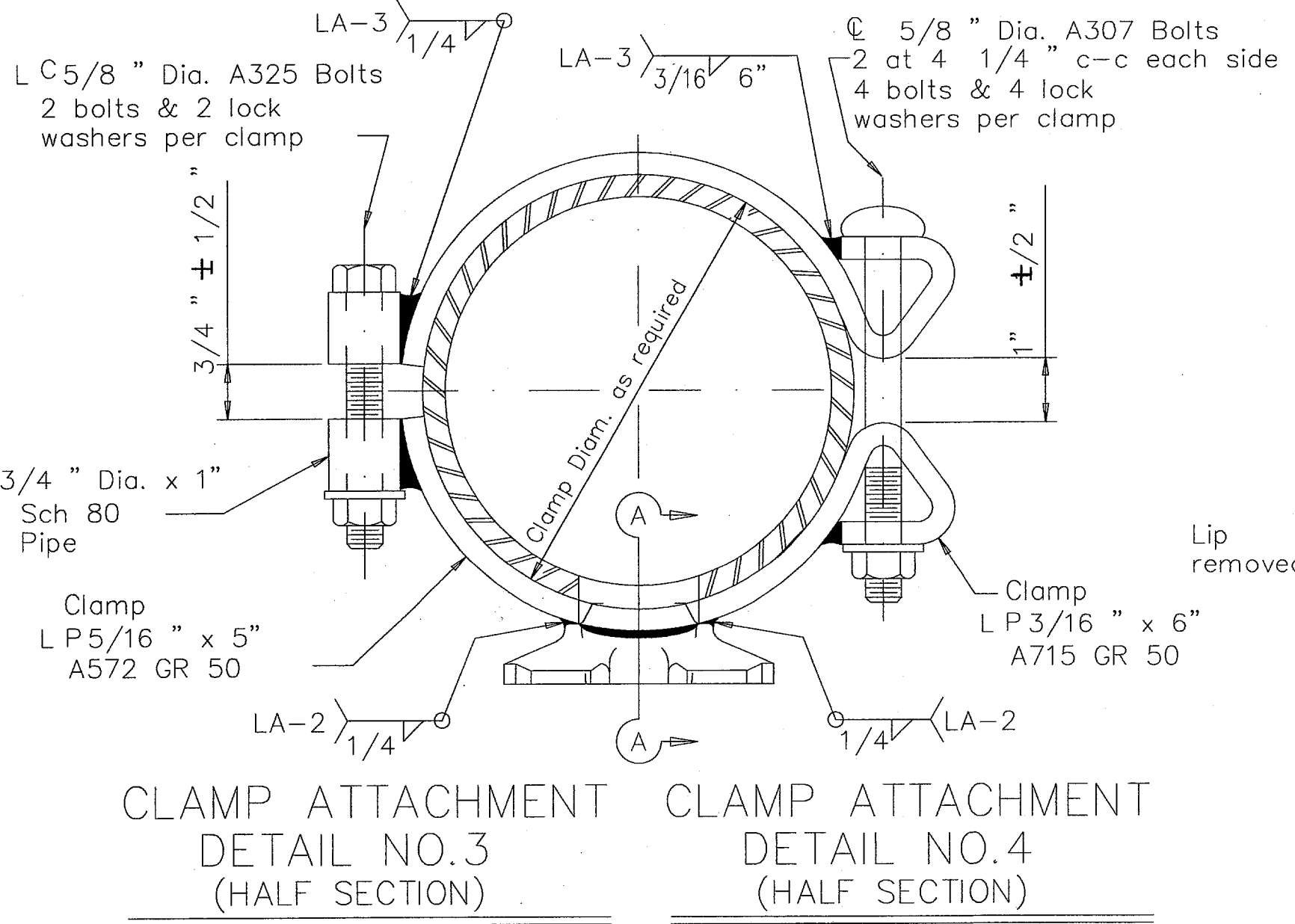
Materials and fabrication shall be in accordance with the Specifications and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absence of specified Fabricator tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.

Unless otherwise noted, all parts shall be galvanized after fabrication in accordance with the Specifications.

Special designs require submission of shop drawings in accordance with the item "Steel Structures".

Each pole simplex fitting shall be supplied with 2 A325 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans. When clamp attachment is specified, the Fabricator shall ship the clamp assembly securely attached to the pole at the location shown on the plans.

If clamp assemblies are ordered without poles, the Fabricator shall ship one upper and one lower clamp assembly together in a single package, including all nuts and washers required for the clamps and simplex fittings.



ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: WJH	REVIEWED: DWG: 249DETAILS-ELEC

ARAPAHO ROAD PHASE II
STANDARD CONSTRUCTION DETAILS
SUPPORT STRUCTURES - ARM DETAILS
TOWN OF ADDISON

Grantham, Burge & Waldbauer
Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27
 GARLAND, TEXAS 75042
 (972) 840-1916 (TEL)
 (972) 840-2156 (FAX)

SHT. TS-14
 OF
 TS-21

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ARM SIZE		A	B	C	D	E	CONN BOLT DIA
D ₁	±	in.	in.	in.	in.	in.	in.
6.5	.179	12	9	9	6	1	1
7.5	.179	13	9	10	6	1	1
8.0	.179	14	10	11	7	1 1/4	1 1/4
9.0	.179	16	11	13	8	1 1/4	1 1/4
9.5	.179	17	12	14	9	1 1/4	1 1/4
9.5	.239	18	12	15	9	1 1/4	1 1/4
10.0	.239	18	12	15	9	1 1/4	1 1/4
10.5	.239	18	13	15	10	1 1/2	1 1/2
11.0	.239	18	13	15	10	1 1/2	1 1/2

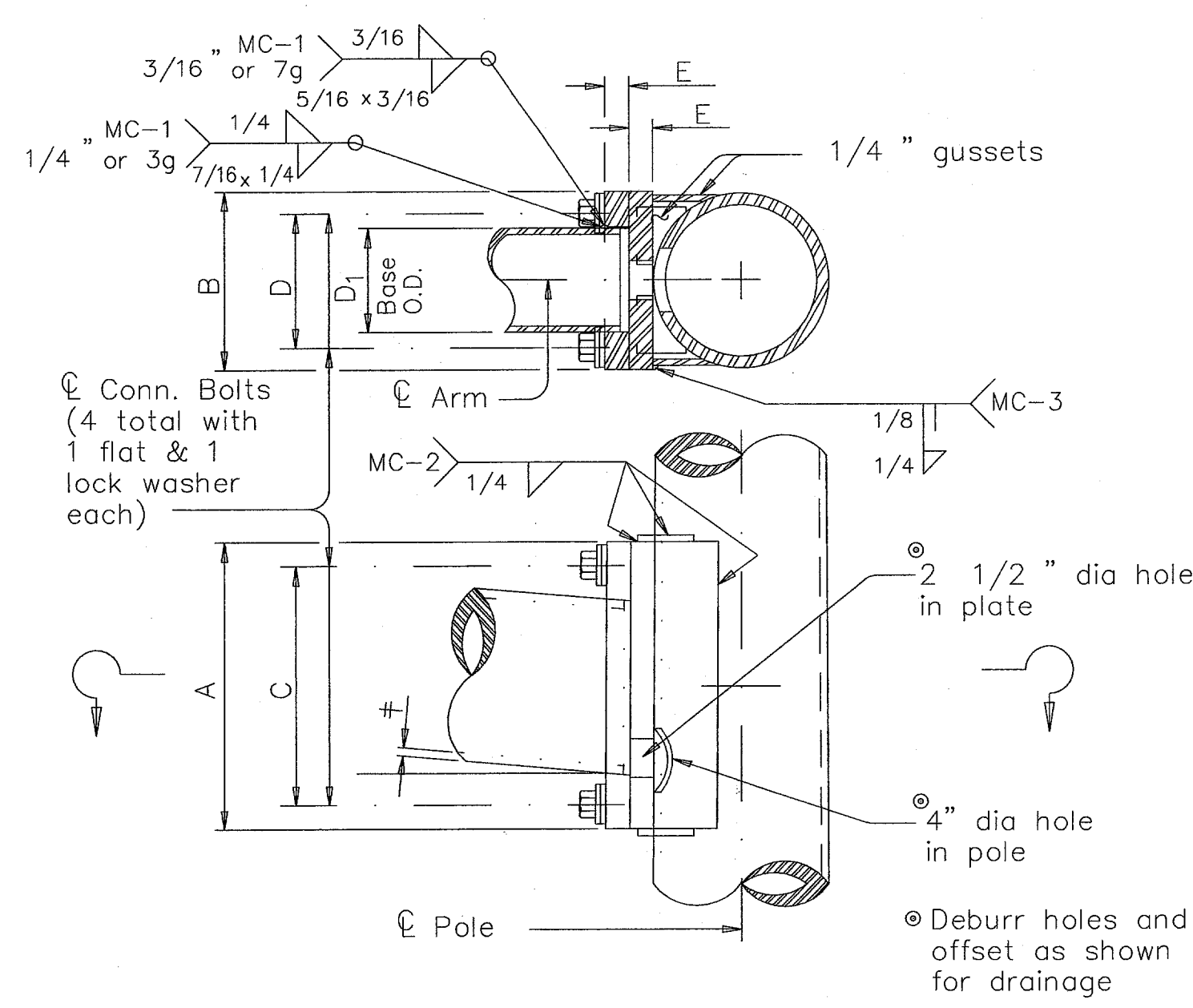
ARM SIZE		A	B	C	D	E	CONN BOLT DIA
D ₁	±	in.	in.	in.	in.	in.	in.
7.0	.179	11	11	8	8	1 1/4	1 1/4
7.5	.179	11	11	8	8	1 1/4	1 1/4
8.0	.179	11	11	8	8	1 1/4	1 1/4
9.0	.179	13	13	10	10	1 1/4	1 1/4
10.0	.179	13	13	10	10	1 1/4	1 1/4
9.5	.239	13	13	10	10	1 1/4	1 1/4
10.0	.239	14	14	11	11	1 1/2	1 1/2
11.0	.239	14	14	11	11	1 1/2	1 1/2
11.5	.239	14	14	11	11	1 1/2	1 1/2

NO.	DATE	REVISION	APPROV.
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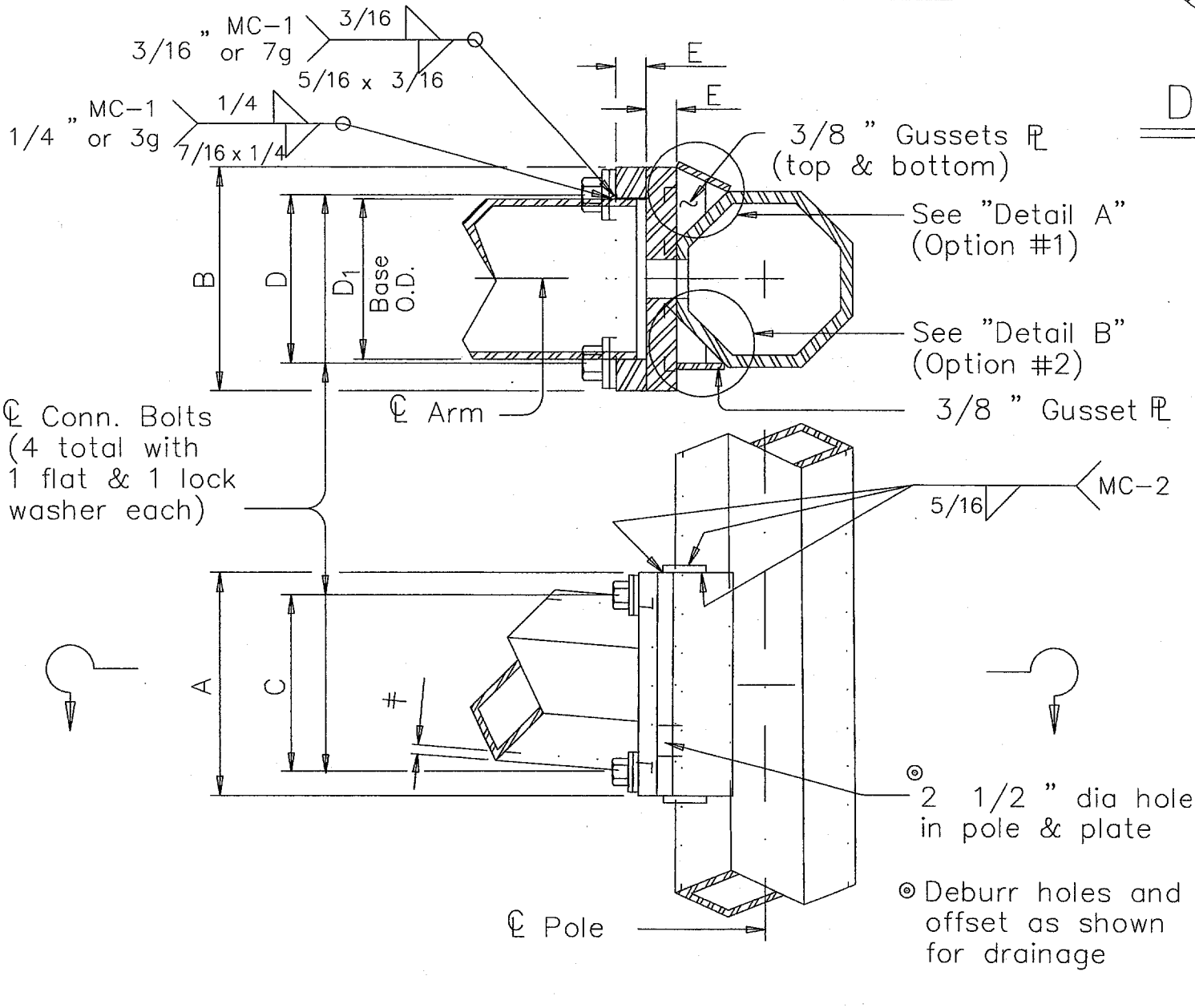
MATERIALS	
Round Shafts or Polygonal Shafts	ASTM A595 GR A, ASTM A570 GR 50, ASTM A607 GR 50, ASTM A572 GR 50 or A36M50
Plates (1)	ASTM A36 OR A572 GR 50 or A595 (2) or A36M50
Connection Bolts	ASTM A325 except where noted
Pin Bolts	ASTM A325
Pipe	ASTM A53 GR A or B, or A501
Misc. Hardware	Galvanized steel or stainless steel or as noted

(1) Any of the materials listed for plates may be used where the drawings do not specify a particular Grade designation.

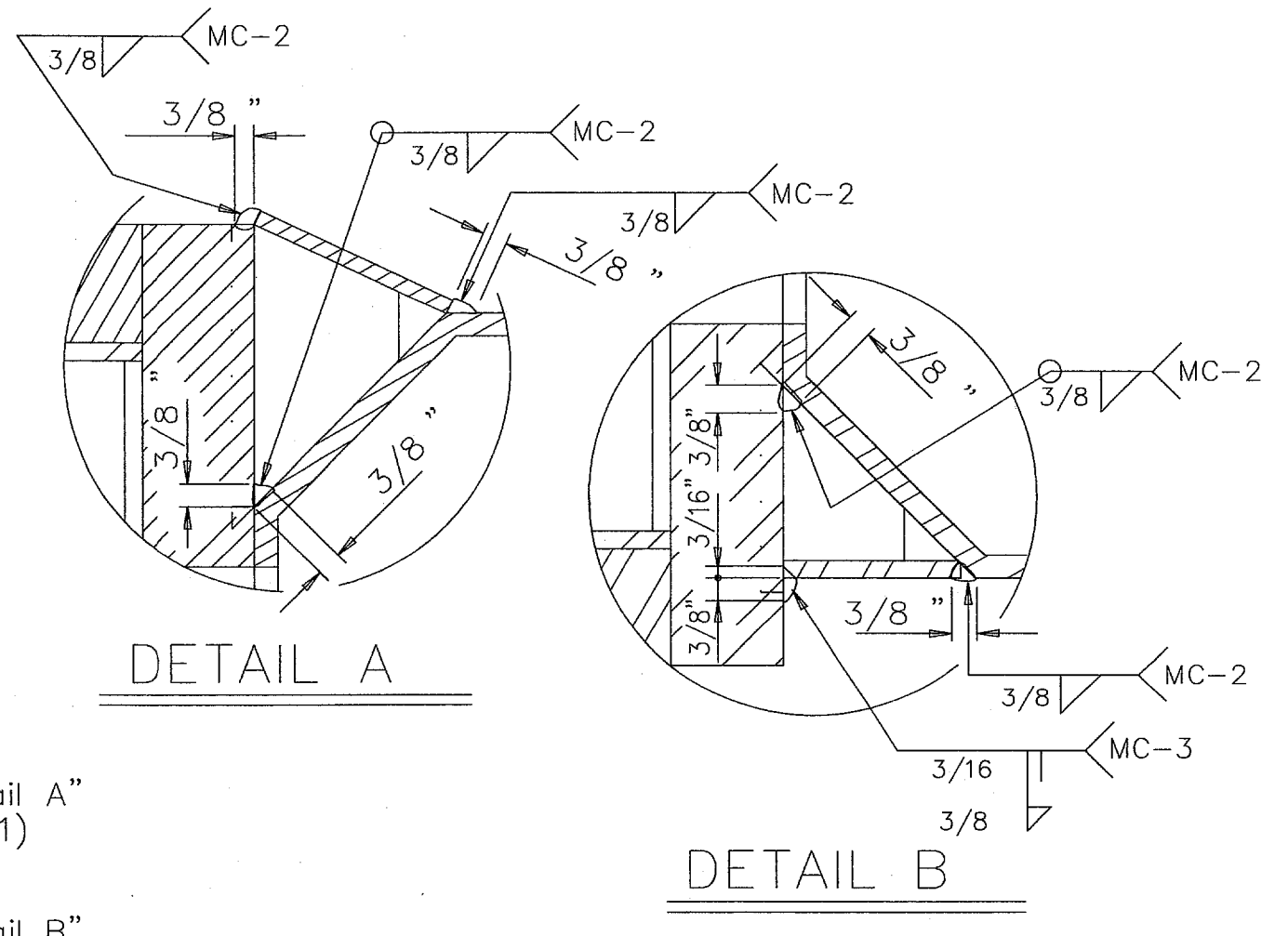
(2) If A595 material is used, it need not be cold worked to A595 requirements, but material must have 40 ksi minimum yield prior to fabrication.



FIXED MOUNT DETAIL 1

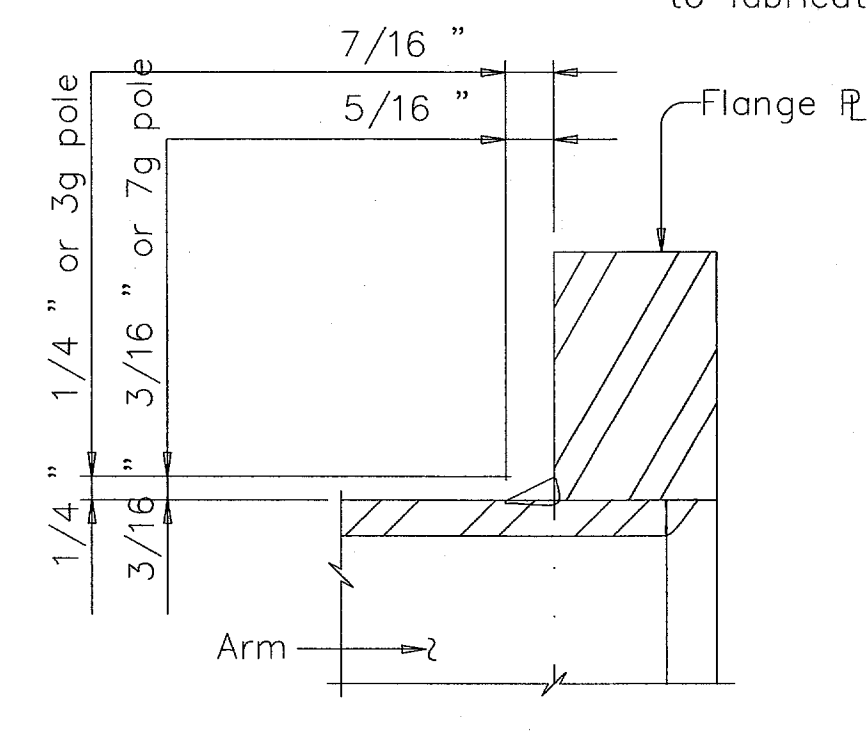


FIXED MOUNT DETAIL 2

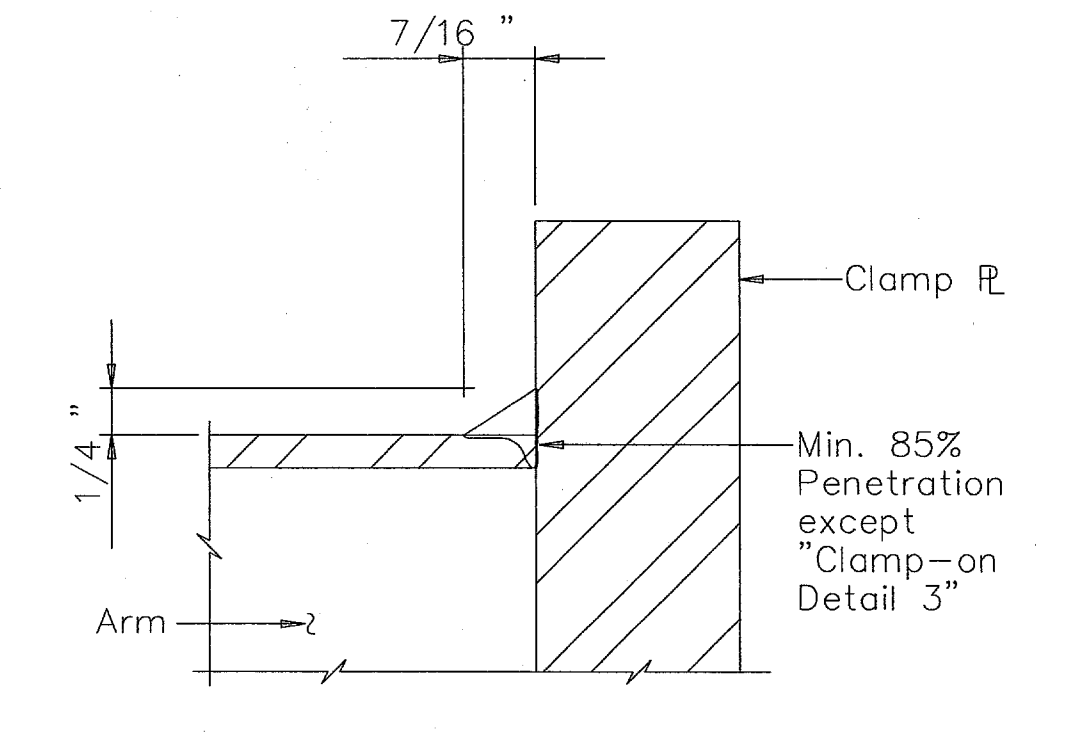


DETAIL A

DETAIL B



FIXED MOUNT ARM



CLAMP-ON ARM

ARM BASE WELD DETAILS

ARM SIZE		A	F	CONN. BOLTS	PIN BOLTS
D ₁	±	in.	in.	No. Dia	No. Dia
6.5	.179	12	8	4 *7/8	2 5/8
7.5	.179	14	8	4 1	2 5/8
8.0	.179	14	8	4 1	2 5/8
9.0	.179	16	10	4 1	2 5/8
9.5	.179	18	12	4 1 1/4	3 5/8
9.5	.239	18	12	4 1 1/4	3 5/8
10.0	.239	18	12	4 1 1/4	3 5/8

ARM SIZE		A	F	T	CONN. BOLTS	PIN BOLTS
D ₁	±	in.	in.	in.	No. Dia	No. Dia
7.0	.179	12	8	3/4	4 3/4	2 5/8
7.5	.179	14	8	3/4	4 3/4	2 5/8
8.0	.179	14	8	3/4	4 3/4	2 5/8
9.0	.179	16	10	7/8	4 1	2 5/8
10.0	.179	18	10	7/8	4 1	2 5/8
9.5	.239	18	10	1	6 1	3 5/8
10.0	.239	18	10	1	6 1	3 5/8

ARM SIZE		A	F	CONN. BOLTS	PIN BOLTS
D ₁	±	in.	in.	No. Dia	No. Dia
6.5	.179	12	8	4 1	2 5/8
7.5	.179	14	8	4 1	2 5/8
8.0	.179	14	8	4 1	2 5/8
9.0	.179	16	10	4 1	2 5/8
9.5	.179	18	12	6 1	3 5/8
9.5	.239	18	12	6 1	3 5/8
10.0	.239	18	12	6 1	3 5/8

GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies. A Maximum 1 1/2" wide vertical slotted hole may be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1"

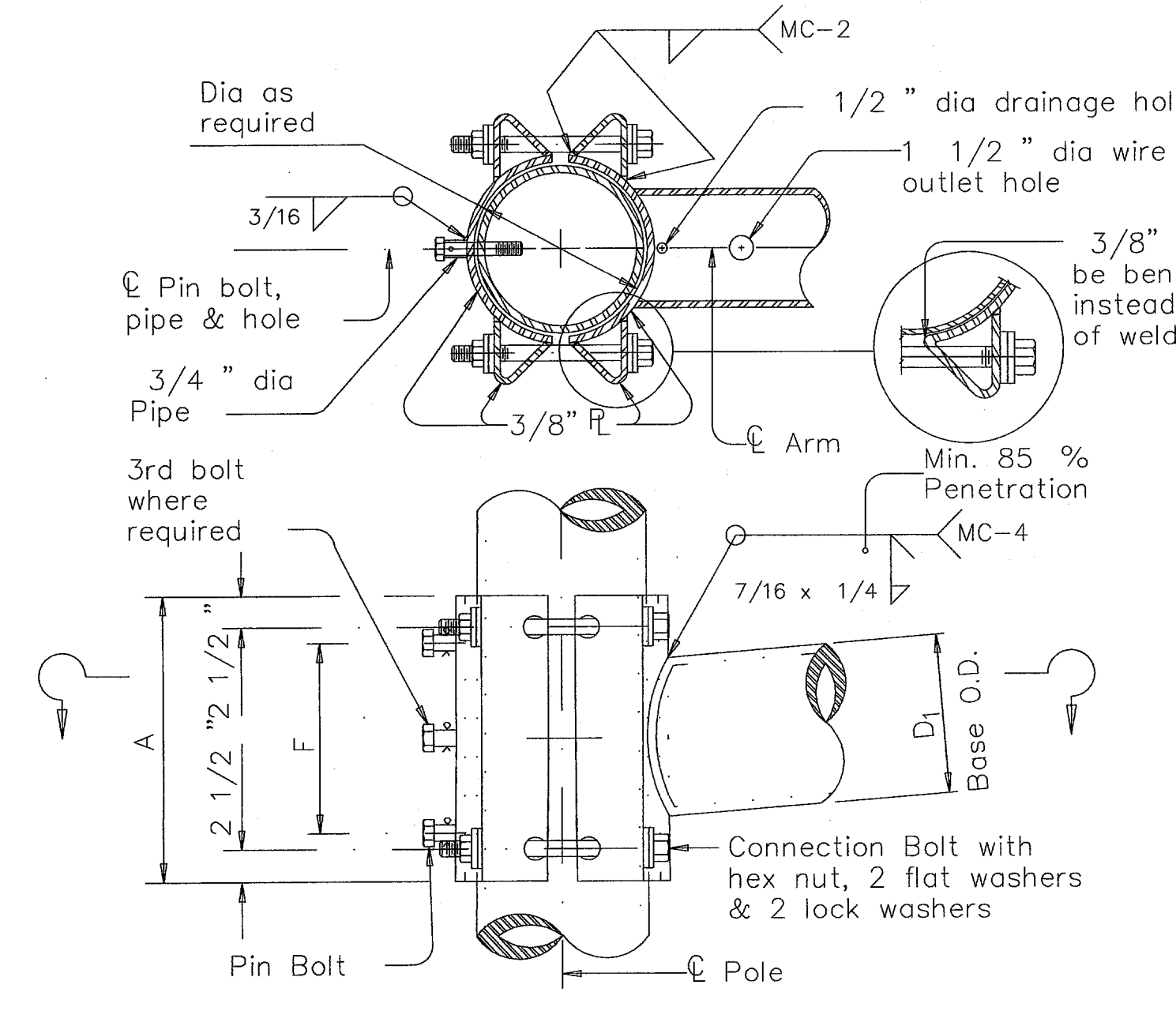
Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast arm assemblies.

Where duplicate parts occur on a detail, welds shown for one part shall apply to all similar parts on the detail.

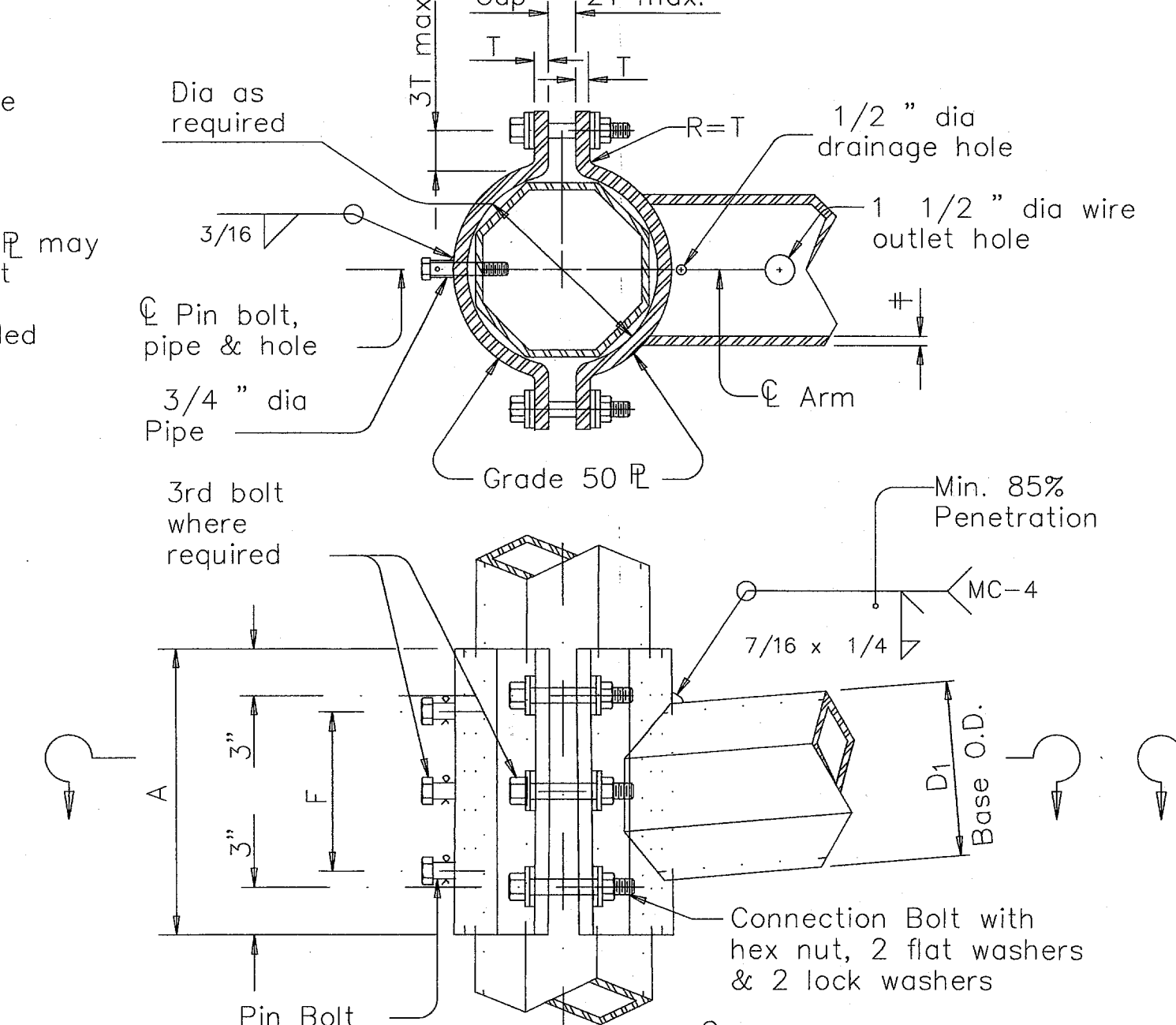
Pin bolts are required to prevent rotation of clamp-on arms under design wind forces.

NOTE:

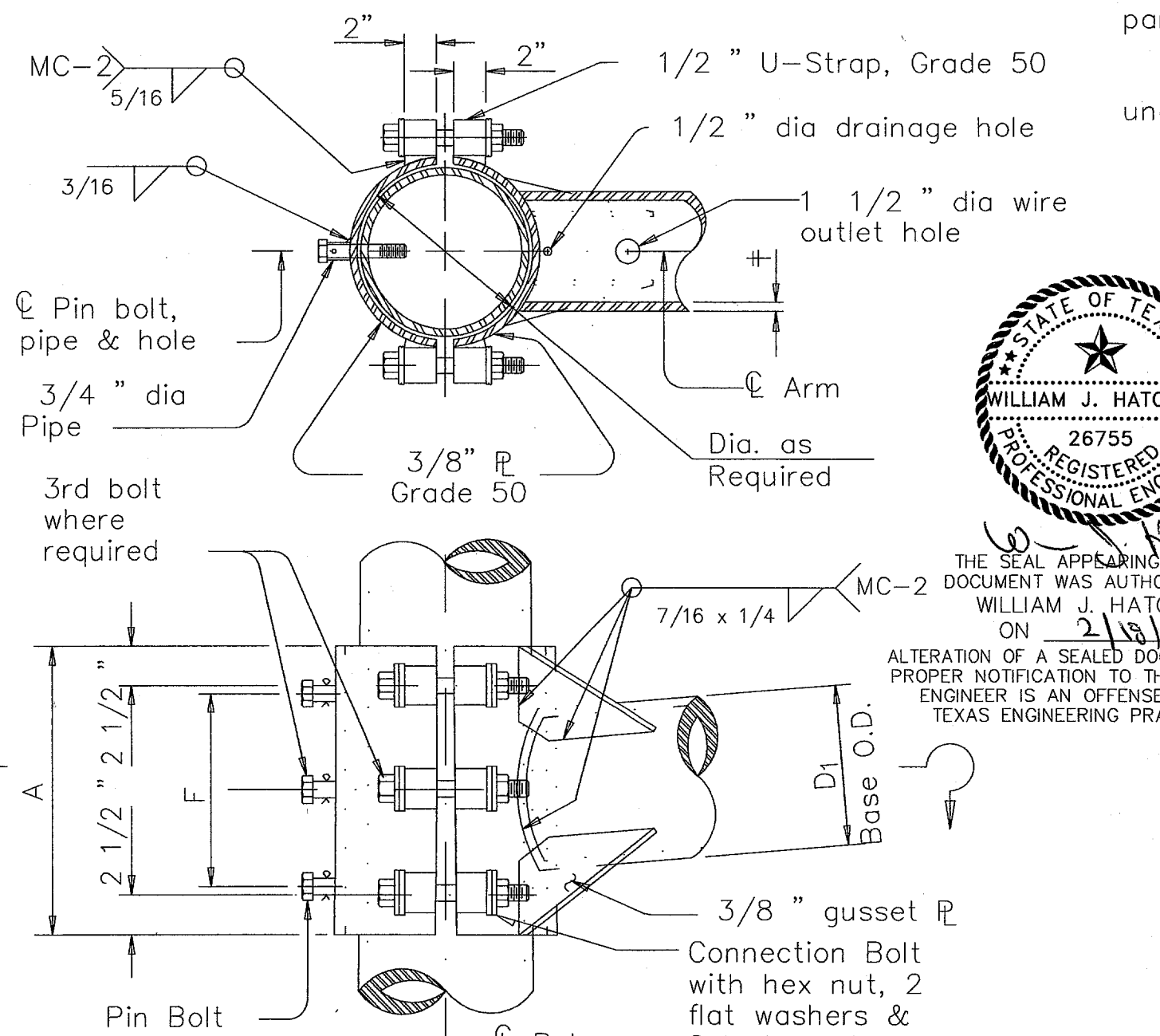
Pin bolts shall be A325 with threads excluded from the shear plane. Pin bolt and 3/4" dia pipe shall have 3/16" dia holes for a 1/8" dia galvanized cotter pin. Back clamp plate shall be furnished with a 3/4" dia hole for each pin bolt. An 11/16" dia hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.



CLAMP-ON DETAIL 1



CLAMP-ON DETAIL 2



CLAMP-ON DETAIL 3



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DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: WJH	REVIEWED: DWG: 249DETAILS-TRAF

ARAPAHO ROAD PHASE II
TRAFFIC SIGNAL SUPPORT STRUCTURES
STANDARD DETAIL
TOWN OF ADDISON

Grantham, Burge & Waldbauer
Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
(972) 840-1916 (TEL)
(972) 840-2156 (FAX)

SHT. TS-16
OF TS-21

THIS DETAIL SHEET WAS OBTAINED FROM TXDOT

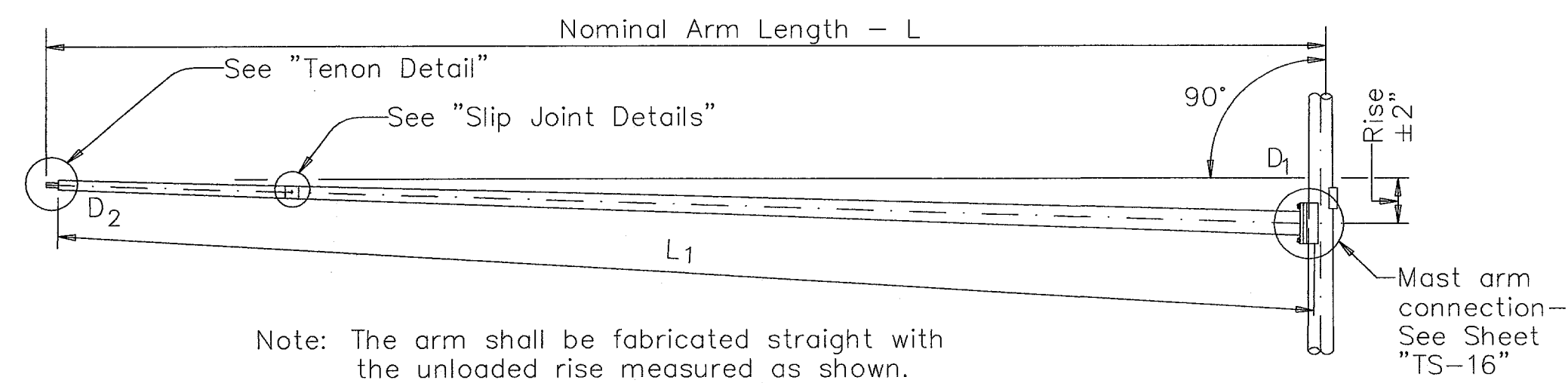
NO.	DATE	REVISION	APPROV.
1			
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Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D _B	D ₁₉	D ₂₄	D ₃₀	① thk	D _B	D ₁₉	D ₂₄	D ₃₀	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	10.5	7.8	7.1	6.3	.179	11.5	8.5	7.7	6.8	.179	30-A
24	11.0	8.3	7.6	6.8	.179	12.0	9.0	8.2	7.3	.179	30-A
28	11.5	8.8	8.1	7.3	.179	12.5	9.5	8.7	7.8	.179	30-A
32	12.5	9.8	9.1	8.3	.179	12.0	9.0	8.2	7.3	.239	30-A
36	12.0	9.3	8.6	7.8	.239	12.5	9.5	8.7	7.8	.239	36-A
40	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
44	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
48	13.0	10.3	9.6	8.8	.239	15.0	12.0	11.2	10.3	.239	36-A

Arm Length	ROUND ARMS					POLYGONAL ARMS				
	L ₁	D ₁	D ₂	① thk	Rise	L ₁	D ₁	② D ₂	① thk	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	6.5	3.8	.179	1'-9"	19.1	7.0	3.5	.179	1'-8"
24	23.1	7.5	4.3	.179	1'-10"	23.1	7.5	3.5	.179	1'-9"
28	27.1	8.0	4.2	.179	1'-11"	27.1	8.0	3.5	.179	1'-10"
32	31.0	9.0	4.7	.179	2'-1"	31.0	9.0	3.5	.179	2'-0"
36	35.0	9.5	4.6	.179	2'-4"	35.0	10.0	3.5	.179	2'-1"
40	39.0	9.5	4.1	.239	2'-8"	39.0	9.5	3.5	.239	2'-3"
44	43.0	10.0	4.1	.239	2'-11"	43.0	10.0	3.5	.239	2'-6"
48	47.0	10.5	4.1	.239	3'-4"	47.0	11.0	3.5	.239	2'-9"

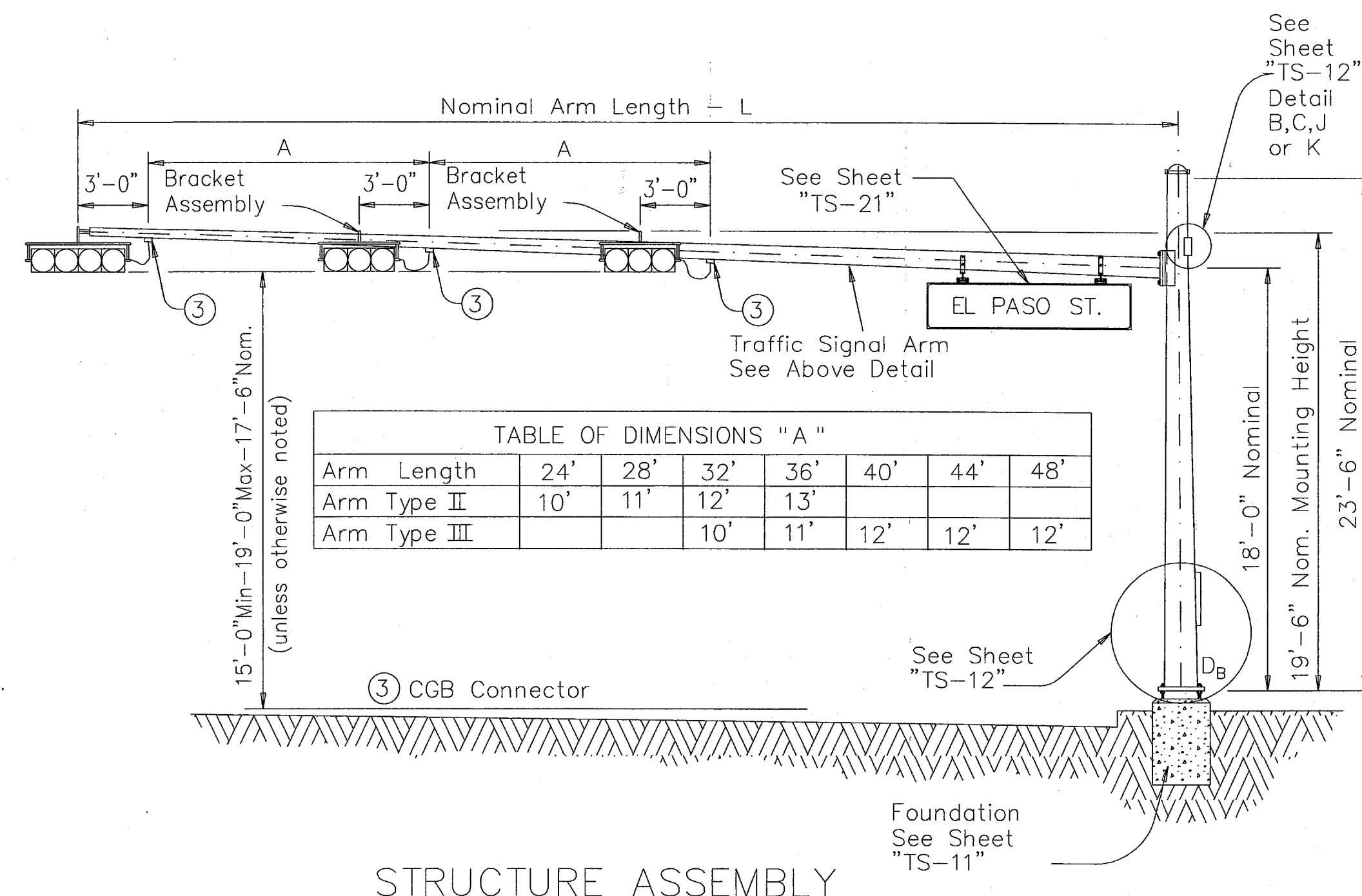
D_B = Pole Base O.D.
D₁₉ = Pole Top O.D. with no Luminaire and no ILSN
D₂₄ = Pole Top O.D. with ILSN w/out Luminaire
D₃₀ = Pole Top O.D. with Luminaire
D₁ = Arm Base O.D.
D₂ = Arm End O.D.
L₁ = Shaft Length
L = Nominal Arm Length

- ① Thickness shown are minimums, thicker materials may be used.
- ② D₂ may be increased by up to 1" for polygonal arms.



Note: The arm shall be fabricated straight with the unloaded rise measured as shown.

TRAFFIC SIGNAL ARM
(Fixed Mount)



Arm Length	24'	28'	32'	36'	40'	44'	48'
Arm Type II	10'	11'	12'	13'			
Arm Type III			10'	11'	12'	12'	12'

VIBRATION WARNING

Mast Arms of approximately 40' or longer are subject to possible harmonic vertical vibrations in light wind conditions due to unusual combinations of signal numbers, weights or positions, arm-wind orientation, and arm-pole stiffness. Arms shall be visually inspected in 5 to 20 mph wind conditions after signal head installation and, if vertical movements with a total excursion (max positive to max negative) of more than approximately 8" are observed at arm tip, damping devices or other means shall be fitted to the arm(s). The necessary damping device(s) or other remedial measures shall be as recommended by the fabricator. Excessive vibrations shall not be allowed to continue for more than two days.

SHIPPING PARTS LIST

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed-arm connection bolts and washers and any additional hardware listed in the table.

Nominal Arm Length	30' Poles With Luminaire		24' Poles With ILSN		19' Poles With No Luminaire and No ILSN	
	Above hardware plus: One (or two if ILSN attached) small hand hole, clamp-on simplex		Above hardware plus one small hand hole		See note above	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20L-80		20S-80		20-80	
24	24L-80		24S-80		24-80	
28	28L-80		28S-80		28-80	1
32	32L-80		32S-80		32-80	
36	36L-80		36S-80		36-80	4
40	40L-80		40S-80		40-80	
44	44L-80		44S-80		44-80	
48	48L-80		48S-80		48-80	1

Traffic Signal Arms (1 per Pole)

Ship each arm with the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	1 CGB connector		1 Bracket Assembly and 2 CGB Connectors		2 Bracket Assemblies and 3 CGB Connectors	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80	1		
32			32II-80		32III-80	
36			36II-80	2	36III-80	2
40					40III-80	
44					44III-80	
48					48III-80	1

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	

④ Supply Option "A" unless otherwise noted

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 1/2"	3'-4"	1
1 3/4"	3'-10"	5

Each anchor bolt assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, 4 lock washers and 4 nut anchor devices (Type 2) per Standard Drawing "TS-11".

Templates may be removed for shipment.



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THIS DETAIL SHEET WAS OBTAINED FROM TXDOT

DATE: DECEMBER, 2001 SCALE: NOT TO SCALE JOB NO.: 00-249
DRAWN: GBW DESIGN: WJH REVIEWED: DWG: 249DETAILS-SIGN

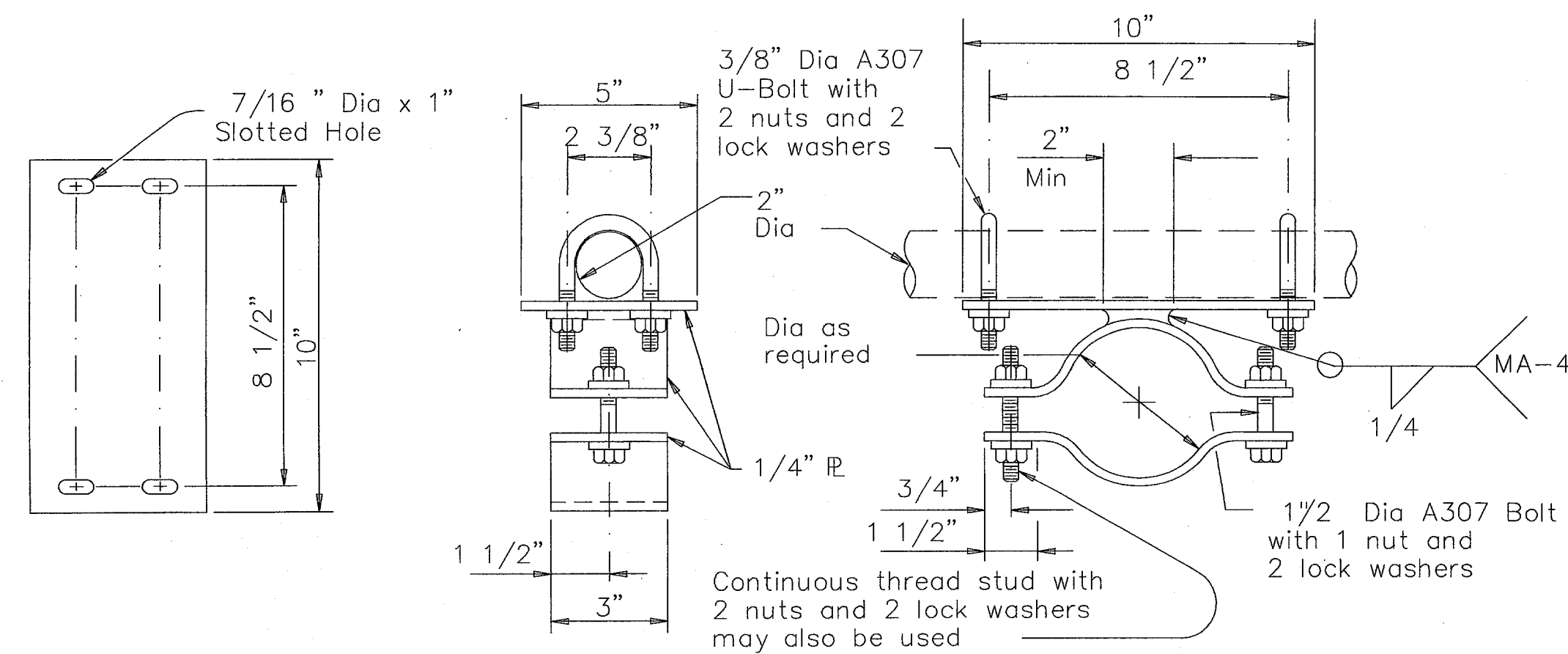
ARAPAHO ROAD PHASE II
TRAFFIC SIGNAL SUPPORT STRUCTURES
SIGNAL MAST ARM ASSEMBLY - 1 of 2

TOWN OF ADDISON

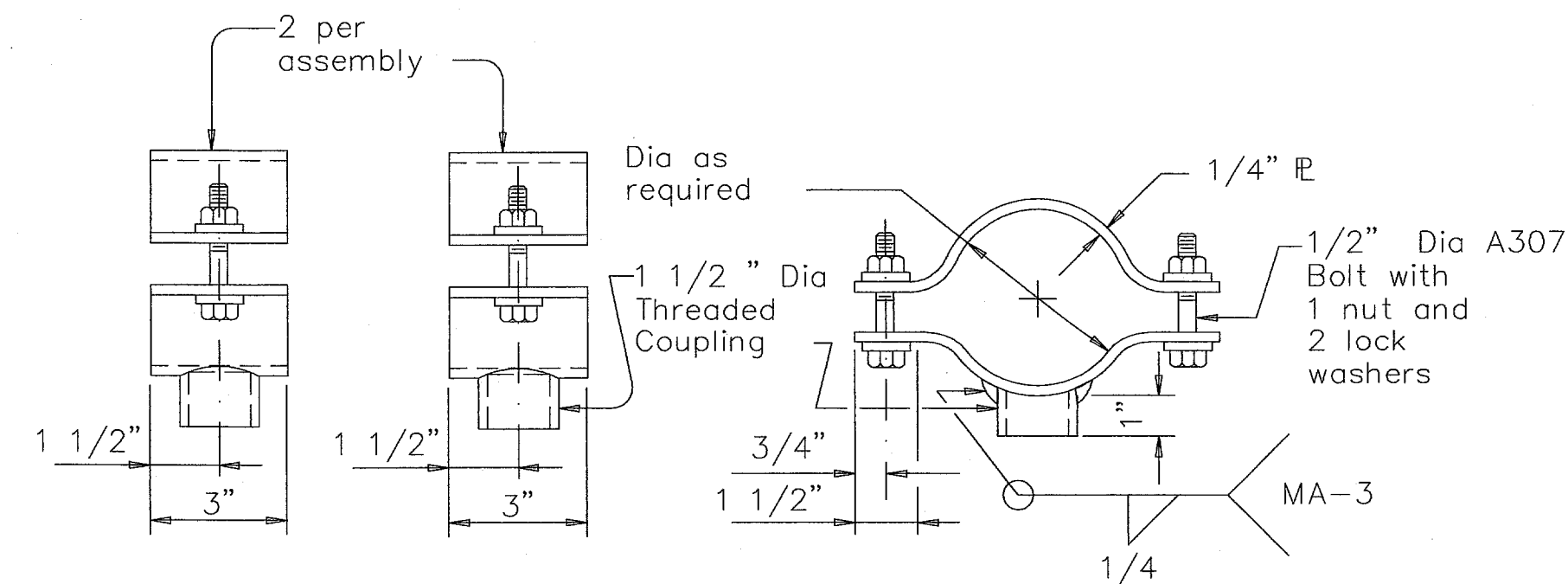
Grantham, Burge & Waldbauer
Engineers, Inc.
1919 S. SHILOH ROAD, SUITE 530, L.B. 27
GARLAND, TEXAS 75042 (972) 840-1916 (TEL)
(972) 840-2156 (FAX)

SHT. TS-17
OF TS-21

NO.	DATE	REVISION	APPROV.
1			
2			
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BRACKET ASSEMBLY DETAILS OPTION A

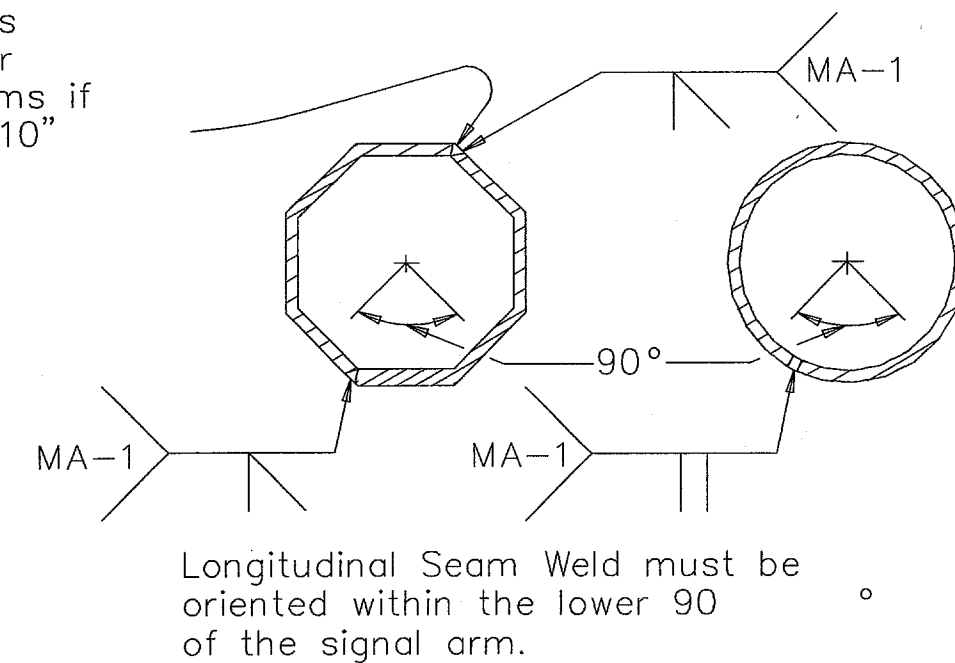


BRACKET ASSEMBLY DETAILS OPTION B

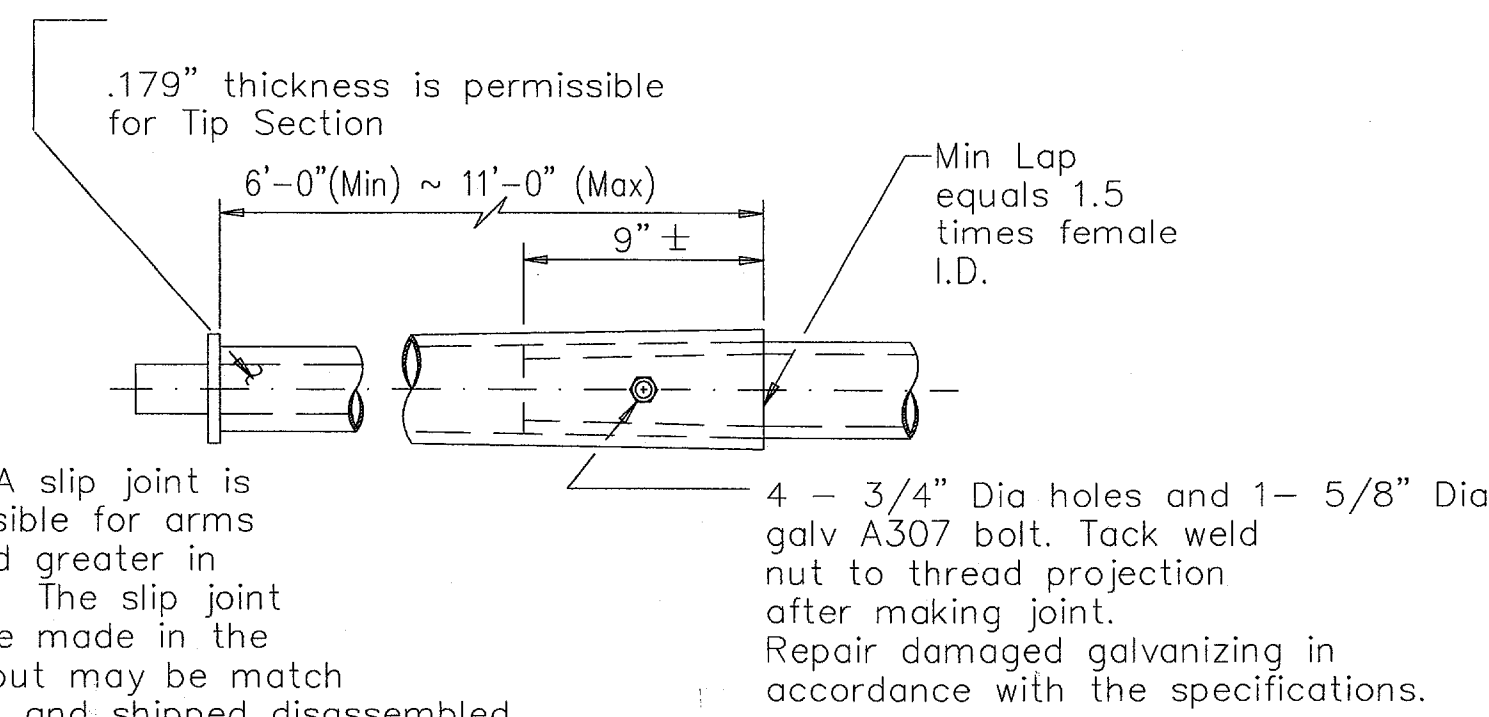
BRACKET ASSEMBLY OPTION C

Stainless steel bands and cast bracket as in "Astro-Brac" with 1 1/2" Dia Threaded Coupling.

