Appendix G2: Preliminary Low Impact Development Plan

Appendices

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PRELIMINARY LOW IMPACT DEVELOPMENT PLAN

TENTATIVE TRACT MAP NO. 83121

Project Address:
Southwest of North Forbes Avenue &
East Miramar Avenue
City of Claremont, CA

Prepared for:

TRUMARK HOMES

450 Newport Center Drive, Suite 300
Newport Beach, CA 92660
(949) 999-9800

Prepared by:

Hunsaker & Associates Irvine, Inc.
3 Hughes
Irvine, CA 92618
(949) 583-1010

Preparation Date:
October 13, 2021

G2-2

PRELIMINARY LOW IMPACT DEVELOPMENT PLAN
"TENTATIVE TRACT MAP NO. 83121"
City of Claremont, CA

PRELIMINARY
LOW IMPACT DEVELOPMENT (LID) PLAN

TENTATIVE TRACT MAP NO. 83121

SOUTHWEST OF NORTH FORBES AVENUE &
EAST MIRAMAR AVENUE
CITY OF CLAREMONT, COUNTY OF LOS ANGELES

PREPARED FOR:

TRUMARKHOMES

450 NEWPORT CENTER DRIVE, SUITE 300
NEWPORT BEACH, CA 92660
(949) 999-9800

SUBMITTED TO:

CITY OF CLAREMONT
PLANNING DIVISION
207 HARVARD AVENUE
CLAREMONT, CA 91711
(909) 399-5460

PREPARED BY:

HUNSAKER & ASSOCIATES IRVINE, INC.
3 HUGHES
IRVINE, CA 92618
(949) 583-1010

PREPARED:

OCTOBER 13, 2021

Engineer's Certification
Low Impact Development (LID) Plan

Preparer (Engineer) Certification			
Preparer (Engineer): David Francke			
Title	Project Manager/Engineer	PE Registration #	49068
Company	Hunsaker & Associates Irvine, Inc.		
Address	3 Hughes, Irvine, CA 92618		
Email	dfrancke@hunsaker.com		
Telephone #	949-583-1010		

I HEREBY CERTIFY THAT THIS LOW IMPACT DEVELOPMENT (LID) PLAN IS IN COMPLIANCE WITH THE REQUIREMENTS SET FORTH IN ORDER NO. R4-2012-0175/NPDES NO. CAS004001 OF THE LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD.

I certify under penalty of law that this document and all attachments were prepared under my jurisdiction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations

Preparer Signature		Date	
Place Stamp Here			

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LID NOTES:

1. Determine and provide the pre- and post- development pervious and impervious areas created by the proposed development[1].

POST DEVELOPMENT					
Impervious Area	7.58	Acres	Percent Impervious	38	%
Pervious Area	12.38	Acres	Percent Pervious	62	%
PRE DEVELOPMENT					
Impervious Area	4.54	Acres	Percent Impervious	20.5	%
Pervious Area	15.42	Acres	Percent Pervious	77.3	%

2. Any modifications to the approved Low Impact Development (LID) report must be resubmitted to the City for approval.
3. A copy of the approved Low Impact Development (LID) report must be in the possession of a responsible person and available at the site at all times.
4. All structural BMP's shall be accessible for inspection and maintenance.
5. Prior to commencement of any work for connection to City or County maintained storm drain, an encroachment permit from the appropriate party shall be obtained.

[1] *Based on project gross area of 19.96 acres, which includes approximately 0.76 acres of Indian Hills Blvd. and 0.39 acres of North Forbes Avenue.*

I. LID Requirements and Project Description

A. LID Background

In 1987, The Federal Water Pollution Control Act (also referred to as the Clean Water Act [CWA] was amended to provide that the discharge of pollutants to waters of the United States from stormwater is effectively prohibited, unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) Permit. The 1987 amendments to the CWA added Section 402 (p), which established a framework for regulating municipal, industrial and construction stormwater discharges under the NPDES program. In California, these permits are issued through the State Water Resources Control Board – (SWRCB) and the nine Regional Water Quality Control Boards.

On November 8, 2012, the Regional Water Quality Control Board, Los Angeles Region (RWQCB), adopted Order No. R4-2012-0175. This Order is the NPDES Permit (NPDES No. CAS004001) for municipal stormwater and urban runoff discharges within the County of Los Angeles.

As adopted in November 2012, the requirements of Order No. R4-2012-0175 (the "Permit') cover 84 cities and the unincorporated areas of Los Angeles County. The County of Los Angeles and the 84 incorporated cities are designated as Permittees.

In compliance with the Permit, the Permittees have implemented a stormwater quality management program (SQMP) with the ultimate goal of accomplishing the requirements of the Permit and reducing the amount of pollutants in stormwater and urban runoff wherein new development/redevelopment projects are required to prepare a Low Impact Development (LID) report.

As a Permittee of the County of Los Angeles, Best Management Practices (BMPs) are enforceable by the City of Claremont.

B. Designated Project Categories

Table 1, Designated Project Categories, identifies the Project as **Category 1**, thereby requiring development of this Low Impact Development (LID) report.

Table 1 – Designated Project Categories

Category	Description
1	All development projects equal to 1 acre or greater of disturbed area and adding more than 10,000 square feet of impervious surface area.
2	Industrial parks with 10,000 square feet or more of surface area.
3	Commercial malls with 10,000 square feet or more of surface area.
4	Retail gasoline outlets with 5,000 square feet or more of surface area.
5	Restaurants (Standard Industrial Classification [SIC] of 5812) with 5,000 square feet or more of surface area.
6	Parking lots with 5,000 square feet or more of impervious surface area, or with 25 or more parking spaces.
7	Automotive service facilities (SIC Codes: 5013, 5014, 5511, 5541, 7532-7534 and 7536-7539) with 5,000 square feet or more of surface area.

Table 1 – Designated Project Categories	
Category	Description
8	Projects located in or directly adjacent to, or discharging directly to a Significant Ecological Area (SEA), where the development will: • Discharge stormwater runoff that is likely to impact a sensitive biological species or habitat; and • Create 2,500 square feet or more of impervious surface area.
9	Redevelopment projects, which are developments that result in creation or addition or replacement of either: 5,000 square feet or more of impervious surface on a site that was previously developed as described in the above bullets; or (2) 10,000 square feet or more of impervious surface area on a site that was previously developed as a single family home. • Where 50 percent or more of the impervious surface of a previously developed site is proposed to be altered and the previous development project was not subject to post-construction stormwater quality control measures, the entire development site (e.g., both the existing development and the proposed alternation) must meet the requirements of the LID Standards Manual. • Where less than 50% of the impervious surface of a previously developed site is proposed to be altered and the previous development project was not subject to post-construction stormwater quality control measures, only the proposed alteration must meet the requirements of the LID Standards Manual. • Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of facility or emergency redevelopment activity required to protect public health and safety. Impervious surface replacement, such as the reconstruction of parking lots and roadways which does not disturb additional area and maintains the original grade and alignment, is considered a routine maintenance activity. Redevelopment does not include the repaving of existing roads to maintain original line and grade.

C. Site Description

The project is located just southwest of the intersection of North Forbes Avenue and East Miramar Avenue, in the City of Claremont. The assessor's parcel numbers (APN) for the site is 8670-003-900. Specifically, the site is bound to the north by an existing trail (Thompson Creek Trail) and single-family residential beyond; to the east by North Forbes Avenue and single-family residential beyond; to the south by single-family residential; and to the west by Indian Hill Boulevard and single-family residential beyond.

The eastern portion of the site consists of the former La Puerta Elementary School. Onsite structures were demolished sometime after 2018, with the pre-project site consisting of asphalt pavement and demolished structures in the northern portion and vacant land in the south. The western project site consists of the existing La Puerta Sports Park.

Surrounding land use includes trail and residential use. Existing land use for the project site includes vacant (closed school site) in the east and park in the west.

There are no known Significant Ecological Area (SEA) located within project limits or directly adjacent to the project site, nor does the project discharge directly to any areas identified as an SEA.

D. Project Description

Trumark Homes proposes Tentative Tract Map No. 83121 for a residential and park subdivision consisting of residential (eastern project area) and existing park (western project area) uses. The park site, designated as Lot 57, will remain as existing and is included as part of TTM 83121 for entitlement purposes only. The eastern portion of the project site will be developed to accommodate 56 single-family residential units with common landscaping areas, private streets, curb, gutter, sidewalk and storm drain improvements, wet and dry utilities and related infrastructure improvements.

A summary of the project's land use is as follows:

Lot	Land Use	Acres
1-56	Residential	6.99
57	Sports Park (existing)	9.23
A	Landscape	0.14
B	Landscape	0.20
C	Private Access	0.11
D	Private Access	0.10
--	Private Streets "A through "D"	2.04
--	Existing Indian Hill Blvd. Existing North Forbes Ave.	1.15
Total	--	19.96

Proposed residential units are anticipated to consist of multi-level units with living area ranging from 2,477 square feet to 3,277 square feet and bedrooms and bathrooms ranging from 3 bedrooms / 3 bathrooms to 4 bedrooms / 4.5 bathrooms.

Parking for the residential portion of the project will include two-car garages for each residential unit, uncovered driveway parking spaces as well as uncovered street adjacent spaces along the project's public streets. Parking for the park site will consist of the existing parking along the western perimeter of the project.

Proposed landscaping within the residential development will consist of private homeowner maintained areas and private common open space areas located along project walkways and parkways. Total landscaping within the residential portion (9.58 acres) is anticipated to consist of approximately 45%, or 4.31 acres

Paved and other impervious areas of the site include the project's private streets, parking areas, curb, walkways and gutter improvements, and the building footprint of each residential unit. Total impervious surface is anticipated to consist of 55% of the total project site, or 5.27 acres.

Activities typical of residential developments can be anticipated for the residential portion of the project. These are anticipated to include day to day activities such as recreation, commuting, gardening and other typical residential activities.

Activities typical of outdoor recreation areas can be anticipated for the park portion of the project and include lounging, picnicking, exercising, sports and other outdoor related physical and non-physical activities.

E. Geotechnical Conditions

Topography – The topography of the project site relatively flat, sloping gently to the southwest with elevations ranging from 1489 feet above mean sea level in the northeast to 1449 feet above mean sea level to the southwest.

Soil Type and Geology – Geographically, the subject property is located within the Peninsular Ranges Geomorphic Province, within the broad San Bernardino Basin. The site is located on a large alluvial fan deposit. Regional topography is dominated by the presence of the faults that define the mountains and hills of the Southern California region.

Based on onsite geotechnical investigations, the subsurface soils include alluvial fan deposits generally consisting of sand with gravels and silt. Surficial scattered cobbles and small boulders were observed throughout the project area.

Based on the County of Los Angeles soils information, onsite soils primarily consist of Hanford Gravelly Sandy Loam (County Soil Type 007 – HG).

Groundwater – Groundwater was not encountered in any of the subsurface evaluations conducted by the most recent geotechnical investigation (LGC Geotechnical, 2020) up to 21.5' below existing surface. Groundwater was not encountered in the previous investigation, which excavated to depths of 46' below existing grade (GeoSystems, 2002). Historic high groundwater is approximately 60 feet below current grade per the Seismic Hazard Zone Report for the project area.

Other Geotechnical Issues – Based on the project's geotechnical investigations (LGC, 2020), there are no geotechnical issues related to infiltration of runoff for the project.

F. Watershed Area and Drainage Conditions

Watershed – The project site lies within the central-northern portion of the San Gabriel River Watershed and is tributary to Thompson Creek. The central and lower portions of the watershed are heavily urbanized, with the lower part of the river flowing through a concrete-lined channel prior to becoming a soft bottom channel near the City of Long Beach.

Existing Drainage – Stormwater and surface water onsite generally flow from northeasterly to southwesterly. Runoff is conveyed as overland flow and sheet flow southerly and southwesterly to a concrete channel located at the project's southwestern perimeter, which discharges to the existing Indian Hill Boulevard parkway to the west. Runoff is then conveyed as gutter flow southerly approximately 0.34 miles prior to discharging to an existing catch basin and conveyed westerly in the existing storm drain in Baseline Road (Facility BI 9713) to Thompson Creek, which is tributary to San Jose Creek, the San Gabriel River (Reaches 3, 2 and 1) and ultimately, the Pacific Ocean.

Proposed Drainage – In the developed condition, stormwater and surface water onsite be conveyed as surface flow to the project's backbone storm drain system and conveyed southerly and westerly prior to discharging to the parkway along India Hill Avenue, as in pre-project conditions.

Based on preliminary soils infiltration testing onsite for the project, project soils is conducive for infiltration. Therefore, the project will employ the use of infiltration BMPs to address the project's LID BMP requirements.

G. Other Site Considerations

Existing Utilities – Based on preliminary site assessment, the locations of existing utilities onsite and offsite would not pose any issues to the project's proposed BMPs.

H. Receiving Water Impairments

When designated beneficial uses of a particular water body are compromised by water quality, Section 303(d) of the Clean Water Act requires identifying and listing that water body as "impaired". Once a water body has been deemed impaired, a Total Maximum Daily Load ("TMDL") must be developed for each water quality constituent that compromises a beneficial use. A TMDL is an estimate of the total load of pollutants, from point, non-point, and natural sources, that a water body may receive without exceeding applicable water quality standards (with a "factor of safety" included). For point sources, including stormwater, the load allocation is referred to as a "Waste Load Allocation" (WLA) whereas for nonpoint sources, the allocation is referred to simply as a "Load Allocation".

