APPENDIX A

FINAL DRAINAGE PLAN

TRIBUTARY AREAS

FINAL DRAINAGE PLAN

WILLOW SPRINGS

COUNTY OF SANTA BARBARA
DECEMBER 20, 2001

MAC Design Associates
CIVIL ENGINEERING * LAND PLANNING * BRIDGE DESIGN
1933 CLIFF DRIVE, SUITE 6, SANTA BARBARA, CALIF. 93109 (805) 957-4748

NOTES

1. ALL STORM DRAIN PIPE WILL BE SMOOTH BORE WITH RIBS HIGH DENSITY POLYETHYLENE (HDPE).
2. G.C.P. ARE GRATED CONCRETE PIPES PER CALTRANS STANDARDS.
3. TYPE "A" DROP INLETS (D.I.) CONFORM TO S.B.CO. PUBLIC WORKS STANDARDS.
4. C.B. ARE PRECAST CONCRETE CATCH BASINS.

SCALE IN FEET
0 60 120 180 240

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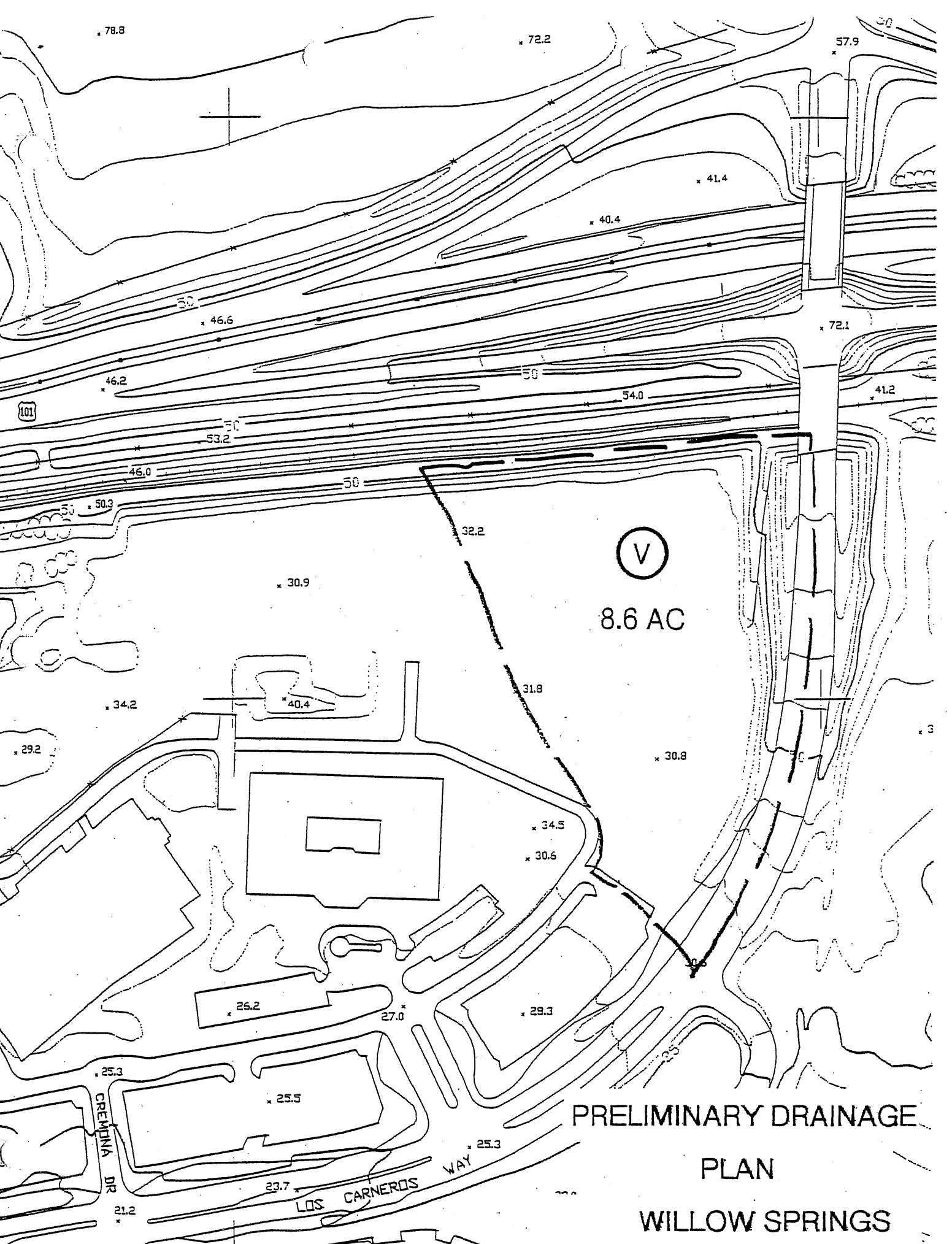
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V
8.6 AC
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21.2
CREMONA DR
LOS CARNEROS WAY
101
PRELIMINARY DRAINAGE
PLAN
WILLOW SPRINGS

PRELIMINARY
STORMWATER CONTROL PLAN
FOR
HERITAGE RIDGE

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W.O. 0343

Date: February 2, 2016

MAC DESIGN ASSOCIATES

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Table 1. Project Data

Project Name/Number	Heritage Ridge
Application Submittal Date	
Project Location	APN: 073-060-031, 032, 033, 034, 035, 036, 037, 038, 039, 040, 041, 042 & 043
Project Phase No.	N/A
Project Type and Description	360 unit residential apartment project consisting of 8 buildings containing the units and 2 recreation buildings. Two of the buildings will be Senior Housing, containing 132 units. The remaining 6 buildings, containing 228 units, will be Work Force Housing.
Total Project Site Area (acres)	16.2 Acres
Total New Impervious Surface Area	303,578 Square Feet
Total Replaced Impervious Surface Area	N/A
Total Pre-Project Impervious Surface Area	0
Total Post-Project Impervious Surface Area	303,578 Square Feet
Net Impervious Area	303,578 Square Feet
Watershed Management Zone(s)	WMZ 1
Design Storm Frequency and Depth	95th Percentile = 2.2 inches
Urban Sustainability Area	N/A

II. Setting

II.A. Project Location and Description

North Willow Springs is the northern portion of Tract 13,646, is located on APN's 073-060-031 through 043, in Goleta, California, and is approximately 16.2 acres. The Tract is located near the intersection of Los Carneros Road and Calle Koral, and is immediately adjacent to the previously approved and developed Willow Springs I & II projects. A vicinity map may is shown on Figure 1.

