City of Oceanside
Drainage Impact Fee Evaluation

March 2016

Garrison Creek

TORY R. WALKER ENGINEERING
RELIABLE SOLUTIONS IN WATER RESOURCES
122 CIVIC CENTER DR, STE 206, VISTA, CA 92084 · 760-414-9212

Revenue & Cost Specialists, LLC

City of Oceanside
Drainage Impact Fee Evaluation

Introduction

The purpose of this study is to evaluate Oceanside's drainage Development Impact Fee (often referred to as DIF) structure, taking into account the 2013 update to the Master Plan of Drainage (MPD) through build-out. The MPD update developed reasonable facility needs and costs to be used as a basis for this analysis.

This study presents supporting calculations for possible revisions to Oceanside City-wide drainage impact fees that can be applied to all private development applications. The final report will support the nexus between needed improvements and the recommended development impact fee structure.

The basis for this current analysis is the estimation of increased runoff to the existing storm drain system from new development. Impact fees are estimated by dividing expansion facility needs (dollars) by developable land (acres), to get dollars/acre. This analysis accounts for differing runoff by differing land uses. This report presents that analysis and the calculation of the DIF based on drainage needs identified in the MPD and the current land use planning.

Calculation of Development Impact Fees

In California, State legislation sets certain legal and procedural parameters for charging development impact fees. This legislation was passed as AB1600 by the California Legislature and is now codified as California Government Code Sections 66000 through 66009. This State law went into effect January 1, 1989, and is generally known as the *Mitigation Fee Act*.

Government Code §66000 requires documentation of projects to be financed by development impact fees prior to their levy and collection, and that the monies collected actually be committed within five years to a project of direct benefit to the development which paid the fees. Specifically, Government Code §66000 require these DIF calculation findings:

1. Delineation of the **PURPOSE** of the fee.
2. Determination of the **USE** of the fee.
3. Determination of the **RELATIONSHIP** between the use of the fee and the type of development paying the fee.
4. Determination of the relationship between the **NEED** for the facility and the type of development project.
5. Determination of the relationship between the **AMOUNT** of the fee and the **COST** of the portion of the facility attributed to the specific development project.

This calculation, with some additions, utilizes a basic methodology consistent with the above requirements of Government Code §66000. Briefly, the following steps were undertaken in the calculation of DIFs for the City:

1. **Define the level of service** desired within the General Plan area for each infrastructure identified as necessary. In some areas, certain statistical measures are commonly used to measure or define an acceptable level of service for a category of infrastructure. Storm Drainage Collection Systems, for instance, are commonly rated based on a Level of Service (LOS) upon the ability of the system capacity to handle the largest rainfall event with a specified probability of occurring in any given year. In this case the recommended service level for the City is based upon a 1% probability of being exceeded in any given year. This is also known as a 100-year storm event.

2. **Review the agency's land use database** and determine the existing mix of land uses and amount of undeveloped and developed land. The magnitude of growth and its impacts can thus be determined by considering this land use data when planning needed storm drain infrastructure. This land use analysis can be found in the **Appendix (page 21)**.

3. **Identify all additions to the capital facilities** inventory necessary to maintain the identified levels of service in the area, and the cost of those additions. An infrastructure Master Plan is the preferred source for this data.

4. **Identify a level of responsibility**, termed in this report as the relative need (or as referenced in the accompanying schedules, *Percent Need* for the facility necessary to accommodate "growth," as defined, and as opposed to current needs.

5. **Distribute the costs** identified as a result of development growth on a basis of demand, by land use. Costs are distributed between each land use based on their relative demand, or nexus, of the capital system. Future storm drainage collection system costs are distributed to each land use based on their storm runoff coefficient or *Coefficient of Drainage*.

Development Impact Fee Structure

The General Plan provides a range of potential densities for residential development; as such, the DIFs for residential uses have been calculated on a *per dwelling unit basis* to reflect more accurately the impacts from a specific development. For example, a property zoned as detached dwelling residential development may contain from three to six units per acre. If fees are calculated merely on an acreage basis, the developer proposing three units per acre would pay the same amount as a developer constructing six units per acre; this inequity is obvious. Similarly, fees are calculated on a square footage basis for business (retail/service, office and industrial, etc.) parcels to reflect the impacts of different building intensities for these types of development.

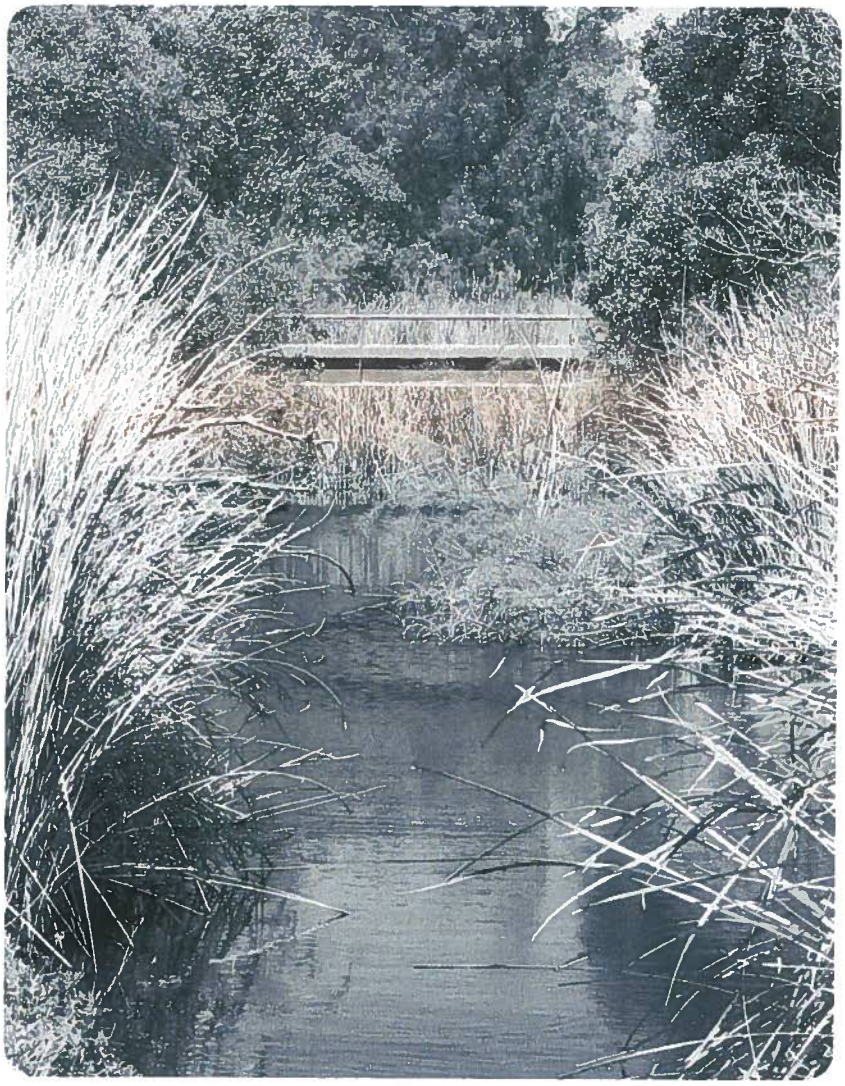
A second reason for the proposed DIF fee structure recommended in this report involves the issue of building expansion or intensification of retail, office and industrial areas. For example, if a property owner of retail/service or industrial property proposes an expansion to his/her building, the question exists about how to charge this proposed expansion for its impact on the City's storm drainage collection system. A fee calculated on a building square footage basis for business uses simplifies this calculation.

In addition to the land use assumptions contained in this report, other important assumptions of this study include the following:

"Normal" Subdivision Improvements Omitted

"Local" public improvements generally associated with and identified as being the sole responsibility of the developer through the subdivision or development review process are not included in either of the project lists or subsequent calculations.

This type of "on site" and immediately adjacent improvement would include all such capital construction within the boundaries of any development, such as street lights, curb, gutter, sidewalks, neighborhood streets, storm drainage collection system pipes less than 36 inches, and all local utility pipes. These improvements would continue to be the direct responsibility of the developer, with or without the addition of DIFs.



Pilgrim Creek

LAND USE ASSUMPTIONS

This report contains an inventory of fully developed, undeveloped and underdeveloped land within the City limits of Oceanside and is based upon the City's most recent General Plan update. The *Undeveloped Parcels*, identified as *Potential Development*, combine to form the base for the distribution of the estimated costs of the service-expanding capital projects necessary to accommodate that same anticipated development. Without the expansion projects, the City would be unable to accommodate that new development, effectively halting it. The *developed* land inventory forms the base for distributing the replacement cost of the existing infrastructure. This action provides the basis for comparison with the proposed DIF schedules and for the *de facto* identification of the many existing Levels of Service (LOS) currently provided by the City's existing storm drainage infrastructure.

Table 1, is the resulting inventory of all private land uses contained within the City and is based on the General Plan's land use inventory and allowable densities. Potential development that has been identified is presented in the **Appendix (page 21)**.

