ATTACHMENT 4
COPY OF PLAN SHEETS SHOWING
PERMANENT STORM WATER BMPS

This is the cover sheet for Attachment 4.
FILTERRA BIOFiltrATION DETAILS
Use this checklist to ensure the required information has been included on the plans:

The plans must identify:

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

Attach project’s drainage report. Refer to Drainage Design Manual to determine the reporting requirements.
Drainage Study
CARDENAS RESIDENCE

LOT 2, MAP NO. 2615
APN 346-050-02-00

Prepared for:
Joseph & Machelle Cardenas
8466 El Paseo Grande
La Jolla, CA 92037

Prepared by:
Christensen Engineering & Surveying
7888 Silverton Avenue, Suite “J”
San Diego, CA 92126
(858) 271-9901

PTS No. 445629

July 26, 2015
Revised June 10, 2016
Introduction

This project involves the demolition of the existing residence on Lot 2 of Map 2615 at 8466 El Paseo Grande (except for the existing deck and drainage improvements, including sump pump) and construction of a new residence and improvements.

The attached drainage area maps are from a topographic survey by K & S Engineering, Inc, prepared in December 2003. A small offsite area conveys runoff onsite while a small onsite area conveys runoff offsite. The majority of the site conveys runoff to the deck and landscaped area where it is collected and conveyed to an existing sump pump. From there it is pumped in a PCV pipe along the southerly boundary to an area near the easterly boundary where it terminates, above ground, and permits runoff to flow over the surface of the ground to El Paseo Grande. The remainder of the site conveys its runoff westerly. Following construction the same general pattern will persist with the offsite runoff now be maintained on the adjacent property northerly. The small area of onsite runoff that was previously conveyed to the southerly property will now be collected and conveyed to the existing sump pump. From there it will now be conveyed to a Filterra Biofiltration unit and then to catch basin with pump and to a gravity catch basin onsite and from there it will flow by gravity through a sidewalk underdrain to El Paseo Grande. The remainder of the site will continue to flow westerly.

The area of imperviousness remains nearly the same (6,019 sf pre-construction, 6,458 post-construction) before and after construction. The imperviousness changes from 50.7% to 54.4%. A runoff coefficient of 0.63 was selected from the County of San Diego Hydrology Manual, Page 3-6 for 50% imperviousness and Soil Type “D”.

Since the project is a priority project due to being located in a Water Quality Sensitive Area.
The Rational Method was used to calculate the anticipated flow for the 100-year storm return frequency event using the method outlined in the City of San Diego Drainage Design Manual.

Antony K. Christensen
RCE 54021 Exp. 12-31-17

JN A2015-38

06-10-16
Date
Calculations

1. **Intensity Calculation**  
(From the City of San Diego Drainage Design Manual, Page 86)  
\[ T_c = \text{Time of concentration} \]
\[ T_c = (1.8 (1.1-C)D^{1/2})/S^{1/3} \]
Since the difference in elevation is 12' (26'-14') and the distance traveled is 158', S=7.6%. C = 0.63  
\[ T_c = 5.4 \text{ minutes.} \]

From table on Page 83
\[ I_{100} = 4.3 \text{ inches} \]

2. **Coefficient Determination**

Pre-Construction and Post-Construction:

From Page 3-6 from the County Hydrology Manual with 50% imperviousness and Soil Type “D”

\[ C = 0.63 \]

Percent imperviousness  
Pre Construction = 50.7%  
Post-Construction = 54.4%

3. **Volume calculations**

\[ Q = \text{CIA} \]

Areas of Drainage

The area of this study is set to the same location occupied by the proposed improvements because the rest of the area will remain unchanged and will not affect runoff. Runoff from the area
northerly of the site, conveyed to it by the 18” and 36” drain will not change.

Pre-Construction

Area offsite draining onsite \[ A = 0.004 \text{ Ac} \]
Area onsite draining offsite southerly \[ B = 0.005 \text{ Ac} \]
Area onsite draining to sump \[ C = 0.183 \text{ Ac} \]
Area onsite draining westerly \[ D = 0.085 \text{ Ac} \]

Post-Construction

Area onsite draining to sump \[ E = 0.188 \text{ Ac} \]
Area onsite draining westerly \[ D = 0.085 \text{ Ac} \]

Pre-Construction

\[ Q_{100A} = (0.63) (4.3) (0.004) \]
\[ Q_{100B} = (0.63) (4.3) (0.005) \]
\[ Q_{100C} = (0.63) (4.3) (0.183) \]
\[ Q_{100D} = (0.63) (4.3) (0.085) \]

\[ Q_{100A} = 0.01 \text{ cfs} \]
\[ Q_{100B} = 0.01 \text{ cfs} \]
\[ Q_{100C} = 0.50 \text{ cfs} \]
\[ Q_{100D} = 0.23 \text{ cfs} \]