Impairments to the project's receiving waters are as follows:

Receiving Water	303(d)	TMDL Status
Thompson Creek	None	None
San Jose Creek (Reach 2)	Indicator Bacteria	Addressed by USEPA approved TMDL
San Jose Creek (Reach 1)	pH Total Dissolved Solids Toxicity	TMDL Required
	Indicator Bacteria	Addressed by USEPA approved TMDL
	Ammonia	Addressed by action other than TMDL
San Gabriel River Reach 3	Indicator Bacteria	Addressed by USEPA approved TMDL
San Gabriel River Reach 2	Cyanide Water Temperature	TMDL Required
	Lead	Addressed by USEPA approved TMDL
San Gabriel River Reach 1	pH, Temperature	TMDL Required
San Gabriel River Estuary	Dioxin Nickel Dissolved Oxygen	TMDL Required
	Copper Indicator Bacteria	Being addressed with USEPA approved TMDL
San Pedro Bay (Pacific Ocean)	Chlordane PCBs Total DDT Toxicity	Being addressed with USEPA approved TMDL

I. Pollutants of Concern

Urban storm water run-off in both the dry and rainy season contains pollutants that can be carried through the storm drain networks to lakes, streams and beaches. The anticipated pollutants of concern for this Project are as follows:

Bacteria and Viruses. Potential sources of bacteria for the Project include landscaping areas, pet wastes, food wastes and naturally occurring sources.

Nutrients. Potential sources of nutrients in storm water consist of the macro-nutrients nitrogen and phosphorous, which are typically found in fertilizers from landscaping areas, decaying vegetation from preservation/natural areas and trash and debris.

Pesticides. Potential sources of pesticides include common landscaping areas and homeowner-owned landscaping areas.

Sediment/Suspended Solids. Potential sources of sediment and suspended solids include landscaping areas.

Trash & Debris. Potential sources include misplacement or overfill of food wastes, wrappers, and other trash materials.

Metals. Potential sources include vehicles and vehicular fluids.

Oil and Grease. Potential sources of oil and grease include automotive vehicles and fluids and maintenance equipment.

Toxic Organic Compounds. Potential sources include pesticides, solvents and hydrocarbons.

II. BEST MANAGEMENT PRACTICES (BMP's)

BMPs are natural or constructed devices, procedures, rules or methods, which when implemented and followed, should reduce and/or eliminate the specific source of pollution of which the BMP is targeted.

A. Site Design Principles

The intention of site design principles is to reduce runoff peak flows and volumes resulting from land development. As required by the MS4 Permit and the County of Los Angeles Low Impact Development Manual, the following site design principles must be considered for use on all projects:

Site Planning – Project proponents must implement a holistic approach to site design in order to develop a more hydraulically-functional site, help maximize the effectiveness of on-site retention and integrate storm water management throughout the project site.

Based on the project's geotechnical report, focused infiltration of runoff is feasible. The project will employ the use of a subsurface infiltration BMP (perforated corrugated metal pipe) to retain the project's required Storm Water Quality Design Volume (SWQDv) from the project's Drainage Management Areas (DMA). Additionally, the project's open space landscaping areas will also provide some retention of runoff via absorption from vegetation and underlying soils.

Protect and Restore Natural Areas – Conservation of natural areas, soils and vegetation helps to retain numerous functions of pre-development hydrology, including rainfall interception, infiltration, and evapotranspiration. Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Sensitive areas, such as streams and their buffers, floodplains, wetlands, steep slopes, and highly-permeable soils, should be protected and/or restored. Slopes can be a major source of sediment and should be properly protected and stabilized. Locating development in less sensitive areas of a project site and conserving naturally vegetated areas can minimize environmental impacts from storm water runoff.

The pre-project site does not contain any natural areas to preserve. Where feasible, existing landscaping areas consisting of tall trees and open grasses will be preserved. Project proposes the use of drought tolerant landscaping within common landscape areas.

Minimize Land Disturbance – The purpose of this site design principle is to protect water quality by preserving the natural hydrologic function of the project site to the maximum extent practicable. By designing a project site layout to preserve natural hydrology and drainage ways at the project site, it reduces the need for grading and disturbance of native vegetation and soils. Siting buildings and impervious surfaces away from steep slopes, drainage ways, and floodplains limits the amount of grading and clearing necessary and reduces the hydrologic impact. This site design principle is most applicable in Greenfield settings, but opportunities to implement this principle may exist in redevelopment projects.

The project site consists of an existing sports park and a partially demolished elementary school site with no natural hydrologic functions. Therefore, this site design principle has not been incorporated into project design.

Minimize Impervious Area – The potential for discharge of pollutants in storm water runoff from a project site increases as the percentage of impervious area within the project site increases because impervious areas increase the volume and rate of storm water runoff. Pollutants deposited on impervious areas are easily mobilized and transported by storm water runoff. Minimizing impervious area through site design is an important method to reducing the pollutant load in storm water runoff.

The Project proposes to minimize impervious area via the use of multi-level units, minimum-width roadway and sidewalk sections wherever feasible and large open space areas within the park site.

B. Source Control Measures

Source control measures are designed to prevent pollutants from contacting storm water runoff or preventing discharge of contaminated storm water runoff to the storm drain system and/or receiving water.

This section describes structural-type, source control measures that must be considered for implementation, in conjunction with appropriate non-structural source control measures, such as good housekeeping and employee training, to optimize pollution prevention.

Structural Controls

Storm Drain Message and Signage (S-1) – Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the storm water conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins within the project area must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.
- Signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the project area.
- Legibility of stencils and signs must be maintained.

All onsite catch basin will be stenciled with the language, "NO DUMPING – DRAINS TO OCEAN" or equivalent phrase. The stencils shall be maintained by the HOA.

Outdoor Material Storage Areas (S-2) – None proposed.

Outdoor Trash Storage/Waste Handling Areas (S-3) – No designated trash enclosures proposed for the residential or park site. All trash will be stored within private areas of each residential home and moved curbside on a weekly basis for disposal by the contracting local waste hauler.

Outdoor Loading/Unloading Dock Area (S-4) – None proposed.

Outdoor Vehicle/Equipment Repair/Maintenance Area (S-5) – None proposed.

Outdoor Vehicle/Equipment/Accessory Wash Area (S-6) – None proposed.

Fuel and Maintenance Area (S-7) – None proposed.

Landscape Irrigation Practices (S-8) – Irrigation runoff provides a pathway for pollutants (i.e., nutrients, bacteria, organics, sediment) to enter the storm drain system. By controlling irrigation, runoff and the potential for pollutant transport is minimized.

Landscape and irrigation areas shall meet the following requirements:

- Minimize use of fertilizer, pesticides, and herbicides.
- Plan sites with sufficient landscaped area and dispersal capacity.
- Consult a landscape professional regarding appropriate plants, fertilizer, mulching applications and irrigation requirements to ensure healthy flora.
- Choose plants that minimize need for fertilizer and pesticides.
- Use native and/or drought tolerant plant species. Group plantings with similar water requirements.
- Employ use of mulch.
- Install rain sensors and pressure sensors to shut off irrigation system during, after rain storms and pressure drops/leaks.
- Implement integrated Pest Management Practices.

Building Materials Selection (S-9) – Building materials can potentially contribute pollutants of concern to storm water runoff through leaching. The use of alternative building materials can reduce pollutants in storm water by eliminating compounds that can leach into storm water runoff. This BMP shall be considered during any work conducted onsite by the property owner.

Alternative materials include the following:

- Replace use of pressure treated wood with cement-fiber or vinyl.
- Minimize the use of copper and galvanized metals on buildings and fencing.

Animal Care and Handling Facilities (S-10) – None proposed.

Outdoor Horticulture Areas (S-11) – None proposed.

Non-Structural Controls

Education of Property Owners, Tenants and Occupants – Educational materials will be provided to homeowners at close of escrow by the owner and periodically thereafter by the HOA to inform them of their potential impacts to downstream water quality. Materials include those described in Attachment F of this report.

Activity Restrictions – Activity restrictions to minimize potential impacts to water quality and with the purpose of protecting water quality will be prescribed by the project's Covenant, Conditions and Restrictions (CC&Rs).

Common Area Landscape Management – Maintenance activities for landscape areas shall be consistent with City and manufacturer guidelines for fertilizer and pesticide. Maintenance includes trimming, weeding and debris removal and vegetation planting and replacement. Stockpiled materials during maintenance activities shall be placed away from drain inlets and runoff conveyance devices. Wastes shall be properly disposed of or recycled. Application of materials shall be limited to the minimum required amounts and restricted within 48 hours prior to rain events.

Common Area Litter Control – Litter control onsite will include the use of HOA, violation reporting and clean up during landscaping maintenance activities and as needed to ensure good housekeeping of the project's common areas.

Street Sweeping Public Streets – The project's public streets shall be swept on a bi-weekly schedule, per the City's sweeping schedule.

C. Storm Water Quality Design Volume (SWQDv)

The design storm, from which the SWQDv is calculated, is defined as the greater of:

- The 0.75-inch, 24-hour rain event; or
- The 85th percentile, 24-hour rain event as determined from the Los Angeles County 85th percentile precipitation isoheytal map.

The SWQDv values for the project were determined using the HydroCalc Program.

Drainage Management Area (DMA)	Acres	% Imp.	C_D	D_{85} (in)	Q_{BMP} (cfs)	SWQDv (cu-ft)
DMA 1	9.6	0.55	0.54	0.8	0.82	14,930.5

D. Storm Water Quality Control Measures

Storm water quality control measures function to augment site design principles and source control measures to reduce storm water runoff volume and potential pollutant loads in runoff to the maximum extent practicable.

Selection of the project's treatment BMPs was based on MS4 Permit requirements, which requires that all designated projects retain the SWQDv on-site using retention based measures, unless retention based measures are determined to be infeasible. Consideration was also given to site constraints, effectiveness in addressing the project's anticipated pollutants of concern; as well as compliance with receiving water impairments and discharge limitations.

Per the project's Geotechnical Engineering Investigation (LGC, 2020) and the preliminary infiltration testing results within the project area, infiltration is assumed to be feasible. Therefore, the project proposes the use of a subsurface detention facility and a dry well system to meet the project's LID BMP requirements.

The corresponding sizing summary of the proposed infiltration BMP is provided in the following table. Supporting calculations are provided in Attachment C of this report.

DMA	Area (AC)	T_C (min)	K_{DESIGN} (cfs)[1]	Maximum Drawdown (hrs)	Detention BMP	Infiltration BMP[2]
DMA 1	9.6	53.0	0.020 cfs per drywell	96	60" CMP X 765'	Dry Well(s) 5' X 40' (Qty 3)

[1] Based on design infiltration rate of 1.35 in/hr, each 5' drywell diameter at 40' of infiltration depth can process 0.020 cfs.
*[2] 14,930.5 ft³/ (0.020 cfs * 60 sec/min * 60 min/hr * 3 drywells) = 69.1 hours drawdown.*

Pre-treatment to the infiltration system will be achieved via the use of mechanical BMP devices, such as vortex separators or baffle boxes.

To meet the zero trash discharge requirement, all project catch basins will be equipped with FULL CAPTURE catch basin inserts/inlet screens to remove trash/litter, debris and sediment from runoff entering the project's storm drain system.

E. Hydromodification Requirements

The project is exempt from the hydromodification requirements of the MS4 Permit, as the project discharges through a fully improved storm drain system that discharges to Thompson Creek, San Jose Creek and the San Gabriel River that are not susceptible to hydromodification impacts.

III. Storm Water Quality Control Measure Maintenance

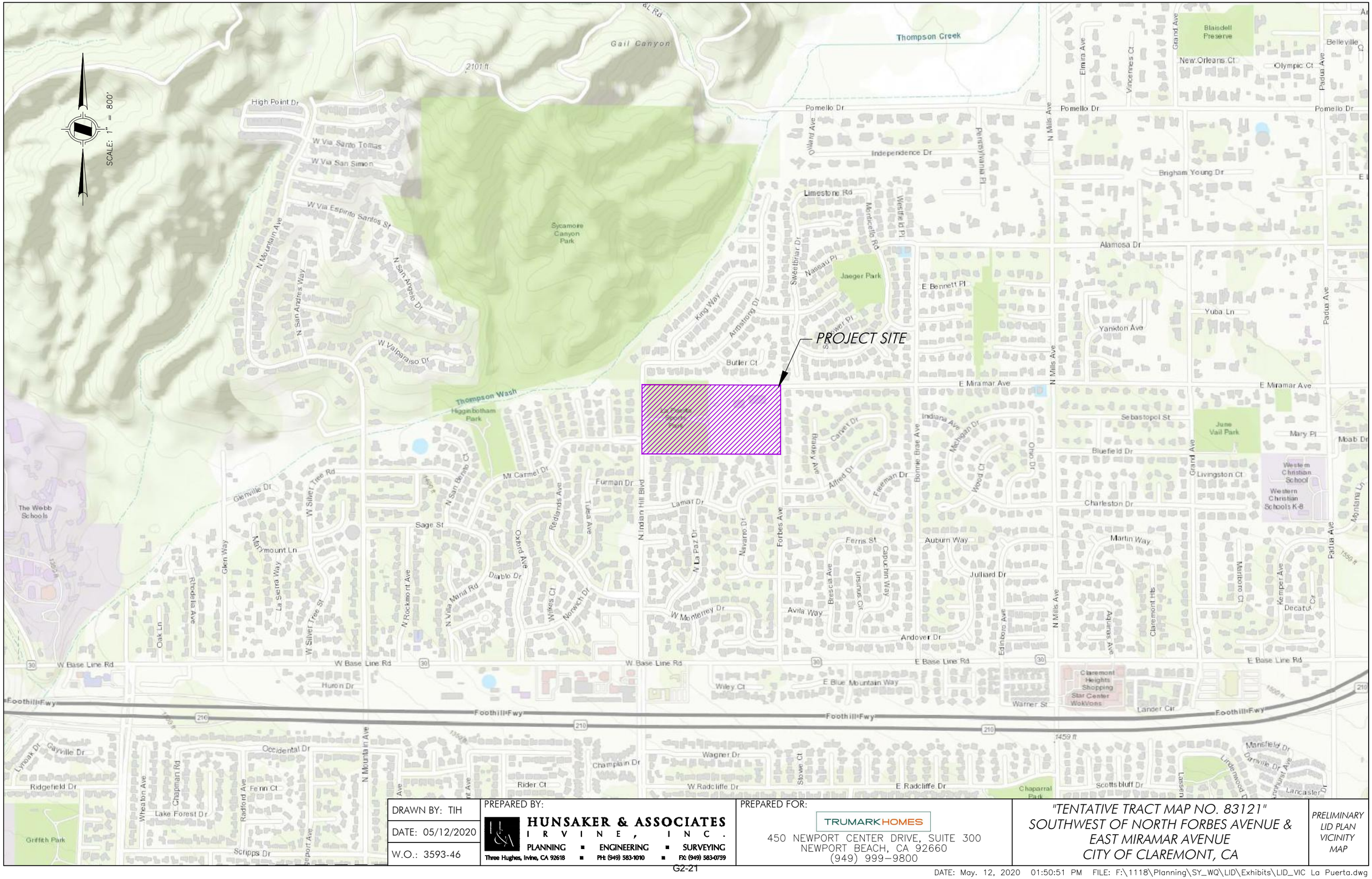
1. Maintenance and inspection activities for the identified BMPs will be performed as indicated on the enclosed BMP Inspection and Maintenance Responsibility/Frequency Matrix in Attachment D.
2. The project owner and proponent, TRUMARK HOMES shall employ self-inspections and record keeping for BMPs, as applicable. The owner shall retain all maintenance records for the lifetime of the Project. The records shall be made readily available for review by all government agencies. Depending on the type of BMP, minimum frequency of inspections may range from weekly, to once a month, quarterly, or yearly.
3. The contact information for the owner is as follows:

Property Owner:	TRUMARK HOMES
Contact:	Joe Martin
Address:	450 Newport Center Drive, Suite 300 Newport Beach, CA 92660
Phone:	(949) 999-9800

   TRUMARK HOMES shall be responsible for the management of the residential portion of the project site and implementation and maintenance of the requirements of this LID Report until such time, the property has not been turned over to the HOA for ownership and maintenance.
4. A copy of the project's on-site BMP maintenance covenant to be recorded at the County of Los Angeles shall be inserted in Attachment F. This maintenance covenant has been devised by the County of Los Angeles to legally assign responsibilities for maintenance of proposed BMP facilities such that they run with the land. In order to comply with item A of the LID Report (provide proof of ongoing BMP maintenance), responsibilities have been listed as an encumbrance on the property (per the maintenance covenant), and shall be signed by the owners, and shall be recorded in the Los Angeles County Recorder's Office.
5. Should a transfer of ownership occur, appropriate notification shall be filed with the County of Los Angeles confirming the change in responsibility and continued implementation of stormwater management requirements.

ATTACHMENTS

ATTACHMENT A VICINITY MAP



DRAWN BY: TIH DATE: 05/12/2020 W.O.: 3593-46	PREPARED BY: HUNSAKER & ASSOCIATES IRVINE, INC. PLANNING ▪ ENGINEERING ▪ SURVEYING Three Hughes, Irvine, CA 92618 ▪ PH: (949) 583-1010 ▪ FX: (949) 583-0759	PREPARED FOR: TRUMARK HOMES 450 NEWPORT CENTER DRIVE, SUITE 300 NEWPORT BEACH, CA 92660 (949) 999-9800	*"TENTATIVE TRACT MAP NO. 83121"* *SOUTHWEST OF NORTH FORBES AVENUE &* *EAST MIRAMAR AVENUE* *CITY OF CLAREMONT, CA*	*PRELIMINARY LID PLAN VICINITY MAP*

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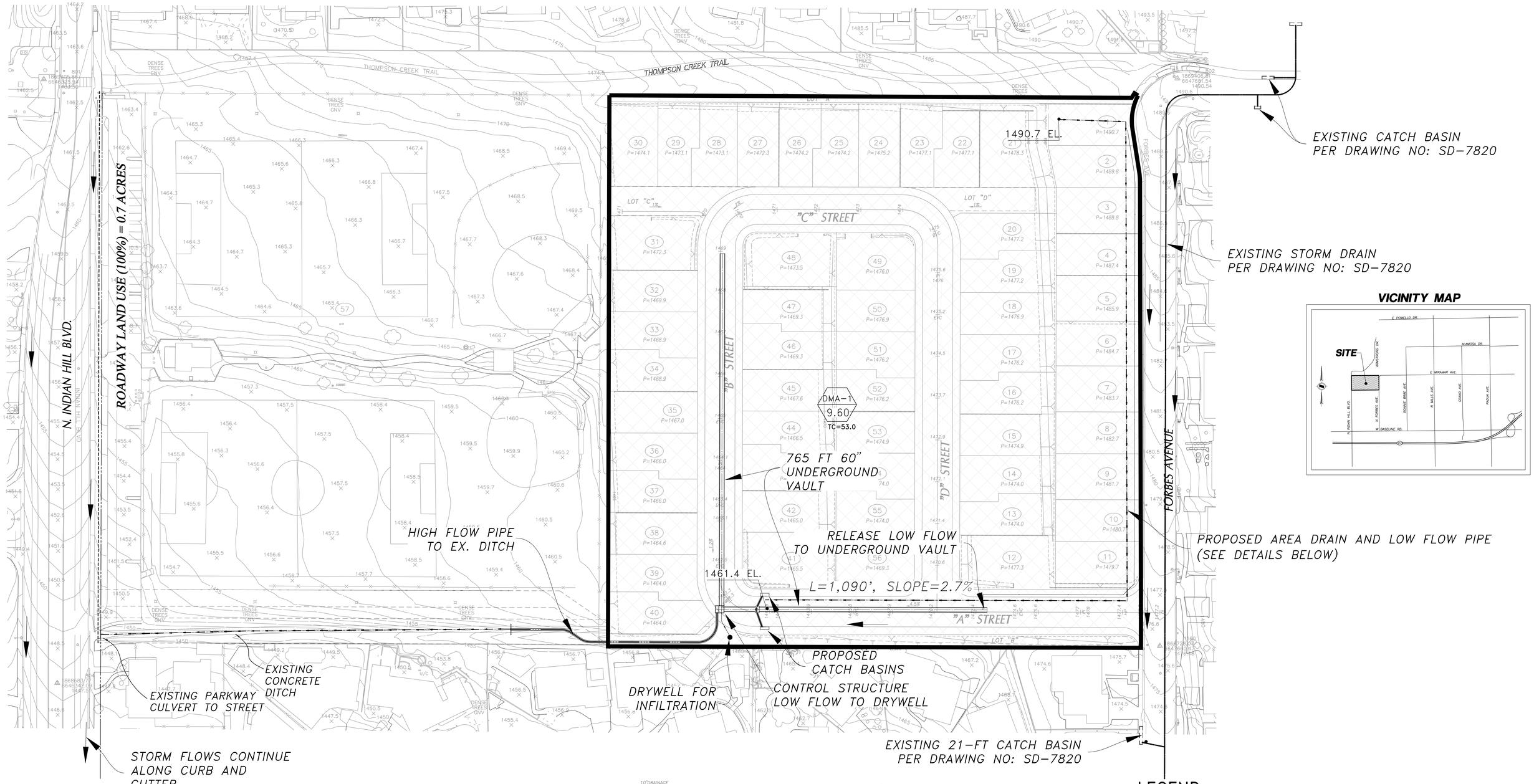
ATTACHMENT B SITE PLAN



VICINITY MAP

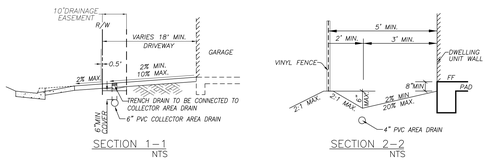
HYDROLOGIC INFORMATION

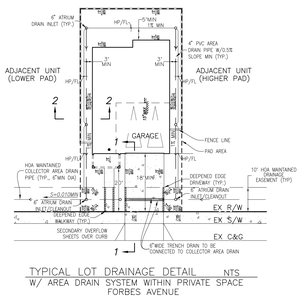
7	DPA ZONE
007	SOIL GROUP
7.7"	50-YEAR 24-HOUR ISOHYET
1	BURN FACTOR
1	BULKING FACTOR
53	TIME OF CONCENTRATION (TC) IN MINUTE
0.8"	85TH PERCENTILE STORM
PROJECT DESIGN STORM	85TH PERCENTILE STORM
55%	THE AREA WEIGHTED AVERAGE IMPERVIOUS PERCENTAGE

SCALE: 1"=40'

0 20 40 80 120 160

SCALE: 1" = 40'





TYPICAL LOT DRAINAGE DETAIL NTS
W/ AREA DRAIN SYSTEM WITHIN PRIVATE SPACE
FORBES AVENUE

LOT 1 TO LOT 12

LEGEND

- DRAINAGE BOUNDARY
- 1A / 1.0 — AREA DESIGNATION FOR AREA "A" AREA ACREAGE (IN ACRES)
- FLOW LINE
- PROPOSED STORM DRAIN
- RESIDENTIAL LAND USE (AREA=10.80 ACRES, 55% IMPERVIOUSNESS)

WATER QUALITY RATES PER DMA AREA

DMA	AREA (ACRES)	WQ FLOW VOLUME (CU FT)	WQ FLOW RATE (CFS)	BMP SIZES	BMP CAPACITY (CU FT)
1	9.60	14,930	0.82	765-FT LONG 60" DIAMETER UNDERGROUND PIPE TO CONTAIN THE VOLUME AND DRYWELL TO INFILTRATE	15,020

PREPARED FOR:
TRUMARK HOMES
450 NEWPORT CENTER DRIVE
SUITE 300
NEWPORT BEACH, CA 92660
TEL. (949) 999-9820

PREPARED BY:
HUNSAKER & ASSOCIATES IRVINE, INC.
PLANNING • ENGINEERING • SURVEYING
Three Hughes • Irvine, CA 92618 • PH (949) 583-1010 • FX (949) 583-0759

EXHIBIT 3
WATER QUALITY DMA MAP FOR
TTM 83121 - LA PUERTA - CLAREMONT
2475 FORBES AVENUE, CLAREMONT, CA 91711

W.O. 3916-48K LA PUERTA - CLAREMONT - WQ MAP
PLOTTED BY: Gary Guan DATE: Sep. 07, 2021 02:32:07 PM FILE: F:\1118\Engineering\SY_Hydrology\WQ Map.dwg

ATTACHMENT C BMP CALCULATIONS AND DETAILS

BMP Calculations

Peak Flow Hydrologic Analysis

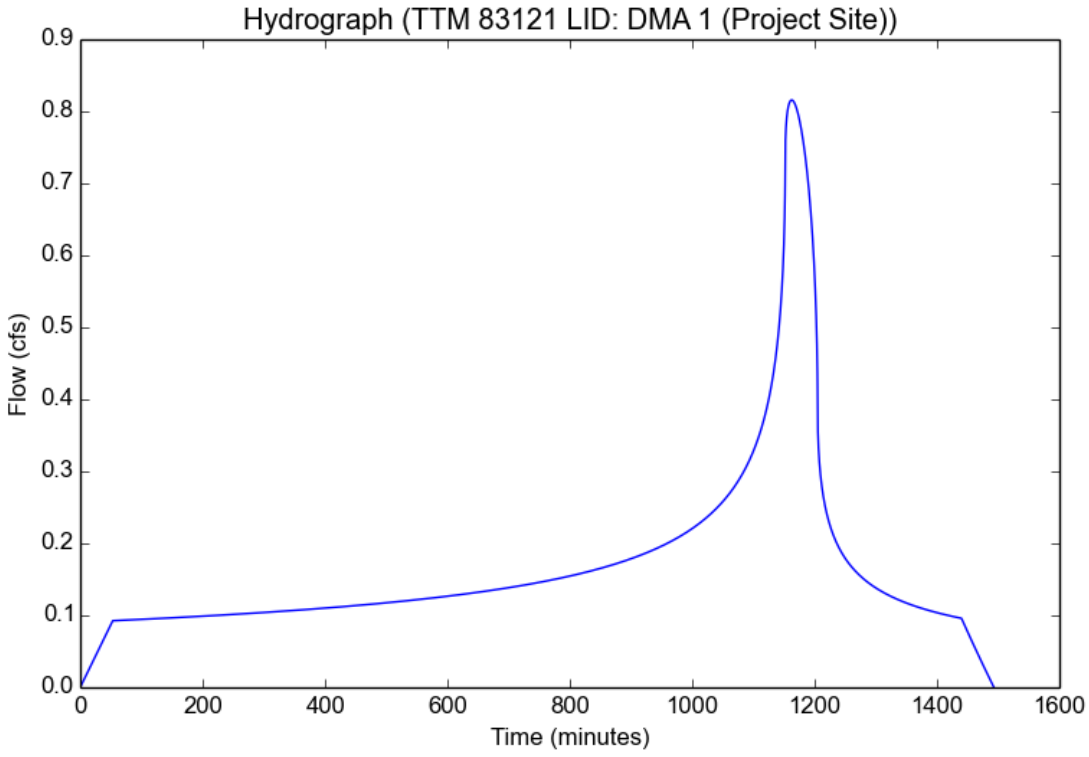
File location: C:/SD/La Puerta - Claremont/Revision/TTM 83121 LID - DMA 1 (Project Site).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	TTM 83121 LID
Subarea ID	DMA 1 (Project Site)
Area (ac)	9.6
Flow Path Length (ft)	1090.0
Flow Path Slope (vft/hft)	0.027
85th Percentile Rainfall Depth (in)	0.8
Percent Impervious	0.55
Soil Type	7
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.8
Peak Intensity (in/hr)	0.1574
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.54
Time of Concentration (min)	53.0
Clear Peak Flow Rate (cfs)	0.8158
Burned Peak Flow Rate (cfs)	0.8158
24-Hr Clear Runoff Volume (ac-ft)	0.3428
24-Hr Clear Runoff Volume (cu-ft)	14930.4632