Second longitudinal Seam Weld is permitted for polygonal arms if D_1 exceeds 10"



ARM WELD DETAIL



SLIP JOINT DETAIL

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor.

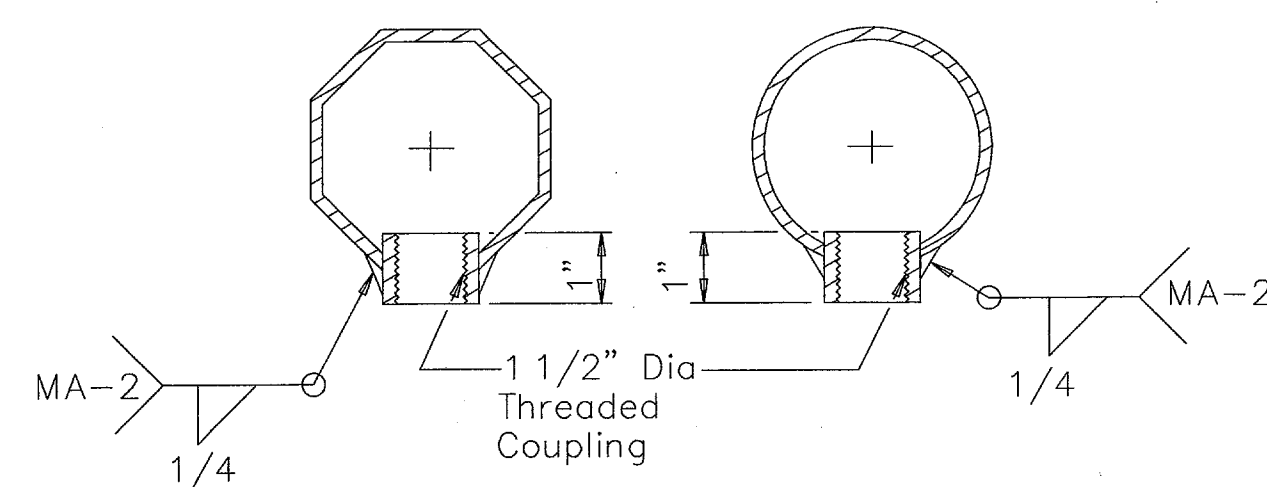
Poles are designed to support one 8'-0" luminaire arm, one 9'-0" internally lighted street name sign and one traffic signal arm with a length as tabulated. The specified luminaire load applied at the end of the luminaire arm equals 75 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.5 sq ft. The specified internally lighted street name sign load applied 4.5 ft from the centerline of the pole equals 85 lbs vertical dead load plus horizontal wind load on an effective projected area of 11.5 sq ft. The specified signal load applied at the end of the traffic signal arm equals 180 lbs vertical dead load plus the horizontal wind load on an effective projected area of 32.4 sq ft (actual area times drag coefficient).

See Standard Sheet "TS-12" for pole details, "TS-16" for traffic signal arm connection details, "TS-15" for internally lighted street name sign arm connection details, "TS-14" for luminaire arm and connection details, "TS-21" for internally lighted street name sign details, and "TS-11" for anchor bolt and foundation details. See "TS-16" for material specifications.

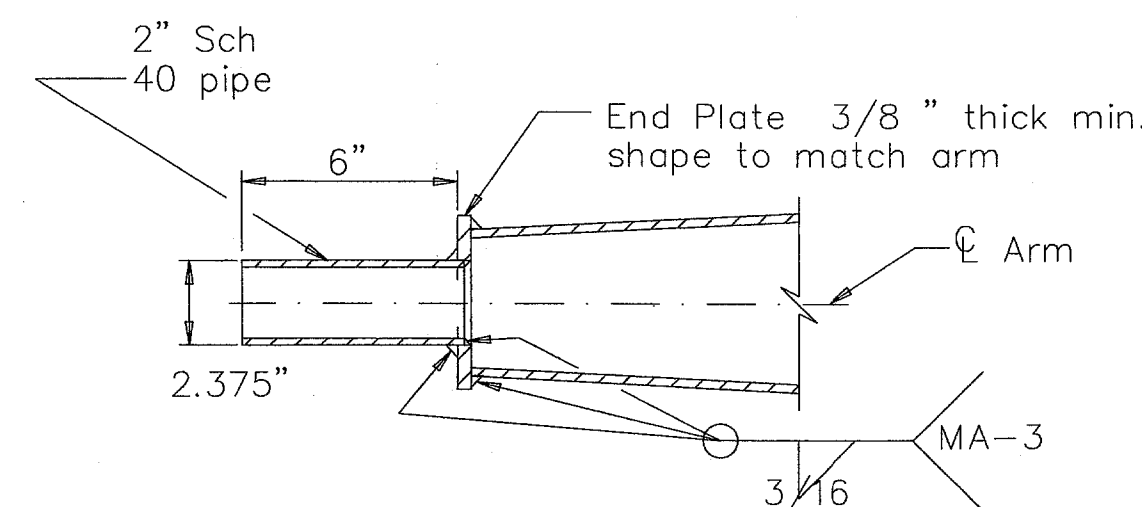
Fabrication shall be in accordance with the Specifications and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Miscellaneous welds which do not call for preapproved weld procedures are nevertheless subject to rejection for poor workmanship. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and the Specifications.

Unless otherwise noted, all parts shall be galvanized in accordance with the Specifications.

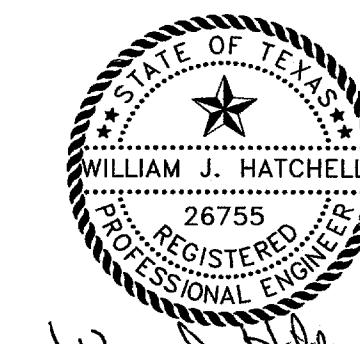
Special design require submission of shop drawings in accordance with the item "Steel Structures".



COUPLING DETAILS



TENON DETAIL



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THIS DETAIL SHEET WAS OBTAINED FROM TXDOT

DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249	78C
DRAWN: GBW	DESIGN: WJH	REVIEWED:	DWG: 249DETAILS-SIGN

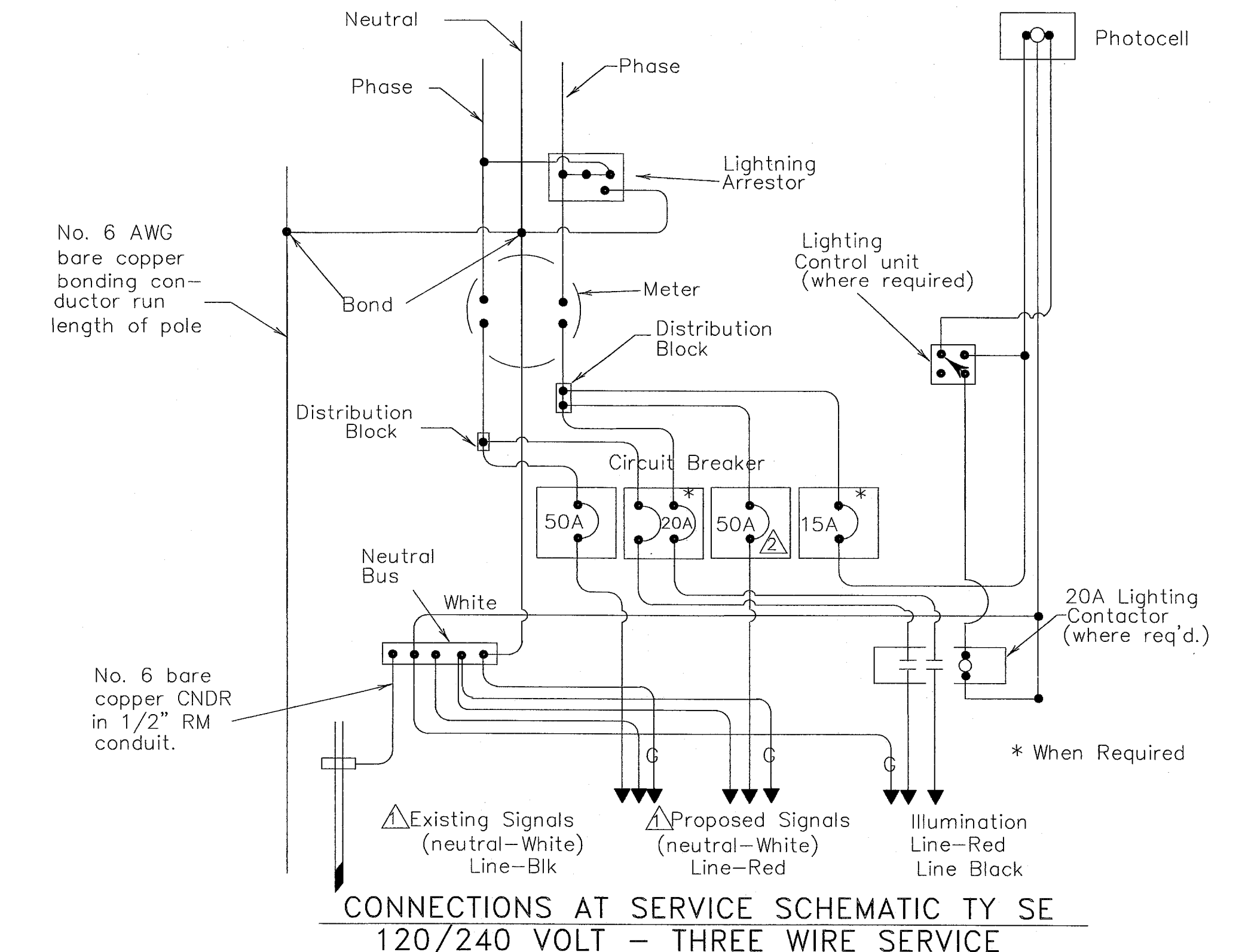
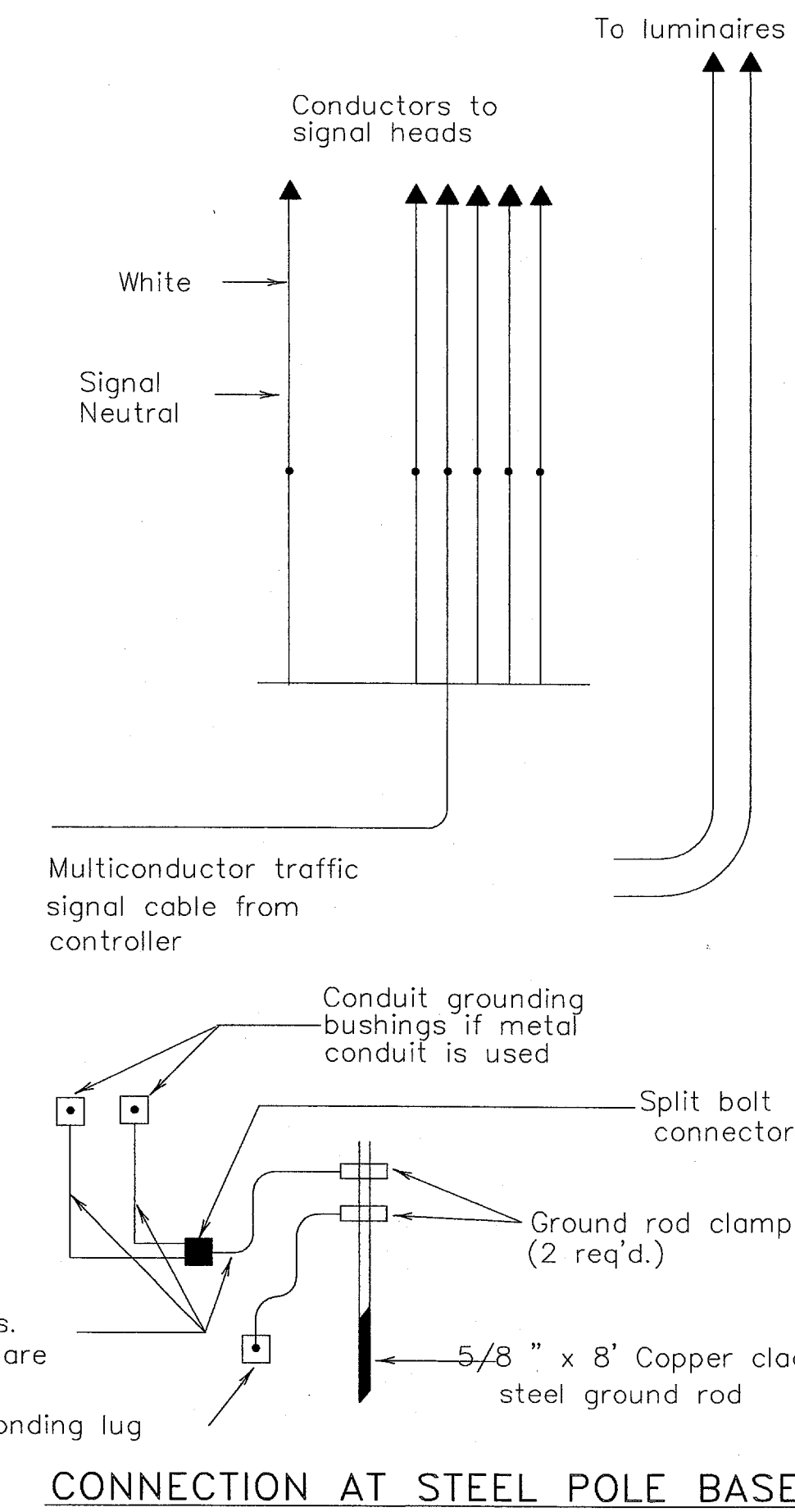
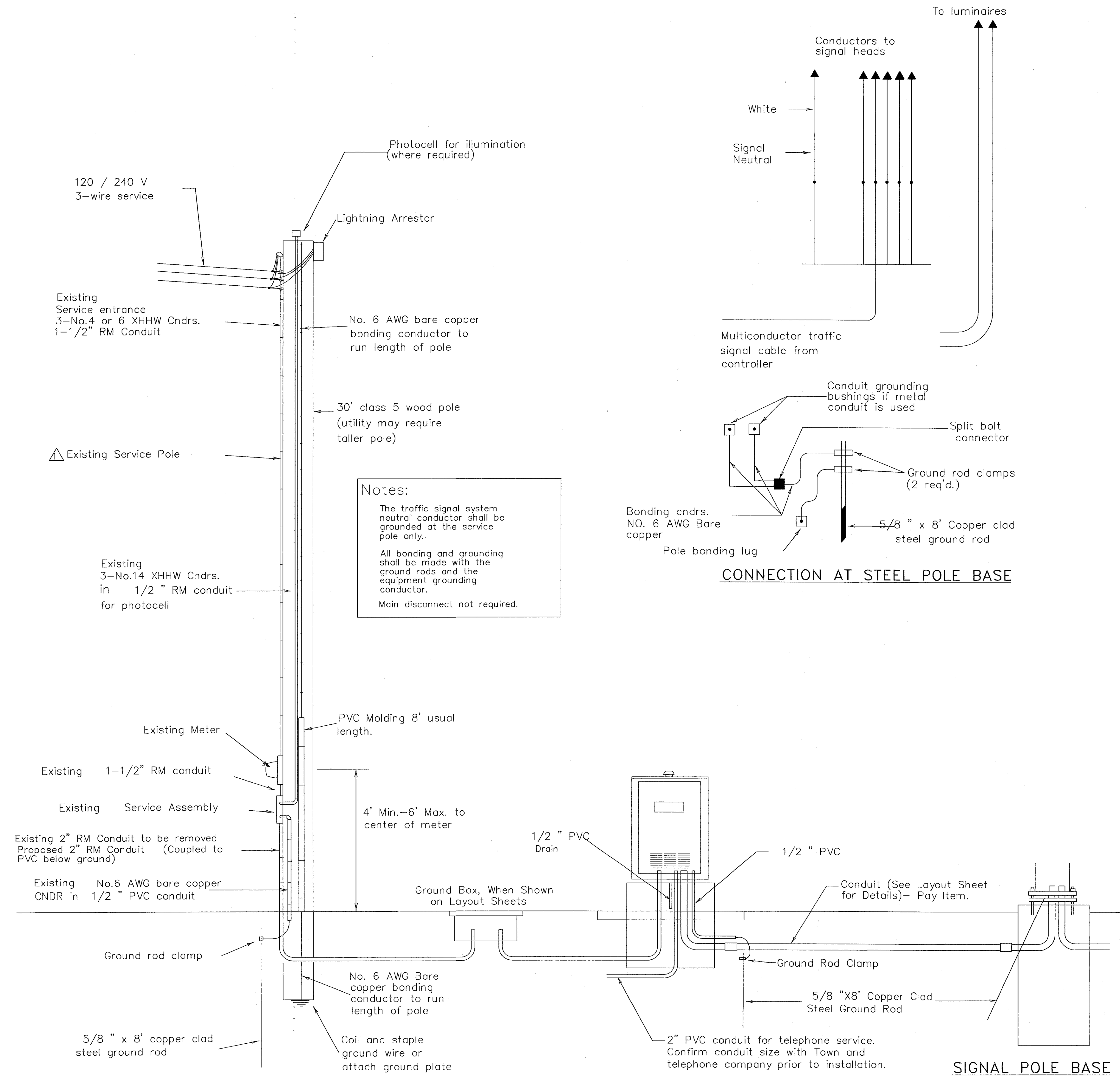
ARAPAHO ROAD PHASE II
TRAFFIC SIGNAL SUPPORT STRUCTURES
SIGNAL MAST ARM ASSEMBLY - 2 of 2

TOWN OF ADDISON

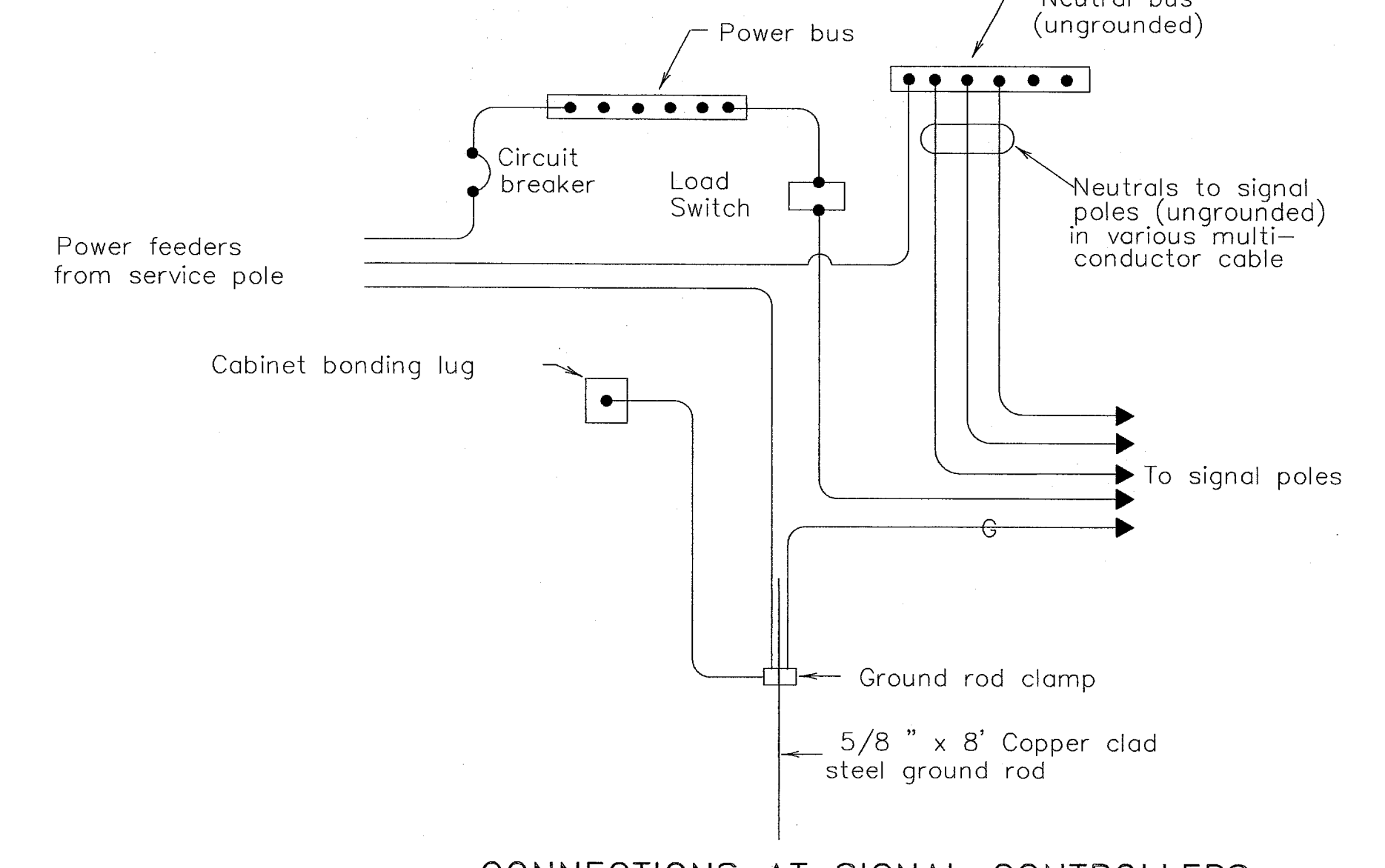
Grantham, Burge & Waldbauer
GBW Engineers, Inc.
 1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042
 (972) 840-1916 (TEL)
 (972) 840-2156 (FAX)

SHT. TS-18 OF TS-21

NO.	DATE	REVISION	APPROV.
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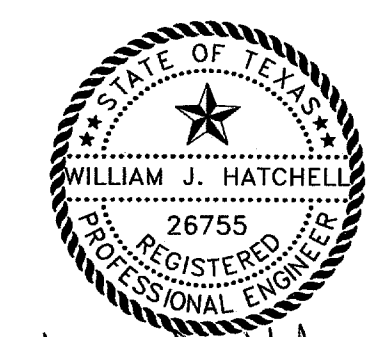
△ All circuit breakers are existing. The contractor shall install a new 50 AMP breaker for the new controller and remove the existing 50 AMP breaker for the existing controller after signals are operational.



SIGNAL POLE BASE

SERVICE POLE

SIGNAL CONTROLLER



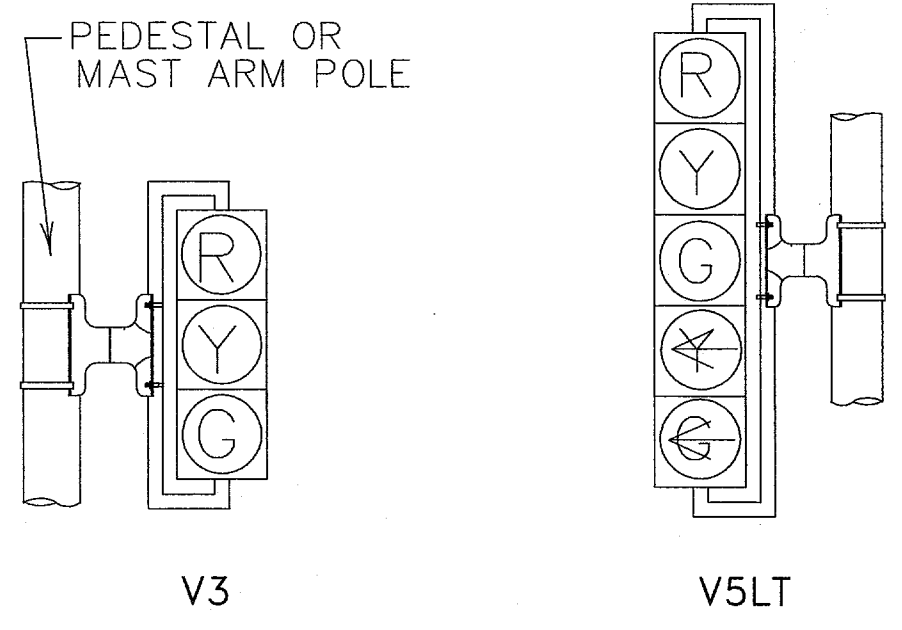
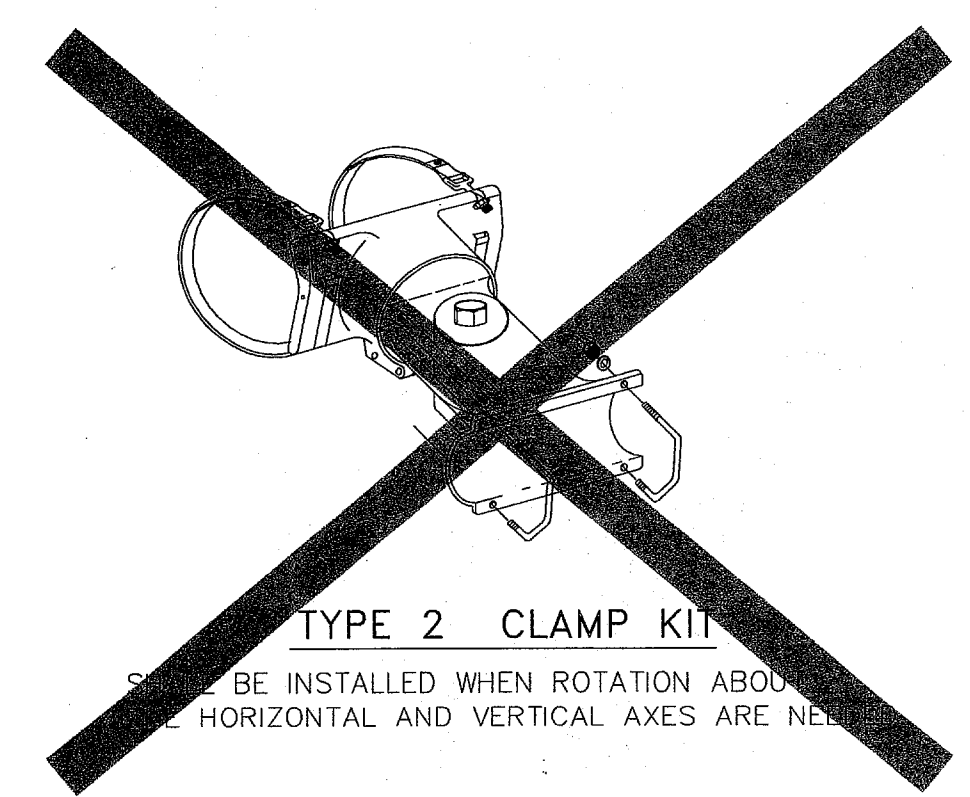
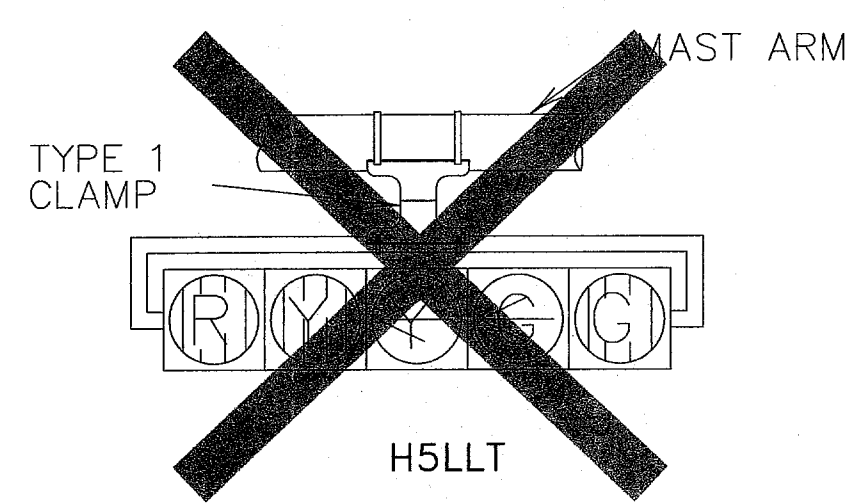
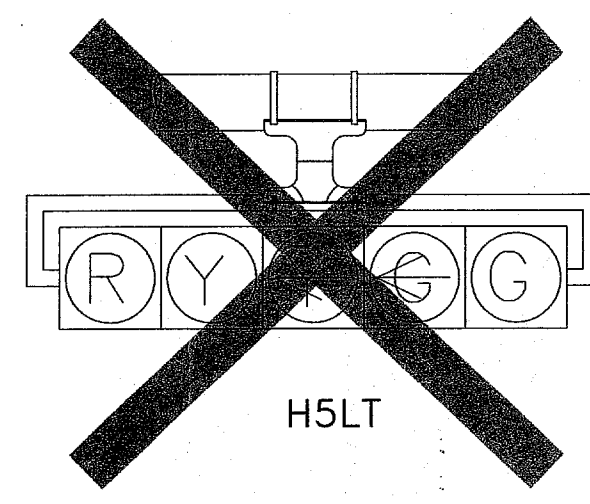
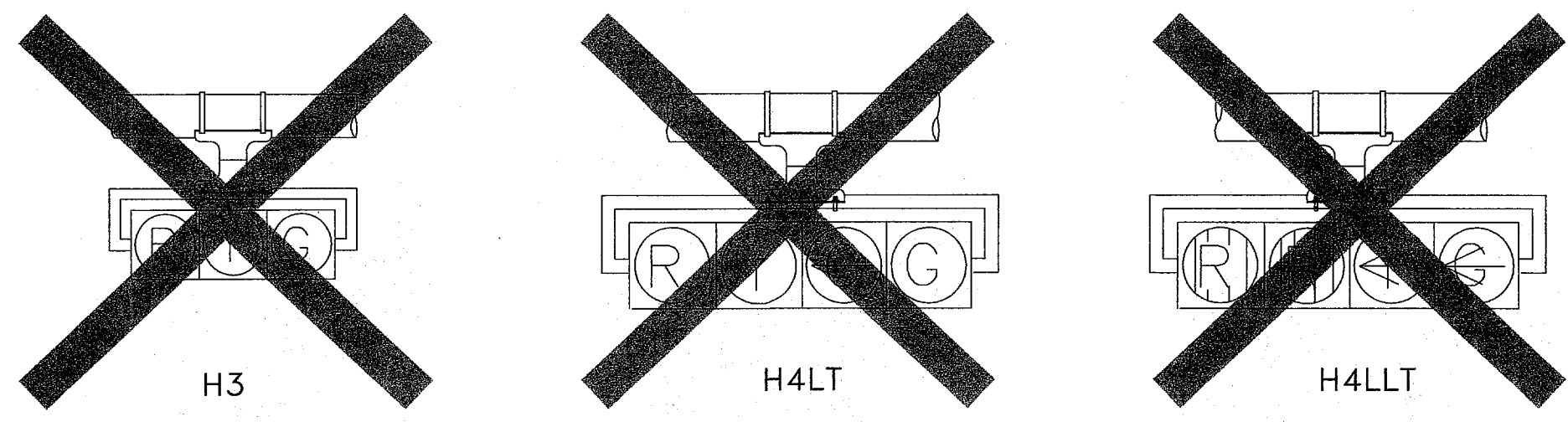
THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY WILLIAM J. HATCHELL ON 2/18/01 ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

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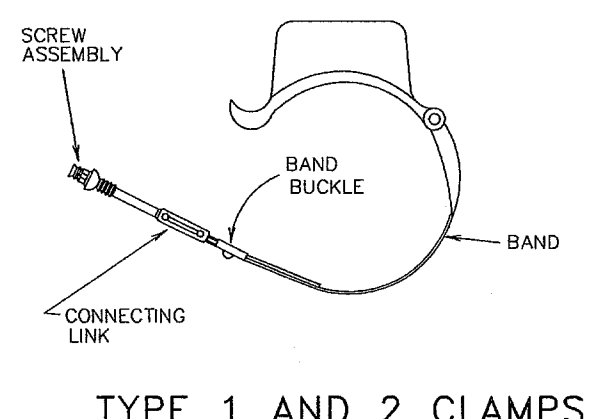
DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: WJH	REVIEWED: DWG: 249DETAILS-TRAF
ARAPAHO ROAD PHASE II		
SERVICE POLE DETAILS		
TOWN OF ADDISON		
Gratham, Burge & Waldbauer Engineers, Inc.		SHT. TS-19 OF TS-21
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042		(972) 840-1916 (TEL) (972) 840-2156 (FAX)

NO.	DATE	REVISION	APPROV.
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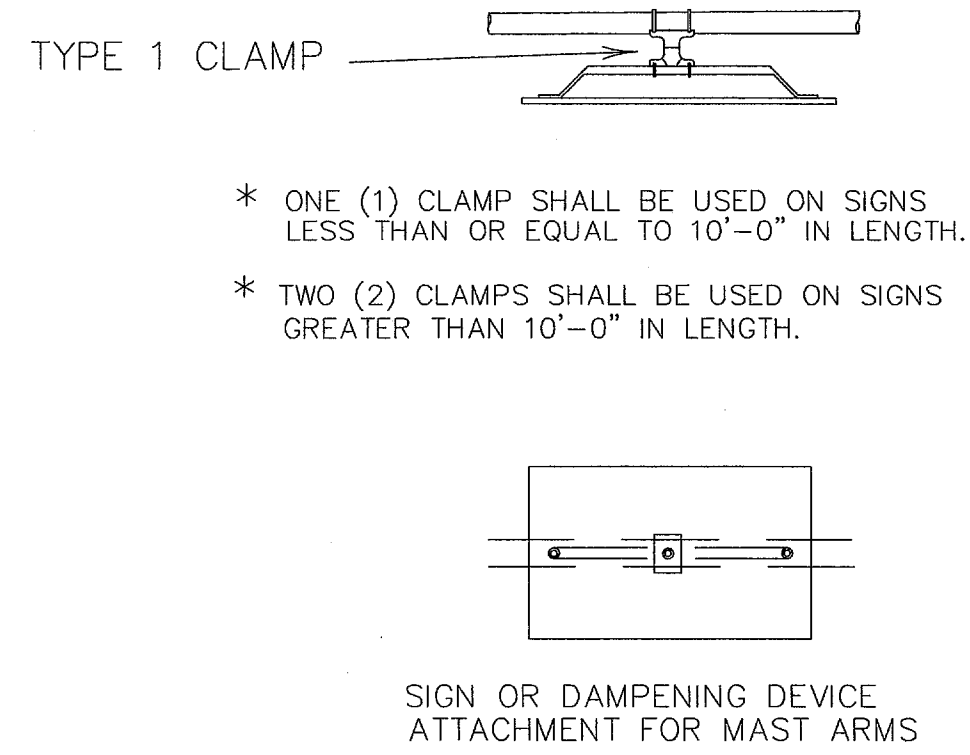
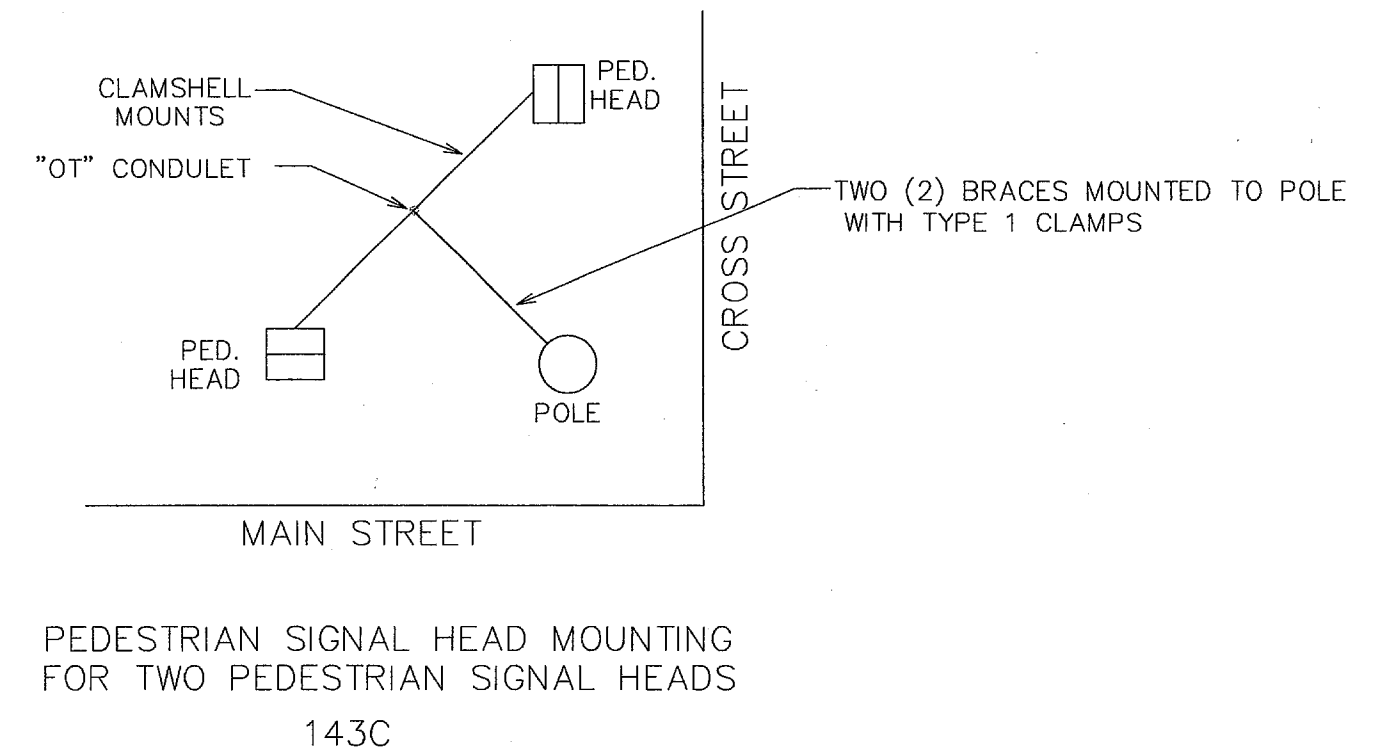
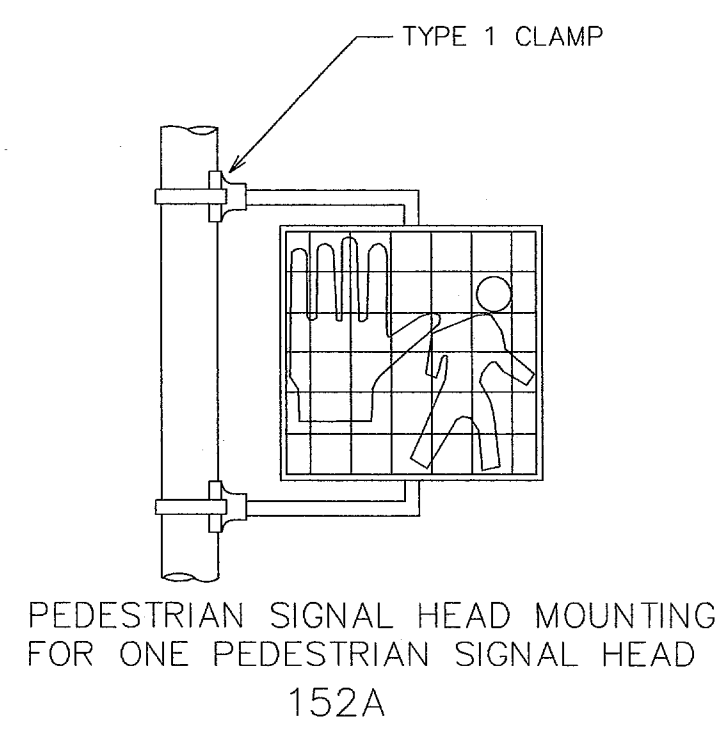
NOTE:
ALL SIGNAL HEADS TO BE MOUNTED VERTICALLY ON MAST ARM PER MANUFACTURERS SPECIFICATIONS.



NOTE:
VERTICAL LOUVERS SHALL BE INSTALLED ON HORIZONTAL MOUNTED SIGNALS, HORIZONTAL LOUVERS SHALL BE INSTALLED ON VERTICAL MOUNTED SIGNAL WHEN NEEDED.

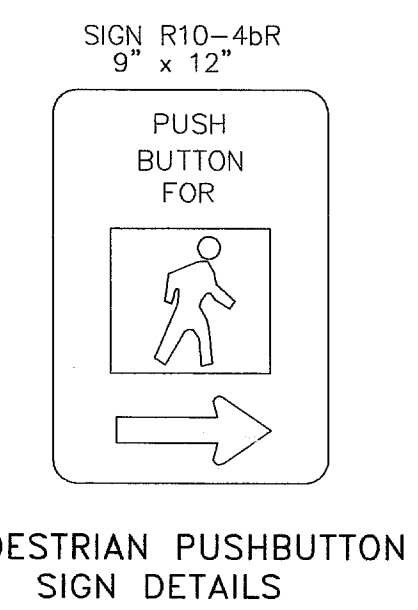
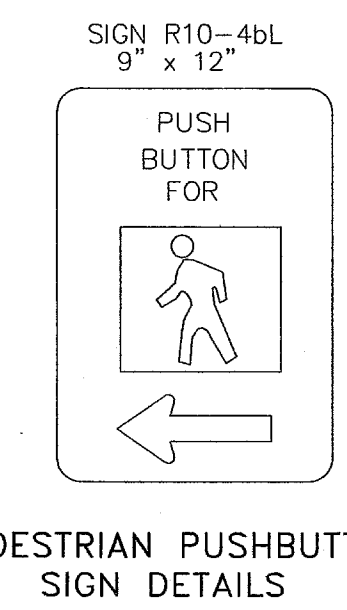
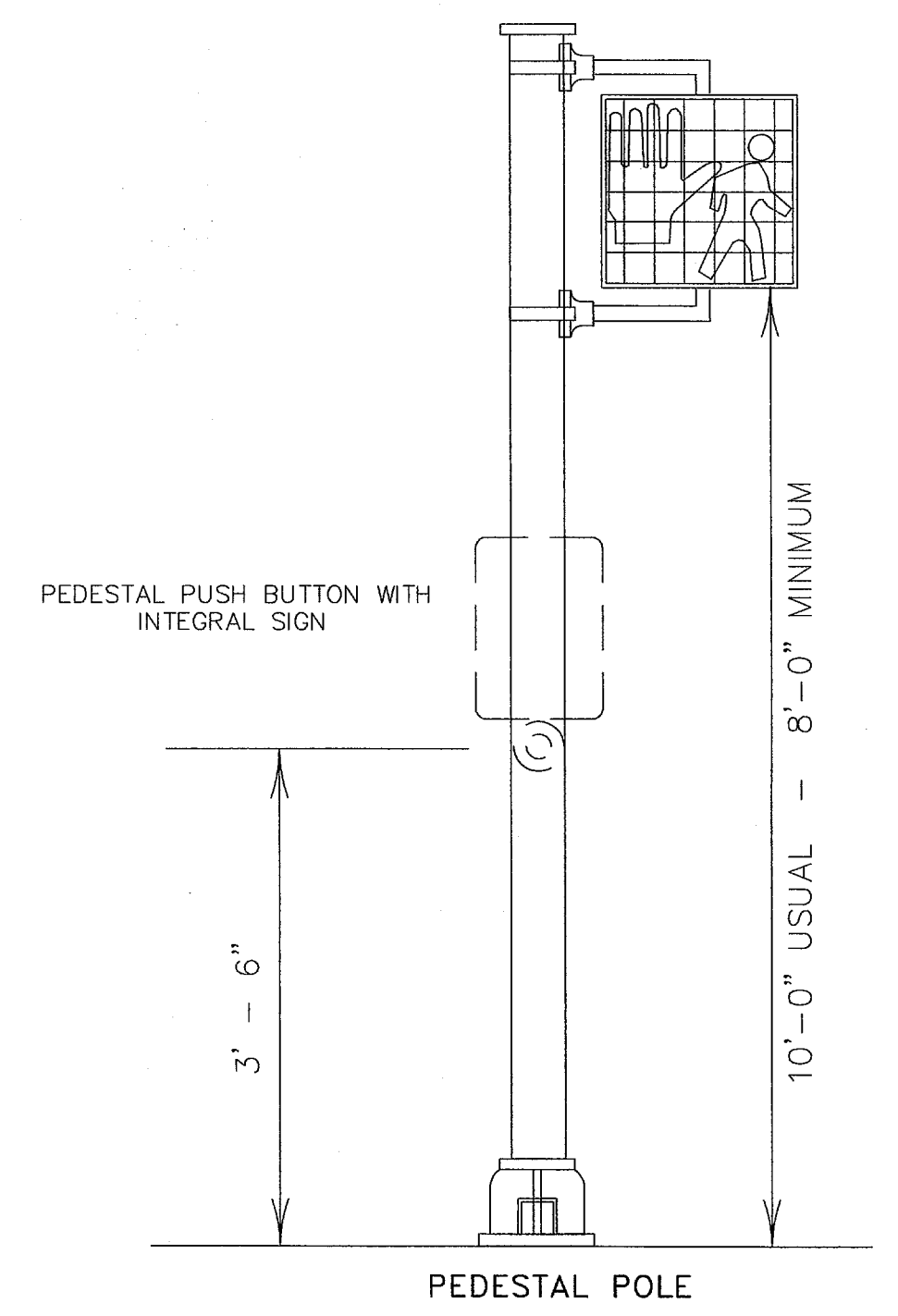


NOTE: CLAM SHELL MOUNTING HARDWARE MAY BE USED INSTEAD OF MOUNTING HARDWARE SHOWN ABOVE, AS APPROVED BY THE ENGINEER. ICC P/N 4805 OR McCAIN QUICKMOUNT OR APPROVED EQUAL.

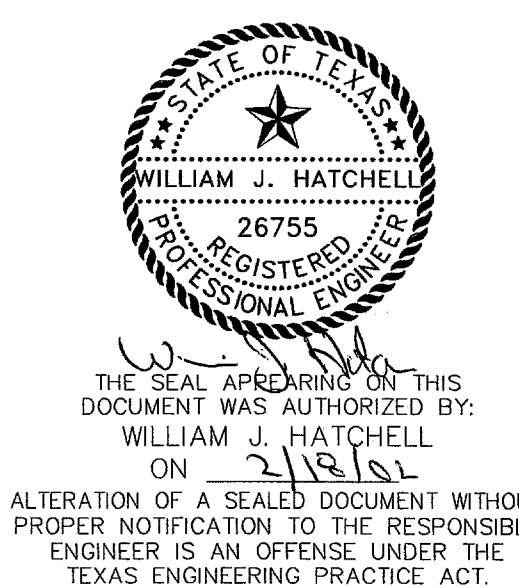


* ONE (1) CLAMP SHALL BE USED ON SIGNS LESS THAN OR EQUAL TO 10'-0" IN LENGTH.
* TWO (2) CLAMPS SHALL BE USED ON SIGNS GREATER THAN 10'-0" IN LENGTH.

NOTE:
THE POLE ON THIS DRAWING IS SHOWN AS AN EXAMPLE ONLY. POLES OF SIMILAR DESIGN FOR ANY CROSS SECTION WHICH MEET THE SPECIFICATIONS AND REQUIREMENTS SHOWN ON THESE DRAWINGS AND ARE APPROVED BY THE TOWN WILL BE DEEMED ACCEPTABLE.



- NOTES:**
1. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH TYPE 1 CLAMPS AND APPROPRIATE TUBING.
 2. ALL PEDESTRIAN SIGNAL HEADS SHALL BE INSTALLED ON THE AWAY-FROM-TRAFFIC SIDE OF THE PEDESTAL OR MAST ARM POLE.
 3. ALL WIRING FOR PEDESTRIAN SIGNALS SHALL BE TOTALLY ENCLOSED WITHIN THE SIGNAL MOUNTING HARDWARE.
 4. ALL PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON SIGNS SHALL DISPLAY THE SYMBOLIZED MESSAGES SHOWN ABOVE.

