



San Francisco Public Works
General – Director’s Office
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Public Works Order No: 207782

**APPROVING AN AMENDED AND RESTATED MONITORING
PLAN AND ESTABLISHING REVISED PERFORMANCE
CRITERIA FOR LIGHTWEIGHT CELLULAR CONCRETE (LCC)
INFRASTRUCTURE FOR USE EXCLUSIVELY FOR THE SITE
OF PHASE 1A OF THE MISSION ROCK PROJECT, FINAL
MAP NO. 9443**

This Order shall SUPERCEDE Order 203,637 in its entirety.

WHEREAS, On October 5, 2017, the Planning Commission certified the Final Environmental Impact Report for Seawall Lot 337 and Pier 48 Mixed-Use Project (“EIR”), prepared pursuant to the California Environmental Quality Act (Cal. Pub. Resources Code §§ 21000 et seq.; hereafter “CEQA”) by Motion No. 20017 for the Seawall Lot 337 and Pier 48 Mixed-Use Project (“Project”), and approved CEQA findings and a Mitigation Monitoring Reporting Program pursuant to Motion No. 20018. On May 21, 2020, the Planning Department issued a note to file on the proposed project change addressed in this Order. The EIR and Planning Department analysis are incorporated herein by reference.

WHEREAS, On January 30, 2018, the Port Commission, through Resolution No. 18-03, approved the Disposition and Development Agreement by and between the Port and SWL 337 Associates, LLC, (“DDA”) concerning the development of the “Project Site” as defined in the DDA.

WHEREAS, On February 13, 2018, the Board of Supervisors adopted Resolution No. 44-18, approving the Memorandum of Understanding Regarding Interagency Cooperation (Mission Rock Project at Seawall Lot 337 and Pier 48) (“ICA”) by and between the City, acting by and through the Mayor, the Board, the City Administrator, the Director of Public Works, the San Francisco Municipal Transportation Agency (“SFMTA”), and the San Francisco Public Utilities Commission (“SFPUC”), and the Port.

WHEREAS, On February 27, 2018, the Board of Supervisors adopted Ordinance No. 33-18 approving a Development Agreement for the Project between the City and County of San Francisco and SWL 337 Associates, LLC (“DA”) and adopted the environmental findings set forth in Motion No. 20019, on file with the Clerk of the Board of Supervisors No. 171313 and incorporated herein by reference.

WHEREAS, On February 27, 2018, the Board adopted Ordinance No. 31-18, approving the Mission Rock Special Use District, Planning Code Section 249.80, which establishes zoning designations for Seawall Lot 337 and Pier 48.

WHEREAS, On April 5, 2019, Subdivider submitted a written request for approval of various Design Modifications and Exceptions, as defined in the Subdivision Regulations, for alternative designs and relief from certain standard requirements in the Subdivision Regulations. The request was circulated by the Director to all affected City agencies for review and comment. The Director held a public hearing on the proposed Design Modifications and Exceptions request on August 7, 2019 and received no public comment. The Director signed Public Works Order No. 202,297 approving the Design Modifications and Exceptions request on November 27, 2019.

WHEREAS, On December 13, 2019, the Director signed Public Works Order No. 202,368 (“Order No. 202,368” or “Conditions of Approval”) approving the Tentative Map for Map No. 9443, regarding Phase 1A of the Project, subject to conditions of approval.

WHEREAS, On May 22, 2020, the Director signed Public Works Order No. 203,189 approving the Subdivider’s request for deferrals of certain conditions of approval set forth in Public Works Order No. 202,368, an exception to the Subdivision Code, and amendments to the Mission Rock Infrastructure Plan (“Infrastructure Plan Amendments”) subject to the subsequent approval of all required City officials and departments and consent of the Subdivider.

WHEREAS, On May 22, 2020, the Director also signed Public Works Order No. 203,194 recommending the Board of Supervisors approval of Final Map No. 9443 for Phase 1A of the Project.

WHEREAS, On June 2, 2020, the Board of Supervisors approved Final Map No. 9443.