BMP Details

The watermark for drainage solutions.®

TORRENT RESOURCES

INDUSTRY SERVICES

Site Drainage Systems
- Stormwater Drywells
- French Drains
- Piping
- Drainage Appurtenances
- Pump Systems

Technical Analysis
- Design Review
- Percolation Testing
- Geologic Database
- ADEQ Drywell Registration

Recharge Systems
- Municipal/Private Recharge Wells
- Injection Wells & Galleries

Environmental Applications
- Pattern Drilling/Soil Remediation
- Drainage Rehabilitation
- Drywell Abandonments
- OSHA HAZMAT-Certified

Drainage Renovation
- Problem Assessment
- Site Redesign/Modification
- System Retrofit

Drainage Maintenance
- Preventive Maintenance
- Service Contracts
- Drywell Cleaning

TORRENT RESOURCES INCORPORATED

1509 East Elwood Street
Phoenix Arizona 85040~1391

phone 602~268~0785
fax 602~268~0820

Nevada
702~366~1234

AZ Lic. ROC070465 A,
ROC047067 B-4; ADWR 363

CA Lic. 528080 A, C-42, HAZ

NV Lic. 0035350 A

NM Lic. 90504 GF04

TORRENT RESOURCES (CA) INCORPORATED

phone 661~947~9836

CA Lic. 886759 A, C-42

www.TorrentResources.com

An evolution of McGuckin Drilling

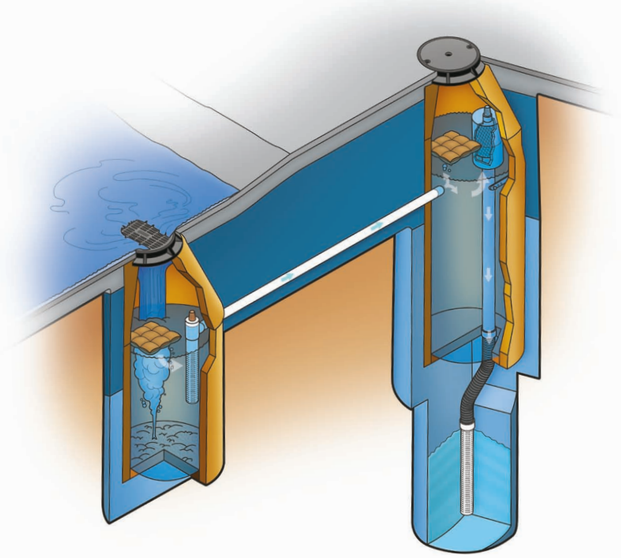
1/12

MaxWell® Plus DRAINAGE SYSTEM

Product Information and Design Features

TORRENT RESOURCES

The ***MaxWell® Plus,*** as manufactured and installed exclusively by Torrent Resources Incorporated, is the industry standard for draining large paved surfaces, nuisance water and other demanding applications. This patented system incorporates state-of-the-art pre-treatment technology.



THE ULTIMATE IN DESIGN

Since 1974, nearly 65,000 MaxWell® Systems have proven their value as a cost-effective solution in a wide variety of drainage applications. They are accepted by state and municipal agencies and are a standard detail in numerous drainage manuals. Many municipalities have recognized the inherent benefits of the MaxWell Plus and now require it for drainage of all paved surfaces.

SUPERIOR PRE-TREATMENT

Industry research, together with Torrent Resources' own experience, have shown that initial storm drainage flows have the greatest impact on system performance. This "first flush" occurs during the first few minutes of runoff, and carries the majority of sediment and debris. Larger paved surfaces or connecting pipes from catch basins, underground storage, etc. can also generate high peak flows which may strain system function. In addition, nuisance water flows require controlled processing separate from normal storm runoff demands.

Manufactured and Installed Exclusively by Torrent Resources Incorporated
Please see reverse side for additional information
U.S. Patent No. 4,923,330

In the ***MaxWell® Plus,*** preliminary treatment is provided through collection and separation in deep large-volume settling chambers. The standard MaxWell Plus System has over 2,500 gallons of capacity to contain sediment and debris carried by incoming water. Floating trash, paper, pavement oil, etc. are effectively stopped by the **PureFlo®** Debris Shields in each chamber. These shielding devices are equipped with an effective screen to filter suspended material and are vented to prevent siphoning of floating surface debris as the system drains.

EFFECTIVE PROCESSING

Incoming water from the surface grated inlets or connecting pipes is received in the Primary Settling Chamber where silt and other heavy particles settle to the bottom. A PureFlo Debris Shield ensures containment by trapping floating debris and pavement oil. The pre-treated flow is then regulated to a design rate of up to 0.25cfs and directed to a Secondary Settling Chamber. The settling and containment process is repeated, thereby effectively achieving controlled, uniform treatment. The system is drained as water rises under the PureFlo Debris Shield and spills into the top of the overflow pipe. The drainage assembly returns the cleaned water into the surrounding soil through the **FloFast®** Drainage Screen.

ABSORBENT TECHNOLOGY

Both MaxWell Plus settling chambers are equipped with absorbent sponges to provide prompt removal of pavement oils. These floating pillow-like devices are 100% water repellent and literally wick petrochemical compounds from the water. Each sponge has a capacity of up to 128 ounces to accommodate effective, long-term treatment. The absorbent is completely inert and will safely remove runoff constituents down to rainbow sheens that are typically no more than one molecule thick.

SECURITY FEATURES

MaxWell Plus Systems include bolted, theft-deterrent, cast iron gratings and covers as standard security features. Special inset castings which are resistant to loosening from accidental impact are available for use in landscaped applications. Machined mating surfaces and "Storm Water Only" wording are standard.

THE MAXWELL FIVE-YEAR WARRANTY

Innovative engineering, quality materials and exacting construction are standard with every MaxWell System designed, manufactured and installed by Torrent Resources Incorporated. The MaxWell Drainage Systems Warranty is the best in the industry and guarantees against failures due to workmanship or materials for a period of five years from date of completion.

MAXWELL® PLUS DRAINAGE SYSTEM DETAIL AND SPECIFICATIONS

CALCULATING MAXWELL PLUS REQUIREMENTS:

The type of property, soil permeability, rainfall intensity and local drainage ordinances determine the number and design of MaxWell Systems. For general applications draining retained stormwater, use one standard ***MaxWell® Plus*** per the instructions below for up to 5 acres of landscaped contributory area, and up to 2 acres of paved surface. To drain nuisance water flows in storm runoff systems, add a remote inlet to the system. For smaller drainage needs, refer to our ***MaxWell® IV.*** For industrial drainage, our ***Envibro® System*** may be recommended. For additional considerations, please refer to **"Design Suggestions For Retention And Drainage Systems"** or consult our Design Staff.

COMPLETING THE MAXWELL PLUS DRAWING

To apply the MaxWell Plus drawing to your specific project, simply fill in the blue boxes per the following instructions. For assistance, please consult our Design Staff.

' PRIMARY SETTLING CHAMBER DEPTH

The overall depth of the Primary Settling Chamber is determined by the amount of surface area being drained. Use a standard depth of **15 feet** for the initial acre of contributory drainage area, **plus 2 feet** for each additional acre, up to the design limits of the property type noted in "Calculating MaxWell Plus Requirements" noted above. Other conditions that would require increased chamber depths are property usage, maintenance scheduling, and severe or unusual service conditions. Connecting pipe depth may dictate deeper chambers so as to maintain the effectiveness of the settling process. Maximum chamber depth is 25 feet. A pump and lift station is recommended for systems with deeper requirements.

' ESTIMATED TOTAL DEPTH

The Estimated Total Depth is the approximate total system depth required to achieve 10 continuous feet of penetration into permeable soils, based upon known soil information. Torrent utilizes specialized **"crowd"** equipped rigs to get through the difficult cemented soil and to reach clean drainage soils at depths up to **180 feet.** An extensive drilling log database is available to use as a reference.

' SETTLING CHAMBER DEPTH

On MaxWell Plus Systems of over 30 feet overall depth and up to 0.25cfs design rate, the standard Settling Chamber Depth is **18 feet.** Maximum chamber depth is 25 feet.

' OVERFLOW HEIGHT

The Overflow Height and Secondary Settling Chamber Depth determine the effectiveness of the settling process. The higher the overflow pipe, the deeper the chamber, the greater the settling capacity. An overflow height of **13 feet** is used with the standard settling chamber depth of **18 feet.**

"Ø DRAINAGE PIPE

This dimension also applies to the **PureFlo®** Debris Shields, the **FloFast®** Drainage Screen, and fittings. The size is based upon system design rates, multiple primary settling chambers, soil conditions, and need for adequate venting. Choices are 6", 8", or 12" diameter. Refer to our company's **"Design Suggestions for Retention and Drainage Systems"** for recommendations on which size best matches your application.

"Ø BOLTED RING & GRATE/COVER

Standard models are quality cast iron and available to fit 24" Ø or 30" Ø manhole openings. All units are bolted in two locations with wording "Storm Water Only" in raised letters. For other surface treatments, please refer to "Design Suggestions for Retention and Drainage Systems."

' INLET PIPE INVERT

Pipes up to 12" in diameter from catch basins, underground storage, etc. may be connected into the primary settling chamber. Larger pipe diameters dictate the use of manhole material for the primary setting chamber with 48" grates on the cone.Inverts deeper than 5 feet will require additional depth in both system settling chambers to maintain respective effective settling capacities.

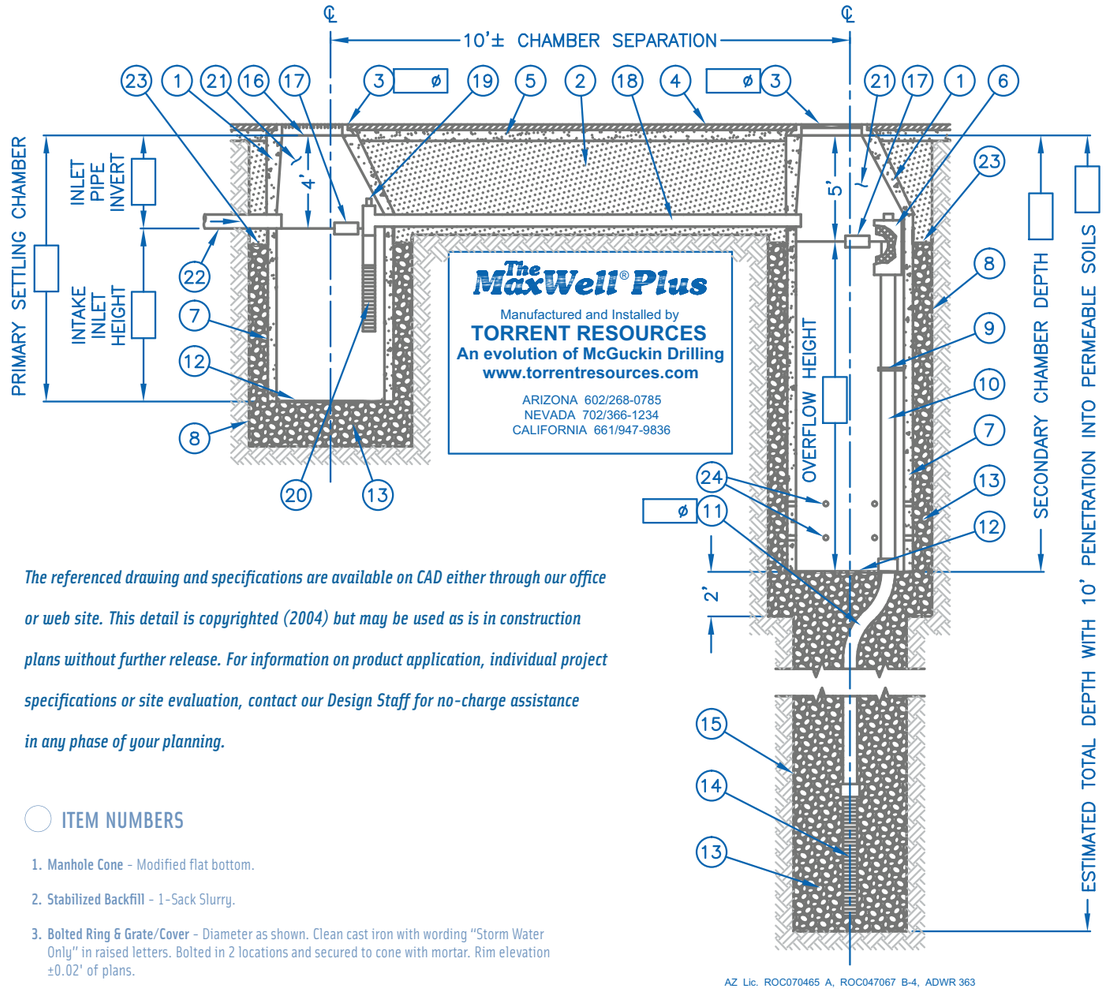
' INTAKE INLET HEIGHT

The Intake Inlet Height determines the effectiveness of the settling process in the Primary Settling Chamber. A minimum inlet height of **11 feet** is used with the standard primary settling chamber depth of 15 feet. Greater inlet heights would be required with increased system demands as noted in Primary Settling Chamber Depth. Freeboard Depth Varies with inlet pipe elevation. Increase primary/secondary settling chamber depths as needed to maintain all inlet pipe elevations above connector pipe overflow.

' CHAMBER SEPARATION

The standard separation between chambers is **10 feet** from center to center. Soil conditions and deeper inverts may dictate required variations in chamber separation.

The MaxWell® Plus Drainage System Detail And Specifications



The referenced drawing and specifications are available on CAD either through our office or web site. This detail is copyrighted (2004) but may be used as is in construction plans without further release. For information on product application, individual project specifications or site evaluation, contact our Design Staff for no-charge assistance in any phase of your planning.

