CITY OF REDONDO BEACH
PUBLIC WORKS, SAFETY AND SUSTAINABILITY COMMISSION AGENDA
Monday, April 27, 2026

415 DIAMOND STREET, REDONDO BEACH

CITY COUNCIL CHAMBER

REGULAR MEETING OF THE PUBLIC WORKS, SAFETY, AND SUSTAINABILITY COMMISSION - 7:00 PM

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1) Public comments can be entered before and during the meeting.
2) Select a SPECIFIC AGENDA ITEM to enter your comment;
3) Public will be prompted to Sign-Up to create a free personal account (one-time) and then comments may be added to each Agenda item of interest.
4) Public comments entered into eComment (up to 2200 characters; equal to approximately 3 minutes of oral comments) will become part of the official meeting record.

EMAIL: TO PARTICIPATE BY WRITTEN COMMUNICATION WITH ATTACHED DOCUMENTS BEFORE 3PM DAY OF MEETING:
Written materials that include attachments pertaining to matters listed on the posted agenda

received after the agenda has been published will be added as supplemental materials under the relevant agenda item. Jesse.Reyes@Redondo.org

REGULAR MEETING OF THE PUBLIC WORKS, SAFETY, AND SUSTAINABILITY COMMISSION - 7:00 PM

A. CALL MEETING TO ORDER

B. ROLL CALL

C. SALUTE TO THE FLAG

D. APPROVE ORDER OF AGENDA

E. BLUE FOLDER ITEMS - ADDITIONAL BACK UP MATERIALS

Blue folder items are additional back up material to administrative reports and/or public comments received after the printing and distribution of the agenda packet for receive and file.

E.1. BLUE FOLDER

F. CONSENT CALENDAR

Business items, except those formally noticed for public hearing, or discussion are assigned to the Consent Calendar. The Commission Members may request that any Consent Calendar item(s) be removed, discussed, and acted upon separately. Items removed from the Consent Calendar will be taken up under the "Excluded Consent Calendar" section below. Those items remaining on the Consent Calendar will be approved in one motion following Oral Communications.

F.1. APPROVE AFFIDAVIT OF POSTING FOR THE PUBLIC WORKS, SAFETY, AND SUSTAINABILITY COMMISSION MEETING

F.2. APPROVE THE PUBLIC WORKS, SAFETY, AND SUSTAINABILITY COMMISSION MEETING MINUTES FOR THE MARCH 23, 2026 REGULAR MEETING

F.3. RECEIVE AND FILE STATUS UPDATES ON PROJECTS DISCUSSED AT THE PUBLIC WORKS AND SUSTAINABILITY COMMISSION

F.4. RECEIVE AND FILE THE MONTHLY UPDATE TO THE CITY'S STRATEGIC PLAN

G. EXCLUDED CONSENT CALENDAR ITEMS

H. PUBLIC PARTICIPATION ON NON-AGENDA ITEMS

This section is intended to provide members of the public with the opportunity to comment on any subject that does not appear on this agenda for action. This section is limited to 30 minutes. Each speaker will be afforded three minutes to address the Commission. Each speaker will be permitted to speak only once. Written requests, if any, will be considered first under this section.

H.1. PUBLIC PARTICIPATION ON NON-AGENDA ITEMS

I. ITEMS CONTINUED FROM PREVIOUS AGENDAS

J. ITEMS FOR DISCUSSION PRIOR TO ACTION

J.1. DISCUSSION REGARDING THE PROPOSED BUDGET FOR FY 2026-27

J.2. PROJECT UPDATE AND DISCUSSION OF TRAFFIC SIGNAL AND CURB RAMP REPLACEMENTS ALONG PROSPECT AVENUE

J.3. RECEIVE AND FILE REPORT ON THE FULTON PLAYFIELD MULTI-BENEFIT INFILTRATION PROJECT, JOB NO. 60280

K. COMMISSION MEMBER ITEMS AND FUTURE COMMISSION AGENDA TOPICS

L. ADJOURNMENT

The next meeting of the Redondo Beach Public Works, Safety, and Sustainability Commission will be a regular meeting to be held at 7:00 p.m. on June 22, 2026, in the Redondo Beach Council Chambers, at 415 Diamond Street, Redondo Beach, California.

It is the intention of the City of Redondo Beach to comply with the Americans with Disabilities Act (ADA) in all respects. If, as an attendee or a participant at this meeting you will need special assistance beyond what is normally provided, the City will attempt to accommodate you in every reasonable manner. Please contact the City Clerk's Office at (310) 318-0656 at least forty-eight (48) hours prior to the meeting to inform us of your particular needs and to determine if accommodation is feasible. Please advise us at that time if you will need accommodations to attend or participate in meetings on a regular basis.

An agenda packet is available 24 hours at www.redondo.org under the City Clerk.

Administrative Report

E.1., **File #** PWSS26-0523 **Meeting Date:** 4/27/2026

TITLE
BLUE FOLDER

Administrative Report

F.1., **File #** PWSS26-0524 **Meeting Date:** 4/27/2026

TITLE

APPROVE AFFIDAVIT OF POSTING FOR THE PUBLIC WORKS, SAFETY, AND SUSTAINABILITY COMMISSION MEETING

PROOF OF POSTING

I, Jessica Handlin, hereby declare, under penalty of perjury, that I am over the age of 18 years and am employed by the City of Redondo Beach, and that the following document:

Agenda Dated April 27, 2026

of the Public Works, Safety, and Sustainability Commission

(City Council/Board/Commission/Committee)

was posted by me at the following locations (s) on the date and hour noted below:

Posted on: April 24, 2026 (date) at 11:00 am (hour)

Posted at: DOOR "1" BULLETIN BOARD

and at CITY CLERK'S OFFICE

Jessica Handlin, Analyst

04/24/2026

Date

Administrative Report

F.2., **File #** PWSS26-0525 **Meeting Date:** 4/27/2026

TITLE

APPROVE THE PUBLIC WORKS, SAFETY, AND SUSTAINABILITY COMMISSION MEETING MINUTES FOR THE MARCH 23, 2026 REGULAR MEETING

Minutes
Regular Meeting- 7:00 P.M.
Public Works, Safety, and Sustainability Commission
Monday, March 23, 2026

A. CALL TO ORDER

A Regular Meeting of the Redondo Beach Public Works, Safety, and Sustainability Commission was called to order by Vice Chair Anderson at 7:00 P.M., in the City Hall Council Chambers, 415 Diamond Street, Redondo Beach, California, and teleconference.

B. ROLL CALL

Commissioners Present: Simpson, Nafissi, Beeli, Vice Chair Anderson

Commissioners Absent: Bajaj, Tsao, Chair Arrata

Officials Present: Ryan Liu, City Traffic Engineer
Jesse Reyes, Capital Projects Program Manager

C. SALUTE TO THE FLAG

Commissioner Nafissi led in the salute to the flag.

D. APPROVE ORDER OF AGENDA

Motion by Commissioner Simpson, seconded by Commissioner Beeli, to approve the order of the agenda as presented.

Motion carried 4-0 by voice vote. Commissioners Bajaj and Tsao and Chair Arrata were absent.

E. BLUE FOLDER ITEMS - ADDITIONAL BACK UP MATERIALS

E.1. BLUE FOLDER

Capital Projects Program Manager Reyes reported no Blue Folder items that evening.

F. CONSENT CALENDAR

F.1. APPROVE AFFIDAVIT OF POSTING FOR THE PUBLIC WORKS, SAFETY, AND SUSTAINABILITY COMMISSION MEETING

F.2. APPROVE THE PUBLIC WORKS, SAFETY, AND SUSTAINABILITY COMMISSION MEETING MINUTES FOR THE FEBRUARY 23, 2026 REGULAR MEETING

Capital Projects Program Manager Reyes reported no hands raised on Zoom and no eComments.

Motion by Commissioner Beeli, seconded by Commissioner Simpson, to accept the Consent Calendar.

Motion carried 4-0 by voice vote. Commissioners Bajaj and Tsao and Chair Arrata were absent.

G. EXCLUDED CONSENT CALENDAR ITEMS - None

H. PUBLIC PARTICIPATION ON NON-AGENDA ITEMS

H.1. PUBLIC PARTICIPATION ON NON-AGENDA ITEMS

Jim Mueller stated there has been a flurry of interest in enhancing the Artesia Blvd. commercial district; reported that parking restrictions have been eliminated and a measure to increase the allowable size of buildings is in the works; said that recent studies have shown that people want a more walkable Artesia Blvd but are reluctant to be on foot in that area; reported that a non-profit called OurNRB has been developed and is sponsoring a weekly public market; announced the first market section is planned for late April on the corner of Artesia and Green Ln.; stated the surveys showed that speeding traffic, noise levels, narrow sidewalks, and limited crossings are major disincentives for walking on Artesia Blvd. which limits its commercial potential; noted that the speed limit on Artesia Blvd. is 35 MPH, which is substantially higher than other streets in business districts, and there is little to no buffer between vehicles and the narrow sidewalks or setbacks; voiced concern over businesses being able to succeed without foot traffic; hoped the Commissioners could elevate the issue to the Council, to the strategic planning process, and any other sources that could start work on altering the traffic environment on Artesia Blvd.

Capital Projects Program Manager Reyes reported no other cards, eComments and no hands raised on Zoom but Mark Nelson would like to speak.

Mark Nelson, Prospect Ave. resident, stated the residents would like to get the curb painted on the other side of the bus stop at the BCHD corner on the frontage road; noted that it is a one-of-a-kind bus stop since it has a road on either side of it; explained that it is an eight foot strip of concrete with a bench in it with Big Prospect on one side and the one-way frontage road on the other side; reported that he sent a comment regarding an unhoused person sleeping at the bus stop the night before; spoke of situations that occur at the bus stop that pose a dangerous situation and wanted the Commission to realize it is a busy on foot street and residents want to get it painted; stated that the Commission approved it last year but it hasn’t gotten done; reported that he did visit the City Attorney and City Manager earlier that day with a letter asking them to direct Public Works to paint it; hoped that the Commission could do something to make it happen, even if they have already approved it; referenced the Papa John’s truck that hit the bucket truck on Prospect and spoke of his 40-year experience with Berkshire Energy and Edison and Sempra, and stated you never put bucket trucks on frontage roads and hang over roads; commented that he wasn’t sure what the City could do but suggested the City tell the contractors not to do that.

Steve Hague, 30+ year resident, applauded Jim Mueller for all his market works; said he lives one block south of Artesia and mentioned he was hit by an e-Bike; noted that the sidewalks are tight and questioned how the City could make the area walkable; voiced concern for public safety and spoke about people on cell phones, Amazon drivers, and people that double park; commented, if they slow people down, the vehicles will go multiple blocks to the side and all the studies done have been about Artesia and not blocks north or south of it; stated the traffic will go into the residential neighborhoods with children, people walking with strollers, and walking their dogs; spoke about cell phones and pointed out that everyone is on their cell phones and he worries about public safety.

Capital Projects Program Manager Reyes reported no hands raised on Zoom.

I. ITEMS CONTINUED FROM PREVIOUS AGENDAS - None

J. ITEMS FOR DISCUSSION PRIOR TO ACTION

J.1. DISCUSSION OF POTENTIAL TRAFFIC CALMING MEASURES AT OPAL & IRENA INTERSECTION

City Traffic Engineer Liu provided some background information, stated that the City received a complaint from a resident, in early March 2026, regarding cut through traffic on Opal St., drivers from Torrance Blvd. turning onto Opal St. to get to Prospect to avoid going to the light at Prospect, safety concerns about high speed traffic, and crosswalk concerns because drivers make fast, shallow turns from Torrance onto Opal due to the geometry of the intersection; reported that staff visited the area and also noticed drivers could potentially drive the wrong way if they ignored the paint on the street going at higher than desired speed; stated that they also noticed an unusual existing northbound stop sign on Irena at Opal, explained it was unusual because the southbound approach does not have a stop; provided more explanation why it was unusual and said it could also be a contributing factor to the higher speeds of vehicles exiting Torrance Blvd. since there is no transition down to lower speeds into the residential area; stated that they discussed some possible solutions and other concerns with that resident as well as provided them with the City's speed cushion policy and other materials; noted that they still need to collect signatures and do the study so it is not the topic that evening and it may be agendized for the Commission at a future date if it reaches the City policy thresholds; reported that the main solution that staff is proposing that evening is centerline hardening at Opal and Irena to reduce the turn speeds; added that they are also proposing to remove the unusual northbound stop on Irena at Opal, which will create a more normal typical experience for drivers and explained why; stated one thing they don't want to recommend is an all-ways stop at Opal/Irena because that would force an immediate stop; provided a map of the solutions that staff was proposing and a visual example of centerline hardening; noted that centerline hardening reinforces compliance with the yellow centerline using physical vertical measures and by putting that line of delineators it will force drivers to slow down into the right turns and left turns coming from Torrance Blvd. and put them in a mindset that they are in a lower speed environment; spoke of a third

optional measure, which staff was looking for feedback from the Commission, of a low profile speed bump to also force a sharper, slower turn onto Opal St.; noted that drivers could go over the low profile bumps and experience a small penalty compared to the other measures they are proposing; reiterated the last measure they are proposing is the removal of the northbound stop sign and paint on the street, said they are not overly concerned about the potential speed increases because there is another stop sign less than 100 ft. from the one they would like to remove; noted there is also a drainage dip cross gutter on Irena Ave. just south of that intersection which acts similar to a speed bump; stated that staff's recommendations are to install centerline hardening at Opal and Irena (if the Commission recommends it they can move forward to procurement and installation), and remove the northbound stop sign at Opal St. (if the Commission recommends it they will bring it to City Council for formal approval); concluded his presentation and offered to answer questions.

Vice Chair Anderson invited public comments.

Tony Acosta, 700 Opal, said he is there representing himself and two or three neighbors; stated they like all the ideas but are concerned about the removal of the stop sign northbound on Opal; commented that people run that stop sign quite a bit and preferred if they put a speed bump or something similar to make people stop.

Brooke Abcarian, 715 Opal, said it was her husband that initially suggested making it a cul de sac; noted, since hearing staff's suggestions, she feels the same as Tony Acosta and would prefer more stop signs; acknowledged that Engineer Liu's statement about too many stop signs tend to make people not stop made sense as well; spoke about the area being an issue and that anything the City could do to slow everyone down would be appreciated.

Chris Bothwell (via Zoom), resident of Opal, voiced concern that the removal of the northbound stop sign would cause accidents because drivers are used to that stop sign being there; said when people do their quick S turn onto Opal St they will be hit on the driver side; suggested placing a speed bump on the southside of Opal St. so that people making the turn from Torrance, onto Irena, and then onto Opal, would have an obstacle slowing them down after they make their S turn onto Opal; commented that yellow sticks in the middle of the road feels like overkill for the situation.

Zach Drummer (via Zoom) wanted to voice his preference to not take out the stop sign but liked the other proposals offered; said he would like to cut off the people being able to enter the street from Irena since people speed through but at the very least they need to keep the stop sign on the southside of the street.

Tracy Drummer (via Zoom) commented that removing the northbound stop sign from Irena would be a recipe for disaster; opined people will not grasp it and they will see T-bone accidents; said the biggest issue is the speed of which people come off of Torrance onto Opal; noted that no one in the area seems to abide by stop signs in that area; opined that removing a stop sign would not be great and suggested some sort of barriers to help;

said it makes sense to shut Opal down as being a two-way street or making it a cul de sac; reported that there are only six houses in the area and they all have kids; suggested putting a crosswalk at Irena and Torrance because it is scary to cross that intersection; reiterated she is against the stop sign removal.

Capital Improvements Project Manager Reyes reported no other hands raised.

Commissioner Nafissi asked staff if they sent a survey to the residents.

City Traffic Engineer Liu responded they didn't send a survey for the traffic calming measures and they were just responding to that request; stated that having a formal survey process for traffic calming would get complicated; said staff did not take the situation lightly and one of the reasons they recommended removing the stop sign was because they believe people come around that corner quickly because they know everyone else has to stop for them; explained if a driver is coming from Torrance Blvd., onto Irena, then going onto Opal St. the northbound Irena drivers have a stop sign so there is no obligation to yield or even slow down because everyone has to wait for the traffic from Torrance Blvd. to go through; stated that is a primary reason staff recommended the removal, along with traffic calming measures, so that the intersection would operate similar to a normal T-intersection; reported that they looked into the history of why the stop sign was placed there because what is there is highly unusual and it is still unclear to them; reported that Opal St. did extend west from that intersection so Opal St. used to go through and then directly enter Torrance Blvd., so they suspect that traffic actually could enter Opal St. directly from Torrance Blvd. at an even shallower angle in the past and that might be why the stop sign was put on Irena; further explained that there were no stop signs in the east/west direction a long time ago and the westbound stop sign was put in during the 80's so when Opal St. was cut off there's a chance the City didn't take away the northbound stop sign; stated their recommendation is to do some cleanup of the intersection because if they had designed it from the beginning they would not have put the northbound stop sign there; said he understood the residents' sentiments and their concerns and that is why they are also proposing measures to address that turn; noted that 150 ft. south of the northbound stop sign, there is a cross gutter so drivers going northbound already have to slow down going through that dip, and then stop again at Torrance Blvd.; felt that the presence of that stop sign does not change the speeds of drivers much.

Commissioner Nafissi commented that there are only six houses so a survey would have been easy to do.

City Traffic Engineer Liu responded that it is a very unusual situation and has not been seen anywhere else so putting it to a vote would put the City in a tough position.

Commissioner Nafissi asked if they explored the cul de sac option or would that be a CIP and outside the scope of the Commission.

City Traffic Engineer Liu replied yes, it would be a CIP plus it would affect residents who

use that route.

Commissioner Nafissi asked if staff had a preferred option since they offered three.

City Traffic Engineer Liu stated they need that first line of more visible cones so that someone from Torrance Blvd can see them, and make the correct decisions as they are turning in, plus the additional bumps on the side, so drivers effectively make the turn into the street, in order to address the speeding complaint where the vehicles are sweeping in; said the low speed bumps he showed them earlier is an optional measure but based on public comment would be useful in slowing drivers down.

Vice Chair Anderson supported removing the stop sign on Irena going northbound and felt it would be safer along with the other measures recommended; asked if they had considered a traffic circle there to help reduce speeds but keep it free flowing at the same time.

City Traffic Engineer Liu responded that they did not look into a traffic circle primarily because they have been tested in the past in the City, the residents were in favor of the concept but not of the temporariness of the materials; said they were careful in their recommendations to also be mindful of what they use outside the direct view of the homes; stated they have heard some concerns with visual blight associated with traffic circles.

Vice Chair Anderson clarified that the solutions offered were temporary and a quick build as opposed to a permanent solution.

City Traffic Engineer Liu confirmed the solutions are temporary and they don't have a lot of great permanent solutions outside of building a formal median at that intersection which would be a CIP project; asked Public Works Director to speak regarding the potential for a traffic circle.

Public Works Director Andy Winje reported that they have attempted to do many traffic circles at intersections similar to the one they are discussing, they have been effective at reducing speeds, creating traffic patterns that allow pedestrians to cross, but the community did not adopt them well; stated the City has realized it is difficult to do a temporary one but that is how they test to see how the community responds to it; stated that the community did not like the traffic circle so the Council abandoned the program; suggested that they look into a more permanent, better looking, traffic circle and asked Engineer Liu if he has looked at the real estate in that area.

City Traffic Engineer Liu responded that they have looked into it and recalled that the auto shop located there is not totally aligned with Opal St. so if the area was filled up with a traffic circle it might introduce some turning difficulties.

Public Works Director Winje noted that they would have some funding issues as well and it would run between $50,000 to $100,000.

Vice Chair Anderson asked if it would be possible to put a yield sign southbound going

east or westbound going southbound going on Irena to Opal.

City Traffic Engineer Liu explained that if they remove the stop sign the left turn lane automatically becomes a yield like any other intersection; added that they don't have the real estate there to mark it properly, it could be confusing with the yield there, and assigning the right-of-way would be difficult.

Commissioner Beeli thanked Engineer Liu for the detailed presentation and supported the options provided.

Motion by Commissioner Beeli, seconded by Commissioner Simpson, to accept the recommendations made by staff on the hardened centerline on Irena, the eight inch diameter yellow raised pavement markers on Opal, the removal of the stop sign on Irena, and the speed bump in the middle to slow vehicles coming off of Torrance.

City Traffic Engineer Liu noted that the recommendation for the stop sign removal will still need to be approved by the City Council.

ROLL CALL VOTE:

AYES: Simpson, Nafissi, Beeli, Vice Chair Anderson

NOES: None

ABSTAIN: None

Motion carried 4-0 by roll call vote. Commissioners Bajaj and Tsao and Chair Arrata were absent.

J.2. DISCUSSION OF POTENTIAL CROSSWALK IMPROVEMENTS AT PCH/AGATE INTERSECTION (CALTRANS)

City Traffic Engineer Liu introduced the item and noted that it is a joint presentation with his department, Public Works, and Caltrans District 7; reported that Wilfred Domingo from the Office of Transportation Safety would also be speaking; provided a slide showing the noticing area for the item and stated they mailed postcards to residents of the meeting that evening; informed the Commission that Caltrans received two customer service requests to install a type of traffic signal or pedestrian hybrid beacon at PCH and Agate St.; noted that there is an existing crosswalk there and the reason why Caltrans is involved is because PCH is State Route 1, which is a Caltrans-owned street; turned the floor over to Wilfred Domingo.

Wilfred Domingo, Office of Transportation Safety, stated he was there as part of Caltrans' community engagement; reiterated they received some customer service requests at the intersection of PCH and Agate St.; reported that they had received a request earlier but when they did their study it did not warrant a pedestrian hybrid beacon or traffic signal; reported that they received another request from a Redondo Beach resident; explained that they use a Intersection Safety and Operational Assessment Process (ISOAP) and it is based on the Safe Systems Approach; further explained that the Safe Systems

Approach has six principles: eliminate death and serious injury, humans make mistakes, humans are vulnerable, responsibility is shared, redundancy is crucial, and safety is proactive and reactive; stated when they do their ISOAP they have different kind of strategies and for this “At-Grade” intersection on PCH and Agate they have the following:

- Minor road stop
- Minor road stop with turn restriction
- All-Way Stop
- Restricted crossing U-turn
- Median U-turn
- Traffic Signal
- Pedestrian Hybrid Beacon (PHB)
- Roundabout

Wilfred Domingo stated the strategies they found to be viable at PCH and Agate are the traffic signal and the PHB; said the signalized is best suited for high traffic volumes or when the right-of-way is constrained and the cost depends on the amount of roadwork; spoke of pedestrian accommodation where pedestrian signals are placed at the designated crosswalk and the legs depend on where the pedestrians are crossing; reported they now have the Leading Pedestrian Interval (LPI) which allows the pedestrians to walk first before the light turns green on the traffic signal and they found that helpful in preventing collisions; stated the PHB only turns on when activated by a pedestrian, so when a pedestrian wants to cross they need to press the button; reported that there is some miscommunication about the PHB and explained that when the button is pressed it does not automatically turn on, it waits until the traffic light turns red so that the flow of traffic isn’t disrupted; noted that there would also be the pedestrian signals that do a countdown so the pedestrian knows how long they have to cross, which accommodates bicyclists as well; provided a video from the City of Irvine that showed how PHB’s provide a safer crossing alternative than traditional crosswalks; reiterated that he is there for community engagement and to educate people on the PHB; offered to answer any questions.

City Traffic Engineer Liu reported that there is an existing PHB on PCH at 3rd St. in Hermosa Beach and Caltrans is constructing one at PCH and Avenue D.

Commissioner Beeli asked Traffic Engineer Liu if the intersection at PCH and Agate going to be another stop line on PCH.

City Traffic Engineer Liu responded that if a PHB is installed it would come with another stop bar in both directions.

Vice Chair Anderson asked if they have any TIMS or police data on any accidents at the intersection.

Wilfred Domingo said a few but not much.

Vice Chair Anderson commented that it is completely based on the two requests from the residents and that Mr. Domingo stated earlier that the study did not warrant for pedestrian crossing.

Wilfred Domingo responded when they did the traffic count it did not warrant the traffic signal so the next viable option would be the PHB.

Vice Chair Anderson asked if the justification for the PHB was based on resident concern or some element of crossing between the residents over to the commercial area.

Discussion followed.

Vice Chair Anderson stated that he is not in favor of it, opined there is sufficient safety for pedestrians to cross, and there is another crossing 300 ft. away if necessary.

Commissioner Beeli asked if it is approved would the City be putting an additional crosswalk on the south side of the intersection.

City Traffic Engineer Liu stated that it would be up to Caltrans but generally with a PHB, there is only one crosswalk, and there is already one existing at that location.

Capital Improvements Project Manager Reyes reported no hands raised on Zoom and no eComments.

Russ reported that he has an office at 604 North PCH and lives on Agate St.; noted for eight years he has had a desk with a window that looks out to that crosswalk; described a man picking up his son's scooter and his son and running across that intersection dodging cars that morning and stated that the intersection is very dangerous; mentioned that he never crosses there because he finds it dangerous so he walks to Irena and around to pick up lunch all the time but he sees people do it; reported that he has seen two accidents, two light poles go down, and a jeep flip and hit his building after a police chase; stated when all the lights are green drivers go about an average of 50 MPH; strongly urged either upgrading that crosswalk or removing it entirely.

City Traffic Engineer Liu stated ultimately it is a Caltrans decision, but the Commission could do a receive and file and provide any advisory recommendations for Caltrans; noted it doesn't follow the typical process of going to the City Council.

Public Works Director Winje stated it is a Caltrans project but it would be important if the Commission had a strong objection to the project for them to voice it and said it would help in future conversations; reiterated that Caltrans' goal that evening was to provide

community engagement and staff brought it in front of the Commission so the public could also speak and so the Commission could provide feedback.

Vice Chair Anderson asked if staff or District 7 could provide more details on next steps.

Wilfred Domingo stated they are looking at the ISOAP process which means they are looking at the traffic signal and the PHB; spoke about the suggestion of the roundabout and said they don't think they have the right of way to do that because it is high volume, they would need two lanes, and that would be a large roundabout; stated that an All-Ways Stop would disrupt traffic so they don't want to do that so that is why they have proposed the solutions he spoke about; stated that they would look more into the collisions; offered to provide more information to them if they wanted it; stated they have not experienced congestion at that intersection and the closest other intersection would be Irena.

Vice Chair Anderson said, if they do go forward with the pedestrian hybrid beacon (hawk), that they need to help with the education with people coming off of the minor street because it can be confusing; agreed with the speaker (Russ) on either removing it completely to force people to go to the next street or upgrade it.

City Traffic Engineer Liu said they had expressed the education component to Caltrans and noted in their Staff Report that PHBs are relatively new and have a learning curve to them; mentioned that Caltrans also offered the option of a traffic signal and if the Commission wanted to they could put that as part of their recommendation or recommend taking away the crosswalk altogether.

Commissioner Nafissi asked Mr. Domingo if Caltrans had engaged the City Councilmember for the district, in which he responded no; suggested that it would be a good opportunity for Caltrans to engage the community because the Councilmember holds monthly meetings and the residents that live closer to that intersection would be able to provide better feedback; reported that it would be Councilmember Castle.

Wilfred Domingo stated he would be happy to come back.

Commissioner Beeli suggested that the City look into contacting the businesses in the area since more foot traffic would be beneficial for them.

City Traffic Engineer Liu reported that they sent postcard noticing to the businesses and the residents on both sides.

Discussion followed that what was brought to the Commission was a result of the responses from the postcards, about 200 were sent, and a Commissioner noted they did receive one; provided what information was on the postcard and it was noted that the resident that spoke followed the directions.

Wilfred Domingo stated they will continue the engagement and will come back again, and they will continue their study.

Motion by Vice Chair Anderson, seconded by Commissioner Nafissi, to receive and file the presentation.

ROLL CALL VOTE:

AYES: Simpson, Nafissi, Beeli, Vice Chair Anderson

NOES: None

ABSTAIN: None

Motion carried 4-0 by roll call vote. Commissioners Bajaj and Tsao and Chair Arrata were absent.

J.3. DISCUSSION AND POSSIBLE ACTION REGARDING COMMUNICATION WITH THE CITY COUNCIL ON ITEMS TO BE ADDED OR MODIFIED ON THE NEXT STRATEGIC PLANNING SESSION

Capital Projects Program Manager Reyes reported that the Strategic Planning Session is on Tuesday, March 31st at 2:00 p.m. at the Main Library in the large conference room; stated the item is an opportunity for the Commission to provide any feedback that they might like to see be added to the Strategic Plan and any comments would be shared with the City Council and City Manager; stated any comments or suggestions would be placed into a memo by staff to be submitted to the Mayor and City Council.

Vice Chair Anderson asked if there was any public comment.

Capital Projects Program Manager Reyes reported no hands raised on Zoom and no eComments.

Commissioner Simpson said he reviewed it and had nothing to add.

Vice Chair Anderson stated he provided recommendations last year and had nothing to add.

Commissioner Nafissi commented that she was surprised there weren't more items on open space and parks; reported that the state gave some guidelines to local health plans a year ago that encouraged public health plans to reinvest in their communities; stated there are five buckets and one of the buckets is local communities that allows cities to get funding from public health plans for playgrounds and open spaces; commented that she didn't know where that fell but it would be something to look into.

K. COMMISSION MEMBER ITEMS AND FUTURE COMMISSION AGENDA TOPICS – None

Commissioner Nafissi asked for an update on the red curb on Prospect.

City Traffic Engineer Liu noted that the Commission voted to extend the red curb on the backside on the frontage road; staff received word from the City Attorney and HR that they needed to hold off due to some legal reasons.

Public Works Director Winje reported due to an ADA accommodation request that was made the City Attorney put a hold on it as she works through it.

Commissioner Nafissi requested some insight be provided and brought back to them.

Public Works Director Winje said he would ask the City Attorney for more information and get that information to Commissioner Nafissi directly.

L. ADJOURNMENT

Vice Chair Anderson announced that the next meeting of the Redondo Beach Public Works, Safety, and Sustainability Commission will be an adjourned joint regular meeting with the Budget and Finance Commission to be held at 6:00 p.m. on April 27, 2026, and a subsequent regular Public Works Safety and Sustainability Commission meeting to follow at 7:00 p.m., in the Redondo Beach Council Chambers, at 415 Diamond Street, Redondo Beach, California.

Motion by Commissioner Beeli, seconded by Vice Chair Anderson, to adjourn the meeting at 8:08 p.m.

Motion carried 4-0 by voice vote. Commissioners Bajaj and Tsao and Chair Arrata were absent.

All written comments submitted via eComment are included in the record and available for public review on the City website.

Respectfully submitted:

_____

Andrew Winje
Public Works Director

Administrative Report

F.3., **File #** PWSS26-0527 **Meeting Date:** 4/27/2026

To: **PUBLIC WORKS, SAFETY, AND SUSTAINABILITY COMMISSION**

From: DEPARTMENT OF PUBLIC WORKS

TITLE

RECEIVE AND FILE STATUS UPDATES ON PROJECTS DISCUSSED AT THE PUBLIC WORKS AND SUSTAINABILITY COMMISSION

BACKGROUND

Based on Public Works, Safety, and Sustainability Commission (PWSSC) recommendation, City staff has prepared a table of all significant projects that have been discussed at the PWSSC since August 26, 2019. The table is included as **Attachment 1**. Staff will continue providing ongoing project status updates to the PWSSC on a quarterly basis.

The most recent update was given at the January 2026 PWSC meeting for Q4 of 2025. Two new items have been added during Q1 of 2026. Two items were deemed complete during the quarter and will be dropped from the tracking table after tonight's meeting.

ATTACHMENTS

- PWSSC Project Status Updates

PUBLIC WORKS, SAFETY, AND SUSTAINABILITY COMMISSION DISCUSSED PROJECTS - QUARTERLY STATUS UPDATE ***Q1 2026***

PROJECT NAME	PWSSC MEETING DATE	PWSC RECOMMENDATION	STAFF ACTION	CC MEETING DATE	CC ACTION	PROJECT STATUS	NOTES & PROJECT STATUS
North Redondo Beach Bikeway Extension	09/30/19	Receive and file report - forward Staff's conceptual design to City Council for approval.	Forward to CC	12/17/24	Approved construction contract	Complete	Construction and landscaping complete. Ribbon cutting was March 5, 2026. Bike path open.
Riviera Village Pedestrian Improvements	03/28/22	To be presented to PWSC at a later date.	Design	N/A		Pending	City received a grant to pursue design for comprehensive improvements in the Riviera Village. Project concepts were presented to transportation and design experts at a Metro Complete Streets Training as a case study. RFP will be issued to start design pending Metro approval of funding agreement. Funding agreement approved by City Council in March 2026.
Pref Parking Zone on N Gertruda	08/28/23	Move forward with Pref Parking Zone - daytimes for res frontage & provide letter to adjoacent businesses	Forward to CC	03/17/26	CC denied Coastal Development Permit.	Complete	Coastal Development Permit ministerial approval was appealed by local businesses due to loss of available public parking in Coastal Zone. CC held appeal hearing on 3/17/2026 and denied Coastal Development Permit. Original CC preferential parking zone resolution has been voided.
Truck Routes in So RB	03/25/24	PWSC recommended City Manager and CC discussions with Torrance counterparts	refer to CM and CC	N/A		On-Hold	Truck route modifications rejected by Torrance Public Works due to no agreement on different traffic issues.
Curbspace at 2400 Artesia	03/25/24	PWSC Approval	N/A	N/A	N/A	Pending	To be implemented at developer cost when project is built.
Diamond Restriping and RUHS Area Traffic Improvements	10/27/25	PWSC recommended CC approval of concept design	Design	12/09/25	CC approved concept design for Diamond	Pending	Plans and Specifications design underway. City is seeking additional funding sources due to cost estimate.
Class IV Bicycle Lanes on PVB	01/27/25	For City Council to fund design and construction of Class IV bike lanes	Design	TBD	TBD	Pending	Design to be funded by FY25-26 bicycle transportation fund. 95% plans submitted to City for final review.
RB Blvd. Corridor MAT Project	04/28/25	Recommend project approval and further design. Recommend further consultation with Torrance	Design	08/19/25	Approved funding agreement, contract, and conceptual design	Pending	Metro funding agreement, consultant contract, and concept design approved by CC. CC to continue outreach to Torrance for cooperation. Design started, additional exhibits to be provided for Lawndale and Torrance.
Ripley/Perkins/Huntington	3/24/25 & 4/24/25	Recommended approval as part of resi rehab project	Forward to CC	09/02/25	Approved plans and specs	Bidding	CC approved resi rehab FY23 plans and specs on 9/2/2025. Project to be bid in April 2026.
500-600 Prospect Frontage (Safety Imp.)	4/28/25 & 06/23/2025	Recommended by PWSC 6/23/25	Staff to do	N/A	N/A	On-Hold	In review with City Attorney's Office and Human Resources.
Preferential Permit Parking Reform	06/23/25	Recommended for CC approval	Forward to CC	09/16/25	CC tabled to future date	On-Hold	CC explored targeted permits for Ave H neighborhood but unlikely due to resident feedback. Larger discussion tabled to future date.
Broadway/Sapphire/Guadalupe - Short-Term	07/28/25	Recommend short-term improvements	Staff to do	N/A	N/A	Construction	Striping was completed in March 2026. Curb materials and bollards in procurement.
Commercial Driveway Widths	12/15/25	Recommend CC to update RBMC commercial driveway standard to be 12' minimum one-way driveways, 20-24' two-way driveways.	Forward to CC	TBD	TBD	Pending	Planning staff to update RBMC in consultation with City Attorney's Office.
Irena & Opal Traffic Calming	03/23/26	Recommend traffic calming, recommend CC to remove NB Irena stop at Opal.	Forward to CC	04/14/26	CC approved NB Irena at Opal stop sign removal	Pending	Traffic calming materials in procurement. Striping changes and stop removal queued up with City striping contractor.
PCH Agate Pedestrian Crossing Signal	03/23/26	Receive and file report and presentation	Continue planning/outreach work with Caltrans	N/A	N/A	Planning	Caltrans received public and PWSSC feedback. Caltrans to continue outreach and studies to determine next steps.

Administrative Report

F.4., **File #** PWSS26-0533 **Meeting Date:** 4/27/2026

To: **PUBLIC WORKS, SAFETY, AND SUSTAINABILITY COMMISSION**

From: DEPARTMENT OF PUBLIC WORKS

TITLE

RECEIVE AND FILE THE MONTHLY UPDATE TO THE CITY'S STRATEGIC PLAN

EXECUTIVE SUMMARY

On March 31, 2026 the City Council held a strategic planning session to discuss and update the City's Strategic Plan. At the session, the Mayor and City Council considered recent accomplishments, completed a strengths, weaknesses, opportunities, and threats (SWOT) analysis, evaluated and adjusted the previously established three-year goals, and listed specific objectives for the upcoming planning period which was set for the next twelve-months. The Strategic Plan is scheduled to be approved by the City Council in May 2026 and therefore no attachment is presented at this time.

The Public Works Department has been assigned as leads or partners for a number of goals under the following priority areas:

- **Priority Area 1: Economic Vitality**
- **Priority Area 2: Public Safety and Community Well-Being**
- **Priority Area 3: Infrastructure and Public Spaces**
- **Priority Area 4: Customer-Centered Service Delivery**
- **Priority Area 5: Community Stewardship**

Staff will continue to regularly update the Commission on progress made on this set of twelve-month objectives as periodic progress reports on the objectives are provided to the Council.

ATTACHMENTS

- 02.17.2026 Strategic Plan Update

Three-Year Priority Areas & 10-Month Objectives

June 2025 – March 2026

CM= City Manager **ATCM**=Assistant to City Manager **CD**=Community Development **CS**=Community Services **FD**=Fire Department **FS**=Financial Services **HR**=Human Resources **IT**=Information Technology **LIB**=Library **PD**=Police Department **PW**=Public Works **WED**=Waterfront and Economic Development **CA**=City Attorney **CC**=City Clerk **CT**=City Treasurer

Priority Area 1: Economic Vitality

Goal 1.1 Enhance the Waterfront

#	When	Who	Objectives	Done	On Target	Revised	Notes
1	March 1, 2026	WED/PW	Investigate the options and costs associated with improving the Pier Parking Structure to allow for redevelopment.			***X***	***This item will trail discussions associated with the vacant commercial space.***
2	July 15, 2025	WED	Identify strategies to proactively market and lease the identified commercial opportunity sites in the Harbor and Pier area.	X			Staff appeared before the City Council during the July 8 and August 12 closed session agendas to discuss the strategies.
3	September 1, 2025	WED	Complete the pre-design engineering studies needed to construct the new public boat launch and present the results to the City Council for review.	X			Pre-design studies have been completed, and staff met with each Councilmember during the weeks of September 8 and September 15, to present the findings.
4	December 31, 2025	WED, PW	Complete the entitlement approval process for all phases of the Seaside Lagoon Rehabilitation Project and complete the plans and specifications for Phase 1 of the project needed for the Coastal Development Permit.			X	Local consideration of approval of the Lagoon's CDP and phase one construction plan set is on schedule. Coastal Commission review and approval is still TBD.
5	October 1, 2025	WED, CD	Identify the process and cost to consider adjusting the Local Coastal Program requirements for King Harbor Marina parking.	X			Staff prepared a discussion item for City Council consideration on November 4, 2025. Direction was given to prepare the parking analysis needed to consider modifying the LCP requirements.
6	March 1, 2026	FD, PD, CA, WED	Research policy options and prepare a draft Safety Ordinance for rental watercraft in King Harbor.			X	Staff is working with the City Council to update Title 12 language. The scope of the initial ordinance project has expanded, and staff anticipates completing this item in June 2026.
7	September 1, 2025	WED	Complete consideration of the preliminary Marine Mammal Center/Waterfront Education Center Property Use and Fundraising Agreement.			***X***	The Option Agreement was drafted and sent to the Marine Mammal Care Center (MMCC) for review in early July. Staff met with MMCC representatives on September 4 to answer questions and walk through the document. MMCC submitted initial comments and redlines on September 14, followed by additional revisions on September 29. Staff presented MMCC's counter proposal to the City Council as an October 7 closed session item. In coordination with outside legal counsel, staff has drafted updated redline language based on City Council direction and sent the redlines to

							MMCC. MMCC submitted redlines in December 2025. City Council discussed the redlines in closed session on December 16, 2025 and formed a subcommittee to finalize a counter. ***The subcommittee held a meeting on January 15, 2026, created a counter offer, and staff returned to City Council on February 3, 2026 for final review. Staff sent the City's counter proposal to MMCC on February 5, 2026. Staff awaits a response from MMCC.***
8	October 1, 2025	WED, FD	Present a report to the City Council comparing the City's harbor/marine management operating model/organizational structure to others.			***X***	Staff anticipates presenting this item to Council in **summer of** 2026
9	October 1, 2025	WED	Prepare a report to discuss the options and process to remove the former Gold's Gym site from the Harbor Tidelands.			***X***	Staff anticipates bringing this as a Closed Session item in ***summer of*** 2026.

Goal 1.2: Revitalize Artesia Boulevard

#	When	Who	Objectives	Done	On Target	Revised	Notes
10	October 1, 2025	CD	Complete the policy discussions for adjusting the FAR Ratio and implementing property investment incentives along the Artesia/Aviation Corridor, in conjunction with the General Plan Phase 2 Update.	X			The policy discussion was held by the City Council on August 5, 2025. The Council directed staff to prepare an ordinance allowing up to 1.5 FAR along Artesia/Aviation.
11	September 1, 2025	CD	Provide a report to the City Council detailing the impact the changes made to Artesia Blvd parking regulations are having on business reinvestment in the area.	X			On August 5, the City Council directed staff to prepare an ordinance that would eliminate commercial parking requirements along Artesia. The draft ordinance will be reviewed by the Planning Commission in September and will return to City Council for consideration of adoption in late October.
12	December 31, 2025	CS, WED, PW	Provide a status report on the public art procurement effort on Artesia Blvd. by the City's newly-hired art consultant.	***X***			***The ARTesia Strategic Plan was presented to and approved by Council on 12/16/25.***
13	October 1, 2025	CD	Provide a report to the City Council on the process to study and consider implementing rooftop dining; lot merger incentives that would encourage property reinvestment/revitalization; and options to enhance the quality of business signage along the boulevards.			***X***	***A draft ordinance was presented to City Council for preliminary feedback on January 6, 2026. The Draft Ordinance will be reviewed by the Planning Commission on February 19, 2026. It is anticipated that it will be adopted by the City Council in May 2026.***

Goal 1.3: Position Redondo Beach as a Destination for Business Investment

#	When	Who	Objectives	Done	On Target	Revised	Notes
14	November 1, 2025	WED, CD, ATCM, MAYOR+ COUNCIL SUBCOMM.	Convene an Economic Development Working Group to help recruit/retain businesses and assist staff in identifying and analyzing conditions/regulations/processes that exist in the City that may impede business reinvestment and report the preliminary results to the City Council.	X			An Economic Development Subcommittee met with two commercial development teams on four occasions to tour Artesia Blvd, the Waterfront, and PCH. Staff are currently working on a contract with a prospective third-party consultant to perform a void analysis along Artesia Blvd to identify desirable uses

							that generate foot and vehicle traffic. The consultant would also catalog parcel owners with contact information at key nodes, promote parcel assemblage, and contact owners to discuss new development standard regulations meant to promote redevelopment. The agreement with AREAS was approved by City Council in early December. The results of AREAS' information gathering will be reviewed by the subcommittee and presented to the City Council when complete.
15	December 31, 2025	CD, WED	Support proactive development in the City with a focus on business retention and enhancing marketing efforts and outreach to potential businesses and provide a report to the City Council on the status of these efforts.	X			A report of the City's economic development efforts will be provided with the above recommended agreement.
16	March 1, 2026	MAYOR, WED, CD, ATCM	Create a Major Events working group to pursue opportunities and attract activities associated with the 2026 World Cup and LA28 Olympics, as appropriate.		X		Following the official launch of the marketing website on November 4, 2025, staff is developing plans and activities for next year.
Future Goal 1.4: Revitalize the Pacific Coast Highway Corridor							

Priority Area 2: Public Safety and Community Well-Being

Goal 2.1 Implement Measure FP (Reconstruct City Fire and Police Facilities)

#	When	Who	Objectives	Done	On Target	Revised	Notes
17	August 1, 2025	ATCM	Complete selection of the firm to serve as the City's Owner's Representative and Bond Program Manager and present the contract to City Council for consideration of approval.	***X***			***Council approved the first amendment to the Agreement with Griffin Structures for Owner's Representative and Program Management Services for Phase 1 of Measure FP Implementation on January 20, 2026.*** ***RFQ/Ps for both the Fire and Police portions of Measure FP Implementation were released on January 29, 2026 with proposals due for both on March 13, 2026.***
18	March 1, 2026	FIN, ATCM, PW, IT, PD, FD, CT	Following selection of the Owner's Representative and Bond Program Manager, work with the City's Municipal Financial Advisor to develop a strategy to appropriately time the City's bond issuance to complete the projects included in Measure FP.		X		PRAG is standing by to advise the City as the funding needs and project schedule are developed in the Strategic Planning phase of Measure FP implementation.
19	March 1, 2026	ATCM, CA	Prepare the selection guidelines and resolution to form a Citizens Oversight Committee to review bond-related expenditures.			X	Staff held a preliminary meeting with the City's Bond Team on January 16, including the Municipal Advisor and Bond Disclosure Council. Bond Issuance is not expected until late 2026. Staff anticipates establishing the Bond Oversight Committee in Q3/4 of this year.
20	July 1, 2025	PW, PD	Complete the studies/design work needed to prepare the federal grant application for funding to replace the City's Police Shooting Range and engage appropriate outside/partnership agencies, pending release of the notice of funding opportunity.	***X***			***The City was notified that the application was not selected for the grant for the FY25 Cycle. Staff is preparing for a resubmittal for this year's cycle when the submission date is confirmed by the Federal Gov. The City is also tracking other possible sources.***

Goal 2.2: Strengthen the City's Mental Health Response and Community Support Systems

#	When	Who	Objectives	Done	On Target	Revised	Notes
21	September 1, 2025	CA, FD, PD	Present a report to the City Council on the City's efforts to utilize grant funding to hire/procure a mental health clinician to provide targeted response to mental health-related incidents in the City.	X			The report was presented to the City Council on September 2, followed by approval of an agreement with Clear on September 9. On October 7, 2025, the City Council also approved an agreement with HERO to provide consultation services and deploy a weekend pilot team
22	August 1, 2025	CA, FD, PD	Explore partnership with Hermosa Beach that would pool resources to enhance the City's ability to respond to mental health issues.	X			The City of Hermosa Beach has agreed to Partner with the City to improve the City's ability to respond to mental health issues.

Goal 2.3: Further Enhance the City's Approach to Addressing Homelessness

#	When	Who	Objectives	Done	On Target	Revised	Notes

23	March 1, 2026	PW, CA	Complete construction of the pallet shelter expansion project.			X	A bid opening occurred on November 5, 2025 and all bids exceeded budget by a wide margin. Additionally, the apparent low bid was protested. Staff is processing the Protest and will bring a recommendation to City Council once that process has been completed. The City Attorney's Office is also seeking additional funding.
24	March 1, 2026	CS	Explore options to secure funding to support family supportive housing and report back to the City Council.		X		
25	August 1, 2025	CS	Develop a program to implement foster youth vouchers and report back to the City Council.	X			The Housing Authority approved the program agreement with Department of Children and Family Services at the June 17, 2025 Council meeting.

Goal 2.4: Continue to Leverage Technology to Enhance Public Safety, Emergency Response, and Community Resilience

#	When	Who	Objectives	Done	On Target	Revised	Notes
26	March 1, 2026	PD	Update the City's Drone First Responder agreement with Aerodome after the company obtains the FAA certificate waiver for autonomous drone use.		*X*		*The FAA autonomous waiver has been acquired. The Police Department is identifying funding for the agreement's amended cost.*
27	October 31, 2025	IT, PD	Investigate options to modernize the City video camera platform and consolidate existing systems.			***X***	*Staff plans to present the new policy as a receive and file item in* ***March 2026****.*
28	February 1, 2026	FD, IT	Complete additional research on the functionality and costs associated with implementing the Tablet Command Application for the Fire Department.	X			The product assessment is complete and Tablet Command was identified as the most suitable product available at this time.

Goal 3.1: Rehabilitate City Roads and Critical Public Facilities

#	When	Who	Objectives	Done	On Target	Revised	Notes
29	December 31, 2025	PW	Identify the cost and process to inventory the condition of City facilities for future implementation of an asset management system.			X	***Staff is exploring software providers and pricing and expects to procure a software package in FY 2026-27. A Facilities Assessment will need to be funded in FY 2026-27 or beyond.***
30	December 1, 2025	PW, ATCM	Pursue grant funding for energy-related infrastructure improvements.		X		Staff continues to explore opportunities to secure grant funding.
31	March 1, 2026	PW	Research and provide a report to Council on the options to enhance the City's Street rehabilitation program.		X		

Goal 3.2: Expand and Enhance Public Spaces, Amenities, and Programs

#	When	Who	Objectives	Done	On Target	Revised	Notes
32	April 1, 2026	CS, PW	Execute the Wilderness Park Master Plan as funded.		X		***The ribbon cutting for the Lower Pond is scheduled for March 19, 2026. Staff will assess remaining CIP funds and determine next steps for execution of the Master Plan.***
33	October 1, 2025	CS, PW	Complete conceptual design of the Franklin Park playground improvements.			X	***The Franklin Park All-Abilities Playground Working Group held meetings from June through September 2025. Council approved the proposed design on December 2, 2025 and requested additional amenities. Staff has worked with the playground design company to determine if additional amenities are feasible, and what cost impacts these would have. Staff received final design and costs on January 26, 2026, and has begun preparing the contract for Council consideration.***
34	November 1, 2025	CS/PW	Explore options to add signage to Ito Park that draws inspiration from signage found in America's National Parks.	X			Staff received information from Public Amenities Commissioners regarding signage language used by the FDR Presidential Museum and subsequently contacted the Museum for additional information. The City has been granted permission to replicate the historical content for usage on signs. Staff

							acquired quotes from three sign production companies and identified the most appropriate vendor. Language for the Ito Park signage is being finalized with the assistance of the Bringing History to the Community subcommittee of the Public Amenities Commission. Installation is anticipated in late 2025.
35	December 31, 2025	CS	Enhance available programming in the City's Teen Center.	***X***			***Staff presented an update to Council on Teen Center operations and programming on January 6, 2026.***
36	November 1, 2025	CM, ATCM, FS	Provide a report on the status of negotiations with RBUSD regarding shared service and facility agreements.	X			The most recent negotiation update was provided to City Council in October. An additional update is scheduled for closed session on November 18, 2025.
37	January 1, 2026	ATCM	Research and provide Council with a report regarding the next steps to implement a licensing agreement to produce and market City-branded apparel using the updated City logo.	***X***			***Staff presented this item at the February 10, 2026 City Council Meeting and received follow up direction.***
38	October 1, 2025	ATCM	Prepare a report for Council to discuss the process and cost associated with updating the City flag with the new logo and also incorporating the logo on other City-maintained flags and banners.	X			Staff presented the report at the October 7, 2025, City Council meeting.

Goal 3.3: Enhance Alternative Transportation Options

#	When	Who	Objectives	Done	On Target	Revised	Notes
39	January 1, 2026	PW	Award the construction contract to implement the City's Local Travel Network (LTN).	X			The project was advertised for bidding on September 18, 2025 and the bid opening was scheduled for October 16, 2025. No bids were received. Council awarded a change order to an existing contractor on December 9, 2025 to have this work done with expected completion in July 2026.
40	December 1, 2025	PW	Develop a strategy to deploy available funding for bike lane repainting to enhance bicycle safety and provide a report on the status of the City's implementation of the Bicycle Master Plan.	X			An agenda item was presented to the City Council on December 2, 2025
41	December 1, 2025	PW	Provide a report to the City Council on the status of the City's active transportation and micro-mobility projects included in the CIP.	X			An agenda item was presented to the City Council on December 2, 2025
42	February 1, 2026	CS	Analyze BCT routes and determine if there are other route options that could enhance youth ridership.			***X***	***The item will be presented to the City Council for discussion on March 3, 2026.***

Future Goal 3.4: Develop Long-Range Plans to Modernize City Facilities, Including the Public Works Yard and City Hall

Priority Area 4: Customer-Centered Service Delivery

Goal 4.1: Improve Customer Service by Expanding the City's Use of Digital Tools and Online Services

#	When	Who	Objectives	Done	On Target	Revised	Notes
43	January 1, 2026	CC, IT	Work with Departments to determine the records and processes that can be digitized in order to improve operations and meet retention and disposition requirements. Develop a plan to digitize City records, make them more easily accessible to the public, and provide a progress report to the City Council.	***X***			***Staff presented an update to the City Council on February 3, 2026. While the targeted goals for the FY 2025-26 have been met, this is an ongoing project which will continue for several years.***
44	March 1, 2026	CC, IT	Research software options to improve the workflow for public records act requests.		X		Following product selection, staff has struggled to negotiate appropriate contract terms. Staff is continuing to assess other options.
45	February 1, 2026	CC, IT, ATCM	Complete implementation of the new Agenda Management System to streamline internal operations and provide for enhanced agenda forecasting.			***X***	The implementation of the new Agenda Management System is underway with go-live scheduled for ***March/April*** of 2026.
46	September 1, 2025	IT, ATCM	Develop a plan to prioritize and implement new online processes to improve the functionality of the City website and enhance service delivery, including the possible use of AI.	X			A task force has been created to update the City's web site in an effort to provide more accurate results for the chat bot to learn.
47	March 1, 2026	IT, ATCM	Implement the Access Redondo App update and make it easier for community members to submit customer requests.		X		The system is tentatively scheduled to begin user acceptance testing mid-February.

Priority Area 5: Community Stewardship

Goal 5.1: Advance Environmental Sustainability and Climate Resilience

#	When	Who	Objectives	Done	On Target	Revised	
48	November 1, 2025	PW	Inventory the City's tree canopy and present a discussion item to the City Council to determine the best strategies to enhance the tree canopy in the future.	X			Staff presented this item to the Public Works and Sustainability Commission in September 2025 and to the City Council on December 9, 2025. Focus will be on City Trees and providing improved and customer friendly access to educational materials.
49	January 1, 2026	PW	Select and hire a consultant needed to study and update the City's Sewer System Management Plan.	X			A contract amendment was approved on July 15, 2025. The SSMP will be presented to Council by June 2026.
50	February 1, 2026	ATCM, PW	Continue to advance efforts to install additional EV charging stations throughout the City.	X			On October 7, 2025 the City Council approved a CFA Grant Agreement for $250,000 of charging equipment for electrical vehicles. An additional Grant from SCE to provide charging infrastructure at the City's Public Works Yard was approved by the City Council on November 18, 2025. A purchase order for the necessary charging equipment was also approved by City Council.
51	September 1, 2025	WED	Provide a status report on the City's California Coastal Commission LCP Local Assistance Grant Program grant application, including climate resiliency.	X			The report was presented to the City Council on September 16, 2025. On October 7, 2025, the City Council approved a grant agreement with the Coastal Commission, securing $500,000 in grant funding.

Goal 5.2: Preserve and Promote the City's Historic Resources and Neighborhood Character

#	When	Who	Objectives	Done	On Target	Revised	Notes
52	November 1, 2025	CD, CA	Provide a report to the City Council on possible updates to the City's Historic Preservation Ordinance.	X			This item was discussed as part of the January 6, 2026 City Council meeting. Direction to staff was provided by City Council.
53	March 1, 2026	CD	Prepare a contract for completion of a Citywide Historical Resources Survey and present it to the City Council for consideration of approval.	X			The historic resources survey was discussed as part of the January 6, 2026 item. No further action on the survey is scheduled at this time.
54	October 1, 2025	CD	Review and present options to Council related to updating parking regulations in the Riviera Village as part of a larger discussion regarding preferred business uses in the Village.			X	This item is tentatively scheduled for discussion at a City Council meeting in March 2026.

Administrative Report

H.1., **File #** PWSS26-0526 **Meeting Date:** 4/27/2026

TITLE

PUBLIC PARTICIPATION ON NON-AGENDA ITEMS

Administrative Report

J.1., **File #** PWSS26-0528 **Meeting Date:** 4/27/2026

To: **PUBLIC WORKS, SAFETY, AND SUSTAINABILITY COMMISSION**

From: DEPARTMENT OF PUBLIC WORKS

TITLE

DISCUSSION REGARDING THE PROPOSED BUDGET FOR FY 2026-27

EXECUTIVE SUMMARY

Each year the City Manager asks the various commissions to provide input for the upcoming fiscal year Operating Budget prior to the submission to the City Council. This item allows the commissioners to provide any input and feedback to the City Manager and staff on any items related to the budget.

Administrative Report

J.2., **File #** PWSS26-0530 **Meeting Date:** 4/27/2026

To: **PUBLIC WORKS, SAFETY, AND SUSTAINABILITY COMMISSION**

From: DEPARTMENT OF PUBLIC WORKS

TITLE

PROJECT UPDATE AND DISCUSSION OF TRAFFIC SIGNAL AND CURB RAMP REPLACEMENTS ALONG PROSPECT AVENUE

EXECUTIVE SUMMARY

Like other components of public infrastructure, traffic signals must be replaced periodically to address normal wear and tear, meet modern standards, add new technologies, and address contemporary traffic and safety issues. Under the Traffic Signal Communication and Network System - Phase 2 Project, the City received $2,630,000 in Metro Measure M grant funds to design traffic signal improvements along Prospect Avenue and Catalina Avenue. This agenda item pertains to improvements along Prospect Avenue only.

Recent codification of Americans with Disabilities Act (ADA) public right-of-way standards and modern Caltrans traffic signal standards has resulted in substantial changes to how traffic signals and intersections operate, feel and look. Because the City is required to comply with ADA and Caltrans standards, this often results in residents experiencing visually different intersections when upgrades are performed, with varying opinions and questions on why changes were made.

At this time, the project's consultant completed the 60% design for traffic signal improvements along Prospect and wishes to gather feedback from the public and the Public Works, Safety, and Sustainability Commission (PWSSC). Feedback received may be incorporated into the project's design, subject to technical feasibility, potential effects on traffic operations and safety, cost, and compliance with the law.

BACKGROUND

Traffic signals along Prospect Avenue vary in condition depending on when they were built and the local conditions. For example, older signals and those subject to increased coastal weathering effects are in more need of replacement. In general, it was found that all traffic signals along Prospect are due for full replacement. The following signalized intersections along Prospect are included in the design scope: Anita/190th Street, Beryl Street, BCHD/Diamond Street, Del Amo Street, Vincent Street, Emerald Street, Torrance Boulevard, Pearl Street, Camino Real, Knob Hill Avenue, and Palos Verdes Boulevard.

Besides general wear/tear and age that are necessitating traffic signal replacements, here are additional motivating factors for this project:

- Bringing crosswalk times and other signal timing parameters to current standards
- Current standards requiring precise positioning between crosswalk push buttons and curb

ramps
- Current standard curb ramps and pedestrian signals at intersections
- Updated Caltrans standards for traffic signal poles
- New battery backup, video detection, and bicycle detection systems for traffic signals
- Capabilities to monitor traffic signals remotely from City Hall in the future
- Addressing resident-driven complaints at particular intersections
- Ability to shorten crosswalk distances, add left-turn arrows, and add leading pedestrian intervals (LPI)

DISCUSSION

The *Prospect Avenue Proposed Improvements Technical Memorandum* goes over in detail the proposed signal improvements along Prospect (**Attachment 1**). City staff is nearly finished providing comments to the 60% plans (**Attachment 2**). Highly visible proposed changes that staff would like the PWSSC and public to be aware of include:

- Current Caltrans standards for traffic signal poles with mast arms require **much larger pole diameters and foundations** which can affect aesthetics. The City is not positioned to deviate from Caltrans standards for risk management reasons.
- Current ADA standards for crosswalks generally require one curb ramp per crosswalk. This means **two ramps per corner** unless technically infeasible.
- **Curb extensions wherever possible** at all signalized intersections to accommodate current standard signal poles and dual crosswalk ramps. This may result in the removal of defacto right-turn lanes, however, staff recommends building curb extensions to improve safety, decrease turning speeds, shorten crosswalk times/distances, improve pedestrian visibility, improve standards compliance, and decrease the chances for utility conflicts. Shorter crosswalk times would also help signals cycle faster to other approaches, reducing delay for drivers. Additionally, curb extensions may be the only feasible way to comply with State and Federal engineering standards.
- **Flashing Yellow Arrows (FYA)** left-turns at the Beryl, Vincent, Emerald, and Knob Hill intersections to allow for time-of-day based left-turn arrow only operations, such as during school peak periods.
- **FYA, split phasing removal, and eastbound approach change** at Del Amo to address resident-driven complaints about long southbound left-turn queues and inefficient signal phasing. Staff also proposes a large bulbout and changing eastbound Del Amo to provide a shared through-right curb lane. This will improve crosswalk safety near Redondo Union High School and repurpose lane space for the heavier eastbound through traffic movement.
- **Leading Pedestrian Interval (LPI)** to provide a crosswalk head start for all major street crossings in accordance with City Council policy.
- **Improved bicycle detection** at all intersections, including minor street detection feedback devices.

The proposed traffic signal changes and curb ramps will not preclude the future ability to install bicycle lanes along Prospect if the City Council chooses to pursue them. Similarly, the traffic signal poles will be sized for potential left-turn lanes and signals for Camino Real at Prospect and for Prospect at Palos Verdes Boulevard, to provide for deferred decisions at these intersections, since left-turn lanes are currently not provided on those approaches.

Staff welcomes review and feedback of the proposed changes and plans. Staff will consider suggested improvements from the public and PWSSC in conjunction with technical engineering and regulatory factors that go into signal design and curb ramp projects.

Once plans are completed, they will be brought to the City Council for final approval. Although funding is not yet available for construction, the City plans to request construction funding through Metro Measure M.

COORDINATION

Coordination of this report took place within the Public Works Department.

ATTACHMENTS

- Prospect Avenue Proposed Improvements Technical Memorandum
- 60% Plans for Prospect Avenue Traffic Signals

TECHNICAL MEMORANDUM

Date: March 27, 2026

To: Ryan Liu, PE (City of Redondo Beach)
Sean Chotikasatien, PE (City of Redondo Beach)

Author: Renee Reavis, TE (BKF Engineers)
Steven Matthew Dauterman, PE, TE, PTOE, RSP_1 (BKF Engineers)

Subject: **Prospect Avenue Proposed Improvements**

INTRODUCTION

This memorandum summarizes recommendations for physical improvements and signal modifications for 11 signalized intersections on Prospect Avenue in the City of Redondo Beach (City), California. The City proposes the following improvements:

- Curb extensions (bulb outs) wherever feasible;
- Improved curb ramps at corners;
- New signal equipment that meets current state standards and provides the City with greater flexibility to adjust signal timings;
- Revised signal timings that meet updated standards and improve conditions for all users;
- Bike-friendly infrastructure;
- Redundant detection infrastructure; and
- Signal communications equipment allowing the City the ability to quickly monitor traffic operations, identify malfunctions, and tweak timings.

This memorandum serves as a supplement to BKF's Existing Conditions Report submitted to the City on October 10, 2025, which primarily analyzed existing signal operations and minimum timing parameter modifications. Since that time, BKF has worked closely with City staff to analyze several additional alternatives for intersection modifications on both Prospect Avenue and Catalina Avenue. This memorandum focuses on changes to Prospect Avenue. **Figure 1** shows the locations of Prospect Avenue study intersections.

Study Intersection 9: Prospect Avenue & Anita Street
Study Intersection 10: Prospect Avenue & Beryl Street
Study Intersection 11: Prospect Avenue & Beach Cities Health District
Study Intersection 12: Prospect Avenue & Diamond Street
Study Intersection 13: Prospect Avenue & Del Amo Boulevard
Study Intersection 14: Prospect Avenue & Vincent Street
Study Intersection 15: Prospect Avenue & Emerald Street
Study Intersection 16: Prospect Avenue & Torrance Boulevard
Study Intersection 17: Prospect Avenue & Pearl Street
Study Intersection 18: Prospect Avenue & Camino Real
Study Intersection 19: Prospect Avenue & Knob Hill Avenue
Study Intersection 20: Prospect Avenue & Palos Verdes Boulevard

Figure 1: Study Area

METHODOLOGY

Physical Improvements and Left Turns

At locations with proposed curb extensions or where left turn modifications were considered, AutoTURN software was utilized to visualize vehicle turning paths and ensure vehicles can physically make left or right turns without colliding with the proposed curb line or opposing left turning vehicles. In general, an AASHTO design vehicle of SU-30 was used. At locations where an existing bus route involves left or right turns through an intersection, a larger BUS-40 design vehicle was used to analyze the corresponding turning movements. The use of these truck-turn types was coordinated with City staff and documented in the project's Basis of Design report.

Operations Analysis

At all intersections, traffic operations were reviewed for Level of Service (LOS), average vehicle delay, and expected 95th-percentile queueing for all movement groups, to ensure that recommended changes would not adversely affect key movements beyond acceptable levels. Although overall intersection or certain movement group operations may exhibit increased delays by the proposed changes, safety concerns and other operational considerations (such as reducing queue spillbacks, improving left-turn responsiveness, or ensuring pedestrian walk and yellow time intervals comply with current standards) typically outweigh those impacts.

Vehicle LOS is a qualitative description of an intersection's operational efficiency from the perspective of the average driver, ranking operations from LOS A (highly favorable) to LOS F (highly unfavorable). Under the City of Redondo Beach's General Plan, Policy P9 in the Circulation Element specifies that the City should maintain or achieve LOS D at City intersections (overall) where feasible.

Intersection and corridor operations were analyzed using Synchro/Simtraffic 12 software. Simtraffic was utilized to ensure that corridor progression was not negatively impacted by proposed operational changes.

PHYSICAL IMPROVEMENTS

Curb extensions are proposed for one or more corners at all signalized intersections except for Prospect Avenue & Beach Cities Health District. Curb extensions provide three key benefits:

- The tighter corner radius encourages turning vehicles to turn more slowly;
- They place pedestrians and cyclists farther into a driver's field of vision; and
- They reduce the pedestrian crossing distance from corner to corner and thus reduce the time spent within the roadway.

Slower turning speeds and improved pedestrian/cyclist visibility have been shown to reduce both the frequency and severity of vehicle-pedestrian collisions at intersections.[1] Additionally, curb extensions are required in many locations in order to provide additional space for infrastructure such as current standard

[1] Mead, J., Zegeer, C., Bushell, M. "Evaluation of Pedestrian Related Roadway Measures: A Summary of Available Research". Federal Highway Administration. DTFH61-11-H-00024. (2014)
https://www.pedbikeinfo.org/downloads/PedestrianLitReview_April2014.pdf

traffic signal equipment, and the improved curb ramps and wider pedestrian paths required by the newest Public Right-of-Way Access Guidelines (PROWAG) and Americans with Disabilities Act (ADA). As discussed further below, curb extensions also reduce pedestrian crossing times at traffic signals, allowing for faster cycles that benefit both pedestrians and drivers. For these reasons, curb extensions have been recommended wherever physically feasible and designed to extend as far into the roadway as possible, within various design constraints such as approach lane geometry, intersection skew, truck turning operations, and impacts on utilities at each corner.

SIGNAL MODIFICATIONS

After studying multiple scenarios, a final preferred alternative for signal modifications on Prospect Avenue was identified and vetted with City staff, referred to as Alternative 9 Version 3 in communications. This scenario accounted for signal modifications to intersections at Beryl Street, Del Amo Boulevard, Vincent Street, Emerald Street, and Knob Hill Avenue.[2] Proposed conditions for people walking and cycling generally improved, whereas overall commuter throughput for drivers was comparable to existing conditions during the weekday rush hours with some exceptions. The proposed conditions also generally improved mainline left-turn movements from Prospect Avenue and from side-streets. The tradeoffs align with overall operational goals to improve overall responsiveness for all users and to improve pedestrian and cyclist safety.

To achieve the above results, several modifications were implemented:

- **Signal Timing Revisions**: As described in the Existing Conditions Report, many key timing parameters (e.g., initial green, yellow, all-red, flash don't walk) were outdated and needed to be updated to meet current industry standards (note, this would have to occur regardless of this project and does account for some of the observed degradation in vehicle operations). Other timing parameters were modified as needed to optimize signal operations after making other changes such as to left turns or lane geometry.
- **Protected Left Turns**: At most locations with existing protected left turn phasing, no change was recommended. In some cases, split phasing or permitted left turn phasing was converted to provide protected left turn phasing. This may either be concurrent (typical operation) or lead-lag (one left goes, then through movements, then the other left goes).
- **Flashing Yellow Arrows (FYA)**: Converting existing left turn operations to utilize a protected-permitted phasing with flashing yellow arrows. Under this operation, the left turn lanes may receive a green arrow (depending on detector settings) for a short protected left turn period, followed by a flashing yellow arrow indicating left turns are permitted but must yield to oncoming through traffic. This operation utilizes special signal heads directing drivers when to yield. In addition, the permitted FYA period can be omitted during certain hours to remove potential conflicts with permitted movements, such as near schools during drop off and pickup times.

[2] It should be noted that future changes to the intersection at Camino Real (restriping the eastbound approach and implementing flashing yellow arrows) were analyzed in Alternative 9 Version 3, but not implemented in the proposed design, and so are excluded from the following descriptions. Changes to this intersection's signal operation are planned as a part of a separate future City project.

In addition to the notable changes listed below, one or more key timing parameters were updated at all intersections, most frequently the yellow and all-red parameters (to allow adequate vehicle clearance time) and flash don't walk parameter (to allow adequate pedestrian clearance time) to meet updated timing standards. This results in slight degradation in overall level of service and slight increase in queues, partly contributing to the slight observed degradation in vehicle operations described below. These changes are described in detail in the Existing Conditions Report. A summary table showing LOS and queues for retimed conditions (no other changes) is included for comparison in **Appendix A**.

Although the proposed curb extensions would reduce the amount of pedestrian clearance time (flash don't walk) required at all intersections, this change was not analyzed as part of this alternative, as curb extension design and the resulting crossing distances had not yet been finalized. In general, reduced clearance times would allow for shorter cycle times and slightly improved operations compared to those described below and included in **Appendix A**. The City may also choose to disengage the FYA operation at school intersections during drop off and pickup periods to enhance pedestrian safety, as noted below, but these operational variations were not analyzed. They can be expected to slightly worsen the queuing operations in affected left turn lanes but to have minimal effects on other movements.

Notable changes to timing, phasing, or lane geometry by intersection are discussed below along with their operation impact:

- **Intersection 10 (Beryl Street)**: Added FYA to existing protected/permitted left turns (all directions). This location features school crosswalks where FYA operation may be disengaged during school drop off and pickup periods. Proposed curb extensions would improve both pedestrian safety and operations.
    - Beryl Street experiences a slight increase in delay and queues with the addition of flashing yellow arrows, while remaining LOS D during peak hours and still meeting City standards.
- **Intersection 13 (Del Amo Boulevard)**: Revised phasing by changing east/west control from split to protected with a lagging westbound left turn phase and changing north/south control to FYA. Revised eastbound lane designations to left, through, through/right to increase throughput and use saved green time for the westbound approach. Adjusted pedestrian walk timing, adjusted splits, and increased overall cycle duration. Addressing northbound and southbound left turn spillbacks by removing split phasing addresses a community concern. This location features school crosswalks where FYA operation may be disengaged during school drop off and pickup periods. Proposed curb extensions would improve both pedestrian safety and operations.
    - With proposed changes, Del Amo Boulevard would operate at LOS D in the AM peak hour and LOS C in the PM peak hour, still meeting City standards. Delays increased compared to existing conditions, but letter LOS categories are unchanged. Left turn queues at this intersection would spill back in the westbound left (AM & PM) and southbound left (PM) directions, but these turn pockets can theoretically be restriped to accommodate the full queues. Northbound through/right lane would continue to spill back to the upstream intersection but by less than under existing conditions. The southbound left turn spillback (AM) and northbound left turn spillback (AM) would both be eliminated. Notably, LOS and

queues of northbound and southbound left turn movements would be improved from existing conditions.

- **Intersection 14 (Vincent Street)**: Changed from permitted operation to FYA for the northbound left turn movement and reduced southbound approach timing parameters. This modification addresses a community concern about left turns. This location features school crosswalks where FYA operation may be disengaged during school drop off and pickup periods. Proposed curb extensions would improve both pedestrian safety and operations.
    - Vincent Street would experience a slight increase in delay and queues with the addition of FYA, worsening in LOS by up to one letter category from LOS B/A to LOS C/B (in the AM and PM peak hours, respectively). This still meets City LOS standards.
- **Intersection 15 (Emerald Street)**: Changed from permitted operation to FYA for northbound left/southbound left turn movement. This location features school crosswalks where FYA operation may be disengaged during school drop off and pickup periods. Proposed curb extensions would improve both pedestrian safety and operations.
    - Emerald Street would experience a slight increase in delay and queues with the addition of FYA, worsening in LOS by up to one letter category from LOS A to LOS B (in both peak hours). This still meets City LOS standards.
- **Intersection 19 (Knob Hill Avenue)**: Added FYA on north/south approaches. This location features school crosswalks where FYA operation may be disengaged during school drop off and pickup periods. Proposed curb extensions would improve both pedestrian safety and operations.
    - By converting the north/south approaches to FYA, Knob Hill Avenue would worsen slightly in both delay and queues (due partly to both increased delay and queues on side streets and northbound/southbound through movements), while remaining at LOS B. It should be noted that with FYA, the northbound and southbound left turn delay would be decreased relative to the retimed conditions described in the Existing Conditions Report.

Operational summary tables for Existing Conditions, Retimed Conditions (revised timing parameters but no other changes), and Proposed Conditions are attached in **Appendix A**. Level of service and queuing worksheets for Existing Conditions are included in **Appendix B**, and level of service and queuing worksheets for Proposed Conditions are included in **Appendix C**.

TABLE OF APPENDICES

A. Level of Service and Queuing Summary Tables
B. Level of Service and Queuing Worksheets – Existing Conditions
C. Level of Service and Queuing Worksheets – Proposed Conditions

A. Level of Service and Queuing Summary Tables

MOE Table v1 - Prospect

No.	Intersection (Movement)	Storage Length (ft.) [1]	AM Peak Hour LOS	AM Peak Hour Delay (sec/veh)	AM Peak Hour 95th % Queue (ft.) [2] [3]	PM Peak Hour LOS	PM Peak Hour Delay (sec/veh)	PM Peak Hour 95th % Queue (ft.) [2] [3]
9	**S Prospect Ave (N/S) & Anita St (E/W)**							
	Overall Intersection - Signalized		**C**	**29.5**		**C**	**28.2**	
	Eastbound Approach		***C***	***24.4***		***C***	***26.7***	
	Eastbound L	135	D	51.2	41	D	50.9	78
	Eastbound TR	660	C	23.4	240	C	25.5	404
	Westbound Approach		***C***	***23.3***		***C***	***23.8***	
	Westbound L	125	D	41.6	200	D	42.5	162
	Westbound TR	450	B	19.4	332	C	21.0	333
	Northbound Approach		***D***	***35.1***		***C***	***29.8***	
	Northbound L	235	D	45.6	#331	D	39.2	#321
	Northbound T	990	C	33.0	431	C	26.6	410
	Northbound R	985	C	25.6	163	C	21.9	115
	Southbound Approach		***D***	***37.6***		***C***	***34.7***	
	Southbound L	100	D	46.6	101	D	45.5	114
	Southbound TR	165	D	36.3	187	C	33.5	302
10	**S Prospect Ave (N/S) & Beryl St (E/W)**							
	Overall Intersection - Signalized		**D**	**35.2**		**C**	**20.7**	
	Eastbound Approach		***C***	***33.4***		***C***	***25.3***	
	Eastbound L	140	C	25.6	47	C	20.1	29
	Eastbound T	290	D	35.5	257	C	26.3	223
	Eastbound R	165	C	27.6	0	C	21.0	0
	Westbound Approach		***C***	***24.4***		***B***	***16.5***	
	Westbound L	190	C	27.6	#420	B	16.4	175
	Westbound T	500	B	19.7	249	B	16.8	164
	Westbound R	100	B	15.9	0	B	14.5	0
	Northbound Approach		***D***	***47.5***		***C***	***21.5***	
	Northbound L	145	C	20.0	64	B	15.2	64
	Northbound TR	945	D	50.0	#629	C	22.2	#399
	Southbound Approach		***C***	***27.8***		***C***	***20.9***	
	Southbound L	215	C	23.7	18	B	16.0	40
	Southbound TR	990	C	28.0	304	C	21.3	309
11	**S Prospect Ave (N/S) & BCHD (E/W)**							
	Overall Intersection - Signalized		**C**	**24.1**		**C**	**21.8**	
	Eastbound Approach		***E***	***61.1***		***D***	***51.4***	
	Eastbound LTR	25	E	61.1	0	D	51.4	0
	Westbound Approach		***E***	***61.5***		***E***	***56.6***	
	Westbound LTR	110	E	61.5	0	E	56.6	168
	Northbound Approach		***B***	***10.1***		***A***	***3.6***	
	Northbound L	95	D	46.2	m2	D	44.5	m1
	Northbound TR	225	B	10.0	211	A	3.6	28
	Southbound Approach		***D***	***38.7***		***C***	***32.5***	
	Southbound L	300	F	83.1	240	E	80.0	114
	Southbound TR	970	C	32.4	592	C	29.6	533
12	**S Prospect Ave (N/S) & Diamond St (E/W)**							
	Overall Intersection - Signalized		**C**	**32.5**		**B**	**18.9**	
	Eastbound Approach		***D***	***52.8***		***D***	***51.2***	
	Eastbound L	95	D	53.0	194	D	52.4	105
	Eastbound TR	295	D	52.5	168	D	49.9	0
	Westbound Approach		***D***	***47.6***		***D***	***49.4***	
	Westbound L	55	D	47.6	7	D	49.4	7
	Westbound TR	205	D	47.6	0	D	49.4	10
	Northbound Approach		***D***	***53.0***		***C***	***34.6***	
	Northbound L	140	F	85.1	115	F	92.9	46
	Northbound TR	1130	D	51.6	#976	C	33.5	515
	Southbound Approach		***A***	***0.9***		***A***	***3.5***	
	Southbound L	95	D	54.1	m8	F	109.1	m17
	Southbound TR	220	A	0.7	21	A	2.8	31
13	**S Prospect Ave (N/S) & Del Amo St (E/W)**							
	Overall Intersection - Signalized		**D**	**36.4**		**C**	**25.3**	
	Eastbound Approach		***D***	***37.9***		***D***	***39.5***	
	Eastbound L	85	C	34.0	60	C	33.4	34
	Eastbound T	250	D	39.6	207	D	40.5	193
	Eastbound R	140	C	34.2	73	C	33.1	47
	Westbound Approach		***D***	***36.4***		***C***	***34.3***	
	Westbound L	110	D	40.0	343	D	37.6	298
	Westbound T	695	C	33.7	278	C	29.7	153
	Westbound R	700	C	28.4	65	C	27.3	56
	Northbound Approach		***D***	***40.5***		***B***	***19.7***	
	Northbound L	130	C	32.6	#236	C	26.7	#125
	Northbound TR	505	D	43.5	#811	B	19.1	386
	Southbound Approach		***C***	***28.7***		***C***	***23.1***	
	Southbound L	135	F	101.8	#208	D	48.1	#328
	Southbound TR	1135	B	19.5	322	B	17.6	346
14	**S Prospect Ave (N/S) & Vincent St (E/W)**							
	Overall Intersection - Signalized		**B**	**17.1**		**A**	**6.7**	
	Eastbound Approach		***C***	***29.1***		***C***	***20.6***	
	Eastbound LTR	590	C	29.1	242	C	20.6	88
	Westbound Approach			***0.0***			***0.0***	
	Westbound LTR	25		0.0			0.0	
	Northbound Approach		***B***	***14.4***		***A***	***4.9***	
	Northbound L	145	C	23.3	47	A	9.3	16

	Northbound TR	285	B	14.0	310	A	4.8	148
	Southbound Approach		***B***	***15.8***		***A***	***6.5***	
	Southbound LTR	500	B	16.0	303	A	6.5	228
15	**S Prospect Ave (N/S) & Emerald St (E/W)**							
	Overall Intersection - Signalized		**A**	**8.2**		**A**	**6.5**	
	Eastbound Approach		***C***	***20.4***		***B***	***18.9***	
	Eastbound LTR	300	C	20.4	116	B	18.9	71
	Westbound Approach		***B***	***17.9***		***B***	***17.6***	
	Westbound LTR	255	B	17.9	51	B	17.6	29
	Northbound Approach		***A***	***7.1***		***A***	***5.2***	
	Northbound L	105	A	9.3	67	A	8.1	29
	Northbound TR	375	A	7.0	248	A	5.1	212
	Southbound Approach		***A***	***6.4***		***A***	***6.1***	
	Southbound L	145	B	10.1	47	A	5.9	13
	Southbound TR	1125	A	6.2	185	A	6.2	304
16	**S Prospect Ave (N/S) & Torrance Blvd (E/W)**							
	Overall Intersection - Signalized		**E**	**55.9**		**D**	**49.6**	
	Eastbound Approach		***D***	***36.3***		***D***	***37.5***	
	Eastbound L	225	E	63.8	#152	E	71.5	#228
	Eastbound T	375	C	30.4	205	C	30.3	285
	Eastbound R	115	C	25.3	0	C	24.0	0
	Westbound Approach		***D***	***37.4***		***D***	***38.7***	
	Westbound L	215	E	73.5	#191	F	81.1	#272
	Westbound T	915	C	29.4	226	C	28.0	252
	Westbound R	175	C	24.9	44	C	23.9	55
	Northbound Approach		***E***	***76.5***		***D***	***52.6***	
	Northbound L	155	E	63.7	75	E	64.6	77
	Northbound T	580	F	81.0	#468	D	52.1	301
	Northbound R	190	D	36.5	98	D	37.9	34
	Southbound Approach		***E***	***61.9***		***E***	***65.4***	
	Southbound L	185	F	142.8	#339	F	129.0	#355
	Southbound TR	590	D	37.5	342	D	49.0	#473
17	**S Prospect Ave (N/S) & Pearl St (E/W)**							
	Overall Intersection - Signalized		**A**	**3.3**		**A**	**2.9**	
	Eastbound Approach		***C***	***20.0***		***B***	***20.0***	
	Eastbound LTR	315	C	20.0	38	B	20.0	32
	Westbound Approach		***B***	***19.7***		***B***	***19.6***	
	Westbound LTR	110	B	19.7	30	B	19.6	22
	Northbound Approach		***A***	***2.8***		***A***	***2.4***	
	Northbound L	115	A	3.0	15	A	3.2	20
	Northbound TR	605	A	2.8	183	A	2.4	132
	Southbound Approach		***A***	***2.5***		***A***	***2.5***	
	Southbound L	90	A	3.6	14	A	2.9	17
	Southbound TR	610	A	2.5	134	A	2.5	154
18	**S Prospect Ave (N/S) & S Camino Real (E/W)**							
	Overall Intersection - Signalized		**D**	**41.1**		**C**	**34.3**	
	Eastbound Approach		***D***	***48.2***		***D***	***40.6***	
	Eastbound LT	1330	D	47.9	212	D	40.5	218
	Eastbound TR	1335	D	48.4	212	D	40.7	218
	Westbound Approach		***D***	***44.8***		***D***	***36.2***	
	Westbound LT	770	D	43.9	354	D	35.7	#412
	Westbound TR	780	D	45.9	354	D	36.8	#412
	Northbound Approach		***D***	***42.1***		***D***	***35.6***	
	Northbound L	130	E	59.5	106	E	58.3	73
	Northbound T	595	D	40.6	410	C	34.1	322
	Southbound Approach		***C***	***34.3***		***C***	***29.1***	
	Southbound L	165	D	51.1	#347	D	42.1	#361
	Southbound T	310	C	27.4	309	C	23.7	301
19	**S Prospect Ave (N/S) & Knob Hill Ave (E/W)**							
	Overall Intersection - Signalized		**A**	**9.9**		**B**	**10.7**	
	Eastbound Approach		***C***	***21.6***		***C***	***23.3***	
	Eastbound LTR	660	C	21.6	130	C	23.3	175
	Westbound Approach		***B***	***17.6***		***B***	***17.5***	
	Westbound LTR	690	B	17.6	14	B	17.5	14
	Northbound Approach		***A***	***8.0***		***A***	***7.7***	
	Northbound L	80	A	9.8	34	B	10.5	46
	Northbound TR	315	A	7.9	129	A	7.3	95
	Southbound Approach		***A***	***7.7***		***A***	***7.9***	
	Southbound L	110	A	9.4	13	A	8.2	8
	Southbound TR	620	A	7.8	104	A	7.9	124
20	**S Prospect Ave (N/S) & Palos Verdes Blvd (E/W)**							
	Overall Intersection - Signalized		**B**	**19.7**		**B**	**17.7**	
	Eastbound Approach		***B***	***17.6***		***B***	***14.9***	
	Eastbound L	215	C	26.5	195	C	23.3	186
	Eastbound TR	475	B	13.8	158	B	11.4	150
	Westbound Approach		***C***	***21.1***		***B***	***18.0***	
	Westbound L	280	C	31.0	102	C	28.6	94
	Westbound TR	785	B	19.6	205	B	16.5	197
	Northbound Approach		***C***	***20.8***		***C***	***20.1***	
	Northbound LT	265	B	19.9	161	B	19.1	127
	Northbound TR	260	C	22.0	161	C	21.5	127
	Southbound Approach		***B***	***19.7***		***C***	***20.1***	
	Southbound LT	310	B	19.1	134	B	19.3	122
	Southbound TR	310	C	20.5	134	C	21.1	122

NOTES:

[1] Effective storage length is based on the storage length plus one-half of the taper length.

[2] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.

