



Richard J. Berry, Mayor

October 17, 2017

Gilbert Aldaz, P.E.  
Applied Engineering & Surveying, Inc.  
1605 Blair Drive NE  
Albuquerque, NM, 87112

**RE: Sotogrande Housing  
Conceptual Grading and Drainage Plan  
Stamp Date: 10/3/17  
Hydrology File: M15D023H**

Dear Mr. Aldaz:

Based upon the information provided in your submittal received 10/3/2017, the Conceptual Grading and Drainage Plan **is not** approved for Preliminary Plat and Site Plan for Building Permit. The following comments need to be addressed for approval of the above referenced project:

1. Please provide the benchmark information for the survey contour information provided.
2. Sheet CIVD1. Under Offsite Flows, Lot 2-A-2 is currently under construction as a Comfort Suites Hotel. They are installing a retaining wall along their western property line. They are building a detention pond which captures the upstream drainage from Lot 2-A-3 and is designed with a release rate of 1.4 cfs at the northwest corner of their property.
3. Sheet CIVD2 & CIVD3. Please add proposed contour lines throughout the project. Since there are multiple building, the proposed contours will help spot drainage issues. I'm particularly concerned with how you are tying back into the existing contours along Woodward Road and Flightway Avenue.
4. Sheet CIVD2 & CIVD3. Please label both ponds as Detention Pond w/ First Flush rather than Retention Pond.
5. Sheet CIVD2 & CIVD3. Please provide pipe calculations showing that both outfall pipes can handle the required release rates for each pond.

# CITY OF ALBUQUERQUE



Richard J. Berry, Mayor

6. Sheet CIVD2 & CIVD3. Please fix the leaders on the Construction Note callouts. Some of the arrows are not pointing to the right object.
7. Sheet CIVD3. I believe you have a design changed that was not corrected. You call out a 22 feet curb cut for drainage access into the proposed detention pond. However this is just a sidewalk right behind a proposed Garage. You also are showing what appears to be a concrete channel at the south side of the detention pond that extends into two parking spaces but this is not called out. Please clarify which one is the drainage structure for the detention pond.
8. Sheet CIVD4. Please show and label the western property line and label the Flightway Ave R.O.W.
9. Sheet CIVD4. It states that a 10 feet wide temporary construction easement required on the adjacent Lot 2-A-2. As I stated in Item #2, Lot 2-A-2 is currently under construction as a Comfort Suites Hotel and a temporary construction easement will not be able to get since there will be a retaining wall built on Lot 2-A-2.

PO Box 1293

If you have any questions, please contact me at 924-3995 or [rbrissette@cabq.gov](mailto:rbrissette@cabq.gov).

Sincerely,

Albuquerque

*Renée C. Brissette*

NM 87103

Renée C. Brissette, P.E. CFM  
Senior Engineer, Hydrology  
Planning Department

[www.cabq.gov](http://www.cabq.gov)



# City of Albuquerque

Planning Department

Development & Building Services Division

## DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 10/2015)

Project Title: Sotogrande Housing Building Permit #: \_\_\_\_\_ Hydrology File #: M-15/D23H  
DRB#: \_\_\_\_\_ EPC#: 1009573 Work Order#: \_\_\_\_\_  
Legal Description: Lot 1A & 2A, Block 2, Sunport Park  
City Address: NE Corner Woodward Road SE and Flightway Avenue SE  
Applicant: Applied Engineering & Surveying, Inc. Contact: Gilbert Aldaz  
Address: 1605 Blair Drive NE, Albuquerque, NM, 87112  
Phone#: 505-480-8125 Fax#: \_\_\_\_\_ E-mail: galdaz47@yahoo.com  
Other Contact: Chad Weltzin - Erstad Architect Contact: \_\_\_\_\_  
Address: 310 N 5th Street, Boise, ID 83702  
Phone#: 208-331-9031 Fax#: \_\_\_\_\_ E-mail: cweltzin@erstadarchitects.com

Check all that Apply:

### DEPARTMENT:

- ☒ HYDROLOGY/ DRAINAGE  
☐ TRAFFIC/ TRANSPORTATION  
☐ MS4/ EROSION & SEDIMENT CONTROL

### TYPE OF SUBMITTAL:

- ☐ ENGINEER/ARCHITECT CERTIFICATION  
☒ CONCEPTUAL G & D PLAN  
☐ GRADING PLAN  
☐ DRAINAGE MASTER PLAN  
☐ DRAINAGE REPORT  
☐ CLOMR/LOMR  
☐ TRAFFIC CIRCULATION LAYOUT (TCL)  
☐ TRAFFIC IMPACT STUDY (TIS)  
☐ EROSION & SEDIMENT CONTROL PLAN (ESC)  
☐ OTHER (SPECIFY) \_\_\_\_\_

### TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

- ☐ BUILDING PERMIT APPROVAL  
☐ CERTIFICATE OF OCCUPANCY  
☒ PRELIMINARY PLAT APPROVAL  
☐ SITE PLAN FOR SUB'D APPROVAL  
☒ SITE PLAN FOR BLDG. PERMIT APPROVAL  
☐ FINAL PLAT APPROVAL  
☐ SIA/ RELEASE OF FINANCIAL GUARANTEE  
☐ FOUNDATION PERMIT APPROVAL  
☐ GRADING PERMIT APPROVAL  
☐ SO-19 APPROVAL  
☐ PAVING PERMIT APPROVAL  
☐ GRADING/ PAD CERTIFICATION  
☐ WORK ORDER APPROVAL  
☐ CLOMR/LOMR

☒ PRE-DESIGN MEETING? James Hughes

IS THIS A RESUBMITTAL? ☒ Yes ☐ No

☐ OTHER (SPECIFY) \_\_\_\_\_

DATE SUBMITTED: 10/03/17 By: Gilbert Aldaz

COA STAFF: \_\_\_\_\_ ELECTRONIC SUBMITTAL RECEIVED: \_\_\_\_\_



DRAINAGE CALCULATIONS

**DRAINAGE PLAN**  
THE FOLLOWING ITEMS CONCERN A PROPOSED 216 MULTI-FAMILY RESIDENTIAL COMPLEX KNOWN AS SOTOGRANDE HOUSING WHICH IS LOCATED AT THE NORTHEAST CORNER OF WOODWARD ROAD SE AND FLIGHTWAY AVENUE SE, ALBUQUERQUE, NEW MEXICO. THE FOLLOWING GRADING AND DRAINAGE PLAN INFORMATION IS CONTAINED HEREON:

- 1. DRAINAGE CALCULATIONS
- 2. DRAINAGE BASIN MAP
- 3. DRAINAGE GRADING PLAN
- 4. VICINITY MAP (M-15)
- 5. FLOOD INSURANCE RATE MAP 35001C0342G - SEPT 26, 2008

**EXISTING CONDITIONS**  
AS SHOWN BY THE VICINITY MAP, THE SITE IS BOUNDED ON THE SOUTH BY WOODWARD ROAD SE ON THE WEST BY TRANSPORT STREET SE AND THE NORTH BY FLIGHTWAY AVENUE SE AND THE EAST BY LOT 2-A-2, BLOCK 2 SUNPORT PARK (SEE ATTACHED VICINITY MAP M-15). THE PARCEL'S LEGAL DESCRIPTION IS LOT 1-A AND LOT 2-A-1, BLOCK 2, SUNPORT PARK, ALBUQUERQUE, NEW MEXICO FILED IN THE OFFICE OF THE COUNTY CLERK OF BERNALILLO COUNTY, NEW MEXICO ON AUGUST 21, 1990 IN MAP BOOK 90C, FOLIO 195. LOT 1-A CONTAINS APPROXIMATELY 10.1 ACRES AND LOT 2A1 CONTAINS APPROXIMATELY 0.59 ACRES. AS PART OF THIS DEVELOPMENT LOT 1A AND LOT 2A1 WILL BE REPLANTED AND COMBINED FOR A TOTAL ACREAGE OF 10.69ACRES.

