Sewer Capacity Study

For
Whittier Blvd. Mixed Use Development
(Site A)
4169 Whittier Blvd.
Los Angeles, CA 90023

P.C. 12342AS

March 2017

Prepared for:
Meta Housing Corp.
1640 S Sepulveda Blvd. Suite 425
Los Angeles, CA 90025
Tel: (310) 575-3543
Contact: Tim Soule

Prepared by:
DK Engineer, Corp.
724 S Spring St. #304
Los Angeles, CA 90014
Tel: (909) 559-7361
Contact: Matt Plourde
1. Introduction

This Study analyzes the Capacity of LA County owned sanitary sewer lines in the east Los Angeles area. The analysis will start at the beginning of the sewer line nearest the project and will end at the connection to the trunk sewer line owned by LA County Sanitation District. This study will consider all tributary areas which connect with the sewer line we anticipate connecting to. The goal of this study is to show that the proposed project will not have a negative impact on the existing sewer infrastructure and no sewers will flow above their designed depth.

2. Site Description

The project site is located on the northwest corner of the intersection of Downey Rd. and Whittier Blvd. The site consists of 2 parcels which together are 0.69 acres. The first parcel is a vacant concrete paved lot. The second parcel consists of a small commercial building and an office. All existing items onsite will be demolished as part of this project.

3. Project Description

The proposed development is a 3-story mixed-use building with 42 apartments and a small retail space on the ground floor. Of the 42 apartments 24 will be studio apartments, 13 will be 1 bedroom and 5 will be 2 bedroom apartments. There will also be parking on the 1st floor with a partial subterranean garage. See Appendix D for floor plans.

Per Los Angeles County Public Works’ Estimated Average Daily Sewage Flows, each studio apartment will add 150 GPD, each 1 bedroom apartment will add 200 GPD, each 2 bedroom 250 GPD and the retail spaces will add 100 GPD per 1000 SF. See appendix F for Estimated Flows.

4. Capacity Analysis Criteria

For the purposes of this study we were asked to model the flow in the sewer line we wish to connect to from the beginning of the line to where the line connects with the county trunk sewer. The model will consider all tributary areas that the sewer serves. Existing flows in the sewer will be determined by Los Angeles County Public Works estimates for land use types. See Appendix F for the estimated average daily sewage flows for various occupancies.

Per the as-builts all mains are made of cement pipe (n=0.013). Each time a new tributary area connects with the sewer main the new flow will be compared against the downstream line with the mildest slope. All flows will be evaluated using Kutter’s Formula and Chart S-C4 from the LA County Design Manual. See Appendix B for the as-builts of the sewer lines leading from the sites to the trunk sewer.
5. Existing Sewer System Description

The upstream manhole for the sewer shed begins on Downey Rd. just south of Hubbard St. (MH 532). This 8” sewer flows to the south at 2.04% and 3.20% and connects with a main along Whittier Blvd. This 8” sewer then flows westerly at 0.40% and connects with a county trunk sewer on Bonnie Beach Pl.

Refer to Appendix A for the LA County Sewer Map of existing sewer lines. Refer to Appendix D for the Tributary Area and Appendix E for the Zoning Map indicating acreage and zoning.

6. Proposed Sewer System Description

The project will discharge to the 8” main running along Downey Rd. between MH 24 and MH 23.

7. Tributary Areas

Tributary areas for this study were determined based on the As-Built plans and the LA County Land Assessor maps. For the purposes of this study only the sewer lines which will directly receive flow from the proposed projects are considered. Other lines which drain to mains downstream of the projects are shown for reference only, flows from these lines will be added as part of the analysis of the capacity study. Existing flows based on this procedure are shown in Table 1 below.

