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List of Abbreviations

APTA: American Public Transportation Association

BCF: billion cubic feet

BRT: bus rapid transit

CARB: California Air Resources Board

CCSM: Community Climate System Model

CH_4: methane

CNG: compressed natural gas

CNRM: Centre National de Recherches Météorologiques

CO_2: carbon dioxide

DJF: December, January, February

ECMP: Energy Conservation Management Plan

GFDL: Geophysical Fluid Dynamics Laboratory

GHE: gasoline hybrid electric

GHG: greenhouse gases

GWP: global warming potential

JJA: June, July, August

LACMTA: Los Angeles County Metropolitan Transportation Authority

LED: light emitting diode

LRTP: Long Range Transportation Plan

MAM: March, April, May

$MMTCO_2e$: million metric tons of carbon dioxide equivalents

MSIP: Metro Sustainability Implementation Plan

MT: metric tons

$MTCO_2e$: metric tons of carbon dioxide equivalents

N_2O: nitrous oxide

NCAR: National Center for Atmospheric Research

PCM: Parallel Climate Model

PMT: passenger miles traveled

PV: photovoltaic

ROW: right of way

SF_6: sulfur hexafluoride

SON: September, October, November

TIGGER: Transit Investments for Greenhouse Gas and Energy Reduction

TOD: transit oriented development

WESS: wayside energy storage substation

Executive Summary

Introduction

Metro is the principal provider of public transportation in Los Angeles County and also the County's transportation planner and coordinator, designer, builder, and operator. As a public transportation agency, Metro has a specific role in addressing climate. Well-planned and well-used public transportation reduces climate changing greenhouse gas (GHG) emissions by creating alternatives to driving and fostering communities that enable more walking and bicycling. Public transportation systems also consume fuel and electricity and thereby produce GHG emissions; however, most transit agencies, including Metro, prevent more emissions than they create. In spite of efforts to reduce GHG emissions, some degree of climate change is likely to occur over the next century, with impacts including rising sea levels, rising temperatures, and more extreme weather patterns. Metro is also responsible for protecting critical services and assets in the transportation system from these impacts. This Climate Action and Adaptation Plan ("the Plan") establishes the framework for Metro to both reduce GHG emissions and prepare for the impacts of climate change. Emissions from 2010 are used as a baseline in the Plan because at the time the Plan was prepared, 2010 emissions data was the most up to date and complete data set available.

Reducing Greenhouse Gas Emissions

This Plan establishes a framework to identify the areas of greatest opportunity for Metro to reduce GHG emissions and evaluates opportunities based on their costs and the volumes of emissions they reduce. Metro's influence on GHG emissions extends to all of the County's transportation systems. As a first step, the Plan focuses on prioritizing the most promising opportunities to reduce emissions from Metro's internal operations by the year 2020. The analysis on which the Plan is based consisted of four steps:

1. Inventory 2010 operational GHG emissions and forecast 2020 emissions.
2. Survey GHG reduction strategies that have been deployed or are under development at Metro or other transit agencies.
3. Quantify the costs and GHG reduction potential of the 11 strategies that appear to be most likely to offer cost effective reductions in GHG emissions by 2020.
4. Quantify the costs and GHG reduction potential of four potential packages of strategies.

Inventory and forecast

In 2010, Metro emitted 476,000 metric tons of carbon dioxide equivalents ($MTCO_2e$) from its operations, or roughly 1.04 $MTCO_2e$ per thousand passenger boardings. For comparison, these emissions account for roughly 1.9 percent of the GHG emissions from all road- and rail-based passenger transportation in Los Angeles County. Metro's transit service accounts for almost 90 percent of the agency's emissions; facilities and non-transit vehicles account for the remainder. Though Metro emits a substantial amount of GHG emissions, the agency displaces more emissions than it produces by offering alternatives to driving and fostering sustainable communities.

From 2010 to 2020, Metro's yearly GHG emissions will increase by seven percent, largely due to expanded bus service and new rail lines. However, annual passenger boardings are expected to increase at an even faster rate, growing by 12 percent, so emissions per passenger boarding will fall by 4.4 percent. An even greater portion of these emissions—95 percent—will come from transit as service expands and actions already underway at both Metro and the State increase the energy efficiency of the agency's buildings.

Strategy analysis

Metro surveyed both internal studies and studies conducted by other transit agencies for potential strategies to reduce emissions, and ranked each in terms of their potential for cost effective reductions in GHG emissions by 2020. Metro then analyzed the 11 highest-scoring measures that are focused on reducing operational emissions. Table ES1 summarizes the cumulative GHG reductions and cost-effectiveness of each measure.

Table ES1: Cumulative Reductions and Cost Effectiveness of Strategies to Reduce GHG Emissions

Strategy	Cumulative GHG Reductions (MT CO2e), 2012–2020	GHG Reduction Cost Effectiveness ($/MT)*
Use Biomethane in CNG Buses (well-to-wheels impacts)	528,555**	$174-379
On-board Railcar Braking Energy Storage	96,411	$180
Gasoline-Electric Hybrid Buses (tank-to-wheels impacts)	76,826	$4,922
Building Indoor Lighting Upgrades: LEDs	71,621	-$78
Building Indoor Lighting Upgrades: Efficient Metal Halides	46,226	-$117
Wayside Energy Storage Substation (WESS)	17,289	$2,774
Retrofit Lighting in Red Line Tunnel	5,783	-$73
Expand Use of Renewable Energy	4,467	$2,303
Municipal Recycled Water For Bus Washing	941	-$570
Extension of Bus Wash On-Site Reclamation	544	-$2,378
Low Water Sanitary Fixtures	424	-$907
Mobile Air Conditioning Replacement	353	$3,103

** Negative numbers indicate a net savings.*

*** Using biomethane in CNG buses reduces well-to-wheels emissions due to fuel production that are not accounted for in Metro's GHG inventory.*

NB: All costs represented are costs to Metro only, and do not include cost impacts to transportation users or other public agencies.

As transit vehicles and systems account for the majority of Metro's GHG emissions, many of the strategies in Table ES1 that deal with buses and rail systems produce correspondingly large reductions. However, these strategies also often involve large net costs for Metro, and are

therefore generally not as cost effective as building energy and water strategies, which tend to save Metro money.

Metro is most likely to implement a package of strategies that reduce GHG emissions. To demonstrate the total impact that multiple strategies could have together, four potential packages of strategies were analyzed, as follows:

1. **Short-Term Cost Saving Strategies**—These are strategies that will provide net savings to Metro by 2020 and are ready for implementation in the near term using readily available methods. They include all strategies related to water and lighting.
2. **Short-Term and Mid-Term Strategies**—All strategies that are ready for implementation in the near term using available methods, as well as additional strategies that are appropriate for wider implementation pending the results of demonstration projects. They include all short-term strategies as well strategies related to rail and renewable energy.
3. **All Strategies with Tank-to-Wheels Benefits**—All strategies that would reduce GHG emissions that are currently counted as part of Metro's GHG inventory. This package excludes the use of biomethane in CNG buses.
4. **All Strategies with Well-to-Wheels Benefits**—All strategies that would reduce GHG emissions regardless of whether or not they are included in Metro's GHG inventory. This package includes the use of biomethane in CNG buses, but excludes gasoline-electric hybrid buses, which are not compatible with the biomethane strategy.

Table ES2 summarizes the GHG reductions potential and net cost to Metro for each package of strategies, between 2012 and 2020.

Table ES2: GHG Reductions and Cost Effectiveness of Packages of GHG Reduction Strategies

Package	Cumulative GHG Reductions (MT CO2e) 2012-2020	Net Cost (2012-2020)*	Reduction in Forecast GHG emissions in 2020	Reduction in GHG emissions per boarding from 2010 to 2020
1. Short-Term Cost Saving Strategies	66,616	-$8,121,116	0.6%	5.0%
2. Short-Term and Mid-Term Strategies	167,494	$67,443,140	4.3%	8.6%
3. All Strategies with Tank-to-Wheels Benefits	244,673	$446,719,774	7.4%	11.5%
4. All Strategies with Well-to-Wheels Benefits	696,402	$206,873,542	28.9%	32.1%

** Negative numbers indicate a net savings.*

NB: All costs represented are costs to Metro only, and do not include cost impacts to transportation users or other public agencies.

Recommendations

Based on this analysis, the Plan concludes that Metro could meet a goal of reducing internal GHG emissions by 0.6% in the year 2020 using cost effective strategies. This is equivalent to reducing the agency's GHG emissions per boarding by 5.0% from 2010 to 2020. As Table ES2 shows, Metro can meet this goal while saving money. Metro has multiple pathways to meeting this goal, including:

- Implement Short-Term Cost Saving Strategy Package – All lighting strategies in this package are underway or scheduled to begin shortly. To implement the remainder of this package, Metro would need to expand its current water saving strategies and ensure their proper operation.
- Partially Implement Short-Term and Mid-Term Strategy Package – It is likely that Metro will have two grant-funded WESS projects operational by 2020, and the agency is already planning to construct several new solar photovoltaic projects on facilities. Metro could attain the proposed goal by implementing the WESS projects on schedule, installing 0.5 MW of additional solar photovoltaic capacity, retrofitting the Red Line tunnel lighting, and completing facility lighting upgrades by 2020.

Adaptation

The adaptation component of the plan is a high-level screening analysis, designed to identify some of the most important Metro services and assets that are likely to be affected by climate impacts. The Plan outlines options for ensuring that these services and assets continue to function as the climate changes. This analysis consisted of four steps:

1. Identify the critical assets and services within the Metro system.
2. Examine local historical climate data and projections for future climate conditions.
3. Qualitatively assess the vulnerability of critical services and assets.
4. Identify potential adaptation strategies that can address these vulnerabilities.

Critical services and assets

This Plan used a simple and qualitative definition of criticality: critical services and assets are those that are essential to transporting Metro's customers. A critical service or asset would be extremely difficult or costly to replace or to substitute. Critical assets and services include:

- bus and rail fleets
- right-of-way on bus rapid transit (BRT) lines
- heavy rail tracks, stations, and energy infrastructure
- light rail tracks, stations, and energy infrastructure
- rail rehabilitation activities

In addition, the Plan identifies critical facilities. Transit facilities were ranked according to their ridership, connectivity to other parts of the transit network, and whether they are the site of current or planned joint development projects. To identify other types of facilities as critical,

including maintenance facilities and administrative buildings, the Plan relied on expert opinions from Metro officials. Critical facilities include several key rail stations, the main bus maintenance facility, two important rail maintenance locations, and Metro's administrative headquarters. Transit projects that are planned for construction using Measure R funds are also considered critical due to the sizeable investments required to complete these projects.

Future climate conditions

Metro drew on historical data on temperature, rainfall and sea level rise, as well as climate models, to examine future climate conditions in Los Angeles County through the end of the century. Major findings include the following:

- Temperatures are projected to continue to rise, possibly in excess of 10°F, and the frequency of extremely hot days is expected to increase.
- There is some evidence of a recent increase in the frequency of events of heavy precipitation, but it is unclear if such a trend might continue into the future. Regardless, the region will continue to experience events of heavy rainfall in the future.
- Sea levels are expected to rise one foot by the mid-21st century and between 20 inches and five feet by the end of the century. However, the risk of impacts from sea level rise is low due to the inland location of most transit assets.

Vulnerabilities and adaptation options

Metro qualitatively assessed the vulnerability of critical services and assets to changing climate conditions in the region based on their exposure to impacts, their sensitivity to extreme heat and heavy rain, and their capacity to adapt to climate impacts through replacement, relocation, or retrofitting. Based on this analysis, the agency identified potential options for adapting each of the critical services and assets. Table ES3 summarizes the vulnerability of critical services and assets and outlines potential adaptation options.

Table ES3: Summary of Vulnerability Analysis and Potential Adaptation Options

Service/Asset	Climate Impact	Potential Adaptation Option
Rail Operations	Equipment malfunction (electrical systems; air conditioning systems) during periods of extreme heat	• Pre-emptive maintenance or inspection; weather/climate-related monitoring
	Railway buckling during periods of extreme heat	• More heat-resistant materials or designs, if available • Increased shading of railways
	Flooding of underground stations and tracks during heavy rainfall events	• Improved stormwater management systems • Infrastructure upgrades in stations (ventilation grates, entrances, seals) • Increased pumping capacity
	Flooding of at-grade railways and (Bus Rapid Transit right-of-ways[1]) during heavy rainfall events	• Upgraded stormwater management systems

[1] Although BRTs are part of Bus Operations, the right-of-ways are functionally more similar to a railway.

Bus Operations	Fleet breakdowns and maintenance during periods of extreme heat	• Pre-emptive maintenance or inspection; weather/climate-related monitoring
New Construction/ Measure R Projects	Exposing new infrastructure to episodes of extreme heat and heavy rainfall events	• Integration of climate considerations in siting and alternatives decisions
	Labor interruptions or delays during periods of extreme heat	• Modification of construction schedules, especially during summer months

Next steps

Next steps to evaluate and expand upon the GHG reduction strategies in the Plan include:

- Establish an interdepartmental working group to monitor the implementation of strategies and progress towards reduction goals. This group could also schedule regular check-ins on emerging technologies.
- Update the Plan with analyses of strategies that reduce emissions from regional transportation, such as strategies that promote transit use, carpooling, and bicycling.
- Update the Plan with new information every 5 years, or more often if significant changes in technology, policy, or legal requirements warrant more frequent updates.
- In future plan updates, include a section on local, state, and federal regulations that directly affect Metro's GHG emissions, such as new vehicle technology regulations.
- Use the annual Sustainability Report to document strategies selected for implementation and monitor progress.

Next steps as Metro moves toward evaluating specific options for adapting to climate change could include:

- Investigate climate vulnerabilities at a higher level of specificity.
- Explore the monetary and social costs of climate impacts and adaptation options.
- Develop a communications strategy for the adaptation component of the Plan and subsequent adaptation activities.
- Explore implementation of climate adaptation principles at the operations level through the FTA-funded Climate Adaptation Pilot Program.