[3] *m: 95th percentile volume and queues (reported from Synchro) are metered by upstream signal.*

MOE Table v1 - Prospect Retimed

No.	Intersection (Movement)	Storage Length (ft.) [1]	AM Peak Hour LOS	AM Peak Hour Delay (sec/veh)	AM Peak Hour 95th % Queue (ft.) [2] [3]	PM Peak Hour LOS	PM Peak Hour Delay (sec/veh)	PM Peak Hour 95th % Queue (ft.) [2] [3]
9	**S Prospect Ave (N/S) & Anita St (E/W)**							
	Overall Intersection - Signalized		**C**	**33.3**		**C**	**31.7**	
	Eastbound Approach		***C***	***27.7***		***C***	***30.4***	
	Eastbound L	135	D	49.9	42	D	47.8	78
	Eastbound TR	660	C	26.9	245	C	29.5	416
	Westbound Approach		***C***	***26.7***		***C***	***27.5***	
	Westbound L	125	D	44.6	#215	D	45.3	165
	Westbound TR	450	C	22.8	347	C	24.9	345
	Northbound Approach		***D***	***40.0***		***C***	***33.3***	
	Northbound L	235	D	54.5	#364	D	45.6	#345
	Northbound T	990	D	36.8	455	C	29.0	424
	Northbound R	985	C	27.8	172	C	23.8	119
	Southbound Approach		***D***	***40.5***		***D***	***37.6***	
	Southbound L	100	D	49.5	104	D	48.3	115
	Southbound TR	165	D	39.2	192	D	36.4	306
10	**S Prospect Ave (N/S) & Beryl St (E/W)**							
	Overall Intersection - Signalized		**D**	**44.5**		**C**	**24.6**	
	Eastbound Approach		***D***	***35.5***		***C***	***28.6***	
	Eastbound L	140	C	27.2	50	C	22.1	30
	Eastbound T	290	D	37.8	262	C	29.7	231
	Eastbound R	165	C	29.5	0	C	23.9	0
	Westbound Approach		***C***	***27.7***		***B***	***19.3***	
	Westbound L	190	C	32.0	#459	B	18.9	184
	Westbound T	500	C	21.3	260	B	19.9	170
	Westbound R	100	B	17.1	0	B	17.2	0
	Northbound Approach		***E***	***65.9***		***C***	***26.6***	
	Northbound L	145	C	22.9	66	B	17.3	68
	Northbound TR	945	E	69.6	#647	C	27.7	#432
	Southbound Approach		***C***	***32.0***		***C***	***24.3***	
	Southbound L	215	C	26.4	18	B	18.0	42
	Southbound TR	990	C	32.4	312	C	24.8	#346
11	**S Prospect Ave (N/S) & BCHD (E/W)**							
	Overall Intersection - Signalized		**C**	**25.9**		**C**	**22.7**	
	Eastbound Approach		***E***	***63.0***		***D***	***53.7***	
	Eastbound LTR	25	E	63.0	0	D	53.7	0
	Westbound Approach		***E***	***63.4***		***E***	***57.7***	
	Westbound LTR	110	E	63.4	0	E	57.7	142
	Northbound Approach		***B***	***11.3***		***A***	***3.8***	
	Northbound L	95	D	49.1	m2	D	44.4	m1
	Northbound TR	225	B	11.2	237	A	3.8	29
	Southbound Approach		***D***	***41.2***		***C***	***34.1***	
	Southbound L	300	F	87.2	244	F	82.6	117
	Southbound TR	970	C	34.6	608	C	31.1	551
12	**S Prospect Ave (N/S) & Diamond St (E/W)**							
	Overall Intersection - Signalized		**C**	**34.8**		**B**	**19.8**	
	Eastbound Approach		***E***	***55.0***		***D***	***53.1***	
	Eastbound L	95	E	55.3	198	D	54.4	108
	Eastbound TR	295	D	54.8	172	D	51.8	0
	Westbound Approach		***D***	***49.6***		***D***	***51.3***	
	Westbound L	55	D	49.6	7	D	51.3	6
	Westbound TR	205	D	49.6	0	D	51.3	10
	Northbound Approach		***E***	***56.9***		***D***	***35.9***	
	Northbound L	140	F	90.4	117	F	94.5	47
	Northbound TR	1130	E	55.4	#1006	C	34.8	531
	Southbound Approach		***A***	***0.9***		***A***	***3.9***	
	Southbound L	95	D	54.3	m8	F	108.8	m17
	Southbound TR	220	A	0.7	0	A	3.3	33
13	**S Prospect Ave (N/S) & Del Amo St (E/W)**							
	Overall Intersection - Signalized		**D**	**38.5**		**C**	**26.4**	
	Eastbound Approach		***D***	***38.5***		***D***	***40.2***	
	Eastbound L	85	C	34.6	61	C	33.9	34
	Eastbound T	250	D	40.3	208	D	41.2	195
	Eastbound R	140	C	34.7	77	C	33.7	47
	Westbound Approach		***D***	***37.4***		***D***	***35.2***	
	Westbound L	110	D	41.3	347	D	38.9	302
	Westbound T	695	C	34.3	282	C	30.2	155
	Westbound R	700	C	28.9	67	C	27.8	57
	Northbound Approach		***D***	***43.2***		***C***	***20.5***	
	Northbound L	130	C	34.0	#240	C	27.8	#128
	Northbound TR	505	D	46.6	#819	B	20.0	392
	Southbound Approach		***C***	***31.1***		***C***	***24.5***	
	Southbound L	135	F	117.7	#210	D	51.9	#334
	Southbound TR	1135	C	20.2	325	B	18.4	352
14	**S Prospect Ave (N/S) & Vincent St (E/W)**							
	Overall Intersection - Signalized		**B**	**17.5**		**A**	**7.0**	
	Eastbound Approach		***C***	***30.0***		***C***	***21.0***	
	Eastbound LTR	590	C	30.0	245	C	21.0	89
	Westbound Approach			***0.0***			***0.0***	
	Westbound LTR	25		0.0			0.0	

	Northbound Approach		***B***	***14.7***		***A***	***5.2***		
	Northbound L	145	C	23.9	48	A	9.7	17	
	Northbound TR	285	B	14.3	314	A	5.0	152	
	Southbound Approach		***B***	***16.2***		***A***	***6.8***		
	Southbound LTR	500	B	16.4	306	A	6.8	234	
15	**S Prospect Ave (N/S) & Emerald St (E/W)**								
	Overall Intersection - Signalized		**A**	**8.8**		**A**	**7.0**		
	Eastbound Approach		***C***	***21.0***		***B***	***19.5***		
	Eastbound LTR	300	C	21.0	118	B	19.5	72	
	Westbound Approach		***B***	***18.4***		***B***	***18.1***		
	Westbound LTR	255	B	18.4	52	B	18.1	29	
	Northbound Approach		***A***	***7.7***		***A***	***5.7***		
	Northbound L	105	B	10.1	69	A	9.0	29	
	Northbound TR	375	A	7.6	255	A	5.6	217	
	Southbound Approach		***A***	***7.0***		***A***	***6.7***		
	Southbound L	145	B	11.0	49	A	6.5	13	
	Southbound TR	1125	A	6.7	190	A	6.8	313	
16	**S Prospect Ave (N/S) & Torrance Blvd (E/W)**								
	Overall Intersection - Signalized		**E**	**60.8**		**E**	**55.7**		
	Eastbound Approach		***D***	***38.6***		***D***	***39.0***		
	Eastbound L	225	E	69.2	#167	E	76.6	#242	
	Eastbound T	375	C	32.0	207	C	31.0	287	
	Eastbound R	115	C	26.6	0	C	24.6	0	
	Westbound Approach		***D***	***39.8***		***D***	***44.6***		
	Westbound L	215	E	79.1	#208	F	103.5	#288	
	Westbound T	915	C	31.1	227	C	29.6	254	
	Westbound R	175	C	26.2	44	C	25.2	55	
	Northbound Approach		***E***	***76.5***		***D***	***52.6***		
	Northbound L	155	E	63.7	75	E	64.6	77	
	Northbound T	580	F	81.0	#468	D	52.1	301	
	Northbound R	190	D	36.5	73	D	37.9	14	
	Southbound Approach		***E***	***75.4***		***E***	***79.0***		
	Southbound L	185	F	194.4	#356	F	176.6	#372	
	Southbound TR	590	D	39.4	#351	D	53.8	#491	
17	**S Prospect Ave (N/S) & Pearl St (E/W)**								
	Overall Intersection - Signalized		**A**	**3.5**		**A**	**3.1**		
	Eastbound Approach		***C***	***20.3***		***C***	***20.2***		
	Eastbound LTR	315	C	20.3	37	C	20.2	32	
	Westbound Approach		***B***	***20.0***		***B***	***19.8***		
	Westbound LTR	110	B	20.0	30	B	19.8	22	
	Northbound Approach		***A***	***3.0***		***A***	***2.6***		
	Northbound L	115	A	3.3	17	A	3.4	23	
	Northbound TR	605	A	3.0	206	A	2.6	149	
	Southbound Approach		***A***	***2.7***		***A***	***2.7***		
	Southbound L	90	A	3.8	16	A	3.1	19	
	Southbound TR	610	A	2.7	151	A	2.7	174	
18	**S Prospect Ave (N/S) & S Camino Real (E/W)**								
	Overall Intersection - Signalized		**D**	**42.8**		**D**	**35.6**		
	Eastbound Approach		***D***	***49.6***		***D***	***42.1***		
	Eastbound LT	1330	D	49.4	212	D	42.0	218	
	Eastbound TR	1335	D	49.9	212	D	42.2	218	
	Westbound Approach		***D***	***46.7***		***D***	***37.7***		
	Westbound LT	770	D	45.7	354	D	37.2	#412	
	Westbound TR	780	D	47.8	354	D	38.3	#412	
	Northbound Approach		***D***	***43.7***		***D***	***36.4***		
	Northbound L	130	E	60.9	106	D	50.3	73	
	Northbound T	595	D	42.2	410	D	35.5	322	
	Southbound Approach		***D***	***36.3***		***C***	***30.7***		
	Southbound L	165	E	55.6	#362	D	43.5	#376	
	Southbound T	310	C	28.5	314	C	25.3	305	
19	**S Prospect Ave (N/S) & Knob Hill Ave (E/W)**								
	Overall Intersection - Signalized		**B**	**10.2**		**B**	**11.0**		
	Eastbound Approach		***C***	***21.6***		***C***	***23.3***		
	Eastbound LTR	660	C	21.6	131	C	23.3	176	
	Westbound Approach		***B***	***17.6***		***B***	***17.5***		
	Westbound LTR	690	B	17.6	14	B	17.5	14	
	Northbound Approach		***A***	***8.3***		***A***	***7.9***		
	Northbound L	80	B	10.2	34	B	10.9	45	
	Northbound TR	315	A	8.2	127	A	7.5	94	
	Southbound Approach		***A***	***8.0***		***A***	***8.2***		
	Southbound L	110	A	9.8	13	A	8.5	8	
	Southbound TR	620	A	8.0	103	A	8.2	123	
20	**S Prospect Ave (N/S) & Palos Verdes Blvd (E/W)**								
	Overall Intersection - Signalized		**C**	**20.8**		**B**	**18.9**		
	Eastbound Approach		***B***	***18.5***		***B***	***16.2***		
	Eastbound L	215	C	27.5	#215	C	24.4	#192	
	Eastbound TR	475	B	14.6	161	B	12.7	154	
	Westbound Approach		***C***	***22.3***		***B***	***18.9***		
	Westbound L	280	C	32.0	103	C	27.1	94	
	Westbound TR	785	C	20.8	206	B	17.8	199	
	Northbound Approach		***C***	***22.1***		***C***	***21.3***		
	Northbound LT	265	C	21.2	162	C	20.2	128	
	Northbound TR	260	C	23.4	162	C	22.7	128	
	Southbound Approach		***C***	***21.0***		***C***	***21.4***		

	Southbound LT	310	C	20.3	136	C	20.5	123
	Southbound TR	310	C	21.8	136	C	22.4	123

NOTES:

[1] Effective storage length is based on the storage length plus one-half of the taper length.

[2] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.

[3] m: 95th percentile volume and queues (reported from Synchro) are metered by upstream signal.

MOE Table v1 - Alt 9 FYA v3

No.	Intersection (Movement)	Storage Length (ft.) [1]	AM Peak Hour LOS	AM Peak Hour Delay (sec/veh)	AM Peak Hour 95th % Queue (ft.) [2] [3]	PM Peak Hour LOS	PM Peak Hour Delay (sec/veh)	PM Peak Hour 95th % Queue (ft.) [2] [3]
9	**S Prospect Ave (N/S) & Anita St (E/W)**							
	Overall Intersection - Signalized		**C**	**33.3**		**C**	**31.7**	
	Eastbound Approach		***C***	***27.7***		***C***	***30.4***	
	Eastbound L	135	D	49.9	43	D	47.8	80
	Eastbound TR	660	C	26.9	251	C	29.5	426
	Westbound Approach		***C***	***26.7***		***C***	***27.5***	
	Westbound L	125	D	44.6	#220	D	45.3	169
	Westbound TR	450	C	22.8	355	C	24.9	353
	Northbound Approach		***D***	***40.0***		***C***	***33.3***	
	Northbound L	235	D	54.5	#373	D	45.6	#353
	Northbound T	990	D	36.8	466	C	29.0	434
	Northbound R	985	C	27.8	176	C	23.8	122
	Southbound Approach		***D***	***40.5***		***D***	***37.6***	
	Southbound L	100	D	49.5	107	D	48.3	118
	Southbound TR	165	D	39.2	197	D	36.4	314
10	**S Prospect Ave (N/S) & Beryl St (E/W)**							
	Overall Intersection - Signalized		**D**	**45.4**		**C**	**24.9**	
	Eastbound Approach		***C***	***33.5***		***C***	***28.1***	
	Eastbound L	140	B	16.0	51	B	16.0	30
	Eastbound T	290	D	38.2	267	C	30.0	236
	Eastbound R	165	C	29.8	0	C	24.1	0
	Westbound Approach		***C***	***27.7***		***B***	***19.9***	
	Westbound L	190	C	32.1	#456	C	20.0	188
	Westbound T	500	C	21.1	264	B	19.8	173
	Westbound R	100	B	17.0	0	B	17.1	0
	Northbound Approach		***E***	***68.5***		***C***	***27.0***	
	Northbound L	145	C	23.2	67	B	17.5	69
	Northbound TR	945	F	72.3	#664	C	28.2	#443
	Southbound Approach		***C***	***32.6***		***C***	***24.6***	
	Southbound L	215	C	25.6	19	B	17.7	43
	Southbound TR	990	C	33.0	318	C	25.1	#353
11	**S Prospect Ave (N/S) & BCHD (E/W)**							
	Overall Intersection - Signalized		**C**	**25.9**		**C**	**22.7**	
	Eastbound Approach		***E***	***63.0***		***D***	***53.7***	
	Eastbound LTR	25	E	63.0	0	D	53.7	0
	Westbound Approach		***E***	***63.4***		***E***	***57.7***	
	Westbound LTR	110	E	63.4	0	E	57.7	146
	Northbound Approach		***B***	***11.3***		***A***	***3.8***	
	Northbound L	95	D	49.1	m2	D	44.4	m1
	Northbound TR	225	B	11.2	243	A	3.8	30
	Southbound Approach		***D***	***41.2***		***C***	***34.1***	
	Southbound L	300	F	87.2	250	F	82.6	119
	Southbound TR	970	C	34.6	623	C	31.1	564
12	**S Prospect Ave (N/S) & Diamond St (E/W)**							
	Overall Intersection - Signalized		**C**	**34.8**		**B**	**19.8**	
	Eastbound Approach		***E***	***55.0***		***D***	***53.1***	
	Eastbound L	95	E	55.3	203	D	54.4	111
	Eastbound TR	295	D	54.8	176	D	51.8	0
	Westbound Approach		***D***	***49.6***		***D***	***51.3***	
	Westbound L	55	D	49.6	7	D	51.3	7
	Westbound TR	205	D	49.6	0	D	51.3	11
	Northbound Approach		***E***	***56.9***		***D***	***35.9***	
	Northbound L	140	F	90.4	120	F	94.5	48
	Northbound TR	1130	E	55.4	#1031	C	34.8	543
	Southbound Approach		***A***	***0.9***		***A***	***3.9***	
	Southbound L	95	D	54.3	m9	F	108.8	m18
	Southbound TR	220	A	0.7	0	A	3.3	34
13	**S Prospect Ave (N/S) & Del Amo St (E/W)**							
	Overall Intersection - Signalized		**D**	**44.4**		**C**	**29.3**	
	Eastbound Approach		***D***	***45.6***		***D***	***37.7***	
	Eastbound L	85	E	57.5	73	D	44.5	37
	Eastbound T	250	D	43.0	112	D	37.0	106
	Eastbound R	140	D	43.5		D	37.0	
	Westbound Approach		***D***	***51.5***		***D***	***53.0***	
	Westbound L	110	E	73.1	#471	E	72.1	#388
	Westbound T	695	C	30.7	251	C	24.2	152
	Westbound R	700	C	26.4	66	C	22.4	58
	Northbound Approach		***D***	***52.5***		***C***	***23.2***	
	Northbound L	130	B	18.2	109	B	15.1	59
	Northbound TR	505	E	59.4	#753	C	24.3	346
	Southbound Approach		***C***	***23.5***		***C***	***21.1***	
	Southbound L	135	C	27.0	#85	C	21.1	#174
	Southbound TR	1135	C	23.1	299	C	21.2	313
14	**S Prospect Ave (N/S) & Vincent St (E/W)**							
	Overall Intersection - Signalized		**C**	**23.4**		**B**	**10.1**	
	Eastbound Approach		***C***	***30.4***		***C***	***22.6***	
	Eastbound LTR	590	C	30.4	216	C	22.6	59
	Westbound Approach			***0.0***			***0.0***	
	Westbound LTR	25		0.0			0.0	

	Northbound Approach		***B***	***14.4***		***A***	***5.0***		
	Northbound L	145	B	16.0	29	A	7.7	10	
	Northbound TR	285	B	14.3	322	A	4.9	132	
	Southbound Approach		***C***	***30.8***		***B***	***12.7***		
	Southbound LTR	500	C	31.6	#448	B	12.9	#325	
15	**S Prospect Ave (N/S) & Emerald St (E/W)**								
	Overall Intersection - Signalized		**B**	**13.7**		**B**	**10.4**		
	Eastbound Approach		***C***	***24.7***		***C***	***23.8***		
	Eastbound LTR	300	C	24.7	145	C	23.8	89	
	Westbound Approach		***C***	***21.6***		***C***	***22.0***		
	Westbound LTR	255	C	21.6	64	C	22.0	35	
	Northbound Approach		***B***	***12.8***		***A***	***8.1***		
	Northbound L	105	A	7.6	47	A	6.6	22	
	Northbound TR	375	B	13.4	325	A	8.2	278	
	Southbound Approach		***B***	***12.0***		***B***	***10.9***		
	Southbound L	145	A	8.1	33	A	5.4	12	
	Southbound TR	1125	B	12.4	245	B	11.0	400	
16	**S Prospect Ave (N/S) & Torrance Blvd (E/W)**								
	Overall Intersection - Signalized		**E**	**60.6**		**E**	**55.6**		
	Eastbound Approach		***D***	***38.6***		***D***	***39.0***		
	Eastbound L	225	E	69.2	#171	E	76.6	#248	
	Eastbound T	375	C	32.0	212	C	31.0	294	
	Eastbound R	115	C	26.6	0	C	24.6	0	
	Westbound Approach		***D***	***39.8***		***D***	***44.6***		
	Westbound L	215	E	79.1	#213	F	103.5	#295	
	Westbound T	915	C	31.1	233	C	29.6	260	
	Westbound R	175	C	26.2	45	C	25.2	56	
	Northbound Approach		***E***	***76.5***		***D***	***52.6***		
	Northbound L	155	E	63.7	77	E	64.6	79	
	Northbound T	580	F	81.0	#479	D	52.1	308	
	Northbound R	190	D	36.5	75	D	37.9	15	
	Southbound Approach		***E***	***74.9***		***E***	***78.7***		
	Southbound L	185	F	192.8	#364	F	176.0	#381	
	Southbound TR	590	D	39.2	#360	D	53.5	#503	
17	**S Prospect Ave (N/S) & Pearl St (E/W)**								
	Overall Intersection - Signalized		**A**	**3.5**		**A**	**3.1**		
	Eastbound Approach		***C***	***20.3***		***C***	***20.2***		
	Eastbound LTR	315	C	20.3	38	C	20.2	33	
	Westbound Approach		***B***	***20.0***		***B***	***19.8***		
	Westbound LTR	110	B	20.0	30	B	19.8	23	
	Northbound Approach		***A***	***3.0***		***A***	***2.6***		
	Northbound L	115	A	3.3	17	A	3.4	23	
	Northbound TR	605	A	3.0	211	A	2.6	153	
	Southbound Approach		***A***	***2.7***		***A***	***2.7***		
	Southbound L	90	A	3.8	16	A	3.1	19	
	Southbound TR	610	A	2.7	155	A	2.7	178	
18	**S Prospect Ave (N/S) & S Camino Real (E/W)**								
	Overall Intersection - Signalized		**D**	**37.1**		**C**	**29.4**		
	Eastbound Approach		***C***	***32.3***		***C***	***28.3***		
	Eastbound L	1330	C	27.4	351	C	21.7	350	
	Eastbound TR	1335	C	32.7	351	C	28.5	350	
	Westbound Approach		***D***	***49.7***		***C***	***33.1***		
	Westbound L	770	C	24.7	#756	C	21.3	#643	
	Westbound TR	780	E	55.8	#756	D	37.1	#643	
	Northbound Approach		***D***	***36.9***		***C***	***30.7***		
	Northbound L	130	D	54.6	93	D	43.6	62	
	Northbound T	595	D	35.3	323	C	29.9	257	
	Southbound Approach		***C***	***30.4***		***C***	***26.1***		
	Southbound L	165	D	46.3	268	D	37.8	263	
	Southbound T	310	C	23.9	230	C	21.2	224	
19	**S Prospect Ave (N/S) & Knob Hill Ave (E/W)**								
	Overall Intersection - Signalized		**B**	**13.7**		**B**	**14.7**		
	Eastbound Approach		***C***	***25.7***		***C***	***28.0***		
	Eastbound LTR	660	C	25.7	160	C	28.0	#219	
	Westbound Approach		***C***	***20.9***		***C***	***20.9***		
	Westbound LTR	690	C	20.9	17	C	20.9	17	
	Northbound Approach		***B***	***11.1***		***A***	***9.9***		
	Northbound L	80	A	8.8	27	A	9.1	34	
	Northbound TR	315	B	11.3	167	B	10.1	124	
	Southbound Approach		***B***	***12.2***		***B***	***13.0***		
	Southbound L	110	A	8.5	11	A	8.3	7	
	Southbound TR	620	B	12.4	145	B	13.1	167	
20	**S Prospect Ave (N/S) & Palos Verdes Blvd (E/W)**								
	Overall Intersection - Signalized		**C**	**20.8**		**B**	**18.9**		
	Eastbound Approach		***B***	***18.5***		***B***	***16.2***		
	Eastbound L	215	C	27.5	#220	C	24.4	#197	
	Eastbound TR	475	B	14.6	165	B	12.7	158	
	Westbound Approach		***C***	***22.3***		***B***	***18.9***		
	Westbound L	280	C	32.0	106	C	27.1	96	
	Westbound TR	785	C	20.8	212	B	17.8	204	
	Northbound Approach		***C***	***22.1***		***C***	***21.3***		
	Northbound LT	265	C	21.2	166	C	20.2	131	
	Northbound TR	260	C	23.4	166	C	22.7	131	
	Southbound Approach		***C***	***21.0***		***C***	***21.4***		

	Southbound LT	310	C	20.3	139	C	20.5	126
	Southbound TR	310	C	21.8	139	C	22.4	126

NOTES:

[1] Effective storage length is based on the storage length plus one-half of the taper length.

[2] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.

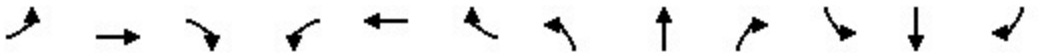
[3] m: 95th percentile volume and queues (reported from Synchro) are metered by upstream signal.

B. Level of Service and Queuing Worksheets – Existing Conditions

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	19	509	166	765	238	432	166	70	395
v/c Ratio	0.23	0.54	0.72	0.54	0.75	0.70	0.33	0.49	0.57
Control Delay (s/veh)	59.6	35.6	63.2	26.9	59.4	39.7	30.5	61.2	40.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	59.6	35.6	63.2	26.9	59.4	39.7	30.5	61.2	40.5
Queue Length 50th (ft)	13	153	112	191	159	263	86	47	127
Queue Length 95th (ft)	41	240	200	332	#331	431	163	101	187
Internal Link Dist (ft)		1736		1055		1020			627
Turn Bay Length (ft)	110		120		210			70	
Base Capacity (vph)	318	1554	318	1568	318	670	555	318	1187
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.33	0.52	0.49	0.75	0.64	0.30	0.22	0.33

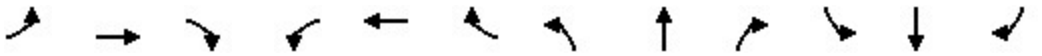
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	402	86	159	662	72	228	415	159	67	339	40
Future Volume (vph)	18	402	86	159	662	72	228	415	159	67	339	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	5.0	5.0	4.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1694	3288		1694	3330		1694	1783	1482	1694	3159	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1694	3288		1694	3330		1694	1783	1482	1694	3159	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	19	419	90	166	690	75	238	432	166	70	353	42
RTOR Reduction (vph)	0	13	0	0	5	0	0	0	0	0	0	0
Lane Group Flow (vph)	19	496	0	166	760	0	238	432	166	70	395	0
Confl. Peds. (#/hr)			3			2			8			3
Confl. Bikes (#/hr)			2			1			2			8
Parking (#/hr)						0					0	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	2.4	33.2		14.8	45.6		20.2	37.2	37.2	7.8	24.8	
Effective Green, g (s)	2.4	33.2		14.8	45.6		20.2	37.2	37.2	7.8	24.8	
Actuated g/C Ratio	0.02	0.30		0.13	0.41		0.18	0.34	0.34	0.07	0.22	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)	1.5	5.0		1.5	5.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	36	983		225	1368		308	597	496	119	705	
v/s Ratio Prot	0.01	0.15		c0.10	c0.23		c0.14	c0.24		0.04	0.13	
v/s Ratio Perm									0.11			
v/c Ratio	0.53	0.50		0.74	0.56		0.77	0.72	0.33	0.59	0.56	
Uniform Delay, d1	53.7	32.1		46.2	25.0		43.2	32.4	27.6	50.0	38.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.3	0.9		10.3	0.8		10.5	4.6	0.5	4.7	1.2	
Delay (s)	60.0	33.0		56.6	25.8		53.7	37.0	28.2	54.8	39.5	
Level of Service	E	C		E	C		D	D	C	D	D	
Approach Delay (s/veh)		33.9			31.3			40.0			41.8	
Approach LOS		C			C			D			D	

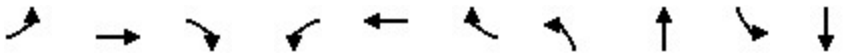
Intersection Summary			
HCM 2000 Control Delay (s/veh)	36.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	402	86	159	662	72	228	415	159	67	339	40
Future Volume (veh/h)	18	402	86	159	662	72	228	415	159	67	339	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	19	419	76	166	690	70	238	432	166	70	353	42
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	30	1011	182	201	1335	135	275	541	449	91	562	66
Arrive On Green	0.02	0.34	0.34	0.11	0.44	0.44	0.16	0.29	0.29	0.05	0.19	0.19
Sat Flow, veh/h	1767	2976	535	1767	3058	310	1767	1856	1539	1767	3004	354
Grp Volume(v), veh/h	19	247	248	166	397	363	238	432	166	70	206	189
Grp Sat Flow(s),veh/h/ln	1767	1763	1749	1767	1763	1606	1767	1856	1539	1767	1763	1595
Q Serve(g_s), s	0.9	9.5	9.6	8.1	14.5	14.5	11.6	19.0	7.6	3.5	9.5	9.7
Cycle Q Clear(g_c), s	0.9	9.5	9.6	8.1	14.5	14.5	11.6	19.0	7.6	3.5	9.5	9.7
Prop In Lane	1.00		0.31	1.00		0.19	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	30	599	594	201	769	701	275	541	449	91	330	298
V/C Ratio(X)	0.64	0.41	0.42	0.83	0.52	0.52	0.86	0.80	0.37	0.77	0.62	0.63
Avail Cap(c_a), veh/h	400	998	990	400	998	909	400	841	697	400	799	723
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.1	22.4	22.4	38.3	18.1	18.1	36.4	28.9	24.8	41.4	33.0	33.1
Incr Delay (d2), s/veh	8.1	1.0	1.0	3.3	1.1	1.3	9.2	4.1	0.7	5.2	2.7	3.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	3.9	3.9	3.6	5.7	5.3	5.5	8.6	2.7	1.6	4.3	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	51.2	23.3	23.4	41.6	19.2	19.4	45.6	33.0	25.6	46.6	35.8	36.3
LnGrp LOS	D	C	C	D	B	B	D	C	C	D	D	D
Approach Vol, veh/h		514			926			836			465	
Approach Delay, s/veh		24.4			23.3			35.1			37.6	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	35.0	17.7	21.5	5.5	43.5	8.5	30.7
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	20.0	50.0	20.0	40.0	20.0	50.0	20.0	40.0
Max Q Clear Time (g_c+I1), s	10.1	11.6	13.6	11.7	2.9	16.5	5.5	21.0
Green Ext Time (p_c), s	0.1	6.4	0.2	3.7	0.0	10.4	0.1	4.4

Intersection Summary	
HCM 7th Control Delay, s/veh	29.5
HCM 7th LOS	C



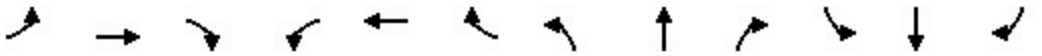
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	267	47	489	322	12	73	1142	12	662
v/c Ratio	0.21	0.70	0.12	0.89	0.44	0.02	0.28	0.91	0.08	0.69
Control Delay (s/veh)	16.8	46.9	0.7	38.6	24.7	0.1	22.4	40.5	20.8	36.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	16.8	46.9	0.7	38.6	24.7	0.1	22.4	40.5	20.8	36.3
Queue Length 50th (ft)	22	160	0	207	150	0	28	330	4	197
Queue Length 95th (ft)	47	257	0	#420	249	0	64	#629	18	304
Internal Link Dist (ft)		687			456			975		1020
Turn Bay Length (ft)	90		190	170		260	110		170	
Base Capacity (vph)	488	562	499	574	775	609	367	1250	323	1000
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.48	0.09	0.85	0.42	0.02	0.20	0.91	0.04	0.66

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	240	42	440	290	11	66	700	328	11	518	77
Future Volume (vph)	63	240	42	440	290	11	66	700	328	11	518	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.95	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1677	1783	1306	1688	1783	1290	1693	3188		1694	3142	
Flt Permitted	0.57	1.00	1.00	0.30	1.00	1.00	0.22	1.00		0.13	1.00	
Satd. Flow (perm)	998	1783	1306	533	1783	1290	399	3188		225	3142	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	70	267	47	489	322	12	73	778	364	12	576	86
RTOR Reduction (vph)	0	0	37	0	0	7	0	40	0	0	9	0
Lane Group Flow (vph)	70	267	10	489	322	5	73	1102	0	12	653	0
Confl. Peds. (#/hr)	23		20	20		23	3		8	8		3
Confl. Bikes (#/hr)			6			25						7
Parking (#/hr)			0			0					0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	27.4	21.9	21.9	49.3	39.8	39.8	42.0	37.0		32.7	31.7	
Effective Green, g (s)	27.4	21.9	21.9	49.3	39.8	39.8	42.0	37.0		32.7	31.7	
Actuated g/C Ratio	0.27	0.22	0.22	0.49	0.39	0.39	0.41	0.37		0.32	0.31	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0		4.0	5.0	
Vehicle Extension (s)	2.0	4.0	4.0	2.5	4.0	4.0	2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	306	385	282	526	700	506	245	1164		87	983	
v/s Ratio Prot	0.01	0.15		c0.21	0.18		c0.02	c0.35		0.00	0.21	
v/s Ratio Perm	0.05		0.01	c0.24		0.00	0.10			0.04		
v/c Ratio	0.23	0.69	0.04	0.93	0.46	0.01	0.30	0.95		0.14	0.66	
Uniform Delay, d1	28.1	36.6	31.4	20.3	22.8	18.7	19.5	31.2		25.8	30.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	5.7	0.1	22.9	0.7	0.0	0.2	15.3		0.3	1.9	
Delay (s)	28.3	42.4	31.4	43.2	23.4	18.7	19.7	46.5		26.1	32.1	
Level of Service	C	D	C	D	C	B	B	D		C	C	
Approach Delay (s/veh)		38.4			35.1			44.9			32.0	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	101.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	240	42	440	290	11	66	700	328	11	518	77
Future Volume (veh/h)	63	240	42	440	290	11	66	700	328	11	518	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	0.98		0.95	0.99		0.96	1.00		0.99	1.00		0.96
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	70	267	6	489	322	4	73	778	320	12	576	76
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	370	377	273	576	733	535	268	834	343	116	916	120
Arrive On Green	0.04	0.20	0.20	0.24	0.39	0.39	0.04	0.34	0.34	0.01	0.31	0.31
Sat Flow, veh/h	1767	1856	1342	1767	1856	1355	1767	2428	997	1767	2955	389
Grp Volume(v), veh/h	70	267	6	489	322	4	73	565	533	12	343	309
Grp Sat Flow(s),veh/h/ln	1767	1856	1342	1767	1856	1355	1767	1763	1662	1767	1763	1581
Q Serve(g_s), s	2.7	11.6	0.3	17.8	11.0	0.2	2.4	26.7	26.8	0.4	14.4	14.5
Cycle Q Clear(g_c), s	2.7	11.6	0.3	17.8	11.0	0.2	2.4	26.7	26.8	0.4	14.4	14.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.60	1.00		0.25
Lane Grp Cap(c), veh/h	370	377	273	576	733	535	268	606	571	116	547	490
V/C Ratio(X)	0.19	0.71	0.02	0.85	0.44	0.01	0.27	0.93	0.93	0.10	0.63	0.63
Avail Cap(c_a), veh/h	598	644	466	669	733	535	500	612	577	407	612	549
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.5	32.1	27.6	19.0	19.2	15.9	19.8	27.4	27.4	23.6	25.5	25.6
Incr Delay (d2), s/veh	0.1	3.5	0.0	8.6	0.6	0.0	0.2	21.4	22.6	0.1	2.1	2.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	5.4	0.1	8.1	4.7	0.0	0.9	14.1	13.5	0.2	6.1	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	25.6	35.5	27.6	27.6	19.7	15.9	20.0	48.8	50.0	23.7	27.7	28.0
LnGrp LOS	C	D	C	C	B	B	C	D	D	C	C	C
Approach Vol, veh/h		343			815			1171			664	
Approach Delay, s/veh		33.4			24.4			47.5			27.8	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.8	34.7	24.4	22.6	7.7	31.8	7.8	39.1
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	15.0	30.0	25.0	30.0	15.0	30.0	15.0	30.0
Max Q Clear Time (g_c+I1), s	2.4	28.8	19.8	13.6	4.4	16.5	4.7	13.0
Green Ext Time (p_c), s	0.0	0.9	0.6	1.9	0.0	4.4	0.0	2.4

Intersection Summary	
HCM 7th Control Delay, s/veh	35.2
HCM 7th LOS	D

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	7	64	2	1340	139	970
v/c Ratio	0.03	0.24	0.03	0.64	0.75	0.60
Control Delay (s/veh)	0.2	2.2	46.0	6.2	90.9	33.6
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay (s/veh)	0.2	2.2	46.0	6.5	90.9	33.6
Queue Length 50th (ft)	0	0	2	25	132	361
Queue Length 95th (ft)	0	0	m2	211	240	592
Internal Link Dist (ft)	170	304		218		975
Turn Bay Length (ft)			70		270	
Base Capacity (vph)	393	381	170	2132	399	1847
Starvation Cap Reductn	0	0	0	233	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.17	0.01	0.71	0.35	0.53

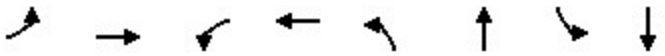
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	0	4	25	0	34	2	1118	115	128	892	0
Future Volume (vph)	3	0	4	25	0	34	2	1118	115	128	892	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	5.5		5.0	5.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.92			0.92		1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1599			1609		1694	3332		1694	3388	
Flt Permitted		0.92			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1495			1435		1694	3332		1694	3388	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	0	4	27	0	37	2	1215	125	139	970	0
RTOR Reduction (vph)	0	6	0	0	57	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	1	0	0	7	0	2	1337	0	139	970	0
Confl. Peds. (#/hr)			1	1					3			
Confl. Bikes (#/hr)									2			1
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			4		11	6 8		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		17.1			17.1		0.9	94.9		16.5	71.6	
Effective Green, g (s)		17.1			17.1		0.9	94.9		16.5	71.6	
Actuated g/C Ratio		0.11			0.11		0.01	0.61		0.11	0.46	
Clearance Time (s)		5.0			5.0		4.0			5.0	5.5	
Vehicle Extension (s)		3.5			3.5		1.5			2.0	6.0	
Lane Grp Cap (vph)		165			158		9	2047		181	1571	
v/s Ratio Prot							c0.00	c0.40		c0.08	0.29	
v/s Ratio Perm		0.00			c0.00							
v/c Ratio		0.00			0.04		0.22	0.65		0.77	0.62	
Uniform Delay, d1		61.1			61.4		76.4	19.2		67.1	31.1	
Progression Factor		1.00			1.00		0.57	0.49		1.00	1.00	
Incremental Delay, d2		0.0			0.1		2.4	0.7		16.0	1.3	
Delay (s)		61.1			61.5		46.2	10.0		83.1	32.4	
Level of Service		E			E		D	B		F	C	
Approach Delay (s/veh)		61.1			61.5			10.1			38.7	
Approach LOS		E			E			B			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	154.4	Sum of lost time (s)	25.0
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

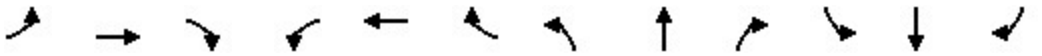
HCM 7th Edition methodology does not support clustered intersections.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	107	101	1	3	54	1204	4	948
v/c Ratio	0.38	0.38	0.00	0.00	0.55	0.88	0.08	0.47
Control Delay (s/veh)	57.6	49.2	53.0	0.0	93.5	51.2	47.8	0.8
Queue Delay	0.3	0.3	0.0	0.0	0.0	0.3	0.0	0.1
Total Delay (s/veh)	57.8	49.5	53.0	0.0	93.5	51.4	47.8	0.9
Queue Length 50th (ft)	90	71	1	0	51	555	4	0
Queue Length 95th (ft)	194	168	7	0	115	#976	m8	21
Internal Link Dist (ft)		3515		195		1175		218
Turn Bay Length (ft)	60				110		80	
Base Capacity (vph)	300	286	265	772	170	1368	170	2329
Starvation Cap Reductn	0	0	0	0	0	0	0	272
Spillback Cap Reductn	26	25	0	0	0	14	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.39	0.00	0.00	0.32	0.89	0.02	0.46

Intersection Summary

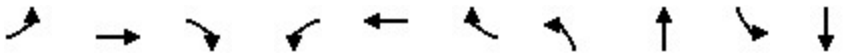
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	1	39	1	0	3	50	1117	3	4	671	210
Future Volume (vph)	153	1	39	1	0	3	50	1117	3	4	671	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		4.0	5.5		4.0	5.5	
Lane Util. Factor	0.95	0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.88		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.98	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.85		1.00	1.00		1.00	0.96	
Flt Protected	0.95	0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1605	1366		1667	1334		1694	3386		1694	3248	
Flt Permitted	0.76	0.83		0.64	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1277	1167		1131	1334		1694	3386		1694	3248	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	165	1	42	1	0	3	54	1201	3	4	722	226
RTOR Reduction (vph)	0	13	0	0	2	0	0	0	0	0	14	0
Lane Group Flow (vph)	107	88	0	1	1	0	54	1204	0	4	934	0
Confl. Peds. (#/hr)	2		13	13		2			5			1
Confl. Bikes (#/hr)			6			102			3			2
Parking (#/hr)		0	0									
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			8		1	6		9	2 4	
Permitted Phases	8			8								
Actuated Green, G (s)	33.2	33.2		33.2	33.2		7.6	61.7		0.9	88.7	
Effective Green, g (s)	33.2	33.2		33.2	33.2		7.6	61.7		0.9	88.7	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.05	0.40		0.01	0.57	
Clearance Time (s)	5.5	5.5		5.5	5.5		4.0	5.5		4.0		
Vehicle Extension (s)	3.5	3.5		3.5	3.5		1.5	6.0		1.5		
Lane Grp Cap (vph)	274	250		243	286		83	1353		9	1865	
v/s Ratio Prot					0.00		c0.03	c0.36		c0.00	c0.29	
v/s Ratio Perm	c0.08	0.08		0.00								
v/c Ratio	0.39	0.35		0.00	0.00		0.65	0.89		0.44	0.50	
Uniform Delay, d1	51.9	51.5		47.6	47.6		72.1	43.2		76.5	19.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.57	0.01	
Incremental Delay, d2	1.1	1.0		0.0	0.0		13.1	8.4		10.6	0.5	
Delay (s)	53.0	52.5		47.6	47.6		85.1	51.6		54.1	0.7	
Level of Service	D	D		D	D		F	D		D	A	
Approach Delay (s/veh)		52.8			47.6			53.0			0.9	
Approach LOS		D			D			D			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	154.4	Sum of lost time (s)	25.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 7th Edition methodology does not support clustered intersections.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	49	208	161	335	280	335	149	1342	91	727
v/c Ratio	0.16	0.66	0.44	0.79	0.63	0.54	0.72	1.05	1.28	0.56
Control Delay (s/veh)	36.5	49.0	14.4	50.8	41.4	7.3	51.6	69.8	234.4	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	36.5	49.0	14.4	50.8	41.4	7.3	51.6	69.8	234.4	27.4
Queue Length 50th (ft)	27	126	19	195	155	0	79	~486	~75	183
Queue Length 95th (ft)	60	207	73	343	278	65	#236	#811	#208	322
Internal Link Dist (ft)		1285			1321			533		1175
Turn Bay Length (ft)	100		100	100			100		100	
Base Capacity (vph)	523	551	545	523	551	683	207	1277	71	1292
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.38	0.30	0.64	0.51	0.49	0.72	1.05	1.28	0.56

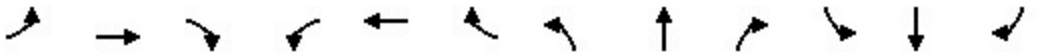
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	183	142	295	246	295	131	834	347	80	597	43
Future Volume (vph)	43	183	142	295	246	295	131	834	347	80	597	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	6.5	6.5		6.5	6.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.96	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1694	1783	1476	1694	1783	1463	1686	3063		1694	3176	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.29	1.00		0.10	1.00	
Satd. Flow (perm)	1694	1783	1476	1694	1783	1463	511	3063		175	3176	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	49	208	161	335	280	335	149	948	394	91	678	49
RTOR Reduction (vph)	0	0	104	0	0	251	0	35	0	0	4	0
Lane Group Flow (vph)	49	208	57	335	280	84	149	1307	0	91	723	0
Confl. Peds. (#/hr)			6			4	10		3	3		10
Confl. Bikes (#/hr)			7			22			1			13
Parking (#/hr)								0	0		0	0
Turn Type	Split	NA	Perm	Split	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6			2	
Permitted Phases			8			4	6			2		
Actuated Green, G (s)	17.8	17.8	17.8	25.0	25.0	25.0	40.7	40.7		40.7	40.7	
Effective Green, g (s)	17.8	17.8	17.8	25.0	25.0	25.0	40.7	40.7		40.7	40.7	
Actuated g/C Ratio	0.18	0.18	0.18	0.25	0.25	0.25	0.41	0.41		0.41	0.41	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	6.5	6.5		6.5	6.5	
Vehicle Extension (s)	2.5	2.5	2.5	3.0	3.0	3.0	4.5	4.5		4.5	4.5	
Lane Grp Cap (vph)	301	317	262	423	445	365	207	1246		71	1292	
v/s Ratio Prot	0.03	c0.12		c0.20	0.16			0.43			0.23	
v/s Ratio Perm			0.04			0.06	0.29			c0.52		
v/c Ratio	0.16	0.66	0.22	0.79	0.63	0.23	0.72	1.05		1.28	0.56	
Uniform Delay, d1	34.8	38.3	35.1	35.1	33.4	29.8	24.9	29.7		29.7	22.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	4.3	0.3	9.8	2.8	0.3	12.9	39.4		199.9	0.8	
Delay (s)	35.0	42.6	35.4	44.8	36.2	30.2	37.7	69.0		229.6	23.5	
Level of Service	C	D	D	D	D	C	D	E		F	C	
Approach Delay (s/veh)		38.9			37.1			65.9			46.5	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	51.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	91.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	183	142	295	246	295	131	834	347	80	597	43
Future Volume (veh/h)	43	183	142	295	246	295	131	834	347	80	597	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.96	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	49	208	46	335	280	55	149	948	350	91	678	43
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	273	286	234	408	428	349	283	1038	380	102	1387	88
Arrive On Green	0.15	0.15	0.15	0.23	0.23	0.23	0.44	0.44	0.44	0.44	0.44	0.44
Sat Flow, veh/h	1767	1856	1520	1767	1856	1513	724	2383	872	421	3184	202
Grp Volume(v), veh/h	49	208	46	335	280	55	149	699	599	91	375	346
Grp Sat Flow(s),veh/h/ln	1767	1856	1520	1767	1856	1513	724	1763	1493	421	1763	1623
Q Serve(g_s), s	2.2	9.8	2.4	16.5	12.6	2.7	17.1	34.1	34.8	5.2	14.0	14.0
Cycle Q Clear(g_c), s	2.2	9.8	2.4	16.5	12.6	2.7	31.1	34.1	34.8	40.0	14.0	14.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.58	1.00		0.12
Lane Grp Cap(c), veh/h	273	286	234	408	428	349	283	768	650	102	768	707
V/C Ratio(X)	0.18	0.73	0.20	0.82	0.65	0.16	0.53	0.91	0.92	0.89	0.49	0.49
Avail Cap(c_a), veh/h	577	606	496	577	606	494	283	768	650	102	768	707
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.8	37.0	33.9	33.5	32.0	28.2	29.8	24.3	24.5	45.2	18.6	18.6
Incr Delay (d2), s/veh	0.2	2.6	0.3	6.4	1.7	0.2	2.8	15.3	19.0	56.6	0.8	0.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	4.6	0.9	7.5	5.6	0.9	3.1	16.4	14.7	3.6	5.6	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	34.0	39.6	34.2	40.0	33.7	28.4	32.6	39.6	43.5	101.8	19.4	19.5
LnGrp LOS	C	D	C	D	C	C	C	D	D	F	B	B
Approach Vol, veh/h		303			670			1447			812	
Approach Delay, s/veh		37.9			36.4			40.5			28.7	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	46.5	26.2	46.5	19.2
Change Period (Y+Rc), s	6.5	5.0	6.5	5.0
Max Green Setting (Gmax), s	40.0	30.0	40.0	30.0
Max Q Clear Time (g_c+I1), s	42.0	18.5	36.8	11.8
Green Ext Time (p_c), s	0.0	2.2	2.8	1.1

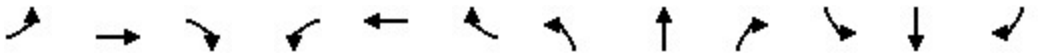
Intersection Summary	
HCM 7th Control Delay, s/veh	36.4
HCM 7th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	NBL	NBT	SBT
Lane Group Flow (vph)	401	48	1158	1163
v/c Ratio	0.71	0.37	0.72	0.73
Control Delay (s/veh)	26.8	22.0	17.4	16.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay (s/veh)	26.8	22.0	17.4	16.9
Queue Length 50th (ft)	146	13	205	196
Queue Length 95th (ft)	242	47	310	303
Internal Link Dist (ft)	2029		1464	533
Turn Bay Length (ft)		110		
Base Capacity (vph)	638	150	1845	1797
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.63	0.32	0.63	0.65

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	281	0	76	0	0	0	43	1031	0	0	802	233
Future Volume (vph)	281	0	76	0	0	0	43	1031	0	0	802	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5					6.5	6.5			6.5	
Lane Util. Factor		1.00					1.00	0.95			0.95	
Frpb, ped/bikes		1.00					1.00	1.00			0.99	
Flpb, ped/bikes		1.00					1.00	1.00			1.00	
Frt		0.97					1.00	1.00			0.97	
Flt Protected		0.96					0.95	1.00			1.00	
Satd. Flow (prot)		1660					1521	3219			3083	
Flt Permitted		0.95					0.16	1.00			1.00	
Satd. Flow (perm)		1639					263	3219			3083	
Peak-hour factor, PHF	0.89	0.92	0.89	0.92	0.92	0.92	0.89	0.89	0.92	0.92	0.89	0.89
Adj. Flow (vph)	316	0	85	0	0	0	48	1158	0	0	901	262
RTOR Reduction (vph)	0	34	0	0	0	0	0	0	0	0	36	0
Lane Group Flow (vph)	0	367	0	0	0	0	48	1158	0	0	1127	0
Confl. Peds. (#/hr)			6				14					14
Confl. Bikes (#/hr)			4									3
Parking (#/hr)	0		0				0	0			0	0
Turn Type	Perm	NA					Perm	NA			NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6					
Actuated Green, G (s)		23.3					36.0	36.0			36.0	
Effective Green, g (s)		23.3					36.0	36.0			36.0	
Actuated g/C Ratio		0.33					0.50	0.50			0.50	
Clearance Time (s)		5.5					6.5	6.5			6.5	
Vehicle Extension (s)		3.0					5.0	5.0			5.0	
Lane Grp Cap (vph)		535					132	1625			1556	
v/s Ratio Prot								0.36			c0.37	
v/s Ratio Perm		c0.22					0.18					
v/c Ratio		0.69					0.36	0.71			0.72	
Uniform Delay, d1		20.8					10.7	13.6			13.8	
Progression Factor		1.00					1.00	1.00			1.00	
Incremental Delay, d2		3.7					3.5	1.9			2.1	
Delay (s)		24.5					14.2	15.5			15.9	
Level of Service		C					B	B			B	
Approach Delay (s/veh)		24.5			0.0			15.5			15.9	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	71.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	281	0	76	0	0	0	43	1031	0	0	802	233
Future Volume (veh/h)	281	0	76	0	0	0	43	1031	0	0	802	233
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.96
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	0	0	1856	1856
Adj Flow Rate, veh/h	316	0	70	0	0	0	48	1158	0	0	901	223
Peak Hour Factor	0.89	0.92	0.89	0.92	0.92	0.92	0.89	0.89	0.92	0.92	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	0	0	3	3
Cap, veh/h	434	0	76	0	605	0	225	1787	0	0	1336	330
Arrive On Green	0.33	0.00	0.33	0.00	0.00	0.00	0.51	0.51	0.00	0.00	0.51	0.51
Sat Flow, veh/h	1053	0	233	0	1856	0	496	3618	0	0	2728	651
Grp Volume(v), veh/h	386	0	0	0	0	0	48	1158	0	0	602	522
Grp Sat Flow(s),veh/h/ln	1286	0	0	0	1856	0	496	1763	0	0	1763	1524
Q Serve(g_s), s	20.8	0.0	0.0	0.0	0.0	0.0	5.8	17.3	0.0	0.0	18.4	18.4
Cycle Q Clear(g_c), s	20.8	0.0	0.0	0.0	0.0	0.0	24.2	17.3	0.0	0.0	18.4	18.4
Prop In Lane	0.82		0.18	0.00		0.00	1.00		0.00	0.00		0.43
Lane Grp Cap(c), veh/h	510	0	0	0	605	0	225	1787	0	0	894	773
V/C Ratio(X)	0.76	0.00	0.00	0.00	0.00	0.00	0.21	0.65	0.00	0.00	0.67	0.68
Avail Cap(c_a), veh/h	539	0	0	0	646	0	250	1965	0	0	982	849
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	23.3	0.0	0.0	0.0	0.0	0.0	22.3	13.0	0.0	0.0	13.3	13.3
Incr Delay (d2), s/veh	5.8	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	2.4	2.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	0.0	0.0	0.0	0.0	0.0	0.7	6.0	0.0	0.0	6.7	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.1	0.0	0.0	0.0	0.0	0.0	23.3	14.0	0.0	0.0	15.6	16.0
LnGrp LOS	C						C	B			B	B
Approach Vol, veh/h		386			0			1206			1124	
Approach Delay, s/veh		29.1			0.0			14.4			15.8	
Approach LOS		C						B			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	42.9	28.9	42.9	28.9
Change Period (Y+Rc), s	6.5	5.5	6.5	5.5
Max Green Setting (Gmax), s	40.0	25.0	40.0	25.0
Max Q Clear Time (g_c+I1), s	20.4	0.0	26.2	22.8
Green Ext Time (p_c), s	12.3	0.0	10.2	0.5

Intersection Summary	
HCM 7th Control Delay, s/veh	17.1
HCM 7th LOS	B

Notes

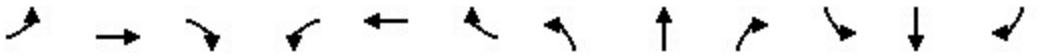
User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	225	92	102	1081	65	886
v/c Ratio	0.63	0.25	0.35	0.58	0.30	0.49
Control Delay (s/veh)	24.0	16.8	13.4	11.0	13.6	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	24.0	16.8	13.4	11.0	13.6	9.5
Queue Length 50th (ft)	62	23	17	110	10	80
Queue Length 95th (ft)	116	51	67	248	47	185
Internal Link Dist (ft)	1046	977		1312		1464
Turn Bay Length (ft)			70		100	
Base Capacity (vph)	565	592	342	2174	256	2138
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.16	0.30	0.50	0.25	0.41

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	20	80	31	31	17	88	913	16	56	667	95
Future Volume (vph)	94	20	80	31	31	17	88	913	16	56	667	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1464			1519		1686	3208		1691	3143	
Flt Permitted		0.82			0.86		0.28	1.00		0.21	1.00	
Satd. Flow (perm)		1232			1332		506	3208		380	3143	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	109	23	93	36	36	20	102	1062	19	65	776	110
RTOR Reduction (vph)	0	38	0	0	15	0	0	2	0	0	13	0
Lane Group Flow (vph)	0	187	0	0	77	0	102	1079	0	65	873	0
Confl. Peds. (#/hr)	15		2	2		15	19		9	9		19
Confl. Bikes (#/hr)			3			4			3			5
Parking (#/hr)	0	0	0	0	0	0		0	0		0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		16.2			16.2		35.6	35.6		35.6	35.6	
Effective Green, g (s)		16.2			16.2		35.6	35.6		35.6	35.6	
Actuated g/C Ratio		0.26			0.26		0.58	0.58		0.58	0.58	
Clearance Time (s)		4.5			4.5		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.5			3.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)		325			352		293	1863		220	1825	
v/s Ratio Prot								c0.34			0.28	
v/s Ratio Perm		c0.15			0.06		0.20			0.17		
v/c Ratio		0.58			0.22		0.35	0.58		0.30	0.48	
Uniform Delay, d1		19.6			17.6		6.8	8.1		6.5	7.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.7			0.3		2.0	0.9		2.1	0.6	
Delay (s)		22.2			17.9		8.8	9.0		8.6	8.0	
Level of Service		C			B		A	A		A	A	
Approach Delay (s/veh)		22.2			17.9			9.0			8.1	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	10.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	61.3	Sum of lost time (s)	9.5
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	20	80	31	31	17	88	913	16	56	667	95
Future Volume (veh/h)	94	20	80	31	31	17	88	913	16	56	667	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	0.98		0.96	0.99		0.96	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	109	23	49	36	36	3	102	1062	17	65	776	95
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	247	58	73	215	177	12	442	2087	33	367	1850	226
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.62	0.62	0.62	0.62	0.62	0.62
Sat Flow, veh/h	691	289	364	568	885	61	628	3367	54	517	2985	365
Grp Volume(v), veh/h	181	0	0	75	0	0	102	556	523	65	458	413
Grp Sat Flow(s),veh/h/ln	1343	0	0	1514	0	0	628	1763	1658	517	1763	1587
Q Serve(g_s), s	4.4	0.0	0.0	0.0	0.0	0.0	5.2	9.2	9.2	4.2	7.0	7.0
Cycle Q Clear(g_c), s	6.4	0.0	0.0	2.0	0.0	0.0	12.3	9.2	9.2	13.4	7.0	7.0
Prop In Lane	0.60		0.27	0.48		0.04	1.00		0.03	1.00		0.23
Lane Grp Cap(c), veh/h	378	0	0	403	0	0	442	1093	1028	367	1093	984
V/C Ratio(X)	0.48	0.00	0.00	0.19	0.00	0.00	0.23	0.51	0.51	0.18	0.42	0.42
Avail Cap(c_a), veh/h	731	0	0	599	0	0	530	1338	1259	439	1338	1205
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.3	0.0	0.0	17.7	0.0	0.0	8.3	5.6	5.6	9.3	5.1	5.1
Incr Delay (d2), s/veh	1.1	0.0	0.0	0.2	0.0	0.0	1.0	1.3	1.4	0.8	0.9	1.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	0.0	0.7	0.0	0.0	0.7	2.4	2.3	0.5	1.8	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.4	0.0	0.0	17.9	0.0	0.0	9.3	6.9	7.0	10.1	6.1	6.2
LnGrp LOS	C			B			A	A	A	B	A	A
Approach Vol, veh/h		181			75			1181			936	
Approach Delay, s/veh		20.4			17.9			7.1			6.4	
Approach LOS		C			B			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	37.7	15.0	37.7	15.0
Change Period (Y+Rc), s	5.0	4.5	5.0	4.5
Max Green Setting (Gmax), s	40.0	18.0	40.0	25.0
Max Q Clear Time (g_c+I1), s	15.4	4.0	14.3	8.4
Green Ext Time (p_c), s	14.3	0.3	18.0	1.1

Intersection Summary	
HCM 7th Control Delay, s/veh	8.2
HCM 7th LOS	A

Notes

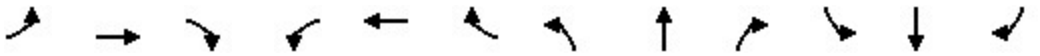
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	115	519	35	144	573	226	52	888	187	228	762
v/c Ratio	0.78	0.47	0.06	0.83	0.48	0.33	0.50	1.03	0.40	1.16	0.73
Control Delay (s/veh)	85.2	32.8	0.2	88.3	32.7	5.1	69.3	83.4	17.4	159.7	42.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	85.2	32.8	0.2	88.3	32.7	5.1	69.3	83.4	17.4	159.7	42.1
Queue Length 50th (ft)	87	167	0	110	185	0	40	~387	42	~208	277
Queue Length 95th (ft)	#152	205	0	#191	226	44	75	#468	98	#339	342
Internal Link Dist (ft)		1689			2029			1308			1312
Turn Bay Length (ft)	190		100	180		150	140		100	160	
Base Capacity (vph)	171	1107	551	190	1184	678	190	861	465	197	1045
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.47	0.06	0.76	0.48	0.33	0.27	1.03	0.40	1.16	0.73

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

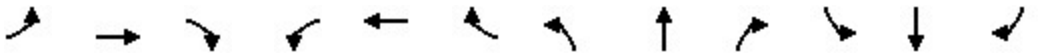
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	441	30	122	487	192	44	755	159	194	568	80
Future Volume (vph)	98	441	30	122	487	192	44	755	159	194	568	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	10	11	12	10	12	12	11	11	12
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.5	6.5	5.0	6.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1472	3219	1369	1636	3388	1519	1636	3505	1532	1694	3315	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1472	3219	1369	1636	3388	1519	1636	3505	1532	1694	3315	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	115	519	35	144	573	226	52	888	187	228	668	94
RTOR Reduction (vph)	0	0	23	0	0	149	0	0	88	0	8	0
Lane Group Flow (vph)	115	519	12	144	573	77	52	888	99	228	754	0
Confl. Peds. (#/hr)			13			8			5			4
Confl. Bikes (#/hr)			5			16			6			12
Parking (#/hr)	0	0	0									
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8			4			2			
Actuated Green, G (s)	12.1	40.3	40.3	12.7	40.9	40.9	6.9	30.5	30.5	14.0	37.6	
Effective Green, g (s)	12.1	40.3	40.3	12.7	40.9	40.9	6.9	30.5	30.5	14.0	37.6	
Actuated g/C Ratio	0.10	0.34	0.34	0.11	0.34	0.34	0.06	0.25	0.25	0.12	0.31	
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.5	6.5	5.0	6.5	
Vehicle Extension (s)	1.5	4.0	4.0	1.5	4.0	4.0	1.5	4.0	4.0	1.5	4.0	
Lane Grp Cap (vph)	148	1081	459	173	1154	517	94	890	389	197	1038	
v/s Ratio Prot	0.08	0.16		c0.09	c0.17		0.03	c0.25		c0.13	0.23	
v/s Ratio Perm			0.01			0.05			0.06			
v/c Ratio	0.78	0.48	0.03	0.83	0.50	0.15	0.55	1.00	0.25	1.16	0.73	
Uniform Delay, d1	52.6	31.6	26.7	52.6	31.4	27.5	55.0	44.7	35.7	53.0	36.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	20.4	1.5	0.1	26.5	1.5	0.6	4.0	29.4	0.5	112.9	2.7	
Delay (s)	73.1	33.1	26.8	79.1	32.9	28.1	59.0	74.1	36.2	165.9	39.4	
Level of Service	E	C	C	E	C	C	E	E	D	F	D	
Approach Delay (s/veh)		39.6			38.8			67.1			68.5	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	55.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	441	30	122	487	192	44	755	159	194	568	80
Future Volume (veh/h)	98	441	30	122	487	192	44	755	159	194	568	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	115	519	8	144	573	51	52	888	83	228	668	85
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	140	1247	488	170	1307	567	67	867	378	206	1018	129
Arrive On Green	0.08	0.35	0.35	0.10	0.37	0.37	0.04	0.25	0.25	0.12	0.32	0.32
Sat Flow, veh/h	1767	3526	1379	1767	3526	1529	1767	3526	1536	1767	3137	399
Grp Volume(v), veh/h	115	519	8	144	573	51	52	888	83	228	375	378
Grp Sat Flow(s),veh/h/ln	1767	1763	1379	1767	1763	1529	1767	1763	1536	1767	1763	1772
Q Serve(g_s), s	7.7	13.4	0.5	9.6	14.7	2.6	3.5	29.5	5.2	14.0	21.9	22.0
Cycle Q Clear(g_c), s	7.7	13.4	0.5	9.6	14.7	2.6	3.5	29.5	5.2	14.0	21.9	22.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	140	1247	488	170	1307	567	67	867	378	206	572	575
V/C Ratio(X)	0.82	0.42	0.02	0.85	0.44	0.09	0.78	1.02	0.22	1.11	0.66	0.66
Avail Cap(c_a), veh/h	206	1247	488	206	1307	567	206	867	378	206	572	575
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	1.00	1.00	1.00	0.92	0.92	0.92	0.87	0.87	0.87
Uniform Delay (d), s/veh	54.4	29.4	25.2	53.4	28.4	24.6	57.2	45.3	36.1	53.0	34.8	34.8
Incr Delay (d2), s/veh	9.4	1.0	0.1	20.1	1.1	0.3	6.5	35.7	0.4	89.8	2.7	2.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	5.8	0.2	5.2	6.3	1.0	1.7	17.0	2.0	11.3	9.7	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	63.8	30.4	25.3	73.5	29.4	24.9	63.7	81.0	36.5	142.8	37.4	37.5
LnGrp LOS	E	C	C	E	C	C	E	F	D	F	D	D
Approach Vol, veh/h		642			768			1023			981	
Approach Delay, s/veh		36.3			37.4			76.5			61.9	
Approach LOS		D			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	36.0	14.5	50.5	9.5	45.5	16.6	48.4
Change Period (Y+Rc), s	5.0	6.5	5.0	6.0	5.0	6.5	5.0	6.0
Max Green Setting (Gmax), s	14.0	29.5	14.0	40.0	14.0	29.5	14.0	40.0
Max Q Clear Time (g_c+I1), s	16.0	31.5	9.7	16.7	5.5	24.0	11.6	15.4
Green Ext Time (p_c), s	0.0	0.0	0.0	5.6	0.0	2.7	0.0	4.9

Intersection Summary	
HCM 7th Control Delay, s/veh	55.9
HCM 7th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

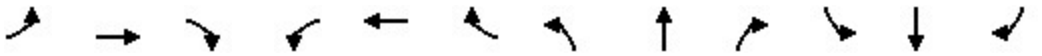
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	73	56	25	1027	21	802
v/c Ratio	0.28	0.19	0.05	0.40	0.07	0.33
Control Delay (s/veh)	14.1	12.4	6.0	5.7	6.5	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	14.1	12.4	6.0	5.7	6.5	5.2
Queue Length 50th (ft)	10	7	2	58	2	41
Queue Length 95th (ft)	38	30	15	183	14	134
Internal Link Dist (ft)	1470	309		1757		1308
Turn Bay Length (ft)			100		70	
Base Capacity (vph)	591	675	490	2669	327	2515
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.08	0.05	0.38	0.06	0.32

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	10	29	13	11	26	22	907	7	19	671	43
Future Volume (vph)	26	10	29	13	11	26	22	907	7	19	671	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12	11	11	12	10	11	11
Total Lost time (s)		4.5			4.5		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.93		1.00	1.00		1.00	0.99	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1467			1617		1694	3383		1470	3186	
Flt Permitted		0.85			0.88		0.35	1.00		0.27	1.00	
Satd. Flow (perm)		1265			1450		622	3383		414	3186	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	29	11	33	15	12	29	25	1019	8	21	754	48
RTOR Reduction (vph)	0	29	0	0	25	0	0	1	0	0	5	0
Lane Group Flow (vph)	0	44	0	0	31	0	25	1026	0	21	797	0
Confl. Peds. (#/hr)	2		2	2		2	1		7	7		1
Confl. Bikes (#/hr)			1			5			4			1
Parking (#/hr)	0	0	0	0		0				0	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		5.9			5.9		32.8	32.8		32.8	32.8	
Effective Green, g (s)		5.9			5.9		32.8	32.8		32.8	32.8	
Actuated g/C Ratio		0.12			0.12		0.67	0.67		0.67	0.67	
Clearance Time (s)		4.5			4.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0			3.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		153			175		418	2278		278	2145	
v/s Ratio Prot								c0.30			0.25	
v/s Ratio Perm		c0.03			0.02		0.04			0.05		
v/c Ratio		0.29			0.17		0.06	0.45		0.08	0.37	
Uniform Delay, d1		19.5			19.2		2.7	3.7		2.7	3.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.0			0.5		0.1	0.3		0.2	0.2	
Delay (s)		20.5			19.7		2.8	4.0		3.0	3.7	
Level of Service		C			B		A	A		A	A	
Approach Delay (s/veh)		20.5			19.7			4.0			3.7	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	4.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	48.7	Sum of lost time (s)	10.0
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	10	29	13	11	26	22	907	7	19	671	43
Future Volume (veh/h)	26	10	29	13	11	26	22	907	7	19	671	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	0.99		1.00	0.99		0.97	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	0.90	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	29	11	0	15	12	1	25	1019	7	21	754	42
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	198	19	0	171	32	3	598	2563	18	497	2421	135
Arrive On Green	0.05	0.05	0.00	0.05	0.05	0.05	0.71	0.71	0.71	0.71	0.71	0.71
Sat Flow, veh/h	1032	391	0	812	649	54	676	3588	25	545	3390	189
Grp Volume(v), veh/h	40	0	0	28	0	0	25	501	525	21	392	404
Grp Sat Flow(s),veh/h/ln	1423	0	0	1515	0	0	676	1763	1850	545	1763	1816
Q Serve(g_s), s	0.4	0.0	0.0	0.0	0.0	0.0	0.6	4.8	4.8	0.7	3.5	3.5
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.7	0.0	0.0	4.1	4.8	4.8	5.5	3.5	3.5
Prop In Lane	0.72		0.00	0.54		0.04	1.00		0.01	1.00		0.10
Lane Grp Cap(c), veh/h	217	0	0	206	0	0	598	1259	1321	497	1259	1297
V/C Ratio(X)	0.18	0.00	0.00	0.14	0.00	0.00	0.04	0.40	0.40	0.04	0.31	0.31
Avail Cap(c_a), veh/h	782	0	0	799	0	0	674	1459	1531	559	1459	1503
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	0.0	0.0	19.4	0.0	0.0	3.0	2.4	2.4	3.5	2.2	2.2
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.3	0.0	0.0	0.1	0.4	0.4	0.1	0.3	0.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.3	0.0	0.0	0.0	0.3	0.3	0.0	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.0	0.0	0.0	19.7	0.0	0.0	3.0	2.8	2.8	3.6	2.5	2.5
LnGrp LOS	C			B			A	A	A	A	A	A
Approach Vol, veh/h		40			28			1051			817	
Approach Delay, s/veh		20.0			19.7			2.8			2.5	
Approach LOS		C			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		35.7		6.6		35.7		6.6				
Change Period (Y+Rc), s		5.5		4.5		5.5		4.5				
Max Green Setting (Gmax), s		35.0		20.0		35.0		20.0				
Max Q Clear Time (g_c+I1), s		6.8		3.1		7.5		2.7				
Green Ext Time (p_c), s		14.2		0.1		10.6		0.1				

Intersection Summary	
HCM 7th Control Delay, s/veh	3.3
HCM 7th LOS	A

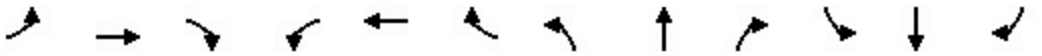
Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	368	662	61	697	233	610
v/c Ratio	0.64	0.87	0.53	0.82	0.87	0.50
Control Delay (s/veh)	57.9	57.3	84.6	59.6	88.0	36.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	57.9	57.3	84.6	59.6	88.0	36.8
Queue Length 50th (ft)	171	273	58	327	216	227
Queue Length 95th (ft)	212	354	106	410	#347	309
Internal Link Dist (ft)	1269	825		628		1757
Turn Bay Length (ft)			100		150	
Base Capacity (vph)	760	834	223	990	323	1272
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.79	0.27	0.70	0.72	0.48

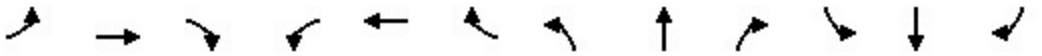
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	224	62	92	228	236	51	576	9	196	477	35
Future Volume (vph)	23	224	62	92	228	236	51	576	9	196	477	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	12	11	11	12	10	11	11
Total Lost time (s)		6.0			6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor		0.95			0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.94		1.00	1.00		1.00	0.99	
Flt Protected		1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3257			2944		1694	3378		1472	3171	
Flt Permitted		1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3257			2944		1694	3378		1472	3171	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	27	267	74	110	271	281	61	686	11	233	568	42
RTOR Reduction (vph)	0	14	0	0	84	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	354	0	0	578	0	61	696	0	233	607	0
Confl. Peds. (#/hr)			11			17			13			44
Confl. Bikes (#/hr)						3			4			
Bus Blockages (#/hr)	0	0	0	0	0	1	0	0	0	0	0	0
Parking (#/hr)				0	0	0				0	0	
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)		24.2			32.6		8.2	36.6		25.6	54.0	
Effective Green, g (s)		24.2			32.6		8.2	36.6		25.6	54.0	
Actuated g/C Ratio		0.17			0.23		0.06	0.26		0.18	0.38	
Clearance Time (s)		6.0			6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		4.0			4.5		2.0	4.5		2.0	4.5	
Lane Grp Cap (vph)		559			680		98	876		267	1214	
v/s Ratio Prot		c0.11			c0.20		0.04	c0.21		c0.16	0.19	
v/s Ratio Perm												
v/c Ratio		0.63			0.85		0.62	0.79		0.87	0.50	
Uniform Delay, d1		54.3			51.9		64.9	48.7		56.1	33.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.6			10.6		8.5	5.6		24.7	0.6	
Delay (s)		56.9			62.5		73.4	54.3		80.8	33.8	
Level of Service		E			E		E	D		F	C	
Approach Delay (s/veh)		56.9			62.5			55.8			46.8	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	54.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	141.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	224	62	92	228	236	51	576	9	196	477	35
Future Volume (veh/h)	23	224	62	92	228	236	51	576	9	196	477	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.96	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	27	267	57	110	271	181	61	686	0	233	568	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	43	423	89	154	376	247	79	926		264	1295	
Arrive On Green	0.16	0.16	0.16	0.24	0.24	0.24	0.04	0.26	0.00	0.15	0.37	0.00
Sat Flow, veh/h	278	2726	574	643	1576	1036	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	179	0	172	312	0	250	61	686	0	233	568	0
Grp Sat Flow(s),veh/h/ln	1842	0	1737	1823	0	1432	1767	1763	0	1767	1763	0
Q Serve(g_s), s	10.3	0.0	10.5	17.8	0.0	18.2	3.9	20.2	0.0	14.6	13.8	0.0
Cycle Q Clear(g_c), s	10.3	0.0	10.5	17.8	0.0	18.2	3.9	20.2	0.0	14.6	13.8	0.0
Prop In Lane	0.15		0.33	0.35		0.72	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	286	0	269	436	0	342	79	926		264	1295	
V/C Ratio(X)	0.63	0.00	0.64	0.72	0.00	0.73	0.78	0.74		0.88	0.44	
Avail Cap(c_a), veh/h	488	0	461	564	0	443	281	1246		468	1295	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.7	0.0	44.9	39.5	0.0	39.7	53.5	38.2	0.0	47.2	27.0	0.0
Incr Delay (d2), s/veh	3.2	0.0	3.6	4.4	0.0	6.2	6.0	2.4	0.0	3.9	0.4	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	0.0	4.8	8.4	0.0	6.9	1.8	8.9	0.0	6.6	5.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	47.9	0.0	48.4	43.9	0.0	45.9	59.5	40.6	0.0	51.1	27.4	0.0
LnGrp LOS	D		D	D		D	E	D		D	C	
Approach Vol, veh/h		351			562			747			801	
Approach Delay, s/veh		48.2			44.8			42.1			34.3	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	23.6	9.0	47.6	33.0	20.9	35.7
Change Period (Y+Rc), s	6.0	4.0	6.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	30.0	18.0	40.0	35.0	30.0	40.0
Max Q Clear Time (g_c+I1), s	12.5	5.9	15.8	20.2	16.6	22.2
Green Ext Time (p_c), s	2.6	0.0	6.2	4.6	0.3	6.6

Intersection Summary	
HCM 7th Control Delay, s/veh	41.1
HCM 7th LOS	D

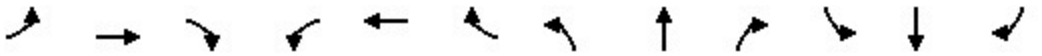
Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	237	15	55	675	16	709
v/c Ratio	0.57	0.04	0.19	0.40	0.05	0.42
Control Delay (s/veh)	23.8	14.1	12.7	11.3	10.7	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	23.8	14.1	12.7	11.3	10.7	8.5
Queue Length 50th (ft)	75	3	13	97	4	71
Queue Length 95th (ft)	130	14	34	129	13	104
Internal Link Dist (ft)	2562	752		1844		628
Turn Bay Length (ft)			75		80	
Base Capacity (vph)	547	530	288	1702	313	1682
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.03	0.19	0.40	0.05	0.42

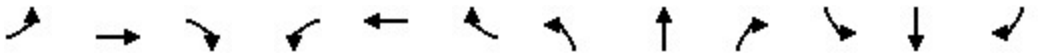
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	111	29	5	5	3	47	558	22	14	396	214
Future Volume (vph)	64	111	29	5	5	3	47	558	22	14	396	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	10	11	11	11	11	11
Total Lost time (s)		6.0			6.0		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		0.99			1.00		0.99	1.00		0.99	1.00	
Frt		0.98			0.97		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1529			1513		1455	3195		1512	2994	
Flt Permitted		0.89			0.88		0.35	1.00		0.37	1.00	
Satd. Flow (perm)		1389			1362		542	3195		591	2994	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	74	129	34	6	6	3	55	649	26	16	460	249
RTOR Reduction (vph)	0	9	0	0	2	0	0	4	0	0	93	0
Lane Group Flow (vph)	0	228	0	0	13	0	55	671	0	16	616	0
Confl. Peds. (#/hr)	42		14	14		42	34		23	23		34
Confl. Bikes (#/hr)			2			2			3			
Parking (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		19.6			19.6		35.4	35.4		35.4	35.4	
Effective Green, g (s)		19.6			19.6		35.4	35.4		35.4	35.4	
Actuated g/C Ratio		0.29			0.29		0.53	0.53		0.53	0.53	
Clearance Time (s)		6.0			6.0		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		409			401		288	1700		314	1593	
v/s Ratio Prot								c0.21			0.21	
v/s Ratio Perm		c0.16			0.01		0.10			0.03		
v/c Ratio		0.56			0.03		0.19	0.39		0.05	0.39	
Uniform Delay, d1		19.8			16.7		8.1	9.2		7.5	9.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.0			0.0		0.7	0.3		0.1	0.3	
Delay (s)		21.8			16.7		8.8	9.5		7.6	9.5	
Level of Service		C			B		A	A		A	A	
Approach Delay (s/veh)		21.8			16.7			9.5			9.4	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	11.5
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	111	29	5	5	3	47	558	22	14	396	214
Future Volume (veh/h)	64	111	29	5	5	3	47	558	22	14	396	214
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	0.95		0.94	0.97		0.94	0.99		0.95	0.99		0.97
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	74	129	24	6	6	1	55	649	21	16	460	141
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	167	245	40	216	188	27	488	1859	60	459	1412	428
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.56	0.56	0.56	0.56	0.56	0.56
Sat Flow, veh/h	358	972	157	523	747	106	802	3300	107	753	2507	761
Grp Volume(v), veh/h	227	0	0	13	0	0	55	346	324	16	322	279
Grp Sat Flow(s),veh/h/ln	1487	0	0	1376	0	0	802	1763	1644	753	1763	1505
Q Serve(g_s), s	4.4	0.0	0.0	0.0	0.0	0.0	2.5	6.6	6.6	0.7	6.1	6.2
Cycle Q Clear(g_c), s	8.1	0.0	0.0	0.4	0.0	0.0	8.6	6.6	6.6	7.4	6.1	6.2
Prop In Lane	0.33		0.11	0.46		0.08	1.00		0.06	1.00		0.51
Lane Grp Cap(c), veh/h	451	0	0	431	0	0	488	993	926	459	993	848
V/C Ratio(X)	0.50	0.00	0.00	0.03	0.00	0.00	0.11	0.35	0.35	0.03	0.32	0.33
Avail Cap(c_a), veh/h	669	0	0	628	0	0	488	993	926	459	993	848
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	0.0	0.0	17.5	0.0	0.0	9.6	7.4	7.4	9.4	7.2	7.3
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.5	0.1	0.4	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	0.0	0.1	0.0	0.0	0.4	2.0	1.9	0.1	1.9	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	21.6	0.0	0.0	17.6	0.0	0.0	9.8	7.8	7.9	9.4	7.7	7.8
LnGrp LOS	C			B			A	A	A	A	A	A
Approach Vol, veh/h		227			13			725			617	
Approach Delay, s/veh		21.6			17.6			8.0			7.7	
Approach LOS		C			B			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	40.5	21.6	40.5	21.6
Change Period (Y+Rc), s	5.5	6.0	5.5	6.0
Max Green Setting (Gmax), s	35.0	25.0	35.0	25.0
Max Q Clear Time (g_c+I1), s	10.6	10.1	9.4	2.4
Green Ext Time (p_c), s	8.6	1.6	7.4	0.0

Intersection Summary	
HCM 7th Control Delay, s/veh	9.9
HCM 7th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

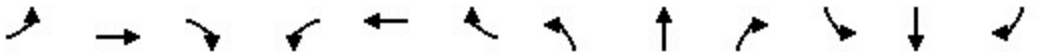
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	202	469	91	554	488	446
v/c Ratio	0.74	0.35	0.55	0.56	0.55	0.52
Control Delay (s/veh)	49.8	19.1	50.2	26.0	23.6	20.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	49.8	19.1	50.2	26.0	23.6	20.6
Queue Length 50th (ft)	89	77	41	107	91	71
Queue Length 95th (ft)	195	158	102	205	161	134
Internal Link Dist (ft)		2554		2157	2447	1844
Turn Bay Length (ft)	200		250			
Base Capacity (vph)	420	1578	315	1318	1125	1067
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.30	0.29	0.42	0.43	0.42

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	188	433	3	85	475	40	8	327	118	33	242	140
Future Volume (vph)	188	433	3	85	475	40	8	327	118	33	242	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)	4.0	5.8		4.0	5.8			5.8			5.8	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1525	3215		1525	3176			3066			3020	
Flt Permitted	0.95	1.00		0.95	1.00			0.94			0.88	
Satd. Flow (perm)	1525	3215		1525	3176			2897			2667	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	202	466	3	91	511	43	9	352	127	35	260	151
RTOR Reduction (vph)	0	1	0	0	7	0	0	38	0	0	70	0
Lane Group Flow (vph)	202	468	0	91	547	0	0	450	0	0	376	0
Confl. Peds. (#/hr)			10			11	13		21	21		13
Confl. Bikes (#/hr)			4			1			4			
Parking (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	13.9	32.1		7.1	25.3			22.8			22.8	
Effective Green, g (s)	13.9	32.1		7.1	25.3			22.8			22.8	
Actuated g/C Ratio	0.18	0.41		0.09	0.33			0.29			0.29	
Clearance Time (s)	4.0	5.8		4.0	5.8			5.8			5.8	
Vehicle Extension (s)	1.5	6.5		1.0	6.5			6.0			6.0	
Lane Grp Cap (vph)	273	1329		139	1035			851			783	
v/s Ratio Prot	c0.13	0.15		0.06	c0.17							
v/s Ratio Perm								c0.16			0.14	
v/c Ratio	0.74	0.35		0.65	0.53			0.53			0.48	
Uniform Delay, d1	30.1	15.6		34.1	21.3			22.9			22.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	8.7	0.5		8.2	1.4			1.5			1.3	
Delay (s)	38.9	16.1		42.2	22.7			24.4			23.8	
Level of Service	D	B		D	C			C			C	
Approach Delay (s/veh)		23.0			25.4			24.4			23.8	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	77.6	Sum of lost time (s)	15.6
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	188	433	3	85	475	40	8	327	118	33	242	140
Future Volume (veh/h)	188	433	3	85	475	40	8	327	118	33	242	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.96	0.99		0.98
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	202	466	2	91	511	35	9	352	87	35	260	78
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	251	1347	6	116	1010	69	70	701	168	113	617	177
Arrive On Green	0.14	0.39	0.39	0.07	0.32	0.32	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1767	3415	15	1767	3171	217	21	2580	618	150	2270	652
Grp Volume(v), veh/h	202	240	228	91	283	263	254	0	194	207	0	166
Grp Sat Flow(s),veh/h/ln	1767	1763	1667	1767	1763	1625	1839	0	1380	1689	0	1384
Q Serve(g_s), s	6.4	5.6	5.6	3.0	7.6	7.6	0.0	0.0	6.9	0.0	0.0	5.8
Cycle Q Clear(g_c), s	6.4	5.6	5.6	3.0	7.6	7.6	6.7	0.0	6.9	7.0	0.0	5.8
Prop In Lane	1.00		0.01	1.00		0.13	0.04		0.45	0.17		0.47
Lane Grp Cap(c), veh/h	251	695	658	116	562	518	563	0	375	531	0	376
V/C Ratio(X)	0.81	0.35	0.35	0.78	0.50	0.51	0.45	0.00	0.52	0.39	0.00	0.44
Avail Cap(c_a), veh/h	607	909	859	456	909	838	848	0	593	782	0	595
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.2	12.4	12.4	26.8	16.1	16.1	17.9	0.0	18.0	17.4	0.0	17.5
Incr Delay (d2), s/veh	2.3	1.4	1.4	4.3	3.2	3.5	2.0	0.0	4.0	1.7	0.0	2.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	2.2	2.1	1.3	3.2	3.1	2.9	0.0	2.4	2.3	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	26.5	13.7	13.8	31.0	19.3	19.6	19.9	0.0	22.0	19.1	0.0	20.5
LnGrp LOS	C	B	B	C	B	B	B		C	B		C
Approach Vol, veh/h		670			637			448			373	
Approach Delay, s/veh		17.6			21.1			20.8			19.7	
Approach LOS		B			C			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.8	28.8		21.6	12.3	24.3		21.6				
Change Period (Y+Rc), s	4.0	5.8		5.8	4.0	5.8		5.8				
Max Green Setting (Gmax), s	15.0	30.0		25.0	20.0	30.0		25.0				
Max Q Clear Time (g_c+I1), s	5.0	7.6		9.0	8.4	9.6		8.9				
Green Ext Time (p_c), s	0.0	7.1		4.3	0.1	8.0		5.1				

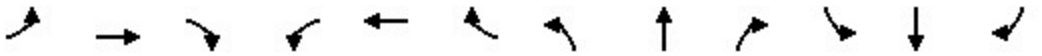
Intersection Summary		
HCM 7th Control Delay, s/veh	19.7	
HCM 7th LOS	B	

Notes
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	40	790	108	723	197	356	94	68	535
v/c Ratio	0.39	0.71	0.62	0.55	0.74	0.59	0.19	0.49	0.70
Control Delay (s/veh)	68.1	37.6	68.0	29.6	65.5	39.1	32.3	66.6	45.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	68.1	37.6	68.0	29.6	65.5	39.1	32.3	66.6	45.8
Queue Length 50th (ft)	28	258	75	216	132	210	47	47	184
Queue Length 95th (ft)	78	404	162	333	#321	410	115	114	302
Internal Link Dist (ft)		1736		1055		1020			627
Turn Bay Length (ft)	110		120		210			70	
Base Capacity (vph)	312	1525	312	1571	312	667	558	312	1175
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.52	0.35	0.46	0.63	0.53	0.17	0.22	0.46

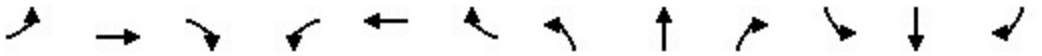
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	623	135	104	612	82	189	342	90	65	484	30
Future Volume (vph)	38	623	135	104	612	82	189	342	90	65	484	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	5.0	5.0	4.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1694	3288		1694	3318		1694	1783	1492	1694	3187	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1694	3288		1694	3318		1694	1783	1492	1694	3187	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	40	649	141	108	638	85	197	356	94	68	504	31
RTOR Reduction (vph)	0	13	0	0	7	0	0	0	0	0	0	0
Lane Group Flow (vph)	40	777	0	108	716	0	197	356	94	68	535	0
Confl. Peds. (#/hr)			2			2			1			1
Confl. Bikes (#/hr)			3						4			5
Parking (#/hr)						0					0	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	5.8	38.5		11.6	44.3		17.7	37.9	37.9	7.9	28.1	
Effective Green, g (s)	5.8	38.5		11.6	44.3		17.7	37.9	37.9	7.9	28.1	
Actuated g/C Ratio	0.05	0.34		0.10	0.39		0.16	0.33	0.33	0.07	0.25	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)	1.5	5.0		1.5	5.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	86	1111		172	1290		263	593	496	117	786	
v/s Ratio Prot	0.02	c0.24		c0.06	0.22		c0.12	0.20		0.04	c0.17	
v/s Ratio Perm									0.06			
v/c Ratio	0.47	0.70		0.63	0.56		0.75	0.60	0.19	0.58	0.68	
Uniform Delay, d1	52.5	32.7		49.1	27.1		46.0	31.7	27.1	51.4	38.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.4	2.5		5.1	0.9		9.8	2.0	0.3	4.7	2.6	
Delay (s)	54.0	35.2		54.2	28.0		55.8	33.7	27.3	56.1	41.5	
Level of Service	D	D		D	C		E	C	C	E	D	
Approach Delay (s/veh)		36.1			31.4			39.5			43.1	
Approach LOS		D			C			D			D	

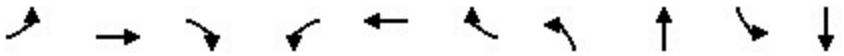
Intersection Summary			
HCM 2000 Control Delay (s/veh)	37.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	113.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	623	135	104	612	82	189	342	90	65	484	30
Future Volume (veh/h)	38	623	135	104	612	82	189	342	90	65	484	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	40	649	127	108	638	78	197	356	94	68	504	31
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	51	1029	201	137	1199	146	235	578	482	88	729	45
Arrive On Green	0.03	0.35	0.35	0.08	0.40	0.40	0.13	0.31	0.31	0.05	0.23	0.23
Sat Flow, veh/h	1767	2932	573	1767	3000	366	1767	1856	1548	1767	3197	196
Grp Volume(v), veh/h	40	390	386	108	374	342	197	356	94	68	277	258
Grp Sat Flow(s),veh/h/ln	1767	1763	1742	1767	1763	1603	1767	1856	1548	1767	1763	1630
Q Serve(g_s), s	1.9	15.8	15.8	5.1	13.8	13.9	9.3	14.0	3.8	3.3	12.3	12.4
Cycle Q Clear(g_c), s	1.9	15.8	15.8	5.1	13.8	13.9	9.3	14.0	3.8	3.3	12.3	12.4
Prop In Lane	1.00		0.33	1.00		0.23	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	51	618	611	137	705	641	235	578	482	88	402	372
V/C Ratio(X)	0.79	0.63	0.63	0.79	0.53	0.53	0.84	0.62	0.20	0.77	0.69	0.69
Avail Cap(c_a), veh/h	413	1031	1018	413	1031	937	413	868	724	413	825	763
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.3	23.1	23.2	38.7	19.6	19.6	36.2	25.1	21.6	40.2	30.2	30.3
Incr Delay (d2), s/veh	9.6	2.3	2.3	3.7	1.3	1.5	3.1	1.5	0.3	5.3	3.0	3.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	6.6	6.5	2.3	5.6	5.1	4.1	6.1	1.4	1.5	5.5	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	50.9	25.4	25.5	42.5	20.9	21.0	39.2	26.6	21.9	45.5	33.2	33.5
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		816			824			647			603	
Approach Delay, s/veh		26.7			23.8			29.8			34.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	35.0	15.4	24.5	6.5	39.2	8.3	31.6
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	20.0	50.0	20.0	40.0	20.0	50.0	20.0	40.0
Max Q Clear Time (g_c+I1), s	7.1	17.8	11.3	14.4	3.9	15.9	5.3	16.0
Green Ext Time (p_c), s	0.1	10.6	0.2	5.0	0.0	9.7	0.1	3.5