WHEREAS, On August 20, 2020, the Infrastructure Plan Amendments became effective upon the approval and/or consent of all required signatories, including Mayor Breed, the Port of San Francisco, the San Francisco Fire Department, SFMTA, Public Works, SFPUC, and Seawall Lot 337 Associates, LLC, as required pursuant to the ICA.

WHEREAS, As required to satisfy the Conditions of Approval of Order No. 202,368 pertaining to the proposed use of lightweight cellular concrete (“LCC”) for Phase 1A of the Project, the satisfaction of which was deferred by the Director pursuant to Order No. 203,189, the City Engineer, following the review and evaluation of the Technical Review Report, as well as the civil and geotechnical peer review reports, has determined that the use of LCC for Phase 1A of the Project may only be approved subject to compliance in full with: i) the Monitoring Plan and Performance Criteria (“LCC Performance Criteria”) that have been approved by the Director and the City Engineer and ii) LCC engineering design criteria (“LCC Design Criteria”) that have been approved by the Director and the City Engineer. Subdivider’s use of LCC shall be subject to the Initial Warranty and Extended Warranty described in Order No. 202,368.

WHEREAS, Subdivider requested amendment to the Exhibit 1 included with Order 203,637 to update monitoring requirements by amending the type of piezometer equipment used to monitor groundwater levels and uplift pressure and also to amend the warranty performance criteria for SFPUC pressurized utilities. Refer to attached revised Exhibit 1 dated 01/11/2023.

WHEREAS, the Director held a duly-noticed public hearing to solicit public comment on Subdivider’s requested amendment to Exhibit 1 on January 11, 2023 and no public comment was received. The Hearing Officer reviewed the requested amendment and made a recommendation to the Director of Public Works to approve the request.

DETERMINATION

1. The Director, based on the recommendation and certification of the Hearing Officer and City Engineer, hereby approves the revised LCC Performance Criteria set forth in revised Exhibit 1 and authorizes the use of LCC exclusively for Phase 1A of the Mission Rock Project Site, Final Map No. 9443, upon issuance of a corresponding street improvement permit, subject to compliance in full with the LCC Performance Criteria and the LCC Design Criteria approved under Order No. 203636.

2. The LCC Performance Criteria and the LCC Design Criteria shall be used to evaluate whether the LCC Infrastructure, as defined in Public Works Order No: 202368, is performing safely and in accordance with its intended use and purpose and whether the LCC Infrastructure has failed and shall require repair, remediation, and/or replacement. As set forth in Public Works Order No: 202368, exceedance of and/or failure to comply with the LCC Performance Criteria shall be deemed a “Failure” of the LCC Infrastructure and shall require Subdivider to take the actions specified in the LCC Performance Criteria.
3. In adopting this Order, Public Works is in no way explicitly or impliedly authorizing or approving the use of LCC Infrastructure, the LCC Performance Criteria, or the LCC Design Criteria for any location outside of Phase 1A of the Project and Public Works is not bound by this Order or decision in Public Works’ evaluation of any other proposal to use LCC or any criteria related thereto.
4. To the extent this action or related Public Works actions regarding LCC or LCC Infrastructure results in the need to amend the Public Works Code, Public Works hereby defers compliance with this requirement until Subdivider’s request to the City for a Notice of Completion on any public improvements that include the use of LCC.
5. Any public improvement designs submitted to Public Works which rely on the LCC Performance Criteria and other protocols identified in this Public Works Order shall be the work product of a California registered professional engineer in responsible charge of the design and shall include the stamp and certification by said engineer.
6. These criteria and other requirements in this Order, including the LCC Performance Criteria and the LCC Design Criteria, represent the minimum criteria and requirements applicable to the use of LCC. Public Works reserves the discretion to require additional analysis and information based on field observation of performance, safety considerations, and new data, testing, and/or other factors that are made available and/or become relevant to the evaluation of the LCC Infrastructure and its conformity to the LCC Design Criteria and LCC Performance Criteria.
7. This Order is a companion to related Orders on LCC Infrastructure and should be read and interpreted consistent with those other Orders.
8. Nothing in this Order shall be deemed to explicitly or impliedly waive any City rights or remedies regarding LCC infrastructure during or after applicable warranty periods.
9. Exhibit 1 is hereby amended as of the date of this Order to version dated 01/11/2023 herein attached.

