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Addendum 3 to Environmental Impact Report

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Case No.:	**2007.946E**
Project Title:	**Candlestick Point-Hunters Point Shipyard Phase II**
EIR:	2007.946E, certified June 3, 2010
Project Sponsor:	Lennar Urban
Lead Agency:	San Francisco Planning Department/Office of Community Investment & Infrastructure
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REMARKS

1. Background

On June 3, 2010, the San Francisco Planning Commission and the Redevelopment Agency Commission certified the Final Environmental Impact Report (Final EIR) for the Candlestick Point – Hunters Point Shipyard Phase II Project (Project), San Francisco Planning Department File Number 2007.0946E and San Francisco Redevelopment Agency File Number ER06.05.07. On July 14, 2010, the San Francisco Board of Supervisors affirmed the Planning Commission's certification of the Final EIR (Motion No. M10-110) and adopted findings of fact, evaluation of mitigation measures and alternatives, and a statement of overriding considerations (File No. 100572) and adopted a Mitigation Monitoring and Reporting Program (MMRP) in fulfillment of the requirements of the California Environmental Quality Act (CEQA). The Project is the integrated redevelopment of 702 acres in the Candlestick Point area and the Hunters Point Shipyard Phase II area with a major mixed-use project, including open space, housing, commercial (office, regional retail, and neighborhood retail) uses, research and development, artist space, a marina, new infrastructure, community uses, entertainment venues, and a new football stadium.

Between June 3, 2010 through August 3, 2010, the Planning Commission, Redevelopment Agency, Board of Supervisors, and other City Boards and Commissions adopted various resolutions, motions and ordinances related to the Project approval and implementation, including but not limited to: (1) General Plan amendments; (2) Planning Code amendments; (3) Zoning Map amendments; (4) Bayview Hunters Point Redevelopment Plan amendments; (5) Hunters Point Shipyard Redevelopment Plan amendments; (6) Interagency Cooperation Agreements; (7) Design for Development documents; (8) Health Code, Public Works Code, Building Code, and Subdivision Code amendments; (9) Disposition and Development Agreement, which included (among other documents) as attachments a Project Phasing

Schedule, a Transportation Plan, and an Infrastructure Plan; (10) Real Property Transfer Agreement; (11) Public Trust Exchange Agreement; (12) Park Reconfiguration Agreement; and (13) Tax Increment Allocation Pledge Agreement.

Subsequent to the certification of the Final EIR and the approvals listed above and as part of the first major phase and sub-phase applications, the project sponsor proposed changes to the Project Phasing Schedule and corresponding changes to the schedules for implementation of related transportation system improvements in the Transportation Plan, including the Transit Operating Plan, and Infrastructure Plan and other public benefits. Addendum No. 1 to the Final EIR, published on December 11, 2013, was prepared to evaluate these changes. A second addendum, Addendum No. 2, was published on May 2, 2014, that evaluated the potential environmental effects from implementation of the Automatic Waste Collection System described in the Final EIR as part of Utility Variant 4. The current addendum, Addendum No. 3 to the Final EIR, evaluates the potential environmental impacts associated with another proposed change to the Project which is a proposal put forth by the project sponsor to demolish the upper level of the Candlestick Park stadium by means of explosives demolition (commonly known as implosion[1]) as opposed to conventional/mechanical demolition.

2. Project Summary

The Project covers approximately 702 acres along the southeastern waterfront of San Francisco consisting of 281 acres at Candlestick Point (Candlestick) and 421 acres at Hunters Point Shipyard (HPS Phase II). The Final EIR evaluated the Project described in Chapter II and several variants. At the time of Project approval in 2010, it was not known whether the 49ers football team would move to Santa Clara or require a new stadium to be built as part of the Project. Consequently, the Board of Supervisors approved several development options, including the Project with the stadium and two non-stadium variants. Specifically, the Board approved these options: (1) the Project with a stadium as described in Chapter II of the Final EIR with the Candlestick Tower Variant 3D, Utility Variant 4, and Shared Stadium Variant 5; (2) the Project without the stadium and with the R&D Variant 1, the Candlestick Tower Variant 3D, and the Utility Variant 4; (3) the Project without the stadium and with the Housing/R&D Variant 2a, the Candlestick Tower Variant 3D, and the Utility Variant 4; and (4) as part of all of the other options, Sub-alternative 4A, which provides for the preservation of four historic structures located in the Hunters Point Shipyard. (See Board of Supervisors CEQA Findings pp. 2-4)

[1] Implosion is a misnomer as buildings do not explode or implode in explosives demolition. However, the term is commonly used to describe the explosives demolition of structures and is used in this addendum for the proposed explosives demolition of Candlestick Park Stadium.

Following the Project approval in 2010, the 49ers decided to move to the City of Santa Clara. Consequently, the project sponsor decided to proceed with the Project without the stadium and with the Housing/R&D Variant 2a, the Candlestick Tower Variant 3D, the Utility Variant 4, and Sub-alternative 4A.

All variants in the Final EIR included the demolition of Candlestick Park Stadium as part of the Project as the site of the stadium was planned for the development of the Candlestick Point Center district, which would include regional retail, office, hotel, entertainment, and residential uses. In its analysis of the environmental impacts of the Project and all variants, the Final EIR analyzed and disclosed the environmental impacts from the conventional demolition of Candlestick Park Stadium by means of mechanical demolition. It did not include an analysis of environmental impacts associated with an explosives demolition method or implosion for the structure. The Project Sponsor, Lennar Urban, proposes now to use a combination of mechanical demolition and implosion for the Candlestick Park Stadium. This Addendum analyzes whether including implosion of the upper levels of the stadium in the demolition plan for the Candlestick Park Stadium would result in new significant environmental impacts, increase the severity of previously identified impacts from conventional demolition techniques, or require new or revised mitigation measures or alternatives.

Lennar Urban would need to obtain a demolition permit from the San Francisco Department of Building Inspection (DBI) for the proposed implosion, notify the Bay Area Air Quality Management District (BAAQMD) of the proposed demolition in compliance with BAAQMD Regulation 11, Rule 2, obtain a San Francisco Fire Department explosives permit, and coordinate the planned demolition with other City departments such as the San Francisco Municipal Transportation Agency, Department of Public Works, San Francisco Police Department, and San Francisco Recreation and Parks Department.

3. Candlestick Park Stadium

Candlestick Park Stadium is owned by the City and County of San Francisco. The City leased the Stadium to the San Francisco 49ers, with the lease ending late July 2014. The 70,207-seat stadium and parking lot areas immediately surrounding the stadium are under the jurisdiction of the San Francisco Recreation and Park Department.

The stadium is set on an irregularly shaped parcel bound by Giants Drive and Gilman Avenue to the north, Hunters Point Expressway to the east, and Jamestown Avenue to the south and Jamestown Avenue/Giants Drive to the west. The large parcel, composed of artificial fill, is located adjacent to a large hill at the west, and bordered by Candlestick Point State Recreation Area to the east and south. The stadium is surrounded by a large, paved parking lot on the north, east, and south sides, with a chain link

fence along the parking lot periphery. Landscaping around the stadium itself is minimal and consists primarily of clusters of trees around both the north and south (main) gates (CIRCA 2010).

The stadium is a reinforced concrete and steel open-air sports and entertainment stadium that was originally constructed in 1960 in four sections. Over the years, eight additional sections were added. The stadium is an enclosed, asymmetrical plan building with a maximum height of 114 feet above grade in one portion of the stadium and a height of 70 feet in another portion of the structure. Seating is provided on two main levels. The upper deck seating is continuous around the perimeter of the stadium, and the lower deck has a section of retractable seating. The upper deck is partially sheltered by a curved roof canopy supported by curved concrete ribs. An exterior concourse encircles the stadium at the upper level. Six gates provide entrances into the stadium. An extensive system of exterior ramps, stairs, and escalators provide access to the main entrances. The stadium has six escalators, three passenger elevators, and one freight elevator. There are four locker rooms, two first aid stations and 44 concession stands. Banks of lights on tall poles, standing just outside the stadium and extending above the stadium's roof, illuminate the playing field for night games (CIRCA 2010).

4. Discussion of Demolition in the Final EIR

The Final EIR (pages II-50 and -51) provides the following description regarding the demolition of existing structures on the project site, including the Candlestick Park stadium.

> **II.F.1 Abatement and Demolition**
>
> Demolition of existing structures within the Project site would occur from 2011 to 2024 on Candlestick Point and from 2010 through 2016 on HPS Phase II. As the majority of development would occur on HPS Phase II during the first phase by 2017, most demolition would initially occur in that area of the Project site. In Candlestick Point, demolition of Alice Griffith housing would also occur in the first phase. The estimated quantity of demolition debris is presented in **Table 1** (Estimated Demolition Debris).
>
> Demolition activities would result in construction debris generated by the removal of structures, roads, and infrastructure. In total, approximately 971,787 tons of construction debris would be generated, including 424,681 tons from Candlestick Point and 547,104 tons from HPS Phase II. Most of the construction debris (45 percent) would consist of concrete, with the remaining debris consisting of wood (17 percent), steel (18 percent), and other miscellaneous debris (20 percent). It is assumed that the concrete debris would be recycled on site as pipe bedding or road base; the

wood debris would be chipped and sent to the local landfill for disposal; and the steel would be recycled off site for other uses.

Candlestick Point

Demolition activities at Candlestick Point would include demolition of the existing Candlestick Park Stadium, associated parking lots, existing infrastructure, and structures on adjacent properties to be acquired, as well as demolition of the Alice Griffith public housing. Minor utilities would be abandoned in place or removed if they would interfere with installation of new infrastructure. Those include existing small-diameter combined sewer, the CPSRA sewer force main, storm drainage facilities, and low-pressure water main. Lennar Urban would be responsible for all demolition at Candlestick Point.

Table 1
Estimated Candlestick Point
Demolition Debris (Tons)

Demolition	Concrete	Wood	Steel	Miscellaneous Debris	Total
Buildings	212,361	26,611	104,250	55,150	298,372
Roads	2,021	0	33	24,255	26,309
Total	214,382	26,611	104,283	79,405	424,681

Source: City and County of San Francisco Planning Department 2010.
Note: The estimated demolition debris includes debris generated from the demolition of all structures within the plan area and not just the stadium.

5. Proposed Revisions to the Project

As noted above, the Final EIR included the demolition of Candlestick Park Stadium in the Project description and all variants evaluated in the Final EIR and the Final EIR considered the impacts of demolition using conventional demolition techniques. The proposed revision to the Project involves the use of explosives demolition to demolish the high-rise portion of the stadium. Lennar Urban is considering using this method because it is difficult to demolish the upper level of the Stadium using mechanical means due to the height of the structure. Explosives demolition may have certain other advantages over mechanical demolition in that it compresses the demolition schedule and reduces the duration of time nearby receptors would be exposed to nuisances such as dust and noise associated with mechanical demolition.

The basic concept of explosives demolition is that by removing key structural supporting elements of a building at certain points, the sections of the building above those points will fall down on the part of the building below those points. Explosives eliminate the support structure and gravity then brings the building down. Implosion is not like typical blasting. Instead it is the engineered progressive failure of a structure induced by the systematic elimination of structural supports through the use of small amounts of strategically placed explosives (CDI 2014).

The implosion process would begin with an evaluation and analysis of the stadium so that an explosives demolition plan specific to the stadium can be developed. Aspects of the demolition process would be the same as used in mechanical demolition, such as security precautions, materials recovery, hazardous materials assessment and abatement, and the mechanical demolition of the low-rise portion of the stadium. As in conventional demolition, materials that can be recovered or salvaged, and materials to be removed ahead of the implosion would be identified. Due to the age of the structure, it is likely to contain asbestos and lead-based paint, and will require abatement in accordance with regulatory requirements (discussed in the Final EIR on p. III-K-41). Therefore, a hazardous materials assessment would be completed and an abatement plan would be developed to remove hazardous materials present within the structure prior to any demolition. Following the completion of these planning studies, the abatement of hazardous materials would be completed and the materials to be salvaged would be removed. Once that is done, preparatory mechanical demolition would be completed, followed by explosives preparation and implosion, and cleanup after implosion. Throughout the process, security would be in place on and around the site. In addition, an outreach program to the people living in the surrounding area would be implemented, and the project sponsor would coordinate the implosion activities with the appropriate public agencies. Each of these phases/steps is described briefly below.