Post-Construction

\[ Q_{100E} = (0.63) (4.3) (0.188) \]
\[ Q_{100D} = (0.63) (4.3) (0.085) \]

\[ Q_{100E} = 0.51 \text{ cfs} \]
\[ Q_{100D} = 0.23 \text{ cfs} \]
Water Quality Flow Rate

For Proprietary BMPs for treating impervious surface runoff flow rate use \( I = 0.2 \) in/hr and multiply \( Q \) by 1.5 to arrive at the flow rate to be treated.

\[
Q = C^*I^*A^*(1.5)
\]

\[
Q_{\text{WQX}} = (0.63) (0.2) (0.188) (1.5)
\]

\[
Q_{\text{WQX}} = .036 \text{ cfs}
\]

The 6 x 4 Filterra unit is capable of conveying 0.055 cfs and so is adequate. The 4 x 4 unit is capable of conveying 0.037 cfs but the 6 x 4 unit is selected for this project to provide a factor of safety to treatment.

4. Discussion

Some offsite runoff that flows onto the site before construction will be retained on the neighboring property, from which it originates, following construction. A portion of the site that flows offsite, before construction will be retained onsite, following construction. The total runoff that flows from the site to El Paseo Grande before and after construction will remain unchanged. The flow to the west will remain unchanged. Following construction, runoff that currently is pumped from the existing sump is discharged onto the surface of property at the southeast corner. Following construction that discharge will be directed to a Filterra Biofiltration unit and then to a catch basin with pump that will convey the treated runoff to a gravity catch basin, that will allow it to flow to a sidewalk underdrain and then onto El Paseo Grande.
Filtterra® Piping Technical Details

Filtterra® is supplied with an internal underdrain system that exits a wall in a perpendicular direction. Most efficient drainage is accomplished when the drain exits on the lower side of the Filtterra®, i.e. nearest the overflow bypass. This is more important when using the larger sized Filtterra® Systems.

Drawing DP1:
Section View through Filtterra Precast Box Wall at Outfall Pipe Connection

All units are supplied with the drainage pipe coupling precast into the wall, at a depth of 3.50 feet (INV to TC). Drawing DP1 is a detail of the coupling. The coupling used is SCH-40 PVC.

Typically, a minimum slope of 0.5% is adequate to accommodate the flow of treated water from the Filtterra®, but each site may present unique conditions based on routing of the outfall pipe (elbows). The pipe must not be a restricting point for the successful operation of Filtterra®. All connecting pipes must accommodate freefall flow. Table 3 lists approved treatment sizing flow rates of the various size Filtterra® units. A safety factor of at least two should be used to size piping from the Filtera based on these conservative approved treatment flow rates.

Table 3: Filtterra Flow Rates & Pipe Details

Important Note: Actual flow rate may be more than double rates below.

<table>
<thead>
<tr>
<th>Filtterra® Size (feet)</th>
<th>Expected Flow Rate (cubic feet/second)</th>
<th>Connecting Drainage Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>4x4</td>
<td>0.037</td>
<td>4&quot; SCH-40 PVC</td>
</tr>
<tr>
<td>4 x 6 or 6 x 4</td>
<td>0.055</td>
<td>4&quot; SCH-40 PVC</td>
</tr>
<tr>
<td>4x6.5 or 6.5x4</td>
<td>0.061</td>
<td>4&quot; SCH-40 PVC</td>
</tr>
<tr>
<td>4 x 8 or 8 x 4</td>
<td>0.075</td>
<td>4&quot; SCH-40 PVC</td>
</tr>
<tr>
<td>4x16 or 16x4</td>
<td>0.150</td>
<td>6&quot; SCH-40 PVC</td>
</tr>
<tr>
<td>6 x 6</td>
<td>0.084</td>
<td>4&quot; SCH-40 PVC</td>
</tr>
<tr>
<td>6 x 8 or 8 x 6</td>
<td>0.112</td>
<td>4&quot; SCH-40 PVC</td>
</tr>
<tr>
<td>6 x 10 or 10 x 6</td>
<td>0.140</td>
<td>6&quot; SCH-40 PVC</td>
</tr>
<tr>
<td>6 x 12 or 12 x 6</td>
<td>0.168</td>
<td>6&quot; SCH-40 PVC</td>
</tr>
<tr>
<td>8x12 or 12x8</td>
<td>0.224</td>
<td>6&quot; SCH-40 PVC</td>
</tr>
<tr>
<td>8x16 or 16x8</td>
<td>0.297</td>
<td>6&quot; SCH-40 PVC</td>
</tr>
<tr>
<td>8x18 or 18x8</td>
<td>0.337</td>
<td>6&quot; SCH-40 PVC</td>
</tr>
<tr>
<td>8x20 or 20x8</td>
<td>0.374</td>
<td>6&quot; SCH-40 PVC</td>
</tr>
</tbody>
</table>
### Table 3-1
### RUNOFF COEFFICIENTS FOR URBAN AREAS