See Appendix C for the LA County Land Assessor Maps and Appendix D for the overall tributary area breakdown.
8. Capacity Analysis

Size and slope of all lines from the property to the trunk sewer were obtained from Los Angeles County Public Works as-built plans. Capacity in these lines will be analyzed using Kutter’s Formula and the zoning factors from LA County:

\[ Q = ZA \]

Where:  
\( Q \) = Sewer Discharge (CFS)  
\( Z \) = Zoning Coefficient (CFS/Acre)  
\( A \) = Area (Acres)

<table>
<thead>
<tr>
<th>Existing Flow at Trunk Sewer Connection</th>
<th>Proposed Flow at Trunk Sewer Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative Flow</td>
<td>Cumulative Flow</td>
</tr>
<tr>
<td>0.04206 CFS</td>
<td>0.07826</td>
</tr>
<tr>
<td>Cumulative Depth</td>
<td>Cumulative Depth</td>
</tr>
<tr>
<td>1.34 in</td>
<td>1.82 in</td>
</tr>
<tr>
<td>Percent Full</td>
<td>Percent Full</td>
</tr>
<tr>
<td>33.50%</td>
<td>45.50%</td>
</tr>
</tbody>
</table>

See Appendix G for full pipe capacity calculations.

The flows from the proposed project site are estimated using LA County Loading Classes for the building uses and a peaking factor of 2.5. The table below shows the total peak flow from the project site. This peak flow is added to the existing flow in the sewers to determine if the project will have any negative impacts on the sewer mains.

<table>
<thead>
<tr>
<th>Site A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units</td>
</tr>
<tr>
<td>Studio</td>
</tr>
<tr>
<td>1 BDR</td>
</tr>
<tr>
<td>2 BDR</td>
</tr>
<tr>
<td>Retail</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

9. Conclusion

Based on our analysis all pipe flows are less than 100% full downstream from the proposed project. Once the proposed peak flow from the site is added in the sewers remain well below the 100% full threshold. Based on this analysis it is assumed the existing sewer infrastructure has capacity for the project. See Appendix G for the calculated results.
Appendix A – LA County Sewer Map
Appendix C – Land Assessor Maps
Appendix D – Proposed Floor Plans
NOTE - ROOM NAMES

REFER TO (A4.01 & A4.02) TYPICAL UNIT PLANS FOR UNIT ROOM NAMES.
NOTE - ROOM NAMES

REFER TO A4.01 & A4.02 TYPICAL UNIT PLANS FOR UNIT ROOM NAMES
Appendix E – Zoning Map
See following sheet for Open Space Zoning of Cemetery
Appendix F – Loading Classes
## Estimated Average Daily Sewage Flows for Various Occupancies

<table>
<thead>
<tr>
<th>Occupancy</th>
<th>Abbreviation</th>
<th>*Average daily flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartment Buildings:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor or Single dwelling units</td>
<td>Apt</td>
<td>100 gal/D.U. ( \rightarrow 150 )</td>
</tr>
<tr>
<td>1 bedroom dwelling units</td>
<td>Apt</td>
<td>150 gal/D.U. ( \rightarrow 200 )</td>
</tr>
<tr>
<td>2 bedroom dwelling units</td>
<td>Apt</td>
<td>200 gal/D.U. ( \rightarrow 250 )</td>
</tr>
<tr>
<td>3 bedroom or more dwelling units</td>
<td>Apt</td>
<td>250 gal/D.U. ( \rightarrow \text{use } 300 \text{ GPD per } 3 \text{ APD} )</td>
</tr>
<tr>
<td>Auditoriums, churches, etc.</td>
<td>Aud</td>
<td>5 gal/seat</td>
</tr>
<tr>
<td>Automobile parking</td>
<td>P</td>
<td>25 gal/1000 sq ft gross floor area</td>
</tr>
<tr>
<td>Bars, cocktail lounges, etc.</td>
<td>Bar</td>
<td>20 gal/seat</td>
</tr>
<tr>
<td>Commercial Shops &amp; Stores</td>
<td>CS</td>
<td>100 gal/1000 sq ft gross floor area</td>
</tr>
<tr>
<td>Hospitals (surgical)</td>
<td>HS</td>
<td>500 gal/bed</td>
</tr>
<tr>
<td>Hospitals (convalescent)</td>
<td>HC</td>
<td>85 gal/bed</td>
</tr>
<tr>
<td>Hotels</td>
<td>H</td>
<td>150 gal/room</td>
</tr>
<tr>
<td>Medical Buildings</td>
<td>MB</td>
<td>300 gal/1000 sq ft gross floor area</td>
</tr>
<tr>
<td>Motels</td>
<td>M</td>
<td>150 gal/unit</td>
</tr>
<tr>
<td>Office Buildings</td>
<td>Off</td>
<td>200 gal/1000 sq ft gross floor area</td>
</tr>
<tr>
<td>Restaurants, cafeterias, etc.</td>
<td>R</td>
<td>50 gal/seat</td>
</tr>
<tr>
<td>Schools:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary or Jr. High</td>
<td>S</td>
<td>10 gal/student</td>
</tr>
<tr>
<td>High Schools</td>
<td>HS</td>
<td>15 gal/student</td>
</tr>
<tr>
<td>Universities or Colleges</td>
<td>U</td>
<td>20 gal/student</td>
</tr>
<tr>
<td>College Dormitories</td>
<td>CD</td>
<td>85 gal/student</td>
</tr>
</tbody>
</table>