PER RECENT SITE VISITS DONE AS PART OF PREPARING THIS DRAINAGE PLAN THE EXISTING SITE IS UNDEVELOPED WITH NATIVE GRASSES AND MINIMAL DISTURBANCE BY OVERHEAD UTILITIES. THE AREA IS RELATIVELY STEEP WITH SLOPES FROM 6% TO 10% IN AN EAST TO WEST DIRECTION.

THIS SITE LIES WITH A MASTER DRAINAGE PLAN KNOWS AS SUNPORT PARK - PHASE 1, DATED 1996. IN PARTICULAR THE MAJORITY OF THE SITE LIES WITH DRAINAGE BASINS A-4, A-5 AND A-9, AND A SMALL PORTION WITHIN DRAINAGE BASIN-A-2. A STORMDRAIN SYSTEM WAS CONSTRUCTED ALONG THE WEST BOUNDARY OF THIS SITE ON TRANSPORT STREET SE THAT ACCEPTS THE FLOW FROM THIS SITE ALONG WITH OTHER ADJACENT AREAS THAT DRAIN INTO FLIGHTWAY AVENUE SE AND WOODWARD ROAD SE. DRAINAGE BASINS A-2, A-4 AND A-5 ALLOWS A DISCHARGE RATE OF 3.4CFS/ACRE AND DRAINAGE BASIN A-9 ALLOWS A DISCHARGE RATE OF 3.85CFS/ACRE.

**PROPOSED CONDITIONS**  
THE PROPOSAL FOR REPLANTING OF THIS SITE CONSIST OF VACATING THE LOT LINE BETWEEN LOT 1-A AND LOT 2-A-1 IN ORDER TO CREATE ONE LEGAL TRACT FOR THIS MULTI-FAMILY RESIDENTIAL COMPLEX.

AS SHOWN BY THE PLAN, THE PROJECT CONSISTS OF NINE MAIN BUILDINGS CONTAINING THE MULTI-FAMILY UNITS AND ONE MAIN BUILDING CONTAINING THE COMMUNITY BUILDING AND SWIMMING POOL. DUE TO THE RELATIVELY STEEP 6% TO 10% EAST TO WEST SLOPES THE SITE WILL BE GRADED TO CREATE A RELATIVELY FLAT TERRACE SLOPE ALONG THE CENTER OF THE PROPERTY FOR THE COMPLEX BY USING STEPPED RETAINING WALLS THAT VARY IN OVERALL HEIGHT FROM 12' TO 17' ALONG THE EAST AND WEST SIDES OF THIS DEVELOPMENT.

INTERNAL PAVED VEHICULAR CIRCULATION AND PARKING WILL BE PROVIDED FOR THE DEVELOPMENT TO SERVE THE MULTI-FAMILY COMPLEX. DRAINAGE FROM THE UNITS WILL BE DISCHARGED INTO THE INTERNAL PAVED CIRCULATION AND DISCHARGED TO TWO NEW DRAINAGE PONDING AREAS, ONE AT THE NORTHWEST CORNER OF THE SITE AND THE OTHER AT THE SOUTHWEST CORNER OF THE SITE, EACH POND WILL BE RECEIVING ABOUT 50% OF THE SITE DRAINAGE. THE INTENT OF EACH OF THE NEW DRAINAGE PONDS IS TO CAPTURE THE FIRST FLUSH REQUIREMENTS WHICH IS THE 90TH PERCENTILE STORM EVENT (FIRST 0.44 INCHES) ALONG WITH ADDITIONAL FLOW NECESSARY TO REDUCE THE PEAK FLOW DISCHARGE AS PER THE MASTER DRAINAGE PLAN. THE ALLOWABLE PEAK FLOW FOM THIS DEVELOPMENT WILL THEN BE DISCHARGED INTO THE EXISTING STORM DRAIN SYSTEM IN FLIGHTWAY AVENUE SE.

THE CALCULATIONS WHICH APPEAR HEREON, ANALYZE BOTH THE EXISTING AND DEVELOPED CONDITIONS FOR THE 100-YEAR, 6 HOUR RAINFALL RUNOFF FOR PEAK FLOWS AND STORM DURATION FOR VOLUME REQUIREMENTS. THE PROCEDURE FOR 40 ACRE AND SMALLER BASINS AS SET FORTH IN THE REVISION OF SECTION 22.7 HYDROLOGY OF THE DEVELOPMENT PROCESS MANUAL, VOLUME 2, DESIGN CRITERIA, DATED JANUARY 1993. THIS D.P.M. PROCEDURE IS USED FOR ANALYZING ONSITE FLOWS.

**DOWNSTREAM CAPACITY**  
BASED ON THE MASTER DRAINAGE PLAN KNOWS AS SUNPORT PARK - PHASE 1, DATED 1996, THIS DEVELOPMENT WILL FOLLOW THE LIMITED DISCHARGE RATES ALLOWED BY THIS MASTER PLAN BY THE USE OF TWO DRAINAGE PONDS TO REDUCE THE ALLOWABLE DISCHARGE RATE FROM THIS SITE.

**OFFSITE FLOWS**  
BASED ON THE TOPOGRAPHIC SURVEY IT APPEARS LOT 2-A, BLOCK 2, WHICH IS EAST OF THIS DEVELOPMENT AS HAD SOME GRADING DISTURBANCE TO TRY AND FORCE HALF THE SITE TO THE SOUTH INTO WOODWARD ROAD SE AND THE OTHER HALF NORTH WHICH ULTIMATELY COMES ONTO THIS DEVELOPMENT. THE FIRST +/-30 FEET EAST OF THIS DEVELOPMENT SHEET FLOWS ONTO THIS DEVELOPMENT.

A PROPOSED DRAINAGE PLAN (M-15/D23G) WAS SUBMITTED TO HYDROLOGY IN APRIL 2016 WHICH PROPOSED TO DRAIN THE SOUTH HALF ONTO WOODWARD ROAD SE AND THE NORTH HALF INTO A NEW RETENTION POND AT THE NORTH END OF LOT 2-A WITH A SPILLWAY SIZED TO DRAIN THIS POND AT A RELEASE RATE OF 1.6CFS. THIS DEVELOPMENT WILL SIZE INFRASTRUCTURE TO ACCEPT THIS OFFSITE FLOW BASED ON A FLOW RATE OF 6.1CFS WHICH IS BASED ON THE DEVELOPED CONDITIONS IN CASE THIS PROPOSED POND SHOULD FAIL IN THE FUTURE.

IN THE INTERIM UNTIL THIS OFFSITE DEVELOPMENT (M-15/D23G) IS DEVELOPED THIS MULTI-FAMILY WILL CONSTRUCT A SWALE ABOVE THE EAST RETAINING WALL TO DISCHARGE THE SOUTH HALF ONTO WOODWARD ROAD SE AND DRAIN THE NORTH HALF NORTH INTO INFRASTRUCTURE TO CAN ACCEPT THIS OFFSITE FLOW TO MINIMIZE DISTURBANCE TO THIS DEVELOPMENT.