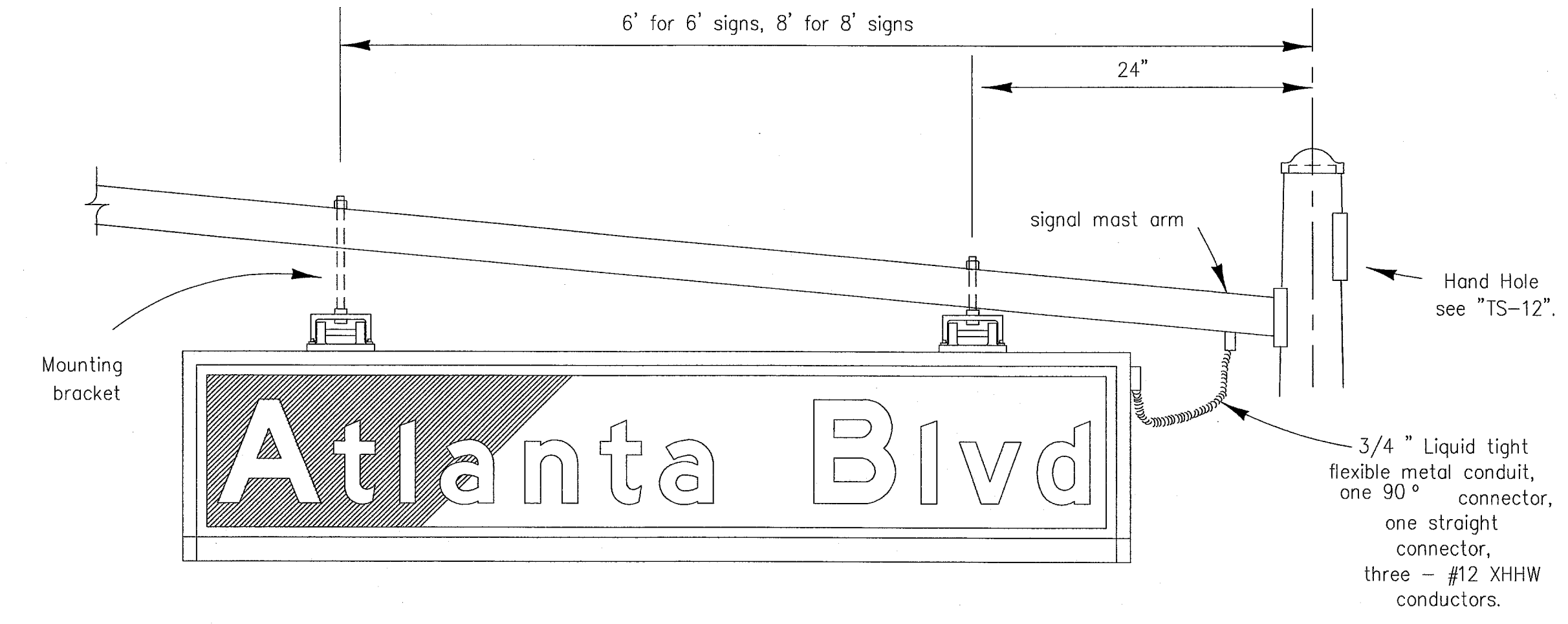
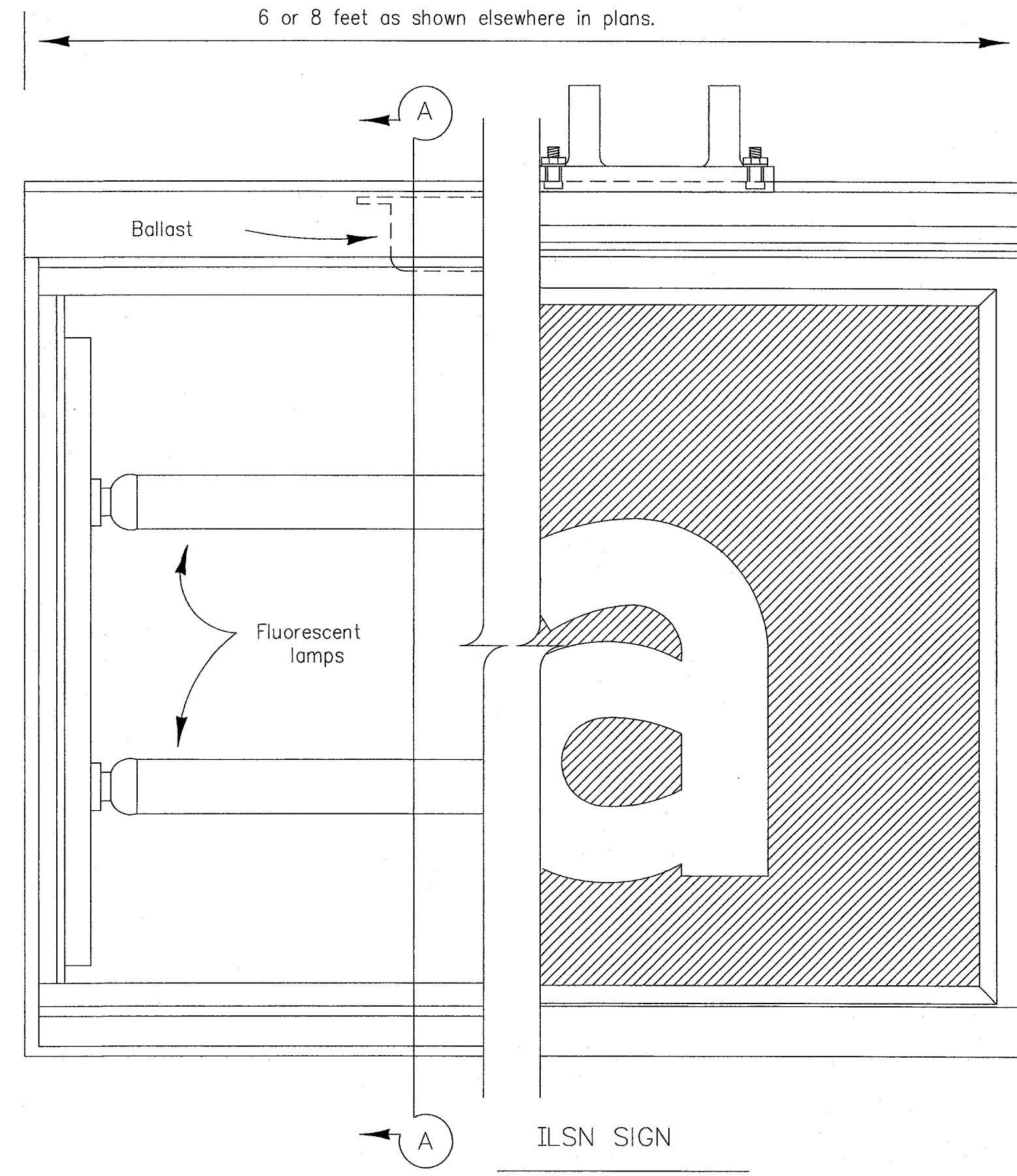
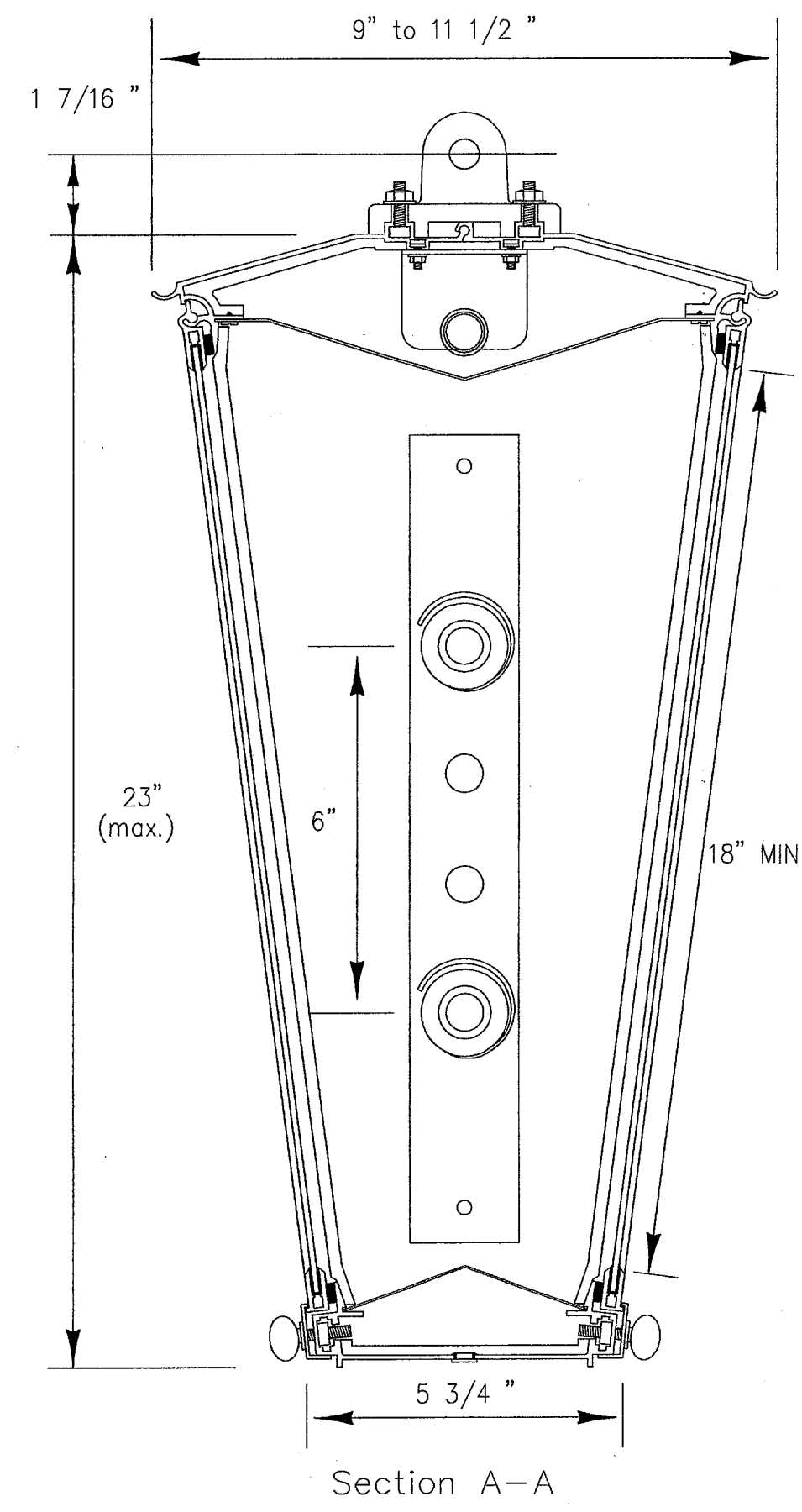


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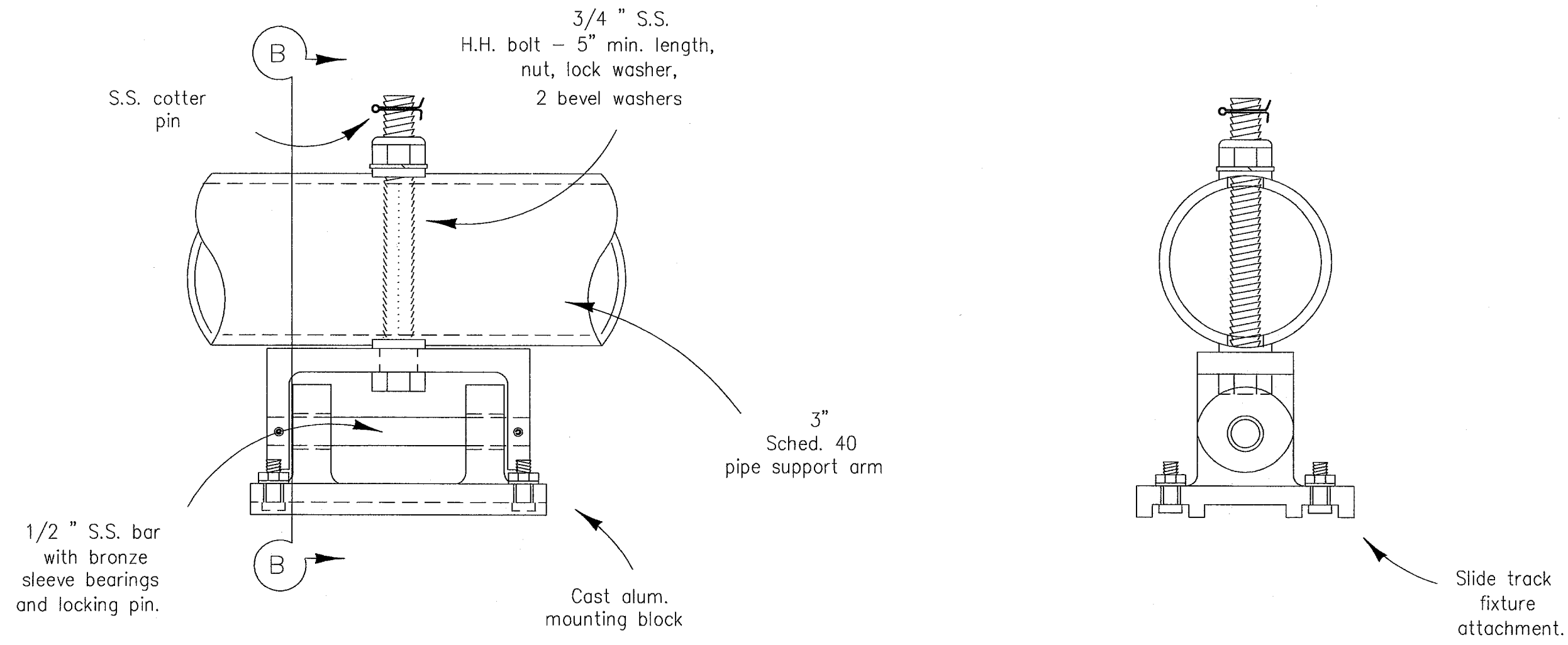
DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249
DRAWN: GBW	DESIGN: WJH	REVIEWED: DWG: 249DETAILS-TRAF
ARAPAHO ROAD PHASE II		
TRAFFIC AND PEDESTRIAN SIGNAL HEAD IDENTIFICATION		
TOWN OF ADDISON		
Gratham, Burge & Waldbauer Engineers, Inc.		SHT. TS-20 OF TS-21
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042		(972) 840-1916 (TEL) (972) 840-2156 (FAX)

INTERNALLY LIGHTED STREET NAME SIGN DETAILS

NO.	DATE	REVISION	APPROV.
1			
2			
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SIGN MOUNTING



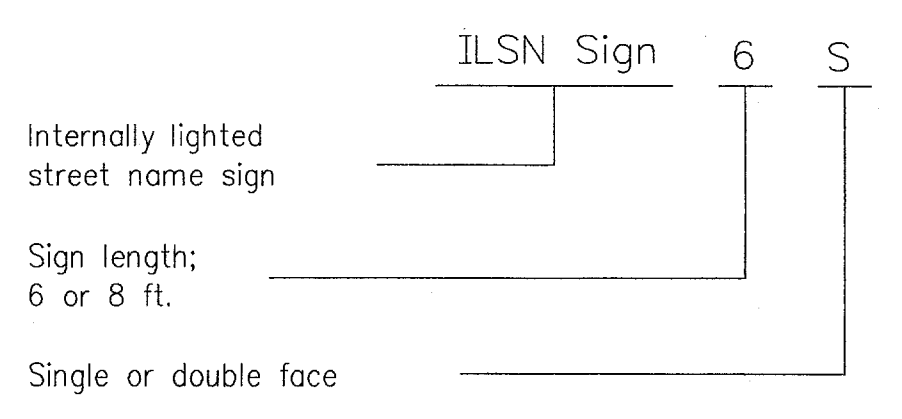
MOUNTING BRACKET

Section B-B

ILSN SIGN NOTES:

1. Eight foot ILSN sign shall not exceed 11.5 sq.ft. effective projected area (EPA) and shall not exceed a weight of 85 lbs. Six foot ILSN sign shall not exceed 8.7 sq.ft. EPA and shall not exceed a weight of 70 lbs.
2. Sign message shall be as shown elsewhere in the plans.
3. See Special Specification, "Internally Lighted Street Name Signs" for additional details.

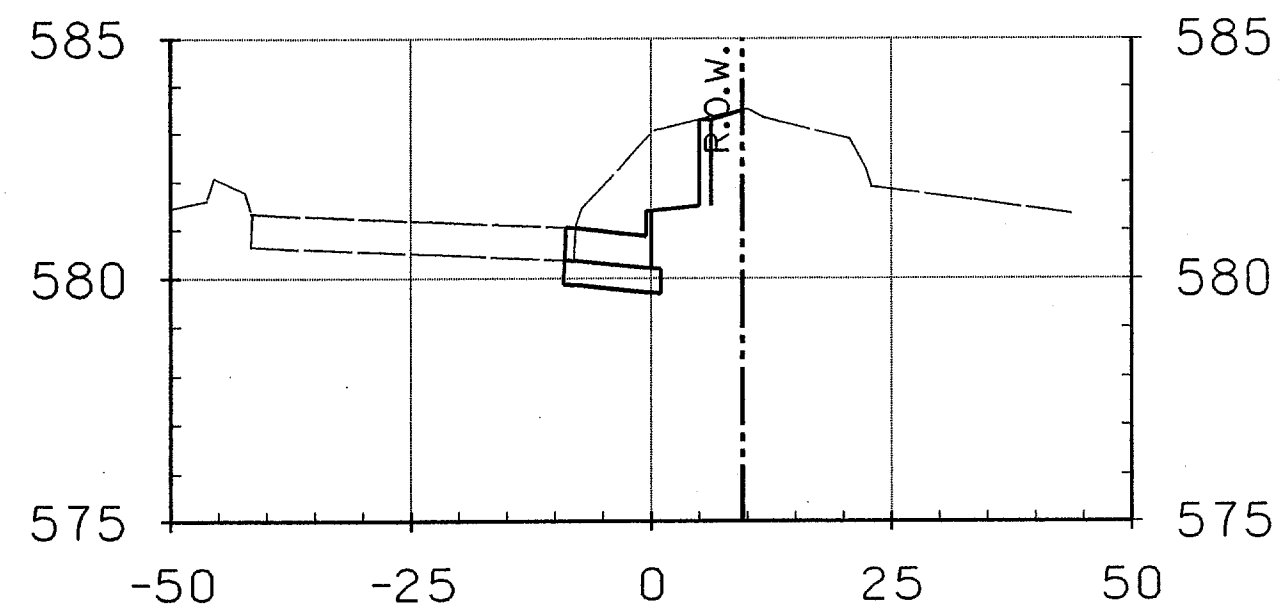
EXPLANATION OF DESCRIPTION



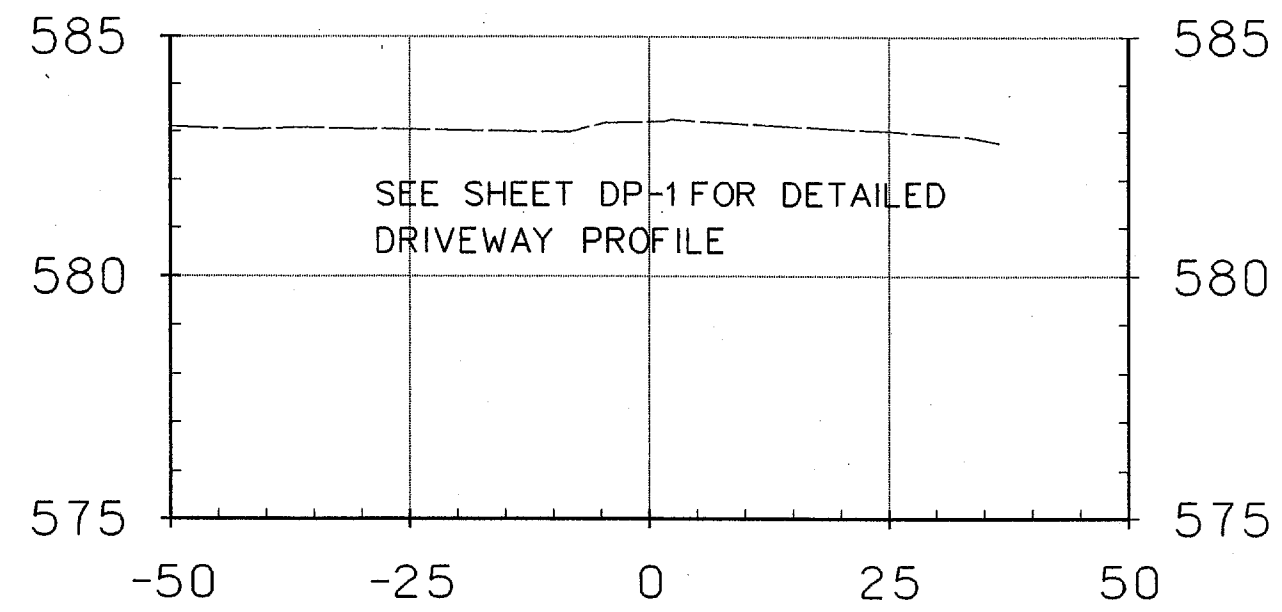
THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY: WILLIAM J. HATCHELL ON 01/18/02. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

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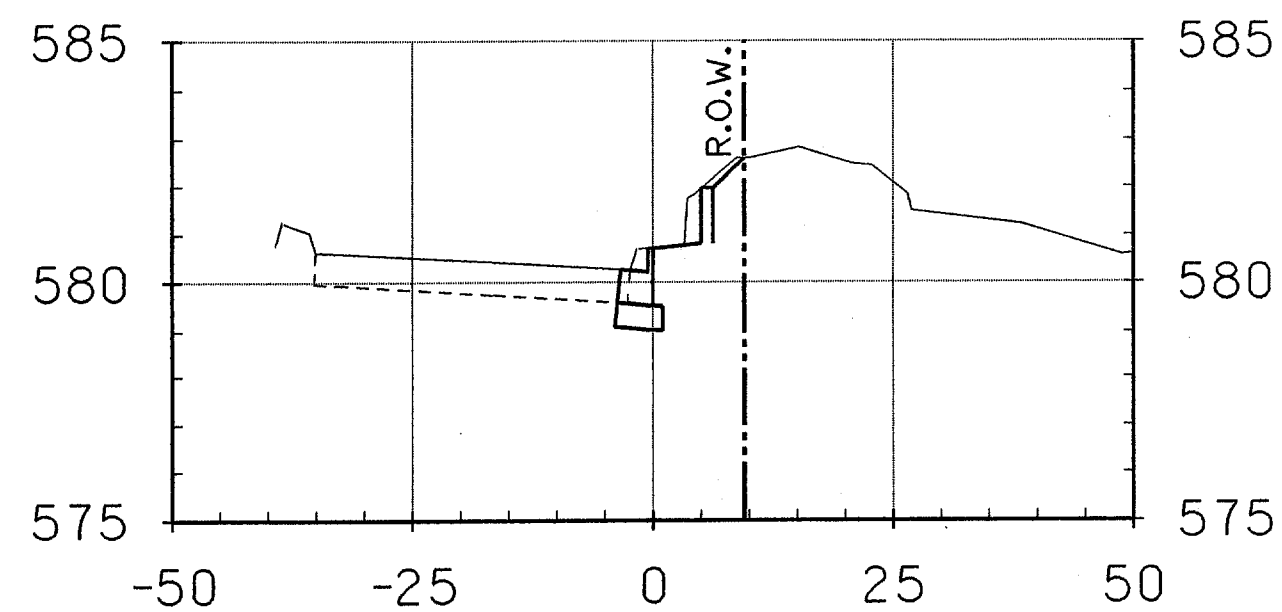
DATE: DECEMBER, 2001	SCALE: NOT TO SCALE	JOB NO.: 00-249	80A
DRAWN: GBW	DESIGN: WJH	REVIEWED:	DWG: 249DETAILS-SIGN
ARAPAHO ROAD PHASE II			
STREET NAME SIGN DETAIL (ILLUMINATED)			
TOWN OF ADDISON			
Grantham, Burge & Waldbauer Engineers, Inc.			SHT. TS-21 OF TS-21
1919 S. SHILOH ROAD, SUITE 530, L.B. 27 GARLAND, TEXAS 75042			
		(972) 840-1916 (TEL) (972) 840-2156 (FAX)	



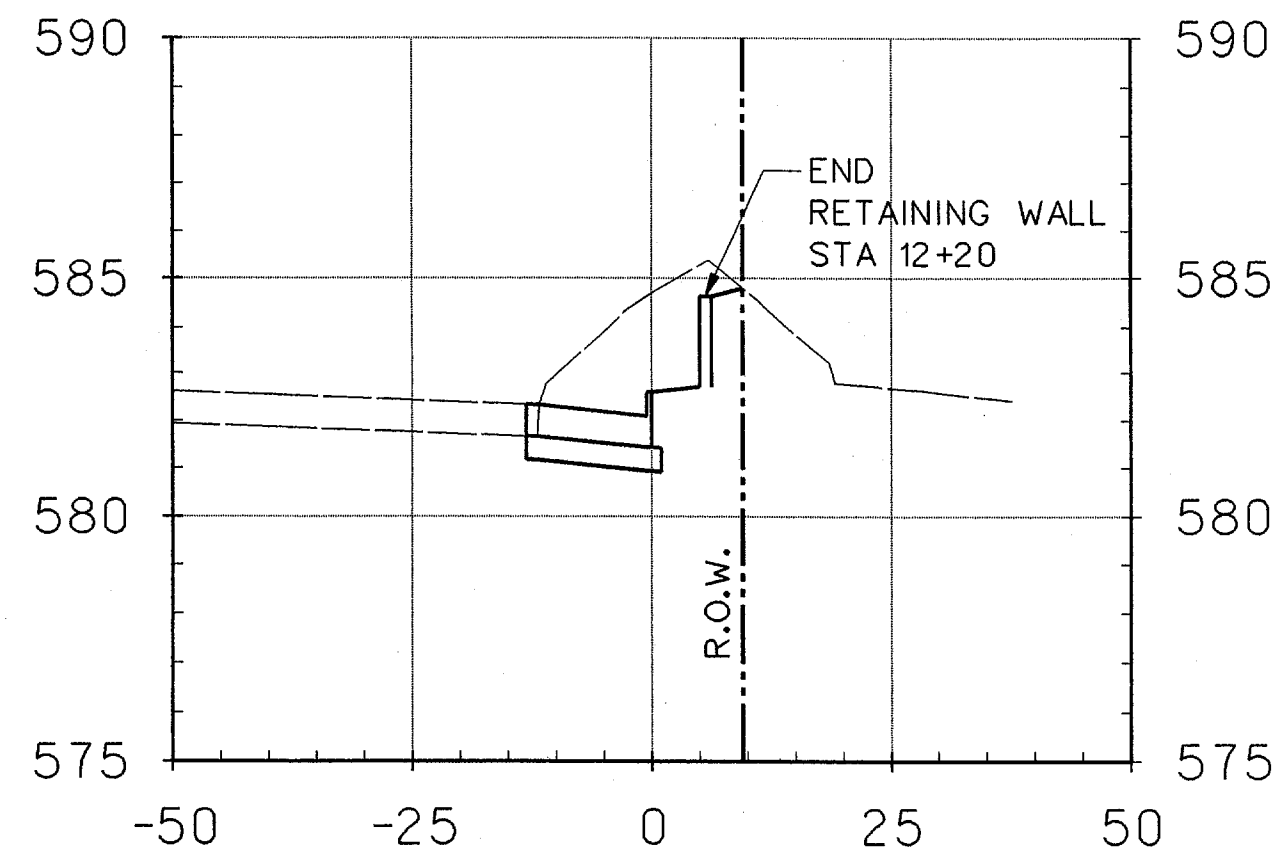
11+00.00
MARSH LANE



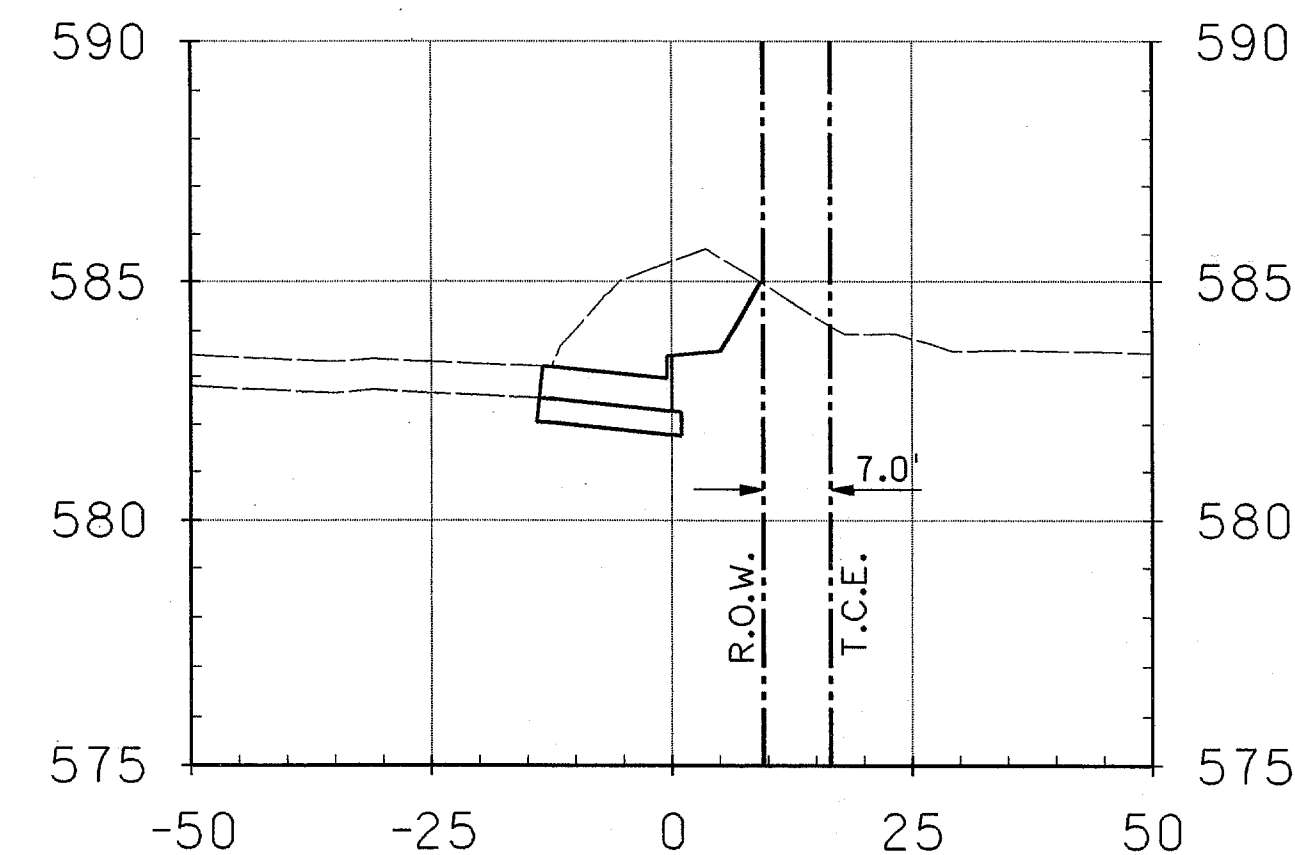
12+44.54
MARSH LANE
☉ DRIVE



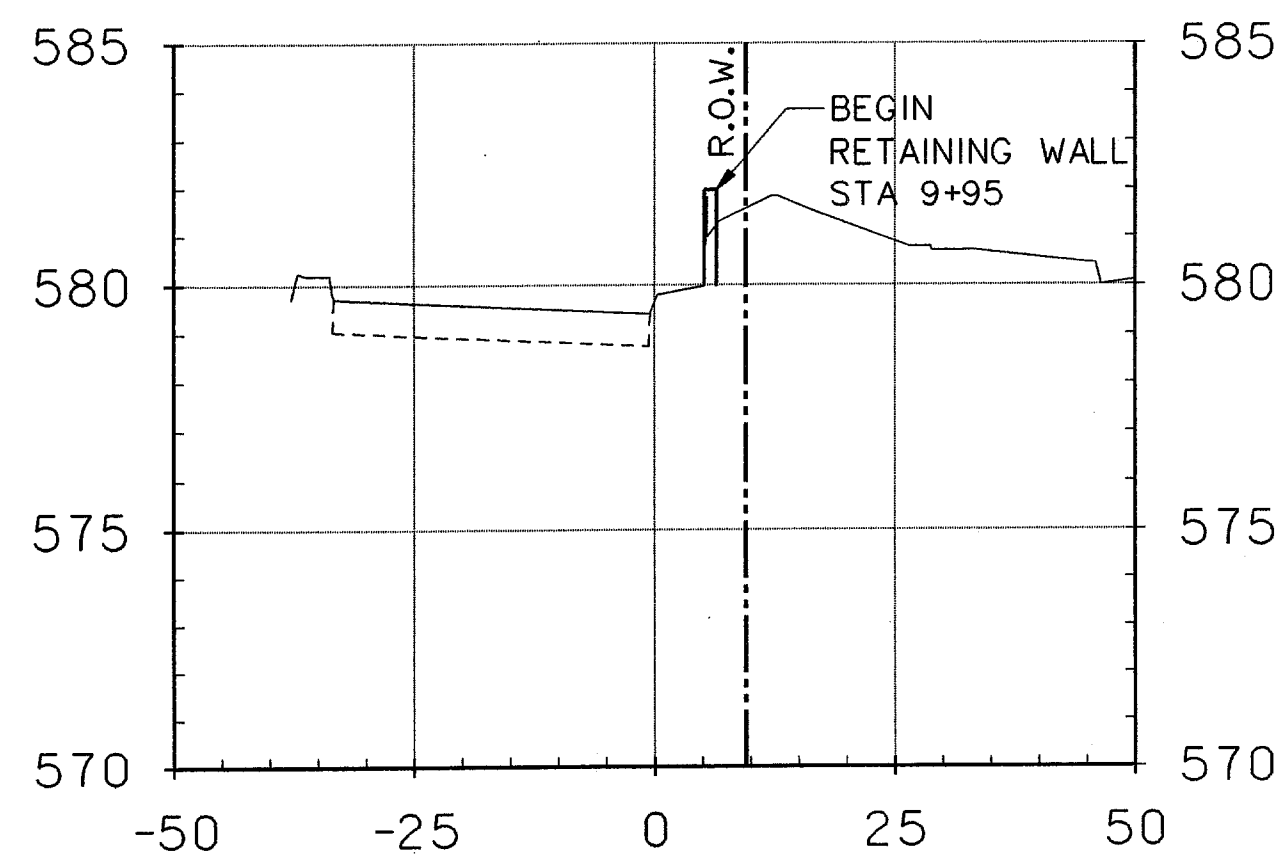
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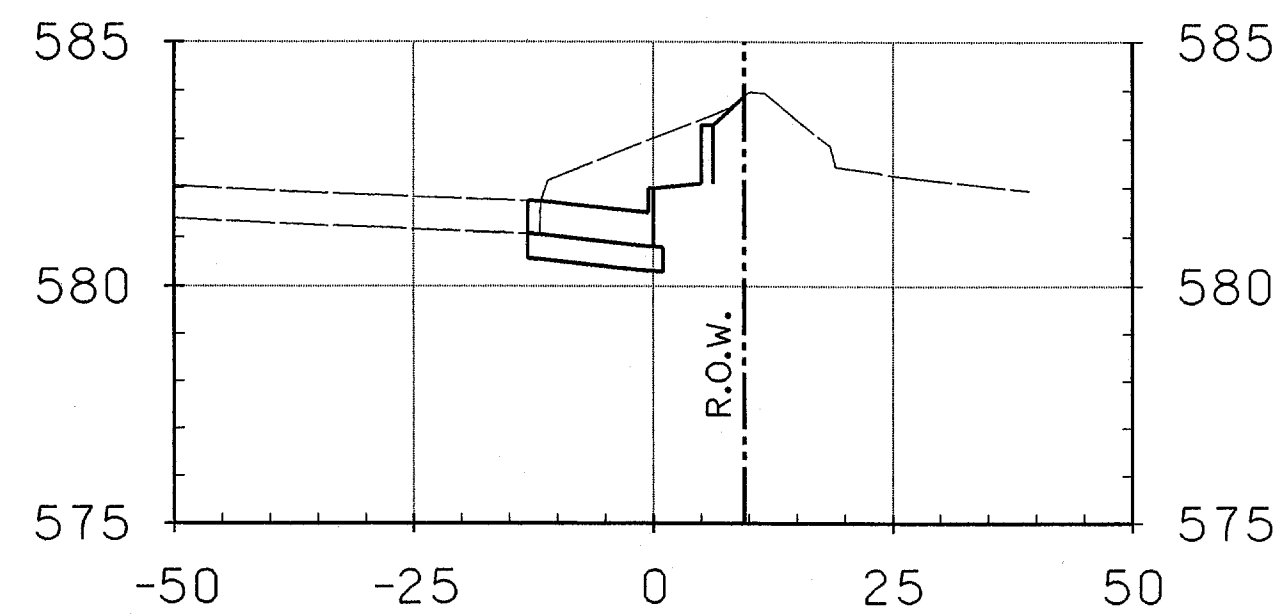
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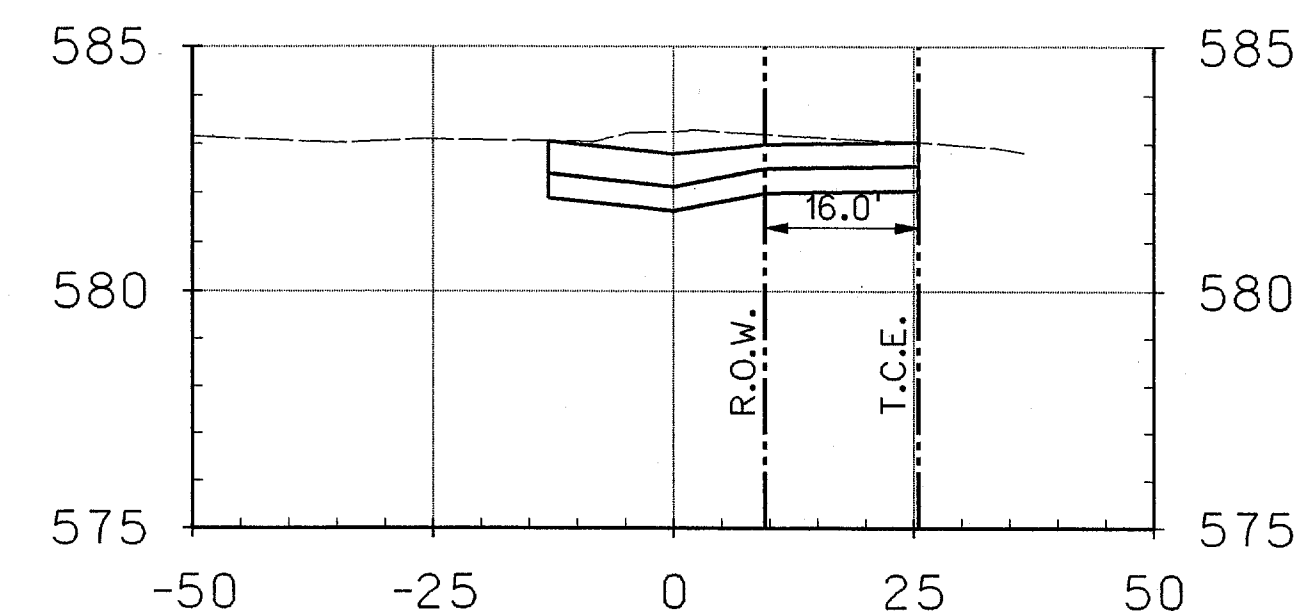
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MARSH LANE



10+00.00
MARSH LANE



11+50.00
MARSH LANE

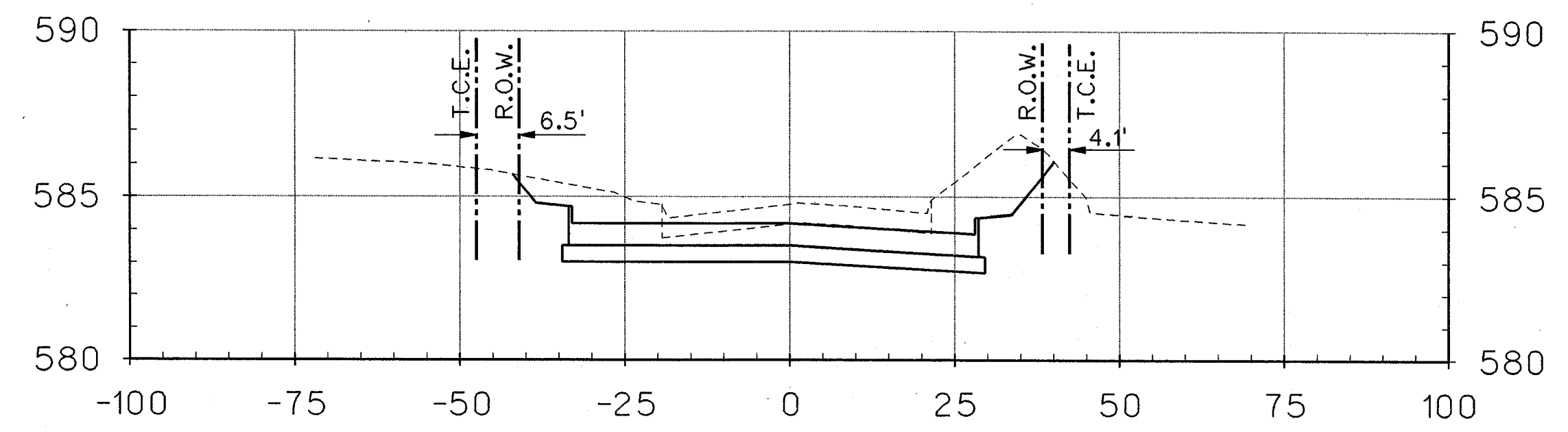
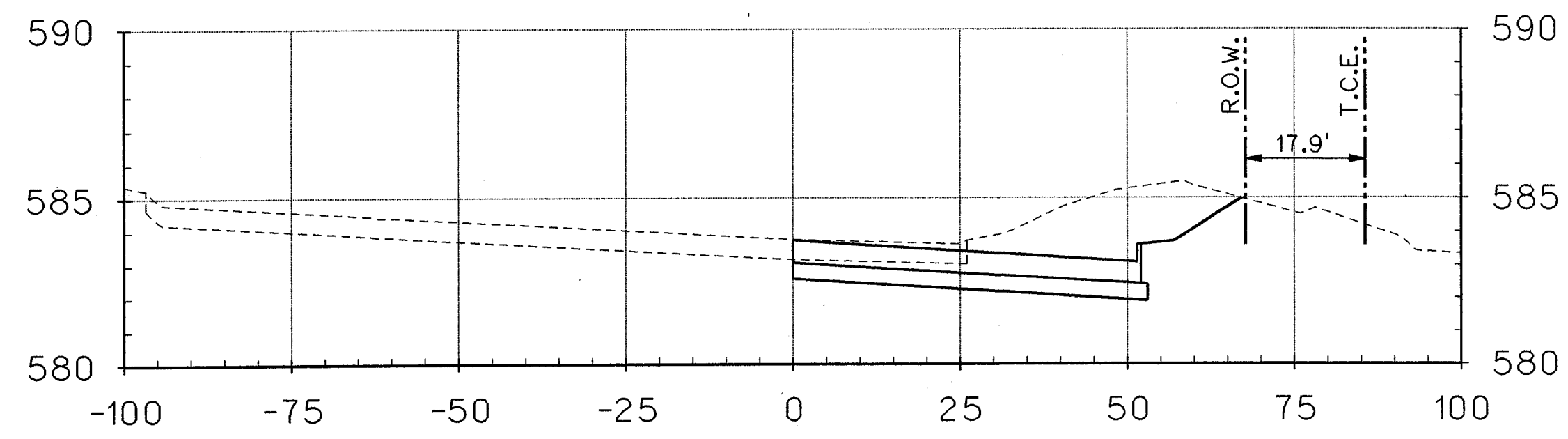
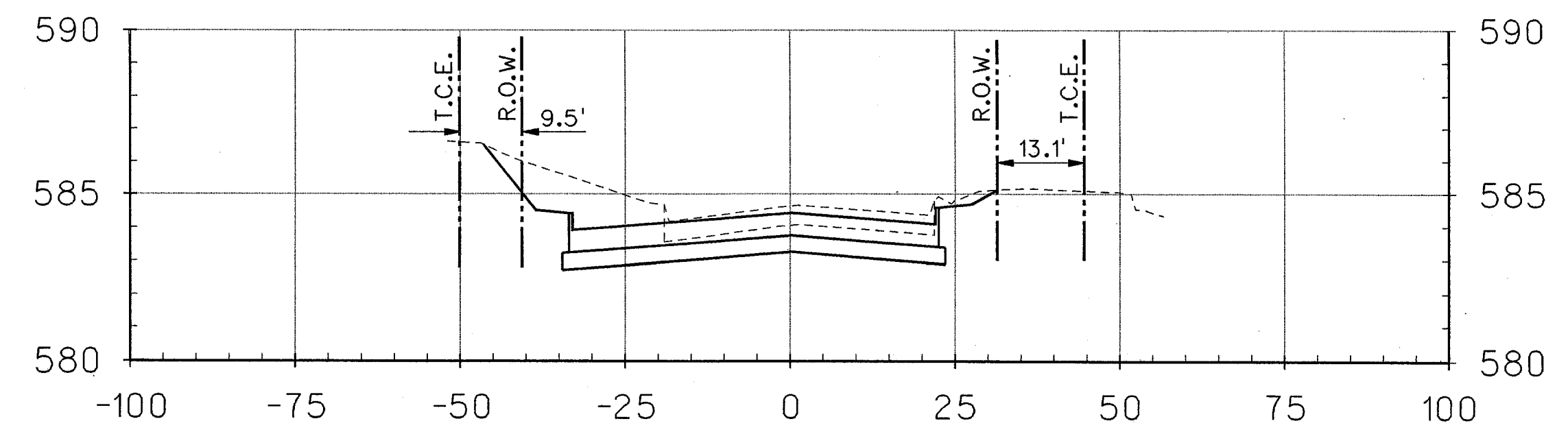
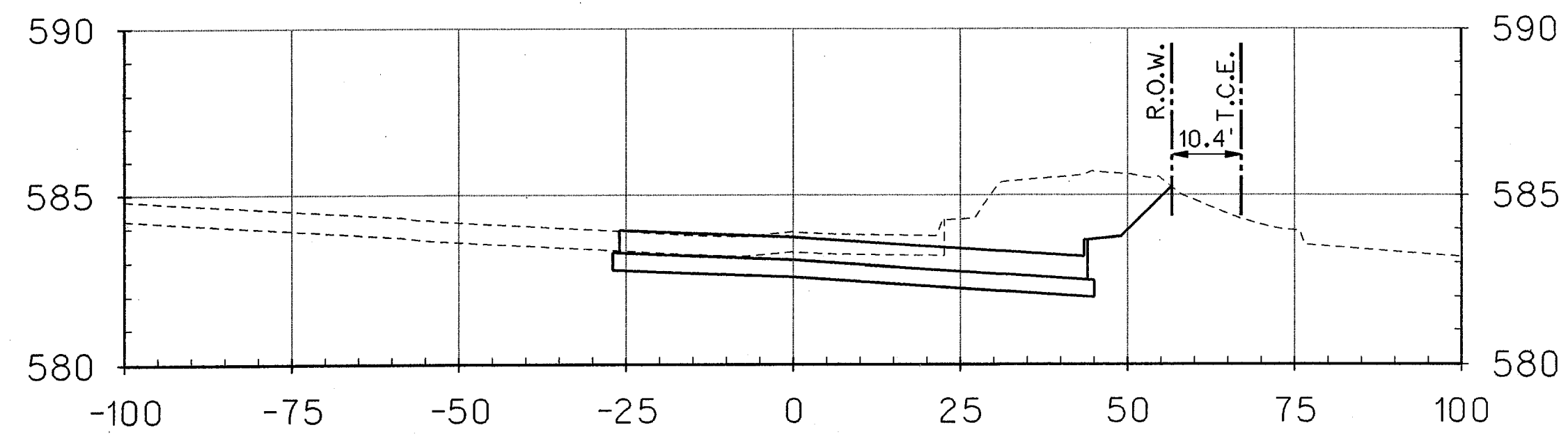
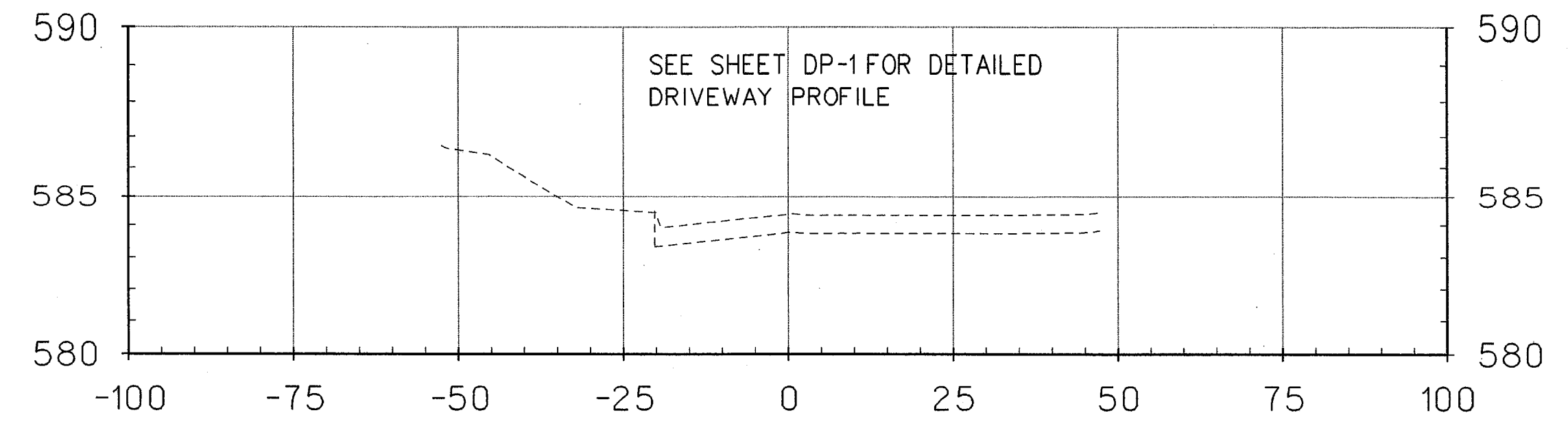
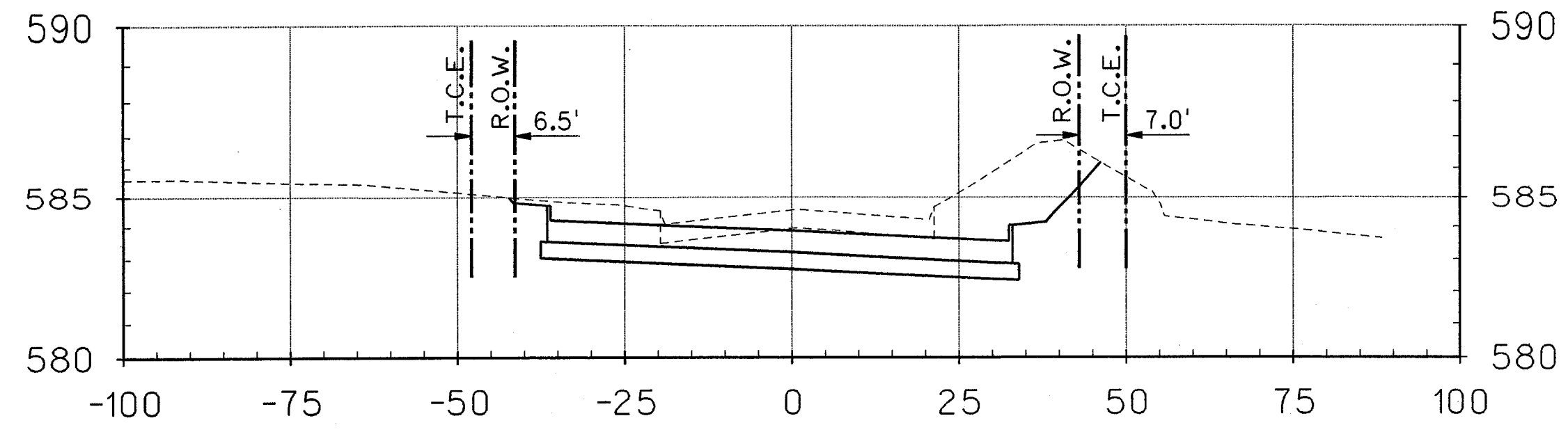


12+50.00
MARSH LANE

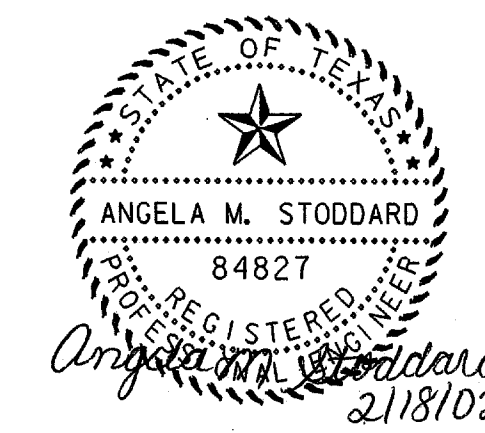
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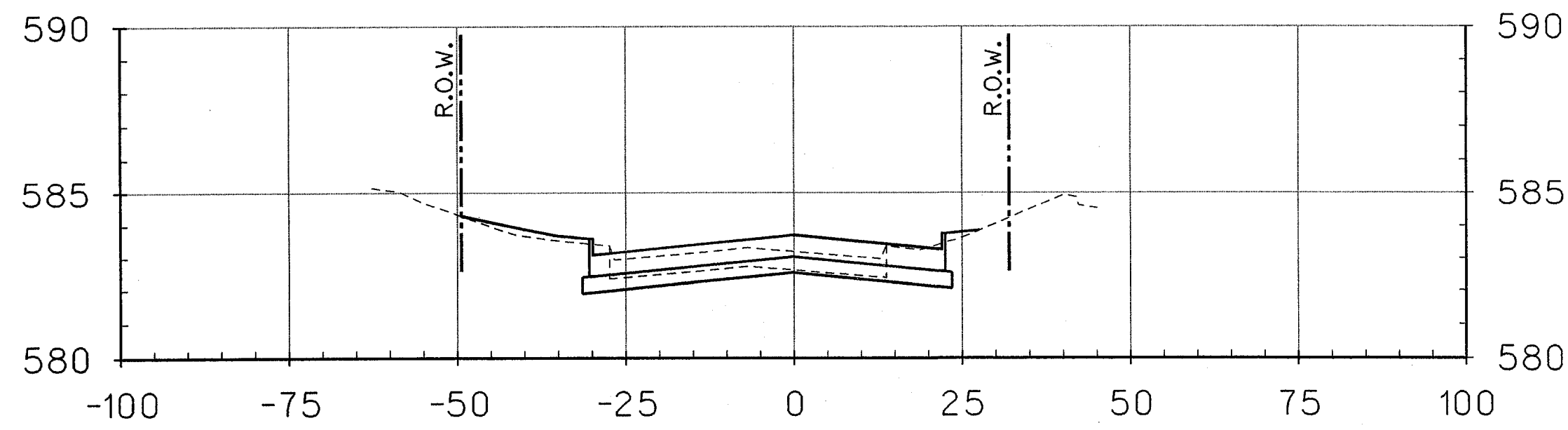
						81
NO.	DATE	REVISION	APPROV.			
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>						
ARAPAHO ROAD - PHASE II						
MARSH LANE TO SURVEYOR BOULEVARD						
CROSS SECTIONS MARSH LANE SHEET 1 OF 1						
TOWN OF ADDISON, TEXAS						
Design	AMS	Drawn	AMS	DATE	SCALE	PROJECT NO. SHEET ID
Check	JDH	Check	JDH	DEC 01	1" = 20' H 1" = 4' V	25768 X-1