*Multiply the average daily flow by 2.5 to obtain the peak flow

## Zoning Coefficients

<table>
<thead>
<tr>
<th>Zone</th>
<th>Coefficient (cfs/Acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>0.001</td>
</tr>
<tr>
<td>Residential*</td>
<td></td>
</tr>
<tr>
<td>R-1</td>
<td>0.004</td>
</tr>
<tr>
<td>R-2</td>
<td>0.008</td>
</tr>
<tr>
<td>R-3</td>
<td>0.012</td>
</tr>
<tr>
<td>R-4</td>
<td>0.016*</td>
</tr>
<tr>
<td>Commercial:</td>
<td></td>
</tr>
<tr>
<td>C-1 through C-4</td>
<td>0.015*</td>
</tr>
<tr>
<td>Heavy Industrial:</td>
<td></td>
</tr>
<tr>
<td>M1 through M-4</td>
<td>0.021*</td>
</tr>
</tbody>
</table>

*Individual building, commercial or industrial plant capacities shall be the determining factor when they exceed the coefficients shown

+ Use 0.001 (cfs/unit) for condominiums only
### Sewer Area Study Table (1)

#### Existing Conditions

<table>
<thead>
<tr>
<th>Street Name</th>
<th>Segment</th>
<th>Pipe</th>
<th>*Capacity</th>
<th>Area (Acres)</th>
<th>Zoning Coeff.</th>
<th>Calculated Flow (cfs)</th>
<th><strong>Cumulative Calculated Flow (cfs)</strong></th>
<th>Cumulative Depth (in)</th>
<th>PC or CI Construction Plan #</th>
<th>Comment</th>
<th>% Full</th>
<th>Cumulative Flow / Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downey Rd.</td>
<td>532</td>
<td>24</td>
<td>8</td>
<td>2.04%</td>
<td>0.79</td>
<td>0.86</td>
<td>0.01032</td>
<td>0.01032</td>
<td>0.531</td>
<td>C-1860</td>
<td>13.28%</td>
<td>1.31%</td>
</tr>
<tr>
<td>Downey Rd.</td>
<td>24</td>
<td>23</td>
<td>8</td>
<td>3.20%</td>
<td>0.99</td>
<td>0.17</td>
<td>0.00204</td>
<td>0.02016</td>
<td>0.643</td>
<td>C-1861</td>
<td>16.08%</td>
<td>2.04%</td>
</tr>
<tr>
<td>Whittier Blvd.</td>
<td>23</td>
<td>N/A</td>
<td>8</td>
<td>0.40%</td>
<td>0.35</td>
<td>1.46</td>
<td>0.0219</td>
<td>0.04206</td>
<td>1.419</td>
<td>C-1861</td>
<td>35.48%</td>
<td>12.02%</td>
</tr>
</tbody>
</table>