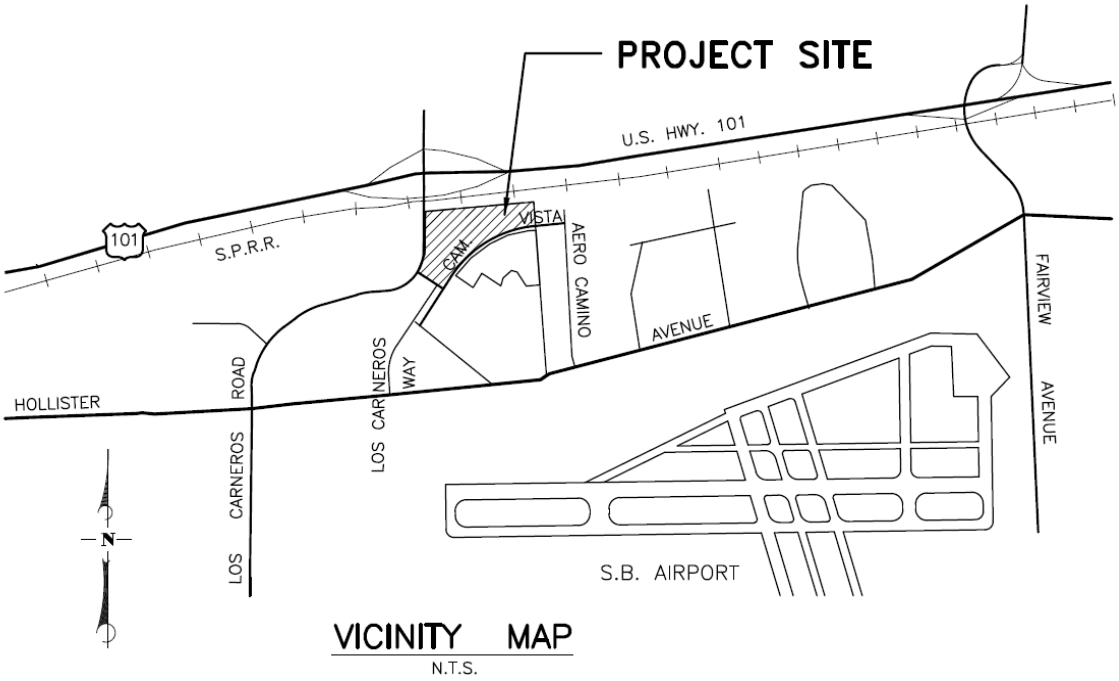


FIGURE 1

II.A.1. Existing Site Features and Conditions

The project site is currently thirteen (13) undeveloped lots adjacent to Willow Springs I and II. Currently there are 2 large soils stockpiles on-site with an unpaved access road. One stockpile is at the west side of the project near Calle Koral and another that runs along the north & east property lines. Currently the highest elevations occur at the top of the westerly stockpile. The center portion of the site is an archaeologically sensitive area and is currently fenced and undisturbed. Once the stockpiles are removed and the site is regraded this center portion of the site will have the highest elevations on the property and will form a ridge that divides the site drainage, with approximately half the site draining in a westerly direction and half the site draining in an easterly direction. Ultimately, all runoff from the property drains through existing storm drains and into a 7.25 acre treatment wetland located on the Willow Springs property. Runoff entering the treatment wetland

will drain across 500 feet (storm drain "A") and 950 feet (storm drain "C") of wetland vegetation before leaving the property at Hollister Avenue. Vegetative cover on the property is highly variable and dependent upon the activity of the stockpile. The hydrologic soils group is mapped as both soil type B and soil type D, as shown on the attached map included in the appendix.

II.A.2. Opportunities and Constraints for Stormwater Control

Opportunities for stormwater control exist along the perimeter of the 2 acre park, at the southeast corner of the project, under parking stall and drive aisles, and in landscaped areas throughout the project.

Constraints occur in the center park area due to higher elevations and underlying soils that are considered archaeologically sensitive. Drive aisle are constrained due to the proposed underground utility lines necessary to serve the project. Landscaped areas adjacent to the buildings are constrained due to seismic/liquefaction and settlement concerns expressed by the project Soils Engineer due to high ground water elevations.

III. Low Impact Development Design Strategies

III.A. Optimization of Site Layout

III.A.1. Limitation of development envelope

The project proposes multi-story buildings which will reduce the over building footprint.

III.A.2. Preservation of natural drainage features

No natural drainage features exist on-site, all drainage is currently sheet flow in nature.

III.A.3. Setbacks from creeks, wetlands, and riparian habitats

This is not applicable to this project site, no creeks, wetlands, or riparian habitats exist on-site.

III.A.4. Minimization of imperviousness

Preservation of the 2-acre park in the center of the project, the use of permeable pavements, and use of multistory buildings will serve to minimize the amount of imperviousness.

III.A.5. Use of drainage as a design element

Bioretention basins, vegetated swales, permeable pavements set on a gravel reservoir, and a subsurface ADS Stormtech Chamber system, will be used as Stormwater Control Measures.

III.B. Use of Permeable Pavements

Uncovered parking stalls throughout the project will be constructed with permeable pavements set on a gravel base. Some walkways and patio area will also be constructed with permeable pavements.

III.C. Dispersal of Runoff to Pervious Areas

Runoff from roof areas will be directed to landscape and pervious areas where possible.

III.D. Stormwater Control Measures

Biorention basins, vegetated swales, permeable pavements set on a gravel reservoir, and a subsurface ADS Stormtech Chamber system, will be used as Stormwater Control Measures.

IV. Documentation of Drainage Design

IV.A. Descriptions of each Drainage Management Area

IV.A.1. Table of Drainage Management Areas

Table 2 – DMA's

DMA Name	Surface Type	Area (Square Feet)
DMA 1A	Roof	2704
DMA 1B	Roof	2241
DMA 1C	Roof	1050
DMA 1D	Roof	1600
DMA 1E	Roof	1888
DMA 1F	Roof	3914
DMA 1G	Roof	5021
DMA 3	Landscape	4,202
DMA 7	Sidewalk	1,315
DMA 9	Landscape	270
DMA 11	Landscape	776
DMA 13	Sidewalk	833
DMA 15	Landscape	735
DMA 17	Landscape	427
DMA 19	Landscape	587
DMA 21	Asphalt	270
DMA 23	Asphalt	1,148
DMA 25	Landscape	605

DMA 27	Sidewalk	531
DMA 29	Landscape	922
DMA 31	Permeable Pavement	2,287
DMA 33	Roof	610
DMA 35	Asphalt	704
DMA 39	Roof	1,291
DMA 41	Landscape	182
DMA 43	Landscape	4,958
DMA 45	Roof	1,485
DMA 47	Permeable Pavement	2,201
DMA 49	Landscape	715
DMA 50	Permeable Pavement	438
DMA 51	Landscape	269
DMA 52	Permeable Pavement	461
DMA 53	Permeable Pavement	782
DMA 54	Sidewalk	918
DMA 55	Landscape	2,781
DMA 56	Sidewalk	221
DMA 57	Landscape	5,664
DMA 59	Roof	7,867
DMA 60	Roof	6,722
DMA 61	Roof	4,992
DMA 62	Roof	5,456
DMA 63	Sidewalk	739
DMA 65	Landscape	1,091
DMA 67	Landscape	1,410
DMA 69	Roof	2,766
DMA 71	Landscape	250
DMA 73	Landscape	838