<table>
<thead>
<tr>
<th>Land Use</th>
<th>NRCS Elements</th>
<th>County Elements</th>
<th>% IMPER.</th>
<th>Runoff Coefficient “C”</th>
<th>Soil Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Undisturbed Natural Terrain (Natural)</td>
<td>Permanent Open Space</td>
<td></td>
<td>0*</td>
<td>0.20</td>
<td>0.25</td>
</tr>
<tr>
<td>Low Density Residential (LDR)</td>
<td>Residential, 1.0 DU/A or less</td>
<td></td>
<td>10</td>
<td>0.27</td>
<td>0.32</td>
</tr>
<tr>
<td>Low Density Residential (LDR)</td>
<td>Residential, 2.0 DU/A or less</td>
<td></td>
<td>20</td>
<td>0.34</td>
<td>0.38</td>
</tr>
<tr>
<td>Low Density Residential (LDR)</td>
<td>Residential, 2.9 DU/A or less</td>
<td></td>
<td>25</td>
<td>0.38</td>
<td>0.41</td>
</tr>
<tr>
<td>Medium Density Residential (MDR)</td>
<td>Residential, 4.3 DU/A or less</td>
<td></td>
<td>30</td>
<td>0.41</td>
<td>0.45</td>
</tr>
<tr>
<td>Medium Density Residential (MDR)</td>
<td>Residential, 7.3 DU/A or less</td>
<td></td>
<td>40</td>
<td>0.48</td>
<td>0.51</td>
</tr>
<tr>
<td>Medium Density Residential (MDR)</td>
<td>Residential, 10.9 DU/A or less</td>
<td></td>
<td>45</td>
<td>0.52</td>
<td>0.54</td>
</tr>
<tr>
<td>Medium Density Residential (MDR)</td>
<td>Residential, 14.5 DU/A or less</td>
<td></td>
<td>50</td>
<td>0.55</td>
<td>0.58</td>
</tr>
<tr>
<td>High Density Residential (HDR)</td>
<td>Residential, 24.0 DU/A or less</td>
<td></td>
<td>65</td>
<td>0.66</td>
<td>0.67</td>
</tr>
<tr>
<td>High Density Residential (HDR)</td>
<td>Residential, 43.0 DU/A or less</td>
<td></td>
<td>80</td>
<td>0.76</td>
<td>0.77</td>
</tr>
<tr>
<td>Commercial/Industrial (N. Com)</td>
<td>Neighborhood Commercial</td>
<td></td>
<td>80</td>
<td>0.76</td>
<td>0.77</td>
</tr>
<tr>
<td>Commercial/Industrial (G. Com)</td>
<td>General Commercial</td>
<td></td>
<td>85</td>
<td>0.80</td>
<td>0.80</td>
</tr>
<tr>
<td>Commercial/Industrial (O.P. Com)</td>
<td>Office Professional/Commercial</td>
<td></td>
<td>90</td>
<td>0.83</td>
<td>0.84</td>
</tr>
<tr>
<td>Commercial/Industrial (Limited L)</td>
<td>Limited Industrial</td>
<td></td>
<td>90</td>
<td>0.83</td>
<td>0.84</td>
</tr>
<tr>
<td>Commercial/Industrial (General L)</td>
<td>General Industrial</td>
<td></td>
<td>95</td>
<td>0.87</td>
<td>0.87</td>
</tr>
</tbody>
</table>

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, C_p, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).

DU/A = dwelling units per acre
NRCS = National Resources Conservation Service
ELEV. FACTOR
0-1500 1.00
1500-3000 1.25
3000-4000 1.42
4000-5000 1.60
5000-6000 1.70
DESERT 1.25

To obtain correct intensity, multiply intensity on chart by factor for design elevation.
EXAMPLE:
GIVEN: LENGTH OF FLOW = 400 FT.
       SLOPE = 1.0 %
       COEFFICIENT OF RUNOFF C = 0.70
READ: OVERLAND FLOW TIME = 15 MINUTES
DRAINAGE AREA MAPS
PRE-DEVELOPMENT DRAINAGE AREA MAP
POST-DEVELOPMENT
DRAINAGE AREA MAP
ATTACHMENT 6
GEOTECHNICAL AND GROUNDWATER INVESTIGATION REPORT

Attach project’s geotechnical and groundwater investigation report. Refer to Appendix C.4 to determine the reporting requirements.
### Categorization of Infiltration Feasibility Condition

**Part 1 - Full Infiltration Feasibility Screening Criteria**

Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Screening Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

**Provide basis:** According to the NCRS superficial soil types in the project vicinity consists of Cr (Coastal Beaches), Corralitos loamy sand with 0 to 5 percent slopes (CsB), and Corralitos loamy sand with 5 to 9 percent slopes (CsC). These are all Type A soils with hydraulic conductivities ranging from 5.95 to 19.98 inches per hour.