1. Introduction to the Plan

As a public transportation agency, Metro has a specific role in addressing climate change at both global and local scales. Public transportation, when well planned and well used, reduces vehicle travel and congestion on roadways, and helps to create communities that enable more walking and bicycling. These impacts in turn reduce emissions of greenhouse gases (GHGs), which contribute to climate change. Even though public transportation agencies produce GHG emissions from their vehicles and facilities, most of them (Metro included) prevent more emissions than they create. Reducing GHG emissions means slowing the worldwide impacts of climate change, which include rising sea levels, rising temperatures, and more extreme weather patterns.

Metro and Los Angeles County will inevitably be affected by a changing climate. Extreme temperatures and higher risk of flooding bring operational and maintenance challenges to Metro's buses and trains. Some assets may have shorter lifespans than originally envisioned, or require structural reinforcements to protect them from long term damage. Preparing for these impacts now can mitigate damage to Metro's transportation systems in the future.

The American Public Transportation Association (APTA) has articulated the relationship of transit agencies to climate change in its *Recommended Practice for Quantifying Greenhouse Gas Emissions from Transit* ('the APTA Protocol'). APTA encourages transit agencies to take stock of the emissions that they produce as well as the emissions that they prevent. APTA also maintains a Sustainability Commitment, to which Metro is a signatory. Pledging to reduce GHG emissions is part of some signatories' commitments. Finally, APTA has released *Guidelines for Climate Action Planning*, in order to encourage transit agencies to work proactively to reduce GHG emissions and prepare for the effects of climate change.

This plan is presented in support of APTA's guidance, and in support of Metro's role as a steward of the environment and of Los Angeles County's transportation assets. Sustainability, including reducing GHG emissions, is one of Metro's core business goals. Fiscal responsibility is another one. Determining how best to protect and preserve Metro's assets from the impacts of climate change is a fiscally responsible action. Public transportation agencies can and must take action on climate change. This plan establishes the framework for the agency to take steps to both reduce GHG emissions and prepare for the impacts of climate change.

1.1. Plan Objectives

Metro has compiled this Climate Action and Adaptation Plan ("the Plan") to serve dual purposes:

1. **Create a framework to evaluate and prioritize areas of opportunity for Metro to reduce GHG emissions from operations.**

   Metro has many opportunities to reduce GHG emissions from its buses, trains, and facilities. There are also opportunities to reduce emissions generated by travel in private vehicles in Los Angeles County. Many of these are described in Metro's *Greenhouse Gas Emissions Cost Effectiveness Study*, which estimated the cost and emissions impacts of 17 current and potential future strategies to reduce emissions. All of the strategies involve some upfront cost, but some of them save money for Metro over time. All of the strategies have

implications beyond GHG emissions. Some would require changes to the way that Metro operates and maintains its assets. Others would change the experience of Metro's riders.

This Plan establishes a framework to identify the areas of greatest opportunity for Metro to reduce GHG emissions, based on estimates of cost and emissions impacts. Strategies examined in this plan will in many cases require further analysis before they can be implemented. The Plan contains key steps to move each strategy toward implementation. As new opportunities to reduce GHG emissions inevitably arise and new information about strategies becomes available, this Plan can be updated to refine priorities and action steps for the agency to reduce GHG emissions.

Metro is the principal provider of public transportation in Los Angeles County and also the County's transportation planner and coordinator, designer, builder, and operator. As such Metro's influence on GHG emissions extends to all of the County's transportation systems. As a first step, the Plan focuses on identifying and prioritizing actions that would affect just Metro's internal operations. Strategies examined in detail are those that would reduce emissions created by Metro from its buses, trains, and facilities. Subsequent versions of this Plan should incorporate actions to reduce travel in private vehicles into the framework.

2. **Present an approach for responding to the likely impacts of climate change on Metro's system.**

   Adaptation options are based upon the ways in which climate conditions are anticipated to affect Metro's infrastructure and operations. In an effort to identify options for Metro, the Plan presents a combined analysis of Metro's major services and assets, the ways in which these assets and services are sensitive to climate, and information about expected future climate conditions.

   The adaptation options presented in the Plan, as well as the analysis that underlies the discussion of Metro's climate vulnerability, are based on a high-level perspective of Metro's infrastructure and operations. This analysis demonstrates a strong link between climate impacts and the ability of Metro to reliably provide service to its customers. In this context, the presentation of adaptations is intended to motivate and guide future research and consideration of potential climate impacts and adaptation strategies, and to provide some of the technical information that can support such activities.

1.2. How to Use this Plan

Mitigation

The strategies included in this Plan are Metro's most promising opportunities to reduce GHG emissions from operations by the year 2020. A horizon year of 2020 is used in order to focus on short-term and medium-term actions to reduce emissions. A baseline year of 2010 is used because it was the most recent GHG emissions data available during development of the Plan. 2020 is also the horizon year for California's GHG reduction goal. Metro's actions can contribute to the achievement of this goal.

Not all of the strategies in the Plan can or should be implemented. The Plan is not intended to identify the best investment for a given asset type. Instead the Plan identifies asset and investment types that should be investigated in further detail, given their potential to reduce emissions. Metro has conducted (and continues to conduct) a number of more detailed studies of opportunities to improve the sustainability of its operations through water conservation, energy conservation, and management of other resources. Some options analyzed in previous documents are included as strategies in the Plan. Those detailed studies are the appropriate medium for analyzing technical options in greater detail.

The information contained in this Plan should be used to support a balanced decision-making process to select strategies that improve the overall sustainability of the agency. Impacts on GHG emissions are only one of a number of factors that influence Metro's investment decisions. All of the strategies evaluated in this report have benefits in addition to GHG reduction, such as reducing transit operating costs, increasing transit ridership, improving mobility, reducing water use, and providing employee benefits. Some strategies involve significant costs. ***Decisions to support any individual strategy should be made based on a composite assessment of all these potential benefits and costs, rather than GHG impacts alone.***

Adaptation

The Plan's approach to considering climate change adaptation is also not intended to provide definitive recommendations. Rather, the Plan provides methodologies and analyses as technical inputs to future discussions of adaptation strategies.

It is clear that any decisions to implement adaptation measures will require significantly more specificity and technical detail than are provided in the Plan. Moreover, the choice to pursue any particular adaptation option will involve broad considerations of a variety of Metro management goals as well as more detailed information about costs and benefits.

In short, the Plan is intended as a first step to inform and facilitate Metro's longer-term commitment to bolstering its resilience to climate variability and climate change.

As a next step, Metro's FTA-funded Climate Adaptation Pilot Program uses principles outlined in the Plan and explores operational climate resiliency from the ground up as a counterpart to the Plan. Metro is taking a two part approach to integrating climate adaptation principles in the agency's processes: top-down planning in this Plan and bottom-up planning from Metro operations.

1.3. The Climate Action and Adaptation Plan in Context

This Plan is part of Metro's long-term Sustainability Program. The Sustainability Program was initiated with the 2008 *Metro Sustainability Implementation Plan (MSIP),* intended to demonstrate Metro's commitment to sustainability through fiscal responsibility, social equity, and environmental stewardship. Metro and Countywide GHG Emissions Management was one of four sustainability projects identified in the MSIP.

Since 2008, Metro has conducted a number of studies and planning efforts under the Sustainability Program. The agency has also issued several policies since 2008 that support the agency's sustainability agenda. A few of the agency's sustainability polices predate the MSIP.

Development and implementation of the Plan will be consistent with the "Plan-Do-Check-Act" model that was established through Metro's Environmental Management System (EMS). An EMS is a set of operational procedures that will ensure compliance with environmental regulations and facilitate environmental stewardship. Metro committed to the establishment and use of an EMS in the 2009 *Environmental Policy*. The EMS has been piloted in two Metro divisions and will soon be rolled out agency-wide. Through the EMS, Metro has been identifying environmental issues of significant concern, proactively addressing those issues, implementing specific solutions to issues as they are developed, and engaging Metro management to ensure continuous improvement. Thus, the EMS provides the structure for managing all environmental issues for Metro; the Climate Action and Adaptation Plan fits within this structure and provides more specific approaches to address climate change mitigation and adaptation.

The graphic below demonstrates the relationship of the Plan to the rest of Metro's Sustainability Program. The MSIP outlines several key goals for the Sustainability Program. Metro's annual Sustainability Report tracks the agency's progress on a number of sustainability indicators, including GHG emissions, energy used, and waste production. The Sustainability Report also documents successful actions and potential future actions.

Exhibit 10

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL TRANSIT ADMINISTRATION
WASHINGTON, D.C.

FULL FUNDING GRANT AGREEMENT

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

REGIONAL CONNECTOR TRANSIT CORRIDOR PROJECT

CA-03-0825

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL TRANSIT ADMINISTRATION

FULL FUNDING GRANT AGREEMENT
(FTA FFGA-20, October 1, 2013)

On the date the authorized U.S. Department of Transportation, Federal Transit Administration (FTA) official signs this Full Funding Grant Agreement, the Government (FTA) has awarded Federal assistance in support of the Project described below. Upon Execution of this Full Funding Grant Agreement by the Grantee named below, the Grantee affirms this Award by the Government (FTA Award), and enters into this Full Funding Grant Agreement with FTA. The following documents are incorporated by reference and made part of this Full Funding Grant Agreement:

(1) "Federal Transit Administration Master Agreement," FTA MA(20), October 1, 2013, [http://www.fta.dot.gov/documents/20-Master.pdf];
(2) The Certifications and Assurances applicable to the Project that the Grantee has selected and provided to FTA, and
(3) Any Award notification containing special conditions or requirements, if issued.

FTA AWARD

The Government (FTA) hereby awards a Full Funding Grant as follows:

Project Number(s): CA-03-0825

Grantee: Los Angeles County Metropolitan Transportation Authority (LACMTA or Metro)

Citation of Statutes Authorizing the Project: 49 U.S.C. §§ 5309(b), 5309(d)

Estimated Net Project Cost: $1,402,932,490

Maximum FTA Amount Awarded [Including This Amendment]: $ 0

Amount of This FTA Award: $0

Maximum Federal New Starts Financial Contribution: $669,900,000

Maximum Percentage of FTA Participation: 52.3 percent

Maximum Percentage of New Starts Participation: 47.7 percent

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FULL FUNDING GRANT AGREEMENT TERMS AND CONDITIONS

ATTACHMENTS

Attachment 2

Los Angeles County Metropolitan Transportation Authority
Regional Connector Transit Corridor Project
Los Angeles, California

Project Description

Narrative Description:

The Regional Connector Transit Corridor Project (Project) consists of the design and construction of 1.9-mile light rail transit line in downtown Los Angeles, with three new underground stations and four new light rail vehicles. The Project will begin at the existing station at 7th/Metro Center and will provide connections via a new underground alignment to the existing Metro Blue, Expo, and Gold lines. The alignment will extend underground from the 7th Street/Metro Center Station following Flower Street, curving east under the 2nd Street roadway tunnel and 2nd Street, and continuing east under the intersection of 1st and Alameda Streets, surfacing to connect to the Metro Gold Line tracks within 1st Street at grade to the east, and north of Temple Street toward Union Station.

Project Description by Standard Cost Category:
The following provides a description of the Project by Standard Cost Categories. These Standard Cost Categories are the basis for the Baseline Cost Estimate and for the Baseline Schedule in Attachments 3 and 4, respectively.

SCC 10 – GUIDEWAY AND TRACK ELEMENTS
This SCC includes the guideway for the Project, which consists of both cut and cover sections and underground twin tunnels. SCC 10 includes the following subcategories.

10.03 Guideway: At-grade in Mixed Traffic
This SCC includes 0.06 route miles of guideway at both legs of the existing Metro Gold Line guideway where Regional Connector will be connecting to 1st Street and Alameda Street.

10.06 Guideway: Underground Cut and Cover
This subcategory includes approximately 0.49 route miles of cut and cover construction, consisting of the following sections: (1) on South Flower Street between 4th and 6th Streets; (2) the underground "Wye" junction beneath the intersection of 1st and Alameda Streets, that splits the Regional Connector trunk line, allowing connections to existing LRT Lines for the reconfigured North/South and East/West services; and (3) the underground guideway sections beneath 1st and Alameda Streets.

This subcategory also includes a special break into the existing 7th and Metro Center Station, installation of soldier piles, excavation support and disposal of soil, raised concrete decking, barrier setup, access shafts in the deck to build the work, waterproofing, muck storage hoppers, walkway concrete and concrete guideway structures, and traffic control and protection.

10.07 Guideway: Underground Tunnel
This subcategory includes the tunneling of approximately 1.16 route miles of the guideway. It includes the procurement, shipping, mobilization, set-up, and deployment of one Earth Pressure Boring Machine and trailing gear for the underground twin tunnel boring operations.

This subcategory also includes excavation; installation of concrete; waterproofing; lighting and ventilation, grouting preparation and permeation grouting, and instrumentation for building protection for tunneling operations. Other items include construction of crossovers and tunnel walkways.

10.08 Guideway: Retained Cut or Fill
This subcategory includes 0.09 route miles of retained cut on 1st Street and 0.1 route miles of retained cut on Alameda Street, including the "boat" structures – U-shaped transition structures – inserted between the cut and cover boxes of the tunnels and the elevated or at-grade alignment sections. Two boat structures are required: one for the transition to the existing Gold Line US 101 bridge overcrossing in the DWP Yard; and the other for the transition to the at-grade Gold Line tracks to East Los Angeles, within 1st Street, near Hewitt Street. This subcategory also includes installation of soldier piles, excavation (including excavation support), waterproofing, concrete structures, walkway concrete, and traffic control and protection.

10.09 Track: Direct Fixation
This subcategory includes 1.64 route miles of direct fixation track.

10.10 Track: Embedded
This subcategory includes 0.01 route miles of embedded track for connections to the existing Metro Gold Line at the tunnel portal on 1st Street.

10.11 Track: Ballasted
This subcategory includes 0.25 route miles ballasted track from Alameda Street towards Union Station.