- **Stadium Evaluation and Development of Implosion Plan:** The implosion plan for the stadium would take into account structural plans of the stadium, geotechnical information for the stadium site and historic data from felling of similar quantities of debris from structures onto similar types of geotechnical conditions. Key structural elements would be identified on the drawings and a collapse sequence would be engineered. From this collapse sequence, the plan would identify the specific location, delay timing and quantities of explosives to be used. (CDI 2008)

- **Hazardous Materials Assessment and Abatement:** Hazardous materials assessment of the stadium has already been completed. The stadium was inspected, sampled and tested for asbestos, lead coatings, PCB-containing materials, fluorescent tubes, and any other hazardous materials that might have been used at the site (VBA 2014). Based on inspection and laboratory testing results, a complete

hazardous materials abatement and remediation program was developed and executed. Onsite third-party certified inspectors oversaw the work (VBA 2014).

- **Soft Demolition:** Clean soft demolition is the systematic and programmed removal of nonstructural components such as furnishings, equipment, finishes, mechanical and plumbing systems, and all other building components that can be reused or recycled.

- **Preparatory Mechanical Demolition:** The mechanical demolition would: (1) provide access to clean reinforced concrete columns where drilling would be performed for the loading of explosives, (2) remove or reduce the amount of materials on site that could generate dust, and (3) weaken the structure in preparation of felling the high-rise portion.

- **Explosives Preparation:** The explosives would be delivered to the site by the local explosive material provider in a licensed explosives delivery vehicle with appropriate coordination with the regulatory agencies, including the City Fire and Police Departments, and 24-hour security measures. They would be placed by licensed and permitted professionals in accordance with the manufacture's recommendation and in accordance with guidelines established by the Institute of Makers of Explosives, in specific locations to facilitate sequential failure of the structure during the collapse.

- **Implosion:** While explosives are on site, the area will be secured by the Demolition Contractor, and patrolled during non-working hours by dedicated security. Several hours prior to the implosion, a pre-determined Explosion Zone around the demolition site will be cordoned off from the general public in coordination with the City, Demolition Contractor, Implosion Contractor, and local authorities. A final countdown will commence 15 minutes before the explosives demolition. The Implosion Contractor will maintain communications at the command post with key authorities during this time and will detonate the explosive charges from the firing position only after an "all clear" message is received. Individuals outside the safety perimeter without radio contact will be alerted of the impending implosion event by the use of auditory sirens/signals. Typically an implosion takes a few seconds and produces a cloud of dust in the immediate vicinity of the imploded structure's footprint. The implosion would be scheduled in the morning hours to avoid windy conditions.

- **Post Implosion Cleanup:** The Implosion Contractor will inspect the debris pile, the adjacent properties/rights-of-way and issue the "All Clear" and the Demolition Contractor will begin dust cleanup operations in coordination with the City. Similar to the debris generated by mechanical demolition, the debris generated by the implosion will be stored and processed on the stadium site.

It is anticipated that the implosion of the stadium would be conducted in winter 2015 mostly likely in the morning when wind conditions at Candlestick Point are the least windy and on a Saturday or Sunday when any road closures or other arrangements needed for the event would be the least disruptive of traffic and normal activities. Given the location of the stadium at Candlestick Point, road closures would be limited to the roads leading to the site, including Harney Way, Jamestown Avenue, Ingerson Avenue, and Gilman Avenue.

6. Analysis of Potential Environmental Effects

The proposed implosion would not affect the long-term occupancy and operations at the Project site. Therefore, it would not alter any of the operational impacts of the Project identified in the Final EIR and would not alter any of the planned construction of new structures and infrastructure. For these reasons, the analysis in the Final EIR of the following subject areas would be unaffected by the proposed explosives demolition of the stadium:

- **Land Use and Plans**: use of explosive demolition in place of mechanical demolition of the stadium would result in no change in land use and plans impacts. (See Final EIR, page III.B-34)

- **Population, Housing, and Employment:** use of explosives demolition in place of mechanical demolition of the stadium would result in no increase in the number of construction employees who might relocate to the project area beyond what was previously analyzed for mechanical demolition. (See Final EIR Impact PH-1, page III.C-14)

- **Shadow:** use of explosives demolition in place of mechanical demolition of the stadium would result in no shadow impacts. (See Final EIR, page III.F-9)

- **Wind:** use of explosives demolition in place of mechanical demolition of the stadium would result in no wind impacts; potential construction impacts due to wind were analyzed in other sections of the EIR: Section III.H (Air Quality) analyzes fugitive dust air emissions, and Section III.M (Hydrology and Water Quality) analyzes erosion from Project construction that could cause fugitive dust emissions. (See Final EIR, page III.G-6)

- **Cultural Resources and Paleontological Resources:** use of explosive demolition in place of mechanical demolition of the stadium would not affect historic resources as there are no historic structures nearby that could be affected and the proposed implosion would not involve any ground disturbing activities, resulting in no change in archaeological resources and paleontological resources impacts. (See Final EIR, page III.J-33)

- **Geology and Soils:** use of explosive demolition in place of mechanical demolition of the stadium would not involve any ground disturbing activities that could result in soil erosion. Therefore there would be no change in geology and soil impacts. (See Final EIR, page III.L-32)

- **Public Services:** use of explosive demolition in place of mechanical demolition of the stadium would not require additional public services or facilities, resulting in no change in public services impacts. (See Final EIR, page III.O-8)

- **Utilities:** use of explosive demolition in place of mechanical demolition of the stadium would not require construction of new or expanded utilities, resulting in no change in utilities impacts. (See Final EIR, page III.Q-16)

- **Energy:** use of explosive demolition in place of mechanical demolition of the stadium would be temporary, resulting in no change in energy impacts. (See Final EIR, page III.R-16)

- **Greenhouse Gas (GHG) Emissions:** the proposed implosion would shorten the duration of demolition activities on the site. Consequently, GHG emissions from construction vehicles and equipment would be reduced. Therefore, overall the total amount of GHG emissions associated with the Project's demolition activities would decrease. The use of explosive demolition in place of mechanical demolition of the stadium would not result in a change in greenhouse gas emissions impacts. (See Final EIR, page III.S-36)

The analysis below focuses on whether implosion of the upper level of the stadium instead of the use of mechanical demolition would change the Final EIR analysis and findings for the Project's construction-related impacts.

6.1 Transportation and Circulation

The potential for the proposed implosion to affect the Final EIR conclusions regarding the Project's construction-phase traffic and circulation impact (*Impact TR-1: Construction Vehicle Traffic and Roadway Construction*) is discussed below.

Impact TR-1: The Final EIR (page III.D-67) estimated and analyzed potential traffic impacts from construction truck trips, including truck trips associated with the removal and off-haul of the demolition debris. The total amount of construction debris generated at the site would not change with the proposed implosion. Therefore, there would be no increase in the number of truck trips associated with debris disposal. Furthermore, given the nature of activities associated with the implosion, the proposed implosion would not generate more construction worker or supply delivery vehicle trips than an all

mechanical demolition plan as analyzed in the Final EIR. Therefore, the previously evaluated impact would remain unchanged.

Traffic patterns would be slightly altered on the day of the implosion in that some of the streets leading to the stadium would need to be closed to traffic. As stated in **Section 5**, a pre-determined area around the demolition site would be cordoned off from the general public in coordination with the City Fire and Police Departments and the San Francisco Municipal Transportation Agency (SFMTA), Demolition Contractor, Implosion Contractor, and local authorities. This Exclusion Zone will be defined in a Final Traffic Control and Safety Perimeter Implementation Plan, which will be submitted to the City for review and approval as part of the required compliance with Final EIR MM TR-1. Roadways leading to or adjacent to the stadium would be cordoned off during the implosion event, including Harney Way, Jamestown Avenue, Ingerson Avenue, and Gilman Avenue. The implosion would take place in the morning on a Saturday or Sunday when road closures would have the least impact on vehicular traffic. Additionally, the road closures would be for a short duration (generally less than 1 hour) and detours would be provided. Any change in traffic volumes from detours would likely be no more than a few additional vehicles, given the low traffic volumes on the roads that would be closed on a weekend morning. There could be an increase in traffic volumes on roads leading to the site from people interested in watching the implosion. However, all traffic on roads leading to the stadium would be controlled and directed by the San Francisco Police Department (or SFMTA Parking and Traffic) and any congestion would be temporary and short-lived. Traffic associated with the implosion and demolition contractors would be subject to compliance with the construction traffic management program required by Final EIR MM TR-1. The Final EIR anticipated that Project construction activities, including demolition activities, could result in travel lane closures and temporary re-routing of transit routes. Thus, the short duration of road closures for the implosion has been covered by the analysis of Impact TR-1 and would be mitigated by Final EIR MM TR-1. Consequently, the findings of the Final EIR under *Impact TR-1* would not change as a result of the proposed implosion of the stadium.

In summary, the proposed implosion would not result in new significant traffic impacts, change or alter any of the traffic or circulation impact conclusions in the Final EIR, or require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the Final EIR's findings related to traffic impacts.

6.2 Aesthetics

The potential for the proposed implosion to affect the Final EIR conclusions regarding the Project's construction-phase impacts on aesthetics and visual resources (*Impact AE-1: Effect on a Scenic Vista or*

Scenic Resources; Impact AE-2: Degradation of Visual Character or Quality, and *Impact AE-3: Effect of Light or Glare on Day or Night Views*) is discussed below.

Impact AE-1: The Final EIR (page III.E-50) determined that construction activities associated with the Project, including the demolition of the stadium, would result in a less than significant impact on scenic vistas and scenic resources and no mitigation measures were required. The change from mechanical demolition of the high-rise section of the stadium to implosion would not affect any scenic vistas or resources. Therefore, the previously evaluated impact would remain unchanged.

Impact AE-2: The Final EIR (page III.E-51) determined that construction activities associated with the Project, including the demolition of the stadium, would result in a potentially significant impact on visual character and quality of the Project site, however with mitigation, the impact would be reduced to a less than significant level. The change from mechanical demolition of the high-rise section of the stadium to implosion would not have any different effect on the visual character of the site. In fact, the implosion may be beneficial in that it would compress the construction schedule and reduce the duration that the site would appear as a construction site. Therefore, the previously evaluated impact would remain unchanged. In any event, Final EIR MM-AE-2 would apply to the demolition activities, which requires screening of construction equipment, a plan for construction staging, access and parking, and implementation of measures to keep mud and dust off vehicles leaving the site, and sweeping of surrounding streets to keep then free of dirt and debris.

Impact AE-3: The Final EIR (page III.E-51) determined that construction activities associated with the Project, including the demolition of the stadium, would result in a less than significant impact related to light and glare. There may be additional night lighting due to the increased security leading up to the implosion but not significantly more than what was analyzed under the Project. Furthermore, due to the compression of the construction schedule facilitated by the implosion, the duration of time that there would be night lighting on the stadium site would be reduced. Therefore, the previously evaluated impact would remain unchanged.

In summary, the proposed implosion would not result in new significant aesthetic impacts, change or alter any of the Final EIR's findings with respect to aesthetic impacts, or require new mitigation measures. Additionally, there are no changed circumstances or new information that would change the Final EIR's findings related to aesthetic impacts.