However, these soil types were not confirmed to be present in the near surface of the site based on our Geotechnical borings and laboratory analysis. Based on the boring logs, the soils consisted of previously placed fill material, Quaternary Slope Wash (Qsw) that consisted of loose to wet, silty to sandy Clay and sandy clayey Silt; Quaternary Old Paralic Deposits (previously mapped as Bay Point Formation), that consisted of a stiff to very stiff pedogenic argillie soil horizon (Qbp-Clay layer), a transitional unit between between Qsw and Qbp. There was an old beach sand layer at depth that is more characteristic to the NCRS soil types listed above.

According to Appendix F, soils with >20% clay or >40% silt as documented at the site are typically not suitable for infiltration.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Screening Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

**Provide basis:** As shown on geologic cross-sections presented in the Faulting and Bluff Evaluation, dated February 12, 2015, and updated in Addendum 03, dated June 10, 2016; both prepared by Construction Testing & Engineering Inc., the fill and Quaternary Slope Wash material are underlain by an impermeable to low permeability argillie soil horizon. Perched groundwater was recognized above this layer within 7 to 10 feet of the surface. The argillie soil layer slopes to the west towards the beach and a series of retaining walls. Any infiltration of water is anticipated to mound and flow down gradient towards the retaining walls. This would result in saturated conditions beneath the structure and behind the retaining walls creating geotechnical hazards.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Screening Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Provide basis: Infiltration rates are anticipated to be below 0.5 inches per hour, however any infiltration could increase the risk of storm water pollutants discharging to the public beach.

---

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

| 4        | Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3. |     | X  |

Provide basis: Infiltration rates are anticipated to be below 0.5 inches per hour, however any infiltration could increase the risk of storm water pollutants discharging to the public beach.

---

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

<table>
<thead>
<tr>
<th>Part 1 Result*</th>
<th>If all answers to rows 1-4 are “Yes” a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration</th>
<th>Part 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>If any answer from row 1-4 is “No”, infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a “full infiltration” design. Proceed to Part 2</td>
<td></td>
</tr>
</tbody>
</table>

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.
## Part 2 — Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Screening Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Do soil and geologic conditions allow for infiltration in any appreciable rate or volume? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Provide basis:</td>
<td>Infiltration at any rate will result in mounding above the argillic (clay) layer, and perched groundwater has already been identified within 10 feet of the existing surface. This is considered an unsuitable condition in Appendix F of the City of San Diego Guidelines for Geotechnical Reports. Also, the fine content of the underlying soils are also considered unsuitable according to Appendix F, as is the slopes along the beach front that are greater than 25% and are retained by retaining walls.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Screening Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Provide basis:</td>
<td>Groundwater mounding would be increased above the clay layer and perched groundwater has already been documented to be within 10 feet of the existing surface. These conditions would create geotechnical hazards for the building and retaining wall foundations.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.
### Worksheet I-8  Page 4 of 4

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Screening Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Provide basis:** As described above, infiltration of any amount would contribute to rising groundwater levels of the shallow perched groundwater conditions.

---

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

| 8        | Can infiltration be allowed without violating downstream water rights? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3. |     |    |

**Provide basis:** N/A

---

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

| Part 2 Result* | If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration. If any answer from row 5-8 is no, then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category is No Infiltration. | None |

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.
June 10, 2016

C/O: Hayer Architecture
Attention: Mr. Greg Friesen
445 Marine View Ave, Suite 280
Del Mar, California 92014
Telephone: 858.792.2800

Via Email: gfriesen@hayerarchitecture.com

Subject: Addendum 03- Response to City of San Diego Cycle Review Comments
Cycle Type 4 –Submitted (Multi-Discipline): LDR-Geology, for Proposed
Cardenas Residence 8466 El Paseo Grande, La Jolla, California

References: At End of Document-Appendix A

Mr. Friesen:

Presented in this letter is our response to the City of San Diego, Cycle Type 4 (Multi-Discipline),
LDR-Geology review for the proposed Cardenas Residence, located at 8466 El Paseo Grande, La
Jolla, California. The numbers for the responses below correspond to the comments in the City
letter, dated November 25, 2015. Comments 1 and 2 refer to project references and, therefore,
no responses are required for these line items. Comments 3 through 11 are addressed herein. A
copy of the City Cycle Issue comments is included as Appendix B.