10.12 Track: Special (Switches, Turnouts)
This subcategory includes the special track and equipment for the two (2) single crossovers at Alameda Street and Flower Street, and the double-crossover immediately east of the 2nd Street and Broadway Station.

10.13 Track: Vibration and Noise Dampening
This subcategory includes mitigation measures for eliminating or minimizing noise and vibration impacts including groundborne noise and groundborne vibration projected to be generated by operations of the constructed project. The potential sensitive land use locations include the Walt Disney Concert Hall, the Colburn School of Music, and the Hikari Lofts. The mitigation measures include the use of resiliently supported fasteners, isolated slab track, high compliance resilient fasteners, floating slab trackbed or other appropriate measures as needed to eliminate impacts and to reduce groundborne noise below FTA annoyance criteria.

Attachment 3

Los Angeles County Metropolitan Transportation Authority
Regional Connector Transit Corridor Project
Los Angeles, California

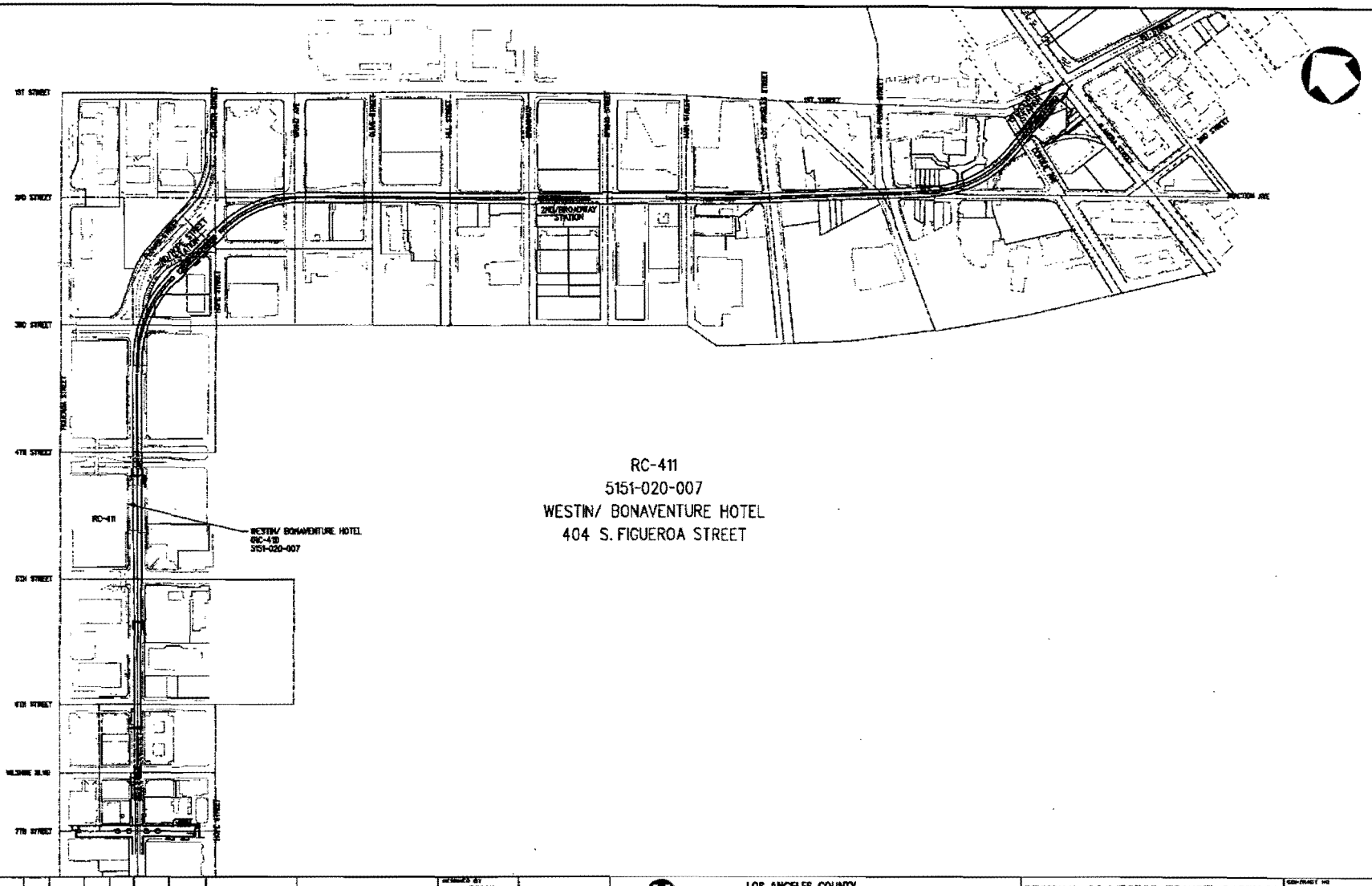
Baseline Cost Estimate

Table 1 – BCE by Standard Cost Category

Applicable Line Items Only	YOE Dollars Total
10 GUIDEWAY & TRACK ELEMENTS (1.9 miles)	**280,622,417**
10.03 Guideway: At-grade in mixed traffic	2,023,175
10.06 Guideway: Underground cut & cover	116,558,093
10.07 Guideway: Underground tunnel	131,295,004
10.08 Guideway: Retained cut or fill	10,555,947
10.09 Track: Direct fixation	9,817,387
10.10 Track: Embedded	76,556
10.11 Track: Ballasted	1,472,707
10.12 Track: Special (switches, turnouts)	5,069,845
10.13 Track: Vibration and noise dampening	3,753,703
20 STATIONS, STOPS, TERMINALS, INTERMODAL (3)	**354,268,073**
20.03 Underground station, stop, shelter, mall, terminal, platform	296,863,490
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	31,821,845
20.07 Elevators, escalators	25,582,739
40 SITEWORK & SPECIAL CONDITIONS	**141,785,395**
40.01 Demolition, Clearing, Earthwork	12,214,689
40.02 Site Utilities, Utility Relocation	44,839,983
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments	10,318,458
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks	2,499,118
40.06 Pedestrian / bike access and accommodation, landscaping	5,553,353
40.07 Automobile, bus, van accessways including roads, parking lots	20,917,022
40.08 Temporary Facilities and other indirect costs during construction	45,442,772
50 SYSTEMS	**69,666,754**
50.01 Train control and signals	12,876,090
50.03 Traction power supply: substations	29,185,070
50.04 Traction power distribution: catenary and third rail	5,340,419
50.05 Communications	10,232,564
50.06 Fare collection system and equipment	9,664,025
50.07 Central Control	2,368,587
Construction Subtotal (10 - 50)	**846,342,640**
60 ROW, LAND, EXISTING IMPROVEMENTS	**115,889,205**
60.01 Purchase or lease of real estate	115,722,187
60.02 Relocation of existing households and businesses	167,018
70 VEHICLES (up to 4)	**16,275,350**
70.07 Spare parts	1,095,438

80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	**261,455,309**
80.01 Preliminary Engineering	39,828,060
80.02 Final Design	69,607,793
80.03 Project Management for Design and Construction	70,039,553
80.04 Construction Administration & Management	41,857,057
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.	8,266,055
80.07 Surveys, Testing, Investigation, Inspection	4,133,026
80.08 Start up	27,723,765
Subtotal (10 - 80)	**1,239,962,503**
90 UNALLOCATED CONTINGENCY	**135,398,916**
Subtotal (10 - 90)	**1,375,361,419**
100 FINANCE CHARGES	**27,571,071**
Total Project Cost (10 - 100)	**1,402,932,490**

Exhibit 11



RC-411
5151-020-007
WESTIN/ BONAVENTURE HOTEL
404 S. FIGUEROA STREET

DESIGNED BY	A. BROOK
DRAWN BY	L. DECHYORAKIJ
CHECKED BY	A. BROOK
IN CHARGE	P. ROY
DATE	01/22/2013

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

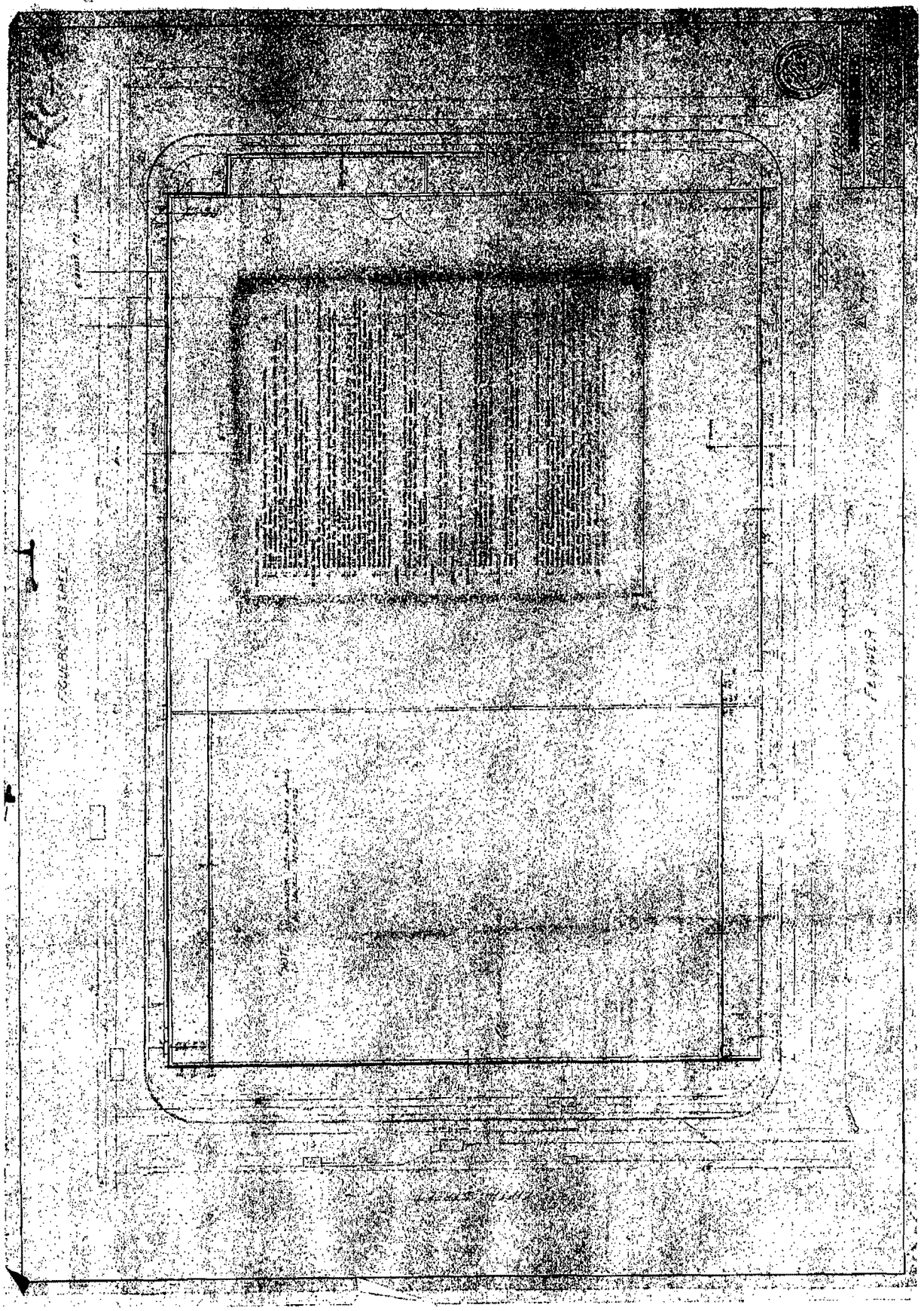
LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

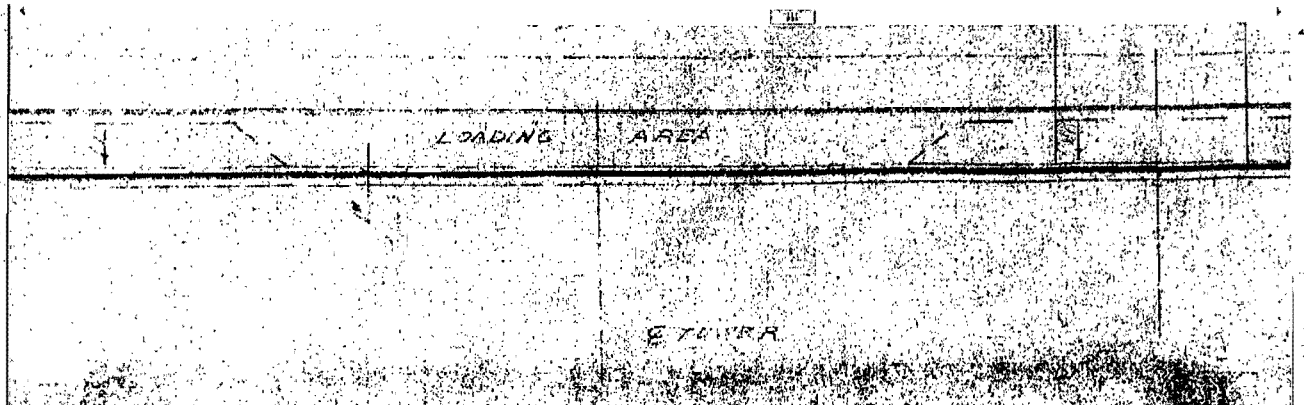
The Connector Partnership

REGIONAL CONNECTOR TRANSIT CORRIDOR
PROJECT DEFINITION DRAWINGS
AS-BUILT RECORD
RC-411
PARCEL NO. 5151-020-007

CONTRACT NO	C0980
DRAWING NO	RC-411
REV	
SCALE	NO SCALE
SHEET NO	

Model Name - Default





TOWER

GENERAL NOTES

PROCEDURE FOR EXCAVATION

1. Drill soldier beam holes using care to prevent excessive caving.
2. Place soldier beams.
3. Fill soldier beam holes to bottom of footing elevation with 2500 psi conc. fill remainder with 1½ sack sand slurry
4. Excavate to level of first anchor, place lagging as wire mesh as excavation proceeds in maximum of 6' lifts.
5. Install drilled cast-in-place shoring anchors. Anchors to be tested under inspection of the Foundation Engineer before excavation proceeds.
6. Repeat steps 4 & 5 for remaining levels of anchors.