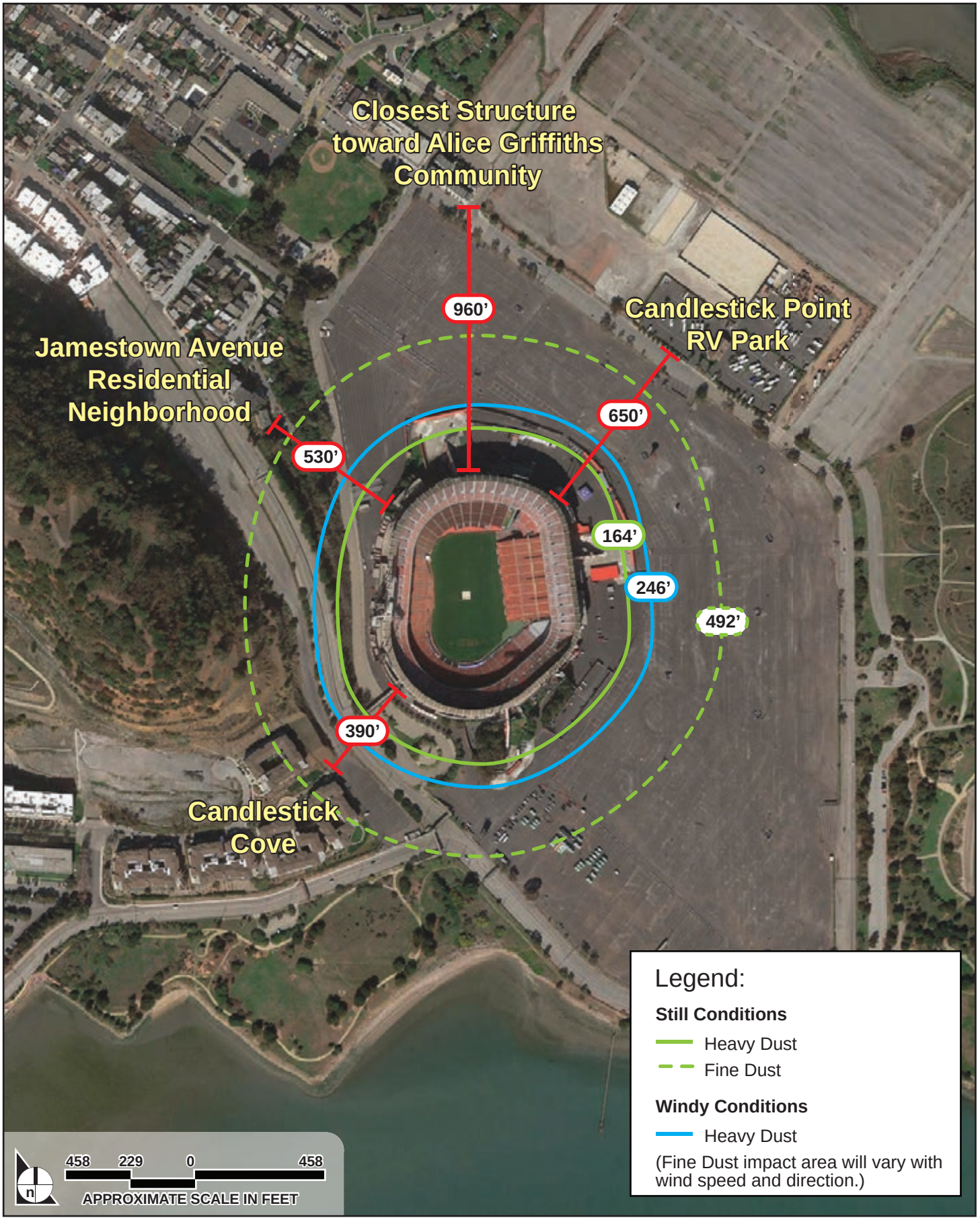
6.3 Air Quality

The proposed implosion would be a short duration, temporary activity during the construction phase of the Project. As described in **Section 5**, the proposed implosion involves the use of explosives to demolish the high-rise portion of the stadium, in addition to conventional mechanical demolition for the rest of the stadium; the Final EIR assumed the latter method only in its analysis of construction-related impacts of the Project.

The potential for the proposed implosion to affect the Final EIR conclusions regarding the Project's construction-phase impacts (*Impact AQ-1: Criteria Pollutants (Construction)*, *Impact AQ-2: DPM from Construction Activities*, and *Impact AQ-3: TACs from Construction Activities*) is discussed below.

Impact AQ-1: Impact AQ-1 in the Final EIR is focused on emissions of criteria pollutants during Project construction (page III.H-23). The construction activity data that was used to evaluate the impacts from the Project's construction emissions included the mechanical demolition of the stadium. The Final EIR noted that the BAAQMD identifies particulate matter (PM_{10}), or fugitive dust, as the pollutant of greatest concern with respect to construction-related emissions. It bases its determination of the significance of a Project's impacts on the dust control measures that will be implemented. The BAAQMD recommends certain control measures and San Francisco Health Code Article 22B, Construction Dust Control, requires the preparation of a site-specific dust control plan (with mandatory control measures similar to the BAAQMD's) for construction projects within 1,000 feet of sensitive receptors (residence, school, childcare center, hospital or other health-care facility or group-living quarters). The Final EIR identified Impact AQ-1 as significant but mitigable with the implementation of Final EIR MM HZ-15. This measure requires the submission of an Asbestos Dust Mitigation Plan (ADMP) to BAAQMD for areas over 1 acre that potentially contain naturally occurring asbestos and SFDPH approval of a Dust Control Plan (DCP) for any construction over 0.5 acre in size at Candlestick Point (the applicability of this mitigation measure to the proposed implosion is discussed below).

Overall, implosion would produce the same amount of dust as mechanical demolition but over a shorter period of time. About 30 percent of dust is created during the implosion and the rest afterward during downsizing and process of material. Although a cloud of visible dust would be produced at the time of the implosion, it would persist only for a brief period. The recent implosion of Warren Hall on the CSU East Bay Hayward campus and the videos of implosions of other large structures in the U.S. and the rest of the world demonstrate that the visible dust during implosion would persist for only a few minutes.



SOURCE: Google, Inc., May 2014

FIGURE **1**

Sensitive Receptors and Implosion Related Dust

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While implosion would result in dust for a shorter period of time, dust would be dispersed over a wider area as shown in **Figure 1**. Demolition that occurs in still air, for a structure the size and open configuration of the stadium, the majority of the large particulate dust would precipitate within 50 meters (164 feet) of the outside perimeter of the stadium. Due to the distance between this area and the nearest off-site structures, no off-site receptors would be affected by large particulate dust under the anticipated implosion schedule and circumstances currently envisioned. Given the high humidity in the Bay area, in still air, fine dust could travel as much as 150 meters (492 feet). As shown in **Figure 1,** this area of effect is largely limited to the stadium site and other than a small portion of Candlestick Cove development, there are no receptors within this area of effect. If weather conditions at the time of the implosion include wind, the large particle dust are expected to precipitate within approximately 75 meters (246 feet) downwind of the structure (see **Figure 1**) and fine dust would remain suspended in the air for several minutes more. Depending on wind velocity, the wind would disperse the remaining fine dust out over a larger area. The distance the fine dust would travel would be a direct function of wind speed at the time of the implosion. Given the prevailing winds at Candlestick Point which are from the west, the dust cloud would travel over the stadium parking lot and then out to the bay, where it would disperse. To address the contingency that winds could shift and some of the finer particles could be dispersed in a landward direction, as part of the DCP, all nearby sensitive receptors would be informed of the implosion and asked to take necessary precautions (e.g., remain indoors, close windows).

Furthermore, the Project Sponsor is required to implement Final EIR MM HZ-15, which requires the implementation of a SFDPH-approved DCP (ADMP requirement is not applicable to the implosion and will apply only during subsequent ground disturbing activities on the stadium site). The DCP for the Project has been prepared and contains specific mitigation measures to the extent deemed necessary by the SFDPH to achieve the goal of no visible dust at the property boundary during all conventional construction activities. These MM HZ-15 measures were formulated primarily to mitigate impacts related to naturally occurring asbestos dust during grading, excavation, soil-disturbing activities.

Additional dust control measures specific to the proposed implosion have been developed by the Project Sponsor in order to achieve the goal and intent of Article 22B, which is to reduce the quantity of dust generated during site preparation, construction and demolition in order to protect the health of the general public, protect the health of on-site workers, minimize public nuisance complaints, and avoid orders to stop work by the Department of Building Inspection. The SFDPH and BAAQMD were consulted in the preparation of the additional dust control measures, and both agencies reviewed the measures included in the *Supplemental Dust Mitigation Requirements During an Implosion (***Appendix A***)*, and determined that these supplemental requirements included all expected dust control measures for an implosion at the project location. These additional dust control measures specific to the proposed

implosion are designed to both minimize dust emissions and exposure to dust from an implosion. They differ from the measures in MM HZ-15 in that they are specific to reducing impacts on the implosion, as opposed to impacts from soil-disturbing activities. The additional dust control measures are included below and incorporated into Revised MM HZ-15, attached as Appendix E.

Revised MM HZ 15 Asbestos Dust Mitigation Plans and Dust Control Plans.

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In the case of implosion, the DCP additionally shall include provisions to achieve the Article 22B goal of minimization of visible dust exposure:

- **Remove dust-generating material prior to implosion, including, without limitation, performing an interior strip out to remove such items as copper, non-structural steel aluminum, dry wall, carpet, window glazing, timber, furniture, fixtures, and equipment. Remove brick and concrete block.**

- **Implement a community outreach program to identify potentially affected sensitive receptors and equipment and to work with receptors and businesses to minimize dust exposure during implosion event, by assisting receptors to stay indoors or to evacuate from the affected area.**

- **Coordinate with facility managers in the affected area to control dust entry into buildings during event.**

- **Implement prompt dust cleanup measures after event; station clean-up crews, including street sweepers, window washers, water trucks and similar equipment and personnel in the area prior to event to facilitate immediate cleanup.**

- **Undertake implosion only during advantageous weather conditions with minimal wind speed and minimal wind movement toward sensitive receptors**

- **Prior to implosion, encase site with a chain link fence and fabric to minimize large particles from leaving the site**

- **Protect stormwater inlets from dust**

…

With implementation of revised MM HZ-15, implosion of the stadium, like deconstruction of the stadium using conventional demolition methods, would result in a significant but mitigable impact from exposure to construction-related dust. Revised MM HZ-15 incorporates additional dust control measures that have been reviewed by BAAQMD and DPH staff to specifically control dust exposure during an implosion event. The measures will both minimize dust and minimize exposure to dust. Therefore, the demolition by implosion would result in no new significant impacts. The previously evaluated impact would remain unchanged.

Impact AQ-2: The construction human health risk assessment (HRA) prepared for the Final EIR and updated in 2013 (as part of Addendum No. 1) analyzed potential human health impacts from exposure to diesel particulate matter (DPM) emissions during Project construction. The 2009 HRA and the 2013 update included all construction emission sources, including the mechanical demolition of the stadium. The analysis concluded that the impact would be less than significant with mitigation (page III.H-24 of the Final EIR and pages 36 and 37 of Addendum No. 1).

The proposed implosion of the high-rise portion would not result in any greater emissions of DPM than previously evaluated under Impact AQ-2 because overall, the same amount of building material would be demolished under both methods of demolition. In fact, implosion would reduce the number of hours that construction equipment would operate at the stadium site and would thereby reduce the total combustion emissions generated by construction equipment at the site, including the total amount of DPM produced during the demolition of the stadium. Therefore, Impact AQ-2 would be reduced and would remain less than significant with mitigation.

As noted above, the proposed implosion would produce a large cloud of dust in the immediate vicinity of the imploded structure's footprint that would persist for a short duration. Although fugitive dust is not considered a toxic air contaminant (TAC), exposure to high concentrations of dust can result in health effects. The control measures, described above, would be included in the DCP for the implosion pursuant to Final EIR revised MM HZ-15 to ensure that the dust cloud does not expose any sensitive or non-sensitive populations to high concentrations of dust. The demolition permit and DCP would limit implosion activities to the morning hours in low wind conditions. Therefore, the implosion would be scheduled in the morning hours to avoid windy conditions.

The dust dispersion patterns on a still air day and a windy day are discussed above under **Impact AQ-1**. Elevated dust levels temporarily produced by the implosion would be controlled through implementation of the DCP so that receptors would not be exposed to high concentrations of dust that could result in adverse health effects. The *Supplemental Dust Mitigation Requirements During an Implosion* include a variety of specific dust control measures to be implemented in association with the implosion. These measures include removal of dust generating material prior to the implosion, implementation of the Public Outreach Program (**Appendix B**) to coordinate with sensitive receptors, and dust control and clean-up measures such as protection of stormwater inlets, street sweeping, and monitoring of weather to limit dust radius. While even a short-term exposure would be avoided by the implementation of the DCP, a short term exposure, should it occur, would be unlikely to result in serious acute (short-term) health effects or long-term adverse health effects. There is no current methodology or scientific basis for assessing long-term health effects from an exposure to particulate matter lasting a few minutes. For

comparison, long-term impacts from particulate matter, if any, are analyzed assuming a 70 year exposure. Furthermore, the dust cloud would not contain any toxic materials that could have lasting effects (testing of the structural elements of the stadium has shown that the columns are made up of only concrete and do not contain any asbestos). Additionally, the abatement of hazardous materials, including asbestos-containing building materials, would be completed before the implosion of the stadium. Consequently, no new significant impact associated with exposure to high dust concentrations would occur and no new mitigation is required.

