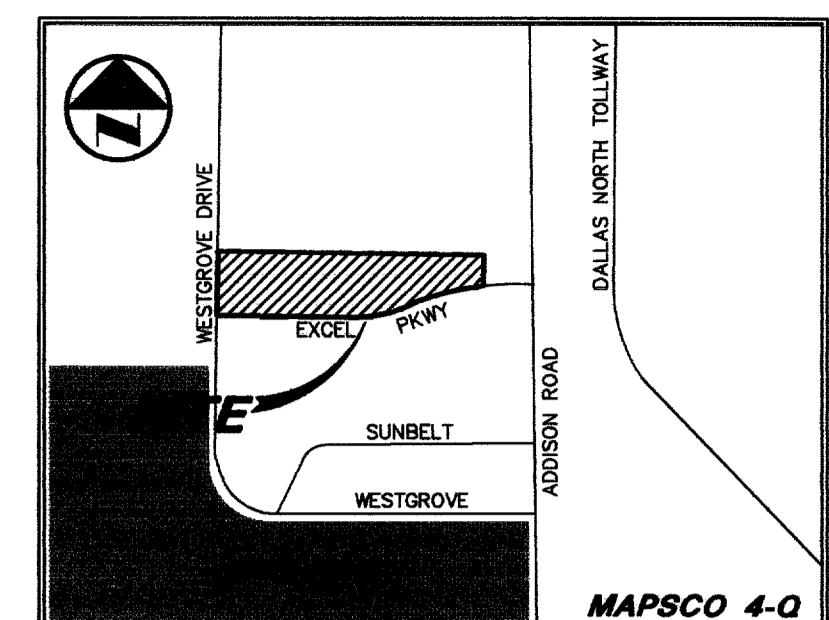


LEGEND

- B BOLLARD
- EM ELECTRIC METER
- PP POWER POLE
- LS LIGHT STANDARD
- WM WATER METER
- WV WATER VALVE
- ICV IRRIGATION CONTROL VALVE
- FH FIRE HYDRANT
- CL CLEANOUT
- MH MANHOLE
- GM GAS METER
- TSC TRAFFIC SIGNAL CONTROL
- TSP TRAFFIC SIGNAL POLE
- TELE TELEPHONE BOX
- TV TV BOX
- FP FLAG POLE
- EM ELECTRIC METER
- SIGN TRAFFIC SIGN
- PROPERTY LINE
- O.H. POWER LINE
- U/G TELEPHONE LINE
- U/G WATER LINE
- U/G GAS LINE
- FENCE
- B.F.R. BARRIER FREE RAMP
- DRAINAGE DIVIDE



GRADING AND DRAINAGE GENERAL NOTES

1. REFER TO GEOTECHNICAL REPORT FOR REQUIREMENTS REGARDING FILL COMPACTION AND MOISTURE CONTENT.
2. UNLESS NOTED, ALL FILL IS TO BE COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY WITHIN 3% OF OPTIMUM MOISTURE CONTENT. FILL TO BE PLACED IN A MAXIMUM OF 6" LIFTS.
3. ALL WALKS TO HAVE A MAXIMUM CROSS SLOPE OF 2%.
4. GRADING OF ALL HANDICAPPED SPACES AND ROUTES TO CONFORM TO STATE, LOCAL AND FEDERAL GUIDELINES.
5. UNLESS NOTED, STORM DRAIN LINES MAY BE OF THE FOLLOWING MATERIALS:
 - A. RCP C-76, CLASS III
 - B. ADS N-12
 - C. HANCOR HI-Q
 AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
6. UNLESS NOTED, GRATE INLET TO BE "AMERICAN INDUSTRIAL PRE-CAST PRODUCTS, INC." PRECAST CATCH BASIN, SIZED AS SHOWN, OF APPROVED EQUAL.
7. FINAL PAVING, CURB AND SIDEWALK ELEVATIONS WILL BE PLACED AT PLUS OR MINUS 0.03 FOOT.
8. REFER TO LANDSCAPE SPECIFICATION FOR SEEDING AND SODDING REQUIREMENTS.
9. ANY CONCRETE, ROCK OR MATERIAL DEEMED UNSUITABLE FOR SUBGRADE, BY ENGINEER, SHALL BE DISPOSED OF OFFSITE AT CONTRACTOR'S EXPENSE.
10. TRENCH BACKFILL MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF NCTCOG ITEM 6.2.10 AND SHALL BE MECHANICALLY COMPACTED IN ACCORDANCE WITH NCTCOG ITEM 6.2.9 TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY UNLESS OTHERWISE SHOWN ON THESE PLANS OR STATED IN THE STANDARD CITY SPECIFICATIONS.
11. EMBEDMENT SHALL CONFORM TO THE REQUIREMENTS OF NCTCOG ITEM 6.2.9 UNLESS OTHERWISE SHOWN ON THESE PLANS OR STATED IN THE STANDARD CITY SPECIFICATIONS.
12. A ROUND MANHOLE COVER MEETING CITY SPECIFICATIONS SHALL BE PLACED IN ALL INLET TOPS. THE MANHOLE COVER SHALL BE PLACED NEAR THE OUTLET PIPE.
13. ALL CONCRETE FOR INLETS AND DRAINAGE STRUCTURES SHALL CONFORM TO NCTCOG ITEM 7.4.5, CLASS "A" UNLESS OTHERWISE SHOWN ON THESE PLANS OR STATED IN STANDARD CITY SPECIFICATIONS.
14. CRUSHED STONE BEDDING OR APPROVED EQUAL SHALL BE PROVIDED BY THE CONTRACTOR WHEN ROCK IS ENCOUNTERED IN TRENCHES. THERE SHALL BE NO ADDITIONAL PAY ITEM OF THE CRUSHED STONE BEDDING.
15. IF REQUIRED DUE TO CONSTRUCTION, POWER POLES TO BE BRACED OR RELOCATED AT CONTRACTOR'S EXPENSE.
16. EXACT FLOW LINE ELEVATIONS OF STUBOUTS WERE UNABLE TO BE DETERMINED FROM CITY DRAWINGS. CONTRACTOR IS TO VERIFY EXACT ELEVATIONS AND CONTACT THE ENGINEER.

DRAINAGE CRITERIA

Q=cfs	Q=0.80
Tc=10	Tc=10
I ₁₀₀ =8.74	I ₁₀₀ =8.74

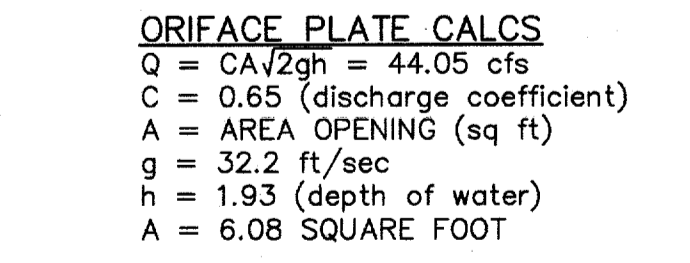
INLET SIZE CALCULATIONS

$Q = CA\sqrt{2gh}$
 $C = 0.65$ (discharge coefficient)
 $A =$ AREA INLET OPENING (sq ft)
 $g = 32.2$ ft/sec
 $h = 0.25'$ (depth of water)
 AREA GRATE INLET No.30 = 4.23 sq ft
 MAX Q GRATE INLET No.30 = 16.80 cfs

REQUIRED DETENTION VOLUME:
 (USING MODIFIED RATIONAL METHOD TO DETERMINE VOLUMES)
 Q_{25} (NET ALLOWABLE RELEASE) = 27.06 cfs
 Q_{100} (BYPASS) = 11.19 cfs
 Allowable Q out Detention = 15.87 cfs
 TOTAL REQUIRED DETENTION VOLUME = 6,196 cubic feet
 VOLUME PROVIDED IN PIPE = 1,875 cubic feet
 TOTAL ON GROUND STORAGE REQUIRED = 4,321 cubic feet
 VOLUME PROVIDED ON GROUND = 5,196 cubic feet

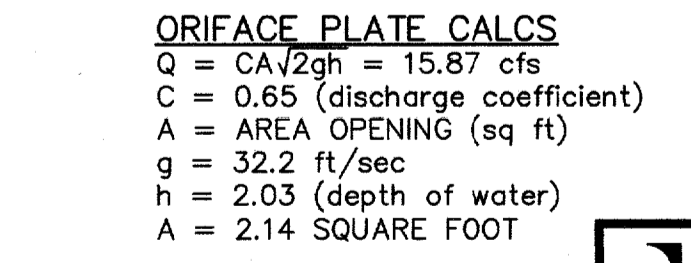
- △ REVISED 05/04/01
- △ REVISED 11/14/00
- △ REVISED 10/11/00

FLOW REDUCER PLATE DETAIL "A"



ORIFACE PLATE CALCS
 $Q = CA\sqrt{2gh} = 44.05$ cfs
 $C = 0.65$ (discharge coefficient)
 $A =$ AREA OPENING (sq ft)
 $g = 32.2$ ft/sec
 $h = 1.93$ (depth of water)
 $A = 6.08$ SQUARE FOOT

FLOW REDUCER PLATE DETAIL "B"



ORIFACE PLATE CALCS
 $Q = CA\sqrt{2gh} = 15.87$ cfs
 $C = 0.65$ (discharge coefficient)
 $A =$ AREA OPENING (sq ft)
 $g = 32.2$ ft/sec
 $h = 2.03$ (depth of water)
 $A = 2.14$ SQUARE FOOT

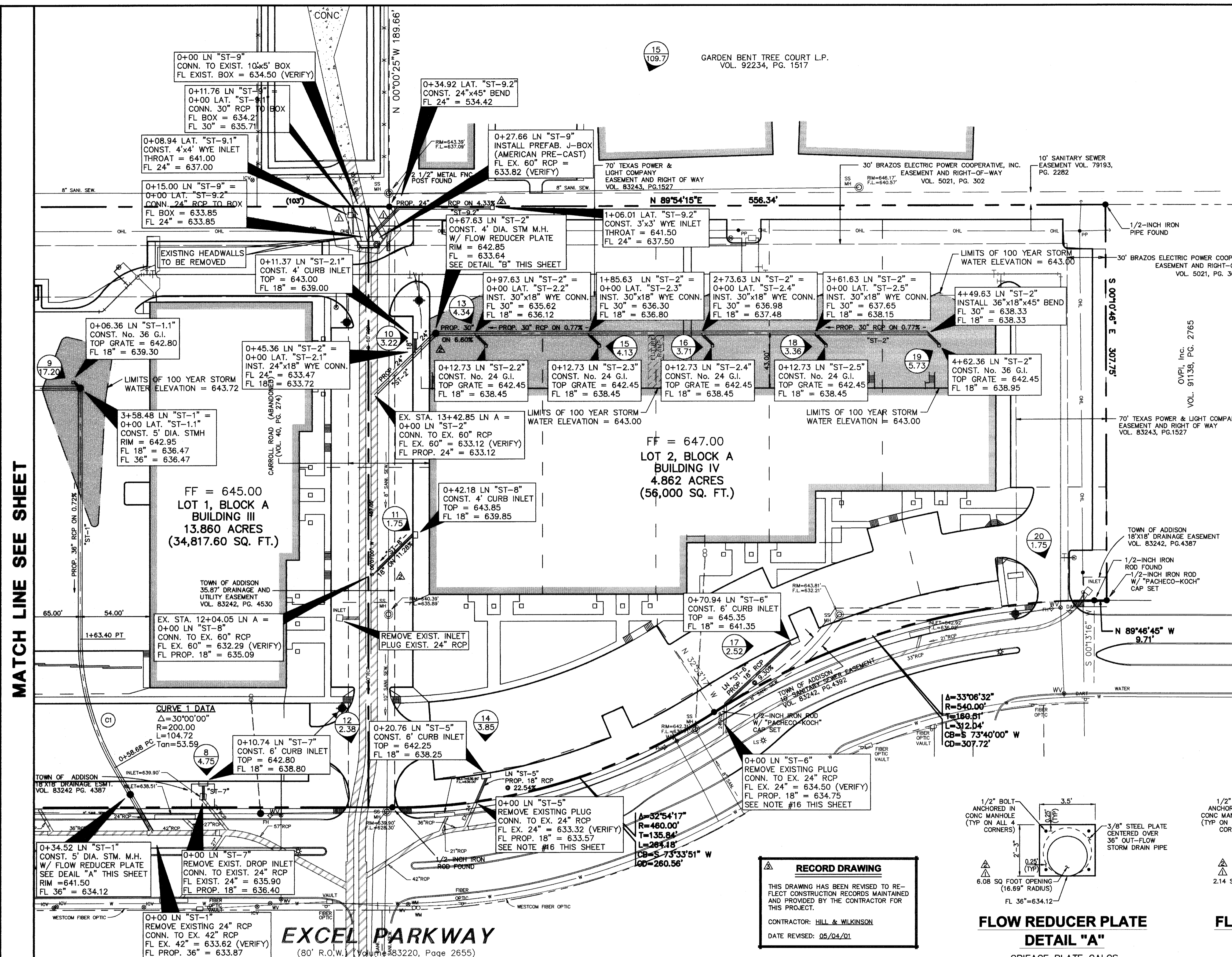
RECORD DRAWING
 THIS DRAWING HAS BEEN REVISED TO REFLECT CONSTRUCTION RECORDS MAINTAINED AND PROVIDED BY THE CONTRACTOR FOR THIS PROJECT.
 CONTRACTOR: HILL & WILKINSON
 DATE REVISED: 05/04/01

BENCHMARKS

BM 1	"□" CUT SET ON THE BACK OF CURB ON THE SOUTH SIDE OF EXCEL, ±950' WEST OF ADDISON ROAD.	ELEV.=642.97
BM 2	60 D NAIL SET IN PP 2203 478 7763, ±500' NORTH OF THE CENTERLINE OF EXCEL.	ELEV.=648.07
BM 3	"□" CUT SET ON THE EAST SIDEWALK OF WESTGROVE, ±190' SOUTH OF AIRBORN DR.	ELEV.=651.73
BM 4	"□" CUT SET ON THE NOSE MEDIAN AT THE INTERSECTION OF EXCEL & WESTGROVE, ±45' EAST OF Q OF WESTGROVE.	ELEV.=645.69



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY STEVEN A. MARKUSSEN, P.E. 70990 ON 07/26/00. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.



MATCH LINE SEE SHEET

RUNOFF CALCULATIONS

DRAINAGE AREA	AREA (ACRES)	Tc (Minutes)	C	I _{ss} (in/hr)	I ₁₀₀ (in/hr)	Q _{ss} (cfs)	Q ₁₀₀ (cfs)
1	0.50	10	0.8	7.29	8.74	2.92	3.50
2	0.41	10	0.8	7.29	8.74	2.39	2.87
3	0.80	10	0.8	7.29	8.74	4.67	5.59
4	3.36	10	0.8	7.29	8.74	19.60	23.49
5	1.45	10	0.8	7.29	8.74	8.46	10.14
6	1.37	10	0.8	7.29	8.74	7.99	9.58
7	0.54	10	0.8	7.29	8.74	3.15	3.78
8	0.68	10	0.8	7.29	8.74	3.97	4.76
9	2.46	10	0.8	7.29	8.74	14.35	17.20
10	0.48	10	0.8	7.29	8.74	2.68	3.22
11	0.25	10	0.8	7.29	8.74	1.46	1.75
12	0.34	10	0.8	7.29	8.74	1.98	2.38
13	0.62	10	0.8	7.29	8.74	3.62	4.34
14	0.55	10	0.8	7.29	8.74	3.21	3.85
15	0.59	10	0.8	7.29	8.74	3.44	4.13
16	0.53	10	0.8	7.29	8.74	3.09	3.71
17	0.36	10	0.8	7.29	8.74	2.10	2.52
18	0.48	10	0.8	7.29	8.74	2.80	3.36
19	0.82	10	0.8	7.29	8.74	4.78	5.73
20	0.25	10	0.8	7.29	8.74	1.46	1.75
21	15.7	10	0.8	7.29	8.74	91.56	109.77

STORM SEWER CALCULATIONS

LINE / STATION	SIZE	Q100 (cfs)	C	V _s (ft/s)	V ² /2g	S _f
LINE "ST-2" (0+00 - 0+45.36)	24"	19.09	19.85	6.08	0.57	0.007122
LINE "ST-2" (0+45.36 - 0+67.83)	24"	15.87	19.85	5.05	0.40	0.004922
LINE "ST-2" (0+67.83 - 0+97.83)	30"	15.87	105.37	3.23	0.16	0.001497
LINE "ST-2" (0+97.83 - 1+85.63)	30"	15.87	35.99	3.23	0.16	0.001497
LINE "ST-2" (1+85.63 - 2+73.63)	30"	12.80	35.99	2.61	0.11	0.000974
LINE "ST-2" (2+73.63 - 3+61.63)	30"	9.09	35.99	1.85	0.05	0.000491
LINE "ST-2" (3+61.63 - 4+49.63)	30"	5.73	35.99	1.17	0.02	0.000195
LINE "ST-2" (4+49.63 - 4+62.36)	18"	5.73	23.18	3.24	0.16	0.002976
LAT "ST-2-1" (0+00 - 0+11.73)	18"	3.22	56.12	1.82	0.05	0.000940
LAT "ST-2-2" (0+00.00 - 0+12.73)	18"	4.34	44.93	2.46	0.09	0.001707
LAT "ST-2-3" (0+00.00 - 0+12.73)	18"	4.13	37.81	2.34	0.08	0.001546
LAT "ST-2-4" (0+00.00 - 0+12.73)	18"	3.71	28.99	2.10	0.07	0.001248
LAT "ST-2-5" (0+00.00 - 0+12.73)	18"	3.36	16.14	1.90	0.06	0.001023
LINE "ST-5" (0+00.00 - 0+20.76)	18"	3.85	49.87	2.18	0.07	0.001343
LINE "ST-6" (0+00.00 - 0+70.94)	18"	2.52	32.03	1.43	0.03	0.000576
LINE "ST-7" (0+00.00 - 0+10.74)	18"	4.75	49.66	2.69	0.11	0.002045
LINE "ST-8" (0+00.00 - 0+42.18)	18"	1.75	37.71	0.99	0.02	0.000278