KETTLER LEWECK
ENGINEERING

SEWER STUDY FOR:

UNIVERSITY OF SAN DIEGO

2015 MASTER PLAN

Facilities Management

5998 Alcala Park

San Diego, CA 92110-2492

KLE PROJECT NO.: 0059

SEWER STUDY

UNIVERSITY OF SAN DIEGO
2015 MASTER PLAN
CONDITIONAL USE PERMIT NO.
PTS 417090
SAN DIEGO, CALIFORNIA

Original Date: June 30, 2015
Revisions Date: October 30, 2015
Final Date: May 9, 2016

Prepared For:

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1.0 INTRODUCTION

The University of San Diego has prepared a new master plan for the existing campus. This sewer study has been prepared as part of the City of San Diego's Conditional Use Permit (CUP) application for the University of San Diego Master Plan project. This study identifies the approximate location and size of the existing public sanitary sewer mains adjacent to and on the existing campus utilizing record information; the location, size, and brief description of the proposed buildings; the approximate location and size of the proposed sewer laterals; and a preliminary estimate of fixture units for the campus projects provided by M.W. Steele on behalf of USD. The preliminary estimate of fixture units represent changes from the existing conditions and is not a summary of the total fixture units on campus. The City of San Diego/Public Utilities Department used this information to determine if the exiting public sanitary sewer facilities located in Via Las Cumbres and Tecolote Canyon have the capacity to support the proposed 2015 master plan projects. In addition, this study includes an evaluation of the existing City lined 7-inch and 8-inch offsite public sewer facilities south of Linda Vista Road from the University boundary to the existing 15-inch sewer located in Gaines Street. The results of this offsite evaluation are included in Exhibits "D" and "E" and made part of Appendix B.

2.0 PROJECT INFORMATION

2.1 Project Location

The University of San Diego (USD) campus occupies approximately 180 acres of land devoted to university-related uses in the central portion of the City of San Diego (City), in the community of Linda Vista. The campus is located 4 miles north of downtown San Diego, approximately 0.5 mile east of Interstate 5 (I-5) and 0.5 mile north of Interstate 8 (I-8). The USD campus is located within an unsectioned area of Township 16 South, Range 3 West, on the U.S. Geological Survey (USGS) 7.5-minute La Jolla quadrangle map. Tecolote Canyon Natural Park forms the northern border of the property; Morena Boulevard is located to the west, with Via Las Cumbres bordering the campus on the east, and Linda Vista Road to the south. Elevations on campus range from approximately 50 feet above mean sea level (AMSL) to approximately 260 feet AMSL With the exception of the steep, north-facing slopes along the northern campus border and the slopes on the western end of campus near Marian Way, the majority of the campus is developed and supports university facilities (buildings, parking lots, athletic fields, etc.) and associated landscaping.

Surrounding land uses include commercial/industrial development and residential housing in the Morena Boulevard area to the west of the campus, student and non-student multi-family housing immediately to the south and various types of residential development to the east. Tecolote Canyon Natural Park contains undeveloped regional open space to the north. The City's Multi-habitat Planning Area (MHPA) occurs on approximately 7.6 acres along the northern edge of the campus and extends offsite into Tecolote Canyon. The campus is located

within the Airport Influence Area (AIA) for San Diego International Airport and Montgomery Field.

Refer to Figure 1 on the following page.

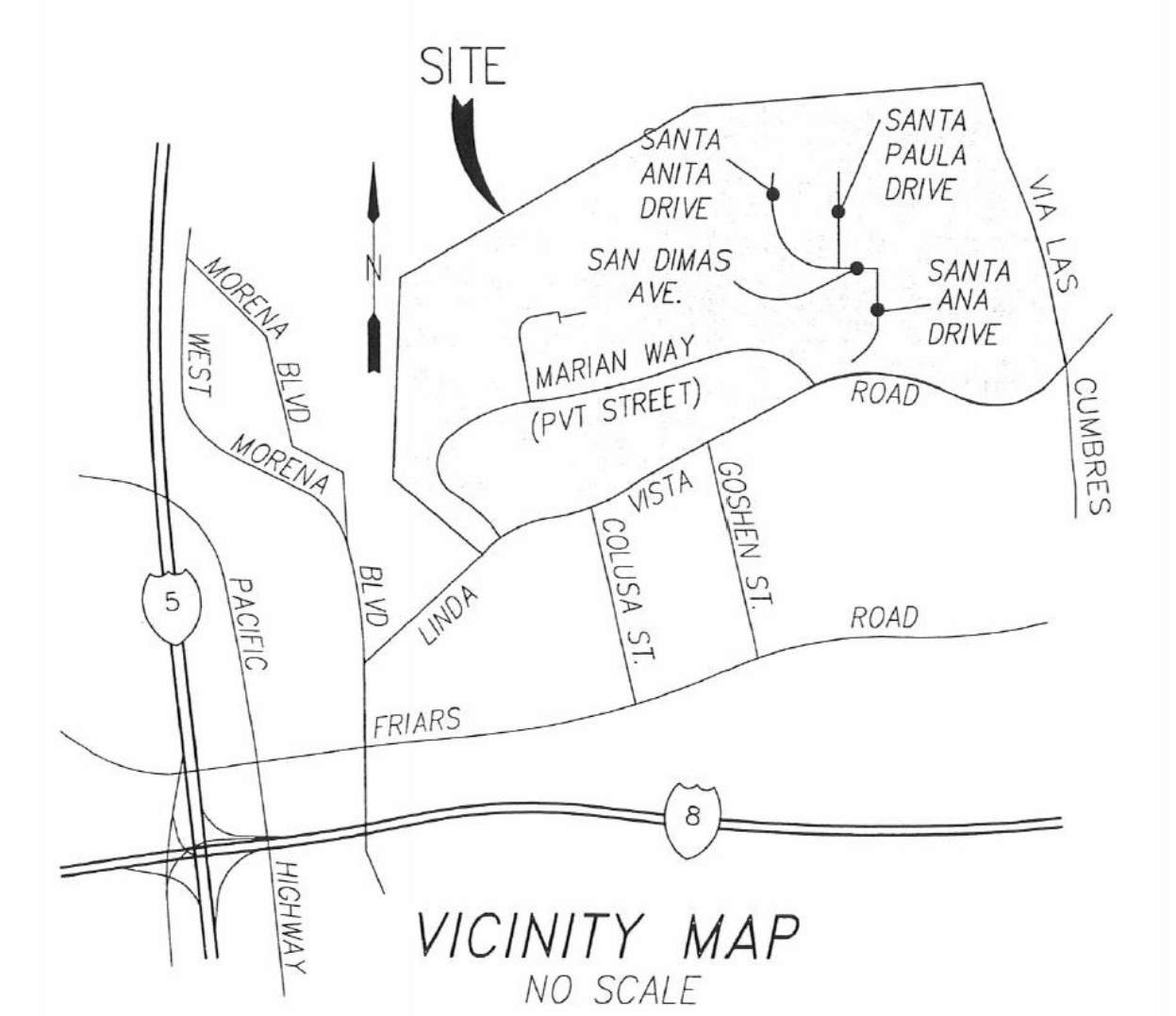


FIGURE 1 – VICINITY MAP

2.2 Project Description

In 1996, USD received approval of its existing Master Plan to guide the phased buildout of the campus through the year 2030. The City issued Conditional Use Permit (CUP)/ Resource Protection Ordinance (RPO) Permit No. 92-0568 to allow the campus to construct 23 conceptual projects and expand student population to 7,000 FTE. Two future study areas were also identified in the Master Plan. The sequence of the projects was not determined at that time in order to provide flexibility with regard to economics and academic needs. The 1996 Master Plan EIR was prepared to assess the short- and long-term, as well as cumulative, impacts of implementing the Master Plan and was certified in conjunction with the CUP approvals.

The Master Plan is a document that records the vision and goals of the physical campus. This vision for the campus is updated from time to time to reflect the changes in demographics and

the economy that affect higher education. Most importantly, the Master Plan is required by the City as the basis for the university's CUP and to ensure the University's fulfillment of current regulations. Over the last several years, USD campus officials have been conducting vision planning and space planning exercises to address the future needs of the university. An update to the existing Master Plan is now proposed.

The proposed USD Master Plan Update provides a comprehensive revision of the 1996 Master Plan and Design Guidelines, as well as the campus' building space and infrastructure needs associated with increasing enrollment from 7,000 full-time equivalent (FTE) students to 10,000 FTE over the next 20+ years. The USD Master Plan Update project would to allow for the development of academic core/student service/ support uses and athletics and recreation uses, and additional student housing. Parking supply expansions would also occur under the proposed Master Plan Update.

Among the projects outlined in the Master Plan Update are 14 proposed construction sites, as well as 16 approved projects identified in the 1996 Master Plan EIR that have previous City review/approvals but remain unbuilt. The 14 proposed project sites would allow for the construction of academic/administrative buildings, student housing, student services uses, athletics/athletic support/administrative buildings, parking, pedestrian circulation and landscape improvements not contemplated in the 1996 Master Plan and related EIR. Design guidelines contained in the Master Plan Update would provide a comprehensive design framework to guide campus development. Other elements of the Master Plan Update address the planning context of the campus, provide an enrollment and space analysis, and identify sustainability goals.

The above-described improvements would require the following entitlements: an amended CUP to allow for the continued institutional use, a Site Development Permit (SDP) to allow impacts to Environmentally Sensitive Lands (ESL), and MHPA Boundary Line Correction to shift developed land out of the Multiple Species Conservation Program (MSCP) preserve.

The Master Plan's proposed building projects include:

Site #	Project Description	Note
Previously Approved Projects		
1	Approved as Sports Park; Tennis Center; Proposed Athletics/ Administrative/ Parking	(2)
2	Approved as Environmental Studies Building; New Academic/ Administrative Building	(1)
3	Approved as Library Expansion; New Academic/Administrative Building	(1)
4	Approved as Landscaped Pedestrian Mall; Proposed Plaza	(1)
5	Approved as Olin Hall Expansion with underground parking; Proposed Academic/Administrative Building with Parking	(2)
6	Approved as Hughes Expansion; Proposed Administrative/ Academic Building	(1)
7	Approved as Serra Hall Addition with partial demolition of existing building; Proposed Academic/Administrative Building	(1)
8	Approved as Pedestrian Mall; Proposed Plaza with enhanced connection across buildings and enhanced entry gateway and tram drop-off	(1)
9	Approved as Recreation, Wellness & Aquatic Center	(1)
10	Approved as Public Safety Building; Proposed Administrative/Parking	(1)
11	Approved as Renovation to Missions; Proposed Housing	(2)
12	Approved as Stadium Grandstands and Fieldhouse Facility	(1)
13	Approved as Collegiate Athletic Center and Office Building	(1)
14	Approved as parking and soccer field	(1)
15	Approved Residential Expansion	(1)
16	Approved as softball, golf and club sports building	(1)
Proposed Projects		
17	Proposed Trails/ Landscape Enhancements	(3)
18	Parking/Administrative/Physical Plant. 2 levels above ground.	(3)
19	Plaza/Mall/Bridge	(3)
20	Proposed Academic/Administrative/Support	(3)
21	Proposed Academic/Administrative/Student Support Services	(3)
22	New Academic/Administrative Building (Four Stories to match Shiley Hall)	(3)
23	New Housing/Parking Structure	(3)
24	New Housing/ Student Services/ Parking	(3)
25	Proposed Academic/ Administrative / Parking Building	(3)
26	Engineering Expansion of Loma Hall; Proposed Academic/Administrative Building	(3)
27	Housing/Student Services	(3)
28	Athletics/Administrative Support	(3)
29	Facilities/Athletic Support	(3)
30	New Student Housing/Student Services/ Parking/Athletics	(3)

Notes:

(1) Project previously approved as part of CUP 92-0568 and/or SCR 140192, SCR 104201
(2) Project previously approved as part of CUP 92-0568. To be modified as part of this CUP Application
(3) Project proposed as part of this CUP Application

3.0 EXISTING CONDITION

The University of San Diego campus has three major sewer basins, the Tecolote Canyon, Linda Vista Road, and Morena basins. A majority of the campus is located within the Tecolote Canyon basin and the sewer connects to the existing trunk sewer located in Tecolote Canyon.

The Tecolote Canyon sewer basin can be further divided into five sub-basins. These sub-basins are identified as A, B, C, D, and E and are all shown on Exhibit A. A majority of the sewer facilities (sewer mains and sewer laterals) located on the campus are private. There is a portion of public sewer located on the most easterly portion of the campus adjacent to Via Las Cumbres. The sewer mains in San Dimas Ave and Santa Paula Drive are also public. The private sewer within each sub-basin connects to an existing public sewer main at the boundary of the campus. Three of these public sewer mains (the three most westerly mains) are located on the north side of the campus near the top of the large existing slope on the south side of Tecolote Canyon. The fourth existing public sewer main is located adjacent to the northeast boundary of the campus (northeast of the existing softball field). This existing sewer connects to the trunk sewer located in Tecolote Canyon. Finally, the fifth existing public sewer main is located within Via Las Cumbres. This existing 8" sewer traverses north in Via Las Cumbres before traversing northwesterly and connecting to the fourth existing public sewer main. All sewer flows from the portion of the campus draining into the Tecolote Canyon sewer basin is collected in the existing 18" trunk sewer (DWG 4608-D) located in the Tecolote Canyon.

The following table identifies the size and record drawing number for the existing public sewer mains by sub-basin.

Sub-Basin	Size of Existing Public Sewer	Record Drawing Number
A	8"	DWG. 20786-6-D
B	10"	DWG. 20786-19-D
C	8"	DWG. 5760-D
D	8"	DWG. 8031-L
E	10"	DWG. 8031-L

The Linda Vista Road sewer basin is a relatively small basin. The Linda Vista sewer basin is shown on Exhibit A. All of the sewer facilities (sewer mains and sewer laterals) located on the campus within this sewer basin are private, with the exception of the portion of sewer located in Josephine Street. The private sewer within this basin connects to an existing 8" public sewer main (constructed per DWG. 9711-L) located in Josephine Street which then traverses across Linda Vista Road.

The Morena sewer basin is also a relatively small basin. The Morena sewer basin is shown on Exhibit A. All of the sewer facilities (sewer mains and sewer laterals) located on the campus

within this sewer basin are private. The private sewer within this basin connects to an existing 8" public sewer main (constructed per DWG. 18029-D) located in Cushman Ave.

The locations of the projects listed in section 2.2 are scattered across the campus. As previously mentioned, the sewer from the campus connects into three existing major sewer basins. The proposed projects by major existing sewer basins are as follows:

Major Existing Sewer Basin No. 1 - Tecolote Canyon

Site #	Project Description
1	Approved as Sports Park; Tennis Center; Proposed Athletics/ Administrative/ Parking
5	Approved as Olin Hall Expansion with underground parking; Proposed Academic/Administrative Building with Parking
11	Approved as Renovation to Missions; Proposed Housing
17	Trails/Landscape Enhancements
20	Academic/Administrative/Support
21	Academic/Administrative/Student Services Building
24	New Housing/ Student Services/ Parking
27	Housing/Student Services
28	Athletics/Administrative
29	Facilities/Athletic Support
30	New Student Housing/Student Services/ Parking/Athletics

Major Existing Sewer Basin No. 2 – Linda Vista Road

Site #	Project Description
22	New Academic/Administrative Building (Four Stories to match Shiley Hall)
23	New Housing/Parking Structure
25	Proposed Academic/ Administrative / Parking Building
26	Engineering Expansion of Loma Hall; Proposed Academic/Administrative Building

Major Existing Sewer Basin No. 3 – Morena

Site #	Project Description
18	Parking/Administrative/Physical Plant. 2 levels above ground.
19	Plaza/Mall/Bridge

4.0 PROPOSED CONDITIONS AND HYDRAULIC CALCULATIONS

The proposed 2015 master plan projects will be designed to sewer consistently with the existing condition. All proposed sewer mains and laterals within the limits of the campus are anticipated to be private, with the possible exception of a portion of sewer near Josephine Street. These private sewer facilities will connect to the existing public mains. Project 30 may include a new lateral connecting to the existing public sewer within Via Las Cumbres. Alternatively, Project 30 may connect to the existing private sewer main located between Jenny Craig Pavilion and the baseball field. This decision will be made during the final design of the project. Otherwise, existing public sewer main connection points are not anticipated to be changed. A new public sewer main may be needed within Linda Vista Road. This main will replace the existing public main within Josephine St. This existing public main will need to be relocated due to the placement of Project 23. Recognizing the preliminary nature of the design, the proposed sewer facilities are preliminary. The approximate location of the proposed sewer mains are shown on Exhibit B. The proposed sewer points of connection (POCs) and additional fixture unit information is shown on Exhibit "C".

Refer to Exhibit "B" for the Proposed Sewer Basin and Improvement Map.

Refer to Exhibit "C" for the Points of Connection (POCs) and the Additional Fixture Unit Information.

4.1 Hydrology Method

Onsite Existing Condition (for the portion of the campus that sewers north to Tecolote Canyon):

There are no estimates of the total existing sewer flows from the main campus. A majority of existing sewer mains on the campus are private and the small amount of public sewer mains have capacity by virtue of the steep pipe slopes/gradients. It is understood that the City/PUD has flow metering data for the public sewer main in Via Las Cumbres as well as the trunk sewer mains in Tecolote Canyon.

Onsite Proposed Conditions (for the portion of the campus that sewers north to Tecolote Canyon):

The sewer demand data for the proposed condition was provided to the City of San Diego by MW Steel on behalf of the University (refer to Table 1 and Appendix A). The information included in Table 1 represents changes from the existing condition and is not a summary of the total fixture units on campus. The number of fixture units for each proposed project was estimated by using the Uniform Plumbing Code (UPC) with augmentations based on the facility standards set by USD. The University has requirements for the number of facilities (showers, toilets, etc.) provided for each bed. These facility standards only show significant differences from the UPC in residential facilities. The City of San Diego Public Utilities Department used this sewer fixture unit data to evaluate the hydraulic characteristics of a portion of the existing

public sewer facilities (i.e. the existing sewer facilities in Via Las Cumbres and Tecolote Canyon). The output of the City's hydraulic modeling is included in Appendix 'B.'

Offsite Existing Condition (for the portion of the campus that sewers south and into the area south of Linda Vista Road):

The estimate of the existing offsite sewer flows, for the areas outside of the limits of the University campus, was based on the City of San Diego Sewer Design Guide. The limits of the overall sewer basin and sewer sub-basins were established using the City's Splash Maps provided by the City/PUD. The current zoning designations by sub-phase were identified. The equivalent population per net acre by zone was also used. The estimate of sewer flows, for the portion of the University campus only within the offsite basin, was based on fixture unit data by MW Steel on behalf of the University. Finally, some adjustments were made and noted for unique conditions within the overall offsite basin. Refer to the sewer generation table shown on Exhibit "E" for the estimate of existing offsite sewer flows.

Offsite Proposed Conditions(for the portion of the campus that sewers south and into the area south of Linda Vista Road):

The estimate of the proposed offsite sewer flows was prepared similarly to the existing condition estimate. The difference is the inclusion of the net increase in fixture units associated with the University's master plan projects. The adjustments for unique conditions within the overall offsite basin referred above were also incorporated into the proposed condition estimates. Refer to the sewer generation table shown on Exhibit "E" for the estimate of proposed sewer flows.

TABLE 1 – PRELIMINARY PROPOSED PROJECT FIXTURE UNITS (ADDITIONAL/CHANGED FU'S)

MAJOR EXISTING SEWER BASIN NO. 1 - TECOLOTE CANYON

		Fixture Units per UPC/USD	
		Sub-total	Add'l Fixture Units
Sub-Basin A	Project 30 – Student Housing		1279
	Sub-Basin A Total		1279
Sub-Basin B	Project 28 – Athletics/Administrative Support		71
	Project 29 – Facilities/ Athletic Support		16
	Sub-Basin B Total		87
Sub-Basin C	Project 11 – Proposed Housing	220	-201
	Project 11 – Demo Existing Apartment	-421	
	Project 27 – Housing Renovation	708	-36
	Project 27 – Demo Existing Apartment	-744	
	Sub-Basin C Total		-237
Sub-Basin D	Project 24 – Housing/Student Services/Parking		506
	Sub-Basin D Total		506
Sub-Basin E	Project 1 – Sports Park	29	-7
	Project 1 – Demo Existing Tennis Facility	-36	
	Project 5 – School of Business		269
	Project 20 – Academic/Admin		0
	Project 21 – Founders Expansion		52
	Camino/Founder's Hall		-423
	Sub-Basin E Total		-109
	Tecolote Canyon Basin Total		1902

TABLE 1 – PRELIMINARY PROPOSED PROJECT FIXTURE UNITS (CONT.)

MAJOR EXISTING SEWER BASIN NO. 2 - LINDA VISTA ROAD

			Add'l Fixture Units
Sub-Basin F	Project 17 – Trails/Landscape Enhancements		0
	Project 22 – Science/ Engineering		751
	Project 23 – Housing Expansion	1716	1231
	Project 23 – Existing Structure Demolition	-485	
	Project 25 – Proposed Academic/ Administrative / Parking Building		261
	Project 26 – Engineering Expansion of Loma Hall		256
	Linda Vista Ave Basin Total		2499

MAJOR EXISTING SEWER BASIN NO. 3 - MORENA

			Add'l Fixture Units
Sub-Basin H	Project 18 – Service Support Space and Parking		0
	Project 19 – Pedestrian Bridge		0
	Morena Basin Total		0

Notes:

1. This table represents changes from the existing condition only and is not a summary of the entire campus demand.
2. Projects previously approved as part of CUP 92-0568 and not modified with this proposed Master Plan Update are not include in the table. Refer to Section 2.2.
3. The Camino/Founder's Hall information is shown even though this work in not a project included in the application. This work consists of tenant improvements to change the usage from residential to administrative. This shift will occur as new residential facilities included in the CUP are constructed.

4.2 Hydraulic Calculations (Onsite and Offsite)

Onsite:

The hydraulic calculations for the existing public sewer facilities servicing the portion of the campus that sewers to the north towards and into the Tecolote Trunk Sewer system (i.e. the existing sewer in Via Las Cumbres and the Tecolote Trunk Sewer) was performed by the City/the Public Utilities Department. The PUD confirmed that these existing public sewer facilities meet the City's Sewer Design Guide standards.

Offsite:

The hydraulic calculations for the existing public offsite sewer facilities located south of Linda Vista Road were performed by the applicant in accordance with the standards identified in the City's Sewer Design Guidelines. These calculations are shown on Exhibit "E".

5.0 PROPOSED SEWER IMPROVEMENTS

After completion of the hydraulic analysis by the City/PUD, as well as the applicant, the City/PUD determined that the following existing improvements did not meet the City's Sewer Design Guide standards:

1. Offsite sewer reaches #10 and #11, as shown on Exhibits "D". Specifically, the existing City lined 7-inch and 8-inch sewer in these two reaches have D/d values in excess of the City maximum of 0.50.

In order to address these non-City standard reaches, the following improvements will be required, as shown on Exhibit "D".

1. Upsize offsite sewer reaches #10 - #13 to 10-inch mains.

6.0 OFFSITE PHASING/OPTIONS/CONDITIONS OF APPROVAL

Offsite Phasing/Conditions of Approval:
Recognizing a portion of the existing City of San Diego public sewer system, located south of Linda Vista Road (i.e. Reaches 10 and 11 as shown on the Offsite Sewer Basin Map Exhibit), do not meet current City standards (i.e. the D/d for these reaches are in excess of 50%), the following options are proposed to assist with the process to mitigate the existing reaches of sewer mains not meeting the City's Sewer Design Guide standards. The mitigation shall include upsizing reaches 10 through 13 (upsizing Reaches 10 through 13 from the City lined 7 inch main or 8-inch main to a 10-inch main) as identified on the Offsite Sewer Basin Map.

1. The City will utilize the results of this Master Plan Sewer Study to create a future City CIP project to upsize Reaches 10 through 13 to a 10-inch sewer main. Depending on the timing of the University's building programs the City's CIP project may replace the subject sewer main reaches prior to the University moving forward with the first Master Plan building project within the offsite Linda Vista sewer basin.
2. The City shall require that any non-University new development project within the offsite Linda Vista sewer basin proposing to increase the sewer flows be required to assist with mitigating the existing undersized sewer mains as part of their project requirements, at no cost to the University.

Also recognizing that some of the University's proposed Master Plan projects (i.e. Project Numbers 22, 23, 25 and 26) may increase the amount of sewer flow within the offsite Linda Vista sewer basin, the following options are being proposed to assist with the process to mitigate the undersized sewer main reaches if the University's project(s) proceed ahead of

other projects, including the City's CIP project. The mitigation shall include upsizing reaches 10 through 13 as identified above.

1. At the time of the Grading Permit, Building Permit and/or Substantial Conformance review (SCR) application for either Buildings 22, 23, 25, and/or 26 within the offsite Linda Vista sewer basin, the University may pursue sewer flow metering of the undersized sewer mains. If the results of the sewer flow metering are different than those included in this Master Plan Sewer Study, the University shall present the results to the City for their review and approval. The University and the City shall then discuss appropriate phasing and potential cost sharing for the improvements which may include no mitigation, deferred mitigation, or mitigating improvements tied to the proposed SCR application.

2. At the time of the Grading Permit, Building Permit and/or Substantial Conformance review (SCR) application for either Buildings 22, 23, 25, and/or 26 within the offsite Linda Vista sewer basin, the University may pursue redirecting, via a private sewer pump station, the project's sewer flows to the north and into the existing public Tecolote Canyon Trunk Sewer and not to the existing public offsite Linda Vista sewer system. The City agrees to cooperate with the University if this option is preferred. If this option is pursued, the City will not require, as part of the above mentioned permit application(s), the offsite Linda Vista undersized sewer mains to be upsized as part of the proposed above mentioned application(s).

Note: Any tenant type improvement that do <u>not</u> increase the existing sewer flow from any of the existing University buildings within the offsite Linda Vista sewer basin shall <u>not</u> trigger the requirement to upsize the offsite undersized City sewer mains.

7.0 DISCUSSION AND CONCLUSIONS

The City's/PUD's analysis of the proposed 2015 Main Campus Master Plan and associated CUP projects has concluded that the existing public sewer facilities located in Via Las Cumbres and in Tecolote Canyon, that convey sewer flows from the portion of the main campus draining north, meet the City's Sewer Design Guide standards.

The City's review of the analysis of the existing offsite public sewer facilities located south of Linda Vista (from Linda Vista to the existing 15-inch sewer located in Gaines Street), that convey sewer from the southern portion of the campus in the area of Josephine Street, has concluded that two existing sewer reaches (i.e. Reaches #10 and #11 as shown on Exhibit "D") do not meet the City's Sewer Design Guide standards.

The City has identified the required mitigation to be upsizing the City lined 7-inch and 8-inch mains (Reach #10 - #13) to a 10-inch main. The timing of these improvements, as well as the identifying responsible entity, will be addressed consistent with the phasing/conditions outlines in section 5 above.

DATE: 05-09-16

GENERAL LEGEND

USD BOUNDARY
CONTROL (HV=1 1350.00 ○ V=1 1350.00)
EDGE OF CONC.
EDGE OF ASPH.
EDGE OF DIRT
AWNING
BUILDING
SIDEWALK
CURB AND GUTTER
FENCE
WALL
RETAINING WALL
GUARD RAIL
PIPE LINE
PARKING STRIPES
ROAD STRIPING
POOL (P) (P)
RAILROAD

RAIL SIGNAL
TANK
VAULT
DROP INLET
VALVE
CATCH BASIN
WATER LINE
FIRE HYDRANT MANHOLE (MH)
STANDPIPE (SP)
SIGN
POWER POLE GUY WIRE
POWER POLE STREET LIGHT
STREET LIGHT STOP LIGHT
MISCELLANEOUS
TREES
SINGLE TREE
PALM
INDEX CONTOUR 1350
INTER CONTOUR 1340

ABBREVIATIONS:

A.–Asph. = ASPHALT C.–Conc = CONCRETE OBS. = OBSCURED
U/C = UNDER CONSTRUCTION W/L = WATER LEVEL.

BUILDING ID SUMMARY

ACADEMIC/ADMINISTRATIVE

7 ALCALÁ PARKWEST - CORONADO
8 ALCALÁ PARKWEST - BARCELONA
10 ALCALÁ PARKWEST - ÁVILA
11 ALCALÁ PARKWEST - DURANGO
16 CAMINO HALL
14 COPLEY LIBRARY
49 DEGHERI ALUMNI CENTER
4 FACILITIES MANAGEMENT COMPLEX
20 FOUNDERS HALL
31 GUADALUPE HALL
23 HAHN SCHOOL OF NURSING AND HEALTH SCIENCE
33 HAHN UNIVERSITY CENTER
25 HUGHES ADMINISTRATION CENTER
12 JOAN B. KROC INSTITUTE FOR PEACE & JUSTICE
36 LOMA HALL AND BOOKSTORE
27 MAHER HALL
21 MANCHESTER EXECUTIVE CONFERENCE CENTER
57 MANCHESTER CHILD DEVELOPMENT CENTER
39 MISSION CROSSROADS
5 MOTHER ROSALIE HILL HALL

ACADEMIC/ADMINISTRATIVE

19 OLIN HALL
40 PARDEE LEGAL RESEARCH CENTER
24 PROCUREMENT; COPY AND GRAPHICS
28 PUBLIC SAFETY, PARKING SERVICES AND VISITOR INFO
15 SACRED HEART HALL
32 SERRA HALL
17 SHILEY CENTER FOR SCIENCE AND TECHNOLOGY
13 STUDENT HEALTH CENTER
34 STUDENT LIFE PAVILION
35 WARREN HALL

PARKING STRUCTURES

48 MISSION PARKING
2 WEST MARIANWAY PARKING

ATHLETIC FACILITIES

47 CUNNINGHAM BASEBALL FIELD
60 EAST TENNIS COURTS
52 FIELD HOUSE
51 JENNY CRAIG PAVILION
44 MANCHESTER VALLEY FIELD
59 POOL
46 SOFTBALL FIELD
55 SPORTS CENTER
41 SPORTS FIELD
56 TORERO STADIUM
43 VALLEY FIELD
58 WEIGHT ROOM
3 WEST TENNIS COURT

ON CAMPUS DINING

5 BERT'S BISTRO
12 LA PALOMA
33 LA GRAN TERRAZA
34 PAVILION DINING/TU MERCADO
50 ATM/CONCESSIONS
27 AROMAS
38 MISSIONS CAFÉ

RESIDENCE HALLS/HOUSING

61 ALCALÁ VISTA APARTMENTS
16 CAMINO HALL
1 CASA DE ALCALÁ
6 CASA DE LA PAZ
20 FOUNDERS HALL
27 MAHER HALL
54 MANCHESTER VILLAGE APARTMENTS
37 MISSION HOUSING COMPLEX
30 PRESIDIO TERRACE APARTMENTS
42 SAN ANTONIO DE PADUA
38 SAN BUENAVENTURA

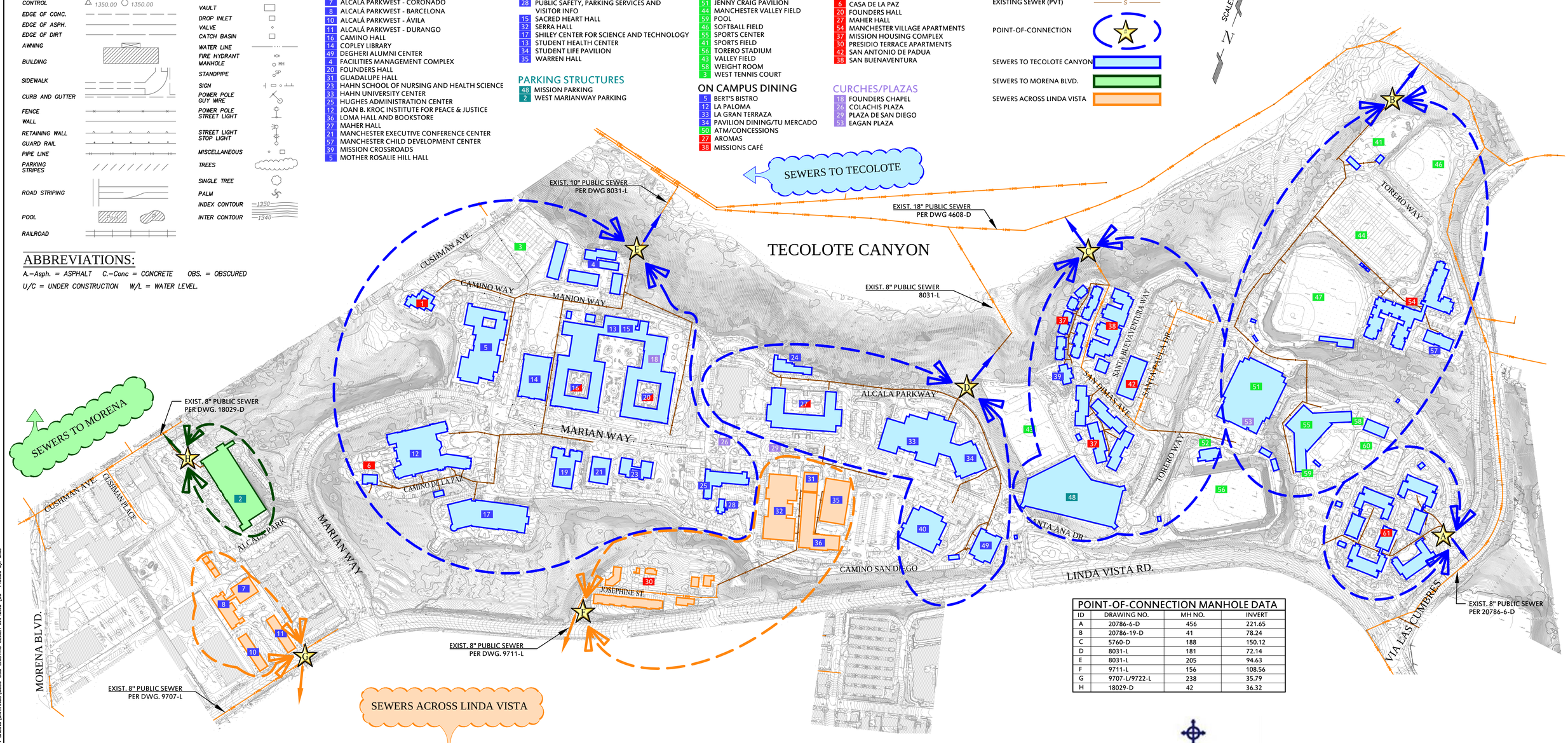
CURCHES/PLAZAS

18 FOUNDERS CHAPEL
26 COLACHIS PLAZA
29 PLAZA DE SAN DIEGO
53 EAGAN PLAZA

SEWER MAP LEGEND

EXISTING SEWER (PUB) — S —
EXISTING SEWER (PVT) — S —
POINT-OF-CONNECTION
SEWERS TO TECOLOTE CANYON
SEWERS TO MORENA BLVD.
SEWERS ACROSS LINDA VISTA

SCALE: 1"=200'
N



POINT-OF-CONNECTION MANHOLE DATA

ID	DRAWING NO.	MH NO.	INVERT
A	20786-6-D	456	221.65
B	20786-19-D	41	78.24
C	5760-D	188	150.12
D	8031-L	181	72.14
E	8031-L	205	94.63
F	9711-L	156	108.56
G	9707-L/9722-L	238	35.79
H	18029-D	42	36.32

DRAWING SCALE

200 0 200 400
SCALE IN FEET
GRAPHIC SCALE

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www.kettlerleweck.com

~ USD MASTER PLAN 2015 ~

EXISTING SEWER BASIN & IMPROVEMENT MAP

EXHIBIT 'A'

DATE: 05-09-16

GENERAL LEGEND

USD BOUNDARY
CONTROL (HV–1 1350.00 ○ V–1 1350.00)
EDGE OF CONC.
EDGE OF ASPH.
EDGE OF DIRT
AWNING
BUILDING
SIDEWALK
CURB AND GUTTER
FENCE
WALL
RETAINING WALL
GUARD RAIL
PIPE LINE
PARKING STRIPES
ROAD STRIPING
POOL
RAILROAD

RAIL SIGNAL
TANK
VAULT
DROP INLET
VALVE
CATCH BASIN
WATER LINE
FIRE HYDRANT
MANHOLE
STANDPIPE
SIGN
POWER POLE GUY WIRE
POWER POLE STREET LIGHT
STREET LIGHT STOP LIGHT
MISCELLANEOUS
TREES
SINGLE TREE
PALM
INDEX CONTOUR –1350
INTER CONTOUR –1340

ABBREVIATIONS:

A.–Asph. = ASPHALT C.–Conc = CONCRETE OBS. = OBSCURED
U/C = UNDER CONSTRUCTION W/L = WATER LEVEL.

BUILDING ID SUMMARY

PREVIOUSLY APPROVED PROJECTS (SHOWN FOR REFERENCE ONLY)

2	ENVIRONMENTAL STUDIES
3	COPLEY LIBRARY ADDITION
4	LANDSCAPED PEDESTRIAN MALL
6	HUGHES EXPANSION
7	SERRA HALL ADDITION
8	PEDESTRIAN MALL
9	RECREATION, WELLNESS, & AQUATIC CENTER
10	PUBLIC SAFETY
12	STADIUM GRANDSTANDS
13	ATHLETIC CENTER
14	PARKING AND SOCCER FIELD
15	EAST STUDENT HOUSING
16	SOFTBALL, GOLF & CLUB SPORTS BUILDING

MODIFIED PROJECTS

		NET FIXTURE UNITS
1	ATHLETICS/ADMIN	-7
5	ACADEMIC/ADMIN	269
11	HOUSING/STUDENT SERV.	-201

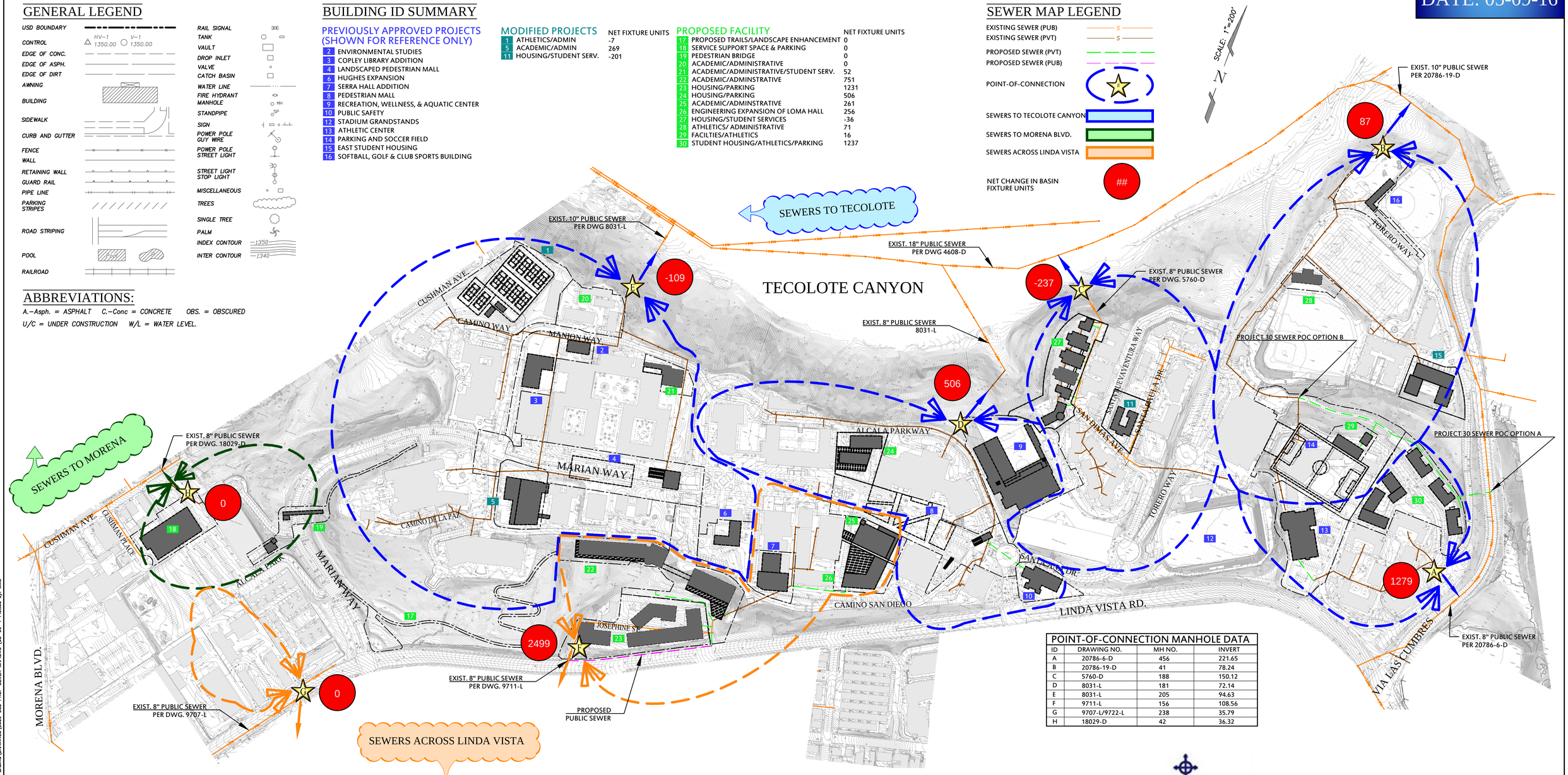
PROPOSED FACILITY

		NET FIXTURE UNITS
17	PROPOSED TRAILS/LANDSCAPE ENHANCEMENT	0
18	SERVICE SUPPORT SPACE & PARKING	0
19	PEDESTRIAN BRIDGE	0
20	ACADEMIC/ADMINISTRATIVE	0
21	ACADEMIC/ADMINISTRATIVE/STUDENT SERV.	52
22	ACADEMIC/ADMINSTRATIVE	751
23	HOUSING/PARKING	1231
24	HOUSING/PARKING	506
25	ACADEMIC/ADMINSTRATIVE	261
26	ENGINEERING EXPANSION OF LOMA HALL	256
27	HOUSING/STUDENT SERVICES	-36
28	ATHLETICS/ ADMINISTRATIVE	71
29	FACILTIES/ATHLETICS	16
30	STUDENT HOUSING/ATHLETICS/PARKING	1237

SEWER MAP LEGEND

EXISTING SEWER (PUB)
EXISTING SEWER (PVT)
PROPOSED SEWER (PVT)
PROPOSED SEWER (PUB)
POINT-OF-CONNECTION
SEWERS TO TECOLOTE CANYON
SEWERS TO MORENA BLVD.
SEWERS ACROSS LINDA VISTA
NET CHANGE IN BASIN FIXTURE UNITS ##

SCALE: 1"=200'
N



POINT-OF-CONNECTION MANHOLE DATA

ID	DRAWING NO.	MH NO.	INVERT
A	20786-6-D	456	221.65
B	20786-19-D	41	78.24
C	5760-D	188	150.12
D	8031-L	181	72.14
E	8031-L	205	94.63
F	9711-L	156	108.56
G	9707-L/9722-L	238	35.79
H	18029-D	42	36.32

DRAWING SCALE

200 0 200 400
SCALE IN FEET
GRAPHIC SCALE

KETTLER LEWECK
ENGINEERING
303 A STREET, SUITE 302
SAN DIEGO, CA 92101
t: 619 269-3444 | f: 619 269-3459
www.kettlerleweck.com

~ USD MASTER PLAN 2015 ~

PROPOSED SEWER BASIN AND IMPROVEMENT MAP

EXHIBIT 'B'

City of San Diego
PUBLIC UTILITIES
Water & Wastewater

Legend

SEWER [Gis]
- Sewer Lateral.Current 100 Route - As-built Lateral
- Sewer Main.Current Route - As-built (not forced)
- Sewer Main.Current Route - Private Main
- Sewer Main.Current Route - As-built (forced)
- Sewer Manhole.Current Location - Standard
- Sewer Meter.Current 400 Location
- Sewer Plug.Current Location
- Sewer Station.Current Extent

COMMON [Gis]
- Flow Arrow.Current Location
- Footprint.Current Common Extent
- Jump Over.Current Sewer Location
- Stabilizing Structure.Current Sewer 400 Extent

LAND-SPLASH [Gis]
- Easement Splash.Drainage Extent
- Easement Splash.General Util. Extent
- Easement Splash.Sewer Extent
- Easement Splash.Water Extent

TELECOM [Gis]
- Conduit.Current Fiber Route - FIBER

LAND [Land]
- Land Area.Extent
- Parcel Area.Extent
- Road Segment.Local Street - New Land
- Road Segment.Paper Street - New Land
- Road Segment.Private Road - New Land
- Road Segment.Speed Hump - New Land
- Road Segment.Walkway - New Land

THOMAS BROTHER [Soup]
- Cultural School Univsy Footprint.College University
- Hydrology Natural Line.River Route
- Hydrology Natural Line.Stream Route
- Hydrology Natural Poly.Ocean Extent
- Hydrology Natural Poly.River Extent
- Ownership Poly.Environment Extent
- Ownership Poly.School University Extent

OTHER [Soup]
- Railroad Route

Point of Connection "B". Net Change of 87 Fixture Units.

Point of Connection "A". Net Change of 1279 Fixture Units.

POINT-OF-CONNECTION MANHOLE DATA

ID	DRAWING NO.	MH NO.	INVERT
A	20786-6-D	456	221.65
B	20786-19-D	41	78.24
C	5760-D	188	150.12
D	8031-L	181	72.14
E	8031-L	205	94.63
F	9711-L	156	108.56
G	9707-L/9722-L	238	35.79
H	18029-D	42	36.32

0 Feet 60 Feet 120 Feet 180 Feet 240 Feet

City of San Diego Public Utilities
Water & Wastewater

Date Printed: 08-27-15

USD MASTER PLAN 2016 - EXHIBIT 'C' SHEET 2 OF 2 (PROPOSED SEWER P.O.C.'S AND FIXTURE UNIT DATA)

City of San Diego
PUBLIC UTILITIES
Water & Wastewater

Legend

SEWER [Gis]
- Sewer Air Vacuum Release Current Location
- Sewer Clean Out Current Location
- Sewer Lateral Current 100 Route - As-built Lateral
- Sewer Lateral Current 100 Route - Private Lateral
- Sewer Lateral Current Blowoff Airvalve Route - As-built Lateral
- Sewer Lateral Current Display 400-100 Route - As-built Lateral
- Sewer Main Current Route - As-built (not forced)
- Sewer Main Current Route - Operational (not forced)
- Sewer Main Current Route - Private Main
- Sewer Main Current Route - As-built (forced)
- Sewer Manhole Current Location - Dropped
- Sewer Manhole Current Location - Standard
- Sewer Plug Current Location
- Sewer Station Current Extent
- Sewer Valves Current Location

COMMON [Gis]
- Comfort Stop Current Sewer Location
- CP Anode Bed Current Sewer Location
- CP Rectifier Current Sewer Location
- CP Test Station Current Sewer Location
- FP Wire Current Sewer Route
- Flow Arrow Current Location
- Flow Arrow Current Location - Inside Inset
- Footprint Current Common Extent
- Jump Over Current Sewer Location
- Pressure Structure Current Sewer 400 Extent

LAND SPLASH [Gis]
- Easement Splash Drainage Extent
- Easement Splash General Util. Extent
- Easement Splash Private Street Extent
- Easement Splash Sewer Extent
- Easement Splash Water Extent

TELECOM [Gis]
- Conduit Current Fiber Route - FIBER

LAND [Land]
- Land Area Extent
- Parcel Area Extent
- Road Segment Alley - New Land
- Road Segment Arterial/Collector - New Land
- Road Segment Local Street - New Land
- Road Segment Minor Hwy/Major Road - New Land
- Road Segment Paper Street - New Land
- Road Segment Private Road - New Land
- Road Segment Speed Hump - New Land
- Road Segment Walkway - New Land

THOMAS BROTHER [Soup]
- Cultural Footprint Government Extent
- Cultural Point.School University Location
- Cultural School Univty Footprint College University
- Hydrology Natural Line.River Route
- Hydrology Natural Line.Stream Route
- Hydrology Natural Poly.Ocean Extent
- Hydrology Natural Poly.River Extent
- Ownership Poly.Environment Extent
- Ownership Poly.School University Extent
- Ownership Recreation Poly.Others Extent
- Ownership Recreation Poly.Park Extent

OTHER [Soup]
- Railroad.Route

Point of Connection "C". Net Change of -237 Fixture Units.

Point of Connection "A". Net Change of 1279 Fixture Units

Point of Connection "D". Net change of 506 Fixture Units.

Point of Connection "E". Net Change of -109 Fixture Units

Existing Public Sewer to be removed

Point of Connection "F". Net Change of 2499 Fixture Units.

Proposed Public Sewer

UNIVERSITY OF SAN DIEGO

POINT-OF-CONNECTION MANHOLE DATA

ID	DRAWING NO.	MH NO.	INVERT
A	20786-6-D	456	221.65
B	20786-19-D	41	78.24
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E	8031-L	205	94.63
F	9711-L	156	108.56
G	9707-L/9722-L	238	35.79
H	18029-D	42	36.32

0 Feet 100 Feet 200 Feet 300 Feet 400 Feet 500 Feet

City of San Diego Public Utilities
Water & Wastewater

Date Printed: 08-27-15

USD MASTER PLAN 2015 - EXHIBIT 'C' SHEET 1 OF 2 (PROPOSED SEWER P.O.C.'S AND FIXTURE UNIT DATA)

APPENDIX A

ESTIMATE OF FIXTURE UNITS BY BUILDING

Residential | Academic | Sports facilities | Dining | Estimated

Plumbing Fixture Calculation - Residential based on the # beds estimated within the Master Plan Study

Proj #	Building Gross	Group	Occupant Load	# Occupants	# Beds /MWS	# Apt	Men	Women	WC (M)	WC (W)	Urinal	Lavatory M)	Lavatory (W)	Drinking Fountain	Service sink	Shower/ BathTubs	Kitchen Sink	Washer (clothes)	Dishwasher - pro
1	2,500	A-3	30	**83**			**42**	**42**	1	2	1	1	1	1	1	2			
2	16,500	E	50	**330**			**165**	**165**	3	6	2	4	4	2	1				
3	33,750	E	50	**675**			**338**	**338**	7	11	3	8	8	5	1				
4	5,400	A-2	30	**180**			**90**	**90**	2	3	1	1	1	1	1	-	1		1
5	73,250	E	50	**1,465**			**733**	**733**	15	24	7	18	18	10	1	-			
6	22,960	E	50	**459**			**230**	**230**	5	8	2	6	6	3	1				
7	76,780	E	50	**1,536**			**768**	**768**	15	26	8	19	19	10	1				
8	NA																		
9	133,507	A-3	30	**4,450**			**2,225**	**2,225**	7	23	9	10	13	10	1	25		2	
10	25,000	E	50	**500**			**250**	**250**	5	8	3	6	6	3	1				
11	24,000	Dorm				80	**40**	**40**	10	10	2	20	20	1	1	20	2	7	
12	NA																		
13	67,642	E/B	50	**1,353**			**676**	**676**	14	23	7	17	17	9	1	10			
14	NA																		
15	80,600	Apt	200		179	90	**90**	**90**		90			90			90	90	15	
16	9,010	A-3	30	**300**			**150**	**150**	2	4	2	1	2	2	1	3			
17	NA																		
18	NA																		
19	NA																		
20	NA														1				
21	13,500	E / B	50	**270**			**135**	**135**	3	5	1	3	3	2	1				
22	206,000	E	50	**4,120**			**2,060**	**2,060**	41	69	21	52	52	27	1				
23	148,240	Apt			329	165	**165**	**165**		165			165			165	165	27	
	3,600	A-2	30	**120**			**60**	**60**	2	3	1	1	1	1	1		1		1
24	65,000	Dorm			186		**93**	**93**	23	23	4	46	46	1	1	46	5	15	
25	71,100	E	50	**1,422**			**711**	**711**	14	24	7	18	18	9	1				
26	69,500	E	50	**1,390**			**695**	**695**	14	23	7	17	17	9	1				
27	85,710	Dorm			245		**122**	**122**	31	31	5	61	61	1	1	61	7	20	
	5,000	A-2	30	**167**			**83**	**83**	2	3	1	1	1	1	1		1		1
28	12,400	A-3	30	**413**			**207**	**207**	3	6	3	2	4	2	1	2			
29	8,500	H/B	2000	**4**			**2**	**2**	1	1		1	1			2			
30	109,500	Apt			243	122	**122**	**122**		122		_		122		_	122	20	
	3,500	A-2	30	**117**			**58**	**58**	2	3	1	1	1	1	1		1		1
CFH	64,500	E/B	50	**1,290**			**645**	**645**	13	22	6	16	16	9	1				

Notes:

For Residential Occupancy Group:

1- Occupancy is based on the estimated beds calculated within the Master Plan Study

2- Fixture units calculation is based on USD standards

DORMS WC: 1 per 8 Beds
Shower: 1 per 8 Beds
Lavatory: 1 per 8 Beds
K. sink: 1 per 20 Beds
Washer 1 per 12 Beds

APTS WC: 1 per 2 Beds
Shower: 1 per 2 Beds
Lavatory: 1 per 2 Beds
K. sink: 1 per 2 Beds
washer 1 per 12 Beds

City of San Diego Fixture Unit Calculation

Proj #	WC (M)	WC (W)	Urinal	Lavatory (M)	Lavatory (W)	Drinking Fountain	Service sink	Shower / Bathtubs	Kitchen Sink - D	Washer	Dishwasher pro	Total
1	5	10	4	1	1	1	3	4				**29**
2	17	28	7	4	4	1	3					**63**
3	34	56	14	8	8	2	3					**126**
4	10	15	4	1	1	1	3	-	2		6	**42**
5	73	122	29	18	18	5	3	-				**269**
6	23	38	9	6	6	2	3					**86**
7	77	128	31	19	19	5	3					**282**
8												
9	33	113	38	10	13	5	3	50	0	8		**273**
10	25	42	10	6	6	2	3					**94**
11	50	50	6	20	20	1	3	40	3	27		**220**
12												
13	68	113	27	17	17	5	3	20				**269**
14												
15	448			90				179	134	60		**910**
16	10	20	8	1	2	1	3	6	0	0		**51**
17												
18												
19												
20												
21	14	23	5	3	3	1	3					**52**
22	206	343	82	52	52	14	3					**751**
23	824			165				329	247	110		**1,675**
	10	15	4	1	1	1	3				6	**41**
24	116	116	15	46	46	1	3	93	8	62		**506**
25	71	119	28	18	18	5	3					**261**
26	70	116	28	17	17	5	3					**256**
27	153	153	20	61	61	1	3	122	10	82		**666**
	10	15	4	1	1	1	3		2		6	**42**
28	15	30	12	2	4	1	3	4	0	0		**71**
29	5	5	0	1	1			4				**16**
30	608			122				243	183	81		**1,237**
	10	15	4	1	1	1	3		2		6	**42**
CFH	65	108	26	16	16	4	3					**237**
TOTAL	**4,667**		**389**	**1,014**		**56**	**66**	**1,095**	**590**	**429**	**24**	**8,567**

Notes:

Assumptions and Data not provided within the Plumbing Fixtures Code:

1- Professional Dishwasher counted as 4 Domestic Dishwasher

Demolition / Existing -Plumbing Fixture estimation (from plans)

Proj #	WC	Urinal	Lavatory	Drinking Fountain	Service sink	Shower	Common shower	Kitchen sink	Washer	Dishwasher
1	5	1	5			1				
2						-				
3						-				
4						-				
5						-				
6	2		2			2				
7	0		0			0		0		
8						-				
9						-				
10						-				
11	41		72			41		41		
12						-				
13						-				
14	32	12	32			19	3		2	
15	8		8					1		1
16	3	2	2							
17						-				
18						-				
19						-				
20						-				
21						-				
22						-				
23	51		51			51		51		
24						-				
25						-				
26						-				
27	78	2	149			73		2	12	
28						-				
29						-				
30						-				
						-				
CFH	49		218			78		1	10	

Notes:

Site 27: Existing Dorms in Mission A have a high ratio of fixtures / bed
1WC, 1 Shower and 2 sinks per 2 double BR (4 persons)

Site 11: Existing San Antonio de Padua Apartments have a high ratio of fixtures / bed
1WC, 1 shower and 2 sinks / Aptms (1 or 2 persons)

Notes:

1- Washer and dishwasher units are indicative (designated as laundry or not designed on plans[

2- Drinking fountain and service sink couldn't be estimated

Demolition / Existing - Fixture Units Calculation

Proj #	WC	Urinal	Lavatory	Drinking Fountain	Service sink	Shower	Common shower	Kitchen sink	Washer	Dishwasher	Total
1	25	4	5			2	0				**36**
2						-					
3						-					
4						-					
5						-					
6	10		2			4					**16**
7	0		0			0					**0**
8						-					
9						-					
10						-					
11	205		72			82		61.5			**421**
12						-					
13						-					
14	160	48	32			38	0		8		**286**
15	40		8			0		1.5		1.5	**51**
16	15	8	2			0					**25**
17						-					
18						-					
19						-					
20						-					
21						-					
22						-					
23	255		51			102		76.5			**485**
24						-					
25						-					
26						-					
27	390	8	149			146		3	48		**744**
28						-					
29						-					
30						-					
						-					
CFH	245		218			156		2	40		**661**
TOTAL	1,345	68	539	0	0	530	0	144	96	2	**2,724**

Notes:

1- Common showers counted as 1 Shower units

Fixture unit difference per site

Proj #	Δ
1	-8
2	63
3	126
4	42
5	269
6	70
7	282
8	0
9	273
10	94
11	-201
12	0
13	269
14	-286
15	859
16	26
17	0
18	0
19	0
20	0
21	52
22	751
23	1,190
	41
24	506
25	261
26	256
27	-78
	42
28	71
29	16
30	1,237
	42
CFH	-423
TOTAL	**5,844**

APPENDIX B

PRELIMINARY HYDROLOGY AND HYDRAULIC CALCULATIONS

Steve Kettler

From: Itkin, Irina <IItkin@sandiego.gov>
Sent: Thursday, February 18, 2016 2:34 PM
To: Steve Kettler
Cc: Wilson, Leonard; Ruiz, Alejandro; Rastakhiz, Mehdi
Subject: USD Sewer Study
Attachments: BasinMap.pdf; 2012 DWF E16S186.xlsx; 2012 DWF E17S412.xlsx; 2012 DWF E16S183 DEVELOPMENT.XLSX; 2012 DWF E16S212 DEVELOPMENT.XLSX; 2012 DWF F16S674 DEVELOPMENT.XLSX; 2012 DWF E16S183.xlsx; 2012 DWF E16S212.xlsx; 2012 DWF F16S674.xlsx; 2012 DWF E16S186 DEVELOPMENT.XLSX; 2012 DWF E17S412 DEVELOPMENT.XLSX

Steve,

I received the hydraulic analysis result from the modeling group:

1. The drainage basins discharging to the Tecolote Canyon Trunk Sewer is fine and don't need further hydraulic evaluations.
   The above statement include the basins from "A" through "E" points of connection to the existing trunk sewer.

2. The basin with point of connection "F" to the existing 8" in Linda Vista Road, required the sewer study to identify the reaches that should be upsized. The downstream system shall be studied to the point of connection to the existing 15" sewer main in Napa Street. See splash map below.

3. Please include in the study the attached modeling report.

Thank you,

City of San Diego
PUBLIC UTILITIES
Water & Wastewater

Point of Connection "C". Net Change of -237 Fixture Units.

-3318 GPD

Basin E16S186

Point of Connection "D". Net change of 606 Fixture Units.

7084 GPD

Basin E16S183

Point of Connection "E". Net Change of -109 Fixture Units

-1680 GPD

Basin E16S212

Point of Connection A. Net Change of 1279 Fixture Units

17906 GPD

Basin F16S674

UNIVERSITY OF SAN DIEGO

Existing Public Sewer to be removed

Basin E17S412

Point of Connection "F". Net Change of 2499 Fixture Units.