Impact AQ-3: The construction HRA prepared for the Final EIR and updated in 2013 analyzed impacts associated with exposure to TACs present in site soils. The results of the analysis are presented in Impact AQ-3 in the Final EIR (page III.H-27). As Impact AQ-3 is related to exposure to TACs present in soils, and the proposed implosion does not involve any disturbance of site soils, this previously evaluated impact would remain unchanged.

In summary, the proposed implosion would not result in a new significant air quality impact, change or alter any of the Final EIR's findings with respect to the construction-phase air quality impacts, or require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the Final EIR's findings with respect to air quality impacts.

6.4 Noise and Vibration

The Final EIR evaluated three construction-phase noise and vibration impacts: *Impact NO-1: Exposure of Persons to Excessive Noise Levels (Construction)*, *Impact NO-2: Exposure of Persons to Excessive Vibration Levels (Construction)*, and *Impact NO-3: Increases in Ambient Noise Levels (Construction)*. The potential for the proposed implosion to affect the Final EIR conclusions regarding these three impacts is discussed below. In addition, the proposed implosion is evaluated to determine whether it could result in a new significant construction-phase impact that was previously not identified.

Impact NO-1: The Final EIR (page III.I-24) analyzed construction noise impacts from demolition and construction activities in the Candlestick Point area, including the mechanical demolition of the stadium and concluded that although noise impact thresholds would be exceeded, the noise impact would be reduced to a less than significant level with the mitigation measures set forth in the Final EIR. Noise levels that would result from an implosion of the stadium were not analyzed in the Final EIR. As stated in **Section 5** above, the implosion is a short-lived event that would be over within 20 or 30 seconds, and would replace the prolonged demolition activity that would be involved in the mechanical demolition of the high-rise portion of the stadium. Therefore, although noise levels at the site would be elevated for

about 20 to 30 seconds, overall the proposed implosion would reduce the exposure of nearby residents to prolonged demolition noise.

Construction Impacts at Off-Site Noise-Sensitive Receptors

Estimates of the noise levels that would be experienced at nearby off-site sensitive receptor locations for a short duration of 20 to 30 seconds are shown below in **Table 2**. These are presented in dBL, which is the sound pressure measured linear 20 Hz to 20 kHz with no weighting applied, and in dBA which are A-weighted levels. The duration of these peak noise levels would be in pulses less than 0.5 seconds in duration, which would place these estimates below OSHA standards for protection for workers against injury from impact noise. During the detonation of the "confined implosion charges" and fall of the structure, noise levels would likely be lower (CDI 2014).

Table 2
Estimated Noise Levels at Key Locations

Sensitive Receptor	Noise Level (dB(L))	Noise Level (dBA)
Candlestick Cove	140.7	122.7
Jamestown Avenue Residential Neighborhood	139.7	121.7
Alice Griffith Community	135.1	118.1
Candlestick Point RV Park	136.6	118.6

*Source: CDI 2014 located in **Appendix C***

As stated in the Final EIR, the Project would cause a significant noise impact during construction if it would generate construction noise between the hours of 8:00 P.M. and 7:00 A.M. that exceeds the ambient noise level by 5 dBA at the nearest property line (unless a special permit has been granted by the Director of Public Works or the Director of Building Inspection); or produce noise by any construction equipment (except impact tools) that would exceed 80 dBA at 100 feet. The Final EIR further explains that the San Francisco Police Code Sections 2907 & 2908 require that (1) noise levels from individual pieces of construction equipment, other than impact tools, not exceed 80 dBA at a distance of 100 feet from the source (the equipment generating the noise); (2) impact tools, such as jackhammers, must have both the intake and exhaust muffled to the satisfaction of the Director of Department of Public Works (DPW); and (3) if the noise from construction would exceed the ambient noise levels at the property line of the site by 5 dBA, the work must not be conducted between 8:00 P.M. and 7:00 A.M., unless the Director of DPW authorizes a special permit for conducting the work during that period.

The proposed implosion would not conflict with the first threshold above because the event would not occur between the hours of 8:00 P.M. and 7:00 A.M. The short-lived noise levels produced by the implosion would exceed the second threshold but would not conflict with the Police Code provisions because the threshold applies to individual pieces of construction equipment (except impact tools) and not an implosion. Furthermore, the City allows for construction noise levels to exceed the standards established if the work is not conducted between the hours of 8:00 P.M. and 7:00 A.M. and the project includes other construction noise attenuating features. Final EIR MM NO-1a.1 requires the Project Sponsor to incorporate noise reducing practices into the construction plans. The proposed implosion noise reducing practices would be described in the plan submitted to the City pursuant to Final EIR MM NO-1a.1, and would include limiting the amount of explosives to the minimum needed to bring the high-rise sections down, using additional layers of non-electric blasting caps above and beyond the primary explosives delay timing for the purpose of reducing noise levels arising out of the implosion, and by removing the lower portions of the structure by mechanical methods. Further, as the implosion and other construction activities associated with the Project would occur under the hours allowed under Sections 2907 and 2908, this impact would be less than significant and no new mitigation is required

Damage to property from overpressure created by the use of explosives was not specifically addressed in the Final EIR. Peak overpressure levels that would result from the implosion are presented in **Table 2**. Window panes, which are the most fragile elements of a building, can withstand peak overpressure levels up to 151 dB(L) (0.1 psi) without breakage (CDI 2014). As the results in the table show, the proposed implosion would generate overpressure levels that are well below this level, and therefore no property damage would occur.

Construction Impacts on Future On-Site Noise-Sensitive Receptors

The Final EIR (page III.I-28) analyzed construction noise impacts from demolition and construction activities on residential uses that would be developed as part of the Project in Candlestick Point. Residential uses that would be developed as part of the Project in Candlestick Point would be occupied starting in 2017. These residential uses would be located in the Alice Griffith district. Subsequent residential uses in Candlestick Point are scheduled for occupancy in 2021, 2025, and 2029 in the CP North, CP South, CP Center, and Jamestown districts. The commercial, neighborhood and regional retail, hotel and performance venue associated with Candlestick Point would be completed by 2021.

The Project would include redevelopment of Alice Griffith Public Housing to provide one-for-one replacement units. Eligible Alice Griffith Public Housing residents would have the opportunity to move to the new units directly from their existing Alice Griffith Public Housing units without having to relocate to any other area. Therefore, while construction would occur at one parcel, residents would

continue to reside at the remaining parcels. As such, the Final EIR identified these residents as on-site receptors during Project construction within the Alice Griffith district.

However, based on the construction schedule and proximity of the Alice Griffith site to the stadium, the Alice Griffith development is not considered as an on-site noise sensitive receptor for the purposes of construction activities associated with the implosion of the stadium. Instead, it is considered a nearby off-site noise-sensitive receptor as discussed above. Therefore, the stadium implosion would not impact on-site noise sensitive uses.

Impact NO-2: The Final EIR (page III.I-33) analyzed the potential effects of high levels of groundborne vibrations produced by construction activities, in terms of their potential to cause human annoyance or result in damage to foundations and exteriors of fragile structures close enough to the construction activity. The analysis included an evaluation of vibrations produced by controlled rock fragmentation technologies such as pulse plasma rock fragmentation (PPRF) and controlled blasting (CB). The Final EIR analysis noted that of all construction activities, impact pile driving would produce the highest levels of vibrations (112 VdB at 25 feet, as shown in Final EIR Table III.1-13). However, due to distance between the vibration source and receptor, the vibration levels experienced at the nearby off-site receptors, including the Alice Griffith district, would not exceed the applicable threshold. The analysis also focused on vibration impacts from loaded truck movement and concluded that vibration levels of 86 VdB would be experienced at the off-site receptors from the movement of Project-related loaded trucks on area roadways and would result in a significant and unavoidable groundborne vibration impact, by causing human annoyance in residential neighborhoods adjacent to the Candlestick Point Project site.

Implosion of the stadium would result in groundborne vibrations that would be the result of the debris hitting the ground. Estimated vibration levels that would be experienced at the nearby sensitive receptor locations due to the proposed implosion are presented in **Table 3** below.

Table 3
Estimated Groundborne Vibrations at Key Locations

Sensitive Receptor	Distance to Receptor (feet)	Peak Particle Velocity (in/sec)	Frequency (Hz)	VdB
Candlestick Cove	390	0.21	15 to 20	111.5
Jamestown Avenue Residential Neighborhood	530	0.16	12 to 17	109.1
Alice Griffith Community	960	0.09	10 to 15	104.1
Candlestick Point RV Park	650	0.13	8 to 12	107.3

*Source: CDI 2014 located in **Appendix C***

Construction Impacts as to Vibration at Off-Site Vibration-Sensitive Receptors

The Final EIR used vibration impact thresholds for residential and other vibration-sensitive land uses provided by the FTA. As shown in Final EIR Table III.I-10, in the case of infrequent events (such as an implosion), vibrations in excess of 65 VdB would result in an impact on buildings where vibration would interfere with interior operations and vibrations in excess of 80 VdB would result in an impact on nearby residents.

There are no institutions such as hospitals and laboratories near the stadium site that contain or operate sensitive equipment. Therefore even though the short-lived vibrations due to the proposed implosion would exceed the threshold of 65 VdB, the vibrations would not interfere with interior operations.

With respect to residential receptors near the stadium site, as shown in **Table 3** above, the vibration levels generated by the proposed implosion would range from 104 to 111 VdB at the nearby sensitive receptors. These levels would be greater than the vibration levels that were estimated to result at these receptors from pile driving on the project site, and would exceed the threshold for impacts on residential receptors. However, the vibrations would be a one-time event and short lived (20 to 30 seconds at the most) and the implosion would be conducted at a time between 7:00 A.M. and 8:00 P.M., when vibrations would not disturb sleep. The Project would also implement Final EIR MM NO-1a.1 which requires incorporation of measures in construction documents to minimize noise and coordination with nearby receptors to respond to complaints. While the goal of MM NO-1a.1 is to move the noise and vibration causing equipment away from the sensitive receptors, with implosion, the revised MM NO-1a.1 would include a measure that would facilitate temporarily moving receptors away from the implosion. The Project Sponsor has proposed to develop a public outreach program as part of the proposed implosion plan that would inform nearby residents, businesses and institutions of the event ahead of time and any residents who require protection against the temporary vibrations would be assisted in relocating outside the area of effect for the duration of the event. See Appendix B, Public Outreach Program. An additional noise and vibration control measure specific to the proposed implosion has been incorporated into Final EIR MM NO-1a.1 to assure that noise and vibration impacts on receptors are minimized during the implosion event. This additional noise and vibration control measure is included below and the associated revised MM NO-1a.1 is attached as Appendix E.

…

■ **Notify building owners and occupants that may be affected by vibration during an implosion event and assist any residents who require protection against temporary vibration in relocating outside the area during the event.**

…

Thus, the vibration impact from the implosion would not be substantially more severe than the significant, unavoidable impact identified in the Final EIR.

Property Damage

To evaluate the potential for property damage from groundborne vibrations produced during an implosion, the most conservative threshold is identified as 3.0 in/sec for buildings constructed of masonry (CDI 2014). As shown in **Table 3** above, the estimated vibration levels and frequencies are well below this threshold level. Therefore the impact from vibrations generated by the implosion on nearby structures would be less than significant. In addition, utilities in the project area would not be damaged because they are typically damaged by ground shear, not ground vibration. An implosion does not generate any ground shear forces.

Construction Impacts as to Vibration at Future On-Site Vibration-Sensitive Receptors

As discussed above, based on the construction schedule and proximity of the Alice Griffith site to the stadium, the Alice Griffith development is not considered a future on-site noise sensitive receptor for the purposes of construction activities associated with the implosion of the stadium. Therefore, the stadium implosion would not impact on-site vibration sensitive uses.

As discussed in the Final EIR, similar to construction noise levels, the conditions under which vibration levels would be considered excessive during construction activities, such as excavation or pile driving, would only occur for the duration of the specified activity and would only impact receptors located within 100 feet or closer of the vibration producing activity. Once the vibration producing activities were completed, the affected receptors would no longer be impacted. Additionally, construction activities would only occur during the hours of 7:00 A.M. to 8:00 P.M. as required by Sections 2907 and 2908 of the Noise Ordinance. Implementation of MM NO-1a.1, MM NO-1a.2, and MM NO-2a would reduce vibration impacts, but not to a less-than-significant level; therefore, this impact would remain significant and unavoidable.

