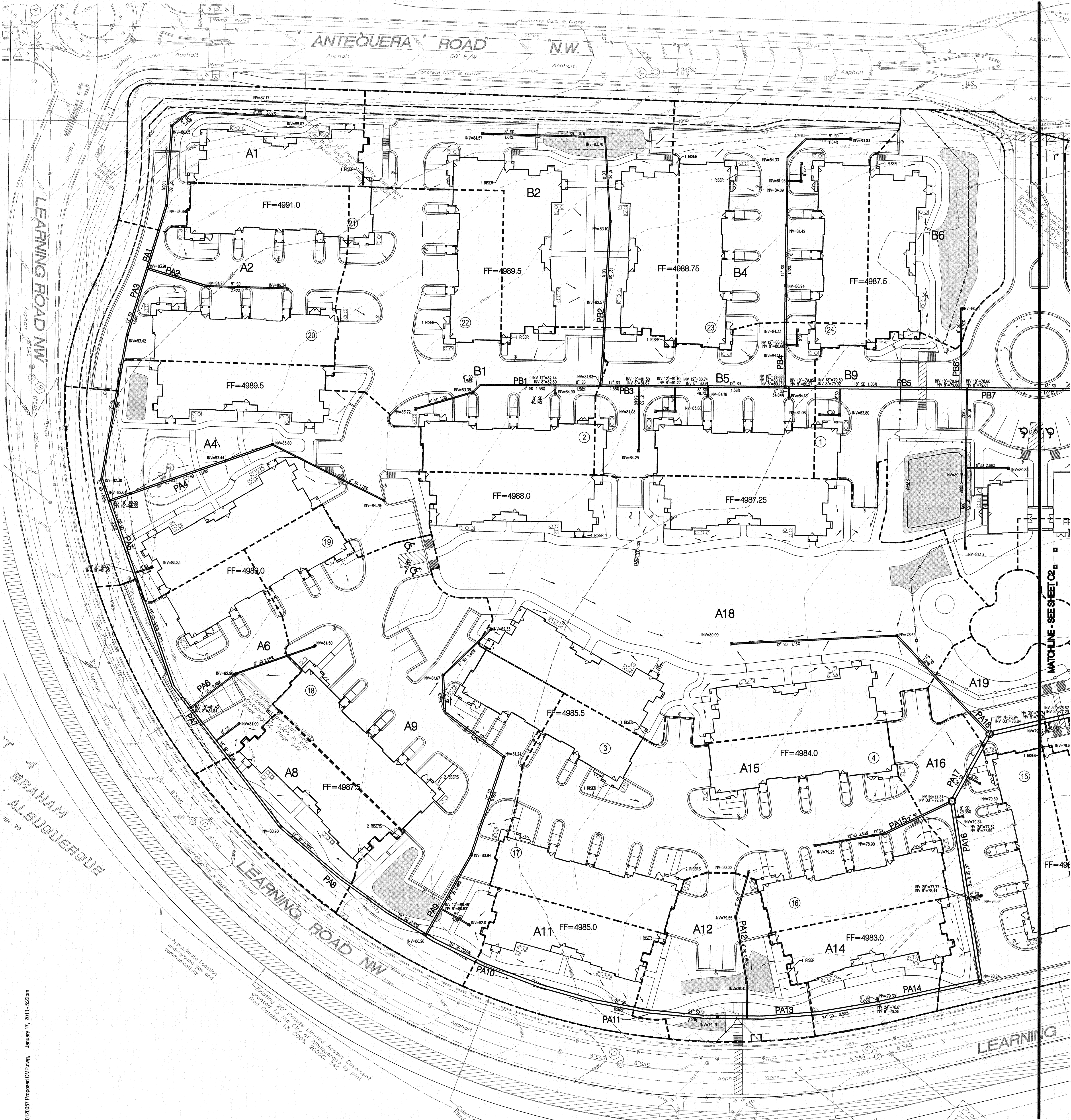




I. INTRODUCTION

The purpose of this submittal is to provide a Final Drainage Management Plan and Final Grading Plan for the development of Andalusia Villas located within Tract 6 of North Andalusia at La Luz.

II. SITE LOCATION

The site is located southeast of the intersection of Coors Boulevard and Montano Road. Antequera Road, Learning Road and Mirandela Street bound the site as shown on Zone Atlas Page F-12. The total site area is approximately 15.8 acres.

III. EXISTING HYDROLOGIC CONDITIONS

Currently this site is undeveloped and the surrounding streets and public infrastructure are in place. The site was mass graded with the development of the North Andalusia at La Luz subdivision. The site generally slopes from the southwest to the northeast. A 36" storm drain has been stubbed out to the property. This stub out is located on Mirandela, south of Antequera. This storm drain was sized to accept developed flows from this tract.

IV. PROPOSED HYDROLOGIC CONDITIONS

The proposed conditions for the Andalusia Villas project are shown on the grading plan sheets C2.00 through 2.07. The project is located within hydrologic zone 1 as defined Figure A-1 in Chapter 22.2 of the Development Process Manual and the hydrologic analysis for this area is based on the 100 year, 6 hour storm event in accordance with Chapter 22.2 of the DPM.

This development consists of 24 residential buildings with 10 units each and a clubhouse/managers apartment. Onsite drainage basins, land treatments and peak runoff flow rates are shown on the Proposed Conditions Basin Data Table on Sheet C1.

Due to the density of this development a storm drain network has been designed to convey site drainage to the storm drain stub out referenced above. Storm drain pipe sizes range from 8" for small area drains up to 36" at the downstream end of the collection system. Design of the storm drains are based on gravity flow. Capacity was calculated using Manning equation. Hydraulic Analysis of the storm drain reaches are shown on the Storm Drain Pipe Table on Sheet C2. The storm drains shown on this table are for the primary storm drains. Sub drainage basins were defined for the analysis of secondary or upstream reaches of the storm drain network. Land treatment and peak runoff from the sub basins is shown on the Proposed Conditions Sub Basin Data Table on Sheet C3. Hydraulic analysis for the secondary storm drains are shown on the Area Drain Storm Drain Pipe Table on Sheet C3.

Generally storm drain inlets have been designed in a sump condition which significantly increases the capacity of the inlets. Traffic rated grades are shown in vehicle traffic areas and non-traffic rated inlets are specified in landscape or non-traffic areas. A hydraulic analysis of the inlets was performed to verify that adequate capacity is provided. An Inlet Table on Sheet C4 shows the inlet capacity and actual flow to the inlet. Small area drains that intercept nuisance flows in the landscape areas adjacent to the buildings are not included in the inlet analysis.

V. CONCLUSION

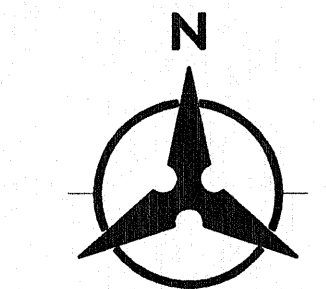
This Drainage Management Plan and Grading Plan demonstrate that the drainage elements proposed with the project are capable of safely conveying the 100 year, 6 hour storm event in accordance with the Development Process Manual. With this submittal we are requesting Grading and Drainage approval for Building Permit.

Andalusia Villas														
Proposed Conditions Basin Data Table														
This table is based on the DPM Section 22.2, Zone 1														
		100 Year Storm Event												
BASIN ID	Area (SQ. FT.)	Area (AC.)	Land Treatment Percentages				Q(100) (cfs/ac.)	Q(100) (cfs)	WTE (inches)	V(100) ₃₆₀ (CF)	V(100) ^{***} (CF)	V(100) ^{***} (AC-FT)	V Retained Onsite (CF)	V(100) ^{***} (AC-FT, Less Ret Vol)
SD LINE 'A'														
A1	12888	0.30	0.0%	34%	17%	49%	3.32	1.0	1.38	1461	2233	0.05		0.05
A2	21026	0.48	0.0%	9%	5%	86%	4.08	2.0	1.80	3156	5368	0.12		0.12
A4	31145	0.71	0.0%	28%	14%	58%	3.49	2.5	1.46	3797	5993	0.14	200	0.13
A6	12878	0.30	0.0%	23%	11%	65%	3.65	1.1	1.55	1669	2698	0.06		0.06
A8	9442	0.22	0.0%	29%	14%	56%	3.47	0.8	1.45	1138	1788	0.04		0.04
A9	38377	0.88	0.0%	15%	7%	77%	3.91	3.4	1.70	5440	9081	0.21	900	0.19
A11	9314	0.21	0.0%	29%	14%	56%	3.47	0.7	1.45	1124	1767	0.04		0.04
A12	10530	0.24	0.0%	38%	19%	43%	3.20	0.8	1.29	1134	1693	0.04	400	0.03
A14	8155	0.19	0.0%	27%	13%	60%	3.55	0.7	1.49	1015	1617	0.04	1250	0.01
A15	36458	0.84	0.0%	6%	3%	91%	4.19	3.5	1.87	5667	9742	0.22		0.22
A16	18683	0.43	0.0%	11%	5%	94%	4.04	1.7	1.78	2772	4697	0.11		0.11
A18	56602	1.30	0.0%	37%	18%	45%	3.23	4.2	1.31	6168	9256	0.21	400	0.20
A19	7158	0.16	0.0%	20%	10%	70%	3.75	0.6	1.56	959	1571	0.04		0.04
A20	16495	0.38	0.0%	23%	11%	65%	3.66	1.4	1.51	2140	3461	0.08	150	0.08
A21	15233	0.35	0.0%	21%	10%	69%	3.73	1.3	1.60	2027	3311	0.08	700	0.06
A23	21968	0.50	0.0%	4%	2%	94%	4.24	2.1	1.90	3471	5994	0.14		0.14
A24	28964	0.66	0.0%	8%	4%	88%	4.13	2.7	1.83	4423	7563	0.17		0.17
A25	34858	0.80	0.0%	31%	15%	53%	3.41	2.7	1.41	4100	6373	0.15	1600	0.11
A26	21408	0.49	0.0%	13%	6%	81%	3.98	2.0	1.74	3112	5238	0.12		0.12
A27	22618	0.52	0.0%	7%	3%	90%	4.16	2.2	1.85	3480	5963	0.14		0.14
A29	11895	0.27	0.0%	36%	17%	47%	3.28	0.9	1.34	1325	2010	0.05	250	0.04
SD LINE 'B'														
B1	27066	0.62	0.0%	9%	4%	87%	4.09	2.5	1.81	4080	6949	0.16		0.16
B2	28942	0.62	0.0%	31%	15%	54%	3.42	2.1	1.42	3191	4976	0.11	400	0.11
B4	22123	0.51	0.0%	11%	6%	83%	4.02	2.0	1.77	3260	5512	0.13		0.13
B5	16099	0.37	0.0%	9%	5%	86%	4.08	1.5	1.80	2417	4111	0.09		0.09
B6	13845	0.32	0.0%	42%	21%	37%	3.07	1.0	1.22	1405	2033	0.05	950	0.02
B8	9270	0.21	0.0%	37%	18%	45%	3.24	0.7	1.32	1018	1533	0.04		0.04
B9	42742	0.98	0.0%	17%	8%	75%	3.85	3.8	1.67	5940	9850	0.23	1250	0.20
B10	26323	0.60	0.0%	13%	6%	81%	3.98	2.4	1.74	3827	6444	0.15		0.15
B12	17500	0.40	0.0%	25%	12%	63%	3.60	1.4	1.52	2222	3566	0.08		0.08
B13	21821	0.50	0.0%	10%	5%	86%	4.07	2.0	1.80	3269	5556	0.13		0.13
B14	12225	0.28	0.0%	37%	18%	45%	3.24	0.9	1.31	1339	2015	0.05	600	0.03
Dog Park	5808	0.13	0.0%	67%	33%	0%	2.31	0.3	0.78	375	-525	0.00	900	0.00
Pool	3094	0.07	0.0%	67%	33%	0%	2.31	0.2	0.78	200	0	-0.01	200	0.00
Antequera	77972	1.79	0.0%	0%	13%	87%	4.18	7.5	1.84	11973	20282	0.47		0.47
Total	768925	17.65	0.0%	18.7%	10.5%	70.8%		66.7		104095	169720	3.90	10050	3.70
Note: Basin A-3 in the North Andalusia Drainage Master Plan includes Antequera Right of Way. The total area within the right of way is 1.79 acres. With land treatment 'D' equal to 87%, the runoff														

Note: Basin A-3 in the North Andalusia Drainage Master Plan includes Antequera Right of Way. The total area within the right of way is 1.79 acres. With land treatment 'D' equal to 87%, the runoff

LEGEND

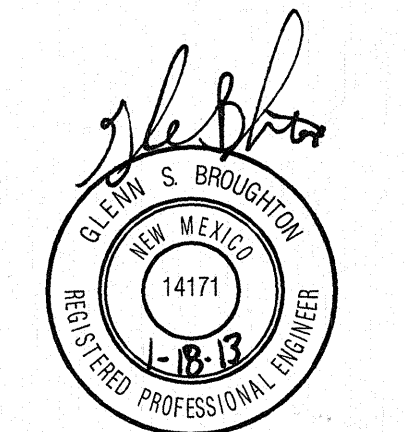
- BASIN BOUNDARY
- A16 BASIN ID
- PA15 STORM DRAIN PIPE I.D.
- WATER HARVESTING AREA



SCALE: 1"=30'

Designed by:	BJS / GSR	
Drawn by:	BO	
Architect of Record:	JL	
Date Plotted:	1/17/13	
Issue for Pricing/Bidding:		
Issue for Permit Application:		
Issue for Construction:		
Revisions:		
#	DATE	COMMENTS

ANDALUCIA AT LA LUZ
ALBUQUERQUE, NM
BAY HILLS DEVELOPMENT



Bohannon & Huston

SHEET CONTENTS:
PROPOSED DRAINAGE
MANAGEMENT PLAN
SHEET NO.
C1
10350



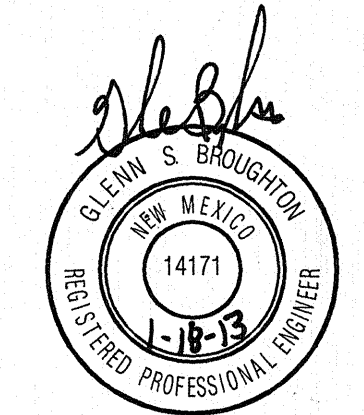
LEGEND	
---	BASIN BOUNDARY
A16	BASIN ID
PA15	STORM DRAIN PIPE I.D.
[Hatched Box]	WATER HARVESTING AREA