35006 GPD

Proposed Public Sewer

POINT-OF-CONNECTION MANHOLE DATA

ID	DRAWING NO.	MH NO.	INVERT
A	20786-6-D	456	221.65
B	20786-19-D	41	78.24
C	5760-D	188	150.12
D	8031-L	181	72.14
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F	9711-L	156	108.56
G	9707-L/9722-L	238	35.79
H	18029-D	42	36.32

Legend

City of San Diego Public Utilities
Water & Wastewater

Date Printed: 08-27-15

City of San Diego
PUBLIC UTILITIES
Water & Wastewater

Legend

SEWER [Silv]
- Sewer Lateral.Current 100 Route - As-built Lateral
- Sewer Main.Current Route - As-built (not forced)
- Sewer Main.Current Route - Private Main
- Sewer Main.Current Route - As-built (forced)
- Sewer Manhole.Current Location - Standard
- Sewer Meter.Current 400 Location
- Sewer Plug.Current Location
- Sewer Station.Current Extent

COMMON [Silv]
- Flow Arrow.Current Location
- Footprint.Current Common Extent
- Jump Over.Current Sewer Location
- Stblkcing Structure.Current Sewer 400 Extent

LAND-RPLASH [Gtx]
- Easement Splash.Drainage Extent
- Easement Splash.General Util. Extent
- Easement Splash.Sewer Extent
- Easement Splash.Water Extent

TELECOM [Silv]
- Conduit.Current Fiber Route - FIBER

LAND [Land]
- Land Area.Extent
- Parcel Area.Extent
- Road Segment.Local Street - New Land
- Road Segment.Paper Street - New Land
- Road Segment.Private Road - New Land
- Road Segment.Speed Hump - New Land
- Road Segment.Walkway - New Land

THOMAS BROTHERS [Brow]
- Cultural School Univty Footprint.College University
- Hydrology Natural Line.River Route
- Hydrology Natural Line.Stream Route
- Hydrology Natural Poly.Ocean Extent
- Hydrology Natural Poly.River Extent
- Ownership Poly.Environment Extent
- Ownership Poly.School University Extent

OTHER [Smyr]
- Railroad.Route

Point of Connection "B"
Net Change of 87 Fixture Units.
12186PD

Basin
F16S674

POINT-OF-CONNECTION MANHOLE DATA

ID	DRAWING NO.	MH NO.	INVERT
A	20786-6-D	456	221.65
B	20786-19-D	41	78.24
C	5760-D	188	150.12
D	8031-L	181	72.14
E	8031-L	205	94.63
F	9711-L	156	108.56
G	9707-L/9722-L	238	35.79
H	18029-D	42	36.32

Basin
F16S674

Point of Connection "A"
Net Change of 1279 Fixture Units.
17906
6PP

City of San Diego Public Utilities
Water & Wastewater

0 Feet 60 Feet 120 Feet 180 Feet 240 Feet

Date Printed: 08-27-15

CITY OF SAN DIEGO
HYDRAULIC MODEL RESULTS TABLE
BASIN E16S183
2012 DWF ALTERNATIVE 1

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	AVG. FLOW (GPD)	MAX. FLOW (GPD)	FULL CAPACITY (GPD)	MAX. Q/CAP (%)	TASK AREA
19021	E16S182.1	E16S183	54.52	52.90	58.90	0.006	10	270	2.44	3.29	32.9	53.17	53.27	5.72	88,105	247,000	1,110,000	22.3	
19020	E16S181.1	E16S182	72.14	54.52	66.52	0.065	10	271	2.45	3.30	33.0	54.80	54.89	11.72	88,105	248,700	3,680,000	6.8	

TOTAL LENGTH (MILES):	0.10	LENGTH OF PIPE - d/D < 50% (MILES):	0.10	LENGTH OF PIPE - Q/CAP < 50% (MILES):	0.10
LENGTH WEIGHTED Q/CAP:	14.5	LENGTH OF PIPE - d/D 50 - 75% (MILES):	0.00	LENGTH OF PIPE - Q/CAP 50 - 75% (MILES):	0.00
LENGTH WEIGHTED d/D:	32.9	LENGTH OF PIPE - d/D 75 - 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP 75 - 100% (MILES):	0.00
LENGTH WEIGHTED HGL BELOW RIM (FT):	8.73	LENGTH OF PIPE - d/D > 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP > 100% (MILES):	0.00

Note: Boxed records indicate condition assessed segments.

CITY OF SAN DIEGO
HYDRAULIC MODEL RESULTS TABLE
BASIN E18S183
2012 DWF AS-BUILT

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	AVG. FLOW (GPD)	MAX. FLOW (GPD)	FULL CAPACITY (GPD)	MAX. Q/CAP (%)	TASK AREA
19021	E16S182.1	E16S183	54.52	52.90	58.90	0.006	10	270	2.38	3.16	31.6	53.16	53.25	5.73	80,850	226,600	1,110,000	20.4	
19020	E16S181.1	E16S182	72.14	54.52	66.52	0.065	10	271	2.38	3.17	31.7	54.78	54.87	11.73	80,850	228,200	3,680,000	6.2	

TOTAL LENGTH (MILES):	0.10	LENGTH OF PIPE - d/D < 50% (MILES):	0.10	LENGTH OF PIPE - Q/CAP < 50% (MILES):	0.10
LENGTH WEIGHTED Q/CAP:	13.3	LENGTH OF PIPE - d/D 50 - 75% (MILES):	0.00	LENGTH OF PIPE - Q/CAP 50 - 75% (MILES):	0.00
LENGTH WEIGHTED d/D:	31.6	LENGTH OF PIPE - d/D 75 - 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP 75 - 100% (MILES):	0.00
LENGTH WEIGHTED HGL BELOW RIM (FT):	8.74	LENGTH OF PIPE - d/D > 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP > 100% (MILES):	0.00

Note: Boxed records indicate condition assessed segments.

CITY OF SAN DIEGO
HYDRAULIC MODEL RESULTS TABLE
BASIN E16S186
2012 DWF ALTERNATIVE 1

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	AVG. FLOW (GPD)	MAX. FLOW (GPD)	FULL CAPACITY (GPD)	MAX. Q/CAP (%)	TASK AREA
19007	E16S187.1	E16S186	58.00	56.02	61.02	0.014	8	141	4.05	4.08	51.0	56.36	56.61	4.66	168,425	468,700	940,000	49.9	
19010	E16S188.1	E16S187	150.12	58.00	66.00	0.461	8	200	4.04	4.10	51.3	58.34	58.60	7.66	168,425	469,900	5,410,000	8.7	
19011	E16S196.1	E16S188	155.78	150.12	157.11	0.177	8	32	9.51	2.17	27.2	150.30	151.71	6.81	168,425	470,300	3,350,000	14.0	
19019	E16S197.1	E16S196	162.12	155.78	161.77	0.052	7	123	6.46	3.07	43.9	156.04	156.68	5.74	168,425	470,500	1,270,000	37.0	
19018	E16S198.1	E16S197	166.17	162.12	169.11	0.018	8	228	4.41	3.84	48.0	162.44	162.74	6.67	168,425	471,100	1,060,000	44.4	
19154	E16S199.1	E16S198	169.50	166.17	172.16	0.026	7	129	4.86	3.85	55.0	166.49	166.86	5.67	168,425	472,700	900,000	52.5	
19017	E16S195.1	E16S199	175.62	169.50	175.49	0.029	8	210	1.99	3.77	47.1	169.81	169.88	5.68	73,350	184,989	1,360,000	13.6	
19014	E16S191.1	E16S195	179.52	175.62	181.61	0.021	8	185	3.42	2.28	28.5	175.81	175.99	5.80	64,875	172,081	1,150,000	15.0	
19013	E16S189.1	E16S191	180.92	179.52	190.51	0.004	8	350	1.69	2.37	29.6	179.72	179.76	10.79	27,355	94,399	500,000	18.9	
19012	E16S190.1	E16S189	183.37	180.92	187.91	0.014	8	170	1.48	2.26	28.2	181.11	181.14	6.80	27,355	94,399	950,000	9.9	
19015	E16S194.1	E16S195	176.54	175.62	181.61	0.014	8	68	0.46	2.24	28.1	175.81	175.81	5.80	8,475	33,900	920,000	3.7	
19016	E16S193.1	E16S194	177.94	176.54	182.53	0.013	8	104	1.16	1.18	14.7	176.64	176.66	5.89	8,475	33,900	920,000	3.7	
19163	E16S200.1	E16S199	172.00	169.50	175.49	0.035	8	71	2.58	3.77	47.1	169.81	169.92	5.68	95,075	268,800	1,490,000	18.0	

TOTAL LENGTH (MILES):	0.38	LENGTH OF PIPE - d/D < 50% (MILES):	0.29	LENGTH OF PIPE - Q/CAP < 50% (MILES):	0.36
LENGTH WEIGHTED Q/CAP:	23.1	LENGTH OF PIPE - d/D 50 - 75% (MILES):	0.09	LENGTH OF PIPE - Q/CAP 50 - 75% (MILES):	0.02
LENGTH WEIGHTED d/D:	39.2	LENGTH OF PIPE - d/D 75 - 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP 75 - 100% (MILES):	0.00
LENGTH WEIGHTED HGL BELOW RIM (FT):	6.95	LENGTH OF PIPE - d/D > 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP > 100% (MILES):	0.00

Note: Boxed records indicate condition assessed segments.

CITY OF SAN DIEGO
HYDRAULIC MODEL RESULTS TABLE
UNIVERSITY OF SAN DIEGO
2012 DWF AS-BUILT

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	AVG. FLOW (GPD)	MAX. FLOW (GPD)	FULL CAPACITY (GPD)	MAX. Q/CAP (%)	TASK AREA
19007	E16S187.1	E16S186	58.00	56.02	61.02	0.014	8	141	4.06	4.12	51.5	56.36	56.62	4.65	170,640	474,900	940,000	50.5	
19010	E16S188.1	E16S187	150.12	58.00	66.00	0.461	8	200	4.05	4.14	51.8	58.35	58.60	7.65	170,640	476,100	5,410,000	8.8	
19011	E16S196.1	E16S188	155.78	150.12	157.11	0.177	8	32	9.56	2.18	27.3	150.30	151.72	6.81	170,640	476,500	3,350,000	14.2	
19019	E16S197.1	E16S196	162.12	155.78	161.77	0.052	7	123	6.49	3.08	44.1	156.04	156.69	5.73	170,640	476,700	1,270,000	37.5	
19018	E16S198.1	E16S197	166.17	162.12	169.11	0.018	8	228	4.43	3.86	48.3	162.44	162.75	6.67	170,640	477,300	1,060,000	45.0	
19154	E16S199.1	E16S198	169.50	166.17	172.16	0.026	7	129	4.88	3.88	55.4	166.49	166.86	5.67	170,640	478,900	900,000	53.2	
19017	E16S195.1	E16S199	175.62	169.50	175.49	0.029	8	210	2.01	3.79	47.4	169.82	169.88	5.68	74,865	187,297	1,360,000	13.8	
19014	E16S191.1	E16S195	179.52	175.62	181.61	0.021	8	185	3.45	2.30	28.8	175.81	176.00	5.80	66,465	174,185	1,150,000	15.1	
19013	E16S189.1	E16S191	180.92	179.52	190.51	0.004	8	350	1.70	2.39	29.9	179.72	179.76	10.79	28,090	96,018	500,000	19.2	
19012	E16S190.1	E16S189	183.37	180.92	187.91	0.014	8	170	1.49	2.28	28.5	181.11	181.14	6.80	28,090	96,018	950,000	10.1	
19015	E16S194.1	E16S195	176.54	175.62	181.61	0.014	8	68	0.45	2.27	28.4	175.81	175.81	5.80	8,395	33,580	920,000	3.7	
19016	E16S193.1	E16S194	177.94	176.54	182.53	0.013	8	104	1.15	1.18	14.7	176.64	176.66	5.89	8,395	33,580	920,000	3.7	
19163	E16S200.1	E16S199	172.00	169.50	175.49	0.035	8	71	2.57	3.79	47.4	169.82	169.92	5.68	95,775	270,800	1,490,000	18.2	

TOTAL LENGTH (MILES):	0.38	LENGTH OF PIPE - d/D < 50% (MILES):	0.29	LENGTH OF PIPE - Q/CAP < 50% (MILES):	0.33
LENGTH WEIGHTED Q/CAP:	23.4	LENGTH OF PIPE - d/D 50 - 75% (MILES):	0.09	LENGTH OF PIPE - Q/CAP 50 - 75% (MILES):	0.05
LENGTH WEIGHTED d/D:	39.5	LENGTH OF PIPE - d/D 75 - 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP 75 - 100% (MILES):	0.00
LENGTH WEIGHTED HGL BELOW RIM (FT):	6.95	LENGTH OF PIPE - d/D > 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP > 100% (MILES):	0.00

Note: Boxed records indicate condition assessed segments.

CITY OF SAN DIEGO
HYDRAULIC MODEL RESULTS TABLE
BASIN E16S212
2012 DWF ALTERNATIVE 1

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	AVG. FLOW (GPD)	MAX. FLOW (GPD)	FULL CAPACITY (GPD)	MAX. Q/CAP (%)	TASK AREA
19035	E16S209.1	E16S212	41.34	41.31	48.31	0.004	10	8	2.85	4.21	42.1	41.66	41.79	6.65	145,065	402,300	880,000	45.7	
19155	E16S208.1	E16S209	41.90	41.34	49.34	0.004	10	140	2.70	4.39	43.9	41.71	41.82	7.63	145,065	402,400	910,000	44.2	
19032	E16S207.1	E16S208	42.59	41.90	49.00	0.004	8	172	2.89	4.74	59.3	42.30	42.42	6.71	145,065	402,500	500,000	80.5	
19031	E16S204.1	E16S207	74.86	42.59	55.59	0.250	10	129	2.00	5.57	55.7	43.05	43.12	12.53	145,070	402,300	7,220,000	5.6	
19030	E16S205.1	E16S204	94.63	74.86	87.86	0.330	10	60	8.74	1.88	18.8	75.02	76.20	12.84	145,070	402,100	8,290,000	4.9	
19029	E17S417.1	E16S205	100.00	94.63	110.63	0.033	8	161	5.23	2.99	37.4	94.88	95.30	15.75	145,070	402,100	1,450,000	27.7	
5488705	E17S418.1	E17S417	105.00	100.00	145.00	0.093	8	54	5.22	3.00	37.5	100.25	100.67	44.75	145,070	402,700	2,430,000	16.6	
5488707	E17S419.1	E17S418	113.00	105.00	160.00	0.101	10	79	1.81	2.35	23.5	105.20	105.25	54.80	40,390	119,873	4,590,000	2.6	
5488709	E17S420.1	E17S419	135.00	113.00	170.00	0.083	10	265	3.42	1.49	14.9	113.12	113.31	56.88	40,390	119,873	4,160,000	2.9	
5488711	E17S421.1	E17S420	160.00	135.00	185.00	0.108	10	232	3.42	1.49	14.9	135.12	135.31	49.88	40,390	119,873	4,740,000	2.5	
5488731	E17S422.1	E17S421	180.00	160.00	190.00	0.078	8	255	4.05	1.44	18.0	160.12	160.37	29.88	40,395	119,886	2,230,000	5.4	
5488734	E17S423.1	E17S422	182.00	180.00	193.00	0.025	8	80	2.98	1.79	22.4	180.15	180.29	12.85	40,395	119,886	1,260,000	9.5	
5488732	E17S368.1	E17S423	185.15	182.00	195.00	0.093	8	34	2.97	1.79	22.4	182.15	182.29	12.85	40,395	119,886	2,430,000	4.9	
5348297	E17S366.1	E17S368	186.53	185.15	207.24	0.035	8	39	3.28	1.67	20.9	185.29	185.46	21.95	40,395	119,886	1,500,000	8.0	
5348299	E17S367.1	E17S366	186.93	186.53	201.19	0.005	8	78	1.97	2.52	31.4	186.74	186.80	14.45	40,395	119,886	570,000	21.0	
5348295	E17S369.1	E17S367	188.00	186.93	200.79	0.005	8	215	1.95	2.53	31.7	187.14	187.20	13.65	40,395	119,886	560,000	21.4	
5348302	E17S370.1	E17S369	188.45	188.00	195.79	0.005	8	92	1.81	2.56	32.0	188.21	188.26	7.58	40,395	119,886	550,000	21.8	
5348322	E17S371.1	E17S370	188.80	188.45	193.89	0.005	8	70	1.80	2.57	32.1	188.66	188.71	5.23	40,395	119,886	560,000	21.4	
5348324	E17S372.1	E17S371	189.65	188.80	193.79	0.005	8	169	1.82	2.56	32.0	189.01	189.06	4.78	40,395	119,886	560,000	21.4	
5348326	E17S373.1	E17S372	190.65	189.65	195.09	0.009	8	110	1.83	2.57	32.1	189.86	189.92	5.23	40,395	119,886	760,000	15.8	
5348328	E17S394.1	E17S373	193.00	190.65	196.49	0.026	4	89	3.33	2.34	58.5	190.85	191.02	5.65	40,395	119,886	200,000	59.9	
5488736	E17S424.1	E17S418	115.00	105.00	160.00	0.033	8	307	4.67	2.58	32.3	105.22	105.55	54.79	104,675	293,100	1,440,000	20.4	
5488738	E17S425.1	E17S424	125.00	115.00	130.00	0.039	8	255	4.66	2.58	32.3	115.22	115.55	14.79	104,675	294,200	1,580,000	18.6	
5488740	E17S426.1	E17S425	130.00	125.00	135.00	0.020	8	250	3.98	2.92	36.5	125.24	125.49	9.76	104,675	295,200	1,120,000	26.4	

TOTAL LENGTH (MILES):	0.63	LENGTH OF PIPE - d/D < 50% (MILES):	0.56	LENGTH OF PIPE - Q/CAP < 50% (MILES):	0.58
LENGTH WEIGHTED Q/CAP:	20.6	LENGTH OF PIPE - d/D 50 - 75% (MILES):	0.07	LENGTH OF PIPE - Q/CAP 50 - 75% (MILES):	0.02
LENGTH WEIGHTED d/D:	31.7	LENGTH OF PIPE - d/D 75 - 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP 75 - 100% (MILES):	0.03
LENGTH WEIGHTED HGL BELOW RIM (FT):	24.10	LENGTH OF PIPE - d/D > 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP > 100% (MILES):	0.00

Note: Boxed records indicate condition assessed segments.

CITY OF SAN DIEGO
HYDRAULIC MODEL RESULTS TABLE
BASIN E16S212
2012 DWF AS-BUILT

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	AVG. FLOW (GPD)	MAX. FLOW (GPD)	FULL CAPACITY (GPD)	MAX. Q/CAP (%)	TASK AREA
19035	E16S209.1	E16S212	41.34	41.31	48.31	0.004	10	8	2.85	4.22	42.2	41.66	41.79	6.65	145,725	404,100	880,000	45.9	
19155	E16S208.1	E16S209	41.90	41.34	49.34	0.004	10	140	2.70	4.40	44.0	41.71	41.82	7.63	145,725	404,200	910,000	44.4	
19032	E16S207.1	E16S208	42.59	41.90	49.00	0.004	8	172	2.90	4.75	59.4	42.30	42.43	6.70	145,730	404,300	500,000	80.9	
19031	E16S204.1	E16S207	74.86	42.59	55.59	0.250	10	129	2.00	5.58	55.8	43.06	43.12	12.53	145,730	404,100	7,220,000	5.6	
19030	E16S205.1	E16S204	94.63	74.86	87.86	0.330	10	60	8.76	1.88	18.8	75.02	76.21	12.84	145,730	404,000	8,290,000	4.9	
19029	E17S417.1	E16S205	100.00	94.63	110.63	0.033	8	161	5.24	3.00	37.5	94.88	95.31	15.75	145,730	403,900	1,450,000	27.9	
5488705	E17S418.1	E17S417	105.00	100.00	145.00	0.093	8	54	5.23	3.00	37.5	100.25	100.67	44.75	145,730	404,500	2,430,000	16.6	
5488707	E17S419.1	E17S418	113.00	105.00	160.00	0.101	10	79	1.83	2.35	23.5	105.20	105.25	54.80	41,085	121,618	4,590,000	2.6	
5488709	E17S420.1	E17S419	135.00	113.00	170.00	0.083	10	265	3.46	1.49	14.9	113.12	113.31	56.88	41,085	121,618	4,160,000	2.9	
5488711	E17S421.1	E17S420	160.00	135.00	185.00	0.108	10	232	3.46	1.50	15.0	135.13	135.31	49.88	41,085	121,618	4,740,000	2.6	
5488731	E17S422.1	E17S421	180.00	160.00	190.00	0.078	8	255	4.08	1.45	18.2	160.12	160.38	29.88	41,085	121,618	2,230,000	5.5	
5488734	E17S423.1	E17S422	182.00	180.00	193.00	0.025	8	80	3.00	1.80	22.5	180.15	180.29	12.85	41,085	121,618	1,260,000	9.7	
5488732	E17S368.1	E17S423	185.15	182.00	195.00	0.093	8	34	2.99	1.81	22.7	182.15	182.29	12.85	41,085	121,618	2,430,000	5.0	
5348297	E17S366.1	E17S368	186.53	185.15	207.24	0.035	8	39	3.31	1.68	21.0	185.29	185.46	21.95	41,085	121,618	1,500,000	8.1	
5348299	E17S367.1	E17S366	186.93	186.53	201.19	0.005	8	78	1.98	2.53	31.7	186.74	186.80	14.45	41,085	121,618	570,000	21.3	
5348295	E17S369.1	E17S367	188.00	186.93	200.79	0.005	8	215	1.84	2.56	32.0	187.14	187.20	13.65	41,085	121,618	560,000	21.7	
5348302	E17S370.1	E17S369	188.45	188.00	195.79	0.005	8	92	1.82	2.58	32.3	188.22	188.27	7.57	41,085	121,618	550,000	22.1	
5348322	E17S371.1	E17S370	188.80	188.45	193.89	0.005	8	70	1.81	2.59	32.4	188.67	188.72	5.22	41,085	121,618	560,000	21.7	
5348324	E17S372.1	E17S371	189.65	188.80	193.79	0.005	8	169	1.83	2.58	32.3	189.02	189.07	4.78	41,085	121,618	560,000	21.7	
5348326	E17S373.1	E17S372	190.65	189.65	195.09	0.009	8	110	1.84	2.58	32.3	189.87	189.92	5.22	41,085	121,618	760,000	16.0	
5348328	E17S394.1	E17S373	193.00	190.65	196.49	0.026	4	89	3.35	2.36	59.1	190.85	191.02	5.64	41,085	121,618	200,000	60.8	
5488736	E17S424.1	E17S418	115.00	105.00	160.00	0.033	8	307	4.67	2.58	32.3	105.22	105.55	54.79	104,650	293,000	1,440,000	20.3	
5488738	E17S425.1	E17S424	125.00	115.00	130.00	0.039	8	255	4.66	2.58	32.3	115.22	115.55	14.79	104,645	294,200	1,580,000	18.6	
5488740	E17S426.1	E17S425	130.00	125.00	135.00	0.020	8	250	3.98	2.92	36.5	125.24	125.49	9.76	104,645	295,100	1,120,000	26.3	

TOTAL LENGTH (MILES):	0.63	LENGTH OF PIPE - d/D < 50% (MILES):	0.56	LENGTH OF PIPE - Q/CAP < 50% (MILES):	0.58
LENGTH WEIGHTED Q/CAP:	20.8	LENGTH OF PIPE - d/D 50 - 75% (MILES):	0.07	LENGTH OF PIPE - Q/CAP 50 - 75% (MILES):	0.02
LENGTH WEIGHTED d/D:	31.9	LENGTH OF PIPE - d/D 75 - 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP 75 - 100% (MILES):	0.03
LENGTH WEIGHTED HGL BELOW RIM (FT):	24.10	LENGTH OF PIPE - d/D > 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP > 100% (MILES):	0.00

Note: Boxed records indicate condition assessed segments.

CITY OF SAN DIEGO
HYDRAULIC MODEL RESULTS TABLE
BASIN E17S412
2012 DWF ALTERNATIVE 1

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	AVG. FLOW (GPD)	MAX. FLOW (GPD)	FULL CAPACITY (GPD)	MAX. Q/CAP (%)	TASK AREA
5477099	E17S314.1	E17S412	-4.20	-6.00	11.00	0.015	15	118	4.60	4.52	30.2	-5.62	-5.29	16.62	347,590	925,500	5,210,000	17.8	
19463	E17S399.1	E17S314	0.00	-4.20	12.50	0.019	15	223	4.59	4.52	30.2	-3.82	-3.50	16.32	347,600	925,500	5,790,000	16.0	
19438	E17S398.1	E17S399	0.40	0.00	12.80	0.007	16	54	3.76	5.08	31.7	0.42	0.64	12.38	347,620	925,300	4,300,000	21.5	
19439	E17S286.1	E17S398	0.78	0.40	13.50	0.004	15	105	3.33	5.71	38.1	0.88	1.05	12.62	347,625	925,300	2,530,000	36.6	
19440	E17S284.1	E17S286	1.61	0.78	12.78	0.002	15	368	2.95	6.26	41.8	1.30	1.44	11.48	347,640	925,100	1,990,000	46.5	
19434	E17S278.2	E17S284	2.30	1.61	14.61	0.002	15	304	2.25	7.22	48.2	2.21	2.29	12.40	315,810	847,100	2,000,000	42.4	
19432	E17S280.1	E17S278	2.52	2.30	13.30	0.002	15	131	2.39	6.86	45.8	2.87	2.96	10.43	315,170	847,300	1,720,000	49.3	
19430	E17S276.1	E17S280	2.70	2.52	13.52	0.001	15	287	2.15	7.33	48.9	3.13	3.20	10.39	307,615	829,500	1,040,000	79.8	
19429	E17S275.1	E17S276	2.97	2.70	12.69	0.004	15	62	1.64	9.13	60.9	3.46	3.50	9.23	307,215	829,700	2,780,000	29.8	
19422	E17S274.1	E17S275	3.15	3.07	13.07	0.000	15	180	2.82	5.58	37.2	3.54	3.66	9.53	259,670	701,600	880,000	79.7	
19423	E17S272.1	E17S274	3.30	3.15	12.05	0.001	15	204	1.64	7.97	53.1	3.81	3.86	8.24	259,695	701,600	1,130,000	62.1	
19418	E17S445.1	E17S272	4.03	3.30	18.30	0.003	15	264	1.56	8.32	55.4	3.99	4.03	14.31	259,725	703,900	2,210,000	31.9	
5551281	E17S444.1	E17S445	4.47	4.03	16.30	0.001	15	311	2.44	5.89	39.3	4.52	4.61	11.78	259,750	705,700	1,580,000	44.7	
5551282	E17S446.1	E17S444	4.71	4.47	19.50	0.001	15	168	1.84	7.02	46.8	5.06	5.11	14.44	246,010	670,400	1,580,000	42.4	
5551280	E17S262.1	E17S446	4.90	4.71	19.60	0.001	15	161	1.89	6.89	45.9	5.28	5.34	14.32	246,025	670,100	1,440,000	46.5	
19415	E17S268.1	E17S262	5.43	4.90	18.90	0.002	15	350	1.11	7.14	47.6	5.50	5.51	13.40	150,135	411,600	1,630,000	25.3	
19414	E17S263.1	E17S268	6.19	5.43	17.43	0.003	15	243	1.68	5.22	34.8	5.87	5.91	11.56	150,150	411,200	2,350,000	17.5	
19411	E17S245.1	E17S263	15.02	6.19	14.39	0.044	8	201	3.10	4.31	53.9	6.55	6.70	7.84	139,490	383,500	1,670,000	23.0	
19363	E17S213.1	E17S245	23.07	15.02	21.02	0.046	8	175	5.45	2.74	34.2	15.25	15.71	5.77	134,880	371,300	1,710,000	21.7	
19364	E17S212.1	E17S213	24.13	23.07	32.07	0.005	8	221	2.97	4.32	54.0	23.43	23.57	8.64	133,720	368,500	550,000	67.0	
19365	E17S214.1	E17S212	25.17	24.13	38.13	0.004	7	260	2.56	4.93	70.5	24.54	24.64	13.59	120,305	332,800	350,000	95.1	
19366	E17S215.1	E17S214	28.73	25.17	33.17	0.016	7	221	2.23	5.66	80.9	25.64	25.72	7.53	120,310	334,000	710,000	47.0	
19371	E17S218.1	E17S215	31.69	28.73	33.73	0.021	7	141	3.58	3.49	49.9	29.02	29.22	4.71	111,015	308,500	810,000	38.1	
19303	E17S142.1	E17S218	50.27	31.69	38.69	0.060	7	308	3.45	3.12	44.6	31.95	32.14	6.74	92,365	256,800	1,370,000	18.7	
19304	E17S143.1	E17S142	54.71	50.27	58.27	0.017	7	261	3.63	2.96	42.3	50.52	50.72	7.75	90,620	252,000	730,000	34.5	
19305	E17S144.1	E17S143	58.53	54.71	60.71	0.017	7	225	3.41	2.96	42.3	54.96	55.14	5.75	85,130	236,800	730,000	32.4	
19306	E17S141.1	E17S144	59.38	58.53	72.53	0.017	8	50	3.25	2.87	35.9	58.77	58.93	13.76	85,130	237,100	1,040,000	22.8	
19302	E17S145.1	E17S141	61.04	59.38	64.38	0.017	8	98	3.50	2.72	34.1	59.61	59.80	4.77	85,130	237,300	1,030,000	23.0	
19301	E17S140.1	E17S145	76.15	61.04	73.04	0.095	7	159	3.74	2.72	38.9	61.27	61.48	11.77	83,610	233,500	1,720,000	13.6	
19312	E17S156.1	E17S140	108.56	76.15	88.15	0.110	8	295	4.80	1.92	24.0	76.31	76.67	11.84	71,185	181,583	2,640,000	6.9	
19313	E17S155.1	E17S156	121.66	108.56	116.55	0.110	8	119	5.78	1.68	21.0	108.70	109.22	7.85	71,180	181,575	2,640,000	6.9	
19314	E17S154.1	E17S155	135.52	121.66	130.65	0.110	8	126	5.78	1.68	21.0	121.80	122.32	8.85	71,180	181,575	2,640,000	6.9	
19315	E17S153.1	E17S154	146.59	135.52	147.51	0.030	8	369	3.91	2.17	27.2	135.70	135.94	11.81	69,025	178,061	1,380,000	12.9	
19317	E17S149.1	E17S153	146.92	146.59	154.58	0.005	8	66	2.11	2.92	36.5	146.83	146.90	7.75	56,375	157,302	560,000	28.1	
19316	E17S152.1	E17S149	153.92	146.92	151.91	0.127	8	55	2.04	3.02	37.8	147.17	147.24	4.74	56,375	157,302	2,840,000	5.5	
19318	E17S151.1	E17S152	155.00	153.92	160.91	0.034	8	32	3.76	1.94	24.3	154.08	154.30	6.83	56,375	157,302	1,460,000	10.8	

TOTAL LENGTH (MILES):	3.39	LENGTH OF PIPE - d/D < 50% (MILES):	2.85	LENGTH OF PIPE - Q/CAP < 50% (MILES):	3.18
LENGTH WEIGHTED Q/CAP:	19.0	LENGTH OF PIPE - d/D 50 - 75% (MILES):	0.32	LENGTH OF PIPE - Q/CAP 50 - 75% (MILES):	0.08
LENGTH WEIGHTED d/D:	36.5	LENGTH OF PIPE - d/D 75 - 100% (MILES):	0.22	LENGTH OF PIPE - Q/CAP 75 - 100% (MILES):	0.14
LENGTH WEIGHTED HGL BELOW RIM (FT):	9.20	LENGTH OF PIPE - d/D > 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP > 100% (MILES):	0.00

Note: Boxed records indicate condition assessed segments.

CITY OF SAN DIEGO
HYDRAULIC MODEL RESULTS TABLE
BASIN E17S412
2012 DWF AS-BUILT

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	AVG. FLOW (GPD)	MAX. FLOW (GPD)	FULL CAPACITY (GPD)	MAX. Q/CAP (%)	TASK AREA
5477099	E17S314.1	E17S412	-4.20	-6.00	11.00	0.015	15	118	4.37	4.24	28.2	-5.65	-5.35	16.65	301,465	802,000	5,210,000	15.4	
19463	E17S399.1	E17S314	0.00	-4.20	12.50	0.019	15	223	4.36	4.24	28.2	-3.85	-3.55	16.35	301,475	802,000	5,790,000	13.9	
19438	E17S398.1	E17S399	0.40	0.00	12.80	0.007	16	54	3.61	4.72	29.5	0.39	0.59	12.41	301,490	801,800	4,300,000	18.6	
19439	E17S286.1	E17S398	0.78	0.40	13.50	0.004	15	105	3.19	5.32	35.4	0.84	1.00	12.66	301,495	801,700	2,530,000	31.7	
19440	E17S284.1	E17S286	1.61	0.78	12.78	0.002	15	368	2.83	5.80	38.6	1.26	1.39	11.52	301,510	802,000	1,990,000	40.3	
19441	E17S285.1	E17S284	6.12	1.61	14.61	0.015	8	300	0.37	6.66	83.3	2.17	2.17	12.44	26,055	91,418	970,000	9.4	
19442	E17S292.1	E17S285	7.41	6.12	12.12	0.004	8	300	1.66	2.15	26.9	6.30	6.34	5.82	21,910	80,911	520,000	15.6	
19434	E17S278.2	E17S284	2.30	1.61	14.61	0.002	15	304	2.13	6.66	44.4	2.17	2.24	12.44	269,670	723,500	2,000,000	36.2	
19432	E17S280.1	E17S278	2.52	2.30	13.30	0.002	15	131	2.30	6.29	41.9	2.82	2.91	10.48	269,025	723,500	1,720,000	42.1	
19430	E17S276.1	E17S280	2.70	2.52	13.52	0.001	15	287	2.05	6.72	44.8	3.08	3.15	10.44	261,470	705,600	1,040,000	67.8	
19429	E17S275.1	E17S276	2.97	2.70	12.69	0.004	15	62	1.56	8.35	55.7	3.40	3.43	9.29	261,060	705,400	2,780,000	25.4	
19422	E17S274.1	E17S275	3.15	3.07	13.07	0.000	15	180	2.72	4.86	32.4	3.48	3.59	9.59	213,510	577,100	880,000	65.6	
19423	E17S272.1	E17S274	3.30	3.15	12.05	0.001	15	204	1.54	7.20	48.0	3.75	3.79	8.30	213,535	577,200	1,130,000	51.1	
19418	E17S445.1	E17S272	4.03	3.30	18.30	0.003	15	264	1.47	7.46	49.8	3.92	3.96	14.38	213,565	579,500	2,210,000	26.2	
5551281	E17S444.1	E17S445	4.47	4.03	16.30	0.001	15	311	2.32	5.30	35.4	4.47	4.56	11.83	213,580	580,700	1,580,000	36.8	
5551282	E17S446.1	E17S444	4.71	4.47	19.50	0.001	15	168	1.73	6.31	42.1	5.00	5.04	14.50	201,555	549,400	1,580,000	34.8	
5551280	E17S262.1	E17S446	4.90	4.71	19.60	0.001	15	161	1.79	6.17	41.1	5.22	5.27	14.38	201,565	550,200	1,440,000	38.2	
19405	E17S246.1	E17S262	10.15	4.90	18.90	0.015	8	350	0.29	6.41	80.1	5.43	5.44	13.47	20,190	76,103	970,000	7.8	
19404	E17S244.1	E17S246	10.75	10.15	16.15	0.004	8	150	1.44	1.80	22.5	10.30	10.33	5.85	13,700	54,800	500,000	11.0	
19403	E17S243.1	E17S244	17.66	10.75	24.75	0.070	8	99	0.95	1.69	21.2	10.89	10.90	13.86	11,620	46,480	2,100,000	2.2	
19410	E17S247.1	E17S262	11.50	4.90	18.90	0.021	8	313	0.94	6.41	80.1	5.43	5.45	13.47	65,490	172,907	1,150,000	15.0	
19397	E17S251.1	E17S247	12.22	11.50	19.73	0.003	8	217	0.38	2.28	28.5	11.69	11.69	8.04	7,265	29,060	460,000	6.3	
19396	E17S252.1	E17S251	13.22	12.22	19.22	0.004	8	250	0.74	1.38	17.3	12.34	12.34	6.88	6,855	27,420	500,000	5.5	
19392	E17S253.1	E17S252	14.30	13.22	20.22	0.004	8	269	0.19	1.32	16.5	13.33	13.33	6.89	1,640	6,560	500,000	1.3	
19408	E17S248.1	E17S247	15.22	11.50	19.73	0.012	8	310	2.65	2.36	29.6	11.70	11.81	8.03	53,440	150,855	870,000	17.3	
19398	E17S250.1	E17S248	16.33	15.22	23.22	0.004	8	278	0.36	2.38	29.7	15.42	15.42	7.80	7,155	28,620	500,000	5.7	
19407	E17S249.1	E17S248	22.78	15.22	23.22	0.024	8	315	2.19	2.38	29.7	15.42	15.49	7.80	44,150	129,188	1,230,000	10.5	
19406	E17S239.1	E17S249	30.69	22.78	29.78	0.025	8	313	1.90	1.88	23.6	22.94	22.99	6.84	27,495	94,711	1,260,000	7.5	
19399	E17S238.1	E17S239	35.79	30.69	38.69	0.102	8	50	1.11	1.55	19.4	30.82	30.84	7.87	12,030	48,120	2,550,000	1.9	
19455	E17S308.1	E17S238	42.79	35.79	42.79	0.040	8	175	0.26	1.01	12.6	35.87	35.88	6.91	1,505	6,020	1,590,000	0.4	
19459	E17S237.1	E17S238	36.00	35.79	42.79	0.010	8	21	1.23	1.31	16.4	35.90	35.92	6.89	10,525	42,100	790,000	5.3	
19400	E17S240.1	E17S239	31.24	30.69	38.69	0.007	8	75	1.85	1.64	20.5	30.83	30.88	7.86	15,470	61,557	680,000	9.1	
19368	E17S219.1	E17S240	39.01	31.24	39.24	0.026	8	300	0.36	1.56	19.5	31.37	31.37	7.87	3,970	15,880	1,280,000	1.2	
19369	E17S220.1	E17S219	40.36	39.04	45.04	0.026	8	50	0.26	0.84	10.5	39.11	39.11	5.93	1,180	4,720	1,290,000	0.4	
19401	E17S241.1	E17S240	31.62	31.24	39.24	0.002	8	157	1.15	1.87	23.4	31.40	31.42	7.84	11,500	46,000	390,000	11.8	
19367	E17S216.1	E17S241	33.07	31.62	37.62	0.005	8	300	0.50	1.74	21.8	31.77	31.77	5.85	6,415	25,660	550,000	4.7	
19370	E17S217.1	E17S216	33.27	33.07	42.07	0.004	8	50	0.00	1.25	15.6	33.17	33.17	8.89	0	0	500,000	0.0	
19402	E17S242.1	E17S241	31.92	31.62	37.62	0.004	8	75	0.05	1.74	21.8	31.77	31.77	5.85	585	2,340	500,000	0.5	
19415	E17S268.1	E17S262	5.43	4.90	18.90	0.002	15	350	0.93	6.41	42.7	5.43	5.45	13.47	108,870	298,500	1,630,000	18.3	
19414	E17S263.1	E17S268	6.19	5.43	17.43	0.003	15	243	1.53	4.42	29.4	5.80	5.83	11.63	108,880	298,300	2,350,000	12.7	
19411	E17S245.1	E17S263	15.02	6.19	14.39	0.044	8	201	2.68	3.67	45.9	6.50	6.61	7.89	98,220	270,000	1,670,000	16.2	
19363	E17S213.1	E17S245	23.07	15.02	21.02	0.046	8	175	4.75	2.32	29.0	15.21	15.56	5.81	93,610	257,700	1,710,000	15.1	
19364	E17S212.1	E17S213	24.13	23.07	32.07	0.005	8	221	2.60	3.59	44.9	23.37	23.47	8.70	92,450	254,700	550,000	46.3	
19365	E17S214.1	E17S212	25.17	24.13	38.13	0.004	7	260	2.19	3.92	56.1	24.46	24.53	13.67	79,030	218,600	350,000	62.5	
19366	E17S215.1	E17S214	28.73	25.17	33.17	0.016	7	221	2.07	4.13	59.0	25.51	25.58	7.65	79,035	219,200	710,000	30.9	

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BASIN E17S412
2012 DWF AS-BUILT

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	AVG. FLOW (GPD)	MAX. FLOW (GPD)	FULL CAPACITY (GPD)	MAX. Q/CAP (%)	TASK AREA
19371	E17S218.1	E17S215	31.69	28.73	33.73	0.021	7	141	3.05	2.80	39.9	28.96	29.11	4.77	70,865	181,070	810,000	22.4	
19303	E17S142.1	E17S218	50.27	31.69	38.69	0.060	7	308	2.76	2.48	35.5	31.90	32.02	6.79	54,620	153,470	1,370,000	11.2	
19304	E17S143.1	E17S142	54.71	50.27	58.27	0.017	7	261	3.02	2.28	32.6	50.46	50.60	7.81	53,045	149,973	730,000	20.5	
19305	E17S144.1	E17S143	58.53	54.71	60.71	0.017	7	225	2.74	2.28	32.6	54.90	55.02	5.81	48,045	138,506	730,000	19.0	
19306	E17S141.1	E17S144	59.38	58.53	72.53	0.017	8	50	2.68	2.18	27.3	58.71	58.82	13.81	48,045	138,506	1,040,000	13.3	
19302	E17S145.1	E17S141	61.04	59.38	64.38	0.017	8	98	2.84	2.09	26.1	59.55	59.68	4.82	48,045	138,506	1,030,000	13.4	
19301	E17S140.1	E17S145	76.15	61.04	73.04	0.095	7	159	3.00	2.10	30.0	61.22	61.35	11.82	46,720	135,374	1,720,000	7.9	
19307	E17S139.1	E17S140	95.78	76.15	88.15	0.095	7	206	0.84	1.51	21.6	76.28	76.29	11.87	8,215	32,860	1,720,000	1.9	
19299	E17S138.1	E17S139	118.49	95.78	104.74	0.136	7	167	0.51	0.96	13.7	95.86	95.86	8.88	2,565	10,260	2,060,000	0.5	
19298	E17S137.1	E17S138	120.09	118.49	126.48	0.014	8	118	0.23	0.85	10.7	118.56	118.56	7.92	1,055	4,220	930,000	0.5	
19308	E17S379.1	E17S139	96.24	95.78	104.74	0.007	8	63	0.50	0.98	12.3	95.86	95.87	8.87	2,805	11,220	680,000	1.7	
19311	E17S378.1	E17S379	96.31	96.24	107.00	0.005	8	14	0.49	0.98	12.3	96.32	96.33	10.68	2,805	11,220	560,000	2.0	
19310	E17S146.1	E17S378	96.73	96.31	108.00	0.007	8	58	0.48	1.01	12.6	96.39	96.40	11.61	2,805	11,220	680,000	1.7	
19309	E17S147.1	E17S146	108.10	96.73	108.73	0.065	8	175	0.50	0.98	12.3	96.81	96.82	11.91	2,805	11,220	2,030,000	0.6	
19297	E17S148.1	E17S147	129.00	108.10	119.09	0.190	8	110	0.19	0.86	10.8	108.17	108.17	10.92	885	3,540	3,480,000	0.1	
19312	E17S156.1	E17S140	108.56	76.15	88.15	0.110	8	295	3.36	1.51	18.9	76.28	76.45	11.87	35,885	110,231	2,640,000	4.2	
19313	E17S155.1	E17S156	121.66	108.56	116.55	0.110	8	119	4.13	1.32	16.5	108.67	108.93	7.88	35,885	110,231	2,640,000	4.2	
19314	E17S154.1	E17S155	135.52	121.66	130.65	0.110	8	126	4.13	1.32	16.5	121.77	122.04	8.88	35,885	110,231	2,640,000	4.2	
19315	E17S153.1	E17S154	146.59	135.52	147.51	0.030	8	369	2.91	1.62	20.3	135.66	135.79	11.86	33,960	107,223	1,380,000	7.8	
19317	E17S149.1	E17S153	146.92	146.59	154.58	0.005	8	66	1.76	2.10	26.2	146.76	146.81	7.82	22,660	82,926	560,000	14.8	
19316	E17S152.1	E17S149	153.92	146.92	151.91	0.127	8	55	1.47	1.98	24.8	147.09	147.12	4.83	22,660	82,926	2,840,000	2.9	
19318	E17S151.1	E17S152	155.00	153.92	160.91	0.034	8	32	2.47	1.38	17.3	154.04	154.13	6.88	22,660	82,926	1,460,000	5.7	
19372	E17S222.1	E17S218	33.49	31.69	38.69	0.008	7	225	0.78	2.48	35.5	31.90	31.91	6.79	15,285	60,946	500,000	12.2	
19373	E17S225.1	E17S222	51.09	33.49	41.49	0.088	8	200	1.15	1.58	19.8	33.62	33.64	7.87	13,080	52,320	2,360,000	2.2	
19374	E17S226.1	E17S225	61.98	51.09	59.09	0.033	8	330	1.60	1.12	14.0	51.18	51.22	7.90	10,955	43,820	1,450,000	3.0	
19300	E17S136.1	E17S226	72.87	61.98	71.98	0.033	8	330	0.72	1.12	14.0	62.07	62.08	9.90	4,960	19,840	1,450,000	1.4	
19379	E17S221.1	E17S215	29.66	28.73	33.73	0.007	8	139	0.25	2.80	35.0	28.96	28.96	4.77	6,250	25,000	650,000	3.8	
19378	E17S224.1	E17S221	43.91	29.66	37.66	0.050	8	285	0.70	1.19	14.9	29.76	29.77	7.90	5,170	20,680	1,780,000	1.2	
19381	E17S211.1	E17S212	32.32	24.13	38.13	0.036	8	230	0.05	3.92	49.1	24.46	24.46	13.67	2,040	8,160	1,500,000	0.5	
19424	E17S273.1	E17S275	4.85	3.07	13.07	0.007	8	269	1.21	4.86	60.8	3.48	3.50	9.59	47,560	137,364	650,000	21.1	
19426	E17S260.1	E17S273	6.06	4.85	12.85	0.004	8	310	1.80	2.74	34.2	5.08	5.13	7.77	41,690	123,129	490,000	25.1	
19427	E17S257.1	E17S260	7.05	6.09	15.09	0.003	8	330	1.61	2.91	36.4	6.33	6.37	8.76	40,105	119,154	430,000	27.7	
19393	E17S258.1	E17S257	7.13	7.05	14.41	0.002	10	35	1.16	2.88	28.8	7.29	7.31	7.12	35,525	109,693	680,000	16.1	
19395	E17S259.1	E17S258	7.50	7.13	14.13	0.019	10	19	0.00	2.71	27.1	7.36	7.36	6.77	0	0	2,010,000	0.0	
19453	E17S294.1	E17S258	7.79	7.13	14.13	0.002	10	274	1.26	2.71	27.1	7.36	7.38	6.77	35,525	109,693	700,000	15.7	
19452	E17S295.1	E17S294	8.44	7.79	13.79	0.002	10	274	1.42	2.67	26.7	8.01	8.04	5.78	34,160	107,551	700,000	15.4	
19450	E17S296.1	E17S295	9.10	8.44	15.44	0.002	10	274	1.17	2.60	26.0	8.66	8.68	6.78	30,785	101,543	700,000	14.5	
19451	E17S293.1	E17S296	9.90	9.10	17.10	0.004	8	200	0.34	2.47	30.9	9.31	9.31	7.79	7,225	28,900	500,000	5.8	
19446	E17S297.1	E17S296	10.54	9.10	17.10	0.007	8	207	0.81	2.47	30.9	9.31	9.32	7.79	17,245	67,259	660,000	10.2	
19443	E17S299.1	E17S297	11.05	10.54	17.54	0.004	8	127	1.53	1.99	24.9	10.71	10.74	6.83	17,245	67,259	500,000	13.5	
19444	E17S298.1	E17S299	11.29	11.05	18.05	0.004	8	60	0.36	1.85	23.1	11.20	11.21	6.85	5,075	20,300	500,000	4.1	
19445	E17S300.1	E17S299	19.91	11.05	18.05	0.029	8	303	0.87	1.85	23.1	11.20	11.22	6.85	12,170	48,680	1,360,000	3.6	
19219	E17S53.1	E17S300	23.24	19.91	26.91	0.032	8	104	0.08	1.18	14.7	20.01	20.01	6.90	585	2,340	1,420,000	0.2	
19449	E17S302.1	E17S296	16.54	9.10	17.10	0.021	8	350	0.30	2.47	30.9	9.31	9.31	7.79	6,315	25,260	1,160,000	2.2	
19447	E17S301.1	E17S302	17.21	16.54	22.54	0.016	8	41	0.25	1.04	13.1	16.63	16.63	5.91	1,500	6,000	1,020,000	0.6	

CITY OF SAN DIEGO
HYDRAULIC MODEL RESULTS TABLE
BASIN E17S412
2012 DWF AS-BUILT

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	AVG. FLOW (GPD)	MAX. FLOW (GPD)	FULL CAPACITY (GPD)	MAX. Q/CAP (%)	TASK AREA
19394	E17S256.1	E17S257	7.95	7.05	14.41	0.007	8	134	0.08	2.88	36.0	7.29	7.29	7.12	2,020	8,080	650,000	1.2	
5519457	E17S436.1	E17S273	5.80	4.85	12.85	0.003	8	287	0.24	2.56	32.0	5.06	5.06	7.79	5,315	21,260	450,000	4.7	
5519402	E17S282.1	E17S436	6.17	5.80	12.00	0.021	8	18	0.66	1.26	15.8	5.91	5.91	6.10	5,315	21,260	1,140,000	1.9	
19428	E17S283.1	E17S282	6.27	6.17	12.17	0.004	8	25	0.56	1.03	12.9	6.26	6.26	5.91	3,405	13,620	500,000	2.7	

TOTAL LENGTH (MILES):	3.39	LENGTH OF PIPE - d/D < 50% (MILES):	3.06	LENGTH OF PIPE - Q/CAP < 50% (MILES):	3.22
LENGTH WEIGHTED Q/CAP:	15.4	LENGTH OF PIPE - d/D 50 - 75% (MILES):	0.15	LENGTH OF PIPE - Q/CAP 50 - 75% (MILES):	0.18
LENGTH WEIGHTED d/D:	32.7	LENGTH OF PIPE - d/D 75 - 100% (MILES):	0.18	LENGTH OF PIPE - Q/CAP 75 - 100% (MILES):	0.00
LENGTH WEIGHTED HGL BELOW RIM (FT):	9.23	LENGTH OF PIPE - d/D > 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP > 100% (MILES):	0.00

Note: Boxed records indicate condition assessed segments.

CITY OF SAN DIEGO
HYDRAULIC MODEL RESULTS TABLE
BASIN F16S674
2012 DWF ALTERNATIVE 1

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	AVG. FLOW (GPD)	MAX. FLOW (GPD)	FULL CAPACITY (GPD)	MAX. Q/CAP (%)	TASK AREA
5531244	F16S651.1	F16S674	142.67	126.84	141.13	0.069	10	230	6.53	2.56	25.6	127.05	127.72	14.08	170,260	464,000	3,780,000	12.3	
5530931	F16S650.1	F16S651	144.33	142.67	153.64	0.008	10	215	3.23	4.27	42.7	143.03	143.19	10.62	170,265	464,500	1,260,000	36.9	
5530929	F16S649.1	F16S650	146.72	144.33	151.04	0.006	10	377	3.01	4.51	45.1	144.71	144.85	6.34	170,270	465,300	1,140,000	40.8	
22842	F16S458.1	F16S649	148.96	146.72	156.41	0.014	8	163	3.12	4.52	56.6	147.10	147.25	9.32	149,905	409,900	930,000	44.1	
22840	F16S456.1	F16S458	156.63	148.96	156.45	0.026	8	291	1.53	3.82	47.7	149.28	149.31	7.17	58,395	161,628	1,290,000	12.5	
22839	F16S454.1	F16S456	185.45	156.63	165.32	0.098	8	295	3.50	2.06	25.8	156.80	156.99	8.52	58,395	161,628	2,490,000	6.5	

TOTAL LENGTH (MILES):	3.20	LENGTH OF PIPE - d/D < 50% (MILES):	3.14	LENGTH OF PIPE - Q/CAP < 50% (MILES):	3.20
LENGTH WEIGHTED Q/CAP:	7.8	LENGTH OF PIPE - d/D 50 - 75% (MILES):	0.06	LENGTH OF PIPE - Q/CAP 50 - 75% (MILES):	0.00
LENGTH WEIGHTED d/D:	22.4	LENGTH OF PIPE - d/D 75 - 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP 75 - 100% (MILES):	0.00
LENGTH WEIGHTED HGL BELOW RIM (FT):	9.72	LENGTH OF PIPE - d/D > 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP > 100% (MILES):	0.00

Note: Boxed records indicate condition assessed segments.

