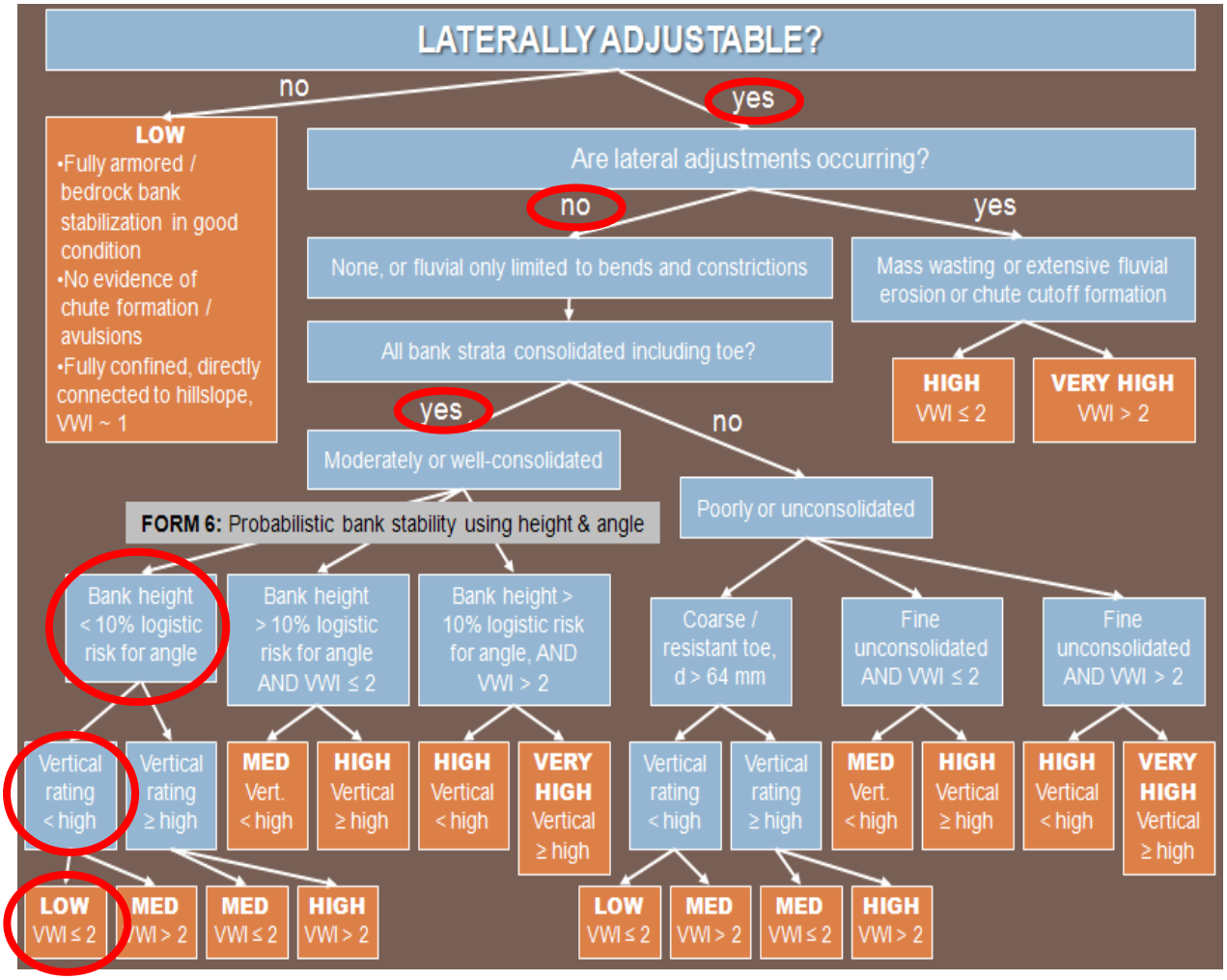
FORM 4: LATERAL SUSCEPTIBILTY FIELD SHEET

Circle appropriate nodes/pathway for proposed site
OR use sequence of questions provided in Form 5.



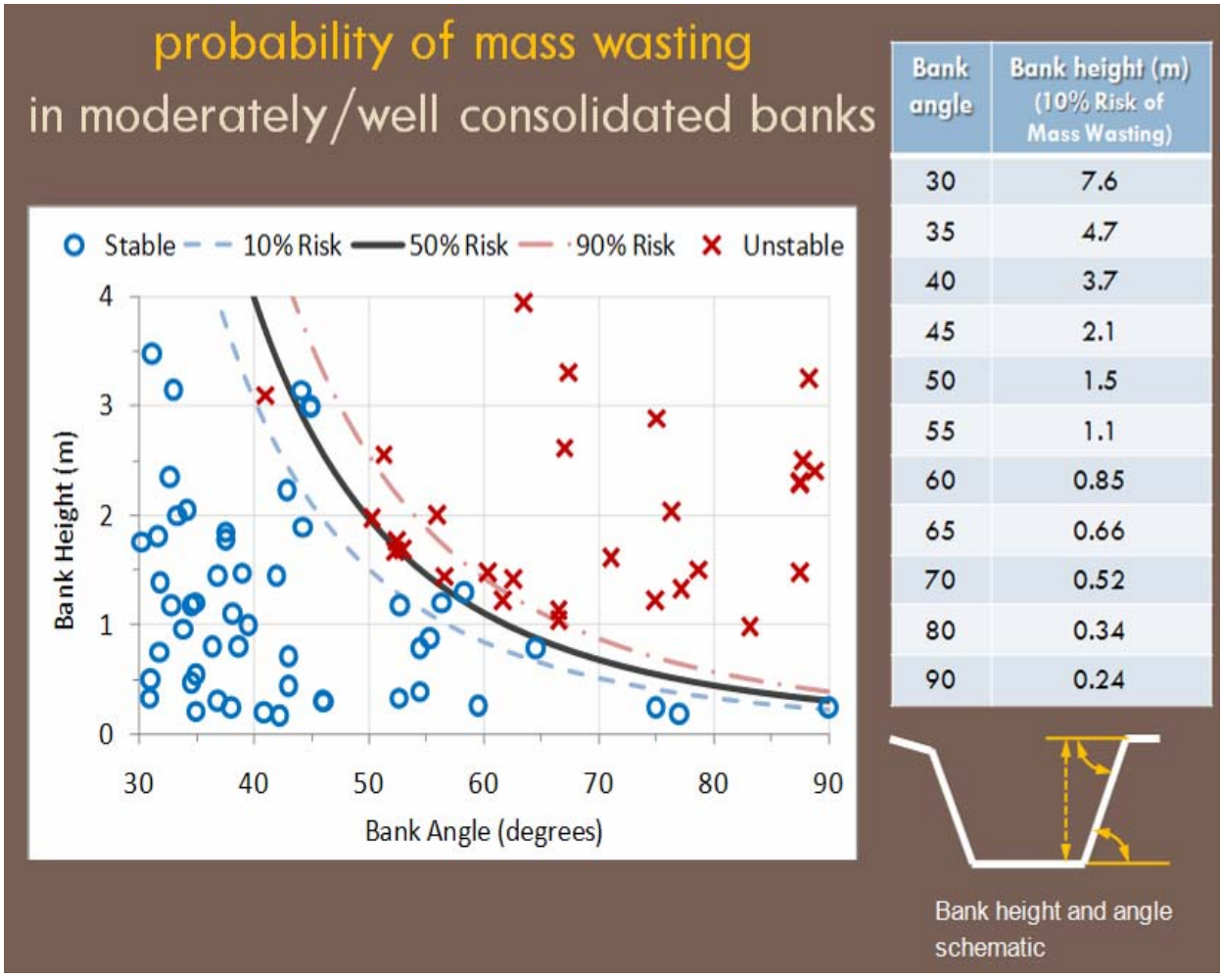
(Sheet 1 of 1)

REACH 1 RESULTS

FORM 6: PROBABILITY OF MASS WASTING BANK FAILURE

If mass wasting is not currently extensive and the banks are moderately- to well-consolidated, measure bank height and angle at several locations (i.e., at least three locations that capture the range of conditions present in the study reach) to estimate representative values for the reach. Use Form 6 Figure 1 below to determine if risk of bank failure is >10% and complete Form 6 Table 1. Support your results with photographs that include a protractor/rod/tape/person for scale.

	Bank Angle (degrees) *(from Field)*	**Bank Height (m)** *(from Field)*	**Corresponding Bank Height for 10% Risk of Mass Wasting (m)** *(from Form 6 Figure 1 below)*	**Bank Failure Risk** *(<10% Risk)* *(>10% Risk)*
Left Bank	2:1 (26.6)	---	---	<10%
Right Bank	2:1 (26.6)	---	---	<10%

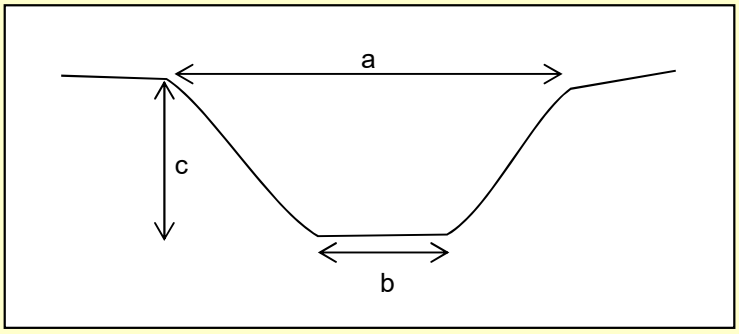


Form 6 Figure 1. Probability Mass Wasting diagram, Bank Angle:Height/% Risk table, and Band Height:Angle schematic.