ANDALUCIA VILLAS STORM DRAIN PIPE TABLE								
PIPE #	Contributing Basins	Size in.	Slope	Capacity cfs	ACTUAL FLOW cfs	PIPE LENGTH ft	INVERT IN	INVERT OUT
SD LINE 'A'								
PA1	A1	12	2.08%	6.07	1.0	103.0	86.05	83.91
PA2	A2	12	2.42%	6.55	2.0	43.0	84.95	83.91
PA3	PA1, PA2	12	1.00%	4.22	2.9	168.6	83.91	82.22
PA4	A4	12	1.03%	4.27	2.5	121.3	83.80	82.55
PA5	PA3, PA4	18	0.50%	8.78	5.4	158.1	82.22	81.43
PA6	A6	8	2.66%	2.33	1.1	99.9	84.50	81.84
PA7	PA5, PA6	18	0.50%	8.81	6.5	105.3	81.43	80.90
PA8	PA7, A8	18	0.50%	8.79	7.3	127.7	80.90	80.26
PA9	A9	12	0.89%	3.97	3.4	65.2	80.84	80.26
PA10	PA8, PA9	24	0.50%	18.88	10.7	236.6	80.26	79.08
PA11	A11	8	9.82%	4.48	0.7	7.8	80.87	80.10
PA12	A12	8	0.66%	1.16	0.8	71.6	79.55	79.08
PA13	PA10, PA11, PA12	24	0.50%	18.95	12.2	93.6	79.08	78.61
PA14	PA13, A14	24	0.50%	18.96	12.9	73.6	78.61	78.24
PA15	A15	12	2.55%	6.73	3.5	61.1	78.90	77.34
PA16	PA14, A16	24	0.71%	22.56	14.6	126.4	78.24	77.34
PA17	PA15, PA16	24	0.60%	20.79	18.1	49.6	77.24	76.94
PA18	A18	12	1.83%	5.69	4.2	93.5	78.65	76.94
PA19	PA17, PA18, A19	30	0.46%	32.87	22.9	91.3	76.84	76.42
PA20	A20	8	1.17%	1.54	1.4	116.7	78.70	77.34
PA21	A21	8	4.96%	3.18	1.3	53.6	79.83	77.17
PA22	PA19, PA20, PA21	30	0.46%	32.71	25.6	118.6	76.42	75.88
PA23	A23	12	1.00%	4.21	2.1	102.2	77.65	76.63
PA24	PA22, PA23, A24	30	0.51%	34.58	30.5	204.4	75.88	74.84
PA25	A25	12	1.11%	4.44	2.7	114.2	76.46	75.19
PA26	PA24, PA25, PB11, PB12, PB13, B26	36	0.55%	58.57	54.7	230.0	74.74	73.47
PA27	A27	12	2.80%	7.04	2.2	102.9	76.84	73.96
PA28	PA26, PA27	36	0.63%	62.80	56.9	116.8	73.47	72.73
PA29	94% A29	8	3.68%	2.74	0.8	106.8	77.50	73.57
PA30	PA28, PA29, PB14	36	0.63%	62.32	58.7	27.2	72.73	72.56
SD LINE 'B'								
PB1	B1	8	1.58%	1.79	2.5	92.0	83.38	81.93
PB2	B2	12	1.01%	4.23	2.1	116.1	83.10	81.93
PB3	PB1, PB2	12	1.58%	5.30	4.7	129.5	81.93	79.88
PB4	B4	12	1.12%	4.45	2.0	115.6	81.42	80.13
PB5	PB3, PB4, B5	18	1.00%	12.42	8.2	124.0	79.88	78.64
PB6	B6	8	2.20%	2.12	1.0	164.8	82.68	79.06
PB7	PB5, PB6	18	1.00%	12.43	9.2	106.7	78.64	77.57
PB8	B8	8	2.13%	2.08	0.7	88.8	79.88	77.99
PB9	PB7, PB8, B9	18	1.60%	15.68	13.7	127.9	77.57	75.53
PB10	B10	12	1.54%	5.23	2.4	131.5	77.80	75.77
PB11	PB9, PB10	18	1.60%	15.72	16.1	36.8	75.53	74.94
PB12	B12	8	1.85%	1.94	1.4	111.6	77.47	75.41
PB13	B13	8	2.12%	2.08	2.0	74.0	76.24	74.67
PB14	B14	8	4.65%	3.08	0.9	84.4	77.60	73.68

* CAPACITY IS BASED ON GRAVITY FLOW, USING MANNING'S EQUATION WITH n=0.011

Designed by:	BJS / GSB	
Drawn by:	BO	
Architect of Record:		
Date Plotted:	1/17/13	
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ANDALUCIA AT LA LUZ
ALBUQUERQUE, NM
BAY HILLS DEVELOPMENT



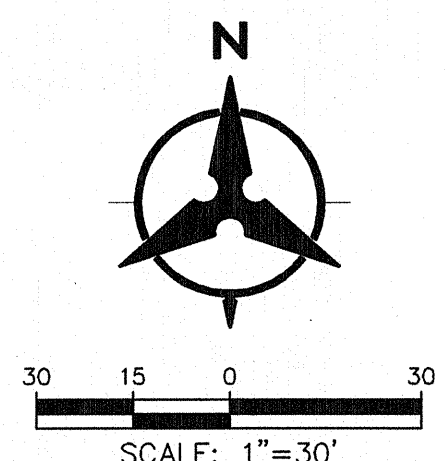
Bohannon & Huston

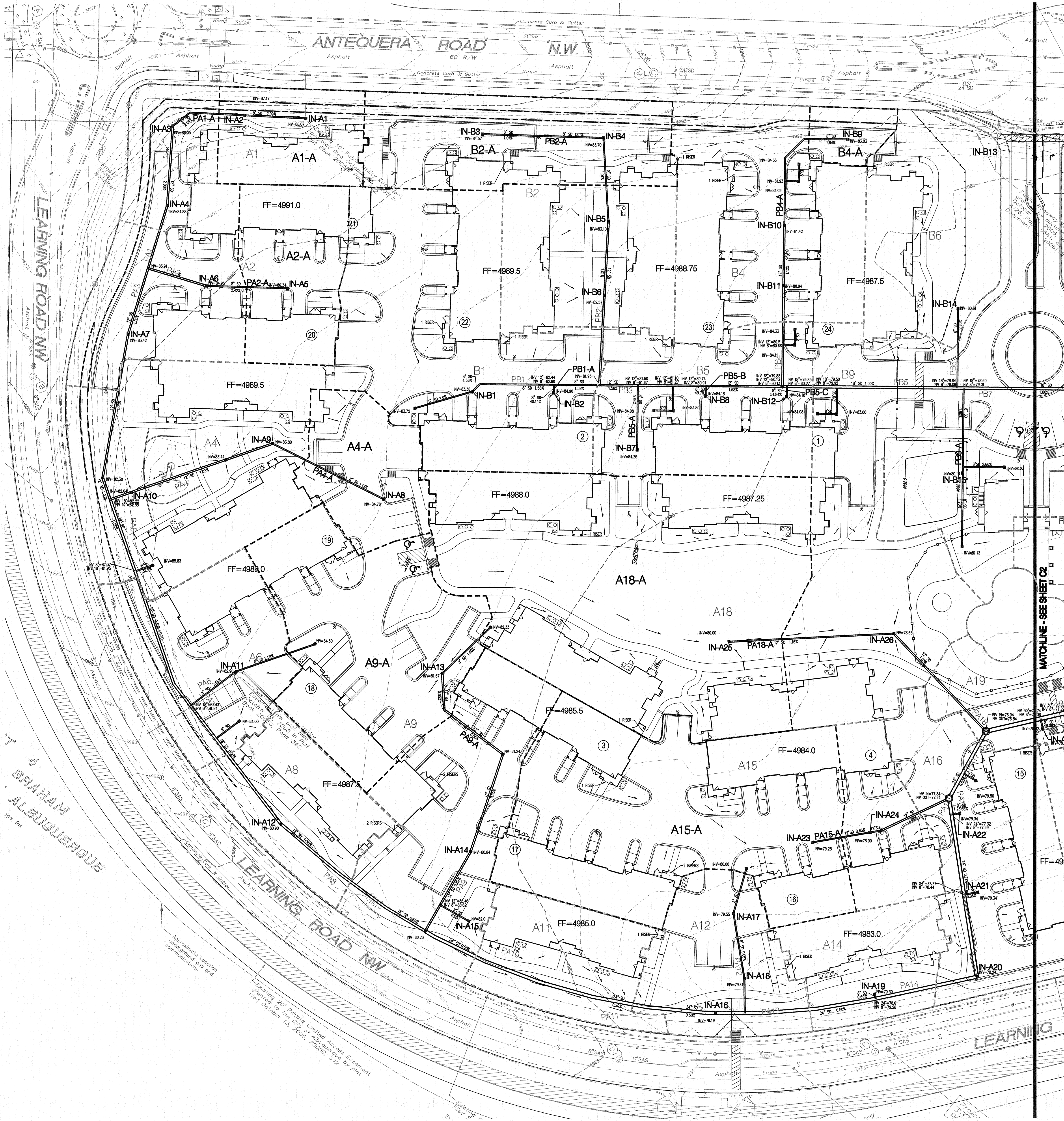
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PROPOSED DRAINAGE
MANAGEMENT PLAN

SHEET NO.

C2

10350





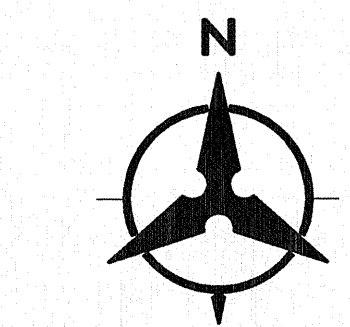
Andalucia Villas									
Proposed Conditions Sub Basin Data Table									
		This table is based on the DPM Section 22.2, Zone 1					100 Year Storm Event		
BASIN	Area	Area	Land Treatment Percentages			Q(100)	Q(100)	WT E	V(100) ₃₀₀
ID	(SQ. FT)	(AC.)	A	B	C	(cfs/ac.)	(cfs)	(inches)	(CF)
SD LINE 'A'									
A1-A	7015	0.16	0.0%	0.0%	41.0%	59.0%	3.76	0.6	1.57
A2-A	9049	0.21	0.0%	0.0%	4.0%	96.0%	4.31	0.9	1.93
A4-A	7752	0.18	0.0%	0.0%	19.0%	81.0%	4.09	0.7	1.78
A9-A	20102	0.46	0.0%	0.0%	20.0%	80.0%	4.07	1.9	1.77
A15-A	29624	0.68	0.0%	0.0%	9.0%	91.0%	4.24	2.9	1.88
A18-A	40722	0.93	0.0%	36.0%	16.0%	48.0%	3.29	3.1	1.35
A23-A	5729	0.13	0.0%	0.0%	20.0%	80.0%	4.07	0.5	1.77
A25-A	17912	0.41	0.0%	0.0%	59.0%	41.0%	3.49	1.4	1.39
A27-A	6638	0.15	0.0%	0.0%	24.0%	76.0%	4.01	0.6	1.73
SD LINE 'B'									
B2-A	14104	0.32	0.0%	0.0%	57.0%	43.0%	3.52	1.1	1.41
B4-A	2185	0.05	0.0%	0.0%	42.0%	58.0%	3.74	0.2	1.56
B10-A	4025	0.09	0.0%	0.0%	40.0%	60.0%	3.77	0.3	1.58
B12-A	5703	0.13	0.0%	0.0%	63.0%	37.0%	3.43	0.4	1.35
B13-A	13485	0.31	0.0%	0.0%	20.0%	80.0%	4.07	1.3	1.77
Total	184045	4.23	0.0%	8%	26%	66%	16.0		24699.6

ANDALUCIA VILLAS AREA DRAIN STORM DRAIN PIPE TABLE								
PIPE #	Contributing Basins	Size in.	Slope	Capacity cfs	ACTUAL FLOW cfs	PIPE LENGTH ft	INVERT IN	INVERT OUT
SD LINE 'A'								
PA1-A	A1-A	8	2.09%	2.07	0.6	96.6	88.07	86.05
PA2-A	A2-A	8	2.42%	2.22	0.9	57.5	86.34	84.95
PA4-A	A4-A	8	1.12%	1.51	0.7	87.7	84.78	83.80
PA9-A	A9-A	12	0.55%	3.12	1.9	151.0	81.67	80.84
PA15-A	A15-A	12	0.85%	3.88	2.9	41.3	79.25	78.90
PA18-A	A18-A	12	1.16%	4.53	3.1	116.9	80.00	78.65
PA23-A	A23-A	8	1.40%	1.69	0.5	72.3	78.66	77.65
PA25-A	A25-A	8	1.11%	1.50	1.4	94.0	77.50	76.46
PA26-A	25% A26	8	48.58%	9.95	0.5	7.7	79.58	75.82
PA26-B	25% A26	8	68.10%	11.78	0.5	5.8	79.22	75.25
PA26-C	50% A26	8	73.32%	12.23	1.0	6.9	79.22	74.19
PA26-D	6% A29	8	20.94%	6.53	0.1	24.6	79.00	73.86
PA27-A	A27-A	8	3.12%	2.52	0.6	66.1	78.90	76.84
SD LINE 'B'								
PB1-A	21% B1	8	40.14%	9.05	0.5	5.7	84.90	82.60
PB2-A	50% B2-A	8	1.01%	1.44	0.6	145.4	84.57	83.10
PB4-A	B4-A	8	1.84%	1.83	0.2	97.9	83.03	81.42
PB5-A	12% B5	8	5.64%	3.39	0.2	45.7	84.25	81.67
PB5-B	54% B5	8	49.70%	10.07	0.8	6.6	84.18	80.91
PB5-C	34% B5	8	54.84%	10.58	0.5	7.1	84.18	80.27
PB9-A	16% B9	8	1.90%	1.97	0.6	111.6	81.13	79.01
PB9-B	84% B9	8	33.48%	8.26	3.2	9.5	80.30	77.12
PB10-A	B10-A	8	1.74%	1.88	0.3	130.2	80.06	77.80
PB12-A	B12-A	8	2.55%	2.28	0.4	60.0	79.00	77.47
PB13-A	B13-A	8	3.47%	2.66	1.3	62.5	78.41	76.24

* CAPACITY IS BASED ON GRAVITY FLOW, USING MANNING'S EQUATION WITH n=0.011

LEGEND	
-----	BASIN BOUNDARY
-----	SUB-BASIN BOUNDARY
IN-A1	INLET I.D.