DRILLED ANCHORS

1. Anchors to be drilled, cast-in-place tension piles. Precautions to be used to prevent excessive caving of holes.
2. Concrete to be 6 sack / yd net gravel pump mix. Plasticent admixture to be added as required for temperature and pumping time. Concrete to be placed by pumping to the bottom of the shaft.
3. Shaft above slip plane to be filled with sand slurry.
4. Anchor rods to be bar type. Threadbars complying with ASTM A-27 & A-722
5. All anchors to be tested to 150% of schedule design load and post tensioned to schedule design load under inspection of the Foundation Engineer. The deflection under the test load should not exceed 0.1 inch over a 15 minute period in order for the anchor to be approved; total deflection during the test load should not exceed 12 inches.
6. Foundation Engineer will inspect the installation of anchors.
7. Testing equipment to be calibrated by an approved testing laboratory, within last 30 days.
8. Representative anchors to be tested to 200% of schedule design load as directed by the Foundation Engineer.

LAGGING

1. Wood lagging to be installed in fill, overburden soils and areas of water seepage in the shale. Soil Engineer shall approve all areas not lagged.
2. 6 x 6 -10 / 10 wire mesh to be installed on the remainder of the shale. Shale to be sprayed with asphalt emulsion.
3. Lagging to be backfilled to provide full bearing.

WELDING

1. All welding to be electric arc using L.A. City approved electrodes.
2. All welders to be L.A. City certified.

STRUCTURAL STEEL

1. All structural steel to comply with ASTM - 36.

REMOVAL

1. Remove that portion of anchor rods in the street right of way within 20ft. of existing grade. Rods shall not be removed or decensioned until the basement walls are complete and backfilled to within 3.0 ft. of the anchor elevation.
2. Remove soldier beams in the street right of way within 10 ft. of the existing grade.

INSPECTION

1. The Foundation Engineer shall inspect the installation of all shoring.
2. Work within the public way or affecting the lateral support of the public way shall be under inspection of the Bureau of Contract Administration.

SPECIAL NOTES

1. Rods shall remain extended and exposed to permit retensioning throughout the service life of the shoring.
2. Anchor rods shall not be welded or used for grounding welding equipment.
3. Berms shall be constructed or some other means provided to prevent storm water from entering excavations over top of shoring.
4. Where excessive caving occurs, as determined by the Foundation Engineer, adequate precautions shall be taken to prevent caving.
5. Excavation shall not be surcharged by heavy equipment or material storage within 10' of top of cut, except in loading areas.
6. Dewatering wells on city property shall be approved in advance by the City Engineer.
7. PROPERTY BOUNDARIES WERE ESTABLISHED BY A LICENSED SURVEYOR
8. CONTROL POINTS SHALL BE ESTABLISHED BY A LICENSED SURVEYOR TO INSURE ACCURATE AND HORIZONTAL CONTROL OF EXCAVATION

TOWER

1. All structural steel to comply with ASTM - 36.

REMOVAL

1. Remove that portion of anchor rods in the street right of way within 20ft. of existing grade. Rods shall not be removed or detensioned until the basement walls are complete and backfilled to within 3.0 ft. of the anchor elevation.
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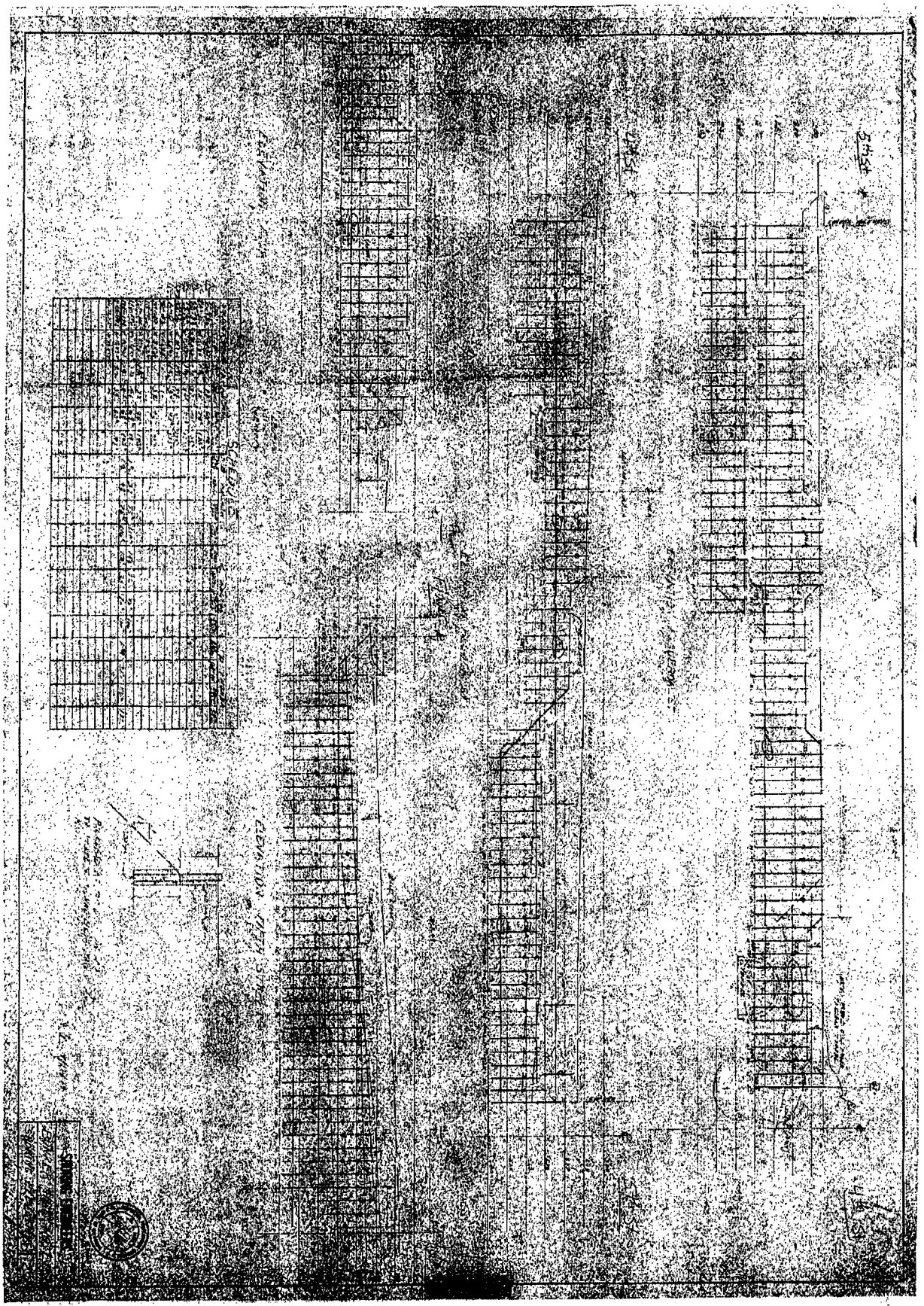
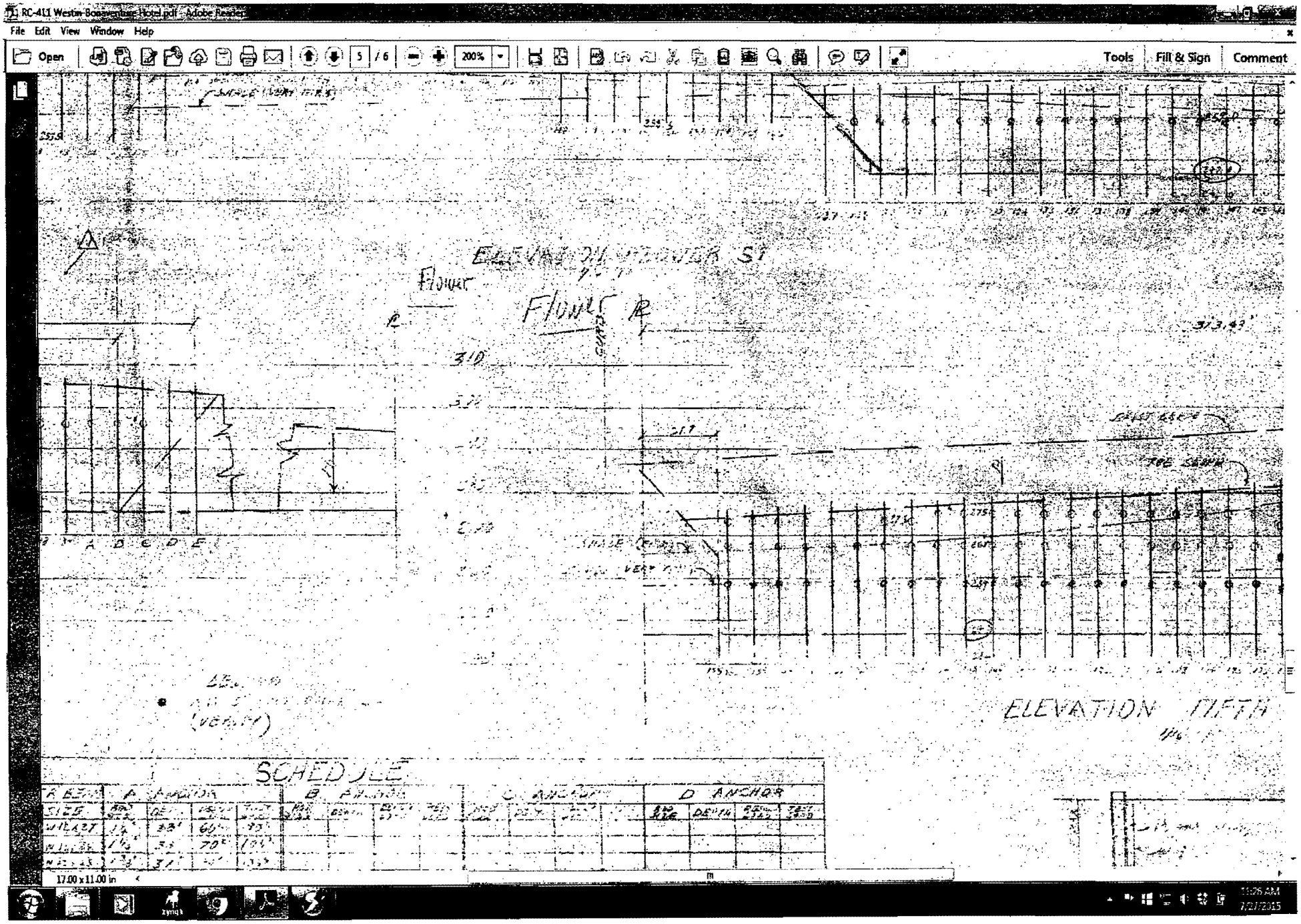
5. Excavation shall not be surcharged by heavy equipment or material storage within 10' of top of cut, except in loading areas.
6. Dewatering wells on city property shall be approved in advance by the City Engineer.
7. PROVIDE BARRICADE AROUND THE EXCAVATION.
8. CONTROL POINTS SHALL BE ESTABLISHED BY A LICENSED SURVEYOR TO MONITOR ANY MOVEMENT OF ST. STREET.

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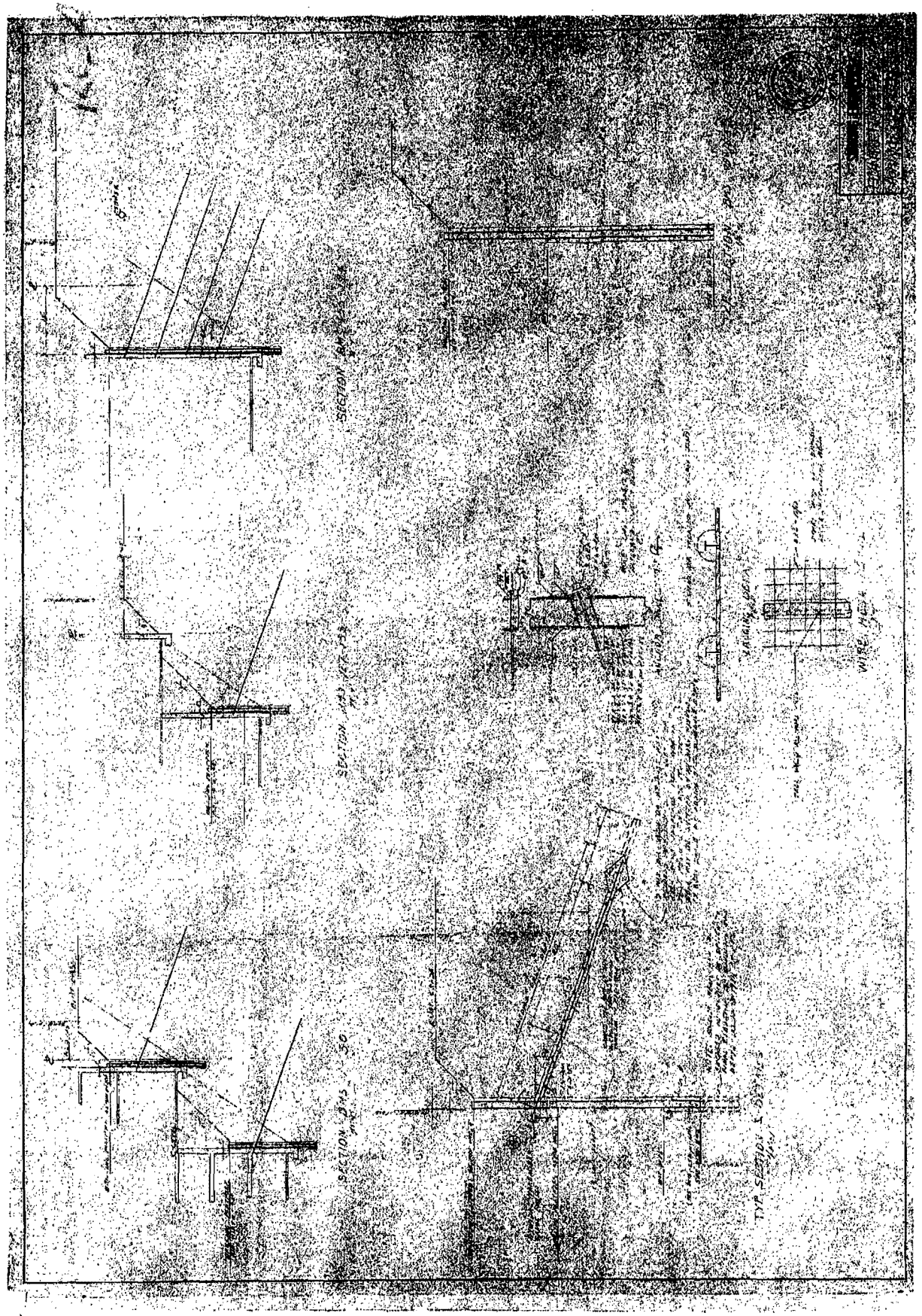
SECTION A-A
SECTION B-B
SECTION C-C
TYP. SECTION
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RC-411 Westin-Bonaventure Hotel.pdf - Adobe Reader