Intersection Summary	
HCM 7th Control Delay, s/veh	28.2
HCM 7th LOS	C



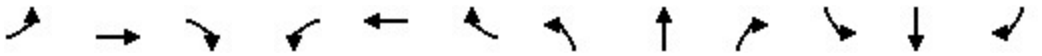
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	35	238	47	288	219	26	80	891	43	705
v/c Ratio	0.10	0.63	0.12	0.61	0.33	0.05	0.27	0.71	0.19	0.65
Control Delay (s/veh)	15.9	40.5	0.7	22.1	23.0	0.2	18.2	27.3	17.8	30.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	15.9	40.5	0.7	22.1	23.0	0.2	18.2	27.3	17.8	30.0
Queue Length 50th (ft)	11	119	0	103	93	0	23	205	12	169
Queue Length 95th (ft)	29	223	0	175	164	0	64	#399	40	309
Internal Link Dist (ft)		687			456			975		1020
Turn Bay Length (ft)	90		190	170		260	110		170	
Base Capacity (vph)	541	645	562	604	869	683	422	1255	399	1155
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.37	0.08	0.48	0.25	0.04	0.19	0.71	0.11	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	228	45	276	210	25	77	561	295	41	633	44
Future Volume (vph)	34	228	45	276	210	25	77	561	295	41	633	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.96	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1678	1783	1328	1692	1783	1315	1693	3178		1694	3180	
Flt Permitted	0.62	1.00	1.00	0.37	1.00	1.00	0.23	1.00		0.19	1.00	
Satd. Flow (perm)	1098	1783	1328	658	1783	1315	417	3178		334	3180	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	35	238	47	288	219	26	80	584	307	43	659	46
RTOR Reduction (vph)	0	0	36	0	0	17	0	49	0	0	4	0
Lane Group Flow (vph)	35	238	11	288	219	9	80	842	0	43	701	0
Confl. Peds. (#/hr)	19		6	6		19	5		5	5		5
Confl. Bikes (#/hr)			8			5			2			3
Parking (#/hr)			0			0					0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	23.5	20.1	20.1	38.9	31.5	31.5	38.6	32.6		33.8	30.2	
Effective Green, g (s)	23.5	20.1	20.1	38.9	31.5	31.5	38.6	32.6		33.8	30.2	
Actuated g/C Ratio	0.26	0.23	0.23	0.44	0.35	0.35	0.43	0.37		0.38	0.34	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0		4.0	5.0	
Vehicle Extension (s)	2.0	4.0	4.0	2.5	4.0	4.0	2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	311	402	299	459	630	464	266	1162		181	1077	
v/s Ratio Prot	0.00	0.13		c0.10	0.12		c0.02	c0.26		0.01	0.22	
v/s Ratio Perm	0.03		0.01	c0.17		0.01	0.11			0.08		
v/c Ratio	0.11	0.59	0.04	0.63	0.35	0.02	0.30	0.72		0.24	0.65	
Uniform Delay, d1	24.7	30.8	26.9	17.7	21.2	18.7	16.0	24.4		18.6	25.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	2.7	0.1	2.3	0.5	0.0	0.2	2.4		0.2	1.6	
Delay (s)	24.7	33.6	27.0	20.1	21.7	18.8	16.3	26.8		18.8	26.6	
Level of Service	C	C	C	C	C	B	B	C		B	C	
Approach Delay (s/veh)		31.6			20.7			25.9			26.1	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	89.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	228	45	276	210	25	77	561	295	41	633	44
Future Volume (veh/h)	34	228	45	276	210	25	77	561	295	41	633	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	0.98		0.95	0.99		0.97	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	35	238	10	288	219	8	80	584	256	43	659	42
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	378	380	276	483	629	465	296	802	351	234	1014	65
Arrive On Green	0.02	0.20	0.20	0.16	0.34	0.34	0.05	0.34	0.34	0.03	0.32	0.32
Sat Flow, veh/h	1767	1856	1348	1767	1856	1370	1767	2362	1034	1767	3186	203
Grp Volume(v), veh/h	35	238	10	288	219	8	80	436	404	43	364	337
Grp Sat Flow(s),veh/h/ln	1767	1856	1348	1767	1856	1370	1767	1763	1633	1767	1763	1626
Q Serve(g_s), s	1.0	7.7	0.4	7.8	5.8	0.3	2.0	14.3	14.3	1.1	11.7	11.7
Cycle Q Clear(g_c), s	1.0	7.7	0.4	7.8	5.8	0.3	2.0	14.3	14.3	1.1	11.7	11.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.63	1.00		0.12
Lane Grp Cap(c), veh/h	378	380	276	483	629	465	296	599	555	234	561	517
V/C Ratio(X)	0.09	0.63	0.04	0.60	0.35	0.02	0.27	0.73	0.73	0.18	0.65	0.65
Avail Cap(c_a), veh/h	742	846	615	878	846	625	616	804	744	592	804	741
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.1	23.9	21.0	15.5	16.3	14.5	15.1	19.1	19.1	15.9	19.3	19.3
Incr Delay (d2), s/veh	0.0	2.4	0.1	0.9	0.5	0.0	0.2	2.9	3.1	0.1	1.8	2.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.4	0.1	2.9	2.4	0.1	0.7	5.7	5.3	0.4	4.6	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.1	26.3	21.0	16.4	16.8	14.5	15.2	21.9	22.2	16.0	21.1	21.3
LnGrp LOS	C	C	C	B	B	B	B	C	C	B	C	C
Approach Vol, veh/h		283			515			920			744	
Approach Delay, s/veh		25.3			16.5			21.5			20.9	
Approach LOS		C			B			C			C	

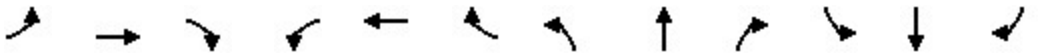
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.7	27.4	14.3	18.5	7.1	25.9	5.4	27.3
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	15.0	30.0	25.0	30.0	15.0	30.0	15.0	30.0
Max Q Clear Time (g_c+I1), s	3.1	16.3	9.8	9.7	4.0	13.7	3.0	7.8
Green Ext Time (p_c), s	0.0	6.0	0.5	1.9	0.1	5.3	0.0	1.7

Intersection Summary	
HCM 7th Control Delay, s/veh	20.7
HCM 7th LOS	C

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	4	191	1	956	57	929
v/c Ratio	0.01	0.57	0.02	0.45	0.52	0.56
Control Delay (s/veh)	0.0	30.7	46.0	2.4	86.4	30.4
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (s/veh)	0.0	30.7	46.0	2.5	86.4	30.4
Queue Length 50th (ft)	0	63	1	23	53	298
Queue Length 95th (ft)	0	168	m1	28	114	533
Internal Link Dist (ft)	150	270		218		975
Turn Bay Length (ft)			70		270	
Base Capacity (vph)	413	393	183	2238	428	1982
Starvation Cap Reductn	0	0	0	220	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.49	0.01	0.47	0.13	0.47

Intersection Summary

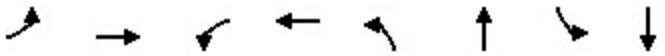
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	2	88	0	97	1	891	36	55	901	0
Future Volume (vph)	2	0	2	88	0	97	1	891	36	55	901	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	5.5		5.0	5.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			0.93		1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1610			1616		1694	3364		1694	3388	
Flt Permitted		0.91			0.85		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1495			1401		1694	3364		1694	3388	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	2	0	2	91	0	100	1	919	37	57	929	0
RTOR Reduction (vph)	0	3	0	0	96	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	1	0	0	95	0	1	955	0	57	929	0
Confl. Peds. (#/hr)			2	2					3	3		
Confl. Bikes (#/hr)									4			1
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			4		11	6 8		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		24.1			24.1		1.0	89.2		7.7	69.0	
Effective Green, g (s)		24.1			24.1		1.0	89.2		7.7	69.0	
Actuated g/C Ratio		0.16			0.16		0.01	0.61		0.05	0.47	
Clearance Time (s)		5.0			5.0		4.0			5.0	5.5	
Vehicle Extension (s)		3.5			3.5		1.5			2.0	6.0	
Lane Grp Cap (vph)		245			229		11	2041		88	1590	
v/s Ratio Prot							c0.00	c0.28		c0.03	c0.27	
v/s Ratio Perm		0.00			c0.07							
v/c Ratio		0.00			0.41		0.09	0.47		0.65	0.58	
Uniform Delay, d1		51.4			55.1		72.5	15.9		68.3	28.5	
Progression Factor		1.00			1.00		0.60	0.20		1.00	1.00	
Incremental Delay, d2		0.0			1.4		1.1	0.4		11.6	1.1	
Delay (s)		51.4			56.6		44.5	3.6		80.0	29.6	
Level of Service		D			E		D	A		E	C	
Approach Delay (s/veh)		51.4			56.6			3.6			32.5	
Approach LOS		D			E			A			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	147.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 7th Edition methodology does not support clustered intersections.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	57	55	1	2	16	854	7	1118
v/c Ratio	0.24	0.17	0.00	0.01	0.25	0.58	0.13	0.48
Control Delay (s/veh)	55.1	1.2	52.0	43.0	82.7	35.9	55.0	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay (s/veh)	55.1	1.2	52.0	43.0	82.7	35.9	55.0	2.4
Queue Length 50th (ft)	48	0	1	1	15	324	7	20
Queue Length 95th (ft)	105	0	7	10	46	515	m17	31
Internal Link Dist (ft)		3515		196		1175		218
Turn Bay Length (ft)	60				110		80	
Base Capacity (vph)	323	386	323	413	183	1466	183	2513
Starvation Cap Reductn	0	0	0	0	0	0	0	384
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.14	0.00	0.00	0.09	0.58	0.04	0.53

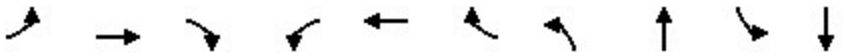
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	0	23	1	1	1	15	783	3	6	963	65
Future Volume (vph)	80	0	23	1	1	1	15	783	3	6	963	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		4.0	5.5		4.0	5.5	
Lane Util. Factor	0.95	0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.93		1.00	1.00		1.00	0.99	
Flt Protected	0.95	0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1605	1358		1692	1633		1694	3386		1694	3350	
Flt Permitted	0.76	0.86		0.72	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1278	1197		1281	1633		1694	3386		1694	3350	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	0	25	1	1	1	16	851	3	7	1047	71
RTOR Reduction (vph)	0	45	0	0	1	0	0	0	0	0	2	0
Lane Group Flow (vph)	57	10	0	1	1	0	16	854	0	7	1116	0
Confl. Peds. (#/hr)	2		1	1		2			3			2
Confl. Bikes (#/hr)			19			4			5			3
Parking (#/hr)		0	0									
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			8		1	6		9	2 4	
Permitted Phases	8			8								
Actuated Green, G (s)	26.5	26.5		26.5	26.5		2.4	62.7		1.0	93.1	
Effective Green, g (s)	26.5	26.5		26.5	26.5		2.4	62.7		1.0	93.1	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.02	0.43		0.01	0.63	
Clearance Time (s)	5.5	5.5		5.5	5.5		4.0	5.5		4.0		
Vehicle Extension (s)	3.5	3.5		3.5	3.5		1.5	6.0		1.5		
Lane Grp Cap (vph)	230	215		230	294		27	1444		11	2121	
v/s Ratio Prot					0.00		c0.01	c0.25		c0.00	c0.33	
v/s Ratio Perm	c0.04	0.01		0.00								
v/c Ratio	0.25	0.05		0.00	0.00		0.59	0.59		0.64	0.53	
Uniform Delay, d1	51.7	49.8		49.4	49.4		71.8	32.3		72.8	14.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.67	0.16	
Incremental Delay, d2	0.7	0.1		0.0	0.0		21.0	1.2		60.2	0.5	
Delay (s)	52.4	49.9		49.4	49.4		92.9	33.5		109.1	2.8	
Level of Service	D	D		D	D		F	C		F	A	
Approach Delay (s/veh)		51.2			49.4			34.6			3.5	
Approach LOS		D			D			C			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	147.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 7th Edition methodology does not support clustered intersections.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	185	107	320	167	228	90	950	185	838
v/c Ratio	0.08	0.67	0.33	0.77	0.38	0.42	0.49	0.71	1.28	0.62
Control Delay (s/veh)	36.6	51.4	10.5	46.9	32.9	6.6	36.3	26.2	195.2	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	36.6	51.4	10.5	46.9	32.9	6.6	36.3	26.2	195.2	26.0
Queue Length 50th (ft)	10	107	0	179	84	0	39	224	~144	204
Queue Length 95th (ft)	34	193	47	298	153	56	#125	386	#328	346
Internal Link Dist (ft)		1311			1321			533		1175
Turn Bay Length (ft)	100		100	100			100		100	
Base Capacity (vph)	538	566	545	547	576	635	183	1337	145	1357
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.33	0.20	0.59	0.29	0.36	0.49	0.71	1.28	0.62

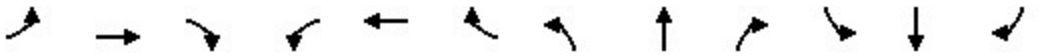
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	174	101	301	157	214	85	588	305	174	763	24
Future Volume (vph)	19	174	101	301	157	214	85	588	305	174	763	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	6.5	6.5		6.5	6.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1694	1783	1482	1694	1783	1489	1692	3038		1694	3201	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.24	1.00		0.19	1.00	
Satd. Flow (perm)	1694	1783	1482	1694	1783	1489	432	3038		344	3201	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	20	185	107	320	167	228	90	626	324	185	812	26
RTOR Reduction (vph)	0	0	90	0	0	172	0	50	0	0	2	0
Lane Group Flow (vph)	20	185	17	320	167	56	90	900	0	185	836	0
Confl. Peds. (#/hr)						2	3		1	1		3
Confl. Bikes (#/hr)			7			4			5			2
Parking (#/hr)								0	0		0	0
Turn Type	Split	NA	Perm	Split	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			6			2	
Permitted Phases			8			4	6			2		
Actuated Green, G (s)	14.9	14.9	14.9	23.5	23.5	23.5	40.6	40.6		40.6	40.6	
Effective Green, g (s)	14.9	14.9	14.9	23.5	23.5	23.5	40.6	40.6		40.6	40.6	
Actuated g/C Ratio	0.16	0.16	0.16	0.25	0.25	0.25	0.43	0.43		0.43	0.43	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	6.5	6.5		6.5	6.5	
Vehicle Extension (s)	2.5	2.5	2.5	3.0	3.0	3.0	4.5	4.5		4.5	4.5	
Lane Grp Cap (vph)	264	278	231	416	438	366	183	1291		146	1360	
v/s Ratio Prot	0.01	c0.10		c0.19	0.09			0.30			0.26	
v/s Ratio Perm			0.01			0.04	0.21			c0.54		
v/c Ratio	0.08	0.67	0.07	0.77	0.38	0.15	0.49	0.70		1.27	0.61	
Uniform Delay, d1	34.4	38.0	34.4	33.5	30.0	28.2	20.0	22.4		27.5	21.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	5.3	0.1	8.3	0.6	0.2	3.6	1.9		163.3	1.1	
Delay (s)	34.5	43.3	34.5	41.8	30.5	28.4	23.5	24.4		190.7	22.4	
Level of Service	C	D	C	D	C	C	C	C		F	C	
Approach Delay (s/veh)		39.7			34.9			24.3			52.9	
Approach LOS		D			C			C			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	37.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	95.5	Sum of lost time (s)	16.5
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	174	101	301	157	214	85	588	305	174	763	24
Future Volume (veh/h)	19	174	101	301	157	214	85	588	305	174	763	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	185	10	320	167	43	90	626	265	185	812	24
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	227	238	197	386	405	337	271	1053	445	243	1533	45
Arrive On Green	0.13	0.13	0.13	0.22	0.22	0.22	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	1767	1856	1535	1767	1856	1543	652	2277	963	619	3314	98
Grp Volume(v), veh/h	20	185	10	320	167	43	90	485	406	185	432	404
Grp Sat Flow(s),veh/h/ln	1767	1856	1535	1767	1856	1543	652	1763	1478	619	1763	1649
Q Serve(g_s), s	0.9	8.3	0.5	14.9	6.7	1.9	9.9	17.6	17.6	22.4	15.1	15.1
Cycle Q Clear(g_c), s	0.9	8.3	0.5	14.9	6.7	1.9	25.0	17.6	17.6	40.0	15.1	15.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.65	1.00		0.06
Lane Grp Cap(c), veh/h	227	238	197	386	405	337	271	815	683	243	815	763
V/C Ratio(X)	0.09	0.78	0.05	0.83	0.41	0.13	0.33	0.59	0.59	0.76	0.53	0.53
Avail Cap(c_a), veh/h	613	644	532	613	644	535	271	815	683	243	815	763
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	36.5	33.1	32.3	29.0	27.2	25.4	17.2	17.2	33.6	16.6	16.6
Incr Delay (d2), s/veh	0.1	4.0	0.1	5.3	0.7	0.2	1.2	1.6	1.9	14.5	1.0	1.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.0	0.2	6.6	2.9	0.7	1.6	6.9	5.8	4.8	5.8	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	33.4	40.5	33.1	37.6	29.7	27.3	26.7	18.8	19.1	48.1	17.6	17.6
LnGrp LOS	C	D	C	D	C	C	C	B	B	D	B	B
Approach Vol, veh/h		215			530			981			1021	
Approach Delay, s/veh		39.5			34.3			19.7			23.1	
Approach LOS		D			C			B			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		46.5		23.9		46.5		16.1				
Change Period (Y+Rc), s		6.5		5.0		6.5		5.0				
Max Green Setting (Gmax), s		40.0		30.0		40.0		30.0				
Max Q Clear Time (g_c+I1), s		42.0		16.9		27.0		10.3				
Green Ext Time (p_c), s		0.0		1.7		7.5		0.8				

Intersection Summary	
HCM 7th Control Delay, s/veh	25.3
HCM 7th LOS	C

Notes
User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	NBL	NBT	SBT
Lane Group Flow (vph)	162	27	943	1266
v/c Ratio	0.56	0.13	0.42	0.57
Control Delay (s/veh)	23.6	7.4	6.5	7.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay (s/veh)	23.6	7.4	6.5	7.9
Queue Length 50th (ft)	36	3	74	114
Queue Length 95th (ft)	88	16	148	228
Internal Link Dist (ft)	2029		1464	533
Turn Bay Length (ft)		110		
Base Capacity (vph)	475	222	2346	2308
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.12	0.40	0.55

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	0	38	0	0	0	25	868	0	0	1033	132
Future Volume (vph)	111	0	38	0	0	0	25	868	0	0	1033	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5					6.5	6.5			6.5	
Lane Util. Factor		1.00					1.00	0.95			0.95	
Frpb, ped/bikes		0.99					1.00	1.00			1.00	
Flpb, ped/bikes		1.00					1.00	1.00			1.00	
Frt		0.97					1.00	1.00			0.98	
Flt Protected		0.96					0.95	1.00			1.00	
Satd. Flow (prot)		1651					1524	3219			3155	
Flt Permitted		0.78					0.19	1.00			1.00	
Satd. Flow (perm)		1337					304	3219			3155	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	0	41	0	0	0	27	943	0	0	1123	143
RTOR Reduction (vph)	0	47	0	0	0	0	0	0	0	0	12	0
Lane Group Flow (vph)	0	115	0	0	0	0	27	943	0	0	1254	0
Confl. Peds. (#/hr)			5				4					4
Confl. Bikes (#/hr)			3									5
Parking (#/hr)	0		0				0	0			0	0
Turn Type	Perm	NA					Perm	NA			NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6					
Actuated Green, G (s)		8.8					37.7	37.7			37.7	
Effective Green, g (s)		8.8					37.7	37.7			37.7	
Actuated g/C Ratio		0.15					0.66	0.66			0.66	
Clearance Time (s)		4.5					6.5	6.5			6.5	
Vehicle Extension (s)		3.0					5.0	5.0			5.0	
Lane Grp Cap (vph)		204					199	2110			2068	
v/s Ratio Prot								0.29			c0.40	
v/s Ratio Perm		c0.09					0.09					
v/c Ratio		0.57					0.14	0.45			0.61	
Uniform Delay, d1		22.6					3.7	4.8			5.7	
Progression Factor		1.00					1.00	1.00			1.00	
Incremental Delay, d2		3.6					0.7	0.3			0.7	
Delay (s)		26.1					4.4	5.1			6.4	
Level of Service		C					A	A			A	
Approach Delay (s/veh)		26.1			0.0			5.1			6.4	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	57.5	Sum of lost time (s)	11.0
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	0	38	0	0	0	25	868	0	0	1033	132
Future Volume (veh/h)	111	0	38	0	0	0	25	868	0	0	1033	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	0	0	1856	1856
Adj Flow Rate, veh/h	121	0	21	0	0	0	27	943	0	0	1123	131
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	0	0	3	3
Cap, veh/h	292	4	27	0	265	0	328	2209	0	0	1885	219
Arrive On Green	0.14	0.00	0.14	0.00	0.00	0.00	0.63	0.63	0.00	0.00	0.63	0.63
Sat Flow, veh/h	1070	28	190	0	1856	0	439	3618	0	0	3101	350
Grp Volume(v), veh/h	142	0	0	0	0	0	27	943	0	0	657	597
Grp Sat Flow(s),veh/h/ln	1288	0	0	0	1856	0	439	1763	0	0	1763	1596
Q Serve(g_s), s	4.9	0.0	0.0	0.0	0.0	0.0	1.9	6.5	0.0	0.0	10.6	10.6
Cycle Q Clear(g_c), s	5.1	0.0	0.0	0.0	0.0	0.0	12.5	6.5	0.0	0.0	10.6	10.6
Prop In Lane	0.85		0.15	0.00		0.00	1.00		0.00	0.00		0.22
Lane Grp Cap(c), veh/h	323	0	0	0	265	0	328	2209	0	0	1105	1000
V/C Ratio(X)	0.44	0.00	0.00	0.00	0.00	0.00	0.08	0.43	0.00	0.00	0.59	0.60
Avail Cap(c_a), veh/h	625	0	0	0	701	0	422	2959	0	0	1480	1339
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	19.7	0.0	0.0	0.0	0.0	0.0	9.0	4.5	0.0	0.0	5.3	5.3
Incr Delay (d2), s/veh	0.9	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.0	1.1	1.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	0.0	0.0	0.0	0.2	1.3	0.0	0.0	2.3	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.6	0.0	0.0	0.0	0.0	0.0	9.3	4.8	0.0	0.0	6.4	6.5
LnGrp LOS	C						A	A			A	A
Approach Vol, veh/h		142			0			970			1254	
Approach Delay, s/veh		20.6			0.0			4.9			6.5	
Approach LOS		C						A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	36.4	11.3	36.4	11.3
Change Period (Y+Rc), s	6.5	4.5	6.5	4.5
Max Green Setting (Gmax), s	40.0	18.0	40.0	18.0
Max Q Clear Time (g_c+I1), s	12.6	0.0	14.5	7.1
Green Ext Time (p_c), s	17.2	0.0	13.1	0.5

Intersection Summary	
HCM 7th Control Delay, s/veh	6.7
HCM 7th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	36	36	917	14	1181
v/c Ratio	0.42	0.12	0.14	0.41	0.04	0.53
Control Delay (s/veh)	20.4	18.2	9.3	7.6	7.6	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	20.4	18.2	9.3	7.6	7.6	8.9
Queue Length 50th (ft)	32	10	4	64	1	93
Queue Length 95th (ft)	71	29	29	212	13	304
Internal Link Dist (ft)	1046	977		1312		1464
Turn Bay Length (ft)			70		100	
Base Capacity (vph)	575	588	261	2301	372	2289
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.06	0.14	0.40	0.04	0.52

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	21	35	17	13	4	33	829	15	13	1030	56
Future Volume (vph)	62	21	35	17	13	4	33	829	15	13	1030	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.99		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1490			1537		1693	3209		1692	3190	
Flt Permitted		0.82			0.83		0.20	1.00		0.29	1.00	
Satd. Flow (perm)		1249			1314		364	3209		519	3190	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	23	38	18	14	4	36	901	16	14	1120	61
RTOR Reduction (vph)	0	25	0	0	3	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	103	0	0	33	0	36	916	0	14	1177	0
Confl. Peds. (#/hr)	8		6	6		8	4		6	6		4
Confl. Bikes (#/hr)			1			1			4			2
Parking (#/hr)	0	0	0	0	0	0		0	0		0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		11.0			11.0		40.0	40.0		40.0	40.0	
Effective Green, g (s)		11.0			11.0		40.0	40.0		40.0	40.0	
Actuated g/C Ratio		0.18			0.18		0.66	0.66		0.66	0.66	
Clearance Time (s)		4.5			4.5		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.5			3.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)		227			238		240	2121		343	2109	
v/s Ratio Prot								0.29			c0.37	
v/s Ratio Perm		c0.08			0.02		0.10			0.03		
v/c Ratio		0.45			0.14		0.15	0.43		0.04	0.56	
Uniform Delay, d1		22.1			20.8		3.9	4.9		3.6	5.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.7			0.3		0.8	0.4		0.1	0.7	
Delay (s)		23.8			21.0		4.7	5.3		3.7	6.2	
Level of Service		C			C		A	A		A	A	
Approach Delay (s/veh)		23.8			21.0			5.2			6.2	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	60.5	Sum of lost time (s)	9.5
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	21	35	17	13	4	33	829	15	13	1030	56
Future Volume (veh/h)	62	21	35	17	13	4	33	829	15	13	1030	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	0.99		0.97	0.99		0.97	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	67	23	11	18	14	1	36	901	15	14	1120	57
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	245	72	24	214	129	7	365	2170	36	460	2085	106
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.64	0.64	0.64	0.64	0.64	0.64
Sat Flow, veh/h	765	452	149	622	817	45	472	3365	56	604	3234	164
Grp Volume(v), veh/h	101	0	0	33	0	0	36	472	444	14	610	567
Grp Sat Flow(s),veh/h/ln	1366	0	0	1483	0	0	472	1763	1658	604	1763	1635
Q Serve(g_s), s	2.1	0.0	0.0	0.0	0.0	0.0	2.2	6.3	6.3	0.6	9.1	9.1
Cycle Q Clear(g_c), s	3.1	0.0	0.0	0.8	0.0	0.0	11.3	6.3	6.3	6.8	9.1	9.1
Prop In Lane	0.66		0.11	0.55		0.03	1.00		0.03	1.00		0.10
Lane Grp Cap(c), veh/h	340	0	0	350	0	0	365	1137	1069	460	1137	1054
V/C Ratio(X)	0.30	0.00	0.00	0.09	0.00	0.00	0.10	0.42	0.42	0.03	0.54	0.54
Avail Cap(c_a), veh/h	817	0	0	645	0	0	451	1460	1373	571	1460	1354
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.3	0.0	0.0	17.4	0.0	0.0	7.7	4.2	4.2	5.8	4.7	4.7
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.1	0.0	0.0	0.4	0.9	0.9	0.1	1.4	1.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	0.3	0.0	0.0	0.2	1.3	1.3	0.1	2.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	18.9	0.0	0.0	17.6	0.0	0.0	8.1	5.0	5.1	5.9	6.1	6.2
LnGrp LOS	B			B			A	A	A	A	A	A
Approach Vol, veh/h		101			33			952			1191	
Approach Delay, s/veh		18.9			17.6			5.2			6.1	
Approach LOS		B			B			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	36.1	12.2	36.1	12.2
Change Period (Y+Rc), s	5.0	4.5	5.0	4.5
Max Green Setting (Gmax), s	40.0	18.0	40.0	25.0
Max Q Clear Time (g_c+I1), s	11.1	2.8	13.3	5.1
Green Ext Time (p_c), s	19.9	0.1	15.2	0.6

Intersection Summary	
HCM 7th Control Delay, s/veh	6.5
HCM 7th LOS	A

Notes

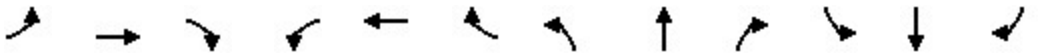
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	144	652	50	174	593	223	49	623	102	220	862
v/c Ratio	0.88	0.57	0.09	0.93	0.49	0.32	0.48	0.79	0.23	1.12	0.88
Control Delay (s/veh)	98.2	34.2	0.3	102.8	32.2	5.0	68.6	51.7	5.9	147.2	51.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	98.2	34.2	0.3	102.8	32.2	5.0	68.6	51.7	5.9	147.2	51.5
Queue Length 50th (ft)	111	218	0	135	192	0	37	236	0	~195	329
Queue Length 95th (ft)	#228	285	0	#272	252	55	77	301	34	#355	#473
Internal Link Dist (ft)		1689			2015			1308			1312
Turn Bay Length (ft)	190		100	180		150	140		100	160	
Base Capacity (vph)	171	1146	570	190	1219	689	190	861	474	197	981
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.57	0.09	0.92	0.49	0.32	0.26	0.72	0.22	1.12	0.88

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

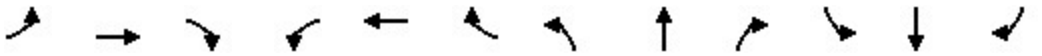
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	613	47	164	557	210	46	586	96	207	695	116
Future Volume (vph)	135	613	47	164	557	210	46	586	96	207	695	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	10	11	12	10	12	12	11	11	12
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.5	6.5	5.0	6.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1472	3219	1379	1636	3388	1520	1636	3505	1568	1694	3306	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1472	3219	1379	1636	3388	1520	1636	3505	1568	1694	3306	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	144	652	50	174	593	223	49	623	102	220	739	123
RTOR Reduction (vph)	0	0	33	0	0	144	0	0	78	0	11	0
Lane Group Flow (vph)	144	652	17	174	593	79	49	623	24	220	851	0
Confl. Peds. (#/hr)			6			12						6
Confl. Bikes (#/hr)			7			9						2
Parking (#/hr)	0	0	0									
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8			4			2			
Actuated Green, G (s)	13.3	41.8	41.8	13.8	42.3	42.3	6.7	27.9	27.9	14.0	35.2	
Effective Green, g (s)	13.3	41.8	41.8	13.8	42.3	42.3	6.7	27.9	27.9	14.0	35.2	
Actuated g/C Ratio	0.11	0.35	0.35	0.12	0.35	0.35	0.06	0.23	0.23	0.12	0.29	
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.5	6.5	5.0	6.5	
Vehicle Extension (s)	1.5	4.0	4.0	1.5	4.0	4.0	1.5	4.0	4.0	1.5	4.0	
Lane Grp Cap (vph)	163	1121	480	188	1194	535	91	814	364	197	969	
v/s Ratio Prot	0.10	c0.20		c0.11	0.18		0.03	0.18		c0.13	c0.26	
v/s Ratio Perm			0.01			0.05			0.02			
v/c Ratio	0.88	0.58	0.04	0.93	0.50	0.15	0.54	0.77	0.07	1.12	0.88	
Uniform Delay, d1	52.6	32.0	25.8	52.6	30.5	26.5	55.1	43.0	35.9	53.0	40.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	38.0	2.2	0.1	44.0	1.5	0.6	3.0	4.6	0.1	98.9	9.4	
Delay (s)	90.6	34.2	25.9	96.6	32.0	27.1	58.2	47.6	36.0	151.9	49.8	
Level of Service	F	C	C	F	C	C	E	D	D	F	D	
Approach Delay (s/veh)		43.3			42.2			46.7			70.5	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	51.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	613	47	164	557	210	46	586	96	207	695	116
Future Volume (veh/h)	135	613	47	164	557	210	46	586	96	207	695	116
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	144	652	15	174	593	70	49	623	19	220	739	111
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	170	1310	515	200	1370	595	63	744	332	206	895	134
Arrive On Green	0.10	0.37	0.37	0.11	0.39	0.39	0.04	0.21	0.21	0.12	0.29	0.29
Sat Flow, veh/h	1767	3526	1386	1767	3526	1531	1767	3526	1572	1767	3065	460
Grp Volume(v), veh/h	144	652	15	174	593	70	49	623	19	220	425	425
Grp Sat Flow(s),veh/h/ln	1767	1763	1386	1767	1763	1531	1767	1763	1572	1767	1763	1762
Q Serve(g_s), s	9.6	17.1	0.8	11.6	14.8	3.5	3.3	20.3	1.2	14.0	27.0	27.0
Cycle Q Clear(g_c), s	9.6	17.1	0.8	11.6	14.8	3.5	3.3	20.3	1.2	14.0	27.0	27.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.26
Lane Grp Cap(c), veh/h	170	1310	515	200	1370	595	63	744	332	206	515	514
V/C Ratio(X)	0.85	0.50	0.03	0.87	0.43	0.12	0.78	0.84	0.06	1.07	0.83	0.83
Avail Cap(c_a), veh/h	206	1310	515	206	1370	595	206	867	387	206	515	514
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	1.00	1.00	1.00	0.96	0.96	0.96	0.83	0.83	0.83
Uniform Delay (d), s/veh	53.4	29.1	23.9	52.3	27.0	23.5	57.4	45.4	37.8	53.0	39.6	39.6
Incr Delay (d2), s/veh	18.1	1.2	0.1	28.7	1.0	0.4	7.2	6.7	0.1	76.0	9.3	9.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	7.3	0.3	6.7	6.3	1.3	1.6	9.5	0.5	10.5	12.8	12.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	71.5	30.3	24.0	81.1	28.0	23.9	64.6	52.1	37.9	129.0	49.0	49.0
LnGrp LOS	E	C	C	F	C	C	E	D	D	F	D	D
Approach Vol, veh/h		811			837			691			1070	
Approach Delay, s/veh		37.5			38.7			52.6			65.4	
Approach LOS		D			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	31.8	16.6	52.6	9.3	41.5	18.6	50.6
Change Period (Y+Rc), s	5.0	6.5	5.0	6.0	5.0	6.5	5.0	6.0
Max Green Setting (Gmax), s	14.0	29.5	14.0	40.0	14.0	29.5	14.0	40.0
Max Q Clear Time (g_c+I1), s	16.0	22.3	11.6	16.8	5.3	29.0	13.6	19.1
Green Ext Time (p_c), s	0.0	3.0	0.0	5.9	0.0	0.3	0.0	6.0

Intersection Summary	
HCM 7th Control Delay, s/veh	49.6
HCM 7th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	62	38	35	788	27	880
v/c Ratio	0.23	0.13	0.08	0.31	0.06	0.36
Control Delay (s/veh)	12.6	11.3	6.1	5.0	6.1	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	12.6	11.3	6.1	5.0	6.1	5.4
Queue Length 50th (ft)	7	3	3	38	2	45
Queue Length 95th (ft)	32	22	20	132	17	154
Internal Link Dist (ft)	1467	309		1757		1308
Turn Bay Length (ft)			100		70	
Base Capacity (vph)	620	682	458	2700	437	2554
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.06	0.08	0.29	0.06	0.34

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	10	30	8	5	22	32	707	10	25	766	35
Future Volume (vph)	16	10	30	8	5	22	32	707	10	25	766	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12	11	11	12	10	11	11
Total Lost time (s)		4.5			4.5		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			0.91		1.00	1.00		1.00	0.99	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1456			1597		1692	3380		1470	3194	
Flt Permitted		0.89			0.90		0.32	1.00		0.35	1.00	
Satd. Flow (perm)		1312			1455		575	3380		547	3194	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	18	11	33	9	5	24	35	777	11	27	842	38
RTOR Reduction (vph)	0	29	0	0	21	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	33	0	0	17	0	35	787	0	27	876	0
Confl. Peds. (#/hr)	1		3	3		1	6		5	5		6
Confl. Bikes (#/hr)			1			1			3			4
Parking (#/hr)	0	0	0	0		0				0	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		5.7			5.7		32.3	32.3		32.3	32.3	
Effective Green, g (s)		5.7			5.7		32.3	32.3		32.3	32.3	
Actuated g/C Ratio		0.12			0.12		0.67	0.67		0.67	0.67	
Clearance Time (s)		4.5			4.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0			3.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		155			172		386	2274		368	2149	
v/s Ratio Prot								0.23			c0.27	
v/s Ratio Perm		c0.03			0.01		0.06			0.05		
v/c Ratio		0.21			0.10		0.09	0.35		0.07	0.41	
Uniform Delay, d1		19.1			18.9		2.7	3.3		2.7	3.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7			0.2		0.2	0.2		0.2	0.3	
Delay (s)		19.8			19.1		2.9	3.5		2.9	3.8	
Level of Service		B			B		A	A		A	A	
Approach Delay (s/veh)		19.8			19.1			3.5			3.8	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	4.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	48.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	41.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	10	30	8	5	22	32	707	10	25	766	35
Future Volume (veh/h)	16	10	30	8	5	22	32	707	10	25	766	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	0.98		0.98	0.98		0.98	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	18	11	1	9	5	1	35	777	10	27	842	34
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	174	22	2	175	21	4	565	2561	33	608	2480	100
Arrive On Green	0.04	0.04	0.04	0.04	0.04	0.04	0.72	0.72	0.72	0.72	0.72	0.72
Sat Flow, veh/h	852	521	47	884	491	98	627	3563	46	682	3450	139
Grp Volume(v), veh/h	30	0	0	15	0	0	35	384	403	27	430	446
Grp Sat Flow(s),veh/h/ln	1420	0	0	1474	0	0	627	1763	1846	682	1763	1826
Q Serve(g_s), s	0.5	0.0	0.0	0.0	0.0	0.0	0.9	3.3	3.3	0.6	3.8	3.8
Cycle Q Clear(g_c), s	0.8	0.0	0.0	0.4	0.0	0.0	4.7	3.3	3.3	3.9	3.8	3.8
Prop In Lane	0.60		0.03	0.60		0.07	1.00		0.02	1.00		0.08
Lane Grp Cap(c), veh/h	198	0	0	201	0	0	565	1267	1327	608	1267	1313
V/C Ratio(X)	0.15	0.00	0.00	0.07	0.00	0.00	0.06	0.30	0.30	0.04	0.34	0.34
Avail Cap(c_a), veh/h	793	0	0	791	0	0	638	1470	1539	686	1470	1523
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	0.0	0.0	19.4	0.0	0.0	3.1	2.1	2.1	2.8	2.2	2.2
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.2	0.0	0.0	0.1	0.3	0.3	0.1	0.3	0.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.2	0.0	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.0	0.0	0.0	19.6	0.0	0.0	3.2	2.4	2.4	2.9	2.5	2.5
LnGrp LOS	B			B			A	A	A	A	A	A
Approach Vol, veh/h		30			15			822			903	
Approach Delay, s/veh		20.0			19.6			2.4			2.5	
Approach LOS		B			B			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	35.7	6.3	35.7	6.3
Change Period (Y+Rc), s	5.5	4.5	5.5	4.5
Max Green Setting (Gmax), s	35.0	20.0	35.0	20.0
Max Q Clear Time (g_c+I1), s	6.7	2.8	5.9	2.4
Green Ext Time (p_c), s	10.7	0.1	12.1	0.0

Intersection Summary	
HCM 7th Control Delay, s/veh	2.9
HCM 7th LOS	A

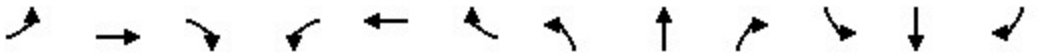
Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	341	620	33	520	221	571
v/c Ratio	0.62	0.79	0.35	0.69	0.81	0.46
Control Delay (s/veh)	55.5	50.4	75.2	52.0	74.2	32.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	55.5	50.4	75.2	52.0	74.2	32.2
Queue Length 50th (ft)	141	228	27	213	179	194
Queue Length 95th (ft)	218	#412	73	322	#361	301
Internal Link Dist (ft)	1269	825		628		1757
Turn Bay Length (ft)			100		150	
Base Capacity (vph)	841	904	250	1110	363	1397
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.69	0.13	0.47	0.61	0.41

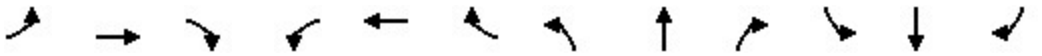
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	285	33	144	244	213	32	490	15	214	514	40
Future Volume (vph)	13	285	33	144	244	213	32	490	15	214	514	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	12	11	11	12	10	11	11
Total Lost time (s)		6.0			6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor		0.95			0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.95		1.00	1.00		1.00	0.99	
Flt Protected		1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3325			2994		1694	3371		1472	3179	
Flt Permitted		1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3325			2994		1694	3371		1472	3179	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	13	294	34	148	252	220	33	505	15	221	530	41
RTOR Reduction (vph)	0	6	0	0	46	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	335	0	0	574	0	33	518	0	221	568	0
Confl. Peds. (#/hr)			5			4			8			8
Confl. Bikes (#/hr)			1						1			5
Bus Blockages (#/hr)	0	0	0	0	0	1	0	0	0	0	0	0
Parking (#/hr)				0	0	0				0	0	
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)		20.8			31.3		4.6	30.2		23.6	49.2	
Effective Green, g (s)		20.8			31.3		4.6	30.2		23.6	49.2	
Actuated g/C Ratio		0.16			0.24		0.04	0.24		0.18	0.38	
Clearance Time (s)		6.0			6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		4.0			4.5		2.0	4.5		2.0	4.5	
Lane Grp Cap (vph)		540			732		60	795		271	1222	
v/s Ratio Prot		c0.10			c0.19		0.02	c0.15		c0.15	0.18	
v/s Ratio Perm												
v/c Ratio		0.62			0.78		0.55	0.65		0.82	0.46	
Uniform Delay, d1		49.9			45.1		60.6	44.1		50.1	29.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.5			6.1		6.1	2.3		16.2	0.5	
Delay (s)		52.4			51.3		66.7	46.4		66.2	30.0	
Level of Service		D			D		E	D		E	C	
Approach Delay (s/veh)		52.4			51.3			47.7			40.1	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	46.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	127.9	Sum of lost time (s)	22.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	285	33	144	244	213	32	490	15	214	514	40
Future Volume (veh/h)	13	285	33	144	244	213	32	490	15	214	514	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	13	294	28	148	252	173	33	505	0	221	530	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	21	473	45	209	355	241	41	795		258	1228	
Arrive On Green	0.15	0.15	0.15	0.24	0.24	0.24	0.02	0.23	0.00	0.15	0.35	0.00
Sat Flow, veh/h	142	3196	302	856	1450	986	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	169	0	166	313	0	260	33	505	0	221	530	0
Grp Sat Flow(s),veh/h/ln	1848	0	1793	1813	0	1480	1767	1763	0	1767	1763	0
Q Serve(g_s), s	8.0	0.0	8.1	14.7	0.0	15.0	1.7	12.1	0.0	11.4	10.8	0.0
Cycle Q Clear(g_c), s	8.0	0.0	8.1	14.7	0.0	15.0	1.7	12.1	0.0	11.4	10.8	0.0
Prop In Lane	0.08		0.17	0.47		0.67	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	274	0	265	443	0	362	41	795		258	1228	
V/C Ratio(X)	0.62	0.00	0.63	0.71	0.00	0.72	0.81	0.63		0.86	0.43	
Avail Cap(c_a), veh/h	595	0	577	680	0	556	341	1512		569	1512	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.2	0.0	37.3	32.2	0.0	32.3	45.3	32.6	0.0	38.9	23.3	0.0
Incr Delay (d2), s/veh	3.2	0.0	3.4	3.5	0.0	4.5	12.9	1.4	0.0	3.2	0.4	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	3.8	6.7	0.0	5.6	0.9	5.2	0.0	5.0	4.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	40.5	0.0	40.7	35.7	0.0	36.8	58.3	34.1	0.0	42.1	23.7	0.0
LnGrp LOS	D		D	D		D	E	C		D	C	
Approach Vol, veh/h		335			573			538			751	
Approach Delay, s/veh		40.6			36.2			35.6			29.1	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	19.8	6.2	38.5	28.8	17.6	27.0
Change Period (Y+Rc), s	6.0	4.0	6.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	30.0	18.0	40.0	35.0	30.0	40.0
Max Q Clear Time (g_c+I1), s	10.1	3.7	12.8	17.0	13.4	14.1
Green Ext Time (p_c), s	2.6	0.0	5.9	5.2	0.3	5.5

Intersection Summary	
HCM 7th Control Delay, s/veh	34.3
HCM 7th LOS	C

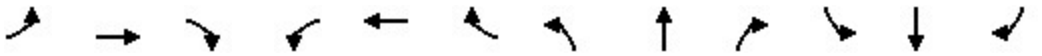
Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	296	16	71	489	7	697
v/c Ratio	0.73	0.06	0.24	0.28	0.02	0.41
Control Delay (s/veh)	30.6	12.5	12.4	9.4	9.3	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	30.6	12.5	12.4	9.4	9.3	8.9
Queue Length 50th (ft)	97	3	14	50	1	63
Queue Length 95th (ft)	175	14	46	95	8	124
Internal Link Dist (ft)	2562	754		1844		628
Turn Bay Length (ft)			75		80	
Base Capacity (vph)	546	500	302	1724	408	1701
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.03	0.24	0.28	0.02	0.41

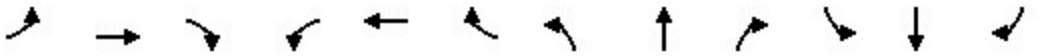
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	129	65	6	1	9	68	443	27	7	477	192
Future Volume (vph)	90	129	65	6	1	9	68	443	27	7	477	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	10	11	11	11	11	11
Total Lost time (s)		6.0			6.0		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.92		1.00	0.99		1.00	0.96	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1519			1435		1467	3185		1517	3053	
Flt Permitted		0.89			0.87		0.36	1.00		0.47	1.00	
Satd. Flow (perm)		1369			1275		560	3185		757	3053	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	94	134	68	6	1	9	71	461	28	7	497	200
RTOR Reduction (vph)	0	16	0	0	6	0	0	6	0	0	54	0
Lane Group Flow (vph)	0	280	0	0	10	0	71	483	0	7	643	0
Confl. Peds. (#/hr)	15		6	6		15	10		10	10		10
Confl. Bikes (#/hr)			3			1			2			3
Parking (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		18.5			18.5		35.2	35.2		35.2	35.2	
Effective Green, g (s)		18.5			18.5		35.2	35.2		35.2	35.2	
Actuated g/C Ratio		0.28			0.28		0.54	0.54		0.54	0.54	
Clearance Time (s)		6.0			6.0		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		388			361		302	1719		408	1648	
v/s Ratio Prot								0.15			c0.21	
v/s Ratio Perm		c0.20			0.01		0.13			0.01		
v/c Ratio		0.72			0.03		0.24	0.28		0.02	0.39	
Uniform Delay, d1		21.0			16.9		7.9	8.1		7.0	8.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.9			0.0		0.8	0.2		0.0	0.3	
Delay (s)		27.9			16.9		8.7	8.3		7.0	9.1	
Level of Service		C			B		A	A		A	A	
Approach Delay (s/veh)		27.9			16.9			8.4			9.0	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	65.2	Sum of lost time (s)	11.5
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	129	65	6	1	9	68	443	27	7	477	192
Future Volume (veh/h)	90	129	65	6	1	9	68	443	27	7	477	192
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	0.98		0.97	0.99		0.97	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	94	134	51	6	1	3	71	461	22	7	497	144
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	178	204	68	245	49	86	470	1825	87	557	1430	411
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.56	0.56	0.56	0.56	0.56	0.56
Sat Flow, veh/h	397	807	269	604	194	342	779	3245	154	901	2543	731
Grp Volume(v), veh/h	279	0	0	10	0	0	71	250	233	7	343	298
Grp Sat Flow(s),veh/h/ln	1473	0	0	1140	0	0	779	1763	1637	901	1763	1511
Q Serve(g_s), s	7.8	0.0	0.0	0.0	0.0	0.0	3.4	4.5	4.5	0.2	6.6	6.7
Cycle Q Clear(g_c), s	10.7	0.0	0.0	0.3	0.0	0.0	10.1	4.5	4.5	4.8	6.6	6.7
Prop In Lane	0.34		0.18	0.60		0.30	1.00		0.09	1.00		0.48
Lane Grp Cap(c), veh/h	450	0	0	381	0	0	470	991	920	557	991	850
V/C Ratio(X)	0.62	0.00	0.00	0.03	0.00	0.00	0.15	0.25	0.25	0.01	0.35	0.35
Avail Cap(c_a), veh/h	665	0	0	557	0	0	470	991	920	557	991	850
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.3	0.0	0.0	17.5	0.0	0.0	10.2	6.9	6.9	8.2	7.4	7.4
Incr Delay (d2), s/veh	2.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.0	0.4	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	0.0	0.1	0.0	0.0	0.5	1.4	1.3	0.0	2.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	23.3	0.0	0.0	17.5	0.0	0.0	10.5	7.2	7.3	8.2	7.8	7.9
LnGrp LOS	C			B			B	A	A	A	A	A
Approach Vol, veh/h		279			10			554			648	
Approach Delay, s/veh		23.3			17.5			7.7			7.9	
Approach LOS		C			B			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	40.5	21.7	40.5	21.7
Change Period (Y+Rc), s	5.5	6.0	5.5	6.0
Max Green Setting (Gmax), s	35.0	25.0	35.0	25.0
Max Q Clear Time (g_c+I1), s	12.1	12.7	8.7	2.3
Green Ext Time (p_c), s	6.2	1.8	7.9	0.0

Intersection Summary	
HCM 7th Control Delay, s/veh	10.7
HCM 7th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	192	454	81	535	416	479
v/c Ratio	0.71	0.33	0.51	0.52	0.49	0.57
Control Delay (s/veh)	45.4	17.0	46.2	23.4	20.8	17.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	45.4	17.0	46.2	23.4	20.8	17.3
Queue Length 50th (ft)	79	68	34	94	64	56
Queue Length 95th (ft)	186	150	94	197	127	122
Internal Link Dist (ft)		2554		2157	2447	1844
Turn Bay Length (ft)	200		250			
Base Capacity (vph)	448	1668	336	1405	1166	1124
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.27	0.24	0.38	0.36	0.43

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	432	4	78	473	40	4	274	122	39	235	185
Future Volume (vph)	184	432	4	78	473	40	4	274	122	39	235	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)	4.0	5.8		4.0	5.8			5.8			5.8	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.95			0.94	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1525	3214		1525	3175			3070			2994	
Flt Permitted	0.95	1.00		0.95	1.00			0.95			0.88	
Satd. Flow (perm)	1525	3214		1525	3175			2917			2638	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	192	450	4	81	493	42	4	285	127	41	245	193
RTOR Reduction (vph)	0	1	0	0	7	0	0	55	0	0	131	0
Lane Group Flow (vph)	192	453	0	81	528	0	0	361	0	0	348	0
Confl. Peds. (#/hr)			4			4	1					1
Confl. Bikes (#/hr)			4			10						2
Parking (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	12.9	30.8		6.5	24.4			19.6			19.6	
Effective Green, g (s)	12.9	30.8		6.5	24.4			19.6			19.6	
Actuated g/C Ratio	0.18	0.42		0.09	0.34			0.27			0.27	
Clearance Time (s)	4.0	5.8		4.0	5.8			5.8			5.8	
Vehicle Extension (s)	1.5	6.5		1.0	6.5			6.0			6.0	
Lane Grp Cap (vph)	271	1365		136	1068			788			713	
v/s Ratio Prot	c0.13	0.14		0.05	c0.17							
v/s Ratio Perm								0.12			c0.13	
v/c Ratio	0.71	0.33		0.60	0.49			0.46			0.49	
Uniform Delay, d1	28.0	14.0		31.7	19.1			22.0			22.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	6.8	0.5		4.6	1.1			1.2			1.5	
Delay (s)	34.8	14.4		36.3	20.3			23.2			23.7	
Level of Service	C	B		D	C			C			C	
Approach Delay (s/veh)		20.5			22.4			23.2			23.7	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	72.5	Sum of lost time (s)	15.6
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	432	4	78	473	40	4	274	122	39	235	185
Future Volume (veh/h)	184	432	4	78	473	40	4	274	122	39	235	185
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	192	450	3	81	493	35	4	285	70	41	245	57
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	243	1391	9	102	1041	74	75	589	141	130	514	118
Arrive On Green	0.14	0.41	0.41	0.06	0.33	0.33	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1767	3406	23	1767	3163	224	10	2618	626	193	2287	524
Grp Volume(v), veh/h	192	233	220	81	274	254	202	0	157	189	0	154
Grp Sat Flow(s),veh/h/ln	1767	1763	1665	1767	1763	1624	1848	0	1406	1589	0	1416
Q Serve(g_s), s	5.3	4.5	4.6	2.3	6.2	6.3	0.0	0.0	4.9	0.3	0.0	4.8
Cycle Q Clear(g_c), s	5.3	4.5	4.6	2.3	6.2	6.3	4.8	0.0	4.9	5.2	0.0	4.8
Prop In Lane	1.00		0.01	1.00		0.14	0.02		0.44	0.22		0.37
Lane Grp Cap(c), veh/h	243	720	680	102	580	534	488	0	316	444	0	318
V/C Ratio(X)	0.79	0.32	0.32	0.79	0.47	0.48	0.41	0.00	0.50	0.43	0.00	0.48
Avail Cap(c_a), veh/h	700	1047	989	525	1047	964	982	0	696	869	0	700
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.1	10.2	10.2	23.5	13.5	13.5	17.0	0.0	17.1	16.9	0.0	17.0
Incr Delay (d2), s/veh	2.2	1.2	1.3	5.1	2.7	3.0	2.0	0.0	4.4	2.3	0.0	4.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	1.7	1.6	1.0	2.6	2.4	2.0	0.0	1.8	1.9	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	23.3	11.4	11.4	28.6	16.2	16.5	19.1	0.0	21.5	19.3	0.0	21.1
LnGrp LOS	C	B	B	C	B	B	B		C	B		C
Approach Vol, veh/h		645			609			359			343	
Approach Delay, s/veh		14.9			18.0			20.1			20.1	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.9	26.4		17.2	10.9	22.4		17.2				
Change Period (Y+Rc), s	4.0	5.8		5.8	4.0	5.8		5.8				
Max Green Setting (Gmax), s	15.0	30.0		25.0	20.0	30.0		25.0				
Max Q Clear Time (g_c+I1), s	4.3	6.6		7.2	7.3	8.3		6.9				
Green Ext Time (p_c), s	0.0	7.1		4.1	0.1	8.0		4.3				

Intersection Summary		
HCM 7th Control Delay, s/veh	17.7	
HCM 7th LOS	B	

Notes

User approved pedestrian interval to be less than phase max green.

C. Level of Service and Queuing Worksheets – Proposed Conditions

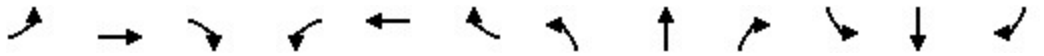
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	19	509	166	765	238	432	166	70	395
v/c Ratio	0.22	0.56	0.73	0.55	0.85	0.72	0.34	0.50	0.55
Control Delay (s/veh)	61.4	38.0	67.8	28.6	74.0	43.1	32.8	64.5	41.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	61.4	38.0	67.8	28.6	74.0	43.1	32.8	64.5	41.2
Queue Length 50th (ft)	14	171	122	211	178	290	95	52	136
Queue Length 95th (ft)	43	251	#220	355	#373	466	176	107	197
Internal Link Dist (ft)		1736		1055		1020			627
Turn Bay Length (ft)	110		120		210			70	
Base Capacity (vph)	281	1471	281	1497	281	632	524	281	1121
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.35	0.59	0.51	0.85	0.68	0.32	0.25	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	402	86	159	662	72	228	415	159	67	339	40
Future Volume (vph)	18	402	86	159	662	72	228	415	159	67	339	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1694	3288		1694	3330		1694	1783	1482	1694	3159	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1694	3288		1694	3330		1694	1783	1482	1694	3159	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	19	419	90	166	690	75	238	432	166	70	353	42
RTOR Reduction (vph)	0	13	0	0	5	0	0	0	0	0	0	0
Lane Group Flow (vph)	19	496	0	166	760	0	238	432	166	70	395	0
Confl. Peds. (#/hr)			3			2			8			3
Confl. Bikes (#/hr)			2			1			2			8
Parking (#/hr)						0					0	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	2.5	34.5		15.0	47.0		18.7	37.7	37.7	8.0	27.0	
Effective Green, g (s)	2.5	34.5		15.0	47.0		18.7	37.7	37.7	8.0	27.0	
Actuated g/C Ratio	0.02	0.29		0.13	0.40		0.16	0.32	0.32	0.07	0.23	
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	1.5	5.0		1.5	5.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	36	967		216	1335		270	573	476	115	727	
v/s Ratio Prot	0.01	0.15		c0.10	c0.23		c0.14	c0.24		0.04	0.13	
v/s Ratio Perm									0.11			
v/c Ratio	0.53	0.51		0.77	0.57		0.88	0.75	0.35	0.61	0.54	
Uniform Delay, d1	56.8	34.4		49.4	27.2		48.2	35.6	30.4	53.1	39.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.3	0.9		13.7	0.9		26.1	5.9	0.6	6.1	1.0	
Delay (s)	63.1	35.3		63.1	28.2		74.3	41.5	31.0	59.2	40.7	
Level of Service	E	D		E	C		E	D	C	E	D	
Approach Delay (s/veh)		36.3			34.4			48.8			43.5	
Approach LOS		D			C			D			D	

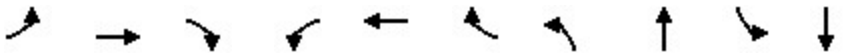
Intersection Summary			
HCM 2000 Control Delay (s/veh)	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	117.2	Sum of lost time (s)	22.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	402	86	159	662	72	228	415	159	67	339	40
Future Volume (veh/h)	18	402	86	159	662	72	228	415	159	67	339	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	19	419	76	166	690	70	238	432	166	70	353	42
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	37	945	170	199	1252	127	272	531	440	90	550	65
Arrive On Green	0.02	0.32	0.32	0.11	0.41	0.41	0.15	0.29	0.29	0.05	0.18	0.18
Sat Flow, veh/h	1767	2976	535	1767	3058	310	1767	1856	1538	1767	3004	354
Grp Volume(v), veh/h	19	247	248	166	397	363	238	432	166	70	206	189
Grp Sat Flow(s),veh/h/ln	1767	1763	1749	1767	1763	1605	1767	1856	1538	1767	1763	1595
Q Serve(g_s), s	1.0	10.5	10.7	8.7	16.2	16.3	12.4	20.5	8.2	3.7	10.2	10.4
Cycle Q Clear(g_c), s	1.0	10.5	10.7	8.7	16.2	16.3	12.4	20.5	8.2	3.7	10.2	10.4
Prop In Lane	1.00		0.31	1.00		0.19	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	37	560	555	199	721	657	272	531	440	90	323	292
V/C Ratio(X)	0.52	0.44	0.45	0.83	0.55	0.55	0.87	0.81	0.38	0.77	0.64	0.65
Avail Cap(c_a), veh/h	346	923	916	346	923	841	346	776	643	346	737	667
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.8	25.6	25.7	41.1	21.3	21.3	39.1	31.4	27.0	44.3	35.7	35.8
Incr Delay (d2), s/veh	4.1	1.2	1.2	3.5	1.4	1.5	15.4	5.4	0.8	5.2	3.0	3.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	4.4	4.5	3.9	6.7	6.1	6.4	9.6	3.0	1.8	4.6	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	49.9	26.8	26.9	44.6	22.7	22.8	54.5	36.8	27.8	49.5	38.7	39.2
LnGrp LOS	D	C	C	D	C	C	D	D	C	D	D	D
Approach Vol, veh/h		514			926			836			465	
Approach Delay, s/veh		27.7			26.7			40.0			40.5	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.1	35.5	20.1	22.8	7.5	44.2	10.3	32.5
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Max Green Setting (Gmax), s	18.5	49.5	18.5	39.5	18.5	49.5	18.5	39.5
Max Q Clear Time (g_c+I1), s	10.7	12.7	14.4	12.4	3.0	18.3	5.7	22.5
Green Ext Time (p_c), s	0.1	6.4	0.1	3.6	0.0	10.2	0.1	4.2

Intersection Summary	
HCM 7th Control Delay, s/veh	33.3
HCM 7th LOS	C



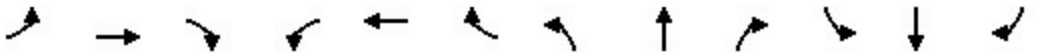
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	267	47	489	322	12	73	1142	12	662
v/c Ratio	0.17	0.71	0.12	0.93	0.45	0.02	0.29	0.93	0.08	0.71
Control Delay (s/veh)	15.1	48.4	0.6	46.7	26.1	0.1	23.8	42.9	21.4	38.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	15.1	48.4	0.6	46.7	26.1	0.1	23.8	42.9	21.4	38.2
Queue Length 50th (ft)	24	169	0	228	163	0	30	343	5	207
Queue Length 95th (ft)	51	267	0	#456	264	0	67	#664	19	318
Internal Link Dist (ft)		687			456			975		1020
Turn Bay Length (ft)	90		190	170		260	110		170	
Base Capacity (vph)	514	545	513	541	747	607	345	1233	282	954
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.49	0.09	0.90	0.43	0.02	0.21	0.93	0.04	0.69

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	240	42	440	290	11	66	700	328	11	518	77
Future Volume (vph)	63	240	42	440	290	11	66	700	328	11	518	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.95	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1684	1783	1306	1687	1783	1290	1693	3188		1694	3142	
Flt Permitted	0.44	1.00	1.00	0.34	1.00	1.00	0.25	1.00		0.11	1.00	
Satd. Flow (perm)	775	1783	1306	609	1783	1290	448	3188		191	3142	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	70	267	47	489	322	12	73	778	364	12	576	86
RTOR Reduction (vph)	0	0	37	0	0	7	0	40	0	0	9	0
Lane Group Flow (vph)	70	267	10	489	322	5	73	1102	0	12	653	0
Confl. Peds. (#/hr)	23		20	20		23	3		8	8		3
Confl. Bikes (#/hr)			6			25						7
Parking (#/hr)			0			0					0	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	D.P+P	NA		D.P+P	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	8		4	4		8	6			2		
Actuated Green, G (s)	45.8	22.3	22.3	45.8	40.3	40.3	38.4	37.4		38.4	32.3	
Effective Green, g (s)	45.8	22.3	22.3	45.8	40.3	40.3	38.4	37.4		38.4	32.3	
Actuated g/C Ratio	0.44	0.21	0.21	0.44	0.38	0.38	0.37	0.36		0.37	0.31	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	2.0	4.0	4.0	2.5	4.0	4.0	2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	384	377	276	505	683	494	235	1133		84	964	
v/s Ratio Prot	0.01	0.15		c0.22	0.18		c0.02	c0.35		0.00	0.21	
v/s Ratio Perm	0.07		0.01	c0.20		0.00	0.10			0.05		
v/c Ratio	0.18	0.71	0.04	0.97	0.47	0.01	0.31	0.97		0.14	0.68	
Uniform Delay, d1	17.9	38.4	32.9	24.7	24.4	20.1	22.9	33.4		25.3	31.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	6.4	0.1	31.7	0.7	0.0	0.3	20.4		0.3	2.1	
Delay (s)	18.0	44.8	33.0	56.4	25.1	20.1	23.2	53.8		25.6	34.0	
Level of Service	B	D	C	E	C	C	C	D		C	C	
Approach Delay (s/veh)		38.5			43.6			51.9			33.8	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	44.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	105.2	Sum of lost time (s)	21.0
Intersection Capacity Utilization	92.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	240	42	440	290	11	66	700	328	11	518	77
Future Volume (veh/h)	63	240	42	440	290	11	66	700	328	11	518	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	0.99		0.95	0.98		0.96	1.00		0.99	1.00		0.96
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	70	267	6	489	322	4	73	778	320	12	576	76
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	436	372	269	572	733	535	247	774	318	103	849	112
Arrive On Green	0.05	0.20	0.20	0.24	0.39	0.39	0.05	0.32	0.32	0.01	0.29	0.29
Sat Flow, veh/h	1767	1856	1342	1767	1856	1355	1767	2427	997	1767	2954	388
Grp Volume(v), veh/h	70	267	6	489	322	4	73	565	533	12	343	309
Grp Sat Flow(s),veh/h/ln	1767	1856	1342	1767	1856	1355	1767	1763	1661	1767	1763	1580
Q Serve(g_s), s	2.1	12.4	0.3	19.8	11.8	0.2	2.7	29.5	29.5	0.4	15.9	16.0
Cycle Q Clear(g_c), s	2.1	12.4	0.3	19.8	11.8	0.2	2.7	29.5	29.5	0.4	15.9	16.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.60	1.00		0.25
Lane Grp Cap(c), veh/h	436	372	269	572	733	535	247	562	530	103	507	454
V/C Ratio(X)	0.16	0.72	0.02	0.85	0.44	0.01	0.30	1.01	1.01	0.12	0.68	0.68
Avail Cap(c_a), veh/h	623	602	435	608	733	535	424	562	530	336	562	504
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.9	34.5	29.7	21.5	20.5	17.0	23.0	31.5	31.5	25.4	29.2	29.2
Incr Delay (d2), s/veh	0.1	3.7	0.0	10.7	0.6	0.0	0.2	39.2	40.8	0.2	3.3	3.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	5.9	0.1	9.5	5.0	0.1	1.1	18.0	17.2	0.2	6.9	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	16.0	38.2	29.8	32.1	21.1	17.0	23.2	70.7	72.3	25.6	32.5	33.0
LnGrp LOS	B	D	C	C	C	B	C	F	F	C	C	C
Approach Vol, veh/h		343			815			1171			664	
Approach Delay, s/veh		33.5			27.7			68.5			32.6	
Approach LOS		C			C			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.8	35.0	27.2	23.6	9.7	32.1	9.2	41.5
Change Period (Y+Rc), s	5.5	5.5	5.0	5.0	5.5	5.5	5.0	5.0
Max Green Setting (Gmax), s	13.5	29.5	24.0	30.0	13.5	29.5	14.0	30.0
Max Q Clear Time (g_c+I1), s	2.4	31.5	21.8	14.4	4.7	18.0	4.1	13.8
Green Ext Time (p_c), s	0.0	0.0	0.3	1.9	0.0	4.0	0.0	2.4

Intersection Summary	
HCM 7th Control Delay, s/veh	45.4
HCM 7th LOS	D

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	7	64	2	1340	139	970
v/c Ratio	0.02	0.23	0.04	0.65	0.76	0.61
Control Delay (s/veh)	0.2	1.8	48.5	6.7	92.5	34.9
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay (s/veh)	0.2	1.8	48.5	6.9	92.5	34.9
Queue Length 50th (ft)	0	0	2	25	136	380
Queue Length 95th (ft)	0	0	m2	243	250	623
Internal Link Dist (ft)	170	304		218		975
Turn Bay Length (ft)			70		270	
Base Capacity (vph)	403	392	151	2101	381	1820
Starvation Cap Reductn	0	0	0	212	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.16	0.01	0.71	0.36	0.53

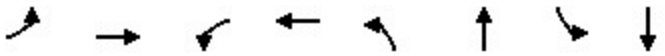
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	0	4	25	0	34	2	1118	115	128	892	0
Future Volume (vph)	3	0	4	25	0	34	2	1118	115	128	892	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5		5.5	5.5		6.0	5.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.92			0.92		1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1599			1609		1694	3332		1694	3388	
Flt Permitted		0.91			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1486			1427		1694	3332		1694	3388	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	0	4	27	0	37	2	1215	125	139	970	0
RTOR Reduction (vph)	0	6	0	0	57	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	1	0	0	7	0	2	1337	0	139	970	0
Confl. Peds. (#/hr)			1	1					3			
Confl. Bikes (#/hr)									2			1
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			4		11	6 8		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		17.1			17.1		0.9	95.0		16.7	71.7	
Effective Green, g (s)		17.1			17.1		0.9	95.0		16.7	71.7	
Actuated g/C Ratio		0.11			0.11		0.01	0.60		0.11	0.45	
Clearance Time (s)		5.5			5.5		5.5			6.0	5.5	
Vehicle Extension (s)		3.5			3.5		1.5			2.0	6.0	
Lane Grp Cap (vph)		160			154		9	2000		178	1535	
v/s Ratio Prot							c0.00	c0.40		c0.08	0.29	
v/s Ratio Perm		0.00			c0.00							
v/c Ratio		0.00			0.04		0.22	0.67		0.78	0.63	
Uniform Delay, d1		63.0			63.2		78.3	21.1		69.0	33.1	
Progression Factor		1.00			1.00		0.60	0.50		1.00	1.00	
Incremental Delay, d2		0.0			0.1		2.3	0.7		18.2	1.4	
Delay (s)		63.0			63.4		49.1	11.2		87.2	34.6	
Level of Service		E			E		D	B		F	C	
Approach Delay (s/veh)		63.0			63.4			11.3			41.2	
Approach LOS		E			E			B			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	158.2	Sum of lost time (s)	28.5
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

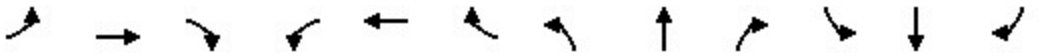
HCM 7th Edition methodology does not support Non-NEMA phasing.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	107	101	1	3	54	1204	4	948
v/c Ratio	0.39	0.39	0.00	0.00	0.56	0.89	0.07	0.47
Control Delay (s/veh)	59.2	51.4	55.0	0.0	96.1	53.4	46.8	0.8
Queue Delay	0.3	0.3	0.0	0.0	0.0	0.3	0.0	0.1
Total Delay (s/veh)	59.6	51.7	55.0	0.0	96.1	53.7	46.8	0.9
Queue Length 50th (ft)	94	75	1	0	53	580	4	0
Queue Length 95th (ft)	203	176	7	0	120	#1031	m9	0
Internal Link Dist (ft)		3515		195		1175		218
Turn Bay Length (ft)	60				110		80	
Base Capacity (vph)	291	276	259	754	151	1348	151	2294
Starvation Cap Reductn	0	0	0	0	0	0	0	270
Spillback Cap Reductn	28	26	0	0	0	14	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.40	0.00	0.00	0.36	0.90	0.03	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	1	39	1	0	3	50	1117	3	4	671	210
Future Volume (vph)	153	1	39	1	0	3	50	1117	3	4	671	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.5	5.5		5.5	5.5	
Lane Util. Factor	0.95	0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.88		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.98	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.85		1.00	1.00		1.00	0.96	
Flt Protected	0.95	0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1605	1366		1666	1329		1694	3386		1694	3248	
Flt Permitted	0.76	0.83		0.65	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1277	1161		1139	1329		1694	3386		1694	3248	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	165	1	42	1	0	3	54	1201	3	4	722	226
RTOR Reduction (vph)	0	12	0	0	2	0	0	0	0	0	14	0
Lane Group Flow (vph)	107	89	0	1	1	0	54	1204	0	4	934	0
Confl. Peds. (#/hr)	2		13	13		2			5			1
Confl. Bikes (#/hr)			6			102			3			2
Parking (#/hr)		0	0									
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			8		1	6		9	2 4	
Permitted Phases	8			8								
Actuated Green, G (s)	33.0	33.0		33.0	33.0		7.5	62.0		0.9	88.8	
Effective Green, g (s)	33.0	33.0		33.0	33.0		7.5	62.0		0.9	88.8	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.05	0.39		0.01	0.56	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.5	5.5		5.5		
Vehicle Extension (s)	3.5	3.5		3.5	3.5		1.5	6.0		1.5		
Lane Grp Cap (vph)	266	242		237	277		80	1327		9	1823	
v/s Ratio Prot					0.00		c0.03	c0.36		c0.00	c0.29	
v/s Ratio Perm	c0.08	0.08		0.00								
v/c Ratio	0.40	0.37		0.00	0.00		0.68	0.91		0.44	0.51	
Uniform Delay, d1	54.1	53.7		49.6	49.6		74.2	45.4		78.4	21.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.56	0.01	
Incremental Delay, d2	1.2	1.1		0.0	0.0		16.2	10.1		10.6	0.6	
Delay (s)	55.3	54.8		49.6	49.6		90.4	55.4		54.3	0.7	
Level of Service	E	D		D	D		F	E		D	A	
Approach Delay (s/veh)		55.0			49.6			56.9			0.9	
Approach LOS		E			D			E			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	158.2	Sum of lost time (s)	28.5
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

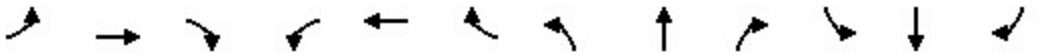
HCM 7th Edition methodology does not support Non-NEMA phasing.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	49	369	335	280	335	149	1342	91	727
v/c Ratio	0.37	0.66	1.02	0.57	0.52	0.51	1.07	0.57	0.57
Control Delay (s/veh)	53.5	28.9	96.6	37.5	6.9	23.2	75.2	31.5	26.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	53.5	28.9	96.6	37.5	6.9	23.2	75.2	31.5	26.6
Queue Length 50th (ft)	30	70	216	162	3	48	~484	28	182
Queue Length 95th (ft)	73	112	#471	251	66	109	#753	#85	299
Internal Link Dist (ft)		1285		1321			533		1175
Turn Bay Length (ft)	100		100			100		100	
Base Capacity (vph)	329	1029	329	555	681	292	1257	159	1270
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.36	1.02	0.50	0.49	0.51	1.07	0.57	0.57

Intersection Summary

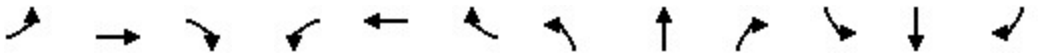
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	183	142	295	246	295	131	834	347	80	597	43
Future Volume (vph)	43	183	142	295	246	295	131	834	347	80	597	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	4.5	6.5		4.5	6.5	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.97	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1694	3125		1694	1783	1464	1692	3063		1694	3175	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.28	1.00		0.10	1.00	
Satd. Flow (perm)	1694	3125		1694	1783	1464	500	3063		177	3175	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	49	208	161	335	280	335	149	948	394	91	678	49
RTOR Reduction (vph)	0	132	0	0	0	238	0	36	0	0	4	0
Lane Group Flow (vph)	49	237	0	335	280	97	149	1306	0	91	723	0
Confl. Peds. (#/hr)			6			4	10		3	3		10
Confl. Bikes (#/hr)			7			22			1			13
Parking (#/hr)								0	0		0	0
Turn Type	Prot	NA		Prot	NA	Perm	D.P+P	NA		D.P+P	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases						4	2			6		
Actuated Green, G (s)	6.8	13.9		20.8	27.9	27.9	45.2	40.2		45.2	40.2	
Effective Green, g (s)	6.8	13.9		20.8	27.9	27.9	45.2	40.2		45.2	40.2	
Actuated g/C Ratio	0.07	0.14		0.20	0.27	0.27	0.44	0.39		0.44	0.39	
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	4.5	6.5		4.5	6.5	
Vehicle Extension (s)	2.5	2.5		3.0	3.0	3.0	3.0	4.5		3.0	4.5	
Lane Grp Cap (vph)	113	426		345	488	400	280	1208		152	1252	
v/s Ratio Prot	0.03	c0.08		c0.20	c0.16		0.03	c0.43		c0.03	0.23	
v/s Ratio Perm						0.07	0.21			0.23		
v/c Ratio	0.43	0.56		0.97	0.57	0.24	0.53	1.08		0.60	0.58	
Uniform Delay, d1	45.7	41.1		40.3	31.9	28.8	18.6	30.9		22.6	24.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	1.3		40.5	1.6	0.3	1.9	50.7		6.2	0.9	
Delay (s)	47.6	42.4		80.8	33.5	29.1	20.5	81.5		28.9	25.1	
Level of Service	D	D		F	C	C	C	F		C	C	
Approach Delay (s/veh)		43.0			48.6			75.4			25.5	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	53.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	101.9	Sum of lost time (s)	22.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	183	142	295	246	295	131	834	347	80	597	43
Future Volume (veh/h)	43	183	142	295	246	295	131	834	347	80	597	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	49	208	46	335	280	55	149	948	350	91	678	43
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	67	337	73	353	519	425	342	977	358	163	1292	82
Arrive On Green	0.04	0.12	0.12	0.20	0.28	0.28	0.05	0.41	0.41	0.05	0.41	0.41
Sat Flow, veh/h	1767	2861	616	1767	1856	1520	1767	2383	872	1767	3184	202
Grp Volume(v), veh/h	49	126	128	335	280	55	149	699	599	91	375	346
Grp Sat Flow(s),veh/h/ln	1767	1763	1714	1767	1856	1520	1767	1763	1492	1767	1763	1623
Q Serve(g_s), s	2.7	6.6	6.9	18.3	12.5	2.6	4.9	37.8	38.6	2.9	15.7	15.7
Cycle Q Clear(g_c), s	2.7	6.6	6.9	18.3	12.5	2.6	4.9	37.8	38.6	2.9	15.7	15.7
Prop In Lane	1.00		0.36	1.00		1.00	1.00		0.58	1.00		0.12
Lane Grp Cap(c), veh/h	67	208	202	353	519	425	342	723	612	163	715	658
V/C Ratio(X)	0.74	0.61	0.63	0.95	0.54	0.13	0.44	0.97	0.98	0.56	0.52	0.53
Avail Cap(c_a), veh/h	353	533	518	353	561	460	342	723	612	170	723	665
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.5	40.9	41.0	38.5	29.8	26.2	17.3	28.1	28.4	23.3	21.9	21.9
Incr Delay (d2), s/veh	11.1	2.1	2.4	34.6	0.9	0.1	0.9	25.7	31.1	3.7	1.1	1.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	3.0	3.0	11.0	5.5	1.0	2.0	20.1	18.2	1.3	6.4	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	57.5	43.0	43.5	73.1	30.7	26.4	18.2	53.8	59.4	27.0	23.0	23.1
LnGrp LOS	E	D	D	E	C	C	B	D	E	C	C	C
Approach Vol, veh/h		303			670			1447			812	
Approach Delay, s/veh		45.6			51.5			52.5			23.5	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	46.1	9.2	32.8	9.1	46.5	25.0	17.0
Change Period (Y+Rc), s	4.5	6.5	5.5	5.5	4.5	6.5	5.5	5.5
Max Green Setting (Gmax), s	5.0	40.0	19.5	29.5	5.0	40.0	19.5	29.5
Max Q Clear Time (g_c+I1), s	6.9	17.7	4.7	14.5	4.9	40.6	20.3	8.9
Green Ext Time (p_c), s	0.0	7.3	0.0	1.4	0.0	0.0	0.0	1.1

Intersection Summary	
HCM 7th Control Delay, s/veh	44.4
HCM 7th LOS	D

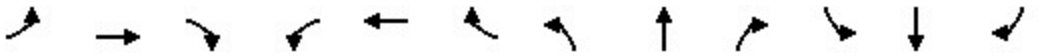
Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	NBL	NBT	SBT
Lane Group Flow (vph)	401	48	1158	1163
v/c Ratio	0.70	0.24	0.70	0.83
Control Delay (s/veh)	22.9	12.1	16.6	26.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay (s/veh)	22.9	12.1	16.6	26.2
Queue Length 50th (ft)	120	10	207	264
Queue Length 95th (ft)	216	29	322	#448
Internal Link Dist (ft)	2029		1464	533
Turn Bay Length (ft)		110		
Base Capacity (vph)	684	202	1899	1446
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.59	0.24	0.61	0.80

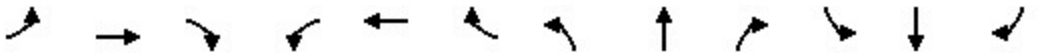
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	281	0	76	0	0	0	43	1031	0	0	802	233
Future Volume (vph)	281	0	76	0	0	0	43	1031	0	0	802	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0					4.5	6.5			6.5	
Lane Util. Factor		1.00					1.00	0.95			0.95	
Frpb, ped/bikes		1.00					1.00	1.00			0.99	
Flpb, ped/bikes		1.00					1.00	1.00			1.00	
Frt		0.97					1.00	1.00			0.97	
Flt Protected		0.96					0.95	1.00			1.00	
Satd. Flow (prot)		1660					1524	3219			3083	
Flt Permitted		0.95					0.13	1.00			1.00	
Satd. Flow (perm)		1639					208	3219			3083	
Peak-hour factor, PHF	0.89	0.92	0.89	0.92	0.92	0.92	0.89	0.89	0.92	0.92	0.89	0.89
Adj. Flow (vph)	316	0	85	0	0	0	48	1158	0	0	901	262
RTOR Reduction (vph)	0	80	0	0	0	0	0	0	0	0	33	0
Lane Group Flow (vph)	0	321	0	0	0	0	48	1158	0	0	1130	0
Confl. Peds. (#/hr)			6				14					14
Confl. Bikes (#/hr)			4									3
Parking (#/hr)	0		0				0	0			0	0
Turn Type	Perm	NA					D.P+P	NA			NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			2					
Actuated Green, G (s)		21.1					33.7	38.2			31.0	
Effective Green, g (s)		21.1					33.7	38.2			31.0	
Actuated g/C Ratio		0.29					0.47	0.53			0.43	
Clearance Time (s)		6.0					4.5	6.5			6.5	
Vehicle Extension (s)		3.0					3.0	5.0			5.0	
Lane Grp Cap (vph)		481					147	1712			1331	
v/s Ratio Prot							0.01	c0.36			c0.37	
v/s Ratio Perm		c0.20					0.14					
v/c Ratio		0.67					0.33	0.68			0.85	
Uniform Delay, d1		22.3					12.1	12.3			18.3	
Progression Factor		1.00					1.00	1.00			1.00	
Incremental Delay, d2		3.5					1.3	1.4			5.8	
Delay (s)		25.8					13.4	13.7			24.1	
Level of Service		C					B	B			C	
Approach Delay (s/veh)		25.8			0.0			13.7			24.1	
Approach LOS		C			A			B			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	71.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	281	0	76	0	0	0	43	1031	0	0	802	233
Future Volume (veh/h)	281	0	76	0	0	0	43	1031	0	0	802	233
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.96
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	0	0	1856	1856
Adj Flow Rate, veh/h	316	0	70	0	0	0	48	1158	0	0	901	223
Peak Hour Factor	0.89	0.92	0.89	0.92	0.92	0.92	0.89	0.89	0.92	0.92	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	0	0	3	3
Cap, veh/h	430	0	75	0	599	0	218	1784	0	0	1058	261
Arrive On Green	0.32	0.00	0.32	0.00	0.00	0.00	0.04	0.51	0.00	0.00	0.40	0.40
Sat Flow, veh/h	1053	0	233	0	1856	0	1767	3618	0	0	2726	651
Grp Volume(v), veh/h	386	0	0	0	0	0	48	1158	0	0	603	521
Grp Sat Flow(s),veh/h/ln	1286	0	0	0	1856	0	1767	1763	0	0	1763	1521
Q Serve(g_s), s	21.2	0.0	0.0	0.0	0.0	0.0	1.1	17.7	0.0	0.0	22.7	22.8
Cycle Q Clear(g_c), s	21.2	0.0	0.0	0.0	0.0	0.0	1.1	17.7	0.0	0.0	22.7	22.8
Prop In Lane	0.82		0.18	0.00		0.00	1.00		0.00	0.00		0.43
Lane Grp Cap(c), veh/h	505	0	0	0	599	0	218	1784	0	0	708	611
V/C Ratio(X)	0.76	0.00	0.00	0.00	0.00	0.00	0.22	0.65	0.00	0.00	0.85	0.85
Avail Cap(c_a), veh/h	521	0	0	0	622	0	264	1931	0	0	736	635
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	23.9	0.0	0.0	0.0	0.0	0.0	15.5	13.3	0.0	0.0	19.9	19.9
Incr Delay (d2), s/veh	6.5	0.0	0.0	0.0	0.0	0.0	0.5	1.1	0.0	0.0	10.2	11.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	0.0	0.0	0.0	0.0	0.0	0.4	6.2	0.0	0.0	10.3	9.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	30.4	0.0	0.0	0.0	0.0	0.0	16.0	14.3	0.0	0.0	30.0	31.6
LnGrp LOS	C						B	B			C	C
Approach Vol, veh/h		386			0			1206			1124	
Approach Delay, s/veh		30.4			0.0			14.4			30.8	
Approach LOS		C						B			C	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	7.6	35.8		29.6		43.4		29.6				
Change Period (Y+Rc), s	4.5	6.5		6.0		6.5		6.0				
Max Green Setting (Gmax), s	5.0	30.5		24.5		40.0		24.5				
Max Q Clear Time (g_c+I1), s	3.1	24.8		0.0		19.7		23.2				
Green Ext Time (p_c), s	0.0	4.5		0.0		13.3		0.3				

Intersection Summary		
HCM 7th Control Delay, s/veh	23.4	
HCM 7th LOS	C	

Notes

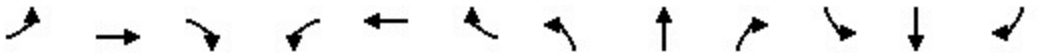
User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	225	92	102	1081	65	886
v/c Ratio	0.67	0.28	0.29	0.67	0.23	0.55
Control Delay (s/veh)	31.6	21.9	9.3	17.7	9.0	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	31.6	21.9	9.3	17.7	9.0	15.3
Queue Length 50th (ft)	83	30	16	190	10	139
Queue Length 95th (ft)	145	64	47	325	33	245
Internal Link Dist (ft)	1046	977		1312		1464
Turn Bay Length (ft)			70		100	
Base Capacity (vph)	487	496	351	1862	286	1831
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.19	0.29	0.58	0.23	0.48

