Los Angeles County
Metropolitan Transportation
Authority
One Gateway Plaza
3rd Floor Board Room
Los Angeles, CA

File #: 2015-1601, **File Type:** Project **Agenda Number:** 30.

CONSTRUCTION COMMITTEE
NOVEMBER 19, 2015

SUBJECT: WESTSIDE PURPLE LINE EXTENSION PROJECT - SECTION 2

ACTION: APPROVE MINOR CHANGES TO WESTSIDE PURPLE LINE EXTENSION, SECTION 2 AND CEQA ADDENDUM

RECOMMENDATION

APPROVING AND ADOPTING project definition changes, CEQA Addendum and Findings and authorize staff to file a Notice of Determination on the Addendum for the **Westside Purple Line Extension Project - Section 2**.

ISSUE

On May 24, 2012, the Metro Board certified the Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Westside Purple line extension from Wilshire Western to Westwood/VA and approved the Project Definition, and adopted Findings of Fact and a Statement of Overriding Considerations under CEQA. Subsequently, due to a proposed commercial development at the corner of Avenue of the Stars and Constellation Boulevard (section 2), the selected construction staging area in Scenario A (Area 1) can no longer be used for the project. Instead, the construction staging areas identified in the Final EIS/EIR as part of Scenario B sites (Area 2 and Area 3) will be used. The station entrance location will remain in the original location at the northeast corner of Constellation Boulevard and Avenue of the Stars (Area 1), and will be incorporated into future developments to be constructed at this location.

In addition, the existing Metro bus layover site on the southeast corner of Century Park West and Constellation Boulevard will be used for the storage of construction materials and parking of construction equipment during the construction period. To offset the loss of the bus layover site, a temporary bus layover site will be constructed in the median of Santa Monica Boulevard.

Pursuant to CEQA Guidelines Section 15164, Metro analyzed potential environmental impacts of the construction area changes and concluded that an addendum would be appropriate. The Addendum

concludes that none of the changes associated with the change in construction staging areas represent substantial changes to the project, result in new significant impacts, or result in previously identified significant effects becoming substantially more severe than shown in the EIS/EIR.

DISCUSSION

As part of the approved project, Scenario A, as identified in the approved EIS/EIR, with the Century City Constellation Station entrance and approximately 5.5 acre construction staging and laydown area at the northeast corner of Constellation Boulevard and Avenue of the Stars (Area 1) was included in the adopted project. Scenario A had sufficient space available for a tunnel excavation operation, construction staging, parking, storage and other work areas. Due to a proposed commercial development at this site, the selected construction staging area can no longer be used for the project. Instead, the staging areas identified in the EIS/EIR as part of Scenario B will be used. The Scenario B sites (Area 2 and Area 3) include two locations along Century Park East and require approved full acquisition of 1940 Century Park East, and 1950 Century Park East as identified previously in the EIS/EIR. Additionally, a temporary construction easement may be used along the property at 2010 Century Park East (AT&T Building) for placement of a conveyor system between Staging Areas 2 and 3.

A portion (less than 0.25 acres) of Area 1 will be required for construction of the station entrance which is to remain in the original location at the northeast corner of Constellation Boulevard and Avenue of the Stars and will be incorporated into future development to be constructed at this location. Metro will coordinate with the developer regarding the station entrance. If the site is not developed at the start of the Constellation Station Construction, it is possible that more than 0.25 acres of Area 1 will be used for construction activities.

Additionally, changes in the scenarios for construction staging have prompted the following adjustments:

- The tunnel boring machine (TBM) will be lowered into the station excavation along Constellation Boulevard. This will require a six-month full closure of approximately 200 feet of the eastern end of Constellation Boulevard between Century Park East and the first driveway on the north side of the street.

- Installation of a new tunnel access shaft and conveyor in Area 2. A vertical access shaft, up to 80 feet in diameter will be constructed to provide access to the tunnel heading for workers and materials and to remove excavated material from the tunnel.

- Operation of an inpatient long-term rehabilitation facility adjacent to construction staging Area 3. Immediately south of staging Area 3, a former physician-run hospital is being remodeled to become a new inpatient rehabilitation facility with a tentative opening date of March 2016. The nine story rehabilitation facility was not in operation at the time of the EIS/EIR certification,

therefore, the analysis of the adjacent construction staging area did not assess potential noise, air quality, dust, light, and visual impacts to an inpatient medical facility. Construction Area 3 will be primarily used for the temporary storage of excavated material which will be hauled away for off-site disposal, as well as storage of materials and equipment required for tunnel and station construction, and for the design-build contractor's office, maintenance shops, and parking.

- Use of existing Metro bus layover area for construction material storage. A material storage area will be placed at the existing 0.3 acre Metro bus layover site on the southeast corner of Century Park West and Constellation Boulevard (Area 5). There will be no ground disturbing activity at the site other than for the installation and removal of soundwalls, and for removal and restoration of curbs and landscaping.

- Temporary bus layover on Santa Monica Boulevard. Due to the use of the existing Metro bus layover site (Area 5), a new temporary bus layover approximately 250 feet long and 12 feet wide will provide parking for up to five buses in the median of Santa Monica Boulevard between Avenue of the Stars and Century Park East (see Figure 4). The layover zone will be located in the landscaped median between the eastbound lanes of Santa Monica Boulevard and a dedicated bus lane, and will be in use for approximately seven years. Also included will be restroom facilities for Metro bus operators.

- Ventilation/Exhaust Structures into the Westfield Century City Property. Metro will require temporary and permanent easements in the Westfield Century City mall property for the purpose of constructing ventilation ducts to service the subway.

- Elimination of train cross-over at Wilshire/Rodeo Station. After an operational analysis was performed to verify that the train cross-over east of the Wilshire/Rodeo Station could be eliminated while maintaining operational requirements for the Westside Subway Extension Project, Section 2, the Metro Board, at its, September 2014 Board meeting approved the elimination of the cross-over. This action will result in significant shortening of the underground station, thus reducing construction costs and impacts to traffic and disruption to the surrounding streets and businesses.

DETERMINATION OF SAFETY IMPACT

This Board action will not have an impact on established safety standards.

FINANCIAL IMPACT

Together, all the changes described in the Addendum will not increase the cost of the Project.

NEXT STEPS

Staff will prepare an amendment to the RFP for Westside Purple Line Extension, Section 2 that will include all necessary design specifications, and mitigation measures to minimize impacts.

ATTACHMENTS

Attachment A - Addendum to the Final Environmental Impact Report/Westside Subway Extension
<http://libraryarchives.metro.net/DB_Attachments/151106_Attachment_A_Addendum_FEIR_with_Appendices.pdf>

Attachment B - Notice of Determination

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Metropolitan Transportation Authority

Westside Purple Line Extension Project, Section 2

Addendum to the Final Environmental Impact Report

October 2015

State Clearinghouse No. 2009031083

Metro

U.S. Department of Transportation
Federal Transit Administration

Table of Contents

List of Figures

List of Tables

List of Appendices

1.0 INTRODUCTION

A Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the extension of the existing Metro Purple Line heavy rail subway (Metro Westside Purple Line Extension Project) was completed, and approved by the Metro Board in April 2012 in accordance with the requirements of the California Environmental Quality Act (CEQA). The EIR was part of a joint document, for which an Environmental Impact Statement (EIS) was also prepared to comply with the requirements of the National Environmental Policy Act (NEPA) and the Federal Transit Administration (FTA). For the purpose of this addendum, only the EIR portion of the joint document (i.e. EIR/EIS) will be referenced. The EIR was prepared by the Los Angeles County Metropolitan Transportation Authority (Metro). The document can be viewed on the Metro website at: http://www.metro.net/projects/westside/

The Project has been divided into three sections for funding purposes. Metro proposes changes to Section 2 of the Westside Purple Line Extension in the County of Los Angeles, California. Section 2 of the project extends from the Wilshire/La Cienega Station to the Century City Constellation Station. These changes are primarily focused on construction staging areas associated with the Century City Constellation Station. Accordingly, pursuant to CEQA Guidelines Section 15164, the purpose of this Addendum is to document changes to the Westside Purple Line Extension Project and analyze the potential environmental impacts that would result from changes to the project since the certification of the Final EIS/EIR. The May 2012 Final EIS/EIR is incorporated herein by reference as part of the analysis of this Addendum.

1.1 Regulatory Requirements

This Addendum presents an evaluation of the proposed project changes to assess if they would present new significant impacts or increase the severity of previously identified significant environmental effects under CEQA. CEQA provides, in Public Resources Code Section 21166, that once an EIR has been prepared for a project, no subsequent or supplemental EIR is to be prepared unless one of the following circumstances occurs:

a. Substantial changes are proposed in the project that will require major revisions to the environmental impact report;

b. Substantial changes have occurred with respect to the circumstances under which the project is being undertaken, which will require major revisions to the environmental impact report; or

c. New information, which was not known and could not have been known at the time the environmental impact report was certified as complete, has become available.

CEQA Guidelines Section 15162 further clarifies the requirements for evaluating proposed changes to a project. Generally, the guidelines state that, once an EIR has been certified, no further EIRs will be prepared unless there are substantial changes in the project, substantial changes in circumstances, or new information of substantial importance, all of which indicate that there will be either a new, significant adverse environmental impact or a substantially more severe adverse environmental impact than previously identified.

This Addendum concludes that the changes to Section 2 of the Westside Purple Line Extension Project are minor and would not be substantial, and with implementation of mitigation measures previously

identified in the Final EIS/EIR, the impact conclusions presented in that document would remain the same. As a result, the analysis concludes that preparation of a subsequent or supplemental EIR is not required.

1.2 Approved Project

The approved project is an 8.97 mile extension of the existing Metro Purple Line heavy rail transit subway system. The extension would operate from the current Metro Purple Line terminus at the Wilshire/Western Station to a new western terminus near the West Los Angeles Veterans Administration (VA) Hospital and include seven new stations: Wilshire/La Brea, Wilshire/Fairfax, Wilshire/La Cienega, Wilshire/Rodeo, Century City Constellation, Westwood/UCLA, and Westwood/VA Hospital (Figure 1 in Appendix A). Also included in the project is the expansion of Metro Division 20 Yard in Downtown Los Angeles for rail storage and maintenance. The project will be built in three construction segments: 1. Wilshire/Western to Wilshire/La Cienega, 2. Wilshire/La Cienega to Century City Constellation, and 3. Century City to Westwood/VA Hospital, with planned operations to the Westwood/VA Hospital Station by 2036. Construction on the first segment began in November 2014. Section 2 of the project extends from the Wilshire/La Cienega Station to the Century City Constellation Station.

1.3 Proposed Project Modifications

Due to a proposed commercial development at the corner of Avenue of the Stars and Constellation Boulevard (Area 1 in Figure 2), the site can no longer be used for construction staging and laydown. However, the station entrance proposed at this location will remain and be incorporated into the new development. This Addendum addresses the changes as a result of the relocation of construction staging areas within Century City, and other changed conditions in Section 2 from what was cleared in the Final EIS/EIR.

The following provides a summary of the areas that have changed from the approved construction staging areas within Century City, and other changed conditions in Section 2 from what was analyzed in the Final EIR.

1. Change in construction staging scenario locations.

   Scenario A, as identified in the Final EIS/EIR, with the Century City Constellation Station entrance and approximately 5.5 acre construction staging and laydown area (staging area) at the northeast corner of Constellation Boulevard and Avenue of the Stars (Area 1) was selected as part of the preferred alternative. Due to a proposed commercial development at this site, the selected construction staging area can no longer be used for the project. Instead, the construction staging areas identified in Final EIS/EIR as part of Scenario B will be used, although the station entrance will remain at the northeast corner of Constellation Boulevard and Avenue of the Stars rather than the station entrance location identified as part of Scenario B (at the southwest corner of Constellation Boulevard and Avenue of the Stars). The Scenario B staging sites (Area 2 and Area 3) include two locations along Century Park East and require full acquisition of 1940 Century Park East, 1950 Century Park East, and 2040 Century Park East.

   Since the Scenario B station entrance will not be used, a portion (less than 0.25 acres) of Area 1 will be required for construction of the station entrance which is to remain in the original location at the

northeast corner of Constellation Boulevard and Avenue of the Stars (Area 1), and will be incorporated into future development to be constructed at this location. Metro will coordinate with the developer regarding the station entrance so as not to preclude a future connection to the development. Although if development of the site has not yet begun when construction of the Century City Constellation Station begins, the station entrance would be designed as described in the Final EIS/EIR. Further, if the site is not developed at the start of the Century City Constellation Station construction, it is possible that more than 0.25 acres of Area 1 will be used for construction activities.

In addition, due to the loss of full use of Area 1, the tunnel boring machine (TBM), used to excavate the tunnels between Century City and La Cienega Boulevard, will be lowered into the station excavation along Constellation Boulevard from the street. This will require a six to nine month full closure of approximately 200 feet of the eastern end of Constellation Boulevard between Century Park East and the first driveway on the north side of the street. Constellation Boulevard is a minor 4-lane east/west collector street traversing a distance of approximately 0.4 miles between Century Park West and Century Park East that is classified in the Transportation Element of the City of Los Angeles General Plan as a Divided Secondary Highway. Within the study area, Constellation Boulevard has two travel lanes in each direction with painted two-way left-turn lanes and primarily provides a means of access to the properties located along its length. The closure of this short section of the noncontiguous Constellation Boulevard will be in place for approximately six to nine months and will not block any building or driveway entrances.

In summary, the station entrance will remain in the original location of Area 1 as identified in the Final EIS/EIR. The construction staging locations identified in Scenario B in the Final EIS/EIR will be used because the approximate 5.5 acre construction staging site identified in Scenario A is no longer available.

2. Installation of a new tunnel access shaft and conveyor in Area 2.

   As noted above, the approximate 5.5 acre construction staging site (Area 1) identified in Scenario A had sufficient space available for a tunnel excavation operation, TBM launch, construction staging, parking, storage, and other work areas. Since the majority of Area 1 will no longer be available for construction staging and removal of excavated materials, a temporary access shaft, up to 80 feet in diameter will be constructed in Area 2 to provide access to the tunnel head for workers and materials and to remove excavated material from the tunnel. The placement of an access shaft in Area 2 was not included as part of a construction staging scenario presented in the Final EIS/EIR. The access shaft will include three phases: construction of the shaft; operations conducted through the shaft including mucking, concrete work, and rail welding; and backfill of the shaft. Construction staging activities in Area 2 will occur for approximately seven years.

   Because Areas 2 and 3 are not adjacent to each other, excavated material will likely be moved between the tunnel access shaft in Area 2 and staging area in Area 3 via an enclosed conveyor system (see Figure 3 for an example of a typical enclosed conveyor system). The conveyer will be in operation for approximately three years and located along a new temporary easement of up to five years (2018-2023) to be acquired by Metro. Should a slurry-type TBM be used, the conveyance system will also carry slurry feed and discharge pipes from the tunnel access shaft to a slurry separation plant in Area 3. There are three proposed location options for the conveyor system, with the final location to be determined after negotiations with the property owner:

I. The first option aligns the conveyor system from the vertical access shaft in Area 2 and travels approximately 400 feet along the east side of the AT&T building at 2010 Century Park East to Area 3 (Figure 2). The conveyor would span the top of the parking structure located on the east side of the building. In addition to the conveyor, temporary pipe racks carrying utility lines, water, grout, foam, compressed air, etc. would also be installed over the top of the parking structure.

II. The second option is also located along the east side of the AT&T building at 2010 Century Park East. With this option the parking structure would be demolished and the conveyor system would be placed at ground level for approximately 400 feet from the access shaft to Area 3. The parking structure is structurally unsound and only partially used now. Should AT&T agree to remove the parking structure, the enclosed conveyor system would be placed at ground level between Areas 2 and 3. Removal of the parking structure would also allow for additional area behind the AT&T building to be used for construction staging and laydown activities and for movement of materials and equipment between Areas 2 and 3. In addition, the area immediately adjacent to the east side of the building will be available for use as parking for employees of the AT&T facility.

III. The third option would place the conveyor system along the west side of the AT&T building in a materials handling corridor. This option would require Metro to obtain a temporary easement along the western portion of the AT&T property and only be used if an easement along the east side of the AT&T building is not feasible. The corridor would extend from staging Area 2 to Area 3, a distance of approximately 400 feet, with a width encompassing one northbound traffic lane and sidewalk in the public right-of-way along the eastern side of Century Park East, and the space between the AT&T building and the eastern edge of the sidewalk. The corridor would be separated from traffic on Century Park East by K-Rail dividers plus fencing with fabric sight screening. Materials handling equipment would travel on the closed street lane. The enclosed conveyor would be elevated such that traffic entering the AT&T facility could pass beneath the conveyor structure. Access to the AT&T building and its facilities would be maintained through the period of use, which is approximately five years. The materials handling corridor along Century Park East would require the temporary relocation of one bus stop serving the Metro 28 line and LADOT Commuter Express line 534.

3. Change in land use adjacent to construction staging Area 3.

   Immediately south of staging Area 3, a former physician-run hospital at 2080 Century Park East that has been closed since 2008 is being remodeled to become a new inpatient rehabilitation facility with a tentative opening date of March 2016. The nine story rehabilitation facility was not in operation at the time of the EIS/EIR studies, therefore the analysis of the adjacent construction staging area did not assess potential impacts to the facility. The 138 bed facility will provide inpatient rehabilitation services. Adjacent to the building, construction staging Area 3 will primarily be used for the temporary storage of excavated material which will then be hauled away for off-site disposal. Area 3 will also be used for storage of materials and equipment required for tunnel and station construction, and for the contractor's office, maintenance shops, and parking. There is no change to the truck haul routes to be used for construction of the Century City Constellation Station identified in the Final EIS/EIR. Construction related activities will be in operation at this site for approximately seven years.

4. Use of existing Metro bus layover area for construction material storage.

   In addition to the Century Park East sites identified in the Final EIS/EIR, a material storage area will be placed at the existing 0.3 acre Metro bus layover site on the southeast corner of Century Park West and Constellation Boulevard (Area 5). The property owner also uses the site for a fuel cell installation to generate electricity. Access to the fuel cell installation will be maintained during the entire time the site is used by Metro. There will be no ground disturbing activity at the site other than for the installation and removal of soundwalls, and for removal and restoration of curbs and landscaping. Following construction of the station, the site will be returned to its current use as a Metro bus layover facility. The site will be used for approximately seven years for storage of construction materials and parking of construction equipment associated with construction of the station.

5. Temporary bus layover on Santa Monica Boulevard.

   Due to the use of the existing Metro bus layover site (Area 5) for construction material storage, a new temporary bus layover approximately 250 feet long and 12 feet wide providing parking for up to five buses, will be constructed in the median of Santa Monica Boulevard between Avenue of the Stars and Century Park East (see Figure 4). Also included will be restroom facilities for Metro bus operators. The layover zone will be located in the landscaped median between the eastbound lanes of Santa Monica Boulevard and a dedicated bus lane, and will be in use for approximately seven years.

6. Ventilation /Exhaust Structures into the Westfield Century City Property.

   Metro will require temporary and approximately 3,000 square feet of permanent easements into the Westfield Century City mall property for the purpose of construction of ventilation ducts to service the subway. Metro is currently in discussions with the property owners regarding the placement of the station appendages (exhaust and vent shafts) within the Westfield Century City property (Figure 5).

7. Elimination of train cross-over at Wilshire/Rodeo Station.

   After an operational analysis was performed to verify that the train cross-over east of the Wilshire/Rodeo Station could be eliminated while still maintaining operational requirements for the Westside Purple Line Extension Project, the Metro Board, at its September 2014 Board meeting approved the elimination of the train cross-over. As a result, the station box shifted east from El Camino Drive to Canon Drive to now Beverly Drive and Canon Drive, with a reduction in length of the station box from originally approximately 1,150 feet to approximately 950 feet (Figure 6 and Figure 7). This action will result in significant shortening of the underground station, thus reducing construction costs and impacts to traffic and disruption to the surrounding streets and businesses during construction due to a smaller construction footprint along Wilshire Boulevard and less truck trips needed for hauling excavated material.

2.0 EVALUATION OF ENVIRONMENTAL IMPACTS

This section demonstrates compliance with Sections 15162 – 15164 of the CEQA Guidelines. Each of the conditions identified in Sections 15162 - 15164 of the CEQA Guidelines is satisfied based on the following:

1. The changes to Section 2 of the Westside Purple Line Extension Project, as described in Section 1.3 Proposed Project Modifications, would not result in new significant environmental effects. The proposed relocation of the Century City Constellation Station construction staging areas results in the same types of construction-related impacts as disclosed in the Final EIS/EIR. The relocation and changes in construction staging areas and activities, including use of an access shaft and materials conveyor systems, would not generate significant new environmental impacts. Implementation of appropriate mitigation measures identified in the Final EIS/EIR would minimize and/or eliminate the potential impacts associated with the proposed project changes. In addition, elimination of the train cross-over structure east of the Wilshire/Rodeo Station would result in significant shortening of the underground station, thus reducing construction costs and impacts to traffic and disruption to the surrounding streets and businesses during construction.

   With the necessary relocation of staging areas, several construction activities, not previously included in the Final EIS/EIR would be required, including construction of an access shaft, launch of the TBM from Constellation Boulevard, and use of a materials conveyor system. Since the majority of Area 1 will no longer be available for construction staging and removal of excavated materials, a temporary access shaft, up to 80 feet in diameter will be constructed in Area 2 to provide access to the tunnel head for workers and materials and to remove excavated material from the tunnel. Because Areas 2 and 3 are not adjacent to each other, excavated material will likely be moved between the access shaft in Area 2 and staging area in Area 3 via an enclosed conveyor system. The conveyer will be in operation for a period of approximately three years and located along a new temporary easement to be acquired by Metro. The relocation of construction activities and required use of an access shaft and conveyor system would not generate any new significant impacts.

   Use of the Metro bus layover site on the southeast corner of Century Park West and Constellation Boulevard for materials and equipment storage during the seven year construction period would require the construction of a temporary bus layover site on Santa Monica Boulevard. The temporary bus layover site would be approximately 250 feet long and 12 feet wide and provide parking for up to five buses between the eastbound lanes of Santa Monica Boulevard and the dedicated bus lane. It would be constructed in the landscaped median of Santa Monica Boulevard between Avenue of the Stars and Century Park East. Also included would be restroom facilities for Metro bus operators. The change in bus layover location will require a minor reroute of the three affected bus lines. Since the proposed terminal will be located near the existing layover location, the impact on existing bus operations will be minimal and patrons will still be able to use a number of the existing bus stops in the area. The temporary use of the Metro bus layover site and construction of a temporary layover site on Santa Monica would not significantly impact bus operations or generate any new impacts.

2. The circumstances and conditions in the area of the Century City Constellation Station area are primarily unchanged from what was analyzed in the Final EIS/EIR, with one notable exception, which is the construction of an inpatient rehabilitation facility at 2080 Century Park East. Located immediately south of staging Area 3, the former physician-run hospital at 2080 Century Park East

that has been closed since 2008, is being remodeled to become a new inpatient rehabilitation facility with a tentative opening date of March 2016. The nine story rehabilitation facility was not in operation at the time of the EIS/EIR analysis. Therefore, the analysis of the adjacent construction staging area did not assess potential impacts to the facility. The 138 bed facility will provide inpatient rehabilitation services. Adjacent to the building, construction staging Area 3 will primarily be used for the temporary storage of excavated material which will then be hauled away for off-site disposal. Area 3 will also be used for storage of materials and as the location of equipment required for tunnel and station construction, and for the contractor's office, maintenance shops, and parking. There is no change to the truck haul routes to be used for construction of the Century City Constellation Station identified in the Final EIS/EIR. Construction related activities will be in operation at this site for approximately seven years. Based on the analysis of construction activities in Area 3, there would be no significant impacts to the new rehabilitation facility located immediately south of the site.

3. There is no substantial new information. The proposed changes to the Century City Constellation Station construction staging does not constitute substantial new information as defined in the CEQA Guidelines. The proposed changes would not result in any additional significant impacts beyond those disclosed in the Final EIS/EIR. All significant impacts identified in the Final EIS/EIR will remain the same or will be mitigated as described in the Mitigation Monitoring Reporting Plan (Appendix B). Impacts associated with changed construction conditions would be mitigated and or minimized to a less than significant level.

2.1 Comparison of Project to Previous Findings

The findings of the Final EIS/EIR and any associated mitigation measures are summarized to provide a basis of comparison of the impacts associated with the proposed project modifications. Generally, impacts associated with the proposed project modifications remain consistent with the findings of the Final EIS/EIR. The relocation of construction staging areas for the Century City Constellation Station would not result in long-term operational impacts. All impacts associated with the construction changes are temporary in duration from six months to seven years depending on the construction activity.

The following sections present the impacts associated with the relocation of the construction staging areas that were analyzed in this Addendum. New impacts or a change in impact severity are not expected for several resource areas identified below and these are not discussed further:

- Land use and development
- Communities and neighborhoods
- Socioeconomic characteristics
- Climate change
- Energy
- Geological resources
- Hazardous waste and materials
- Water resources

- Safety and security
- Parklands and community services and facilities
- Historic, archaeological, and paleontological resources
- Growth impacts

2.1.1 Transportation

Applicable CEQA Threshold of Significance

Would the proposed project have a new or substantially more severe impact related to an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e. result in a substantial increase in either the number of vehicle trips, the volume capacity ratio of roads, or congestion at intersections)?

The intersection level-of-service (LOS) analysis assumes that an intersection would be significantly affected by traffic volume changes if the project will cause an increase in average vehicle delay according to the following thresholds as presented in the Final EIS/EIR:

- Final LOS C – if the delay is increased by 10 or more seconds;
- Final LOS D – if the delay is increased by 7.5 or more seconds; and
- Final LOS E/F – if the delay is increased by 5 or more seconds.

The LOS definitions and ranges of delay are shown in Table 1 and represent average conditions for all vehicles at an intersection across an entire hour.

Table 1. Level-of-service Definitions for Signalized Intersections

Level of Service	Control Delay (seconds/vehicles)	Interpretation[1]
A	≤10.0	This lese-of-service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop. Short cycle lengths may also contribute to low density.
B	>10.0 and ≤20.0	This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.
C	>20.0 and ≤35.0	These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, although many vehicles still pass through the intersection without stopping.
D	>35.0 and ≤55.0	At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	>55.0 and ≤80.0	These high delay values generally indicate poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.
F	>80.0	This level, considered unacceptable by most drivers, often occurs with oversaturation; that is, when arrival flow rates exceed the capacity of the intersection. IT may also occur at high volume-to-capacity ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Source: *Highway Capacity Manual,* Transportation Research Board (TRB 2000)
[1]Level of Service interpretation was derived from *Highway Capacity Manual 1994,* Transportation Research Board, 1994

Final EIS/EIR Conclusions

Chapter 3 of Final EIS/EIR concluded that traffic impacts associated with project construction include reduced roadway traffic lanes and temporary street closures which could result in major traffic disruptions and bottlenecks. As part of the project construction, full street closures would generally be limited to the nighttime and weekends. Partial street closures would be limited to nighttime, weekend, and off-peak periods, except during installation of temporary shoring where the closure would be continuous throughout the day. Potential street closure locations would be based on proposed station and station entrance construction methods, duration, and sequencing. Additionally, commercial driveways may be subject to reduced access around construction sites. Emergency vehicle access (e.g., police, fire and rescue, and ambulance) in and around construction work sites may be affected by lane closures, temporary street closures, and detours.

In Section 2, under 2035 project conditions, 24 of the 83 analyzed intersections (29 percent) would operate at an acceptable level of service (LOS) D or better in the A.M. peak hour. The remaining 59 intersections (71 percent) would operate at LOS E or F (deficient LOS) during the A.M. peak hour. Twenty-four (24) of the 83 Section 2 analyzed intersections (29 percent) would operate at an acceptable LOS D or better in the P.M. peak hour. The remaining 59 intersections (71 percent) would operate at LOS E or F (deficient LOS) during the P.M. peak hour. By 2035, the majority of study intersections would operate under congested conditions (LOS F) during peak hours both with and without the project.

Temporary street closures would require temporary rerouting of bus lines and bus stop locations, which would add transit travel time for bus riders. Before implementation of changes that affect bus operations and/or stop locations, transit providers would be contacted at least 100 days in advance.

These impacts, even with implementation of mitigation would remain as temporary significant impacts. The Final EIS/EIR stated that as construction details are further defined, additional traffic projections would be conducted to determine the expected traffic volumes at evaluated intersections and to identify if additional mitigation, beyond what was previously identified, would be necessary.

Proposed Project Modifications

As noted above, the approximate 5.5 acre construction staging site identified in Area 1 had sufficient space available for a tunnel excavation operation, construction staging, parking, storage, and other work areas. Due to the loss of full use of Area 1, the TBM will be launched from the station excavation along Constellation Boulevard. This will require the full closure of approximately 200 feet of the eastern end of Constellation Boulevard between Century Park East and the first driveway on the north side of the street for approximately six to nine months for installation of the soldier piles, installation of the decking, excavation of the launch box at the east end of the station excavation, and assembly of the TBM.

Table 2 provides a summary of the expected changes from the existing 2015 level of service (LOS) at key intersections around the Century City Constellation Station during the approximate six to nine months that the eastern portion of Constellation Boulevard is closed to traffic.

Table 2. LOS Changes at Key Intersections

Intersection	Existing Conditions (2015)				200 Foot Full Closure of Constellation Boulevard			
	A.M. Peak Hour		P.M .Peak Hour		A.M. Peak		P.M. Peak	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Century Park East/ Santa Monica Blvd	F	141.9	F	117.9	F	102.8	F	204.7
Century Park East/ Constellation Blvd	C	30.0	D	39.4	A	7.5	A	6.1
Century Park East/ Olympic Blvd	D	52.6	D	53.3	E	65.7	D	49.0
Avenue of the Stars/ Santa Monica Blvd	F	143.3	F	115.0	F	190.5	F	133.9
Avenue of the Stars/ Constellation Blvd	D	35.8	C	31.7	F	127.6	F	93.7
Avenue of the Stars/ WB Olympic Blvd	B	17.1	A	7.9	C	32.5	A	8.7
Avenue of the Stars/ EB Olympic Blvd	D	41.7	C	30.5	F	103.5	E	73.2
Century Park West/ Santa Monica Blvd	F	139.1	F	145.6	F	136.9	F	157.8
Century Park West/ Constellation Blvd	A	9.1	C	35.0	B	11.5	D	37.3
Century Park West/ Olympic Blvd	F	82.6	E	79.5	F	81.0	F	79.8

Source: *Traffic Management Plan (Draft)*, Parsons Brinckerhoff 2015

The temporary closure and diversion of traffic from the eastern end of Constellation Boulevard, would result in the three intersections along Santa Monica Boulevard (at Century Park East, Avenue of the Stars, and Century Park West) continuing to operate at LOS F during both the A.M. and P.M. peak hours. Changes in LOS would occur at seven of the intersections with four intersections, Century Park East/Olympic Boulevard, Avenue of the Stars/Constellation Boulevard, Avenue of the Stars/westbound Olympic Boulevard, and Century Park West/Constellation Boulevard, worsening in the A.M. peak. Four intersections (Avenue of the Stars/Constellation Boulevard, Avenue of the Stars/eastbound Olympic Boulevard, Century Park West/Constellation Boulevard, and Century Park West/Olympic Boulevard) would worsen in the P.M. peak. In addition, the LOS at Century Park East/Constellation Boulevard would improve in both the A.M. and P.M. peak periods since traffic would not be allowed to turn onto Constellation Boulevard from Century Park East. The remaining study intersections would continue to operate at LOS D or better during both peak hours.

The closure of a portion of one northbound lane on Century Park East to accommodate the materials handling corridor between Areas 2 and 3 would have minimal impacts to traffic operations along Century Park East. During the time that the lane on Century Park East is closed, the expected LOS at the three intersections along the street (at Santa Monica, Constellation Boulevard, and Olympic Boulevard) would generally remain the same in the A.M. peak period. Over the course of the five year period that the lane is closed to traffic, the Century Park East intersection at Constellation would fluctuate from LOS C to A, while the intersection at Olympic would fluctuate between LOS D and E depending on the other traffic control actions occurring in the area. For the P.M. peak period, the LOS for the three intersections along Century Park East would also generally remain the same, except there would be some improvements at Century Park East/Constellation Boulevard throughout the period of the lane closure. Pedestrian traffic would be detoured around the closed portion of Century Park East.

The proposed changes would affect transit operations in the vicinity of the Century City Constellation Station. The use of the existing Metro bus layover site at Century Park West/Constellation Boulevard would require Metro bus lines 16, 316, and 28 to use the temporary bus layover to be constructed along Santa Monica Boulevard. The temporary layover would be constructed in the median of Santa Monica Boulevard and would not affect existing traffic lanes. The change in bus layover location would require minor route changes in the operations of each of the affected bus lines. In addition, the materials handling corridor to be placed along a portion of the northbound side of Century Park East would require the temporary relocation of a bus stop serving Metro line 28 and LADOT Commuter Express line 534.

Current Project-Specific or Modified Mitigation Measures:

As previously discussed, the transportation impacts associated with project construction would remain temporarily significant even following implementation of mitigation.

Implementation of the mitigation measures previously identified in the Final EIS/EIR will minimize the transportation related impacts associated with the temporary full closure of 200 feet of Constellation Boulevard, the temporary lane closure on Century Park East, and the temporary relocation of the Metro bus layover area. These measures include the following:

TCON-1 Traffic Control Plans: Site-specific traffic control plans will be developed to minimize construction for each work zone location. These locations will include, but not be limited to utility relocations, stations, crossovers, laydown areas, TBM launch and removal locations, emergency exit shafts, station entrances, drop pipes, and grout injection. Traffic control plans will follow state and local jurisdiction guidelines and standards. Traffic control plans will be developed for Wilshire, Santa Monica, and Constellation Boulevards and north-south streets including, but not limited to, La Brea Avenue, Fairfax Avenue, La Cienega Boulevard, Rodeo Drive, Beverly Drive, Canon Drive, Century Park East, Avenue of the Stars, Westwood Boulevard, Veteran Avenue, Sepulveda Boulevard, I-405 ramps to/from eastbound Wilshire Boulevard, and Bonsall Avenue. Traffic control plans will encompass the following:

- Minimum lane widths;
- Number of available travel lanes;
- Number, length, and location of temporary right and left-turn lanes;
- Temporary street closures and detour routes;
- Traffic-control devices;
- Temporary traffic signals and street lighting;
- Temporary pedestrian access and routes;
- Temporary bicycle routes;
- Temporary driveway access;
- Temporary business access; and
- Construction site phasing.

Advanced traffic control will extend beyond one arterial street on each side of each station construction location. Business owners will be interviewed to identify the type of business, delivery and shipping schedules, and critical days/times of year for the business. Specific street closures will be developed in close coordination with the local jurisdictions during the Final Design phase.

TCON-3 Emergency Vehicle Access: Emergency vehicle access will be maintained at all times to the construction work site, adjacent businesses, and residential neighborhoods.

TCON-4 Transportation Management Plan: Once subway construction sequencing/phasing and the truck haul routes have been concurred upon by Metro and reviewed by local jurisdictions and Caltrans, an overall LPA Transportation Management Plan (TMP) will be developed with and approved by Metro and other appropriate agencies. The TMP will include the following:

- Public information (e.g., media alerts, website);
- Traveler information (e.g., traffic advisory radio, changeable message signs [CMS]);
- Incident management (e.g., TMP coordination, tow truck services);
- Construction (e.g. detour routes, haul routes, mitigation, construction times);
- Demand management (e.g., carpooling, express bus service, variable work hours, parking management); and
- Coordination with concurrent LPSs.

TCON-6 Temporary Bus Stops and Route Diversions: Construction impacts to local and regional transit operations will be mitigated to minimize impacts to the degree possible at each station construction location. Impacts will be mitigated through, but not limited to, the use of temporary relocated bus stops and temporary route diversions. Impacts will be coordinated with each transit agency and/or provider.

TCON-9 Construction Worker Parking: Metro will require that all construction contractors identify adequate off-street parking for construction workers at Metro approved locations.

TCON-10 Pedestrian Routes and Access: Safe pedestrian routes and access will be provided through and/or adjacent to construction work areas. Pedestrian routes and access, including temporary pedestrian facilities, will comply with the requirements of the ADA and must be properly signed and lighted.

TCON-11 Bicycle Paths and Access: Bicycle traffic (e.g., paths, lanes, and routes) will be maintained safely through and adjacent to construction work areas. If bicycle traffic cannot be maintained, then alternative temporary bicycle routes will be identified, signed, and lighted.

In addition to the measures presented in the Final EIS/EIR, several traffic management strategies have been identified as part of the Draft TMP (Appendix C). These strategies are closely related to TCON-4 and involve coordination and outreach with the public. The strategies include:

- Implementation of a public awareness campaign to educate motorists, merchants, residents, elected officials and governmental agencies about construction activities and associated impacts. The PAC will work to enhance public acceptance, tolerance and cooperation while helping to reduce the traffic demand in the construction zone by encouraging motorists to take alternate routes or to

travel outside of closure hours. Specific elements that may be used to accomplish these objectives include press releases/special alerts to news outlets and traffic reports which will be sent to inform motorists about construction activities. Paid advertising may also be used to inform motorists about construction activities.

- Brochures and other project notices will be prepared by Metro staff, in coordination with the contractors, to keep the public (residents, businesses, travelers, etc.) informed about the project and anticipated closures and impacts.
- Press releases and media alerts will be prepared and distributed by Metro staff in coordination with the contractors, as required or needed throughout the length of project.
- Advertisements for public meetings regarding the project will be printed in a number of publications and distributed throughout the cities surrounding the project areas.
- Public meetings will be held to provide information about the project and anticipated closures/impacts to any and all interested parties including, political offices, residents, motorists, community groups, school districts, developers, truckers, etc.
- The Metro project website (www.metro.net) will be the primary information source for up-to-date project information. The project website will contain information such as traffic alerts, current schedule, news related to the project, alternatives developed by the community, past and future meetings/hearings, frequently asked questions (FAQs), and links to major stakeholders of the project.
- A Motorist Information System will be in place during construction in order to enable motorists to make informed decisions about their travel plans and options with real-time traffic information. The key components of this system include changeable message signs (CMS), portable CMS (PCMS), and ground mounted signs, that will provide real time traffic information to motorists approaching the construction zone.
- The project will require PCMS's at various locations during construction. PCMS's should be placed and operated as needed to inform motorists of construction activities and closures. Additional PCMS's should be made available during the project and may be placed and operated as deemed necessary by the contractor. During construction, all PCMS's should be checked nightly and fixed or replaced as needed to ensure that they are in a proper working condition and that their visibility is not compromised.
- Ground mounted signs will be used during the construction of the project and these signs shall be placed at appropriate locations as specified by the contractor to guide motorists through the construction zones and detour routes.

The proposed project modifications to Section 2 of the Westside Purple Line Extension Project would not cause any new or substantially more significant impacts related to transportation, circulation, and parking than previously addressed in the Final EIS/EIR.

2.1.2 Acquisition and Displacement of Existing Uses

Final EIS/EIR Conclusions

Section 4.2.2 of the Final EIS/EIR discusses the land ownership and leasing agreements that will change due to the Project. The Final EIS/EIR indicated that there would be between 5 and 25 full property

acquisitions, one to four permanent easements required for station entrances and construction staging, and up to four temporary construction easements required for Section 2. Section 2 would also require 32 permanent underground easements for the subway tunnel.

At the Century City Constellation Station site, identified temporary construction easements include parcels at 1940, 1950 and 2040 Century Park East, in addition to a permanent easement for the station entrance at 10131 Constellation Boulevard.

Proposed Project Modifications

The change in construction staging areas for the Century City Constellation Station will require a new temporary construction easement for materials storage and construction offices at the Metro bus layover site located at the southeast corner of Century Park West and Constellation Boulevard. To offset the loss of the five bus layover spaces, a new temporary layover area will be created in the median of Santa Monica Boulevard. Following construction of the Century City Constellation Station, the site will return to use as a Metro bus layover. In addition, access to the fuel cell installation located on the site will be maintained during the entire seven years the site is used by Metro for construction-related purposes.

A temporary construction easement of up to five years may be used along the eastern portion of the property at 2010 Century Park East (AT&T building) for placement of the conveyor system between staging Areas 2 and 3. The conveyor system would either run across the top of the existing parking structure located on the east side of the AT&T building or, should agreement be reached with the property owners for removal of the parking structure, the conveyor would connect the shaft in Area 2 to Area 3 at ground level. In addition to the installation and operation of the conveyor system, the Project will seek to acquire a temporary construction easement to a larger area of the parking lot to use for construction staging for the duration of the Project.

If use of the eastern portion of the AT&T property is not feasible, the conveyor system would be placed in a temporary construction easement, lasting approximately five years, along the west side of the AT&T building in a materials handling corridor along an approximately 400 foot long section of Century Park East. The easement would have a width encompassing one northbound traffic lane and sidewalk in the public right-of-way along the eastern side of Century Park East, and the space between the AT&T building and the eastern edge of the sidewalk.

In addition, temporary and permanent easements will be needed for ventilation and exhaust shafts within the Westfield Mall property located along the north side of Constellation Boulevard for the purpose of constructing ventilation ducts to service the subway. Metro is currently in discussions with the property owners regarding the placement of the station appendages (exhaust and vent shafts) within the Westfield Mall property.

Current Project-Specific or Modified Mitigation Measures:

Implementation of mitigation measure CN-3, previously identified in the Final EIS/EIR, will provide mitigation for the required temporary and permanent easements.

CN-3 Compensation for Easements: For easements, Metro will appraise each property to determine the fair market value of the portion that will be used either temporarily during construction or permanently above and below ground. As required by both the Uniform Relocation Assistance and Real Property

Acquisition Act and California Relocation Assistance Act, just compensation, which will not be less than the approved appraisal, will be made to each displaced property owner.

The proposed project modifications to Section 2 of the Westside Purple Line Extension Project would not cause any new or substantially more significant impacts related to acquisitions and displacements than previously addressed in the Final EIS/EIR.

2.1.3 Visual and Aesthetics

Applicable CEQA Threshold of Significance

As identified in the Final EIS/EIR, visual impacts during construction will be considered significant if the construction of the project results in any of the following:

- Conflicts with or complements the existing visual character;
- Changes in visual quality;
- Effects on viewers (considers viewer sensitivity);
- Intrudes on or blocks sensitive views (emphasizes views protected by local jurisdictions);
- Creates shadows; or
- Creates new light or glare source.

Final EIS/EIR Conclusions

Construction-related visual impacts of the project are discussed in Section 4.15.3 of the Final EIS/EIR. The Century City area is described as a dense auto-oriented urban center with tall buildings and wide boulevards. The high-rises in the area are a visual landmark and prominent buildings contribute to the visual character. The area lacks strong consistent architectural and urban design features. Project-related construction activities would result in the introduction of heavy construction equipment, stockpiled construction-related materials, noise barriers, erosion devices, excavated materials, new lighting sources, and removal of trees from some areas which conflicts with the existing visual character and results in a change in visual quality for the areas adjacent to the construction sites. During the construction period, these visual elements will temporarily degrade the physical character of the station and staging areas, resulting in adverse effects without mitigation.

Proposed Project Modifications

The visual effects associated with the construction staging changes at the Century City Constellation are similar to what was identified in Section 4.15.3 of the Final EIS/EIR because project-related construction activities include the use of heavy construction equipment, stockpiled construction-related materials, noise barriers, erosion devices, excavated materials, and new lighting sources. The implementation of the mitigation measures identified below would reduce the anticipated visual impacts so that no adverse effects remain.

The change in visual conditions associated with the changes in the construction staging areas for the Century City Constellation Station are described below.

The construction of an approximate 80 feet in diameter shaft to access the tunnel and installation of a conveyor to move material out of the tunnel was not included in the Final EIS/EIR as part of the activities

in Area 2. With Area 2 surrounded by a 20 feet high temporary barrier, the shaft opening would likely be visible from only the upper floors of the office building immediately north of Area 2 (1888 Century Park East). The shaft opening would not be visible to pedestrians or motorists on Century Park East or students and faculty at Beverly Hills High School.

If the AT&T building parking structure can be removed, the conveyor system and temporary pipe racks carrying utility lines, water, grout, foam, compressed air, etc. between Areas 2 and 3 would be placed at ground level and the horizontal conveyor between the tunnel access shaft Area 3 would rise less than 10 feet above ground level. Under this scenario the conveyor system would not be visible to the surrounding properties except the upper floors of the office building immediately north of Area 2 (1888 Century Park East) and the rehabilitation facility south of Area 3 (2080 Century Park East). Removal of the parking structure would not substantially alter the visual character of the surrounding area as construction activities and demolition of structures are already planned to occur in the immediate vicinity, including the demolition of 1940 Century Park East and parking garage of the AAA building (1950 Century Park East) immediately north of the AT&T parking structure. The vertical conveyor at the shaft may exceed the height of the 20 foot barrier and require additional screening.

If the AT&T building parking structure is not demolished and the conveyor system and temporary pipe racks must span the top level of the three story parking structure, a taller vertical conveyor from the shaft would be required. In order to span the parking structure, the shaft conveyor system may be higher than the standard 20 foot barrier surrounding the site and would therefore be visible to both the upper floors of the office building immediately north of the Area 2 and Beverly Hills High School located immediately east of the staging areas and conveyor system.

If it is not feasible to install the conveyor system on the east side of the AT&T building, the system would be elevated approximately 15 feet high across the west side of the AT&T building as part of a materials handling corridor. Access to the AT&T building would be maintained. Installation of the elevated conveyor and use of an approximate 400 foot portion of Century Park East for movement of materials and equipment would present a new visual change for viewers along Century Park East. In addition, up to four large trees along Century Park East may be removed to accommodate the conveyor system and materials handling corridor. Following construction, the area would be restored and use of the sidewalk and traffic lane returned.

In order to minimize the visual intrusion of the shaft conveyor system, the structure will be screened to reduce effects on adjacent viewers. In addition, the horizontal conveyor system between Area 2 and Area 3 would be enclosed to minimize the visual and noise intrusion of the system no matter which option for its placement is used.

Construction staging activities in Area 3 will create visual impacts to the new long-term rehabilitation facility at 2080 Century Park East. The nine-story structure is located immediately south of Area 3 with the views from the north side of the building impacted by construction staging activities in Area 3, including hauling operations removing excavated material and equipment and materials storage. In addition, construction-related lighting sources would be introduced in Area 3, which may potentially affect the north side of the rehabilitation facility. There are several large trees along the northern edge of the medical facility property that would help provide some minimal screening of Area 3.

The use of the Metro bus layover at the corner of Century Park West and Constellation Boulevard (Area 5) will create a new temporary visual change for the office building (10250 Constellation Boulevard)

located east of the site, primarily the offices facing west. With the bus layover site surrounded by a 20 foot high barrier, only the upper floors of the office building, which would overlook the materials and equipment storage in Area 5, would be affected.

Installation of the temporary Metro bus layover site in the Santa Monica Boulevard median may require the removal of up to four small trees and landscaping within the median. The removal of the trees and vegetation would be a noticeable visual change for those motorists traveling east on Santa Monica Boulevard. Once use of the temporary layover site is no longer needed, the median would be restored to previous conditions.

Current Project-Specific or Modified Mitigation Measures:

Implementation of the mitigation measures previously identified in the Final EIS/EIR will minimize the temporary visual related impacts associated with the relocation of construction staging activities and introduction of new visual elements, including the access shaft and conveyor system, to the Century City Constellation Station area. These measures include:

CON – 2 Timely Removal of Erosion Devices: Visually obtrusive erosion-control devices, such as silt fences, plastic ground cover, and straw bales will be removed as soon as the area is stabilized.

CON-3 Location of Construction Materials: Stockpile areas will be located in less visibly sensitive areas and, whenever possible, not be visible from the road or to residents and businesses. Limits on heights of excavated materials will be developed during design based on the specific area available for storage of material and visual impact.

CON-4 Construction Lighting: Lighting will be directed toward the interior of the construction staging area and be shielded so that it will not spill over into adjacent residential areas. In addition, temporary sound walls of Metro approved design will be installed at station and work areas. These will block direct light and views of the construction areas from residences.

CON-5 Screening of Construction Staging Areas: Construction staging areas will be screened to reduce visual effects on adjacent viewers.

VIS-2 Replacement for Tree Removal: Where mature trees are removed, replacement with landscape amenities of equal value will be incorporated into final designs, where feasible, to enhance visual integrity of the station area.

The proposed project modifications to Section 2 of the Westside Purple Line Extension Project would not cause any new or substantially more significant impacts related to visual resources than previously addressed in the Final EIS/EIR.

2.1.4 Air Quality

Applicable CEQA Threshold of Significance

As outlined in the Final EIS/EIR, the CEQA significance criteria for the project was established by the South Coast Air Quality Management District (SCAQMD). The project would result in significant impacts if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;

- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

Final EIS/EIR Conclusions

Construction period air quality impacts are discussed in Section 4.15.3 of the Final EIS/EIR. The results show that SCAQMD thresholds will be exceeded for all pollutants over the duration of the construction period. The majority of emissions will occur as a result of the removal and transport of soils for disposal from tunneling and excavation activity. Implementation of mitigation measures will help reduce air quality particulate matter impacts, but given the construction plan, it is unlikely that the levels will be below the SCAQMD thresholds during construction and therefore, adverse effects will remain after mitigation.

In addition, demolition, grading, stockpiling, and hauling soil will contribute to particulate matter emissions affecting the local environment. At TBM entry and exit sites where dirt handling exists, the SCAQMD thresholds for PM_{10} will be exceeded if not mitigated.

Proposed Project Modifications

An assessment of the air quality construction impacts was conducted to account for the changed construction conditions at the Century City Constellation Station (Appendix D). The assessment utilized California Air Resources Board (CARB) EMFAC2011 mobile source emission factors, and the SCAQMD OFFROAD emission factors. SCAQMD OFFROAD was used to develop emission factors from off-road construction equipment. Using these various data sources, daily construction emission levels were developed. The values were compared to the air quality construction significance thresholds shown in Table 3 to determine if the project would meet or exceed these values (Table 4). As the construction schedule is still preliminary at this time, construction emissions were estimated for each major activity.

Table 3. SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds[1]		
Pollutant	Construction[2]	Operation[3]
Nitrogen Oxides (NOx)	100 lbs/day	55 lbs/day
Volatile Organic Compounds (VOC)	75 lbs/day	55 lbs/day
Respirable Particulate Matter (PM_{10})	150 lbs/day	150 lbs/day
Fine Particulate Matter ($PM_{2.5}$)	55 lbs/day	55 lbs/day
Sulfur Oxides (SOx)	150 lbs/day	150 lbs/day
Carbon Monoxide (CO)	550 lbs/day	550 lbs/day
Lead (Pb)	3 lbs/day	3 lbs/day
Toxic Air Contaminants (TACs), Odor and GHG Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Hazard Index ≥ 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
GHG	10,000 MT/yr CO2eq for industrial facilities	
Ambient Air Quality for Criteria Pollutants[4]		
NO_2 1-hour average annual average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (state) 0.03 ppm (state) and 0.0534 ppm (federal)	
PM_{10} 24-hour average annual average	10.4 µg/m3 (construction)[5] & 2.5 µg/m3 (operation) 1.0 µg/m3	
$PM_{2.5}$ 24-hour average	10.4 µg/m3 (construction)5 & 2.5 µg/m3 (operation)	
SO_2 1-hour average 24-hour average	0.25 ppm (state) & 0.075 ppm (federal-99th percentile) 0.04 ppm (state)	
Sulfate 24-hour average	25 µg/m3 (state)	
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)	
Lead 30-day average Rolling 3-month average	1.5 µg/m3 (state) 0.15 µg/m3 (federal)	

SCAQMD, March 2015, http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2
[1]Source: SCAQMD CEQA Handbook (SCAQMD, 1993).
[2]Construction thresholds apply to both the South Coast Air Basin and Coachella Valley (Salton Sea and Mojave Desert Air Basins).
[3]For Coachella Valley, the mass daily thresholds for operation are the same as the construction thresholds.
[4]Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
[5]Ambient air quality threshold based on SCAQMD Rule 403.
KEY: lbs/day = pounds per day; ppm = parts per million; µg/m3 = microgram per cubic meter;
≥ = greater than or equal to; MT/yr CO_2eq = metric tons per year of CO_2 equivalents

Based on the analysis, the changed construction scenario at the Century City Constellation Station would exceed SCAQMD thresholds for PM_{10} as shown in Table 4. The increase in PM_{10} is due to the overlap of station box dirt handling and tunnel excavation dirt handling.

Table 4. Estimated Highest Daily Construction Impacts for Century City Constellation Station Construction (lbs/day) – Before Mitigation

Activity	VOC	CO	NOx	PM_{10}	$PM_{2.5}$
Construction Equipment	10	50	65	3	3
Dust Generated from Dirt Handling (Excavation, Backfilling, etc.)				158	33
Mobile Sources (Deliveries, worker trips, hauling of material, etc.)	2	16	33	2	1
Highest Daily Total	12	66	98	163*	37
SCAQMD Thresholds	75	550	100	150	55

Note: Because the maximum daily emissions from construction equipment, dust generation, and mobile sources do not occur on the same day, the highest daily totals (which are presented) are less than the sum of the individual source maximums.
*Exceeds threshold

With implementation of the mitigation measures previously identified in the Final EIS/EIR, PM_{10} and $PM_{2.5}$ will be reduced and SCAQMD thresholds will not be exceeded for any pollutant (Table 5).

Table 5. Estimated Highest Daily Construction Impacts for Century City Constellation Station Construction (lbs/day) – After Mitigation

Activity	VOC	CO	NOx	PM10	PM2.5
Construction Equipment	10	50	65	3	3
Dust Generated from Dirt Handling (Excavation, Backfilling, etc.)				26	5
Mobile Sources (Deliveries, worker trips, hauling of material, etc.)	2	16	33	2	1
Highest Daily Total*	11	67	98	31	9
SCAQMD Thresholds	75	550	100	150	55

Note: Because the maximum daily emissions from construction equipment, dust generation, and mobile sources do not occur on the same day, the highest daily totals (which are presented) are less than the sum of the individual source maximums.

Current Project-Specific or Modified Mitigation Measures:

While the analysis indicates that there would be a slight increase in PM_{10} which would exceed the SCAQMD threshold, implementation of various mitigation measures previously identified in Final EIS/EIR will reduce the levels to below the threshold. These measures include the following:

CON-6 Meet Mine Safety (MSHA) Standards: Tunnel locomotives (hauling spoils and other equipment to the tunnel head) will be approved by Metro to meet mine safety (MSHA) standards.

CON-7 Meet SCAQMD Standards: Metro and its contractors will set and maintain equipment to meet SCAQMD standards, including NOx.

CON-8 Monitoring and Recording of Air Quality at Worksites: Monitoring and recording of air quality at the worksites will be conducted. Construction will be altered as required to maintain a safe working atmosphere. The working environment will be kept in compliance with federal, state, and local regulations, including SCAQMD and Cal/OSHA standards.

CON-9 No Idling of Heavy Equipment: Metro specifications will require that contractors not unnecessarily idle heavy equipment.

CON-10 Maintenance of Construction Equipment: Metro will require its contractors to maintain and tune engines per manufacturer's specifications to perform at EPA certification levels, where applicable, and to perform at verified standards applicable to retrofit technologies.

CON-11 Prohibit Tampering of Equipment: Metro will prohibit its contractors from tampering with engines and require continuing adherence to manufacturer's recommendations.

CON-12 Use of Best Available Emissions Control Technologies: Metro will encourage its contractors to lease new, clean equipment meeting the most stringent applicable federal or state standards (e.g., Tier 3 or greater engine standards) or best available emissions control technologies on all equipment.

CON-13 Placement of Construction Equipment: Construction equipment and staging zones will be located away from sensitive receptors and fresh air intakes to buildings and air conditioners.

CON-14 Measures to Reduce the Predicted PM10 Levels: Mitigation measures such as watering, the use of soil stabilizers, etc. will be applied to reduce the predicted PM10 levels to below the SCAQMD daily construction threshold levels. A watering schedule will be established to prevent soil stockpiles from drying out.

CON-15 Reduce Street Debris: At truck exit areas, wheel washing equipment will be installed to prevent soil from being tracked onto city streets, and followed by street sweeping as required to clean streets.

CON-16 Dust Control During Transport: Trucks will be covered to control dust during transport of spoils.

CON-17 Fugitive Dust Control: To control fugitive dust, wind fencing and phase grading operations, where appropriate, will be implemented along with the use of water trucks for stabilization of surfaces under windy conditions.

CON-18 Street Watering: Surrounding streets at construction sites will be watered by trucks as needed to eliminate air-borne dust.

CON-19 Spillage Prevention for Non-Earthmoving Equipment: Provisions will be made to prevent spillage when hauling materials and operating non-earthmoving equipment. Additionally, speed will be limited to 15 mph for these activities at construction sites.

CON-20 Spillage Prevention for Earthmoving Equipment: Provisions will be made to prevent spillage when hauling materials and operating earthmoving equipment. Additionally, speed will be limited to 10 mph for these activities at construction sites.

CON-21 Additional Controls to Reduce Emissions: EPA-registered particulate traps and other appropriate controls will be used where suitable to reduce emissions of particulate matter and other pollutants at the construction site.

Additionally, to minimize any potential fugitive dust associated with operation of the conveyor system, the vertical shaft conveyor at the tunnel access shaft will be screened and the conveyor system between Area 2 and Area 3 will be enclosed.

The proposed project modifications to Section 2 of the Westside Purple Line Extension Project would not cause any new or substantially more significant impacts related to air quality than previously addressed in the Final EIS/EIR.

2.1.5 Noise and Vibration

Applicable CEQA Thresholds of Significance

The criteria for assessing noise and vibration impacts for construction are based on the City of Los Angeles CEQA Thresholds Guide, City of Los Angeles noise ordinance, City of Beverly Hills noise ordinance, County of Los Angeles noise ordinance, and the Metro Baseline Specifications Section 01 56 19, Construction Noise and Vibration Control. Residential land uses (where people sleep) or institutional land uses such as theatres, churches, or schools are considered to be sensitive receivers. Commercial and industrial land uses are not considered sensitive. A summary of the construction noise limits for the City of Los Angeles and the City of Beverly Hills is presented in Table 6.

Table 6. Summary of Construction Noise Limits

Construction Activity	Noise Limit[1], dBA
City of Los Angeles Daytime (7:00 A.M.-10:00 P.M.), general activities in or within 500 feet of a residential zone	75 dBA at a distance of 50 feet
City of Los Angeles Daytime (7:00 A.M.-9:00 P.M.), steady high-pitch noise or repeated impulsive noises	70 dBA
City of Los Angeles Daytime (7:00 A.M.-9:00 P.M.), less than 15 minute duration in a period of 60 consecutive minutes	80 dBA
City of Los Angeles Nighttime (9:00 P.M.-7:00 A.M.), all activities	Nighttime Ambient + 5dB
City of Beverly Hills Daytime (8:00 A.M.-6:00 P.M.), all activities	Ambient +5 dB
City of Beverly Hills Evening (6:00 P.M.-9:00 P.M.), all activities	Evening Ambient + 5dB
City of Beverly Hills Nighttime (9:00 P.M.-8:00 A.M.), all activities	Nighttime Ambient + 5 dB

Note: [1]Noise limit applies to the façade of the closest noise sensitive property.

Final EIS/EIR Conclusions

Section 4.15.3 of the Final EIS/EIR presents the construction-related noise and vibration impacts. Noise from at-grade construction of the stations will be generated by heavy equipment such as bulldozers, backhoes, hauling trucks, scrapers, loaders, cranes, and paving machines. Table 7 shows the noise emission levels for typical construction equipment. Noise levels from point source stationary noise sources, such as construction equipment, decrease at a rate of 6 dB per doubling of distance. For example, a distance of 250 feet from a construction area will be 14 dB less than at 50 feet.

Table 7. Construction Equipment Noise Emission Levels

Construction Equipment	Noise Level at 50 Feet
Roller	74 dBA
Concrete Vibrator, Pump, or Saw	76 dBA
Spike Driver	77 dBA
Backhoe, Tie Handler	80 dBA
Dozer	81 dBA
Ballast Equalizer, Compactor, Concrete Pump, or Shovel	82 dBA
Ballast Tamper, Crane Mobile, or Scarifer	83 dBA
Tie Cutter	84 dBA
Concrete Mixer, Grader, Impact Wrench, Loader, Pneumatic Tool, Tie Inserter, or Auger Drill Rig	85 dBA
Crane Derrick, Jack Hammer, or Truck	88 dBA
Paver or Scraper	89 dBA
Rail Saw	90 dBA
Pile Driver (Sonic)	96 dBA
Rock Drill	98 dBA

Source: Federal Transit Administration Manual, Table 12-1, 2006

Based on the noise emissions presented in Table 7, all of the construction equipment will exceed the existing presumed ambient noise levels in the City of Los Angeles and will introduce new sources of noise to the immediate vicinity of the construction sites. As stated in the Final EIS/EIR, noise impacts will be reduced through implementation of the identified measures but adverse construction noise impacts will remain after mitigation in areas of concentrated construction activity including near stations, tunnel access portals, and construction laydown areas.

Proposed Project Modifications

A construction noise impact assessment was performed for the construction staging changes at the Century City Constellation Station (Appendix E). Noise measurements at various receivers adjacent to the construction areas in the City of Los Angeles and City of Beverly Hills were taken to record the preconstruction noise environment, see Table 8.

Table 8. Pre-Construction Noise Measurement Results in the Century City Constellation Station Area

Site No.	Measurement Location	Nighttime Leq
A	1918-1952 Fox Hills Drive (MFR)	58 dBA
B	2050 Century Park West (MFR)	59 dBA
C	Hyatt Regency Century Plaza Hotel, 2025 Avenue of the Stars	56 dBA
D	2010 Century Park East (Offices)	63 dBA
E	Century City Hospital & Medical Center, 2080 Century Park East	63 dBA
F	2160 Century Park East (MFR)	65 dBA
6	1888 Century Park East (Offices)[(a)]	63 dBA
7	Century Plaza Towers, 2049 Century Park East (Offices)[(a)]	59 dBA
8	Annenberg Space for Photography and the Skylight Studios, 10050 Constellation Boulevard[(a)]	56 dBA
9	Bain & Company Building, 1901 Avenue of the Stars[(a)]	61 dBA
10	The Century, 10 West Century Drive (Offices)[(a)]	57 dBA
11	Constellation Place, 10250 Constellation Boulevard (Offices)[(a)]	64 dBA

Sites G and 5 are in the City of Beverly Hills and subject to the Beverly Hills' Noise Code				
		Daytime	Evening	Nighttime
G	401 Shirley Place, Beverly Hills (SFR)	68 dBA	68 dBA	63 dBA
5	Beverly Hills High School[(a)]	56 dBA	53 dBA	51 dBA

Notes:
[(a)] 1-hour measurements were taken at Sites 5 through 11. At these locations the daytime Leq, evening Leq, and nighttime Leq were estimated by comparing the 1-hour measurement to the same hour of the nearest 24-hour measurement location.
(b) Nighttime is from 9:00 P.M. to 7:00 A.M as defined by the City of Los Angles Municipal Code.
MFR – Multi-Family Residences
SFR – Single-Family Residences

The predicted construction noise levels and noise limits for the various receivers adjacent to the construction areas are presented in Table 9. The information presented shows the predicted construction noise during the daytime, evening, and nighttime hours for Receivers G and 5 which are in the City of Beverly Hills, compared with the Beverly Hills Municipal Code noise limit, i.e., existing ambient noise plus 5 dB. The remaining receiver sites which are within the City of Los Angeles are presented showing the predicted daytime construction noise as compared to the Los Angeles Municipal Code noise limit of 75 dBA and the nighttime construction noise to the existing ambient noise plus 5 dB.

The analysis assumed that the following equipment is expected to be used at each of the staging areas during the nighttime hours[1]:

- Area 3: front end loader, boom crane, haul trucks, ventilation plant, compressor plant, foam plant, conveyor system, mechanical shop, and electrical shop.
- Area 2: excavator, roller compactor, dozer, tower crane, rough terrain crane, hydraulic crane, haul trucks, fork lift truck, conveyor system, concrete pump, dewatering station, pickup truck, and tunnel ventilation fans and scrubbers.
- TBM Launch Site: dozer, excavator, front end loader, boom crane, rough terrain crane, concrete pump, fork lift truck, and pickup truck.

[1] Nighttime hours are 9:00 P.M. to 7:00 A.M. for the City of Los Angeles and 6:00 P.M. to 8:00 A.M. for the City of Beverly Hills

- Century City Constellation Station Box: grader, roller compacter, dozer, excavator, front end loader, boom crane, rough terrain crane, concrete pump, haul trucks, fork lift truck, pickup truck, and ventilation fans.
- Area 5: forklift and pickup truck.

In addition, the analysis assumed a 20 foot high noise barrier around all sites except for the Constellation Boulevard Station Box and TBM Launch Site areas where a moveable noise barrier with an approximate height of 14 feet, will be used to shield the construction activities. The equipment used during nighttime hours will comply with the low noise equipment emissions limits specified in Metro's Specification Section 01 56 19 Construction Noise and Vibration Control.

As shown in Table 9, the daytime construction noise level at the Beverly Hills High School (Site 5) would exceed the noise limit by 2 dB. At all the other sites analyzed the daytime noise limits are not exceeded. At Site C, Hyatt Regency Century Plaza Hotel, the nighttime noise limit is exceeded by 2 dB. Moveable noise barriers and/or sound control curtains located closer to the construction activities at the Century City Constellation Station Box can be used to further reduce the construction noise to below the noise limit. At Site 5 the nighttime noise limit would be exceeded by 1 dB. Moveable noise barriers and/or sound control curtains located closer to the construction activities at Area 2 can be used to further reduce the construction noise to below the noise limit. At all the other sites analyzed the evening and nighttime noise limits are not exceeded.

Table 9. Century City Constellation Station Construction Noise – Leq (dBA)

Receiver[1]	Location	Daytime Construction Noise	Daytime Noise Limit[2]	Evening Construction Noise	Evening Noise Limit[3]	Nighttime Construction Noise	Nighttime Noise Limit[4]
The following receivers are within the jurisdiction of the City of Beverly Hills							
G	401 Shirley Place (SFR)	45	73	40	73	40	68
5	Beverly Hills High School	63	61	57	58	57	56
The following receivers are within the jurisdiction of the City of Los Angles							
A	1918-1952 Fox Hills Drive (MFR)	54	75	N/A	N/A	50	63
B	2050 Century Park West (MFR)	42	75	N/A	N/A	38	64
C	Hyatt Regency Century Plaza Hotel, 2025 Avenue of the Stars	67	75	N/A	N/A	63	61
D	2010 Century Park East (Offices)	62	75	N/A	N/A	58	68
E	Century City Hospital & Medical Center, 2080 Century Park East[5]	67	75	N/A	N/A	54	68
F	2160 Century Park East (MFR)	52	75	N/A	N/A	41	65
6	1888 Century Park East (Offices)	63	65	N/A	N/A	50	68
7	Century Plaza Towers, 2049 Century Park East (Offices)	69	75	N/A	N/A	54	64
8	Annenberg Space for Photography and the Skylight Studios, 10050 Constellation Boulevard	66	75	N/A	N/A	54	61
9	Bain & Company Building, 1901 Avenue of the Stars	57	75	N/A	N/A	54	66
10	The Century, 10 West Century Drive (Offices)	57	75	N/A	N/A	54	62
11	Constellation Place, 10250 Constellation Boulevard (Offices)	58	75	N/A	N/A	54	69

Notes:
[1]The location of the modeled receiver is shown on Figure 2-4 of the *Section 2 Construction Noise/Vibration Mitigation and Monitoring Plan (Draft)*.
[2] Daytime is defined as 8:00 A.M. to 6:00 P.M. by the City of Beverly Hills and 7:00 A.M. to 9:00 P.M. by the City of Los Angeles.
[3] Evening is defined as 6:00 P.M. to 9:00 P.M. by the City of Beverly Hills. The City of Los Angeles municipal code does not include evening hours.
[4] Nighttime is defined as 9:00 P.M. to 8:00 A.M. by the City of Beverly Hills and 9:00 P.M to 7:00 A.M. by the City of Los Angeles.
[5] Construction noise at Site E was modeled at street level. The analysis of the upper floor construction noise is presented in Table 11.

Rehabilitation Facility Adjacent Area 3

As previously discussed, the long-term rehabilitation facility is a new sensitive receptor that was not analyzed as part of the Final EIS/EIR and is located immediately south of staging Area 3. Area 3 will be primarily used for day and night stockpiling and off-hauling of tunnel muck for approximately two of the

seven years the site will be used for construction staging. The site will also be used for equipment operation, material storage and contractor offices. Equipment that may be in operation on site includes a compressor plant, ventilation plant, grout plant, foam plant, conveyor system, boom crane, and front end loader. The site will include a machine shop and electrical shop. Upon completion of the tunneling operations, the site will be used to support concreting of tunnels, rail installation, and mechanical and electrical finishing. The 20 foot high noise barrier wall at the perimeter of Area 3 will shield the construction noise activities at the street level of the building resulting in an average nighttime noise level of 66 dBA which is 2 dB less than the noise limit of 68 dBA (see Table 9). Since the patient rooms of the hospital overlooking the construction site are on upper floors of the building a more detailed noise assessment was prepared for this receiver.

Ambient noise readings were taken adjacent to the long-term rehabilitation facility at 2080 Century Park East and staging Area 3. Table 10 presents the one-hour measured noise levels at the two monitoring sites adjacent to the rehabilitation facility.

Table 10. One-Hour Measured Noise Levels – Leq (dBA)

One-Hour Measurement Period Starting at:	Site E	Site F
7 P.M.	65	70
8 P.M.	63	69
9 P.M.	62	68
10 P.M.	61	67
11 P.M.	61	67
Midnight	58	63
1 A.M.	59	60
2 A.M.	63	59
3 A.M.	56	57
4 A.M.	60	59
5 A.M.	61	64
6 A.M.	70	69
7 A.M.	68	70
8 A.M.	70	71
9 A.M.	69	71

Source: *Draft Century City Hospital Nighttime Construction Noise Assessment, Purple Line Subway Extension Memorandum* (ATS 2015)
Site E located on northwest corner of 2080 Century Park East
Site F located on southeast corner of Olympic Boulevard and Century Park East intersection

As a worst case scenario the ambient noise of Leq=56 dBA measured from 3 A.M. and 4 A.M. was used as the nighttime noise impact threshold for the hospital building. The ambient was measured at ground level and adjusted for additional height of the 3rd through the 8th floor patient levels. The adjusted ambient along with the nighttime noise impact threshold are presented in Table 11 along with the predicted noise levels from nighttime construction activities. The predicted nighttime construction noise is based on a 20 foot noise barrier wall around the perimeter of the site and the use of low noise emission equipment.

Table 11. Nighttime Construction Noise Impact Thresholds at the Century City Rehabilitation Facility

Hospital Building Floor	Ambient Noise Level, Leq (dBA)	Los Angeles Nighttime Construction Noise Limit, Leq (dBA)	Nighttime Construction Noise, Leq (dBA)	Exceeds the Nighttime Noise Limits (Y/N)
Ground Level	56	61	66	Y
Patient Floor 3	52	57	69	Y
Patient Floor 4	51	56	69	Y
Patient Floor 5	51	56	69	Y
Patient Floor 6	51	56	69	Y
Patient Floor 7	51	56	69	Y
Patient Floor 8	51	56	68	Y

Source: *Section 2 Construction Noise/Vibration Mitigation and Monitoring Plan (Draft)* (ATS 2015)

The predicted construction noise at the patient floors exceeds the nighttime noise limits of existing ambient plus 5 dB.

Current Project-Specific or Modified Mitigation Measures:

Construction-related noise impacts will require mitigation to meet the Los Angeles CEQA noise thresholds, the specified Metro limits, and the noise ordinances for the Cities of Los Angeles and Beverly Hills. The Final EIS/EIR identified the following typical noise-control measures:

CON-22 Hire or Retain the Services of an Acoustical Engineer: Hire or retain the services of an acoustical engineer to be responsible for preparing and overseeing the implementation of the Noise Control and Monitoring Plans. The Noise Control and Monitoring Plan will ensure that noise levels are at or below criteria levels in Metro Baseline Specifications Section 01565, Construction Noise and Vibration Control.

CON-23 Prepare Noise Control Plan: Prepare a Noise Control Plan that includes an inventory of construction equipment used during daytime and nighttime hours, an estimate of projected construction noise levels, and locations and types of noise abatement measures that may be required to meet the noise limits specified in the Noise Control and Monitoring Plan.

CON-24 Comply with the Provisions of the Nighttime Noise Variance: In the case of nighttime construction, the contractor will comply with the provisions of nighttime noise variances issued by local jurisdictions. The variance processes for the Cities of Los Angeles and Beverly Hills require the applicant to provide a noise mitigation plan and to hold additional public meetings before granting the variance to allow work that would be performed outside the permitted working hours.

CON-25 Noise Monitoring: Conduct periodic noise measurements in accordance with an approved Noise Monitoring Plan, specifying monitoring locations, equipment, procedures, and schedule of measurements and reporting methods to be used.

CON-26 Use of Specific Construction Equipment: At night, use only construction equipment operating at the surface of the construction site under full load, are certified to meet specified lower noise level limits set in the Noise Control Plan, and specified in the noise variance application.

CON-27 Noise Barrier Walls for Nighttime Construction: Where nighttime construction activities are expected to occur, erect Metro designed noise barrier walls at each construction site prior to the start of

construction activities. Barriers should be designed to reduce construction site noise levels by at least 5 dBA.

CON-28 Comply with Local Noise Ordinances: Construction activities will comply as applicable with the City of Los Angeles, City of Beverly Hills, and County of Los Angeles.

CON-29 Signage: Readily visible signs indicating "Noise Control Zone" will be prepared and posted on or near construction equipment operating close to sensitive noise sites.

CON-30 Use of Noise Control Devices: Noise control devices that meet original specifications and performance will be used.

CON-31 Use of Fixed Noise-Producing Equipment for Compliance: Fixed noise-producing equipment will be used to comply with regulations in the course of LPA-related construction activity.

CON-32 Use of Mobile or Fixed Noise-Producing Equipment: Mobile or fixed noise producing construction equipment that are equipped to operate within noise levels will be used to the extent practical.

CON-33 Use of Electrically Powered Equipment: Electrically powered equipment will be used to the extent practical.

CON-34 Use of Temporary Noise Barriers and Sound-Control Curtains: Temporary moveable noise barriers and sound-control curtains will be erected where construction activity is predicted to exceed the noise limits and is unavoidably close to noise-sensitive receivers.

CON-35 Distance from Noise-Sensitive Receivers: Within each construction area, earth-moving equipment, fixed noise generating equipment, stockpiles, staging areas, and other noise producing operations will be located as far as practicable from noise-sensitive receivers.

CON-36 Limited Use of Horns, Whistles, Alarms, and Bells: Use of horns, whistles, alarms, and bells will be limited for use as warning devices, as required for safety.

CON-37 Requirements for Project Equipment: All noise-producing project equipment, including vehicles that use internal combustion engines, will be required to be equipped with mufflers and air-inlet silencers, where appropriate, and kept in good operating condition that meets or exceeds original factory specifications. Mobile or fixed "package" equipment will be equipped with shrouds and noise-control features that are readily available for that type of equipment.

CON-38 Limited Audibility of Project Related Public Addresses or Music: Any Project-related public address or music system will not be audible at any sensitive receiver.

CON-39 Use of Haul Routes with the Least Overall Noise Impact: To the extent practical, based on traffic flow, designated haul routes for construction-related traffic will be used based on the least overall noise impact.

CON-40 Designated Parking Areas for Construction-Related Traffic: Non-noise sensitive designated parking areas for Project-related traffic will be used.

CON-41 Enclosures for Fixed Equipment: Enclosures for fixed equipment, such as TBM slurry processing plants, will be required to reduce noise.

In addition, to the measures presented in the Final EIS/EIR, specific noise control measures for focused activities in Area 3 adjacent to the rehabilitation facility have been identified in order to meet the nighttime noise limits. These include the following:

- Fully enclose or surround the compressor plant, ventilation plant, grout plant, foam plant, machine shop, and electrical shop with noise barrier walls;
- Enclose motors and transfer points on the conveyor system;
- Boom crane and front end loader will be low emission equipment as required by Metro Specification Section 01 56 19, Construction Noise and Vibration Control, Parts 3.01 and 3.04, and Table 4;
- Retrofit the boom crane and front end loader to be used during night operations with a hospital grade muffler and additional damping and insulation added to the engine compartments; and
- Install an additional 16-foot noise barrier wall within the interior of Area 3 to further shield the noise from the front end loader and crane operations (see Figure 8).

With implementation of these additional measures the nighttime construction noise for the patient floors of the rehabilitation facility are predicted to not exceed the Los Angeles nighttime construction noise limits.

The proposed project modifications to Section 2 of the Westside Purple Line Extension Project would not cause any new or substantially more significant noise impacts than previously addressed in the Final EIS/EIR.

2.1.6 Ecological/Biological Resources

Applicable CEQA Thresholds of Significance

As presented in Section 4.10.5, the construction of the project would have a significant impact on ecosystems/biological resources if it would result in the following:

- The loss of individuals, or the reduction of existing habitat, of a state- or Federally listed endangered, threatened, rare, protected, or candidate species, or a Species of Special Concern, or Federally-listed critical habitat;
- The loss of individuals, the reduction of existing habitat or plant community;
- Interfere with habitat such that normal species behaviors are disturbed (e.g., from introducing noise, light) to a degree that may diminish the chances for the long-term survival of a sensitive species.

Final EIS/EIR Conclusions

The Westside project is located in a densely developed urban land area, including the Century City Constellation Station area. No impacts to sensitive ecological or biological resources are anticipated. Construction activities may require the removal or trimming of trees and an adverse impact could occur if an active migratory bird nest is located in trees being disturbed. This includes direct impacts through removal or pruning and indirect disturbance due to increased noise and vibration during construction

for trees within 100 feet of the construction footprint. As the majority of the project area provides low quality habitat for migratory birds, indirect impacts are not expected to be substantial with only a small number of migratory birds displaced, if any.

Proposed Project Modifications

Construction of a new temporary Metro bus layover site in the median of Santa Monica Boulevard would require the removal of up to four small trees. In addition, if placement of the conveyor system on the east side of the AT&T building is not feasible, it would be located along the west side of the building, which may require the removal of four large trees along Century Park East. An adverse impact could occur if an active migratory bird nest is disturbed in any of these trees.

Current Project-Specific or Modified Mitigation Measures:

Mitigation measures will be implemented to meet the requirements for compliance with the Migratory Bird Treaty Act and state migratory bird protection. The following measures will be implemented to minimize any biological impacts associated with the changes in Section 2:

CON-66 Biological Survey: Two biological surveys will be conducted, one 15 days prior and a second 72 hours prior to construction that will remove or disturb suitable nesting habitat.

CON-67 – Compliance with City Regulations: If construction or operation of the LPA requires removal or pruning of a protected tree, a removal permit will be required in accordance with applicable municipal codes and ordinances of the city in which the affected tree is located. Within the City of Los Angeles, compliance with the Native Tree Protection Ordinance will require a tree removal permit from the Los Angeles Board of Public Works. Similarly, within the City of Beverly Hills, applicable tree protection requirements, such as tree removal permits will be followed.

CON-69 Avoidance of Migratory Bird Nesting Season: Construction activities that involve removal or trimming will be timed to occur outside the migratory bird nesting season, which occurs generally from March 1st through August 31st and as early as February 1st for raptors.

VIS-2 Replacement for Tree Removal: Where mature trees are removed, replacement with landscape amenities of equal value will be incorporated into final designs, where feasible, to enhance the visual integrity of station areas.

The proposed project modifications to Section 2 of the Westside Purple Line Extension Project would not cause any new or substantially more significant impacts to ecological/biological resources than previously addressed in the Final EIS/EIR.

2.1.7 Cumulative Impacts

Applicable CEQA Thresholds of Significance

Section 15355 of the CEQA Guidelines defines cumulative impacts as two or more individual effects that, when considered together, are considerable and may compound or increase other environmental impacts. Cumulative impacts can result from individually minor, but collectively significant, projects occurring over a period of time.

Final EIS/EIR Conclusions

As stated in Section 4.17 of the Final EIS/EIR, if construction of Section 2 occurs at the same time as other projects in a particular community, cumulative effects associated with noise and vibration, street closures and traffic, aesthetics, access to businesses and public facilities, and other construction-related effects may be significant during construction. Implementation of project-related mitigation measures would lessen the effects so as not to be cumulatively considerable.

Proposed Project Modifications

In the immediate vicinity of the Century City Constellation station there are two projects currently underway, construction of the rehabilitation facility at 2080 Century Park East and remodeling of the Westfield Century City property. It is anticipated that each of these projects will be complete before construction of the Century City Constellation Station begins. Should there be any other construction projects occurring when work begins on the station, implementation of the identified mitigation measures would ensure that there is not an increase the project-related cumulative impacts or alter the cumulative impact findings as presented in the Final EIS/EIR.

The proposed project modifications to Section 2 of the Westside Purple Line Extension Project would not cause any new or substantially more significant cumulative impacts than previously addressed in the Final EIS/EIR.

3.0 CONCLUSIONS

No substantial changes result from the proposed changes to Section 2 of the Westside Purple Line Extension Project. There is no new information of substantial importance since the Final EIS/EIR that would result in any new significant environmental effects or substantial increase in the severity of previously identified significant effects related to project impacts.

It is the finding of Metro that the previous environmental documents, as herein amended, may be used to fulfill the environmental review requirements of the current project. Because the current project meets the conditions for the application of CEQA Guidelines Section 15164, preparation of a new EIR is not required for the issue areas discussed above.

APPENDIX A FIGURES

APPENDIX A FIGURES

Figure 1. Project Location

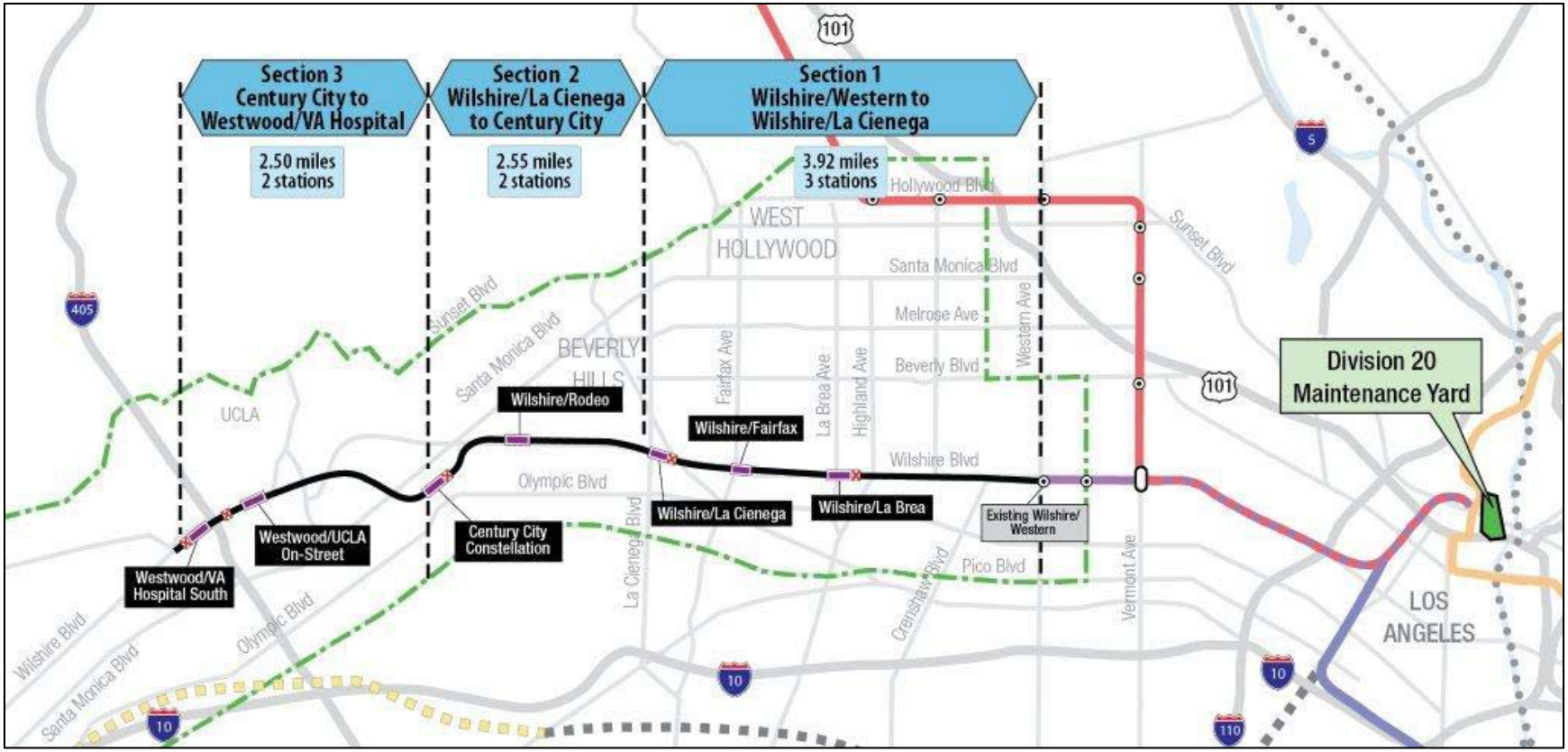


Figure 2. Century City Constellation Station Staging Areas

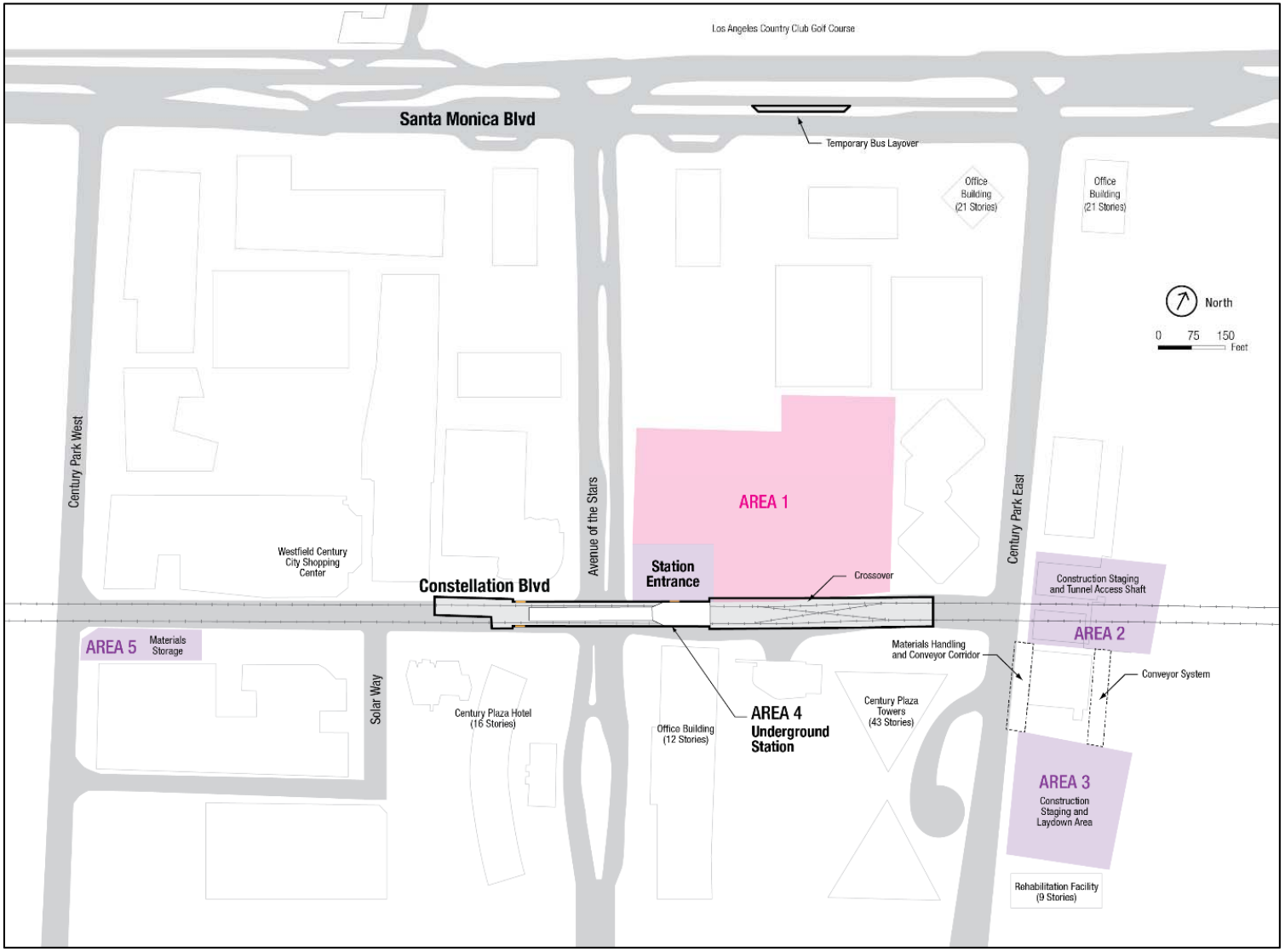


Figure 3. Typical Enclosed Conveyor

Figure 4. Potential Santa Monica Boulevard Bus Layover Design

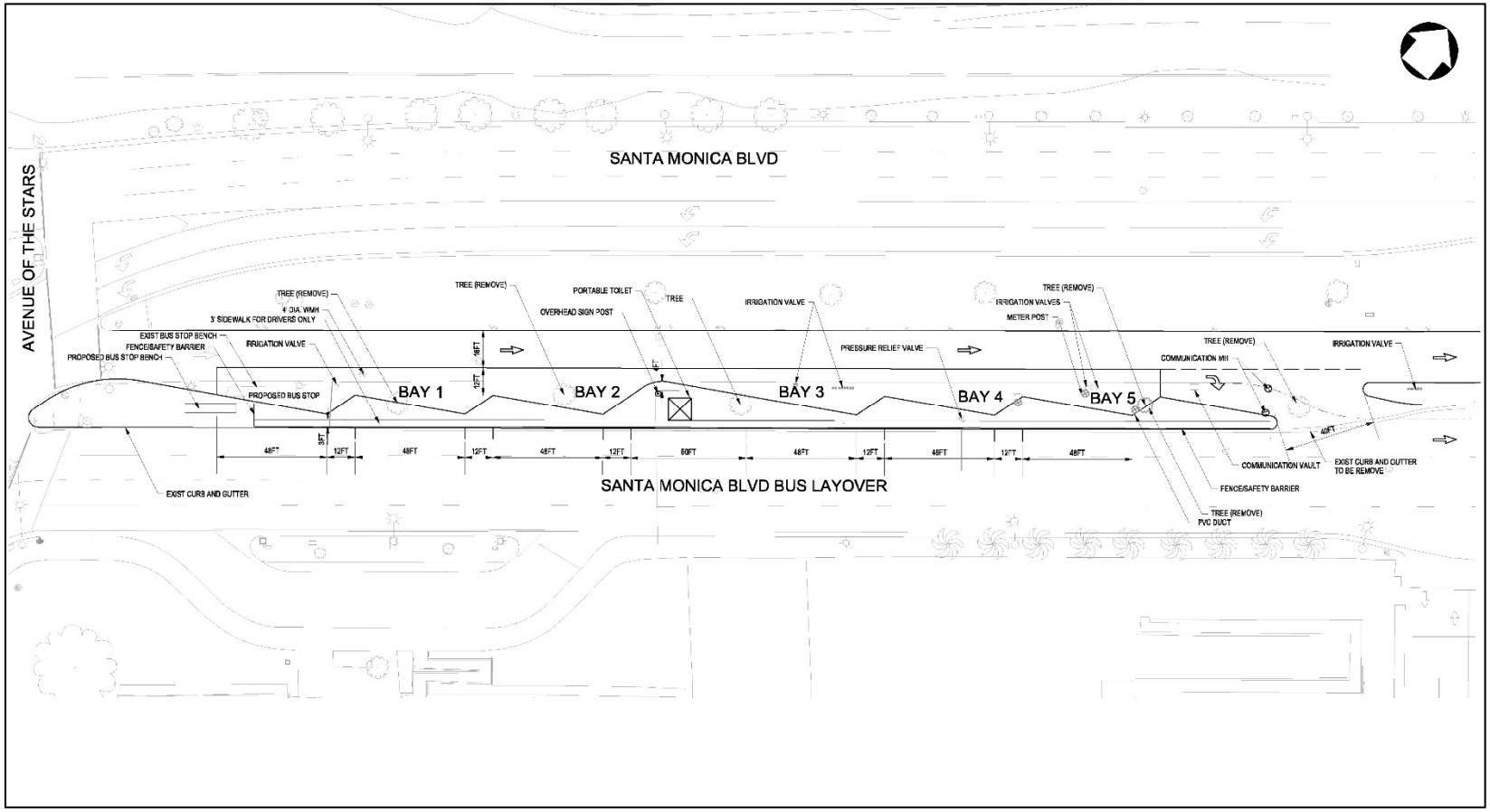


Figure 5. Ventilation/Exhaust Structures on the Westfield Century City Property

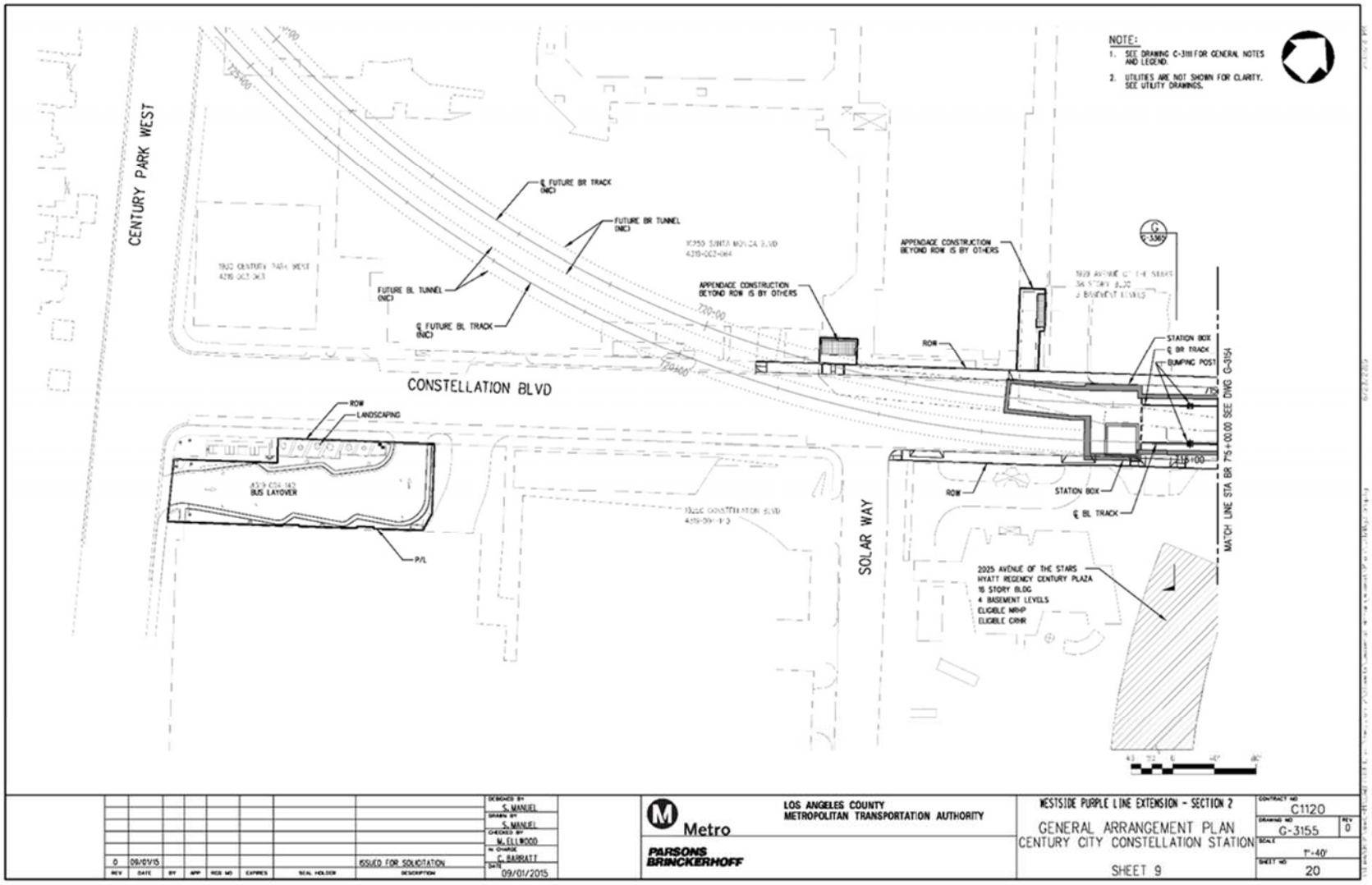


Figure 6. Wilshire/Rodeo Station Original Configuration with Cross-over

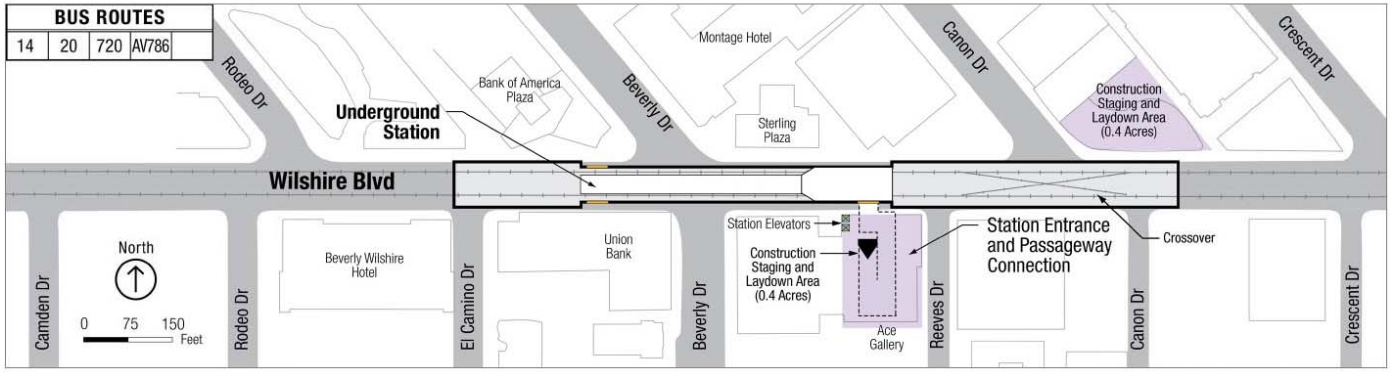


Figure 7. Wilshire/Rodeo Station without Cross-over

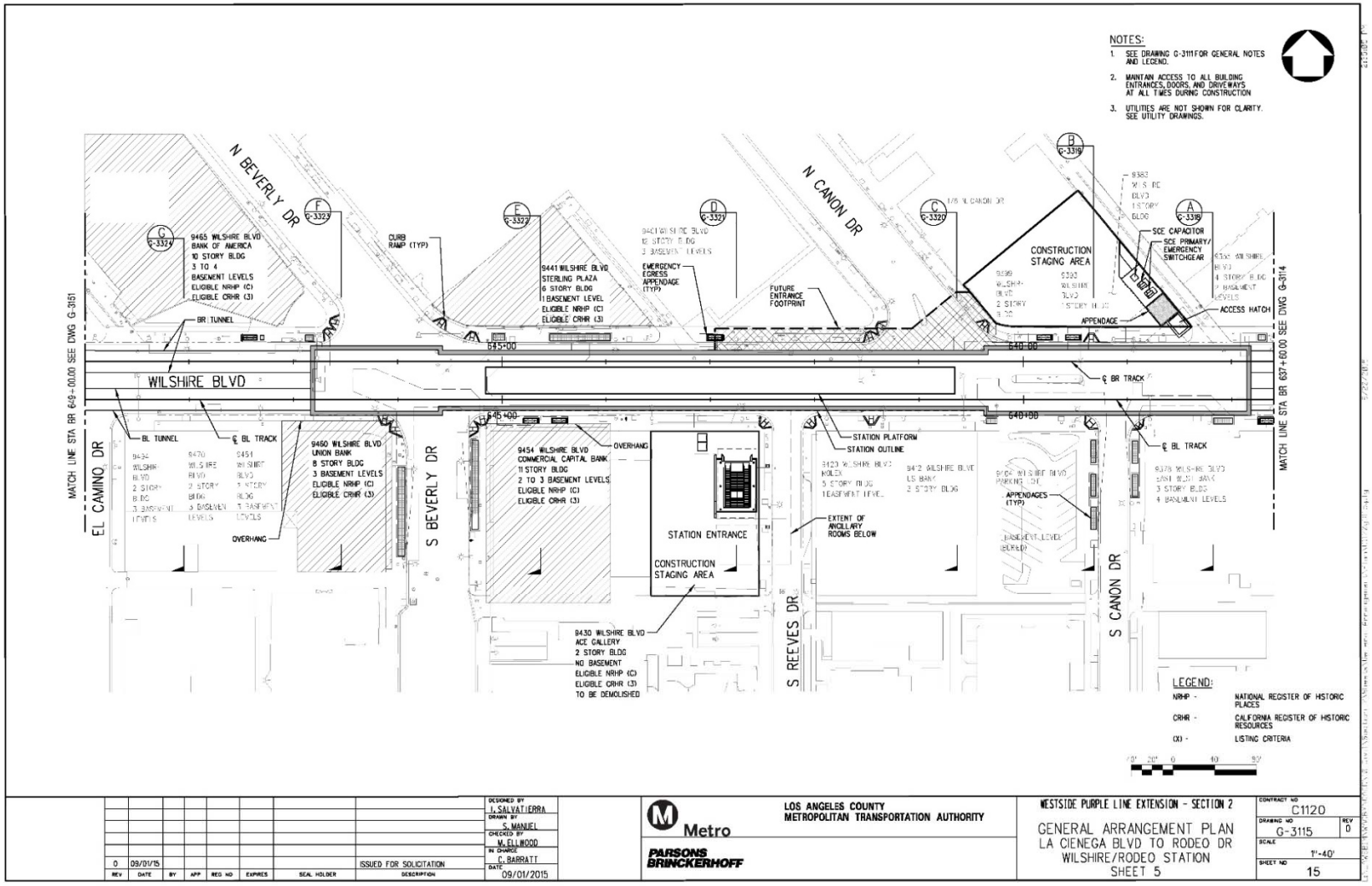
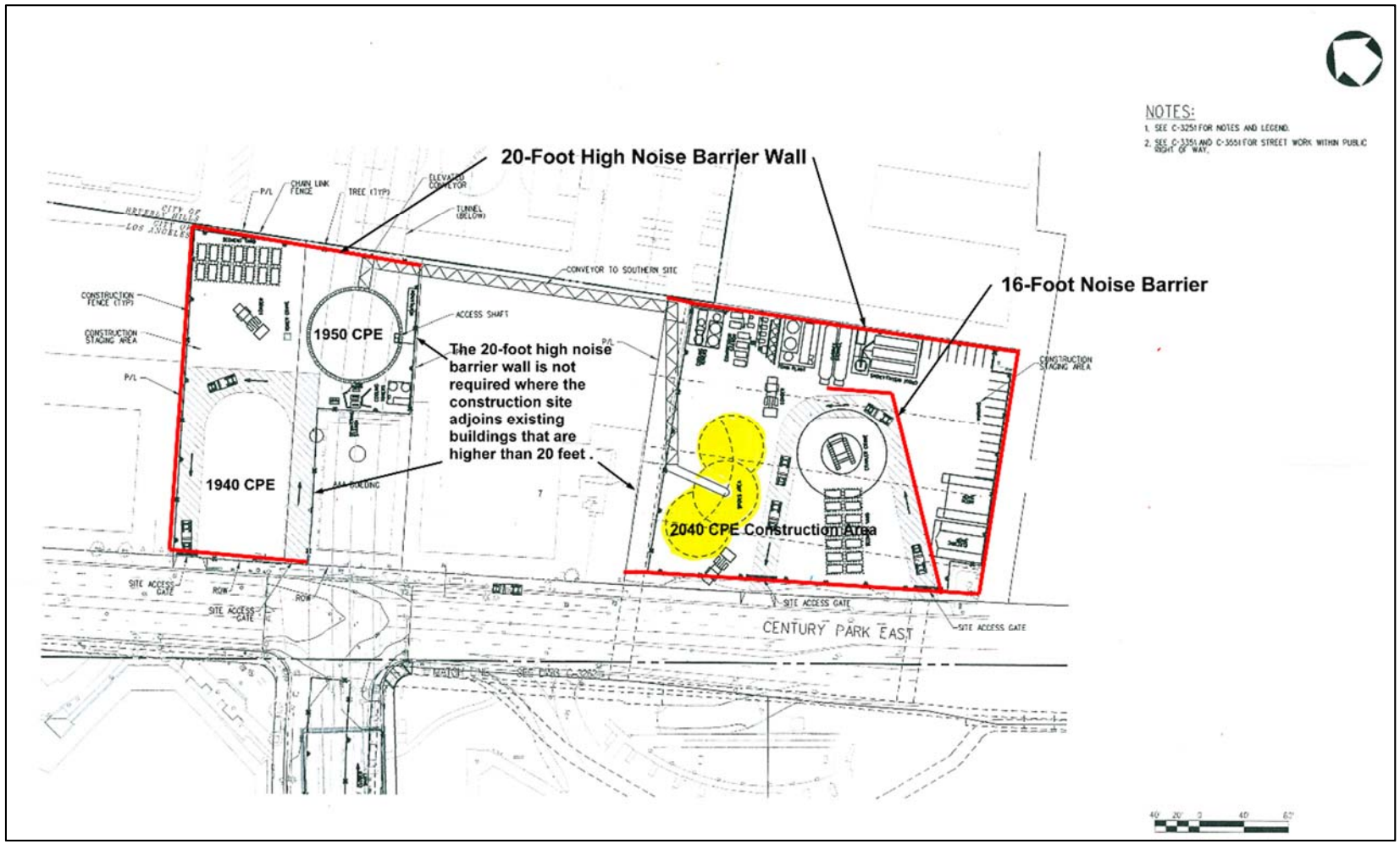


Figure 8. Staging Areas 2 and 3 Noise Barrier Walls



Los Angeles County
Metropolitan Transportation Authority

March 2012

Westside Subway Extension

Final Environmental Impact Statement/Environmental Impact Report—Volume 4

APPENDIX I: *Mitigation Monitoring and Reporting Plan*

Metro

U.S. Department of Transportation
Federal Transit Administration

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The purpose of the mitigation monitoring effort is to ensure that the Mitigation Measures identified in the EIS/EIR to mitigate the potentially significant environmental effects of the project are, in fact, properly carried out. In its findings concerning the environmental effects of a project for which an EIS/EIR was prepared, a Lead Agency must also include a finding that a mitigation monitoring or reporting program has been prepared and provides a satisfactory program that will ensure avoidance or sufficient reduction of the significant effects of the project. The following mitigation monitoring plan contains a brief statement of all Mitigation Measures; identifies the monitoring action; indicates the party responsible for implementing the mitigation; and identifies the enforcement agency, monitoring agency and the monitoring phase or timing. The Los Angeles County Metropolitan Transportation Authority (Metro) shall be responsible for assuring full compliance with the provisions of this program. The Chief Executive Officer (CEO) of Metro may delegate duties and responsibilities to Metro staff, applicants, and consultants as necessary. The CEO shall also ensure that monitoring reports are filed on a timely basis and, when identified, that plan violations are corrected. Progress toward completion of the required mitigation plan, or violations thereof, shall be reported at prescribed intervals to the CEO. The reports shall be prepared using approved forms or an acceptable format. These reports will be available for public review at any time.