Impact NO-3: The Final EIR (page III.I-39) evaluated the potential for the Project's construction activities to result in a substantial temporary increase in noise levels and determined that noise levels would be increased substantially by certain construction activities, especially pile driving which can produce noise levels of 101 dBA at 50 feet from source, and that even with mitigation, Impact NO-3 would remain significant and unavoidable. As **Table 2** above shows, the implosion related noise levels would range from about 118 to 123 dBA at the nearby receptors and would be higher than the noise levels previously analyzed for construction activities such as pile driving. However, as described above, the proposed

implosion would be a one-time event that would result in elevated noise levels, lasting between 20 and 30 seconds. Therefore, due to the limited duration of noise exposure, the implosion would not result in a substantially more severe impact than the significant, unavoidable impact identified in the Final EIR.

In summary, the proposed implosion would not result in a new or substantially more severe significant noise and vibration impact, change or alter any of the Final EIR's findings with respect to the construction-phase noise and vibration impacts, or require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the Final EIR's findings with respect to noise and vibration impacts.

6.5 Hazards and Hazardous Materials

The potential for the proposed implosion to affect the Final EIR conclusions regarding the Project's construction-phase impacts related to hazards and hazardous materials (*Impact HZ-1: Exposure to Known Contaminants; Impact HZ-2: Exposure to Previously Unidentified Contaminants during Construction; Impact HZ-3: Off-Site Transport and Disposal of Contaminated Soil and Groundwater; Impact HZ-7: Contaminated Surface Runoff from Construction Sites; Impact HZ-15: Exposure to Naturally Occurring Asbestos; Impact HZ-16: Exposure to Hazardous Materials in Building and Structures; Impact HZ-18: Construction Activities with Potential to Generate Hazardous Air Emissions within One-Quarter Mile of a School,* and *Impact HZ-20: Routine Use, Storage, Transportation, and Disposal of Hazardous Materials*) is discussed below.

Impact HZ-1: The Final EIR (page III.K-53) evaluated the Project site and concluded that due to the fill materials on the site, construction at Candlestick Point could expose construction workers, the public, or the environment to previously unknown contamination, but that the potentially significant impact would be reduced to a less than significant level with mitigation. The proposed implosion would not involve any ground disturbing activities and therefore would not alter or contribute to this impact.

Impact HZ-2: The Final EIR (page III.K-580) evaluated the potential for Project construction, including the demolition of the stadium, to encounter previously unknown underground storage tanks, and the analysis concluded that the potentially significant impact would be reduced to a less than significant level with mitigation. The proposed implosion would not involve any ground disturbing activities and therefore would not alter or contribute to this impact.

Impact HZ-3: The Final EIR (page III.K-60) evaluated the potential for the off-haul of hazardous materials from Project construction to affect the construction workers, the public, or the environment, and the analysis concluded that the impact would be less than significant with mitigation. Demolition of the stadium was anticipated in the Final EIR and the proposed implosion would not increase the off-haul of

hazardous materials from the Project site, and would therefore not alter or increase the severity of this effect or require new mitigation measures.

Impact HZ-7: The Final EIR (page III.K-70) evaluated the potential for construction activities at Candlestick Point to expose construction workers, the public, or the environment to unacceptable levels of hazardous materials in stormwater runoff, and the analysis concluded that with mitigation, which includes the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), the impact would be less than significant. As stated in **Section 5**, prior to the implosion all hazardous materials present in the stadium will be abated. Following the implosion, all debris will be collected and processed, and dust that would precipitate around the implosion site would be cleaned up using sweeping and vacuuming techniques outlined in the Asbestos Dust Mitigation and Fugitive Dust Control Plan (Final EIR MM HY-15) and SWPPP (Final EIR MM HY-1a.1) that would be reviewed and approved by the City prior to the implosion. To the extent water is used in the clean-up of some portion of the site, the runoff will be controlled (as required by Final EIR MM HY-1a.1) so as not to discharge directly to any receiving waters. The proposed implosion will be one element of the project construction activities and would be subject to the controls included in the Project SWPPP (Final EIR MM-HY-1a.1). Therefore, the proposed implosion will not alter or increase the severity of the impact or require new mitigation measures.

Impact HZ-15: The Final EIR (page III.K-97) analyzed the potential for Project construction and grading activities to disturb soil or rock that contain naturally occurring asbestos in a manner that would present a human health hazard and the analysis concluded that the impact would be less than significant with mitigation. Final EIR MM HZ-15 requires the preparation and implementation of Asbestos Dust Mitigation Plans (ADMP) and Dust Control Plans (DCP). There would likely be asbestos and lead-based paint within the stadium which could become airborne during the implosion. As stated in **Section 5**, a hazardous materials assessment would be completed and an abatement plan developed to remove hazardous materials present within the structure prior to any demolition. (Testing of the structural elements of the stadium has been completed and the results show that the columns do not contain any asbestos and trace amounts of asbestos [less than 0.1% and well below Cal OSHA, BAAQMD and NESHAP standards] are present in only some limited portions of the structure). The abatement of hazardous materials would be completed before the implosion. Therefore, any hazard from asbestos or lead-based paint becoming airborne during the implosion would be avoided. Therefore, the proposed implosion will not alter or increase the severity of the impact or require new mitigation measures.

Impact HZ-16: The Final EIR (page III.K-101) analyzed the potential for construction at Candlestick Point to result in a health hazard to construction workers, the public, or the environment as a result of the

demolition or renovation of existing structures that could include asbestos containing materials, lead-based paint, PCBs, or fluorescent lights containing mercury. Implementation of applicable regulations and standards would ensure that potential health and environmental hazards associated with asbestos, lead, or PCBs in buildings and structures to be demolished would be minimized to the extent required by law, and the impact would be less than significant. As noted above, the proposed implosion would be preceded by the abatement of hazardous materials present in the stadium in compliance with the law. Therefore the proposed implosion would not alter or increase the severity of the impact or require new mitigation measures.

Impact HZ-18: The Final EIR (page III.K-105) analyzed the potential for construction activities at Candlestick Point to disturb soil that contains naturally occurring asbestos, demolition of buildings that contain hazardous substances, or disturbance of contaminated soils or groundwater within one-quarter mile of an existing school and the analysis concluded that the impact would be less than significant with mitigation. Additionally Bret Harte Elementary School is greater than a quarter mile away from the Project site. As noted above, the proposed implosion would not involve any ground disturbing activities and would be preceded by the abatement of hazardous materials present in the stadium in compliance with the law. In addition, the implosion would be conducted on a weekend when the nearby schools would not be in session, and as discussed above in **Section 6.3, Air Quality**, the area of potential dust impacts would be limited to the immediate vicinity of the site. Therefore, the proposed implosion will not alter or increase the severity of the impact or require new mitigation measures.

Impact HZ-20: The Final EIR (page III.K-101) analyzed the potential for Project construction to result in impacts to construction workers, visitors, or the environment from the routine use, storage, transportation, and disposal of hazardous materials and the analysis concluded that the impact would be less than significant. All hazardous materials used in the demolition of the stadium are previously addressed in the Final EIR analysis. The use of explosives for rock blasting is also previously addressed in the Final EIR analysis. The use, storage, and transportation of explosives that would be used in the proposed implosion would be conducted in compliance with all federal, state and local laws and regulations. The explosives would be delivered to the site by the local explosive material provider in a licensed explosives delivery vehicle with appropriate coordination with the regulatory agencies, including the City Fire and Police Departments, and 24-hour security measures. Compliance with all applicable requirements would limit the chance for accidental release of hazardous materials. Therefore the proposed implosion would not alter or increase the severity of the impact or require new mitigation measures.

In summary, the proposed implosion would not change or alter any of the Final EIR's findings with respect to hazards and hazardous material impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the Final EIR's hazards and hazardous material impact findings.

6.6 Hydrology and Water Quality

The potential for the proposed implosion to affect the Final EIR conclusions regarding the Project's construction-phase impacts related to hydrology and water quality (*Impact HY-1: Water Quality Standards and Waste Discharge Requirements*) is discussed below.

Impact HY-1: The Final EIR (page III.M-57) determined that Project construction activities at Candlestick Point could result in an exceedance of water quality standards or contribute to or cause a violation of waste discharge requirements. However the impact would be less than significant with mitigation which includes the preparation and implementation of a SWPPP as required by Final EIR MM HY-1a. As stated in **Section 5**, prior to the implosion all hazardous materials present in the stadium will be abated. Following the implosion, all debris will be collected and processed, and dust that would precipitate around the implosion site will be cleaned up using sweeping and vacuuming techniques and water will not be used as required by the SWPPP prepared pursuant to Final EIR MM HY-1a.1. To the extent water is used in some portion of the site, the runoff will be controlled, as required by the SWPPP (Final EIR MM HY-1a.1), so as not to discharge directly to any receiving waters. The proposed implosion will be one element of the project construction activities and would be subject to the controls included in the Project SWPPP. Therefore, the proposed implosion will not alter or increase the severity of the impact or require new mitigation measures.

In summary, the proposed implosion would not change or alter any of the Final EIR's findings with respect to hydrology and water quality impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the Final EIR's hydrology and water quality impact findings.

6.7 Biological Resources

The potential for the proposed implosion to affect the Final EIR conclusions regarding the Project's construction-phase impacts on biological resources (*Impact BI-6: Birds* and *Impact BI-12: Essential Fish Habitat*) is discussed below. In addition, the proposed implosion is evaluated to determine whether it could result in a new significant construction-phase impact that was previously not identified. Other construction-phase impacts analyzed in the Final EIR are not relevant because the proposed implosion

would not remove any trees or interfere with movement of native resident or migratory wildlife species. Additionally, the implosion would not disturb potentially contaminated soil within the shoreline or the Bay.

Impact BI-6: The Final EIR (page III.N-72) evaluated the potential for construction at Candlestick Point to result in a substantial adverse effect, either directly or through habitat modifications, on any bird species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS. The analysis concluded that a potentially significant impact could occur to nesting birds from construction-related disturbances. However, with mitigation the impact would be reduced to a less than significant level. The proposed implosion would occur during the nonbreeding season for birds that nest in the vicinity and therefore would not result in an impact on nesting birds. Therefore, the proposed implosion will not alter or increase the severity of the impact or require new mitigation measures.

Impact BI-12: The Final EIR (page III.N-88) included an evaluation of the potential for Project construction activities to affect Essential Fish Habitat (EFH). The Bay adjacent to the Project site has been designated EFH in the Pacific Coast Salmon Plan, Coast Pelagics Fishery Management Plan, and Pacific Groundfish Fishery Management Plan. The Final EIR analysis concluded that impacts to EFH from in-water improvements proposed as part of the Project would be reduced to a less than significant level with mitigation. The proposed implosion does not involve any activities in the bay. Furthermore, as shown in **Figure 1**, the area of direct effect of the implosion (the area within which most of the dust generated by the implosion is expected to precipitate) does not extend to the open waters of the bay. As shown in the figure, the large-particle dust would precipitate within 50 meters (m) or about 164 feet of the stadium under calm conditions and up to 75 m (246 feet) away under windy conditions; finer dust could travel up to 150 m (492 feet) without wind. As noted earlier, the demolition permit and *Fugitive Dust Control Plan* would limit implosion activities to the morning hours in low wind conditions. The nearest sensitive biological resources/habitats that could potentially be affected by dust are the wetlands and aquatic habitats (and the species using them) surrounding Candlestick Point. The closest such habitats are located 250 m (820 feet) to the south of the stadium; South Basin is located 600 m (1,968 feet) away, Yosemite Slough is 850 m (2,788 feet) away, and the nearest marsh restoration area in Yosemite Slough is located more than 900 m (2,953 feet) away. As a result, no substantial amounts of dust from the implosion will reach sensitive biological resources (H.T. Harvey & Associates 2014). The evaluation by HT Harvey is presented in **Appendix D**.