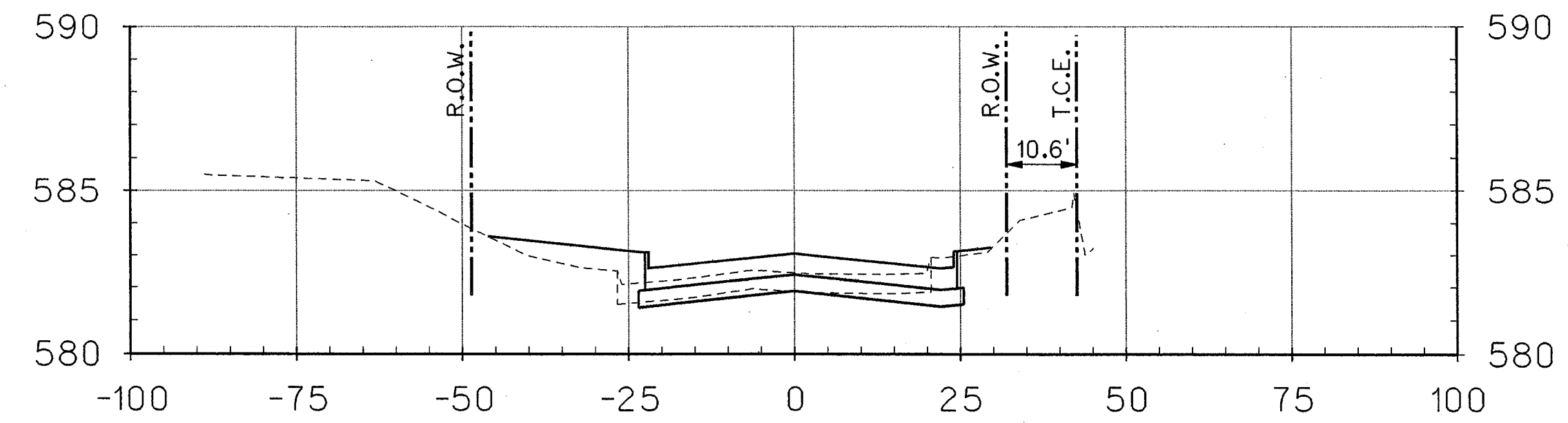
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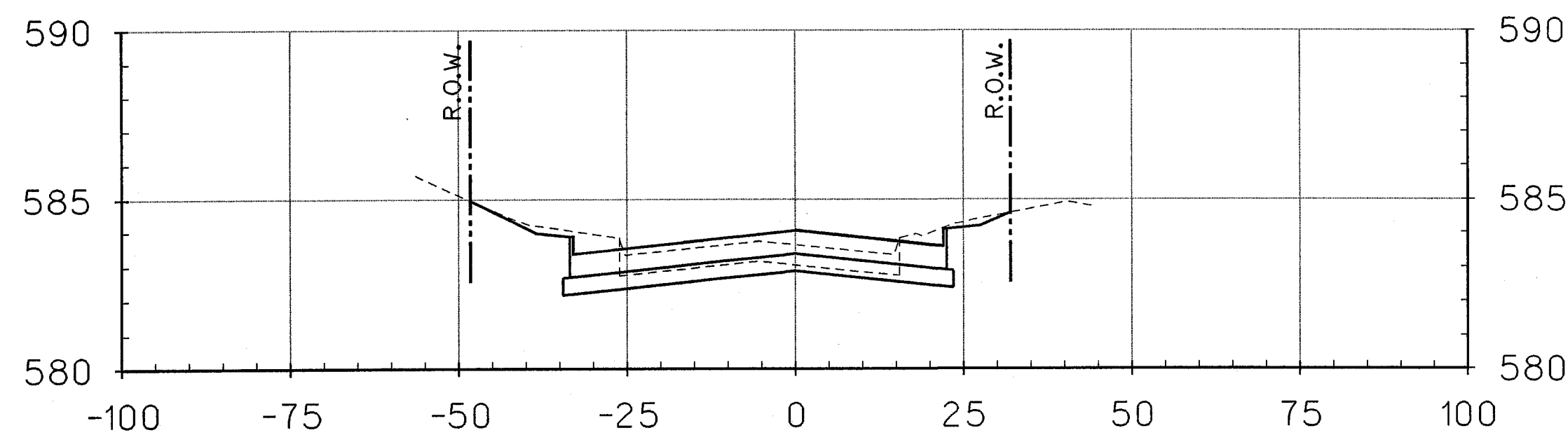
				82	
NO.	DATE	REVISION	APPROV.		
HNTB ARCHITECTS ENGINEERS PLANNERS <small>The HNTB Companies</small>					
ARAPAHO ROAD - PHASE II MARSH LANE TO SURVEYOR BOULEVARD					
CROSS SECTIONS STA. 10+41.06 (BEGIN) - STA. 12+33.90 SHEET 1 OF 10					
TOWN OF ADDISON, TEXAS					
Design	AMS	Drawn	AMS	DATE	SCALE
Check	JDH	Check	JDH	DEC 01	1" = 20' H 1" = 4' V
				PROJECT NO.	SHEET ID
				25768	X-2



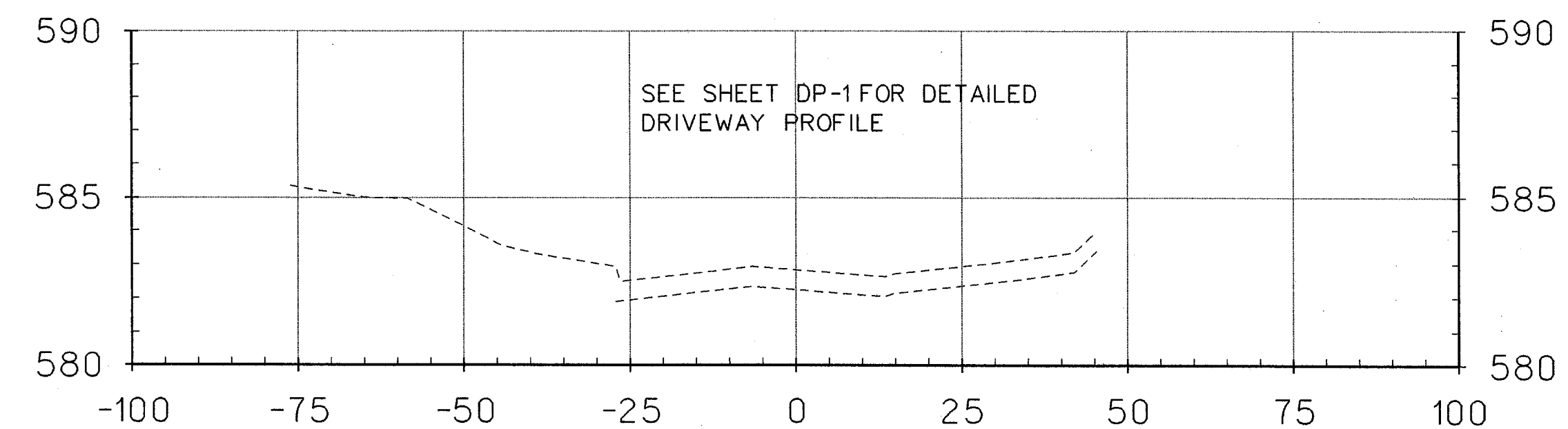
13+50.00



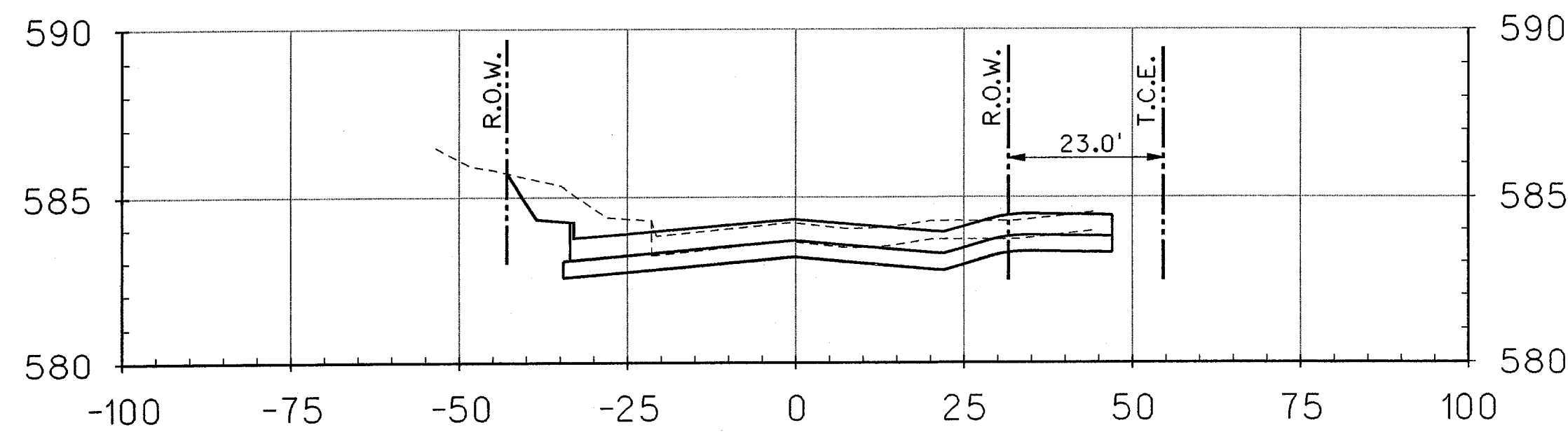
14+50.00



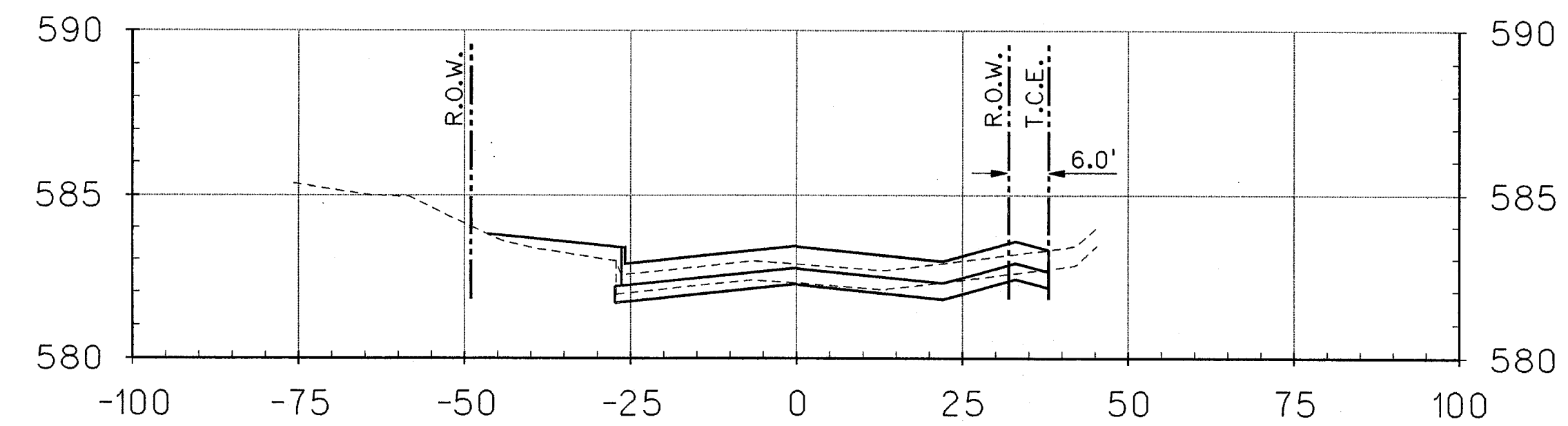
13+00.00



14+01.44
Q DRIVE

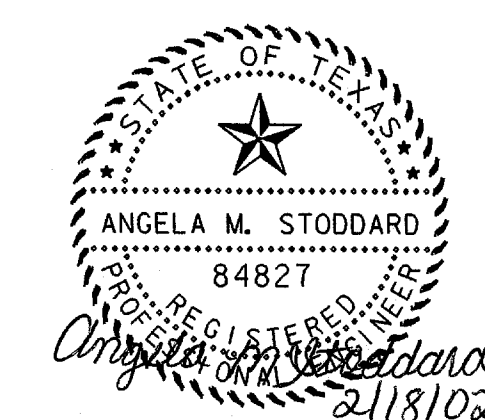


12+50.00

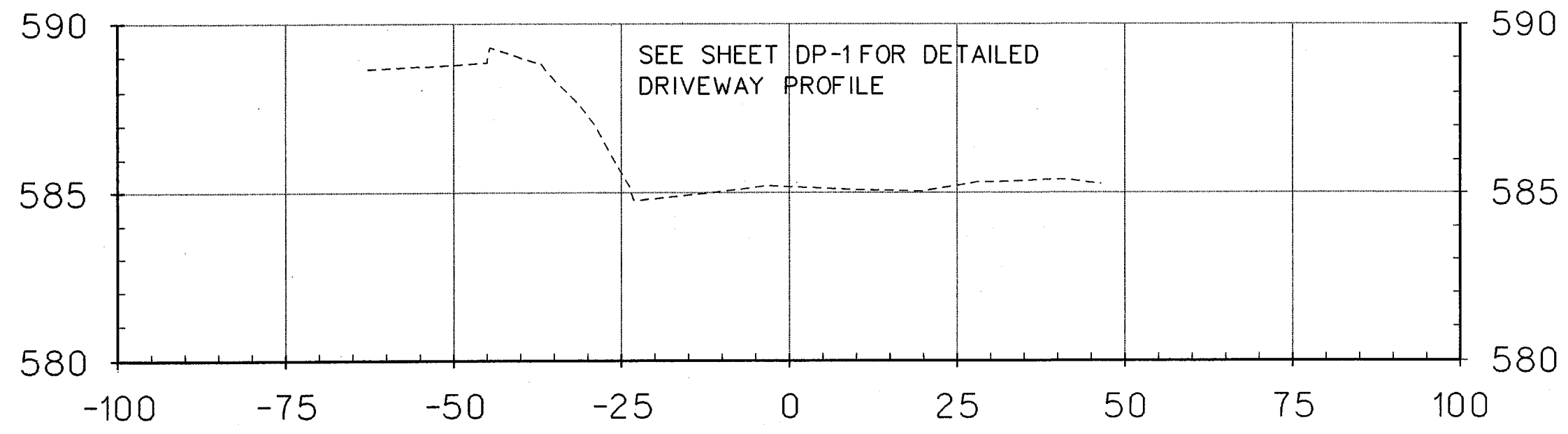


14+00.00

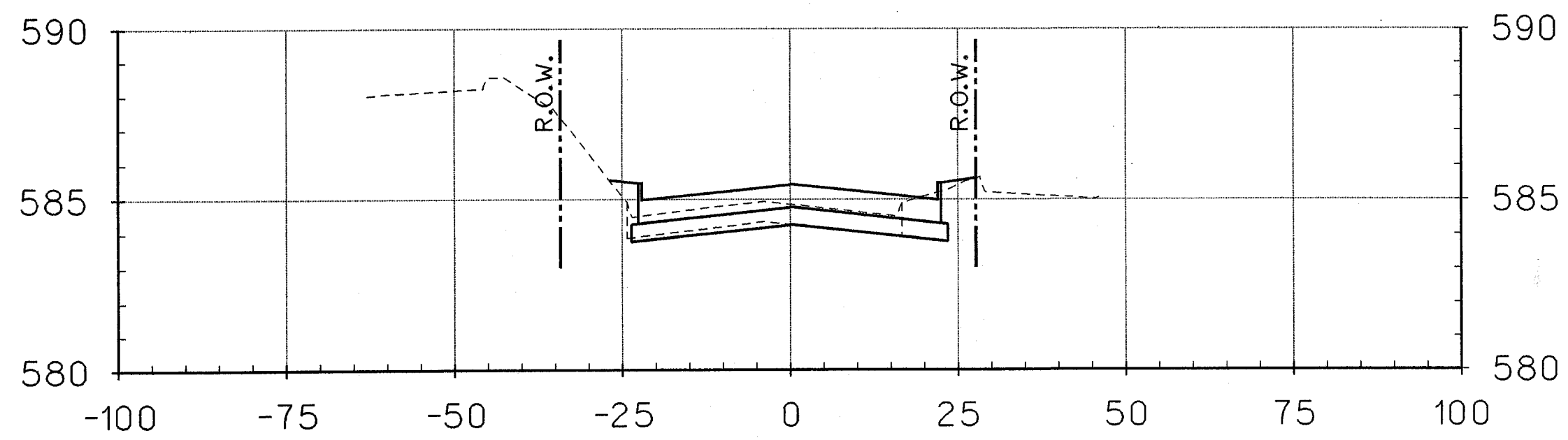
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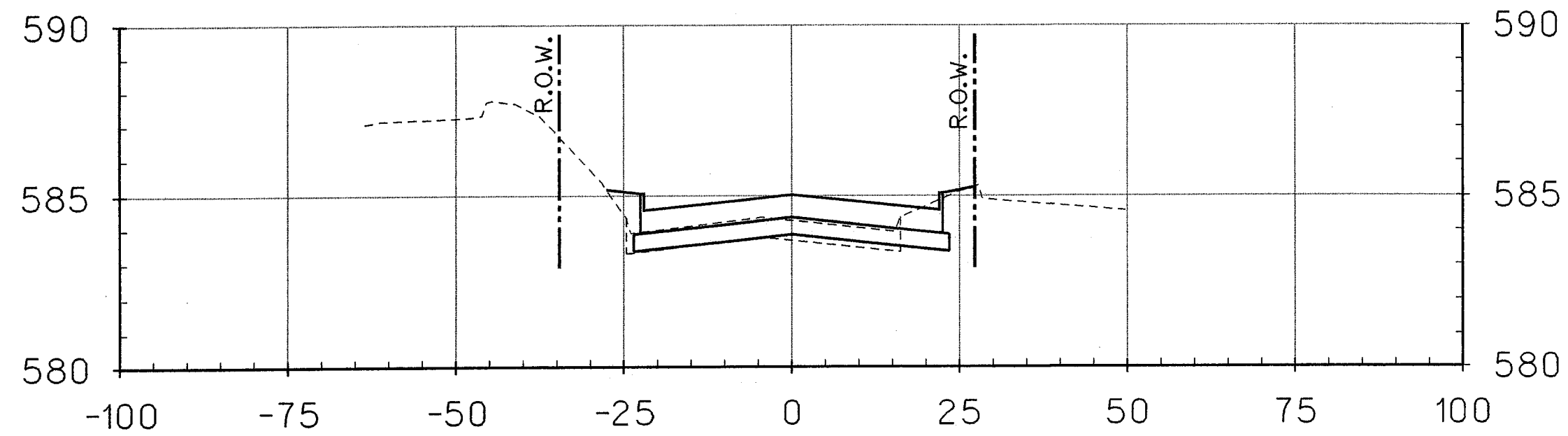
						83
NO.	DATE	REVISION			APPROV.	
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>						
ARAPAHO ROAD - PHASE II						
MARSH LANE TO SURVEYOR BOULEVARD						
CROSS SECTIONS STA. 12+50 - STA. 14+50 SHEET 2 OF 10						
TOWN OF ADDISON, TEXAS						
Design	AMS	Drawn	AMS	DATE	SCALE	PROJECT NO. SHEET ID
Check	JDH	Check	JDH	DEC 01	1" = 20' H 1" = 4' V	25768 X-3



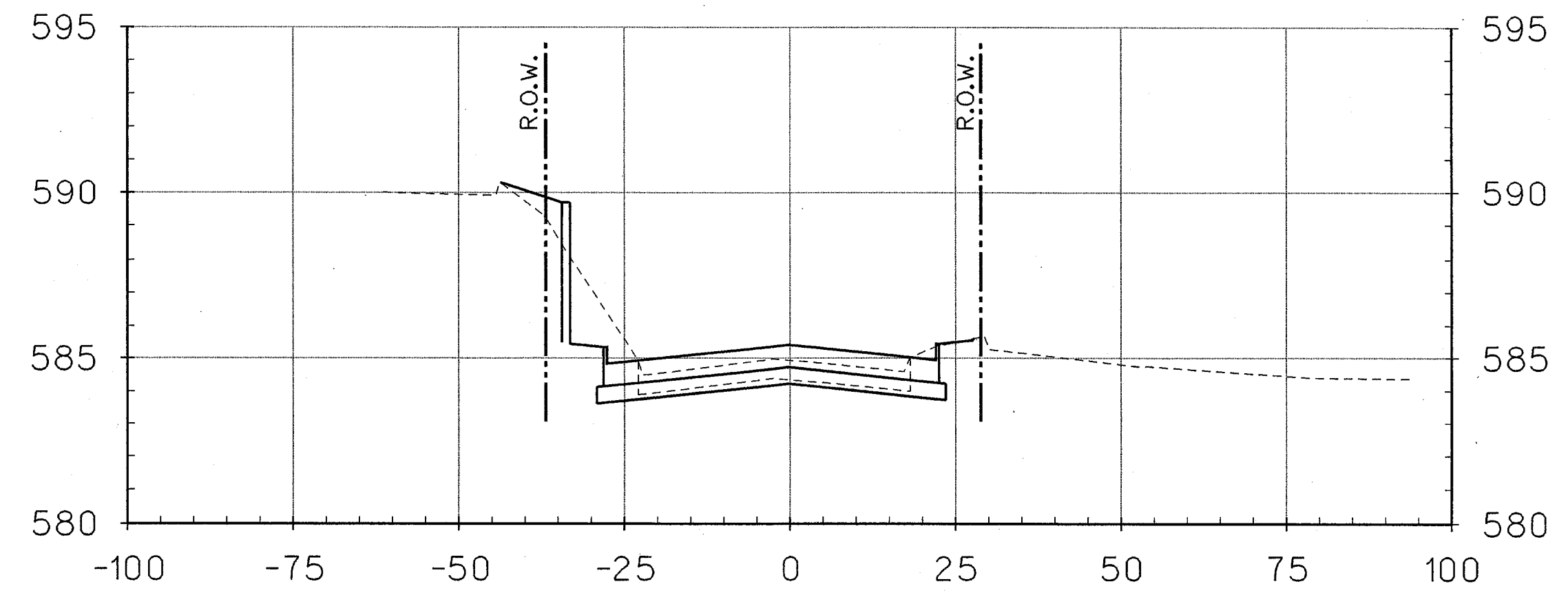
17+99.96
Q DRIVE



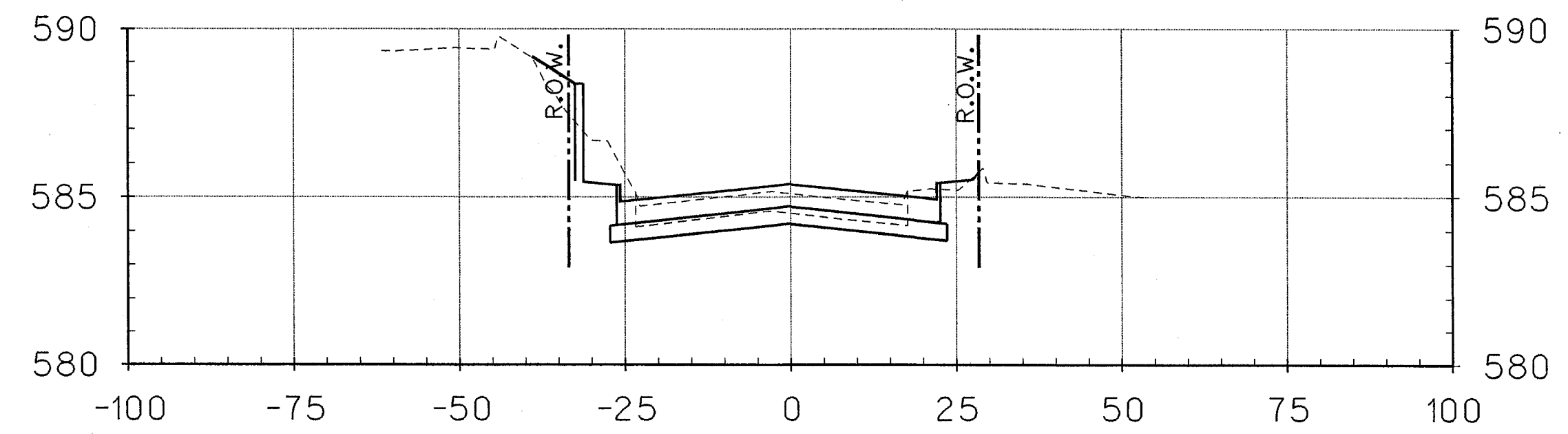
17+50.00



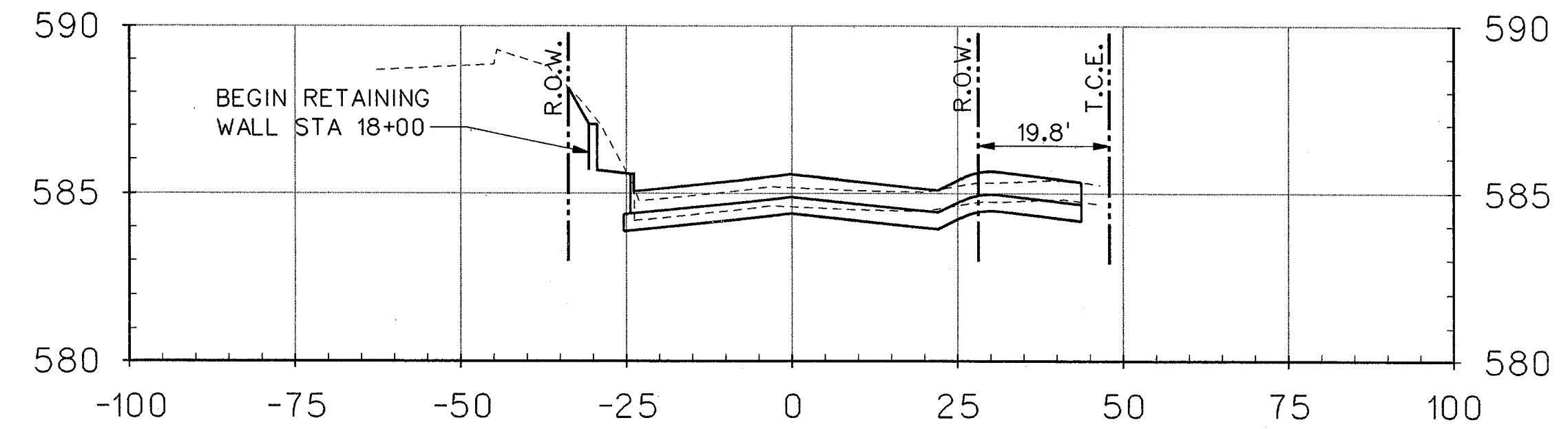
17+00.00



19+00.00



18+50.00

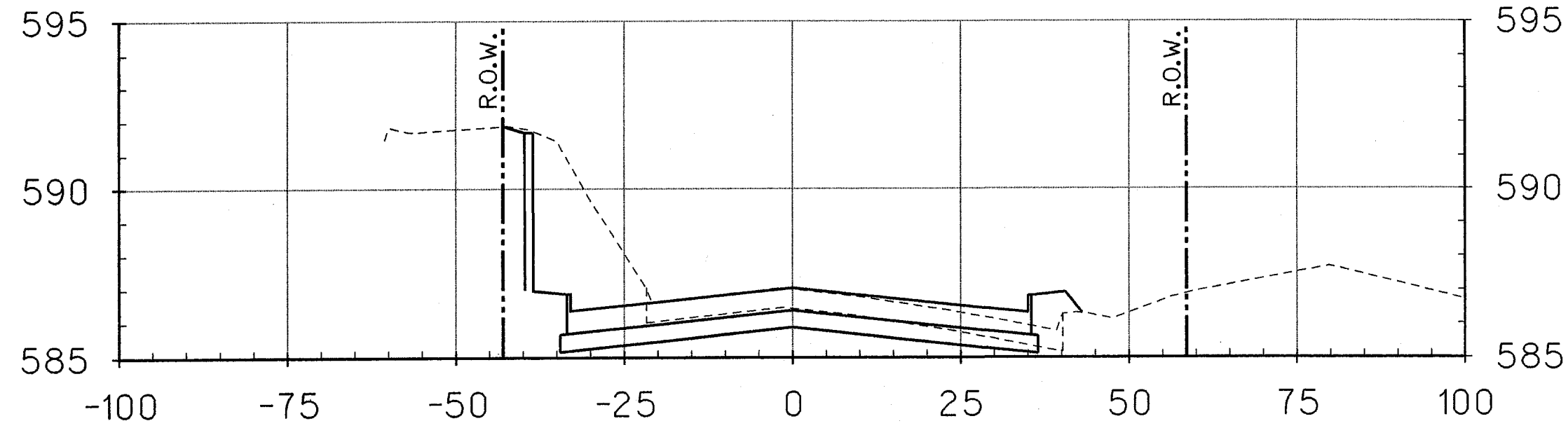


18+00.00

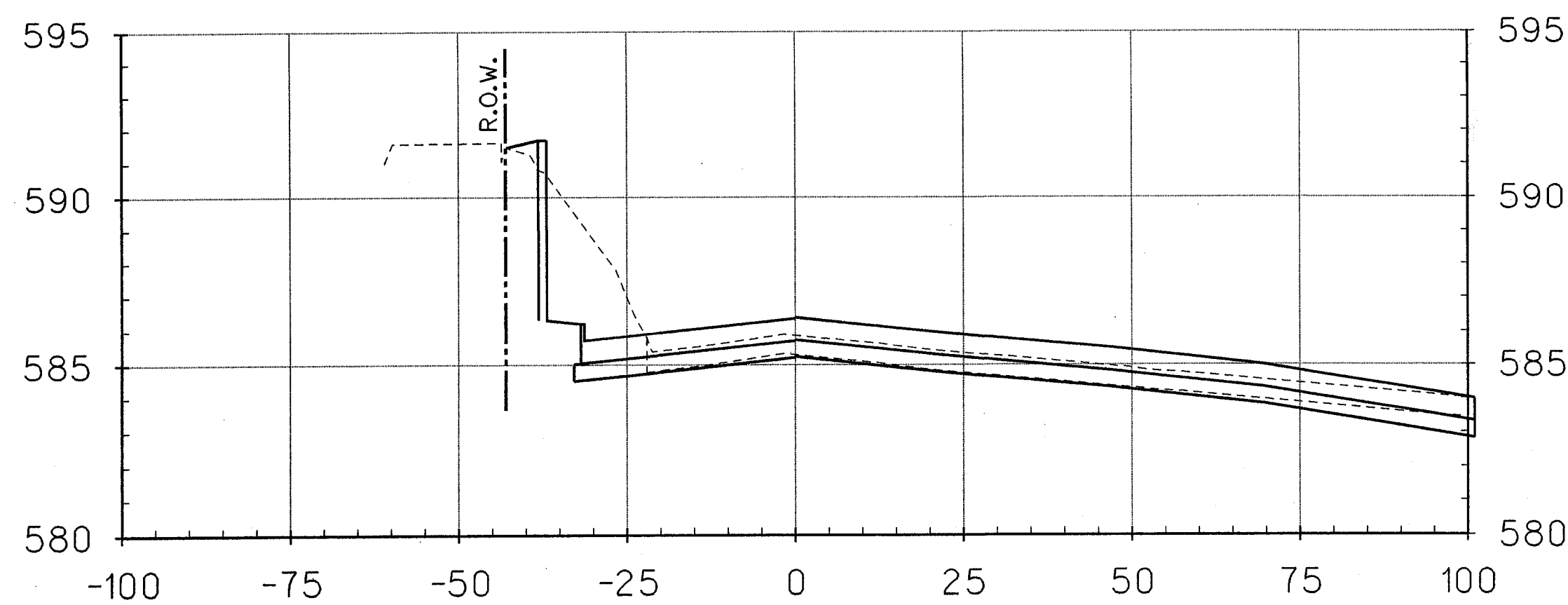
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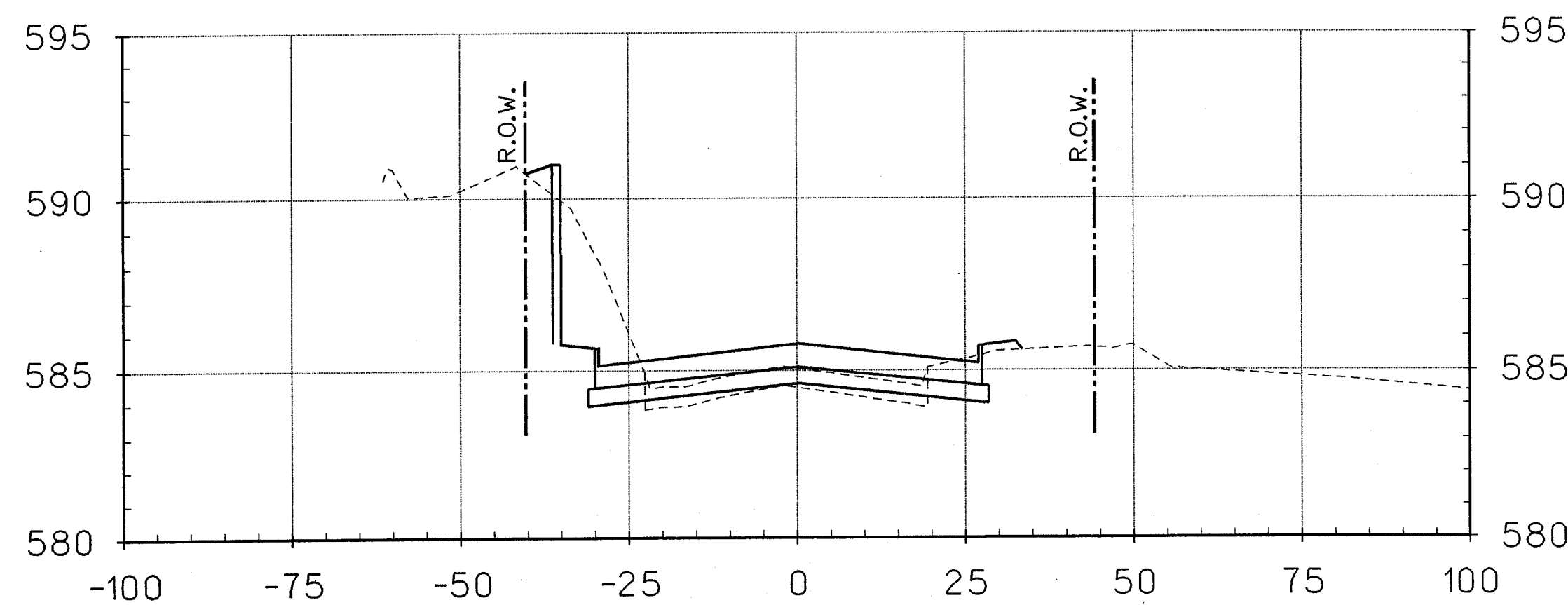
										85
NO.	DATE	REVISION	APPROV.							
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>										
ARAPAHO ROAD - PHASE II MARSH LANE TO SURVEYOR BOULEVARD										
CROSS SECTIONS STA. 17+00 - STA. 18+50 SHEET 4 OF 10										
TOWN OF ADDISON, TEXAS										
Design	AMS	Drawn	AMS	DATE	SCALE	PROJECT NO.	SHEET ID			
Check	JDH	Check	JDH	DEC 01	1" = 20'H 1" = 4'V	25768	X-5			



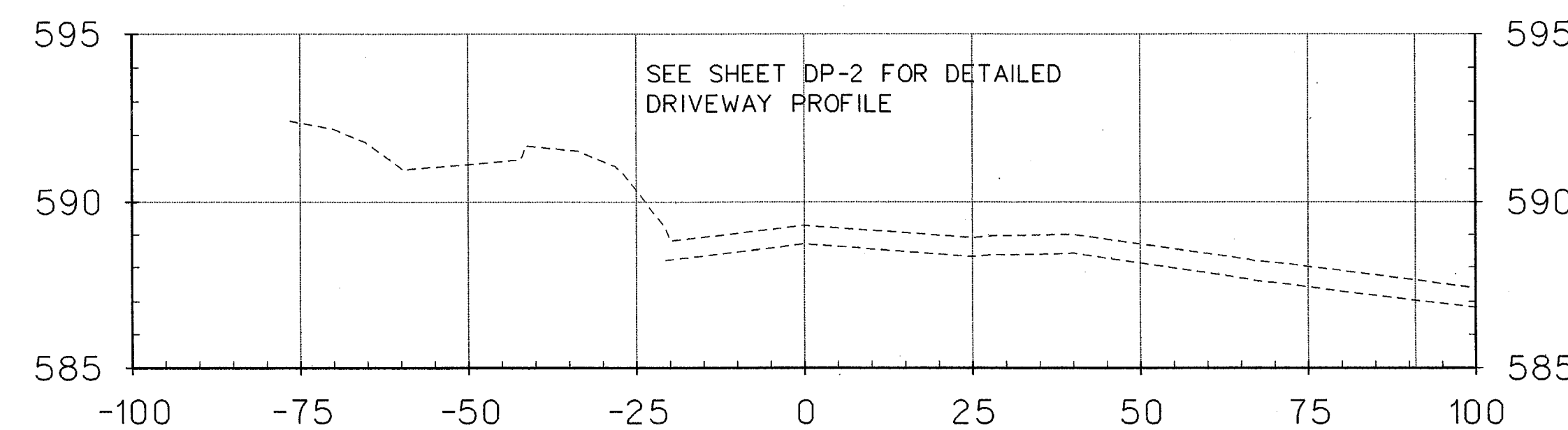
20+50.00



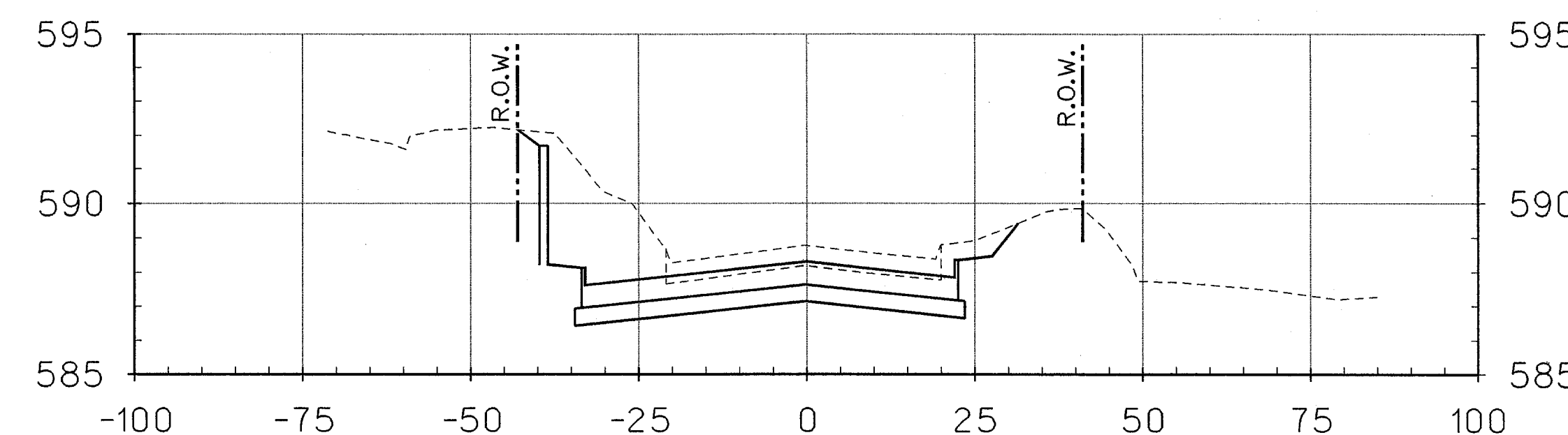
20+00.00



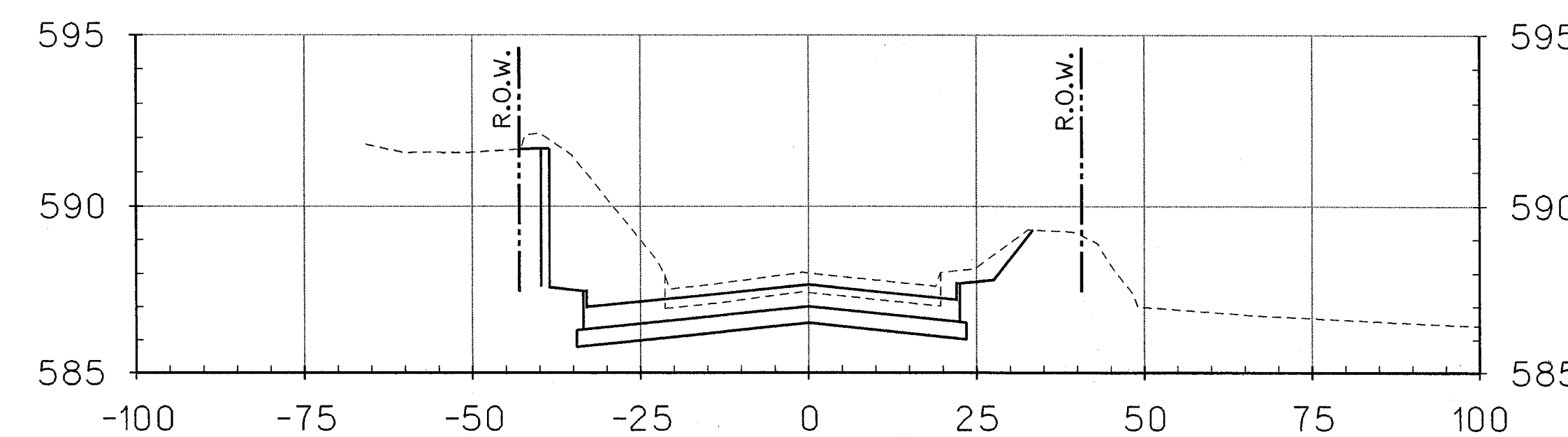
19+50.00



21+98.12
Q DRIVE



21+50.00

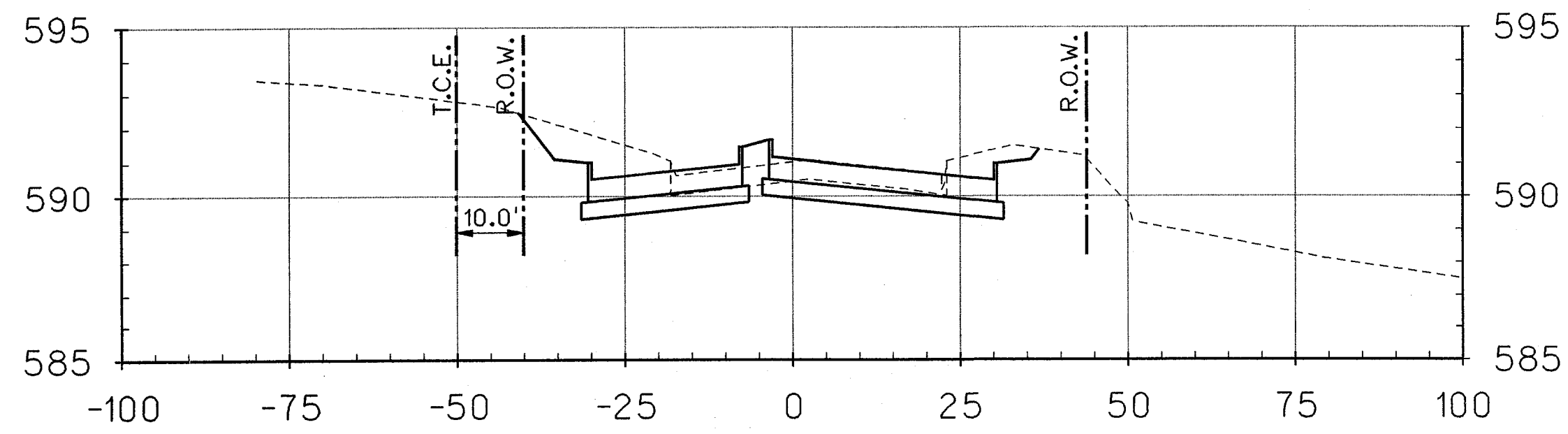


21+00.00

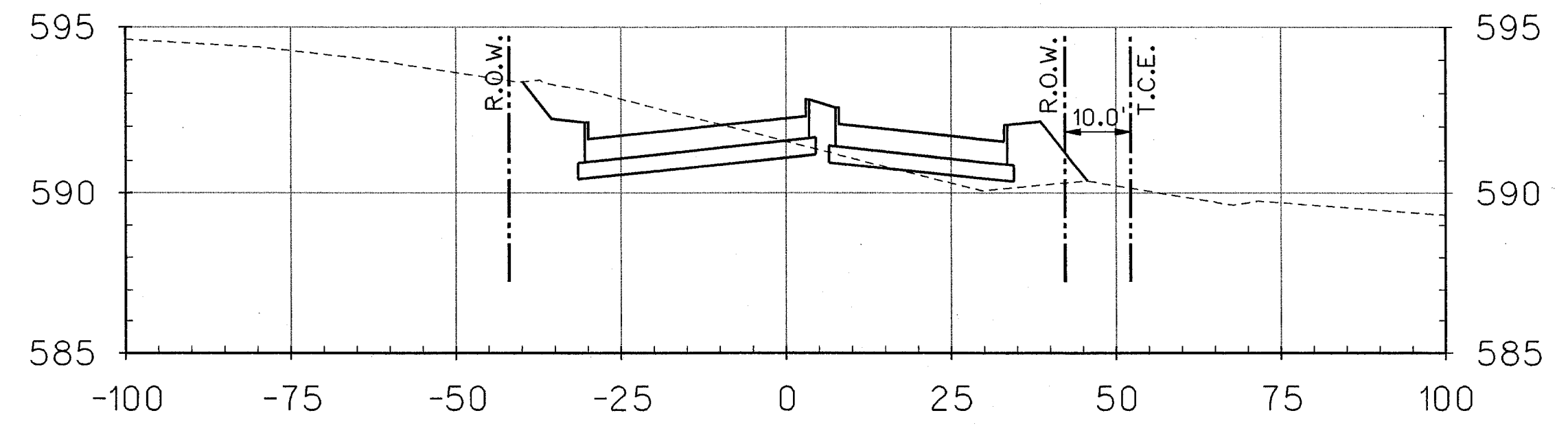
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NO. DATE REVISION APPROV.						
HNTB ARCHITECTS ENGINEERS PLANNERS <small>The HNTB Companies</small>						
ARAPAHO ROAD - PHASE II MARSH LANE TO SURVEYOR BOULEVARD						
CROSS SECTIONS STA. 19+00 - STA. 21+00 SHEET 5 OF 10						
TOWN OF ADDISON, TEXAS						
Design	AMS	Drawn	AMS	DATE	SCALE	PROJECT NO. SHEET ID
Check	JDH	Check	JDH	DEC 01	1" = 20' H 1" = 4' V	25768 X-6



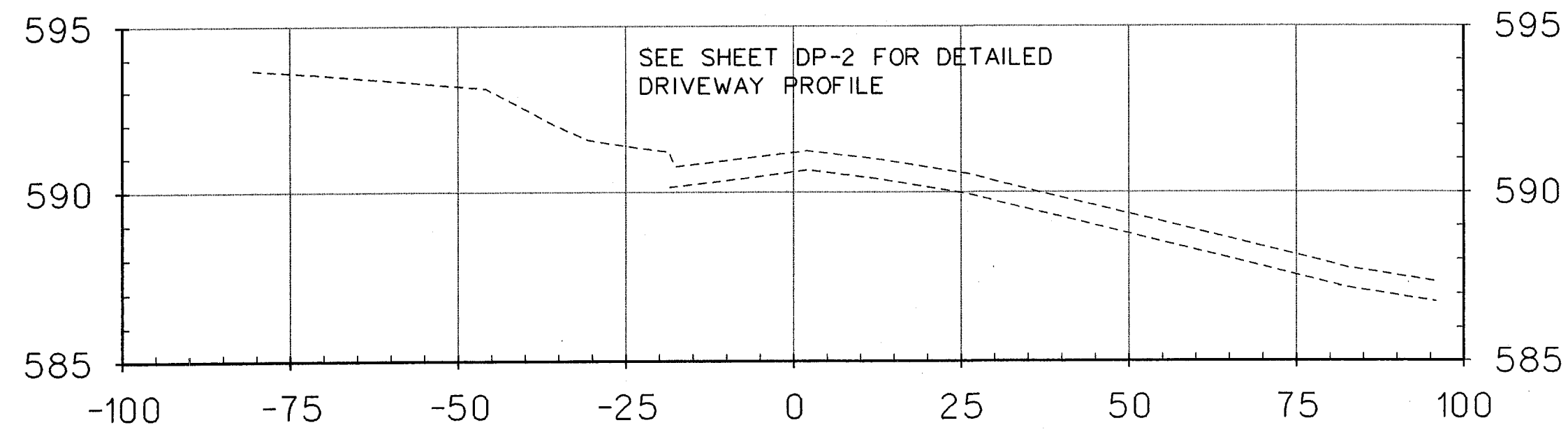
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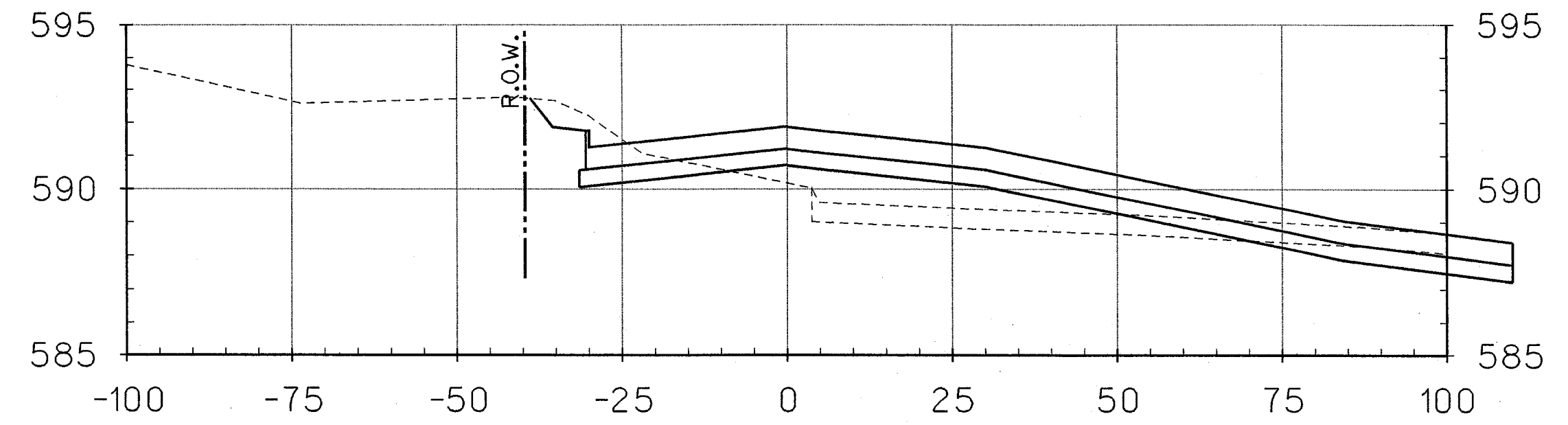
25+00.00



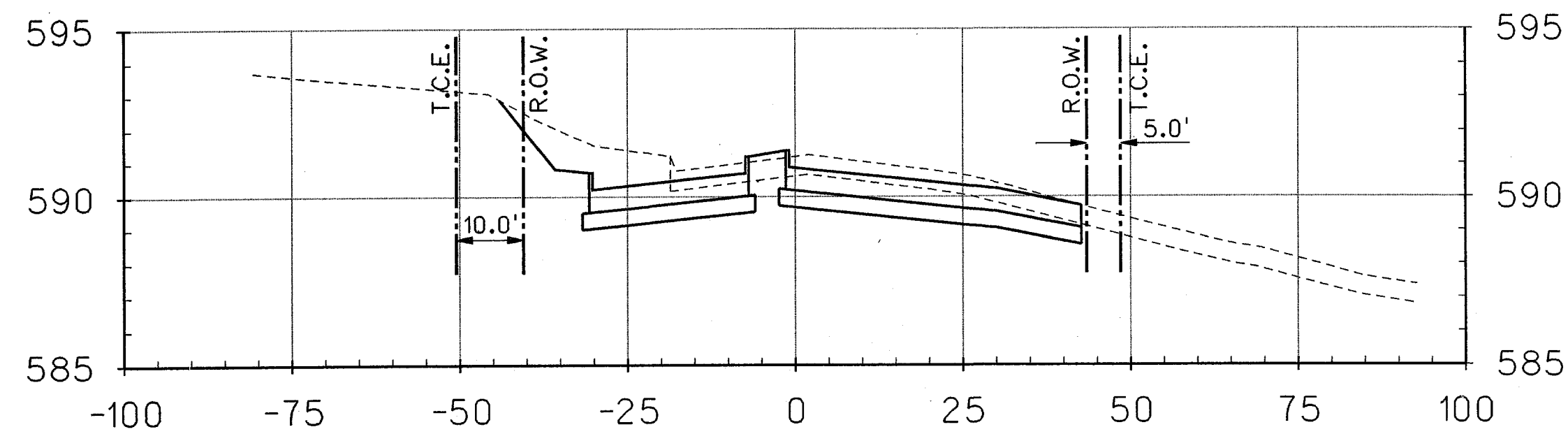
26+50.00



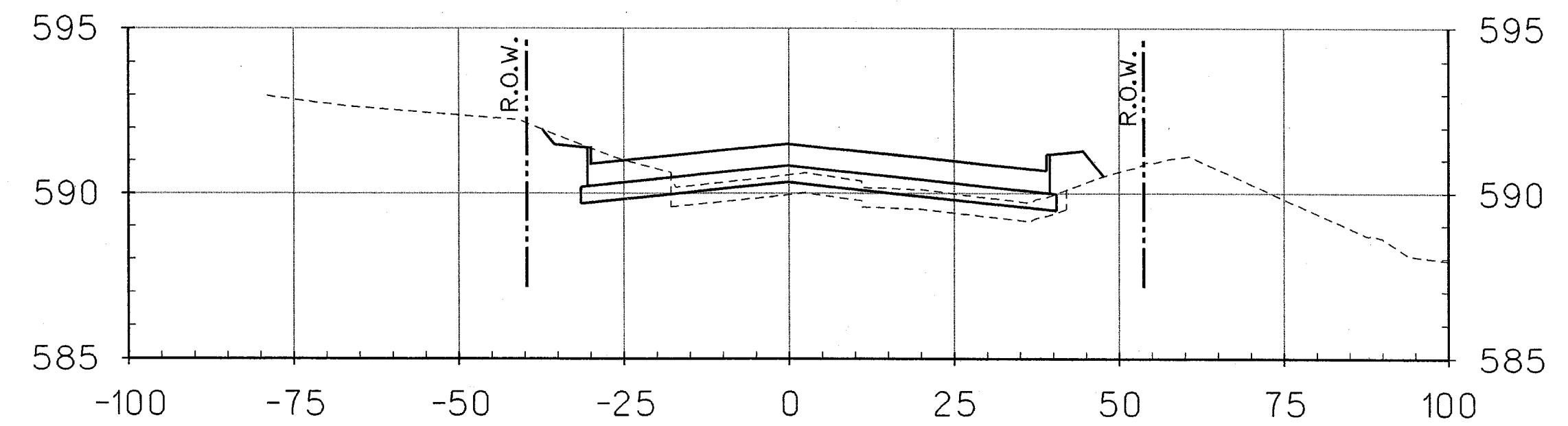
24+60.01
☉ DRIVE



26+00.00



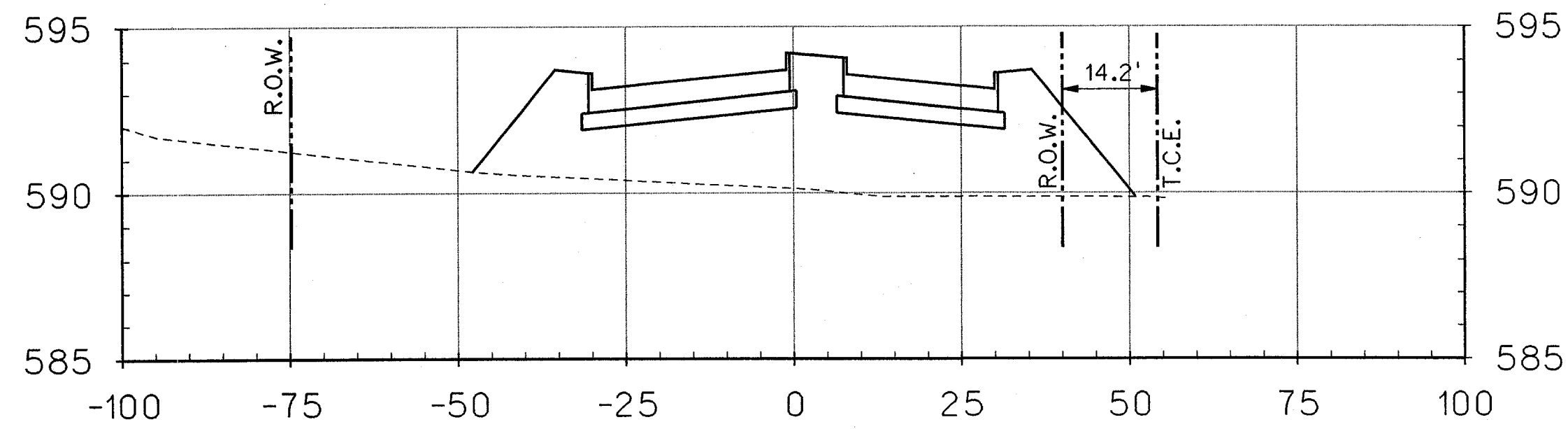
24+50.00



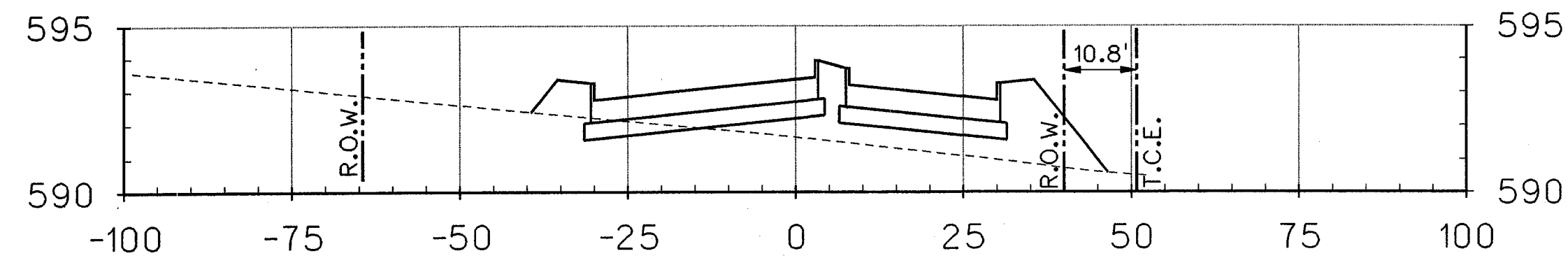
25+50.00

						88
NO.	DATE	REVISION			APPROV.	
HNTB ARCHITECTS ENGINEERS PLANNERS <small>The HNTB Companies</small>						
ARAPAHO ROAD - PHASE II MARSH LANE TO SURVEYOR BOULEVARD						
CROSS SECTIONS STA. 23+50 - STA. 25+50 SHEET 7 OF 10						
TOWN OF ADDISON, TEXAS						
Design	AMS	Drawn	AMS	DATE	SCALE	PROJECT NO. SHEET ID
Check	JDH	Check	JDH	DEC 01	1" = 20' H 1" = 4' V	25768 X-8