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Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
Transportation			
Mitigation: T-1—Coordination with Property Owners Metro will coordinate with the appropriate property owners and other relevant parties regarding permanent parking losses. All property owners will be compensated under the Uniform Relocation Assistance and Real Property Acquisition Act as described in mitigation measure CN-1 and will receive compensation for easements as described in mitigation measure CN-3.	Verify coordination	Metro	– Metro – Metro – Final Design and Construction
T-2—Parking Monitoring and Community Outreach In the one-half mile area surrounding each station where unrestricted parking is located, a program will be established to monitor on-street parking activity in the area prior to the opening of service and monitor the availability of parking monthly for six months following the opening of service. Based on the available supply in each station area before the opening of service, Metro will set a performance standard that would identify a demand exceeding 100 percent of supply after opening as an impact due to the parking activity of LPA patrons. If the performance standard is met, LPA. Metro will work with the appropriate local jurisdiction (City of Los Angeles and City of Beverly Hills) and affected communities to assess the need for specific elements of a residential permit parking (RPP) program for the affected neighborhoods. For station areas at high risk of spillover Metro will conduct outreach meetings for the affected communities to gauge the interest of residents participating in an RPP program (prior to the opening of the subway), regardless of whether parking shortages have been identified. For the Westwood/VA Hospital Station, the majority of station-area parking supply is for the exclusive use of VA patients, visitors, doctors, and staff. Development of an RPP program for the VA is not applicable. At this station, Metro will monitor spillover parking at VA lots controlled only by decals and/or signage (i.e., no gates or other controlled access). Once the subway has opened,	Report conditions and verify plan.	Metro	– Metro – Metro – Operations

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
an assessment of the spillover parking magnitude will be made, and if the spillover parking is determined to be unmanageable by VA security, a parking management plan for the VA campus will be developed and implemented. #			
T-3—Residential Permit Parking Program In general, RPP districts are created to ensure that neighborhood residents have access to on-street parking. These programs are in effect across the United States, including Los Angeles County. They are commonly used to address spillover parking concerns, such as those that arise when residential neighborhoods are in close proximity to commercial districts that do not provide sufficient parking. Patrons of the commercial districts, who are non-residents, tend to spill over into adjacent residential neighborhoods to find parking. The impact that spillover parking causes is adverse, and restricting parking to residents only, or limiting the time non-residents can park, is one way to mitigate these adverse impacts. If the need for an RPP district has been determined through Mitigation Measure T-2, RPP programs will be implemented according to guidelines established by each local jurisdiction. Metro will reimburse local jurisdictions for costs associated with developing both the RPP programs and installing parking restriction signs in neighborhoods within a one-half mile walking distance of each affected station. Metro will not be responsible for the costs of permits for residents desiring to park on streets in RPP districts. For locations where spillover parking cannot be addressed through a RPP program, alternative mitigation options will include the implementation of parking time restrictions for non-residents. Metro will work with local jurisdictions to determine which option(s) will be preferable.	Verify funding.	Metro	– Metro – Metro – Operations
T-4—Consideration of Shared Parking Program Metro will consider developing a shared parking program with operators of off-street parking facilities to accommodate the LPA's parking demand, thereby allowing subway riders to use excess capacity in these facilities. The revised off-street parking analysis conducted for the Final EIS/EIR determined that more than 100,000 off-street parking spaces serve commercial land uses within a one-half mile walking distance of the seven LPA station locations. As part of the analysis, a sampling of parking facility operators for each station location was contacted to	Report conditions and verify plan.	Metro	– Metro – Metro – Operations

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
determine availability of public parking in their facility on weekdays and weekends, daily parking rate, facility occupancy, and interest in partnering with Metro to make parking available to riders of the Westside Subway Extension. Based on a sample of operators at each station area, some shared parking potential for subway riders exists. However, this potential may be limited at individual facilities because many are near their capacity during weekdays. For six months following the opening of service, Metro will monitor off-street parking activity in station areas through communication with parking operators by quantitatively assessing through surveys the effects on parking demand as a result of the LPA and revisit their interest in participating in a shared parking program. It is anticipated that the LPA will reduce parking demand in station areas, as some employees will use the subway to commute to work rather than driving. Because the development of a shared parking program will be contingent on the willingness of parking facility operators to participate, as well as the availability of parking supply at their facilities, it may be infeasible to implement this measure at some or all station areas where spillover parking impacts have been identified.			
T-5—Install Crossing Deterrents Install appropriate signage and deterrents to prohibit crossing Wilshire Boulevard at Orange Grove Avenue. This mitigation measure would be implemented for the Wilshire/Fairfax Station South Entrance Option.	Review and verify plans.	Metro	– Metro – Metro – Final Design and Construction
T-6—Install High-Visibility Crosswalk/Crossing Deterrents Stripe a high-visibility crosswalk on the east leg of the intersection of El Camino Drive and Wilshire Boulevard. If a crosswalk is not feasible, install appropriate signage and deterrents to prohibit crossing Wilshire Boulevard on the east side of El Camino Drive. This mitigation measure would be implemented for the Wilshire/Rodeo Station Union Bank Entrance Option.	Review and verify plans.	Metro	– Metro – Metro – Final Design and Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
T-7—Install High-Visibility Crosswalk Stripe a high-visibility crosswalk treatment appropriate for unsignalized intersections on the south leg of the intersection of Reeves Drive and Wilshire Boulevard. This mitigation measure would be implemented for Wilshire/Rodeo Station Ace Gallery Entrance Option.	Review and verify plans.	Metro	– Metro – Metro – Final Design and Construction
T-8—Install High-Visibility Crosswalk Stripe a high-visibility crosswalk treatment appropriate for unsignalized intersections on all four legs of Bonsall Avenue where it intersects with both the eastbound and westbound Wilshire Boulevard access ramps. Curb ramps fully compliant with ADA should be installed on all four corners. This mitigation measure would be implemented for the Westwood/VA Hospital Station South Entrance Option or the Westwood/VA Hospital Station North Entrance Option.	Review and verify plans.	Metro	– Metro – Metro – Final Design and Construction
T-9—Provide consistency with General Plan Designation Sidewalk Width Adjacent to Metro- Controlled Parcels The LPA will be designed to ensure a minimum sidewalk/parkway width is provided on the portions of streets fronting parcels controlled by Metro, as required by General Plan street classification designation for each jurisdiction where an LPA station is located. For example, the Street Designations and Standards of the Transportation Element of the City of Los Angeles General Plan require a 12-foot-wide sidewalk/parkway on a Major Highway Class II, and a 10-foot-wide sidewalk/parkway on a Secondary. Thus, sidewalks on the portions of streets designated as Major Highway Class II that front parcels controlled by Metro will need a 12-foot-wide sidewalk/parkway.	Review and verify consistency	Metro	– Metro – Metro – Final Design
T-10—Provide consistency with General Plan Designation Sidewalk Width Coordination with Jurisdictions Metro will coordinate with local jurisdictions to identify sidewalks in station areas that do not meet this minimum and will encourage local agencies to widen them. Sidewalks adjacent to parcels not controlled by Metro may be less than the required minimum per general plan designation. Because sidewalks are the responsibility of local jurisdictions, Metro does not have the authority to widen	Verify coordination	Metro	– Metro – Metro – Prior to Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
them directly, but will encourage local jurisdictions to do so.			
T-11—Provide High Visibility Crosswalk Treatments Metro will provide highly visible crosswalk treatments at intersections affected by LPA construction, following the Metro Rail Design Criteria.	Review and verify plans	Metro	– Metro – Metro – Final Design and Construction
T-12—Meet Federal, State, Local Standards for Crossing Metro will coordinate with local jurisdictions to identify crossings that do not meet current ADA, CA MUTCD, and other relevant Federal, State, and Local standards and will encourage local jurisdictions to upgrade them accordingly. Beyond those directly affected by LPA construction activities, which Metro is responsible for upgrading on restoration of all streets and crossings affected by LPA construction activities, crossings that do not meet standards are the responsibility of local jurisdictions. Metro does not have the authority to upgrade them directly, but will encourage local jurisdictions to do so.	Verify identification and coordination	Metro	– Metro – Metro – Prior to Construction
T-13—Meet Metro Rail Design Criteria Minimums for Bicycle Parking The LPA will provide bicycle parking to meet the minimum required number of bicycle parking spaces per the Metro Rail Design Criteria. This mitigation measure would be implemented at all LPA station entrance options where it is feasible to implement, which is expected to be at the following stations: • Wilshire/La Brea (all entrance options) • Wilshire/Fairfax (all entrance options except the LACMA entrance option) • Wilshire/La Cienega • Wilshire/Rodeo (Ace Gallery Entrance Option) • Westwood/UCLA Off-Street • Westwood/UCLA On-Street (Lot 36 Entrance) • Westwood/VA Hospital South • Westwood/VA Hospital North	Review and verify plans	Metro	– Metro – Metro – Final Design
T-14—Study Bicycle Parking Demand & Footprint Configuration Metro will continue to assess bicycle parking demand as the project progresses through the design and construction process and size the bicycle facilities at each station accordingly. Bicycle parking demand can vary station-to-station, and the	Monitor bicycle parking demand around stations.	Metro	– Metro – Metro – Operations

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
footprint required to meet that demand will vary. For example, bicycle lockers are more space intensive, while secured bicycle rooms can accommodate bicycle parking in a more compact footprint. The appropriate configuration and ultimate footprint reserved for bicycle parking at each station will vary by demand levels and space constraints. The Westside Subway Extension Station Circulation Report (Metro 2011am) details footprint ranges for each station area based on configuration of bicycle parking.			
T-15— Determine Alternative Sites for Bicycle Parking At LPA station entrance options that are physically constrained, Metro shall look for space for bicycle parking at an alternative site, which could include provision of secured bicycle parking in an adjacent storefront or other development, install signage to direct subway riders to bicycle parking already provided at buildings or on streets near station entrances, or provide enhanced bicycle parking facilities at an adjacent station on the LPA to meet any unsatisfied demand from this station. This mitigation measure would be implemented for the following LPA station entrance options: • Wilshire/Fairfax Station–LACMA Entrance Option • Wilshire/Rodeo Station–Union Bank Entrance Option • Wilshire/Rodeo Station–Bank of America Entrance Option • Century City Constellation Station • Century City Santa Monica Boulevard Station • Westwood/UCLA On-Street Station (north and south entrances at Wilshire/Westwood Boulevards)	Review and verify plans	Metro	– Metro – Metro – Final Design
T-16—Study Bus-Rail Interface Metro will continue to assess bus-rail interface. As a result of further study Metro, working with affected jurisdictions, will relocate bus stops at some LPA stations to minimize the number of streets riders must cross to transfer between the LPA and interfacing bus lines.	Verify study completion	Metro	– Metro – Metro – Construction
TCON-1—Traffic Control Plans Site-specific traffic-control plans will be developed to minimize construction impacts for each work zone location. These locations will include, but not be	Review and verify plans.	Contractor	– Metro – Metro – Final Design and

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
limited to, utility relocations, stations, crossovers, laydown areas, TBM launch and removal locations, emergency exit shafts, station entrances, drop pipes, and grout injection. Traffic-control plans will follow State and local jurisdiction guidelines and standards. Traffic-control plans will be developed for Wilshire, Santa Monica, and Constellation Boulevards and north-south streets, including, but not limited to, La Brea Avenue, Fairfax Avenue, La Cienega Boulevard, Rodeo Drive, Beverly Drive, Canon Drive, Century Park East, Avenue of the Stars, Westwood Boulevard, Veteran Avenue, Sepulveda Boulevard, I-405 ramps to/from eastbound Wilshire Boulevard, and Bonsall Avenue. Traffic control plans will encompass the following: • Minimum lane widths • Number of available travel lanes (two lanes minimum in each direction during peak periods) • Number, length, and location of temporary right and left-turn lanes • Temporary street closures and detour routes • Traffic-control devices (signing and striping) • Temporary traffic signals and street lighting • Temporary pedestrian access and routes • Temporary bicycle routes • Temporary driveway access • Temporary business access • Construction site phasing To facilitate traffic flow and mitigate major disruption and bottlenecks due to construction, advanced traffic control will extend beyond one arterial street on each side of each station construction location. This will help disperse peak-hour traffic flows onto the adjacent arterial street network. Business owners will be interviewed to identify the type of business, delivery and shipping schedules, and critical days/times of years for the business. Traffic-control plans will incorporate this information. Specific street closures will be developed in close coordination with the local jurisdictions during the Final Design phase.			Construction
TCON-2—Designated Haul Routes	Review and verify	Contractor	– Metro

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
Designated truck haul routes using arterial streets are intended to minimize noise, vibration, and other possible impacts to adjacent businesses, schools, major commercial developments, and residential neighborhoods. Metro will incorporate the following objectives into its truck haul route plans: • Establish nighttime truck haul operations times/days for each route. Truck haul operations will not be allowed in the AM and PM peak hours, in residential neighborhoods (where feasible), during noise restriction hours and special events, holiday season restrictions, and as restricted by State and local jurisdictional mandates. • Establish truck haul headways to avoid platoons of trucks upon local arterial streets and freeways. Establish a vehicle dispatching system at construction laydown areas and off-site locations to monitor and address truck headway issues as they arise. • Develop truck haul routes for each site in coordination with and approved by State and local jurisdictions. • Incorporate comments and issues from State and local jurisdictions into the final approved truck haul routes and truck haul operation schedules.	plans.		– Metro – Final Design and Construction
TCON-3—Emergency Vehicle Access Emergency vehicle access will be maintained at all times to the construction work site, adjacent businesses, and residential neighborhoods. In addition, emergency vehicle access will be maintained at all times to and from fire stations, hospitals, and medical facilities near the construction sites and along the haul routes. LPA construction activities and haul route operations will be coordinated with local law enforcement representatives and fire department officials during the Final Design phase.	Review and verify plans.	Contractor	– Metro – Metro – Final Design and Construction
TCON-4—Transportation Management Plan Once subway construction sequencing/phasing and the truck haul routes have been concurred upon by Metro and reviewed by local jurisdictions and Caltrans, an overall LPA Transportation Management Plan (TMP) will be developed with and approved by Metro and other appropriate agencies. The TMP will include the following:	Review and verify plans.	Contractor	– Metro – Metro – Final Design and Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
• Public information (e.g., media alerts, website) • Traveler information (e.g., traffic advisory radio, changeable message signs (CMS)) • Incident management (e.g., TMP coordination, tow truck services) • Construction (e.g., detour routes, haul routes, mitigation, construction times) • Demand management (e.g., carpooling, express bus service, variable work hours, parking management) • Coordination with concurrent LPAs The TMP will also address individual and overlapping haul route impacts and will impacts resulting from concurrent and overlapping station(s) and tunnel excavation work.			
TCON-5—Coordination with Planned Roadway Improvements Construction of the subway and new station locations will be coordinated with local jurisdictions for future programmed projects, such as the Wilshire Bus Rapid Transit Project.	Review and verify plans.	Metro	– Metro – Metro – Planning, Final Design and Construction
TCON-6—Temporary Bus Stops and Route Diversions Construction impacts to local and regional transit operations (e.g., Metro Bus, Santa Monica Big Blue Bus, Culver City Bus, LAX Flyaway, DASH, and UCLA Campus Shuttle) will be mitigated to minimize impacts to the degree possible at each station construction location. Impacts to local and regional transit will be mitigated through, but not be limited to, the use of temporary relocated bus stops and temporary route diversions. Impacts to local and regional transit operations will be coordinated with each transit agency and/or provider. In addition, the Final Design-level mitigation proposals will be approved by the transit agency and/or provider and the local jurisdictions and incorporated into the TMP.	Review and verify plans.	Contractor	– Metro – Metro – Final Design and Construction
TCON-7—Parking Management A parking management program will be developed to minimize impacts due to temporary removal of on- and off-street parking within the construction work zone. The program will incorporate appropriate parking control measures, replacement parking within a reasonable distance from the affected parking	Review and verify plans.	Metro	– Metro – Metro – Final Design and Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
locations, if available, or other transportation demand management (TDM) strategies. Development of the parking management program will be coordinated with the appropriate local jurisdictions and affected communities or property owners and be incorporated into the TMP.			
TCON-8—Parking Monitoring and Community Outreach In addition, a parking monitoring and community outreach program will be established during the construction phase of the LPA to monitor on-street parking activity. If a parking shortage is identified during construction, Metro will work with the appropriate local jurisdiction and affected communities or property owners to assess the shortage level and implement mitigation as part of the parking management program.	Report conditions and verify plan.	Metro	– Metro – Metro – Final Design and Construction
TCON-9—Construction Worker Parking Metro will require that all construction contractors identify adequate off-street parking for construction workers at Metro-approved locations. This will occur for each construction site to minimize additional loss of parking. Metro will work with construction contractors on implementation of adequate off-street parking for construction workers.	Review and verify plans.	Contractor	– Metro – Metro – Final Design and Construction
TCON-10—Pedestrian Routes and Access Safe pedestrian routes and access will be provided through and/or adjacent to construction work areas. Pedestrian routes and access, including temporary pedestrian facilities, will comply with the requirements of the ADA and must be properly signed and lighted. Special facilities, such as handrails, fences, and walkways, will be provided for pedestrian safety. Temporary pedestrian routes and access concerns will be addressed with, but not limited to, local residents, the VA Hospital, schools, and businesses and approved by the local jurisdiction. Pedestrian routes and access will be monitored and maintained throughout construction.	Review and verify plans.	Contractor	– Metro – Metro – Final Design and Construction
TCON-11—Bicycle Paths and Access Bicycle traffic (e.g., paths, lanes, and routes) will be maintained safely through and adjacent to construction work areas. If bicycle traffic cannot be maintained, then	Review and verify plans.	Contractor	– Metro – Metro – Final Design and

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
alternative temporary bicycle routes will be identified, signed, and lighted. These alternative routes should be on adjacent streets that can safely accommodate bicycle traffic. Development of these routes will be coordinated with bicycle groups and local jurisdictions. Temporary routes will require approval by the local jurisdiction. Bicycle access will be monitored and maintained throughout construction.			Construction
Land Use			
No significant impacts will result from the LPA. The LPA will not conflict with applicable land use plans and policies; therefore, no mitigation will be required.	N/A	N/A	N/A
Socioeconomic Characteristics			
Mitigation: The following measures will be implemented to ensure impacts related to displacements and acquisitions are avoided or further minimized. CN-1—Relocation Assistance and Compensation Metro will provide relocation assistance and compensation for all displaced businesses and residences, as required by both the Uniform Relocation Assistance and Real Property Acquisition Act and the California Relocation Assistance Act. All real property acquired by Metro will be appraised to determine its fair market value. Just compensation, which will not be less than the approved appraisal, will be made to each displaced property owner. Each business and residence displaced as a result of the LPA will be given advance written notice and will be informed of their eligibility for relocation assistance and payments under the Uniform Relocation Assistance and Property Acquisition Act. It is anticipated that most businesses will relocate and, as such, most jobs will be relocated and will not be permanently displaced. However, there are permanent job losses anticipated. Metro shall coordinate with the appropriate jurisdictions regarding business relocations.	Verify compliance	Metro	– Metro – Metro – Before Final Design
CN-2—Propose Joint-use Agreements While employment loss as a result of property acquisitions will not result in an adverse effect, Metro will propose where feasible joint-use agreements for the land it will take for station entrances and construction staging to induce job	Verify coordination with owners	Metro	– Metro – Metro – Before Final Design

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
creation in areas to further reduce the affect any job loss.			
CN-3—Compensation for Easements For easements, Metro will appraise each property to determine the fair market value of the portion that will be used either temporarily during construction or permanently above and below ground. Just compensation, which will not be less than the approved appraisal, will be made to each displaced property owner.	Verify coordination	Metro	– Metro – Metro – Before Final Design
Environmental Justice			
No disproportionately high and adverse impact to minorities and low-income communities will occur during operation of the Project. Therefore, no additional mitigation measures are required.	N/A	N/A	N/A
Visual Quality			
Mitigation: While there are no significant impacts, the mitigation measures, as listed below, are incorporated into the LPA and will ensure that impacts related to conflicts between scale and visual character, building removal and right-of-way acquisition, removal of mature vegetation, location of ancillary facilities, and introduction of new sources of light and glare are avoided or minimized. VIS-1—Minimize Visual Clutter To minimize visual clutter, system components should be integrated and the potential for conflicts reduced between the transit system and adjacent communities; design of the system stations and components will follow the recommendations and guidance developed in the urban design analysis conducted for the LPA (Metro 2009d). These guidelines include the following: (1) preserve and enhance the unique cultural identity of each station area and its surrounding community by implementing art and landscaping; and (2) promote a sense of place, safety, and walkability by providing street trees, walkways or sidewalks, lighting, awnings, public art, and/or street furniture.	Review and integrate guidance in system design	Metro/Contractor	– Metro – Metro – Before Final Design
VIS-2—Replacement for Tree Removal Where mature trees are removed, replacement with landscape amenities of equal value will be incorporated into final designs, where feasible, to enhance visual	Have arborist prepare tree removal plan	Metro	– Metro – Metro – Before Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
integrity of the station area.			
VIS-3—Source Shielding in Exterior Lighting Source shielding in exterior lighting at the maintenance and storage facility will be used to limit spillover light and glare.	Review and verify Final Design plans	Metro	– Metro – Metro – Final Design
VIS-4—Integrate Station Designs with Area Redevelopment Plans Station designs will be integrated with area redevelopment plans. The objective is to create a unified visual setting where the station components such as entrances, complement redevelopment plans.	Verify coordination with surrounding communities	Metro	– Metro – Metro – Before Final Design
Air Quality			
The LPA will not exceed the National Ambient Air Quality Standards, the California Ambient Air Quality Standards, or SCAQMD significance thresholds during operation of the LPA. The LPA is predicted to result in lower emissions of some criteria pollutants; therefore, no mitigation will be required.	N/A	N/A	N/A
Climate Change			
Mitigation: No mitigation is required. However, Metro recognizes that climate change is a serious issue. The following measures will be implemented to further ensure beneficial impacts: CC-1—Implement Pedestrian and Transit-Oriented Development at Stations Metro will continue to promote and support implementation of pedestrian-oriented and transit-oriented development at stations.	Review and integrate where possible into Final Design	Metro	– Metro – Metro – Before Final Design
CC-2—Energy Conservation Energy conservation will be implemented throughout design and construction.	Review and verify implementation	Metro	– Metro – Metro – Before and during Final Design
CC-3—Promote Transit Ridership Metro will continue to promote transit ridership through marketing and educational programs.	Verify implementation of Public Outreach Campaign	Metro	– Metro – Metro – Before, during and after Final Design,

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
			Construction, and project implementation
CC-4—Green Power Metro will use green power when/where available and priced competitively with other energy sources.	Verify compliance	Metro	– Metro – Metro – Final Design
Noise and Vibration			
Mitigation: To mitigate the potential for ground-borne noise impacts to theatre and residential uses above the subway tunnel due to train operation along tangent track and crossover track the following mitigation measures will be included in the final design of the LPA: VIB-1—Use of High Compliance Direct Fixation Resilient Rail Fasteners A high compliance direct fixation resilient rail fasteners will be incorporated into the design of the trackwork at the location listed below, which will reduce ground-borne noise by 5 to 7 dBA: • Wilshire Ebell Theatre at Site V8 (Figure 4-38) • Saban Theatre at Site V25 (Figure 4-38)	Review and verify plans.	Metro	– Metro – Metro – Final Design

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
VIB-2—Use of a Low Impact Crossover A low impact crossover, such as a moveable point frog or a spring-loaded frog, will be used in the design of the following crossover, which will reduce ground-borne noise by 5 to 6 dBA: • Wilshire/La Brea No. 10 Double Crossover for the apartments at Site V16 (Figure 4-38)	Review and verify plans.	Metro	– Metro – Metro – Final Design
Energy			
No significant impacts. LPA conditions decreases system-wide vehicle miles traveled (VMT), which results in less energy consumption as compared to the existing conditions, therefore, no mitigation will be required.	N/A	N/A	N/A
Geologic Hazards			
Mitigation: Construction and design will be performed in accordance with the latest Federal and State seismic and environmental requirements as well as State and local building codes. By compliance with these regulations and requirements, potential impacts from geologic hazards will be minimized. The following measures are also included to further avoid and minimize impacts. GEO-1—Seismic Ground Shaking Metro design criteria require probabilistic seismic hazard analyses (PSHA) to estimate earthquake loads on structures. These analyses take into account the combined effects of all nearby faults to estimate ground shaking. A site-specific PSHA will be used as the basis for evaluating the ground motion levels along the LPA. The structural elements of the LPA will be designed and constructed to resist or accommodate appropriate site-specific estimates of ground loads and distortions imposed by the design earthquakes and conform to Metro's Design Standards for the Operating and Maximum Design Earthquakes. The concrete structures are designed according to the Building Code Requirements for Structural Concrete by the American Concrete Institute (ACI 318).	Review and verify plans	Metro	– Metro – Metro – Final Design
GEO-2—Fault Crossing Tunnel, Fault Rupture, Tunnel Crossing LPA—Century City Constellation option Design will allow for the tunnels to cross the faults nearly perpendicular to limit	Verify completion of studies and incorporation of	Metro	– Metro – Metro

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
the area of potential damage and will use Metro's two level approach to assess fault offsets and the associated structural design required to accommodate the offset. During Final Design, fault crossings will be designed for the ground conditions at the crossing location and incorporate the methods used to excavate and support the tunnel. Metro design criteria require use of a probabilistic approach to determine the Maximum Design Earthquake and Operating Design Earthquake. Design must include the following: • Prevent collapse of the tunnel to ensure tunnel safety • Maintaining structural continuity of tunnel ring • Preventing flow of water and soil • Establishing the tunnel size to maintain tunnel clearances and provide a guideway for derailed trains to decelerate without impact Several preliminary design approaches or combinations have been considered and will be further developed in Final Design: • Steel tunnel rings with compressible material between the ring and soil to accommodate movement of the fault • Flexible steel linings • Articulated joints between tunnel segments for added flexibility • Oversized tunnel to allow additional movement and to some extent, more rapid repair after a seismic event. This could also be accomplished using cut and cover methods.	the recommended design measure into Final Design.		– Final Design

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
GEO-3—Operational Procedures during Earthquake In addition to design measures, As Metro has implemented on the existing Red line, it will implement Standard Operating Procedures in seismic areas to detect earthquakes and will provide back-up power, lighting, and ventilation systems to increase safety during tunnel or station evacuations in the event of loss of power due to an earthquake. For example, seismographs are located in 11 of the existing Metro Red/Purple Line stations to detect ground motions and trigger Standard Operating Procedures (SOP #8 – Earthquake) by the train operators and controllers. Operating procedures are dependent on the level of earthquake and include stopping or holding trains, gas monitoring, informing passengers, communications with Metro's Central Control, and inspecting for damage.	Verify safety measures are implemented	Metro	– Metro – Metro – Operations
GEO-4—Liquefaction and Seismic Settlement At liquefaction or seismic settlement prone areas, evaluations by geotechnical engineers will be performed to provide estimates of the magnitude of the anticipated liquefaction or settlement. Based on the magnitude of evaluated liquefaction, a suitable mitigation will be selected, either structural design, or ground improvement (such as deep soil mixing) or deep foundations to non liquefiable soil (such as drilled piles). Site specific design will be selected based upon the State of California Guidelines design criteria set forth in the Metro Seismic Design Criteria.	Review and verify plans	Metro	– Metro – Metro – Final Design
GEO-5— Hazardous Subsurface Gas Operations As with the existing Metro Red and Purple Lines and the Metro Gold Line Eastside Extension, Metro will install gas monitoring and detection systems with alarms, as well as ventilation equipment to dissipate gas to safe levels according to Metro's current Design Criteria and Cal/OSHA standards for a safe work environment. Measures will include, but are not limited to, the following for both tunnel and station operation: • High volume ventilation systems with back-up power sources • Gas detection systems with alarms • Emergency ventilation triggered by the gas detection systems	Review and verify plans	Metro	– Metro – Metro – Final Design

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
• Automatic equipment shut-off • Maintenance and operations personnel training. • Gas detection instrumentation is set to send alarms to activate ventilation systems and evacuate the structures as follows: Methane gas—Minor alarm at 10 percent of LEL (activate ventilation) and major alarms at 20 percent of LEL (evacuation of area) • Hydrogen sulfide—Minor alarm at 8 ppm and major alarm at 10 ppm.			
GEO-6—Hazardous Subsurface Gas Structural Design Tunnels and stations will be designed to provide a redundant protection system against gas intrusion hazard. The primary protection from hazardous gases during operations is provided by the physical barriers (tunnel and station liner membranes) that keep gas out of tunnels and stations. As with the existing Metro Red and Purple Lines and the Metro Gold Line Eastside Extension, tunnels and stations will be designed to exclude gas to below alarm levels (GEO-5) and include gas monitoring and detection systems with alarms, as well as ventilation equipment to dissipate gas. • At stations in elevated gassy ground (e.g., Wilshire/Fairfax, construction will be accomplished using slurry walls—or similar methods such as continuous drilled piles—to provide a reduction of gas inflow both during and after construction than would occur with conventional soldier piles and lagging. • Other station design concepts to reduce gas and water leakage will use additional barriers, compartmentalized barriers to facilitate leak sealing, and use of flexible sealants, such as poly-rubber gels, along with the high-density polyethylene-type materials that are used on Metro's underground stations. • Consideration of secondary station walls to provide additional barriers or an active system (low or high pressure barrier) will also be studied further to determine if they will be incorporated into the LPA. • The evaluations will include laboratory testing programs such as those conducted for the Metro Gold Line Eastside Extension during development of the double gasket system and material testing for long term exposure to the ground conditions for materials such as rubber gaskets used for tunnel segment linings. Testing programs will examine:	Review and verify plans	Metro	– Metro – Metro – Final Design

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
○ Segment leakage—gasket seal under pressure before, during, and after seismic movements. This will include various gasket materials and profiles (height and width). ○ Gasket material properties—effective life and resistance to deterioration when subjected to man-made and natural contaminants, including methane, asphaltic materials, and hydrogen sulfide. ○ Alternative products to High Density Polyethylene products such as poly-rubber gels, now in use in ground containing methane in other cities. ○ Methods for field testing high-density polyethylene joints. These are now being used for landfill liners and water tunnels under internal water pressure.			
GEO-7—Tunnel Advisory Panel Design Review The Metro Tunnel Advisory Panel (TAP) will review designs with respect to geologic hazards in areas of identified higher risk. These include the Century City area (seismic risk) and the Fairfax area (gassy ground risk). The TAP will be supplemented, as necessary, by qualified experts in seismic design, gas intrusion and ground contaminant effects on underground structures.	Verify compliance	Contractor	– *Metro* – Metro – Construction
Hazardous Materials			
Mitigation : In addition to the mitigation measures outlined for geologic hazards, measures to further ensure that any impacts are avoided or minimized for the LPA include the following: HAZ-1—Disposal of Groundwater Disposal of groundwater from underground structures will comply with the City of Los Angeles Industrial Wastewater Permit if there is any contaminated groundwater leakage into final structure.	Verify compliance	Contractor	– Metro – Metro – Construction –
HAZ-2—Emergency Response Procedure In the unlikely event of a major hazardous materials release close to or in the vicinity of the LPA, Metro will develop emergency response procedures in	Verify compliance	Metro	– Metro – Metro – Operations

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
conformance with Federal, State, and local regulations.			–
Ecosystems/Biological Resources			
No significant impacts will result from the LPA, therefore no mitigation will be required.	N/A	N/A	N/A
Water Quality			
Mitigation : In addition to the standard Best Management Practices (BMPs) and other measures required for compliance with Federal, State, and local requirements, the following measures will be implemented to further ensure that there will be no adverse water quality or hydrology impacts. WQ-1—Drainage Control Plan A drainage control plan will be developed to properly convey drainage from the Study Area and to avoid *ponding on adjacent properties*. The plan will be developed to assure that the flood capacity of existing drainage or water conveyance features will not be reduced in a way that will cause ponding or flooding during storms.	Verify completion of drainage plan	Contractor	– California State Water Resources Control Board (SWRCB) – Metro – Construction
WQ-2—Runoff Treatment During operation runoff will be treated using the most appropriate BMP as listed below to further ensure compliance Title III and Title IV of the Clean Water Act and NPDES standards as overseen by the local jurisdictions: • BMP1: Infiltration basins/trenches—Infiltration basins are surface ponds that capture first-flush stormwater and treat it by allowing it to percolate into the ground and through permeable soils. Infiltration trenches are excavated trenches that have been lined with filter fabric and backfilled with stone to form an underground basin that allows runoff to infiltrate into the soil. As the water percolates through the ground, physical, chemical, and biological processes occur to remove sediments and soluble pollutants. Pollutants are trapped in the upper soil layers and the water is released to groundwater. Infiltration basins are generally dry except immediately following storms, but a low-flow channel may be necessary if a constant base flow is present. • BMP2: Porous pavement— Porous pavement can be either asphalt-based	Verify compliance and implementation in final design plans	Metro	– California State Water Resources Control Board (SWRCB) – Metro – Final Design

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
pavement or pre-casted permeable concrete pavers. The permeable concrete paver is a preferred feature of the City of Los Angeles' Green Street Policy. Both concrete pavers and asphalt-based paving material allows stormwater to quickly infiltrate the surface pavement layer to enter into a high-void aggregate sub-base layer. The captured runoff is stored in this "reservoir" layer until it either infiltrates into the underlying soil strata or is routed through an under drain system to a conventional stormwater conveyance system. Porous pavement is typically applicable only in low-traffic areas. • BMP3: Vegetated Filter Planters—These are newly adopted bio-parkway or flow-through planters engineered in accordance to the City of Los Angeles' Green Street Policy. They are planters with selected vegetations and engineered soils to treat and filter storm-water from street and / or roof runoff. The design storm First-Flush polluted storm-water will be treated and filtered. At large storm events, clean storm-water will be by-passed to normal drainage facilities. These devices are most suitable to urban environment such as the current LPA corridor.			
Safety and Security			
Mitigation: These measures further describe those Metro currently uses or will implement to further ensure that there are no adverse impacts. SS-1—Passenger Safety I Implement public safety awareness and employee training program.	Verify coordination and Public Outreach	Metro	– Metro – Metro – Prior operations
SS-2—Passenger Safety II Develop and implement a project-specific safety certification plan that will result in safety certification of all certifiable project elements	Verify compliance and implementation in Final Design Plans	Metro	– City of Los Angeles – Metro – Final Design/Project Implementation
SS-3—Construction Safety Implement a Construction Safety and Security Plan which includes safety rules, procedures, and policies to protect workers and work sites during construction such as warning and/or notification signs, detours, and barriers and includes	Verify compliance	Metro	– Metro – Metro – Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
compliance with OSHA standards			
SS-4—Fire Protection and Safety Design in accordance with Metro fire/life safety criteria, CBC, and other applicable Federal, State, and local rules and regulations.	Verify compliance	Metro	– Metro – Metro – Final Design
SS-5—Methane and Hydrogen Sulfide Gas Leak Protection Design in accordance with Metro Fire/Life safety criteria, Metro ventilation criteria, and according to the findings in the *Westside Subway Extension Geotechnical and Hazardous Materials Technical Report (*Metro 2010i) and with special design, construction and operational attention to the gassy ground tunnels and stations.	Verify compliance	Metro	– Metro – Metro – Final Design
SS-6—Security Preventing Criminal Activity Incorporate security features, including lighting, communication devices (e.g., passenger telephones), closed circuit television, signs and other design features, and law enforcement officers to reduce criminal activities.	Verify compliance	Metro	– Metro – Metro – Final Design
SS-7—Security Preventing Terrorist Attacks Implementation of security features, including security education and employee training specific to terrorism awareness, lighting, communication devices (e.g., passenger telephones), closed circuit television, signs and other design features to reduce terrorism activities.	Verify compliance	Metro	– Metro – Metro – Final Design and Project Implementation
SS-8—Emergency Response Development and implementation of a comprehensive emergency preparedness plan, employee and emergency responders training, and system design features.	Verify compliance	Metro	– Metro – Metro – Final Design and Project Implementation
Parklands and Community Facilities			
Mitigation: The following measure will incorporated into the LPA to ensure impacts related to displacements and acquisitions are avoided or further minimized. CN-1—Relocation Assistance and Compensation Metro will provide relocation assistance and compensation for all displaced	Verify Compliance	Metro	– Metro – Metro Before Final Design

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
businesses and residences, as required by both the Uniform Relocation Assistance and Real Property Acquisition Act and the California Relocation Assistance Act. All real property acquired by Metro will be appraised to determine its fair market value. Just compensation, which will not be less than the approved appraisal, will be made to each displaced property owner. Each business and residence displaced as a result of the LPA will be given advance written notice and will be informed of their eligibility for relocation assistance and payments under the Uniform Relocation Assistance and Property Acquisition Act. It is anticipated that most businesses will relocate and, as such, most jobs will be relocated and will not be permanently displaced. However, there are permanent job losses anticipated. Metro shall coordinate with the appropriate jurisdictions regarding business relocations.			
Historic, Archeological, and Paleontological Resources			
Mitigation: For the properties that have a determination of No Adverse Effect, implementation of mitigation measure HR-1 will further ensure avoidance of adverse effects to the historic properties. In addition, implementation of mitigation measure HR-4 will ensure that inadvertent direct construction-related impacts to built historic properties within the APE do not alter the materials, features, or finishes that are important to the integrity of the property. Implementation of mitigation measure (AR-1) will reduce construction impacts to undocumented archaeological resources, including human remains. Implementation of the mitigation measures (PA-1) will substantially reduce the impacts to paleontological resources. During construction, implementation of mitigation measures (PA-2 through PA-7) would further reduce impacts to undocumented paleontological resources. HR-1—Treatment to Avoid Adverse Effects Design Phase Planning. The project would be designed in adherence to the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Rehabilitating Historic Buildings* and the *Guidelines for the Treatment of Cultural Landscapes* at the following four historic properties that	Verify compliance	Metro	– California Department of Parks and Recreation Office of Historic Preservation – Metro – Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
will be altered by either construction staging activities or station entrances to ensure there is no adverse effect to these properties: • LACMA West May Company – WSE 24 (6067 Wilshire Boulevard) • Union Bank Building—WSE 14 (9460 Wilshire Boulevard) • Linde (Westwood) Medical Plaza - WSE 10 (10921 Wilshire Boulevard) • VA Medical Center Historic District—WSE 41 (11301 Wilshire Boulevard) including the Wadsworth Theater and Contributing Landscape Elements Designs will ensure the preservation of the character-defining features of the historic properties, and would avoid damaging or destroying materials, features, or finishes that are important to the property, while also considering economic and technical feasibility. Metro will ensure that the SHPO has opportunity to review the design by the architectural historian. Design Review and Monitoring. Metro will retain the services of a qualified historic preservation consultant with experience in architectural preservation to review structural designs and construction activities, and will require onsite periodic construction monitoring by a historic preservation consultant to ensure protection of historic fabric and compliance with approved designs and the *Secretary of the Interior's Standards for the Rehabilitation of Historic Properties*.			
HR-2—Treatment to Resolve Adverse Effect HABS/HAER Documentation—The adverse effects of the Undertaking on the Ace Gallery will be resolved by FTA by requiring Metro to implement and complete National Park Service Historic American Building Survey (HABS) or Historic American Engineering Record (HAER) documentation, pursuant to Section 110(b) of the National Historic Preservation Act for the adversely-affected property. Prior to any action, the photo-recordation and documentation consistent with the standards of the National Park Service HABS or HAER will be prepared by a Secretary of Interior qualified professional architectural historian or historic architect. Whenever possible, HABS/HAER documentation Level 2 would be employed whenever measured drawings for a property are available. If measured drawings are not available, HABS/HAER documentation Level 1 would	Verify Compliance	Metro	– California Department of Parks and Recreation Office of Historic Preservation – Metro – Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
be employed. The HABS/HAER documentation will be forwarded by the Metro to the FTA and SHPO for review. The FTA, in consultation with Metro and SHPO, will approve the materials and permit Metro to proceed with demolition of the adversely-affected property. Following approval of the HABS/HAER documentation, Metro will ensure that the materials are placed on file with Metro and Responsible Agencies, historical societies and preservation groups, local university and community libraries, and other appropriate national and local repositories and archives, as identified by Metro. Public Website Development—*In connection with* HABS/HAER documentation, Metro will develop a public website linked to Metro's website concerning the history of the Ace Gallery. The website would be based on the photographs produced as part of the HABS/HAER documentation, and historic archival research previously prepared as part of the Undertaking and historic documentation. A public website, which provides historic and documentary information regarding historic properties that would be substantially altered or demolished as a result of the Undertaking, will be prepared and maintained for a ten-year period.			
HR-3—Construction Starting Beyond 2019 For those portions of the APE in which construction would start beyond 2019, Metro would retain the services of a Secretary of Interior professional qualified architectural historian to complete an updated historic property survey and evaluation to ensure that construction of the LPA would have no effect on eligible historic properties built after 1968 not previously inventoried during preparation of the Draft EIS/EIR or the Final EIS/EIR for the LPA. A draft and final report on the results of the survey and evaluation would be submitted to Metro, FTA, SHPO, and other signatories to the Memorandum of Agreement for review and approval prior to initiation of any beyond-2019 ground-disturbing activities within the APE for the LPA. The final report would be placed on file with	Verify compliance	Metro	– California Department of Parks and Recreation Office of Historic Preservation – Metro – Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
Metro and Responsible Agencies, the South Central Coastal Information Center, and other appropriate local repositories identified by Metro within three months after the work has been completed. If any of the newly inventoried built resources are determined to be eligible historic resources and may be adversely affected by the LPA, the FTA, with the assistance of Metro, shall review and approve appropriate mitigation measures, which shall be devised by Metro in concert with a qualified architectural historian. To the extent feasible, treatment to avoid and minimize adverse effects shall follow Mitigation Measure HR-1. In the event activities associated with the LPA cannot be implemented in a manner which meets adherence to Secretary of the Interior's Standards under HR-1, then the treatment described in Mitigation Measures HR-2 or other treatment appropriate to the specific resource(s) would be implemented.			

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
PA-1—Memorandum of Understanding Metro will implement the Memorandum of Understanding with the George C. Page Museum of La Brea Discoveries regarding treatment of paleontological resources from asphaltic deposits.	Verify compliance	Metro	– California Department of Parks and Recreation Office of Historic Preservation – Metro – Final Design
Construction (Archaeological, Historic and Paleontological Resources)			
Mitigation: The Memorandum of Agreement (MOA) sets forth measures to be implemented to reduce potential construction impacts within the APE to known archaeological historic properties and to undocumented archaeological resources, including human remains. For additional details refer to the MOA found in Appendix D. Implementation of the following measures will reduce impacts to archeological resources: For the property that has a determination of No Adverse Effect, implementation of mitigation measure HR-1 will further ensure avoidance of adverse effects to the historic properties. In addition, implementation of mitigation measure HR-4 will ensure that inadvertent direct construction-related impacts to built historic properties within the APE do not alter the materials, features, or finishes that are important to the integrity of the property. Even with implementation of this mitigation measure, construction of the LPA will result in an unavoidable and significant impact to a historic resource at the Wilshire/Rodeo Station to accommodate construction staging activities. AR-1—Unanticipated Discoveries and Consultation with Native American Individuals, Tribes and Organizations and Treatment of Cultural Remains and Artifacts If previous unidentified cultural resources, including human remains, are encountered during construction or earth-disturbing activities, all activities at that location shall be halted until a qualified archaeologist can examine the resources and assess their significance. If the resources are determined to be significant, Metro will notify FTA and SHPO within 48 hours of the discovery to determine the appropriate course of action.	Verify compliance with mitigation monitoring plan	Metro	– California Department of Parks and Recreation Office of Historic Preservation – Metro – Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
For resources determined eligible or assumed to be eligible for the NRHP by FTA, Metro will notify the FTA, ACHP, and SHPO of those actions that it proposes to avoid, minimize, or mitigate adverse effects. Consulting parties will have 48 hours to provide their views on the proposed actions. The FTA will ensure that timely-filed recommendations of consulting parties are taken into account prior to granting approval of the measures that the Metro will implement to resolve adverse effects. Metro will carry out the approved measures prior to resuming construction activities in the location of the discovery. Metro will ensure that the expressed wishes of Native American individuals, tribes, and organizations are taken into consideration when decisions are made regarding the disposition *of other* Native American archaeological materials and records relating to Indian tribes. Should Indian burials and related items be discovered during construction of the project, Metro will consult with the affected Native American individuals, tribes and organization regarding the treatment of cultural remains and artifacts. These will be treated in accordance with the requirements of the California Health and Safety Code. If the county coroner/medical examiner determines that the human remains are or may be of Native American origin, then the discovery shall be treated in accordance with the provisions of §§ 5097.98 (a) - (d) of the California Public Resources Code which provides for the notification of discovery of Native American human remains, descendants; disposition of human remains and associated grave goods.			
HR-4—Geotechnical Pre-Construction Survey and Historic Land-scape Protection Geotechnical Investigations. For historic properties, further geotechnical investigations will be undertaken to evaluate soil, groundwater, seismic, and environmental conditions along the alignment. This analysis will assist in the development of appropriate support mechanisms and measures for cut and fill	Hire a qualified historic preservation consultant	Metro	– California Department of Parks and Recreation Office of Historic Preservation – Metro

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
construction areas. The subsurface investigation will also identify areas that could cause differential settlement as a result of using a tunnel boring machine (TBM) in close proximity to historic properties. An architectural historian or historical architect who meets the Secretary of the Interior's Professional Qualification Standards (36 CFR Part 61) will provide input and review of final design documents prior to implementation of the mechanisms and measures. The review will evaluate whether the geotechnical investigations and support measures for cut and fill, and measures to prevent differential settlement meet the Secretary of the Interior's *Standards for the Treatment of Historic Properties*. The evaluation of measures will be forwarded by Metro to the FTA and SHPO for review. Then FTA, in consultation with SHPO, upon the SHPO's concurrence, shall approve the evaluation and permit Metro to proceed with construction. Historic District Contributing Historic Landscape Element Pre-Construction Survey. Metro will develop a survey of the contributing landscape elements of the VA Medical Center Historic District located within 20 feet of the Westwood/VA Hospital North and South Station portal-related cut-and-cover and construction staging areas during Final Design. The survey will be prepared by a qualified architectural historian and historic landscape architect and/or qualified arborist with the assistance of a technician/surveyor using high-resolution GPS equipment. The survey will establish an inventory of each mature historic tree species and the precise location of each individual tree in the survey area. The inventory survey will also assess the feasibility of temporarily removing and then replanting the extant trees in their original location, including how the trees should be moved and temporarily stored. A report on the results of the inventory will be submitted to FTA, Metro, and SHPO for review and will be placed on file with Metro. Historic District Contributing Historic Landscape Element Landscape Protection Measures. The results of the pre-construction survey will be used for marking			– Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
trees to be avoided during construction, for implementation of relocation recommendations as necessary if avoidance of any of the trees is infeasible, and for onsite use during construction activities to ensure the historic trees remaining in place are protected. Should any trees that are temporarily removed not survive a reasonable period after they are replanted, as determined by a qualified arborist, Metro will obtain and plant adult-aged replacement trees of the same species to rehabilitate the historic landscape. Historic District Contributing Historic Landscape Element Construction Monitoring. Metro will retain the services of a qualified historic preservation consultant with experience in the preservation of historic landscapes. The consultant will review the existing landscape designs and proposed construction activities, and develop a plan for onsite periodic construction monitoring to ensure protection of historic fabric and compliance with the *Guidelines for the Treatment of Cultural Landscapes*.			
PA-2—Early Fossil Recovery Metro will seek early approval to begin fossil recovery in advance of construction if feasible.	Seek early approval from California Department of Parks and Recreation Office of Historic Preservation	Metro	– California Department of Parks and Recreation Office of Historic Preservation – Metro – Prior to construction
PA-3—Retain the Services of a Qualified Principal Paleontologist Metro will retain the services of a qualified principal paleontologist (minimum of graduate degree, 10 years of experience as a principal investigator and specialty in vertebrate paleontology) to oversee execution of mitigation measures.	Verify compliance and completion of monitoring report	Metro	– California Department of Parks and Recreation Office of Historic Preservation – Metro

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
			– Construction
PA-4—Development of a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) Metro's qualified principal paleontologist will develop a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) acceptable to the collections manager of the Vertebrate Paleontology Section of the Natural History Museum of Los Angeles County and the collection manager of the Page Museum of La Brea Discoveries. Metro will implement the PRMMP during construction. The plan will clearly demarcate the areas to be monitored and specify criteria. At the completion of paleontological monitoring for the LPA, a paleontological resources monitoring report will be prepared and submitted to the Page Museum of La Brea Discoveries and the Natural History Museum of Los Angeles County to document the results of the monitoring activities and summarize the results of any paleontological resources encountered.	Verify completion of PRMMP and compliance with PRMMP	Metro	– California Department of Parks and Recreation Office of Historic Preservation – Metro – Construction
PA=5—Required Activities for Recovered Fossils in the PRMMP The PRMMP will include specifications for processing, stabilizing, identifying, and cataloging any fossils recovered on the LPA. For any tar pit deposits encountered, this will include chemical removal of asphalt from matrix and specimens. Cleaned matrix will require microscopic examination for small fossils, including invertebrates and plants, by a qualified paleontologist.	Verify compliance with PRMMP	Metro	– California Department of Parks and Recreation Office of Historic Preservation – Metro – Construction
PA-6—Preparation of a Report on Paleontological Resources Recovered Metro's qualified principal paleontologist will prepare a report detailing the paleontological resources recovered, their significance, and arrangements made for their curation at the conclusion of the monitoring effort.	Verify report has been prepared	Metro	– California Department of Parks and Recreation Office of Historic Preservation – Metro – Construction
PA-7—Curation of Identified and Prepared Fossils Metro will provide the resources necessary to curate the identified and prepared fossils as specified in the Memorandum of Understanding between Metro, FTA,	Verify compliance	Metro	– California Department of Parks and Recreation

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
and the George C. Page Museum of Rancho La Brea Discoveries. Those fossils recovered from asphaltic deposits will be curated at the George C. Page Museum. All other fossils will be curated at the Natural History Museum of Los Angeles County.			Office of Historic Preservation – Metro – Construction
Growth Inducing			
No significant impacts, therefore, no mitigation will be required.	N/A	N/A	N/A
Cumulative Impacts			
Mitigation: The implementation of mitigation measures T-1, T-2, T-3, and T-4 will help reduce the magnitude of parking impacts.	Verify compliance	Metro	– Metro – Metro Final Design and Prior to Construction
Construction (Land Use)			
Mitigation: Implementation of mitigation measures TCON-1, TCON-10 and TCON-11 will further ensure that traffic and pedestrian circulation and access will be maintained throughout construction.	Review and verify plans.	Contractor	– Metro – Metro Final Design and Construction
Construction (Community and Neighborhoods)			
CON-1—Signage Signage to indicate accessibility to businesses will be used in the vicinity of construction activity. In addition, implementation of mitigation measures TCON-1, TCON-2, TCON-3, T-CON-4, TCON-7, TCON-8, TCON-10 and TCON-11 will reduce construction impacts to communities and neighborhoods.	Verify compliance	Metro	– Metro – Metro – Construction
Construction (Environmental Justice)			
Construction will not result in disproportionate adverse impacts to environmental justice communities. No additional measures will be required	N/A	N/A	N/A

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
Construction(Visual and Aesthetics)			
Mitigation: To ensure impacts related to construction activities are minimized, the following mitigation measures will be implemented: CON-2—Timely Removal of Erosion-Control Devices Visually obtrusive erosion-control devices, such as silt fences, plastic ground cover, and straw bales, will be removed as soon as the area is stabilized.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-3—Location of Construction Materials Stockpile areas will be located in less visibly sensitive areas and, whenever possible, not be visible from the road or to residents and businesses. Limits on heights of excavated materials will be developed during design based on the specific area available for storage of material and visual impact.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-4—Construction Lighting Lighting will be directed toward the interior of the construction staging area and be shielded so that it will not spill over into adjacent residential areas. In addition, temporary sound walls of Metro approved design will be installed at station and work areas. These will block direct light and views of the construction areas from residences.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-5—Screening of Construction Staging Areas Construction staging areas will be screened where possible, to reduce visual effects on adjacent viewers	Verify compliance	Contractor	– Metro – Metro – Construction
Construction(Air Quality)			
Mitigation: These mitigation measures will help to reduce air quality particulate matter impacts, but it is unlikely—given the current construction plan—that these levels, especially NO, will be below the SCAQMD threshold during construction. Therefore, adverse effects will remain after mitigation. CON-6—Meet Mine Safety (MSHA) Standards	Verify compliance	Contractor	– Metro – Metro – Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
Tunnel locomotives (hauling spoils and other equipment to the tunnel heading) will be approved by Metro to meet mine safety (MSHA) standards.			
CON-7—Meet SCAQMD Standards Metro and its contractors will set and maintain work equipment and standards to meet SCAQMD standards, including NOx.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-8—Monitoring and Recording of Air Quality at Worksites Monitoring and recording of air quality at the worksites will be conducted. In areas of gassy soil conditions (Wilshire/La Brea and Wilshire/Fairfax work sites), air quality will be continuously monitored and recorded. Construction will be altered as required to maintain a safe working atmosphere. The working environment will be kept in compliance with Federal, State, and local regulations, including SCAQMD and Cal/OSHA standards.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-9—No Idling of Heavy Equipment Metro specifications will require that contractors not unnecessarily idle heavy equipment.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-10—Maintenance of Construction Equipment Metro will require its contractors to maintain and tune engines per manufacturer's specifications to perform at EPA certification levels, where applicable, and to perform at verified standards applicable to retrofit technologies. Metro will also require periodic, unscheduled inspections to limit unnecessary idling and to ensure that construction equipment is properly maintained, tuned, and modified consistent with established specifications.	Verify compliance	Metro	– Metro – Metro – Construction
CON-11—Prohibit Tampering of Equipment Metro will prohibit its contractors from tampering with engines and require continuing adherence to manufacturer's recommendations.	Verify compliance	Metro	– Metro – Metro – Construction
CON-12—Use of Best Available Emissions Control Technologies Metro will encourage its contractors to lease new, clean equipment meeting the	Verify compliance	Metro	– Metro – Metro

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
most stringent of applicable Federal or State standards (e.g., Tier 3 or greater engine standards) or best available emissions control technologies on all equipment.			– Construction
CON-13—Placement of Construction Equipment Construction equipment and staging zones will be located away from sensitive receptors and fresh air intakes to buildings and air conditioners.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-14—Measures to Reduce the Predicted PM_{10} Levels Mitigation measures such as watering, the use of soil stabilizers, etc. will be applied to reduce the predicted PM_{10} levels to below the SCAQMD daily construction threshold levels. A watering schedule will be established to prevent soil stockpiles from drying out.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-15—Reduce Street Debris At truck exit areas, wheel washing equipment will be installed to prevent soil from being tracked onto city streets, and followed by street sweeping as required to clean streets.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-16—Dust Control During Transport Trucks will be covered to control dust during transport of spoils.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-17—Fugitive Dust Control To control fugitive dust, wind fencing and phase grading operations, where appropriate, will be implemented along with the use of water trucks for stabilization of surfaces under windy conditions.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-18—Street Watering Surrounding streets at construction sites will be watered by trucks as needed to eliminate air-borne dust. In keeping with Metro's prior policy on the Eastside Gold Line, the contractor will water streets in the station area impacted by dust not less than once a day and more often if needed.	Verify compliance	Contractor	– Metro – Metro – Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
CON-19—Spillage Prevention for Non-Earthmoving Equipment Provisions will be made to prevent spillage when hauling materials and operating non-earthmoving equipment. Additionally, speed will be limited to 15 mph for these activities at construction sites.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-20—Spillage Prevention for Earthmoving Equipment Provisions will be made to prevent spillage when hauling materials and operating earth-moving equipment. Additionally, speed will be limited to 10 mph for these activities at construction sites.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-21—Additional Controls to Reduce Emissions EPA-registered particulate traps and other appropriate controls will be used where suitable to reduce emissions of particulate matter and other pollutants at the construction site.	Verify compliance	Contractor	– Metro – Metro – Construction
Construction (Climate Change)			
Mitigation: Implementation of air quality mitigation measures CON-6 through CON-13 will further reduce climate change impacts due to construction.	Verify compliance	Metro/Contractor	– Metro – Metro Construction
Construction (Noise and Vibration)			

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
Mitigation: Noise impacts from construction of the LPA will require mitigation to meet the Los Angeles CEQA noise thresholds, the Metro specified limits, and the noise ordinances for Los Angeles County and the cities of Los Angeles and Beverly Hills. The final determination of construction noise impacts will depend on the equipment and activities used by the contractor to construct the LPA. Since this information on means and methods of construction is not available now, noise mitigation is presented as typical noise-control measures that have been used on other similar construction projects. Metro Baseline Specifications Section 01565, Construction Noise and Vibration Control, require that the contractor shall, among other provisions: CON-22—Hire or Retain the Services of an Acoustical Engineer Hire or retain the services of an Acoustical Engineer to be responsible for preparing and overseeing the implementation of the Noise Control and Monitoring Plans. Noise Control and Monitoring Plan will ensure that noise levels are at or below criteria levels in Metro Baseline Specifications Section 01565, Construction Noise and Vibration Control.	Verify compliance	Metro	– Metro – Metro – Construction
CON-23—Prepare a Noise Control Plan Prepare a Noise Control Plan that includes an inventory of construction equipment used during daytime and nighttime hours, an estimate of projected construction noise levels, and locations and types of noise abatement measures that may be required to meet the noise limits specified in the Noise Control and Monitoring Plan.	Verify compliance	Metro	– Metro – Metro – Construction
CON-24—Comply with the Provisions of the Nighttime Noise Variance In the case of nighttime construction, the contractor will comply with the provisions of the nighttime noise variance issued by local jurisdictions. The variance processes for the Cities of Los Angeles and Beverly Hills and the County of Los Angeles require the applicant to provide a noise mitigation plan and to hold additional public meetings before granting the variance to allow work that would be performed outside of the permitted working hours.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-25—Noise Monitoring Conduct periodic noise measurement in accordance with an approved Noise	Verify compliance	Contractor	– Metro – Metro

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
Monitoring Plan, specifying monitoring locations, equipment, procedures, and schedule of measurements and reporting methods to be used.			– Construction
CON-26—Use of Specific Construction Equipment At night, use only construction equipment operating at the surface of the construction site under full load, are certified to meet specified lower noise level limits set in the Noise Control Plan, and specified in the noise variance application.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-27—Noise Barrier Walls for Nighttime Construction Where nighttime construction activities are expected to occur, erect Metro-designed noise barrier walls at each construction site prior to the start of construction activities. Barriers should be designed to reduce construction site noise levels by at least 5 dBA.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-28—Comply with Local Noise Ordnances The LPA will comply as applicable with the City of Los Angeles, City of Beverly Hills, and County of Los Angeles noise ordinances during construction hours. Compliance with City of Los Angeles, City of Beverly Hills, and County of Los Angeles standards for short-term operation of mobile equipment and long-term construction operations of stationary equipment, including noise levels and hours of operation, also will occur. Hours of construction activity will be varied to meet special circumstances and restrictions. Municipal and building codes of each city in the Study Area include restrictions on construction hours. The City of Los Angeles limits construction activity to 8 a.m. to 6 p.m. on Monday through Friday and 9 a.m. to 5 p.m. on Saturdays, with no construction on Sundays and Federal holidays. The City of Beverly Hills identifies general construction hours of 8:00 a.m. to 6:00 p.m. from Monday through Saturday. For all the cities in the Study Area, construction is prohibited on Sundays and city holidays. Construction outside of these working periods will require a variance from the applicable city. The variance processes for the Cities of Los Angeles and Beverly Hills and the County of Los Angeles require the applicant to provide a noise mitigation plan and hold additional public meeting,	Verify compliance	Contractor	– City of Los Angeles City of Beverly Hills City of Santa Monica City of West Hollywood, and County of Los Angeles – Metro – Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
CON-29—Signage Readily visible signs indicating "Noise Control Zone" will be prepared and posted on or near construction equipment operating close to sensitive noise sites.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-30—Use of Noise Control Devices Noise-control devices that meet original specifications and performance will be used.	Verify compliance	Contractor	– Metro – Metro – Project implementation
CON-31—Use of Fixed Noise-Producing Equipment for Compliance Fixed noise-producing equipment will be used to comply with regulations in the course of LPA-related construction activity.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-32—Use of Mobile or Fixed Noise-Producing Equipment Mobile or fixed noise-producing construction equipment that are equipped to operate within noise levels will be used to the extent practical.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-33—Use of Electrically Powered Equipment Electrically powered equipment will be used to the extent practical.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-34—Use of Temporary Noise Barriers and Sound-Control Curtains Temporary noise barriers and sound-control curtains will be erected where LPA-related construction activity is unavoidably close to noise-sensitive receivers.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-35—Distance from Noise-Sensitive Receivers Within each construction area, earth-moving equipment, fixed noise-generating equipment, stockpiles, staging areas, and other noise-producing operations will be located as far as practicable from noise-sensitive receivers.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-36—Limited Use of Horns, Whistles, Alarms, and Bells	Verify compliance	Contractor	– Metro

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
Use of horns, whistles, alarms, and bells will be limited for use as warning devices, as required for safety.			– Metro – Construction/Project Implementation
CON-37—Requirements on Project Equipment All noise-producing project equipment, including vehicles that use internal combustion engines, will be required to be equipped with mufflers and air-inlet silencers, where appropriate, and kept in good operating condition that meets or exceeds original factory specifications. Mobile or fixed "package" equipment (e.g., arc- welders, air compressors) will be equipped with shrouds and noise-control features that are readily available for that type of equipment.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-38—Limited Audibility of Project Related Public Addresses or Music Any LPA-related public address or music system will not be audible at any adjacent sensitive receiver.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-39—Use of Haul Routes with the Least Overall Noise Impact To the extent practical, based on traffic flow, designated haul routes for construction-related traffic will be used based on the least overall noise impact. For example, heavily loaded trucks will be routed away from residential streets if possible. Where no alternatives are available, haul routes will take into consideration streets with the fewest noise-sensitive receivers.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-40—Designated Parking Areas for Construction-Related Traffic Non-noise-sensitive designated parking areas for LPA-related traffic will be used.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-41—Enclosures for Fixed Equipment Enclosures for fixed equipment, such as TBM slurry processing plants, will be required to reduce noise.	Verify compliance	Contractor	– Metro – Metro – Construction
Mitigation: To ensure that noise and vibration impacts associated with construction are below threshold levels, Metro's plans, specifications, and estimates ("bid") documents will include the following measures:	Verify compliance	Contractor	– Metro – Metro – Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
CON-42—Phasing Ground Impacting Operations Demolition, earth moving, and ground impacting operations will be phased so as not to occur in the same time period.			
CON-43—Alternatives to Impact Pile Driving Impact pile driving will be avoided. Drill piles or sonic or vibratory drivers will be used where the geological conditions permit their use and where ground vibration damage risk criteria are satisfied.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-44—Alternative Demolition Methods Demolition methods will be selected to minimize noise and vibration impact where possible.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-45—Restriction on Use of Vibratory Rollers and Packers Use of vibratory rollers and packers will be avoided near vibration sensitive areas.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-46—Metro Ground-Born Noise and Ground-Born Vibration Limits If the Metro ground-borne noise limits or ground-borne vibration limits are exceeded, the contractor will be required to take action to reduce vibrations to acceptable levels. Such action could include reducing the muck train speed, additional rail and tie isolation, and more frequent rail and wheel maintenance.	Verify compliance	Contractor	– Metro – Metro – Construction
Construction (Energy)			
No mitigation required. However, to further ensure there is no a wasteful, inefficient, or unnecessary energy usage, Metro will require the construction contractor to implement energy conserving BMPs in accordance with Metro's Energy and Sustainability Policy	Verify Compliance	Metro	– Metro – Metro – Construction
Construction (Geologic Hazards)			
Mitigation: The following measures will be implemented to reduce impacts related to subsidence and settlement due to tunneling.	Verify compliance	Contractor	– Metro – Metro – Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
CON-47—Use of Pressurized-Face TBMs for Tunnel Construction To optimize control of the ground overlying and surrounding the tunnels and limit ground settlement to acceptable levels, pressurized-face TBMs will be used for tunnel construction, which will allow the tunnel lining to be installed and grout to be injected into the annulus between the lining and the ground immediately behind the TBM concurrently and without having to lower groundwater levels by dewatering.			
CON-48—Preconstruction Survey, Instrumentation, and Monitoring Preconstruction Survey, Instrumentation, and Monitoring: As added protection to detect tunneling-induced settlement and settlement induced by other excavation activities, pre-construction surveys will be performed to document the existing conditions of buildings along the alignment before tunneling begins, and instrumentation will be installed to monitor structures. During construction, instrumentation (e.g., ground surface and building monitoring programs) will be in place to measure movements and provide information to the resident engineer and contractor on tunneling performance, as well as to document that the settlement specifications are met. If measurements indicate settlement limits could be exceeded, the contractor will be required to change or add methods and/or procedures to comply with those limits. Construction work will be reassessed if settlements exceed action (warning) levels.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-49—Additional Geotechnical Exploration During the design phases, additional geotechnical exploration and analysis will be undertaken to confirm areas where dewatering will be required and if it will cause significant subsidence. If these conditions are found, methods to prevent lowering of the groundwater outside of the excavation will be employed. These methods could include use of slurry walls, secant pile walls, or other methods for the construction of the station walls to reduce the settlement impacts due to groundwater lowering.	Verify completion of research	Metro	– Metro – Metro – Final Design
CON-50—Additional Methods to Reduce Settlement Where conditions warrant (for example, more shallow tunnels directly below	Verify compliance	Metro	– Metro – Metro

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
sensitive structures or at cross-passages), additional methods to reduce settlement will be specified. Such methods could include the following: • Permeation grouting to improve the ground prior to tunneling • Compaction grouting to consolidate the ground above the tunnel • Compensation grouting as the tunnel is excavated • Underpinning the structure's foundation			– Construction
CON-51—Techniques to Lower the Risk of Exposure to Hydrogen Sulfide In areas where hydrogen sulfide is encountered, several techniques could be used to lower the risk of exposure. The primary measures to prevent exposure to hydrogen sulfide gas are separation of materials from the tunnel environment, and increased ventilation capacity to dilute gases to safe levels as defined by Cal/OSHA. Secondary measures could include pre-treatment of groundwater containing hydrogen sulfide by displacing and oxidation of the hydrogen sulfide by injecting water (possibly containing dilute hydrogen peroxide) into the ground and groundwater in advance of the tunnel excavation. This "in-situ oxidation" method reduces hydrogen sulfide levels even before the ground is excavated. This pre-treatment method is unlikely to be necessary where a slurry-face TBM is used, but may be implemented at tunnel-to-station connections or at cross-passage excavation areas and where open excavation and limited dewatering may be conducted such as emergency exit shafts and low-point sump excavations. When needed to reduce hydrogen sulfide to safe levels for slurry treatment; additives could be mixed with the bentonite (clay) slurry during the tunneling and/or prior to discharge into the slurry separation plant. For example, zinc oxide could be added to the slurry as a "scavenger" to precipitate dissolved hydrogen sulfide when slurry hydrogen sulfide levels get too high. Gas levels will be maintained in accordance with Cal/OSHA requirements for safe working environments.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-52—Measures to Reduce Cas Inflows For the stations in elevated gas zones, the use of relatively impermeable lagging, use of diaphragm or slurry walls or equivalent will be implemented to reduce of gas inflows both during and after construction. The slurry wall provides a thick	Verify compliance	Contractor	– Metro – Metro – Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
(typically 3 to 4 feet) concrete barrier against water and gas intrusion, and significantly reduces the need for dewatering the station during construction. Grout tubes can be pre-placed within slurry wall panels to be used in the event leakage occurs. Slurry walls present a challenge in accommodating existing utilities, and typically more utility relocation is required for slurry wall systems. Additional ventilation, continuous monitoring, and worker training for exposure to hazardous gases will also be required during station construction. In extreme cases, some work may require temporary use of personal protective equipment, such as fitted breathing apparatus.			
CON-53—Further Research on Oil Well Locations Prior to construction, more detailed research on oil well locations will be conducted. Detection of oil wells will include use of magnetic devices to sense oil well casings within the tunnel alignment. Where the tunnel alignment cannot be adjusted to avoid well casings, the California Department of Conservation (Department of Oil, Gas and Geothermal Resources) will be contacted to determine the appropriate method to re-abandon the well. Oil Well abandonment must proceed in accordance with California Laws for Conservation of Petroleum and Gas (1997), Division 3. Oil and gas, Chapter 1. Oil and Gas Conservation, Article 4, Sections 3228, 3229, 3230, and 3232. The requirements include written notification of the State Department of Oil, Gas and Geothermal Resources (DOGGR), protection of adjacent property, and before commencing any work to abandon any well, obtaining approval by the DOGGR. Abandonment work including sealing off oil/gas bearing units, pressure grouting etc, must be performed by a state-licensed contractor under the regulatory oversight and approval of DOGGR. Similarly, during construction if an unknown well is encountered, the contractor will notify Metro, Cal/OSHA, and the Gas and Geothermal Resources for well abandonment, and proceed in accordance with state requirements.	Verify completion of research on oil locations	Metro	– Metro – Metro – Prior to Construction
CON-54—Worker Safety for Gassy Tunnels Although not specifically required for gassy tunnels, workers will be supplied with oxygen-supply-type self-rescuers (breathing apparatus required for safety during	Verify compliance	Contractor	– Metro – Metro – Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
evacuation during fires).			
Construction (Hazardous Waste and Materials)			
Mitigation: In addition to the measures implemented as required by applicable regulations the following mitigation measures will be implemented so there will be no impact associated with hazardous waste and materials due to construction activities . CON-55—Site Assessments As detailed design-level plans are prepared, and precise LPA excavation limits defined, a more detailed Environmental Site Assessment (Phase II) will be conducted prior to construction in areas of impacted soil. A base line soil sampling protocol will be established with special attention to those areas of environmental concern. The soil will be assessed for constituents likely to be present in the subsurface including, but not limited to, total petroleum hydrocarbons, volatile and semi-volatile organic compounds, polychlorinated biphenyls, polynuclear aromatic hydrocarbons, pesticides, lead arsenates, and Title 22 metals. The depth of the sampling will be based on the depth of excavation or type of construction activities. In addition, in areas where groundwater will be encountered, samples will also be analyzed for suspected contaminants prior to dewatering to ensure that National Pollutant Discharge Elimination System discharge requirements are satisfied.	Verify completion of ESA and sampling	Metro	– Metro – Metro – Prior to Construction
CON-56—Soil Reuse As detailed design-level plans are prepared, and precise LPA excavation dimensions defined, a soil mitigation plan will be prepared showing the extent of soil excavation during construction. The soil mitigation plan will use Metro's Standard Specifications for soil reuse criteria, which include a sampling plan for stockpiled materials, and the disposition of materials that do not satisfy the reuse criteria. It will specify guidelines for imported materials. The plan will include provisions for soil screening for contamination during grading or excavation activities.	Verify compliance	Metro	– Metro – Metro – Prior to Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
CON-57—Sampling During Construction Metro will sample soil suspected of contamination and analyze the excavated soil for the purpose of classifying material and determining disposal requirements. If excavated soil is suspected or known to be contaminated, the contractor to perform the following operations: • Segregate and stockpile the material in a way that will facilitate measurement of the stockpile volume. • Spray the stockpile with water or an SCAQMD-approved vapor suppressant and cover the stockpile with a heavy-duty plastic (e.g., Visqueen) to prevent soil volatilization to the atmosphere or exposure to nearby workers.	Verify compliance	Metro	– Metro – Metro – Construction
CON-58—Soil Testing Soil samples that are suspected of contamination will be analyzed for suspected chemicals by a California certified laboratory. If contaminated soil is found, it will be removed, transported to an approved disposal location and remediated or disposed according to state and federal laws. Where contaminated levels can be diluted to acceptable levels soils may be re-used on-site.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-59—Personal Protection The contractor will provide qualified and trained personnel and personal protective equipment (PPE) to perform operations that require the disturbance of contaminated substances including excavation of stations, slurry/tunnel material processing, segregation, stockpiling, loading and hauling.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-60—Contaminated Groundwater Groundwater contamination encountered during subsurface construction activities may be treated on-site to acceptable local and state criteria and then discharged into the sanitary sewer. If on-site treatment is not feasible due to the type and severity of the contamination identified, the contaminated ground water may need to be disposed of by recycling in a permitted facility. If unanticipated contaminated groundwater (not included in the health and safety plan) is encountered during construction, the contractor will stop work in the vicinity, cordon off the area, and contact Metro and the appropriate hazardous waste coordinator and maintenance hazardous spill coordinator at Metro and will	Verify completion of testing of suspect contaminated groundwater	Metro/Contractor	– Metro – Metro – Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
immediately notify the Certified Unified Program Agencies (City of Los Angeles Fire Department, County of Los Angeles Fire Department, and Los Angeles Regional Water Quality Control Board [LARWQCB]) responsible for hazardous materials and wastes. In coordination with the LARWQCB, an investigation and remediation plan will be developed in order to protect public health and the environment. Any hazardous or toxic materials will be disposed according to local, state, and federal regulations.			
CON-61—Health and Safety Plan A health and safety plan will be required by LPA specifications. The plan will include response to exposure of personnel to constituents of concern identified in the Phase II Environmental Site Assessment.	Verify completion of health and safety plan and compliance	Metro	– Metro – Metro – Construction
CON-62—Storage of Contaminated Materials Hazardous or contaminated materials will be properly stored to prevent contact with precipitation and runoff.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-63—Monitoring the Environment An effective monitoring and cleanup program will be developed and implemented for spills and leaks of hazardous materials	Verify compliance	Metro	– Metro – Metro – Construction
CON-64—Equipment Repair and Maintenance Equipment to be repaired or maintained will be placed in covered areas on a pad of absorbent material to contain leaks, spills, or small discharges	Verify compliance	Contractor	– Metro – Metro – Construction
CON-65—Removal of Chemical Residue Any significant chemical residue on the construction sites will be removed.	Verify compliance	Contractor	– Metro – Metro – construction
Construction (Ecosystems/ Biological Resources)			
Mitigation: Mitigation measures will be required for compliance with the Migratory Bird Treaty Act and State migratory bird protection and to avoid and minimize impacts to bird species that may utilize trees that could be removed or disturbed during construction of the LPA.	Verify completion of biological surveys	Metro	– Metro – Metro – Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
CON-66—Biological Survey Two biological surveys will be conducted, one 15 days prior and a second 72 hours prior to construction that will remove or disturb suitable nesting habitat. The surveys will be performed by a biologist with experience conducting breeding bird surveys. The biologist will prepare survey reports documenting the presence or absence of any protected native bird in the habitat to be removed and any other such habitat within 300 feet of the construction work area (within 500 feet for raptors). If a protected native bird is found, surveys will be continued in order to locate any nests. If an active nest is located, construction within 300 feet of the nest (500 feet for raptor nests) will be postponed until the nest is vacated and juveniles have fledged and when there is no evidence of a second attempt at nesting.			
CON-67—Compliance with City Regulations If construction or operation of the LPA requires removal or pruning of a protected tree, a removal permit will be required in accordance with applicable municipal codes and ordinances of the city in which the affected tree is located. Within the City of Los Angeles, compliance with the Native Tree Protection Ordinance will require a tree removal permit from the Los Angeles Board of Public Works. Similarly, within the City of Beverly Hills, applicable tree protection requirements, such as tree removal permits, will be followed. Tree removal permits may require replanting of protected trees within the Study Area or at another location to mitigate for the removal of these trees.	Verify compliance	Metro/Contractor	– Metro – Metro – Construction
CON-68—Tree Pruning If construction or operation will entail pruning of any protected tree, the pruning will be performed in a manner that does not cause permanent damage or adversely affect the health of the trees.	Verify compliance	Metro/Contractor	– Metro – Metro – Construction
CON-69—Avoidance of Migratory Bird Nesting Season Construction activities that involve tree removal or trimming will be timed to occur outside the migratory bird nesting season, which occurs generally from March 1st through August 31st and as early as February 1st for raptors.	Verify compliance	Metro/Contractor	– Metro – Metro – Construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
Construction (Hydrology and Water Resources)			
Mitigation: In addition to the measures identified for geologic hazards and hazardous wastes and materials, the following measures are recommended to avoid and minimize impacts to water resources and water quality as they relate to groundwater. CON-70—Methods to Control Contaminated Groundwater In the event contaminated groundwater is encountered in test borings and it is determined that contamination is likely to spread, this concern will be mitigated during design and engineering. For example, perched contaminated groundwater in upper levels of the excavation could be allowed to contaminate groundwater in lower levels of an excavation. Methods to control this could include isolation of dewatering systems or/and use of groundwater barriers.	Verify mitigation is completed during project design and engineering.	Metro	– California State Water Resources Control Board (SWRCB) – Metro – Final Design

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
CON-71—Plan if Contaminated Groundwater is Encountered If contaminated groundwater is encountered during construction, the contractor will stop work in the vicinity, cordon off the area, and contact the appropriate hazardous waste coordinator and maintenance hazardous spill coordinator at Metro and immediately notify the Certified Unified Program Agencies (City of Los Angeles Fire Department, County of Los Angeles Fire Department, and Los Angeles RWQCB) responsible for hazardous materials and wastes. Through coordination with the Los Angeles RWQCB, an investigation and remediation plan will be developed to protect public health and the environment. The contractor will treat or dispose of any hazardous or toxic materials according to local, State, and Federal regulations.	Verify compliance	Metro/Contractor	– California State Water Resources Control Board (SWRCB) – Metro – Construction
Mitigation: In addition to the measures identified for geologic hazards and hazardous wastes and materials, the following measures are recommended to avoid and minimize impacts to water resources and water quality as they relate to drainage: CON-72—Erosion and Sediment Control Plan An erosion and sediment control plan will be established prior to construction. The plan will include the following BMPs as appropriate: • Use of natural drainage, detention ponds, sediment ponds, or infiltration pits to allow runoff to collect and to reduce or prevent erosion • Use of barriers to direct and slow the rate of runoff and to filter out large-sized sediments • Use of down drains or chutes to carry runoff from the top of a slope to the bottom; • Control of the use of water for irrigation so as to avoid off-site runoff	Monitor compliance	Metro	– California State Water Resources Control Board (SWRCB) – Metro – Construction
CON-73—Landscape and Construction Debris Landscape and construction debris will be periodically and consistently removed.	Monitor compliance	Metro	– California State Water Resources Control Board (SWRCB) – Metro

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
			– Final Design
CON-74—Use of Non-Toxic Herbicides or Fertilizers Non-toxic alternatives will be employed for any necessary applications of herbicides or fertilizers.	Monitor compliance	Metro	– California State Water Resources Control Board (SWRCB) – Metro – Construction
CON-75—Use of Temporary Detention Basins Temporary detention basins will be installed to remove suspended solids by settlement.	Verify compliance	Contractor	– California State Water Resources Control Board (SWRCB) – Metro – Construction
CON-76—Water Quality Monitoring Water quality of runoff will be periodically monitored before discharge from the site and into the storm drainage system	Verify compliance	Metro/Contractor	– California State Water Resources Control Board (SWRCB) – Metro – Construction
Mitigation: BMPs for tunnel construction activities will include, but are not limited to, the following measures. CON-77—Use of Stormwater Runoff BMPs Construction sites will have BMPs to divert stormwater runoff from entering the construction area. Containment around the site will include use of temporary measures such as fiber rolls to surround the construction areas to prevent any spills of slurry discharge or spoils recovered during the separation process. Downstream drainage inlets will also be temporarily covered to prevent discharge from entering the storm drain system.	Verify compliance	Metro/Contractor	– California State Water Resources Control Board (SWRCB) – Metro – Construction
CON-78—Measures to Reduce the Tracking of Sediment and Debris	Verify compliance	Metro/Contractor	– California State

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
Construction entrances/exits will be properly set up so as to reduce or eliminate the tracking of sediment and debris offsite. Appropriate measures will include measures such as grading to prevent runoff from leaving the site, and establishing "rumble racks" or wheel water points at the exit to remove sediment from construction vehicles.			Water Resources Control Board (SWRCB) – Metro – Construction
CON-79—Cleaning of Equipment Onsite rinsing or cleaning of any equipment will be performed in contained areas and rinse water will be collected for appropriate disposal.	Verify compliance	Metro/Contractor	– California State Water Resources Control Board (SWRCB) – Metro – Construction
CON-80—Construction Site Water Collection A tank will be required on work sites to collect the water for periodic offsite disposal. Since the slurry production is a closed-loop system in which the water separated from the discharge slurry is continually recycled, minimal and infrequent water discharges are anticipated. These discharges could be accommodated in a tank onsite to collect the water and disposed of periodically.	Verify compliance	Contractor	– California State Water Resources Control Board (SWRCB) – Metro – Construction
CON-81—Soil and Building Material Storage Soil and other building materials (e.g., gravel) stored onsite must be contained and covered to prevent contact with stormwater and offsite discharge.	Verify compliance	Contractor	– California State Water Resources Control Board (SWRCB) – Metro – Construction
Construction (Parks and Community Facilities)			
Mitigation: In addition to the measures for communities and neighborhoods, the following measures will avoid and minimize impacts to parks and community facilities. CON-82—Communication with Schools School districts and private school institutions along the alignment will be informed of changes to Metro bus routes, school bus routes, and pedestrian	Verify coordination	Metro	– Metro – Metro – Prior to construction

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
crossings prior to construction.			
CON-83—Work with Transportation, Police, Public Works, and Community Service Departments Metro will work with transportation, police, public works, and community services departments of jurisdictions along the alignment to implement mutually agreed upon measures, such as posting of clearly marked signs, pavement markings, lighting as well as implementing safety instructional programs, to enhance the safety of pedestrians, particularly in the vicinity of schools and access routes to hospitals. The measures will be developed to conform to Metro Rail Transit Design Criteria and Standards, Fire/Life Safety Criteria, Volume IX.	Verify coordination and compliance	Metro	– Metro – Metro – Prior to Construction
CON-84—Instructional Rail Safety Programs for Schools Metro will provide at no charge to school districts an instructional rail safety program with materials to all affected elementary middle and high schools.	Verify coordination and implementation of Public Outreach Program	Metro	– City of Los Angeles – Metro – Prior to Construction and project implementation
CON-85—Informational Program to Enhance Safety Metro will provide an on-going informational program to nearby medical facilities, senior centers, and parks if requested by these facilities, to enhance safety. The program will be similar to that described for the schools except the information and materials provided will be geared toward senior citizens.	Verify coordination and implementation of Public Outreach Program	Metro	– Metro – Metro – Construction
CON-86—Traffic Control Contractors will be required to control traffic during construction by following the City of Los Angeles Work Area Traffic Control Manual; City of Los Angeles Bureau of Engineering Standard Plan S-610-12 (Notice to Contractors-Comprehensive); and the Bureau of Engineering Standard Specifications for Public Works Construction. Comparable standards will be enforced for work conducted in the other jurisdictions along the alignment.	Verify compliance	Contractor	– Metro – Metro – Construction
CON-87—Designation of Safe Emergency Vehicle Routes	Verify coordination	Metro	– Metro

Mitigation Measures	Monitoring Action	Party Responsible for Implementing Mitigation	– Enforcement Agency – Monitoring Agency – Timeframe
Safe emergency vehicle routes will be designated around construction sites. The identification of the routes will be coordinated with other agencies.			– Metro – Prior to Construction
Construction (Economic and Fiscal)			
CON-88—Minimize Disruption of Access to Businesses Both standard and site-specific mitigation measures will be developed to minimize disruption of pedestrian access to businesses and disruption of general vehicular traffic flow or access to specific businesses. Implementation of mitigation measures CON-1, TCON-1, T-CON-4, TCON-7, TCON-8, TCON-10, and TCON-11 will further reduce construction impacts to businesses.	Verify inclusion into project design and implementation	Metro	– Metro – Metro – Construction

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

WESTSIDE SUBWAY EXTENSION PROJECT
ENGINEERING MANAGEMENT SERVICES

Contract No. PS-4350-2000



Traffic Management Plan (Draft)

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Metro

Prepared by:

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Table of Contents

List of Figures

List of Tables

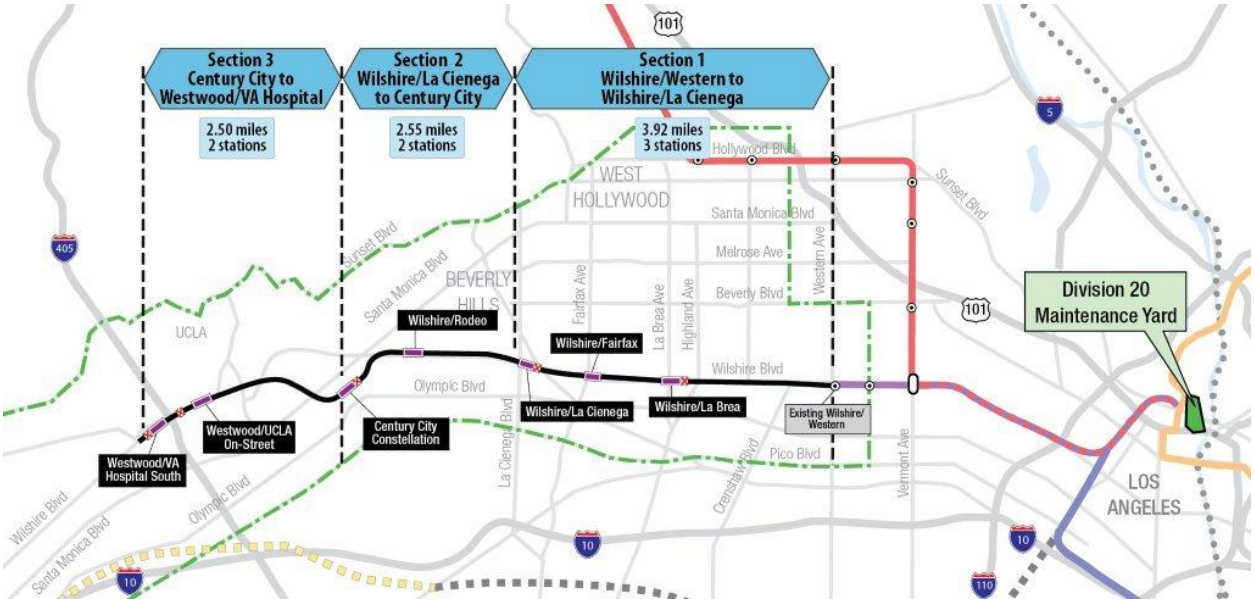
List of Appendices

1.0 PROJECT DESCRIPTION & PURPOSE OF TRAFFIC MANAGEMENT PLAN (TMP)

1.1 Project Description

The Westside Subway Extension is an extension of the Metro Purple Line along the Wilshire Boulevard corridor in Los Angeles County. Section 2 of the Project extends approximately 2.55 miles underground beneath Wilshire Boulevard and Constellation Boulevard from the west end of the La Cienega Station tail tracks in the vicinity of the intersection of Wilshire Boulevard and Stanley Drive. Section 2 lies within two local jurisdictions – the City of Los Angeles, and the City of Beverly Hills and follows an east-west alignment with one underground station located beneath Wilshire Boulevard near Rodeo Drive before heading southwest to Constellation Boulevard with one underground station located beneath Constellation Boulevard at Avenue of the Stars – see Figure 1-1. Each Station will be constructed by cut and cover within the street right of way. Soldier piles and lagging have been assumed for excavation support but the eventual shoring system will be determined by the Contractor. The station excavations will be decked over to maintain traffic during tunneling and the station construction.

Figure 1-1: Project Map



1.2 Purpose of TMP

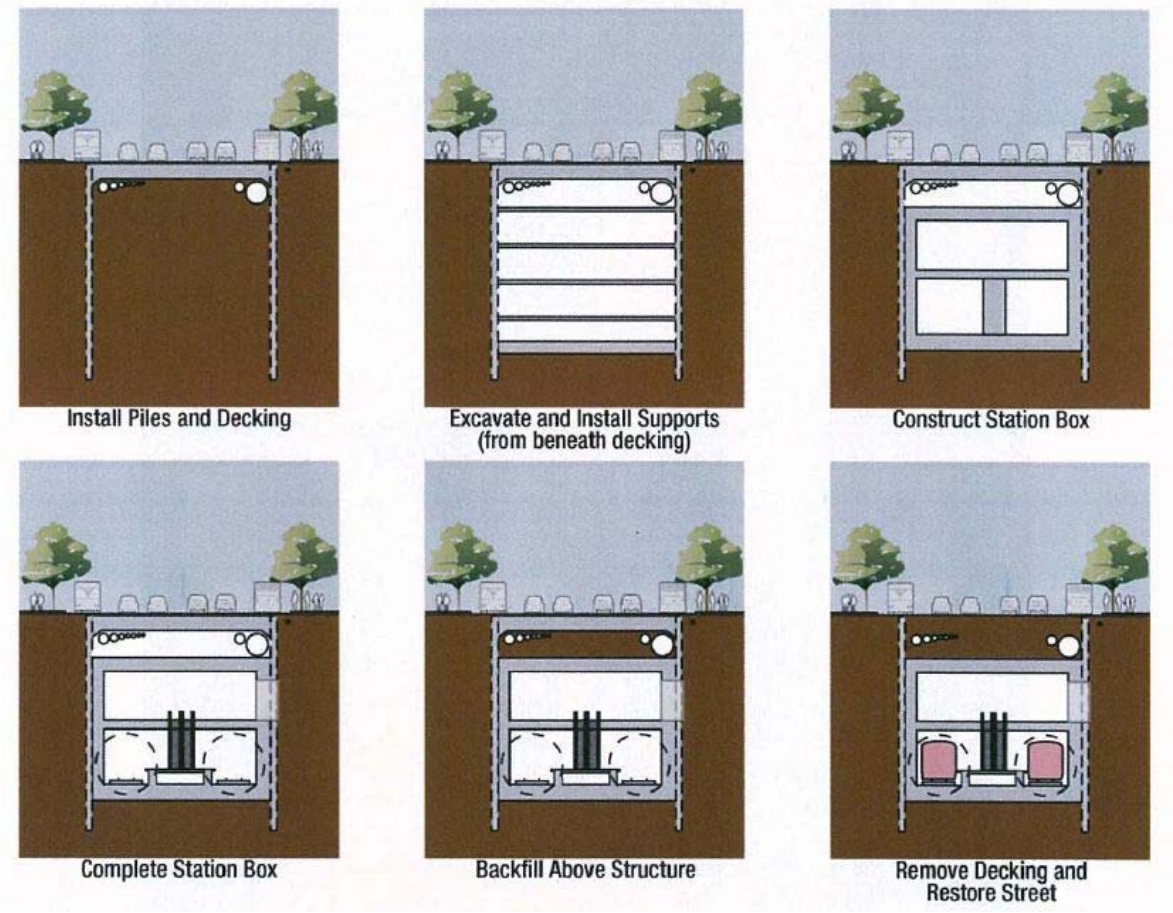
Due to the significant time required to set up traffic control, mobilize large pile drilling rigs and supporting equipment and restore streets on a daily basis, it is impractical to mobilize and demobilize equipment each day to keep all traffic lanes open for peak hour traffic. Metro is submitting this Traffic Management Plan, including work area traffic control plans (WTCP), and Temporary Signal Plans to obtain peak hour exemption permits for soldier pile installation. Permits from both City of Los Angeles and the City of Beverly Hills are needed prior to February of 2016, the close of the bid period for Contract C1120 - Section 2 Design Build.

2.0 CONSTRUCTION APPROACH FOR SOLDIER PILE INSTALLATION

The construction approach is to install the soldier piles in stages, closing one side of the street at a time to create a construction work site of sufficient size to position the piling rig and supporting equipment whilst maintaining one lane of traffic in each direction. The exception to this approach is during pile installation at the street intersections. For major intersections the piles will be installed across the intersection in stages during weekends, maintaining traffic in both directions and along intersecting streets, but with some restrictions on left and right turns. For minor intersections, the intersection will be temporarily closed during pile installation and a restriction will be placed on entering or exiting adjoining streets via Constellation Boulevard. For driveways and entrances to parking garages, pile installation will be phased where possible to allow the driveway to remain in service, or carried out during times (nights and weekends) when driveways can be closed.

Once the piles are installed, the street will be partially excavated to a depth of approximately 8 to 12 feet and the street will be decked over. The decking installation will be performed in stages during weekend closures with the street reopened for Monday morning traffic. A typical cut and cover construction approach is shown in Figure 2-1.

Figure 2-1: Cut and Cover Construction Approach



3.0 CENTURY CITY CONSTELLATION STATION

Tunneling lies on the Critical Path for the project. Advancing the excavation of the east end of the station box permits tunneling to begin earlier. To do so, the most easterly 250 feet of the station box, called the Launch Box, will be excavated first to expedite launching of the TBM. To clear the Launch Box pile corridor, advanced utility relocations will be undertaken. While piling of the Launch Box is under way, utility relocations for the remainder of the station box will continue concurrently.

Once utility relocations west of the Launch Box are complete, piling and street decking for the remainder of the Constellation Station will proceed.

3.1 Construction Durations

The construction durations for soldier pile installation are based on obtaining peak hour exemptions. Due to the size of equipment and the extensive traffic control required to set up the necessary lane closures, it is not practical to perform the pile drilling without peak hour exemptions. It is assumed that pile drilling will be conducted during normal City of Los Angeles Work hours with the peak hour exemption. Construction durations for pile drilling at Century City/Constellation in the City of Los Angeles are based on the following work hours.

- Pile drilling - Monday through Friday. 07:00 to 21:00 with other work continuing beyond 21:00 under a night-time noise variance.
- Pile drilling Saturday. Pile drilling Sundays. 08:00 to 18:00 with other work continuing on beyond 18:00 under a night-time noise variance. Pile drilling and pile installation in the intersection of Constellation Boulevard with Avenue of the Stars and across major underground parking garage entrances is assumed to occur during weekends with continuous work authorized between 21:00 on Friday through 06:00 on the following Monday morning.

Construction durations also depend on the productivity achieved in drilling piles, which can vary greatly depending on the nature of the ground, obstructions encountered, ground water inflow and other unforeseen conditions. Ten hours drilling per pile has been assumed for the Launch Box. Fifteen hours drilling per pile has been assumed for the longer piles required in the Station Box.

4.0 STAGES OF CONSTRUCTION FOR SOLDIER PILE INSTALLATION

Installation of the soldier piles and decking along Constellation Boulevard at the Century City/Constellation Station will take place during ten major construction stages. The following sections present a description of each major construction stage at each construction site location. The traffic control plan exhibits showing details of the proposed stages of construction are presented in Appendix A.

The traffic control elements common to all stages of work will include:

- Removal of conflicting signage and striping.
- Installation of K-rails and crash cushions per approved.
- Installation of channelizers, delineators and barricades per approved.
- Installation of signs, advance warning devices, flashing arrow boards and portable changeable signs as required.

4.1 Constellation Station

The construction stages for soldier pile installation at Century City/Constellation Station are shown in Figure 4-1. The anticipated sequence of soldier pile installation and durations at Century City/Constellation Station is summarized in Figure 4-2. Activity durations are based on 10 hours drilling time per pile for launch box piles and 15 hours per pile for the station piles

Figure 4-1: Soldier pile construction stages at Century City/Constellation Station

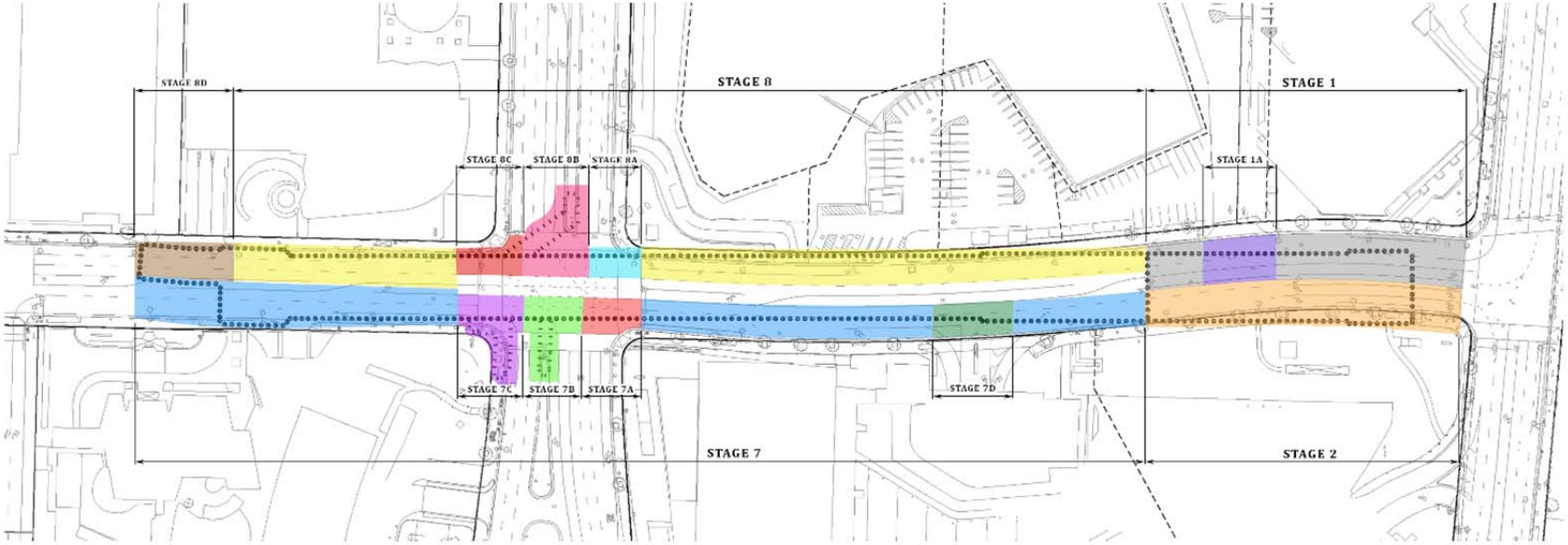
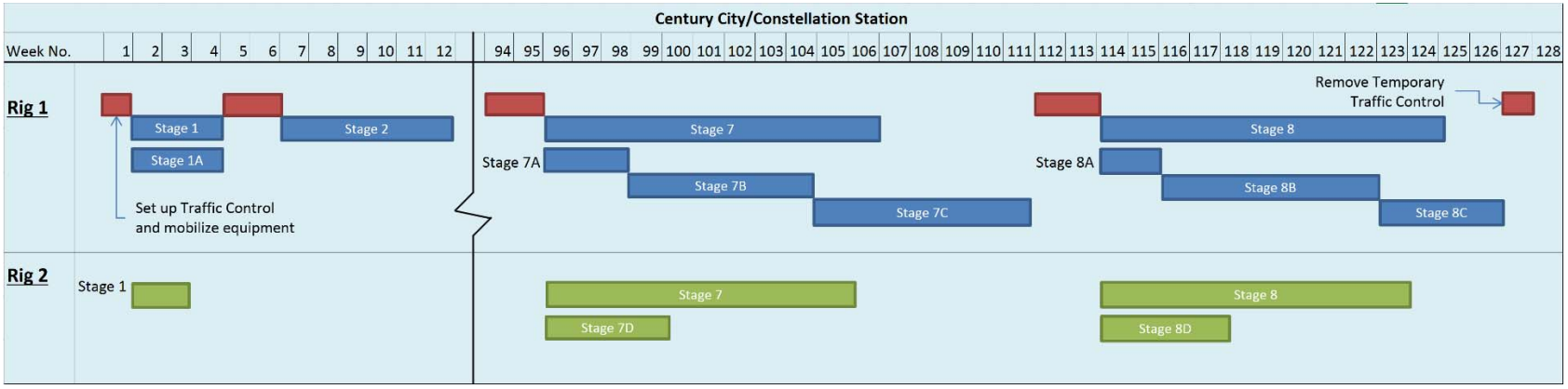


Figure 4-2: Soldier Pile installation schedule at Century City/Constellation Station



4.1.1 Work in Advance of Piling and Decking

The advance work will serve to clear utilities out of the pile corridor and decking for the Launch Box. In the first phase, telecommunication lines will be moved into a single joint trench. In the second phase, water and gas lines will be relocated concurrently with AT&T cable pulling and splicing at the joint trench. Work on both can be completed concurrently by closing the north lanes and maintaining traffic flow on the south of the street with two lanes in each direction. The water and SCG lines will connect to the existing service lines once clear of the Launch Box. Power relocations will follow the completion of water and SCG relocations. Both phases only require Watch Manual for traffic control and will not require the use of K-rail.

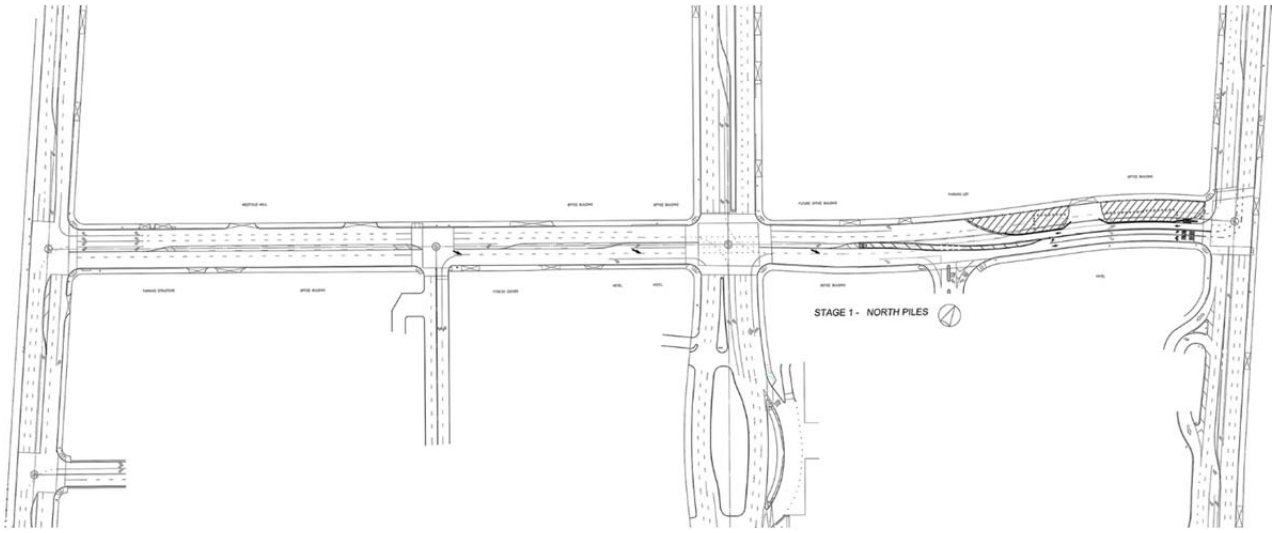
4.1.2 Stage 1: Launch Box Piling – North Side

Work area during this stage will be along the north side of Constellation Boulevard between Century Park East and the underground parking garage entrance to 10100 Constellation Boulevard. Traffic will be moved to the south side of Constellation Boulevard. The affected travel control zone will extend from Solar Way to Century Park East. Due to the size of the pile drilling and support equipment, the work area will remain in-place for an extended period of time, requiring an exemption from L.A.M.C. 62.61 from the Bureau of Engineering (LABOE) for work performed during peak hours. The traffic control elements in this stage will include:

- Reconfiguration of travel lanes to one lane each direction along the east end of Constellation Boulevard and with a left turn pocket to northbound Century Park East
- Elimination of parking on both sides of Constellation Boulevard within the work area limits.
- Relocation of bus stops within work areas
- Maintain local access to businesses at all times.
- Maintain pedestrian access on north and south sides of the street at all times.

All pile drilling performed during this stage will occur during normal working hours; Monday – Friday 07:00 to 21:00 and Saturday from 08:00 to 18:00. Metro will request a night time noise variance to work additional hours at the end of these shifts for non-drilling activities such as pile setting, concreting, trenching. The proposed staging is presented in Figure 4-3.

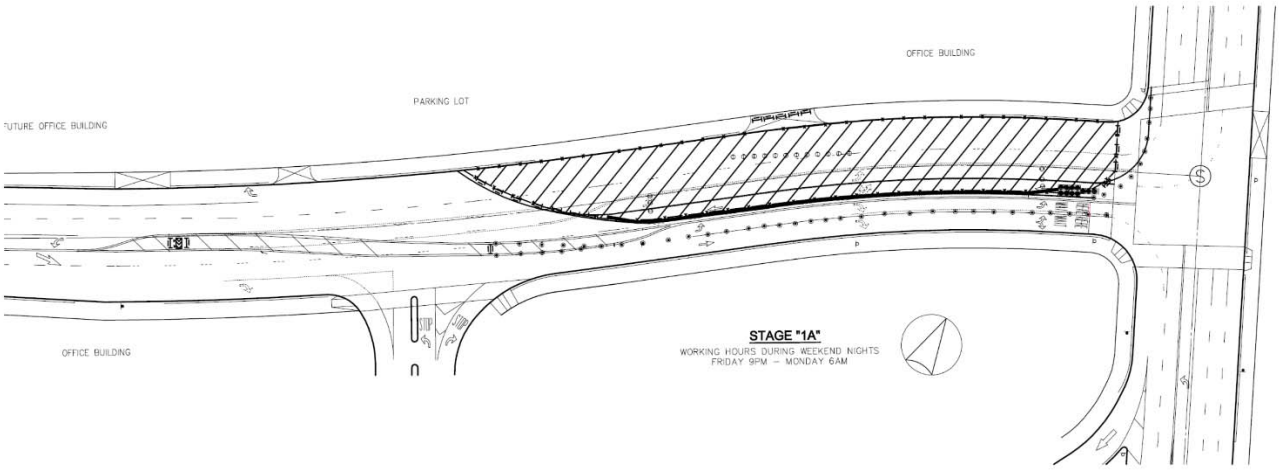
Figure 4-3: Closure for Launch Box Piling, North Side at Constellation/Century City Station



4.1.3 Stage 1A: Launch Box Piling – North Side

Work area during this stage (Figure 4-4) will be along the north side of Constellation Boulevard across the entrance to the Watt Plaza alley. The work during this stage will require the closure of the Constellation Boulevard entrance to the Watt Plaza alley. An alternate entrance on Century Park East will remain open. Pedestrian access will be maintained on both sides of Constellation Boulevard throughout this stage. All work performed during stage will occur over weekends from Friday 9:00 pm to Monday 6:00 am, with access to the alley from Constellation Boulevard becoming available on Monday 6:00 am. Constellation Boulevard will have minimum of one travel lane available in each direction.

Figure 4-4: Closure for Launch Box Piling, North Side at Constellation/Century City Station



4.1.4 Stage 2: Launch Box Piling – South Side and Utility Relocations

Work area during this stage will be along the south side of Constellation Boulevard between Century Park East and the underground parking garage entrance to 10100 Constellation Boulevard for pile installation, and along the north side of Constellation Boulevard between the Watt Plaza alley at 10131

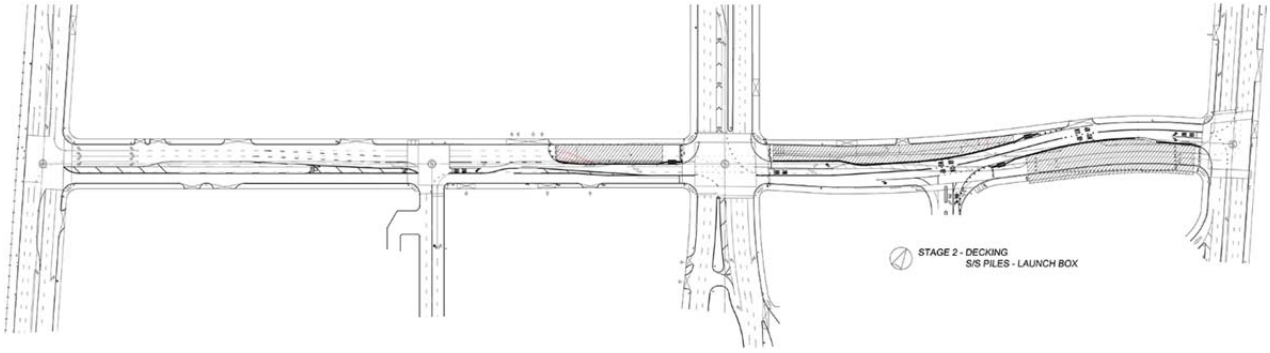
Constellation Boulevard and Solar Way for utility relocation work. The affected travel control zone will extend between Century Park West and Century Park East. Due to the size of the pile drilling and support equipment, the work area will remain in-place for an extended period of time, requiring an exemption from L.A.M.C. 62.61 from the Bureau of Engineering (LABOE) for work performed during peak hours. The traffic control elements in this stage will include:

- Reconfiguration of travel lanes to one lane each direction along Constellation Boulevard between Century Park West and Century Park East.
- Elimination of parking on both sides of Constellation Boulevard within the work area limits.
- Relocation of bus stops within work areas.
- Maintain local access to businesses at all times.
- Relocation of valet parking for Craft Restaurant at 10100 Constellation Boulevard to Avenue of the Stars.
- Maintain pedestrian access on north side of the street at all times.
- With the exception of the section of sidewalk along the south of Constellation Boulevard between Century Park East and the underground parking garage entrance to 10100 Constellation Boulevard, maintain pedestrian access on south side of the street at all times. Pedestrian access to the south of Constellation Boulevard between Century Park East and the underground parking garage entrance to 10100 Constellation Boulevard shall be restored upon completion of pile construction work on the sidewalk.