The vibrations and noise levels associated with implosion would be well below the levels at which injury or mortality of fish in water surrounding Candlestick Point might occur. The National Marine Fisheries

Service considers peak noise levels of 206 decibels (dB) to be the threshold for adverse effects on fish. The maximum noise level from the implosion would be 150.7 dB at a location 119 m from the stadium. Noise levels would attenuate even further at greater distances where aquatic habitats and fish are located (H.T. Harvey & Associates 2014).

In summary, the proposed implosion would not change or alter any of the Final EIR's findings with respect to biological resource impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the Final EIR's biological resource impact findings.

6.8 Recreation

The potential for the proposed implosion to result in an impact on recreational resources is evaluated below.

During the implosion the nearby roadways would be closed to limit public access to the area for safety reasons. The road closures would limit access to Candlestick Point State Recreation Area during the implosion event and portions of the bay near the site would also be cordoned off to recreational boats and aircrafts. As required by the demolition permit, the implosion would take place on a Saturday or Sunday morning and the closures would remain in effect for not more than a few hours (generally less than 1 hour) during preparation and cleanup for the implosion. Consequently, the recreation area would be unavailable for a short period of time. Due to the short duration of the closure, the implosion event would not substantially increase demand for other nearby recreational facilities.

In summary, the proposed implosion would not change or alter any of the Final EIR's findings with respect to recreation impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the Final EIR's findings with respect to recreation impacts.

7. Conclusion

Based on the foregoing, it is concluded that the analyses conducted and the conclusions reached in the Final EIR certified in November 2009 remain valid. Other than as described in this Addendum, no Project changes have occurred and the proposed implosion described in the Addendum will not cause any new significant impacts not identified in the Final EIR or an increase in the severity of previously identified significant effects. Further, no substantial changes have occurred with respect to circumstances surrounding the Project that will cause significant environmental impacts or a substantial increase in the severity of previously identified significant effects. Finally, no new information has become available that shows (1) the Project will cause significant environmental impacts not discussed in the previous EIR, (2) significant effects will be substantially more severe, or (3) new or different feasible mitigation measures or alternatives from those adopted will substantially reduce one or more significant effects of the project. Therefore no supplemental environmental review beyond this addendum is required.

Date of Determination:

September 19, 2014

I do hereby certify that the above determination has been made pursuant to State and Local requirements.

Sarah B. Jones
Environmental Review Officer

cc: Therese Brekke, Lennar Urban
Immanuel Bereket, OCII
Bulletin Board / Master Decision File
Distribution List

8. References

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H.T. Harvey & Associates. 2014. *Candlestick Park Demolition – Assessment of Potential Biological Resources Impacts from Implosion.* June 10.

APPENDIX A

Supplemental Dust Mitigation Requirements During an Implosion

SECTION 01500—SUPPLEMENTAL "D-1"
SUPPLEMENTAL DUST MITIGATION REQUIREMENTS DURING AN IMPLOSION

For an Implosion Option, the additional measures required to be included in the Contractor's Site Specific Dust Control Plan shall include:

A. Removal of dust generating material prior to implosion. After the hazardous material is abated from the building, the demolition contractor shall perform an interior strip out of the entire stadium removing such items as copper, non-structural steel aluminum, dry wall, carpet, window glazing, timber, furniture, fixtures, equipment, and other similar items. The Contractor shall remove brick and/or concrete block in the building in efforts to minimize the amount of dust generated during an implosion.

B. Dust Control through Community Outreach. The demolition Contractor shall implement a Community Outreach program. This program will identify sensitive receptors in the surrounding area, such as business with sensitive equipment, and areas with people sensitive to dust. The Contractor will coordinate directly with these surrounding uses and identify their specific needs. Potential options for sensitive receptors include (a) evacuation during the implosion or (b) if certain people are not able to evacuate, make provisions to ensure that they stay inside during the event so as not be exposed to the dust.

C. Coordinate with management of surrounding facilities in the receptor area to turn off any HVAC or air circulation equipment for a short duration prior to, during, and after the implosion until the dust has settled. If it is not possible to turn off the equipment, arrange to protect the intake vents of specific buildings with filters and or plastic, so that no dust enters the buildings.

D. Proper SWPPP controls shall be established in areas where dust control is expected. This will include inlet protection at areas where post demolition street sweeping is expected so that large amounts of dust do not enter the Storm Drain or Combined Sewer System.

E. Dust clean-up crews including mobile street sweepers, window washers, water trucks etc. shall be strategically stationed prior to implosion at potentially impacted areas. Immediately after the implosion, these crews will begin their work cleaning the surrounding area.

F. The Contractor shall establish constraints to ensure that the implosion will occur when advantageous weather conditions (i.e., wind direction and speed) will minimize dust impacts on surrounding receptors.

G. To the extent feasible, plan the building implosion sequence to generate dust in a certain direction away from sensitive receptors.

H. The blast elements shall be encased with chain link fence and fabric so as to minimize any projection of large particles from the actual blast locations.

APPENDIX B

Public Outreach Program

Appendix B Public Outreach Program

A Public Outreach Program would be developed and tailored to suit the needs of the target groups potentially affected by the implosion. The first task with the Outreach Program would be to identify both the primary target group and any subgroups which may exist in the adjacent community. The primary target group would comprise those properties/entities which would be directly impacted by the implosion event. Subgroups within the primary target group would consist of one or more of the following: mass transportation authorities (i.e. bus, subway or rail systems), utilities, individual residential units, or residential complexes. These target groups would be informed of the implosion event and meetings would be held to discuss any issues or specific information pertinent to the event. The Candlestick Park site is oriented such that very few Primary and Secondary Target Groups are expected, as the prevailing winds are generally away from any residential areas.

Additionally, agencies that would be affected by the implosion would be involved in the Outreach Program.

Once the project safety perimeter and exclusion zones have been determined, (a safety perimeter being that area which will be cordoned off from the public by Police on the day of the implosion), all properties within this safety perimeter are automatically considered members of the primary target group.

Outside of that area and upon review of historic prevailing wind data as collected by the National Weather Service or others, other properties outside of the safety perimeter may also be targeted. Those eligible properties outside of the safety perimeter will typically be downwind, taller and dust sensitive.

Outreach communication targets that are deemed to have organizational, scheduling, public notification requirements, or managerial communication responsibilities will be contacted 3-4 weeks in advance. Typical entities in this first subgroup will include, but not necessarily be limited to, office buildings, large mercantile establishments, apartment/condominium complexes, utilities, mass transportation authorities, churches and hospitals. The second subgroup consists of smaller, individualized groups. This second subgroup will be composed primarily of individual residential units, small businesses and small mercantile establishments. Communication with this subgroup would ordinarily begin approximately 10 days prior to the demolition.

OUTREACH PROGRAM GOALS

APPENDIX C

Preliminary Implosion Plan

CONTROLLED DEMOLITION INCORPORATED

SEQUENCE OF OPERATIONS & COMPARISON OF METHODOLOGIES

FOR THE DEMOLITION OF:

CANDLESTICK PARK

LOCATION:

490 JAMESTOWN AVENUE
SAN FRANCISCO, CALIFORNIA 94124

PREPARED FOR:

VAN BRUNT ASSOCIATES, INC.

1401 NORTH BROADWAY, SUITE 225
WALNUT CREEK, CALIFORNIA 94596
ATTN: MIKE VAN BRUNT
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PREPARED BY:

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WWW.CONTROLLED-DEMOLITION.COM

PREPARED:

MAY 16, 2014

I. BACKGROUND

Candlestick Park (the stadium) and adjacent properties are being developed under a partnership between Lennar and the City of San Francisco. To date, the planning, scheduling, budgeting and approvals for demolition of the stadium have been performed assuming City of San Francisco Planning Council approval for conventional demolition operations have been given.

In order to explore the "best method" for demolishing the stadium, Lennar put out a Request for Proposal (RFP) for consultants to investigate environmental remediation and demolition methodology alternatives to those previously assumed. VBA, Inc., (VBA) along with their teaming partners, Silverado Contractors, Inc. (Silverado) and Controlled Demolition, Inc. (CDI) were selected for this consulting role.

At the request of Lennar and in coordination with VBA and Silverado, Mark Loizeaux, President of CDI, traveled to San Francisco on Monday, May 5, 2014, to meet with representatives of Lennar and its City of San Francisco partners relative to the comparison of the safety, environmental impact and community relations aspects of an implosion approach as compared to the conventional demolition methods previously approved.

Mr. Loizeaux walked/reviewed the stadium with representatives from Lennar and Silverado. CDI has also had the opportunity to review structural drawings of the various stages of construction of the stadium, soil borings, local regulations and political considerations brought forward by Lennar, the City of San Francisco and the VBA team.

This report is offered in response to a request made by Lennar on the afternoon of May 5, 2014.

II. SEQUENCE OF OPERATIONS REGARDLESS OF CONVENTIONAL OR EXPLOSIVES DEMOLITION METHODOLOGIES

A. Continuation of permitting and regulatory compliance requirements for performance of the work.

B. Vacation of the premises by the San Francisco 49ers' organization and others.

C. Completion of environmental investigation of materials on site to ensure compliance with applicable regulations, regardless of the demolition methodology used.

D. Selected salvage will be removed by the Property Owner.

E. Selected memorabilia will be removed by the Property Owner.

Note: Environmental investigation, Owner salvage and removal of memorabilia may begin prior to vacation of the premises.

F. Award of a contract (or contracts) for environmental remediation and demolition operations in accordance with the regulatory and performance requirements finalized under Items A thru C, above.

G. The successful contractor(s) would, as agreed in their contract scope of work and in coordination with Lennar and other parties involved with the project:

1. Facilitate or assist with removal of salvage/memorabilia.

2. Coordinate with or perform environmental remediation, as needed, in consideration of environmental investigations performed and regulatory requirements related to performance of same.

3. Coordinate with or perform the termination of utilities to the structure and within that demolition area where such utilities might be impacted by demolition operations.

4. Perform the soft-strip of deleterious materials from the structure to allow recycling of clean concrete debris, as well as the gut-out of materials that might cause avoidable dust during demolition operations, regardless of methodology ultimately used for the main stadium.

III. CONVENTIONAL DEMOLITION OPERATIONS

Soft-Strip

Skid steer loaders with demolition attachments, combined with hand labor would be used to perform the soft-strip of deleterious materials from the structure, as well as the gut-out of materials that might cause avoidable dust during conventional demolition operations.

Low-Rise

Cranes with wrecking balls or excavators with specialty demolition attachments would be used by experienced operators to first remove the exterior low-rise ramps and other construction outside of the stadium proper. Simultaneously, or in sequence, similar equipment would be used to remove low-rise seating inside the stadium. All of these operations can be performed in a fashion which would permit the use of proven, efficacious dust palliation methods to control visible dust emissions, ensuring minimal environmental impact on the community at large and, particularly, with regard to the Alice Griffiths Community which CDI was advised contains a significant number of medically challenged residents. Depending on the amount of heavy equipment the selected demolition contractor brought to the project, the duration of this first phase would be approximately six (6) weeks.

High-Rise

High-reach hydraulic excavators or cranes with wrecking balls could be effectively used to demolish the high-rise portion of the stadium structure down to grade. Given the robust winds at and around the stadium, it is unlikely that there are any dust palliation methods which would be effective if a crane and wrecking ball were used to demolish the high-rise structure. While water can be piped to the top of high-reach excavators that could be used to mechanically “munch” down the upper stands and cantilever roof, dust palliation in this regard is generally ineffective where high winds are present and where the pulverized concrete debris has to fall great distances to grade.

Foundations

The same heavy equipment used to demolish and remove the low-rise structures and seating would be used to remove the foundations. Given a possible overlap sequencing of high-rise demolition and foundation removal, the overrun of foundation removal beyond high-rise demolition would be approximately eight (8) weeks.

The overall duration for the conventional demolition of the low-rise and high-rise stadium down to grade is expected to be approximately twenty-two (22) weeks. Removal of selected foundations which conflict with future development would likely take an additional eight (8) weeks above and beyond completion of superstructure demolition/debris removal.

A. Dust

The mechanical demolition of the high-rise portion of the structure (up to 120’ above grade), using the above methods, would result in unavoidable dust emissions that cannot reasonably be controlled by methods

ordinarily employed in the demolition industry. The relatively long duration of such mechanical operations and dust emissions would, by definition, expose the community to low levels of dust for a long period of time. The low visibility of this level of dust often leads to inattention by residents in the community, ultimately resulting in far higher levels of dust exposure from demolition operations than can be predicted during the design stage for such projects.