Critical Flow Calculator

Reach 1

enter all values in green cells
and drop down boxes



Inputs

a) Receiving channel width at top of bank (ft) - see figure on right	28.0
b) Channel width at bed (ft)	10.0
c) Bank height at top of bank (ft)	3.0
Channel gradient (ft/ft)	0.0034
Receiving channel roughness	Same as above, but more stones and weeds n=0.035
Channel materials (use weakest of bed or banks). If materials are varied use weakest material covering more than 20% of channel.	unconsolidated sandy loam 0.035 lb/sq ft alluvial silt (non coloidal) 0.045 lb/sq ft medium gravel 0.12 lb/sq ft alluvial silt/clay 0.26 lb/sq ft 2.5 inch cobble 1.1 lb/sq ft enter own d50 (variable) vegetation (bed and banks) 0.6 lb/sq ft
Select method of calculating Q2	Input own Q2 Calculate Q2 using USGS regression

Receiving water watershed annual precip (inches)	16.22	Receiving water watershed area at PoC (sq mi)	0.087
Project watershed annual precipitation (inches)	16.22	Project watershed area draining to PoC (sq mi)	0.087

Outputs - Flow control range

Receiving water Q2	2.2	**Point of Compliance low flow rate (cfs)**	**1.1**
Project site Q2	2.2	**Low flow class**	**0.5Q2**
		Channel vulnerability	**Low**

ATTACHMENT 3

Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 3a	Structural BMP Maintenance Plan (Required)	☒ Included See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 3b	Draft Stormwater Maintenance Notification / Agreement (when applicable)	☐ Included ☐ Not Applicable

Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:

Attachment 3a must identify:

- ☒ Specific maintenance indicators and actions for proposed structural BMP(s). This must be based on Section 7.7 of the BMP Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
- ☐ How to access the structural BMP(s) to inspect and perform maintenance
- ☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐ Recommended equipment to perform maintenance
- ☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

Attachment 3b: For all Structural BMPs, Attachment 3b must include a draft maintenance agreement in the County's standard format depending on the Category (PDP applicant to contact County staff to obtain the current maintenance agreement forms). Refer to Section 7.3 in the BMP Design Manual for a description of the different categories.

Maintenance Indicators and Actions for Vegetated BMPs

Typical Maintenance Indicator(s) for Vegetated BMPs	Maintenance Actions
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation.
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.
Overgrown vegetation	Mow or trim as appropriate, but not less than the design height of the vegetation per original plans when applicable (e.g. a vegetated swale may require a minimum vegetation height).
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas and adjust the irrigation system.
Erosion due to concentrated storm water runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, The County must be contacted prior to any additional repairs or reconstruction.
Standing water in vegetated swales	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, loosening or replacing top soil to allow for better infiltration, or minor re-grading for proper drainage. If the issue is not corrected by restoring the BMP to the original plan and grade, County staff in the Watershed Protection Program must be contacted prior to any additional repairs or reconstruction.
Standing water in bioretention, biofiltration with partial retention, or biofiltration areas, or flow-through planter boxes for longer than 96 hours following a storm event*	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains (where applicable), or repairing/replacing clogged or compacted soils.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable.
*These BMPs typically include a surface ponding layer as part of their function which may take 96 hours to drain following a storm event.	

ATTACHMENT 4

County of San Diego PDP Structural BMP Verification for Permitted Land Development Projects

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County of San Diego BMP Design Manual Verification Form	
Project Summary Information	
Project Name	Village Place Apartments
Record ID (e.g., grading/improvement plan number)	PDS2015-STP-15-026
Project Address	521 16TH Street Ramona, CA 92065
Assessor's Parcel Number(s) (APN(s))	282-261-60-00
Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	San Dieguito River, Santa Maria Valley Ramona 905.41
Responsible Party for Construction Phase	
Developer's Name	Trustees of the Robert & Victoria Burch Living Trust and William M. Vaughan
Address	PO Box 1412 Ramona, CA 92065
Email Address	rburch@raburch.com
Phone Number	760-789-3549
Engineer of Work	Thomas A. Jones
Engineer's Phone Number	619-582-4992
Responsible Party for Ongoing Maintenance	
Owner's Name(s)*	Trustees of the Robert & Victoria Burch Living Trust and William M. Vaughan
Address	PO Box 1412 Ramona, CA 92065
Email Address	rburch@raburch.com
Phone Number	760-789-3549
*Note: If a corporation or LLC, provide information for principal partner or Agent for Service of Process. If an HOA, provide information for the Board or property manager at time of project closeout.	

County of San Diego BMP Design Manual Verification Form Page 2 of 4					
Stormwater Structural Pollutant Control & Hydromodification Control BMPs* (List all from SWQMP)					
Description/Type of Structural BMP	**Plan Sheet #**	**STRUCT-URAL BMP ID#**	**Maint-enance Category**	**Maintenance Agreement Recorded Doc #**	**Revisions**
Biofiltration with Partial Retention and Hydromodification		1	2		
*All Priority Development Projects (PDPs) require a Structural BMP					

Note: If this is a partial verification of Structural BMPs, provide a list and map denoting Structural BMPs that have already been submitted, those for this submission, and those anticipated in future submissions.

County of San Diego BMP Design Manual Verification Form Page 3 of 4

Checklist for Applicant to submit to PDCI:

- ☐ Copy of the final accepted SWQMP and any accepted addendum.
- ☐ Copy of the most current plan showing the Stormwater Structural BMP Table, plans/cross-section sheets of the Structural BMPs and the location of each verified as-built Structural BMP.
- ☐ Photograph of each Structural BMP.
- ☐ Photograph(s) of each Structural BMP during the construction process to illustrate proper construction.
- ☐ Copy of the approved Structural BMP maintenance agreement and associated security

By signing below, I certify that the Structural BMP(s) for this project have been constructed and all BMPs are in substantial conformance with the approved plans and applicable regulations. I understand the County reserves the right to inspect the above BMPs to verify compliance with the approved plans and Watershed Protection Ordinance (WPO). Should it be determined that the BMPs were not constructed to plan or code, corrective actions may be necessary before permits can be closed.

Please sign your name and seal.

Professional Engineer's Printed Name:

_____

Professional Engineer's Signed Name:

_____

Date:_____

[SEAL]

County of San Diego BMP Design Manual Verification Form Page 4 of 4

COUNTY - OFFICIAL USE ONLY:

For PDCI: Verification Package #: _____

PDCI Inspector: _____

Date Project has/expects to close: _____

Date verification received from EOW: _____

By signing below, PDCI Inspector concurs that every noted Structural BMP has been installed per plan.

PDCI Inspector's Signature: _____ Date: _____

FOR WPP:

Date Received from PDCI: _____

WPP Submittal Reviewer: _____

WPP Reviewer concurs that the information provided for the following Structural BMPs is acceptable to enter into the Structural BMP Maintenance verification inventory:

List **acceptable** Structural BMPs:

WPP Reviewer's Signature: _____ Date: _____

ATTACHMENT 5

Copy of Plan Sheets Showing Permanent Storm Water BMPs, Source Control, and Site Design

This is the cover sheet for Attachment 5.

Use this checklist to ensure the required information has been included on the plans:

The plans must identify:

☒ Structural BMP(s) with ID numbers matching Step 6 Summary of PDP Structural BMPs
☒ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
☒ Details and specifications for construction of structural BMP(s)
☐ Signage indicating the location and boundary of structural BMP(s) as required by County staff
☐ How to access the structural BMP(s) to inspect and perform maintenance
☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
☐ Recommended equipment to perform maintenance
☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
☒ Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
☒ All BMPs must be fully dimensioned on the plans
☐ When proprietary BMPs are used, site-specific cross section with outflow, inflow, and model number must be provided. Photocopies of general brochures are not acceptable.
☐ Include all source control and site design measures described in Steps 4 and 5 of the SWQMP. Can be included as a separate exhibit as necessary.

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PRELIMINARY PROJECT CONDITIONS RELATED TO PALEONTOLOGICAL RESOURCES

PALEONTOLOGICALLY SENSITIVE AREAS ARE THOSE IDENTIFIED AS HAVING HIGH, MODERATE, LOW OR MARGINAL POTENTIAL TO CONTAIN PALEONTOLOGICAL RESOURCES. MITIGATION INCLUDES MONITORING DURING GRADING AND/OR EXCAVATION, HOWEVER, THE MONITORING REQUIREMENT IS DIFFERENT FOR HIGH/MODERATE AND LOW/MARGINAL. ONLY THE AREAS OF NO POTENTIAL DO NOT REQUIRE MONITORING. GUIDELINES FOR DETERMINING SIGNIFICANCE FOR PALEONTOLOGICAL RESOURCES ARE AT: HTTP://WWW.SDCOUNTY.CA.GOV/PDS/DOCS/PALEO-GUIDELINES.PDF.

PROJECT SPECIFIC INFORMATION: A REVIEW OF THE COUNTY'S PALEONTOLOGICAL RESOURCES POTENTIAL AND SENSITIVITY MAP AND DATA ON SAN DIEGO COUNTY'S GEOLOGIC FORMATIONS INDICATES THAT THE PROJECT IS LOCATED ON GEOLOGICAL FORMATIONS THAT POTENTIALLY CONTAIN UNIQUE PALEONTOLOGICAL RESOURCES. EXCAVATING INTO UNDISTURBED GROUND BENEATH THE SOIL HORIZONS MAY CAUSE A SIGNIFICANT IMPACT IF UNIQUE PALEONTOLOGICAL RESOURCES ARE ENCOUNTERED. THE PROJECT IS IN AN AREA RATED AS HAVING LOW POTENTIAL FOR CONTAINING UNIQUE PALEONTOLOGICAL RESOURCES.