Sub Basin & Area Drain
Storm Drain Analysis

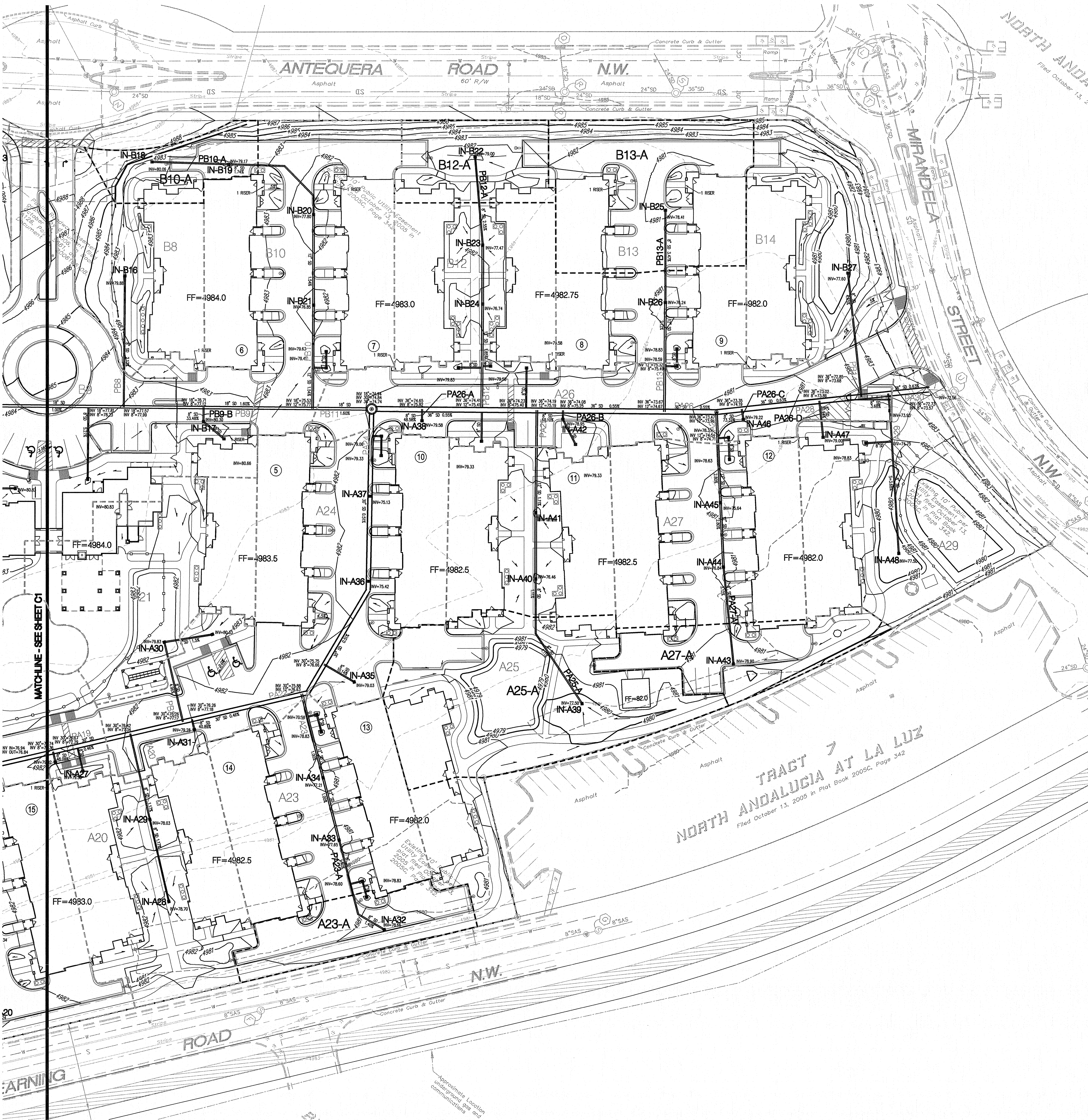


Designed by:	BJS / GSB	
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#	DATE	COMMENTS

ANDALUCIA AT LA LUZ
ALBUQUERQUE, NM
BAY HILLS DEVELOPMENT



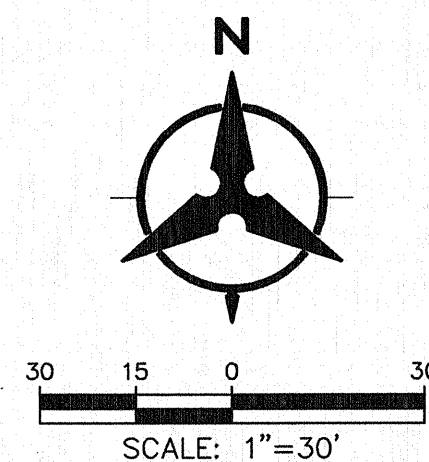
Bohannon & Huston



ANDALUCIA VILLAS							
INLET TABLE							
INLET #	CONTRIBUTING BASIN	INLET TYPE	TOP OF GRATE	ACTUAL FLOW (cfs)	AVAIL. HEAD FT	*CAPACITY (cfs)	Grate Calculation
IN-A1	60% A1-A	Nyloplast 12" dome Grate	89.73	0.4	0.47	0.7	Sump
IN-A2	40% A1-A	Nyloplast 12" dome Grate	89.73	0.2	0.1	0.5	Sump
IN-A3	23% A1	Nyloplast 12" dome Grate	89.62	0.2	0.31	0.5	Sump
IN-A4	23% A1	2'x2' Traffic Grate	89.97	0.2	0.2	2.0	Sump
IN-A5	A2-A	2'x2' Traffic Grate	88.34	0.9	0.36	2.7	Sump
IN-A6	37% A2	2'x2' Traffic Grate	88.45	0.7	0.25	2.3	Sump
IN-A7	20% A2	2'x2' Traffic Grate	88.00	0.4	0.90	4.0	Sump
IN-A8	A4-A	2'x2' Traffic Grate	88.78	0.7	0.41	2.7	Sump
IN-A9	37% A4	Nyloplast 12" dome Grate	87.38	0.9	0.90	1.2	Sump
IN-A10	38% A4	Nyloplast 12" dome Grate	86.64	0.9	1.40	1.6	Sump
IN-A11	A6	2'x2' Traffic Grate	86.36	1.1	0.40	2.7	Sump
IN-A12	A8	Nyloplast 12" dome Grate	86.11	0.8	0.31	0.5	Sump
IN-A13	A9-A	2'x2' Traffic Grate	84.17	1.9	0.64	3.2	Sump
IN-A14	45% A9	2'x2' Traffic Grate	83.63	1.5	0.57	3.2	Sump
IN-A15	3% A9	Nyloplast 8" dome Grate	84.00	0.1	0.75	0.4	Sump
IN-A16	A11	Nyloplast 12" dome Grate	82.87	0.7	0.70	1.0	Sump
IN-A17	50% A12	2'x2' Traffic Grate	82.05	0.4	0.45	2.8	Sump
IN-A18	50% A12	Nyloplast 12" dome Grate	81.76	0.4	0.38	0.8	Sump
IN-A19	A14	Nyloplast 18" dome Grate	81.30	0.7	0.38	1.6	Sump
IN-A20	25% A16	2'x2' Traffic Grate	81.32	0.4	0.33	2.6	Sump
IN-A21	28% A16	2'x2' Traffic Grate	81.34	0.5	0.30	2.3	Sump
IN-A22	47% A16	2'x2' Traffic Grate	81.34	0.8	0.30	2.3	Sump
IN-A23	A15-A	2'x2' Traffic Grate	81.50	2.9	0.50	3.0	Sump
IN-A24	19% A15	2'x2' Traffic Grate	81.80	0.7	0.20	2.0	Sump
IN-A25	A18-A	Nyloplast 18" dome Grate	82.20	3.1	0.80	2.5	Sump
IN-A26	31% A18	Nyloplast 18" dome Grate	81.73	1.3	1.30	3.1	Sump
IN-A27	A19	2'x2' Traffic Grate	81.82	0.6	0.48	3.0	Sump
IN-A28	63% A20	Nyloplast 12" dome Grate	80.67	0.9	1.33	1.5	Sump
IN-A29	37% A20	Nyloplast 12" dome Grate	81.30	0.5	0.70	1.0	Sump
IN-A30	A21	Nyloplast 12" dome Grate	81.83	1.3	0.72	1.0	Sump
IN-A31	24% A24	2'x2' Traffic Grate	81.28	0.7	0.48	3.0	Sump
IN-A32	A23-A	2'x2' Traffic Grate	80.66	0.5	0.50	3.0	Sump
IN-A33	34% A23	2'x2' Traffic Grate	80.80	0.7	0.36	2.6	Sump
IN-A34	40% A23	2'x2' Traffic Grate	80.80	0.9	0.40	2.7	Sump
IN-A35	19% A24	2'x2' Traffic Grate	81.03	0.5	0.36	2.6	Sump
IN-A36	27% A24	2'x2' Traffic Grate	81.28	0.7	0.37	2.6	Sump
IN-A37	30% A24	2'x2' Traffic Grate	81.28	0.8	0.37	2.6	Sump
IN-A38	21% A26	2'x2' Traffic Grate	81.58	0.4	0.54	3.0	Sump
IN-A39	A25-A	Nyloplast 18" dome Grate	79.50	1.4	0.82	2.5	Sump
IN-A40	23% A25	Nyloplast 12" dome Grate	80.90	0.6	0.76	1.1	Sump
IN-A41	26% A25	Nyloplast 12" dome Grate	81.20	0.7	0.62	0.9	Sump
IN-A42	30% A26	2'x2' Traffic Grate	81.22	0.6	0.54	3.0	Sump
IN-A43	A27-A	2'x2' Traffic Grate	80.40	0.6	0.79	4.0	Sump
IN-A44	36% A27	2'x2' Traffic Grate	80.80	0.8	0.39	2.7	Sump
IN-A45	35% A27	2'x2' Traffic Grate	80.74	0.8	0.40	2.7	Sump
IN-A46	49% A26	2'x2' Traffic Grate	80.50	1.0	0.64	3.4	Sump
IN-A47	3% A29	Nyloplast 12" dome Grate	81.00	0.0	0.56	0.8	Sump
IN-A48	97% A29	Nyloplast 12" dome Grate	79.50	0.9	1.55	1.8	Sump
IN-B1	78% B1	2'x2' Traffic Grate	86.80	2.0	0.40	2.7	Sump
IN-B2	22% B1	2'x2' Traffic Grate	86.90	0.6	0.30	2.3	Sump
IN-B3	56% B2-A	2'x2' Traffic Grate	87.95	0.6	0.75	3.8	Sump
IN-B4	44% B2-A	Nyloplast 12" dome Grate	87.25	0.5	0.74	1.1	Sump
IN-B5	23% B2	Nyloplast 12" dome Grate	87.75	0.5	0.68	1.0	Sump
IN-B6	24% B2	Nyloplast 12" dome Grate	87.75	0.5	0.68	1.0	Sump
IN-B7	12% B5	2'x2' Traffic Grate	86.25	0.2	0.25	2.1	Sump
IN-B8	51% B5	2'x2' Traffic Grate	86.18	0.8	0.27	2.1	Sump
IN-B9	B4-A	2'x2' Traffic Grate	86.41	0.2	0.35	2.6	Sump
IN-B10	62% B4	2'x2' Traffic Grate	86.30	1.3	0.40	2.7	Sump
IN-B11	28% B4	2'x2' Traffic Grate	86.45	0.6	0.35	2.6	Sump
IN-B12	37% B5	2'x2' Traffic Grate	86.14	0.6	0.21	2.0	Sump
IN-B13	35% B6	Nyloplast 12" dome Grate	85.30	0.3	0.50	0.7	Sump
IN-B14	65% B6	Nyloplast 12" dome Grate	85.15	0.6	0.65	1.0	Sump
IN-B15	20% B9	Nyloplast 12" dome Grate	83.00	0.8	0.60	0.9	Sump
IN-B16	B8	Nyloplast 12" dome Grate	81.88	0.7	1.65	1.8	Sump
IN-B17	80% B9	2'x2' Traffic Grate	82.30	3.0	0.49	3.0	Sump
IN-B18	50% B10-A	Nyloplast 12" dome Grate	82.36	0.2	0.64	1.0	Sump
IN-B19	50% B10-A	2'x2' Traffic Grate	82.96	0.2	0.30	2.3	Sump
IN-B20	45% B10	2'x2' Traffic Grate	81.47	1.1	0.73	3.8	Sump
IN-B21	38% B10	2'x2' Traffic Grate	81.74	0.9	0.56	3.0	Sump
IN-B22	B12-A	Nyloplast 12" dome Grate	81.00	0.4	0.97	1.3	Sump
IN-B23	31% B12	Nyloplast 12" dome Grate	81.40	0.4	1.03	1.3	Sump
IN-B24	36% B12	Nyloplast 12" dome Grate	81.40	0.5	1.03	1.3	Sump
IN-B25	B13-A	2'x2' Traffic Grate	80.41	1.3	0.79	4.0	Sump
IN-B26	38% B13	2'x2' Traffic Grate	80.74	0.8	0.56	3.0	Sump
IN-B27	B14	Nyloplast 12" dome Grate	79.60	0.9	2.16	2.0	Sump

* A 50% CLOGGING FACTOR HAS BEEN APPLIED TO THE INLET CAPACITY.
Note: Inlets IN-A12, IN-A25, IN-A30 and IN-B17 are slightly under capacity with a 50% clogging factor.
In the event that these inlets become clogged drainage will overflow to the next downstream inlets (IN-A14, IN-A26, IN-A31 and IN-B21). These inlets have enough excess capacity with a the clogging factor to intercept the additional flow.

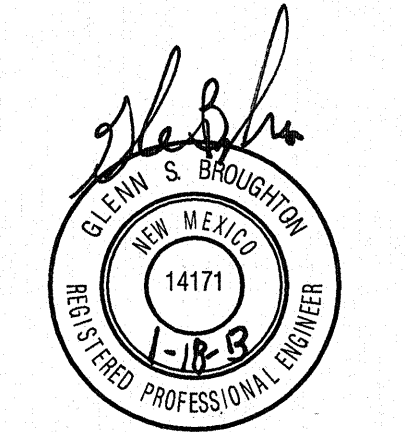
LEGEND	
---	BASIN BOUNDARY
----	SUB-BASIN BOUNDARY
IN-A1	INLET I.D.