In addition, as the Cycle Issues are multi-discipline, we have provided additional information
characterizing the potential infiltration at the site. This information is intended to provide
information for project team members to address Community Planning Group Cycle Issue
Comment No. 9, and LDR-Engineering; Cycle Issue Comment No. 7.

1.0 CYCLE ISSUE COMMENT RESPONSES

Comment Issue No. 3: Submit the following document: Update Preliminary Geotechnical
Recommendations, Cardenas Residence (formerly Lusardi Residence), 8466 El Paseo
Grande, La Jolla California 92037, prepared by Construction Testing & Engineering, Inc.,
dated November 2, 2009 (their project no. 10-10144G).

Response: A copy of the above requested report is included as Appendix C.
Comment Issue No. 4: Submit the following document: Preliminary Geotechnical Recommendations, Proposed Lusardi Residence, 8466 El Paseo Grande, La Jolla California, 92037, prepared by Construction Testing & Engineering, Inc., dated March 24, 2006 (their project no. 10-8264G).

Response: A copy of the above requested report is included as an attachment to the "Update Preliminary Geotechnical Recommendations, Cardenas Residence (formerly Lusardi Residence), 8466 El Paseo Grande, La Jolla California 92037, prepared by Construction Testing & Engineering, Inc., dated November 2, 2009; Project no. 10-10144G", that is included in Appendix C herein.

Comment Issue No. 5: Submit an addendum geotechnical report or update letter that addresses the proposed development for the purpose of environmental review and the following:

Response: This response to comment letter serves as Addendum 03 to the Update Geotechnical Report, Proposed Cardenas Residence, 8466 El Paseo Grande, La Jolla California, 92037, prepared by Construction Testing & Engineering, Inc., dated September 11, 2015, (project no. 10-12702G).

Comment Issue No. 6: Provide a geologic/geotechnical map that shows the distribution of fill and surficial deposits and the proposed development.

Response: The attached Figure 2 is an updated geologic/geotechnical map that has incorporated the new proposed improvements, distribution of fill and surficial deposits, and the proposed development.

Comment Issue No. 7: Provide geologic/geotechnical cross sections updated to show the proposed development.

Response: The attached Figure 3a, b, c, and d, are updated geologic/geotechnical cross sections that have incorporated the new proposed improvements for the development.

Comment Issue No. 8: The project’s geotechnical consultant should consider updating their description of site geology with respect to the current regional geologic mapping by Kennedy and Tan (2008).

Response: We have added a note on the figures to reflect the nomenclature change of the referenced geologic map units to be consistent with the current regional geologic mapping by Kennedy and Tan (2008). However, the map symbols on the map and sections have not been changed from Bay Point Formation to Quaternary Old Paralic Deposits in order to keep the figures consistent with previous reports and boring logs that were completed prior to the nomenclature change.
Comment Issue No. 9: The project’s geotechnical consultant should reference the Tsunami Inundation Map for Emergency Planning, La Jolla Quadrangle, prepared by the California Emergency Management Agency, dated June 1, 2009 and indicate if there is a potential tsunami hazard for the site.

Response: The Tsunami Inundation Map for Emergency Planning, La Jolla Quadrangle, prepared by the California Emergency Management Agency, dated June 1, 2009, is attached as Figure 4. As shown on Figure 4, the tsunami hazard zone boundaries appear to be controlled, in part, by the existing sea wall along the beach front. However, given a tsunami event coupled with high tide storm conditions, it is possible that waves could flood the public access way and in severe cases, flood the lawn area of the residence. However, the main structure foundations are approximately 18 feet above sea level and are located approximately 45 feet outside of the designated hazard zone on the Tsunami Inundation Map. Based on these observations, we conclude that there is a low probability for a significant tsunami hazard at the site.

Comment Issue No. 10: Provide an updated conclusion regarding geologic hazards of the site and summarize any geologic hazards potentially impacting the proposed development.

Response: From review of the previous investigations and/or reports, it appears that geologic hazards at the site are primarily limited to those caused by violent shaking from earthquake generated ground motion waves, and potential differential settlement of the Quaternary undocumented fill and unsuitable Quaternary Slopewash soils at the site.

However, it is our professional opinion that these potential geologic hazards will be mitigated, provided the recommendations in the above referenced reports are incorporated into the design and construction of the project, and that grading and construction of site improvements are conducted in accordance with the 2013 California Building Code (CBC).

As discussed in response to Comment #9, there is generally a low probability for a significant tsunami hazard at the site, although wave run up could affect the public seawall and access way.

Comment Issue No. 11: Provide an updated conclusion regarding the suitability of the site for the proposed development.

Response: CTE concludes that the proposed development of the site is feasible from a geotechnical standpoint, provided the recommendations in the referenced project reports and addenda are incorporated into the design and construction of the project.