* Calculated using Kutter's Formula with n=0.013 (as in S-C4 graph in PC Procedural Manual)

** Based on current land use and coefficients per LA County. (Attach supporting calculations)

*** For pipes > 15" % Full should be calculated by taking the flow depth divided by 0.75 times the pipe diameter

### Sewer Area Study Table (2)

#### Proposed Conditions

<table>
<thead>
<tr>
<th>Street Name</th>
<th>Segment</th>
<th>Pipe</th>
<th>*Capacity</th>
<th>Area (Acres)</th>
<th>Zoning Coeff.</th>
<th>Calculated Flow (cfs)</th>
<th><strong>Cumulative Calculated Flow (cfs)</strong></th>
<th>Cumulative Depth (in)</th>
<th>PC or CI Construction Plan #</th>
<th>Comment</th>
<th>% Full</th>
<th>Cumulative Flow / Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downey Rd.</td>
<td>532</td>
<td>24</td>
<td>8</td>
<td>2.04%</td>
<td>0.79</td>
<td>0.86</td>
<td>0.01032</td>
<td>0.01032</td>
<td>0.531</td>
<td>C-1860</td>
<td>13.28%</td>
<td>1.31%</td>
</tr>
<tr>
<td>Downey Rd.</td>
<td>24</td>
<td>23</td>
<td>8</td>
<td>3.20%</td>
<td>0.99</td>
<td>0.17</td>
<td>0.00204</td>
<td>0.02016</td>
<td>0.643</td>
<td>C-1861</td>
<td>16.08%</td>
<td>2.04%</td>
</tr>
<tr>
<td>Whittier Blvd.</td>
<td>23</td>
<td>N/A</td>
<td>8</td>
<td>0.40%</td>
<td>0.35</td>
<td>1.46</td>
<td>0.0219</td>
<td>0.04206</td>
<td>1.419</td>
<td>C-1861</td>
<td>35.48%</td>
<td>12.02%</td>
</tr>
</tbody>
</table>

* Calculated using Kutter's Formula with n=0.013 (as in S-C4 graph in PC Procedural Manual)

** Based on current land use and coefficients per LA County. (Attach supporting calculations)

*** For pipes > 15" % Full should be calculated by taking the flow depth divided by 0.75 times the pipe diameter

Existing flow plus proposed peak flow of 0.0362 CFS
MANHOLE 532 TO MANHOLE 24

FLOW DIAGRAM FOR THE DESIGN OF CIRCULAR SANITARY SEWERS

NOTE: Based on Kutter's formulae with n = 0.013
Quantities per Ac=2.14004cfs, C=0.15cfs, H.I.=0.02cfs.

PIPE DIAMETER

NOTE: Use 15" 1/2 full for computing design capacity of new sewer system. Use 15" 3/4 full for checking capacity of exist sewer system.

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS

COUNTY ENGINEER STANDARD: S-C4

DATE: 3/60
DESIGN: ORE 10/63

Assistant Deputy

Engineer
MANHOLE 23 TO TRUNK SEWER

FLOW DIAGRAM FOR THE DESIGN OF CIRCULAR SANITARY SEWERS

NOTE: Based on Kutter’s formulae with n = 0.13
Quantities per A = 2.4 x 0.0045, C = 0.055, H.L = 0.02 c.f.s.

PIPE DIAMETER

<table>
<thead>
<tr>
<th>DIA</th>
<th>15&quot;</th>
<th>15 1/2 Full</th>
<th>16&quot;</th>
<th>16 1/2 Full</th>
<th>17&quot;</th>
<th>17 1/2 Full</th>
<th>18&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>1600</td>
<td>1.5</td>
<td>2.0</td>
<td>2.5</td>
<td>3.0</td>
<td>3.5</td>
<td>4.0</td>
<td>4.5</td>
</tr>
<tr>
<td>1200</td>
<td>1.2</td>
<td>1.6</td>
<td>2.0</td>
<td>2.4</td>
<td>2.8</td>
<td>3.2</td>
<td>3.6</td>
</tr>
<tr>
<td>1000</td>
<td>1.0</td>
<td>1.4</td>
<td>1.7</td>
<td>2.1</td>
<td>2.5</td>
<td>2.9</td>
<td>3.3</td>
</tr>
<tr>
<td>800</td>
<td>0.8</td>
<td>1.2</td>
<td>1.5</td>
<td>1.8</td>
<td>2.2</td>
<td>2.6</td>
<td>3.0</td>
</tr>
<tr>
<td>600</td>
<td>0.6</td>
<td>0.9</td>
<td>1.2</td>
<td>1.5</td>
<td>1.8</td>
<td>2.1</td>
<td>2.4</td>
</tr>
</tbody>
</table>