DMA 74	Sidewalk	1,558
DMA 75	Pavers/Concrete	682
DMA 77	Permeable Pavement	2,076
DMA 79	Pavers/Concrete	226
DMA 80	Permeable Pavement	2,537
DMA 81	Landscape	348
DMA 82	Landscape	589
DMA 83	Permeable Pavement	2,542
DMA 85	Landscape	952
DMA 91	Permeable Pavement	783
DMA 92	Roof	891
DMA 93	Permeable Pavement	914
DMA 94	Roof	891
DMA 95	Permeable Pavement	1,044
DMA 96	Roof	1,188
DMA 97	Landscape	583
DMA 98	Roof	891
DMA 100	Roof	891
DMA 101	Asphalt/Roof	33,159
DMA 102	Roof	891
DMA 103	Landscape	34,606
DMA 104	Roof	1,188
DMA 105	Landscape	13,469
DMA 106	Roof	891
DMA 107	Sidewalk	493
DMA 109	Landscape	8,804
DMA 111	Landscape	8,168
DMA 113	Asphalt	1,078
DMA 115	Permeable Pavement	3,687

DMA 117	Permeable Pavement	596
DMA 119	Permeable Pavement	596
DMA 121	Permeable Pavement	744
DMA 123	Permeable Pavement	1,233
DMA 125	Asphalt/Roof	19,716
DMA 127	Permeable Pavement	1,507
DMA 129	Landscape	334
DMA 131	Permeable Pavement	522
DMA 133	Landscape	983
DMA 135	Landscape	1,300
DMA 137	Landscape	738
DMA 139	Landscape	635
DMA 141	Permeable Pavement	783
DMA 143	Permeable Pavement	783
DMA 145	Landscape	749
DMA 147	Landscape	634
DMA 149	Landscape	2,199
DMA 151	Roof	6,909
DMA 153	Roof	6,909
DMA 155	Permeable Pavement	522
DMA 157	Landscape	1,126
DMA 159	Landscape	589
DMA 161	Landscape	1,169
DMA 163	Roof	5,351
DMA 165	Roof	5,351
DMA 167	Landscape	9,456
DMA 169	Landscape	805
DMA 171	Landscape	392
DMA 173	Permeable Pavement	1,044

DMA 175	Landscape	575
DMA 177	Asphalt/Roof	24,841
DMA 179	Permeable Pavement	1,044
DMA 181	Landscape	1,103
DMA 183	Landscape	580
DMA 185	Landscape	1,394
DMA 187	Landscape	1,078
DMA 189	Landscape	1,128
DMA 191	Permeable Pavement	1,175
DMA 193	Landscape	575
DMA 195	Roof	5,351
DMA 197	Roof	5,351
DMA 199	Landscape	553
DMA 201	Permeable Pavement	1,044
DMA 203	Landscape	904
DMA 205	Landscape	650
DMA 207	Landscape	234
DMA 209	Landscape	390
DMA 211	Permeable Pavement	1,062
DMA 213	Asphalt/Roof	5,936
DMA 215	Landscape	196
DMA 221	Permeable Pavement	1,709
DMA 223	Landscape	893
DMA 225	Landscape	1,627
DMA 227	Permeable Pavement	1,044
DMA 229	Landscape	550
DMA 231	Permeable Pavement	522
DMA 233	Roof	13,953
DMA 235	Landscape	1,198

DMA 237	Landscape	355
DMA 239	Permeable Pavement	1,350
DMA 241	Landscape	1,142
DMA 243	Landscape	3,056
DMA 245	Asphalt/Roof	28,008
DMA 247	Roof	24,468
DMA 249	Landscape	2,721
DMA 251	Landscape	1,738
DMA 253	Landscape	3,331
DMA 255	Permeable Pavement	1,041
DMA 257	Permeable Pavement	653
DMA 258	Landscape	690
DMA 259	Roof	4,751
DMA 261	Landscape	2,666
DMA 263	Permeable Pavement	5,681
DMA 265	Pavers/Concrete	946
DMA 267	Landscape	1,768
DMA 269	Permeable Pavement	522
DMA 271	Permeable Pavement	1,044
DMA 273	Asphalt/Roof	26,042
DMA 275	Permeable Pavement	783
DMA 277	Sidewalk	1,385
DMA 278	Sidewalk	685
DMA 279	Landscape	395
DMA 281	Permeable Pavement	653
DMA 283	Roof	15,050
DMA 285	Landscape	529
DMA 287	Permeable Pavement	1,305
DMA 289	Sidewalk	1,371

DMA 291	Permeable Pavement	522
DMA 295	Landscape	883
DMA 300	Landscape	80,554

IV.A.2. Drainage Management Area Descriptions

DMA area and surface type are described in the previous Table.

IV.B. Tabulation and Sizing Calculations

DMA type and connection are described in the Project Clean Water SCM Sizing Calculator attached below.

V. Source Control Measures

V.A. Site activities and potential sources of pollutants

V.B. Source Control Table

Table 3

Potential source of runoff pollutants	Permanent source control BMPs	Operational source control BMPs
Inlets	Mark inlets with words "No Dumping"	Maintain and periodically replace inlet markings
Landscape Pesticide Use	Integrated Pest Management Plan	
Pools & Spas	Plumb to Sanitary Sewer	
Refuse Areas	Enclosed area with lids and roof structure	Service by local hauler
Sidewalks and Parking Lots		Sweep regularly

V.C. Features, Materials, and Methods of Construction of Source Control BMPs

See Grading & Drainage Plans, and Landscape Plans for details and methods of construction.

VI. Stormwater Facility Maintenance

VI.A. Ownership and Responsibility for Maintenance in Perpetuity

The Owner shall enter into Maintenance Agreement that runs with the land, with the City of Goleta, accepting responsibility for operation and maintenance of the on-site Post Construction Stormwater Facilities shown and referenced in the project plans and reports.

The applicant accepts responsibility for the operation and maintenance of stormwater treatment and flow-control facilities for the life of the project. Any future change or alteration, or the failure to maintain any feature described herein can result in penalties including but not limited to fines, property liens, and other actions for enforcement of a civil judgement.

VI.B. Summary of Maintenance Requirements for Each Stormwater Facility

An Operations and Maintenance Plan (O&M) will prepared and submitted for City of Goleta approval as a part of final project approval. The Owner shall designate the Person(s) responsible for maintenance of Stormwater Control Measures, keeping of inspection records, and correspondence with the City of Goleta. This person will manage all contractors and employees who will work on or maintain the Stormwater Control Measures, and will be the point of contact for problems such as clogged drains, broken irrigation lines, etc.

VII. Construction Checklist

Table 4 – Construction Checklist

Stormwater Control Plan Page #	BMP Description	See Plan Sheet #s
1	Self Treating Landscape Areas	C3
1	Self Retaining Landscape Areas	C3
1	Self Retaining Permeable Pavement Areas	C3
1	Bioretention/Bioswale Areas	C3
1	Stormtech Chambers	C3
1	Storm Drain Inlets	C3

VIII. Certifications

The preliminary design of stormwater treatment facilities and other stormwater pollution control measures in this plan are in accordance with the current edition of the Santa Barbara County Project Clean Water's Stormwater Technical Guide.