Sub Basin & Area Drain
Storm Drain Analysis

Designed by:	BJS / GSB	
Drawn by:	BO	
Architect of Record:	JL	
Date Plotted:	1/17/13	
Issue for Pricing / Bidding:		
Issue for Permit Application:		
Issue for Construction		
Revisions:		
#	DATE	COMMENTS

ANDALUCIA AT LA LUZ
ALBUQUERQUE, NM
BAY HILLS DEVELOPMENT



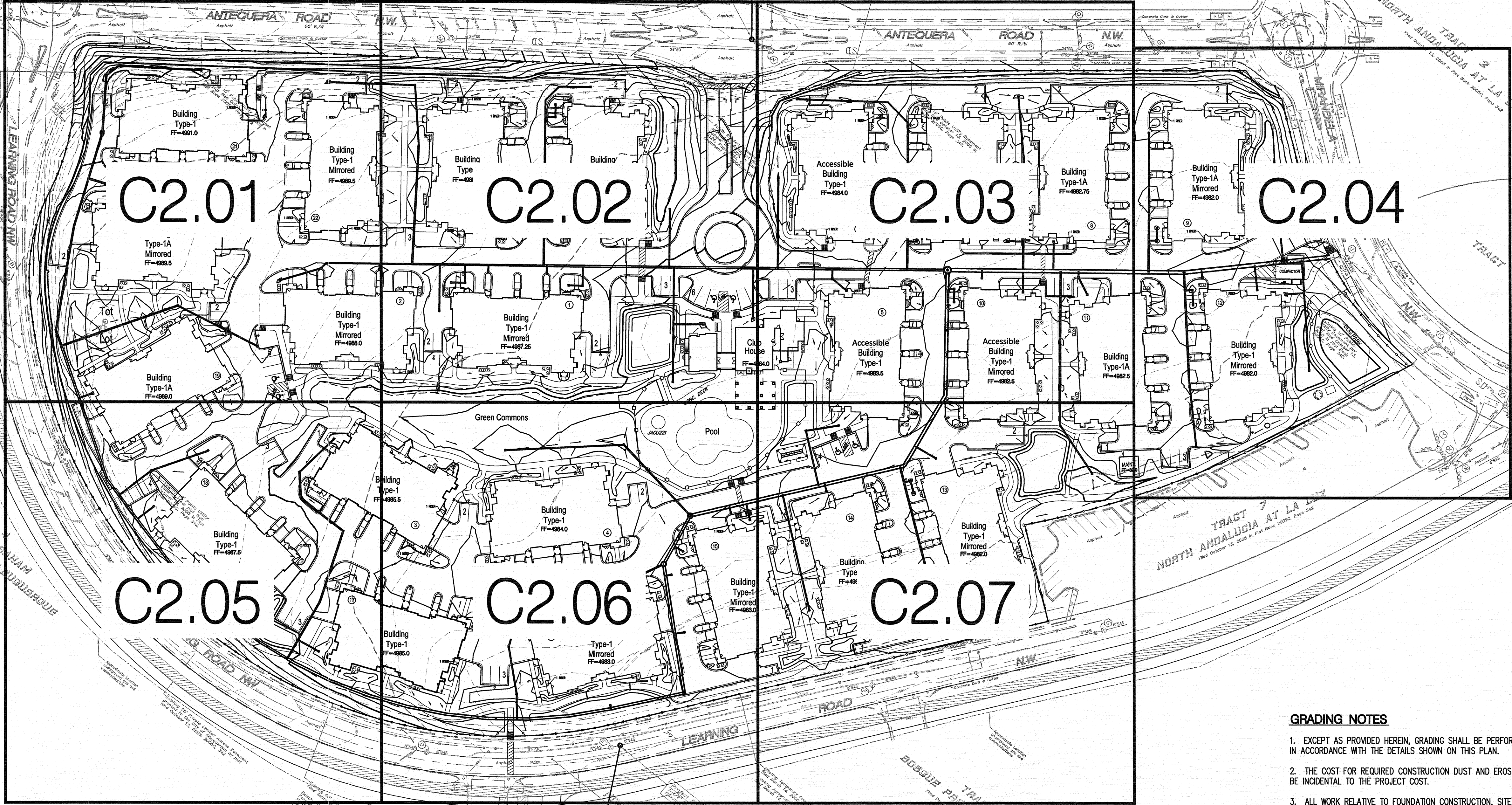
Bohannon & Huston

PROJECT BENCHMARK

Albuquerque Control Survey Monument "13-E11"
New Mexico State Plane, Central Zone (NAD 83)
coordinates as published:
North= 1,511,150.048
East= 1,507,830.738
Elevation= 5,109.053 feet (NAVD 88)
Delta Alpha= -00°15'19.38"
Combined ground to grid factor= 0.999679673

CONTROL POINT #1
3 1/2" ALUMINUM CAP
N=1508845.63
E=1509431.32
ELEV= 4988.79

CONTROL POINT #2
3 1/2" ALUMINUM CAP
N=1508224.45
E=1509765.38
ELEV= 4983.22

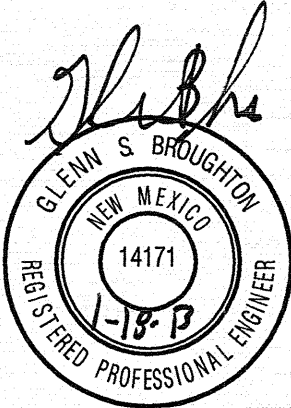


GRADING NOTES

- EXCEPT AS PROVIDED HEREIN, GRADING SHALL BE PERFORMED AT THE ELEVATIONS AND IN ACCORDANCE WITH THE DETAILS SHOWN ON THIS PLAN.
- THE COST FOR REQUIRED CONSTRUCTION DUST AND EROSION CONTROL MEASURES SHALL BE INCIDENTAL TO THE PROJECT COST.
- ALL WORK RELATIVE TO FOUNDATION CONSTRUCTION, SITE PREPARATION, AND PAVEMENT INSTALLATION, AS SHOWN ON THIS PLAN, SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE "GEOTECHNICAL INVESTIGATION". ALL OTHER WORK SHALL, UNLESS OTHERWISE STATED OR PROVIDED FOR HEREON, BE CONSTRUCTED IN ACCORDANCE WITH THE PROJECT, (FIRST PRIORITY) SPECIFICATIONS, AND/OR THE CITY OF ALBUQUERQUE (COA) STANDARD SPECIFICATIONS FOR PUBLIC WORKS (SECOND PRIORITY).
- EARTH SLOPES SHALL NOT EXCEED 3 HORIZONTAL TO 1 VERTICAL UNLESS SHOWN OTHERWISE.
- IT IS THE INTENT OF THESE PLANS THAT THIS CONTRACTOR SHALL NOT PERFORM ANY WORK OUTSIDE OF THE PROPERTY BOUNDARIES EXCEPT AS REQUIRED BY THIS PLAN.
- THE CONTRACTOR IS TO ENSURE THAT NO SOIL ERODES FROM THE SITE ONTO ADJACENT PROPERTY OR PUBLIC RIGHT-OF-WAY.
- A DISPOSAL SITE FOR ANY & ALL EXCESS EXCAVATION MATERIAL, AND UNSUITABLE MATERIAL AND/OR A BORROW SITE CONTAINING ACCEPTABLE FILL MATERIAL SHALL BE OBTAINED BY THE CONTRACTOR IN COMPLIANCE WITH APPLICABLE ENVIRONMENTAL REGULATIONS AND APPROVED BY THE OBSERVER. ALL COSTS INCURRED IN OBTAINING A DISPOSAL OR BORROW SITE AND HAUL TO OR FROM SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE.
- PAVING AND ROADWAY GRADES SHALL BE +/- 0.1' FROM PLAN ELEVATIONS. PAD ELEVATION SHALL BE +/- 0.05' FROM BUILDING PLAN ELEVATION.
- ALL PROPOSED CONTOURS REFLECT TOP OF PAVEMENT ELEVATIONS IN THE PARKING AREA AND MUST BE ADJUSTED FOR MEDIANS AND ISLANDS.
- VERIFY ALL ELEVATIONS SHOWN ON PLAN FROM BASIS OF ELEVATION CONTROL STATION PRIOR TO BEGINNING CONSTRUCTION.

Designed by:	BJS / GSB	
Drawn by:	BO	
Architect of Record:		
Date Plotted:	1/18/13	
Issue for Pricing / Bidding:		
Issue for Permit Application:		
Issue for Construction		
Revisions:		
#	DATE	COMMENTS

ANDALUCIA VILLAS
ALBUQUERQUE, NM
BAY HILLS DEVELOPMENT



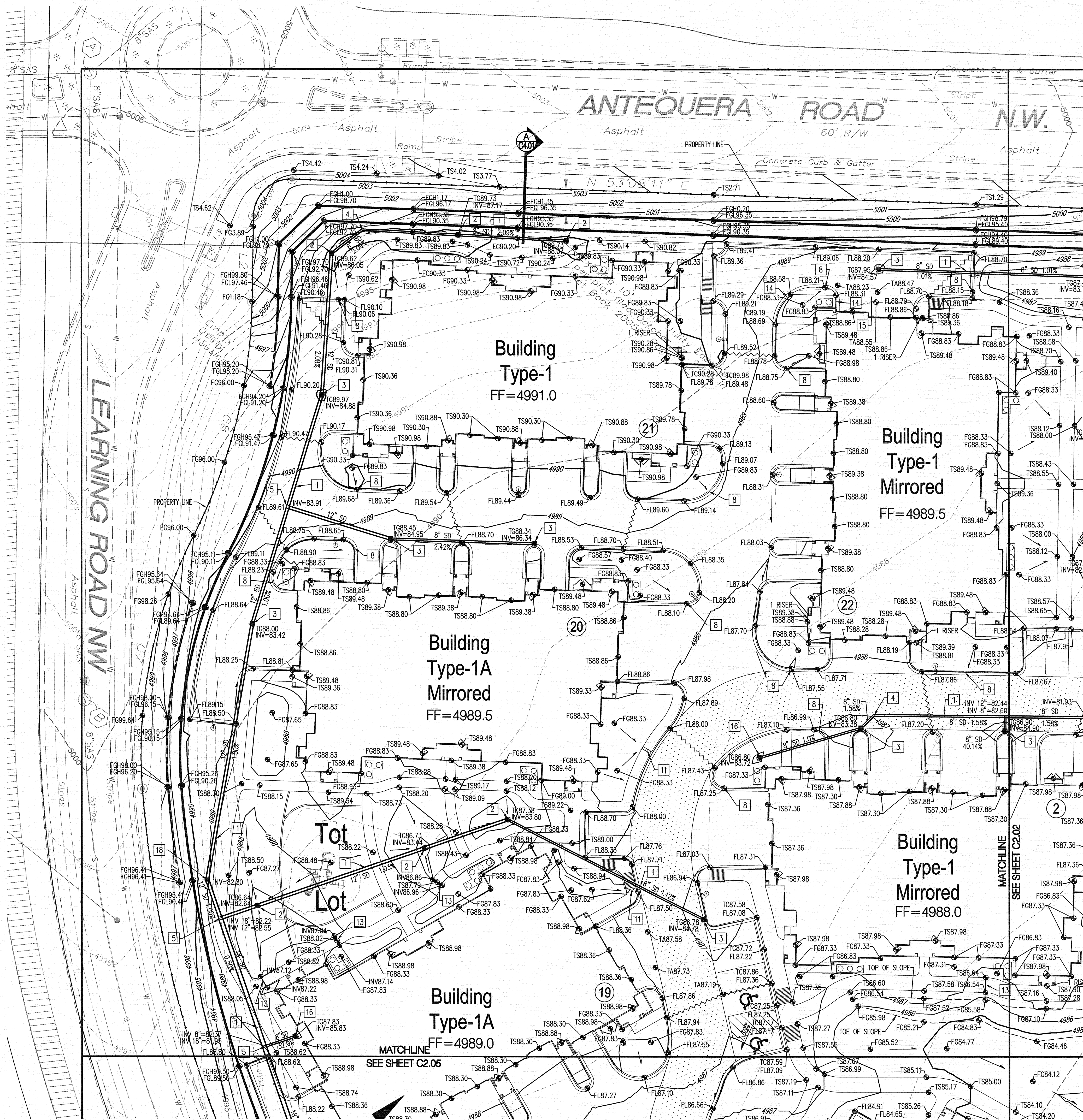
Bohannon & Huston

SHEET CONTENTS:
OVERALL GRADING &
DRAINAGE PLAN

SHEET NO.

C2.00

10350



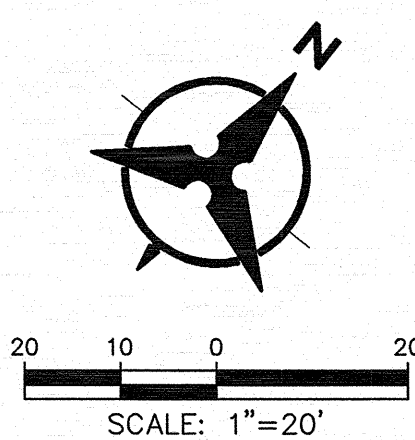
GRADING KEYED NOTES

1. INSTALL HDPE STORM DRAIN WITH WATER TIGHT JOINTS. SEE PLAN FOR SIZE, SLOPE & INVERT ELEVATIONS.
2. INSTALL NYLOPLAST INLINE DRAIN WITH 12" DOMED GRATE.
3. INSTALL NYLOPLAST 2'x2' TRAFFIC RATED INLET & GRATE.
4. INSTALL PREFABRICATED BEND WITH WATER TIGHT JOINTS.
5. INSTALL PREFABRICATED INSERTA TEE.
6. CONNECT TO EXISTING STORM DRAIN STUB OUT WITH CONCRETE COLLAR.
7. INSTALL 18" WIDE SIDEWALK CULVERT PER COA STD DWG 2236.
8. CONSTRUCT 12" WIDE CURB OPENING FOR DRAINAGE.
9. INSTALL PREFABRICATED INSERTA WYE.
10. INSTALL 4' DIA TYPE "E" STORM DRAIN MANHOLE PER COA STD DWG 2102.
11. INSTALL 12" WIDE SIDEWALK CULVERT PER COA STD DWG 2236.
12. INSTALL 6' DIA TYPE "E" STORM DRAIN MANHOLE PER COA STD DWG 2102.
13. INSTALL 6" SDR-35 PVC PIPE.
14. TRANSITION FROM 6" HIGH CURB TO FLUSH CURB.
15. MAINTAIN A 4' WIDE PEDESTRIAN WALKWAY WITH A 2.0% MAXIMUM CROSS SLOPE.
16. INSTALL NYLOPLAST INLINE DRAIN WITH 8" DOMED GRATE.
17. INSTALL NYLOPLAST INLINE DRAIN WITH 18" DOMED GRATE.
18. INSTALL NYLOPLAST JUNCTION STRUCTURE.
19. INSTALL 4' DIA TYPE "C" STORM DRAIN MANHOLE PER COA STD DWG 2101.
20. CONSTRUCT 12" WIDE CONCRETE RIBBON CHANNEL PER COA STD DWG 2236, OMIT CHECKERED STEEL PLATE.
21. CONSTRUCT 3'-0" WIDE x 12" DEEP RIP-RAP RUNDOWN. 4"-6" ROCK OVER NON-WOVEN FILTER FABRIC.

NOTE:
IN LOCATIONS REQUIRING CURB OPENINGS FOR DRAINAGE (KEYED NOTE 8) THE FINISHED SURFACE OF LANDSCAPE MATERIAL SHALL BE AT EQUAL ELEVATION WITH THE ADJACENT ASPHALT PAVEMENT OR CONCRETE GUTTER.