AZ Lic. ROC070465 A, ROC047067 B-4, ADWR 363
CA Lic. 528080, C-42, HAZ.
NV Lic. 0035350 A - NM Lic. 90504 GF04

ITEM NUMBERS

1. **Manhole Cone** - Modified flat bottom.
2. **Stabilized Backfill** - 1-Sack Slurry.
3. **Bolted Ring & Grate/Cover** - Diameter as shown. Clean cast iron with wording "Storm Water Only" in raised letters. Bolted in 2 locations and secured to cone with mortar. Rim elevation ±0.02' of plans.
4. **Graded Basin or Paving** (by Others).
5. **Compacted Base Material** (by Others).
6. **PureFlo® Debris Shield** - Rolled 16 Ga. steel X 24" length with vented anti-siphon and internal .265" Max. SWO flattened expanded steel screen X 12" length. **Fusion bonded epoxy coated.**
7. **Pre-cast Liner** - 4000 PSI concrete 48" ID. X 54" OD. **Center in hole** and align sections to **maximize bearing surface.**
8. **Min. 6' Ø Drilled Shaft.**
9. **Support Bracket** - Formed 12 Ga. steel. **Fusion bonded epoxy coated.**
10. **Overflow Pipe** - Sch. 40 PVC mated to drainage pipe at base seal.
11. **Drainage Pipe** - ADS highway grade with TRI-A coupler. **Suspend pipe** during backfill operations to prevent buckling or breakage. Diameter as noted.
12. **Base Seal** - Geotextile or concrete slurry.
13. **Rock** - Washed, sized between 3/8" and 1-1/2" to **best complement soil conditions.**
14. **FloFast® Drainage Screen** - Sch. 40 PVC 0.120" slotted well screen with 32 slots per row/ft. Diameter varies 120" overall length with TRI-B coupler.
15. **Min. 4' Ø Shaft** - Drilled to **maintain permeability** of drainage soils.
16. **Fabric Seal** - U.V. Resistant Geotextile - **To be removed by customer** at project completion.
17. **Absorbent** – Hydrophobic Petrochemical Sponge. Min 128 oz. capacity.
18. **Connector Pipe** – 4" Ø Sch. 40 PVC.
19. **Anti-Siphon Vent** with flow regulator.
20. **Intake Screen** – Sch. 40 PVC 0.120" modified slotted well screen with 32 slots per row/ft. 48" overall length with TRI-C end cap.
21. **Freeboard Depth Varies** with inlet pipe elevation. Increase primary/secondary settling chamber depths as needed to maintain all inlet pipe elevations above connector pipe overflow.
22. **Optional Inlet Pipe** (by Others).
23. **Moisture Membrane** – 6 mil. Plastic. Place securely against eccentric cone and hole sidewall. Used in lieu of slurry in landscaped areas.
24. **Eight** – (8) **perforations per foot,** 2 row minimum.

CONTECH®
ENGINEERED SOLUTIONS

Corrugated Metal Pipe Solutions

CONTECH®
PIPE SOLUTIONS

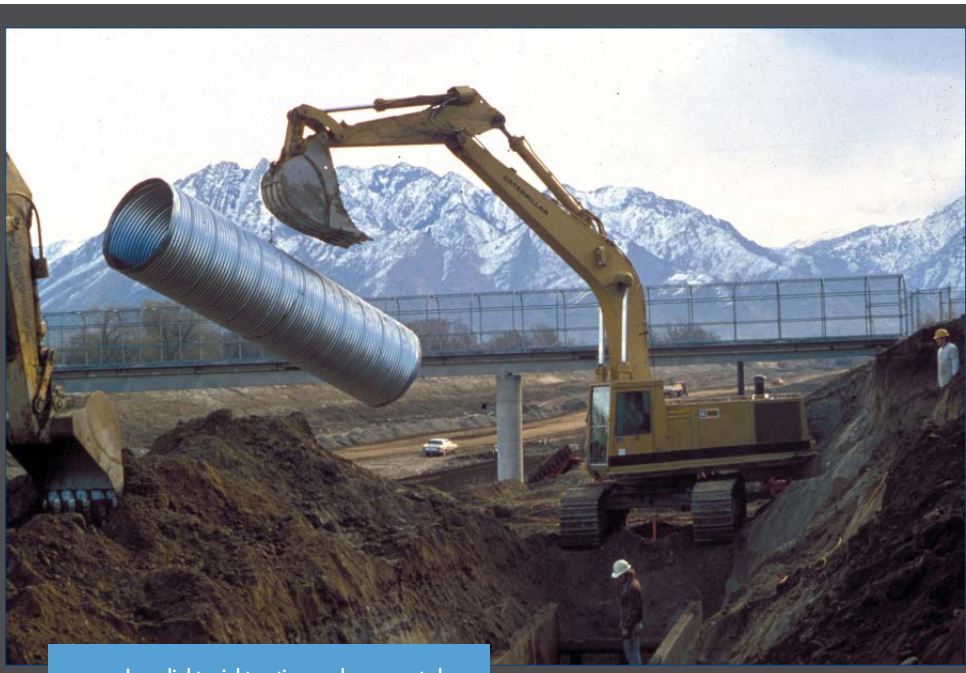
Contech® Corrugated Metal Pipe

Solutions for severe-to-normal conditions

Coast-to-coast, engineers and contractors rely on Contech Corrugated Metal Pipe for culverts, storm sewers, small bridges, stormwater detention systems, conduits and windmill foundations. No other type of drainage structure offers the range of structural strength that's available with Corrugated Metal Pipe—it performs where rigid pipe fails.

Contech Engineered Solutions LLC manufactures to repeatable and exacting standards HEL-COR® and ULTRA FLO® pipe—which has a 0.012 Manning's "n"—in galvanized, Aluminized Steel Type 2, polymer-coated and aluminum.

Numerous industry standards for pipe configurations, coatings and linings have been conceived and developed by Contech. That is how we have earned the reputation as the world leader in pipe design and innovation.



Long lightweight sections make corrugated steel pipe easy to install.

Corrugated Steel Pipe . . . The Core of Strength

Corrugated steel pipe is similar to the superstructure of a building in that it supports the interior walls and gives structure to the facade. Steel is the proven, strong-shouldered material that is coated with zinc, Aluminized Steel Type 2, tough polymer or asphalt to increase durability for prolonged design life. Corrugated steel pipe is the strength at the core of all coatings and linings.

Contech's Corrugated Steel Pipe provides the power and tenacity to your culverts, storm sewers and stormwater detention systems to withstand severe environmental conditions and burial depths. We offer coatings and linings to increase the life of installations up to 100 years as well as provide products with a Manning's "n" equivalent to other smooth wall drainage products.

Two primary shapes
Full-round pipe is recommended for most applications. However, for limited headroom conditions, Contech produces a pipe-arch shape. The low, wide pipe-arch design distributes the area horizontally to provide adequate capacity without raising the grade.

Corrugations and wall thicknesses
Both Contech Pipe and Pipe-Arch are produced in a variety of gages, which are available with either helical or annular corrugations. Contech HEL-COR® Pipe (helical corrugations) is furnished with continuous locked seams, and with rerolled annular ends. Contech riveted pipe is furnished with annular corrugations only.

Corrugations include $1\text{-}^{1}/_{2}$" x $^{1}/_{4}$" and $2\text{-}^{2}/_{3}$" x $^{1}/_{2}$" for economical and efficient metal use in small diameters;
3" x 1" and 5" x 1" offer high sectional properties in large-diameter pipe.

The wide variety of corrugations and thicknesses permits selection of materials for a balanced design to meet specific jobsite conditions. Each project can be designed individually for the most cost-effective combination of corrugations, thicknesses, sizes, materials and installations, maximizing your investment on a job-by-job basis. For guidance, call your local Contech sales representative.

HEL-COR® Corrugated Steel Pipe

Helically corrugated HEL-COR steel pipe, available in round and pipe-arch shapes, has over 65 years of proven performance. It is manufactured with continuous locked seams with annular corrugated ends to use with soil-tight HUGGER® Bands.

Typical applications are culverts, stormwater detention systems, small bridges, conduits and storm sewers. A wide variety of wall thicknesses (gages), corrugations, diameters and pipe section lengths permit a choice of materials to meet specific job site requirements.

Durability requirements are addressed by a wide choice of materials: galvanized steel, aluminized steel type 2 (ALT2) and polymer-coated steel. For increased hydraulic efficiency, HEL-COR Smooth Cor™ has a steel lining.

Standard fittings include tees, wyes, elbows, saddle branches, reducers and manifolds for detention systems. Manholes and catch basins are fabricated to meet specific job requirements.

As a construction shaft liner, HEL-COR Pipe, with or without ring beam stiffeners, can be supplied in up to 171 inch diameters.

Over 60 years of proven performance

Reference Specifications		
Material	Galvanized Steel	AASHTO M218 ASTM A 929
	Aluminized Steel Type 2 (ALT2)	AASHTO M274 ASTM A 929
	Polymer-Coated Steel	AASHTO M246 ASTM A 742 ASTM A 849
	Aluminum Alloy	AASHTO M197 ASTM B 744
Pipe	Steel (Galvanized and ALT2 HEL-COR and ULTRA FLO)	AASHTO M36 ASTM A 760
	Steel (Polymer-Coated HEL-COR, ULTRA FLO, and Smooth Cor)	AASHTO M36 AASHTO M245 ASTM A 762
	Aluminum (Corlix, ULTRA FLO)	AASHTO M196 ASTM B 745
Coating/Lining	Asphalt	AASHTO M190 ASTM A 849
Design	Steel (HEL-COR, ULTRA FLO, Smooth Cor)	AASHTO Section 12* ASTM A 796
	Aluminum (Corlix, ULTRA FLO)	AASHTO Section 12* ASTM A 790
Installation	Steel (HEL-COR, ULTRA FLO, Smooth Cor)	AASHTO Section 26* ASTM A 798
	Aluminum (Corlix, ULTRA FLO)	AASHTO Section 26* ASTM A 788

*AASHTO LRFD Bridge Design Specification and AASHTO Standard Specification for highway bridges.

CORLIX® Aluminum Pipe

Long Service Life … Economical

Contech's CORLIX Aluminum Pipe provides a predictable service life of more than 75 years when installed in the recommended soil/water environment. It is ideal for municipal storm sewers, underground stormwater detention systems or any standard drainage project that must withstand corrosive environments.

Economical

Lower initial cost begins with CORLIX pipe's weight. It weighs only 1/35 as much as reinforced concrete. Lighter weight means easier installation. Trench width and depths are reduced due to the smaller outside diameters, resulting in time and cost savings for both excavation and backfill.

Single lengths up to 40 feet ensure more accurate pipe alignment at time of placement and through the life of the system. Longer lengths save installation time with fewer joints. Even more footage per truckload is possible with bundles of nested pipe—and unloading time is minimal.

A CORLIX underground detention system with prefabricated stubs eliminates the need for forming concrete junction boxes.

CORLIX Aluminum Pipe can be installed in salt water environments.

Predictable service life of more than 75 years

ULTRA FLO®

smooth interior corrugated storm sewer pipe

Manning's "n" of 0.012 … Equal to Concrete Pipe

ULTRA FLO has over 25 years of proven performance on municipal, transportation, residential development, shopping center and airport storm sewer and stormwater detention projects. ULTRA FLO's rapid acceptance is based on its Manning's "n" of 0.012, structural strength and faster/lower-cost installation than concrete. Plus, ULTRA FLO is available in galvanized steel, Aluminized Steel Type 2, polymer-coated and aluminum to meet a wide variety of environmental and service life requirements. For projects with limited headroom, ULTRA FLO is available in pipe-arch.

Superior Hydraulics

Research at Utah State University shows that ULTRA FLO Storm Sewer Pipe Systems are hydraulically equivalent to reinforced concrete pipe. The Water Research Laboratory performed hydraulic tests on ULTRA FLO spiral-rib pipe with $^{3}/_{4}$" x $^{3}/_{4}$" x 7 $^{1}/_{2}$" continuous ribs. At full flow, the Manning's "n" was 0.012 (Report No. 1277 and 1278, *2002*). For further reference, see FHWA Hydraulic Design Series No. 5, *December 1996*.

ULTRA FLO is one of the most hydraulically efficient storm sewer systems available because of its smooth interior surface and longer lengths, resulting in fewer joints and hydraulically efficient prefabricated junctions: elbows, manholes and catch basins.

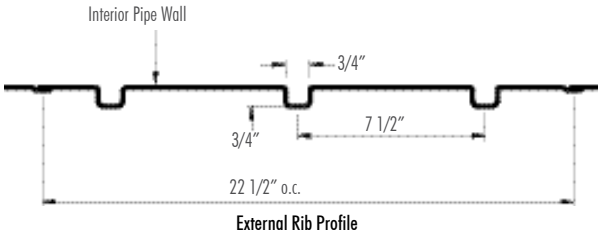
Installed Cost Savings

Millions of feet of ULTRA FLO have been installed in thousands of storm sewer projects nationwide, providing significant cost savings. Because steel ULTRA FLO weighs less than 10% of concrete pipe, handling and installation costs are greatly reduced. Aluminum ULTRA FLO has only $^{1}/_{35}$ the weight of concrete pipe. Lower labor costs also result from fast and easy joining. Contech QUICK STAB® joints or coupling bands do not require special skills or tools. Twenty-foot standard lengths mean fewer joints and faster laying. And, longer lengths are available on special order. ULTRA FLO's smaller outside diameter permits a reduction in trench widths and depths, providing time and cost savings for both excavation and backfilling operations.

Shop-fabricated fittings save installation time in the field while providing hydraulically efficient junctions.

Reduced excavation—because of ULTRA FLO's smaller outside diameter—lowers cost.

ULTRA FLO's smooth interior provides superior hydraulic capacity while the exterior box ribs provide structural strength.