Table 1
Land Use Inventory
(from Tables 8 and 9)

Land-Use Database within The General Plan Area	Existing Development		Potential Development		Total General Plan Build-out	
	Acres	Units or S.F.	Acres	Units or S.F.	Acres	Units or S.F.
Estate Density Dwellings	2,773.7	5,525	938.4	1,858	3,712.1	7,383
Low Density Dwellings	5,550.6	33,656	365.5	2,310	5,916.1	35,966
High Density Dwellings	892.7	12,487	21.0	287	913.7	12,774
Attached Dwellings	335.9	10,502	56.1	1,754	392.0	12,256
Commercial Uses	2,638.3	49,634,443	458.2	8,085,607	3,096.5	57,720,050
Commercial Coastal Uses	101.8	3,325,806	22.0	718,740	123.8	4,044,546
Industrial Uses	920.2	20,041,956	232.9	5,072,562	1,153.1	25,114,518
Downtown/Harbor Uses	339.0	11,075,130	13.9	454,113	352.9	11,529,243
Private Institutional Uses	264.5	3,456,486	65.0	849,420	329.5	4,305,906
Master Plan Overlay Uses	483.2	15,786,144	1.4	45,738	484.6	15,831,882
Total Acres	14,299.9		2,174.4		16,474.3	
Residential Dwellings	9,552.9	62,170	1,381.0	6,209	10,933.9	68,379
Business Uses	4,747.0	103,319,965	793.4	15,226,180	5,540.4	118,546,145
Total Acres	**14,299.9**		**2,174.4**		**16,474.3**	

As of September 2015

DIF Land-use Types Definitions

This report classifies private development into four residential *DIF Land-use Types* and six business-based *DIF Land-use Types.* For purposes of the report, the term *DIF Land-use Type* will refer to one of the ten broad types under which the City's specifically defined zoning code *land-uses* will fall. These *DIF Land-use Types* are defined:

Residential Land Uses:

- **Estate Density Detached Dwelling Units** - Corresponds to an allowable use within the City's land use designation of Estate A Residential (EA-R), Estate B Residential Density (EB-R).
- **Low Density Detached Dwelling Units** - Corresponds to an allowable use within the City's land use designation of Medium Density Dwellings (MDA-R), Single Family Detached Residential (SFD-R), Low Density Residential, Coastal (C-RL), and Mixed High Density, Coastal (C-RMHT).
- **High Density Detached Dwelling Units** - Corresponds to an allowable use within the City's land use designation of some Medium Density - B (MDB-R) and Medium Density - C (MDC-R).
- **Attached Dwelling Units** - Corresponds to an allowable use within the City's land use designation of some High Density (HD-R), Urban High Density (UHD-R), Medium Density, Coastal (C-RM), and High Density, Coastal (C-RH).

Business/Commerce Land Uses:

- **Commercial Uses** - As utilized in this report, Commercial uses include the general category of retail services and thus includes outlets ranging from restaurants to auto repair shops to shopping centers. This category includes the relevant portions of the Community Commercial (CC), Neighborhood Commercial (NC), General Commercial (GC), Special Commercial (SC), Professional Commercial (PC), Specific Plan Rancho Del Oro (S-1-84), Del Oro Hills (S-2-84 and S-3-84) and El Corazon (SP-1-09).
- **Commercial Coastal Uses** - This category contains all business uses (residential, commercial lodging and business) within the coastal areas. Each of the two uses have a similar allowable Floor Area Ratios (0.75 FAR).
- **Industrial Uses** - This category contains all businesses engaged in heavy manufacturing or industrial development in the single industrial zone, such as General Industrial (GI), Light Industrial (LI) and Light Industrial, Coastal (C-LI).
- **Downtown/Harbor Uses** - This category contains all business uses (residential, commercial lodging and business) within the downtown and harbor areas. Each of the two have similar allowable Floor Area Ratios (0.75 FAR), which tends to allow multiple floors.
- **Private Institutional Uses** - This category includes private schools, fraternal organizations, churches and similar non-commercial uses. These facilities usually have a 0.30 FAR, or 13,068 square feet of pad per gross acre.

- **Master Plan Overlay** - This category includes development of large, unsubdivided areas consistent with the General Plan. It is also used to maintain an environmental equilibrium consistent with existing vegetation, soils, and drainage patterns, and to avoid premature development creating demands that exceed capacity.

Definitions of DIF Application Categories Status

For each of the DIF land-use categories detailed above and on **Table 2**, following, acreage is categorized as either *Existing Development or Potential Development*. Definitions regarding the status of each land use are as follows:

Existing Developed Acres – This column title reference identifies non-public land in the City which is developed, or land which has received a building permit, but may not yet be constructed. Acreage in this category may include non-conforming use areas of the City which contain extensive development or before changes to the General Plan were made.

Potential Development Acres – The title refers to all non-public vacant acreage located within the City that is generally vacant or under-utilized.

Table 2 provides a summary of the detailed land use inventory, limited to privately held property, provided on **Table 1**. City staff's land use inventory reveals that there are presently 14,299.9 acres of privately-held developed land (about 86.7% of all privately owned acreage in the City) within the City's current boundaries. Conversely, there remain 2,174.4 acres of vacant or under-developed land within the City's limits (or about 13.1% of all privately held land). Acreage designated for estate and low density dwelling units constitutes the greatest amount of vacant acreage of all the land uses (1,303.9 acres).

Table 2
Summary of the City of Oceanside's
Developed and Potential Development Acreage

DIF Land-use Type	Existing Developed Acres	% of Total Private Acres	Potential Development Acres	% of Total Private Acres	Total Private Acres
Estate Dwelling Units	2,773.7	16.8%	938.4	5.7%	3,712.1
Low Density Dwelling Units	5,550.6	33.7%	365.5	2.2%	5,916.1
Medium Density Dwelling Units	892.7	5.4%	20.0	0.1%	913.7
Attached Dwelling Units	335.9	2.0%	56.1	0.3%	392.0
Commercial Uses	2,638.3	16.0%	458.2	2.8%	3,096.5
Commercial Coastal Uses	101.8	0.6%	22.0	0.1%	123.8
Industrial Uses	920.2	5.6%	232.9	1.4%	1,153.1
Downtown/Harbor Uses	339.0	2.1%	13.9	0.1%	352.9
Private Institutional Uses	264.5	1.6%	65.0	0.4%	329.5
Master Plan Overlay Uses	483.2	2.9%	1.4	0.0%	484.6
Total Acres	**14,299.9**	**86.7%**	**2,174.4**	**13.1%**	**16,474.3**

As of September 2015

Storm Drainage Collection System Facilities

The Existing General Plan Drainage System

The City's existing storm drainage network is composed of streets and gutters, inlets, storm detention basins, storm drain pipes, open channels and creeks or rivers located throughout the City. These include the San Luis Rey River, Loma Alta Creek and Buena Vista Creek, all of which drain to the Pacific Ocean. However, as vacant parcels continue to be developed, the existing City storm drainage system will reach its finite capacity. Additionally, there are areas in the City, such as near fire stations, and police stations that require storm drainage improvements to insure adequate safety response times.

Oceanside is like many municipalities that are mature. That is, most of the City's major development opportunities have been completed (86.8%). The City's original Master Plan of Drainage (MPD) was based upon the less dense General Plan land use determined many years ago. The MPD and its specifically planned storm drainage lines, appurtenances and basins were appropriate for that General Plan. However over many years of density changing General Plan update adjustments (usually upwards) and General Plan zone changes, a number component lines of the storm drainage collection system will prove inadequate.

City records indicate that there has been about $270.6 million invested in the existing system of collection pipes, manholes, connections, basins and basin improvements. This number does not include right-of-way costs. Additionally there is $6.4 million in the existing Storm Drainage DIF Fund balance in a number of impact fee funds for a total storm drainage collection system value of about $277.0 million.

Property-based Benefit Reasoning

Initially, the use of separate zones was reconsidered for each drainage basin within the City because each area may have differing capital needs for storm water collection. Storm water runoff near The Strand may not *directly* impact homeowners along Douglas Drive; similarly, a debris detention basin along Mesa Drive required to handle runoff from the local residences may provide little *direct* benefit to the businesses along North Avenue.

In each case, there can be some distinct property-related areas of benefit for each drainage basin. However, the owners and users of all developed and undeveloped parcels benefit, both directly and indirectly, from all City-wide existing and future storm drainage improvements. As the various systems within the greater community of the City of Oceanside develop, concurrent with development of private property, the benefits are generally recognized as:

1. Proposed development projects can only be approved by the City when precautions, generally in the form of infrastructure improvements, have been made that assure developed and undeveloped downstream parcels will not be adversely impacted (i.e., inundated, flooded, cut off from access), by storm water from the project being proposed. The avoidance of downstream damage from the development of an upstream parcel is an important public safety concern, and the City must concern itself with such issues when approving private development projects.

2. The private development project being assessed a DIF will receive the same storm water protection from other development projects upstream from that project.

3. Storm water must be adequately and sufficiently conveyed and removed to large scale flood control channels or creeks to assure access by public safety vehicles to all parts of the City, regardless of which zone a call-for-service is in. Fire rescue calls, as well as many law enforcement and public works responses, simply cannot "sit-out" a heavy rainstorm. To the contrary, emergency calls-for-service increase during such storm events, and the City's public safety and maintenance units must be able to respond **to all drainage zones from where they are normally assigned**.

4. The City of Oceanside's citizens and business owners/employees must also be able to travel safely (and send/receive goods and services) in heavy rain through one zone to another. An adequate and sufficient storm drainage system will provide such protection.

5. Storm drainage collection pipes protect the integrity of the road bed of the many important arterials and collectors, and thus when completed will maximize the availability of arterial and collector roadways during a large rainfall event.

Demand Upon Infrastructure Created by the Development of Underdeveloped or Undeveloped Parcels

The construction of flood control and storm drainage facilities is essential for the preservation of private property, public streets, curbs and other facilities. The City is generally responsible for both flood control[1], and for storm drainage. The building of new residences and businesses on presently undeveloped land will increase the amount of storm water runoff, and thus accelerate the need for additional storm drainage facilities to handle increased runoff from these developing areas. As vacant land is developed and pervious surfaces are replaced with impervious surfaces, greater amounts of the rainfall runs off of the developed parcel.

The amount of runoff will vary with differing types of development (i.e. land-use) and the associated *runoff coefficients*. Approximately 72% of rainfall that falls on a parcel developed with low density detached dwelling residences runs off that parcel in a larger storm event. For an attached dwelling, runoff is not much higher than a detached dwelling (approximately 81%). Most business uses such as lodging, retail/service and office have a runoff coefficient in excess of 83%, while typical industrial uses are slightly higher at 85%.

Storm Water Runoff Models

Two runoff methodologies are often used to estimate runoff related to DIF calculations - Coefficient of Drainage, and Impervious Surface Model.