All pile drilling performed during this stage will occur during normal working hours; Monday – Friday 07:00 to 21:00 and Saturday from 08:00 to 18:00. Metro will request a night time noise variance to work additional hours at the end of these shifts for non-drilling activities such as pile setting, concreting, trenching.

While piling is underway in the work zone on the south of Constellation Boulevard near the Century Park East intersection, utility relocations will be taking place in the work zone on the north of Constellation Boulevard between Solar Way and the Watt Plaza alley at 10131 Constellation Boulevard to clear the remainder of the pile corridor. The proposed staging is presented in Figure 4-5.

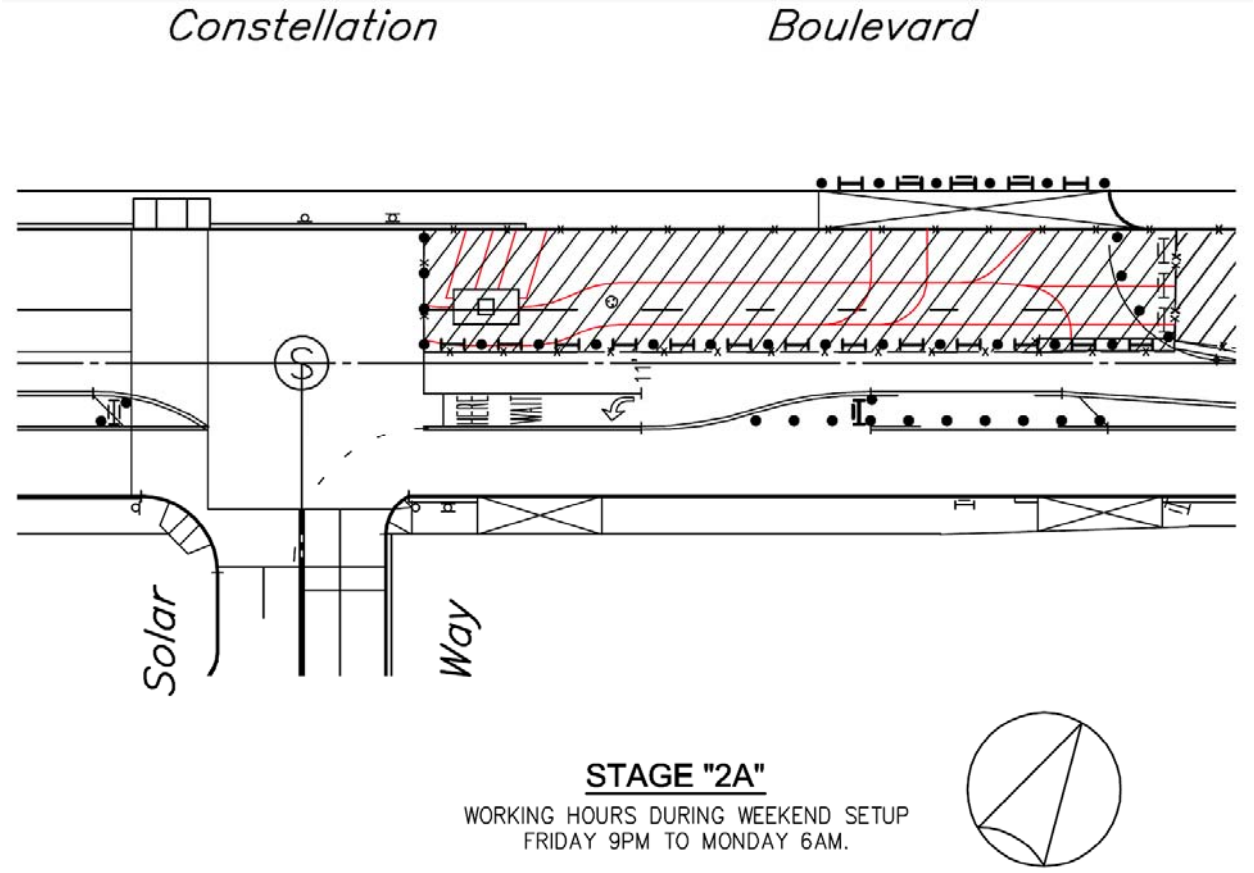
Figure 4-5: Closure for Launch Box Piling, South Side at Constellation/Century City Station



4.1.5 Stage 2A: Launch Box Piling – South Side and Utility Relocations with Weekend Closure

Work area during this stage (Figure 4-6) will be along Constellation Boulevard between Solar Way and the parking garage entrance to 1999 Avenue of the Stars and will require a weekend closure of this section of Constellation Boulevard. The work during this stage will require the closure of the underground parking garage at 1999 Avenue of the Stars for utility relocations. Pedestrian access will be maintained on the north side of Constellation Boulevard throughout this stage. All work performed during stage will occur over weekends from Friday 9:00 pm to Monday 6:00 am, with access to the parking garage from Constellation Boulevard becoming available on Monday 6:00 am.

Figure 4-6: Closure for Launch Box Piling, South Side and Utility Relocations with Weekend Closure



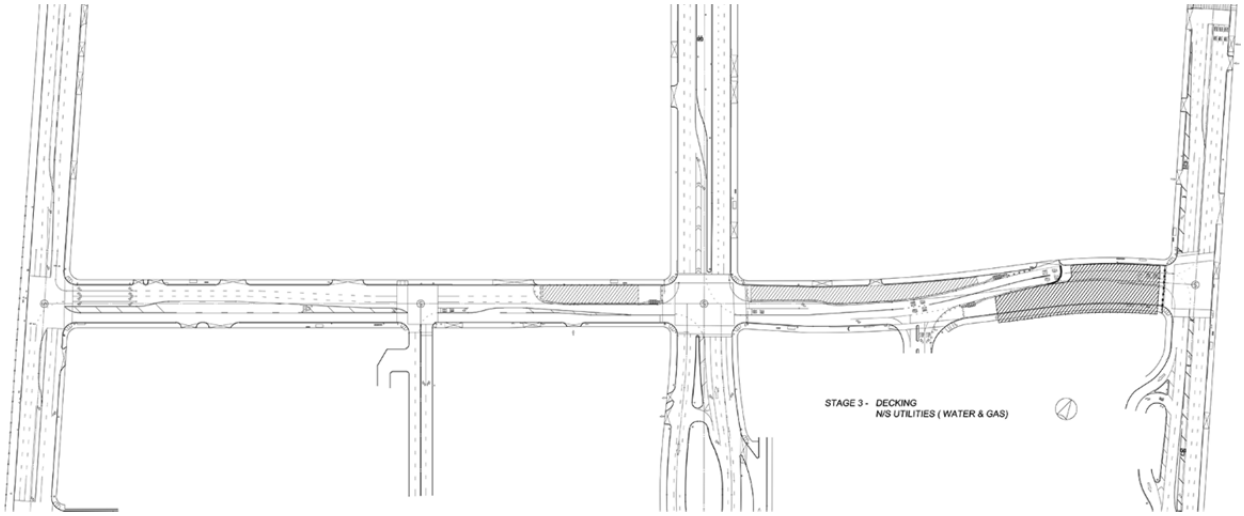
4.1.6 Stage 3: Launch Box Decking

Work area during this stage will be the full width of Constellation Boulevard between Century Park East and the Watt Plaza at 10131 Constellation Boulevard and extending on the south side of Constellation Boulevard to the entrance to the underground parking structure at 10100 Constellation Boulevard for decking installation, and along the north side of Constellation Boulevard between the Watt Plaza alley at 10131 Constellation Boulevard and Solar Way for utility relocation work. The affected travel control zone will extend from Century Park West to Century Park East. Eastbound traffic on Constellation Boulevard will be detoured before crossing Avenue of the Stars, with only local access traffic permitted to continue straight through Avenue of the Stars to the underground parking garage at 10100

Constellation Boulevard. The proposed staging is presented in Figure 4-7. Access will be maintained to all driveways, alleys, and garage entrances. The traffic control elements in this stage will include:

- Reconfiguration of travel lanes to one lane each direction along Constellation Boulevard between Century Park West and Watt Plaza Alley.
- Elimination of parking on both sides of Constellation Boulevard within the work area limits.
- Prohibition of turns onto Constellation Boulevard from Century Park East.
- Maintain local access to businesses at all times.
- Maintain pedestrian access on both sides of the street at all times except for the south sidewalk between Century Park East and 10100 Constellation Boulevard, which will be closed.

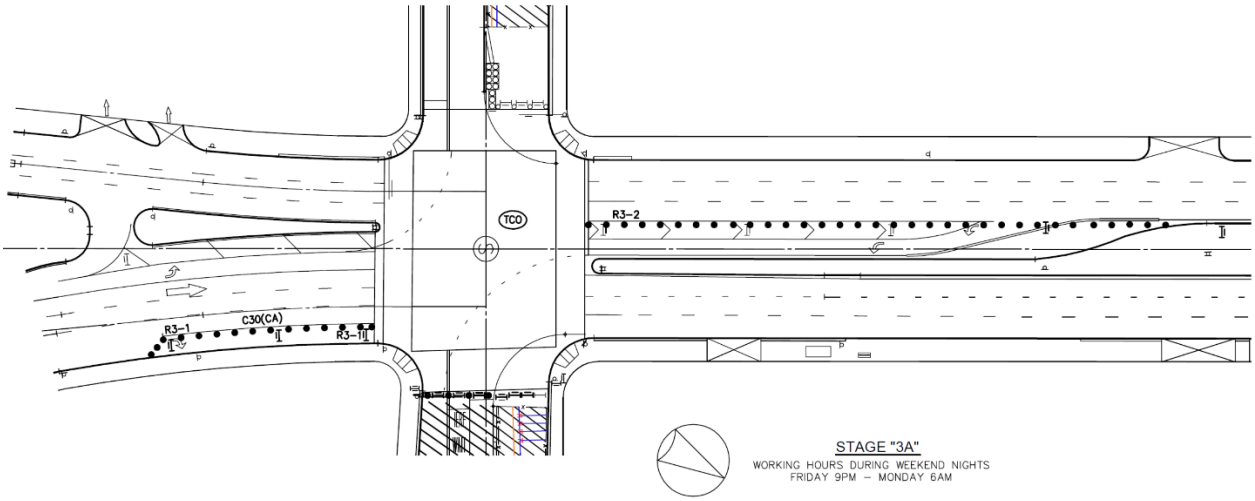
Figure 4-7: Full Closure for TBM Assembly and Launch at Constellation/Century City Station



4.1.7 Stage 3A: Launch Box Decking – Weekend Closure

Work area during this stage (Figure 4-8) will be along Constellation Boulevard between Avenue of the Stars and Century Park East and will require the full closure of this section of Constellation Boulevard. The work during this stage will require the closure of the Constellation Boulevard entrance to the Watt Plaza alley and the entrance to the underground parking garage at 10100 Constellation Boulevard. Pedestrian access will be maintained on the north side of Constellation Boulevard throughout this stage. All work performed during stage will occur over weekends from Friday 9:00 pm to Monday 6:00 am, with access to the alley from Constellation Boulevard becoming available on Monday 6:00 am.

Figure 4-8: Full Closure for TBM Assembly and Launch at Constellation/Century City Station



4.1.8 Stage 4: Launch Box Excavation

Work area during this stage will be along the south side of Constellation Boulevard between Century Park East and the underground parking garage entrance to 10100 Constellation Boulevard, as well as along the north side of Constellation Boulevard between the Watt Plaza alley at 10131 Constellation Boulevard and Solar Way. The affected travel control zone will extend between Century Park West and Century Park East. Due to the usage of heavy equipment, intense effort, continual production requirement in limited space during this stage, the work area will remain in-place for an extended period of time thus requiring an exemption from L.A.M.C. 62.61 from the Bureau of Engineering (LABOE) for work performed during peak hours. The traffic control elements in this stage will include:

- Reconfiguration of travel lanes to one lane each direction along Constellation Boulevard between Century Park West and Century Park East.
- Elimination of parking on both sides of Constellation Boulevard within the work area limits.
- Relocation of bus stops within work areas.
- Relocation of valet parking for Craft Restaurant at 10100 Constellation Boulevard to Avenue of the Stars.
- Maintain local access to businesses at all times.
- Maintain pedestrian access on north and south sides of the street at all times, except for the south sidewalk on Constellation Boulevard between 10100 Constellation Boulevard and Century Park East, which will be closed during this stage.

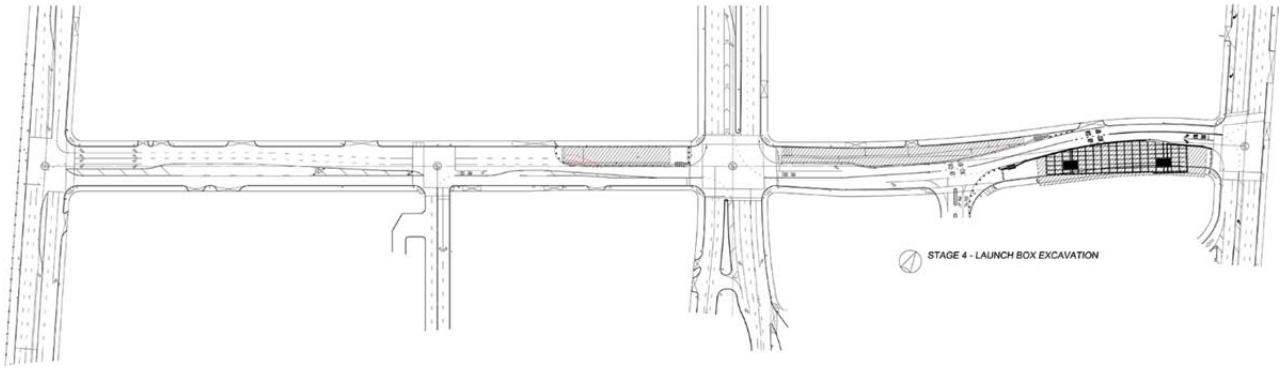
Excavation activities performed during this stage will occur during normal working hours; Monday – Friday 07:00 to 21:00 and Saturday from 08:00 to 18:00. Metro will request a night time noise variance to work additional hours at the end of these shifts.

While Launch Box excavation is underway in the work zone on the south of Constellation Boulevard near the Century Park East intersection, utility relocations will be taking place in the work zone on the north

of Constellation Boulevard between Solar Way and the Watt Plaza alley at 10131 Constellation Boulevard to clear the remainder of the pile corridor.

Haul trucks will enter the construction zone just to the east of 10100 Constellation Boulevard to be loaded with excavated material. They will leave through the east end of the construction zone and turn left onto Century Park East. The proposed staging is presented in Figure 4-9.

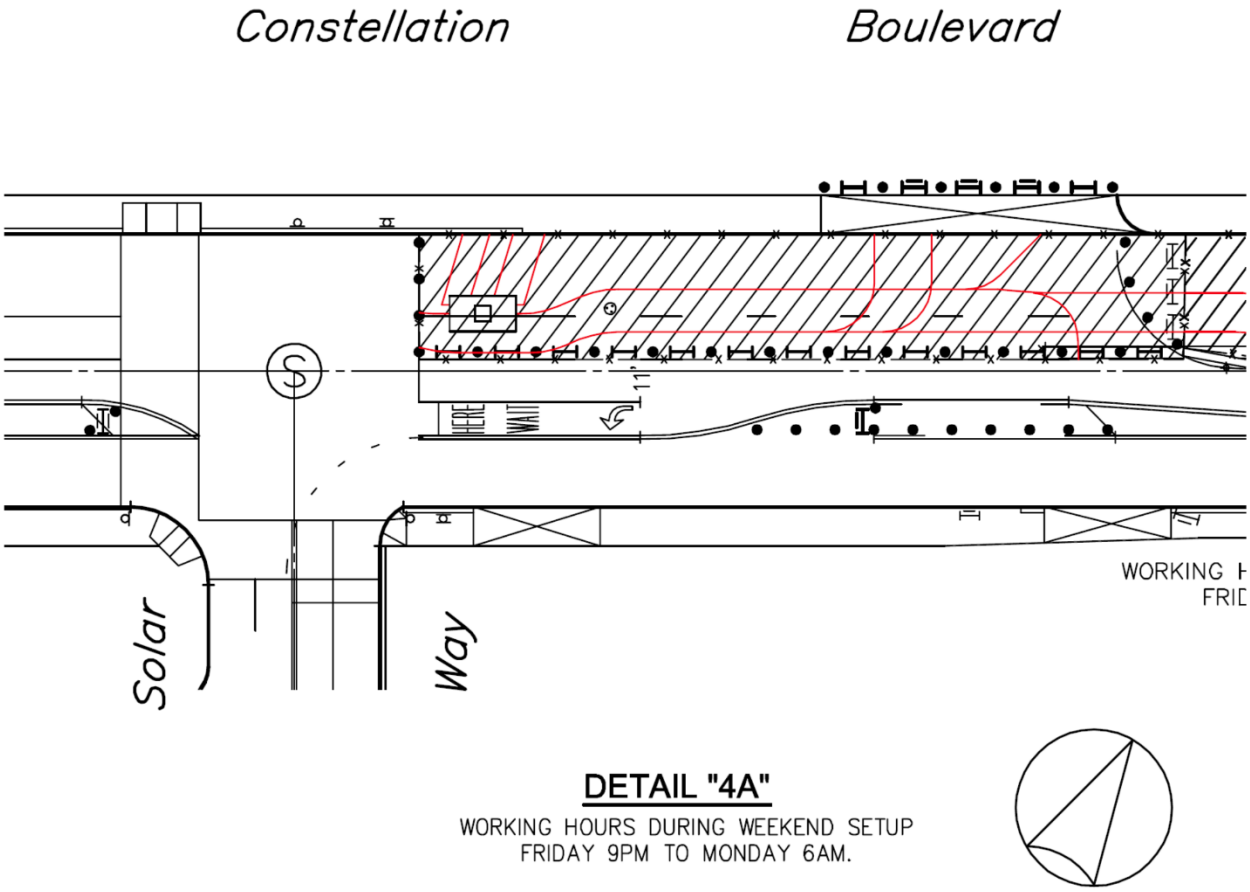
Figure 4-9: Closure for Launch Box Excavation at Constellation/Century City Station



4.1.9 Stage 4A: Launch Box Excavation – Weekend Closure

Work during this stage will consist of utility relocations at the parking garage entrance to 1999 Avenue of the Stars. The work area will extend into three eastbound lanes requiring shifting of traffic Lanes to the south side of Constellation Boulevard and restriction of all turns into and out of the parking garage. Pedestrian access will remain open along the North of Constellation Boulevard throughout this stage. All work performed during this stage will occur over weekends from Friday 9:00 pm to Monday 6:00 am, with lanes becoming operational on Monday 6:00 am. Constellation Boulevard will have a minimum of one travel lane available in each direction. Left turns onto Solar Way will be maintained. The proposed staging is presented in Figure 4-10.

Figure 4-10: Full Closure for TBM Assembly and Launch at Constellation/Century City Station



4.1.10 Stage 5: TBM Launch

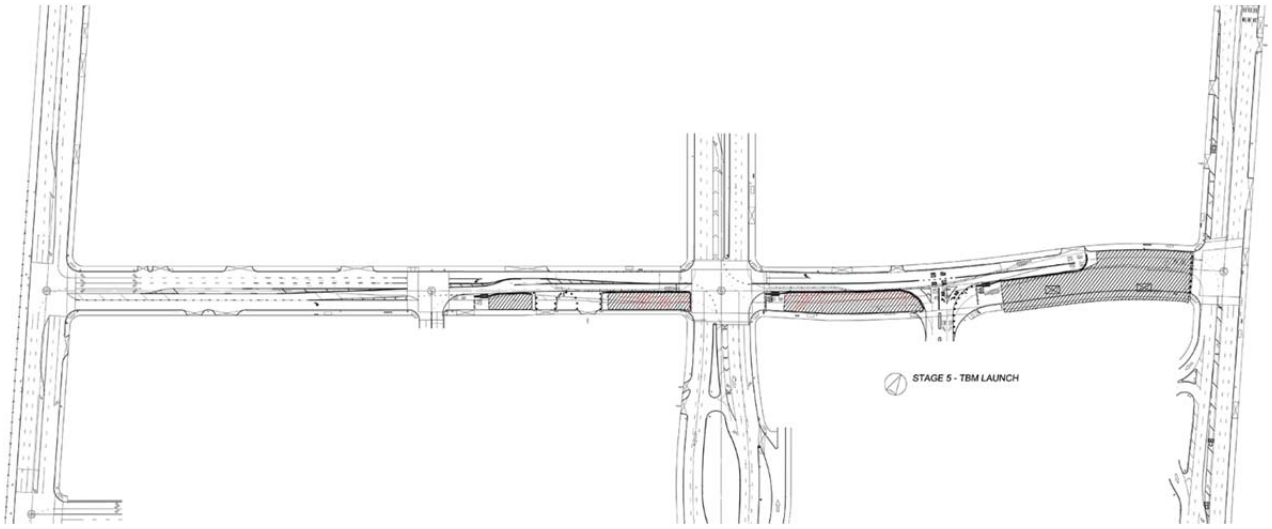
Work area during this stage (Figure 4-11) will be the full width of Constellation Boulevard between Century Park East and Watt Plaza alley and extending on the south side of Constellation Boulevard to the parking garage entrance to 10100 Constellation Boulevard. The south side of Constellation Boulevard between the underground parking garage entrance to 10100 Constellation Boulevard and Solar Way will also be closed during this stage for utility relocations.

Constellation Boulevard east of Avenue of the Stars will be closed to through traffic. Eastbound traffic on Constellation Boulevard will be detoured before crossing Avenue of the Stars, although local access only will be permitted to continue straight through Avenue of the Stars until having to enter the parking garage at 10100 Constellation Boulevard and Watt Plaza alley. Access will be maintained to all driveways, alleys, and garage entrances at all times.

The affected travel control zone will extend between Century Park West and Century Park East. Due to the usage of heavy equipment, intense effort, continual production requirement in limited space during this stage, the work area will remain in-place for an extended period of time thus requiring an exemption from L.A.M.C. 62.61 from the Bureau of Engineering (LABOE) for work performed during peak hours. The traffic control elements in this stage will include:

- Full closure of Constellation Boulevard east of Watt Plaza alley.
- Reconfiguration of travel lanes to one lane each direction along Constellation Boulevard between Century Park West and 10100 Constellation Boulevard.
- Elimination of parking on both sides of Constellation Boulevard within the work area limits.
- Prohibition of turns onto Constellation Boulevard from Century Park East.
- Relocation of bus stops within work areas.
- Relocation of valet parking for Craft Restaurant at 10100 Constellation Boulevard to Avenue of the Stars.
- Maintain local access to businesses at all times.
- Maintain pedestrian access on both sides of the street at all times except for the south sidewalk on Constellation Boulevard between 10100 Constellation Boulevard and Century Park East, which will be closed.

Figure 4-11: Full Closure for TBM Launch at Constellation/Century City Station



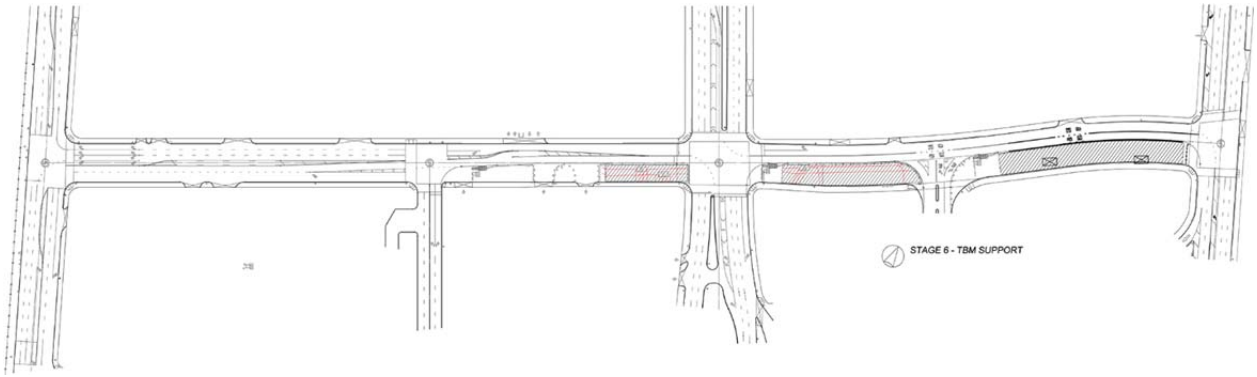
4.1.11 Stage 6: TBM Support

Work area during this stage (Figure 4-12) will be along the south side of Constellation Boulevard between Century Park East and the parking garage entrance to 10100 Constellation Boulevard. The south side of Constellation Boulevard between the underground parking garage entrance to 10100 Constellation Boulevard and Solar Way will also be closed during this stage for utility relocations. This will require moving traffic lanes over to the north side of Constellation Boulevard. The affected travel control zone will extend between Century Park West and Century Park East. Due to the usage of heavy equipment, intense effort, continual production requirement in limited space during this stage, the work area will remain in-place for an extended period of time thus requiring an exemption from L.A.M.C. 62.61 from the Bureau of Engineering (LABOE) for work performed during peak hours.

The traffic control elements in this stage will include:

- Reconfiguration of travel lanes to one lane each direction along Constellation Boulevard between Century Park West and Century Park East.
- Elimination of parking on both sides of Constellation Boulevard within the work area limits.
- Relocation of valet parking for Craft Restaurant at 10100 Constellation Boulevard to Avenue of the Stars.
- Relocation of bus stops within work areas.
- Maintain local access to businesses at all times.
- Maintain pedestrian access on both sides of Constellation Boulevard at all times.
- TBM Support work performed during this stage will 24 hours per day Monday through Saturday and on Sundays from 08:00 to 18:00. Metro will request a night time noise variance for work beyond regular work hours.

Figure 4-12: Full Closure for TBM Launch at Constellation/Century City Station



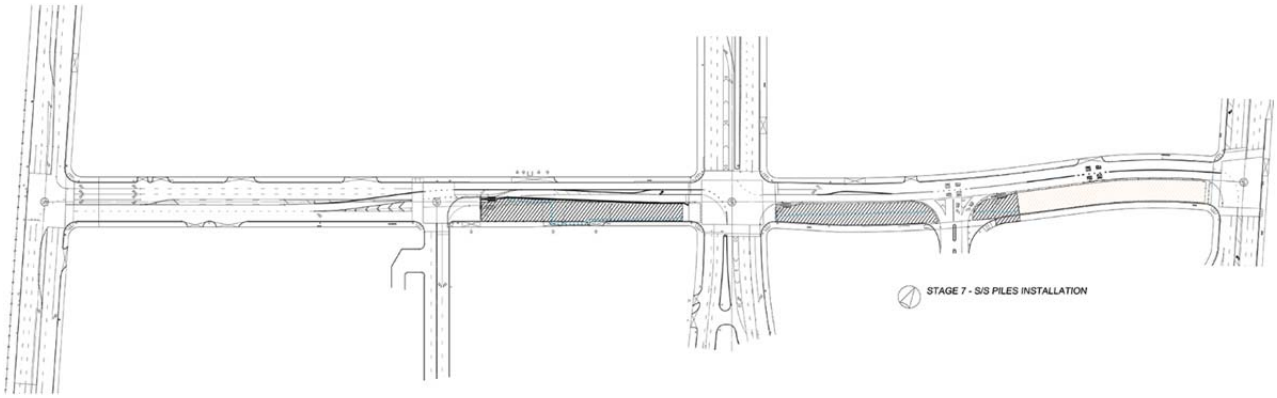
4.1.12 Stage 7: Station Box Piling – South Side

Work area during this stage (Figure 4-13) will be setup along the south side of Constellation Boulevard between Century Park East and Solar Way. This will require moving traffic lanes over to the north side of Constellation Boulevard. The affected travel control zone will extend along Constellation Boulevard between Century Park East and Century Park West. Due to the size of the pile drilling and support equipment, the work area will remain in-place for an extended period of time thus requiring an exemption from L.A.M.C. 62.61 from the Bureau of Engineering (LABOE) for work performed during peak hours. The traffic control elements in this stage will include:

- Reconfiguration of travel lanes to one lane each direction along Constellation Boulevard between Century Park West and Century Park East.
- Elimination of parking on both sides of Constellation Boulevard within the work area limits.
- Relocation of valet parking for Craft Restaurant at 10100 Constellation Boulevard to Avenue of the Stars.
- Relocation of bus stops within work areas.
- Closure of the Constellation Boulevard vehicle entrance to the Century Plaza Hotel.
- Closure of the eastern vehicle entrance to the Equinox Gym.

- Maintain local access to businesses at all times.
- Maintain pedestrian access on north side of the street at all times.
- Pedestrian access on the south sidewalk of Constellation Boulevard between Solar Way and Avenue of the Stars will be closed. All pile drilling performed during this stage will occur during normal working hours; Monday – Friday 07:00 to 21:00 and Saturday from 08:00 to 18:00. Metro will request a night time noise variance to work additional hours at the end of these shifts for non-drilling activities such as pile setting, concreting, trenching.

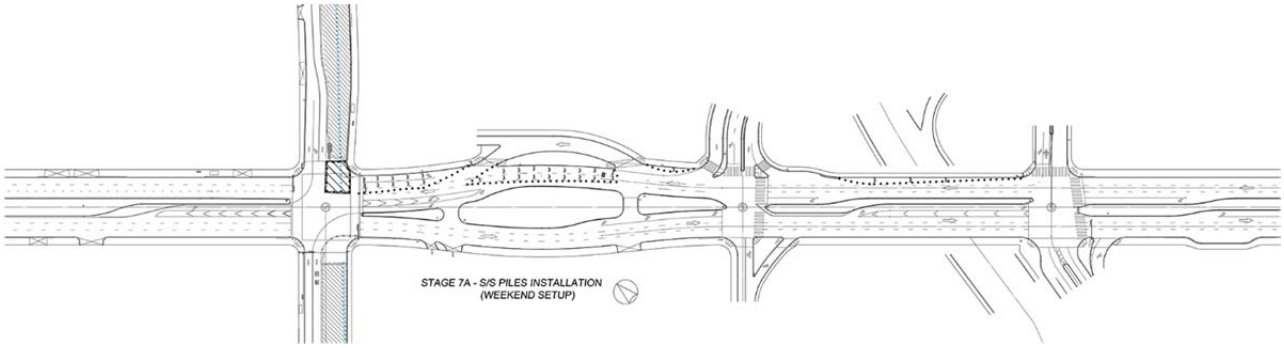
Figure 4-13: Closure for Station Box Piling, South Side at Constellation/Century City Station



4.1.13 Stage 7A

Work during this stage will consist of pile installation at the southeast corner of the intersection of Avenue of the Stars and Constellation Boulevard. Stage one work area will extend into two northbound lanes and one right turn lane, requiring shifting of traffic Lanes along Avenue of the Stars. The affected travel control zone will extend along Avenue of the Stars between Constellation Boulevard and the ramps to eastbound Olympic Boulevard. Right turns from Avenue of the Stars onto Constellation Boulevard will be prohibited during this stage. The east leg crosswalk will be closed during this stage to accommodate the required work area. Pedestrian access will still be possible using the opposite side of street for crossing Constellation Boulevard. All work performed during stage will occur over weekends from Friday 9:00 pm to Monday 6:00 am, with lanes becoming operational on Monday 6:00 am. Both Avenue of the Stars and Constellation Boulevard will have minimum of one travel lane available in each direction. The proposed staging is presented in Figure 4-14.

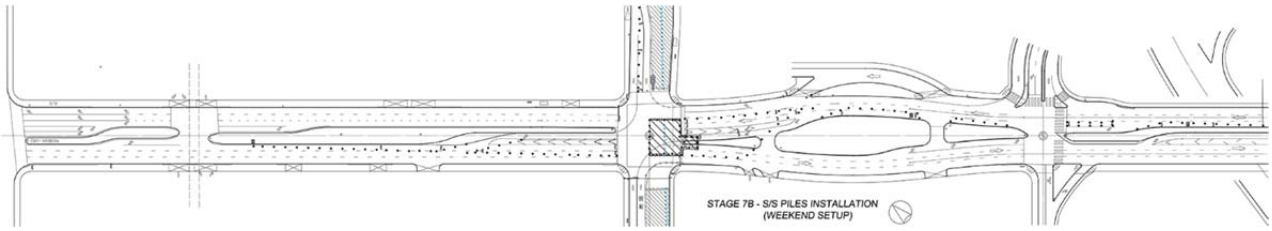
Figure 4-14: Closure for Station Box Piling, South Side at Constellation/Century City Station



4.1.14 Stage 7B

Work during this stage will consist of pile installation within the intersection of Constellation Boulevard and Avenue of the Stars in the middle lanes on Avenue of the Stars and the southern lanes of Constellation Boulevard. Northbound traffic on Avenue of the Stars will be directed toward the east side of the work area while southbound traffic will traverse on the west side of the work area. The affected travel control zone will extend along Avenue of the Stars between Santa Monica Boulevard and the ramps to eastbound Olympic Boulevard. Left turn movement for northbound Avenue of the Stars will be prohibited in addition to the prohibition of left turns onto Avenue of the Stars from westbound traffic on Constellation Boulevard. The south leg crosswalk will be closed during this stage to accommodate the required work area. Pedestrian access will still be possible using the opposite side of street for crossing Avenue of the Stars. All work performed during stage will occur over weekends from Friday 9:00 pm to Monday 6:00 am, with lanes becoming operational on Monday 6:00 am. Both Avenue of the Stars and Constellation Boulevard will have minimum of one travel lane available in each direction. The proposed staging is presented in Figure 4-15.

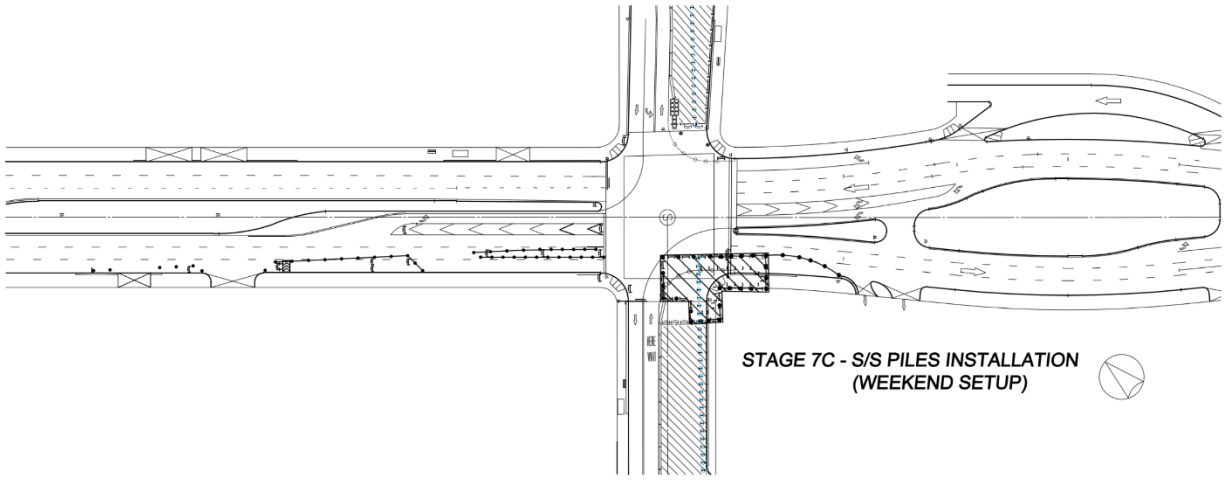
Figure 4-15: Closure for Station Box Piling, South Side at Constellation/Century City Station



4.1.15 Stage 7C

Work during this stage will consist of pile installation at the southwest corner of the intersection Avenue of the Stars and Constellation Boulevard. The work area will extend into two southbound lanes on Ave of the Stars requiring shifting of traffic Lanes along Avenue of the Stars and restriction of right turns from eastbound Constellation Boulevard onto southbound Avenue of the Stars. The affected travel control zone will extend along Avenue of the Stars between Santa Monica Boulevard and Constellation Boulevard. The west leg and south leg crosswalks will be closed during this stage to accommodate the required work area. Pedestrian access will still be possible using the opposite sides of the street for crossing Avenue of the Stars and Constellation Boulevard. All work performed during stage will occur over weekends from Friday 9:00 pm to Monday 6:00 am, with lanes becoming operational on Monday 6:00 am. Both Avenue of the Stars and Constellation Boulevard will have minimum of one travel lane available in each direction. The proposed staging is presented in Figure 4-16.

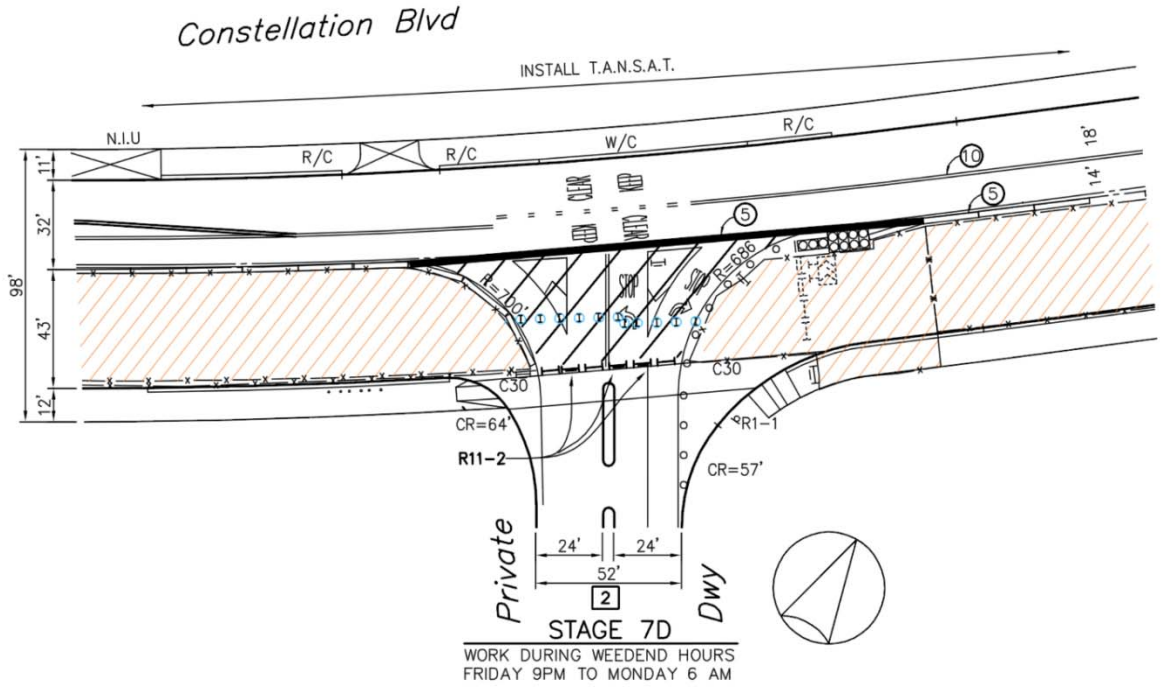
Figure 4-16: Closure for Station Box Piling, South Side at Constellation/Century City Station



4.1.16 Stage 7D

Work during this stage (Figure 4-17) will consist of pile installation at the parking garage entrance to 10100 Constellation Boulevard. The work area will extend into three eastbound lanes requiring shifting of traffic Lanes to the north side of Constellation Boulevard and restriction of all turns into and out of the parking garage. Pedestrian access will be restricted at the Work area, but the sidewalk along the north of Constellation Boulevard will be open. All work performed during this stage will occur over weekends from Friday 9:00 pm to Monday 6:00 am, with lanes becoming operational on Monday 6:00 am. Constellation Boulevard will have a minimum of one travel lane available in each direction.

Figure 4-17: Closure for Station Box Piling, South Side at Constellation/Century City Station



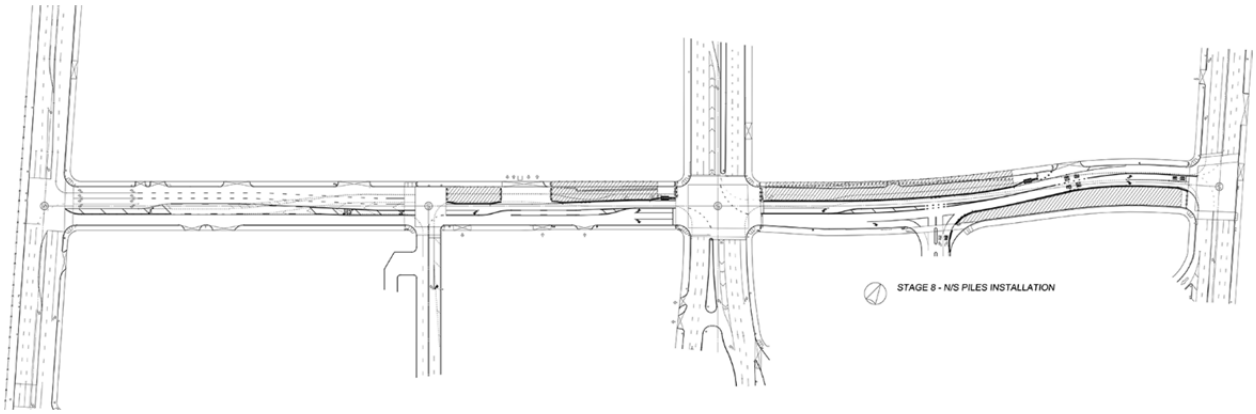
4.1.17 Stage 8: Station Box Piling – North Side

Work area during this stage (Figure 4-18) will be setup along the north side of Constellation Boulevard between Solar Way and the Watt Plaza alley, as well as along the south side of Constellation Boulevard between the parking garage entrance at 10100 Constellation Boulevard and Century Park East. This will require moving traffic lanes over to the south side of Constellation Boulevard between Solar Way and the parking garage entrance at 10100 Constellation Boulevard, and to the north side of Constellation Boulevard between Watt Plaza alley and Century Park East. The affected travel control zone will extend between Century Park East and Century Park West. Due to the size of the pile drilling and support equipment, the work area will remain in-place for an extended period of time thus requiring an exemption from L.A.M.C. 62.61 from the Bureau of Engineering (LABOE) for work performed during peak hours. The traffic control elements in this stage will include:

- Reconfiguration of travel lanes to one lane each direction along Constellation Boulevard between Century Park East and Solar Way.
- Elimination of parking on both sides of Constellation Boulevard within the work area limits.
- Relocation of valet parking for Craft Restaurant at 10100 Constellation Boulevard to Avenue of the Stars.
- Relocation of bus stops within work areas.
- Maintain local access to businesses at all times.
- Maintain pedestrian access on south side of the street at all times.
- With the exception of the section of the sidewalk section between Avenue of the Stars and the Watt Plaza Alley and the sidewalk between Solar Way and Avenue of the Stars, maintain pedestrian access on north side of the street at all times. Pedestrian access to the impacted sections of sidewalk shall be restored upon completion of pile construction work.

All pile drilling performed during this stage will occur during normal working hours; Monday – Friday 07:00 to 21:00 and Saturday from 08:00 to 18:00. Metro will request a night time noise variance to work additional hours at the end of these shifts for non-drilling activities such as pile setting, concreting and trenching.

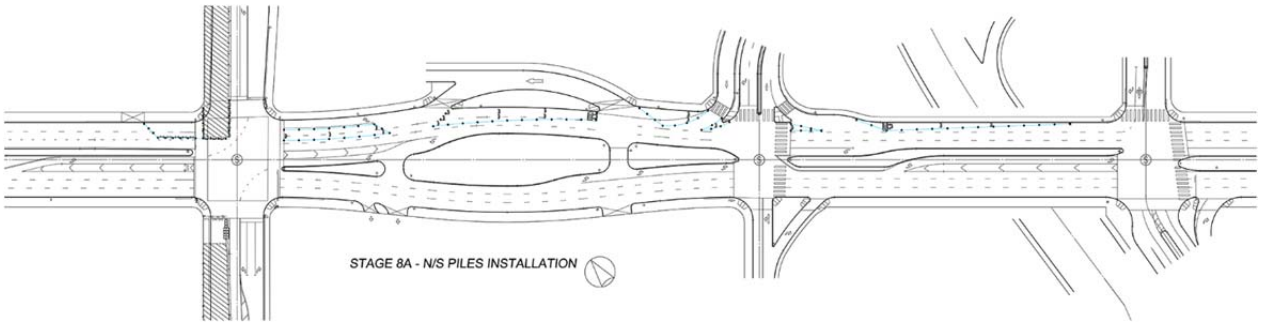
Figure 4-18: Closure for Station Box Piling, North Side at Constellation/Century City Station



4.1.18 Stage 8A

Work during this stage (Figure 4-19) will consist of pile installation at the northeast corner of Avenue of the Stars and Constellation Boulevard. The work area will extend into two northbound lanes on Avenue of the Stars requiring shifting of traffic Lanes along Avenue of the Stars. The affected travel control zone will extend along Avenue of the Stars between Constellation Boulevard and the ramps to eastbound Olympic Boulevard. Right turns from westbound Constellation Boulevard onto northbound Avenue of the Stars will be prohibited during this stage. The east and north legs of the crosswalk will be closed during this stage to accommodate the required work area. Pedestrian access will still be possible using the opposite sides of the street to cross Avenue of the Stars and Constellation Boulevard. All work performed during stage will occur over weekends from Friday 9:00 pm to Monday 6:00 am, with lanes becoming operational on Monday 6:00 am. Both Avenue of the Stars and Constellation Boulevard will have minimum of one travel lane available in each direction.

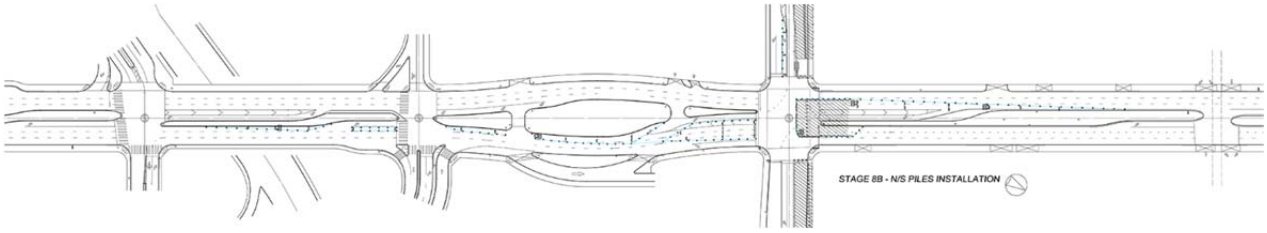
Figure 4-19: Closure for Station Box Piling, North Side at Constellation/Century City Station



4.1.19 Stage 8B

Work during this stage (Figure 4-20) will consist of installing piles within the intersection of Constellation Boulevard and Avenue of the Stars in the middle lanes on Avenue of the Stars and the northern lanes of Constellation Boulevard. Southbound traffic on Avenue of the Stars will be directed toward the west side of the work area while northbound traffic will traverse on the east side of the work area. The affected travel control zone will extend along Avenue of the Stars between Santa Monica Boulevard and the ramps to eastbound Olympic Boulevard. Left turn movement for southbound Avenue of the Stars will be prohibited in addition to the prohibition of left turns for eastbound Constellation Boulevard at the intersection. In addition the north leg crosswalk will be closed during this stage to accommodate the required work area. Pedestrian access will still be possible using the opposite side of street to cross Avenue of the Stars. All work performed during stage will occur over weekends from Friday 9:00 pm to Monday 6:00 am, with lanes becoming operational on Monday 6:00 am. Both Avenue of the Stars and Constellation Boulevard will have minimum of one travel lane available in each direction.

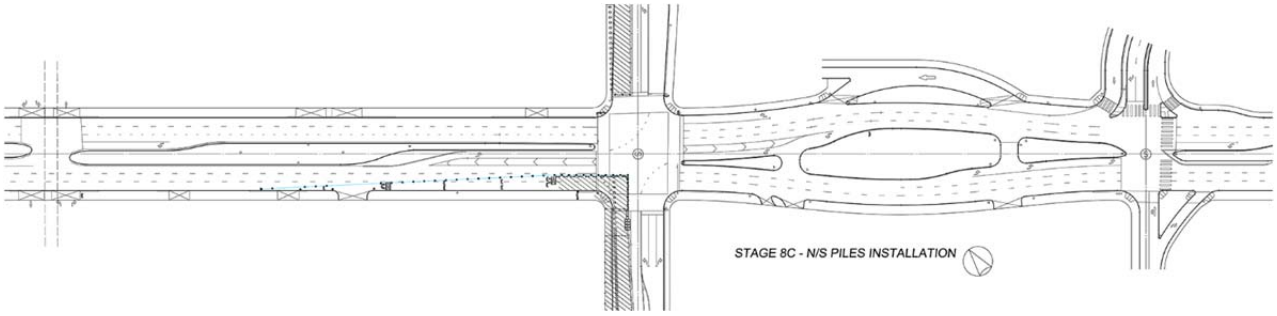
Figure 4-20: Closure for Station Box Piling, North Side at Constellation/Century City Station



4.1.20 Stage 8C

Work during this stage (Figure 4-21) will consist of pile installation at the northwest corner of the intersection of Avenue of the Stars and Constellation Boulevard. The work area will extend into two southbound lanes of Avenue of the Stars, requiring shifting of traffic lanes along Avenue of the Stars and restriction of all right turns onto westbound Constellation Boulevard. The affected traffic control zone will extend along Avenue of the Stars between Santa Monica Boulevard and Constellation Boulevard. The north and west leg crosswalks will be closed during this stage to accommodate the required work area. Pedestrian access will still be possible using the opposite sides of street to cross Avenue of the Stars and Constellation Boulevard. All work performed during stage will occur over weekends from Friday 9:00 pm to Monday 6:00 am, with lanes becoming operational on Monday 6:00 am. Both Avenue of the Stars and Constellation Boulevard will have minimum of one travel lane available in each direction.

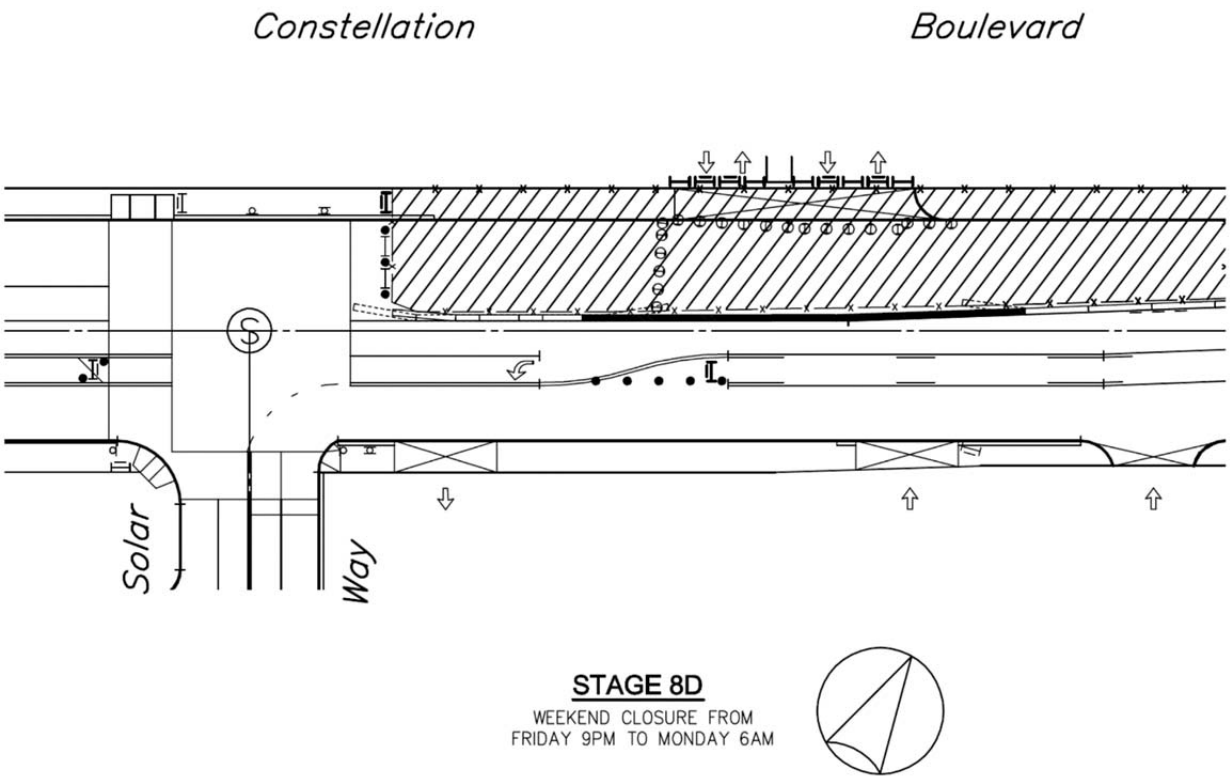
Figure 4-21: Closure for Station Box Piling, North Side at Constellation/Century City Station



4.1.21 Stage 8D

Work during this stage (Figure 4-22) will consist of pile installation at the parking garage entrance to the Sun America Building at 1999 Avenue of the Stars and the service ramp for Westfield Mall. The Stage 8 work area will be temporarily extended across the parking garage entrance and service ramp during weekend closures. Pedestrian access will be restricted at the Work area, but the sidewalk along the south of Constellation Boulevard will remain open. All work performed during this stage will occur over weekends from Friday 9:00 pm to Monday 6:00 am, with the parking garage entrance and service ramp becoming operational on Monday 6:00 am. Constellation Boulevard will have a minimum of one travel lane available in each direction.

Figure 4-22: Closure for Station Box Piling, North Side at Constellation/Century City Station



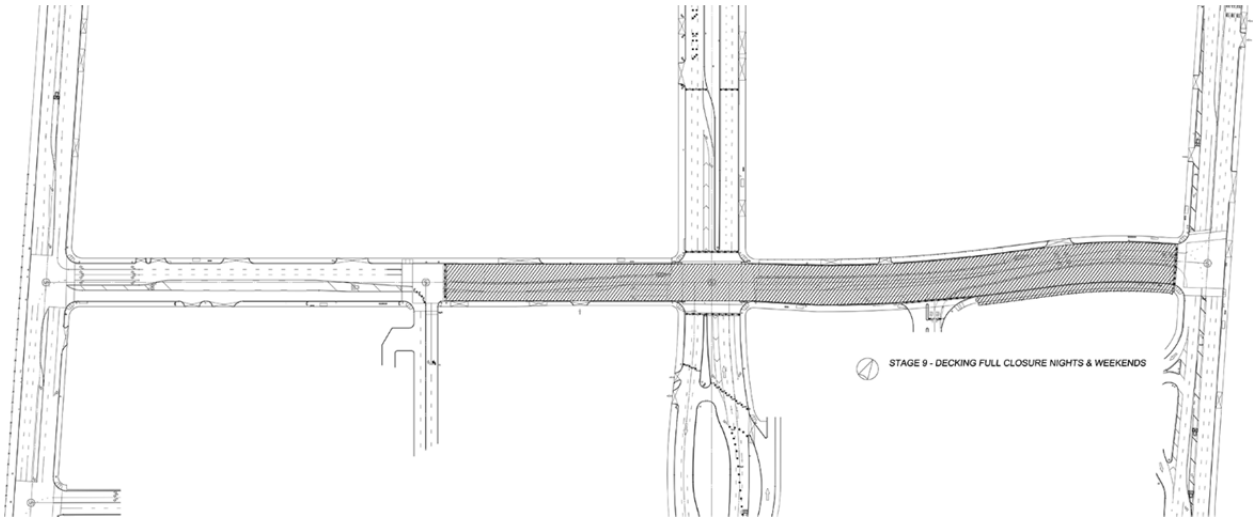
4.1.22 Stage 9: Station Box Decking

Work area during this stage (Figure 4-23) will be the full width of Constellation Boulevard between Century Park East and Solar Way. This will require a full closure of Constellation Boulevard during decking installation which will occur in a series of full street weekend closures. Closures will begin at 9:00 pm on Friday night and finish at 6:00 am on the following Monday morning.

The affected travel control zone will extend from Century Park West to Century Park East along Constellation Boulevard and along Avenue of the Stars between Santa Monica Boulevard and Olympic Boulevard. Eastbound traffic on Constellation Boulevard will be detoured before reaching the work area. Access will be maintained to all driveways, alleys, and garage entrances outside the full street closure zone. The traffic control elements in this stage will include:

- Elimination of parking on both sides of Constellation Boulevard within the work area limits.
- Prohibition of turns onto Constellation Boulevard from Century Park East, Avenue of the Stars, and Solar Way.
- Maintain local access to businesses at all times, except those in the full street closure zone.
- Maintain pedestrian access on both sides of the street at all times except near the work area.

Figure 4-23: Closure for Station Box Decking at Constellation/Century City Station



4.1.23 Stage 9A

Once decking installation west of and within the intersection of Avenue of the Stars and Constellation Boulevard is complete, the Stage 9 work area will be reduced to between Century Park East and Avenue of the Stars. The work area between Avenue of the Stars and Solar Way will be immediately configured to the Stage 10 layout.

4.1.24 Stage 10: Station Box Excavation and Construction

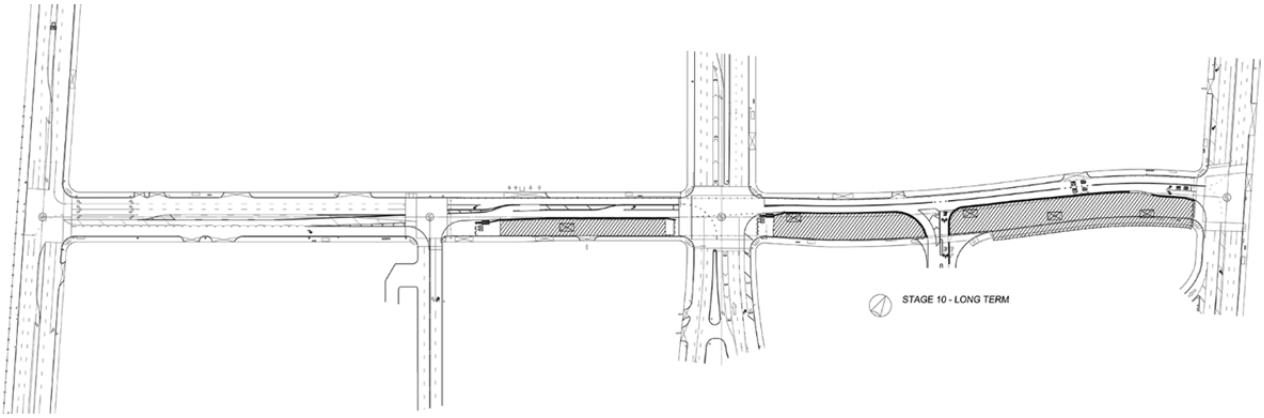
Work during this stage will include the excavation of the station box and station construction. Materials will be moved into and out of the station through shafts located within Constellation Boulevard. There are no construction staging areas available immediately adjacent to the station box so these activities must occur in the street. The work area during this stage will be setup in Constellation Boulevard between Century Park East and Solar Way. This will require moving traffic lanes over to the north side of Constellation Boulevard. There will be one lane in each direction along Constellation Boulevard between Solar Way and Century Park East. The affected travel control zone will extend between Century Park East and Century Park West. The proposed staging is presented in Figure 4-24. The traffic control elements in this stage will include:

- Reconfiguration of travel lanes to one lane each direction along Constellation Boulevard between Century Park East and Solar Way.
- Left turns from westbound Constellation Boulevard onto southbound Avenue of the Stars will be restricted.
- Elimination of parking on both sides of Constellation Boulevard within the work area limits.
- Relocation of valet parking for Craft Restaurant at 10100 Constellation Boulevard to Avenue of the Stars.
- Relocation of bus stops within work areas.
- Closure of the Century Plaza Hotel parking garage entrance on Constellation Boulevard.
- Closure of one entrance to the Equinox Gym at 10220 Constellation Boulevard.

- Pedestrian access will be maintained along the north and south of Constellation Boulevard at all times, except for that section of south sidewalk east of the parking garage entrance to 10100 Constellation Boulevard to Century Park East.
- Access to local businesses will be maintained at all times.

Due to the usage of heavy equipment, intense effort, continual production requirement in limited space during this stage, the work area will remain in-place for an extended period of time thus requiring an exemption from L.A.M.C. 62.61 from the Bureau of Engineering (LABOE) for work performed during peak hours.

Figure 4-24: Closure for Station Box Excavation & Construction at Constellation/Century City Station



5.0 TRAFFIC MANAGEMENT STRATEGIES

5.1 Public Information / Public Awareness Campaign (PAC)

The primary goal of a PAC is to educate motorists, merchants, residents, elected officials and governmental agencies about construction activities and associated impacts. The PAC is an important tool for reaching target audiences with important construction project information.

With an effective PAC, public acceptance, tolerance and cooperation will be enhanced. In addition, this element is expected to reduce the traffic demand in the construction zone by encouraging motorists to take alternate routes or to travel outside of closure hours.

In general, the PAC is designed to meet the following objectives:

- Identify all target audiences who will be impacted by construction activities;
- Serve as the focal point for project related questions regarding construction activities, road closures, noise, dust, and other construction related activities;
- Inform the public about the construction project and how the project could affect their travel; and
- Promote alternate modes of transportation and alternate routes.

Specific elements that may be used to accomplish these objectives include press releases/special alerts to news outlets and traffic reports which will be sent to inform motorists about construction activities. Paid advertising may also be used to inform motorists about construction activities.

Residents, businesses and schools within the project vicinity should be notified of the project and closures anticipated as a result of the construction work. The PAC should pay particular attention to informing emergency services of alternate routes available during closures of local roadways. These are discussed under “Alternate Route Strategies.”

Specific components of the PAC are described in the following sections.

5.2 Brochures and Mailers

Brochures and other project notices will be prepared by Los Angeles County Metropolitan Transportation Authority (Metro) staff, in coordination with Caltrans and the DB Contractor, to keep the public (residents, businesses, travelers, etc.) informed about the project and anticipated closures and impacts.

In addition, meeting notices/agendas (in English and Spanish) will be prepared and distributed in advance of public meetings related to the project.

5.3 Press Releases/Media Alerts

Press releases and media alerts will be prepared and distributed by Metro staff in coordination with Caltrans and the DB Contractor, as required or needed throughout the length of project. Writing press releases includes, but is not limited to, research/writing, editing and distribution of information to cover any/all new developments, closures, detours, etc. Press releases will be distributed via e-mail or fax to media outlets and/or emergency services in the vicinity.

Press releases and media alerts will be prepared and distributed by Metro staff; therefore, the associated costs are not included in the TMP.

5.4 Paid Advertisement

Advertisements for public meetings regarding the project will be printed in a number of publications and distributed throughout the cities surrounding the project areas. These publications may include:

- Los Angeles Times
- LA Downtown News
- LA Weekly
- La Opinion
- Korea Daily
- Los Angeles Sentinel
- Beverly Hills Courier
- Beverly Hills Weekly
- Westside Today

It is assumed that two rounds of paid advertising for printed advertisements will occur for each set of public meetings, assuming one set of public meetings at the beginning of the project and one set of public meetings during the project.

5.5 Public Meetings/ Hearings

Public meetings will be held to provide information about the project and anticipated closures/impacts to any and all interested parties including, political offices, residents, motorists, community groups, school districts, developers, truckers, etc.

5.6 Project Website

The Metro project website (www.metro.net) will be the primary information source for up-to-date project information. The project website will contain information such as traffic alerts, current schedule, news related to the project, alternatives developed by the community, past and future meetings/hearings, frequently asked questions (FAQs), and links to major stakeholders of the project.

5.7 Motorist Information

The effective implementation of a Motorist Information System during construction is crucial to enabling motorists to make informed decisions about their travel plans and options with real-time traffic information. The key components of this system considered in this TMP include CMS, PCMS, and ground mounted signs, that will provide real time traffic information to motorists approaching the construction zone.

5.8 Portable Changeable Message Signs

PCMS are considered one of the best methods to alert motorists of construction activities, expected closures, delays, and possible detours prior to reaching the construction zone.

The project will require PCMS's at various locations during construction. PCMS's should be placed and operated as needed to inform motorists of construction activities and closures. Additional PCMS's should be made available during the project and may be placed and operated as deemed necessary by the DB Contractor.

During construction, all PCMS's should be checked nightly and fixed or replaced as needed to ensure that they are in a proper working condition and that their visibility is not compromised.

Suitable locations and messages for the PCMS's will be determined by the DB Contractor.

5.9 Temporary Motorist Information Signs

Ground mounted signs are another effective method of getting information to motorists about construction activities and detours.

Signs will be used during the construction of the project and these signs shall be placed at appropriate locations as specified by the DB Contractor to guide motorists through the construction zones and detour routes.

Ground mounted signs shall be maintained and updated to keep information current and accurate.

Ground mounted signs shall also provide advance warnings to motorists of future intersection closures. It is the responsibility of the DB Contractor to provide and maintain ground mounted signs.

6.0 EXISTING PEAK HOUR TRAFFIC VOLUMES

The existing AM and PM peak hour turning movement traffic volumes for the roadways surrounding the Constellation Station construction area are taken from the traffic study that was prepared as part of the environmental impact report for the Century City Center project. The counts that were taken for Century City Center project were collected in 2011. These counts were more recent than the ones that were collected in Fall 2008 and Spring 2009 for the Westside Subway Extension environmental document. The actual 2011 count data is presented in Appendix B. To represent the existing 2015 traffic conditions, a 0.5% annual growth rate was applied to the 2011 turning movement traffic volumes. The resulting 2015 AM and PM peak hour turning movement traffic volumes, at each one of the ten study intersections around the Constellation Station, are presented in Figure 6-1.

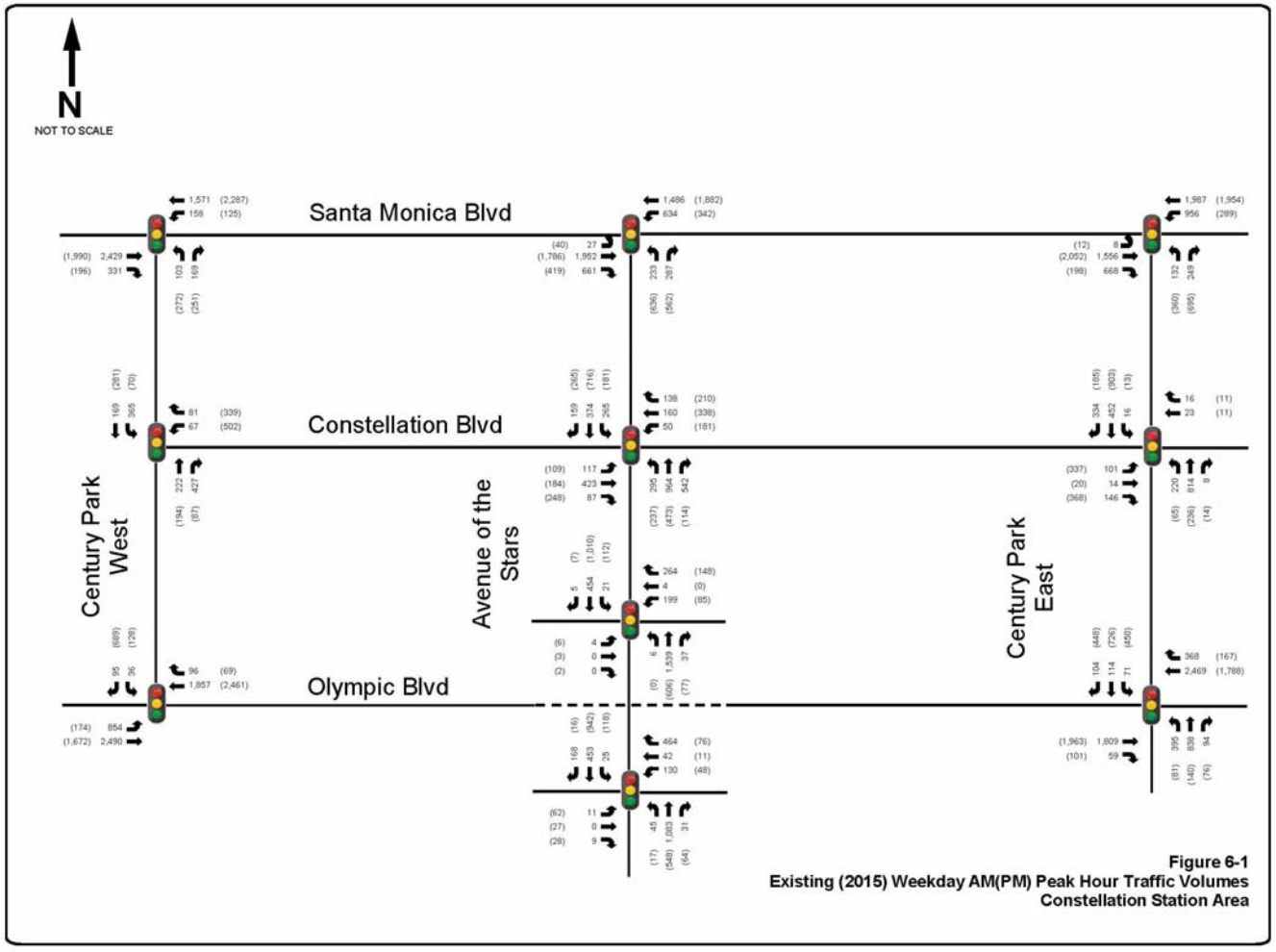
A total of ten (10) intersections were evaluated in the vicinity of the Constellation Station construction area. The AM and PM peak hour existing conditions level of service (LOS) are presented in Appendix C. Results at these intersection locations are presented in Table 6-1.

Table 6-1: Existing (2015) Level of Service Results

Intersection	Existing Conditions (2015)			
	AM Peak Hour		PM Peak Hour	
	LOS	Delay	LOS	Delay
Century Park East/Santa Monica Blvd	F	141.9	F	117.9
Century Park East/Constellation Blvd	C	30.0	D	39.4
Century Park East/Olympic Blvd	D	52.6	D	53.3
Avenue of the Stars/Santa Monica Blvd	F	143.3	F	115.0
Avenue of the Stars/Constellation Blvd	D	35.8	C	31.7
Avenue of the Stars/WB Olympic Blvd	B	17.1	A	7.9
Avenue of the Stars/EB Olympic Blvd	D	41.7	C	30.5
Century Park West/Santa Monica Blvd	F	139.1	F	145.6
Century Park West/Constellation Blvd	A	9.1	C	35.0
Century Park West/Olympic Blvd	F	82.6	E	79.5

All three intersections along Santa Monica Boulevard are currently operating at LOS F during both the AM and PM peak hours. In addition, the intersection of Century Park West and Olympic Boulevard is operating at LOS F in the AM peak hour and LOS E in the PM peak hour. The remaining six study intersections are operating at LOS D or better during both peak hours.

Figure 6-1: Existing (2015) Weekday AM (PM) Peak Hour Traffic Volumes



7.0 TRAFFIC EVALUATION

This section of the report presents an evaluation of traffic operations at the intersections surrounding the Constellation Station, during the morning and afternoon peak periods, due to the construction of the station box, the soldier piles, and the decking installation at the Section 2 station area of the Purple Line Extension. The following sections provide an overview of the traffic operational status during these construction activities at the Constellation Station. The existing AM and PM peak hour level of service at the intersection locations being evaluated during the construction activity were presented in the previous section. This information was developed from the latest available set of traffic counts, which were taken from the Century City Center project environmental document.

7.1 Constellation Station

The Constellation station is located in Century City below Constellation Boulevard and Avenue of the Stars. Construction of the station extends from Century Park East to Solar Way, which is located at the mid-block of the Constellation Boulevard segment between Avenue of the Stars and Century Park West. Constellation Boulevard is a 4-lane east/west collector street that is classified in the Transportation Element of the City of Los Angeles General Plan as a Divided Secondary Highway. Within the study area, there are two travel lanes in each direction and a painted two-way left turn median. In addition, dedicated left turn and right turn lanes are provided at the Avenue of the Stars intersection. Avenue of the Stars is a 6-lane major north/south arterial that is classified as a Divided Major Class II Highway. In the study area, there are three travel lanes in each direction and a raised landscaped median. In addition, dedicated left turn lanes are provided at the signalized intersections and at building access locations.

Construction of the station box, the soldier piles, and the decking installation along Constellation Boulevard will take place during ten major construction stages. A description of each construction stage was presented in Section 3 of this document. The following sections present an evaluation of traffic operations for each major construction stage. The traffic control plan exhibits showing details of the proposed stages of construction are presented in Appendix A.

7.1.1 Stage 1

Work area during this stage is focused on the roadway segment along the north side of Constellation Boulevard between Century Park East and the underground parking garage entrance to 10100 Constellation Boulevard. The proposed work consists of piling on the north side of the street to construct the TBM launch box. This will require moving traffic lanes over to the south side of the street. The affected travel control zone will extend from approximately Solar Way to the west and Century Park East to the east. The work area will remain in-place for an extended period of time due to the size of the pile drilling and support equipment.

Adjacent to the construction area, one lane of traffic will be open in each direction and access to and from the Century Park East and Constellation Boulevard intersection would be maintained. Table 7-1 presents the level of service (LOS) results when the number of lanes along Constellation Boulevard at the Century Park East intersection are reduced to one lane in each direction. However, the eastbound approach at Constellation Boulevard will be configured to accommodate a left turn only lane and a shared left and right turn lane.

Table 7-1: Stage 1 Level of Service Results

Intersection	Stage 1			
	AM Peak Hour		PM Peak Hour	
	LOS	Delay	LOS	Delay
Century Park East/Santa Monica Blvd	F	141.9	F	142.9
Century Park East/Constellation Blvd	C	28.1	D	42.3
Century Park East/Olympic Blvd	D	52.6	D	47.8
Avenue of the Stars/Santa Monica Blvd	F	143.3	F	118.3
Avenue of the Stars/Constellation Blvd	D	36.5	D	37.0
Avenue of the Stars/WB Olympic Blvd	B	17.1	A	7.5
Avenue of the Stars/EB Olympic Blvd	D	41.7	C	31.8
Century Park West/Santa Monica Blvd	F	139.1	F	146.1
Century Park West/Constellation Blvd	A	9.1	D	35.7
Century Park West/Olympic Blvd	F	82.6	E	79.2

As shown in Table 7-1, traffic operating conditions will predominantly remain the same as the existing traffic conditions. All the three intersections along Santa Monica Boulevard would continue to operate at LOS F during both the AM and PM peak hours. In addition, the intersection of Century Park West and Olympic Boulevard would continue to operate at LOS F in the AM peak hour and LOS E in the PM peak hour. The remaining six study intersections would continue to operate at LOS D or better during both peak hours.

7.1.2 Stage 2

Work area during this stage will be along the south side of Constellation Boulevard between Century Park East and the underground parking garage entrance to 10100 Constellation Boulevard, as well as along the north side of Constellation Boulevard between the Watt Plaza alley at 10131 Constellation Boulevard and Solar Way. The proposed work consists of pile installation on the south side of the street to continue the construction of the TBM launch box and utility relocation work along the north side of the street. This will require moving traffic lanes over to the north and south sides of the streets. The affected travel control zone will extend from approximately Century Park West to the west and Century Park East to the east.

In addition, eastbound and westbound left turns from Constellation Boulevard onto Avenue of the Stars would be restricted during this construction stage. As a result of the proposed left turn restrictions at the Avenue of the Stars intersection, it is anticipated that motorists will perform their left turn maneuver at the Century Park East and the Century Park West intersections. Furthermore, the dual northbound and southbound left turn lanes from Avenue of the Stars onto Constellation Boulevard will be reduced to one left turn lane in each direction. Local access to businesses on the south side of the roadway will be maintained. Table 7-2 presents the level of service results during this stage.

Table 7-2: Stage 2 Level of Service Results

Intersection	Stage 2			
	AM Peak Hour		PM Peak Hour	
	LOS	Delay	LOS	Delay
Century Park East/Santa Monica Blvd	F	133.7	F	120.7
Century Park East/Constellation Blvd	C	27.7	C	21.6
Century Park East/Olympic Blvd	D	52.6	D	51.6
Avenue of the Stars/Santa Monica Blvd	F	145.5	F	117.0
Avenue of the Stars/Constellation Blvd	F	96.0	E	57.2
Avenue of the Stars/WB Olympic Blvd	B	17.1	A	7.0
Avenue of the Stars/EB Olympic Blvd	D	48.9	D	45.0
Century Park West/Santa Monica Blvd	F	138.2	F	148.4
Century Park West/Constellation Blvd	B	10.6	C	21.4
Century Park West/Olympic Blvd	F	81.8	E	76.1

As shown in Table 7-2, with one traffic lane in each direction of Constellation Boulevard, traffic operations at the intersection of Avenue of the Stars and Constellation Boulevard would deteriorate to LOS F in the AM peak hour and LOS E in the PM peak hour. In addition, all the three intersections along Santa Monica Boulevard would continue to operate at LOS F during both the AM and PM peak hours. Also, the intersection of Century Park West and Olympic Boulevard would continue to operate at LOS F in the AM peak hour and LOS E in the PM peak hour. The remaining five study intersections would continue to operate at LOS D or better during both peak hours.

7.1.3 Stage 3

Work area during this stage will be across the full width of Constellation Boulevard between Century Park East and the underground parking garage entrance to 10100 Constellation Boulevard, as well as the north side of Constellation Boulevard between the Watt Plaza alley at 10131 Constellation Boulevard and Solar Way. During this stage, the construction activity consists of decking installation of the TBM launch box and utility relocation work along the north side of the street. This will require a full closure of Constellation Boulevard between Century Park East and the underground parking garage entrance to 10100 Constellation Boulevard. The affected travel control zone will extend from approximately Century Park West to the west and Century Park East to the east.

During this stage, northbound and southbound traffic turning westbound onto Constellation Boulevard from Century Park East would be diverted around the construction area and use Avenue of the Stars to get to their destination. Similarly, eastbound traffic on Constellation Boulevard will be detoured before crossing Avenue of the Stars, although local access traffic destined to the buildings along this segment of Constellation Boulevard will be permitted to continue straight through Avenue of the Stars until reaching the entrance of the underground parking garage at 10100 Constellation Boulevard. Access will be maintained to all driveways, alleys, and garage entrances at all times.

In addition, eastbound and westbound left turns from Constellation Boulevard onto Avenue of the Stars would be restricted during this construction stage. As a result of the proposed left turn restrictions at the Avenue of the Stars intersection, it is anticipated that motorists will perform their left turn maneuver at the Century Park West intersection. Furthermore, the dual northbound and southbound left turn lanes from Avenue of the Stars onto Constellation Boulevard will be reduced to one left turn lane in each direction. Table 7-3 presents the level of service results during this stage.

Table 7-3: Stage 3 Level of Service Results

Intersection	Stage 3			
	AM Peak Hour		PM Peak Hour	
	LOS	Delay	LOS	Delay
Century Park East/Santa Monica Blvd	F	102.8	F	204.7
Century Park East/Constellation Blvd	A	7.5	A	6.1
Century Park East/Olympic Blvd	E	65.7	D	49.0
Avenue of the Stars/Santa Monica Blvd	F	190.5	F	133.9
Avenue of the Stars/Constellation Blvd	F	127.6	F	93.7
Avenue of the Stars/WB Olympic Blvd	C	32.5	A	8.7
Avenue of the Stars/EB Olympic Blvd	F	103.5	E	73.2
Century Park West/Santa Monica Blvd	F	136.9	F	157.8
Century Park West/Constellation Blvd	B	11.5	D	37.3
Century Park West/Olympic Blvd	F	81.0	E	79.8

During Stage 3, traffic operations at the intersection of Avenue of the Stars and Constellation Boulevard would deteriorate to LOS F during both the AM and PM peak hours. Also, the LOS at the intersection of Century Park East and Olympic Boulevard would deteriorate to LOS E during the AM peak hour. Similarly, the LOS at the intersection of Avenue of the Stars and EB Olympic Boulevard would deteriorate to LOS F in the AM peak hour and LOS E in the PM peak hour. Furthermore, all the three intersections along Santa Monica Boulevard and the intersection of Century Park West and Olympic Boulevard will continue to operate at LOS E or worse during both peak hours. The remaining three study intersections would continue to operate at LOS D or better during both peak hours.

7.1.4 Stage 4

Work area during this stage will be along the south side of Constellation Boulevard between Century Park East and the underground parking garage entrance to 10100 Constellation Boulevard, as well as along the north side of Constellation Boulevard between the Watt Plaza alley at 10131 Constellation Blvd and Solar Way. The proposed work consist of excavating for the construction of the TBM launch box. This will require moving traffic lanes over to the north and south side of the street. The affected travel control zone will extend from approximately Century Park West to the west and Century Park East to the east.

In addition, eastbound and westbound left turns from Constellation Boulevard onto Avenue of the Stars would be restricted during this construction stage. As a result of the proposed left turn restrictions at

the Avenue of the Stars intersection, it is anticipated that motorists will perform their left turn maneuver at the Century Park East and the Century Park West intersections. Furthermore, the dual northbound and southbound left turn lanes from Avenue of the Stars onto Constellation Boulevard will be reduced to one left turn lane in each direction. Local access to businesses on the south side of the roadway will be maintained. Table 7-4 presents the level of service results during this stage.

Table 7-4: Stage 4 Level of Service Results

Intersection	Stage 4			
	AM Peak Hour		PM Peak Hour	
	LOS	Delay	LOS	Delay
Century Park East/Santa Monica Blvd	F	133.7	F	120.7
Century Park East/Constellation Blvd	C	27.7	C	21.6
Century Park East/Olympic Blvd	D	52.6	D	51.6
Avenue of the Stars/Santa Monica Blvd	F	145.5	F	117.0
Avenue of the Stars/Constellation Blvd	F	96.0	E	57.2
Avenue of the Stars/WB Olympic Blvd	B	17.1	A	7.0
Avenue of the Stars/EB Olympic Blvd	D	48.9	D	45.0
Century Park West/Santa Monica Blvd	F	138.2	F	148.4
Century Park West/Constellation Blvd	B	10.6	C	21.4
Century Park West/Olympic Blvd	F	81.8	E	76.1

As shown in Table 7-4, with one traffic lane in each direction of Constellation Boulevard, traffic operations at the intersection of Avenue of the Stars and Constellation Boulevard would deteriorate to LOS F in the AM peak hour and LOS E in the PM peak hour. In addition, all the three intersections along Santa Monica Boulevard would continue to operate at LOS F during both the AM and PM peak hours. Also, the intersection of Century Park West and Olympic Boulevard would continue to operate at LOS F in the AM peak hour and LOS E in the PM peak hour. The remaining five study intersections would continue to operate at LOS D or better during both peak hours.

7.1.5 Stage 5

Work area during this stage will be across all of Constellation Boulevard between Century Park East and the underground parking garage entrance to 10100 Constellation Boulevard, as well as the south side of Constellation Boulevard between the underground parking garage entrance to 10131 Constellation Boulevard and Solar Way for utility relocation. This stage will be used to launch the TBM and will require a full closure of Constellation Boulevard between Century Park East and the underground parking garage entrance to 10100 Constellation Boulevard. The affected travel control zone will extend from approximately Century Park West to the west and Century Park East to the east.

Northbound and southbound traffic turning westbound onto Constellation Boulevard from Century Park East would be diverted around the construction area and use Avenue of the Stars to get to their destination. Eastbound traffic on Constellation Boulevard will be detoured before crossing Avenue of the Stars, although local access traffic destined to the buildings along this segment of Constellation

Boulevard will be permitted to continue straight through Avenue of the Stars until reaching the entrance of the underground parking garage at 10100 Constellation Boulevard. Access will be maintained to all driveways, alleys, and garage entrances at all times. The affected travel control zone will extend from approximately Century Park West to the west and Century Park East to the east. This stage also includes the closure of one northbound lane on Century Park East, across from the Constellation Boulevard intersection, to allow construction traffic to travel back and forth between the 1940 Century Park East and the 2040 Century Park East staging sites. Traffic traveling in and out of the AT&T building driveway across from Constellation Boulevard will be maintained.

In addition, eastbound and westbound left turns from Constellation Boulevard onto Avenue of the Stars would be restricted during this construction stage. As a result of the proposed left turn restrictions at the Avenue of the Stars intersection, it is anticipated that motorists will perform their left turn maneuver at the Century Park West intersection. Furthermore, the dual northbound and southbound left turn lanes from Avenue of the Stars onto Constellation Boulevard will be reduced to one left turn lane in each direction. Table 7-5 presents the level of service results during this stage.

Table 7-5: Stage 5 Level of Service Results

Intersection	Stage 5			
	AM Peak Hour		PM Peak Hour	
	LOS	Delay	LOS	Delay
Century Park East/Santa Monica Blvd	F	102.8	F	204.7
Century Park East/Constellation Blvd	A	1.3	A	1.9
Century Park East/Olympic Blvd	E	66.0	D	48.8
Avenue of the Stars/Santa Monica Blvd	F	190.5	F	133.9
Avenue of the Stars/Constellation Blvd	F	127.6	F	93.7
Avenue of the Stars/WB Olympic Blvd	C	32.5	A	8.7
Avenue of the Stars/EB Olympic Blvd	F	103.5	E	73.2
Century Park West/Santa Monica Blvd	F	136.9	F	157.8
Century Park West/Constellation Blvd	B	11.5	D	37.3
Century Park West/Olympic Blvd	F	81.0	E	79.8

During Stage 5, traffic operations at the intersection of Avenue of the Stars and Constellation Boulevard would deteriorate to LOS F during both the AM and PM peak hours. Also, the LOS at the intersection of Century Park East and Olympic Boulevard would deteriorate to LOS E during the AM peak hour. Similarly, the LOS at the intersection of Avenue of the Stars and EB Olympic Boulevard would deteriorate to LOS F in the AM peak hour and LOS E in the PM peak hour. Furthermore, all the three intersections along Santa Monica Boulevard and the intersection of Century Park West and Olympic Boulevard will continue to operate at LOS E or worse during both peak hours. The remaining three study intersections would continue to operate at LOS D or better during both peak hours.

7.1.6 Stage 6

Work area during this stage will be along the south side of Constellation Boulevard between Century Park East and the underground parking garage entrance to 10100 Constellation Blvd to accommodate TBM support activities. The south side of Constellation Boulevard between the underground parking garage entrance to 10100 Constellation Boulevard and Solar Way will also be closed during this stage for utility relocations. This will require moving traffic lanes over to the north side of the street. The affected travel control zone will extend from approximately Solar Way to the west and Century Park East to the east. This stage also includes the closure of one northbound lane on Century Park East, across from the Constellation Boulevard intersection, to allow construction traffic to travel back and forth between the 1940 Century Park East and the 2040 Century Park East staging sites. Traffic traveling in and out of the AT&T building driveway across from Constellation Boulevard will be maintained.

In addition, eastbound and westbound left turns from Constellation Boulevard onto Avenue of the Stars would be restricted during this construction stage. As a result of the proposed left turn restrictions at the Avenue of the Stars intersection, it is anticipated that motorists will perform their left turn maneuver at the Century Park East and the Century Park West intersections. Furthermore, the dual northbound and southbound left turn lanes from Avenue of the Stars onto Constellation Boulevard will be reduced to one left turn lane in each direction. Local access to businesses on the south side of the roadway will be maintained. Table 7-6 presents the level of service results during this stage.

Table 7-6: Stage 6 Level of Service Results

Intersection	Stage 6			
	AM Peak Hour		PM Peak Hour	
	LOS	Delay	LOS	Delay
Century Park East/Santa Monica Blvd	F	133.7	F	120.7
Century Park East/Constellation Blvd	C	29.0	C	21.5
Century Park East/Olympic Blvd	D	52.7	D	52.0
Avenue of the Stars/Santa Monica Blvd	F	145.5	F	117.0
Avenue of the Stars/Constellation Blvd	F	105.1	E	56.4
Avenue of the Stars/WB Olympic Blvd	B	17.1	A	7.0
Avenue of the Stars/EB Olympic Blvd	D	48.9	D	45.0
Century Park West/Santa Monica Blvd	F	138.2	F	148.4
Century Park West/Constellation Blvd	B	10.4	C	21.5
Century Park West/Olympic Blvd	F	81.8	E	76.1

As shown in Table 7-6, with one traffic lane in each direction of Constellation Boulevard, traffic operations at the intersection of Avenue of the Stars and Constellation Boulevard would deteriorate to LOS F in the AM peak hour and LOS E in the PM peak hour. In addition, all the three intersections along Santa Monica Boulevard would continue to operate at LOS F during both the AM and PM peak hours. Also, the intersection of Century Park West and Olympic Boulevard would continue to operate at LOS F in the AM peak hour and LOS E in the PM peak hour. The remaining five study intersections would continue to operate at LOS D or better during both peak hours.

7.1.7 Stage 7

Work area during this stage will be setup along the south side of Constellation Boulevard between Century Park East to the east and Solar Way to the west to drill the south station box piles. This will require moving traffic lanes over to the north side of the street. The affected travel control zone will extend along Constellation Boulevard from approximately Century Park East to the east and Century Park West to the west. In addition, the traffic control zone will extend along Avenue of the Stars from the Olympic Boulevard eastbound on/off ramp to Constellation Boulevard during the night time and weekend hours. This stage also includes the closure of one northbound lane on Century Park East, across from the Constellation Boulevard intersection, to allow construction traffic to travel back and forth between the 1940 Century Park East and the 2040 Century Park East staging sites. Traffic traveling in and out of the AT&T building driveway across from Constellation Boulevard will be maintained.

In addition, eastbound and westbound left turns from Constellation Boulevard onto Avenue of the Stars would be restricted during this construction stage. As a result of the proposed left turn restrictions at the Avenue of the Stars intersection, it is anticipated that motorists will perform their left turn maneuver at the Century Park East and the Century Park West intersections. Furthermore, the dual northbound and southbound left turn lanes from Avenue of the Stars onto Constellation Boulevard will be reduced to one left turn lane in each direction. Local access to businesses on the south side of the roadway will be maintained. Table 7-7 presents the level of service results during this stage.

Table 7-7: Stage 7 Level of Service Results

Intersection	Stage 7			
	AM Peak Hour		PM Peak Hour	
	LOS	Delay	LOS	Delay
Century Park East/Santa Monica Blvd	F	133.7	F	120.7
Century Park East/Constellation Blvd	C	29.0	C	21.5
Century Park East/Olympic Blvd	D	52.7	D	52.0
Avenue of the Stars/Santa Monica Blvd	F	145.5	F	117.0
Avenue of the Stars/Constellation Blvd	F	105.1	E	56.4
Avenue of the Stars/WB Olympic Blvd	B	17.1	A	7.0
Avenue of the Stars/EB Olympic Blvd	D	48.9	D	45.0
Century Park West/Santa Monica Blvd	F	138.2	F	148.4
Century Park West/Constellation Blvd	B	10.4	C	21.5
Century Park West/Olympic Blvd	F	81.8	E	76.1

As shown in Table 7-7, with one traffic lane in each direction of Constellation Boulevard, traffic operations at the intersection of Avenue of the Stars and Constellation Boulevard would deteriorate to LOS F in the AM peak hour and LOS E in the PM peak hour. In addition, all the three intersections along Santa Monica Boulevard would continue to operate at LOS F during both the AM and PM peak hours. Also, the intersection of Century Park West and Olympic Boulevard would continue to operate at LOS F in the AM peak hour and LOS E in the PM peak hour. The remaining five study intersections would continue to operate at LOS D or better during both peak hours.

7.1.8 Stage 8

Work area during this stage will be setup along the north side of Constellation Boulevard between Century Park East to the east and Solar Way to the west to drill the north station box piles. This will require moving traffic lanes over to the south side of the street. The affected travel control zone will extend from approximately Century Park East to the east and Century Park West to the west. This stage also includes the closure of one northbound lane on Century Park East, across from the Constellation Boulevard intersection, to allow construction traffic to travel back and forth between the 1940 Century Park East and the 2040 Century Park East staging sites. Traffic traveling in and out of the AT&T building driveway across from Constellation Boulevard will be maintained.

There are no left turn restrictions from Constellation Boulevard onto northbound and southbound Avenue of the Stars. In addition, the dual northbound and southbound left turn lanes from Avenue of the Stars onto Constellation Boulevard will be reduced to one left turn lane in each direction. Local access to businesses on the south side of the roadway will be maintained. Table 7-8 presents the level of service results during this stage.

Table 7-8: Stage 8 Level of Service Results

Intersection	Stage 8			
	AM Peak Hour		PM Peak Hour	
	LOS	Delay	LOS	Delay
Century Park East/Santa Monica Blvd	F	141.9	F	142.9
Century Park East/Constellation Blvd	C	24.2	B	18.4
Century Park East/Olympic Blvd	D	52.7	D	48.8
Avenue of the Stars/Santa Monica Blvd	F	143.3	F	118.3
Avenue of the Stars/Constellation Blvd	F	71.0	F	107.5
Avenue of the Stars/WB Olympic Blvd	B	17.1	A	6.8
Avenue of the Stars/EB Olympic Blvd	D	41.7	C	31.3
Century Park West/Santa Monica Blvd	F	139.1	F	146.1
Century Park West/Constellation Blvd	A	8.6	D	32.0
Century Park West/Olympic Blvd	F	82.6	E	79.1

As shown in Table 7-8, with one traffic lane in each direction of Constellation Boulevard, traffic operations at the intersection of Avenue of the Stars and Constellation Boulevard would deteriorate to LOS F during both peak hours. In addition, all the three intersections along Santa Monica Boulevard would continue to operate at LOS F during both the AM and PM peak hours. Also, the intersection of Century Park West and Olympic Boulevard would continue to operate at LOS F in the AM peak hour and LOS E in the PM peak hour. The remaining five study intersections would continue to operate at LOS D or better during both peak hours.

7.1.9 Stage 9

Stage 9 consists of a continuous full closure of Constellation Boulevard from Century Park East to Solar Way to install the station box decking. The north/south movement of traffic along Avenue of the Stars

would remain open at Constellation Boulevard; however, any turns would be prohibited for the duration of the full closure. Alternate access to businesses along Constellation Boulevard would be identified and provided during the duration of this full closure. All traffic along this segment of Constellation Boulevard would be diverted to adjacent roadways such as Century Park West, Avenue of the Stars, and Century Park East. This stage also includes the closure of one northbound lane on Century Park East, across from the Constellation Boulevard intersection, to allow construction traffic to travel back and forth between the 1940 Century Park East and the 2040 Century Park East staging sites. Traffic will traveling in and out of the AT&T building driveway straight across from Constellation Boulevard will be maintained. All work performed during this stage will occur over weekends from Friday 9:00 pm to Monday 6:00 am, with lanes becoming operational on Monday at 6:00 am. However, if there is a change in this proposed schedule and the full closure extends to the weekday AM and/or PM peak hours, then the level of service results of the intersection operating conditions due to the a full closure along Constellation Boulevard are presented in Table 7-9.

Table 7-9: Stage 9 Level of Service Results

Intersection	Stage 9			
	AM Peak Hour		PM Peak Hour	
	LOS	Delay	LOS	Delay
Century Park East/Santa Monica Blvd	F	221.0	F	202.6
Century Park East/Constellation Blvd	A	1.4	A	2.2
Century Park East/Olympic Blvd	E	68.5	D	46.2
Avenue of the Stars/Santa Monica Blvd	F	147.1	F	163.7
Avenue of the Stars/Constellation Blvd	N/A	N/A	N/A	N/A
Avenue of the Stars/WB Olympic Blvd	C	22.8	D	37.2
Avenue of the Stars/EB Olympic Blvd	E	72.3	D	51.1
Century Park West/Santa Monica Blvd	F	199.9	F	197.5
Century Park West/Constellation Blvd	B	16.3	B	14.9
Century Park West/Olympic Blvd	E	66.9	F	107.6

During the Stage 9 construction period, with a proposed peak period full closure of Constellation Boulevard from Century Park East to Solar Way, traffic operations at the intersections of Century Park East and Olympic Boulevard and Avenue of the Stars and EB Olympic Boulevard would deteriorate to LOS E in the AM peak hour and continue to operate at LOS D in the PM peak hour. In addition, all the three intersections along Santa Monica Boulevard would continue to operate at LOS F during both the AM and PM peak hours. Also, the intersection of Century Park West and Olympic Boulevard would operate at LOS E in the AM peak hour and LOS F in the PM peak hour. The remaining four study intersections would continue to operate at LOS D or better during both peak hours.

7.1.10 Stage 10

Work area during this stage will be setup along the south side of Constellation Boulevard between Century Park East to the east and Solar Way to the west. The construction work during this stage will consist of excavating the station box and delivering materials for station construction through shafts

located within Constellation Boulevard. There are no construction staging areas available immediately adjacent to the station box so these activities must occur in the street. This will require moving the traffic lanes over to the north side of the street. The affected travel control zone will extend from approximately Century Park East to the east and Century Park West to the west. Pedestrian access will be maintained along the north and south of Constellation Boulevard at all times. This stage also includes the closure of one northbound lane on Century Park East, across from the Constellation Boulevard intersection, to allow construction traffic to travel back and forth between the 1940 Century Park East and the 2040 Century Park East staging sites. Traffic traveling in and out of the AT&T building driveway across from Constellation Boulevard will be maintained.

In addition, eastbound left turns from Constellation Boulevard onto Avenue of the Stars would be permitted and westbound left turns from Constellation Boulevard onto Avenue of the Stars would be restricted during this construction stage. As a result of the proposed westbound left turn restrictions at the Avenue of the Stars intersection, it is anticipated that motorists will perform their left turn maneuver at the Century Park East and the Century Park West intersections. Furthermore, the dual northbound and southbound left turn lanes from Avenue of the Stars onto Constellation Boulevard will be reduced to one left turn lane in each direction. Local access to businesses on the south side of the roadway will be maintained. Table 7-10 presents the level of service results during this stage.

Table 7-10: Stage 10 Level of Service Results

Intersection	Stage 10			
	AM Peak Hour		PM Peak Hour	
	LOS	Delay	LOS	Delay
Century Park East/Santa Monica Blvd	F	141.9	F	142.9
Century Park East/Constellation Blvd	C	24.2	B	18.4
Century Park East/Olympic Blvd	D	52.7	D	50.3
Avenue of the Stars/Santa Monica Blvd	F	143.3	F	118.3
Avenue of the Stars/Constellation Blvd	F	85.6	F	178.3
Avenue of the Stars/WB Olympic Blvd	B	17.4	A	6.6
Avenue of the Stars/EB Olympic Blvd	D	52.7	E	70.6
Century Park West/Santa Monica Blvd	F	139.1	F	146.1
Century Park West/Constellation Blvd	A	9.3	C	29.7
Century Park West/Olympic Blvd	F	82.1	E	78.9

As shown in Table 7-10, with one traffic lane in each direction along Constellation Boulevard, traffic operations at the intersection of Avenue of the Stars and Constellation Boulevard would deteriorate to LOS F during both peak hours and the LOS for the intersection of Avenue of the Stars and EB Olympic Boulevard would deteriorate to LOS E in the PM peak hour. Also, all the three intersections along Santa Monica Boulevard would continue to operate at LOS F during both the AM and PM peak hours. The intersection of Century Park West and Olympic Boulevard would continue to operate at LOS F in the AM peak hour and at LOS E in the PM peak hour. The remaining four study intersections would continue to operate at LOS D or better during both peak hours.

APPENDIX A TRAFFIC CONTROL PLANS

APPENDIX A TRAFFIC CONTROL PLANS

(Under Separate Cover)

WORKSITE TRAFFIC CONTROL NOTES

1. EXPECTED START DATE IS JANUARY 2018. STAGE DURATION WILL BE DETERMINED UPON THE AWARD OF CONSTRUCTION CONTRACT AND COORDINATED BY THE CONTRACTOR.
2. CONTACT _____FOR "MTA" PERSONNEL RESPONSIBLE FOR WTCP IMPLEMENTATION/MAINTENANCE.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LABOR AND MATERIAL INVOLVED IN THE REMOVAL, INSTALLATION, AND MAINTENANCE OF ALL STRIPING, PAVEMENT MARKINGS, SIGNING, BARRICADING, DELINEATORS, ETC SHOWN ON THESE DETOUR PLANS AND AS CONSTRUCTION STAGING NECESSITATES.
4. THE CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO THE LADOT TEMPORARY TRAFFIC MANAGEMENT SECTION (EMAIL: Edgar.Rodriguez@lacity.org) AT LEAST FIVE (5) WORKING DAYS PRIOR TO CONSTRUCTION WITH THE DATE(S) OF IMPLEMENTATION & TYPE OF TEMPORARY TRAFFIC CONTROL IMPLEMENTATION (INCLUDE ACCEPTANCE DATE ON PLAN & SHEET NUMBER) & BRIEF DESCRIPTION OF WORK. DEPARTMENT OF TRANSPORTATION RESERVES THE RIGHT TO OBSERVE THESE CONTROL PLANS IN USE AND TO MAKE NECESSARY CHANGES AS FIELD CONDITIONS WARRANT. ANY CHANGES SHALL SUPERSEDE THESE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PLACEMENT OF ANY ADDITIONAL TRAFFIC CONTROL DEVICES NECESSARY TO ASSURE PUBLIC SAFETY AT ALL TIMES DURING CONSTRUCTION. LADOT SHALL APPROVE MARK OUT PRIOR TO IMPLEMENTATION OF LONG TERM TEMPORARY PAVEMENT STRIPING.
5. ALL CONSTRUCTION RELATED WARNING SIGNS SHALL BE IN BLACK LEGEND WITH ORANGE BACKGROUND AND IN CONFORMANCE WITH THE LATEST EDITION OF THE CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
6. THE STRIPING AND SIGNING SHOWN FOR REMOVAL ON THESE PLANS MAY BE DIFFERENT THAN WHAT EXISTS AT TIME OF INSTALLATION OF A CONSTRUCTION STAGE. THE CONTRACTOR SHALL REMOVE ALL CONFLICTING SIGNING AND STRIPING, WHETHER OR NOT IT IS DEPICTED ACCURATELY ON THESE PLANS.
7. CONTRACTOR SHALL NOTIFY METRO AT (213) 922-4632 OR ANY OTHER AFFECTED TRANSIT SERVICES AT LEAST FIVE (5) WORKING DAYS PRIOR TO CONSTRUCTION.
8. ALL TRAFFIC CONTROL DEVICES SHALL BE KEPT IN THEIR PROPER POSITION AT ALL TIMES, AND SHALL BE REPAIRED, REPLACED OR CLEANED AS NECESSARY TO PRESERVE THEIR APPEARANCE AND CONTINUITY.
9. CONTRACTORS SHALL PROVIDE FLAGGERS AS DEEMED NECESSARY BY CITY. A FLAGGER SHALL USE THE APPROVED OCTAGONAL STOP/SLOW PADDLE, SHALL WEAR AN ORANGE SAFETY VEST (PADDLE AND VEST MUST BE REFLECTORIZED FOR NIGHT WORK) AND HARD HAT, AS REQUIRED BY THE WATCH MANUAL AND MUST BE PROPERLY TRAINED BY THE CONTRACTOR PERFORMING THE WORK SAFELY. APPROPRIATE ADVANCE SIGNS MUST ALSO BE INSTALLED, PER THE WATCH MANUAL.
10. ALL TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE REMOVED FOLLOWING COMPLETION OF EACH CONSTRUCTION STAGE AND THE PERMANENT TRAFFIC CONTROL DEVICES SHALL BE RESTORED BY THE CONTRACTOR UPON REMOVAL OF DETOUR STRIPING.
11. ALL SIGNS, DELINEATORS, BARRICADES, ETC., SHALL CONFORM TO THE STATE OF CALIFORNIA STANDARD SPECIFICATIONS, "WATCH MANUAL" LATEST EDITION, THE LATEST EDITION OF THE CALIFORNIA MUTCD, AND NOTICE TO CONTRACTORS – COMPREHENSIVE, STANDARD PLAN S-610 (LATEST EDITION).
12. CONTRACTOR SHALL NOTIFY LADOT WESTERN SIGNAL MAINTENANCE SUPERVISOR AT (213) 485-6790 FIVE (5) WORKING DAYS PRIOR TO ANY EXCAVATION OR CONSTRUCTION WITHIN 10-FEET OF EXISTING TRAFFIC SIGNAL DETECTOR LOOPS, CONDUIT, INTERCONNECTS, OR ATSAC FIBER OPTIC CABLE.
13. ANY DAMAGE TO TRAFFIC SIGNAL DETECTOR LOOPS, CONDUITS, INTERCONNECTS, OR FIBER OPTIC CABLE SHALL BE REPAIRED OR REPLACED IMMEDIATELY BY THE CONTRACTOR AT THEIR OWN EXPENSE. DELAYS IN REPAIR OF INTERCONNECT OR ATSAC FIBER OPTIC CABLE WILL REQUIRE THE PAYMENT OF LIQUIDATION DAMAGES TO THE CITY OF LOS ANGELES DEPARTMENT OF TRANSPORTATION. IMMEDIATELY NOTIFY LADOT WESTERN SIGNAL MAINTENANCE SUPERVISOR AT (213) 485-6790 OF ANY DAMAGES.
14. FOR THE TEMPORARY "TOW AWAY NO STOPPING ANY TIME" SIGNS, CONTRACTOR SHALL CONTACT THE SPECIAL TRAFFIC CONTROLS OFFICE AT (213) 485-2298 AT FIVE (5) WORKING DAYS IN ADVANCE OF EACH NEW CONSTRUCTION STAGE. THE INSTALLATION OF THE TEMPORARY "TOW AWAY NO STOPPING ANYTIME". FOR WTCP IMPLEMENTATION DURATION OF MORE THAN ONE (1) MONTH, THE CONTRACTOR SHALL FURNISH AND INSTALL "TOW AWAY NO STOPPING ANYTIME" SIGNS PER CITY SPECIFICATION (METAL & REFLECTORIZED). CONTACT TEMPORARY TRAFFIC MANAGEMENT AT (Email: edgar.rodriguez@lacity.org) FOR SAMPLES.
15. THERE SHALL BE NO STORAGE OF CONSTRUCTION MATERIALS OR EQUIPMENT OUTSIDE THE DESIGNATED WORK AREA AS INDICATED IN THE WTCP. STORAGE OF CONSTRUCTION MATERIALS OR EQUIPMENT WITHIN THE DESIGNATED AREA SHALL BE DONE IN A MANNER NOT TO CREATE VISIBILITY OBSTRUCTIONS TO THE MOTORING PUBLIC.
16. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVEWAYS AT ALL TIMES AND SHALL COORDINATE WITH RESIDENTS/BUSINESSES ANY CLOSURE/LIMITED ACCESS TO THEIR DRIVEWAYS.
17. CONTRACTOR SHALL COORDINATE WORK WITH FACILITY MANAGEMENT FOR THE "MTA" DURING CONSTRUCTION HOURS.
18. CONTRACTOR SHALL PERFORM WORK IN ONLY ONE STAGE AT A TIME. THE CONTRACTOR SHALL ONLY UTILIZE THAT PORTION OF THE DESIGNATED "WORK AREA" WHICH IS NEEDED FOR CONSTRUCTION AT ANY GIVEN TIME.
19. THE CROSSWALKS ACROSS THREE LEGS OF ANY SIGNALIZED INTERSECTION SHALL BE MAINTAINED AT ALL TIMES. "NO PED CROSSING" (R9-3) SIGNS SHALL BE INSTALLED WHEN A PAINTED CROSSWALK IS UNAVAILABLE FOR USE DUE TO CONSTRUCTION.
20. CONTRACTOR SHALL INSTALL R3-18 (NO LEFT AND NO U-TURN) SIGNS AT INTERSECTIONS WHERE THE LEFT TURN LANE HAS BEEN CLOSED FOR CONSTRUCTION. SIGNS SHOULD BE INSTALLED ON MAST ARMS AND FAR LEFT OF THE INTERSECTION OR AT LOCATIONS WHERE THEY WILL BE CLEARLY VISIBLE BY THE THRU TRAFFIC.
21. CONTRACTOR SHALL PROVIDE CHANGEABLE MESSAGE SIGNS AS FIELD CONDITIONS/DETOURS WARRANT AND AS DEEMED NECESSARY BY LADOT, EVEN IF THEY ARE NOT SHOWN ON THESE PLANS.
- ✱ 22. WORKING HOURS FOR STAGING WILL BE LIMITED TO THE HOURS OF 7AM TO 11PM MONDAY THRU FRIDAY AND SATURDAY 7AM TO 11PM.
23. WORKSITE TRAFFIC CONTROL IS FOR THE INSTALLATION OF SOLDIER PILES FOR THE TEMPORARY SUPPORT SYSTEM SHORING.
24. LADOT PARKING METER DIVISION MUST BE NOTIFIED AT (213) 473-8270 AT LEAST TEN (10) WORKING DAYS PRIOR TO START OF CONSTRUCTION WHENEVER PARKING METERS WILL BE AFFECTED. LADOT PARKING METER DIVISION WILL COORDINATE THE REMOVAL OF METERS, POSTS AND SIGNS AS NEEDED AND, UPON COMPLETION OF THE PROJECT, THE REINSTALLATION OF METERS, POSTS, SIGNS AND/OR PAINT AS NEEDED. FAILURE TO NOTIFY LADOT PARKING METER DIVISION EITHER PRIOR TO OR UPON COMPLETION OF CONSTRUCTION WILL RESULT IN THE IMPOSITION OF A PENALTY AND MAKE THE CONTRACTOR LIABLE FOR THE COST OF ANY MISSING OR DAMAGED METERS, POSTS, SIGNS, ETC. THAT DEPARTMENT RECORDS INDICATE WERE PRESENT.