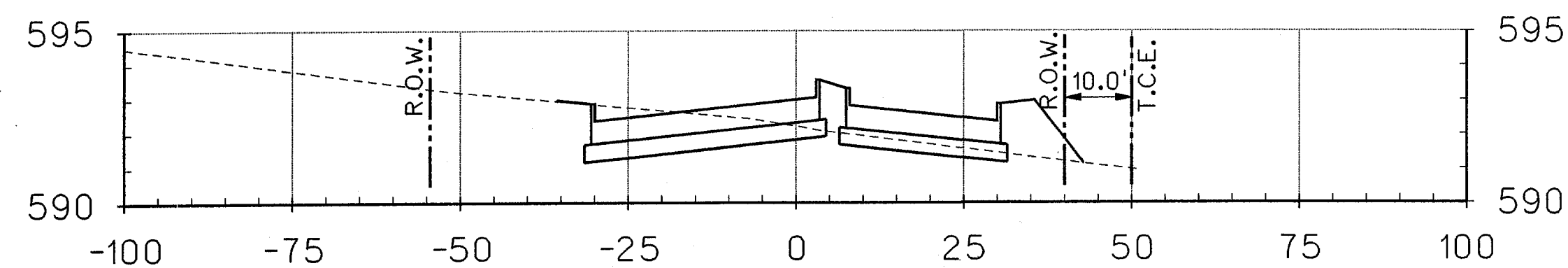




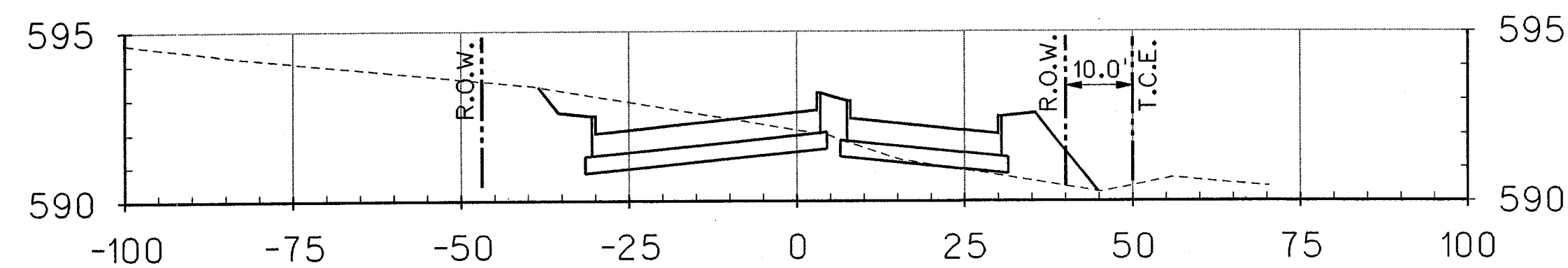
28+50.00



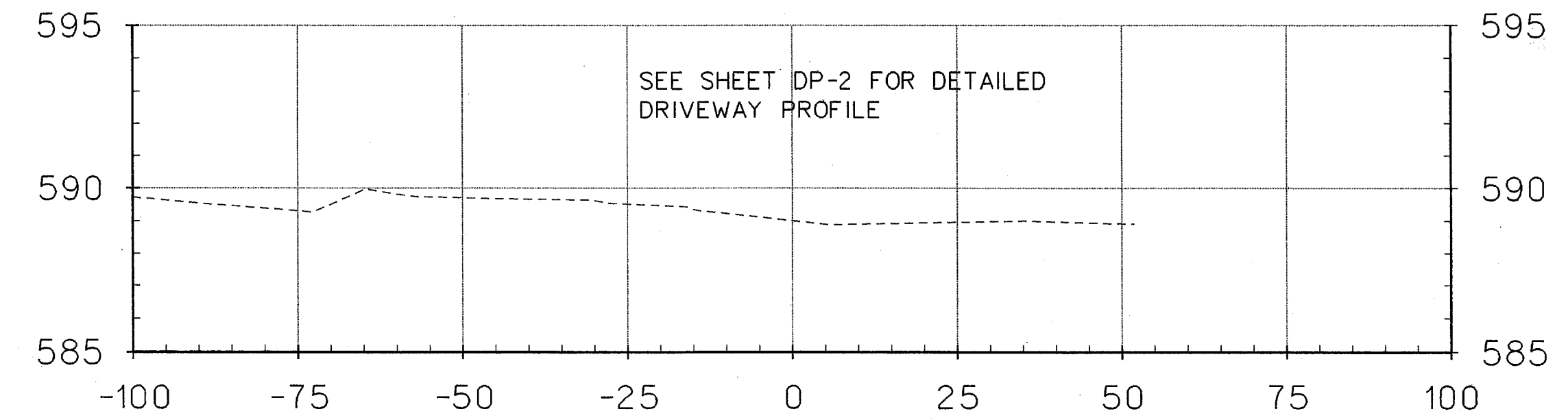
28+00.00



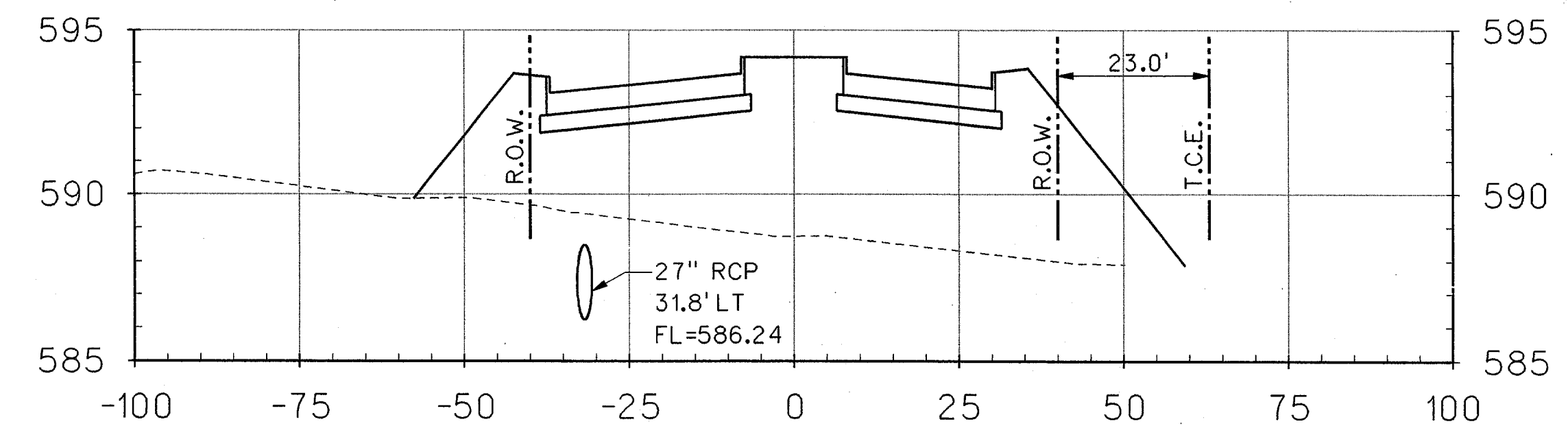
27+50.00



27+00.00

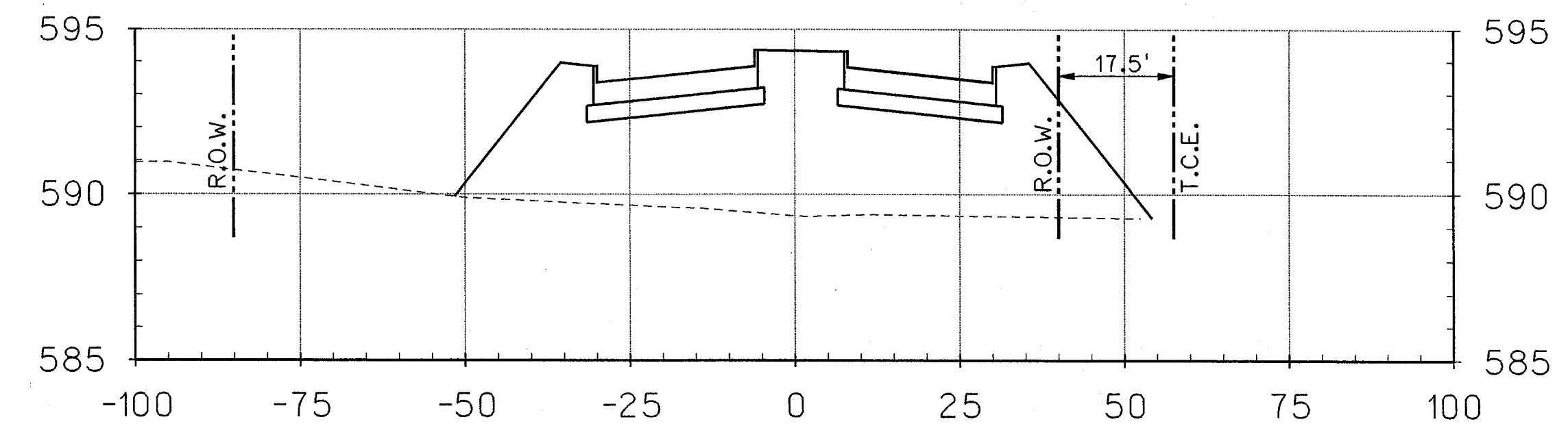


29+73.95
Q DRIVE



NOTE: NO TCE REQUIRED ON LEFT SIDE DUE TO TXU AGREEMENT LETTER DATED NOV. 30, 2001.

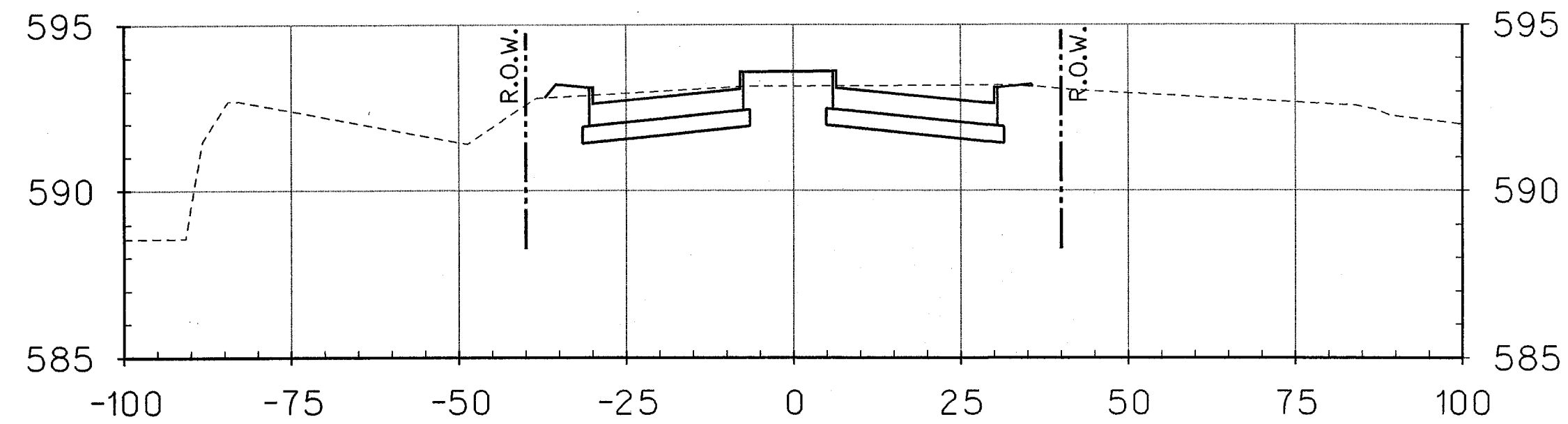
29+50.00



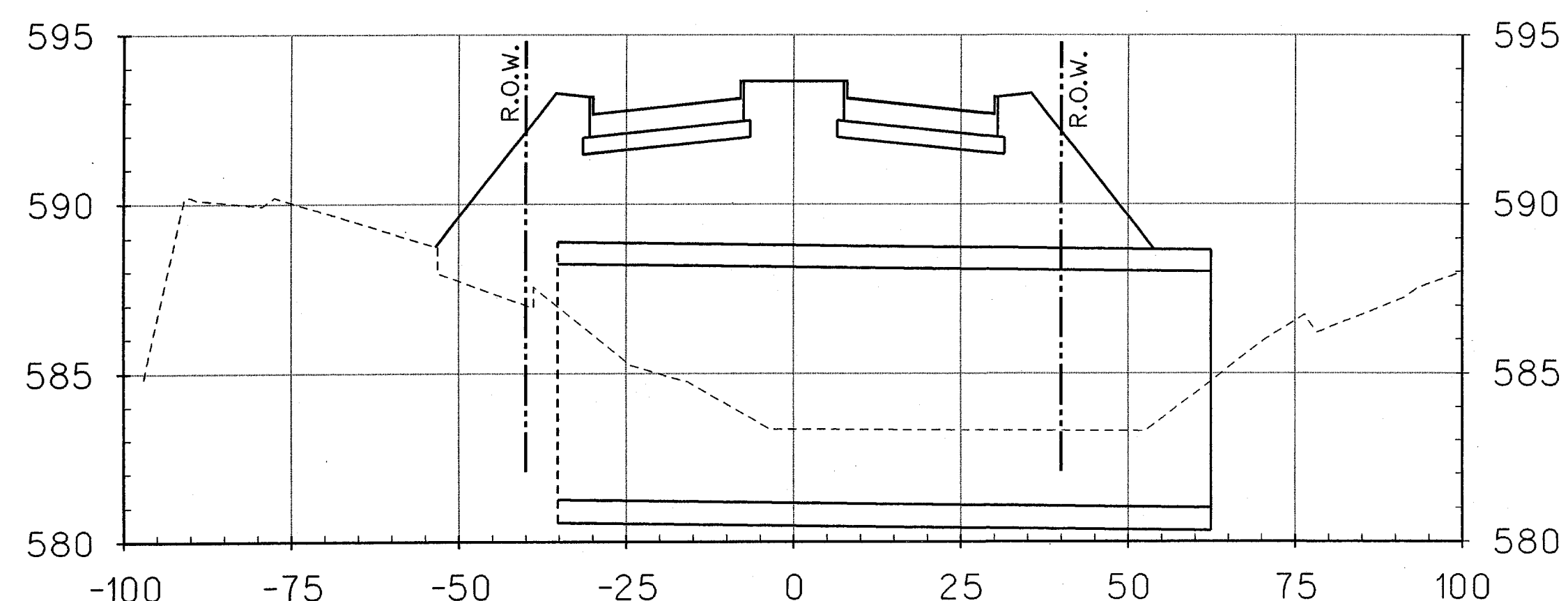
29+00.00

NO.	DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS <small>The HNTB Companies</small>			
ARAPAHO ROAD - PHASE II			
MARSH LANE TO SURVEYOR BOULEVARD			
CROSS SECTIONS STA. 26+00 - STA. 28+50 SHEET 8 OF 10			
TOWN OF ADDISON, TEXAS			
Design	AMS	Drawn	AMS
DATE	DEC 01	SCALE	1" = 20' H 1" = 4' V
PROJECT NO.	25768	SHEET ID	X-9
Check	JDH	Check	JDH



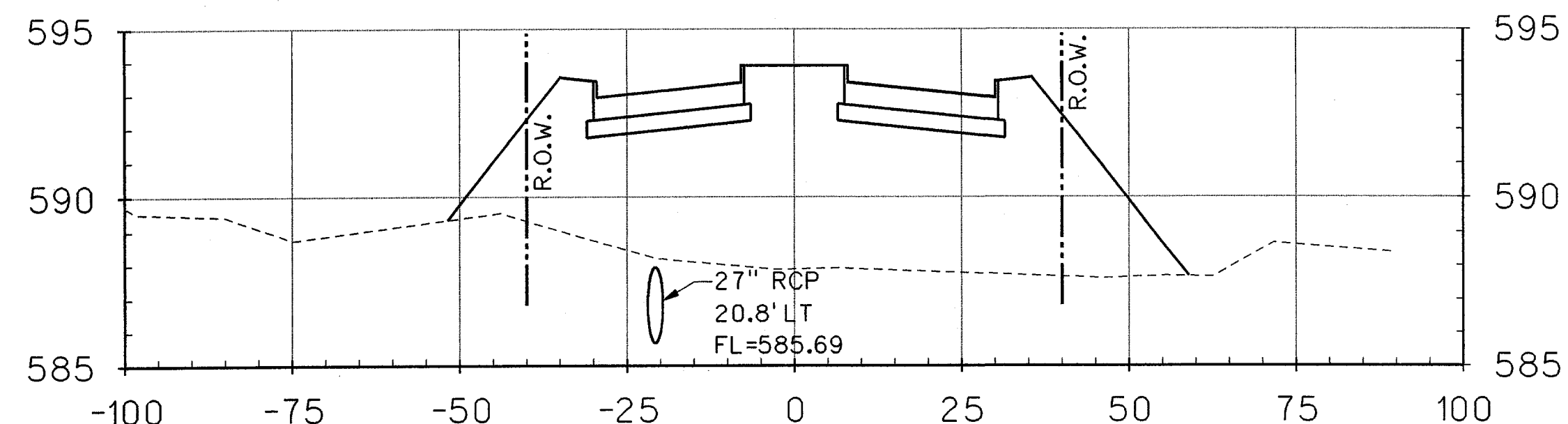


31+00.00



NOTE: NO TCE REQUIRED DUE TO TXU AGREEMENT
LETTER DATED NOV. 30, 2001 AND DRAINAGE EASEMENT.

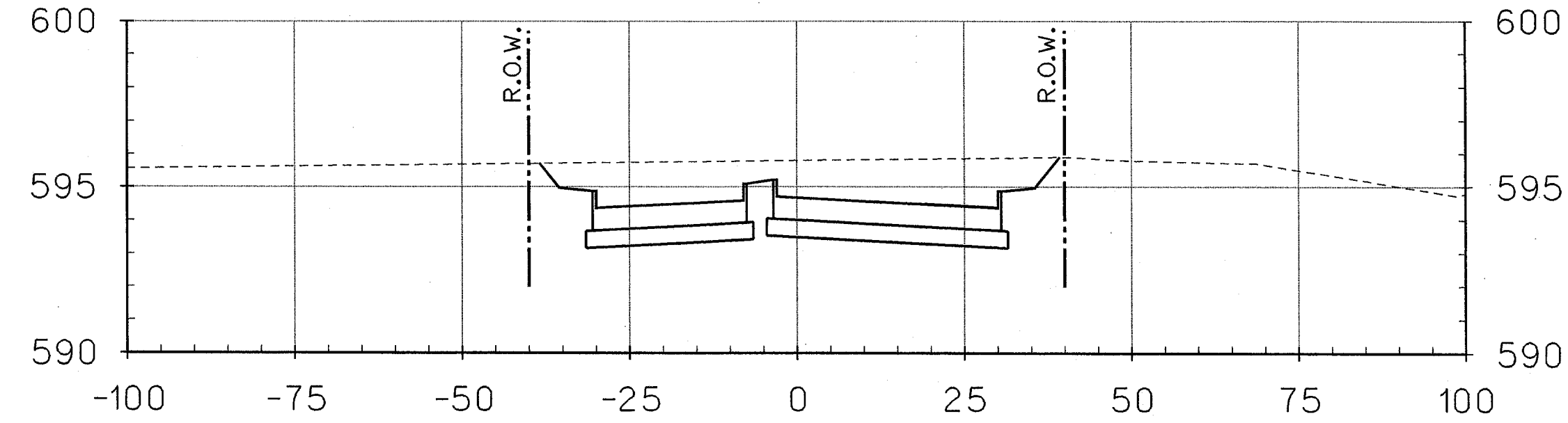
30+50.00



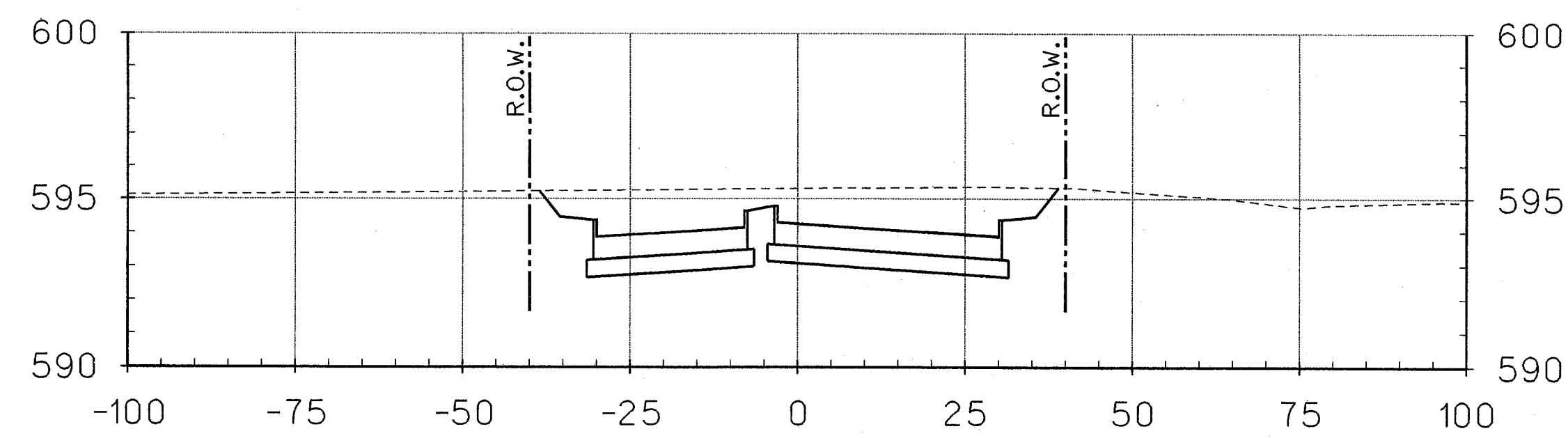
NOTE: NO TCE REQUIRED DUE TO TXU AGREEMENT
LETTER DATED NOV. 30, 2001.

30+00.00

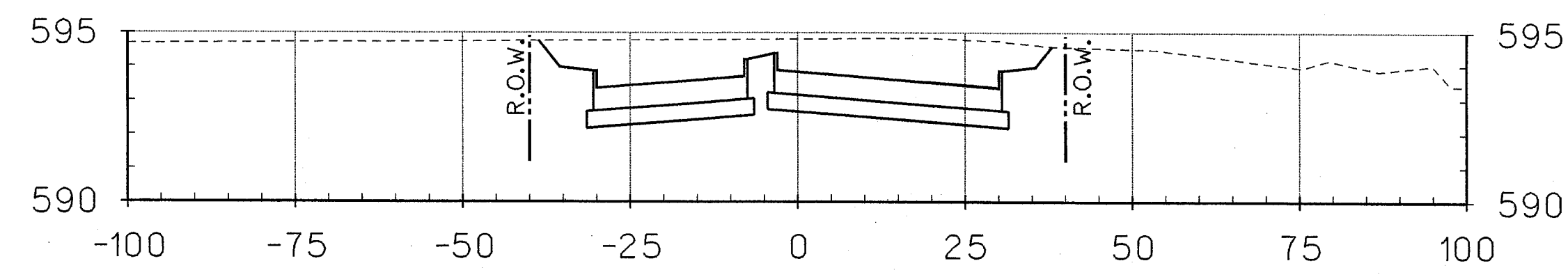
27" RCP
20.8' LT
FL=585.69



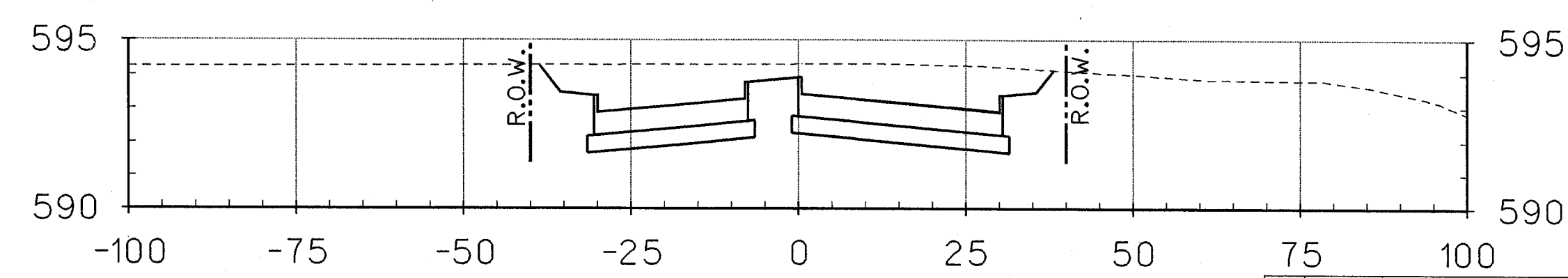
33+00.00



32+50.00



32+00.00

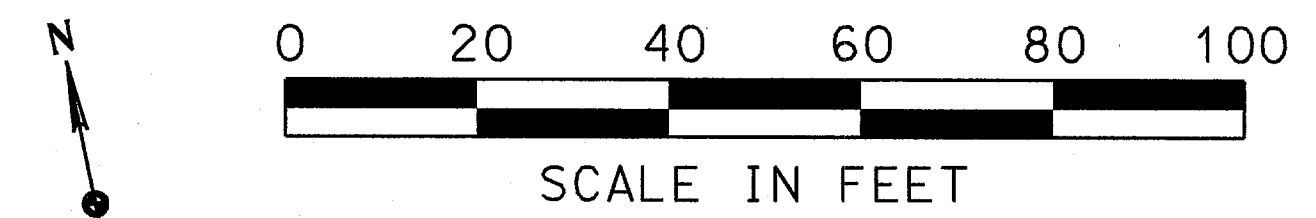


31+50.00



NO.		DATE		REVISION		APPROV.	
<p>HNTB ARCHITECTS ENGINEERS PLANNERS The HNTB Companies</p> <p>ARAPAHO ROAD - PHASE II MARSH LANE TO SURVEYOR BOULEVARD</p> <p>CROSS SECTIONS STA. 29+00 - STA. 31+00 SHEET 9 OF 10</p> <p>TOWN OF ADDISON, TEXAS</p>							
Design	AMS	Drawn	AMS	DATE	SCALE	PROJECT NO.	SHEET ID
Check	JDH	Check	JDH	DEC 01	1" = 20' H 1" = 4' V	25768	X-10

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BORED CONDUIT BY OTHERS

2#4, 1#4 GND.
SEE NOTE 3
PEDESTRIAN LIGHTING CONTROL CABINET. SEE NOTE 4

SEE NOTE 3
2#8, 1#8 GND.

STA. 10+77.2
77.4' LT. ϕ ARAPAHO

STA. 10+80
70.94' LT. ϕ ARAPAHO

2#8, 1#8 GND.
STA. 10+98
39.07' LT. ϕ ARAPAHO

R.O.W.

STA. 12+53
39.33' LT. ϕ ARAPAHO

2#8, 1#8 GND.

10+00

11+00

12+00

ARAPAHO ROAD

13+00

14+00

MATCH LINE STA. 15+00

MARSH LANE

STA. 10+80
39.72' RT. ϕ ARAPAHO

STA. 10+70
41.51' RT. ϕ ARAPAHO

2#8, 1#8 GND.
STA. 10+40
64.00' RT. ϕ ARAPAHO

14+37

R.O.W.

STA. 14+30
28.48' RT. ϕ ARAPAHO

NOTES:

1. CONTRACTOR TO INSTALL POLE FOUNDATIONS AND CONDUIT; TXU TO INSTALL CIRCUIT CONDUCTORS AND 40 FT. RECTANGULAR STYLE STREET LIGHTING STANDARDS.
2. ALL STREET LIGHTING FOUNDATIONS SHALL BE SET 6 FEET BEHIND CURB.
3. CONTRACTOR TO CONNECT CONDUIT TO EXISTING TXU STUB OUT.
4. SERVICE FOR THE PEDESTRIAN LIGHTING CONTROL CABINET SHALL COME FROM THE GROUND MOUNTED PULLBOX. CONTRACTOR SHALL COORDINATE WITH TXU FOR ALL SERVICE REQUIREMENTS.

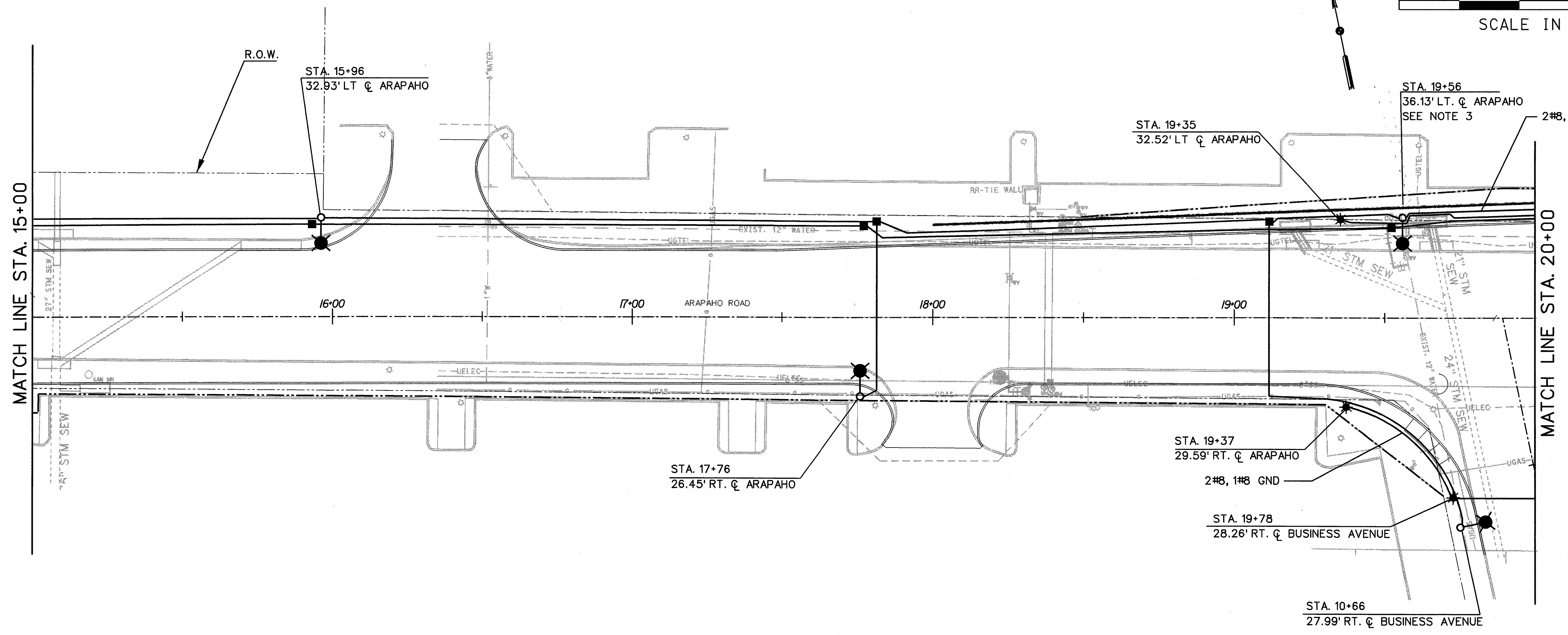
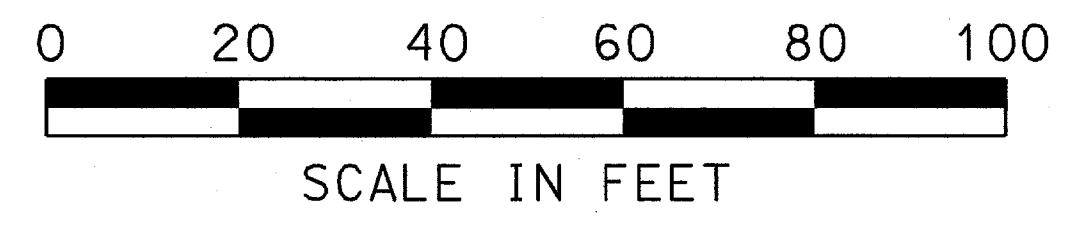
LEGEND

- STREET LIGHTING STANDARD. SEE NOTE 1
- PEDESTRIAN LIGHTING STANDARD, BEGA 9801MH-175ED-17MH-906H 240 VOLT BALLAST
- CONDUIT, 2" SCH 40 PVC
- GROUND MOUNTED PULLBOX, TYPE A



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			92
HNTB ARCHITECTS ENGINEERS PLANNERS <small>The ZIVTS Companies</small>			
ARAPAHO ROAD - PHASE II			
MARSH LANE TO SURVEYOR BOULEVARD			
ILLUMINATION PLAN STA. 10+00 TO STA. 15+00			
TOWN OF ADDISON, TEXAS			
Design Check	JGS LEL	Drawn Check	TGM JGS
DATE	OCT 11		SCALE
PROJECT NO.	25768		SHEET NO.
			1L-1

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NOTES:

1. CONTRACTOR TO INSTALL POLE FOUNDATIONS AND CONDUIT; TXU TO INSTALL CIRCUIT CONDUCTORS AND 40 FT. RECTANGULAR STYLE STREET LIGHTING STANDARDS.
2. ALL STREET LIGHTING FOUNDATIONS SHALL BE SET 6 FEET BEHIND CURB.
3. COORDINATE LOCATION OF POLE FOUNDATION WITH RETAINING WALL.

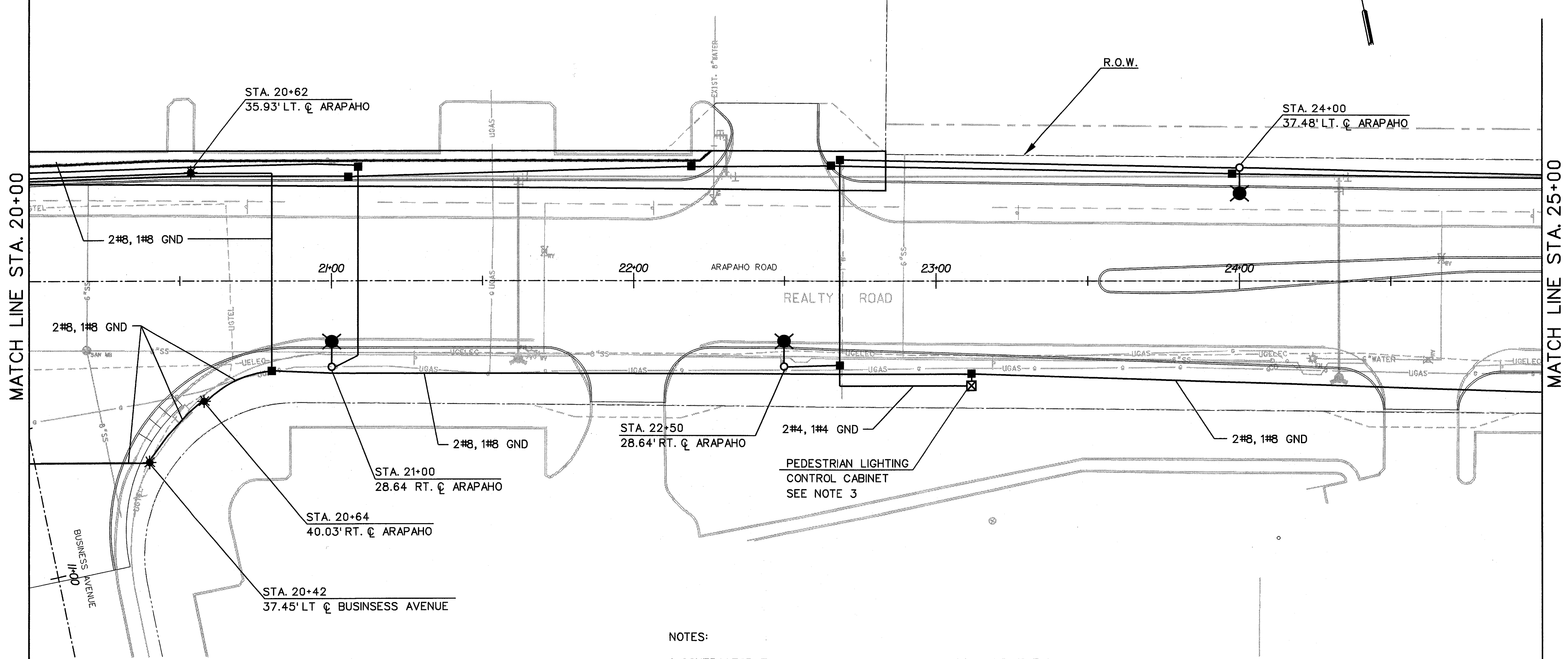
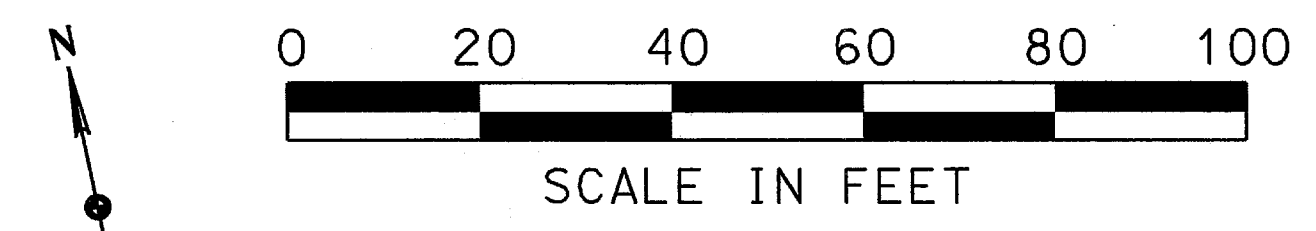
LEGEND

- STREET LIGHTING STANDARD. SEE NOTE 1
- PEDESTRIAN LIGHTING STANDARD, BEGA 9801MH-175ED-17MH-906H
- CONDUIT, 2" SCH 40 PVC
- GROUND MOUNTED PULLBOX, TYPE A



NO.		DATE		REVISION		APPROV.	
ARCHITECTS ENGINEERS PLANNERS The HNTB Companies							
ARAPAHO ROAD - PHASE II MARSH LAKE TO SURVEYOR BOULEVARD							
ILLUMINATION PLAN STA 15+00 TO STA 20+00							
TOWN OF ADDISON, TEXAS							
Design	JGS	Drawn	TGM	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	LEL	Check	JGS	OCT 11		25768	IL-2



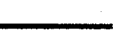

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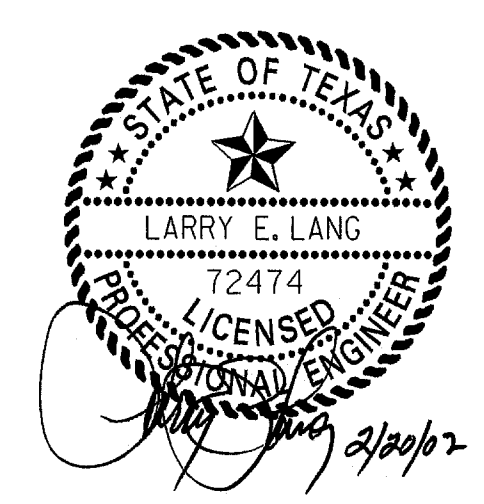
NOTES:


1. CONTRACTOR TO INSTALL POLE FOUNDATIONS AND CONDUIT; TXU TO INSTALL CIRCUIT CONDUCTORS AND 40 FT. RECTANGULAR STYLE STREET LIGHTING STANDARDS.
2. ALL STREET LIGHTING FOUNDATIONS SHALL BE SET 6 FEET BEHIND CURB.
3. SERVICE FOR THE PEDESTRIAN LIGHTING CONTROL CABINET SHALL COME FROM THE NEARBY STREET LIGHTING CIRCUIT. CONTRACTOR SHALL COORDINATE WITH TXU FOR ALL SERVICE REQUIREMENTS.

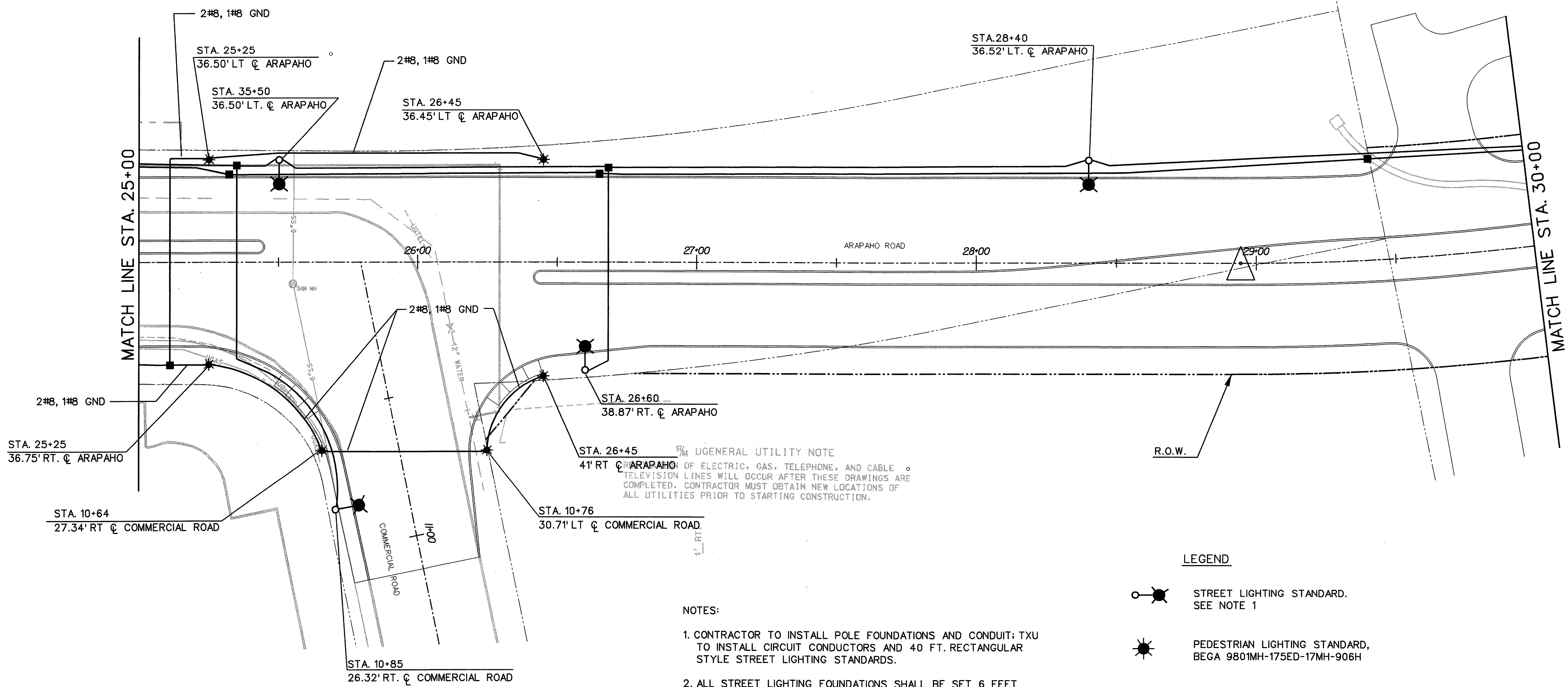
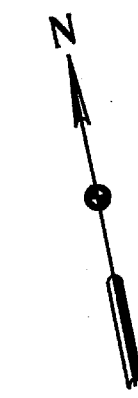
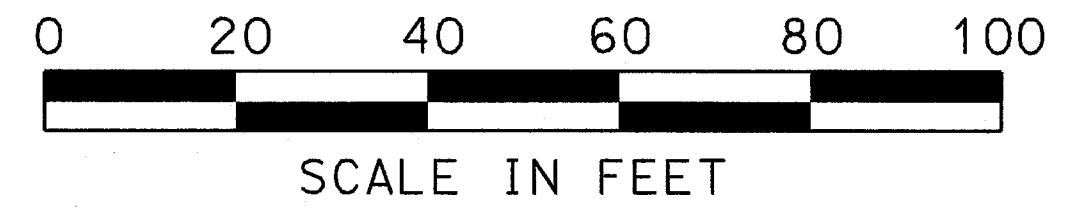
LEGEND

-  STREET LIGHTING STANDARD. SEE NOTE 1
-  PEDESTRIAN LIGHTING STANDARD, BEGA 9801MH-175ED-17MH-906H
-  CONDUIT, 2" SCH 40 PVC
-  GROUND MOUNTED PULLBOX, TYPE A

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NO.	DATE	REVISION	APPROV.	<div style="text-align: right; font-weight: bold; font-size: 1.2em;">94</div>
 HNTB ARCHITECTS ENGINEERS PLANNERS <small>The HNTB Companies</small>				
ARAPAHO ROAD - PHASE II				
MARSH LANE TO SURVEYOR BOULEVARD				
ILLUMINATION PLAN STA 20+00 TO STA 25+00				
TOWN OF ADDISON, TEXAS				
Design	JGS	Drawn	TGM	DATE
Check	LEL	Check	JGS	OCT 11
SCALE	PROJECT NO.		SHEET NO.	
	25768		IL-3	



GENERAL UTILITY NOTE
 OF ELECTRIC, GAS, TELEPHONE, AND CABLE TELEVISION LINES WILL OCCUR AFTER THESE DRAWINGS ARE COMPLETED. CONTRACTOR MUST OBTAIN NEW LOCATIONS OF ALL UTILITIES PRIOR TO STARTING CONSTRUCTION.

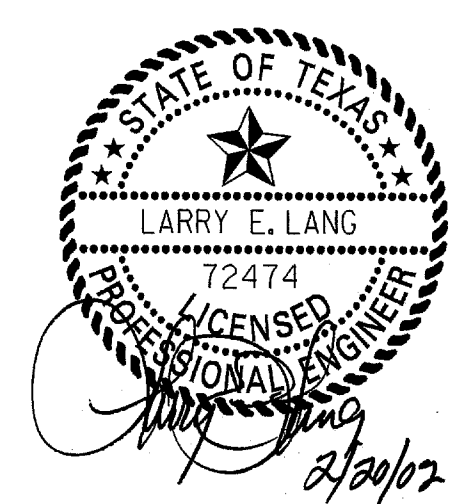
NOTES:

1. CONTRACTOR TO INSTALL POLE FOUNDATIONS AND CONDUIT; TXU TO INSTALL CIRCUIT CONDUCTORS AND 40 FT. RECTANGULAR STYLE STREET LIGHTING STANDARDS.
2. ALL STREET LIGHTING FOUNDATIONS SHALL BE SET 6 FEET BEHIND CURB.

LEGEND

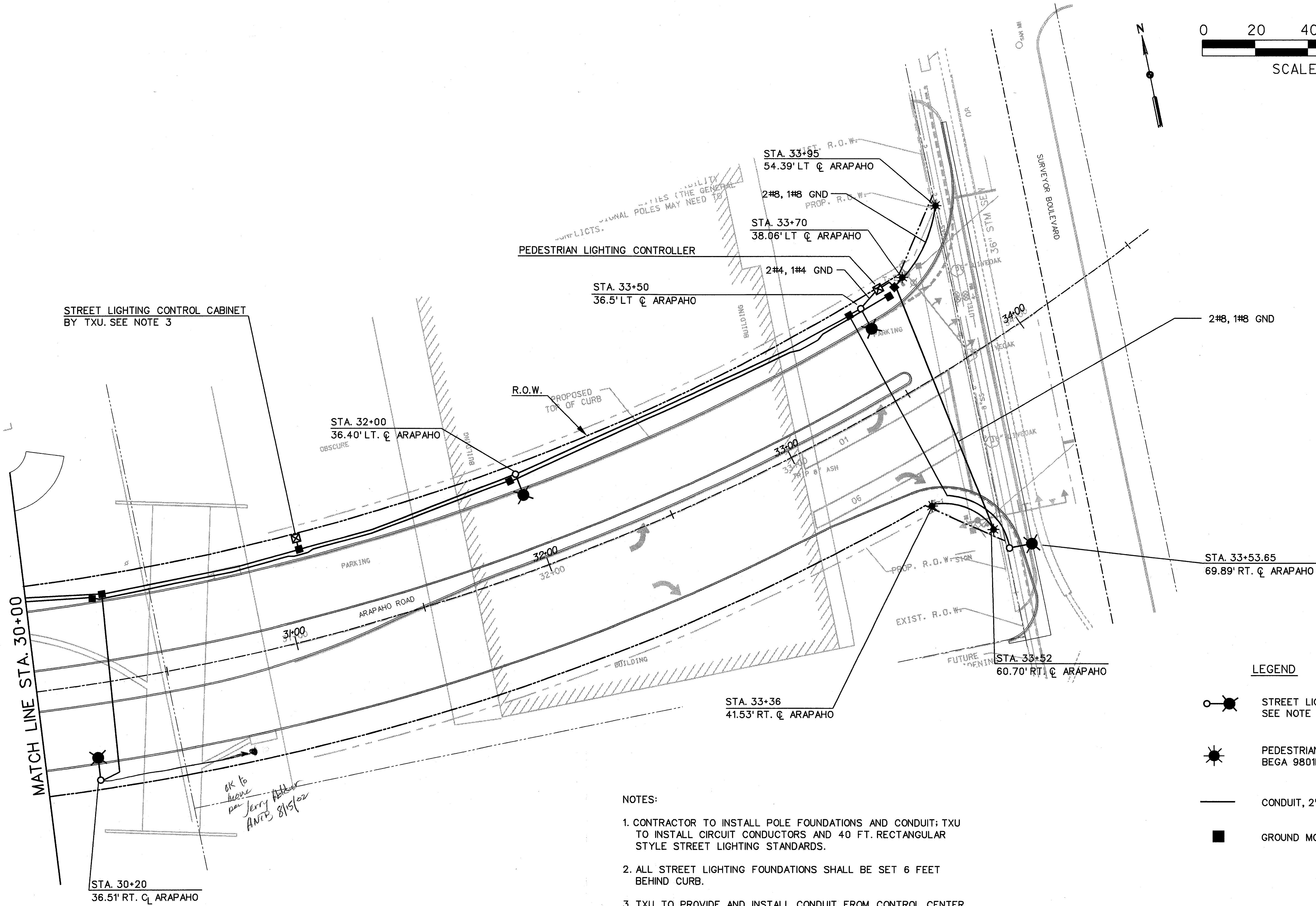
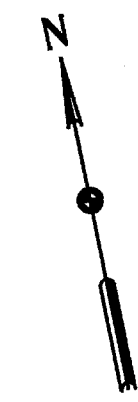
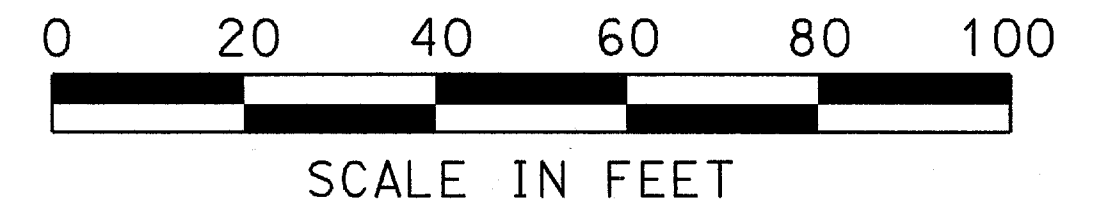
- STREET LIGHTING STANDARD. SEE NOTE 1
- PEDESTRIAN LIGHTING STANDARD, BEGA 9801MH-175ED-17MH-906H
- CONDUIT, 2" SCH 40 PVC
- GROUND MOUNTED PULLBOX, TYPE A

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NO. DATE		REVISION		APPROV.	
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>					
ARAPAHO ROAD - PHASE II					
MARSH LANE TO SURVEYOR BOULEVARD					
ILLUMINATION PLAN STA. 25+00 TO STA. 30+00					
TOWN OF ADDISON, TEXAS					
Design JGS	Drawn TGM	DATE	SCALE	PROJECT NO.	SHEET NO.
Check LEL	Check JGS	OCT 11		25768	IL-4

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STREET LIGHTING CONTROL CABINET
BY TXU. SEE NOTE 3

PEDESTRIAN LIGHTING CONTROLLER

LEGEND

- STREET LIGHTING STANDARD. SEE NOTE 1
- PEDESTRIAN LIGHTING STANDARD, BEGA 9801MH-175ED-17MH-906H
- CONDUIT, 2" SCH 40 PVC
- GROUND MOUNTED PULLBOX, TYPE A

NOTES:

1. CONTRACTOR TO INSTALL POLE FOUNDATIONS AND CONDUIT; TXU TO INSTALL CIRCUIT CONDUCTORS AND 40 FT. RECTANGULAR STYLE STREET LIGHTING STANDARDS.
2. ALL STREET LIGHTING FOUNDATIONS SHALL BE SET 6 FEET BEHIND CURB.
3. TXU TO PROVIDE AND INSTALL CONDUIT FROM CONTROL CENTER TO PULLBOX.
4. SERVICE FOR THE PEDESTRIAN LIGHTING CONTROL CABINET SHALL COME FROM THE NEARBY STREET LIGHTING CIRCUIT. CONTRACTOR SHALL COORDINATE WITH TXU FOR ALL SERVICE REQUIREMENTS.