Exhibit 1

Monitoring Plan and Performance Criteria for LCC Infrastructure (“LCC Performance Criteria”)
Revised 01/11/2023

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DocuSigned by:

Albert Ko

Ko, Albert | 281DC30E04CF41A...

City Engineer

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DocuSigned by:

Carla Short

Short, Carla | 073CF73A4EA6486...

Interim Director

Mission Rock Phase 1A: Monitoring Plan and Performance Criteria for LCC Infrastructure – Revised 1/11/2023

Notes:

1. This document is meant to supplement Public Works Order No. 202368. As set forth in Public Works Order No: 202368, “LCC Infrastructure” means the “[lightweight cellular concrete] (‘LCC’), the at-grade and subsurface physical improvements and utility facilities to be constructed within parks, open space, and rights-of-way as part of the Project, including but not limited to improvements at interfaces between existing right-of-ways and new right-of-ways containing LCC, and at interfaces between LCC and fronting or adjacent lots.”
2. The LCC Infrastructure shall meet the performance criteria set forth for the 75-year life of Phase 1A of the Seawall Lot 337 and Pier 48 mixed-use project (“Project”).
3. The LCC Criteria below shall be used to evaluate whether the LCC Infrastructure is performing safely and in accordance with its intended use and purpose. As set forth in Public Works Order No: 202368, exceedance of and/or failure to comply with the LCC Criteria below shall be deemed a “Failure” of the LCC Infrastructure and shall require subdivider to take the required actions listed below, consistent with terms of the “Initial Warranty,” the “Extended Warranty,” and the subdivider’s comprehensive insurance program as described in Public Works Order No 202368.
4. The purpose of the settlement monitoring program is to evaluate the construction and long-term performance of LCC infrastructure proposed for the Project.
5. Different instrumentations and monitoring schedules are required to evaluate the construction and long-term performance of the proposed improvements. The instrumentations consist of extensometers, settlement points, and piezometers.
6. Settlement surveys shall be conducted by a California Licensed Surveyor.
7. Minimum monitoring frequency is listed below and the City, in its discretion, may require more frequent monitoring if any observed reading is approaching the applicable threshold and is within 10% of the thresholds.
8. Subdivider shall ensure extensometers, settlement monuments, utility monitoring points and piezometers perform as intended and shall replace any defective or damaged settlement monuments and piezometers so as not to impede ability to collect data for next scheduled reading. Subdivider shall not be responsible for replacing settlement monuments, utility monitoring points and piezometers damaged by the City or its contractors.
9. Compliance standards for City Infrastructure are not modified or changed by the LCC Performance Criteria.
10. City reserves the right to perform additional tests and/or collect all data it deems appropriate to evaluate performance of the LCC Infrastructure. Should City elect to undertake such additional tests or data collection, at its cost, or audit information that the Subdivider is required to submit, Subdivider, and its successors, shall cooperate with the City in these efforts.
11. Subdivider shall provide a written report to the City every six (6) months, in a form prescribed by the City, detailing the results of following:
 - a. Information collected as described below.
 - b. Whether there are any engineering, safety, or performance problems or issues with, or located on or about, the interface of LCC Infrastructure and (i) existing ROWS, (ii) fronting or adjacent development lots, or (iii) open space areas containing geofoam.
 - c. Whether there are any engineering, safety, or performance problems or issues with, or located on or about, street trees and landscaping in or above LCC.
12. Subdivider shall notify the City within 14 calendar days upon discovery of any incident of threshold exceedance described below. Further, Subdivider shall provide report summarizing findings and proposed remediation measures within 45 calendar days of the discovery.
13. Major seismic event is defined as Mw>6.70 within 50 kilometers.