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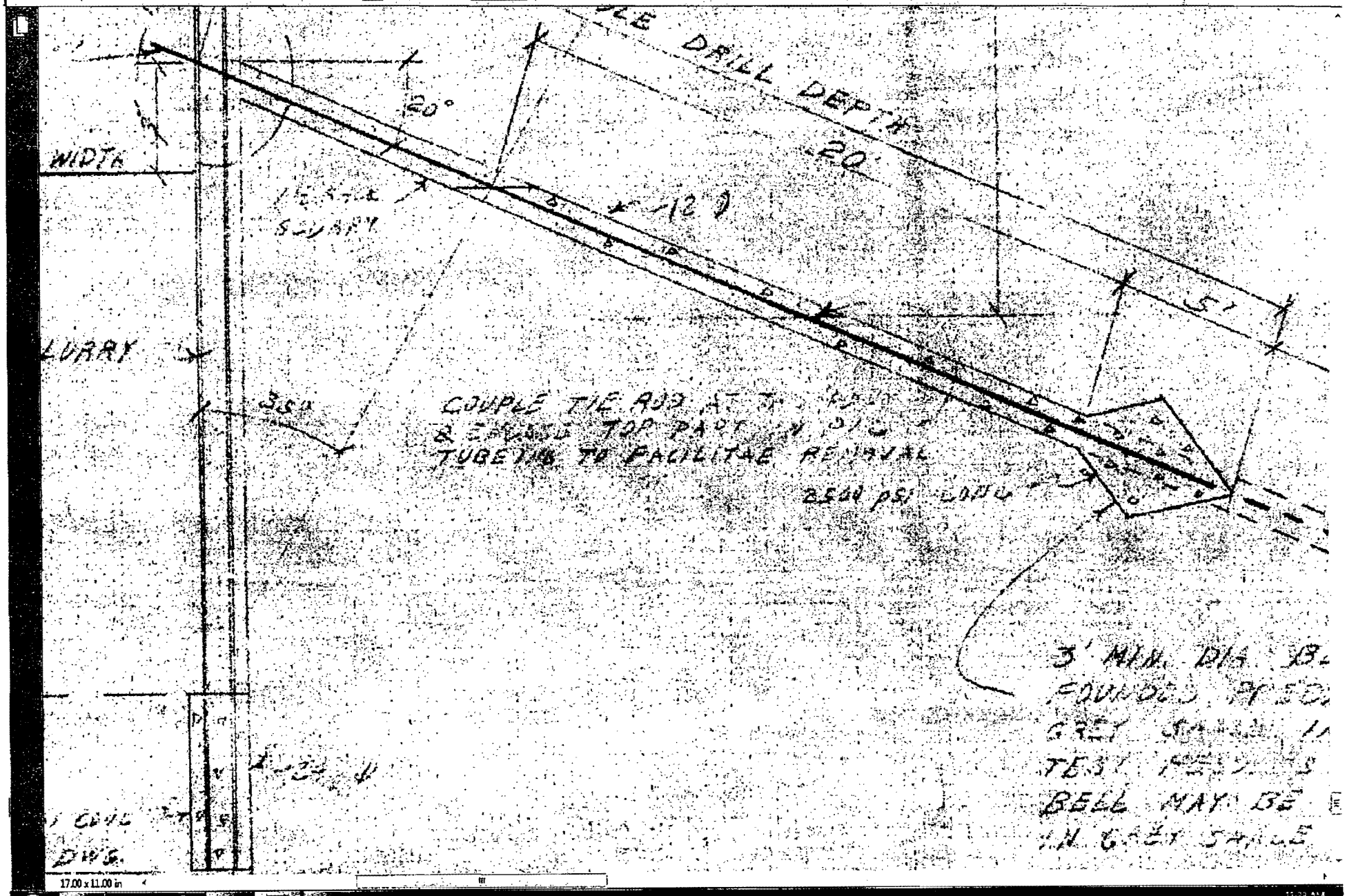

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11:38 AM
7/27/2015

PC5

Exhibit 12

---------- Forwarded message ----------
From: **Czarcinski, Michael** <Michael.Czarcinski@westinbonaventure.com>
Date: Thu, Jul 16, 2015 at 10:22 AM
Subject: FW: Flower St construction/ load-in
To: "christophersutton.law@gmail.com" <christophersutton.law@gmail.com>

We could not get this truck into garage because of MTA

MICHAEL
CZARCINSKI (char-chin-ski)
Managing Director

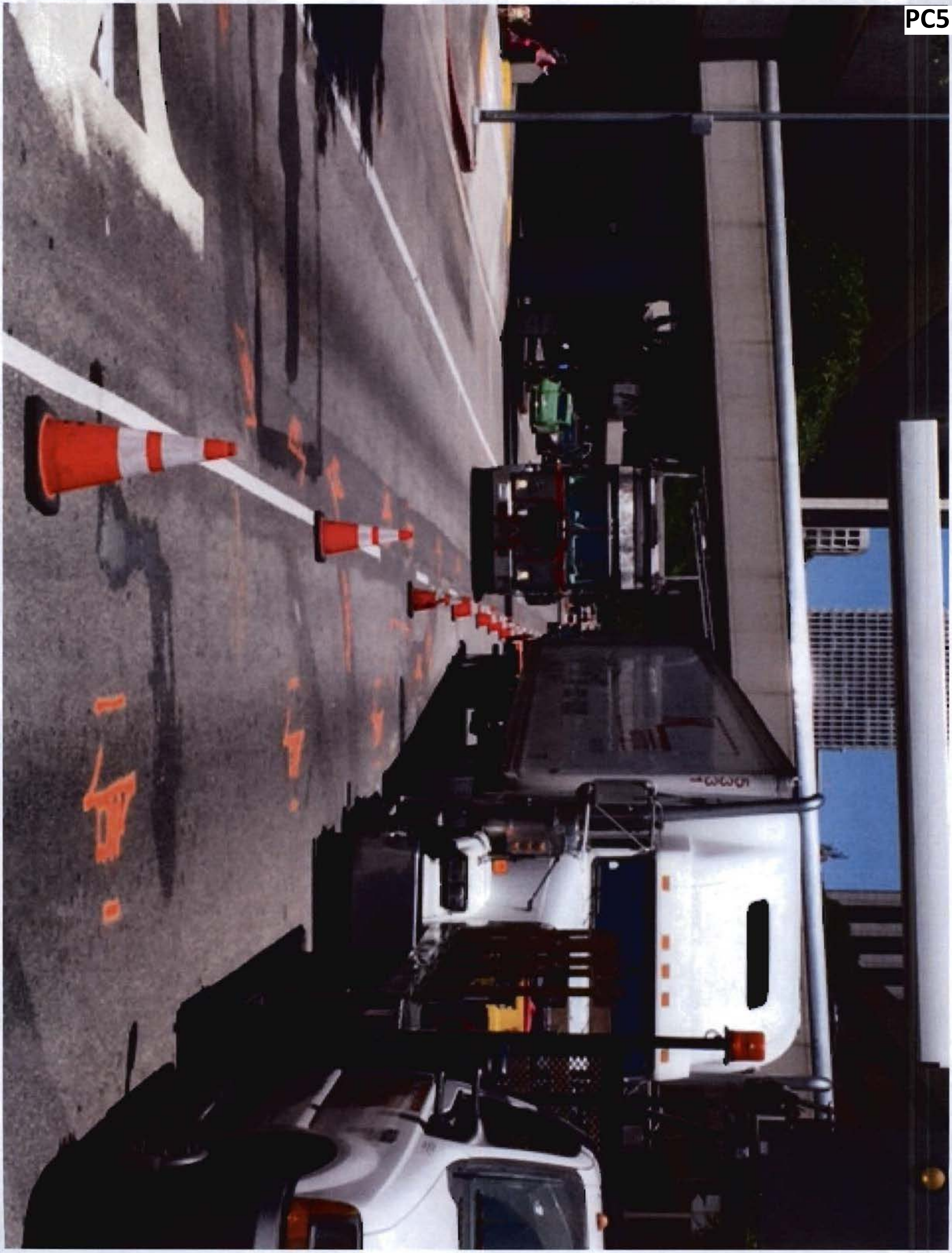
THE WESTIN BONAVENTURE
404 South Figueroa Street, Los Angeles, CA 90071
T 213.612.4880 F 213.612.4893 C 213.505.7728

WEBSITE | FACEBOOK | OFFERS | MEETINGS

-----Original Message-----
From: Long, Thomas
Sent: Wednesday, July 15, 2015 1:55 PM
To: Czarcinski, Michael
Subject: Flower St construction/ load-in

Mike,
Included are a few photos of the Flower St. Construction , and its impact on our loading dock load-in process.

PC5



PC5

PC5

Responses to Comments

PC5

Responses to Comments from Sutton, Christopher

Response to Comment PC5-1

As documented in the Final EIS/EIR and disclosed in the Draft SEIS, there would be temporary adverse effects associated with Project construction. Potential effects related to two method construction alternatives, Alternatives A and B, on Flower Street between 4th Street and the 7th Street/Metro Center Station are discussed in the SEIS in Chapter 3, Transportation and Circulation and Chapter 4, Affected Environment and Environmental Consequences. Chapter 5 of the Draft SEIS presents a summary of the consequences associated with the construction and operation of the two tunneling method alternatives.

- See Final EIS/EIR Chapter 4.18 Construction Impacts; Section 4.18.3.4 Locally Preferred Alternative for full analysis of construction impacts associated with the Project and mitigation measures identified.
- See Draft SEIS Section 2.1.2 Construction Methods of the Project; Section 2.1.3 Construction Staging for the Project for detailed descriptions of Project construction methods and construction staging areas associated with the tunneling alternatives which were not pursued.
- See Draft SEIS Chapter 3, 4 and 5 for discussion of potential environmental consequences of the two construction alternatives.

Response to Comment PC5-2

Metro will continue to provide timely notices.

Response to Comment PC5-3

As stated in Chapter 1, the Draft SEIS was prepared to address the Order of the United States District Court for the Central District of California in Today's IV, Inc. vs. Federal Transit Administration et al and 515/555 Flower Associates, LLC vs. Federal Transit Administration et al. The Judgment and Order for Partial Injunctive Relief by the Honorable John A. Kronstadt on May 28, 2014 and September 9, 2014, respectively, require that the FTA as the federal lead agency pursuant to NEPA, with Metro, prepare a supplemental analysis under the National Environmental Policy Act (NEPA) that addresses the feasibility of Open-Face Shield and SEM tunneling alternatives. The Draft SEIS is intended to provide more information on the tunnel construction alternatives on Flower Street that were withdrawn from consideration, specifically Open-Face Shield and Sequential Excavation Method (SEM) tunneling for the Flower Street portion of the Regional Connector project alignment between 4th Street and the 7th Street/Metro Center Station, as required by the Judgment.

The factual premise of this statement is false, there have been no material changes to the Project that are substantially different from what was presented and analyzed in the Final EIS/EIR that would require further analysis under 23 CFR § 771.129. The design refinements to

the project were evaluated and they would not result in new or adverse impacts, and would not change the conclusions of the analysis for Alternative A and B.

- See Draft SEIS Section 1.2 Purpose and Scope of this Supplemental Environmental Document for purpose and limit of scope for this environmental analysis.

Response to Comment PC5-4

See response to Comment PC5-3, which responds to comments made in this comment.

The agencies reject the commenter's support of a deep tunnel alternative on several grounds. It fails to satisfy Metro policy decision, so it fails to meet the project's purpose and need. It may be physically possible, but it is not feasible as a matter of sound public policy because it would be impractical under the physical constraints; it would increase the burden on the Little Tokyo environmental justice community; it would cost more; and it would delay the schedule. The current project design is superior in all of these ways. Finally, NEPA does not require the agencies to analyze a deep tunnel alternative in detail because it is similar to other alternatives the environmental document is already analyzing.

First, as a policy Matter, Metro's Board has decided that the light rail project accommodate that future station. The commenter's suggested deep tunnel alternative could not accommodate that future station, so it does not meet the policy goals for this project.

Second, NEPA does not require analysis of an infinite number of alternatives in the environmental document. Under 40 CFR § 1505.1(e), NEPA requires evaluation of a reasonable range of alternatives and a brief discussion of alternatives which were eliminated from detailed study. As stated in Chapter 1 of the Draft SEIS, the Draft SEIS was prepared in response to the Judgment and Order for Partial Injunctive Relief by the Honorable John A. Kronstadt on May 28, 2014 and September 9, 2014. The SEIS is a limited-scope document that provides additional detail on tunneling methods not selected for construction along Flower Street, specifically Open-Face Shield and SEM tunneling for the Flower Street portion of the Regional Connector project alignment between 4th Street and the 7th Street/Metro Center Station.