100 FEET 0 100 200 FEET
80 0 80 160
60 0 60 120
20 0 20 40
0 0 0 0
10 0 10 20
20 0 20 40
1"=20' ORIGINAL MAP SCALE 1"=40'

WORKSITE TRAFFIC CONTROL NOTES (CONT'D)

25. UNLESS K-RAILS AND CRASH CUSHIONS ARE INSTALLED, CONTRACTOR SHALL PROVIDE MIN. 5-FOOT SHOULDER FROM ANY OPEN EXCAVATION.
26. ALL K-RAIL ENDS, PLATFORMS, AND FIXED OBJECTS WITHIN THE ROADWAY SHALL BE PROTECTED BY CRASH CUSHIONS OR BY AN APPROVED ATTENUATION SYSTEM, UNLESS THEY ARE PLACED AT LEAST 15 FEET AWAY FROM EDGE OF TRAVELED WAY. AT A DRIVEWAY, FOR A 20-FOOT K-RAIL THE HORIZONTAL OFFSET SHALL NOT EXCEED 5 FEET (MAX. TAPER RATE SHALL NOT EXCEED 4:1).
27. NOTIFY FILM LA (JOSH MINGO) AT (213) 977-8600 AT LEAST FIVE (5) WORKING DAYS PRIOR TO CONSTRUCTION TO COORDINATE WITH FILMING ACTIVITIES.
28. ALL TEMPORARY SIGNAGE INSTALLED ADJACENT TO PEDESTRIAN TRAVEL WAY MUST ALLOW FOR ADA-COMPLIANT PASSAGEWAYS.
29. CONCRETE K-RAIL SECTIONS TO BE CONTINUOUSLY CONNECTED. IN AREAS WITH LESS THAN 2-FEET TO EDGE OF EXCAVATION, SECURE K-RAIL TO PAVEMENT PER CALTRANS SPECIFICATIONS.
30. ANY CHANGES TO WORK AREAS, WORK HOURS, AND/OR APPROVED PLANS SHALL BE SUBMITTED TO LADOT FOR REVIEW AND APPROVAL.
31. THE CONTRACTOR SHALL BE RESPONSIBLE FOR STRIPING (PROPOSED AND EXISTING) SHOWN ON THIS WTCP TO BE IN GOOD CONDITION AND VISIBLE. THE CONTRACTOR SHALL REPAINT ANY FADED EXISTING STRIPING AS DIRECTED BY THE LADOT ENGINEER.
32. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ANY MISSING OR DAMAGED SIGNS (DUE TO CONSTRUCTION) ACCORDING TO THE LATEST LADOT SPECIFICATIONS.
33. BOARD OF PUBLIC WORKS OR THEIR DESIGNEE (BUREAU OF STREET SERVICES) SHALL APPROVE ALL STREET AND SIDEWALK CLOSURES. AN EXEMPTION OF THE MAYOR'S DIRECTIVE #2 (RUSH HOUR CONSTRUCTION ON ANY CITY STREETS) MUST BE APPROVED BY BUREAU OF ENGINEERING FOR ALL PEAK HOUR LANE CLOSURES ON ARTERIAL STREETS.
34. THE CONTRACTOR SHALL NOTIFY LOS ANGELES FIRE DEPARTMENT (LAFD) CAPTAIN IN CHARGE, OPERATIONS CONTROL DIVISION AT (213) 485-6185 AND APPROPRIATE LOCAL FIRE STATION NOT LESS THAN 72-HOURS PRIOR TO IMPLEMENTING ANY STREET CLOSURE.
35. THE CONTRACTOR SHALL NOTIFY LOS ANGELES POLICE DEPARTMENT (LAPD) AT (213) 485-2651 AND APPROPRIATE LOCAL POLICE DIVISION NOT LESS THAN 72-HOURS PRIOR TO IMPLEMENTING ANY STREET CLOSURE.
36. THE CONTRACTOR SHALL INSTALL SIDE REFLECTORS WITH CUBE-CORNER LENSES OR TOP-MOUNTED REFLECTORS (FACING THE DRIVER) ON ALL K-RAIL BARRIERS.
37. TRUCK HAUL ROUTES SHALL NOT USE LOCAL OR COLLECTOR STREETS. ALL TRUCK ROUTES SHALL BE APPROVED BY THE BUREAU OF STREET SERVICES AND ADOPTED BY THE TCTMC.
38. IF CONFLICT WILL OCCUR BETWEEN THIS STAGE OF CONSTRUCTION AND THE WILSHIRE BRT STRIPING, THE CONTRACTOR SHALL SUBMIT NEW PLANS AND OBTAIN APPROVALS FROM LADOT BEFORE PROCEEDING TO IMPLEMENTATION.
39. CONTRACTOR SHALL NOT CLOSE TRAFFIC LANES UNTIL READY TO START WORK WITHIN THE LANE CLOSURE. TRAFFIC LANE CLOSURES SHALL BE REMOVED IF WORK WITHIN THE CLOSURE IS NOT BEING ACTIVELY PURSUED.

TEMPORARY STRIPING NOTES

1. REMOVE ALL CONFLICTING STRIPING PRIOR TO INSTALLATION OF TCP.
2. WHEN REMOVAL IS REQUIRED BY CONSTRUCTION, CROSSWALK MARKINGS AND PEDESTRIAN SIGNAL HEADS SHALL BE REMOVED SIMULTANEOUSLY.
3. BUBBLE NOTES: SEE PLAN SHEETS.
4. WHEN REQUIRED BY CONSTRUCTION, THE CONTRACTOR SHALL MAKE ARRANGEMENTS WITH METRO, OR THE APPROPRIATE TRANSIT OPERATION, FOR THE TEMPORARY RELOCATION OF BUS STOPS/ZONE. COORDINATE RELOCATION WITH LADOT FOR INSTALLATION OF "TEMPORARY TOW AWAY NO STOPPING-BUS ZONE" SIGNS.
5. CONTRACTOR SHALL PROVIDE REFLECTORIZED CONES AT TYPE III BARRICADE SUPPORTS TO ALERT PEDESTRIANS TO THE BARRICADE SUPPORT.
6. FIELD CONDITIONS MAY VARY FROM THOSE SHOWN ON THE TCP. IN THE EVENT FIELD CONDITIONS ARE DIFFERENT, THE CONTRACTOR SHALL COORDINATE WITH LADOT AND THE AUTHORITY BEFORE IMPLEMENTING THE TCP. THE CONTRACTOR MAY BE REQUIRED TO SUBMIT A REVISED TCP TO LADOT AND THE AUTHORITY FOR APPROVAL PRIOR TO IMPLEMENTATION.

RESTORATION STRIPING NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LABOR AND MATERIAL INVOLVED IN THE MARKOUT AND INSTALLATION OF ALL RESTORATION STRIPING/PAVEMENT MARKING. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE REMOVAL OF ALL CONFLICTING DETOUR, STRIPING, SIGNING, AND OTHER DETOUR-RELATED TRAFFIC CONTROL DEVICES PRIOR TO THE INSTALLATION OF THE FINAL STRIPING.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAINTING OF ALL EXISTING STRIPING THAT HAS BEEN DAMAGED DURING THE CONSTRUCTION PROCESS.
3. MARKOUT SHALL BE HEAVY PAINT BRUSH MARKINGS OVER A PULLED ROPE IN THE RESPECTIVE WHITE AND YELLOW COLORS OF THE PROPOSED STRIPING. STRIPING AND PAVEMENT MARKING SHALL BE IN HOT APPLIED ALKYD THERMOPLASTIC IN ACCORDANCE WITH LADOT SPECIFICATION NO. S.51-005-10 AND 76-012-15.
4. THE CONTRACTOR SHALL CONTACT LADOT TEMPORARY TRAFFIC MANAGEMENT SECTION (Email: edgar.rodriguez@lacity.org) AT LEAST (5) WORKING DAYS BEFORE BEGINNING OF MARKOUT, THE CONTRACTOR SHALL CORRECT ALL ERRORS IN MARKOUT REQUESTED BY LADOT. THE INSTALLATION OF THERMOPLASTIC STRIPING MAY PROCEED ONLY AFTER APPROVAL OF MARKOUT BY THE LADOT ENGINEER.
5. TEMPORARY REFLECTIVE RAISED PAVEMENT MARKERS SHALL BE MAINTAINED ADJACENT TO ANY TEMPORARY CENTERLINE, MARKOUT CENTERLINE, OR A SCAR OF A SANDBLASTED CENTERLINE, AS APPLICABLE, AS PER LAYOUT STANDARD PLAN NO. S-453.0 IF CONTRACTOR IS UNABLE TO RESTORE STRIPING AS PLANNED.

STEEL PLATE NOTES:

1. WHEN BACK FILLING OPERATIONS OF AN EXCAVATION IN THE TRAVELED WAY, WHETHER TRANSVERSE OR LONGITUDINAL, CANNOT BE PROPERLY COMPLETED WITHIN A WORKDAY, PROVIDE STEEL PLATE BRIDGING WITH A NONSKID SURFACE AND SHORING TO PRESERVE UNOBSTRUCTED TRAFFIC FLOW. IN SUCH CASES, THE FOLLOWING CONDITIONS SHALL APPLY:

A. STEEL PLATES USED FOR BRIDGING SHALL EXTEND A MINIMUM OF 12 INCHES BEYOND THE EDGES OF THE TRENCH.
B. INSTALL STEEL PLATE BRIDGING TO OPERATE WITH MINIMUM NOISE.
C. SHORE THE TRENCH TO SUPPORT THE BRIDGING AND TRAFFIC LOADS.
D. USE TEMPORARY PAVING WITH COLD ASPHALT CONCRETE TO FEATHER THE EDGES OF THE PLATES.

WORKZONE NOTES:

1. SOLDIER PILES SHOWN ARE SUGGESTIVE AND SUBJECT TO CHANGE UPON COMPLETION OF EXCAVATION SUPPORT SYSTEM DESIGN.

TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 12" YELLOW DIAGONAL
14. TWO WAY LEFT TURN YELLOW LANE (4" SOLID LINE AND 4"X12' @ 36' GAP WITH 3" CLEARANCE)

LADOT HAS DETERMINED THAT THERE WILL BE SIGNIFICANT IMPACT TO TRAFFIC CIRCULATION DUE TO THE REQUESTED EXEMPTION FOR LANE CLOSURES DURING PEAK PERIODS. LADOT'S ACCEPTANCE OF THIS WORKSITE PLAN DOES NOT CONSTITUTE A MITIGATION FOR SUCH AN IMPACT.

✱ CONTRACTOR TO OBTAIN PROPER APPROVALS FOR NOISE VARIANCE FROM LAPD BEYOND THE NORMAL WORKING HOURS AUTHORIZED IN THE LOS ANGELES MUNICIPAL CODE.

SETUP OF TRAFFIC CONTROL (K-RAILS AND STRIPING) SHALL BE DONE ON WEEKENDS ONLY.

CENTURY CITY CONSTELLATION STATION

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____
References: FIELD CHECK A-

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
GENERAL NOTES, LEGEND AND DETAILS

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E	W	PCR_____	TF-1500	1/39

REVIEWED:_____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY C. SANTOS
DRAWN BY C. SANTOS
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR. SUITE 470 IRVINE, CA 92618
T 949-753-9010 F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
GENERAL NOTES

CONTRACT NO
DRAWING NO TF-1500 REV
SCALE NO SCALE
SHEET NO

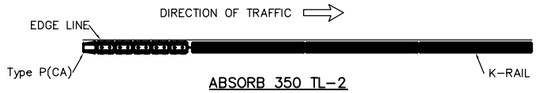
CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1500.dwg Oct 01, 2015 2:23pm SantosC

LEGEND

PROPOSED	EXISTING	EXISTING TO BE REMOVED	
			CONSTRUCTION AREA
	Ⓢ		SIGNALIZED INTERSECTION
R/C	R/C	R/C	RED CURB
			STRIPING AND MARKING
			2'x20' K-RAIL (INTERCONNECTED)
			TYPE II BARRICADE/WITH SIGN AS NOTED
			TYPE III BARRICADE/WTH SIGN AS NOTED
			SIGN AND POST
			SIGN ON EXISTING POLE
			30" EPOXIED SURFACE MOUNT DELINEATOR WITH REFLECTIVE SHEETING
			28" PORTABLE DELINEATOR
			PORTABLE FLASHING ARROW BOARD (FAB)
			DRIVEWAY
			SIGN ON TEMPORARY SIGNAL STANDARD
			SIGN ON TEMPORARY SIGNAL MAST ARM
CMS	CMS	CMS	PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
			CRASH CUSHION ARRAY "TS-11"
			PORTABLE DIAMOND FLASHING BOARD
			FLAGGER
			HIGH LEVEL WARNING DEVICES
			ABSORB 350 TL-2
			FENCE WITH SCREEN

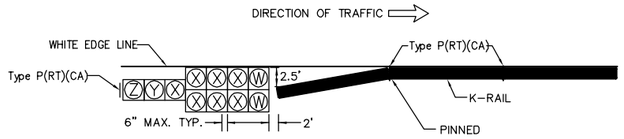
1"=20' ORIGINAL MAP SCALE 1"=40'

100 FEET 200 FEET
80 160
60 120
20 40
0 0
10 20
20 40



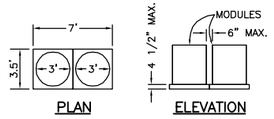
ABSORB 350 TL-2

NON-DIRECTIVE, GATING, CRASH CUSHION
Maximum Speed of 70 km/h (43 mph)
DETAIL A

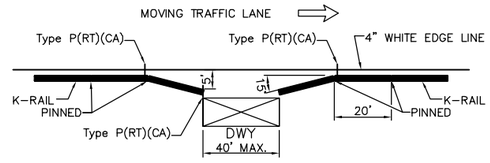


WEIGHT OF SAND
(W=2,100 LBS.)
(X=1,400 LBS.)
(Y=700 LBS.)
(Z=400 LBS.)

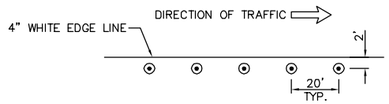
TYPICAL INSTALLATION OF CRASH CUSHIONS
40 MPH MAXIMUM INTERSECTIONS
DETAIL B



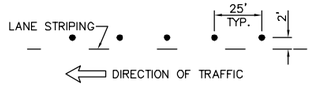
CRASH CUSHION PALLET DETAIL
DETAIL C
(TO BE USED AT THE DISCRETION OF THE CONTRACTOR)



TYPICAL INSTALLATION OF K-RAILS
NON-INTERSECTIONS
DETAIL E



TYPICAL INSTALLATION OF SURFACE MOUNT DELINEATORS
DETAIL D



TYPICAL INSTALLATION OF PORTABLE DELINEATORS
DETAIL E

STATION CONSTRUCTION SEQUENCING CONCEPT

CONSTRUCTION PHASING	CONSTRUCTION ACTIVITY	SHEET(S)	ANTICIPATED DURATION
STAGE-1	SOLDIER PILE CONSTRUCTION FIRST 250' + NORTH SIDE OF CONSTELLATION BLVD	3,4	15 WORKING DAYS
STAGE-1A	SOLDIER PILE CONSTRUCTION FIRST 250' + NORTH SIDE OF CONSTELLATION BLVD WEEKEND DRIVEWAY CLOSURE SET UP	3	3 WEEKENDS
STAGE-2	SOLDIER PILE CONSTRUCTION FIRST 350' + SOUTH SIDE OF CONSTELLATION BLVD UTILITIES ON THE NORTH SIDE OF CONSTELLATION (WATER, GAS & POWER)	5,6	30 WORKING DAYS
STAGE-3	DECKING FIRST 250' + UTILITIES N/S (WATER & GAS)	7,8,9	4 WEEKENDS
STAGE-4	LAUNCH BOX EXCAVATION UTILITIES N/S (WATER, GAS & POWER)	11,12	100 WORKING DAYS
STAGE-5	TBM LAUNCH UTILITIES S/S (POWER)	13,14,15	9 MONTHS
STAGE-6	TBM SUPPORT UTILITIES S/S (POWER)	16,17	5 MONTHS
STAGE-7	S/S PILING UTILITIES S/S (POWER)	18,19	35 WORKING DAYS
STAGE-7A	S/S PILING CROSSING AVENUE OF THE STARS WEEKEND SET-UP	20,21	2 WEEKENDS
STAGE-7B	S/S PILING CROSSING AVENUE OF THE STARS WEEKEND SET-UP	22,23	4 WEEKENDS
STAGE-7C	S/S PILING CROSSING AVENUE OF THE STARS WEEKEND SET-UP	24,25	5 WEEKENDS
STAGE-7D,7E	S/S PILING CROSSING AVENUE OF THE STARS WEEKEND DRIVEWAY CLOSURE SET-UP	18,19	3 WEEKENDS
STAGE-8	N/S PILING UTILITIES N/S (WATER, GAS & POWER)	26,27	40 WORKING DAYS
STAGE-8A	N/S PILING CROSSING AVENUE OF THE STARS WEEKEND SET-UP	28,29	2 WEEKENDS
STAGE-8B	N/S PILING CROSSING AVENUE OF THE STARS WEEKEND SET-UP	30,31	4 WEEKENDS
STAGE-8C	N/S PILING CROSSING AVENUE OF THE STARS WEEKEND SET-UP	32,33	3 WEEKENDS
STAGE-8D	N/S PILING CROSSING AVENUE OF THE STARS WEEKEND DRIVEWAY CLOSURE SET-UP	27	4 WEEKENDS
STAGE-9	DECKING FULL CLOSURE (NIGHTS/WEEKENDS)	34,35,36	
STAGE-10	LONGTERM STAGING	38,39	3 YEARS

CENTURY CITY CONSTELLATION STATION

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____
References:
FIELD CHECK
A-

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
LEGEND AND DETAILS

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR____	TF-1501	2 / 39

REVIEWED: _____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE, IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY C. SANTOS
DRAWN BY C. SANTOS
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
LEGEND AND DETAILS

CONTRACT NO
DRAWING NO TF-1501 REV
SCALE NO SCALE
SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBIM\WAGBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1501.dwg Oct 01, 2015 2:21pm SantosC

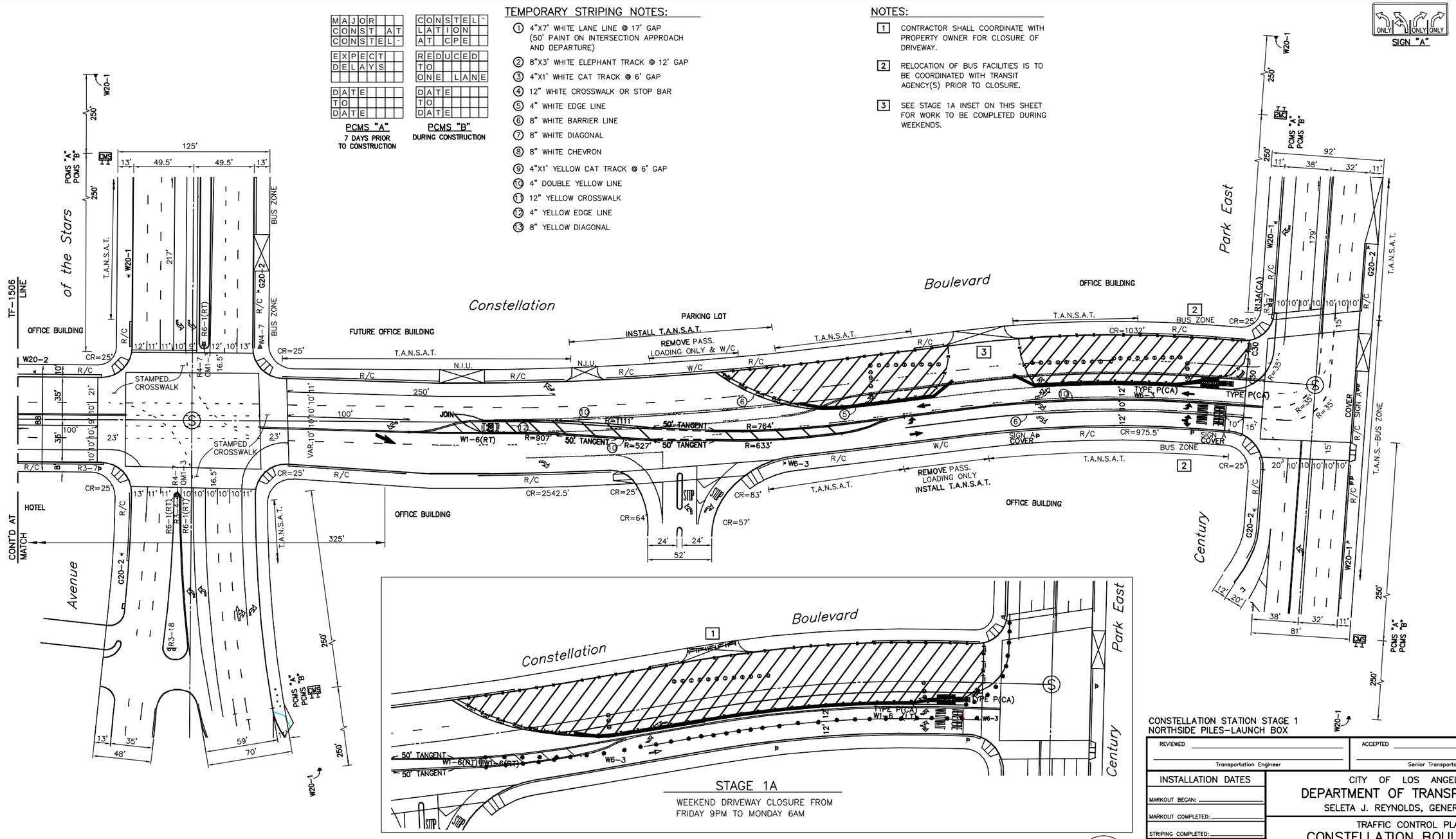
MAJOR CONST AT CONSTEL-	CONSTEL- LATION AT CPE
EXPECT DELAYS	REDUCED TO ONE LANE
DATE TO DATE	DATE TO DATE
PCMS "A" 7 DAYS PRIOR TO CONSTRUCTION	PCMS "B" DURING CONSTRUCTION

TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 8" WHITE DIAGONAL
8. 8" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 8" YELLOW DIAGONAL

NOTES:

1. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR CLOSURE OF DRIVEWAY.
2. RELOCATION OF BUS FACILITIES IS TO BE COORDINATED WITH TRANSIT AGENCY(S) PRIOR TO CLOSURE.
3. SEE STAGE 1A INSET ON THIS SHEET FOR WORK TO BE COMPLETED DURING WEEKENDS.



SCALE: 1"=40'

CONSTELLATION STATION STAGE 1
NORTHSIDE PILES–LAUNCH BOX

REVIEWED: _____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE, IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____
References:
FIELD CHECK
A-5150

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
FROM CENTURY PARK EAST
TO CENTURY PARK WEST

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR____	TF-1505	3/39

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY T. SAADALLA
DRAWN BY T. SAADALLA
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CONSTELLATION STATION
STAGE 1 – SHEET 1

CONTRACT NO
DRAWING NO TF-1505 REV
SCALE 1"=40'
SHEET NO

END ROAD WORK G20-2
LEFT LANE ENDS R9-1(LT)
W1-6(RT)
W4-2(LT)
LANE CLOSED C-30
TYPE P(CA)
ROAD WORK AHEAD W20-1
W6-3

MAJOR CONST AT CONSTEL-

EXPECT DELAYS

DATE TO DATE

PCMS "A"
7 DAYS PRIOR TO CONSTRUCTION

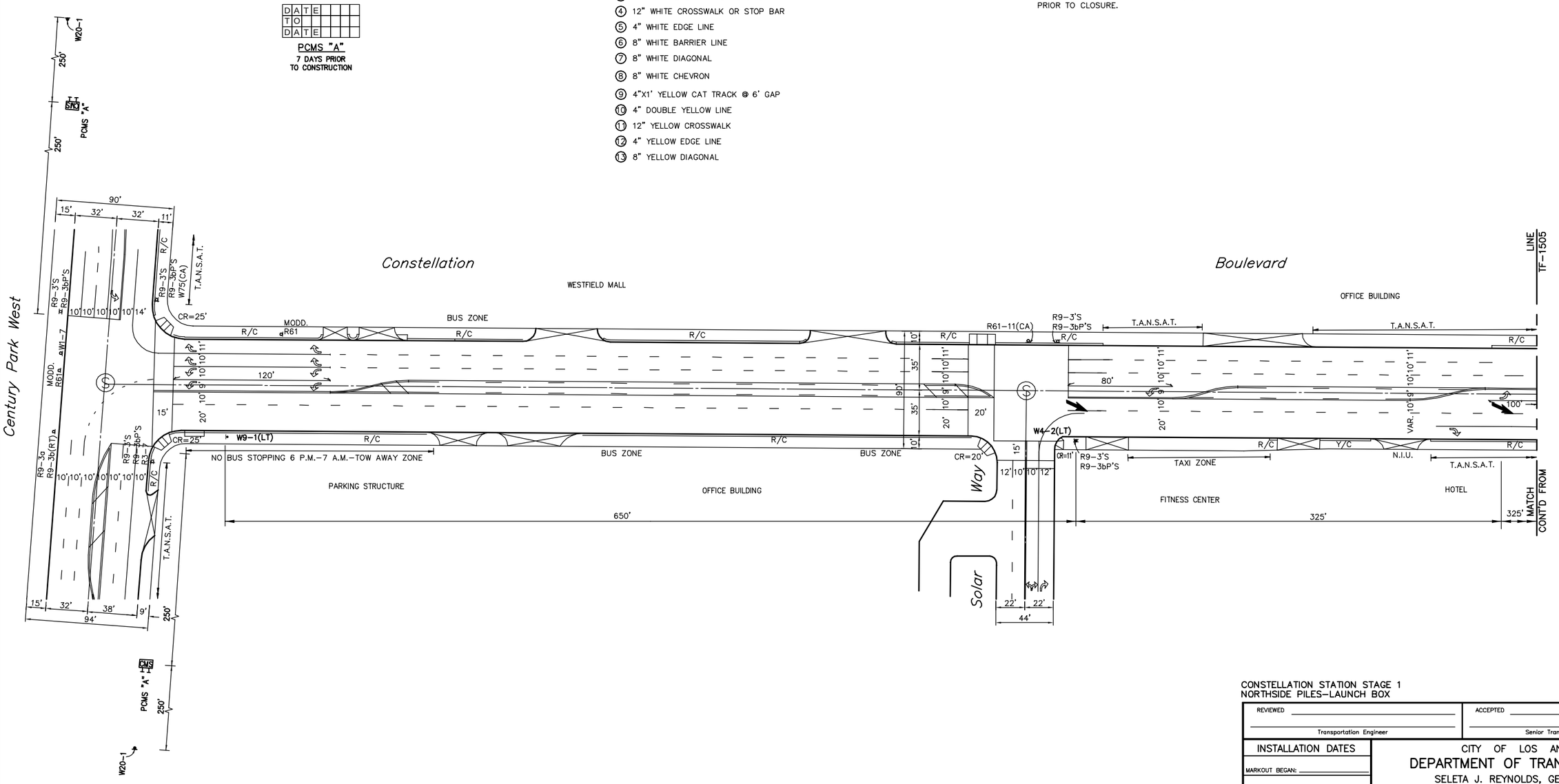
TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 8" WHITE DIAGONAL
8. 8" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 8" YELLOW DIAGONAL

NOTES:

1. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR CLOSURE OF DRIVEWAY.
2. RELOCATION OF BUS FACILITIES IS TO BE COORDINATED WITH TRANSIT AGENCY(S) PRIOR TO CLOSURE.

MODD. R61



SCALE: 1"=40'

CONSTELLATION STATION STAGE 1
NORTHSIDE PILES–LAUNCH BOX

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____
References:
FIELD CHECK A-5150

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR_____	TF-1506	4 / 39

REVIEWED:_____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY T. SAADALLA
DRAWN BY T. SAADALLA
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

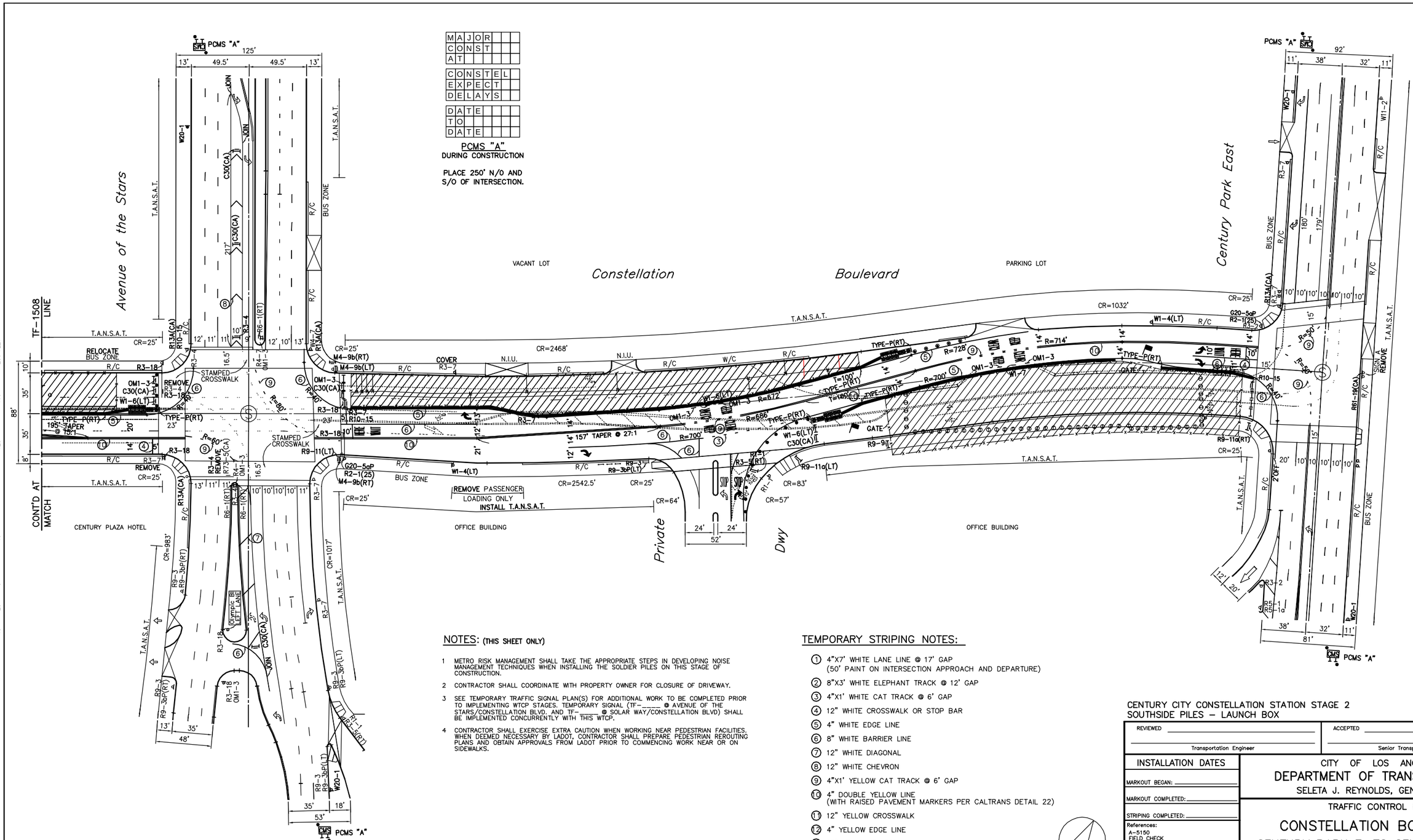
INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CONSTELLATION STATION
STAGE 1 – SHEET 2

CONTRACT NO
DRAWING NO TF-1506 REV
SCALE 1"=40'
SHEET NO

1"=20' ORIGINAL MAP SCALE 1"=40'

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION – TRAFFIC CONTROL\SHEETS\c0XXXtf1505.dwg Sep 30, 2015 2:49pm SantosC



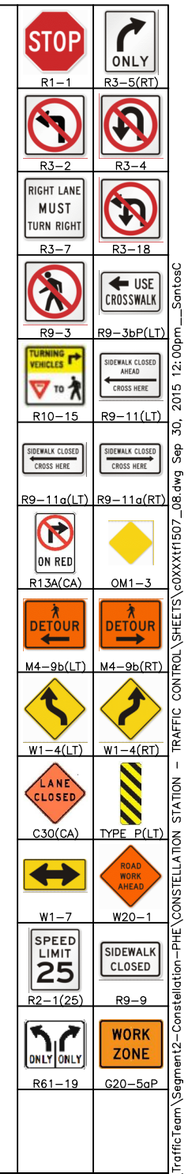
NOTES: (THIS SHEET ONLY)

1. METRO RISK MANAGEMENT SHALL TAKE THE APPROPRIATE STEPS IN DEVELOPING NOISE MANAGEMENT TECHNIQUES WHEN INSTALLING THE SOLDIER PILES ON THIS STAGE OF CONSTRUCTION.
2. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR CLOSURE OF DRIVEWAY.
3. SEE TEMPORARY TRAFFIC SIGNAL PLAN(S) FOR ADDITIONAL WORK TO BE COMPLETED PRIOR TO IMPLEMENTING WTCP STAGES. TEMPORARY SIGNAL (TF-____ @ AVENUE OF THE STARS/CONSTELLATION BLVD. AND TF-____ @ SOLAR WAY/CONSTELLATION BLVD) SHALL BE IMPLEMENTED CONCURRENTLY WITH THIS WTCP.
4. CONTRACTOR SHALL EXERCISE EXTRA CAUTION WHEN WORKING NEAR PEDESTRIAN FACILITIES. WHEN DEEMED NECESSARY BY LADOT, CONTRACTOR SHALL PREPARE PEDESTRIAN REROUTING PLANS AND OBTAIN APPROVALS FROM LADOT PRIOR TO COMMENCING WORK NEAR OR ON SIDEWALKS.

TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 12" YELLOW DIAGONAL

SCALE: 1"=40'



CADD PROJECT FILE NAME: L:\LAWSBM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1507_08.dwg Sep 30, 2015 12:00pm Santosc

CENTURY CITY CONSTELLATION STATION STAGE 2
SOUTHSIDE PILES - LAUNCH BOX

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____
References: A-5150 FIELD CHECK

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR____	TF-1507	5/39

REVIEWED: _____ 20 ___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY J. BANZON
DRAWN BY J. BANZON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

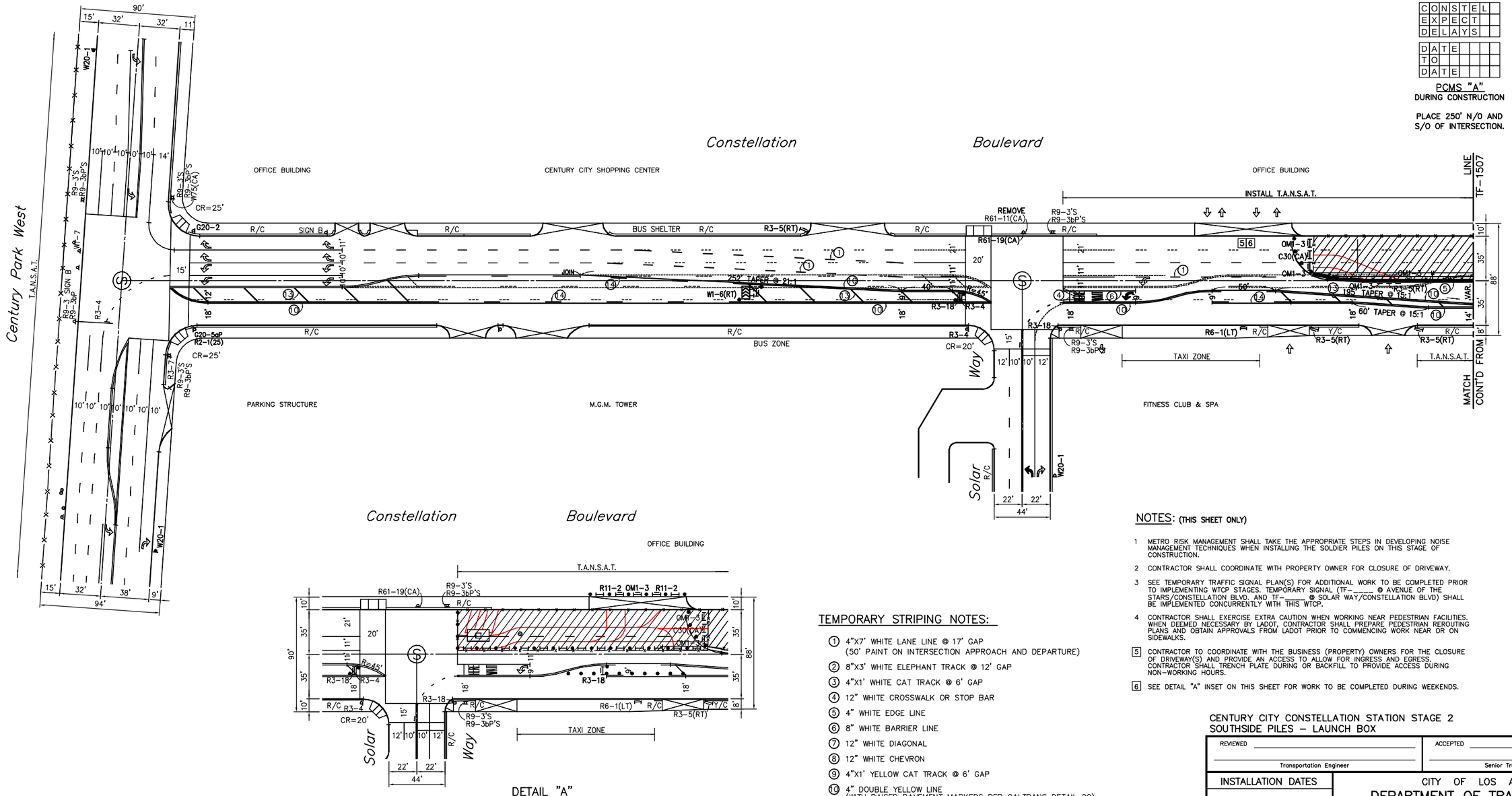
PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR. SUITE 470 IRVINE, CA 92618 T 949-753-9010 F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 2 - SHEET 1

CONTRACT NO
DRAWING NO TF-1507 REV
SCALE 1"=40'
SHEET NO

1"=20' ORIGINAL MAP SCALE 1"=40'



DETAIL "A"

WORKING HOURS DURING WEEKEND SETUP
FRIDAY 9PM TO MONDAY 6AM.

TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 12" YELLOW DIAGONAL
14. 4" YELLOW TWO-WAY LEFT TURN LANE LINE

SCALE: 1"=40'

MAJOR CONST
CONSTEL EXPECT DELAYS
DATE TO DATE

PCMS "A"
DURING CONSTRUCTION

PLACE 250' N/O AND S/O OF INTERSECTION.

NOTES: (THIS SHEET ONLY)

1. METRO RISK MANAGEMENT SHALL TAKE THE APPROPRIATE STEPS IN DEVELOPING NOISE MANAGEMENT TECHNIQUES WHEN INSTALLING THE SOLDIER PILES ON THIS STAGE OF CONSTRUCTION.
2. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR CLOSURE OF DRIVEWAY.
3. SEE TEMPORARY TRAFFIC SIGNAL PLAN(S) FOR ADDITIONAL WORK TO BE COMPLETED PRIOR TO IMPLEMENTING WTCP STAGES. TEMPORARY SIGNAL (TF-____ @ AVENUE OF THE STARS/CONSTELLATION BLVD. AND TF-____ @ SOLAR WAY/CONSTELLATION BLVD) SHALL BE IMPLEMENTED CONCURRENTLY WITH THIS WTCP.
4. CONTRACTOR SHALL EXERCISE EXTRA CAUTION WHEN WORKING NEAR PEDESTRIAN FACILITIES. WHEN DEEMED NECESSARY BY LADOT, CONTRACTOR SHALL PREPARE PEDESTRIAN REROUTING PLANS AND OBTAIN APPROVALS FROM LADOT PRIOR TO COMMENCING WORK NEAR OR ON SIDEWALKS.
5. CONTRACTOR TO COORDINATE WITH THE BUSINESS (PROPERTY) OWNERS FOR THE CLOSURE OF DRIVEWAY(S) AND PROVIDE AN ACCESS TO ALLOW FOR INGRESS AND EGRESS. CONTRACTOR SHALL TRENCH PLATE DURING OR BACKFILL TO PROVIDE ACCESS DURING NON-WORKING HOURS.
6. SEE DETAIL "A" INSET ON THIS SHEET FOR WORK TO BE COMPLETED DURING WEEKENDS.

SPEED LIMIT 25 R2-1(25)	ONLY R3-5(RT)
R3-4	R3-18
ONLY ONLY R61-19	END ROAD WORK G20-2
WORK ZONE G20-5aP	W1-6(RT)
W4-2(LT)	ROAD WORK AHEAD W20-1
OM1-3	LANE CLOSED C30(CA)
ONE WAY R6-1(RT)	ROAD CLOSED R11-2

CENTURY CITY CONSTELLATION STATION STAGE 2
SOUTHSIDE PILES – LAUNCH BOX

REVIEWED _____ Transportation Engineer
ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____
References:
A-5150
FIELD CHECK

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR____	TF-1508	6 / 39

REVIEWED: _____ 20 ___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE, IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY J. BANZON
DRAWN BY J. BANZON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

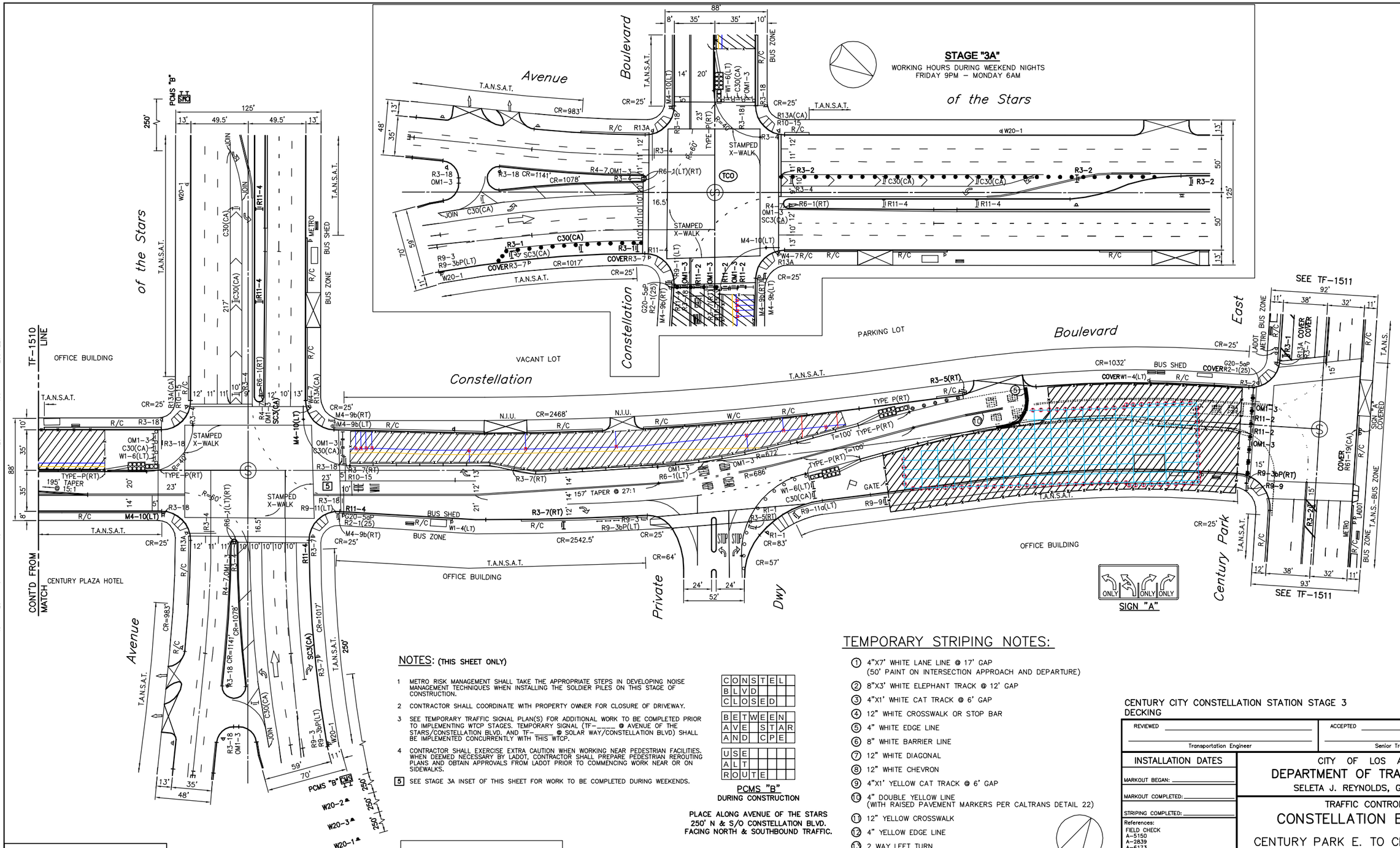
INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR. SUITE 470 IRVINE, CA 92618
T 949-753-9010 F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 2 – SHEET 2

CONTRACT NO
DRAWING NO TF-1508 REV
SCALE 1"=40'
SHEET NO

1"=20' ORIGINAL MAP SCALE

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1507_08.dwg Sep 30, 2015 12:05pm Santosc



NOTES: (THIS SHEET ONLY)

1. METRO RISK MANAGEMENT SHALL TAKE THE APPROPRIATE STEPS IN DEVELOPING NOISE MANAGEMENT TECHNIQUES WHEN INSTALLING THE SOLDIER PILES ON THIS STAGE OF CONSTRUCTION.
2. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR CLOSURE OF DRIVEWAY.
3. SEE TEMPORARY TRAFFIC SIGNAL PLAN(S) FOR ADDITIONAL WORK TO BE COMPLETED PRIOR TO IMPLEMENTING WTCP STAGES. TEMPORARY SIGNAL (TF-____ @ AVENUE OF THE STARS/CONSTELLATION BLVD. AND TF-____ @ SOLAR WAY/CONSTELLATION BLVD) SHALL BE IMPLEMENTED CONCURRENTLY WITH THIS WTCP.
4. CONTRACTOR SHALL EXERCISE EXTRA CAUTION WHEN WORKING NEAR PEDESTRIAN FACILITIES. WHEN DEEMED NECESSARY BY LADOT, CONTRACTOR SHALL PREPARE PEDESTRIAN REROUTING PLANS AND OBTAIN APPROVALS FROM LADOT PRIOR TO COMMENCING WORK NEAR OR ON SIDEWALKS.

[5] SEE STAGE 3A INSET OF THIS SHEET FOR WORK TO BE COMPLETED DURING WEEKENDS.

PCMS "B"
DURING CONSTRUCTION

PLACE ALONG AVENUE OF THE STARS 250' N & S/O CONSTELLATION BLVD. FACING NORTH & SOUTHBOUND TRAFFIC.

TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 2 WAY LEFT TURN

SCALE: 1"=40'

R3-1 R3-2 R3-5(LT) R3-7(RT) R11-2 R11-4 OM1-3 C30(CA) M4-10(LT) M4-10(RT) W20-1 W20-2 W20-3 SC3(CA) R9-9 R9-3bP(RT)

CENTURY CITY CONSTELLATION STATION STAGE 3 DECKING

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____

References:
FIELD CHECK
A-5150
A-2839
A-6173

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR____	TF-1509	7/39

REVIEWED:_____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY C. SANTOS
DRAWN BY C. SANTOS
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

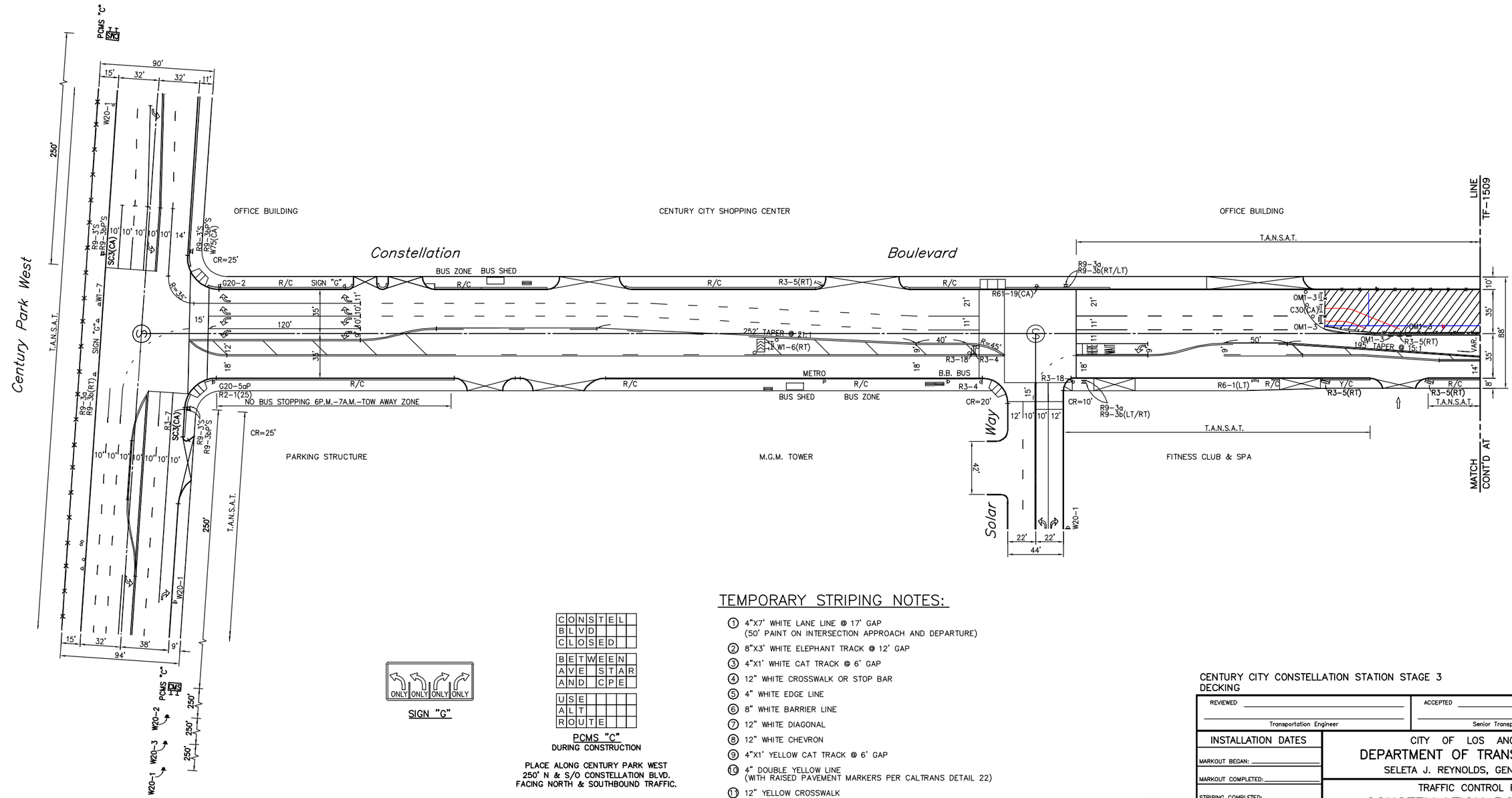
INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR. SUITE 470 IRVINE, CA 92618
T 949-753-9010 F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 3 – SHEET 1

CONTRACT NO
DRAWING NO TF-1509 REV
SCALE 1"=40'
SHEET NO

1"=20' ORIGINAL MAP SCALE 1"=40'

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\cOXXXtf1509.dwg Sep 30, 2015 11:35am Santosc



SIGN "G"

C	O	N	S	T	E	L	
B	L	V	D				
C	L	O	S	E	D		

B	E	T	W	E	E	N	
A	V	E		S	T	A	R
A	N	D		C	P	E	

U	S	E					
A	L	T					
R	O	U	T	E			

PCMS "C"
DURING CONSTRUCTION

PLACE ALONG CENTURY PARK WEST
250' N & S/O CONSTELLATION BLVD.
FACING NORTH & SOUTHBOUND TRAFFIC.

TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP
   (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE
    (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 2 WAY LEFT TURN

SCALE: 1"=40'

ROAD WORK AHEAD W20-1	DETOUR AHEAD W20-2
ROAD CLOSED AHEAD W20-3	DETOUR SC3(CA)

CENTURY CITY CONSTELLATION STATION STAGE 3 DECKING

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES

MARKOUT BEGAN: _____

MARKOUT COMPLETED: _____

STRIPING COMPLETED: _____

References:
FIELD CHECK
A-5150
A-2839
A-6173

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR_____	TF-1510	8/39

REVIEWED: _____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY C. SANTOS
DRAWN BY C. SANTOS
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 3 – SHEET 2

CONTRACT NO

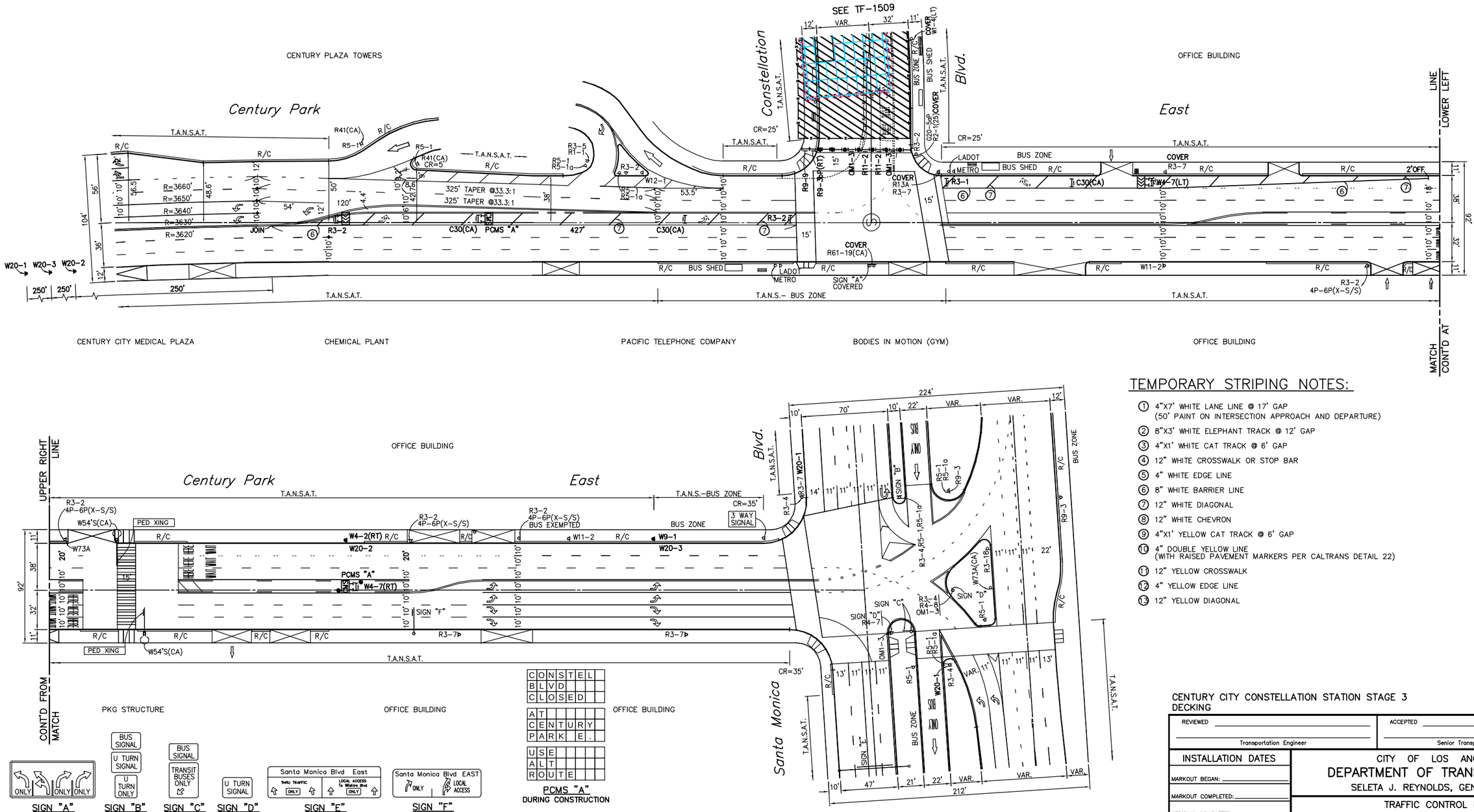
DRAWING NO TF-1510 REV

SCALE 1"=40'

SHEET NO

1"=20' ORIGINAL MAP SCALE 1"=40'

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1510.dwg Sep 30, 2015 11:38am__Santosc



TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 12" YELLOW DIAGONAL

CENTURY CITY CONSTELLATION STATION STAGE 3 DECKING

REVIEWED: _____ Transportation Engineer	ACCEPTED: _____ Senior Transportation Engineer

INSTALLATION DATES	CITY OF LOS ANGELES
MARKOUT BEGAN:	DEPARTMENT OF TRANSPORTATION
MARKOUT COMPLETED:	SELETA J. REYNOLDS, GENERAL MANAGER
STRIPING COMPLETED:	TRAFFIC CONTROL PLAN
References: FIELD CHECK A-5150 A-2839 A-6173	CONSTELLATION BOULEVARD
	CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR____	TF-1511	9/39

REVIEWED: _____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY C. SANTOS
DRAWN BY C. SANTOS
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR. SUITE 470 IRVINE, CA 92618
T 949-753-9010 F 949-753-9014

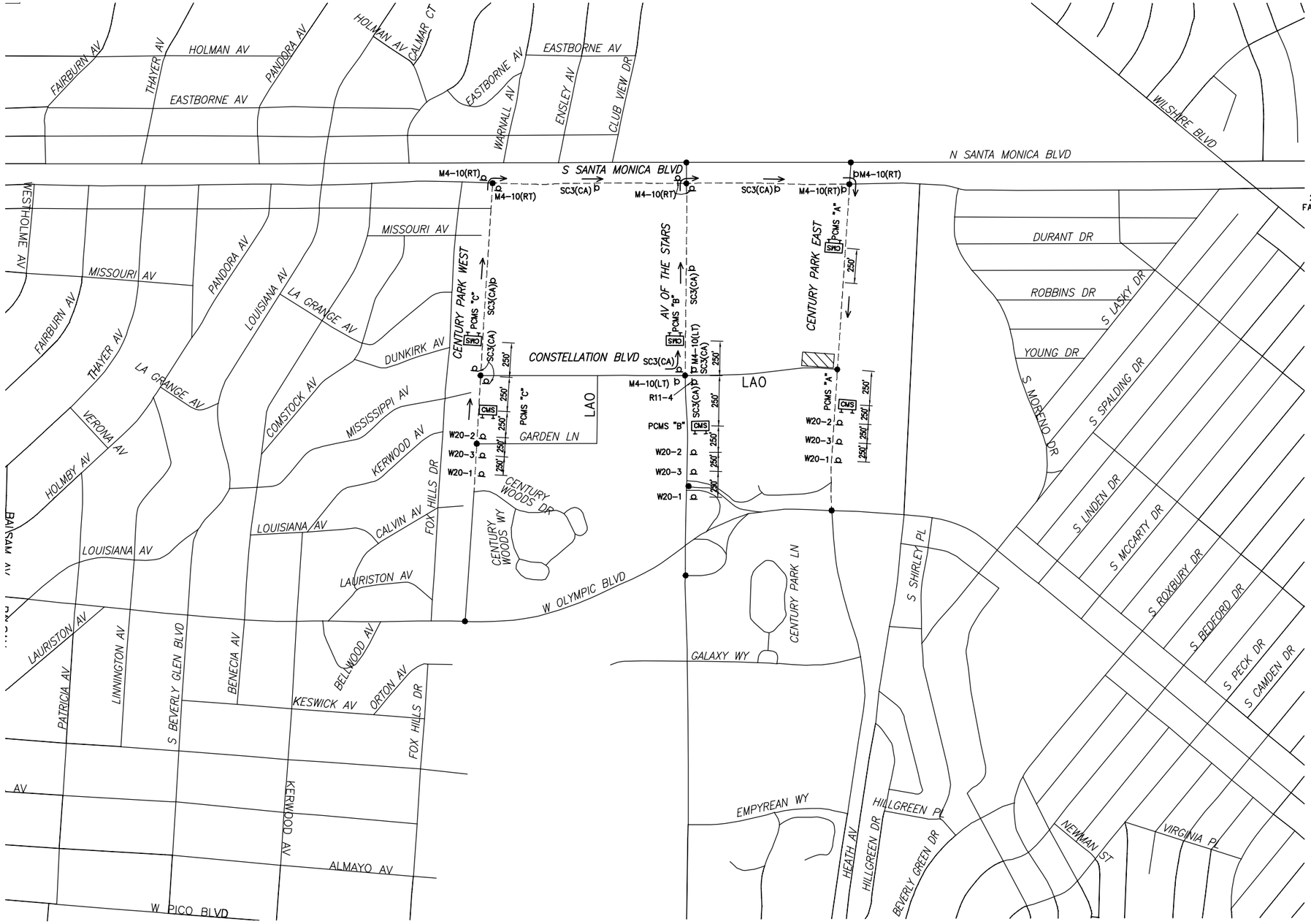
WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION WORKSITE TRAFFIC CONTROL PLAN CENTURY CITY CONSTELLATION STATION STAGE 3 – SHEET 3

CONTRACT NO
DRAWING NO TF-1511 REV
SCALE 1"=40'
SHEET NO

R3-1 | R3-2
ROAD CLOSED | LANE CLOSED
R11-2 | C30(CA)
OM1-3 | W4-2(RT)
THRU TRAFFIC MERGE RIGHT | THRU TRAFFIC MERGE LEFT
W4-7(RT) | W4-7(LT)
RIGHT LANE ENDS | ROAD WORK AHEAD
W9-1(RT) | W20-1
DETOUR AHEAD | ROAD CLOSED AHEAD
W20-2 | W20-3
SIDEWALK CLOSED | USE CROSSWALK
R9-9 | R9-3bP(RT)

1"=20' ORIGINAL MAP SCALE 1"=40'

CADD PROJECT FILE NAME: L:\LAWSBM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1511.dwg Sep 30, 2015 11:39am SantosC



CONSTEL
BLVD
CLOSED

AT
CENTURY
PARK E.

USE
ALT
ROUTE

PCMS "A"
DURING CONSTRUCTION

PLACE ALONG CENTURY PARK EAST
250' N & S/O CONSTELLATION BLVD.
FACING NORTH & SOUTHBOUND TRAFFIC.

CONSTEL
BLVD
CLOSED

BETWEEN
AVE STAR
AND CPE

USE
ALT
ROUTE

PCMS "B"
DURING CONSTRUCTION

PLACE ALONG AVENUE OF THE STARS
250' N & S/O CONSTELLATION BLVD.
FACING NORTH & SOUTHBOUND TRAFFIC.

CONSTEL
BLVD
CLOSED

BETWEEN
AVE STAR
AND CPE

USE
ALT
ROUTE

PCMS "C"
DURING CONSTRUCTION

PLACE ALONG CENTURY PARK WEST
250' N & S/O CONSTELLATION BLVD.
FACING NORTH & SOUTHBOUND TRAFFIC.

LEGEND:

- ● – SIGNALIZED INTERSECTION
- ▨ – PROPOSED WORK AREA
- ◂ – PROPOSED DETOUR SIGN
- PCMS – PROPOSED CHANGEABLE MESSAGE SIGN (PCMS)
- TCO – TRAFFIC CONTROL OFFICER
- LAO – LOCAL ACCESS ONLY

NOTES: (THIS SHEET ONLY)

1. SEE DRAWING TF-xxxx FOR ALL WTCP SIGNS ASSOCIATED WITH THIS DETOUR.

SCALE: 1"=40'

ROAD CLOSED TO THRU TRAFFIC
R11-4

DETOUR
M4-10(LT)

DETOUR
M4-10(RT)

ROAD WORK AHEAD
W20-1

DETOUR AHEAD
W20-2

ROAD CLOSED AHEAD
W20-3

DETOUR
SC3(CA)

CENTURY CITY CONSTELLATION STATION STAGE 3 & 5
DECKING & TBM LAUNCH DETOUR

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES

MARKOUT BEGAN: _____

MARKOUT COMPLETED: _____

STRIPING COMPLETED: _____

References:

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
EASTBOUND CLOSURE-STAGE 3 & 5

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
–	–	PCR____	TF-1512	10/39

REVIEWED: _____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE, IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY C. SANTOS
DRAWN BY C. SANTOS
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
TRAFFIC DETOUR PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 3 & 5 – SHEET 4

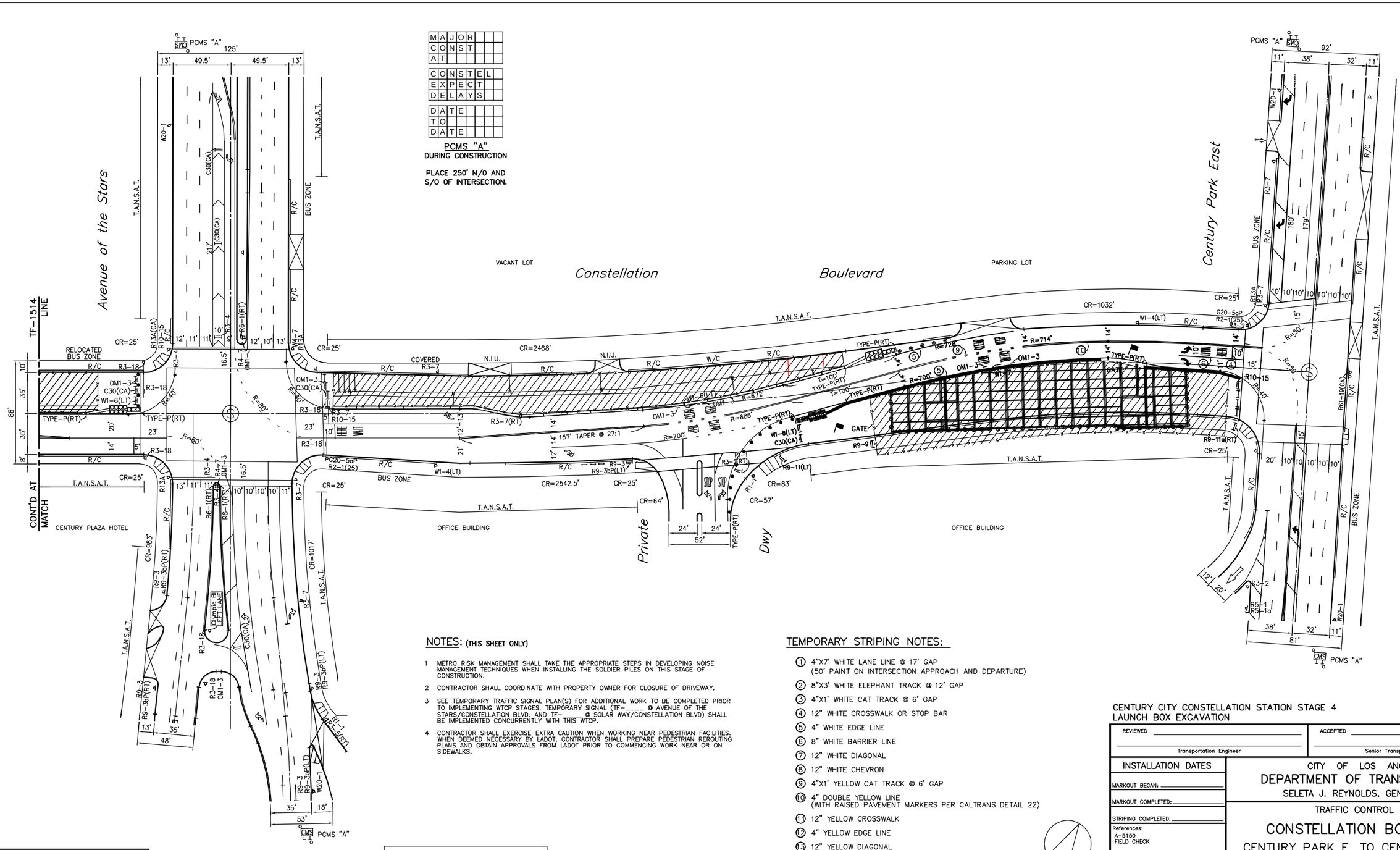
CONTRACT NO

DRAWING NO	REV
TF-1512	

SCALE 1"=40'

SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1512.dwg Sep 30, 2015 11:44am SantosC



NOTES: (THIS SHEET ONLY)

1. METRO RISK MANAGEMENT SHALL TAKE THE APPROPRIATE STEPS IN DEVELOPING NOISE MANAGEMENT TECHNIQUES WHEN INSTALLING THE SOLDIER PILES ON THIS STAGE OF CONSTRUCTION.
2. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR CLOSURE OF DRIVEWAY.
3. SEE TEMPORARY TRAFFIC SIGNAL PLAN(S) FOR ADDITIONAL WORK TO BE COMPLETED PRIOR TO IMPLEMENTING WTCP STAGES. TEMPORARY SIGNAL (TF-____ @ AVENUE OF THE STARS/CONSTELLATION BLVD. AND TF-____ @ SOLAR WAY/CONSTELLATION BLVD) SHALL BE IMPLEMENTED CONCURRENTLY WITH THIS WTCP.
4. CONTRACTOR SHALL EXERCISE EXTRA CAUTION WHEN WORKING NEAR PEDESTRIAN FACILITIES. WHEN DEEMED NECESSARY BY LADOT, CONTRACTOR SHALL PREPARE PEDESTRIAN REROUTING PLANS AND OBTAIN APPROVALS FROM LADOT PRIOR TO COMMENCING WORK NEAR OR ON SIDEWALKS.

TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 12" YELLOW DIAGONAL

SCALE: 1"=40'

R10-15	OM1-3
W1-7	TYPE P(RT)
R9-9	W1-6(LT)
C30(CA)	R9-11a(RT)
R9-11(LT)	

CENTURY CITY CONSTELLATION STATION STAGE 4 LAUNCH BOX EXCAVATION

REVIEWED: _____ Transportation Engineer

ACCEPTED: _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____
References:
A-5150
FIELD CHECK

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR_____	TF-1513	11/39

REVIEWED: _____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE, IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY J. BANZON
DRAWN BY J. BANZON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

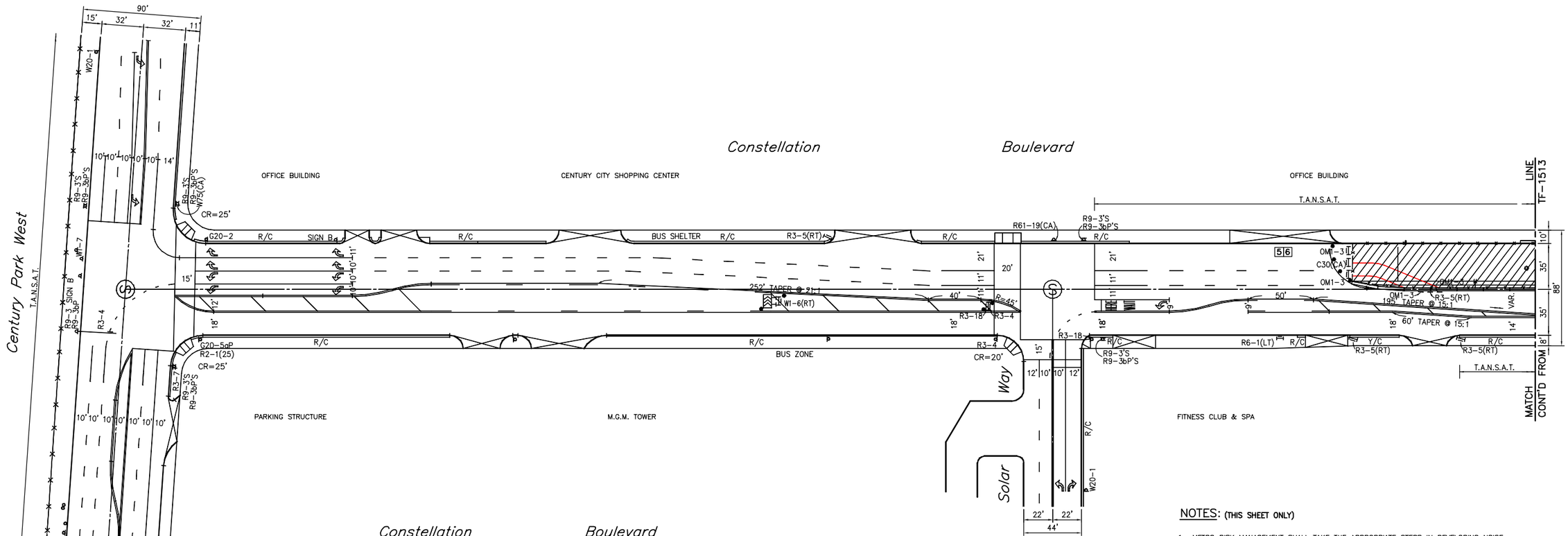
PARSONS BRINCKERHOFF

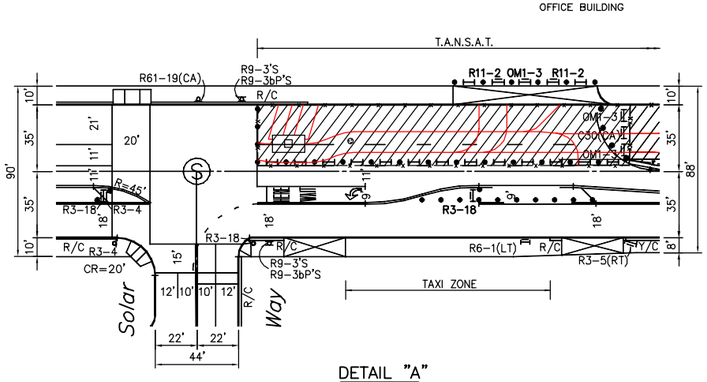
INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR. SUITE 470 IRVINE, CA 92618
T 949-753-9010 F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 4 – SHEET 1

CONTRACT NO
DRAWING NO TF-1513 REV
SCALE 1"=40'
SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\Traffic Team\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1513_14.dwg Sep 30, 2015 12:08pm ___SantosC





DETAIL "A"

WORKING HOURS DURING WEEKEND SETUP
FRIDAY 9PM TO MONDAY 6AM.

NOTES: (THIS SHEET ONLY)

1 METRO RISK MANAGEMENT SHALL TAKE THE APPROPRIATE STEPS IN DEVELOPING NOISE MANAGEMENT TECHNIQUES WHEN INSTALLING THE SOLDIER PILES ON THIS STAGE OF CONSTRUCTION.

2 CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR CLOSURE OF DRIVEWAY.

3 SEE TEMPORARY TRAFFIC SIGNAL PLAN(S) FOR ADDITIONAL WORK TO BE COMPLETED PRIOR TO IMPLEMENTING WTCP STAGES. TEMPORARY SIGNAL (TF-____ @ AVENUE OF THE STARS/CONSTELLATION BLVD. AND TF-____ @ SOLAR WAY/CONSTELLATION BLVD) SHALL BE IMPLEMENTED CONCURRENTLY WITH THIS WTCP.

4 CONTRACTOR SHALL EXERCISE EXTRA CAUTION WHEN WORKING NEAR PEDESTRIAN FACILITIES. WHEN DEEMED NECESSARY BY LADOT, CONTRACTOR SHALL PREPARE PEDESTRIAN REROUTING PLANS AND OBTAIN APPROVALS FROM LADOT PRIOR TO COMMENCING WORK NEAR OR ON SIDEWALKS.

[5] CONTRACTOR TO COORDINATE WITH THE BUSINESS (PROPERTY) OWNERS FOR THE CLOSURE OF DRIVEWAY(S) AND PROVIDE AN ACCESS TO ALLOW FOR INGRESS AND EGRESS. CONTRACTOR SHALL TRENCH PLATE DURING OR BACKFILL TO PROVIDE ACCESS DURING NON-WORKING HOURS.

[6] SEE DETAIL "A" INSET ON THIS SHEET FOR WORK TO BE COMPLETED DURING WEEKENDS.

TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 12" YELLOW DIAGONAL
14. 4" YELLOW TWO-WAY LEFT TURN LANE LINE

SCALE: 1"=40'

ROAD CLOSED R11-2 | OM1-3 | R3-18

CENTURY CITY CONSTELLATION STATION STAGE 4
LAUNCH BOX EXCAVATION

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____
References: A-5150 FIELD CHECK

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR____	TF-1514	12/39

REVIEWED:_____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE, IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY J. BANZON
DRAWN BY J. BANZON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

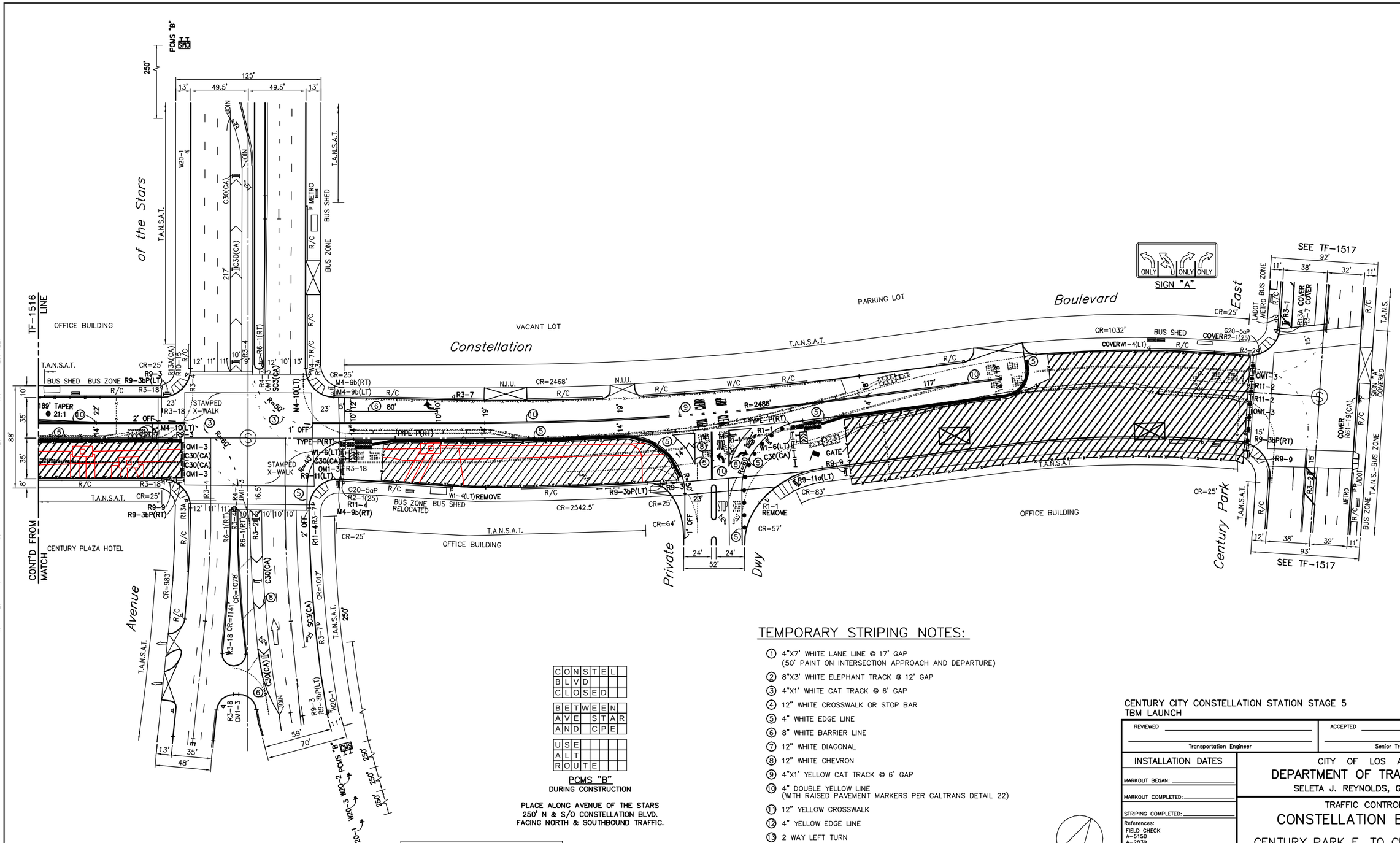
INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR. SUITE 470 IRVINE, CA 92618
T 949-753-9010 F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 4 - SHEET 2

CONTRACT NO
DRAWING NO TF-1514 REV
SCALE 1"=40'
SHEET NO

1"=20' ORIGINAL MAP SCALE 1"=40'

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1513_14.dwg Sep 30, 2015 12:13pm__SantosC



TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
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5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 2 WAY LEFT TURN

SCALE: 1"=40'

R3-1	R3-2
R3-5(LT)	R3-7(RT)
R11-2	R11-4
OM1-3	C30(CA)
M4-10(LT)	M4-10(RT)
W20-1	W20-2
W20-3	SC3(CA)
R9-9	R9-3bP(RT)
R9-11a(RT)	

CENTURY CITY CONSTELLATION STATION STAGE 5
TBM LAUNCH

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____
References:
FIELD CHECK
A-5150
A-2839
A-6173

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR____	TF-1515	13/39

REVIEWED: _____ 20 ___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY C. SANTOS
DRAWN BY C. SANTOS
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

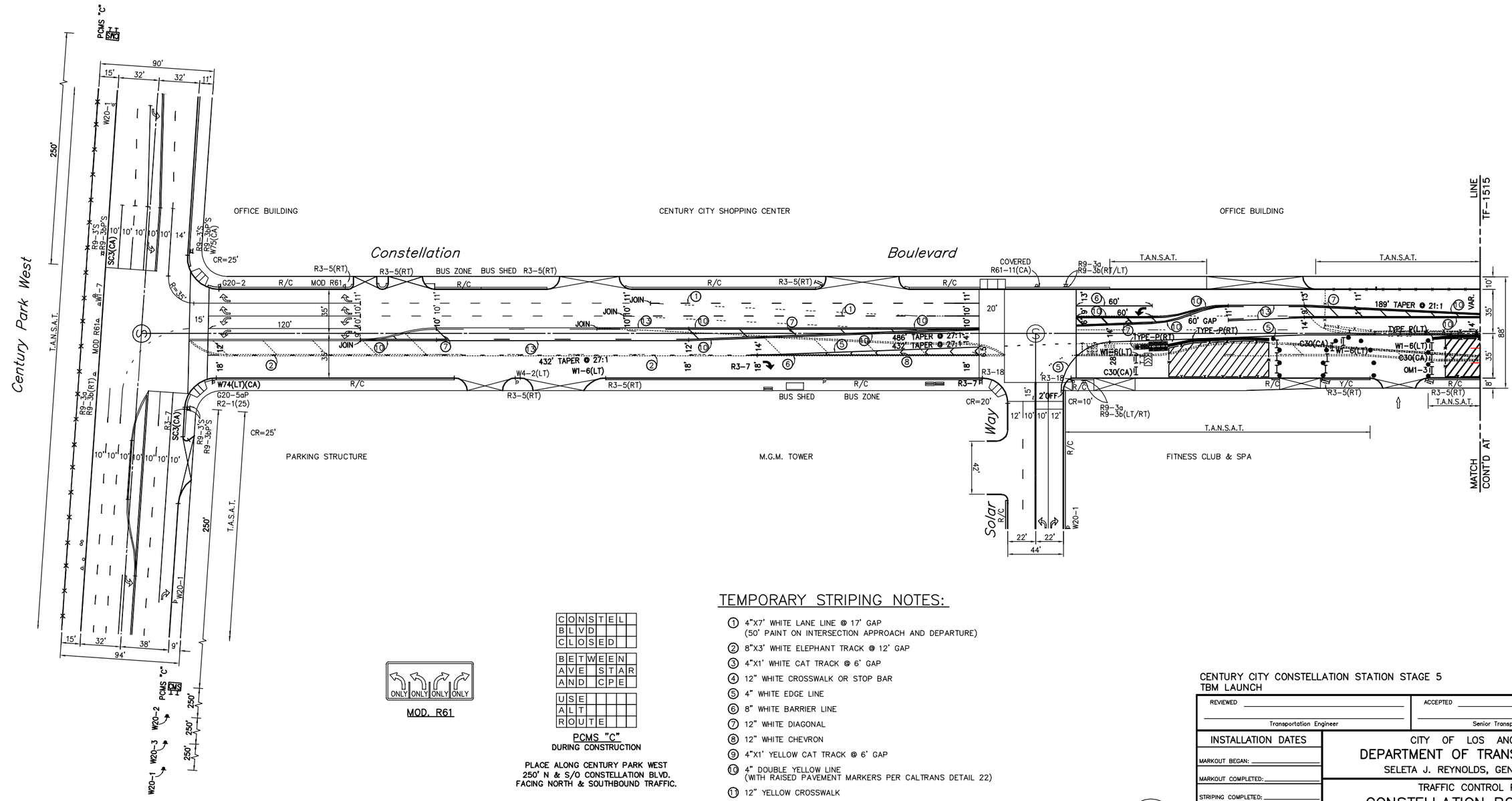
INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 5 – SHEET 1

CONTRACT NO
DRAWING NO TF-1515 REV
SCALE 1"=40'
SHEET NO

1"=20' ORIGINAL MAP SCALE 1"=40'

CADD PROJECT FILE NAME: L:\LAWSBM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\cOXXXtf1515.dwg Sep 30, 2015 11:44am__Santosc



MOD. R61

CONSTEL
BLVD
CLOSED
BETWEEN
AVE STAR
AND CPE
USE
ALT
ROUTE

PCMS "C"
DURING CONSTRUCTION

PLACE ALONG CENTURY PARK WEST
250' N & S/O CONSTELLATION BLVD.
FACING NORTH & SOUTHBOUND TRAFFIC.

TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 2 WAY LEFT TURN

SCALE: 1"=40'

ROAD WORK AHEAD W20-1	DETOUR AHEAD W20-2
ROAD CLOSED AHEAD W20-3	DETOUR SC3(CA)

CENTURY CITY CONSTELLATION STATION STAGE 5
TBM LAUNCH

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____

References:
FIELD CHECK
A-5150
A-2839
A-6173

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR_____	TF-1516	14 / 39

REVIEWED: _____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY C. SANTOS
DRAWN BY C. SANTOS
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

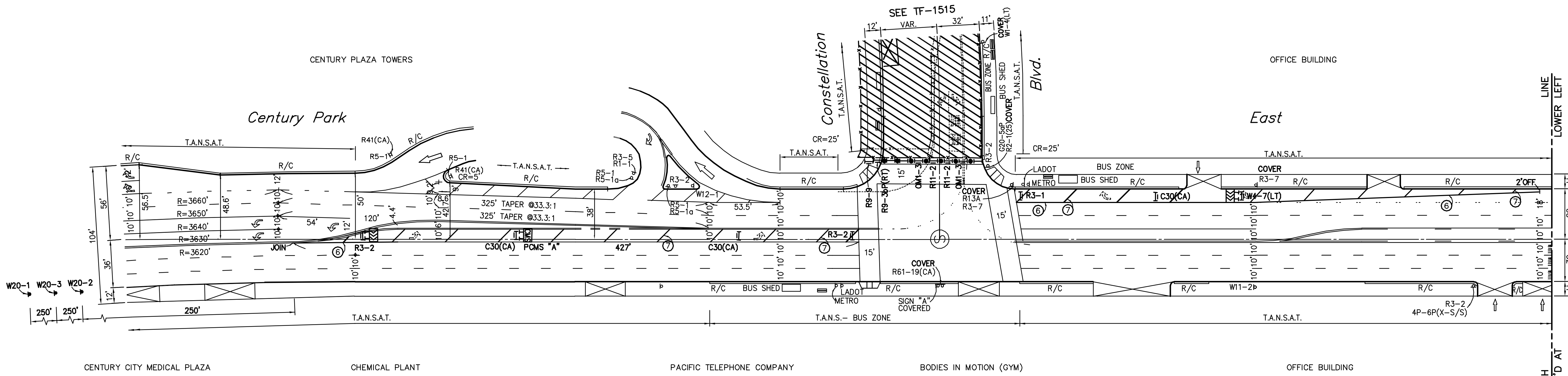
INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 5 - SHEET 2

CONTRACT NO
DRAWING NO TF-1516 REV
SCALE 1"=40'
SHEET NO

1"=20' ORIGINAL MAP SCALE 1"=40'

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\cOXXXtf1516.dwg Sep 30, 2015 11:46am__SantosC



TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
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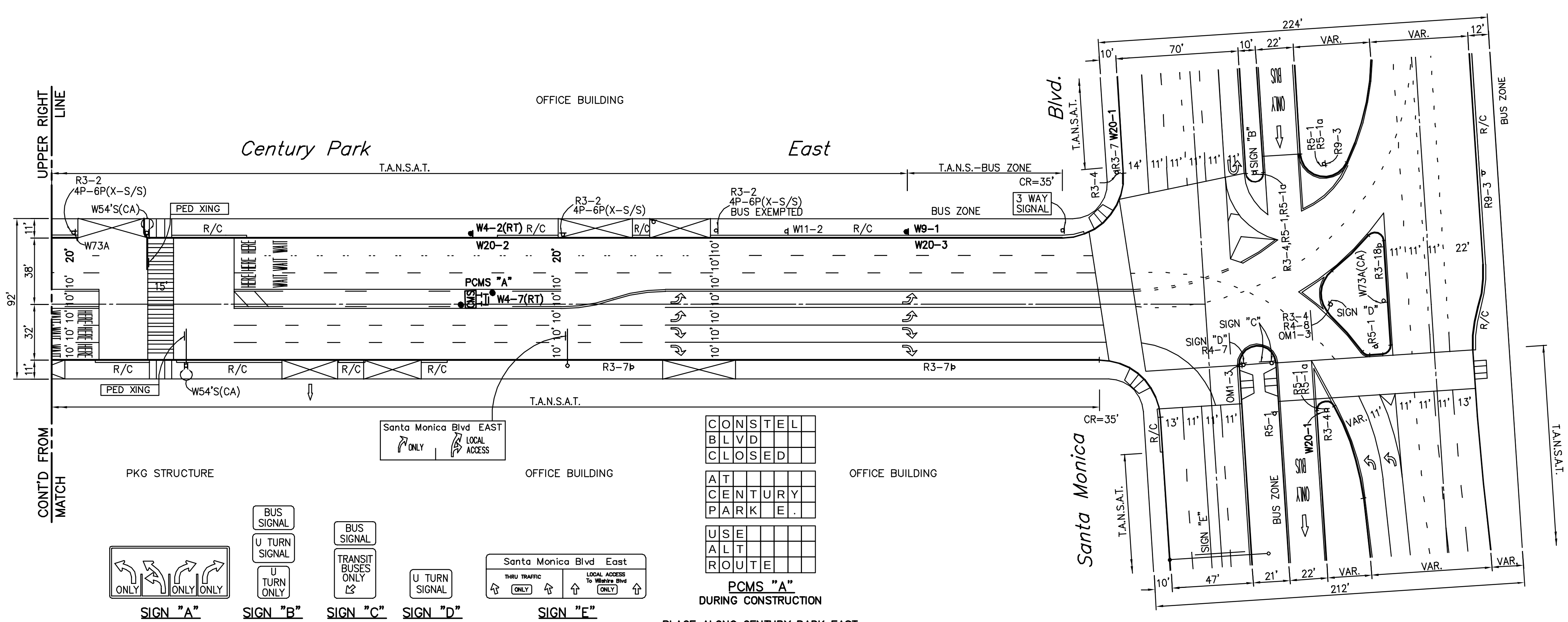
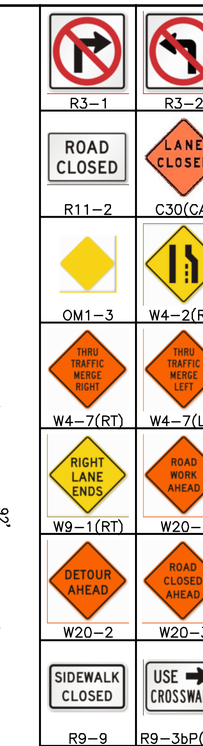
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 12" YELLOW DIAGONAL



PLACE ALONG CENTURY PARK EAST 250' N & S/O CONSTELLATION BLVD. FACING NORTH & SOUTHBOUND TRAFFIC.



SCALE: 1"=40'

CENTURY CITY CONSTELLATION STATION STAGE 5
TBM LAUNCH

REVIEWED ____ Transportation Engineer	ACCEPTED ____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: ____
MARKOUT COMPLETED: ____
STRIPING COMPLETED: ____
References: FIELD CHECK A-5150 A-2839 A-6173

Thomas Guide	District
632-E3	W

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

PROJECT NO. PCR____ DRAWING NO. TF-1517 15/39

REVIEWED: ____ 20 __
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY C. SANTOS
DRAWN BY C. SANTOS
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

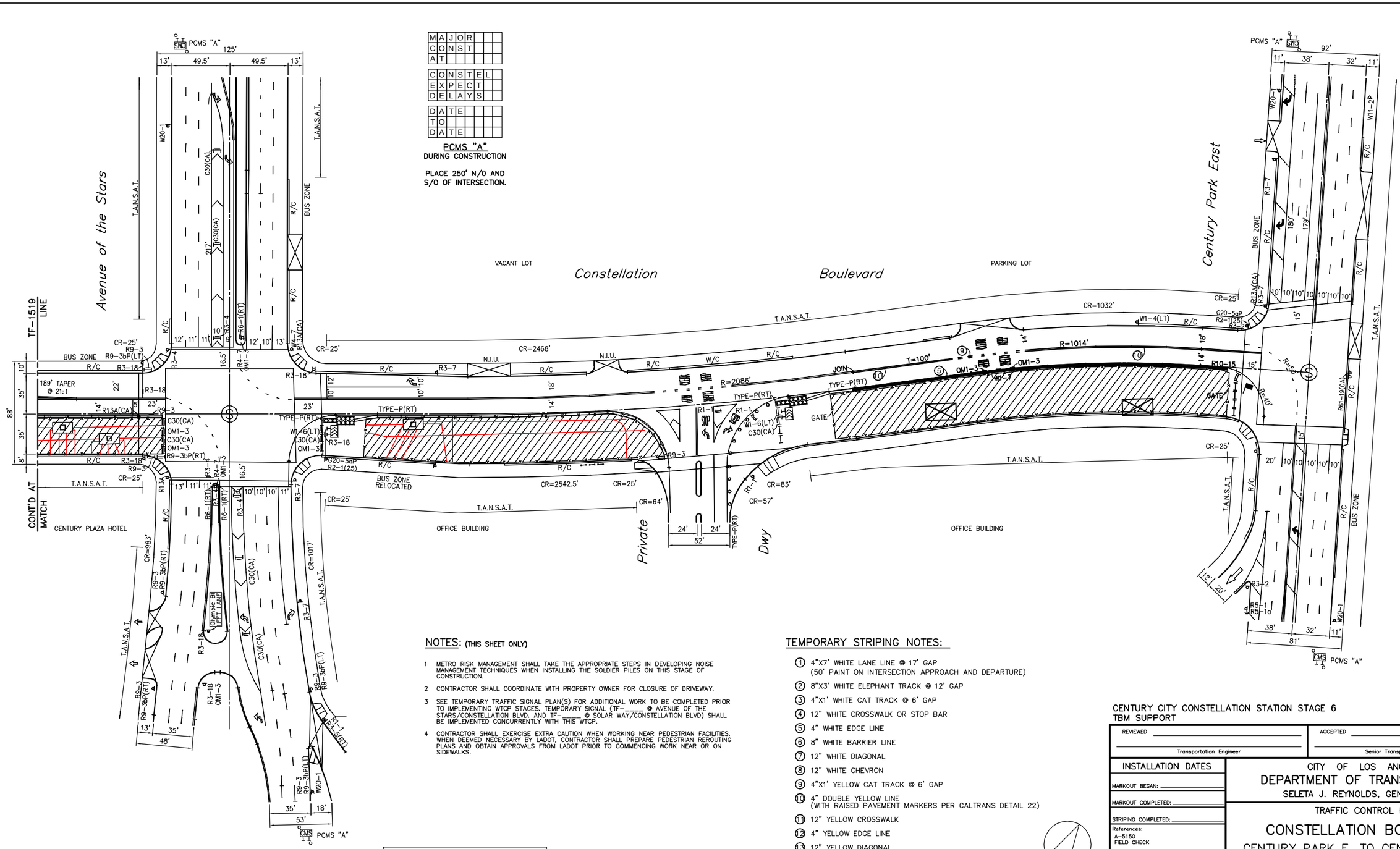
Metro
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
PARSONS BRINCKERHOFF
INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR. SUITE 470 IRVINE, CA 92618 T 949-753-9010 F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 5 - SHEET 3

CONTRACT NO
DRAWING NO TF-1517 REV
SCALE 1"=40'
SHEET NO

1"=20' ORIGINAL MAP SCALE 1"=40'

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1517.dwg Sep 30, 2015 11:47am __SantosC



NOTES: (THIS SHEET ONLY)

1. METRO RISK MANAGEMENT SHALL TAKE THE APPROPRIATE STEPS IN DEVELOPING NOISE MANAGEMENT TECHNIQUES WHEN INSTALLING THE SOLDIER PILES ON THIS STAGE OF CONSTRUCTION.
2. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR CLOSURE OF DRIVEWAY.
3. SEE TEMPORARY TRAFFIC SIGNAL PLAN(S) FOR ADDITIONAL WORK TO BE COMPLETED PRIOR TO IMPLEMENTING WTCP STAGES. TEMPORARY SIGNAL (TF-_____ @ AVENUE OF THE STARS/CONSTELLATION BLVD. AND TF-_____ @ SOLAR WAY/CONSTELLATION BLVD) SHALL BE IMPLEMENTED CONCURRENTLY WITH THIS WTCP.
4. CONTRACTOR SHALL EXERCISE EXTRA CAUTION WHEN WORKING NEAR PEDESTRIAN FACILITIES. WHEN DEEMED NECESSARY BY LADOT, CONTRACTOR SHALL PREPARE PEDESTRIAN REROUTING PLANS AND OBTAIN APPROVALS FROM LADOT PRIOR TO COMMENCING WORK NEAR OR ON SIDEWALKS.

TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 12" YELLOW DIAGONAL

SCALE: 1"=40'

CENTURY CITY CONSTELLATION STATION STAGE 6 TBM SUPPORT

REVIEWED: _____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY J. BANZON
DRAWN BY J. BANZON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

REVIEWED _____ Transportation Engineer
ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____
References: A-5150 FIELD CHECK

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR_____	TF-1518	16/39

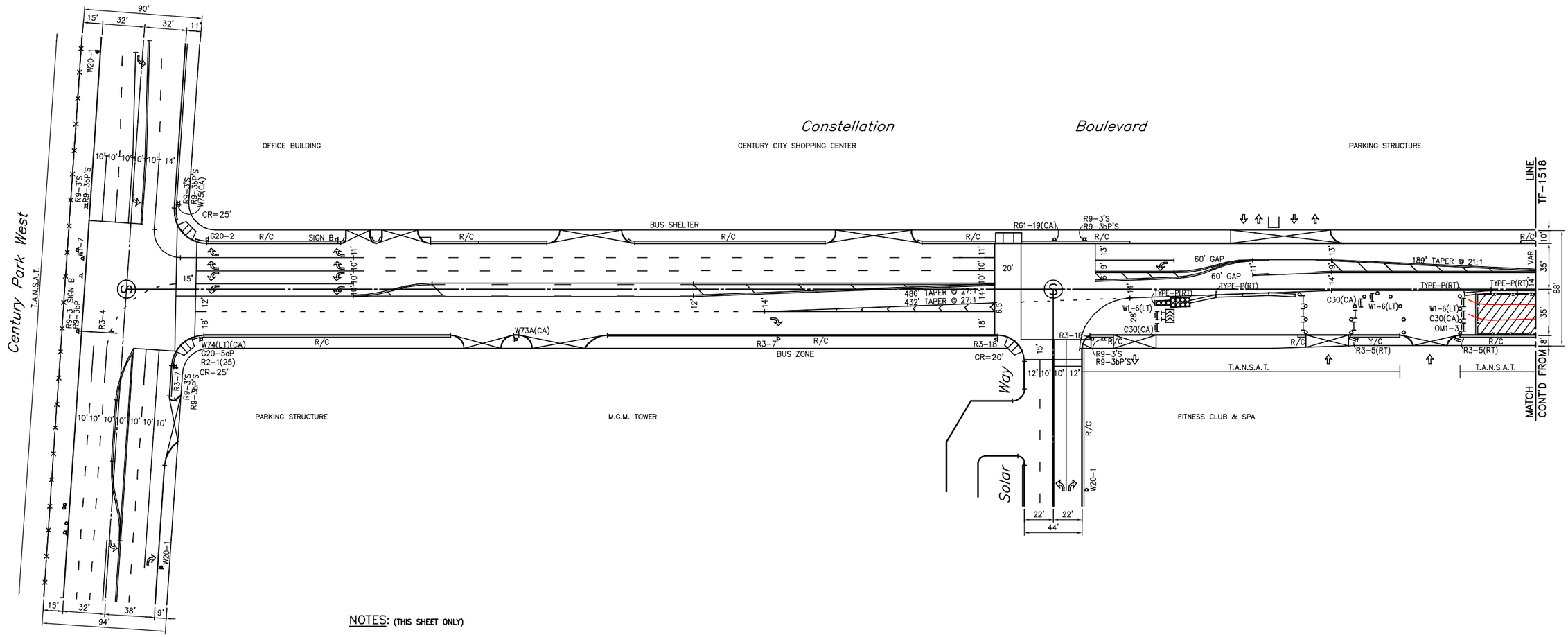
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
Metro
PARSONS BRINCKERHOFF
INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR. SUITE 470 IRVINE, CA 92618 T 949-753-9010 F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION WORKSITE TRAFFIC CONTROL PLAN CENTURY CITY CONSTELLATION STATION STAGE 6 – SHEET 1

CONTRACT NO
DRAWING NO TF-1518 REV
SCALE 1"=40'
SHEET NO

R10-15 TURNING VEHICLES TO
W1-7
OM1-3

CADD PROJECT FILE NAME: L:\LAWSBM\WACBM\CADD\95_Working\Traffic Team\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\cOXXXtf1518_19.dwg Sep 30, 2015 1:04pm Santosc



1"=20' ORIGINAL MAP SCALE 1"=40'

NOTES: (THIS SHEET ONLY)

1 METRO RISK MANAGEMENT SHALL TAKE THE APPROPRIATE STEPS IN DEVELOPING NOISE MANAGEMENT TECHNIQUES WHEN INSTALLING THE SOLDIER PILES ON THIS STAGE OF CONSTRUCTION.

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REVIEWED:_____ 20___

BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

SCALE: 1"=40'

CENTURY CITY CONSTELLATION STATION STAGE 6
TBM SUPPORT

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES

MARKOUT BEGAN: _____

MARKOUT COMPLETED: _____

STRIPING COMPLETED: _____

References:
A-5150
FIELD CHECK

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN

CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR____	TF-1519	17/39

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY J. BANZON
DRAWN BY J. BANZON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 6 – SHEET 2

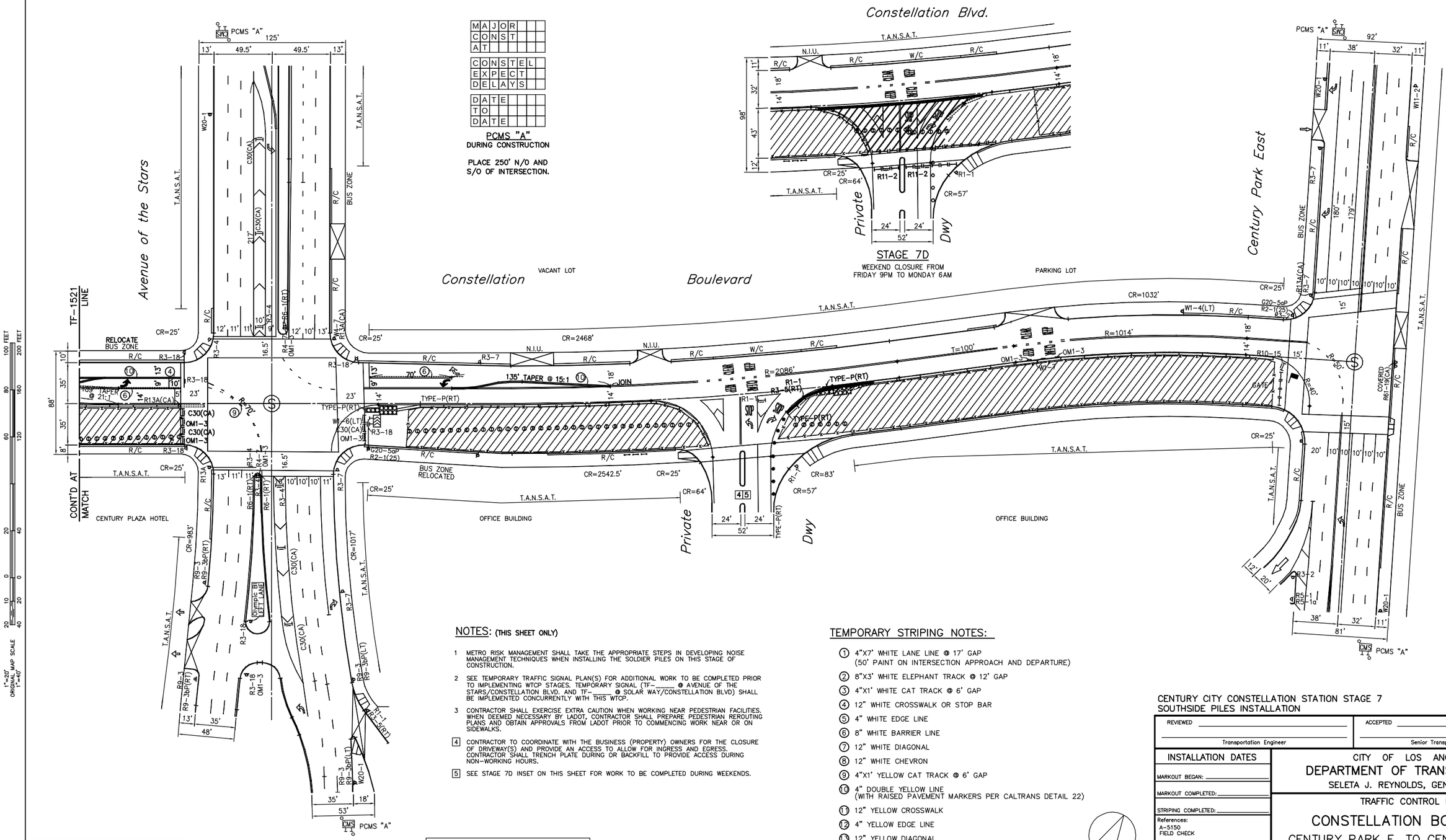
CONTRACT NO

DRAWING NO TF-1519 REV

SCALE 1"=40'

SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBIM\WAGBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION – TRAFFIC CONTROL\SHEETS\cOXXXtf1518_19.dwg Sep 30, 2015 1:06pm ___Santosc



NOTES: (THIS SHEET ONLY)

1. METRO RISK MANAGEMENT SHALL TAKE THE APPROPRIATE STEPS IN DEVELOPING NOISE MANAGEMENT TECHNIQUES WHEN INSTALLING THE SOLDIER PILES ON THIS STAGE OF CONSTRUCTION.
2. SEE TEMPORARY TRAFFIC SIGNAL PLAN(S) FOR ADDITIONAL WORK TO BE COMPLETED PRIOR TO IMPLEMENTING WTCP STAGES. TEMPORARY SIGNAL (TF-____ @ AVENUE OF THE STARS/CONSTELLATION BLVD. AND TF-____ @ SOLAR WAY/CONSTELLATION BLVD) SHALL BE IMPLEMENTED CONCURRENTLY WITH THIS WTCP.
3. CONTRACTOR SHALL EXERCISE EXTRA CAUTION WHEN WORKING NEAR PEDESTRIAN FACILITIES. WHEN DEEMED NECESSARY BY LADOT, CONTRACTOR SHALL PREPARE PEDESTRIAN REROUTING PLANS AND OBTAIN APPROVALS FROM LADOT PRIOR TO COMMENCING WORK NEAR OR ON SIDEWALKS.
4. CONTRACTOR TO COORDINATE WITH THE BUSINESS (PROPERTY) OWNERS FOR THE CLOSURE OF DRIVEWAY(S) AND PROVIDE AN ACCESS TO ALLOW FOR INGRESS AND EGRESS. CONTRACTOR SHALL TRENCH PLATE DURING OR BACKFILL TO PROVIDE ACCESS DURING NON-WORKING HOURS.
5. SEE STAGE 7D INSET ON THIS SHEET FOR WORK TO BE COMPLETED DURING WEEKENDS.

TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 12" YELLOW DIAGONAL

SCALE: 1"=40'

STOP R1-1	ONLY R3-5(RT)
TYPE P(RT)	ROAD CLOSED R11-2
LANE CLOSED C30(CA)	OM1-3
ROAD CLOSED R11-2	

CENTURY CITY CONSTELLATION STATION STAGE 7
SOUTHSIDE PILES INSTALLATION

REVIEWED: _____ Transportation Engineer

ACCEPTED: _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____
References: A-5150 FIELD CHECK

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR____	TF-1520	18/39

REVIEWED: _____ 20 ___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY L. GASTON
DRAWN BY L. GASTON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

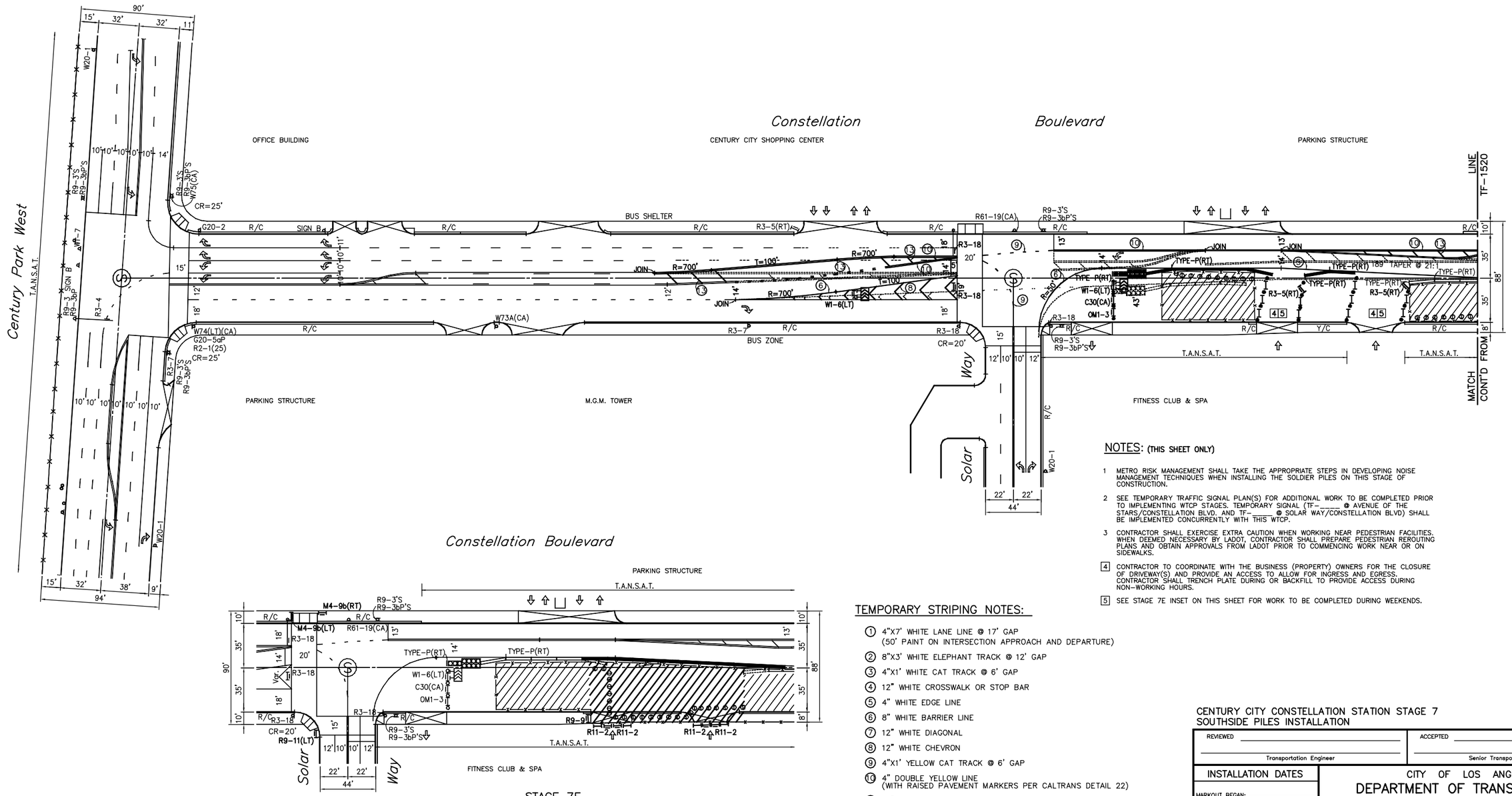
INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR. SUITE 470 IRVINE, CA 92618
T 949-753-9010 F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 7 – SHEET 1

CONTRACT NO
DRAWING NO TF-1520 REV
SCALE 1"=40'
SHEET NO

1"=20' ORIGINAL MAP SCALE 1"=40'

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\cOXXXtf1520_21a.dwg Oct 01, 2015 12:51pm Santosc



STAGE 7E

WORK DURING WEEKEND HOURS
FRIDAY 9PM TO MONDAY 6AM

NOTES: (THIS SHEET ONLY)

1. METRO RISK MANAGEMENT SHALL TAKE THE APPROPRIATE STEPS IN DEVELOPING NOISE MANAGEMENT TECHNIQUES WHEN INSTALLING THE SOLDIER PILES ON THIS STAGE OF CONSTRUCTION.
2. SEE TEMPORARY TRAFFIC SIGNAL PLAN(S) FOR ADDITIONAL WORK TO BE COMPLETED PRIOR TO IMPLEMENTING WTCP STAGES. TEMPORARY SIGNAL (TF-____ @ AVENUE OF THE STARS/CONSTELLATION BLVD. AND TF-____ @ SOLAR WAY/CONSTELLATION BLVD) SHALL BE IMPLEMENTED CONCURRENTLY WITH THIS WTCP.
3. CONTRACTOR SHALL EXERCISE EXTRA CAUTION WHEN WORKING NEAR PEDESTRIAN FACILITIES. WHEN DEEMED NECESSARY BY LADOT, CONTRACTOR SHALL PREPARE PEDESTRIAN REROUTING PLANS AND OBTAIN APPROVALS FROM LADOT PRIOR TO COMMENCING WORK NEAR OR ON SIDEWALKS.
4. CONTRACTOR TO COORDINATE WITH THE BUSINESS (PROPERTY) OWNERS FOR THE CLOSURE OF DRIVEWAY(S) AND PROVIDE AN ACCESS TO ALLOW FOR INGRESS AND EGRESS. CONTRACTOR SHALL TRENCH PLATE DURING OR BACKFILL TO PROVIDE ACCESS DURING NON-WORKING HOURS.
5. SEE STAGE 7E INSET ON THIS SHEET FOR WORK TO BE COMPLETED DURING WEEKENDS.

TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 12" YELLOW DIAGONAL

SCALE: 1"=40'

ONLY R3-5(RT)	ROAD CLOSED R11-2
LANE CLOSED C30(CA)	W1-6(LT)
OM1-3	TYPE P(RT)
SIDEWALK CLOSED R9-9	SIDEWALK CLOSED AHEAD CROSS HERE R9-11(LT)
ROAD CLOSED R11-2	R3-18
DETOUR M4-9b(LT)	DETOUR M4-9b(RT)

1"=20' ORIGINAL MAP SCALE 1"=40'

CENTURY CITY CONSTELLATION STATION STAGE 7
SOUTHSIDE PILES INSTALLATION

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____
References:
A-5150
FIELD CHECK

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN

CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR____	TF-1521	19/39

REVIEWED:_____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY J. BANZON
DRAWN BY J. BANZON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

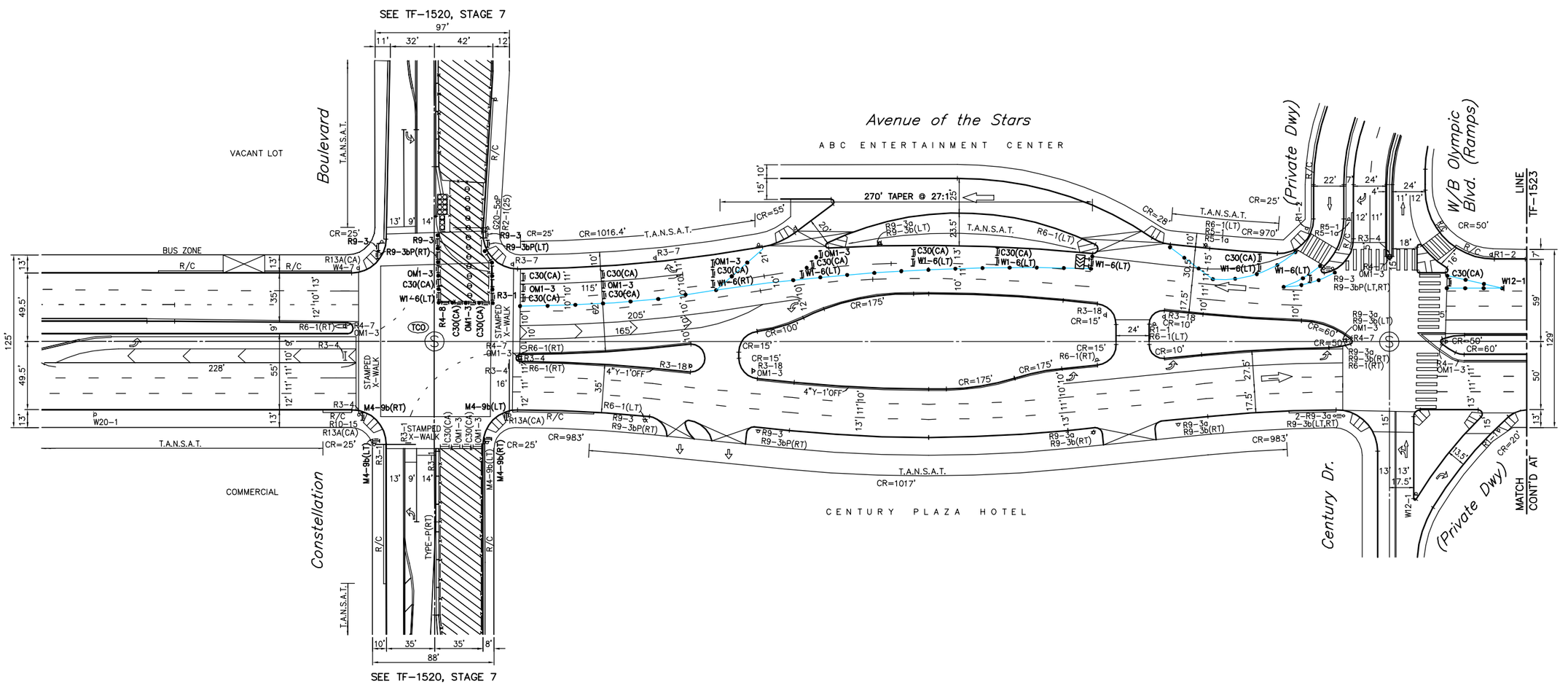
PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR. SUITE 470 IRVINE, CA 92618
T 949-753-9010 F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 7 – SHEET 2

CONTRACT NO
DRAWING NO TF-1521 REV
SCALE 1"=40'
SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1520_21a.dwg Oct 01, 2015 12:52pm Santosc



M4-9b(LT)	M4-9b(RT)
R9-3bP(LT)	R9-3bP(RT)
W1-6(LT)	R3-1
R3-7	R9-3
R9-11a(LT)	R9-11a(RT)
OM1-3	W12-1
R4-8	C30(CA)

SCALE: 1"=40'

CENTURY CITY CONSTELLATION STATION STAGE 7A
SOUTHSIDE PILES INSTALLATION (WEEKEND SETUP)

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES

MARKOUT BEGAN: _____

MARKOUT COMPLETED: _____

STRIPING COMPLETED: _____

References:
FIELD CHECK
A-5150
A-2839
A-6173

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR_____	TF-1522	20/39

REVIEWED: _____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY L. GASTON
DRAWN BY L. GASTON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 7A – SHEET 1

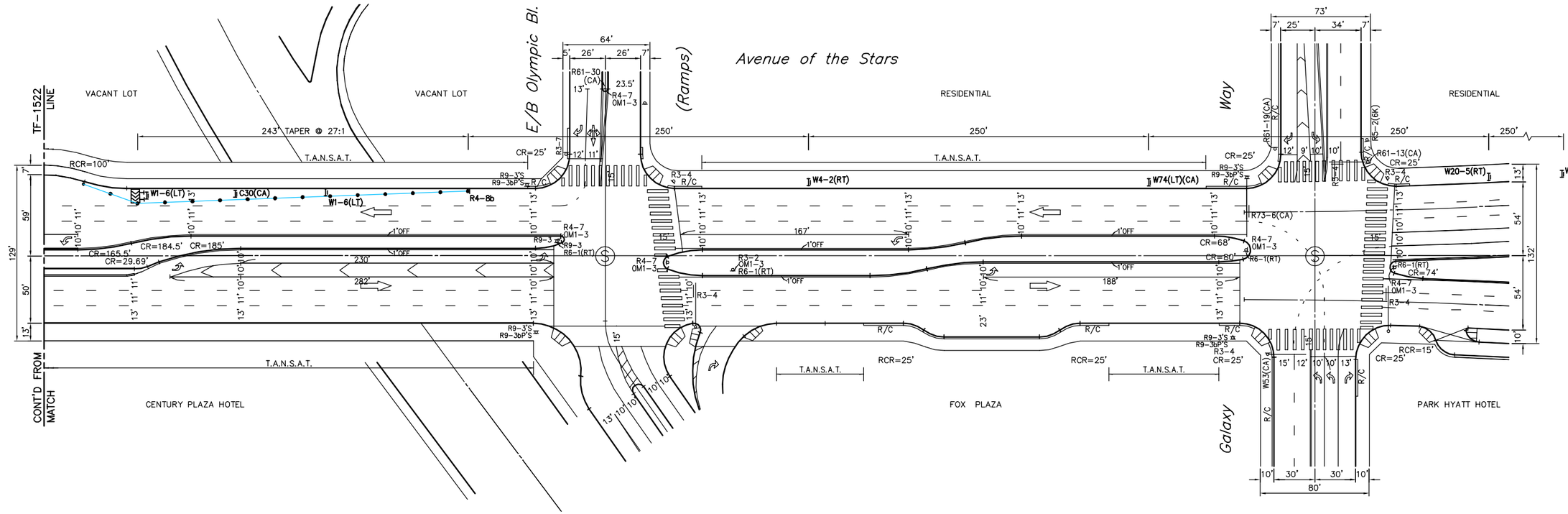
CONTRACT NO

DRAWING NO TF-1522 REV

SCALE 1"=40'

SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1522_23a.dwg Oct 01, 2015 12:57pm ___Santosc



SCALE: 1"=40'

1"=20' ORIGINAL MAP SCALE 1"=40'

KEEP LEFT R4-8b | W1-6(LT)

LANE CLOSED C30(CA) | W4-2(RT)

RIGHT LANE CLOSED AHEAD W20-5(RT) | THRU TRAFFIC MERGE LEFT W74(LT)(CA)

CENTURY CITY CONSTELLATION STATION STAGE 7A
SOUTHSIDE PILES INSTALLATION (WEEKEND SETUP)

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES

MARKOUT BEGAN: _____

MARKOUT COMPLETED: _____

STRIPING COMPLETED: _____

References:
FIELD CHECK
A-5150
A-2839
A-6173

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR_____	TF-1523	21/39

REVIEWED:_____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY L. GASTON
DRAWN BY L. GASTON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

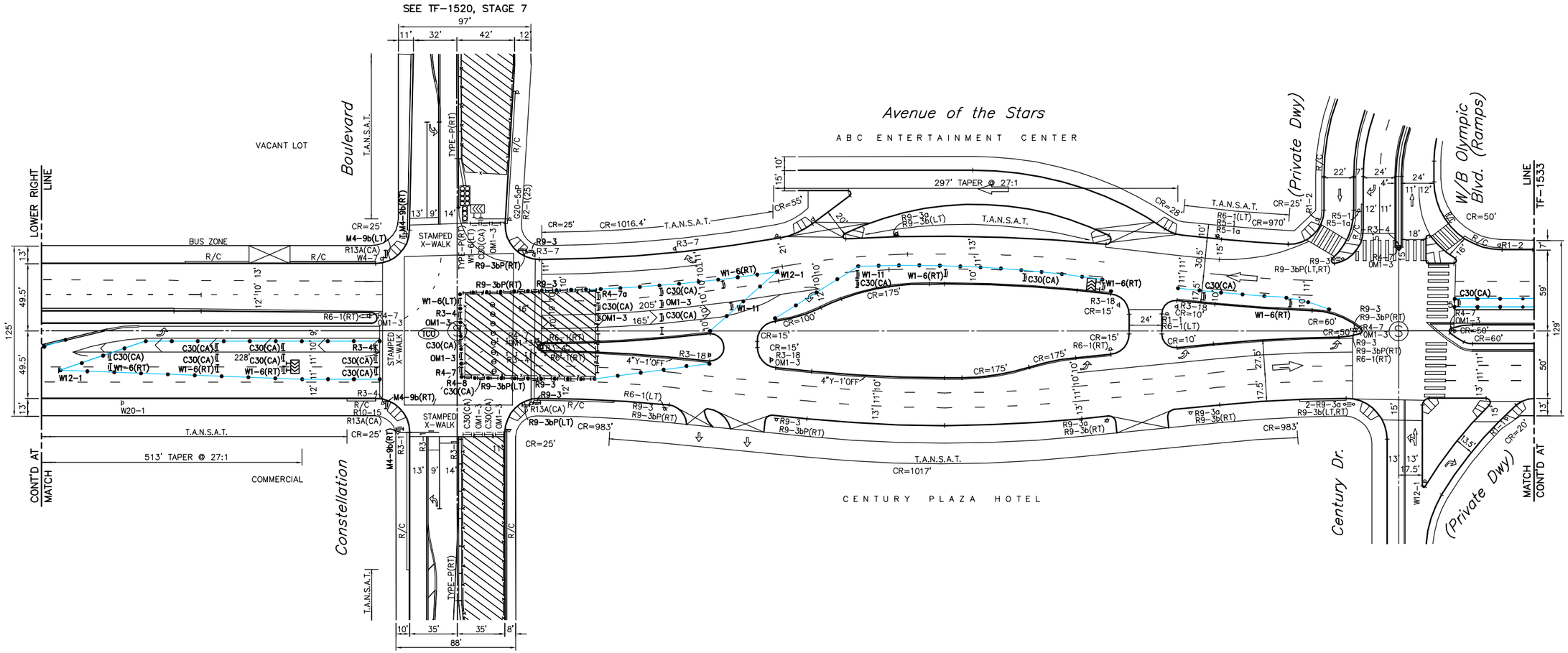
INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

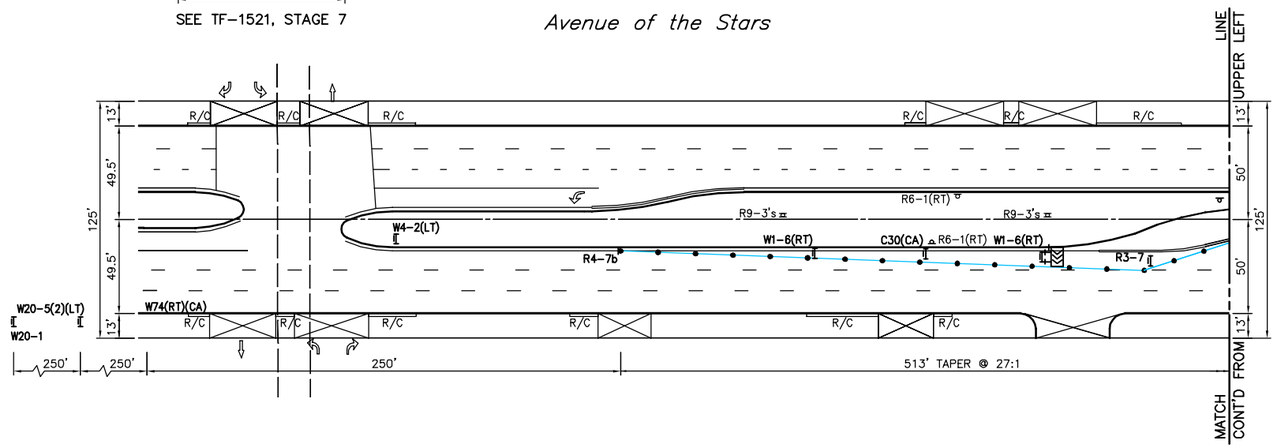
WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 7A – SHEET 2

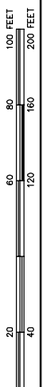
CONTRACT NO
DRAWING NO TF-1523 REV
SCALE 1"=40'
SHEET NO

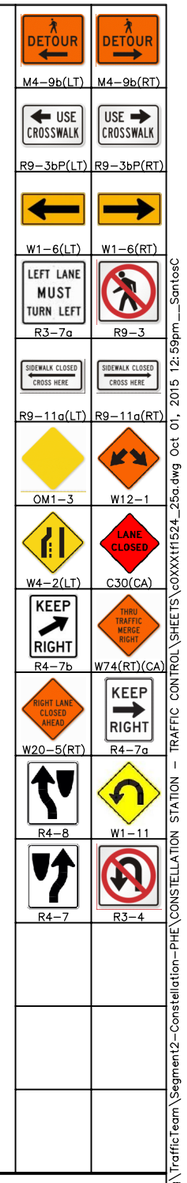
CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1522_23a.dwg Oct 01, 2015 12:57pm___SantosC

SEE TF-1520, STAGE 7









CENTURY CITY CONSTELLATION STATION STAGE 7B
SOUTHSIDE PILES INSTALLATION (WEEKEND SETUP)

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES

MARKOUT BEGAN: _____

MARKOUT COMPLETED: _____

STRIPING COMPLETED: _____

References:
FIELD CHECK
A-5150
A-2839
A-6173

Thomas Guide	District
632-E3	W

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

PROJECT NO. PCR_____ | DRAWING NO. TF-1524 | 22/39

SCALE: 1"=40'

REVIEWED:_____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE, IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY L. GASTON
DRAWN BY L. GASTON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

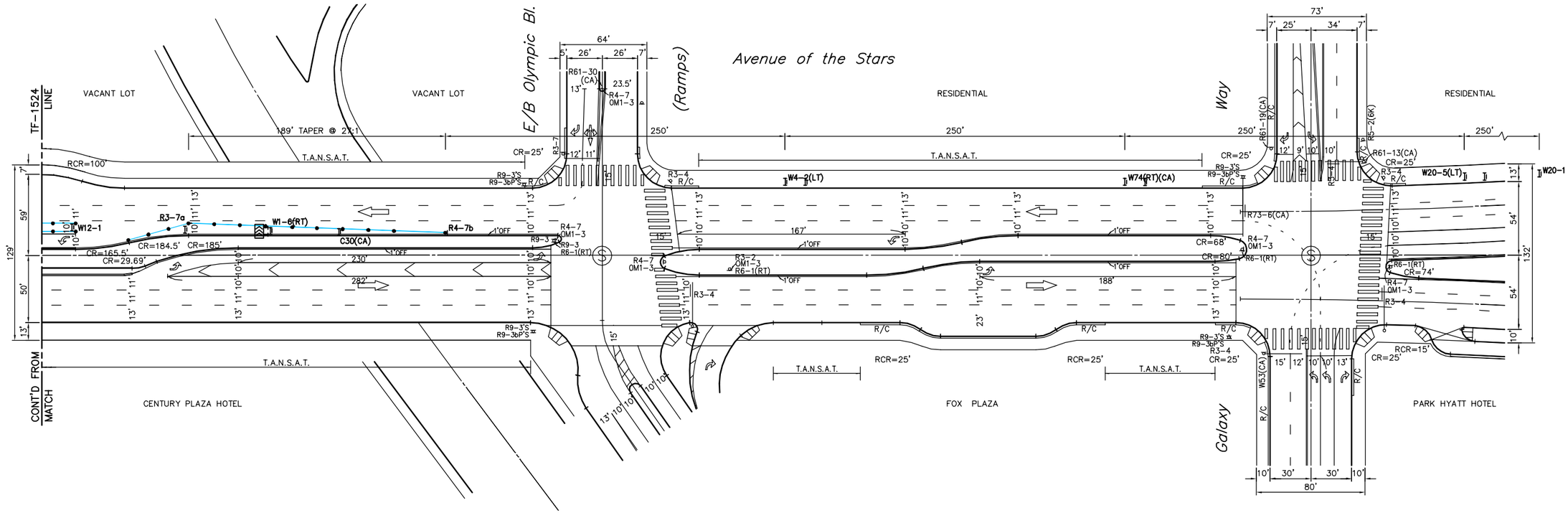
PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 7B – SHEET 1

CONTRACT NO
DRAWING NO TF-1524 | REV
SCALE 1"=40'
SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1524_25a.dwg Oct 01, 2015 12:59pm___SantosC



SCALE: 1"=40'

1"=20' ORIGINAL MAP SCALE 1"=40'

M4-9b(LT)	M4-9b(RT)
R9-3bP(LT)	R9-3bP(RT)
W1-6(LT)	W1-6(RT)
R3-7a	R9-3
R9-11a(LT)	R9-11a(RT)
OM1-3	W12-1
W4-2(LT)	C30(CA)
R4-7b	W74(RT)(CA)
W20-5(LT)	

CENTURY CITY CONSTELLATION STATION STAGE 7B
SOUTHSIDE PILES INSTALLATION (WEEKEND SETUP)

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES

MARKOUT BEGAN: _____

MARKOUT COMPLETED: _____

STRIPING COMPLETED: _____

References:
FIELD CHECK
A-5150
A-2839
A-6173

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR_____	TF-1525	23/39

REVIEWED:_____ 20___

BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY L. GASTON
DRAWN BY L. GASTON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 7B – SHEET 2

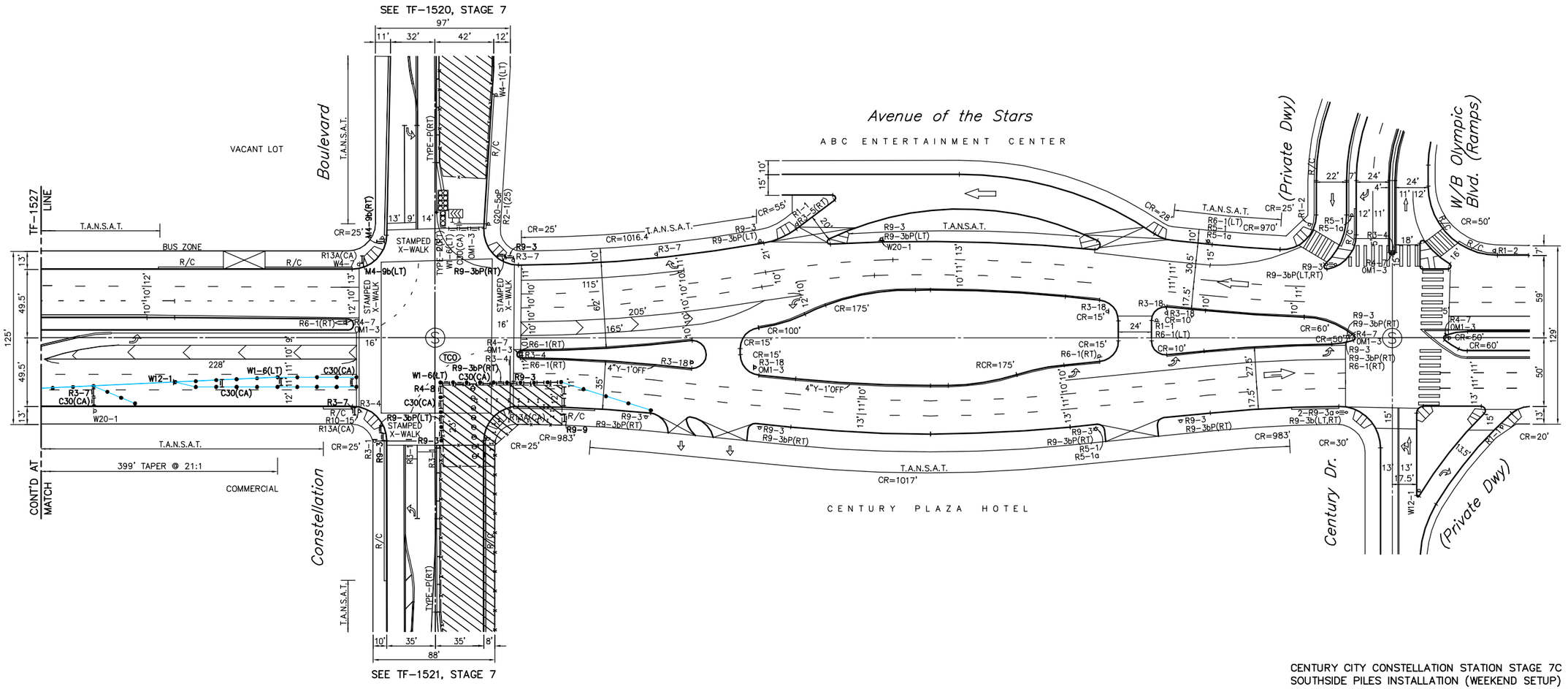
CONTRACT NO

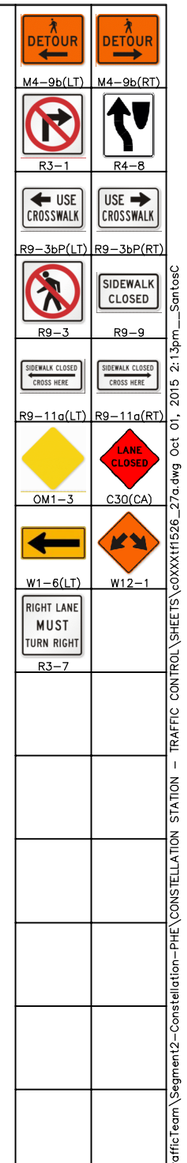
DRAWING NO TF-1525 REV

SCALE 1"=40'

SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1524_25a.dwg Oct 01, 2015 12:59pm___SantosC





CENTURY CITY CONSTELLATION STATION STAGE 7C
SOUTHSIDE PILES INSTALLATION (WEEKEND SETUP)

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES

MARKOUT BEGAN: _____

MARKOUT COMPLETED: _____

STRIPING COMPLETED: _____

References:
FIELD CHECK
A-5150
A-2839
A-6173

Thomas Guide	District
632-E3	W

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

PROJECT NO. PCR____ DRAWING NO. TF-1526 24/39

SCALE: 1"=40'

REVIEWED:_____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY L. GASTON
DRAWN BY L. GASTON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

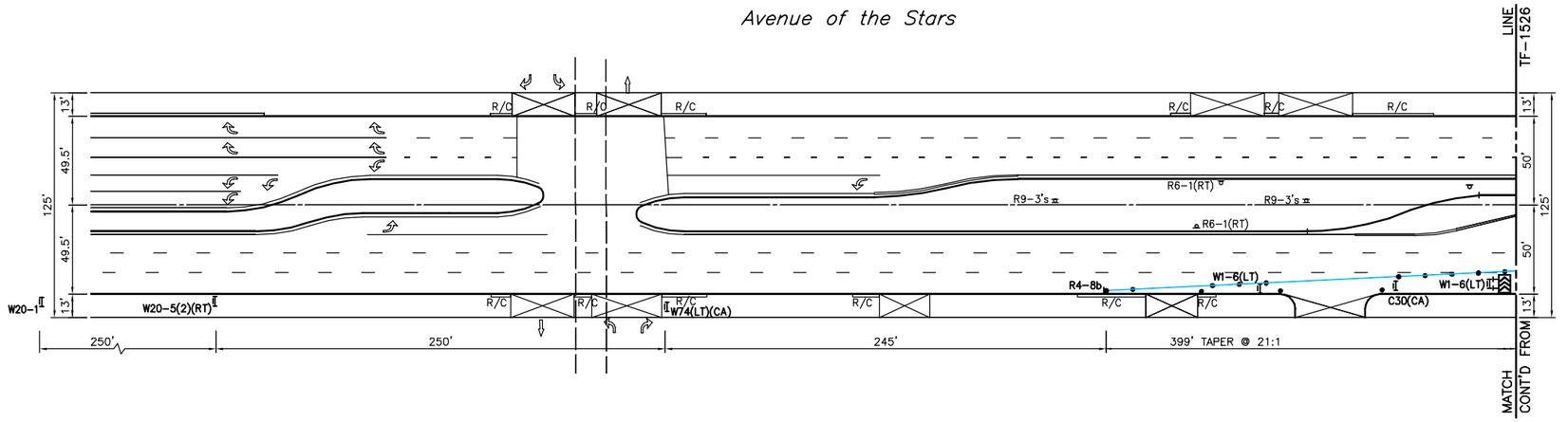
PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 7C – SHEET 1

CONTRACT NO
DRAWING NO TF-1526 REV
SCALE 1"=40'
SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\Traffic Team\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\cOXXXtf1526_27a.dwg Oct 01, 2015 2:13pm__SantosC



R4-8b

W1-6(LT)

W4-2(RT)

W20-1

W20-5(RT)

W74(LT)(CA)

C30(CA)

SCALE: 1"=40'

CENTURY CITY CONSTELLATION STATION STAGE 7C
SOUTHSIDE PILES INSTALLATION (WEEKEND SETUP)

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES

MARKOUT BEGAN: _____

MARKOUT COMPLETED: _____

STRIPING COMPLETED: _____

References:
FIELD CHECK
A-5150
A-2839
A-6173

Thomas Guide	District
632-E3	W

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

PROJECT NO. PCR____ | DRAWING NO. TF-1527 | 25/39

REVIEWED:_____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY L. GASTON
DRAWN BY L. GASTON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

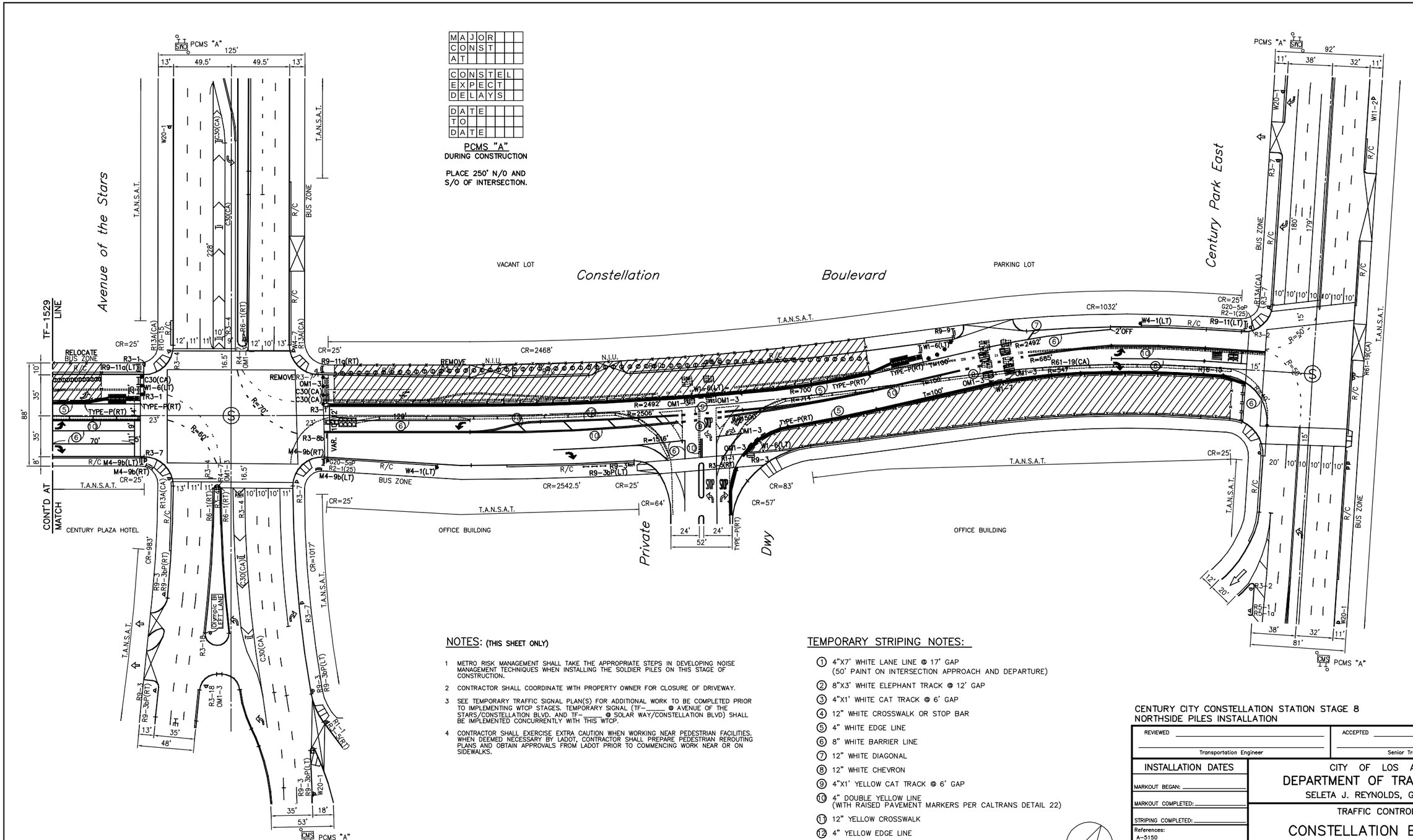
PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 7C – SHEET 2

CONTRACT NO
DRAWING NO TF-1527 | REV
SCALE 1"=40'
SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION – TRAFFIC CONTROL\SHEETS\c0XXXtf1526_27a.dwg Oct 01, 2015 2:13pm__SantosC



NOTES: (THIS SHEET ONLY)

1. METRO RISK MANAGEMENT SHALL TAKE THE APPROPRIATE STEPS IN DEVELOPING NOISE MANAGEMENT TECHNIQUES WHEN INSTALLING THE SOLDIER PILES ON THIS STAGE OF CONSTRUCTION.
2. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR CLOSURE OF DRIVEWAY.
3. SEE TEMPORARY TRAFFIC SIGNAL PLAN(S) FOR ADDITIONAL WORK TO BE COMPLETED PRIOR TO IMPLEMENTING WTCP STAGES. TEMPORARY SIGNAL (TF-_____ @ AVENUE OF THE STARS/CONSTELLATION BLVD, AND TF-_____ @ SOLAR WAY/CONSTELLATION BLVD) SHALL BE IMPLEMENTED CONCURRENTLY WITH THIS WTCP.
4. CONTRACTOR SHALL EXERCISE EXTRA CAUTION WHEN WORKING NEAR PEDESTRIAN FACILITIES. WHEN DEEMED NECESSARY BY LADOT, CONTRACTOR SHALL PREPARE PEDESTRIAN REROUTING PLANS AND OBTAIN APPROVALS FROM LADOT PRIOR TO COMMENCING WORK NEAR OR ON SIDEWALKS.

TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 12" YELLOW DIAGONAL

SCALE: 1"=40'

1"=20' ORIGINAL MAP SCALE 1"=40'

R1-1	R3-5(RT)
R3-2	R3-4
R3-7	R3-18
R9-3	R9-3bP(LT)
R10-15	R9-11(LT)
R9-11a(LT)	R9-11a(RT)
R13A(CA)	OM1-3
M4-9b(LT)	M4-9b(RT)
W1-4(LT)	W1-4(RT)
C30(CA)	TYPE P(LT)
W1-7	W20-1
R3-1	R3-8b

CENTURY CITY CONSTELLATION STATION STAGE 8
NORTHSIDE PILES INSTALLATION

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____
References:
A-5150
FIELD CHECK

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR_____	TF-1528	26/39

REVIEWED: _____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE, IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY J. BANZON
DRAWN BY J. BANZON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

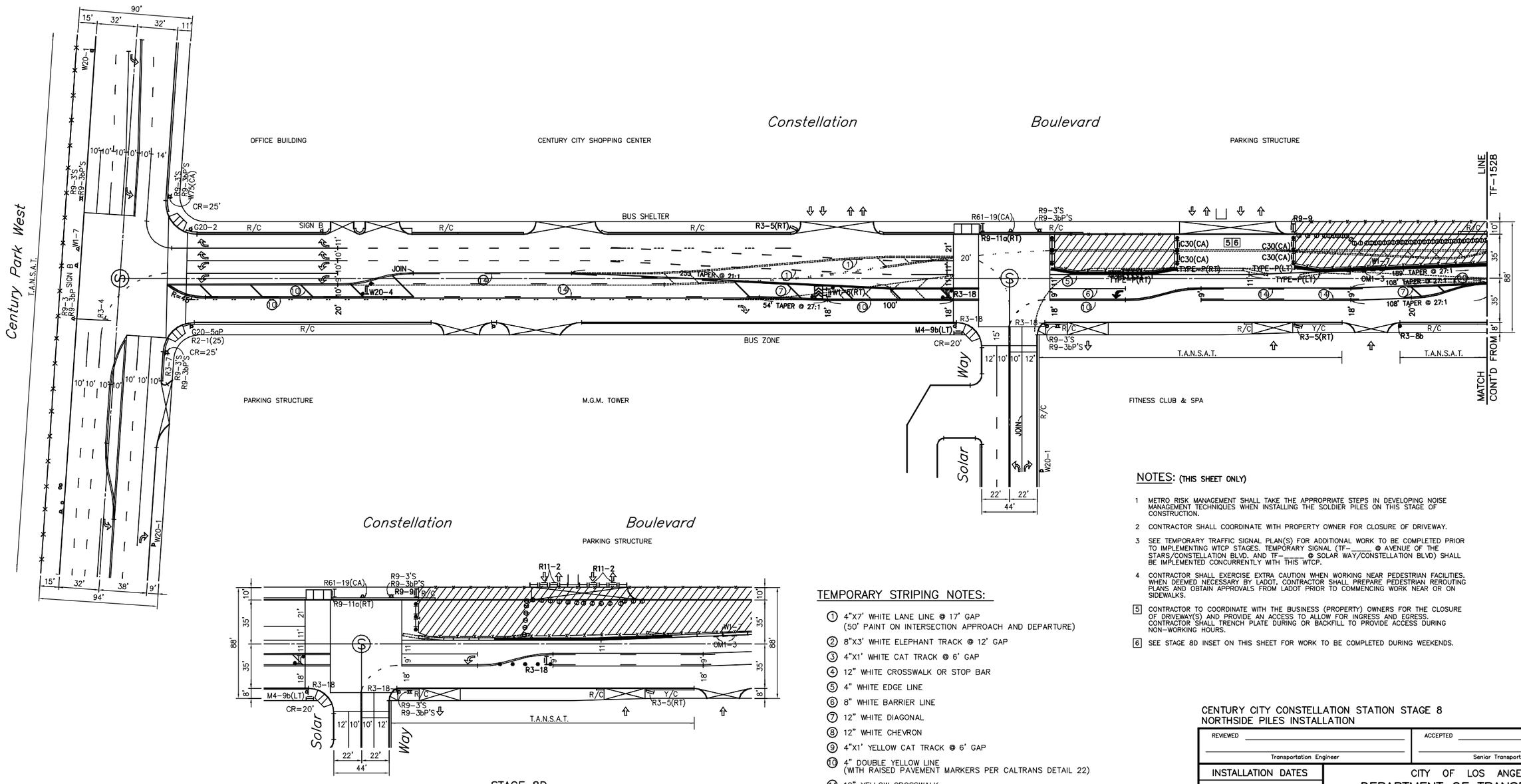
PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR. SUITE 470 IRVINE, CA 92618
T 949-753-9010 F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 8 – SHEET 1

CONTRACT NO
DRAWING NO TF-1528 REV
SCALE 1"=40'
SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION – TRAFFIC CONTROL\SHEETS\c0XXXtf1528_29.dwg Sep 30, 2015 12:23pm Santosc



STAGE 8D

WEEKEND CLOSURE FROM
FRIDAY 9PM TO MONDAY 6AM

TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 12" YELLOW DIAGONAL
14. 4"x12' YELLOW TWLTL @ 36' GAP

SCALE: 1"=40'

NOTES: (THIS SHEET ONLY)

1 METRO RISK MANAGEMENT SHALL TAKE THE APPROPRIATE STEPS IN DEVELOPING NOISE MANAGEMENT TECHNIQUES WHEN INSTALLING THE SOLDIER PILES ON THIS STAGE OF CONSTRUCTION.

2 CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR CLOSURE OF DRIVEWAY.

3 SEE TEMPORARY TRAFFIC SIGNAL PLAN(S) FOR ADDITIONAL WORK TO BE COMPLETED PRIOR TO IMPLEMENTING WTCP STAGES. TEMPORARY SIGNAL (TF-_____ @ AVENUE OF THE STARS/CONSTELLATION BLVD. AND TF-_____ @ SOLAR WAY/CONSTELLATION BLVD) SHALL BE IMPLEMENTED CONCURRENTLY WITH THIS WTCP.

4 CONTRACTOR SHALL EXERCISE EXTRA CAUTION WHEN WORKING NEAR PEDESTRIAN FACILITIES. WHEN DEEMED NECESSARY BY LADOT, CONTRACTOR SHALL PREPARE PEDESTRIAN REROUTING PLANS AND OBTAIN APPROVALS FROM LADOT PRIOR TO COMMENCING WORK NEAR OR ON SIDEWALKS.

[5] CONTRACTOR TO COORDINATE WITH THE BUSINESS (PROPERTY) OWNERS FOR THE CLOSURE OF DRIVEWAY(S) AND PROVIDE AN ACCESS TO ALLOW FOR INGRESS AND EGRESS. CONTRACTOR SHALL TRENCH PLATE DURING OR BACKFILL TO PROVIDE ACCESS DURING NON-WORKING HOURS.

[6] SEE STAGE 8D INSET ON THIS SHEET FOR WORK TO BE COMPLETED DURING WEEKENDS.

CENTURY CITY CONSTELLATION STATION STAGE 8
NORTHSIDE PILES INSTALLATION

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN:
MARKOUT COMPLETED:
STRIPING COMPLETED:
References: A-5150 FIELD CHECK

Thomas Guide	District
632-E3	W

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN

CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

PROJECT NO. PCR_____ | DRAWING NO. TF-1529 | 27/39

REVIEWED:_____ 20___

BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY J. BANZON
DRAWN BY J. BANZON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

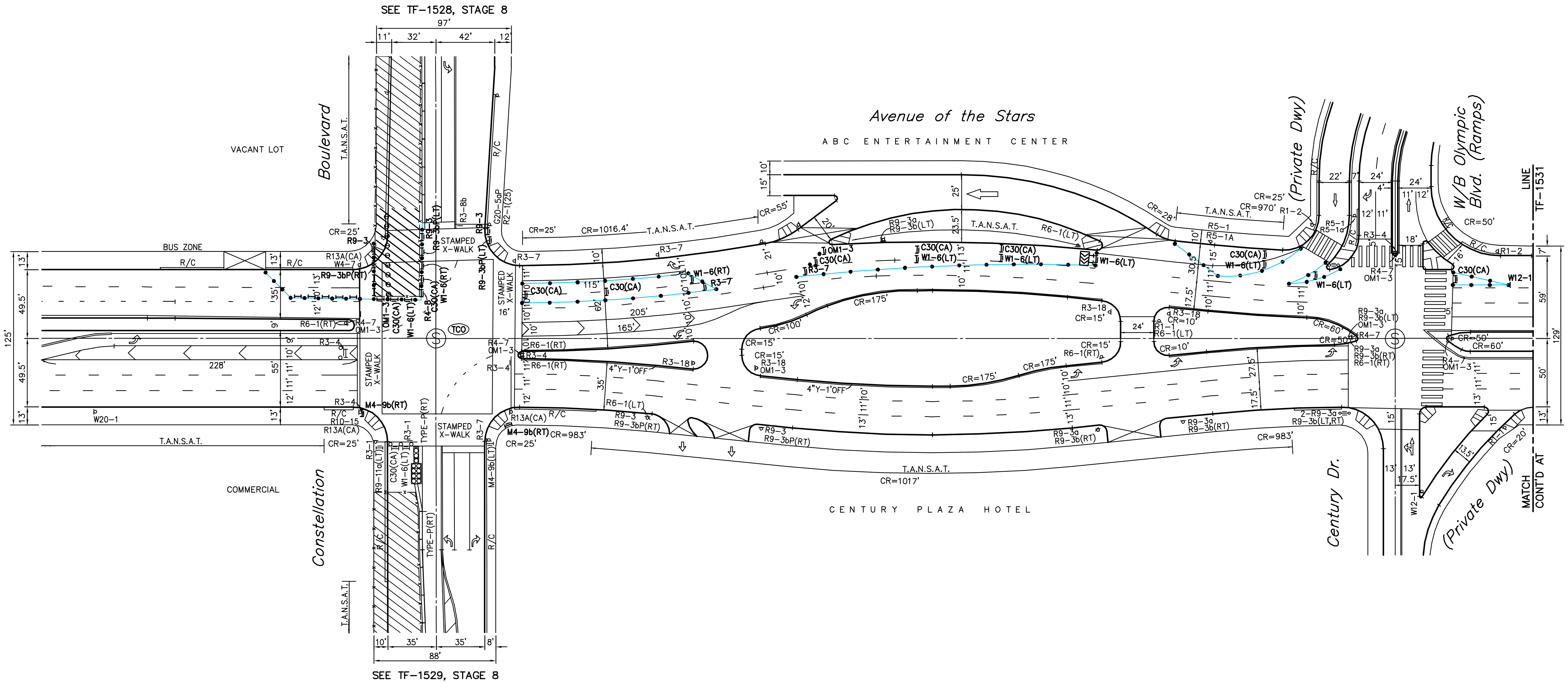
WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 8 - SHEET 2

CONTRACT NO
DRAWING NO TF-1529 | REV
SCALE 1"=40'
SHEET NO

R2-1(25) SPEED LIMIT 25
R3-5(RT) ONLY
R3-4
R3-18
R61-19 ONLY ONLY
G20-2 END ROAD WORK
G20-5aP WORK ZONE
W1-6(RT)
W1-7
W20-1 ROAD WORK AHEAD
OM1-3
C30(CA) LANE CLOSED
M4-9b(LT) DETOUR
M4-9b(RT) DETOUR
R9-11a(RT) SIDEWALK CLOSED CROSS HERE
W20-4 ONE LANE ROAD AHEAD
TYPE P(LT)
TYPE P(RT)
R9-9 SIDEWALK CLOSED
R11-2 ROAD CLOSED
R3-8b ONLY ONLY ONLY

1"=20' ORIGINAL MAP SCALE 1"=40'

CADD PROJECT FILE NAME: C:\LAWSBIM\WACBM\CADD\95_Working\Traffic Team\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1528_29.dwg Sep 30, 2015 12:25pm_Santosc



1"=20' ORIGINAL MAP SCALE 1"=40'

SCALE: 1"=40'

CENTURY CITY CONSTELLATION STATION STAGE 8A
NORTHSIDE PILES INSTALLATION (WEEKEND SETUP)

REVIEWED ______ Transportation Engineer	ACCEPTED ______ Senior Transportation Engineer

INSTALLATION DATES	CITY OF LOS ANGELES DEPARTMENT OF TRANSPORTATION SELETA J. REYNOLDS, GENERAL MANAGER
MARKOUT BEGAN: ______ MARKOUT COMPLETED: ______ STRIPING COMPLETED: ______	TRAFFIC CONTROL PLAN CONSTELLATION BOULEVARD CENTURY PARK E. TO CENTURY PARK W.
References: FIELD CHECK A-5150 A-2839 A-6173	

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR____	TF-1530	28/39

REVIEWED:______________ 20___

BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY J. BANZON
DRAWN BY J. BANZON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

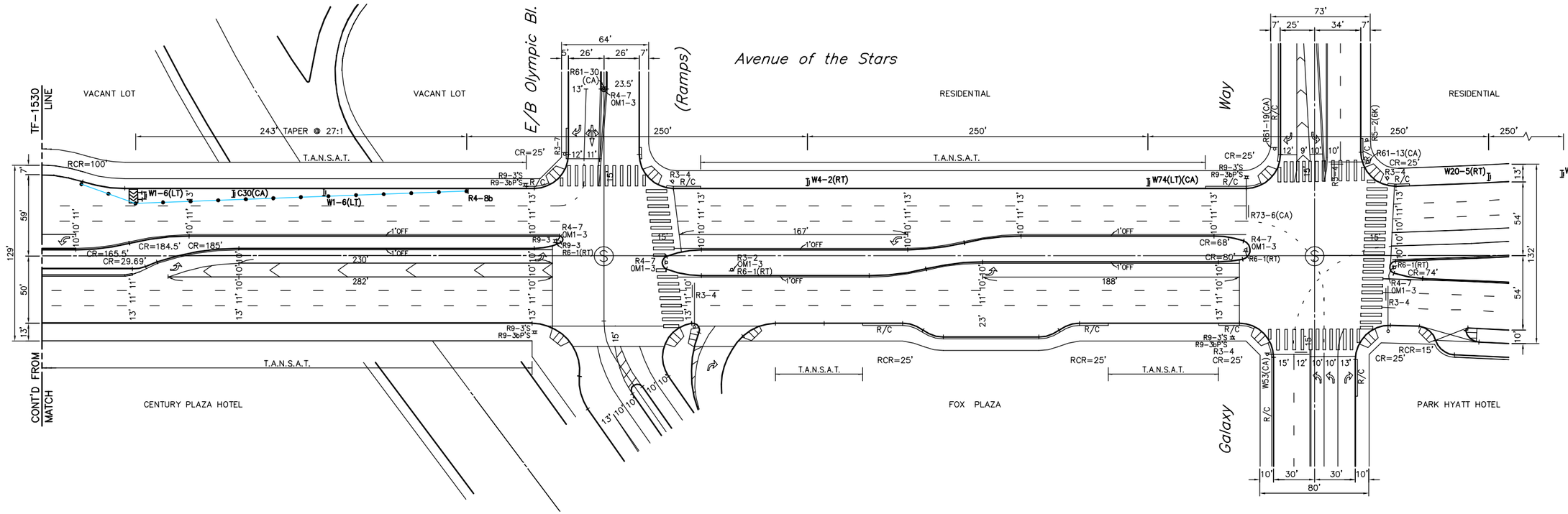
PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 8A - SHEET 1

CONTRACT NO
DRAWING NO TF-1530
REV
SCALE 1"=40'
SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1530_31.dwg Sep 30, 2015 12:29pm __SantosC



SCALE: 1"=40'

1"=20' ORIGINAL MAP SCALE 1"=40'

KEEP LEFT R4-8b	W1-6(LT)
LANE CLOSED C30(CA)	W4-2(RT)
RIGHT LANE CLOSED AHEAD W20-5(RT)	THRU TRAFFIC MERGE LEFT W74(LT)(CA)

CENTURY CITY CONSTELLATION STATION STAGE 8A
NORTHSIDE PILES INSTALLATION (WEEKEND SETUP)

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____
References:
FIELD CHECK
A-5150
A-2839
A-6173

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR_____	TF-1531	29/39

REVIEWED:_____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY J. BANZON
DRAWN BY J. BANZON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

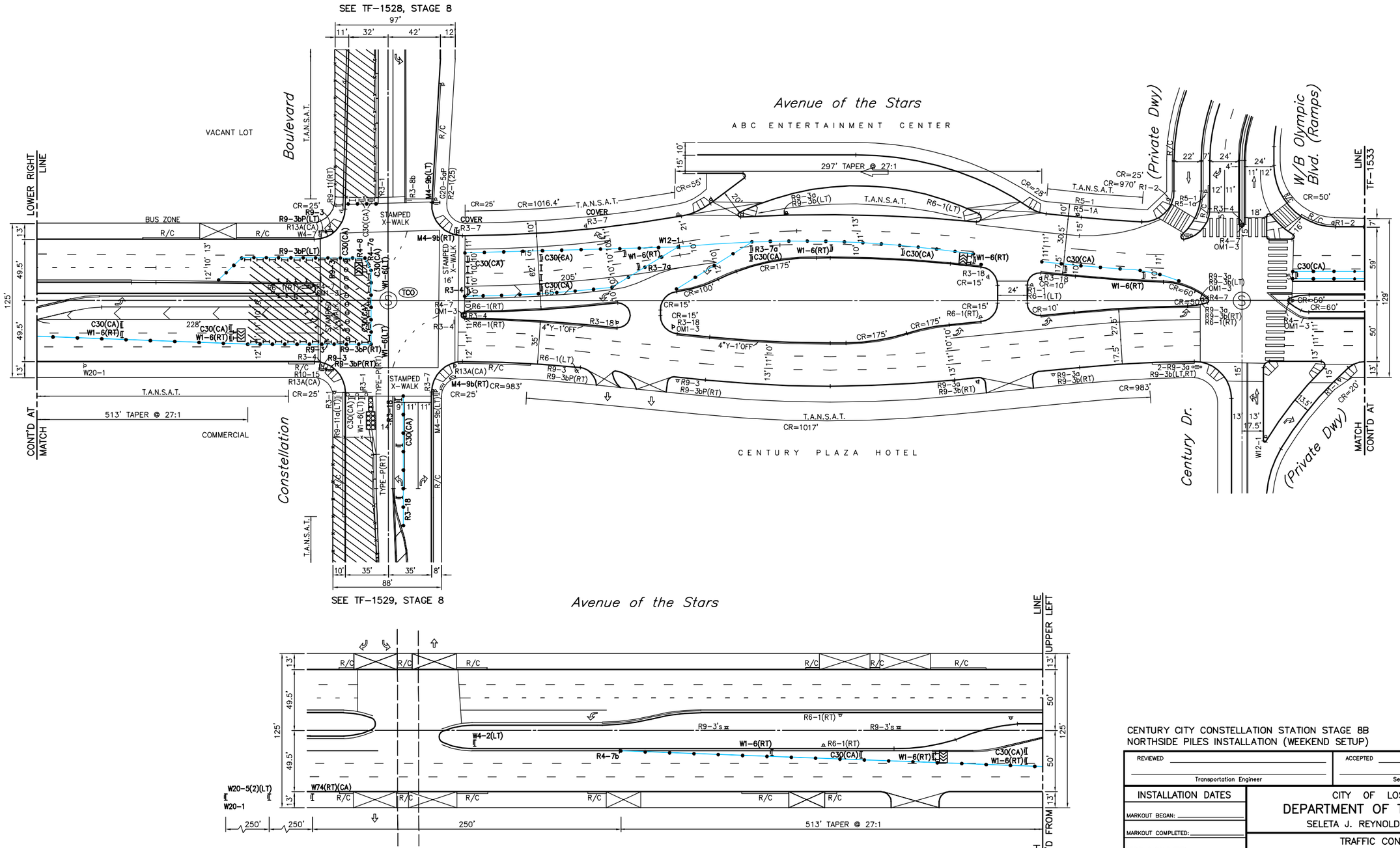
PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 8A – SHEET 2

CONTRACT NO
DRAWING NO TF-1531 REV
SCALE 1"=40'
SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1530_31.dwg Sep 30, 2015 12:31pm__SantosC



M4-9b(LT)	M4-9b(RT)
R9-3bP(LT)	R9-3bP(RT)
W1-6(LT)	W1-6(RT)
R9-3	R9-11a(LT)
R9-11a(RT)	OM1-3
W12-1	W4-2(LT)
C30(CA)	R4-7b
W74(RT)(CA)	W20-5(RT)
R4-7a	R4-8

CENTURY CITY CONSTELLATION STATION STAGE 8B
NORTHSIDE PILES INSTALLATION (WEEKEND SETUP)

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES

MARKOUT BEGAN: _____

MARKOUT COMPLETED: _____

STRIPING COMPLETED: _____

References:
FIELD CHECK
A-5150
A-2839
A-6173

Thomas Guide	District
632-E3	W

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

PROJECT NO. PCR____ | DRAWING NO. TF-1532 | 30/39

REVIEWED: _____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE, IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY J. BANZON
DRAWN BY J. BANZON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

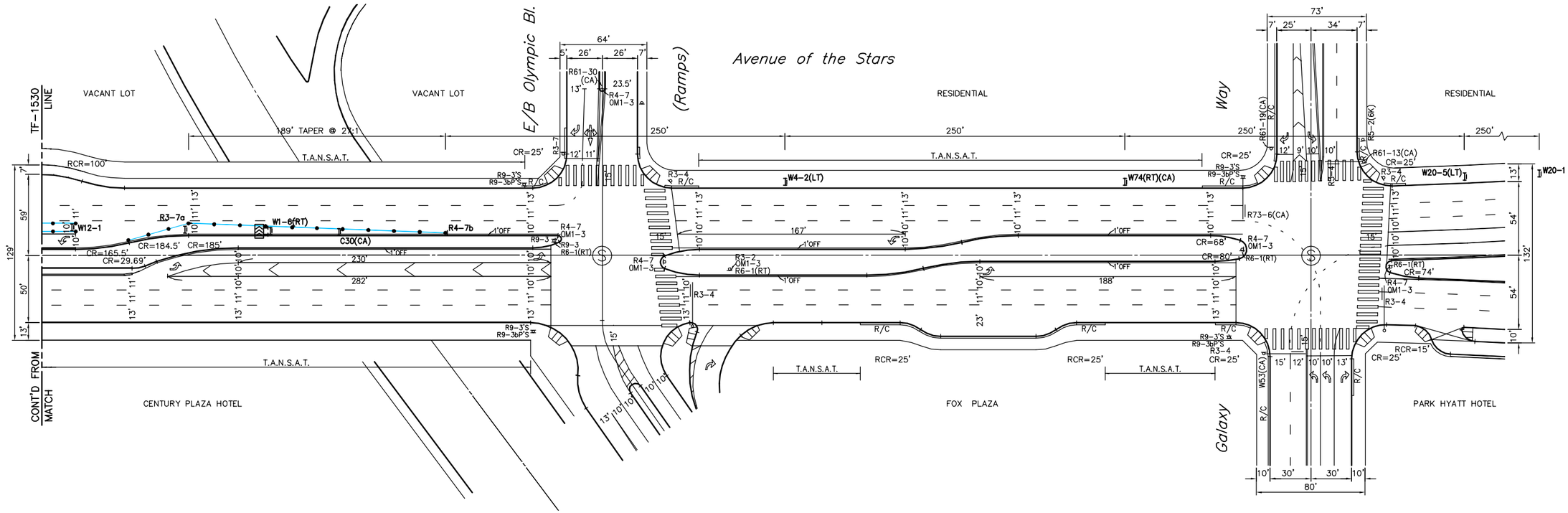
INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 8B – SHEET 1

CONTRACT NO
DRAWING NO TF-1532 | REV
SCALE 1"=40'
SHEET NO

ORIGINAL MAP SCALE 1"=20' 1"=40'

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\Traffic Team\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\cOXXXtf1532_33.dwg Sep 30, 2015 12:33pm Santosc



SCALE: 1"=40'

1"=20' ORIGINAL MAP SCALE 1"=40'

DETOUR M4-9b(LT)	DETOUR M4-9b(RT)
USE CROSSWALK R9-3bP(LT)	USE CROSSWALK R9-3bP(RT)
W1-6(LT)	W1-6(RT)
LEFT LANE MUST TURN LEFT R3-7a	R9-3
SIDEWALK CLOSED CROSS HERE R9-11a(LT)	SIDEWALK CLOSED CROSS HERE R9-11a(RT)
OM1-3	W12-1
W4-2(LT)	LANE CLOSED C30(CA)
KEEP RIGHT R4-7b	THRU TRAFFIC MERGE RIGHT W74(RT)(CA)
LEFT LANE CLOSED AHEAD W20-5(LT)	

CENTURY CITY CONSTELLATION STATION STAGE 8B
NORTHSIDE PILES INSTALLATION (WEEKEND SETUP)

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____
References:
FIELD CHECK
A-5150
A-2839
A-6173

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR_____	TF-1533	31/39

REVIEWED:_____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY J. BANZON
DRAWN BY J. BANZON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

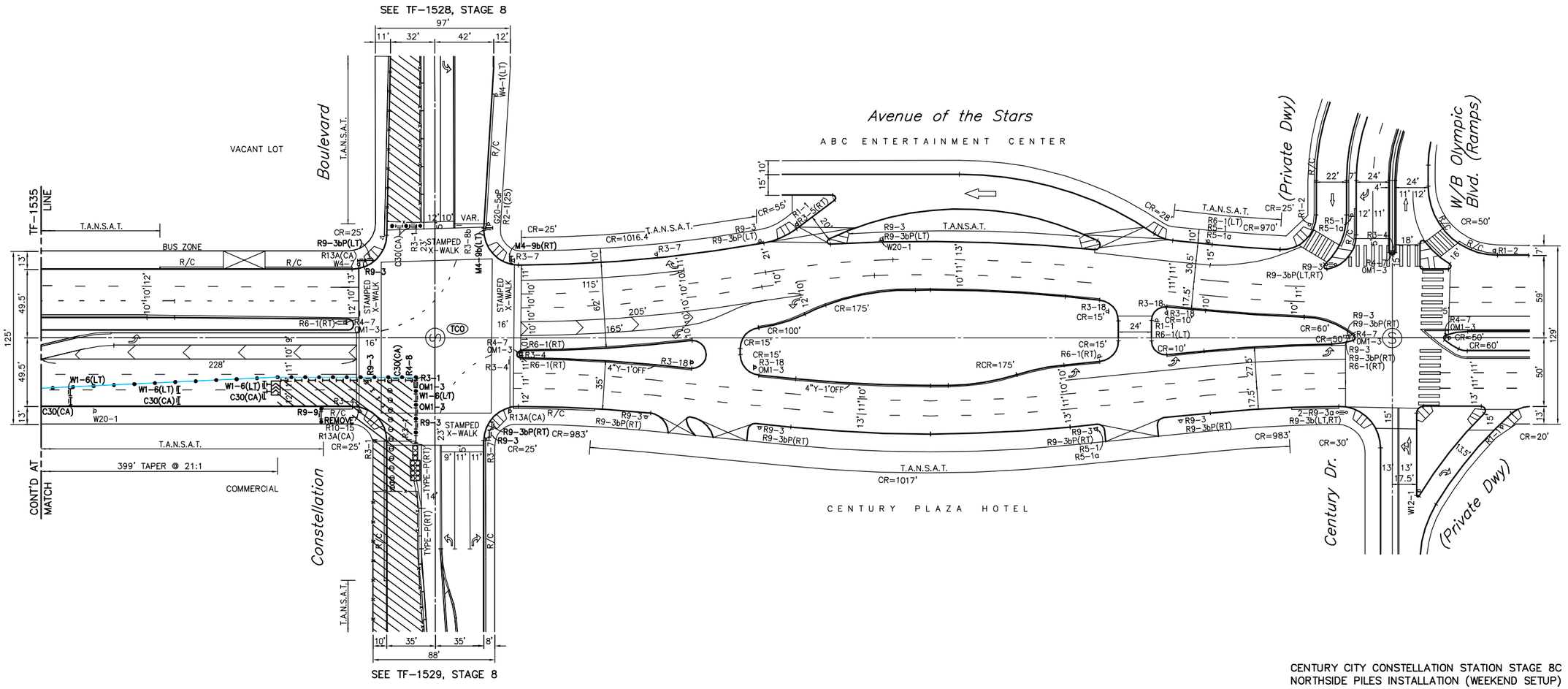
PARSONS BRINCKERHOFF

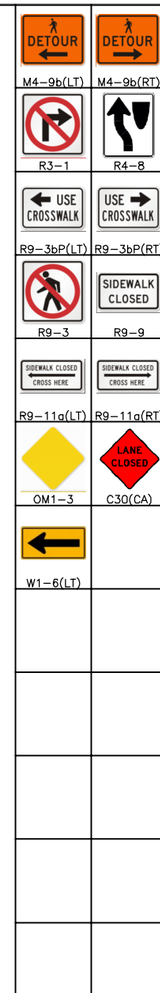
INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 8B – SHEET 2

CONTRACT NO
DRAWING NO TF-1533 REV
SCALE 1"=40'
SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1532_33.dwg Sep 30, 2015 12:34pm Santosc





CENTURY CITY CONSTELLATION STATION STAGE 8C
NORTHSIDE PILES INSTALLATION (WEEKEND SETUP)

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES

MARKOUT BEGAN: _____

MARKOUT COMPLETED: _____

STRIPING COMPLETED: _____

References:
FIELD CHECK
A-5150
A-2839
A-6173

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
632-E3	W	PCR____	TF-1534	32/39

SCALE: 1"=40'

REVIEWED: _____ 20___

BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY J. BANZON
DRAWN BY J. BANZON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

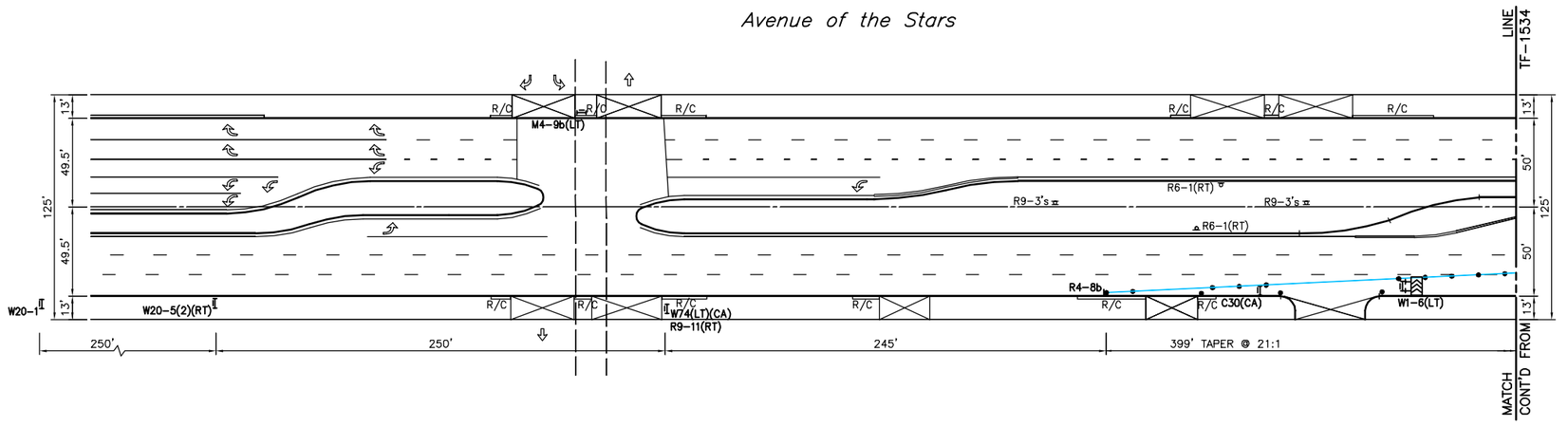
PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 8C – SHEET 1

CONTRACT NO
DRAWING NO TF-1534 REV
SCALE 1"=40'
SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\Traffic Team\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1534_35.dwg Sep 30, 2015 12:36pm Santosc



M4-9b(LT)

R9-11(RT)

R4-8b


W1-6(LT)


W4-2(RT)

W20-1

W20-5(RT)

W74(LT)(CA)

C30(CA)

CENTURY CITY CONSTELLATION STATION STAGE 8C
NORTHSIDE PILES INSTALLATION (WEEKEND SETUP)

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES

MARKOUT BEGAN: _____

MARKOUT COMPLETED: _____

STRIPING COMPLETED: _____

References:
FIELD CHECK
A-5150
A-2839
A-6173

Thomas Guide	District
632-E3	W

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

PROJECT NO. PCR____ | DRAWING NO. TF-1535 | 33/39

SCALE: 1"=40'

REVIEWED:_____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY J. BANZON
DRAWN BY J. BANZON
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

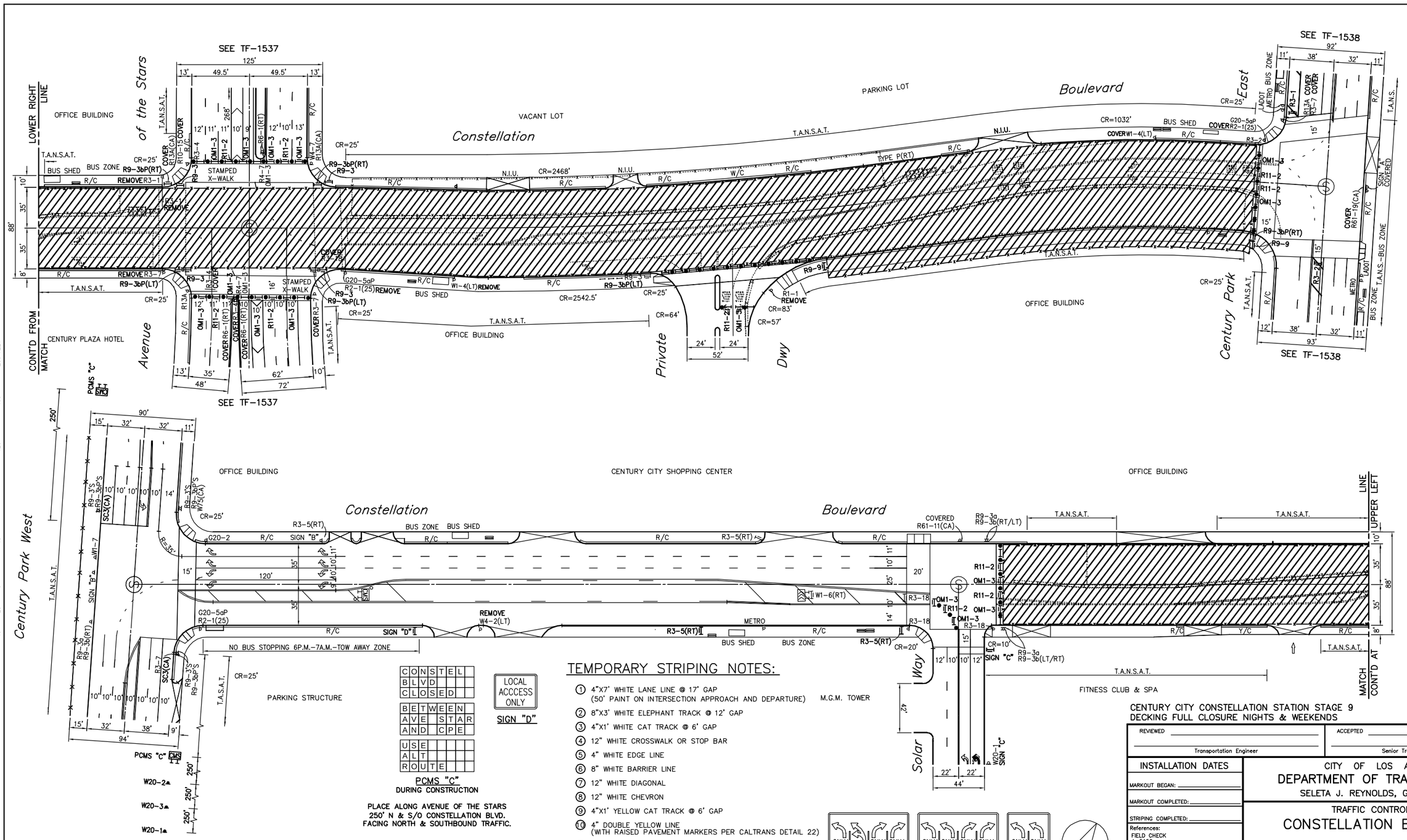
PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 8C – SHEET 2

CONTRACT NO
DRAWING NO TF-1535 | REV
SCALE 1"=40'
SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION – TRAFFIC CONTROL\SHEETS\c0XXXtf1534_35.dwg Sep 30, 2015 12:36pm SantosC



TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE) M.G.M. TOWER
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 2 WAY LEFT TURN

R3-1 | R3-2

R3-5(LT) ONLY | R3-7(RT) RIGHT LANE MUST TURN RIGHT

R11-2 ROAD CLOSED | R11-4 ROAD CLOSED TO THRU TRAFFIC

OM1-3 | C30(CA) LANE CLOSED

M4-10(LT) DETOUR | M4-10(RT) DETOUR

W20-1 ROAD WORK AHEAD | W20-2 DETOUR AHEAD

W20-3 ROAD CLOSED AHEAD | SC3(CA) DETOUR

R9-9 SIDEWALK CLOSED | R9-3bP(RT) USE CROSSWALK

R9-3bP(LT) USE CROSSWALK | R9-3

R3-5(RT) ONLY

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1536.dwg Sep 30, 2015 11:48am Santosc

CENTURY CITY CONSTELLATION STATION STAGE 9
DECKING FULL CLOSURE NIGHTS & WEEKENDS

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____

References:
FIELD CHECK
A-5150
A-2839
A-6173

Thomas Guide	District
632-E3	W

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

PROJECT NO. PCR_____ | DRAWING NO. TF-1536 | 34/39

REVIEWED: _____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE, IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY C. SANTOS
DRAWN BY C. SANTOS
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

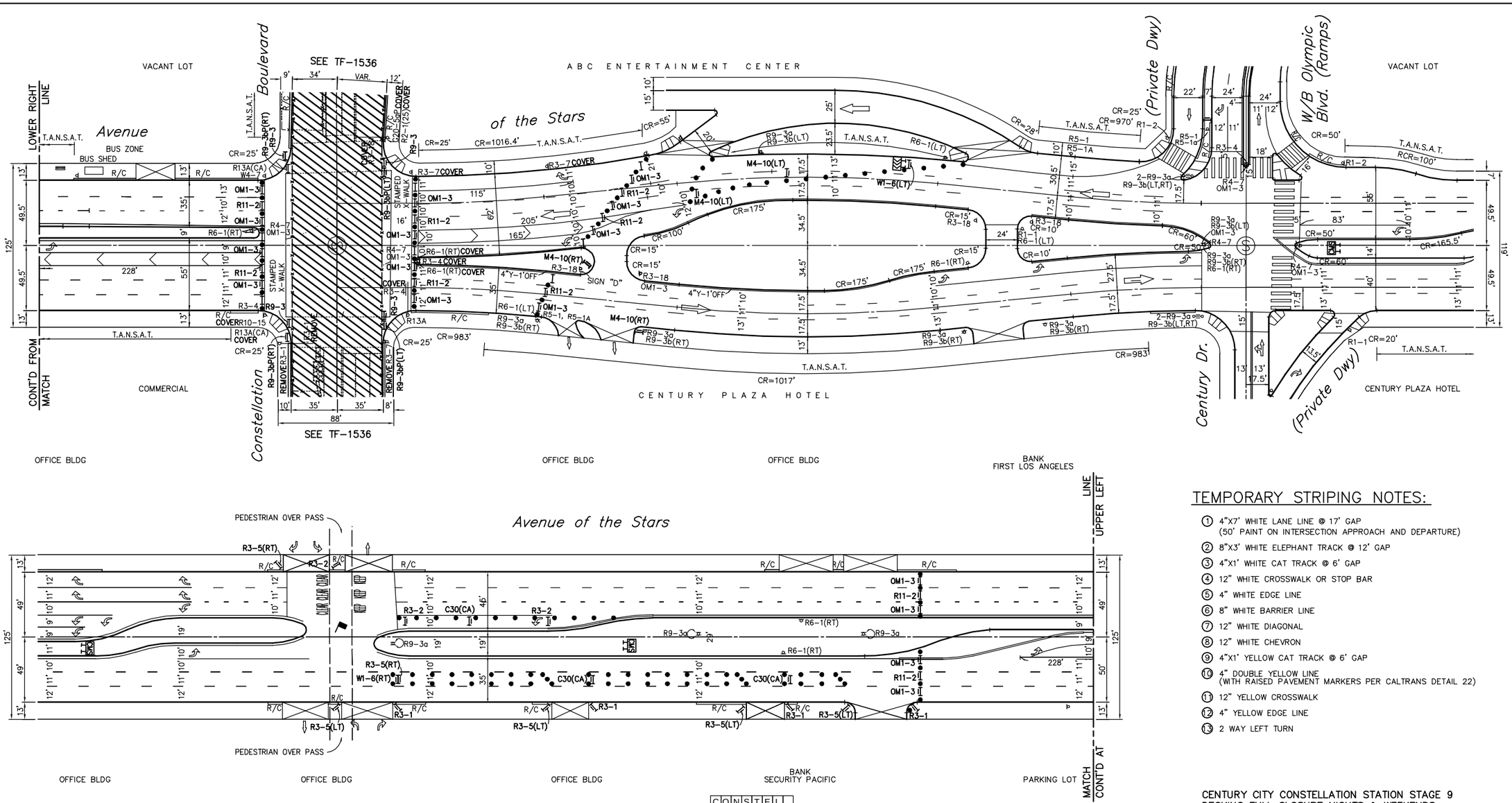
Metro
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

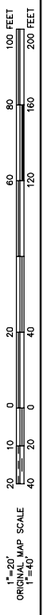
PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR. SUITE 470 IRVINE, CA 92618
T 949-753-9010 F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 9 – SHEET 1

CONTRACT NO
DRAWING NO TF-1536 | REV
SCALE 1"=40'
SHEET NO





TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 2 WAY LEFT TURN

CENTURY CITY CONSTELLATION STATION STAGE 9
DECKING FULL CLOSURE NIGHTS & WEEKENDS

Olympic Bl
LEFT LANE

SIGN "D"

C	O	N	S	T	E	L	
B	L	V	D				
C	L	O	S	E	D		

B	E	T	W	E	E	N	
A	V	E		S	T	A	R
A	N	D		C	P	E	

U	S	E					
A	L	T					
R	O	U	T	E			

PCMS "B"
DURING CONSTRUCTION

PLACE ALONG AVENUE OF THE STARS
250' N & S/O CONSTELLATION BLVD.
FACING NORTH & SOUTHBOUND TRAFFIC.

SCALE: 1"=40'

REVIEWED: _____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY C. SANTOS
DRAWN BY C. SANTOS
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

REVIEWED _____ Transportation Engineer
ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____
References:
FIELD CHECK
A-5150
A-2839
A-6173

Thomas Guide	District
632-E3	W

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

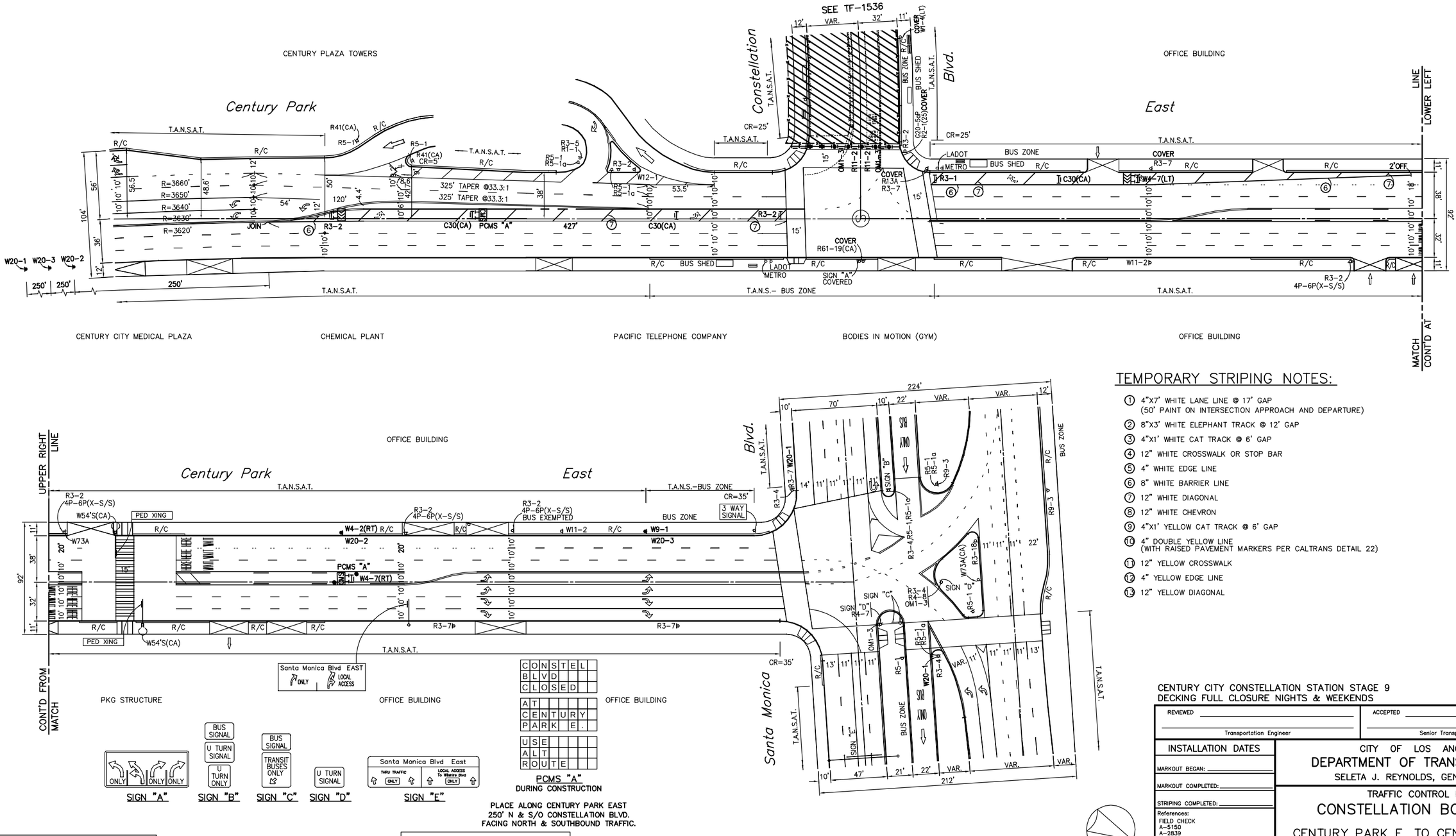
TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

PROJECT NO. PCR____
DRAWING NO. TF-1537
35/39

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 9 – SHEET 2

CONTRACT NO
DRAWING NO TF-1537
REV
SCALE 1"=40'
SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1537.dwg Sep 30, 2015 11:49am__SantosC



TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
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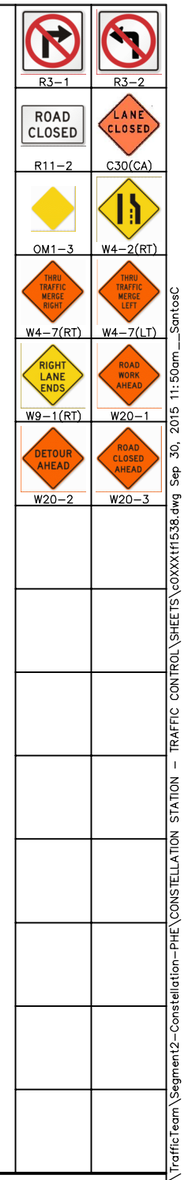
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 12" YELLOW DIAGONAL

CENTURY CITY CONSTELLATION STATION STAGE 9
DECKING FULL CLOSURE NIGHTS & WEEKENDS



REVIEWED: _____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE. IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY C. SANTOS
DRAWN BY C. SANTOS
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

REVIEWED _____ Transportation Engineer
ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____
References:
FIELD CHECK
A-5150
A-2839
A-6173

Thomas Guide	District
632-E3	W

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

PROJECT NO. PCR____
DRAWING NO. TF-1538
36/39

LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

Metro

PARSONS BRINCKERHOFF

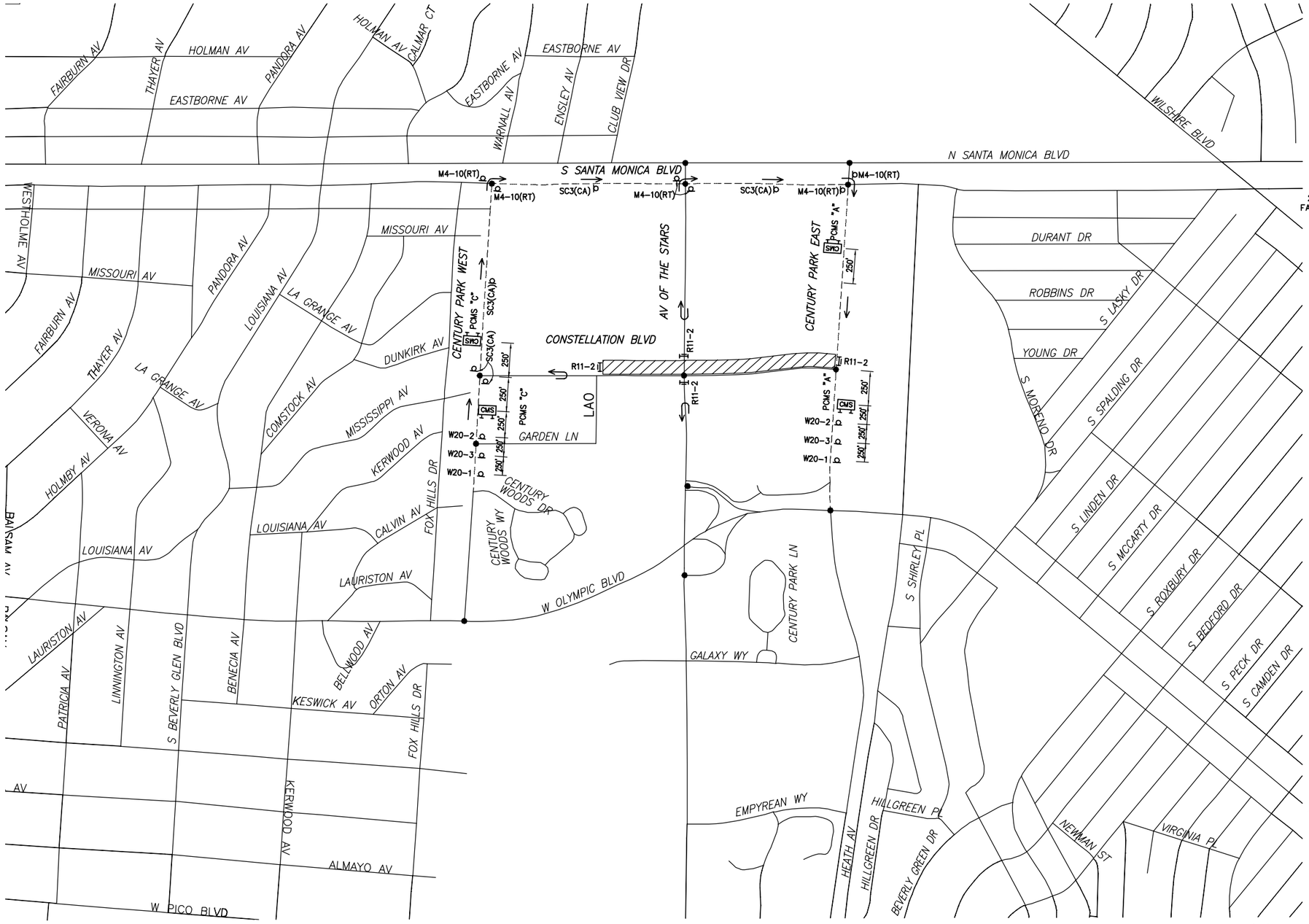
INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 9 – SHEET 3

CONTRACT NO
DRAWING NO TF-1538
REV
SCALE 1"=40'
SHEET NO

1"=20' ORIGINAL MAP SCALE

CADD PROJECT FILE NAME: L:\LAWSBM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\c0XXXtf1538.dwg Sep 30, 2015 11:50am SantosC



CONSTEL BLVD CLOSED
AT CENTURY PARK E.
USE ALT ROUTE

PCMS "A"
DURING CONSTRUCTION

PLACE ALONG CENTURY PARK EAST
250' N & S/O CONSTELLATION BLVD.
FACING NORTH & SOUTHBOUND TRAFFIC.

CONSTEL BLVD CLOSED
BETWEEN AVE STAR AND CPE
USE ALT ROUTE

PCMS "B"
DURING CONSTRUCTION

PLACE ALONG AVENUE OF THE STARS
250' N & S/O CONSTELLATION BLVD.
FACING NORTH & SOUTHBOUND TRAFFIC.

CONSTEL BLVD CLOSED
BETWEEN AVE STAR AND CPE
USE ALT ROUTE

PCMS "C"
DURING CONSTRUCTION

PLACE ALONG CENTURY PARK WEST
250' N & S/O CONSTELLATION BLVD.
FACING NORTH & SOUTHBOUND TRAFFIC.

LEGEND:

- ● – SIGNALIZED INTERSECTION
- ▨ – PROPOSED WORK AREA
- ◂ – PROPOSED DETOUR SIGN
- TCO – TRAFFIC CONTROL OFFICER
- LAO – LOCAL ACCESS ONLY

NOTES: (THIS SHEET ONLY)

1. SEE DRAWING TF-xxxx FOR ALL WTCP SIGNS ASSOCIATED WITH THIS DETOUR.

SCALE: 1"=40'

CENTURY CITY CONSTELLATION STATION STAGE 9
DECKING/DECKING REMOVAL FULL CLOSURE NIGHTS/WEEKENDS

ROAD CLOSED TO THRU TRAFFIC R11-4 | DETOUR M4-10(LT)
DETOUR M4-10(RT) | ROAD WORK AHEAD W20-1
DETOUR AHEAD W20-2 | ROAD CLOSED AHEAD W20-3
DETOUR SC3(CA)

REVIEWED _____ Transportation Engineer
ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES
MARKOUT BEGAN: _____
MARKOUT COMPLETED: _____
STRIPING COMPLETED: _____
References:

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN
CONSTELLATION BOULEVARD
EASTBOUND CLOSURE–STAGE 9

Thomas Guide	District	PROJECT NO.	DRAWING NO.	
–	–	PCR____	TF-1539	37/39

REVIEWED: _____ 20__
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE, IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY C. SANTOS
DRAWN BY C. SANTOS
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
TRAFFIC DETOUR PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 9 – SHEET 4

CONTRACT NO
DRAWING NO TF-1539 | REV
SCALE 1"=40'
SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION - TRAFFIC CONTROL\SHEETS\cOXXXtf1539.dwg Sep 30, 2015 11:52am SantosC

NOTES: (THIS SHEET ONLY)

1 METRO RISK MANAGEMENT SHALL TAKE THE APPROPRIATE STEPS IN DEVELOPING NOISE MANAGEMENT TECHNIQUES WHEN INSTALLING THE SOLDIER PILES ON THIS STAGE OF CONSTRUCTION.

2 CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR CLOSURE OF DRIVEWAY.

3 SEE TEMPORARY TRAFFIC SIGNAL PLAN(S) FOR ADDITIONAL WORK TO BE COMPLETED PRIOR TO IMPLEMENTING WTCP STAGES. TEMPORARY SIGNAL (TF-_____ @ AVENUE OF THE STARS/CONSTELLATION BLVD. AND TF-_____ @ SOLAR WAY/CONSTELLATION BLVD) SHALL BE IMPLEMENTED CONCURRENTLY WITH THIS WTCP.

4 CONTRACTOR SHALL EXERCISE EXTRA CAUTION WHEN WORKING NEAR PEDESTRIAN FACILITIES. WHEN DEEMED NECESSARY BY LADOT, CONTRACTOR SHALL PREPARE PEDESTRIAN REROUTING PLANS AND OBTAIN APPROVALS FROM LADOT PRIOR TO COMMENCING WORK NEAR OR ON SIDEWALKS.

TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
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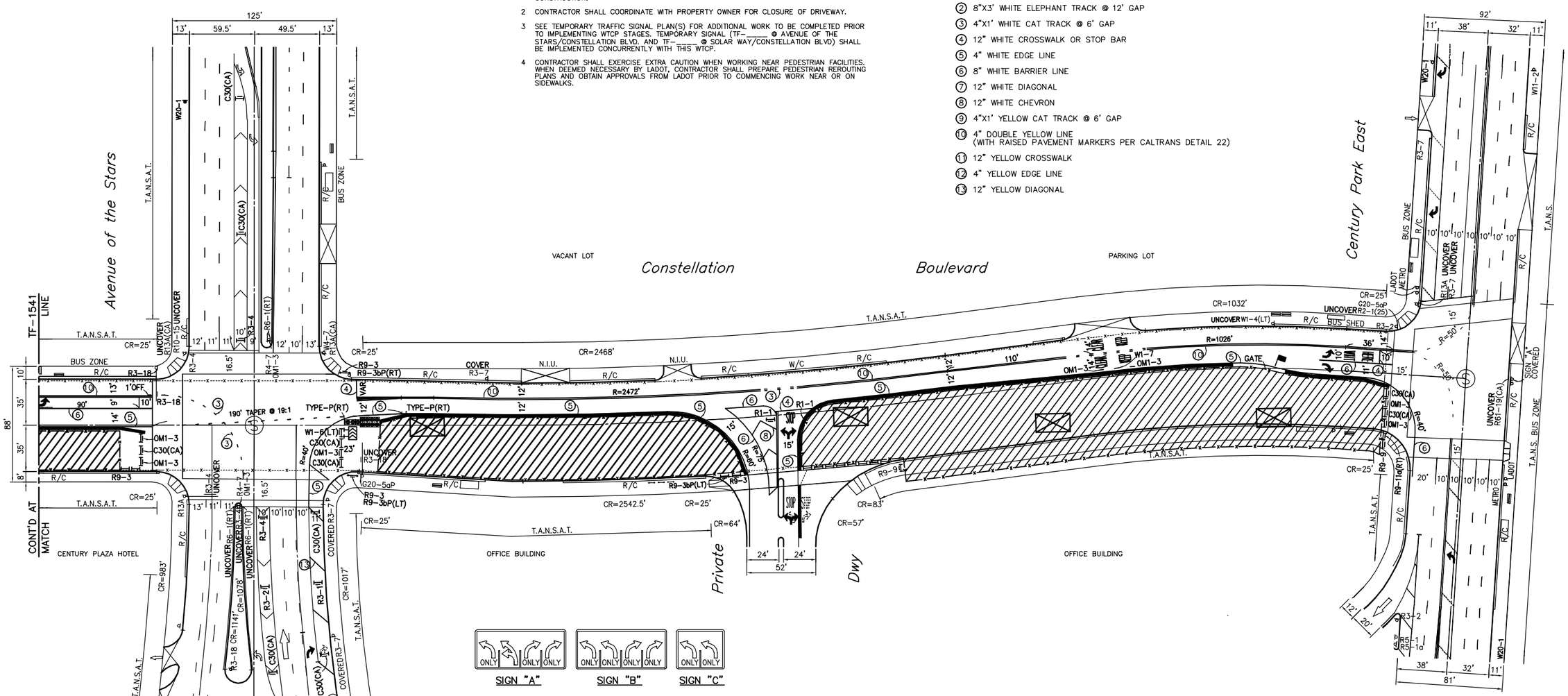
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 12" YELLOW DIAGONAL



CENTURY CITY CONSTELLATION STATION STAGE 10

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES

MARKOUT BEGAN: _____

MARKOUT COMPLETED: _____

STRIPING COMPLETED: _____

References:
FIELD CHECK
A-5150
A-2839
A-6173

Thomas Guide	District
632-E3	W

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN

CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

PROJECT NO. PCR_____ | DRAWING NO. TF-1540 | 38/39

REVIEWED: _____ 20___
BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE, IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY C. SANTOS
DRAWN BY C. SANTOS
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

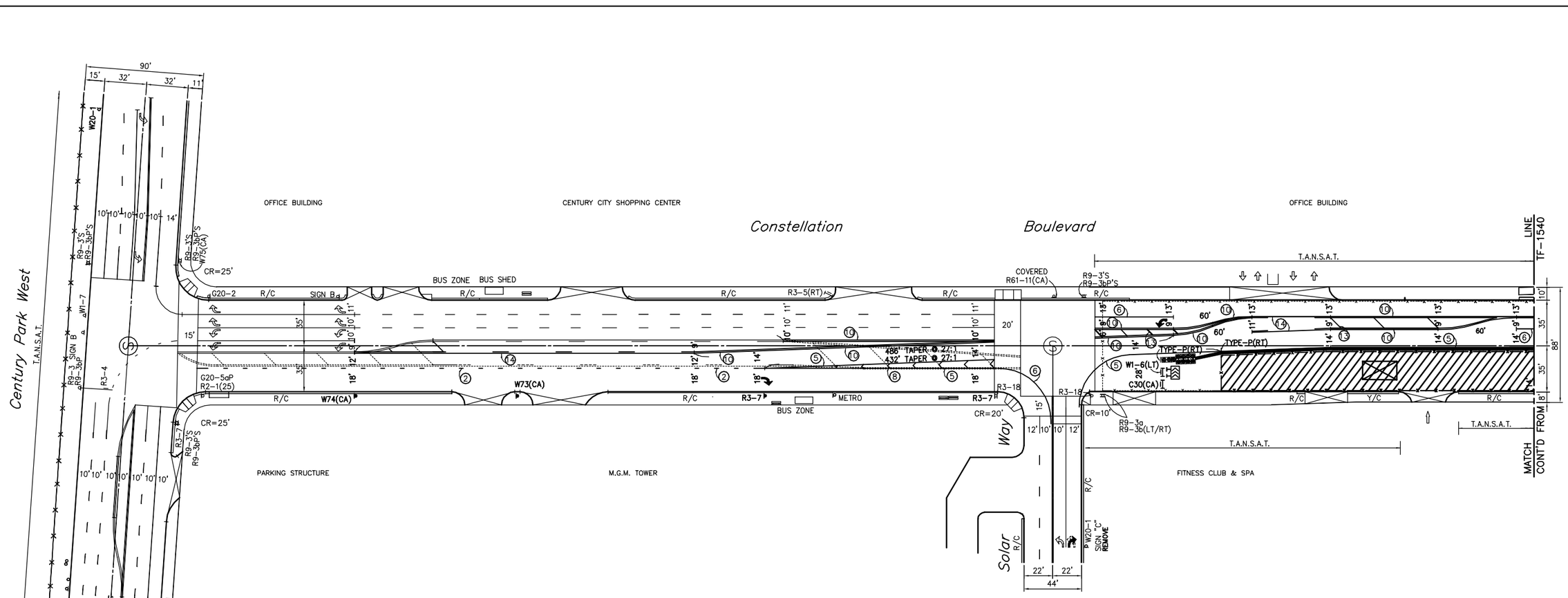
INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR. SUITE 470 IRVINE, CA 92618
T 949-753-9010 F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 10 – SHEET 1

CONTRACT NO
DRAWING NO TF-1540 | REV
SCALE 1"=40'
SHEET NO

R1-1 STOP
R3-1
R3-2
R3-4
R3-7 RIGHT LANE MUST TURN RIGHT
R3-18
R9-3
R9-3bP(LT) USE CROSSWALK
R9-3bP(RT) USE CROSSWALK
R9-11(LT) SIDEWALK CLOSED AHEAD CROSS HERE
R9-11a(LT) SIDEWALK CLOSED CROSS HERE
R9-11a(RT) SIDEWALK CLOSED CROSS HERE
R9-9 SIDEWALK CLOSED
OM1-3
C30(CA) LANE CLOSED
TYPE P(LT)
TYPE P(RT)
W20-1 ROAD WORK AHEAD
W1-6(LT)
W1-7

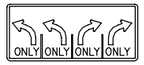
CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION – TRAFFIC CONTROL\SHEETS\cOXXXtf1540.dwg Sep 30, 2015 11:52am SantosC



NOTES: (THIS SHEET ONLY)

1. METRO RISK MANAGEMENT SHALL TAKE THE APPROPRIATE STEPS IN DEVELOPING NOISE MANAGEMENT TECHNIQUES WHEN INSTALLING THE SOLDIER PILES ON THIS STAGE OF CONSTRUCTION.
2. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR CLOSURE OF DRIVEWAY.
3. SEE TEMPORARY TRAFFIC SIGNAL PLAN(S) FOR ADDITIONAL WORK TO BE COMPLETED PRIOR TO IMPLEMENTING WTCP STAGES. TEMPORARY SIGNAL (TF-_____ @ AVENUE OF THE STARS/CONSTELLATION BLVD. AND TF-_____ @ SOLAR WAY/CONSTELLATION BLVD) SHALL BE IMPLEMENTED CONCURRENTLY WITH THIS WTCP.
4. CONTRACTOR SHALL EXERCISE EXTRA CAUTION WHEN WORKING NEAR PEDESTRIAN FACILITIES. WHEN DEEMED NECESSARY BY LADOT, CONTRACTOR SHALL PREPARE PEDESTRIAN REROUTING PLANS AND OBTAIN APPROVALS FROM LADOT PRIOR TO COMMENCING WORK NEAR OR ON SIDEWALKS.

SIGN "A"



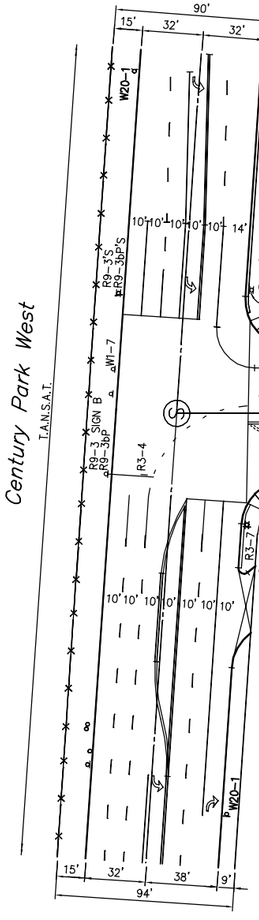
SIGN "B"

SIGN "C"

TEMPORARY STRIPING NOTES:

1. 4"X7' WHITE LANE LINE @ 17' GAP (50' PAINT ON INTERSECTION APPROACH AND DEPARTURE)
2. 8"X3' WHITE ELEPHANT TRACK @ 12' GAP
3. 4"X1' WHITE CAT TRACK @ 6' GAP
4. 12" WHITE CROSSWALK OR STOP BAR
5. 4" WHITE EDGE LINE
6. 8" WHITE BARRIER LINE
7. 12" WHITE DIAGONAL
8. 12" WHITE CHEVRON
9. 4"X1' YELLOW CAT TRACK @ 6' GAP
10. 4" DOUBLE YELLOW LINE (WITH RAISED PAVEMENT MARKERS PER CALTRANS DETAIL 22)
11. 12" YELLOW CROSSWALK
12. 4" YELLOW EDGE LINE
13. 12" YELLOW DIAGONAL
14. 2 WAY LEFT TURN

SCALE: 1"=40'



RIGHT LANE MUST TURN RIGHT R3-7	W1-6(RT)
W1-6(LT)	LANE CLOSED C30(CA)
TYPE P(LT)	TYPE P(RT)
ROAD WORK AHEAD W20-1	RIGHT LANE TURNS RIGHT AHEAD W73A(CA)
THRU TRAFFIC MERGE LEFT W74(CA)	

CENTURY CITY CONSTELLATION STATION STAGE 10

REVIEWED _____ Transportation Engineer

ACCEPTED _____ Senior Transportation Engineer

INSTALLATION DATES

MARKOUT BEGAN: _____

MARKOUT COMPLETED: _____

STRIPING COMPLETED: _____

References:
FIELD CHECK
A-5150
A-2839
A-6173

Thomas Guide	District
632-E3	W

CITY OF LOS ANGELES
DEPARTMENT OF TRANSPORTATION
SELETA J. REYNOLDS, GENERAL MANAGER

TRAFFIC CONTROL PLAN

CONSTELLATION BOULEVARD
CENTURY PARK E. TO CENTURY PARK W.