Coefficient of Drainage is used to estimate the fraction of rainfall that runs off a drainage area and better distributes the storm drainage costs over differing land-uses benefiting from those same projects. For this methodology, costs were distributed between land uses using established runoff coefficients.

The impervious surface calculation model assumes dry ground conditions prior to the rainstorm, while FEMA criteria and federally-insured FHA loans require the identification of storm projects based upon a fully saturated ground model prior to the rainfall event. Therefore, the application of an Impervious Surface model to potential land-uses is not a

1 Generally involving the control of larger quantities of flood water through channels, creeks, and rivers.

particularly good method for either determining storm system project costs or distributing those costs to the parcels benefiting from those same storm system improvements. As an example, vacant land is classified as 100% pervious, but a nearly 65% runoff coefficient could be assumed on that vacant parcel for a 25-year storm event. After the parcel is developed, the 65% runoff coefficient might rise to 75% for a normal tract development of four units per acre, or 85% for industrial land.

Clearly, rainfall runoff increases with development, even with on-site capture requirements. The cumulative effects of additional runoff must be managed with the appropriate capital facilities. These costs of the new storm drainage (and flood control) revenue shortages will be distributed by the runoff coefficients, i.e., the percentage of property that will end up with impervious coverage that does not allow absorption into the soil.

The Purpose of the Fee

The building of new residences and businesses on undeveloped land will require the installation of additional storm collection system improvements of sufficient capacity with an adequate number of inlets to handle increased rainwater runoff from these areas where nearby development reduces natural absorption. The City does not have an alternative revenue source available and storm drain needs must compete with other general fund needs. Storm drainage collection system facilities in Oceanside constitute one of the highest development costs, primarily due to slope topography, and thus the need to collect and control storm water.

Revenues raised from a properly calculated and demand supported Storm Drainage Collection Facilities DIF are limited to the capitalized costs related to growth. The fees will be used to construct additional, parallel, or upsized storm drainage lines necessary to increase the drainage system capacity of the system to accommodate the additional rainwater runoff generated by new development. Conversely, the Storm Drainage Collection System DIF receipts will not be used for the ordinary repair of any same-size replacement of existing storm drainage lines.

The Use of the Fee

The collected DIF receipts will be used to increase the capacity of the storm water drainage collection system and its capability in removing excess surface storm water from the street system. This allows safe travel for residents and businesses throughout the City during significant rainfall events. The costs of extending the same level of storm drainage protection to the newly developing residences and businesses, as is provided to the existing community (that has largely paid for the existing system), is calculated for the proposed impact fee. The DIF revenues will be used to expand the capacity of the storm drainage facilities necessary to extend the same level of services. City staff have identified a total of $36,171,430 in storm drainage collection projects required to maximize the City's network of conveyance and basin projects.

The City has not experienced any significant financial assistance from the County of San Diego Regional Flood Control District[2] over the years and does not anticipate any change in that source. Without any inter-governmental assistance, the remaining mitigating revenue source is the City's existing storm drainage DIF funds balance of $6,436,381 which acts to reduce the total construction cost figure to $29,284,549.

2 Due to the fact that the San Diego County Flood Control District was formed by an Act of the State Legislature and charged dealing with flood control and watershed issues in the unincorporated areas of the County.

Identified Projects

The following projects are detailed in other portions of this document and are summarized below:

SD-01 and SD-02, Cleveland Street and Surfrider Way - Construct 4,026 linear feet of new 36" to 66" reinforced concrete pipe (henceforth referred to as RCP) in Cleveland Street and Surfrider Way.

SD-03, Macario Drive and Libby Lake Area - Construct 1,050 linear feet of new 30" RCP parallel to existing 30" RCP from roughly Macario Drive and Monica Circle to an energy dissipater and rip-rap above Libby Lake.

SD-04, Downs Street at Skylark Drive - Construct 1,200 linear feet of a parallel 2' by 3' trapezoidal concrete channel to outfall into Loma Alta Creek.

SD-05, Hoover Street and Oceanside Boulevard - Construct 290 linear feet of 2.5'x5' reinforced concrete box (RCB) culvert adjacent to Hoover Street and replace and existing RCP with 71 linear feet of 2.5' x 4' RCB, crossing Oceanside Boulevard. Also, construct 207 linear feet of 3'x8' concrete channel.

SD-06, Oceanside Boulevard at Foussat Road and Edgehill Lane - Construct 180 linear feet of 36" RCP in Foussat Road and 364 linear feet of 48" RCP in Oceanside Boulevard. The final segment is an upsizing of an inadequate capacity corrugated metal line from Oceanside Boulevard at Edgehill Lane to the Loma Alta Creek - 91 linear feet of 54" RCP, 42 linear feet of 66" RCP and parallel 60" and 66" RCP.

SD-07, North Foussat Road at Tonopah Street - Upsize 552 linear feet of various sized RCB with larger RCB.

SD-10, Via Esmarca at Vista Way - Replace existing cast-in-place pipe (CIPP) and RCP with 587 linear feet of 66" RCP.

SD-12/13, Cameo Drive at Columbia Drive and Marvin Street at College Boulevard - Construct an 886 linear feet of 60" RCP parallel to the existing CIPP in Cameo Drive. Also, in Cameo Drive, construct 886 linear feet of parallel 60" RCP, and 280 linear feet of 36" RCP, parallel to existing pipe. In College Boulevard replace 376 linear feet of existing with double 36" RCP and construct 94 linear feet of 36" RCP crossing College Boulevard.

SD-16, El Camino Real Detention Basins Outlet Modification - Retrofit the existing outlet with an engineered weir to control low flows at the El Camino Real detention basins.

A-1, North Pacific Street, south of San Luis Rey River - Upsize 247 linear feet of 33" RCP with 48" RCP including tie-in to existing storm drains.

C-1, Carino Way - Upsize 183 linear feet of 30" RCP to 42" RCP, including connections to existing up/downstream storm drains.

C-2, Cardiff Bay Drive - Upsize 213 linear feet of 36" RCP to 42" RCP, including connection to existing up/downstream storm drains.

F-1, Wisconsin Avenue near The Strand - Upsize 774 linear feet of 42" and 48" CIPP and RCP to 48" to 66" RCP, including connection to existing up/downstream storm drains.

F-2, South Coast Highway and Oceanside Boulevard - Upsize 150 linear feet of 30" RCP to 42" RCP along the east side of South Coast Highway, south of Oceanside Boulevard to Loma Alta Creek, including connection to existing up/downstream storm drains.

F-3, Vine Street and Birchley Place - Upsize 1,247 linear feet of 48" and 54" storm drain to 60" and 72" RCP along Vine Street, northwest of Interstate 5 and Oceanside Boulevard, including connections to up/downstream drains.

F-4, Parkwood Lane - Upsize 140 linear feet of 30" storm drain to 36" RCP, just south of Oceanside Boulevard.

F-5, Apple Street and Oceanside Boulevard - Upsize 3,288 linear feet of various storm drains and box culverts to larger storm drains, box culverts, and concrete channels west of Greenbrier and Interstate 5, including connection to existing facilities.

F-6, Cadillac Circle - Upsize 138 linear feet of 36" RCP to 42" RCP south of Cadillac Circle cul-de-sac, including connection to existing up/downstream storm drains.

F-7, Crouch Street - Upsize 183 linear feet of 36" RCP to 42" and 48" RCP located in Crouch Street and in the south side of Oceanside Boulevard.

G-1, Turnbull Street - Upsize 30" RCP crossing Turnbull Street with 37 linear feet of 54" RCP connecting to existing storm drain.

G-2, Garrison Street - Reconstruct concrete channel parallel to Garrison Street, under feeder street, approximately 31' long and 54" deep.

G-3, Las Vegas Drive and Tropicana Drive - Upsize double 2'x5' box culvert under Tropicana Drive to double 3'x6'. Upsize single 2'x6' box culvert under Las Vegas Drive to double 3'x6'.

G-4, Mission Avenue and Foussat Road - Upsize 160 linear feet of 30" RCP to 60" RCP in front of commercial area.

H-1, Mesa Drive and Rancho del Oro Drive - Upsize 379 linear feet of parallel 60" and 66" storm drains with parallel 96" RCP, including transition structures to existing storm drains.

H-2, Douglas Drive - Upsize 285 linear feet of 36" and 48" RCP for 42" and 54" RCP, along commercial area of Douglas Drive, south of Mission Avenue.

H-3, Mesa Drive - Upsize 655 linear feet of 36" storm drains to 60" and 72" RCP, including connections to existing, near Martin Luther King Jr Park and Mesa Drive.

H-4, Old Grove Road and Mission Avenue - Upsize 921 linear feet of 30" and 36" RCP to 36" to 48" RCP, including connections to existing storm drains.

H-5, Mission Avenue and Old Grove Road - Upsize 328 linear feet of 30" RCP to 48" RCP, include existing connections.

H-6, Avenida Marguarita - Upsize 530 linear feet of 30" storm drain to 36" RCP, including existing connections, through Avenida Marguarita cul-de-sac and crossing Mission Avenue.

H-7, College Boulevard - Upsize a 264 linear foot portion of the 60" storm drain along College Boulevard to 66" RCP, located west of Frazee Road.

H-8, North River Road - Replace 490 linear feet of 24" and 30" storm drains in fire station parking area adjacent to North River Road with 42" and 48" RCP, draining to San Luis Rey River.

H-9, Mesa Drive and Woodview Drive - Replace 814 linear feet portions of the 36" and 48" storm drain in Mesa Drive with 42" and 60" RCP, including connection to existing up/ downstream storm drains.

H-10, Frazee Road and Muirwood Drive - Upsize 792 linear feet of 30" storm drain to 36" and 42" RCP, including existing connections.

I-1, College Boulevard - Upsize 448 linear feet of 30" storm drain to 36" and 42" RCP along northern edge of commercial area fronting College Boulevard and Highway 76.

I-2, Mesa Drive and Alamos Park Drive - Upsize 2,703 linear feet of 30" to 73" storm drains to 36" to 84" RCP, including transition structures.