Performance Variable	Monitoring Instrumentation	Commencement and Frequency of Routine Monitoring and Sampling	LCC Criteria	Required Action	Notes
Ground movement (heave, settlement)	<ul style="list-style-type: none"> Four (4) Vertical Multipoint borehole Extensometers (MBX) 	<ul style="list-style-type: none"> Readings every two weeks after final layer of LCC placement. Six months after placement of final layer of LCC, Public Works, at its discretion may allow the frequency to be reduced to one reading per month. Reading to establish baseline elevations will be performed within 30 day of final NOC for Phase 1A. Monthly readings shall commence during the first year after final NOC for Phase 1A. Quarterly readings during the second year, after final NOC for Phase 1A. Readings every six months during the third year, after final NOC for Phase 1A. Annual readings during 4th through 9th years. Readings every six months during the 10th year (i.e., final year of required monitoring). 	<p>Performance Criteria:</p> <p><u>Settlement/Heave Criteria:</u> For 1st and 2nd Year after final NOC for Phase 1A:</p> <ul style="list-style-type: none"> Differential settlement shall not exceed 1/900 (1.00”/75 ft) excluding a major seismic event Maximum settlement of 0.75” and maximum heave of 0.25” excluding a major seismic event If a major seismic event were to occur prior to acceptance, differential settlement of 1/600 (1.50”/75 ft) and maximum settlement of 1.50” <p>For 3rd year through 5th year after final NOC for Phase 1A:</p> <ul style="list-style-type: none"> Differential settlement shall not exceed 1/720 (1.25”/75 ft) excluding a major seismic event Maximum settlement of 1.00” and maximum heave of 0.375” excluding a major seismic event. If a major seismic event were to occur prior to acceptance, differential settlement of 1/600 (1.50”/75 ft) and maximum settlement of 1.50” 	<ol style="list-style-type: none"> 1. The performance of the infrastructure within the public right-of-way shall abide by the applicable City Code(s) and Orders. 2. For the period of 10 years after the issuance of final NOC for Phase 1A, the Subdivider shall perform sampling and monitoring as outlined in this table. Subdivider to evaluate settlement/heave in the area of monuments exceeding the performance criteria, including the area up to the next closest monuments, and submit a report specifying underlying cause of settlement/heave. Depending on the results of the evaluation, Subdivider shall propose repair and/or replacement of all affected LCC Infrastructure. Any proposed repair, replacement, or other remediation is subject to review and approval of the City. The extent of the repair and/or replacement may extend to the next monument point. 3. The settlement and/or heave in the public right-of-way exceeding the performance criteria listed for sidewalks, pathways, and roadways will be considered Failure and will require correction under the applicable warranty, while such warranty is in effect, or subdivider’s comprehensive insurance program, as may be applicable . 	<ol style="list-style-type: none"> 1. Multipoint Borehole Extensometers (MBX) shall be installed through LCC and fill and extend to dense material below Young Bay Mud. The targeted locations of the sensors shall be at bottom of LCC, bottom of fill, and at three different levels within Young Bay Mud. The objective is to determine the settlement/heave versus depth in the soil profile. 2. The extensometers shall be installed in between stone columns. 3. Reading accuracy shall be plus or minus 0.01 foot. 4. Subdivider to protect the extensometers in place and provide vehicular traffic-rated casting and raise access to finish grade after the roadway is completed and in service. 5. Settlement monitoring shall start one month after final layer of LCC placement. However, the performance thresholds shall be applicable to settlements after the issuance of the final NOC for Phase 1A. 6. Geotechnical Engineer of Record shall demonstrate future compliance with the residual settlement by comparison of the monitored data and predicted settlement. 7. Subdivider shall propose locations of extensometers and submit such proposal(s) to the City for review and approval.
	<ul style="list-style-type: none"> Ten (10) settlement monuments within Sanitary Sewer/Storm Drain Manholes (shown in SIP Drawing No. C13.00) One (1) additional utility monitoring point for each block between manholes for Sanitary or Storm Drain 	<ul style="list-style-type: none"> Settlement monuments shall be installed within one month of installation of Sanitary Sewer/Storm Drain lines and Manholes Readings every two weeks after settlement monuments are established and continuously thereafter until roadway construction is completed. Six months after placement of final layer of LCC, Public Works, at its discretion may allow the frequency to be reduced to one reading per month. Reading to establish baseline elevations will be performed within 30 day of final NOC for Phase 1A. Monthly readings during the first year after final NOC for Phase 1A. Quarterly readings during the second year, after final NOC for Phase 1A. Readings every six months during the third year, after final NOC for Phase 1A. Annual readings during 4th through 9th years. 	<p>For 6th year through 10th year after final NOC for Phase 1A:</p> <ul style="list-style-type: none"> Differential settlement of 1/720 (1.25”/75 ft) excluding a major seismic event Maximum settlement of 1.25” and maximum heave of 0.50” excluding a major seismic event If a major seismic event were to occur prior to acceptance, differential settlement of 1/600 (1.50”/75 ft) and maximum settlement of 1.50” <p><u>Sidewalks and Pedestrian Pathways:</u> Sidewalks are designed as rigid pavement as required by the City with positive drainage provided to direct runoff away from development parcels and meet accessibility requirements in effect at time of issuance of the street improvement permit (“SIP”). In compliance with SFPW recommendations, design cross slopes are generally at 1.67%. Performance Criteria for accessibility requirements include but are not limited to:</p> <ul style="list-style-type: none"> 2.0% maximum cross slope 0.50” maximum wide horizontal gap 0.25” maximum vertical differential 		