CITY OF SAN DIEGO
HYDRAULIC MODEL RESULTS TABLE
BASIN F16S674
2012 DWF AS-BUILT

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	AVG. FLOW (GPD)	MAX. FLOW (GPD)	FULL CAPACITY (GPD)	MAX. Q/CAP (%)	TASK AREA
5531244	F16S651.1	F16S674	142.67	126.84	141.13	0.069	10	230	6.23	2.42	24.2	127.04	127.65	14.09	151,645	412,500	3,780,000	10.9	
5530931	F16S650.1	F16S651	144.33	142.67	153.64	0.008	10	215	3.12	4.01	40.1	143.00	143.16	10.64	151,645	412,500	1,260,000	32.7	
5530929	F16S649.1	F16S650	146.72	144.33	151.04	0.006	10	377	2.91	4.24	42.4	144.68	144.81	6.36	151,650	413,500	1,140,000	36.3	
22842	F16S458.1	F16S649	148.96	146.72	156.41	0.014	8	163	2.98	4.25	53.1	147.07	147.21	9.34	132,755	362,500	930,000	39.0	
22840	F16S456.1	F16S458	156.63	148.96	156.45	0.026	8	291	1.17	3.56	44.6	149.26	149.28	7.19	41,245	122,019	1,290,000	9.5	
22839	F16S454.1	F16S456	185.45	156.63	165.32	0.098	8	295	3.03	1.78	22.2	156.78	156.92	8.54	41,245	122,019	2,490,000	4.9	
22838	F16S455.1	F16S454	221.65	185.45	191.63	0.102	8	356	2.46	1.40	17.6	185.57	185.66	6.06	23,405	84,877	2,540,000	3.3	
22869	F17S1.1	F16S455	244.20	221.65	227.64	0.064	8	350	2.87	1.25	15.6	221.75	221.88	5.88	23,405	84,877	2,020,000	4.2	
22870	F17S2.1	F17S1	244.98	244.20	261.34	0.010	8	78	2.27	1.78	22.3	244.35	244.43	16.99	23,405	84,877	790,000	10.7	
22871	F17S4.1	F17S2	245.29	244.98	259.97	0.002	10	146	1.28	2.44	24.4	245.18	245.21	14.78	23,405	84,877	660,000	12.9	
22873	F17S5.1	F17S4	246.53	245.29	260.28	0.004	7	296	1.18	2.24	32.1	245.48	245.50	14.80	20,375	76,633	360,000	21.3	
23038	F17S6.1	F17S5	247.25	246.53	262.52	0.004	7	178	1.55	2.07	29.5	246.70	246.74	15.81	16,875	66,094	350,000	18.9	
22874	F17S8.1	F17S6	247.86	247.25	267.24	0.004	7	155	1.53	2.08	29.7	247.42	247.46	19.81	16,875	66,094	350,000	18.9	
22875	F17S7.1	F17S8	255.00	247.86	269.85	0.019	8	381	0.56	1.91	23.9	248.02	248.02	21.83	8,215	32,860	1,090,000	3.0	
22876	F17S9.1	F17S8	265.21	247.86	269.85	0.094	7	184	0.64	1.91	27.3	248.02	248.03	21.83	8,660	34,640	1,710,000	2.0	
22877	F17S10.1	F17S9	270.00	265.21	273.20	0.034	8	140	1.38	1.06	13.2	265.30	265.33	7.90	8,660	34,640	1,470,000	2.4	
22841	F16S457.1	F16S458	152.30	148.96	156.45	0.022	8	153	2.56	3.56	44.6	149.26	149.36	7.19	91,510	249,500	1,180,000	21.1	
22837	F16S442.1	F16S457	163.50	152.30	158.99	0.032	8	350	3.83	2.63	32.9	152.52	152.75	6.47	90,525	247,100	1,420,000	17.4	
22836	F16S417.1	F16S442	198.85	163.50	169.49	0.101	8	350	4.39	2.39	31.8	163.70	164.00	5.79	87,475	239,000	2,130,000	11.2	
22803	F16S413.1	F16S417	208.65	198.85	205.84	0.070	8	140	0.17	1.87	23.4	199.01	199.01	6.83	2,450	9,800	2,110,000	0.5	
22823	F16S440.1	F16S417	207.10	198.85	205.84	0.103	8	80	3.72	1.87	25.0	199.01	199.22	6.83	52,595	148,964	2,160,000	6.9	
22804	F16S502.1	F16S440	209.00	207.10	213.09	0.010	8	199	2.46	2.52	33.6	207.31	207.40	5.78	52,595	148,964	650,000	22.9	
22805	F16S420.1	F16S502	228.15	209.00	219.34	0.144	8	133	0.08	2.52	31.5	209.21	209.21	10.13	1,795	7,180	3,030,000	0.2	
22822	F16S421.1	F16S420	261.56	228.15	235.14	0.566	8	59	0.41	0.83	10.4	228.22	228.22	6.92	1,795	7,180	6,000,000	0.1	
22821	F16S422.1	F16S421	263.13	261.56	268.55	0.010	8	157	0.36	0.90	11.3	261.64	261.64	6.91	1,795	7,180	790,000	0.9	
22820	F16S423.1	F16S422	269.92	263.13	268.12	0.070	8	97	0.22	0.90	11.3	263.21	263.21	4.91	1,100	4,400	2,110,000	0.2	
22806	F16S600.1	F16S502	241.18	209.00	219.34	0.134	8	240	2.23	2.52	31.5	209.21	209.29	10.13	49,750	142,478	2,920,000	4.9	
5459130	F16S598.1	F16S600	246.05	241.18	246.74	0.055	8	88	4.01	1.63	20.4	241.32	241.57	5.42	48,785	140,238	1,870,000	7.5	
5459133	F16S601.1	F16S598	253.18	246.05	252.49	0.032	8	225	1.60	1.64	20.6	246.19	246.23	6.30	19,000	72,622	1,420,000	5.1	
5459135	F16S599.1	F16S601	258.15	253.18	266.49	0.031	8	159	2.05	1.31	16.4	253.29	253.35	13.20	17,635	68,475	1,410,000	4.9	
5459136	F16S602.1	F16S599	260.85	258.15	268.24	0.020	8	136	0.08	1.28	16.1	258.26	258.26	9.98	665	2,660	1,120,000	0.2	
5531219	F16S664.1	F16S599	262.50	258.15	268.24	0.031	8	140	1.90	1.28	16.1	258.26	258.31	9.98	15,870	62,866	1,400,000	4.5	
5531221	F16S665.1	F16S664	267.43	262.50	274.99	0.040	8	124	1.95	1.25	15.6	262.60	262.66	12.38	15,515	61,705	1,590,000	3.9	
5531211	F16S656.1	F16S598	248.67	246.08	252.49	0.009	8	287	2.27	1.95	24.4	246.24	246.32	6.25	28,615	97,145	750,000	13.0	
5531182	F16S661.1	F16S656	249.42	248.67	273.49	0.005	8	137	1.87	2.15	26.8	248.85	248.90	24.64	25,845	90,923	590,000	15.4	
5531194	F16S658.1	F16S661	251.99	249.42	270.49	0.008	8	312	1.57	2.03	25.4	249.59	249.63	20.90	25,845	90,923	720,000	12.6	
5531196	F16S660.1	F16S658	252.92	251.99	264.99	0.010	8	94	1.64	1.86	23.3	252.15	252.19	12.84	23,855	86,032	790,000	10.9	
5531201	F16S659.1	F16S660	254.60	252.92	268.24	0.010	8	163	2.30	1.78	22.2	253.07	253.15	15.17	23,855	86,032	810,000	10.6	
5531198	F16S652.1	F16S659	255.53	254.60	266.24	0.008	8	124	2.06	1.93	24.1	254.76	254.83	11.48	23,855	86,032	690,000	12.5	
5531176	F16S653.1	F16S652	260.11	255.53	271.49	0.049	8	94	1.50	1.84	23.0	255.68	255.72	15.80	21,295	79,222	1,760,000	4.5	
5531177	F16S654.1	F16S653	266.27	260.11	272.24	0.036	8	171	2.36	1.32	16.5	260.22	260.31	12.02	20,725	77,627	1,510,000	5.1	
22785	F16S387.1	F16S654	279.00	266.44	273.49	0.038	8	331	2.33	1.28	16.1	266.55	266.63	6.94	19,815	75,020	1,550,000	4.8	
22786	F16S388.1	F16S387	284.25	279.00	283.99	0.019	7	282	2.70	1.43	20.5	279.12	279.23	4.87	17,700	68,676	760,000	9.0	
22867	F16S389.1	F16S388	286.05	284.25	290.24	0.006	7	282	1.80	1.79	25.6	284.40	284.45	5.84	15,820	62,703	440,000	14.3	
22787	F16S348.1	F16S389	308.50	286.05	294.04	0.084	7	268	0.13	1.67	23.8	286.19	286.19	7.85	1,430	5,720	1,620,000	0.4	

CITY OF SAN DIEGO
HYDRAULIC MODEL RESULTS TABLE
BASIN F16S674
2012 DWF AS-BUILT

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	AVG. FLOW (GPD)	MAX. FLOW (GPD)	FULL CAPACITY (GPD)	MAX. Q/CAP (%)	TASK AREA
22788	F16S391.1	F16S389	289.35	286.05	294.04	0.014	7	231	1.10	1.67	23.8	286.19	286.21	7.85	12,605	50,420	670,000	7.5	
22749	F16S345.1	F16S391	291.02	289.35	296.34	0.004	7	379	1.40	1.60	22.9	289.48	289.51	6.85	10,405	41,620	370,000	11.2	
22748	F16S344.1	F16S345	297.60	291.02	297.01	0.043	7	153	0.74	1.54	21.9	291.15	291.16	5.86	7,480	29,920	1,160,000	2.6	
22747	F16S346.1	F16S344	301.50	297.60	306.59	0.030	7	131	1.06	1.01	14.4	297.68	297.70	8.90	5,825	23,300	960,000	2.4	
22750	F16S347.1	F16S346	312.39	301.50	310.49	0.036	7	301	0.69	1.00	14.2	301.58	301.59	8.90	3,695	14,780	1,060,000	1.4	
22751	F16S350.1	F16S347	321.33	312.39	318.37	0.039	7	231	0.52	0.91	13.0	312.47	312.47	5.91	2,465	9,860	1,100,000	0.9	
5531180	F16S655.1	F16S652	257.36	255.53	271.49	0.007	8	249	0.15	1.84	23.0	255.68	255.68	15.80	2,155	8,620	680,000	1.3	
5531215	F16S662.1	F16S656	255.00	248.67	273.49	0.124	8	51	0.09	1.90	23.7	248.83	248.83	24.66	1,235	4,940	2,810,000	0.2	
5531217	F16S663.1	F16S662	262.38	255.00	277.99	0.154	8	48	0.29	0.83	10.4	255.07	255.07	22.92	1,235	4,940	3,130,000	0.2	
22824	F16S441.1	F16S417	204.17	198.85	205.84	0.054	8	98	2.14	1.87	25.0	199.01	199.08	6.83	30,095	100,190	1,560,000	6.4	
22825	F16S439.1	F16S441	213.35	204.17	210.16	0.060	8	153	3.12	1.40	17.6	204.29	204.44	5.87	30,095	100,190	1,950,000	5.1	
22819	F16S438.1	F16S439	248.15	213.35	227.34	0.120	8	290	0.45	1.37	17.1	213.46	213.47	13.88	4,075	16,300	2,760,000	0.6	
22818	F16S429.1	F16S438	264.15	248.15	254.14	0.080	8	200	0.34	0.88	11.0	248.22	248.22	5.91	1,610	6,440	2,250,000	0.3	
22826	F16S443.1	F16S439	217.40	213.35	227.34	0.014	8	285	2.61	1.68	21.0	213.49	213.60	13.85	25,455	89,992	950,000	9.5	
22827	F16S449.1	F16S443	236.57	217.40	239.39	0.139	8	138	0.18	1.67	20.9	217.54	217.54	21.85	2,125	8,500	2,970,000	0.3	
22828	F16S444.1	F16S449	261.12	236.57	246.56	0.123	8	200	0.28	0.84	10.5	236.64	236.64	9.92	1,225	4,900	2,790,000	0.2	
22835	F16S450.1	F16S443	218.26	217.40	239.39	0.004	8	215	1.62	2.21	27.6	217.58	217.63	21.80	22,495	82,487	500,000	16.5	
22833	F16S453.1	F16S450	225.08	218.26	228.25	0.062	8	110	1.18	2.05	25.7	218.43	218.45	9.82	19,510	74,129	1,980,000	3.7	
22832	F16S448.1	F16S453	243.73	225.08	231.07	0.084	8	222	2.56	1.19	14.9	225.18	225.28	5.89	19,510	74,129	2,310,000	3.2	
22831	F16S447.1	F16S448	250.73	243.73	249.72	0.020	8	350	1.85	1.36	17.0	243.84	243.90	5.88	16,990	66,457	1,120,000	5.9	
22829	F16S435.1	F16S447	260.20	250.73	259.72	0.036	8	262	1.43	1.36	17.0	250.84	250.87	8.87	13,035	52,140	1,510,000	3.5	
22816	F16S434.1	F16S435	265.70	260.20	271.19	0.030	8	184	1.60	1.15	14.4	260.30	260.34	10.89	11,525	46,100	1,380,000	3.3	
22815	F16S433.1	F16S434	271.26	265.70	271.69	0.022	8	256	1.04	1.14	14.3	265.80	265.81	5.89	7,450	29,800	1,170,000	2.5	
22813	F16S431.1	F16S433	273.16	271.26	277.25	0.010	8	190	0.69	1.07	13.4	271.35	271.36	5.90	4,480	17,920	790,000	2.3	
22812	F16S430.1	F16S431	273.92	273.16	279.15	0.004	8	190	0.52	1.04	13.1	273.25	273.25	5.90	3,235	12,940	500,000	2.6	
22811	F16S428.1	F16S430	274.88	273.92	280.91	0.004	8	240	0.30	1.07	13.4	274.01	274.01	6.90	1,900	7,600	500,000	1.5	
22810	F16S424.1	F16S428	275.52	274.88	282.87	0.004	8	160	0.15	0.96	12.0	274.96	274.96	7.91	810	3,240	500,000	0.6	
22814	F16S437.1	F16S433	272.00	271.26	277.25	0.004	8	185	0.20	1.07	13.4	271.35	271.35	5.90	1,310	5,240	500,000	1.0	
22879	F17S12.1	F16S434	270.50	265.70	271.69	0.016	8	300	0.52	1.14	14.3	265.80	265.80	5.89	3,720	14,880	1,010,000	1.5	
22878	F17S11.1	F17S12	271.40	270.50	276.49	0.006	8	150	0.26	0.97	12.2	270.58	270.58	5.91	1,415	5,660	610,000	0.9	
22817	F16S445.1	F16S435	259.77	260.20	271.19	-0.002	8	175	0.18	1.15	14.4	260.30	260.30	10.89	1,290	5,160	-390,000	-1.3	
22830	F16S446.1	F16S447	252.83	250.73	259.72	0.070	8	30	0.04	1.36	17.0	250.84	250.84	8.87	345	1,380	2,110,000	0.1	
22834	F16S452.1	F16S450	218.52	218.26	228.25	0.004	8	65	0.14	2.05	25.7	218.43	218.43	9.82	2,300	9,200	500,000	1.8	
22843	F16S460.1	F16S649	158.98	146.72	156.41	0.075	8	164	0.44	4.24	53.0	147.07	147.08	9.34	18,905	72,339	2,180,000	3.3	
22844	F16S461.1	F16S460	174.00	158.98	164.99	0.114	8	132	2.63	1.16	14.6	159.08	159.18	5.91	18,905	72,339	2,690,000	2.7	
22846	F16S585.1	F16S461	178.91	174.00	179.99	0.030	8	162	1.31	1.10	13.8	174.09	174.12	5.90	8,785	35,140	1,390,000	2.5	
22847	F16S464.1	F16S585	180.52	178.91	185.00	0.015	8	107	0.75	1.08	13.5	179.00	179.01	6.00	4,805	19,220	970,000	2.0	
5102490	F16S569.1	F16S585	181.95	178.91	185.00	0.015	8	202	0.62	1.08	13.5	179.00	179.01	6.00	3,980	15,920	980,000	1.6	
22772	F16S378.1	F16S569	187.08	181.95	192.00	0.015	8	342	0.70	0.98	12.3	182.03	182.04	9.97	3,980	15,920	970,000	1.6	
22777	F16S374.1	F16S378	193.74	187.08	194.67	0.042	8	159	0.70	0.98	12.3	187.16	187.17	7.51	3,980	15,920	1,630,000	1.0	

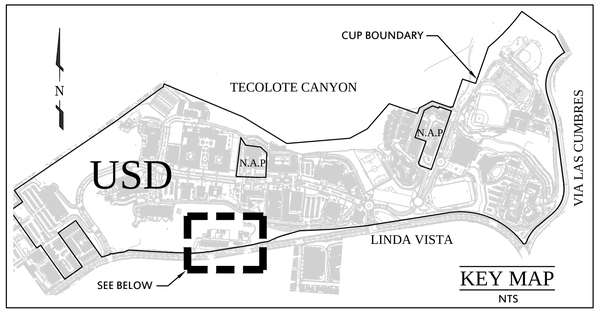
TOTAL LENGTH (MILES):	3.20	LENGTH OF PIPE - d/D < 50% (MILES):	3.14	LENGTH OF PIPE - Q/CAP < 50% (MILES):	3.20
LENGTH WEIGHTED Q/CAP:	7.5	LENGTH OF PIPE - d/D 50 - 75% (MILES):	0.06	LENGTH OF PIPE - Q/CAP 50 - 75% (MILES):	0.00
LENGTH WEIGHTED d/D:	22.0	LENGTH OF PIPE - d/D 75 - 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP 75 - 100% (MILES):	0.00

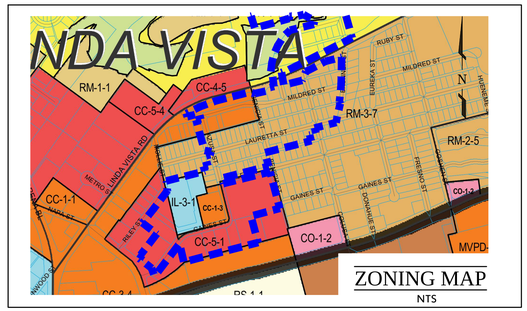
CITY OF SAN DIEGO
HYDRAULIC MODEL RESULTS TABLE
BASIN F16S674
2012 DWF AS-BUILT

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	AVG. FLOW (GPD)	MAX. FLOW (GPD)	FULL CAPACITY (GPD)	MAX. Q/CAP (%)	TASK AREA

LENGTH WEIGHTED HGL BELOW RIM (FT): 9.72 LENGTH OF PIPE - d/D > 100% (MILES): 0.00 LENGTH OF PIPE - Q/CAP > 100% (MILES): 0.00

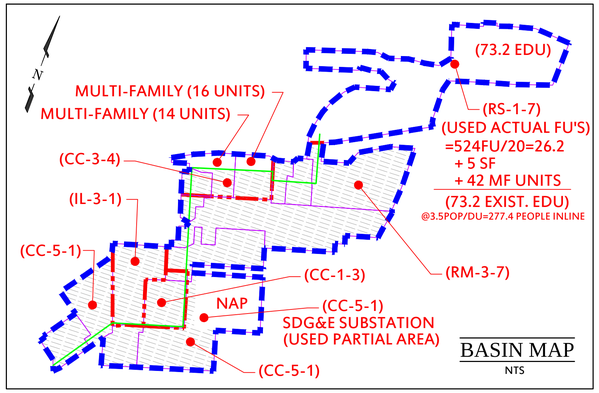
Note: Boxed records indicate condition assessed segments.

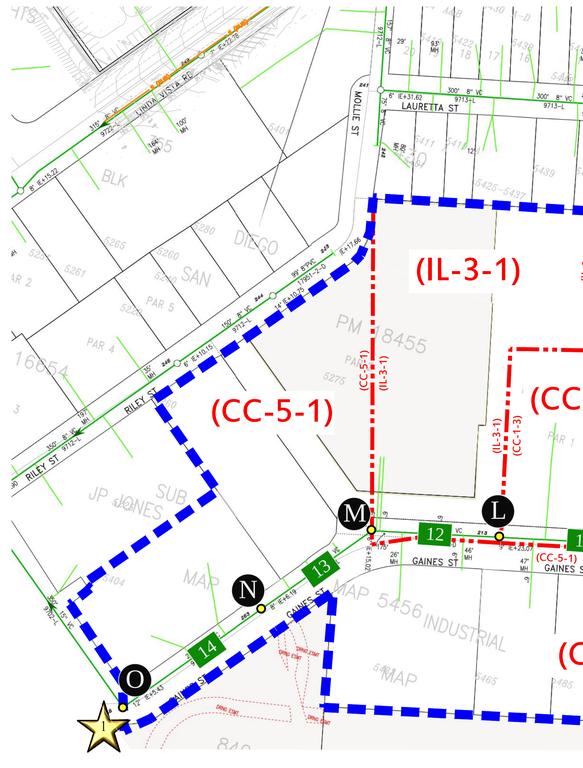




RS-1-7 RM-3-7 CC-5-1 CC-3-4 CC-1-3 IL-3-1

(REPRESENTS APPLICABLE ZONING USED IN THIS OFFSITE SEWER STUDY)





LEGEND

- EXISTING SEWER (PUBLIC) ONSITE
- EXISTING SEWER (PVT) ONSITE
- EXISTING SEWER (PUBLIC) OFFSITE
- EXISTING SEWER MANHOLE (PUBLIC)
- REACH ANALYSIS (SEE TABLE BELOW)
- SEWER BASIN
- PUBLIC SEWER REACH (SEE TABLE BELOW)
- ZONING DIVIDE LINE (SEE ZONING MAP THIS SHT.)
- POINT-OF-COMPARISON
- PROPOSED CUP PROJECT

22 NEW ACADEMIC/ADMINISTRATIVE BUILDING
23 NEW HOUSING/PARKING STRUCTURE
25 NEW ACADEMIC/ADMINISTRATIVE BUILDING
26 ENGINEERING EXPANSION OF LOMA HALL
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EXHIBIT 'D' - OFFSITE SEWER BASIN MAP (05-09-16)

X:\PROJECTS\0059 - USD MASTER PLAN (MWSG)\ENGR\REPORTS\SEWER STUDY (OFFSITE)\CAD EXHIBIT\BACKUP\0059 USD PROP SEWER MAP_OFFSITE.DW Plotted by: Mike

SEWER GENERATION TABLE (EXISTING CONDITIONS)

LINE	FROM MH ID	TO MH ID	GROSS AREA (Acres)	NET AREA (Acres)	POP. INLINE (Table 1-1)	SERVED TOTAL	PEAK DESIGN FLOW PEAK/AVG RATIO	M.G.D.	CFS	LINE SIZE (inches)	DESIGN SLOPE (%)	dn(FT) n= 0.013	dn/D	VELOCITY (fps)
1	A	B	-	-	256.2	256.2	3.81	0.078	0.121	8	10.99	0.08	0.12	5.2
2	B	C	4.1	3.3	365.4	621.6	2.90	0.144	0.223	7	9.50	0.12	0.21	6.0
3	C	D	0.8	0.7	74.7	696.3	2.84	0.158	0.245	8	1.69	0.18	0.27	3.3
4	D	E	0.5	0.4	49.1	745.4	2.80	0.167	0.258	8	1.70	0.18	0.27	3.3
5	E	F	0.8	0.7	58.8	MULTI-FAMILY WITHIN COMMERCIAL ZONE								
			-	-	56.0	860.1	2.66	0.183	0.283	8	1.70	0.19	0.29	3.4
6	F	G	0.5	0.4	37.8	MULTI-FAMILY WITHIN COMMERCIAL ZONE								
			-	-	49.0	946.9	2.55	0.193	0.299	7	1.70	0.21	0.36	3.5
7	G	H	0.6	0.5	20.0	SPLIT ZONING (SEE BELOW)								
			0.4	0.3	33.6	1,000.5	2.50	0.200	0.310	7	6.03	0.15	0.26	5.6
8	H	I	5.8	4.6	517.3	1,517.8	2.38	0.289	0.447	7	2.10	0.24	0.41	4.2
9	I	J	2.4	2.0	219.1	SPLIT ZONING (SEE BELOW)								
			0.2	0.1	6.0	1,742.9	2.33	0.325	0.503	7	1.61	0.28	0.48	4.0
10	J	K	(0)	(0)	0.0	1,742.9	2.33	0.325	0.503	7	0.40	0.45	**0.77**	2.3
11	K	L	1.5	1.2	52.9	SPLIT ZONING (SEE BELOW)								
			2.8	2.3	99.3	1,895.0	2.30	0.349	0.540	8	0.48	0.39	**0.59**	2.6
12	L	M	2.6	2.1	129.6	SPLIT ZONING (SEE BELOW)								
			1.1	0.9	38.1	2,062.8	2.28	0.377	0.583	8	4.60	0.21	0.32	6.0
13	M	N	2.1	1.7	73.2	2,136.0	2.27	0.388	0.601	8	4.39	0.22	0.33	6.0
14	N	O	1.2	1.0	60.6	2,196.6	2.26	0.397	0.614	15	0.31	0.35	0.28	2.2
NOTES:					2,196.6	(CHECK)							(<0.5?)	(>2fps?)

1. THE FOLLOWING DENSITY CONVERSION FACTORS WERE USED IN THE CALCULATIONS NOTED ABOVE BASED ON THE CITY OF SAN DIEGO SEWER DESIGN GUIDE TABLE 1-1

ZONE	EQUIVALENT POPULATION (POP/NET AC)	
RS-1-7	31.5	
RM-3-7	111.8	
SCHOOLS	31.2	(HOWEVER, USED ACTUAL FIXTURE UNITS (524) AND CONVERTED TO EDU'S (1FU=20EDUS) + 47 EXISTING EDU'S)
COMMERCIAL	43.7 (*)	(ALL EXISTING COMMERCIAL USES ARE SINGLE STORY EXCEPT WHERE NOTED (BLUE) ABOVE)
		(EXISTING MULTI-FAMILY HOUSING WITHIN COMMERCIAL ZONE - 30 UNITS TOTAL INTO 2 REACHES)
INDUSTRIAL	62.5 (*)	(ALL EXISTING INDUSTRIAL USES ARE SINGLE STORY NOTED HEREON)
(*) PER FLOOR OF BUILDING		

2. NO FLOW GENERATED IN THIS REACH (I.E. NO ADDITIONAL LATERALS)
   (0) NO FLOW GENERATED IN THIS REACH (I.E. NO SEWER LATERAL)
3. SDG&E SUBSTATION
   (SDG&E SUBSTATION - ONLY INCLUDED PART OF SITE WITH STRUCTURE, NOT ENTIRE SITE)
4. NET AREA REPRESENTED ABOVE IS 0.8*GROSS AREA

SEWER GENERATION TABLE (PROPOSED CONDITIONS)

LINE	FROM MH ID	TO MH ID	GROSS AREA (Acres)	NET AREA (Acres)	POP. INLINE (Table 1-1)	SERVED TOTAL	PEAK DESIGN FLOW PEAK/AVG RATIO	M.G.D.	CFS	LINE SIZE (inches)	DESIGN SLOPE (%)	dn(FT) n= 0.013	dn/D	VELOCITY (fps)
1	A	B	-	-	532.5	532.5	2.97	0.127	0.196	8	10.99	0.10	0.15	6.0
2	B	C	4.1	3.3	365.4	898.0	2.60	0.187	0.289	7	9.50	0.13	0.22	6.4
3	C	D	0.8	0.7	74.7	972.6	2.53	0.197	0.304	8	1.69	0.20	0.30	3.5
4	D	E	0.5	0.4	49.1	1,021.7	2.49	0.204	0.315	8	1.70	0.20	0.30	3.5
5	E	F	0.8	0.7	58.8	MULTI-FAMILY WITHIN COMMERCIAL ZONE								
			-	-	56.0	1,136.5	2.46	0.224	0.347	8	1.70	0.21	0.32	3.6
6	F	G	0.5	0.4	37.8	MULTI-FAMILY WITHIN COMMERCIAL ZONE								
			-	-	49.0	1,223.2	2.45	0.239	0.370	7	1.70	0.23	0.39	3.7
7	G	H	0.6	0.5	20.0	SPLIT ZONING (SEE BELOW)								
			0.4	0.3	33.6	1,276.8	2.43	0.249	0.385	7	6.03	0.17	0.29	6.0
8	H	I	5.8	4.6	517.3	1,794.1	2.32	0.333	0.516	7	2.10	0.26	0.45	4.4
9	I	J	2.4	2.0	219.1	SPLIT ZONING (SEE BELOW)								
			0.2	0.1	6.0	2,019.2	2.29	0.370	0.572	7	1.61	0.30	**0.51**	4.1
10	J	K	(0)	(0)	0.0	2,019.2	2.29	0.370	0.572	7	0.40	0.46	**0.79**	**1.9**
11	K	L	1.5	1.2	52.9	SPLIT ZONING (SEE BELOW)								
			2.8	2.3	99.3	2,171.4	2.26	0.393	0.609	8	0.48	0.42	**0.63**	2.6
12	L	M	2.6	2.1	129.6	SPLIT ZONING (SEE BELOW)								
			1.1	0.9	38.1	2,339.1	2.23	0.418	0.647	8	4.60	0.23	0.35	6.2
13	M	N	2.1	1.7	73.2	2,412.3	2.22	0.429	0.664	8	4.39	0.23	0.35	6.1
14	N	O	1.2	1.0	60.6	2,473.0	2.21	0.438	0.678	15	0.31	0.37	0.30	2.3
NOTES:					2,473.0	(CHECK)							(<0.5?)	(>2fps?)

1. THE FOLLOWING DENSITY CONVERSION FACTORS WERE USED IN THE CALCULATIONS NOTED ABOVE BASED ON THE CITY OF SAN DIEGO SEWER DESIGN GUIDE TABLE 1-1

ZONE	EQUIVALENT POPULATION (POP/NET AC)	
RS-1-7	31.5	
RM-3-7	111.8	
SCHOOLS	31.2	(USED NEW FIXTURE UNITS (2499) +524 (EXISTING) AND CONVERTED TO EDU'S (1FU=20EDUS) + 1 EXISTING EDU TO REMAIN)
COMMERCIAL	43.7 (*)	(ALL EXISTING COMMERCIAL USES ARE SINGLE STORY EXCEPT WHERE NOTED (BLUE) ABOVE)
		(EXISTING MULTI-FAMILY HOUSING WITHIN COMMERCIAL ZONE - 30 UNITS TOTAL INTO 2 REACHES)
INDUSTRIAL	62.5 (*)	(ALL EXISTING INDUSTRIAL USES ARE SINGLE STORY NOTED HEREON)
(*) PER FLOOR OF BUILDING		

2. NO FLOW GENERATED IN THIS REACH (I.E. NO ADDITIONAL LATERALS)
   (0) NO FLOW GENERATED IN THIS REACH (I.E. NO SEWER LATERAL)
3. SDG&E SUBSTATION
   (SDG&E SUBSTATION - ONLY INCLUDED PART OF SITE WITH STRUCTURE, NOT ENTIRE SITE)
4. NET AREA REPRESENTED ABOVE IS 0.8*GROSS AREA

KETTLER LEWECK ENGINEERING — *EXISTING*

CAUTION: ONLY FOR CIRCULAR

Input					Results					Check	
Description	Slope (ft/ft)	Discharge (cfs)	Pipe Dia. (ft)	Manning's Coefficient	Sc (ft/ft)	Velocity (fps)	Vc (fps)	Depth (ft)	Dc (ft)	Check for Depth>1.8	Max. Possible Dischage (cfs)
1	0.110	0.121	0.67	0.013	0.0056	5.2	1.81	0.08	0.16	1 OKAY	4.28
2	0.095	0.223	0.58	0.013	0.0066	6.0	2.30	0.12	0.23	2 OKAY	2.79
3	0.017	0.245	0.67	0.013	0.0062	3.3	2.28	0.18	0.23	2 OKAY	1.68
4	0.017	0.258	0.67	0.013	0.0062	3.3	2.32	0.18	0.24	2 OKAY	1.69
5	0.017	0.283	0.67	0.013	0.0062	3.4	2.39	0.19	0.25	2 OKAY	1.69
6	0.017	0.299	0.58	0.013	0.0068	3.5	2.51	0.21	0.27	3 OKAY	1.18
7	0.060	0.310	0.58	0.013	0.0068	5.6	2.54	0.15	0.27	2 OKAY	2.22
8	0.021	0.447	0.58	0.013	0.0074	4.2	2.87	0.24	0.33	3 OKAY	1.31
9	0.016	0.503	0.58	0.013	0.0078	4.0	3.00	0.28	0.35	3 OKAY	1.15
10	0.004	0.503	0.58	0.013	0.0078	2.3	3.00	0.45	0.35	4 OKAY	0.57
11	0.005	0.540	0.67	0.013	0.0068	2.6	2.92	0.39	0.35	3 OKAY	0.90
12	0.046	0.583	0.67	0.013	0.0069	6.0	3.00	0.21	0.36	2 OKAY	2.77
13	0.044	0.601	0.67	0.013	0.0070	6.0	3.03	0.22	0.37	2 OKAY	2.71
14	0.003	0.614	1.25	0.013	0.0046	2.2	2.52	0.35	0.32	2 OKAY	3.85

KETTLER LEWECK ENGINEERING — *PROPOSED*

CAUTION: ONLY FOR CIRCULAR

Input					Results					Check	
Description	Slope (ft/ft)	Discharge (cfs)	Pipe Dia. (ft)	Manning's Coefficient	Sc (ft/ft)	Velocity (fps)	Vc (fps)	Depth (ft)	Dc (ft)	Check for Depth>1.8	Max. Possible Dischage (cfs)
1	0.110	0.196	0.67	0.013	0.0061	6.0	2.13	0.10	0.21	2 OKAY	4.28
2	0.095	0.289	0.58	0.013	0.0067	6.4	2.48	0.13	0.26	2 OKAY	2.79
3	0.017	0.304	0.67	0.013	0.0063	3.5	2.44	0.20	0.26	2 OKAY	1.68
4	0.017	0.315	0.67	0.013	0.0063	3.5	2.46	0.20	0.26	2 OKAY	1.69
5	0.017	0.347	0.67	0.013	0.0063	3.6	2.54	0.21	0.28	2 OKAY	1.69
6	0.017	0.370	0.58	0.013	0.0070	3.7	2.69	0.23	0.30	3 OKAY	1.18
7	0.060	0.385	0.58	0.013	0.0071	6.0	2.72	0.17	0.30	2 OKAY	2.22
8	0.021	0.516	0.58	0.013	0.0078	4.4	3.03	0.26	0.36	3 OKAY	1.31
9	0.016	0.572	0.58	0.013	0.0082	4.1	3.16	0.30	0.37	3 OKAY	1.15
10	0.004	0.572	0.58	0.013	0.0082	1.9	3.16	0.46	0.37	8 OKAY	0.57
11	0.005	0.609	0.67	0.013	0.0070	2.6	3.04	0.42	0.37	4 OKAY	0.90
12	0.046	0.647	0.67	0.013	0.0072	6.2	3.11	0.23	0.38	2 OKAY	2.77
13	0.044	0.664	0.67	0.013	0.0073	6.1	3.14	0.23	0.39	3 OKAY	2.71
14	0.003	0.678	1.25	0.013	0.0047	2.3	2.62	0.37	0.33	2 OKAY	3.85

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APPENDIX C

CITY OF SAN DIEGO SEWER DESIGN GUIDE, 2013 (Excerpts only)

streets, in accordance with Council Policies 400-13 and 400-14 (ATTACHMENT 1).

c. As development or redevelopment occurs, existing sewers in environmentally-sensitive areas shall be relocated to streets or other appropriate areas where possible (Ref. Municipal Code §144.0240(a)).

d. Where an existing canyon sewer main has capacity to serve a new development, the number of sewer mains penetrating the canyon from a new development shall be limited. This shall require coordination with other new developments wanting to access the same canyon sewer main. Sewer main access roads shall be provided to the point of connection and to the extent of all new manholes, and shall be coordinated with other access requirements, such as equestrian, pedestrian, multiple-use recreational trails, or storm water detention/retention/remediation facilities. However, all sewer access in canyons or other environmentally-sensitive lands shall be designed in conformance with Council Policies 400-13 and 400-14 (ATTACHMENT 1).

e. To assist in determining where to direct sewer flow or where new sewer facilities may be located within canyons and environmentally-sensitive lands, a cost-benefit analysis shall be conducted per Council Policy 400-14 (ATTACHMENT 1).

f. Sewer access roads that penetrate into canyons shall not exceed the maximum allowable slope (Ref. Subsection 3.2.3.4c) and shall be aligned along the centerline of the sewer main as much as practicable.

g. To assist in determining where new sewer facilities and sewer access roads may be located within canyons and environmentally-sensitive lands, a sewer maintenance plan shall be prepared in accordance with Council Policy 400-13 (ATTACHMENT 1).

1.3 PLANNING STUDY

1.3.1 General Requirements

For a new development and/or redevelopment, a sewer planning study for new sewer facilities shall be prepared, as directed by the Senior Civil Engineer, to demonstrate that there are no negative impacts on the existing sewer system. A minimum of three (3) copies of the planning study shall be submitted, each stamped and wet/electronically signed by a Civil Engineer registered in the State of California. Each study shall be bound and formatted in accordance with this *Sewer Design Guide* and/or the *Clean Water Program (CWP) Guidelines*.

The final approved sewer study shall also be submitted electronically in PDF format.

For new development, the planning study must be approved prior to approval of the tentative map. The study shall include all items listed in the minimum intake standards for sewer studies and subsequent reviews shall include an explanation for each review comment.

1.3.1.1 Capacity

For new development and/or redevelopment, the planning study shall address the capacity of all sewer collection and trunk sewer systems that will be impacted downstream of the new development and/or redevelopment and shall demonstrate that sewer capacity is available in those systems to accommodate the new development and/or redevelopment (refer to Section 1.7). Authorization and approval to impact any downstream sewer system must be obtained from the reviewing Senior Civil Engineer. If such downstream sewer system has already been identified as critical or sub-critical in a monitoring report, the Senior Civil Engineer may require additional field monitoring to determine if adequate capacity is available.

For an existing development and/or redevelopment, the planning study shall address the existing capacity within the existing sewer collection system, and identify all existing facilities whose capacity will be exceeded by projected sewage flows.

Where available capacity will be exceeded, the planning study shall propose upsizing of sewer facilities in accordance with Subsection 1.3.3.

Where applicable, the DESIGN ENGINEER shall incorporate into the community's existing master sewer plan, including zoning changes and other specific plans, the proposed sewer system amendments resulting from the drainage basin evaluation.

1.3.1.2 Drainage Basin

The planning study shall address the sewage generating potential of the entire drainage basin where the development is located. It shall also include current topographic maps of the entire drainage basin and any and all adjacent new developments for which a planning study has not yet been submitted and/or approved. The maps shall demonstrate that no adjacent development, including potential and existing pumped lands outside of the drainage basin and any lands outside of the incorporated boundaries of the City of San Diego with potential to be served but where no current master sewerage plan exists, will be precluded from obtaining sewer service. The planning study shall also show all proposed sewer system alignments (superimposed on planned

street alignments) and all potential points of entry of sewage from surrounding lands.

1.3.1.3 Depth of Mains

The planning study shall clearly identify all existing and/or proposed facilities which will exceed standard depths for sewer mains as defined in Subsection 2.2.1.5. In cases where proposed sewers will exceed 15 feet in depth, a request for design deviation (ATTACHMENT 2) must be submitted to the Water and Sewer Development Review Senior Civil Engineer with the Sewer Planning Study. A design deviation will only be approved in exceptional cases and when adequate justification is provided. Mains more than 20 feet deep shall also require approval from the Wastewater Collection Division Senior Civil Engineer.

1.3.1.4 Existing Studies

The City of San Diego maintains an extensive library of sewer planning studies which were prepared for lands throughout the City. These studies are available for review at the Water and Sewer Development Section, Public Utilities Department. All studies are catalogued by subdivision or trunk sewer name. Logs of sewer flow study analyses for recently monitored trunk sewers and a map of sewers which meet the Regional Water Quality Control Board (RWQCB) criteria for being critical or sub-critical may also be viewed. In addition, information regarding proposed CIP projects within the vicinity of a given project may be requested. In many cases, an addendum or reference to one of the existing planning studies may be acceptable in lieu of an independent study. Concurrent with the preparation of planning studies for sewers proposed to connect to existing canyon sewer mains, a study of flow redirection per Council Policy 400-13 and a cost-benefit analysis per Council Policy 400-14 shall be prepared (Refer to ATTACHMENT 1). An existing analysis of redirection of flows and a cost-benefit analysis, as required by Council Policies 400-13 and 400-14 respectively, may be available for reference for various existing canyon sewers.

1.3.2 Flow Estimation

1.3.2.1 Land Use

Present or future allowable land use, whichever results in higher equivalent population, shall be used to generate potential sewage flows.

1.3.2.2 Flow Determination

Flow definitions and calculation procedures are listed below. All calculations shall be tabulated for each sewer main section (manhole to manhole) in the

format shown on Figure 1-2.

Equivalent Population: The equivalent population shall be calculated from zoning information (Ref. Section 1.6). For major new facilities such as high rise apartment buildings, flow rates (assuming one lateral) shall be checked based on the most current, adopted edition of the Uniform Plumbing Code. The most conservative flow rate shall govern.

Daily Per Capita Sewer Flow: The sewer flow for the equivalent population shall be 80 gallons per capita per day (gpcd).

Average Dry Weather Flow (ADWF): Equivalent populations shall be used to calculate the average dry weather flow. The average dry weather flow for each sewer main reach (manhole to manhole) shall be determined by multiplying the total accumulated equivalent population contributing to that reach by 80 gallons per capita per day:

Average Dry Weather Flow = (80 gpcpd) x (Equivalent Population)

Peaking Factor for Dry Weather Flow (PFDWF): The peaking factor is the ratio of peak dry weather flow to average dry weather flow. It is dependent upon the equivalent population within a tributary area. The tributary area is the area upstream of, and including, the current reach for the total flow in each reach of pipe. Figure 1-1, consisting of the table prepared by Holmes and Narver in 1960, shall be used to determine peaking factors for each tributary area. In no instance shall the dry weather flow peaking factor be less than 1.5.

Peak Dry Weather Flow (PDWF): The peak dry weather flow for each sewer main reach shall be determined by multiplying the average dry weather flow by the appropriate peaking factor (Note that peak dry weather flows are not algebraically cumulative as routed through the sewer system, i.e. the peak dry weather flow at any point shall be based on the equivalent population in the basin to that point (Ref. Figure 1-2).

Peak Dry Weather Flow = (Average Dry Weather Flow) x (Dry Weather Flow Peaking Factor)

Peaking Factor for Wet Weather Flow (PFWWF): The peaking factor for wet weather flow is the ratio of peak wet weather flow to peak dry weather flow. It is basin-specific and shall be based on essential information available at the time of the planning study. Information such as historical rainfall/sewage flow data, land use, soil data, pipe/manhole age, materials and conditions, groundwater elevations (post development), inflow and infiltration (I/I) studies, size, slope and densities of the drainage basin, etc., should be utilized in the wet weather analysis to estimate the peaking factor for wet weather. Upward adjustments shall be made in areas with expected high inflow and

infiltration (i.e. high ground water or in areas with lush landscaping schemes). Flow meters are installed throughout the City's sewer system. Flow data collected from these meters are available upon request. The objective of this analysis is to quantify the magnitude of peak wet weather flow with a 10-year return period on a statistical basis.

The Senior Civil Engineer overseeing the preparation of the planning study shall coordinate with the City Sewer Modeling Group for approval of the peaking factors to be used for design.

Peak Wet Weather Flow (PWWF): The peak wet weather flow (or design flow) for a gravity sewer main reach shall be determined by multiplying the peak dry weather flow (ref. Figure 1-2) by the appropriate wet weather peaking factor. The peak wet weather flow is the design flow for a gravity sewer main. It is determined at any point in the system based on the associated upstream average dry weather flow in the basis to that point times the peaking factor for wet weather.

Peak Wet Weather Flow = (Peak Dry Weather Flow) x (Wet Weather Peaking Factor)

1.3.3 Pipe Sizing Criteria

1.3.3.1 Hydraulic Requirements

Manning's formula for open-channel flows shall be used to calculate flows in gravity sewer mains. Manning's coefficient of roughness "n" shall be assumed to be 0.013 for all types of sewer pipe. Sewer grades shall be designed for velocities of 3 to 5 feet per second (fps) where possible. This is extremely important in areas where peak flow will not be achieved for many years. The minimum allowable velocity is 2 fps at calculated peak dry weather flow, excluding infiltration. Sewer mains that do not sustain 2 fps at peak flows shall be designed to have a minimum slope of 1 percent. Additional slope may be required by the Senior Civil Engineer where fill of varied depth is placed below the pipe in order to provide adequate slope after expected settlement occurs. The maximum allowable velocity shall be 10 fps and shall be avoided by adjusting slopes, by increasing the pipe diameter, or by utilizing a vertical curve transition to lower velocities per subsections 2.2.4 and 2.2.9.4. If the Senior Civil Engineer approves a velocity greater than 10 fps, the pipe shall be upgraded to SDR 18 PVC (standard dimension ratio polyvinyl chloride), concrete-encased VC (vitrified clay), or PVC sheet-lined reinforced concrete pipe.

1.3.3.2 Slope

Slope shall be calculated as the difference in elevation at each end of the pipe divided by the horizontal length of the pipe, and shall be a constant value between manholes.

1.3.3.3 Ratio of Depth of Flow to Pipe Diameter (d_n/D)

New sewer mains 15 inches and smaller in diameter shall be sized to carry the projected peak wet weather flow at a depth not greater than half of the inside diameter of the pipe (d_n/D not to exceed 0.5). New sewer mains 18 inches and larger shall be sized to carry the projected peak wet weather flow at a depth of flow not greater than 3/4 of the inside diameter of the pipe (d_n/D not to exceed 0.75).

1.3.3.4 Minimum Pipe Sizes

The size of a sewer pipe is defined as the inside diameter of the pipe. Sewer mains shall be a minimum of 8 inches in diameter in residential areas, and a minimum of 10 inches in commercial, industrial, and high-rise building areas.

1.3.4 Sewer Study Exhibit Criteria

The DESIGN ENGINEER's sewer study exhibits shall be used to evaluate hydraulics and to establish minimum street and easement widths. Therefore, these documents need to reflect depths and separation of mains from other utilities and improvements. Refer to the Minimum Intake Standards for Sewer Studies in Subsection 1.8.

1.3.5 Private On-Site Wastewater Treatment and Reuse

Refer to Attachment 6 for permitting guidelines of private on-site wastewater treatment and reuse in the City of San Diego.

1.4 SEPARATION OF MAINS

1.4.1 Horizontal Separation

1.4.1.1 Wet Utilities

The separation of water, sewer, reclaimed water mains, and storm drains shall comply with the *State of California Department of Health Services Criteria for the Separation of Water Mains and Sanitary Sewers*. At least 10 feet of horizontal separation shall be maintained between the nearest outer surfaces of sewer lines and potable water mains. More stringent separation requirements

APPENDIX D

CITY OF SAN DIEGO SPLASH MAPS

City of San Diego
PUBLIC UTILITIES
Water & Wastewater

Legend

SEWER [Gis]
- Sewer Air Vacuum Release Current Location
- Sewer Clean Out Current Location
- Sewer Lateral Current 100 Route - As-built Lateral
- Sewer Lateral Current 100 Route - Private Lateral
- Sewer Lateral Current Blowoff Airvalve Route - As-built Lateral
- Sewer Lateral Current Display 400 100 Route - As-built Lateral
- Sewer Main Current Route - As-built (not forced)
- Sewer Main Current Route - Operational (not forced)
- Sewer Main Current Route - Private Main
- Sewer Main Current Route - As-built (forced)
- Sewer Manhole Current Location - Dropped
- Sewer Manhole Current Location - Standard
- Sewer Plug Current Location
- Sewer Station Current Extent
- Sewer Valve Current Location

COMMON [Gis]
- Comfort Stop Current Sewer Location
- CP Anode Bed Current Sewer Location
- CP Rectifier Current Sewer Location
- CP Test Station Current Sewer Location
- FP Wire Current Sewer Route
- Flow Arrow Current Location
- Flow Arrow Current Location - Inside Inset
- Footprint Current Common Extent
- Jump Over Current Sewer Location
- Pressure Structure Current Sewer 400 Extent

LAND SPLASH [Gis]
- Easement Splash Drainage Extent
- Easement Splash General Util. Extent
- Easement Splash Private Street Extent
- Easement Splash Sewer Extent
- Easement Splash Water Extent

TELECOM [Gis]
- Conduit Current Fiber Route - FIBER

LAND [Land]
- Land Area Extent
- Parcel Area Extent
- Road Segment Alley - New Land
- Road Segment Arterial/Collector - New Land
- Road Segment Local Street - New Land
- Road Segment Minor Hwy/Major Road - New Land
- Road Segment Paper Street - New Land
- Road Segment Private Road - New Land
- Road Segment Speed Hump - New Land
- Road Segment Walkway - New Land

THOMAS BROTHER [Soup]
- Cultural Footprint Government Extent
- Cultural Point School University Location
- Cultural School Univty Footprint College University
- Hydrology Natural Line River Route
- Hydrology Natural Line Stream Route
- Hydrology Natural Poly Ocean Extent
- Hydrology Natural Poly River Extent
- Ownership Poly Environment Extent
- Ownership Poly School University Extent
- Ownership Recreation Poly Others Extent
- Ownership Recreation Poly Park Extent

OTHER [Soup]
- Railroad Route

0 Feet 100 Feet 200 Feet 300 Feet 400 Feet 500 Feet

City of San Diego Public Utilities
Water & Wastewater

Date Printed: 08-27-15

City of San Diego
PUBLIC UTILITIES
Water & Wastewater

Legend

SEWER [Gis]
- Sewer Lateral.Current 100 Route - As-built Lateral
- Sewer Main.Current Route - As-built (not forced)
- Sewer Main.Current Route - Private Main
- Sewer Main.Current Route - As-built (forced)
- Sewer Manhole.Current Location - Standard
- Sewer Meter.Current 400 Location
- Sewer Plug.Current Location
- Sewer Station.Current Extent

COMMON [Gis]
- Flow Arrow.Current Location
- Footprint.Current Common Extent
- Jump Over.Current Sewer Location
- Stabilizing Structure.Current Sewer 400 Extent

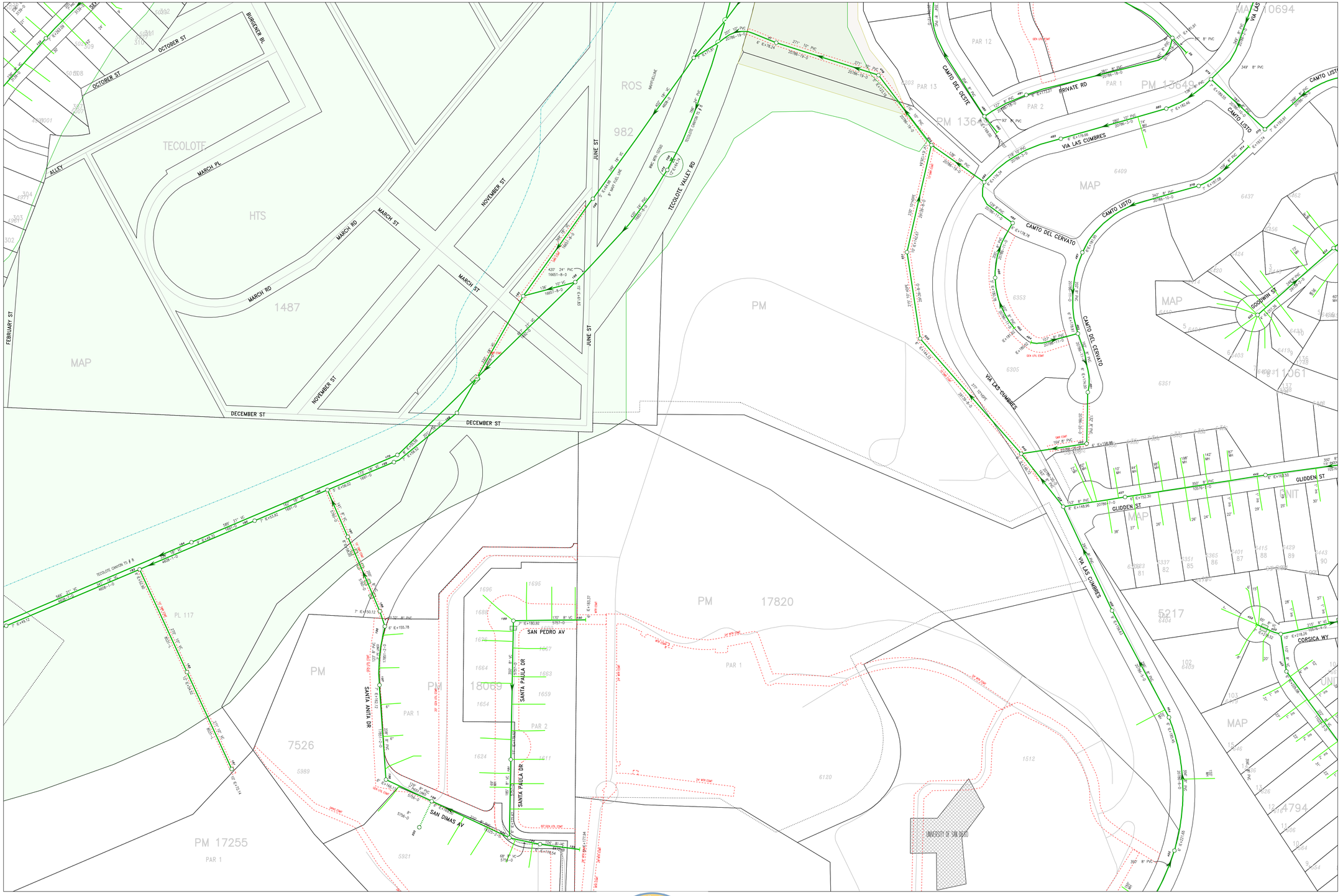
LAND-SPLASH [Gis]
- Easement Splash.Drainage Extent
- Easement Splash.General Util. Extent
- Easement Splash.Sewer Extent
- Easement Splash.Water Extent

TELECOM [Gis]
- Conduit.Current Fiber Route - FIBER

LAND [Land]
- Land Area.Extent
- Parcel Area.Extent
- Road Segment.Local Street - New Land
- Road Segment.Paper Street - New Land
- Road Segment.Private Road - New Land
- Road Segment.Speed Hump - New Land
- Road Segment.Walkway - New Land

THOMAS BROTHER [Soup]
- Cultural School Univsy Footprint.College University
- Hydrology Natural Line.River Route
- Hydrology Natural Line.Stream Route
- Hydrology Natural Poly.Ocean Extent
- Hydrology Natural Poly.River Extent
- Ownership Poly.Environment Extent
- Ownership Poly.School University Extent

OTHER [Soup]
- Railroad Route



0 Feet 60 Feet 120 Feet 180 Feet 240 Feet

City of San Diego Public Utilities
Water & Wastewater

Date Printed: 08-27-15

City of San Diego
PUBLIC UTILITIES
Water & Wastewater

Legend

SEWER [Gis]
- Sewer Lateral.Current 100 Route - As-built Lateral
- Sewer Lateral.Current 100 Route - Private Lateral
- Sewer Main.Current Route - As-built (not forced)
- Sewer Main.Current Route - Operational (not forced)
- Sewer Main.Current Route - Private Main
- Sewer Main.Current Route - As-built (forced)
- Sewer Manhole.Current Location - Dropped
- Sewer Manhole.Current Location - Standard
- Sewer Plug.Current Location

COMMON [Gis]
- Flow Arrow.Current Location
- Footprint.Current Common Extent
- Stabilizing Structure.Current Sewer 400 Extent

LAND-SPLASH [Gis]
- Easement Splash.Drainage Extent
- Easement Splash.General Util. Extent
- Easement Splash.Sewer Extent
- Easement Splash.Water Extent

TELECOM [Gis]
- Conduit.Current Fiber Route - FIBER

LAND [Land]
- Land Area.Extent
- Parcel Area.Extent
- Road Segment.Alley - New Land
- Road Segment.Arterial/Collector - New Land
- Road Segment.Local Street - New Land
- Road Segment.Minor Hwy/Major Road - New Land
- Road Segment.Paper Street - New Land
- Road Segment.Private Road - New Land
- Road Segment.Speed Hump - New Land

THOMAS BROTHER [Soup]
- Cultural School Univ Footprint,College University
- Hydrology Natural Line.River Route
- Hydrology Natural Line.Stream Route
- Hydrology Natural Poly.Ocean Extent
- Hydrology Natural Poly.River Extent
- Ownership Poly.School University Extent
- Ownership Recreation Poly.Others Extent

OTHER [Soup]
- Railroad.Route

0 Feet 60 Feet 120 Feet 180 Feet 240 Feet

City of San Diego Public Utilities
Water & Wastewater

Date Printed: 08-27-15

HELIX
Environmental Planning

University of San Diego Master Plan Update and Conditional Use Permit Amendment

Waste Management Plan

October-2016

Prepared for:
MW Steele Group
1805 Newton Avenue, Suite A
San Diego, CA 92113

Prepared by:
HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

WASTE MANAGEMENT PLAN

for the

UNIVERSITY OF SAN DIEGO MASTER PLAN UPDATE AND CONDITIONAL USE PERMIT AMENDMENT

Prepared for:
MW Steele Group
1805 Newton Avenue, Suite A
San Diego, CA 92113

Prepared by:
HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

October 2016

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ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
AMSL	above mean sea level
Applicant	University of San Diego, Campus
C&D	Construction and Demolition
CalRecycle	California Department of Resources Recycling and Recovery
CEQA	California Environmental Quality Act
CF	cubic foot/feet
City	City of San Diego
CIWMA	California Integrated Waste Management Act of 1989
CUP	Conditional Use Permit
CY	cubic yard(s)
DSD	Development Services Department
EIR	Environmental Impact Report
ESD	Environmental Services Department
FTE	full-time equivalent
I-	Interstate
IWMP	Integrated Waste Management Plan
lbs	pounds
LEED	Leadership in Energy and Environmental Design
Project	University of San Diego Master Plan Update
MHPA	Multi-habitat Planning Area
MPU	Master Plan Update
MSCP	Multiple Species Conservation Program
RPO	Resource Protection Ordinance
SCR	Substantial Conformance Review
SDMC	San Diego Municipal Code
SDP	Site Development Permit
SF	square foot/feet
SRRE	Source Reduction and Recycling Element
State	State of California
SWMC	Solid Waste Management Coordinator

ACRONYMS AND ABBREVIATIONS (cont.)

USD	University of San Diego
USGBC	U.S. Green Building Council
WDM	Waste Diversion Measure
WMP	Waste Management Plan

1.0 INTRODUCTION

1.1 PURPOSE OF THE REPORT

The purpose of this Waste Management Plan (WMP) is to identify the quantity of solid waste that would be generated during demolition, construction, and operation activities associated with the proposed University of San Diego (USD) Master Plan Update (MPU or Project) campus improvements and facilities, and to identify measures to reduce the potential impacts associated with management of such waste.

Proper separation and diversion of recyclable waste materials is required in order to divert each material type to a recycling/reuse facility with the highest possible diversion rate. As discussed further in Section 2.0, *Regulatory Framework*, in order to comply with City of San Diego's (City's) waste reduction ordinances and the waste diversion goals established in State Assembly Bill (AB) 341, MPU projects must achieve a 75 percent diversion rate during demolition and construction. The City's California Environmental Quality Act (CEQA) Significance Thresholds for solid waste identify a threshold of 1,500 tons of waste or more during construction and demolition (C&D) for direct solid waste impacts, and 60 tons of waste or more during C&D for potentially significant cumulative solid waste impacts (City 2011). The City Environmental Services Department's (ESD) *2016 Certified Construction & Demolition Recycling Facility Directory* (Appendix A; City 2016) provides guidance on identifying recycling/reuse facility locations, accepted materials, recycling/reuse rates, and associated disposal fees and/or the value of the materials accepted for recycling/reuse.

This WMP has been prepared consistent with applicable federal, State, and local laws, regulations, and standards pertinent to the USD MPU. Its goal is to implement an approach for managing waste that utilizes waste diversion measures to conserve landfill space, preserves environmental quality, and conserves natural resources. The WMP describes the project measures and design features that would reduce the amount of waste generated and how waste reduction and recycling goals would be achieved. Responsibility for ensuring ongoing WMP compliance would be under the direction of the Project Solid Waste Management Coordinator, as assigned by USD (Applicant).

1.2 PROJECT LOCATION

The land within the proposed MPU boundary includes approximately 180 acres devoted to university-related uses in the central portion of the City, in the community of Linda Vista. USD is located four miles north of downtown San Diego, approximately 0.5 mile east of Interstate (I-) 5 and 0.5 mile north of I-8 (Figure 1). The university is located within an unsectioned area of Township 16 South, Range 3 West, on the U.S. Geological Survey 7.5-minute La Jolla quadrangle map (Figures 2 and 3). Tecolote Canyon Natural Park forms the northern border of the proposed MPU boundary; Morena Boulevard is located to the west, with Via Las Cumbres on the east, and Linda Vista Road to the south. Elevations on campus range from approximately 50 feet above mean sea level (AMSL) to approximately 260 feet AMSL. With the exception of the steep, north-facing slopes along the northern campus border and the slopes on the western end of campus near Marian Way, the majority of the campus is developed and supports university facilities (buildings, parking lots, athletic fields, etc.) and associated landscaping.

1.3 PROJECT DESCRIPTION

In 1996, USD received approval of its existing Master Plan to guide the phased buildout of the campus through the year 2030. The City issued Conditional Use Permit (CUP)/Resource Protection Ordinance (RPO) Permit No. 92-0568 to allow USD to construct 23 conceptual projects and expand the population to 7,000 full-time equivalent (FTE) students. Two future study areas were also identified in the 1996 Master Plan. The sequence of the projects was not determined at that time in order to provide flexibility with regard to economics and academic needs. The 1996 Master Plan Environmental Impact Report (EIR; City 1996) was prepared to assess the short- and long-term, as well as cumulative, impacts of implementing the 1996 Master Plan and was certified in conjunction with the CUP approvals.

The 1996 Master Plan is a document that records the vision and goals of the physical campus. This vision for the campus is updated from time-to-time to reflect the changes in demographics and the economy that affect higher education. Most importantly, the 1996 Master Plan is required by the City as the basis for the university's CUP and to ensure the university's fulfillment of current regulations. Over the last several years, USD campus officials have been conducting vision planning and space planning exercises to address the future needs of the university. An update to the existing Master Plan is now proposed.

The proposed USD MPU provides a comprehensive revision of the 1996 Master Plan and Design Guidelines, as well as the campus' building space and infrastructure needs associated with increasing enrollment from 7,000 FTE students to 10,000 FTE students over the next 20+ years. The proposed USD MPU would to allow for the development of academic core/student service/support uses and athletics, recreation uses, and additional student housing. Parking supply expansions would also occur under the proposed MPU.

Among the projects outlined in the proposed MPU are 14 new projects (Figure 4 [projects numbered 17 through 30]), as well as 16 approved projects (projects numbered 1 through 16 but not shown on Figure 4) identified in the 1996 Master Plan EIR that have previous City review/approvals but remain unbuilt. The 14 project sites would allow for the construction of academic/administrative buildings, student housing, student services uses, athletics/athletic support/administrative buildings, parking, pedestrian circulation, and landscape improvements not contemplated in the 1996 Master Plan and related EIR. The 14 projects (Projects 17 through 30) are listed below.

17. Trails/Landscape Enhancements
18. Parking/Administrative
19. Plaza/Mall/Bridge
20. Academic/Administrative/Support
21. Academic/Administrative/Student Services Building
22. Academic/Administrative Building
23. Housing/Parking Structure
24. Housing/ Student Services/Parking

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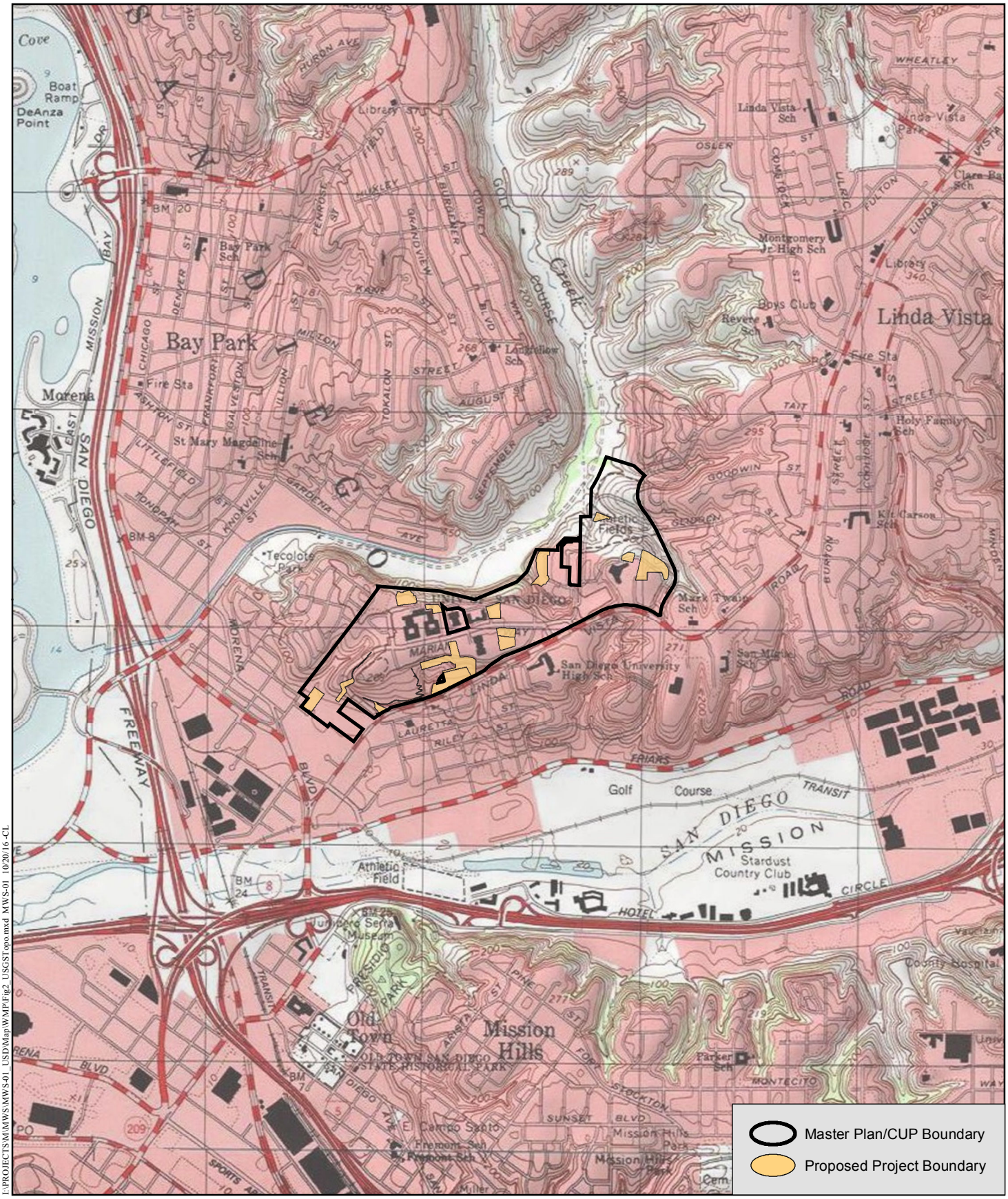
Regional Location Map

UNIVERSITY OF SAN DIEGO MASTER PLAN UPDATE

HELIX Environmental Planning

N 0 8 Miles

Figure 1



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Project Vicinity (USGS Topography)

UNIVERSITY OF SAN DIEGO MASTER PLAN UPDATE

HELIX Environmental Planning

N

0 2,000 Feet

Figure 2

Note: Compliance with existing City regulations to protect Environmentally Sensitive Lands within CUP Boundary would eliminate need for deed restrictions

Master Plan/CUP Boundary
Proposed Project Boundary
Existing Deed Restriction Area

New Proposed Projects #s 17-30

UNIVERSITY OF SAN DIEGO MASTER PLAN UPDATE

HELIX Environmental Planning

0 500 Feet

Figure 3

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Source: M.W. Steele Group, Inc. 2015

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Project Plan

UNIVERSITY OF SAN DIEGO MASTER PLAN UPDATE

Figure 4

HELIX Environmental Planning

25. Academic/Administrative /Parking Building
26. Engineering Expansion of Loma Hall; Academic/Administrative Building
27. Housing/Student Services
28. Athletics/Administrative Building
29. Facilities/Athletics Support
30. Student Housing/Student Services/Parking/Athletics

Design guidelines contained in the MPU would provide a comprehensive design framework to guide campus development. Other elements of the proposed MPU address the planning context of the campus, provide an enrollment and space analysis, and identify sustainability goals.