NOTE: USE 15" 1/2 FULL FOR COMPUTING DESIGN CAPACITY OF A NEW SEWER SYSTEM.
USE 15" 3/4 FULL FOR CHECKING CAPACITY OF EXIST. SEWER SYSTEM.

0.35 CFS
MANHOLE 532 TO 24
EXISTING FLOW

\( Q_{\text{FULL}} = 0.79 \text{ CFS} \times 2 = 1.58 \text{ CFS} \)

\( \frac{Q}{Q_{\text{FULL}}} = \frac{0.01032}{1.58} = 0.016 \)

\[ d/D = 0.066 \]

\[ d = 0.066(8) = 0.531 \text{ in} \]
MANHOLE 24 TO 23
EXISTING FLOW

$Q_{FULL} = 0.99 \text{ CFS} \times 2 = 1.98 \text{ CFS}$

$Q/Q_{FULL} = \frac{0.02016}{1.98} = 0.010$

$d/D = 0.080$

$d = 0.080(8) = 0.643 \text{ in}$
MANHOLE 23 TO Trunk
EXISTING FLOW

\[ Q_{\text{FULL}} = 0.35 \text{ CFS} \times 2 = 0.70 \text{ CFS} \]

\[ Q/Q_{\text{FULL}} = \frac{0.04206}{0.70} = 0.06 \]

\[ d/D = 0.177 \]

\[ d = 0.177(8) = 1.419 \text{ in} \]
MANHOLE 24 TO 23
PROPOSED FLOW

\[ Q_{\text{FULL}} = 0.99 \text{ CFS} \times 2 = 1.98 \text{ CFS} \]

\[ Q/Q_{\text{FULL}} = \frac{0.05636}{1.98} = 0.028 \]

\[ d/D = 0.126 \]

\[ d = 0.126(8) = 1.009 \text{ in} \]
MANHOLE 23 TO Trunk
PROPOSED FLOW

\[ Q_{\text{FULL}} = 0.35 \text{ CFS} \times 2 = 0.70 \text{ CFS} \]

\[ Q/Q_{\text{FULL}} = 0.07826/0.70 = 0.112 \]

\[ d/D = 0.2359 \]

\[ d = 0.235(8) = 1.878 \text{ in} \]
Appendix H – LA County Sanitations District Letter
February 2, 2016

Ref. Doc. No.: 3856170

Mr. Matt Plourde
Civil Engineer
DK Engineer Corp.
724 South Spring Street, #304
Los Angeles, CA 90014

Dear Mr. Plourde:

Will Serve Letter for the Whittier-Downey Mixed Use Apartment Complex located on 4169 Whittier Boulevard and 4200 Whittier Boulevard in Los Angeles

The Sanitation Districts of Los Angeles County (Districts) received your will serve letter request update for the subject project on January 23, 2017. The proposed project is located within the jurisdictional boundary of District No. 2. We offer the following comments:

1. Previous comments submitted by the Districts in correspondence dated August 30, 2016 (copy enclosed) still apply to the subject project with the following updated information.

2. The Joint Water Pollution Control Plant currently processes an average flow of 254.1 million gallons per day.

3. All other information concerning Districts' facilities and sewerage service is current.

If you have any questions, please contact the undersigned at (562) 908-4288, extension 2717.