Alternative B in the Draft SEIS includes deep tunneling and the analysis of Alternative B has benefits, risks, and costs similar to the suggested deep tunnel alternative. Alternative B provides a basis for evaluating the deep tunnel alternative. GHG analysis in Section 4.2.2.2 was conducted for Alternative B and a deep tunnel alternative which would have similar impacts as under Alternative B. Additional schedule delays, costs, environmental, and safety risks associated with Alternative B and the resulting increased depth of the 2nd/Hope Station have been identified and evaluated in the Draft SEIS. Minor shortening of the tunnel through increasing the 2nd/Hope Station depth 1) increases the amount and duration of excavation of materials handled at the Mangrove site 2) maintains impacts on Flower Street south of 5th Street 3) still has the potential for tieback interface and 4) still increases operations costs but reduces operational efficiencies on Flower Street south of 5th Street. Based on the potential impacts,

safety risks, and issues associated with a deeper alternative are discussed above, it is not considered as a viable alternative.

Third, the commenter's deep tunnel alignment is not practicable. Increasing the depth of the 2nd/Hope Station as proposed by the commenter's deep tunnel alternative" would increase safety risks during construction and the amount of material required to be excavated to reach the depth of the station at 2nd and Hope. In addition, stations must meet Metro's Fire Life Safety Design Criteria requirements for emergency exiting of riders during unforeseen circumstances within the tunnels or at the station. In particular, riders must be able to exit the station adequately in case of emergency. A deeper station must be able to meet the emergency exit requirements. Meeting the Fire Life Safety Design Criteria requirements will be more challenging and is not certain with a significantly deeper station.

Fourth, a deeper alignment from 2nd/Hope results in an increased grade elevation from 5th Street to 7th Street Metro Center Stations resulting in reduced operating speeds, increased travel time and increased operational costs. For construction of Alternative A and B higher emissions result due to the use of grouting equipment, and for a longer duration. In addition, operationally, a qualitative assessment found that reduced emissions in some locations for Alternative B, the deeper alternative, would be more than offset by increased emissions associated with long term operational demands entering the 7th/Metro station and slower and less efficient transit operations. As presented in Chapter 5.0 Comparison of the Tunneling Method Alternatives versus the Project, Alternatives A and B, and therefore a deep tunnel alternative do not meet the purpose and need of the project.

Fifth, the suggested adjustment of the 2nd/Hope Station does not guarantee avoidance of tiebacks on Flower Street during construction while simultaneously rising at an acceptable grade to the 7th Street Metro Center Station to allow for safe and efficient operations.

Sixth, the deep tunnel alternative suggested by the commenter, still risks running into tiebacks. It is uncertain whether the depth of the tunnel would guarantee that the EPBM would not run into tiebacks closer to the 5th and Flower intersection. If an EPBM interfaces with a tieback, it would result in greater surface construction impacts associated with rectifying the situation than any of the alternatives identified in addition to significant delays and cost increases. The characteristics of the deeper alternative can be found in Section 2.3.2.2 analysis for Alternative B which states the following:

> *The deeper alignment proposed by Alternative B would have significant impacts on the future 5th/Flower and the 2nd/Hope stations:*
>
> - *The modified sag provides for a flat spot at a one percent grade to accommodate a future 5th/Flower Station. The future station would have to be configured as a side platform since the narrow center-to-center spacing of the twin tunnels would preclude construction of a center platform. The depth of this alternative's tunnels would*

accommodate construction of a mezzanine. Construction of the future station side platforms would require demolition of a portion of each tunnel in order to provide an opening to connect with the two side platforms. Transit service would be interrupted for a substantial length of time to permit this major construction work to take place. Deviations would be required from Metro rail design standards to accommodate the site-specific conditions.

- *Due to this alternative's greater depth, the 2nd/Hope Station would be shifted down by 32 feet from the Project station depth (96 feet) to 128 feet from TOR to the street surface. This station location would be deeper because the low point in Alternative B was shifted to the north to accommodate a future 5th/Flower Station. The greater station depth would have an increased risk to stability and safety of excavation shoring; this is an unprecedented depth for work of this nature in Los Angeles, which is not addressed by Metro Support of Excavation standards. Excavating at this depth would increase the difficulty in ventilating the excavation pit during construction, and increase the risk of exposure to hazardous gases. The greater depth would increase the amount of spoils (23,000 cubic yards) handled at the 2nd/Hope station site.*

As shown, a deeper alignment, as indicated by the commenter's deep tunnel alternative, from 2nd/Hope results in an increased grade elevation from 5th Street to 7th Street Metro Center Station resulting in reduced operating speeds, travel time and increased operational costs.

Furthermore, schedule impacts associated with change of project design and obtaining environmental clearance would be significant, even if performed in parallel. For the deeper alignment, per the Draft SEIS Alternative B, this would result in 7 months of schedule delay. Costs would also potentially increase as indicated in the Draft SEIS to potentially $403 million.

Finally due to the extended use of the EPBM, as indicated in the Draft SEIS, "The two tunneling method alternatives [EPBM to 5th Street] shift a majority of the effects resulting from the handling of excavation materials from the Flower street Segment, a high rise commercial district with wide streets, to Little Tokyo, a low to mid-rise mixed use district with visitor and cultural destinations, and identified as an environmental justice community."

- See Draft SEIS Section 1.2 Purpose and Scope of this Supplemental Environmental Document for purpose and need which indicates service levels that would not be met by a deeper tunnel alternative.
- See Draft SEIS Section 2.2 Development of Alternatives which presents the basis for identifying and evaluating the tunneling method alternatives in the SEIS.
- See Draft SEIS Section 2.2.1 Flower Street Existing Conditions; Section 2.3.1 Tunnel Construction Methods; Section 2.3.2 Description of Tunneling Method Alternatives for detailed description of existing conditions, constraints, construction methods per alternative, and associated impacts.
- See Draft SEIS Section 5.4 Construction and Risk Considerations, Section 5.5 Summary of Impacts of Alternatives versus the Project, Section 5.8 Cost and Funding Considerations for comparison of benefits, costs, and risk for a deep tunneling alternative

- See Draft SEIS Appendix A: Draft Flower Tunneling Method Alternatives Section 4.7 Transit Structure Configuration; Section 4.8 Underground Obstructions to Tunneling - Tiebacks; Section 5.0 Alternative Alignments and Tunneling Methods for detailed descriptions of existing conditions along Flower Street.

For all of these reasons, the commenter's suggested deep tunnel alignment would not meet Metro's policy goals; is infeasible as a matter of sound public policy, although it may be physically possible; and NEPA does not require the agencies to analyze it as an additional alternative because it is similar to other alternatives analyzed in detail in the environmental document.

Response to Comment PC5-5

See response to Comment PC5-4, which responds to comments made in this comment.

Response to Comment PC5-6

See response to Comment PC5-4 regarding the analysis of a deep tunnel alternative and the purpose and scope of the SEIS.

Noise and vibration impacts at the Colburn School were analyzed in the Final EIS/EIR. As stated in Section 4.7.3.5.1, Construction Noise and Vibration of the Final EIS/EIR:

> *As a school, the Colburn School was considered a Category 3 land use, in other words a land use with primarily daytime use. The analysis using the Category 3 land use classification determined that no significant impacts would occur at the Colburn School during construction. At the request of the Colburn School, additional noise analysis was undertaken, treating the school as a Category 1 land use. Given that the distance between the LRT tunnel and the Colburn School would be greater than the distance between the LRT tunnel and the Walt Disney Concert Hall and that GBV impacts would not occur at the Walt Disney Concert Hall during construction, operation of the TBM and delivery trains would not result in significant GBV impacts to the Colburn School even if the school is treated as a Category 1 land use. Although the Colburn School is properly considered as a Category 3 land use in this analysis, if the Colburn School were a Category 1 land use, a potentially significant GBN impact could occur at the Colburn School due to operation of the TBM and delivery trains during construction. Thus, in an abundance of caution, the mitigation identified in Section 4.7.4.2.1 below has been modified to ensure that GBN generated by the TBM and delivery trains would not impact the sensitive activity occurring at the Colburn School*.

Since approval of the Final EIS/EIR for the Project, Metro has been implementing its mitigations as identified in the Mitigation Monitoring and Reporting Program (MMRP). This includes but is not limited to activities such as construction schedule coordination with adjacent uses and monitoring, as well as continued development of design specifications in order to mitigate for impacts. The referenced April 2013 study was an in-progress study to determine the final

specifications needed to mitigate for impacts in that location. Metro continues to work with the Colburn School on the results of the report, the construction schedule and the design and installment of the mitigation planned.

- See Final EIS/EIR Chapter 4.7 Noise and Vibration, Section 4.7.3.5.1 Construction Noise and Vibration; Section 4.7.4.2.1 Final Construction Mitigation Measures for the Locally Preferred Alternative for analysis pertaining to the Project, construction impacts, and mitigation measures.

Response to Comment PC5-7

See response to Comment PC5-3 regarding purpose and scope of this SEIS and court order.

Response to Comment PC5-8

See response to Comment PC5-3 regarding purpose and scope of the SEIS. See response to PC5-43 regarding alternatives.

Alternative A in the Draft SEIS includes the use of the EPBM to bore tunnels generally following the horizontal and vertical alignment of the Project from 3rd Street to south of 4th Street with open face shield tunnel excavation from 4th Street to 5th Street, and SEM tunnel construction from 5th Street to the existing 7th Street/Metro Center Station as required by the judgment. Alternative B proposes the use of EPBM to bore twin tunnels generally following the horizontal alignment of the LPA, but with a deeper vertical alignment than the Project. The EPBM method would be used to tunnel to just south of 5th Street, with SEM tunnel construction from south of 5th Street to the existing 7th Street/Metro Center Station. The Draft SEIS identifies EPBM use along Flower Street in Alternative B to reduce the risk of tunneling where appropriate along the alignment.

The environmental document examines the feasibility of Alternative A and B. Refer to Section 2.2.3.2 Earth Pressure Balance Tunnel Boring Method and Section 2.3.2.2 Alternative B – EPBM/SEM Low Alignment Alternative for explanation on tunnel depth and avoidance of tiebacks.

The commenter supports the use of an EPBM from 4th to 5th Street with cut and cover construction from 5th Street to 7th Street/Metro Center Station. To address comments on the Draft EIS/EIR to maximize the use of EPBM on Flower Street, Metro studied, analyzed, and extended the use of EPBM south on Flower Street from 3rd Street to 4th Street; thereby reducing the need for cut and cover between 3rd and 4th Streets. Per the Final EIS/EIR Chapter 9, Section 9.2.1.2 Comment Response Project Refinements, and Mitigation Measures Summary:

> *Refinements have been made to the LPA since publication of the Draft EIS/EIR specifically to address concerns regarding potential impacts of construction. These refinements would reduce the extent of cut and cover activities and associated street lane and sidewalk closures. Cut and cover would not occur on 2nd Street in Little Tokyo, and the tunnel under Flower Street between 3rd and 4th Streets would be excavated using a*

TBM instead of cut and cover. The TBM would be inserted at the property northeast of 1st and Alameda Streets, the Mangrove property (formerly known as the Nikkei Center), and transported underground to Central Avenue, where it would begin excavating westward. Thus, the main site of construction has been moved away from the heart of Little Tokyo reducing impacts from construction including routing truck traffic away from the community core.

The use of EPBM on Flower Street has been analyzed in the Final EIS/EIR for the Project along with the cut and cover construction method. As discussed in response to comment PC5-4, NEPA does not require analysis of an infinite number of alternatives, including combinations of multiple construction methods, in the environmental document. Cut and cover construction was analyzed in the Final EIS/EIR for all of Flower Street and selected for the section south of 4th Street. EPBM was analyzed in the Final EIS/EIR and selected for use from 1st and Central to 2nd and Hope Street with cut and cover at station areas.

Additional analysis was conducted to further extend the use of EPBM. Due to presence of tiebacks, the presence of the 4th Street bridge piers, the depth and location of the 7th Street Metro Center Station, the soils conditions on Flower Street from 4th Street to 7th Street, the disproportionate environmental impacts to an environmental justice community, the additional costs and the operational inefficiency for a primary regional core service, the EPBM was not selected for use south of 4th Street. Thus, the prior environmental analysis already considered that alternative and rejected it.

The agencies have weighed the commenter's support for the use of cut and cover south of 5th Street, as part of the deep tunnel alternative, but ultimately rejected that option. The use of cut and cover between 5th and 7th Street, has been analyzed in the Final EIS/EIR and is selected for the certain depth of the Project. This depth allows for the operation of trains to run efficiently and maintain Metro required travel times. Increased depth of this alignment, compared to the project, to accommodate the use of the EPBM would increase the length of time of cut and cover construction activities from 5th to Flower. It would also create grade of track and operational conditions that are similar to Alternative B. (See also response to comment PC5-4 for additional discussion).

- See Final EIS/EIR Section 4.18.2.5.1 Cut and Cover Construction for construction methods selected for the Project
- See Draft SEIS Section 2.2.1 Flower Street Existing Conditions; Section 2.3.1 Tunnel Construction Methods; Section 2.3.2 Description of Tunneling Method Alternatives for detailed description of existing conditions, constraints, construction methods per alternative, and associated impacts.
- See Draft SEIS Chapter 2.0 Alternatives Considered, Section 2.3.2.2 Alternative B for description on Alternative B configuration and associated construction method risks, need for grouting, and schedule impacts.

- See Draft SEIS Appendix A: Draft Flower Street Tunneling Method Alternatives Chapter 3.0 Development of Project Configuration which identify and evaluate the tunneling method alternatives in the SEIS.
- Chapter 5.0 of the Draft SEIS, Comparison of the Tunneling Method Alternatives versus the Project, provides a summary of the effectiveness of Alternatives A and B in meeting the purpose and need of the project.