External Rib Profile

Smooth Cor™

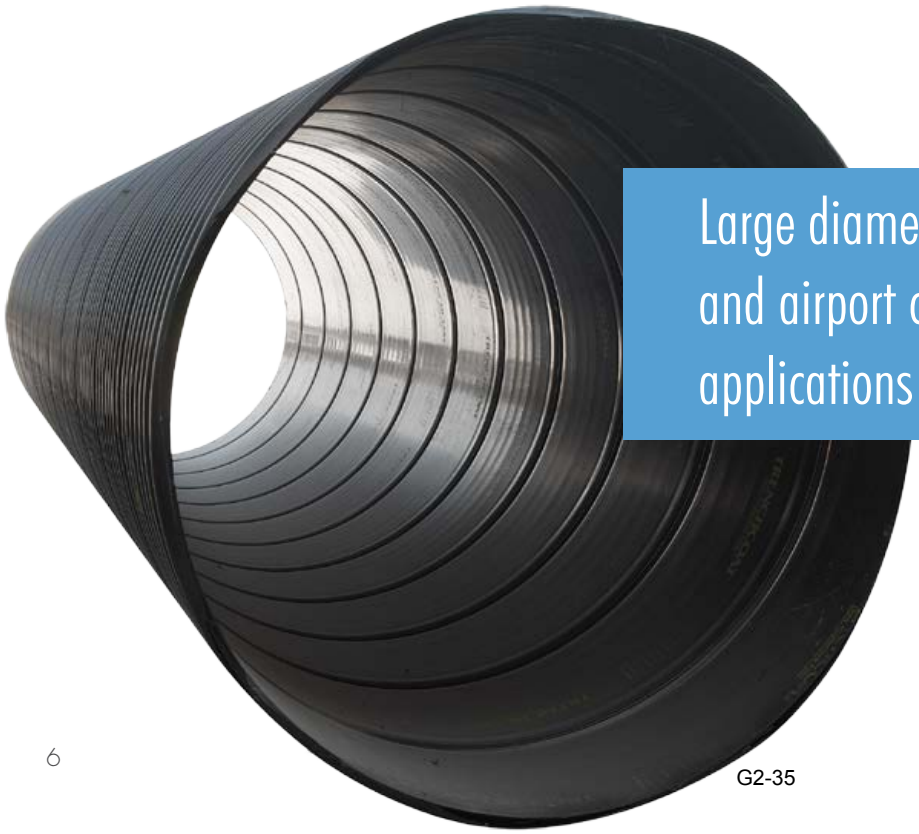
Steel-lined corrugated steel pipe Manning's "n" = 0.012

Smooth Cor double wall pipe consists of a standard corrugated steel pipe as its structural exterior shell and a hydraulically smooth steel liner, which provides an excellent alternative to reinforced concrete pipe in weak soils and steep slopes. The liner is continuously attached to the exterior shell along the lock seam. Both the interior liner and exterior shell are coated on both sides with polymer coating. Smooth Cor is also available in pipe-arch shape. Smooth Cor is covered by AASHTO M36, Type IA, Pipe Arch is Type IIA.

Excellent hydraulics

Smooth Cor, with its smooth interior surface, is hydraulically superior to conventional corrugated steel pipe and with fewer joints and tough polymer coating, outperforms reinforced concrete pipe.

Smooth Cor, with its long lengths, light weight, and beam strength, is superior to concrete pipe in many difficult situations such as weak soils, poor subsurface drainage conditions, steep slopes and high fills. It should be specified as an alternative under normal site conditions and specified exclusively under very difficult situations that demand the strength of CSP with positive joints and a hydraulically efficient smooth liner.



Large diameter storm sewers, DOT projects and airport construction are ideal applications for Smooth Cor.

G2-35

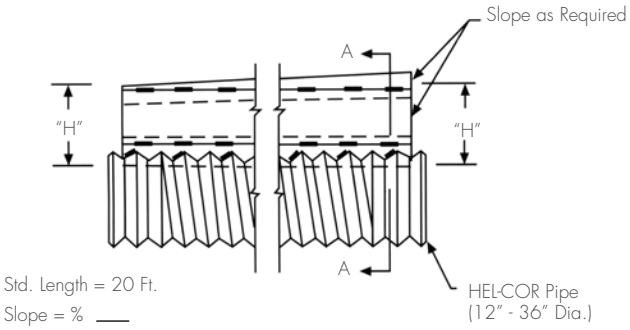
Slotted Drain™
intercepts 50% more runoff

Contech Slotted Drain is a practical, continuous opening inlet for the efficient removal of surface water on streets and highways. The grate on a standard 20-foot length of Slotted Drain will intercept up to 50% more runoff than most standard 2′ x 2′ grate inlets. In parking lots, Slotted Drain removes sheet flow without complex multiple grades or water channeling devices like asphalt dikes, berms and curbs.

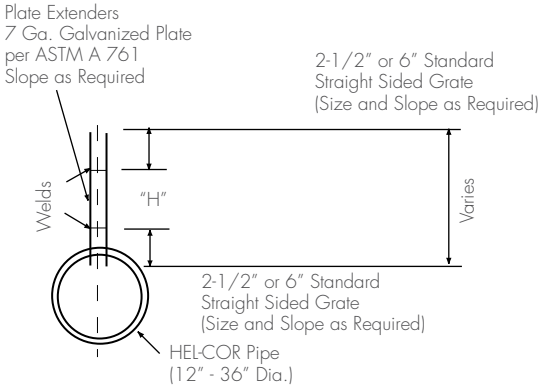
Slotted Drain is fabricated from corrugated steel pipe cut along a longitudinal axis with a trapezoidal or straight-sided grate. Reinforcing spacer plates are welded in place to form a 1 1/2″-inch-wide slot opening. The slot collects runoff and channels it to the pipe below.

Variable height grates (straight-sided) can be supplied for installation on flat grades. Generally, the grade built into variable-height grates is a maximum of 1%.

See Variable Height Grate Drawing 1008732



Side View



Section A-A

Slotted Drain Applications

- Curb inlets
- Airport aprons, taxiways, hangars and de-icing areas
- Railroad intermodal facilities with heavy wheel loads
- Shoulder and median barrier drains
- Inlet system across driveways
- Pedestrian thoroughfares, malls and bicycle paths
- Parking lots and other continuous paved surfaces

Trapezoidal design of the grate prevents clogging and debris build-up.

Pipe Coating Alternatives

Galvanized Steel Pipe

Pre-galvanizing is the most widely used and most economical metallic coating for corrugated steel pipe. Pre-galvanizing protects and extends service life. In addition to forming a physical barrier against corrosion, the zinc coating sacrifices itself slowly by galvanic action to protect the base steel. This action continues as long as any zinc remains. The design life of galvanized pipe—installed in a corrosive environment—can be extended by coating the pipe with asphalt.

Aluminized Type 2 (ALT2) Steel Pipe

Corrugated pipe is fabricated from steel that has been hot-dipped in commercially pure aluminum. Over 50 years of field-testing confirms that ALT2 corrugated steel pipe offers 75 years or more of maintenance free service life in the environmental ranges of pH 5-9 with resistivities as low as 1,500 ohm-cm.

Excellent Barrier Protection

Aluminum forms a passive aluminum oxide reaction product film that adds to the service life by providing good barrier protection. This passive film forms rapidly and maintains better protection over a wider environmental range than zinc reaction product films. The aluminum oxide passive film is effective in both hard and soft water.

The passive oxide film will endure as long as the free aluminum coating layer lasts. When this layer is eventually penetrated, there is an underlying hard, thick alumimum-iron alloy layer that provides further corrosion protection plus some significant abrasion protection.

In the environmental range of pH 5-9 and resistivities as low as 1,500 ohm-cm, 43-year old field installations have shown that the multiple layer coating protection of Aluminized Steel Type 2 provides a service life 3 to 10 times longer than plain galvanized steel.

In some cases, the pH/ resistivity ranges may be extended somewhat as is the case in arid regions where moisture availability is generally a controlling factor, and satisfactory service life may be realized at soil resistivities somewhat below the 1,500 ohm-cm lower limit. In wetter climates, satisfactory service life may be realized as soil pH values below the 5.0 lower limit when resistivities are relatively high.

Polymer-Coated Steel Pipe offers 100-Year protection against abrasion and corrosion

Contech's Corrugated Steel Pipe (CSP) with heavy-gage polymer coating offers long-term protection for storm drains and culverts. Even under harsh conditions, Polmer coating protects against abrasion and corrosion to provide at least 100 years of service life.

This tough film, bonded to both the inside and outside of Contech's galvanized CSP, serves as a protective barrier—resisting corrosion from acids, salts and alkalis found in today's storm sewers and culverts.

The film has been subjected to chemical resistance tests such as ASTM A 543 and A 742. These tests and others, including exposure to detergent, 10% sodium hydroxide (pH 14), 10% sodium chloride, 10% hydrochloric acid (pH less than 0.1) and 10% ammonium hydroxide dramatically demonstrate the corrosion resistance of the polymer film.

NCSPA Research

The National Corrugated Steel Pipe Association (NCSPA) has conducted field studies of corrugated steel pipe with heavy-gage protective film—under various environmental conditions — at numerous sites throughout the United States.

From this research, NCSPA predicts the following service life expectancies:

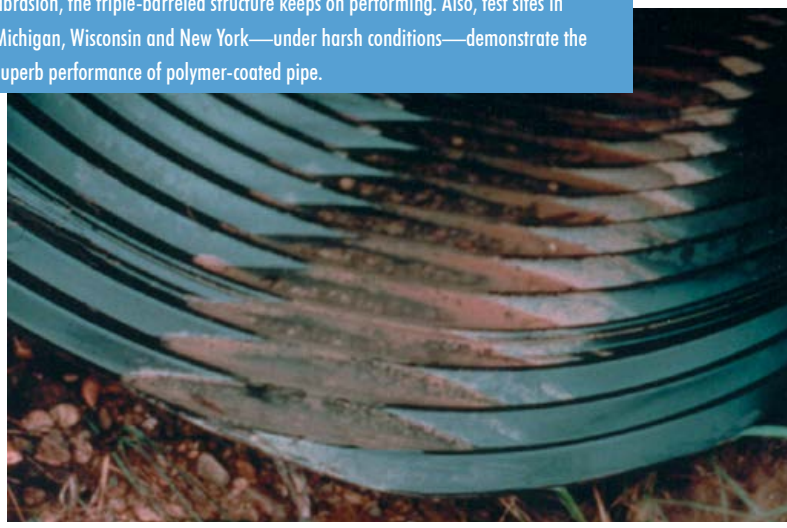
Service Life	pH Levels	Min. Resistivity
100 Years	5-9	1,500 ohm.cm
75 Years	4-9	750 ohm.cm
50 Years	3-12	250 ohm.cm

Polymer coating is available on corrugated steel pipe and pipe-arch as well as hydraulically superior products—such as Smooth Cor and ULTRA FLO. Your local Contech sales representative can provide details on availability.

A polymer-coated corrugated steel pipe system also provides excellent performance in methane gas recovery applications in landfills. The CSP is structurally capable of handling the heavy and settling loads in a landfill and the polymer coating provides added corrosion resistance to the pipe.

If you have a project with corrosive soil conditions such as bluish-gray or green clays or other tough environmental conditions, CSP coated with polymer protective coating may be the solution to your drainage problems.

Installed in 1975 by the Arkansas State Highway Department as a test installation, this 66"-diameter polymer-coated corrugated steel pipe remains in excellent condition. After more than 40 years of exposure to pH 5.5, sediment and moderate abrasion, the triple-barreled structure keeps on performing. Also, test sites in Michigan, Wisconsin and New York—under harsh conditions—demonstrate the superb performance of polymer-coated pipe.



Aluminum Durability

Superior abrasion resistance

CORLIX® aluminum pipe's superior abrasion resistance has been proven through years of exposure to wet/dry abrasion-corrosion cycles. In normally abrasive runoffs, aluminum will only peen with minimum metal loss.

Superior corrosion resistance

CORLIX's superior corrosion resistance is achieved by a special aluminum clad culvert material. The rugged core alloy 3004-(H32 or H34) is rated as highly corrosion resistant. Then to increase its resistance, the aluminum culvert coil is clad on both sides with alloy 7072, which is anodic to the core alloy—protecting it both physically and electrochemically against corrosion. This is primarily due to a thin, tenacious, inert oxide barrier that forms on the metal surface when exposed to air. This tough, tightly adhering oxide barrier cannot be easily removed. If damaged or affected by an aggressive environment, it reforms.

This is referred to as a "self-healing" effect. The oxide barrier appears on the pipe surface as a grayish-white coating that will build up over time.

Service-life expectancy studies on installed aluminum drainage products have been conducted since the early 1960s by state and federal agencies. 16 gage (0.060") corrugated aluminum pipe provides a predictable service life of 75+ years in the recommended soil/water environments with a pH range of 4.0 to 9.0 and a resistivity of 500 ohm-cm or greater.

In addition, good performance can be expected in seawater environments of 35 ohm-cm when the pipe is backfilled with a clean, free draining granular material.

With proper backfilling and cover, CORLIX is an excellent choice for drainage pipe.

For multiple barrel applications, Contech manufactures multi-outlet end sections.

End Sections

Contech End Sections provide an economical, attractive, hydraulically efficient and durable inlet and outlet on culverts and storm sewers. End sections provide protection against erosion and scouring. They improve hydraulic capacity by channeling flow into and out of the pipe efficiently. They are also reusable if lengthening or relocating the drainage structure is necessary.

Galvanized End Sections present a clean-cut effect that is aesthetically pleasing. The tapered sides blend with the contour of the slope to increase roadside aesthetics. Compared with concrete headwalls, end sections are safer and easier to maintain. Weeds are cut easily with regular highway mowers. The wide opening minimizes collection of debris and silting.

End sections provide protection against erosion and scouring.

Joints and Fittings

Contech Lock-Seam HEL-COR Pipe and Pipe-Arch feature universal ends, so a variety of standard couplings may be used.

Hugger® Joint

Contech offers the HUGGER Joint, which uses an annular corrugation to fully engage each annular pipe end for 360°. When used with optional rubber O-ring gaskets, the HUGGER Joint is the industry's tightest.

QUICK STAB® Joint

Saves Time and Money With Faster Pipe Coupling

The Contech QUICK STAB joint speeds installation, reducing your costs— installing storm sewers and culverts has never been easier or faster.