**EROSION CONTROL**  
THE CONTRACTOR WILL BE REQUIRED TO PREPARE A STORM WATER POLLUTION PREVENTION PLAN FOR THE SITE PRIOR TO ROUGH GRADING OF THE SITE. THE CONTRACTOR WILL ALSO BE REQUIRED TO SECURE A TOP SOIL DISTURBANCE PERMIT ALONG WITH A STORM WATER POLLUTION PREVENTION PLAN FROM THE EPA PRIOR TO ROUGH GRADING OF THE SITE.

THE CONTRACTOR WILL ALSO BE REQUIRED TO PROTECT EXISTING INLETS ALONG FLIGHTWAY AVENUE SE ADJACENT TO THE SITE WITH SEDIMENT CONTROL MEASURES DURING CONSTRUCTION IN ORDER TO MINIMIZE SEDIMENT FROM ENTERING THESE INLETS AND ADJACENT STREETS.

DRAINAGE CALCULATIONS:

- 1. PRECIPITATION ZONE = 2
- 2. DESIGN STORM = DEPTH (INCHES) AT 100-YEAR STORM  
6-HOUR = 2.35 INCHES  
24-HOUR = 2.75 INCHES  
10 DAY = 3.95 INCHES
- 3. PEAK DISCHARGE (CFS/ACRE) FOR 100-YEAR, ZONE 2, TABLE A-9:  
Q = 1.56 CFS/ACRE SOIL UNCOMPACTED "A"  
Q = 2.28 CFS/ACRE LANDSCAPED "B"  
Q = 3.14 CFS/AC COMPACTED SOIL "C"  
Q = 4.70 CFS/ACRE IMPERVIOUS AREA "D"  
FOR WATERSHEDS LESS THAN OR EQUAL TO 40 ACRES
- 4. EXCESS PRECIPITATION, E (INCHES), FOR 100-YEAR, 6 HOUR STORM, ZONE 2, TABLE A-8:  
E = 0.53 INCHES SOIL UNCOMPACTED "A"  
E = 0.78 INCHES LANDSCAPED "B"  
E = 1.13 INCHES COMPACTED SOIL "C"  
E = 2.12 INCHES IMPERVIOUS AREA "D"
- 5. EXISTING CONDITIONS ONSITE FLOWS (LOT 1-A AND LOT 2-A-1)  
TOTAL AREA = 10.69ACRES  
IMPERVIOUS AREA "A" = 10.69ACRES  
Q(EXISTING-6HR) = (1.56 X 10.69) = 16.68CFS (6HR) EXISTING 100-YEAR ONSITE FLOW RATE INTO EXISTING STORM DRAINS ADJACENT TO THE SITE ON FLIGHTWAY AVENUE SE  
V(PROPOSED-6HR) = ((0.53 X 10.69)/ 12) = 0.47AC-FT = 20.556CF EXISTING 100-YEAR ONSITE FLOW VOLUME INTO EXISTING STORM DRAINS ADJACENT TO THE SITE ON FLIGHTWAY AVENUE SE

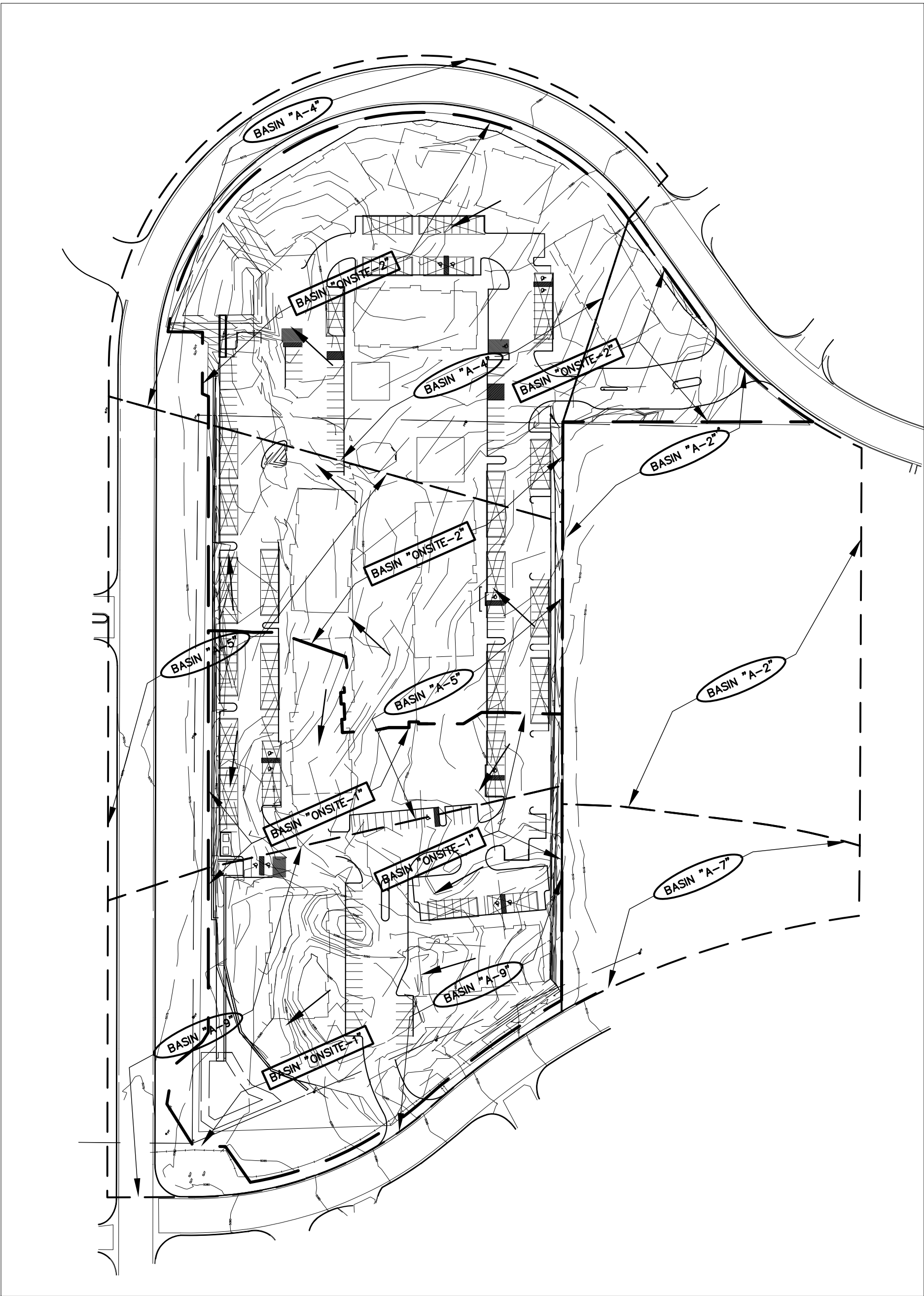
- 6. PROPOSED CONDITIONS ONSITE FLOWS INTO SOUTHWEST DRAINAGE POND DRAINAGE BASIN "ONSITE-1"  
TOTAL AREA = 1.69,877SF = 3.90ACRES  
ROOF AREA, TYPE "D" = 8,350SF(A) + 10,160SF(D) + 5,550SF(COMM) + 9,200SF(C) = 33,260SF = 0.76ACRES  
ASPHALT ACCESS, PARKING AND SIDEWALKS, TYPE "D" = 61,072SF = 1.40AC  
TYPE B AND C, 50% EACH OF REMAINING AREAR = 0.50 (3.90AC - 0.76AC) = 0.87AC/EACH  
TREATMENT B AND C  