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	<ul style="list-style-type: none"> • Ten (10) settlement monuments on valve nuts of LPW and AWSS Water (shown in SIP Drawing No. C13.00) • Four (4) additional settlement monuments are required one-month after completion of final layer of LCC. 	<ul style="list-style-type: none"> • Reading every six months during the 10th year (i.e., final year of required monitoring). • Settlement monuments shall be installed within one month of installation of valve boxes for LPW, and AWSS. Six months after placement of final layer of LCC, Public Works, at its discretion may allow the frequency to be reduced to one reading per month. • Reading to establish baseline elevations will be performed within 30 day of final NOC for Phase 1A. • Monthly readings during the first year after the final NOC for Phase 1A. • Quarterly readings during the second year, after final NOC for Phase 1A. • Readings every six months during the third year, after final NOC for Phase 1A. • Annual readings during 4th through 9th years. • Reading every six months during the 10th year (i.e., final year of required monitoring). • Readings every two weeks after final layer of LCC placement. Six months after placement of final layer of LCC, Public Works, at its discretion may allow the frequency to be reduced to one reading per month. • Reading to establish baseline elevations will be performed within 30 day of final NOC for Phase 1A. • Monthly readings during the first year after the final NOC for Phase 1A. • Quarterly readings during the second year, after final NOC for Phase 1A. • Readings every six months during the third year, after final NOC for Phase 1A. • Annual readings during 4th through 9th years. • Readings every six months during the 10th year (i.e., final year of required monitoring). 	<p><u>Roadways including curbs, gutters and crosswalks:</u> In compliance with Public Works requirements, street pavement and curbs in Rights-of-way shall maintain positive surface flow, and design slopes for roadways shall be from 0.3% to 5% longitudinal with a minimum of 0.5% to 5% longitudinal slope for gutter and with a 2% to 5% cross slope. Crosswalks within streets are also subject to accessibility requirements listed in the “Sidewalks and Pedestrian Pathways” section above.</p> <p><u>Shared Public Ways:</u> Shared Public Ways are designed such that pedestrian and vehicular modes of travel may share portion of the right-of-way. These areas are designed as rigid pavement as required by the City with positive drainage provided to direct runoff away from development parcels and comply with the “Performance Criteria for accessibility requirements” identified above, design cross slopes are generally at 1.67% with a maximum cross-slope of 2% in any direction. Design slopes for roadway are from 0.3% to 5% longitudinal with a minimum of 0.5% design longitudinal slope for the bottom of the valley gutter.</p>		<ol style="list-style-type: none"> 1. Reading accuracy shall be plus or minus 0.001 foot. 2. Subdivider to protect the monitoring points in place and provide vehicular traffic-rated casting and raise access to finish grade after the roadway is completed and in service. 3. Settlement monitoring shall start one month after final layer of LCC placement. However, the warranty performance thresholds shall be applicable to settlements after the final NOC for Phase 1A is issued. GEOR shall demonstrate future compliance with the residual settlement by comparison of the monitored data and predicted settlement. 4. If City or Port performs maintenance on low pressure water or AWSS infrastructure that is being monitored and such maintenance impacts the condition of the monitoring monument, a new baseline elevation for the monitoring monument shall be established by the Subdivider at the time of next reading. Additionally, Subdivider shall inform the city of the new baseline at the time of the next reporting. <ol style="list-style-type: none"> 1. Reading accuracy shall be plus or minus 0.001 foot. 2. Subdivider to protect the monitoring points in place and provide vehicular traffic-rated casting and raise access to finish grade after the roadway is completed and in service. 3. Settlement monitoring shall start one month after final layer of LCC placement. However, the performance thresholds shall be applicable to settlements after the final NOC for phase 1A is issued. GEOR shall demonstrate future compliance with the residual settlement by comparison of the monitored data and predicted settlement. 4. Subdivider shall propose locations of additional monuments and submit such proposal (s) to the City for review and approval. 5. Should the City or Port perform maintenance on infrastructure that is being monitored and such maintenance impacts the condition of the monitoring monument, a new baseline elevation for the monitoring monument shall be established by the Subdivider at the time of next reading. Additionally, Subdivider shall inform the city of the new baseline at the time of the next reporting.