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	20	80	31	31	17	88	913	16	56	667	95
Future Volume (vph)	94	20	80	31	31	17	88	913	16	56	667	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.5	5.5		4.5	5.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1463			1519		1692	3208		1694	3142	
Flt Permitted		0.83			0.84		0.26	1.00		0.18	1.00	
Satd. Flow (perm)		1237			1305		459	3208		326	3142	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	109	23	93	36	36	20	102	1062	19	65	776	110
RTOR Reduction (vph)	0	33	0	0	13	0	0	1	0	0	12	0
Lane Group Flow (vph)	0	192	0	0	79	0	102	1080	0	65	874	0
Confl. Peds. (#/hr)	15		2	2		15	19		9	9		19
Confl. Bikes (#/hr)			3			4			3			5
Parking (#/hr)	0	0	0	0	0	0		0	0		0	0
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		D.P+P	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)		17.6			17.6		40.2	36.5		40.2	36.5	
Effective Green, g (s)		17.6			17.6		40.2	36.5		40.2	36.5	
Actuated g/C Ratio		0.24			0.24		0.55	0.50		0.55	0.50	
Clearance Time (s)		5.0			5.0		4.5	5.5		4.5	5.5	
Vehicle Extension (s)		3.5			3.0		3.0	6.0		3.0	6.0	
Lane Grp Cap (vph)		299			315		316	1608		249	1575	
v/s Ratio Prot							c0.02	c0.34		0.01	0.28	
v/s Ratio Perm		c0.16			0.06		0.16			0.13		
v/c Ratio		0.64			0.25		0.32	0.67		0.26	0.55	
Uniform Delay, d1		24.8			22.3		8.2	13.6		8.6	12.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.9			0.4		0.6	1.7		0.6	0.9	
Delay (s)		29.7			22.7		8.8	15.4		9.2	13.5	
Level of Service		C			C		A	B		A	B	
Approach Delay (s/veh)		29.7			22.7			14.8			13.2	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	72.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	20	80	31	31	17	88	913	16	56	667	95
Future Volume (veh/h)	94	20	80	31	31	17	88	913	16	56	667	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	0.98		0.96	0.99		0.96	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	109	23	49	36	36	3	102	1062	17	65	776	95
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	228	53	70	194	162	11	438	1730	28	361	1496	183
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.07	0.51	0.51	0.05	0.50	0.50
Sat Flow, veh/h	707	275	365	565	847	59	1767	3366	54	1767	2983	365
Grp Volume(v), veh/h	181	0	0	75	0	0	102	556	523	65	458	413
Grp Sat Flow(s),veh/h/ln	1347	0	0	1471	0	0	1767	1763	1658	1767	1763	1585
Q Serve(g_s), s	5.2	0.0	0.0	0.0	0.0	0.0	1.7	14.0	14.0	1.0	10.9	10.9
Cycle Q Clear(g_c), s	7.6	0.0	0.0	2.4	0.0	0.0	1.7	14.0	14.0	1.0	10.9	10.9
Prop In Lane	0.60		0.27	0.48		0.04	1.00		0.03	1.00		0.23
Lane Grp Cap(c), veh/h	351	0	0	367	0	0	438	906	852	361	884	795
V/C Ratio(X)	0.52	0.00	0.00	0.20	0.00	0.00	0.23	0.61	0.61	0.18	0.52	0.52
Avail Cap(c_a), veh/h	608	0	0	489	0	0	462	1115	1048	407	1115	1003
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.3	0.0	0.0	21.4	0.0	0.0	7.3	10.8	10.8	7.8	10.5	10.5
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.3	0.0	0.0	0.3	2.4	2.6	0.2	1.7	1.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.0	0.9	0.0	0.0	0.5	4.9	4.7	0.3	3.9	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	24.7	0.0	0.0	21.6	0.0	0.0	7.6	13.2	13.4	8.1	12.2	12.4
LnGrp LOS	C			C			A	B	B	A	B	B
Approach Vol, veh/h		181			75			1181			936	
Approach Delay, s/veh		24.7			21.6			12.8			12.0	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	36.8		17.0	7.9	37.6		17.0				
Change Period (Y+Rc), s	4.5	5.5		5.0	4.5	5.5		5.0				
Max Green Setting (Gmax), s	5.0	39.5		17.5	5.0	39.5		24.5				
Max Q Clear Time (g_c+I1), s	3.7	12.9		4.4	3.0	16.0		9.6				
Green Ext Time (p_c), s	0.0	13.7		0.2	0.0	15.6		1.0				

Intersection Summary		
HCM 7th Control Delay, s/veh	13.7	
HCM 7th LOS	B	

Notes

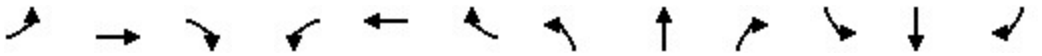
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	115	519	35	144	573	226	52	888	187	228	762
v/c Ratio	0.82	0.48	0.06	0.88	0.50	0.34	0.49	1.03	0.38	1.30	0.75
Control Delay (s/veh)	93.6	33.8	0.2	98.9	33.8	5.2	68.3	83.4	11.9	211.0	43.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	93.6	33.8	0.2	98.9	33.8	5.2	68.3	83.4	11.9	211.0	43.9
Queue Length 50th (ft)	90	172	0	114	192	0	41	~397	23	~231	290
Queue Length 95th (ft)	#171	212	0	#213	233	45	77	#479	75	#364	#360
Internal Link Dist (ft)		1689			2029			1308			1312
Turn Bay Length (ft)	190		100	180		150	140		100	160	
Base Capacity (vph)	153	1073	556	170	1146	663	170	861	489	176	1013
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.48	0.06	0.85	0.50	0.34	0.31	1.03	0.38	1.30	0.75

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

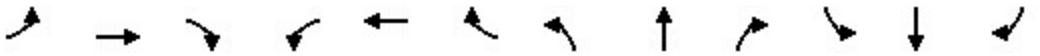
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	441	30	122	487	192	44	755	159	194	568	80
Future Volume (vph)	98	441	30	122	487	192	44	755	159	194	568	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	10	11	12	10	12	12	11	11	12
Total Lost time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1472	3219	1369	1636	3388	1519	1636	3505	1532	1694	3315	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1472	3219	1369	1636	3388	1519	1636	3505	1532	1694	3315	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	115	519	35	144	573	226	52	888	187	228	668	94
RTOR Reduction (vph)	0	0	24	0	0	152	0	0	112	0	8	0
Lane Group Flow (vph)	115	519	11	144	573	74	52	888	76	228	754	0
Confl. Peds. (#/hr)			13			8			5			4
Confl. Bikes (#/hr)			5			16			6			12
Parking (#/hr)	0	0	0									
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8			4			2			
Actuated Green, G (s)	11.4	38.7	38.7	12.0	39.3	39.3	6.9	30.8	30.8	12.5	36.4	
Effective Green, g (s)	11.4	38.7	38.7	12.0	39.3	39.3	6.9	30.8	30.8	12.5	36.4	
Actuated g/C Ratio	0.10	0.32	0.32	0.10	0.33	0.33	0.06	0.26	0.26	0.10	0.30	
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	
Vehicle Extension (s)	1.5	4.0	4.0	1.5	4.0	4.0	1.5	4.0	4.0	1.5	4.0	
Lane Grp Cap (vph)	139	1038	441	163	1109	497	94	899	393	176	1005	
v/s Ratio Prot	0.08	0.16		c0.09	c0.17		0.03	c0.25		c0.13	c0.23	
v/s Ratio Perm			0.01			0.05			0.05			
v/c Ratio	0.83	0.50	0.03	0.88	0.52	0.15	0.55	0.99	0.19	1.30	0.75	
Uniform Delay, d1	53.3	32.8	27.8	53.3	32.7	28.5	55.0	44.4	34.9	53.8	37.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	30.2	1.7	0.1	38.0	1.7	0.6	4.0	26.8	0.3	168.4	3.3	
Delay (s)	83.5	34.6	27.9	91.3	34.4	29.2	59.0	71.2	35.2	222.1	41.0	
Level of Service	F	C	C	F	C	C	E	E	D	F	D	
Approach Delay (s/veh)		42.6			41.8			64.7			82.7	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	59.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	441	30	122	487	192	44	755	159	194	568	80
Future Volume (veh/h)	98	441	30	122	487	192	44	755	159	194	568	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	115	519	8	144	573	51	52	888	83	228	668	85
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	140	1189	465	170	1249	541	67	867	378	184	979	124
Arrive On Green	0.08	0.34	0.34	0.10	0.35	0.35	0.04	0.25	0.25	0.10	0.31	0.31
Sat Flow, veh/h	1767	3526	1378	1767	3526	1528	1767	3526	1536	1767	3136	399
Grp Volume(v), veh/h	115	519	8	144	573	51	52	888	83	228	375	378
Grp Sat Flow(s),veh/h/ln	1767	1763	1378	1767	1763	1528	1767	1763	1536	1767	1763	1772
Q Serve(g_s), s	7.7	13.7	0.5	9.6	15.0	2.7	3.5	29.5	5.2	12.5	22.3	22.4
Cycle Q Clear(g_c), s	7.7	13.7	0.5	9.6	15.0	2.7	3.5	29.5	5.2	12.5	22.3	22.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	140	1189	465	170	1249	541	67	867	378	184	550	553
V/C Ratio(X)	0.82	0.44	0.02	0.85	0.46	0.09	0.78	1.02	0.22	1.24	0.68	0.68
Avail Cap(c_a), veh/h	184	1189	465	184	1249	541	184	867	378	184	550	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	1.00	1.00	1.00	0.92	0.92	0.92	0.81	0.81	0.81
Uniform Delay (d), s/veh	54.4	30.9	26.5	53.4	29.9	25.9	57.2	45.3	36.1	53.8	36.1	36.1
Incr Delay (d2), s/veh	14.7	1.1	0.1	25.7	1.2	0.3	6.5	35.7	0.4	139.1	3.1	3.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	6.0	0.2	5.4	6.5	1.0	1.7	17.0	2.0	12.6	9.9	10.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	69.2	32.0	26.6	79.1	31.1	26.2	63.7	81.0	36.5	192.8	39.2	39.2
LnGrp LOS	E	C	C	E	C	C	E	F	D	F	D	D
Approach Vol, veh/h		642			768			1023			981	
Approach Delay, s/veh		38.6			39.8			76.5			74.9	
Approach LOS		D			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	36.0	16.0	49.0	11.0	44.0	18.0	47.0
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s	12.5	29.5	12.5	39.5	12.5	29.5	12.5	39.5
Max Q Clear Time (g_c+I1), s	14.5	31.5	9.7	17.0	5.5	24.4	11.6	15.7
Green Ext Time (p_c), s	0.0	0.0	0.0	5.6	0.0	2.6	0.0	4.8

Intersection Summary	
HCM 7th Control Delay, s/veh	60.6
HCM 7th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	73	56	25	1027	21	802
v/c Ratio	0.27	0.18	0.05	0.40	0.07	0.33
Control Delay (s/veh)	13.8	12.2	6.8	6.3	7.3	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	13.8	12.2	6.8	6.3	7.3	5.8
Queue Length 50th (ft)	10	7	2	62	2	44
Queue Length 95th (ft)	38	30	17	211	16	155
Internal Link Dist (ft)	1470	309		1757		1308
Turn Bay Length (ft)			100		70	
Base Capacity (vph)	583	666	485	2638	319	2486
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.08	0.05	0.39	0.07	0.32

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	10	29	13	11	26	22	907	7	19	671	43
Future Volume (vph)	26	10	29	13	11	26	22	907	7	19	671	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12	11	11	12	10	11	11
Total Lost time (s)		5.0			5.0		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.93		1.00	1.00		1.00	0.99	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1467			1617		1694	3383		1470	3186	
Flt Permitted		0.85			0.88		0.35	1.00		0.26	1.00	
Satd. Flow (perm)		1265			1450		622	3383		410	3186	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	29	11	33	15	12	29	25	1019	8	21	754	48
RTOR Reduction (vph)	0	29	0	0	25	0	0	1	0	0	5	0
Lane Group Flow (vph)	0	44	0	0	31	0	25	1026	0	21	797	0
Confl. Peds. (#/hr)	2		2	2		2	1		7	7		1
Confl. Bikes (#/hr)			1			5			4			1
Parking (#/hr)	0	0	0	0		0				0	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		6.2			6.2		33.1	33.1		33.1	33.1	
Effective Green, g (s)		6.2			6.2		33.1	33.1		33.1	33.1	
Actuated g/C Ratio		0.12			0.12		0.66	0.66		0.66	0.66	
Clearance Time (s)		5.0			5.0		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0			3.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		157			180		413	2248		272	2117	
v/s Ratio Prot								c0.30			0.25	
v/s Ratio Perm		c0.03			0.02		0.04			0.05		
v/c Ratio		0.28			0.17		0.06	0.46		0.08	0.38	
Uniform Delay, d1		19.8			19.5		2.9	4.0		3.0	3.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.0			0.5		0.1	0.3		0.3	0.2	
Delay (s)		20.8			19.9		3.0	4.3		3.2	4.0	
Level of Service		C			B		A	A		A	A	
Approach Delay (s/veh)		20.8			19.9			4.3			4.0	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	49.8	Sum of lost time (s)	10.5
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

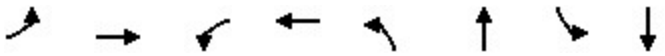
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	10	29	13	11	26	22	907	7	19	671	43
Future Volume (veh/h)	26	10	29	13	11	26	22	907	7	19	671	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	0.99		1.00	0.99		0.97	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	0.90	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	29	11	0	15	12	1	25	1019	7	21	754	42
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	196	19	0	169	32	3	588	2532	17	489	2392	133
Arrive On Green	0.05	0.05	0.00	0.05	0.05	0.05	0.71	0.71	0.71	0.71	0.71	0.71
Sat Flow, veh/h	1032	392	0	812	650	54	676	3588	25	545	3390	189
Grp Volume(v), veh/h	40	0	0	28	0	0	25	501	525	21	392	404
Grp Sat Flow(s),veh/h/ln	1424	0	0	1516	0	0	676	1763	1850	545	1763	1816
Q Serve(g_s), s	0.4	0.0	0.0	0.0	0.0	0.0	0.6	5.0	5.0	0.7	3.6	3.6
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.7	0.0	0.0	4.2	5.0	5.0	5.7	3.6	3.6
Prop In Lane	0.72		0.00	0.54		0.04	1.00		0.01	1.00		0.10
Lane Grp Cap(c), veh/h	215	0	0	204	0	0	588	1244	1306	489	1244	1281
V/C Ratio(X)	0.19	0.00	0.00	0.14	0.00	0.00	0.04	0.40	0.40	0.04	0.32	0.32
Avail Cap(c_a), veh/h	757	0	0	773	0	0	664	1441	1513	550	1441	1484
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	0.0	0.0	19.7	0.0	0.0	3.2	2.6	2.6	3.8	2.4	2.4
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.3	0.0	0.0	0.1	0.5	0.4	0.1	0.3	0.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.3	0.0	0.0	0.0	0.4	0.4	0.0	0.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.3	0.0	0.0	20.0	0.0	0.0	3.3	3.0	3.0	3.8	2.7	2.7
LnGrp LOS	C			B			A	A	A	A	A	A
Approach Vol, veh/h		40			28			1051			817	
Approach Delay, s/veh		20.3			20.0			3.0			2.7	
Approach LOS		C			B			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	35.7	7.1	35.7	7.1
Change Period (Y+Rc), s	5.5	5.0	5.5	5.0
Max Green Setting (Gmax), s	35.0	19.5	35.0	19.5
Max Q Clear Time (g_c+I1), s	7.0	3.1	7.7	2.7
Green Ext Time (p_c), s	14.2	0.1	10.5	0.1

Intersection Summary	
HCM 7th Control Delay, s/veh	3.5
HCM 7th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

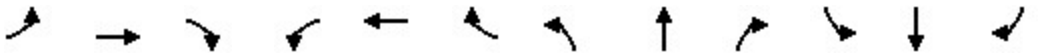


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	27	341	110	552	61	697	233	610
v/c Ratio	0.20	0.73	0.50	1.13	0.47	0.74	0.82	0.46
Control Delay (s/veh)	30.6	48.7	37.9	117.9	66.8	43.1	69.0	25.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	30.6	48.7	37.9	117.9	66.8	43.1	69.0	25.7
Queue Length 50th (ft)	13	234	58	~524	48	266	179	185
Queue Length 95th (ft)	35	351	107	#756	93	323	268	230
Internal Link Dist (ft)		1269		825		628		1757
Turn Bay Length (ft)					100		150	
Base Capacity (vph)	135	550	221	487	253	1225	380	1531
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.62	0.50	1.13	0.24	0.57	0.61	0.40

Intersection Summary

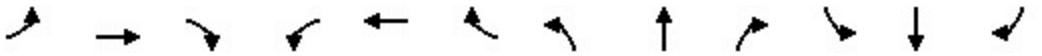
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	224	62	92	228	236	51	576	9	196	477	35
Future Volume (vph)	23	224	62	92	228	236	51	576	9	196	477	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	12	11	11	12	10	11	11
Total Lost time (s)	6.0	6.0		5.5	6.0		5.5	6.0		5.5	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.92		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1694	1716		1525	1459		1694	3378		1472	3165	
Flt Permitted	0.11	1.00		0.33	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	198	1716		530	1459		1694	3378		1472	3165	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	27	267	74	110	271	281	61	686	11	233	568	42
RTOR Reduction (vph)	0	7	0	0	26	0	0	1	0	0	4	0
Lane Group Flow (vph)	27	334	0	110	526	0	61	696	0	233	606	0
Confl. Peds. (#/hr)			11			17			13			44
Confl. Bikes (#/hr)						3			4			
Bus Blockages (#/hr)	0	0	0	0	0	1	0	0	0	0	0	0
Parking (#/hr)				0	0	0				0	0	
Turn Type	D.P+P	NA		D.P+P	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	6			2								
Actuated Green, G (s)	38.7	33.5		39.2	36.0		7.4	33.2		21.9	47.7	
Effective Green, g (s)	38.7	33.5		39.2	36.0		7.4	33.2		21.9	47.7	
Actuated g/C Ratio	0.33	0.29		0.33	0.31		0.06	0.28		0.19	0.41	
Clearance Time (s)	6.0	6.0		5.5	6.0		5.5	6.0		5.5	6.0	
Vehicle Extension (s)	4.0	4.0		2.0	4.5		2.0	4.5		2.0	4.5	
Lane Grp Cap (vph)	99	490		225	447		106	956		274	1287	
v/s Ratio Prot	0.01	0.19		c0.02	c0.36		0.04	c0.21		c0.16	0.19	
v/s Ratio Perm	0.08			0.14								
v/c Ratio	0.27	0.68		0.49	1.18		0.58	0.73		0.85	0.47	
Uniform Delay, d1	30.7	37.2		29.6	40.7		53.4	38.0		46.1	25.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	4.2		0.6	100.4		4.6	3.2		20.8	0.5	
Delay (s)	32.7	41.4		30.2	141.1		58.1	41.2		66.9	26.0	
Level of Service	C	D		C	F		E	D		E	C	
Approach Delay (s/veh)		40.7			122.6			42.5			37.3	
Approach LOS		D			F			D			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	60.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	117.3	Sum of lost time (s)	23.5
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	224	62	92	228	236	51	576	9	196	477	35
Future Volume (veh/h)	23	224	62	92	228	236	51	576	9	196	477	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	27	267	57	110	271	181	61	686	0	233	568	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	149	441	94	314	294	196	79	967		266	1341	
Arrive On Green	0.03	0.30	0.30	0.05	0.32	0.32	0.04	0.27	0.00	0.15	0.38	0.00
Sat Flow, veh/h	1767	1479	316	1767	918	613	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	27	0	324	110	0	452	61	686	0	233	568	0
Grp Sat Flow(s),veh/h/ln	1767	0	1795	1767	0	1531	1767	1763	0	1767	1763	0
Q Serve(g_s), s	1.0	0.0	15.9	4.4	0.0	29.3	3.5	18.0	0.0	13.3	12.2	0.0
Cycle Q Clear(g_c), s	1.0	0.0	15.9	4.4	0.0	29.3	3.5	18.0	0.0	13.3	12.2	0.0
Prop In Lane	1.00		0.18	1.00		0.40	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	149	0	535	314	0	491	79	967		266	1341	
V/C Ratio(X)	0.18	0.00	0.61	0.35	0.00	0.92	0.78	0.71		0.87	0.42	
Avail Cap(c_a), veh/h	189	0	611	314	0	521	283	1371		490	1371	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.6	0.0	30.9	24.4	0.0	33.7	48.6	33.6	0.0	42.7	23.5	0.0
Incr Delay (d2), s/veh	0.8	0.0	1.8	0.2	0.0	22.1	6.0	1.7	0.0	3.5	0.4	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	7.1	1.8	0.0	13.5	1.7	7.7	0.0	5.9	5.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	27.4	0.0	32.7	24.7	0.0	55.8	54.6	35.3	0.0	46.3	23.9	0.0
LnGrp LOS	C		C	C		E	D	D		D	C	
Approach Vol, veh/h		351			562			747			801	
Approach Delay, s/veh		32.3			49.7			36.9			30.4	
Approach LOS		C			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	36.7	10.1	45.1	8.7	39.0	21.0	34.2
Change Period (Y+Rc), s	5.5	6.0	5.5	6.0	6.0	6.0	5.5	6.0
Max Green Setting (Gmax), s	5.5	35.0	16.5	40.0	5.0	35.0	28.5	40.0
Max Q Clear Time (g_c+I1), s	6.4	17.9	5.5	14.2	3.0	31.3	15.3	20.0
Green Ext Time (p_c), s	0.0	2.5	0.0	6.3	0.0	1.4	0.3	7.0

Intersection Summary	
HCM 7th Control Delay, s/veh	37.1
HCM 7th LOS	D

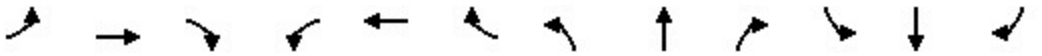
Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	237	15	55	675	16	709
v/c Ratio	0.63	0.05	0.15	0.39	0.04	0.46
Control Delay (s/veh)	30.7	18.2	9.0	12.0	8.2	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	30.7	18.2	9.0	12.0	8.2	12.2
Queue Length 50th (ft)	97	4	12	98	3	105
Queue Length 95th (ft)	160	17	27	167	11	145
Internal Link Dist (ft)	2562	752		1844		628
Turn Bay Length (ft)			75		80	
Base Capacity (vph)	499	484	355	1726	400	1549
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.03	0.15	0.39	0.04	0.46

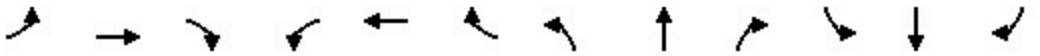
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	111	29	5	5	3	47	558	22	14	396	214
Future Volume (vph)	64	111	29	5	5	3	47	558	22	14	396	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	10	11	11	11	11	11
Total Lost time (s)		6.0			6.0		4.5	6.0		4.5	6.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.97		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1526			1511		1466	3194		1520	2989	
Flt Permitted		0.89			0.88		0.34	1.00		0.36	1.00	
Satd. Flow (perm)		1380			1352		526	3194		584	2989	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	74	129	34	6	6	3	55	649	26	16	460	249
RTOR Reduction (vph)	0	8	0	0	2	0	0	3	0	0	79	0
Lane Group Flow (vph)	0	229	0	0	13	0	55	672	0	16	630	0
Confl. Peds. (#/hr)	42		14	14		42	34		23	23		34
Confl. Bikes (#/hr)			2			2			3			
Parking (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		D.P+P	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		19.1			19.1		39.7	38.8		39.7	37.0	
Effective Green, g (s)		19.1			19.1		39.7	38.8		39.7	37.0	
Actuated g/C Ratio		0.25			0.25		0.53	0.52		0.53	0.49	
Clearance Time (s)		6.0			6.0		4.5	6.0		4.5	6.0	
Vehicle Extension (s)		4.0			4.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)		350			342		311	1645		319	1468	
v/s Ratio Prot							c0.01	0.21		0.00	c0.21	
v/s Ratio Perm		c0.17			0.01		0.09			0.03		
v/c Ratio		0.65			0.04		0.18	0.41		0.05	0.43	
Uniform Delay, d1		25.1			21.2		8.9	11.2		8.6	12.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.8			0.1		0.3	0.3		0.1	0.4	
Delay (s)		29.9			21.2		9.1	11.6		8.6	12.8	
Level of Service		C			C		A	B		A	B	
Approach Delay (s/veh)		29.9			21.2			11.4			12.7	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	75.3	Sum of lost time (s)	16.5
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	111	29	5	5	3	47	558	22	14	396	214
Future Volume (veh/h)	64	111	29	5	5	3	47	558	22	14	396	214
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	0.95		0.93	0.97		0.93	0.99		0.95	0.99		0.96
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	74	129	24	6	6	1	55	649	21	16	460	141
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	155	229	38	195	171	24	475	1684	54	428	1210	367
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.05	0.51	0.51	0.02	0.48	0.48
Sat Flow, veh/h	368	957	157	509	714	102	1767	3300	107	1767	2504	759
Grp Volume(v), veh/h	227	0	0	13	0	0	55	346	324	16	322	279
Grp Sat Flow(s),veh/h/ln	1482	0	0	1325	0	0	1767	1763	1643	1767	1763	1501
Q Serve(g_s), s	5.9	0.0	0.0	0.0	0.0	0.0	1.1	8.6	8.6	0.3	8.3	8.4
Cycle Q Clear(g_c), s	9.6	0.0	0.0	0.4	0.0	0.0	1.1	8.6	8.6	0.3	8.3	8.4
Prop In Lane	0.33		0.11	0.46		0.08	1.00		0.06	1.00		0.51
Lane Grp Cap(c), veh/h	422	0	0	391	0	0	475	900	839	428	852	725
V/C Ratio(X)	0.54	0.00	0.00	0.03	0.00	0.00	0.12	0.39	0.39	0.04	0.38	0.38
Avail Cap(c_a), veh/h	581	0	0	535	0	0	517	900	839	518	852	725
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.2	0.0	0.0	20.8	0.0	0.0	8.7	10.6	10.7	8.5	11.7	11.7
Incr Delay (d2), s/veh	1.5	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.6	0.0	0.6	0.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	0.0	0.2	0.0	0.0	0.4	3.0	2.8	0.1	3.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	25.7	0.0	0.0	20.9	0.0	0.0	8.8	11.2	11.3	8.5	12.3	12.4
LnGrp LOS	C			C			A	B	B	A	B	B
Approach Vol, veh/h		227			13			725			617	
Approach Delay, s/veh		25.7			20.9			11.1			12.2	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.9	42.5		23.1	7.8	40.5		23.1				
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		6.0				
Max Green Setting (Gmax), s	5.0	34.5		25.0	5.0	34.5		25.0				
Max Q Clear Time (g_c+I1), s	2.3	10.6		11.6	3.1	10.4		2.4				
Green Ext Time (p_c), s	0.0	7.8		1.5	0.0	7.0		0.0				

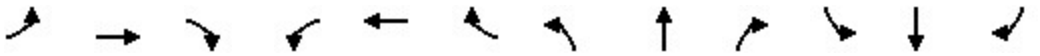
Intersection Summary		
HCM 7th Control Delay, s/veh	13.7	
HCM 7th LOS	B	

Notes
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	202	469	91	554	488	446
v/c Ratio	0.76	0.36	0.54	0.57	0.56	0.53
Control Delay (s/veh)	53.3	19.9	50.3	26.8	24.3	21.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	53.3	19.9	50.3	26.8	24.3	21.2
Queue Length 50th (ft)	95	83	44	115	97	76
Queue Length 95th (ft)	#220	165	106	212	166	139
Internal Link Dist (ft)		2554		2157	2447	1844
Turn Bay Length (ft)	200		250			
Base Capacity (vph)	388	1528	286	1283	1083	1026
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.31	0.32	0.43	0.45	0.43

Intersection Summary

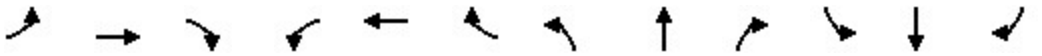
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	188	433	3	85	475	40	8	327	118	33	242	140
Future Volume (vph)	188	433	3	85	475	40	8	327	118	33	242	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)	5.0	5.8		5.0	5.8			6.3			6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1525	3215		1525	3176			3066			3020	
Flt Permitted	0.95	1.00		0.95	1.00			0.94			0.88	
Satd. Flow (perm)	1525	3215		1525	3176			2894			2656	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	202	466	3	91	511	43	9	352	127	35	260	151
RTOR Reduction (vph)	0	1	0	0	7	0	0	38	0	0	70	0
Lane Group Flow (vph)	202	468	0	91	547	0	0	450	0	0	376	0
Confl. Peds. (#/hr)			10			11	13		21	21		13
Confl. Bikes (#/hr)			4			1			4			
Parking (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	13.7	32.3		7.2	25.8			22.9			22.9	
Effective Green, g (s)	13.7	32.3		7.2	25.8			22.9			22.9	
Actuated g/C Ratio	0.17	0.41		0.09	0.32			0.29			0.29	
Clearance Time (s)	5.0	5.8		5.0	5.8			6.3			6.3	
Vehicle Extension (s)	1.5	6.5		1.0	6.5			6.0			6.0	
Lane Grp Cap (vph)	262	1306		138	1030			833			765	
v/s Ratio Prot	c0.13	0.15		0.06	c0.17							
v/s Ratio Perm								c0.16			0.14	
v/c Ratio	0.77	0.36		0.66	0.53			0.54			0.49	
Uniform Delay, d1	31.4	16.4		35.0	21.9			23.9			23.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	12.0	0.5		8.4	1.4			1.6			1.4	
Delay (s)	43.4	16.9		43.3	23.3			25.5			24.9	
Level of Service	D	B		D	C			C			C	
Approach Delay (s/veh)		24.9			26.1			25.5			24.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	79.5	Sum of lost time (s)	17.1
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	188	433	3	85	475	40	8	327	118	33	242	140
Future Volume (veh/h)	188	433	3	85	475	40	8	327	118	33	242	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.96	0.99		0.98
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	202	466	2	91	511	35	9	352	87	35	260	78
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	249	1322	6	116	989	68	67	680	163	108	590	171
Arrive On Green	0.14	0.39	0.39	0.07	0.31	0.31	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1767	3415	15	1767	3171	217	21	2579	618	146	2235	648
Grp Volume(v), veh/h	202	240	228	91	283	263	254	0	194	206	0	167
Grp Sat Flow(s),veh/h/ln	1767	1763	1667	1767	1763	1625	1838	0	1379	1646	0	1384
Q Serve(g_s), s	6.7	5.8	5.8	3.1	8.0	8.0	0.0	0.0	7.3	0.1	0.0	6.1
Cycle Q Clear(g_c), s	6.7	5.8	5.8	3.1	8.0	8.0	7.0	0.0	7.3	7.4	0.0	6.1
Prop In Lane	1.00		0.01	1.00		0.13	0.04		0.45	0.17		0.47
Lane Grp Cap(c), veh/h	249	682	645	116	550	507	547	0	364	504	0	365
V/C Ratio(X)	0.81	0.35	0.35	0.78	0.52	0.52	0.46	0.00	0.53	0.41	0.00	0.46
Avail Cap(c_a), veh/h	556	876	828	410	876	807	803	0	560	729	0	562
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.1	13.1	13.1	27.8	17.0	17.1	19.0	0.0	19.0	18.4	0.0	18.6
Incr Delay (d2), s/veh	2.4	1.4	1.5	4.2	3.4	3.8	2.2	0.0	4.4	1.9	0.0	3.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	2.3	2.2	1.4	3.4	3.2	3.1	0.0	2.5	2.4	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	27.5	14.6	14.6	32.0	20.5	20.8	21.2	0.0	23.4	20.3	0.0	21.8
LnGrp LOS	C	B	B	C	C	C	C		C	C		C
Approach Vol, veh/h		670			637			448			373	
Approach Delay, s/veh		18.5			22.3			22.1			21.0	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.0	29.2		22.2	13.5	24.6		22.2				
Change Period (Y+Rc), s	5.0	5.8		6.3	5.0	5.8		6.3				
Max Green Setting (Gmax), s	14.0	30.0		24.5	19.0	30.0		24.5				
Max Q Clear Time (g_c+I1), s	5.1	7.8		9.4	8.7	10.0		9.3				
Green Ext Time (p_c), s	0.0	7.1		4.1	0.1	7.9		5.0				

Intersection Summary		
HCM 7th Control Delay, s/veh	20.8	
HCM 7th LOS	C	

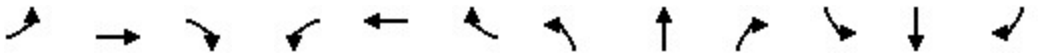
Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	40	790	108	723	197	356	94	68	535
v/c Ratio	0.39	0.74	0.64	0.57	0.76	0.60	0.19	0.50	0.72
Control Delay (s/veh)	69.9	40.6	71.6	31.8	70.5	41.8	34.5	69.5	48.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	69.9	40.6	71.6	31.8	70.5	41.8	34.5	69.5	48.4
Queue Length 50th (ft)	30	277	80	232	144	231	52	50	197
Queue Length 95th (ft)	80	426	169	353	#353	434	122	118	314
Internal Link Dist (ft)		1736		1055		1020			627
Turn Bay Length (ft)	110		120		210			70	
Base Capacity (vph)	274	1433	274	1476	274	622	520	274	1100
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.55	0.39	0.49	0.72	0.57	0.18	0.25	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



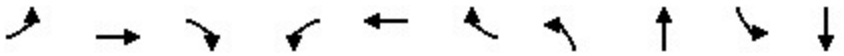
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	623	135	104	612	82	189	342	90	65	484	30
Future Volume (vph)	38	623	135	104	612	82	189	342	90	65	484	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1694	3288		1694	3319		1694	1783	1492	1694	3187	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1694	3288		1694	3319		1694	1783	1492	1694	3187	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	40	649	141	108	638	85	197	356	94	68	504	31
RTOR Reduction (vph)	0	13	0	0	6	0	0	0	0	0	0	0
Lane Group Flow (vph)	40	777	0	108	717	0	197	356	94	68	535	0
Confl. Peds. (#/hr)			2			2			1			1
Confl. Bikes (#/hr)			3						4			5
Parking (#/hr)						0					0	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	5.9	39.2		11.7	45.0		17.9	38.8	38.8	8.0	28.9	
Effective Green, g (s)	5.9	39.2		11.7	45.0		17.9	38.8	38.8	8.0	28.9	
Actuated g/C Ratio	0.05	0.33		0.10	0.38		0.15	0.32	0.32	0.07	0.24	
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	1.5	5.0		1.5	5.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	83	1076		165	1247		253	577	483	113	769	
v/s Ratio Prot	0.02	c0.24		c0.06	c0.22		c0.12	0.20		0.04	c0.17	
v/s Ratio Perm									0.06			
v/c Ratio	0.48	0.72		0.65	0.57		0.78	0.62	0.19	0.60	0.70	
Uniform Delay, d1	55.4	35.5		52.1	29.7		49.0	34.2	29.2	54.3	41.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	3.0		6.9	1.0		12.9	2.3	0.3	6.1	3.0	
Delay (s)	57.0	38.4		59.0	30.8		61.9	36.4	29.4	60.4	44.4	
Level of Service	E	D		E	C		E	D	C	E	D	
Approach Delay (s/veh)		39.3			34.4			43.2			46.2	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	40.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	119.7	Sum of lost time (s)	22.0
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	623	135	104	612	82	189	342	90	65	484	30
Future Volume (veh/h)	38	623	135	104	612	82	189	342	90	65	484	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	40	649	127	108	638	78	197	356	94	68	504	31
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	62	962	188	136	1111	136	232	565	471	88	712	44
Arrive On Green	0.03	0.33	0.33	0.08	0.37	0.37	0.13	0.30	0.30	0.05	0.22	0.22
Sat Flow, veh/h	1767	2932	573	1767	3000	366	1767	1856	1548	1767	3197	196
Grp Volume(v), veh/h	40	390	386	108	375	341	197	356	94	68	277	258
Grp Sat Flow(s),veh/h/ln	1767	1763	1742	1767	1763	1603	1767	1856	1548	1767	1763	1630
Q Serve(g_s), s	2.0	17.5	17.5	5.5	15.5	15.6	10.0	15.1	4.1	3.5	13.3	13.3
Cycle Q Clear(g_c), s	2.0	17.5	17.5	5.5	15.5	15.6	10.0	15.1	4.1	3.5	13.3	13.3
Prop In Lane	1.00		0.33	1.00		0.23	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	62	578	571	136	653	594	232	565	471	88	393	363
V/C Ratio(X)	0.65	0.67	0.68	0.79	0.57	0.58	0.85	0.63	0.20	0.77	0.71	0.71
Avail Cap(c_a), veh/h	357	954	943	357	954	868	357	801	668	357	761	704
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	26.5	26.5	41.5	23.0	23.0	38.8	27.4	23.6	42.9	32.8	32.8
Incr Delay (d2), s/veh	4.2	2.9	3.0	3.8	1.7	1.9	6.8	1.7	0.3	5.3	3.3	3.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	7.5	7.4	2.5	6.4	5.9	4.6	6.7	1.5	1.6	6.0	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	47.8	29.4	29.5	45.3	24.7	24.9	45.6	29.0	23.8	48.3	36.1	36.4
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	D	D
Approach Vol, veh/h		816			824			647			603	
Approach Delay, s/veh		30.4			27.5			33.3			37.6	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.6	35.5	17.5	25.9	8.7	39.4	10.0	33.3
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Max Green Setting (Gmax), s	18.5	49.5	18.5	39.5	18.5	49.5	18.5	39.5
Max Q Clear Time (g_c+I1), s	7.5	19.5	12.0	15.3	4.0	17.6	5.5	17.1
Green Ext Time (p_c), s	0.1	10.3	0.1	4.9	0.0	9.5	0.1	3.5

Intersection Summary	
HCM 7th Control Delay, s/veh	31.7
HCM 7th LOS	C



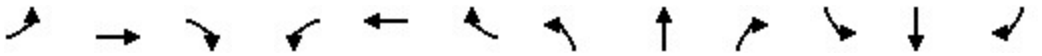
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	35	238	47	288	219	26	80	891	43	705
v/c Ratio	0.08	0.65	0.12	0.64	0.33	0.05	0.29	0.73	0.20	0.67
Control Delay (s/veh)	15.4	42.9	0.6	24.5	24.0	0.2	20.3	29.9	19.5	32.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	15.4	42.9	0.6	24.5	24.0	0.2	20.3	29.9	19.5	32.8
Queue Length 50th (ft)	12	131	0	115	102	0	26	230	14	188
Queue Length 95th (ft)	30	236	0	188	173	0	69	#443	43	#353
Internal Link Dist (ft)		687			456			975		1020
Turn Bay Length (ft)	90		190	170		260	110		170	
Base Capacity (vph)	542	618	568	586	838	678	387	1216	347	1088
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.39	0.08	0.49	0.26	0.04	0.21	0.73	0.12	0.65

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	228	45	276	210	25	77	561	295	41	633	44
Future Volume (vph)	34	228	45	276	210	25	77	561	295	41	633	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.96	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1783	1328	1691	1783	1315	1693	3178		1694	3180	
Flt Permitted	0.56	1.00	1.00	0.43	1.00	1.00	0.25	1.00		0.16	1.00	
Satd. Flow (perm)	985	1783	1328	769	1783	1315	440	3178		293	3180	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	35	238	47	288	219	26	80	584	307	43	659	46
RTOR Reduction (vph)	0	0	37	0	0	17	0	50	0	0	4	0
Lane Group Flow (vph)	35	238	10	288	219	9	80	841	0	43	701	0
Confl. Peds. (#/hr)	19		6	6		19	5		5	5		5
Confl. Bikes (#/hr)			8			5			2			3
Parking (#/hr)			0			0					0	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	D.P+P	NA		D.P+P	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	8		4	4		8	6			2		
Actuated Green, G (s)	36.3	20.9	20.9	36.3	33.0	33.0	36.5	32.9		36.5	30.6	
Effective Green, g (s)	36.3	20.9	20.9	36.3	33.0	33.0	36.5	32.9		36.5	30.6	
Actuated g/C Ratio	0.39	0.22	0.22	0.39	0.35	0.35	0.39	0.35		0.39	0.33	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	2.0	4.0	4.0	2.5	4.0	4.0	2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	405	397	295	448	627	462	250	1114		167	1037	
v/s Ratio Prot	0.00	0.13		c0.11	0.12		c0.02	c0.26		0.01	0.22	
v/s Ratio Perm	0.03		0.01	c0.14		0.01	0.10			0.09		
v/c Ratio	0.09	0.60	0.04	0.64	0.35	0.02	0.32	0.75		0.26	0.68	
Uniform Delay, d1	18.1	32.7	28.6	21.5	22.5	19.8	19.1	26.9		19.4	27.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	2.8	0.1	2.8	0.5	0.0	0.3	3.1		0.3	1.9	
Delay (s)	18.1	35.5	28.6	24.3	22.9	19.9	19.4	30.0		19.7	29.2	
Level of Service	B	D	C	C	C	B	B	C		B	C	
Approach Delay (s/veh)		32.6			23.5			29.2			28.7	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	93.8	Sum of lost time (s)	21.0
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	228	45	276	210	25	77	561	295	41	633	44
Future Volume (veh/h)	34	228	45	276	210	25	77	561	295	41	633	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	0.99		0.95	0.99		0.97	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	35	238	10	288	219	8	80	584	256	43	659	42
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	421	369	268	467	599	442	285	756	331	229	973	62
Arrive On Green	0.03	0.20	0.20	0.16	0.32	0.32	0.05	0.32	0.32	0.04	0.31	0.31
Sat Flow, veh/h	1767	1856	1346	1767	1856	1369	1767	2361	1033	1767	3186	203
Grp Volume(v), veh/h	35	238	10	288	219	8	80	436	404	43	364	337
Grp Sat Flow(s),veh/h/ln	1767	1856	1346	1767	1856	1369	1767	1763	1632	1767	1763	1626
Q Serve(g_s), s	1.0	8.8	0.4	9.3	6.7	0.3	2.3	16.6	16.6	1.2	13.4	13.5
Cycle Q Clear(g_c), s	1.0	8.8	0.4	9.3	6.7	0.3	2.3	16.6	16.6	1.2	13.4	13.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.63	1.00		0.12
Lane Grp Cap(c), veh/h	421	369	268	467	599	442	285	564	522	229	538	496
V/C Ratio(X)	0.08	0.65	0.04	0.62	0.37	0.02	0.28	0.77	0.77	0.19	0.68	0.68
Avail Cap(c_a), veh/h	693	750	544	758	750	553	510	700	648	481	700	646
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.0	27.3	24.0	19.0	19.3	17.1	17.3	22.8	22.8	17.6	22.6	22.6
Incr Delay (d2), s/veh	0.0	2.7	0.1	1.0	0.5	0.0	0.2	4.9	5.4	0.1	2.3	2.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.0	0.1	3.7	2.8	0.1	0.9	7.1	6.6	0.5	5.5	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	16.0	30.0	24.1	20.0	19.8	17.1	17.5	27.7	28.2	17.7	24.9	25.1
LnGrp LOS	B	C	C	C	B	B	B	C	C	B	C	C
Approach Vol, veh/h		283			515			920			744	
Approach Delay, s/veh		28.1			19.9			27.0			24.6	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	29.3	16.8	19.8	9.5	28.2	7.6	29.0
Change Period (Y+Rc), s	5.5	5.5	5.0	5.0	5.5	5.5	5.0	5.0
Max Green Setting (Gmax), s	13.5	29.5	24.0	30.0	13.5	29.5	14.0	30.0
Max Q Clear Time (g_c+I1), s	3.2	18.6	11.3	10.8	4.3	15.5	3.0	8.7
Green Ext Time (p_c), s	0.0	5.1	0.5	1.8	0.0	4.9	0.0	1.7

Intersection Summary	
HCM 7th Control Delay, s/veh	24.9
HCM 7th LOS	C

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	4	191	1	956	57	929
v/c Ratio	0.01	0.56	0.02	0.45	0.52	0.56
Control Delay (s/veh)	0.0	24.5	45.0	2.4	87.2	31.0
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (s/veh)	0.0	24.5	45.0	2.5	87.2	31.0
Queue Length 50th (ft)	0	43	1	23	54	296
Queue Length 95th (ft)	0	146	m1	30	119	564
Internal Link Dist (ft)	150	270		218		975
Turn Bay Length (ft)			70		270	
Base Capacity (vph)	430	406	164	2228	413	1969
Starvation Cap Reductn	0	0	0	198	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.47	0.01	0.47	0.14	0.47

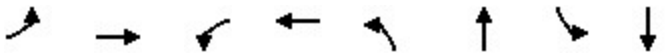
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	2	88	0	97	1	891	36	55	901	0
Future Volume (vph)	2	0	2	88	0	97	1	891	36	55	901	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5		5.5	5.5		6.0	5.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			0.93		1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1610			1616		1694	3364		1694	3388	
Flt Permitted		0.92			0.85		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1514			1401		1694	3364		1694	3388	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	2	0	2	91	0	100	1	919	37	57	929	0
RTOR Reduction (vph)	0	3	0	0	117	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	1	0	0	74	0	1	955	0	57	929	0
Confl. Peds. (#/hr)			2	2					3	3		
Confl. Bikes (#/hr)									4			1
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			4		11	6 8		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)		23.3			23.3		1.0	89.7		7.8	69.4	
Effective Green, g (s)		23.3			23.3		1.0	89.7		7.8	69.4	
Actuated g/C Ratio		0.16			0.16		0.01	0.60		0.05	0.46	
Clearance Time (s)		5.5			5.5		5.5			6.0	5.5	
Vehicle Extension (s)		3.5			3.5		1.5			2.0	6.0	
Lane Grp Cap (vph)		234			217		11	2007		87	1564	
v/s Ratio Prot							c0.00	c0.28		c0.03	c0.27	
v/s Ratio Perm		0.00			c0.05							
v/c Ratio		0.00			0.34		0.09	0.48		0.66	0.59	
Uniform Delay, d1		53.7			56.6		74.2	17.1		69.9	30.0	
Progression Factor		1.00			1.00		0.58	0.20		1.00	1.00	
Incremental Delay, d2		0.0			1.1		1.1	0.4		12.7	1.1	
Delay (s)		53.7			57.7		44.4	3.8		82.6	31.1	
Level of Service		D			E		D	A		F	C	
Approach Delay (s/veh)		53.7			57.7			3.8			34.1	
Approach LOS		D			E			A			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	150.3	Sum of lost time (s)	28.5
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 7th Edition methodology does not support Non-NEMA phasing.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	57	55	1	2	16	854	7	1118
v/c Ratio	0.24	0.17	0.00	0.01	0.23	0.59	0.11	0.49
Control Delay (s/veh)	56.3	1.1	53.0	44.5	82.3	36.7	53.2	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay (s/veh)	56.3	1.1	53.0	44.5	82.3	36.7	53.2	2.6
Queue Length 50th (ft)	49	0	1	1	15	328	0	21
Queue Length 95th (ft)	111	0	7	11	48	543	m18	34
Internal Link Dist (ft)		3515		196		1175		218
Turn Bay Length (ft)	60				110		80	
Base Capacity (vph)	316	396	316	404	164	1456	164	2507
Starvation Cap Reductn	0	0	0	0	0	0	0	360
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.14	0.00	0.00	0.10	0.59	0.04	0.52

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	0	23	1	1	1	15	783	3	6	963	65
Future Volume (vph)	80	0	23	1	1	1	15	783	3	6	963	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.5	5.5		5.5	5.5	
Lane Util. Factor	0.95	0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.93		1.00	1.00		1.00	0.99	
Flt Protected	0.95	0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1605	1357		1692	1633		1694	3386		1694	3350	
Flt Permitted	0.76	0.85		0.72	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1278	1190		1281	1633		1694	3386		1694	3350	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	0	25	1	1	1	16	851	3	7	1047	71
RTOR Reduction (vph)	0	45	0	0	1	0	0	0	0	0	2	0
Lane Group Flow (vph)	57	10	0	1	1	0	16	854	0	7	1116	0
Confl. Peds. (#/hr)	2		1	1		2			3			2
Confl. Bikes (#/hr)			19			4			5			3
Parking (#/hr)		0	0									
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			8		1	6		9	2 4	
Permitted Phases	8			8								
Actuated Green, G (s)	26.2	26.2		26.2	26.2		2.4	63.5		1.0	92.7	
Effective Green, g (s)	26.2	26.2		26.2	26.2		2.4	63.5		1.0	92.7	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.02	0.42		0.01	0.62	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.5	5.5		5.5		
Vehicle Extension (s)	3.5	3.5		3.5	3.5		1.5	6.0		1.5		
Lane Grp Cap (vph)	222	207		223	284		27	1430		11	2066	
v/s Ratio Prot					0.00		c0.01	c0.25		c0.00	c0.33	
v/s Ratio Perm	c0.04	0.01		0.00								
v/c Ratio	0.26	0.05		0.00	0.00		0.59	0.60		0.64	0.54	
Uniform Delay, d1	53.6	51.7		51.3	51.3		73.5	33.5		74.5	16.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.65	0.16	
Incremental Delay, d2	0.7	0.1		0.0	0.0		21.0	1.2		60.2	0.6	
Delay (s)	54.4	51.8		51.3	51.3		94.5	34.8		108.8	3.3	
Level of Service	D	D		D	D		F	C		F	A	
Approach Delay (s/veh)		53.1			51.3			35.9			3.9	
Approach LOS		D			D			D			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	150.3	Sum of lost time (s)	28.5
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

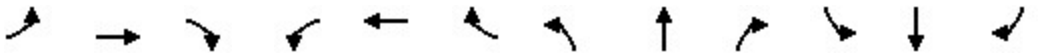
HCM 7th Edition methodology does not support Non-NEMA phasing.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	292	320	167	228	90	950	185	838
v/c Ratio	0.17	0.62	1.05	0.30	0.37	0.33	0.77	0.84	0.63
Control Delay (s/veh)	45.4	30.7	103.6	28.1	6.1	15.1	26.2	48.2	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	45.4	30.7	103.6	28.1	6.1	15.1	26.2	48.2	24.0
Queue Length 50th (ft)	11	54	~214	67	0	23	211	51	194
Queue Length 95th (ft)	37	106	#388	152	58	59	346	#174	313
Internal Link Dist (ft)		1311		1321			533		1175
Turn Bay Length (ft)	100		100			100		100	
Base Capacity (vph)	284	1154	305	613	662	270	1458	221	1485
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.25	1.05	0.27	0.34	0.33	0.65	0.84	0.56

Intersection Summary

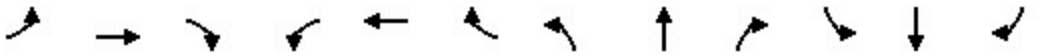
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	174	101	301	157	214	85	588	305	174	763	24
Future Volume (vph)	19	174	101	301	157	214	85	588	305	174	763	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	4.5	6.5		4.5	6.5	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.95		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1694	3172		1694	1783	1490	1694	3037		1694	3201	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.23	1.00		0.17	1.00	
Satd. Flow (perm)	1694	3172		1694	1783	1490	408	3037		300	3201	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	20	185	107	320	167	228	90	626	324	185	812	26
RTOR Reduction (vph)	0	89	0	0	0	160	0	58	0	0	2	0
Lane Group Flow (vph)	20	203	0	320	167	68	90	892	0	185	836	0
Confl. Peds. (#/hr)						2	3		1	1		3
Confl. Bikes (#/hr)			7			4			5			2
Parking (#/hr)								0	0		0	0
Turn Type	Prot	NA		Prot	NA	Perm	D.P+P	NA		D.P+P	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases						4	2			6		
Actuated Green, G (s)	2.6	10.5		19.4	27.3	27.3	40.1	35.0		40.1	36.2	
Effective Green, g (s)	2.6	10.5		19.4	27.3	27.3	40.1	35.0		40.1	36.2	
Actuated g/C Ratio	0.03	0.11		0.21	0.30	0.30	0.44	0.38		0.44	0.39	
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	4.5	6.5		4.5	6.5	
Vehicle Extension (s)	2.5	2.5		3.0	3.0	3.0	3.0	4.5		3.0	4.5	
Lane Grp Cap (vph)	47	362		357	529	442	232	1155		208	1259	
v/s Ratio Prot	0.01	c0.06		c0.19	0.09		0.02	0.29		c0.05	0.26	
v/s Ratio Perm						0.05	0.15			c0.34		
v/c Ratio	0.43	0.56		0.90	0.32	0.15	0.39	0.77		0.89	0.66	
Uniform Delay, d1	44.0	38.6		35.3	25.1	23.8	16.3	25.0		21.3	22.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.5	1.5		23.8	0.3	0.2	1.1	3.7		33.6	1.6	
Delay (s)	48.4	40.1		59.1	25.4	24.0	17.4	28.7		54.9	24.5	
Level of Service	D	D		E	C	C	B	C		D	C	
Approach Delay (s/veh)		40.6			40.1			27.7			30.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	174	101	301	157	214	85	588	305	174	763	24
Future Volume (veh/h)	19	174	101	301	157	214	85	588	305	174	763	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	185	10	320	167	43	90	626	265	185	812	24
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	40	300	16	331	469	390	312	857	363	293	1279	38
Arrive On Green	0.02	0.09	0.09	0.19	0.25	0.25	0.06	0.38	0.38	0.06	0.39	0.39
Sat Flow, veh/h	1767	3397	182	1767	1856	1544	1767	2276	963	1767	3314	98
Grp Volume(v), veh/h	20	95	100	320	167	43	90	485	406	185	432	404
Grp Sat Flow(s),veh/h/ln	1767	1763	1816	1767	1856	1544	1767	1763	1477	1767	1763	1649
Q Serve(g_s), s	0.9	4.0	4.1	13.9	5.7	1.7	2.3	18.3	18.4	5.0	15.5	15.5
Cycle Q Clear(g_c), s	0.9	4.0	4.1	13.9	5.7	1.7	2.3	18.3	18.4	5.0	15.5	15.5
Prop In Lane	1.00		0.10	1.00		1.00	1.00		0.65	1.00		0.06
Lane Grp Cap(c), veh/h	40	155	160	331	469	390	312	664	556	293	680	636
V/C Ratio(X)	0.50	0.61	0.62	0.97	0.36	0.11	0.29	0.73	0.73	0.63	0.64	0.64
Avail Cap(c_a), veh/h	331	671	691	331	706	588	328	909	762	293	909	851
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.5	34.1	34.1	31.3	23.8	22.3	14.6	20.8	20.8	16.8	19.4	19.4
Incr Delay (d2), s/veh	7.1	2.9	2.9	40.9	0.5	0.1	0.5	3.0	3.5	4.3	1.7	1.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	1.8	1.9	9.3	2.4	0.6	0.9	7.5	6.3	2.2	6.1	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	44.5	37.0	37.0	72.1	24.2	22.4	15.1	23.7	24.3	21.1	21.1	21.2
LnGrp LOS	D	D	D	E	C	C	B	C	C	C	C	C
Approach Vol, veh/h		215			530			981			1021	
Approach Delay, s/veh		37.7			53.0			23.2			21.1	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	36.4	7.2	25.1	9.5	35.7	20.0	12.3
Change Period (Y+Rc), s	4.5	6.5	5.5	5.5	4.5	6.5	5.5	5.5
Max Green Setting (Gmax), s	5.0	40.0	14.5	29.5	5.0	40.0	14.5	29.5
Max Q Clear Time (g_c+I1), s	4.3	17.5	2.9	7.7	7.0	20.4	15.9	6.1
Green Ext Time (p_c), s	0.0	8.6	0.0	0.9	0.0	8.8	0.0	0.8

Intersection Summary	
HCM 7th Control Delay, s/veh	29.3
HCM 7th LOS	C

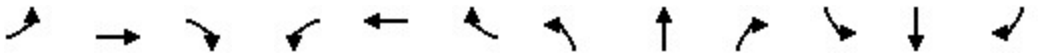
Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	NBL	NBT	SBT
Lane Group Flow (vph)	162	27	943	1266
v/c Ratio	0.53	0.09	0.41	0.62
Control Delay (s/veh)	14.7	4.3	5.5	11.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay (s/veh)	14.7	4.3	5.5	11.5
Queue Length 50th (ft)	10	2	61	94
Queue Length 95th (ft)	59	10	132	#325
Internal Link Dist (ft)	2029		1464	533
Turn Bay Length (ft)		110		
Base Capacity (vph)	538	306	2504	2051
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.30	0.09	0.38	0.62

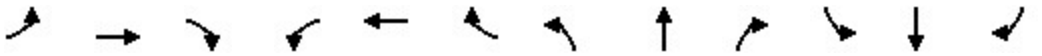
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	0	38	0	0	0	25	868	0	0	1033	132
Future Volume (vph)	111	0	38	0	0	0	25	868	0	0	1033	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0					4.5	6.5			6.5	
Lane Util. Factor		1.00					1.00	0.95			0.95	
Frpb, ped/bikes		0.99					1.00	1.00			1.00	
Flpb, ped/bikes		1.00					1.00	1.00			1.00	
Frt		0.97					1.00	1.00			0.98	
Flt Protected		0.96					0.95	1.00			1.00	
Satd. Flow (prot)		1651					1525	3219			3154	
Flt Permitted		0.78					0.17	1.00			1.00	
Satd. Flow (perm)		1337					269	3219			3154	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	0	41	0	0	0	27	943	0	0	1123	143
RTOR Reduction (vph)	0	112	0	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	0	50	0	0	0	0	27	943	0	0	1255	0
Confl. Peds. (#/hr)			5				4					4
Confl. Bikes (#/hr)			3									5
Parking (#/hr)	0		0				0	0			0	0
Turn Type	Perm	NA					D.P+P	NA			NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			2					
Actuated Green, G (s)		6.5					34.3	38.8			32.6	
Effective Green, g (s)		6.5					34.3	38.8			32.6	
Actuated g/C Ratio		0.11					0.60	0.68			0.57	
Clearance Time (s)		5.0					4.5	6.5			6.5	
Vehicle Extension (s)		3.0					3.0	5.0			5.0	
Lane Grp Cap (vph)		153					200	2198			1810	
v/s Ratio Prot							0.00	c0.29			c0.40	
v/s Ratio Perm		c0.04					0.08					
v/c Ratio		0.33					0.14	0.43			0.69	
Uniform Delay, d1		23.1					5.1	4.0			8.6	
Progression Factor		1.00					1.00	1.00			1.00	
Incremental Delay, d2		1.3					0.3	0.3			1.5	
Delay (s)		24.4					5.4	4.3			10.0	
Level of Service		C					A	A			B	
Approach Delay (s/veh)		24.4			0.0			4.3			10.0	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	56.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	0	38	0	0	0	25	868	0	0	1033	132
Future Volume (veh/h)	111	0	38	0	0	0	25	868	0	0	1033	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	0	0	1856	1856
Adj Flow Rate, veh/h	121	0	21	0	0	0	27	943	0	0	1123	131
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	0	0	3	3
Cap, veh/h	279	4	27	0	262	0	296	2249	0	0	1566	182
Arrive On Green	0.14	0.00	0.14	0.00	0.00	0.00	0.03	0.64	0.00	0.00	0.52	0.52
Sat Flow, veh/h	1067	31	191	0	1856	0	1767	3618	0	0	3101	350
Grp Volume(v), veh/h	142	0	0	0	0	0	27	943	0	0	657	597
Grp Sat Flow(s),veh/h/ln	1289	0	0	0	1856	0	1767	1763	0	0	1763	1595
Q Serve(g_s), s	5.4	0.0	0.0	0.0	0.0	0.0	0.4	6.9	0.0	0.0	14.8	14.9
Cycle Q Clear(g_c), s	5.5	0.0	0.0	0.0	0.0	0.0	0.4	6.9	0.0	0.0	14.8	14.9
Prop In Lane	0.85		0.15	0.00		0.00	1.00		0.00	0.00		0.22
Lane Grp Cap(c), veh/h	310	0	0	0	262	0	296	2249	0	0	918	831
V/C Ratio(X)	0.46	0.00	0.00	0.00	0.00	0.00	0.09	0.42	0.00	0.00	0.72	0.72
Avail Cap(c_a), veh/h	559	0	0	0	623	0	410	2706	0	0	1032	934
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	21.6	0.0	0.0	0.0	0.0	0.0	7.6	4.7	0.0	0.0	9.5	9.6
Incr Delay (d2), s/veh	1.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	2.9	3.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.0	0.0	0.0	0.0	0.1	1.5	0.0	0.0	4.8	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	22.6	0.0	0.0	0.0	0.0	0.0	7.7	4.9	0.0	0.0	12.5	12.9
LnGrp LOS	C						A	A			B	B
Approach Vol, veh/h		142			0			970			1254	
Approach Delay, s/veh		22.6			0.0			5.0			12.7	
Approach LOS		C						A			B	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	6.1	33.6		12.4		39.8		12.4				
Change Period (Y+Rc), s	4.5	6.5		5.0		6.5		5.0				
Max Green Setting (Gmax), s	5.0	30.5		17.5		40.0		17.5				
Max Q Clear Time (g_c+I1), s	2.4	16.9		0.0		8.9		7.5				
Green Ext Time (p_c), s	0.0	10.1		0.0		13.9		0.5				

Intersection Summary												
HCM 7th Control Delay, s/veh			10.1									
HCM 7th LOS			B									

Notes
User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	36	36	917	14	1181
v/c Ratio	0.44	0.12	0.11	0.42	0.03	0.57
Control Delay (s/veh)	24.7	21.2	6.9	9.6	6.6	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	24.7	21.2	6.9	9.6	6.6	12.8
Queue Length 50th (ft)	35	10	4	76	2	110
Queue Length 95th (ft)	89	35	22	278	12	400
Internal Link Dist (ft)	1046	977		1312		1464
Turn Bay Length (ft)			70		100	
Base Capacity (vph)	529	562	332	2236	436	2142
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.06	0.11	0.41	0.03	0.55

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	21	35	17	13	4	33	829	15	13	1030	56
Future Volume (vph)	62	21	35	17	13	4	33	829	15	13	1030	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.5	5.5		4.5	5.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.99		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1489			1536		1694	3209		1693	3190	
Flt Permitted		0.82			0.86		0.19	1.00		0.28	1.00	
Satd. Flow (perm)		1248			1358		332	3209		497	3190	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	23	38	18	14	4	36	901	16	14	1120	61
RTOR Reduction (vph)	0	22	0	0	3	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	106	0	0	33	0	36	916	0	14	1177	0
Confl. Peds. (#/hr)	8		6	6		8	4		6	6		4
Confl. Bikes (#/hr)			1			1			4			2
Parking (#/hr)	0	0	0	0	0	0		0	0		0	0
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		D.P+P	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)		11.3			11.3		43.1	42.4		43.1	41.5	
Effective Green, g (s)		11.3			11.3		43.1	42.4		43.1	41.5	
Actuated g/C Ratio		0.16			0.16		0.62	0.61		0.62	0.60	
Clearance Time (s)		5.0			5.0		4.5	5.5		4.5	5.5	
Vehicle Extension (s)		3.5			3.0		3.0	6.0		3.0	6.0	
Lane Grp Cap (vph)		203			221		237	1960		320	1907	
v/s Ratio Prot							c0.00	0.29		0.00	c0.37	
v/s Ratio Perm		c0.09			0.02		0.09			0.03		
v/c Ratio		0.52			0.15		0.15	0.47		0.04	0.62	
Uniform Delay, d1		26.6			24.9		5.8	7.4		5.2	8.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.8			0.3		0.3	0.5		0.1	1.0	
Delay (s)		29.4			25.2		6.1	7.8		5.2	9.9	
Level of Service		C			C		A	A		A	A	
Approach Delay (s/veh)		29.4			25.2			7.8			9.9	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	69.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	21	35	17	13	4	33	829	15	13	1030	56
Future Volume (veh/h)	62	21	35	17	13	4	33	829	15	13	1030	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	0.98		0.97	0.99		0.97	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	67	23	11	18	14	1	36	901	15	14	1120	57
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	213	63	21	187	116	6	346	1959	33	414	1816	92
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.04	0.58	0.58	0.02	0.56	0.56
Sat Flow, veh/h	773	440	148	642	809	45	1767	3365	56	1767	3233	164
Grp Volume(v), veh/h	101	0	0	33	0	0	36	472	444	14	610	567
Grp Sat Flow(s),veh/h/ln	1362	0	0	1496	0	0	1767	1763	1658	1767	1763	1635
Q Serve(g_s), s	2.9	0.0	0.0	0.0	0.0	0.0	0.5	8.9	8.9	0.2	13.5	13.6
Cycle Q Clear(g_c), s	3.9	0.0	0.0	1.0	0.0	0.0	0.5	8.9	8.9	0.2	13.5	13.6
Prop In Lane	0.66		0.11	0.55		0.03	1.00		0.03	1.00		0.10
Lane Grp Cap(c), veh/h	298	0	0	310	0	0	346	1026	965	414	990	918
V/C Ratio(X)	0.34	0.00	0.00	0.11	0.00	0.00	0.10	0.46	0.46	0.03	0.62	0.62
Avail Cap(c_a), veh/h	664	0	0	526	0	0	430	1194	1123	534	1194	1108
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.0	0.0	0.0	21.8	0.0	0.0	6.5	7.0	7.0	5.4	8.6	8.6
Incr Delay (d2), s/veh	0.8	0.0	0.0	0.1	0.0	0.0	0.1	1.2	1.2	0.0	2.3	2.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.0	0.4	0.0	0.0	0.1	2.7	2.6	0.1	4.4	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	23.8	0.0	0.0	22.0	0.0	0.0	6.6	8.1	8.2	5.4	10.8	11.0
LnGrp LOS	C			C			A	A	A	A	B	B
Approach Vol, veh/h		101			33			952			1191	
Approach Delay, s/veh		23.8			22.0			8.1			10.9	
Approach LOS		C			C			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	38.3		13.4	5.5	39.5		13.4				
Change Period (Y+Rc), s	4.5	5.5		5.0	4.5	5.5		5.0				
Max Green Setting (Gmax), s	5.0	39.5		17.5	5.0	39.5		24.5				
Max Q Clear Time (g_c+I1), s	2.5	15.6		3.0	2.2	10.9		5.9				
Green Ext Time (p_c), s	0.0	17.1		0.1	0.0	15.0		0.5				

Intersection Summary		
HCM 7th Control Delay, s/veh	10.4	
HCM 7th LOS	B	

Notes

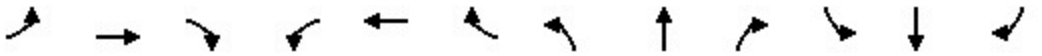
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	144	652	50	174	593	223	49	623	102	220	862
v/c Ratio	0.94	0.58	0.09	1.02	0.50	0.33	0.47	0.79	0.22	1.25	0.91
Control Delay (s/veh)	112.5	34.9	0.3	128.3	33.1	5.1	67.6	51.7	2.6	194.8	55.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	112.5	34.9	0.3	128.3	33.1	5.1	67.6	51.7	2.6	194.8	55.7
Queue Length 50th (ft)	115	225	0	~147	198	0	38	242	0	~217	343
Queue Length 95th (ft)	#248	294	0	#295	260	56	79	308	15	#381	#503
Internal Link Dist (ft)		1689			2015			1308			1312
Turn Bay Length (ft)	190		100	180		150	140		100	160	
Base Capacity (vph)	153	1127	580	170	1186	676	170	861	498	176	948
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.58	0.09	1.02	0.50	0.33	0.29	0.72	0.20	1.25	0.91

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

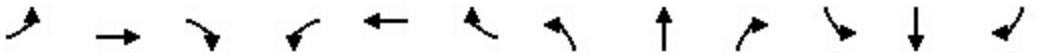
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	613	47	164	557	210	46	586	96	207	695	116
Future Volume (vph)	135	613	47	164	557	210	46	586	96	207	695	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	10	11	12	10	12	12	11	11	12
Total Lost time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1472	3219	1379	1636	3388	1519	1636	3505	1568	1694	3306	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1472	3219	1379	1636	3388	1519	1636	3505	1568	1694	3306	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	144	652	50	174	593	223	49	623	102	220	739	123
RTOR Reduction (vph)	0	0	33	0	0	147	0	0	78	0	11	0
Lane Group Flow (vph)	144	652	17	174	593	76	49	623	24	220	851	0
Confl. Peds. (#/hr)			6			12						6
Confl. Bikes (#/hr)			7			9						2
Parking (#/hr)	0	0	0									
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8			4			2			
Actuated Green, G (s)	12.5	40.8	40.8	12.5	40.8	40.8	6.7	28.2	28.2	12.5	34.0	
Effective Green, g (s)	12.5	40.8	40.8	12.5	40.8	40.8	6.7	28.2	28.2	12.5	34.0	
Actuated g/C Ratio	0.10	0.34	0.34	0.10	0.34	0.34	0.06	0.24	0.24	0.10	0.28	
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	
Vehicle Extension (s)	1.5	4.0	4.0	1.5	4.0	4.0	1.5	4.0	4.0	1.5	4.0	
Lane Grp Cap (vph)	153	1094	468	170	1151	516	91	823	368	176	936	
v/s Ratio Prot	0.10	c0.20		c0.11	0.18		0.03	0.18		c0.13	c0.26	
v/s Ratio Perm			0.01			0.05			0.02			
v/c Ratio	0.94	0.60	0.04	1.02	0.52	0.15	0.54	0.76	0.07	1.25	0.91	
Uniform Delay, d1	53.4	32.8	26.5	53.8	31.7	27.5	55.1	42.7	35.7	53.8	41.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	54.7	2.4	0.1	75.3	1.6	0.6	3.0	4.3	0.1	150.7	12.7	
Delay (s)	108.1	35.2	26.6	129.1	33.3	28.1	58.2	47.0	35.8	204.4	54.2	
Level of Service	F	D	C	F	C	C	E	D	D	F	D	
Approach Delay (s/veh)		47.1			49.0			46.2			84.7	
Approach LOS		D			D			D			F	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	58.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	613	47	164	557	210	46	586	96	207	695	116
Future Volume (veh/h)	135	613	47	164	557	210	46	586	96	207	695	116
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	144	652	15	174	593	70	49	623	19	220	739	111
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	170	1284	504	184	1312	569	63	744	332	184	856	129
Arrive On Green	0.10	0.36	0.36	0.10	0.37	0.37	0.04	0.21	0.21	0.10	0.28	0.28
Sat Flow, veh/h	1767	3526	1385	1767	3526	1530	1767	3526	1572	1767	3064	460
Grp Volume(v), veh/h	144	652	15	174	593	70	49	623	19	220	425	425
Grp Sat Flow(s),veh/h/ln	1767	1763	1385	1767	1763	1530	1767	1763	1572	1767	1763	1762
Q Serve(g_s), s	9.6	17.3	0.8	11.7	15.2	3.6	3.3	20.3	1.2	12.5	27.5	27.5
Cycle Q Clear(g_c), s	9.6	17.3	0.8	11.7	15.2	3.6	3.3	20.3	1.2	12.5	27.5	27.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.26
Lane Grp Cap(c), veh/h	170	1284	504	184	1312	569	63	744	332	184	493	492
V/C Ratio(X)	0.85	0.51	0.03	0.95	0.45	0.12	0.78	0.84	0.06	1.20	0.86	0.86
Avail Cap(c_a), veh/h	184	1284	504	184	1312	569	184	867	387	184	493	492
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	1.00	1.00	1.00	0.96	0.96	0.96	0.80	0.80	0.80
Uniform Delay (d), s/veh	53.4	29.8	24.5	53.4	28.4	24.8	57.4	45.4	37.8	53.8	41.0	41.1
Incr Delay (d2), s/veh	23.2	1.3	0.1	50.1	1.1	0.4	7.2	6.7	0.1	122.2	12.4	12.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	7.5	0.3	7.7	6.6	1.4	1.6	9.5	0.5	11.7	13.4	13.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	76.6	31.0	24.6	103.5	29.6	25.2	64.6	52.1	37.9	176.0	53.4	53.5
LnGrp LOS	E	C	C	F	C	C	E	D	D	F	D	D
Approach Vol, veh/h		811			837			691			1070	
Approach Delay, s/veh		39.0			44.6			52.6			78.7	
Approach LOS		D			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	31.8	18.0	51.2	10.8	40.0	19.0	50.2
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s	12.5	29.5	12.5	39.5	12.5	29.5	12.5	39.5
Max Q Clear Time (g_c+I1), s	14.5	22.3	11.6	17.2	5.3	29.5	13.7	19.3
Green Ext Time (p_c), s	0.0	3.0	0.0	5.9	0.0	0.0	0.0	5.9

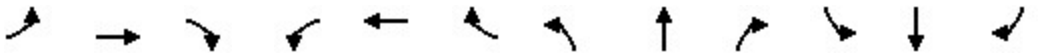
Intersection Summary	
HCM 7th Control Delay, s/veh	55.6
HCM 7th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	62	38	35	788	27	880
v/c Ratio	0.22	0.13	0.08	0.31	0.07	0.37
Control Delay (s/veh)	12.4	11.1	6.9	5.6	6.9	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	12.4	11.1	6.9	5.6	6.9	6.0
Queue Length 50th (ft)	7	4	3	42	2	48
Queue Length 95th (ft)	33	23	23	153	19	178
Internal Link Dist (ft)	1467	309		1757		1308
Turn Bay Length (ft)			100		70	
Base Capacity (vph)	612	672	451	2670	432	2526
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.06	0.08	0.30	0.06	0.35

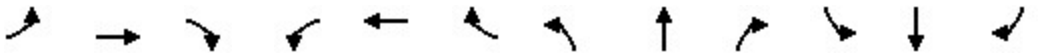
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	10	30	8	5	22	32	707	10	25	766	35
Future Volume (vph)	16	10	30	8	5	22	32	707	10	25	766	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12	11	11	12	10	11	11
Total Lost time (s)		5.0			5.0		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			0.91		1.00	1.00		1.00	0.99	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1456			1597		1692	3380		1470	3194	
Flt Permitted		0.89			0.90		0.32	1.00		0.35	1.00	
Satd. Flow (perm)		1312			1454		571	3380		547	3194	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	18	11	33	9	5	24	35	777	11	27	842	38
RTOR Reduction (vph)	0	29	0	0	21	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	33	0	0	17	0	35	787	0	27	876	0
Confl. Peds. (#/hr)	1		3	3		1	6		5	5		6
Confl. Bikes (#/hr)			1			1			3			4
Parking (#/hr)	0	0	0	0		0				0	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		6.0			6.0		32.6	32.6		32.6	32.6	
Effective Green, g (s)		6.0			6.0		32.6	32.6		32.6	32.6	
Actuated g/C Ratio		0.12			0.12		0.66	0.66		0.66	0.66	
Clearance Time (s)		5.0			5.0		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0			3.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		160			177		379	2244		363	2120	
v/s Ratio Prot								0.23			c0.27	
v/s Ratio Perm		c0.03			0.01		0.06			0.05		
v/c Ratio		0.21			0.10		0.09	0.35		0.07	0.41	
Uniform Delay, d1		19.4			19.1		3.0	3.6		2.9	3.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6			0.2		0.2	0.2		0.2	0.3	
Delay (s)		20.0			19.4		3.2	3.8		3.1	4.1	
Level of Service		C			B		A	A		A	A	
Approach Delay (s/veh)		20.0			19.4			3.8			4.1	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	4.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	49.1	Sum of lost time (s)	10.5
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

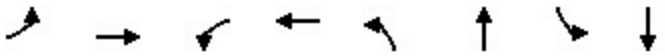


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	10	30	8	5	22	32	707	10	25	766	35
Future Volume (veh/h)	16	10	30	8	5	22	32	707	10	25	766	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	0.98		0.98	0.98		0.98	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	18	11	1	9	5	1	35	777	10	27	842	34
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	172	22	2	173	21	4	556	2530	33	598	2450	99
Arrive On Green	0.04	0.04	0.04	0.04	0.04	0.04	0.71	0.71	0.71	0.71	0.71	0.71
Sat Flow, veh/h	852	521	47	885	492	98	627	3563	46	682	3450	139
Grp Volume(v), veh/h	30	0	0	15	0	0	35	384	403	27	430	446
Grp Sat Flow(s),veh/h/ln	1420	0	0	1475	0	0	627	1763	1846	682	1763	1826
Q Serve(g_s), s	0.5	0.0	0.0	0.0	0.0	0.0	1.0	3.4	3.4	0.6	4.0	4.0
Cycle Q Clear(g_c), s	0.8	0.0	0.0	0.4	0.0	0.0	4.9	3.4	3.4	4.1	4.0	4.0
Prop In Lane	0.60		0.03	0.60		0.07	1.00		0.02	1.00		0.08
Lane Grp Cap(c), veh/h	196	0	0	198	0	0	556	1252	1311	598	1252	1297
V/C Ratio(X)	0.15	0.00	0.00	0.08	0.00	0.00	0.06	0.31	0.31	0.05	0.34	0.34
Avail Cap(c_a), veh/h	767	0	0	765	0	0	627	1452	1520	676	1452	1504
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	0.0	0.0	19.7	0.0	0.0	3.3	2.3	2.3	3.0	2.4	2.4
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.2	0.0	0.0	0.1	0.3	0.3	0.1	0.3	0.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	0.1	0.0	0.0	0.1	0.3	0.3	0.0	0.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.2	0.0	0.0	19.8	0.0	0.0	3.4	2.6	2.6	3.1	2.7	2.7
LnGrp LOS	C			B			A	A	A	A	A	A
Approach Vol, veh/h		30			15			822			903	
Approach Delay, s/veh		20.2			19.8			2.6			2.7	
Approach LOS		C			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		35.7		6.8		35.7		6.8				
Change Period (Y+Rc), s		5.5		5.0		5.5		5.0				
Max Green Setting (Gmax), s		35.0		19.5		35.0		19.5				
Max Q Clear Time (g_c+I1), s		6.9		2.8		6.1		2.4				
Green Ext Time (p_c), s		10.7		0.1		12.1		0.0				

Intersection Summary	
HCM 7th Control Delay, s/veh	3.1
HCM 7th LOS	A

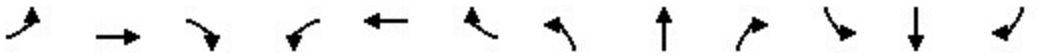
Notes
User approved pedestrian interval to be less than phase max green.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	13	328	148	472	33	520	221	571
v/c Ratio	0.06	0.66	0.57	0.86	0.29	0.65	0.78	0.43
Control Delay (s/veh)	24.1	41.1	35.9	48.4	57.4	39.9	60.1	23.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	24.1	41.1	35.9	48.4	57.4	39.9	60.1	23.4
Queue Length 50th (ft)	5	188	64	252	20	153	132	138
Queue Length 95th (ft)	22	350	142	#643	62	257	263	224
Internal Link Dist (ft)		1269		825		628		1757
Turn Bay Length (ft)					100		150	
Base Capacity (vph)	218	626	259	550	284	1373	426	1686
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.52	0.57	0.86	0.12	0.38	0.52	0.34

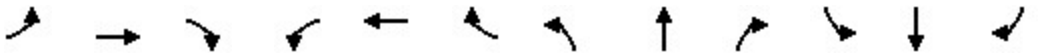
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	285	33	144	244	213	32	490	15	214	514	40
Future Volume (vph)	13	285	33	144	244	213	32	490	15	214	514	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	12	11	11	12	10	11	11
Total Lost time (s)	6.0	6.0		5.5	6.0		5.5	6.0		5.5	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.93		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1694	1752		1525	1482		1694	3371		1472	3175	
Flt Permitted	0.23	1.00		0.38	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	409	1752		608	1482		1694	3371		1472	3175	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	13	294	34	148	252	220	33	505	15	221	530	41
RTOR Reduction (vph)	0	3	0	0	21	0	0	2	0	0	4	0
Lane Group Flow (vph)	13	325	0	148	451	0	33	518	0	221	567	0
Confl. Peds. (#/hr)			5			4			8			8
Confl. Bikes (#/hr)			1						1			5
Bus Blockages (#/hr)	0	0	0	0	0	1	0	0	0	0	0	0
Parking (#/hr)				0	0	0				0	0	
Turn Type	D.P+P	NA		D.P+P	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	6			2								
Actuated Green, G (s)	37.9	32.7		38.4	36.2		4.3	26.6		19.5	41.8	
Effective Green, g (s)	37.9	32.7		38.4	36.2		4.3	26.6		19.5	41.8	
Actuated g/C Ratio	0.35	0.30		0.36	0.34		0.04	0.25		0.18	0.39	
Clearance Time (s)	6.0	6.0		5.5	6.0		5.5	6.0		5.5	6.0	
Vehicle Extension (s)	4.0	4.0		2.0	4.5		2.0	4.5		2.0	4.5	
Lane Grp Cap (vph)	164	532		265	499		67	834		267	1234	
v/s Ratio Prot	0.00	0.19		c0.03	c0.30		0.02	c0.15		c0.15	0.18	
v/s Ratio Perm	0.03			0.17								
v/c Ratio	0.08	0.61		0.56	0.90		0.49	0.62		0.83	0.46	
Uniform Delay, d1	24.5	32.0		27.2	34.0		50.5	36.0		42.4	24.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	2.4		1.5	20.2		2.1	1.8		17.8	0.5	
Delay (s)	24.8	34.4		28.7	54.2		52.6	37.8		60.2	24.9	
Level of Service	C	C		C	D		D	D		E	C	
Approach Delay (s/veh)		34.0			48.1			38.7			34.8	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	39.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	107.5	Sum of lost time (s)	23.5
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	285	33	144	244	213	32	490	15	214	514	40
Future Volume (veh/h)	13	285	33	144	244	213	32	490	15	214	514	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	13	294	28	148	252	173	33	505	0	221	530	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	175	462	44	330	295	202	56	830		261	1239	
Arrive On Green	0.02	0.28	0.28	0.07	0.32	0.32	0.03	0.24	0.00	0.15	0.35	0.00
Sat Flow, veh/h	1767	1665	159	1767	917	630	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	13	0	322	148	0	425	33	505	0	221	530	0
Grp Sat Flow(s),veh/h/ln	1767	0	1824	1767	0	1547	1767	1763	0	1767	1763	0
Q Serve(g_s), s	0.4	0.0	13.0	5.0	0.0	21.6	1.5	10.7	0.0	10.2	9.6	0.0
Cycle Q Clear(g_c), s	0.4	0.0	13.0	5.0	0.0	21.6	1.5	10.7	0.0	10.2	9.6	0.0
Prop In Lane	1.00		0.09	1.00		0.41	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	175	0	506	330	0	497	56	830		261	1239	
V/C Ratio(X)	0.07	0.00	0.64	0.45	0.00	0.85	0.58	0.61		0.85	0.43	
Avail Cap(c_a), veh/h	252	0	760	330	0	645	347	1679		599	1679	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.4	0.0	26.6	21.0	0.0	26.7	40.1	28.7	0.0	34.9	20.8	0.0
Incr Delay (d2), s/veh	0.3	0.0	1.9	0.4	0.0	10.5	3.5	1.2	0.0	2.9	0.4	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	5.7	2.0	0.0	8.9	0.7	4.5	0.0	4.4	3.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	21.7	0.0	28.5	21.3	0.0	37.1	43.6	29.9	0.0	37.8	21.2	0.0
LnGrp LOS	C		C	C		D	D	C		D	C	
Approach Vol, veh/h		335			573			538			751	
Approach Delay, s/veh		28.3			33.1			30.7			26.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	29.3	8.2	35.5	7.3	33.0	17.9	25.8
Change Period (Y+Rc), s	5.5	6.0	5.5	6.0	6.0	6.0	5.5	6.0
Max Green Setting (Gmax), s	5.5	35.0	16.5	40.0	5.0	35.0	28.5	40.0
Max Q Clear Time (g_c+I1), s	7.0	15.0	3.5	11.6	2.4	23.6	12.2	12.7
Green Ext Time (p_c), s	0.0	2.6	0.0	6.0	0.0	3.1	0.3	5.6

Intersection Summary	
HCM 7th Control Delay, s/veh	29.4
HCM 7th LOS	C

Notes

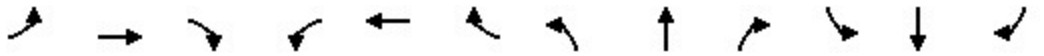
User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	296	16	71	489	7	697
v/c Ratio	0.78	0.07	0.20	0.28	0.01	0.47
Control Delay (s/veh)	38.9	15.6	9.3	10.9	7.9	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	38.9	15.6	9.3	10.9	7.9	14.1
Queue Length 50th (ft)	125	3	14	58	1	106
Queue Length 95th (ft)	#219	17	34	124	7	167
Internal Link Dist (ft)	2562	754		1844		628
Turn Bay Length (ft)			75		80	
Base Capacity (vph)	479	440	350	1738	487	1485
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.04	0.20	0.28	0.01	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	129	65	6	1	9	68	443	27	7	477	192
Future Volume (vph)	90	129	65	6	1	9	68	443	27	7	477	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	10	11	11	11	11	11
Total Lost time (s)		6.0			6.0		4.5	6.0		4.5	6.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.92		1.00	0.99		1.00	0.96	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1517			1432		1470	3185		1521	3051	
Flt Permitted		0.89			0.87		0.34	1.00		0.47	1.00	
Satd. Flow (perm)		1368			1274		530	3185		754	3051	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	94	134	68	6	1	9	71	461	28	7	497	200
RTOR Reduction (vph)	0	14	0	0	7	0	0	4	0	0	48	0
Lane Group Flow (vph)	0	282	0	0	9	0	71	485	0	7	649	0
Confl. Peds. (#/hr)	15		6	6		15	10		10	10		10
Confl. Bikes (#/hr)			3			1			2			3
Parking (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		D.P+P	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		19.9			19.9		41.4	40.5		41.4	37.6	
Effective Green, g (s)		19.9			19.9		41.4	40.5		41.4	37.6	
Actuated g/C Ratio		0.26			0.26		0.53	0.52		0.53	0.48	
Clearance Time (s)		6.0			6.0		4.5	6.0		4.5	6.0	
Vehicle Extension (s)		4.0			4.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)		349			325		327	1658		410	1474	
v/s Ratio Prot							c0.01	c0.15		0.00	c0.21	
v/s Ratio Perm		c0.21			0.01		0.10			0.01		
v/c Ratio		0.81			0.03		0.22	0.29		0.02	0.44	
Uniform Delay, d1		27.2			21.7		9.1	10.5		8.6	13.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		13.5			0.0		0.3	0.2		0.0	0.4	
Delay (s)		40.6			21.8		9.4	10.8		8.6	13.6	
Level of Service		D			C		A	B		A	B	
Approach Delay (s/veh)		40.6			21.8			10.6			13.6	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	77.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	129	65	6	1	9	68	443	27	7	477	192
Future Volume (veh/h)	90	129	65	6	1	9	68	443	27	7	477	192
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	0.98		0.97	0.99		0.97	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	94	134	51	6	1	3	71	461	22	7	497	144
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	165	192	65	219	43	78	464	1689	80	513	1212	349
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.05	0.52	0.52	0.01	0.48	0.48
Sat Flow, veh/h	407	794	269	576	179	324	1767	3245	154	1767	2542	731
Grp Volume(v), veh/h	279	0	0	10	0	0	71	250	233	7	344	297
Grp Sat Flow(s),veh/h/ln	1469	0	0	1079	0	0	1767	1763	1636	1767	1763	1509
Q Serve(g_s), s	9.9	0.0	0.0	0.0	0.0	0.0	1.4	5.7	5.8	0.1	9.2	9.3
Cycle Q Clear(g_c), s	12.7	0.0	0.0	0.4	0.0	0.0	1.4	5.7	5.8	0.1	9.2	9.3
Prop In Lane	0.34		0.18	0.60		0.30	1.00		0.09	1.00		0.48
Lane Grp Cap(c), veh/h	423	0	0	341	0	0	464	917	852	513	841	720
V/C Ratio(X)	0.66	0.00	0.00	0.03	0.00	0.00	0.15	0.27	0.27	0.01	0.41	0.41
Avail Cap(c_a), veh/h	572	0	0	463	0	0	493	917	852	619	841	720
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.5	0.0	0.0	20.9	0.0	0.0	9.0	9.7	9.7	8.3	12.3	12.3
Incr Delay (d2), s/veh	2.5	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.4	0.0	0.7	0.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	0.0	0.1	0.0	0.0	0.5	2.0	1.9	0.0	3.3	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	28.0	0.0	0.0	20.9	0.0	0.0	9.1	10.0	10.1	8.3	13.0	13.1
LnGrp LOS	C			C			A	B	B	A	B	B
Approach Vol, veh/h		279			10			554			648	
Approach Delay, s/veh		28.0			20.9			9.9			13.0	
Approach LOS		C			C			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.2	43.6		23.5	8.3	40.5		23.5				
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		6.0				
Max Green Setting (Gmax), s	5.0	34.5		25.0	5.0	34.5		25.0				
Max Q Clear Time (g_c+I1), s	2.1	7.8		14.7	3.4	11.3		2.4				
Green Ext Time (p_c), s	0.0	5.6		1.6	0.0	7.5		0.0				

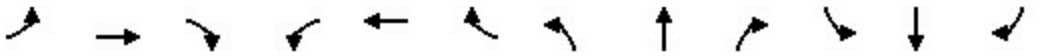
Intersection Summary		
HCM 7th Control Delay, s/veh	14.7	
HCM 7th LOS	B	

Notes
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	192	454	81	535	416	479
v/c Ratio	0.72	0.34	0.49	0.53	0.50	0.58
Control Delay (s/veh)	48.0	17.9	46.0	24.3	21.6	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	48.0	17.9	46.0	24.3	21.6	18.0
Queue Length 50th (ft)	84	73	36	101	69	61
Queue Length 95th (ft)	#197	158	96	204	131	126
Internal Link Dist (ft)		2554		2157	2447	1844
Turn Bay Length (ft)	200		250			
Base Capacity (vph)	413	1616	304	1364	1116	1077
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.28	0.27	0.39	0.37	0.44

Intersection Summary

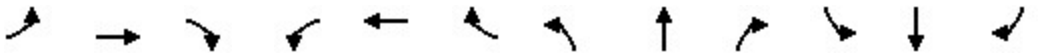
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	432	4	78	473	40	4	274	122	39	235	185
Future Volume (vph)	184	432	4	78	473	40	4	274	122	39	235	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)	5.0	5.8		5.0	5.8			6.3			6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.95			0.94	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1525	3214		1525	3175			3070			2994	
Flt Permitted	0.95	1.00		0.95	1.00			0.95			0.87	
Satd. Flow (perm)	1525	3214		1525	3175			2915			2627	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	192	450	4	81	493	42	4	285	127	41	245	193
RTOR Reduction (vph)	0	1	0	0	7	0	0	55	0	0	131	0
Lane Group Flow (vph)	192	453	0	81	528	0	0	361	0	0	348	0
Confl. Peds. (#/hr)			4			4	1					1
Confl. Bikes (#/hr)			4			10						2
Parking (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	12.9	31.2		6.6	24.9			19.8			19.8	
Effective Green, g (s)	12.9	31.2		6.6	24.9			19.8			19.8	
Actuated g/C Ratio	0.17	0.42		0.09	0.33			0.27			0.27	
Clearance Time (s)	5.0	5.8		5.0	5.8			6.3			6.3	
Vehicle Extension (s)	1.5	6.5		1.0	6.5			6.0			6.0	
Lane Grp Cap (vph)	263	1342		134	1058			772			696	
v/s Ratio Prot	c0.13	0.14		0.05	c0.17							
v/s Ratio Perm								0.12			c0.13	
v/c Ratio	0.73	0.34		0.60	0.50			0.47			0.50	
Uniform Delay, d1	29.3	14.7		32.8	19.9			23.0			23.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	8.6	0.5		5.2	1.2			1.3			1.6	
Delay (s)	37.9	15.2		38.0	21.1			24.3			24.9	
Level of Service	D	B		D	C			C			C	
Approach Delay (s/veh)		22.0			23.3			24.3			24.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	74.7	Sum of lost time (s)	17.1
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	432	4	78	473	40	4	274	122	39	235	185
Future Volume (veh/h)	184	432	4	78	473	40	4	274	122	39	235	185
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	192	450	3	81	493	35	4	285	70	41	245	57
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	242	1331	9	116	1011	72	71	579	138	125	501	115
Arrive On Green	0.14	0.39	0.39	0.07	0.32	0.32	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1767	3405	23	1767	3163	224	10	2618	626	190	2266	522
Grp Volume(v), veh/h	192	233	220	81	274	254	202	0	157	188	0	155
Grp Sat Flow(s),veh/h/ln	1767	1763	1665	1767	1763	1624	1848	0	1406	1562	0	1416
Q Serve(g_s), s	5.6	4.9	4.9	2.4	6.6	6.7	0.0	0.0	5.2	0.5	0.0	5.1
Cycle Q Clear(g_c), s	5.6	4.9	4.9	2.4	6.6	6.7	5.0	0.0	5.2	5.7	0.0	5.1
Prop In Lane	1.00		0.01	1.00		0.14	0.02		0.44	0.22		0.37
Lane Grp Cap(c), veh/h	242	689	651	116	564	519	478	0	311	428	0	313
V/C Ratio(X)	0.79	0.34	0.34	0.70	0.49	0.49	0.42	0.00	0.51	0.44	0.00	0.49
Avail Cap(c_a), veh/h	633	997	942	467	997	919	918	0	650	807	0	654
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.2	11.3	11.3	24.3	14.5	14.5	18.0	0.0	18.1	18.0	0.0	18.1
Incr Delay (d2), s/veh	2.3	1.3	1.4	2.8	3.0	3.3	2.1	0.0	4.6	2.6	0.0	4.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	1.9	1.8	1.0	2.8	2.6	2.2	0.0	1.9	2.1	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	24.4	12.7	12.7	27.1	17.5	17.8	20.2	0.0	22.7	20.5	0.0	22.4
LnGrp LOS	C	B	B	C	B	B	C		C	C		C
Approach Vol, veh/h		645			609			359			343	
Approach Delay, s/veh		16.2			18.9			21.3			21.4	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.5	26.5		18.0	12.2	22.8		18.0				
Change Period (Y+Rc), s	5.0	5.8		6.3	5.0	5.8		6.3				
Max Green Setting (Gmax), s	14.0	30.0		24.5	19.0	30.0		24.5				
Max Q Clear Time (g_c+I1), s	4.4	6.9		7.7	7.6	8.7		7.2				
Green Ext Time (p_c), s	0.0	7.0		4.0	0.1	7.9		4.2				

Intersection Summary		
HCM 7th Control Delay, s/veh	18.9	
HCM 7th LOS	B	

Notes

User approved pedestrian interval to be less than phase max green.