The above-described improvements would require the following entitlements: an amended CUP to allow for the continued institutional use, a Site Development Permit to allow impacts to ESL, and a Multi-habitat Planning Area (MHPA) Boundary Line Correction to shift already developed land out of the MHPA, which is the City's Multiple Species Conservation Program (MSCP preserve).

This report only analyzes the 14 projects (except for cumulative impacts) contained in the MPU since the other 16 projects have already been analyzed and approved by the City under the 1996 Master Plan. Table 1, *Master Plan Update Projects*, provides the uses that would be suitable for each of the 14 project sites and estimated square footages. The projected uses may change over time depending on campus needs and funding sources. Additionally, the USD MPU allows for the renovation, enhancement, expansion, and potential replacement of existing structures as may be required in the future and consistent with the design guidelines of the campus. The design and planning information for each project listed in Table 1 is preliminary; more detailed design drawings would be produced when the campus requests building permit approvals in the future. A Substantial Conformance Review (SCR) process would be completed for each of those building permit requests.

Table 1
MASTER PLAN UPDATE PROJECTS

Site No.	Lot Area (SF)	Building Footprint (SF)	Building Gross (SF)	Building Assignable (SF)	Building Height (Stories/ Levels)	Project Description
17	36,500	n/a	n/a	n/a	n/a	Former Lower Olin Future Study Area; Trails/Landscape Enhancements
18	61,850	27,200	136,000	n/a	3.0	Parking/Administrative/Support
19	36,800	5,000	n/a	n/a	1.0	Plaza/Mall/Bridge
20	55,940	25,000	32,000	19,200	1.0 & 2.0	Academic/Administrative/Support
21	22,520	9,000	13,500	8,100	1.5	Academic/Administrative/Student Services Building
22	156,120	50,000	175,000	105,600	4.0	Academic/Administrative Building
23	74,540	49,000	148,240	88,944	4.0	Student Housing (329 beds)/Parking Structure

Table 1 (cont.)
MASTER PLAN UPDATE PROJECTS

Site No.	Lot Area (SF)	Building Footprint (SF)	Building Gross (SF)	Building Assignable (SF)	Building Height (Stories/ Levels)	Project Description
24	41,650	22,000	65,000	39,000	3.5	Student Housing (186 beds)/Student Services/Parking
25	34,910	23,700	71,100	42,660	3.0	Academic/Administrative/Parking Building
26	43,980	26,000	69,500	41,700	3.0	Former Engineering Expansion of Loma Hall; Academic/Administrative Building
27	89,690	28,570	85,710	51,426	3.0	Student Housing (245 beds)/Student Services
28	22,790	6,200	12,400	7,440	2.0	Athletics/Administrative Building
29	22,580	4,280	4,280	2,568	1.0	Facilities/Athletics Support
30	131,780	36,500	109,500	65,700	3.0	Student Housing (243 beds)/Student Services/Parking/Athletics
TOTAL	**827,650**	**312,450**	**922,230**	**417,738**	n/a	n/a

SF = square footage; n/a = not applicable

2.0 REGULATORY FRAMEWORK

2.1 State of California

The State of California (State) Integrated Waste Management Act (CIWMA) of 1989 [California AB 939], which is administered by the California Department of Resources Recycling and Recovery (CalRecycle), requires counties to develop an Integrated Waste Management Plan (IWMP) that describes local waste diversion and disposal conditions, and lays out realistic programs to achieve the waste diversion goals. IWMPs compile Source Reduction and Recycling Elements (SRREs) that are required to be prepared by each local government, including cities. SRREs analyze the local waste stream to determine where to focus diversion efforts, and provide a framework to meet waste reduction mandates. The goal of the solid waste management efforts is not to increase recycling, but to decrease the amount of waste entering landfills. AB 939 required all cities and counties to divert a minimum 50 percent of all solid waste from landfill disposal.

In 2011, the State legislature enacted AB 341 (California Public Resource Code Section 42649.2), increasing the diversion target to 75 percent statewide. AB 341 also requires the provision of recycling service to commercial and residential facilities that generate 4 cubic yards (CY) or more of solid waste per week.

In October 2014, Governor Brown signed AB 1826 Chesbro (Chapter 727, Statutes of 2014), requiring businesses to recycle their organic waste on and after April 1, 2016, depending on the amount of waste they generate per week. Organic waste means food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste. For businesses that generate 8 or more CY of organic waste per week,

this requirement begins April 1, 2016, while those that generate 4 CY of organic waste per week must have an organic waste recycling program in place beginning January 1, 2017. This law also requires that on and after January 1, 2016, local jurisdictions across the state implement an organic waste recycling program to divert organic waste generated by businesses, including multi-family residential dwellings that consist of five or more units. This law phases in the mandatory recycling of commercial organics over time, while also offering an exemption process for rural counties.

2.2 City of San Diego

The City has enacted codes and policies directed at the achievement of State-required diversion levels, including the Refuse and Recyclable Materials Storage Regulations (Municipal Code Chapter 14, Article 2 Division 8), Recycling Ordinance (City 2007; Municipal Code Chapter 6, Article 6, Division 7), and the Construction and Demolition (C&D) Debris Deposit Ordinance (City 2008; Municipal Code Chapter 6, Article 6, Division 6). The City's Zero Waste Plan, a component of the City's Climate Action Plan, was approved and adopted by City Council on July 13, 2015. The Zero Waste Plan identifies goals and strategies to achieve 75 percent diversion by 2020, 90 percent diversion by 2035, and "zero" waste by 2040 (City 2015).

As stated in the City Development Services Department (DSD) CEQA Significance Determination Thresholds (City 2011), implementation of these regulations and ordinances alone is not projected to achieve a 50 percent diversion rate, far below the current 75 percent diversion level targeted by the State and identified in the Zero Waste Plan for 2020. The City's ESD estimates that compliance with existing City ordinances and regulations alone achieves only an approximate 40 percent diversion rate (City 2013). Therefore, discretionary projects must undertake additional measures to comply with existing regulations.

City of San Diego CEQA Significance Determination Thresholds

The City's CEQA Significance Determination Thresholds establish solid waste generation thresholds for discretionary projects. Projects that involve construction, demolition, and/or renovation that meet or exceed the thresholds described below are considered to have potentially significant solid waste impacts and require the preparation of a WMP.

Direct Impacts

Projects that include the construction, demolition, or renovation of 1,000,000 square feet (SF) or more of building space may generate approximately 1,500 tons of waste or more during construction and demolition, and are considered to have direct impacts on solid waste services.

- Direct impacts result from the generation of large amounts of waste, which brings facilities closer to daily throughput limits, shortens facility lifespans, requires increased numbers of trucks and other equipment, and makes it difficult for the City to achieve required waste reduction levels. Waste management planning is based on a steady rate of waste generation and does not assume increased waste generation due to growth.

- While all projects are required to comply with the City's waste management ordinances, direct and cumulative impacts are mitigated by the implementation of project-specific WMPs, which may reduce solid waste impacts to below a level of significance.

- For projects over 1,000,000 SF, a significant direct and cumulative solid waste impact would result if the compliance with the City's ordinances and the WMP fail to reduce the impacts of such projects to below a level of significance and/or if a WMP for the project is not prepared and conceptually approved by the ESD prior to distribution of the draft environmental document for public review.

Cumulative Impacts

Projects that include the construction, demolition, and/or renovation of 40,000 SF or more of building space may generate approximately 60 tons of waste or more per year, and are considered to have cumulative impacts on solid waste services.

While all projects are required to comply with the City's waste management ordinances, cumulative impacts are mitigated by the implementation of a project-specific WMP that reduces solid waste impacts to below a level of significance.

LEED Projects Exceeding the Significance Thresholds

Projects that intend certification as U.S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) Silver or better would include LEED measures as part of their WMP. This would demonstrate implementation of sustainability measures intended to assure a minimal project "environmental footprint," including mitigating the types of impacts caused by waste generation.

As stated in Chapter 7, Sustainability, of the USD MPU, all new buildings and additions on campus would be required to meet minimum energy saving and sustainable design standards of USGBC LEED Silver (or equivalent). The MPU campus improvements would incorporate sustainable and waste reduction elements consistent with LEED principles (as discussed further in Section 6.3 of this report). Although the entitlements being sought under the MPU (which include the 14 new projects and excludes the 16 projects that have already been analyzed and approved by the City under the 1996 Master Plan) do not propose construction, demolition, or renovation of 1,000,000 SF or more, the projects would generate more than 1,500 tons of solid waste materials during demolition and construction. Therefore, without solid waste diversion measures, the MPU would exceed the City's threshold for direct solid waste impacts. Further, the MPU proposes construction of more than 40,000 SF, thereby also exceeding the City's threshold for cumulative solid waste impacts without implementation of solid waste diversion measures. Because implementation of the MPU projects without waste diversion measures would exceed direct and cumulative solid waste thresholds, preparation of this WMP is required under CEQA to ensure that the MPU contribution to the overall waste produced within the City will be reduced sufficiently to allow the City to comply with the waste reduction targets established in the Public Resources Code and State statutes.

City of San Diego Refuse and Recyclable Materials Storage Ordinance

San Diego Municipal Code (SDMC) Section 142.0801 et seq. contains the language of the City Refuse and Recyclable Materials Storage Ordinance (Storage Ordinance), an ordinance that is required by State law. Table 2, *Required Minimum Storage Areas for Residential Development* (Municipal Code Table 142-08B), provides information on minimum exterior refuse and recyclable material storage areas for residential development.

Table 2
REQUIRED MINIMUM STORAGE AREAS FOR RESIDENTIAL DEVELOPMENT

Number of Dwelling Units	Minimum Refuse Storage Area (SF)	Minimum Recyclable Material Storage Area (SF)	Total Minimum Storage Area (SF)
2-6	12	12	24
7-15	24	24	48
16-25	48	48	96
26-50	96	96	192
51-75	144	144	288
76-100	192	192	348
101-125	240	240	480
126-150	288	288	676
151-175	336	336	672
176-200	384	384	768
200+	384 + 48 for every 25 dwelling units above 201	384 + 48 for every 25 dwelling units above 201	768 + 96 for every 25 dwelling units above 201

SF = square feet

Table 3, *Required Minimum Storage Areas for Non-residential Development* (Municipal Code Table 142-08C) provides information on minimum exterior refuse and recyclable material storage areas for non-residential development.

Table 3
REQUIRED MINIMUM STORAGE AREAS FOR NON-RESIDENTIAL DEVELOPMENT

Gross Floor Area (SF)	Minimum Refuse Storage Area (SF)	Minimum Recyclable Material Storage Area (SF)	Total Minimum Storage Area (SF)
0-5,000	12	12	24
5,001-10,000	24	24	48
10,001-25,000	48	48	96
25,001-50,000	96	96	192
50,001-75,000	144	144	288
75,001-100,000	192	192	384
100,001+	192+48 SF for every 25,000 SF of building area above 100,001	192+48 SF for every 25,000 SF of building area above 100,001	384+96 SF for every 25,000 SF of building area above 100,001

SF = square feet

City of San Diego Recycling Ordinance

The City's Recycling Ordinance, found in SDMC section 66.0701 et seq., was adopted in November 2007 (City 2007). The Recycling Ordinance requires the provision of recycling service for all commercial facilities, all single-family residences, and multi-family residences with more than 49 units. The Ordinance also provides an exemption for land uses that generate less than 6 CY of waste per week. However, as noted above, AB 341, which was chaptered after the City enacted this ordinance, has imposed a requirement that "captures" any uses being served with 4 CY or more of refuse capacity. This State requirement makes the provision of recycling service a virtually universal requirement. In addition, the Recycling Ordinance also requires development of educational materials to ensure occupants are informed about the City's ordinance and recycling services, including information on types of recyclable materials accepted.

City of San Diego Construction and Demolition (C&D) Debris Deposit Ordinance

On July 1, 2008, the City's C&D Debris Deposit Ordinance became effective (City 2008). An amendment to the ordinance and revisions to the associated C&D deposit schedule were approved by the City Council on December 10, 2013 (effective January 1, 2014) and on April 19, 2016 (effective June 22, 2016). The C&D Debris Deposit Ordinance is designed to keep C&D materials out of local landfills and ensure that materials are diverted from disposal. The ordinance creates an economic incentive to recycle C&D debris through the collection of fully refundable deposits that are returned, in whole or in part, upon proof of the amount of C&D debris the project applicant diverted from landfill disposal. The ordinance requires that the majority of construction, demolition and remodeling projects requiring building, combination, and demolition permits pay a refundable C&D Debris Recycling Deposit and divert at least 65 percent of their debris by recycling, reusing, or donating usable materials. The deposit is held until the applicant provides receipts demonstrating that a minimum 65 percent of the material generated has been diverted from disposal in landfills.

The C&D Ordinance stipulates that projects will be required to divert 75 percent of their wastes when mixed debris facilities with a permitted daily tonnage capacity of at least 1,000 tons maintain a 75 percent diversion rate for three consecutive calendar year quarters. Greater than 75 percent diversion also may be required for a project if a higher goal is specified during discretionary permitting. Mixed debris recyclers in San Diego County currently achieve between 65 and 85 percent diversion rates at their facilities (refer to Appendix A). This is because not everything that comes through the door is usable or marketable. While there are two facilities that achieve a diversion rate greater than 75 percent, others have diversion rates of 65 percent. For a project that would dispose of mixed debris at one of the facilities that achieve a 65 percent diversion rate, virtually all clean C&D waste from a project must be source separated and sent to a material-specific recycling facility, such as aggregate and metal recyclers, in order to achieve an overall diversion rate of 75 percent. Higher diversion rates can also be accomplished by salvage and/or on-site reuse of C&D materials. The City's C&D thresholds and deposit amounts are shown below in Table 4, *City C&D Deposit Schedule*.

Table 4
CITY C&D DEPOSIT SCHEDULE

Building Category	Deposit per SF[1]	Minimum SF Subject to Ordinance	Maximum SF Subject to Ordinance	Range of Deposits
Residential New Construction, Non-residential Alterations, Demolition	$0.40	1,000	100,000	$400-$40,000
Non-residential New Construction	$0.20	1,000	50,000	$200-$10,000
Flat Rate				
Residential Alterations	$1,000	1,000	6,999	$1,000

Source: City 2016c
[1] Deposit amounts are applied to the entire area(s) where work will be performed, and are calculated based on square footage.
SF = square feet

3.0 EXISTING CONDITIONS

3.1 EXISTING CONDITIONS

Waste Generation and Diversion –Construction and Demolition

All new campus buildings and additions identified in the MPU are proposed to meet minimum sustainable design standards of USGBC LEED Silver (or equivalent). Existing site building materials and/or materials with recycled content are used, where possible, to divert waste generated by construction and demolition. Construction management firms and general contractors are required to document waste hauling for the USGBC's process, and comply with the City's source separation and diversion requirements (pers. comm. Melissa Plaskonos; USD 2016a).

Waste Generation and Diversion - Operation

Waste generated on campus is either disposed or diverted. Methods of waste diversion include recycling, composting, and source reduction (not generating waste in the first place). The private waste hauler Waste Management provides waste collection services to the campus. These services include the collection of solid waste, recyclables, and green waste not already processed and recycled on campus. Table 5, *Existing 2015 Annual Waste Diversion*, provides the waste collection totals for 2015, as well as diversion rates for each type of collection bin and the overall diversion rate for all waste collected by Waste Management.

Table 5
EXISTING 2015 ANNUAL WASTE DIVERSION

Tonnage Collected By Service	2015 Totals (tons)
Commercial Bins	
Solid Waste	991.40
Recycling	605.14
Green Waste	n/a
Total Tonnage Collected	**1,596.54**
Commercial Bin Diversion Percentage	*37.9%*
Roll Off Bins	
Solid Waste	577.55
Recycling	98.65
Green Waste	64.28
Total Tonnage Collected	**740.48**
Roll Off Diversion Percentage	*22.0%*
Total Tonnage Collected (All Services)	
Solid Waste	1,568.95
Recycling	703.79
Green Waste	64.28
Composted Green Waste	133.65
Electronics Recycling	414.27
Total Tons Collected	**2,884.94**
Total Tons Diverted	**1,315.99**
Total Diversion Percentage for All Services	**45.6%**

Source: Waste Management 2016

As shown in the table, the overall waste diversion rate for waste collection services provided by Waste Management in 2015 was 45.6 percent. Additional recycling and sustainability programs, such as green waste chipping; composting and campus food digestion system; and recycling of cardboard, electronic waste, etc. add to the overall diversion rate achieved on campus. It is estimated that the current diversion rate on campus is closer to 60 percent with the implementation of these programs, which are discussed in greater detail below (pers. comm. Michael Cantanzaro; USD 2016b).

Recyclable Materials

USD has an extensive list of conservation and recycling programs currently in operation throughout the campus that include: mixed paper recycling bins in all offices, classrooms and libraries; commingled aluminum, metal, glass, and plastic bottles and cans recycling bins; corrugated cardboard recycling; carpet recycling; wood pallet diversion; waste oil recycling; anti-freeze recycling; event recycling (sports games, student events, etc.); green waste recycling; material recovery (redistribute, reuse, or donate surplus office supplies, equipment, and furniture); water conservation (low-flow showerheads, faucets, toilets, timed irrigation, etc.); and energy conservation ("Green Lights Program") (USD 2016e and 2016f).

USD has a single-stream recycling system for commingled mixed paper, aluminum, metal, glass, and plastic bottles and cans recycling with pick-up service by Waste Management. Waste Management separates the commodities at their transfer station located in El Cajon. The campus currently provides recycling bins for commingled recyclables in all offices, libraries, classrooms, residential units, vending areas, and throughout campus in front of buildings and on patios. Recycling dumpsters are located at each residential hall area and major building area for regular pickup by Waste Management (typically two to five times per week) (pers. comm. Louis Magana; USD 2016c).

The USD Electronic Recycling Center offers recycling of electronic waste (computers, printers, etc.), batteries, toner cartridges, fluorescent tube, and compact fluorescent bulb and ballast to the USD community and the public. The Electronic Recycling Center serves to reduce the amount of electronic waste that enters landfills and to repurpose and responsibly recycle electronic waste. Over 1.6 million pounds (lbs) of electronic waste have been collected since it opened in April 2011.

USD recognizes that recycled content products are essential for an environmentally sound production system. USD purchases and participates in the following programs:

- Products for which the United States Environmental Protection Agency has established minimum recycled content standard guidelines
- Copiers and printers that can be used with recycled content products
- Recycled electronic product program
- Recycled content transportation products to include signs, cones, parking stops and parking signs
- Sustainable disposable dining ware (e.g., paper plates, napkins, and disposable packaging made from recycled content and/or biodegradable; disposable flatware made from ecoproducts; etc.)

Green Waste

The majority of green waste generated on campus is chipped on site and used as mulch in the grounds areas. This has produced all the mulch that is used on campus for over 6 years. The

excess green waste that is not used to produce mulch is exported off-campus to the Miramar Greenery (pers. comm. Charles Thomas; USD 2016d). An estimated 300 CY (or 81 tons) per year is typically exported, with approximately 64.28 tons collected in 2015.

Compostable Waste

The main dining area at USD (Pavilion Dining) utilizes a BioHiTech Food Digester that transforms 3,200 lbs of food waste into grey water each week. Food waste is added to the digester continuously throughout the day. The digester uses a highly specialized formula of micro-organisms to break down food waste into grey water, which is then disposed into the sewer system to be treated as wastewater. The digester reduces the amount of solid waste for disposal, eliminating the need for composting, diverting waste from landfills and decreasing fuel consumption.

The campus currently has a small pilot composting program at the Missions Café. The café composts all pre- and post-consumer food scraps, diverting over 100 lbs of food waste per week from the landfill and supporting the USD Community Garden (USD 2016f).

A total of 133.65 tons of green waste was estimated to have been composted on campus in 2015.

4.0 PRE-CONSTRUCTION WASTE GENERATION AND DIVERSION: DEMOLITION, CLEARING/GRUBBING, AND GRADING

All C&D-generated waste would be subject to compliance with the source separation and diversion requirements contained in this WMP to divert, recycle, and/or re-use these materials to the maximum degree possible. “Mixed C&D Debris” recyclers attain at most an 85 percent diversion rate, whereas as identified in the City’s *2016 Certified Construction & Demolition Recycling Facility Directory* (Appendix A), “source separated” material recyclers can attain nearly 100 percent diversion rates (City 2016). As a result, in order to achieve the highest level of waste diversion from landfills, and highest dollar value for the quality of materials, USD MPU projects would source separate (segregate) clean recyclable materials on the site by material type, to the maximum extent practicable, and divert them for recycling or reuse at City-certified facilities specializing in each material type.

Prior to initiation of construction activities associated with the proposed MPU projects, site preparation may require the clearing/grubbing of existing vegetation as well as the demolition of the existing structures; paved parking lot areas; and/or sidewalk, curbs, and gutters. These phases of construction are described below.

4.1 DEMOLITION

While no specific demolition materials or quantities are available at this preliminary planning level, the following types of demolition debris would likely be generated during construction of USD MPU projects:

- Metals
- Concrete/Asphalt
- Brick/Masonry
- Masonry
- Wood
- Drywall
- Carpet/Carpet padding
- Ceramic tile
- Ceiling tile
- Roofing materials
- Doors
- Windows
- Fixtures

The City uses a rule of thumb of 3 lbs/SF of waste materials generated during demolition (3 lbs = 0.0015 tons). Material quantities are based on City guidance as follows:

- Total SF of structure to be demolished x each material type = Total quantity of demolition debris generated

Using waste management programs such as source separation and salvage during demolition activities, a target diversion rate of 90 percent has been identified for demolition activities associated with the MPU. This is consistent with the waste diversion requirement for LEED Silver Certification, which all new buildings and additions on campus would be required to meet. The appropriate source separation techniques would be utilized during all demolition activities associated with future development under the USD MPU in order to achieve the 90 percent diversion rate. This would be demonstrated during the SCR process as part of project approval, and would be consistent with the existing conditions for demolition of structures and facilities on campus. Demolition debris would be source separated and taken to the appropriate facilities provided in the City's *2016 Certified Construction & Demolition Recycling Facility Directory* (Appendix A). In addition to source separation, each project would salvage some demolition materials for reuse onsite, as described further in Section 4.4, below. MUP projects that are proposed to or are exploring options to require demolition of structures include Sites 20, 23, 24, and 27.

4.2 CLEARING AND GRUBBING

Prior to initiation of construction activities, site preparation may require the clearing/grubbing of existing vegetation and removal of miscellaneous debris (e.g., trash, concrete, asphalt, gravel, and other debris) present on site. Other waste materials associated with the clearing and grubbing are anticipated to include negligible amounts of waste generated by contractors working on the site during the grading process. Clearing and grubbing materials generated during site preparation activities are anticipated to be either chipped on site and used for mulch on campus, or exported off site to the Miramar Landfill Greenery. Other waste materials generated during clearing and grubbing would be would be source separated and taken to the appropriate facilities provided in the City's *2016 Certified Construction & Demolition Recycling Facility Directory* (Appendix A). This would achieve a 100 percent diversion rate.

4.3 GRADING

Grading will be required for a number of projects identified in the USD MPU, particularly those proposing subterranean parking. Grading will be balanced on site to the extent practicable. Excavated soil that is not balanced on site is anticipated to be diverted to one of the facilities from the City's *2016 Certified Construction & Demolition Recycling Facility Directory* (Appendix A). This is consistent with the current practice for grading associated with development projects on campus. Certified facilities include the following:

- Hanson Aggregates West, Miramar, 9229 Harris Plant Road, San Diego, CA 92126
- Vulcan Carol Canyon Landfill and Recycle Site, 10051 Black Mountain Road, San Diego, CA 92126
- Enniss Incorporated, 12421 Vigilante Road, Lakeside, CA 92040
- Moody's, 3210 Oceanside Boulevard, Oceanside, CA 92056
- Robertson's Ready Mix, 2094 Willow Glen Drive, El Cajon, CA 92019

Other waste materials associated with grading are anticipated to include negligible amounts of waste generated by contractors working on site during the grading process.

4.4 SUMMARY OF PRE-CONSTRUCTION DEMOLITION, CLEARING/ GRUBBING, AND GRADING WASTE GENERATION AND DIVERSION

As discussed above, the waste materials to be generated during demolition, clearing and grubbing, and excavation for Project implementation would be source separated for recycling or reuse at City-certified facilities specializing in each material type, as applicable.

Salvage

Demolition of the existing structures, surface parking lots, and curb/gutter/sidewalk would generate salvageable materials. Since no specific inventory of reusable items has been conducted at this preliminary design stage, a detailed salvage plan has not been prepared. Each individual project within the Master Plan Update would be required to salvage a minimum of five percent of demolition materials. Specific plans for salvage of pre-construction demolition materials would be addressed during the SCR process as part of project approval, as described further in Section 8.0.

Recycling

Materials generated during pre-construction demolition, clearing and grubbing, and grading that are designated for recycling would be source separated on site during these activities. The City's *2016 Certified Construction & Demolition Recycling Facility Directory,* updated quarterly, states the diversion rate for these materials shall be 100 percent, except mixed C&D debris which achieves a maximum 85 percent diversion rate at the EDCO CDI Recycling and Buy Back Center (City 2016). An overall 90 percent diversion rate is targeted for demolition and grading materials using source separation.

5.0 CONSTRUCTION WASTE GENERATION AND DIVERSION

In order to estimate the quantity of waste generated during construction, City ESD staff recommends assuming each material type (carpet, ceiling tiles, etc.) would approximately equal the square footage of each structure. This square footage can then be multiplied by the weight of the material, and divided by 10 (percent) to account for waste generated during the construction process. A 10 percent construction waste generation rate is a very conservative figure, used here for analysis of the "worst-case" scenario based on the following reasoning:

- The cost of purchasing construction materials in excess of the quantity required is prohibitive.

- Many materials, such as metal studs, come prefabricated in specific sizes, such that the contractor can accurately predict and purchase the specific quantity that would be required.

- Contractors can return unused and unneeded items (such as metal studs, appliances, fixtures, etc.) and/or utilize materials (such as brick or drywall) on other projects.

- Not all materials would be utilized throughout Project square footage, so generation rates based on the total square footage are bound to be overestimated.

No specific construction materials or quantities are available at this preliminary planning level; however, the following building materials which may generate waste are likely to be used during construction:

- Metals
- Concrete
- Asphalt
- Brick/Masonry
- Wood
- Drywall
- Carpet/Carpet padding
- Ceramic tile
- Ceiling tile
- Roofing materials

Other waste generated would consist of packaging materials from construction material, appliances, windows, etc., including the following:

- Corrugated cardboard (packaging)
- Industrial plastics (plastic wrap, fasteners, etc.)
- Styrofoam (appliance packaging, not peanuts)

5.1 ESTIMATED CONSTRUCTION WASTE GENERATION AND DIVERSION

The City uses a rule of thumb of 3 lbs/SF of waste materials generated during construction (3 lbs = 0.0015 tons). Material quantities are based on City guidance as follows:

- Total Project SF x each material type = Total quantity of construction materials required
- Total construction material required x 10 percent = Anticipated quantity of construction waste generated

Anticipated construction waste generation for each of the project identified in the USD MPU is shown in Table 6, *Construction Solid Waste Generation, Diversion Rates, and Facilities*. As shown in the table, the overall construction waste anticipated to be generated upon implementation of all the new projects identified in the MPU is conservatively estimated to be 194.6 tons (primarily comprised of mixed debris and trash); approximately 1,056.2 tons of construction waste would be diverted using source separation and processing of mixed construction debris. These estimates are based on the gross square footage of the proposed structures for each project identified in the USD MPU.

Table 6
CONSTRUCTION SOLID WASTE GENERATION, DIVERSION RATES, AND FACILITIES

Site No. and Description	Building Gross SF	Material	Diversion Rate (Percent)[1]	Tons Diverted[2]	Tons Disposed
17. Trails/Landscape Enhancements	n/a	n/a	n/a	n/a	n/a
18. Parking/Administrative/ Physical Plant	136,000	Metals	100	20.4	0
		Concrete/Asphalt	100	20.4	0
		Brick/Masonry	100	20.4	0
		Wood	100	20.4	0
		Drywall	100	20.4	0
		Carpet/Carpet Padding	100	20.4	0
		Ceramic Tile	100	20.4	0
		Mixed Debris	60	12.2	8.2
		Trash	0	0	20.4
		SITE 18 TOTAL	**84.5**	**155.0**	**28.6**
19. Plaza/Mall/Bridge	n/a	n/a	n/a	n/a	n/a
20. Academic/ Administrative/Support	32,000	Metals	100	4.8	0
		Concrete/Asphalt	100	4.8	0
		Brick/Masonry	100	4.8	0
		Wood	100	4.8	0
		Drywall	100	4.8	0
		Carpet/Carpet Padding	100	4.8	0
		Ceramic Tile	100	4.8	0
		Mixed Debris	60	2.9	1.9
		Trash	0	0	4.8
		SITE 20 TOTAL	**84.5**	**36.5**	**6.7**

Table 6 (cont.)
CONSTRUCTION SOLID WASTE GENERATION, DIVERSION RATES, AND FACILITIES

Site No. and Description	Building Gross SF	Material	Diversion Rate (Percent)[1]	Tons Diverted[2]	Tons Disposed
21. Academic/ Administrative/Student Services Building	13,500	Metals	100	2.0	0
		Concrete/Asphalt	100	2.0	0
		Brick/Masonry	100	2.0	0
		Wood	100	2.0	0
		Drywall	100	2.0	0
		Carpet/Carpet Padding	100	2.0	0
		Ceramic Tile	100	2.0	0
		Mixed Debris	60	2.9	1.9
		Trash	0	0	2.0
		SITE 21 TOTAL	**84.5**	**15.4**	**2.8**
22. Academic/ Administrative Building	175,000	Metals	100	26.3	0
		Concrete/Asphalt	100	26.3	0
		Brick/Masonry	100	26.3	0
		Wood	100	26.3	0
		Drywall	100	26.3	0
		Carpet/Carpet Padding	100	30.9	0
		Ceramic Tile	100	26.3	0
		Mixed Debris	60	15.8	10.5
		Trash	0	0	26.3
		SITE 22 TOTAL	**84.5**	**199.5**	**36.8**
23. Housing (329 beds)/ Parking Structure	148,240	Metals	100	22.2	0
		Concrete/Asphalt	100	22.2	0
		Brick/Masonry	100	22.2	0
		Wood	100	22.2	0
		Drywall	100	22.2	0
		Carpet/Carpet Padding	100	22.2	0
		Ceramic Tile	100	22.2	0
		Mixed Debris	60	13.3	8.9
		Trash	0	0	22.2
		SITE 23 TOTAL	**84.5**	**169.0**	**31.1**
24. Housing (186 beds)/ Student Services/Parking	65,000	Metals	100	9.8	0
		Concrete/Asphalt	100	9.8	0
		Brick/Masonry	100	9.8	0
		Wood	100	9.8	0
		Drywall	100	9.8	0
		Carpet/Carpet Padding	100	9.8	0
		Ceramic Tile	100	9.8	0
		Mixed Debris	60	5.9	3.9
		Trash	0	0	9.8
		SITE 24 TOTAL	**84.5**	**74.1**	**13.7**

Table 6 (cont.)
CONSTRUCTION SOLID WASTE GENERATION, DIVERSION RATES, AND FACILITIES

Site No. and Description	Building Gross SF	Material	Diversion Rate (Percent)[1]	Tons Diverted[2]	Tons Disposed
25. Academic/ Administrative/Parking Building	71,100	Metals	100	10.7	0
		Concrete/Asphalt	100	10.7	0
		Brick/Masonry	100	10.7	0
		Wood	100	10.7	0
		Drywall	100	10.7	0
		Carpet/Carpet Padding	100	10.7	0
		Ceramic Tile	100	10.7	0
		Mixed Debris	60	6.4	4.3
		Trash	0	0	10.7
		SITE 25 TOTAL	**84.5**	**81.1**	**14.9**
26. Academic/ Administrative Building	69,500	Metals	100	10.4	0
		Concrete/Asphalt	100	10.4	0
		Brick/Masonry	100	10.4	0
		Wood	100	10.4	0
		Drywall	100	10.4	0
		Carpet/Carpet Padding	100	10.4	0
		Ceramic Tile	100	10.4	0
		Mixed Debris	60	6.3	4.2
		Trash	0	0	10.4
		SITE 26 TOTAL	**84.5**	**79.2**	**14.6**
27. Housing (245 beds)/ Student Services	85,710	Concrete/Asphalt	100	12.9	0
		Brick/Masonry	100	12.9	0
		Wood	100	12.9	0
		Drywall	100	12.9	0
		Carpet/Carpet Padding	100	12.9	0
		Ceramic Tile	100	12.9	0
		Mixed Debris	60	7.7	5.1
		Trash	0	0	12.9
		SITE 27 TOTAL	**84.5**	**97.7**	**18.0**
28. Athletics/Administrative Building	12,400	Concrete/Asphalt	100	1.9	0
		Brick/Masonry	100	1.9	0
		Wood	100	1.9	0
		Drywall	100	1.9	0
		Carpet/Carpet Padding	100	1.9	0
		Ceramic Tile	100	1.9	0
		Mixed Debris	60	1.1	0.7
		Trash	0	0	1.9
		SITE 28 TOTAL	**84.5**	**14.1**	**2.6**

Table 6 (cont.)
CONSTRUCTION SOLID WASTE GENERATION, DIVERSION RATES, AND FACILITIES

Site No. and Description	Building Gross SF	Material	Diversion Rate (Percent)[1]	Tons Diverted[2]	Tons Disposed
29. Facilities/Athletics Support	4,280	Concrete/Asphalt	100	1.3	0
		Brick/Masonry	100	1.3	0
		Wood	100	1.3	0
		Drywall	100	1.3	0
		Carpet/Carpet Padding	100	1.3	0
		Ceramic Tile	100	1.3	0
		Mixed Debris	60	0.8	0.5
		Trash	0	0	1.3
		SITE 29 TOTAL	**84.5**	**9.7**	**1.8**
30. Student Housing (243 beds)/Student Services/Parking/ Athletics	109,500	Concrete/Asphalt	100	16.4	0
		Brick/Masonry	100	16.4	0
		Wood	100	16.4	0
		Drywall	100	16.4	0
		Carpet/Carpet Padding	100	16.4	0
		Ceramic Tile	100	16.4	0
		Mixed Debris	60	9.9	6.6
		Trash	0	0	16.4
		SITE 30 TOTAL	**84.5**	**124.8**	**23.0**
		USD MPU TOTAL	**84.5**	**1,056.2**	**194.6**

Source: City 2012, USD 2016

[1] Trash would be taken to the Miramar Landfill (5180 Convoy Street, San Diego, CA 92111) at a zero percent diversion rate. All other construction debris would be taken to an appropriate facility listed on the City's *2016 Certified Construction & Demolition Recycling Facility Directory*. Facilities that process metals, concrete/asphalt, wood, drywall, carpet, and carpet padding all achieve a 100 percent diversion rate for these materials. Facilities that process mixed debris achieve a minimum 60 percent diversion rate, which was conservatively assumed for this Project (City 2016; Appendix B).

[2] For each material type, construction waste quantities are calculated based on:

- Three lbs of waste per total project SF (e.g., 32,000 SF for Site 20 x 3 lbs/SF = 96,000 lbs, or 48 tons[1 lb = 0.0005 ton])
- Total construction material required x 10 percent = anticipated quantity of construction waste generated (4.8 tons)

lbs = pounds; SF = square feet

* Note that numbers may not total due to rounding

5.2 PROPOSED POST-CONSUMER CONTENT CONSTRUCTION MATERIALS

In order to further minimize waste, USD MPU projects would utilize recycled content construction materials, where possible, in accordance with the design guidelines. Given the preliminary nature of the Project plans, an overall target of 10 percent post-consumer recycled content will be required for each individual project in order to achieve LEED Silver (or equivalent), with verification of purchase of materials equating to this target to be provided prior to or during the pre-construction meeting. See Section 7.1, for the construction waste management, coordination and oversite measures that would be conducted on projects identified in the MPU pursuant to this WMP.

6.0 OCCUPANCY WASTE GENERATION AND DIVERSION

The City's Storage Ordinance (Municipal Code Section 142.0801 et. seq.) requires the provision of separate bins for recyclable waste products to be separated from non-recyclable solid waste. Recycling containers would be provided at convenient locations throughout the campus in compliance with the Storage Ordinance, meeting or exceeding the minimums shown in Tables 1 and 2. The campus already implements these requirements as part of its existing operations.

For the new MPU projects, the campus or its designee(s) would continue to provide education for on-site custodial duties regarding the appropriate waste diversion program to ensure the proper handling of waste. Each employee would be educated on the principles of proper waste handling and diversion to meet the Applicant's goal to reduce/reuse/recycle. The City's ESD provides a list of waste generation factors for the occupancy phase of development, included as Appendix C of this report. The estimated future waste generation and diversion for the 14 proposed USD MPU projects is shown in Table 6, *Estimated Annual Solid Waste Generation and Diversion Rates*. These estimates are based on the assignable square footage of the proposed structures for each project identified in the USD MPU, which takes into account all assignable space within each building (e.g., rooms are included, but public corridors, elevators, stairwells, mechanical rooms, public bathrooms, custodial rooms, shaft spaces, etc. may be excluded). The assignable square footage was used to be able to compare the waste generated from existing campus facilities (which total 2,380,905 SF of assignable building space) to the proposed facilities.

Table 7
ESTIMATED ANNUAL SOLID WASTE GENERATION AND DIVERSION RATES

Site/Land Use	Assignable SF	Waste Generation Factor[1]	Tons Generated (per year)	% Diversion from Source-Separated Recycling[2,3]	Tons Diverted (per year)	Tons Disposed (per year)
17. Trails/Landscape Enhancements	n/a	n/a	n/a	n/a	n/a	n/a
18. Parking/Administrative/ Physical Plant	n/a	n/a	n/a	n/a	n/a	n/a
19. Plaza/Mall/Bridge	n/a	n/a	n/a	n/a	n/a	n/a
20. Academic/Administrative/ Support	19,200	0.0017	32.6	40	13.1	19.6
21. Academic/Administrative/ Student Services Building	8,100	0.0017	13.8	40	5.5	8.3
22. Academic/Administrative Building	105,000	0.0017	178.5	40	71.4	107.1
23. Housing (329 beds)/ Parking Structure	88,944	0.0045	400.2	40	160.1	240.1
24. Housing (186 beds)/Student Services/Parking	39,000	0.0045	175.5	40	70.2	105.3

Table 7 (cont.)
ESTIMATED ANNUAL SOLID WASTE GENERATION AND DIVERSION RATES

Site/Land Use	Assignable SF	Waste Generation Factor[1]	Tons Generated (per year)	% Diversion from Source-Separated Recycling[2,3]	Tons Diverted (per year)	Tons Disposed (per year)
25. Academic/Administrative/ Parking Building	42,660	0.0017	72.5	40	29.0	43.5
26. Academic/Administrative Building	41,700	0.0017	70.9	40	28.4	42.5
27. Housing (245 beds)/Student Services	51,426	0.0045	231.4	40	92.6	138.9
28. Athletics/Administrative Building	7,440	0.0017	12.6	40	5.1	7.6
29. Facilities/Athletics Support	2,568	0.0017	4.4	40	1.7	2.7
30. Student Housing (243 beds)/Student Services/Parking/Athletics	65,700	0.0045	295.7	40	118.3	177.4
USD MPU TOTAL			**1,488.1**	**40**	**595.2**	**892.8**

Source: City 2012 (Appendix C)

[1] Waste generation factors provided in Appendix C to this WMP; for projects providing a variety of uses, the most conservative waste generation factor was used. For projects with student housing, the "Hotels/Motels" waste generation factor of 0.0045 was used to more accurately reflect this type of housing. For academic/administrative uses, the more conservative "Office" waste generation factor of 0.0017 was used (as opposed to 0.0013 for "Education").

[2] Reflects compliance with existing City Storage Ordinance and City Recycling Ordinance and excludes campus-specific recycling programs that increase waste diversion.

[3] The Applicant would contract with City-approved recycling haulers and disposal facilities.

* Note that numbers may not total due to rounding.

As shown in the table, it is anticipated that at full buildout of all projects proposed in the USD MPU, approximately 892.8 tons of waste are anticipated to be disposed of annually, and approximately 595.2 tons are estimated to be diverted. These estimates are based on the City's current waste generation factors, which do not take into consideration the additional sustainability measures and recycling programs that are conducted on the campus that go above and beyond the overall 40 percent diversion estimated by the City for occupancy. It is estimated that the current diversion rate on campus is closer to 60 percent with the implementation of additional recycling and sustainability programs, such as green waste chipping; composting and campus food digestion system; and recycling of cardboard, electronic waste, etc. (pers. comm. Michael Cantanzaro; USD 2016b). Additionally, where a mix of uses is proposed, the most conservative waste generation factor was used since the anticipated SF for each use (e.g., administrative, student housing, parking, etc.) is not currently known at this time. For example, a building may have a mix of student housing and administrative uses, but a waste generation factor of 0.0045 was applied. Because these estimates are based on the assignable SF for each of the proposed sites, less waste would likely be generated for less intensive uses such as parking where the total SF is not differentiated between uses during calculation. Based on these considerations, the actual waste generation would be much lower than the estimated waste generation rates.

The USD MPU proposes the construction of approximately 417,738 SF of assignable building space, which represents the occupied and/or "useable" portions of the buildings. As described in Section 3.0, the existing 2,380,905 ASF on campus generates approximately 1,569.0 tons of waste and diverts approximately 703.8 tons, according to data provided by Waste Management (2016). This represents an overall waste generation of 1.32 lbs of disposed waste per SF and 0.59 lbs of diverted waste per SF per year for the existing campus (where 1 ton equals 2,000 lbs). Full buildout of the MPU is calculated to generate 3.78 lbs of disposed waste per SF and 2.52 lbs of diverted waste per SF per year; this increase from the estimated waste generation for the existing uses is due to the conservative nature of the waste generation rates provided in Table 7; however, for reasons noted above, including the incorporation of additional sustainability measures and recycling programs, it is anticipated that the actual waste generated during operation of the projects would be less than calculated. Moreover, the projects are anticipated to be built out over a period of 20 years, during which time more stringent waste regulations are already anticipated (e.g., composting requirements) or are likely to be applied to further reduce waste generation.

7.0 WASTE REDUCTION, RECYCLING, AND DIVERSION MEASURES

USD is committed to waste reduction during all aspects of MPU project implementation—including demolition, grading, construction, and operation—and would comply with the Waste Diversion Measures (WDM) described below to ensure compliance with applicable solid waste disposal and waste reduction regulations and ordinances. Mandatory compliance with these measures shall be included in all Project contractor agreements, clearly reflected on Project plans, and verifiable by City ESD staff through written submittals and/or site inspections as described below.

7.1 CONSTRUCTION WASTE MANAGEMENT, COORDINATION, AND OVERSIGHT

Contractor Agreements and City Coordination

All WDM described herein shall be included as part of contractor agreements and clearly reflected on project plans identifying activities required to be undertaken during clearing, grading, and construction. These measures shall also be provided in checklist format to City ESD staff prior to the initiation of any activities identified in the WMP. ESD staff shall be allowed access to the project site, project plans, and contractor education program meetings and materials (described below) to verify conformance with these measures.

Designation of a Solid Waste Management Coordinator

Prior to initiation of any construction, clearing, grading, or grubbing activities, the Campus shall designate a Solid Waste Management Coordinator (SWMC) for the project with the authority to provide guidelines and procedures for contractor(s) and staff to implement waste reduction and recycling efforts. These responsibilities shall include, but are not limited to, the following:

- Prepare a Contractor Education Program on the waste separation and diversion/disposal procedures specified in this WMP. The Contractor Education Program shall contain, at a minimum, the following information:

    - Written and visual description of each waste type required to be source separated
    - Written and graphic description of how each waste type must be treated prior to and during source separation
    - Direction on which waste types go to mixed-debris facilities
    - Direction on which waste types go to Miramar Landfill
    - Direction on materials requiring special handling, such as hazardous materials
    - Contact designated contractor in case of questions or emergency
    - Contact at City ESD in case of questions or emergency
    - Phone number, address, and telephone contact information for each contracted hauler and disposal/diversion facility to be utilized

- Ensure the correct number and signage of bins, as specified in this WMP.

- Ensure a maximum 5 percent contamination by different waste types/non-recyclable materials by weight in the bins.

- Ensure no overtopping of bins occurs.

- Work with contractor(s) to refine estimated quantities of each type of material that would be recycled, reused, or disposed of as waste, then assist contractor(s) with documentation of that waste through receipts at each recycling and landfill facility identified in this WMP, or as otherwise agreed to by ESD staff.

- Issue stop work orders if procedures and standards specified in this WMP are not being followed/met.

- Coordinate with ESD and/or Mitigation Monitoring staff, including regular communication and invitations to the work site, and ensure appropriate staff members are involved at every stage.

- Ensure ESD staff attendance at the contractor education meeting and pre-construction meetings of each phase of the development.

Contractor Waste Management Training

For each USD MPU construction project, the SWMC or an ESD-approved contractor designee shall carry out Contractor Education Program presentations ensuring all Project personnel are trained regarding content and requirements of this WMP. Prior to beginning work on any portion of a project, each member of the team, including all workers, subcontractors, and suppliers, shall

be provided with a copy of the WMP, and undergo training on proper waste management procedures applicable to the project.

- The project's SWMC, or ESD-approved Contractor-designee shall carry out contractor waste management training presentations for each new group or individual hired, contracted, or assigned to work on the project.

- The SWMC and/or Contractor-designee shall ensure that each person working on the project has completed the waste management training by maintaining a written log to be signed and dated by each trainee upon completion of the training program. Copies of this written log, along with a list of all applicable personnel, shall be provided to City ESD staff for verification during each phase of project activities.

Daily Site Inspections by Contractor(s)

For each USD MPU construction project, the contractor(s) shall conduct daily inspections of the construction site to ensure compliance with the requirements of this WMP and with all other applicable laws and ordinances. Daily inspections shall include verifying the availability and number of dumpsters based on amount of debris being generated, verifying trash and recycled materials dumpsters are correctly labeled, ensuring proper sorting and segregation of materials, and ensuring excess materials are properly salvaged. The project contractor(s) shall report the results of the daily site inspections to the SWMC.

Regular Removal of Waste Materials

The project contractor(s) shall ensure removal of construction waste materials in sufficient frequency to prevent over-topping of bins. The accumulation and burning of on-site grading/land-clearing and construction waste materials shall be prohibited.

City Verification

The Campus shall ensure a representative of the City's ESD attends pre-construction meetings prior to clearing, grading, and construction to ensure that the following items are verified:

- Material segregation, recycling, and reuse is occurring per the WMP;

- Soil is being transported to an appropriate facility for reuse;

- Grubbed materials are sent to a suitable green waste recycling facility;

- Contract documents have appropriate estimates and constraints to avoid "overbuying" construction materials;

- Contract documents specify methods to achieve five percent post-consumer content goal;

- Contamination levels (i.e., different waste types/non-recyclable materials) do not exceed five percent by weight;

- An appropriate diversion rate (as specified in this WMP) has been included on the deposit form;

- Contract documents specify agreements for each recyclable/reusable material type to be taken to an appropriate recycling/reuse facility, as specified in this WMP; and

- Minimum exterior refuse and recyclable material storage areas have been incorporated into Project plans, as a requirement of the City of San Diego Storage Ordinance (Municipal Code Section 142.0801 et. seq.).

7.2 CONSTRUCTION WASTE REDUCTION, DIVERSION COMPLIANCE, AND VERIFICATION

Identification, Separation, and Diversion of Recyclable/Reusable Materials

The Campus shall ensure that:

- Throughout project activities, waste materials shall be source separated on site into the appropriate bin based on materials type, according to the categories in this WMP. Materials generated during clearing, grading, and construction that would be source separated and recycled are listed below:

    - Mixed C&D (wood, dirt, concrete, drywall, brick, metals, rock, asphalt, tile, cardboard)
    - Metals
    - Concrete
    - Asphalt
    - Wood
    - Drywall
    - Carpet
    - Carpet padding
    - Clean fill dirt
    - Green waste

- A separate bin for each clean waste material type to be generated during each phase of clearing, grading, and construction activity shall be provided on the site, subject to the following requirements:

    - Containers shall be clearly labeled, with a list of acceptable and unacceptable materials. The list of acceptable materials must be the same as the materials recycled at the receiving material recovery facility or recycling processor.
    - The collection containers for recyclable grading/land-clearing and construction waste shall contain no more than five percent non-recyclable materials, by weight.

- Regular visual inspections of dumpsters and recycling bins shall be conducted to remove contaminants.
- Recycling areas shall be clearly identified with large signs. Lists of acceptable and unacceptable materials shall be posted on recycling bins and throughout the Project site and all recycled material signage shall be visible on at least two sides of haul containers.
- Recycling bins shall be placed in areas that would be readily accessible and would minimize misuse or contamination. The SWMC shall be responsible for these efforts and they shall be reviewed at pre-construction meetings and/or during contractor education meetings, if conducted separately.
- Recyclable and/or reusable waste materials collected in source-separated bins shall be diverted to recycling/reuse facilities as designated in Tables 3 and 4 of this WMP, or to another facility listed on the City's *2016 Certified Construction & Demolition Recycling Facility Directory*, should the designated facilities not be available.

Source Reduction Measures

For each USD MPU construction project, contractors and subcontractors, in cooperation with the project's SWMC and ESD staff, as applicable, shall coordinate to minimize the over-purchasing of construction materials to lower the amount of materials taken to recycling and disposal facilities. Each project shall minimize over-purchasing through purchase of pre-cut materials, whenever possible. The following steps shall be undertaken:

- Detailed material estimates shall be used to reduce risk of unplanned and potentially wasteful material cuts.

- Contractor and subcontractor material purchasing agreements shall include a waste reduction provision requesting that: materials and equipment be delivered in packaging made of recyclable material; vendors reduce the amount of packaging; packaging be taken back by vendors for reuse or recycling; and vendors take back all unused product. Contracts containing this language shall be made available to ESD staff during ESD site visits for inspection.

- Post-consumer content products shall be employed in the design and construction of the new facilities with the goal of achieving five percent post-consumer content materials. Efforts to use post-consumer content may include using products manufactured with post-consumer content materials (i.e., products that were bought, used, and recycled by consumers), such as natural textiles, aggregate, or concrete. Receipts demonstrating post-consumer content shall be provided to ESD staff at or prior to the pre-construction meetings.

- Prior to submittal, final plans shall indicate the anticipated source and quantity of materials to be reused on site, and the source, quantity, and percentage of post-consumer content waste products anticipated to be utilized for construction.

- Contractors shall include the anticipated source and quantity of post-consumer content products proposed for reuse or purchase in their bid.

- Final plans inclusive of the information above shall be provided to ESD for verification.

7.3 OPERATIONAL WASTE MANAGEMENT AND DIVERSION MEASURES

USD MPU Sustainability Measures and Project Design Features

Through its Office of Sustainability, USD implements a number of sustainability initiatives, identified in the USD MPU. The USD MPU encourages each building program and site design to address their specific means of contributing to the highest possible sustainable design, construction, operations, and maintenance standards as appropriate. Each project would promote recycling and waste management and support sustainable procurement. The following USD MPU strategies (from Section 8.15, *Sustainability*, of the MPU) support a more sustainable campus with respect to operational waste management and diversion.

Building Design

- New buildings will be designed to meet LEED Silver (or equivalent) standards.

Maintenance / Waste Reduction

- Continue to provide recycling bins/receptacles throughout the campus, including locations near the on-site trail system, as part of a landfill diversion program.

- Continue to divert landscape maintenance waste to the Miramar Greenery.

- Additionally, the multi-stream containers to separate food waste and have the option to compost will be incorporated at individual dining areas on campus, pursuant to AB 1826.

City Requirements

Prior to issuance of any certificate of occupancy/tentative certificate of occupancy, the Campus shall invite a representative of the City ESD to:

- Inspect and approve storage areas that have been provided consistent with the City's Storage Ordinance;

- Ensure that a hauler has been retained to provide recyclable materials collection, and, if applicable, landscape waste collection; and

- Inspect and approve education materials for building tenants/owners that are required pursuant to the City's Recycling Ordinance.

For specialized product purchasing (e.g., with recycled content) to be used during occupancy, the Campus shall provide for inspection by ESD the documentation that would be used to carry out this requirement.

8.0 WASTE MANAGEMENT PLAN IMPLEMENTATION – SUBSTANTIAL CONFORMANCE REVIEW

Each project implemented under the Master Plan Update would be required to obtain SCR approval from the City. The SCR process includes a review of the construction proposal against the approved exhibits, permit conditions, environmental documentation, applicable land use policies, and the public record for the approved CUP. City staff will recommend approval of the construction proposal if it falls within the parameters of the prior approval. A SCR decision for the USD Master Plan Update proposals would be at Staff level (i.e., Process 1). Substantial conformance shall be determined based on the locations, descriptions, and building areas specified on the construction sites maps and in the construction site matrices contained within the Master Plan Update. As an alternative to submitting for SCR, USD may choose to include their proposed changes as part of a complete construction permit application (building permit, grading permit, public improvement permit, etc.).

For each project, consistency with the WMP would be included as part of the SCR process. Each project would be reviewed for consistency with the Master Plan Update WMP, as well as consistency with applicable waste management regulations and ordinances in place at that time, to ensure that the state and local policies regarding waste management will be implemented.

Per the current CUP, City staff may make one of the following determinations at the conclusion of the SCR process:

- Find the construction proposal meets the criteria in the permit, the EIR certified with the permit (i.e., the SEIR), and the Master Plan and Design Guidelines. As long as the impacts of the construction proposal were analyzed in the SEIR, and the proposal is within a reasonable range of the overall building envelope specified by the Master Plan and CUP, no further environmental review is required and administrative approval would be granted.

OR

- Find the proposal is not in substantial conformance with the permit.

- Require a Site Specific Permit amendment for a proposal not in conformance with the permit.

- Require a site-specific environmental review for a proposal not in conformance with the certified SEIR.

9.0 CONCLUSION

As discussed under Regulatory Framework, a project may result in a significant direct impact under City CEQA Significance Thresholds if it generates more than 1,500 tons of solid waste materials during construction and demolition. Projects that include the construction, demolition, and/or renovation of 40,000 SF or more of building space or generate approximately 60 tons of

waste or more, are considered to have potentially significant cumulative impacts on solid waste services. Further, AB 341 requires the diversion of 75 percent of solid waste, and mandatory provision of recycling collection service during occupancy.

9.1 SUMMARY OF WASTE GENERATION AND DIVERSION

During pre-construction demolition, clearing/grubbing, and grading activities, the projects identified in the USD MPU would produce excavated soils, green waste, asphalt/concrete, and other C&D waste. Per City standard assumptions for demolition activities, an estimated 90 percent of waste would be diverted through waste management programs. This would not represent a substantial change over existing conditions for demolition of structures and facilities on campus, as a similar waste diversion rate is expected to be achieved.

During construction, the projects identified in the USD MPU would produce 1,250.8 tons of solid waste (metal, concrete, asphalt, brick/masonry, wood, drywall, carpet, carpet padding, mixed debris, and trash), and divert 1,056.2 tons of solid waste materials from the landfill, as identified in Table 6 (for a net disposal quantity of 194.6 tons). The diverted material would consist of clean, source-separated (segregated) recyclable and/or reusable material, as well as mixed debris, to be deposited at the recycling/reuse facilities identified in the City's *2016 Certified Construction & Demolition Recycling Facility Directory* (Appendix A; City 2016). Approximately 194.6 tons of solid waste material generated during construction is anticipated to be disposed of as non-recyclable/non-reusable waste at Miramar Landfill, for an overall diversion rate during construction of approximately 84.5 percent. This would not represent a substantial change over existing conditions for demolition of structures and facilities on campus, as a similar waste diversion rate is expected to be achieved.

During occupancy, it has been estimated that the projects identified in the USD MPU would generate 1,488.1 tons of waste per year, and would divert 595.2 tons per year to recycling/reuse facilities, resulting in an estimated 40 percent diversion of waste from the landfill, as identified in Table 5. These materials would consist of clean, recyclable materials, gathered in on-site recycling bins. Approximately 892.8 tons per year, or 60 percent of occupancy material generated, are estimated to be disposed of as non-recyclable/non-reusable waste at Miramar Landfill. Although this represents a substantial increase in waste generated on campus, overall the projects identified in the USD MPU would be expected to achieve a similar or better diversion rate than existing uses on campus through the incorporation of additional sustainability measures and recycling programs. It is anticipated that the actual waste generated during operation of the projects would be less than calculated during the 20-year timeframe in which they are proposed to be constructed.

9.2 COMPLIANCE WITH CITY AND STATE REGULATIONS

Project compliance with City and State regulations is addressed below.

State of California

Based on the quantified waste generation and diversion rates discussed above, the Project would exceed the 75 percent solid waste diversion rate for waste produced during each of the construction phases. The Project would fail to meet the 75 percent waste reduction target

annually once the buildings are occupied. This shortcoming is overcome by the following factors:

- The segregation proposed during pre-construction and construction would achieve a 90 and 84.5 percent diversion rate, respectively, exceeding the 75 percent target.

- The Project would incorporate mandatory waste reduction, recycling, and diversion measures as identified in Sections 7.1 and 7.2 of this WMP during pre-construction and construction, to further reduce solid waste impacts.

- Ongoing diversion of green waste (landscaping debris) through on-campus mulching and export to Miramar Greenery would avoid unnecessary contributions to Miramar Landfill.

- To minimize generation of waste materials, recycled, post-consumer content materials would be incorporated in interiors and exteriors, to the extent practicable.

In addition to these measures implemented during pre-construction and construction activities, the Campus would commit to the recycling requirements identified in Section 7.3 of this WMP, to further reduce solid waste impacts during occupancy.

City of San Diego

Based on the quantified waste generation and diversion rates discussed above, implementation of the USD MPU would result in a less than significant impact regarding the following City thresholds related to direct solid waste impacts during construction:

- The MPU would fall below the City's CEQA Significance Determination Threshold (generation of more than 1,500 tons of solid waste materials) for direct impacts to solid waste facilities during demolition and construction.

- The MPU would exceed the 75 percent solid waste diversion rate for waste produced during demolition and construction phases by achieving 90 and 84.5 percent diversion rates, respectively.

Regarding cumulative impacts, the USD MPU proposes greater than 40,000 SF of building space and together these projects exceed the City's 60-ton threshold for disposal of waste during C&D, since approximately 204.3 tons of solid waste is anticipated to be disposed of at the Miramar Landfill during construction activities alone. During occupancy, the Project would achieve an average 40 percent diversion of waste via source-separated recycling and would dispose of approximately 892.8 tons of waste per year once the buildings are occupied. This would exceed the City's CEQA Significance Determination Threshold for cumulative impacts to solid waste services. This exceedance would be overcome through implementation of the measures specified in Chapter 7.0 of this WMP, which would provide adequate waste management during pre-construction, construction, and operation of the projects. USD MPU projects would comply with the City's Storage Ordinance and provide at the appropriate square footage of trash and recycling storage space for each new facility (refer to Tables 2 and 3). USD MPU projects would comply

with the City Recycling Ordinance by providing adequate space, bins, and educational materials for recycling during occupancy.

Upon compliance with waste diversion measures included in this WMP, plus implementation of sustainability and efficiency features identified in existing campus programs and the MPU, the USD MPU's contribution to cumulative solid waste generation would be less than cumulatively considerable.

10.0 REFERENCES

BioHiTech

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2016b *City of San Diego Construction & Demolition C&D Debris Conversion Rate Table*. June 6.

2016c *Construction and Demolition (C&D) Debris Recycling Fact Sheet*. June 29. Available at: https://www.sandiego.gov/sites/default/files/legacy/development-services/pdf/industry/infobulletin/cd_fact_sheet_6_29_16.pdf.

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2012 *City of San Diego Waste Generation Factors – Occupancy Phase*. October 1.

2011 *California Environmental Quality Act Significance Determination Thresholds*. Development Services Department. January, as amended. Available at: http://www.sandiego.gov/development-services/pdf/news/sdtceqa.pdf.

2008 *Construction and Demolition Debris Deposit Ordinance* (Municipal Code Chapter 6, Article 6, Division 6). January 1.

2007 *Recycling Ordinance* (Municipal Code Chapter 6, Article 6, Division 7). November.