The QUICK STAB joint is a bell and spigot joining system with the bell only 1-1/2" larger than the pipe. It is attached to the pipe at the factory, then shipped to the job site ready for installation.

Bell and spigot joints speed installation and provide the same soil tightness as HUGGER bands.

Contech HUGGER® Joint is the industry's tightest

Contech QUICK STAB save time and money over conventional banding systems.

Fittings

Standard fittings such as tees, wyes, elbows, saddle branches, manifolds and reducers are available for Contech Pipe and Pipe-Arches. Special fittings, including manholes and catch basins, can be fabricated to meet your needs.

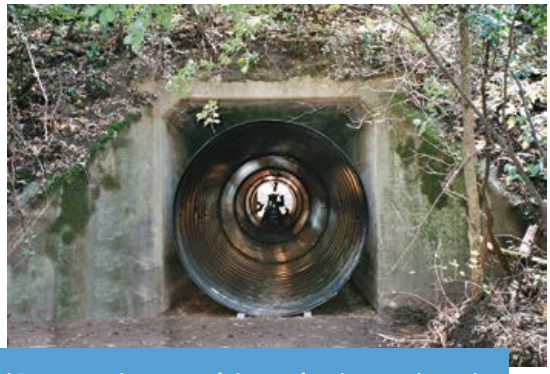
Contech is a leader in Underground Detention Systems. Pre-fabricated fittings can be designed and constructed to efficiently meet project requirements.

Relining & Rehabilitation

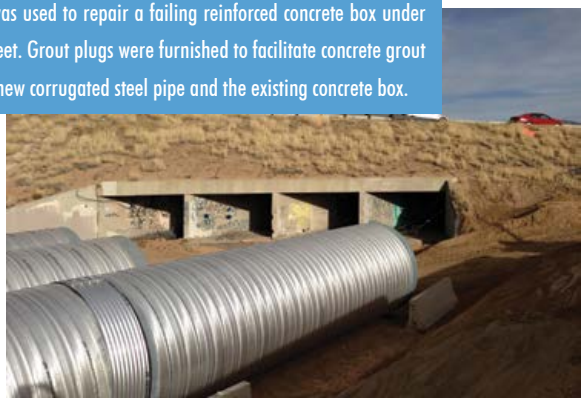
As our infrastructure ages, the roadway, water management and sewer control systems are deteriorating and losing integrity. Maintaining these critical structures is a major challenge.

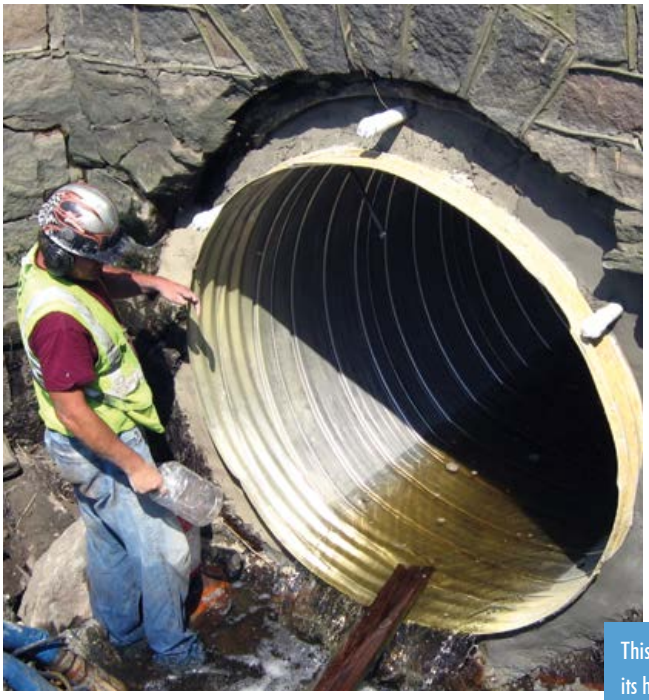
However, it is often possible to salvage failing structures and eliminate the time, cost and safety problems of complete replacement.

Restoring structural and/or hydraulic capacity without road closure is usually achieved with less time, expense and disruption than the replacement alternative. Contech offers a variety of products and systems to facilitate rehabilitation of storm and sanitary sewers, culverts and bridges.



Corrugated Steel Pipe was used to repair a failing reinforced concrete box under a height of cover of 91 feet. Grout plugs were furnished to facilitate concrete grout placement between the new corrugated steel pipe and the existing concrete box.





This aging drainage structure was relined with steel ULTRA FLO pipe, restoring its hydraulic and structural properties while avoiding costly and time-consuming replacement.

Contech offers a variety of products and systems to facilitate rehabilitation.

MOBILE PIPE®

MOBILE PIPE® modular mill can be delivered to remote site locations on trucks and assembled on-site for fast and cost-effective on-site steel pipe manufacturing. The MOBILE PIPE modular mill is designed to be a self-supporting factory that can be quickly deployed and put into production. Re-corrugated ends are also available to meet specific project needs. Once on-site, pipe manufacturing progresses quickly enough to allow pipe installation within four hours.

MOBILE PIPE can produce HEL-COR®, ULTRA FLO® and Smooth Cor™ corrugated metal pipe in a variety of sizes. Diameters from 3 to 16 feet and lengths up to 35 feet can be accommodated. This pipe meets the same levels of quality construction as does all Contech manufactured pipe, with high coil feedrate speeds and the same lock-seam edge process used in conventional pipe manufacturing. The intermodal capapbilities allow these systems to moved via truck, train or ship.

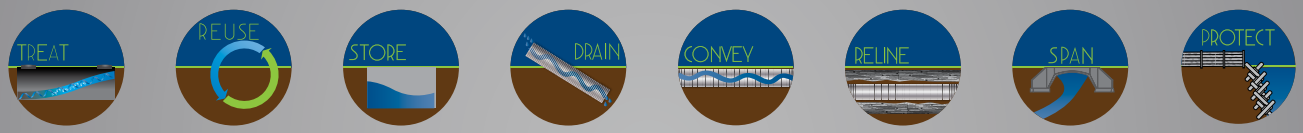
Air Power/Windmill — Contech large-diameter CMP – manufactured with the MOBILE PIPE® – is used as a deep foundation form at the base of the windmill. CMP is placed vertically to act as a form for the poured-in-place concrete foundation along with being used in the many access roads.

MOBILE PIPE® is ideal for:

- Remote Jobs
- Projects requiring large continuous pipe production (detention systems, windmill foundation forms, vertical shafts, caissons)
- Support for natural disasters where immediate deployment and rebuilding is required
- Sites with limited storage space or restricted traffic patterns (mines, military bases, airports, etc.)

CONTECH®
ENGINEERED SOLUTIONS

COMPLETE SITE SOLUTIONS



STORMWATER SOLUTIONS

Helping to satisfy stormwater management requirements on land development projects

- Stormwater Treatment
- Detention/Infiltration
- Rainwater Harvesting
- Biofiltration/Bioretention

PIPE SOLUTIONS

Meeting project needs for durability, hydraulics, corrosion resistance, and stiffness

- Corrugated Metal Pipe (CMP)
- Steel Reinforced Polyethylene (SRPE)
- High Density Polyethylene (HDPE)
- Polyvinyl Chloride (PVC)

STRUCTURES SOLUTIONS

Providing innovative options and support for crossings, culverts, and bridges

- Plate, Precast & Truss bridges
- Hard Armor
- Retaining Walls
- Tunnel Liner Plate

Site Development Solutions

From normal to severe conditions, Contech provides a full-range of corrugated metal pipe for culverts, storm sewers, small bridges, stormwater detention systems and conduits.

For more information, go to www.conteches.com/cmp

or call 800-338-1122.

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ATTACHMENT D OPERATION & MAINTENANCE PLAN

O&M Plan Structural BMP Inspection and Maintenance Responsibility/Frequency Matrix

BMP Inspection and Maintenance Responsibility/Frequency Matrix			
BMP	RESPONSIBILITY	INSPECTION/MAINTENANCE ACTIVITIES	MINIMUM FREQUENCY
Structural BMPs			
Storm Drain Message and Signage (S-1)	HOA	Storm drain stencils shall be inspected for legibility, at minimum, once prior to the storm season, no later than October 1st each year. Those determined to be illegible will be re-stenciled as soon as possible.	Annually
Landscape Irrigation Practices (S-8)	HOA	In conjunction with routine maintenance activities, verify that landscape design continues to function properly by adjusting properly to eliminate overspray to hardscape areas, and to verify that irrigation timing and cycle lengths are adjusted in accordance with water demands, given time of year, weather, day or night time temperatures based on system specifications and local climate patterns.	Weekly
Building Materials Selection (S-9)	HOA	In conjunction with routine maintenance activities, alternative building materials that pose minimal potential for pollutant leaching should be considered for use in maintenance and replacement projects for homeowners and park facilities	Ongoing
Non-Structural BMPs			
Education of Property Owners, Tenants and Occupants	HOA	Educational materials will be provided to homeowners at close of escrow by the owner and thereafter on an annual basis by the HOA. Materials shall include those provided in Attachment A of this Plan and any updated materials.	Close of escrow and annually.
Activity Restrictions	HOA	The Owner will prescribe activity restrictions to protect surface water quality, through a Covenant, Conditions and Restrictions (CC&Rs) agreement, lease agreements, facility use agreement (for park facility), or other equally effective measure, for the project. Upon takeover of site responsibilities by long term responsible parties, each party shall be responsible for ensuring residents' or park users' compliance and prescribe and implement activity restrictions required of its contractors.	Ongoing

BMP Inspection and Maintenance Responsibility/Frequency Matrix			
BMP	RESPONSIBILITY	INSPECTION/MAINTENANCE ACTIVITIES	MINIMUM FREQUENCY
Common Area Landscape Management	HOA	Maintenance shall be consistent with City requirements, plus fertilizer and/or pesticide usages shall be consistent with County guidelines for use of fertilizers and pesticides. Maintenance includes mowing, weeding, and debris removal on a weekly basis. Trimming, replanting and replacement of mulch shall be performed on an as-needed basis. Trimmings, clippings, and other waste shall be properly disposed of off-site in accordance with local regulations. Materials temporarily stockpiled during maintenance activities shall be placed away from water courses and drain inlets. Application of landscaping materials shall be limited to minimal amounts required and not within 48 hours prior to predicted rain events.	Weekly
Common Area Litter Control	HOA	Litter patrol, violations investigation, reporting and other litter control activities shall be performed in conjunction with maintenance activities. Litter collection and removal shall be performed on a weekly basis.	Ongoing patrols. Weekly (minimum) pick up and removal.
Street Sweeping Private Streets and Parking Lots	HOA	Streets and parking lots shall be swept every other week, consistent with the City's current sweeping schedule	Bi-Weekly
Storm Water Quality Control Measures			
Dry Well (RET-4)	HOA	Inspect for standing water inside Infiltration Well shaft and that water infiltrates into underlying soil completely. Inspect and remove accumulated sediment and debris in upper well shaft chamber when sediment/debris accumulation reaches 1/10th the depth of the overflow height or 12", whichever is less. *Note: In order to protect the Infiltration Wells from sediment laden runoff from undeveloped pads or construction activities upstream, a physical barrier shall be incorporated into the design of the Storm Drain system and shall remain in place until the adjacent and upstream pads are operational.*	After significant after events > 0.8" visual inspections for standing water. Clean inlet chamber semi-annually and as needed.

BMP Inspection and Maintenance Responsibility/Frequency Matrix			
BMP	RESPONSIBILITY	INSPECTION/MAINTENANCE ACTIVITIES	MINIMUM FREQUENCY
Proprietary Treatment Control Measures (T-6) – Vortex Separators, Gross Solids Removal Devices	HOA	Inspect prior to and after traditional rainy season. Inspect for accumulated debris, trash and oil/grease accumulation; remove (vactor truck) accumulated debris when system reaches 75% of capacity and as needed based on site activities (e.g. spills, leaks, etc.).	Semi-annual (Spring and Fall)

ATTACHMENT E BMP INSPECTION MAINTENANCE RECORDS

(FOR FINAL LID PLAN)

ATTACHMENT F EDUCATIONAL MATERIALS

(FOR FINAL LID PLAN)

ATTACHMENT G SOILS REPORT

February 12, 2021 Project No.: 19180-01

Mr. Joe Martin
Trumark Homes
450 Newport Center Drive, Suite 300
Newport Beach, CA 92660

Subject: ***Supplemental Dry Well Infiltration Evaluation for the Proposed La Puerta School Site Residential Development, Tentative Tract Map Number 83121, City of Claremont, Los Angeles County, California***

Introduction

In accordance with your request and authorization, LGC Geotechnical, Inc. has performed a supplemental dry well infiltration evaluation for the planned approximately 10-acre residential development, located at the demolished La Puerta School Site, Tentative Tract Map Number 83121, in the City of Claremont, County of Los Angeles, California. The dry well is proposed in the southwestern corner of the site.

The purpose of our evaluation was to perform field dry well infiltration testing in the approximate area of the proposed dry well system (see Figure 1 – Dry Well Location Map). As part of this report, we have: 1) performed the excavation of one small-diameter dry well boring; 2) performed field dry well infiltration testing within the small-diameter boring; and 3) prepared this report summarizing the results of our infiltration testing.

This response report should be considered as part of the project design documents in conjunction with our previous geotechnical report (LGC Geotechnical, 2020a). In the case of conflict, the recommendations contained herein should supersede those provided in our previous report. The remaining recommendations provided in our previous geotechnical report (LGC Geotechnical, 2020a) remain valid and applicable.

Field Dry Well Infiltration Testing

One small diameter 8-inch diameter hollow-stem auger boring was excavated to a depth of approximately 50 feet below existing grade. The boring was utilized for a dry well infiltration test performed per the County of Los Angeles Geotechnical and Materials Engineering Division (GMED) GS200.2 (2017) guidelines. One 3-inch diameter slotted PVC pipe was placed near the center of the boring to measure water level during the test and deliver water. The dry well anulus was subsequently backfilled with a crushed ¼-inch gravel.