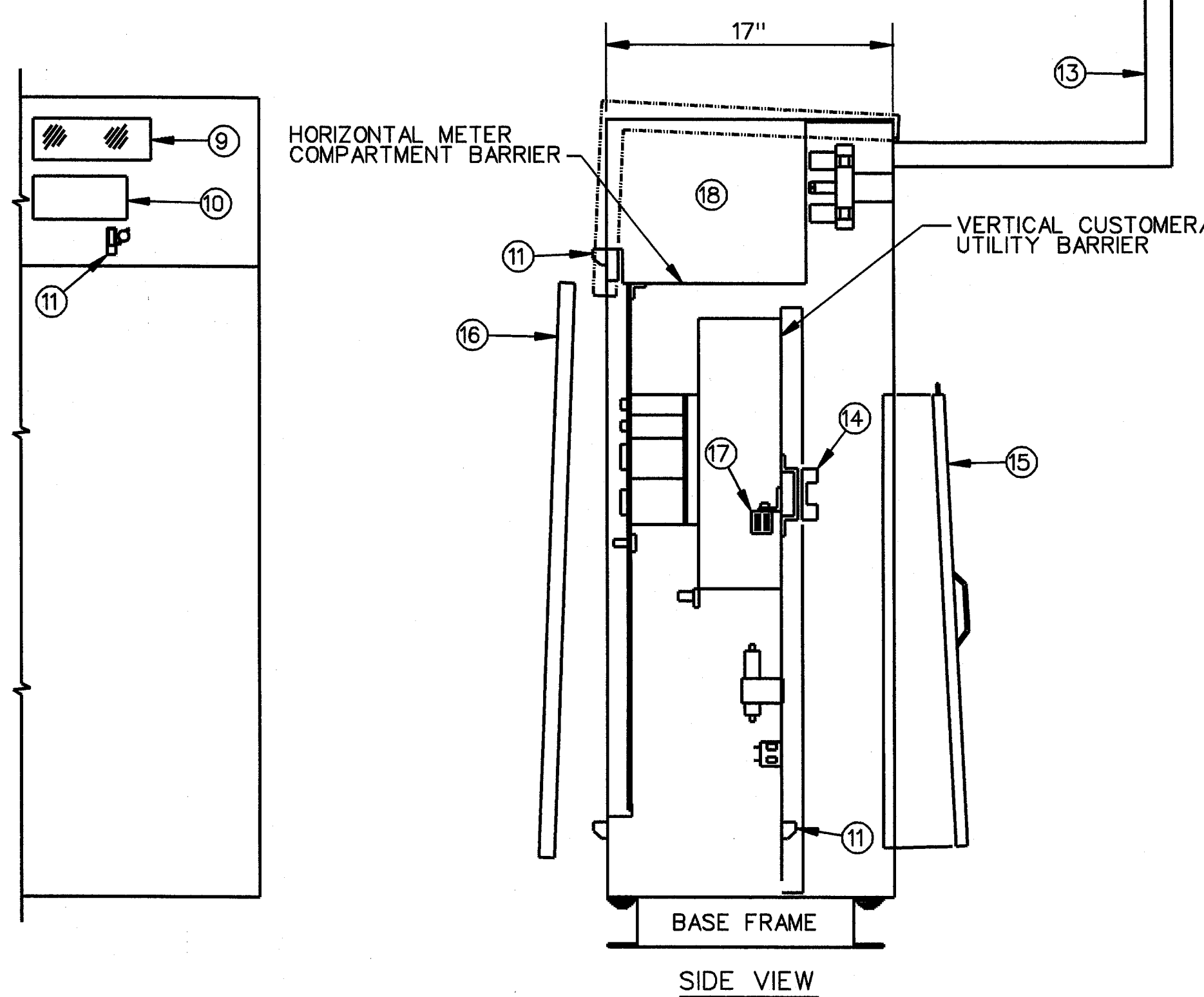
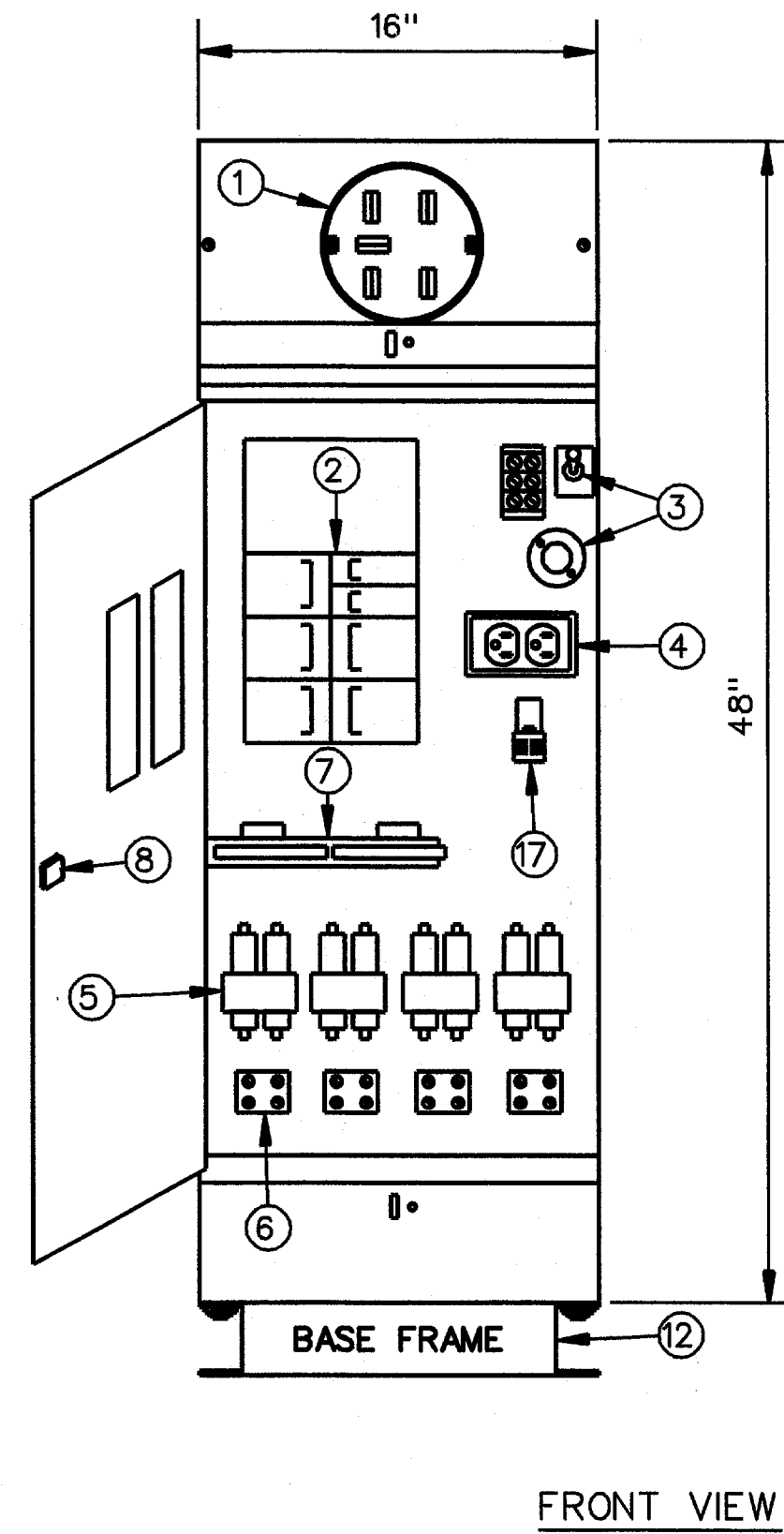
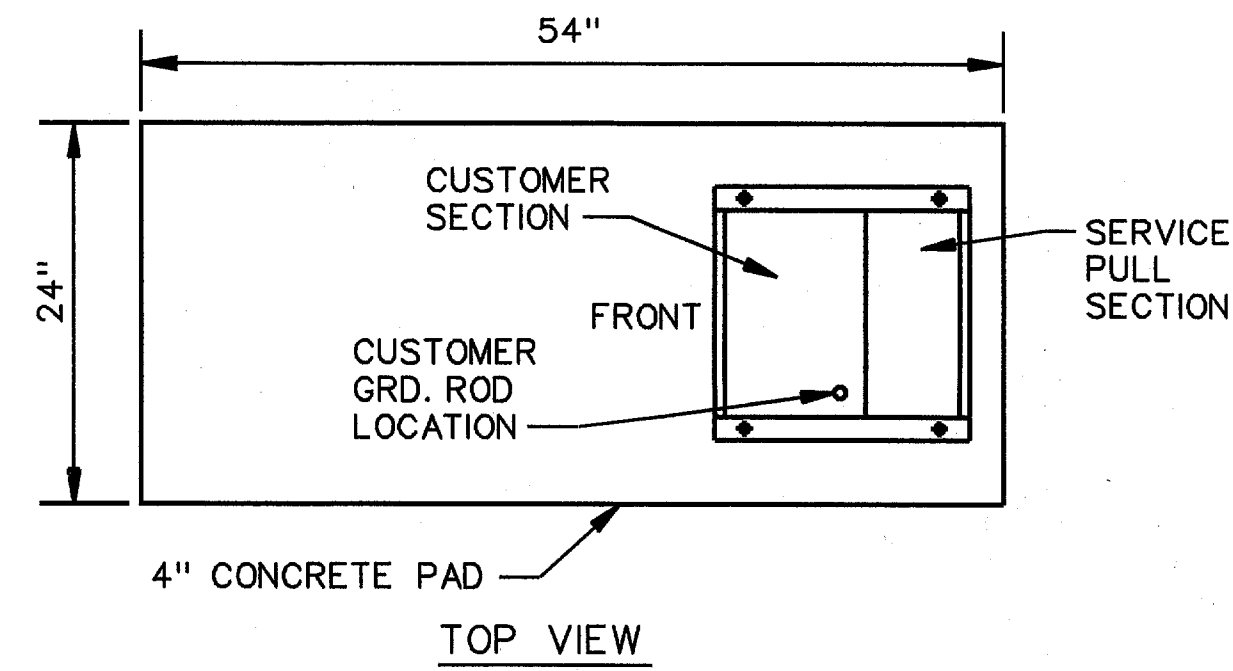
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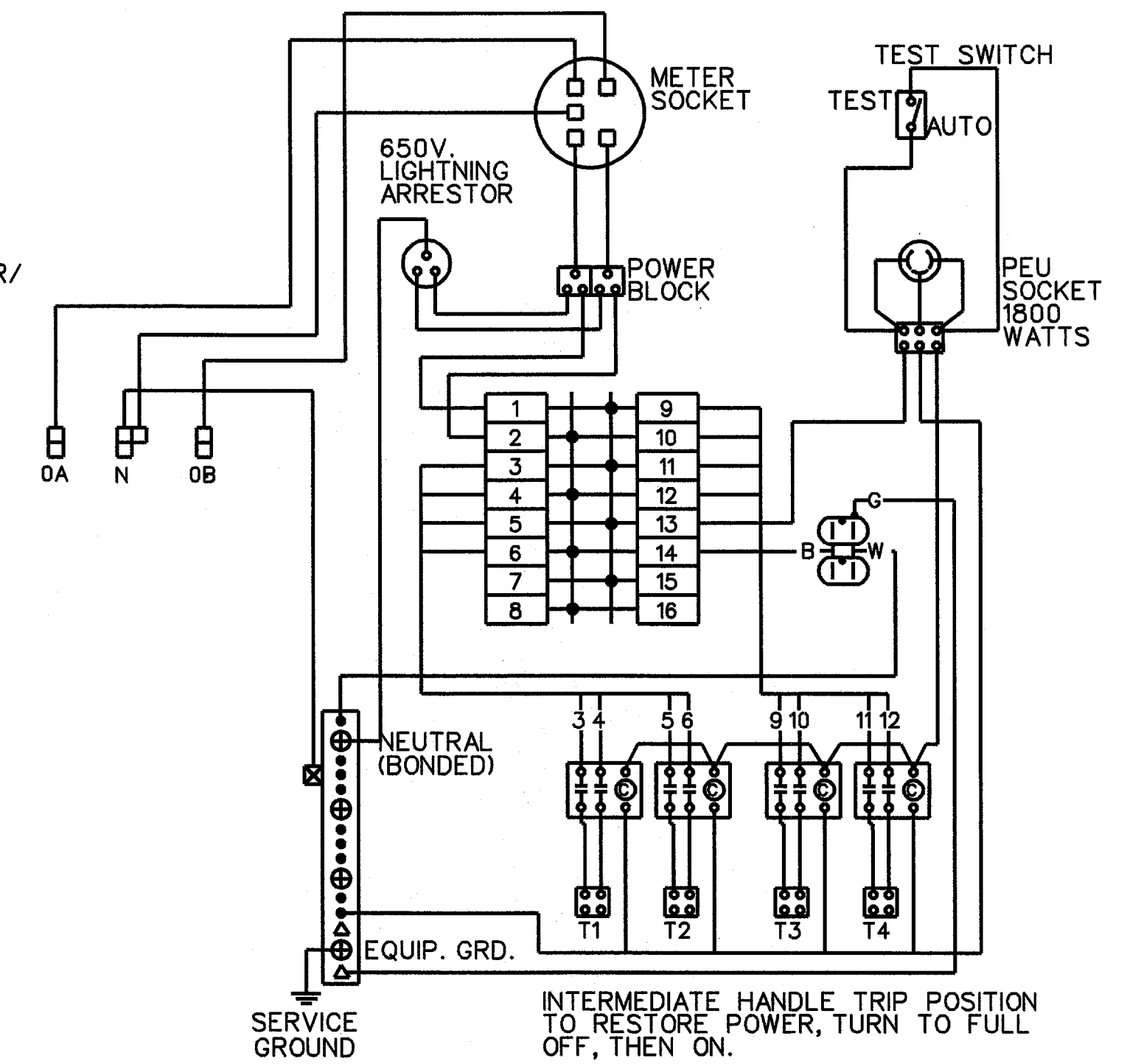
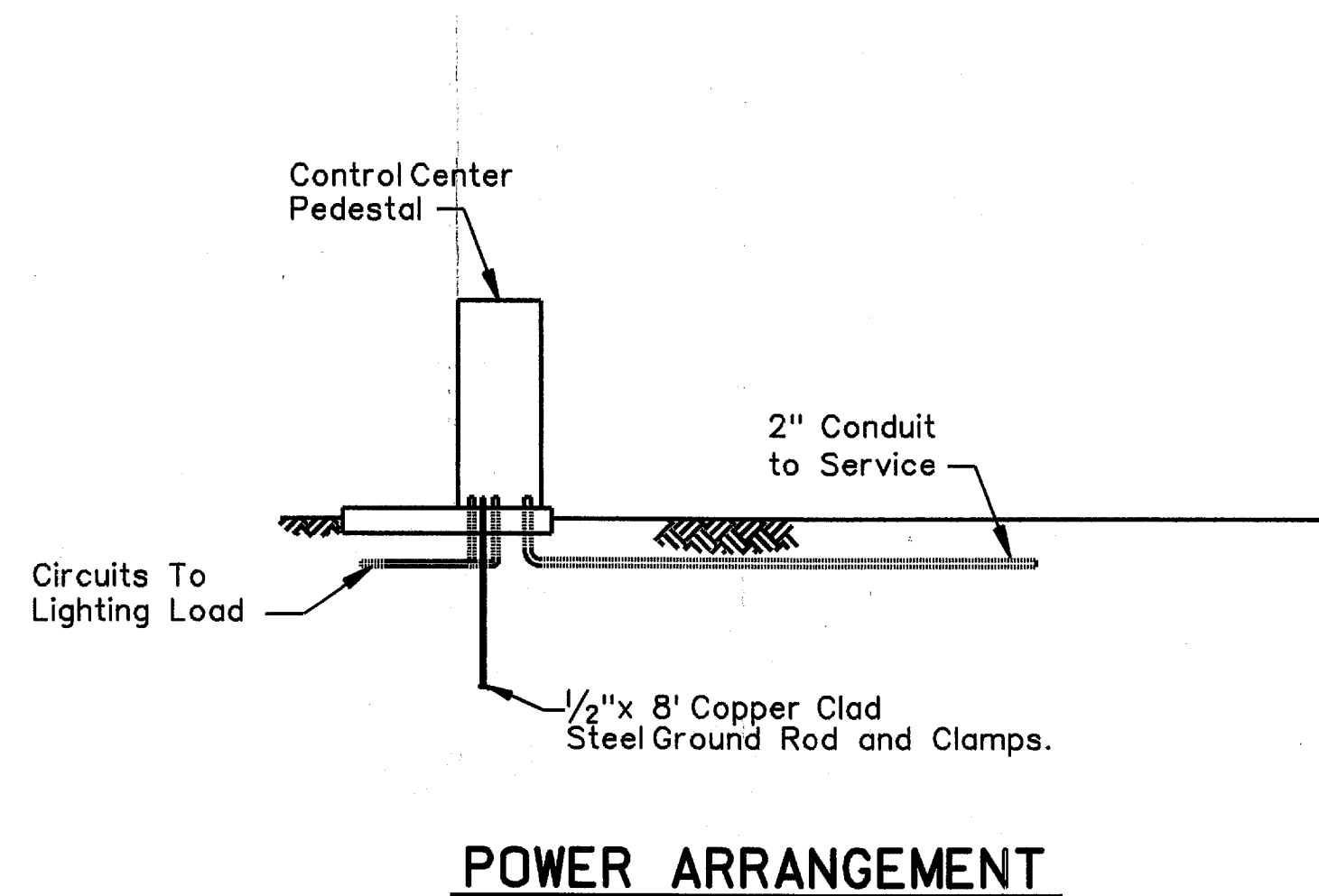
NO. DATE		REVISION		APPROV.	
96					
HNTB ARCHITECTS ENGINEERS PLANNERS <small>The HNTB Companies</small>					
ARAPAHO ROAD - PHASE II					
MARSH LANE TO SURVEYOR BOULEVARD					
ILLUMINATION PLAN					
STA. 30+00 TO SURVEYOR BLVD.					
TOWN OF ADDISON, TEXAS					
Design JGS	Drawn TGM	DATE	SCALE	PROJECT NO.	SHEET NO.
Check LEL	Check JGS	OCT 11		25768	IL-5

19-FEB-2002 J:\25768\DWGS\1-104.dgn 25768

NOTES TO CABINET DETAILS



CONTROL CENTER CABINET DETAILS



CONTROL CENTER WIRING DIAGRAM

NOTES:

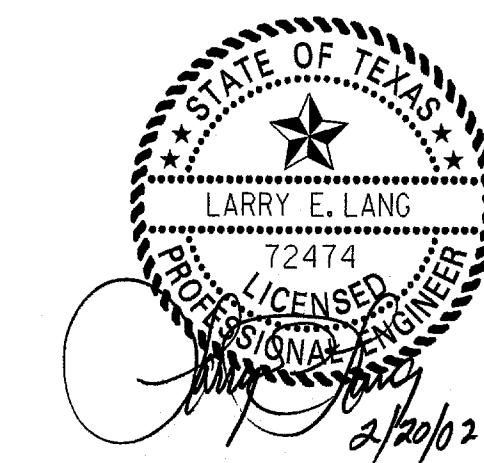
1. The secondary breaker for the photo-cell circuit shall be 15 Amp. single pole.
2. The wiring for the load and line side of the power block shall be #2 AWG.
3. The wiring for the control circuit shall be #12 AWG.
4. The power center enclosure shall be Meyer, Unicorn or approved equal.

- 1 U.L. RECOGNIZED METER SOCKET AS PER UTILITY REQUIREMENTS.
- 2 U.L. RECOGNIZED 16 CIRCUIT COPPER PLUG-ON INTERIOR SUPPLIED WITH U.L. LISTED 100 AMP TWO-POLE SERVICE DISCONNECT.
- 3 U.L. RECOGNIZED PHOTO ELECTRIC RECEPTACLE FACTORY WIRED TO U.L. RECOGNIZED TERMINAL BLOCK. U.L. LISTED TWO POSITION TEST SWITCH CONNECTED IN SERIES WITH PHOTO ELECTRIC RECEPTACLE.
- 4 U.L. LISTED 20 AMP DUPLEX RECEPTACLE PROTECTED BY A G.F.C.I. CIRCUIT BREAKER.
- 5 U.L. LISTED 30 AMP LIGHTING RELAYS FACTORY WIRED FROM 30 AMP TWO POLE CIRCUIT BREAKERS.
- 6 U.L. RECOGNIZED TWO POSITION 175 AMP, 600 VOLT, TERMINAL BLOCKS FACTORY WIRED FROM LOAD TERMINALS OF LIGHTING RELAYS. TERMINAL BLOCKS SHALL ACCEPT A MAXIMUM OF #2/0 AWG CONDUCTORS.
- 7 FACTORY BONDED NEUTRAL ASSEMBLY SHALL CONSIST OF U.L. RECOGNIZED MULTI-POSITION TERMINAL BARS. ADDITIONAL POSITIONS PROVIDE FOR SERVICE GROUND AND EQUIPMENT GROUND CONDUCTORS. NEUTRAL TERMINALS SHALL ACCEPT A MAXIMUM OF #1/0 AWG CONDUCTORS.
- 8 FULLY HINGED 16 GAUGE ZINC COATED DEADFRONT, PROVIDED WITH A HALF TURN LATCH FOR QUICK ACCESS TO THE CUSTOMER SECTION.
- 9 METER READING WINDOW CONSISTS OF 3/16" THICK BY 2 1/2" HIGH BY 6" WIDE HEAT-TREATED GLASS.
- 10 OUTSIDE NAMEPLATE OF .025" THICK ALUMINUM. STAMPED WITH CATALOG NUMBER, AMPERAGE AND VOLTAGE INFORMATION.
- 11 PADLOCK BRACKET WITH 7/16" DIAMETER HOLE FOR ADDED SECURITY PROVIDED FOR THE METER HINGED COVER, THE CUSTOMER COVER AND THE UTILITY PULL SECTION COVER.
- 12 BASE FRAME CONSTRUCTED OF TWELVE GAUGE ZINC COATED STEEL, FINISHED WITH THE SAME GREEN POWDER AS THE ENCLOSURE. BASE PROVIDED WITH WELD NUT AND THE APPROPRIATE HARDWARE FOR ATTACHING THE PEDESTAL TO THE BASE. HARDWARE ACCESSIBLE ONLY FROM INSIDE THE CUSTOMER AND UTILITY COMPARTMENTS. BASE HAS PROVISIONS FOR OPTIONAL GALVANIZED 5/8-11 X 18" LONG ANCHOR BOLT KIT, CATALOG NUMBER CP-ABK-5/8.
- 13 PERMANENTLY ATTACHED HINGED METER COVER SHALL OPEN 180 DEGREES TO REST POSITION ALLOWING FULL ACCESS TO METER SOCKET AREA.
- 14 U.L. RECOGNIZED 200 AMP RATED SERVICE TERMINATION LANDING ASSEMBLY SHALL BE U.L. LISTED WIRING TERMINALS MOUNTED ON 1/4" THICK ELECTRO TIN PLATED ALUMINUM BUS, SUPPORTED BY A 600 VOLT RATED GLASS REINFORCED INSULATING MOUNTING CHANNEL. TERMINALS SHALL BE 1 3/4" AWAY FROM THE STEEL BARRIER WHICH SEPARATES THE UTILITY AND CUSTOMER SECTIONS. WIRING TERMINALS SHALL BE FASTENED FROM THE FRONT FOR EASE OF REMOVAL.
- 15 UTILITY SERVICE TERMINATION COMPARTMENT COVER PROVIDED WITH A HANDLE FOR SAFE HANDLING, AND SECURED BY A TAMPER-RESISTANT SCREW AND PROVISION FOR PADLOCK.
- 16 CUSTOMER SECTION COVER SHALL HAVE A PRODUCT WIRING DIAGRAM ATTACHED ON THE INSIDE SURFACE WITH A PLASTIC POCKET AND CLEAR ADHESIVE TAPE. DIAGRAM CONTAINS PRODUCT RATING, CATALOG NUMBER AND WIRING SCHEMATIC ILLUSTRATION.
- 17 U.L. LISTED "LIGHTNING PROTECTIVE DEVICE" FACTORY WIRED TO SERVICE ENTRANCE LANDING.
- 18 WRENCH FOR TAMPER RESISTANT SCREW STORED IN METER COMPARTMENT.

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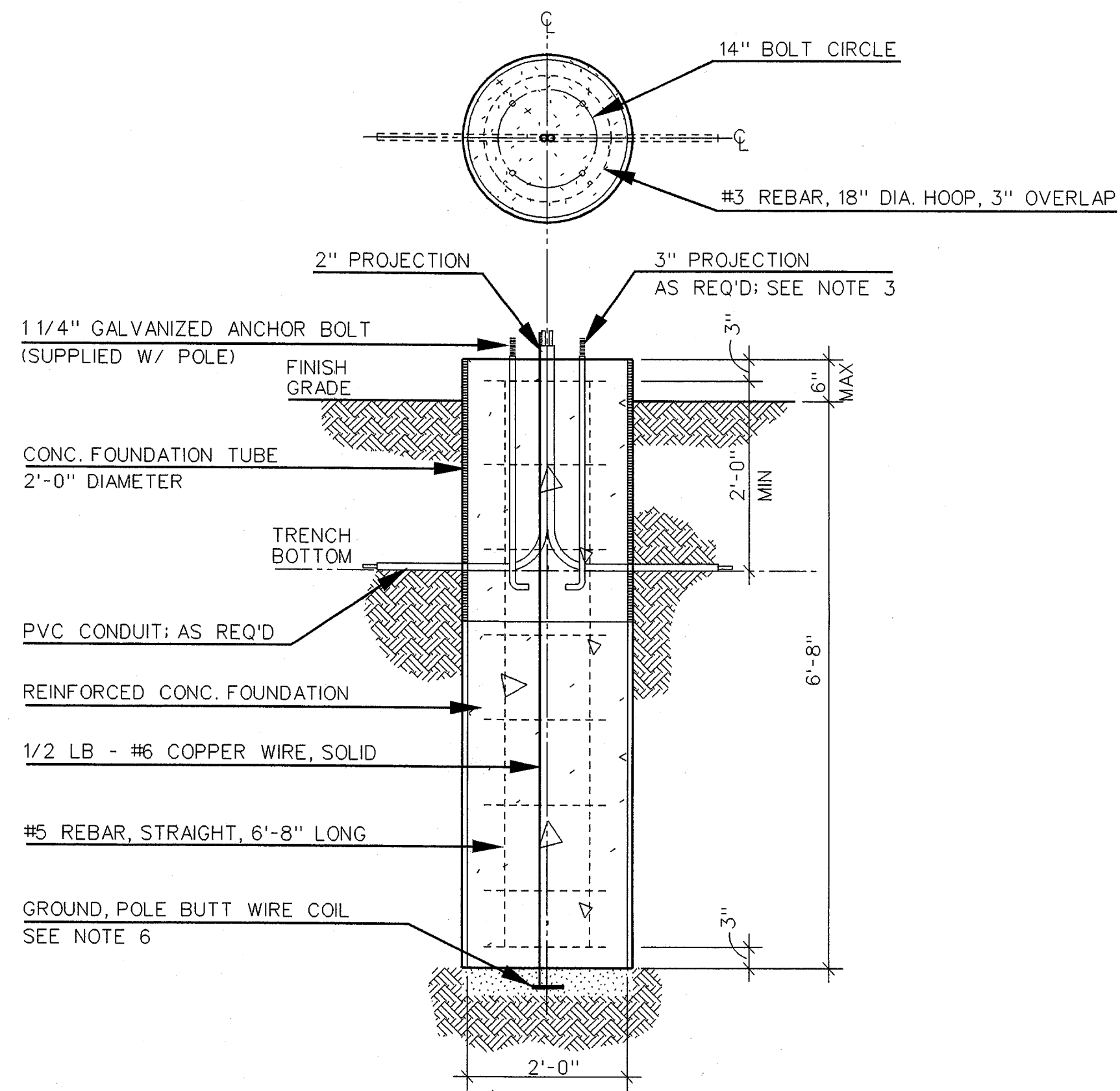


NO. DATE		REVISION		APPROV.	
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>					
ARAPAHO ROAD - PHASE II					
MARSH LANE TO SURVEYOR BOULEVARD					
ELECTRICAL DETAILS					
TOWN OF ADDISON, TEXAS					
Design JGS	Drawn TGM	DATE	SCALE	PROJECT NO.	SHEET NO.
Check LEL	Check JGS	OCT 11		25768	IL-6

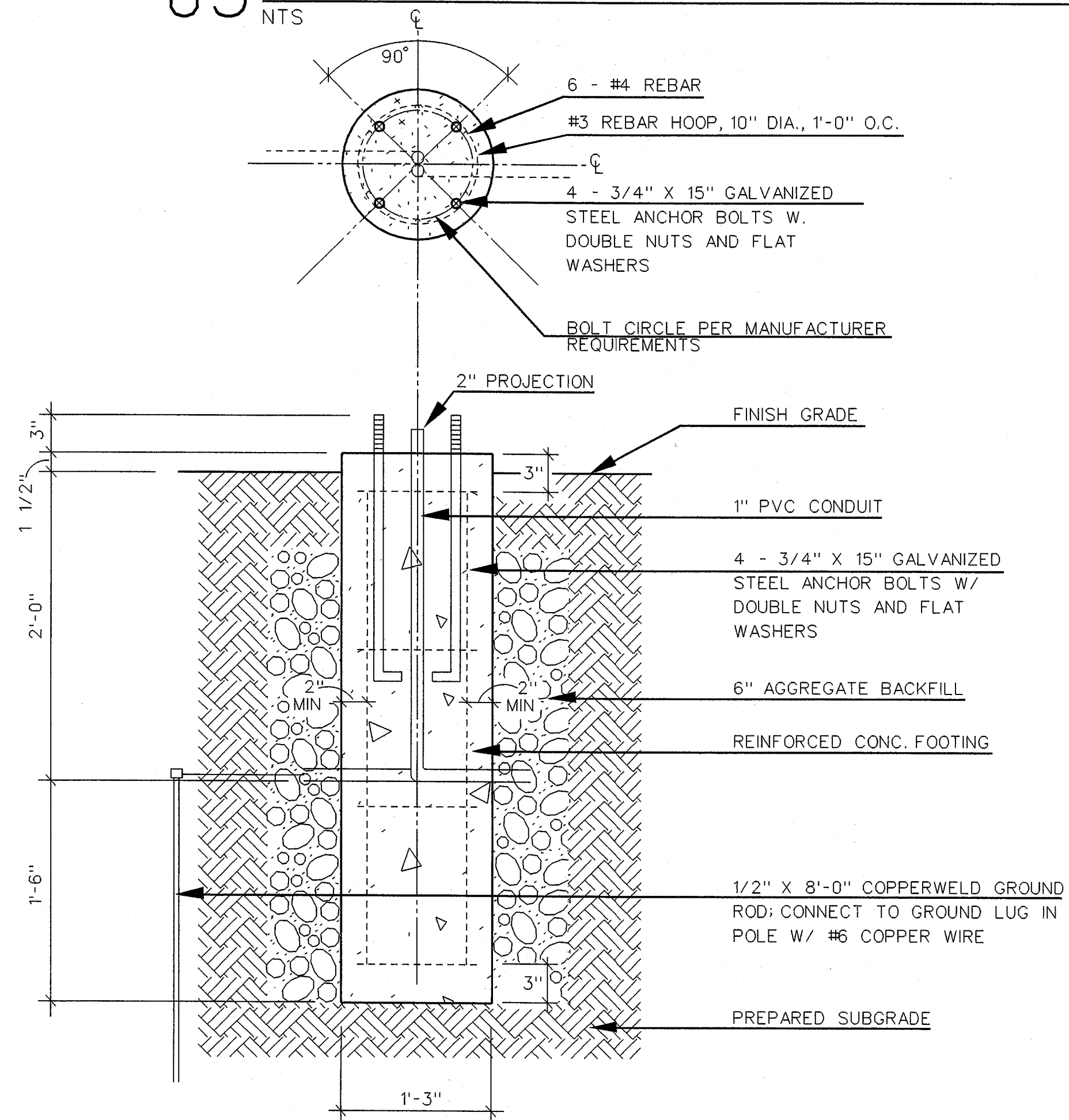
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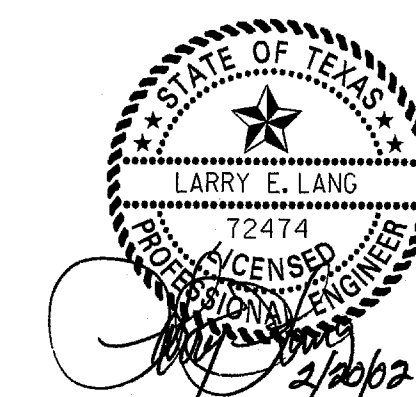
1. CONCRETE TO BE MINIMUM 3000 PSI AT 28 DAYS. MAXIMUM AGGREGATE 3/4" TOP OF FOUNDATION TO BE TROWELED TO A FLAT AND LEVEL SURFACE. AVOID EXCESSIVE TROWELING. CONCRETE TO SET A MINIMUM OF 72 HOURS BEFORE POLE INSTALLATION.
2. REBAR HOOPS ARE TIED BEGINNING 3" BELOW TOP OF CONCRETE FORM AND ARE REPEATED AT APPROX. 1' INTERVALS TO BOTTOM OF FOUNDATION.
3. ANCHOR BOLTS TO BE SUPPLIED WITH POLE. USE TEMPLATE FURNISHED BY POLE MANUFACTURER FOR ALIGNING ANCHOR BOLTS. PROJECTION OF 3" ON 25' & 30' SQUARE AND 3 1/2" ON 40' SQUARE AND 37' ROUND POLES.
4. CONCRETE FORM OF SONOTUBE TO EXTEND TO BOTTOM OF TRENCH OR AS NEEDED.
5. PROVIDE 2'-0" PITTAIL FOR CONNECTION OF GROUND WIRE TO POLE.
6. A MINIMUM OF 12" OF BARE #6 SD CU WIRE TO BE PLACED IN BOTTOM OF HOLE AND COVERED W/ 2" OF DIRT.
7. IF SOIL HAS BEEN DISTURBED, EXTEND FOUNDATION BY DEPTH OF DISTURBED SOIL.
8. TXU WILL REMOVE THE EXISTING COBRA HEAD LIGHTS WHEN THE NEW LIGHTS ARE INSTALLED.



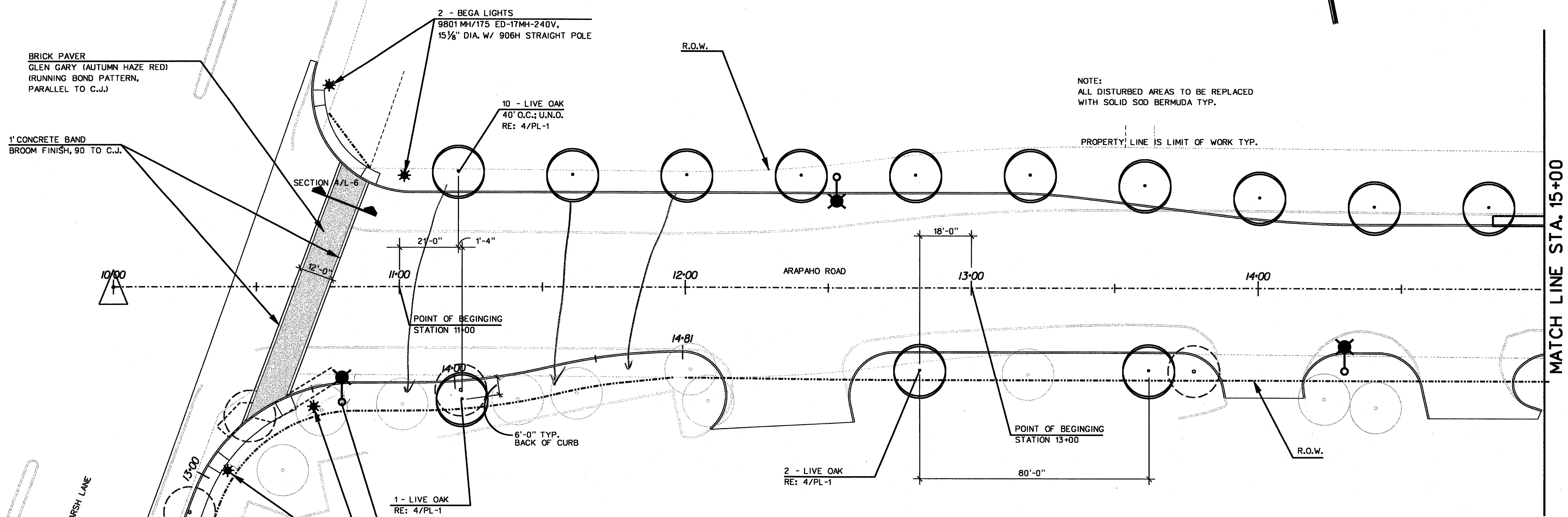
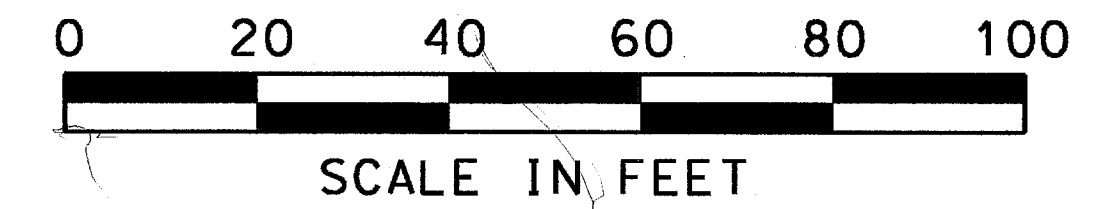
05 STREET LIGHT FOUNDATION DETAIL



04 PEDESTRIAN LIGHT FOUNDATION DETAIL



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HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>							
ARAPAHO ROAD - PHASE II							
MARSH LANE TO SURVEYOR BOULEVARD							
SITE WORK DETAILS							
TOWN OF ADDISON, TEXAS							
Design	JGS	Drawn	TGM	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	LEL	Check	JGS	OCT 11		25768	IL-7

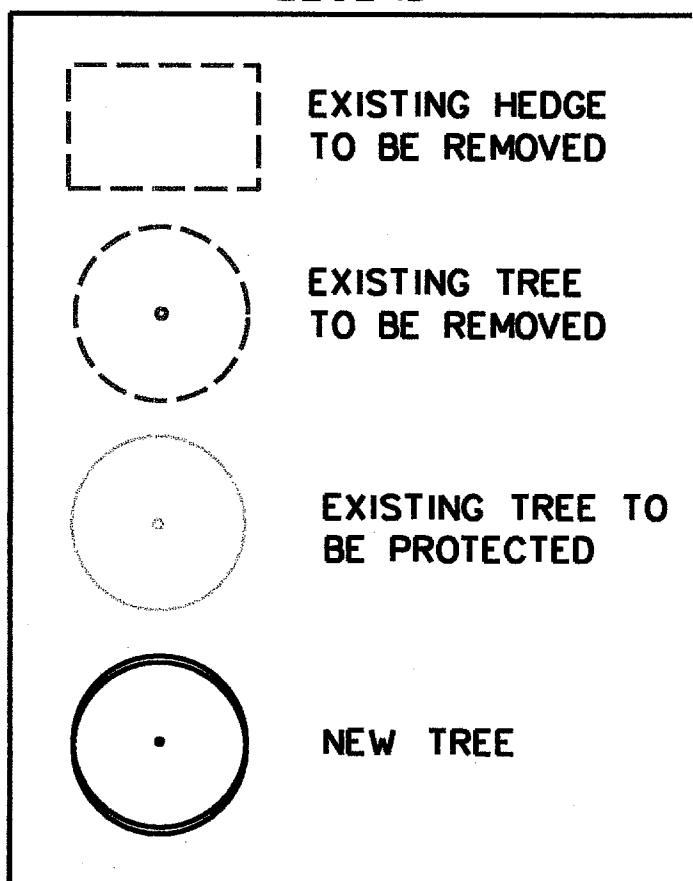


NOTE:
ALL DISTURBED AREAS TO BE REPLACED
WITH SOLID SOD BERMUDA TYP.

PROPERTY LINE IS LIMIT OF WORK TYP.

MATCH LINE STA. 15+00

LEGEND



PLANT SCHEDULE

QTY	BOTANICAL NAME/ COMMON NAME	CALIPER	HEIGHT	SIZE	REMARKS
56	QUERCUS VIRGINIANA/ LIVE OAK	6"	14-16'	200 GAL	FULL & SYMMETRICAL 6'-0" BRANCHING HEIGHT 40'-0" O.C., U.N.O. 6'-0" BACK OF CURB U.N.O.
28	ILLEX ATTENUATA 'FOSTER'/ FOSTER HOLLY	3"	8-10'	30 GAL.	SPECIMEN FULL & SYMMETRICAL 24'-0" O.C., U.N.O.
18	LAGERSTROEMIA INDICA/ CREPE MYRTLE	2-3"	8-10'	30 GAL.	MULTI-STEM, 4-6 CANES FULL & SYMMETRICAL 8'-0" O.C., U.N.O.
80	ILLEX CORNUTA 'DWARF BURFORD'/ DWARF BURFORD HOLLY		18-24"	5 GAL.	FULL TO GROUND 36" O.C.
65	LOROPETALUM CHINENSIS RUBRUM 'BURGUNDY'/ FRINGE FLOWER		18-24"	5 GAL.	FULL TO GROUND 36" O.C.
	GROUND COVER ASIAN JASMINE	8"-10"		4" POTS	5 RUNNERS MIN 1'-0" O.C.
	GRASS CYNODON DACTYLON/ BERMUDA				SOLID SOD

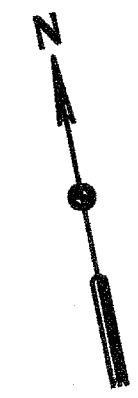
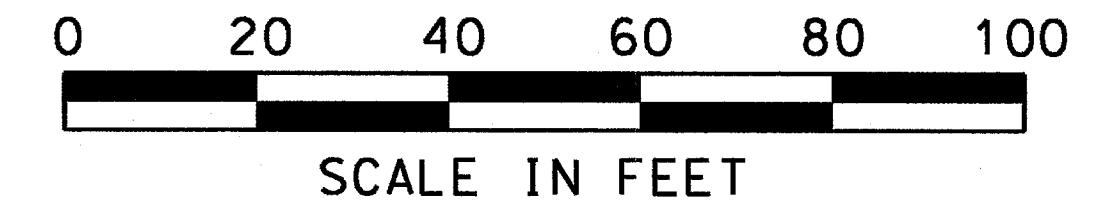
MATCH LINE A-A'

MATCH LINE A-A'

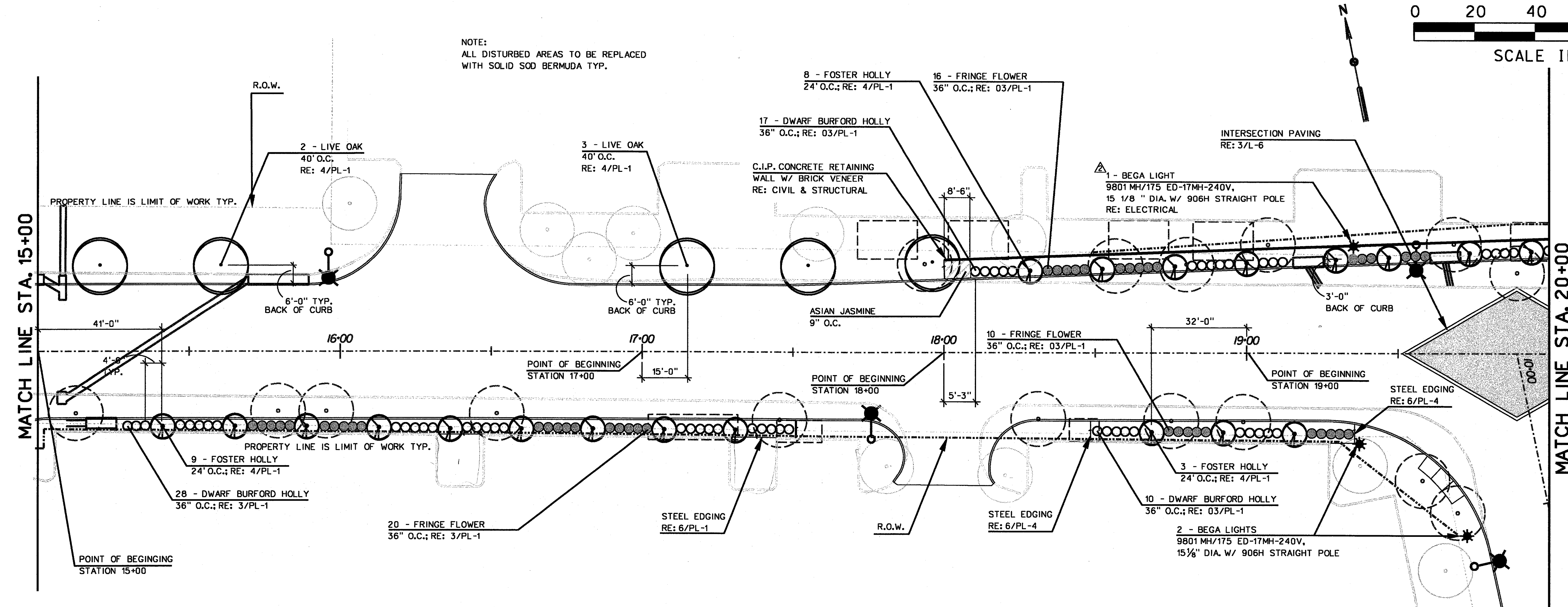


99

NO.	DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>			
ARAPAHO ROAD - PHASE II			
MARSH LANE TO SURVEYOR BOULEVARD			
LAYOUT AND PLANTING PLAN STA. 10+00 TO STA. 15+00			
TOWN OF ADDISON, TEXAS			
Design DAB	Drawn DAB	DATE	SCALE
Check MP	Check DAB	JUN 15	1" = 20'
PROJECT NO.		SHEET NO.	
25768		L-1	



NOTE:
ALL DISTURBED AREAS TO BE REPLACED
WITH SOLID SOO BERMUDA TYP.

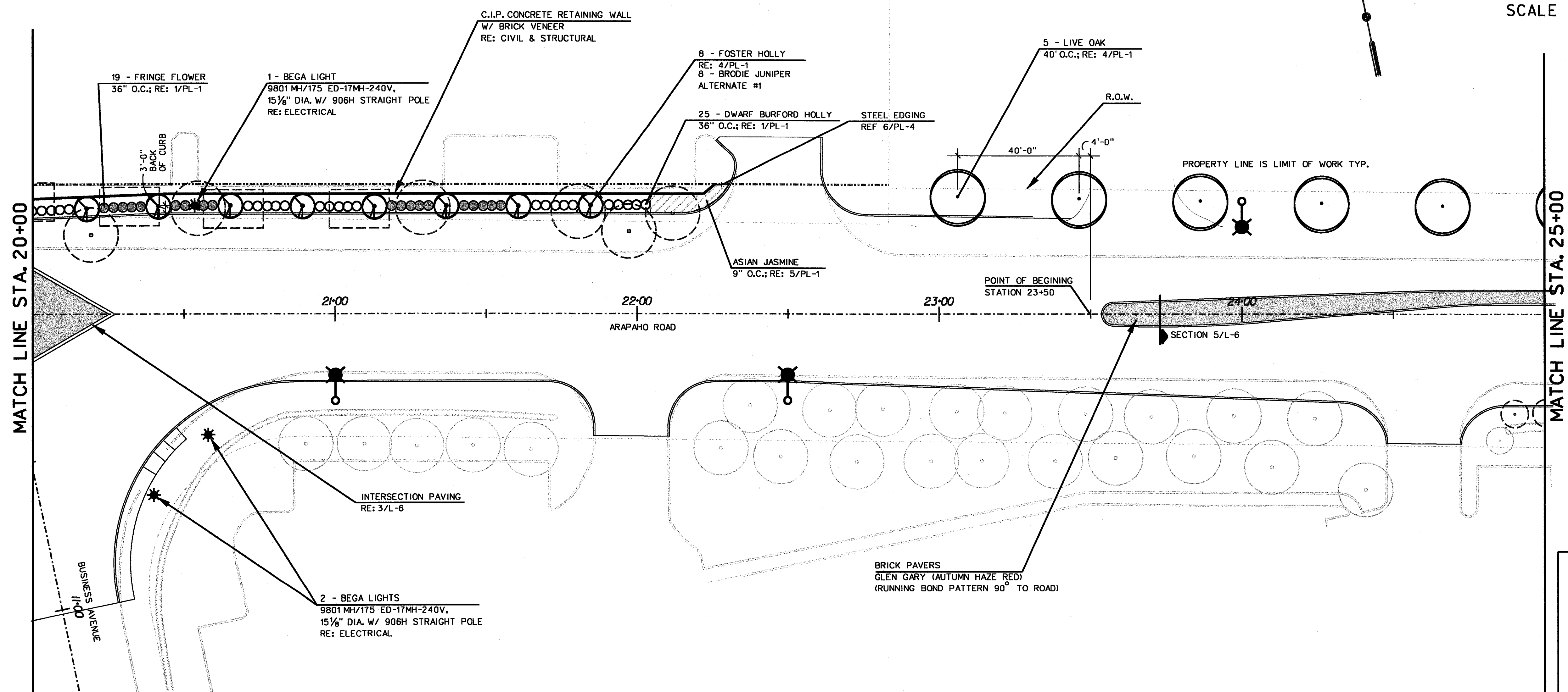
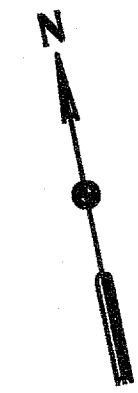
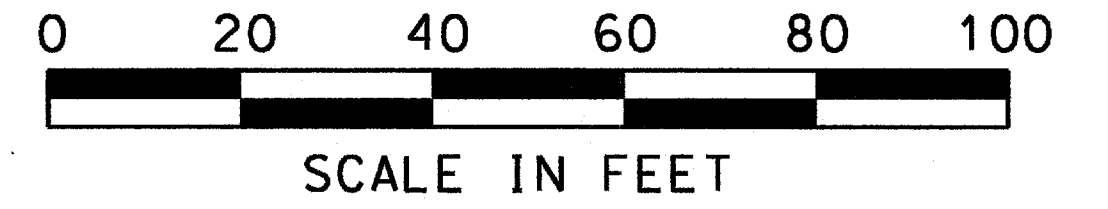


LEGEND

	EXISTING HEDGE TO BE REMOVED
	EXISTING TREE TO BE REMOVED
	EXISTING TREE TO BE PROTECTED
	NEW TREE
	NEW ORNAMENTAL TREE
	NEW SHRUB



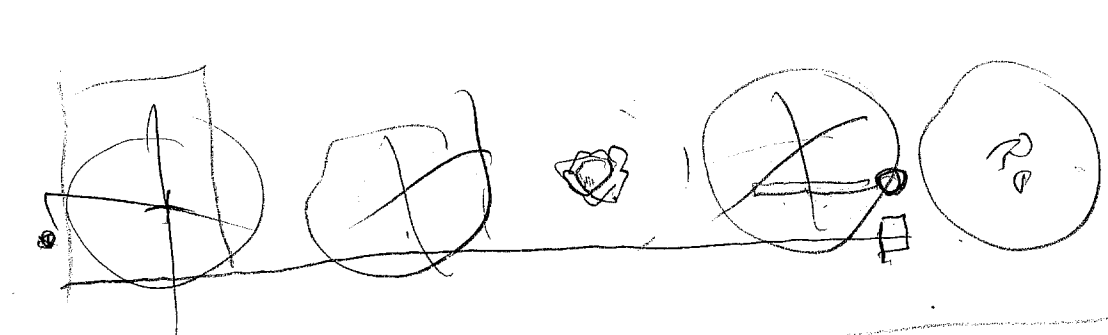
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1/02	NOTE CHANGE
NO. DATE	REVISION
HNTB ARCHITECTS ENGINEERS PLANNERS The HNTB Companies ARAPAHO ROAD - PHASE II MARSH LANE TO SURVEYOR BOULEVARD LAYOUT AND PLANTING PLAN STA 15+00 TO STA 20+00 TOWN OF ADDISON, TEXAS	
Design DAB	Drawn DAB
Check MP	Check DAB
DATE	SCALE
JUN 15	1" = 20'
PROJECT NO.	SHEET NO.
25768	L-2



NOTE:
ALL DISTURBED AREAS TO BE REPLACED
WITH SOLID SOD BERMUDA TYP.