CENTRAL COAST REGION
STORMWATER CONTROL MEASURE
SIZING CALCULATOR

Central Coast Region Stormwater Control Measure Sizing Calculator

Version: 2/26/2014

1. Project Information

Project name:	North Willow Springs
Project location:	City of Goleta
Tier 2/Tier 3:	Tier 3 - Retention
Design rainfall depth (in):	2.2
Total project area (ft2):	705,672
Total new impervious area (ft2):	303,578
Total replaced impervious in a USA (ft2):	N/A
Total replaced impervious not in a USA (ft2):	N/A
Total pervious/landscape area (ft2):	402,094

2. DMA Characterization

Name	DMA Type	Area (ft2)	Surface Type	New, Replaced?	Connection
DMA 1A	Drains to Self-Retaining	2704	Roof		DMA 3
DMA 1B	Drains to Self-Retaining	2241	Roof		DMA 3
DMA 1C	Drains to Self-Retaining	1050	Roof		DMA 11
DMA 1D	Drains to Self-Retaining	1600	Roof		DMA 15
DMA 1E	Drains to Self-Retaining	1888	Roof		DMA 29
DMA 3	Self-Retaining	4202			
DMA 7	Drains to SCM	1315	Concrete or asphalt	New	SCM 1
DMA 9	Self-Treating	270			
DMA 11	Self-Retaining	776			
DMA 13	Drains to Self-Retaining	833	Concrete or asphalt		DMA 19
DMA 15	Self-Retaining	735			
DMA 17	Self-Retaining	427			
DMA 19	Self-Retaining	587			
DMA 21	Drains to SCM	270	Concrete or asphalt	New	SCM 1
DMA 23	Drains to Self-Retaining	1148	Concrete or asphalt		DMA 31
DMA 25	Self-Retaining	605			
DMA 27	Drains to Self-Retaining	531	Concrete or asphalt		DMA 25
DMA 29	Self-Retaining	922			
DMA 31	Self-Retaining	2287			
DMA 33	Drains to SCM	610	Roof	New	SCM 4
DMA 35	Drains to Self-Retaining	704	Concrete or asphalt		DMA 31
DMA 39	Drains to SCM	1291	Roof	New	SCM 4
DMA 41	Self-Retaining	182			
DMA 43	Self-Retaining	4958			
DMA 45	Drains to Self-Retaining	1485	Roof		DMA 47
DMA 47	Self-Retaining	2201			
DMA 49	Self-Retaining	715			
DMA 50	Self-Retaining	438			
DMA 51	Self-Retaining	269			
DMA 52	Self-Retaining	461			
DMA 53	Self-Retaining	782			
DMA 54	Drains to Self-Retaining	918	Concrete or asphalt		DMA 53
DMA 55	Self-Retaining	2781			
DMA 56	Drains to Self-Retaining	221	Concrete or asphalt		DMA 52
DMA 57	Self-Retaining	5664			
DMA 59	Drains to SCM	7867	Roof	New	SCM 3
DMA 60	Drains to SCM	6722	Roof	New	SCM 6
DMA 61	Drains to SCM	4992	Roof	New	SCM 8

DMA 62	Drains to Self-Retaining	5456	Roof		DMA 109
DMA 63	Drains to Self-Retaining	739	Concrete or asphalt		DMA 67
DMA 65	Self-Retaining	1091			
DMA 67	Self-Retaining	1410			
DMA 69	Drains to Self-Retaining	2766	Roof		DMA 67
DMA 71	Self-Retaining	250			
DMA 73	Self-Retaining	838			
DMA 74	Drains to Self-Retaining	1558	Concrete or asphalt		DMA 93
DMA 75	Drains to Self-Retaining	682	Concrete or asphalt		DMA 77
DMA 77	Self-Retaining	2076			
DMA 79	Drains to Self-Retaining	226	Concrete or asphalt		DMA 77
DMA 80	Self-Retaining	2537			
DMA 81	Self-Retaining	348			
DMA 82	Self-Retaining	589			
DMA 83	Self-Retaining	2542			
DMA 85	Self-Retaining	952			
DMA 91	Self-Retaining	783			
DMA 92	Drains to SCM	891	Roof	New	SCM 7
DMA 93	Self-Retaining	914			
DMA 94	Drains to SCM	891	Roof	New	SCM 7
DMA 95	Self-Retaining	1044			
DMA 96	Drains to SCM	1188	Roof	New	SCM 7
DMA 97	Self-Retaining	583			
DMA 98	Drains to SCM	891	Roof	New	SCM 7
DMA 100	Drains to SCM	891	Roof	New	SCM 7
DMA 101	Drains to SCM	33159	Concrete or asphalt	New	SCM 5
DMA 102	Drains to SCM	891	Roof	New	SCM 7
DMA 103	Self-Treating	34606			
DMA 104	Drains to SCM	1188	Roof	New	SCM 7
DMA 105	Self-Retaining	13469			
DMA 106	Drains to SCM	891	Roof	New	SCM 7
DMA 107	Drains to Self-Retaining	493	Concrete or asphalt		DMA 97
DMA 109	Self-Retaining	8804			
DMA 111	Self-Retaining	8168			
DMA 113	Drains to Self-Retaining	1078	Concrete or asphalt		DMA 115
DMA 115	Self-Retaining	3687			
DMA 117	Self-Retaining	596			
DMA 119	Self-Retaining	596			
DMA 121	Self-Retaining	744			
DMA 123	Self-Retaining	1233			
DMA 125	Drains to SCM	19716	Concrete or asphalt	New	SCM 5
DMA 127	Self-Retaining	1507			
DMA 129	Self-Retaining	334			
DMA 131	Self-Retaining	522			
DMA 133	Self-Retaining	983			
DMA 135	Self-Retaining	1300			
DMA 137	Self-Retaining	738			
DMA 139	Self-Retaining	635			
DMA 141	Self-Retaining	783			
DMA 143	Self-Retaining	783			
DMA 145	Self-Retaining	749			
DMA 147	Self-Retaining	634			
DMA 149	Self-Retaining	2199			
DMA 151	Drains to SCM	6909	Roof	New	SCM 9
DMA 153	Drains to SCM	6909	Roof	New	SCM 9
DMA 155	Self-Retaining	522			
DMA 157	Self-Retaining	1126			
DMA 159	Self-Retaining	589			
DMA 161	Self-Retaining	1169			