TREATMENT	AREA(ACRES)
A	0
B	0.87
C	0.87
D	2.16

  
Q(PROPOSED-6HR) = (2.28 X 0.87) + (3.14 X 0.87) + (4.70 X 2.16) = 14.87CFS (6HR) PROPOSED 100-YEAR ONSITE FLOW VOLUME INTO SOUTHWEST DRAINAGE POND  
V(PROPOSED-6HR) = ((0.78 X 0.87) + (1.13 X 0.87) + (2.12 X 2.16))/ 12) = 0.52AC-FT = 22.651CF PROPOSED 100 YEAR ONSITE VOLUME INTO SOUTHWEST DRAINAGE POND
- 7. ALLOWABLE RELEASE RATE BASED ON SOUTHWEST POND PER SUNPORT PARK MASTER PLAN FOR DRAINAGE BASIN "ONSITE-1"  
TOTAL AREA = 1.69,877SF = 3.90ACRES  
PERCENT OF BASIN "ONSITE-1" AREA WITHIN MASTER DRAINAGE PLAN BASINS "A-9" AND "A-5"  
PERCENT = (115,584SF / 169,877SF) X 100% = 68% BASIN "A-9"  
PERCENT = (54,293SF / 169,877SF) X 100% = 32% BASIN "A-5"  
ALLOWABLE DISCHARGE RATE FOR "ONSITE-1" = (0.68 X 3.90AC X 3.85CFS/AC) + (0.32 X 3.90AC X 3.4CFS/AC) = 14.45CFS ALLOWABLE  
  
Q(PROPOSED-6HR) FOR BASIN "ONSITE-1" = 14.87CFS > 14.45CFS ALLOWABLE DISCHARGE RATE, **REDUCE BASIN "ONSITE-1" BY 0.42CFS TO MINIMIZE DOWNSTREAM CAPACITY IMPACTS**
- 8. PROPOSED CONDITIONS INTO SOUTHWEST DRAINAGE POND PER FIRST FLUSH STORM WATER CONTROL MEASURES PER ORDINANCE Q-2013016 FOR DRAINAGE BASIN "ONSITE-1"  
FOR THE PURPOSED OF THE ORDINANCE THE 90TH PERCENTILE STORM EVENT IS 0.44INCHES FROM IMPERVIOUS AREAS.  
V(FIRST FLUSH) = 0.44" X TREATMENT "D" = (0.44"/12"/') X 94,089SF  
= 3,450CF REQUIRED TO BE DETAINED FOR FIRST FLUSH
- 9. PROPOSED SOUTHWEST DRAINAGE POND VOLUME  
ELEVATION = 5074.0 AREA = 2,430SF  
ELEVATION = 5077.0 AREA = 4,752SF  
VOLUME PROVIDE = ((2,430SF + 4,752SF)/2) X 3FEET DEPTH = 10,773CF
- 10. HYDROGRAPH FOR SOUTHWEST POND  
Tb(BASE TIME) = (2.017 X E X A1/Qp) - (0.25 x Ad/A1)  
E = ((0.87 x 0.78) + (0.87 x 1.13) + (2.16 x 2.12))/ 3.90 = 1.60inches  
Tb(BASE TIME) = ((2.017 x 1.40 x 3.90)/14.87) - (0.25 x 2.16/3.90) =0.71hour  
Tp(PeAK) = (0.7 X Tc) + ((1.6 - (Ad/A1))/12)  
Tp(PeAK) = (0.7 x 0.2hr) + (1.6 - (2.16/3.90))/ 12 = 0.23hours  
T = 0.25 X Ad/A1 = 0.25 X (2.16/3.90) = 0.14hours
- 11. VOLUME REQUIRED PER HYDROGRAPH TO BE DETAINED BASED ON ALLOWABLE RELEASE RATE FOR SOUTHWEST POND  
VOL(RELEASE RATE) = (14.87CFS - 14.45CFS) X 0.14hours x 3600sec/hour  
VOL(RELEASE RATE) = 236CF, USE 1,000CF  
VOL(REQUIRED) = 3,450CF(FIRST FLUSH) + 1,000CF(ALLOWABLE) = **4,450CF REQUIRED < 10,773CF REQUIRED OK**
- 12. PROPOSED CONDITIONS ONSITE FLOWS INTO NORTHWEST DRAINAGE POND FOR DRAINAGE BASIN "ONSITE-2"  
TOTAL AREA = 256,576SF = 5.89ACRES  
ROOF AREA, TYPE "D" = 9,200SF(C) + 10,160SF(D) + 8,350SF(A) + 9,200SF(C) + 9,040SF(B) + 8,350SF(A) = 54,300SF = 1.25ACRES  
ASPHALT ACCESS, PARKING AND SIDEWALKS, TYPE "D" = 99,248SF = 2.27AC  
TYPE B AND C, 50% EACH OF REMAINING AREAR = 0.50 (5.89AC - 1.25AC - 2.27AC) = 1.18AC/EACH TREATMENT B AND C  