GENERAL INFORMATION: SINCE AN IMPACT TO PALEONTOLOGICAL RESOURCES DOES NOT TYPICALLY OCCUR UNTIL THE RESOURCE IS DISTURBED, MONITORING DURING EXCAVATION IS THE ESSENTIAL MEASURE TO MITIGATE POTENTIALLY SIGNIFICANT IMPACTS TO UNIQUE PALEONTOLOGICAL RESOURCES TO A LEVEL BELOW SIGNIFICANCE. MONITORING AND COLLECTION OF PALEONTOLOGICAL RESOURCES DURING SITE EXCAVATION ENSURES THAT POTENTIALLY ADVERSE IMPACTS TO PALEONTOLOGICAL RESOURCES ARE REDUCED TO A LEVEL BELOW SIGNIFICANCE. THE TYPE OF MONITORING REQUIRED IS BASED ON THE AMOUNT OF EXCAVATION PROPOSED AND THE SITE'S POTENTIAL FOR CONTAINING UNIQUE PALEONTOLOGICAL RESOURCES. TO MITIGATE FOR THE PROJECT'S POTENTIAL IMPACT TO PALEONTOLOGICAL RESOURCES, THE PROJECT WILL BE REQUIRED TO COMPLY WITH THE FOLLOWING PROJECT CONDITION:

DRAFT GRADING PLAN NOTES:

PRIOR TO APPROVAL OF GRADING OR IMPROVEMENT PLANS, THE APPLICANT SHALL:

A. PROVIDE EVIDENCE THAT GRADING AND/OR OTHER EXCAVATION WILL BE MONITORED FOR FOSSILS. THE PERSON RESPONSIBLE FOR FOSSIL MONITORING NEED NOT BE A QUALIFIED PALEONTOLOGIST OR A QUALIFIED PALEONTOLOGICAL RESOURCES MONITOR, AND MAY BE AN EMPLOYEE(S) OF THE GRADING CONTRACTOR, AND IN SOME CASES, MAY BE THE EQUIPMENT OPERATOR(S). EVIDENCE SHALL BE A LETTER FROM THE GRADING CONTRACTOR TO THE DIRECTOR OF PLANNING & DEVELOPMENT SERVICES STATING THE NAMES OF THOSE INDIVIDUALS THAT WILL BE RESPONSIBLE FOR MONITORING FOR FOSSILS.

B. PROVIDE EVIDENCE TO THE DIRECTOR OF PUBLIC WORKS (DPW) THAT THE FOLLOWING NOTES HAVE BEEN PLACED ON THE GRADING PLAN:

1. IF A FOSSIL OR GROUP OF FOSSILS (E.G. A SHELL BED) OF GREATER THAN TWELVE INCHES IN ANY DIMENSION (INCLUDING CIRCUMFERENCE) IS ENCOUNTERED BENEATH THE SOIL LAYERS (MEANING THAT IT IS NOT ARCHAEOLOGICAL) DURING GRADING OR OTHER EXCAVATION:

   a. ALL EARTHMOVING OPERATIONS IN THE AREA WHERE THE FOSSIL WAS FOUND SHALL BE SUSPENDED IMMEDIATELY;

   b. THE COUNTY'S PERMIT COMPLIANCE COORDINATOR SHALL BE NOTIFIED;

   c. THE APPLICANT SHALL CONTRACT WITH A QUALIFIED PALEONTOLOGIST TO EVALUATE THE SIGNIFICANCE OF THE FOSSIL. A QUALIFIED PALEONTOLOGIST IS A PERSON WITH A PH.D. OR MASTER'S DEGREE IN PALEONTOLOGY OR A RELATED FIELD, AND WHO HAS KNOWLEDGE OF SAN DIEGO COUNTY PALEONTOLOGY AND DOCUMENTED EXPERIENCE IN PROFESSIONAL PALEONTOLOGICAL PROCEDURES AND TECHNIQUES.

   d. VERIFICATION OF THE CONTRACT SHALL BE PRESENTED IN A LETTER FROM THE QUALIFIED PALEONTOLOGIST TO THE DIRECTOR OF PLANNING & DEVELOPMENT SERVICES STATING THAT HE/SHE HAS BEEN CONTRACTED TO DETERMINE IF THE FOUND FOSSIL IS SIGNIFICANT. IF THE FOSSIL IS SIGNIFICANT, THE QUALIFIED PALEONTOLOGIST SHALL:

      o SALVAGE UNEARTHED FOSSIL REMAINS, INCLUDING SIMPLE EXCAVATION OF EXPOSED SPECIMENS OR, IF NECESSARY, PLASTER-JACKETING OF LARGE AND/OR FRAGILE SPECIMENS OR MORE ELABORATE QUARRY EXCAVATIONS OF RICHLY FOSSILIFEROUS DEPOSITS;

      o IN THE FIELD, RECORD STRATIGRAPHIC AND GEOLOGIC DATA TO PROVIDE A CONTEXT FOR THE RECOVERED FOSSIL REMAINS, TYPICALLY INCLUDING A DETAILED DESCRIPTION OF ALL PALEONTOLOGICAL LOCALITIES WITHIN THE PROJECT SITE, AS WELL AS THE LITHOLOGY OF FOSSIL-BEARING STRATA WITHIN THE MEASURED STRATIGRAPHIC SECTION, IF FEASIBLE, AND PHOTOGRAPHIC DOCUMENTATION OF THE GEOLOGIC SETTING;

   e. GRADING AND EXCAVATION CAN RESUME EITHER WHEN THE QUALIFIED PALEONTOLOGIST DETERMINES THAT THE FIND IS NOT SIGNIFICANT OR AFTER THE FOSSIL HAS BEEN REMOVED AND THE ASSOCIATED DATA COLLECTED.

C. PRIOR TO ROUGH GRADING INSPECTION SIGN-OFF PROVIDE EVIDENCE THAT MONITORING FOR FOSSILS HAS BEEN COMPLETED. EVIDENCE SHALL BE IN THE FORM OF A LETTER FROM THE GRADING CONTRACTOR TO TE DIRECTOR OF PLANNING & DEVELOPMENT SERVICES. [PDS, FEE].

PRELIMINARY PROJECT CONDITIONS RELATED TO PALEONTOLOGICAL RESOURCES CONTINUED

PRIOR TO FINAL GRADING RELEASE:

1. IF NO PALEONTOLOGICAL RESOURCES WERE DISCOVERED, SUBMIT A "NO FOSSILS FOUND" LETTER FROM THE GRADING CONTRACTOR TO THE DIRECTOR OF PLANNING & DEVELOPMENT SERVICES STATING THAT THE MONITORING HAS BEEN COMPLETED AND THAT NO FOSSILS WERE DISCOVERED, AND INCLUDING THE NAMES AND SIGNATURES FROM THE FOSSIL MONITORS. THE LETTER SHALL BE IN THE FORMAT OF ATTACHMENT E OF THE COUNTY OF SAN DIEGO GUIDELINES FOR DETERMINING SIGNIFICANCE FOR PALEONTOLOGICAL RESOURCES. [PDS FEE]

2. IF PALEONTOLOGICAL RESOURCES WERE DISCOVERED AND SALVAGED, THE FOLLOWING TASKS SHALL BE COMPLETED BY OR UNDER THE SUPERVISION OF A QUALIFIED PALEONTOLOGIST:

   a. PREPARE COLLECTED FOSSIL REMAINS FOR CURATION, TO INCLUDE CLEANING THE FOSSILS BY REMOVING THE ENCLOSING ROCK MATERIAL, STABILIZING FRAGILE SPECIMENS USING GLUES AND OTHER HARDENERS, IF NECESSARY, AND REPAIRING BROKEN SPECIMENS;

   b. CURATE, CATALOG AND IDENTIFY ALL FOSSIL REMAINS TO THE LOWEST TAXON POSSIBLE, INVENTORY SPECIMENS, ASSIGNING CATALOG NUMBERS, AND ENTER THE APPROPRIATE SPECIMEN AND LOCALITY DATA INTO AN COLLECTION DATABASE;

   c. TRANSFER THE CATALOGED FOSSIL REMAINS AND COPIES OF RELEVANT FIELD NOTES, MAPS, STRATIGRAPHIC SECTIONS, AND PHOTOGRAPHS TO AN ACCREDITED INSTITUTION FOR ARCHIVAL STORAGE AND/OR DISPLAY, PREFERABLY:

      O SAN DIEGO NATURAL HISTORY MUSEUM, PHYSICAL ADDRESS: 1788 EL PRADO, SAN DIEGO, CA 92101; MAILING ADDRESS: P.O. BOX 121390, SAN DIEGO, CA 92112-1390, (619) 232-3821

      O NATURAL HISTORY MUSEUM OF LOS ANGELES COUNTY, 900 EXPOSITION BOULEVARD, LOS ANGELES, CA 90007, (213) 763-DINO

      O SAN BERNARDINO MUSEUM OF NATURAL HISTORY, 2024 ORANGE TREE LANE, REDLANDS, CALIFORNIA 92374, (909) 307-2669

      O UNIVERSITY OF CALIFORNIA MUSEUM OF PALEONTOLOGY, BERKELEY, 1101 VALLEY LIFE SCIENCES BUILDING, BERKELEY, CA 94720-4780, (510) 642-1821

      O ANZA-BORREGO DESERT STATE PARK, 200 PALM CANYON DRIVE, BORREGO SPRINGS, CA 92004, (760) 767-5311

PRELIMINARY PROJECT CONDITIONS RELATED TO PALEONTOLOGICAL RESOURCES CONTINUED

   d. PREPARE A FINAL PALEONTOLOGICAL RESOURCES MITIGATION PROGRAM REPORT SUMMARIZING THE FIELD AND TABORATORY METHODS USED, THE STRATIGRAPHIC UNITS INSPECTED, THE TYPES OF FOSSILS RECOVERED, AND THE SIGNIFICANCE OF THE CURATED COLLECTION.

   e. SUBMIT A DETAILED REPORT PREPARED BY THE QUALIFIED PALEONTOLOGIST IN THE FORMAT PROVIDED IN APPENDIX * OF THE GUIDELINES FOR DETERMINING SIGNIFICANCE FOR PALEONTOLOGICAL RESOURCES AND DOCUMENTING CURATION OF THE COLLECTED FOSSILS AND IDENTIFYING WHICH ACCREDITED INSTITUTION HAS AGREED TO ACCEPT THE CURATED FOSSILS;

   f. SUBMITTING TWO HARD COPIES OF THE FINAL PALEONTOLOGICAL RESOURCES MITIGATION REPORT TO THE DIRECTOR OF PDS FOR FINAL APPROVAL OF THE MITIGATION, AND SUBMIT AN ELECTRONIC COPY OF THE COMPLETE REPORT IN MICROSOFT WORD ON A CD. SUBMIT ONE COPY OF THE REPORT TO THE SAN DIEGO NATURAL HISTORY MUSEUM AND ONE COPY TO THE INSTITUTION THAT RECEIVED THE FOSSILS. [PDS FEE]