SHEET INDEX

SHEET NO.	SHEET TITLE	DESCRIPTION
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02	GN-01	GENERAL NOTES
03-13	SI-01 TO SI-11	STREET IMPROVEMENT PLAN
14-25	CD-01 TO CD-12	CONSTRUCTION DETAILS
26-36	SS-01 TO SS-11	SIGNING AND STRIPING PLAN
37-58	E-01 TO E-22	ELECTRICAL PLAN

CITY OF REDONDO BEACH

PUBLIC WORKS DEPARTMENT
ENGINEERING SERVICES DIVISION
REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM
PROSPECT AVE. BETWEEN ANITA ST. AND PALOS VERDES BLVD.
PROJECT NO. 41490

REDONDO BEACH

BENCHMARK

LOS ANGELES COUNTY PUBLIC WORKS BENCHMARK

DESIGNATION: QY 10954
YEAR: 2013
DATUM: NAVD88
ELEV: 96.815'

DESCRIPTION: DPW BM TAG IN N CB 10FT WEST OF BCR AT NW COR TORRANCE BL AND GUADALUPE AVE.

BASIS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS PROJECT IS THE CALIFORNIA COORDINATES SYSTEM NAD83, ZONE 5 (2017.50EPOCH) AND ESTABLISHED LOCALLY BY FIELD-OBSERVED TIES RELATIVE TO CALIFORNIA SPATIAL REFERENCE NETWORK STATIONS "LBC1" AND "TORP", IN ACCORDANCE WITH THE CALIFORNIA PUBLIC RESOURCES CODE, SECTIONS 8801-8819 AND WITH A BEARING OF NORTH 78°08'56" EAST. ALL LINEAR MEASUREMENTS ARE IN US SURVEY FEET. TO OBTAIN GROUND DISTANCES, DIVIDE GRID DISTANCES AT STATION "A" WITH COMBINED SCALE FACTOR OF 1.00004224.

STATION	NORTHING	EASTING	ELEVATION
LBC1	1761296.38'	6520006.24'	47.52'
TORP	1748960.84'	6461221.83'	103.06'
"A"	1773206.83'	6448514.67'	90.61'
"B"	1757389.79'	6448317.69'	93.01'

UTILITY CONTACT LIST

COMPANY	CONTACT	PHONE NUMBER
AMERICAN DARK FIBER	JOSEPH GONZALEZ	(951)858-0154
CALIFORNIA WATER SERVICE	CARDINAL FERNANDEEZEES	(310)420-8217
CHEVRON PIPELINE COMPANY	ALLEN JUST	(714)508-2677
COUNTY SANITATION DISTRICT - COMPTON	ENGINEERING COUNTER	(310)638-1161
CROWN CASTLE	FIBER DIG ALERT	(800)654-3110
FRONTIER	DONALD CRITCHFIELD	(310)264-5100
LA COUNTY PUBLIC WORKS - FLOOD MAINTENANCE	ADAM LEE	(626)458-6185
LA DEPARTMENT OF WATER AND POWER	ENGINEERING COUNTER	(213)367-6428
MARATHON PIPELINE	PATRICK KELLEY	(562)208-0511
MCI BUSINESS (VERIZON)	VERIZON INVESTIGATIONS	(800)289-327
SOCAL GAS	ENGINEERING COUNTER	(310)687-2011
SOUTHERN CALIFORNIA EDISON	GILBERT ACEVEZ	(909)548-7249
SPECTRUM	NATASCHA FUCSIK	(310)216-3545
WEST BASIN MUNICIPAL WATER DISTRICT	FRANK FUCHS	(310)660-6255
ZAYO FNA ABOVENET	GEORGE HUSS	(213)283-3601

DIGALERT

DIAL BEFORE YOU DIG — TWO WORKING DAYS BEFORE YOU DIG

TOLL FREE 1-800-227-2600

Underground Service Alert of Southern California

PROJECT VICINITY MAP
NTS

ABBREVIATIONS

BFP	BACKFLOW PREVENTER
BC	BEGIN CURVE
BCR	BEGIN CURB RETURN
BEG	BEGIN
C OR C/L	CENTER LINE
C&G	CURB AND GUTTER
CMH	COMMUNICATIONS MAN HOLE
COM	COMMUNICATIONS
CPB	COMMUNICATIONS PULLBOX
DW	DOMESTIC WATER
DWY	DRIVEWAY
E/ELEC	ELECTRICAL
EB	ELECTRICAL BOX
EC	END CURVE
ECB	ELECTRICAL CONTROL BOX
ECR	END CURB RETURN
EVT	ELECTRICAL VAULT
EX	EXISTING
FS	FINISH SURFACE
FH	FIRE HYDRANT
FL	FLOW LINE
G	GAS LINE
GV	GAS VALVE
GW	GUY WIRE/GUIDE WIRE
JP	JOINT POLE
LT	LEFT
MH	MANHOLE
OH	OVERHEAD
PP	POWER POLE
PB	PULL BOX
PVMT	PAVEMENT
RT	RIGHT
R/W	RIGHT-OF-WAY
RW	RECLAIMED WATER
SHT	SHEET
SS	SANITARY SEWER
SSMH	SANITARY SEWER MANHOLE
SW	SIDEWALK
SCE	SOUTHERN CALIFORNIA EDISON
SD	STORM DRAIN
SDDI	STORM DRAIN DRAINAGE INLET
SDMH	STORM DRAIN MANHOLE
SD VLT	STORM DRAIN VAULT
STD	STANDARD
SSMH	SANITARY SEWER MANHOLE
T	TELEPHONE
TC	TOP OF CURB
TMH	TELEPHONE MANHOLE
TS	TRAFFIC SIGNAL
UG	UNDERGROUND
WM	WATER METER
WMH	WATER MANHOLE
WV	WATER VALVE
W VLT	WATER VAULT

SYMBOLS LEGEND

- CENTERLINE
- RIGHT OF WAY LINE
- EX WATER VALVE
- EX GAS VALVE
- EX FIRE HYDRANT
- EX MANHOLE
- EX SANITARY SEWER MANHOLE
- EX STORM DRAIN MANHOLE
- EX COMMUMNICATIONS MANHOLE
- EX ELECTRICAL EMANHOLE
- EX TELECOMMUNICATIONS MANHOLE
- EX SIGN
- EX PULL BOX
- EX JUNCTION POLE
- EX STREET LIGHT

N

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER — SHEILA AMPARO — 78003 Exp 9-30-27 CIVIL — STATE OF CALIFORNIA

PLANS PREPARED BY:

DESIGNED BY:	MB	DATE: 02/06/26
DRAWN BY:	JC	DATE: 02/06/26
CHECKED BY:	SA	DATE: 02/06/26

CIVIL ENGINEER: SHEILA AMPARO LICENSE NO. 78003

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2

TITLE SHEET

DRAWN	JC	CHECKED	MB/SA
SCALE	AS NOTED	APPROVED BY	ANDREW S. WINJE, P.E. CITY ENGINEER
DATE		PROJECT NO.	41490
SHEET NO.	01 OF 58 SHEETS	DRAWING NO.	T-01

DRAWING: \\bkf-nb\vol4\2024\41992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-01-nb-ti.dwg PLOTTED: 2/6/2026 3:30 PM BY: Jacob

GENERAL NOTES

1. GENERAL NOTES APPLY TO ALL PLANS.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND SUBSTRUCTURES, WHETHER SHOWN OR NOT. VERIFICATION BY POTHOLING AND/OR METAL DETECTORS FOR UTILITY LINES AND UTILITY COVERS IS REQUIRED.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES ENCOUNTERED DURING THIS PROJECT, AND SHALL NOTIFY THE CITY ENGINEER IMMEDIATELY OF ANY UNDOCUMENTED SUBSTRUCTURES. ANY DAMAGES TO UTILITIES AS A RESULT OF CONTRACTOR'S ACTION SHALL BE REPAIRED AT THE CONTRACTOR'S SOLE EXPENSE TO THE SATISFACTION OF THE AGENCY HAVING JURISDICTION.
4. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED TEMPORARY AND PERMANENT PERMITS, INCLUDING LICENSES, CERTIFICATES, INSPECTIONS, TESTS, AND SERVICE. COPIES OF APPLICABLE PERMITS AND AN APPROVED SET OF PLANS SHALL BE AT THE JOB SITE AT ALL TIMES.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING CONSTRUCTION WITH ALL UTILITIES.
6. CONTRACTOR SHALL FURNISH AND INSTALL ALL SIGNS, LIGHTS, BARRICADES, FLASHING ARROW BOARDS, AND ANY OTHER TRAFFIC CONTROL WARNING DEVICES IN GOOD WORKING CONDITIONS, INCLUDING FLAGMEN, AS MAY BE REQUIRED BY THE CITY ENGINEER. ALL ITEMS MENTIONED SHALL CONFORM TO THE REQUIREMENTS SPECIFIED IN THE LATEST EDITION OF THE WORK AREA TRAFFIC CONTROL HANDBOOK MUTCD MANUAL. FAILURE TO DO SO WILL BE CITED UNDER THE APPLICABLE SECTION OF THE C.V.C AND CORRECTIVE COST TO THE CITY WILL BE CHARGED TO THE CONTRACTOR. 'NO PARKING' SIGNS (11" X 17") CONTAINING CONSTRUCTION TIMES, CONSTRUCTION DATES. AND A REFERENCE TO CVC22651, MUST BE POSTED 72 HOURS PRIOR TO CONSTRUCTION. DOOR HANGERS WITH CONSTRUCTION INFORMATION MUST BE DISTRIBUTED TO AFFECTED BUSINESSES 72 HOURS PRIOR TO CONSTRUCTION.
7. CONTRACTOR IS RESPONSIBLE FOR ALL SURVEY WORK NECESSARY FOR CONSTRUCTION.
8. ALL WORK SHALL CONFORM TO THE LATEST EDITION AND SUPPLEMENTS OF THE STANDARD SPECIFICATIONS AND PLANS FOR PUBLIC WORKS CONSTRUCTION.
9. THE WORK AREA SHALL BE CLEANED DAILY AND KEPT CLEAN OF ALL DUST, DIRT, AND DEBRIS.
10. CONSTRUCTION WILL NEED TO BE COORDINATED WITH THE TRASH AND STREET SWEEPING SERVICES, WHICH ARE SCHEDULED ONCE A WEEK. CANCELLATION OF TRASH OR STREET SWEEPING SERVICES FOR ANY WEEK WILL NOT BE PERMITTED.
11. CONTRACTOR SHALL HAND DELIVER 'NOTICE TO TENANTS' TO ALL AFFECTED BUSINESSES AT LEAST THREE DAYS PRIOR TO THE START OF CONSTRUCTION. BUSINESSES SHALL ALSO BE INFORMED VA NOTICES OF ANY SIGNIFICANT CHANGES TO THE PROJECT SCOPE OR SCHEDULE. ALL NOTICES MUST BE APPROVED BY THE CITY ENGINEER.COST FOR NOTIFICATION SHALL BE INCLUDED IN THE BID PRICE FOR CONSTRUCTION STAGING AND TRAFFIC CONTROL.
12. THE CITY ENGINEER SHALL BE NOTIFIED A MINIMUM OF 48 HOURS PRIOR TO REMOVAL OF EXISTING TRAFFIC STRIPES, PAVEMENT LEGENDS, OR SIGNS.
13. CONTRACTOR SHALL SUBMIT COPIES OF ASPHALT WASTE DISPOSAL TICKETS FROM THE RECYCLING SOURCE TO THE CITY ENGINEER AND/OR THEIR REPRESENTATIVE.
14. CONTRACTOR SHALL VISIT THE SITE AND VERIFY ALL DIMENSIONS, EXISTING AND FINISH SURFACE ELEVATIONS, CONDITIONS, ETC. AT THE JOB SITE BEFORE SUBMITTING A BID OR COMMENCING WORK. THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY DISCREPANCIES OR ERRORS IN THE PLANS TO THE CITY ENGINEER.
15. NO CHANGES IN THE PLANS SHALL BE MADE OR EXTRA WORK PERFORMED WITHOUT WRITTEN APPROVAL OF THE CITY ENGINEER'S REPRESENTATIVE.
16. CONTRACTOR SHALL RESET ALL CENTERLINE TIE/MONUMENTS AND PRESENT THE CITY WITH A CENTERLINE DOCUMENT STAMP APPROVED BY A LICENSED ENGINEER/SURVEYOR.
17. CONTRACTOR SHALL ADJUST ALL MANHOLES, VALVE BOXES, ETC. TO FINISHED GRADE AT THE CONTRACTOR'S EXPENSE.
18. CONTRACTOR TO KEEP AT LEAST HALF OF THE ROADWAY WIDTH OPEN IN EACH DIRECTION AT ALL TIMES

ENGINEERING SERVICES DIVISION NOTES

A. MYLAR COPY OF THE RECORDED TRACT MAP/PARCEL MAP SHALL BE SUBMITTED TO THE CITY ENGINEER, PRIOR TO REQUESTING FINAL BUILDING INSPECTION.

B. RECORDED COPY OF THE REQUIRED COVENANT/EASEMENT/DEED/DEED RESTRICTION SHALL BE SUBMITTED TO THE CITY ENGINEER, PRIOR TO REQUESTING FINAL BUILDING INSPECTION.

C. ALL EASEMENTS, OIL WELLS, SUBSTRUCTURES, SUPERSTRUCTURES, LANDSCAPE, HARDSCAPE, UTILITY POLES, UTILITY BOXES, UTILITY VENTS, UTILITY VAULTS, UTILITY CABINETS, UTILITY OVERHEAD LINES AND WATER HYDRANTS ARE SHOWN ON THIS SITE PLAN.

D. CONTRACTOR, AT ITS SOLE COST, SHALL ENSURE THAT PERMITTED WORK WILL NOT CREATE POTENTIAL FLOODING OF NEIGHBORING IMPROVEMENTS, NOR WILL IT ALTER THE EXISTING COURSE OF WATER FLOW.

E. CONTRACTOR SHALL NOTIFY CITY ENGINEERING SERVICES DIVISION 48 HOURS PRIOR TO COMMENCING ANY WORK IN PUBLIC RIGHT OF WAY.

F. WORK IN PUBLIC RIGHT OF WAY, SHALL COMPLY WITH THE LATEST EDITION OF APWA STANDARD PLANS AND SPECIFICATIONS, AND SHALL BE EXECUTED TO THE SATISFACTION OF CITY ENGINEER AND/OR HIS REPRESENTATIVE.

G. WORK IN PUBLIC RIGHT OF WAY SHALL BE PERFORMED BY LICENSED CONTRACTORS. CONTRACTORS AND SUBCONTRACTORS SHALL POSSESS VALID REDONDO BEACH BUSINESS LICENSES.

H. CONTRACTOR SHALL MAINTAIN CONSTRUCTION PERMITS AND AN APPROVED SET OF PLANS ON SITE AT ALL TIME. CONTRACTOR SHALL SURRENDER ALL REQUIRED CONSTRUCTION DOCUMENTS TO THE CITY ENGINEER AND/OR HIS REPRESENTATIVE UPON DEMAND.

I. PRIOR TO ISSUANCE OF THE BUILDING/ENGINEERING PERMIT, CONTRACTOR MUST PROVIDE PROOF OF INSURANCE. CONTRACTOR SHALL MAINTAIN ON CITY FILES APPROVED ONE MILLION DOLLAR GENERAL LIABILITY NAMING THE CITY ADDITIONAL INSURED, WITH 30-DAY CANCELLATION NOTICE. THE INSURANCE POLICY SHALL STATE "THE CITY OF REDONDO BEACH, ITS OFFICERS, ELECTED OFFICIALS, ATTORNEYS, EMPLOYEES, MEMBERS OF BOARDS AND COMMISSIONS, AGENTS AND VOLUNTEERS ARE HEREBY NAMED ADDITIONAL INSURED." THE CERTIFICATE OF INSURANCE MUST STATE THAT THE INSURANCE IS "PRIMARY" AND NOT EXCESS. THE CANCELLATION CLAUSE SHALL STATE "SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT.

ENGINEERING SERVICES DIVISION NOTES CONT.

J. CONTRACTOR SHALL REPLACE AT ITS SOLE COST, DAMAGED SIDEWALK, DRIVEWAYS, CURB, GUTTER AND PAVEMENT TO THE SATISFACTION OF THE CITY ENGINEER AND/OR HIS REPRESENTATIVE.

K. CONSTRUCT NEW RESIDENTIAL CONCRETE DRIVEWAY TYPE __ WHERE NOTED ON SITE PLAN. NEW CONCRETE SHALL BE CLASS 520-C-2500.

L. CONSTRUCT NEW COMMERCIAL CONCRETE DRIVEWAY TYPE __ WHERE NOTED ON SITE PLAN. NEW CONCRETE SHALL BE CLASS 520-C-2500.

M. CONSTRUCT NEW CONCRETE SIDEWALK WHERE NOTED ON SITE PLAN. NEW SIDEWALK SHALL MATCH EXISTING. NEW CONCRETE SHALL BE CLASS 520-C-2500.

N. CONSTRUCT NEW CONCRETE CURB AND GUTTER WHERE NOTED ON SITE PLAN. NEW CURB SHALL HAVE FACE HEIGHT OF 6 INCHES OR MATCH EXISTING. NEW GUTTER SHALL BE 12 INCHES WIDE OR MATCH EXISTING. NEW CONCRETE SHALL BE CLASS 520-C-2500.

O. CONSTRUCT NEW FULL-DEPTH ASPHALT CONCRETE PAVEMENT WHERE NOTED ON SITE PLAN. NEW ASPHALTIC CONCRETE SHALL BE CLASS D1-PG-64-10.

P. CONSTRUCT NEW CONCRETE CURB RAMP WITH ADJACENT 3-FOOT MINIMUM ASPHALTIC CONCRETE PAVEMENT, WHERE NOTED ON SITE PLAN. NEW CONCRETE SHALL BE CLASS 520-C-2500. NEW ASPHALTIC CONCRETE SHALL BE CLASS D1-PG-64-10.

Q. NEW SEWER LATERAL SHALL BE CONNECTED TO MAIN SEWER LINE WITHIN PROPERTY FRONTAGE. SEWER LATERAL SHALL BE PERPENDICULAR TO MAIN SEWER LINE. MINIMUM SEWER LATERAL DIAMETER SHALL BE 4-INCH. NO CONNECTION TO EXISTING SEWER IS ALLOWED UNLESS THE EXISTING SEWER MEETS THE CURRENT CODE REQUIREMENTS AND THE APPROVAL OF THE BUILDING DIVISION. QUALITY/QUANTITY OF SEWAGE CONSTITUENTS SHALL COMPLY WITH THE REQUIREMENTS OF THE LATEST EDITION OF THE WASTEWATER ORDINANCE OF THE SANITATION DISTRICTS OF LOS ANGELES COUNTY. PROVIDE 6-INCH CLEAN-OUT IMMEDIATELY BEHIND SIDEWALK. ENCASE CLEAN-OUT IN CONCRETE BOX MARKED "S" OR "SEWER". DESIGN SHALL BE PERFORMED BY A REGISTERED CIVIL ENGINEER.

R. NEW PUBLIC OR QUASI-PUBLIC UTILITY FACILITIES SHALL BE LOCATED IN PUBLIC PARKWAY (THE LANDSCAPED AREAS WITHIN THE CITY RIGHT OF WAY), OUTSIDE OF CURB RAMPS, DRIVEWAYS AND SIDEWALK, UNLESS OTHERWISE NOTED ON SITE PLAN.

S. TRAFFIC DELINEATION SHALL BE EXECUTED IN ACCORDANCE WITH THE LATEST EDITION OF THE CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CA-MUTCD) AND TO THE SATISFACTION OF THE CITY ENGINEER AND/OR HIS REPRESENTATIVE.

T. COMMERCIAL VEHICLES TRANSPORTING SOIL, EQUIPMENT OR CONSTRUCTION MATERIALS, AND HAVING UNLADEN WEIGHT AS DEFINED IN SECTION 660 OF CVC OF 6,000 POUNDS OR MORE OR HAVING MANUFACTURER'S GROSS WEIGHT RATING AS DEFINED IN SECTION 390 OF CVC OF 10,000 POUNDS OR MORE SHALL USE DESIGNATED TRUCK ROUTE TO COMMUTE TO PROJECT SITE. ANY COMMERCIAL VEHICLE HAVING A FULLY LADEN WEIGHT OF 20,000 POUNDS OR MORE SHALL NOT USE CONDITIONAL TRUCK ROUTE.

U. PUBLIC WORKS INSPECTOR SHALL INSPECT ALL STREET IMPROVEMENTS; ALL SEWER SYSTEMS INCLUDING ALL PIPING, TRENCHING, BACKFILLING AND SEWER EJECTOR; ALL STORM DRAIN SYSTEMS INCLUDING ALL PIPING, TRENCHING, BACKFILLING, CATCH BASINS, SUMP PUMPS AND OIL/WATER SEPARATOR. FIRST INSPECTION SHALL TAKE PLACE AFTER FORMS ARE IN PLACE FOR SIDEWALKS, DRIVEWAYS, ETC. OR AT THE TIME OF CONSTRUCTING THE SEWER LINE SADDLE. SECOND INSPECTION SHALL TAKE PLACE WHILE SIDEWALKS, DRIVEWAYS, ETC., ARE BEING POURED AND FINISHED OR AT THE TIME OF BACKFILLING. BACKFILLING, COMPACTION AND TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH CITY STANDARDS AND TO THE SATISFACTION OF THE CITY ENGINEER AND/OR HIS REPRESENTATIVE. FINAL INSPECTION WILL BE MADE PRIOR TO CITY BUILDING DIVISION FINAL INSPECTION. AT THAT TIME, IF ALL WORK PERTAINING TO PUBLIC RIGHT OF WAY IS IN GOOD ORDER, THE PERMIT DEPOSITS WILL BE RELEASED, LESS ANY AND ALL CHARGES.

V. CONTRACTOR SHALL ARRANGE FOR PUBLIC WORKS INSPECTION 24 HOURS IN ADVANCE. CONTRACTOR SHALL CONTACT THE ENGINEERING SERVICES DIVISION AT (310) 937-6653 BEFORE 3:00 P.M. FOR ALL INSPECTION REQUESTS. CALLS RECEIVED AFTER 3:00 P.M. SHALL NOT BE SCHEDULED FOR NEXT BUSINESS DAY INSPECTION.

W. CONTRACTOR SHALL SUBMIT COMPACTION REPORTS AND CONCRETE/ASPHALT CLASS CERTIFICATES TO THE ENGINEERING SERVICES DIVISION PRIOR TO REQUESTING FINAL INSPECTION.

X. DUST CONTROL SHALL BE ENFORCED TO THE SATISFACTION OF THE CITY ENGINEER AND/OR HIS REPRESENTATIVE THROUGHOUT CONSTRUCTION.

Y. NOISE CONTROL SHALL BE ENFORCED TO THE SATISFACTION OF THE CITY ENGINEER AND/OR HIS REPRESENTATIVE THROUGHOUT CONSTRUCTION. ACTUAL CONSTRUCTION ACTIVITIES IN PUBLIC RIGHT OF WAY MAY OCCUR FROM 7:00 A.M. TO 6:00 P.M., MONDAY THROUGH FRIDAY. NO WORK IN PUBLIC RIGHT OF WAY SHALL OCCUR ON SATURDAYS WITHOUT PRIOR AUTHORIZATION FROM THE CITY ENGINEER AND/OR HIS REPRESENTATIVE. AUTHORIZED WORK ON SATURDAYS SHALL OCCUR FROM 9:00 A.M. TO 5:00 P.M. NO WORK IN PUBLIC RIGHT OF WAY SHALL OCCUR ON SUNDAYS OR NATIONAL HOLIDAYS.

Z. PUBLIC RIGHT OF WAY SHALL BE KEPT CLEAR AND CLEAN TO THE SATISFACTION OF THE CITY ENGINEER AND/OR HIS REPRESENTATIVE THROUGHOUT CONSTRUCTION. NO STORAGE OF DEBRIS, MATERIALS OR EQUIPMENT SHALL BE ALLOWED ON PUBLIC RIGHT OF WAY WITHOUT PRIOR WRITTEN CONSENT FROM THE CITY ENGINEER AND/OR HIS REPRESENTATIVE. SUCH CONSENT SHALL BE RENEWED DAILY. IF CITY CREWS ARE CALLED UPON TO PERFORM WORK OF CONTRACTOR, REGARDING CITY RIGHT OF WAY, CONTRACTOR SHALL BE CHARGED FOR ALL EXPENSES INCURRED BY CITY CREWS.

AA. CONTRACTOR SHALL LOCATE AND PROTECT IN PLACE EXISTING UTILITIES AT ITS SOLE COST. CONTRACTOR SHALL REPAIR, AT ITS COST AND TO THE SATISFACTION OF THE CITY ENGINEER, HIS REPRESENTATIVE AND/OR TO THE UTILITY COMPANIES, ANY DAMAGE INFLICTED BY CONTRACTOR ON EXISTING UTILITIES.

BB. CONTRACTOR SHALL LOCATE AND PROTECT IN PLACE EXISTING SURVEY POINTS AT ITS SOLE COST. CONTRACTOR SHALL RE-ESTABLISH DAMAGED SURVEY POINTS, AT ITS SOLE COST, AND TO THE SATISFACTION OF THE CITY ENGINEER AND/OR HIS REPRESENTATIVE.

CC. CONTRACTOR SHALL REPLACE AT ITS SOLE COST, REMOVED/DAMAGED TREES/LANDSCAPING WITHIN PUBLIC RIGHT OF WAY, TO THE SATISFACTION OF THE CITY ENGINEER AND/OR HIS REPRESENTATIVE.

SIGNING AND STRIPING NOTES

1. GENERAL SIGNING AND STRIPING NOTES APPLY TO ALL PLAN SHEETS.
2. SIGNS, STRIPING, PAVEMENT MARKINGS, AND PAVEMENT MARKERS SHALL BE INSTALLED PER THE 2026 EDITION OF THE CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CA MUTCD) AND 2025 EDITION OF THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) STANDARD PLANS AND SPECIFICATIONS UNLESS OTHERWISE NOTED.
3. ALL CONFLICTING STRIPING AND PAVEMENT MARKINGS SHALL BE COMPLETELY REMOVED BY SANDBLASTING PRIOR TO INSTALLATION OF NEW STRIPING AND MARKINGS.
4. SIGN SHEETING SHALL BE 3M DG3 OR CITY-APPROVED EQUIVALENT.
5. STRIPING AND PAVEMENT MARKINGS SHALL BE ALKYD THERMOPLASTIC WITH GLASS BEADS. MATERIAL SHALL CONFORM TO SPECIFICATION 8010-004 (TYPE II) FOR GLASS BEADS. APPLICATION SHALL CONFORM TO CALTRANS STANDARD SPECIFICATION SECTION 84-2. CONTRACTOR SHALL VERIFY LATEST MATERIALS SPECIFICATIONS AND SHALL NOTIFY CITY ENGINEER AND/OR THEIR REPRESENTATIVE OF ANY CHANGE PRIOR TO INSTALLATION.
6. LIMIT LINES SHALL BE INSTALLED 4' EDGE-TO-EDGE IN ADVANCE OF THE CROSSWALK AT A 90 DEGREE ANGLE TO THE CENTERLINE OR LANE LINE. WHEN THE CROSSWALK IS INSTALLED AT AN ANGLE, THE 4' BUFFER SHALL BE MEASURED FROM THE EDGE OF CROSSWALK TO THE LIMIT LINE AT THE CENTER OF THE LANE. LANE AND CHANNELIZING LINES SHALL TERMINATE AT LIMIT LINE.
7. CROSSWALKS SHALL BE 2' CONTINENTAL STRIPES WITH 3' GAPS. INSTALLATION SHALL BEGIN WITH THE FIRST STRIPE CENTERED ON THE CENTERLINE; ADDITIONAL STRIPES SHALL BE INSTALLED AT A SPACING OF 5' CENTER-ON-CENTER. STRIPES SHALL NOT BE INSTALLED CLOSER THAN 1' FROM PAVEMENT EDGE. ANY INSTALLATION QUESTIONS SHALL BE DISCUSSED WITH THE CITY ENGINEER AND/OR THEIR REPRESENTATIVE PRIOR TO INSTALLATION.
8. ALL LANE STRIPING AT INTERSECTION APPROACHES WITHOUT CROSSWALKS SHALL END 10 FEET FROM THE EXTENSION OF THE INTERSECTING CURB LINE.
9. ALL LANE LINES AT INTERSECTION APPROACHES AND DEPARTURES SHALL BEGIN AND END WITH 50 FEET OF 6" SOLID LINE UNLESS OTHERWISE SHOWN.
10. ALL CENTERLINE STRIPING AT INTERSECTION APPROACHES SHALL BE DOUBLE YELLOW FOR A DISTANCE OF 50 FEET UNLESS OTHERWISE SHOWN.
11. LANE WIDTHS SHALL BE MEASURED BETWEEN THE CENTER LINES OF EACH ADJACENT SINGLE OR DOUBLE STRIPE(S) OR TOP OF CURBS AS APPROPRIATE. ACTUAL LANE WIDTHS MAY VARY FROM THOSE SHOWN ON PLAN(S) DUE TO TOPOGRAPHY AND STREET CURVATURE. ANY CHANGES TO STRIPED LANE WIDTHS FOR THOSE SHOWN ON PLAN(S) REQUIRE APPROVAL BY THE CITY ENGINEER AND/OR THEIR REPRESENTATIVE PRIOR TO CAT-TRACKING.
12. ALL STRIPING SHALL BE CAT-TRACKED AND APPROVED BY THE CITY ENGINEER AND/OR THEIR REPRESENTATIVE PRIOR TO FINAL INSTALLATION. A MINIMUM OF THREE DAYS NOTICE MUST BE PROVIDED TO THE CITY ENGINEER AND/OR THEIR REPRESENTATIVE, (310) 318-0661, FOR APPROVAL OF CAT-TRACKING AND/OR STRIPING.
13. ALL TWO-WAY, BLUE RETROREFLECTIVE PAVEMENT MARKERS, TYPE D, FOR FIRE HYDRANT LOCATIONS ARE TO BE RESTORED. NUMBER OF MARKERS TO BE VERIFIED BY CONTRACTOR.
14. ALL COSTS TO RESTORE STRIPING, PAVEMENT MARKINGS, AND PAVEMENT MARKERS TO MATCH THE EXISTING CONDITION PER THE PRECEDING NOTES SHALL BE INCLUDED IN THE BID PRICE.
15. TELESPAR, ROUND, AND WOOD POSTS IN SIDEWALK TO BE REMOVED SHALL BE REMOVED COMPLETELY AND THE HOLE BACKFILLED, PACKED, AND FINISHED WITH NON-SHRINK GROUT. U-POSTS IN SIDEWALK TO BE REMOVED MAY BE CUT OFF FLUSH TO SIDEWALK. POSTS IN DIRT TO BE REMOVED SHALL BE REMOVED COMPLETELY AND THE HOLE BACKFILLED, COMPACTED, AND MADE FLUSH WITH SURROUNDING SURFACE AREA.
16. ALL NEW SIGNS SHALL HAVE PERMANENTLY AFFIXED ON THE BACK OF THE SIGN THE MONTH AND YEAR OF INSTALLATION.
17. ALL REMOVED SIGNS SHALL BE RETURNED TO THE CITY.
18. THE CONTRACTOR SHALL DETERMINE THE LOCATION OF ANY EXISTING UNDERGROUND UTILITIES TO DRILLING HOLES OR PREPARING SIGN FOUNDATIONS.

ELECTRICAL NOTES

1. TRAFFIC SIGNAL, LIGHTING, AND ELECTRICAL SYSTEMS SHALL CONFORM TO THE 2025 EDITION OF THE PROVISIONS OF THE STANDARD SPECIFICATIONS AND STANDARD PLANS OF THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION, 2018 STANDARD PLANS AND SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 2026 CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE SPECIAL CONDITIONS, AND ALL REVISIONS AND DOCUMENTS REFERENCED THEREBY.
2. ALL MATERIALS AND EQUIPMENT SHALL BE FURNISHED BY THE CONTRACTOR.
3. ALL WIRING SHALL BE MARKED (TAGGED_ WITHIN THE CONTROLLER CABINET FOR PHASE IDENTIFICATION.
4. ALL SIGNAL EQUIPMENT SHALL BE WIRED IN ACCORDANCE WITH THE SIGNAL PHASE DIAGRAM.
5. RELOCATION OF WIRELESS RADIO EQUIPMENT AND ANTENNA SHALL BE DONE BY THE AGENCY, CONTRACTOR SHALL CONTACT THE SIGNAL SHOP SUPERVISOR MR. JEFF MAGALLANES AT (626)458-1704 TEN (10) WORKING DAYS IN ADVANCE FOR COORDINATION.
6. ALL NEW PULL BOXES SHALL BE NO. 6, UNLESS OTHERWISE NOTED.
7. ALL NEW UNDERGROUND CONDUIT SHALL BE SCHEDULE 80 PVC, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
8. THREE-CONDUCTOR CABLE (3CSC) AND TWELVE-CONDUCTOR CABLE (12 CSC) SHALL BE INSTALLED IN LIEU OF INDIVIDUAL CONDUCTORS. NO OTHER TRAFFIC SIGNAL (TS) MULTI-CONDUCTOR CABLE WILL BE ACCEPTED UNLESS OTHERWISE APPROVED BY THE ENGINEER.
9. IF ABANDONING EXISTING CONDUIT, REMOVE EXISTING CONDUCTORS.
10. NEW VEHICLE HEADS SHALL BE L.E.D. (LIGHT EMITTING DIODE) VEHICLE HEADS PER LOST ANGELES COUNTY DPW SPECIFICATIONS. (SEE SPECIAL PROVISIONS).
11. NEW PEDESTRIAN HEADS SHALL BE L.E.D. (LIGHT EMITTING DIODE) COUNTDOWN PEDESTRIAN HEADS. (SEE SPECIAL PROVISIONS).
12. ALL NEW PEDESTRIAN PUSH BUTTONS SHALL BE ADA COMPLIANT.
13. POLE LOCATIONS SHOWN HEREON ARE APPROXIMATE. PRECISE LOCATIONS SHALL BE ESTABLISHED IN THE FIELD AND VERIFIED BY THE PROJECT ENGINEER.
14. ALL NEW PEDESTRIAN PUSH BUTTONS SHALL BE INSTALLED NO FURTHER THAN 5 FEET FROM THE BACK OF CROSSWALK OR LIMIT LINE UNLESS OTHERWISE NOTED.
15. "INSTALL", AS USED IN CONSTRUCTION NOTES, SHALL MEAN "FURNISH AND INSTALL".

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2

GENERAL NOTES

DRAWN	CHECKED	SCALE
JC	MB/SA	AS NOTED

APPROVED BY: ANDREW S. WINJE, P.E. CITY ENGINEER — DATE:

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	02 OF 58 SHEETS	GN-01

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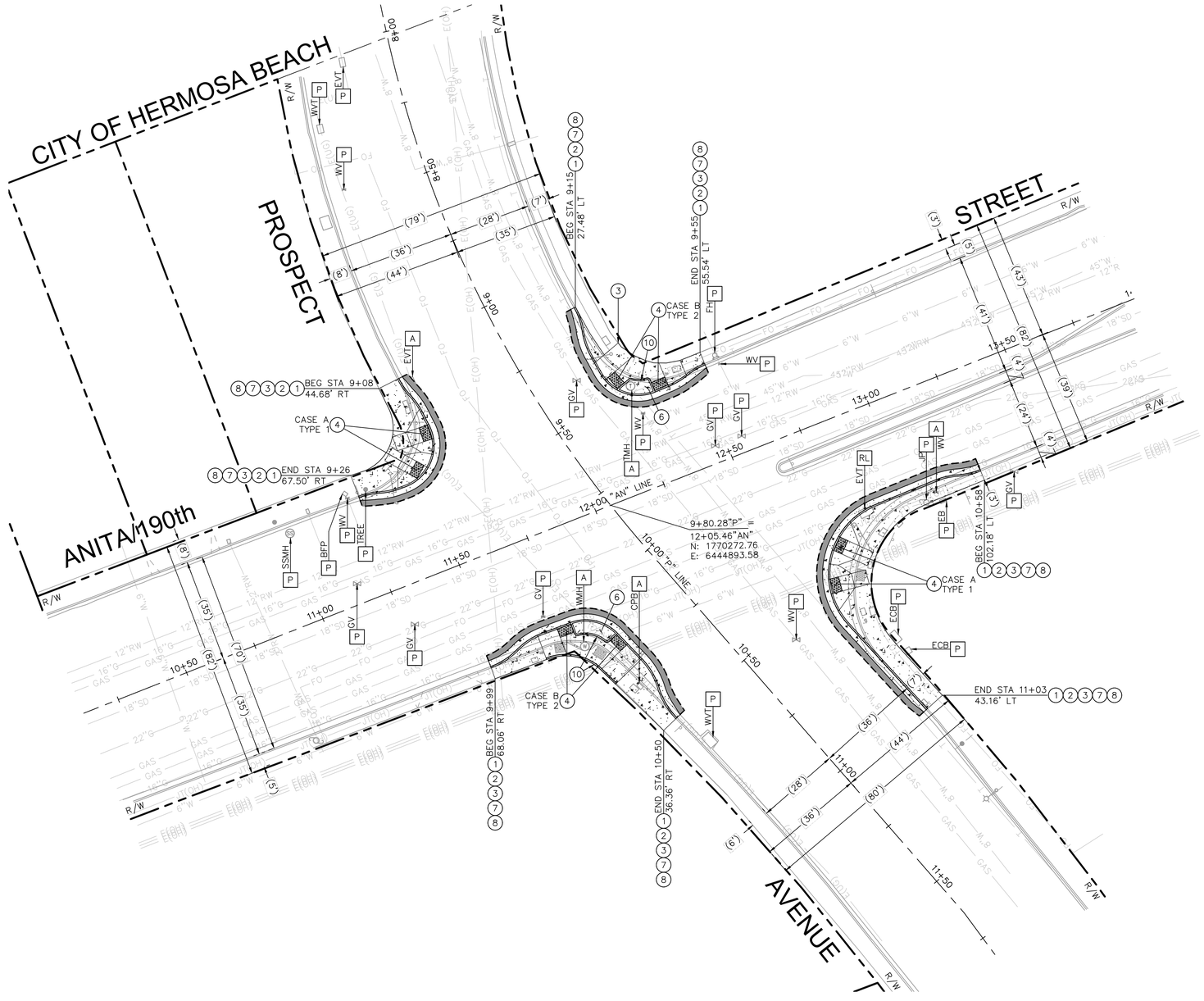
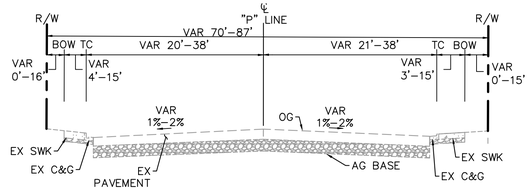
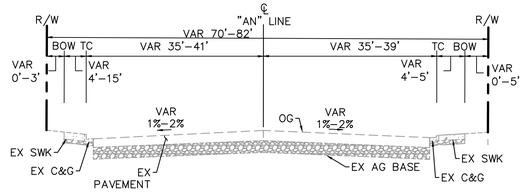




PROSPECT AVENUE
NTS



ANITA/190th STREET
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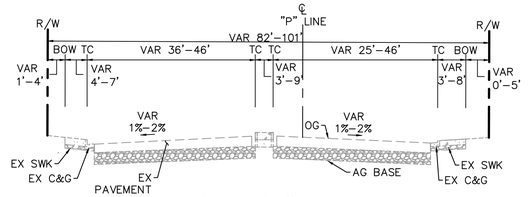

ANITA/190th STREET
NTS

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

CONSTRUCTION NOTES

- [P] PROTECT IN PLACE (ITEM)
- [A] ADJUST TO GRADE (ITEM)
- [R] REMOVE (ITEM)
- [RL] RELOCATE (ITEM)
- (1) SAWCUT AND REMOVE INTERFERING PORTIONS OF EX PCC CURB & GUTTER, SIDEWALK, CURB RAMP AND / OR LOCAL DEPRESSION, UNLESS OTHERWISE NOTED, AS REQUIRED FOR THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS.
- (2) SAWCUT & REMOVE AND CONSTRUCT 24" WIDE FULL DEPTH AC SLOT PAVEMENT PER DETAIL A ON SHEET CD–01.
- (3) CONSTRUCT 4" PCC SIDEWALK PER SPPWC STD PLAN 113–2 OVER 4" CRUSHED AGGREGATE BASE.
- (4) CONSTRUCT PCC CURB RAMP PER SPPWC STANDARD PLAN 111–5 (TYPE AND CASE PER PLAN) WITH 36"x60" DETECTABLE WARNING SURFACE.
- (5) CONSTRUCT DRIVEWAY APPROACH (TYPE B) PER SPPWC STANDARD 110–2. WIDTH PER PLAN.
- (6) CONSTRUCT 4" PCC SURFACE PER SPPWC STD PLAN 113–2 OVER 4" CRUSHED AGGREGATE BASE.
- (7) CONSTRUCT PCC CURB AND GUTTER (6" CF), TYPE A2–6, PER SPPWC STD PLAN 120–3 OVER 6" CRUSHED AGGREGATE BASE. W=24".
- (8) CONSTRUCT PCC GUTTER TRANSITION PER DETAIL B ON SHEET CD–01
- (9) CONSTRUCT CROSS GUTTER PER SPPWC STD 122–2.
- (10) CONSTRUCT PCC PEDESTRIAN CURB (6" CF), TYPE A1–6 PER SPPWC STD PLAN 120–3 OVER 6" CRUSHED AGGREGATE BASE.

LEGEND

- DETECTABLE WARNING SURFACE
- FULL DEPTH AC, SEE DETAIL A ON SHEET CD–01
- PCC IMPROVEMENTS

STREET IMPROVEMENT GENERAL NOTES:

1. GENERAL STREET IMPROVEMENT NOTES APPLY TO ALL PLAN SHEETS.
2. SEE SS SHEETS FOR SIGNING AND STRIPING DETAILS.
3. SEE E SHEETS FOR TRAFFIC SIGNAL RELOCATIONS, ADJUSTMENT, AND PROTECTION DETAILS.
4. SEE CD SHEETS FOR CONSTRUCTION DETAILS.

N

scale 20 0 20 40 feet
1" = 20'

LEGEND

- SAWCUT LINE
- EX R/W LINE
- CENTERLINE
- T — EX TELECOMMUNICATIONS
- (XX)"W — EX DOMESTIC WATER
- FO — EX FIBER OPTIC
- (XX)"SS — EX SANITARY SEWER
- COM(UG) — EX UNDERGROUND COMMUNICATION
- OH — EX OVERHEAD COMMUNICATION
- E(OH) — EX OVERHEAD ELECTRIC
- E(UG) — EX UNDERGROUND ELECTRIC
- (XX)"GAS — EX GAS
- O — EX OIL

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2
STREET IMPROVEMENT
PROSPECT AVENUE & ANITA/190TH STREET

DRAWN JC	CHECKED MB	SCALE 1" = 20'	
APPROVED BY ANDREW S. WINJE, P.E. CITY ENGINEER		DATE	
PROJECT NO. 41490	SHEET NO. 03 OF 58 SHEETS	DRAWING NO. SI-01	

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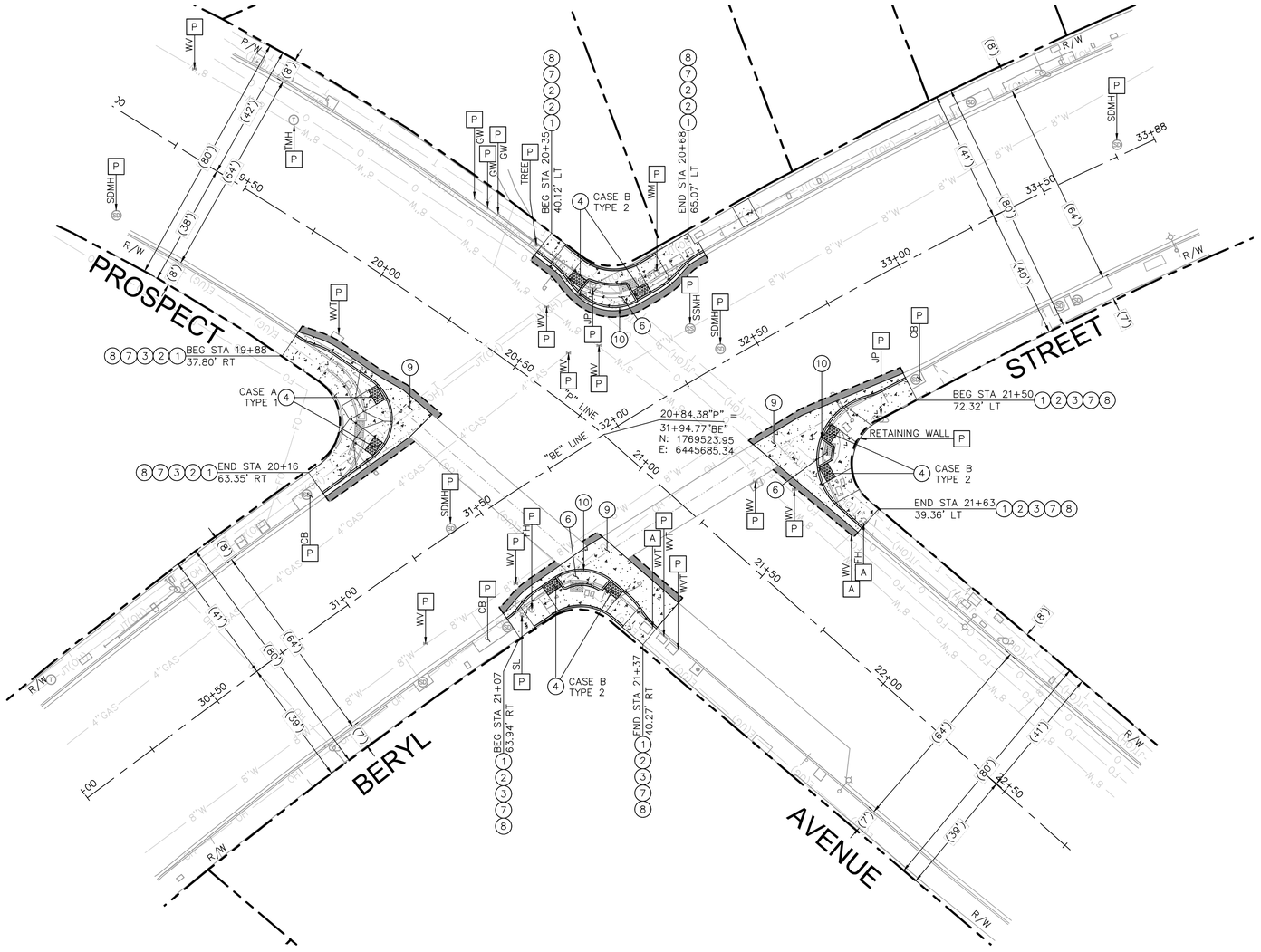
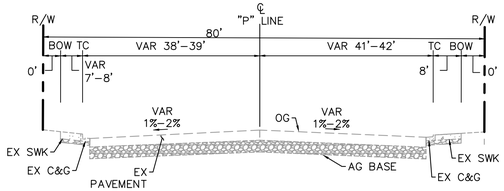
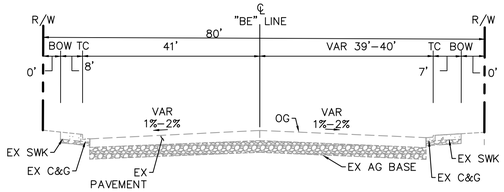




PROSPECT AVENUE
NTS



BERYL STREET
NTS

CONSTRUCTION NOTES

- (P) PROTECT IN PLACE (ITEM)
- (A) ADJUST TO GRADE (ITEM)
- (R) REMOVE (ITEM)
- (RL) RELOCATE (ITEM)
- (1) SAWCUT AND REMOVE INTERFERING PORTIONS OF EX PCC CURB & GUTTER, SIDEWALK, CURB RAMP AND / OR LOCAL DEPRESSION, UNLESS OTHERWISE NOTED, AS REQUIRED FOR THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS.
- (2) SAWCUT & REMOVE AND CONSTRUCT 24" WIDE FULL DEPTH AC SLOT PAVEMENT PER DETAIL A ON SHEET CD–01.
- (3) CONSTRUCT 4" PCC SIDEWALK PER SPPWC STD PLAN 113–2 OVER 4" CRUSHED AGGREGATE BASE.
- (4) CONSTRUCT PCC CURB RAMP PER SPPWC STANDARD PLAN 111–5 (TYPE AND CASE PER PLAN) WITH 36"x60" DETECTABLE WARNING SURFACE.
- (5) CONSTRUCT DRIVEWAY APPROACH (TYPE B) PER SPPWC STANDARD 110–2. WIDTH PER PLAN.
- (6) CONSTRUCT 4" PCC SURFACE PER SPPWC STD PLAN 113–2 OVER 4" CRUSHED AGGREGATE BASE.
- (7) CONSTRUCT PCC CURB AND GUTTER (6" CF), TYPE A2–6, PER SPPWC STD PLAN 120–3 OVER 6" CRUSHED AGGREGATE BASE. W=24".
- (8) CONSTRUCT PCC GUTTER TRANSITION PER DETAIL B ON SHEET CD–01
- (9) CONSTRUCT CROSS GUTTER PER SPPWC STD 122–2.
- (10) CONSTRUCT PCC PEDESTRIAN CURB (6" CF), TYPE A1–6 PER SPPWC STD PLAN 120–3 OVER 6" CRUSHED AGGREGATE BASE.

LEGEND

- DETECTABLE WARNING SURFACE
- FULL DEPTH AC, SEE DETAIL A ON SHEET CD–01
- PCC IMPROVEMENTS

STREET IMPROVEMENT GENERAL NOTES:

1. GENERAL STREET IMPROVEMENT NOTES APPLY TO ALL PLAN SHEETS.
2. SEE SS SHEETS FOR SIGNING AND STRIPING DETAILS.
3. SEE E SHEETS FOR TRAFFIC SIGNAL RELOCATIONS, ADJUSTMENT, AND PROTECTION DETAILS.
4. SEE CD SHEETS FOR CONSTRUCTION DETAILS.

N

20 0 20 40
scale 1" = 20' feet

LEGEND

- SAWCUT LINE
- EX R/W LINE
- CENTERLINE
- T — EX TELECOMMUNICATIONS
- (XX)"W — EX DOMESTIC WATER
- FO — EX FIBER OPTIC
- (XX)"SS — EX SANITARY SEWER
- COM(UG) — EX UNDERGROUND COMMUNICATION
- OH — EX OVERHEAD COMMUNICATION
- E(OH) — EX OVERHEAD ELECTRIC
- E(UG) — EX UNDERGROUND ELECTRIC
- (XX)"GAS — EX GAS
- O — EX OIL

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

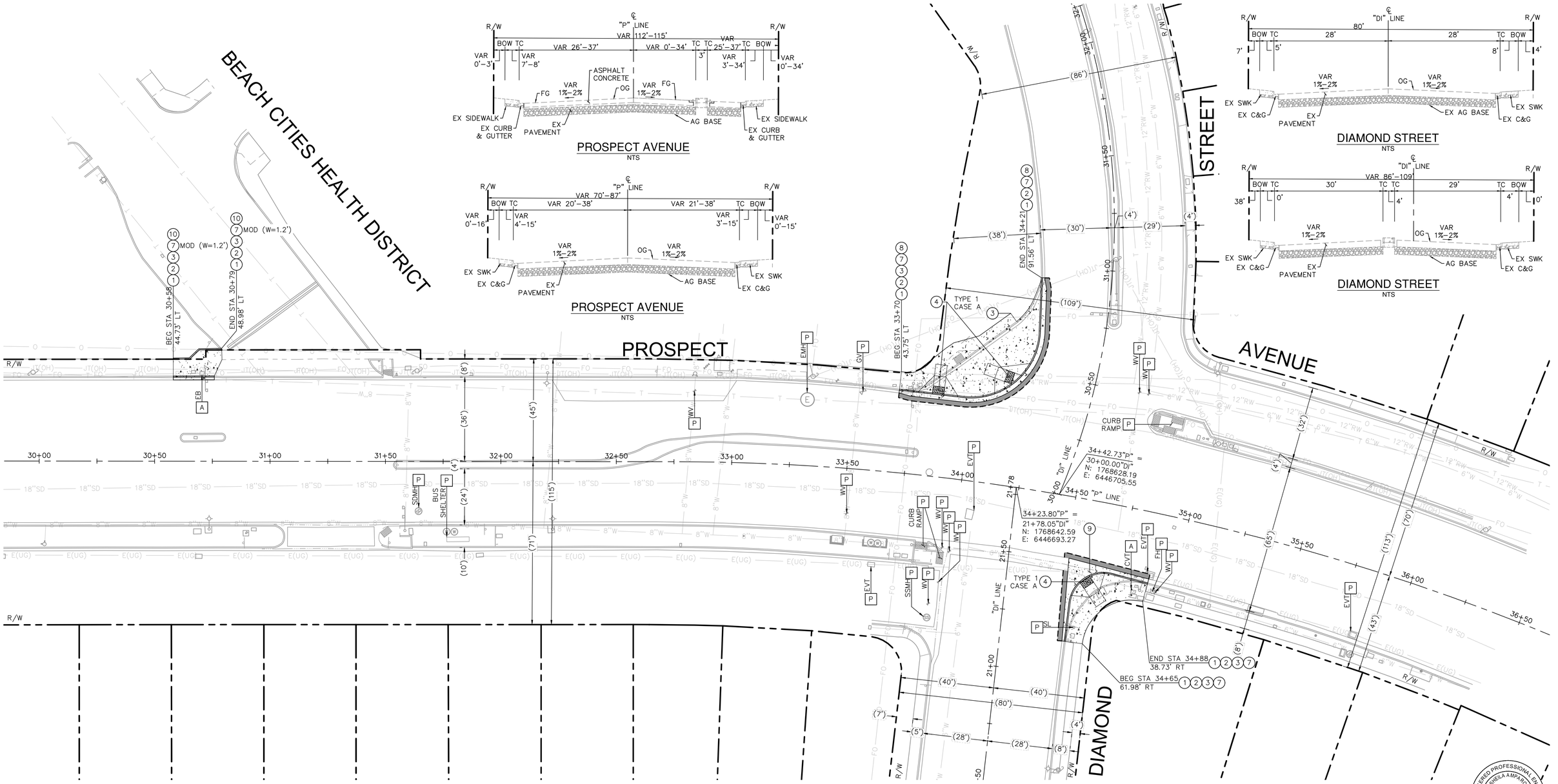
CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2

STREET IMPROVEMENT
PROSPECT AVENUE & BERYL STREET

DRAWN JC	CHECKED MB	SCALE 1" = 20'	
APPROVED BY ANDREW S. WINJE, P.E. CITY ENGINEER		DATE	
PROJECT NO. 41490	SHEET NO. 04 OF 58 SHEETS	DRAWING NO. SI-02	

DRAWING: \\bf-no\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-02-rb-si-pros-01.dwg PLOTTED: 2/6/2026 3:13 PM BY:



CONSTRUCTION NOTES

- P PROTECT IN PLACE (ITEM)
- A ADJUST TO GRADE (ITEM)
- R REMOVE (ITEM)
- RL RELOCATE (ITEM)
- (1) SAWCUT AND REMOVE INTERFERING PORTIONS OF EX PCC CURB & GUTTER, SIDEWALK, CURB RAMP AND / OR LOCAL DEPRESSION, UNLESS OTHERWISE NOTED, AS REQUIRED FOR THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS.
- (2) SAWCUT & REMOVE AND CONSTRUCT 24" WIDE FULL DEPTH AC SLOT PAVEMENT PER DETAIL A ON SHEET CD-01.
- (3) CONSTRUCT 4" PCC SIDEWALK PER SPPWC STD PLAN 113-2 OVER 4" CRUSHED AGGREGATE BASE.
- (4) CONSTRUCT PCC CURB RAMP PER SPPWC STANDARD PLAN 111-5 (TYPE AND CASE PER PLAN) WITH 36"x60" DETECTABLE WARNING SURFACE.
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- (9) CONSTRUCT CROSS GUTTER PER SPPWC STD 122-2.
- (10) CONSTRUCT PCC PEDESTRIAN CURB (6" CF), TYPE A1-6 PER SPPWC STD PLAN 120-3 OVER 6" CRUSHED AGGREGATE BASE.

LEGEND

- DETECTABLE WARNING SURFACE
- FULL DEPTH AC, SEE DETAIL A ON SHEET CD-01
- PCC IMPROVEMENTS

STREET IMPROVEMENT GENERAL NOTES:

1. GENERAL STREET IMPROVEMENT NOTES APPLY TO ALL PLAN SHEETS.
2. SEE SS SHEETS FOR SIGNING AND STRIPING DETAILS.
3. SEE E SHEETS FOR TRAFFIC SIGNAL RELOCATIONS, ADJUSTMENT, AND PROTECTION DETAILS.
4. SEE CD SHEETS FOR CONSTRUCTION DETAILS.

20 0 20 40
scale 1" = 20' feet

LEGEND

- SAWCUT LINE
- EX R/W LINE
- CENTERLINE
- T EX TELECOMMUNICATIONS
- (XX)"W EX DOMESTIC WATER
- FO EX FIBER OPTIC
- (XX)"SS EX SANITARY SEWER
- COM(UG) EX UNDERGROUND COMMUNICATION
- OH EX OVERHEAD COMMUNICATION
- E(OH) EX OVERHEAD ELECTRIC
- E(UG) EX UNDERGROUND ELECTRIC
- (XX)"GAS EX GAS
- O EX OIL

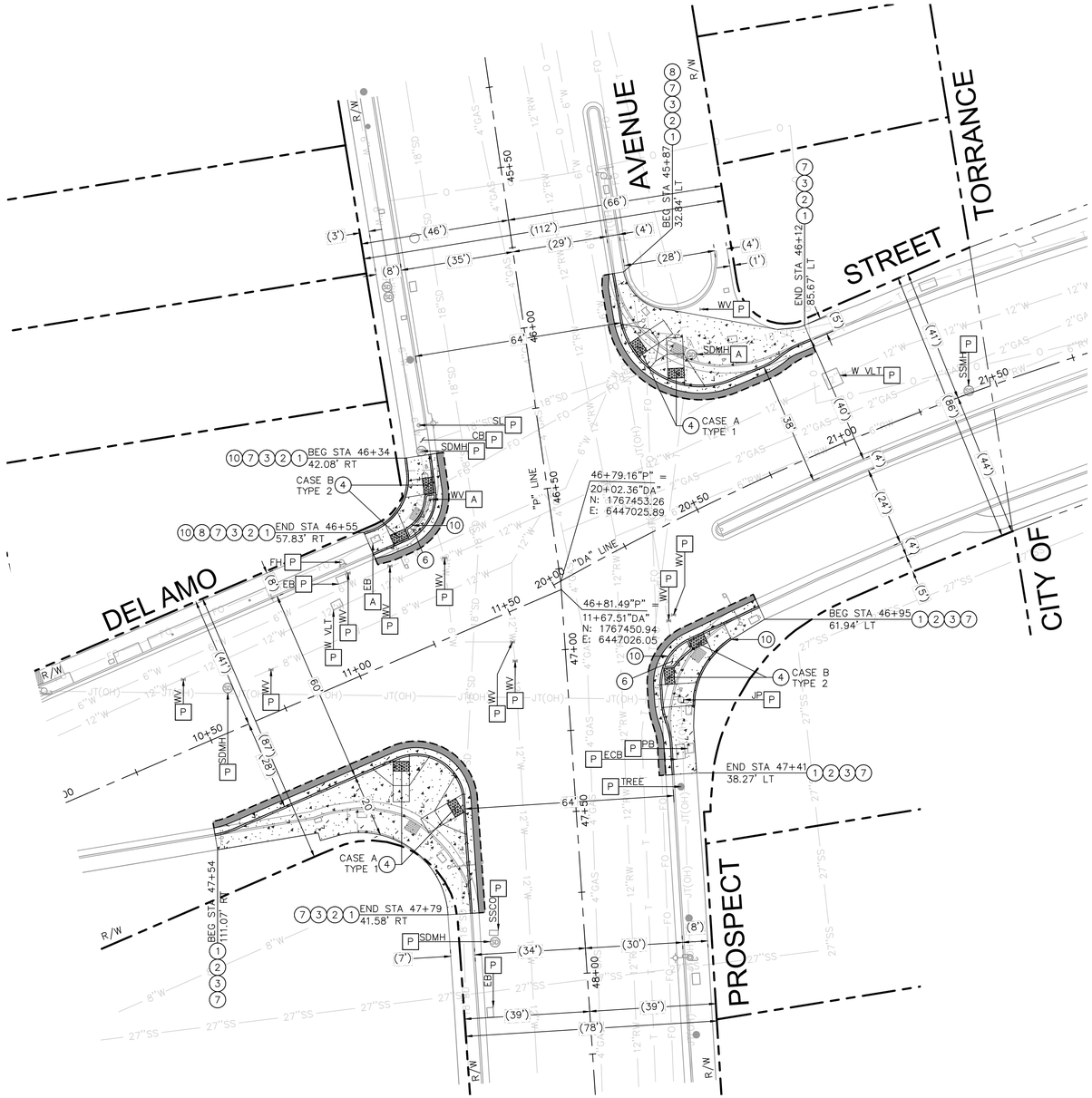
REVISIONS	
DATE	DESCRIPTION

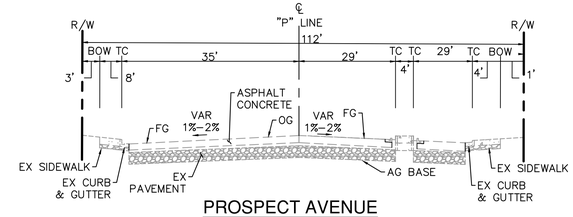
CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2
STREET IMPROVEMENT
PROSPECT AVE & DIAMOND ST-BEACH CITIES

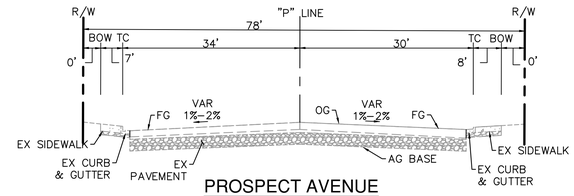
DRAWN JC	CHECKED MB	SCALE 1" = 20'	
APPROVED BY ANDREW S. WINJE, P.E. CITY ENGINEER		DATE	
PROJECT NO. 41490	SHEET NO. 05 OF 58 SHEETS	DRAWING NO. SI-03	

DRAWING: \\bkf-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-02-rb-si-pros-01.dwg PLOTTED: 2/6/2026 3:14 PM BY:

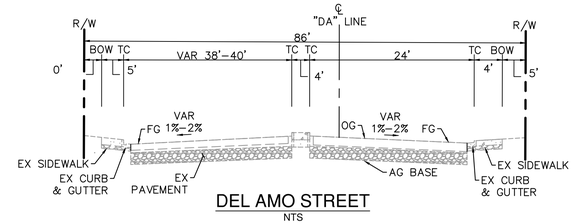




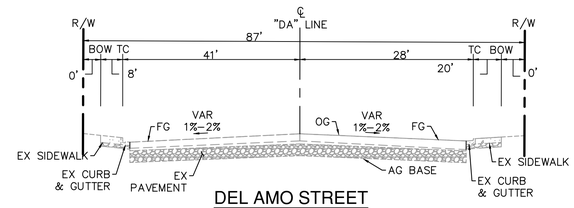
PROSPECT AVENUE
NTS



PROSPECT AVENUE
NTS



DEL AMO STREET
NTS



DEL AMO STREET
NTS

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

CONSTRUCTION NOTES

- P PROTECT IN PLACE (ITEM)
- A ADJUST TO GRADE (ITEM)
- R REMOVE (ITEM)
- RL RELOCATE (ITEM)
- (1) SAWCUT AND REMOVE INTERFERING PORTIONS OF EX PCC CURB & GUTTER, SIDEWALK, CURB RAMP AND / OR LOCAL DEPRESSION, UNLESS OTHERWISE NOTED, AS REQUIRED FOR THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS.
- (2) SAWCUT & REMOVE AND CONSTRUCT 24" WIDE FULL DEPTH AC SLOT PAVEMENT PER DETAIL A ON SHEET CD–01.
- (3) CONSTRUCT 4" PCC SIDEWALK PER SPPWC STD PLAN 113–2 OVER 4" CRUSHED AGGREGATE BASE.
- (4) CONSTRUCT PCC CURB RAMP PER SPPWC STANDARD PLAN 111–5 (TYPE AND CASE PER PLAN) WITH 36"x60" DETECTABLE WARNING SURFACE.
- (5) CONSTRUCT DRIVEWAY APPROACH (TYPE B) PER SPPWC STANDARD 110–2. WIDTH PER PLAN.
- (6) CONSTRUCT 4" PCC SURFACE PER SPPWC STD PLAN 113–2 OVER 4" CRUSHED AGGREGATE BASE.
- (7) CONSTRUCT PCC CURB AND GUTTER (6" CF), TYPE A2–6, PER SPPWC STD PLAN 120–3 OVER 6" CRUSHED AGGREGATE BASE. W=24".
- (8) CONSTRUCT PCC GUTTER TRANSITION PER DETAIL B ON SHEET CD–01
- (9) CONSTRUCT CROSS GUTTER PER SPPWC STD 122–2.
- (10) CONSTRUCT PCC PEDESTRIAN CURB (6" CF), TYPE A1–6 PER SPPWC STD PLAN 120–3 OVER 6" CRUSHED AGGREGATE BASE.

LEGEND

- DETECTABLE WARNING SURFACE
- FULL DEPTH AC, SEE DETAIL A ON SHEET CD–01
- PCC IMPROVEMENTS

STREET IMPROVEMENT GENERAL NOTES:

1. GENERAL STREET IMPROVEMENT NOTES APPLY TO ALL PLAN SHEETS.
2. SEE SS SHEETS FOR SIGNING AND STRIPING DETAILS.
3. SEE E SHEETS FOR TRAFFIC SIGNAL RELOCATIONS, ADJUSTMENT, AND PROTECTION DETAILS.
4. SEE CD SHEETS FOR CONSTRUCTION DETAILS.

N

20 0 20 40
scale 1" = 20' feet

LEGEND

- SAWCUT LINE
- EX R/W LINE
- CENTERLINE
- T EX TELECOMMUNICATIONS
- (XX)"W EX DOMESTIC WATER
- FO EX FIBER OPTIC
- (XX)"SS EX SANITARY SEWER
- COM(UG) EX UNDERGROUND COMMUNICATION
- OH EX OVERHEAD COMMUNICATION
- E(OH) EX OVERHEAD ELECTRIC
- E(UG) EX UNDERGROUND ELECTRIC
- (XX)"GAS EX GAS
- O EX OIL

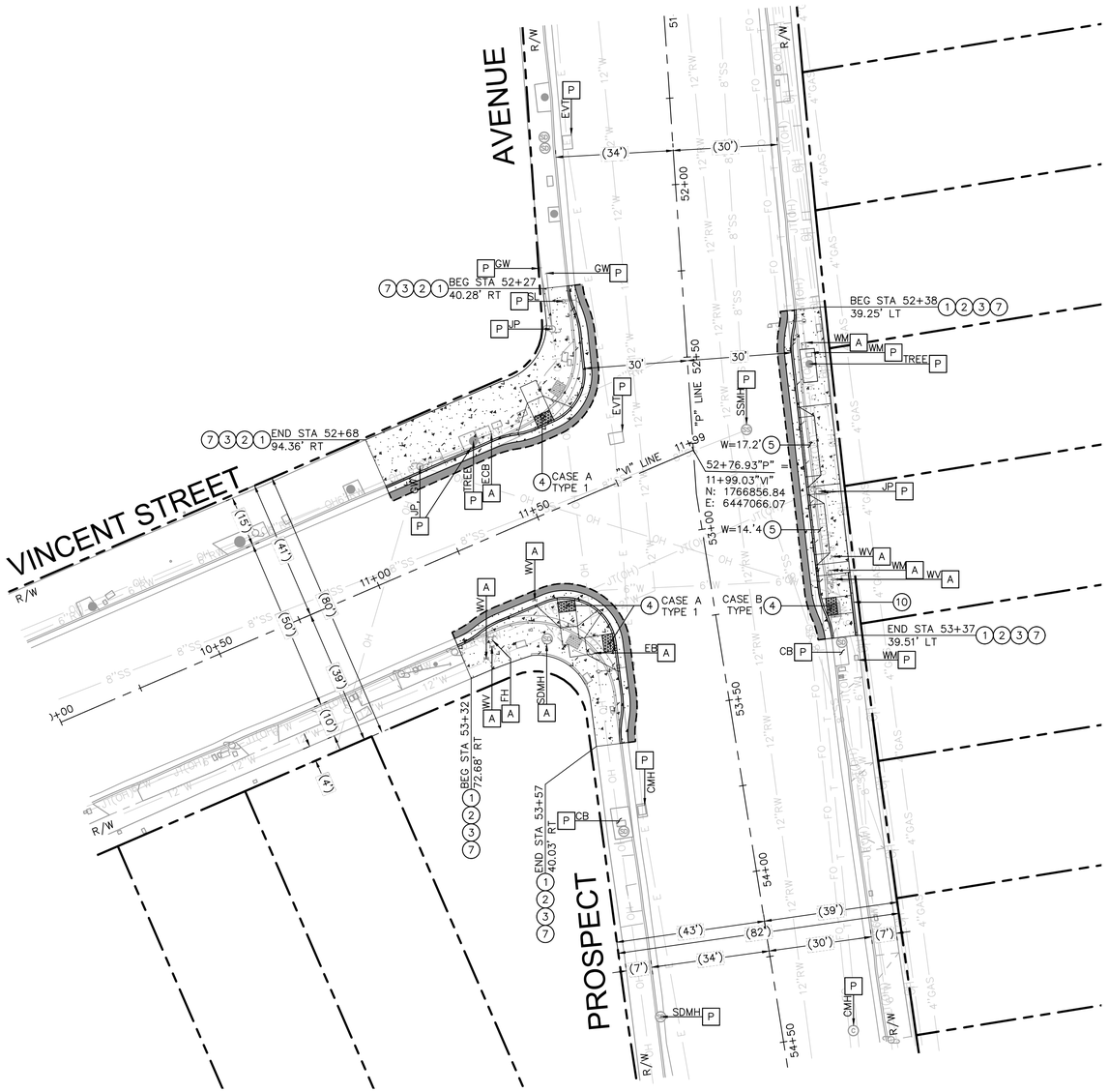
REVISIONS	
DATE	DESCRIPTION

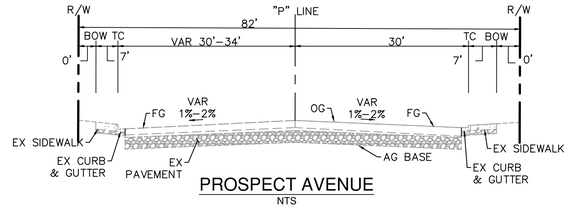
CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2
STREET IMPROVEMENT
PROSPECT AVENUE & DEL AMO STREET

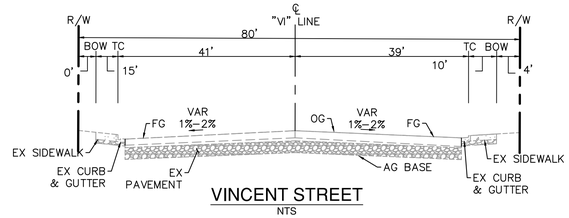
DRAWN	JC	CHECKED	MB	SCALE	1" = 20'
APPROVED BY	ANDREW S. WINJE, P.E. CITY ENGINEER			DATE	
PROJECT NO. 41490		SHEET NO. 06 OF 58 SHEETS		DRAWING NO. SI-04	

DRAWING: \\btf-nt\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-02-rb-si-pros-01.dwg PLOTTED: 2/6/2026 3:35 PM BY:





PROSPECT AVENUE
NTS



VINCENT STREET
NTS

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

CONSTRUCTION NOTES

- [P] PROTECT IN PLACE (ITEM)
- [A] ADJUST TO GRADE (ITEM)
- [R] REMOVE (ITEM)
- [RL] RELOCATE (ITEM)
- (1) SAWCUT AND REMOVE INTERFERING PORTIONS OF EX PCC CURB & GUTTER, SIDEWALK, CURB RAMP AND / OR LOCAL DEPRESSION, UNLESS OTHERWISE NOTED, AS REQUIRED FOR THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS.
- (2) SAWCUT & REMOVE AND CONSTRUCT 24" WIDE FULL DEPTH AC SLOT PAVEMENT PER DETAIL A ON SHEET CD–01.
- (3) CONSTRUCT 4" PCC SIDEWALK PER SPPWC STD PLAN 113–2 OVER 4" CRUSHED AGGREGATE BASE.
- (4) CONSTRUCT PCC CURB RAMP PER SPPWC STANDARD PLAN 111–5 (TYPE AND CASE PER PLAN) WITH 36"x60" DETECTABLE WARNING SURFACE.
- (5) CONSTRUCT DRIVEWAY APPROACH (TYPE B) PER SPPWC STANDARD 110–2. WIDTH PER PLAN.
- (6) CONSTRUCT 4" PCC SURFACE PER SPPWC STD PLAN 113–2 OVER 4" CRUSHED AGGREGATE BASE.
- (7) CONSTRUCT PCC CURB AND GUTTER (6" CF), TYPE A2–6, PER SPPWC STD PLAN 120–3 OVER 6" CRUSHED AGGREGATE BASE. W=24".
- (8) CONSTRUCT PCC GUTTER TRANSITION PER DETAIL B ON SHEET CD–01
- (9) CONSTRUCT CROSS GUTTER PER SPPWC STD 122–2.
- (10) CONSTRUCT PCC PEDESTRIAN CURB (6" CF), TYPE A1–6 PER SPPWC STD PLAN 120–3 OVER 6" CRUSHED AGGREGATE BASE.

LEGEND

- DETECTABLE WARNING SURFACE
- FULL DEPTH AC, SEE DETAIL A ON SHEET CD–01
- PCC IMPROVEMENTS

STREET IMPROVEMENT GENERAL NOTES:

1. GENERAL STREET IMPROVEMENT NOTES APPLY TO ALL PLAN SHEETS.
2. SEE SS SHEETS FOR SIGNING AND STRIPING DETAILS.
3. SEE E SHEETS FOR TRAFFIC SIGNAL RELOCATIONS, ADJUSTMENT, AND PROTECTION DETAILS.
4. SEE CD SHEETS FOR CONSTRUCTION DETAILS.

N

20 0 20 40
scale 1" = 20' feet

LEGEND

- SAWCUT LINE
- EX R/W LINE
- CENTERLINE
- T — EX TELECOMMUNICATIONS
- W — EX DOMESTIC WATER
- FO — EX FIBER OPTIC
- SS — EX SANITARY SEWER
- COM(UG) — EX UNDERGROUND COMMUNICATION
- OH — EX OVERHEAD COMMUNICATION
- E(OH) — EX OVERHEAD ELECTRIC
- E(UG) — EX UNDERGROUND ELECTRIC
- GAS — EX GAS
- O — EX OIL

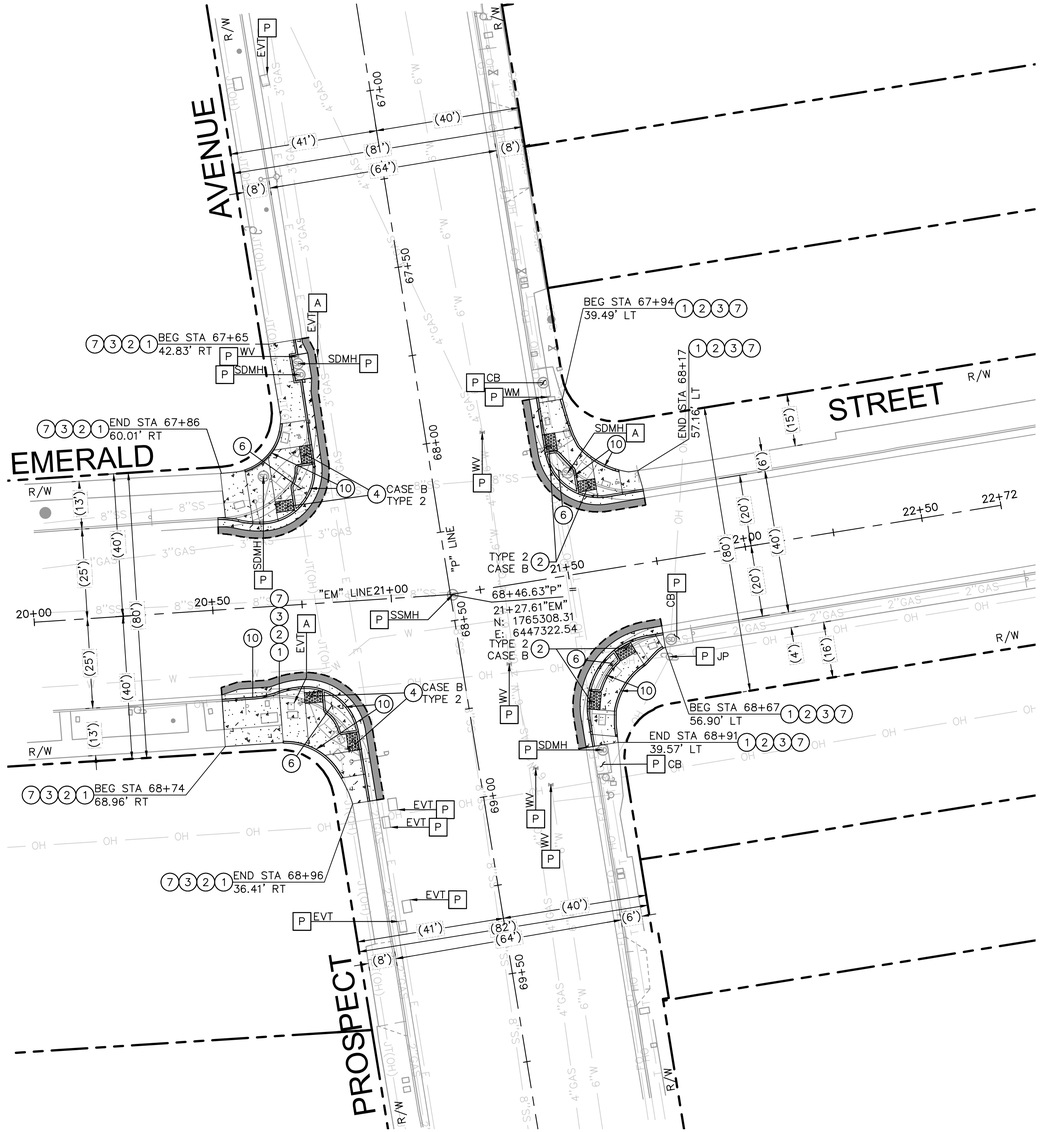
REVISIONS	
DATE	DESCRIPTION

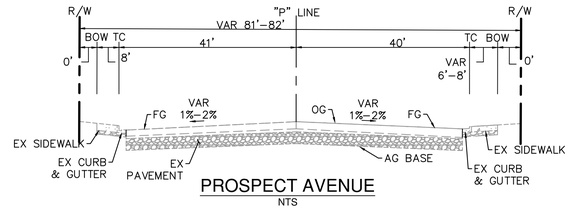
CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2
STREET IMPROVEMENT
PROSPECT AVENUE & VINCENT STREET

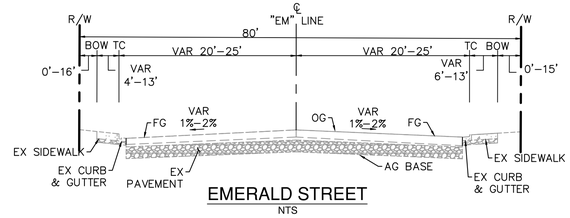
DRAWN	JC	CHECKED	MB	SCALE	1" = 20'
APPROVED BY	ANDREW S. WINJE, P.E. CITY ENGINEER			DATE	
PROJECT NO. 41490		SHEET NO. 07 OF 58 SHEETS		DRAWING NO. SI-05	

DRAWN: \\dot-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-06-rb-si-pros-02.dwg PLOTTED: 2/6/2026 3:15 PM BY:





PROSPECT AVENUE
NTS



EMERALD STREET
NTS

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

CONSTRUCTION NOTES

- [P] PROTECT IN PLACE (ITEM)
- [A] ADJUST TO GRADE (ITEM)
- [R] REMOVE (ITEM)
- [RL] RELOCATE (ITEM)
- (1) SAWCUT AND REMOVE INTERFERING PORTIONS OF EX PCC CURB & GUTTER, SIDEWALK, CURB RAMP AND / OR LOCAL DEPRESSION, UNLESS OTHERWISE NOTED, AS REQUIRED FOR THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS.
- (2) SAWCUT & REMOVE AND CONSTRUCT 24" WIDE FULL DEPTH AC SLOT PAVEMENT PER DETAIL A ON SHEET CD-01.
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- (4) CONSTRUCT PCC CURB RAMP PER SPPWC STANDARD PLAN 111-5 (TYPE AND CASE PER PLAN) WITH 36"x60" DETECTABLE WARNING SURFACE.
- (5) CONSTRUCT DRIVEWAY APPROACH (TYPE B) PER SPPWC STANDARD 110-2. WIDTH PER PLAN.
- (6) CONSTRUCT 4" PCC SURFACE PER SPPWC STD PLAN 113-2 OVER 4" CRUSHED AGGREGATE BASE.
- (7) CONSTRUCT PCC CURB AND GUTTER (6" CF), TYPE A2-6, PER SPPWC STD PLAN 120-3 OVER 6" CRUSHED AGGREGATE BASE. W=24".
- (8) CONSTRUCT PCC GUTTER TRANSITION PER DETAIL B ON SHEET CD-01
- (9) CONSTRUCT CROSS GUTTER PER SPPWC STD 122-2.
- (10) CONSTRUCT PCC PEDESTRIAN CURB (6" CF), TYPE A1-6 PER SPPWC STD PLAN 120-3 OVER 6" CRUSHED AGGREGATE BASE.

LEGEND

- DETECTABLE WARNING SURFACE
- FULL DEPTH AC, SEE DETAIL A ON SHEET CD-01
- PCC IMPROVEMENTS

STREET IMPROVEMENT GENERAL NOTES:

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4. SEE CD SHEETS FOR CONSTRUCTION DETAILS.