I-3, North Santa Fe Avenue and Champlain Street - Upsize 703 linear feet of 60" and 66" storm drains in North Santa Fe and easement adjacent to Champlain Street to 72" and 66" RCP, including connection to existing up/downstream storm drains.

I-4, Pacesetter Street - Replace a 181 linear feet portion of 33" storm drain in Pacesetter Street cul-de-sac near Edgewater Avenue with 42" RCP, including connection to existing up/downstream storm drains.

J-1, Lago Grande Drive - Upsize 200 linear feet of parallel 42" storm drains with parallel 48" RCP, under Lago Grande Drive, near Valle del Sol.

K-2, Vista Way - Upsize a 128 linear feet portion of 36" storm drain to 48" RCP near Vista Way and east of Jefferson Street, through commercial area, including connection to existing up/downstream storm drains.

L-1, **Via Esmarca and Via Camino Verde** - Upsize a 273 linear feet portion of 30" storm drain to 48" RCP, including connections to existing storm drains.

L-2, El Camino Country Club - Replace older portion and upsize 1,503 linear feet of 72" storm drain to 84" RCP located along the southern edge of the El Camino Country Club golf course.

L-3, Vista Way near Italia Way - Upsize 113 linear feet portion of a 48" storm drain to 54" and 60" RCP, including existing connections.

L-4, Rancho Aqua Hedonia - Replace and upsize a 248 linear foot portion of an existing 36" CIPP storm drain with a 42" RCP, located where Rancho Aqua Hedonia crosses Vista Way, including connections to existing storm drains.

L-5, Rancho del Oro Drive - Upsize a 225 linear foot portion of a 30" storm drain to a 36" RCP, located in Rancho del Oro Drive, north of Viscaya Way, including connections to existing storm drains.

L-6, Barnard Drive - Replace 1,152 linear feet of an under-sized portion of 30" to 42" storm drain with 36" and 48" RCP, including connections to existing, located in Barnard Drive, just north of College Boulevard.

L-7, Downstream of Collins Basins - Replace a 322 linear foot under-sized rock-lined channel that drains the Collins Basins, with concrete lined channel, draining to Loma Alta Creek.

L-8, Colgate Drive - Replace and upsize 761 linear feet of existing CIPP and RCP in Colgate Drive with a 36" and 42" RCP, cross street is Dartmouth Drive. Includes connections to existing storm drains.

M-1, Avenida del Oro - Upsize 147 linear feet of 30" storm drain where Avenida del Oro crosses Oceanside Boulevard, with 36" RCP, including connection to existing up/ downstream storm drains.

M-2, College Boulevard - Upsize 53 linear feet triple 5'x6' RCB under College Boulevard just north of rail road, with triple 5'x8' RCB. Also, replace a 36" CIPP with 42" RCP, on the west side of College Boulevard just south of the railroad.

M-3, Oceanside Boulevard and Beverly Glen Drive - Upsize portions of a 48" concrete pipe on the north side of Oceanside Boulevard, with 54" and 78" RCP, including existing connections.

M-4, Easement near Elm Tree Drive - Upsize 385 linear feet of existing 30" storm drain with 36" and 42" RCP, located in Elm Tree Drive, near Pepper Tree Drive, and in easement, including connections to existing storm drains.

N-1, Meadowbrook Drive and Glenhaven Drive - Replace 337 linear feet of 30" CIPP with 36" RCP, including existing connections.

O-1, Hackamore Drive - Replace 764 linear feet of 36" storm drain in Hackamore Drive, north of Spur Drive and in easement, with 42" RCP, including connection to existing storm drains.

P-1, College Boulevard and Vista Way - Replace 766 linear feet of 72" corrugated metal pipe in College Boulevard, crossing Vista Way and Highway 78, with 78" RCP, including connections to other storm drains.

P-2, Easement near Tiberon Drive - Upsize 210 linear feet of 48" storm drain in an easement between Tiberon Drive and open channel, west of Thunder Drive, with 54" RCP, including connection to existing up/downstream storm drains.

P-3, Easement near Amigos Count - Upsize 144 linear feet of 30" storm drain in easement with 36" RCP, including connection to existing up/downstream storm drains.

P-4, Blackwell Road at Winslow Road - Upsize 174 linear feet of 60" RCP with 66" RCP including connections.

P-5, Harriet Street, Easement, Emerald Drive - Upsize 697 linear feet portions of a 30" storm drain starting in Harriet Street, through easements, and into Emerald Drive, with 36" to 48" RCP, including connections to existing storm drains.

Q-1, Cannon Road and Mystra Way - Upsize 276 linear feet of 30" storm drain with 36" RCP, including connection to existing up/downstream storm drains.

SUMMARY OF FINDINGS

City staff and consultants have identified $36,171,430 in master planned capital improvement projects required through the City's General Plan, including a small number of projects that are existing deficiencies and those needed solely to support future growth. An example of an existing deficiency would be the replacement of a deteriorating 42-inch corrugated pipe with 36-inch reinforced concrete pipe (RCP).

There are proposed replacements of existing RCP with far larger pipe due to increases in flow rates, primarily due to increases in General Plan densities. Most, (98.75%, or $35,720,930), of the $36,171,430 project list is required as the result of accommodating continued development with new or increased capacity storm drainage pipes, channels, box culverts and other capacity increasing projects. The remaining $450,500 is the result of near replacement pipe without upsizing, thus not an impact fee project. About 18.0% of the identified development-generated capital projects can be funded by an un-obligated balance of $6,436,381 (as of March 2016) in the various existing DIF receipts (or fund balance). **Table 3** indicates the proposed impact fee schedule.

Table 3
Summary of Proposed Development Impact Fees for the City's General Plan Area

DIF Land Use Type	Recommended Development Impact Fees
Estate Density Dwelling Units	$6,191 per Unit
Low Density Dwelling Units	$2,054 per Unit
High Density Dwelling Units	$976 per Unit
Attached Dwelling Units	$467 per Unit
Commercial Uses	$0.848 per S.F.
Commercial Coastal Uses	$0.458 per S.F.
Industrial Uses	$0.704 per S.F.
Downtown/Harbor Uses	$0.469 per S.F.
Private Institutional Uses	$1.117 per S.F.
Master Planned Overlay Uses	$0.467 per S.F.

A specific DIF rate schedule detailing each land use can be found in **Schedule 1.3** of the **Appendix (page 36)**. It also identifies the probable development impact fee revenue.

Relationship Between the Use of the Fee and the Type of Development Paying the Fee

The Storm Drainage DIFs that are imposed and collected will be used to mitigate the storm water runoff generated by the type of development. If the development is a retail/service or industrial property generating a significant amount of runoff, the fee collected will be proportionally higher and will be enough to construct the required additions to the storm drainage system downstream from this development.

A listing of these runoff coefficients[3] along with typical build-out densities (in the form of residential units or business square feet) is provided in **Table 4** following:

Table 4
Storm Drainage Runoff Coefficients
and Average Development Densities (by Acre)

DIF Land-use Type	Average Density per Acre or FAR	Runoff Coefficient
Estate Density Detached Dwelling Units	1 - 3 Units	0.680
Low Density Detached Dwelling Units	3.1 - 8 Units	0.720
High Density Dwelling Units	8.1 - 18 Units	0.740
Attached Dwelling Units	18.1 or > Units	0.810
Commercial Uses	0.41 FAR	0.830
Commercial Coastal Uses	0.75 FAR	0.830
Industrial Uses	0.50 FAR	0.850
Downtown/Harbor Uses	0.75 FAR	0.850
Private Institutional Uses	0.30 FAR	0.810
Master Plan Overlay Uses	0.75 FAR	0.850

As stated earlier, the Master Plan storm drainage system requires a net contribution of fees and/or contributed capital of $29,284,549 in existing storm drainage capital projects. **Table 5** (**Schedule 1.3**) demonstrates the DIF schedule that would need to be imposed to fully fund the completion of the storm drainage system's collection of pipes and channels identified in the Master Facilities Plan as necessary for the City.

It would not be unreasonable to require development, those generating greater amounts of rainwater runoff, to finance some portion of the identified storm drainage needs providing there is no violation of the proportionality requirement. **Table 5** indicates the resulting fees required to fully fund all of the projects. Please note that the DIF, by land use, is in terms of *units*, such as residential dwellings or business square feet of building pad.

3 San Bernardino Hydrology Manual (1986), Williamson and Schmidt, Irvine, CA , Figure C-4.

Table 5
100-yr Storm Event Needs-based Storm Drainage System
Development Impact Costs
by DIF Land-use Type

DIF Land-use Type	Allocation of Development Costs	Development Impact Costs Per Unit or Square Foot
Estate Density Dwelling Units	$11,503,264	$6,191 per Unit
Low Density Dwelling Units	$4,744,975	$2,054 per Unit
High Density Attached Units	$280,253	$976 per Unit
Attached Dwelling Units	$819,089	$467 per Unit
Commercial Uses	$6,855,806	$0.848 per S.F.
Commercial Coastal Uses	$329,158	$0.458 per S.F.
Industrial Uses	$3,568,615	$0.704 per S.F.
Downtown/Harbor Uses	$212,899	$0.469 per S.F.
Private Institutional Uses	$949,112	$1.117 per S.F.
Master Plan Overlay Uses	$21,378	$0.467 per S.F.

Schedule 1.3 indicates that the 2,174.4 acres of land within the City with potential for development would generate 1,624.5 acre runoff, or about 15.1% over the existing 10,784.8 acres of existing coefficient runoff from the currently developed City identified in **Schedule 1.1**.

Relationship Between the Amount of the Fee and the Cost of the Portion of the Facility Attributed to the Development Project

Similar to the section above, the relationship is based upon the projected amount of storm water that will need to be collected and safely transported to the larger flood control channels, creeks or rivers. The downstream collection lines (lines further down from the proposed project, but prior to the outfall into a river or flood control channel) need to be sized to handle all of the storm water collected upstream. Storm water that is collected in one location accumulates with feeder lines along the way and thus the downstream system must be built increasingly larger (at increasing higher material and construction costs) the farther it gets away from its source.