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1997 *Refuse and Recyclable Materials Storage Regulations* (Municipal Code Chapter 14, Article 2 Division 8). December 9.

State of California (State)

1989 *California Integrated Waste Management Act of 1989*. State of California Assembly Bill 939.

University of San Diego (USD)

2016a Personal communication between Melissa Plaskonos of USD and Kim Baranek of HELIX Environmental Planning, Inc. (HELIX). Via email, January 12.

2016b Personal communication between Michael Catanzaro of USD and Vanessa Toscano of HELIX. Via phone, January 13. Via email, January 21.

2016c Personal communication between Louis Magana of USD and Vanessa Toscano of HELIX. Via email, January 22.

2016d Personal communication between Charles Thomas of USD and Vanessa Toscano of HELIX. Via email, January 22.

2016e USD Website: Recycling. Accessed February 2. Available at: http://www.sandiego.edu/facilities/facilities-services/general-services/recycling.php.

2016f USD Website: Office of Sustainability. Accessed February 3. Available at: http://sites.sandiego.edu/sustainability/.

2016 University of San Diego Master Plan Update. M.W. Steele Group. October.

Waste Management

2016 USD Tonnage Diversion Rates 2015.

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Appendix A

2016 CERTIFIED CONSTRUCTION & DEMOLITION RECYCLING FACILITY DIRECTORY

2016 Certified Construction & Demolition Recycling Facility Directory

These facilities are certified by the City of San Diego to accept materials listed in each category. Hazardous materials are not accepted. The diversion rate for these materials shall be considered 100%, except mixed C&D debris which updates quarterly. The City is not responsible for changes in facility information. Please call ahead to confirm details such as accepted materials, days and hours of operation, limitations on vehicle types, and cost. For more information visit: www.recyclingworks.com.

Please note: In order to receive recycling credit, Mixed C&D Facility and transfer station receipts must: *-be coded as construction & demolition (C&D) debris* *-have project address or permit number on receipt* **Make sure to notify weighmaster that your load is subject to the City of San Diego C&D Ordinance.* *Note about landfills: Miramar Landfill and other landfills do not recycle mixed C&D debris.*	Mixed C&D Debris	Asphalt/Concrete	Brick/Block/Rock	Building Materials for Reuse	Cardboard	Carpet	Carpet Padding	Ceiling Tile	Ceramic Tile/Porcelain	Clean Fill Dirt	Clean Wood/Green Waste	Drywall	Industrial Plastics	Lamps/Light Fixtures	Metal	Mixed Inerts	Styrofoam Blocks
EDCO Recovery & Transfer 3660 Dalbergia St, San Diego, CA 92113 619-234-7774 | www.edcodisposal.com/public-disposal	65%											•					
EDCO Station Transfer Station & Buy Back Center 8184 Commercial St, La Mesa, CA 91942 619-466-3355 | www.edcodisposal.com/public-disposal	65%				•							•			•		
EDCO CDI Recycling & Buy Back Center 224 S. Las Posas Rd, San Marcos, CA 92078 760-744-2700 | www.edcodisposal.com/public-disposal	85%				•										•		
Escondido Resource Recovery 1044 W. Washington Ave, Escondido 760-745-3203 | www.edcodisposal.com/public-disposal	65%																
Fallbrook Transfer Station & Buy Back Center 550 W. Aviation Rd, Fallbrook, CA 92028 760-728-6114 | www.edcodisposal.com/public-disposal	65%				•										•		
Otay C&D/Inert Debris Processing Facility 1700 Maxwell Rd, Chula Vista, CA 91913 619-421-3773 | www.sd.disposal.com	77%																
Ramona Transfer Station & Buy Back Center 324 Maple St, Ramona, CA 92065 760-789-0516 | www.edcodisposal.com/public-disposal	65%				•										•		
SANCO Resource Recovery & Buy Back Center 6750 Federal Blvd, Lemon Grove, CA 91945 619-287-5696 | www.edcodisposal.com/public-disposal	65%				•										•		
All American Recycling 10805 Kenney St, Santee, CA 92071 619-508-1155 (Must call for appointment)						•											
Allan Company 6733 Consolidated Wy, San Diego, CA 92121 858-578-9300 | www.allancompany.com/facilities.htm					•										•		
Allan Company Miramar Recycling 5165 Convoy St, San Diego, CA 92111 858-268-8971 | www.allancompany.com/facilities.htm					•										•		
AMS 4674 Cardin St, San Diego, CA 92111 858-541-1977 | www.a-m-s.com								•									

	Mixed C&D Debris	Asphalt/Concrete	Brick/Block/Rock	Building Materials for Reuse	Cardboard	Carpet	Carpet Padding	Ceiling Tile	Ceramic Tile/Porcelain	Clean Fill Dirt	Clean Wood/Green Waste	Drywall	Industrial Plastics	Lamps/Light Fixtures	Metal	Mixed Inerts	Styrofoam Blocks
Armstrong World Industries, Inc. 300 S. Myrida St, Pensacola, FL 32505 877-276-7876 (Press 1, Then 8) www.armstrong.com/commceilingsna								•									
Cactus Recycling 8710 Avenida De La Fuente, San Diego, CA 92154 619-661-1283 | www.cactusrecycling.com					•								•		•		•
DFS Flooring 10178 Willow Creek Road, San Diego, CA 92131 858-630-5200 | www.dfsflooring.com						•	•										
Enniss Incorporated 12421 Vigilante Rd, Lakeside, CA 92040 619-443-9024 | www.ennissinc.com		•	•						•	•							
Escondido Sand and Gravel 500 N. Tulip St, Escondido, CA 92025 760-432-4690 | www.weirasphalt.com/esg		•															
Habitat for Humanity ReStore 10222 San Diego Mission Rd, San Diego, CA 92108 619-516-5267 | www.sdhfh.org/restore.php				•													
Hanson Aggregates West – Lakeside Plant 12560 Highway 67, Lakeside, CA 92040 858-547-2141		•															
Hanson Aggregates West – Miramar 9229 Harris Plant Rd, San Diego, CA 92126 858-974-3849		•								•							
Hidden Valley Steel & Scrap, Inc. 1342 Simpson Wy, Escondido, CA 92029 760-747-6330															•		
HVAC Exchange 2675 Faivre St, Chula Vista, CA 91911 619-423-1855 | www.thehvacexchange.com															•		
IMS Recycling Services 2740 Boston Ave, San Diego, CA 92113 619-423-1564 | www.imsrecyclingservices.com					•								•				
IMS Recycling Services 2697 Main St, San Diego, CA 92113 619-231-2521 | www.imsrecyclingservices.com													•		•		
Inland Pacific Resource Recovery 12650 Slaughterhouse Canyon Rd, Lakeside, CA 92040 619-390-1418											•						
Lamp Disposal Solutions 1405 30th Street, San Diego, CA 92154 858-569-1807 | www.lampdisposalsolutions.com														•			
Universal Waste Disposal 8051 Wing Avenue, El Cajon, CA 92020 619-438-1093 | www.universalwastedisposal.com														•			
Los Angeles Fiber Company 4920 S. Boyle Ave, Vernon, CA 90058 323-589-5637 | www.lafiber.com						•	•										

	Mixed C&D Debris	Asphalt/Concrete	Brick/Block/Rock	Building Materials for Reuse	Cardboard	Carpet	Carpet Padding	Ceiling Tile	Ceramic Tile/Porcelain	Clean Fill Dirt	Clean Wood/Green Waste	Drywall	Industrial Plastics	Lamps/Light Fixtures	Metal	Mixed Inerts	Styrofoam Blocks
Miramar Greenery, City of San Diego 5180 Convoy St, San Diego, CA 92111 858-694-7000 | www.sandiego.gov/environmental-services/miramar/greenery.shtml											•						
Moody's 3210 Oceanside Blvd., Oceanside, CA 92056 760-433-3316		•								•						•	
Otay Valley Rock, LLC 2041 Heritage Rd, Chula Vista, CA 91913 619-591-4717 | www.otayrock.com		•															
Reclaimed Aggregates Chula Vista 855 Energy Wy, Chula Vista, CA 91913 619-656-1836		•														•	
Reconstruction Warehouse 3650 Hancock St., San Diego, CA 92110 619-795-7326 | www.recowarehouse.com				•													
Robertson's Ready Mix 2094 Willow Glen Dr, El Cajon, CA 92019 619-593-1856		•								•						•	
Romero General Construction Corp. 8354 Nelson Wy, Escondido, CA 92026 760-749-9312 | www.romerogc.com/crushing/nelsonway.htm		•															
SA Recycling 3055 Commercial St., San Diego, CA 92113 619-238-6740 | www.sarecycling.com															•		
SA Recycling 1211 S. 32nd St., San Diego, CA 92113 619-234-6691 | www.sarecycling.com															•		
Vulcan Carol Canyon Landfill and Recycle Site 10051 Black Mountain Rd, San Diego, CA 92126 858-530-9465 | www.vulcanmaterials.com/carrollcanyon		•	•							•						•	

Appendix B

2016 CITY OF SAN DIEGO C&D DEBRIS CONVERSION RATE TABLE

CITY OF SAN DIEGO

Construction & Demolition (C&D) Debris Conversion Rate Table

This worksheet lists materials typically generated from a constructionor demolition project and provides formulas for converting common units (i.e. cubic yards, square feet, and board feet) to tons. It is a tool that should be used for preparing your Waste Mangement Form - Part I, which requires that quantities be provided in tons.

Note: Weigh receipts are required for your refund request.

Step 1: Enter the estimated quantity for each applicable material in Column I, based on units

Step 2: Multiply by Tons/Unit figure listed in Column II. Enter the result for each material in Column III.

If using Excel version, column III will automatically calculate tons.

Step 3: Enter quantities for each separated material from Column III on this worksheet into the corresponding section of your Waste Management Form - Part I.

		Column I			Column II		Column III
Category	**Material**	**Volume**	**Unit**		**Tons/Unit**		**Tons**
Asphalt/Concrete	Asphalt (broken)		cy	x	0.70	=	
	Concrete (broken)		cy	x	1.20	=	
	Concrete (solid slab)		cy	x	1.30	=	
Brick/Masonry/Tile	Brick (broken)		cy	x	0.70	=	
	Brick (whole, palletized)		cy	x	1.51	=	
	Masonry Brick (broken)		cy	x	0.60	=	
	Tile		sq ft	x	0.00175	=	
Building Materials (doors, windows, cabinets, etc.)			cy	x	0.15	=	
Cardboard (flat)			cy	x	0.05	=	
Carpet	By square foot		sq ft	x	0.0005	=	
	By cubic yard		cy	x	0.30	=	
Carpet Padding/Foam			sq ft	x	0.000125	=	
Ceiling Tiles	Whole (palletized)		sq ft	x	0.0003	=	
	Loose		cy	x	0.09	=	
Drywall (new or used)	1/2" (by square foot)		sq ft	x	0.0008	=	
	5/8" (by square foot)		sq ft	x	0.00105	=	
	Demo/used (by cubic yd)		cy	x	0.25	=	
Earth	Loose/Dry		cy	x	1.20	=	
	Excavated/Wet		cy	x	1.30	=	
	Sand (loose)		cy	x	1.20	=	
Landscape Debris (brush, trees, etc)			cy	x	0.15	=	
Mixed Debris	Construction		cy	x	0.18	=	
	Demolition		cy	x	1.19	=	
Scrap metal			cy	x	0.51	=	
Shingles, asphalt			cy	x	0.22	=	
Stone (crushed)			cy	x	2.35	=	
Unpainted Wood & Pallets	By board foot		bd ft	x	0.001375	=	
	By cubic yard		cy	x	0.15	=	
Garbage/Trash			cy	x	0.18	=	
Other (estimated weight)			cy	x	estimate	=	
			cy	x	estimate	=	
			cy	x	estimate	=	
					Total All		

Appendix C

CITY OF SAN DIEGO WASTE GENERATION FACTORS – OCCUPANCY PHASE

Waste Generation Factors – Occupancy Phase

The following factors are used by the City of San Diego Environmental Services Department to estimate the expected waste generation in a new residential or commercial development.

Residential Uses
Residential Unit = 1.6 tons/year/unit
Multi-family Unit = 1.2 tons/year/unit

Example: To calculate the amount of waste that will be generated from a project with 100 new homes, multiply the number of homes by the generation factor.

100 single family homes x 1.6 = 160 tons/year
100 multi-family units x 1.2 = 120 tons/year

Commercial/Industrial Uses

General Retail	0.0028
Restaurants & Bars	0.0122
Hotels/Motels	0.0045
Food Stores	0.0073
Auto/Service/Repair	0.0051
Medical Offices	0.0033
Hospitals	0.0055
Office	0.0017
Transp/Utilities	0.0085
Manufacturing	0.0059
Education	0.0013
Unclassified Services	0.0042

Example: To calculate the amount of waste that could be generated from a new building with 10,000 square feet for offices and 10,000 square feet for manufacturing, multiply the square footage for each use by the generation factor.

10,000 square feet x 0.0017 = 17 tons/year
10,000 square feet x 0.0059 = 59 tons per year

Total estimated waste generation for building = 76 tons/year

December 8, 2016
Kleinfelder Project No. 20162332.001A

Melissa Plaskonos
Facilities Management
University of San Diego
5998 Alcala Park
San Diego, California 92110

SUBJECT: Geotechnical Review of Subsequent Environmental Impact Report
USD Master Plan Update
University of San Diego
San Diego, California

References:

1) USD Master Plan Update Subsequent Environmental Impact Report, University of San Diego, San Diego, California, Prepared by Helix Environmental Planning, December 2016 Submittal

2) Geotechnical Services for Master Plan Update and CUP Amendment, University of San Diego, Alcala Park, San Diego, California, Prepared by Kleinfelder, dated October 27, 2015, Kleinfelder Project No. 20162332.001A

3) Geotechnical Response to City of San Diego LDR-Geology Review Comments - Cycle 10, Master Plan Update and CUP Amendment, University of San Diego, San Diego, California, Prepared by Kleinfelder, dated April 11, 2016, Kleinfelder Project No.20162332.001A

Dear Ms. Plaskonos:

In response to a review comment from the City of San Diego, Kleinfelder has performed a geotechnical review of Section 7.1.3 of the USD Master Plan Update Subsequent Environmental Impact Report (Reference 1). Our review was performed to evaluate whether the content of our above referenced geotechnical report and response to review comments (References 2 and 3) was adequately incorporated into the Environmental Impact Report (EIR).

Based on our review, Kleinfelder is of the opinion that the geologic and geotechnical conclusions, recommendations and mitigations from the referenced geotechnical report have been substantially incorporated into the referenced EIR document we reviewed.

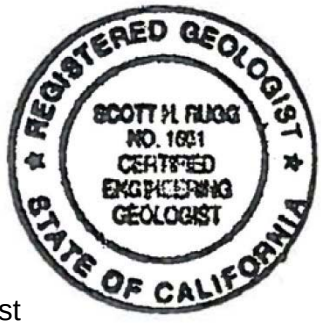
550 West C Street, Suite 1200, San Diego CA 92101 **p |** 619.831.4600 **f |** 619.232.1039

Please note that EIR was not checked by Kleinfelder for conformance to regulations or other client and governmental requirements. Our review was limited to observing that the document generally conformed to the intent of the recommendations and mitigations in the referenced geotechnical report.

This letter is subject to the limitations contained in our October 27, 2015 report for the subject project.

Sincerely,

KLEINFELDER



Kevin Crennan, GE 2511
Sr. Geotechnical Engineer

Scott Rugg, CEG 1651
Sr. Engineering Geologist

cc: Ms. Kim Baranek, Helix Environmental Planning
Mr. Diego Velasco, M.W. Steele

February 23, 2016
Revised April 11, 2016
Project No. 20162332.001A

LDR-Geology / Mr. Jim Quinn
City of San Diego
Development Services Department
1222 First Avenue, MS 301
San Diego, California 92101

Subject: **Geotechnical Response to City of San Diego LDR-Geology Review Comments - Cycle 10 Master Plan Update and CUP Amendment University of San Diego Campus San Diego, California**

City Project # 417090 (LDR – Geology)

References: **Geotechnical Services for Master Plan Update and CUP Amendment, University of San Diego Campus, San Diego, California, California, Prepared by Kleinfelder, dated October 27, 2015, Kleinfelder Project No. 20162332.001A**

Dear Mr. Quinn:

We have received comments from the Cycle 10 December 15, 2015 LDR-Geology review for the above referenced project in response to the referenced geotechnical report. We have responded to Issues 6 through 12 (in italics) below, and have included the original Issue (in boldface) for your reference. This supersedes our previous response on February 23, 2016. Other Issues will be addressed by other consultants or designers.

We understand the purpose of the EIR and our supporting geotechnical study is to obtain clearance from a CEQA standpoint. The proposed project provides a framework to guide campus development over the next 15 to 20 years. As such, the submitted plans reflect conceptual designs.

Our responses to the review comments are presented below.

Issue 6: **Provide a site-specific geologic/geotechnical map that shows the distribution of fill and geologic units on a topographic base that shows the proposed development. Show geologic structure. The consultant could consider using the project site maps as a base map (Kettler Leweck Engineering sheet C-15 through C-31).**

Response: Based on review of published geologic maps, previous reports on campus, and aerial photographs, the attached Figures present the requested information. No site specific exploration was performed to develop these maps. In regards to

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geologic structure, bedding attitudes have been depicted for sites nearby or adjacent to slopes composed of Eocene units where previous mapping has identified structure. For sites located inbound of slopes underlain by Lindavista Formation, structure is not shown as this unit is typically subhorizontal with shallow dips, interpreted from regional mapping.

Issue 7: Show the location of the "Outlook" fault identified in previous studies by Kleinfelder and others on the site-specific geologic/geotechnical map.

Response: Fault is shown on attached figures.

Issue 8: Show the area of the faults identified in the 2014 SANDAG study on the site-specific geologic/geotechnical map.

Response: Fault is shown on attached figures.

Issue 9: Show the approximate areas of anticipated remedial grading if necessary to address potential impacts on biologic or other resources.

Response: The attached figures present the requested information. The estimated limits of potential remedial grading pertain to the building footprint and do not include potential shallow grading less than about 2 feet for improvements such as hardscape or paving. These limits are well within the limits of work shown on civil plans. Some sites do not have remedial grading and contain a note of the attached figure in place of limits of remedial grading.

Issue 10: Provide representative cross sections for each project site with slopes steeper that 4:1. Show the existing and proposed grades, and distribution of fill and geologic units. Show the approximate limits of anticipated remedial grading on the cross sections if necessary to address potential impacts on biologic or other resources.

Response: Based on review of published geologic maps, previous geotechnical reports on campus, and aerial photographs, the attached Figures present the requested information. Cross-sections were developed for the each of the two proposed buildings on Site 22 as their footprints are on 4:1 slopes. Other sites are either on low sloping ground or the proposed building is setback from adjacent slopes on relatively level ground. Site 19 will only consist of constructing a pedestrian bridge foundation on very dense formational material on a slope so no cross section provided. No site specific exploration was performed for this study.

Issue 11: The project's geotechnical consultant indicates that the potential for fault rupture at the proposed site 18 parking structure it considered moderate. The project's geotechnical consultant must address if there is a potential for a significant effect and if mitigation measures (i.e., structural setbacks) are recommended.

Response: The hazard with respect to fault rupture on the university campus is considered to be moderate for Site 18 and the potential for fault rupture will be addressed by performing a site specific fault investigation in accordance with the City of San Diego Guidelines during the future design-level investigation. The investigation would address both potential presence of faulting and activity level if faulting is encountered. Appropriate mitigation measures such as building setback from a fault would be recommended if active faulting is encountered.

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Issue 12: Clarify if there is a potential for a significant effect due to slope instability. If a potentially significant effect is identified the consultant should recommend mitigation measures or verify if an unmitigated significant effect is indicated.

Response: Based on the relatively level ground over most of the campus, distance to slopes, presence of very dense formational materials, geologic structure, investigation of mapped landslide feature, and professional judgment, the hazard to the proposed improvements by landslides or shallower slope stability is considered low. The majority of proposed developments will not impact stability of the existing slopes and the potential for slope instability impacting the project sites is low. In response to Comment 10 above, we developed geologic two cross sections for each of the two buildings (designated as west building and east building) on Site 22. Although site specific slope stability analyses will be performed during future design level reports we have performed a preliminary slope stability analyses for the west building location which has more critical geometry than the east building site.

Slope stability analyses require assumptions including development of soil strength parameters and geometry of subsurface conditions. These were developed based on review of prior studies on campus and review of historical aerial photographs. Limit equilibrium slope stability analyses were performed using the computer program Slope/W v. 2012 by Geo-Slope International. Spencer's method of slices was used, which satisfies both moment and force equilibrium.

Evaluation of global stability involves developing a cross section of the existing topography and the currently anticipated building geometry, developing a Generalized Soil Profile and soil strength parameters, and calculating the FOS. The following soil strength parameters below were conservatively estimated for this preliminary study:

Soil Type	Unit Weight, (pcf)	Cohesion (psf)	Friction Angle (deg)
Fill	120	50	30
Scripps Formation	120	250	38

The results of the analyses indicate a calculated minimum safety factor of 2.14 for static conditions and 1.21 for pseudo-static conditions. Since these values are above the conventional minimum values of 1.5 and 1.1 for what we consider the most critical section, additional analyses for other sites are not warranted at this time. Based on our experience with the site soils from numerous projects on campus and experience with performing slope stability analyses, it is our opinion that permanent slopes consisting of fill or formational materials with favorable geologic structure are grossly stable with a maximum inclination of 2 horizontal to 1 vertical. These slopes have calculated safety factors against deep-seated slope failure greater than 1.5 for static conditions and 1.1 for pseudo-static conditions.

Based on the results of our preliminary analyses, it is our opinion that remedial grading will not be required to mitigate slope instability. Conventional keying and benching of new fills slopes, if any, would likely be performed.

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This response letter is subject to the limitations contained in our October 27, 2015 report for the project.

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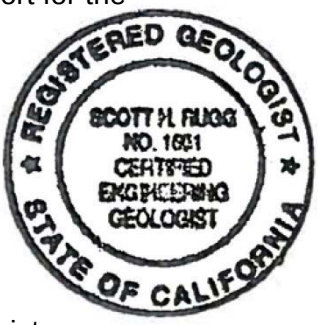

Kevin Crennan, GE 2511
Project Manager

Scott Rugg, CEG 1651
Senior Engineering Geologist

Attachments: Geologic Map for Each Site
Geologic Cross Sections for Site 22

cc: Mr. Roger Manion, University of San Diego
Mr. Diego Velasco, M.W. Steele

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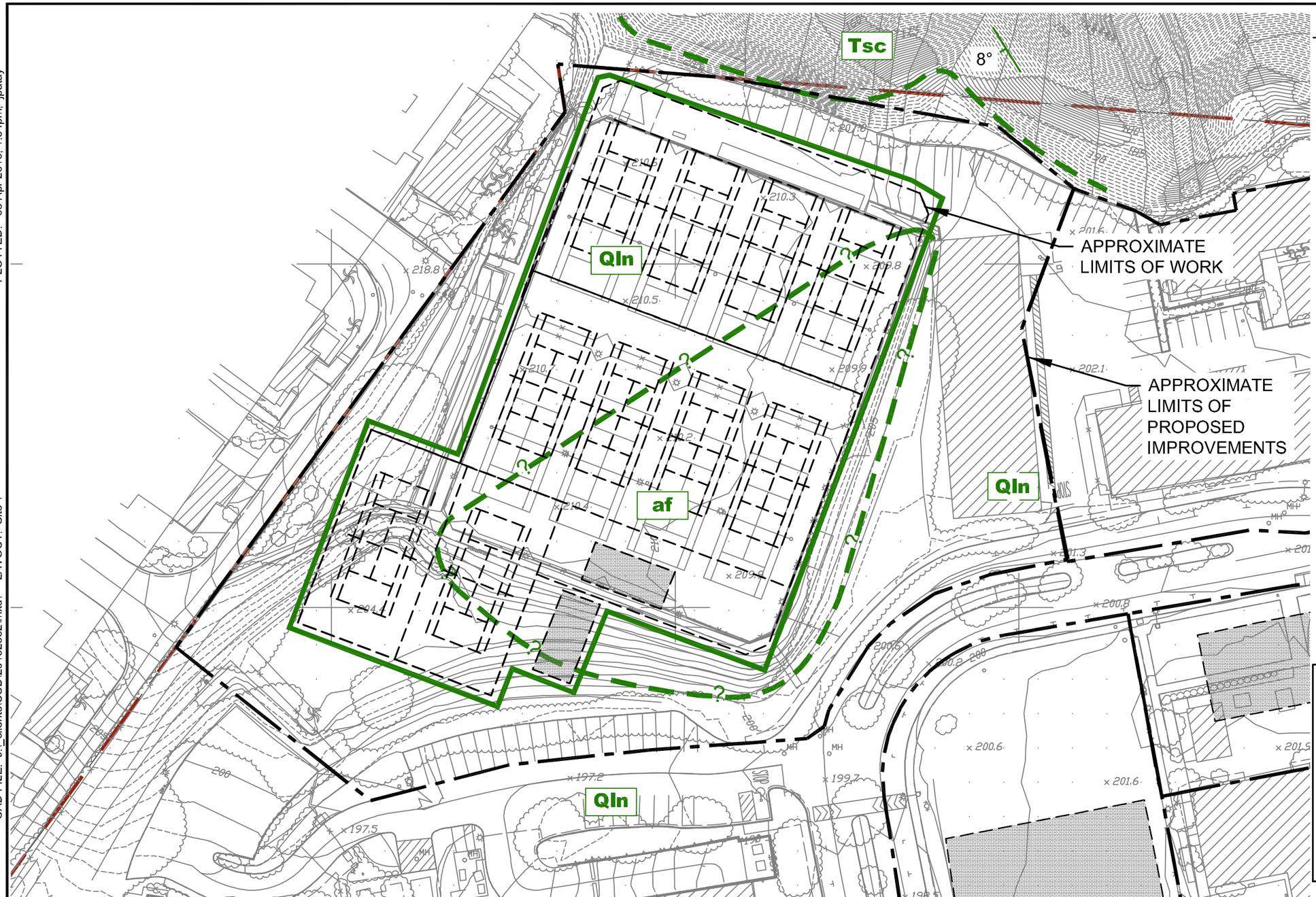
GEOLOGIC MAP FOR EACH SITE



SITE LOCATION

SOURCE:
BASEMAP FROM KETTLER LEWECK ENGINEERING, APRIL 2016.

60 30 0 60
APPROXIMATE SCALE (feet)

N

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GEOLOGIC MAP
PROJECT SITE NO. 1

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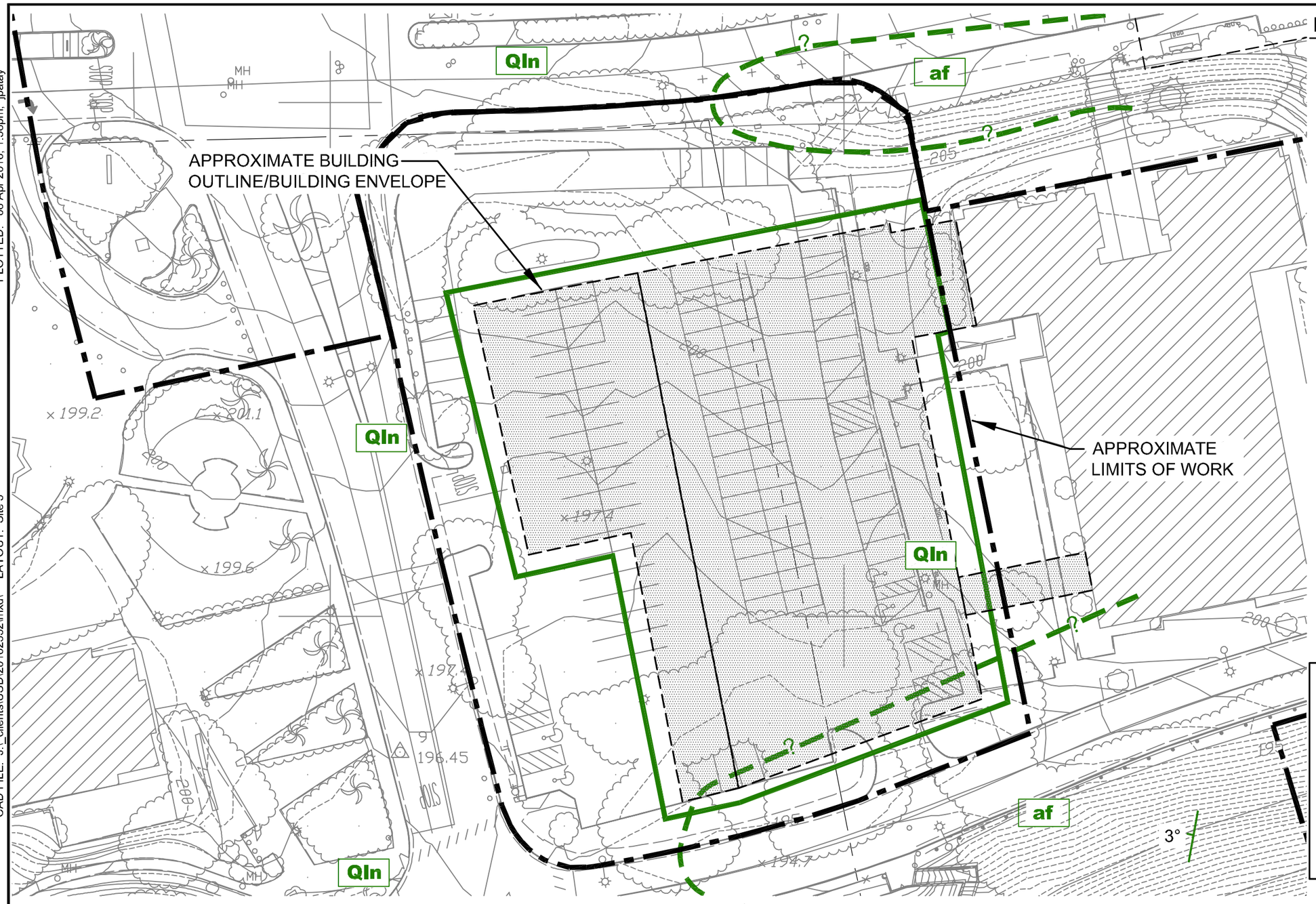
SAN DIEGO, CALIFORNIA

FIGURE
1



SITE LOCATION

SOURCE:
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40 20 0 40
APPROXIMATE SCALE (feet)

N

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GEOLOGIC MAP
PROJECT SITE NO. 5

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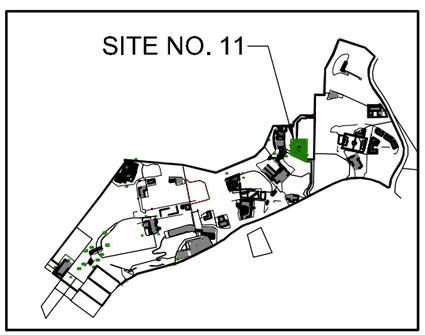
MASTER PLAN UPDATE
SAN DIEGO, CALIFORNIA

FIGURE
2

ATTACHED IMAGES:
ATTACHED XREFS: XRef: 0059 BNDY_PLINE; XRef: 0059 CUP BOUNDARY_PLINE; XRef: 0059 USD CUP_Projects; XRef: 0059 USD TOPO
CAD FILE: J:_clients\USD\20162332\mxd\ LAYOUT: Site 5
PLOTTED: 08 Apr 2016, 1:58pm, jpatay

LEGEND

- LIMITS OF REMEDIAL GRADING
- af — ARTIFICIAL FILL
- Tsc — SCRIPPS FORMATION
- ? — GEOLOGIC CONTACT
- 3° — BEDDING STRUCTURE



SITE LOCATION

SOURCE:
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40 20 0 40
APPROXIMATE SCALE (feet)

N

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GEOLOGIC MAP
PROJECT SITE NO. 11

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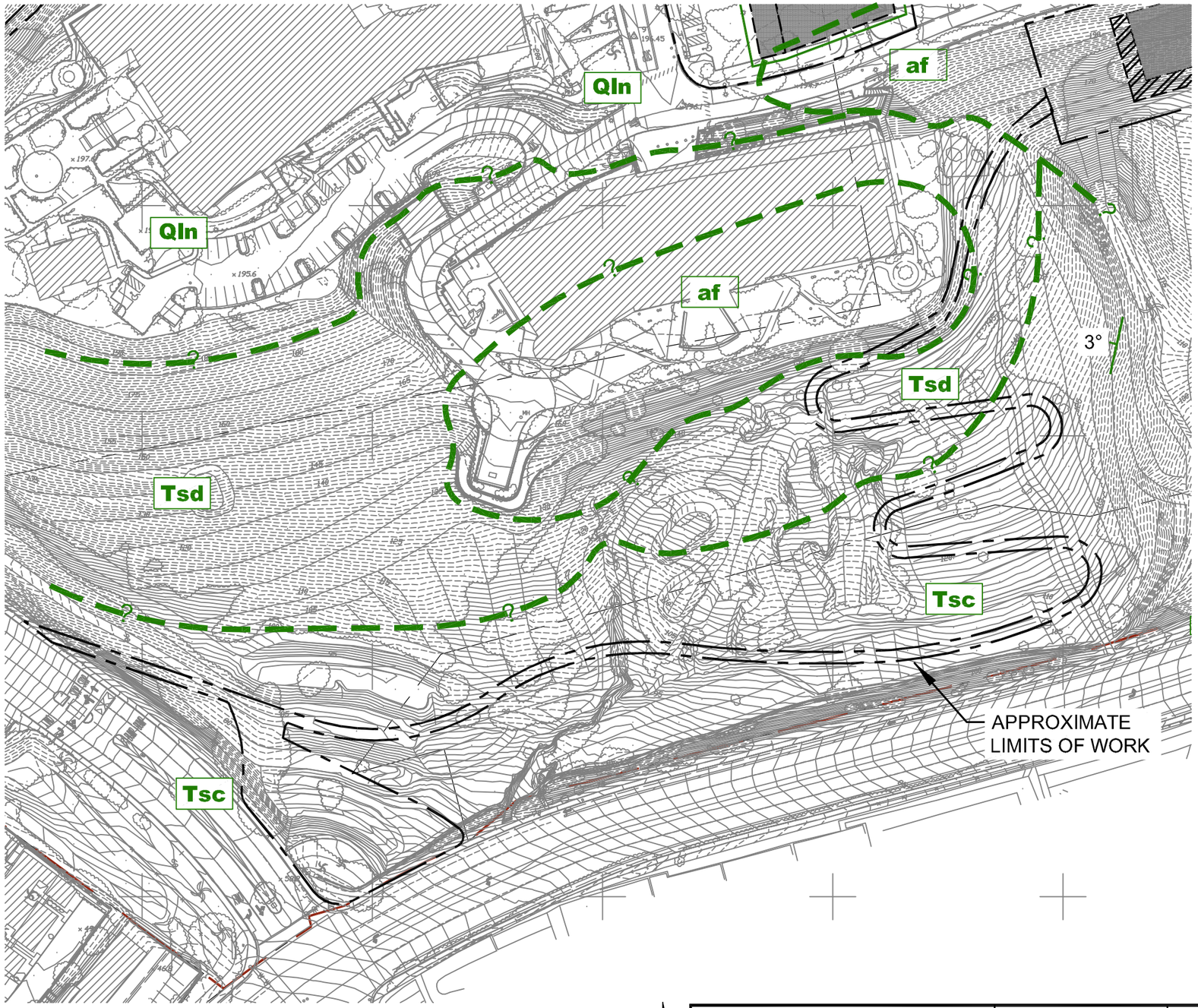
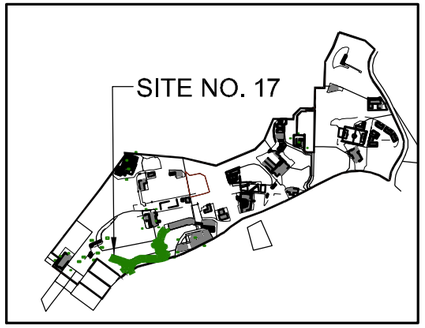
FIGURE
3



LEGEND

- af — ARTIFICIAL FILL
- Qln — LINDAVISTA FORMATION
- Tsd — SAN DIEGO FORMATION
- Tsc — SCRIPPS FORMATION
- ? — GEOLOGIC CONTACT
- 3° — BEDDING STRUCTURE

NOTE:
NO REMEDIAL GRADING FOR THIS PROJECT SITE.



SITE LOCATION

SOURCE:
BASEMAP FROM KETTLER LEWECK ENGINEERING, APRIL 2016.

100 50 0 100
APPROXIMATE SCALE (feet)

N

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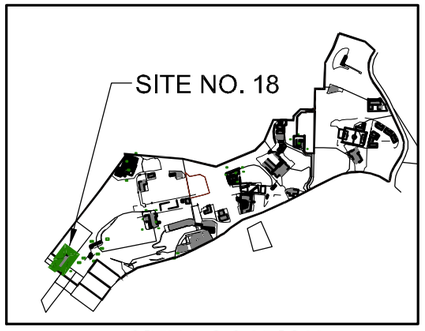
FIGURE
4

LEGEND

- LIMITS OF REMEDIAL GRADING
- af — ARTIFICIAL FILL
- Qbp — BAY POINT FORMATION
- ? — GEOLOGIC CONTACT
- FAULT, DASHED WHERE INFERRED, DOTTED WHERE CONCEALED



SITE LOCATION

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50 25 0 50
APPROXIMATE SCALE (feet)

N

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GEOLOGIC MAP
PROJECT SITE NO. 18

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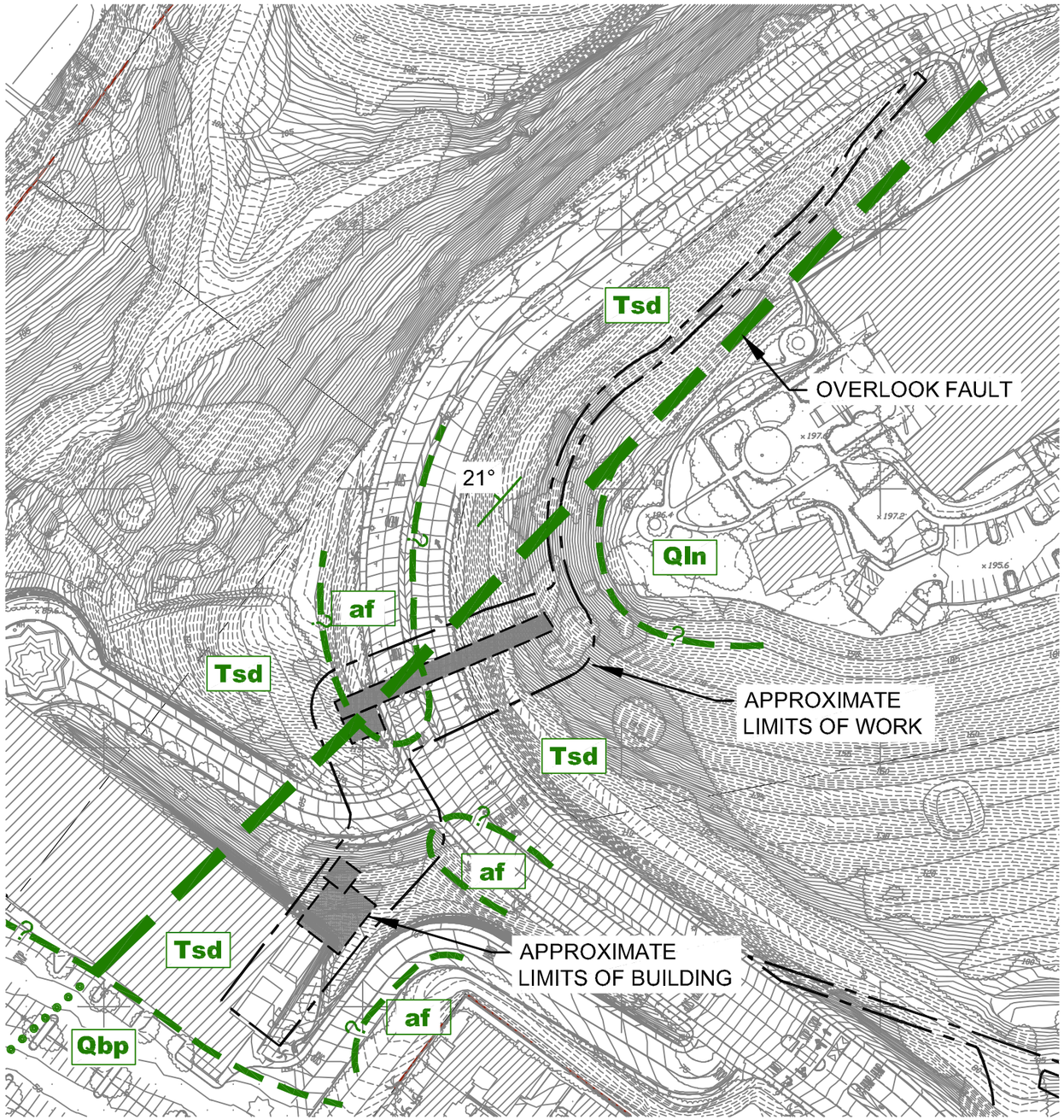
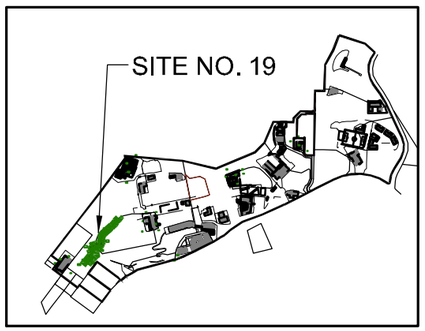
FIGURE
5



LEGEND

- af — ARTIFICIAL FILL
- Qbp — BAY POINT FORMATION
- Qln — LINDAVISTA FORMATION
- Tsd — SAN DIEGO FORMATION
- —?— GEOLOGIC CONTACT
- FAULT, DASHED WHERE INFERRED, DOTTED WHERE CONCEALED
- 21° — BEDDING STRUCTURE

NOTE:
NO REMEDIAL GRADING FOR THIS PROJECT SITE.



SITE LOCATION

SOURCE:
BASEMAP FROM KETTLER LEWECK ENGINEERING, APRIL 2016.

100 50 0 100
APPROXIMATE SCALE (feet)

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GEOLOGIC MAP
PROJECT SITE NO. 19

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FIGURE
6

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CAD FILE: J:_clients\USD\20162332\mxd\ LAYOUT: Site19
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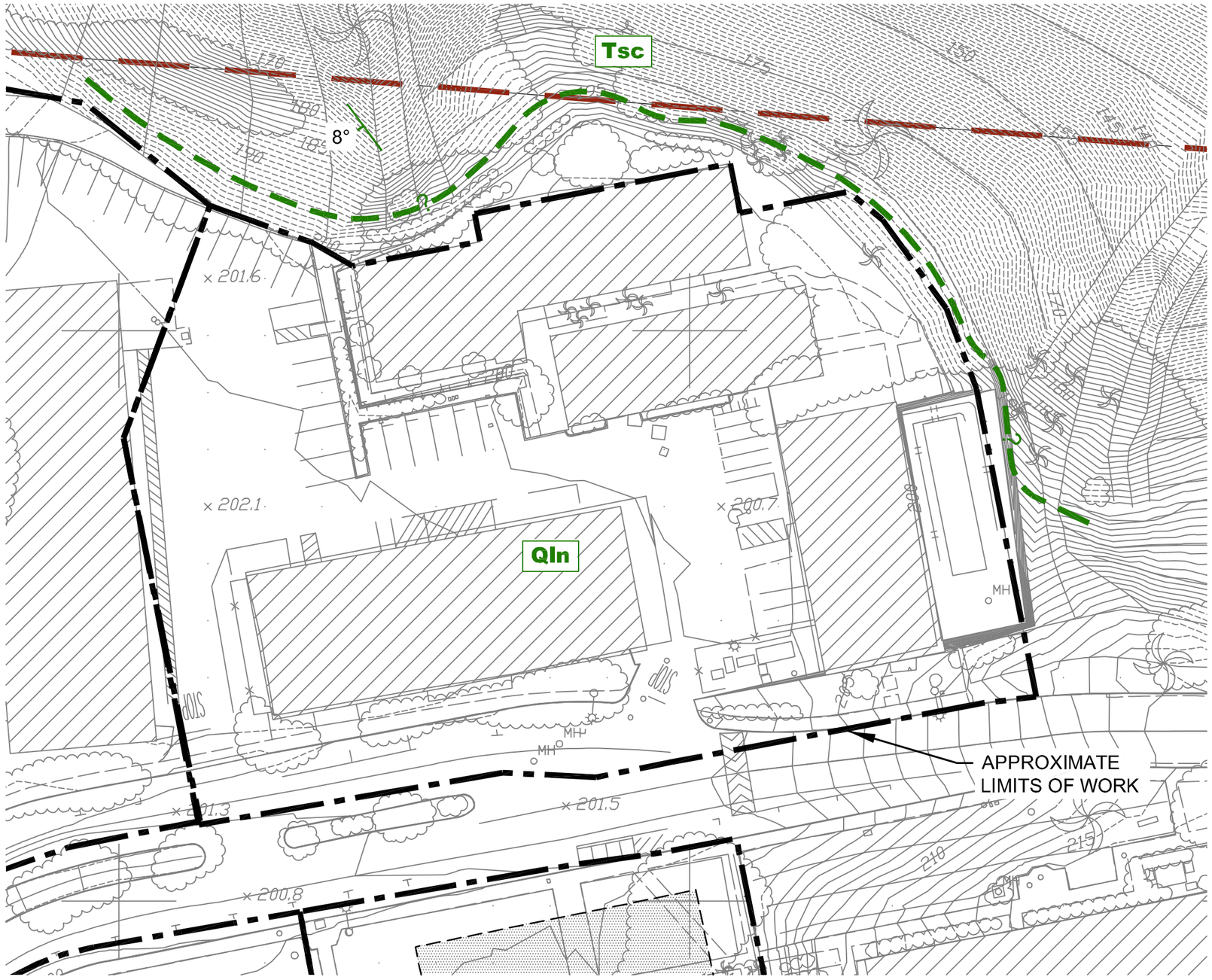
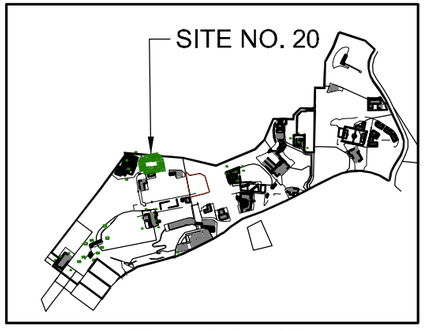


LEGEND

- Qln — LINDAVISTA FORMATION
- Tsc — SCRIPPS FORMATION
- ? — GEOLOGIC CONTACT
- 8° — BEDDING STRUCTURE

NOTES:
PROJECT PROPOSED TO MOVE INTERNAL BUILDING FUNCTIONS ONLY AND DOES NOT CREATE ANY NEW IMPERVIOUS AREAS OR LAND DISTURBANCES OR GRADING.

NO REMEDIAL GRADING FOR THIS PROJECT SITE.



SITE LOCATION

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40 20 0 40
APPROXIMATE SCALE (feet)

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GEOLOGIC MAP
PROJECT SITE NO. 20

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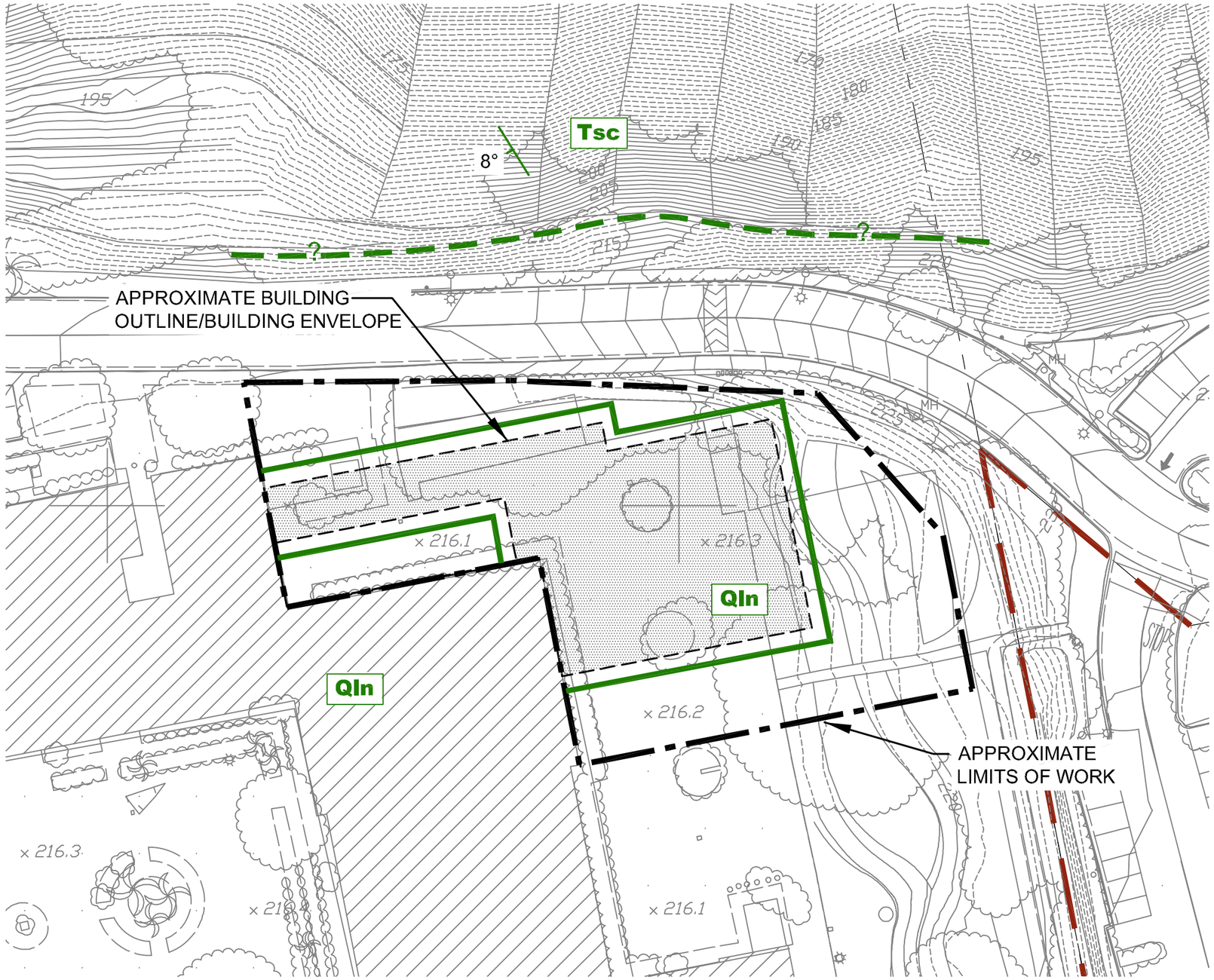
SAN DIEGO, CALIFORNIA

FIGURE
7



LEGEND

- LIMITS OF REMEDIAL GRADING
- Qln — LINDAVISTA FORMATION
- Tsc — SCRIPPS FORMATION
- ? — GEOLOGIC CONTACT
- 8° — BEDDING STRUCTURE

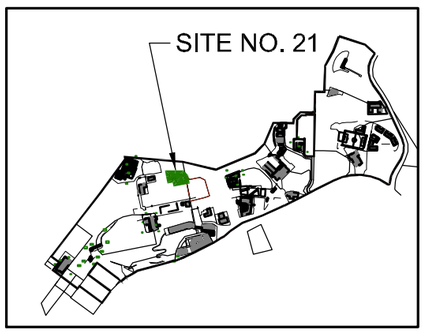


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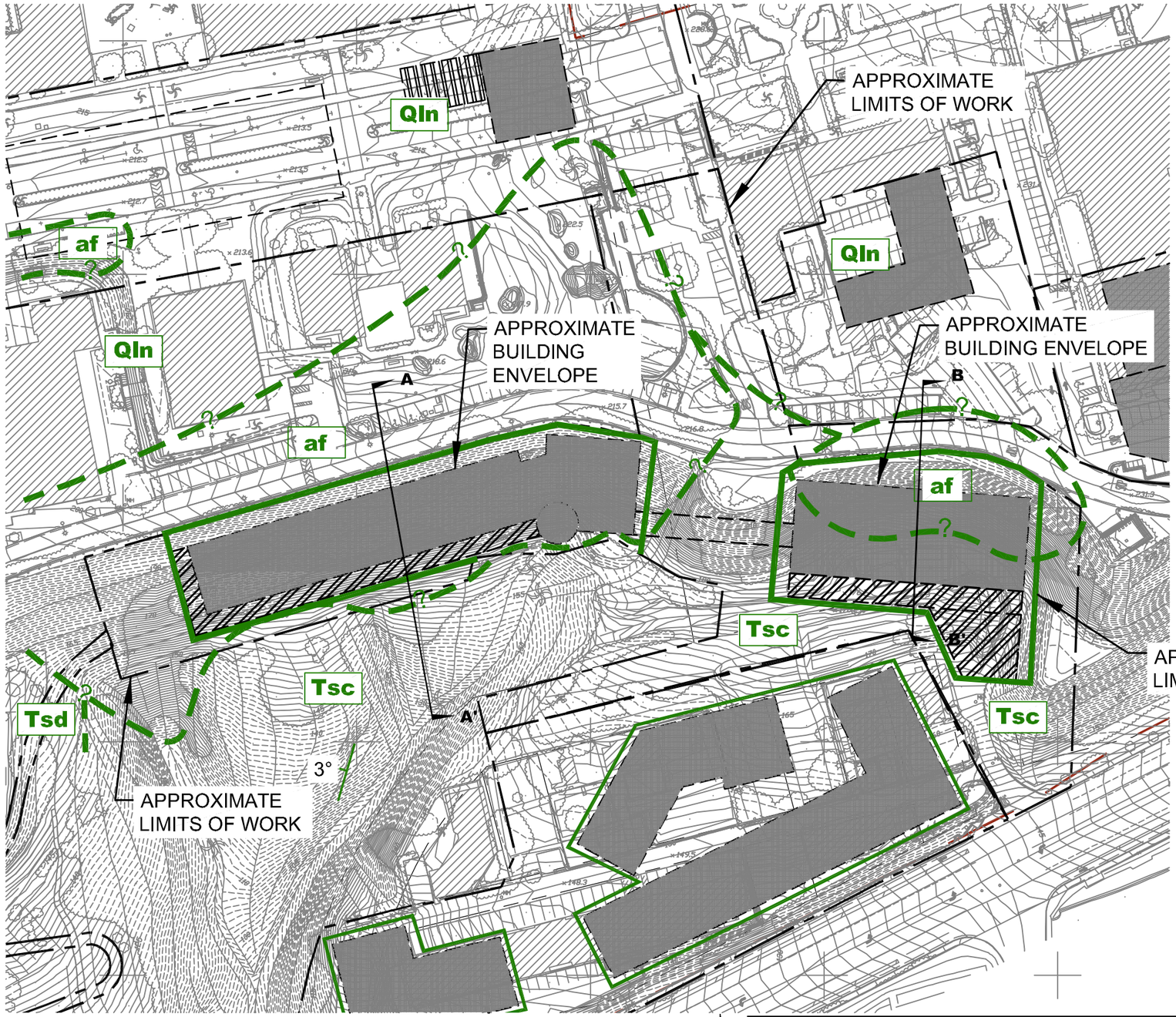
FIGURE
8



LEGEND

- LIMITS OF REMEDIAL GRADING
- af — ARTIFICIAL FILL
- Qln — LINDAVISTA FORMATION
- Tsd — SAN DIEGO FORMATION
- Tsc — SCRIPPS FORMATION
- GEOLOGIC CONTACT
- 3° — BEDDING STRUCTURE
- A — A' — APPROXIMATE LOCATION OF CROSS SECTION

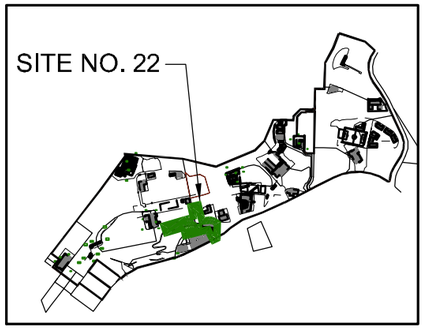


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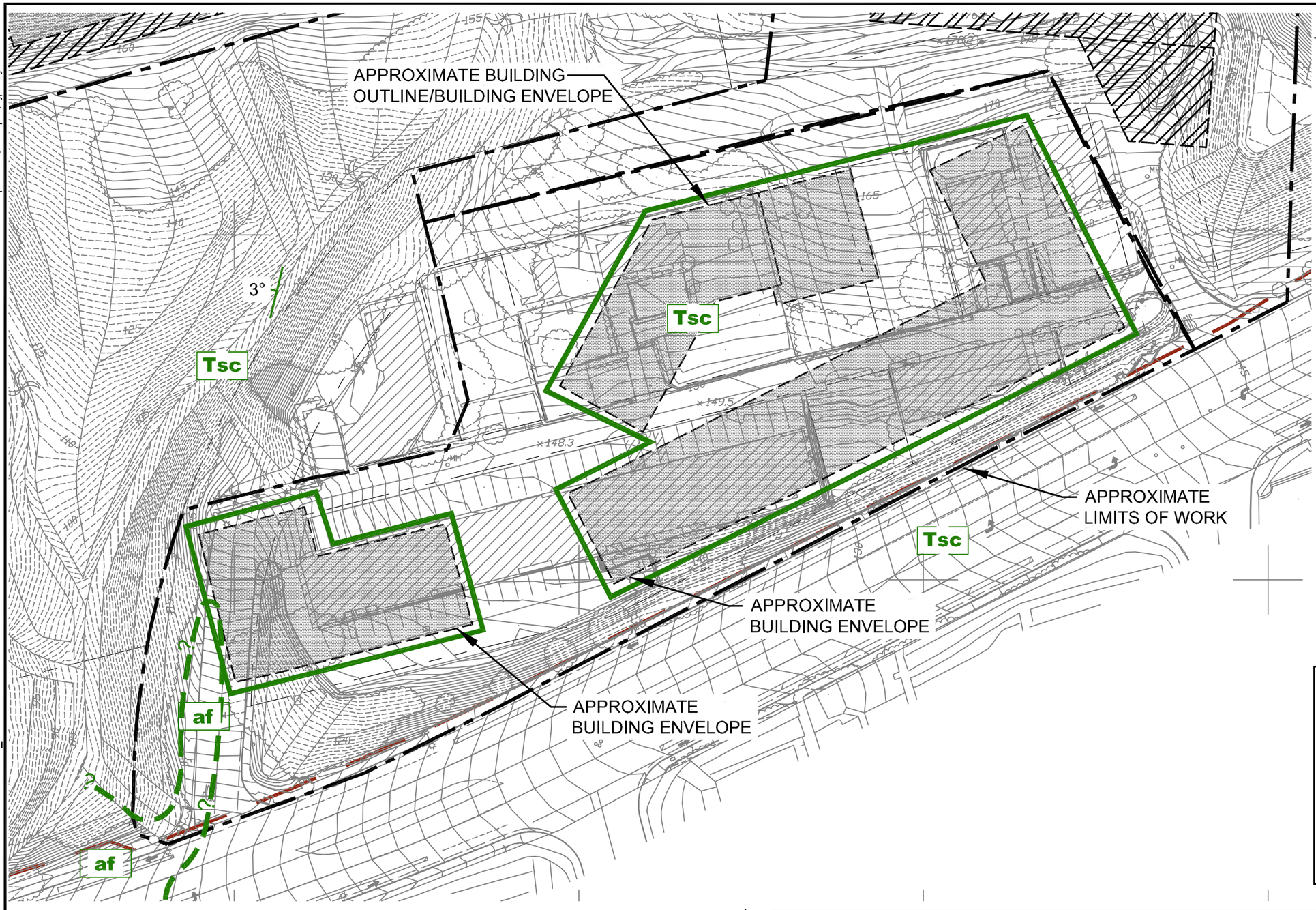
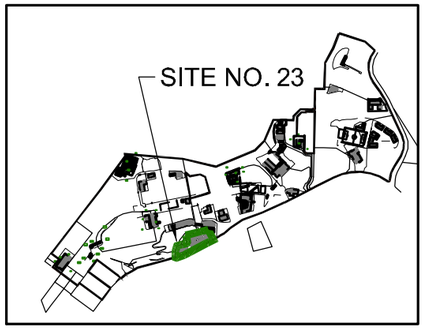
FIGURE
9