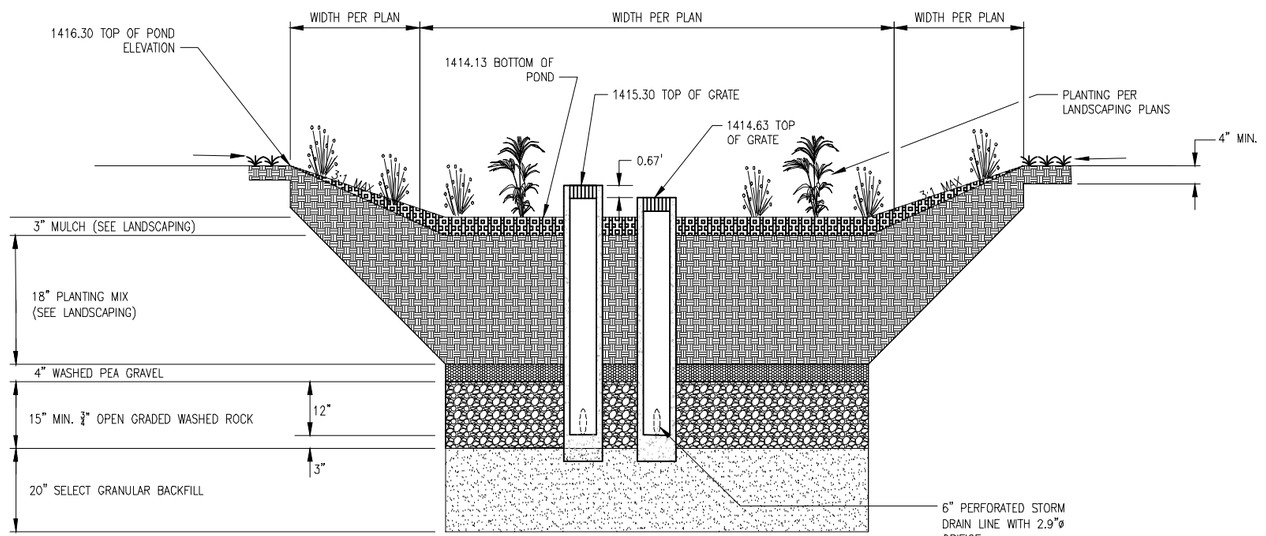
   g. SUBMIT PROOF OF TRANSFER OF PALEONTOLOGICAL RESOURCES, IN THE FORM OF A LETTER, FROM THE DIRECTOR OF THE PALEONTOLOGY DEPARTMENT OF THE ACCREDITED INSTITUTION TO THE DIRECTOR OF PDS VERIFYING THAT THE CURATED FOSSILS FROM THE PROJECT SITE HAVE BEEN RECEIVED BY THE INSTITUTION. [PDS FEE]

NOTES:

1. UNDERGROUND UTILITIES AS SHOWN ARE FROM AVAILABLE DRAWINGS SUPPLEMENTED BY OBSERVED ALIGNMENTS WITH SURFACE MANHOLES, VALVES, ETC. CONTRACTOR TO VERIFY EXACT LOCATION, DEPTH AND SIZE OF UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. SURFACE ITEMS SHOWN ARE FROM AERIAL TOPOGRAPHY, COMPLETED BY SAN-LO AERIAL SURVEYS JULY 25, 2013. ANY OBSERVED VARIATIONS FROM PLANS OR UTILITIES THAT ARE FOUND WHICH ARE NOT SHOWN ON PLANS SHOULD BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE PROJECT MANAGER AND ENGINEER OF WORK.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY MONUMENTATION AND/ OR BENCHMARKS WHICH WILL BE DISTURBED OR DESTROYED BY CONSTRUCTION. SUCH POINTS SHALL BE REFERENCED AND REPLACED WITH APPROPRIATE MONUMENTATION BY A LICENSED LAND SURVEYOR OR A REGISTERED CIVIL ENGINEER AUTHORIZED TO PRACTICE LAND SURVEYING. A CORNER RECORD OR RECORD OF SURVEY, AS APPROPRIATE, SHALL BE FILED BY A LICENSED LAND SURVEYOR OR REGISTERED CIVIL ENGINEER AS REQUIRED BY THE LAND SURVEYOR'S ACT.
3. A BOUNDARY SURVEY WAS NOT PERFORMED.

ABBREVIATIONS

AC	ASPHALT CONCRETE
CB	CATCH BASIN
℄	CENTERLINE
CONC	CONCRETE
ø	DIAMETER
FF	FINISH FLOOR
FH	FIRE HYDRANT
FL	FLOW LINE
FS	FINISH SURFACE
GVW	GATE VALVE WATER
IE	INVERT ELEVATION
ℙ	PROPERTY LINE
RCP	REINFORCE CONCRETE PIPE
RPBP	REDUCED PRESSURE BACKFLOW PREVENTOR
SCO	SEWER CLEANOUT
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
S	SEWER
SMH	SEWER MANHOLE
TC	TOP OF CURB
TF	TOP OF FOOTING
TG	TOP OF GRATE
TW	TOP OF WALL
TYP	TYPICAL
W/	WITH
W	WATER



A/C-1 BIO-FILTRATION WITH PARTIAL RETENTION - SECTION A-A
NO SCALE

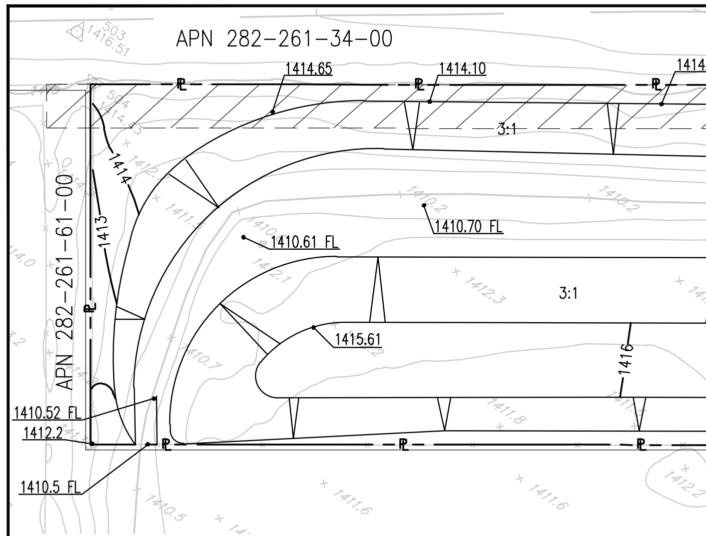
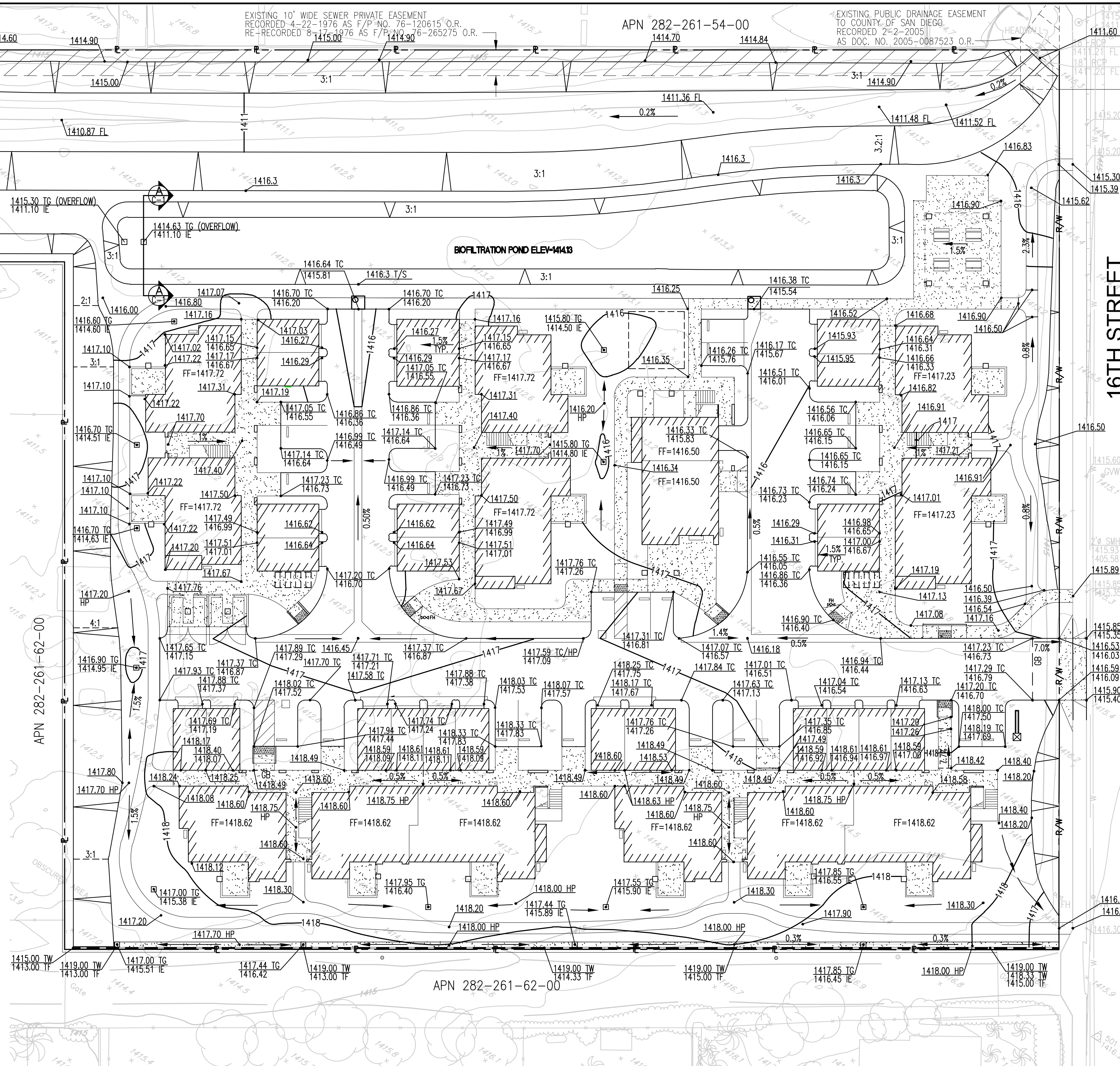
BDS Engineering, Inc
Civil Engineering
Land Surveying
5575 Lake Park Way, Suite 114
La Mesa, California 91942
(619) 582-4992 FAX (619) 582-7428
BDS PROJECT NO. 14-18