N

20 0 20 40
scale 1" = 20' feet

LEGEND

- SAWCUT LINE
- EX R/W LINE
- CENTERLINE
- T — EX TELECOMMUNICATIONS
- W — EX DOMESTIC WATER
- FO — EX FIBER OPTIC
- SS — EX SANITARY SEWER
- COM(UG) — EX UNDERGROUND COMMUNICATION
- OH — EX OVERHEAD COMMUNICATION
- E(OH) — EX OVERHEAD ELECTRIC
- E(UG) — EX UNDERGROUND ELECTRIC
- GAS — EX GAS
- O — EX OIL

REVISIONS	
DATE	DESCRIPTION

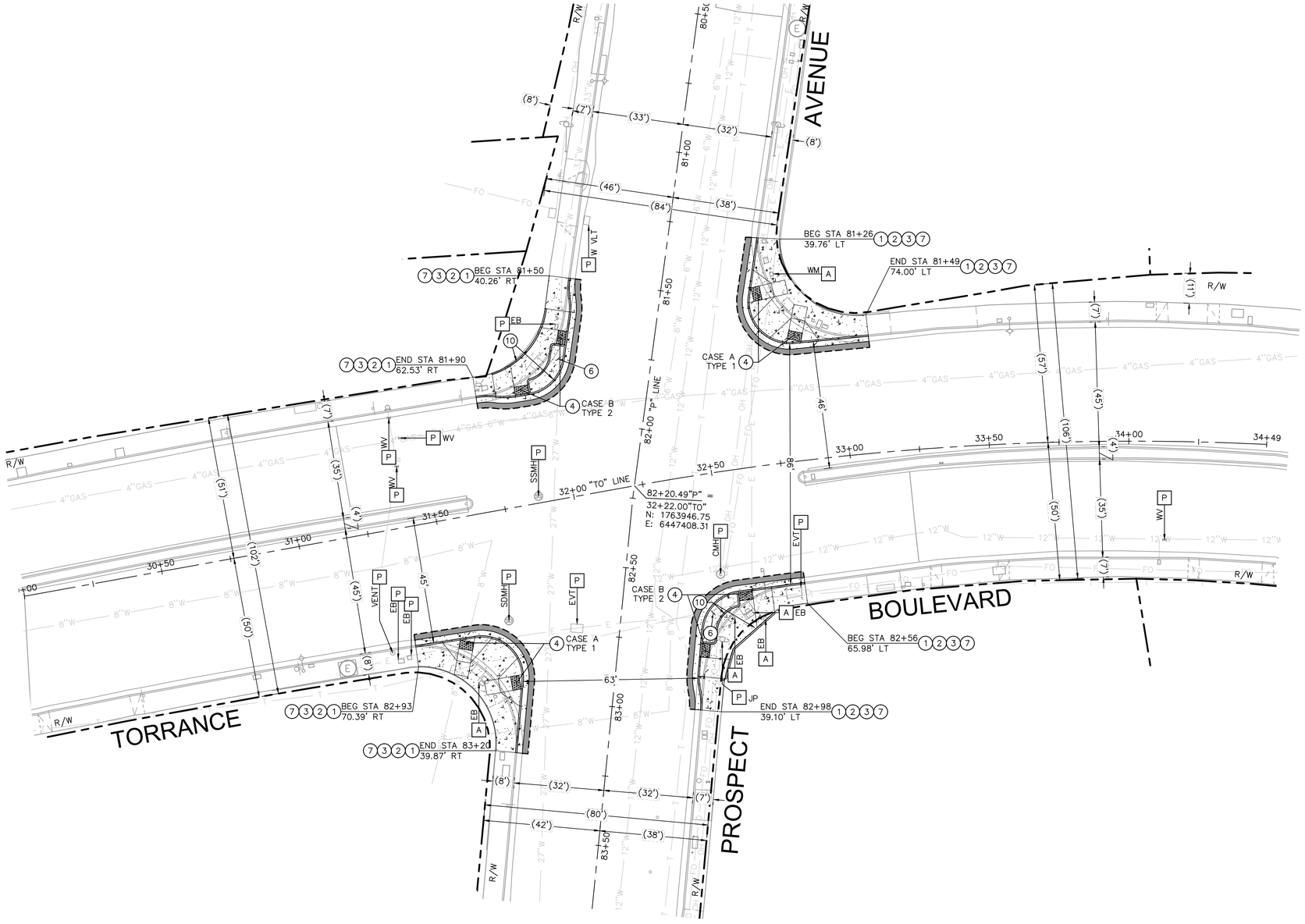
CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

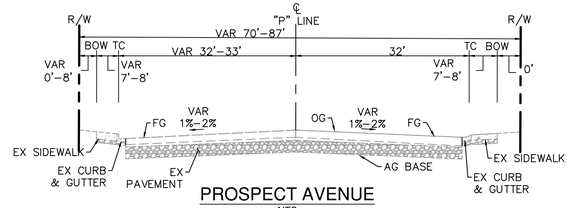
REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2

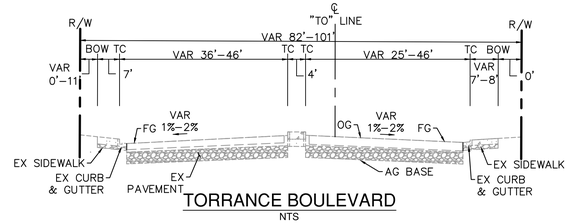
STREET IMPROVEMENT
PROSPECT AVENUE & EMERALD STREET

DRAWN JC	CHECKED MB	SCALE 1" = 20'	
APPROVED BY ANDREW S. WINJE, P.E. CITY ENGINEER		DATE	
PROJECT NO. 41490	SHEET NO. 08 OF 58 SHEETS	DRAWING NO. SI-06	

DRAWING: \\bkf-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-06-rb-si-pros-02.dwg PLOTTED: 2/6/2026 3:15 PM BY:







60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

CONSTRUCTION NOTES

- (P) PROTECT IN PLACE (ITEM)
- (A) ADJUST TO GRADE (ITEM)
- (R) REMOVE (ITEM)
- (RL) RELOCATE (ITEM)
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- (2) SAWCUT & REMOVE AND CONSTRUCT 24" WIDE FULL DEPTH AC SLOT PAVEMENT PER DETAIL A ON SHEET CD–01.
- (3) CONSTRUCT 4" PCC SIDEWALK PER SPPWC STD PLAN 113–2 OVER 4" CRUSHED AGGREGATE BASE.
- (4) CONSTRUCT PCC CURB RAMP PER SPPWC STANDARD PLAN 111–5 (TYPE AND CASE PER PLAN) WITH 36"x60" DETECTABLE WARNING SURFACE.
- (5) CONSTRUCT DRIVEWAY APPROACH (TYPE B) PER SPPWC STANDARD 110–2. WIDTH PER PLAN.
- (6) CONSTRUCT 4" PCC SURFACE PER SPPWC STD PLAN 113–2 OVER 4" CRUSHED AGGREGATE BASE.
- (7) CONSTRUCT PCC CURB AND GUTTER (6" CF), TYPE A2–6, PER SPPWC STD PLAN 120–3 OVER 6" CRUSHED AGGREGATE BASE. W=24".
- (8) CONSTRUCT PCC GUTTER TRANSITION PER DETAIL B ON SHEET CD–01
- (9) CONSTRUCT CROSS GUTTER PER SPPWC STD 122–2.
- (10) CONSTRUCT PCC PEDESTRIAN CURB (6" CF), TYPE A1–6 PER SPPWC STD PLAN 120–3 OVER 6" CRUSHED AGGREGATE BASE.

LEGEND

- DETECTABLE WARNING SURFACE
- FULL DEPTH AC, SEE DETAIL A ON SHEET CD–01
- PCC IMPROVEMENTS

STREET IMPROVEMENT GENERAL NOTES:

1. GENERAL STREET IMPROVEMENT NOTES APPLY TO ALL PLAN SHEETS.
2. SEE SS SHEETS FOR SIGNING AND STRIPING DETAILS.
3. SEE E SHEETS FOR TRAFFIC SIGNAL RELOCATIONS, ADJUSTMENT, AND PROTECTION DETAILS.
4. SEE CD SHEETS FOR CONSTRUCTION DETAILS.

N

20 0 20 40
scale 1" = 20' feet

LEGEND

- SAWCUT LINE
- EX R/W LINE
- CENTERLINE
- T EX TELECOMMUNICATIONS
- W EX DOMESTIC WATER
- FO EX FIBER OPTIC
- SS EX SANITARY SEWER
- COM(UG) EX UNDERGROUND COMMUNICATION
- OH EX OVERHEAD COMMUNICATION
- E(OH) EX OVERHEAD ELECTRIC
- E(UG) EX UNDERGROUND ELECTRIC
- GAS EX GAS
- O EX OIL

REVISIONS	
DATE	DESCRIPTION

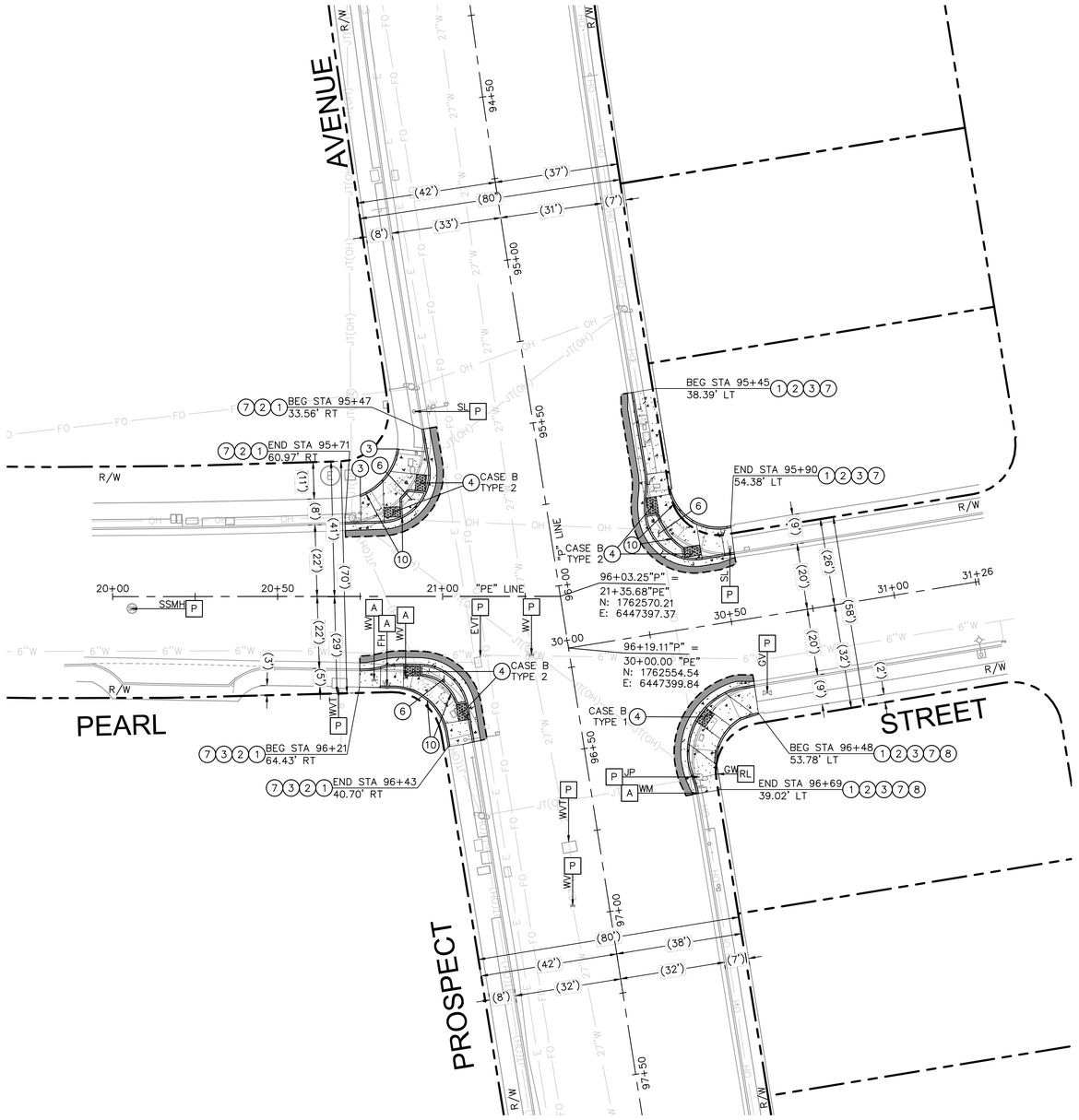
CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

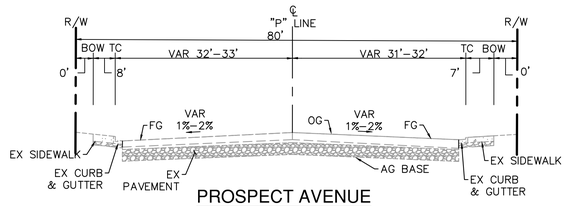
REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2

STREET IMPROVEMENT
PROSPECT AVENUE & TORRANCE BOULEVARD

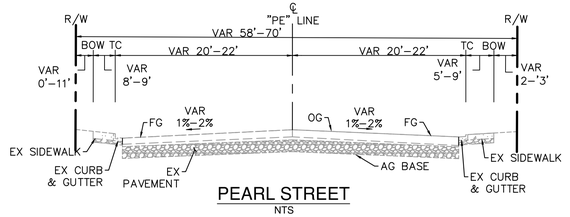
DRAWN	JC/MO	CHECKED	MB	SCALE	1" = 20'
APPROVED BY	ANDREW S. WINJE, P.E. CITY ENGINEER			DATE	
PROJECT NO. 41490		SHEET NO. 09 OF 58 SHEETS		DRAWING NO. SI-07	

DRAWING: \\bkt-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-06-ns-si-pros-02.dwg PLOTTED: 2/6/2026 3:15 PM BY:





PROSPECT AVENUE
NTS



PEARL STREET
NTS

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

CONSTRUCTION NOTES

- P PROTECT IN PLACE (ITEM)
- A ADJUST TO GRADE (ITEM)
- R REMOVE (ITEM)
- RL RELOCATE (ITEM)
- (1) SAWCUT AND REMOVE INTERFERING PORTIONS OF EX PCC CURB & GUTTER, SIDEWALK, CURB RAMP AND / OR LOCAL DEPRESSION, UNLESS OTHERWISE NOTED, AS REQUIRED FOR THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS.
- (2) SAWCUT & REMOVE AND CONSTRUCT 24" WIDE FULL DEPTH AC SLOT PAVEMENT PER DETAIL A ON SHEET CD–01.
- (3) CONSTRUCT 4" PCC SIDEWALK PER SPPWC STD PLAN 113–2 OVER 4" CRUSHED AGGREGATE BASE.
- (4) CONSTRUCT PCC CURB RAMP PER SPPWC STANDARD PLAN 111–5 (TYPE AND CASE PER PLAN) WITH 36"x60" DETECTABLE WARNING SURFACE.
- (5) CONSTRUCT DRIVEWAY APPROACH (TYPE B) PER SPPWC STANDARD 110–2. WIDTH PER PLAN.
- (6) CONSTRUCT 4" PCC SURFACE PER SPPWC STD PLAN 113–2 OVER 4" CRUSHED AGGREGATE BASE.
- (7) CONSTRUCT PCC CURB AND GUTTER (6" CF), TYPE A2–6, PER SPPWC STD PLAN 120–3 OVER 6" CRUSHED AGGREGATE BASE. W=24".
- (8) CONSTRUCT PCC GUTTER TRANSITION PER DETAIL B ON SHEET CD–01
- (9) CONSTRUCT CROSS GUTTER PER SPPWC STD 122–2.
- (10) CONSTRUCT PCC PEDESTRIAN CURB (6" CF), TYPE A1–6 PER SPPWC STD PLAN 120–3 OVER 6" CRUSHED AGGREGATE BASE.

LEGEND

- DETECTABLE WARNING SURFACE
- FULL DEPTH AC, SEE DETAIL A ON SHEET CD–01
- PCC IMPROVEMENTS

STREET IMPROVEMENT GENERAL NOTES:

1. GENERAL STREET IMPROVEMENT NOTES APPLY TO ALL PLAN SHEETS.
2. SEE SS SHEETS FOR SIGNING AND STRIPING DETAILS.
3. SEE E SHEETS FOR TRAFFIC SIGNAL RELOCATIONS, ADJUSTMENT, AND PROTECTION DETAILS.
4. SEE CD SHEETS FOR CONSTRUCTION DETAILS.

N

20 0 20 40
scale 1" = 20' feet

LEGEND

- SAWCUT LINE
- EX R/W LINE
- CENTERLINE
- T EX TELECOMMUNICATIONS
- W EX DOMESTIC WATER
- FO EX FIBER OPTIC
- SS EX SANITARY SEWER
- COM<UG> EX UNDERGROUND COMMUNICATION
- OH EX OVERHEAD COMMUNICATION
- E<OH> EX OVERHEAD ELECTRIC
- E<UG> EX UNDERGROUND ELECTRIC
- GAS EX GAS
- O EX OIL

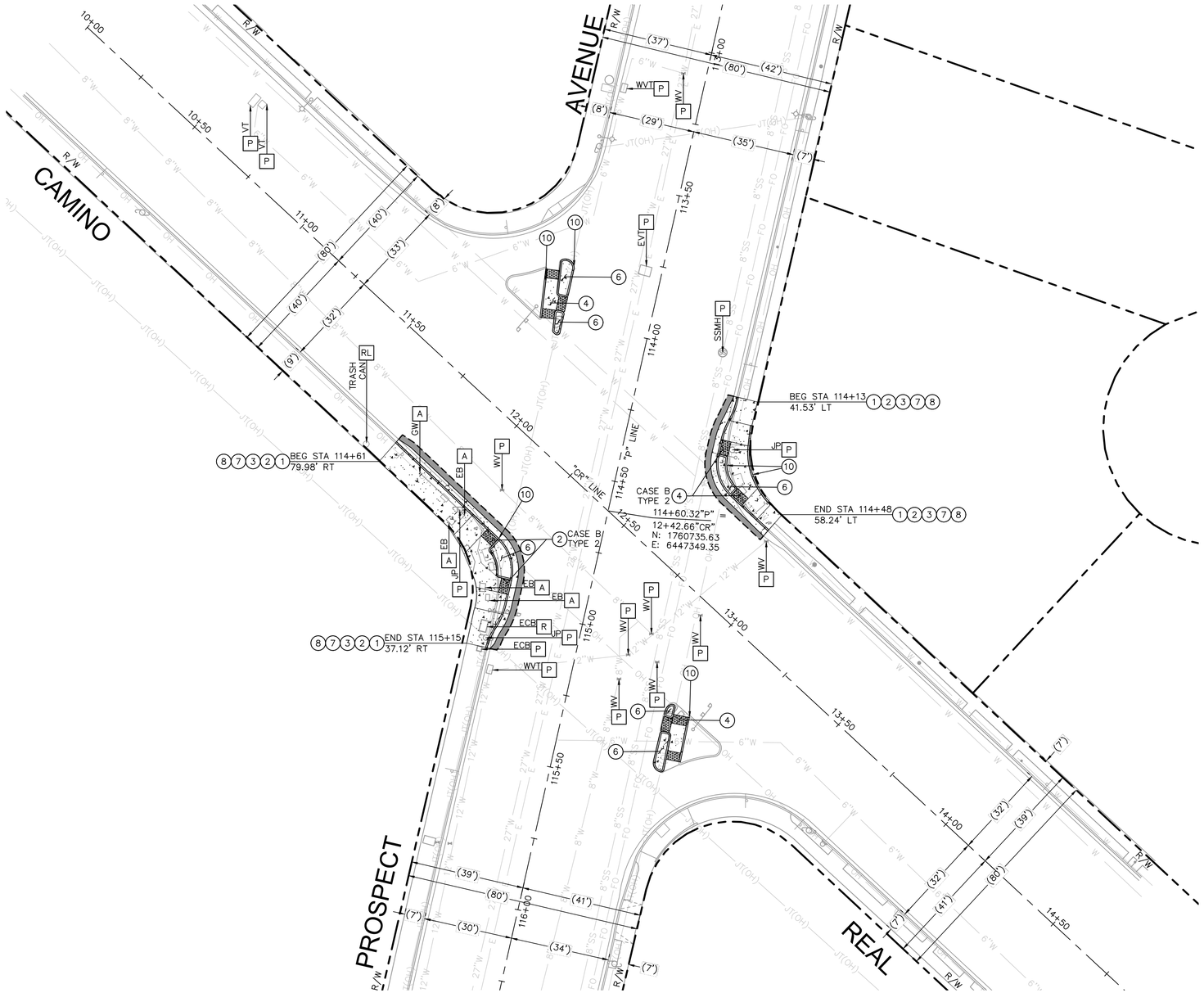
REVISIONS	
DATE	DESCRIPTION

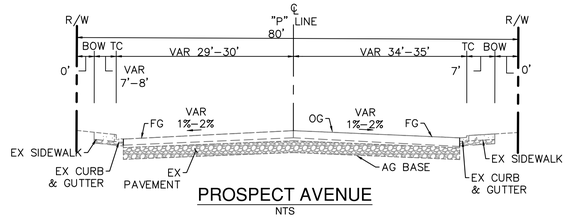
CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
STREET IMPROVEMENT
PROSPECT AVENUE & PEARL STREET

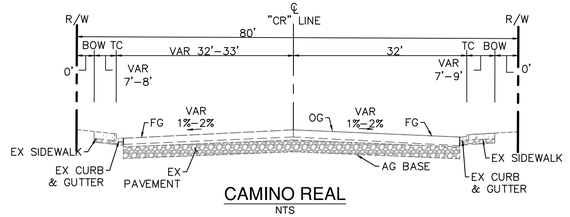
DRAWN	CHECKED	SCALE
JC	MB	1" = 20'
APPROVED BY: ANDREW S. WINJE, P.E. CITY ENGINEER		DATE:
PROJECT NO. 41490	SHEET NO. 10 OF 58 SHEETS	DRAWING NO. SI-08

DRAWING: \\pbf-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-06-rb-si-pros-02.dwg PLOTTED: 2/6/2026 3:15 PM BY:





PROSPECT AVENUE
NTS



CAMINO REAL
NTS

CONSTRUCTION NOTES

- (P) PROTECT IN PLACE (ITEM)
- (A) ADJUST TO GRADE (ITEM)
- (R) REMOVE (ITEM)
- (RL) RELOCATE (ITEM)
- (1) SAWCUT AND REMOVE INTERFERING PORTIONS OF EX PCC CURB & GUTTER, SIDEWALK, CURB RAMP AND / OR LOCAL DEPRESSION, UNLESS OTHERWISE NOTED, AS REQUIRED FOR THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS.
- (2) SAWCUT & REMOVE AND CONSTRUCT 24" WIDE FULL DEPTH AC SLOT PAVEMENT PER DETAIL A ON SHEET CD-01.
- (3) CONSTRUCT 4" PCC SIDEWALK PER SPPWC STD PLAN 113-2 OVER 4" CRUSHED AGGREGATE BASE.
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- (7) CONSTRUCT PCC CURB AND GUTTER (6" CF), TYPE A2-6, PER SPPWC STD PLAN 120-3 OVER 6" CRUSHED AGGREGATE BASE. W=24".
- (8) CONSTRUCT PCC GUTTER TRANSITION PER DETAIL B ON SHEET CD-01
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- (10) CONSTRUCT PCC PEDESTRIAN CURB (6" CF), TYPE A1-6 PER SPPWC STD PLAN 120-3 OVER 6" CRUSHED AGGREGATE BASE.

LEGEND

- DETECTABLE WARNING SURFACE
- FULL DEPTH AC, SEE DETAIL A ON SHEET CD-01
- PCC IMPROVEMENTS

STREET IMPROVEMENT GENERAL NOTES:

1. GENERAL STREET IMPROVEMENT NOTES APPLY TO ALL PLAN SHEETS.
2. SEE SS SHEETS FOR SIGNING AND STRIPING DETAILS.
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4. SEE CD SHEETS FOR CONSTRUCTION DETAILS.

N

20 0 20 40
scale 1" = 20' feet

LEGEND

- SAWCUT LINE
- EX R/W LINE
- CENTERLINE
- T EX TELECOMMUNICATIONS
- W EX DOMESTIC WATER
- FO EX FIBER OPTIC
- SS EX SANITARY SEWER
- COM(UG) EX UNDERGROUND COMMUNICATION
- OH EX OVERHEAD COMMUNICATION
- E(OH) EX OVERHEAD ELECTRIC
- E(UG) EX UNDERGROUND ELECTRIC
- GAS EX GAS
- O EX OIL

60% SUBMITTAL (02/06/2025)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

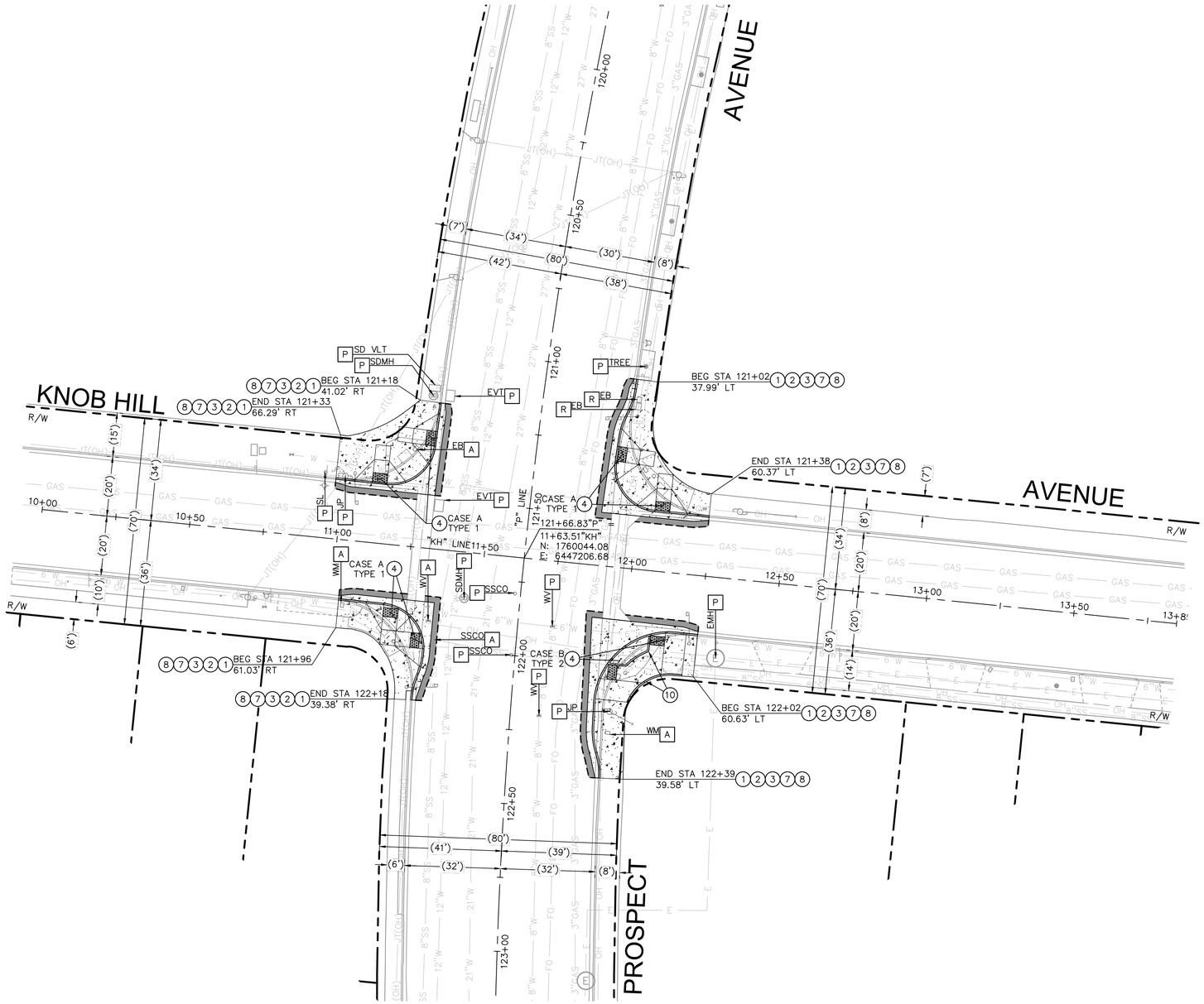
REVISIONS	
DATE	DESCRIPTION

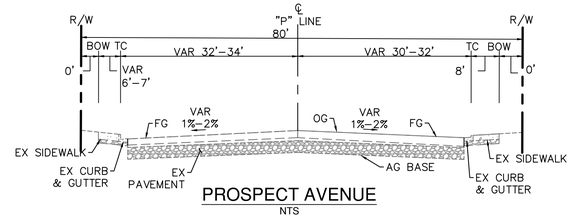
CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2
STREET IMPROVEMENT
PROSPECT AVENUE & CAMINO REAL

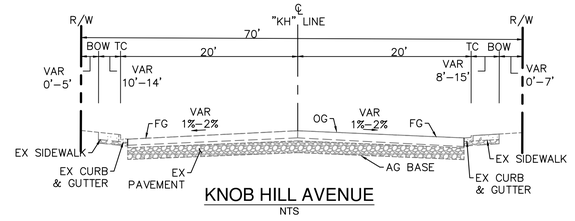
DRAWN	JC	CHECKED	MB	SCALE	1" = 20'
APPROVED BY	ANDREW S. WINJE, P.E. CITY ENGINEER			DATE	
PROJECT NO. 41490		SHEET NO. 11 OF 58 SHEETS		DRAWING NO. SI-09	

DRAWING: \\atf-no\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-10-rb-si-pros-03.dwg PLOTTED: 2/6/2026 3:17 PM BY:





PROSPECT AVENUE
NTS



KNOB HILL AVENUE
NTS

CONSTRUCTION NOTES

- P PROTECT IN PLACE (ITEM)
- A ADJUST TO GRADE (ITEM)
- R REMOVE (ITEM)
- RL RELOCATE (ITEM)
- (1) SAWCUT AND REMOVE INTERFERING PORTIONS OF EX PCC CURB & GUTTER, SIDEWALK, CURB RAMP AND / OR LOCAL DEPRESSION, UNLESS OTHERWISE NOTED, AS REQUIRED FOR THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS.
- (2) SAWCUT & REMOVE AND CONSTRUCT 24" WIDE FULL DEPTH AC SLOT PAVEMENT PER DETAIL A ON SHEET CD–01.
- (3) CONSTRUCT 4" PCC SIDEWALK PER SPPWC STD PLAN 113–2 OVER 4" CRUSHED AGGREGATE BASE.
- (4) CONSTRUCT PCC CURB RAMP PER SPPWC STANDARD PLAN 111–5 (TYPE AND CASE PER PLAN) WITH 36"x60" DETECTABLE WARNING SURFACE.
- (5) CONSTRUCT DRIVEWAY APPROACH (TYPE B) PER SPPWC STANDARD 110–2. WIDTH PER PLAN.
- (6) CONSTRUCT 4" PCC SURFACE PER SPPWC STD PLAN 113–2 OVER 4" CRUSHED AGGREGATE BASE.
- (7) CONSTRUCT PCC CURB AND GUTTER (6" CF), TYPE A2–6, PER SPPWC STD PLAN 120–3 OVER 6" CRUSHED AGGREGATE BASE. W=24".
- (8) CONSTRUCT PCC GUTTER TRANSITION PER DETAIL B ON SHEET CD–01
- (9) CONSTRUCT CROSS GUTTER PER SPPWC STD 122–2.
- (10) CONSTRUCT PCC PEDESTRIAN CURB (6" CF), TYPE A1–6 PER SPPWC STD PLAN 120–3 OVER 6" CRUSHED AGGREGATE BASE.

LEGEND

- DETECTABLE WARNING SURFACE
- FULL DEPTH AC, SEE DETAIL A ON SHEET CD–01
- PCC IMPROVEMENTS

STREET IMPROVEMENT GENERAL NOTES:

1. GENERAL STREET IMPROVEMENT NOTES APPLY TO ALL PLAN SHEETS.
2. SEE SS SHEETS FOR SIGNING AND STRIPING DETAILS.
3. SEE E SHEETS FOR TRAFFIC SIGNAL RELOCATIONS, ADJUSTMENT, AND PROTECTION DETAILS.
4. SEE CD SHEETS FOR CONSTRUCTION DETAILS.

N

20 0 20 40
scale 1" = 20' feet

LEGEND

- SAWCUT LINE
- EX R/W LINE
- CENTERLINE
- T EX TELECOMMUNICATIONS
- W EX DOMESTIC WATER
- FO EX FIBER OPTIC
- SS EX SANITARY SEWER
- COM(UG) EX UNDERGROUND COMMUNICATION
- OH EX OVERHEAD COMMUNICATION
- E(OH) EX OVERHEAD ELECTRIC
- E(UG) EX UNDERGROUND ELECTRIC
- GAS EX GAS
- O EX OIL

60% SUBMITTAL (02/06/2025)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

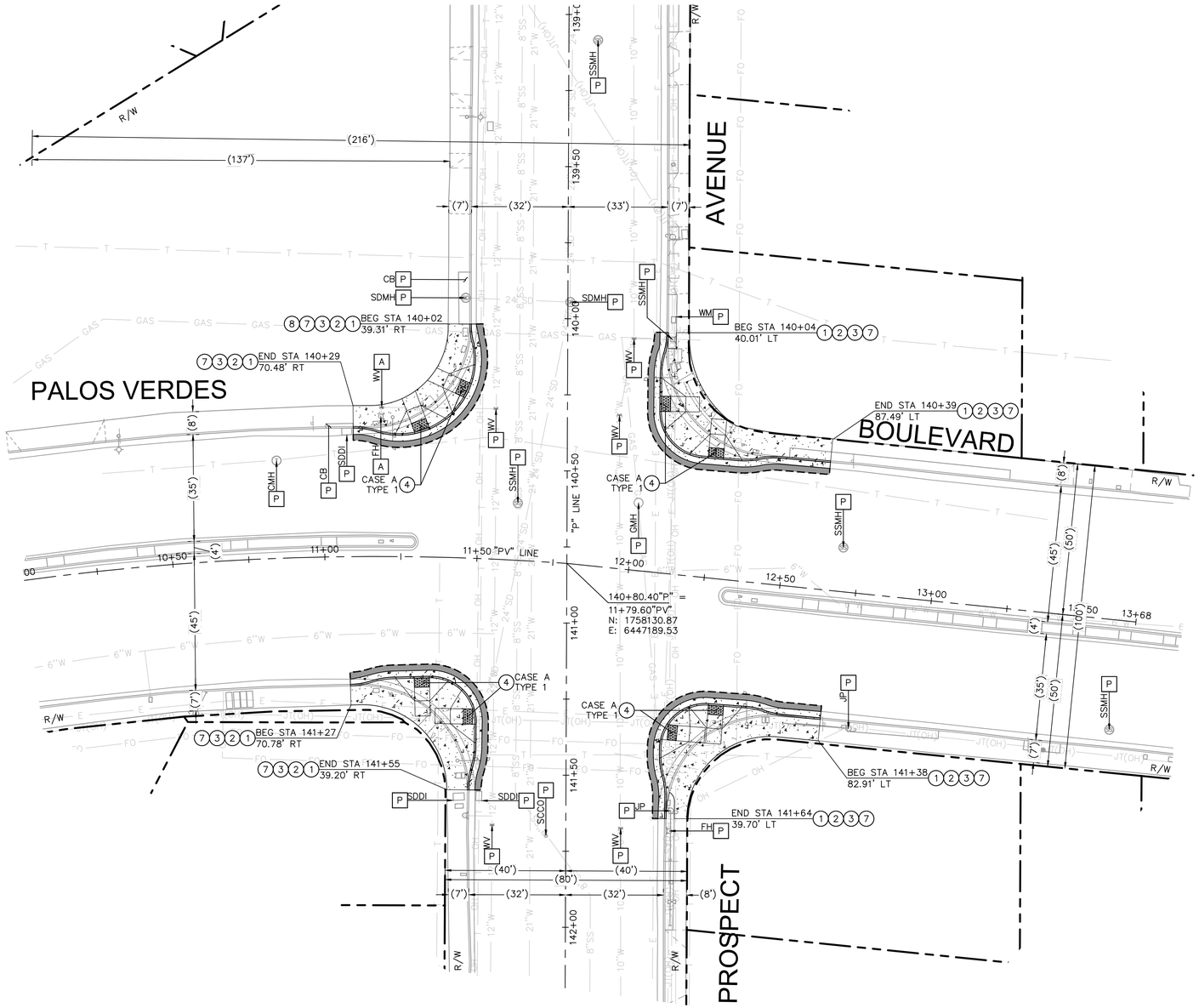
REVISIONS	
DATE	DESCRIPTION

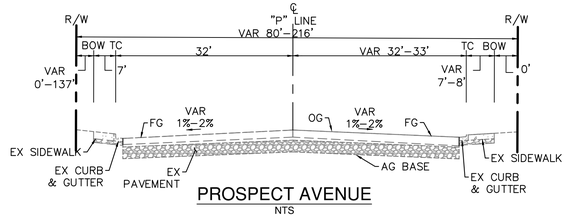
CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2
STREET IMPROVEMENT
PROSPECT AVENUE & KNOB HILL AVENUE

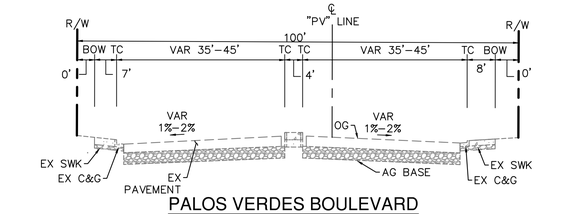
DRAWN	JC	CHECKED	MB	SCALE	1" = 20'
APPROVED BY	ANDREW S. WINJE, P.E. CITY ENGINEER			DATE	
PROJECT NO. 41490		SHEET NO. 12 OF 58 SHEETS		DRAWING NO. SI-10	

DRAWING: \\bf-no\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-10-rb-si-pros-03.dwg PLOTTED: 2/6/2026 3:17 PM BY:





PROSPECT AVENUE
NTS



PALOS VERDES BOULEVARD
NTS

60% SUBMITTAL (02/06/2025)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

CONSTRUCTION NOTES

- P PROTECT IN PLACE (ITEM)
- A ADJUST TO GRADE (ITEM)
- R REMOVE (ITEM)
- RL RELOCATE (ITEM)
- (1) SAWCUT AND REMOVE INTERFERING PORTIONS OF EX PCC CURB & GUTTER, SIDEWALK, CURB RAMP AND / OR LOCAL DEPRESSION, UNLESS OTHERWISE NOTED, AS REQUIRED FOR THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS.
- (2) SAWCUT & REMOVE AND CONSTRUCT 24" WIDE FULL DEPTH AC SLOT PAVEMENT PER DETAIL A ON SHEET CD-01.
- (3) CONSTRUCT 4" PCC SIDEWALK PER SPPWC STD PLAN 113-2 OVER 4" CRUSHED AGGREGATE BASE.
- (4) CONSTRUCT PCC CURB RAMP PER SPPWC STANDARD PLAN 111-5 (TYPE AND CASE PER PLAN) WITH 36"x60" DETECTABLE WARNING SURFACE.
- (5) CONSTRUCT DRIVEWAY APPROACH (TYPE B) PER SPPWC STANDARD 110-2. WIDTH PER PLAN.
- (6) CONSTRUCT 4" PCC SURFACE PER SPPWC STD PLAN 113-2 OVER 4" CRUSHED AGGREGATE BASE.
- (7) CONSTRUCT PCC CURB AND GUTTER (6" CF), TYPE A2-6, PER SPPWC STD PLAN 120-3 OVER 6" CRUSHED AGGREGATE BASE. W=24".
- (8) CONSTRUCT PCC GUTTER TRANSITION PER DETAIL B ON SHEET CD-01
- (9) CONSTRUCT CROSS GUTTER PER SPPWC STD 122-2.
- (10) CONSTRUCT PCC PEDESTRIAN CURB (6" CF), TYPE A1-6 PER SPPWC STD PLAN 120-3 OVER 6" CRUSHED AGGREGATE BASE.

LEGEND

- DETECTABLE WARNING SURFACE
- FULL DEPTH AC, SEE DETAIL A ON SHEET CD-01
- PCC IMPROVEMENTS

STREET IMPROVEMENT GENERAL NOTES:

1. GENERAL STREET IMPROVEMENT NOTES APPLY TO ALL PLAN SHEETS.
2. SEE SS SHEETS FOR SIGNING AND STRIPING DETAILS.
3. SEE E SHEETS FOR TRAFFIC SIGNAL RELOCATIONS, ADJUSTMENT, AND PROTECTION DETAILS.
4. SEE CD SHEETS FOR CONSTRUCTION DETAILS.

N

20 0 20 40
scale 1" = 20' feet

LEGEND

- SAWCUT LINE
- EX R/W LINE
- CENTERLINE
- T EX TELECOMMUNICATIONS
- W EX DOMESTIC WATER
- FO EX FIBER OPTIC
- SS EX SANITARY SEWER
- COM(UG) EX UNDERGROUND COMMUNICATION
- OH EX OVERHEAD COMMUNICATION
- E(OH) EX OVERHEAD ELECTRIC
- E(UG) EX UNDERGROUND ELECTRIC
- GAS EX GAS
- O EX OIL

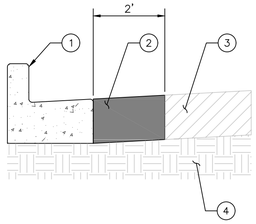
REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2
STREET IMPROVEMENT
PROSPECT AVENUE & PALOS VERDES BOULEVARD

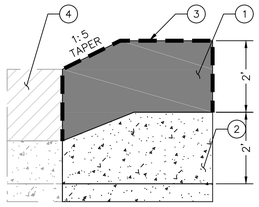
DRAWN	JC	CHECKED	MB	SCALE	1" = 20'
APPROVED BY	ANDREW S. WINJE, P.E. CITY ENGINEER			DATE	
PROJECT NO. 41490		SHEET NO. 13 OF 58 SHEETS		DRAWING NO. SI-11	

DRAWING: \\bkf-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-10-si-pros-03.dwg PLOTTED: 2/6/2026 3:17 PM BY:



1. SAWCUT, REMOVE & CONSTRUCT CURB & GUTTER/DRIVEWAY PER PLAN
2. SAWCUT, REMOVE & REPLACE 6" FULL DEPTH AC SLOT PAVEMENT. CONSTRUCT 2" SURFACE COURSE (ARHM)
3. EXISTING AC PAVEMENT
4. COMPACT SUBGRADE TO 95% RELATIVE COMPACTION

A A.C. SLOT PAVING DETAIL
SCALE: N.T.S.



1. 2' AC SLOT PER DETAIL A ON SHEET CD-01
2. CONSTRUCT 6" PCC CURB AND GUTTER TYPE A2-6 PER SPPWC STD PLAN 120-3. W=24"
3. SAWCUT LINE
4. EXISTING AC PAVEMENT
5. COMPACT SUBGRADE TO 95% RELATIVE COMPACTION

B PCC GUTTER TRANSITION
SCALE: N.T.S.

LEGEND:

- PROPOSED PCC
- EXISTING PCC
- PROPOSED AC PAVEMENT
- EXISTING AC PAVEMENT
- EXISTING AGGREGATE BASE
- EXISTING SUBGRADE
- SAWCUT LINE

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2

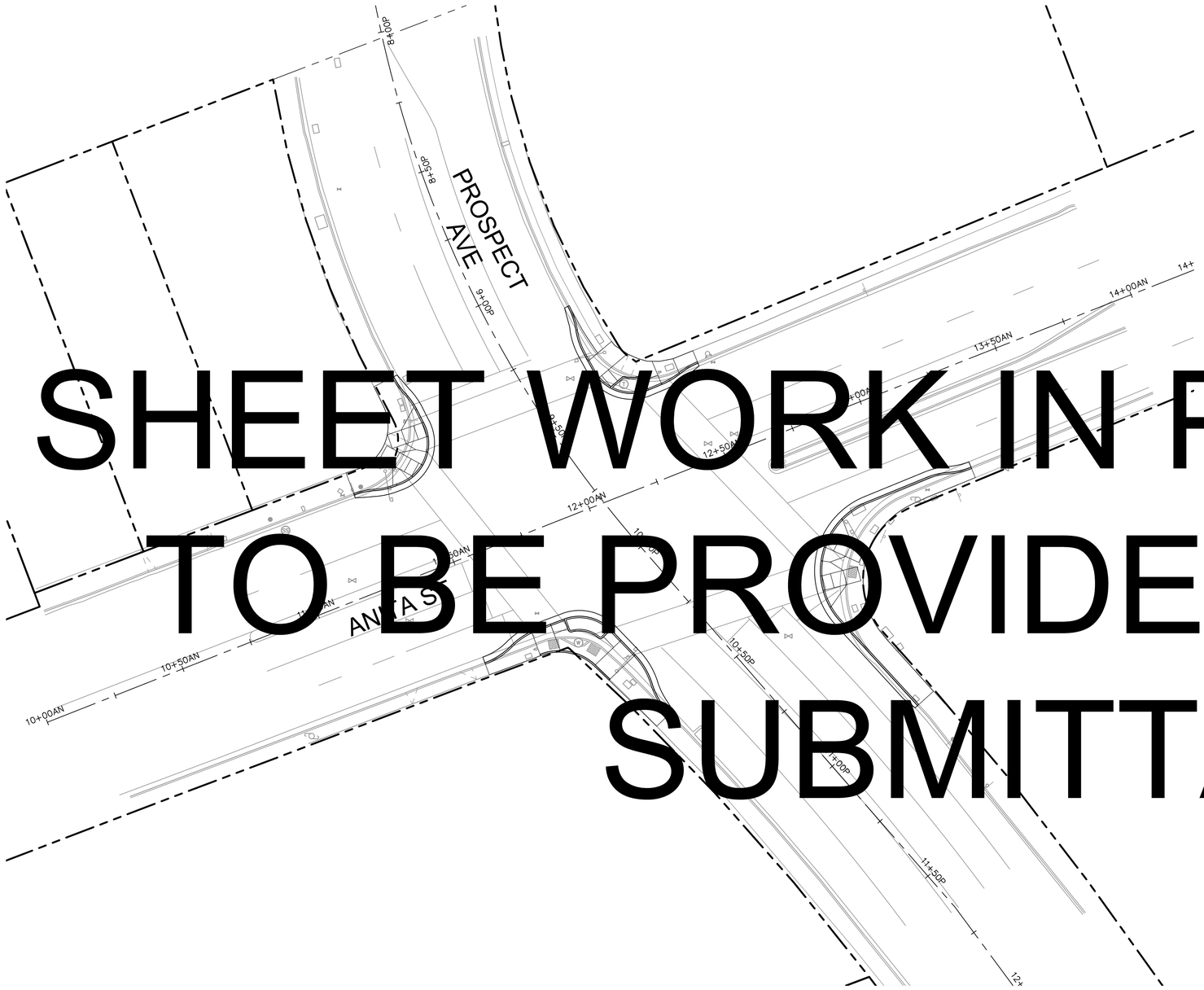
CONSTRUCTION DETAILS

DRAWN	CHECKED	SCALE
JC	MB	1" = 20'

APPROVED BY _____ DATE _____
ANDREW S. WINJE, P.E. CITY ENGINEER

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	14 OF 58 SHEETS	CD-01

DRAWING: J:\pw-rb\work\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-14-rb-cd-01-pros.dwg PLOTTED: 2/6/2026 3:27 PM



SHEET WORK IN PROGRESS TO BE PROVIDED AT 90% SUBMITTAL

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

N

20 0 20 40
scale 1" = 20' feet

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2

CONSTRUCTION DETAILS
PROSPECT AVENUE & ANITA/190TH STREET

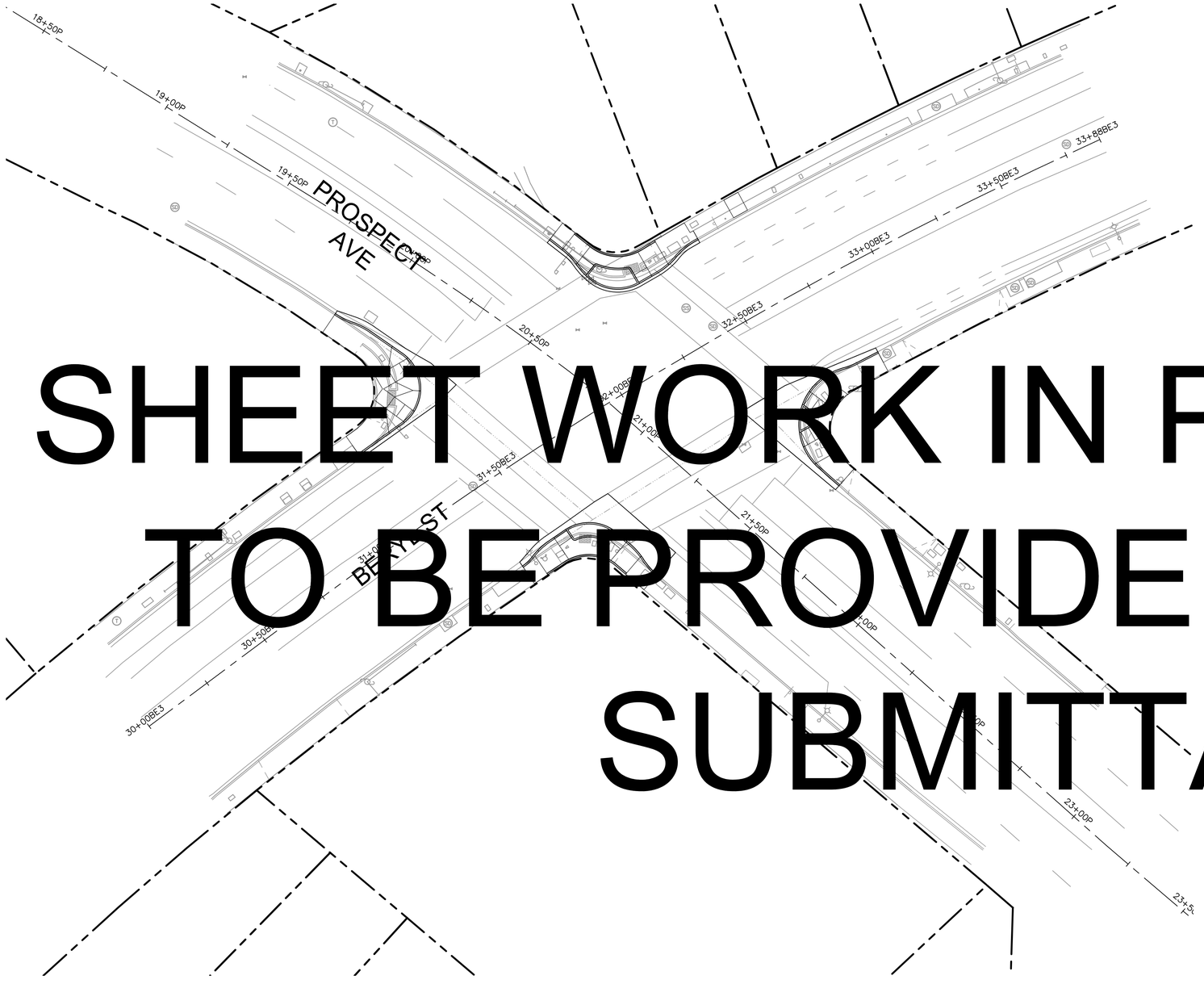
DRAWN	CHECKED	SCALE
JC	MB	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER

DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	15 OF 58 SHEETS	CD-02

DRAWING: \\atl-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-14-rb-cd-01-pros.dwg PLOTTED: 2/6/2026 3:27 PM



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CIVIL
STATE OF CALIFORNIA

N

20 0 20 40
scale 1" = 20' feet

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2

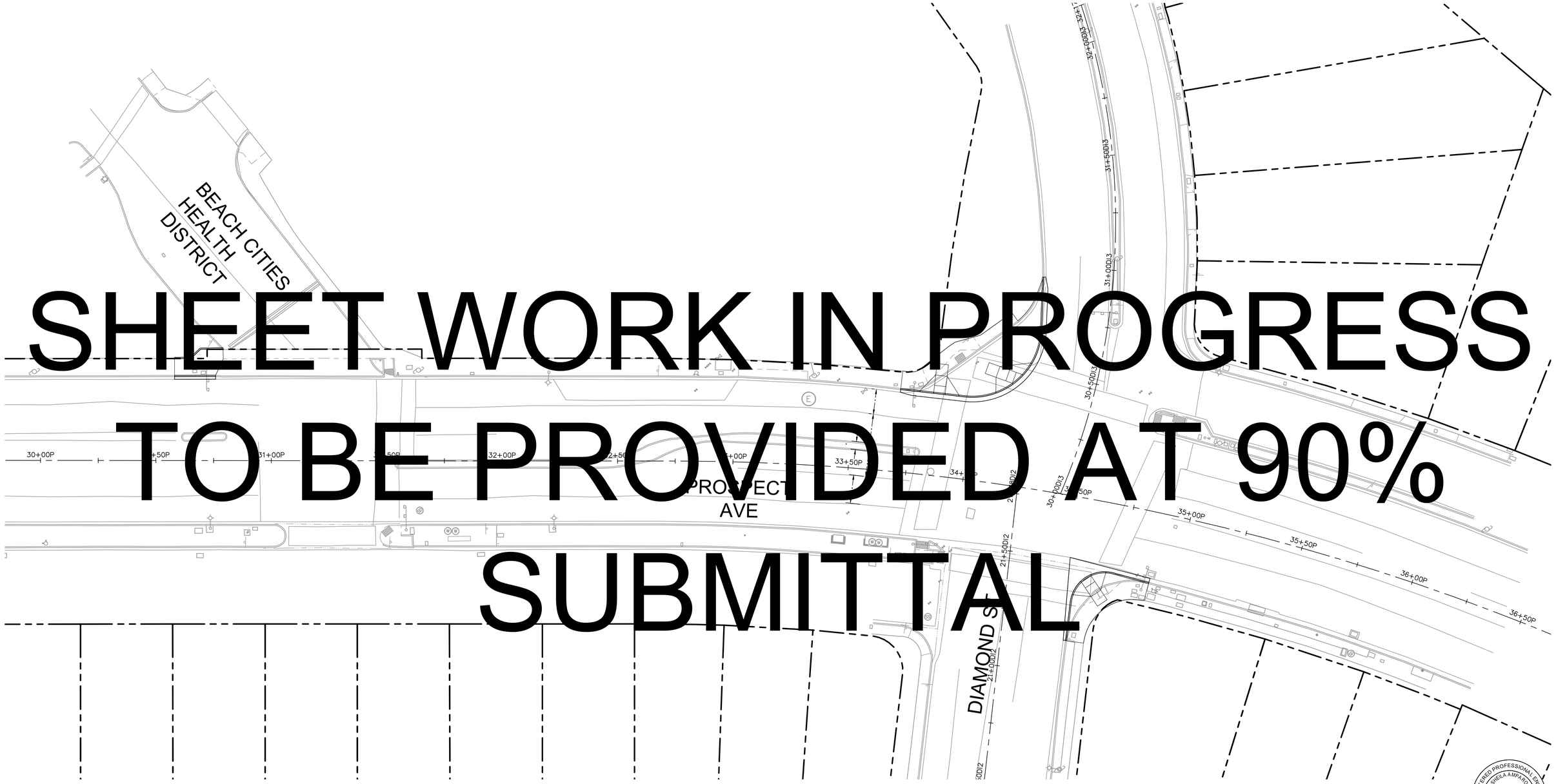
CONSTRUCTION DETAILS
PROSPECT AVENUE & BERYL STREET

DRAWN	CHECKED	SCALE
JC	MB	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER
DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	16 OF 58 SHEETS	CD-03

DRAWING: J:\pkf-rb\work\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-14-rb-cd-01-pros.dwg PLOTTED: 2/6/2026 3:27 PM



SHEET WORK IN PROGRESS

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REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
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Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

20 0 20 40
scale 1" = 20' feet

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

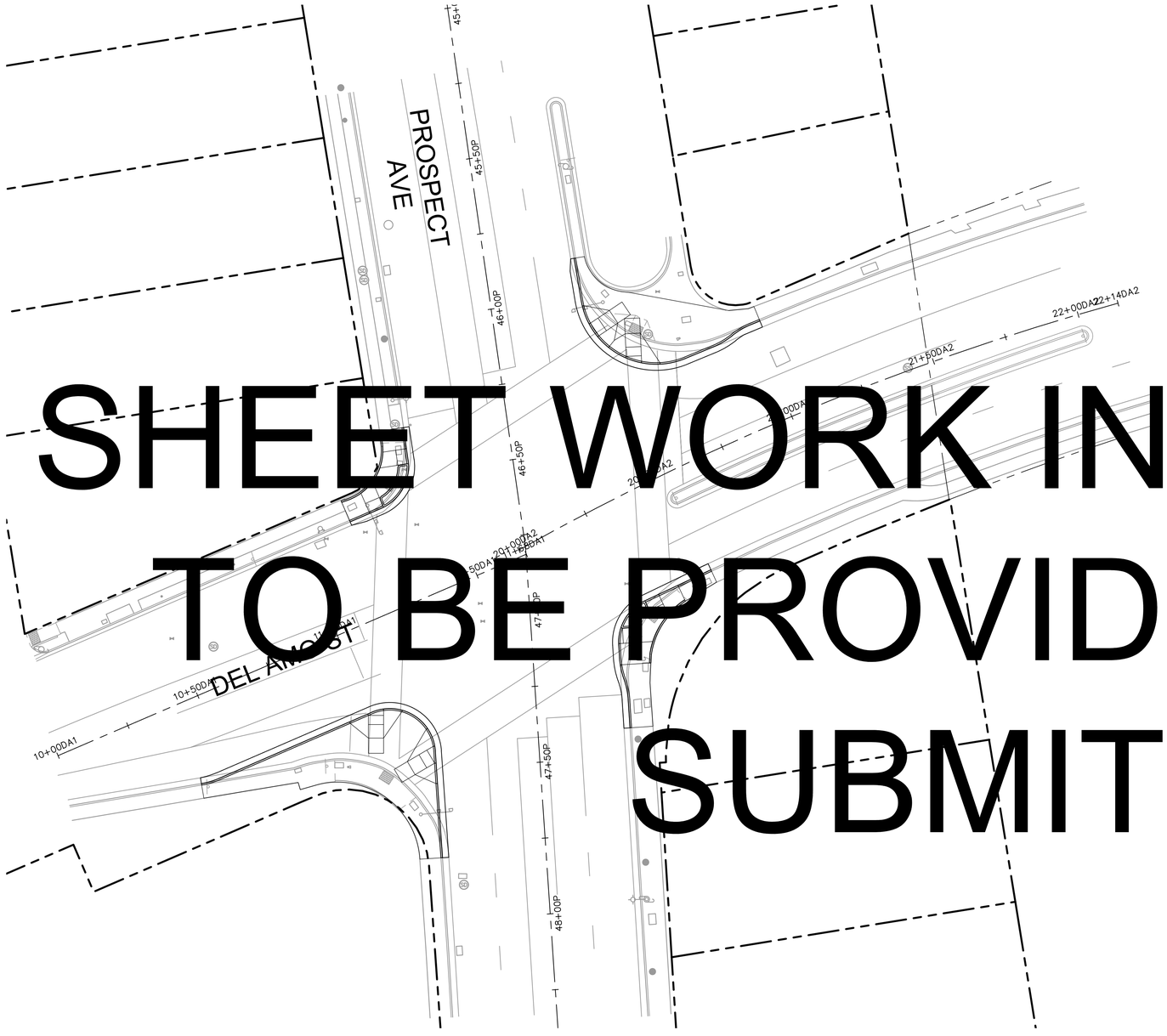
REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
CONSTRUCTION DETAILS
PROSPECT AVE & DIAMOND ST-BEACH CITIES

DRAWN	CHECKED	SCALE
JC	MB	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER
DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	17 OF 58 SHEETS	CD-04

DRAWING: \\bkf-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-14-rb-cd-01-pros.dwg PLOTTED: 2/6/2026 3:27 PM



SHEET WORK IN PROGRESS
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REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
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Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

N

20 0 20 40
scale 1" = 20' feet

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2

CONSTRUCTION DETAILS
PROSPECT AVENUE & DEL AMO STREET

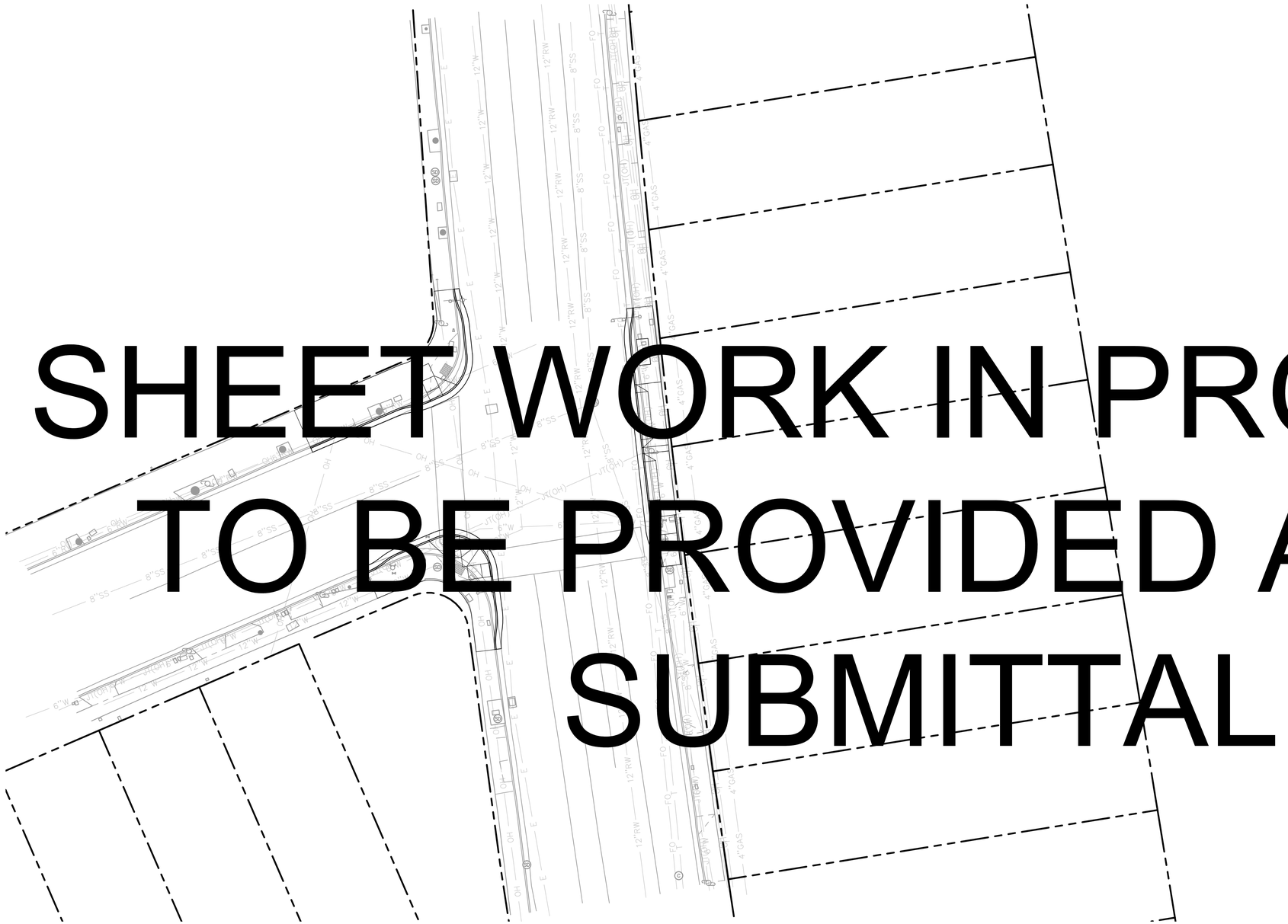
DRAWN	CHECKED	SCALE
JC	MB	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER

DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	18 OF 58 SHEETS	CD-05

DRAWING: \\bkt-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-14-rb-cd-01-pros.dwg PLOTTED: 2/6/2026 3:27 PM



SHEET WORK IN PROGRESS
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REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
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CIVIL
STATE OF CALIFORNIA

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20 0 20 40
scale 1" = 20' feet

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

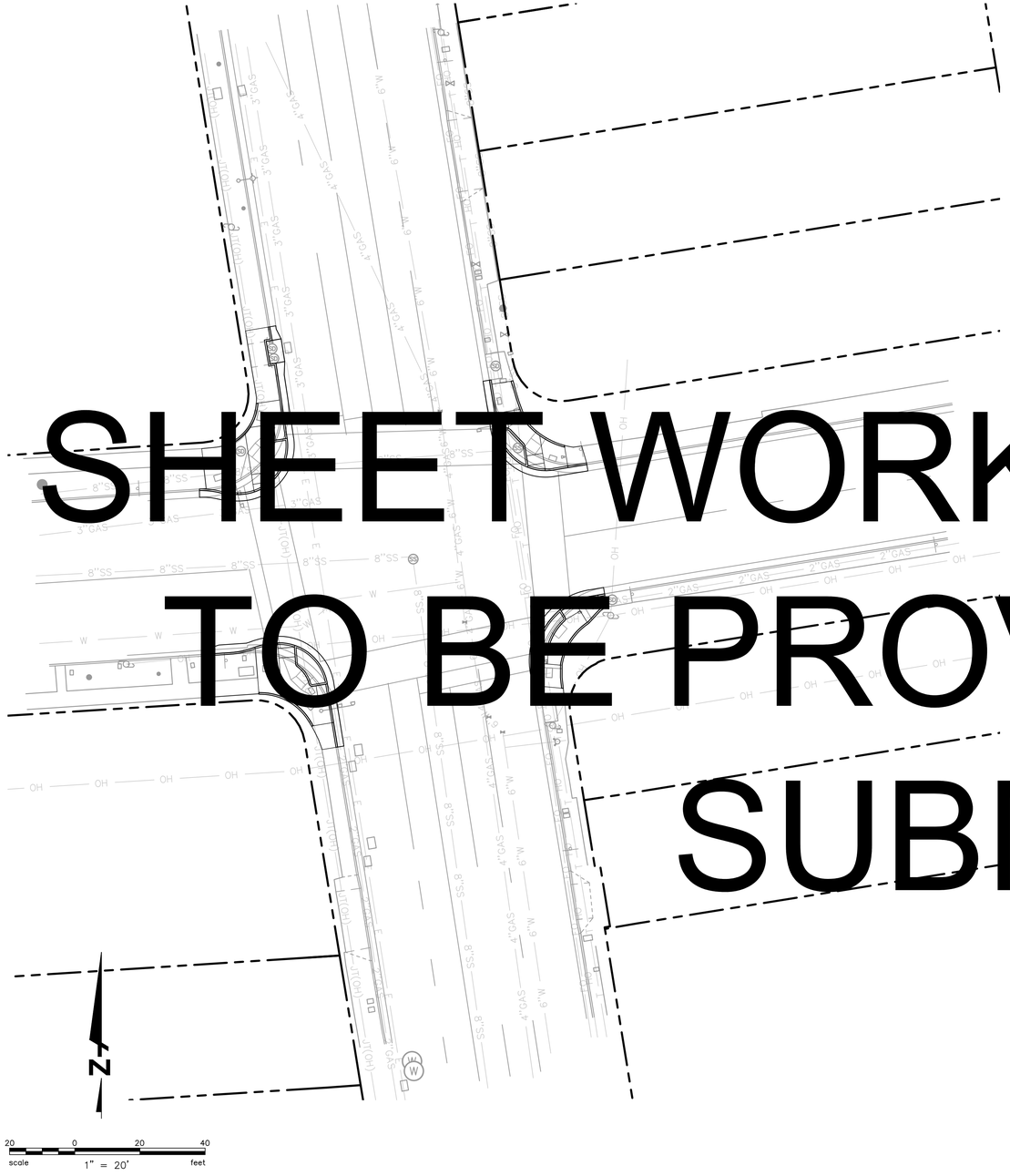
REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
CONSTRUCTION DETAILS
PROSPECT AVENUE & VINCENT STREET

DRAWN	CHECKED	SCALE
JC	MB	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER
DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	19 OF 58 SHEETS	CD-06

DRAWING: \\pkf-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-15-rb-cd-02-pros.dwg PLOTTED: 2/6/2026 3:28 PM



SHEET WORK IN PROGRESS
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SUBMITTAL

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REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
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Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
CONSTRUCTION DETAILS
PROSPECT AVENUE & EMERALD STREET

DRAWN	CHECKED	SCALE
JC	MB	1" = 20'

APPROVED BY _____ DATE _____
ANDREW S. WINJE, P.E. CITY ENGINEER

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	20 OF 58 SHEETS	CD-07

DRAWING: \\pkf-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-15-rb-cd-02-pros.dwg PLOTTED: 2/6/2026 3:28 PM

SHEET WORK IN PROGRESS
TO BE PROVIDED AT 90%
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REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
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CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

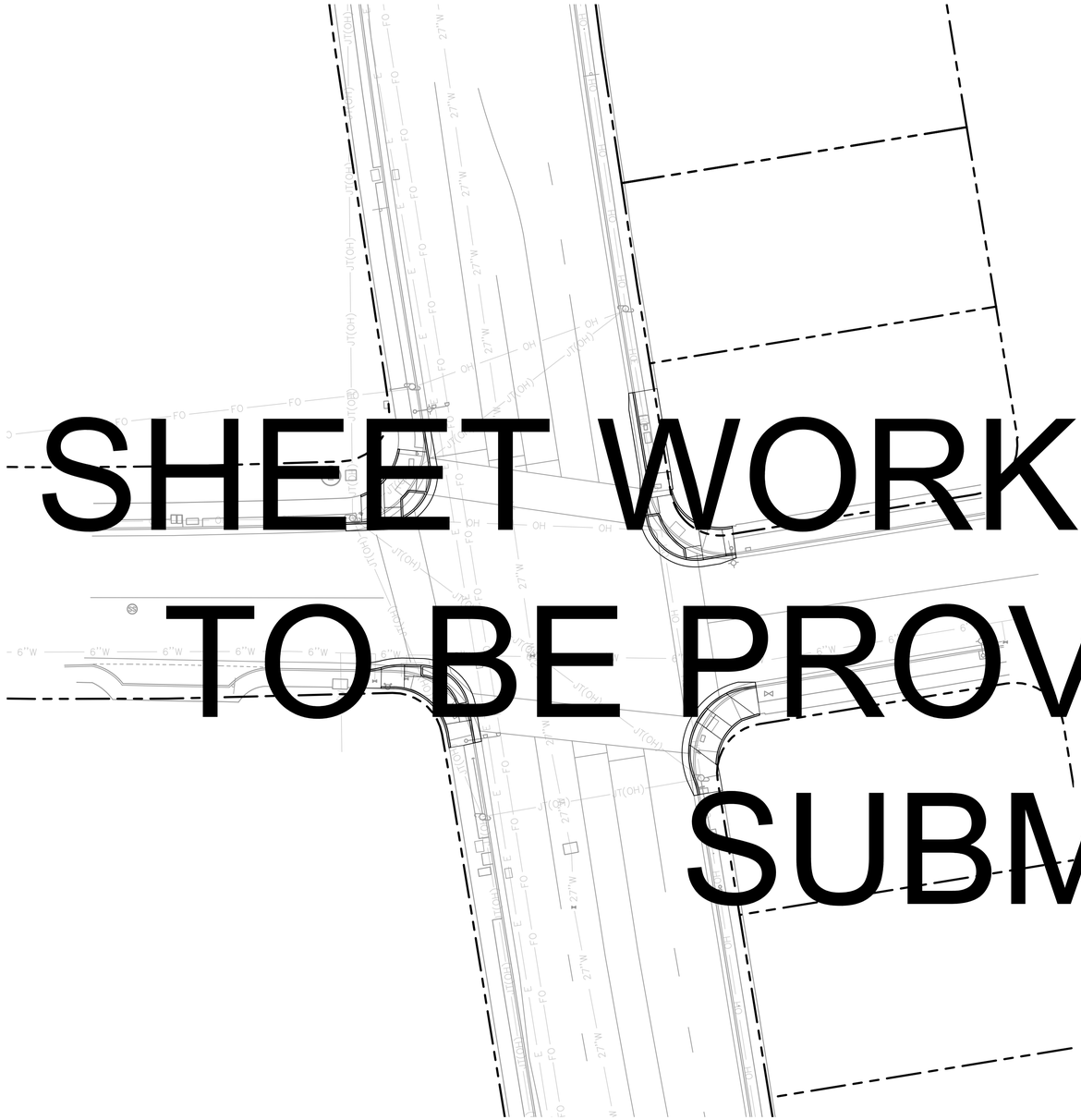
REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
CONSTRUCTION DETAILS
PROSPECT AVENUE & TORRANCE BOULEVARD

DRAWN	CHECKED	SCALE
JC	MB	1" = 20'

APPROVED BY _____ DATE _____
ANDREW S. WINJE, P.E. CITY ENGINEER

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	21 OF 58 SHEETS	CD-08

DRAWING: \\bkf-rb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992--15--cd-02-pros.dwg PLOTTED: 2/6/2026 3:28 PM



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STATE OF CALIFORNIA

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20 0 20 40
scale 1" = 20' feet

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

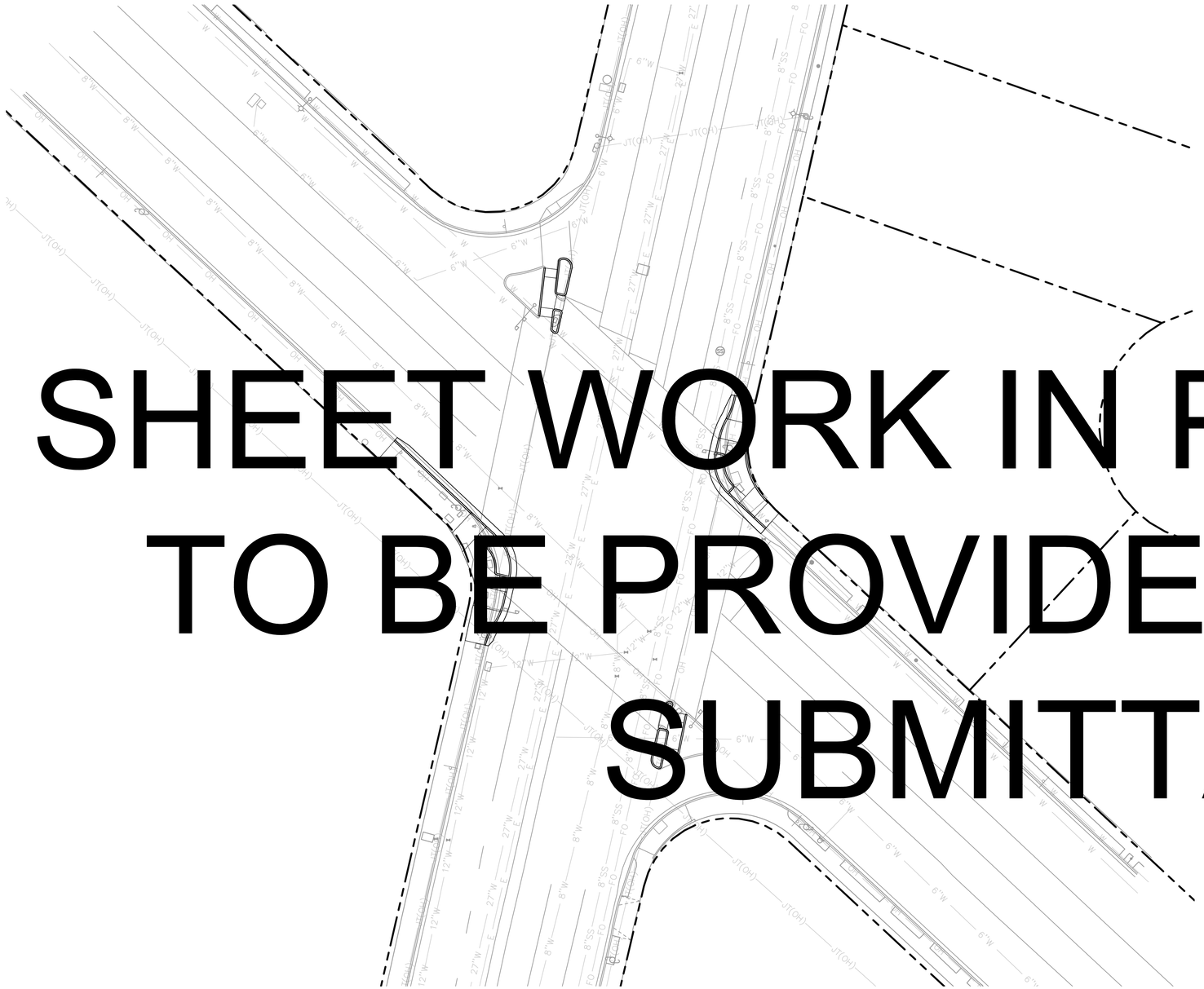
REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
CONSTRUCTION DETAILS
PROSPECT AVENUE & PEARL STREET

DRAWN	CHECKED	SCALE
JC	MB	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER
DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	22 OF 58 SHEETS	CD-09

DRAWING: \\bf-nt\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-15-rb-cd-02-pros.dwg PLOTTED: 2/6/2026 3:28 PM



SHEET WORK IN PROGRESS
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N

20 0 20 40
scale 1" = 20' feet

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
CONSTRUCTION DETAILS
PROSPECT AVENUE & CAMINO REAL

DRAWN	CHECKED	SCALE
JC	MB	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER

DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	23 OF 58 SHEETS	CD-10

DRAWING: \\pw-rb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992--16--cd-03-pros.dwg PLOTTED: 2/6/2026 3:29 PM

SHEET WORK IN PROGRESS
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SUBMITTAL

60% SUBMITTAL (02/06/2026)
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REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

N

20 0 20 40
scale 1" = 20' feet

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2

CONSTRUCTION DETAILS
PROSPECT AVENUE & KNOB HILL AVENUE

DRAWN	JC	CHECKED	MB	SCALE	1" = 20'
APPROVED BY	ANDREW S. WINJE, P.E. CITY ENGINEER			DATE	
PROJECT NO. 41490		SHEET NO. 24 OF 58 SHEETS		DRAWING NO. CD-11	

DRAWING: \\bkt-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-16-rb-cd-03-pros.dwg PLOTTED: 2/6/2026 3:29 PM

SHEET WORK IN PROGRESS
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SUBMITTAL

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NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

N

20 0 20 40
scale 1" = 20' feet

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
CONSTRUCTION DETAILS
PROSPECT AVENUE & PALOS VERDES BOULEVARD

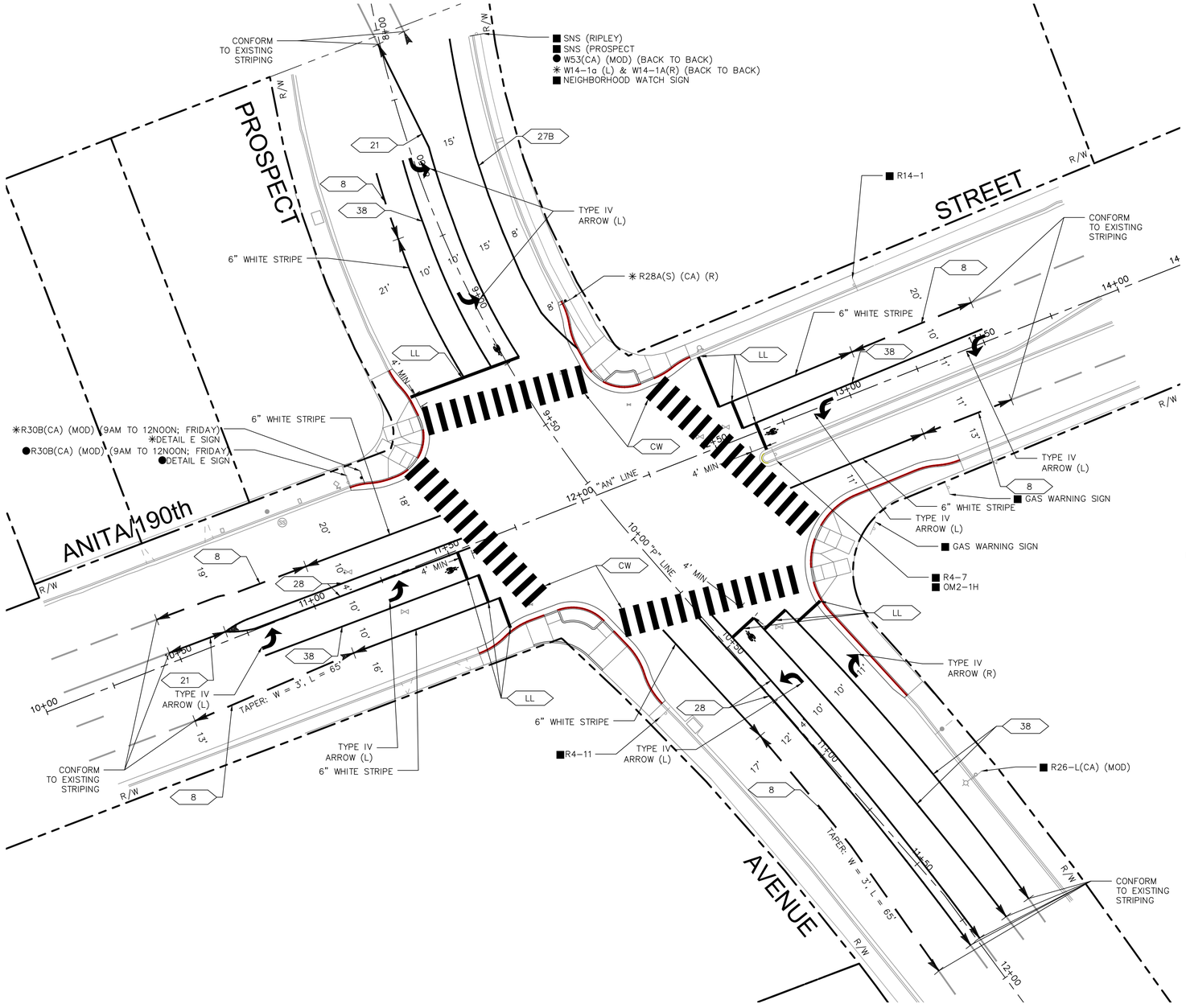
DRAWN	CHECKED	SCALE
JC	MB	1" = 20'

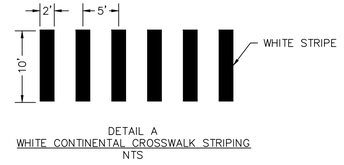
APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER

DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	25 OF 58 SHEETS	CD-12

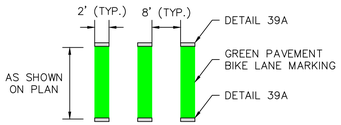
DRAWING: \\pkf-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-16-rb-cd-03-pros.dwg PLOTTED: 2/6/2026 3:29 PM



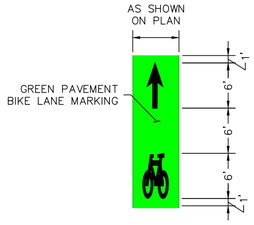


DETAIL A
WHITE CONTINENTAL CROSSWALK STRIPING
NTS

DETAIL B
YELLOW CONTINENTAL CROSSWALK STRIPING
NTS



DETAIL C
GREEN BIKE LANE HATCH
NTS



DETAIL D
GREEN BIKE LANE SYMBOL
NTS

DETAIL E
90 MIN PARKING SIGN
NTS

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

LEGEND (SHEETS SS-01 THROUGH SS-11 ONLY):

No.	INSTALL PAVEMENT DELINEATION DETAIL PER 2025 CALTRANS STANDARD PLANS.
CW	INSTALL 24" WIDE CONTINENTAL CROSSWALK (24" WHITE STRIPE AT 5' O.C.). SEE DETAIL A ON THIS SHEET.
SC	INSTALL 10' WIDE CONTINENTAL CROSSWALK (24" YELLOW STRIPE AT 5' O.C.). SEE DETAIL B ON THIS SHEET.
LL	INSTALL 12" WHITE STRIPE AS SHOWN FOR ADVANCED VEHICLE LIMIT LINE.
■	INSTALL HIGH-FRICTION GREEN BIKE LANE PAVEMENT MARKING.
	INSTALL PAVEMENT MARKING DETAIL PER 2025 CALTRANS STANDARD PLANS.
	BIKE LOOP DETECTOR SYMBOL PER 2026 CAMUTCD.
STOP	INSTALL PAVEMENT PARKING TEXT PER 2025 CALTRANS STANDARD PLANS

○	EXISTING ROADSIDE SIGN AND POST
○	PROPOSED ROAD SIGN ON EXISTING POST
●	PROPOSED ROAD SIGN AND POST
●	EXISTING SIGN TO BE REMOVED
■	EXISTING SIGN TO REMAIN
✳	INSTALL NEW SIGN
	INSTALL RED CURB
	INSTALL YELLOW CURB

N

20 0 20 40
scale 1" = 20' feet

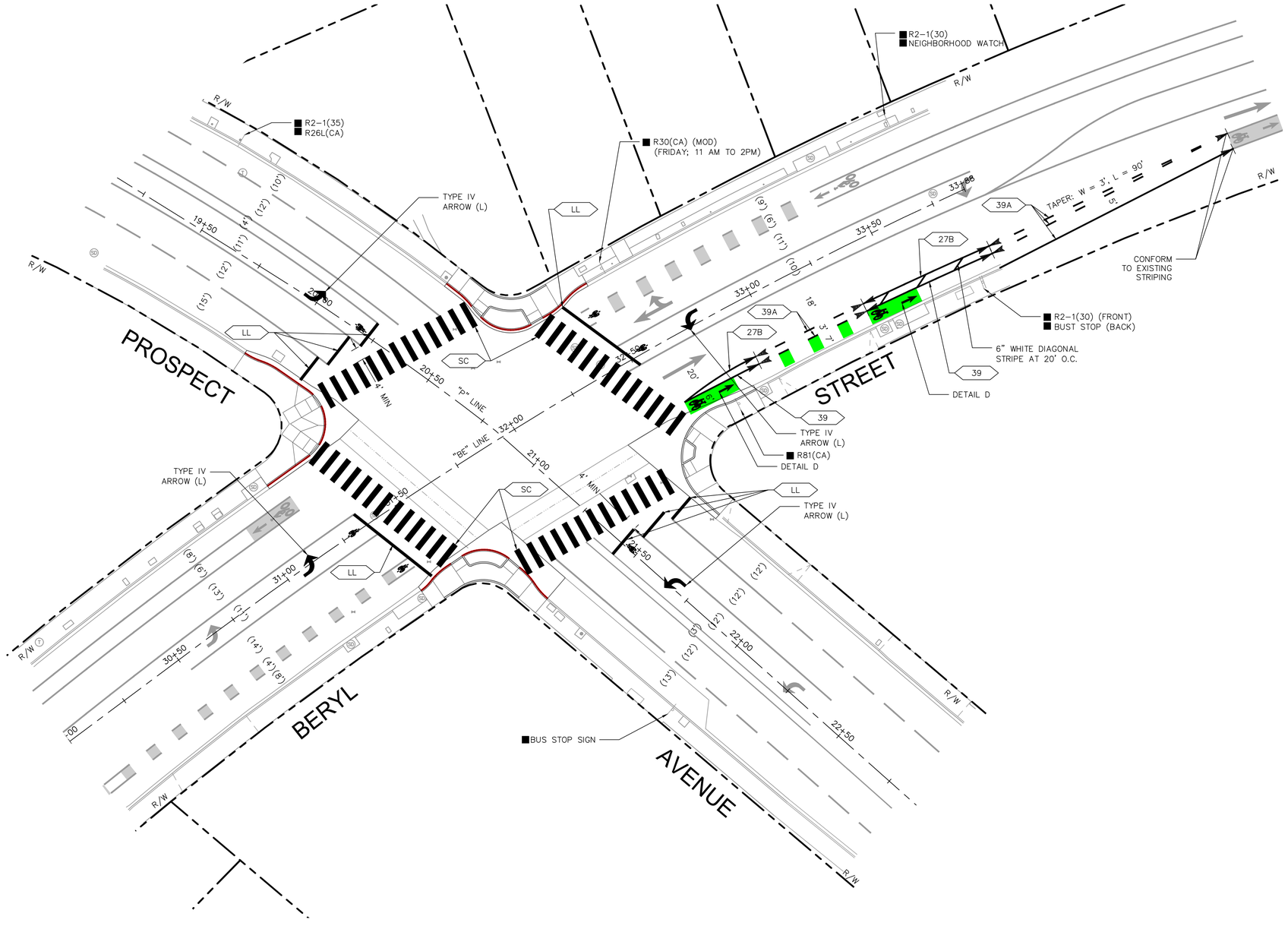
REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
SIGNING & STRIPING
PROSPECT AVENUE & ANITA/190TH STREET

DRAWN JC	CHECKED MB	SCALE 1" = 20'	
APPROVED BY ANDREW S. WINJE, P.E. CITY ENGINEER		DATE	
PROJECT NO. 41490	SHEET NO. 26 OF 58 SHEETS	DRAWING NO. SS-01	

DRAWING: \\pkf-nb\vol4\202x\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-28-rb-pd-pros-01.dwg PLOTTED: 2/5/2026 5:58 PM



20 0 20 40
scale 1" = 20' feet

FOR LEGEND AND NOTES REFER TO SHEET SS-01

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REGISTERED PROFESSIONAL ENGINEER
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DATE	DESCRIPTION

CITY OF REDONDO BEACH
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DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2

SIGNING & STRIPING
PROSPECT AVENUE & BERYL STREET

DRAWN	CHECKED	SCALE
JC	MB	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER

DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	27 OF 58 SHEETS	SS-02

DRAWING: \\bf-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-28-rb-pd-pros-01.dwg PLOTTED: 2/5/2026 8:09 PM

BEACH CITIES HEALTH DISTRICT

PROSPECT AVENUE

DIAMOND STREET

■CUSTOM (UNATHORIZED VEHICLE)

■BUS STOP SIGN

●NO PARKING FRIDAY

✳NO PARKING FRIDAY

■ TYPE Q(CA)

■R30(CA) (MOD)
(FRIDAY; 9 AM TO 12PM)

■R5-1■

■R30(CA) (MOD)
(FRIDAY; 9 AM TO 12PM)

■BUS STOP SIGN

TYPE IV
ARROW (L)

■R4-7
■N-1(CA)
■R30(CA) (MOD)
(FRIDAY; 9 AM TO 12PM)
■R30(CA) (MOD)
(THURSDAY; 9AM TO 12PM)
■NEIGHBORHOOD WATCHSIGN

■R6-1(R)

■R30(CA) (MOD)
(FRIDAY; 11AM TO 2PM)
■R81(CA)
✳R81a(CA)

■ R5-2(MOD) (6000LBS)

■R30(CA) (MOD)
(FRIDAY; 9 AM TO 12PM)

■ R1-1
● R30(CA) (MOD)
(FRIDAY; 9 AM TO 12PM)

■ R2-1(15)
● R30(CA)(MOD)
(THURSDAY; 9AM TO 12PM)

● R10-22
● SNS (DIAMOND)
● SNS (PROSPECT)

✳ R10-22
✳ SNS (DIAMOND)
✳ SNS (PROSPECT)

TYPE IV
ARROW (L)

"DI" LINE

"P" LINE

4' MIN

15'

(15')

STOP

CW

SC

LL

22

38

R/W

30+00 30+50 31+00 31+50 32+00 32+50 33+00 33+50 34+00 34+50 35+00 35+50 36+00

21+78 21+50 21+00

(12') (13') (11') (14') (19') (18')

20 0 20 40
scale 1" = 20' feet

FOR LEGEND AND NOTES REFER TO SHEET SS-01

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
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Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

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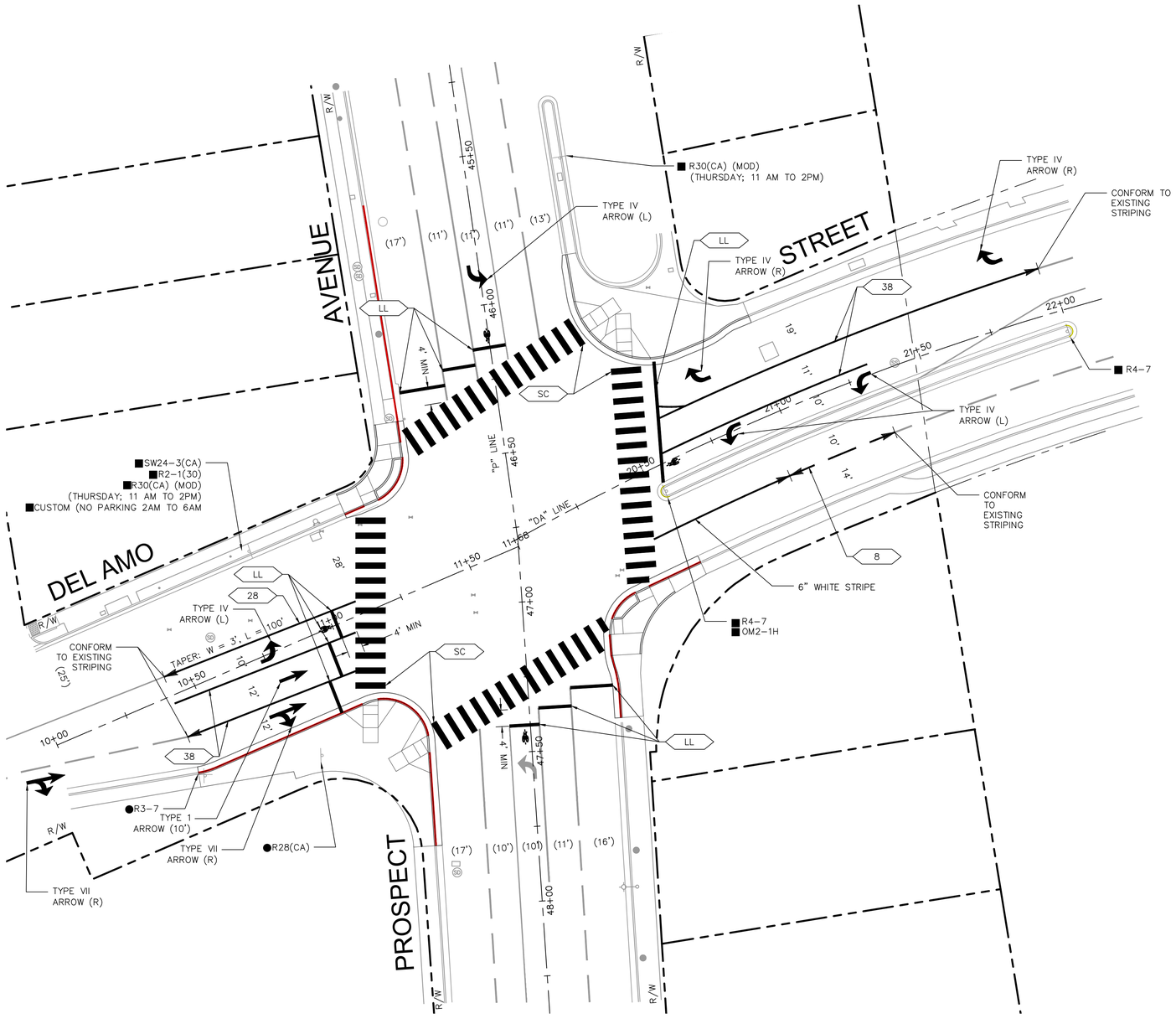
CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
SIGNING & STRIPING
PROSPECT AVE & DIAMOND ST-BEACH CITIES

DRAWN	JC	CHECKED	MB	SCALE	1" = 20'
APPROVED BY				DATE	
	ANDREW S. WINJE, P.E. CITY ENGINEER				
PROJECT NO. 41490		SHEET NO. 28 OF 58 SHEETS		DRAWING NO. SS-03	

DRAWING: \\pkf-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-28-rb-pd-pros-01.dwg PLOTTED: 2/5/2026 5:58 PM



N

20 0 20 40
scale 1" = 20' feet

FOR LEGEND AND NOTES REFER TO SHEET SS-01.