DMA 163	Drains to SCM	5351	Roof	New	SCM 10
DMA 165	Drains to SCM	5351	Roof	New	SCM 10
DMA 167	Self-Treating	9456			
DMA 169	Self-Retaining	805			
DMA 171	Self-Retaining	392			
DMA 173	Self-Retaining	1044			
DMA 175	Self-Retaining	575			
DMA 177	Drains to SCM	24841	Concrete or asphalt	New	SCM 11
DMA 179	Self-Retaining	1044			
DMA 181	Self-Retaining	1103			
DMA 183	Self-Retaining	580			
DMA 185	Self-Retaining	1394			
DMA 187	Self-Retaining	1078			
DMA 189	Self-Retaining	1128			
DMA 191	Self-Retaining	1175			
DMA 193	Self-Retaining	575			
DMA 195	Drains to SCM	5351	Roof	New	SCM 11
DMA 197	Drains to SCM	5351	Roof	New	SCM 11
DMA 199	Self-Retaining	553			
DMA 201	Self-Retaining	1044			
DMA 203	Self-Retaining	904			
DMA 205	Self-Retaining	650			
DMA 207	Self-Retaining	234			
DMA 209	Self-Retaining	390			
DMA 211	Self-Retaining	1062			
DMA 213	Drains to SCM	5936	Concrete or asphalt	New	SCM 11
DMA 215	Self-Retaining	196			
DMA 221	Self-Retaining	1709			
DMA 223	Self-Retaining	893			
DMA 225	Self-Retaining	1627			
DMA 227	Self-Retaining	1044			
DMA 229	Self-Retaining	550			
DMA 231	Self-Retaining	522			
DMA 233	Drains to SCM	13953	Roof	New	SCM 15
DMA 235	Self-Retaining	1198			
DMA 237	Self-Retaining	355			
DMA 239	Self-Retaining	1350			
DMA 241	Self-Retaining	1142			
DMA 243	Self-Retaining	3056			
DMA 245	Drains to SCM	28008	Concrete or asphalt	New	SCM 15
DMA 247	Drains to SCM	24468	Roof	New	SCM 15
DMA 249	Self-Retaining	2721			
DMA 251	Self-Retaining	1738			
DMA 253	Self-Retaining	3331			
DMA 255	Self-Retaining	1041			
DMA 257	Self-Retaining	653			
DMA 258	Self-Retaining	690			
DMA 259	Drains to SCM	4751	Roof	New	SCM 15
DMA 261	Self-Retaining	2666			
DMA 263	Self-Retaining	5681			
DMA 265	Drains to Self-Retaining	946	Concrete or asphalt		DMA 263
DMA 267	Self-Retaining	1768			
DMA 269	Self-Retaining	522			
DMA 271	Self-Retaining	1044			
DMA 273	Drains to SCM	26042	Concrete or asphalt	New	SCM 15
DMA 275	Self-Retaining	783			
DMA 277	Drains to Self-Retaining	1385	Concrete or asphalt		DMA 275
DMA 278	Drains to SCM	685	Concrete or asphalt	New	SCM 15
DMA 279	Self-Retaining	395			

DMA 281	Self-Retaining	653			
DMA 283	Drains to SCM	15050	Roof	New	SCM 13
DMA 285	Self-Retaining	529			
DMA 287	Self-Retaining	1305			
DMA 289	Drains to Self-Retaining	1371	Concrete or asphalt		DMA 287
DMA 291	Self-Retaining	522			
DMA 295	Self-Retaining	883			
DMA 300	Self-Treating	80554			
DMA 1F	Drains to Self-Retaining	3914	Roof		DMA 43
DMA 1G	Drains to Self-Retaining	5021	Roof		DMA 43

DMA Summary Area	
Total project impervious area (ft2):	303578
New impervious area (ft2):	262620
Replaced impervious within a USA (ft2):	0
Replaced impervious not in a USA (ft2):	0
Total pervious/landscape area (ft2):	0

3. SCM Characterization

Name	SCM Type	Safety Factor	SCM Soil Type	Infilt. Rate (in/hr)	Area (ft2)
SCM 1	Bioretention	1	HSG C/D	0.25	1248
SCM 3	Bioretention	1	HSG C/D	0.25	1147
SCM 5	Direct Infiltration	2	HSG C/D	0.25	6739
SCM 7	Bioretention	1	HSG C/D	0.25	2648
SCM 9	Bioretention	1	HSG C/D	0.25	2733
SCM 11	Bioretention	1	HSG C/D	0.25	8248
SCM 13	Bioretention	1	HSG C/D	0.25	4724
SCM 15	Bioretention	1	HSG C/D	0.25	14907
SCM 4	Bioretention	1	HSG C/D	0.25	714
SCM 6	Bioretention	1	HSG C/D	0.25	1004
SCM 8	Bioretention	1	HSG C/D	0.25	517
SCM 10	Bioretention	1	HSG C/D	0.25	6272

4. Run SBUH Model

5. SCM Minimum Sizing Requirements

SCM Name	Min. Required Storage Vol. (ft3)	Depth Below Underdrain (ft)	Drain Time (hours)
SCM 1	144	0.29	0.0
SCM 3	978	2.13	40.9
SCM 5	16356	6.07	48.5
SCM 7	745	0.70	11.4
SCM 9	1556	1.42	27.2
SCM 11	4662	1.41	27.0
SCM 13	1482	0.78	13.3
SCM 15	12012	2.01	38.7
SCM 4	180	0.63	9.5
SCM 6	829	2.07	39.7
SCM 8	809	3.91	62.6
SCM 10	965	0.38	2.9

6. Self-Retaining Area Sizing Checks

Self-Retaining DMA Name	Self-Retaining DMA Area (ft2)	Tributary DMA Name	Tributary DMA Area (ft2)	Tributary / SRA Area Ratio
DMA 3	4202	DMA 1A; DMA 1B	4945	1.18

DMA 11	776	DMA 1C	1050	1.35
DMA 15	735	DMA 1D	1600	2.18
DMA 17	427		0	0.00
DMA 19	587	DMA 13	833	1.42
DMA 25	605	DMA 27	531	0.88
DMA 29	922	DMA 1E	1888	2.05
DMA 31	2287	DMA 23; DMA 35	1852	0.81
DMA 41	182		0	0.00
DMA 43	4958	DMA 1F; DMA 1G	8935	1.80
DMA 47	2201	DMA 45	1485	0.67
DMA 49	715		0	0.00
DMA 50	438		0	0.00
DMA 51	269		0	0.00
DMA 52	461	DMA 56	221	0.48
DMA 53	782	DMA 54	918	1.17
DMA 55	2781		0	0.00
DMA 57	5664		0	0.00
DMA 65	1091		0	0.00
DMA 67	1410	DMA 63; DMA 69	3505	2.49
DMA 71	250		0	0.00
DMA 73	838		0	0.00
DMA 77	2076	DMA 75; DMA 79	908	0.44
DMA 80	2537		0	0.00
DMA 81	348		0	0.00
DMA 82	589		0	0.00
DMA 83	2542		0	0.00
DMA 85	952		0	0.00
DMA 91	783		0	0.00
DMA 93	914	DMA 74	1558	1.70
DMA 95	1044		0	0.00
DMA 97	583	DMA 107	493	0.85
DMA 105	13469		0	0.00
DMA 109	8804	DMA 62	5456	0.62
DMA 111	8168		0	0.00
DMA 115	3687	DMA 113	1078	0.29
DMA 117	596		0	0.00
DMA 119	596		0	0.00
DMA 121	744		0	0.00
DMA 123	1233		0	0.00
DMA 127	1507		0	0.00
DMA 129	334		0	0.00
DMA 131	522		0	0.00
DMA 133	983		0	0.00
DMA 135	1300		0	0.00
DMA 137	738		0	0.00
DMA 139	635		0	0.00
DMA 141	783		0	0.00
DMA 143	783		0	0.00
DMA 145	749		0	0.00
DMA 147	634		0	0.00
DMA 149	2199		0	0.00
DMA 155	522		0	0.00
DMA 157	1126		0	0.00
DMA 159	589		0	0.00
DMA 161	1169		0	0.00
DMA 169	805		0	0.00
DMA 171	392		0	0.00
DMA 173	1044		0	0.00
DMA 175	575		0	0.00