From time to time the City may require an applicant of a private project to construct an improvement (or portion thereof) that is on the list of required improvements (**Schedule 1.2**). This is often done to expedite the project for the applicant/developer. The developer would receive a credit for any money expended on this required improvement against their calculated storm drainage impact fee. If the cost of the required improvement exceeds the development's calculated impact fee, a reimbursement agreement may be in order. If a required storm drainage project is not listed on **Schedule 1.2**, no DIF credit or reimbursement should be given.

Table 6 (from **Schedule 1.1**), distributes the total equity value (at current replacement costs) of the existing storm drainage system at $277.0 million referenced earlier over the existing developed community. The total consists of the actual existing storm drainage pipe systems at $178.3 million, ditch/channel improvements at $12.4 million, box culvert systems at $37.2 million, pipe system inlets at $36.6 million, basin/spillway improvements at $6.2 million, and existing DIF fund balance of $6.4 million. The asset/equity investment represents the long term financial commitment contributed by the existing community through dedications (from the developers of these established developments) and tax contributions.

Table 6
Existing Storm Drainage System
Community Financial Commitment Comparison Data

DIF Land-use Type	Allocation of Existing System Assets	Asset/Equity Investment Per Unit or Square Foot
Estate Density Dwelling Units	$48,484,543	$8,775 per Unit
Low Density Dwelling Units	$102,787,232	$3,054 per Unit
High Density Dwelling Units	$16,900,327	$1,353 per Unit
Attached Dwelling Units	$6,926,363	$660 per Unit
Commercial Uses	$55,965,016	$1.128 per S.F.
Commercial Coastal Uses	$2,216,436	$0.666 per S.F.
Industrial Uses	$20,224,981	$1.009 per S.F.
Downtown Uses	$7,480,472	$0.675 per S.F.
Private Institutional Uses	$5,541,091	$1.603 per S.F.
Master Plan Overlay Uses	$10,528,072	$0.667 per S.F.

Of note is the fact that in **Table 6**, the investment "equity" of the current community is noticeably greater (by roughly 136%) than that of the previously exhibited *Minimum Needs-based Impact Costs* when compared on a "per acre of drainage comparison". Additionally, the system is a prerequisite system and must be in place prior to development in order to not increase flood risks to existing development or contiguous properties.

Currently, the developed portion of the City represents 87% of the ultimate General Plan build-out total runoff but has generated a slightly larger 90% of the ultimate system indicating that the master plan storm drainage system is advanced in terms of proportional development. **Schedule 1.3** (as summarized in **Table 5**) is thus required to ensure that there continues to be sufficient storm drainage collection and storage facilities to not allowed downstream and local damage from a predictable large storm event.

RECAP OF RECOMMENDED STORM DRAINAGE IMPROVEMENTS DIFS

- Adopt a single zone storm drainage fee schedule for the entire City as runoff from precipitation travels through every part of the City to the Pacific Ocean.
- Adopt **Schedule 1.3** for the 10 basic land-uses. Additionally, adopt the *Average Cost per Gross Acre* of $13,468 for developments that do not involve usable business space to be occupied (e.g. additional asphalt parking area or parking structure).

APPENDIX

Current Drainage Impact Fee Structure

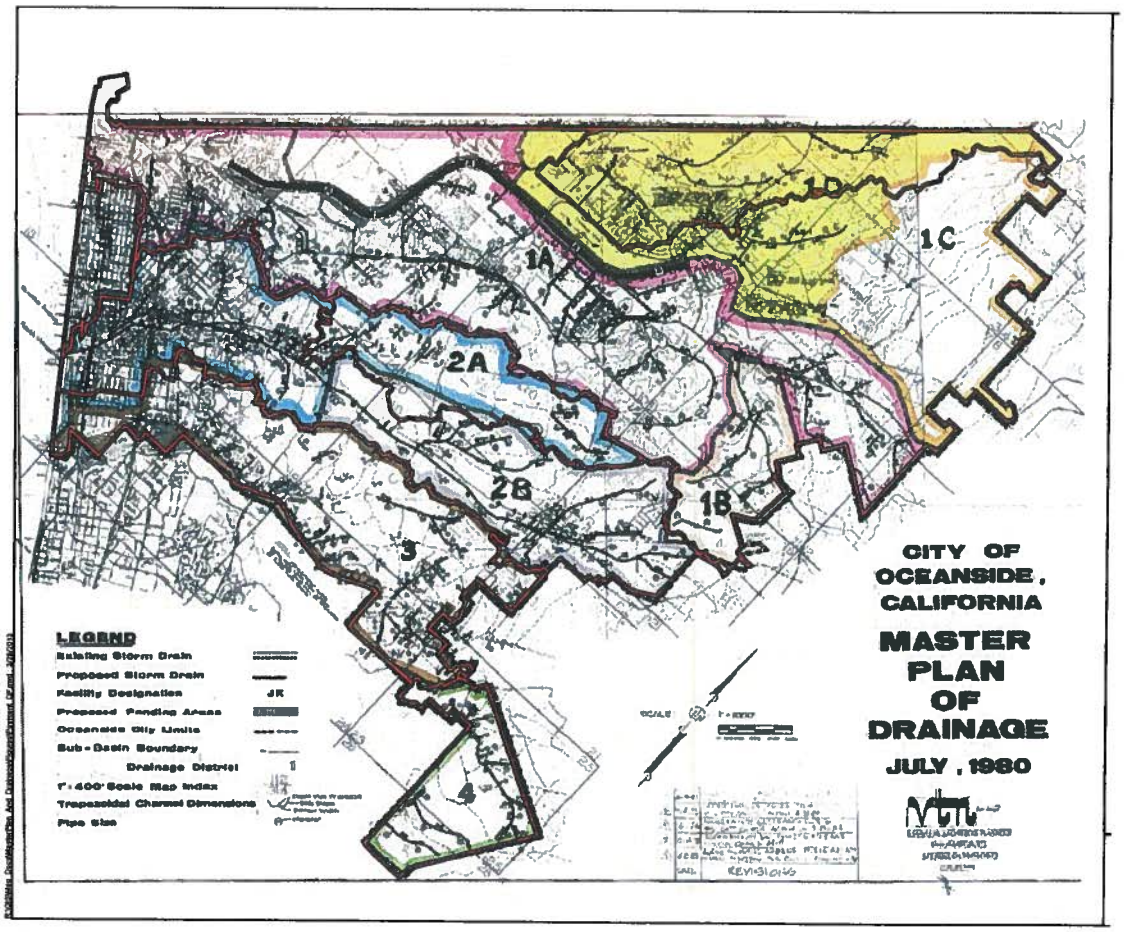
The existing drainage fees by drainage zone districts are shown below. Red lines were over lain on the figure below to show the actual watershed boundaries from the 2013 Update to the MPD, which do not align with the drainage zone districts.

Table 7
Drainage Fees

Drainage Fees Per Gross Area Subdivided or Developed

Drainage Zone District	Major Watercourse Component	Local Facility Component	Total
I-A	$3,842.00	$7,500.00	$11,342.00
I-B	$3,842.00	$3,842.00	$7,684.00
I-C	$3,842.00	-0-	$3,842.00
I-D	$3,842.00	$4,870.00	$8,712.00
II-A	$8,611.00	$7,353.00	$15,964.00
II-B	$8,611.00	$4,766.00	$13,377.00
III-A	$1,459.00	$2,460.00	$3,919.00
IV	-0-	$5,988.00	$5,988.00
V	-0-	$2,843.00	$2,843.00

*All Drainage Fees Per Resolution No. 06-R0334-1
Passed and adopted by the City Council of the City of Oceanside on May 17, 2006.



Land Use Analysis

Undeveloped (or under-developed) parcels were identified using the latest Oceanside land use mapping and aerial photography, along with GIS parcel information supplied by the city and site visits. Vacant parcels that are not zoned for development (such as, agriculture, open space, civic, utility easements, and transportation) were excluded. **Table 8** below summarizes the amount of available land for development by land use. The map on the next page shows the location of these areas. **Table 9** shows how the land uses were grouped for this study into the ten basic land uses.

Table 8
Expanded Land Use Database

Total - Land-use Database	Existing Development		Potential Development		Total General Plan Build-out	
	Acres	# of Units	Acres	# of Units	Acres	# of Units
Estate A Residential	67.0	40	56.5	94	123.5	134
Estate B Residential	2,706.7	10,353	881.9	1,764	3,588.6	12,117
Detached Dwellings	3,156.3	14,046	168.4	842	3,324.7	14,888
Medium Density A (MDA-R)	2,259.2	17,961	176.6	1,325	2,435.8	19,286
Medium Density B (MDB-R)	653.1	8,164	16.4	205	669.5	8,369
Medium Density C (MDC-R)	239.6	4,313	4.6	83	244.2	4,396
High Density Residential (HD-R)	132.3	3,301	22.1	530	154.4	3,831
Urban High Density (UHD-R)	27.9	1,004	3.7	133	31.6	1,137
Low Density Coastal (C-RL)	124.2	869	20.3	142	144.5	1,011
Medium Density Coastal (CRM)	5.4	194	0.0	0	5.4	194
High Density Coastal (C-RH)	170.3	6,131	30.3	1,091	200.6	7,222
Mixed High Density	10.9	76	0.2	1	11.1	77
Community Commercial (CC)	299.4	3,912,559	88.7	1,159,132	388.1	5,071,691
Neighborhood Commercial	124.8	1,630,886	19.2	250,906	144.0	1,881,792
General Commercial	144.7	1,890,940	33.3	435,164	178.0	2,326,104
Special Commercial	217.0	2,835,756	33.9	443,005	250.9	3,278,761
Professional Commercial	112.6	1,471,457	42.3	552,776	154.9	2,024,233
General Commercial Coastal	69.4	2,267,298	20.8	679,536	90.2	2,946,834
Commercial Visitor Lodging	32.4	1,058,508	1.2	39,204	33.6	1,097,712
Private Institutional	264.5	3,456,486	65.0	849,420	329.5	4,305,906
General Industrial	135.6	2,953,368	26.6	579,348	162.2	3,532,716
Light Industrial	774.9	16,877,322	205.4	4,473,612	980.3	21,350,934
Light Industrial Coastal & C-TU	9.4	204,732	0.9	19,602	10.3	224,334
Downtown - Residential	95.2	3,426	5.5	179,685	100.7	183,111
Downtown - Commercial	47.6	1,554,439	2.8	91,476	50.4	1,645,915
Downtown - Lodging	95.2	3,108,877	5.6	182,952	100.8	3,291,829
Harbor	101.2	1,542,895	0.0	0	101.2	1,542,895
Master Plan Overlay	483.2	15,786,144	1.4	45,738	484.6	15,831,882
Specific Plan - 1-84 Rancho Del Oro	1,017.1	22,152,438	177.0	3,855,060	1,194.1	26,007,498
Specific Plan - 2-84 Del Oro Hills	252.1	5,490,738	8.8	191,664	260.9	5,682,402
Specific Plan - 3-84	49.2	1,071,576	0.0	0	49.2	1,071,576
El Corazon Park - Mixed Use	421.4	5,268	55.0	1,197,900	476.4	1,203,168
Total - City Limits	14,299.9		2,174.4		16,474.3	