Response to Comment PC5-9

The commenter supports the use of EPBM between 4th and 5th Streets. See response to Comment PC5-3 and Comment PC5-4 regarding the consideration of the deep tunnel alternative, use of the EPBM, and challenges associated with tunneling from the 2nd/Hope Station. See response to Comment PC5-8 regarding efforts to extend the use of EPBM on Flower Street.

Response to Comment PC5-10

See response to Comment PC5-4 regarding the deep tunnel alternative and constraints.

Response to Comment PC5-11

See response to Comment PC5-4 regarding 2nd/Hope Street Station.

The level tunnels result from a deeper station at 2nd/Hope, an already deep station for the Project in comparison to other underground stations in the Metro Rail system. Construction of a deeper station construction activity would result in increased time for excavating material, therefore increase construction activities at the surface related to construction and hauling, and increase safety impacts related to extreme depths of the station. This increase in depth and time would result in increased station construction costs. These costs and impacts would be tradeoffs between the perceived improvements in schedule, costs and impacts related to a deeper, but more level tunnel.

As indicated, the schedule impacts associated with change of project design and obtaining environmental clearance would be significant, even if performed in parallel. For the deeper alignment, per the Draft SEIS Alternative B, this would result in 7 months of schedule delay. Costs would also potentially increase as indicated in the Draft SEIS to potentially $403 million.

Due to the extended use of the EPBM, as indicated in the Draft SEIS, “The two tunneling method alternatives [EPBM to 5th Street] shift a majority of the effects resulting from the handling of excavation materials from the Flower Street Segment, a high rise commercial district with wide streets, to Little Tokyo, a low to mid-rise mixed use district with visitor and cultural destinations, and identified as an environmental justice community.” Most importantly, the adjustment of the 2nd/Hope Station does not assist Metro in a guaranteed avoidance of tiebacks on Flower Street during construction while simultaneously rising at an acceptable grade to the 7th Street Metro Center Station to allow for safe and efficient operations. A deeper alignment from 2nd/Hope results in an increased grade elevation from 5th Street to 7th Street Metro Center Stations resulting in reduced operating speeds, travel time and increased operational costs.

- See Draft SEIS Section 2.3.1 Tunnel Construction Methods; Chapter 4.5 Geotechnical, Subsurface, and Seismic Hazards for existing conditions along Flower Street and tunneling methods.
- See Draft SEIS Appendix A: Draft Flower Tunneling Method Alternatives Section 4.1 Geologic Conditions for detailed descriptions of tunneling methods and construction techniques.

Response to Comment PC5-12

See response to comment PC5-8 regarding EPBM to 5th Street followed by cut and cover construction to 7th Street/Metro Center Station.

Comment references a draft tunneling report dated April 25, 2012, which has since been updated to reflect the Court direction received in May 2014. The Draft Tunnel Report, dated August 19, 2014, was included in Appendix A of the Draft SEIS. In the Draft Tunnel Report presented in Appendix A, the mapping of the alternatives is consistent as that presented in the Draft SEIS. The Final Tunnel Report is included in Appendix A and has had no updates since the Draft.

Response to Comment PC5-13

The Draft SEIS discusses environmental consequences associated with the construction and operation of the two tunneling method alternatives, Alternative A and B, and why they were withdrawn from consideration, including consideration of operational impacts.

Retaining the possibility of a 5th/Flower Station is not illusory. It is consistent with NEPA to identify and disclose the Metro Board's intention to include the 5th/Flower Station in the future if possible. The Metro Board approved the Project on Thursday April 26, 2012, with a Board directive to not preclude a future 5th/Flower Station. The clearly stated intention and policy decision was to build the station at this important location if funding can be identified in the future. This would be a separate project. The Metro Board committed to keeping the 5th/Flower Station for future consideration. Per meeting minutes for the April 26, 2012 Board meeting:

> *Item #74 APPROVED RECOMMENDATIONS A-D AS NEEDED:*
>
> *A. the Project Definition for the Regional Connector Transit Corridor, which is based on the Locally Preferred Alternative (LPA) of a 1.9 mile Light Rail project with three stations previously designated by the Board in October 2010 and which incorporates several design refinements, including:*
> *11. Preserve the opportunity to install a future station north of 5th and Flower Streets*

Should the 5th/Flower Station be implemented in the future, additional environmental evaluation in compliance with CEQA and NEPA as applicable, and an evaluation of cost and operational effects would be conducted.

- See Chapter 5.0 of the Draft SEIS, Comparison of the Tunneling Method Alternatives versus the Project, provides a summary of the effectiveness of Alternatives A and B in meeting the purpose and need of the project.
- See Draft SEIS Appendix A: Draft Flower Tunneling Method Alternatives Chapter 3.0 Development of Project Configuration; Chapter 4.7 Transit Structure Configuration; Section 4.7.1 Deferred 5th/Flower Street Station for identification and evaluation of the tunneling method alternatives in the Draft SEIS.

Response to Comment PC5-14

See response to Comment PC5-4 regarding the 2nd/Hope Street Station and deep tunnel alignment constraints.

See response to Comment PC5-8 regarding EPBM along Flower Street.

See response to Comment PC5-13 regarding the 5th/Flower Street Station and project refinements.

Response to Comment PC5-15

The SEIS discussed the 55 mph operational speed on the Flower Street as one of many factors considered in weighing the alternatives. The agencies sought to reach that speed because it would decrease the time between stations and make taking transit more attractive for riders. If the Metro Board later decides to build the 5th/Flower Street Station, it will have to decide whether the slower trips are worth the benefits of that station. It is not required for Metro to make those decisions at this time.

The Project provides a 55 mph operating speed in the Flower Street segment, meeting Metro's operating criteria, while Alternatives A and B would result in a speed reduction in this key LRT system segment to 35 mph. Reduction of the maximum operating speed in this key system link would decrease rail service headways, operational efficiency, and operating capacity for the entire Metro LRT system. Refer to Chapter 5, Section 5.6 for more detail regarding the comparison of alternatives.

Response to Comment PC5-16

See response to Comment PC5-8 regarding construction schedule.

Response to Comment PC5-17

See response to Comment PC5-3 regarding refinements to the Project and the purpose and scope of the Draft SEIS.

The Draft SEIS references the noise and vibration conditions and analytical information related to the Project and the entire project alignment in Chapter 4.7, Noise and Vibration of the Final EIS/EIR. This analysis applies the methodology consistent with the FTA Transit Noise and Vibration Impact Assessment (USDOT 2006). More information is available in Appendix S, Noise

and Vibration Technical Memorandum, and Appendix 2, Updated Locally Preferred Alternative Noise and Vibration Analysis, of the Final EIS/EIR.

Noise and vibration effects during construction of Alternatives A and B were evaluated using the FTA's guidance manual. As done with the Project, sensitive receptors along Flower Street were identified and sites identified where noise measurements were conducted. Appendix F has been added to the SEIS to provide information on the detailed noise modeling assumptions, construction equipment, and results for the tunneling alternatives analyzed in the Draft SEIS. A reference to the Appendix has been added to Section 4.4 of the SEIS.

- See Final EIS/EIR Chapter 4.7 Noise and Vibration, Section 4.7.3.5.1 Construction Noise and Vibration; Section 4.7.4.2.1 Final Construction Mitigation Measures for the Locally Preferred Alternative for detailed analysis and associated technical calculations for noise and vibration analysis for the Project.
- See Draft SEIS Chapter 4.4 Noise and Vibration for analysis for Alternatives A and B.
- See Appendix B, Section 1.5 Noise and Vibration Regulatory Framework for thresholds of significance for methodology used in the Draft SEIS.
- See Appendix F, Noise and Vibration Prediction Model Outputs for detailed noise model results and spreadsheets for Alternatives A and B.

Response to Comment PC5-18

See response to Comment PC5-3 regarding refinements to the Project.

The Final EIS/EIR contemplates that construction would occur during the daytime *and* nighttime. As noted in Chapter 4 Noise and Vibration, Section 4.7.3 Environmental Impacts/Environmental Consequences the "analysis considered both daytime and nighttime construction activities using the procedures and criteria for a general noise assessment presented in Chapter 12 of the FTA guidance manual (USDOT 2006)". Additionally, mitigation measures identified in the Final EIS/EIR for the Project state:

> *NV-8 Nighttime construction activities that produce noticeable vibration shall be avoided near vibration-sensitive locations.*
>
> *NV-16 Higher performance mufflers shall be used on equipment used during nighttime hours as needed near sensitive land uses.*

The Settlement Agreement with Flower Associates does not increase the scope and intensity of nighttime construction activities on Flower St. Section 3.2 of the Agreement merely states that Metro will apply for and use its best efforts to obtain the necessary work approvals (i.e., nighttime and weekend variances) to allow the Contractor to perform the water main relocation as night work and/or weekend work, the pile and cap beam installation as night work and/or weekend work, the deck installation as weekend work, the TBM removal as night work and/or weekend work, and the deck removal and street restoration as weekend work (except final paving may occur on weekdays). If Metro receives any of these work approvals from the City,

the Contractor *may* work during such approved periods to minimize the duration of daytime work activities, but the Contractor may nevertheless elect to work during the daytime period; provided. However that deck installation, deck removal, street restoration (other than final paving) and certain segments of water main relocation and pile and cap beam installation shall occur as weekend work only. Thus, the Final EIS/EIR contemplated work during the day and at night, and Section 3.2 of the Agreement does not change the considerations for day and nighttime work in the Final EIS/EIR nor does it assume that construction activities occur only at night.

With regard to the removal of deck panels, Section 9.10 of the Settlement Agreement preserves the Contractor's ability to temporarily remove panels at night to obtain vertical access to the work area below the decking assuming work approvals have been obtained from the City. The temporary removal of deck panels is consistent with the Final EIS/EIR description of construction staging areas along Flower St.

Contrary to the commenter's statement that the removal and transport of excavated soils would otherwise be through the TBM removal shaft, the Final EIS/EIR in Appendix K (see Figure 3-3 and Table 3-2) identified construction staging areas along Flower St. where soil will be excavated and transported. The TBM removal shaft is solely for the removal of the TBM, not excavated soil.

- See Final EIS/EIR Chapter 4.7 Noise and Vibration for noise analysis for the Project.
- See Final EIS/EIR Section 4.7.3.5.1 Construction Noise and Vibration for methodology and mitigations for the Project.

Response to Comment PC5-19

Text included a typo and is corrected in Section 4.4.3 Mitigation Measures. "As with the Project, there would be no potentially construction-related adverse effects after implementation of these mitigation measures for Alternatives A and B. However, the alternatives may have additional noise impacts along Flower Street beyond those identified for the Project due to the size and type of grouting and support equipment required for ground stabilization…."

- See Draft SEIS Section 4.4.3 Mitigation Measures for updated text.

Response to Comment PC5-20

Resolution of claims concerning noise impacts during construction of the Project is not related to the Draft SEIS analysis. Metro continues to implement the approved MMRP for noise and vibration mitigation. See response to comment PC5-3 regarding purpose and scope of the Draft SEIS.

Analysis for construction noise and vibration for the project can be found in Section 4.7.3.5.1 Construction Noise and Vibration. Additionally, Section 4.7.4 Mitigation Measures, NV-1 through NV-29, details the mitigations in place which Metro implements during the construction of the Project. Noise impact analysis for Alternatives A and B in the Draft SEIS can be found in Section 4.4 Noise and Vibration.

Metro continues to implement mitigation measures for noise during construction including during utility relocation activities per the MMRP as identified in the Final EIS/EIR. The commenter's letter includes documentation of complaints that Metro has received about noise during utility relocation and pre-construction activities such as surveys, geotechnical and utility investigations. For each complaint received, Metro recorded the complaint; field measurements and inspections were undertaken to establish noise levels present during the complaint and whether levels were a result of Metro activities. Where appropriate photos were taken showing mitigation in place properly applied (e.g. noise blankets). In every instance except for one on June 26, 2014, the findings documented that the complaint was during a time that Metro was not active at the complaint site, or that while Metro activities were occurring within the FTA criteria for construction noise. The June 26, 2014 incident, noted as out of compliance (over 85 dBA), had occurred in the very early stage of construction. Following this incident mitigation measures and procedures were refined based on lessons learned and no further out of compliance incidents occurred. Results of evaluation of each complaint were communicated back to each complainant except in instances where pending legal action precluded such notification. Complaints, noise levels present, and actions taken are summarized in the Log of Responses to Noise Complaints at 5th/Flower below.

- See SEIS Section 1.2 Purpose and Scope of this Supplemental Environmental Document for purpose and limit of scope for this environmental analysis.

- See Final EIS/EIR Chapter 4.7 Noise and Vibration, Section 4.7.3.5.1 Construction Noise and Vibration; Section 4.7.4.2.1 Final Construction Mitigation Measures for the Locally Preferred Alternative; Chapter 4.18 Construction, Section 4.18.4.2.6 Noise and Vibration; Chapter 8 Mitigation Monitoring and Reporting Program for all construction noise and vibration analysis for the Project as well as mitigation measures.

Response to Comment PC5-21

The regional reduction in GHG emissions due to traffic congestion relief is greater than the new emissions associated with construction activities and operation of the LRT trains and new facilities. The project would result in an overall reduction in GHG emissions in the region. The Project was also included in SCAG's 2008 Regional Transportation Plan as a strategic transit system expansion project. The RTP is intended to reduce Greenhouse gas emissions.

Based on a qualitative assessment, any difference in greenhouse gas emissions for Alternatives A and B compared to the project would be negligible. Section 4.2 of the SEIS has been updated to clarify the operational impact during operation. Reduced emissions in some locations for a deeper alternative would be offset by increased emissions associated with long term operational demands entering the 7th/Metro station and slower and less efficient transit operations. As stated in Section 1.2, there is no change in the location of the project or the project area studied, which remains as presented in the Final EIS/EIR.