DMA 179	1044		0	0.00
DMA 181	1103		0	0.00
DMA 183	580		0	0.00
DMA 185	1394		0	0.00
DMA 187	1078		0	0.00
DMA 189	1128		0	0.00
DMA 191	1175		0	0.00
DMA 193	575		0	0.00
DMA 199	553		0	0.00
DMA 201	1044		0	0.00
DMA 203	904		0	0.00
DMA 205	650		0	0.00
DMA 207	234		0	0.00
DMA 209	390		0	0.00
DMA 211	1062		0	0.00
DMA 215	196		0	0.00
DMA 221	1709		0	0.00
DMA 223	893		0	0.00
DMA 225	1627		0	0.00
DMA 227	1044		0	0.00
DMA 229	550		0	0.00
DMA 231	522		0	0.00
DMA 235	1198		0	0.00
DMA 237	355		0	0.00
DMA 239	1350		0	0.00
DMA 241	1142		0	0.00
DMA 243	3056		0	0.00
DMA 249	2721		0	0.00
DMA 251	1738		0	0.00
DMA 253	3331		0	0.00
DMA 255	1041		0	0.00
DMA 257	653		0	0.00
DMA 258	690		0	0.00
DMA 261	2666		0	0.00
DMA 263	5681	DMA 265	946	0.17
DMA 267	1768		0	0.00
DMA 269	522		0	0.00
DMA 271	1044		0	0.00
DMA 275	783	DMA 277	1385	1.77
DMA 279	395		0	0.00
DMA 281	653		0	0.00
DMA 285	529		0	0.00
DMA 287	1305	DMA 289	1371	1.05
DMA 291	522		0	0.00
DMA 295	883		0	0.00

HYDROCAD CALCULATIONS
FOR
ADS STORMTECH CHAMBERS

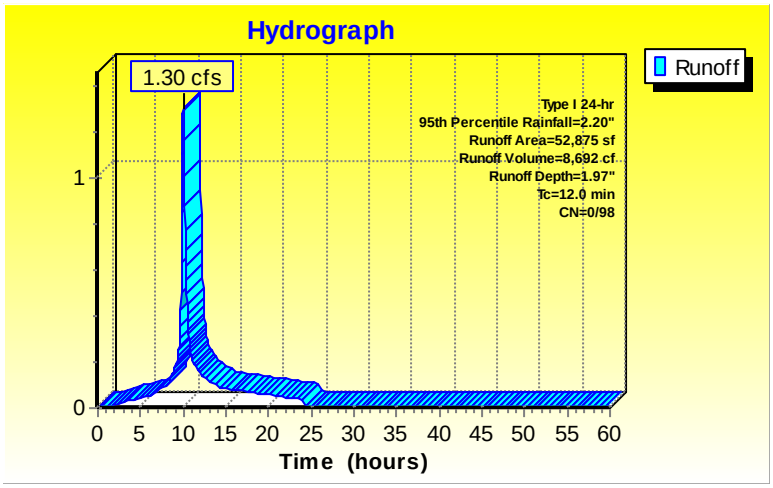
Summary for Subcatchment 22S: Area A (Post-Development)

Runoff = 1.30 cfs @ 9.98 hrs, Volume= 8,692 cf, Depth= 1.97"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Type I 24-hr 95th Percentile Rainfall=2.20"

Area (sf)	CN	Description
52,875	98	Paved parking, HSG D
52,875		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**



Events for Subcatchment 22S: Area A (Post-Developm

Event	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
1inch-24hr	0.54	3,485	0.79
2year	1.92	13,075	2.97
5year	2.80	19,272	4.37
10year	3.38	23,408	5.31
25year	4.09	28,514	6.47
50year	4.62	32,256	7.32
95th Percentile	1.30	8,692	1.97
100year	**5.12**	**35,867**	**8.14**

Summary for Pond 8P: StormTech Basin

Inflow Area = 52,875 sf,100.00% Impervious, Inflow Depth = 1.97" for 95th Percentile event
Inflow = 1.30 cfs @ 9.98 hrs, Volume= 8,692 cf
Outflow = 0.04 cfs @ 5.45 hrs, Volume= 7,822 cf, Atten= 97%, Lag= 0.0 min
Discarded = 0.04 cfs @ 5.45 hrs, Volume= 7,822 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 1.56' @ 23.52 hrs Surf.Area= 0.153 ac Storage= 0.134 af

Plug-Flow detention time= 1,249.7 min calculated for 7,822 cf (90% of inflow)
Center-of-Mass det. time= 1,186.6 min (1,908.6 - 722.0)

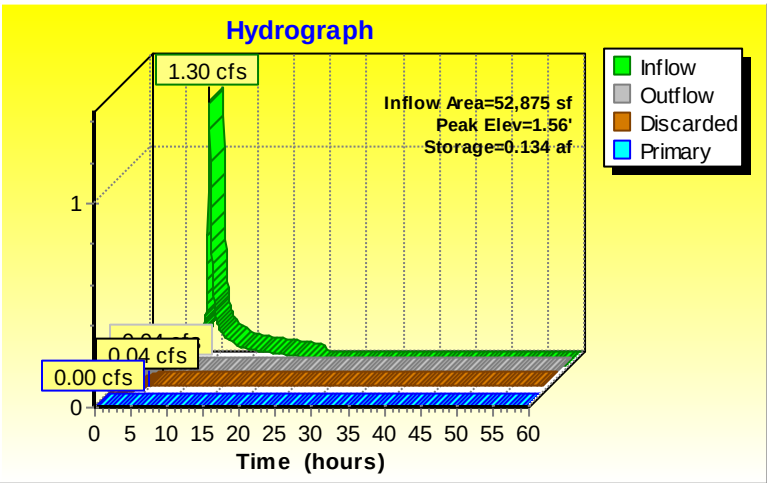
Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	0.229 af	**22.75'W x 292.57'L x 5.75'H Field A**
			0.879 af Overall - 0.305 af Embedded = 0.574 af x 40.0% Voids
#2A	1.00'	0.305 af	**ADS_StormTech MC-3500 c +Cap** x 120 Inside #1
			Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
			Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
			3 Rows of 40 Chambers
			Cap Storage= +15.6 cf x 2 x 3 rows = 93.6 cf
		0.534 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	3.25'	**18.0" Vert. Orifice/Grate** C= 0.600
#2	Discarded	0.00'	**0.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 5.45 hrs HW=0.06' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.04 cfs)