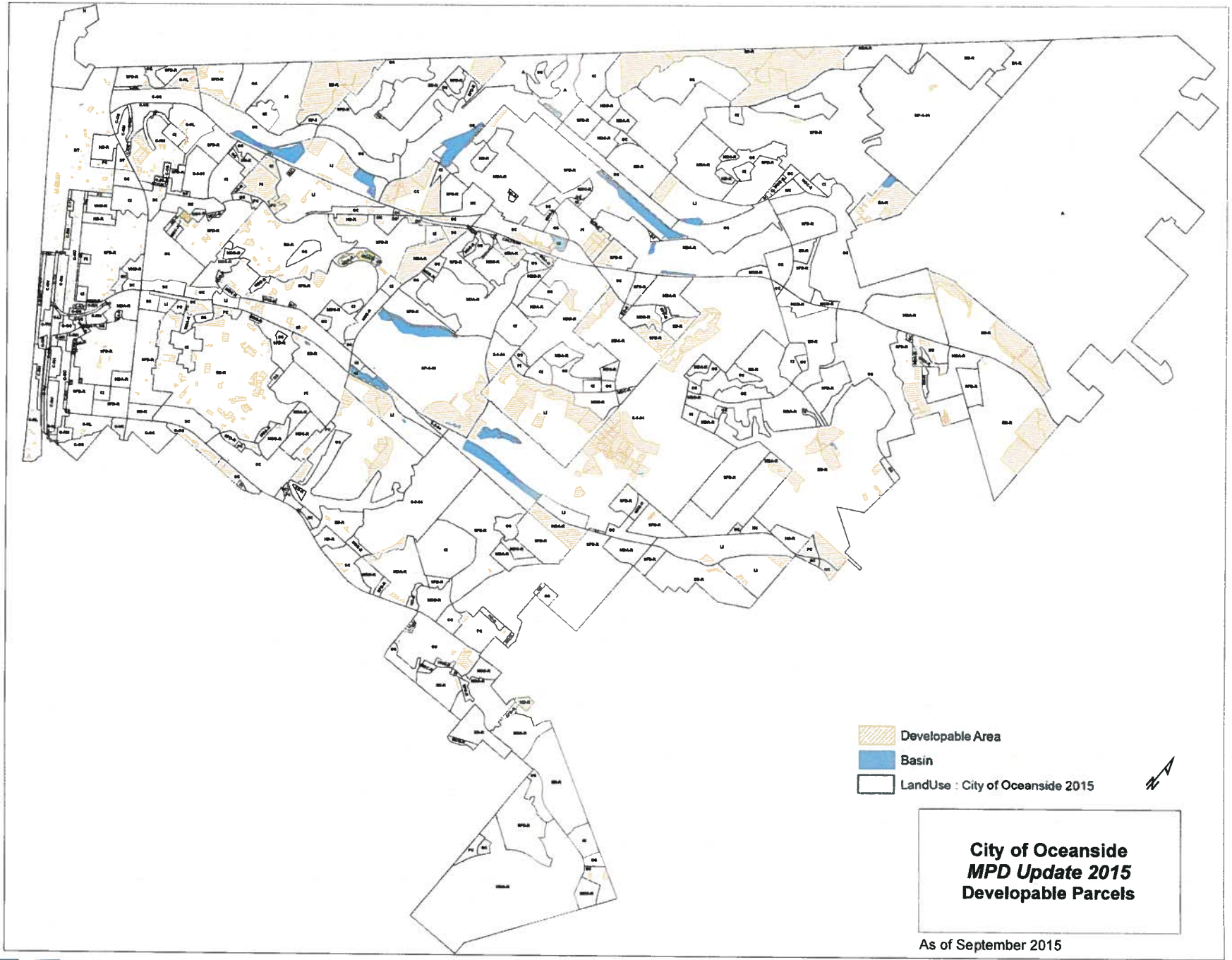

Developable Area
Basin
LandUse : City of Oceanside 2015
City of Oceanside
MPD Update 2015
Developable Parcels
As of September 2015

Table 9
Land Use Groupings

City of Oceanside General and Coastal Plan Land Use Grouped by Proposed DIF Category		Existing Development / Not Devopable	Potential Development	Total Land Use
		Acres	Acres	Acres
Estate Density Dwellings				
EA-R	Estate A Residential (0.5 - 0.9 DU/A)	67.0	56.5	123.5
EB-R	Estate B Residential (1.0 - 3.5)	2,706.7	881.9	3,588.6
		2,773.7	**938.4**	**3,712.1**
Low Density Dwellings				
SFD-R	Single Family Detached Residential (3.6 - 5.9)	3,156.3	168.4	3,324.7
MDA-R	Medium Density - A Residential (6.0 - 9.9)	2,259.2	176.6	2,435.8
C-RL	Low Density Residential (coastal), R-1	124.2	20.3	144.5
C-RMHT	Mixed High Density & Trans. Res. (coastal)	10.9	0.2	11.1
		5,550.6	**365.5**	**5,916.1**
High Density Dwellings				
MDB-R	Medium Density - B Residential (10.0 - 15.0)	653.1	16.4	669.5
MDC-R	Medium Density - C Residential (15.1 - 20.9)	239.6	4.6	244.2
		892.7	**21.0**	**913.7**
Attached Dwellings				
HD-R	High Density Residential (21.0 - 28.9)	132.3	22.1	154.4
UHD-R	Urban High Density Residential (29.0 - 43.0)	27.9	3.7	31.6
C-RM	Medium Density Residential (coastal), R-2	5.4	0	5.4
C-RH	High Density Residential (coastal), R-3	170.3	30.3	200.6
		335.9	**56.1**	**392.0**
Commercial Uses				
CC	Community Commercial	299.4	88.7	388.1
NC	Neighborhood Commercial	124.8	19.2	144.0
GC	General Commercial	144.7	33.3	178.0
SC	Special Commercial	217.0	33.9	250.9
PC	Professional Commercial	112.6	42.3	154.9
S-1-84	Specific Plan (LI,SDR-R,EB-R,CC), Rancho Del Oro	1,017.1	177.0	1,194.1
S-2-84	Specific Plan (SFD-R,HD-R,MDC-R), Del Oro Hills	252.1	8.8	260.9
S-3-84	Specific Plan (MDA-R,MDB-R)	49.2	0	49.2
SP-1-09	El Corazon (Park, Habitat, Mixed use)	421.4	55.0	476.4
		2,638.3	**458.2**	**3,096.5**
Commercial Coastal Uses				
C-GC	General Commercial (coastal)	69.4	20.8	90.2
C-VC	Commercial Visitor (coastal)	32.4	1.2	33.6
		101.8	**22.0**	**123.8**
Industrial Uses				
GI	General Industrial	135.6	26.6	162.2
LI	Light Industrial	774.9	205.4	980.3
C-LI	Light Industrial (coastal)	9.7	0.9	10.6
		920.2	**232.9**	**1,153.1**
Downtown/Harbor Uses				
DT	Downtown	237.8	13.9	251.7
H	Harbor	101.2	0	101.2
		339.0	**13.9**	**352.9**
Private Institutional Uses				
PI	Private Institutional	**264.5**	**65.0**	**329.5**
Master Plan Overlay Uses				
MP-1-96	Master Plan Overlay District (EA-R,SFD-R,MDA-R,EB-R)	**483.2**	**1.4**	**484.6**
Total for DIF Categories		**14,299.9**	**2,174.4**	**16,474.3**
Not Used in DIF Categories				
	Open Space, Agriculture, Civic, Transportation	6,725.0	9.1	6,734.1
TOTAL CITY		**21,024.9**	**2,183.5**	**23,208.4**

Unit Costs

The unit costs for this study were based on the 2013 MPD. Using the Engineering News Record Construction Cost Index, the unit costs were increased 16.6% from January 2013 to January 2015.