VILLAGE PLACE APARTMENTS
521 16th STREET, RAMONA, CA 92065

Revisions:

Sheet Title: CIVIL NOTES
Date: 4/2/18
Project No.: 13017
Sheet No.: C-1

DWG. FILE: L:\PROJECTS\1418\Engr\04 Civils\C-1.dwg PLOT DATE: Apr 02, 2018 - 9:35am

NOTES:

1. FOR ADDITIONAL INFORMATION, LEGEND, ABBREVIATIONS, BENCHMARK, AND HORIZONTAL CONTROL, SEE SHEET C-1.
2. FOR ADDITIONAL INFORMATION SEE ARCHITECTURAL, LANDSCAPE, STRUCTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS.

PRELIMINARY GRADING PLAN NOTE:

THIS PLAN IS PROVIDED TO ALLOW FOR FULL AND ADEQUATE DISCRETIONARY REVIEW OF A PROPOSED DEVELOPMENT PROJECT. THE PROPERTY OWNER ACKNOWLEDGES THAT ACCEPTANCE OR APPROVAL OF THIS PLAN DOES NOT CONSTITUTE AN APPROVAL TO PERFORM ANY GRADING SHOWN HEREON, AND AGREES TO OBTAIN A VALID GRADING PERMIT BEFORE COMMENCING SUCH ACTIVITY.

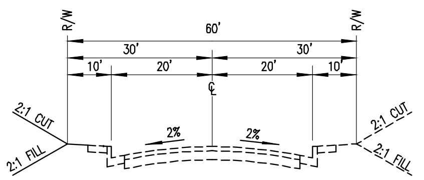
LEGEND

ALL SCREENED ITEMS ARE EXISTING

NEW CONTOUR	1415
NEW SPOT ELEVATION	1415.50 TC / 1415.00
NEW SLOPES	
DIRECTION OF FLOW	

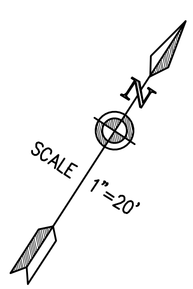
GRADING QUANTITIES:

GRADED AREA	3.41 ACRES
CUT QUANTITIES	1,437 CYD
FILL QUANTITIES	14,264 CYD
IMPORT	12,828 CYD
MAX. CUT DEPTH	4 FT
MAX CUT SLOPE RATIO (2:1MAX)	3:1
MAX. FILL DEPTH	5 FT
MAX FILL SLOPE RATIO (2:1MAX)	3:1

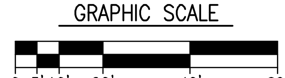


TYPICAL SECTION: 16TH STREET

NO SCALE



GRAPHIC SCALE



SCALE: 1" = 20'

DWG. FILE: L:\PROJECTS\1418\Engr\04 Onsite\C-2.dwg PLOT DATE: Apr 02, 2018-9:35am

BDS Engineering, Inc
Civil Engineering
Land Surveying
5575 Lake Park Way, Suite 114
La Mesa, California 91942
(619) 582-4992 FAX (619) 582-7428
BDS PROJECT NO. 14-18

VILLAGE PLACE APARTMENTS

521 16th STREET, RAMONA, CA 92065

Revisions:

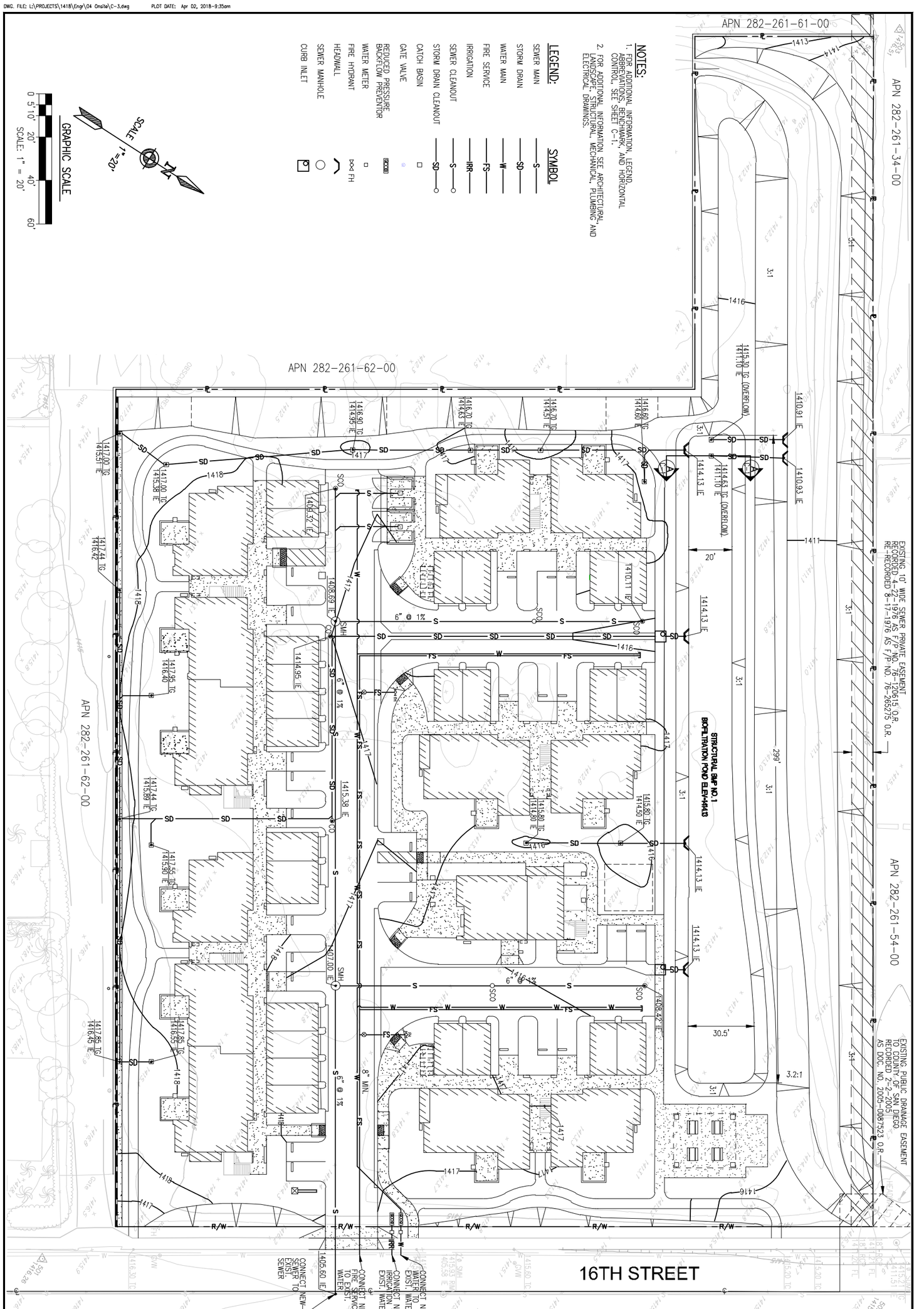
Sheet Title: PRELIMINARY GRADING PLAN

Project No.: 13017

Date: 4/2/18

Sheet No.: C-2

DWG. FILE: L:\PROJECTS\1418\Engr\04 Onsite\C-3.dwg PLOT DATE: Apr 02, 2018 - 9:35am



Sheet No.: C-3	Sheet Title: PRELIMINARY UTILITY PLAN	Revisions:	**VILLAGE PLACE APARTMENTS**		BDS Engineering, Inc Civil Engineering Land Surveying 5575 Lake Park Way, Suite 114 La Mesa, California 91942 (619) 582-4992 FAX (619) 582-7428 BDS PROJECT NO. 14-18
	Project No.: 13017 Date: 4/2/18		521 16th STREET, RAMONA, CA 92065		

ATTACHMENT 6

Copy of Project's Drainage Report

This is the cover sheet for Attachment 6.