PROJECT NO. PCR_____ | DRAWING NO. TF-1541 | 39/39

REVIEWED:_____ 20___

BSS Investigation and Enforcement

IF THE PLAN HAS NOT BEEN IMPLEMENTED WITHIN THREE (3) YEARS OF THE APPROVED DATE, IT MUST BE RESUBMITTED TO LADOT FOR REVIEW AND APPROVAL

60% SUBMITTAL

REV	DATE	BY	APP	REG NO	EXPIRES	SEAL HOLDER	DESCRIPTION

DESIGNED BY C. SANTOS
DRAWN BY C. SANTOS
CHECKED BY K. DERDERIAN
IN CHARGE K. DERDERIAN
DATE 10/02/2015

Metro
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

PARSONS BRINCKERHOFF

INTUEOR MAXIMIZING VALUE
7700 IRVINE CENTER DR.
SUITE 470
IRVINE, CA 92618
T 949-753-9010
F 949-753-9014

WESTSIDE PURPLE LINE EXTENSION - SECTION 2
STATION SHORING & EXCAVATION
WORKSITE TRAFFIC CONTROL PLAN
CENTURY CITY CONSTELLATION STATION
STAGE 10 – SHEET 2

CONTRACT NO

DRAWING NO TF-1541 | REV

SCALE 1"=40'

SHEET NO

CADD PROJECT FILE NAME: L:\LAWSBIM\WACBM\CADD\95_Working\TrafficTeam\Segment2-Constellation-PHE\CONSTELLATION STATION STAGE 10 – TRAFFIC CONTROL\SHEETS\c0XXXtf1541.dwg Sep 30, 2015 11:54am Santosc

APPENDIX B EXISTING PEAK HOUR COUNTS

APPENDIX B EXISTING PEAK HOUR COUNTS

WILTEC

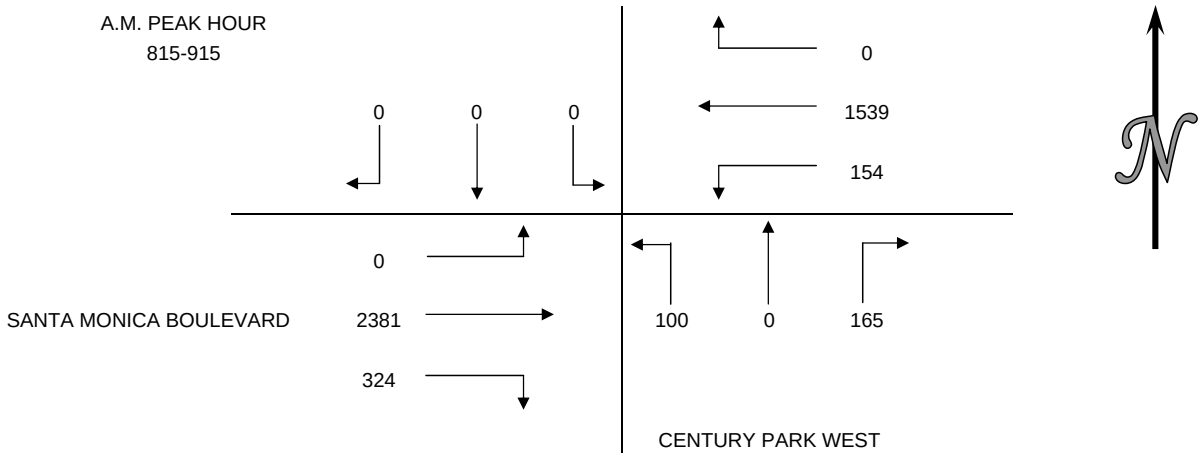
Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

CLIENT: GIBSON TRANSPORTATION CONSULTANTS **4**
PROJECT: CENTURY CITY TRAFFIC COUNTS
DATE: THURSDAY FEBRUARY 10, 2011
PERIOD: 7:00 AM TO 10:00 AM
INTERSECTION: N/S CENTURY PARK WEST
E/W SANTA MONICA BOULEVARD

15 MIN COUNTS													
	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
700-715	0	0	0	0	275	16	12	0	9	27	354	0	693
715-730	0	0	0	0	345	9	18	0	12	38	391	0	813
730-745	0	0	0	0	299	27	22	0	28	57	503	0	936
745-800	0	0	0	0	440	15	19	0	14	58	517	0	1063
800-815	0	0	0	0	402	33	25	0	22	80	529	0	1091
815-830	0	0	0	0	422	31	30	0	23	80	565	0	1151
830-845	0	0	0	0	407	33	44	0	23	94	613	0	1214
845-900	0	0	0	0	377	47	52	0	18	79	625	0	1198
900-915	0	0	0	0	333	43	39	0	36	71	578	0	1100
915-930	0	0	0	0	370	72	38	0	25	65	564	0	1134
930-945	0	0	0	0	423	47	55	0	50	50	597	0	1222
945-1000	0	0	0	0	373	38	52	0	27	36	588	0	1114
HOUR TOTALS													
	1	2	3	4	5	6	7	8	9	10	11	12	
TIME	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
700-800	0	0	0	0	1359	67	71	0	63	180	1765	0	3505
715-815	0	0	0	0	1486	84	84	0	76	233	1940	0	3903
730-830	0	0	0	0	1563	106	96	0	87	275	2114	0	4241
745-845	0	0	0	0	1671	112	118	0	82	312	2224	0	4519
800-900	0	0	0	0	1608	144	151	0	86	333	2332	0	4654
815-915	0	0	0	0	1539	154	165	0	100	324	2381	0	4663
830-930	0	0	0	0	1487	195	173	0	102	309	2380	0	4646
845-945	0	0	0	0	1503	209	184	0	129	265	2364	0	4654
900-1000	0	0	0	0	1499	200	184	0	138	222	2327	0	4570



WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

5

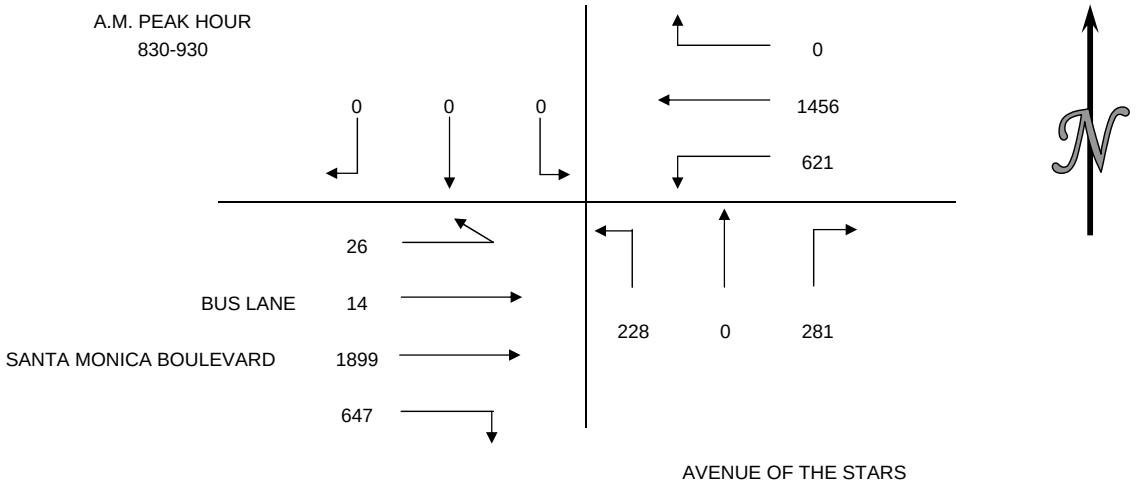
CLIENT: GIBSON TRANSPORTATION CONSULTANTS
PROJECT: CENTURY CITY TRAFFIC COUNTS
DATE: THURSDAY FEBRUARY 10, 2011
PERIOD: 7:00 AM TO 10:00 AM
INTERSECTION: N/S AVENUE OF THE STARS
E/W SANTA MONICA BOULEVARD

15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	11B EBTH	12 EBUT	TOTAL
700-715	0	0	0	0	240	52	29	0	24	103	259	2	1	710
715-730	0	0	0	0	314	79	29	0	43	123	297	4	0	889
730-745	0	0	0	0	335	109	34	0	54	138	337	3	0	1010
745-800	0	0	0	0	331	138	47	0	74	156	452	2	8	1208
800-815	0	0	0	0	408	137	46	0	47	160	445	2	2	1247
815-830	0	0	0	0	397	141	49	0	65	181	420	2	4	1259
830-845	0	0	0	0	415	184	67	0	70	127	452	4	5	1324
845-900	0	0	0	0	336	168	59	0	55	186	503	3	3	1313
900-915	0	0	0	0	366	157	68	0	44	151	441	2	9	1238
915-930	0	0	0	0	339	112	87	0	59	183	503	5	9	1297
930-945	0	0	0	0	401	159	59	0	75	153	430	4	10	1291
945-1000	0	0	0	0	338	170	83	0	58	148	450	6	14	1267

HOUR TOTALS

TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	11B EBTH	12 EBUT	TOTAL
700-800	0	0	0	0	1220	378	139	0	195	520	1345	11	9	3817
715-815	0	0	0	0	1388	463	156	0	218	577	1531	11	10	4354
730-830	0	0	0	0	1471	525	176	0	240	635	1654	9	14	4724
745-845	0	0	0	0	1551	600	209	0	256	624	1769	10	19	5038
800-900	0	0	0	0	1556	630	221	0	237	654	1820	11	14	5143
815-915	0	0	0	0	1514	650	243	0	234	645	1816	11	21	5134
830-930	0	0	0	0	1456	621	281	0	228	647	1899	14	26	5172
845-945	0	0	0	0	1442	596	273	0	233	673	1877	14	31	5139
900-1000	0	0	0	0	1444	598	297	0	236	635	1824	17	42	5093



WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

6

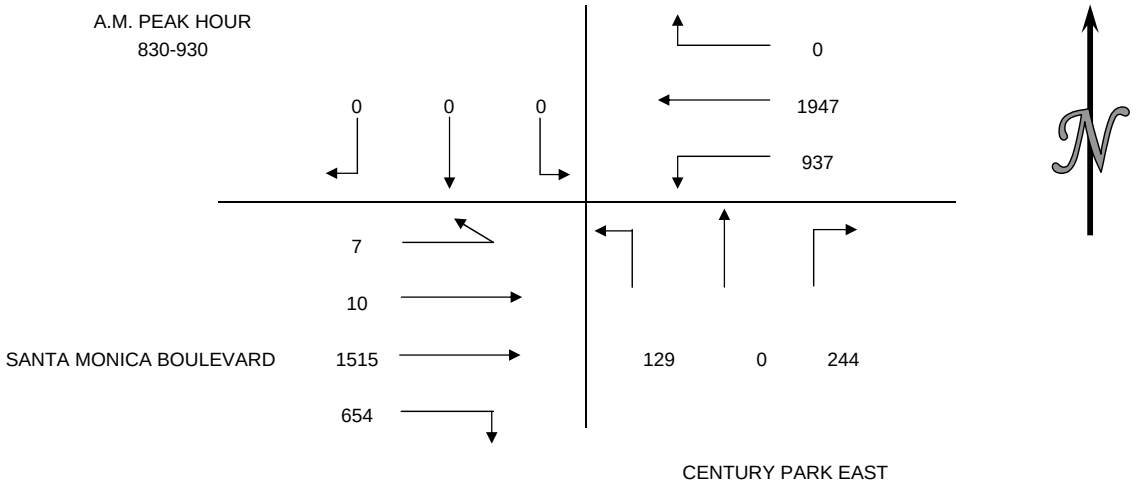
CLIENT: GIBSON TRANSPORTATION CONSULTANTS
PROJECT: CENTURY CITY TRAFFIC COUNTS
DATE: THURSDAY FEBRUARY 10, 2011
PERIOD: 7:00 AM TO 10:00 AM
INTERSECTION: N/S CENTURY PARK EAST
E/W SANTA MONICA BOULEVARD

15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	11B EBTH	12U EBUT	TOTAL
700-715	0	0	0	0	245	63	22	0	11	41	196	3	1	582
715-730	0	0	0	0	362	88	33	0	20	78	261	3	2	847
730-745	0	0	0	0	399	104	29	0	32	91	284	1	1	941
745-800	0	0	0	0	476	143	56	0	21	118	365	3	1	1183
800-815	0	0	0	0	480	180	64	0	39	149	410	2	1	1325
815-830	0	0	0	0	519	223	43	0	30	142	349	0	2	1308
830-845	0	0	0	0	511	213	59	0	40	174	391	3	4	1395
845-900	0	0	0	0	456	232	58	0	20	163	348	2	1	1280
900-915	0	0	0	0	499	262	52	0	32	127	366	2	1	1341
915-930	0	0	0	0	481	230	75	0	37	190	410	3	1	1427
930-945	0	0	0	0	413	223	28	0	27	82	346	0	0	1119
945-1000	0	0	0	0	498	156	51	0	17	126	410	1	1	1260

HOUR TOTALS

TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	11B EBTH	12U EBUT	TOTAL
700-800	0	0	0	0	1482	398	140	0	84	328	1106	10	5	3553
715-815	0	0	0	0	1717	515	182	0	112	436	1320	9	5	4296
730-830	0	0	0	0	1874	650	192	0	122	500	1408	6	5	4757
745-845	0	0	0	0	1986	759	222	0	130	583	1515	8	8	5211
800-900	0	0	0	0	1966	848	224	0	129	628	1498	7	8	5308
815-915	0	0	0	0	1985	930	212	0	122	606	1454	7	8	5324
830-930	0	0	0	0	1947	937	244	0	129	654	1515	10	7	5443
845-945	0	0	0	0	1849	947	213	0	116	562	1470	7	3	5167
900-1000	0	0	0	0	1891	871	206	0	113	525	1532	6	3	5147



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Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

CLIENT:		GIBSON TRANSPORTATION CONSULTANTS
PROJECT:		CENTURY CITY TRAFFIC COUNTS
DATE:		WEDNESDAY FEBRUARY 9, 2011
PERIOD:		7:00 AM TO 10:00 AM
INTERSECTION:	N/S	CENTURY PARK WEST
	E/W	CONSTELLATION BOULEVARD

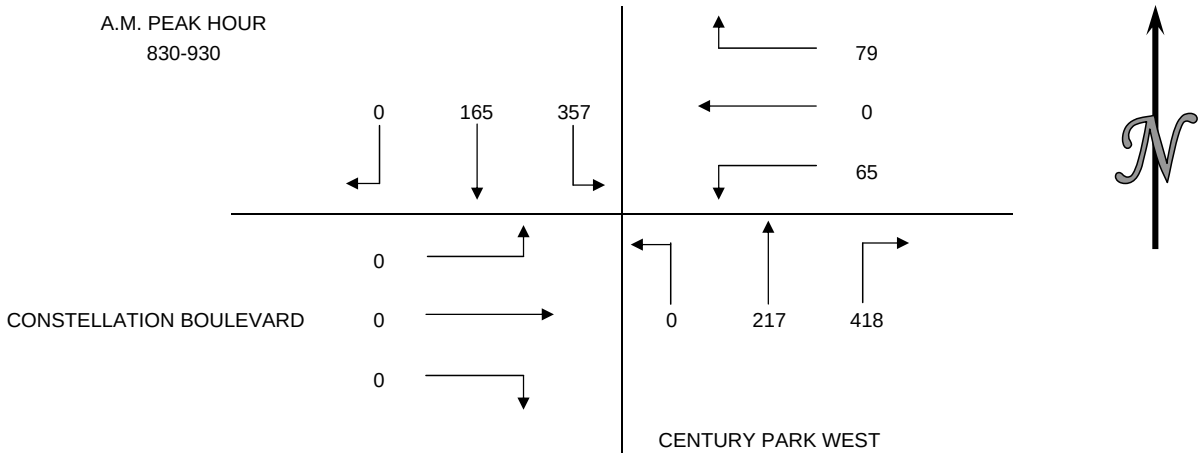
9

15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-715	0	11	35	8	0	12	29	10	0	0	0	0	105
715-730	0	8	34	15	0	5	47	26	0	0	0	0	135
730-745	0	25	47	6	0	6	29	16	0	0	0	0	129
745-800	0	32	57	20	0	5	45	35	0	0	0	0	194
800-815	0	26	66	29	0	11	86	59	0	0	0	0	277
815-830	0	35	84	18	0	11	81	32	0	0	0	0	261
830-845	0	28	83	16	0	14	103	52	0	0	0	0	296
845-900	0	57	105	11	0	5	121	49	0	0	0	0	348
900-915	0	35	94	31	0	20	112	60	0	0	0	0	352
915-930	0	45	75	21	0	26	82	56	0	0	0	0	305
930-945	0	28	52	23	0	23	92	47	0	0	0	0	265
945-1000	0	33	60	37	0	28	81	51	0	0	0	0	290

HOUR TOTALS

TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-800	0	76	173	49	0	28	150	87	0	0	0	0	563
715-815	0	91	204	70	0	27	207	136	0	0	0	0	735
730-830	0	118	254	73	0	33	241	142	0	0	0	0	861
745-845	0	121	290	83	0	41	315	178	0	0	0	0	1028
800-900	0	146	338	74	0	41	391	192	0	0	0	0	1182
815-915	0	155	366	76	0	50	417	193	0	0	0	0	1257
830-930	0	165	357	79	0	65	418	217	0	0	0	0	1301
845-945	0	165	326	86	0	74	407	212	0	0	0	0	1270
900-1000	0	141	281	112	0	97	367	214	0	0	0	0	1212



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Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

CLIENT:		GIBSON TRANSPORTATION CONSULTANTS	**10**
PROJECT:		CENTURY CITY TRAFFIC COUNTS	
DATE:		WEDNESDAY FEBRUARY 9, 2011	
PERIOD:		7:00 AM TO 10:00 AM	
INTERSECTION:	N/S	AVENUE OF THE STARS	
	E/W	CONSTELLATION BOULEVARD	

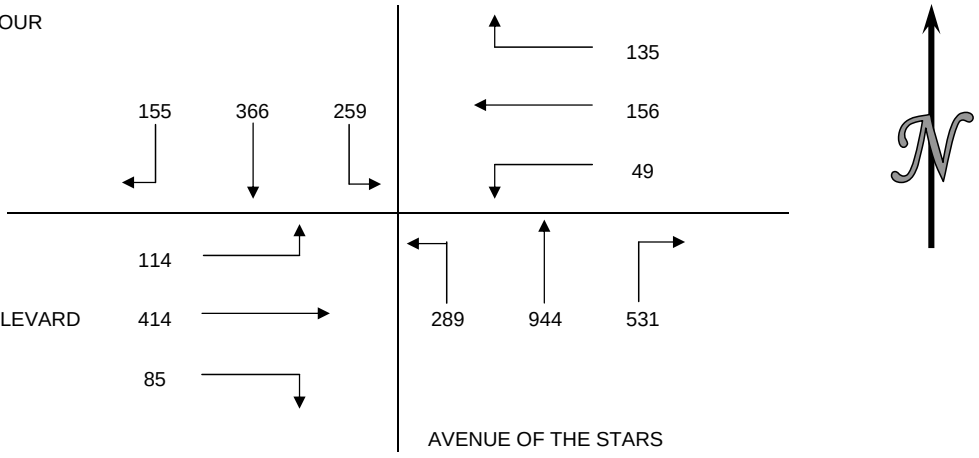
15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-715	22	42	35	12	10	4	70	88	28	13	20	5	349
715-730	23	55	53	10	13	1	58	104	30	10	27	5	389
730-745	21	84	51	15	16	5	65	153	31	9	41	13	504
745-800	43	93	67	21	23	6	74	172	56	11	58	18	642
800-815	30	89	55	24	22	6	110	196	60	13	63	29	697
815-830	48	93	83	25	21	6	123	235	61	18	95	35	843
830-845	49	76	61	31	30	4	144	256	71	12	89	17	840
845-900	42	92	71	34	33	4	152	241	64	16	112	35	896
900-915	33	95	59	38	52	23	122	231	83	27	118	35	916
915-930	31	103	68	32	41	18	113	216	71	30	95	27	845
930-945	53	141	73	34	29	11	99	211	66	7	75	28	827
945-1000	53	115	50	39	29	6	71	160	55	13	60	30	681

HOUR TOTALS

TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-800	109	274	206	58	62	16	267	517	145	43	146	41	1884
715-815	117	321	226	70	74	18	307	625	177	43	189	65	2232
730-830	142	359	256	85	82	23	372	756	208	51	257	95	2686
745-845	170	351	266	101	96	22	451	859	248	54	305	99	3022
800-900	169	350	270	114	106	20	529	928	256	59	359	116	3276
815-915	172	356	274	128	136	37	541	963	279	73	414	122	3495
830-930	155	366	259	135	156	49	531	944	289	85	414	114	3497
845-945	159	431	271	138	155	56	486	899	284	80	400	125	3484
900-1000	170	454	250	143	151	58	405	818	275	77	348	120	3269

A.M. PEAK HOUR
830-930



WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

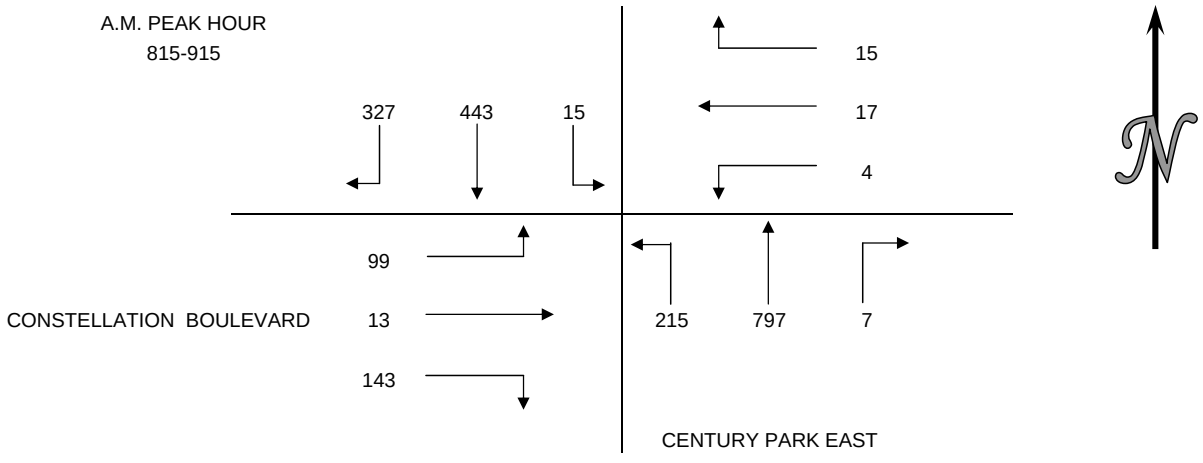
CLIENT:		GIBSON TRANSPORTATION CONSULTANTS	**11**
PROJECT:		CENTURY CITY TRAFFIC COUNTS	
DATE:		WEDNESDAY FEBRUARY 9, 2011	
PERIOD:		7:00 AM TO 10:00 AM	
INTERSECTION:	N/S	CENTURY PARK EAST	
	E/W	CONSTELLATION BOULEVARD	

15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-715	30	44	3	0	4	0	4	70	24	17	1	12	209
715-730	47	60	2	3	2	6	2	104	20	14	1	10	271
730-745	38	77	3	9	3	0	4	113	29	17	0	4	297
745-800	45	81	2	3	14	3	1	147	40	19	3	17	375
800-815	58	90	2	4	5	2	1	178	36	34	1	28	439
815-830	80	109	4	4	7	1	1	212	45	34	1	22	520
830-845	59	109	4	5	5	2	1	222	43	22	0	23	495
845-900	96	116	7	2	3	1	5	188	71	51	10	30	580
900-915	92	109	0	4	2	0	0	175	56	36	2	24	500
915-930	58	106	2	3	3	1	1	164	43	49	3	38	471
930-945	60	108	1	2	3	0	2	158	34	20	0	34	422
945-1000	42	77	1	1	0	1	1	107	35	28	3	19	315

HOUR TOTALS

TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-800	160	262	10	15	23	9	11	434	113	67	5	43	1152
715-815	188	308	9	19	24	11	8	542	125	84	5	59	1382
730-830	221	357	11	20	29	6	7	650	150	104	5	71	1631
745-845	242	389	12	16	31	8	4	759	164	109	5	90	1829
800-900	293	424	17	15	20	6	8	800	195	141	12	103	2034
815-915	327	443	15	15	17	4	7	797	215	143	13	99	2095
830-930	305	440	13	14	13	4	7	749	213	158	15	115	2046
845-945	306	439	10	11	11	2	8	685	204	156	15	126	1973
900-1000	252	400	4	10	8	2	4	604	168	133	8	115	1708



WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

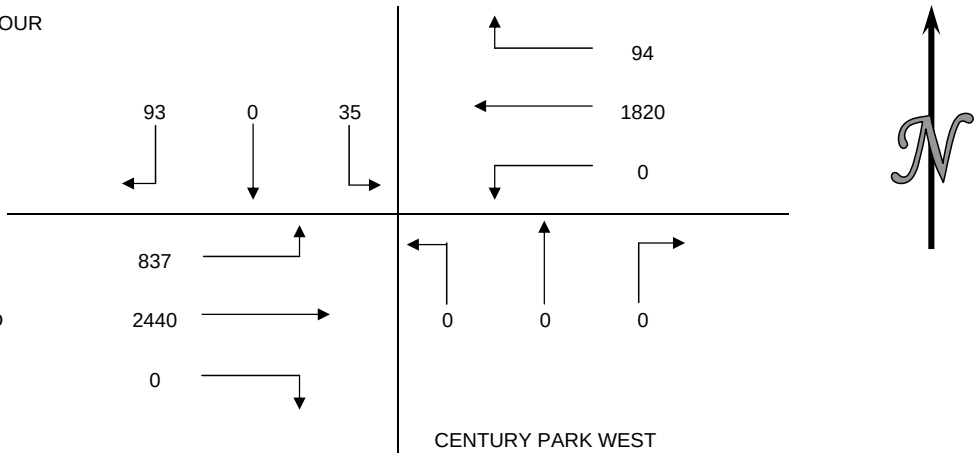
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

CLIENT:		GIBSON TRANSPORTATION CONSULTANTS **14**
PROJECT:		CENTURY CITY TRAFFIC COUNTS
DATE:		TUESDAY FEBRUARY 8, 2011
PERIOD:		7:00 AM TO 10:00 AM
INTERSECTION:	N/S	CENTURY PARK WEST
	E/W	OLYMPIC BOULEVARD

15 MIN COUNTS													
	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
700-715	13	0	11	6	329	0	0	0	0	0	128	35	522
715-730	8	0	0	18	365	0	0	0	0	0	229	51	671
730-745	19	0	1	13	494	0	0	0	0	0	335	82	944
745-800	29	0	13	17	492	0	0	0	0	0	432	90	1073
800-815	24	0	12	18	484	0	0	0	0	0	538	130	1206
815-830	21	0	8	15	482	0	0	0	0	0	578	221	1325
830-845	31	0	12	24	450	0	0	0	0	0	629	216	1362
845-900	27	0	9	25	456	0	0	0	0	0	626	193	1336
900-915	14	0	6	30	432	0	0	0	0	0	607	207	1296
915-930	31	0	14	28	424	0	0	0	0	0	576	159	1232
930-945	41	0	9	16	473	0	0	0	0	0	517	129	1185
945-1000	31	0	9	29	476	0	0	0	0	0	355	127	1027
HOUR TOTALS													
	1	2	3	4	5	6	7	8	9	10	11	12	
TIME	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
700-800	69	0	25	54	1680	0	0	0	0	0	1124	258	3210
715-815	80	0	26	66	1835	0	0	0	0	0	1534	353	3894
730-830	93	0	34	63	1952	0	0	0	0	0	1883	523	4548
745-845	105	0	45	74	1908	0	0	0	0	0	2177	657	4966
800-900	103	0	41	82	1872	0	0	0	0	0	2371	760	5229
815-915	93	0	35	94	1820	0	0	0	0	0	2440	837	5319
830-930	103	0	41	107	1762	0	0	0	0	0	2438	775	5226
845-945	113	0	38	99	1785	0	0	0	0	0	2326	688	5049
900-1000	117	0	38	103	1805	0	0	0	0	0	2055	622	4740

A.M. PEAK HOUR
815-915



WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

CLIENT:		GIBSON TRANSPORTATION CONSULTANTS	**15**
PROJECT:		CENTURY CITY TRAFFIC COUNTS	
DATE:		WEDNESDAY FEBRUARY 9, 2011	
PERIOD:		7:00 AM TO 10:00 AM	
INTERSECTION:	N/S	AVENUE OF THE STARS	
	E/W	WEST OLYMPIC BOULEVARD	

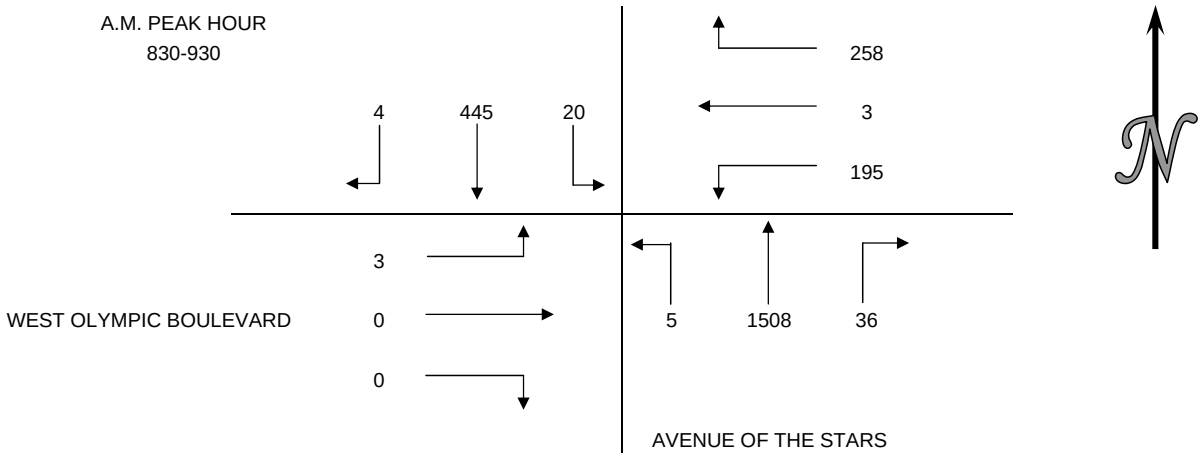
15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-715	1	54	0	24	0	4	9	139	0	1	0	0	232
715-730	0	62	1	42	0	13	4	154	1	0	0	0	277
730-745	0	86	3	28	0	15	12	217	2	0	0	0	363
745-800	0	70	3	63	0	24	9	304	0	0	0	0	473
800-815	3	101	3	78	0	26	4	320	0	0	0	0	535
815-830	0	106	3	82	0	22	8	346	0	0	0	1	568
830-845	0	88	6	71	0	45	11	393	4	0	0	0	618
845-900	0	107	5	70	1	56	10	385	0	0	0	0	634
900-915	3	115	6	56	0	41	3	383	1	0	0	3	611
915-930	1	135	3	61	2	53	12	347	0	0	0	0	614
930-945	2	149	7	54	1	39	10	296	2	1	0	0	561
945-1000	0	115	10	40	2	43	9	228	0	0	0	0	447

HOUR TOTALS

TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-800	1	272	7	157	0	56	34	814	3	1	0	0	1345
715-815	3	319	10	211	0	78	29	995	3	0	0	0	1648
730-830	3	363	12	251	0	87	33	1187	2	0	0	1	1939
745-845	3	365	15	294	0	117	32	1363	4	0	0	1	2194
800-900	3	402	17	301	1	149	33	1444	4	0	0	1	2355
815-915	3	416	20	279	1	164	32	1507	5	0	0	4	2431
830-930	4	445	20	258	3	195	36	1508	5	0	0	3	2477
845-945	6	506	21	241	4	189	35	1411	3	1	0	3	2420
900-1000	6	514	26	211	5	176	34	1254	3	1	0	3	2233

A.M. PEAK HOUR
830-930



WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

CLIENT:		GIBSON TRANSPORTATION CONSULTANTS	**16**
PROJECT:		CENTURY CITY TRAFFIC COUNTS	
DATE:		WEDNESDAY FEBRUARY 9, 2011	
PERIOD:		7:00 AM TO 10:00 AM	
INTERSECTION:	N/S	AVENUE OF STARS	
	E/W	OLYMPIC BOULEVARD EAST	

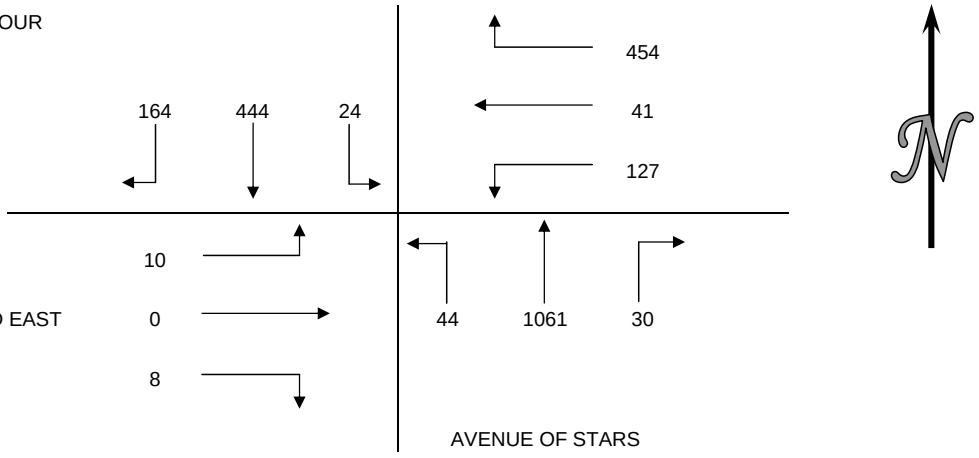
15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-715	8	54	3	29	1	5	1	123	4	0	0	1	229
715-730	19	55	1	22	2	3	4	151	1	1	0	1	260
730-745	20	66	6	41	5	9	5	188	3	1	0	4	348
745-800	20	74	5	58	2	11	8	222	7	0	1	1	409
800-815	31	88	6	92	10	10	3	232	9	3	0	1	485
815-830	23	108	7	114	1	25	11	243	6	0	1	1	540
830-845	34	95	5	133	7	32	10	295	7	0	0	5	623
845-900	28	118	8	113	7	17	5	240	15	1	0	2	554
900-915	52	100	3	87	16	37	6	281	9	5	0	1	597
915-930	50	131	8	121	11	41	9	245	13	2	0	2	633
930-945	33	152	5	88	7	17	16	202	7	1	0	2	530
945-1000	25	120	9	64	8	25	6	183	4	3	0	5	452

HOUR TOTALS

TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-800	67	249	15	150	10	28	18	684	15	2	1	7	1246
715-815	90	283	18	213	19	33	20	793	20	5	1	7	1502
730-830	94	336	24	305	18	55	27	885	25	4	2	7	1782
745-845	108	365	23	397	20	78	32	992	29	3	2	8	2057
800-900	116	409	26	452	25	84	29	1010	37	4	1	9	2202
815-915	137	421	23	447	31	111	32	1059	37	6	1	9	2314
830-930	164	444	24	454	41	127	30	1061	44	8	0	10	2407
845-945	163	501	24	409	41	112	36	968	44	9	0	7	2314
900-1000	160	503	25	360	42	120	37	911	33	11	0	10	2212

A.M. PEAK HOUR
830-930



WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

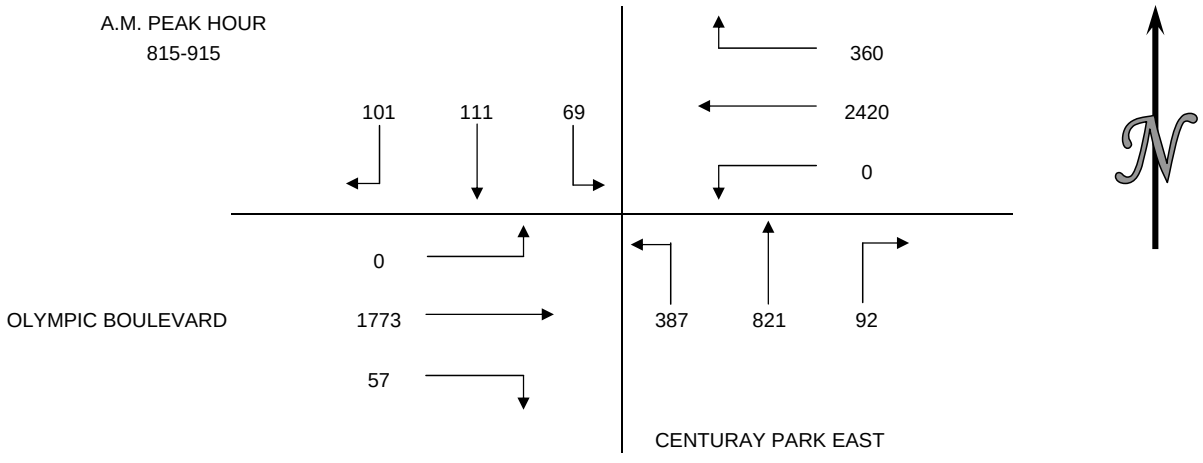
CLIENT:		GIBSON TRANSPORTATION CONSULTANTS	**17**
PROJECT:		CENTURY CITY TRAFFIC COUNTS	
DATE:		WEDNESDAY FEBRUARY 9, 2011	
PERIOD:		7:00 AM TO 10:00 AM	
INTERSECTION:	N/S	CENTURAY PARK EAST	
	E/W	OLYMPIC BOULEVARD	

15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-715	10	21	11	47	357	0	10	66	37	4	208	1	772
715-730	17	16	8	30	403	0	11	72	23	7	234	0	821
730-745	17	20	21	46	500	0	15	83	52	8	288	0	1050
745-800	17	20	14	55	576	0	19	148	65	30	350	0	1294
800-815	21	18	13	65	498	0	10	176	72	8	434	0	1315
815-830	26	29	11	92	587	0	18	204	88	15	488	0	1558
830-845	20	32	16	76	575	0	28	228	106	10	440	0	1531
845-900	24	18	20	85	622	0	28	219	98	15	438	0	1567
900-915	31	32	22	107	636	0	18	170	95	17	407	0	1535
915-930	24	13	30	74	575	0	24	112	67	17	381	0	1317
930-945	29	33	26	72	607	0	23	145	58	16	424	0	1433
945-1000	30	28	15	77	523	0	14	99	39	18	337	0	1180

HOUR TOTALS

TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-800	61	77	54	178	1836	0	55	369	177	49	1080	1	3937
715-815	72	74	56	196	1977	0	55	479	212	53	1306	0	4480
730-830	81	87	59	258	2161	0	62	611	277	61	1560	0	5217
745-845	84	99	54	288	2236	0	75	756	331	63	1712	0	5698
800-900	91	97	60	318	2282	0	84	827	364	48	1800	0	5971
815-915	101	111	69	360	2420	0	92	821	387	57	1773	0	6191
830-930	99	95	88	342	2408	0	98	729	366	59	1666	0	5950
845-945	108	96	98	338	2440	0	93	646	318	65	1650	0	5852
900-1000	114	106	93	330	2341	0	79	526	259	68	1549	0	5465



WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

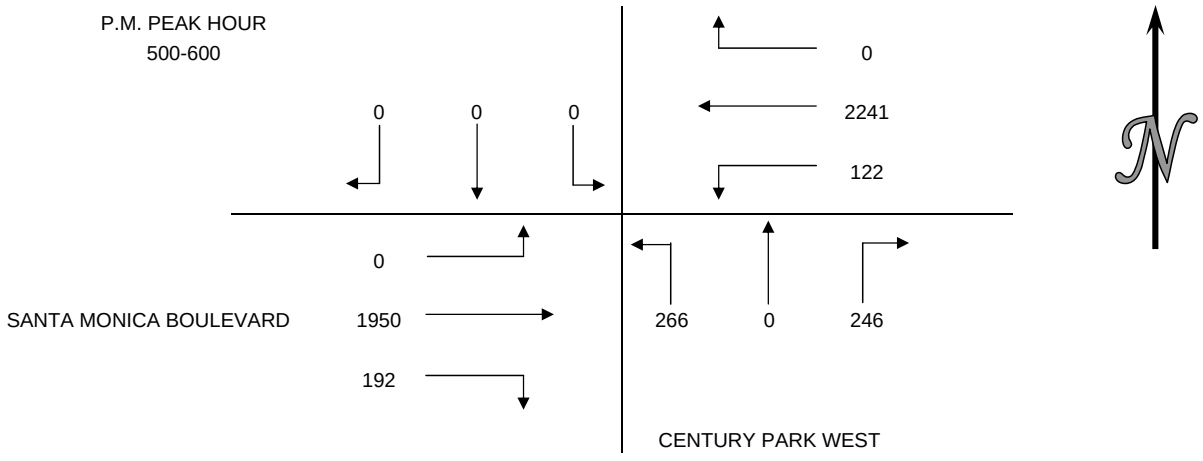
CLIENT:		GIBSON TRANSPORTATION CONSULTANTS	**4**
PROJECT:		CENTURY CITY TRAFFIC COUNTS	
DATE:		THURSDAY FEBRUARY 10, 2011	
PERIOD:		3:00 PM TO 6:00 PM	
INTERSECTION:	N/S	CENTURY PARK WEST	
	E/W	SANTA MONICA BOULEVARD	

15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
300-315	0	0	0	0	438	29	57	0	54	33	510	0	1121
315-330	0	0	0	0	584	31	49	0	58	29	468	0	1219
330-345	0	0	0	0	502	19	64	0	53	30	479	0	1147
345-400	0	0	0	0	525	24	53	0	78	35	463	0	1178
400-415	0	0	0	0	564	28	64	0	78	31	476	0	1241
415-430	0	0	0	0	520	32	50	0	53	37	407	0	1099
430-445	0	0	0	0	496	26	59	0	68	47	424	0	1120
445-500	0	0	0	0	474	24	48	0	78	65	425	0	1114
500-515	0	0	0	0	536	33	71	0	54	47	501	0	1242
515-530	0	0	0	0	565	23	55	0	73	49	467	0	1232
530-545	0	0	0	0	553	30	63	0	74	56	531	0	1307
545-600	0	0	0	0	587	36	57	0	65	40	451	0	1236

HOUR TOTALS

TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
300-400	0	0	0	0	2049	103	223	0	243	127	1920	0	4665
315-415	0	0	0	0	2175	102	230	0	267	125	1886	0	4785
330-430	0	0	0	0	2111	103	231	0	262	133	1825	0	4665
345-445	0	0	0	0	2105	110	226	0	277	150	1770	0	4638
400-500	0	0	0	0	2054	110	221	0	277	180	1732	0	4574
415-515	0	0	0	0	2026	115	228	0	253	196	1757	0	4575
430-530	0	0	0	0	2071	106	233	0	273	208	1817	0	4708
445-545	0	0	0	0	2128	110	237	0	279	217	1924	0	4895
500-600	0	0	0	0	2241	122	246	0	266	192	1950	0	5017



WILTEC

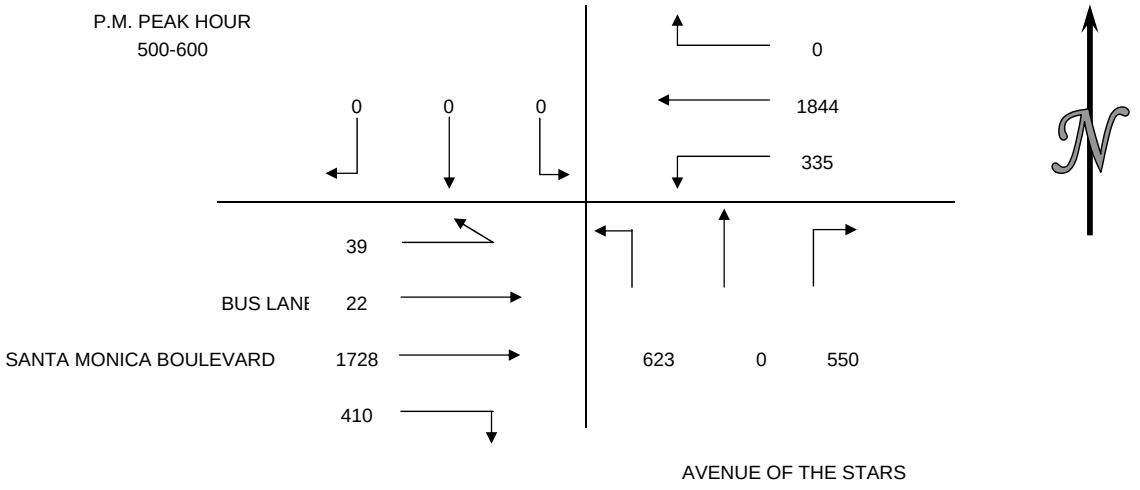
Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

CLIENT: GIBSON TRANSPORTATION CONSULTANTS **5**
PROJECT: CENTURY CITY TRAFFIC COUNTS
DATE: THURSDAY FEBRUARY 10, 2011
PERIOD: 3:00 PM TO 6:00 PM
INTERSECTION: N/S AVENUE OF THE STARS
E/W SANTA MONICA BOULEVARD

15 MIN COUNTS														
	1	2	3	4	5	6	7	8	9	10	11	11B	12U	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBTH	EBLT	TOTAL
300-315	0	0	0	0	415	60	81	0	108	101	474	2	14	1255
315-330	0	0	0	0	493	102	62	0	106	92	413	4	14	1286
330-345	0	0	0	0	394	82	90	0	87	96	428	4	18	1199
345-400	0	0	0	0	478	101	114	0	116	93	372	3	9	1286
400-415	0	0	0	0	426	106	71	0	108	105	423	2	17	1258
415-430	0	0	0	0	442	82	95	0	123	78	368	5	11	1204
430-445	0	0	0	0	378	64	104	0	116	84	397	3	7	1153
445-500	0	0	0	0	402	68	91	0	123	87	409	1	4	1185
500-515	0	0	0	0	429	74	128	0	138	104	431	4	13	1321
515-530	0	0	0	0	465	95	120	0	161	109	409	3	9	1371
530-545	0	0	0	0	442	78	171	0	156	105	453	1	10	1416
545-600	0	0	0	0	508	88	131	0	168	92	435	1	7	1430
HOUR TOTALS														
	1	2	3	4	5	6	7	8	9	10	11	11B	12U	
TIME	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBTH	EBLT	TOTAL
300-400	0	0	0	0	1780	345	347	0	417	382	1687	13	55	5026
315-415	0	0	0	0	1791	391	337	0	417	386	1636	13	58	5029
330-430	0	0	0	0	1740	371	370	0	434	372	1591	14	55	4947
345-445	0	0	0	0	1724	353	384	0	463	360	1560	13	44	4901
400-500	0	0	0	0	1648	320	361	0	470	354	1597	11	39	4800
415-515	0	0	0	0	1651	288	418	0	500	353	1605	13	35	4863
430-530	0	0	0	0	1674	301	443	0	538	384	1646	11	33	5030
445-545	0	0	0	0	1738	315	510	0	578	405	1702	9	36	5293
500-600	0	0	0	0	1844	335	550	0	623	410	1728	9	39	5538



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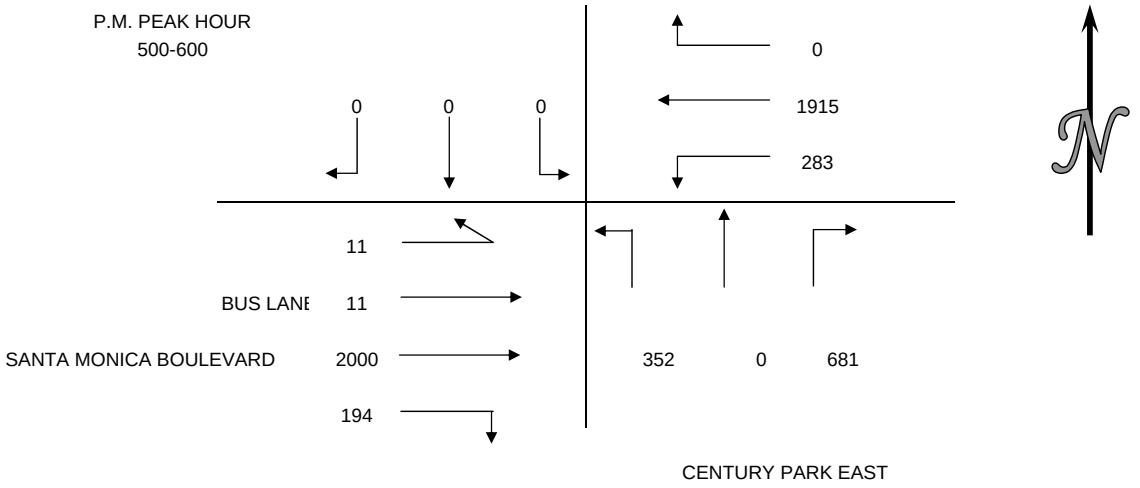
Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

CLIENT: GIBSON TRANSPORTATION CONSULTANTS **6**
PROJECT: CENTURY CITY TRAFFIC COUNTS
DATE: THURSDAY FEBRUARY 10, 2011
PERIOD: 3:00 PM TO 6:00 PM
INTERSECTION: N/S CENTURY PARK EAST
E/W SANTA MONICA BOULEVARD

15 MIN COUNTS														
	1	2	3	4	5	6	7	8	9	10	11	11B	12U	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBTH	EBUT	TOTAL
300-315	0	0	0	0	463	159	84	0	58	60	471	4	7	1306
315-330	0	0	0	0	467	189	79	0	69	61	432	4	4	1305
330-345	0	0	0	0	459	177	106	0	68	80	460	2	10	1362
345-400	0	0	0	0	411	127	105	0	56	74	414	3	5	1195
400-415	0	0	0	0	514	135	111	0	66	52	440	1	5	1324
415-430	0	0	0	0	406	99	133	0	50	63	419	4	6	1180
430-445	0	0	0	0	387	116	113	0	62	82	430	3	9	1202
445-500	0	0	0	0	408	94	133	0	80	69	485	1	6	1276
500-515	0	0	0	0	437	71	144	0	79	54	453	4	5	1247
515-530	0	0	0	0	427	57	190	0	81	54	531	2	2	1344
530-545	0	0	0	0	504	62	218	0	105	48	494	2	4	1437
545-600	0	0	0	0	547	93	129	0	87	38	522	3	0	1419
HOUR TOTALS														
	1	2	3	4	5	6	7	8	9	10	11	11B	12U	
TIME	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBTH	EBUT	TOTAL
300-400	0	0	0	0	1800	652	374	0	251	275	1777	13	26	5168
315-415	0	0	0	0	1851	628	401	0	259	267	1746	10	24	5186
330-430	0	0	0	0	1790	538	455	0	240	269	1733	10	26	5061
345-445	0	0	0	0	1718	477	462	0	234	271	1703	11	25	4901
400-500	0	0	0	0	1715	444	490	0	258	266	1774	9	26	4982
415-515	0	0	0	0	1638	380	523	0	271	268	1787	12	26	4905
430-530	0	0	0	0	1659	338	580	0	302	259	1899	10	22	5069
445-545	0	0	0	0	1776	284	685	0	345	225	1963	9	17	5304
500-600	0	0	0	0	1915	283	681	0	352	194	2000	11	11	5447



WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

CLIENT:		GIBSON TRANSPORTATION CONSULTANTS	**9**
PROJECT:		CENTURY CITY TRAFFIC COUNTS	
DATE:		WEDNESDAY FEBRUARY 9, 2011	
PERIOD:		3:00 PM TO 6:00 PM	
INTERSECTION:	N/S	CENTURY PARK WEST	
	E/W	CONSTELLATION	

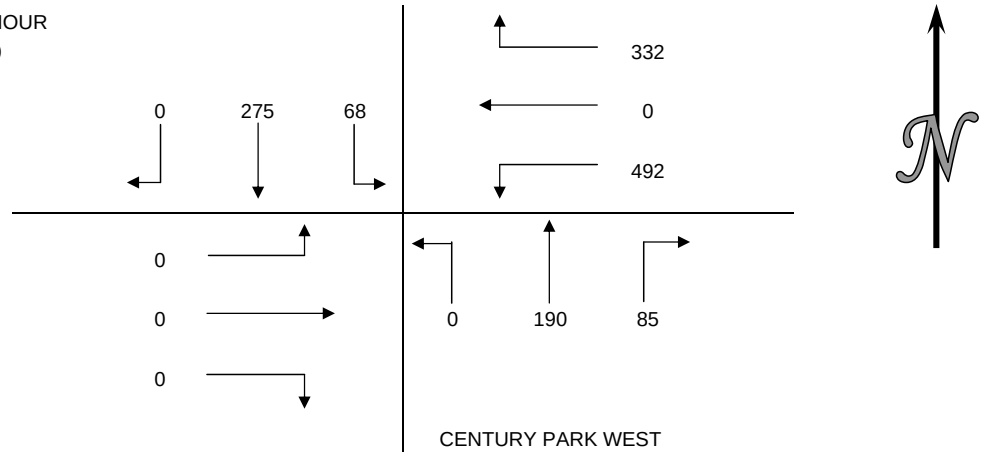
15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
300-315	0	47	19	55	0	73	34	50	0	0	0	0	278
315-330	0	40	18	67	0	81	28	34	0	0	0	0	268
330-345	0	33	23	52	0	64	20	35	0	0	0	0	227
345-400	0	49	21	82	0	75	38	38	0	0	0	0	303
400-415	0	58	17	81	0	94	31	36	0	0	0	0	317
415-430	0	56	18	51	0	80	25	41	0	0	0	0	271
430-445	0	59	24	77	0	110	17	44	0	0	0	0	331
445-500	0	60	10	58	0	88	25	24	0	0	0	0	265
500-515	0	68	16	88	0	124	25	40	0	0	0	0	361
515-530	0	76	23	82	0	117	22	46	0	0	0	0	366
530-545	0	59	12	92	0	146	18	57	0	0	0	0	384
545-600	0	72	17	70	0	105	20	47	0	0	0	0	331

HOUR TOTALS

TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
300-400	0	169	81	256	0	293	120	157	0	0	0	0	1076
315-415	0	180	79	282	0	314	117	143	0	0	0	0	1115
330-430	0	196	79	266	0	313	114	150	0	0	0	0	1118
345-445	0	222	80	291	0	359	111	159	0	0	0	0	1222
400-500	0	233	69	267	0	372	98	145	0	0	0	0	1184
415-515	0	243	68	274	0	402	92	149	0	0	0	0	1228
430-530	0	263	73	305	0	439	89	154	0	0	0	0	1323
445-545	0	263	61	320	0	475	90	167	0	0	0	0	1376
500-600	0	275	68	332	0	492	85	190	0	0	0	0	1442

P.M. PEAK HOUR
500-600



WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

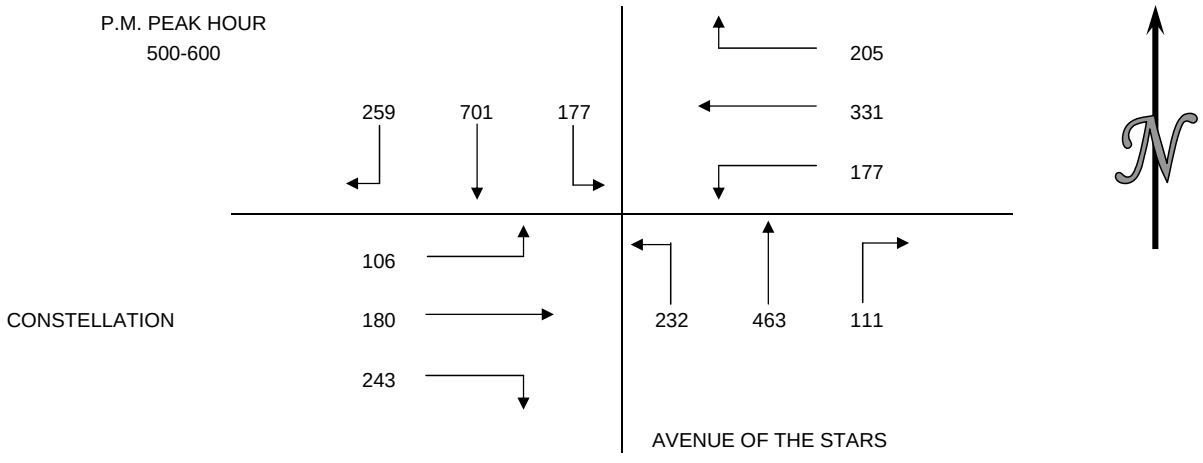
CLIENT:		GIBSON TRANSPORTATION CONSULTANTS	**10**
PROJECT:		CENTURY CITY TRAFFIC COUNTS	
DATE:		WEDNESDAY FEBRUARY 9, 2011	
PERIOD:		3:00 PM TO 6:00 PM	
INTERSECTION:	N/S	AVENUE OF THE STARS	
	E/W	CONSTELLATION	

15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
300-315	45	151	29	24	44	23	26	132	55	47	35	19	630
315-330	36	130	32	32	44	17	25	129	46	31	23	16	561
330-345	27	120	30	18	43	19	32	115	42	37	34	20	537
345-400	53	125	33	23	34	18	22	130	64	44	40	16	602
400-415	73	144	30	34	53	22	29	125	51	33	33	19	646
415-430	51	124	34	23	40	27	23	112	44	42	39	12	571
430-445	55	136	29	32	58	38	29	104	47	43	37	18	626
445-500	50	142	26	36	47	26	20	119	55	37	28	11	597
500-515	61	171	46	54	79	47	35	104	53	60	46	26	782
515-530	47	179	41	45	73	39	24	112	61	63	30	20	734
530-545	76	192	37	50	88	56	32	111	45	59	50	36	832
545-600	75	159	53	56	91	35	20	136	73	61	54	24	837

HOUR TOTALS

TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
300-400	161	526	124	97	165	77	105	506	207	159	132	71	2330
315-415	189	519	125	107	174	76	108	499	203	145	130	71	2346
330-430	204	513	127	98	170	86	106	482	201	156	146	67	2356
345-445	232	529	126	112	185	105	103	471	206	162	149	65	2445
400-500	229	546	119	125	198	113	101	460	197	155	137	60	2440
415-515	217	573	135	145	224	138	107	439	199	182	150	67	2576
430-530	213	628	142	167	257	150	108	439	216	203	141	75	2739
445-545	234	684	150	185	287	168	111	446	214	219	154	93	2945
500-600	259	701	177	205	331	177	111	463	232	243	180	106	3185



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Phone: (626) 564-1944 Fax: (626) 564-0969

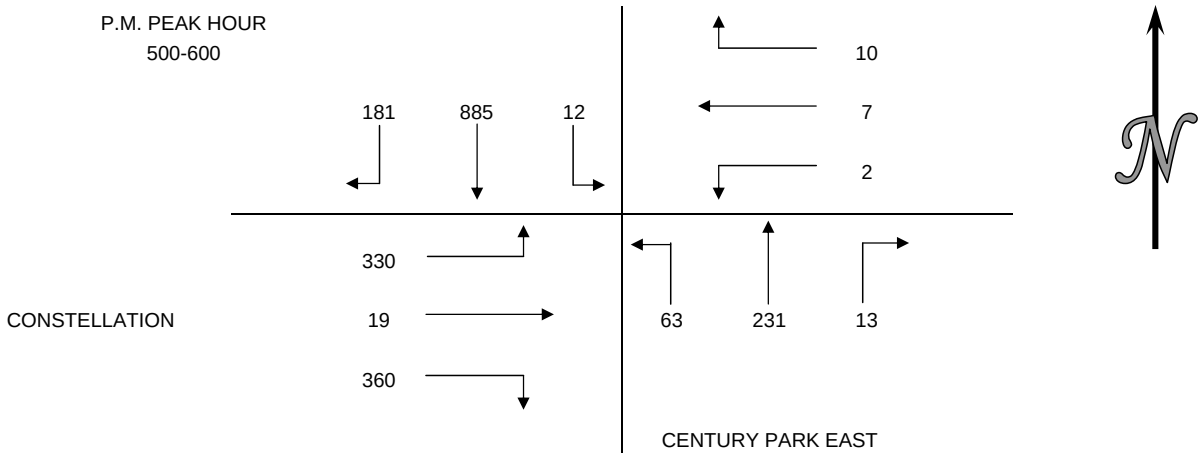
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

CLIENT:		GIBSON TRANSPORTATION CONSULTANTS
PROJECT:		CENTURY CITY TRAFFIC COUNTS
DATE:		WEDNESDAY FEBRUARY 9, 2011
PERIOD:		3:00 PM TO 6:00 PM
INTERSECTION:	N/S	CENTURY PARK EAST
	E/W	CONSTELLATION

11

15 MIN COUNTS													
	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
300-315	38	108	0	0	2	0	4	68	16	71	3	41	351
315-330	29	135	2	1	2	2	5	81	24	60	1	28	370
330-345	24	132	3	2	1	0	5	77	24	63	1	35	367
345-400	34	135	1	5	0	0	2	83	21	60	0	36	377
400-415	24	141	1	4	5	0	0	96	26	72	2	43	414
415-430	24	150	1	1	1	1	0	59	17	55	2	49	360
430-445	28	165	3	0	0	0	1	62	26	82	4	56	427
445-500	21	147	3	0	4	3	3	55	12	66	1	75	390
500-515	49	197	0	3	4	0	1	69	19	105	5	92	544
515-530	64	265	7	1	0	0	2	52	12	63	0	76	542
530-545	25	228	1	3	1	2	3	56	17	105	3	92	536
545-600	43	195	4	3	2	0	7	54	15	87	11	70	491
HOUR TOTALS													
	1	2	3	4	5	6	7	8	9	10	11	12	
TIME	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
300-400	125	510	6	8	5	2	16	309	85	254	5	140	1465
315-415	111	543	7	12	8	2	12	337	95	255	4	142	1528
330-430	106	558	6	12	7	1	7	315	88	250	5	163	1518
345-445	110	591	6	10	6	1	3	300	90	269	8	184	1578
400-500	97	603	8	5	10	4	4	272	81	275	9	223	1591
415-515	122	659	7	4	9	4	5	245	74	308	12	272	1721
430-530	162	774	13	4	8	3	7	238	69	316	10	299	1903
445-545	159	837	11	7	9	5	9	232	60	339	9	335	2012
500-600	181	885	12	10	7	2	13	231	63	360	19	330	2113



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INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

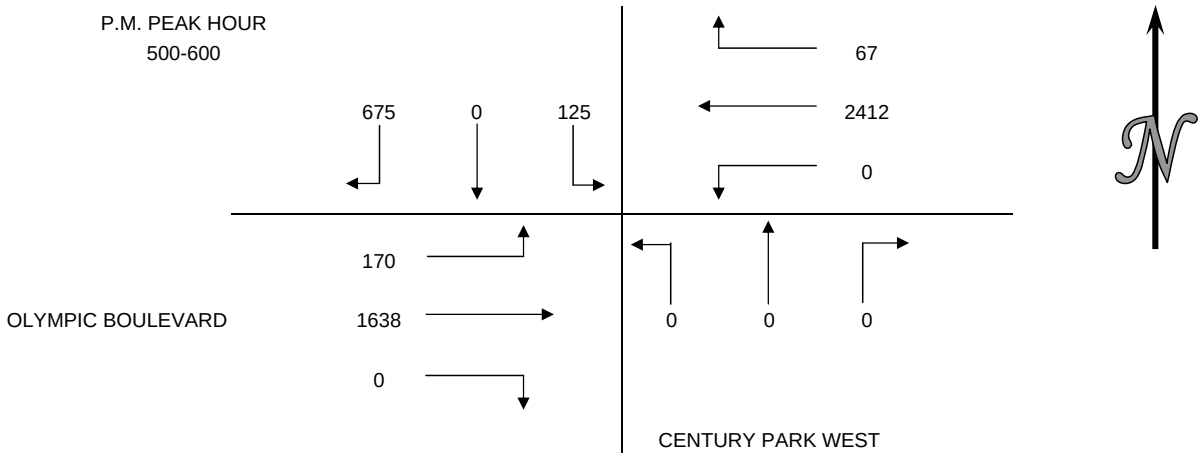
CLIENT:		GIBSON TRANSPORTATION CONSULTANTS	**14**
PROJECT:		CENTURY CITY TRAFFIC COUNTS	
DATE:		TUESDAY FEBRUARY 8, 2011	
PERIOD:		3:00 PM TO 6:00 PM	
INTERSECTION:	N/S	CENTURY PARK WEST	
	E/W	OLYMPIC BOULEVARD	

15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
300-315	115	0	30	14	455	0	0	0	0	0	381	65	1060
315-330	90	0	17	18	506	0	0	0	0	0	390	41	1062
330-345	82	0	32	15	512	0	0	0	0	0	450	65	1156
345-400	106	0	22	20	500	0	0	0	0	0	353	56	1057
400-415	133	0	28	21	534	0	0	0	0	0	420	38	1174
415-430	105	0	26	12	532	0	0	0	0	0	449	61	1185
430-445	145	0	25	14	568	0	0	0	0	0	428	41	1221
445-500	130	0	24	11	543	0	0	0	0	0	405	52	1165
500-515	199	0	28	12	607	0	0	0	0	0	422	30	1298
515-530	148	0	35	19	668	0	0	0	0	0	400	31	1301
530-545	157	0	27	15	543	0	0	0	0	0	434	64	1240
545-600	171	0	35	21	594	0	0	0	0	0	382	45	1248

HOUR TOTALS

TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
300-400	393	0	101	67	1973	0	0	0	0	0	1574	227	4335
315-415	411	0	99	74	2052	0	0	0	0	0	1613	200	4449
330-430	426	0	108	68	2078	0	0	0	0	0	1672	220	4572
345-445	489	0	101	67	2134	0	0	0	0	0	1650	196	4637
400-500	513	0	103	58	2177	0	0	0	0	0	1702	192	4745
415-515	579	0	103	49	2250	0	0	0	0	0	1704	184	4869
430-530	622	0	112	56	2386	0	0	0	0	0	1655	154	4985
445-545	634	0	114	57	2361	0	0	0	0	0	1661	177	5004
500-600	675	0	125	67	2412	0	0	0	0	0	1638	170	5087



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INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

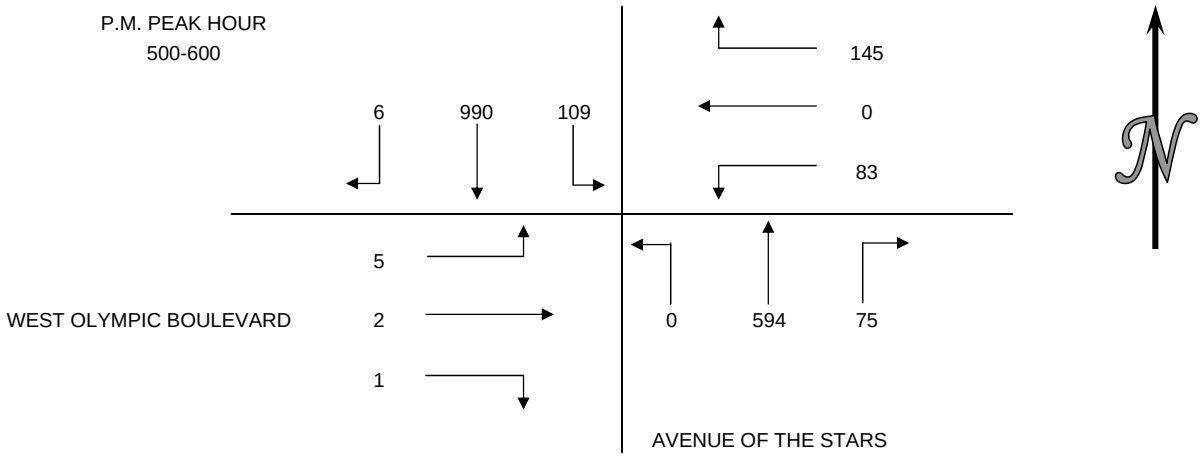
CLIENT: GIBSON TRANSPORTATION CONSULTANTS **15**
PROJECT: CENTURY CITY TRAFFIC COUNTS
DATE: WEDNESDAY FEBRUARY 9, 2011
PERIOD: 3:00 PM TO 6:00 PM
INTERSECTION: N/S AVENUE OF THE STARS
E/W WEST OLYMPIC BOULEVARD

15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
300-315	2	200	26	51	0	24	21	149	0	2	1	1	477
315-330	0	154	13	39	0	17	11	145	0	1	0	2	382
330-345	1	139	19	28	0	23	17	132	2	2	0	1	364
345-400	0	175	23	40	0	27	9	148	0	0	0	1	423
400-415	2	190	26	44	0	38	14	174	1	3	0	0	492
415-430	0	166	15	32	0	18	10	143	0	3	0	0	387
430-445	0	181	35	39	3	25	18	152	1	0	0	2	456
445-500	1	208	20	40	1	29	15	122	0	2	0	1	439
500-515	1	238	19	45	0	29	16	157	0	0	0	3	508
515-530	0	257	31	40	0	22	18	139	0	1	1	1	510
530-545	1	255	35	24	0	15	16	147	0	0	1	1	495
545-600	4	240	24	36	0	17	25	151	0	0	0	0	497

HOUR TOTALS

TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
300-400	3	668	81	158	0	91	58	574	2	5	1	5	1646
315-415	3	658	81	151	0	105	51	599	3	6	0	4	1661
330-430	3	670	83	144	0	106	50	597	3	8	0	2	1666
345-445	2	712	99	155	3	108	51	617	2	6	0	3	1758
400-500	3	745	96	155	4	110	57	591	2	8	0	3	1774
415-515	2	793	89	156	4	101	59	574	1	5	0	6	1790
430-530	2	884	105	164	4	105	67	570	1	3	1	7	1913
445-545	3	958	105	149	1	95	65	565	0	3	2	6	1952
500-600	6	990	109	145	0	83	75	594	0	1	2	5	2010



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INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

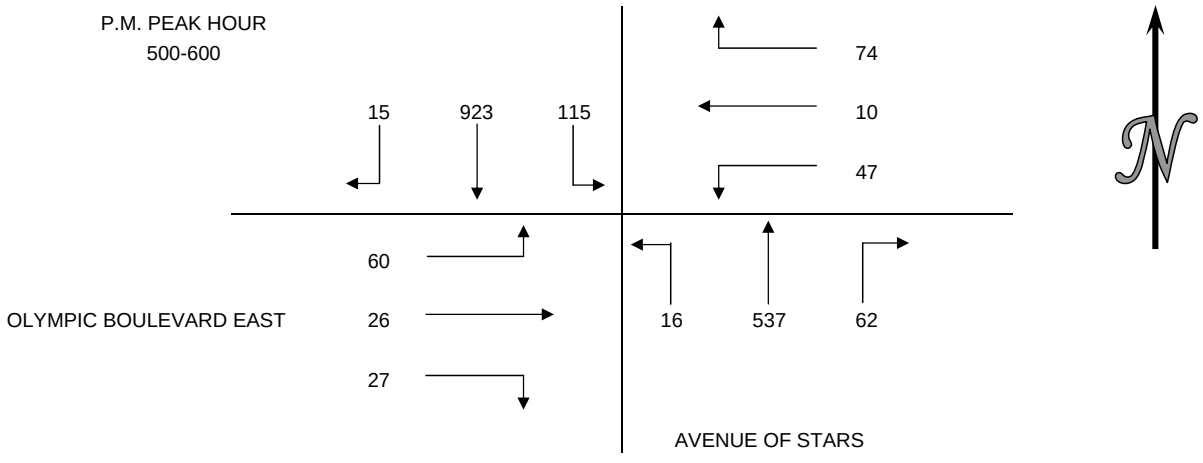
CLIENT:		GIBSON TRANSPORTATION CONSULTANTS	**16**
PROJECT:		CENTURY CITY TRAFFIC COUNTS	
DATE:		WEDNESDAY FEBRUARY 9, 2011	
PERIOD:		3:00 PM TO 6:00 PM	
INTERSECTION:	N/S	AVENUE OF STARS	
	E/W	OLYMPIC BOULEVARD EAST	

15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
300-315	10	184	23	21	0	10	16	127	3	1	2	10	407
315-330	7	141	12	12	1	4	10	139	3	8	1	3	341
330-345	3	147	22	21	3	8	10	130	5	6	1	4	360
345-400	7	173	15	19	1	13	8	127	3	4	2	2	374
400-415	5	188	33	20	1	4	17	154	2	8	5	8	445
415-430	5	190	21	19	1	10	11	121	3	6	3	4	394
430-445	2	188	18	21	1	11	10	134	6	4	4	11	410
445-500	4	200	20	18	1	9	8	114	2	4	8	6	394
500-515	10	242	34	18	5	8	18	126	5	9	8	16	499
515-530	2	221	28	16	2	10	17	123	1	5	9	13	447
530-545	1	257	29	15	2	16	10	137	7	7	6	16	503
545-600	2	203	24	25	1	13	17	151	3	6	3	15	463

HOUR TOTALS

TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
300-400	27	645	72	73	5	35	44	523	14	19	6	19	1482
315-415	22	649	82	72	6	29	45	550	13	26	9	17	1520
330-430	20	698	91	79	6	35	46	532	13	24	11	18	1573
345-445	19	739	87	79	4	38	46	536	14	22	14	25	1623
400-500	16	766	92	78	4	34	46	523	13	22	20	29	1643
415-515	21	820	93	76	8	38	47	495	16	23	23	37	1697
430-530	18	851	100	73	9	38	53	497	14	22	29	46	1750
445-545	17	920	111	67	10	43	53	500	15	25	31	51	1843
500-600	15	923	115	74	10	47	62	537	16	27	26	60	1912



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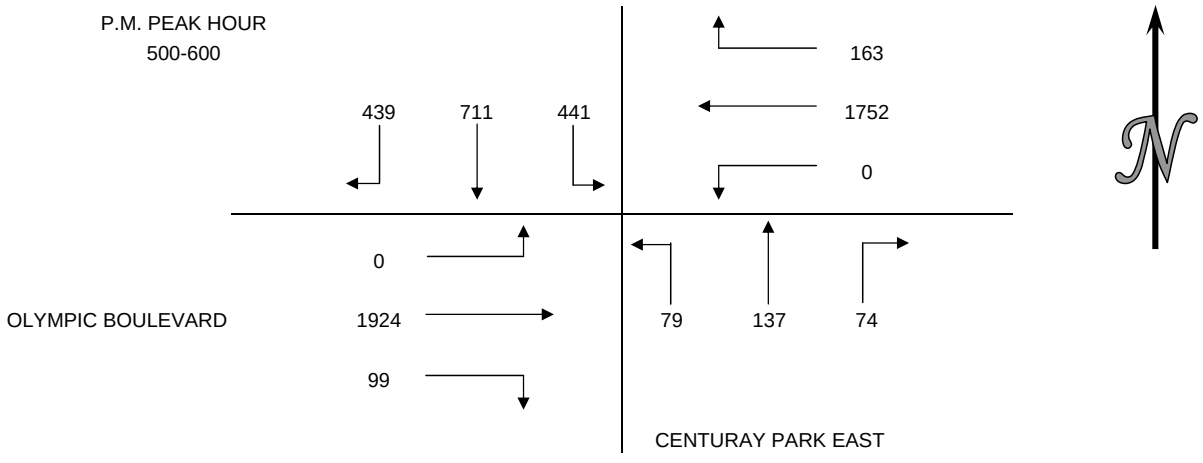
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

INTERSECTION

CLIENT:		GIBSON TRANSPORTATION CONSULTANTS	**17**
PROJECT:		CENTURY CITY TRAFFIC COUNTS	
DATE:		WEDNESDAY FEBRUARY 9, 2011	
PERIOD:		3:00 PM TO 6:00 PM	
INTERSECTION:	N/S	CENTURAY PARK EAST	
	E/W	OLYMPIC BOULEVARD	

15 MIN COUNTS													
	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
300-315	55	62	68	47	364	0	26	41	17	23	361	0	1064
315-330	51	68	58	33	331	0	18	58	15	27	381	0	1040
330-345	68	82	84	45	379	0	25	63	18	20	419	0	1203
345-400	59	66	70	47	366	0	17	62	16	26	443	0	1172
400-415	86	87	82	40	372	1	21	57	20	34	486	0	1286
415-430	86	96	98	37	399	0	27	43	10	18	430	0	1244
430-445	101	87	98	45	452	0	17	36	17	21	512	0	1386
445-500	95	104	87	43	432	0	10	27	7	23	439	0	1267
500-515	122	174	104	55	416	0	23	33	12	25	445	0	1409
515-530	100	156	112	40	474	0	19	32	22	26	524	0	1505
530-545	104	192	135	22	405	0	17	28	24	24	487	0	1438
545-600	113	189	90	46	457	0	15	44	21	24	468	0	1467
HOUR TOTALS													
	1	2	3	4	5	6	7	8	9	10	11	12	
TIME	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
300-400	233	278	280	172	1440	0	86	224	66	96	1604	0	4479
315-415	264	303	294	165	1448	1	81	240	69	107	1729	0	4701
330-430	299	331	334	169	1516	1	90	225	64	98	1778	0	4905
345-445	332	336	348	169	1589	1	82	198	63	99	1871	0	5088
400-500	368	374	365	165	1655	1	75	163	54	96	1867	0	5183
415-515	404	461	387	180	1699	0	77	139	46	87	1826	0	5306
430-530	418	521	401	183	1774	0	69	128	58	95	1920	0	5567
445-545	421	626	438	160	1727	0	69	120	65	98	1895	0	5619
500-600	439	711	441	163	1752	0	74	137	79	99	1924	0	5819

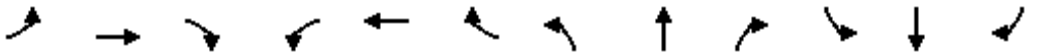


APPENDIX C EXISTING LEVEL OF SERVICE CONDITIONS

APPENDIX C EXISTING LEVEL OF SERVICE CONDITIONS

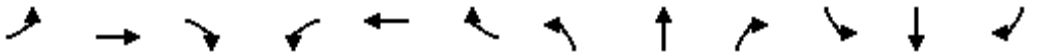
Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	8	1556	668	956	1987	132	249
Ideal Flow (vphpl)	1200	1200	1200	1200	1200	1200	1200
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	0.97	0.86	0.97	0.88
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1118	4047	971	2168	4047	2168	1760
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1118	4047	971	2168	4047	2168	1760
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	8	1604	689	986	2048	136	257
RTOR Reduction (vph)	0	0	62	0	0	0	192
Lane Group Flow (vph)	8	1604	627	986	2048	136	65
Confl. Peds. (#/hr)			33	33			38
Confl. Bikes (#/hr)			14				1
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	Over
Protected Phases	1	6	4	3	2 3	4	3
Permitted Phases			6				
Actuated Green, G (s)	1.0	31.0	59.1	29.0	66.0	28.1	29.0
Effective Green, g (s)	2.0	33.0	64.9	28.0	68.0	31.0	28.0
Actuated g/C Ratio	0.02	0.30	0.59	0.25	0.62	0.28	0.25
Clearance Time (s)	5.0	6.0	6.9	3.0		6.9	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	20	1214	572	551	2501	610	448
v/s Ratio Prot	c0.01	c0.40	c0.31	c0.45	0.51	0.06	0.04
v/s Ratio Perm			0.34				
v/c Ratio	0.40	1.32	1.10	1.79	0.82	0.22	0.15
Uniform Delay, d1	53.4	38.5	22.5	41.0	16.2	30.3	31.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.6	150.4	66.6	362.5	2.2	0.2	0.2
Delay (s)	66.0	188.9	89.2	403.5	18.4	30.5	31.9
Level of Service	E	F	F	F	B	C	C
Approach Delay (s)		158.6			143.6	31.4	
Approach LOS		F			F	C	

Intersection Summary			
HCM 2000 Control Delay	141.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.37		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	118.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	101	14	146	0	18	21	220	814	8	16	452	334
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	0.88		1.00		1.00	0.91		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1504	1524	2493		1544		1583	4543		1583	3167	1417
Flt Permitted	0.95	0.96	1.00		1.00		0.39	1.00		0.23	1.00	1.00
Satd. Flow (perm)	1504	1524	2493		1544		653	4543		376	3167	1417
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	115	16	166	0	20	24	250	925	9	18	514	380
RTOR Reduction (vph)	0	0	136	0	21	0	0	1	0	0	0	289
Lane Group Flow (vph)	57	74	30	0	23	0	250	933	0	18	514	91
Turn Type	Split	NA	custom		NA		pm+pt	NA		Perm	NA	Over
Protected Phases	4	4	7 1		3		1	6			2	4
Permitted Phases							6			2		
Actuated Green, G (s)	21.0	21.0	15.1		9.7		40.5	35.5		35.5	35.5	21.0
Effective Green, g (s)	21.6	21.6	16.3		10.7		40.5	36.7		36.7	36.7	21.6
Actuated g/C Ratio	0.24	0.24	0.18		0.12		0.45	0.41		0.41	0.41	0.24
Clearance Time (s)	4.6	4.6			5.0		4.0	5.2		5.2	5.2	4.6
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.4		3.2	3.2	3.0
Lane Grp Cap (vph)	360	365	451		183		345	1852		153	1291	340
v/s Ratio Prot	0.04	0.05	0.01		c0.01		c0.04	0.21			0.16	c0.06
v/s Ratio Perm							c0.29			0.05		
v/c Ratio	0.16	0.20	0.07		0.12		0.72	0.50		0.12	0.40	0.27
Uniform Delay, d1	27.0	27.3	30.5		35.5		19.3	19.9		16.6	18.8	27.8
Progression Factor	0.76	0.77	1.49		1.00		1.78	1.56		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.9	0.0		0.3		4.6	0.6		1.6	0.9	1.9
Delay (s)	21.3	21.9	45.5		35.8		39.1	31.6		18.1	19.8	29.7
Level of Service	C	C	D		D		D	C		B	B	C
Approach Delay (s)		35.0			35.8			33.2			23.9	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.6
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

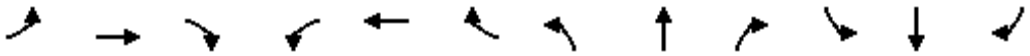


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1809	59	0	2469	368	395	838	94	71	114	104
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		0.91	1.00		0.86		0.97	0.91		0.97	0.95	0.88
Frt		1.00	0.85		0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected		1.00	1.00		1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		4550	1417		5622		3072	4481		3072	3167	2493
Flt Permitted		1.00	1.00		1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		4550	1417		5622		3072	4481		3072	3167	2493
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1846	60	0	2519	376	403	855	96	72	116	106
RTOR Reduction (vph)	0	0	25	0	27	0	0	15	0	0	0	58
Lane Group Flow (vph)	0	1846	35	0	2868	0	403	936	0	72	116	48
Turn Type		NA	pm+ov		NA		Prot	NA		Prot	NA	Perm
Protected Phases		6	3		2		3	8		7	4	
Permitted Phases			6									4
Actuated Green, G (s)		40.1	52.1		40.1		12.0	28.7		6.4	23.1	23.1
Effective Green, g (s)		41.6	52.1		41.6		12.0	30.0		6.4	24.4	24.4
Actuated g/C Ratio		0.46	0.58		0.46		0.13	0.33		0.07	0.27	0.27
Clearance Time (s)		5.5	4.0		5.5		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)		4.9	3.0		5.2		3.0	5.1		3.0	5.1	5.1
Lane Grp Cap (vph)		2103	820		2598		409	1493		218	858	675
v/s Ratio Prot		0.41	0.01		c0.51		c0.13	c0.21		0.02	0.04	
v/s Ratio Perm			0.02									0.02
v/c Ratio		0.88	0.04		1.10		0.99	0.63		0.33	0.14	0.07
Uniform Delay, d1		21.9	8.2		24.2		38.9	25.3		39.8	24.8	24.4
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.54	0.45	0.16
Incremental Delay, d2		5.6	0.0		53.2		40.3	2.0		0.9	0.1	0.1
Delay (s)		27.5	8.2		77.4		79.2	27.3		62.2	11.4	3.9
Level of Service		C	A		E		E	C		E	B	A
Approach Delay (s)		26.9			77.4			42.7			21.2	
Approach LOS		C			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	52.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

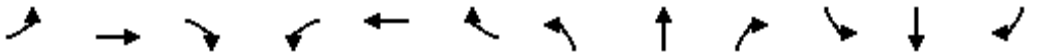
Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	27	1952	661	634	1486	233	287
Ideal Flow (vphpl)	1200	1200	1200	1200	1200	1200	1200
Total Lost time (s)	4.0	4.0	4.0	6.0	3.3	4.0	6.0
Lane Util. Factor	1.00	0.86	1.00	0.97	0.91	0.94	0.88
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1118	4047	949	2168	3212	3152	1760
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1118	4047	949	2168	3212	3152	1760
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	27	1972	668	640	1501	235	290
RTOR Reduction (vph)	0	0	93	0	0	0	225
Lane Group Flow (vph)	27	1972	575	640	1501	235	65
Confl. Peds. (#/hr)			55	55		1	111
Confl. Bikes (#/hr)			15				7
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	Over
Protected Phases	1	6	4	3	3 2	4	3
Permitted Phases			6				
Actuated Green, G (s)	4.2	37.1	64.2	27.0	70.8	27.1	27.0
Effective Green, g (s)	5.2	39.8	70.0	27.0	69.5	30.0	27.0
Actuated g/C Ratio	0.04	0.33	0.58	0.22	0.58	0.25	0.22
Clearance Time (s)	5.0	6.7	6.9	6.0		6.9	6.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0		5.0	3.0
Lane Grp Cap (vph)	48	1342	553	487	1860	788	396
v/s Ratio Prot	c0.02	c0.49	c0.26	c0.30	0.47	0.07	0.04
v/s Ratio Perm			0.35				
v/c Ratio	0.56	1.47	1.04	1.31	0.81	0.30	0.16
Uniform Delay, d1	56.3	40.1	25.0	46.5	20.0	36.5	37.4
Progression Factor	0.50	1.33	2.56	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	211.6	23.5	155.4	2.7	0.4	0.2
Delay (s)	29.5	264.8	87.5	201.9	22.6	36.9	37.6
Level of Service	C	F	F	F	C	D	D
Approach Delay (s)		218.0			76.2	37.3	
Approach LOS		F			E	D	

Intersection Summary			
HCM 2000 Control Delay	143.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	107.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



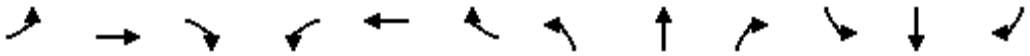
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	117	423	87	50	160	138	295	964	542	265	374	159
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Total Lost time (s)	4.0	4.5	4.0	2.0	4.5	4.5	4.0	4.5	3.0	4.0	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.91	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.92	1.00	1.00	0.94	1.00	0.97	
Flpb, ped/bikes	0.98	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1552	3167	1362	1565	3167	1307	3072	4550	1330	3072	4217	
Flt Permitted	0.44	1.00	1.00	0.48	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	719	3167	1362	791	3167	1307	3072	4550	1330	3072	4217	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	131	475	98	56	180	155	331	1083	609	298	420	179
RTOR Reduction (vph)	0	0	60	0	0	102	0	0	80	0	86	0
Lane Group Flow (vph)	131	475	38	56	180	53	331	1083	529	298	513	0
Confl. Peds. (#/hr)	69		51	51		69	66		76	76		66
Confl. Bikes (#/hr)			2						2			5
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	pm+ov	Prot	NA	
Protected Phases	1	6	3	5	2		3	8	5	7	4	
Permitted Phases	6		6	2		2			8			
Actuated Green, G (s)	21.9	21.9	34.5	31.7	29.2	29.2	12.6	21.0	37.3	12.3	20.7	
Effective Green, g (s)	21.4	23.4	34.5	33.2	30.7	30.7	12.6	21.5	38.3	12.3	21.2	
Actuated g/C Ratio	0.24	0.26	0.38	0.37	0.34	0.34	0.14	0.24	0.43	0.14	0.24	
Clearance Time (s)	3.5	6.0	4.0	3.5	6.0	6.0	4.0	5.0	3.5	4.0	5.0	
Vehicle Extension (s)	3.0	4.3	3.0	3.0	4.3	4.3	3.0	5.0	3.0	3.0	4.3	
Lane Grp Cap (vph)	249	823	522	444	1080	445	430	1086	610	419	993	
v/s Ratio Prot	0.05	c0.15	0.01	0.02	0.06		0.11	c0.24	c0.16	c0.10	0.12	
v/s Ratio Perm	0.08		0.02	0.02		0.04			0.24			
v/c Ratio	0.53	0.58	0.07	0.13	0.17	0.12	0.77	1.00	0.87	0.71	0.52	
Uniform Delay, d1	28.7	29.0	17.6	19.3	20.7	20.4	37.3	34.2	23.5	37.2	29.9	
Progression Factor	0.82	0.84	4.50	1.14	1.09	2.21	0.72	0.74	0.38	1.00	1.00	
Incremental Delay, d2	1.9	1.2	0.1	0.1	0.1	0.1	6.7	24.0	10.4	5.6	1.9	
Delay (s)	25.5	25.6	79.3	22.1	22.6	45.1	33.5	49.3	19.3	42.8	31.9	
Level of Service	C	C	E	C	C	D	C	D	B	D	C	
Approach Delay (s)		33.1			31.5			37.7			35.5	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	35.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	0	0	199	4	264	6	1539	37	21	454	5
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Total Lost time (s)		4.4			4.4	4.4	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.91	1.00	1.00	0.91	
Frt		1.00			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.95			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1583			1589	1417	1583	4550	1417	1583	4542	
Flt Permitted		0.48			0.73	1.00	0.45	1.00	1.00	0.10	1.00	
Satd. Flow (perm)		803			1213	1417	752	4550	1417	162	4542	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	4	0	0	224	4	297	7	1729	42	24	510	6
RTOR Reduction (vph)	0	0	0	0	0	18	0	0	15	0	1	0
Lane Group Flow (vph)	0	4	0	0	228	279	7	1729	27	24	515	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8		8	6		6	2		
Actuated Green, G (s)		22.8			22.8	22.8	56.8	56.8	56.8	56.8	56.8	
Effective Green, g (s)		23.8			23.8	23.8	57.8	57.8	57.8	57.8	57.8	
Actuated g/C Ratio		0.26			0.26	0.26	0.64	0.64	0.64	0.64	0.64	
Clearance Time (s)		5.4			5.4	5.4	5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		212			320	374	482	2922	910	104	2916	
v/s Ratio Prot								c0.38			0.11	
v/s Ratio Perm		0.00			0.19	c0.20	0.01		0.02	0.15		
v/c Ratio		0.02			0.71	0.75	0.01	0.59	0.03	0.23	0.18	
Uniform Delay, d1		24.5			30.0	30.3	5.8	9.3	5.9	6.8	6.5	
Progression Factor		1.00			1.00	1.00	0.78	1.31	1.03	1.86	1.76	
Incremental Delay, d2		0.0			7.3	7.9	0.0	0.6	0.0	4.7	0.1	
Delay (s)		24.5			37.3	38.3	4.6	12.8	6.1	17.2	11.6	
Level of Service		C			D	D	A	B	A	B	B	
Approach Delay (s)		24.5			37.8			12.6			11.8	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.4
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	0	9	130	42	464	45	1083	31	25	453	168
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Total Lost time (s)	4.1	4.1			4.0	4.0	4.0	4.1		4.0	4.1	
Lane Util. Factor	1.00	1.00			0.95	0.95	1.00	0.91		1.00	0.91	
Frt	1.00	0.85			0.95	0.85	1.00	1.00		1.00	0.96	
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1417			1462	1346	1583	4531		1583	4365	
Flt Permitted	0.32	1.00			0.84	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	533	1417			1261	1346	1583	4531		1583	4365	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	12	0	10	148	48	527	51	1231	35	28	515	191
RTOR Reduction (vph)	0	9	0	0	23	281	0	3	0	0	60	0
Lane Group Flow (vph)	12	1	0	0	284	135	51	1263	0	28	646	0
Turn Type	Perm	NA		Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		3			4	5	1	6		5	2	
Permitted Phases	3			4		4						
Actuated Green, G (s)	11.0	11.0			15.5	25.6	6.3	33.5		10.1	37.3	
Effective Green, g (s)	12.5	12.5			17.0	25.6	6.3	34.2		10.1	38.0	
Actuated g/C Ratio	0.14	0.14			0.19	0.28	0.07	0.38		0.11	0.42	
Clearance Time (s)	5.6	5.6			5.5	4.0	4.0	4.8		4.0	4.8	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	74	196			238	382	110	1721		177	1843	
v/s Ratio Prot		0.00				0.04	c0.03	c0.28		0.02	c0.15	
v/s Ratio Perm	c0.02				c0.23	0.06						
v/c Ratio	0.16	0.01			1.19	0.35	0.46	0.73		0.16	0.35	
Uniform Delay, d1	34.1	33.4			36.5	25.6	40.2	24.0		36.1	17.6	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		0.86	1.55	
Incremental Delay, d2	1.0	0.0			121.1	0.6	3.1	2.8		0.4	0.5	
Delay (s)	35.2	33.4			157.6	26.2	43.3	26.8		31.6	27.8	
Level of Service	D	C			F	C	D	C		C	C	
Approach Delay (s)		34.4			82.0			27.4			28.0	
Approach LOS		C			F			C			C	

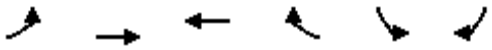
Intersection Summary			
HCM 2000 Control Delay	41.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.2
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2429	331	158	1571	103	169
Ideal Flow (vphpl)	1200	1200	1200	1200	1200	1200
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	0.97	0.91	0.97	0.91
Frpb, ped/bikes	1.00	0.91	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	0.94	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.97	1.00
Satd. Flow (prot)	3212	905	2168	3212	2078	910
Flt Permitted	1.00	1.00	0.95	1.00	0.97	1.00
Satd. Flow (perm)	3212	905	2168	3212	2078	910
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	2479	338	161	1603	105	172
RTOR Reduction (vph)	0	101	0	0	66	82
Lane Group Flow (vph)	2479	237	161	1603	116	13
Confl. Peds. (#/hr)		59	59		11	
Confl. Bikes (#/hr)		14				
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	6	4	3 5	2	4	
Permitted Phases		6				4
Actuated Green, G (s)	61.8	76.9	24.0	61.8	15.1	15.1
Effective Green, g (s)	63.0	80.7	24.0	63.0	17.0	17.0
Actuated g/C Ratio	0.52	0.67	0.20	0.52	0.14	0.14
Clearance Time (s)	5.2	5.9		5.2	5.9	5.9
Vehicle Extension (s)	3.7	3.8		3.5	3.8	3.8
Lane Grp Cap (vph)	1686	608	433	1686	294	128
v/s Ratio Prot	c0.77	0.06	c0.07	0.50	c0.06	
v/s Ratio Perm		0.21				0.01
v/c Ratio	1.47	0.39	0.37	0.95	0.39	0.11
Uniform Delay, d1	28.5	8.7	41.5	27.0	46.8	44.9
Progression Factor	1.00	1.00	1.53	0.66	1.00	1.00
Incremental Delay, d2	214.9	1.9	0.1	10.2	3.9	1.6
Delay (s)	243.4	10.6	63.5	28.1	50.7	46.5
Level of Service	F	B	E	C	D	D
Approach Delay (s)	215.5			31.3	49.3	
Approach LOS	F			C	D	

Intersection Summary			
HCM 2000 Control Delay	139.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	98.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	67	81	222	427	365	169
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Total Lost time (s)	4.5	3.5	3.5	4.5	5.0	3.5
Lane Util. Factor	0.97	0.88	0.95	1.00	1.00	0.91
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	2493	3167	1417	1583	4550
Flt Permitted	0.95	1.00	1.00	1.00	0.55	1.00
Satd. Flow (perm)	3072	2493	3167	1417	917	4550
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	74	90	247	474	406	188
RTOR Reduction (vph)	0	71	0	64	0	0
Lane Group Flow (vph)	74	19	247	410	406	188
Turn Type	Prot	pm+ov	NA	pm+ov	pm+pt	NA
Protected Phases	4	1	2	4	1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	8.0	17.7	58.3	66.3	72.0	72.0
Effective Green, g (s)	8.5	18.7	59.8	67.3	71.0	73.5
Actuated g/C Ratio	0.09	0.21	0.66	0.75	0.79	0.82
Clearance Time (s)	5.0	4.0	5.0	5.0	4.0	5.0
Vehicle Extension (s)	3.0	3.0	5.8	3.0	3.0	4.4
Lane Grp Cap (vph)	290	517	2104	1130	787	3715
v/s Ratio Prot	0.02	0.00	0.08	c0.03	c0.05	0.04
v/s Ratio Perm		0.00		0.25	c0.36	
v/c Ratio	0.26	0.04	0.12	0.36	0.52	0.05
Uniform Delay, d1	37.8	28.5	5.5	3.9	2.9	1.6
Progression Factor	1.14	0.63	0.14	3.63	1.00	1.00
Incremental Delay, d2	0.4	0.0	0.0	0.0	0.6	0.0
Delay (s)	43.5	17.8	0.8	14.3	3.5	1.6
Level of Service	D	B	A	B	A	A
Approach Delay (s)	29.4		9.6			2.9
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

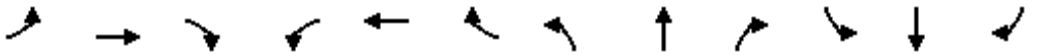


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	854	2490	1857	96	36	95
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Total Lost time (s)	4.0	4.6	4.6	4.6	4.1	3.3
Lane Util. Factor	0.97	0.91	0.91	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	4550	4550	1417	3072	2493
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3072	4550	4550	1417	3072	2493
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	880	2567	1914	99	37	98
RTOR Reduction (vph)	0	0	0	62	0	0
Lane Group Flow (vph)	880	2567	1914	37	37	98
Turn Type	Prot	NA	NA	Perm	Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases				6		4
Actuated Green, G (s)	21.0	54.4	29.4	29.4	25.0	46.0
Effective Green, g (s)	21.0	55.6	30.6	30.6	25.7	47.4
Actuated g/C Ratio	0.23	0.62	0.34	0.34	0.29	0.53
Clearance Time (s)	4.0	5.8	5.8	5.8	4.8	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	716	2810	1547	481	877	1312
v/s Ratio Prot	c0.29	0.56	c0.42		0.01	c0.02
v/s Ratio Perm				0.03		0.02
v/c Ratio	1.23	0.91	1.24	0.08	0.04	0.07
Uniform Delay, d1	34.5	15.1	29.7	20.1	23.2	10.5
Progression Factor	1.00	1.00	1.00	1.00	1.26	1.14
Incremental Delay, d2	115.1	5.9	112.5	0.3	0.0	0.0
Delay (s)	149.6	21.0	142.2	20.4	29.4	12.0
Level of Service	F	C	F	C	C	B
Approach Delay (s)		53.8	136.2		16.8	
Approach LOS		D	F		B	

Intersection Summary			
HCM 2000 Control Delay	82.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

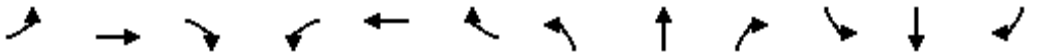
Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	12	2052	198	289	1954	360	695
Ideal Flow (vphpl)	1200	1200	1200	1200	1200	1200	1200
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	0.97	0.86	0.97	0.88
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1118	4047	967	2168	4047	2168	1760
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1118	4047	967	2168	4047	2168	1760
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	12	2115	204	298	2014	371	716
RTOR Reduction (vph)	0	0	84	0	0	0	534
Lane Group Flow (vph)	12	2115	120	298	2014	371	182
Confl. Peds. (#/hr)			33	33			38
Confl. Bikes (#/hr)			14				1
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	Over
Protected Phases	1	6	4	3	2 3	4	3
Permitted Phases			6				
Actuated Green, G (s)	1.0	35.5	59.1	29.0	70.5	23.6	29.0
Effective Green, g (s)	2.0	37.5	64.9	28.0	72.5	26.5	28.0
Actuated g/C Ratio	0.02	0.34	0.59	0.25	0.66	0.24	0.25
Clearance Time (s)	5.0	6.0	6.9	3.0		6.9	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	20	1379	570	551	2667	522	448
v/s Ratio Prot	c0.01	c0.52	0.05	0.14	c0.50	c0.17	0.10
v/s Ratio Perm			0.07				
v/c Ratio	0.60	1.53	0.21	0.54	0.76	0.71	0.41
Uniform Delay, d1	53.6	36.2	10.6	35.4	12.7	38.2	34.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	40.2	243.9	0.2	1.1	1.3	4.5	0.6
Delay (s)	93.8	280.1	10.7	36.5	14.0	42.8	34.7
Level of Service	F	F	B	D	B	D	C
Approach Delay (s)		255.6			16.9	37.5	
Approach LOS		F			B	D	

Intersection Summary			
HCM 2000 Control Delay	117.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	337	20	368	3	8	11	65	236	14	13	903	185
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	0.88		1.00		1.00	0.91		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1504	1516	2493		1545		1583	4512		1583	3167	1417
Flt Permitted	0.95	0.96	1.00		0.39		0.13	1.00		0.57	1.00	1.00
Satd. Flow (perm)	1504	1516	2493		609		218	4512		951	3167	1417
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	383	23	418	3	9	12	74	268	16	15	1026	210
RTOR Reduction (vph)	0	0	342	0	11	0	0	6	0	0	0	160
Lane Group Flow (vph)	191	215	76	0	13	0	74	278	0	15	1026	50
Turn Type	Split	NA	custom	Perm	NA		pm+pt	NA		Perm	NA	Over
Protected Phases	4	4	7 1		3		1	6			2	4
Permitted Phases				3			6			2		
Actuated Green, G (s)	21.0	21.0	15.1		9.7		40.5	35.5		35.5	35.5	21.0
Effective Green, g (s)	21.6	21.6	16.3		10.7		40.5	36.7		36.7	36.7	21.6
Actuated g/C Ratio	0.24	0.24	0.18		0.12		0.45	0.41		0.41	0.41	0.24
Clearance Time (s)	4.6	4.6			5.0		4.0	5.2		5.2	5.2	4.6
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.4		3.2	3.2	3.0
Lane Grp Cap (vph)	360	363	451		72		173	1839		387	1291	340
v/s Ratio Prot	0.13	c0.14	0.03				c0.02	0.06			c0.32	0.04
v/s Ratio Perm					c0.02		0.17			0.02		
v/c Ratio	0.53	0.59	0.17		0.19		0.43	0.15		0.04	0.79	0.15
Uniform Delay, d1	29.8	30.3	31.1		35.7		16.6	16.8		16.0	23.3	27.0
Progression Factor	0.73	0.73	3.35		1.00		1.12	0.81		1.00	1.00	1.00
Incremental Delay, d2	5.5	6.9	0.2		1.3		1.5	0.2		0.2	5.1	0.9
Delay (s)	27.3	29.1	104.6		37.0		20.1	13.7		16.2	28.5	27.9
Level of Service	C	C	F		D		C	B		B	C	C
Approach Delay (s)		67.0			37.0			15.0			28.2	
Approach LOS		E			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	39.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.6
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

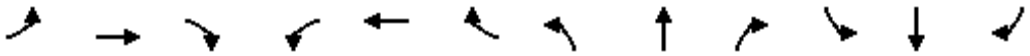


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1963	101	0	1788	167	81	140	76	450	726	448
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		0.91	1.00		0.86		0.97	0.91		0.97	0.95	0.88
Frt		1.00	0.85		0.99		1.00	0.95		1.00	1.00	0.85
Flt Protected		1.00	1.00		1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		4550	1417		5660		3072	4309		3072	3167	2493
Flt Permitted		1.00	1.00		1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		4550	1417		5660		3072	4309		3072	3167	2493
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	2003	103	0	1824	170	83	143	78	459	741	457
RTOR Reduction (vph)	0	0	27	0	16	0	0	1	0	0	0	85
Lane Group Flow (vph)	0	2003	76	0	1978	0	83	220	0	459	741	372
Turn Type		NA	pm+ov		NA		Prot	NA		Prot	NA	Perm
Protected Phases		6	3		2		3	8		7	4	
Permitted Phases			6									4
Actuated Green, G (s)		37.5	45.1		37.5		7.6	28.7		9.0	30.1	30.1
Effective Green, g (s)		39.0	45.1		39.0		7.6	30.0		9.0	31.4	31.4
Actuated g/C Ratio		0.43	0.50		0.43		0.08	0.33		0.10	0.35	0.35
Clearance Time (s)		5.5	4.0		5.5		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)		4.9	3.0		5.2		3.0	5.1		3.0	5.1	5.1
Lane Grp Cap (vph)		1971	710		2452		259	1436		307	1104	869
v/s Ratio Prot		c0.44	0.01		0.35		0.03	0.05		c0.15	c0.23	
v/s Ratio Perm			0.04									0.15
v/c Ratio		1.02	0.11		0.81		0.32	0.15		1.50	0.67	0.43
Uniform Delay, d1		25.5	11.8		22.2		38.8	21.1		40.5	24.9	22.4
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.19	1.06	1.19
Incremental Delay, d2		24.4	0.1		3.0		0.7	0.2		236.4	1.8	0.6
Delay (s)		49.9	11.9		25.2		39.5	21.3		284.5	28.2	27.2
Level of Service		D	B		C		D	C		F	C	C
Approach Delay (s)		48.1			25.2			26.3			98.9	
Approach LOS		D			C			C			F	

Intersection Summary			
HCM 2000 Control Delay	53.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

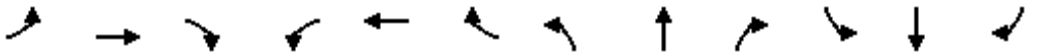
Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	40	1786	419	342	1882	636	562
Ideal Flow (vphpl)	1200	1200	1200	1200	1200	1200	1200
Total Lost time (s)	4.0	4.0	4.0	6.0	3.3	4.0	6.0
Lane Util. Factor	1.00	0.86	1.00	0.97	0.91	0.94	0.88
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1118	4047	950	2168	3212	3152	1760
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1118	4047	950	2168	3212	3152	1760
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	40	1804	423	345	1901	642	568
RTOR Reduction (vph)	0	0	137	0	0	0	440
Lane Group Flow (vph)	40	1804	286	345	1901	642	128
Confl. Peds. (#/hr)			55	55		1	111
Confl. Bikes (#/hr)			15				7
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	Over
Protected Phases	1	6	4	3	3 2	4	3
Permitted Phases			6				
Actuated Green, G (s)	5.6	35.7	62.8	27.0	69.4	27.1	27.0
Effective Green, g (s)	6.6	38.4	68.6	27.0	68.1	30.0	27.0
Actuated g/C Ratio	0.05	0.32	0.57	0.22	0.57	0.25	0.22
Clearance Time (s)	5.0	6.7	6.9	6.0		6.9	6.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0		5.0	3.0
Lane Grp Cap (vph)	61	1295	543	487	1822	788	396
v/s Ratio Prot	c0.04	c0.45	0.13	0.16	c0.59	c0.20	0.07
v/s Ratio Perm			0.17				
v/c Ratio	0.66	1.39	0.53	0.71	1.04	0.81	0.32
Uniform Delay, d1	55.6	40.8	15.7	42.9	26.0	42.4	38.9
Progression Factor	0.88	1.46	6.77	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	177.3	0.2	4.7	33.4	7.3	0.5
Delay (s)	51.0	237.1	106.7	47.6	59.3	49.7	39.3
Level of Service	D	F	F	D	E	D	D
Approach Delay (s)		209.5			57.5	44.8	
Approach LOS		F			E	D	

Intersection Summary			
HCM 2000 Control Delay	115.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



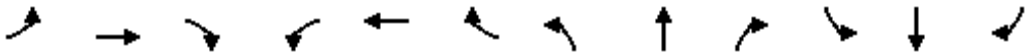
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	109	184	248	181	338	210	237	473	114	181	716	265
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Total Lost time (s)	4.0	4.5	4.0	2.0	4.5	4.5	4.0	4.5	3.0	4.0	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.91	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.92	1.00	1.00	0.93	1.00	0.97	
Flpb, ped/bikes	0.99	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1560	3167	1359	1548	3167	1307	3072	4550	1312	3072	4250	
Flt Permitted	0.46	1.00	1.00	0.62	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	755	3167	1359	1014	3167	1307	3072	4550	1312	3072	4250	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	122	207	279	203	380	236	266	531	128	203	804	298
RTOR Reduction (vph)	0	0	111	0	0	178	0	0	73	0	65	0
Lane Group Flow (vph)	122	207	168	203	380	58	266	531	55	203	1037	0
Confl. Peds. (#/hr)	69		51	51		69	66		76	76		66
Confl. Bikes (#/hr)			2						2			5
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	pm+ov	Prot	NA	
Protected Phases	1	6	3	5	2		3	8	5	7	4	
Permitted Phases	6		6	2		2			8			
Actuated Green, G (s)	17.7	17.7	26.7	23.1	20.6	20.6	9.0	26.0	37.9	15.9	32.9	
Effective Green, g (s)	17.2	19.2	26.7	24.6	22.1	22.1	9.0	26.5	38.9	15.9	33.4	
Actuated g/C Ratio	0.19	0.21	0.30	0.27	0.25	0.25	0.10	0.29	0.43	0.18	0.37	
Clearance Time (s)	3.5	6.0	4.0	3.5	6.0	6.0	4.0	5.0	3.5	4.0	5.0	
Vehicle Extension (s)	3.0	4.3	3.0	3.0	4.3	4.3	3.0	5.0	3.0	3.0	4.3	
Lane Grp Cap (vph)	220	675	403	356	777	320	307	1339	610	542	1577	
v/s Ratio Prot	c0.05	0.07	0.04	c0.08	0.12		c0.09	0.12	0.01	0.07	c0.24	
v/s Ratio Perm	0.05		0.08	c0.07		0.04			0.03			
v/c Ratio	0.55	0.31	0.42	0.57	0.49	0.18	0.87	0.40	0.09	0.37	0.66	
Uniform Delay, d1	32.1	29.8	25.4	28.3	29.1	26.8	39.9	25.4	15.1	32.7	23.5	
Progression Factor	1.05	1.06	0.96	1.05	1.05	1.51	0.84	1.08	2.59	1.00	1.00	
Incremental Delay, d2	3.0	0.4	0.7	2.2	0.8	0.4	21.5	0.9	0.1	0.4	2.2	
Delay (s)	36.7	32.0	25.0	31.8	31.4	40.8	55.1	28.4	39.2	33.1	25.7	
Level of Service	D	C	C	C	C	D	E	C	D	C	C	
Approach Delay (s)		29.7			34.2			37.6			26.9	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	31.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	3	2	85	0	148	0	606	77	112	1010	7
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Total Lost time (s)		4.4			4.4	4.4		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		0.91	1.00	1.00	0.91	
Frt		0.98			1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected		0.97			0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1583			1583	1417		4550	1417	1583	4545	
Flt Permitted		0.87			0.75	1.00		1.00	1.00	0.38	1.00	
Satd. Flow (perm)		1414			1250	1417		4550	1417	636	4545	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	7	3	2	96	0	166	0	681	87	126	1135	8
RTOR Reduction (vph)	0	2	0	0	0	136	0	0	24	0	1	0
Lane Group Flow (vph)	0	10	0	0	96	30	0	681	63	126	1142	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8		8	6		6	2		
Actuated Green, G (s)		15.4			15.4	15.4		64.2	64.2	64.2	64.2	
Effective Green, g (s)		16.4			16.4	16.4		65.2	65.2	65.2	65.2	
Actuated g/C Ratio		0.18			0.18	0.18		0.72	0.72	0.72	0.72	
Clearance Time (s)		5.4			5.4	5.4		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		257			227	258		3296	1026	460	3292	
v/s Ratio Prot								0.15			c0.25	
v/s Ratio Perm		0.01			c0.08	0.02			0.04	0.20		
v/c Ratio		0.04			0.42	0.12		0.21	0.06	0.27	0.35	
Uniform Delay, d1		30.3			32.6	30.8		4.0	3.6	4.3	4.6	
Progression Factor		1.00			1.00	1.00		1.09	1.62	0.87	0.97	
Incremental Delay, d2		0.1			1.3	0.2		0.1	0.1	1.2	0.2	
Delay (s)		30.4			33.9	31.0		4.5	5.9	4.9	4.6	
Level of Service		C			C	C		A	A	A	A	
Approach Delay (s)		30.4			32.0			4.7			4.7	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.4
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	27	28	48	11	76	17	548	64	118	942	16
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Total Lost time (s)	4.1	4.1			4.0	4.0	4.0	4.1		4.0	4.1	
Lane Util. Factor	1.00	1.00			0.95	0.95	1.00	0.91		1.00	0.91	
Frt	1.00	0.92			0.97	0.85	1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00			0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1540			1485	1346	1583	4478		1583	4539	
Flt Permitted	0.24	1.00			0.77	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	394	1540			1178	1346	1583	4478		1583	4539	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	70	31	32	55	12	86	19	623	73	134	1070	18
RTOR Reduction (vph)	0	26	0	0	11	49	0	14	0	0	1	0
Lane Group Flow (vph)	70	37	0	0	74	19	19	682	0	134	1087	0
Turn Type	Perm	NA		Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		3			4	5	1	6		5	2	
Permitted Phases	3			4		4						
Actuated Green, G (s)	15.4	15.4			11.8	25.1	4.0	29.6		13.3	38.9	
Effective Green, g (s)	16.9	16.9			13.3	25.1	4.0	30.3		13.3	39.6	
Actuated g/C Ratio	0.19	0.19			0.15	0.28	0.04	0.34		0.15	0.44	
Clearance Time (s)	5.6	5.6			5.5	4.0	4.0	4.8		4.0	4.8	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	73	289			174	375	70	1507		233	1997	
v/s Ratio Prot		0.02				0.01	0.01	0.15		c0.08	c0.24	
v/s Ratio Perm	c0.18				c0.06	0.01						
v/c Ratio	0.96	0.13			0.42	0.05	0.27	0.45		0.58	0.54	
Uniform Delay, d1	36.2	30.4			34.9	23.7	41.6	23.4		35.7	18.6	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		0.88	1.42	
Incremental Delay, d2	90.1	0.2			1.7	0.1	2.1	1.0		3.3	1.0	
Delay (s)	126.3	30.6			36.5	23.8	43.7	24.3		34.7	27.4	
Level of Service	F	C			D	C	D	C		C	C	
Approach Delay (s)		81.0			30.9			24.9			28.2	
Approach LOS		F			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.2
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

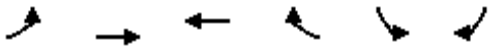
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1990	196	125	2287	272	251
Ideal Flow (vphpl)	1200	1200	1200	1200	1200	1200
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	0.97	0.91	0.97	0.91
Frpb, ped/bikes	1.00	0.91	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	0.96	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.97	1.00
Satd. Flow (prot)	3212	905	2168	3212	2108	910
Flt Permitted	1.00	1.00	0.95	1.00	0.97	1.00
Satd. Flow (perm)	3212	905	2168	3212	2108	910
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	2031	200	128	2334	278	256
RTOR Reduction (vph)	0	64	0	0	39	121
Lane Group Flow (vph)	2031	136	128	2334	354	20
Confl. Peds. (#/hr)		59	59		11	
Confl. Bikes (#/hr)		14				
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	6	4	3 5	2	4	
Permitted Phases		6				4
Actuated Green, G (s)	62.9	78.0	22.9	62.9	15.1	15.1
Effective Green, g (s)	64.1	81.8	22.9	64.1	17.0	17.0
Actuated g/C Ratio	0.53	0.68	0.19	0.53	0.14	0.14
Clearance Time (s)	5.2	5.9		5.2	5.9	5.9
Vehicle Extension (s)	3.7	3.8		3.5	3.8	3.8
Lane Grp Cap (vph)	1715	616	413	1715	298	128
v/s Ratio Prot	0.63	0.03	c0.06	c0.73	c0.17	
v/s Ratio Perm		0.12				0.02
v/c Ratio	1.18	0.22	0.31	1.36	1.19	0.16
Uniform Delay, d1	28.0	7.2	41.8	28.0	51.5	45.2
Progression Factor	1.00	1.00	0.83	0.97	1.00	1.00
Incremental Delay, d2	89.2	0.8	0.1	163.9	112.5	2.6
Delay (s)	117.1	8.0	34.9	191.0	164.0	47.8
Level of Service	F	A	C	F	F	D
Approach Delay (s)	107.4			182.9	133.3	
Approach LOS	F			F	F	

Intersection Summary			
HCM 2000 Control Delay	145.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	502	339	194	87	70	281
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Total Lost time (s)	4.5	3.5	3.5	4.5	5.0	3.5
Lane Util. Factor	0.97	0.88	0.95	1.00	1.00	0.91
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	2493	3167	1417	1583	4550
Flt Permitted	0.95	1.00	1.00	1.00	0.56	1.00
Satd. Flow (perm)	3072	2493	3167	1417	928	4550
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	558	377	216	97	78	312
RTOR Reduction (vph)	0	255	0	19	0	0
Lane Group Flow (vph)	558	122	216	78	78	312
Turn Type	Prot	pm+ov	NA	pm+ov	pm+pt	NA
Protected Phases	4	1	2	4	1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	23.2	28.2	47.8	71.0	56.8	56.8
Effective Green, g (s)	23.7	29.2	49.3	72.0	55.8	58.3
Actuated g/C Ratio	0.26	0.32	0.55	0.80	0.62	0.65
Clearance Time (s)	5.0	4.0	5.0	5.0	4.0	5.0
Vehicle Extension (s)	3.0	3.0	5.8	3.0	3.0	4.4
Lane Grp Cap (vph)	808	808	1734	1204	604	2947
v/s Ratio Prot	c0.18	c0.01	0.07	0.02	0.01	0.07
v/s Ratio Perm		0.04		0.04	c0.07	
v/c Ratio	0.69	0.15	0.12	0.06	0.13	0.11
Uniform Delay, d1	29.8	21.6	9.9	1.9	7.0	6.0
Progression Factor	1.41	3.53	0.61	0.00	1.00	1.00
Incremental Delay, d2	2.1	0.1	0.1	0.0	0.1	0.1
Delay (s)	44.2	76.4	6.2	0.0	7.1	6.1
Level of Service	D	E	A	A	A	A
Approach Delay (s)	57.2		4.3			6.3
Approach LOS	E		A			A

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	174	1672	2461	69	128	689
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Total Lost time (s)	4.0	4.6	4.6	4.6	4.1	3.3
Lane Util. Factor	0.97	0.91	0.91	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	4550	4550	1417	3072	2493
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3072	4550	4550	1417	3072	2493
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	179	1724	2537	71	132	710
RTOR Reduction (vph)	0	0	0	31	0	0
Lane Group Flow (vph)	179	1724	2537	40	132	710
Turn Type	Prot	NA	NA	Perm	Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases				6		4
Actuated Green, G (s)	12.1	54.4	38.3	38.3	25.0	37.1
Effective Green, g (s)	12.1	55.6	39.5	39.5	25.7	38.5
Actuated g/C Ratio	0.13	0.62	0.44	0.44	0.29	0.43
Clearance Time (s)	4.0	5.8	5.8	5.8	4.8	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	413	2810	1996	621	877	1066
v/s Ratio Prot	0.06	0.38	c0.56		0.04	c0.09
v/s Ratio Perm				0.03		0.19
v/c Ratio	0.43	0.61	1.27	0.06	0.15	0.67
Uniform Delay, d1	35.8	10.6	25.2	14.6	24.0	20.6
Progression Factor	1.00	1.00	1.00	1.00	1.69	0.51
Incremental Delay, d2	0.7	1.0	126.1	0.2	0.1	1.6
Delay (s)	36.5	11.6	151.3	14.8	40.6	12.2
Level of Service	D	B	F	B	D	B
Approach Delay (s)		13.9	147.6		16.6	
Approach LOS		B	F		B	

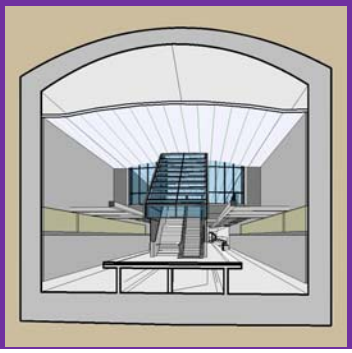
Intersection Summary			
HCM 2000 Control Delay	79.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

WESTSIDE PURPLE LINE EXTENSION PROJECT, SECTION 2

ADVANCED PRELIMINARY ENGINEERING

Contract No. PS-4350-2000


Century City Constellation Station
Air Quality Impacts Memorandum

Prepared for:

Metro

Prepared by:

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Review Copy		
	Date	Initials
Originator	10-Aug-15	ET
Checker	18-Aug-15	LC
Back Checker	07-Oct-15	RM
Verified by	07-Oct-15	RM

October 8, 2015

Table of Contents

List of Tables

1.0 INTRODUCTION

This memorandum supplements the *Westside Subway Extension Air Quality Technical Report (*August 2010) and the *Westside Subway Extension Air Quality Memorandum* (December 2011) and supports the *Westside Subway Extension Final EIS/EIR* (March 2012). This memorandum updates the analysis in Section 3.4 of the *Air Quality Memorandum* to incorporate further refinements to the construction approach and schedule for the Century City Constellation Station.