<p>Groundwater Level and uplift pressure</p>	<p>Four (4) Standpipe Piezometers, with a vibrating wire piezometer and data logger</p>	<ul style="list-style-type: none"> • Provide sufficient sensors and data logging units to collect hourly readings from vibrating wire piezometers to capture tide and storm influence at the project site for the first three months and first storm season. • Daily readings within influence zone of dewatering activities and minimum of readings every two weeks until final NOC for Phase 1A is issued. • Monthly readings during the first year after final NOC for Phase 1A. • Quarterly readings during the second year, after final NOC for Phase 1A. • Readings every six months during the third year, after final NOC for Phase 1A. • Annual readings during 4th through 10th years. 	<p>Groundwater level shall be monitored to confirm if El. 94 ft (best estimated GWT level in Langan’s October 2019 geotechnical report) is accurate as design basis in year 2019.</p> <p>Appendix 3 of CCSF (2015), “Guidance for Incorporating Sea Level Rise into Capital Planning in San Francisco: Assessing Vulnerability and Risk to Support Adaptation,” provided equations to station sea level rise for the “upper end of range” and “most likely” projection for different years.</p> <p>If the measured groundwater level is higher than that predicted in Appendix 3 during the 10th year after the issuance of final NOC for Phase 1A, there is a high probability that the groundwater level will be higher than the assumed 97.0 feet used for the “most likely” scenario.</p>	<ol style="list-style-type: none"> 1. If the measured sustained groundwater level is different than EL. 94 feet 2 years after issuance of Final NOC for Phase 1A, the GEOR shall prepare and submit calculations to verify the adequacy of the as-built conditions for load offset and uplift based on the updated data. 2. If based on these calculations, the LCC Infrastructure is shown to be potentially inadequate at or before year 75, then the Subdivider shall develop, in consultation with the Port of San Francisco, San Francisco Public Works, and the San Francisco Public Utilities Commission, adaptive management strategies to mitigate potential settlement and heave. City agencies will work collaboratively to identify funding to implement these strategies, and such funding sources may include the Mission Rock Community Facilities District, the Port-wide Infrastructure Financing District, or General Obligation Bonds. 	<ol style="list-style-type: none"> 1. Standpipe Piezometers to measure groundwater elevation below the bottom of LCC. The objective is to confirm groundwater level assumed in design and, monitor sea level rise. 2. Install standpipe piezometers a month after pouring top layer of LCC. 3. Subdivider to protect the piezometers in place and provide vehicular traffic-rated casting and raise access to finish grade after the roadway is completed and in service. 4. Reading accuracy shall be plus or minus 0.01 foot.
<p>Gravity Utilities</p>	<ul style="list-style-type: none"> • Ten (10) settlement monuments within Sanitary Sewer/Storm Drain Manholes (shown in SIP Drawing No. C13.00) • One (1) additional utility monitoring point for each block between manholes for Sanitary or Storm Drain. 	<ul style="list-style-type: none"> • Readings every two weeks after final layer of LCC placement. • Reading to establish baseline elevations will be performed within 30 day of final NOC for Phase 1A. • Monthly readings during the first year after final NOC for Phase 1A. • Quarterly readings during the second year, after final NOC for Phase 1A. • Readings every six months during the third year, after final NOC for Phase 1A. • Annual readings during 4th through 9th years. 	<p>Warranty Performance Criteria</p> <ul style="list-style-type: none"> • Any of the following characteristics identified during video inspection of the gravity utilities will be considered a settlement defect: <ul style="list-style-type: none"> ○ Low spot in gravity utilities. Low spots are identified during videoing by spraying water in pipe, then videoing with a 1” measuring device (fishing weights are common) suspended in front of camera. Max low spots: 10” DIA pipe = 0.50” ponding max, 14” DIA pipe = 0.75” ponding max, greater than 14” DIA pipe = 1.00” ponding max. ○ Joint separations (0.75” or greater opening between pipe sections) ○ Cocked joints present in straight runs or on the wrong side of pipe curves ○ Chips in pipe ends 	<ol style="list-style-type: none"> 1. For every 0.5” of settlement or heave without major seismic event, video inspection of gravity sanitary and storm sewer assets shall be required within 30 days of discovery. All assets located between two nearest manholes shall be inspected. 2. Defects identified from the video inspection must be remedied by the Subdivider to the City’s satisfaction under the applicable warranty and/or the Subdivider’s comprehensive insurance program, as may be applicable. 3. The extent and nature of the replacement, repair or redesign shall be based on an evaluation of the mechanism and extent of failure. 	