If hardcopy or CD is not attached, the following information should be provided:

Title:
Prepared By:
Date:

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VILLAGE PLACE APARTMENTS
521 16TH Street
Ramona, CA 92105

Record ID: PDS2015-STP-15-026

HYDROLOGY & HYDRAULIC CALCULATIONS

May 30, 2017
Revised: November 21, 2017

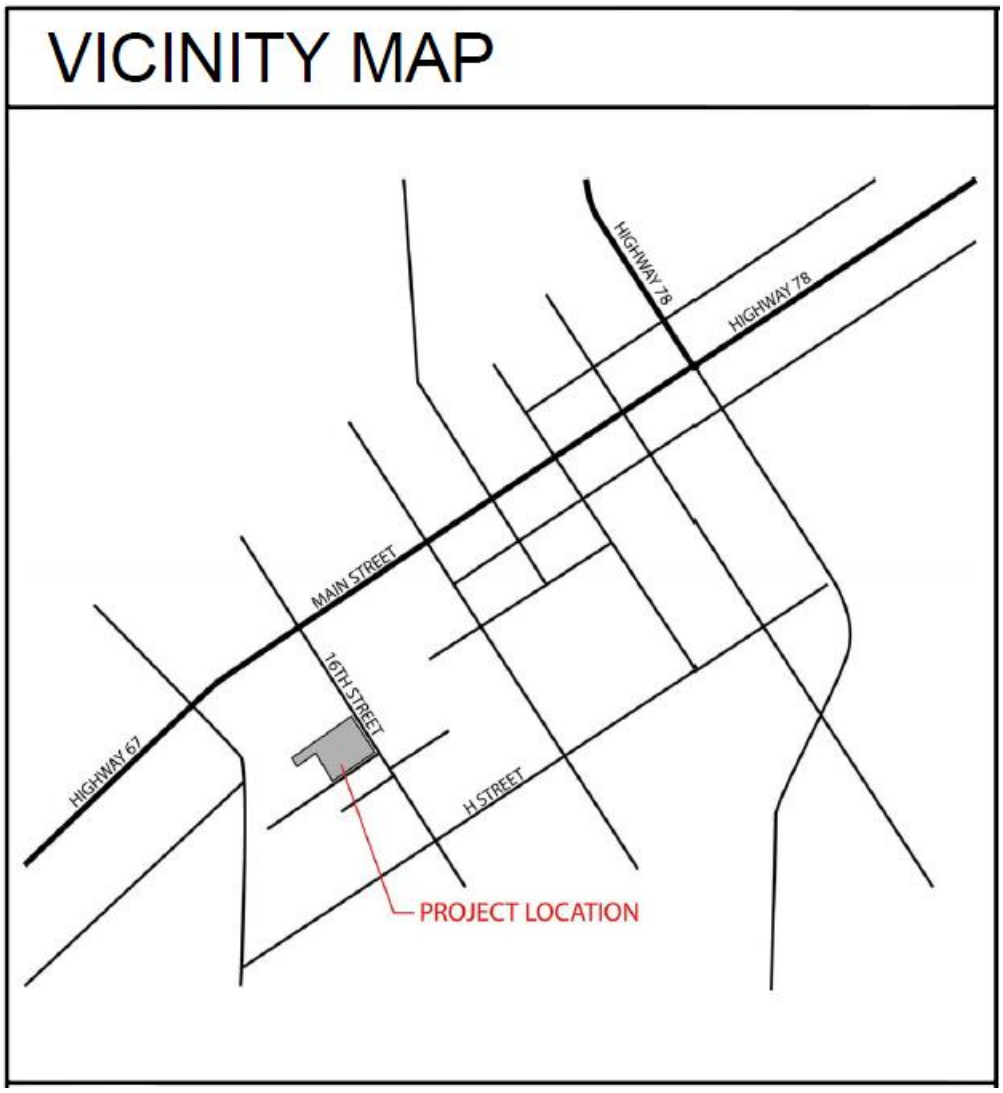
BDS ENGINEERING, INC.
CIVIL ENGINEERS
6859 Federal Boulevard
Lemon Grove, CA 91945
(619) 582-4992
Project: 14-18

Thomas A Jones

R.O.W. R.C.E. 34867 — 11/21/17 DATE

TABLE OF CONTENTS

I. VICINITY MAP



II. SCOPE OF WORK

The scope of this study is to provide the hydrology and hydraulic calculations for the Village Place Apartments project. This study includes analysis of the existing hydrologic conditions and the proposed development hydrologic conditions consisting of a multi-family residential development.

III. PROJECT DESCRIPTION

The Village Place Apartments site is on the west side of 16th Street approximately 800 feet south of Highway 67 / Main street in Ramona, California. The project area is 3.41 acres and proposes the construction of multi-family residential development.

IV. ENGINEER'S QUALIFICATIONS

BDS Engineering Inc. (BDS) has over 40 years of experience in water resources management including:

- Hydrology / Hydraulic Studies and Reports
- Storm Drain Design
- Drainage feasibility Studies and Reports

V. HYDROLOGIC ANALYSIS

A hydrologic analysis was made to estimate peak flood flows for return of 100 years.

This hydrologic analysis was made by the use of an aerial survey by San Lo Surveys in July, 2013, SanGis topographic data (for the larger drainage basin) and supplemented with a topographic survey by BDS Engineering Inc., August 2015. The hydrology for post development was made by the use of the proposed grading plan by BDS Engineering Inc.

The rational method of runoff computation as described in the County of San Diego Hydrology Manual was used to determine the quantity of storm water runoff. County of San Diego Hydrology reference material is included in Appendix A.

The basic rational formula is Q=CIA where:

"Q" is the peak rate of flow in cubic feet per second (CFS).
"C" is a runoff coefficient expressed as that percentage of rainfall, which becomes surface runoff. We are using soil group 'D'.
"I" is the average rainfall intensity in inches per hour for a storm duration equal to the time of concentration (t_c) of the contributing drainage area.
"A" is the drainage area in acres tributary to design point.
"t_c" is the time of concentration required for runoff to flow from the most remote part of the watershed to the outlet point under consideration.

VI. EXISTING HYDROLOGIC CONDITIONS

The existing site is 3.41 acres of undeveloped land covered with natural vegetation. The site drains from east to west with a natural drainage channel that runs parallel to the northern property line and outlets on the adjacent parcel before connecting to an underground storm drain system at Ramona Street. The storm is then conveyed to the Santa Maria creek that joins the San Dieguito River and outlets at the Pacific Ocean in Del Mar. Upstream of the site is a drainage area of 51.41 acres. This area is comprised of General Commercial, Medium Density Residential, High Density Residential and Natural area. The pre-development drainage areas exhibit H-1 and hydrologic calculations are in included in Appendix B.

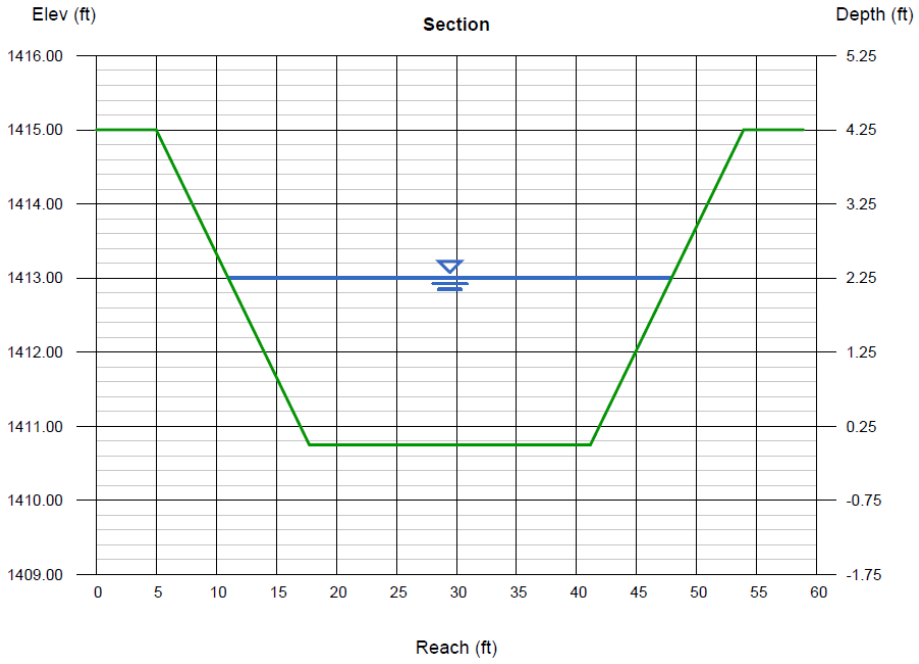
VII. PROPOSED HYDROLOGIC CONDITIONS

The majority of the proposed site, 2.41 acres, will drain to a bio-filtration pond with partial retention and with hydromodification capacity, the pond will outlet at the north end of the site into an improved and widened drainage channel. The remainder of the site, 1.0 acres, has drainage areas are self-mitigating, including the drainage channel, or de minimis. The proposed bio-filtration pond meets the required water quality requirements as well as the runoff discharged at the Point of Compliance meets the hydromodification requirements of 0.5 Q2 to Q10. In addition, there are no known PCCSYAs with the project site per the WMAA mapping method. The proposed disturbance area is 3.41 acres. The hydromodification calculations are included in the SWQMP in Attachment 2a. The proposed housing for the site does not place housing within a 100-year flood hazard area according to FEMA and the County of San Diego Flood Maps, see Appendix C. The post-development drainage areas exhibit H-2 and the hydrologic calculations are in included in Appendix B. A summary is provided in the table below.

Summary of Modified Rational Method						
Drainage Area	Downstream Node	Area (acre)	Tc (min)	I (in/hr)	C	Q (cfs)
System 1:						
Pre-Development	100	51.41	28.0	2.77	0.69	97.5
System 1&3:						
Post-Development	100	54.85	25.3	2.95	0.69	111.1
Difference:		**+3.44**	**-2.7**	**+0.18**	**0**	**+13.6**
System 2:						
Pre-Development	200	2.61	17.0	3.82	0.30	3.0
Post-Development	200	0.15	5.0	8.40	0.30	0.5
Difference:		**-2.46**	**-12.0**	**+4.58**	**0**	**-2.5**

VIII. CONCLUSION

As seen in the table above, the downstream end of the channel of System 1&3, Node 100, will see an increase in flow by approximately 13.6 cfs. This increase in the channel is mitigated throughout the site with an improved channel design. The new channel will be widened to approximately 23 feet, will have a slope of 0.2%, and will be vegetated with native grass and meadow seed mix and. As seen in the channel section below, the 100-year water level is adequately contained within the channel and has an additional 2 feet of freeboard; therefore no flooding will occur on-site. The velocity within the channel will be 1.6 fps which is well below an erosive velocity 5.0 fps, per the San Diego County Hydraulic Design Manual Table 5-1.



Also, Drainage System 2 that sheet flows onto the adjacent property will have a decrease in run-off of 2.5 cfs at Node 200. The post-development run-off velocity for this system is 1.1 fps. Erosion is not anticipated.