- See Draft SEIS Chapter 4.3 Climate Change, Section 4.3.2 Environmental Consequences.

Log of Responses to Noise Complaints at 5th/Flower

DATE	SOURCE of COMPLAINT	COMPLAINT	MONITORED NOISE LEVEL				OBSERVATIONS
			FIXED		ATTENDED		
			(dBA 1-hr Leq)	(dBA 8-hr Leq)	(dBA 1-hr Leq)	dBA 8-hr Leq)	
24-Feb-14	Westin Bonaventure - Patrick Serge	jack hammering on 5th/no noise barriers & noise > 91 dBA	-	-	-	-	Metro was not active at the complaint site on 2/24/2014. Complaint was sent on 6/5/2014.
16-Jun-14	Westin Bonaventure - Patrick Serge	exit from garage is barricaded	N/A	N/A	N/A	N/A	Action was taken to mitigate the noise impact. Construction Relations emailed complainant on June 19, 2014 with action taken to address the concern. A flagger was provided to assist with daily operations of the Hotel during this phase of the work.
17-Jun-14	Westin Bonaventure - Patrick Serge	exit from garage is barricaded - no flagger	N/A	N/A	N/A	N/A	Action was takent to mitigate the noise impact. Construction activities were stopped at the complaint site. Construction Relations emailed complainant on June 19, 2014 acknowledging their concern and addressing questions in regards to improving access and installing advance warning signs.
26-Jun-14	Westin Bonaventure - Patrick Serge	at 9am - sound blankets but noise >86 dBA	-	-	87.5	89.2	Action was taken to mitigate the noise impact. Activities included sawcutting and grinding on 5th and on Flower. Sound blankets deployed on 6-ft panels on Flower and 5th. The contractor, ARCADIS, had a sound meter in front of City National Plaza. The construction activity of sawcutting from 8am to 9am with levels >90 dBA was recorded and the inspector was notified.
10-Jul-14	Westin Bonaventure - Patrick Serge	no flag person	N/A	N/A	N/A	N/A	Action was taken to mitigate the noise impact. A flagger was provided at the complaint site.
21-Jul-14	Westin Bonaventure - Patrick Serge	at 11am noise = sound blankets but noise = 83 dBA	84.7	74.6	82	78	Metro activies were occurring within the FTA criteria for construction noise. The activity of sawcutting started at 9am at 5th and Flower. The activity occurred north in front of complaint site. Sound blankets were deployed on 6-ft panels on both sides.The contractor, ARCADIS, attended monitoring. The activity of sawcutting continued from 10am to 13:00pm.
	Westin Bonaventure - Michael Czarcinski (complaint at 1pm)	noise > 90 dBA	72.2				Action was taken to mitigate the noise impact. Noise measurements were taken and recorded as the following: 1-hr Leq 7am - 3pm ranged from 71.7 dBA to 84.7 dBA [@11am]; Lmax 84.5 dBA to 95.2 dBA on fixed monitoring. Noise measurements of 70.8 dBA to 82.0 dBA [1-hour Leq] on attened monitoring and Lmax= 91.3 dBA from sawcutting activity.
5-Aug-14	Westin Bonaventure - Patrick Serge	at 9:30am, sound blankets but noise = 82.8 dBA	71.8	71.9	-	-	Metro activities where occurring within the FTA standards.

*Fixed = Represents at fixed point monitoring device
*Attended = Represents a hand held meter
*FTA criterion for construction noise is 85 dBA for commercial land uses (Transit Noise and Vibration Impact Assessment, FTA, May 2006)

Log of Responses to Noise Complaints at 5th/Flower

DATE	SOURCE of COMPLAINT	COMPLAINT	MONITORED NOISE LEVEL				OBSERVATIONS
			FIXED		ATTENDED		
			(dBA 1-hr Leq)	(dBA 8-hr Leq)	(dBA 1-hr Leq)	dBA 8-hr Leq)	
6-Aug-14	Westin Bonaventure - Patrick Serge	at 9:30am, sound blankets but noise = 82.6 dBA	71	73.7			Action was taken to mitigate the noise impact. The construction activity of sawcutting behind sound blankets was recored. The Metro inspector was notified of noise and moved trucks to mitigate. The Lmax = 86.0 dBA was recorded.
26-Aug-14	Westin Bonaventure - Patrick Serge	at 9:30am, sound blankets but noise >80 dBA	74.1	77.5	78.4	76.0	Action was taken to mitigate the noise impact. A drill and set pilings for shoring (auger drill and crane) were used at complaint site. A set 8 piles were completed. A drill motor higher than blankets on 6-foot panels which was directly across Flower from entrance was used. The noise level was Lmax = 86.3 dBA (fixed) and Lmax = 94.7 dBA (attended) due to auger drill construction equipment.
28-Aug-14	Westin Bonaventure - Patrick Serge	at 10am, sound blankets but noise = 81.3 dBA	73.8	74.9	74.8	75.3	Action was taken to mitigate the noise impact. The activity of hand-digging in trench was recorded on Flower street. Sound blankets were used. A clay spade was used to remove slurry. There was also tree cutting in front of California Club with a noise level of Lmax = 90.2 dBA (fixed) and Lmax = 86.9 dBA (attended).
29-Aug-14	Westin Bonaventure - Patrick Serge	at 10:15am, sound blankets but noise >80 dBA	81.6	77.4	77.4	77.8	Action was taken to mitigate the noise impact. The activity of potholing at Manhole 530 was conducted. The activity of saw cutting for I-beam pilings was recorded as well. A clay spade was used to remove asphalt and sound blankets were in place. The noise level of Lmax = 93.5 dBA (fixed) and Lmax = 102.1 dBA (attended) due to truck horn.
15-Sep-14	Westin Bonaventure - Patrick Serge	9am, jack hammmering with sound blankets; noise > 85 dBA	74.1	74.8	75.2	75.3	Action was taken to mitigate the noise impact. The acitivity of sawcutting asphalt for I-beams was conducted. The asphalt was removed using clay spade and a backhoe equipmnet used for excavation. Sound blankets were in place. The noise level of Lmax = 84.0 dBA (fixed) and Lmax = 86.9 dBA (attended) due to jackhammer equipment.
16-Sep-14	Westin Bonaventure - Patrick Serge	11am - drilling with sound blankets in place; noise >85 dBA	75.6	74.1	77.8/75.2	72.1	Action was taken to mitigate the noise impact. The activity of drilling and setting pilings with auger drill and crane was conducted and sound blankets were used. The noise level of Lmax = 91.2 dBA (fixed])and Lmax = 102.4 dBA (attended) due to 11:29am ambulance sirens.

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*Attended = Represents a hand held meter
*FTA criterion for construction noise is 85 dBA for commercial land uses (Transit Noise and Vibration Impact Assessment, FTA, May 2006)

Log of Responses to Noise Complaints at 5th/Flower

DATE	SOURCE of COMPLAINT	COMPLAINT	MONITORED NOISE LEVEL				OBSERVATIONS
			FIXED		ATTENDED		
			(dBA 1-hr Leq)	(dBA 8-hr Leq)	(dBA 1-hr Leq)	dBA 8-hr Leq)	
10-Nov-14	Westin Bonaventure- Patrick Serge	6:30am- construction staging					Action was taken to mitigate the noise impact. Construction Relations emailed complainant on Nov. 10, 2014 with action taken to address the concern. Contractor was notified.
	Westin Bonaventure- Patrick Serge	9:15am-no flag person located adjacent to loading dock					Action was taken to mitigate the noise impact. Contruction Relations emailed complainant on Nov.10, 2014 and provided photo of flagger adjacent to the loading dock.
11-Dec-14	Westin Bonaventure - Patrick Serge	no sound blankets - noise >83 dBA	N/A		79.4	75.3	Action was taken to mitigate the noise impact. Construction Relations emailed complainant on Dec.11, 2014 acknowledging complaint and notifying him that it will be investigated. Activities/actions included; excavation and installation of shoring at 4th and Flower. Sound blankets were in place and used due to jackhammering and hand digging. The inspector directed the contractor, Pulice, to move and add blankets to address the complaint.
	Westin Bonaventure - Patrick Serge	at 11:58am, no sound blankets, noise greater than 86 dBA	N/A		73.2		Metro activities were occurring within the FTA criteria for construction noise. The activity of replating and cleanup was recorded at 11:58am.
7-Jan-15	Westin Bonaventure - Patrick Serge	at 8:25am, no sound blankets and noise = 83 dBA	71.0	70.4	74.3	75.5	Metro activities were occurring within the FTA criteria for construction noise. The contractor,ARCADIS, took photos of jack hammering activitiy and the sound blankets in place.
17-Jan-15	Westin Bonaventure - Patrick Serge	at 9am, noise >82 dBA while jack hammering; sound blankets in place	68.2/68.9	69.32	72.2/70.3	71.6	Metro activities were occurring within the FTA criteria for construction noise. The activity jack hammering at 8:57am with an Lmax attended = 83.8 dBA was recorded. The inspector took a picture at 9:15am of backhoe equipment behind sound blankets and recorded that activity was within compliance.
26-Mar-15	Westin Bonaventure - Patrick Serge	noise recorded on 3/21/2015; noise > 80 dBA and 90 dBA	66.6 - 70.1	68.4	N/A	N/A	Metro activities were occurring within the FTA criteria for construction noise.
18-Apr-15	Westin Bonaventure - Patrick Serge	Advanced Engineering Acoustics report citing noise from sawcutting and paving; noise > 80 dBA [transient >90 dBA]	-	-			Metro activities were occurring within the FTA criteria for construction noise. Double sound blankets were in place.

*Fixed = Represents at fixed point monitoring device
*Attended = Represents a hand held meter
*FTA criterion for construction noise is 85 dBA for commercial land uses (Transit Noise and Vibration Impact Assessment, FTA, May 2006)

Log of Responses to Noise Complaints at 5th/Flower

DATE	SOURCE of COMPLAINT	COMPLAINT	MONITORED NOISE LEVEL				OBSERVATIONS
			FIXED		ATTENDED		
			(dBA 1-hr Leq)	(dBA 8-hr Leq)	(dBA 1-hr Leq)	dBA 8-hr Leq)	
25-Apr-15	Westin Bonaventure - Patrick Serge	Advanced Engineering Acoustics report citing noise >80 dBA and 90 dBA	-	-	73.7 - 84.8	79.4	Metro activities were occurring within the FTA criteria for construction noise. The noise level of Lmax from backhoe, sirens, skateboard, fire truck, vacuum truck, and whacker were recorded. The contractor, ARCADIS, observed two operations at corner of 5th and Flower including a backhoe, dump truck, vacuum truck, and cement trucks. Sound blankets were in place.
26-May-15	Westin Bonaventure - Patrick Serge	sawcutting with noise > 86 dBA	-	-	73.0-80.8	76.7	Metro activities were occurring within the FTA criteria for construction noise. The contractor, ARCADIS, observed work through intersection between 5th and Flower, which included saw cutting. Sound blankets were in place through intersection. The noise measurement of Lmax notes up to 104.3 dBA due to emergency vehicles.
10-Jul-15	Westin Bonaventure - Patrick Serge	sawcutting with noise > 92 dBA; no noise personnel on site	-	73.5	71.7-78.6	74.7	Metro activities were occurring within the FTA criteria for construction noise. Backhoe equipment on 5th Street, west of Flower, was recored. Sound blankets were in place on 5th Street. The noise level up to Lmax = 97.1 dBA was noted due to ambulance passing through.

*Fixed = Represents at fixed point monitoring device
*Attended = Represents a hand held meter
*FTA criterion for construction noise is 85 dBA for commercial land uses (Transit Noise and Vibration Impact Assessment, FTA, May 2006)

Response to Comment PC5-22

See response to Comment PC5-3 regarding the purpose and scope of the Draft SEIS.

See response to Comment PC5-21 regarding greenhouse gas analysis.

Alternative B in the Draft SEIS includes deep tunneling and the analysis of Alternative B has benefits and risks similar to the suggested deep tunnel alternative. See response to comment PC5-4 regarding the deep tunnel alternative.

Response to Comment PC5-23

See response to Comment PC5-8. See response to comment PC5-4 regarding the deep tunnel alternative.

Response to Comment PC5-24

See response to Comment PC5-23. See response to comment PC5-4 regarding the deep tunnel alternative.

Response to Comment PC5-25

As noted in Chapter 4.8 Environmental Justice of the Draft SEIS, both Alternative A and B would disproportionately impact Little Tokyo, an EJ community, as the duration and the intensity of construction impacts would be increased under Alternative A or B as compared to the Project. The longer construction activity duration and the increase in truck activity from the tunneling method alternatives would disproportionately impact Little Tokyo. There would be an increase in truck muck truck activity and construction traffic near Little Tokyo and trucking activities would be extended by 10 months under Alternative A and 8 months under Alternative B compared to the Project. Chapter 3.0 Transportation, Traffic Circulation for both Alternatives A and B details the change in excavation materials handling through the Mangrove site in Little Tokyo. Additionally, Chapter 5.0 Comparison of the Tunneling Method Alternatives versus the Project, Table 5.2-1 lists the shift in construction truck activity for Alternatives A and B.

An EJ analysis includes consultation with affected community regarding potential disproportionate adverse impacts. The Little Tokyo community worked at great length with FTA and Metro and the sensitivity of this fragile historic community is clearly recorded in the Final EIS/EIR in the EJ analysis and in the comments and responses. The community has been adversely impacted by construction projects in the past. The concerns about construction in their community, including disruption, congestion, and perception of construction inconvenience adversely impacting businesses are clearly expressed in the comments from LT community members on the Draft EIS/EIR (see FEIS/EIR volume F-2 and F-3). Metro has worked out a careful and specific mitigation program designed to address Little Tokyo construction impacts identified in the Final EIS/EIR. The community has indicated that any noticeable increase in construction impacts beyond those identified in the Final EIS/EIR would upset the careful balance worked out with the community and create adverse EJ impacts. As stated in SEIS Section 4.8.3 Mitigation Measures: