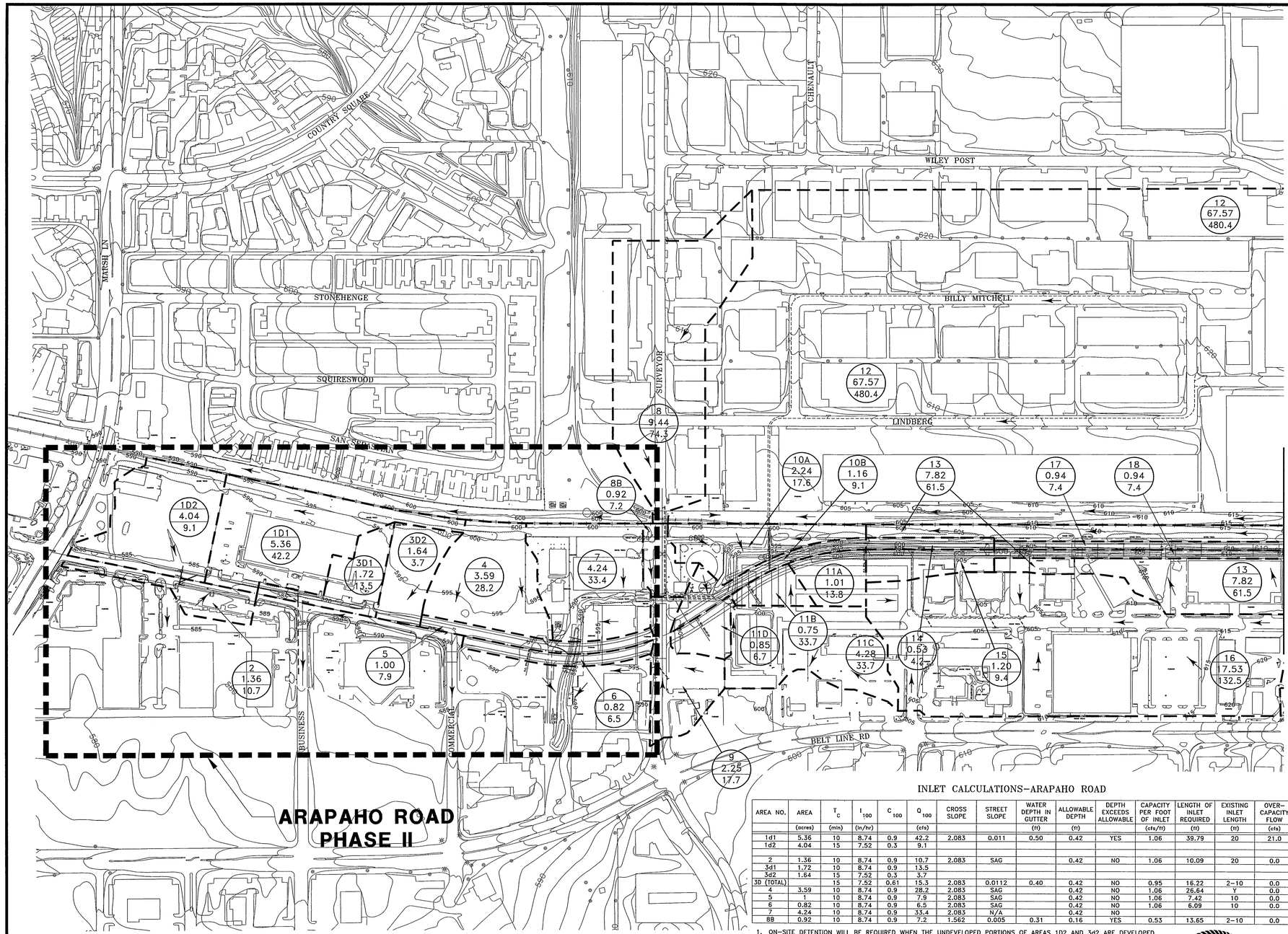
NO.	DATE	REVISION	APPROV.
1			
2			
3			



200 0 200 400
scale feet

DRAINAGE AREA CALCULATIONS

AREA NO.	AREA	C_{100}	T_C	I_{100}	Q_{100}	COMMENTS
	(acres)		(min)	(in/hr)	(cfs)	
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 "Y" 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 "Y" 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 "Y" 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 "Y" 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	INTENSITY I_{100}	COMMENTS
	Length	Average Velocity	Time	Length	Average Velocity	Time			
	(ft)	(fps)	(min)	(ft)	(fps)	(min)	(min)	(in/hr)	
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	C_{100}	ΣCA	T_C	I_{100}	Q_{100}
	(acres)			(min)	(in/hr)	(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: Q_{100} = 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: Q_{100} = 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	T_C	I_{100}	C_{100}	Q_{100}	CROSS SLOPE	STREET SLOPE	WATER DEPTH IN GUTTER	ALLOWABLE DEPTH	DEPTH EXCEEDS ALLOWABLE	CAPACITY PER FOOT OF INLET	LENGTH OF INLET REQUIRED	EXISTING INLET LENGTH	OVER–CAPACITY FLOW
	(acres)	(min)	(in/hr)		(cfs)			(ft)	(ft)		(cfs/ft)	(ft)	(ft)	(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

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.

LEGEND:
DRAINAGE DIVIDE
EXISTING STORM SEWER SYSTEM
PROPOSED STORM SEWER SYSTEM
1 — DRAINAGE AREA
1.66 — ACRES
8.0 — Q_{100}

STATE OF TEXAS
BRUCE R. GRANTHAM
62659
REGISTERED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY:
BRUCE R. GRANTHAM
ON 02/14/02

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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. D-1 OF D-2