IX. DECLARATION OF RESPONSIBLE CHARGE

I, HEREBY DECLARE THAT I AM THE CIVIL ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUISNESS AND PROFRESSIONS CODE, AND THAT THE DESIGN IS CONSITENT WITH CURRENT DESIGN.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATIONS BY THE COUTNY OF SAN DIEGO IS CONFINED TO A REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN

Thomas A. Jones
R.C.E. 34867
EXP. 9-30-19

11/21/17
Date

X. APPENDIX

A. COUNTY OF SAN DIEGO HYDROLOGY MANUAL REFERENCE MATERIAL

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)

SITE LOCATION
P6=3.19

Orange County

Riverside County

Imperial County

Pacific Ocean

Mexico

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
S.D. COUNTY
SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
CORONADO
SD
CHULA VISTA
IMPERIAL BEACH

117°30' 117°15' 117°00' 116°45' 116°30' 116°15'
33°30' 33°15' 33°00' 32°45' 32°30'

DPW GIS
Department of Public Works
Geographic Information Services

SanGIS
We Have San Diego Covered!

N W E S

3 0 3 Miles

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

Isopluvial (inches)

SITE LOCATION
P24=5.78

Orange County

Riverside County

Imperial County

Pacific Ocean

Mexico

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
S.D. COUNTY
SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
CORONADO
CHULA VISTA
IMPERIAL BEACH
SD

33°30'
33°15'
33°00'
32°45'
32°30'
117°30'
117°15'
117°00'
116°45'
116°30'
116°15'

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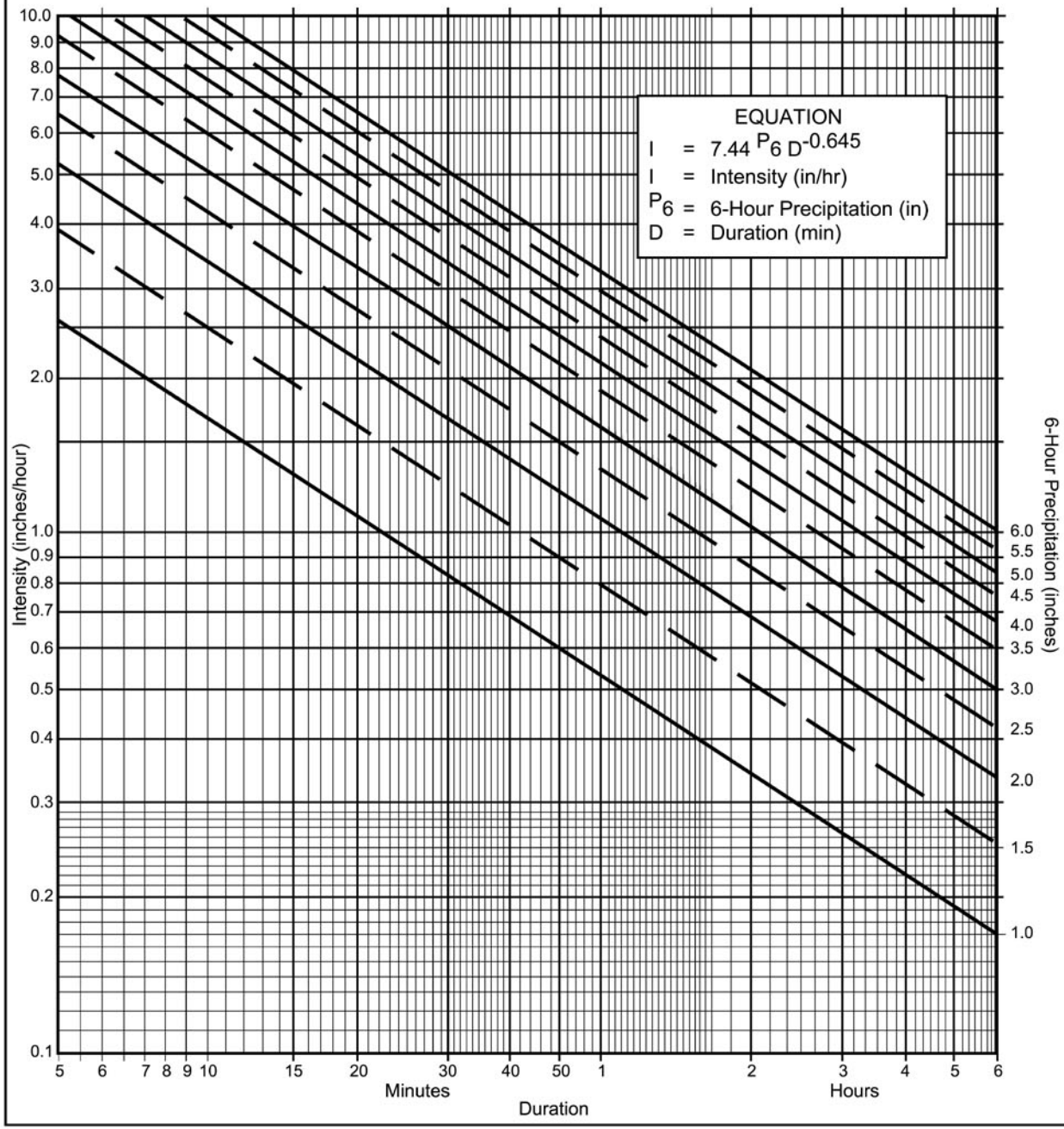
3 0 3 Miles



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form: SEE ATTACHED CHART

(a) Selected frequency _____ year

(b) P_6 = _____ in., P_{24} = _____, $\frac{P_6}{P_{24}}$ = _____ %(2)

(c) Adjusted P_6(2) = _____ in.

(d) t_x = _____ min.

(e) I = _____ in./hr.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

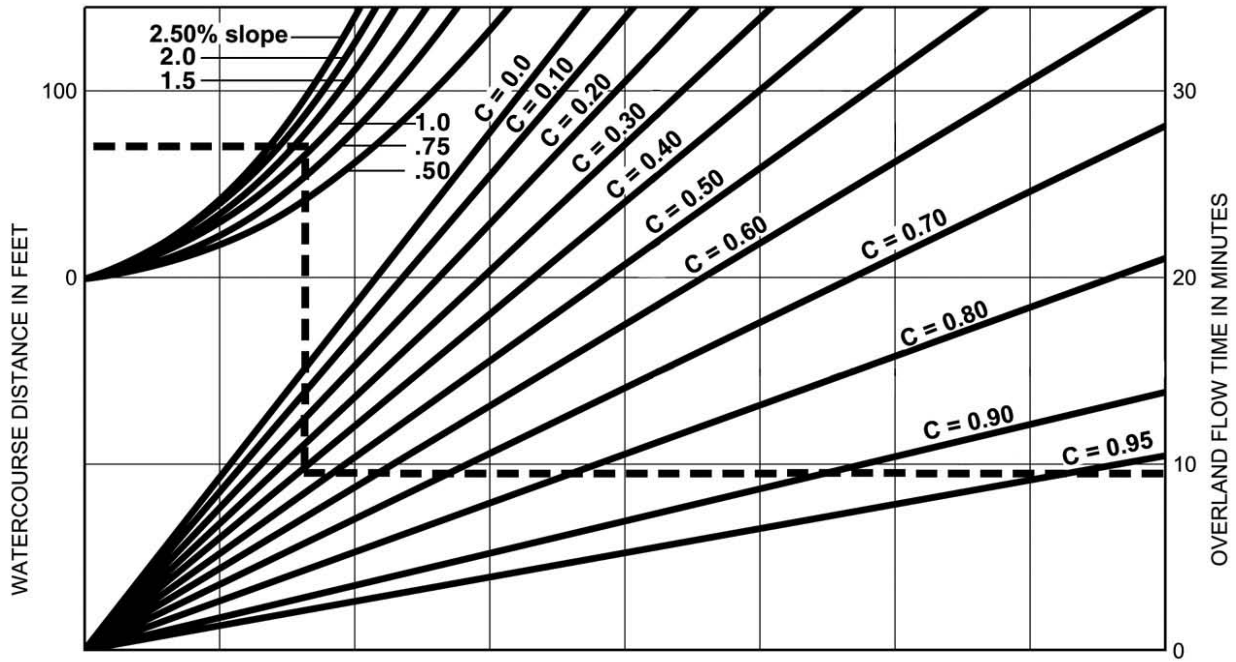
Intensity-Duration Design Chart - Template

FIGURE 3-1

Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0*	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service



EXAMPLE:

Given: Watercourse Distance (D) = 70 Feet
Slope (s) = 1.3%
Runoff Coefficient (C) = 0.41
Overland Flow Time (T) = 9.5 Minutes

$$T = \frac{1.8\,(1.1-C)\sqrt{D}}{\sqrt[3]{s}}$$

SOURCE: Airport Drainage, Federal Aviation Administration, 1965

FIGURE 3-3

Rational Formula - Overland Time of Flow Nomograph

Note that the Initial Time of Concentration should be reflective of the general land-use at the upstream end of a drainage basin. A single lot with an area of two or less acres does not have a significant effect where the drainage basin area is 20 to 600 acres.