As a result of this refined analysis, SCAQMD thresholds will be exceeded for PM_{10} during the construction of the Project, prior to mitigation. With the proposed mitigation implemented, however, both PM_{10} and $PM_{2.5}$ will be reduced, and SCAQMD thresholds would not be exceeded for any pollutant. These determinations are consistent with the findings in the *Westside Subway Extension Draft EIS/EIR* (September 2010).

Only the LPA (Alternative 2) is included in this memorandum. The LPA is being constructed as three consecutive phases under the Metro Long Range Transportation Plan (LRTP) Scenario.

Information on regulatory framework, analysis methodology and existing conditions/affected environment can be found in the *Westside Subway Extension Project Air Quality Technical Report*.

2.0 REFINEMENTS TO CONSTRUCTION APPROACH AND SCHEDULE

The reason for the re-evaluation of Section 2 of the Westside Subway Extension is a result of a change in the development timeline for the parcel originally identified in the August 2012 Record of Decision (ROD) as the primary construction staging and laydown area along with station entrance for the Century City Constellation Station.

Due to a proposed commercial development at the corner of Avenue of the Stars and Constellation Boulevard (Area 1), the site can no longer be utilized for construction staging and laydown. However, the station entrance proposed at this location will remain and be incorporated into the new development. The following provides a summary of the areas of change from the approved construction staging scenario for the Century City Constellation Station (see Figure 2-1 for locations of referenced areas):

1. Change in construction staging scenario locations

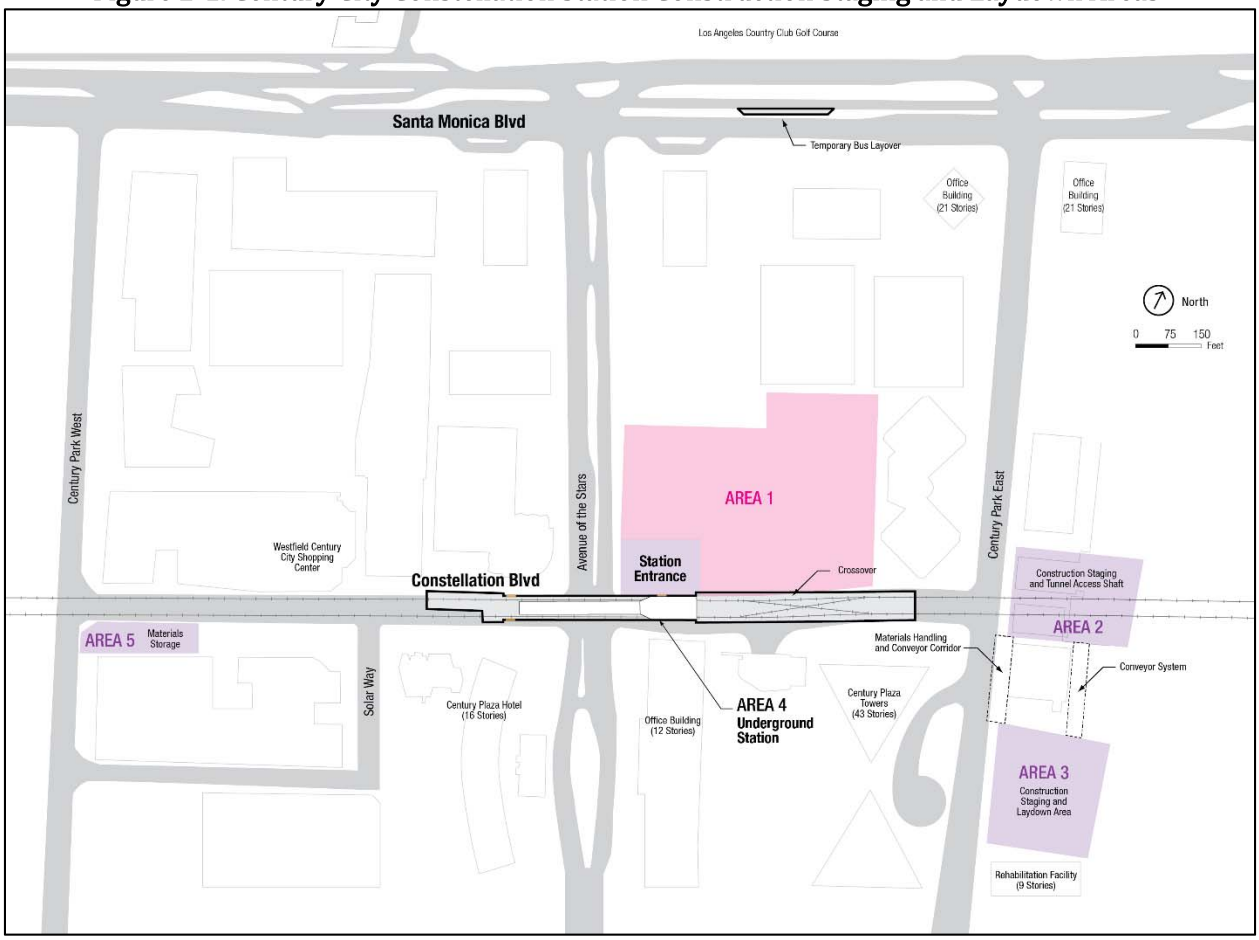
Scenario A, as identified in the EIS/EIR, with the Century City Constellation Station entrance and approximately 5.5 acre construction staging and laydown area (staging area) at the northeast corner of Constellation Boulevard and Avenue of the Stars (Area 1) was selected as part of the preferred alternative. Due to a proposed commercial development at this site, the selected construction staging area can no longer be used for the project. Instead, the staging areas identified in EIS/EIR as part of Scenario B will be used. The Scenario B sites (Area 2 and Area 3) include two locations along Century Park East and require full acquisition of 1940 Century Park East, 1950 Century Park East, and 2040 Century Park East.

A portion (less than 0.25 acres) of Area 1 will be required for construction of the station entrance which is to remain in the original location at the northeast corner of Constellation Boulevard and Avenue of the Stars (Area 1) and will be incorporated into future development to be constructed at this location. Metro will coordinate with the developer regarding the station entrance, although if development of the site has not yet begun when construction of the Constellation Station begins, the station entrance would be designed as described in the EIR. If the site is not developed at the start of the Constellation Station construction, it is possible that more than 0.25 acres of Area 1 will be used for construction activities.

In addition, due to the loss of full use of Area 1, the tunnel boring machine (TBM) will be lowered into the station excavation along Constellation Boulevard. This will require the full closure of approximately 200 feet of the eastern end of Constellation Boulevard between Century Park East and the first driveway on the north side of the street. Constellation Boulevard is a minor 4-lane east/west collector street median traversing a distance of approximately 0.4 miles between Century Park West and Century Park East that is classified in the Transportation Element of the City of Los Angeles General Plan as a Divided Secondary Highway. Within the study area, Constellation Boulevard has two travel lanes in each direction with painted two-way left-turn lanes and primarily provides a means of access to the properties located along its length. The closure of this short section of the noncontiguous Constellation Boulevard will be in place for approximately six months and will not block any building or driveway entrances.

Therefore, a hybrid of construction staging scenarios will be implemented with the station entrance location from Scenario A and staging areas from Scenario B.

Figure 2-1. Century City Constellation Station Construction Staging and Laydown Areas



2. Installation of a new tunnel access shaft and conveyor in Area 2

Since the majority of Area 1 will no longer be available for construction staging and removal of excavated materials, a temporary vertical access shaft, up to 80 feet in diameter will be constructed in Area 2 to provide access to the tunnel heading for workers and materials and to remove excavated material from the tunnel. The placement of a vertical access shaft in Area 2 was not included as part of a construction staging scenario presented in the EIS/EIR. The vertical access shaft will include three phases: construction of the shaft; operations conducted through the shaft including mucking, concrete work, and rail welding; and backfill of the shaft. Construction staging activities in Area 2 will occur for approximately seven years.

Because Areas 2 and 3 are not adjacent to each other, excavated material will likely be moved between the tunnel access shaft in Area 2 and staging area in Area 3 via an enclosed conveyor system. The conveyer will be in operation for approximately three years and located along a new temporary easement to be acquired by Metro. Should a slurry TBM be used, the conveyance system will carry the slurry feed and discharge pipes from the tunnel access shaft to a slurry separation plant in Area 3. There are three proposed location options for the conveyor system, with the final location to be determined after negotiations with the property owner:

I. The first option aligns the conveyor system from the vertical access shaft in Area 2 and travels approximately 400 feet along the east side of the AT&T building parking structure at 2010 Century Park East to Area 3. The conveyor would span the top of the parking structure. In addition to the conveyor, temporary pipe racks carrying utility lines, water, grout, foam, compressed air, etc. would also be installed over the top of the parking structure.

II. The second option is also located along the east side of the AT&T building at 2010 Century Park East. With this option the parking structure would be demolished and the conveyor system would be placed at ground level for approximately 400 feet from the tunnel shaft to Area 3. The parking structure is structurally unsound and only partially used now. Should AT&T agree to remove the parking structure, the enclosed conveyor system would be placed at ground level between Areas 2 and 3. Removal of the parking structure would also allow for additional area behind the AT&T building to be used for construction staging and laydown activities and for movement of materials and equipment between Areas 2 and 3. In addition, the area immediately adjacent to the east side of the building will be available for use as parking for employees of the AT&T facility.

III. The third option would place the conveyor system along the west side of the AT&T building in a materials handling corridor. This option would only be used if an easement along the east side of the AT&T building is not feasible. The corridor would extend from staging Area 2 to Area 3, a distance of approximately 400 feet, with a width encompassing one northbound traffic lane and sidewalk in the public right-of-way along the eastern side of Century Park East, and the space between the AT&T building and the eastern edge of the sidewalk. The corridor would be separated from traffic on Century Park East by K-Rail dividers plus fencing with fabric sight screening. Materials handling equipment would travel on the closed street lane. The enclosed conveyor would be elevated such that traffic entering the AT&T facility could pass beneath the conveyor structure. Access to the AT&T building and their facilities will be maintained through the period of use, which is approximately five years. The materials handling corridor along Century Park East would require the temporary relocation of one bus stop serving the Metro 28 line and LADOT Commuter Express line 534.

3. Operation of inpatient long-term rehabilitation facility adjacent to construction staging Area 3

Immediately south of staging Area 3, a former physician-run hospital at 2080 Century Park East that has been closed since 2008 is being remodeled to become a new inpatient rehabilitation facility with a tentative opening date of March 2016. The nine story rehabilitation facility was not in operation at the time of the EIR, therefore the analysis of the adjacent construction staging area did not assess potential noise, air quality, dust, light, and visual impacts to an inpatient medical facility. The 138 bed facility will provide inpatient rehabilitation services. Adjacent to the building, construction staging Area 3 will primarily be used for the temporary storage of excavated material which will then be hauled away for off-site disposal. Area 3 will also be used for storage of materials and equipment required for tunnel and station construction, and for the design/build contractor's office, maintenance shops, and parking. There is no change to the truck haul routes to be used for construction of the Century City Constellation Station identified in the EIS/EIR. Construction related activities will be in operation at this site for approximately seven years.

4. Use of existing Metro bus layover area for construction material storage

In addition to the Century Park East sites identified in the EIR, a material storage area will be placed at the existing 0.3 acre Metro bus layover site on the southeast corner of Century Park West and Constellation Boulevard (Area 5). The property owner also uses the site for a fuel cell installation to generate electricity. Access to the fuel cell installation will be maintained during the entire time the site is used by Metro. There will be no ground disturbing activity at the site other than for the installation and removal of soundwalls, and for removal and restoration of curbs and landscaping. Following construction of the station, the site will be returned to its current use as a Metro bus layover facility. The site will be used approximately seven years for storage of construction ma

5. Temporary bus layover on Santa Monica Boulevard

Due to the use of the existing Metro bus layover site (Area 5), a new temporary bus layover approximately 250 feet long and 12 feet wide providing parking for up to five buses, will be constructed in the median of Santa Monica Boulevard between Avenue of the Stars and Century Park East. Also included will be restroom facilities for Metro bus operators. The layover zone will be located in the landscaped median between the eastbound lanes of Santa Monica Boulevard and a dedicated bus lane, and will be in use for approximately seven years.

6. Westfield Mall Station Entrance

A potential second station entrance is under consideration at the Westfield Century City Mall. A knockout panel will be included in the northwest corner of the station box which will allow the Westfield Mall to connect directly to the Constellation Station if desired. In addition, Metro is currently in discussions with the property owners regarding the placement of the station appendages (exhaust and vent shafts) within the Westfield Mall property.

7. Elimination of train cross-over at Wilshire/Rodeo Station.

After an operational analysis was performed to verify that the train cross-over east of the Wilshire/Rodeo Station could be eliminated while still maintaining operational requirements for the Westside Subway Extension Project, Section 2, the Metro Board, at its September 2014 Board meeting approved the elimination of the cross-over. This action will result in significant shortening of the underground station, thus reducing construction costs and impacts to traffic and disruption to the surrounding streets and businesses.

3.0 CONSTRUCTION ASSESSMENTS

3.1 Existing with Project

An assessment of the air quality construction impacts was conducted. The assessment utilized CARB's EMFAC2011 mobile source emission factors, and the SCAQMD OFFROAD emission factors. SCAQMD OFFROAD was used to develop emission factors from off-road construction equipment. Using these various data sources, daily construction emission levels were developed. These values were compared to the air quality construction significance thresholds shown in Table 3-1 to determine if the project would meet or exceed these values. As the construction schedule is still preliminary at this time, construction emissions were estimated for each major activity.

Table 3-1: SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds[1]		
Pollutant	Construction[2]	Operation[3]
Nitrogen Oxides (NOx)	100 lbs/day	55 lbs/day
Volatile Organic Compounds (VOC)	75 lbs/day	55 lbs/day
Respirable Particulate Matter (PM10)	150 lbs/day	150 lbs/day
Fine Particulate Matter (PM2.5)	55 lbs/day	55 lbs/day
Sulfur Oxides (SOx)	150 lbs/day	150 lbs/day
Carbon Monoxide (CO)	550 lbs/day	550 lbs/day
Lead (Pb)	3 lbs/day	3 lbs/day
Toxic Air Contaminants (TACs), Odor and GHG Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Hazard Index ≥ 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
GHG	10,000 MT/yr CO2eq for industrial facilities	
Ambient Air Quality for Criteria Pollutants[4]		
NO2 1-hour average annual average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (state) 0.03 ppm (state) and 0.0534 ppm (federal)	
PM10 24-hour average annual average	10.4 µg/m3 (construction)[5] & 2.5 µg/m3 (operation) 1.0 µg/m3	
PM2.5 24-hour average	10.4 µg/m3 (construction)[5] & 2.5 µg/m3 (operation)	
SO2 1-hour average 24-hour average	0.25 ppm (state) & 0.075 ppm (federal-99th percentile) 0.04 ppm (state)	
Sulfate 24-hour average	25 µg/m3 (state)	
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)	
Lead 30-day average Rolling 3-month average	1.5 µg/m3 (state) 0.15 µg/m3 (federal)	

SCAQMD, March 2015, http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2
[1]*Source: SCAQMD CEQA Handbook (SCAQMD, 1993).*
[2]Construction thresholds apply to both the South Coast Air Basin and Coachella Valley (Salton Sea and Mojave Desert Air Basins).
[3]For Coachella Valley, the mass daily thresholds for operation are the same as the construction thresholds.
[4]Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
[5]Ambient air quality threshold based on SCAQMD Rule 403.
KEY: lbs/day = pounds per day; ppm = parts per million; µg/m3 = microgram per cubic meter; ≥ = greater than or equal to; MT/yr CO2eq = metric tons per year of CO2 equivalents

As shown in Table 3-2, for the Century City Constellation Station, SCAQMD thresholds would be exceeded for PM_{10}.

Table 3-2: Estimated Highest Daily Construction Impacts for Century City Constellation Station Construction (lbs/day) – Prior to Mitigation

Activity	VOC	CO	NOx	PM_{10}	$PM_{2.5}$
Construction Equipment	10	50	65	3	3
Dust Generated from Dirt Handling (Excavation, Backfilling, etc.)				158	33
Mobile Sources (Deliveries, worker trips, hauling of material, etc.)	2	16	33	2	1
Highest Daily Total*	11	67	98	163	37
SCAQMD Thresholds	**75**	**550**	**100**	**150**	**55**

Note: Because the maximum daily emissions from construction equipment, dust generation, and mobile sources do not occur on the same day, the highest daily totals (which are presented) are less than the sum of the individual source maximums.

3.2 Mitigation Measures

To reduce air quality impacts related to construction activities, the following mitigation measures are recommended to be implemented. All of these mitigations were included in the Final EIS/EIR, published in March 2012 and are included in the Mitigation Monitoring and Reporting Plan.

CON-6—Meet Mine Safety (MSHA) Standards

Tunnel locomotives (hauling spoils and other equipment to the tunnel heading) will be approved by Metro to meet MSHA standards.

CON-7—Meet SCAQMD Standards

Metro and its contractors will set and maintain work equipment and standards to meet SCAQMD standards, including NOx.

CON-8—Monitoring and Recording of Air Quality at Worksites

Monitoring and recording of air quality at the worksites will be conducted. In areas of gassy soil conditions, air quality will be continuously monitored and recorded. Construction will be altered as required to maintain a safe working atmosphere. The working environment will be kept in compliance with federal, state, and local regulations, including SCAQMD and Cal/OSHA standards.

CON-9—No Idling of Heavy Equipment

Metro specifications will require that contractors not unnecessarily idle heavy equipment.

CON-10—Maintenance of Construction Equipment

Metro will require its contractors to maintain and tune engines per manufacturer's specifications to perform at EPA certification levels, where applicable, and to perform at verified standards applicable to retrofit technologies. Metro will also require periodic,

unscheduled inspections to limit unnecessary idling and to ensure that construction equipment is properly maintained, tuned, and modified consistent with established specifications.

CON-11—Prohibit Tampering of Equipment

Metro will prohibit its contractors from tampering with engines and require continuing adherence to manufacturer's recommendations.

CON-12—Use of Best Available Emissions Control Technologies

Metro will encourage its contractors to lease new, clean equipment meeting the most stringent of applicable federal or state standards (e.g., Tier 3 or greater engine standards) or best available emissions control technologies on all equipment.

CON-13—Placement of Construction Equipment

Construction equipment and staging zones will be located away from sensitive receptors and fresh air intakes to buildings and air conditioners.

CON-14—Measures to Reduce the Predicted PM10 Levels

Mitigation measures such as watering, the use of soil stabilizers, etc. will be applied to reduce the predicted PM_{10} levels to below the SCAQMD daily construction threshold levels. A watering schedule will be established to prevent soil stockpiles from drying out.

CON-15—Reduce Street Debris

At truck exit areas, wheel washing equipment will be installed to prevent soil from being tracked onto city streets, and followed by street sweeping as required to clean streets.

CON-16—Dust Control During Transport

Trucks will be covered to control dust during transport of spoils.

CON-17—Fugitive Dust Control

To control fugitive dust, wind fencing and phase grading operations, where appropriate, will be implemented along with the use of water trucks for stabilization of surfaces under windy conditions.

CON-18—Street Watering

Surrounding streets at construction sites will be watered by trucks as needed to eliminate air-borne dust. In keeping with Metro's prior policy on the Eastside Gold Line, the contractor will water streets in the station area impacted by dust not less than once a day and more often if needed.

CON-19—Spillage Prevention for Non-Earthmoving Equipment

Provisions will be made to prevent spillage when hauling materials and operating non-earthmoving equipment. Additionally, speed will be limited to 15 mph for these activities at construction sites.

CON-20—Spillage Prevention for Earthmoving Equipment

Provisions will be made to prevent spillage when hauling materials and operating earth-moving equipment. Additionally, speed will be limited to 10 mph for these activities at construction sites.

CON-21—Additional Controls to Reduce Emissions

EPA-registered particulate traps and other appropriate controls will be used where suitable to reduce emissions of particulate matter and other pollutants at the construction site.

3.3 Impacts Remaining After Mitigation

With the implementation of the mitigation measures listed above in Section 3.2, PM_{10} and $PM_{2.5}$ will be reduced, and SCAQMD thresholds would not be exceeded for any pollutant.

Table 3-3. Estimated Highest Daily Construction Impacts for Century City Constellation Station Construction (lbs/day) – After Mitigation

Activity	VOC	CO	NOx	PM_{10}	$PM_{2.5}$
Construction Equipment	10	50	65	3	3
Dust Generated from Dirt Handling (Excavation, Backfilling, etc.)				26	5
Mobile Sources (Deliveries, worker trips, hauling of material, etc.)	2	16	33	2	1
Highest Daily Total*	11	67	98	31	9
SCAQMD Thresholds	**75**	**550**	**100**	**150**	**55**

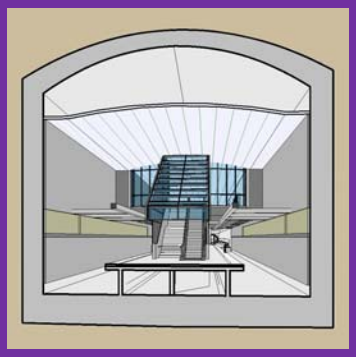
Note: Because the maximum daily emissions from construction equipment, dust generation, and mobile sources do not occur on the same day, the highest daily totals (which are presented) are less than the sum of the individual source maximums.

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

WESTSIDE PURPLE LINE EXTENSION PROJECT, SECTION 2

ADVANCED PRELIMINARY ENGINEERING

Contract No. PS-4350-2000


Section 2 Construction Noise/ Vibration Mitigation and Monitoring Plan (Draft)

Prepared for:

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October 8, 2015

Table of Contents

List of Figures

List of Tables

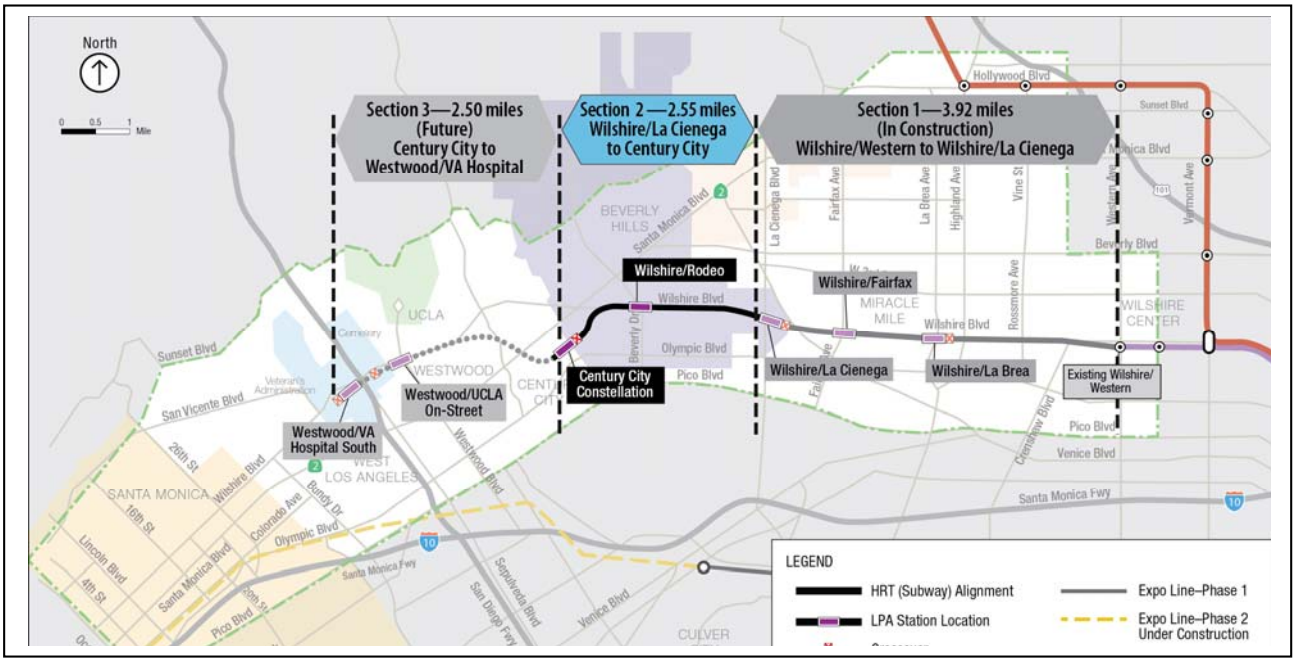
List of Appendices

1.0 INTRODUCTION

The Westside Subway Extension Project is located in western Los Angeles County, and will extend the heavy rail Metro Purple Line subway line westward from the existing Wilshire/Western station to the Veterans Administration (VA) Hospital in Westwood. The subway lies within the Cities of Los Angeles and Beverly Hills, and a part of unincorporated Los Angeles County in the vicinity of the Federal Building and the Veterans Administration Hospital area.

The project consists of approximately nine miles of twin bore tunnels, seven underground stations, and modifications to the existing Division 20 rail vehicle storage and maintenance facility. The project will be constructed in three sections which are shown in Figure 1-1 and with further contracts for modifications to the Division 20 Maintenance Yard.

Figure 1-1: Project Sections



A design / build contract for Section 1 was awarded on November 5, 2014 and Notice to Proceed issued on January 12, 2015. Section 2 received Entry into Engineering from the FTA on December 31, 2014. Advanced Preliminary Engineering for Section 2 is now underway with the goal of issuing a Request for Proposals in late 2015.

The Westside Subway Extension Section 2 Project (the Project) involves construction activities which generate high noise and vibration levels. This Construction Noise and Vibration Plan (the Plan) discloses the predicted noise and vibration effects of construction activities related to the Project based on possible construction methods, though the actual means and methods employed during construction will be determined by the construction contractors and may differ from those described in this document.

This Plan outlines the potential noise and vibration effects of constructing Section 2, a 2.55 mile section with two stations at Wilshire/ Rodeo and Century City on Constellation Blvd. It describes possible construction methods, though the actual means and methods employed during construction will be determined by the construction contractors and may differ from those outlined in this document.

The Plan was prepared to meet the criteria, standards, and mitigation commitments in the Westside Subway Extension Final Environmental Impact Statement/ Environmental Impact Report (EIS/EIR), March 2012. The Plan identifies receivers where noise or vibration impact may occur as a result of construction activities, provides additional information on the noise and vibration limits for the planned means and methods of construction, and recommends mitigation measures and monitoring locations where necessary.

2.0 CONSTRUCTION ACTIVITIES

The Project's plans call for lay down and staging areas to support the station construction and tunneling activities. Site plans and more detailed descriptions of the activities to be conducted at each laydown site can be found in the Westside Purple Line Extension - Section 2 Construction Approach (June 2015). A brief description of each construction area and the noise and vibration generating construction activities modeled in this Plan follow below. The location of the construction areas discussed below are shown in Figure 2-3 and Figure 2-4.

2.1 Wilshire/Rodeo

A station box will be constructed below Wilshire Boulevard between S. Crescent Drive and S. Beverly Drive as shown on Figure 2-3. The lay down and staging areas supporting the construction of the Wilshire/Rodeo Station are:

Wilshire/Rodeo Station Box: Construction of the Wilshire/Rodeo Station box includes installation of piling and lagging, excavation below street level and installation of main deck beams and street decking. The installation of the main deck beams and street decking occurs over the 56 hour weekend closure (16 weekend closures). The remaining excavation is done under the street decking system. Spoils are hoisted to the surface by crane and temporarily stockpiled in the adjacent laydown and staging areas. The spoils are then loaded onto trucks for transportation to a disposal site. Once excavation is complete, station concreting occurs which includes concreting of station appendages and entrance structure. Concreting is followed backfilling and compaction of the station, appendages and entrance structure. Concurrent with the backfilling and compaction operation is installation of station mechanical and electrical in the various ancillary spaces/rooms and the entrance structure. Station finishes follows including those in the station entrance. Concurrent with the installation of the station finishes, site restoration occurs including AC pavement, concrete sidewalks, curbs, gutters, street lighting, signal systems, landscaping, signing, pavement striping and installation of street furniture.

Wilshire South Staging Area (Site 9447 Wilshire Blvd): This site is utilized for materials staging to support construction of Rodeo Station. The site includes an open shaft which allows access to the main station box, storage containers, air scrubbers and a water treatment plant. This staging area is shown on Figure 2-1 labeled as Parcel 4. This staging site will be used during station excavation to stockpile, load and haul-out excavated materials.

Wilshire North Staging Area (Site 9384 thru 9440 Wilshire Blvd): This site is utilized for muck handling for excavation down to 12' below street level. Once the main deck beams and street decking are in place, this site will revert over to support construction of Rodeo Station. The site includes an open shaft which allows access to the main station box, temporary power and a water treatment plant. This staging site will be used during station excavation to stockpile, loading and haul-out of excavated materials. This staging area is shown on Figure 2-1 labeled as Parcels 1, 2, and 3.

Figure 2-1: Lay down and Staging Areas at Wilshire/Rodeo Station

2.2 Century City/Constellation

A station box will be constructed below Constellation Boulevard between Century Park East and Solar Way (Figure 2-4). The lay down and staging areas supporting the construction of the Century City Station are:

Median of Constellation Boulevard: Main construction staging to support all construction operations necessary to construct Century City/Constellation station with the exception of installing main deck beams and street decking which occurs continuously over the 56 hour weekend closures (21 weekend closures). As there are no spoils storage areas available, all spoils are immediately loaded onto trucks and taken to disposal sites. This site is to be utilized for both day and night work shifts. This area is shown on Figure 2-2 labeled as Site 4.

Construction Site 1940 Century Park East (CPE): Primary use is to support tunneling operations for day and night shifts. This site also is to receive materials such as pre-cast concrete segments which constitute the tunnel lining. This site will also support the mining of cross-passages and concreting of tunnels and cross-passages, mechanical, electrical and finishes for day shifts. This area is shown on Figure 2-2 labeled as Site 2. Tunnel ventilation and air scrubbing equipment will be located on this site, together with a temporary substation providing power for tunneling equipment

Construction Site 1950 CPE: Access shaft to support tunneling operations for day and night shifts during tunneling. The access shaft facilitates removal of tunnel muck as well as for deliveries of precast segments to rail mounted cars below which will be taken to the TBM's rear trailing gear for installation as the tunnel liner. Other miscellaneous material appurtenances will also be delivered in this manner. This site also supports concreting of tunnels (invert & walkway) and cross-passages, mechanical, electrical and finishes for day shifts. This area is shown on Figure 2-2 labeled as Site 2. During construction of the access shaft, the site will also be used by excavating and hoisting equipment required for shaft construction. At the completion of tunnel construction, the shaft will be used to

support rail welding. Stock rail will be delivered to the site by trucks. The rail will be lowered down to track level through the shaft and placed in stockpiles. A portable rail welding plant will be set up at the bottom of the shaft to weld stock rail into continuous welded rail (CWR) strings approximately 500 ft long. The CWR strings will also be stockpiled within the tunnels

Construction Site 2040 CPE: Main construction staging site to support tunneling operations for day and night shifts during tunneling. This site also supports the drying and storage of tunnel muck until such time as it is loaded onto trucks and taken to disposal sites. This site houses the compressor plant, ventilation plant, grout plant, foam plant, conveyor system, machine shop and electrical shop. Upon completion of tunneling, this site reverts to daytime use to support concreting of tunnels and cross-passages, mechanical, electrical and finishes. This area is shown on Figure 2-2 labeled as Site 3.

Construction Site at Constellation Boulevard and Century Park West (Parcel W3901): Primary use of this site for miscellaneous tool storage as well as limited materials storage to support Century City/Constellation Station construction operations. This site is to be for both day and night work shifts. This area is shown on Figure 2-2 labeled as Site 5.

Once tunnels have been completed, the tunneling operation will demobilize, thereby leaving construction sites 1940 CPE, 1950 CPE, and 2040 CPE to support construction of the Century City/Constellation Station and Systems installation (Trackwork, Traction Power, Automatic Train Control and Communications).

Figure 2-2: Lay down and Staging Areas at Century City/Constellation Station

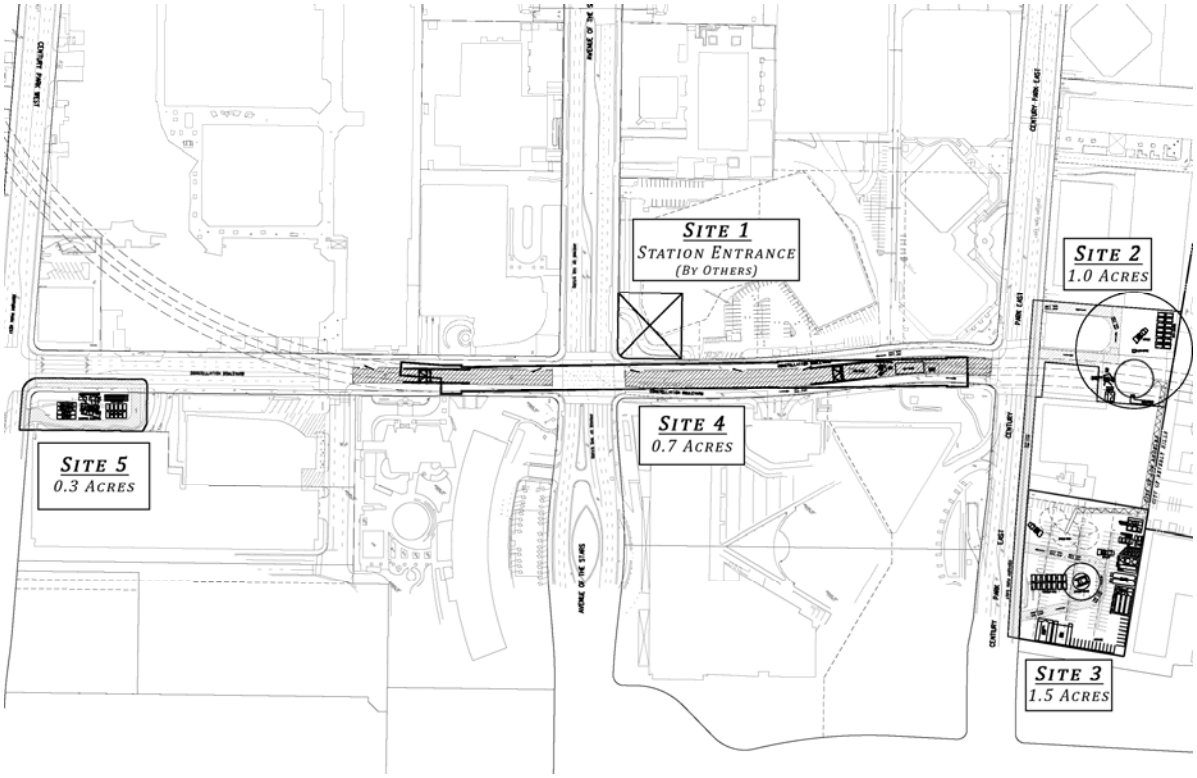


Figure 2-3: Wilshire/Rodeo Station Construction Sites and Noise Receivers

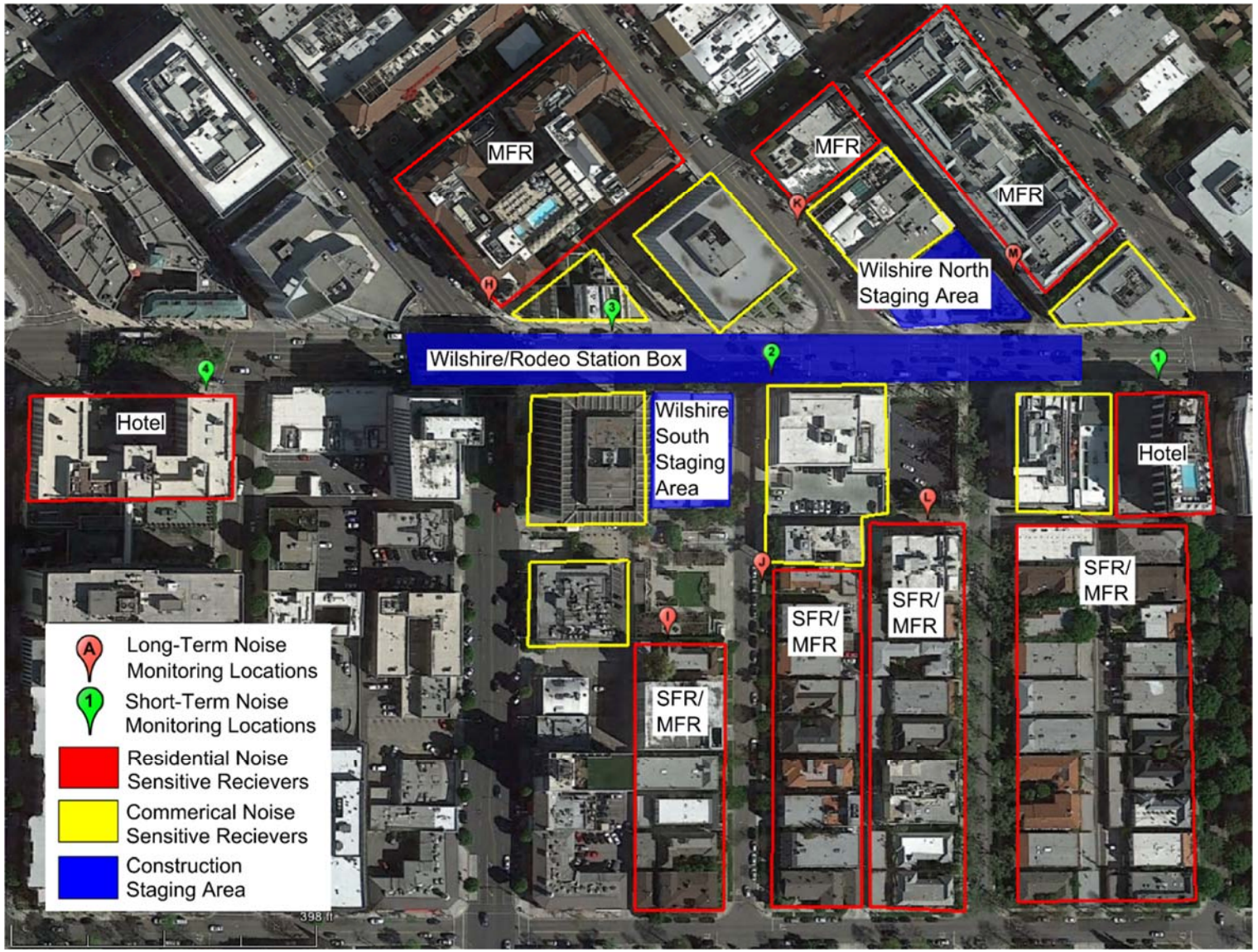
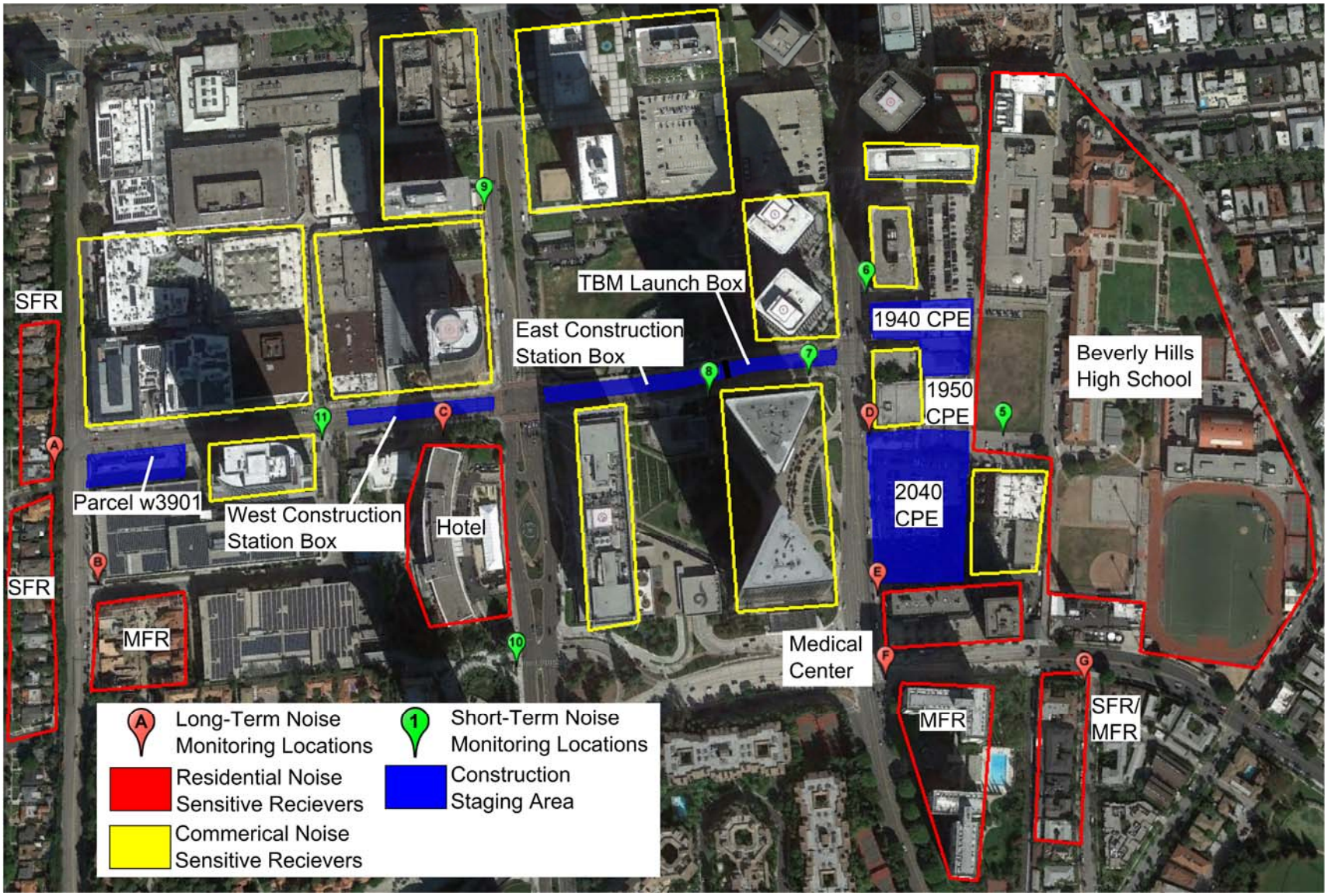


Figure 2-4: Century City/Constellation Station Construction Sites and Noise Receivers



3.0 PRE-CONSTRUCTION NOISE MEASUREMENTS

Existing noise conditions were documented at sensitive receivers closest to the construction areas to determine the baseline ambient noise levels before construction activities. The location of the noise sensitive receivers are shown on Figure 2-3 and Figure 2-4. These existing noise measurements are used as the basis for:

- A noise variance from the City of Los Angeles for construction during the nighttime hours 9:00 P.M. to 7:00 A.M.
- A noise variance from the City of Beverly Hills for construction during the evening hours of 6:00 P.M. to 9:00 P.M. and nighttime hours of 9:00 P.M. to 8:00 A.M.
- Establish City of Beverly Hills daytime construction noise limits during the hours of 8:00 A.M. to 6:00 P.M.

Existing daytime noise, from 7:00 A.M. to 9:00 P.M., at receivers in the City of Los Angeles was not measured because the City has a construction noise limit of 75 dBA for these hours.

The results of the noise measurements are presented in Table 3-1 and Table 3-2. The table presents the average of the measured daytime, evening, and nighttime noise levels (Leq) for receivers in the jurisdiction of the City of Beverly Hills and the nighttime Leq, for receivers within the jurisdiction of the City of Los Angeles. Detailed measurement results are presented in Appendix B.

Table 3-1: Pre-Construction Noise Measurement Results Wilshire/Rode Station

Site No.	Measurement Location	Daytime Leq[b]	Evening Leq[b]	Nighttime Leq[b]
H	210 N. Beverly Drive (MFR)	72 dBA	70 dBA	69 dBA
I	133-153 S. Reeves Drive (SFR/MFR)	59 dBA	56 dBA	54 dBA
J	Sitaj Hotel, 120 S. Reeves Drive	58 dBA	56 dBA	52 dBA
K	192 N. Canon Drive (Offices)	68 dBA	65 dBA	65 dBA
L	121-157 S. Canon Drive (SFR/MFR)	61 dBA	61 dBA	57 dBA
M	AKA Beverly Hills Hotel, 155 N. Crescent Drive	62 dBA	60 dBA	62 dBA
1	Beverly Sixty Hotel, 9360 Wilshire Boulevard[a]	76 dBA	74 dBA	72 dBA
2	The Rolex Building, 9420 Wilshire Boulevard (Offices) [a]	74 dBA	72 dBA	70 dBA
3	Sterling Plaza/Bank of California, 9441 Wilshire Boulevard (Offices) [a]	74 dBA	72 dBA	71 dBA
4	Beverly Wilshire Hotel, 9500 Wilshire Boulevard[a]	73 dBA	72 dBA	70 dBA

Notes:
[a] 1-hour measurements were taken at Sites 1 through 4. The daytime Leq, evening Leq, and nighttime Leq were estimated by comparing the 1-hour measurement to the same hour of the nearest 24-hour measurement location.
[b] Daytime is from 8:00 A.M. to 6:00 P.M., evening is from 6:00 P.M. to 9:00 P.M. and nighttime is from 9:00 P.M. to 8:00 A.M.,
MFR – Multi-Family Residences
SFR – Single-Family Residences

Table 3-2: Pre-Construction Noise Measurement Results Century City/Constellation Station

Site No.	Measurement Location	Nighttime Leq[b]		
A	1918-1952 Fox Hills Drive (MFR)	58 dBA		
B	2050 Century Park West (MFR)	59 dBA		
C	Hyatt Regency Century Plaza Hotel, 2025 Avenue of the Stars	56 dBA		
D	2010 Century Park East (Offices)	63 dBA		
E	Century City Hospital & Medical Center, 2080 Century Park East	63 dBA		
F	2160 Century Park East (MFR)	65 dBA		
6	1888 Century Park East (Offices)[a]	63 dBA		
7	Century Plaza Towers, 2049 Century Park East (Offices)[a]	59 dBA		
8	Annenberg Space for Photography and the Skylight Studios, 10050 Constellation Boulevard[a]	56 dBA		
9	Bain & Company Building, 1901 Avenue of the Stars[a]	61 dBA		
10	The Century, 10 West Century Drive (Offices)[a]	57 dBA		
11	Constellation Place, 10250 Constellation Boulevard (Offices)[a]	64 dBA		
Sites G and 5 are in the City of Beverly Hills and subject to the Beverly Hills' Noise Code				
		Daytime	Evening	Nighttime
G	401 Shirley Place, Beverly Hills (SFR)	68 dBA	68 dBA	63 dBA
5	Beverly Hills High School[a]	56 dBA	53 dBA	51 dBA

Notes:
[a] 1-hour measurements were taken at Sites 5 through 11. At these locations the daytime Leq, evening Leq, and nighttime Leq were estimated by comparing the 1-hour measurement to the same hour of the nearest 24-hour measurement location.
[b] Nighttime is from 9:00 P.M. to 7:00 A.M as defined by the City of Los Angles Municipal Code.
MFR – Multi-Family Residences
SFR – Single-Family Residences

4.0 CONSTRUCTION NOISE LIMITS

The Project is subject to the local noise limits set forth in the City of Los Angeles Municipal Code (LAMC) and the City of Beverly Hills Municipal Code (BHMC). The Wilshire/Rodeo construction areas are located in the City of Beverly Hills and are subject to the BHMC. The Century City/Constellation construction areas are in the City of Los Angeles and are subject to the LAMC. The exception are those noise sensitive receivers within the City of Beverly Hills limits are affected by the activities at Century City/Constellation construction sites on Century Park East. These receivers, single-family residences on Shirley Place (Site G) and Beverly Hills High School (Site 5) are subject to the BHMC.

4.1 City of Los Angeles Noise Limits

Section 112.05 of the LAMC sets a maximum noise level for powered equipment of 75 dBA at a distance of 50 feet when operated within 500 feet of a residential zone. However, compliance with this standard is not required where “technically infeasible”. Technically infeasible means that the established noise limits cannot be met with at the project site despite the use of mufflers, shields, sound barriers, and/or other noise reduction devices or techniques employed during the operation of equipment.

Section 111.02 of the LAMC provides procedures and criteria for the measurement and impact assessment of noise sources. Specifically, the procedures provide for a penalty of 5 dBA for steady high-pitched noise or repeated impulsive noises. Conversely, the procedures provide a credit of 5 dBA for noise occurring less than 15 minutes in a period of 60 consecutive minutes during the day because short-term noise events are typically less annoying than continuous noise sources.

The LAMC also restricts the hours of construction activities. Section 41.40 prohibits construction between the hours of 9:00 P.M. and 7:00 A.M. Monday through Friday, 6:00 P.M and 8:00 A.M on Saturday, and at any time on Sunday. Construction during nighttime hours or on Sunday requires a noise variance. If a noise variance is obtained, construction can be conducted during nighttime hours with a noise limit of 5 decibels above the measured ambient.

Pre-construction noise measurements were conducted at the sensitive receivers adjacent to the construction areas to determine the pre-construction ambient noise levels and nighttime construction noise limits. The noise measurement results are presented in Section 0. More detailed information on the ambient measurement results are shown in Appendix B.

4.2 City of Beverly Hills Noise Limits

Section 5-1-202 of the BHMC limits the noise level of any machinery, equipment, pump, fan, air conditioning apparatus, or similar mechanical device in any manner so as to create any noise which would cause the noise level at the property line of any property to exceed the ambient noise level by more than five decibels.

Section 5-1-205 of the BHMC restricts the hours of construction activity during the hours of 6:00 P.M. and 8:00 A.M. of any day or at any time on a Sunday or public holiday. The Project may be granted an afterhours construction permit authorizing work during restricted hours if the city building official determines that the public interest will be served by such a permit.

The BHMC does not mention the nighttime noise limit that is applied if a nighttime noise permit is obtained. In this Plan, we assume that the nighttime noise limit will be five decibels above the ambient

noise level. This is consistent with the limit applied during the nighttime hours in the City of Los Angeles and with the limit applied during the daytime in the city of Beverly Hills.

4.3 Summary of Noise Limits

A summary of the noise limits is presented in Table 4-1. The table presents the different noise limits for City of Los Angeles and the City of Beverly Hills. Additionally, there are different limits for different times of day. For the noise impact analysis in this Plan, the limits are applied at the facade of the nearest sensitive receivers. Residential land uses (where people sleep) or institutional land uses such as theatres, churches, or schools are considered to be sensitive receivers. Commercial and industrial land uses are not considered sensitive and are not assessed for impact in this Plan.

Table 4-1: Summary of Construction Noise Limits

Construction Activity	Noise Limit[1], dBA
City of Los Angeles Daytime (7:00 A.M.-9:00 P.M.), general activities	75 dBA
City of Los Angeles Daytime (7:00 A.M.-9:00 P.M.), steady high-pitch noise or repeated impulsive noises	70 dBA
City of Los Angeles Daytime (7:00 A.M.-9:00 P.M.), less than 15 minute duration in a period of 60 consecutive minutes	80 dBA
City of Los Angeles Nighttime (9:00 P.M.-7:00 A.M.), all activities	Nighttime Ambient + 5dB
City of Beverly Hills Daytime (8:00 A.M.-6:00 P.M.), all activities	Daytime Ambient +5 dB
City of Beverly Hills Evening (6:00 P.M.-9:00 P.M.), all activities	Evening Ambient + 5dB
City of Beverly Hills Nighttime (9:00 P.M.-8:00 A.M.), all activities	Nighttime Ambient + 5 dB

Notes:
[1]Noise limit applies to the facade of the closest noise sensitive property.

5.0 CONSTRUCTION VIBRATION LIMITS

The primary concern regarding construction vibration relates to risk of damage. Vibration is generally assessed in terms of peak particle velocity (PPV) for risk of building damage. PPV is the appropriate metric for evaluating the potential of building damage and is often used when monitoring blasting and construction vibration because it relates to the stresses that are experienced by the buildings.

Vibration damage risk thresholds from the Westside Subway Extension Final EIS/EIR are presented in Table 5-1. The table presents PPV thresholds for different building categories. The 'Structural Building Damage' category is the level above which there is a risk that structural damage may occur. The 'Architectural Building Damage' category is the level above which there is a risk that superficial building damage, such as small cracks, may occur. The third category, 'Damage Risk to Historic Buildings and Cultural Resource Structures' is meant to apply to historic buildings that are particularly susceptible to damage. In this Plan, we use the 'Architectural Building Damage' threshold of 0.5 PPV for all non-historic structures. Where the PPV exceeds 0.5, monitoring or other appropriate mitigation measures such as using alternative construction approaches, are considered.

Table 5-1: Construction Vibration Damage Risk Thresholds

Building Category	Peak Particle Velocity (in/sec)
Structural Building Damage	2.0
Architectural Building Damage	0.5
Damage Risk to Historic Buildings and Cultural Resource Structures	0.12 to 0.2
Source: Westside Subway Extension Final EIS/EIR, LAMTA, March 2012.	

A survey of the cultural resources and historic properties within the project area were completed as part of the EIS/EIR.

Table 5-2 lists the properties identified in the survey which are eligible for the National Register of Historic Places (NRHP) and the California Register of Historic Places (CHRP) and are within 500 feet of any of the construction laydown areas or other major construction activities. Based the existing condition of the properties identified as historic these building will be assessed with the upper limit of the damage risk threshold of 0.2 PPV in/sec in this Plan. This is a conservative threshold to prevent any architectural damage to the buildings.

Table 5-2: Properties Listed and Eligible as NRHP

Property	Status
Sterling Plaza/Bank of California, 9441 Wilshire Boulevard	Potentially Eligible NRHP, CRHP
Ace Gallery, 9430 Wilshire Boulevard	Potentially Eligible NRHP, CRHP
Union Bank Building, 9460 Wilshire Boulevard	Potentially Eligible NRHP, CRHP
Beverly Hills High School	Potentially Eligible NRHP, CRHP
Century Plaza Hotel, 2025 Avenue of the Stars	Potentially Eligible NRHP, CRHP
Source: Historic Properties Supplemental Survey Technical Report, LAMTA, March 2012.	

5.1 Groundborne Noise

During tunnel excavation the operation of the tunnel train will result in groundborne noise levels that could affect receivers above the tunnel such as residences, hotels, theaters, churches, and schools. Metro has adopted a groundborne noise criteria for tunneling that is based on adding 5 dB to the FTA groundborne noise criteria. Table 5-3 lists the criteria which are also included in Metros' Contract Specification Section 01565, Construction Noise and Vibration Control, which will be included as part of the contract documents for this Project.

Table 5-3: Allowable Maximum Interior Groundborne Noise from Underground Construction Activities (Lmax)

Land Use Activity	Groundborne Noise Level Limits – L_{max} (dBA)
Single-Family Dwellings	40
Multi-Family Dwellings	45
Hotel/Motel	45
Offices	50
Commercial Buildings	55
Concert Halls, Recording and TV Studios	30
Auditoriums and Music Rooms	35
Churches and Theaters	40
Hospital Sleeping Rooms	45
Schools and Libraries	50
Note: Maximum ground borne noise is as measured in the inside of the affected noise sensitive structure.	

6.0 CONSTRUCTION NOISE PREDICTIONS

6.1 Noise Prediction Methodology

The projected daytime and nighttime construction noise levels were modeled using CadnaA version 4.0, a three dimensional graphics oriented noise modeling program that uses the International Standards Organization (ISO)9613, a general purpose standard for outdoor noise propagation. CadnaA incorporates the following elements:

- An emission model to determine the noise generated by the equipment at a reference distance.
- A propagation model that calculates how the noise level varies with distance.
- A prediction model that sums the noise of each source at sensitive locations.

The noise modeling includes the effects of ground cover, the shielding of building structures, and the reduction provided by a noise barrier wall (if one is specified in the construction plans). The construction noise levels were estimated at each of the receivers within close proximity to the construction sites. The source noise levels used in the model for different pieces of construction equipment are based on the actual measured noise level data presented in Table 6-1. This data is from the Federal Highway Administration (FHWA) Roadway Construction Noise Model.

6.2 Noise Prediction Results and Impact Assessment

Noise prediction models were developed for each construction site based on the project plan drawings and the current means and methods planned for the construction phases. Each of the construction sites where nighttime activities will occur are assumed to have a noise barrier wall of different heights erected around the perimeter of each site and construction at that site would use low noise emission equipment as specified by Metro's Specification Section 01 56 19, Construction Noise and Vibration Control (Appendix C). The following sections present predictions of noise levels at sensitive receivers in the vicinity of the laydown areas and other areas where construction activity is scheduled to take place. The hourly noise levels from the proposed construction activities (Leq) and the applicable noise limits at the nearest receivers are presented in Table 6-2 and Table 6-3.

6.2.1 Wilshire/Rodeo Station

Activities at the Wilshire/Rodeo site consist of construction of the station box and support of underground mining activities. There are three construction areas, all of which, will support construction activities during nighttime hours from 6:00 P.M. to 8:00 A.M. During these nighttime hours the following equipment is expected to be used at each of these areas:

- Wilshire/Rodeo Station Box Area: boom crane, rough terrain crane, fork lift truck, and a pickup truck.
- Wilshire South Staging Area: rough terrain crane, excavator, dump trucks, fork lift truck, and pickup truck.
- Wilshire North Staging Area: hydraulic crane, excavator, dump trucks, fork lift truck, and pickup truck.

Moveable noise barriers, as shown in Figure 9-3, shall be used to mitigate noise at surface work sites within the perimeter of the Wilshire/Rodeo Station Box Area. A 20 foot high noise barrier walls shall be constructed at the perimeters of the Wilshire South Staging Area and the Wilshire North Staging Area. The noise barrier walls will be constructed in accordance with Metro's Specification Section 01 56 19, Construction Noise and Vibration Control (Appendix C). Equipment used during nighttime hours at these construction areas shall comply with the low noise equipment emission limits also specified in Section 01 56 19. Wilshire/Rodeo noise receivers are presented below. The predicted construction noise at the nearby noise sensitive receivers to these construction areas during the daytime, evening, and nighttime hours compared with the BHMC noise levels limits of the existing ambient noise plus 5 dB are presented in Table 6-2. The predicted construction noise levels at all the receiver sites analyzed do not exceed the daytime, evening, or nighttime BHMC noise limits.

Table 6-1: Construction Equipment Noise Emission Levels

Equipment Description	Lmax Noise Limit at 50 ft, dB Slow	Is Equipment an Impact Device?
Auger Drill Rig	85 dBA	No
Backhoe	80 dBA	No
Boring Jack Power Unit	80 dBA	No
Chain Saw	85 dBA	No
Clam Shovel	93 dBA	Yes
Compactor (ground)	80 dBA	No
Compressor (air)	80 dBA	No
Concrete Mixer Truck	85 dBA	No
Concrete Pump Truck	82 dBA	No
Concrete Saw	90 dBA	No
Crane (mobile or stationary)	85 dBA	No
Dozer	85 dBA	No
Dump Truck	84 dBA	No
Excavator	85 dBA	No
Flat Bed Truck	84 dBA	No
Front End Loader	80 dBA	No
Generator (25 KVA or less)	70 dBA	No
Generator (more than 25 KVA)	82 dBA	No
Gradall	85 dBA	No
Horizontal Boring Hydraulic Jack	80 dBA	No
Impact Pile Driver (diesel or drop)	95 dBA	Yes
Jackhammer	85 dBA	Yes
Mounted Impact Hammer (hoe ram)	90 dBA	Yes
Paver	85 dBA	No
Pickup Truck	55 dBA	No
Pneumatic Tools	85 dBA	No
Pumps	77 dBA	No
Rock Drill	85 dBA	No
Scraper	85 dBA	No
Slurry Plant	78 dBA	No
Slurry Trenching Machine	82 dBA	No
Soil Mix Drill Rig	80 dBA	No
Tractor	84 dBA	No
Vacuum Excavator (Vac-Truck)	85 dBA	No
Vacuum Street Sweeper	80 dBA	No
Vibratory Concrete Mixer	80 dBA	No
Vibratory Pile Driver	95 dBA	No
Welder	73 dBA	No
Source: Federal Highway Administration (FHWA) Roadway Construction Noise Model, 2006		

Table 6-2: Wilshire/Rodeo Nighttime Construction Noise – Leq (dBA)

Receiver[1]	Location	Daytime Construction Noise	Daytime Noise Limit[2]	Evening Construction Noise	Evening Noise Limit	Nighttime Construction Noise	Nighttime Noise Limit
H	210 N. Beverly Drive (MFR)	69	77	54	75	54	74
I	133-153 S. Reeves Drive (SFR/MFR)	59	64	55	61	55	59
J	Sirtaj Hotel 120 S. Reeves Drive	60	63	57	61	57	57
K	192 N. Canon Drive (Offices)	64	73	54	70	54	70
L	121-157 S. Canon Drive (SFR/MFR)	63	66	52	66	52	62
M	AKA Beverly Hills Hotel, 155 N. Crescent Drive	62	67	59	65	59	67
1	Beverly Sixty Hotel, 9360 Wilshire Boulevard	65	81	54	79	54	77
2	The Rolex Building, 9420 Wilshire Boulevard (Offices)	70	79	62	77	62	75
3	Sterling Plaza/Bank of California, 9441 Wilshire Boulevard (Offices)	72	79	62	77	62	76
4	Beverly Wilshire Hotel, 9500 Wilshire Boulevard	63	78	52	77	52	75

Notes:
[1]The location of the modeled receiver is shown on Figure 2-3.

6.2.2 Century City/Constellation Station

Activities at the Century City/Constellation site consist of launching of the TBM, construction of the station box, removal of the tunnel spoils, and support of station and tunnel underground mining activities. There are five construction areas, all of which, will support construction activities during nighttime hours from 9:00 P.M. to 7:00 A.M for most of the noise receivers that are within the jurisdiction of the City of Los Angeles and 6:00 P.M. to 8:00 A.M. for those two receivers, Site G, SFR on Shirley Place and Site 5, Beverly Hills High School that are within the jurisdiction of the City of Beverly Hills. During these nighttime hours the following equipment is expected to be used at each of these areas:

- 2040 CPE Construction Area: front end loader, boom crane, haul trucks, ventilation plant, compressor plant, foam plant, conveyor system, mechanical shop, and electrical shop.
- 1940-1950 CPE Construction Area: excavator, roller compactor, dozer, tower crane, rough terrain crane, hydraulic crane, haul trucks, fork lift truck, conveyor system, concrete pump, dewatering station, pickup truck, tunnel ventilation fans and scrubbers.
- TBM Launch Site: dozer, excavator, front end loader, boom crane, rough terrain crane, concrete pump, fork lift truck, and pickup truck.
- Century City/Constellation Station Box: grader, roller compacter, dozer, excavator, front end loader, boom crane, rough terrain crane, concrete pump, haul trucks, fork lift truck, pickup truck, and ventilation fans.

- Construction Site at Constellation Boulevard and CPW (Parcel W3901): forklift and pickup truck.

A noise barrier wall shall be constructed at the perimeter of the following construction areas:

- 2040 CPE Construction Area - 20 foot high
- 1940-1950 CPE Construction Area - 20 foot high
- Construction Site at Constellation Boulevard and CPW (Parcel W3901) – 20 foot high

At the Century City/Constellation Station Box and the TBM Launch Site areas a moveable noise barrier, as shown in Figure 9-3, shall be used at the perimeter of the construction sites.

The noise barrier wall and moveable noise barrier shall be constructed in accordance with Metro's Specification Section 01 56 19, Construction Noise and Vibration Control (Appendix C). Equipment used during nighttime hours at these construction areas shall comply with the low noise equipment emission limits also specified in Section 01 56 19.

Table 6-3 presents the predicted construction noise during the daytime, evening, and nighttime hours for Receivers G and 5 which are in the City of Beverly Hills, compared with the BHMC noise levels limits of the existing ambient noise plus 5 dB. The remaining receiver sites which are within the City of Los Angeles are presented showing the predicted daytime construction noise is compared to the LAMC noise limit of 75 dBA and the nighttime construction noise to the existing ambient noise plus 5 dB.

As shown in Table 6-3, the daytime construction noise level at Site 5, Beverly Hills High School, would exceed the noise limit by 2 dB. At all the other sites analyzed the daytime noise limits are not exceeded. At Site C, Hyatt Regency Century Plaza Hotel, the nighttime noise limit is exceeded by 2 dB and At Site 5 the nighttime noise limit would be exceeded by 1 dB. At all the other sites analyzed the evening and nighttime noise limits are not exceeded.

At both the Century City Station Box and the 1940-1950 CPE Construction Area moveable noise barriers and/or sound control curtains located closer to the construction activities could be used to further reduce the construction noise at Sites C and 5 to below the noise limit.

The Contractor will be responsible for providing additional noise control measures and/or limiting the equipment and construction activities to be used at the Century City/Constellation Station Box Area to meet the LAMC nighttime noise limit at Site C and at the 1940-1950 CPE Construction Area to meet the BHMC daytime and nighttime noise limits at Site 5.

Table 6-3: Century City/Constellation Nighttime Construction Noise – Leq (dBA)

Receiver[1]	Location	Daytime Construction Noise	Daytime Noise Limit[2]	Evening Construction Noise	Evening Noise Limit[3]	Nighttime Construction Noise	Nighttime Noise Limit[4]
The following receivers are within the jurisdiction of the City of Beverly Hills							
G	401 Shirley Place (SFR)	45	73	40	73	40	68
5	Beverly Hills High School	63	61	57	58	57	56
The following receivers are within the jurisdiction of the City of Los Angles							
A	1918-1952 Fox Hills Drive (MFR)	54	75			50	63
B	2050 Century Park West (MFR)	42	75			38	64
C	Hyatt Regency Century Plaza Hotel, 2025 Avenue of the Stars	67	75			63	61
D	2010 Century Park East (Offices)	62	75			58	68
E[5]	Century City Hospital & Medical Center, 2080 Century Park East	67	75			54	68
F	2160 Century Park East (MFR)	52	75			41	70
6	1888 Century Park East (Offices)	63	75			50	68
7	Century Plaza Towers, 2049 Century Park East (Offices)	69	75			54	64
8	Annenberg Space for Photography and the Skylight Studios, 10050 Constellation Boulevard	66	75			54	61
9	Bain & Company Building, 1901 Avenue of the Stars	52	75			54	66
10	The Century, 10 West Century Drive (Offices)	57	75			54	62
11	Constellation Place, 10250 Constellation Boulevard (Offices)	58	75			54	69

Notes:
[1]The location of the modeled receiver is shown on Figure 2-4.
[2] Daytime is defined as 8:00 A.M. to 6:00 P.M. by the City of Beverly Hills and 7:00 A.M. to 9:00 P.M. by the City of Los Angeles.
[3] Evening is defined as 6:00 P.M. to 9:00 P.M. by the City of Beverly Hills. The City of Los Angeles municipal code does not include evening hour.
[4] Nighttime is defined as 9:00 P.M. to 8:00 A.M. by the City of Beverly Hills and 9:00 P.M to 7:00 A.M. by the City of Los Angeles.
[5] Construction noise at Site E was modeled at street level. A more detailed assessment of the construction noise at the upper floors of the Century City Hospital is presented in Section 6.2.3.

6.2.3 Century City Hospital and Medical Center

The Century City Hospital is adjoining 2040 CPE Construction Area. The 20 foot high noise barrier wall at the perimeter of this site will shield the construction noise activities at the street level of the hospital building resulting in an average nighttime noise level of 66 dBA which is 2 dB less than the noise limit of 68 dBA (see Table 6-3). Since the patient rooms of the hospital overlooking the construction site are on the upper floors of the building a more detailed noise assessment was prepared for this receiver.

The primary use of 2040 CPE construction site is for the main construction staging to support tunneling operations for day and night shifts during tunneling. This site also supports the drying and storage of tunnel muck until such time as it is loaded onto trucks and taken to disposal sites. It is expected that

removal of muck from this site by truck will occur during nighttime hours. This site houses the compressor plant, ventilation plant, grout plant, foam plant, conveyor system, machine shop and electrical shop. A long boom crane and a front end loader will also operate during both day and night shifts. Upon completion of tunneling, this site reverts to daytime use to support concreting of tunnels and cross-passages, mechanical, electrical and finishes.

The assessment is based on the expected construction activities at the 2040 Century Park East (CPE) construction site between the hours of 9 P.M. and 7 A.M. (Figure 1). Patient rooms at the hospital facing the construction site are on the 3rd through the 8th floors of the building. The assessment includes the predicted construction noise at these floors and also adjusts the ambient noise levels measured at ground level at these different building heights.

Existing Ambient Noise Levels

Ambient noise measurements were conducted at the Century City Hospital at 2080 Century Park East, 180 feet from Olympic Boulevard (Site E) setback 4 feet from the street curb (Figure 6-1). The measured noise levels were then adjusted to account for the additional setback distance of the hospital building. The adjusted 24 one-hour Leq ambient noise levels at the face of the hospital building is graphically shown in Figure 6-2.

The measurements were conducted from 7 P.M. to 10 A.M. This time period was chosen to characterize the nighttime noise levels at the hospital. Section 41.40 of the Los Angeles Municipal Code requires a variance for nighttime construction from 9 P.M. to 7 A.M. The variance is based on not exceeding a noise limit of the ambient level plus 5 dB. Ambient noise measurements were not conducted during daytime hours because the City of Los Angeles has a maximum construction noise level limit of 75 dBA for daytime construction regardless of the ambient level.

Figure 6-1: Noise Measurement Sites

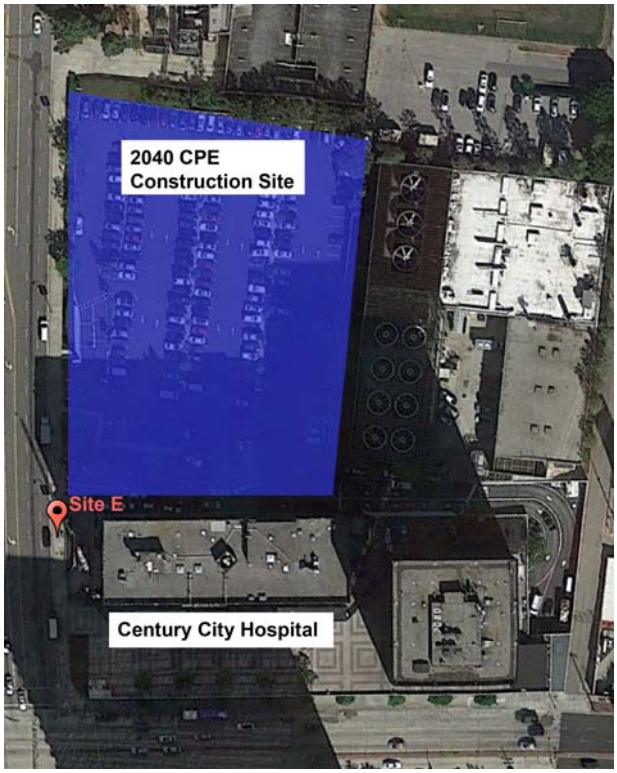
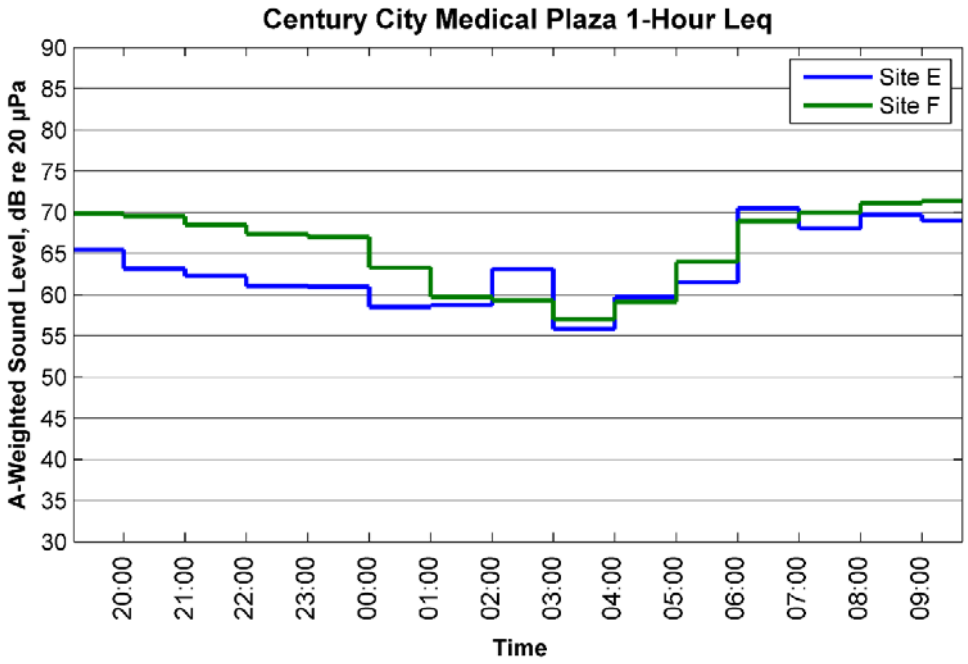


Figure 6-2: Century City Hospital Measured Noise Levels



As a worst case scenario the ambient noise of Leq=56 dBA measured from 3 A.M. and 4 A.M. was used as the nighttime noise impact threshold for the hospital building. The ambient was measured at ground level and adjusted for additional height of the 3rd through the 8th floor patient levels. The adjusted ambient along with the nighttime noise impact threshold are presented in Table 6-4 along with the predicted noise levels from nighttime construction activities. The predicted nighttime construction noise is based on a 20 foot noise barrier wall around the perimeter of the site and the use of low noise emission equipment.

Table 6-4. Nighttime Construction Noise Impact Thresholds at the Century City Hospital

Hospital Building Floor	Ambient Noise Level, Leq (dBA)	Los Angles Nighttime Construction Noise Limit, Leq (dBA)	Nighttime Construction Noise, Leq (dBA)	Exceeds the Nighttime Noise Limit (Y/N)
Ground Level	56	61	66	Y
Patient Floor 3	52	57	69	Y
Patient Floor 4	51	56	69	Y
Patient Floor 5	51	56	69	Y
Patient Floor 6	51	56	69	Y
Patient Floor 7	51	56	69	Y
Patient Floor 8	51	56	68	Y

The predicted construction noise at the patient floors exceed the nighttime noise limits of existing ambient plus 5 dB. Additional noise control measures recommended for the 2040 CPE Construction Area to meet the nighttime noise limits are presented in Section 9.0 of this report.

7.0 CONSTRUCTION VIBRATION PREDICTIONS

7.1 Prediction Methodology

For this study, the FTA analytical/empirical construction vibration prediction model was used to estimate vibration levels propagate from construction equipment to vibration sensitive locations. The vibration model is based on a combination of previous works including measured equipment vibration emission data from the FTA and the Central Artery/Tunnel project in Boston, and ground transmissibility relationships found in Charles Dowding's reference textbook Construction Vibrations1. The fundamental equation used in the model is based on propagation relationships of vibration through average soil conditions and distance, as follows:

$$PPV_{receiver} = PPV_{ref} * \left(100 / Dist_{receiver} \right)^{n},$$

where:

PPVreceiver = predicted PPV at the receiver,

PPVref = reference PPV of equipment at 100 feet,

Distreceiver = distance from the receiver to the equipment in feet, and

n = 1.5 (the vibration attenuation rate through the soil).

The suggested value for n in the FTA Manual is 1.5. The value for n can lie between 1.0 and 2.0 and a value of 1.5 is commonly used in general models. The value of 1.1 is considered appropriate for this model because the project area has stiff soils which generally have a higher value of n.

Equipment vibration emission levels used for the predictions are shown in Table 7-1. The levels were gathered from measurements performed and published from several projects including the FTA Manual, Central Artery/Tunnel Project in Boston, and Dowding's textbook. The equipment with a reference PPV of N/A implies the equipment does not generate vibration levels significantly above normal ambient levels. Therefore, equipment such as generators and compressors that may require noise modeling and assessment are not assessed for vibration impact. The vibration generating equipment that is likely to be used during the Project are shown as highlighted in Table 7-1.

[1] Dowding, Charles, Construction Vibrations, Prentice Hall, Upper Saddle River, NJ, 1996.

Table 7-1: Equipment Vibration Emission Levels

Equipment Description	Vibration Type (Steady or Transient)	Ref PPV at 100 ft
Auger Drill Rig	Steady	0.011125
Backhoe	Steady	0.011
Compactor	Steady	0.03
Concrete Mixer	Steady	0.01
Concrete Pump	Steady	0.01
Crane	Steady	0.001
Large Dozer	Steady	0.07
Small Dozer	Steady	0.04
Dump Truck	Steady	0.01
Excavator	Steady	0.011
Flat Bed Truck	Steady	0.01
Front End Loader	Steady	0.011
Gradall	Steady	0.011
Grader	Steady	0.011
Horizontal Boring Hydraulic Jack	Steady	0.003
Hydra Break Ram	Transient	0.05
Impact Pile Driver	Transient	0.2
Insitu Soil Sampling Rig	Steady	0.011125
Jackhammer	Steady	0.030
Paver	Steady	0.01
Pickup Truck	Steady	0.01
Scraper	Steady	0.000375
Slurry Trenching Machine	Steady	0.002125
Soil Mix Drill Rig	Steady	0.011125
Tractor	Steady	0.01
Tunnel Boring Machine (rock)	Steady	0.0058
Tunnel Boring Machine (soil)	Steady	0.003
Vibratory Pile Driver	Steady	0.15
Vibratory Roller (large)	Steady	0.059
Vibratory Roller (small)	Steady	0.022
Blasting	Transient	0.75
Clam Shovel	Transient	0.02525
Rock Drill	Steady	0.011125
3-ton truck at 35 mph	Steady	0.0002

7.2 Prediction Results and Impact Assessment

Table 7-2 presents the distance beyond which the damage risk criteria would not be exceeded for the major vibration-generating pieces of equipment likely to be used for the Project. Most of the equipment can be operated without risk of damage at distances of 35 feet or greater from historic building or at distances of 20 feet or greater from non-historic buildings.

Table 7-2: Distance to Construction Vibration Impact Thresholds

Equipment	PPV Ref Level at 100 ft (in/sec)	Distance to Impact Threshold of 0.5 in/sec PPV[(a)]	Distance to Impact Threshold of 0.2 in/sec PPV[(a)]
Compactor	0.030 in/sec	10 ft	20 ft
Cranes	0.001 in/sec	2 ft	3 ft
Dozer	0.040 in/sec	15 ft	25 ft
Dump Truck	0.01 in/sec	3 ft	8 ft
Front End Loader	0.011 in/sec	4ft	8 ft
Jackhammer	0.035 in/sec	12 ft	22 ft

Notes:
[(a)]The impact threshold for non-historic buildings is 0.5in/sec PPV and the impact threshold for historic buildings is 0.2 in/sec PPV.

7.2.1 Wilshire/Rodeo Station

The Sterling Plaza/Bank of California building and Union Bank Building (see Table 5-2) are within 25 feet of the Wilshire/Rodeo Station Box Construction Area. At this distance there is the potential risk of exceeding the damage risk criteria of 0.20 inches/second during jackhammering, compacting, and operation of a dozer.

7.2.2 Century City/Constellation Station

The closest building of the Century Plaza Hotel to the station box construction is more than 40 feet from the edge of the construction. The Beverly Hills High School is over 200 feet from 2040 CPE and 1940-1950 CPE Construction Areas. At these distances it is not expected that the equipment assumed to be used for construction will exceed the damage risk criteria of 0.20 inches/second.

7.3 Tunnel Trains

Previous measurements conducted of tunnel trains operating during the construction of the Metro Red Line Segment 2 tunnel shows a predominance of high frequency energy, up to 125 Hz. This contrasts with the groundborne vibration from rail trains in subways where vibration levels usually peak below 60 Hz. The high frequency energy of the tunnel trains means the community intrusion is more likely to be caused by groundborne noise rather than perceptible vibration.

Tunnel trains are expected to operate for the duration of the tunnel construction typically 24 to 36 months until the final trackwork is installed. The vibration from the tunnel train operations is transmitted directly into the tunnel invert through the rails. Providing a resilient support under the track in the form of rubber rail pad will reduce the high frequency vibration and in most cases either eliminate or minimize the perception of the groundborne noise in the buildings above the tunnel.

7.4 Sensitive Receivers

There are several vibration sensitive receivers that may be affected during the tunnel excavation including:

- Montage Hotel and Condominiums

- Beverly Wilshire Hotel
- Apartment Buildings
- Hotels
- Medical Offices
- Beverly Hills High School Offices and Classrooms

As discussed above the effects of the TBM would be limited to a few days when its operations would be perceptible at these receivers. In terms of a tunnel train operating in the tunnel, mitigation measures to control train vibrations would need to be included for the entire length of the running tunnel from the Wilshire/Rodeo Station to the Century City/Constellation Station due to the close proximity of these receivers above the tunnel.

8.0 GROUNDBORNE VIBRATION DURING TUNNELING

The primary sources of vibration during tunneling are generated by the tunnel boring machine (TBM) and the tunnel train used to carry muck, pre-cast concrete tunnel segments and materials. The TBM will be used to excavate the running tunnel between the Wilshire/Rodeo and Century City/Constellation station boxes. The TBMs will be pressurized closed face tunnel boring machines. The tunnel trains run 24 hours a day in the underground tunnels if used to take out the muck disposed of by the tunnel boring machines. These trains have open gondolier cars which are pulled by a diesel locomotive and run at speed of about 5 to 10 mph. Tunnel trains follow the TBMs as they move ahead boring the tunnel. A conveyor connected to the center of the cutter head of the TBM delivers the muck to these trains. The trains carry the muck outside from the TBM area, where the cars are lifted to the surface through a shaft by gantry cranes and the muck is deposited in muck piles before loading on to dump trucks and then carried away from the construction site. These same tunnel trains are used to transport material and the precast tunnel lining segments. The tunnel trains run on temporary rails that are usually directly fixed to the invert of the tunnel. These trains are also used to carry tunnel segments and materials.

8.1 Tunnel Boring Machines

The main source of vibration during tunneling is when the TBM pushes the shield forward against the earth using a hydraulic ram. The vibration generated by this action would be perceptible above the tunnel at distances of 100 feet from the tunnel centerline and would approach human annoyance levels at closer distances. Most of the energy from the TBM operation is at low frequencies (30 Hz and lower). This would mean that if the TBM vibration is perceived in buildings above the tunnel, it will be perceived as feelable vibration rather than ground-borne noise.

Vibration levels from TBMs are always below damage risk levels, either structural damage or minor cosmetic damage such as hairline fractions in plaster or drywall. This is an important point since whenever ground-borne vibration is perceptible, most people's first response is "This must be damaging my house."

There is the potential for community intrusion during the passing of the TBM. The advance rate of the TBM is expected to be approximately 40 feet per day. The presence of the TBM beneath any one residential structure where it would be perceptible as either feelable vibration or ground-borne noise would be approximately three to four days. The intrusion would not be continuous but would occur only at times when the shield is pushed against the earth using the hydraulic ram approximately four to six times a day. There are no measures that can be used to mitigate the effects of the TBM other than keeping residents informed when the tunneling will occur in their area and that some vibration may be perceptible, but not damaging.

9.0 MITIGATION

A perimeter noise barrier wall has been incorporated into the design of the construction sites at Wilshire/Rodeo and Century City/Constellation Stations where nighttime construction will occur. The noise barrier wall shall be constructed in accordance with Metro's Specification Section 01 56 19, Construction Noise and Vibration Control (Appendix C). The noise and vibration predictions presented in this report identified impacts at the construction sites that require additional mitigation measures.

This section identifies mitigation measures to be used in addition to the noise barrier wall and low noise emission equipment to meet the nighttime noise limits. Also included are measures that should be considered if compliance with the noise limits are not met and general control measures that shall be implemented by the Contractor at all sites.

9.1 Wilshire/Rodeo Station

The potential for noise impact at sensitive receivers during both daytime and nighttime construction was determined not to exceed the BHMC and LAMC noise level limits using noise barrier walls and low noise emission equipment. It is not expected that any other noise mitigation measures are needed. The exception is the Century City Hospital (Site E) where additional mitigation measures are needed to reduce nighttime construction noise to the upper floor patient rooms on the 3rd through 8th floors.

9.2 Century City/Constellation Station

To meet the noise level limits required by the City of Los Angeles for nighttime construction at the Century City Hospital patient floors, levels 3 through 8, the following noise control measures will be required in addition to the 20-foot high noise barrier wall constructed around the perimeter of the 2040 CPE construction site (Figure 9-1) and the use of low noise emission equipment.

- The compressor plant, ventilation plant, grout plant, foam plant, machine shop and electrical shop are to be fully enclosed.
- The conveyor system is to be enclosed.
- The boom crane and front end loader used during the night shift are to be retrofitted with a hospital grade muffler and additional damping and insulation added to the engine compartments.
- A supplemental 16-foot noise barrier wall shall be built, as shown in Figure 9-1, to further shield the noise from the front end loader and crane operations.

With the implementation of these noise control measures the nighttime construction noise at the patient floors of the Century City Hospital building are predicted not to exceed the Los Angeles nighttime construction noise limits as shown in Table 6-4. The nighttime construction noise contours at the face of the hospital building are shown graphically in Figure 9-2.

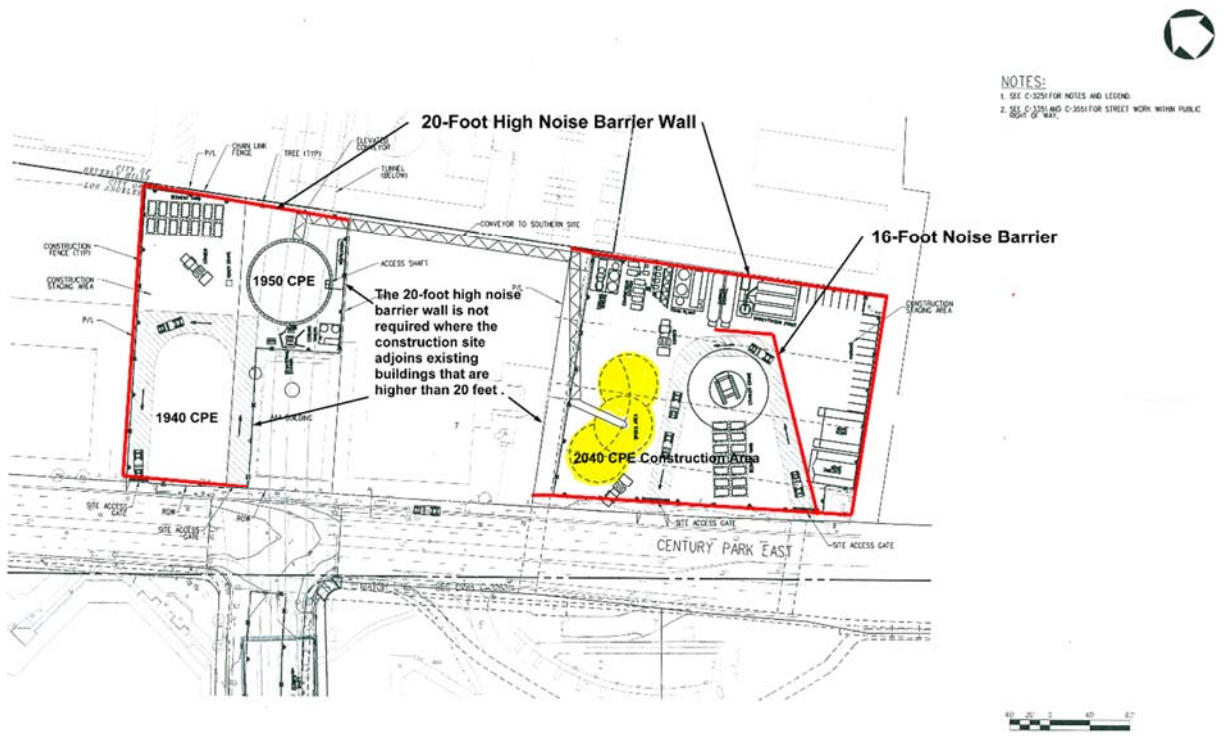


Figure 9-1: 2040 CPE and 1940-1950 CPE Construction Site Noise Barrier Walls

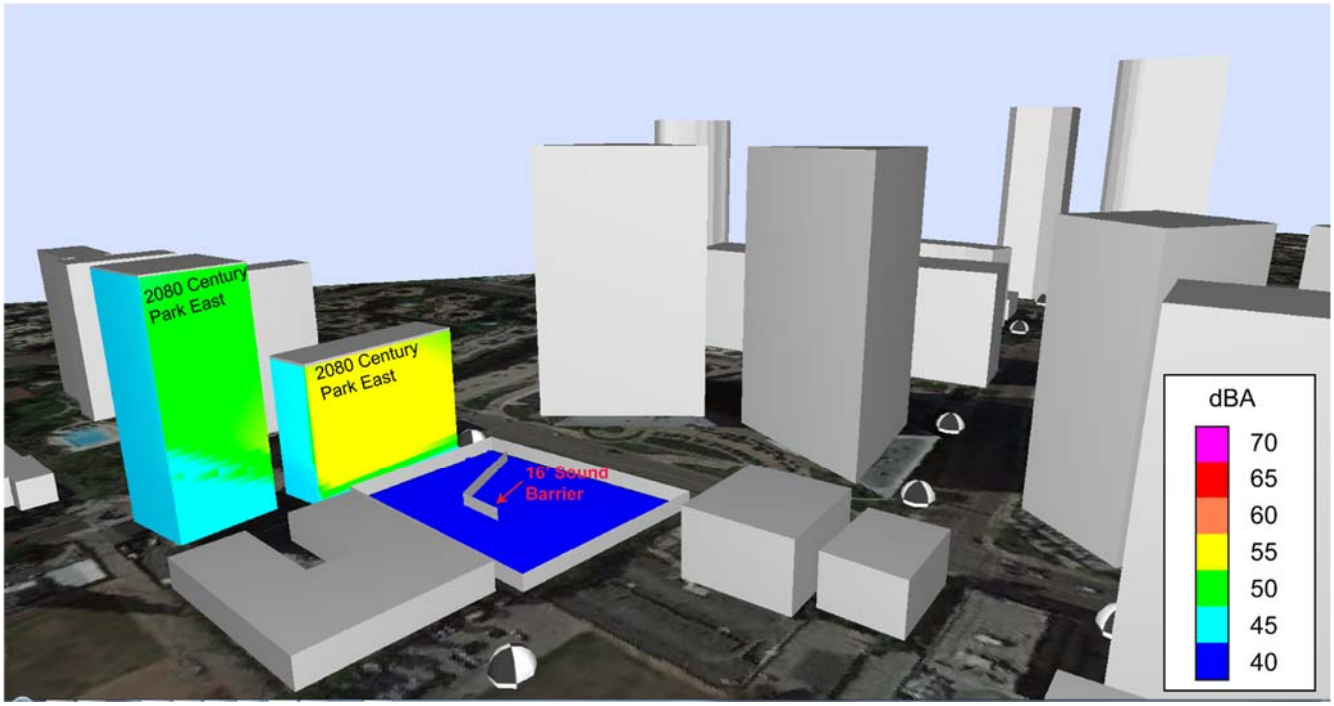


Figure 9-2: Nighttime Noise Level Contours at Century City Hospital

9.3 Backup Alarms

All equipment operating during nighttime hours at all construction sites shall use low impact backup alarms. The low impact back-up alarms shall comply with CCR Title 8, Section 1592, Warning Methods. For equipment that must comply with CCR Title 8, Section 1592(a), equip these vehicles with compliant white sound, broadband and multi-frequency type back-up alarm devices. For equipment subject to the requirements of CCR Title 8, Section 1592(b) the Contractor may choose to equip with automatic back-up audible alarms. Such alarms shall only be of a compliant white sound, broadband or multi-frequency back-up alarm type device.

The compliant white sound, broadband and multi-frequency type back-up alarm device shall be a self-adjusting, "smart" reversing, alarm that continually adjusts to 5 dB above ambient. Acceptable manufacturers are Brigade, ECCO or approved equal. The compliant white sound, broadband and multi-frequency type back-up alarm device shall be rated as medium duty or heavy duty, as the field conditions and/or usage would dictate.

9.4 Running Tunnel from Wilshire/Rodeo and Century City/Constellation Stations

To reduce the vibration generated by a tunnel train the Contractor shall be required to use a durable resilient system to support and the tunnel train tracks. Such as system would include a resilient mat under the tracks and a resilient grommet or bushing under the heads of any track fasteners. The hardness of the resilient mat should be in the 40 to 50 durometer range and be about 1 to 2" thick, depending on how heavily loaded the cars would be. The Contractor would need to select the mat thickness so that the rail doesn't bottom out during a train passby.

If the Metro ground-borne noise limits presented in Table 5-3 are exceeded, the contractor shall be required to take action to reduce vibrations to acceptable levels. Such action could include reducing the train speed, additional rail and tie isolation, and maintain the tunnel train track and train wheels in good order to reduce potential vibration impacts, including keeping gaps between track sections to a minimum and more frequent maintenance to avoid wheel flats.

9.5 Additional Mitigation Measures

The following are additional noise control measures that can be used to at the construction site to shield noise generating equipment.

- Moveable noise barriers that can be located within the construction site in close proximity to the equipment and activities that are exceeded the impact thresholds. The moveable noise barriers shall be constructed in accordance with Metro's Specification Section 01 56 19, Construction Noise and Vibration Control, Article 2.03, Moveable Noise Barriers (Appendix C). The height of the moveable noise barrier shall be a minimum of 14 feet. A representative design of a moveable noise barrier used for other construction projects is shown in Figure 9-3.

- Noise control curtains that can be tented over the area where the noisy equipment is operating. The noise curtain shall be constructed in accordance with Metro's Specification Section 01 56 19, Construction Noise and Vibration Control, Article 2.04, Noise Control Curtains (Appendix C).

- Replace the standard engine exhaust muffler with a hospital grade engine silencer for stationary cranes, front end loaders, dozers, and any other diesel powered equipment operating during nighttime hours.

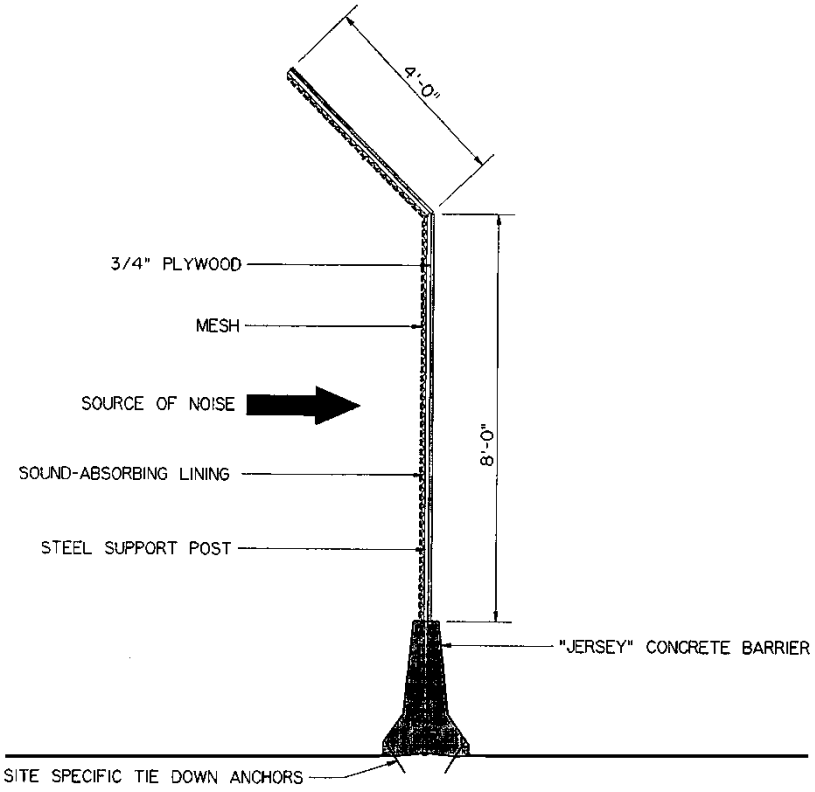


Figure 9-3: Representative Moveable Noise Barrier Design

9.6 General Noise and Vibration Control Measures

The following general noise and vibration control measures shall be implemented by the Contractor at all construction sites:

- Readily visible signs indicating “Noise Control Zone” would be prepared.
- Noise-control devices that meet original specifications and performance would be used.
- Fixed noise-producing equipment would be used to comply with regulations in the course of project activity.
- Mobile or fixed noise-producing equipment that are equipped to mitigate noise to the extent practical would be used.
- Electrically-powered equipment would be used to the extent practical.
- Temporary noise barriers and sound-control curtains would be erected where project activity is unavoidably close to noise-sensitive receivers.