Table 10
Estimated Unit Costs

January 2013 (ENR CCI 9,437)		January 2015 (ENR CCI 10,999) 16.55% Increase	
Size	**Unit Cost**	**Size**	**Unit Cost (rounded)**
Reinforced Concrete Pipe (RCP)			
36"	$530/LF	36"	$620/LF
42	620	42	720
48	720	48	840
54	800	54	930
60	870	60	1,010
66	920	66	1,070
72	990	72	1,150
78	1,040	78	1,210
84	1,120	84	1,310
90	1,160	90	1,350
96	1,220	96	1,420
Parallel 30	500	Parallel 30	580
Parallel 36	530	Parallel 36	620
Parallel 60	870	Parallel 60	1,010
Double 36	930	Double 36	1,080
Reinforced Concrete Box (RCB), H x W			
Double 3' x 6'	1,390	Double 3' x 6'	1,620
Double 3' x 8'	1,730	Double 3' x 8'	2,020
Triple 5' x 8'	2,700	Triple 5' x 8'	3,150
5' x 8'	1,080	5' x 8'	1,260
6' x 8'	1,170	6' x 8'	1,360
2.5' x 4'	620	2.5' x 4'	720
2.5' x 5'	720	2.5' x 5'	840
2' x 6'	800	2' x 6'	930
2.5' x 6.5'	810	2.5' x 6.5'	940
2' x 7'	820	2' x 7'	960
2' x 8'	840	2' x 8'	980
4' x 8'	980	4' x 8'	1,140
Concrete Channel, D x W			
2' x 3' trapezoid	420	2' x 3' trapezoid	490
3 'x 8' rectangular	460	3 'x 8' rectangular	540

Storm Drain Facility Costs

Based on the above unit costs, storm drain facilities costs are summarized below by project number. The MPD 2013 estimated costs are shown along with the 2015 escalated costs.

Table 11
Estimated Project Costs

MPD Storm Drain Facility ID	MPD Atlas Page	Existing Facility			Recommended Size to Convey 100-year Storm	Estimated Upgrade Cost	
		Facility Type	Size (Inches)	Length (feet)		2013	2015
PO-18	A	RCP	36	285	42	$176,700	$205,200
PO-19	A	RCP	30	584	36	$309,520	$362,080
PO-22	A	RCP	36	52	66	$47,840	$55,640
PO-23	A	RCP	36	364	66	$334,880	$389,480
PO-24	A	RCP	36	139	66	$127,880	$148,730
PO-26	A	RCP	36	325	66	$299,000	$347,750
PO-27	A	RCP	30	52	48	$37,440	$43,680
PO-36	A	RCP	36	338	48	$243,360	$283,920
PO-37	A	RCP	36	756	48	$544,320	$635,040
PO-38	A	RCP	36	384	48	$276,480	$322,560
PO-39	A	RCP	30	301	36	$159,530	$186,620
PO-900	A	RCP	New	420	48	$302,400	$352,800
PO-901	A	RCP	New	10	42	$6,200	$7,200
PO-902	A	RCP	New	16	48	$11,520	$13,440
					SD-01/02 Total	**$2,877,070**	**$3,354,140**
PC-149	D	CIPP	30	498	Parallel 30	$249,000	$288,840
PC-200	D	CIPP	30	552	Parallel 30	$276,000	$320,160
					SD-03 Total	**$525,000**	**$609,000**
LAC-528	F	RCP	30	1,200	2' x 3' Trap.	$504,000	$588,000
LAC-529	F	RCP	30	22	2.5' x 6.5'	$17,820	$20,680
LAC-530	F	CMP	24	74	2.5' x 6.5'	$59,940	$69,560
LAC-900	F	RCP	New	440	36	$233,200	$272,800
LAC-901	F	RCP	New	570	42	$353,400	$410,400
					SD-04 Total	**$1,168,360**	**$1,361,440**
LAC-499	F	RCP	30	40	2.5' x 4'	$24,800	$28,800
LAC-500	F	RCP	30	31	2.5' x 4'	$19,220	$22,320
LAC-501	F	RCP	30	204	2.5' x 5'	$146,880	$171,360
LAC-502	F	RCP	30	68	2.5' x 5'	$48,960	$57,120
LAC-503	F	RCP	30	18	2.5' x 5'	$12,960	$15,120
LAC-727	F	Open channel	3' deep	207	3 'x 8' Channel	$95,220	$111,780
					SD-05 Total	**$348,040**	**$406,500**

MPD Storm Drain Facility ID	MPD Atlas Page	Existing Facility			Recommended Size to Convey 100-year Storm	Estimated Upgrade Cost	
		Facility Type	Size (inches)	Length (feet)		2013	2015
LAC-489	G	CMPE	38 x 57	451	66	$414,920	$482,570
LAC-490	G	RCP	36	62	54	$49,600	$57,660
LAC-717	G	CMPE	27 x 43	29	54	$23,200	$26,970
LAC-718	G	CMPE	38 x 57	718	60	$624,660	$725,180
LAC-719	G	CMPE	27 x 43	42	66	$38,640	$44,940
LAC-902	G	RCP	24	328	48	$236,160	$275,520
LAC-903	G	RCP	18	36	48	$25,920	$30,240
LAC-904	G	RCP	New	180	36	$95,400	$111,600
LAC-905	G	RCP	24	41	36	$21,730	$25,420
					SD-06 Total	**$1,530,230**	**$1,780,100**
SLR-724	G	RCB	2' x 3'	90	2' x 7'	$73,800	$86,400
SLR-728	G	CMP	22 x 36	195	2' x 6'	$156,000	$181,350
SLR-729	G	RCB	2' x 5'	231	2' x 8'	$194,040	$226,380
SLR-730	G	RCB	3' x 4'	36	4' x 8'	$35,280	$41,040
					SD-07 Total	**$429,120**	**$535,170**
BVC-81	L	CIPP	48	100	66	$92,000	$107,000
BVC-82	L	CIPP	48	106	66	$97,520	$113,420
BVC-85	L	CIPP	48	334	66	$307,280	$357,380
BVC-102	L	RCP	42	47	66	$43,240	$50,290
					SD-10 Total	**$540,040**	**$628,090**
BVC-229	L	CIPP	72	390	Parallel 60	$339,300	$393,900
BVC-230	L	CIPP	66	380	Parallel 60	$330,600	$383,800
BVC-252	L	CIPP	42	361	48	$259,920	$303,240
BVC-253	L	RCP	36	346	48	$249,120	$290,640
BVC-254	L	CIPP	42	90	48	$64,800	$75,600
BVC-255	L	CIPP	42	87	48	$62,640	$73,080
BVC-256	M	RCP	36	302	48	$217,440	$253,680
BVC-355	L	CIPP	60	116	Parallel 60	$100,920	$117,160
BVC-257	M	RCP	36	333	48	$239,760	$279,720
BVC-258	M	RCP	36	280	Parallel 36	$148,400	$173,600
BVC-259	M	RCP	30	376	Double 36	$349,680	$406,080
BVC-900	M	RCP	24	94	36	$49,820	$58,280
					SD-12/13 Total	**$2,412,400**	**$2,808,780**
LAC-A	F	Outlet Weir			Design	$141,000	$164,340
					SD-16 Total	**$141,000**	**$164,340**
SLR-866	A	RCP	33	247	48	$177,840	$207,480
					A-1 Total	**$177,840**	**$207,480**
SLR-707	C	RCP	30	183	42	$113,460	$131,760
					C-1 Total	**$113,460**	**$131,760**
PC-179	C	RCP	36	213	42	$132,060	$153,360
					C-2 Total	**$132,060**	**$153,360**

MPD Storm Drain Facility ID	MPD Atlas Page	Existing Facility			Recommended Size to Convey 100-year Storm	Estimated Upgrade Cost	
		Facility Type	Size (inches)	Length (feet)		2013	2015
PO-10	F	RCP	48	111	54	$88,800	$103,230
PO-11	F	CIPP	48	26	66	$23,920	$27,820
PO-13	F	CIPP	42	450	48	$324,000	$378,000
PO-15	F	CIPP	48	85	54	$68,000	$79,050
PO-16	F	RCP	48	61	54	$48,800	$56,730
PO-9	F	RCP	42	41	48	$29,520	$34,440
					F-1 Total	**$583,040**	**$679,270**
LAC-689	F	RCP	30	150	42	$93,000	$108,000
					F-2 Total	**$93,000**	**$108,000**
LAC-601	F	RCP	54	237	60	$206,190	$239,370
LAC-602	F	RCP	54	109	60	$94,830	$110,090
LAC-603	F	RCP	48	242	60	$210,540	$244,420
LAC-604	F	RCP	48	139	72	$137,610	$159,850
LAC-605	F	RCP	54	306	60	$266,220	$309,060
LAC-606	F	RCP	54	214	72	$211,860	$246,100
					F-3 Total	**$1,127,250**	**$1,308,890**
LAC-617	F	RCP	30	140	36	$74,200	$86,800
					F-4 Total	**$74,200**	**$86,800**
LAC-557	F	RCP	60	152	66	$139,840	$162,640
LAC-558	F	RCP	60	607	78	$631,280	$734,470
LAC-559	F	RCP	60	200	66	$184,000	$214,000
LAC-562	F	RCP	72	325	78	$338,000	$393,250
LAC-563	F	RCP	72	342	78	$355,680	$413,820
LAC-565	F	Single Box Culvert	5' x 6'	43	5' x 8'	$46,440	$54,180
LAC-570	F	Single Box Culvert	5' x 6'	142	5' x 8'	$153,360	$178,920
LAC-572	F	RCP	36	30	42	$18,600	$21,600
LAC-578	F	Parallel RCPs	24	99	60	$86,130	$99,990
LAC-579	F	Parallel RCPs	24	99	60	$86,130	$99,990
LAC-630	F	Double Box Culvert	3' x 5 ' each	76	Double 3' x 8'	$131,480	$153,520
LAC-634	F	Single Box Culvert	5' x 6'	187	5' x 8'	$201,960	$235,620
LAC-636	F	Parallel CMPEs	42	78	48	$56,160	$65,520
LAC-637	F	Parallel CMPEs	27	78	36	$41,340	$48,360
LAC-638	F	Parallel CMPEs	42	78	48	$56,160	$65,520
LAC-639	F	Parallel CMPEs	27	78	36	$41,340	$48,360
LAC-730	F	Concrete Channel	48 deep	674	54	$539,200	$626,820
					F-5 Total	**$3,107,100**	**$3,616,580**
LAC-587	F	RCP	36	138	42	$85,560	$99,360
					F-6 Total	**$85,560**	**$99,360**