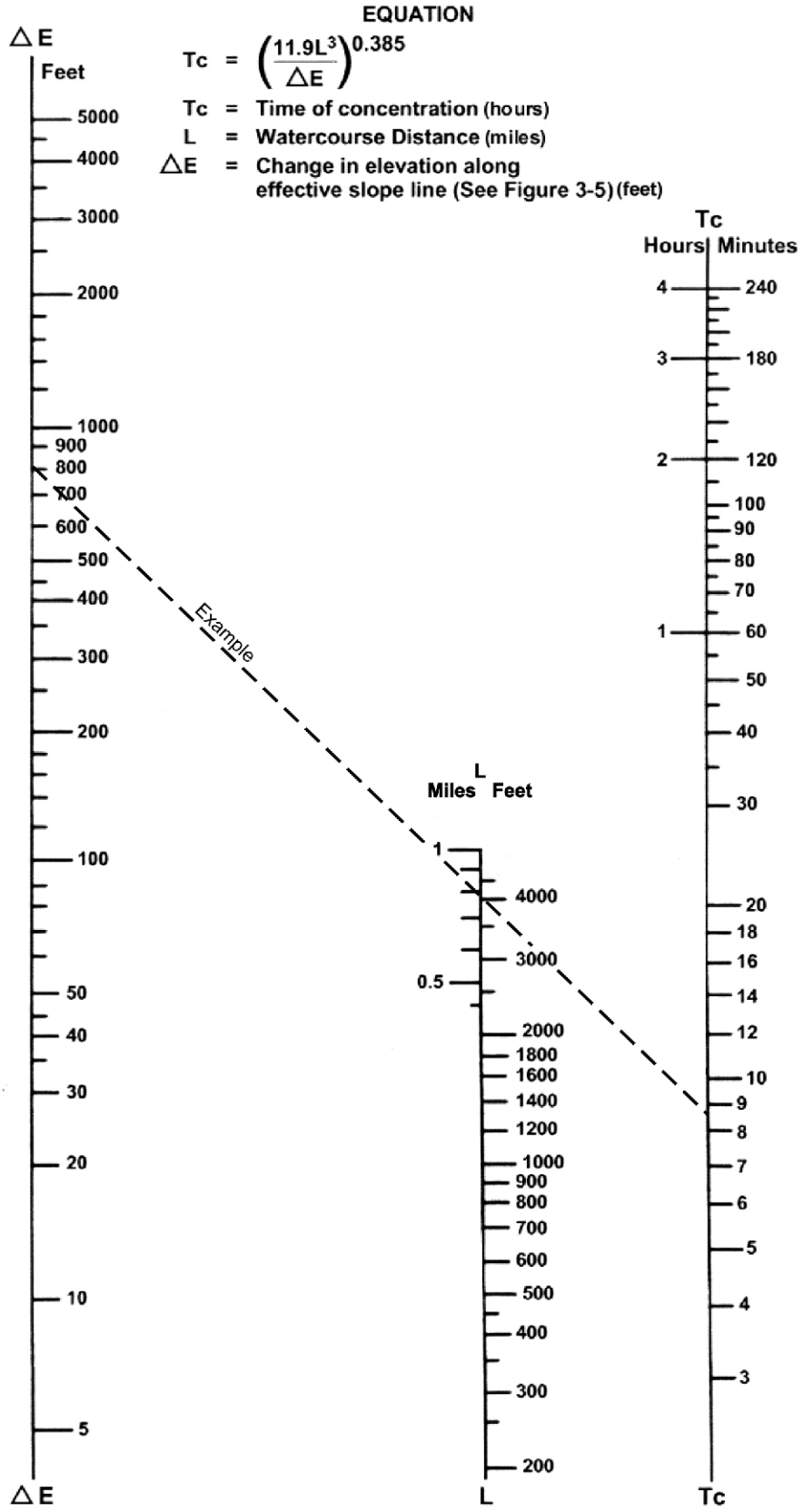
Table 3-2 provides limits of the length (Maximum Length (L_M)) of sheet flow to be used in hydrology studies. Initial T_i values based on average C values for the Land Use Element are also included. These values can be used in planning and design applications as described below. Exceptions may be approved by the "Regulating Agency" when submitted with a detailed study.

Table 3-2

MAXIMUM OVERLAND FLOW LENGTH (L_M)
& INITIAL TIME OF CONCENTRATION (T_i)

Element*	DU/ Acre	.5%		1%		2%		3%		5%		10%	
		L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i
Natural		50	13.2	70	12.5	85	10.9	100	10.3	100	8.7	100	6.9
LDR	1	50	12.2	70	11.5	85	10.0	100	9.5	100	8.0	100	6.4
LDR	2	50	11.3	70	10.5	85	9.2	100	8.8	100	7.4	100	5.8
LDR	2.9	50	10.7	70	10.0	85	8.8	95	8.1	100	7.0	100	5.6
MDR	4.3	50	10.2	70	9.6	80	8.1	95	7.8	100	6.7	100	5.3
MDR	7.3	50	9.2	65	8.4	80	7.4	95	7.0	100	6.0	100	4.8
MDR	10.9	50	8.7	65	7.9	80	6.9	90	6.4	100	5.7	100	4.5
MDR	14.5	50	8.2	65	7.4	80	6.5	90	6.0	100	5.4	100	4.3
HDR	24	50	6.7	65	6.1	75	5.1	90	4.9	95	4.3	100	3.5
HDR	43	50	5.3	65	4.7	75	4.0	85	3.8	95	3.4	100	2.7
N. Com		50	5.3	60	4.5	75	4.0	85	3.8	95	3.4	100	2.7
G. Com		50	4.7	60	4.1	75	3.6	85	3.4	90	2.9	100	2.4
O.P./Com		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
Limited I.		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
General I.		50	3.7	60	3.2	70	2.7	80	2.6	90	2.3	100	1.9

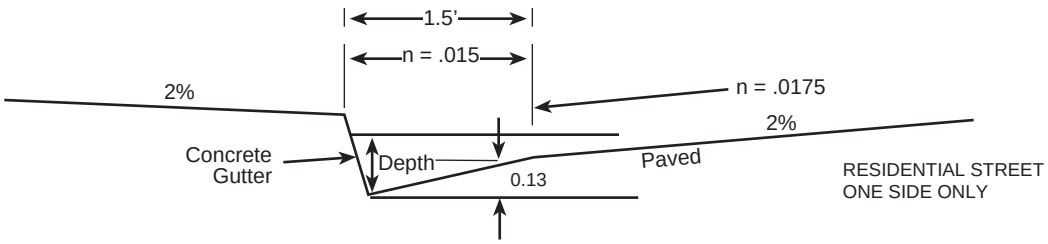
*See Table 3-1 for more detailed description

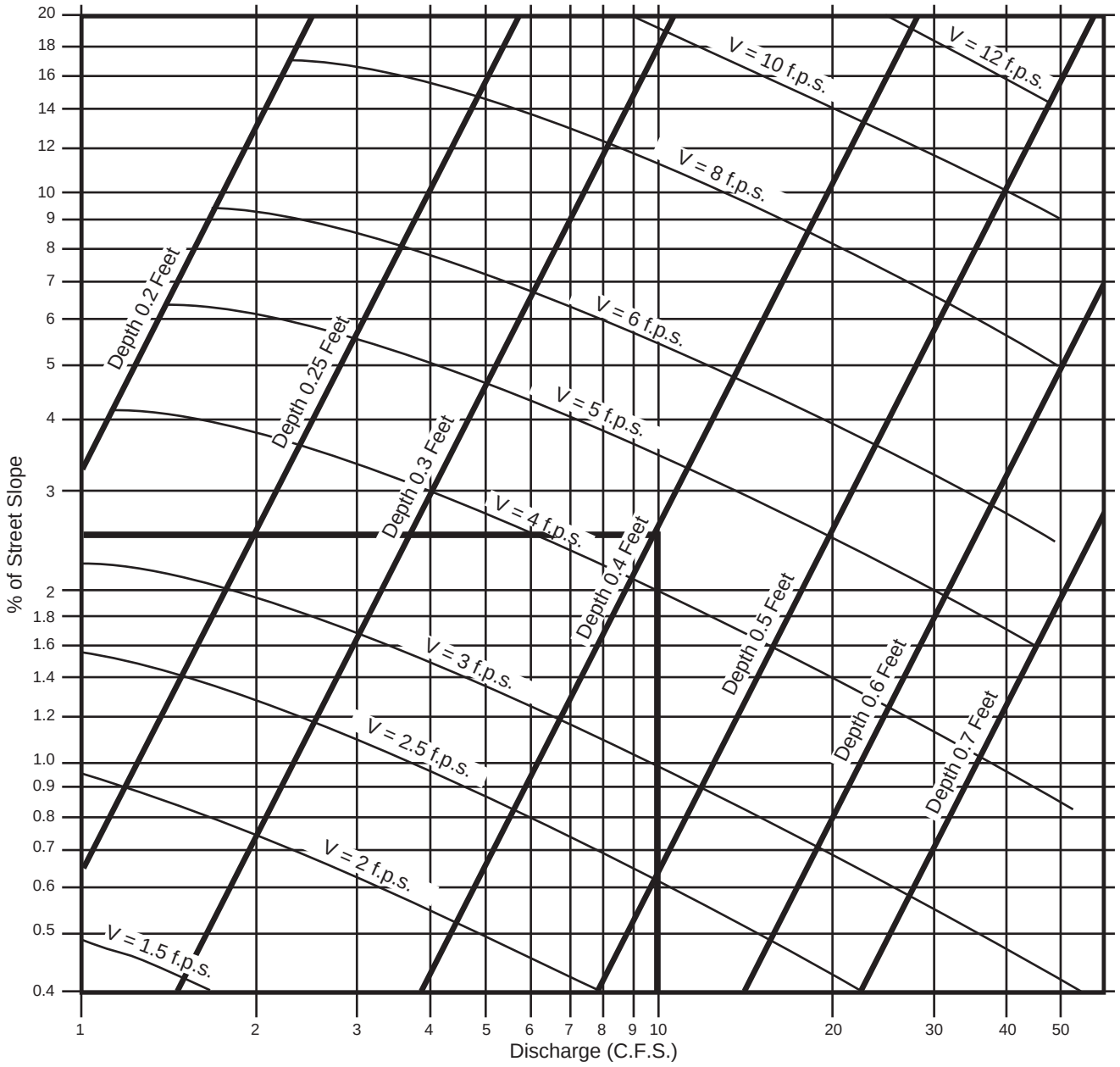


SOURCE: California Division of Highways (1941) and Kirpich (1940)

FIGURE 3-4

Nomograph for Determination of
Time of Concentration (Tc) or Travel Time (Tt) for Natural Watersheds





EXAMPLE:

Given: Q = 10 S = 2.5%

Chart gives: Depth = 0.4, Velocity = 4.4 f.p.s.

SOURCE: San Diego County Department of Special District Services Design Manual

F I G U R E

Gutter and Roadway Discharge - Velocity Chart

3-6

B. HYDROLOGIC CALCULATIONS