B. Vibration

Vibration from conventional demolition operations should have no impact on adjacent communities.

C. Noise

Noise created by large, hydraulic excavators with specialty demolition attachments can become objectionable to residents of adjacent communities depending on wind speed and direction. Such winds and topographical features can focus noise from long term conventional operations. While the decibel levels generated by conventional demolition should not be an issue given the distances from the demolition site to the adjacent residential areas, the duration of those operations becomes a factor when dealing with sensitive adjacent communities.

D. General Risk

Given the amount of room available around the stadium, conventional demolition operations should propose "no physical risk" to pedestrian/vehicular traffic or third party properties.

Although the duration of mechanical demolition of major sports facilities such as this exposes workers to additional risk by virtue of the duration alone, there are highly qualified, Bay Area-based demolition contractors who have the experience, the trained professional personnel and the specialty equipment necessary to carry out the conventional demolition of the stadium safely. For this reason, the only points of comparison needed between conventional demolition and implosion of the above-grade high-rise structure is related to environmental exposure of residents in adjacent communities to dust and noise, the actual cost of conventional demolition as compared to the cost of implosion, and the value of time which might be saved by implosion over conventional demolition.

IV. EXPLOSIVES DEMOLITION OPERATIONS

Soft-Strip

The same methods would be used for the same duration by the demolition contractor in the strip-out of the structure to pre-remove deleterious and dust-creating materials from the main high-rise structure.

Low-Rise Demolition

The same conventional demolition equipment and methods would be used for the same duration to pre-remove low-rise structures around the outside of the stadium and low-rise seating inside the stadium bowl.

The advantages of explosives demolition begin with the fact that preparation for "implosion" can start and be as much as 85% completed before a mechanical demolition operation on the high-rise structure could even begin. Implosion preparations on the stadium would be limited to the drilling of holes in supporting concrete elements and removal of non-load bearing walls and modification of other walls (following approval of such operations by the contractor's structural engineer). The pre-drilling of major sports venues such as this have consistently proven to be a safe and effective operation without resulting in any significant weakening of the structure leading up to its implosion - even under the seismic loads which the stadium might be subjected to in the Bay Area.

Other than drilling of small diameter holes in supporting elements and the engineered removal of certain walls to provide access for implosion preparation, the only remaining implosion-related activity on site would be the placement of protective cover, as needed, around elements to be blasted during the implosion (to mitigate the possibility of fly of debris outside of the demolition zone as a result of implosion operations).

The total time to prepare the stadium for implosion would be approximately one (1) month. That work can begin during environmental remediation and be completed while the demolition contractor is removing low-rise structures outside and low-rise seating inside of the high-rise structure. The implosion of the high-rise structure could take place within a week of the completion of low-rise demolition operations.

The overall duration of Candlestick Park demolition, with implosion of the high-rise section, would be a full two (2) months or more faster than the purely conventional demolition of the complex.

The byproducts of explosives demolition are as follows:

A. Dust

Conventional demolition operations on a concrete structure such as this pulverize the structural elements, in place, allowing the debris to fall to grade. Given the high winds at the project site, the heights involved and in consideration of the free fall of pulverized debris from the high-rise structure, it is unlikely that a truly efficacious dust palliation method can be designed, much less applied during the months of conventional demolition operations needed to bring the high-rise structure to grade.

Conversely, explosives demolition does not pulverize construction materials. Rather, it undermines the high-rise structure allowing it to travel to grade, generally in an unbroken fashion. It is the post-implosion secondary downsizing of the resultant debris at grade that will generate more than 70% of the overall dust that would be created by conventional operations. Once the structure has been lowered to grade via implosion operations, there are a myriad of highly effective dust palliation methods which a demolition contractor can employ to ensure that there are no visible emissions or dust impact on the sensitive communities adjacent to the stadium.

One advantage of implosion is that it occurs at a known time on a known date. An experienced Community Outreach Team comprised of Lennar, Lennar's demolition consultant, the main demolition contractor and the implosion contractor can develop a program to completely address the potential impact of the implosion on the community. From a dust standpoint, this means that primary and secondary outreach targets will be identified as to their dust sensitivity. They can be educated accordingly and precautionary measures can be put in place so that when the implosion occurs, the impact of any dust reaching those community areas is either mitigated or eliminated through planning and execution by that experienced team.

Put simply, an implosion approach creates the same amount of dust that a conventional demolition operation would create. 30% or less of that total amount of dust is created during the implosion and the community is prepared for same. Likewise, the contractor is prepared to clean up the dust quickly and then control the remaining 70% of the dust created in the downsizing/processing of material on site under effective dust palliation control measures.

B. Vibration

Vibration is a natural byproduct of any material falling to grade. While the relatively slow process of conventional demolition of the high-rise structure would drop the same quantity of material as implosion, the slowness of conventional operations would generate no significant vibration.

Conversely, implosion brings the entire high-rise structure to grade in a single, continuous event over 20 seconds or so. It is the obligation of the implosion contractor to design an implosion sequence in consideration of the configuration and weight of the structure being felled, the soil/water table conditions underlying the site, the distance to adjacent improvements/community facilities to remain and the sensitivity of those adjacent improvements/community facilities to vibration displacement and even vibration frequency which would be created by the implosion plan.

CDI has reviewed the structural plans of the stadium and the geotechnical report describing the nature and vibration conductive propensities of sub-grade conditions underlying the stadium and adjacent communities. In consideration of those factors, we designed a Preliminary Implosion Plan to control the duration and sequence of fall of the quantity/weight of debris present in the high-rise structure to be imploded. We then used historic data from felling of similar quantities of debris from structures onto similar types of geotechnical conditions. We then adjusted the timing of the Implosion Plan (to control the amount of debris falling over time) to keep vibration displacement and frequency to a level which cannot possibly damage adjacent improvements/community facilities adjacent to the Candlestick stadium location.

On attached CDI Drawing No. 97537-01, CDI has indicated the four (4) adjacent community locations which Lennar advised would be "sensitive" from a political standpoint.

Using CDI's historic data on the felling of similar structures on similar geotechnical strata, we have estimated vibration measured at each of those locations during CDI's execution of its proposed Preliminary Implosion Plan to be as follows:

PPV = 40.6(Dist.)^(-0.885)

- Point 1 – 390 ft: 0.21 in/sec, peak particle velocity (PPV) at a frequency of 15 to 20 Hz.
- Point 2 – 530 ft: 0.16 in/sec, peak particle velocity (PPV) at a frequency of 12 to 17 Hz.
- Point 3 – 960 ft: 0.09 in/sec, peak particle velocity (PPV) at a frequency of 10 to 15 Hz.
- Point 4 – 650 ft: 0.13 in/sec, peak particle velocity (PPV) at a frequency of 8 to 12 Hz.

Ground Vibration Standards

Decades of vibration research by the US Bureau of Mines and other agencies has led to the established criteria relating to the likelihood of damage to structures from vibration intensities and frequencies. The intensity is typically measured as peak particle velocity (PPV, or the rate-of-motions of an oscillating particle within a mass - usually the ground.)

Most vibration standards are designed to correlate damage with impulsive, man-made vibration focused on residential structures. "Residential" means 1-story to 2-story, freestanding structures that constitute what we generally assume to be a single-family dwelling. For residential construction, this research has resulted in the recommendation that vibration outside the resonant frequencies of the subject structures not exceed 2.0 in/sec PPV. This standard is designed to preclude 'threshold damage" to residential structures. Threshold damage is defined as "loosening of paint; small plaster cracks and joints between construction elements; lengthening of old cracks." Local regulations often reduce allowable PPV levels as low as 1.0 in/sec to provide a 100% Factor of Safety (FoS) to preclude the possibility of damage to adjacent properties.

The damage threshold for engineered concrete and steel framed structures, load bearing masonry walls, heavy commercial buildings, or higher levels of damage to residential structures, is published as being 3.0 in/sec for masonry and 10.0 in/sec for reinforced mass concrete and higher for steel structures. A study by Chae (1978), recommends a safe threshold criterion of 4.0 in/sec for commercial structures of substantial construction. Studies by Oriard (1980) and others suggest that reinforced concrete framed commercial and industrial construction can withstand vibration in excess of 10.0 in/sec without sustaining damage. Utilities

and pipelines (Siskind and Stagg, 1994) and other engineered structures that are designed to withstand live loads from pressurization, seismic activity, tsunamis, or high winds (hurricanes) would have an even higher damage threshold.

Based on CDI's estimates, the likely vibration recorded at the four (4) points of interest shown on the attached drawing would be a fraction of that needed to damage the most sensitive of older, distressed residential structures, much less more modern structures of greater integrity.

With regard to buried utilities adjacent to the fall area of debris, these are constrained lines which are generally not sensitive to damage from vibration caused by construction-type activities. This is the case at the Candlestick Park location even in consideration of the "young bay mud" and "old bay mud" which has been identified beneath a portion of the stadium and adjacent to the stadium site. The explosives felling of the stadium using the preliminary method developed by CDI would have no impact, whatsoever, on buried utilities of any nature.

C. Noise

Noise pollution is of critical concern when working around residential communities. Estimating noise at the Candlestick Stadium site is a somewhat challenging task, given the variable winds which prevail in the area.

That being said, CDI reviewed the quantities and types of explosives that would be used under its Preliminary Implosion Plan and determined, through the use of our seven (7) decades of historic data, that the still air decibel levels monitored at each of the four (4) locations shown on the attached drawing during the implosion would be as follows:

PO = 4.42(SD)^(-0.713)

- Point 1 –140.7 dB(L)
- Point 2 –139.7 dB(L)
- Point 3 –135.1 dB(L)
- Point 4 –136.6 dB(L)

The duration of these peak dB(L) levels would be in pulses less than 0.5 seconds in duration during the initiation of "unconfined detonating cord" used to initiate the confined demolition charges within concrete support columns under the structure. These noise levels are below OSHA standards for protection of workers against injury from impact noise, and do not vary significantly from noise levels experienced by the general public during a holiday fireworks presentation or a summer thunderstorm, overhead.

During the detonation of the "confined implosion charges" buried in the boreholes drilled into concrete columns and fall of the structure, dB(L) levels should be even lower.

Peak Overpressure Risk to Adjacent Improvements

Studies have shown that in the worst case of a window pane under stress, windows can withstand peak overpressure (PO) levels up to 151 dB (L) (0.1 psi) and that properly installed windows can withstand PO levels up to 170 dB (L) (1.0 psi). Window breakage would be the first type of adjacent improvement damage to result from PO. The United States Bureau of Mines (USBM) (1980) recommends a peak overpressure limit of 133 dB(L) (0.013 psi) to minimize complaints from quarry blasting; however, explosive demolition operations are typically exempt from the limit due to the singular nature of the event and the overly restrictive nature of this limit for demolition work. The peak overpressure levels estimated by CDI, based on our historic data against our Preliminary Implosion Plan, could not possibly damage even sensitive adjacent properties much less create any risk to community residents.

NOTE: Under CDI's Preliminary Implosion Plan, we have intentionally avoided work on the 9" and 12" diameter cast C1018-20 steel columns which are used to support the upper deck around much of the perimeter of the Stadium. While CDI's initial calculations indicate that we could use linear shaped charges to modify these columns (after engineered modification per CDI's design), we want to avoid the use of unconfined linear shaped charge explosives on this project due to the high frequency/high displacement peak overpressure generated by the use of such charges. We are comfortable with our preliminary implosion design…without having to explosively address these steel columns.

D. General Risk

During the preparation of the high-rise section of the stadium for implosion, risk to workers is no more than that which construction workers are exposed to on a day-to-day basis. They are lower than the risks to which demolition workers are generally exposed to, given that implosion preparations are performed on clean level working surfaces without concern for working around structures that are in various stages of demolition.

By way of example, CDI's Workers Compensation Experience Modification Rate (EMR) is 0.71, demonstrating the safety of CDI's operations on a day-to-day basis.

Given that an exclusion zone will be cleared around the stadium during the implosion itself, there is absolutely no risk to the general public, whatsoever, during the implosion of the structure.