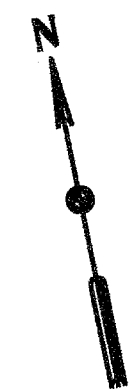
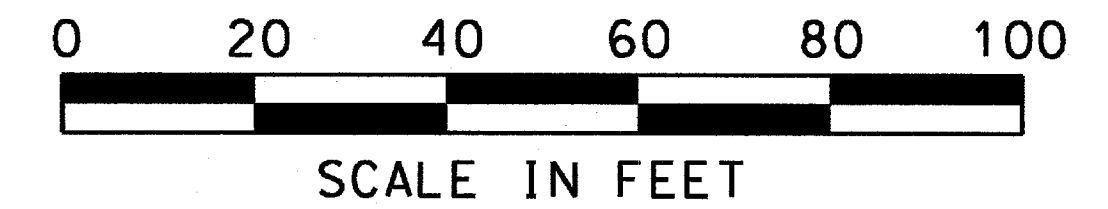
LEGEND

	EXISTING HEDGE TO BE REMOVED
	EXISTING TREE TO BE REMOVED
	EXISTING TREE TO BE PROTECTED
	NEW TREE
	NEW ORNAMENTAL TREE
	NEW SHRUB

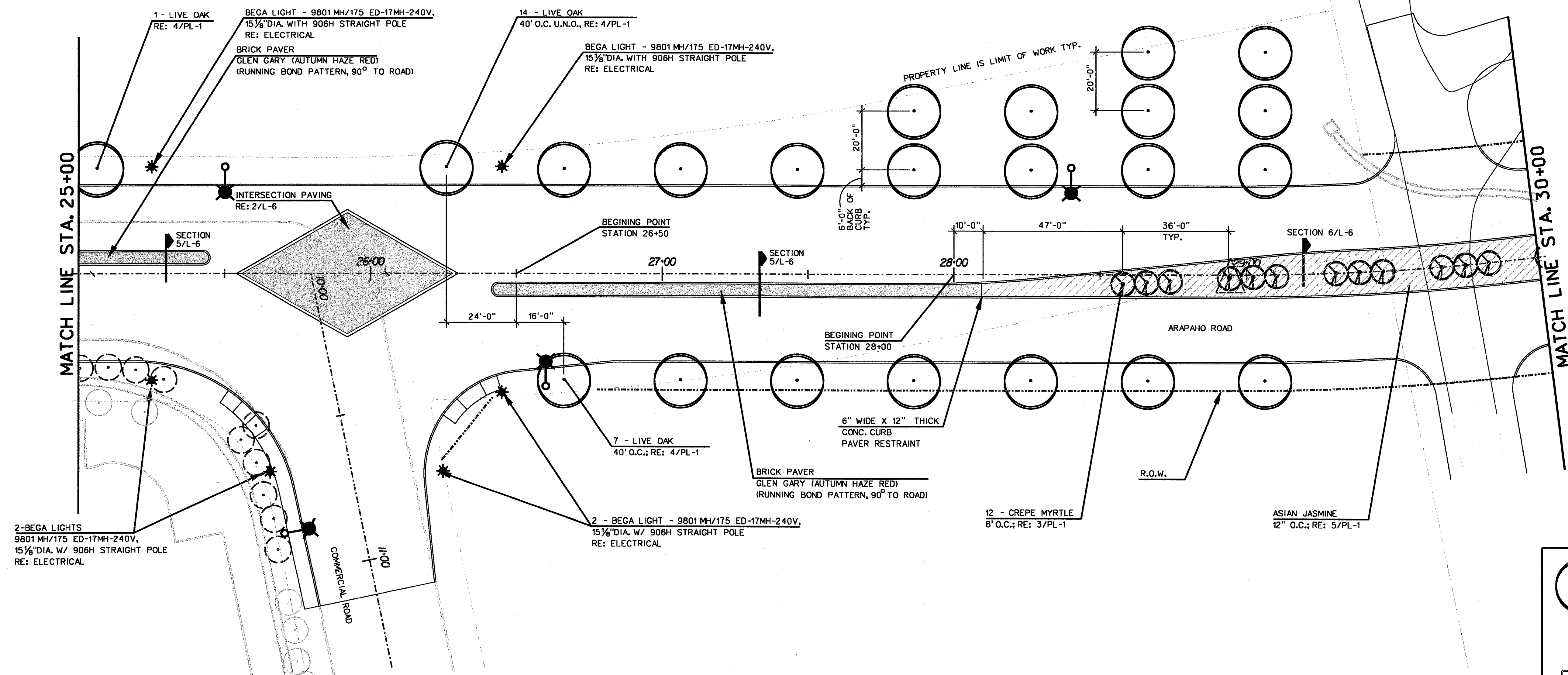


NO.	DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>			
ARAPAHO ROAD - PHASE II			
MARSH LANE TO SURVEYOR BOULEVARD			
LAYOUT AND PLANTING PLAN STA 20+00 TO STA 25+00			
TOWN OF ADDISON, TEXAS			
Design	DAB	Drawn	DAB
DATE	JUN 15	SCALE	1" = 20'
PROJECT NO.	25768	SHEET NO.	L-3

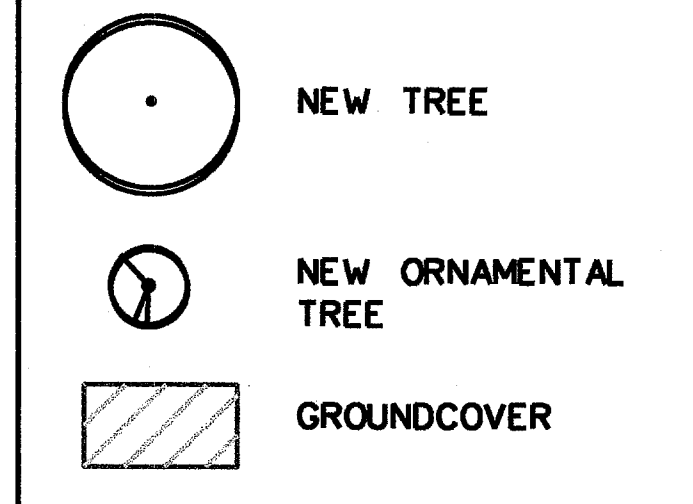
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NOTE:
ALL DISTURBED AREAS TO BE REPLACED
WITH SOLID SOD BERMUDA TYP.



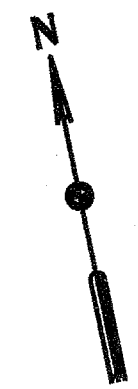
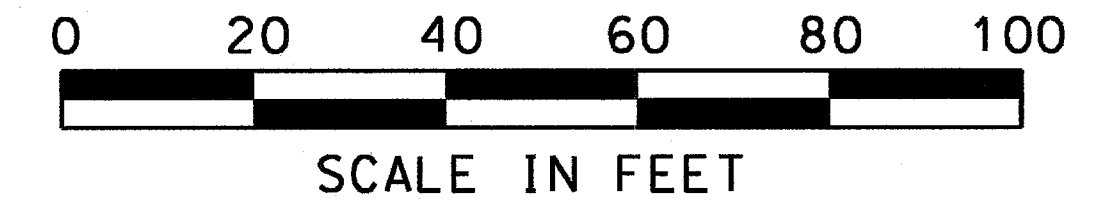
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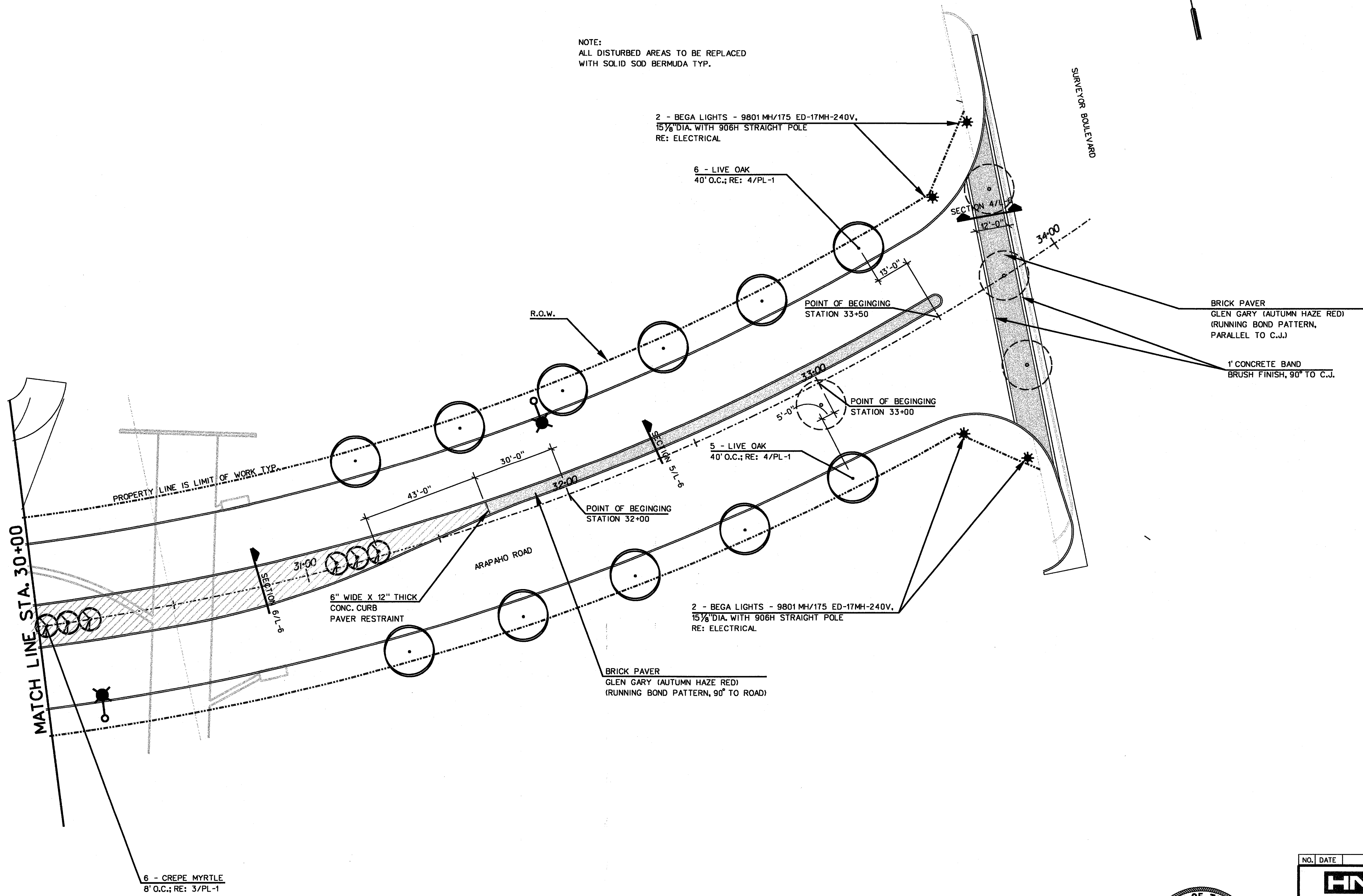
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NO.	DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>			
ARAPAHO ROAD - PHASE II			
MARSH LANE TO SURVEYOR BOULEVARD			
LAYOUT AND PLANTING PLAN STA. 25+00 TO STA. 30+00			
TOWN OF ADDISON, TEXAS			
Design	DAB	Drawn	DAB
DATE	JUN 15	SCALE	1" = 20'
PROJECT NO.	25768	SHEET NO.	L-4





NOTE:
ALL DISTURBED AREAS TO BE REPLACED
WITH SOLID SOD BERMUDA TYP.



LEGEND

	EXISTING TREE TO BE REMOVED
	NEW TREE
	NEW ORNAMENTAL TREE
	GROUNDCOVER

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NO.	DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>			
ARAPAHO ROAD - PHASE II			
MARSH LANE TO SURVEYOR BOULEVARD			
LAYOUT AND PLANTING PLAN STA. 30+00 TO SURVEYOR BLVD.			
TOWN OF ADDISON, TEXAS			
Design	DAB	Drawn	DAB
Check	MP	Check	DAB
DATE	JUN 15	SCALE	1" = 20'
PROJECT NO.	25768	SHEET NO.	L-5

25768

IRRIGATION LEGEND:

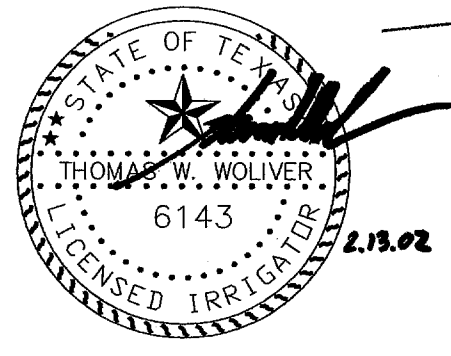
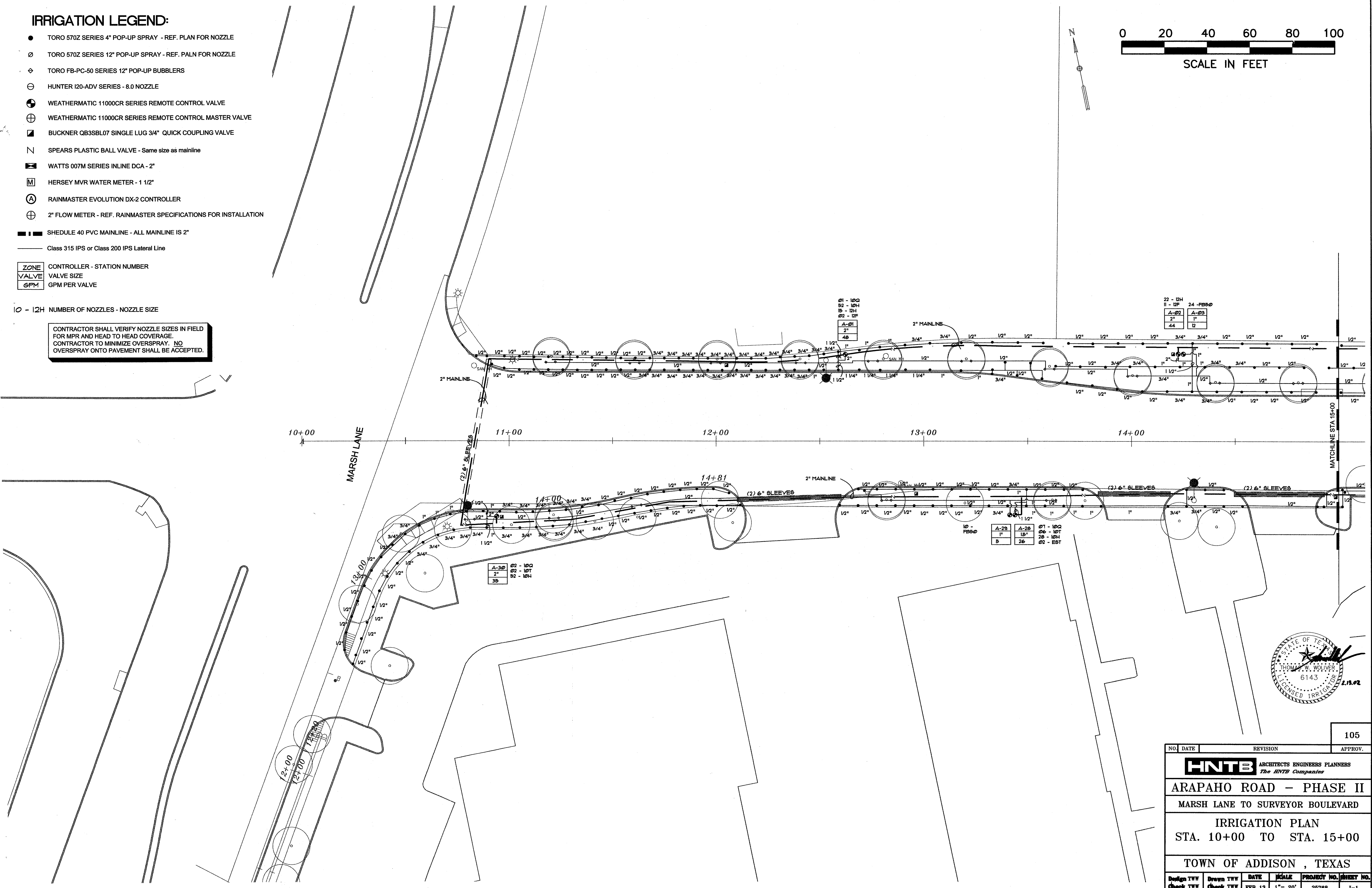
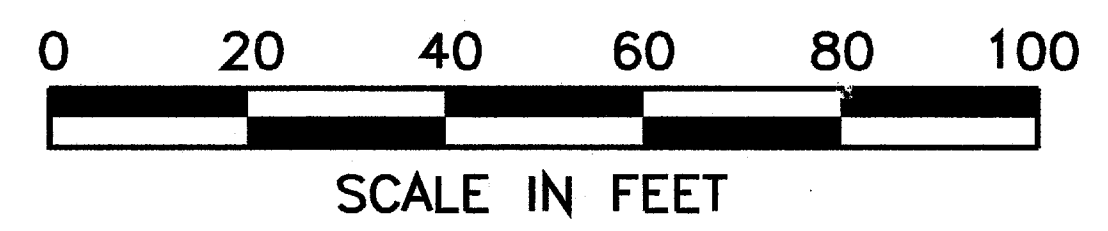
- TORO 570Z SERIES 4" POP-UP SPRAY - REF. PLAN FOR NOZZLE
- TORO 570Z SERIES 12" POP-UP SPRAY - REF. PLAN FOR NOZZLE
- ◇ TORO FB-PC-50 SERIES 12" POP-UP BUBBLERS
- ⊖ HUNTER I20-ADV SERIES - 8.0 NOZZLE
- ⊕ WEATHERMATIC 11000CR SERIES REMOTE CONTROL VALVE
- ⊕ WEATHERMATIC 11000CR SERIES REMOTE CONTROL MASTER VALVE
- ⊠ BUCKNER QB3SBL07 SINGLE LUG 3/4" QUICK COUPLING VALVE
- N SPEARS PLASTIC BALL VALVE - Same size as mainline
- ⊠ WATTS 007M SERIES INLINE DCA - 2"
- M HERSEY MVR WATER METER - 1 1/2"
- ⊕ RAINMASTER EVOLUTION DX-2 CONTROLLER
- ⊕ 2" FLOW METER - REF. RAINMASTER SPECIFICATIONS FOR INSTALLATION

■ SCHEDULE 40 PVC MAINLINE - ALL MAINLINE IS 2"
 — Class 315 IPS or Class 200 IPS Lateral Line

ZONE CONTROLLER - STATION NUMBER
 VALVE VALVE SIZE
 GPM GPM PER VALVE

10 - 12H NUMBER OF NOZZLES - NOZZLE SIZE

CONTRACTOR SHALL VERIFY NOZZLE SIZES IN FIELD FOR MPR AND HEAD TO HEAD COVERAGE. CONTRACTOR TO MINIMIZE OVERSPRAY. NO OVERSPRAY ONTO PAVEMENT SHALL BE ACCEPTED.



105

NO.	DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>			
ARAPAHO ROAD - PHASE II MARSH LANE TO SURVEYOR BOULEVARD IRRIGATION PLAN STA. 10+00 TO STA. 15+00 TOWN OF ADDISON, TEXAS			
Design TWW	Drawn TWW	DATE	SCALE
Check TWW	Check TWW	FEB 13	1" = 20'
		PROJECT NO.	SHEET NO.
		25768	I-1

IRRIGATION LEGEND:

- TORO 570Z SERIES 4" POP-UP SPRAY - REF. PLAN FOR NOZZLE
- ∅ TORO 570Z SERIES 12" POP-UP SPRAY - REF. PLAN FOR NOZZLE
- ◇ TORO FB-PC-50 SERIES 12" POP-UP BUBBLERS
- ⊖ HUNTER I20-ADV SERIES - 8.0 NOZZLE
- ⊕ WEATHERMATIC 11000CR SERIES REMOTE CONTROL VALVE
- ⊕ WEATHERMATIC 11000CR SERIES REMOTE CONTROL MASTER VALVE
- ▣ BUCKNER QB3SBL07 SINGLE LUG 3/4" QUICK COUPLING VALVE
- N SPEARS PLASTIC BALL VALVE - Same size as mainline
- ⊖ WATTS 007M SERIES INLINE DCA - 2"
- M HERSEY MVR WATER METER - 1 1/2"
- A RAINMASTER EVOLUTION DX-2 CONTROLLER
- ⊕ 2" FLOW METER - REF. RAINMASTER SPECIFICATIONS FOR INSTALLATION

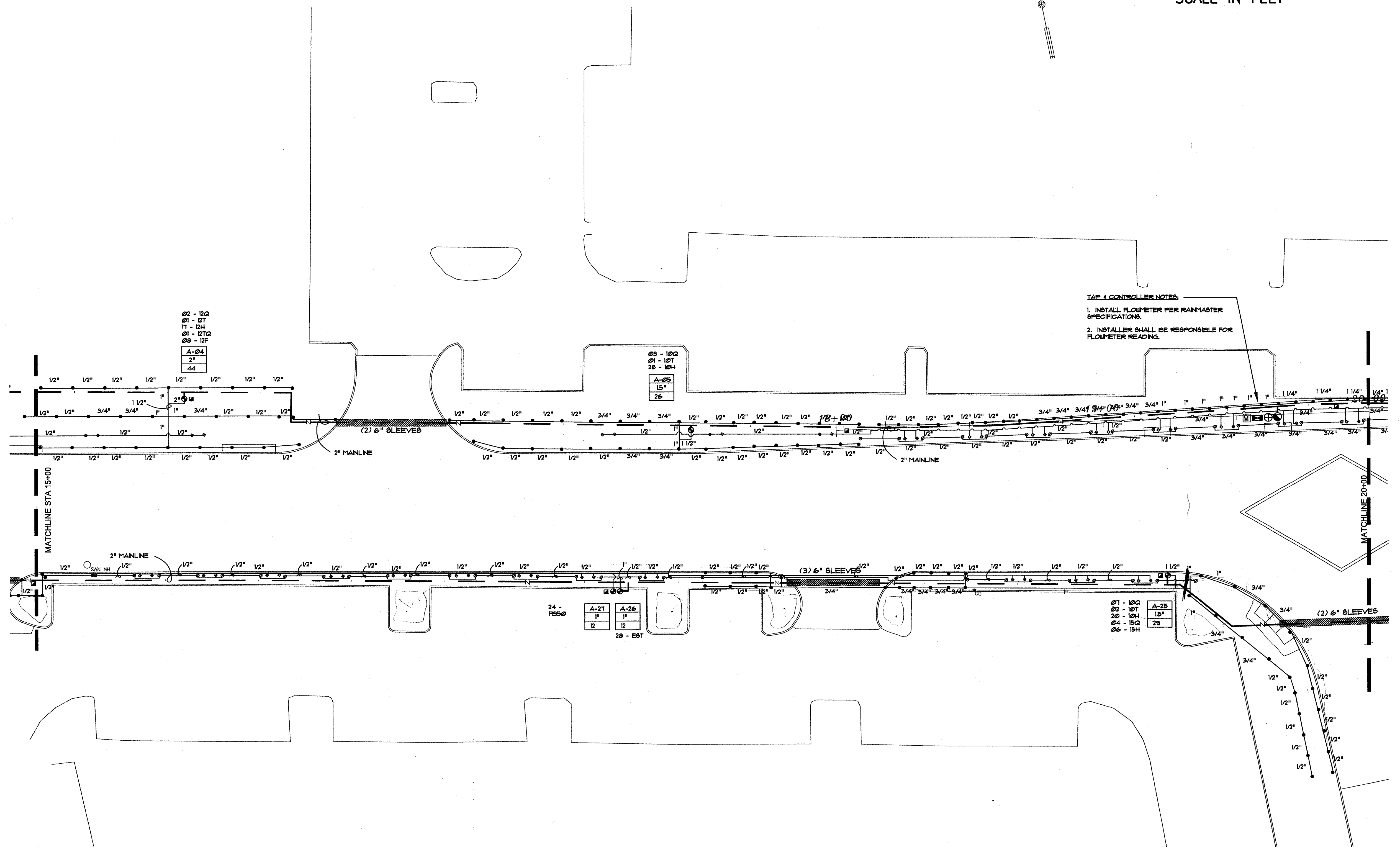
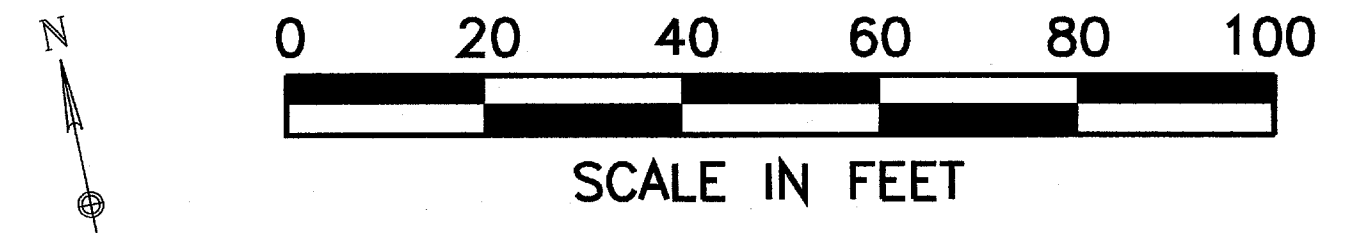
■ SCHEDULE 40 PVC MAINLINE - ALL MAINLINE IS 2"

— Class 315 IPS or Class 200 IPS Lateral Line

ZONE	CONTROLLER - STATION NUMBER
VALVE	VALVE SIZE
GPM	GPM PER VALVE

∅ - 12H NUMBER OF NOZZLES - NOZZLE SIZE

CONTRACTOR SHALL VERIFY NOZZLE SIZES IN FIELD FOR MPR AND HEAD TO HEAD COVERAGE. CONTRACTOR TO MINIMIZE OVERSPRAY. NO OVERSPRAY ONTO PAVEMENT SHALL BE ACCEPTED.



TAP & CONTROLLER NOTES:
 1. INSTALL FLOWMETER PER RAINMASTER SPECIFICATIONS.
 2. INSTALLER SHALL BE RESPONSIBLE FOR FLOWMETER READINGS.

02 - 12Q
01 - 12T
11 - 12H
01 - 12TQ
08 - 12F

A-24
2"
44

A-21
1"
12

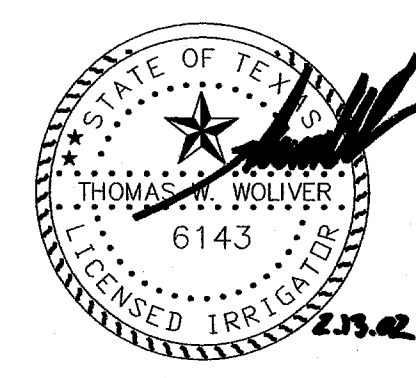
A-26
1"
12

07 - 12Q
02 - 12T
20 - 12H
04 - 12C
06 - 12H

A-28
1 1/2"
28

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NO.	DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>			
ARAPAHO ROAD - PHASE II MARSH LANE TO SURVEYOR BOULEVARD			
IRRIGATION PLAN STA. 15+00 TO STA. 20+00			
TOWN OF ADDISON, TEXAS			
Design TWW	Drawn TWW	DATE	SCALE
Check TWW	Check TWW	FEB 13	1" = 20'
		PROJECT NO.	SHEET NO.
		25768	I-2



IRRIGATION LEGEND:

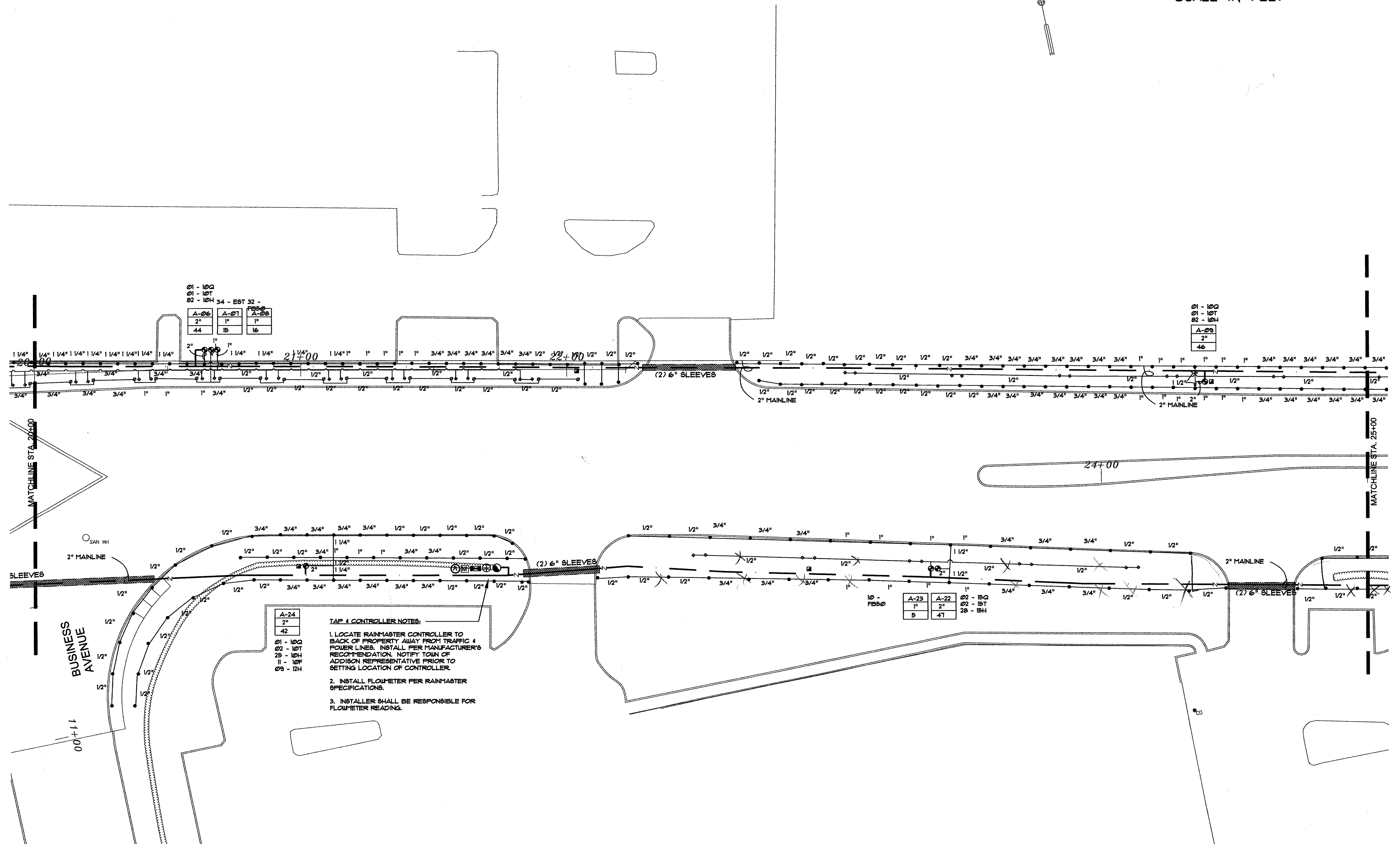
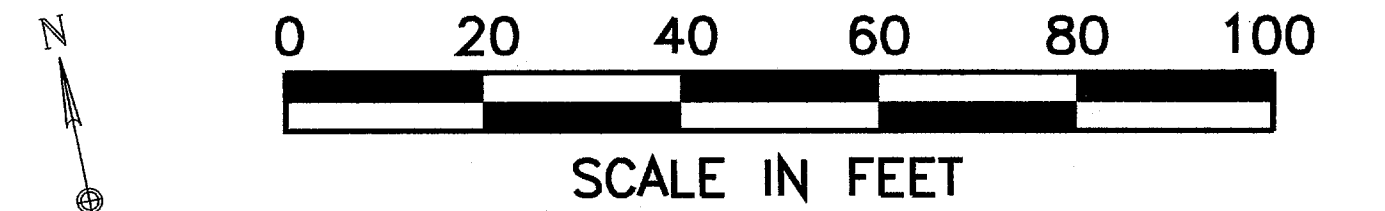
- TORO 570Z SERIES 4" POP-UP SPRAY - REF. PLAN FOR NOZZLE
- TORO 570Z SERIES 12" POP-UP SPRAY - REF. PLAN FOR NOZZLE
- ◇ TORO FB-PC-50 SERIES 12" POP-UP BUBBLERS
- ⊖ HUNTER I20-ADV SERIES - 8.0 NOZZLE
- ⊕ WEATHERMATIC 11000CR SERIES REMOTE CONTROL VALVE
- ⊕ WEATHERMATIC 11000CR SERIES REMOTE CONTROL MASTER VALVE
- BUCKNER QB3SBL07 SINGLE LUG 3/4" QUICK COUPLING VALVE
- N SPEARS PLASTIC BALL VALVE - Same size as mainline
- ⊠ WATTS 007M SERIES INLINE DCA - 2"
- M HERSEY MVR WATER METER - 1 1/2"
- A RAINMASTER EVOLUTION DX-2 CONTROLLER
- ⊕ 2" FLOW METER - REF. RAINMASTER SPECIFICATIONS FOR INSTALLATION

■ SCHEDULE 40 PVC MAINLINE - ALL MAINLINE IS 2"
 — Class 315 IPS or Class 200 IPS Lateral Line

ZONE CONTROLLER - STATION NUMBER
 VALVE VALVE SIZE
 GPM GPM PER VALVE

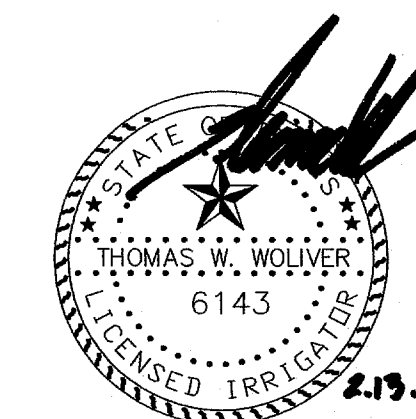
10 - 12H NUMBER OF NOZZLES - NOZZLE SIZE

CONTRACTOR SHALL VERIFY NOZZLE SIZES IN FIELD FOR MPR AND HEAD TO HEAD COVERAGE. CONTRACTOR TO MINIMIZE OVERSPRAY. NO OVERSPRAY ONTO PAVEMENT SHALL BE ACCEPTED.



107

NO.	DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>			
ARAPAHO ROAD - PHASE II			
MARSH LANE TO SURVEYOR BOULEVARD			
IRRIGATION PLAN			
STA. 20+00 TO STA. 25+00			
TOWN OF ADDISON, TEXAS			
Design TWW	Drawn TWW	DATE	SCALE
Check TWW	Check TWW	FEB 13	1" = 20'
		PROJECT NO.	SHEET NO.
		25768	I-3



25768

IRRIGATION LEGEND:

- TORO 570Z SERIES 4" POP-UP SPRAY - REF. PLAN FOR NOZZLE
- TORO 570Z SERIES 12" POP-UP SPRAY - REF. PALN FOR NOZZLE
- ◇ TORO FB-PC-50 SERIES 12" POP-UP BUBBLERS
- ⊖ HUNTER I20-ADV SERIES - 8.0 NOZZLE
- ⊕ WEATHERMATIC 11000CR SERIES REMOTE CONTROL VALVE
- ⊕ WEATHERMATIC 11000CR SERIES REMOTE CONTROL MASTER VALVE
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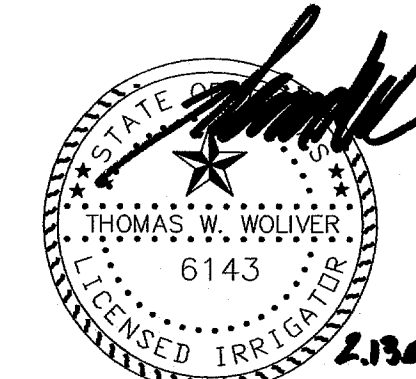
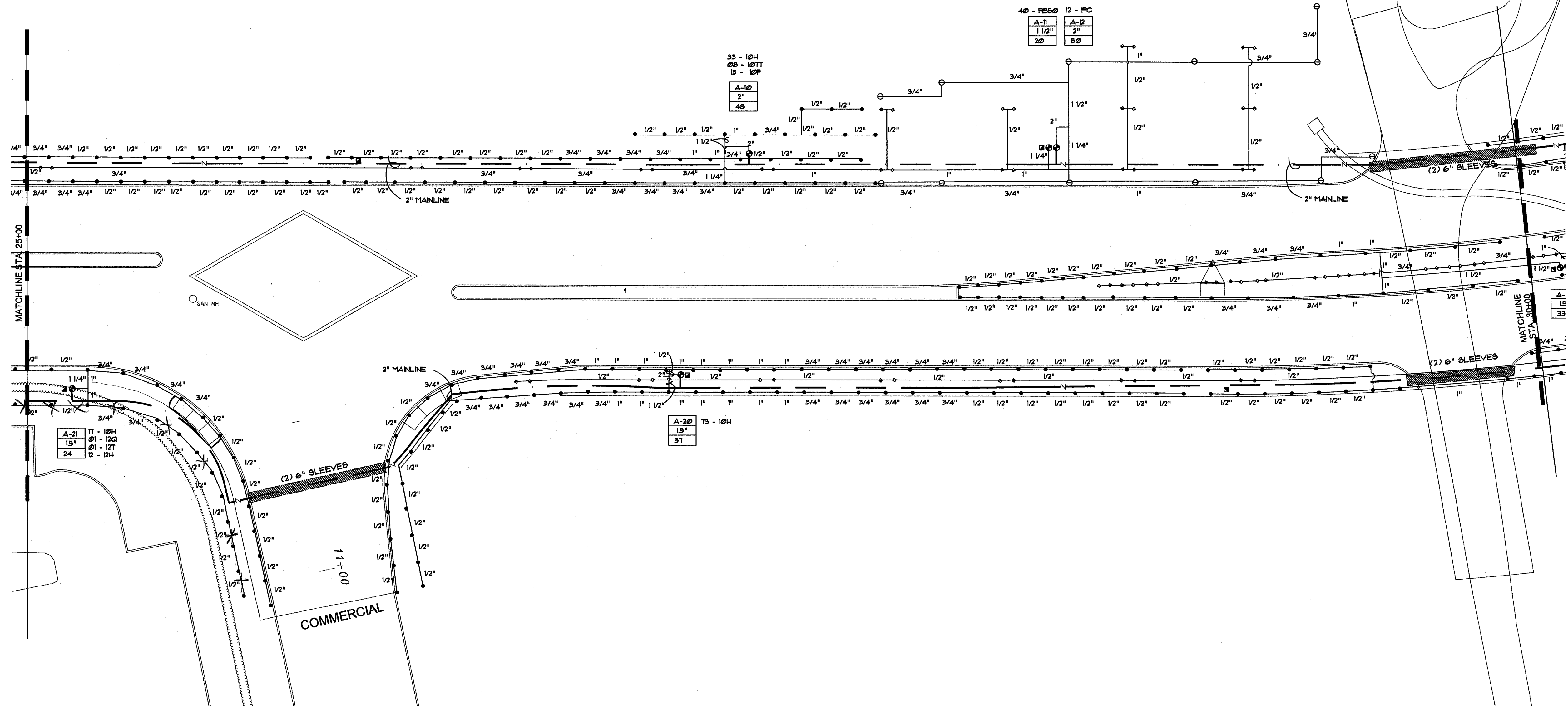
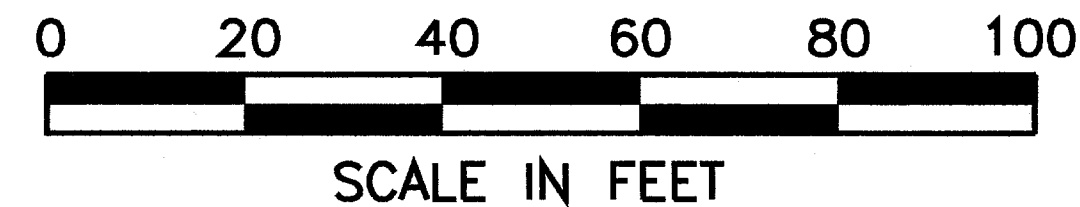
■ SCHEDULE 40 PVC MAINLINE - ALL MAINLINE IS 2"

— Class 315 IPS or Class 200 IPS Lateral Line

ZONE	CONTROLLER - STATION NUMBER
VALVE	VALVE SIZE
GPM	GPM PER VALVE

10 - 12H NUMBER OF NOZZLES - NOZZLE SIZE

CONTRACTOR SHALL VERIFY NOZZLE SIZES IN FIELD FOR MPR AND HEAD TO HEAD COVERAGE. CONTRACTOR TO MINIMIZE OVERSPRAY. NO OVERSPRAY ONTO PAVEMENT SHALL BE ACCEPTED.



NO.	DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>			
ARAPAHO ROAD - PHASE 2			
MARSH LANE TO SURVEYOR BOULEVARD			
IRRIGATION PLAN			
STA. 25+00 TO STA. 30+00			
TOWN OF ADDISON, TEXAS			
Design TW	Drawn TW	DATE	SCALE
Check TW	Check TW	FEB 13	1" = 20'
			PROJECT NO. 25768
			SHEET NO. 1-4

108

IRRIGATION LEGEND:

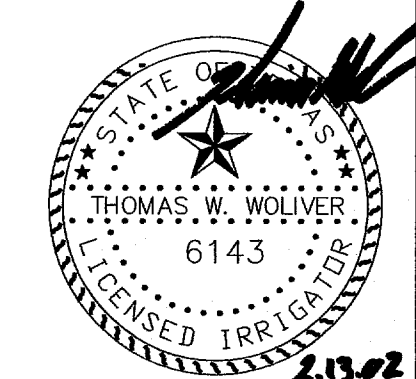
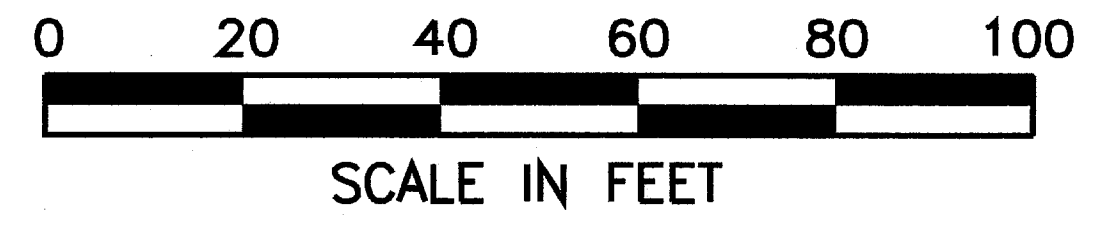
- TORO 570Z SERIES 4" POP-UP SPRAY - REF. PLAN FOR NOZZLE
- TORO 570Z SERIES 12" POP-UP SPRAY - REF. PALN FOR NOZZLE
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- W WATTS 007M SERIES INLINE DCA - 2"
- M HERSEY MVR WATER METER - 1 1/2"
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■ SCHEDULE 40 PVC MAINLINE - ALL MAINLINE IS 2"
 --- Class 315 IPS or Class 200 IPS Lateral Line

ZONE CONTROLLER - STATION NUMBER
 VALVE VALVE SIZE
 GPM GPM PER VALVE

○ - 12H NUMBER OF NOZZLES - NOZZLE SIZE

CONTRACTOR SHALL VERIFY NOZZLE SIZES IN FIELD FOR MPR AND HEAD TO HEAD COVERAGE. CONTRACTOR TO MINIMIZE OVERSPRAY. NO OVERSPRAY ONTO PAVEMENT SHALL BE ACCEPTED.

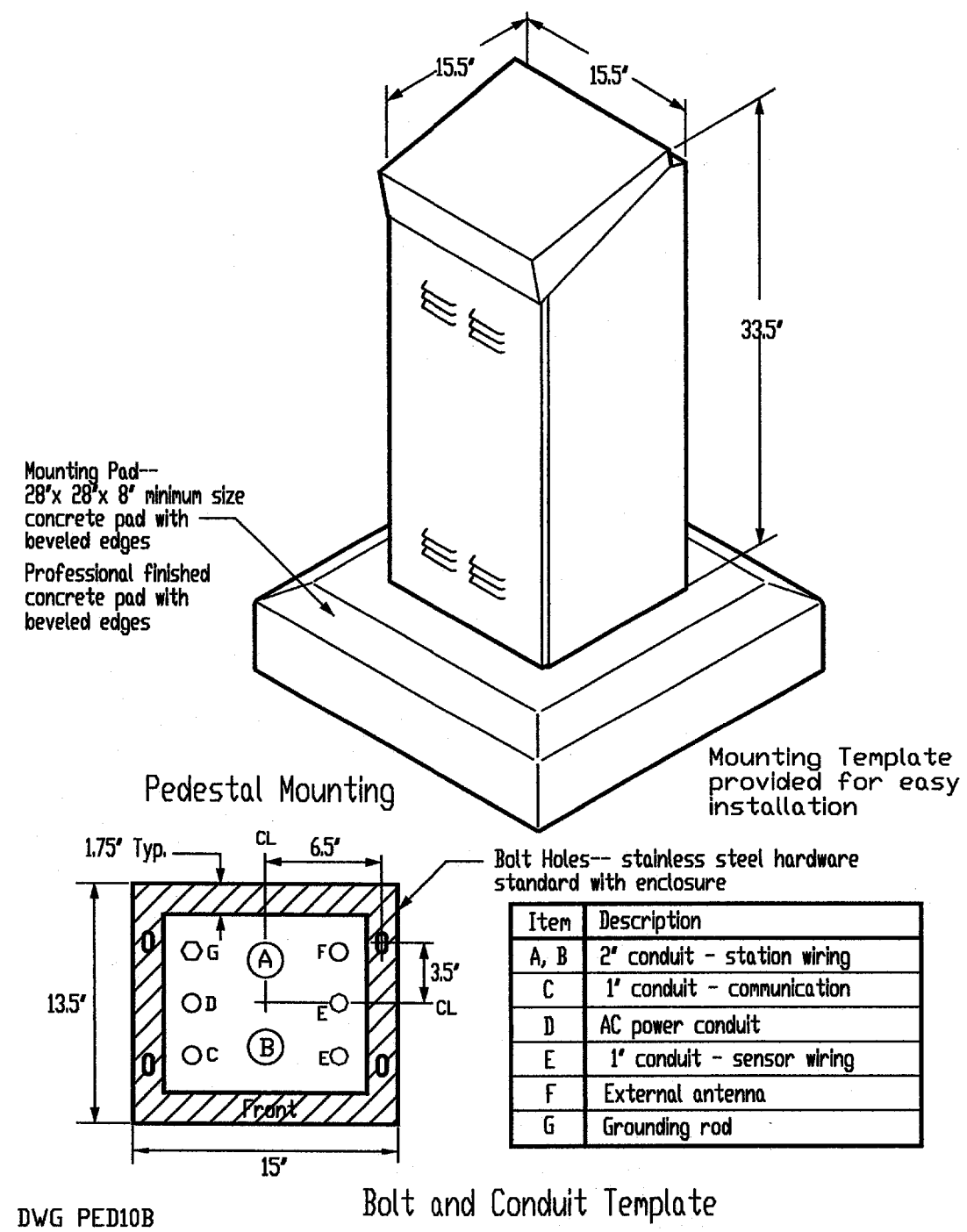


NO.	DATE	REVISION	109	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>				
ARAPAH0 ROAD - PHASE II				
MARSH LANE TO SURVEYOR BOULEVARD				
IRRIGATION PLAN				
STA. 30+00 TO STA. 35+00				
TOWN OF ADDISON, TEXAS				
Design TWW	Drawn TWW	DATE	SCALE	PROJECT NO. SHEET NO.
Check TWW	Check TWW	FEB 13	1" = 20'	25788 1-5

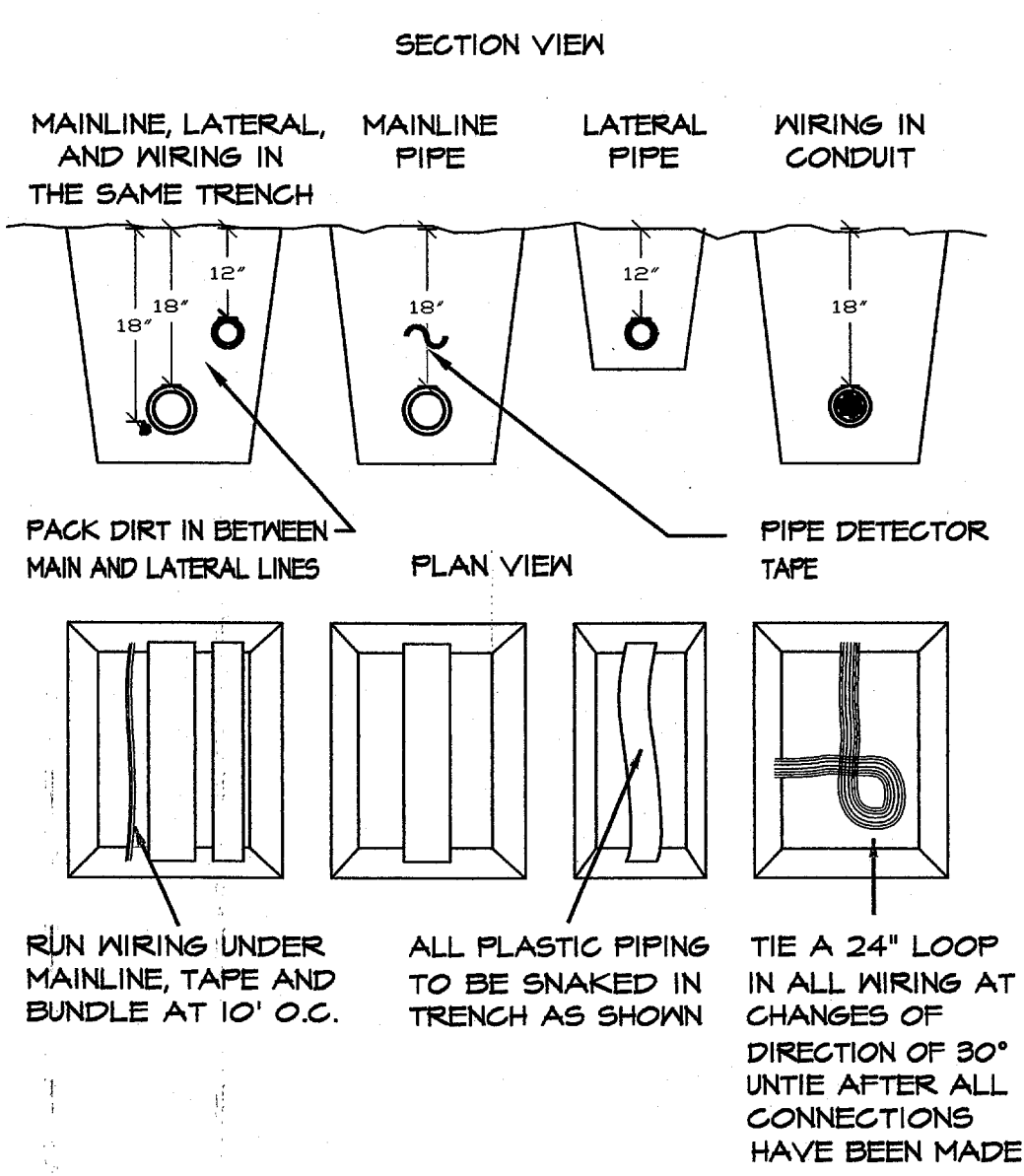
IRRIGATION NOTES

- This design is based on head to head coverage with no single head coverage. Nozzles shall be adjusted to prevent spraying onto or over paved surfaces or structures. Do not exceed manufacturer's specifications.
- All mainline pipe 2" and smaller is to be SCH 40 PVC; larger sizes are to be Class 200 PVC. Put no more than two (2) pipes in any one trench. All lateral piping to be Class 200 PVC.
- Fittings: No crosses are permitted. Separate tees and/or elbows by at least 12". Reduction tees are preferred over use of single reducer bushings. Multiple reducers' bushings will not be accepted. Only Spears and Lasco are permitted. Allow 18" out side sleeve bore before first fitting. No 45-degree elbows on 1" and larger pipe are allowed.
- Wiring: 14 gauge UF, Red - Control wires, White - Ground wires. Anytime wiring changes direction, such as at an elbow or tee, allow a loop at least one hand width (10 inches) alongside the fitting at that location. Only continuous wire runs are permissible unless otherwise approved. Wire should follow mainline where possible and lay along single side not crossing a lateral line. Master valve wiring to be blue colored. Run (2) two extra wires, one on each side of the loop with both of them terminating in same valve box across the street from the controller.
- Use King connectors for all station wire splices. Allow at least 36" of pigtail wire splice. All valve splices are to be housed in standard (large) Ametek rectangular valve boxes. All fitted splices are to be in 10" round Ametek plastic valve boxes.
- Valves are to be located within standard (large) Ametek rectangular plastic valve boxes with 4" - 6" of pea gravel placed underneath the valve in such a manner as to prevent soil infiltration into the box. The pea gravel should only contact the bottom of the valve body. Use appropriate sized ball valves before remote station valves. No valves smaller than 1" shall be permitted.
- Only Buckner QB3SBL07 single lug 3/4" QCV's are permitted. They are connected to a threaded fitting. Teflon paste and appropriate length gray Schedule 80 nipples and Schedule 40 fittings are to be used. Secure to 18"x1/2" steel rebar with stainless steel screw clamp. House QVC in a 10" round plastic Ametek valve box.
- All head to be attached to threaded fittings via 6" Lasco polyethylene nipples cut to appropriate length.
- Only Hersey MVR meters and three (3) brass flanges are acceptable. Meter lay lengths must be in accordance with the Town of Addison's Public Works Department specifications. Stainless steel bolts and nuts must be used in the installation along with neoprene gaskets. House in appropriate size, concrete box with lid. To bring box to ground level, use bricks or pavers, and backfill inside below meter base with at least 6" of pea gravel. Connection to main must be approved and inspected by the Town's utility department and all tap materials are to be purchased at the expense of the contractor and must comply with the Town's specifications. Contractor is also to obtain a permit prior to installation.
- Only Watts 007 M series inline check valve assemblies are to be used. Connect meter flange using Teflon paste and Gray Schedule 80 nipple of sufficient length to center the DCA within its housing. House in appropriate size, rectangular Ametek plastic valve box, use bricks or pavers for DCA support. If DCA is located in pavers or concrete, use appropriate sized box. See note above regarding meter installation. Contractor to follow same instructions with the exception of using plastic valve box extensions for increased height. Connect irrigation mainline to DCA using Teflon paste and PVC male adapter. Installer is responsible for DCA testing per State and local laws.
- Female threaded plastic Spears ball valves with positive T-handle cut off must be installed every 200' of mainline for isolation purposes (ref. Plans for locations). House in standard (large) rectangular Ametek plastic valve box and follow meter box installation instructions for DCA assembly.
- RainMaster Evolution DX-2 stainless steel controller with heavy-duty transient protection along with stainless steel freestanding pedestal is permitted. Controller must include all necessary hardware to ensure reliable communication and operation with the Town's central control located at 16801 Westgrove. Installation must include the following RainMaster hardware, purchased only from a RainMaster supplier; DX-03 sensor board, DX-PH phone communication option, 3" flow meter, and shielded EV-cab-Sen flow meter cable. An approved size Weathermatic 11000 series master valve flow meter and master valve must be housed in a large Ametek rectangular plastic valve box. Flow meter cable must be sized appropriately and be of a continuous run; no splices will be allowed except at the point of connection to the flow meter. Connections will be soldered and water proofed using a 3-M DBY connector. Cab-Sen cable will be installed within continuous 3/4" or larger gray PVC conduit with 6" or larger J-boxes placed every 200' or where 360 degrees of fittings are installed; only sweeps are permitted. It is the contractor's responsibility to entail the cost and work in conjunction with Southwestern Bell Telephone to establish a dedicated phone service and install an interface with the pedestal at each controller location via a direct burial cable. Controllers are to be affixed to a Town approved permanent concrete pad via four (4) 7/16" or large stainless steel bolts, nuts and washers. All wiring is to enter the pedestal via approved size gray PVC sweep elbows extending at least 1" through the top of the pad and 2" from the side of the pad. Control wiring, 120-volt service, flow meter cable, and phone cables are to be separated with each having its own access elbow. All local and national codes must conform to any and all aspects of the installation. The entire installation must conform to RainMaster specifications and be approved by the Town prior to and be inspected during installation. Such specifications will include grounding and pad configurations and distances from water meter to master valve to flow meter and first fitting. Additional hardware, if applicable, will be needed to control remote devices such as lighting, fountains, booster pumps; these will also be the responsibility of the contractor to supply, install, and ensure proper operation. The Town of Addison may also specify the installation of a RainMaster ET Tracker and any related equipment to make it a functional component of the computer-controlled system. A functional mini-click freeze sensor must be installed at every controller in an approved location by an approved method. Consult RainMaster for specifics of freeze sensor installation and other specs on the whole installation.