131 Calle Iglesia, Suite 200, San Clemente, CA 92672 (949) 369-6141 www.lgcgeotechnical.com

Water from a nearby fire hydrant was introduced into the solid water delivery pipe until the dry well target infiltration depth was reached. The target dry well infiltration zone was tested from approximately 10 to 50 feet below existing grade, equating to approximately 40 feet of dry well infiltration testing. Once the target dry well water head was achieved, the water delivery flow rate was adjusted to maintain an approximate constant head. The water source was frequently cut off from the dry well to measure the interim falling head in intervals of approximately 5 to 15 minutes to measure the infiltration rate. During testing, the water head in the dry well test hole was measured using a "Levelogger" pore pressure sensor connected to a nearby computer equipped with recording software. The Levelogger was placed near the bottom of the dry well hole, corrected for height above bottom, and measured the water head in the dry well test in 2 second intervals. The water head was recorded throughout the duration of the testing and used to analyze the falling head and constant head testing.

After all testing was complete, the PVC pipe was backfilled with sand and the upper few feet of PVC pipe was cut and removed. Some settlement of the backfill should be expected over time. Native soil cuttings were left onsite and spread out around the dry well test hole.

Based on the County of Los Angeles testing guidelines, the infiltration rate of the dry well test was determined by calculating the fall in head over a time duration. Additionally, the flow rate of the water introduced into the dry well was measured at various times throughout the test. The average infiltration rate over the last three consecutive readings is known as the measured stabilized infiltration rate and is provided in Table 1 below. The flow rate, correlated with the infiltration rate, was calculated and is presented in Table 1 below. Please note that the values provided in Table 1 do not include any reduction factors for the test procedure, site variability and long-term siltation plugging that are required in order to determine the long-term infiltration rate, refer to Table 2 in the following section. The dry well infiltration test was performed using relatively clean water free of particulates, silt, etc. Refer to the attached infiltration dry well test data.

TABLE 1

Summary of Dry Well Infiltration Testing

Dry Well Test Location	Flow Rate* ** (cfs)	Raw Measured Infiltration Rate* (in/hr)
DW-1	0.03	2.7

* Does not include required reduction factors, refer to Table 2 in the following section.

** The Flow Rate (cubic feet per second) is equivalent to the results of the tested 8-inch dry well scaled up to a production dry well of 48 inches in diameter. The published Flow Rate is computed by multiplying Flow Rate by the ratio of the wetted area of the proposed 48-inch diameter Production dry well over the wetted area of the 8-inch diameter Dry Well Percolation Test ($Flow_{48in} = Flow_{8in} * (Aw_{48} / Aw_{8})$).

Subsurface Dry Well Water Infiltration Design

The long-term infiltration rate is determined by dividing the raw measured infiltration rate by a series of reduction factors including; test procedure (RF_t), site variability (RF_v) and long-term siltation plugging and maintenance (RF_s). The reduction factor for long-term siltation plugging and

maintenance (RF_s) is the purview of the infiltration system designer (project Civil Engineer) per the Los Angeles County testing guidelines (2017). The test procedure reduction factor and recommended site variability reduction factor to be applied to the raw measured infiltration rate are provided below in Table 2. The long-term infiltration rate is the raw measured infiltration rate divided by the total reduction factor (RF_t x RF_v x RF_s).

TABLE 2

Reduction Factors Applied to Measured Dry Well Infiltration Rate

Consideration	Reduction Factor
Test procedure, dry well percolation test, RF_t	2
Site variability, number of tests, etc., RF_v	1.5
Long-term siltation plugging and maintenance, RF_s	Per Dry Well Designer
Total Reduction Factor, RF = RF_t x RF_v x RF_s	**TBD**

If required, stormwater may be infiltrated into the subsurface soils via a dry well infiltration system from depths of approximately 10 to 50± feet below existing grade using the values presented in Table 1 and Reduction Factors presented above in Table 2. We do not recommend stormwater be infiltrated into the subsurface soils at depths shallower than approximately 10 feet below existing grade. Please note that caving may occur at depths shallower than the target depth of 50 feet below existing grade during excavation of the dry well. Difficult drilling conditions and presence of oversized cobble should be anticipated by the dry well installation contractor, refer to the reference geotechnical report for subsurface conditions (LGC Geotechnical, 2020a).

The following should be considered for design of any required infiltration system:

- Water discharge from any infiltration/dry well systems should not occur within the zone of influence of foundation footings (column and load bearing wall locations). For preliminary purposes we recommend a minimum setback of 15 feet from the structural improvements.
- An adequate setback distance between any infiltration facility and adjacent property lines should be maintained.
- We recommend the design of any infiltration system include at least one redundancy or overflow system. It may be prudent to provide an overflow system directly connected to the storm drain system in order to prevent failure of the infiltration system, either as a result of lower than anticipated infiltration and/or very high flow volumes.
- The infiltration values provided are based on clean water and this requires the removal of trash, debris, soil particles, etc., and on-going maintenance. Over time, siltation and plugging may reduce the infiltration rate and subsequent effectiveness of the infiltration system. It should be noted that methods to prevent this shall be the responsibility of the infiltration designer and are not the purview of the geotechnical consultant. If adequate measures cannot be incorporated into the design and maintenance of the system, then the infiltration rates may

need to be further reduced. These and other factors should be considered in selecting a design infiltration rate.

- Any designed infiltration system will require routine periodic maintenance.
- Contamination and environmental suitability of the site for infiltration was not evaluated by us and should be evaluated by others (environmental consultant). We only addressed the geotechnical issues associated with stormwater infiltration.

LGC Geotechnical should be provided with details for any planned required infiltration/dry well system early in the design process for geotechnical input.

Closure

Our services were performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable soils engineers and geologists practicing in this or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

Should you have any questions regarding this letter, please do not hesitate to contact our office. We appreciate this opportunity to be of service.

Sincerely,

LGC Geotechnical, Inc.

Ryan Douglas, PE, GE 3147
Project Engineer

RLD/DJB/amm

Attachment: References
Figure 1 – Dry Well Location Map
Dry Well Infiltration Test Results

Distribution: (1) Addressee (via email)

References

California Division of Mines and Geology (CDMG), 2000a, State of California Seismic Hazard Zone Report for the Mt. Baldy 7.5-Minute Quadrangle, Los Angeles County, California, Seismic Hazard Zone Report 2000-005, dated 2000.

_____, 2000b, State of California Seismic Hazard Zones, Mt. Baldy Quadrangle, Official Map, scale: 1:24,000, dated November 17, 2000.

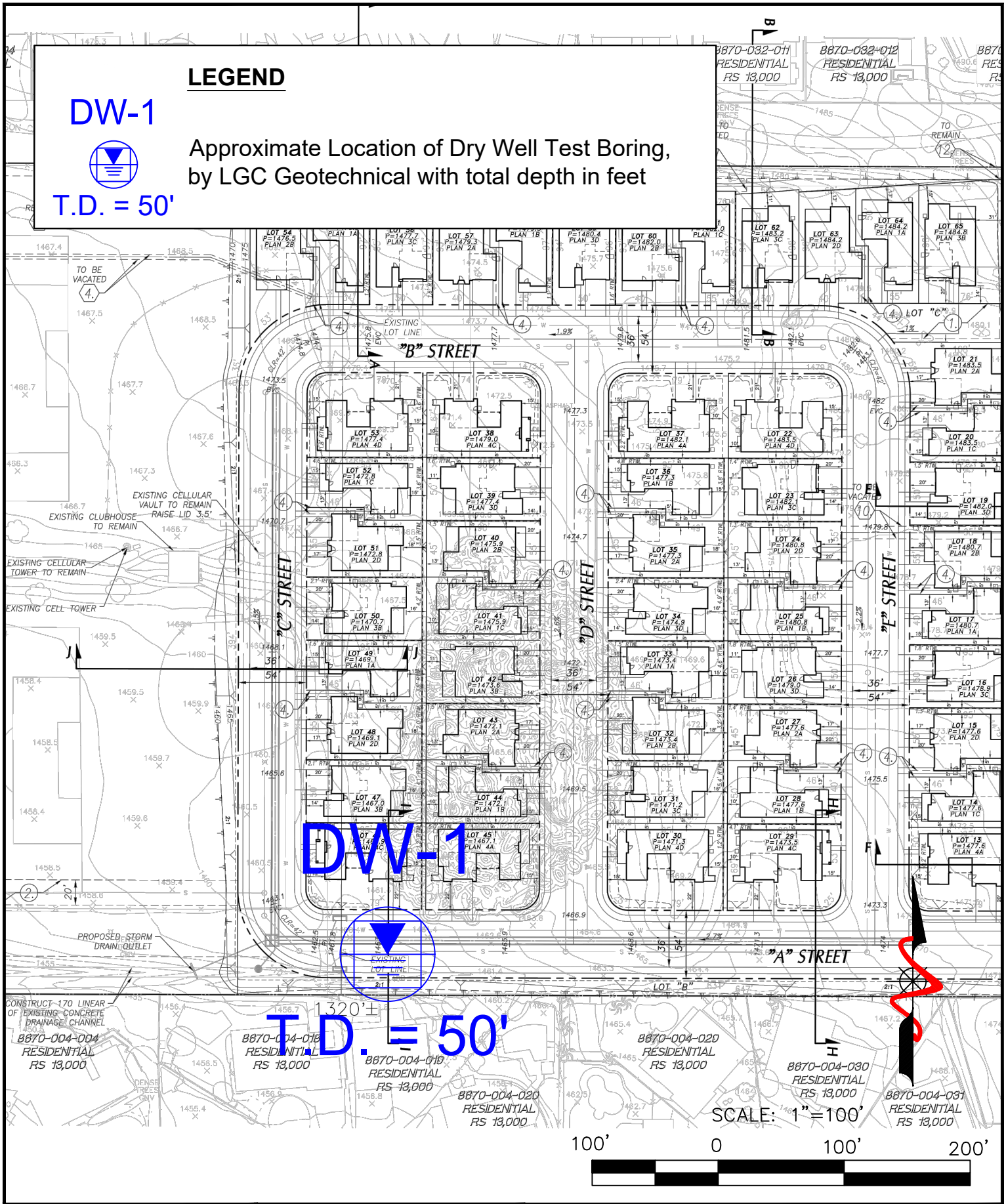
County of Los Angeles, 2017, Guidelines for Geotechnical Investigation and Reporting Low Impact Development Stormwater Infiltration, Department of Public Works Geotechnical and Materials Engineering Division, GS200.2, dated June 30, 2017.

GeoSystems, 2002, Preliminary Soils and Engineering Geologic Investigation for Proposed Grade K-12 Classroom Building Amphitheater and Parking Areas (La Puerta Elementary School), 2475 N. Forbes Avenue, Claremont, California, Project No. GS01-1209, dated February 14, 2002.

Hunsaker and Associates (Hunsaker), 2020, Site Plan, TTM 83121, La Puerta School Site, Claremont, California, dated June 12, 2020.

LGC Geotechnical, Inc., 2020a, Preliminary Geotechnical Evaluation Including Field Infiltration Testing Results for the Proposed La Puerta School Site Residential Development, City of Claremont, Los Angeles County, California, Project No. 19180-01, dated January 31, 2020.

_____, 2020b, Supplemental Infiltration Evaluation for the Proposed La Puerta School Site Residential Development, Tentative Tract Map Number 83121, City of Claremont, Los Angeles County, California, Project No. 19180-01, dated July 9, 2020.



LGC Geotechnical, Inc.

FIGURE 1
Dry Well Location Map G2-58

PROJECT NAME	Trumark - La Puerta
PROJECT NO.	19180-01
ENG. / GEOL.	RLD / KTM
SCALE	1" = 100'
DATE	February 2021

Dry Well Infiltration Test Data Sheet

LGC Geotechnical, Inc

131 Calle Iglesia Suite A, San Clemente, CA 92672 tel. (949) 369-6141

Project Name: La Puerta
Project Number: 19180-01
Date: 2/11/2021
Location: Claremont

Test hole dimensions (if circular)	
Boring Depth (feet)*:	50
Boring Diameter (inches):	8
Pipe Diameter (inches):	3

*measured at time of test

Test pit dimensions (if rectangular)	
Pit Depth (feet):	
Pit Length (feet):	
Pit Breadth (feet):	

Main Test Data

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval, Δt (min)	Initial Depth of Water, D_o (feet)	Final Depth of Water, D_f (feet)	Change in Water Level, ΔD (feet)	Surface Area of Test Section (feet ^2)	Raw Infiltration Rate (in/hr)
1	9:28	9:32	4.2	45.04	40.13	4.91	89.53	3.3
2	10:26	10:35	9.0	40.50	35.20	5.30	79.62	1.9
3	11:03	11:12	8.8	40.59	35.22	5.37	79.74	1.9
4	11:23	11:31	7.9	40.72	35.48	5.24	80.15	2.1
5	11:46	11:53	7.1	39.94	35.38	4.57	79.22	2.0
6	12:08	12:15	6.2	42.11	36.76	5.35	82.94	2.6
7	12:36	12:43	6.4	40.01	35.67	4.34	79.60	2.1
8	13:00	13:05	5.5	40.13	36.05	4.08	80.12	2.3
9	13:26	13:31	4.7	40.13	36.55	3.58	80.65	2.4
10	14:12	14:16	4.3	40.04	36.57	3.47	80.57	2.5
11	14:24	14:30	5.8	41.82	36.3	5.52	82.16	2.9
12	14:34	14:39	4.88	40.91	36.84	4.07	81.77	2.6

Measured Infiltration Rate	**2.7**
Feasibility Factor of Safety	TBD
Feasibility Infiltration Rate	

Sketch:

Notes:

Based on Guidelines from: LA County dated 06/2017

Spreadsheet Revised on: 12/23/2019