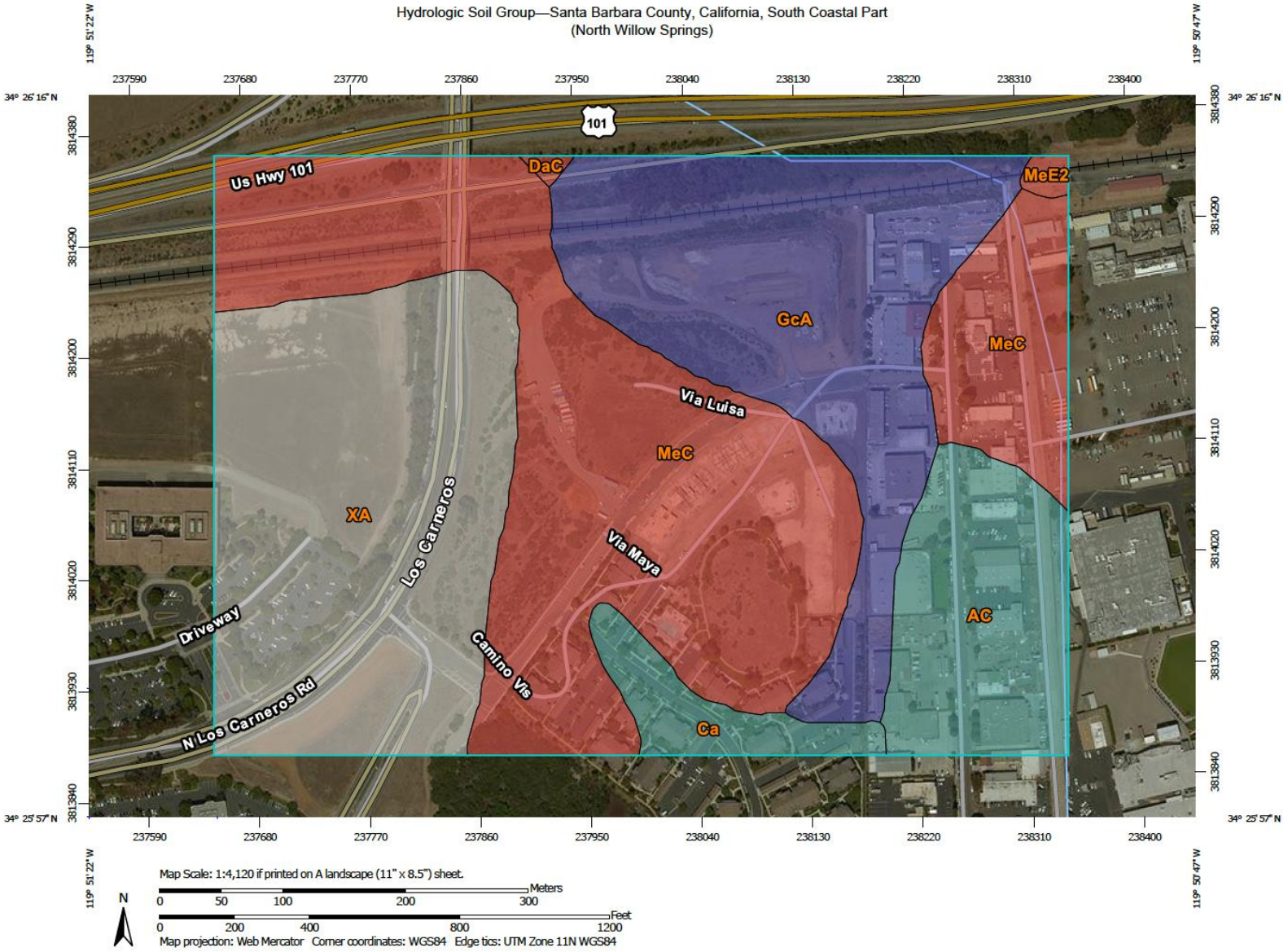
Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
1=Orifice/Grate (Controls 0.00 cfs)



Events for Pond 8P: StormTech Basin

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
1inch-24hr	0.54	0.04	**0.04**	0.00	0.57	0.035
2year	1.92	0.04	0.04	0.00	2.33	0.231
5year	2.80	0.10	0.04	0.06	3.36	0.350
10year	3.38	0.21	0.04	0.17	3.43	0.358
25year	4.09	0.46	0.04	0.42	3.53	0.369
50year	4.62	0.78	0.04	0.74	3.63	0.379
95th Percentile	1.30	0.04	0.04	0.00	1.56	0.134
100year	**5.12**	**1.33**	0.04	**1.29**	**3.76**	**0.393**

HYDROLOGIC SOIL GROUP


Hydrologic Soil Group—Santa Barbara County, California, South Coastal Part
(North Willow Springs)
119° 51' 22" W
119° 50' 47" W
34° 26' 16" N
34° 25' 57" N
237590
237680
237770
237860
237950
238040
238130
238220
238310
238400
3814380
3814290
3814200
3814110
3814020
3813930
3813840
101
Us Hwy 101
DaC
MeE2
GcA
MeC
Via Luisa
MeC
XA
Los Carneros
Via Maya
AC
Driveway
Camino Vis
N Los Carneros Rd
Ca
Map Scale: 1:4,120 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 50 100 200 300
Feet
0 200 400 800 1200
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84
USDA
Natural Resources
Conservation Service
Web Soil Survey
National Cooperative Soil Survey
12/22/2013
Page 1 of 4

Hydrologic Soil Group—Santa Barbara County, California, South Coastal Part
(North Willow Springs)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Santa Barbara County, California, South Coastal Part
Survey Area Data: Version 5, Jan 3, 2008

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 28, 2013—Sep 14, 2013

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Santa Barbara County, California, South Coastal Part (CA673)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
AC	AQUENTS, FILL AREAS	C	8.1	9.7%
Ca	CAMARILLO FINE SANDY LOAM	C	2.7	3.2%
DaC	DIABLO CLAY, 2 TO 9 PERCENT SLOPES	D	0.1	0.2%
GcA	GOLETA FINE SANDY LOAM, 0 TO 2 PERCENT SLOPES	B	18.4	22.0%
MeC	MILPITAS-POSITAS FINE SANDY LOAMS, 2 TO 9 PERCENT SLOPES	D	32.5	38.7%
MeE2	MILPITAS-POSITAS FINE SANDY LOAMS, 15 TO 30 PERCENT SLOPES, ERODED	D	0.3	0.3%
XA	XERORTHENTS, CUT AND FILL AREAS		21.7	25.9%
Totals for Area of Interest			**83.8**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

STORMWATER CONTROL PLAN

&

PRELIMINARY GRADING & DRAINAGE PLAN

LEGEND

- PERMEABLE PAVEMENT
- BIORETENTION AREA
- CARPORT

REGISTERED PROFESSIONAL ENGINEER
DALE W. WEBER
No. 53753
EXPIRES 06-30-15
CIVIL
STATE OF CALIFORNIA

DATE SIGNED _____

NO.	DATE	REVISION	APPD.