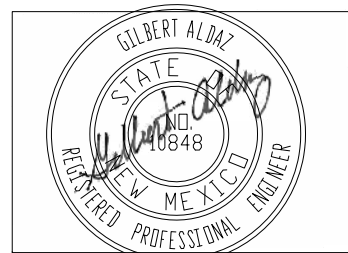
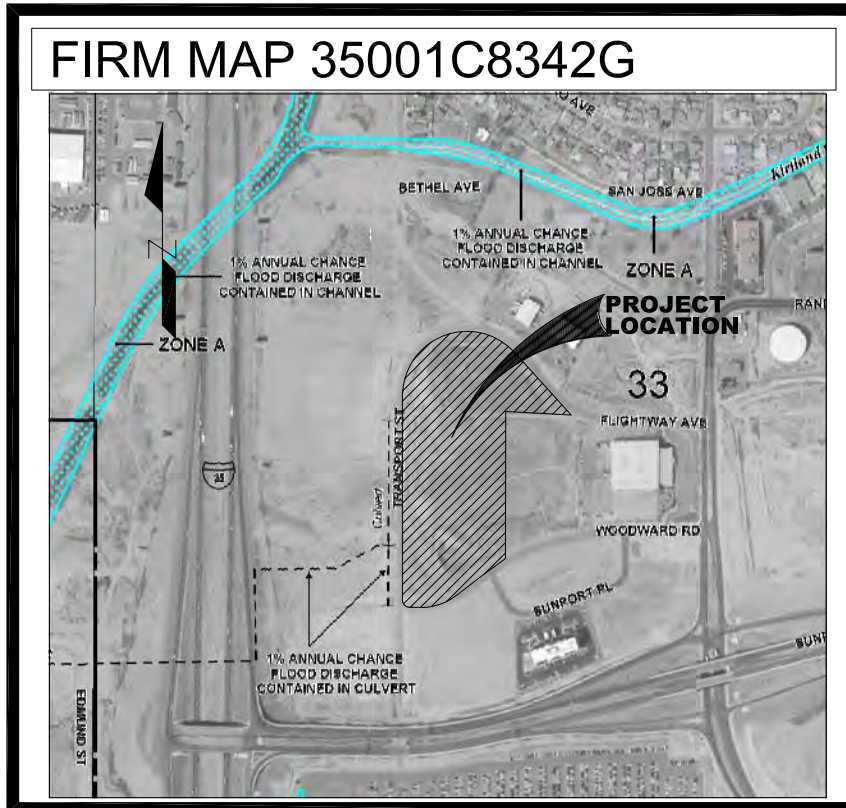
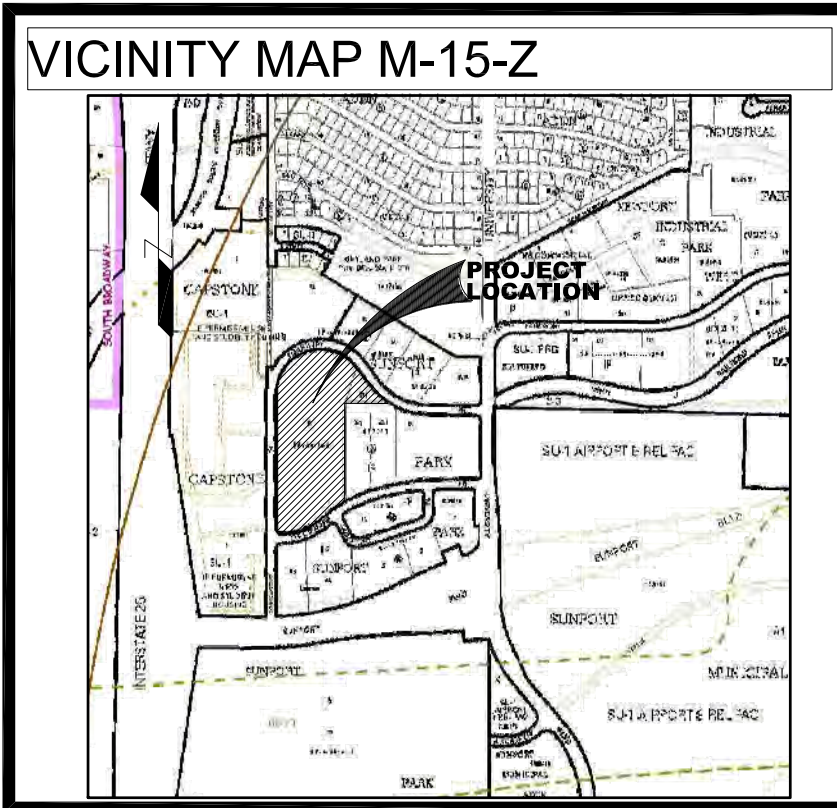
TREATMENT	AREA(ACRES)
A	0
B	1.18
C	1.19
D	3.52

  
Q(PROPOSED-6HR) = (2.28 X 1.18) + (3.14 X 1.19) + (4.70 X 3.52) = 22.97CFS (6HR) PROPOSED 100-YEAR ONSITE FLOW VOLUME INTO NORTHWEST DRAINAGE POND  
V(PROPOSED-6HR) = ((0.78 X 1.18) + (1.13 X 1.19) + (2.12 X 3.52))/ 12) = 0.81AC-FT = 35.284CF PROPOSED 100 YEAR ONSITE VOLUME INTO NORTHWEST DRAINAGE POND
- 13. ALLOWABLE RELEASE RATE BASED FOR NORTHWEST DRAINAGE POND PER SUNPORT PARK MASTER PLAN FOR DRAINAGE BASIN "ONSITE-2"  
TOTAL AREA = 256,576SF = 5.89ACRES  
PERCENT OF BASIN "ONSITE-2" AREA WITHIN MASTER DRAINAGE PLAN BASINS "A-5", "A-4" AND "A-2"  
PERCENT = (85,280SF / 256,576SF) X 100% = 33% BASIN "A-5"  
PERCENT = (146,128SF / 256,576SF) X 100% = 57% BASIN "A-4"  
PERCENT = (25,104SF / 256,576SF) X 100% = 10% BASIN "A-2"  
ALLOWABLE DISCHARGE RATE FOR "ONSITE-2" = (0.33 X 5.89AC X 3.4CFS/AC) + (0.57 X 5.89AC X 3.4CFS/AC) + (0.10 X 5.89A X 3.4CFS/AC) = **20.02CFS ALLOWABLE**  
  
Q(PROPOSED-6HR) FOR BASIN "ONSITE-2" = 22.97CFS > 20.02CFS ALLOWABLE DISCHARGE RATE, **REDUCE BASIN "ONSITE-2" BY 2.95CFS TO MINIMIZE DOWNSTREAM CAPACITY IMPACTS**
- 14. PROPOSED CONDITIONS INTO SOUTHWEST DRAINAGE POND PER FIRST FLUSH STORM WATER CONTROL MEASURES PER ORDINANCE Q-2013016 FOR DRAINAGE BASIN "ONSITE-2"  
FOR THE PURPOSED OF THE ORDINANCE THE 90TH PERCENTILE STORM EVENT IS 0.44INCHES FROM IMPERVIOUS AREAS.  
V(FIRST FLUSH) = 0.44" X TREATMENT "D" = (0.44"/12"/') X 153,334SF  
= 5,622CF REQUIRED TO BE DETAINED FOR FIRST FLUSH
- 13. PROPOSED NORTHWEST DRAINAGE POND VOLUME  
ELEVATION = 5072.5 AREA = 5,094SF  
ELEVATION = 5074.0 AREA = 8,505SF  
VOLUME PROVIDE = ((5,094SF + 8,505SF)/2) X 1.5FEET DEPTH = 10,199CF
- 14. HYDROGRAPH FOR NORTHWEST POND  
Tb(BASE TIME) = (2.017 X E X A1/Qp) - (0.25 x Ad/A1)  
E = ((1.18 x 0.78) + (1.19 x 1.13) + (3.52 x 2.12))/ 5.89 = 1.65inches  
Tb(BASE TIME) = ((2.017 x 1.65 x 5.89)/22.97) - (0.25 x 3.52/5.89) = 0.70hour  
Tp(PeAK) = (0.7 X Tc) + ((1.6 - (Ad/A1))/12)  
Tp(PeAK) = (0.7 x 0.2hr) + (1.6 - (3.52/5.89))/ 12 = 0.22hours  
T = 0.25 X Ad/A1 = 0.25 X (3.52/5.89) = 0.15hours
- 15. VOLUME REQUIRED PER HYDROGRAPH TO BE DETAINED BASED ON ALLOWABLE RELEASE RATE FOR SOUTHWEST POND  
VOL(RELEASE RATE) = (22.97CFS - 20.02CFS) X 0.15hours x 3600sec/hour  
VOL(RELEASE RATE) = 1,593CF, USE 2,000CF  
VOL(REQUIRED) = 5,622CF(FIRST FLUSH) + 2,000CF(ALLOWABLE) = **7,622CF REQUIRED < 10,199CF REQUIRED OK**
- 16. CHECK FLOW CAPACITY FOR EXISTING INLET AND EXISTING STORM DRAIN ON FLIGHTWAY AVENUE FOR PROPOSED NORTHWEST DRAINAGE POND  
Q = 20.02CFS PROPOSED  
EXISTING STORM DRAIN DIAMETER = 24", EXISTING SLOPE INTO MANHOLE FROM EXISTING INLET = 7.21%  
MANNING'S n=0.013 FOR RCP STORM DRAIN  
MANNING'S PIPE FLOW CALCULATOR Q(CAPACITY) = 60.74CFS > 20.02CFS REQUIRED (EXISTING STORMDRAIN HAS ALMOST 3X CAPACITY FOR NORTHWEST POND)
- 17. CHECK FLOW CAPACITY FOR EXISTING INLET AND EXISTING STORM DRAIN ON FLIGHTWAY AVENUE FOR PROPOSED SOUTHWEST DRAINAGE POND  
Q = 14.45CFS PROPOSED  
EXISTING STORM DRAIN DIAMETER = 24", EXISTING SLOPE INTO MANHOLE FROM EXISTING INLET = 6.70%  
MANNING'S N=0.013 FOR RCP STORM DRAIN  
MANNINGS PIPE FLOW CALCULATOR Q(CAPACITY) = 58.55CFS > 14.45CFS REQUIRED (EXISTING STORMDRAIN HAS ALMOST 4X CAPACITY FOR SOUTHWEST POND)



DRAINAGE BASIN BOUNDARY MAP

SCALE: 1" = 100'



10-03-2017

CONSULTANTS

APPLIED ENGINEERING AND SURVEYING, INC.