In addition, CTE has found the recommendations in the referenced reports to be in compliance with common geotechnical engineering practices and should be considered valid.
However, CTE reserves the right to further modify recommendations and/or provide additional recommendations based on the actual conditions encountered at the site during earthwork and/or construction.

2.0 INFILTRATION CHARACTERIZATION

It is our understanding, based on the City of San Diego’s review comments from Community Planning Group Cycle Issue Comment No. 9 and LDR-Engineering; Cycle Issue Comment No. 7, that the proposed project is within a Water Quality Sensitive Area and is a Priority Development Project (PDP). Therefore, the project requires information per the Storm Water Standards, Part 1, BMP Design Manual, Appendix C, Section C.2 and Worksheet C.4-1. This addendum report provides information characterizing the infiltration potential at the site that can be used as an attachment to the Water Quality Technical Report as requested by Planning Group Cycle Issue Comment No. 9. A copy of Worksheet C.4-1 is included within Appendix D, and is summarized below.

Based on questions per Worksheet C.4-1 and CTE’s previous geotechnical and Bluff Evaluation Reports, the site soils and site conditions have a number of unsuitable features pertaining to potential infiltration. These include soils greater than 20 percent clay and greater than 40 percent silt, shallow perched groundwater within 10 feet of the existing surface, slopes greater than 25%, and groundwater mounding creating geotechnical hazards to building foundations and retaining walls along the beach public access. As shown on the Worksheet C.4.1 it does not appear that the noted geologic conditions allow for infiltration in any appreciable rate or volume and, therefore, on-site infiltration is generally considered to be infeasible. The Work Sheet feasibility screening category is "No Infiltration".

This document is subject to the same limitations as the previous geotechnical documents prepared for the subject project. The opportunity to be of service is appreciated. If you have any questions, please do not hesitate to contact this office.

Respectfully submitted,

CONSTRUCTION TESTING & ENGINEERING, INC.

Dan T. Math, GE #2665
Principal Engineer

Martin E. Siem, CEG #2311
Certified Engineering Geologist

MES/DTM/JFL:nri
Figures:
Figure 1 Not Included
Figure 2 Geologic/Exploration Location Map (updated).
Figure 3 (a-d) Updated Geologic/Geotechnical Cross Sections
Figure 4 Tsunami Inundation Map

Attachments:
Appendix A References
Appendix B City Comments
VIEW LOOKING NORTH

Explanation

FL: Coarse of loam to medium stiff, rework Quarternary Slope Wash as described below, with loose, silty sand, abundant organic matter, root, topsoil, form surf and planter areas, minor debris.

Quarternary Slope Wash (Qsw):
- consists of loose to stiff, moist to wet, yellowish-gray brown to yellowish-olive brown, slightly mottled, silty to sandy clay, stony to sandy silty clay, with organic, locally developed pedocic structure, some carbonate near the upper contact, and occasional carbon fragments. The unit is massive with locally developed weak discontinuous laminations. Upper and lower contacts are gradational.

Unit 1 (Qsw1):
- consists of medium stiff to stiff, locally loose when saturated, moist to wet, dark gray brown to olive brown, orange brown, black, slightly mottled, sandy clay, with visually estimated medium to coarse-grained sand percentages up to 10 percent, scattered pebbles, abundant organic material (carbon fragments and disseminated carbon) throughout. Upper contact is locally gradational to distinct, and the lower contact is gradational with Bzp.

Quarternary Bay Point Formation *

Unit 2 (Bp): Bp consists of stiff to very stiff, locally hard, moist to wet, dark reddish brown, dark gray-brown, black, dark orange-brown, extensively mottled, silty to sandy clay, with distinctive coarse- to medium-grained sand throughout, scattered organic material (carbon fragments, disseminated carbon), massive to moderately subangular-blocky soil structure, with clay films at horizontal levels C-5, C-10, C-15. Define upper and lower contacts.

Unit 3 (Bp): Bp consists of a transitional unit between the overlying (Bp) clay and mud and the underlying units to medium dense clayey sand, moist to wet, milky brown, orange-brown, gray, with black, weaker soil structure than overlying unit Bp2. Gradual to massive, with locally mesic subangular-blocky soil structure.

Unit 4 (Bp): Bp consists of a distinctive change in lithology from the clay and silt of the overlying units to medium dense to dense, wet, gray to black, fine to medium-grained silty clayey sand that grades downward into a poorly graded sand with silts, abundant black rice. Unit is interpreted as a pole-bank sand.