MAC Design Associates
CIVIL ENGINEERING • LAND PLANNING • BRIDGE DESIGN
1933 CLIFF DRIVE, SUITE 6, SANTA BARBARA, CALIF. 93109 (805) 957-4748

DESIGN DWW CHECKED MAC
DRAWN TLA
DALE W. WEBER DATE: 7-27-14
PROJECT ENGINEER
R.C.E. 53753 (EXP. 6-30-15)

CITY OF GOLETA, CALIFORNIA
REVIEWED BY:
_____ DATE _____
FOR

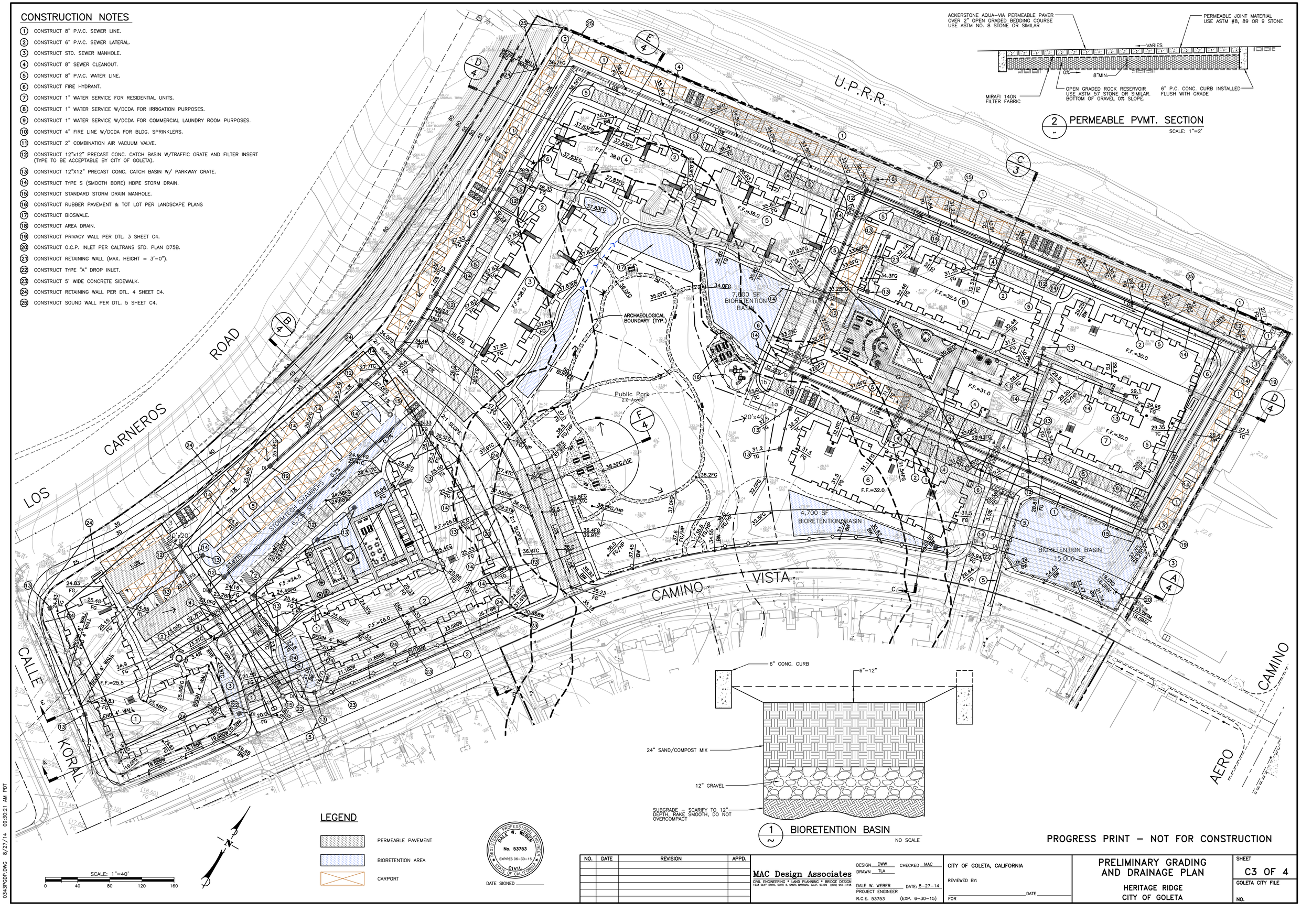
PRELIMINARY STORMWATER CONTROL PLAN

HERITAGE RIDGE
CITY OF GOLETA

SHEET 1 OF 1
GOLETA CITY FILE NO.

CONSTRUCTION NOTES

1. CONSTRUCT 8" P.V.C. SEWER LINE.
2. CONSTRUCT 6" P.V.C. SEWER LATERAL.
3. CONSTRUCT STD. SEWER MANHOLE.
4. CONSTRUCT 8" SEWER CLEANOUT.
5. CONSTRUCT 8" P.V.C. WATER LINE.
6. CONSTRUCT FIRE HYDRANT.
7. CONSTRUCT 1" WATER SERVICE FOR RESIDENTIAL UNITS.
8. CONSTRUCT 1" WATER SERVICE W/DCDA FOR IRRIGATION PURPOSES.
9. CONSTRUCT 1" WATER SERVICE W/DCDA FOR COMMERCIAL LAUNDRY ROOM PURPOSES.
10. CONSTRUCT 4" FIRE LINE W/DCDA FOR BLDG. SPRINKLERS.
11. CONSTRUCT 2" COMBINATION AIR VACUUM VALVE.
12. CONSTRUCT 12"x12" PRECAST CONC. CATCH BASIN W/TRAFFIC GRATE AND FILTER INSERT (TYPE TO BE ACCEPTABLE BY CITY OF GOLETA).
13. CONSTRUCT 12"X12" PRECAST CONC. CATCH BASIN W/ PARKWAY GRATE.
14. CONSTRUCT TYPE S (SMOOTH BORE) HDPE STORM DRAIN.
15. CONSTRUCT STANDARD STORM DRAIN MANHOLE.
16. CONSTRUCT RUBBER PAVEMENT & TOT LOT PER LANDSCAPE PLANS
17. CONSTRUCT BIOSWALE.
18. CONSTRUCT AREA DRAIN.
19. CONSTRUCT PRIVACY WALL PER DTL. 3 SHEET C4.
20. CONSTRUCT O.C.P. INLET PER CALTRANS STD. PLAN D75B.
21. CONSTRUCT RETAINING WALL (MAX. HEIGHT = 3'-0").
22. CONSTRUCT TYPE "A" DROP INLET.
23. CONSTRUCT 5' WIDE CONCRETE SIDEWALK.
24. CONSTRUCT RETAINING WALL PER DTL. 4 SHEET C4.
25. CONSTRUCT SOUND WALL PER DTL. 5 SHEET C4.



2 PERMEABLE PVMT. SECTION
SCALE: 1"=2'

1 BIORETENTION BASIN
NO SCALE

LEGEND

- PERMEABLE PAVEMENT
- BIORETENTION AREA
- CARPORT

SCALE: 1"=40'
0 40 80 120 160

REGISTERED PROFESSIONAL ENGINEER — DALE W. WEBER — No. 53753 — EXPIRES 06-30-15 — CIVIL — STATE OF CALIFORNIA
DATE SIGNED _____

PROGRESS PRINT – NOT FOR CONSTRUCTION

NO.	DATE	REVISION	APPD.

MAC Design Associates
CIVIL ENGINEERING • LAND PLANNING • BRIDGE DESIGN
1533 CLIFF DRIVE, SUITE 6, SANTA BARBARA, CALIF. 93109 (805) 957-4748

DESIGN DWW CHECKED MAC
DRAWN TLA
DALE W. WEBER DATE: 8-27-14
PROJECT ENGINEER
R.C.E. 53753 (EXP. 6-30-15)

CITY OF GOLETA, CALIFORNIA
REVIEWED BY:
_____ DATE _____
FOR

PRELIMINARY GRADING AND DRAINAGE PLAN
HERITAGE RIDGE
CITY OF GOLETA

SHEET C3 OF 4
GOLETA CITY FILE NO.

034.3PGDP.DWG 8/27/14 09:30:21 AM PDT