Very truly yours,

[Signature]
Adriana Raza
Customer Service Specialist
Facilities Planning Department

AR:ar

Enclosure

cc: M. Sullivan
    M. Tatalovich

DOC: #4030718.D02
August 30, 2016

Ref. Doc. No.: 3856170

Mr. Matt Plourde
Civil Engineer
DK Engineer Corp.
724 South Spring Street, #304
Los Angeles, CA 90014

Dear Mr. Plourde:

Will Serve Letter for the Whittier-Downey Mixed Use Apartment Complex

The Sanitation Districts of Los Angeles County (Districts) received your will serve letter request for the subject project on August 22, 2016. The proposed project is located within the jurisdictional boundaries of District No. 2. We offer the following comments regarding sewerage service:

1. The wastewater flow originating from the proposed project will discharge to local sewer lines, which are not maintained by the Districts, for conveyance to either or both the Districts’ Belvedere Trunk Sewer, located in Bonnie Beach Place at Whittier Boulevard, or the Douglas Avenue Trunk Sewer, located in Sydney Drive at Olympic Boulevard. The Districts’ 15-inch diameter Belvedere Trunk Sewer has a capacity of 3.3 million gallons per day (mgd) and conveyed a peak flow of 0.7 mgd when last measured in 2011. The Districts’ 12-inch diameter Douglas Avenue Trunk Sewer has a capacity of 1.1 mgd and conveyed a peak flow of 0.3 mgd when last measured in 2016.

2. The wastewater generated by the proposed project will be treated at the Joint Water Pollution Control Plant located in the City of Carson, which has a capacity of 400 mgd and currently processes an average flow of 256.8 mgd.

3. The expected average wastewater flow from the proposed project, described in the application as a 112-unit apartment complex, is 17,472 gallons per day. For a copy of the Districts’ average wastewater generation factors, go to www.lacsd.org, Wastewater & Sewer Systems, click on Will Serve Program, and click on the Table L Loadings for Each Class of Land Use link.

4. The Districts are empowered by the California Health and Safety Code to charge a fee for the privilege of connecting (directly or indirectly) to the Districts’ Sewerage System or for increasing the strength or quantity of wastewater discharged from connected facilities. This connection fee is a capital facilities fee that is imposed in an amount sufficient to construct an incremental expansion of the Sewerage System to accommodate the proposed project. Payment of a connection fee will be required before a permit to connect to the sewer is issued. For more information and a copy of the Connection Fee Information Sheet, go to www.lacsd.org, Wastewater & Sewer Systems, click...
on Will Serve Program, and search for the appropriate link. In determining the impact to the Sewerage System and applicable connection fees, the Districts’ Chief Engineer will determine the user category (e.g. Condominium, Single Family home, etc.) that best represents the actual or anticipated use of the parcel or facilities on the parcel. For more specific information regarding the connection fee application procedure and fees, please contact the Connection Fee Counter at (562) 908-4288, extension 2727.

5. In order for the Districts to conform to the requirements of the Federal Clean Air Act (CAA), the capacities of the Districts’ wastewater treatment facilities are based on the regional growth forecast adopted by the Southern California Association of Governments (SCAG). Specific policies included in the development of the SCAG regional growth forecast are incorporated into clean air plans, which are prepared by the South Coast and Antelope Valley Air Quality Management Districts in order to improve air quality in the South Coast and Mojave Desert Air Basins as mandated by the CAA. All expansions of Districts’ facilities must be sized and service phased in a manner that will be consistent with the SCAG regional growth forecast for the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. The available capacity of the Districts’ treatment facilities will, therefore, be limited to levels associated with the approved growth identified by SCAG. As such, this letter does not constitute a guarantee of wastewater service, but is to advise you that the Districts intend to provide this service up to the levels that are legally permitted and to inform you of the currently existing capacity and any proposed expansion of the Districts’ facilities.

If you have any questions, please contact the undersigned at (562) 908-4288, extension 2717.

Very truly yours,

Adriana Raza
Customer Service Specialist
Facilities Planning Department

AR: ar

cc: M. Sullivan
    M. Tatalovich