- Designated haul routes would be used based on the least overall noise impact Route heavily-loaded trucks away from residential streets, if possible. Identification of haul routes would consider streets with the fewest noise sensitive receivers if no alternatives are available.
- Non-noise sensitive, designated parking areas for project-related vehicles would be used.
- Earth-moving equipment, fixed noise-generating equipment, stockpiles, staging areas, and other noise-producing operations would be located as far as practicable from noise-sensitive receivers.
- The use of air horn type devices, including but not limited to vehicle mounted or hand held, shall not be used to communicate signals from one area of the project site to another. Compliance with the requirements of the Tunnel Safety Orders for signaling systems shall be obtained through the use of other auditory or visual systems other than the use of air horn type devices.
- Use of horns, whistles, alarms, and bells would be limited.
- All noise-producing project equipment and vehicles would be required to use internal combustion engines equipped with mufflers and air-inlet silencers, where appropriate, and kept in good operating condition that meet or exceed original factory specifications. Mobile or fixed “package” equipment (e.g., arc- welders, air compressors) would be equipped with shrouds and noise control features that are readily available for that type of equipment.
- Any project-related public address or music system would not be audible at any adjacent receiver.
- Demolition, earth moving, and ground impacting operations would be phased so as not to occur in the same time period.
- Impact pile driving would be avoided. Drilled piles drivers would be used where the geological conditions permit their use.
- Demolition methods would be selected to minimize noise and vibration impact where possible.
- Use of vibratory rollers and packers would be avoided near vibration sensitive areas.
- An elastomer isolator would be installed between the floor of the tunnel and the rails and ties on which the tunnel train carrying excavated materials operates. If the Metro ground-borne noise limits or ground-borne vibration limits are exceeded, the Contractor shall be required to take action to reduce vibrations to acceptable levels. Such action could include reducing the tunnel train speed, additional rail and tie isolation, and more frequent rail and wheel maintenance.
- Enclosures for fixed equipment such as TBM slurry processing plants would be required in order to reduce noise.

Metro Baseline Specifications Section 01565, Construction Noise and Vibration Control requires that the contractor shall, among other provisions

- Hire or retain the services of an Acoustical Engineer to be responsible for preparing and overseeing the implementation of the Noise Control and Monitoring Plans.
- Prepare a Noise Control Plan that includes an inventory of construction equipment used during daytime and nighttime hours, estimate of projected construction noise levels, and locations and types of noise abatement measures that may be required to meet the specified noise limits.

- In the case of nighttime construction, the contractor shall comply with the provisions of the nighttime noise variance issued by the local jurisdictions.
- Conduct periodic noise measurement in accordance with an approved Noise Monitoring Plan, specifying monitoring locations, equipment, procedures, and schedule of measurements and reporting methods to be used.
- During nighttime hours, use equipment at the surface of the construction site that, operating under full load, is certified to meet specified lower noise level limits than standard equipment.
- For nighttime construction activities, erect Metro designed noise barrier walls at each construction site prior to the start of any construction activities.

10.0 MONITORING

The Contractor is required to submit a Noise and Vibration Monitoring Plan prepared, stamped, and administered by the Contractor's Acoustical Engineer. Noise and vibration monitoring shall be performed at locations in the vicinity of all of the construction sites.

10.1 Noise Monitoring

There are two types of noise monitoring that shall be performed, depending on the location and the expected level of impact. The first type is continuous noise monitoring, which is to be performed in areas where nighttime work is anticipated from 6:00 P.M. to 8:00 A.M. in the City of Beverly Hills and from 9:00 P.M. to 7:00 AM. In the City of Los Angeles. The second type is short-term noise monitoring, which consists of weekly short-duration (1 hour or more) measurements to verify that noise levels during construction do not exceed the predicted noise levels or relevant impact criteria.

Continuous noise monitoring will require the installation of permanent monitoring stations that include microphones, sound level meters, power sources, and associated ancillary equipment. Each continuous noise monitoring station should also include data transmission capabilities to make remote access possible. Monitors should be installed in locations that provide a direct line of sight to construction activities and are representative of residential (or otherwise noise-sensitive) receivers.

In all measurement sites the continuous noise monitor shall be located at side of the building closest to the construction activities no closer than 3 feet from the building façade. If this is not possible and another site is selected the measured data shall be adjusted to the building setback distance from the construction activities.

Weekly short-term noise measurements may be performed using a sound level meter and associated ancillary equipment. Short-term measurements should be conducted at a height of approximately 5 feet above ground level.

Contractor must initiate short-term noise monitoring when performing a new activity or as requested by Metro.

10.1.1 Wilshire/Rodeo

Continuous noise levels shall be monitored at the following locations:

- 210 N. Beverly Drive (Site H)
- Sirtaj Hotel, 120 S. Reeves Drive (Site J)
- AKA Beverly Hills Hotel, 155 N. Crescent Drive (Site M)
- Beverly Sixty Hotel (Site 1)

Short-term noise measurements shall be conducted on a weekly basis during daytime and nighttime hours at the following locations:

- 133-153 S. Reeves Drive (Site I)

- 192 N. Canon Drive (Site K)
- 121-157 S. Canon Drive (Site L)
- The Rolex Building, 9420 Wilshire Boulevard (Site 2)
- Sterling Plaza/Bank of California, 9441 Wilshire Boulevard (Site 3)

If the measured levels exceed the noise limits specified in Table 4-1, reduce the noise levels by appropriate abatement measures, or terminate the construction activity responsible for the noise limit exceedance.

10.1.2 Century City/Constellation

Continuous noise levels shall be monitored at the following locations:

- Hyatt Regency Century Plaza Hotel (Site C)
- Century City Hospital (Site E)

Short-term noise measurements will be conducted on a weekly basis during daytime and nighttime hours at the following locations:

- Beverly Hills High School (Site 5)
- 401 Shirley Place (Site G)
- 1918-1952 Fox Hills Drive (Site A)
- 2050 Century Park West (Site B)
- 2010 Century Park East (Site D)
- 2160 Century Park East (Site F)
- 1888 Century Park East (Site 6)
- Century Plaza Towers, 2049 Century Park East (Site 7)
- Annenberg Space for Photography and the Skylight Studios, 10050 Constellation Boulevard (Site 8)
- Bain & Company Building, 1901 Avenue of the Stars (Site 9)
- The Century, 10 West Century Drive (Site 10)
- Constellation Place, 10250 Constellation Boulevard (Site 11)

If the measured levels exceed the noise limits specified in Table 4-1, reduce the noise levels by appropriate abatement measures, or terminate the construction activity responsible for the noise limit exceedance.

10.2 Vibration Monitoring

Vibration monitoring for this project shall consist of continuous measurements of vibration at the closest building façade to the construction activities of the following historic buildings using a permanent vibration monitor:

- Sterling Plaza/Bank of California, 9441 Wilshire Boulevard
- Union Bank Building, 9460 Wilshire Boulevard

Short term vibration measurements shall also be conducted at buildings closest to the construction activities during periods of construction when equipment that generate a substantial amount of ground-borne vibration (such as jack hammer or compactor) are in use. All vibration monitors used for either permanent monitoring or short term measurements should be equipped with an “alarm” feature to provide notification that vibration impact criteria have been approached or exceeded.

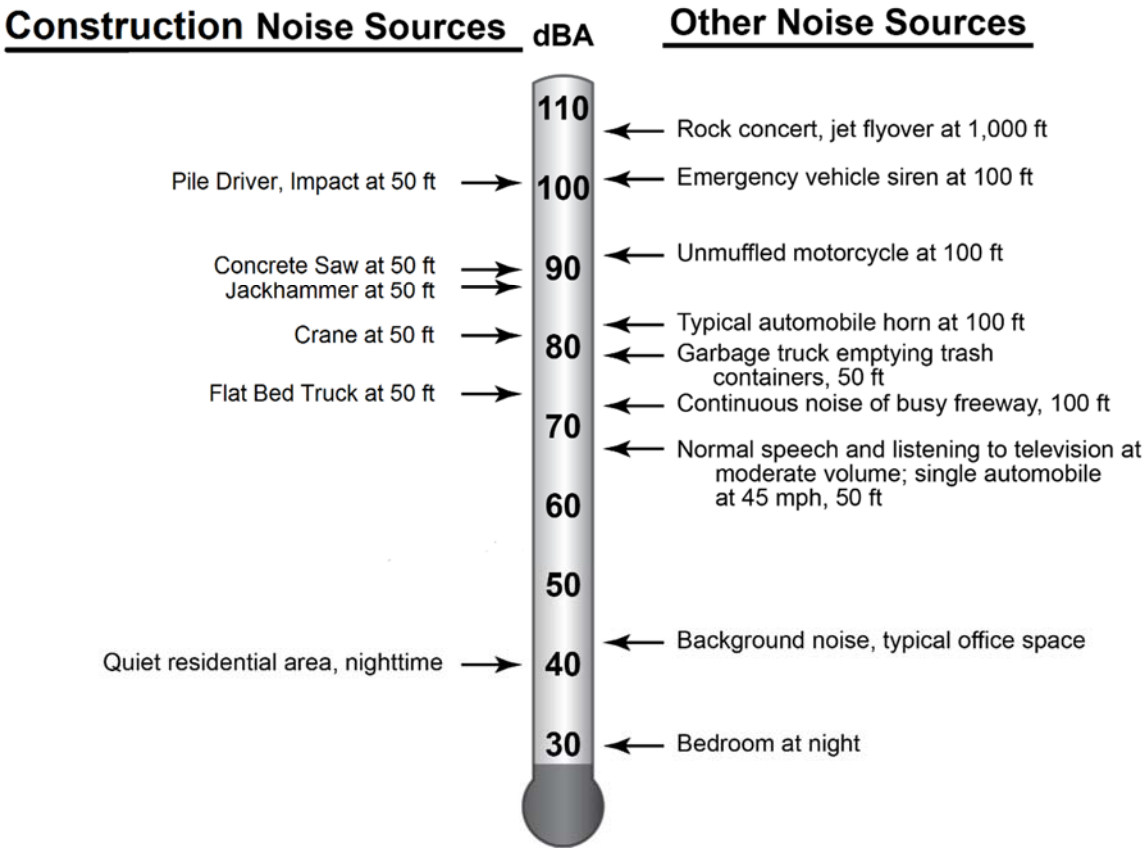
APPENDIX A FUNDAMENTALS OF NOISE AND VIBRATION

APPENDIX A FUNDAMENTALS OF NOISE AND VIBRATION

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is generally defined as unwanted or excessive sound. Sound can vary in intensity by over one million times within the range of human hearing. Therefore, a logarithmic scale, known as the decibel scale (dB), is used to quantify sound intensity and compress the scale to a more manageable range.

Sound is characterized by both its amplitude and frequency (or pitch). The human ear does not hear all frequencies equally. In particular, the ear deemphasizes low and very high frequencies. To better approximate the sensitivity of human hearing, the A-weighted decibel scale has been developed. A-weighted decibels are abbreviated as "dBA." On this scale, the human range of hearing extends from approximately 3 dBA to around 140 dBA. As a point of reference, Figure A-1 includes examples of A-weighted sound levels from common indoor and outdoor sounds.

Figure A-1: Typical Outdoor and Indoor Noise Levels



Using the decibel scale, sound levels from two or more sources cannot be directly added together to determine the overall sound level. Rather, the combination of two sounds at the same level yields an increase of 3 dBA. The smallest recognizable change in sound level is approximately 1 dBA. A 3-dBA increase is generally considered perceptible, whereas a 5-dBA increase is readily perceptible. A 10-dBA increase is judged by most people as an approximate doubling of the perceived loudness.

Two of the primary factors that reduce levels of environmental sounds are increasing the distance between the sound source and the receiver and having intervening obstacles, such as walls, buildings, or terrain features that block the direct path between the sound source and the receiver. Factors that act to increase the loudness of environmental sounds include the proximity of the sound source to the receiver, sound enhancements caused by reflections, and focusing caused by various meteorological conditions.

Brief definitions of the measures of environmental noise used in this report are:

- **Equivalent Sound Level (Leq)**: Environmental sound fluctuates constantly. The equivalent sound level (Leq), sometimes referred to as the energy-average sound level, is the most common means of characterizing community noise. Leq represents a constant sound that, over the specified period, has the same sound energy as the time-varying sound.
- **Day-Night Sound Level (Ldn)**: Ldn is basically a 24-hour Leq with an adjustment to reflect the greater sensitivity of most people to nighttime noise. The adjustment is a 10-dB penalty for all sound that occurs between the hours of 10 P.M. and 7 A.M. The effect of the penalty is that, when calculating Ldn, any event that occurs during the nighttime is equivalent to 10 of the same event during the daytime. Ldn is the most common measure of total community noise over a 24-hour period.
- **Maximum Sound Level (Lmax)**: The maximum sound level over a period of time or for a specific event can also be a useful parameter for characterizing specific noise sources. Standard sound level meters have two settings, fast and slow, which represent different time constants. Lmax using the fast setting will typically be 1 to 3 dB greater than Lmax using the slow setting.
- **Percent Exceedance Level (Lxx)**: This is the sound level that is exceeded for xx percent of the measurement period. For example, L99 is the sound level exceeded 99 percent of the measurement period. For a one hour period, the sound level is less than L99 for 36 seconds of the hour and the sound level is greater than L1 for 36 seconds of the hour. L1 represents typical maximum sound levels, L33 is approximately equal to Leq when free-flowing traffic is the dominant noise source, L50 is the median sound level, and L99 is close to the minimum sound level.
- **Sound Exposure Level (SEL)**: SEL is a measure of the total sound energy of an event. In essence, all sound from the event is compressed into a one-second period. This means that SEL increases as the event duration increases and as the event sound level increases. SEL is useful for estimating the Ldn that would be caused by individual events such as train passbys.

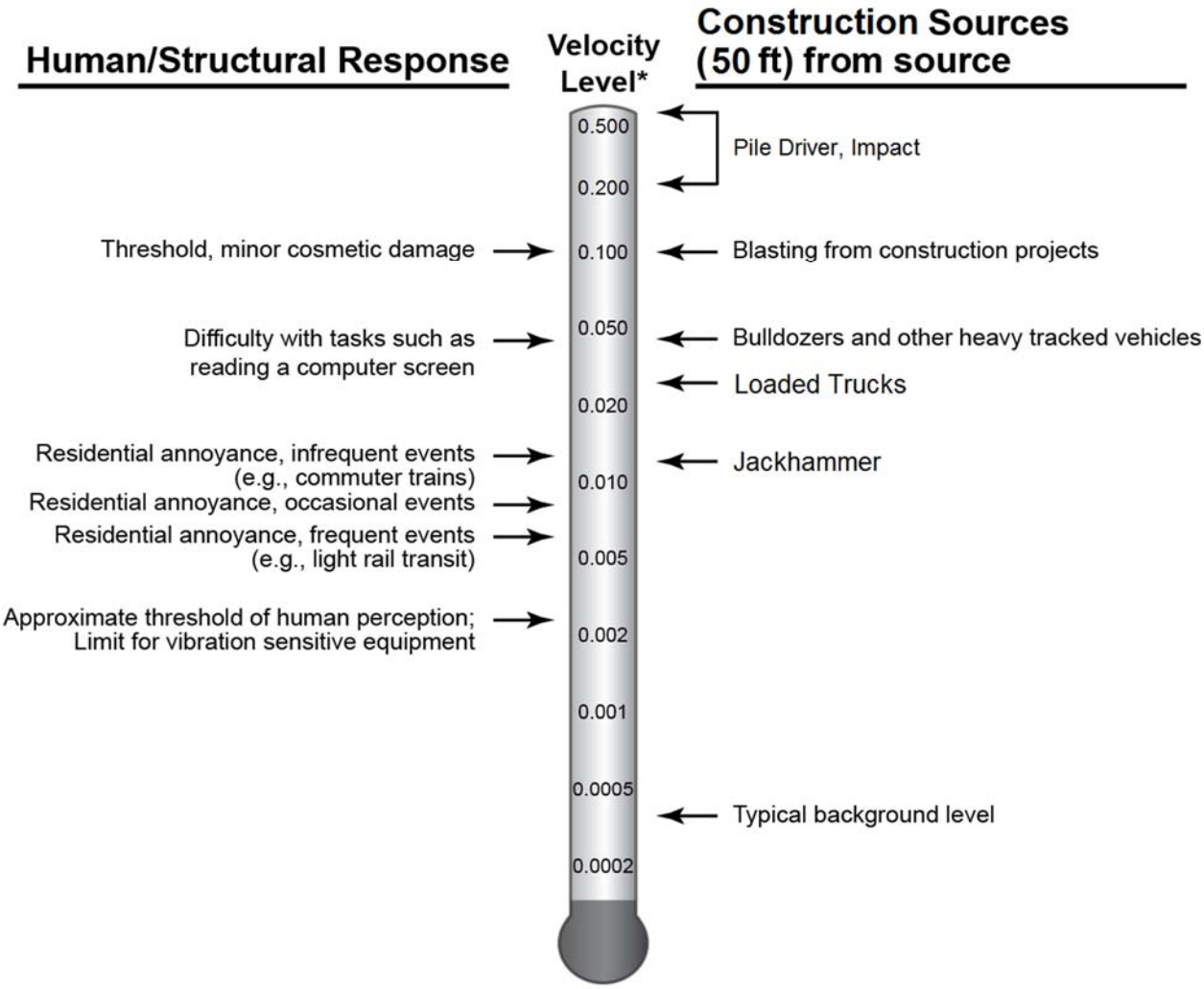
Vibration is an oscillatory motion that can be described in terms of the displacement, velocity, or acceleration of the motion. One potential effect from the proposed project is an increase in vibration that is transmitted from the tracks through the ground into adjacent houses. When evaluating human response, groundborne vibration is usually expressed in terms of decibels using the RMS vibration velocity. RMS is defined as the average of the squared amplitude of the vibration signal. To avoid confusion with sound decibels, the abbreviation VdB is used for vibration decibels. All vibration decibels in this report use a decibel reference of 1 μin/sec. Vibration can also be expressed as the peak particle velocity (PPV), which is generally used to evaluate whether vibration has potential to cause damage to fragile building structures. Peak particle velocity is normally expressed in inches per second.

The potential adverse effects of rail transit groundborne vibration are as follows:

- **Perceptible Building Vibration**: This is when building occupants feel the vibration of the floor or other building surfaces. Experience has shown that the threshold of human perception is around 65 VdB and that vibration that exceeds 75 to 80 VdB may be intrusive and annoying to building occupants.
- **Rattle**: The building vibration can cause rattling of items on shelves and hanging on walls, and various different rattle and buzzing noises from windows and doors.
- **Reradiated Noise**: The vibration of room surfaces radiates sound waves that may be audible to humans. This is referred to as groundborne noise. When audible groundborne noise occurs, it sounds like a low-frequency rumble. For surface rail systems the groundborne noise is usually masked by the normal airborne noise radiated from the transit vehicle and the rails.
- **Damage to Building Structures**: Vibration from rail systems is usually one to two orders of magnitude below the most restrictive thresholds for preventing building damage. However, fragile and extremely fragile structures may be susceptible to damage if the tracks are in sufficient proximity to the structure.

Figure A-2 shows typical RMS vibration velocity levels from rail and nonrail sources as well as the human and structure response to such levels.

Figure A-2: Typical RMS Vibration Velocity Levels



Often it is necessary to determine the contribution at different frequencies when evaluating vibration or noise signals. The 1/3-octave band spectrum is the most common procedure used to evaluate frequency components of acoustic signals. The term “octave” has been borrowed from music where it refers to a span of eight notes. The ratio of the highest frequency to the lowest frequency in an octave is 2:1. For a 1/3-octave band spectrum, each octave is divided into three bands where the ratio of the lowest frequency to the highest frequency in each 1/3-octave band is 21/3:1 (1.26:1). An octave consists of three 1/3 octaves.

The 1/3-octave band spectrum of a signal is obtained by passing the signal through a bank of filters. Each filter excludes all components except those that are between the upper and lower range of one 1/3-octave band. The FTA Guidance Manual is a good reference for additional information on transit noise and vibration and the technical terms used in this section.

Construction equipment can produce high levels of vibration, and many pieces of equipment will incite vibration levels greater than expected from train operations. Vibration from construction equipment is generally expressed as a peak particle velocity (PPV) in units of inches per second. The PPV is an instantaneous linear peak value and is more appropriate for assessing vibration when damage is a concern.

APPENDIX B NOISE MEASUREMENT RESULTS

APPENDIX B NOISE MEASUREMENT RESULTS

Noise measurements were conducted at sensitive receivers near the construction laydown areas to document the pre-construction ambient noise levels. This section includes brief descriptions of the measurement sites and tables of the hourly sound levels.

B.1 WILSHIRE/RODEO STATION

Six long-term (24-hour) measurements and four short-term (1-hour) measurement were conducted near the Wilshire/Rodeo laydown, staging, and construction areas to document the pre-construction ambient noise levels. The hourly results of the measurements are presented in Table B-1 and Table B-2. Brief descriptions of the measurement sites follow below:

- Site H - 210 North Beverly Drive: A long-term noise measurement was conducted from 10:19 A.M. on August 10th 2015 to 10:19 A.M. on August 11th 2015. The building is an apartment complex with ground floor retail. The microphone was located on the sidewalk in front of Beverly Drive, about 10 feet from the building façade, 20 feet from Wilshire Boulevard, the main source of traffic noise at this site. The microphone was 5 feet above street level.

- Site I - 133-153 South Reeves Drive: A long-term noise measurement was conducted from 9:04 A.M. on August 11th 2015 to 9:42 A.M. on August 12th 2015. The building is an apartment complex at the south end of Reeves Park. The microphone was located within this park, about 10 feet from the southern end of the park, 20 feet from the western end, and 100 feet from Reeves Drive. The main noise source at this site was traffic on Reeves Drive. The microphone was 5 feet above street level.

- Site J - 120 South Reeves Drive: A long-term noise measurement was conducted from 9:32 A.M. on August 11th 2015 to 10:32 A.M. on August 12th 2015. The microphone was located on the sidewalk in front of the Sirtaj Hotel. It was 13 feet from the building façade. It was 4 feet from Reeves Drive, the main source of traffic noise at this site. The microphone was 5 feet above street level.

- Site K - 192 North Canon Drive: A long-term noise measurement was conducted from 10:37 A.M. on August 10th 2015 to 11:02 A.M. on August 11th 2015. The building is an apartment/office complex with ground floor retail. The microphone was located on the sidewalk in front of Canon Drive, 6 feet from the building façade 220 feet from Wilshire Boulevard, and 4 feet from Canon Drive. The main source of traffic noise at this site was from Canon Drive. The microphone was 5 feet above street level.

- Site L - 121-157 South Canon Drive: A long-term noise measurement was conducted from 9:04 A.M. on August 11th 2015 to 9:42 A.M. on August 12th 2015. The building is an apartment complex on Canon Drive directly south of a small parking lot. The microphone was located in an alley between the apartment complex and the parking lot at the southern end of the alley, 190 feet from Wilshire Boulevard and 90 feet from Canon Drive. The main source of traffic noise at this site was from Canon Drive. The microphone was 5 feet above street level and 5 feet from the building wall.

- Site M – 155 North Crescent Drive: A long-term noise measurement was conducted from 8:35 A.M. on August 10th 2015 to 9:14 A.M. on August 11th 2015. The building is the AKA Beverly Hills Hotel located on Crescent Drive with one end of the building on Crescent Drive and the other on an alley between and Crescent Drive and Canon Drive. The microphone was located in this alley 3 feet from the building façade, 265 feet from Wilshire Boulevard. The main noise source at this site was trucks coming through the alley. The microphone was 5 feet above street level.

- Site 1 – Beverly Sixty Hotel, 9360 Wilshire Boulevard: A long-term noise measurement was conducted from 8:57 A.M. on August 11th 2015 to 9:57 A.M. on August 11th 2015. The microphone was located on the sidewalk in front of the hotel on Wilshire Boulevard, the main traffic noise source at this site. The microphone was 3 feet from the building façade, 12 feet from Wilshire Boulevard, and 5 feet above street level.

- Site 2 – The Rolex Building, 9420 Wilshire Boulevard: A long-term noise measurement was conducted from 7:34 A.M. on August 11th 2015 to 8:37 A.M. on August 11th 2015. The microphone was located on the sidewalk in front of the building on Wilshire Boulevard, the main traffic noise source at this site. The microphone was 12 feet from the building façade, 3 feet from Wilshire Boulevard, and 5 feet above street level.

- Site 3 – Sterling Plaza/Bank of California, 9441 Wilshire Boulevard: A long-term noise measurement was conducted from 7:35 on August 11th 2015 to 8:39 on August 11th 2015. The microphone was located on the sidewalk in front of the building on Wilshire Boulevard, the main traffic noise source at this site. The microphone was 8 feet from the building façade, 5 feet from Wilshire Boulevard, and 5 feet above street level.

- Site 4 – Beverly Wilshire Hotel, 9500 Wilshire Boulevard: A long-term noise measurement was conducted from 7:25 A.M. on August 11th 2015 to 8:25 A.M. on August 11th 2015. The microphone was located on the sidewalk in front of the hotel building on South El Camino Drive 7 feet from the building façade, 18 feet from Wilshire Boulevard and 5 feet above street level. Traffic on Wilshire Boulevard was the main source of noise at this site.

Table B-1: Long-Term Noise Measurement Results at Wilshire/Rodeo

Hour Start	Site H	Site I	Site J	Site K	Site L	Site M
11:00	70.4	57.9	58.3	68.5	61.4	61.8
12:00	73.7	58.6	55.5	66.0	60.8	65.9
13:00	71.3	57.9	57.2	68.2	60.0	72.3
14:00	71.4	59.2	58.1	71.2	59.8	59.5
15:00	70.8	58.2	58.5	67.6	60.8	62.4
16:00	70.1	59.0	57.1	66.2	59.1	59.7
17:00	74.4	59.3	58.5	67.0	64.4	59.4
18:00	71.1	57.4	56.9	67.1	59.3	59.8
19:00	70.2	55.7	55.5	64.8	62.5	60.9
20:00	70.0	54.4	55.0	63.7	59.8	59.0
21:00	68.8	53.6	54.2	68.9	60.4	60.9
22:00	69.2	53.7	53.2	65.3	55.6	64.3
23:00	67.8	54.9	52.6	65.3	56.5	57.5
00:00	67.6	51.5	53.6	65.4	56.6	59.1
01:00	67.1	51.5	49.1	59.0	53.7	56.0
02:00	65.7	50.4	48.6	64.3	51.8	54.4
03:00	64.0	50.9	47.4	58.7	52.7	54.5
04:00	63.2	52.4	49.8	55.1	54.8	60.2
05:00	67.1	53.5	50.6	62.6	54.6	64.7
06:00	70.9	57.8	53.1	65.5	56.9	66.2
07:00	73.3	57.5	56.0	66.5	60.6	64.5
08:00	71.8	61.6	56.3	69.2	61.0	63.2
09:00	71.2	59.6	57.4	71.6	58.8	63.2
10:00	70.9	58.0	57.8	66.3	62.4	63.9
Daytime (8 am-6.pm)	72	59	60	64	63	62
Evening (6pm-9pm)	70	56	56	65	61	60
Nighttime (9pm-8am)	69	54	52	65	57	62

Table B-2: Short-Term Noise Measurement Results at Wilshire/Rodeo

Hour Start	Site 1	Site 2	Site 3	Site 4
11:00	74.1	72.2	72.3	71.5
12:00	77.5	75.5	75.6	74.8
13:00	75.1	73.1	73.2	72.4
14:00	75.1	73.2	73.2	72.4
15:00	74.5	72.6	72.7	71.8
16:00	73.9	71.9	72.0	71.2
17:00	78.2	76.2	76.3	75.5
18:00	74.8	72.9	73.0	72.2
19:00	73.9	71.9	72.0	71.2
20:00	73.7	71.8	71.9	71.1
21:00	72.5	70.6	70.7	69.9
22:00	72.9	71.0	71.1	70.2
23:00	71.5	69.6	69.7	68.9
00:00	71.3	69.3	69.4	68.6
01:00	70.8	68.9	69.0	68.2
02:00	69.4	67.5	67.6	66.8
03:00	67.7	65.8	65.9	65.0
04:00	66.9	64.9	65.0	64.2
05:00	70.8	68.8	68.9	68.1
06:00	74.6	72.6	72.7	71.9
07:00	77.1	75.1	75.2	74.4
08:00	75.5	73.6	73.7	72.9
09:00	74.9	73.0	73.0	72.2
10:00	74.6	72.6	72.7	71.9
Daytime (8 am-6.pm)	76	74	74	73
Evening (6pm-9pm)	74	72	72	72
Nighttime (9pm-8am)	72	70	71	70

B.2 CENTURY CITY/CONSTELLATION STATION

Six long-term nighttime measurements, from 9:00 P.M. to 7:00 A.M. (minimum 10 hour), one long-term 24-hour noise measurement, and seven short-term (1-hour) measurement were conducted near the Century City/Constellation laydown, staging, and construction areas to document the pre-construction ambient noise levels. The hourly results of the measurements are presented in Table B-3 and Table B-4. Brief descriptions of the measurement sites follow below:

- Site A – 1918 0 1952 Fox Hills Drive: A nighttime noise measurement was conducted from 7:55 P.M. on August 17th 2015 to 8:00 A.M. on August 18th 2015. The buildings are a row of single family house across from the trees on the western side of Century Park West. The microphone was located within this tree area, 10 feet from the curb of Century Park West, the main traffic noise source at this site. The microphone was 5 feet above street level.

- Site B – 2050 Century Park West: A nighttime noise measurement was conducted from 7:21 P.M. on August 13th 2015 to 8:02 A.M. on August 14th 2015. The site is an under-construction apartment complex on the SE corner of Solar Way and Century Park West. The microphone was located 3 feet from the north side of Solar Way, 30 feet from the east curb of Century Park West, and 5 feet above street level. Traffic on Century Park West was the main source of noise at this site.

- Site C – Hyatt Regency Century Plaza Hotel, 2025 Avenue of the Stars: A nighttime noise measurement was conducted from 7:35 P.M. on August 13th 2015 to 8:11 A.M. on August 14th 2015. The microphone was located in the slightly hilly landscaped area between the hotel and Constellation Boulevard, 25 feet from Constellation Boulevard, and 70 feet from the hotel. The microphone was 8 feet above street level. Traffic on Constellation Boulevard was the main source of noise at this site.

- Site D – 2019 Century Park East: A nighttime noise measurement was conducted from 7:45 P.M. on August 12th 2015 to 8:11 A.M. on August 13th 2015. The microphone was located on the sidewalk in front office building at this location, 12 feet from Century Park East, 32 feet from the south side of the building, and 5 feet above street level. Daytime data was also taken from 9:30 A.M. on August 13th 2015 to 8:03 P.M. on August 13th 2015. The second location was 2 feet from Century Park East, 22 feet from the west side of the building, and 5 feet above street level. Traffic on Century Park East was the main source of noise at this site.

- Site E – Century Park Hospital and Medical Center, 2080 Century Park East: A nighttime noise measurement was conducted from 7:11 P.M. on August 13th 2015 to 9:39 A.M. on August 14th 2015. The microphone was located on the sidewalk of Century Park East, 4 feet from the curb and 40 feet from the building façade. The microphone was 5 feet above street level. Traffic on Century Park East was the main source of noise at this site.

- Site F – 2160 Century Park East: A nighttime noise measurement was conducted from 7:11 P.M. on August 13th 2015 to 9:39 A.M. on August 14th 2015. The site is a high rise apartment complex. The microphone was located on the sidewalk of Olympic Boulevard in front of the building, 4 feet from the curb and 20 feet from the façade. The microphone was 5 feet above street level. Traffic on Olympic Boulevard was the main noise source at this site.

- Site G – 401 Shirley Place, Beverly Hills: A long-term noise measurement was conducted from 10:28 A.M. on August 11th 2015 to 8:54 A.M. on August 12th 2015. The site is a row of single family houses on Shirley Place. The microphone was located on the sidewalk of Shirley place, 3 feet from the curb, 15 feet from the façade, and 40 feet from Olympic Boulevard, the main source of traffic noise at this site. The microphone was 5 feet above street level.

- Site 5 – Beverly Hills High School: A short-term noise measurement was conducted on August 12th 2015 from 8:36 P.M. to 8:57 P.M. at one location, and 8:59 P.M. to 9:30 P.M. at another location. At the first location the microphone was located in the back of the high school parking lot, closest to Century Park East. The main noise source at this location was the HVAC of the building located on Heath Ave behind the high school parking lot. The other measurement location at the corner of the high school soccer field and Heath Avenue. Both microphones were 5 feet above street level.

- Site 6 – 1888 Century Park East: A short-term noise measurement was conducted from 9:01 P.M. on August 12th 2015 to 10:01 P.M. on August 12th 2015. The microphone was located on the sidewalk of Century Park East in front of the office building. The microphone 5 feet from the curb, 14 feet from the building façade, and 5 feet above street level. The traffic on Century Park East was the main source of noise at this site.

- Site 7 – Century Park Towers, 2049 Century Park East: A short-term noise measurement was conducted from 10:03 P.M. on August 12th 2015 to 11:03 P.M. on August 12th 2015. The microphone was located on the sidewalk of Constellation Boulevard, 5 feet from the curb, 100 feet from the building façade, and 5 feet above street level. Traffic on Constellation Boulevard was the main source of noise at this site.

- Site 8 - Annenberg Space for Photography and the Skylight Studios, 10050 Constellation Boulevard: A short-term noise measurement was conducted from 9:29 P.M. on August 12th 2015 to 10:45 P.M. on August 12th 2015. The microphone was located on the sidewalk of Constellation Boulevard in front of the art studio, 22 feet from the curb, 23 feet from the building façade, and 5 feet above street level. Traffic on Constellation Boulevard was the main source of noise at this site.

- Site 9 - Bain & Company Building, 1901 Avenue of the Stars: A short-term noise measurement was conducted from 9:29 P.M. on August 13th 2015 to 10:45 P.M. on August 13th 2015. The microphone was located on the sidewalk of Avenue of the Stars in front of the office building. It was 8 feet from the curb, 32 feet from the building façade, and 7.5 feet above street level. Traffic on Avenue of the Stars was the main source of noise at this site.

- Site 10 - The Century, 10 West Century Drive: A short-term noise measurement was conducted from 9:43 P.M. on August 13th 2015 to 10:44 P.M. on August 13th 2015. The microphone was located on the sidewalk of Avenue of the Stars in front of the apartment complex, 13 feet from the curb, 200 feet from the building façade, and 5 feet above street level. Traffic on Avenue of the Stars was the main source of noise at this site.

- Site 11 - Constellation Place, 10250 Constellation Boulevard: A short-term noise measurement was conducted from 9:43 P.M. on August 13th 2015 to 10:44 P.M. on August 13th 2015. The microphone was located in front of the office building on the sidewalk of Constellation Boulevard, 10 feet from the curb, 40 feet from the building façade, and 5 feet above street level. Traffic on Constellation Boulevard was the main source of noise at this site.

Table B-3: Long-Term Noise Measurement Results at Century City/Constellation

Hour Start	Site A	Site B	Site C	Site D	Site E	Site F	Site G
11:00							67.6
12:00							67.3
13:00							67.5
14:00							67.9
15:00							67.6
16:00							68.4
17:00							68.9
18:00							67.0
19:00							66.8
20:00							68.7
21:00	61.9	63.2	57.6	62.2	62.3	68.5	67.7
22:00	60.9	59.2	57.6	61.8	61.0	67.4	66.9
23:00	58.2	58.5	56.0	60.8	60.9	67.0	65.1
00:00	54.1	54.6	57.1	61.0	58.5	63.3	64.1
01:00	51.3	58.5	51.9	58.5	58.7	59.7	61.4
02:00	49.5	53.8	54.1	58.9	63.1	59.3	58.2
03:00	55.5	53.7	49.4	58.3	55.8	57.0	58.2
04:00	51.9	56.6	54.9	59.6	59.7	59.1	56.6
05:00	58.2	61.5	55.8	61.1	61.5	64.0	59.2
06:00	60.6	60.6	59.8	69.0	70.5	68.9	62.4
07:00							66.1
08:00							68.3
09:00							68.3
10:00							65.6
Daytime (8 am-6.pm)							69
Evening (6pm-9pm)							68
Nighttime (9pm-8am for Site G and 9pm-7am for Sites A through F)	58	59	56	63	63	65	63

Table B-4: Short-Term Noise Measurement Results at Century City/Constellation

Hour Start	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10	Site 11
11:00	54.8						
12:00	56.1						
13:00	55.6						
14:00	54.9						
15:00	55.1						
16:00	54.6						
17:00	54.8						
18:00	53.7						
19:00	53.4						
20:00	51.5						
21:00	50.2	62.2	59.7	57.2	62.4	58.5	65.2
22:00	49.7	61.8	58.3	57.2	62.4	58.5	65.2
23:00	48.7	60.8	57.9	55.6	60.8	56.9	63.6
00:00	48.9	61.0	56.9	56.7	61.9	58.0	64.7
01:00	46.4	58.5	57.1	51.5	56.7	52.8	59.5
02:00	46.8	58.9	54.6	53.7	58.9	55.0	61.6
03:00	46.3	58.3	55.0	49.1	54.3	50.4	57.0
04:00	47.6	59.6	54.4	54.5	59.7	55.8	62.5
05:00	49.1	61.1	55.7	55.4	60.6	56.8	63.4
06:00	56.9	69.0	57.3	59.4	64.6	60.7	67.3
07:00	54.4						
08:00	56.3						
09:00	57.4						
10:00	55.7						
Daytime (8 am-6.pm)	56						
Evening (6pm-9pm)	53						
Nighttime (9pm-8am for Site 5 and 9pm-7am for Sites 6 through 11)	51	63	59	56	61	57	64

APPENDIX C SPECIFICATION SECTION 01 56 19 CONSTRUCTION NOISE AND VIBRATION CONTROL

Los Angeles County Metropolitan Transportation Authority
Westside Purple Line Extension Project, Section 2

SECTION 01 56 19

CONSTRUCTION NOISE AND VIBRATION CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Eliminating or minimizing noise and vibration generated by construction activities, and complying with applicable noise regulations, specification requirements, and noise and vibration limits specified within this Section.

B. Metro has prepared a Final Environmental Impact Statement/Final Environmental Impact Report for the Westside Subway Extension, with supporting technical reports on noise and vibration, which describe impacts the Project will have on the environment and indicates measures Metro has agreed to implement. See 01 35 44 Environmental Mitigation and Monitoring.

C. Metro is pursuing an initial variance from The City of Los Angeles Board of Police Commissioners for nighttime and weekend construction for this Contract. Once the variance is obtained, the variance will be good for a 6 month period. Variance shall be renewable by contractor every six months on the condition that the Contractor is in good standing and no community complaints are registered. This variance would allow the Contractor to schedule Work at night and weekends subject to the provisions of the variance to Section 41.40 of the Los Angeles Municipal Code, and the provisions herein. The variance could be withdrawn if the construction noise levels exceed the ambient noise level on the premise of any occupied property by more than five decibels from 9:00 PM to 7:00 AM Monday through Friday, from 9:00 PM Friday to 8:00 AM Saturday, from 6:00PM Saturday to 8:00 AM Sunday and all day Sunday as well as from 6:00 PM Sunday to 7:00 AM Monday.

D. Metro is pursuing an initial variance from the City of Beverly Hills for night-time and weekend construction. Contractor will be responsible for renewing variance if initial variance is issued.

E. Use equipment with effective noise-suppression devices and employ other noise control measures such as enclosures and barriers necessary to protect the public. Schedule and conduct operations in a manner that will minimize, to the greatest extent feasible, the disturbance to the public in areas adjacent to the construction activities and to occupants of buildings in the vicinity of the construction activities.

F. Submit a Noise Control Plan and a Noise Monitoring Plan, as specified in this Section. Both plans shall be prepared by an Acoustical Engineer meeting the qualifications specified in this Section. Do not operate noise generating construction equipment at the construction site prior to acceptance of the Noise Control and Monitoring Plans. Update Noise Control Plan every three months.

G. Compliance with the requirements of this Section may require the use of equipment with special exhaust silencers or noise attenuating enclosures, and construction of temporary enclosures or noise barriers around activities.

H. Use haul routes and staging areas, as approved by Metro and the City of Los Angeles or City of Beverly Hills to minimize noise at residential and other sensitive receptor sites. Do not operate trucks used for removal of excavated material and delivery of construction materials on local residential streets or on streets that pass by schools during school hours, unless specifically accepted by Metro.

I. Metro will monitor Contractor's performance of tasks specified, and will inspect necessary records, reports and procedures.

J. Staff members shall be trained by and work with the Acoustical Engineer specified in this Section to conduct measurements and manage noise and vibration control.

K. Contractor will coordinate with Metro on communicating with the noise sensitive locations listed in Table 5 and others that may arise during the life of the project regarding noise and vibration monitoring, schedule of construction activities where activities may affect these locations, and implementing mitigation measures to reduce noise and vibration

1.02 RELATED SECTIONS

A.	Section 01 31 30	Interface with Other Jurisdictions
B.	Section 01 33 00	Submittal Procedures
C.	Section 01 35 23	Worksite Safety Requirements
D.	Section 01 35 53	Worksite Security Requirements
E.	Section 01 43 10	Project Quality Program Requirements - Design/Build
F.	Section 01 51 23	Temporary Construction Ventilation
G.	Section 01 56 26	Construction Fencing (Wood)
H.	Section 01 56 28	Construction Fencing (Chain Link)

1.03 REFERENCES

A. California Code of Regulations (CCR), Title 24

B. California Health and Safety Code (CHSC)

C. City of Los Angeles Building Code, Chapter XI, Los Angeles Noise Ordinance

D. City of Beverly Hills Municipal Code.

E. American National Standards Institute (ANSI):

1. ANSI S1.4 - Specification for Sound Level Meters

2. ANSI S1.10 – Methods for the calibration of microphones

3. ANSI S2.4 - Method for Specifying the Characteristics of Auxiliary Analog Equipment for Shock and Vibration Measurements

F. ASTM International (ASTM):

1. ASTM C423 - Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

2. ASTM E90 - Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

3. ASTM E413 - Classification for Rating Sound Insulation

G. International Electrotechnical Commission (IEC):

1. IEC 61672 - Electroacoustics Sound Level Meters

2. IEC 179 - Precision Sound Level Meters

H. Occupational Safety and Health Act (OSHA) regulations (CCR Title 8)

I. Society of Automotive Engineers (SAE):

1. SAE J88 - Sound Measurement Off-Road Work Machines - Exterior

2. SAE J366 - Exterior Sound Level for Heavy Trucks and Buses

3. SAE J994 - Alarm- Backup- Electric Laboratory Performance Testing

J. International Organization for Standardization (ISO):

1. ISO 9533 - Earth-moving machinery. Machine-mounted audible travel alarms and forward horns – Test methods and performance criteria.

K. U.S. Department of Transportation, Federal Highway Administration (FHWA):

1. Special Report Highway Construction Notes: Measurement, Prediction, and Mitigation. (March, 1977)

L. U.S. Department of Transportation, Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment, FTA-VA-90-1003-06, May 2006

M. U.S. Environmental Protection Agency (EPA):

1. EPA Report NTID 300.1 – Notice from Construction Equipment and Operations, Building Equipment, and Home Appliances. (1972)

1.04 QUALITY ASSURANCE

A. Comply with requirements of Section 01 43 10, Project Quality Program Requirements – Design/Build.

B. Qualifications for the Acoustical Engineer:

1. The minimum requirements for the Acoustical Engineer: Bachelor of Science Degree or higher degree, from a qualified program in engineering, physics, or architecture offered by an accredited university or college, and ten years' experience in noise and vibration control engineering and noise and vibration analysis, or current enrollment as a full Member or Board-certified Member in the Institute of Noise Control Engineering.

2. Acoustical Engineer must demonstrate substantial and responsible experience in preparing and implementing construction noise control and monitoring plans on construction projects conducted in an urban setting calculating construction noise abatement measures.

3. Acoustical Engineer must demonstrate substantial and responsible experience in preparing and implementing construction noise control and monitoring plans on construction projects conduced in an urban setting, calculating construction noise abatement measures.

1.05 SUBMITTALS

A. Refer to Section 01 33 00, Submittal Procedures.

B. Qualifications and work experience of the Acoustical Engineer as specified in paragraph 1.04.B of this Section. This submittal is required prior to the submittal of the Noise Control and Noise Monitoring Plans.

C. Proposed locations for pre-construction ambient noise measurements at all work sites.

D. Pre-construction ambient noise level measurement report.

E. Contractor's Noise Control Plan as specified in this Section.

F. Contractor's Noise Monitoring Plan and the weekly Noise Measurement Reports as specified in this Section.

G. Noise measurement equipment makes and models, and calibration conformance certificates as specified in this Section.

H. Equipment noise certification reports as specified in this Section.

I. Shop and Working Drawings, computations, material data and other criteria, for noise abatement measures, identified in the Noise Control Plan and for moveable noise barriers, noise barrier walls and noise control curtains as specified in this Section. Have drawings and computations stamped by a License Professional Engineer registered in the State of California.

J. Contractors Weekly Vibration Measurement Reports as specified in this Section.

K. Contractor's Vibration Control Plans and Vibration Monitoring Plan as specified in this Section.

L. Material Safety Data Sheets (MSDS): Manufacturer's Material Safety Data Sheets for each type of material used in Work.

1.06 DEFINITIONS

A. Construction Site: For purpose of noise and vibration control requirements, the Contract limits of construction. This includes Right-of-Way lines, property lines, construction Easement Boundary or property lines and Contractor staging areas outside the defined boundary lines, used expressly for construction.

B. Noise Level Measurements: Unless otherwise indicated, the use of A-weighted and "slow" response settings of instrument complying with Type 2 requirements of latest revision of ANSI S1.4 and IEC 61672.

C. Pre-construction ambient noise levels: Existing noise levels measured 3 feet from the building face of the noise sensitive receivers so named herein.

D. A-Weighted Noise Levels: Decibels (referenced to 20 micro-Pascal) as measured with A-weighting network of standard sound level meter, abbreviated dBA.

E. C-Weighted Noise Level: Decibels (referenced to 20 micro-Pascal) as measured using the C-weighting network on a sound level meter complying with the criteria for a Type 1 (Precision) or Type 2 (General Purpose Sound Level Meter), as defined in the current revision of ANSI S1.4. Use the FAST setting on the sound level meter to measure the C-weighted sound level.

F. Vibration Measurements: The use of a vibration transducer, amplifier, peak detector, and frequency band filters complying with ANSI S2.4.

G. Vibration: Velocity in microinches per second. Vibration levels are expressed as velocity levels in Decibels referenced to one microinch per second, abbreviated VdB.

H. Daytime: As defined by the City of Los Angeles - 7:00 AM to 9:00 PM Monday through Friday local time, and Saturdays, 8:00 AM to 6:00 PM. As defined by the City of Beverly Hills - 8:00 AM to 6:00 PM Monday through Friday.

I. Nighttime: Periods other than daytime.

J. Noise Sensitive Locations: Residential areas, institutions, hospitals, parks, and other locations so named herein.

K. L_{max}: The maximum measured sound level.

L. One-hour Leq A weighted Equivalent Sound Level (Leq): The continuous sound level that represents the same sound energy as the varying sound levels over one hour.

M. Sound Transmission Class (STC): A single number rating calculated in accordance with ASTM E413, using values of sound transmission loss. It provides an estimate of the performance of a partition in certain common sound insulation problems.

N. Stationary/Continuous Noise: Daytime noise from stationary sources, and parked mobile sources that produce repetitive or long-term noise lasting more than two hours.

O. Mobile/Intermittent Noise: Daytime noise from non-stationary mobile equipment operated by a driver, or from source of intermittent, non-recurring on long-term basis, non-scheduled, non-repetitive, short-term noises (not lasting more than two hours).

1.07 RESPONSIBILITIES OF CONTRACTOR

A. Perform Work within the permissible noise levels, work schedule limitations, and procedures provided for in this Section and applicable Federal, state, county and municipal codes, regulations, and standards.

B. Other than those provided herein, be responsible for obtaining, at Contractor's own expense, permits, variances, equipment certifications, and other documents required by this Section and by applicable Federal, state, county and municipal codes, regulations and standards.

C. With regard to noise monitoring, include the following:

1. Furnish instrumentation for noise monitoring that complies with the standards specified in this Section and that is capable of measuring the sound levels defined in this Section.

2. Collect and report noise monitoring data, report whether the noise monitoring data indicates compliance under specialized in this Section, and submit a Noise Measurement Report to Metro on a weekly basis. Noise monitoring that is not conducted at the façade of the noise sensitive receiver should be adjusted accordingly.

3. Provide access to Metro to review measured data and coordinate the Contractor's schedule for noise monitoring.

4. Implement noise abatement measures as required by this Section, based on the Contractor's noise monitoring data and nuisance conditions reported by Metro.

D. With regard to vibration monitoring, include the following:

1. Furnish instrumentation for vibration monitoring that complies with the standards specified in Paragraph 1.02.A of this Section and that is capable of measuring the vibration levels defined in Paragraph 3.05.A of this Section

2. Collect and report vibration monitoring data, report whether the vibration monitoring data indicates compliance as specified in this Section, and submit a Vibration Measurement Report to Metro on a weekly basis.

3. Provide access to Metro to review measured data and coordinate with the Contractor's schedule for vibration monitoring schedules.

4. Implement vibration abatement measures as required by this Section, based on the Contractor's vibration monitoring data and nuisance conditions reported by Metro.

E. The adjacent noise and vibration sensitive locations include, but are not limited to, the following:

1. Properties listed in Table 5 of this Section

PART 2 - PRODUCTS

2.01 NOISE CONTROL MATERIALS

A. Noise control materials may be new or used. Used materials shall be sound and free of damage and defects and shall be of a quality and condition to perform their designed function.

2.02 NOISE BARRIER WALLS

A. Install noise barrier walls around all construction staging areas.

B. Use material that will last for the duration of construction of this Contract. Construct using AC Plywood or acceptable equal.

C. Line the construction site side of noise barrier walls with glass fiber or mineral wool type noise-absorbing material at least two inches thick. Protect this material using wire mesh or perforated sheets that are corrosion resistant and that have at least 30 percent open area and provision for water drainage, or provide a wall assembly with a STC-25 or greater, based on certified sound transmission loss data taken according to ASTM E90 and a Noise Reduction Coefficient (NRC) rating of NRC-0.70 or greater, based on certified sound absorption coefficient data taken according to ASTM C423.

D. Construct gates and doors in the wall either hinged or rolling of the same or equally effective material as the noise barrier wall. Construct gates and doors in the wall to ensure that the edges overlap the wall to eliminate gaps. During nighttime hours maintain gates and doors in a closed position except for brief periods of time to allow access to the Construction Site.

E. Attach lagging to support posts designed so that the wall will withstand 80 mph wind loads plus a 30 percent gust factor.

F. Provide flush mating surfaces of wall sides when walls are joined together or at corners. Close gaps between wall sections and between bottom edge of walls and grade with material that will completely close the gaps and be dense enough to attenuate noise.

G. Be responsible for the design, detailing and adequacy of the framework and supports, posts, attachment methods and other appurtenances required for the proper erection of the noise control barriers.

H. Prepare the design details for the noise control wall footing, steel posts, supports and framework, signed and sealed by a Professional Engineer licensed in the State of California. Submit the design and detailed engineering to Metro.

I. Design and install foundations or piers for walls that do not require excessive noise to remove.

J. Height of Noise Barriers: As required to meet noise control plan requirements, but not less than 20 ft. at Construction Laydown Yards.

K. Temporary Art and Displays: Refer to Sections 01 58 13 A, Temporary Signs and Banners, 01 56 26, Construction Fencing (Wood) and Section 01 56 28, Construction Fencing (Chain Link), for temporary artwork and displays.

L. Post readily visible signs indicating "Noise Control Zone" on or near construction equipment operating close to noise sensitive sites

2.03 MOVEABLE NOISE BARRIERS

A. Construct moveable barriers of AC Plywood sheeting, or other acceptable material. Line barriers on construction site side with glass fiber or mineral wool type sound absorbing material at least two inches thick to produce a noise barrier assembly with an STC25 rating or greater. Protect sound absorbing material by wire mesh or perforated sheets that are corrosion resistant and that have at least 30 percent open area, with provision for water drainage.

B. Provide materials and details of construction sufficiently weather resistant to last through the duration of construction of this Contract.

C. Construction Details:

1. Attach barrier panels to support frames constructed in sections to provide a moveable barrier utilizing the standard temporary precast concrete median barrier or other supports.

2. When barrier units are joined together, overlap the mating surfaces of the barrier sides or make flush with each other. Close gaps between barrier units, and between the bottom edge of the barrier panels and the ground, with material that will completely close the gaps and be dense enough to attenuate noise.

3. Height of barriers: As required to meet noise control plan requirements.

2.04 NOISE CONTROL CURTAINS

A. Noise Control Curtains: Durable, flexible composite material featuring a noise barrier layer bonded to a sound-absorptive material on one side.

1. STC rating of STC-25 or greater based on certified sound transmission loss data taken according to ASTM E90.

2. NRC rating of NRC 0.70 or greater based on certified sound absorption coefficient data taken according to ASTM C423.

B. Noise Barrier Layer: A rugged, impervious material with a surface weight of at least one pound per square foot.

C. Sound Absorptive Material: Include a protective facing, and securely attached to one side of the noise barrier layer over its entire surface.

1. Mildew resistant, vermin proof and non-hygroscopic.

D. The noise control curtain materials: Abuse resistant, exhibiting superior hanging and tear strength during construction. The curtain barrier material shall have a minimum

breaking strength of 120 lb/in. and a minimum tear strength of 30 lb/in. Based on the same test procedures, the curtain absorptive material facing shall have a minimum breaking strength of 100 lb/in. and a minimum tear strength of seven lb/in.

1. Corrosion resistant to most acids, mild alkalis, road salts, oils and grease.

2. Fire retardant, and approved by the City of Los Angeles Fire Department prior to procurement.

E. Construct gates and doors of a material with a STC 25 or greater rating.

F. Construction Details:

1. Install the noise control curtains in vertical segments extending the full curtain height, and have seams and joints with a minimum overlap of two inches and be sealed using hook fasteners or double grommets. Use construction details according to the manufacturer's recommendations.

2. Secure the curtain at ground level and/or at intermediate points by framework and supports.

3. Be responsible for the design, detailing and adequacy of framework, supports, ties, attachment methods and other appurtenances required for the proper installation of the curtain.

4. Height of Curtains: As required to meet noise control plan requirements.

5. Prepare and seal the design and details necessary for the noise control curtain framework and supports using a Professional Engineer licensed in the State of California. Submit the design and detailed engineering to Metro for review prior to procurement.

2.05 VIBRATION CONTROL FOR TUNNEL TRAIN

A. If ground-borne noise limits or ground-borne vibration limits are exceeded, the contractor will be required to take action to reduce noise and/or vibrations to acceptable levels. Such action could include:

1. A durable resilient system to support and the tunnel train tracks. Such as system would include:

a. Resilient mat under the tracks

b. A resilient grommet or bushing under the heads of any track fasteners.

2. The hardness of the resilient mat should be in the 40 to 50 durometer range and be about 1 to 2" thick, depending on how heavily loaded the cars would be.

3. The Contractor would need to select the mat thickness so that the rail doesn't bottom out during a train passby.

4. Reduce the speed of the tunnel trains.

5. Maintain the tunnel train track and train wheels in good order to reduce potential vibration impacts, including keeping gaps between track sections to a minimum and more frequent maintenance to avoid wheel flats.

PART 3 - EXECUTION

3.01 ACOUSTICAL ENGINEER

A. Engage an Acoustical Engineer meeting requirements of Para 1.04B of this Section to be responsible for preparing and overseeing the implementation of the Noise Control Plan and mitigation measures.

3.02 NOISE LEVEL LIMITS

A. A summary of Allowable Construction Site Noise Levels in the cities of Los Angeles and Beverly Hills is provided on Table 2. Contractor to review and update to current City Codes and Ordinances.

B. Metro has taken measurements of the ambient noise levels at noise sensitive receivers near the construction areas. The measured ambient noise levels are presented in Table 1. These measured ambient levels are for information only and not to be used as the basis for developing allowable noise levels. Contractor shall review and update the noise sensitive locations listed in Table 5, adding and deleting locations to reflect changes since the date of the RFP.

C. Neither the LAPD nor the City of Beverly Hills have taken measurements of the ambient noise levels at construction locations. Contractor will take pre-construction 24-hour noise level measurements at each of the noise sensitive locations listed in Table 5. Where nighttime work is planned for any project sites, take pre-construction measurements at Table 5 locations during nighttime hours and provide to Metro. The selection of the measurement sites shall be subject to Metro approval. Measure levels, continuously over a 14 day period, 30 days prior to the beginning of construction, under the supervision of the Acoustical Engineer. Report data to Metro as 1-hour Leq (A-weighted) levels or other selected measurement period as directed by Metro. The Contractor's Acoustical Engineer will establish the day and night noise level limits based on the measured data for Metro's review and approval.

D. After completion of Contractor's pre-construction ambient noise measurements, Table 1 will be updated to indicate for each receiver site, the daytime, evening, and nighttime noise limits for construction. If either the LAPD or the City of Beverly Hills has granted the nighttime noise variance, it will include nighttime limits for selected sites, thus complementing these Ldn criteria, as shown in the Appendix. If LAPD or City of Beverly Hills noise limits differ from the Metro project noise criteria, apply the strictest.

E. The ground borne noise levels within building structures due to underground construction activities - Limited to the Lmax noise levels listed in Table 3.

F. At the surface of the construction site during nighttime hours use only equipment that, operating under full load, meets the noise limits specified in Table 4 when measured according to the test procedures used for equipment noise certification as specified in this Section.

G. Contractor is prohibited from operating equipment at night that does not meet nighttime noise emission limits in Table 4 below. If the Contractor's existing equipment on-site does not meet nighttime noise emission limits for surface construction activities specified in Table 4 or falls out of compliance, remove the non-compliant equipment promptly from nighttime service by immediately parking and turning off equipment when it is safe to do so.

H. Trucks operating off-site between the hours of 12:00 midnight and 5:00 AM must have lower emission limits (80 dBA at 50 feet) than normally required by the California Vehicle Code. All trucks used for these nighttime hours must be certified in accordance with these specifications. Take necessary steps to comply with this limit, which may include fitting this equipment with high grade engine exhaust silencers and engine casing sound insulation.

3.03 NOISE CONTROL MEASURES

A. Noise Barrier Walls

1. At the Wilshire/Rodeo Station laydown and staging work areas a 20-foot high noise barrier wall shall be erected around the perimeter of each of the work areas as shown in the Contract drawings in accordance with Article 2.02 of this Section.

2. At the Century City/Constellation Station laydown and staging work areas a 20-foot high noise barrier wall shall be erected around the perimeter of each of the work areas as shown in the Contract drawings in accordance with Article 2.02 of this Section.

B. Moveable Noise Barriers

1. For construction occurring at the Wilshire/Rodeo Station Box, Century City/Constellation Station Box and Century City/Constellation TBM Launch Area, moveable noise barriers with a nominal height of 14 feet shall be used at the perimeter of these sites in accordance with Article 2.03 of this Section.

C. These supplemental noise mitigation measures shall be provided at the 2040 CPE Work Area.

1. Compressor plant, ventilation plant, grout plant, foam plant, machine shop and electrical shop shall be fully enclosed.

2. Conveyor system shall be enclosed.

3. All diesel powered equipment, such as a boom crane or front end loader used during the night shift shall be retrofitted with a hospital grade muffler and additional damping and insulation added to the engine compartments.

4. A supplemental 16-foot high noise barrier wall will be built on site, as shown in the Contract drawings in accordance with Article 2.02 of this Section to further shield the noise from spoils handling operations.

Los Angeles County Metropolitan Transportation Authority
Westside Purple Line Extension Project, Section 2

3.04 NOISE CONTROL PLAN

A. Requirements:

1. The Acoustical Engineer is responsible for preparing and overseeing the implementation of the Noise Control Plan.

2. Submit the Noise Control Plan to Metro or its designee a minimum of 90 days prior to the start of work.

3. Noise Control Plan: Include the following for daytime and nighttime construction activities that may occur at the surface of the construction site:

   a. Site Drawing: Prepare a scaled drawing of the construction site indicating the following:

      1) Contract name and number

      2) Contractor's name

      3) Date

      4) Scale

      5) Direction of North

      6) Noise sensitive locations near the construction site

      7) Construction equipment locations used during daytime and nighttime hours, designated by the code letter used in Column (a) in Part A of the Noise Control Plan Form, Figure 4.

      8) Locations of the noise levels calculated for residential, commercial, and industrial areas as specified in this Section.

      9) Locations and types of noise abatement measures that may be required to meet codes and regulations as indicated by the calculations as specified in this Section.

   b. Equipment Inventory: Prepare an inventory of equipment used during daytime and nighttime hours by providing the following information in the indicated columns of Noise Control Plan Form, Figure 4.

      1) Column (a): Code letter in sketch to indicate position of equipment on site and to identify Certificates of Noise Compliance

      2) Column (b): Appropriate equipment category from Table 4

      3) Column (c): Equipment manufacturer and model, if known at the time of the Plan's preparation

      4) Column (d): Unique identifier (ID), such as registration number, if known at the time of the Plans preparation.

5) Column (e): Equipment horsepower

6) Column (f): Noise emission limit from Table 4.

7) Column (g): Estimated noise level at 50 feet; if greater than the value in Column (f), source noise control device (e.g. mufflers) must be used to comply with limit.

8) Column (h): Estimated date of first use on site

9) Column (i): Estimated date of last use on site.

c. Noise Calculations: Prepare calculations of daytime and nighttime L_{max} and one-hour L_{eq} noise levels expected at the nearest residential, commercial and industrial property line based on the equipment noise levels given in Part A of the Noise Control Plan Form. Determine the nearest property lines from the currently identified noise sensitive locations indicated in Table 5. Calculate preliminary one-hour L_{eq} construction noise projections for those sensitive locations and insert with locations into Table 6. Make the calculations for locations where noise emitted by applicable equipment will cause the greatest noise level for each type of land use, for daytime and nighttime periods if necessary. Provide the results on Part B of the Noise Control Plan Form with calculations included below the results, and with the locations for the calculations indicated on the site sketch. The noise calculation procedure shall be as follows:

1) Calculate L_{max} according to the method outlined below:

$L_{max}(\text{equipment}) = EL - 20 \log_{10} (D/50)$

where:

EL = Estimated equipment noise level at 50 feet, in dBA.

D = Distance from the equipment to property-line location, in feet.

Then, combine the individual contributions of each piece of equipment to obtain the overall maximum construction noise level at each location as follows:

$L_{max}(\text{overall}) = 10 \log_{10} (\text{SUM } 10 [L_{max}(\text{equipment})/10])$

2) Calculate one-hour L_{eq} according to the methodology recommended by the US Department of Transportation, Federal Highway Administration Special Report Highway Construction Noise: Measurement, Prediction and Mitigation, as follows:

First, calculate the construction one-hour L_{eq} at each property-line location for each item of equipment using the following equation:

One-hour $L_{eq}(\text{equipment}) = EL - 20 \log_{10}(D/50) + 10 \log_{10}(UF/100)$

where:

EL = Estimated equipment noise level at 50 feet, in dBA.

D = Distance from the equipment to the property-line location, in feet.

UF = "Usage factor," expressed as the percent of time that the equipment is operated at full power while on site. This factor shall be estimated by the Contractor or the qualified acoustical engineer. Guidelines for the selection of usage factors are provided by the US Environmental Protection Agency (EPA) Report NTID 300.1, Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.

Then, combine the individual contributions of each piece of equipment to obtain the overall construction one-hour L_{eq} at each location as follows:

One-hour L_{eq}(overall) =10 $\log_{10}$ (SUM 10[one-hour Leq (equipment)/10])

3) Compare the calculated L_{max} and one-hour L_{eq} values with the Contract limits specified in this Section.

d. Description of Required Noise Abatement Measures as specified in Paragraph 3.2.B of this Section.

4. Noise Control Plan for Construction Activities Near Schools – If any primary or secondary schools are identified within the noise impact area of construction, the Contractor shall prepare noise control plans to maintain acceptable interior noise levels within the school classrooms and occupied spaced. Metro will develop these criteria in coordination with the Los Angeles Unified School District (LAUSD), the Beverly Hills Unified School District (BHUSD), and individual school administrators. The Contractor shall monitor the construction noise levels to ensure compliance.

5. Update the Noise Control Plan at three month intervals (based on Metro's initial acceptance date) and re-submit the Plan within 10 days of the start of each quarterly period. Update and re-submit the Noise Control Plan upon any major change in work schedule, construction methods, or equipment operations not included in the most recent Plan.

B. Noise Abatement Measures: If the results of the noise calculations prepared in accordance with this Section indicate that noise level limits listed in this Section will be exceeded, identify proposed noise abatement measures, their anticipated effects (dBA reductions), and a schedule for their implementation. Re-calculate the noise levels at the nearest sensitive receptor location property lines which include the anticipated noise reduction effects and submit the results on Part B of the Noise Control Plan Form. Include, as backup documentation to Part B of the Noise Control Plan, drawings, sketches, and suitable calculations which demonstrate anticipated

noise reduction benefits and that proposed structures or facilities comply with applicable building code requirements.

C. Noise Reduction Methods: To the extent required to meet the noise limits specified by this Section, include noise reduction measures listed below, or others of the Contractor's devising to minimize construction noise emission levels. Noise reduction measures include, but are not limited to the following:

1. Scheduling truck loading, unloading, and hauling operations so as to minimize noise impact near noise sensitive locations and surrounding communities.

2. Locating stationary equipment so as to minimize noise impact on the community.

3. Do not leave equipment pieces idling when not in use.

4. Limiting the use of enunciators or public address systems, except for emergency notifications. Any public address or music system must not be audible at any adjacent sensitive receiver

5. Maintaining equipment such that parts of vehicles and loads are secure against rattling and banging.

6. Limit the time that steel decking or plates for street decking or covering excavated areas are in use.

7. Grading of surfaced irregularities on construction sites to prevent the generation of impact noise and ground vibrations by passing vehicles.

8. Schedule Work to avoid simultaneous activities that both generate high noise levels.

3.05 NOISE MONITORING PLAN

A. Requirements:

1. Noise Monitoring Plan shall be prepared and administered by the Contractor's Acoustical Engineer.

2. 60 days prior to commencing work, submit the Noise Monitoring Plan to Metro, specifying the nighttime and daytime construction activities, monitoring locations, equipment, procedures, schedule of measurements and reporting methods to be used.

3. Furnish noise monitoring data to Metro or its designee on a weekly basis. Include measurements taken during the previous week.

4. In the event that the measured noise levels exceed allowable limits, halt operation of the activity causing the exceedance and immediately notify Metro within one hour of the exceedance. Work on that activity shall be suspended until such time as an alternative construction method can be used and additional Noise Abatement Measures can be implemented as specified in the Noise Control Plan before this same activity can be resumed.

5. If the measured nighttime levels exceed the noise limits specified in this Section, reduce the noise levels by appropriate abatement measures in order to comply with the nighttime Noise Variance requirements or terminate the nighttime construction activity responsible for the noise limits exceedance until the daytime hours when higher noise levels are permitted.

B. Measurement Locations:

1. Measure noise levels at the noise-sensitive locations identified in Table 5 of this Section. These locations may change during the Contract and shall be updated as required by Metro.

2. Prepare and submit a scaled plan indicating monitoring locations, including measurements to be taken at construction site boundaries and at nearby residential, commercial and industrial property lines.

C. Noise Monitoring - (Continuous Noise Monitoring Stations (CMS)

1. Maintain continuous noise monitoring stations (CMS) with internet access at minimum of four selected locations within the community affected by the nighttime construction activities, and with an additional continuous noise monitoring station at the station construction sites at Wilshire/Rodeo and Century City Constellation.

2. CMS stations shall be programmed with an initial trigger that provides an alert when the construction noise levels are within 3 dB of the noise limit and a second trigger when the noise levels are at or above the noise limit.

3. CMS stations shall continuously measure the equivalent sound level (one-hour Leq) and the maximum sound level (Lmax) on the A-Scale (dBA) and report the measured levels on a real time basis and/or one-hour time period or other selected measurement period as directed by Metro. CMS shall make audio recordings of all exceedances.

4. Provide noise monitor telemetry links and software and computer capable of continuously measuring noise and transmitting the measured data from each of the CMS by a web based application to a computer located at the contractor's office.

5. Contractor shall review and analyze CMS data each day. The Acoustical Engineer or his designee shall each day listen to the audio of the exceedence events and identify the cause is from contractors work and not other sources such as emergency vehicle siren, helicopter etc. Submit noise data to Metro or its designee on a weekly basis using the Noise Measurements Report Form provided in Figure 2.

6. Monitoring locations for CMS will be selected by LAPD, City of Beverly Hills and Metro to ensure that the Nighttime Noise Variance requirements are met. As work progresses at each of the construction areas it may be necessary to periodically relocate the continuous noise monitors to the area most sensitive to on-going construction noise activities.

D. Noise Monitoring – Hand Held Monitors

1. Provide Metro with one Type 1 (precision sound level meter that meets the requirements outlined in this Section.

2. Measurement Equipment:

a. Perform noise measurements with an instrument that is in compliance with the criteria for a Type 1 (Precision) or Type 2 (General Purpose) Sound Level Meter as defined in the current revision of ANSI S1.4.

b. Provide sound level meters capable of measuring the L_{max} and one-hour L_{eq} on both the A-Weighted and C-Weighted scales required by regulatory criteria and Noise Level Limits.

c. Calibrate sound level meters, microphones, and calibrators for certified laboratory conformance at least once a year. Submit a current certificate of conformance to Metro prior to using the sound level meter and submit updated certificates following subsequent calibrations on a yearly basis for the duration of this Contract or upon the completion of repairs to the instrument.

E. Measurement Procedure – Hand Held Monitors

1. Field calibrate the sound level meter using an acoustic calibrator, according to the manufacturer's specifications, prior to each measurement.

2. Except as otherwise indicated, perform measurements using the A weighting network and the SLOW response of the sound level meter.

3. Measure impulsive or impact noises using the C-Weighting network and the FAST response of the sound level meter.

4. Fit the measurement microphone with an appropriate windscreen at the location of the sensitive receptor at least four to six feet away from the nearest reflective surface.

5. Take noise measurements at 3 feet from the building face of noise sensitive locations within 150 feet of the construction site at least once each week and after a change in construction activity or construction location. Measurement Periods: Minimum of 15 minutes.

6. Construction noise measurements shall coincide with daytime and nighttime periods of maximum noise generating construction activity, and be taken during the construction phase or activity that has the greatest potential to create annoyance or to exceed applicable noise regulations and restrictions.

7. If, in the estimation of the person performing the measurements, outside noise sources contribute significantly to the measured noise level, repeat the measurements (with the same outside source contributions when construction is inactive to determine the background noise level

8. Submit noise data to Metro or its designee on a weekly basis using the Noise Measurements Report Form provided in Figure 2. Note the type of measurement (e.g. baseline, on-going construction) on the form.

9. Clearly identify monitoring locations and sketch on the back of the Noise Measurements Report Form, Figure 2, along with the locations of and distances from any noise sensitive location.

10. Identify construction equipment operating during the monitoring period and the locations sketched on the back of the Noise Measurements Report Form, along with the locations and distances to any noise sensitive location.

3.06 EQUIPMENT NOISE CERTIFICATION

A. Requirements for Construction Equipment:

1. Ensure that Contractor and Subcontractor equipment, of the categories listed in Table 4 to be used (during nighttime hours at the surface of the construction site) for a total duration greater than five days, shall be tested for compliance with the stated noise emission limits by the Acoustical Engineer during the first day of use on the construction site or at an alternative site acceptable to Metro.

2. Retest equipment as described above at six month intervals while in use on-site, and certify new equipment before being placed into service at the site.

3. For each piece of equipment tested, submit a noise report to Metro or its designee by completing the Application for Certificate of Equipment Noise Compliance provided in Figure 3. Ensure that the equipment identification number used for the Certificates is consistent with the identification number used in the Noise Control Plan.

4. Do not use equipment of the categories listed in Table 4, as described above on-site without valid certificates of noise compliance submitted as required.

B. Test Procedures for Construction Equipment:

1. Operate engine powered equipment by the Contractor or Contractor's representative at maximum governed rpm under full load conditions during the tests under the supervision of the Acoustical Engineer.

2. Test portable and mounted impact hammers, such as hoe rams and jackhammers to be used for concrete breaking, by the Acoustical Engineer during the first day of actual operation at the construction site under maximum load conditions as rated by the equipment manufacturer.

3. Noise certification measurements: As specified in Paragraph 3.03 F. of this Section. Use an acoustic calibrator of the type recommended by the sound level meter manufacturer prior to measurements.

4. If possible, make measurements at two locations:

a. Two feet outside the right side of the equipment casing, at a distance of 50 feet and height of five feet above ground level, and;

b. Two feet outside the left side of the equipment casing, at a distance of 50 feet and a height of five feet above ground level, with the equipment operating as indicated in items 3.04.B.1, or 2 above for a minimum period of one minute. Reduce measurements made at less than 50 feet, because of space limitations at the test site, by the values given in Table 7 to estimate the 50-foot sound level.

C. Compliance:

1. Submit a noise report to Metro for each item of equipment used on the surface of the construction site during nighttime hours of the categories listed in Table 4. Submit the report on the form shown in Figure 3 with certification by the Acoustical Engineer that equipment noise emissions do not exceed those prescribed in Table 4.

2. If the noise levels obtained during the tests exceed those specified in Table 4, remove such equipment from nighttime use until such equipment is modified and retested, or substitute other equipment to meet the noise level requirements.

3. Upon compliance Metro will mark the noise report indicating Metro's concurrence, including the certification date and equipment identification number, for verification by Metro. Keep the noise reports readily available on file in the construction field office for inspection by Metro upon request.

4. The Certificate of Noise Compliance will remain valid for a period of six months only. Delays caused by the certification refusal or by time lost in improving the rejected equipment or finding alternate acceptable equipment will not be a basis for monetary or time delay claims, or for avoidance of liquidated damages or withholding of payment.

5. Equipment shall be subject to spot noise level testing by Metro's discretion to determine that the equipment in use meets the requirements specified in Table 4. If such tests are requested by Metro, locate and operate the equipment as directed by Metro at the designated site so as to facilitate the measurements.

a. Provide Metro with a copy of the results of the measurements. If such tests demonstrate that any equipment does not comply with this part, Metro will revoke the certificate of Noise Compliance and the Contractor will take the equipment out of use according to requirements of this Section until compliance is achieved. A new Certificate of Noise Compliance will be issued upon proof of compliance.

3.07 VIBRATION LEVEL LIMITS

A. Measures applied to limit noise levels may in some cases limit vibration levels also. Measures specified above for noise levels are applicable.

B. All Areas: Conduct Construction activities so that vibration levels at a distance of 50 feet from construction limits or at nearest affected building (whichever is closer) do not exceed root-mean-square (rms) unweighted vibration velocity levels in vertical direction over a frequency range of 1 to 100 Hz as listed in Table 8. Limit ground-

borne noise inside buildings due to construction vibration to below the limits in Table 3.

C. Historic and Cultural Resources Structures – The Contractor will be responsible for the protection of vibration sensitive historic buildings or cultural resource structures that are within 200 feet of any construction activity. These structures have been identified in the Final EIS/EIR. Vibration from construction activities shall not exceed the Category IV levels as indicated in Table 9 for any length of time. The Contractor shall perform periodic vibration monitoring at the closest structure to any construction activities using approved seismographs. If at any time the construction activity results in vibration levels that exceed those specified herein, that activity shall be halted immediately and work on that activity shall be suspended until such time as an alternative construction method can be used that will result in lower vibration levels.

D. The groundborne vibration levels at building structures due to any construction activities shall be no greater than the peak particle vibration levels shown in Table 9. The Contractor shall perform periodic vibration monitoring at the closest occupied building structure to any construction activities using approved seismographs. If at any time the construction activity results in vibration levels that exceed those specified herein, that activity shall be halted immediately and work on that activity shall be suspended until such time as an alternative construction method can be used that will result in lower vibration levels.

E. Vibration levels at buildings affected by construction operations refer to vertical direction vibration on ground surface or building floor.

F. Conduct daily measurements of vibration during peak vibration generating construction activities.

3.08 VIBRATION CONTROL AND MONITORING PLAN

A. Requirements

1. Same as noted above for the Noise Control Plan (3.02.A) and Noise Monitoring Plan (3.03.A), applied to vibration, where applicable.

2. Vibration Calculations – In the absence of relevant vibration measurement data that can be applied to this Project, prepare calculations of maximum groundborne noise and vibration at representative buildings along the Project. Preliminary source vibration levels are indicated in Table 10. These source levels are preliminary in nature and it is up to the Contractor to verify and update information during construction (and, where possible, before construction). Provide the results on a form similar to Part B of the Noise Control Plan Form, with the calculations included below the results, and with the locations for the calculations indicated on the site sketch. The vibration calculation procedure shall be as follows:

a. Damage Assessment – Calculate the vibration according to the method outlined below:

$$PPV_{equipment} = PPV_{ref} \times (25/D)^{1.5}$$

where:

$PPV_{equipment}$ is the peak particle velocity in units of inches/second of the equipment adjusted for distance

PPV_{ref} is the reference vibration level in units of inches /second at 25 feet (see Table 10)

D is the distance from the equipment to the receiver, in feet.

b. Annoyance Assessment – Calculate the vibration according to the method outlined below:

$Lv(D) = Lv(25\ ft) - 30\ log_{10}\ (D/25) + correction$

where:

Lv(D) is the rms vibration velocity in logarithmic units of VdB re 10^{-6} in/sec of the equipment, adjusted for distance.

Lv(25 ft) is the reference vibration level in logarithmic units of VdB re 10-6 in/sec at 25 ft (see Table 10).

D is the distance from the equipment to the receiver, in feet.

Correction is as noted in Table 11.

B. Vibration Abatement Measures – if the results of the vibration calculations or representative field data indicate that the vibration level limits listed in this Section will be exceeded, identify proposed vibration abatement measures, their anticipated vibration effects, and schedule for their implementation. Provide calculations demonstrating the effectiveness of the proposed abatement measures, and, if applicable, provide applicable drawings and sketches to indicate where such abatement measures will be placed.

C. Vibration Reduction Methods – See paragraph 3.02.C for methods which can reduce noise and vibration.

D. Vibration Measurement Locations

1. Measure vibration and groundborne noise at sensitive locations in the vicinity of the construction sites. These locations may change during the Contract and shall be updated as required by Metro.

2. Prepare and submit a scaled plan indicating monitoring locations.

E. Vibration Monitor

1. Maintain a vibration monitoring station with internet connection at the closest building to the vibration generating construction activities. See Section 3.05 for other requirements. Measure vibration and groundborne noise at a minimum of these locations where there are buildings that are eligible for listing on the National Register of Historic Properties:

a. Pending

F. Measurement Equipment

1. Use an Instantel Blastmate III, Minimate Plus, Minimate Series IV pro or approved equal to monitor vibration. See 3.03.E for groundborne noise equipment requirements.

2. Calibrate vibration equipment at a certified laboratory at least once a year. Provide calibration documentation to Metro prior to placing equipment in service.

G. Measurement Procedure – See 3.03.F for general guidelines applicable to spot check for vibration and groundborne noise.

3.09 CONSTRUCTION SITE NOISE CONTROL

A. Perimeter Noise Barrier Wall:

1. Furnish and install perimeter noise barrier walls along streets as indicated. The noise barrier walls shall provide sufficient noise reduction to meet the daytime or nighttime noise limits specified in this Section. It is the Contractor's responsibility to meet these limits by other methods such as installing additional fixed barrier walls or movable barriers, raising the height of the noise barrier walls, and providing additional noise control measures specified in this Section. Perimeter fencing shall be a minimum height of 20 ft.

2. Construct gates and/or doors in the wall either hinged or rolling of the same or equally effective material as the noise barrier wall. Construct gates and doors in the wall to ensure that the edges overlap the wall to eliminate gaps. During nighttime hours maintain gates and doors in a closed position except for brief periods of time to allow access to the Construction Site.

3. Install noise barrier walls, gates, and doors in the wall before commencing any work.

B. Noise Barrier Walls for Pile Installation and Grouting Stage Areas:

1. Provide Noise Control walls on perimeter of pile installation closure and grouting staging areas.

2. Provide noise absorptive material behind gawk screens on K-Rail which are adjacent to live traffic, and on construction chain link fencing, which is adjacent to the sidewalk.

3.10 CONSTRUCTION SITE VIBRATION CONTROL

A. Provide an elastomer isolator installed between the floor of the tunnel and the rails and ties on which the excavated materials train operates. The elastomer isolator shall be provided for the full extent of the running tunnel between the end of the Wilshire/La Cienega Station and the Constellation Century City Station.

B. Submit the excavated materials train rail vibration elastomer isolator design for Metro acceptance before installation of the track.

C. If the Metro ground-borne noise or ground-borne vibration limits (Table 3) are exceeded the Contractor will be required to take additional action to reduce vibration to acceptable levels.

3.11 CONSTRUCTION METHODS – EQUIPMENT

A. Minimize the use of impact devices, such as jackhammers, pavement breakers, and hoe rams. Where possible, use concrete crushers or pavement saws rather than hoe rams for tasks such as concrete deck removal and retaining wall demolition.

B. Pneumatic impact tools and equipment used at the construction site shall have intake and exhaust mufflers recommended by the manufacturers thereof, to meet relevant noise ordinance limitations and Metro project criteria shown in this Section.

C. Equip noise producing equipment i.e. jackhammers and pavement breakers with acoustically attenuating shields or shrouds recommended by the manufacturers thereof, to meet relevant noise ordinance limitations.

D. Line or cover hoppers, conveyor transfer points, storage bins, and chutes with sound-deadening material.

E. All noise producing equipment, including vehicles that use internal combustion engines will be required to be equipped with mufflers and air-inlet silencers, where appropriate, and kept in good operating condition that meets or exceeds original factory specifications. Mobile or fixed "package" equipment (e.g., arc welders, air compressors, ventilation fans) will be equipped with shrouds and similar noise control features, to meet noise ordinance limitations.

F. Blasting and Impact Pile Driving is specifically prohibited from use. Use of vibrating and impact hammers shall also be limited due to close proximity of adjacent buildings

G. As required to meet the noise limits specified in this Section, use alternative procedures of construction, and select proper combination of techniques that generate least overall noise and vibration. Such alternative procedures include the following:

1. Use electric welders powered from utility main lines instead of riveting or electric generators/welders.

2. Mix concrete off-site instead of on-site.

3. Employ prefabricated structures instead of assembling on-site.

4. Solar powered arrow boards

5. VMS message signs

H. Use only construction equipment, both fixed and mobile, that is equipped to operate within noise limits. At night, use only equipment when, when operating at the surface of the construction site under full load, is certified to meet the specified lower noise

level limits set in the noise control plan and specified in the noise variance application.

I. Use construction equipment manufactured or modified to dampen noise and vibration emissions, such as:

1. Use electric electrically powered equipment to the extent possible instead of diesel powered equipment.

2. Use hydraulic tools instead of pneumatic impact tools.

3. Use electric instead of air or gasoline driven saws.

4. Whisper Jet diesel powered generators.

J. Readily visible signs indicating "Noise Control Zone" shall be used.

K. Noise control devices that meet original specifications and performance shall be used.

L. Mobile or fixed noise-producing equipment shall be equipped to mitigate noise to the extent practical would be used.

M. Earth-moving equipment, fixed noise-generating equipment, stockpiles, staging areas, and other noise-producing operations would be located as far as practicable from noise-sensitive receivers.

N. The use of air horn type devices, including but not limited to vehicle mounted or hand held, shall not be used to communicate signals from one area of the project site to another. Compliance with the requirements of the Tunnel Safety Orders for signaling systems shall be obtained through the use of other auditory or visual systems other than the use of air horn type devices.

O. Use of horns, whistles, alarms, and bells would be limited.

P. Any project-related public address or music system would not be audible at any adjacent receiver.

Q. Enclosures for fixed equipment such as TBM slurry processing plants would be required in order to reduce noise.

R. Used approved design of silencers for all ventilation fans.

3.12 CONSTRUCTION METHODS – OPERATIONS

A. Operate equipment so as to minimize banging, clattering, buzzing, and other annoying types of noises, especially near residential areas during the nighttime hours.

B. To the extent feasible, configure the construction site in a manner that keeps noisier equipment and activities as far as possible from noise sensitive locations and nearby buildings.

C. In no case shall the above restrictions limit the Contractor's responsibility for compliance with applicable Federal, state and local safety ordinances and regulations and other Sections of these construction specifications.

D. Maximize physical separation, as far as practicable, between noise generators and noise receptors. Separation includes following measures:

1. Provide enclosures for stationary items of equipment and barriers around particularly noisy areas on site.

2. Locate stationary equipment to minimize noise and vibration impact on community, subject to acceptance of Metro.

E. Demolition methods to be selected to minimize noise and vibration impact where possible.

F. Use of vibratory rollers and packers tobe avoided near vibration sensitive areas.

G. Temporary noise barriers and sound-control curtains to be erected where project activity is unavoidably close to noise-sensitive receivers.

H. Minimize noise-intrusive impacts during most noise sensitive hours. Limit activities such as concrete saw cutting to daytime and early evenings.

1. Plan noisier operations during times of highest ambient noise levels.

2. Keep noise levels relatively uniform; avoid excessive and impulse noises.

3. Turn off idling equipment.

4. Phase in start-up and shut-down of site equipment.

I. Select truck routes for muck disposal so that noise from heavy-duty trucks will have minimal impact on sensitive land uses (e.g., residential).

1. Conduct truck loading, unloading and hauling operations so noise and vibration are kept to a minimum.

2. Where possible, route heavily loaded trucks away from residential streets. Where no alternatives are available, haul route selection will take into consideration streets with the fewest noise-sensitive receivers..

3. Submit haul routes and staging areas to the City of Los Angeles, Bureau of Engineering and LADOT, or the City of Beverly Hills 30 days before required date.

J. Minimize vibrations from operations and equipment where necessary.

1. Maintain smooth surfaces for construction equipment and vehicles to travel on (e.g., truck routes, tunnel train rail) to minimize vibration.

2. Conduct TBM operations and maintain equipment to minimize unnecessary vibration.

K. Use non-noise sensitive, designated parking areas for project related traffic.

3.13 CONSTRUCTION METHODS – MOVEABLE NOISE BARRIERS

A. At a minimum, provide movable noise barriers for work in public right-of-way during night time hours in accordance with requirements of this Section for Moveable Noise Barriers.

B. Provide readily removable noise barriers so that they may be repositioned, as necessary, to provide noise abatement for non-stationary and stationary processes.

C. Installation, Maintenance, and Removal:

1. Install the barriers such that the sound-absorptive surfaces face the noise source.

2. Maintain the moveable noise barriers and repair damage that occurs, including, but not limited to, keeping barriers clean and free from graffiti, and maintaining structural integrity. Promptly repair or replace gaps, holes, and weaknesses in the barriers, and openings between, or under the units with new material.

D. The use of moveable noise barriers is a minimum noise control requirement that may not provide sufficient noise reduction to meet the daytime or nighttime noise limits specified in this Section. It is the Contractor's responsibility to meet these limits by other methods such as installing additional moveable noise barriers, installing noise barrier walls, and providing additional noise control measures specified in this Section as indicated.

3.14 CONSTRUCTION METHODS – NOISE CONTROL CURTAIN

A. Install noise control curtains in accordance with requirements of this Section for Noise Control Curtains, as required to meet the noise limits specified in this Section, to shield public from construction noise during the course of the Contract.

B. The noise control curtains shall be readily moveable so that they may be repositioned, as necessary, to provide noise abatement for non-stationary and stationary processes.

C. Installation, Maintenance and Removal:

1. The noise control curtains shall be installed without any gaps such that the sound-absorptive side faces the construction activity to be shielded.

2. Maintain the noise control curtains and promptly repair any damage that may occur. Gaps, holes or weaknesses in the curtain, or openings between the curtain and the ground shall be promptly repaired by the Contractor.

3.15 NOISE AWARENESS TRAINING

All Contractor personnel on site shall participate in 15 minute Noise Awareness Training provided by Metro.

3.16 CONSTRUCTION SCHEDULE

When traffic restrictions allow, schedule saw cutting, jack hammering and other noisy activities during the day or early evening hours.

3.17 LOW IMPACT BACK-UP ALARMS

A. Use low impact back-up alarms on all equipment during nighttime hours. The equipment shall include, but not limited to, cranes, low boys, backhoes, loaders, concrete pumps, excavators, haulers, dump trucks, work trucks, and concrete mix trucks.

B. The low impact back-up alarms used by the Contractor shall comply with CCR Title 8, Section 1592, Warning Methods.

1. For equipment that must comply with CCR Title 8, Section 1592(a), equip these vehicles with compliant white sound, broadband and multi-frequency type back-up alarm devices.

2. For equipment subject to the requirements of CCR Title 8, Section 1592(b) and that the Contractor chooses to equip with automatic back-up audible alarms as the means for complying with this section; such alarms shall only be of a compliant white sound, broadband or multi-frequency back-up alarm type device.

3. The compliant white sound, broadband and multi-frequency type back-up alarm device shall be a self-adjusting, "smart" reversing, alarm that continually adjusts to 5 db above ambient. Acceptable manufacturers are Brigade, ECCO or approved equal.

4. The compliant white sound, broadband and multi-frequency type back-up alarm device shall be rated as medium duty or heavy duty, as the field conditions and/or usage would dictate.

Los Angeles County Metropolitan Transportation Authority
Westside Purple Line Extension Project, Section 2

TABLE 1 – ALLOWABLE SOUND LEVELS OF TOTAL CONSTRUCTION SITE NOISE BASED ON METRO's AMBIENT NOISE MEASUREMENTS

Wilshire/Rode Station

Site No.	Measurement Location	Daytime Leq[a]	Evening Leq[a]	Nighttime Leq[a]
H	210 N. Beverly Drive (MFR)	77 dBA	75 dBA	74 dBA
I	133-153 S. Reeves Drive (SFR/MFR)	64 dBA	61 dBA	59 dBA
J	Sirtaj Hotel, 120 S. Reeves Drive	63 dBA	61 dBA	57 dBA
K	192 N. Canon Drive (Offices)	73 dBA	70 dBA	70 dBA
L	121-157 S. Canon Drive (SFR/MFR)	66 dBA	66 dBA	62 dBA
M	AKA Beverly Hills Hotel, 155 N. Crescent Drive	67 dBA	65 dBA	67 dBA
1	Beverly Sixty Hotel, 9360 Wilshire Boulevard	81 dBA	79 dBA	77 dBA
2	The Rolex Building, 9420 Wilshire Boulevard (Offices)	79 dBA	77 dBA	75 dBA
3	Sterling Plaza/Bank of California, 9441 Wilshire Boulevard (Offices)	79 dBA	77 dBA	76 dBA
4	Beverly Wilshire Hotel, 9500 Wilshire Boulevard	78 dBA	77 dBA	75 dBA

Notes:
[a] Daytime is from 8:00 A.M. to 6:00 P.M., evening is from 6:00 P.M. to 9:00 P.M. and nighttime is from 9:00 P.M. to 8:00 A.M.
MFR – Multi-Family Residences
SFR – Single-Family Residences

Century City/Constellation Station

Site No.	Measurement Location	Nighttime Leq[a]		
A	1918-1952 Fox Hills Drive (MFR)	63 dBA		
B	2050 Century Park West (MFR)	64 dBA		
C	Hyatt Regency Century Plaza Hotel, 2025 Avenue of the Stars	61 dBA		
D	2010 Century Park East (Offices)	68 dBA		
E	Century City Hospital & Medical Center, 2080 Century Park East – 1st floor	68 dBA		
E	Century City Hospital & Medical Center, 2080 Century Park East – 3rd floor	64 dBA		
E	Century City Hospital & Medical Center, 2080 Century Park East – 8th floor	63 dBA		
F	2160 Century Park East (MFR)	70 dBA		
6	1888 Century Park East (Offices)	68 dBA		
7	Century Plaza Towers, 2049 Century Park East (Offices)	64 dBA		
8	Annenberg Space for Photography and the Skylight Studios, 10050 Constellation Boulevard	61 dBA		
9	Bain & Company Building, 1901 Avenue of the Stars	66 dBA		
10	The Century, 10 West Century Drive (Offices)	62 dBA		
11	Constellation Place, 10250 Constellation Boulevard (Offices)	71 dBA		
Sites G and 5 are in the City of Beverly Hills and subject to the Beverly Hills' Noise Code				
		Daytime[b]	Evening[b]	Nighttime[b]
G	401 Shirley Place, Beverly Hills (SFR)	68 dBA	68 dBA	63 dBA
5	Beverly Hills High School	56 dBA	53 dBA	51 dBA

Notes:
[a] Nighttime is from 9:00 P.M. to 7:00 A.M as defined by the City of Los Angles Municipal Code.
[b] Daytime is from 8:00 A.M. to 6:00 P.M., evening is from 6:00 P.M. to 9:00 P.M. and nighttime is from 9:00 P.M. to 8:00 A.M.MFR – Multi-Family Residences
SFR – Single-Family Residences

Los Angeles County Metropolitan Transportation Authority
Westside Purple Line Extension Project, Section 2

TABLE 2 – SUMMARY OF ALLOWABLE CONSTRUCTION SITE NOISE LEVELS (CITY OF LOS ANGELES AND CITY OF BEVERLY HILLS)

Construction Activity	Noise Limit[1], dBA
City of Los Angeles Daytime (7:00 A.M.-9:00 P.M.), general activities	75 dBA
City of Los Angeles Daytime (7:00 A.M.-9:00 P.M.), steady high-pitch noise or repeated impulsive noises	70 dBA
City of Los Angeles Daytime (7:00 A.M.-9:00 P.M.), less than 15 minute duration in a period of 60 consecutive minutes	80 dBA
City of Los Angeles Nighttime (9:00 P.M.-7:00 A.M.), all activities	Nighttime Ambient + 5dB
City of Beverly Hills Daytime (8:00 A.M.-6:00 P.M.), all activities	Daytime Ambient +5 dB
City of Beverly Hills Evening (6:00 P.M.-9:00 P.M.), all activities	Evening Ambient + 5dB
City of Beverly Hills Nighttime (9:00 P.M.-8:00 A.M.), all activities	Nighttime Ambient + 5 dB
Notes: [1]Noise limit applies to the facade of the closest noise sensitive property.	

TABLE 3 – ALLOWABLE MAXIMUM INTERIOR GROUND-BORNE NOISE FROM UNDERGROUND CONSTRUCTION ACTIVITIES

Land Use Activity	Groundborne Noise Level Limits – L_{max} (dBA)
Single-Family Dwellings	40
Multi-Family Dwellings	45
Hotel/Motel	45
Offices	50
Commercial Buildings	55
Concert Halls, Recording and TV Studios	30
Auditoriums and Music Rooms	35
Churches and Theaters	40
Hospital Sleeping Rooms	45
Schools and Libraries	50

Los Angeles County Metropolitan Transportation Authority
Westside Purple Line Extension Project, Section 2

TABLE 4 – NOISE EMISSION LIMITS FOR CONSTRUCTION EQUIPMENT USED DURING NIGHTTIME HOURS; MEASURED AT 50 FEET FROM CONSTRUCTION EQUIPMENT(1)

Equipment Category	Lmax Level (dBA)
All other equipment > 5HP	81
Auger Drill Rig	81
Backhoe	75
Bar Bender	75
Boring Jack Power Unit	80
Chain Saw	81
Compactor	75
Compressor (2)	65
Compressor (other)	75
Concrete Mixer	71
Concrete Pump	77
Concrete Saw	81
Crane	81
Dozer	81
Dump Truck	81
Excavator	81
Flat Bed Truck	81
Front End Loader	75
Generator	77
Gradall	81
Grader	81
Horizontal Boring Hydraulic Jack	80
Jackhammer	81
Paver	81
Pickup Truck	55
Pneumatic Tools	81
Pumps	77
Rock Drill	81
Scraper	81
Soil Mix Drill Rig	80
Tractor	79
Vacuum Excavator (Vac Truck)	81
Vacuum Street Sweeper	80
Welder	73
Notes: (1) Noise emission limits apply to equipment used at surface on the construction site during nighttime hours of 9 pm to 7 am. (2) Portable Air Compressor that is rated at 75 cfm or greater and that operates at greater than 50 psi	

Los Angeles County Metropolitan Transportation Authority
Westside Purple Line Extension Project, Section 2

TABLE 5 – NOISE SENSITIVE LOCATIONS

WILSHIRE/RODEO STATION

210 N. Beverly Drive
133-153 S. Reeves Drive
Sirtaj Hotel,120 S. Reeves Drive
192 N. Canon Drive
121-157 S. Canon Drive
AKA Beverly Hills Hotel, 155 N. Crescent Drive
Beverly Sixty Hotel, 9360 Wilshire Boulevard
The Rolex Building, 9420 Wilshire Boulevard
Sterling Plaza/Bank of California, 9441 Wilshire Boulevard
Beverly Wilshire Hotel, 9500 Wilshire Boulevard

CENTURY CITY/CONSTELLATION STATION

1918-1952 Fox Hills Drive
2050 Century Park West
Hyatt Regency Century Plaza Hotel, 2025 Avenue of the Stars
2010 Century Park East
Century City Hospital & Medical Center, 2080 Century Park East
2160 Century Park East
1888 Century Park East
Century Plaza Towers, 2049 Century Park East
Annenberg Space for Photography and the Skylight Studios, 10050 Constellation Boulevard
Bain & Company Building, 1901 Avenue of the Stars
The Century, 10 West Century Drive
Constellation Place, 10250 Constellation Boulevard
401 Shirley Place
Beverly Hills High School

Los Angeles County Metropolitan Transportation Authority
Westside Purple Line Extension Project, Section 2

TABLE 6 – PRELIMINARY NOISE PROJECTIONS
(REFER TO DRAWING PREPARED ACCORDING TO REQUIREMENTS OF THIS SECTION.)

Activity	Typical Expected Leq Levels at 50 ft from Construction Equipment, with No Noise Control Measures (dBA)

TABLE 7 – ADJUSTMENTS FOR CLOSE-IN EQUIPMENT NOISE MEASUREMENTS

Measurement Values to be Subtracted from Measured Sound	
Distance (Feet)	**Level to Estimate Sound Level at 50 Feet (dBA)**
19-21	8
22-23	7
24-26	6
27-29	5
30-33	4
34-37	3
38-42	2
43-47	1
48-50	0

Los Angeles County Metropolitan Transportation Authority
Westside Purple Line Extension Project, Section 2

TABLE 8 – CONSTRUCTION VIBRATION LIMITS FOR ANNOYANCE

Vibration Type	Permissible Aggregate Duration	Vibration Limit (peak particle velocity (PPV))	Vibration Limit (VdB re 10^{-6} in/sec)
Sustained	>1 hour/day	0.01 in/sec	80
Transient	<1 hour/day	0.03	90
Transient	<10 minutes/day	0.10	100

TABLE 9 – CONSTRUCTION VIBRATION LIMITS FOR DAMAGE RISK TO BUILDINGS

Building Category	Allowable Peak Vibration (peak particle velocity (PPV) in/sec)	Allowable Peak Vibration (VdB re 10^{-6} in/sec)
I. Reinforced-concrete, steel or timber (no plaster)	0.50	114
II. Engineered concrete and masonry (no plaster)	0.30	110
III. Non-engineered timber and masonry buildings	0.20	106
IV. Buildings extremely susceptible to vibration damage	0.12	101

TABLE 10 – VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT(1)

Equipment	Peak Vibration at 25 ft (peak particle velocity (PPV) in/sec)	Approximate RMS Vibration at 25 ft (VdB re 10-6 in/sec)
Pile Driver (impact)	0.644 – 1.518	104 - 112
Pile Driver (sonic/vibratory)	0.170 – 0.734	93 - 105
Clam Shovel Drop (slurry wall)	0.202	94
Hydromill (slurry wall)	Soil 0.008 Rock 0.017	66 75
Vibratory Roller Compactor	0.210	94
Hoe Ram	0.089 – 0.19	87 - 94
Large Bulldozer	0.089	87
Caisson Drilling	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58
Tunnel Boring Machine (2)	0.055 AT 33 ft	83 AT 33 ft
Tunnel Train (2)	0.050 AT 50 ft	82 AT 50 ft
Notes: (1) This source data is preliminary in nature and it is up to the Contractor to verify and update information during construction (and, where possible, before construction). (2) For underground sources, use the slant distance determined by calculating the hypotenuse of the triangle formed by the depth between the building and top-of-rail and the horizontal (plan) distance between the building and top-of-rail.		

Los Angeles County Metropolitan Transportation Authority
Westside Purple Line Extension Project, Section 2

TABLE 11 – CORRECTION FACTORS FOR VIBRATION CALCULATIONS

Vibration	Correction Factors (dB)
Vibration (VdB) to groundborne noise (dBA)	-20dBA
Building coupling and path to sensitive space	4-stories or greater: -7 dB

Los Angeles County Metropolitan Transportation Authority
Westside Purple Line Extension Project, Section 2

FIGURE 1
QUARTERLY NOISE CONTROL PLAN FORM - PART B

QUARTERLY NOISE CONTROL PLAN (DUPLICATE AS NEEDED)

Contract No.: _____ Contract Name: _____

Contractor: _____ Site: _____

Date: _____ Land Use: _____

Resubmit every 3 months.

PART B: RESIDENTIAL, COMMERCIAL AND INDUSTRIAL PROPERTY NOISE LEVELS

	Calculated Noise Levels (dBA)*	
	Calculated one hour Leq (dBA)	Calculated Lmax (dBA)
Nighttime		

NOISE ABATEMENT MEASURES **ANTICIPATED EFFECTS**

CALCULATIONS: Attach additional sheet(s) as needed.

Contract No(s): _____

Los Angeles County Metropolitan Transportation Authority
Westside Purple Line Extension Project, Section 2

FIGURE 2. NOISE MEASUREMENTS REPORT FORM

Date: _____

Time:_____

NOISE MEASUREMENTS REPORT FORM

Measured By: _____ Of: _____
(Company)

Monitoring Address: _____
(Provide Sketch on Back)

Location No: _____ Wind Speed: _____ Km/Hr Direction:_____
(MPH x 1.6)

Location of Sound Level Meter: (No closer than 15 meters from equipment and 3 meters from building)

Monitoring was Conducted: _____ Meters from Equipment (_____)
(Type(s): Leave Blank for Baseline)

Land Use: ☐ Residential/Institutional ☐ Business/Recreational ☐ Industrial

Sound Level Meter: Make and Model: _____ ☐ A - Weighted Sound Level (Slow)
☐ C - Weighted Sound Level (Fast)

Duration of Measurement:_____
(15 minutes to 1 hour)

Calibration		Field Notes (example: 2200-2205 H, Airplane 90 dB)
one-hour L_{eq}		
L_{50}		
L_{10}		
$L_{1.0}$		
MAX_L		
Allowable Noise Limit		

Check one of the following:

☐ Ongoing Construction ☐ Post-Construction: _____ ☐ Baseline Conditions
(Contract)

(Complete all that apply below)

Active Contract(s): _____
(List all contracts that contribute to measured noise)

Complaint Response: _____
(Describe: Include Log-In Number)

Abatement Follow-up: _____
(Describe)

Los Angeles County Metropolitan Transportation Authority
Westside Purple Line Extension Project, Section 2

FIGURE 3

EQUIPMENT SOUND LEVEL DATA REPORTING FORM

EQUIPMENT SOUND LEVEL DATA REPORTING FORM

APPLICATION FOR CERTIFICATE OF EQUIPMENT NOISE COMPLIANCE

Contractor Name: _____
Contract Name & Number: _____

Equipment Type: _____
Manufacturer & Model Number: _____
Identification Number: _____
Rated Power & Capacity: _____
Operating Condition During Test: _____

Measured Sound Levels at 20 to 50 feet:

Measured Values and Distance:
Right Side: _____ dBA (SLOW), at _____ feet
Left Side: _____ dBA (SLOW), at _____ feet

Estimated Values at 50-Foot Distance:
Right Side: _____ dBA (SLOW).
Left Side: _____ dBA (SLOW).

Maximum Values Allowed for this Equipment: _____ dBA (SLOW) at 50 feet.

If equipment sound level exceeds maximum value allowed, indicate action taken to achieve compliance:
_____
_____
_____

Name, Address & Phone No. _____
of Acoustical Engineer _____

Authorized Signature: _____ Date: _____
CONTRACTOR'S APPROVAL:
Authorized Signature: _____ Date: _____
ENGINEER'S CONCURRENCE:
Authorized Signature: _____ Date: _____

Los Angeles County Metropolitan Transportation Authority
Westside Purple Line Extension Project, Section 2

FIGURE 4
QUARTERLY NOISE CONTROL PLAN FORM - PART A

QUARTERLY NOISE CONTROL PLAN - NIGHTTIME CONSTRUCTION ACTIVITIES AT THE SURFACE OF THE CONSTRUCTION SITE (DUPLICATE AS NEEDED)

Contract No.: _____ Contract Name: _____ Contractor: _____

Site: _____ Date: _____Resubmit every three months

(ATTACH SITE SKETCH)

PART A: EQUIPMENT INVENTORY

Code letter (a)	Equipment				Noise Limit (f)	Estimated Noise at 50'* (g)	Date Begin (h)	Date End (i)
	Category (b)	Model (c)	ID# (d)	HP (e)				

END OF SECTION 01 56 19

Print Form

Notice of Determination

Appendix D

To:

☒ Office of Planning and Research

U.S. Mail:
P.O. Box 3044
Sacramento, CA 95812-3044

Street Address:
1400 Tenth St., Rm 113
Sacramento, CA 95814

☒ County Clerk
County of: Los Angeles
Address: 12400 Imperial Highway
Norwalk, CA 90650

From:
Public Agency: LACMTA
Address: One Gateway Plaza
Los Angeles, CA 90012
Contact: David Mieger
Phone: 213.922.3040

Lead Agency (if different from above):
Address:
Contact:
Phone:

SUBJECT: Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

State Clearinghouse Number (if submitted to State Clearinghouse): 2009031083

Project Title: Westside Subway Extension Transit Corridor

Project Applicant: LACMTA (Metro)

Project Location (include county): Los Angeles

Project Description:
In May 2012, the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) prepared by the Los Angeles County Metropolitan Transportation Authority (Metro) for the Westside Subway Extension Phases 2 and 3 was approved by the Metro Board of Directors. Subsequently, due to a proposed development at the corner of Avenue of the Stars and Constellation Boulevard, the selected construction staging area (Scenario A) can no longer be used for the project. Instead, the staging areas identified in the FEIR/FEIS as part of Scenario B will be used. A portion (less than 0.25 acres) of Area 1 will be required for the construction of the station entrance which is to remain

This is to advise that the Los Angeles County Metropolitan Transportation Authority has approved the above
(☒ Lead Agency or ☐ Responsible Agency)

described project on _____ and has made the following determinations regarding the above
(date)
described project.

1. The project [☐ will ☒ will not] have a significant effect on the environment.
2. ☒ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
   ☐ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures [☒ were ☐ were not] made a condition of the approval of the project.
4. A mitigation reporting or monitoring plan [☒ was ☐ was not] adopted for this project.
5. A statement of Overriding Considerations [☒ was ☐ was not] adopted for this project.
6. Findings [☒ were ☐ were not] made pursuant to the provisions of CEQA.

This is to certify that the final EIR with comments and responses and record of project approval, or the negative Declaration, is available to the General Public at:
Los Angeles County Metropolitan Transportation Authority, One Gateway Plaza, Los Angeles, CA 90012

Signature (Public Agency): _____ Title: Executive Officer

Date: _____ Date Received for filing at OPR: _____

Authority cited: Sections 21083, Public Resources Code.
Reference Section 21000-21174, Public Resources Code.

Revised 2011