CIVIL ENGINEERING, LAND PLANNING AND SURVEYING

THE LEADER IN SUSTAINABLE REAL ESTATE DEVELOPMENT

PACIFIC WEST ARCHITECTURE

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SOTOGRANDE HOUSING

2900 Transport Street SE

revision:		
no.	desc.	date

project:	160804
date:	100317
drawn:	Author
checked:	Checker

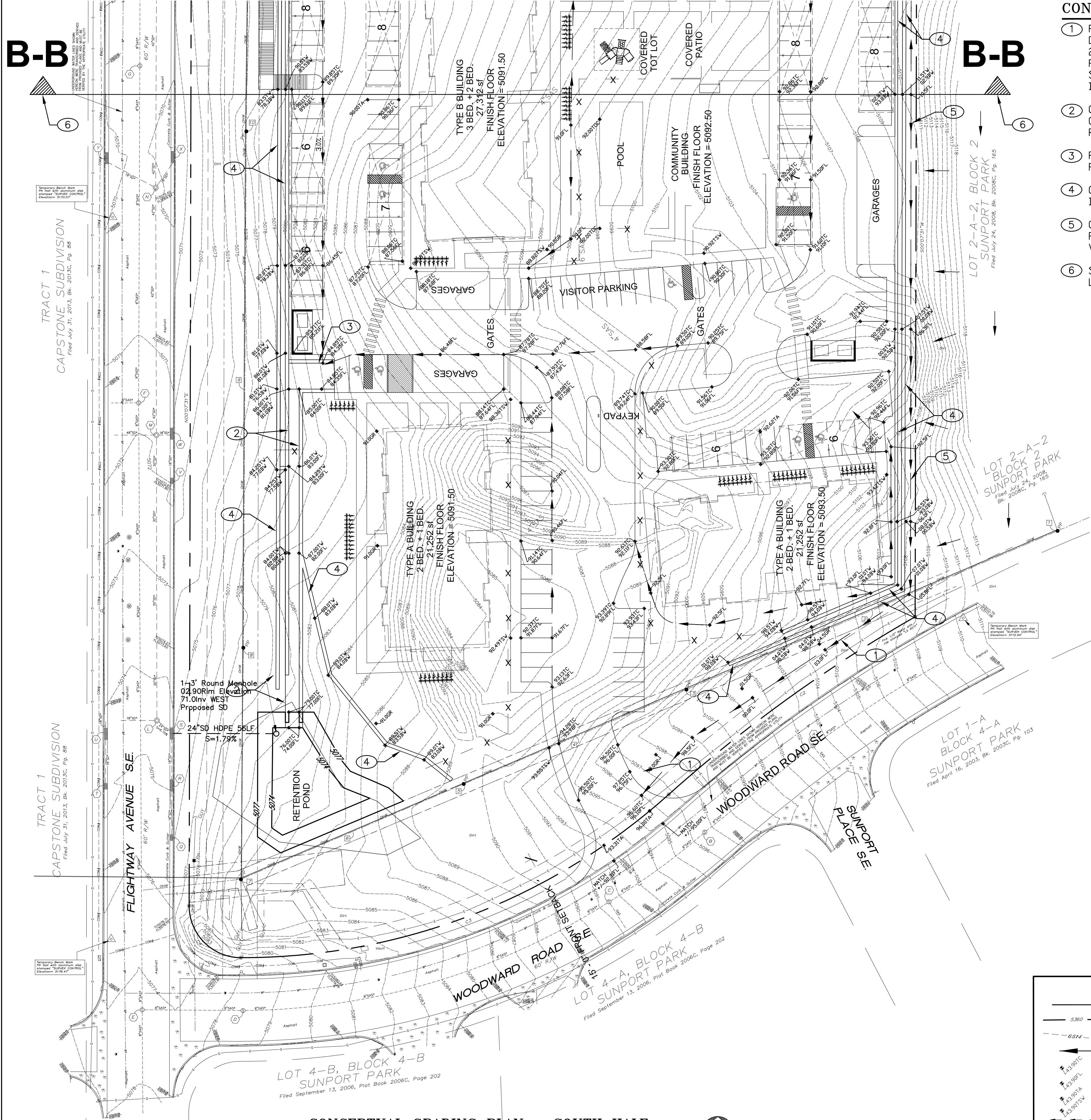
DRB APPROVAL

CONCEPTUAL DRAINAGE CALCULATIONS

CIVD1



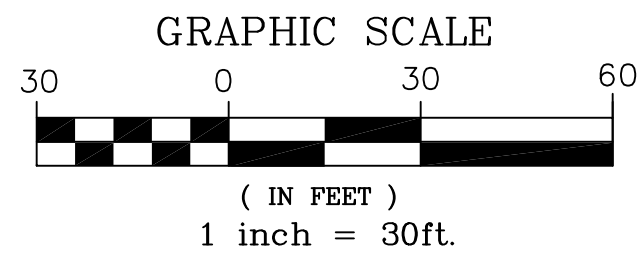
MATCH LINE - SEE NORTH HALF SHEET FOR CONTINUATION



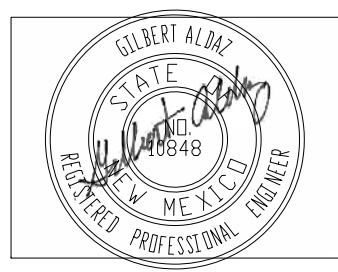
CONSTRUCTION NOTES:

- 1 PROVIDE 2' WIDE CURB OPENING TO ALLOW UNDEVELOPED OFFSITE FLOWS TO DRAIN INTO WOODWARD ROAD SE, ONCE LOT 2-A-2 IS DEVELOPED THESE FLOWS SHOULD BE DIRECTED SOUTH FROM LOT 2-A-2 INTO WOODWARD ROAD SE, THIS TEMPORARY SWALE AND OPENING SHOULD NOT BE USED FOR OFFSITE DEVELOPED CONDITIONS.
- 2 CONSTRUCT 6' WIDE CONCRETE CHANNEL PER CITY STD. DWG. TO CONVEY ONSITE DRAINAGE FLOWS FROM PARKING LOT INTO NEW RETENTION/DETENTION POND.
- 3 PROVIDE 15' WIDE CURB OPENING TO CONVEY PARKING LOT FLOWS INTO NEW CONCRETE CHANNEL.
- 4 CONSTRUCT RETAINING WALLS PER STRUCTURAL DETAIL DRAWINGS AND PER THE GRADES SHOWN ON THIS PLAN.
- 5 CONSTRUCT SWALE ABOVE RETAINING WALL TO CONVEY OFFSITE FLOWS TO THE SOUTH AND INTO THE SWALE DIRECTED TOWARDS WOODWARD ROAD SE.
- 6 SEE SHEET CIVD4 FOR TYPICAL CROSS SECTION AT THIS LOCATION