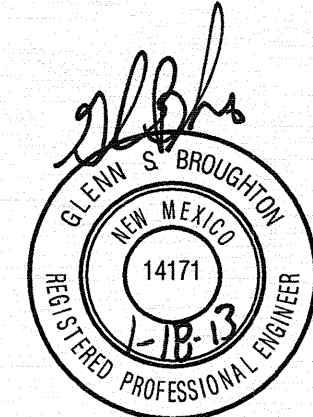
LEGEND

- PROPERTY LINE
- EXISTING CONTOURS
- PROPOSED SPOT ELEVATION
TC=TOP OF CURB, FL=FLOW LINE
TS=TOP OF SIDEWALK, TA=TOP OF ASPHALT
EX=EXISTING, FG=FINISHED GRADE
TG=TOP OF GRATE, INV=INVERT
FGH=FINISHED GRADE HIGH
FGL=FINISHED GRADE LOW
- PROPOSED DIRECTION OF FLOW
- WATER BLOCK/RIDGE
- PROPOSED RETAINING WALL
- PROPOSED INDEX CONTOURS
- PROPOSED INTER CONTOURS
- HEAVY DUTY ASPHALT PAVEMENT
- PROPOSED PERIMETER FENCE



Designed by:	BJS / GSB	
Drawn by:	BO	
Architect of Record:		
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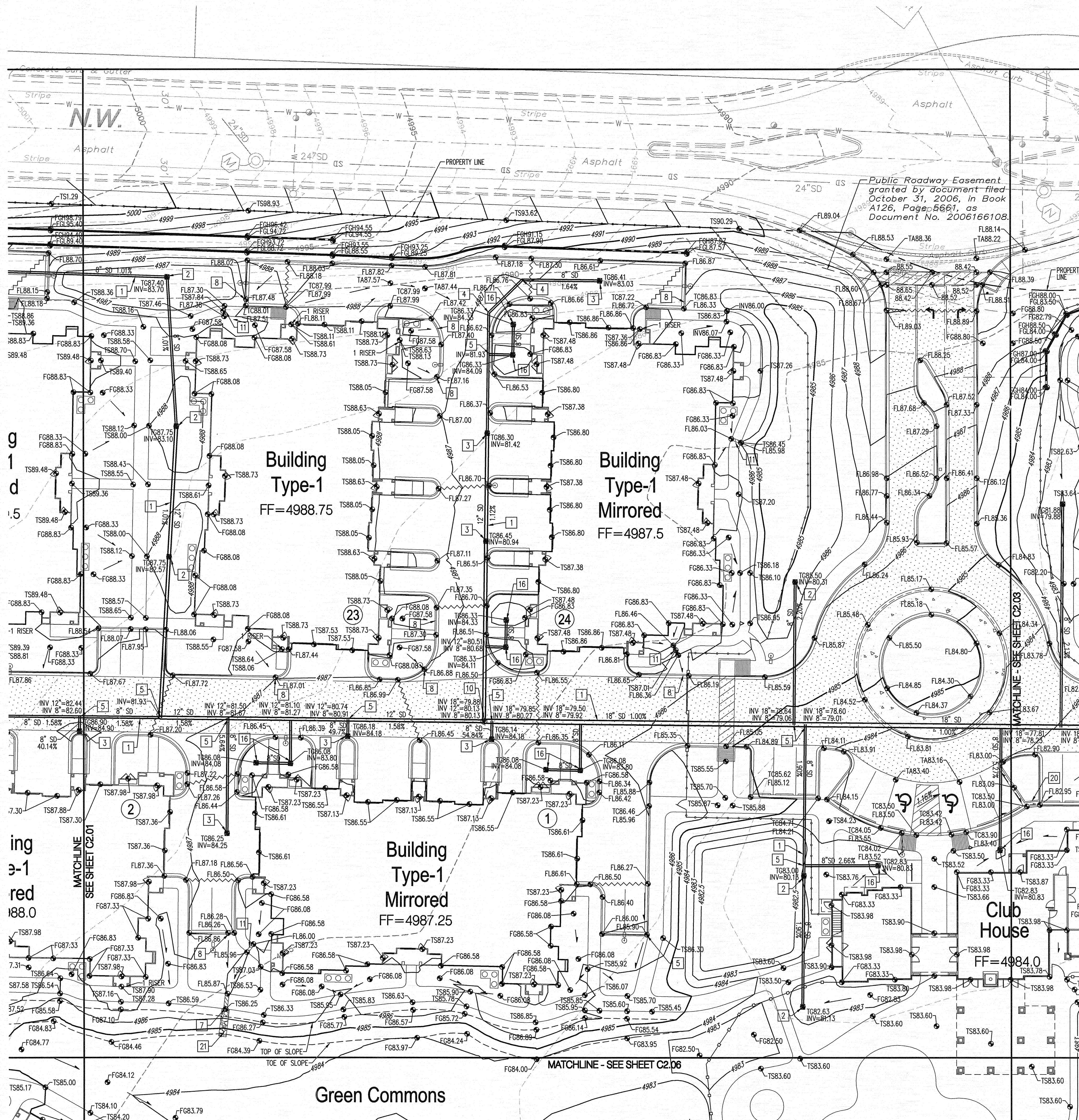
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ALBUQUERQUE, NM
BAY HILLS DEVELOPMENT



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SHEET CONTENTS:
GRADING & DRAINAGE PLAN
SHEET NO.

C2.01



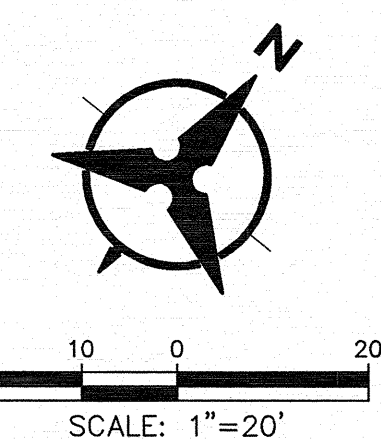
GRADING KEYED NOTES

1. INSTALL HDPE STORM DRAIN WITH WITH WATER TIGHT JOINTS. SEE PLAN FOR SIZE, SLOPE & INVERT ELEVATIONS.
2. INSTALL NYLOPLAST INLINE DRAIN WITH 12" DOMED GRATE.
3. INSTALL NYLOPLAST 2'x2' TRAFFIC RATED INLET & GRATE.
4. INSTALL PREFABRICATED BEND WITH WATER TIGHT JOINTS.
5. INSTALL PREFABRICATED INSERTA TEE.
6. CONNECT TO EXISTING STORM DRAIN STUB OUT WITH CONCRETE COLLAR.
7. INSTALL 18" WIDE SIDEWALK CULVERT PER COA STD DWG 2236.
8. CONSTRUCT 12" WIDE CURB OPENING FOR DRAINAGE.
9. INSTALL PREFABRICATED INSERTA WYE.
10. INSTALL 4" DIA TYPE "E" STORM DRAIN MANHOLE PER COA STD DWG 2102.
11. INSTALL 12" WIDE SIDEWALK CULVERT PER COA STD DWG 2236.
12. INSTALL 6" DIA TYPE "E" STORM DRAIN MANHOLE PER COA STD DWG 2102.
13. INSTALL 6" SDR-35 PVC PIPE.
14. TRANSITION FROM 6" HIGH CURB TO FLUSH CURB.
15. MAINTAIN A 4' WIDE PEDESTRIAN WALKWAY WITH A 2.0% MAXIMUM CROSS SLOPE.
16. INSTALL NYLOPLAST INLINE DRAIN WITH 8" DOMED GRATE.
17. INSTALL NYLOPLAST INLINE DRAIN WITH 18" DOMED GRATE.
18. INSTALL NYLOPLAST JUNCTION STRUCTURE.
19. INSTALL 4" DIA TYPE "C" STORM DRAIN MANHOLE PER COA STD DWG 2101.
20. CONSTRUCT 12" WIDE CONCRETE RIBBON CHANNEL PER COA STD DWG 2236, OMIT CHECKERED STEEL PLATE.
21. CONSTRUCT 3'-0" WIDE x 12" DEEP RIP-RAP RUNDOWN. 4"-6" ROCK OVER NON-WOVEN FILTER FABRIC.

NOTE:
IN LOCATIONS REQUIRING CURB OPENINGS FOR DRAINAGE (KEYED NOTE 8) THE FINISHED SURFACE OF LANDSCAPE MATERIAL SHALL BE AT EQUAL ELEVATION WITH THE ADJACENT ASPHALT PAVEMENT OR CONCRETE GUTTER.

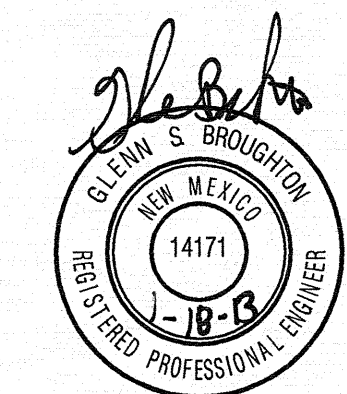
LEGEND

- PROPERTY LINE
- - - - - EXISTING CONTOURS
- 85.15 PROPOSED SPOT ELEVATION
- TC=TOP OF CURB, FL=FLOW LINE
- TS=TOP OF SIDEWALK, TA=TOP OF ASPHALT
- EX=EXISTING, FG=FINISHED GRADE
- TC=TOP OF GRATE, INV=INVERT
- FGH=FINISHED GRADE HIGH
- FGI=FINISHED GRADE LOW
- S=2.0% PROPOSED DIRECTION OF FLOW
- Water block/ridge
- Proposed retaining wall
- 5.00% PROPOSED INDEX CONTOURS
- Proposed inter contours
- Heavy duty asphalt pavement
- Proposed perimeter fence



Designed by:	BJS / GSB	
Drawn by:	BO	
Architect of Record:		
Date Plotted:	1/18/13	
Issue for Pricing / Bidding:		
Issue for Permit Application:		
Issue for Construction		
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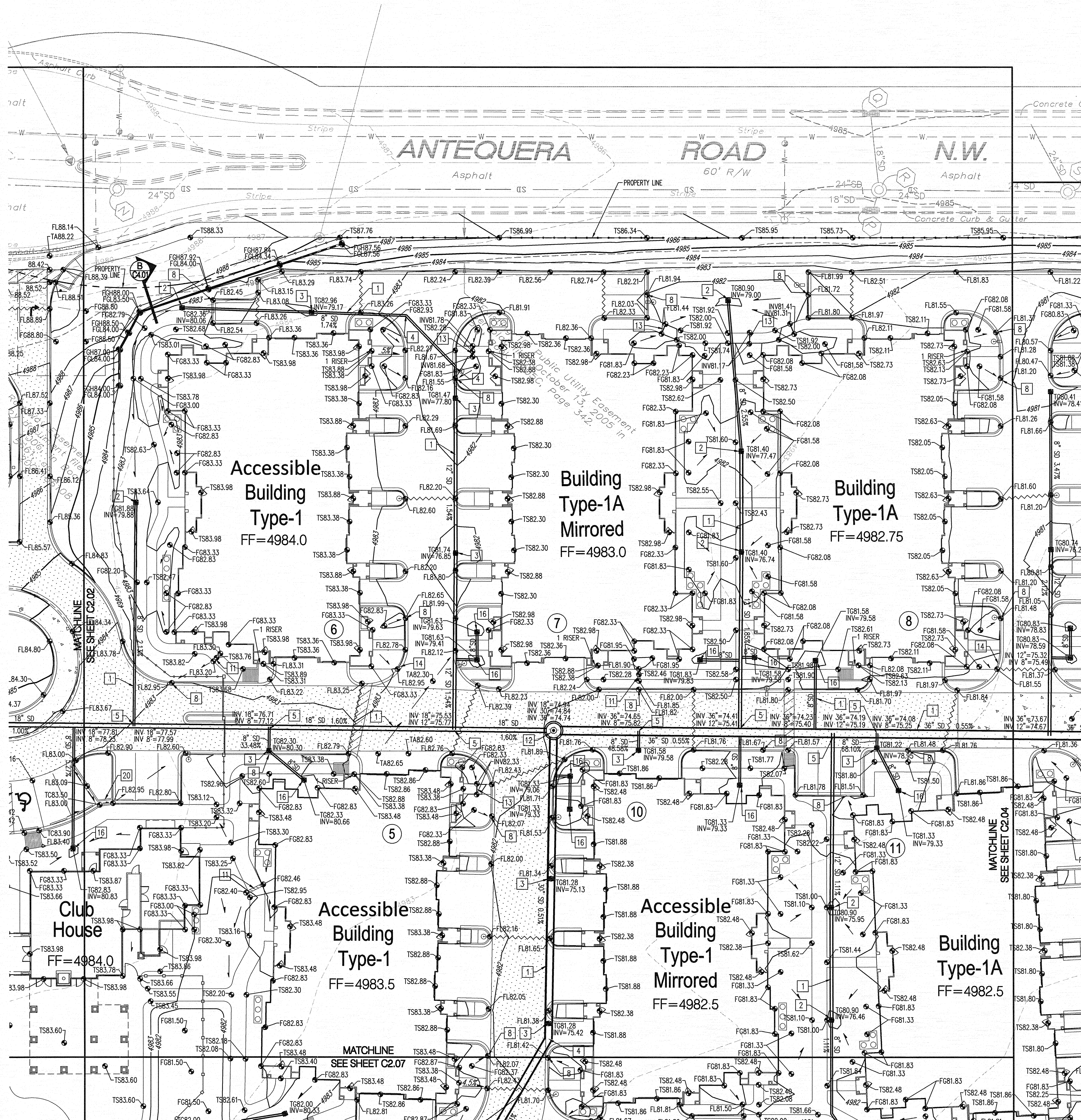
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BAY HILLS DEVELOPMENT



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SHEET CONTENTS:
GRADING & DRAINAGE PLAN
SHEET NO.

C2.02



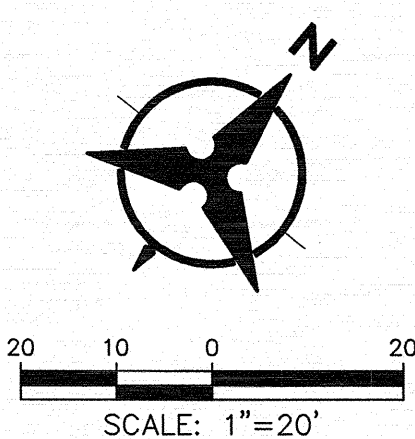
GRADING KEYED NOTES

1. INSTALL HDPE STORM DRAIN WITH WITH WATER TIGHT JOINTS. SEE PLAN FOR SIZE, SLOPE & INVERT ELEVATIONS.
2. INSTALL NYLOPLAST INLINE DRAIN WITH 12" DOMED GRATE.
3. INSTALL NYLOPLAST 2'x2' TRAFFIC RATED INLET & GRATE.
4. INSTALL PREFABRICATED BEND WITH WATER TIGHT JOINTS.
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8. CONSTRUCT 12" WIDE CURB OPENING FOR DRAINAGE.
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NOTE:
IN LOCATIONS REQUIRING CURB OPENINGS FOR DRAINAGE (KEYED NOTE 8) THE FINISHED SURFACE OF LANDSCAPE MATERIAL SHALL BE AT EQUAL ELEVATION WITH THE ADJACENT ASPHALT PAVEMENT OR CONCRETE GUTTER.