60% SUBMITTAL (02/06/2026)
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CITY OF REDONDO BEACH
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ENGINEERING SERVICES DIVISION

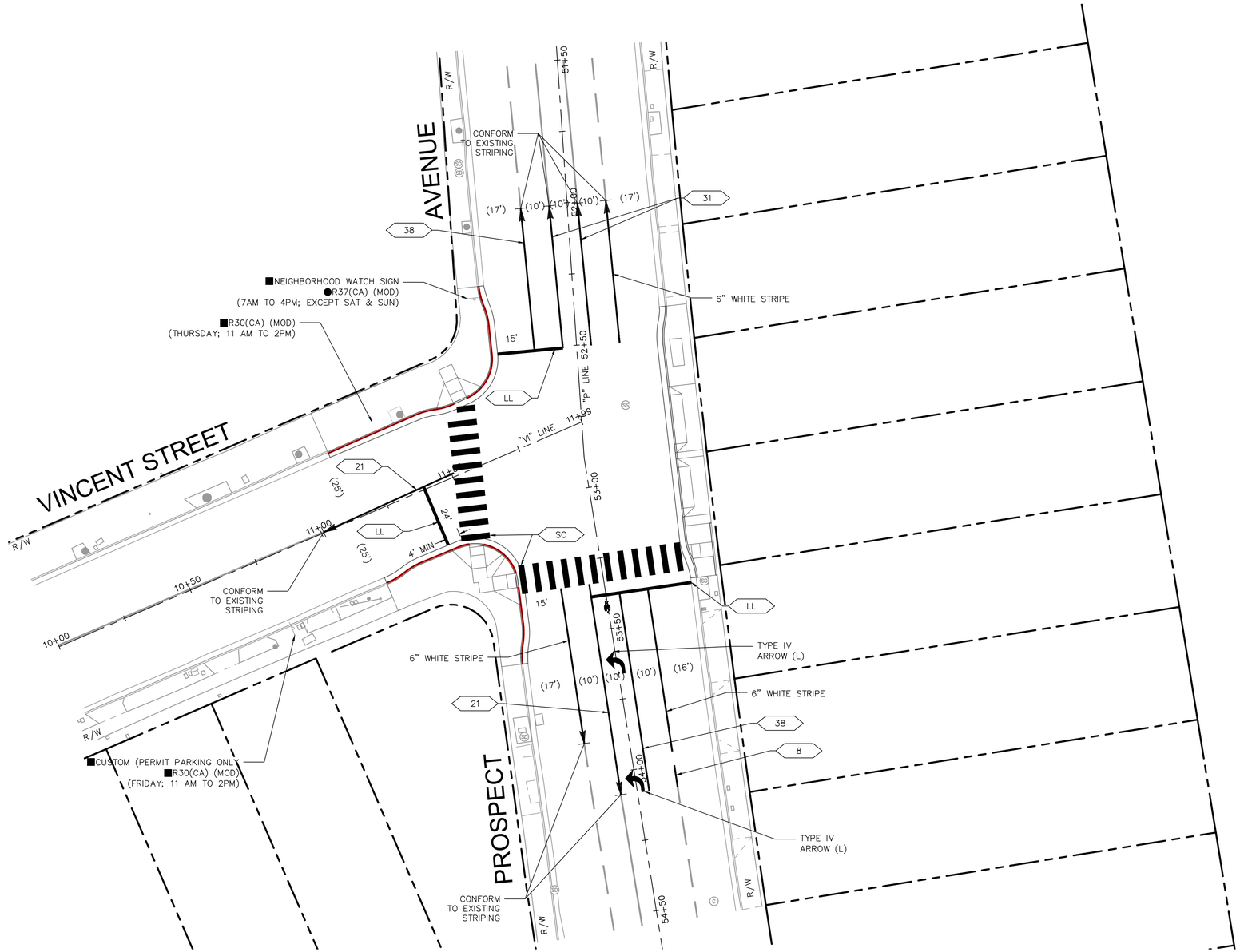
REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
SIGNING & STRIPING
PROSPECT AVENUE & DEL AMO STREET

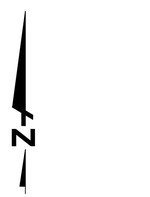
DRAWN	CHECKED	SCALE
JC	MB	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER
DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	29 OF 58 SHEETS	SS-04

DRAWING: \\bf-no\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-28-rb-pd-pros-01.dwg PLOTTED: 2/5/2026 5:59 PM





20 0 20 40
scale 1" = 20' feet

FOR LEGEND AND NOTES REFER TO SHEET SS-01.

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

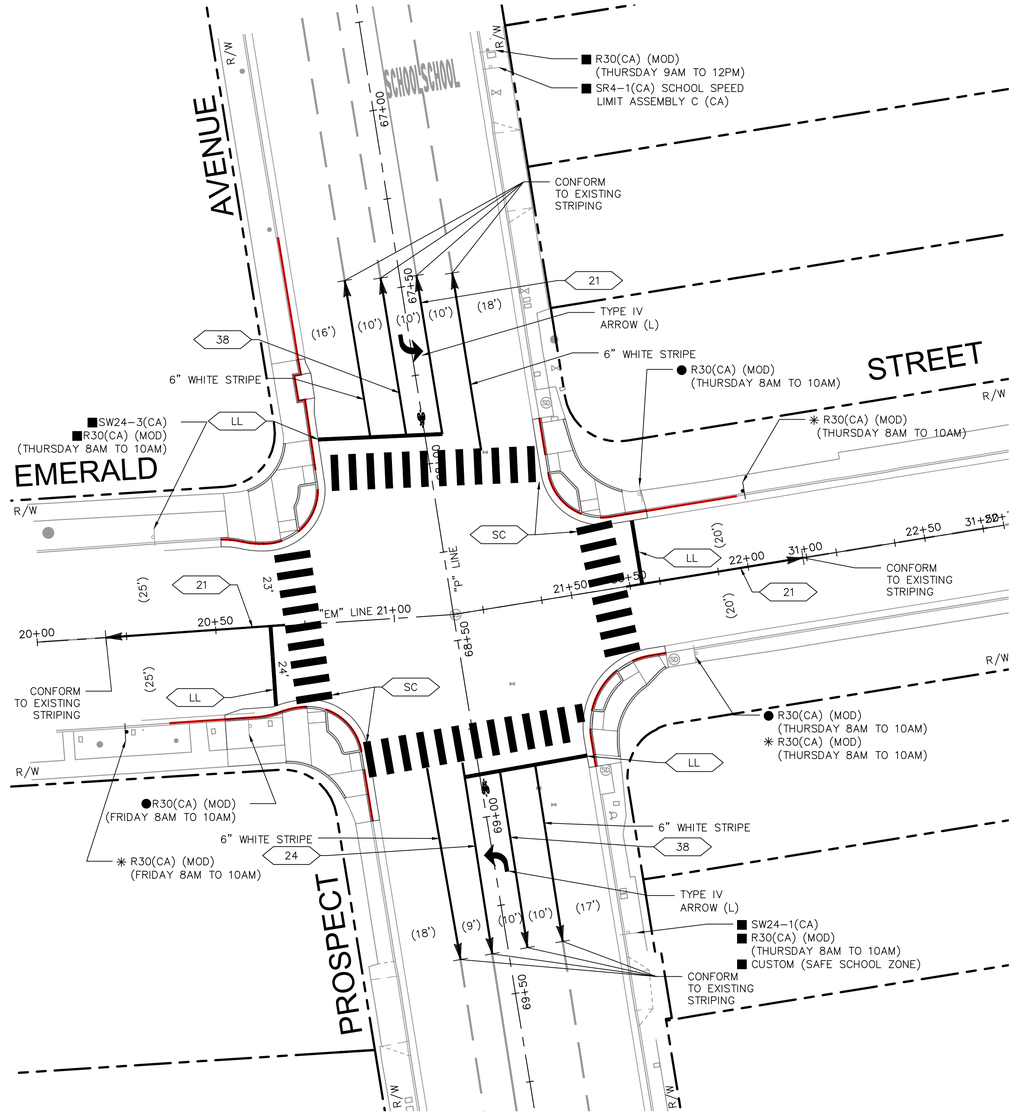
REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
SIGNING & STRIPING
PROSPECT AVENUE & VINCENT STREET

DRAWN	CHECKED	SCALE
JC	MB	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER
DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	30 OF 58 SHEETS	SS-05

DRAWING: \\pkf-mh\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-32-rb-pd-pros-02.dwg PLOTTED: 2/5/2026 5:59 PM



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20 0 20 40
scale 1" = 20' feet

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DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

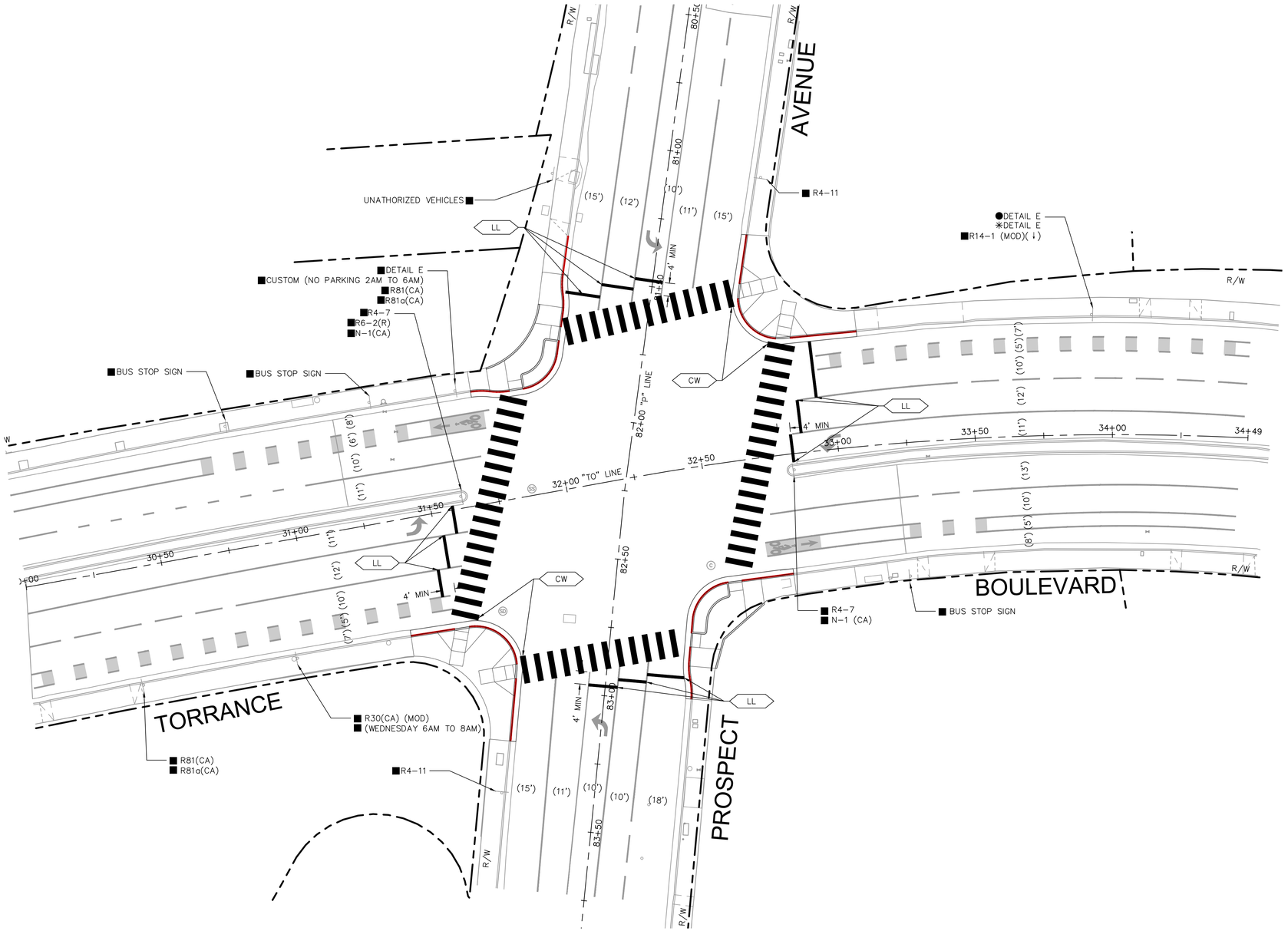
REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
SIGNING & STRIPING
PROSPECT AVENUE & EMERALD STREET

DRAWN	CHECKED	SCALE
JC	MB	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER
DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	31 OF 58 SHEETS	SS-06

DRAWING: \\pkf-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-32-nb-pd-pros-02.dwg PLOTTED: 2/5/2026 5:59 PM



N

scale 1" = 20' feet

20 0 20 40

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DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
SIGNING & STRIPING
PROSPECT AVENUE & TORRANCE BOULEVARD

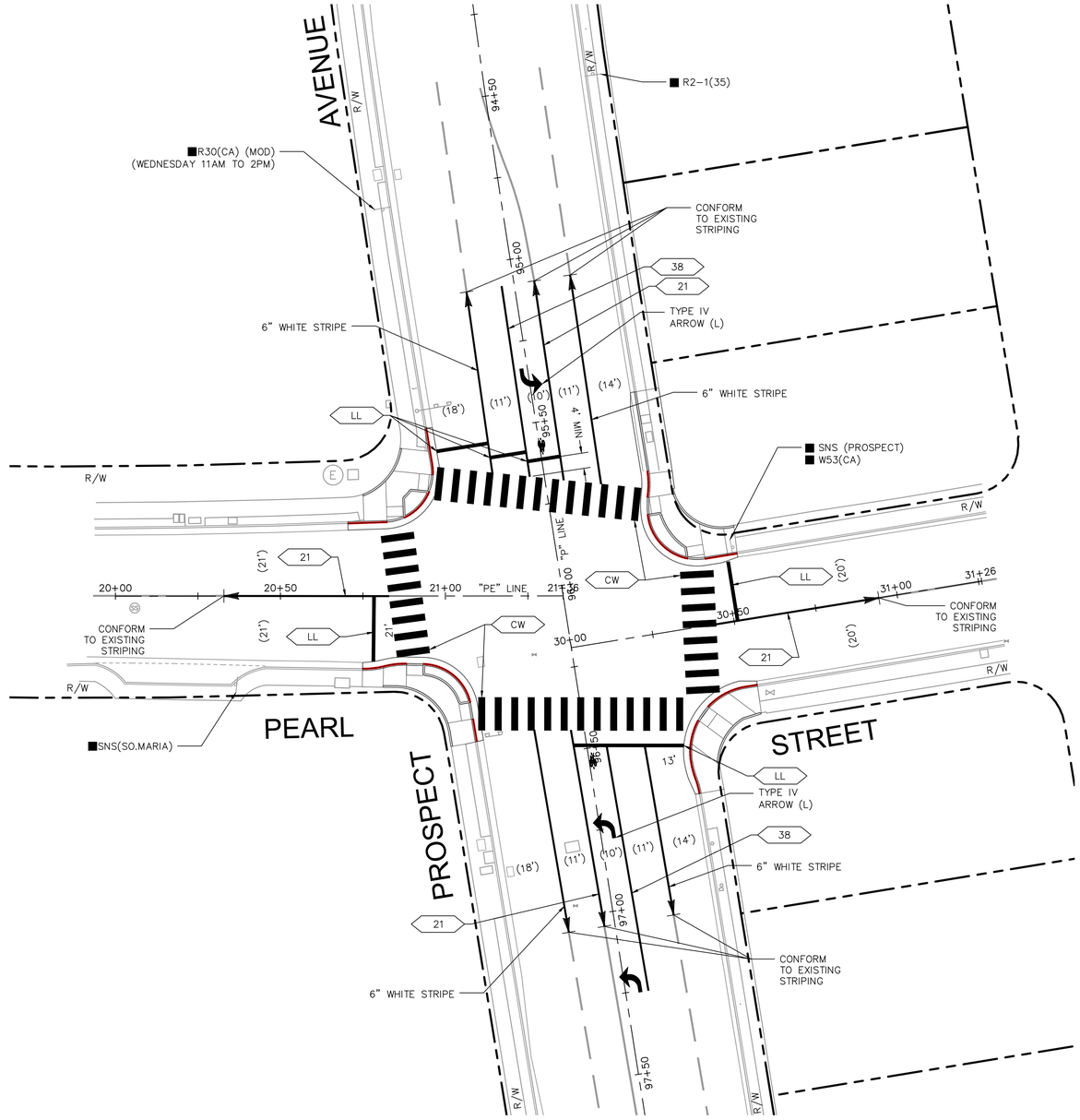
DRAWN	CHECKED	SCALE
JC	MB	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER

DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	32 OF 58 SHEETS	SS-07

DRAWING: \\pkf-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-32-rb-pros-02.dwg PLOTTED: 2/5/2026 5:59 PM



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scale 1" = 20' feet

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CITY OF REDONDO BEACH
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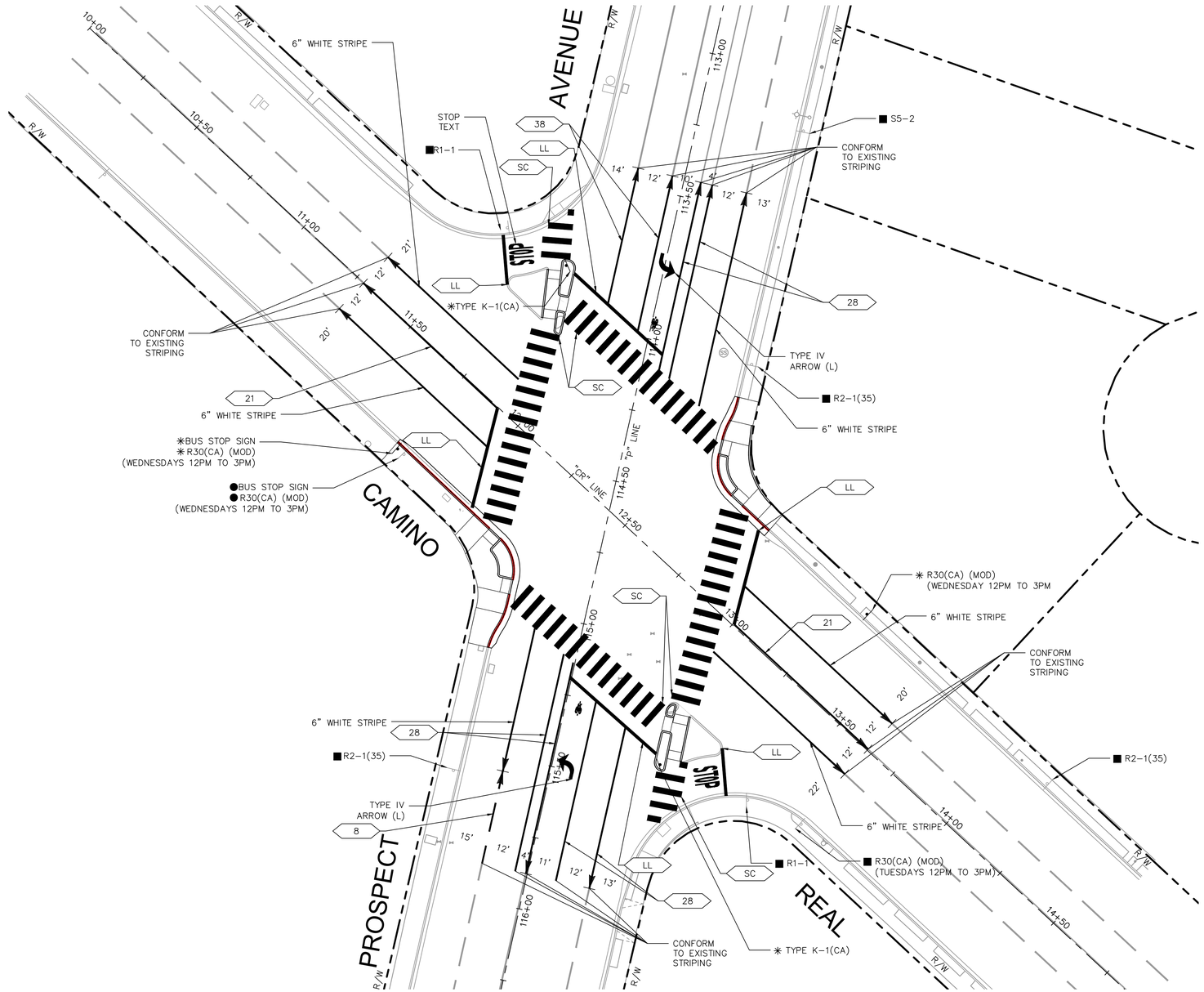
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2

SIGNING & STRIPING
PROSPECT AVENUE & PEARL STREET

DRAWN JC	CHECKED MB	SCALE 1" = 20'	
APPROVED BY ANDREW S. WINJE, P.E. CITY ENGINEER		DATE	
PROJECT NO. 41490	SHEET NO. 33 OF 58 SHEETS	DRAWING NO. SS-08	

DRAWING: \\bkf-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-32-rb-pd-pros-02.dwg PLOTTED: 2/5/2026 9:44 PM



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20 0 20 40
scale 1" = 20' feet

FOR LEGEND AND NOTES REFER TO SHEET SS-01

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REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

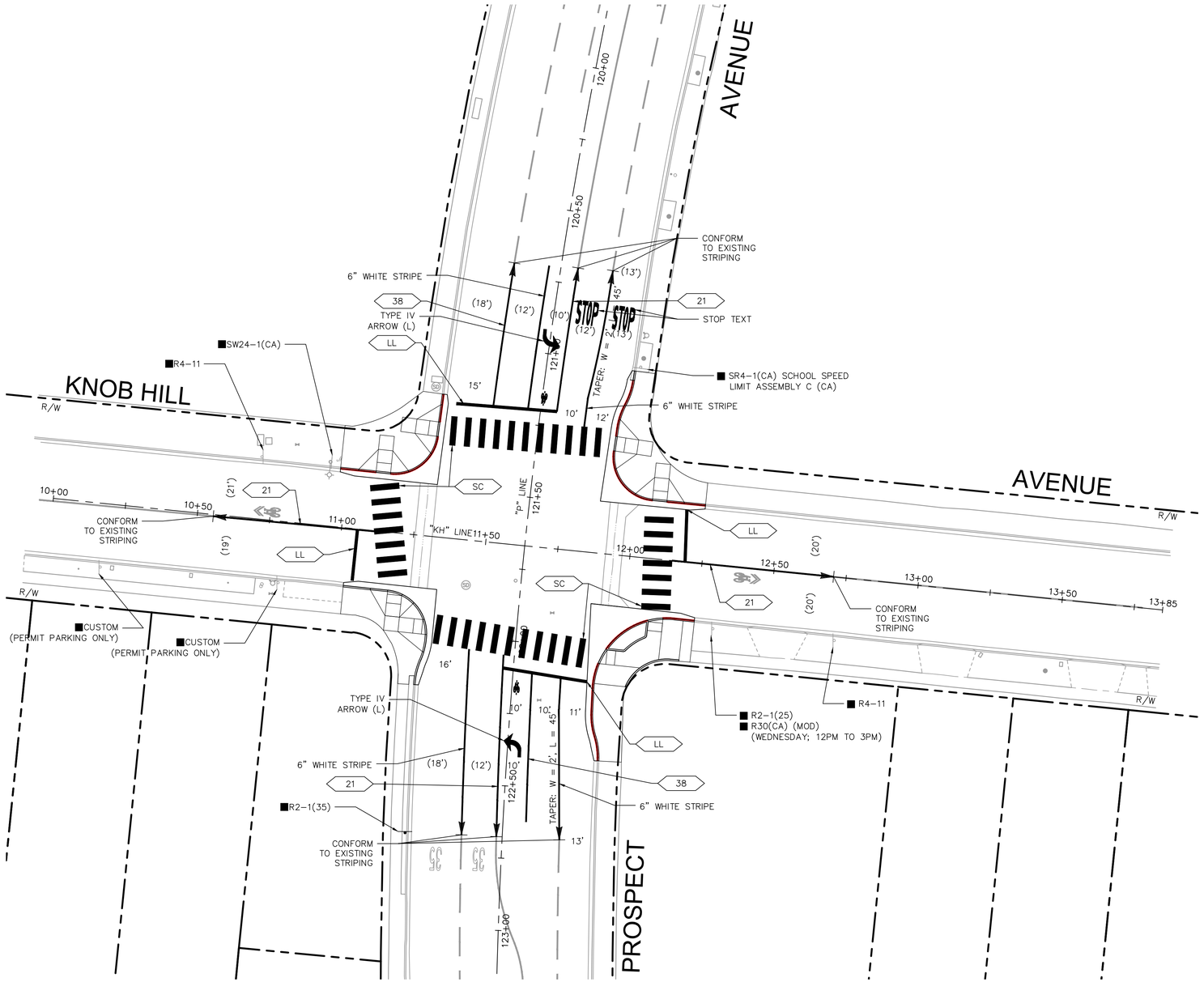
REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
SIGNING & STRIPING
PROSPECT AVENUE & CAMINO REAL

DRAWN	CHECKED	SCALE
JC	MB	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER
DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	34 OF 58 SHEETS	SS-09

DRAWING: \\bkt-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-36-nb-pd-pros-03.dwg PLOTTED: 2/5/2026 6:00 PM



N

20 0 20 40
scale
1" = 20'
feet

60% SUBMITTAL (02/06/2026)
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SHEILA AMPARO
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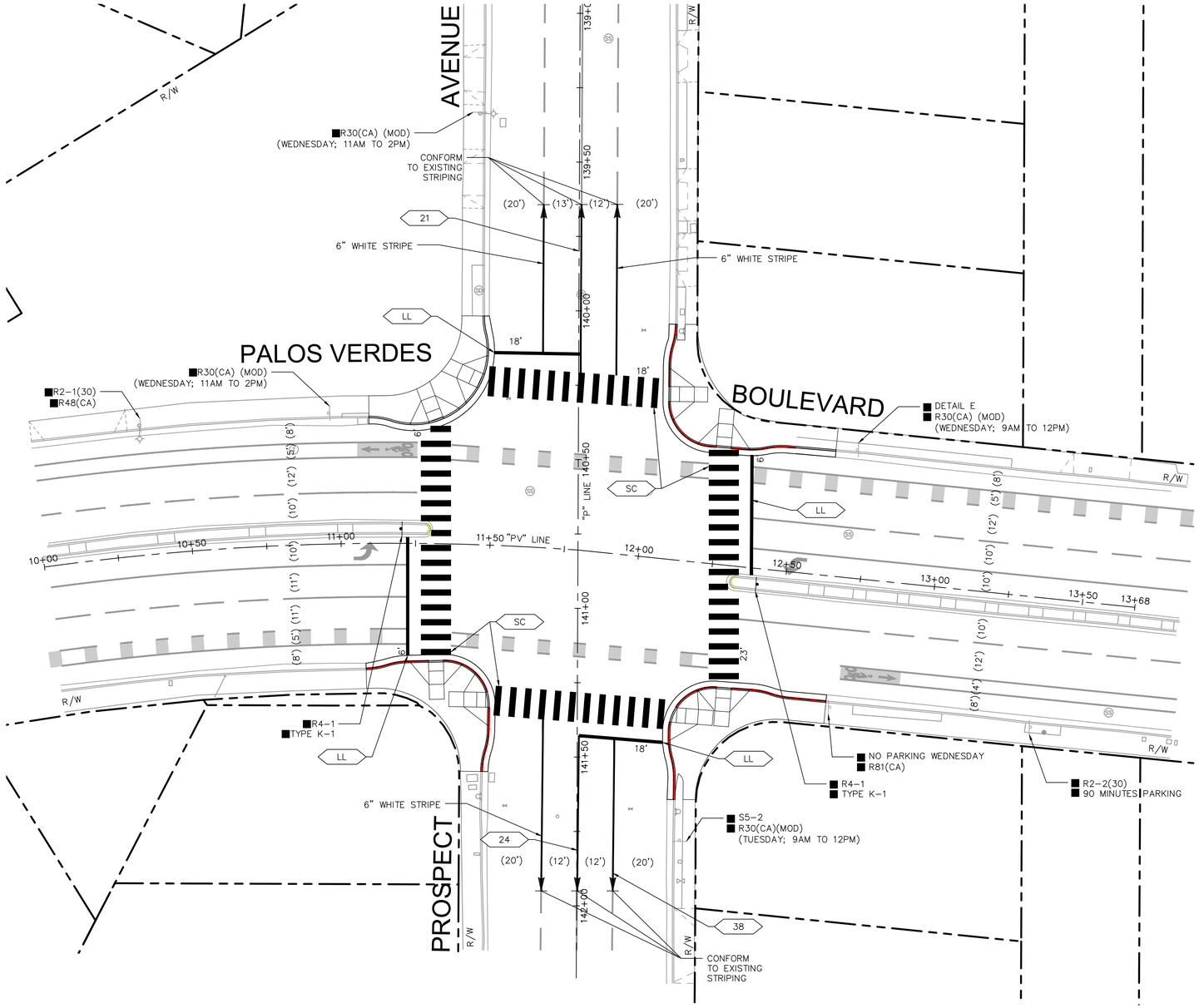
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
SIGNING & STRIPING
PROSPECT AVENUE & KNOB HILL AVENUE

DRAWN	JC	CHECKED	MB	SCALE	1" = 20'
APPROVED BY				DATE	
ANDREW S. WINJE, P.E. CITY ENGINEER					
PROJECT NO. 41490		SHEET NO. 35 OF 58 SHEETS		DRAWING NO. SS-10	

DRAWING: \\pkf-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-36-rb-pd-pros-03.dwg PLOTTED: 2/5/2026 6:00 PM



N

20 0 20 40
scale 1" = 20' feet

FOR LEGEND AND NOTES REFER TO SHEET SS-01

60% SUBMITTAL (02/06/2026)
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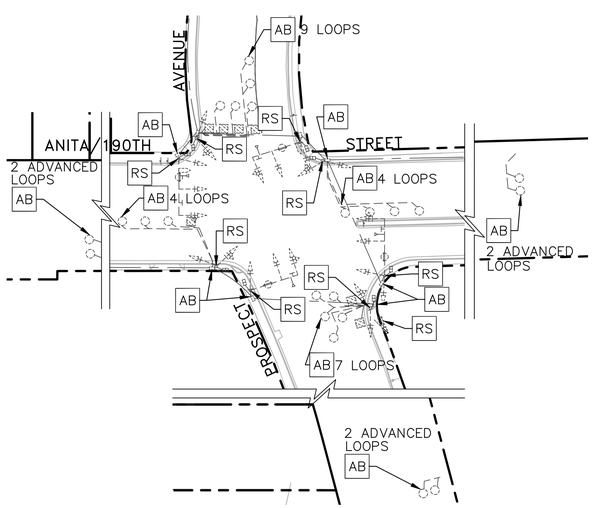
CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
SIGNING & STRIPING
PROSPECT AVENUE & PALOS VERDES BOULEVARD

DRAWN	JC	CHECKED	MB	SCALE	1" = 20'
APPROVED BY	ANDREW S. WINJE, P.E. CITY ENGINEER			DATE	
PROJECT NO. 41490		SHEET NO. 36 OF 58 SHEETS		DRAWING NO. SS-11	

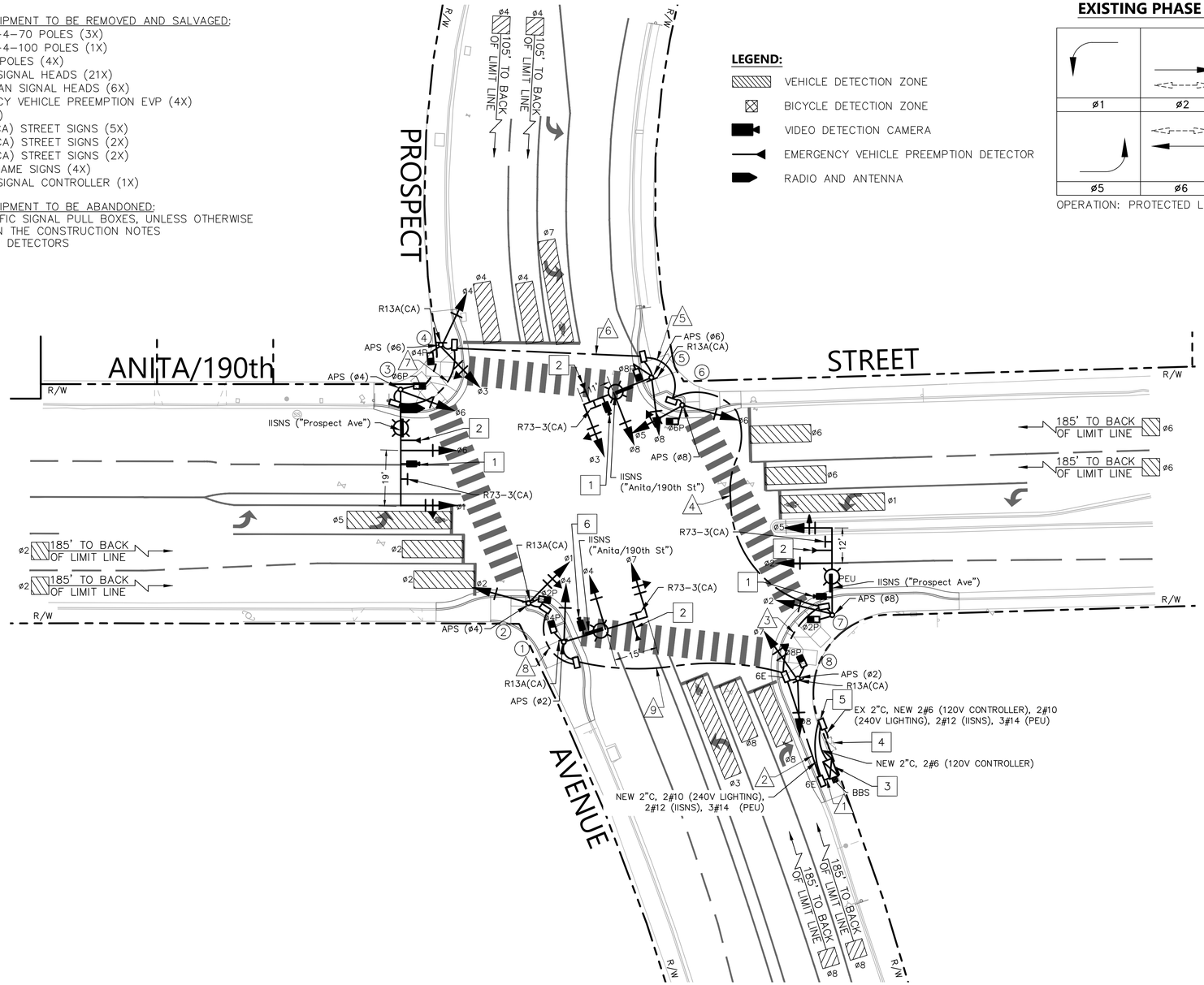
DRAWING: \\pkf-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-36-rb-pd-pros-03.dwg PLOTTED: 2/5/2026 6:00 PM



REMOVAL PLAN
1"=50'

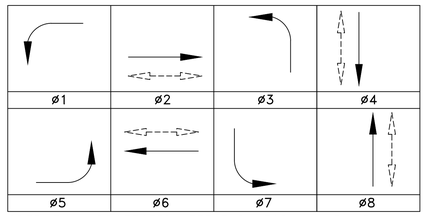
EXISTING EQUIPMENT TO BE REMOVED AND SALVAGED:
1. TYPE 24-4-70 POLES (3X)
2. TYPE 24-4-100 POLES (1X)
3. TYPE 1A POLES (4X)
4. VEHICLE SIGNAL HEADS (21X)
5. PEDESTRIAN SIGNAL HEADS (6X)
6. EMERGENCY VEHICLE PREEMPTION EVP (4X)
7. IISNS (4X)
8. R-13A (CA) STREET SIGNS (5X)
9. R73-3 (CA) STREET SIGNS (2X)
10. R73-2 (CA) STREET SIGNS (2X)
11. STREET NAME SIGNS (4X)
12. TRAFFIC SIGNAL CONTROLLER (1X)

EXISTING EQUIPMENT TO BE ABANDONED:
1. ALL TRAFFIC SIGNAL PULL BOXES, UNLESS OTHERWISE NOTED ON THE CONSTRUCTION NOTES
2. ALL LOOP DETECTORS



LEGEND:
- VEHICLE DETECTION ZONE
- BICYCLE DETECTION ZONE
- VIDEO DETECTION CAMERA
- EMERGENCY VEHICLE PREEMPTION DETECTOR
- RADIO AND ANTENNA

EXISTING PHASE DIAGRAM TO REMAIN



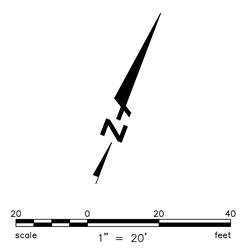
OPERATION: PROTECTED LEFT TURN FOR ø1, ø3, ø5, & ø7

TRAFFIC SIGNAL GENERAL NOTES:

SEE GENERAL NOTE SHEET FOR GENERAL NOTES.
1. ALL MATERIALS AND EQUIPMENT SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR EXCEPT LACO-1 WWV PROGRAM, RADIO CORRECTED TIME BASE UNIT AND ANTENNA.
2. LACO-1 WWV PROGRAM, RADIO CORRECTED TIME BASE UNIT AND ANTENNA SHALL BE FURNISHED AND INSTALLED BY THE CITY.

CONSTRUCTION NOTES:

1. FURNISH AND INSTALL ITERIS VANTAGE VECTOR VIDEO DETECTION CAMERA ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS. SEE SPECIAL PROVISIONS. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER TO CONFIGURE VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER DIRECTION OF THE CITY REPRESENTATIVE.
2. FURNISH AND INSTALL EMERGENCY VEHICLE PREEMPTION DETECTOR ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS.
3. FURNISH AND INSTALL NEW CABINET WITH NEW TYPE 332 CABINET AND BACKUP BATTERY SYSTEM. FURNISH AND INSTALL NEW 2070 ATC CONTROLLER UNIT WITH D4 SOFTWARE. CONFIGURE NEW CONTOLLER UNIT AND PROVIDE ALL NECESSARY EQUIPMENT TO ACHIEVE INTENDED OPERATION SHOWN. FURNISH AND INSTALL NEW ACCESSIBLE PEDESTRIAN SIGNAL (APS) SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, AND ALL NECESSARY WIRES AND CONNECTORS TO ACHIEVE THE INTENDED OPERATION. FURNISH AND INSTALL NEW ITERIS VANTAGE VECTOR VIDEO DETECTION SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, SLDC CABLE, MONITOR, AND MOUSE. SETUP VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER THE DIRECTION OF THE CITY REPRESENTATIVE. FURNISH AND INSTALL CAT 5E CABLE OR AS SPECIFIED BY THE MANUFACTURER'S REPRESENTATIVE TO EACH CAMERA.
4. EXISTING SERVICE CABINET TO REMAIN.
5. WHEN NEW SIGNAL IS READY TO BE ACTIVATED, SALVAGE EXISTING SIGNAL CONTROLLER AND DEMO EXISTING FOUNDATION. PRESERVE THE EXISTING ELECTRICAL CONDUIT RUN BETWEEN THE CONTROLLER AND SERVICE CABINET. INSTALL NO. 5 PULL BOX AT THE LOCATION OF THE PREVIOUS CONTROLLER'S FOUNDATION. RUN NEW WIRES TO THE SERVICE CABINET, NEW SIGNAL CONTROLLER, AND 6E PULL BOX AS SHOWN.
6. FURNISH AND INSTALL ITERIS VANTAGE VECTOR VIDEO DETECTION CAMERA ON LUMINAIRE MAST ARM PER MANUFACTURER'S SPECIFICATIONS. SEE SPECIAL PROVISIONS. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER TO CONFIGURE VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER DIRECTION OF THE CITY REPRESENTATIVE.



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NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2
TRAFFIC SIGNAL
PROSPECT AVENUE & ANITA STREET

DRAWN	CHECKED	SCALE
KW/MO	SD	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER
DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	37 OF 58 SHEETS	E-01

DRAWING: \\at-nt\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-17-rb-tb-pros-01.dwg PLOTTED: 2/6/2026 10:19 AM

CONDUCTOR SCHEDULE

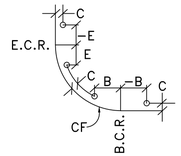
WIRE	POLE NO.	PHASE	1	2	3	4	5	6	7	8	9
12 WIRE CONDUCTOR SIGNAL CABLE (CSC) 12–#14	①	Φ4, Φ7, Φ4P	1	1							1
	②	Φ1, Φ2, Φ2P	1	1						1	1
	③	Φ1, Φ6, Φ6P	1	1	1	1	1	1	1		
	④	Φ3, Φ4, Φ4P	1	1	1	1	1	1			
	⑤	Φ3, Φ5, Φ8P	1	1	1	1	1				
	⑥	Φ5, Φ6, Φ6P	1	1	1	1					
	⑦	Φ2, Φ5, Φ2P	1	1	1						
	⑧	Φ7, Φ9, Φ8P	1	1							
		TOTAL	8	8	5	4	3	2	1	1	2
3 WIRE CONDUCTOR SIGNAL CABLE (CSC) 3–#14	①	APS (Φ2)	1	1							1
	②	APS (Φ4)	1	1						1	1
	③	APS (Φ4)	1	1	1	1	1	1	1		
	④	APS (Φ6)	1	1	1	1	1	1			
	⑤	APS (Φ6)	1	1	1	1	1				
	⑥	APS (Φ8)	1	1	1	1					
	⑦	APS (Φ8)	1	1	1						
	⑧	APS (Φ2)	1	1							
		TOTAL	8	8	5	4	3	2	1	1	2
#14 AWG	PEU			3	3						
#12 AWG	IISNS			2	2	2	2	2	2	2	2
#10 AWG	LED LUMINARIES			2	2	2	2	2	2	2	2
	SIGNAL COMMON		1	1	1	1	1	1	1	1	1
	TOTAL		1	3	3	3	3	3	3	3	3
VIDEO DETECTION POWER AND VIDEO			4	4	3	2	2	1	1		1
WIRELESS RADIO (CAT5E)			1	1	1	1	1	1	1		1
EMERGENCY VEHICLE PREEMPTION			4	4	3	2	2	1	1		1
CONDUIT SIZE (IN.)			2–3	2–3	4	3	3	3	3	3	3
PERCENT FILL			15%	17%	14%	19%	17%	12%	10%	3%	12%

ALL CABLES AND CONDUITS ARE NEW

POLE SCHEDULE

No.	STANDARD TYPE	HEIGHT	S.M.A.	L.M.A.	LUM. LED	IISNS LEGEND	SIGNAL MOUNTING VEH	M.A.	PED	PPB** PHASE	ARROW	POLE LOCATION E	B	C	REMARKS
①	24–4–100	30'	35'	12'	110W*	Anita/190th St	SV–1–T	MAS MAS	SP–1–T	ø2	←	–6.0'	–	3.0'	INSTALL EVP AND R73–3(CA) ON S.M.A. INSTALL VIDEO DETECTION SYSTEM ON L.M.A. INSTALL R13A(CA) ON POLE AT A MOUNTING HEIGHT OF 25' ABOVE GRADE.
②	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø4	←	–	1.0'	2.5'	INSTALL R13A(CA) ON POLE.
③	26–4–100	30'	40'	12'	110W*	Prospect Ave	SV–1–T	MAS MAS	SP–1–T	ø4	←	–6.5'	–	6.9'	INSTALL VIDEO DETECTION SYSTEM, RADIO INTERCONNECT SYSTEM, EVP, AND R73–3(CA) ON S.M.A.
④	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø6	→	–	–8.6'	3.2'	INSTALL R13A(CA) ON POLE.
⑤	24–4–100	30'	35'	12'	110W*	Anita/190th St	SV–1–T	MAS MAS	SP–1–T	ø6	←	1.6'	–	3.4'	INSTALL VIDEO DETECTION SYSTEM, EVP, AND R73–3(CA) ON S.M.A. INSTALL R13A(CA) ON POLE AT A MOUNTING HEIGHT OF 25' ABOVE GRADE.
⑥	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø8	←	–	1.0'	2.5'	
⑦	19–4–100	30'	30'	12'	110W*	Prospect Ave	SV–1–T	MAS MAS	SP–1–T	ø8	←	6.0'	–	6.2'	INSTALL VIDEO DETECTION SYSTEM, EVP, AND R73–3(CA) ON S.M.A. INSTALL PEU ON L.M.A.
⑧	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø2	→	–	3.4'	6.8'	INSTALL R13A(CA) ON POLE.

ALL POLES AND EQUIPMENT ARE NEW.
IISNS = LED INTERNALLY ILLUMINATED STREET NAME SIGN.
* LED LUMINAIRE TO BE NAV NAVION LED OR CITY APPROVED EQUAL.
** ACCESSIBLE PEDESTRIAN PUSH BUTTON (PPB) SHALL BE AN ACCESSIBLE PEDESTRIAN SIGNAL (APS).



POLE PLACEMENT DETAIL
NTS

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
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DATE	DESCRIPTION

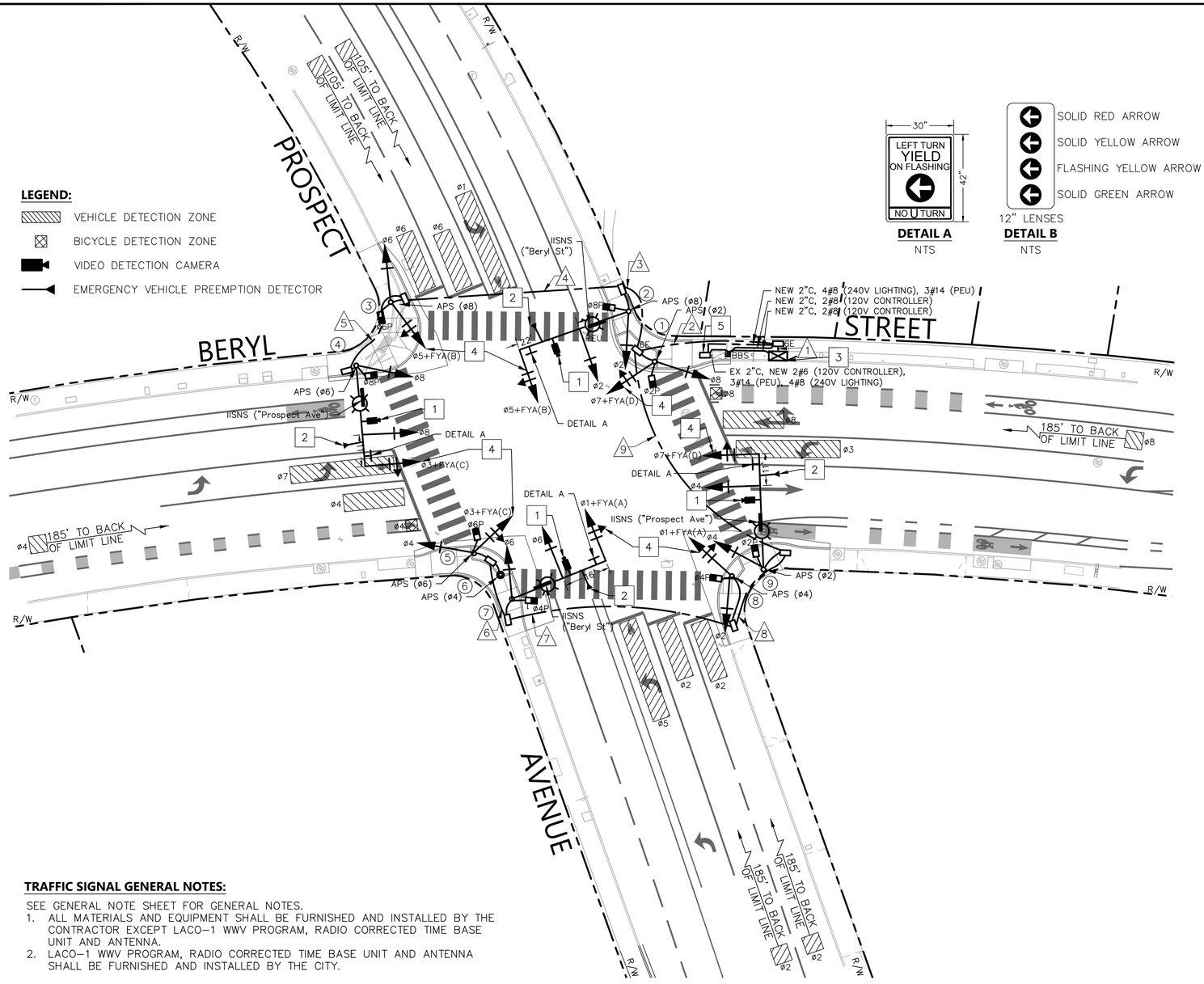
CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2

TRAFFIC SIGNAL
PROSPECT AVENUE & ANITA STREET

DRAWN	CHECKED	SCALE
KW/MO	SD	1" = 20'
APPROVED BY: ANDREW S. WINJE, P.E. CITY ENGINEER		DATE:
PROJECT NO. 41490	SHEET NO. 38 OF 58 SHEETS	DRAWING NO. E-02

DRAWING: k:\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-17-rb-ts-pros-01 - copy.dwg PLOTTED: 2/6/2026 11:39 AM BY:

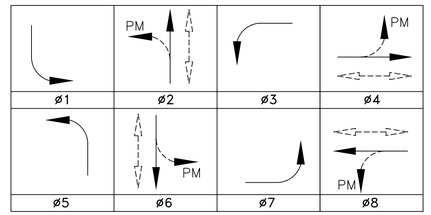


DETAIL A
NTS

12" LENSES

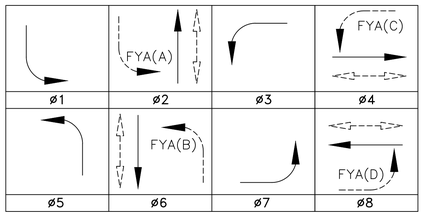
DETAIL B
NTS

EXISTING PHASE DIAGRAM

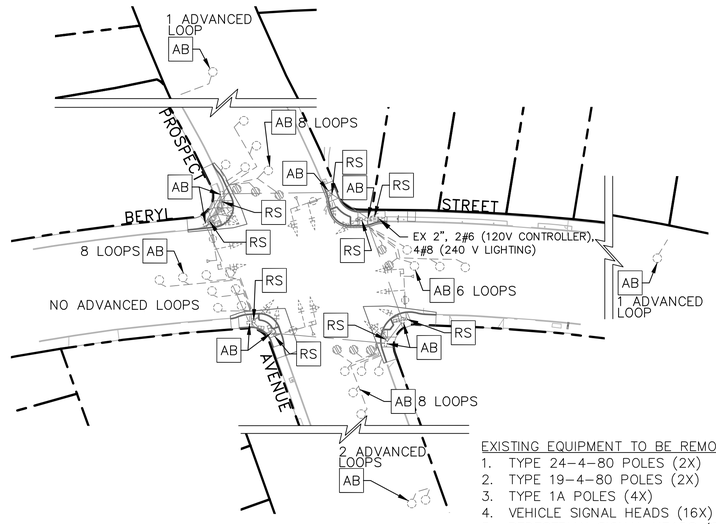


OPERATION:
PERMITTED LEFT TURN FOR ø2, ø4, ø6, & ø8
PROTECTED LEFT TURN FOR ø1, ø3, ø5, & ø7
PM = PERMITTED

PROPOSED PHASE DIAGRAM



OPERATION:
PROTECTED LEFT TURN FOR ø1, ø3, ø5, & ø7
PERMITTED OPPOSING LEFT TURN FOR ø2, ø4, ø6, & ø8
FYA = FLASHING YELLOW ARROW



REMOVAL PLAN
1"=50'

EXISTING EQUIPMENT TO BE REMOVED AND SALVAGED:
1. TYPE 24-4-80 POLES (2X)
2. TYPE 19-4-80 POLES (2X)
3. TYPE 1A POLES (4X)
4. VEHICLE SIGNAL HEADS (16X)
5. PEDESTRIAN SIGNAL HEADS (8X)
6. EMERGENCY VEHICLE PREEMPTION EVP (4X)
7. IISNS (4X)
8. R10-12 STREET SIGNS (4X)
9. TRAFFIC SIGNAL CONTROLLER (1X)

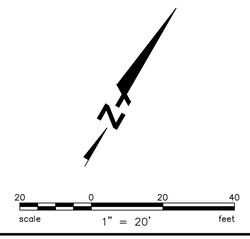
EXISTING EQUIPMENT TO BE ABANDONED:
1. ALL TRAFFIC SIGNAL PULL BOXES, UNLESS OTHERWISE NOTED ON CONSTRUCTION NOTES
2. ALL LOOP DETECTORS

TRAFFIC SIGNAL GENERAL NOTES:

SEE GENERAL NOTE SHEET FOR GENERAL NOTES.
1. ALL MATERIALS AND EQUIPMENT SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR EXCEPT LACO-1 WWV PROGRAM, RADIO CORRECTED TIME BASE UNIT AND ANTENNA.
2. LACO-1 WWV PROGRAM, RADIO CORRECTED TIME BASE UNIT AND ANTENNA SHALL BE FURNISHED AND INSTALLED BY THE CITY.

CONSTRUCTION NOTES:

1. FURNISH AND INSTALL ITERIS VANTAGE VECTOR VIDEO DETECTION CAMERA ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS. SEE SPECIAL PROVISIONS. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER TO CONFIGURE VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER DIRECTION OF THE CITY REPRESENTATIVE.
2. FURNISH AND INSTALL EMERGENCY VEHICLE PREEMPTION DETECTOR ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS.
3. FURNISH AND INSTALL NEW CABINET WITH NEW TYPE 332 CABINET AND BACKUP BATTERY SYSTEM. FURNISH AND INSTALL NEW 2070 ATC CONTROLLER UNIT WITH D4 SOFTWARE. CONFIGURE NEW CONTOLLER UNIT AND PROVIDE ALL NECESSARY EQUIPMENT TO ACHIEVE INTENDED OPERATION SHOWN. FURNISH AND INSTALL NEW ACCESSIBLE PEDESTRIAN SIGNAL (APS) SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, AND ALL NECESSARY WIRES AND CONNECTORS TO ACHIEVE THE INTENDED OPERATION. FURNISH AND INSTALL NEW ITERIS VANTAGE VECTOR VIDEO DETECTION SYSTEM COMPLETE WITH CENTRAL CONTROLUNIT, SLDC CABLE, MONITOR, AND MOUSE. SETUP VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER THE DIRECTION OF THE CITY REPRESENTATIVE. FURNISH AND INSTALL CAT 5E CABLE OR AS SPECIFIED BY THE MANUFACTURER'S REPRESENTATIVE TO EACH CAMERA.
4. FURNISH AND INSTALL NEW 4-SECTION SIGNAL HEAD. SEE DETAIL B.
5. WHEN NEW SIGNAL IS READY TO BE ACTIVATED, SALVAGE EXISTING SIGNAL CONTROLLER AND DEMO EXISTING FOUNDATION. PRESERVE THE EXISTING ELECTRICAL CONDUIT RUN BETWEEN THE CONTROLLER AND SERVICE CABINET. INSTALL NO. 5 PULL BOX AT THE LOCATION OF THE PREVIOUS CONTROLLER'S FOUNDATION. RUN NEW WIRES TO THE SERVICE CABINET, NEW SIGNAL CONTROLLER, AND 6E PULL BOX AS SHOWN.



60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2
TRAFFIC SIGNAL
PROSPECT AVENUE & BERYL STREET

DRAWN KW/MO	CHECKED SD	SCALE 1" = 20'	
APPROVED BY ANDREW S. WINJE, P.E. CITY ENGINEER		DATE	
PROJECT NO. 41490	SHEET NO. 39 OF 58 SHEETS	DRAWING NO. E-03	

DRAWING: \\pkf-ns\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-17-rb-ts-pros-01.dwg PLOTTED: 2/6/2026 10:19 AM

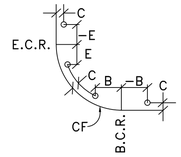
CONDUCTOR SCHEDULE

WIRE	POLE NO.	PHASE	1	2	3	4	5	6	7	8	9
12 WIRE CONDUCTOR SIGNAL CABLE (CSC) 12–#14	①	Φ7, FYA(D), Φ8, Φ2P	1	1							
	②	Φ2, Φ5, FYA(B), Φ8P	1	1	1						
	③	Φ5, FYA(B), Φ6, Φ6P	1	1	1	1					
	④	Φ3, FYA(C), Φ8, Φ8P	1	1	1	1	1				
	⑤	Φ3, FYA(C), Φ4, Φ6P	1	1				1	1	1	1
	⑦	Φ1, FYA(A), Φ6, Φ4P	1	1					1	1	1
	⑧	Φ1, FYA(A), Φ2, Φ4P	1	1						1	1
	⑨	Φ4, Φ7, FYA(D), Φ2P	1	1							1
		TOTAL	8	8	3	2	1	1	2	3	4
3 WIRE CONDUCTOR SIGNAL CABLE (CSC) 3–#14	①	APS (Φ2)	1	1							
	②	APS (Φ8)	1	1	1						
	③	APS (Φ8)	1	1	1	1					
	④	APS (Φ6)	1	1	1	1	1				
	⑤	APS (Φ6)	1	1				1	1	1	1
	⑥	APS (Φ4)	1	1					1	1	1
	⑧	APS (Φ4)	1	1						1	1
	⑨	APS (Φ2)	1	1							1
		TOTAL	8	8	3	2	1	1	2	3	4
#14 AWG	PEU			3	3						
#12 AWG	IISNS			2	2	2	2		2	2	2
#10 AWG	LED LUMINARIES			2	2	2	2		2	2	2
	SIGNAL COMMON		1	1	1	1	1	1	1	1	1
	TOTAL		1	3	3	3	3	1	3	3	3
VIDEO DETECTION POWER AND VIDEO			4	4	2	1	1		1	1	2
EMERGENCY VEHICLE PREEMPTION			4	4	2	1	1		1	1	2
CONDUIT SIZE (IN.)			2–3	2–3	3	3	3	3	3	3	3
PERCENT FILL			14%	15%	15%	9%	7%	2%	9%	10%	16%

POLE SCHEDULE

No.	STANDARD TYPE	HEIGHT	S.M.A.	L.M.A.	LUM. LED	IISNS LEGEND	SIGNAL MOUNTING VEH	M.A.	PED	PPB** PHASE	ARROW	POLE LOCATION E	B	C	REMARKS
①	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø2	←	–	0.95'	2.6'	
②	26–4–100	30'	40'	12'	113W*	Beryl St	SV–1–T	MAS–4B MAS	SP–1–T	ø8	←	–8.4'	–	6.1'	INSTALL VIDEO DETECTION SYSTEM, EVP AND DETAIL A SIGN ON S.M.A. INSTALL PEU ON L.M.A. SEE CONSTRUCTION NOTE 5.
③	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø8	→	–	–6.5'	6.9'	
④	24–4–100	30'	35'	12'	166W*	Prospect Ave	SV–1–T	MAS–4B MAS	SP–1–T	ø6	←	–8.6'	–	3.2'	INSTALL VIDEO DETECTION SYSTEM, EVP AND DETAIL A SIGN ON S.M.A. SEE CONSTRUCTION NOTE 5.
⑤	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø6	←	–	1.5'	2.65'	
⑥	PBA POST	–	–	–	–	–	–	–	–	ø4	→	1.35'	–	4.15'	
⑦	24–4–100	30'	35'	12'	113W*	Beryl St	SV–1–T	MAS–4B MAS	SP–1–T	–	–	–7.8'	–	3.15'	INSTALL VIDEO DETECTION SYSTEM, EVP AND DETAIL A SIGN ON S.M.A. SEE CONSTRUCTION NOTE 5.
⑧	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø4	→	–	12.7'	2.8'	
⑨	26–4–100	30'	40'	12'	166W*	Prospect Ave	SV–1–T	MAS–4B MAS	SP–1–T	ø2	←	4.7'	–	8.55'	INSTALL VIDEO DETECTION SYSTEM, EVP, AND DETAIL A SIGN ON S.M.A. SEE CONSTRUCTION NOTE 5.

ALL POLES AND EQUIPMENT ARE NEW.
IISNS = LED INTERNALLY ILLUMINATED STREET NAME SIGN.
* LED LUMINAIRE TO BE NAV NAVION LED OR CITY APPROVED EQUAL.
** PEDESTRIAN PUSH BUTTON (PPB) SHALL BE AN ACCESSIBLE PEDESTRIAN SIGNAL (APS).



POLE PLACEMENT DETAIL
NTS

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2

TRAFFIC SIGNAL
PROSPECT AVENUE & BERYL STREET

DRAWN	CHECKED	SCALE
KW/MO	SD	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER

DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	40 OF 58 SHEETS	E-04

DRAWING: k:\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-17-rb-ts-pros-01 - copy.dwg PLOTTED: 2/6/2026 11:42 AM BY:

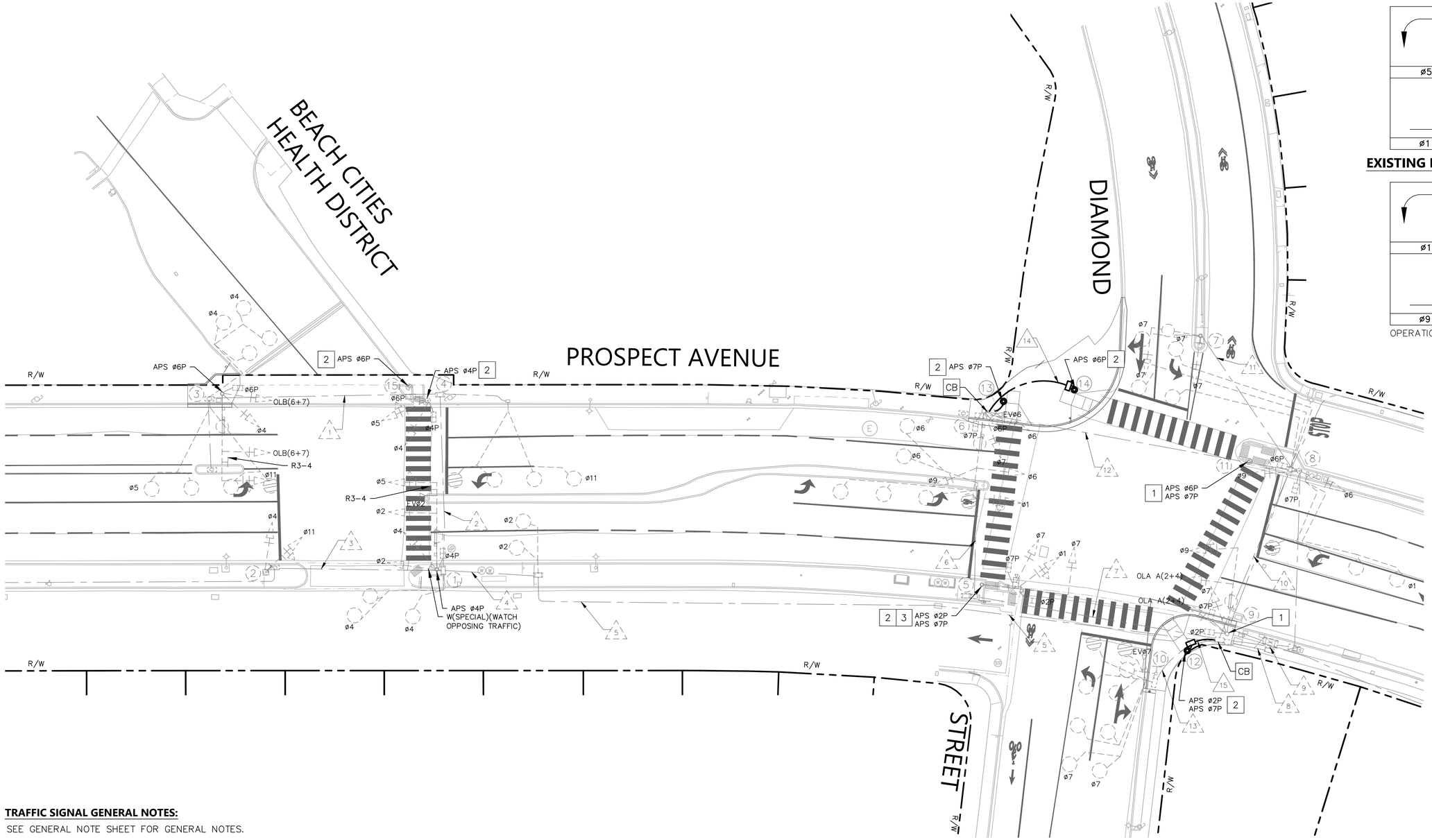
EXISTING PHASE DIAGRAM TO REMAIN: BCHD

		NOT USED	
ø5	ø2	ø3	ø4
		NOT USED	NOT USED
ø11	ø6	ø7	ø8

EXISTING PHASE DIAGRAM TO REMAIN: DIAMOND

		NOT USED	
ø1	ø2	ø3	ø7
		NOT USED	NOT USED
ø9	ø6	ø7	ø8

OPERATION: PROTECTED LEFT TURN FOR ø1, ø5, ø9, & ø11



TRAFFIC SIGNAL GENERAL NOTES:

SEE GENERAL NOTE SHEET FOR GENERAL NOTES.

CONSTRUCTION NOTES:

1. REMOVE EXISTING APS. FURNISH AND PLUG HOLE.
2. APS UNITS SHALL HAVE LOCATOR TONE, VIBROTACTILE WALK INDICATION, AND VOICE FEEDBACK ENABLED.
3. REMOVE EXISTING ø2P APS AND REINSTALL ON 12" EXTENSION WITH 90° BRACKET. ARROW SHALL BE PARALLEL TO CROSSWALK.

20 0 20 40
scale 1" = 20' feet

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
TRAFFIC SIGNAL
PROSPECT AVE & DIAMOND ST-BEACH CITIES

DRAWN RR	CHECKED SD	SCALE 1" = 20'	
APPROVED BY ANDREW S. WINJE, P.E. CITY ENGINEER		DATE	
PROJECT NO. 41490	SHEET NO. 41 OF 58 SHEETS	DRAWING NO. E-05	

DRAWING: \\bkf-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-17-rb-ts-pros-01.dwg PLOTTED: 2/6/2026 10:20 AM

CONDUIT AND CONDUCTOR SCHEDULE

Wire	Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
#14 AWG	Φ1							3	6	6	3		3			
	Φ2								3	3	3		3			
	Φ7							3	6	6	3	3				
	Φ9								3	3	3					
	ΦOLA (2+4)								3	3						
	Φ2P							2	2	2						
	Φ7P							2	4	4	2		2			
	Φ7 BPB								2	2	1		1			
	Φ2 PPB							1	1	1						1N
	Φ6 PPB						1	1	2		1				1N	
	Φ7 PPB							1	2	2	1		1			1N
	PPB COMMON						1N	1	1	1	1		1		1N	1N
	IISNS							1	2	2	1		1			
	SPARES							3	6	6	3	3	3			
	Total	0	0	0	0	0	2	18	43	41	22	6	15	0	2N	3N
#10 AWG	Φ2				3	3										
	Φ4	3	3	6	3	3										
	Φ5		3		3	3										
	Φ11	3	3	6	3	3										
	ΦOLB (6+7)	3	3		3	3										
	Φ4P		2		2	2										
	Φ6P	2	2		2	2										
	Φ2 BPB			1	1	1										
	Φ6 BPB		1		1	1										
	Φ4 PPB		1		1	1										
	Φ6 PPB	1	1		1	1										
	PPB COMMON	1	1	1	1	1										
	IISNS	1	1		1	1										
	SPARES	3	3	3	3	3										
	SIGNAL & SIGN COM.	1	1	1	2	2		2	4	4	2	1	1			
	LUMINAIRES	2	2		2	2		2	8	8	4	2	2			
		20	27	18	32	32	0	4	12	12	6	3	3	0	0	0
DLC	Φ1								1	1	1					
	Φ2			2	2	4		4	4	4						
	Φ4			1	2	2		2	2	2						
	Φ5	1	1		1	1		1	1	1						
	Φ6						2	2	2	4						
	Φ7								2	2	1			2		
	Φ9						1	1	1	1						
	Φ11		1		1	1		1	1	1						
	Total	1	2	3	6	8	3	11	14	16	2	0	0	2	0	0
Video Detection Power and Video														1		
Emergency Vehicle Preemption		1	1	1	1	1		1	2	2	1		1			
Conduit Size (in.)		2.5	2.5	2.5	2.5	3	2.5	3	2–3	2–3	2.5	2.5	2.5	2.5	2	2
Percent Fill		14%	0%	13%	22%	15%	1%	8%	10%	9%	14%	4%	10%	4%	1%	2%

△ EXISTING CONDUIT

△ NEW CONDUIT

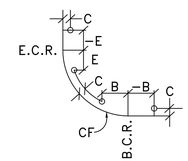
POLE SCHEDULE

No.	STANDARD TYPE	HEIGHT	S.M.A.	L.M.A.	LUM. LED	IISNS LEGEND	SIGNAL MOUNTING VEH	M.A.	PED	PPB** PHASE	ARROW	POLE LOCATION E	B	C	REMARKS
(1)	24–4–70	30'	35'	12'	110W*	BEACH CITIES HEALTH DISTRICT	SV–1–T	MAS MAS	SP–1–T	ø4	←	6.0'	–	2.5'	EXISTING R3–4 ON S.M.A. TO REMAIN.
(2)	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	–	–	–	5.0'	4.0'	EXISTING BIKE PUSH BUTTON FACING STREET TO REMAIN.
(3)	24–4–70	30'	35'	12'	110W*	BEACH CITIES HEALTH DISTRICT	SV–2–T	MAS MAS	SP–1–T	ø6	←	9'	–	2.5'	EXISTING R3–4 ON S.M.A. TO REMAIN.
(4)	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø4	→	–	3.0'	2.5'	EXISTING BIKE PUSH BUTTON FACING STREET TO REMAIN. SEE CONSTRUCTION NOTE 2.
(5)	24–3–70	30'	35'	12'	110W*	Prospect Ave	SV–2–T	MAS MAS	SP–1–T	ø2 ø7	← →	–	0'	2.5'	EXISTING BIKE PUSH BUTTON FACING STREET TO REMAIN. SEE CONSTRUCTION NOTES 2 AND 3.
(6)	24–4–70	30'	35'	12'	110W*	Diamond St	SV–2–T	–	SP–1–T	–	–	10'	–	2.5'	EXISTING BIKE PUSH BUTTON FACING STREET TO REMAIN.
(7)	17D–1–70	30'	18'	12'	110W*	–	SV–1–T	MAS MAS	SP–1–T	–	–	–	0'	2'	
(8)	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	–	–	–	0'	2'	EXISTING BIKE PUSH BUTTON FACING STREET TO REMAIN.
(9)	24–4–70	30'	35'	–	110W*	Diamond St	SV–2–T	MAS MAS	SP–1–T	–	–	5.0'	–	2.5'	
(10)	15	30'	–	12'	110W*	–	–	–	SP–1–T	–	–	–	7.0'	2.5'	EXISTING BIKE PUSH BUTTON FACING STREET TO REMAIN. REMOVE EXISTING PUSH BUTTONS AND PLUG HOLE. SEE CONSTRUCTION NOTE 1.
(11)	2	–	–	–	–	–	–	–	–	ø6 ø7	→ ←	–	–	1.0'	
(12)	2	–	–	–	–	–	–	–	–	ø2 ø7	→ ←	0.4'	–	14.5'	SEE CONSTRUCTION NOTE 2.
(13)	2	–	–	–	–	–	–	–	–	ø7	←	–14.8'	–	8.4'	SEE CONSTRUCTION NOTE 2.
(14)	2	–	–	–	–	–	–	–	–	ø6	→	–	14.6'	11.0'	SEE CONSTRUCTION NOTE 2.
(15)	2	–	–	–	–	–	–	–	–	ø6	→	–	6.0'	3.8'	SEE CONSTRUCTION NOTE 2.

IISNS = LED INTERNALLY ILLUMINATED STREET NAME SIGN.
* EXISTING WATTAGE IS ESTIMATED.
** ACCESSIBLE PEDESTRIAN PUSH BUTTON (PPB) SHALL BE AN ACCESSIBLE PEDESTRIAN SIGNAL (APS).

◌ EXISTING POLE

○ NEW POLE



POLE PLACEMENT DETAIL
NTS

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

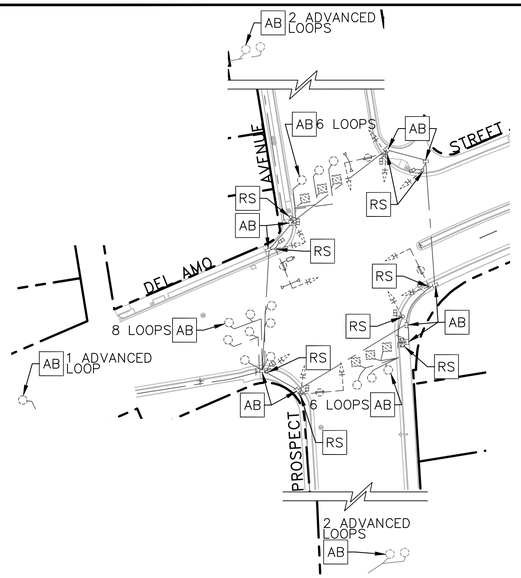
REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
TRAFFIC SIGNAL
PROSPECT AVE & DIAMOND ST-BEACH CITIES

DRAWN	CHECKED	SCALE
RR	SD	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER
DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	42 OF 58 SHEETS	E-06

DRAWING: \\pkf-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-17-nb-ts-pros-01.dwg PLOTTED: 2/6/2026 10:19 AM



REMOVAL PLAN
1"=50'

EXISTING EQUIPMENT TO BE REMOVED AND SALVAGED:
1. TYPE 1A POLES (4X)
2. TYPE 19-2-129 POLES (4X)
3. VEHICLE SIGNAL HEADS (12X)
4. PEDESTRIAN SIGNAL HEADS (8X)
5. EMERGENCY VEHICLE PREEMPTION EVP (2X)
6. CAMERA (1X)
7. IISNS (4X)
8. TRAFFIC SIGNAL CONTROLLER (1X)

EXISTING EQUIPMENT TO BE ABANDONED:
1. ALL TRAFFIC SIGNAL PULL BOXES, UNLESS OTHERWISE NOTED ON THE CONSTRUCTION NOTES
2. ALL DETECTORS LOOPS

LEGEND:

- VEHICLE DETECTION ZONE
- BICYCLE DETECTION ZONE
- VIDEO DETECTION CAMERA
- EMERGENCY VEHICLE PREEMPTION DETECTOR

TRAFFIC SIGNAL GENERAL NOTES:

SEE GENERAL NOTE SHEET FOR GENERAL NOTES.

EXISTING PHASE DIAGRAM

NOT USED	PM		
ø1	ø2	ø3	ø4
NOT USED	PM		
ø5	ø6	ø7	ø8

OPERATION:
SPLIT PHASE.
PROTECTED LEFT TURN FOR ø3, ø7.
PERMITTED OPPOSING LEFT TURN FOR ø2, ø6.

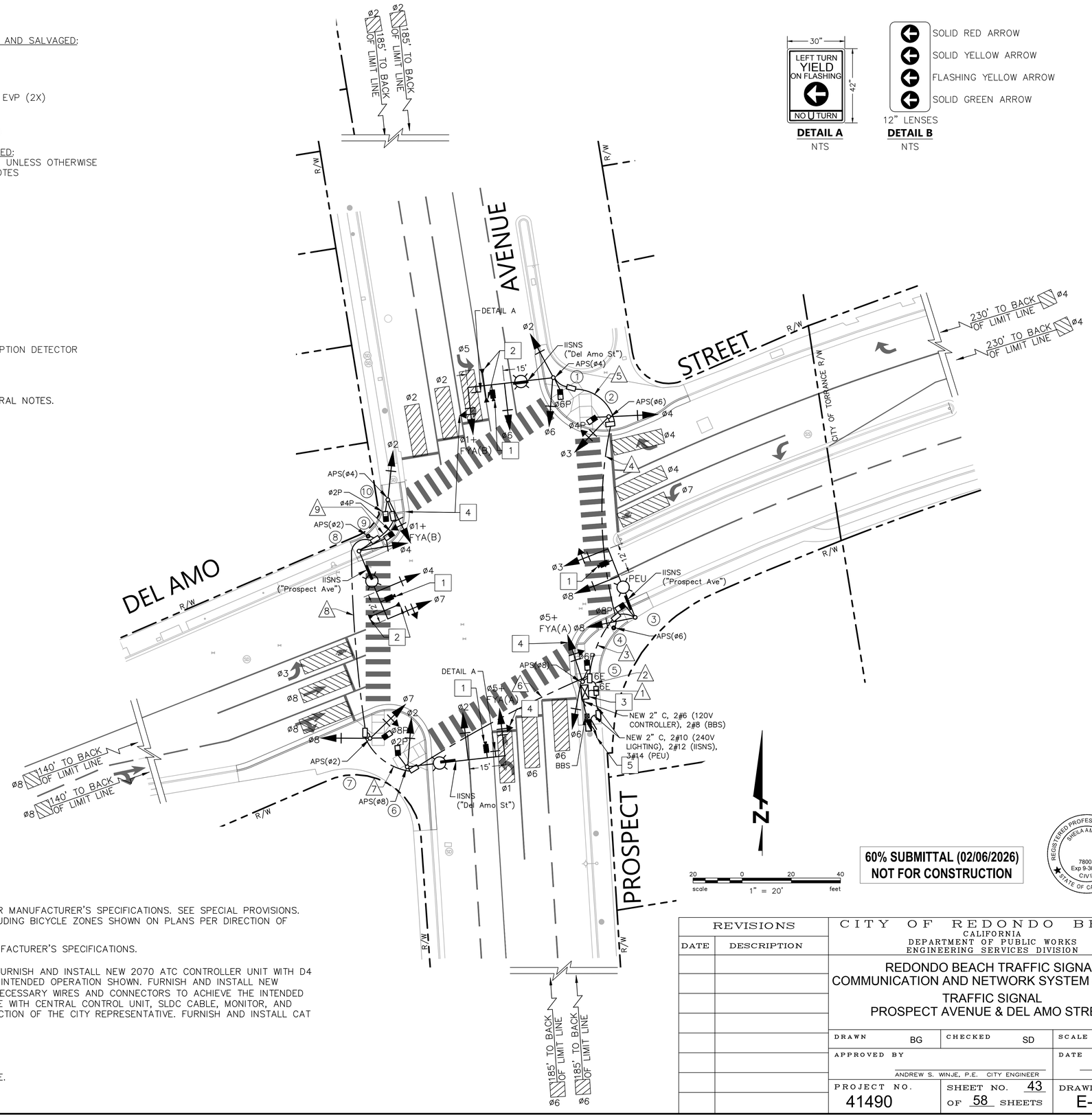
PROPOSED PHASE DIAGRAM

	FYA(B)		
ø1	ø2	ø3	ø4
	FYA(A)		
ø5	ø6	ø7	ø8

OPERATION:
PROTECTED LEFT TURN FOR ø1, ø3, ø5, & ø7.
LEADING LEFT TURN FOR ø3, LAGGING LEFT TURN FOR ø7
PERMITTED OPPOSING LEFT TURN FOR ø2 & ø6.
FYA = FLASHING YELLOW ARROW

CONSTRUCTION NOTES:

1. FURNISH AND INSTALL ITERIS VANTAGE VECTOR VIDEO DETECTION CAMERA ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS. SEE SPECIAL PROVISIONS. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER TO CONFIGURE VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER DIRECTION OF THE CITY REPRESENTATIVE.
2. FURNISH AND INSTALL EMERGENCY VEHICLE PREEMPTION DETECTOR ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS.
3. FURNISH AND INSTALL NEW CABINET WITH NEW TYPE 332 CABINET AND BACKUP BATTERY SYSTEM. FURNISH AND INSTALL NEW 2070 ATC CONTROLLER UNIT WITH D4 SOFTWARE. CONFIGURE NEW CONTOLLER UNIT AND PROVIDE ALL NECESSARY EQUIPMENT TO ACHIEVE INTENDED OPERATION SHOWN. FURNISH AND INSTALL NEW ACCESSIBLE PEDESTRIAN SIGNAL (APS) SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, AND ALL NECESSARY WIRES AND CONNECTORS TO ACHIEVE THE INTENDED OPERATION. FURNISH AND INSTALL NEW ITERIS VANTAGE VECTOR VIDEO DETECTION SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, SLDC CABLE, MONITOR, AND MOUSE. SETUP VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER THE DIRECTION OF THE CITY REPRESENTATIVE. FURNISH AND INSTALL CAT 5E CABLE OR AS SPECIFIED BY THE MANUFACTURER'S REPRESENTATIVE TO EACH CAMERA.
4. FURNISH AND INSTALL NEW 4-SECTION SIGNAL HEAD. SEE DETAIL B.
5. INSTALL NEW SERVICE CABINET TO SERVICE POINT; FINAL DESIGN WILL BE IN COORDINATION WITH SCE.