THIS DRAWING IS  
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LEGEND			
5.360	NEW FINAL SURFACE GRADE	154.24	EXISTING TOP OF CURB ELEVATION
6.514	EXISTING CONTOUR GRADE	154.08	EXISTING FLOWLINE ELEVATION
6.514	DRAINAGE FLOW DIRECTION	153.98	NEW DIRT GRADE ELEVATION
153.98	NEW TOP OF CURB ELEVATION	153.98	FLOWLINE SWALE ELEVATION
153.98	NEW FLOWLINE OF CURB ELEVATION	153.98	NEW TOP OF WALL ELEVATION
153.98	NEW TOP OF ASPHALT ELEVATION	153.98	NEW BOTTOM OF WALL ELEVATION
153.98	NEW TOP OF SIDEWALK ELEVATION		
153.98	DRAINAGE SWALE		



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CONCEPTUAL  
PLAN

CIVD2

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project:  
date:  
drawn:  
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DRB  
APPROVAL

SOTOGRADE  
HOUSING  
2900 Transport Street SE

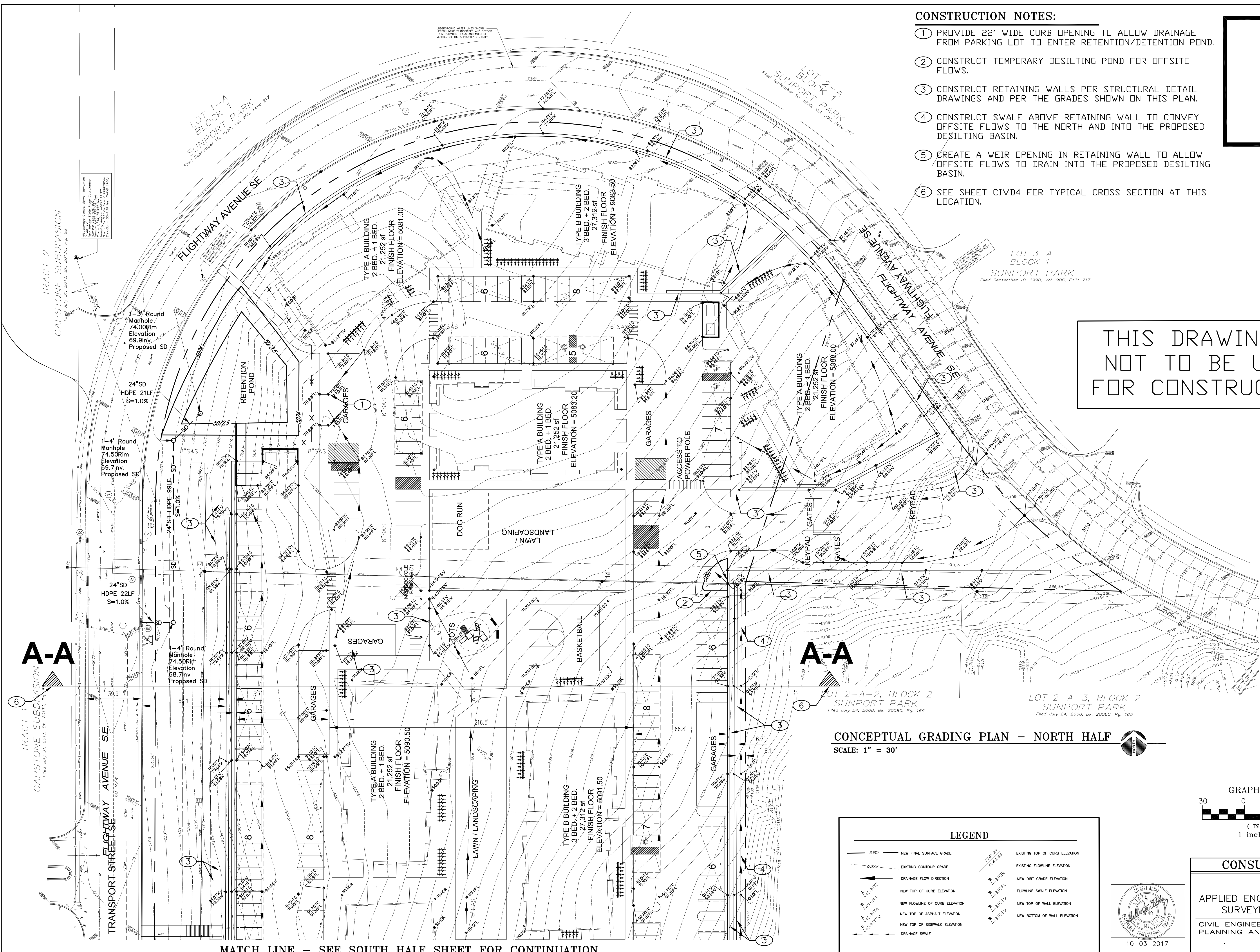
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CONSTRUCTION NOTES:

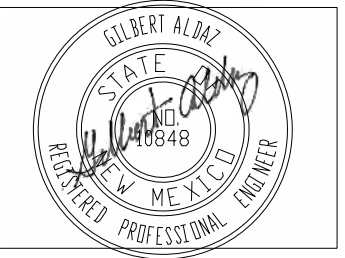
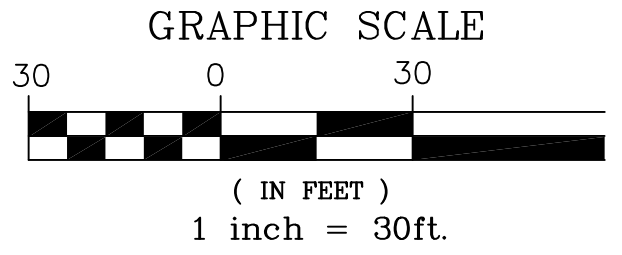
- 1 PROVIDE 22' WIDE CURB OPENING TO ALLOW DRAINAGE FROM PARKING LOT TO ENTER RETENTION/DETENTION POND.
- 2 CONSTRUCT TEMPORARY DESILTING POND FOR OFFSITE FLOWS.
- 3 CONSTRUCT RETAINING WALLS PER STRUCTURAL DETAIL DRAWINGS AND PER THE GRADES SHOWN ON THIS PLAN.
- 4 CONSTRUCT SWALE ABOVE RETAINING WALL TO CONVEY OFFSITE FLOWS TO THE NORTH AND INTO THE PROPOSED DESILTING BASIN.
- 5 CREATE A WEIR OPENING IN RETAINING WALL TO ALLOW OFFSITE FLOWS TO DRAIN INTO THE PROPOSED DESILTING BASIN.
- 6 SEE SHEET CIVD4 FOR TYPICAL CROSS SECTION AT THIS LOCATION.