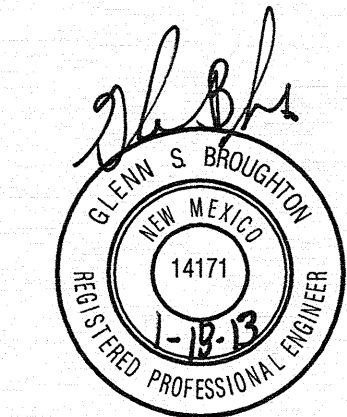
LEGEND

- PROPERTY LINE
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TC=TOP OF CURB, FL=FLOW LINE
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- PROPOSED INTER CONTOURS
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- PROPOSED PERIMETER FENCE



Designed by:	BJS / GSB	
Drawn by:	BO	
Architect of Record:		
Date Plotted:	1/18/13	
Issue for Pricing / Bidding:		
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ANDALUCIA VILLAS
ALBUQUERQUE, NM
BAY HILLS DEVELOPMENT

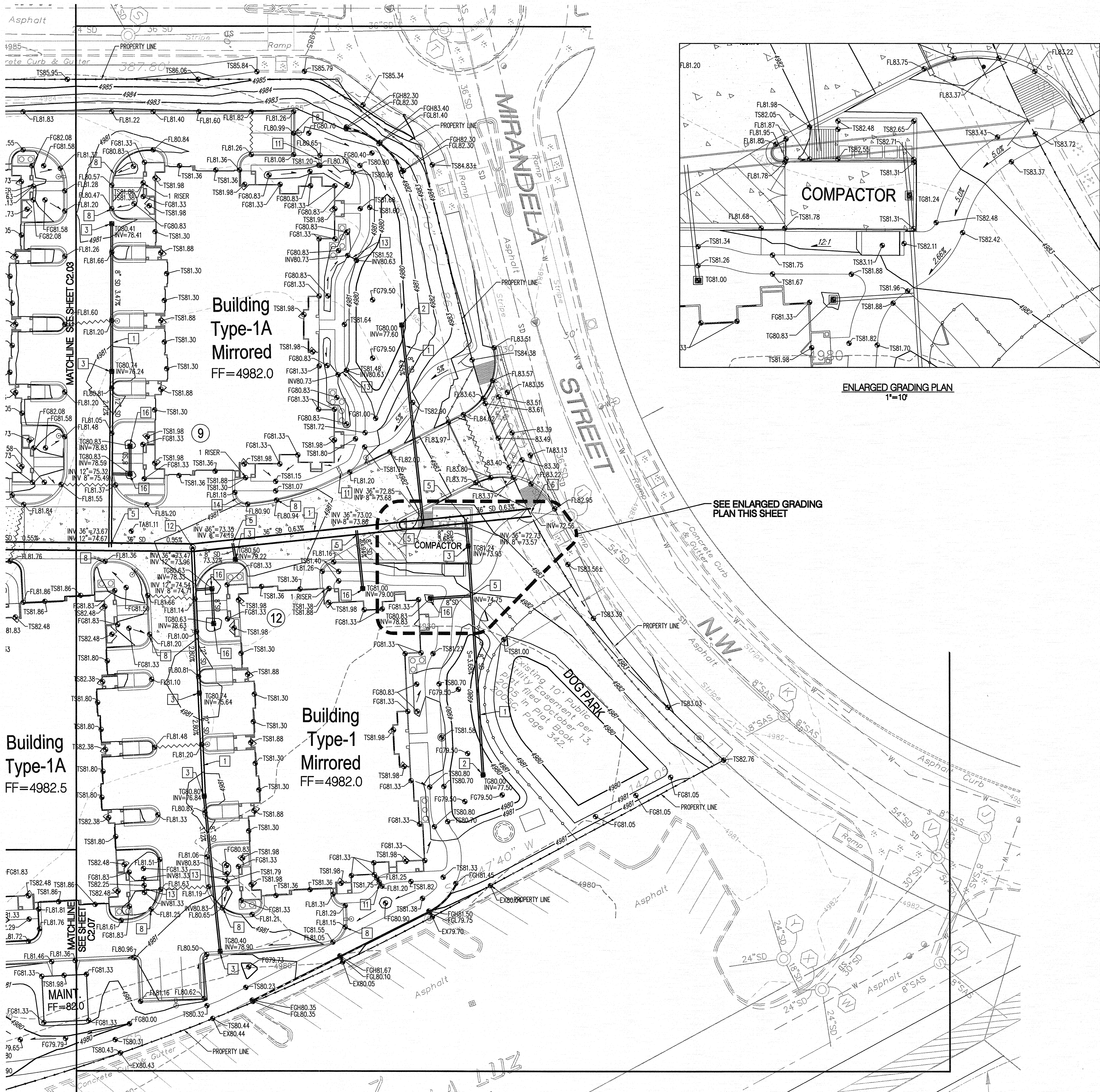


Bohannon  **Huston**

SHEET CONTENTS:
GRADING & DRAINAGE PLAN

SHEET NO.

C2.03



GRADING KEYED NOTES

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13. INSTALL 6" SDR-35 PVC PIPE.
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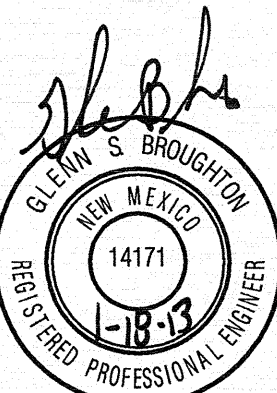
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Designed by:	BJS / GSB
Drawn by:	BO
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ANDALUCIA VILLAS
ALBUQUERQUE, NM
BAY HILLS DEVELOPMENT



Bohannon & Huston

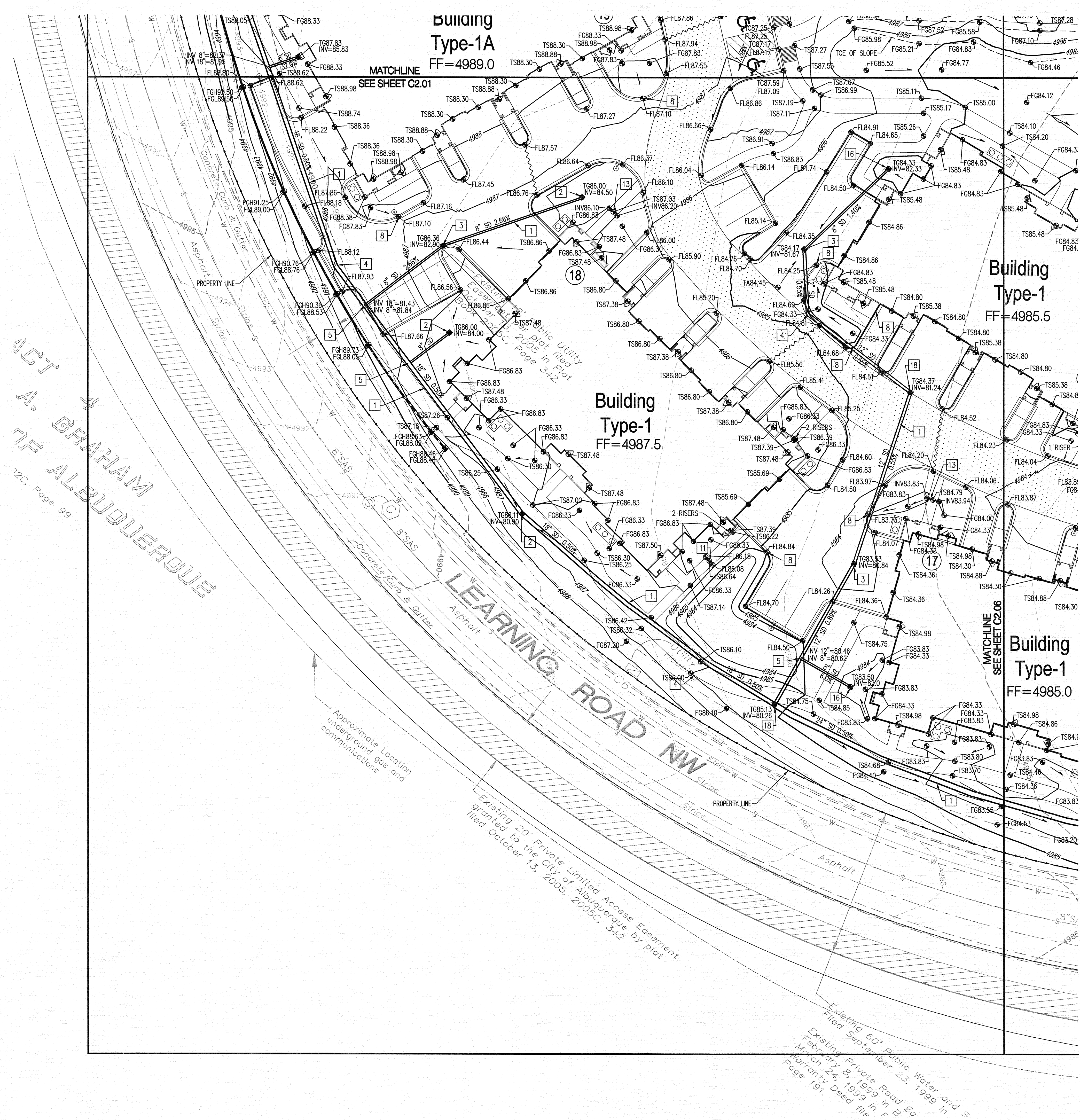
SHEET CONTENTS:
GRADING & DRAINAGE PLAN

SHEET NO.

C2.04

10350

P:\2012\2057\CDPP\Plans\General\2012057\gr05.dwg January 18, 2013 8:15am
Plotted by: BORTEGA



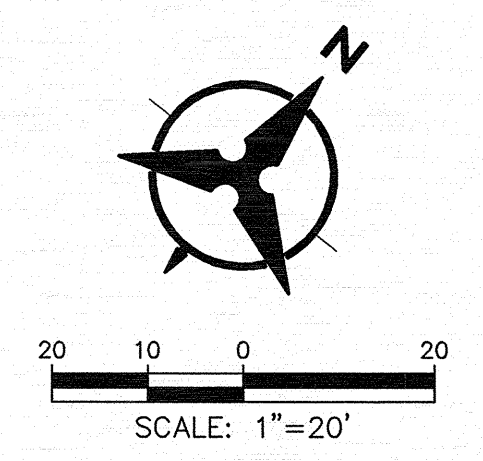
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ANDALUCIA VILLAS
ALBUQUERQUE, NM
BAY HILLS DEVELOPMENT



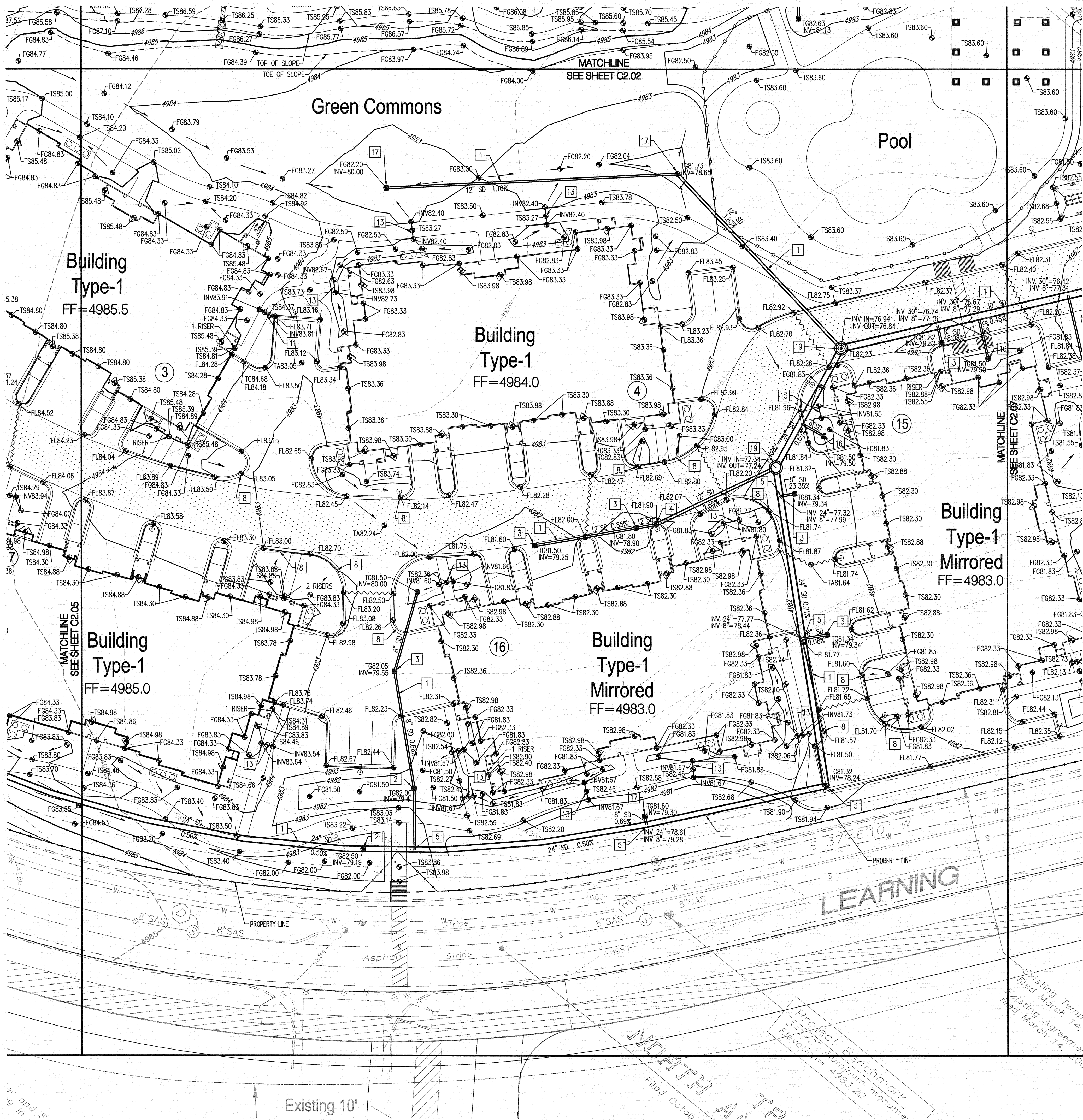
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SHEET CONTENTS:
GRADING &
DRAINAGE PLAN

SHEET NO.