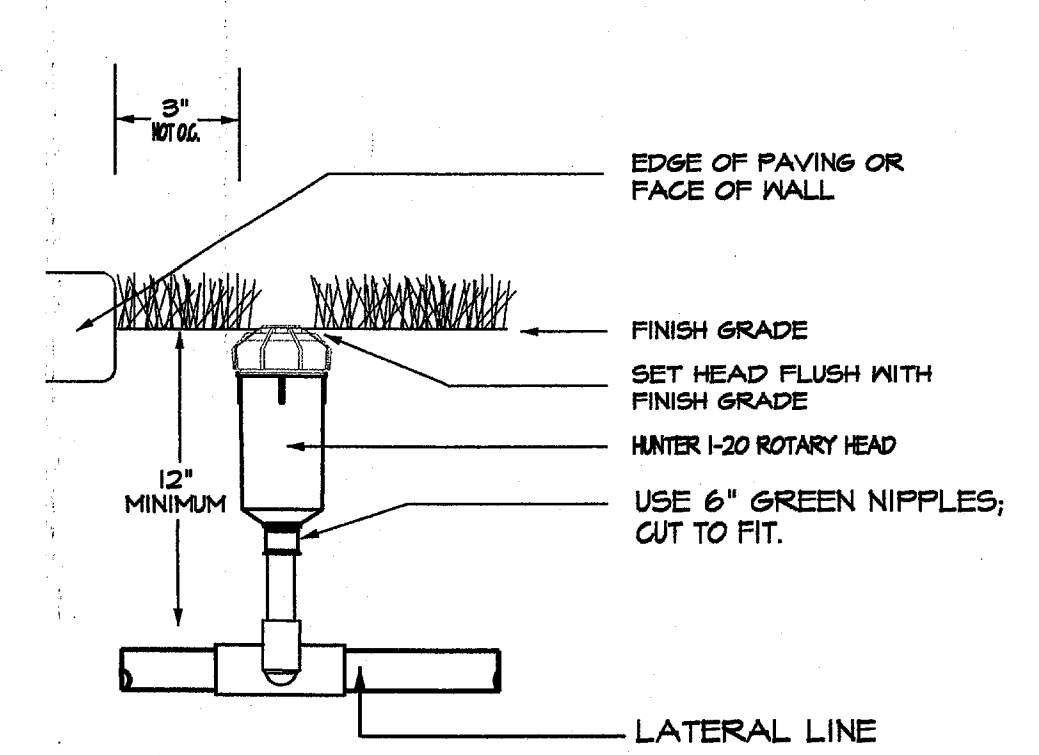
- Use clean and approved topsoil to back fill all pipe to a depth. All heads and boxes are to be back filled to grade with clean topsoil. No rocks greater than 1" are allowed. Compact trenches to alleviate settling. Minimal depth of coverage is 12".
- All sleeves 2" and smaller will be Schedule 40 PVC with size and location noted on the plan. Larger sizes will be Class 200. All piping underneath paving, including sidewalks must be sleeved.
- Use appropriate and approved PVC solvent. Use Turf-tite blue primer on all glue joints. Avoid excess use and wipe all joints and fittings clean.
- The installer is responsible for resetting head and/or box height due to settling. Contractor must simply a workmanship warranty for (1) year from date of completion.
- All work is to be accomplished by or directly supervised at all times by an on-site irrigator licensed by the State of Texas. All work performed must adhere to all requirement with Section 34 of the Texas Water Code governed by TNRCC.
- Prior to any backfilling of trenches, an inspection by the Town's representative must take place and any necessary changes implemented; otherwise, manual excavation to enable proper inspection will be necessary.
- Valve sequencing must be performed by the contractor and in order approved by the Town's representative. At least 10' of extra station wiring within the bottom of the pedestal is necessary for each zone and must be of neat and orderly appearance.
- Plans are diagrammatic and field adjustments are often necessary. For this reason, prior to trenching, head layout with flags needs to be done and locations approved by Town's representative. Not doing so may result in the relocation of heads at the contractor's expense.
- Any deficiencies in coverage note by the Town's inspector will be rectified at the cost of the contractor.
- Water taps will be 2" in size. All parts must conform to Town of Addison Water Department specifications and are the responsibility of the contractor to provide. Inspection of taps used by Water Department representative must occur. Excavation and tap permits are required. Meters are to be 1 1/2" in size and again conform to Water Department specifications for type and installation along with meter boxes and backfilling procedures. Contact: Addison Utilities Department at (972) 450-2871
- All paving must have Town-approved sleeve sizes and quantities present. It is the responsibility of the contractor to notify the Town of any area where sleeving should be present but is not and provide such materials at the contractor's expense.
- RainMaster controllers and associated hardware will be utilized on the job. Reference Town's Irrigation specifications for this aspect of the job. Note: separate stations may be necessary for operation of lights, fountains, etc; additional hardware is also needed and is to be purchased and installed by the contractor. For part numbers and pricing of any RainMaster equipment, contact Matt Swor of Longhorn, Inc. at (972) 406-0222. For technical questions, contact John Terosian of RainMaster at (800) 777-1477.
- Communication is the key. If you are unsure - Call Ron Lee, Addison Parks Department, (972) 450-2851.
- THIS SYSTEM IS BASED ON A MINIMUM OPERATING PRESSURE ON 60 PSI AND TOTAL DEMAND OF 60 GPM. NOTIFY TOWN'S REPRESENTATIVE IF ANY DISCREPANCY ARISES.
- No QCV or station valves adjacent to curb.
- Run mainline away from the curb where it will not interfere with the trees in the middle of the Right-of-way. Hand trench around all dripline canopies of existing trees.
- Power to irrigation controller shall be fed from pedestrian light power source. Irrigation feeder wires should be connected directly to a circuit breaker in the pedestrian lighting controller and not to a lighting contactor.



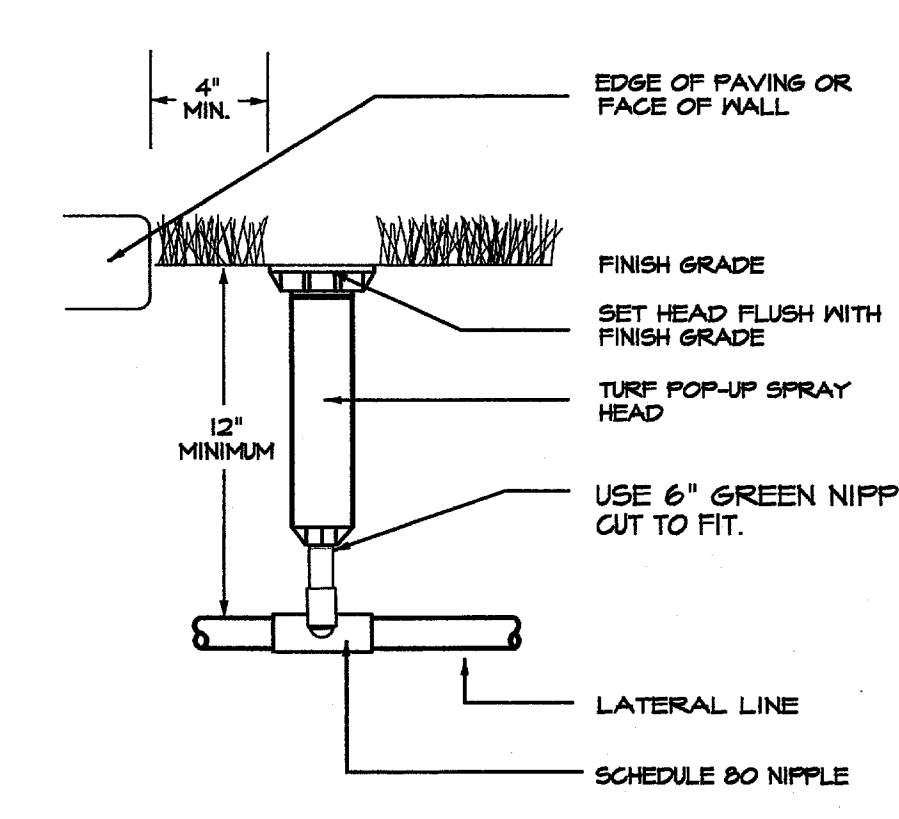
08 STAINLESS STEEL PEDESTAL



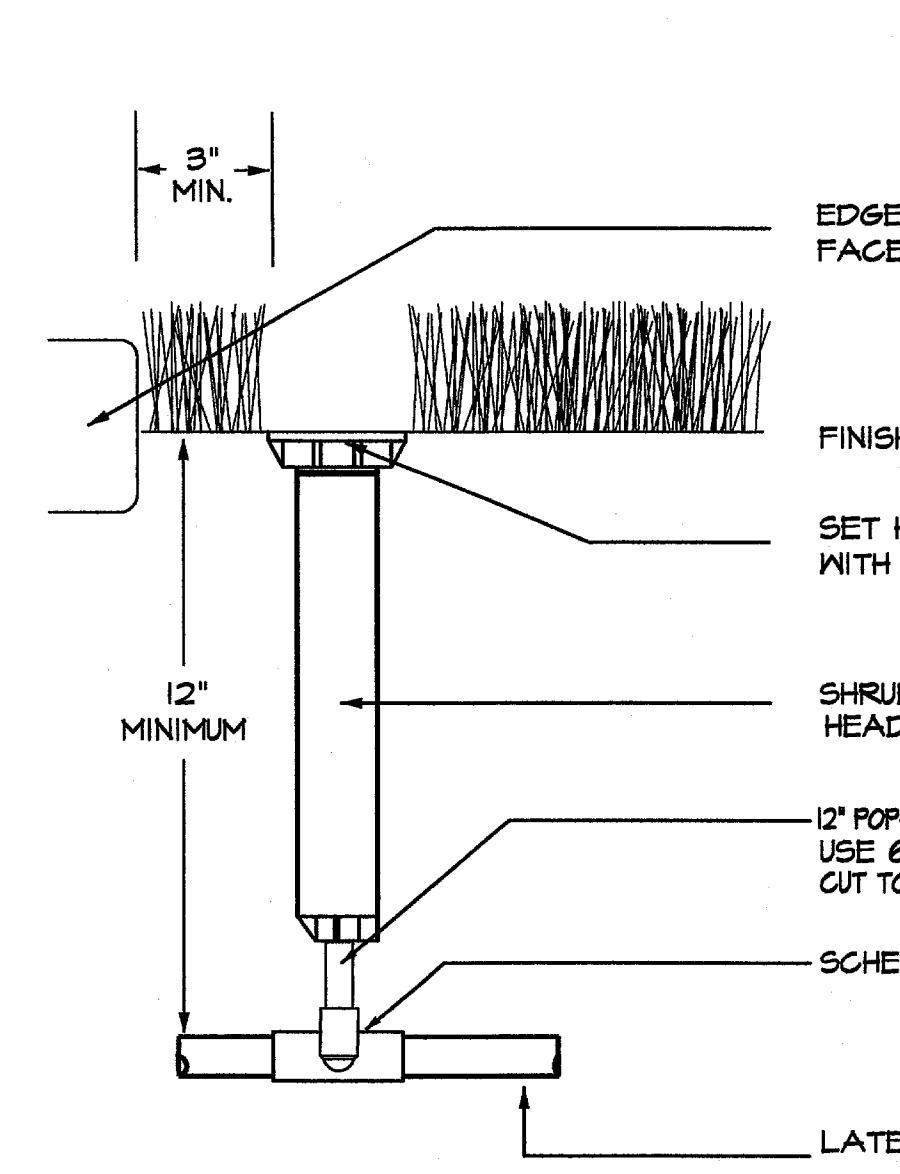
07 TRENCHING



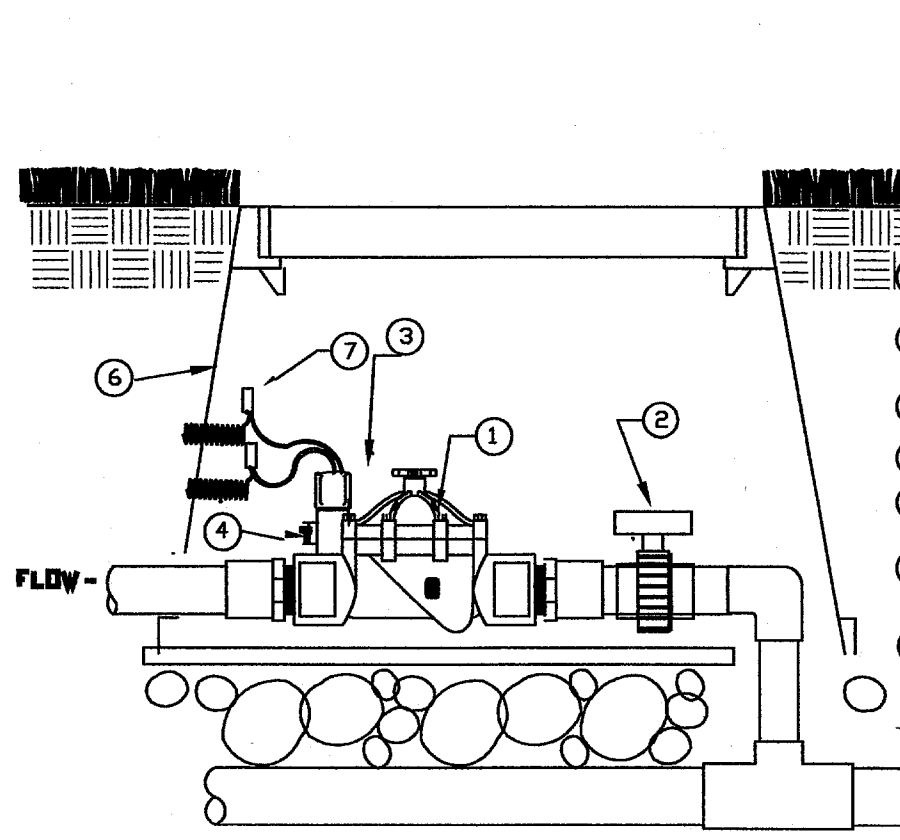
06 ROTOR HEAD



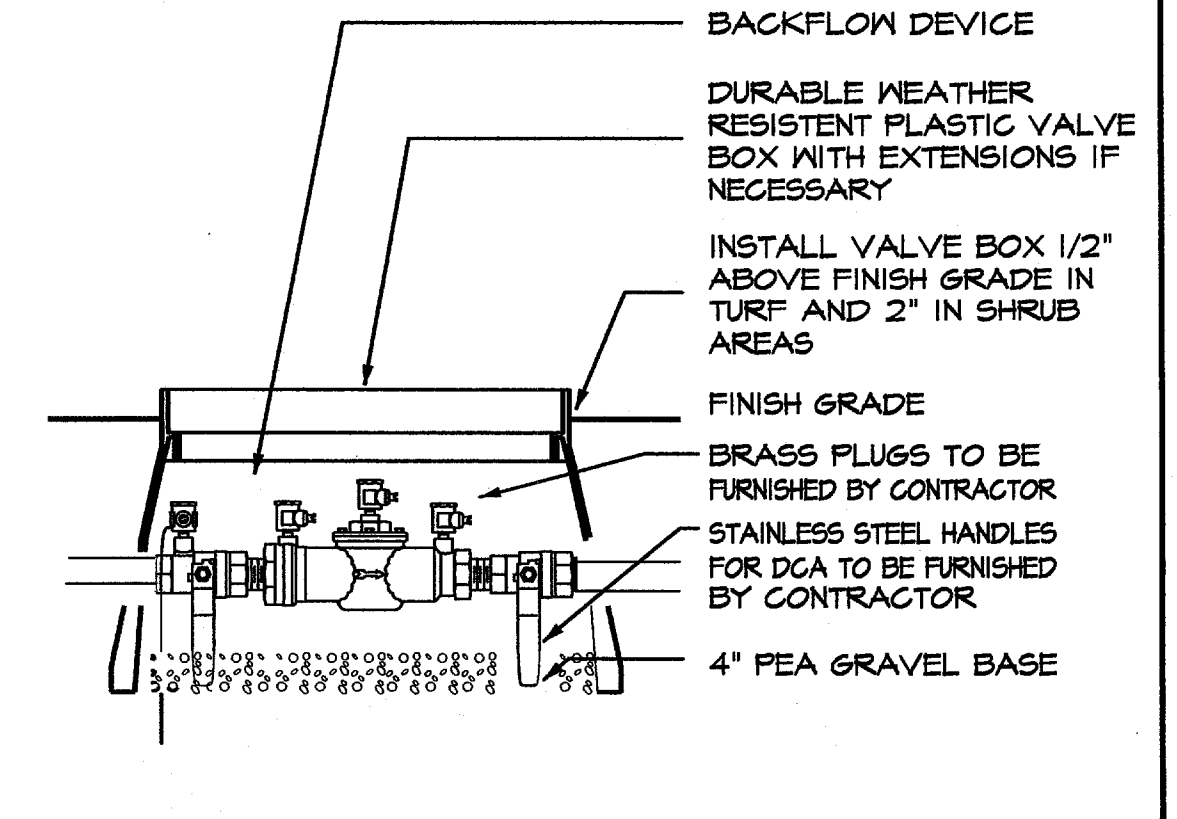
05 TURF HEAD POP-UP



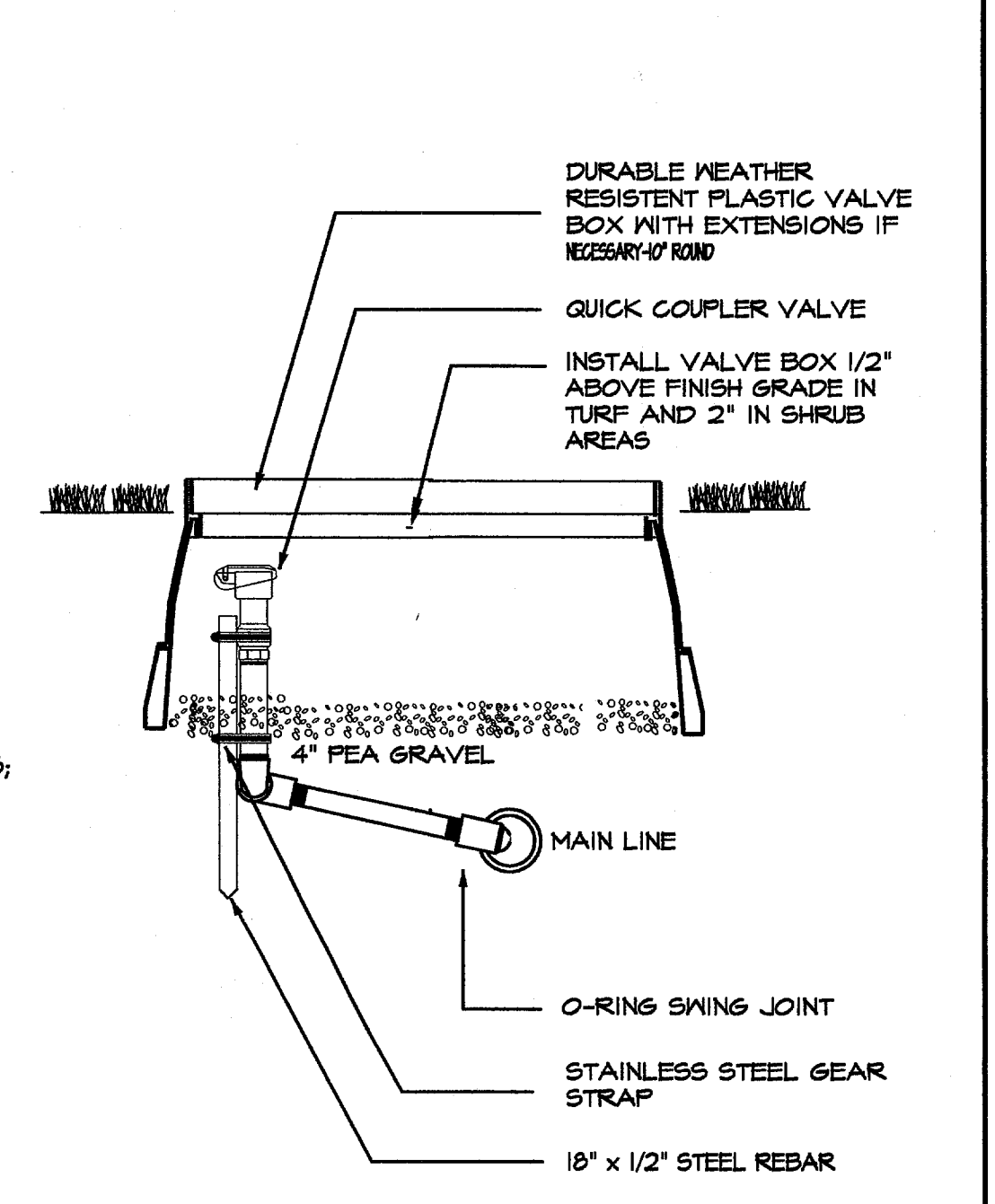
04 SHRUB POP-UP SPRAY



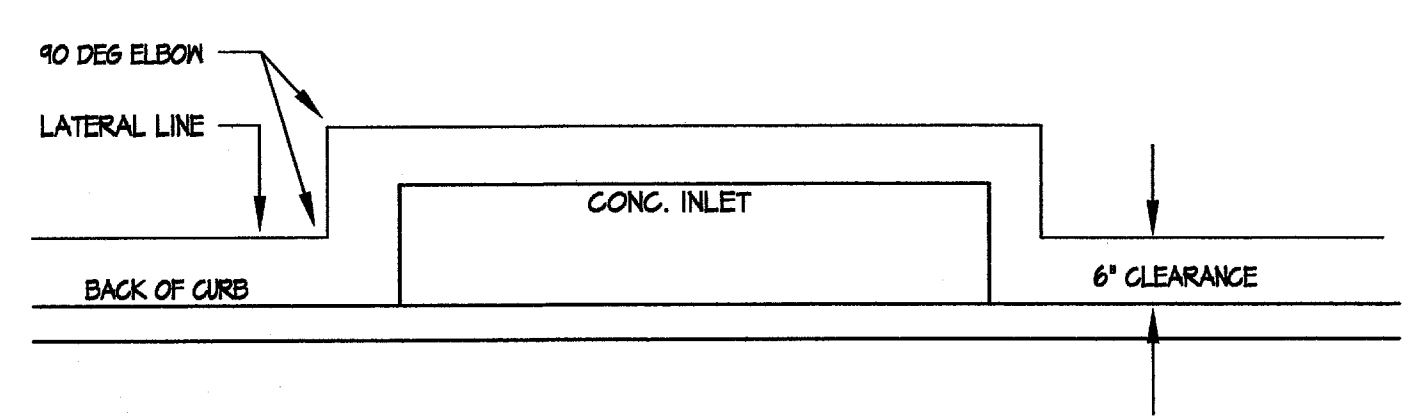
03 CONTROL VALVE



02 DOUBLE CHECK ASSEMBLY



01 QUICK COUPLER VALVE



09 PIPING AROUND INLET

STATE OF TEXAS
THOMAS W. WOLIVER
6143
LICENSED IRRIGATOR
219.02

NO.	DATE	REVISION	APPROV.
110			

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

ARAPAHO ROAD - PHASE II

MARSH LANE TO SURVEYOR BOULEVARD

IRRIGATION
NOTES & DETAILS

TOWN OF ADDISON, TEXAS

Design	TWW	Drawn	TWW	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	TWW	Check	TWW	FEB 13	1" = 20'	25768	1-6

PLANTING NOTES:

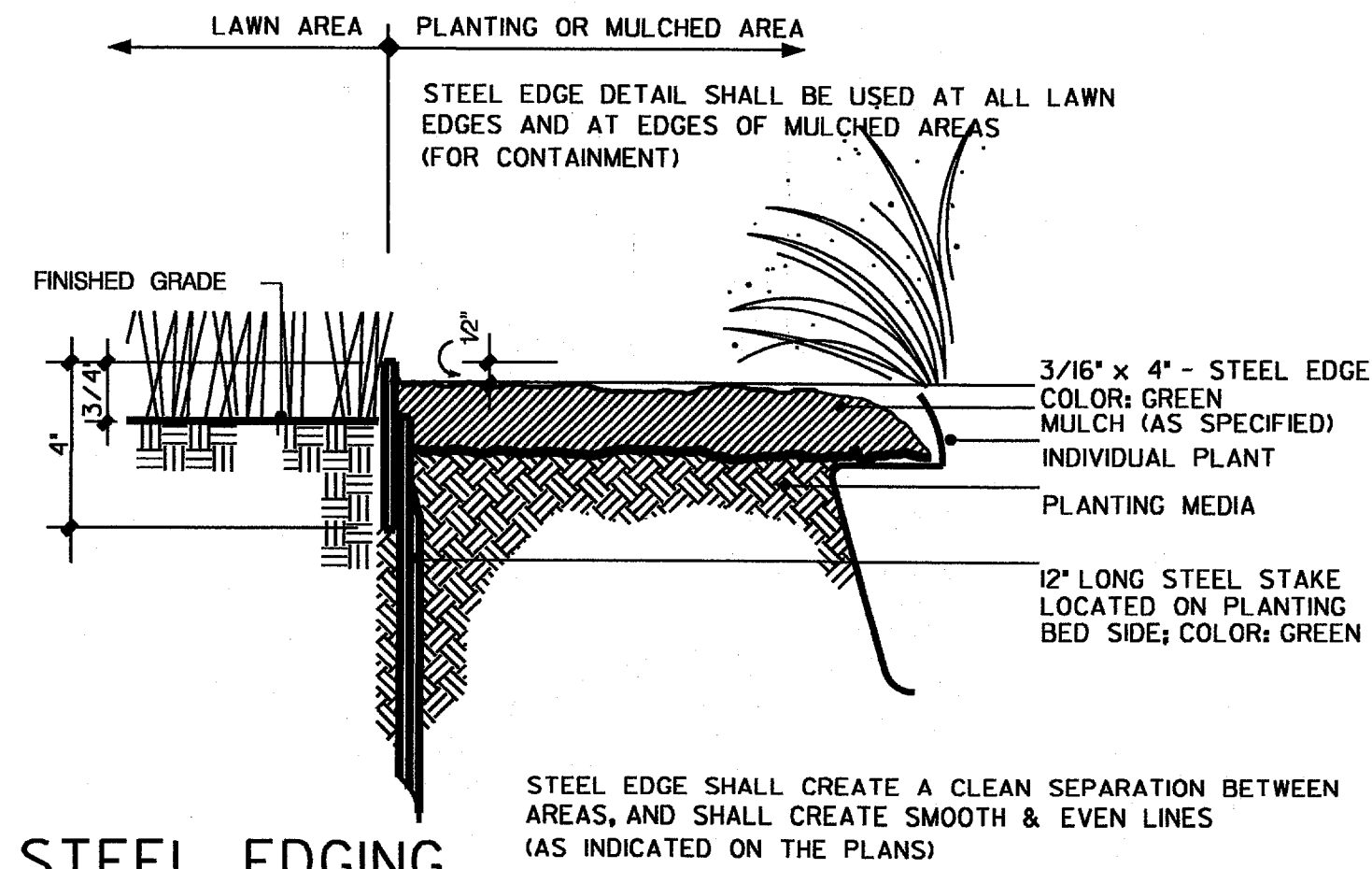
- PROPOSED TREE LOCATIONS ARE DIAGRAMMATIC. CONTRACTOR SHALL STAKE OUT ALL INFORMAL TREE LOCATIONS IN FIELD USING COLORED FLAGS FOR EACH DIFFERENT TREE SPECIES FOR REVIEW AND APPROVAL BY THE LANDSCAPE ARCHITECT PRIOR TO EXCAVATION. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO ADJUST PLANTS TO EXACT LOCATION IN FIELD.
- CONTRACTOR IS RESPONSIBLE FOR VERIFYING LOCATIONS OF UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ADVISE THE LANDSCAPE ARCHITECT OF ANY CONDITION FOUND ON SITE WHICH PROHIBITS INSTALLATION AS SHOWN ON THESE DRAWINGS.
- TREES SHALL BE PLANTED AT LEAST FIVE (5') FEET FROM ANY UTILITY LINE, AND OUTSIDE ALL UTILITY EASEMENTS (THREE (3') FEET DIAMETER CLEAR AROUND HYDRANTS). TREES AND SHRUBS SHALL BE A MINIMUM OF TWO (2') FEET FROM BACK OF CURB.
- TREES OVERHANGING SIDEWALKS AND PARKING OR PEDESTRIAN AREAS SHALL HAVE A MINIMUM CLEAR TRUNK BRANCHING HEIGHT OF SIX (6') FEET.
- TREES OVERHANGING VISIBILITY EASEMENTS OR RIGHT-OF-WAYS SHALL HAVE A MINIMUM CLEAR TRUNK HEIGHT OF SIX (6') FEET.
- ALL PLANT MATERIAL SHALL BE MAINTAINED IN A HEALTHY AND GROWING CONDITION, AND MUST BE REPLACED WITH PLANT MATERIAL OF SIMILAR VARIETY AND SIZE IF DAMAGED, DESTROYED OR REMOVED.
- LANDSCAPED AREAS SHALL BE KEPT FREE OF TRASH, LITTER, AND WEEDS AT ALL TIMES DURING CONSTRUCTION.
- LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR FINE GRADING, REMOVAL OF MISCELLANEOUS DEBRIS AND ANY ADDITIONAL FILL REQUIRED TO CREATE A SMOOTH CONDITION PRIOR TO PLANTING IN ALL LAWN AREAS. GENERAL CONTRACTOR IS RESPONSIBLE FOR ROUGH GRADING TO WITHIN 3' OF FINAL GRADE.
- ALL QUANTITIES ON THESE PLANS ARE FOR INFORMATION ONLY. PLANT SPACING IS AS INDICATED ON PLANT SCHEDULE UNLESS OTHERWISE NOTED. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE FULL COVERAGE IN ALL PLANTING AREAS AS SPECIFIED IN THE PLANT SCHEDULE REMARKS.
- ALL LANDSCAPED (NON-TURF) AREAS WILL BE IRRIGATED VIA AN UNDERGROUND AUTOMATIC IRRIGATION SYSTEM. REFER TO IRRIGATION PLANS FOR LOCATION OF IRRIGATION METER, SLEEVES AND CONTROLLER.
- ALL REQUIRED TREES MUST BE MULCHED AT A DEPTH OF 3" AROUND THE TREE AT TIME OF INSPECTION.
- TOPSOIL FOR THE TURF AREAS SHALL BE 3" DEEP MINIMUM.
- ALL GRASSED AREAS DAMAGED BY CONSTRUCTION SHALL RECEIVE 3 INCHES OF TOPSOIL AND SOLID SODDING. MAXIMUM PAY LIMITS ARE SHOWN IN THE PLANS. SOD SHALL CONSIST OF LIVE, GROWING BERMUDA GRASS. SOD SHALL HAVE A HEALTHY VIRILE ROOT SYSTEM OF DENSE, THICKLY MATTED ROOTS THROUGHOUT THE SOIL OF THE SOD FOR A MINIMUM THICKNESS OF INCH. SOD WITH THE GRASS THINNED OUT, OR THE ROOTS DRIED OUT SHALL NOT BE USED. SOD SHALL BE MOIST FROM DIGGING UNTIL PLANTING. SOD SHALL BE VIRTUALLY FREE FROM NOXIOUS WEEDS, JOHNSON GRASS OR OTHER GRASSES OR ANY OTHER MATTER DELETERIOUS TO ITS GROWTH OR WHICH MIGHT AFFECT ITS SUBSISTENCE OR HARDINESS WHEN TRANSPLANTED. PROVIDE ON GOING WATER VIA IRRIGATION SYSTEM, HAND WATERING OR WATERING TRUCK UNTIL GRASS HAS ESTABLISHED 3 WEEKS AFTER PLANTING.

TREE PROTECTION NOTES:

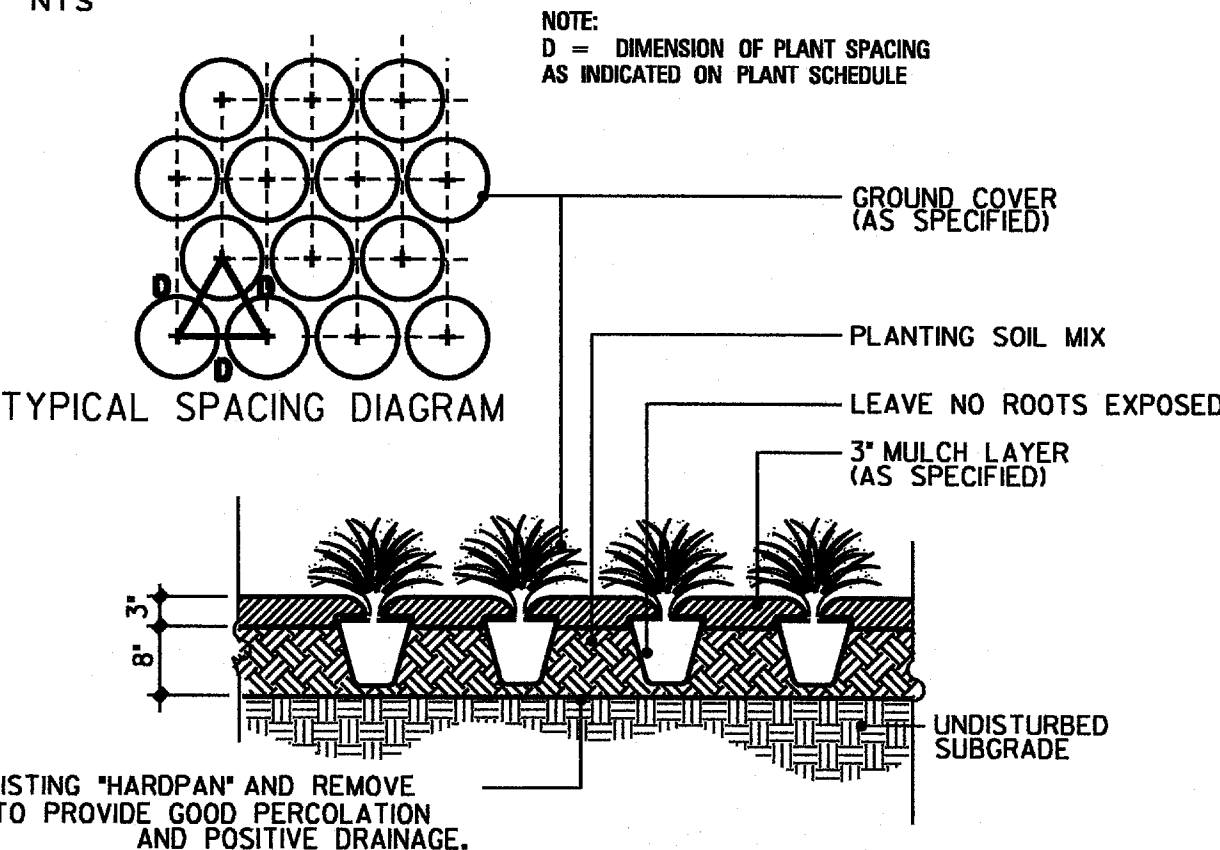
- PRIOR TO CONSTRUCTION, ALL TREES TO BE PRESERVED SHALL BE CLEARLY MARKED/TAGGED WITH BRIGHTLY COLORED TAPE WRAPPED AROUND THE MAIN TRUNK.
- FENCING SHALL BE ERECTED AROUND EACH TREE OR GROUP OF TREES AT APPROX. THE TREE'S DRIP LINE. FENCING SHALL BE 6' CHAIN LINK FENCE AS PER DETAIL 4/L-4.00.
- DURING THE CONSTRUCTION STAGE OF DEVELOPMENT, CLEANING OF EQUIPMENT OR MATERIALS UNDER THE CANOPY OF ANY TREE OR GROUP OF TREES TO REMAIN SHALL BE STRICTLY PROHIBITED. NO DISPOSAL OF ANY WASTE MATERIAL SUCH AS, BUT NOT LIMITED TO PAINT, OIL, SOLVENTS, ASPHALT, CONCRETE, MORTAR ETC. UNDER THE CANOPY OF ANY TREE OR GROUP OF TREES TO REMAIN.
- NO ATTACHMENTS OR WIRES OF ANY KIND, OTHER THAN THOSE OF A PROTECTIVE NATURE, SHOULD BE ATTACHED TO ANY TREE.
- CUT/FILL: A MIN. OF 75% OF THE CRITICAL ROOT ZONE (CRZ) SHALL BE PRESERVED AT NATURAL GRADE. NO DISTURBANCE OF THE SOIL GREATER THAN 4 INCHES WILL BE LOCATED CLOSER TO THE TREE TRUNK THAN 1/2 OF THE CRZ RADIUS DISTANCE.
- THE DESIGN & TRENCHING FOR IRRIGATION LINES SHALL NOT CROSS THE CRZ OF PRESERVED TREES. THE IRRIGATION TRENCHES SHALL BE LOCATED OUTSIDE OF THE CRZ AND DESIGNED TO THROW WATER INTO THE AREA WITHIN THE DRIP LINE OF THE TREE. ANY TRENCHING WHICH MUST BE DONE WITHIN THE CRZ SHALL BE DONE BY HAND. TRENCH INTO THE CRZ IN A RADIAL MANNER, SUCH AS IN A BICYCLE SPOKE CONFIGURATION.
- NO ROTOTILLING SHALL BE ALLOWED WITHIN THE CRITICAL ROOT ZONE. AERATE OR LOOSEN TOP 2 INCHES OF SOIL AND HAND DIG PITS. ADJUST PLANT LAYOUT TO AVOID ROOTS.
- CONTRACTOR SHALL FOLLOW THE TOWN OF ADDISON'S TREE PROTECTION GUIDELINES. WHERE THERE ARE DISCREPANCIES THE GREATER PROTECTIVE MEASURES SHALL GOVERN.

TREE REMOVAL NOTE:

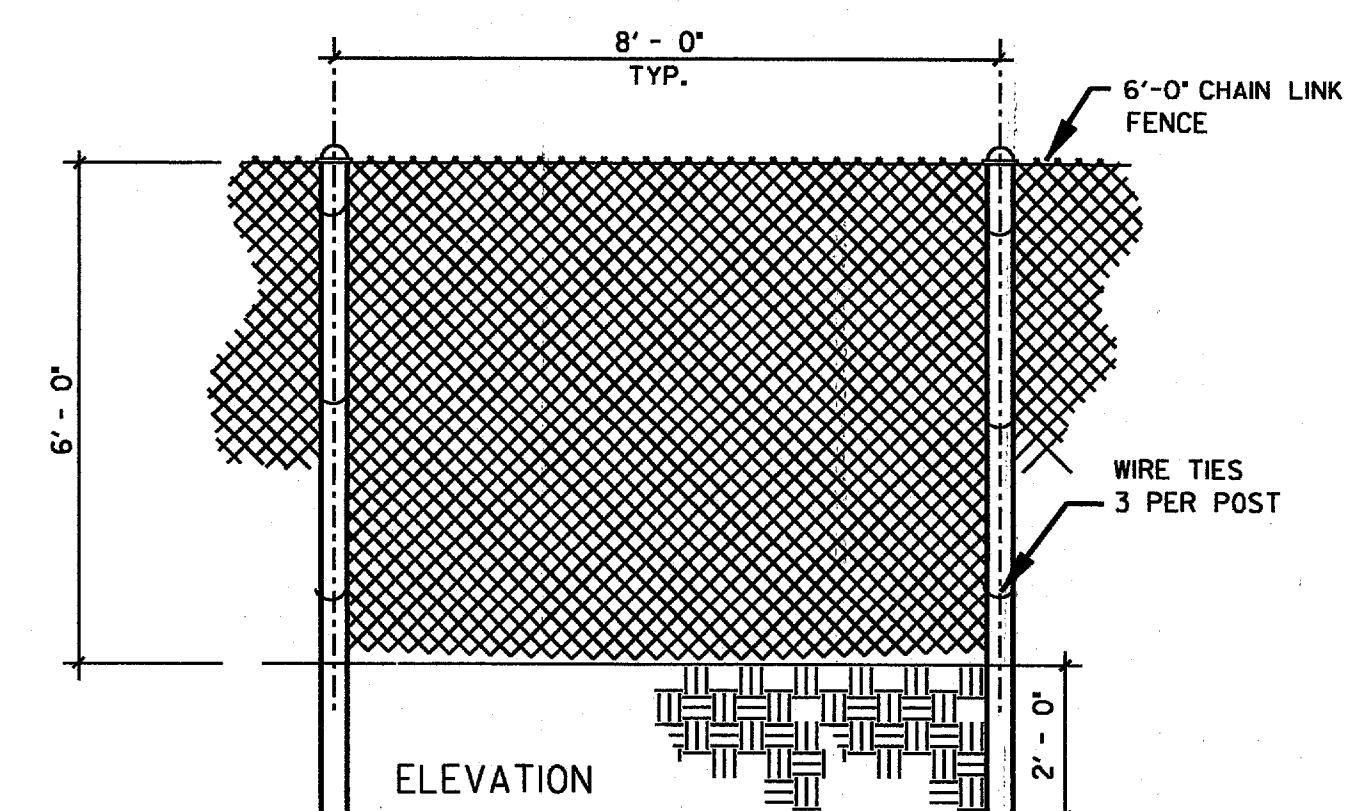
- TAG TREES TO BE REMOVED RELATIVE TO PROPOSED CURBLINE/IMPROVEMENTS & REVIEW WITH LANDSCAPE ARCHITECT PRIOR TO REMOVAL.



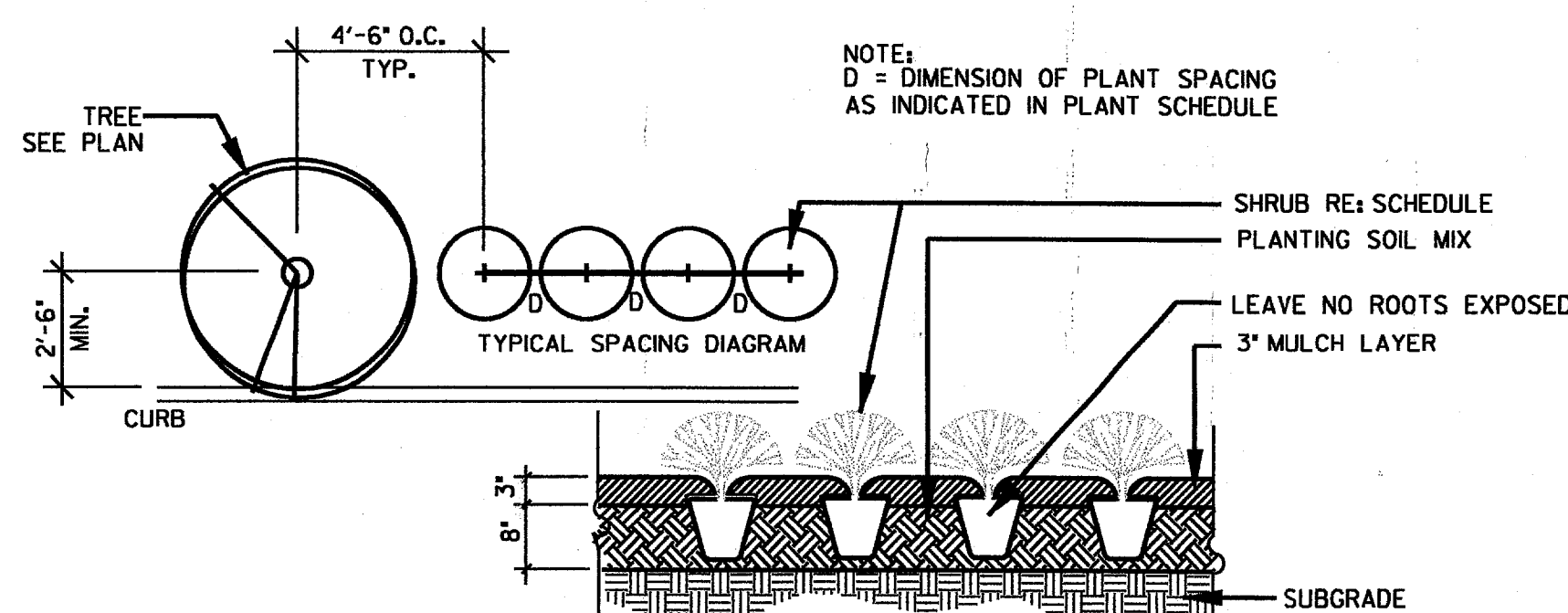
06 STEEL EDGING
NTS



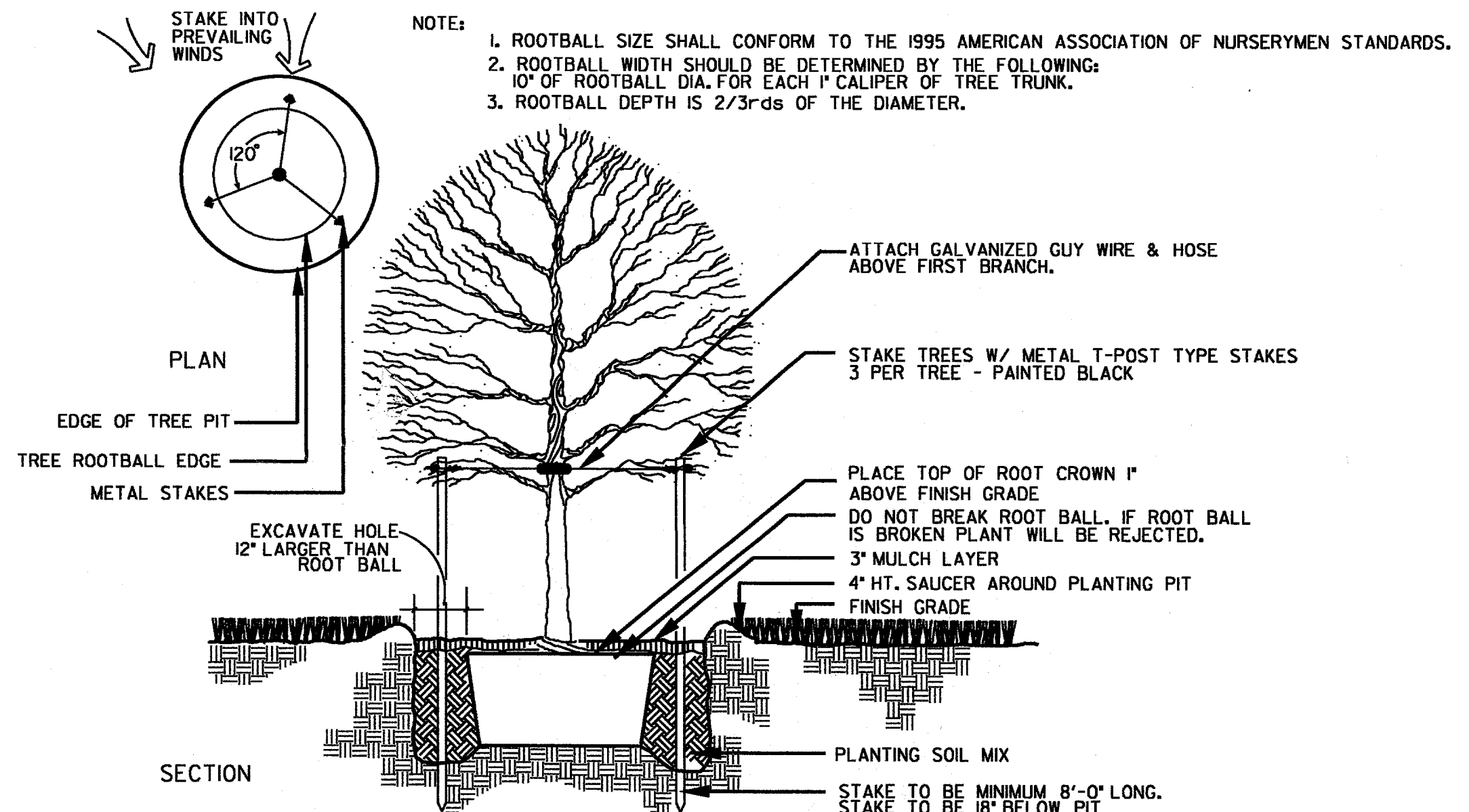
05 GROUND COVER PLANTING
NTS



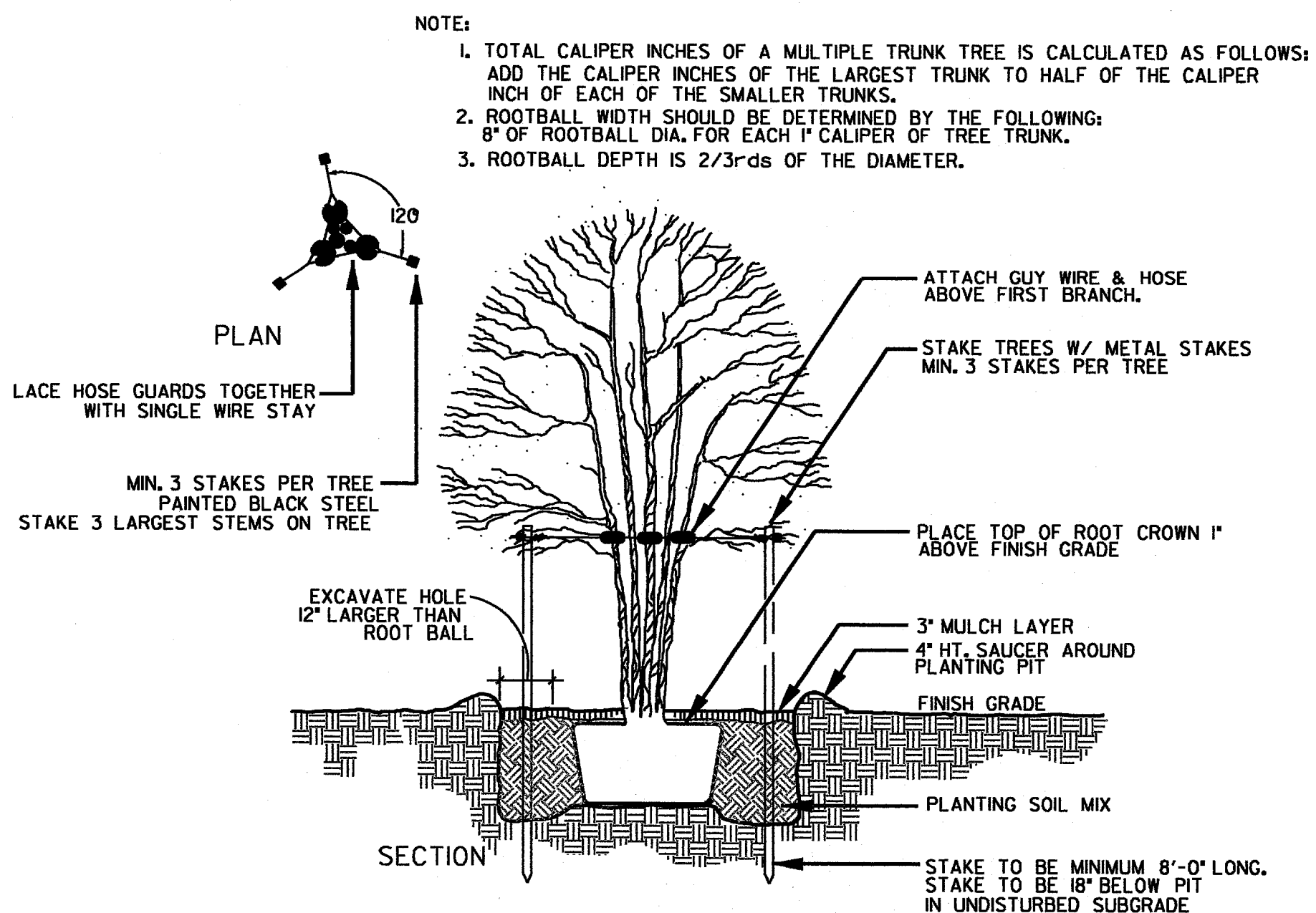
04 TREE PROTECTION FENCING DETAIL
NTS



03 SHRUB PLANTING
NTS



02 TREE PLANTING AND STAKING
NTS



01 MULTI-STEM TREE PLANTING AND STAKING
NTS



NO.	DATE	REVISION	APPROV.
HNTB ARCHITECTS ENGINEERS PLANNERS <i>The HNTB Companies</i>			
ARAPAHO ROAD - PHASE II			
MARSH LANE TO SURVEYOR BOULEVARD			
PLANTING DETAILS AND NOTES			
TOWN OF ADDISON, TEXAS			
Design DAB	Drawn DAB	DATE	SCALE
Check MP	Check DAB	AUG 01	1" = 20'
		PROJECT NO.	SHEET NO.
		25768	PL-1