*The Quarternary Bay Point Formation map units are based on pre-2008 geologic map nomenclature. Based on recent regional geologic mapping (Kendall and Tan, 2008), units of the Bay Point Formation are now equivalent to the Quarternary Old Pacific Deposits, map units Qop-1 of Kendall and Tan, 2008. The earlier nomenclature has remained unchanged in order to maintain consistency with the nomenclature used in previous completed site investigations and boring logs.

Gradation contact between mapped units.

Approximate location or inferred (?) location of geologic contacts

Zones of carbonate accumulation

Interpolated Natural Grade/ PreExisting Grade

Proposed Final grade

Perched groundwater observed

Groundwater at time of drilling

Construction Testing & Engineering, Inc.

1411 Montel Rd Ste 115, Elsinore, CA 92525 Ph (760) 745-4055

CROSS SECTION A-A'

CARDEMAS RESIDENCE

6466 EL PASO GRANDE

LA JOLLA, CALIFORNIA

NOTE: SCALE REQUIRES ON-SITE ADJUSTMENT

1" = 30' = 20'

0 10' 20' 30' 40'

1 inch = 20' ft.

45' 65' 85' 105'
APPENDIX A

REFERENCES
REFERENCES


APPENDIX B

CITY OF SAN DIEGO CYCLE ISSUES

CYCLE TYPE 4-SUBMITTED (MULTI_DISCIPLINE): LDR-GEOLGY, DATED NOVEMBER 15, 2015
The review due date was changed to 02/11/2016 from 11/23/2015 per agreement with customer. The reviewer has indicated they want to review this project again. Reason chosen by the reviewer: New Document Required. We request a 2nd complete submittal for LDR-Geology on this project as: Submitted (Multi-Discipline). The reviewer has requested more documents be submitted. Your project still has 11 outstanding review issues with LDR-Geology (all of which are new). Last month LDR-Geology performed 77 reviews, 87.0% were on-time, and 77.1% were on projects at less than < 3 complete submittals.

445629-4 (11/25/2015)

References

<table>
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<th>Issue</th>
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<td>x</td>
<td>1</td>
<td>Addendum 02 Update Geotechnical Report, Proposed Cardenas Residence, 8466 El Paseo Grande, La Jolla, California 92037, prepared by Construction Testing &amp; Engineering, Inc., dated September 11, 2015 (their project no. 10-12702G)</td>
</tr>
<tr>
<td>x</td>
<td>2</td>
<td>Addendum 01 to Updated Preliminary Geotechnical Recommendations, Cardenas Residence (formally Lusardi Residence), 8466 El Paseo Grande, La Jolla, California 92037, prepared by Construction Testing &amp; Engineering, Inc., dated December 16, 2009 (their project no. 10-10144G)</td>
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Comments

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<td>3</td>
<td>Submit the following document: Updated Preliminary Geotechnical Recommendations, Cardenas Residence (formally Lusardi Residence), 8466 El Paseo Grande, La Jolla, California 92037, prepared by Construction Testing &amp; Engineering, Inc., dated November 2, 2009 (their project no. 10-10144G)</td>
</tr>
<tr>
<td>x</td>
<td>4</td>
<td>Submit the following document: Preliminary Geotechnical Investigation, Proposed Lusardi Residence, 8466 El Paseo Grande, La Jolla, California, prepared by Construction Testing &amp; Engineering, Inc., dated March 24, 2006 (their project no. 10-8264G)</td>
</tr>
<tr>
<td>x</td>
<td>5</td>
<td>Submit an addendum geotechnical report or update letter that addresses the proposed development for the purposes of environmental review and the following:</td>
</tr>
<tr>
<td>x</td>
<td>6</td>
<td>Provide a geologic/ geotechnical map that shows the distribution of fill and surficial deposits and the proposed development.</td>
</tr>
<tr>
<td>x</td>
<td>7</td>
<td>Provide geologic/ geotechnical cross sections updated to show the proposed development.</td>
</tr>
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For questions regarding the 'LDR-Geology' review, please call Jim Quinn at (619) 446-5334. Project Nbr: 445629 / Cycle: 4

Glenn Gargas 446-5142
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<th>Num</th>
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<td>8</td>
<td></td>
<td>The project's geotechnical consultant should consider updating their description of site geology with respect to current regional geologic mapping by Kennedy and Tan (2008).</td>
</tr>
<tr>
<td>☐</td>
<td>9</td>
<td></td>
<td>The project's geotechnical consultant should reference the Tsunami Inundation Map for Emergency Planning, La Jolla Quadrangle, prepared by the California Emergency Management Agency, dated June 1, 2009 and indicate if there is a potential tsunami hazard for the site.</td>
</tr>
<tr>
<td>☐</td>
<td>10</td>
<td></td>
<td>Provide an updated conclusion regarding geologic hazards of the site and summarize any geologic hazards potentially impacting the proposed development.</td>
</tr>
<tr>
<td>☐</td>
<td>11</td>
<td></td>
<td>Provide an updated conclusion regarding the suitability of the site for the proposed development.</td>
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<td>☐</td>
<td></td>
<td></td>
<td>(New Issue)</td>
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<td>(New Issue)</td>
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</table>
### Worksheet C.4-1: Categorization of Infiltration Feasibility Condition