C2.05

10350



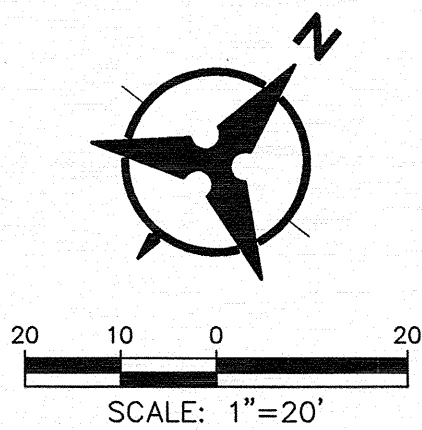
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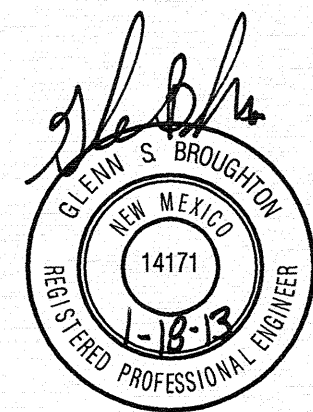
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ANDALUCIA VILLAS
ALBUQUERQUE, NM
BAY HILLS DEVELOPMENT



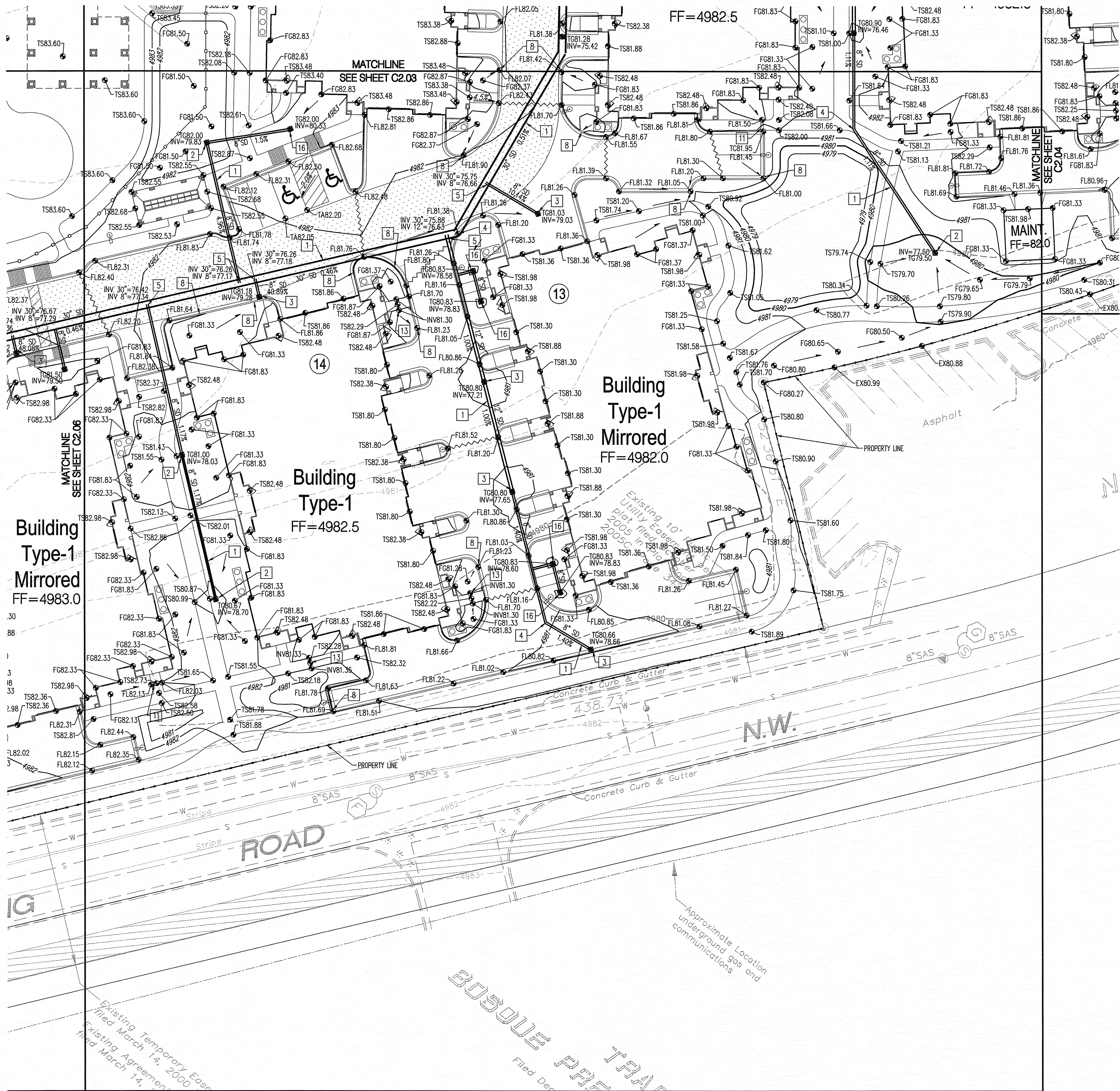
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GRADING &
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SHEET NO.

C2.06

10350



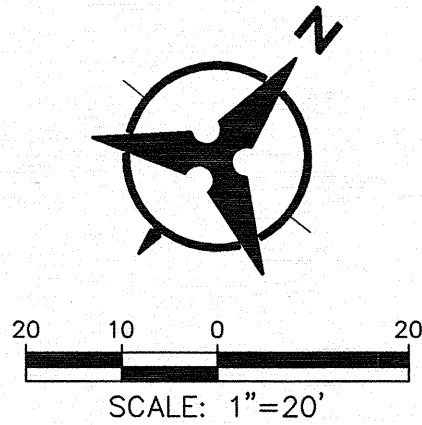
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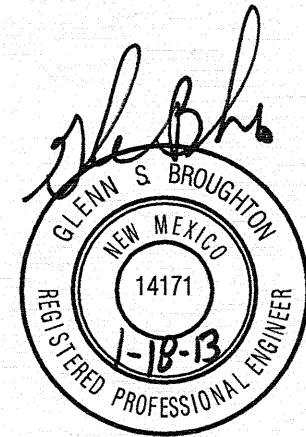
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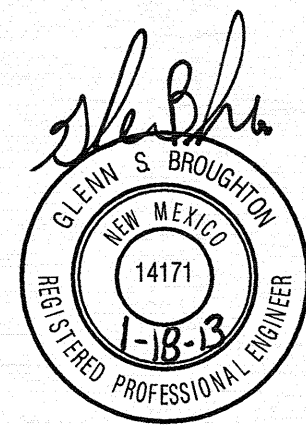
SHEET CONTENTS:
GRADING &
DRAINAGE PLAN

SHEET NO.

C2.07

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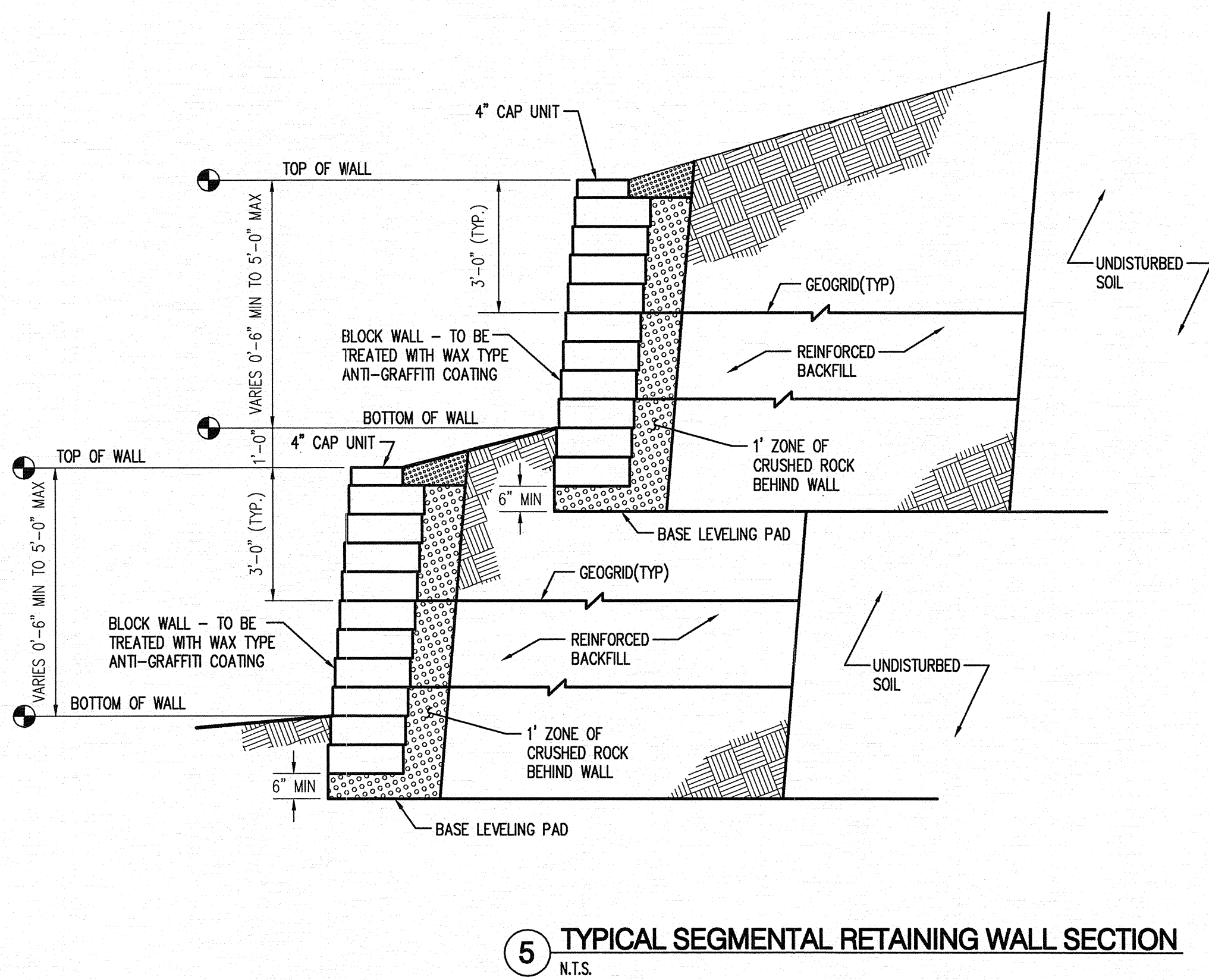
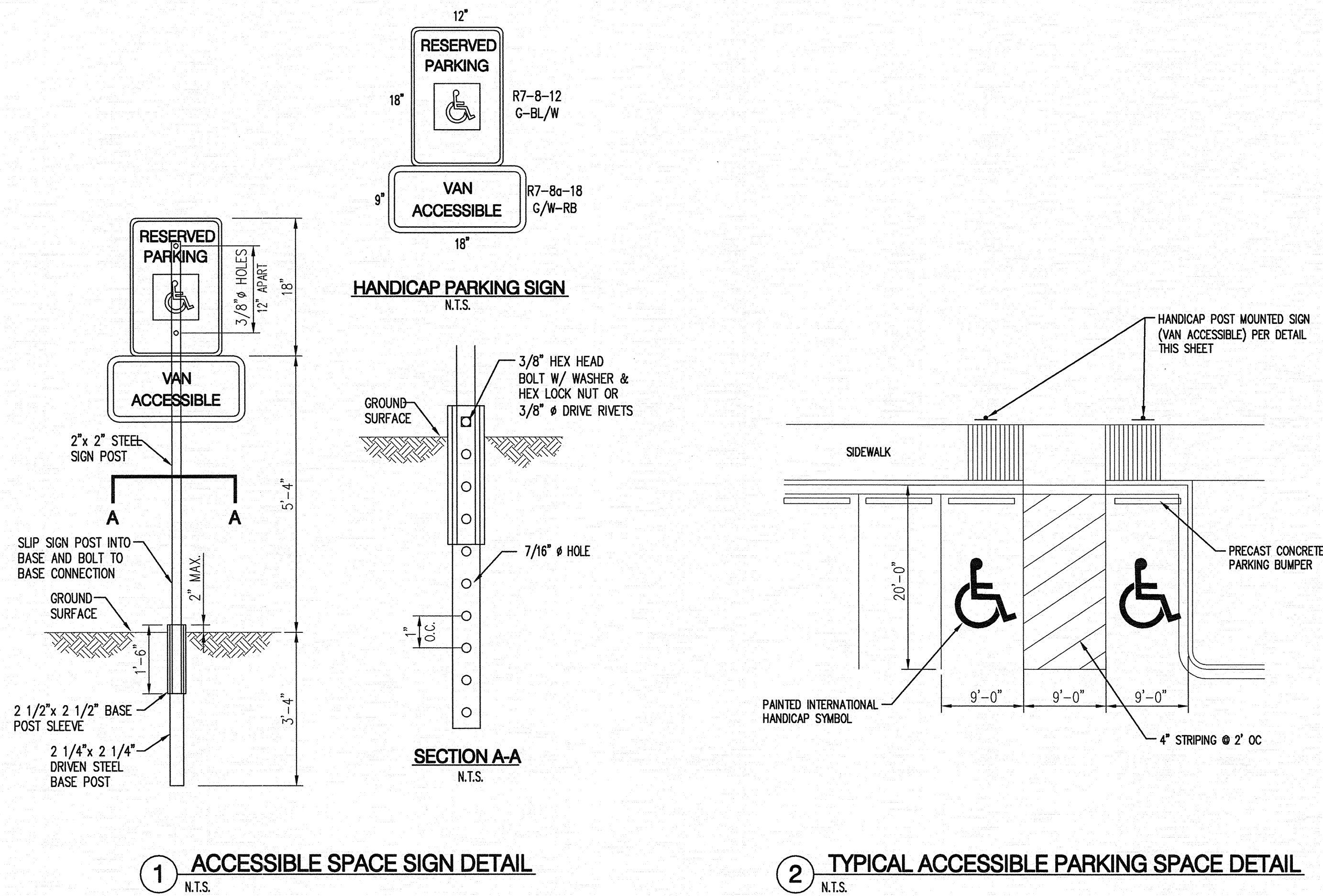
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SHEET CONTENTS:
CIVIL DETAILS

SHEET NO.

C4.01

10350



(NOTE: RETAINING WALL CONTRACTOR TO PERMIT WALL DIRECTLY THROUGH THE PERMITTING AUTHORITY. CONTRACTOR TO PROVIDE BOHANNAN HUSTON INC. WITH SHOP DRAWINGS (FOR APPROVAL) FOR EACH WALL PRIOR TO CONSTRUCTION.)

SEGMENTAL RETAINING WALL CONSTRUCTION NOTES:

RETAINING WALL CONTRACTOR TO MEET CONTRACTOR'S QUALIFICATIONS LISTED BELOW (UNLESS OTHERWISE APPROVED BY OWNER)

CONTRACTOR TO PROVIDE SHOP DRAWINGS PREPARED BY A PROFESSIONAL ENGINEER REGISTERED IN NEW MEXICO & QUALIFIED TO DESIGN SEGMENTAL RETAINING WALLS TO BOHANNAN HUSTON FOR REVIEW PRIOR TO SUBMITTING TO GOVERNING ENTITY.

RETAINING WALL SYSTEM REQUIREMENTS (PROVIDED BY MANUFACTURER OR CONTRACTOR).

SOIL AND COMPACTION TESTING SHALL BE PERFORMED DURING CONSTRUCTION (BASE, 1/2 HEIGHT, AND FINAL).

APPROVED SHOP DRAWINGS MUST BE AVAILABLE ON-SITE AT ALL TIMES.

CONTRACTOR TO PROVIDE OWNER WITH COLOR SAMPLES FOR FINAL COLOR SELECTION.

ELEVATIONS SHOWN ARE TO TOP OF WALL AND BOTTOM OF WALL AT FINAL GRADE (DOES NOT INCLUDE FOOTER).