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		<ul style="list-style-type: none"> Readings every six months during the 10th year (i.e., final year of required monitoring). 	<ul style="list-style-type: none"> Cracked or damaged pipe Dropped joints High rate of water infiltration (by rate or volume) or water damage Irregular condition without logical explanation inconsistent with pipe material or pipe manufacturer’s specifications, which can be attributed to the performance of LCC. 		
<p>Pressurized Utilities</p>	<ul style="list-style-type: none"> Ten (10) settlement monuments on valve nuts of LPW and AWSS Water (shown in SIP Drawing No. C13.00) 	<p><u>For settlement:</u></p> <ul style="list-style-type: none"> Settlement monuments shall be installed within one month of installation of valve boxes for LPW, and AWSS. Six months after placement of final layer of LCC, Public Works, at its discretion may allow the frequency to be reduced to one reading per month. Reading to establish baseline elevations will be performed within 30 day of final NOC for Phase 1A. Monthly readings during the first year after the final NOC for Phase 1A. Quarterly readings during the second year, after final NOC for Phase 1A. Readings every six months during the third year, after final NOC for Phase 1A. Annual readings during 4th through 9th years. Readings every six months during the 10th year (i.e., final year of required monitoring). <p><u>For LPW Pressure Testing:</u></p> <ul style="list-style-type: none"> At end of the Initial Warranty period (i.e., two years from the issuance of the last NOC within Phase 1A), or after 0.5” of monitored settlement or heave, whichever occurs first. At end of the Extended Warranty Period (as defined in Order No. 202368), of 1” of monitored settlement or heave, whichever occurs first. At the end of the Extended Warranty Period (as defined in Order No. 202368) when greater than 1” of monitored settlement or heave is measured. 	<p>Warranty Performance Criteria:</p> <p>For LPW Pressure Testing: SFPUC’s leak detection crew shall be deployed to the site to detect if there are any leaks in the LPW system. The method of detection is based on measuring changes in sound in pressurized pipes. Sound is measured using a hand-held ultrasonic device applied to pipes, hydrants, and/or valves. The type and intensity of sound indicates where a leak may be located.</p>	<ol style="list-style-type: none"> Every 0.50” of settlement or heave excluding a major seismic event shall require Subdivider to perform inspection of the pressurized water systems (LPW, RW and AWSS) within 30 days of discovery. Such inspection shall include a site walk of the pressurized systems (between two nearest valve locations), visual inspection for water leaks and cracked or damaged surface facilities. Determination that a section of pressurized pipes may be leaking shall require investigation and spot correction under the applicable warranty and/or the Subdivider’s comprehensive insurance program, as may be applicable. LPW Pressure Testing to be performed at the cost of Subdivider to identify any possible leaks. 	