MPD Storm Drain Facility ID	MPD Atlas Page	Existing Facility			Recommended Size to Convey 100-year Storm	Estimated Upgrade Cost	
		Facility Type	Size (inches)	Length (feet)		2013	2015
LAC-504	F	RCP	36	40	42	$24,800	$28,800
LAC-505	F	RCP	36	56	48	$40,320	$47,040
LAC-507	F	RCP	36	87	48	$62,640	$73,080
					F-7 Total	**$127,760**	**$148,920**
SLR-738	G	RCP	30	37	54	$29,600	$34,410
					G-1 Total	**$29,600**	**$34,410**
GC-191	G	Trap channel under road	54 deep	31	Design	$90,000	$104,900
					G-2 Total	**$90,000**	**$104,900**
SLR-861	G	Double Box Culvert	2' x 5' each	54	Double 3' x 6'	$75,060	$87,480
SLR-863	G	Single Box Culvert	2 'x 6'	75	Double 3' x 6'	$104,250	$121,500
					G-3 Total	**$179,310**	**$208,980**
SLR-732	G	RCP	30	160	60	$139,200	$161,600
					G-4 Total	**$139,200**	**$161,600**
GC-170	H	RCP	60	208	96	$253,760	$295,360
GC-178	H	CIPP	66	171	96	$208,620	$242,820
					H-1 Total	**$462,380**	**$538,180**
SLR-845	H	RCP	36	36	42	$22,320	$25,920
SLR-909	H	RCP	48	249	54	$199,200	$231,570
					H-2 Total	**$221,520**	**$257,490**
GC-97	H	RCP	36	280	72	$277,200	$322,000
GC-98	H	RCP	36	325	60	$282,750	$328,250
GC-99	H	RCP	36	50	60	$43,500	$50,500
					H-3 Total	**$603,450**	**$700,750**
SLR-556	H	RCP	36	148	48	$106,560	$124,320
SLR-558	H	RCP	36	443	48	$318,960	$372,120
SLR-559	H	RCP	30	160	42	$99,200	$115,200
SLR-560	H	RCP	30	104	36	$55,120	$64,480
SLR-603	H	RCP	36	66	42	$40,920	$47,520
					H-4 Total	**$620,760**	**$723,640**
SLR-563	H	RCP	30	328	48	$236,160	$275,520
					H-5 Total	**$236,160**	**$275,520**
SLR-885	H	Unknown	30	530	36	$280,900	$328,600
					H-6 Total	**$280,900**	**$328,600**
SLR-379	H	RCP	60	264	66	$242,880	$282,480
					H-7 Total	**$242,880**	**$282,480**

MPD Storm Drain Facility ID	MPD Atlas Page	Existing Facility			Recommended Size to Convey 100-year Storm	Estimated Upgrade Cost	
		Facility Type	Size (inches)	Length (feet)		2013	2015
SLR-678	H	RCP	30	98	42	$60,760	$70,560
SLR-679	H	RCP	30	98	42	$60,760	$70,560
SLR-680	H	RCP	30	98	42	$60,760	$70,560
SLR-681	H	Parallel RCPs	24	98	48	$70,560	$82,320
SLR-685	H	Parallel RCPs	24	98	48	$70,560	$82,320
					H-8 Total	**$323,400**	**$376,320**
SLR-300	I	RCP	48	468	60	$407,160	$472,680
SLR-311	H	RCP	36	346	42	$214,520	$249,120
					H-9 Total	**$621,680**	**$721,800**
SLR-319	H	RCP	30	289	36	$153,170	$179,180
SLR-320	I	RCP	30	246	36	$130,380	$152,520
SLR-321	I	RCP	30	257	42	$159,340	$185,040
					H-10 Total	**$442,890**	**$516,740**
SLR-188	I	RCP	30	232	36	$122,960	$143,840
SLR-424	I	RCP	30	216	42	$133,920	$155,520
					I-1 Total	**$256,880**	**$299,360**
SLR-120	I	RCP	48	54	84	$60,480	$70,740
SLR-121	I	RCP	36	37	54	$29,600	$34,410
SLR-122	I	RCP	30	253	36	$134,090	$156,860
SLR-123	I	RCP	30	219	42	$135,780	$157,680
SLR-124	I	RCP	60	522	66	$480,240	$558,540
SLR-125	I	RCP	60	537	66	$494,040	$574,590
SLR-127	I	RCP	60	97	66	$89,240	$103,790
SLR-288	I	RCP	30	296	36	$156,880	$183,520
SLR-289	I	RCP	30	197	36	$104,410	$122,140
SLR-90	I	CIPP	72	233	78	$242,320	$281,930
SLR-92	I	CIPP	72	258	78	$268,320	$312,180
					I-2 Total	**$2,195,400**	**$2,556,380**
SLR-155	I	RCP	66	428	72	$423,720	$492,200
SLR-158	I	RCP	60	275	66	$253,000	$294,250
					I-3 Total	**$676,720**	**$786,450**
SLR-72	I	RCP	33	181	42	$112,220	$130,320
					I-4 Total	**$112,220**	**$130,320**
SLR-51	J	Parallel RCPs	42	100	48	$72,000	$84,000
SLR-52	J	Parallel RCPs	42	100	48	$72,000	$84,000
					J-1 Total	**$144,000**	**$168,000**
BVC-89	K	RCP	36	128	48	$92,160	$107,520
					K-2 Total	**$92,160**	**$107,520**

MPD Storm Drain Facility ID	MPD Atlas Page	Existing Facility			Recommended Size to Convey 100-year Storm	Estimated Upgrade Cost	
		Facility Type	Size (inches)	Length (feet)		2013	2015
BVC-109	L	RCP	30	273	48	$196,560	$229,320
					L-1 Total	**$196,560**	**$229,320**
BVC-138	L	SRSP	72	496	84	$555,520	$649,760
BVC-139	L	SRSP	72	311	84	$348,320	$407,410
BVC-140	L	SRSP	72	193	84	$216,160	$252,830
BVC-141	L	SRSP	72	503	84	$563,360	$658,930
					L-2 Total	**$1,683,360**	**$1,968,930**
BVC-198	L	RCP	48	96	54	$76,800	$89,280
BVC-199	L	RCP	48	17	60	$14,790	$17,170
					L-3 Total	**$91,590**	**$106,450**
BVC-224	L	CIPP	36	248	42	$153,760	$178,560
					L-4 Total	**$153,760**	**$178,560**
BVC-179	L	RCP	30	225	36	$119,250	$139,500
					L-5 Total	**$119,250**	**$139,500**
BVC-247	L	RCP	30	143	36	$75,790	$88,660
BVC-248	L	RCP	30	151	36	$80,030	$93,620
BVC-264	P	RCP	42	127	48	$91,440	$106,680
BVC-282	L	RCP	30	351	36	$186,030	$217,620
BVC-283	L	RCP	33	380	36	$201,400	$235,600
					L-6 Total	**$634,690**	**$742,180**
LAC-193	L	Rock Lined Channel	60 deep	323	Design	$300,000	$349,650
					L-7 Total	**$300,000**	**$349,650**
BVC-236	L	CIPP	30	37	36	$19,610	$22,940
BVC-237	L	CIPP	30	162	36	$85,860	$100,440
BVC-238	M	CIPP	30	241	36	$127,730	$149,420
BVC-239	M	CIPP	30	271	36	$143,630	$168,020
BVC-243	M	RCP	30	50	42	$31,000	$36,000
					L-8 Total	**$407,830**	**$476,820**
LAC-422	M	RCP	30	147	36	$77,910	$91,140
					M-1 Total	**$77,910**	**$91,140**
LAC-149	M	CIPP	36	78	42	$48,360	$56,160
LAC-150	M	CIPP	36	194	42	$120,280	$139,680
LAC-247	M	Triple Box Culvert	5' x 6' ea	53	Triple 5' x 8'	$143,100	$166,950
					M-2 Total	**$311,740**	**$362,790**
LAC-70	M	CIPP	48	414	54	$331,200	$385,020
LAC-75	M	CP	48	354	54	$283,200	$329,220
LAC-76	M	CP	48	233	78	$242,320	$281,930
					M-3 Total	**$856,720**	**$996,170**

MPD Storm Drain Facility ID	MPD Atlas Page	Existing Facility			Recommended Size to Convey 100-year Storm	Estimated Upgrade Cost	
		Facility Type	Size (inches)	Length (feet)		2013	2015
LAC-43	M	RCP	30	124	42	$76,880	$89,280
LAC-44	M	RCP	30	45	36	$23,850	$27,900
LAC-45	M	RCP	30	183	36	$96,990	$113,460
LAC-46	M	RCP	30	33	36	$17,490	$20,460
					M-4 Total	**$215,210**	**$251,100**
SLR-267	N	CIPP	30	337	36	$178,610	$208,940
					N-1 Total	**$178,610**	**$208,940**
SLR-42	O	Unknown	36	100	42	$62,000	$72,000
SLR-7	O	RCP	36	664	42	$411,680	$478,080
					O-1 Total	**$473,680**	**$550,080**
BVC-287	P	CMP	72	57	78	$59,280	$68,970
BVC-289	P	CMP	72	709	78	$737,360	$857,890
					P-1 Total	**$796,640**	**$926,860**
BVC-330	P	RCP	48	210	54	$168,000	$195,300
					P-2 Total	**$168,000**	**$195,300**
AH-1	P	RCP	30	29	36	$15,370	$17,980
AH-2	P	RCP	30	115	36	$60,950	$71,300
					P-3 Total	**$76,320**	**$89,280**
AH-10	P	RCP	60	174	66	$160,080	$186,180
					P-4 Total	**$160,080**	**$186,180**
BVC-126	P	RCP	30	72	42	$44,640	$51,840
BVC-127	P	RCP	30	118	36	$62,540	$73,160
BVC-129	P	RCP	30	40	48	$28,800	$33,600
BVC-134	P	RCP	30	112	36	$59,360	$69,440
BVC-136	P	RCP	36	355	42	$220,100	$255,600
					P-5 Total	**$415,440**	**$483,640**
AH-98	Q	RCP	30	276	36	$146,280	$171,120
					Q-1 Total	**$146,280**	**$171,120**
					TOTAL	**$31,057,710**	**$36,171,430**