LEGEND

- LIMITS OF REMEDIAL GRADING
- af — ARTIFICIAL FILL
- Tsc — SCRIPPS FORMATION
- ? — GEOLOGIC CONTACT
- 3° — BEDDING STRUCTURE



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60 30 0 60
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GEOLOGIC MAP
PROJECT SITE NO. 23

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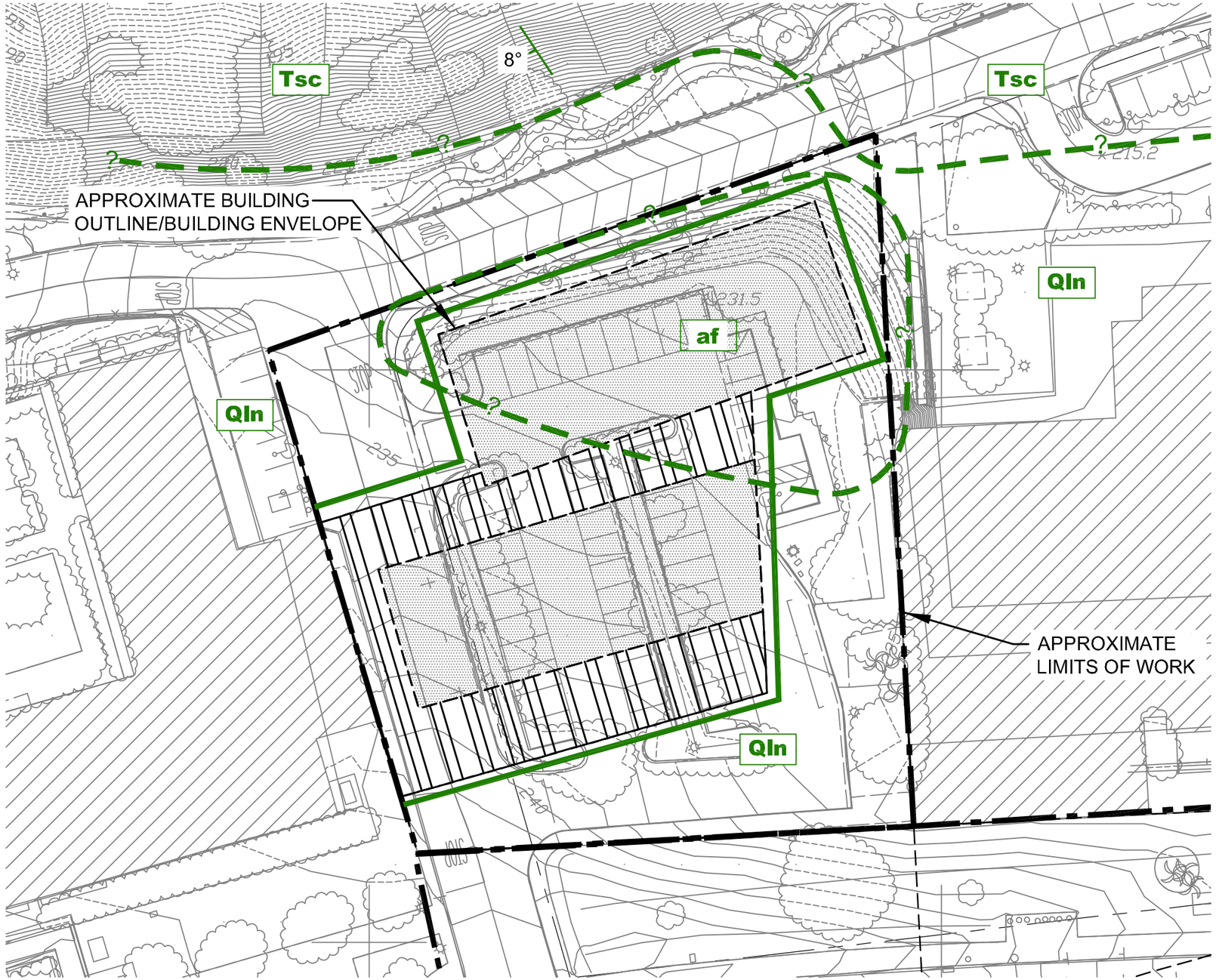
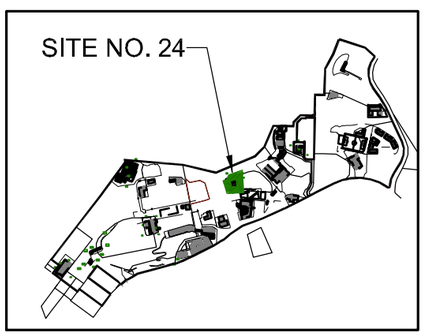
FIGURE
10



LEGEND

- LIMITS OF REMEDIAL GRADING
- af — ARTIFICIAL FILL
- QIn — LINDAVISTA FORMATION
- Tsc — SCRIPPS FORMATION
- ? — GEOLOGIC CONTACT
- 8° — BEDDING STRUCTURE



SITE LOCATION

SOURCE:
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40 20 0 40
APPROXIMATE SCALE (feet)

N

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GEOLOGIC MAP
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FIGURE
11

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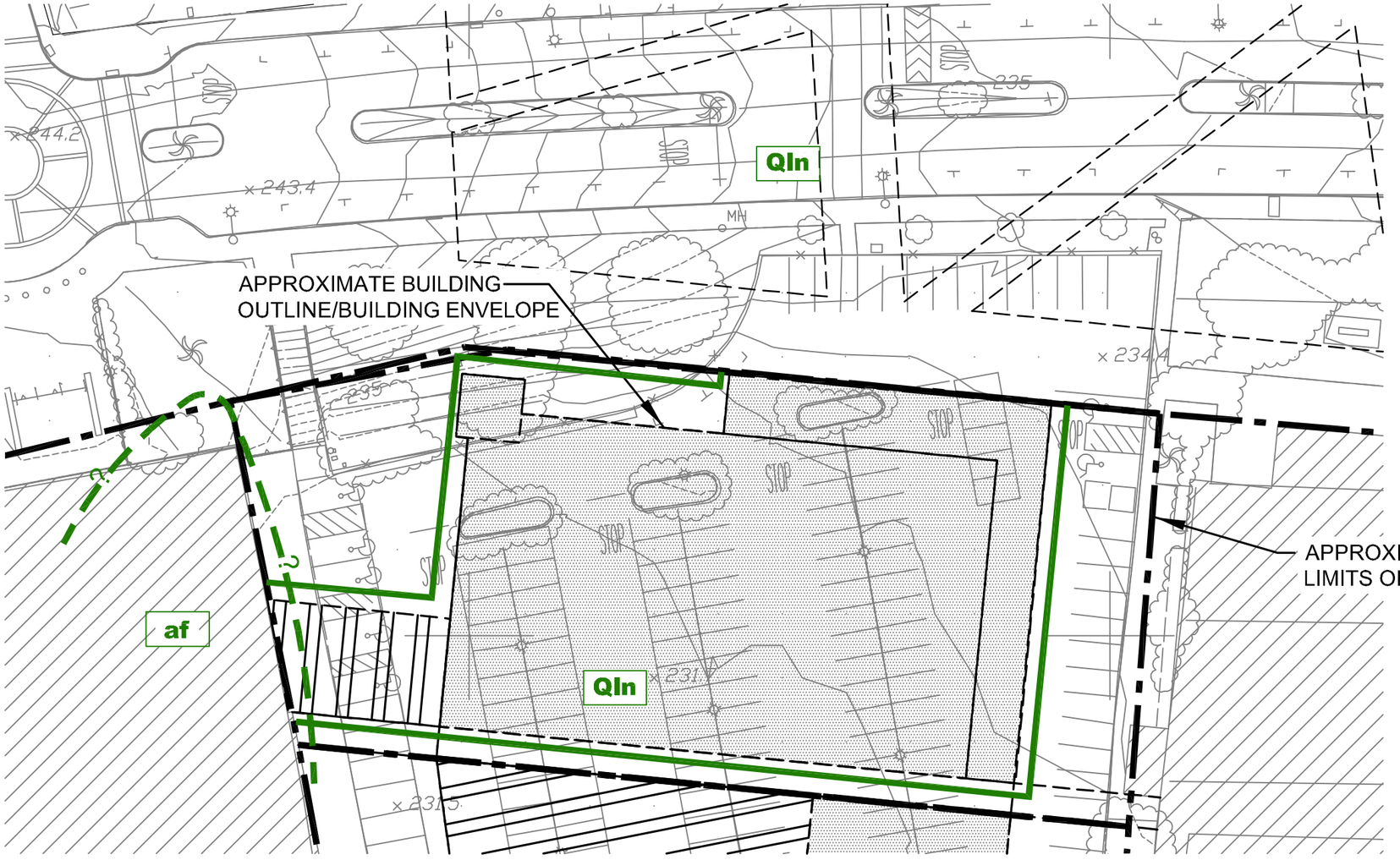
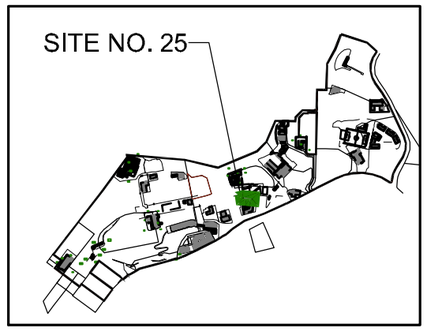
CAD FILE: J:_clients\USD\20162332\mxd\ LAYOUT: Site 24
PLOTTED: 08 Apr 2016, 4:15pm, jpatay

LEGEND

- LIMITS OF REMEDIAL GRADING
- af — ARTIFICIAL FILL
- QIn — LINDAVISTA FORMATION
- ? — GEOLOGIC CONTACT





SITE LOCATION

SOURCE:
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40 20 0 40
APPROXIMATE SCALE (feet)

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GEOLOGIC MAP
PROJECT SITE NO. 25

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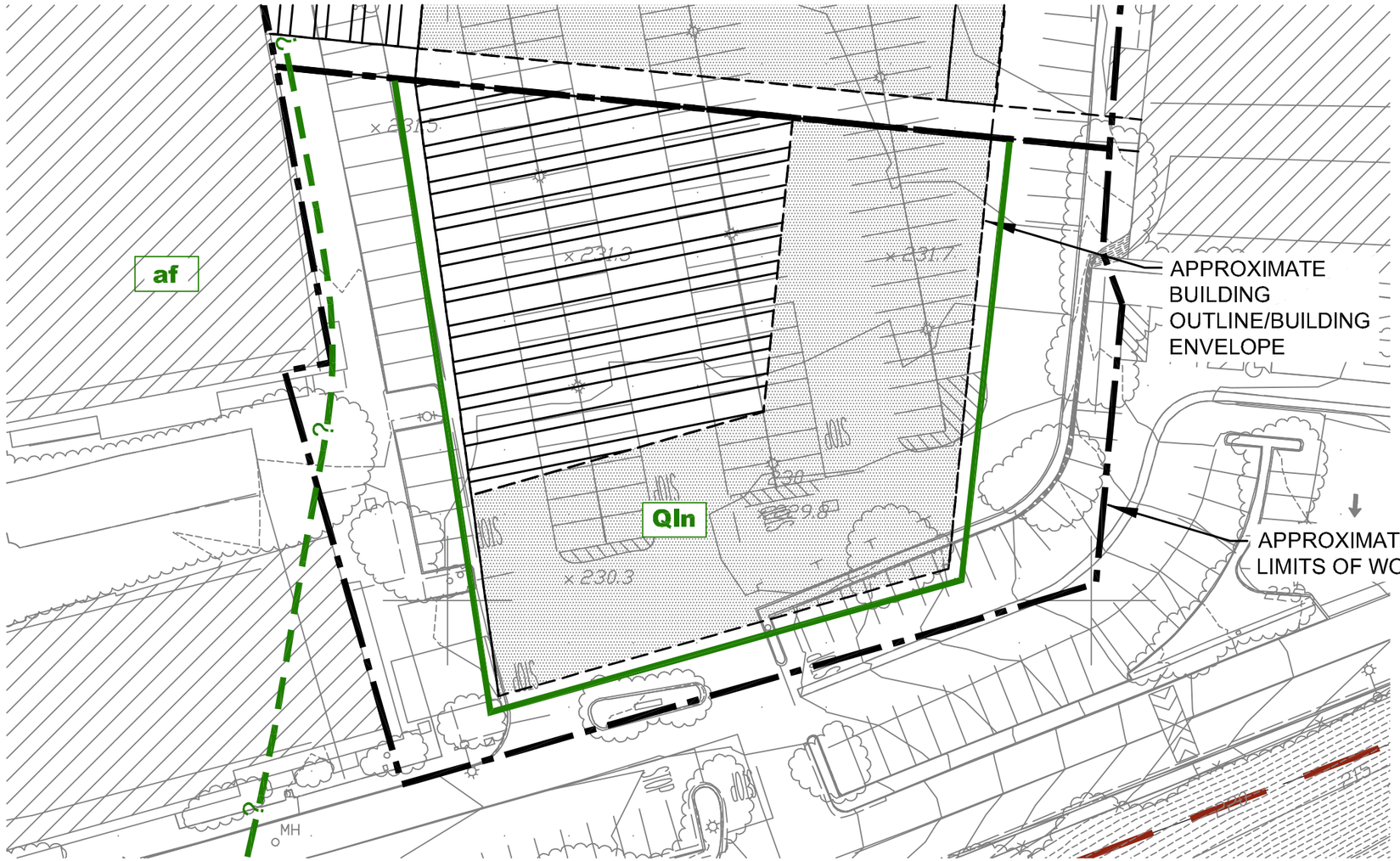
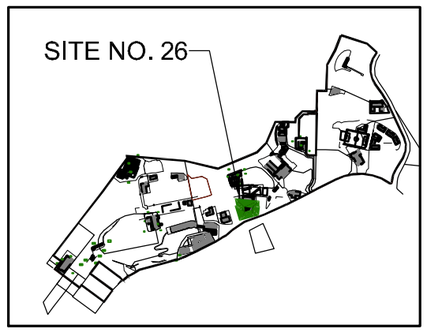
FIGURE
12

LEGEND

- LIMITS OF REMEDIAL GRADING
- af — ARTIFICIAL FILL
- Qln — LINDAVISTA FORMATION
- ? — GEOLOGIC CONTACT





SITE LOCATION

SOURCE:
BASEMAP FROM KETTLER LEWECK ENGINEERING, APRIL 2016.

40 20 0 40
APPROXIMATE SCALE (feet)

N

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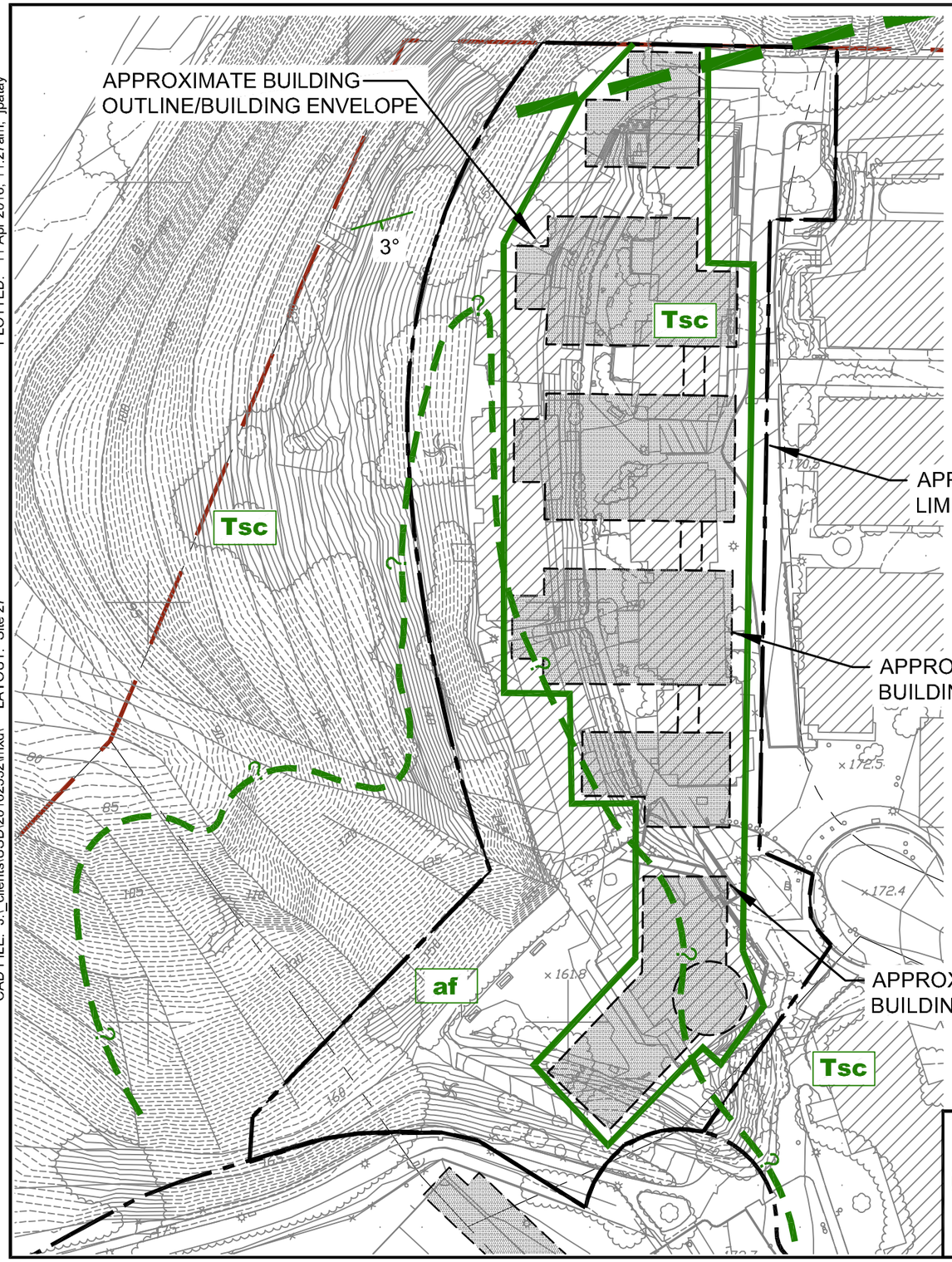
FILE NAME:	20162332_Sites.dwg

GEOLOGIC MAP
PROJECT SITE NO. 26

UNIVERSITY OF SAN DIEGO
MASTER PLAN UPDATE
SAN DIEGO, CALIFORNIA

FIGURE
13



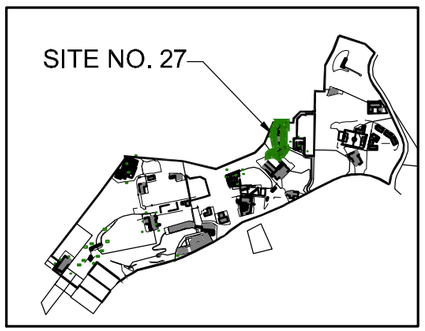
LEGEND

- LIMITS OF REMEDIAL GRADING
- af — ARTIFICIAL FILL
- Tsc — SCRIPPS FORMATION
- GEOLOGIC CONTACT
- FAULT, DASHED WHERE INFERRED, DOTTED WHERE CONCEALED
- 3° — BEDDING STRUCTURE

N

60 30 0 60

APPROXIMATE SCALE (feet)



SITE LOCATION

SOURCE:
BASEMAP FROM KETTLER LEWECK ENGINEERING, APRIL 2016.

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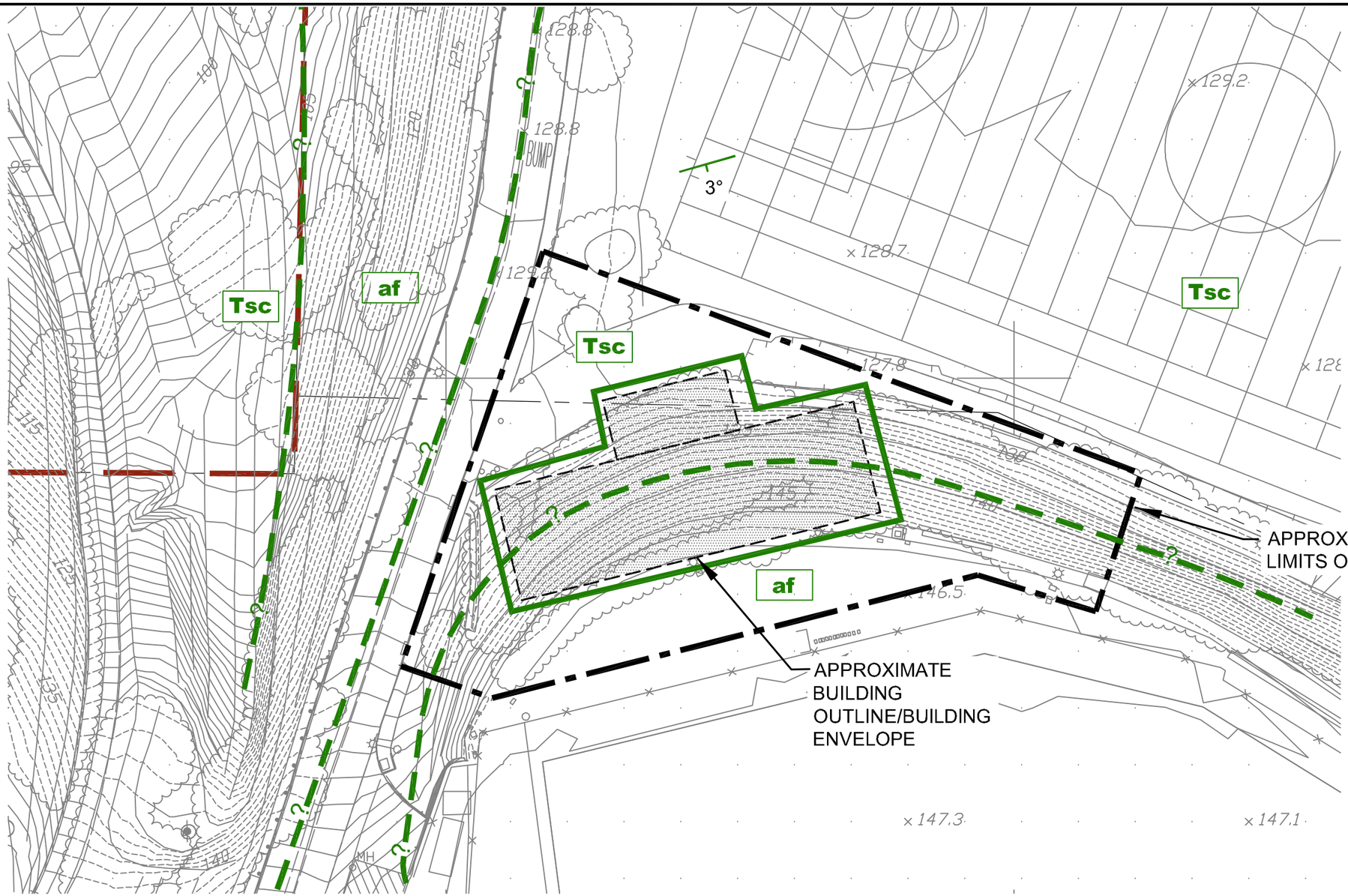
DRAWN:	4/11/2016
DRAWN BY:	JP
CHECKED BY:	SR
FILE NAME:	20162332_Sites.dwg

GEOLOGIC MAP
PROJECT SITE NO. 27

UNIVERSITY OF SAN DIEGO
MASTER PLAN UPDATE
SAN DIEGO, CALIFORNIA

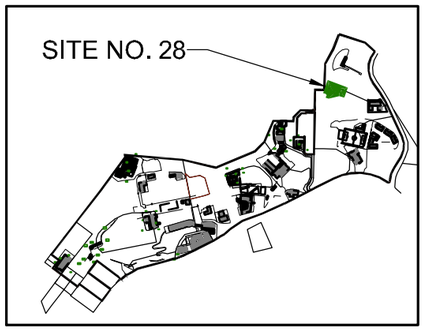
FIGURE
14

ATTACHED IMAGES:
ATTACHED XREFS: XRef: 0059 BNDY_PLINE; XRef: 0059 CUP BOUNDARY_PLINE; XRef: 0059 USD CUP_Projects; XRef: 0059 USD TOPO
CAD FILE: J:_clients\USD\20162332\mxd\ LAYOUT: Site 27 PLOTTED: 11 Apr 2016, 11:27am, jpatay



LEGEND

- LIMITS OF REMEDIAL GRADING
- af — ARTIFICIAL FILL
- Tsc — SCRIPPS FORMATION
- ? — GEOLOGIC CONTACT
- 3° — BEDDING STRUCTURE



SITE LOCATION

SOURCE:
BASEMAP FROM KETTLER LEWECK ENGINEERING, APRIL 2016.

40 20 0 40
APPROXIMATE SCALE (feet)

N

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DRAWN:	4/11/2016
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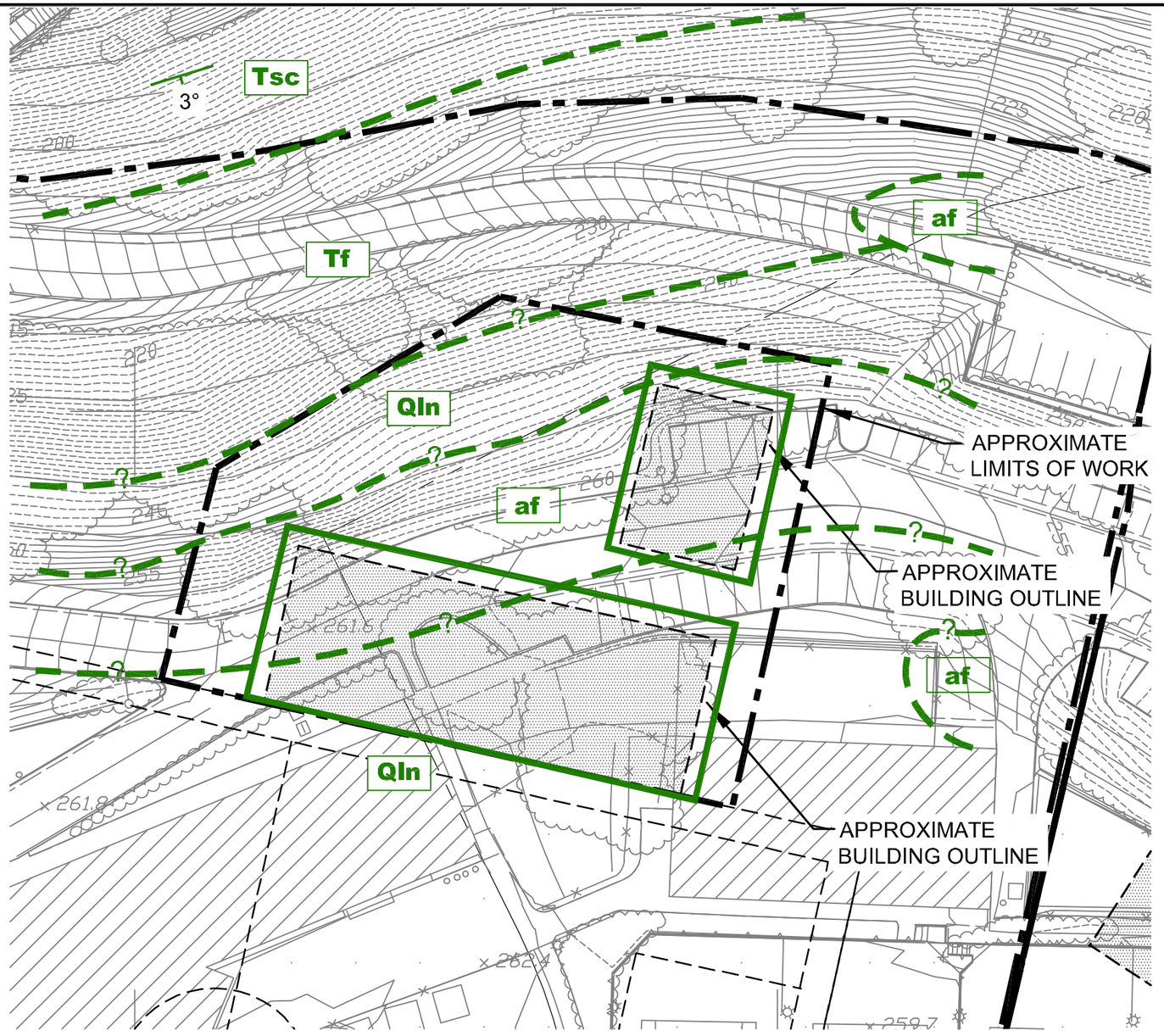
CHECKED BY:	SR
FILE NAME:	20162332_Sites.dwg

GEOLOGIC MAP
PROJECT SITE NO. 28

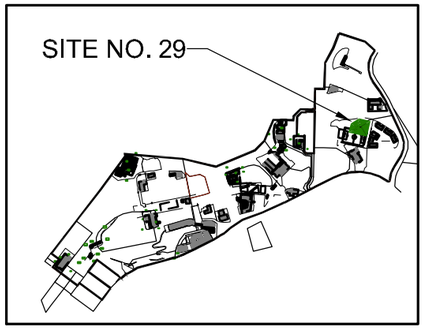
UNIVERSITY OF SAN DIEGO
MASTER PLAN UPDATE
SAN DIEGO, CALIFORNIA

FIGURE
15



LEGEND

- LIMITS OF REMEDIAL GRADING
- af — ARTIFICIAL FILL
- QIn — LINDAVISTA FORMATION
- Tf — FRIARS FORMATION
- Tsc — SCRIPPS FORMATION
- ? — GEOLOGIC CONTACT
- 3° — BEDDING STRUCTURE



SITE LOCATION

SOURCE:
BASEMAP FROM KETTLER LEWECK ENGINEERING, APRIL 2016.

40 20 0 40
APPROXIMATE SCALE (feet)

N

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DRAWN:	4/11/2016
DRAWN BY:	JP
CHECKED BY:	SR
FILE NAME:	20162332_Sites.dwg

GEOLOGIC MAP
PROJECT SITE NO. 29

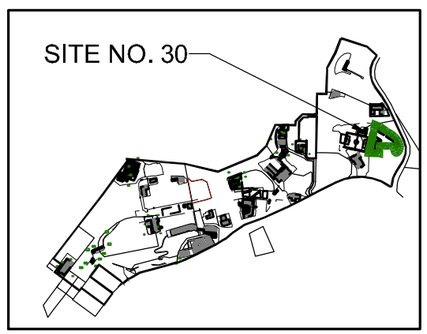
UNIVERSITY OF SAN DIEGO
MASTER PLAN UPDATE
SAN DIEGO, CALIFORNIA

FIGURE
16

ATTACHED IMAGES:
ATTACHED XREFS: XRef: 0059 BNDY_PLINE; XRef: 0059 CUP BOUNDARY_PLINE; XRef: 0059 USD CUP_Projects; XRef: 0059 USD TOPO
CAD FILE: J:_clients\USD\20162332\mxd\ LAYOUT: Site 29
PLOTTED: 11 Apr 2016, 11:37am, jpatay

LEGEND

- LIMITS OF REMEDIAL GRADING
- af — ARTIFICIAL FILL
- QIn — LINDAVISTA FORMATION
- Tf — FRIARS FORMATION
- Tsc — SCRIPPS FORMATION
- ? — GEOLOGIC CONTACT
- 3° — BEDDING STRUCTURE



SITE LOCATION

SOURCE:
BASEMAP FROM KETTLER LEWECK ENGINEERING, APRIL 2016.

60 30 0 60
APPROXIMATE SCALE (feet)

N

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PROJECT NO.	20162332
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CHECKED BY:	SR
FILE NAME:	20162332_Sites.dwg

GEOLOGIC MAP
PROJECT SITE NO. 30

UNIVERSITY OF SAN DIEGO
MASTER PLAN UPDATE
SAN DIEGO, CALIFORNIA

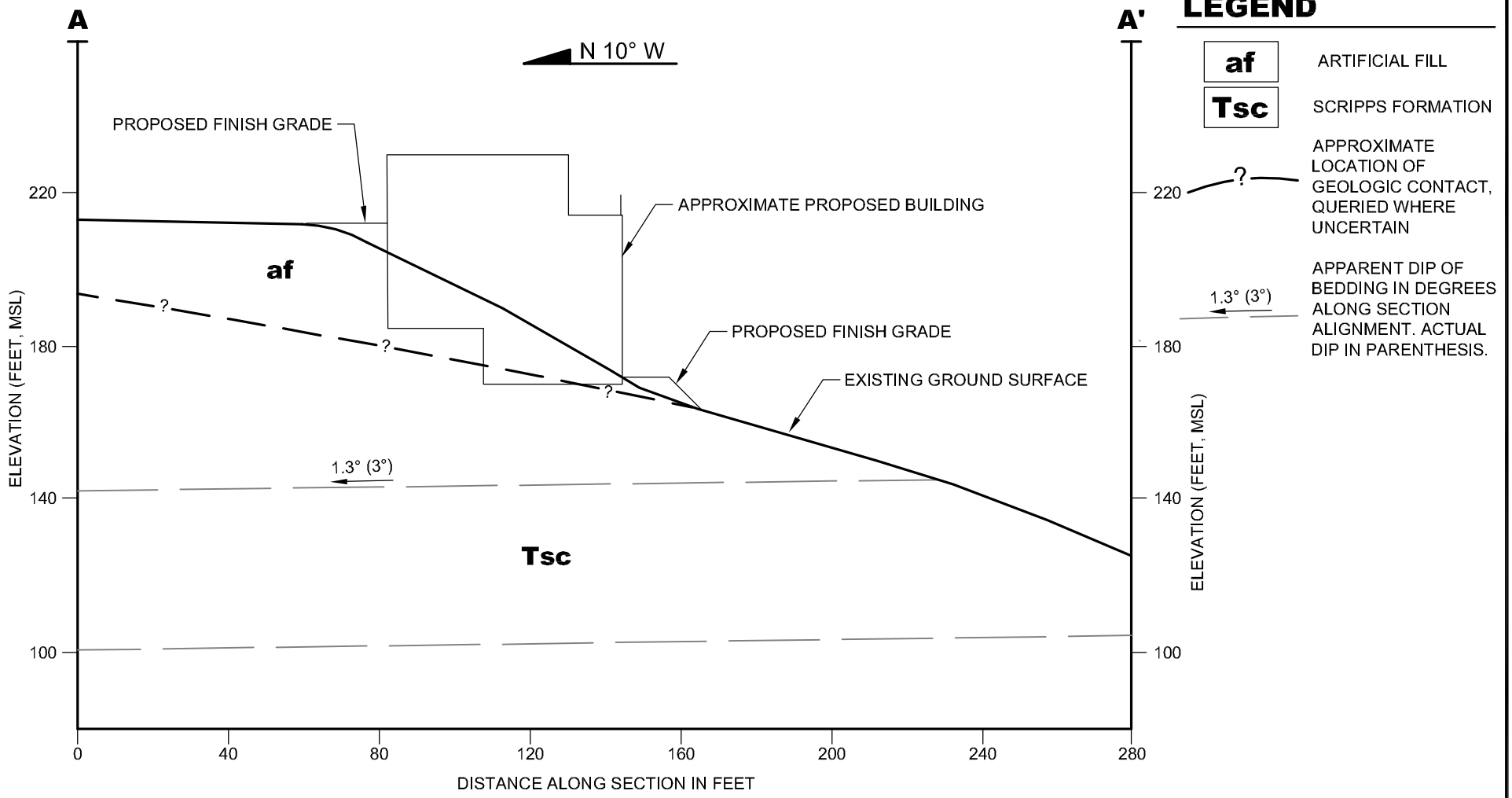
FIGURE
17

ATTACHED IMAGES:
ATTACHED XREFS: XRef: 0059 BNDY_PLINE; XRef: 0059 CUP BOUNDARY_PLINE; XRef: 0059 USD CUP_Projects; XRef: 0059 USD TOPO
CAD FILE: J:_clients\USD\20162332\mxd\ LAYOUT: Site 30
PLOTTED: 11 Apr 2016, 11:28am, jpatay

GEOLOGIC CROSS SECTIONS FOR SITE 22

ATTACHED IMAGES:
ATTACHED XREFS:

CAD FILE: J:_clients\USD\20162332\mxd\ LAYOUT: Section A PLOTTED: 11 Apr 2016, 12:30pm, jpatay



LEGEND

- af — ARTIFICIAL FILL
- Tsc — SCRIPPS FORMATION
- ? — APPROXIMATE LOCATION OF GEOLOGIC CONTACT, QUERIED WHERE UNCERTAIN
- 1.3° (3°) — APPARENT DIP OF BEDDING IN DEGREES ALONG SECTION ALIGNMENT. ACTUAL DIP IN PARENTHESIS.

40 20 0 40

APPROXIMATE HORIZONTAL AND VERTICAL SCALE (feet)

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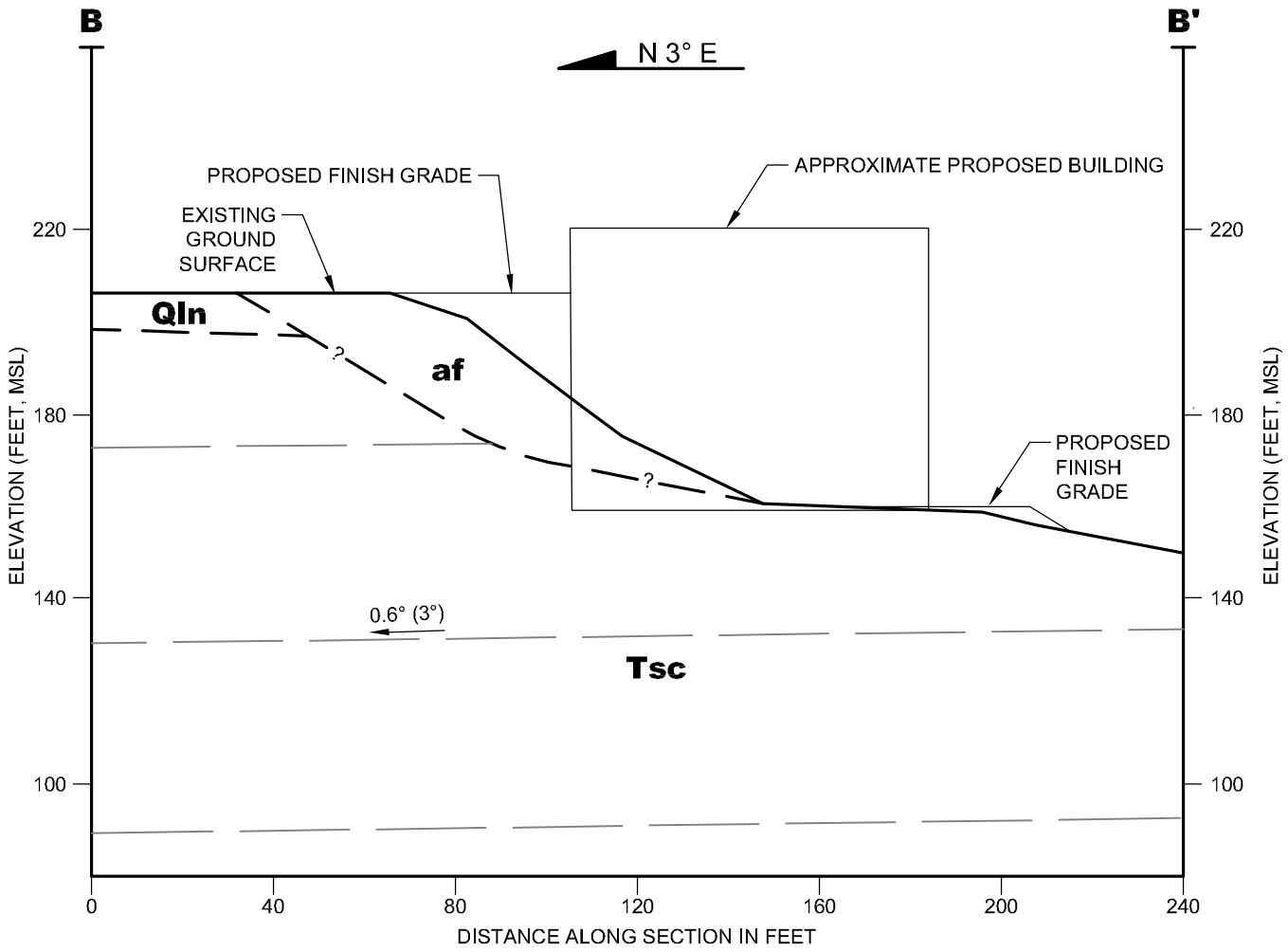
GEOLOGIC CROSS SECTION A-A'
PROJECT SITE NO. 22

UNIVERSITY OF SAN DIEGO
MASTER PLAN UPDATE
SAN DIEGO, CALIFORNIA

FIGURE
18

ATTACHED IMAGES:
ATTACHED XREFS:

CAD FILE: J:_clients\USD\20162332\mxd\ LAYOUT: Section B PLOTTED: 11 Apr 2016, 12:29pm, jpatay



LEGEND

- af — ARTIFICIAL FILL
- Qln — LINDAVISTA FORMATION
- Tsc — SCRIPPS FORMATION
- ? — APPROXIMATE LOCATION OF GEOLOGIC CONTACT, QUERIED WHERE UNCERTAIN
- 1.3° (3°) — APPARENT DIP OF BEDDING IN DEGREES ALONG SECTION ALIGNMENT. ACTUAL DIP IN PARENTHESIS.

40 20 0 40

APPROXIMATE HORIZONTAL AND VERTICAL SCALE (feet)

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FILE NAME:	20162332_xsec.dwg

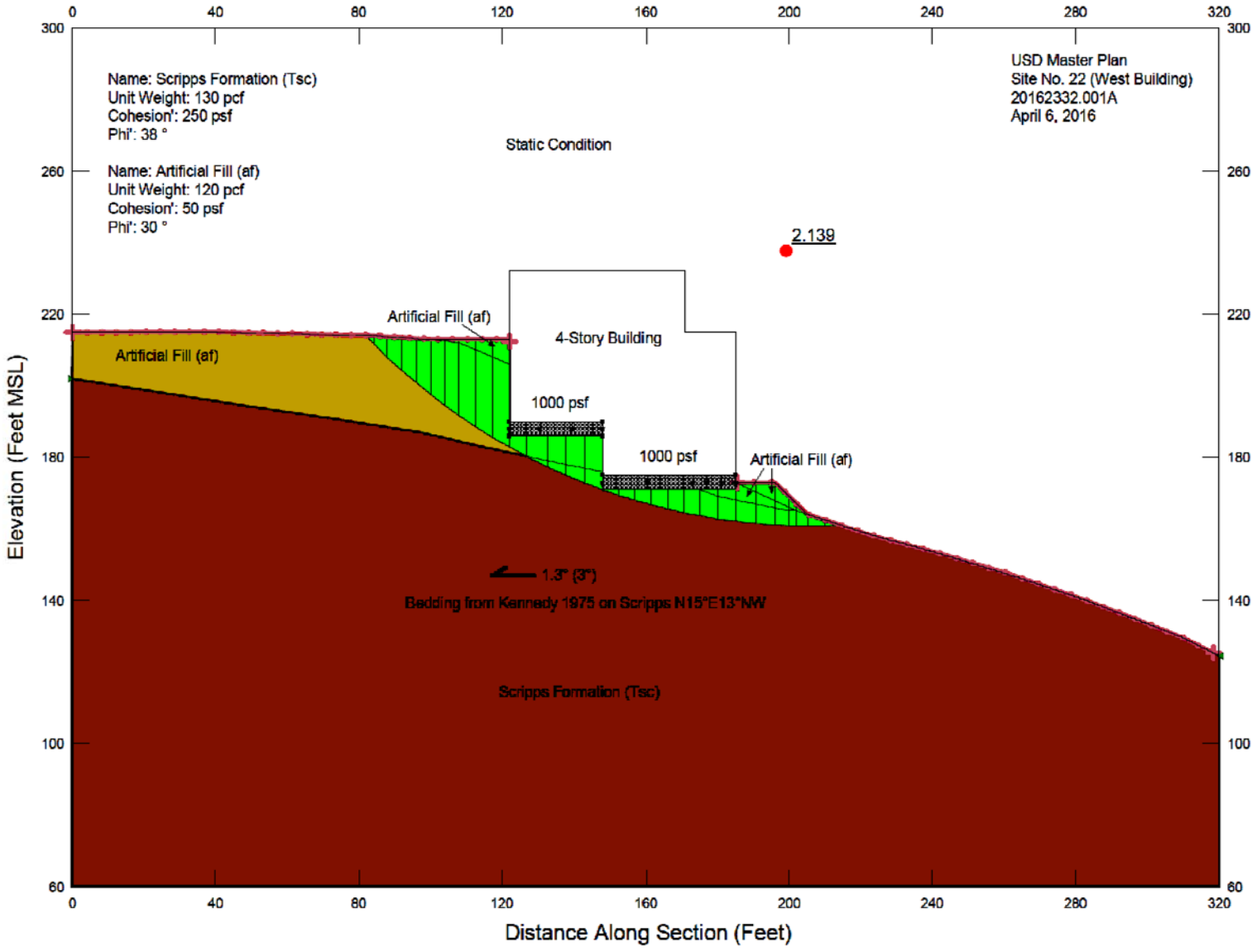
GEOLOGIC CROSS SECTION B-B'
PROJECT SITE NO. 22

UNIVERSITY OF SAN DIEGO
MASTER PLAN UPDATE
SAN DIEGO, CALIFORNIA

FIGURE
19

ATTACHED IMAGES:
ATTACHED XREFS:

CAD FILE: J:_clients\USD\20162332\mxd\ LAYOUT: Static PLOTTED: 11 Apr 2016, 12:30pm, jpatay



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PROJECT NO.	20162332
DRAWN:	4/11/2016
DRAWN BY:	JP
CHECKED BY:	KC
FILE NAME:	20162332_xsec.dwg

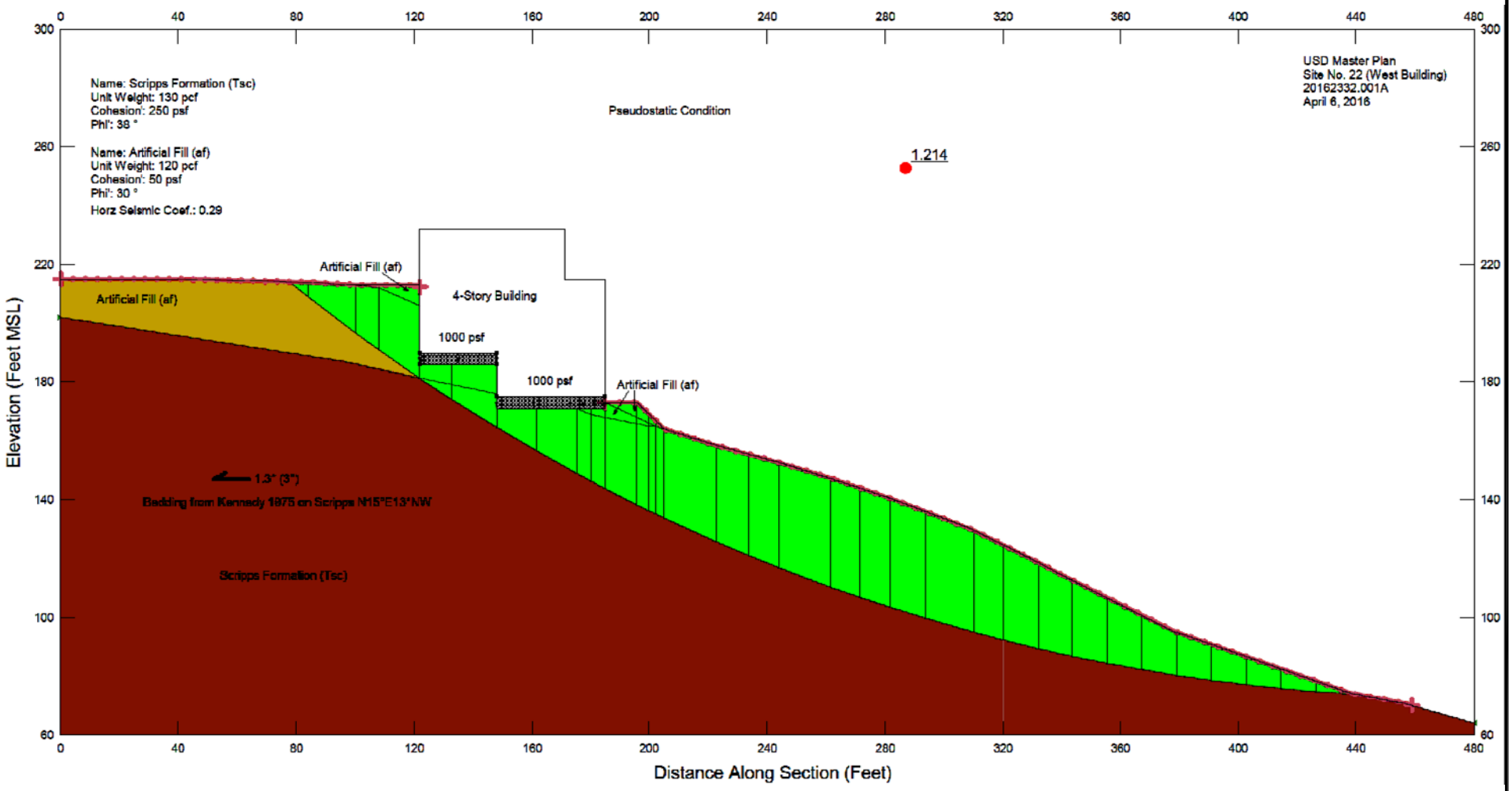
STATIC SLOPE STABILITY
PROJECT SITE NO. 22

UNIVERSITY OF SAN DIEGO
MASTER PLAN UPDATE
SAN DIEGO, CALIFORNIA

FIGURE
20

ATTACHED IMAGES:
ATTACHED XREFS:

CAD FILE: J:_clients\USD\20162332\mxd\ LAYOUT: Pseudo-Static PLOTTED: 11 Apr 2016, 12:25pm, jpatay



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PROJECT NO.	20162332
DRAWN:	4/11/2016
DRAWN BY:	JP
CHECKED BY:	KC
FILE NAME:	20162332_xsec.dwg

PSEUDO-STATIC SLOPE STABILITY
PROJECT SITE NO. 22

UNIVERSITY OF SAN DIEGO
MASTER PLAN UPDATE
SAN DIEGO, CALIFORNIA

FIGURE
21

October 27, 2015
Project No. 20162332.001A

Mr. Roger Manion
Facilities Management
University of San Diego
5998 Alcala Park
San Diego, California 92110

Subject: Geotechnical Services for Master Plan Update and CUP Amendment
University of San Diego Campus
San Diego, California

Dear Mr. Manion:

In accordance with our proposal dated September 10, 2015 this report presents Kleinfelder's geotechnical feasibility evaluation of the Master Plan Update and amendment to the Conditional Use Permit (CUP) for University of San Diego (USD) campus.

PROJECT AND SITE DESCRIPTION

To assist in our study, we have discussed the project with you and Mr. Diego Velasco of M.W. Steele. In addition, we have reviewed the Draft Master Plan Update prepared by M.W. Steele, dated October 5, 2015. Based on our review of the Draft Master Plan, up to 30 projects have been identified as possible in the next 15 to 20 years. Only 14 of the projects are considered new with the remaining 16 projects being included in the 1996 CUP and amendments. The new projects vary in size and complexity from landscape, roadway enhancements and sports facilities, to multi-story structures with subterranean levels. The 14 new projects are summarized in the following Site Condition section, with detailed information on each site presented later in this report under the Project Description section.

SITE CONDITIONS

The USD campus is comprised of an approximate land area of 180 acres bound to the north by Tecolote Canyon, south by Linda Vista Road, east by Via las Cumbres and west by the Morena District and Overlook Height neighborhood in San Diego, California. The university owns approximately 9 additional acres at the base of campus at Alcalá Park West on the opposite side of Linda Vista Road. The approximate location of the site is shown on Plate 1, Site Vicinity Map. The locations of the 14 newly proposed projects are shown on Figure 2, Proposed Project Sites.

The majority of the campus is situated mostly on a relatively flat lying mesa. Elevations range from approximately 40 feet above mean sea level (MSL) at the west side to 272 feet MSL on the east side of campus. Hillsides descend along the north portion of campus, adjacent to Tecolote Canyon and portions of the southern and western area of campus. The slopes heights are up to approximately 70 feet along the north to Tecolote Canyon

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Natural Park and up to about 55 feet in the southwest along Lindavista Drive. Slope inclinations are typically 2H:1V (horizontal to vertical) or flatter. The slopes are mostly natural with several cut and fill slopes around the perimeter of the site graded during previous campus development projects. The property is well landscaped and maintained and has generally been graded to provide sufficient surface drainage.

The proposed Master Plan will involves demolition of some older facilities and construction of numerous new structures and roadway and landscape improvements. Based on our understanding of the proposed improvements, proposed grades within most of new construction areas will not change significantly from that of existing elevations. Each of the proposed projects is described later in this report.

PURPOSE

The purpose of this study is to provide a preliminarily geotechnical evaluation of each site based on review of applicable documents, maps, and a geologic reconnaissance performed by our Certified Engineering Geologist (CEG). We understand that this report will be reviewed by the City of San Diego for application of a Conditional Use Permit (CUP) amendment. In addition, we understand this information will ultimately be utilized by others for development of an EIR. The 1996 Master Plan included 25 approved projects, of which 13 have been completed. The proposed geotechnical scope of work only addresses the 14 projects designated as "proposed" in the Draft Master Plan dated October 5, 2015.

Our intent is to provide the level of analysis we understand the client desires to be reasonably informed about the existing geologic and geotechnical conditions of the subject site. This report is not intended for later submittal to the City of San Diego in order to issue permits for site development.

SCOPE OF SERVICES

Kleinfelder performed the following scope of services for the project:

- Review of the proposed CUP master plan and related information provided by the project architect.
- Review of previous geotechnical and geologic reports prepared by Kleinfelder and other consultant reports provided by USD.
- Review of available geologic maps, topographic maps and historical aerial photography pertinent to the site.
- A site reconnaissance of the proposed development areas shown on the master plan.
- Preparation of geotechnical/geologic feasibility report addressing potential site conditions and geologic hazards which may or may not impact the CUP master plan development areas. The report will include the following
  - Vicinity map and site plan showing proposed CUP master plan;
  - Regional and Site Geologic Map.

- Discussion of the anticipated site and subsurface conditions at each proposed development area;
- Discussion of potential geologic hazards which may impact the sites;
- Discussion of general faulting and seismicity in the region;
- Discussion of potential groundwater conditions;
- Discussion of preliminary foundation options;
- Discussion of significant geologic site constraints, if any.

It should be noted that this is a feasibility level report which addresses anticipated geotechnical/geologic conditions based on review of existing available data and a reconnaissance level site review. Subsurface work, laboratory testing, or engineering design level work was not performed on the proposed master plan development elements. A detailed geotechnical/geologic investigation and engineering analysis should be performed as part of the future design phase of the specific project areas.

REVIEW OF EXISTING SUBSURFACE INFORMATION

We have reviewed numerous unpublished geotechnical reports in our files pertinent to the subject site along with published geologic maps and aerial photography. Kleinfelder has performed extensive geotechnical work on the USD campus since 1999 and has accumulated subsurface data throughout the campus. These references are listed in Appendix A, References.

SITE GEOLOGY

The university campus is situated on a relatively level land form surface which was beveled by near-shore (paralic) marine wave action processes during the Pleistocene period. Later stream processes downcut into this flat-lying mesa topography, producing the existing canyon drainage system throughout this area. The surface of the various mesa are typically characterized by gently rolling, low relief topography. Our review of historical aerial photography and geotechnical reports shows that the original land surface of the site exhibited this pattern of low topographic relief. Grading to develop the campus and various building pads primarily consisted of shallow cut and fill on the mesa surfaces with deeper fills required within several drainage features and adjacent to slopes around the perimeter of the property. The fill areas are further discussed later in this report.

Numerous geotechnical/geologic studies have been performed during the development of the university campus. The studies reviewed for this report are listing in Appendix A. The regional geologic map (Kennedy, 1975) is depicted on Figure 3. This map is preferred to the more recent geologic map (Kennedy and Tan, 2008). These documents describe geologic and subsurface condition across most of the campus property. The oldest (lower lying) geologic materials at the site consist of Eocene-age Friars Formation and Scripps Formation. The Eocene units are overlain by the Pliocene-age San Diego Formation exposed at the northwest corner of the campus. These units were subsequently beveled by a marine incursion during the early to middle Pleistocene during which the Pleistocene-age Lindavista Formation was deposited as sea-level regressed. The Lindavista Formation is

designated as Very Old Paralic Deposits on a more recent map by Kennedy and Tan (2008). The Lindavista Formation caps the surface of the various mesas at the site and surrounding area. Another late Pleistocene-age marine incursion resulted in deposition of the Bay Point Formation on a lower marine beveled surface along the southwest portion of campus, referred to as Alcalá Park West. The Bay Point Formation is designated as Old Paralic Deposits on the 2008 Kennedy and Tan geologic map. Fill was placed at numerous locations across the campus to create the various building pads. The deepest fill occur in the larger drainages on the west and north-central portion of the campus. Detailed description of the soil and geologic units are described below.

Artificially Placed Fill Soils

Artificial fill soils are derived from the mechanical compaction of soils placed during earthwork grading operations. Most of the fill on the campus was generated from on-site cuts made into the Lindavista, Scripps and Friars Formations and are composed of a variety of materials ranging from sandy clay to silty sand. Much of the fill across the campus is relatively shallow (less than five feet). However several sites are underlain by previous drainage features or steep hillsides which required placement of deeper fill to create suitable building pads. These deeper fill areas are typically on the order of 15 to 30 feet with local areas up to 40 to 50 feet in thickness and mostly occur around the perimeter of the campus at the previously discussed drainage locations. Documentation of the fill compaction has been identified for some of the fill. However, much of the fill placed during the original and early phase of the campus development may not exist or be available and thus, this fill is considered undocumented.

Bay Point Formation (Old Paralic Deposits)

The late Pleistocene-age Bay Point Formation is a marine terrace unit and generally consists of a dense, brown to reddish brown, silty to clayey sand. This unit is located at the extreme southwest corner of campus in the low elevations at the toe of the west descending slopes. This unit was not present within the historical campus boundaries but is located within subsequent property acquisitions on the west side of campus.

Lindavista Formation (Very Old Paralic Deposits)

The early to middle Pleistocene-age Lindavista Formation is also a marine terrace unit and consists of a very dense, brown to reddish brown, silty to clayey sandstone. It is typically moderately cemented and contains occasional beds and small lenses of gravel and cobble sized clasts derived from erosion of older geologic units. This unit caps the majority of the central portion of campus that have not been impacted by erosion of drainage features. This unit is typically less than 10 feet thick with a basal elevation of approximately 205 feet MSL.

Friars Formation

The Eocene-age Friars Formation underlies the approximate eastern third of the site directly below the Lindavista Formation and outcrops at the surface in some areas. It generally consists of an olive to gray, clayey to silty sandstone. The sandstone is typically lightly to

moderately cemented. The clayey facies of the Friars Formation in the eastern portions of San Diego are typically prone to landsliding. The sandy portions of this unit are generally much less prone to landsliding and occur mostly in the western portion of San Diego such as the site vicinity.

Scripps Formation

The Eocene-age Scripps Formation underlies the majority of the site below the Lindavista Formation and Friars Formation. It is prominently exposed on the northern and southern slopes. It consists of a gray to light yellow-brown, silty sandstone with occasional localized layers of sandy siltstone and gravels beds. The sandstone ranges from moderately to highly cemented with few concreted beds and isolated clasts that are highly resistant to erosion and form prominent outcrops. The Scripps Formation has mild structural dips (less than 5 degrees) and is not typically prone to landsliding.

Groundwater

Our review indicates that groundwater was only encountered at an elevation of 14 feet MSL within geotechnical borings on the extreme western portion of campus. Groundwater, seeps or springs were not encountered within the reviewed test borings in the remainder of campus. Perched groundwater may develop along the interface of more permeable fill soils and less permeable formational materials, particularly within infilled drainages.

GEOLOGIC STRUCTURE

The geologic map by Kennedy and Tan (2008) indicates that the Eocene-age geologic units (Scripps Formation and Friars Formation) are gently deformed by a north/south aligned anticlinal fold structure. This folding is not observed within the overlying Lindavista Formation (Very Old Paralic Deposits), since it occurs in a drainage area where the Lindavista has been eroded. The Lindavista Formation is generally flat-lying and is separated from the underlying Scripps Formation and Friars Formation by an erosional unconformity.