#### Part 1 - Full Infiltration Feasibility Screening Criteria
Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Screening Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Provide basis: According to the NCRS superficial soil types in the project vicinity consists of Cr (Coastal Beaches), Corralitos loamy sand with 0 to 5 percent slopes (CaB), and Corralitos loamy sand with 5 to 9 percent slopes (CaC). These are all Type A soils with hydraulic conductivities ranging from 5.95 to 19.98 inches per hour.

However, these soil types were not confirmed to be present in the near surface of the site based on our Geotechnical borings and laboratory analysis. Based on the boring logs, the soils consisted of previously placed fill material, Quaternary Slope Wash (Qsw) that consisted of loose to wet, silty to sandy Clay and sandy clayey Silt; Quaternary Old Paralic Deposits (previously mapped as Bay Point Formation), that consisted of a stiff to very stiff pedogenic argillie soil horizon (Qsp-Clay layer), a transitional unit between between Qsw and Qsp. There was an old beach sand layer at depth that is more characteristic to the NCRS soil types listed above.

According to Appendix F, soils with >20% clay or >40% silt as documented at the site are typically not suitable for infiltration.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

<table>
<thead>
<tr>
<th></th>
<th>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Provide basis: As shown on geologic cross-sections presented in the Faulting and Bluff Evaluation, dated February 12, 2015, and updated in Addendum 03, dated June 10, 2016; both prepared by Construction Testing & Engineering Inc., the fill and Quaternary Slope Wash material are underlain by an impermeable to low permeability argillie soil horizon. Perched groundwater was recognized above this layer within 7 to 10 feet of the surface. The argillie soil layer slopes to the west towards the beach and a series of retaining walls. Any infiltration of water is anticipated to mound and flow down gradient towards the retaining walls. This would result in saturated conditions beneath the structure and behind the retaining walls creating geotechnical hazards.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.
## Appendix C: Geotechnical and Groundwater Investigation Requirements

### Worksheet C.4-1 Page 2 of 4

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Screening Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Provide basis: Infiltration rates are anticipated to be below 0.5 inches per hour, however any infiltration could increase the risk of storm water pollutants discharging to the public beach.

---

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

| 4        | Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3. |     | X  |

Provide basis: Infiltration rates are anticipated to be below 0.5 inches per hour, however any infiltration could increase the risk of storm water pollutants discharging to the public beach.

---

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

| Part 1 Result* | If all answers to rows 1 - 4 are “Yes” a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration. If any answer from row 1-4 is “No”, infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a “full infiltration” design. Proceed to Part 2. | Part 2 |

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.
### Appendix C: Geotechnical and Groundwater Investigation Requirements

#### Worksheet C.4-1 Page 3 of 4

**Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria**

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Screening Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Do soil and geologic conditions allow for infiltration in any appreciable rate or volume? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Provide basis: *Infiltration at any rate will result in mounding above the argillic (clay) layer, and perched groundwater has already been identified within 10 feet of the existing surface. This is considered an unsuitable condition in Appendix F of the City of San Diego Guidelines for Geotechnical Reports. Also, the fine content of the underlying soils are also considered unsuitable according to Appendix F, as is the slopes along the beach front that are greater than 25% and are retained by retaining walls.*

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Screening Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Provide basis: *Groundwater mounding would be increased above the clay layer and perched groundwater has already been documented to be within 10 feet of the existing surface. These conditions would create geotechnical hazards for the building and retaining wall foundations.*

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.
### Appendix C: Geotechnical and Groundwater Investigation Requirements

**Worksheet C.4-1 Page 4 of 4**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Screening Question</th>
<th>Yes</th>
<th>No</th>
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</thead>
<tbody>
<tr>
<td>7</td>
<td>Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provide basis: As described above, infiltration of any amount would contribute to rising groundwater levels of the shallow perched groundwater conditions.</td>
<td></td>
<td></td>
</tr>
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</table>

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Screening Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Can infiltration be allowed without violating downstream water rights? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provide basis: N/A</td>
<td></td>
<td></td>
</tr>
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</table>

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

<table>
<thead>
<tr>
<th>Part 2 Result*</th>
<th></th>
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<tbody>
<tr>
<td>If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration.</td>
<td>NONE</td>
</tr>
<tr>
<td>If any answer from row 5-8 is no, then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category is No Infiltration.</td>
<td></td>
</tr>
</tbody>
</table>

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.