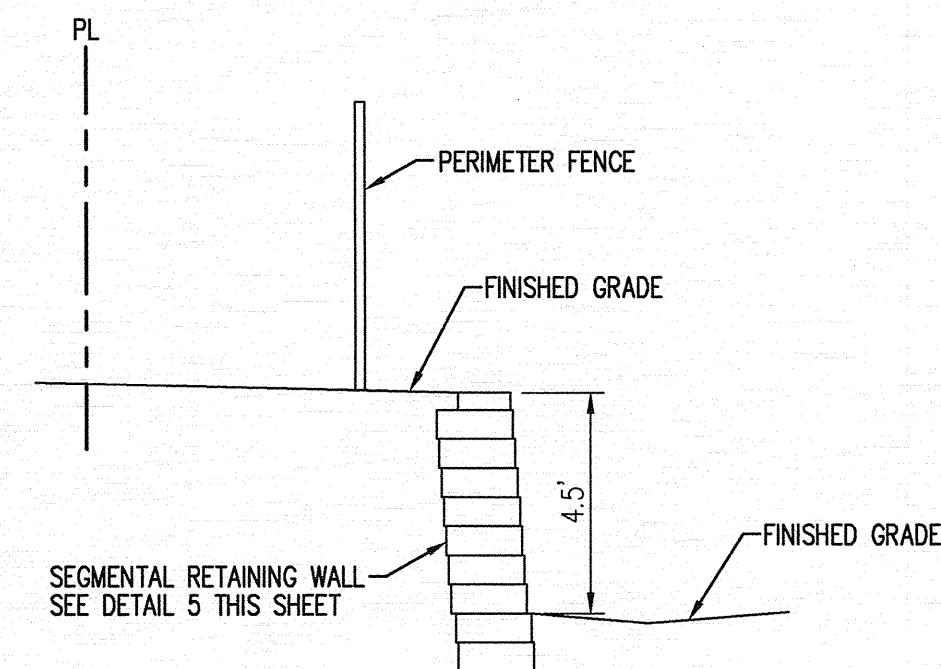
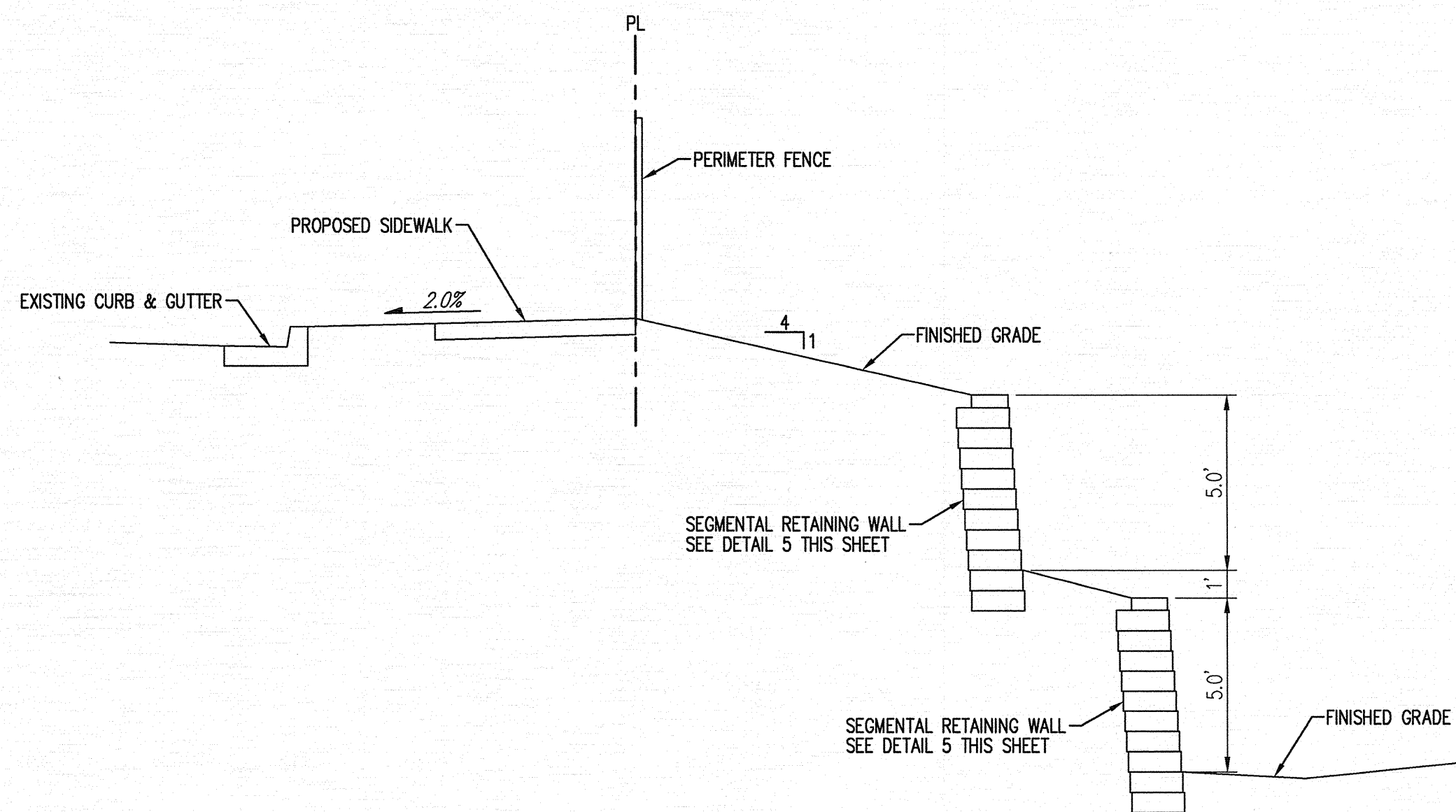
CONTRACTOR TO INCLUDE ANY OVER EXCAVATION AND CONTROLLED BACKFIELD ASSOCIATED WITH RETAINING WALL IN RETAINING WALL BID.

CONTRACTOR'S QUALIFICATIONS:

RESUME OF COMPLETED PROJECTS, TO INCLUDE SQUARE FOOTAGE AND WALL HEIGHTS.

REFERENCES: 2-3 GENERAL CONTRACTORS OR PROJECT OWNERS (DEPENDING ON SIZE OF PROJECT)

BOND CAPABILITIES.



Andalucia Villas											
Proposed Conditions Basin Data Table											
Antequera Capacity Analysis											
This table is based on the DPM Section 22.2, Zone: 1			100 Year Storm Event								
BASIN	Area	Area	Land Treatment Percentages				Q(100)	Q(100)	WT E	V(100) ₃₆₀	V(100) _{10 Day}
ID	(SQ. FT)	(AC.)	A	B	C	D	(cfs/ac.)	(cfs)	(inches)	(CF)	(CF)
SD LINE 'A'											
A-4	157588	3.62	0.0%	9.0%	9.0%	82.0%	4.02	14.56	1.76	23176	39006
A-5A	47159	1.08	0.0%	24.0%	10.0%	66.0%	3.66	3.96	1.56	6131	9943
OS1	43192	0.99	0.0%	0.0%	10.0%	90.0%	4.22	4.18	1.87	6738	11500
OS2	21101	0.48	0.0%	0.0%	10.0%	90.0%	4.22	2.04	1.87	3292	5618
Total	269040	6.18	0.0%	9.5%	9.4%	81.1%		24.75		39336	66067

Mannings Analysis for Open Channel:

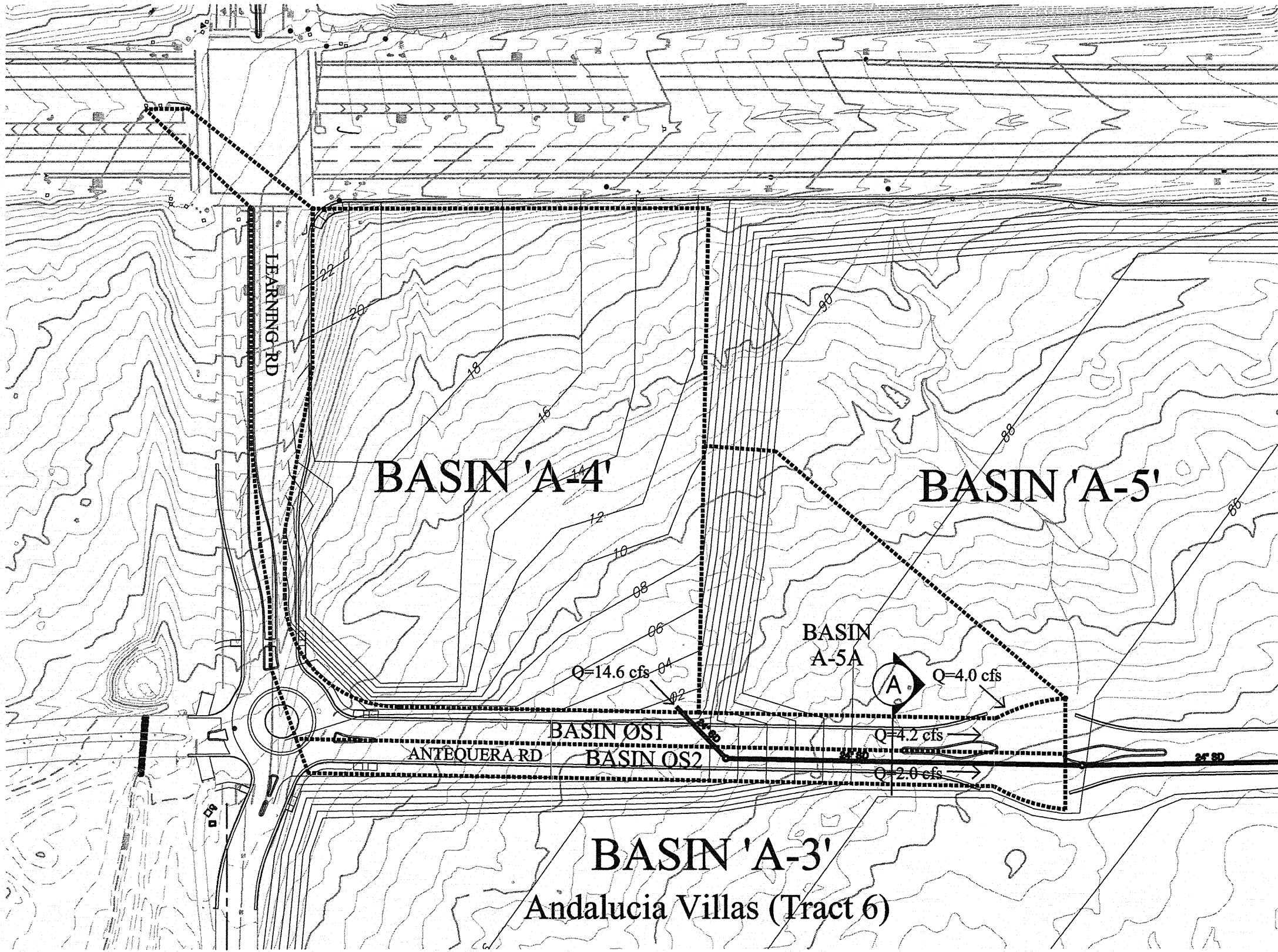
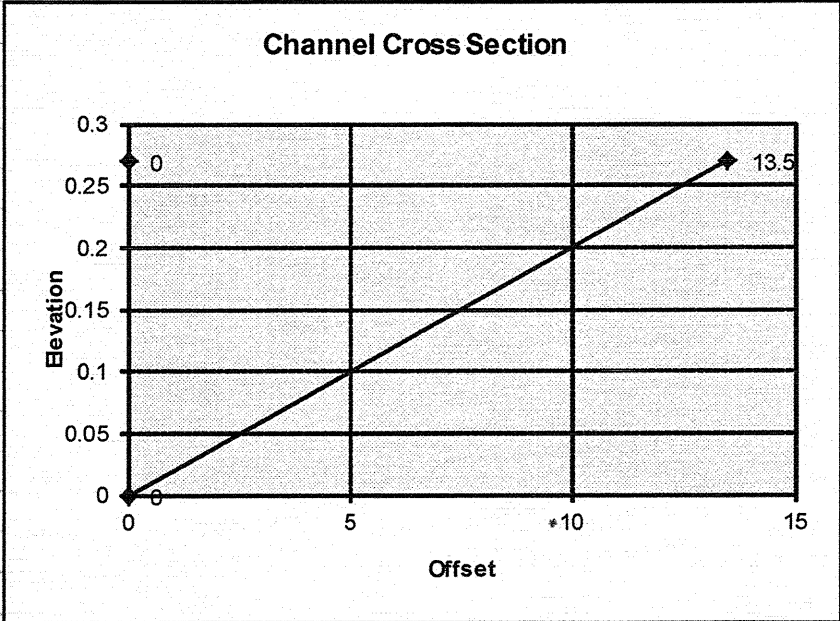
Manning's Eqn: $Q = 1.49/n \times AR^{2/3} \times S^{1/2}$

Channel Coordinates - Offset and Elevation

Point #	Offset	Elevation
1	0	0.27
2	0	0
3	0	0
4	13.5	0.27

A	1.8225 sq. ft
WP	0.5400 ft.
R	3.375 ft.
Slope	2.0000%
n	0.035

$Q = 24.69$
 $V = 13.55$

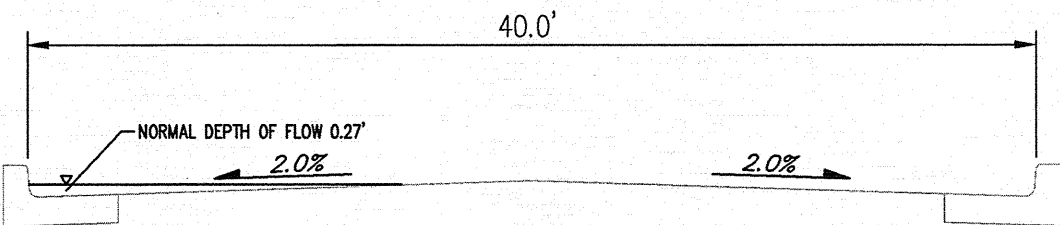


Antequera Road Capacity Analysis

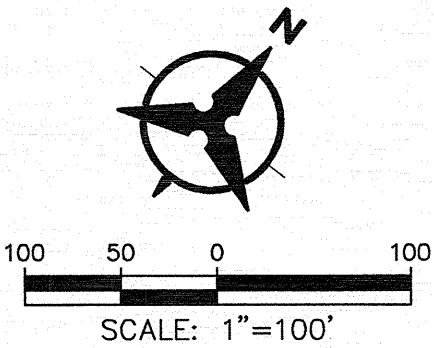
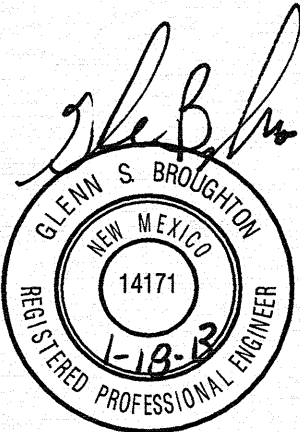
The purpose of this analysis is to demonstrate that drainage from the public right of way will not enter the Andalucia Villas Site (Tract 6, North Andalucia at La Luz). Antequera Road and upstream drainage area has been divided into four basins. Basin A-4 is as defined on the North Andalucia Drainage Master Plan. Basin A-5A is the portion of basin A-5 which discharges to Antequera upstream of the entrance to Andalucia Villas. Basin OS1 includes the north half of Learning Road and the west half of Antequera Road. Basin OS2 is the east half of Antequera Road. Peak flows are based on the 100 year, 6 hour event in accordance with Section 22.2 of the DPM.

Antequera Road is a 40 foot road section with a 2% crown. Basins A-4, A-5A and OS1 all drain to the west side of Antequera Road. The worst case peak discharge to the street is 22.8 cfs. This assumes that no drainage is conveyed in the Antequera public storm drain. Normal depth of flow was calculated in the west half of the street at Section A. This depth of flow was calculated to be 0.27 feet, which is less than the crown height. Therefore drainage west of the crown is contained on that side of the street.

Basin OS2 is the only contributing drainage area on the east side of Antequera. The peak flow is 2 cfs. The flow depth is less than 1/2". An 8" water block has been provided in the grading design. Based on this analysis drainage from the public road will not enter the Andalucia Villas site.



SECTION A
NTS



Antequera Street Capacity Analysis

January 18, 2013