GEOLOGIC HAZARDS

We have performed a preliminary review of the site with respect to the potential presence of geologic and/or seismic hazards. These hazards include landslides, expansive soils, liquefaction, seismic compression, fault surface rupture, and flooding. The following sections discuss these hazards and their potential at this site.

City of San Diego Geologic Hazard Maps

Review of the City of San Diego Seismic Safety Study (2008) shows the majority of campus is mapped within hazard zones 51 and 52, some within zone 23 in sloping areas or lower elevation areas where the Friars Formation such as at the eastern campus area, and a localized zone 12 area on the west side of campus.

Hazard zone 51 is described as level mesas underlain by terrace deposits and bedrock with nominal geologic risk. Hazard zone 52 is described as a low geologic risk area consisting of other level areas of gently sloping to steep terrain and favorable geologic structure in respects to slope stability. Hazard zone 23 is described as Friars Formation with neutral or favorable geologic structure with respect to slope stability and is considered a low to moderate geologic risk. Areas of hazard zone 23 require a geotechnical study to include slope stability analysis.

Hazard zone 12 is mapped along the potentially active fault crossing the southwest corner of the site. This fault was previously studied during several investigations by Kleinfelder in early to mid-2000s and was confirmed to be potentially active as indicated on the City maps. In light of its potentially active status, this fault would likely not preclude development or require a setback, if present. However, sites with habitable structures in the vicinity of the fault would still require site specific fault investigation. This fault and other fault structures indicated in previous campus studies is further discussed in a later section below.

EXPANSIVE SOILS

Expansive soils are characterized by their ability to undergo significant volume changes (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from precipitation, landscape irrigation, utility leakage, roof drainage, perched groundwater, drought, or other factors and may result in unacceptable settlement or heave of structures or concrete slabs supported on grade.

Based on our review of the soil conditions depicted on the test borings logs and on the results of expansion index tests from previous geotechnical reports, the majority of soil typically has a very low to low expansion potential according to the 2013 CBC (Section 1802A.3.2). Some soils with moderate expansion potential may be present near the surface where the Lindavista Formation is highly weathered. No special mitigation measures for expansive soils are recommended for this sites other than removal and segregation where exposed near finish surface in structural areas.

SEISMIC GROUND SHAKING

The project site, like all Southern California, is a seismically active area and is likely to experience ground shaking as a result of earthquakes on nearby or more distant faults. The Rose Canyon fault zone and Elsinore fault zones dominate the seismicity of the area. Active strands of the Rose Canyon fault zone (SANDAG, 2014) may occur near the western edge of the campus.

Based on our understanding of the proposed site development and on definitions provided in the current 2013 CBC, the majority of the campus is underlain by shallow fill over dense formational soils and will likely be classified as CBC Site Class C. Areas underlain by fills deeper than about 10 to 20 feet or Bay Point Formation will likely be classified as Site Class D.

LIQUEFACTION

Earthquake-induced soil liquefaction can be described as a significant loss of soil strength and stiffness caused by an increase in pore water pressure resulting from cyclic loading

during shaking. Liquefaction is most prevalent in loose to medium dense, sandy and gravely soils below the groundwater table. The potential consequences of liquefaction to engineered structures include loss of bearing capacity, buoyancy forces on underground structures, ground oscillations or “cyclic mobility”, increased lateral earth pressures on retaining walls, post liquefaction settlement, lateral spreading and “flow failures” in slopes.

Liquefaction is not considered a significant risk to the proposed project due to dense soil and the lack of groundwater at the site.

SEISMIC COMPRESSION

Seismic compression results from the accumulation of contractive volumetric strains in unsaturated soil during earthquake shaking. Loose to medium dense granular material with no fines or with low plasticity fines are most susceptible to seismic compression.

Based on the anticipated depth of fill over very dense formational soil and the character of the fill, total seismic compression settlement of is anticipated to be on the order of ¼-inch. This value should be evaluated in design level investigations for areas of deeper fill.

FAULT SURFACE RUPTURE

The City of San Diego occupies a region within a complex zone of faulting dominated by numerous, typically northwest trending faults. The faulting is related to tectonic forces created by movement between two large earth plates known as the Pacific and North America Plates. The most dominant fault structure in this system is known as the San Andreas fault. The most notable fault feature within the City of San Diego is known as the Rose Canyon Fault Zone (RCFZ). This fault zone is comprised of a system of numerous fault structures and consists of both onshore and offshore fault branches. The main onshore branch of the fault extends from near the La Jolla Beach and Tennis Club over Mt Soledad and south generally following Interstate 5 into downtown San Diego. North of the Tennis Club it extends offshore to the north and is probably part of the Newport-Inglewood Fault further to the north. Numerous studies over the past 25 years have conclusively shown that many of the faults within the RCFZ are active. The RCFZ is an active fault system with only portions of the known fault trace currently designated by the State of California as active. The closest active fault branch to the site designated by the State of California is located approximately 2 miles to the northwest near the Clairemont Drive bridge crossing over Interstate 5.

The geologic map of the La Jolla Quadrangle (Kennedy, 1975), and fault maps by Treiman (1993) indicate that the northwestern portion of the campus is underlain by the Overlook fault (Figure 3). This system of faults is also included in the City of San Diego Seismic Safety Study (2008). The fault is not shown on these maps as displacing late Pleistocene-age terrace deposits of the Bay Point Formation. The fault is highly oblique to the orientation of the Rose Canyon Fault. Accordingly, it is classified as potentially active or pre-Holocene. An active fault is defined by the State of California as being a “sufficiently active and well defined fault” that has exhibited surface displacement within Holocene time (about the last 11,000 years). The definition of “potentially active” varies. A generally accepted definition of “potentially active” is a fault showing evidence of displacement that is

older than 11,000 years (pre-Holocene age) and younger than 1.6 million years (Pleistocene age).

Kleinfelder previously evaluated the Overlook fault for several building sites on campus. These sites included the West Parking Structure (Kleinfelder, 2001), Joan B. Kroc School of Peace Studies (Kleinfelder, 2000), and the Mother Rosale Hill Hall (Kleinfelder, 2005). Where encountered, these studies confirmed that the fault does not displace Holocene-age soil materials. The West Parking Structure was built over this fault in the early 2000s since a setback was not recommended or required. The Joan B. Kroc School is set back south of the fault. No faulting was observed in our exploratory trenches for the current Mother Rosale Hill Hall. Kleinfelder concluded that the previously mapped fault either passes south of the site or terminates prior to reaching the southeastern corner of the site. It is unknown if trenching was performed for the structures east of this location since geotechnical and geologic reports have not been identified.

During downhole geologic logging of a large diameter boring for the Mission Student Housing project (Kleinfelder, 2006) indicated a high angle structure was identified below a depth of 85 feet which juxtaposed two differing types of geologic materials. It was our professional opinion that this structure is due to ancient faulting and not landsliding which had been mapped in that area. This interpretation was based on several observations. First, this structure has a very high angle (85 degrees to vertical and sometimes inverted) at a depth where a landslide plane would be anticipated to be very flat. The fracturing and related disturbance was isolated to a very narrow band of less than 1 foot. Landslides are characterized by notable disturbance of the translated mass which results in fracturing, displacement and rotation of variable sized blocks from above the plane of slippage to the ground surface. Finally, the strike of the structure was similar and roughly aligns with the Overlook fault discussed above. It remains our professional opinion that the fault north of the Mission Housing site is only potentially active and probably related to the Overlook fault on the west side of campus. This is indicated by similar strike and dip structures of these faults.

The campus also does not lie within an Alquist-Priolo Earthquake Fault Zone. A recent analysis of vintage aerial photography by SANDAG (2014) indicates possible historical fault related features in the modern landscape very near the west property boundary, in vicinity of proposed Site 1 Parking structure. This fault may likely be a branch of the Old Town fault mapped by Kennedy (1975). This fault is part of the Rose Canyon fault zone that may be active.

Trenching was performed by Kleinfelder for the West Marian parking structure to verify the absence of active faulting related to the Old Town fault. Based on observations of the geologic units exposed in the exploratory fault trench, along with subsequent observations during site grading, no evidence of faulting was observed.

The faults identified from our review of published geologic maps, previous geotechnical reports and historical air photographs are presented on Figure 3. Note that we have used the 1975 geologic map as the base map since the scale of the map better depicts the fault than the updated 2008 geologic map and the faults are mapped in the same location. The Overlook fault does not project toward any of the proposed buildings but does project close

to the proposed Site 19 Pedestrian Bridge over Marian Way. The faults identified in the SANDAG 2014 study are also included on this map.

Based on this information, the hazard with respect to fault rupture on the university campus is considered to be low, with the exception of the Site 18 parking structure where it is considered moderate. The potential for fault rupture will be addressed during the design-level investigation of each structure.

LANDSLIDES AND SLOPE STABILITY

Landslides are deep-seated ground failures (tens to hundreds of feet deep) in which a large section of a slope slides downhill. Landslides are not to be confused with smaller slope failures such as surficial slumps which are usually limited to the upper several feet of the slope surface or rotational or block slope failures in the upper roughly 5 to 30 feet of the surface. Landslides can cause damage to structures both above and below the slide mass. Undermining of foundations can damage structures above the slide area. Areas below a slide can be damaged by being overridden and crushed by the failed slope material.

The majority of the proposed structures are located on a relatively level ground surface over a hundred feet from the perimeter slopes around the campus, with Sites 20, 22, 23, 24 25 and 27 located closer than 100 feet. Evidence of previous landslides was not identified during our review of geologic maps and aerial photographs, or geologic reconnaissance, with the exception of Site 27 as discussed below. Landsliding and slope stability were evaluated in several of the referenced geotechnical reports for projects which were adjacent to slopes. Landslides or slope instability were not identified in any of the reviewed reports.

The geologic map by Kennedy and Tan (2005) shows a large landslide feature in the area in the vicinity of Site 27, New Housing / Student Services. This area is along the upper slopes of Tecolote Canyon and was previously investigated by Kleinfelder (2006) for the Mission Student Housing project. The mapped area of the landslide includes the Mission Student Housing complex, seminary and Jenny Craig Sports Pavilion. Our literature review indicates this feature has not been identified on any other published maps and was apparently the first time this hillside has been mapped as being within a potential landslide area. Based on the absence of any previous mapping of this feature or recent development to identify it, it is speculated that the recent mapping is based on aerial photo interpretations of a suspicious feature. Kleinfelder (2006) excavated and downhole logged a large diameter boring (LD1) adjacent to the slope side of the proposed housing project to investigate for the potential presence of landslide related structures. The boring penetrated to a depth of 95 feet below ground surface and was visually logged by an engineering geologist from Kleinfelder. Evidence of typical landslide related features were not observed and it was concluded that landsliding was not present. The City of San Diego reviewed the report and approved the project.

The Jenny Craig Sports Pavilion was constructed in the 1990s and has also been included within the zone of the mapped landslide by Kennedy and Tan (2005). Geocon Incorporated performed geotechnical/geologic testing and observation of the earthwork construction for this project. The earthwork included the excavation of deep cut slopes to prepare the site for construction of the subterranean bowl of the pavilion. Geocon did not report any

indication of landslide features. Due to the size of the pavilion project and associated cuts, landslide features would have been easily identified during earthwork operations. It is therefore concluded that a landslide is not present at the pavilion site and based on the observations in the boring of this study, we find that the mapped landslide is not present below the subject site.

Based on the relatively level ground over most of the campus, distance to slopes, presence of very dense formational materials, geologic structure, investigation of mapped landslide feature, and professional judgment, the hazard to the proposed improvements by landslides or shallower slope stability is considered low. The majority of proposed developments will not impact stability of the existing slopes and the potential for slope instability impacting the project sites is low. Sites 22 and 23 will have subterranean levels cut into the existing slopes, as discussed in the structure specific sections later in this report. Slope stability would be addressed on future design level reports for projects adjacent to slopes.

TSUNAMIS AND SEICHES

A tsunami is a giant sea wave (which can reach over 50 feet in height) usually generated by rapid displacement on a submarine fault or submarine landslide. Tsunamis can travel at speeds of hundreds of miles per hour over distances of thousands of miles. In the open ocean, tsunamis have large wavelengths and are difficult to detect. As the sea wave approaches shore, the wave decreases in wavelength and increases in amplitude (height). Large tsunamis can travel well beyond the normal wave break of the shoreline and cause damage to near shore structures. A seiche is an oscillation (wave) of a body of water in an enclosed or semi-enclosed basin that varies in period, depending on the physical dimensions of the basin, from a few minutes to several hours, and in height from several inches to several feet. A seiche is caused chiefly by local changes in atmospheric pressure, aided by winds, tidal currents, and occasionally earthquakes.

The project site is located about 3.3 miles from the Pacific Ocean and is located at an elevation of approximately 40 to 270 feet or more MSL. Therefore, the hazard with respect to a tsunami or seiche is considered low.

FLOODING

The Federal Emergency Management Administration (FEMA) maintains a collection of Flood Insurance Rate Maps (FIRM), which covers the entire United States. These maps identify those areas, which may be subjected to 100-year and 500-year cycle floods. A set of these maps for the County of San Diego are available for viewing on the SANGIS website (www.sangis.org). Based on our review of FEMA map panels 06073C1614G and 06073C1618G, no areas of the campus is mapped within either a 100-year or 500-year floodplain.

PROJECT DESCRIPTIONS AND ANTICIPATED GEOTECHNICAL SITE CONDITIONS

Our review indicates that a moderate amount of grading and earthwork has been performed at various times during the development history of the university campus to create suitable areas for construction of buildings, roadways, parking areas and athletic facilities. Most of

the structures appear to have been constructed on relatively level natural ground surfaces. However, some the recent projects have been constructed adjacent to slopes, over slopes, or on infilled drainages since much of the available level space has been developed. For structures completed prior to Kleinfelder's involvement with geologic and geotechnical engineering support, the earthwork likely consisted of cutting into the native materials and placement of the excavated soils to achieve design grade. Since Kleinfelder began performing field explorations at the site in 1999, various conditions have been encountered with respect to fill depths and other geologic conditions.

Our previous geotechnical explorations, review of geologic maps and reports by other consultants, review of historical aerial photos, and visual observations during site reconnaissance were utilized to perform a preliminary characterization of anticipated subsurface conditions and geologic hazards at each site. For example, our review indicates that deeper fill placement in previous drainage features was performed at several locations around the perimeter slope areas of the campus. These areas were previously described in the discussion of fill soils above. The anticipated geotechnical conditions at each of the newly proposed master plan sites are discussed below.

Site 17 – Lower Olin Future Study Area; Proposed Trails / Landscape Enhancements

Trails and landscape enhancements are planned on the southwestern slope above Lindavista Road, below the Shiley Science Center and east of the western entrance road to campus. The trail will traverse the lower portion of the slope then switchback up to Site 22, the proposed administration building. The trail construction will likely consist of shallow cuts on the upslope and fills on the downslope side of the trail and may include some short retaining walls. Subsurface conditions are anticipated to primarily consist of shallow colluvial soils over Scripps Formation on the majority of the slope and Lindavista Formation at the top of slope. The slopes appear to be grossly stable and should not be impacted by the proposed construction.

Site 18 – Parking/Administrative/Physical Plant.

The proposed 5-story structure is located at the extreme western edge of the campus, partially within an existing paved parking lot adjacent to the existing West Parking Structure and partially within a vacant lot on the west. The structure may have up to 3 levels of subterranean parking and a footprint of 30,300 sf. Existing site elevations within the proposed building footprint range between approximately 40 and 55 feet MSL from west to east. An approximate 5-foot high slope descends from the eastern parking lot to the vacant lot below.

Based on a review of a Kleinfelder (2005) report for the adjacent parking structure, the majority of the footprint is likely underlain by approximately 2 to 15 feet of fill and alluvium / colluvium over dense soils of the Bay Point Formation. The fill and alluvium are related to a natural drainage which trends northeast of the structure and was later infilled during earthwork operations to level site grades. Based on the proposed 2 to 3 levels of subterranean parking, it is likely that formational soils will be present at foundation elevations.

Review of the City of San Diego Seismic Safety Study and previous Kleinfelder reports shows a hazard zone "12", potentially active fault crossing about 50 feet south of the building. This fault was previously studied during an investigation by Kleinfelder in 2000 for the adjacent parking structure, and it was confirmed to be potentially active as indicated on the City maps. A reconnaissance level study by SANDAG 2014 indicates possible fault related features just adjacent to the western corner of this structure. Based on this data, a fault study will likely be required in the western portion of the structure to address the potential for active faulting.

Site 19 – Plaza/Mall/Bridge

A pedestrian bridge and associated plaza are proposed to connect the western portion of campus to the existing West Parking Structure and the proposed parking structure in Site 18. This facility would primarily be constructed on the slope south of Marion Way and north of the Kroc Institute, with the pedestrian bridge crossing over Marian Way, just northeast of the existing parking structure. The Scripps Formation is likely present at or near the surface in this area and will likely be present at or near foundation elevations for the bridge. Short retaining walls or modifications to the slopes would be likely associated with establishing a level terrace for the plaza and mall area.

Site 20 – Academic/Administrative/Support Buildings

The proposed project is located in an area currently developed with four buildings for the Facilities Management Complex and Central Plant in the northwestern portion of campus. The site is located north of Manion Way, east of a tennis court complex and adjacent to a slope which descends to Tecolote Canyon. The proposed building may be 1 to 2-stories with a 25,000 sf footprint. Site elevations range from about 201 feet to 204 feet MSL. The building would be located about 50 feet south of the slope that descends about 140 feet into Tecolote Canyon. The slope has an estimated inclination of about 2:1 with local inclinations up to 1 ½:1, and is thickly vegetated. The slope does not exhibit visible signs of instability.

Our geologic reconnaissance along with a review of geologic maps and aerial photographs indicates that the site is primarily underlain by a thin cap of Lindavista Formation over the Scripps Formation. Kleinfelder performed a geotechnical investigation and subsequent construction phase services for the adjacent Central Plant which was constructed immediately adjacent to the slope.

Site 21 - Academic/Administrative/Student Services Building

The proposed project is located in an existing landscaped lawn and courtyard area, east of Founders Hall and Founders Chapel west of the Manion Way loop road. The building may be up to 2-stories with a 9,000 sf footprint. Site elevations range from about 215 feet to 217 feet MSL from north to south. The building would be located at least 60 feet south of the slope that descends about 160 feet into Tecolote Canyon. The slope has an estimated inclination of about 2:1 with local inclinations up to 1 ½:1, and is thickly vegetated. The slope does not exhibit visible signs of instability.

Our geologic reconnaissance along with a review of geologic maps and aerial photographs indicates that the site is primarily underlain by a thin cap of Lindavista Formation over the Scripps Formation. Shallow fill may be present in some areas. Shallow foundations are anticipated for building support.

Site 22 – Academic/Administrative Building and
Site 23 – Housing/Parking Structure

The proposed structures are located on the hillside south of the Camino San Diego loop road and north of Linda Vista Road. The area is roughly below the School of Nursing and east of the Shiley Science Center. The academic building would be constructed on the upper portion of the slope and the housing and parking structure would be located on the lower portion, with a new road (Colousa Street) constructed between them. Both structures would have subterranean levels which step down the hillside. The academic building may have up to 4 levels and a footprint of 62,000 sf. The housing building may have up to 4 levels and a footprint of 52,200 sf. Existing site elevations within the proposed building footprints range between approximately 148 feet and 218 feet MSL. The slope which descends to Linda Vista Road appears to be mostly natural on the east with fill in the upper portions on the west. Slope inclinations are typically on the order of 10:1 along the toe and mid-section and local inclinations of up to 2:1 on the upper slope section.

Several single family dwellings and an apartment building are located on the lower portions of the slope with a paved access road extending to the upper slope area near some old concrete foundations and slabs. Our geologic reconnaissance along with a review of geologic maps and aerial photographs indicates that the site is primarily underlain by the Scripps Formation with an overlying thin cap of Lindavista Formation in the upper elevations. Canyon fill is located on the western portion and the surface in some areas is covered by shallow colluvium and possibly fill.

Site 24 – Housing/ Student Services/ Parking

The proposed project is located in a current paved parking lot west of the Hahn University Center, north of Torero Way and south of the Alcala Park loop road. The building may be up to 3½-stories with a 22,000 sf footprint. Site elevations range from about 230 feet to 240 feet MSL from north to south. The building would be located about 80 feet south of the slope that descends about 160 feet into Tecolote Canyon. The slope has an estimated inclination of about 2:1 with local inclinations up to 1 ½:1, and is thickly vegetated. The slope does not exhibit visible signs of instability.

Our geologic reconnaissance along with a review of geologic maps and aerial photographs indicates that the site is primarily underlain by a thin cap of Lindavista Formation over the Scripps Formation. The site is located just west of investigations for the Hahn Center Expansion (Kleinfelder, 2007) and Torero Bookstore (Kleinfelder, 2014). Borings for the Hahn University Center Expansion were located near the eastern portion of the proposed building. The site is anticipated to be underlain by shallow fill on the order 2 to 10 feet which deepens toward the north. Therefore, the preliminary assessment indicates that construction would likely include remedial grading and supporting the building on shallow foundations.

Site 25 – Academic/ Administrative / Parking Building and
Site 26 – Engineering Expansion of Loma Hall; Proposed Academic/Administrative Building

The proposed Site 25 Academic/ Administrative / Parking Building and the Site 26 Engineering Expansion of Loma Hall are located in the current paved parking lot west of the Pardee Research Center and east of Loma Hall and Warren Hall. Site 25 would be located in the northern portion of the parking lot adjacent to Torero Way on the north and Site 26 would be located in the southern portion of the parking lot. Site 25 may be up to 3-stoies with a 23,700 sf footprint and Site 26 may be up to 3-stories with a 26,000 sf footprint. Site elevations range from about 230 feet to 235 feet MSL on the level portion of the mesa. The buildings would be located about 100 feet north of the cut slope that descends to Lindavista Road.

Our geologic reconnaissance along with a review of geologic maps and aerial photographs indicates that the site is primarily underlain by a thin cap of Lindavista Formation over the Scripps Formation, with shallow fill in some areas. The slope to the south has an estimated inclination of about 1 ½:1. The slope does not exhibit visible signs of instability. The westernmost area of the slope has been effected by gully erosion likely due to a concentration of surface runoff across this area.

Site 27 – Housing/ Student Services

The proposed project consists of demolition of several existing two-story student housing buildings and replacement with three-story housing buildings. The new building footprint is approximately 28,570 square feet. The area is located in the north-central portion of campus at the northern end of San Dimas Road. The site is adjacent to slopes which descend approximately 100 feet north and west to the floor of Tecolote Canyon. The site is also just west of the Mission student housing which was investigated by Kleinfelder (2006) and constructed shortly thereafter. The existing building pad is relatively level with site elevations estimated to range from about 160 to 170 feet MSL.

Site 28 – Athletics/Administrative Building

The proposed additional improvements may consist of a 2-story building with an approximate footprint of 6,200 sf, located just east of Torero Way and northeast of Fowler Park and Cunningham Field. The first story of the proposed building would likely be built into the existing slope which descends from the left field fence of Fowler Park to the Manchester Valley football practice field. The existing thickly-vegetated slope is approximately 15 to 20 feet in height with an inclination of about 2:1.

The site was previously investigated by Kleinfelder (2011). Fill was observed in three borings and ranged in depth from about 4 to 8 feet below existing ground surface (bgs). The fill depth appears to increase for portions of the building north of the toe of slope, with an estimated fill depth in excess of 15 feet on the north. The fill appears to have been placed on the previous natural slope surface during the original grading for the baseball field and Manchester Valley field below.

Based on the anticipated fill depth and structural loads, design could either consist of remedial grading to remove and recompact the old fills and support the building on shallow foundations, or to support the building on drilled piers extending through the fill.

Review of aerial photography indicates a northwest/southeast trending tributary drainage feature to Tecolote Canyon was present east of the site but does not appear to impact the proposed footprint. Review of the 2006 Kleinfelder study indicates that the site is underlain by Scripps Formation and possibly shallow fill. Stability of existing slopes will be evaluated during design, however preliminary assessment of the slopes indicates the slopes are grossly stable. As discussed in the previous section for Landslides and Slope Stability, it is our opinion that the suspected landslide shown on the geologic map by Kennedy (2005) is not present.

Site 29 – Facilities/Athletic Support

The proposed Facilities/Athletic Support building is located at the southeastern corner of the campus, directly north of the tennis court complex. The proposed 1-story building would have a footprint of 8,500 sf. The site is currently occupied by asphalt-paved parking lots and roadway, and landscaping. This area is likely underlain by shallow fill over the Lindavista Formation and Scripps Formation Existing site elevations within the proposed building area range between approximately 250 and 260 feet MSL so some cut-fill grading or short retaining walls may be required. The closest previous geotechnical investigation reviewed was for the Alcala Student Housing (Kleinfelder, 2005), located about 300 feet southeast of the proposed improvements.

Site 30 – New Student Housing/Student Services/Parking/Athletics

The proposed New Student Housing is located at the southeastern corner of the campus, directly north of an existing student housing complex and west of Via Las Cumbres Road. Several new buildings are proposed up to 3-stories with a combined footprint of 36,500 sf. The site is currently occupied by asphalt paved parking lots, roadways, tennis courts, a mechanical building and landscaping. As previously discussed in this report, a portion of this area is located within a historic drainage feature previously filled during earthwork operations to level site grades on campus. In addition, the western portion of the parking lot is likely located on a wedge of fill placed over natural ground to expand the size of the parking lot. Therefore portions of the building area are likely underlain by fill soils which thicken to the northeast. The preliminary estimate of the maximum depth of fill from existing site elevations may be on the order of 15 feet to 50 feet. Based on our review of the referenced Master Plan, cut and fill grading is anticipated to create building pads. Existing site elevations within the proposed building area range between approximately 240 and 260 feet MSL. The closest previous geotechnical investigation reviewed was for the Alcala Student Housing (Kleinfelder, 2005), located about 200 feet south of the proposed improvements. Due to fill depths up to about 50 feet, the existing building was constructed on drilled pier foundations.

PRELIMINARY DISCUSSION AND CONCLUSIONS

The proposed development discussed in this report for the master plan update appears feasible from a geotechnical standpoint based on the information currently available. Most of the university campus appears to have been developed on a relatively level ground surface with grading performed to fill the historic drainage features and develop building pads adjacent to slopes. The proposed development will consist of continued infill of buildings within existing parking lots and landscape areas, construction on previously undeveloped areas around the campus perimeter, and demolition of outdated structures and new construction. Geotechnical investigations will be performed to support future design of the projects.

The primary geotechnical/geologic concerns are seismic effects from ground shaking, and potential undocumented fills of variable depth below some of the proposed building sites. Although the majority of fill is less than 5 feet in depth, several areas may have fill depths up to about 50 feet.

Seismicity and Faulting

The site, like all of Southern California, is a seismically active area and is likely to experience ground shaking as a result of earthquakes on nearby or more distant faults. Damages to both architectural and structural elements of buildings could result due to the direct effects of seismic shaking. Seismic shaking could also result in lurching of the ground surface in the areas immediately adjacent to slopes, however, the proposed site improvements are located away from slopes and the slopes generally consist of very dense formational soils. It should be noted that the hazard with respect of seismic forces is not particular to the site and would be similarly expected on the nearby other properties in this region.

Based on review of prior studies and published geologic maps, there is no indication of active faulting across the campus property. The current closest mapped active fault is located 2 miles to the northwest. However, a recent reconnaissance level study in area by SANDAG (2014) for the Mid-Coast Trolley project indicates a possible recent fault related feature very near the west end of the proposed Site 18 Parking Structure. The other known fault on campus, the Overlook fault, has been investigated and classified as pre-Holocene by Kleinfelder. Other than Site 19 Plaza/Mall/Bridge across Marian Way, this fault does not project toward the newly proposed improvements. Since the Overlook fault is classified as pre-Holocene (potentially active), it would likely not require a structural setback or preclude development at these locations.

Foundation Considerations

The magnitude of estimated total and differential settlement can dictate the foundation type and is a function of fill depth, soil type, age of fill, documentation of compaction; density of natural geologic formations, and height of the proposed structure. For shallow to intermediate fill depths, remedial grading is the most common and economical alternative. In areas of deeper fill or proximity to existing structures, structures with higher estimated settlements are typically constructed on deep foundations consisting of drilled piers. These

have successfully been utilized on numerous projects on campus. Due to the cementation of the underlying formational units and the noise implications, driven piles are likely not feasible for the campus. Rammed aggregate piers are an intermediate foundation alternative where the depth of undocumented fill is less than about 25 to 30 feet. Rammed aggregate piers were successfully utilized for support of the Science Building in the early 2000s. The potential foundation types for the proposed improvements are included in the preceding sections of this report for each proposed improvement.

LIMITATIONS

Recommendations contained in this feasibility report are preliminary and based on our field reconnaissance, research, and our present knowledge of the proposed construction. This is a preliminary report for master planning purposes and a geotechnical investigation will be required prior to design and construction of the various projects.

We have strived to prepare the findings, opinions, and recommendations in this report in a manner consistent with the standards of care and skill ordinarily exercised by members of this profession practicing under similar conditions in the geographic vicinity and at the time the services were performed. No warranty or guarantee, express or implied is made. Information and recommendations presented in this report should not be extrapolated to other areas or be used for other projects without our prior review and response.

This report may be used only by the client and site owner and only for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both on site and off site) or other factors may change over time, and additional work may be required with the passage of time. Any party other than the client and site owner who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of the report, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party.

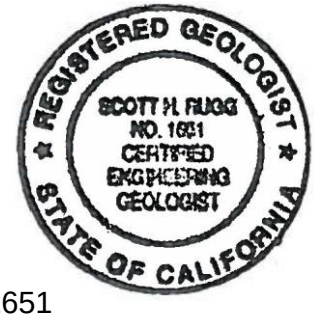
The scope of our geotechnical services did not include any environmental site assessment for the presence or absence of hazardous/toxic materials. Kleinfelder will assume no responsibility or liability whatsoever for any claim, damage, or injury which results from pre-existing hazardous materials being encountered or present on the project site, or from the discovery of such hazardous materials.

CLOSURE

We appreciate this opportunity to be of service and look forward to continuing to work with you on this project. If you have any questions about this submittal, please contact us at (619) 831-4600.

Respectfully,

KLEINFELDER



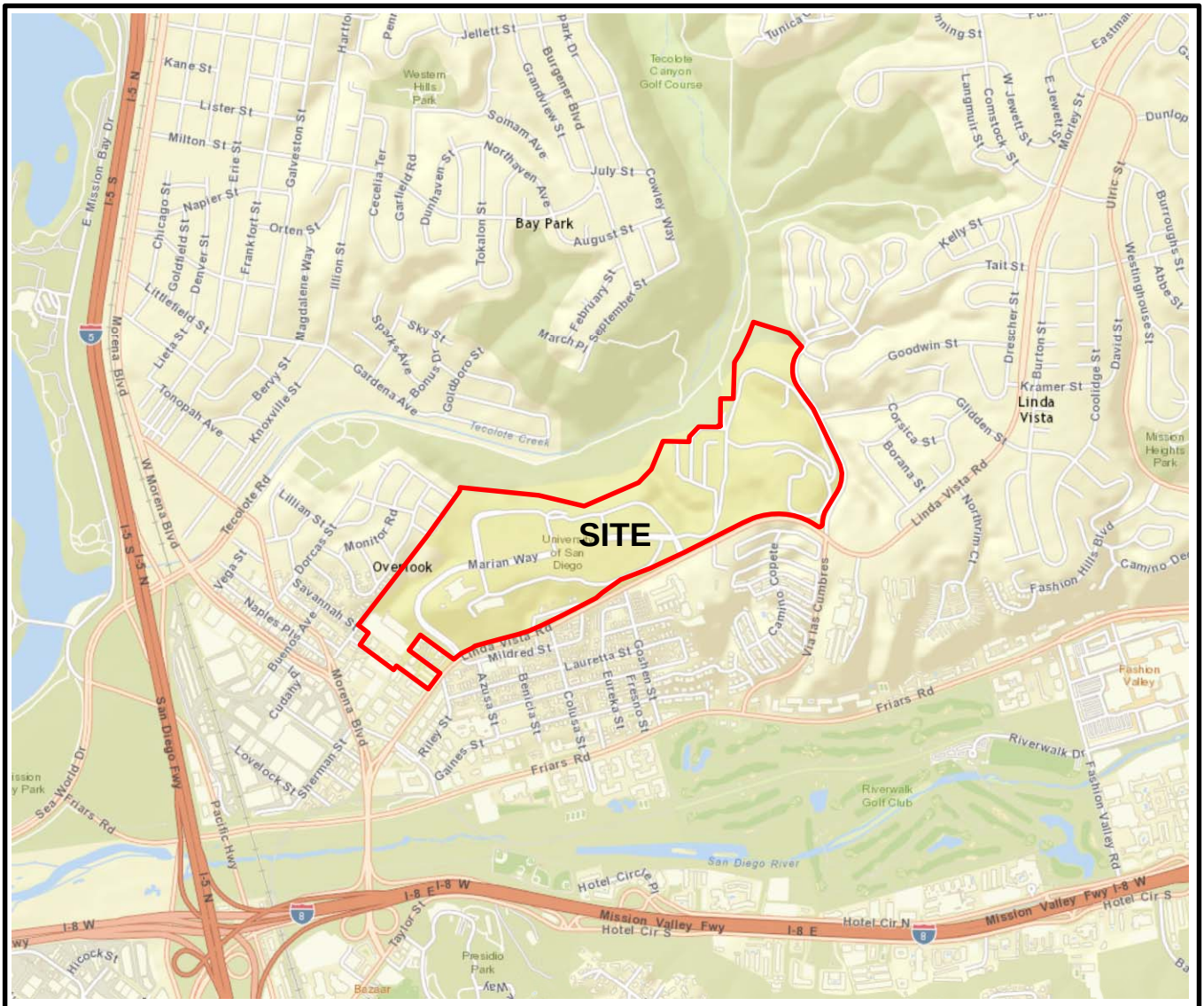
Scott H. Rugg, CEG 1651
Senior Engineering Geologist

Kevin M. Crennan, G.E. 2511
Senior Geotechnical Engineer

SHR:KMC:mm

Attachments: Plate 1 – Site Vicinity Map
Plate 2 – Proposed Project Sites
Plate 3 – Regional Geologic Map
Appendix A – References

PLATES



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DRAWN BY:	JP
CHECKED BY:	KC
FILE NAME:	20162332_VIC.mxd

SITE VICINITY MAP

MASTER PLAN UPDATE
UNIVERSITY OF SAN DIEGO
SAN DIEGO, CALIFORNIA

FIGURE
1

SOURCE:
UNIVERSITY OF SAN DIEGO MASTER PLAN UPDATE,
PROPOSED PROJECT SITES, DATED OCTOBER 5, 2015.

NOT TO SCALE

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PROPOSED PROJECT SITES

MASTER PLAN UPDATE
UNIVERSITY OF SAN DIEGO
SAN DIEGO, CALIFORNIA

FIGURE
2

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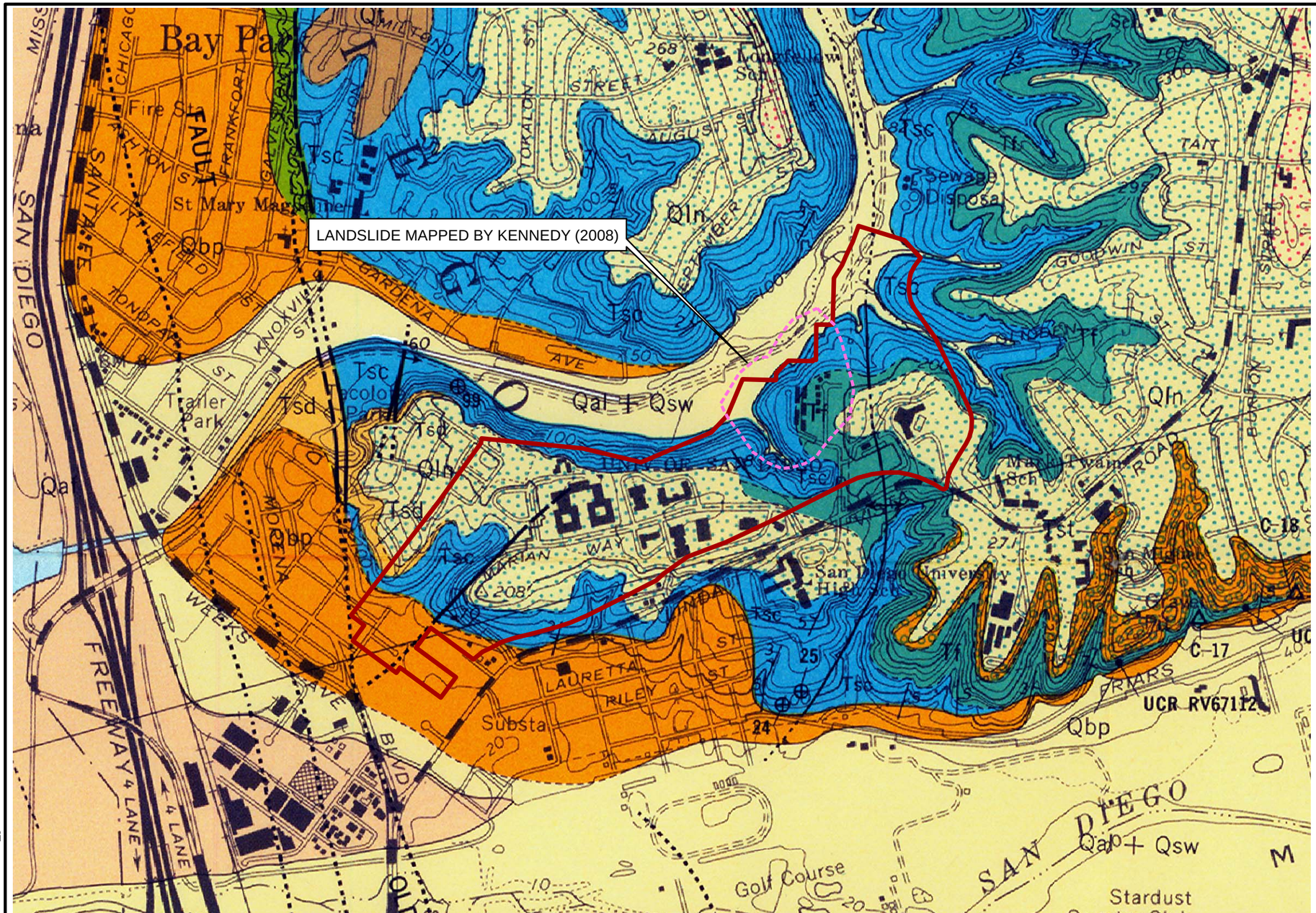

SOURCE:
BULLETIN 200, CALIFORNIA DIVISION OF MINES AND GEOLOGY, KENNEDY, 1975.

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REGIONAL GEOLOGIC MAP

MASTER PLAN UPDATE
UNIVERSITY OF SAN DIEGO
SAN DIEGO, CALIFORNIA

FIGURE
3

APPENDIX A
References

APPENDIX A
REFERENCES

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September 9, 2016

Development Services Department
City of San Diego
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Subject: Memorandum for Updated Traffic Impact Analysis Changes to Acoustical Analysis Report Findings for the University of San Diego Master Plan Update

HELIX Environmental Planning, Inc. (HELIX) prepared an Acoustical Analysis Report (AAR) in April 2016 to analyze the noise impacts of the University of San Diego (USD) Master Plan Update. As part of the noise analysis, traffic noise impacts from the Master Plan Update were analyzed using traffic volumes from the Master Plan Update's Traffic Impact Analysis (TIA), written by Linscott, Law & Greenspan (LLG) Engineers on July 2, 2015. The TIA has been subsequently updated, with the latest version being revised in August 2016. This memorandum compares the latest TIA update with the TIA the AAR was analyzed with to determine if AAR findings and conclusions should be updated.

TIA Changes to AAR Findings

Applicable updates from the TIA would include changes that affected street segment average daily trips (ADT) used in the AAR. Only roadway segments on Linda Vista Road, Colusa Street, and Via Las Cumbres were analyzed in the AAR, as other segments included in the TIA (e.g., Friars Road, Sea World Drive, Tecolote Road, and Morena Boulevard) were determined to receive negligible additional traffic noise from the Master Plan Update. Minor ADT updates in the updated TIA for Sea World Drive and Morena Boulevard would not affect this conclusion.

The only applicable ADT volume analyzed in the AAR updated from the July 2, 2015 report is on the Ulric Street to Genesee Avenue segment of Linda Vista Road; the ADT was reduced from 37,400 to 31,800. A reduction in traffic would lead to a reduction in traffic noise. In the AAR, noise impacts on this segment were found to be less than significant. Therefore, the ADT volume analyzed in the AAR of 37,400 represents a conservative analysis and the AAR's findings would not need to be updated to reflect the lower traffic volume.

Other changes in the TIA, such as mitigation measure updates and other language updates, would have no bearing on the AAR results as this information was not used to perform the AAR analysis.

Conclusion

It has been determined that the updates to the Master Plan Update's TIA that occurred after the AAR traffic noise analysis was performed would have no impact on the AAR findings and conclusions. No changes to the AAR findings and conclusions would be necessary.

Regards

Charles Terry

September 9, 2016
Date

HELIX
Environmental Planning

University of San Diego Master Plan Update and Conditional Use Permit Amendment

Acoustical Analysis Report

April 2016

Prepared for:
MW Steele Group
1805 Newton Avenue, Suite A
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Prepared by:
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UNIVERSITY OF SAN DIEGO MASTER PLAN UPDATE AND CONDITIONAL USE PERMIT AMENDMENT

ACOUSTICAL ANALYSIS REPORT

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April 2016

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LIST OF ACRONYMS

ADT	average daily trip
AIA	Airport Influence Area
AMSL	above mean sea level
ANSI	American National Standards Institute
BTR	Biological Technical Report
CAD	Computer Aided (engineering and architectural) Design
CadnaA	Computer Aided Noise Abatement
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
City	City of San Diego
CNEL	Community Noise Equivalent Level
CUP	Conditional Use Permit
Daytime	The period from 7:00 a.m. to 10:00 p.m.
dB	decibel
dBA	A-weighted decibels
EIR	Environmental Impact Report
Evening	The period from 7:00 p.m. to 10:00 p.m.
FTA	Federal Transit Administration
FTE	full-time equivalent
HVAC	heating, ventilation, and air conditioning
Hz	Hertz
I-	Interstate
kHz	kilohertz
L_{DN}	Day-Night Sound Level
L_{EQ}	one-hour average sound level
MHPA	Multi-habitat Planning Area
mPa	micro-Pascals
mph	miles per hour
MPU	Master Plan Update
NSLUs	noise-sensitive land uses
ppv	peak particle velocity

LIST OF ACRONYMS (cont.)

RCNM	Roadway Construction Noise Model
RPO	Resource Protection Ordinance
SDG&E	San Diego Gas & Electric
SDMC	San Diego Municipal Code
SPL	sound pressure level
S_{WL}	sound power level
TAP	Trane Acoustics Program
TIA	Traffic Impact Analysis
TNM	Traffic Noise Model
USD	University of San Diego
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service

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EXECUTIVE SUMMARY

This report presents an assessment of potential construction and operational noise impacts associated with the proposed University of San Diego (USD) Master Plan Update (MPU or Project) and associated Conditional Use Permit (CUP) amendment.

The proposed MPU provides a comprehensive revision of the 1996 Master Plan and Design Guidelines, as well as the campus' building space and infrastructure needs associated with increasing enrollment from 7,000 full-time equivalent (FTE) students to 10,000 FTE over the next 20+ years. Among the projects outlined in the MPU are 14 proposed construction sites, as well as 16 approved projects identified in the 1996 Master Plan Environmental Impact Report (EIR) that have previous City of San Diego (City) review/approvals but remain unbuilt.

No exterior use areas created as part of the MPU would exceed applicable City General Plan Noise Element standards. Due to future traffic noise produced by Linda Vista Road, interior noise levels for Project 23 would exceed the City and State's 45 CNEL interior threshold. As part of the requirements during the building permit process, final design for Project 23 will demonstrate that noise attenuation is adequate to ensure that noise levels would not exceed the 45 dBA L_{EQ} interior noise limit. With conformance to this requirement, impacts to interior noise at Project 23 would be less than significant.

Stationary noise sources from the MPU projects would include the heating, ventilation, and air conditioning (HVAC) units of the other projects. The HVAC units would not be expected to exceed significance thresholds.

Traffic noise generated by the Project would not cause direct significant impacts to off-site noise-sensitive land uses (NSLUs). The cumulative Year 2035 traffic from the proposed MPU and the surrounding projects in the area, as well as regional growth, would increase noise above thresholds on two roadway segments (Colusa Street and Via Las Cumbres, between Friars Road and Linda Vista Road). However, the Project's addition of noise would not be cumulatively considerable and impacts would be less than significant.

On-campus construction noise impacts would be addressed through USD's construction best management practices, including notification to building occupants of potential construction noise, internal coordination, and restrictions on construction scheduling. Less than significant construction noise impacts would occur.

Construction of the Project, including demolition and grading, would not cause significant noise impacts to off-campus human receptor NSLUs. However, construction noise may exceed the 60 dBA L_{EQ} threshold for sensitive habitat in the Multi-habitat Planning Area (MHPA) along the northern edge of campus and Tecolote Canyon Natural Park. Mitigation for these impacts are described in the Project's Biological Technical Report (HELIX Environmental Planning, Inc.; HELIX 2015).

Vibration impacts from the potential use of a vibratory roller during construction would not cause significant impacts to on-campus or off-campus vibration sensitive land uses. None of the proposed University uses would produce new sources of vibration.

Although the project is within the Airport Influence Area for the San Diego International Airport and Montgomery Field, the project would not be located within the 60 CNEL noise contours for either airport, and impacts from airport noise would be less than significant.

1.0 INTRODUCTION

1.1 PROJECT LOCATION

The proposed University of San Diego (USD) Master Plan Update (MPU or Project) would occur on the USD campus located in the City of San Diego (City) in San Diego County (see Figure 1, *Regional Location,* and Figure 2, *Project Vicinity*). The USD campus occupies approximately 180 acres of land devoted to USD-related uses in the central portion of the City in the community of Linda Vista. The campus is located 4 miles north of downtown San Diego, approximately 0.5 mile east of Interstate (I-) 5 and 0.5 mile north of I-8. The USD campus is located within an unsectioned area of Township 16 South, Range 3 West, on the U.S. Geological Survey (USGS) 7.5-minute La Jolla quadrangle map. Tecolote Canyon Natural Park forms the northern border of the property; Morena Boulevard is located to the west, with Via Las Cumbres bordering the campus on the east, and Linda Vista Road to the south. Elevations on campus range from approximately 50 feet above mean sea level (AMSL) to approximately 260 feet AMSL. With the exception of the steep, north-facing slopes along the northern campus border and the slopes on the western end of campus near Marian Way, the majority of the campus is developed and supports university facilities (buildings, parking lots, athletic fields, etc.) and associated landscaping.

1.2 PROJECT DESCRIPTION

In 1996, USD received approval of its existing Master Plan to guide the phased buildout of the campus through the year 2030. The City issued Conditional Use Permit (CUP)/Resource Protection Ordinance (RPO) Permit No. 92-0568 to allow the campus to construct 23 conceptual projects and expand to 7,000 full-time equivalent (FTE) students. Two future study areas were also identified in the Master Plan. The sequence of the projects was not determined at that time in order to provide flexibility with regard to economics and academic needs. The 1996 Master Plan Environmental Impact Report (EIR) was prepared to assess the short- and long-term, as well as cumulative, impacts of implementing the Master Plan and was certified in conjunction with the CUP approvals. Since 1996, the Master Plan and CUP for USD has been amended a number of times and USD has received approval of projects through substantial conformance to CUP/RPO Permit No. 92-0568.

The Master Plan is a document that records the vision and goals of the physical campus. This vision for the campus is updated from time to time to reflect the changes in demographics and the economy that affect higher education. Most importantly, the Master Plan is required by the City as the basis for USD's CUP and to ensure USD's fulfillment of current regulations. Over the last several years, USD campus officials have been conducting vision planning and space planning exercises to address the future needs of the university. An update to the existing Master Plan is now proposed.

The proposed USD MPU provides a comprehensive revision of the 1996 Master Plan and Design Guidelines, as well as the campus' building space and infrastructure needs associated with increasing enrollment from 7,000 FTE students to 10,000 FTE over the next 20+ years. The USD MPU would allow for the development of academic core/student service/support uses and

athletics and recreation uses, and additional student housing. Parking supply expansions would also occur under the proposed MPU.

Among the projects outlined in the MPU are 14 proposed construction sites, as well as 16 approved projects identified in the 1996 Master Plan EIR that have previous City review/ approvals but remain unbuilt. The 14 proposed project sites would allow for the construction of academic/administrative buildings, student housing, student services uses, athletics/athletic support/administrative buildings, parking, pedestrian circulation and landscape improvements not contemplated in the 1996 Master Plan and related EIR (see Figure 3, *Project Plan*). Design guidelines contained in the MPU would provide a comprehensive design framework to guide campus development. Other elements of the MPU address the planning context of the campus, provide an enrollment and space analysis, and identify sustainability goals.

1.3 CONSTRUCTION NOISE CONTROL BEST MANAGEMENT PRACTICES

USD would implement the following construction noise control best management practices to manage construction noise and vibration levels on campus from the proposed MPU projects:

- Campus-wide emails or targeted emails would be sent to building occupants, as applicable, depending on the type of project construction and associated noise levels.
- Meetings would be held between USD Facilities Management and potentially affected departments in advance of and during construction to give notice of construction noise and vibration and to insure that noise and vibration levels are appropriate.
- Construction would occur Monday through Saturday between the hours of 7:00 a.m. to 7:00 p.m.
- Construction would not be scheduled during finals week.
- If possible, heavy construction activities (e.g., demolition and heavy grading) would only occur during intersessions.

2.0 ENVIRONMENTAL SETTING

2.1 NOISE AND SOUND LEVEL DESCRIPTORS AND TERMINOLOGY

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ}, with a specified duration. The Community Noise Equivalent Level (CNEL) is a 24-hour average, where noise levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dB weighting, and sound levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dB weighting. This is similar to the Day-Night sound level (L_{DN}), which is a 24-hour average with an added 10 dB weighting on the same nighttime hours but no added weighting on the evening hours. Sound levels expressed in CNEL are always based on dBA. These metrics are used to express noise levels for both

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Regional Location

UNIVERSITY OF SAN DIEGO MASTER PLAN UPDATE

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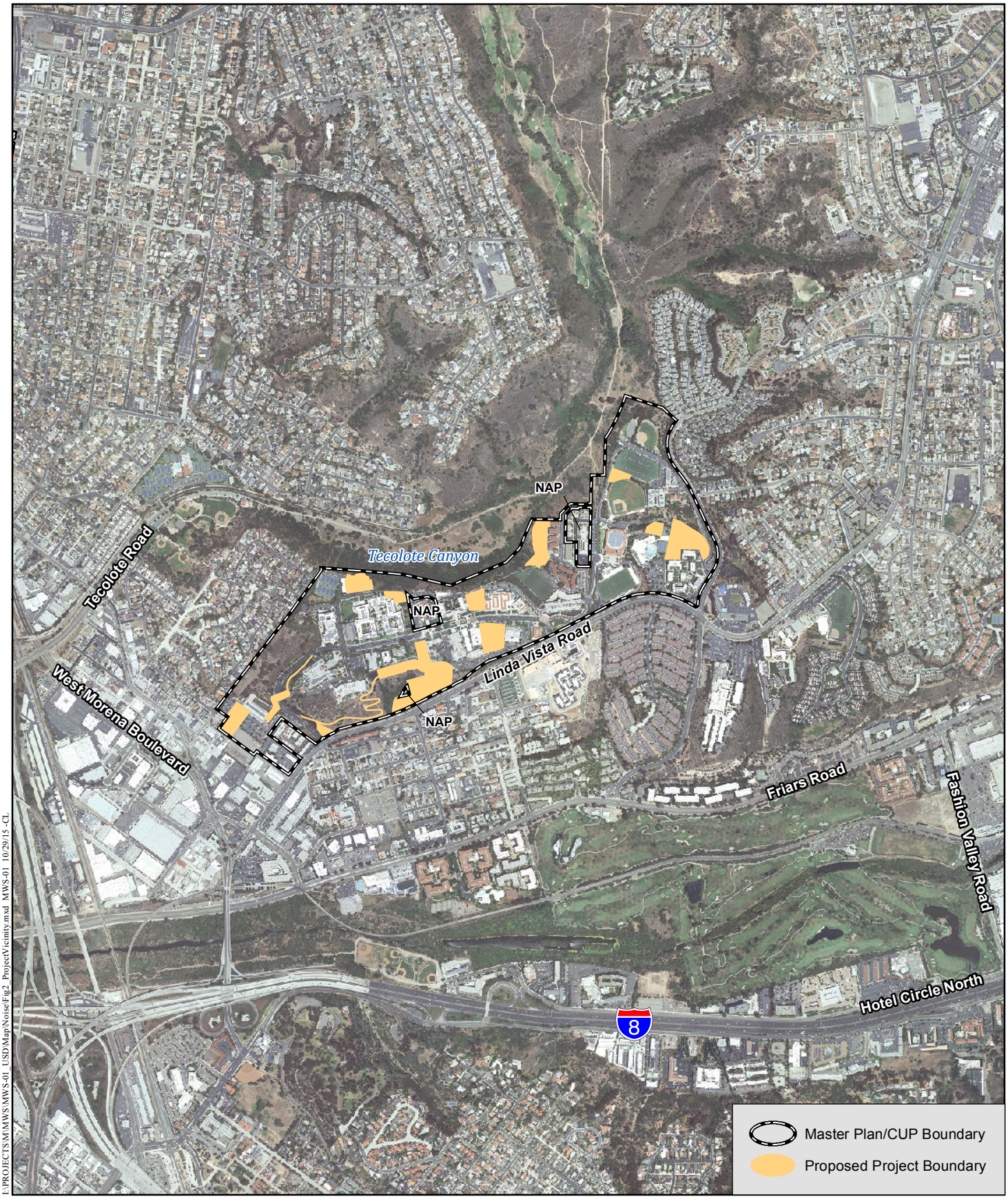
N 0 8 Miles

Figure 1



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Project Vicinity

UNIVERSITY OF SAN DIEGO MASTER PLAN UPDATE

HELIX Environmental Planning

N

0 1,500 Feet

Figure 2

LEGEND

- Existing Academic/Admin and Support Building
- New[1] Academic/Admin and Support Building
- Existing Residential Building
- New[1] Residential Building
- Existing Student Life/Dining Building
- New[1] Student Life/Dining Building
- Existing Parking Structure
- New[1] Parking Structure
- Background Trees
- Accent Trees
- Alignment Trees
- Proposed CUP Boundary

0′ 200′ 500′

1. New buildings include unbuilt, previously approved projects and proposed projects. See Section 6.0 for project details.

Source: M.W. Steele Group, Inc. 2016

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Project Plan

UNIVERSITY OF SAN DIEGO MASTER PLAN UPDATE

HELIX Environmental Planning

Figure 3

measurement and municipal regulations, as well as for land use guidelines and enforcement of noise ordinances.

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver contribute to the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

The amplitude of pressure waves generated by a sound source determines the loudness of that source. A logarithmic scale is used to describe sound pressure level (SPL) in terms of dB units. The threshold of hearing for the human ear is about 0 dB, which corresponds to 20 micro-Pascals (mPa).

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions.

2.2 NOISE AND VIBRATION SENSITIVE LAND USES

Noise-sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise, such as residential dwellings, transient lodging, hospitals, educational facilities, libraries, and sensitive habitat. Industrial and commercial land uses are generally not considered sensitive to noise. NSLUs adjacent or nearby to the campus include single- and multi-residences, Mark Twain High School, Frances Parker School, and sensitive habitat (Tecolote Canyon Natural Park).

Land uses in which ground-borne vibration could potentially interfere with operations or equipment, such as research, manufacturing, hospitals, and university research operations (Federal Transit Administration [FTA] 2006) are considered “vibration-sensitive.” The degree of sensitivity depends on the specific equipment that would be affected by the ground-borne vibration. In addition, excessive levels of ground-borne vibration of either a regular or an intermittent nature can result in annoyance to residential uses. Vibration-sensitive land uses in the Project area include single and multi-family residences.

2.3 REGULATORY FRAMEWORK

Applicable noise standards for the proposed Project are codified in the following City regulations:

2.3.1 San Diego Municipal Code (SDMC), Chapter 5, Article 9.5, Division 4, §59.5.0404 Construction Noise

(a) It shall be unlawful for any person, between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on legal holidays as specified in Section 21.04 of the San Diego Municipal Code, with exception of Columbus Day and Washington's Birthday, or on Sundays, to erect, construct, demolish, excavate for, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise unless a permit has been applied for and granted beforehand by the Noise Abatement and Control Administrator. In granting such permit, the Administrator shall consider whether the construction noise in the vicinity of the proposed work site would be less objectionable at night than during the daytime because of different population densities or different neighboring activities; whether obstruction and interference with traffic particularly on streets of major importance, would be less objectionable at night than during the daytime; whether the type of work to be performed emits noises at such a low level as to not cause significant disturbances in the vicinity of the work site; the character and nature of the neighborhood of the proposed work site; whether great economic hardship would occur if the work were spread over a longer time; whether proposed night work is in the general public interest; and he shall prescribe such conditions, working times, types of construction equipment to be used, and permissible noise levels as he deems to be required in the public interest.

(b) Except as provided in subsection (c) hereof, it shall be unlawful for any person, including the City of San Diego, to conduct any construction activity so as to cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 dBA during the 12-hour period from 7:00 a.m. to 7:00 p.m.

(c) The provisions of subsection (b) of this section shall not apply to construction equipment used in connection with emergency work, provided the Administrator is notified within 48 hours after commencement of work.

2.3.2 SDMC, Chapter 5, Article 9.5, Division 4, § 59.5.0401, Sound Level Limits

(a) It shall be unlawful for any person to cause noise by any means to the extent that the one-hour average sound level exceeds the applicable limit given in the following table (Table 1, *Applicable Noise Limits*), at any location in the City on or beyond the boundaries of the property on which the noise is produced. The noise subject to these limits is that part of the total noise at the specified location that is due solely to the action of said person.

Table 1 APPLICABLE NOISE LIMITS		
Land Use Zone	**Time of Day**	**One-hour Average Sound Level (dBA)**
Single Family Residential	7:00 a.m. to 7:00 p.m.	50
	7:00 p.m. to 10:00 p.m.	45
	10:00 p.m. to 7:00 a.m.	40
Multi-Family Residential (up to a maximum density of 1/2000)	7:00 a.m. to 7:00 p.m.	55
	7:00 p.m. to 10:00 p.m.	50
	10:00 p.m. to 7:00 a.m.	45
All other Residential	7:00 a.m. to 7:00 p.m.	60
	7:00 p.m. to 10:00 p.m.	55
	10:00 p.m. to 7:00 a.m.	50
Commercial	7:00 a.m. to 7:00 p.m.	65
	7:00 p.m. to 10:00 p.m.	60
	10:00 p.m. to 7:00 a.m.	60
Industrial or Agricultural	Anytime	75

Source: SDMC, Chapter 5, Article 9.5, Division 4, §59.5.0401, Sound Level Limits.

(b) The sound level limit at a location on a boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts. Permissible construction noise level limits shall be governed by Section 59.5.0404 of this article.

(c) Fixed-location public utility distribution or transmission facilities located on or adjacent to a property line shall be subject to the noise level limits of Part (a) of this section, measured at or beyond 6 feet from the boundary of the easement upon which the equipment is located.

2.3.3 City of San Diego General Plan Noise Element and Development Services Department's CEQA Significance Determination Thresholds

The City General Plan Noise Element (City 2008) and City Development Services Department's California Environmental Quality Act (CEQA) Significance Determination Thresholds (City 2011), which originate with the Noise Element, establish noise compatibility guidelines for uses affected by traffic noise. For schools and multi-family residential, the exterior usable space noise compatibility guideline is 65 CNEL and the interior noise compatibility guideline is 45 CNEL. It should be noted that per the latest City General Plan revisions (City 2015), the threshold for the exterior useable space of a park land use has been revised to 70 CNEL (up from 65 CNEL).