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CONCEPTUAL GRADING PLAN - NORTH HALF

SCALE: 1" = 30'

LEGEND					
	5,860	NEW FINAL SURFACE GRADE		TC41.24 FL40.66	EXISTING TOP OF CURB ELEVATION
	6,814	EXISTING CONTOUR GRADE			EXISTING FLOWLINE ELEVATION
		DRAINAGE FLOW DIRECTION		L4.3,930R	NEW DIRT GRADE ELEVATION
	L4.3,981C	NEW TOP OF CURB ELEVATION		L4.3,980L	FLOWLINE SWALE ELEVATION
	L4.3,981C	NEW FLOWLINE OF CURB ELEVATION		L4.3,981W	NEW TOP OF WALL ELEVATION
	L4.3,981A	NEW TOP OF ASPHALT ELEVATION		L4.3,980W	NEW BOTTOM OF WALL ELEVATION
	L4.3,981SA	NEW TOP OF SIDEWALK ELEVATION			
		DRAINAGE SWALE			



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CONCEPTUAL GRADING PLAN

CIVD3

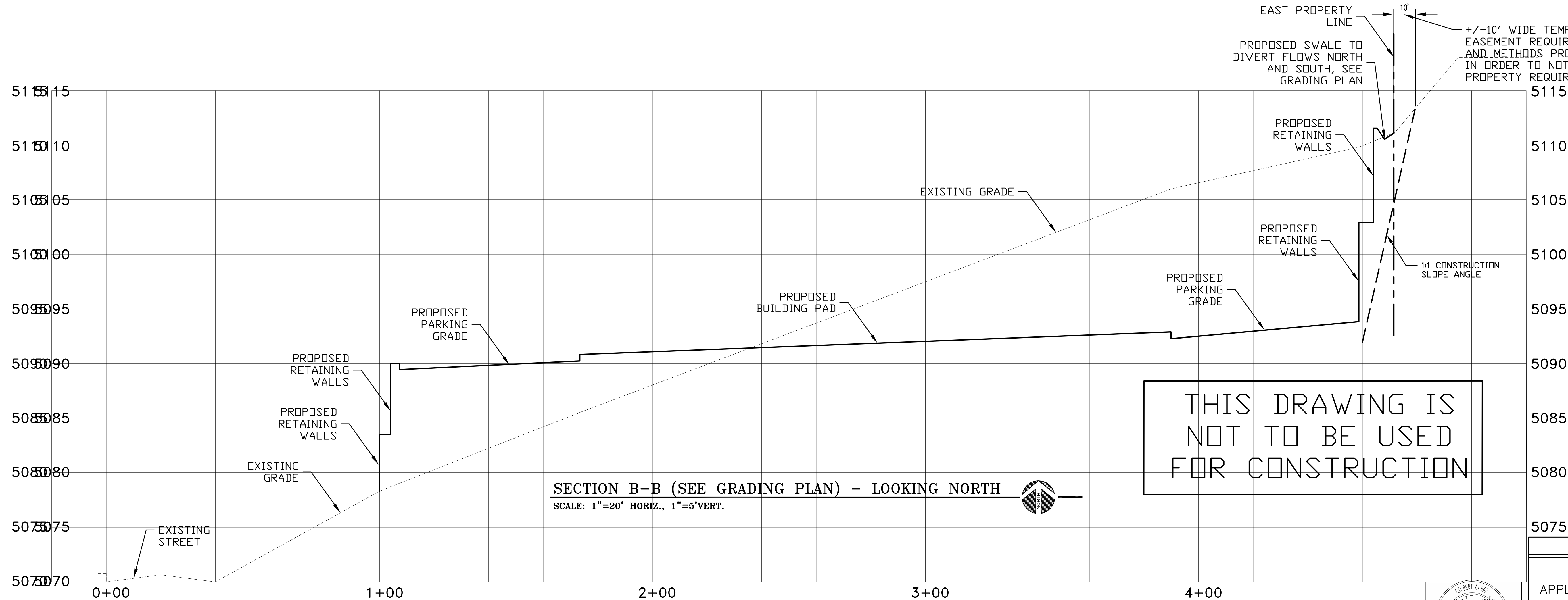
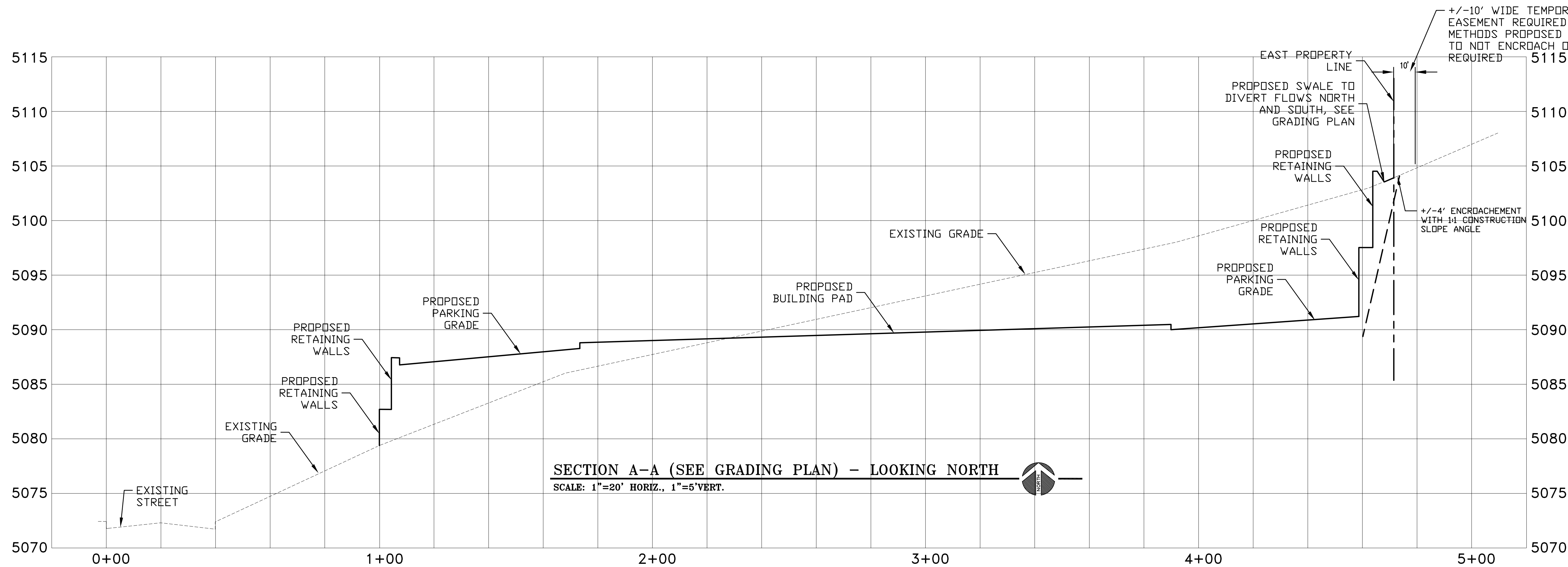
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PACIFIC WEST ARCHITECTURE

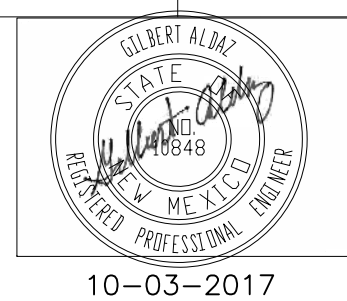
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10-03-2017

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**APPROVAL**

**CONCEPTUAL**  
**CROSS**  
**SECTIONS**  
**CIVD4**

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