V. CONCLUSION

The high-rise portion of Candlestick Park is a perfect candidate for implosion operations, as compared to conventional demolition, as respects safety of workers and the nature/duration of various types of exposure to the adjacent communities and their residents. Those facts, combined with what will likely be an equivalent or lesser cost using explosives to put the high-rise portion of the structure at grade and the savings of time in clearing the site, permitting new development to proceed at a faster pace, makes it difficult to justify a non-implosion approach to the high-rise portion of this particular structure.

APPENDIX D

Assessment of Potential Biological Resources Impacts from Implosion

H.T. HARVEY & ASSOCIATES
Ecological Consultants

Memorandum

10 June 2014 **Project #2943-03**

To: **Therese Brekke, Lennar Urban**
From: **Steve Rottenborn**
Subject: **Candlestick Park Demolition – Assessment of Potential Biological Resources Impacts from Implosion**

Per your request, I have reviewed information concerning the proposed demolition of Candlestick Park via implosion to determine whether this method of demolition, rather than mechanical demolition, would pose any impacts to biological resources that were not addressed in the 2010 Environmental Impact Report for the Candlestick Point – Hunters Point Shipyard Phase 2 project. It is my understanding that demolition would occur around January 2015, during the nonbreeding season for birds that nest in the vicinity. My assessment is based on the 28 May 2014 *Candlestick Park Stadium Explosives Demolition Draft Project Description* and the 16 May 2014 *Preliminary Implosion Plan*, as well as my understanding of the biological resources present in the vicinity of the stadium.

I have determined that no impacts to biological resources potentially resulting from demolition via implosion would occur that are substantially greater than those that might occur from mechanical demolition.

According to the materials I reviewed, large-particle dust would precipitate within 50 meters (m) of the stadium under calm conditions and up to 75 m away under windy conditions; finer dust could travel up to 150 m without wind. Demolition is proposed to be performed in the morning, in non-windy conditions. The nearest sensitive biological resources/habitats that could potentially be affected by dust are the wetlands and aquatic habitats (and the species using them) surrounding Candlestick Point. The closest such habitats are located 250 m to the south of the stadium; South Basin is located 600 m away, Yosemite Slough is 850 m away, and the nearest marsh restoration area in Yosemite Slough is located more than 900 m away. As a result, no substantial amounts of dust from the implosion will reach sensitive biological resources. In addition, implosion would allow for dust from mechanical removal of the demolished stadium (following implosion) to be controlled, whereas mechanical removal of the upper levels of the stadium in the absence of implosion would not allow for dust alleviation. Implosion would also allow for the conditions under which demolition occurs to be controlled (e.g., to ensure that there are no strong winds).

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Because implosion would occur in January, no nesting birds would be impacted by the noise associated with implosion. Birds foraging in the vicinity of the stadium would be temporarily disturbed, but they are expected to quickly resume their normal behaviors following implosion.

The vibrations and noise levels associated with implosion would be well below the levels at which injury or mortality of fish in water surrounding Candlestick Point might occur. The National Marine Fisheries Service considers peak noise levels of 206 decibels (dB) to be the threshold for adverse effects on fish. The maximum noise level indicated in the materials describing the proposed implosion are 150.7 dB at a location 119 m from the stadium. Noise levels would attenuate even further at greater distances where aquatic habitats and fish are located.

Surrounding the demolition/implosion site there are real and perceived concerns/needs. The goals of the Outreach Program are:

i. To disseminate the appropriate amount of information about the project at the appropriate time. An early and very General Statement of interest in the concerns of the Community members is issued to let the respective members of the outreach targets know that they are going to be contacted, listened to and supported.

ii. To subsequently provide information to members of each group relative to their specific structures and operations in response to their general concerns, the target group member can deal with real/target-specific concerns/needs.

iii. To listen or provide a channel of communication for the members of each target group in order to learn how to minimize or eliminate problems/conflicts or deal with perceived concerns/needs.

COMMUNICATION STRATEGIES AND TECHNIQUES

Communication is accomplished by one of the following two (2) methods:

i. Distribution of leaflets and providing contact information should additional questions arise.

ii. Distribution of leaflets with follow-up contact/site visit and providing contact information should additional questions arise. Individual meetings with specific targets are preferred to group meetings to avoid a "herd mentality" with regard to questions or concerns.

COMMUNICATION CONTENT

The information provided to the majority of the members of the primary target group will answer the following four (4) questions:

i. When will implosion activities affect them?

ii. What implosion activities affect them?

iii. What do they need to do to prepare for the implosion?

iv. What will the demolition team members do to support their needs?

Appendix E

2007.0946E Candlestick Point-Hunters Point Shipyard Phase II Development Plan EIR

Revised Mitigation Measures for Implosion

Additions to Mitigation Measure text is in **bold and underline**.

MM HZ 15 Asbestos Dust Mitigation Plans and Dust Control Plans.

Prior to obtaining a grading, excavation, site, building or other permit from the City that includes soil disturbance activities, the Project Applicant shall obtain approval of an Asbestos Dust Mitigation Plan (ADMP) from BAAQMD for areas over 1 acre that potentially contain naturally occurring asbestos and approval of a Dust Control Plan (DCP) from SFDPH for all areas at HPS Phase II and for areas over 0.5 acre at Candlestick Point. Compliance with the ADMP and DCP shall be required as a condition of the permit.

The ADMP shall be submitted to and approved by the BAAQMD prior to the beginning of construction, and the Project Applicant must ensure the implementation of all specified dust control measures throughout the construction Project. The ADMP shall require compliance with the following specific control measures to the extent deemed necessary by the BAAQMD to meet its standard:

- For construction activities disturbing less than one acre of rock containing naturally occurring asbestos, the following specific dust control measures must be implemented in accordance with the asbestos ATCM before construction begins and each measure must be maintained throughout the duration of the construction Project:

  - ☐ Limit construction vehicle speed at the work site to 15 miles per hour

  - ☐ Sufficiently wet all ground surfaces prior to disturbance to prevent visible dust emissions from crossing the property line

  - ☐ Keep all graded and excavated areas around soil improvement operations, visibly dry unpaved roads, parking and staging areas wetted at least three times per shift daily with reclaimed water during construction to prevent visible dust emissions from crossing the property line. Increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour

  - ☐ Adequately wet all storage piles, treat with chemical dust suppressants, or cover piles when material is not being added to or removed from the pile

  - ☐ Wash down all equipment before moving from the property onto a paved public road

  - ☐ Clean all visible track out from the paved public road by street sweeping or a HEPA filter equipped vacuum device within 24 hours

- For construction activities disturbing greater than one acre of rock containing naturally occurring asbestos, construction contractors are required to prepare an ADMP specifying measures that will be taken to ensure that no visible dust crosses the property boundary during

construction. The plan must specify the following measures, to the extent deemed necessary by the BAAQMD to meet its standard:

☐ Prevent and control visible track out from the property onto adjacent paved roads. Sweep with reclaimed water at the end of each day if visible soil material is carried out from property
☐ Ensure adequate wetting or covering of active storage piles
☐ Hydroseed or apply non-toxic soil stabilizers to disturbed surface areas and storage piles greater than ten cubic yards or 500 square feet of excavated materials, backfill material, import material, gravel, sand, road base, and soil that will remain inactive for seven days or more.
☐ Control traffic on on-site unpaved roads, parking lots, and staging areas—including a maximum vehicle speed of 15 miles per hour or less
☐ Control earth moving activities
☐ Provide as much water as necessary to control dust (without creating run-off) in any area of land clearing, earth movement, excavation, drillings, and other dust-generating activity
☐ Control dust emissions from off-site transport of naturally occurring asbestos containing materials
☐ Stabilize disturbed areas following construction

If required by the BAAQMD, air monitoring shall be implemented to monitor for off-site migration of asbestos dust during construction activities, and appropriate protocols shall be established and implemented for notification of nearby schools, property owners and residents when monitoring results indicate asbestos levels that have exceeded the standards set forth in the plan.

The DCP shall be submitted to and approved by the SFDPH prior to the beginning of construction, and the site operator must ensure the implementation of all specified dust control measures throughout the construction Project. The DCP shall require compliance with the following specific mitigation measures to the extent deemed necessary by the SFDPH to achieve no visible dust at the property boundary

■ Submission of a map to the Director of Health showing all sensitive receptors within 1,000 feet of the site.

■ Keep all graded and excavated areas, areas around soil improvement operations, visibly dry unpaved roads, parking and staging areas wetted at least three times per shift daily with reclaimed water during construction to prevent visible dust emissions from crossing the property line. Increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour

■ Analysis of wind direction and placement of upwind and downwind particulate dust monitors.

■ Record keeping for particulate monitoring results.

■ Requirements for shutdown conditions based on wind, dust migration, or if dust is contained within the property boundary but not controlled after a specified number of minutes.

■ Establishing a hotline for surrounding community members who may be potentially affected by Project-related dust. Contact person shall respond and take corrective action within 48 hours. Post publicly visible signs around the site with the hotline number as well as the phone number of the BAAQMD and make sure the numbers are given to adjacent residents, schools, and businesses.

- Limiting the area subject to construction activities at any one time.

- Installing dust curtains and windbreaks on windward and downwind sides of the property lines, as necessary. Windbreaks on windward side should have no more than 50% air porosity.

- Limiting the amount of soil in trucks hauling soil around the job site to the size of the truck bed and securing with a tarpaulin or ensuring the soil contains adequate moisture to minimize or prevent dust generation during transportation.

- Enforcing a 15 mph speed limit for vehicles entering and exiting construction areas.

- Sweeping affected streets with water sweepers at the end of the day.

- Hiring an independent third party to conduct inspections for visible dust and keeping records of those inspections.

- Minimizing the amount of excavated material or waste materials stored at the site.

- Prevent visible track out from the property onto adjacent paved roads. Sweep with reclaimed water at the end of each day if visible soil material is carried out from property

In the case of implosion, the DCP additionally shall include provisions to achieve the Article 22B goal of minimization of visible dust exposure:

- **Remove dust-generating material prior to implosion, including, without limitation, performing an interior strip out to remove such items as copper, non-structural steel aluminum, dry wall, carpet, window glazing, timber, furniture, fixtures, and equipment. Remove brick and concrete block.**

- **Implement a community outreach program to identify potentially affected sensitive receptors and equipment and to work with receptors and businesses to minimize dust exposure during implosion event, by assisting receptors to stay indoors or to evacuate from the affected area.**

- **Coordinate with facility managers in the affected area to control dust entry into buildings during event.**

- **Implement prompt dust cleanup measures after event; station clean-up crews, including street sweepers, window washers, water trucks and similar equipment and personnel in the area prior to event to facilitate immediate cleanup.**

- **Undertake implosion only during advantageous weather conditions with minimal wind speed and minimal wind movement toward sensitive receptors**

- **Prior to implosion, encase site with a chain link fence and fabric to minimize large particles from leaving the site**

- **Protect stormwater inlets from dust**

For all areas, this measure shall be implemented through Article 22B (areas over one half acre) or for HPS Phase II through a requirement in the potential additions to Article 31 imposing requirements to parcels other than Parcel A or through an equivalent process established by the City or Agency.

MM NO 1a.1 Construction Document Mitigation to Reduce Noise <u>and Vibration</u> Levels during Construction.

The Project Applicant shall incorporate the following practices into the construction documents to be implemented by the Project contractor:

- Provide enclosures and mufflers for stationary equipment, shrouding or shielding for impact tools, and barriers around particularly noisy operations on the site

- Use construction equipment with lower noise emission ratings whenever possible, particularly air compressors

- Provide sound-control devices on equipment no less effective than those provided by the manufacturer

- Locate stationary equipment, material stockpiles, and vehicle staging areas as far as practicable from sensitive receptors

- Prohibit unnecessary idling of internal combustion engines

- Require applicable construction-related vehicles and equipment to use designated truck routes to access the Project site

- Implement noise attenuation measures to the extent feasible, which may include, but are not limited to, noise barriers or noise blankets. The placement of such attenuation measures will be reviewed and approved by the Director of Public Works prior to issuance of development permits for construction activities.

- **<u>Notify building owners and occupants that may be affected by vibration during an implosion event and assist any residents who require protection against temporary vibration in relocating outside the area during the event.</u>**

- Designate a Noise Disturbance Coordinator who shall be responsible for responding to complaints about noise during construction. The telephone number of the Noise Disturbance Coordinator shall be conspicuously posted at the construction site and shall be provided to the City. Copies of the construction schedule shall also be posted at nearby noise-sensitive areas.