2.3.4 Federally Listed Biological Species

Some studies, such as that completed by the Bioacoustics Research Team (1997), have concluded that 60 dBA is a single, simple criterion to use as a starting point for passerine impacts until more specific research is done. Associated guidelines produced by the U.S. Fish and

Wildlife Service (USFWS) require that project noise be limited to a level not to exceed 60 dBA L_{EQ} or, if the existing ambient noise level is above 60 dBA L_{EQ}, increase the ambient noise level by 3 dBA at the edge of occupied habitat during the avian species breeding season. The 60 dBA L_{EQ} is contained in the CEQA Significance Determination Thresholds as well, although noise impacts to the California gnatcatcher are only analyzed if the project is within the Multi-habitat Planning Area (MHPA). There are no restrictions for the gnatcatcher outside of the MHPA any time of the year.

2.4 EXISTING CONDITIONS

2.4.1 Surrounding Land Uses

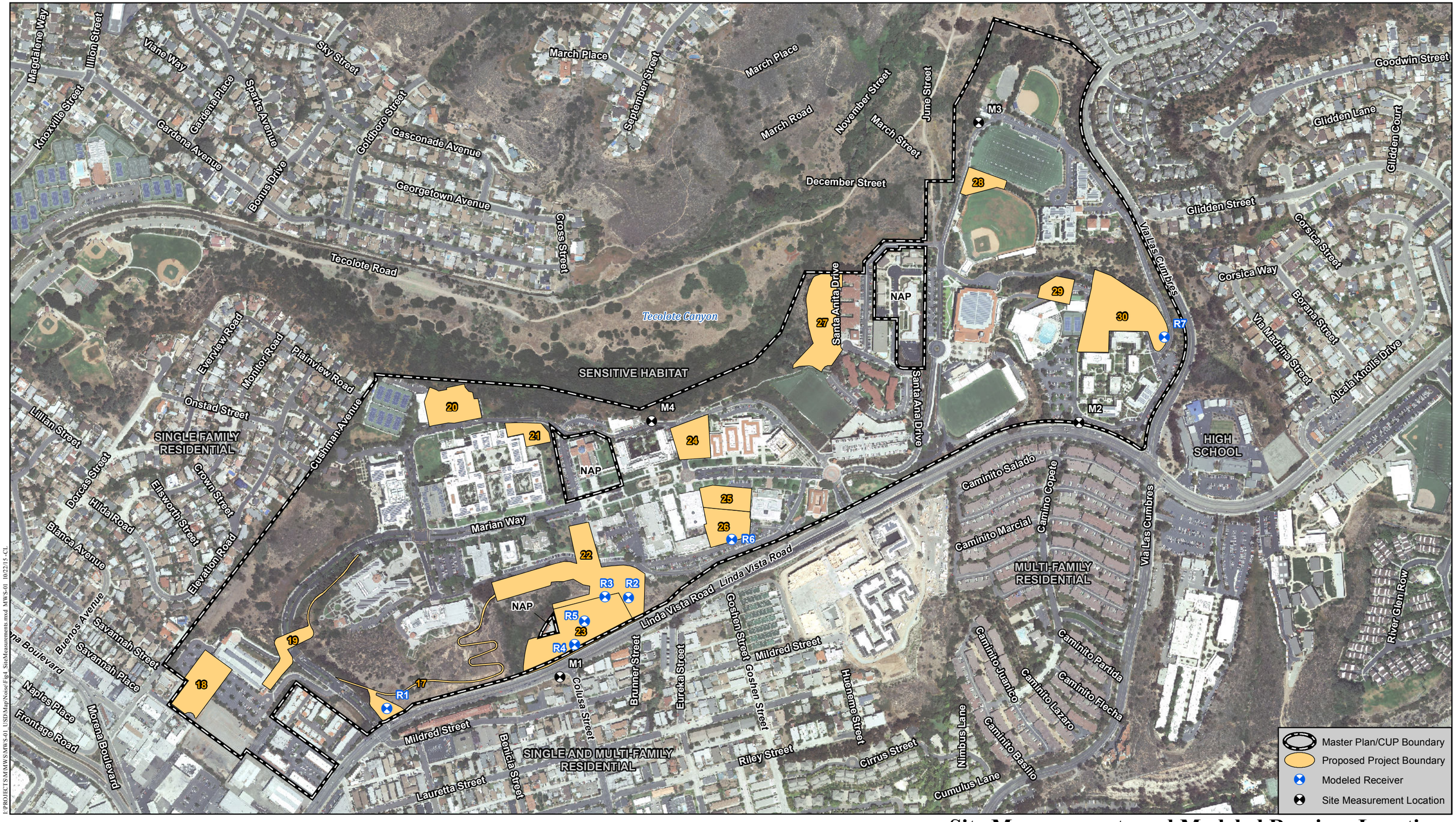
Surrounding land uses include commercial/industrial development and residential housing in the Morena Boulevard area to the west of the campus, student and non-student multi-family housing immediately to the south, and Mark Twain High School, Francis Parker School, and various types of residential development to the east. Tecolote Canyon Natural Park contains undeveloped regional open space to the north. The City's MHPA occurs on approximately 7.6 acres along the northern edge of the campus and extends off-site into Tecolote Canyon Natural Park. The campus is located within the Airport Influence Area (AIA) for San Diego International Airport and Montgomery Field.

2.4.2 Existing Noise Conditions

2.4.2.1 *General Site Survey*

Four traffic noise measurements were conducted during a site visit on October 15, 2015 (see Appendix A, *On-site Noise Measurement Sheets*, for survey notes). The measurements were performed at two areas on the southern end of campus that are adjacent to residential land uses and two areas on the northern end of campus that are adjacent to sensitive habitat (see Figure 4, *Site Measurements and Modeled Receiver Locations*, for measurement locations). During the noise measurements, start and end times were recorded and vehicle counts were made for cars, medium trucks (double-tires/two axles), and heavy trucks (three or more axles) for the corresponding road segments. The measurement time (between 10 to 15 minutes) was sufficiently long for a representative traffic volume to occur and the noise level (L_{EQ}) to stabilize. The vehicle counts were then converted to one-hour equivalent volumes by applying an appropriate factor.

The measured noise levels and related weather conditions are shown in Table 2, *Noise Measurements Results*. Traffic counts for the timed measurements and the one-hour equivalent volumes are shown in Table 3, *Measured Traffic Volumes and Vehicular Distribution.*



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Site Measurements and Modeled Receiver Locations

UNIVERSITY OF SAN DIEGO MASTER PLAN UPDATE

HELIX Environmental Planning

0 500 Feet

Figure 4

Table 2
NOISE MEASUREMENT RESULTS

Site	Location	Nearest Off-campus NSLU	Conditions	Time	dBA L_{EQ}	Notes
1	100 feet west of Colusa Street on Linda Vista Road	Residential	74°F, 4 miles per hour (mph) wind, 66 percent humidity	9:49-10:04 a.m.	70.2	Cloudy
2	South of Alcala Vista Apartments (On-campus residences) on Linda Vista Road	Residential	74°F, 4 mph wind, 76 percent humidity	10:28-10:38 a.m.	65.3	Cloudy
3	West of Manchester Valley Field and east of Tecolote Canyon	Habitat	74°F, 3 mph wind, 70 percent humidity	10:55-11:10 a.m.	55.6	Cloudy; occasional yelling from baseball field; bird noise from canyon
4	On eastern side of USD Mail Center, just south of Tecolote Canyon	Habitat	75°F, 6 mph wind, 75 percent humidity	11:35-11:50 a.m.	51.4	Cloudy; distant background noise from Interstate 5; bird noise

Note: See Figure 4 for measurement site locations.

Table 3
MEASURED TRAFFIC VOLUMES AND VEHICULAR DISTRIBUTION

Roadway	Traffic	Autos	MT[1]	HT[2]
Linda Vista Road near Colusa Street (Measurement 1)	15-minute count	195	3	2
	One-hour Equivalent	780	12	8
	Percent	**97%**	**2%**	**1%**
Linda Vista Road near Via Las Cumbres (Measurement 2)	10-minute count	115	2	0
	One-hour Equivalent	460	8	0
	Percent	**98%**	**2%**	**0%**

[1] MT=Medium Trucks (double tires/two axles)
[2] HT=Heavy Trucks (three or more axles)

3.0 METHODOLOGY AND SIGNIFICANCE CRITERIA

3.1 METHODOLOGY AND EQUIPMENT

The following equipment was used to measure existing noise levels at the Project site:

- Larson Davis System LxT Integrating Sound Level Meters
- Larson Davis Model CA150 Calibrator
- Windscreen and tripod for the sound level meter
- Digital camera

The sound level meter was field-calibrated immediately prior to the noise measurements to ensure accuracy. All measurements were made with a meter that conforms to the American National Standards Institute (ANSI) specifications for sound level meters (ANSI SI.4-1983 R2001). All instruments were maintained with National Bureau of Standards traceable calibration per the manufacturers' standards.

Modeling of the exterior noise environment for this report was accomplished using two computer noise models: Computer Aided Noise Abatement (CadnaA) version 4.5 and Traffic Noise Model (TNM) version 2.5. CadnaA is a model-based computer program developed by DataKustik for predicting noise impacts in a wide variety of conditions. CadnaA assists in the calculation, presentation, assessment, and mitigation of noise exposure. It allows for the input of project-related information, such as noise source data, barriers, structures, and topography to create a detailed CadnaA model, and uses the most up-to-date calculation standards to predict outdoor noise impacts. CadnaA traffic noise prediction is based on the data and methodology used in the TNM. TNM was released in February 2004 by the U.S. Department of Transportation (USDOT), and calculates the daytime average hourly L_{EQ} from 3-dimensional model inputs and traffic data (California Department of Transportation [Caltrans] 2004). TNM was developed from Computer Aided Design (CAD) plans provided by the project applicant. Input variables included road alignment, elevation, lane configuration, area topography, existing and planned noise control features, projected traffic volumes, estimated truck composition percentages, and vehicle speeds.

The one-hour L_{EQ} noise level is calculated utilizing peak-hour traffic; peak-hour traffic volumes can be estimated based on the assumption that 10 percent of the average daily traffic would occur during a peak hour. The model-calculated one-hour L_{EQ} noise output is the equivalent to the CNEL (Caltrans 2009).

Project construction noise was analyzed using the Roadway Construction Noise Model (RCNM; USDOT 2008), which utilizes estimates of sound levels from standard construction equipment.

3.2 ASSUMPTIONS

3.2.1 Construction

Construction would require heavy equipment during demolition, mass grading, utility installations, building construction and paving. Construction equipment used on the proposed

project sites would include but not be limited to: backhoes, compactors, concrete saws, dozers, dump trucks, generators, loaders, pavers, and dump trucks.

The most likely source of vibration during construction of the proposed projects would be a vibratory roller, which may be used to achieve soil compaction as part of the foundation construction.

3.2.2 Operation

The known or anticipated operational noise sources include residential heating, ventilation, and air conditioning (HVAC) units and vehicular traffic.

3.2.2.1 *Heating, Ventilation, and Air Conditioning Units*

The projects would likely use commercial-sized HVAC units. For the purposes of this analysis, the specifications for Carrier 48PG 14-ton HVAC units, which have a sound power level (S_{WL}) of 83.3 dBA, are used to analyze the noise impact from the proposed projects' units. The manufacturer's noise data for the HVAC units is provided below in Table 4, *Condenser Noise Data*; more detailed data can be found in Appendix B, *Carrier 48PG Condenser Data*. Modeling for these HVAC units was performed in Trane Acoustics Program (TAP).

Table 4
CONDENSER NOISE DATA

Product	Nominal Tons	Noise Levels in Decibels[1] (dB) Measured at Octave Frequencies							Overall Noise Level in dBA[1]
		125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	4 KHz	8 KHz	
Carrier 48PG	14	85.9	85.3	81.8	78.2	72.2	67.9	59.9	83.3

Source: Appendix B
[1] Sound Power Levels (S_{WL})
KHz = kilohertz

3.2.2.2 *Vehicular Traffic*

The Traffic Impact Analysis (TIA) for the Project (Linscott, Law & Greenspan Engineers [LLG] 2015) provides the Existing, Near Term (2019), and Long Term (2035) future traffic volumes without and with the proposed Project for surrounding street segments. Anticipated future traffic noise levels are based on these forecasted traffic volumes. Table 5, *Existing, Near-term, and Long-term Traffic Volumes*, shows the daily traffic volumes under each scenario for the street segments in the vicinity of the Project site.

Table 5
EXISTING, NEAR-TERM, AND LONG-TERM TRAFFIC VOLUMES

Roadway Segment	ADT					
	Existing	Existing + Project	Near Term (2019)	Near Term + Project (2019)	Long Term (2035)	Long Term + Project (2035)
Linda Vista Road						
Napa Street to Marian Way/ Mildred Street	26,868	31,328	27,205	28,425	28,700	33,160
Marian Way/Mildred Street to Colusa Street	18,880	20,972	19,285	19,845	23,100	25,192
Colusa Street to Alcala Parkway	18,938	21,448	19,355	20,045	20,600	23,110
Alcala Parkway to Via Las Cumbres	17,401	21,121	17,704	18,724	22,500	26,220
Via Las Cumbres to Kramer Street	14,381	16,331	14,564	15,104	23,600	25,550
Kramer Street to Comstock Street	15,480	17,150	15,663	16,123	19,800	21,470
Comstock Street to Ulric Street	16,548	18,038	16,731	17,141	23,200	24,690
Ulric Street to Genesee Avenue	23,429	24,729	23,612	23,972	37,400	38,700
Colusa Street						
Friars Road to Linda Vista Road	2,190	3,590	2,224	2,604	5,100	6,500
Via Las Cumbres						
Friars Road to Linda Vista Road	7,858	9,068	7,972	8,302	16,300	17,510

Source: LLG 2015

The posted speed limits on Linda Vista Road and Via Las Cumbres are 40 mph and 25 mph, respectively. The speed limit on Colusa Street is unposted, but assumed to be a typical residential speed limit of 25 mph. Based upon site visit observations, the percentage breakdown of vehicles was assumed to be 97 percent autos, 2 percent medium trucks, and 1 percent heavy trucks. These percentages were used for vehicle composition for modeling the existing and future noise conditions in the vicinity of the Project.

TNM software was used to calculate the distances to noise contour lines for all four scenarios (refer to Section 4.4.2).

4.0 IMPACTS

4.1 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

The following thresholds are based on the City General Plan Noise Element and Noise Ordinance, as applicable to the Project.

A significant noise impact would occur if the Project would:

1. Expose new development to noise levels at exterior use areas in excess of the noise compatibility standards established in the City General Plan Noise Element. For

multi-family and school uses, the noise compatibility standard is 65 CNEL for exterior use areas and 45 CNEL for interior uses. For recreational uses, the noise compatibility standard is 70 CNEL for exterior use areas.

2. Subject vibration-sensitive land uses to ground-borne vibration that exceeds the "severe" criteria, as specified by Caltrans (2013), for residences of 0.4 inches per second peak particle velocity (PPV).

3. Result or create a significant permanent increase in the existing noise levels. For the purposes of this analysis, a significant increase would be greater than a perceptible change (3 dBA) over existing conditions or generate noise levels at a common property line that exceed the limits shown in Table 1.

4. Result in temporary construction noise that exceeds:

    - 75 dBA L_{EQ} (12 hour) at the property line of a residentially-zoned property from 7:00 a.m. to 7:00 p.m. (as identified in Section 59.0404 of the SDMC); or

    - 60 dBA L_{EQ} or an exceedance of the average ambient noise level by 3 dBA L_{EQ}, whichever is greater, at the edge of sensitive biological habitat within the MHPA during the breeding season.

4.2 ISSUE 1: NOISE LEVEL STANDARD COMPLIANCE FOR NEW USES

As noted in the assumptions, future traffic noise levels presented in this analysis are based on forecasted traffic volumes provided in the Project TIA. Refer to Table 5 for the forecasted average daily trip (ADT) data for all analyzed traffic conditions.

4.2.1 Transportation Noise

4.2.1.1 *Exterior Residential Noise Levels*

Because the highest traffic volumes were estimated under the Long Term + Project (2035) scenario, this scenario was used to conservatively estimate on-site exterior noise levels, such as student common areas, from traffic to the proposed MPU projects that would be located near Linda Vista Road or Via Las Cumbres (specifically, Projects 17, 22, and 23). Building façades were estimated to address interior noise (specifically, Projects 22, 23, 26, and 30), discussed below under Section 4.2.1.2. Receiver locations were based upon the preliminary buildout layout in the MPU, as depicted in Figure 3. These receivers were modeled at a height of 5 feet above ground level. The results of this modeling are shown in Table 6, *Future On-Site Noise Levels* and the location of these receivers can be seen in Figure 4.

Due to their distance from Linda Vista Road and Via Las Cumbres and intervening topography and structures, proposed projects located further from these transportation noise sources within the USD campus would not have the potential to be exposed to significant transportation noise and are not modeled.

Table 6
FUTURE ON-SITE NOISE LEVELS

Project	Proposed Use	Receiver Number	Receiver Type	Noise Levels (CNEL)	Proposed Use Threshold	Exceed Threshold?
17	Recreation	R1	Exterior Use	66.9	70[1]	No
22	Academic/ Administration	R2	Building Façade	59.8	60[2]	No
		R3	Exterior Use	57.4	65[1]	No
23	Housing/Parking Structure	R4	Building Façade	**69.3**	**60**[2]	**Yes**
		R5	Exterior Use	61.6	65[1]	No
26	Academic/ Administration	R6	Building Façade	54.8	60[2]	No
30	Housing	R7	Building Façade	57.8	60[2]	No

[1] The 65 CNEL threshold represents the exterior noise compatibility standard for multi-family and school uses; the 70 CNEL threshold represents the exterior noise compatibility standard for recreational uses.

[2] The 60 CNEL threshold represents the noise level limit where architectural material are normally able to reduce exterior to interior noise to within the interior noise standard of 45 CNEL.

Note: Noise levels are based on traffic volumes provided in the project traffic report (LLG 2015) for the Long Term + Project (2035) condition.

As can be seen in Table 6, no future exterior on-site noise levels would have the potential to exceed the City's Noise Element exterior 65 CNEL or 70 CNEL limit, and impacts would be less than significant. In addition, per the Design Guidelines presented in the MPU, exterior areas such as common areas intended to be used by student residents will be located behind structures and shielded from traffic noise produced by Linda Vista Road.

4.2.1.2 *Interior Residential Noise Levels*

Traditional architectural materials are normally able to reduce exterior to interior noise by up to 15 dBA. Because building façade noise levels may exceed 60 CNEL at Project 23, traditional architectural materials would not be expected to attenuate interior noise to 45 CNEL. Therefore, interior noise levels at Project 23 are likely to exceed the Title 24 interior noise standard of 45 CNEL. If Project 23 is used only as a parking structure, no interior noise threshold would be applicable. As part of the requirements during the building permit process, final design for Project 23 will demonstrate that noise attenuation is adequate to ensure that noise levels would not exceed the 45 dBA L_{EQ} interior noise limit. With conformance to this building permit requirement, impacts to interior noise at Project 23 would be less than significant.

Noise levels at building façades for the remaining MPU projects would not be expected to exceed 60 CNEL, and therefore would not be expected to exceed the interior noise level standard of 45 CNEL.

4.2.2 Mitigation Measures

Because impacts related to Issue 1 would be less than significant, no mitigation is required.

4.2.3 Significance of Impacts After Mitigation

Impacts would be less than significant without mitigation.

4.3 ISSUE 2: EXCESSIVE GROUND-BORNE VIBRATION

4.3.1 Impact Analysis

4.3.1.1 *Construction Vibration*

On-campus Impacts

The greatest potential source of vibration during construction activities on campus would be a vibratory roller. A vibratory roller would be expected to be used within 25 feet of the nearest on-campus vibration-sensitive land uses, i.e., classrooms and student housing. A vibratory roller would create approximately 0.210 inches per second PPV at a distance of 25 feet (Caltrans 2013). Using the Caltrans criterion of 0.4 inches per second PPV at 25 feet, the approximately 0.210 inches per second PPV vibration impact would be less than what is considered a "severe" impact. In addition, the proposed projects would implement the construction best management practices described under Section 1.3 to manage vibration levels. Therefore, although a vibratory roller may be perceptible to nearby on-campus vibration-sensitive land uses, temporary impacts associated with the roller (and other potential construction equipment) would be less than significant.

Off-campus Impacts

Similar to on-campus uses, the greatest source of vibration during construction of the proposed projects to off-campus NSLUs would be a vibratory roller and would be expected to be used within 75 feet of NSLUs. As discussed above, a vibratory roller would not cause significant impacts at 25 feet; therefore, the roller would also not cause significant vibration impacts at 75 feet.

4.3.1.2 *Operation Vibration*

The proposed MPU projects would not include operational equipment that would generate substantial vibration. Therefore, operational vibration impacts would be less than significant.

4.3.2 Mitigation Measures

Because impacts related to Issue 2 would be less than significant, no mitigation is required.

4.3.3 Significance of Impacts After Mitigation

Impacts would be less than significant without mitigation.

4.4 ISSUE 3: PERMANENT INCREASE IN AMBIENT NOISE LEVELS

The anticipated primary Project operational noise sources include the HVAC units and vehicular traffic. Potential impacts from these sources are discussed below.

4.4.1 Stationary Noise

The proposed MPU projects would likely have HVAC units on the roof of each building. The nearest NSLU to one of these projects would be the off-campus residences approximately 130 feet south of Project 23. It was assumed there would be a 7-foot barrier around the HVAC units. At this distance, a 14-ton Carrier 48PG Condenser was modeled to generate a noise level of 30 dBA L_{EQ}, This would be below the 40 dBA L_{EQ} single-family residential nighttime noise limit from Table 1, and impacts would be less than significant.

4.4.2 Off-site Transportation Noise

4.4.2.1 *Exterior*

TNM software was used to calculate the noise contour distances for off-site roadway segments in the Project vicinity for the following scenarios: Existing, Existing + Project, Near Term (2019), Near Term + Project (2019), Long Term (2035), and Long Term + Project (2035). The off-site roadway modeling represents a conservative analysis that does not take into account topography or attenuation provided by existing structures. The results of this analysis for the CNEL at the nearest NSLU to the roadway segments are shown below in Table 7, *Off-site Traffic Noise Levels.* Additional analysis for the 70, 65, and 60 CNEL distances are provided in Appendix C, *Off-site Traffic Noise Levels.*

A direct significant impact would occur if exterior useable spaces are exposed to noise levels that exceed the thresholds listed under Section 2.3.3, if those uses were not exposed to noise levels above the thresholds before the Project. For both single and multi-family residential land uses, the threshold would be 65 CNEL. If noise levels under the Existing, Near Term, or Long Term scenarios without the Project already exceed the applicable significance thresholds, a significant impact would occur for the Existing + Project, Near Term + Project, and Long Term + Project scenarios if the Project's contribution would be 3 CNEL or greater. As seen in Table 7, the Project does not increase any of the noise levels above the allowable increase for any scenario. Therefore, direct exterior off-site transportation noise impacts would be less than significant.

Table 7
OFF-SITE TRAFFIC NOISE LEVELS

Roadway Segment	Distance to Nearest NSLU (feet)[1]	CNEL at Nearest NSLU								
		Existing			Near Term (2019)			Long Term (2035)		
		Existing	Existing + Project	Change in CNEL	Near Term	Near Term + Project	Change in CNEL	Long Term	Long Term + Project	Change in CNEL
Linda Vista Road										
Napa Street to Marian Way/Mildred Street	50	70.0	70.7	0.7	70.1	70.3	0.2	70.3	70.9	0.6
Marian Way/Mildred Street to Colusa Street	50	68.5	69.0	0.5	68.6	68.7	0.1	69.4	69.7	0.3
Colusa Street to Alcala Parkway	50	68.5	69.0	0.5	68.6	68.8	0.2	68.9	69.4	0.5
Alcala Parkway to Via Las Cumbres	50	68.1	69.0	0.9	68.2	68.5	0.3	69.3	69.9	0.6
Via Las Cumbres to Kramer Street	50	67.3	67.9	0.6	67.4	67.5	0.1	69.5	69.8	0.3
Kramer Street to Comstock Street	50	67.6	68.1	0.5	67.7	67.8	0.1	68.7	69.1	0.4
Comstock Street to Ulric Street	100	61.3	61.6	0.3	61.3	61.4	0.1	62.7	63.0	0.3
Ulric Street to Genesee Avenue	50	69.4	69.7	0.3	69.5	69.5	0	71.5	71.6	0.1
Colusa Street										
Friars Road to Linda Vista Road	50	54.1	56.5	2.4	54.2	55.2	1.0	57.9	59.1	1.2
Via Las Cumbres										
Friars Road to Linda Vista Road	50	59.9	60.4	0.5	59.9	60	0.1	63.0	63.3	0.3

[1] Distance measured from roadway centerline; the nearest NSLUs on all roadways are residential land uses.

4.4.2.2 *Interior*

For both single and multi-family residential land uses, the threshold would be 45 CNEL for interior spaces. As typical architectural materials are expected to attenuate noise levels by 15 CNEL, if noise levels are above 60 CNEL at the building façades a significant interior impact would occur. If noise levels under the Existing, Near Term, or Long Term scenarios without the Project already exceed the applicable significance thresholds, a significant impact would occur for the Existing + Project, Near Term + Project, and Long Term + Project scenarios if the Project's contribution would be 3 CNEL or greater.

No roadway segments would cause interior noise to exceed applicable thresholds under any scenario. Therefore, the Project's off-site transportation noise would not cause significant direct impacts to the interior noise.

4.4.2.3 *Cumulative*

Exterior

The potential for a cumulative noise impact can occur when traffic from multiple projects combines to increase noise levels above thresholds. A significant cumulative exterior impact would occur if the Project results in the exposure of a residential NSLU to a combined exterior noise level of 65 CNEL or greater or if the Project would cause an increase of 3 CNEL in Existing + Long Term + Project conditions if that total is above 65 CNEL. As shown on Table 8, *Cumulative Off-site Traffic Noise Levels*, two segments (Colusa Street and Via Las Cumbres, between Friars Road and Linda Vista Road) are identified as having a significant cumulative exterior impact according to this standard.

A cumulatively considerable contribution to this impact would occur if the Project contributes more than 3 dBA to the cumulative noise increase. The Project would not contribute more than 3 dBA to the cumulative increase in traffic noise along these two segments. Therefore, cumulative traffic-related exterior noise impacts from the proposed Project are not cumulatively considerable and the Project would not cause a significant cumulative impact.

Interior

A significant cumulative interior impact would occur if the Project's noise increase yields interior noise levels in excess of 45 CNEL while also causing an increase of at least 3 CNEL over existing conditions. As typical architectural materials are expected to attenuate noise levels by 15 CNEL, interior noise levels would be 45 CNEL or greater if the noise levels at the building façades exceed 60 CNEL. One segment (Friars Road to Linda Vista Road on Via Las Cumbres) would have a significant cumulative interior impact according to this standard.

A cumulatively considerable contribution to this impact would occur if the Project contributes more than 3 dBA to the cumulative noise increase. The Project would not contribute more than 3 dBA to the cumulative increase in traffic noise along this segment. As no segments are identified as having a significant cumulative exterior impact according to this standard, cumulative traffic-related interior noise impacts would not be significant.

Table 8
CUMULATIVE OFF-SITE TRAFFIC NOISE LEVELS

Roadway Segment	Distance to Nearest NSLU (feet)[1]	CNEL at Nearest NSLU						
		Existing	Long Term	Long Term + Project	Change from Existing to Long Term + Project	Cumulative Impact?	Change from Long Term to Long Term + Project	Cumulatively Considerable Impact?
Linda Vista Road								
Napa Street to Marian Way/ Mildred Street	50	70.0	70.3	70.9	0.9	No	0.6	No
Marian Way/Mildred to Colusa Street	50	68.5	69.4	69.7	1.2	No	0.3	No
Colusa Street to Alcala Parkway	50	68.5	68.9	69.4	0.9	No	0.5	No
Alcala Parkway to Via Las Cumbres	50	68.1	69.3	69.9	1.8	No	0.6	No
Via Las Cumbres to Kramer Street	50	67.3	69.5	69.8	1.5	No	0.3	No
Kramer Street to Comstock Street	50	67.6	68.7	69.1	1.5	No	0.4	No
Comstock Street to Ulric Street	100	61.3	62.7	63.0	1.7	No	0.3	No
Ulric Street to Genesee Avenue	50	69.4	71.5	71.6	2.2	No	0.1	No
Colusa Street								
Friars Road to Linda Vista Road	50	54.1	57.9	59.1	5.0	**Yes**	1.2	No
Via Las Cumbres								
Friars Road to Linda Vista Road	50	59.9	63.0	63.3	3.4	**Yes**	0.3	No

[1] Distance measured from roadway centerline; the nearest NSLUs on all roadways are residential land uses.

4.4.3 Mitigation Measures

Because impacts related to Issue 3 would be less than significant, no mitigation is required.

4.4.4 Significance of Impacts After Mitigation

Impacts would be less than significant without mitigation.

4.5 ISSUE 4: TEMPORARY INCREASE IN AMBIENT NOISE LEVELS

4.5.1 Construction Noise

The primary source of temporary noise associated with implementation of the MPU would be construction activities for the proposed projects. Construction of these facilities would occur in phases over the planning horizon of the MPU. Construction for each project would involve several phases including grading, foundation construction and finish construction. Some projects would require demolition of existing structures or parking lots before grading. Noise generated by construction equipment can vary in intensity and duration during each phase of construction. The potential noise levels associated with typical construction equipment that may be used during construction of proposed MPU projects are identified in Table 9, *Typical Construction Equipment Noise Levels*. As shown in Table 9, construction noise levels at 50 feet from individual equipment would range from approximately 73 to 83 dBA L_{EQ}, depending on the type of construction equipment.

Table 9
TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	Usage Per Day Percentage	Maximum Noise Level dBA L_{EQ} 50 feet from source
Backhoe	40	74
Compactor	20	76
Concrete Saw	20	83
Dozer	40	78
Dump Trucks	40	73
Excavator	40	77
Generator	50	78
Loader	40	75
Paver	40	80

Source: RCNM 2015

Reasonable worst-case construction scenarios would be from the simultaneous operation of a concrete saw, loader, and dump truck or of an excavator, loader, and dump truck. Both groups of equipment would be used during the demolition or grading phases to remove or modify existing structures, parking lots and/or soil, with the loaders and dump trucks used to remove the debris. Noise impacts from specific projects are described below.

4.5.1.1 *Human Receptors*

Human Receptors

Off-campus

Off-campus human receptor NSLUs are located to the east, west, and south of proposed construction activities. Single- and multi-family residences in a residential zone are within approximately 130 feet of the closest proposed MPU project (Project 23). Potential single- and multi-family residences are within 75 feet of MPU Project 18; however, this area is zoned commercial (CC-5-4). Mark Twain High School is located approximately 200 feet southeast of the closest proposed MPU Project (Project 30).

Construction noise levels at 130 feet could temporarily reach 73.6 dBA L_{EQ} (12 hour) from the use of a concrete saw, loader, and dump truck and 69.8 dBA L_{EQ} (12 hour) from the use of an excavator, loader, and dump truck. The 75 dBA L_{EQ} (12 hour) contour line for the use of a concrete saw, loader, and dump truck would be approximately 110 feet and the contour line for the use of an excavator, loader, and dump truck would be 72 feet. Model printouts can be seen in Appendix D, *Roadway Construction Noise Model (RCNM) Calculations*.

The closest residences described above would be within distance of the 75 dBA L_{EQ} (12 hour) line for the operation of a concrete saw, loader, and dump truck. However, these properties are zoned commercial and are therefore not covered under the City's Noise Ordinance, Noise Element, and CEQA Significance Determination Thresholds. No other off-campus human receptor NSLUs would be within the 75 dBA L_{EQ} (12 hour) construction noise contour lines for the proposed MPU projects; therefore, noise impacts from construction activities to these receptors would be less than significant.

On-Campus

The greatest potential for noise to on-campus NSLUs would be the demolition of buildings at Projects 20, 23, and 27, and the potential for heavy grading at Project 22. Demolition at Project 23 would occur downhill and several hundred feet from the nearest on-campus buildings and would not be expected to generate significant noise to those buildings. For demolition at Projects 20 and 27 and grading at Project 22, the equipment listed above (use of an excavator, loader, and dump truck or use of an concrete saw, loader, and dump truck) was assumed to operate at an average distance of 130 feet from the nearest NSLUs (e.g., St. Francis Seminary to the east of Project 27 and Sacred Heart Hall to the south of Project 20). Over the course of a day, the equipment may be closer or farther than 130 feet from the nearest NSLU; however, a reasonable average is 130 feet. At these distances, construction noise levels could temporarily reach 73.6 dBA L_{EQ} (12 hour) from the use of a concrete saw, loader, and dump truck and 69.8 dBA L_{EQ} (12 hour) from the use of an excavator, loader, and dump truck. Therefore, noise levels to on-campus NSLUs from MPU construction activities would not exceed standards set in the City's Noise Ordinance and CEQA Significance Determination Thresholds.

USD would implement the construction best management practices described in Section 1.3 to further reduce on-campus noise impacts to human receptors. These practices include emails to building occupants providing notification of potential construction noise; coordination via

meetings between Facilities Management and potentially affected departments in advance of and during construction; restricting construction to Monday through Saturday between the hours of 7:00 a.m. to 7:00 p.m.; not allowing construction during finals week; and, if possible, only performing heavy construction activities (e.g., demolition and grading) during intersessions. Therefore, with construction noise levels not exceeding City standards and with implementation of the best management practices, noise impacts from construction activities to on campus receptors would be less than significant.

4.5.1.2 *Sensitive Habitat*

Sensitive habitat is located in the MHPA along the northern perimeter of the campus and the Tecolote Canyon Natural Park area. These habitat areas may support avian nesting for sensitive bird species that may be affected by construction noise. This habitat would be within 50 feet of the closest MPU project construction activities. Construction noise levels at this distance could temporarily reach 81.9 dBA L_{EQ} (12 hour) from the use of a concrete saw, loader, and dump truck and 78.1 dBA L_{EQ} (12 hour) from the use of an excavator, loader, and dump truck. The 60 dBA L_{EQ} (12 hour) contour line for the use of a concrete saw, loader, and dump truck would be approximately 620 feet and the contour line for the use of an excavator, loader, and dump truck would be approximately 400 feet. Therefore, if construction activities using a concrete saw, loader, and dump truck occur within 620 feet of sensitive habitat and if activities using an excavator, loader, and dump truck occur within 400 feet, a potentially significant noise impact would occur to sensitive habitat within the MHPA.

4.5.2 Mitigation Measures

Mitigation measures for construction noise impacts to sensitive habitat within the MHPA are described in the Project's Biological Technical Report (BTR) (HELIX Environmental Planning, Inc.; HELIX 2015).

4.5.3 Significance of Impacts After Mitigation

With the implementation of the mitigation measures described in the Project's BTR, potential construction noise impacts to nearby sensitive habitat within the MHPA would be reduced to less than significant levels.

4.6 ISSUE 5: AIRPORT NOISE LEVELS

4.6.1 Public and Private Airports

The southwestern end of the USD campus is located approximately 2.1 miles north of the San Diego International Airport and the northeastern end of the Project site is located approximately 3.2 miles southwest of Montgomery Field, both public airports. The USD campus is located within Airport Influence Area – Review Area 2 for San Diego International Airport and partially within the influence area for Montgomery Field (Airport Land Use Commission 2014 and 2010). However, the Project site is not located within the 60 CNEL or greater noise contours for either airport and any new projects associated with the MPU would not be subject to significant airport noise levels. In addition, the Project site is not within close distance of any private airstrip. Therefore, impacts associated with airports and airstrips are less than significant.

4.6.2 Mitigation Measures

Because impacts related to Issue 5 would be less than significant, no mitigation is required.

4.6.3 Significance of Impacts After Mitigation

Impacts would be less than significant without mitigation.

5.0 LIST OF PREPARERS

Bill Vosti	Acoustic Analyst
Charles Terry	Senior Acoustic Specialist
Joanne M. Dramko, AICP	Quality Assurance Reviewer
Kim Baranek	Senior Project Manager

6.0 REFERENCES

Airport Land Use Commission

2014 San Diego International Airport Land Use Compatibility Plan. May 1.

2010 Montgomery Field Airport Land Use Compatibility Plan. December 20.

Bioacoustics Research Team

1997 Environmental Effects of Transportation Noise, A Case Study: Noise Criteria for Protection of Endangered Passerine Birds. University of California, Davis, Transportation Noise Control Center Technical Report 97-001.

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2009 East Campus Bed Tower Project Noise Impact Analysis. November 23.

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2011 California Environmental Quality Act Significance Determination Thresholds. January.

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U.S. Department of Transportation (USDOT)

2008 Roadway Construction Noise Model.

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Appendix A

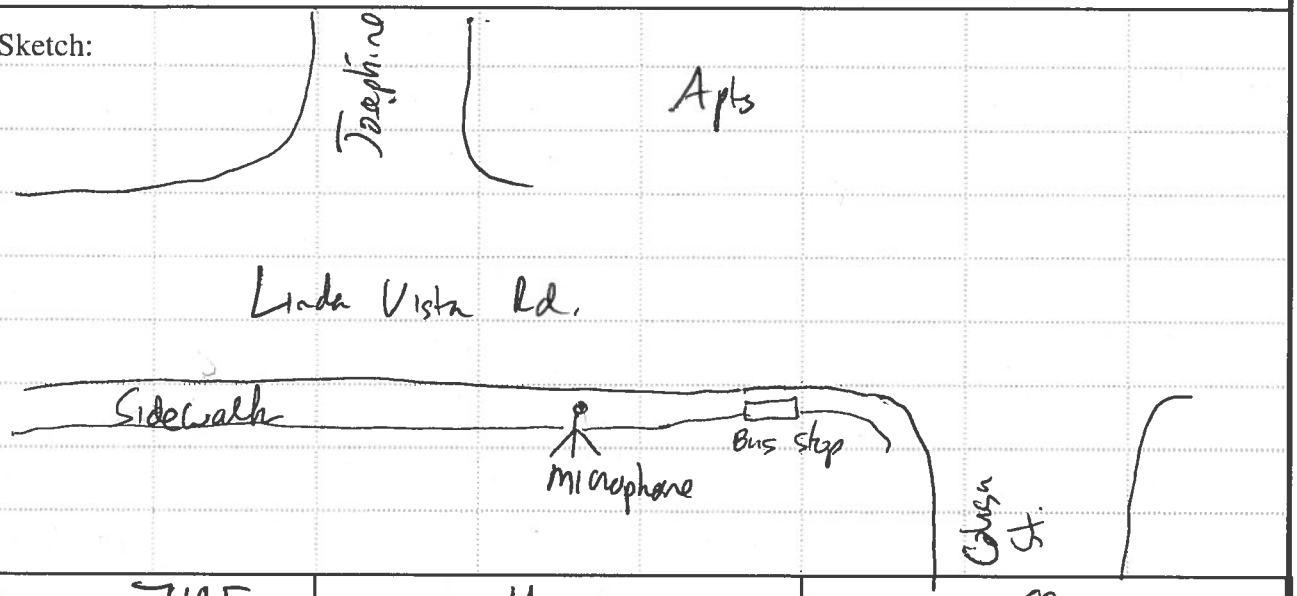
ON-SITE NOISE MEASUREMENT SHEETS

Site Survey

Job # MWS-01		Project Name: USD Master Plan	
Date: 10/15	Site #: —		Engineer: Bill V
Address: Near Colusa St on Linda Vista Road			
Meter: LxT	Serial #: 0001741	Calibrator: CAL150	Serial #: 3688

Notes: Cloudy

Sketch:



Temp: 74°F	Wind Spd: ~4 mph	Humidity: 66 %	
Start of Measurement: 9:49am	End of Measurement: 10:04 pm	70.2 dBA L_{EQ}	

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)
	1	1

Noise Measurement for Information Only

No Through Roadways

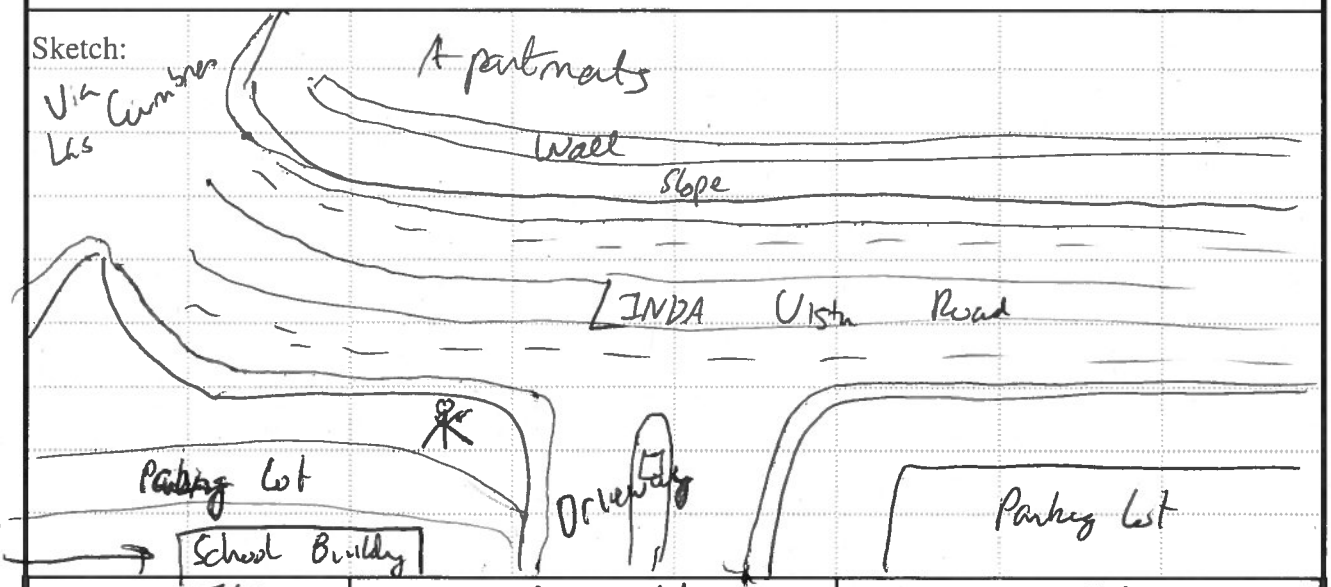
No Calibration Analysis Will Be Provided

Site Survey

Job # MWS-01	Project Name: USD Master Plan		
Date: 10/15	Site #: —	Engineer: B.L.U	
Address: Near Alcala Vista Apartments			
Meter: LxT	Serial #: 0001741	Calibrator: CAL150	Serial #: 3688

Notes: Cloudy

Sketch:



Temp: 74	Wind Spd: NW 4 mph	Humidity: 76 %	
Start of Measurement: 10:26	End of Measurement: 10:38	65.3 dBA L_{EQ}	

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)
10 min tally	||	

Noise Measurement for Information Only

No Through Roadways

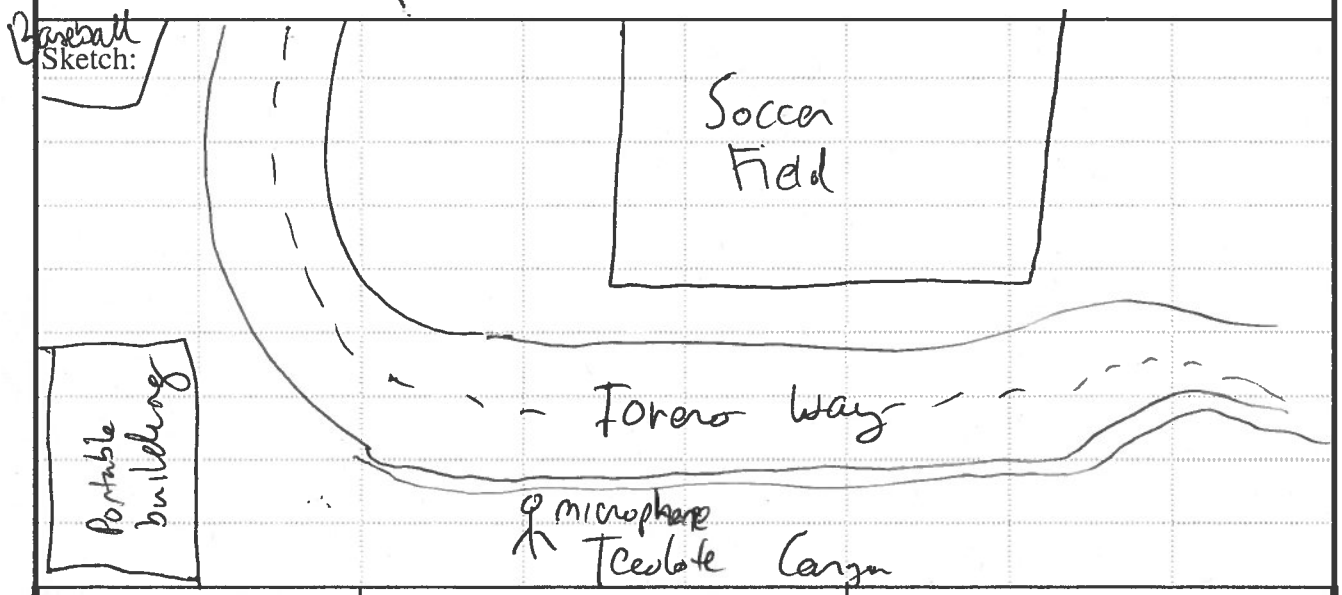
No Calibration Analysis Will Be Provided

Site Survey

Job # MWS-01	Project Name: USO Master Plan		
Date: 10/15	Site #: —	Engineer: Bill V	
Address: Near Manchester Valley Field			
Meter: LxT	Serial #: 0001741	Calibrator: CAL150	Serial #: 3688

Notes: Cloudy; occasional yelling from baseball field; bird noise from canyon

Sketch:



Temp: 74	Wind Spd: 3 mph	Humidity: 70 %
Start of Measurement: 10:55	End of Measurement: 11:10	55.6 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)
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Noise Measurement for Information Only

No Through Roadways

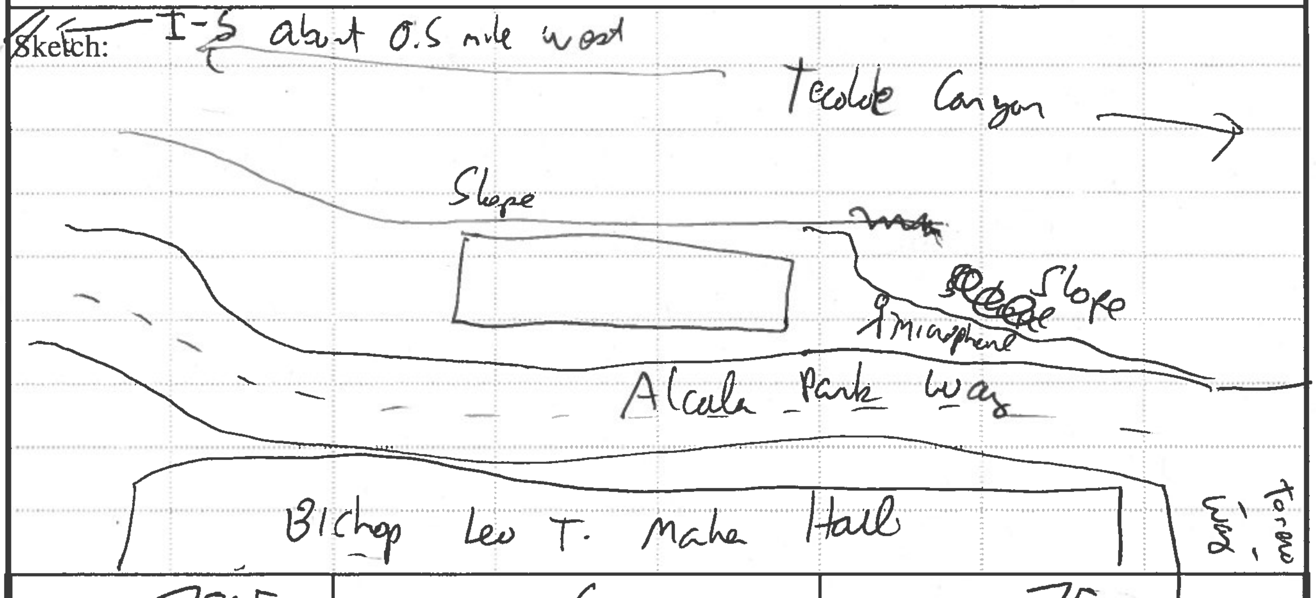
No Calibration Analysis Will Be Provided

Site Survey

Job # MWS-01		Project Name: USD Master Plan	
Date: 10/15	Site #: –		Engineer: Bill V
Address: On Alcala Park Way, near Torero Way			
Meter: LxT	Serial #: 000771	Calibrator: CAL150	Serial #: 3683

Notes: Cloudy; distant background noise from I-5; bird noise

Sketch:



Temp: 75°F	Wind Spd: 6 mph	Humidity: 75 %
Start of Measurement: 11:35	End of Measurement: 11:50	51.4 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)
IIII IIII IIII IIII IIII	II	
IIII IIII		
Noise Measurement for Information Only		
No Through Roadways		
No Calibration Analysis Will Be Provided		

Appendix B

CARRIER 48PG CONDENSER DATA

OPERATION AIR QUANTITY LIMITS

48PG03-14 Vertical and Horizontal Units

UNIT 48PG	COOLING (cfm)		HEATING (cfm)*	
	Min	Max	Min	Max
03	600	1000	600	1680
04 (Low Heat)	900	1500	600	1680
04 (Med Heat)	900	1500	940	2810
04 (High Heat)	900	1500	1130	2820
05 (Low Heat)	1200	2000	600	1680
05 (Med Heat)	1200	2000	940	2810
05 (High Heat)	1200	2000	1130	2820
06 (Low Heat)	1500	2500	940	2810
06 (Med Heat)	1500	2500	1130	2820
06 (High Heat)	1500	2500	1510	2520
07 (Low Heat)	1800	3000	940	2810
07 (Med Heat)	1800	3000	1130	2820
07 (High Heat)	1800	3000	1510	2520
08 (Low Heat)	2250	3750	2060	5160
08 (Med Heat)	2250	3750	2110	6870
08 (High Heat)	2250	3750	2450	4900
09 (Low Heat)	2550	4250	2060	5160
09 (Med Heat)	2550	4250	2110	6870
09 (High Heat)	2550	4250	2450	4900
12 (Low Heat)	3000	5000	2110	6870
12 (Med Heat)	3000	5000	2450	4900
12 (High Heat)	3000	5000	3150	6300
14 (Low Heat)	3750	6250	2110	6870
14 (Med Heat)	3750	6250	2450	4900
14 (High Heat)	3750	6250	3150	6300

*Consult tables on pages 8 and 9 if using a stainless steel heat exchanger.

Outdoor Sound Power (Total Unit)

UNIT 48PG	A−WEIGHTED* (dB)	OCTAVE BAND LEVELS dB							
		63	125	250	500	1000	2000	4000	8000
03	75.0	82.6	79.9	75.7	73.3	70.0	64.3	58.4	50.5
04	73.2	79.8	77.2	74.1	70.1	68.0	63.6	58.4	51.9
05	71.9	79.7	79.6	72.6	69.6	66.0	61.4	56.4	48.5
06	78.5	82.2	82.6	79.5	75.7	73.9	68.6	64.0	56.3
07	78.5	87.5	83.0	78.5	76.3	73.8	68.4	63.8	56.5
08	80.0	91.7	83.6	81.0	77.9	75.0	69.9	66.0	59.3
09	79.9	89.1	82.7	80.0	77.7	75.0	70.2	66.3	57.8
12	80.0	90.4	83.1	80.9	77.8	75.2	70.0	66.1	57.6
14	83.3	86.4	85.9	85.3	81.8	78.2	72.2	67.9	59.9

LEGEND

dB − Decibel

***** Sound Rating AHRI or tone Adjusted, A−Weighted Sound Power Level in dB. For sizes 03−12, the sound rating is in accordance with AHRI Standard 270−1995. For sizes 14, the sound rating is in accordance with AHRI 370−2010.

Appendix C

OFF-SITE TRAFFIC NOISE LEVELS

Appendix C
OFF-SITE TRAFFIC NOISE LEVELS

Table C-1
OFF-SITE TRAFFIC NOISE LEVELS

Roadway/Segment	Distance to Nearest NSLU	Existing				Existing + Project				Near Term				Near Term + Project				Long Term				Long Term + Project			
		CNEL @ Nearest NSLU (dBA)	70 CNEL (ft.)	65 CNEL (ft.)	60 CNEL (ft.)	CNEL @ Nearest NSLU (dBA)	70 CNEL (ft.)	65 CNEL (ft.)	60 CNEL (ft.)	CNEL @ Nearest NSLU (dBA)	70 CNEL (ft.)	65 CNEL (ft.)	60 CNEL (ft.)	CNEL @ Nearest NSLU (dBA)	70 CNEL (ft.)	65 CNEL (ft.)	60 CNEL (ft.)	CNEL @ 100 ft. (dBA)	70 CNEL (ft.)	65 CNEL (ft.)	60 CNEL (ft.)	CNEL @ Nearest NSLU (dBA)	70 CNEL (ft.)	65 CNEL (ft.)	60 CNEL (ft.)
Linda Vista Road																									
Napa Street to Marian Way/Mildred Street	50	70	50	84	143	70.7	53	90	154	70.1	52	85	144	70.3	51	87	151	70.3	52	86	146	70.9	55	94	160
Marian Way/Mildred Street to Colusa Street	50	68.5	38	73	121	69	41	75	127	68.6	38	72	122	68.7	40	74	125	68.7	40	74	125	69.7	48	81	139
Colusa Street to Alcala Parkway	50	68.5	38	73	121	69	41	75	127	68.6	38	73	124	68.8	40	74	125	68.8	40	74	125	69.4	45	78	134
Alcala Parkway to Via Las Cumbres	50	68.1	35	69	117	69	41	75	127	68.2	36	70	119	68.5	38	72	121	68.5	38	72	121	69.9	49	83	141
Via Las Cumbres to Kramer Street	50	67.3	29	64	107	67.9	33	67	114	67.4	30	64	108	67.5	31	65	110	67.5	30	65	110	69.8	48	82	140
Kramer Street to Comstock Street	50	67.6	32	66	111	68.1	34	68	116	67.7	33	68	115	67.8	33	68	113	67.8	33	68	113	69.1	43	76	129
Comstock Street to Ulric Street	100	61.3	33	67	115	61.6	36	71	119	61.3	33	68	115	61.4	34	68	116	61.4	34	69	116	63	47	81	139
Ulric Street to Genesee Avenue	50	69.4	45	79	135	69.7	47	81	139	69.5	45	79	135	69.5	46	80	136	69.5	46	80	136	71.6	60	100	170
Colusa Street																									
Friars Road to Linda Vista Road	50	54.1	IRW	IRW	12	56.5	IRW	IRW	25	54.2	IRW	IRW	14	55.2	IRW	IRW	17	55.2	IRW	IRW	17	59.1	IRW	14	42
Via Las Cumbres																									
Friars Road to Linda Vista Road	50	59.9	IRW	16	49	60.4	IRW	18	52	59.9	IRW	16	49	60	IRW	16	50	60	IRW	16	50	63.3	IRW	36	72

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Appendix D

ROADWAY CONSTRUCTION NOISE MODEL (RCNM) CALCULATIONS

Residential - Concrete Saw

Equipment	Base dBA L_{MAX}	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance To:	Distance
Noise Sum	89.6	N/A	N/A	N/A	81.9	#	130.0	73.6	#	75	110.8
Concrete Saw	89.6	20%	8	12	80.8	#	130.0	72.5	#	75	98.0
Loader	79.1	40%	8	12	73.4	#	130.0	65.1	#	75	41.4
Dump Truck	76.5	40%	8	12	70.8	#	130.0	62.5	#	75	30.7

Residential - Excavator

Equipment	Base dBA L_{MAX}	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance To:	Distance
Noise Sum	80.7	N/A	N/A	N/A	78.1	#	130.0	69.8	#	75	71.6
Excavator	80.7	40%	8	12	75.0	#	130.0	66.7	#	75	49.8
Loader	79.1	40%	8	12	73.4	#	130.0	65.1	#	75	41.4
Dump Truck	76.5	40%	8	12	70.8	#	130.0	62.5	#	75	30.7

Sensitive Habitat - Concrete Saw

Equipment	dBA L_{MAX}	Base Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance To:	Distance
Noise Sum	89.6	N/A	N/A	N/A	81.9	#	50.0	81.9	#	60	622.9
Concrete Saw	89.6	20%	8	12	80.8	#	50.0	80.8	#	60	551.4
Loader	79.1	40%	8	12	73.4	#	50.0	73.4	#	60	232.8
Dump Truck	76.5	40%	8	12	70.8	#	50.0	70.8	#	60	172.6

Sensitive Habitat - Excavator

Equipment	Base dBA L_{MAX}	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance To:	Distance
Noise Sum	80.7	N/A	N/A	N/A	78.1	#	50.0	78.1	#	60	402.9
Excavator	80.7	40%	8	12	75.0	#	50.0	75.0	#	60	279.9
Loader	79.1	40%	8	12	73.4	#	50.0	73.4	#	60	232.8
Dump Truck	76.5	40%	8	12	70.8	#	50.0	70.8	#	60	172.6

Memorandum

HELIX Environmental Planning, Inc.
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La Mesa, CA 91942
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619.462.0552 **fax**
www.**helixepi**.com

Date: April 6, 2017

To: Kim Baranek

From: W. Larry Sward

Subject: USD Master Plan Update

HELIX Proj. No.: MWS-01

Message:

This memo presents the results of a focused sensitive plant survey and vegetation mapping verification for Project Areas 17, 19, 22, and 23 on March 6, 2017. These project sites are the only areas where native or naturalized vegetation, and that could support sensitive plant species, would be directly impacted by implementation of the Master Plan Update. This survey was conducted in response to a request by the City of San Diego to update the vegetation mapping I performed on August 15, 2014 and the previous sensitive plant species survey I conducted on May 22, 2015.

VEGETATION MAPPING

The vegetation mapping provided in the Biological Technical Report (BTR)[1] remains accurate.

SENSITIVE PLANTS

No individuals of sensitive plants, other than those reported in the BTR, were observed in these project areas. While not observed during the previous survey in 2015 and this survey, ashy spike-moss may occur in these project areas as analyzed in the BTR.

The four project areas were also evaluated for the 19 potentially occurring sensitive plant species that were identified in Appendix D of the BTR. These potentially occurring species can be grouped into three categories: 1) species observable at the time of the survey but not present; 2) very unlikely to occur due to a lack of habitat; and 3) species whose range does not include the USD campus.

[1] HELIX Environmental Planning, Inc. 2016. University of San Diego Master Plan Update and Conditional Use Permit Amendment, Biological Technical Report. December.

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HELIX Environmental Planning

Species Observable At The Time Of The Survey But Not Present. This category includes four perennial succulents and shrubs that would have been observed if present: Shaw's agave (*Agave shawii*), golden-spined cereus (*Bergerocactus emoryi*), snake cholla (*Cylindropuntia californica* var. *californica*), and cliff spurge (*Euphorbia misera*). Five annual and perennial species that were observable at the time of the 2015 and 2017 surveys but were not observed include San Diego ambrosia (*Ambrosia pumila*), aphanisma (*Aphanisma blitoides*), coastal dunes milk-vetch (*Astragalus tener* var. *titi*), variegated dudleya (*Dudleya variegata*), and beach goldenaster (*Heterotheca sessiliflora* ssp. *sessiliflora*). Since none of these species was observed, none is expected to occur.

Species Unlikely To Occur Due To A Lack Of Habitat. This category includes eight species: San Diego thornmint (*Acanthomintha ilicifolia*; clay soils), Encinitas baccharis (*Baccharis vanessae*; chaparral), short-leaved dudleya (*Dudleya brevifolia*; Torrey sandstone), San Diego button-celery (*Eryngium aristulatum* var. *parishii*; vernal pools and mesic grasslands), spreading navarretia (*Navarretia fossalis*; vernal pools), California adder's-tongue (*Ophioglossum californicum*; vernal pools and other mesic areas), California Orcutt grass (*Orcuttia californica*; vernal pools), and San Diego mesa mint (*Pogogyne abramsii*; vernal pools). The habitats for each of these species are listed above following the species' scientific name. These habitats are not present in the four project areas.

Species Whose Range Does Not Include The USD Campus. This category includes two species: Otay tarplant (*Deinandra conjugens*) and Otay Mesa mint (*Pogogyne nudiuscula*). The USD campus is outside of the known range for both of these species.

In conclusion, the determinations in Appendix D of the BTR for potentially occurring sensitive plant species are supported by this survey.