DETAIL A
NTS

DETAIL B
NTS

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2

TRAFFIC SIGNAL
PROSPECT AVENUE & DEL AMO STREET

DRAWN	CHECKED	SCALE
BG	SD	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER
DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	43 OF 58 SHEETS	E-07

DRAWING: \\lat-nb\vol4\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-17-rb-ts-pros-01.dwg PLOTTED: 2/6/2026 10:20 AM

CONDUIT AND CONDUCTOR SCHEDULE

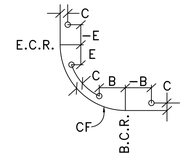
WIRE	POLE NO.	PHASE	1	2	3	4	5	6	7	8	9
12 WIRE CONDUCTOR SIGNAL CABLE (CSC) 12–#14	①	Φ1, FYA(A), Φ6, Φ6P	1	1	1	1	1				
	②	Φ3, Φ4, Φ4P	1	1	1	1					
	③	Φ3, Φ8, Φ8P	1	1	1						
	⑤	Φ5, FYA(B), Φ6, Φ6P	1	1							
	⑥	Φ2, Φ5, FYA(B), Φ2P	1	1				1			
	⑦	Φ7, Φ8, Φ8P	1	1				1	1		
	⑧	Φ4, Φ7, Φ4P	1	1				1	1	1	
	⑩	Φ1, FYA(A), Φ2, Φ2P	1	1				1	1	1	1
		TOTAL	8	8	3	2	1	4	3	2	1
3 WIRE CONDUCTOR SIGNAL CABLE (CSC) 3–#14	①	APS (Φ4); Φ2	1	1	1	1	1				
	②	APS (Φ6)	1	1	1	1					
	④	APS (Φ6)	1	1	1						
	⑤	APS (Φ8)	1	1							
	⑥	APS (Φ8)	1	1				1			
	⑦	APS (Φ2)	1	1				1	1		
	⑨	APS (Φ2)	1	1				1	1	1	
	⑩	APS (Φ4)	1	1				1	1	1	1
		TOTAL	8	8	3	2	1	4	3	2	1
#14 AWG		PEU		3	3						
#12 AWG		IISNS		2	2	2	2	2	2	2	
#10 AWG		LED LUMINARIES		2	2	2	2	2	2	2	
		SIGNAL COMMON	1	1	1	1	1	1	1	1	1
		TOTAL	1	3	3	3	3	3	3	3	1
VIDEO DETECTION POWER AND VIDEO			4	4	2	1	1	2	1	1	
EMERGENCY VEHICLE PREEMPTION			4	4	2	1	1	2	1	1	
CONDUIT SIZE (IN.)			2–3	2–3	3	3	3	3	3	3	3
PERCENT FILL			14%	15%	15%	9%	7%	16%	10%	9%	2%

ALL CABLES AND CONDUITS ARE NEW

POLE SCHEDULE

No.	STANDARD TYPE	HEIGHT	S.M.A.	L.M.A.	LUM. LED	IISNS LEGEND	SIGNAL MOUNTING VEH	M.A.	PED	PPB** PHASE	ARROW	POLE LOCATION E	B	C	REMARKS
①	24–3–100	30'	35'	12'	166W*	Del Amo St	SV–2–T	MAS MAS	SP–1–T	ø4	←	–6.0'	–	3.9'	INSTALL VIDEO DETECTION SYSTEM AND EVP ON S.M.A. SEE CONSTRUCTION NOTE 5. MOUNT ø2 SIGNAL HEAD AT 17' ABOVE GRADE.
②	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø6	→	–	5.7'	5.9'	
③	19–3–100	30'	30'	12'	113W*	Prospect Ave	SV–1–T	MAS MAS	SP–1–T	–	–	–	–15.5'	5.1'	INSTALL VIDEO DETECTION SYSTEM ON S.M.A. INSTALL PEU ON L.M.A. SEE CONSTRUCTION NOTE 5.
④	2	3'–6"	–	–	–	–	–	–	–	ø6	←	–	–5.8'	5.2'	
⑤	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø8	→	–9.9'	–	2.8'	
⑥	26–3–100	30'	40'	12'	166W*	Del Amo St	SV–1–T	MAS MAS	SP–1–T	ø8	←	–8.9'	–	8.3'	INSTALL VIDEO DETECTION SYSTEM ON S.M.A. SEE CONSTRUCTION NOTE 5.
⑦	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø2	→	–	–5.9'	8.9'	
⑧	19–3–100	30'	30'	12'	166W*	Prospect Ave	SV–1–T	MAS MAS	SP–1–T	–	–	–	–9.2'	2.5'	INSTALL VIDEO DETECTION SYSTEM AND EVP ON S.M.A. SEE CONSTRUCTION NOTE 5.
⑨	2	3'–6"	–	–	–	–	–	–	–	ø2	←	–	–3.4'	6.6'	
⑩	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø4	→	–0.7'	–	6.0'	

ALL POLES AND EQUIPMENT ARE NEW.
IISNS = LED INTERNALLY ILLUMINATED STREET NAME SIGN.
* LED LUMINAIRE TO BE NAV NAVION LED OR CITY APPROVED EQUAL.
** PEDESTRIAN PUSH BUTTON (PPB) SHALL BE AN ACCESSIBLE PEDESTRIAN SIGNAL (APS).



POLE PLACEMENT DETAIL
NTS

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

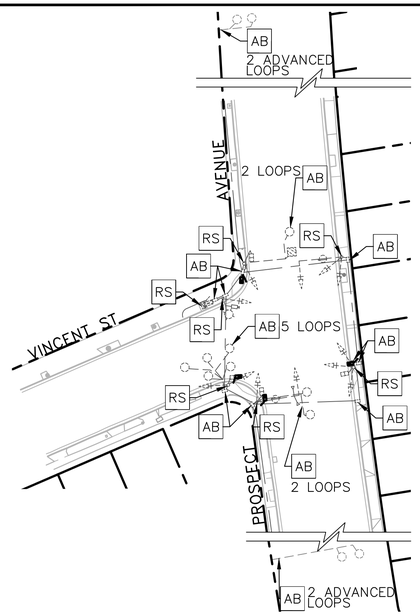
REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
TRAFFIC SIGNAL
PROSPECT AVENUE & DEL AMO STREET

DRAWN	CHECKED	SCALE
BG	SD	1" = 20'

APPROVED BY _____ DATE _____
ANDREW S. WINJE, P.E. CITY ENGINEER

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	44 OF 58 SHEETS	E-08

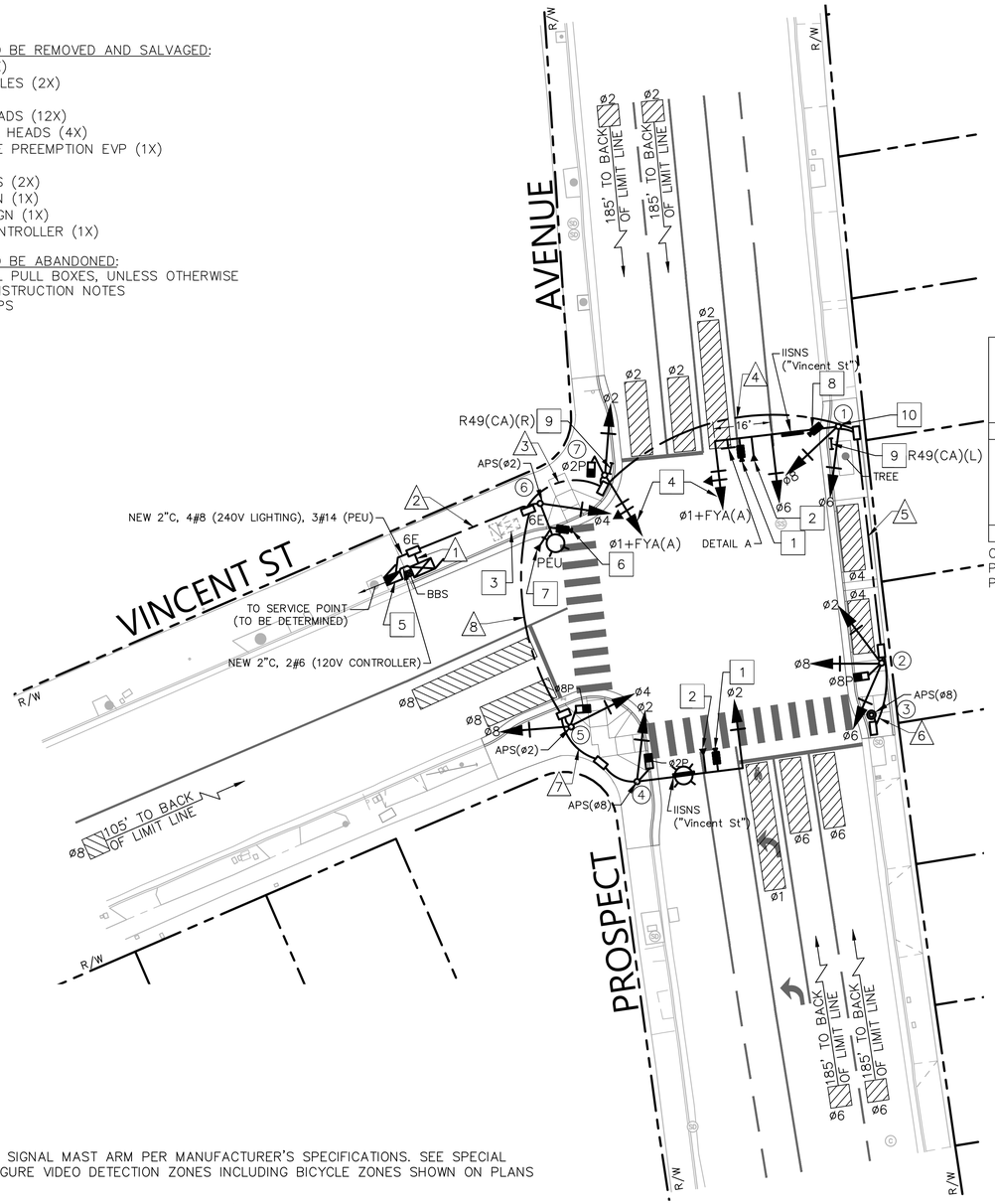
DRAWING: k:\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992--17--rb--ts--pros--01.dwg PLOTTED: 2/6/2026 11:45 AM BY: Matthew



REMOVAL PLAN
1"=50'

EXISTING EQUIPMENT TO BE REMOVED AND SALVAGED:
1. TYPE 1A POLES (3X)
2. TYPE 19–2–129 POLES (2X)
3. TYPE 15 (1X)
4. VEHICLE SIGNAL HEADS (12X)
5. PEDESTRIAN SIGNAL HEADS (4X)
6. EMERGENCY VEHICLE PREEMPTION EVP (1X)
7. IISNS (2X)
8. R9–3 STREET SIGNS (2X)
9. R9–3B STREET SIGN (1X)
10. R49(CA) STREET SIGN (1X)
11. TRAFFIC SIGNAL CONTROLLER (1X)

EXISTING EQUIPMENT TO BE ABANDONED:
1. ALL TRAFFIC SIGNAL PULL BOXES, UNLESS OTHERWISE NOTED ON THE CONSTRUCTION NOTES
2. ALL DETECTOR LOOPS



LEGEND:
- VEHICLE DETECTION ZONE
- BICYCLE DETECTION ZONE
- VIDEO DETECTION CAMERA
- EMERGENCY VEHICLE PREEMPTION DETECTOR
- PEDESTRIAN BARRICADE

EXISTING PHASE DIAGRAM

NOT USED	PM	NOT USED	PM
ø1	ø2	ø3	ø4
NOT USED	PM	NOT USED	PM
ø5	ø6	ø7	ø8

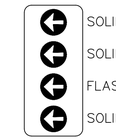
OPERATION:
PERMITTED LEFT TURN FOR ø2, ø4, ø6, & ø8
PM = PERMITTED

PROPOSED PHASE DIAGRAM

	FYA(A) PM	NOT USED	PM
ø1	ø2	ø3	ø4
NOT USED		NOT USED	PM
ø5	ø6	ø7	ø8

OPERATION:
PROTECTED LEFT TURN FOR ø1
PERMITTED LEFT TURN FOR ø2, ø4, & ø8
PERMITTED OPPOSING LEFT TURN (FYA) FOR ø2
FYA = FLASHING YELLOW ARROW

DETAIL A
NTS



- SOLID RED ARROW
- SOLID YELLOW ARROW
- FLASHING YELLOW ARROW
- SOLID GREEN ARROW

12" LENSES

DETAIL B
NTS

TRAFFIC SIGNAL GENERAL NOTES:

SEE GENERAL NOTE SHEET FOR GENERAL NOTES.

CONSTRUCTION NOTES:

1. FURNISH AND INSTALL ITERIS VANTAGE VECTOR VIDEO DETECTION CAMERA ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS. SEE SPECIAL PROVISIONS. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER TO CONFIGURE VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER DIRECTION OF THE CITY REPRESENTATIVE.
2. FURNISH AND INSTALL EMERGENCY VEHICLE PREEMPTION DETECTOR ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS.
3. FURNISH AND INSTALL NEW CABINET WITH NEW TYPE 332 CABINET AND BACKUP BATTERY SYSTEM. FURNISH AND INSTALL NEW 2070 ATC CONTROLLER UNIT WITH D4 SOFTWARE. CONFIGURE NEW CONTOLLER UNIT AND PROVIDE ALL NECESSARY EQUIPMENT TO ACHIEVE INTENDED OPERATION SHOWN. FURNISH AND INSTALL NEW ACCESSIBLE PEDESTRIAN SIGNAL (APS) SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, AND ALL NECESSARY WIRES AND CONNECTORS TO ACHIEVE THE INTENDED OPERATION. FURNISH AND INSTALL NEW ITERIS VANTAGE VECTOR VIDEO DETECTION SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, SLDC CABLE, MONITOR, AND MOUSE. SETUP VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER THE DIRECTION OF THE CITY REPRESENTATIVE. FURNISH AND INSTALL CAT 5E CABLE OR AS SPECIFIED BY THE MANUFACTURER'S REPRESENTATIVE TO EACH CAMERA.
4. FURNISH AND INSTALL NEW 4–SECTION SIGNAL HEAD. SEE DETAIL B.
5. INSTALL NEW SERVICE CABINET TO SERVICE POINT; FINAL DESIGN WILL BE IN COORDINATION WITH SCE.
6. FURNISH AND INSTALL ITERIS VANTAGE VECTOR VIDEO DETECTION CAMERA ON LUMINAIRE MAST ARM PER MANUFACTURER'S SPECIFICATIONS. SEE SPECIAL PROVISIONS. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER TO CONFIGURE VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER DIRECTION OF THE CITY REPRESENTATIVE.
7. FURNISH AND INSTALL EMERGENCY VEHICLE PREEMPTION DETECTOR ON LUMINAIRE MAST ARM PER MANUFACTURER'S SPECIFICATIONS.
8. FURNISH AND INSTALL ITERIS VANTAGE VECTOR VIDEO DETECTION CAMERA WITH A 5' RISER ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS. SEE SPECIAL PROVISIONS. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER TO CONFIGURE VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER DIRECTION OF THE CITY REPRESENTATIVE.
9. INSTALL PEDESTRIAN BARRICADE.
10. CONTRACTOR SHALL WORK WITH THE CITY PRIOR TO THE INSTALLATION OF THE TRAFFIC SIGNAL AND SHALL COORDINATE WITH THE CITY ARBORIST ON TREE CONDITION.

N

20 0 20 40
scale 1" = 20' feet

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
TRAFFIC SIGNAL
PROSPECT AVENUE & VINCENT STREET

DRAWN	CHECKED	SCALE
KW/MO	SD	1" = 20'
APPROVED BY: ANDREW S. WINJE, P.E. CITY ENGINEER		DATE:
PROJECT NO. 41490	SHEET NO. 45 OF 58 SHEETS	DRAWING NO. E-09

DRAWING: k:\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-21-rb-ts-pros-02.dwg PLOTTED: 2/6/2026 8:45 AM BY: Matthew

CONDUCTOR SCHEDULE

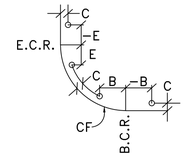
WIRE	POLE NO.	PHASE	1	2	3	4	5	6	7	8
12 WIRE CONDUCTOR SIGNAL CABLE (CSC) 12–#14	①	Φ1, FYA(A), Φ6, Φ8	1	1	1	1				
	②	Φ2, Φ6, Φ8 Φ8P	1	1	1	1	1			
	④	Φ2, Φ2P	1	1					1	1
	⑤	Φ4, Φ8, Φ8P	1	1						1
	⑥	Φ4	1	1						
	⑦	Φ2, Φ4, FYA(A), Φ2P	1	1	1					
		TOTAL	6	6	3	2	1	0	1	2
3 WIRE CONDUCTOR SIGNAL CABLE (CSC) 3–#14	③	APS (Φ8)	1	1	1	1	1			
	④	APS (Φ8)	1	1					1	1
	⑤	APS (Φ2)	1	1						1
	⑥	APS (Φ2)	1	1						
		TOTAL	4	4	1	1	1	0	1	2
#14 AWG	PEU			1						
#12 AWG	IISNS			2	2	2			2	2
#10 AWG	LED LUMINARIES			2	2				2	2
	SIGNAL COMMON		1	1	1	1	1	1	1	1
	TOTAL		1	3	3	1	1	1	3	3
VIDEO DETECTION POWER AND VIDEO			4	4	2	2			1	1
EMERGENCY VEHICLE PREEMPTION			3	3	1	1			1	1
CONDUIT SIZE (IN.)			2–3	2–3	3	3	3	3	3	3
PERCENT FILL			10%	11%	10%	9%	2%	1%	7%	9%

ALL CABLES AND CONDUITS ARE NEW

POLE SCHEDULE

No.	TYPE	STANDARD HEIGHT	S.M.A.	L.M.A.	LUM. LED	IISNS LEGEND	SIGNAL MOUNTING VEH	M.A.	PED	PPB** PHASE	ARROW	POLE LOCATION E	B	C	REMARKS
①	23–4–100	30'	35'	–	–	Vincent St	SV–2–T	MAS–4B MAS	–	–	–	–	–	3.2'	INSTALL VIDEO DETECTION SYSTEM (ONE ON SMA AND ONE ON SMA WITH A 5' RISER), EVP, AND DETAIL "A" SIGN ON S.M.A. SEE CONSTRUCTION NOTE 5 AND 10.
②	1A	10'	–	–	–	–	TV–3–T	–	SP–1–T	–	–	–	–	8.3'	
③	PBA POST	–	–	–	–	–	–	–	–	ø8	→	–	–	2.4'	
④	19–4–100	30'	30'	12'	113W*	Vincent St	SV–1–T	MAS	SP–1–T	ø8	←	–8.0'	–	9.5'	INSTALL VIDEO DETECTION SYSTEM AND EVP ON S.M.A.
⑤	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø2	→	–	–3.3'	6.2'	
⑥	15TS (CUSTOM)	25'	–	12'	113W*	–	SV–1–T	–	–	ø2	←	–9.8'	–	7.35'	INSTALL VIDEO DETECTION SYSTEM, EVP, AND PEU ON L.M.A.
⑦	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	–	–	–	3.7'	2.7'	SEE CONSTRUCTION NOTE 5.

ALL POLES AND EQUIPMENT ARE NEW.
IISNS = LED INTERNALLY ILLUMINATED STREET NAME SIGN.
* LED LUMINAIRE TO BE NAV NAVION LED OR CITY APPROVED EQUAL.
** ACCESSIBLE PEDESTRIAN PUSH BUTTON (PPB) SHALL BE AN ACCESSIBLE PEDESTRIAN SIGNAL (APS).



POLE PLACEMENT DETAIL
NTS

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

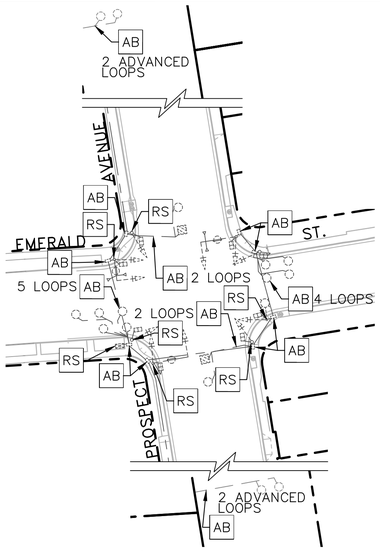
REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
TRAFFIC SIGNAL
PROSPECT AVENUE & VINCENT STREET

DRAWN	CHECKED	SCALE
KW/MO	SD	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER
DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	46 OF 58 SHEETS	E-10

DRAWING: k:\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-21-rb-ts-pros-02.dwg PLOTTED: 2/6/2026 10:24 AM BY: Matthew

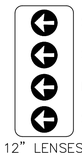


REMOVAL PLAN
1"=50'

EXISTING EQUIPMENT TO BE REMOVED AND SALVAGED:
1. TYPE 19–2–129 POLES (2X)
2. TYPE 17–2–129 POLE (1X)
3. TYPE 1A POLES (4X)
4. TYPE 15 POLE (1X)
5. VEHICLE SIGNAL HEADS (11X)
6. PEDESTRIAN SIGNAL HEADS (8X)
7. EMERGENCY VEHICLE PREEMPTION EVP (2X)
8. IISNS (3X)
9. STREET NAME SIGNS (2X)
10. TRAFFIC SIGNAL CONTROLLER (1X)

EXISTING EQUIPMENT TO BE ABANDONED:
1. ALL TRAFFIC SIGNAL PULL BOXES, UNLESS OTHERWISE NOTED ON THE CONSTRUCTION NOTES
2. ALL BIKE DETECTOR LOOPS

DETAIL A
NTS



DETAIL B
NTS

LEGEND:

- VEHICLE DETECTION ZONE
- BICYCLE DETECTION ZONE
- VIDEO DETECTION CAMERA
- EMERGENCY VEHICLE PREEMPTION DETECTOR

EXISTING PHASE DIAGRAM

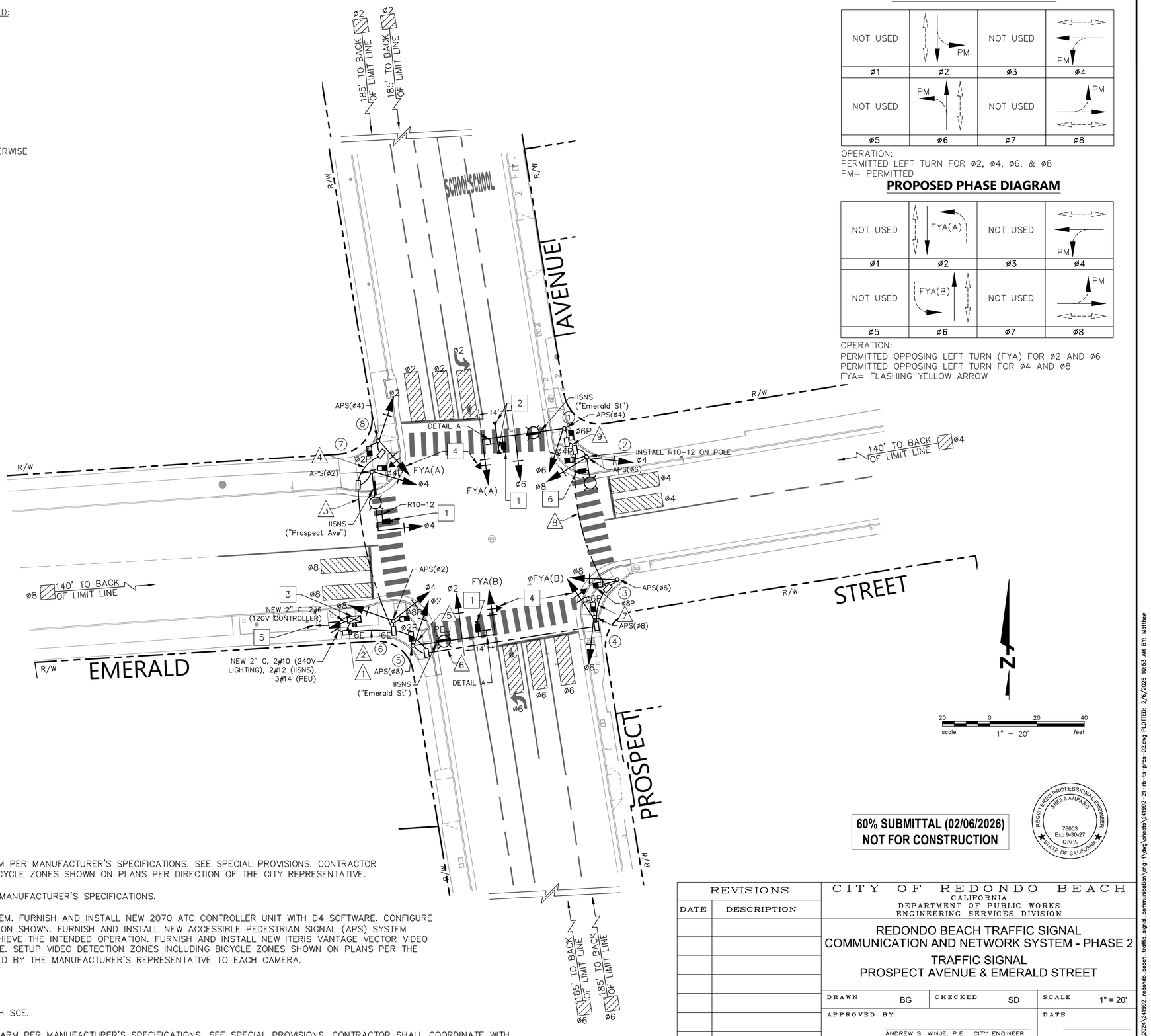
NOT USED	PM	NOT USED	PM
ø1	ø2	ø3	ø4
NOT USED	PM	NOT USED	PM
ø5	ø6	ø7	ø8

OPERATION:
PERMITTED LEFT TURN FOR ø2, ø4, ø6, & ø8
PM= PERMITTED

PROPOSED PHASE DIAGRAM

NOT USED	FYA(A)	NOT USED	PM
ø1	ø2	ø3	ø4
NOT USED	FYA(B)	NOT USED	PM
ø5	ø6	ø7	ø8

OPERATION:
PERMITTED OPPOSING LEFT TURN (FYA) FOR ø2 AND ø6
PERMITTED OPPOSING LEFT TURN FOR ø4 AND ø8
FYA= FLASHING YELLOW ARROW



TRAFFIC SIGNAL GENERAL NOTES:

SEE GENERAL NOTE SHEET FOR GENERAL NOTES.

CONSTRUCTION NOTES:

1. FURNISH AND INSTALL ITERIS VANTAGE VECTOR VIDEO DETECTION CAMERA ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS. SEE SPECIAL PROVISIONS. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER TO CONFIGURE VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER DIRECTION OF THE CITY REPRESENTATIVE.
2. FURNISH AND INSTALL EMERGENCY VEHICLE PREEMPTION DETECTOR ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS.
3. FURNISH AND INSTALL NEW CABINET WITH NEW TYPE 332 CABINET AND BACKUP BATTERY SYSTEM. FURNISH AND INSTALL NEW 2070 ATC CONTROLLER UNIT WITH D4 SOFTWARE. CONFIGURE NEW CONTOLLER UNIT AND PROVIDE ALL NECESSARY EQUIPMENT TO ACHIEVE INTENDED OPERATION SHOWN. FURNISH AND INSTALL NEW ACCESSIBLE PEDESTRIAN SIGNAL (APS) SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, AND ALL NECESSARY WIRES AND CONNECTORS TO ACHIEVE THE INTENDED OPERATION. FURNISH AND INSTALL NEW ITERIS VANTAGE VECTOR VIDEO DETECTION SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, SLDC CABLE, MONITOR, AND MOUSE. SETUP VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER THE DIRECTION OF THE CITY REPRESENTATIVE. FURNISH AND INSTALL CAT 5E CABLE OR AS SPECIFIED BY THE MANUFACTURER'S REPRESENTATIVE TO EACH CAMERA.
4. FURNISH AND INSTALL NEW 4–SECTION SIGNAL HEAD. SEE DETAIL B.
5. INSTALL NEW SERVICE CABINET TO SERVICE POINT; FINAL DESIGN WILL BE IN COORDINATION WITH SCE.
6. FURNISH AND INSTALL ITERIS VANTAGE VECTOR VIDEO DETECTION CAMERA ON LUMINAIRE MAST ARM PER MANUFACTURER'S SPECIFICATIONS. SEE SPECIAL PROVISIONS. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER TO CONFIGURE VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER DIRECTION OF THE CITY REPRESENTATIVE.

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2

TRAFFIC SIGNAL
PROSPECT AVENUE & EMERALD STREET

DRAWN BG	CHECKED SD	SCALE 1" = 20'
APPROVED BY ANDREW S. WINJE, P.E. CITY ENGINEER		DATE
PROJECT NO. 41490	SHEET NO. 47 OF 58 SHEETS	DRAWING NO. E-11

DRAWING: k:\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-21-tb-pros-02.dwg PLOTTED: 2/6/2026 10:53 AM BY: Mathew

CONDUCTOR SCHEDULE

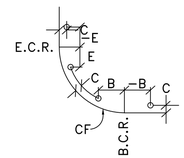
Wire	Pole No.	Phase	1	2	3	4	5	6	7	8	9
12 Wire Conductor Signal Cable (CSC) 12–#14	①	Φ6, FYA(A), Φ6P	1	1			1	1	1	1	1
	②	Φ4, Φ8, Φ4P	1	1			1	1	1	1	
	③	Φ8, Φ8P	1	1			1	1	1		
	④	Φ2, FYA(B), Φ6, Φ6P	1	1			1	1			
	⑤	Φ2, FYA(B), Φ2P	1	1			1				
	⑥	Φ4, Φ8, Φ8P	1	1							
	⑦	Φ4, Φ4P	1	1	1						
	⑧	Φ2, Φ6, FYA(A), Φ2P	1	1	1	1					
		Total	8	8	2	1	5	4	3	2	1
3 Wire Conductor Signal Cable (CSC) 3–#14	①	APS (Φ4)	1	1			1	1	1	1	1
	②	APS (Φ6)	1	1			1	1	1	1	
	③	APS (Φ6)	1	1			1	1	1		
	④	APS (Φ8)	1	1			1	1			
	⑤	APS (Φ8)	1	1			1				
	⑥	APS (Φ2)	1	1							
	⑦	APS (Φ2)	1	1	1						
	⑧	APS (Φ4)	1	1	1	1					
		Total	8	8	2	1	5	4	3	2	1
#14 AWG	PEU			3			3				
#12 AWG	IISNS			2	2		2	2	2	2	2
#10 AWG	LED Luminaries			2	2		2	2	2	2	2
	Singal Common		1	1	1	1	1	1	1	1	1
	Total		1	3	3	1	3	3	3	3	3
Video Detection Power and Video			4	4	1		3	2	2	1	1
Emergency Vehicle Preemption			2	2			2	2	2	2	2
Conduit Size (in.)			2–3	2–3	3	3	3	3	3	3	3
Percent Fill			13%	14%	8%	2%	21%	16%	14%	10%	8%

ALL CABLES AND CONDUITS ARE NEW

POLE SCHEDULE

No.	STANDARD TYPE	HEIGHT	S.M.A.	L.M.A.	LUM. LED	IISNS LEGEND	SIGNAL MOUNTING VEH	M.A.	PED	**PPB PHASE	ARROW	POLE LOCATION E	B	C	REMARKS
①	24–4–100	30'	35'	12'	113W*	Emerald St	SV–1–T	MAS–4B MAS	SP–1–T	ø4	←	–6.0'	–	5.8'	INSTALL VIDEO DETECTION SYSTEM, TWO EVP'S (BACK TO BACK), AND DETAIL A SIGN ON SIGNAL MAST ARM. SEE CONSTRUCTION NOTE 4.
②	15TS	30'	–	12'	113W*	–	SV–2–T	–	SP–1–T	ø6	→	–	1.8'	7.5'	INSTALL VIDEO DETECTION SYSTEM ON LIGHTING MAST ARM. INSTALL R10–12 SIGN ABOVE POLE–MOUNTED ø6 SIGNAL HEAD. SEE CONSTRUCTION NOTE 6.
③	1A	10'	–	–	–	–	TV–1–T	–	SP–1–T	ø6	←	–	2.2'	5.4'	
④	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø8	→	0.4'	–	5.6'	
⑤	24–4–100	30'	35'	12'	113W*	Emerald St	SV–1–T	MAS–4B MAS	SP–1–T	ø8	←	–5.7'	–	8.0'	INSTALL VIDEO DETECTION SYSTEM AND DETAIL A SIGN ON SIGNAL MAST ARM. INSTALL PEU ON LIGHTING MAST ARM. SEE CONSTRUCTION NOTE 4.
⑥	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø2	→	–	13.9'	9.2'	
⑦	19–3–100	30'	25'	12'	113W*	Prospect Ave	SV–1–T	MAS	SP–1–T	ø2	←	–	15.6'	7.9'	INSTALL VIDEO DETECTION SYSTEM, TWO EVP'S (BACK TO BACK), AND R10–12 SIGN ON SIGNAL MAST ARM.
⑧	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø4	→	–5.8'	–	8.7'	

ALL POLES AND EQUIPMENT ARE NEW.
IISNS = LED INTERNALLY ILLUMINATED STREET NAME SIGN.
* LED LUMINAIRE TO BE NAV NAVION LED OR CITY APPROVED EQUAL.
** ACCESSIBLE PEDESTRIAN SIGNAL (APS).



POLE PLACEMENT DETAIL
NTS

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

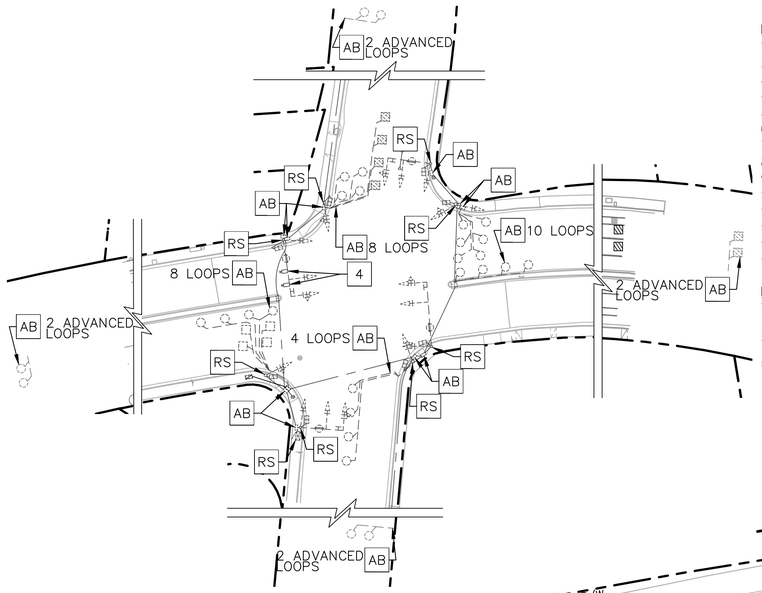
REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
TRAFFIC SIGNAL
PROSPECT AVENUE & EMERALD STREET

DRAWN	CHECKED	SCALE
BG	SD	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER
DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	48 OF 58 SHEETS	E-12

DRAWING: K:\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-21-rb-ts-pros-02.dwg PLOTTED: 2/6/2026 11:06 AM BY: Matthew



REMOVAL PLAN
1"=50'

EXISTING EQUIPMENT TO BE REMOVED AND SALVAGED:
1. TYPE 19-3-70 POLES (2X)
2. TYPE 26-3-70 POLES (2X)
3. TYPE 1A POLES (4X)
4. VEHICLE SIGNAL HEADS (13X)
5. PV VEHICLE SIGNAL HEADS (3X)
6. PEDESTRIAN SIGNAL HEADS (8X)
7. EMERGENCY VEHICLE PREEMPTION EVP (1X)
8. IISNS (4X)
9. R73-3 (CA) STREET SIGNS (2X)
10. R73-2 (CA) STREET SIGNS (2X)
11. STREET NAME SIGNS (4X)
12. TRAFFIC SIGNAL CONTROLLER AND CABINET (1X)
13. AUTOMATIC LICENSE PLATE RECOGNITION CAMERAS* (2X)
14. VANTAGE VECTOR BY ITERIS (4X)

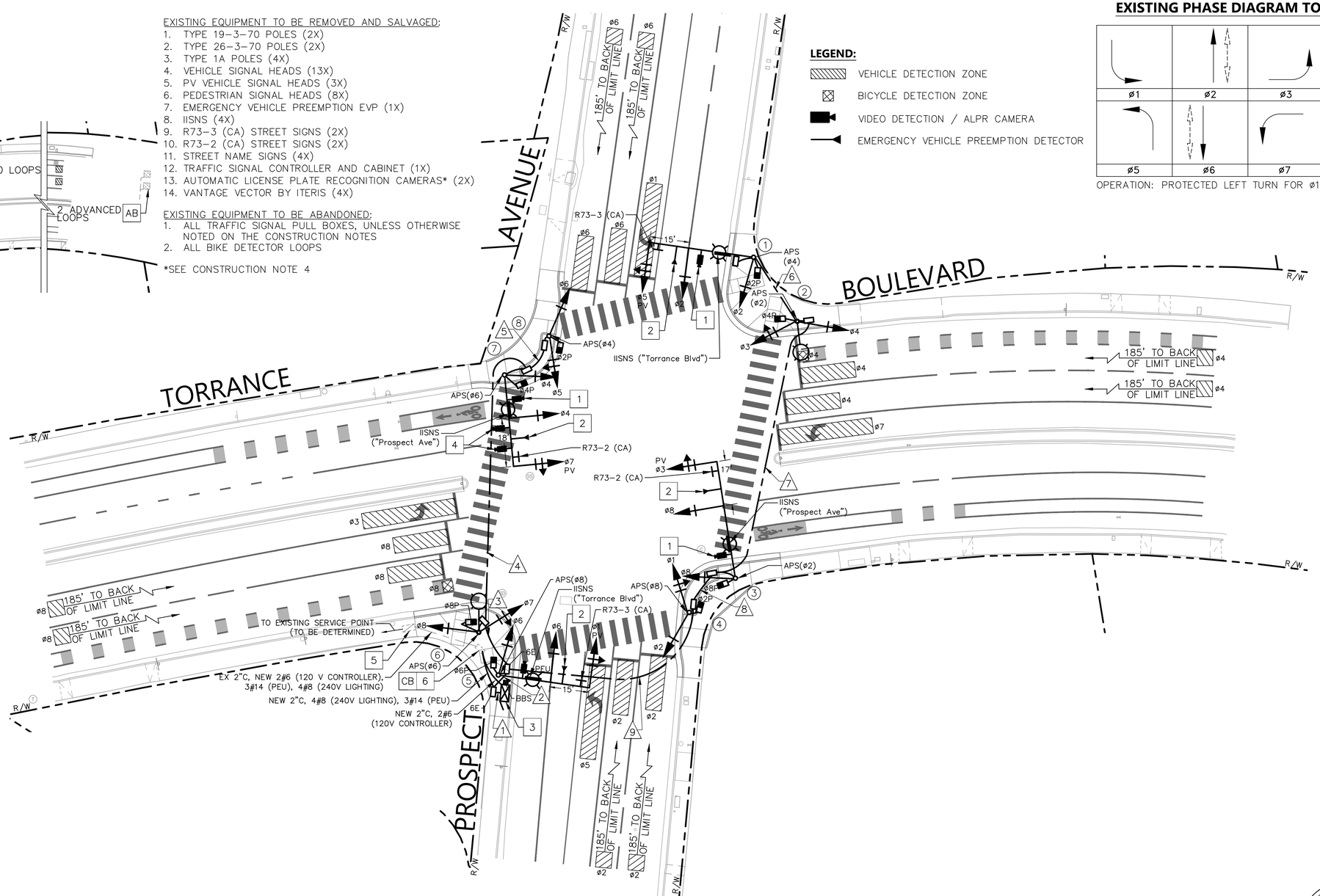
EXISTING EQUIPMENT TO BE ABANDONED:
1. ALL TRAFFIC SIGNAL PULL BOXES, UNLESS OTHERWISE NOTED ON THE CONSTRUCTION NOTES
2. ALL BIKE DETECTOR LOOPS

*SEE CONSTRUCTION NOTE 4

EXISTING PHASE DIAGRAM TO REMAIN

ø1	ø2	ø3	ø4
ø5	ø6	ø7	ø8

OPERATION: PROTECTED LEFT TURN FOR ø1, ø3, ø5, & ø7



TRAFFIC SIGNAL GENERAL NOTES:

SEE GENERAL NOTE SHEET FOR GENERAL NOTES.

CONSTRUCTION NOTES:

1. FURNISH AND INSTALL ITERIS VANTAGE VECTOR VIDEO DETECTION CAMERA ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS. SEE SPECIAL PROVISIONS. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER TO CONFIGURE VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER DIRECTION OF THE CITY REPRESENTATIVE.
2. FURNISH AND INSTALL EMERGENCY VEHICLE PREEMPTION DETECTOR ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS.
3. FURNISH AND INSTALL NEW CABINET WITH NEW TYPE 332 CABINET AND BACKUP BATTERY SYSTEM. FURNISH AND INSTALL NEW 2070 ATC CONTROLLER UNIT WITH D4 SOFTWARE. CONFIGURE NEW CONTOLLER UNIT AND PROVIDE ALL NECESSARY EQUIPMENT TO ACHIEVE INTENDED OPERATION SHOWN. FURNISH AND INSTALL NEW ACCESSIBLE PEDESTRIAN SIGNAL (APS) SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, AND ALL NECESSARY WIRES AND CONNECTORS TO ACHIEVE THE INTENDED OPERATION. FURNISH AND INSTALL NEW ITERIS VANTAGE VECTOR VIDEO DETECTION SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, SLDC CABLE, MONITOR, AND MOUSE. SETUP VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER THE DIRECTION OF THE CITY REPRESENTATIVE. FURNISH AND INSTALL CAT 5E CABLE OR AS SPECIFIED BY THE MANUFACTURER'S REPRESENTATIVE TO EACH CAMERA.
4. CONTRACTOR TO REMOVE TWO EXISTING ALPR CAMERAS ALONG WITH THEIR MOUNTS AND OTHER EQUIPMENT, AND STORE SAFELY DURING CONSTRUCTION TO PREVENT DAMAGE. CONTRACTOR SHALL INSTALL CAMERAS ONTO THE NEW SIGNAL POLE, SIMILAR TO EXISTING CONDITIONS. ANY DAMAGED CAMERAS OR THEIR RESPECTIVE EQUIPMENT SHALL BE REPLACED IN KIND AT THE CONTRACTOR'S EXPENSE.
5. EXISTING SERVICE CABINET TO REMAIN.
6. CONTRACTOR TO REPLACE EXISTING NO. 3.5 PULL BOX WITH NO. 5 PULL BOX. MAINTAIN EXISTING ELECTRICAL CONDUIT TO EXISTING SERVICE CABINET.

N

20 0 20 40
scale 1" = 20' feet

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2
TRAFFIC SIGNAL
PROSPECT AVENUE & TORRANCE BOULEVARD

DRAWN	CHECKED	SCALE
KW/MO	SD	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER
DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	49 OF 58 SHEETS	E-13

DRAWING: k:\2024\241992_redondo_beach_traffic_signal_communication\eng-1\eng\sheets\241992-21-rb-ts-pros-02.dwg PLOTTED: 2/6/2026 12:47 PM BY: Matthew

CONDUCTOR SCHEDULE

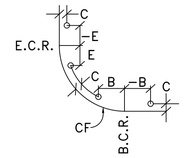
WIRE	POLE NO.	PHASE	1	2	3	4	5	6	7	8	9
12 WIRE CONDUCTOR SIGNAL CABLE (CSC) 12–#14	①	Φ2, Φ5, Φ2P	1	1				1	1	1	1
	②	Φ3, Φ4, Φ4P	1	1					1	1	1
	③	Φ3, Φ8, Φ8P	1	1						1	1
	④	Φ1, Φ2, Φ2P	1	1							1
	⑤	Φ1, Φ6, Φ6P	1	1							
	⑥	Φ7, Φ8, Φ8P	1	1	1						
	⑦	Φ4, Φ7, Φ4P	1	1	1	1					
	⑧	Φ5, Φ6, Φ2P	1	1	1	1	1				
		TOTAL	8	8	3	2	1	1	2	3	4
3 WIRE CONDUCTOR SIGNAL CABLE (CSC) 3–#14	①	APS (Φ4)	1	1				1	1	1	1
	②	APS (Φ2)	1	1					1	1	1
	③	APS (Φ2)	1	1						1	1
	④	APS (Φ8)	1	1							1
	⑤	APS (Φ8)	1	1							
	⑥	APS (Φ6)	1	1	1						
	⑦	APS (Φ6)	1	1	1	1					
	⑧	APS (Φ4)	1	1	1	1	1				
		TOTAL	8	8	3	2	1	1	2	3	4
#14 AWG	PEU			3							
#12 AWG	IISNS			2	2	2		2	2	2	2
#10 AWG	LED LUMINARIES			2	2	2		2	2	2	2
	SIGNAL COMMON	1	1	1	1	1	1	1	1	1	1
	TOTAL	1	3	3	3	1	3	3	3	3	3
VIDEO DETECTION POWER AND VIDEO		4	4	1	1		1	1	2	2	
ALPR POWER AND VIDEO (CAT6E)		2	2	2	2						
EMERGENCY VEHICLE PREEMPTION		4	4	1	1		1	1	2	2	
CONDUIT SIZE (IN.)		2–3	2–3	3	3	3	3	3	3	3	
PERCENT FILL		17%	18%	16%	15%	2%	7%	9%	14%	16%	

ALL CABLES AND CONDUITS ARE NEW

POLE SCHEDULE

No.	STANDARD TYPE	HEIGHT	S.M.A.	L.M.A.	LUM. LED	IISNS LEGEND	SIGNAL MOUNTING VEH	M.A.	PED	PPB** PHASE	ARROW	POLE LOCATION E	B	C	REMARKS
①	26–4–100	30'	40'	12'	110W*	Torrance Blvd	SV–1–T	MAS MAS	SP–1–T	ø4	←	–12.9'	–	8.2'	INSTALL EVP AND R73–3 (CA) ON S.M.A. INSTALL VIDEO DETECTION SYSTEM ON L.M.A.
②	TS–15	30'	–	–	–	–	SV–2–T	–	SP–1–T	ø2	→	–	–10.8'	3.3'	
③	26–4–100	30'	45'	12'	110W*	Prospect Ave	SV–1–T	MAS MAS	SP–1–T	ø2	←	–6.0'	–	5.65'	INSTALL EVP AND R73–2 (CA) ON S.M.A. INSTALL VIDEO DETECTION SYSTEM ON L.M.A.
④	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø8	←	–	–4.0'	2.5'	
⑤	24–4–100	30'	35'	12'	110W*	Torrance Blvd	SV–1–T	MAS MAS	SP–1–T	ø8	←	–9.9'	–	5.7'	INSTALL EVP AND 73–3 (CA) ON S.M.A. INSTALL VIDEO DETECTION SYSTEM AND PEU ON L.M.A.
⑥	TS–15	30'	–	–	–	–	SV–2–T	–	SP–1–T	ø6	←	–	1.8'	9.35'	
⑦	24–4–100	30'	35'	12'	110W*	Prospect Ave	SV–1–T	MAS MAS	SP–1–T	ø6	←	–6.0'	–	3.2'	INSTALL EVP AND R73–2 (CA) ON S.M.A. REINSTALL ALPR CAMERAS ON S.M.A. INSTALL VIDEO DETECTION SYSTEM ON L.M.A. SEE CONSTRUCTION NOTE 4.
⑧	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø4	←	–	–4.05'	2.5'	

ALL POLES AND EQUIPMENT ARE NEW.
IISNS = LED INTERNALLY ILLUMINATED STREET NAME SIGN.
* LED LUMINAIRE TO BE NAV NAVION LED OR CITY APPROVED EQUAL. PENDING LIGHTING ANALYSIS.
** ACCESSIBLE PEDESTRIAN PUSH BUTTON (PPB) SHALL BE AN ACCESSIBLE PEDESTRIAN SIGNAL (APS).



POLE PLACEMENT DETAIL
NTS

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
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REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
TRAFFIC SIGNAL
PROSPECT AVENUE & TORRANCE BOULEVARD

DRAWN	CHECKED	SCALE
KW/MO	SD	1" = 20'

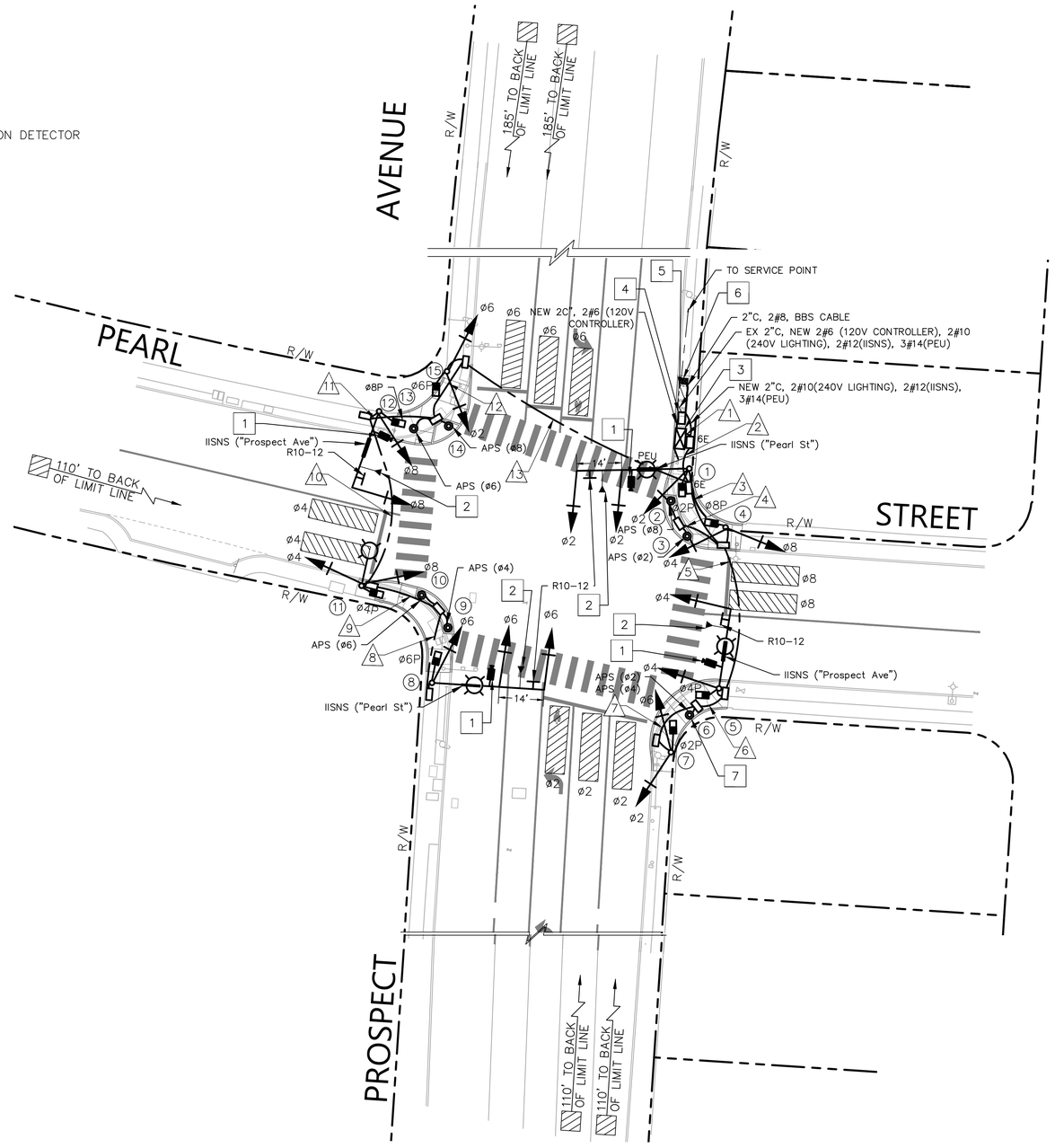
APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER
DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	50 OF 58 SHEETS	E-14

DRAWING: k:\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-21-rb-tb-prop-02.dwg PLOTTED: 2/6/2026 10:20 AM BY: Matthew

LEGEND:

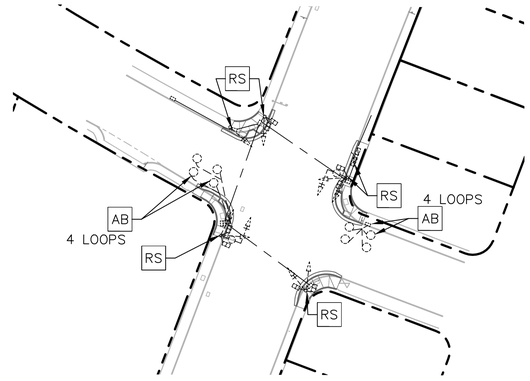
- VEHICLE DETECTION ZONE
- BICYCLE DETECTION ZONE
- VIDEO DETECTION CAMERA
- EMERGENCY VEHICLE PREEMPTION DETECTOR



EXISITNG PHASE DIAGRAM TO REMAIN

NOT USED	PM	NOT USED	PM
ø1	ø2	ø3	ø4
NOT USED	PM	NOT USED	PM
ø5	ø6	ø7	ø8

OPERATION:
PERMITTED LEFT TURN FOR ø2, ø6, ø4, ø8



REMOVAL PLAN
1"=50'

EXISTING EQUIPMENT TO BE REMOVED AND SALVAGED:
1. TYPE TYPE III POLES (2X)
2. TYPE 1A POLES (3X)
3. VEHICLE SIGNAL HEADS (10X)
4. PEDESTRIAN SIGNAL HEADS (8X)
5. R26 (CA) STREET SIGNS (1X)
6. STREET NAME SIGNS (2X)
7. TYPE II CABINET (1X)
8. TRAFFIC SIGNAL CONTROLLER (1X)

EXISTING EQUIPMENT TO BE ABANDONED:
1. ALL TRAFFIC SIGNAL PULL BOXES UNLESS OTHERWISE NOTED IN THE CONSTRUCTION PLANS
2. ALL DETECTOR LOOPS

CONSTRUCTION NOTES:

1. FURNISH AND INSTALL ITERIS VANTAGE VECTOR VIDEO DETECTION CAMERA ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS. SEE SPECIAL PROVISIONS. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER TO CONFIGURE VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER DIRECTION OF THE CITY REPRESENTATIVE.
2. FURNISH AND INSTALL EMERGENCY VEHICLE PREEMPTION DETECTOR ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS.
3. FURNISH AND INSTALL NEW CABINET WITH NEW TYPE 332 CABINET. FURNISH AND INSTALL NEW 2070 ATC CONTROLLER UNIT WITH D4 SOFTWARE. CONFIGURE NEW CONTOLLER UNIT AND PROVIDE ALL NECESSARY EQUIPMENT TO ACHIEVE INTENDED OPERATION SHOWN. FURNISH AND INSTALL NEW ACCESSIBLE PEDESTRIAN SIGNAL (APS) SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, AND ALL NECESSARY WIRES AND CONNECTORS TO ACHIEVE THE INTENDED OPERATION.FURNISH AND INSTALL NEW ITERIS VANTAGE VECTOR VIDEO DETECTION SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, SLDC CABLE, MONITOR, AND MOUSE. SETUP VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER THE DIRECTION OF THE CITY REPRESENTATIVE. FURNISH AND INSTALL CAT 5E CABLE OR AS SPECIFIED BY THE MANUFACTURER'SREPRESENTATIVE TO EACH CAMERA.
4. CONTRACTOR TO REPLACE EXISTING NO. 3.5 PULL BOX WITH NO. 5 PULL BOX. MAINTAIN EXISTING ELECTRICAL CONDUIT TO EXISTING SERVICE CABINET.
5. EXISTING SERVICE CABINET TO REMAIN.
6. FURNISH AND INSTALL NEW BATTERY BACK UP SYSTEM.
7. APS UNIT(S) SHALL HAVE LOCATOR TONE, VIBROTACTILE WALK INDICATION, AND VOICE FEEDBACK ENABLED.

TRAFFIC SIGNAL GENERAL NOTES:

SEE GENERAL NOTE SHEET FOR GENERAL NOTES.

N

20 0 20 40
scale 1" = 20' feet

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
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REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
TRAFFIC SIGNAL
PROSPECT AVENUE & PEARL STREET

DRAWN	RS	CHECKED SD	SCALE 1" = 20'
APPROVED BY ANDREW S. WINJE, P.E. CITY ENGINEER			DATE
PROJECT NO. 41490		SHEET NO. 51 OF 58 SHEETS	DRAWING NO. E-15

DRAWING: k:\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992--17--rb--ts--pros--04.dwg PLOTTED: 2/6/2026 12:56 PM BY: Matthew

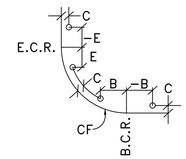
CONDUIT AND CONDUCTOR SCHEDULE

WIRE	POLE NO.	PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13
12 WIRE CONDUCTOR SIGNAL CABLE (CSC) 12–#14	①	Φ2, Φ2P	1	1											
	④	Φ4, Φ8, Φ8P	1	1	1										
	⑤	Φ4, Φ4P	1	1	1		1								
	⑦	Φ2, Φ6, Φ2P	1	1	1		1	1	1						
	⑧	Φ6, Φ6P	1	1						1	1	1	1	1	1
	⑪	Φ4, Φ8, Φ4P	1	1								1	1	1	1
	⑫	Φ8, Φ8P	1	1									1	1	1
	⑮	Φ2, Φ6, Φ6P	1	1											1
		TOTAL	8	8	3	0	2	1	1	1	1	2	3	3	4
3 WIRE CONDUCTOR SIGNAL CABLE (CSC) 3–#14	②	APS (Φ8)	1	1	1	1									
	③	APS (Φ2)	1	1	1	1									
	⑥	APS (Φ2), APS (Φ4)	2	2	2		2	2							
	⑨	APS (Φ4)	1	1							1	1	1	1	1
	⑩	APS (Φ6)	1	1							1	1	1	1	1
	⑬	APS (Φ6)	1	1										1	1
	⑭	APS (Φ8)	1	1										1	1
		TOTAL	8	8	4	2	2	2	0	0	2	2	2	4	4
#14 AWG	PEU			3											
#12 AWG	IISNS			2	2		2			2	2	2	2	2	2
#10 AWG	LED LUMINARIES			2	2		2			2	2	2	2	2	2
	SIGNAL COMMON		1	1	1	1	1	1	1	1	1	1	1	1	1
	TOTAL		1	3	3	1	3	1	1	3	3	3	3	3	3
VIDEO DETECTION POWER AND VIDEO			4	4		1				1	1	1	2	2	2
EMERGENCY VEHICLE PREEMPTION			4	4		1				1	1	1	2	2	2
CONDUIT SIZE (IN.)			2–3	2–3	3	3	3	3	3	3	3	3	3	3	3
PERCENT FILL			14%	15%	4%	7%	5%	3%	1%	6%	9%	5%	5%	4%	3%

POLE SCHEDULE

No.	STANDARD TYPE	HEIGHT	S.M.A.	L.M.A.	LUM. LED	IISNS LEGEND	SIGNAL MOUNTING VEH	M.A.	PED	**PPB PHASE	ARROW	POLE LOCATION E	B	C	REMARKS
①	19–4–100	30'	35'	12'	113W	Pearl St	SV–1–T	MAS MAS	SP–1–T			–2.6'		5.5'	INSTALL VEHICLE DETECTION CAMERA SYSTEM, EVP, AND DETAIL A SIGN ON S.M.A. INSTALL PEU ON LMA. SEE CONSTRUCTION NOTES 1 & 2.
②	PBA POST	–	–	–	–	–	–	–	–	ø8	→	7.8'		2.5'	
③	PBA POST	–	–	–	–	–	–	–	–	ø2	←		6.8'	1.7'	
④	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	–	–		–5.0'	6.7'	
⑤	19–3–100	30'	25'	12'	113W	Prospect Ave	SV–1–T	MAS	SP–1–T	–	–	3.2'		2.8'	INSTALL VEHICLE DETECTION CAMERA SYSTEM, AND EVP ON S.M.A. SEE CONSTRUCTION NOTES 1 & 2.
⑥	PBA POST	–	–	–	–	–	–	–	–	ø2 ← ø4 →		11.9'		8.26'	INSTALL APS SYSTEMS WITH TWO MOUNTING ADAPTOR
⑦	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	–	–		1.3'	5.9'	
⑧	19–4–100	30'	35'	12'	113W	Pearl St	SV–1–T	MAS MAS	SP–1–T	–	–		–10.5'	5.9'	INSTALL VEHICLE DETECTION CAMERA SYSTEM, AND EVP ON S.M.A. SEE CONSTRUCTION NOTES 1 & 2.
⑨	PBA POST	–	–	–	–	–	–	–	–	ø4	→		6.8'	1.75'	
⑩	PBA POST	–	–	–	–	–	–	–	–	ø6	←	1.8'		2.0'	
⑪	15TS	–	–	12'	113W	–		–	SP–1–T	–	–	–17.1'		2.1'	
⑫	18–3–100	17'	25'	–	–	Prospect Ave	SV–1–T	MAS	SP–1–T	–	–		–12.3'	8.0'	INSTALL VEHICLE DETECTION CAMERA SYSTEM, AND EVP ON S.M.A. SEE CONSTRUCTION NOTES 1 & 2.
⑬	PBA POST	–	–	–	–	–	–	–	–	ø6	←		–0.6'	4.8'	
⑭	PBA POST	–	–	–	–	–	–	–	–	ø8	←	9.8'		2.7'	
⑮	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	–	–	–6.2'		7.8'	

ALL POLES AND EQUIPMENT ARE NEW.
IISNS = LED INTERNALLY ILLUMINATED STREET NAME SIGN.
* LED LUMINAIRE TO BE NAV NAVION LED OR CITY APPROVED EQUAL.
** PEDESTRIAN PUSH BUTTON (PPB) SHALL BE AN ACCESSIBLE PEDESTRIAN SIGNAL (APS).



POLE PLACEMENT DETAIL
NTS

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

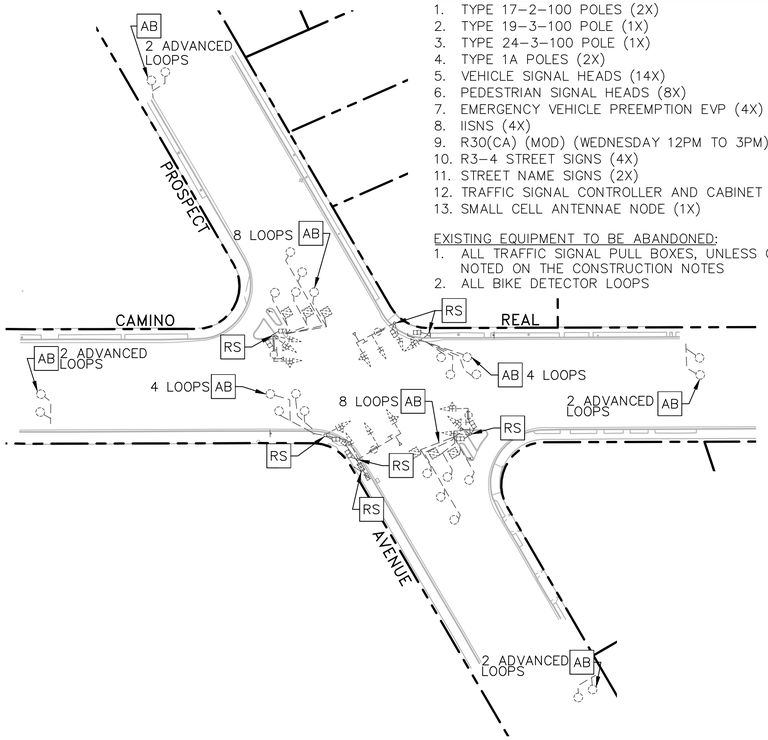
REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
TRAFFIC SIGNAL
PROSPECT AVENUE & PEARL STREET

DRAWN	RS	CHECKED	SD	SCALE	1" = 20'
APPROVED BY	ANDREW S. WINJE, P.E. CITY ENGINEER			DATE	
PROJECT NO. 41490		SHEET NO. 52 OF 58 SHEETS		DRAWING NO. E-16	

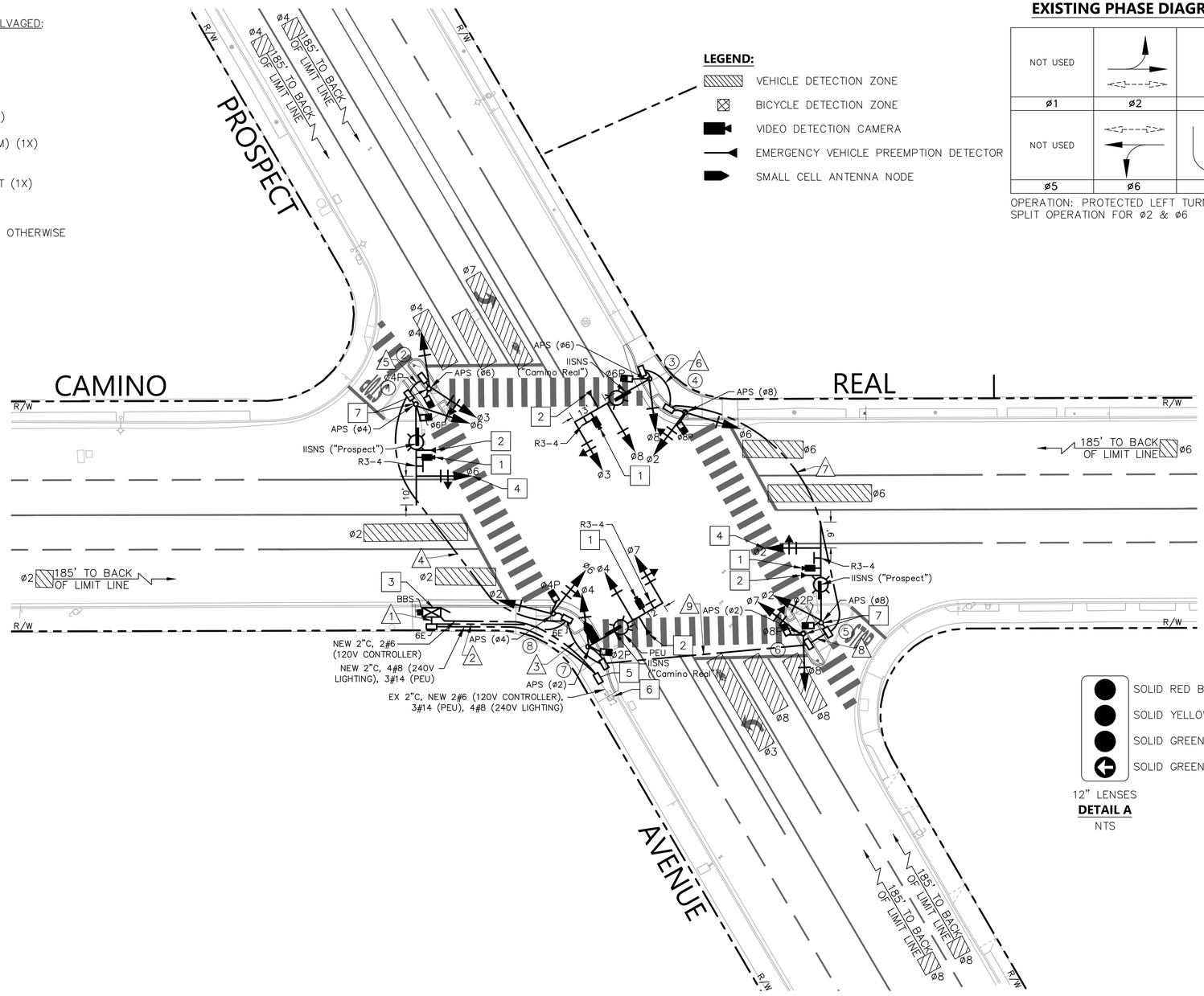
DRAWING: k:\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-17-rb-ts-pros-04.dwg PLOTTED: 2/6/2026 12:06 PM BY: Matthew



REMOVAL PLAN
1"=50'

EXISTING EQUIPMENT TO BE REMOVED AND SALVAGED:
1. TYPE 17-2-100 POLES (2X)
2. TYPE 19-3-100 POLE (1X)
3. TYPE 24-3-100 POLE (1X)
4. TYPE 1A POLES (2X)
5. VEHICLE SIGNAL HEADS (14X)
6. PEDESTRIAN SIGNAL HEADS (8X)
7. EMERGENCY VEHICLE PREEMPTION EVP (4X)
8. IISNS (4X)
9. R30(CA) (MOD) (WEDNESDAY 12PM TO 3PM) (1X)
10. R3-4 STREET SIGNS (4X)
11. STREET NAME SIGNS (2X)
12. TRAFFIC SIGNAL CONTROLLER AND CABINET (1X)
13. SMALL CELL ANTENNAE NODE (1X)

EXISTING EQUIPMENT TO BE ABANDONED:
1. ALL TRAFFIC SIGNAL PULL BOXES, UNLESS OTHERWISE NOTED ON THE CONSTRUCTION NOTES
2. ALL BIKE DETECTOR LOOPS

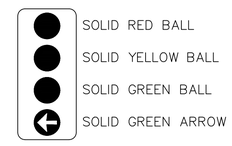


LEGEND:
- VEHICLE DETECTION ZONE
- BICYCLE DETECTION ZONE
- VIDEO DETECTION CAMERA
- EMERGENCY VEHICLE PREEMPTION DETECTOR
- SMALL CELL ANTENNA NODE

EXISTING PHASE DIAGRAM TO REMAIN

NOT USED			
ø1	ø2	ø3	ø4
NOT USED			
ø5	ø6	ø7	ø8

OPERATION: PROTECTED LEFT TURN FOR ø3 & ø7
SPLIT OPERATION FOR ø2 & ø6



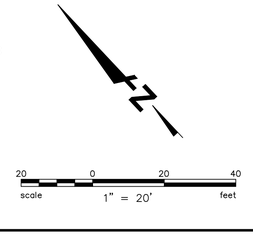
12" LENSES
DETAIL A
NTS

TRAFFIC SIGNAL GENERAL NOTES:

SEE GENERAL NOTE SHEET FOR GENERAL NOTES.
1. ALL MATERIALS AND EQUIPMENT SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR EXCEPT SMALL CELL ANTENNA NODE.
2. SMALL CELL ANTENNA NODE SHALL BE FURNISHED AND INSTALLED BY THE CITY.

CONSTRUCTION NOTES:

1. FURNISH AND INSTALL ITERIS VANTAGE VECTOR VIDEO DETECTION CAMERA ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS. SEE SPECIAL PROVISIONS. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER TO CONFIGURE VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER DIRECTION OF THE CITY REPRESENTATIVE.
2. FURNISH AND INSTALL EMERGENCY VEHICLE PREEMPTION DETECTOR ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS.
3. FURNISH AND INSTALL NEW CABINET WITH NEW TYPE 332 CABINET AND BACKUP BATTERY SYSTEM. FURNISH AND INSTALL NEW 2070 ATC CONTROLLER UNIT WITH D4 SOFTWARE. CONFIGURE NEW CONTOLLER UNIT AND PROVIDE ALL NECESSARY EQUIPMENT TO ACHIEVE INTENDED OPERATION SHOWN. FURNISH AND INSTALL NEW ACCESSIBLE PEDESTRIAN SIGNAL (APS) SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, AND ALL NECESSARY WIRES AND CONNECTORS TO ACHIEVE THE INTENDED OPERATION. FURNISH AND INSTALL NEW ITERIS VANTAGE VECTOR VIDEO DETECTION SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, SLDC CABLE, MONITOR, AND MOUSE. SETUP VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER THE DIRECTION OF THE CITY REPRESENTATIVE. FURNISH AND INSTALL CAT 5E CABLE OR AS SPECIFIED BY THE MANUFACTURER'S REPRESENTATIVE TO EACH CAMERA.
4. FURNISH AND INSTALL NEW 4-SECTION HEAD. SEE DETAIL A.
5. WHEN NEW SIGNAL IS READY TO BE ACTIVATED, SALVAGE EXISTING SIGNAL CONTROLLER AND DEMO EXISTING FOUNDATION. PRESERVE THE EXISTING ELECTRICAL CONDUIT RUN BETWEEN THE CONTROLLER AND SERVICE CABINET. INSTALL NO. 5 PULL BOX AT THE LOCATION OF THE PREVIOUS CONTROLLER'S FOUNDATION. RUN NEW WIRES TO THE SERVICE CABINET, NEW SIGNAL CONTROLLER, AND 6E PULL BOX AS SHOWN.
6. EXISTING SERVICE CABINET TO REMAIN.
7. FURNISH AND INSTALL NEW APS WITH VOICE ACTIVATION.



60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2
TRAFFIC SIGNAL
PROSPECT AVENUE & CAMINO REAL

DRAWN KW/MO	CHECKED SD	SCALE 1" = 20'	
APPROVED BY ANDREW S. WINJE, P.E. CITY ENGINEER		DATE	
PROJECT NO. 41490	SHEET NO. 53 OF 58 SHEETS	DRAWING NO. E-17	

DRAWING: k:\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-25-rb-ts-pros-03.dwg PLOTTED: 2/6/2026 1:00 PM BY: Matthew

CONDUCTOR SCHEDULE

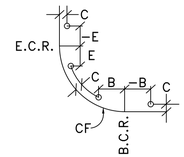
WIRE	POLE NO.	PHASE	1	2	3	4	5	6	7	8	9
12 WIRE CONDUCTOR SIGNAL CABLE (CSC) 12–#14	①	Φ6, Φ6P	1	1		1					
	②	Φ3, Φ4, Φ4P	1	1		1	1				
	③	Φ3, Φ8, Φ6P	1	1	1			1	1	1	1
	④	Φ2, Φ6, Φ8P	1	1	1				1	1	1
	⑤	Φ2, Φ2P	1	1	1					1	1
	⑥	Φ7, Φ8, Φ8P	1	1	1						1
	⑦	Φ4, Φ7, Φ2P	1	1	1						
	⑧	Φ2, Φ6, Φ4P	1	1							
		TOTAL	8	8	5	2	1	1	2	3	4
3 WIRE CONDUCTOR SIGNAL CABLE (CSC) 3–#14	①	APS (Φ4)	1	1		1					
	②	APS (Φ6)	1	1		1	1				
	③	APS (Φ6)	1	1	1			1	1	1	1
	④	APS (Φ8)	1	1	1				1	1	1
	⑤	APS (Φ8)	1	1	1					1	1
	⑥	APS (Φ2)	1	1	1						1
	⑦	APS (Φ2)	1	1	1						
	⑧	APS (Φ4)	1	1							
		TOTAL	8	8	5	2	1	1	2	3	4
#14 AWG	PEU			3	3						
#12 AWG	IISNS			2	2	2		2	2	2	2
#10 AWG	LED LUMINARIES			2	2	2		2	2	2	2
	SIGNAL COMMON	1	1	1	1	1	1	1	1	1	1
	TOTAL	1	3	3	3	1	3	3	3	3	3
VIDEO DETECTION POWER AND VIDEO		4	4	3	1		1	1	2	2	
WIRELESS RADIO (CAT5E)		1	1	1							
EMERGENCY VEHICLE PREEMPTION		4	4	3	1		1	1	2	2	
CONDUIT SIZE (IN.)		2–3	2–3	4	3	3	3	3	3	3	
PERCENT FILL		15%	17%	14%	9%	2%	7%	9%	14%	16%	

ALL CABLES AND CONDUITS ARE NEW

POLE SCHEDULE

STANDARD No.	TYPE	HEIGHT	S.M.A.	L.M.A.	LUM. LED	IISNS LEGEND	SIGNAL MOUNTING VEH	M.A.	PED	PPB** PHASE	ARROW	POLE LOCATION E	B	C	REMARKS
①	24–4–100	30'	35'	12'	166W*	Prospect	SV–1–T	MAS–4B	SP–1–T	ø4	←	–	–	1.5'	INSTALL VIDEO DETECTION SYSTEM, EVP, AND R3–4 ON S.M.A. INSTALL APS VOICE ACTIVATION. SEE CONSTRUCTION NOTE 5.
②	1A	10'	–	–	–	–	TV–1–T	–	SP–1–T	ø6	→	–	–	1.0'	INSTALL APS VOICE ACTIVATION.
③	19–4–100	30'	30'	12'	113W*	Camino Real	SV–1–T	MAS MAS	SP–1–T	ø6	←	–6.5'	–	3.0'	INSTALL VIDEO DETECTION SYSTEM, EVP, AND R3–4 ON S.M.A.
④	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø8	←	–	1.0'	2.5'	DO NOT REINSTALL R30(CA) (MOD) (WEDNESDAY 12PM TO 3PM) ON POLE. MOVE SIGN; SEE SS PLANS.
⑤	24–4–100	30'	35'	12'	166W*	Prospect	SV–1–T	MAS–4B	SP–1–T	ø8	←	–	–	1.5'	INSTALL VIDEO DETECTION SYSTEM, EVP, AND R3–4 ON S.M.A. INSTALL APS VOICE ACTIVATION. SEE CONSTRUCTION NOTE 5.
⑥	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø2	→	–	–	1.3'	INSTALL APS VOICE ACTIVATION.
⑦	19–4–100	30'	30'	12'	113W*	Camino Real	SV–1–T	MAS MAS	SP–1–T	ø2	←	–7.5'	–	3.3'	INSTALL VIDEO DETECTION SYSTEM, EVP, AND R3–4 ON S.M.A. INSTALL PEU ON L.M.A.
⑧	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø4	←	–	1.0'	2.6'	

ALL POLES AND EQUIPMENT ARE NEW.
IISNS = LED INTERNALLY ILLUMINATED STREET NAME SIGN.
* LED LUMINAIRE TO BE NAV NAVION LED OR CITY APPROVED EQUAL.
** ACCESSIBLE PEDESTRIAN PUSH BUTTON (PPB) SHALL BE AN ACCESSIBLE PEDESTRIAN SIGNAL (APS).



POLE PLACEMENT DETAIL
NTS

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

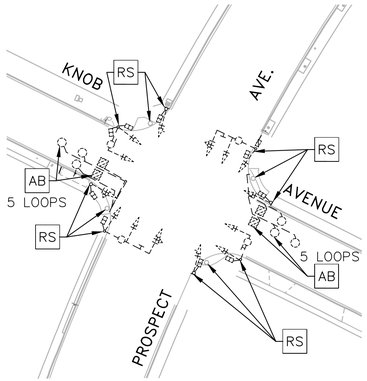
REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
TRAFFIC SIGNAL
PROSPECT AVENUE & CAMINO REAL

DRAWN	CHECKED	SCALE
KW/MO	SD	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER
DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	54 OF 58 SHEETS	E-18

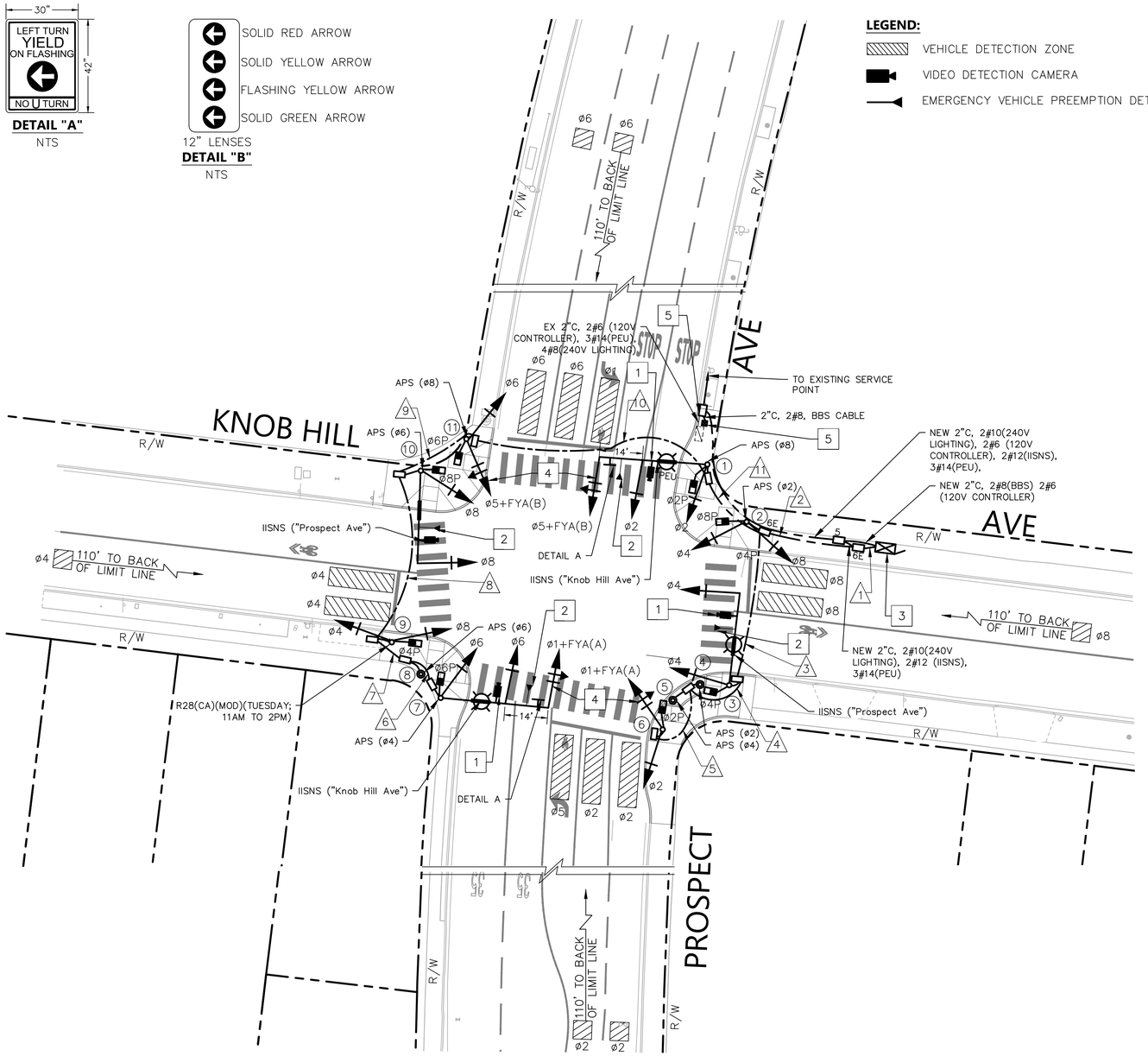
DRAWING: k:\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-25-rb-tss-pros-03.dwg PLOTTED: 2/6/2026 11:17 AM BY: Matthew



REMOVAL PLAN
1"=50'

DETAIL "A"
NTS

12" LENSES
DETAIL "B"
NTS



LEGEND:

- VEHICLE DETECTION ZONE
- VIDEO DETECTION CAMERA
- EMERGENCY VEHICLE PREEMPTION DETECTOR

EXISITING PHASE DIAGRAM

NOT USED	PM	NOT USED	PM
ø1	ø2	ø3	ø4
NOT USED	PM	NOT USED	PM
ø5	ø6	ø7	ø8

OPERATION:
PERMITTED LEFT TURN FOR ø2, ø6, ø4, ø8
PM=PERMISSIVE

PROPOSED PHASE DIAGRAM

	FYA(A)	NOT USED	PM
ø1	ø2	ø3	ø4
	FYA(B)	NOT USED	PM
ø5	ø6	ø7	ø8

OPERATION: PROTECTED LEFT TURN FOR ø1, ø5
PERMISSIVE LEFT TURN FOR ø4, ø8
PERMITTED OPPOSING LEFT TURN (FYA) FOR ø2, ø6
FYA = FLASHING YELLOW ARROW

EXISTING EQUIPMENT TO BE REMOVED AND SALVAGED:
1. TYPE 17-2-100 POLES (3X)
2. TYPE 16-1-100 POLES (1X)
3. TYPE 1A POLES (4X)
4. VEHICLE SIGNAL HEADS (12X)
5. PEDESTRIAN SIGNAL HEADS (8X)
6. PUSH BUTTON ASSEMBLY (PBA) (4X)
7. R-30B (CA) STREET SIGNS (2X)
8. R26 (CA) STREET SIGNS (2X)
9. STREET NAME SIGNS (2X)
10. TRAFFIC SIGNAL CONTROLLER (1X)
11. SERVICE CONTROLLER

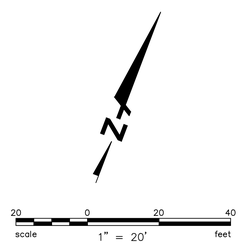
EXISTING EQUIPMENT TO BE ABANDONED:
1. ALL TRAFFIC SIGNAL PULL BOXES UNLESS OTHERWISE NOTED IN THE CONSTRUCTION NOTES
2. ALL BIKE DETECTOR LOOPS

TRAFFIC SIGNAL GENERAL NOTES:

SEE GENERAL NOTE SHEET FOR GENERAL NOTES.
1. ALL MATERIALS AND EQUIPMENT SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR EXCEPT LACO-1 WWV PROGRAM, RADIO CORRECTED TIME BASE UNIT AND ANTENNA.
2. LACO-1 WWV PROGRAM, RADIO CORRECTED TIME BASE UNIT AND ANTENNA SHALL BE FURNISHED AND INSTALLED BY THE CITY.

CONSTRUCTION NOTES:

1. FURNISH AND INSTALL ITERIS VANTAGE VECTOR VIDEO DETECTION CAMERA ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS. SEE SPECIAL PROVISIONS. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER TO CONFIGURE VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER DIRECTION OF THE CITY REPRESENTATIVE.
2. FURNISH AND INSTALL EMERGENCY VEHICLE PREEMPTION DETECTOR ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS.
3. FURNISH AND INSTALL NEW CABINET WITH NEW TYPE 332 CABINET. FURNISH AND INSTALL NEW 2070 ATC CONTROLLER UNIT WITH D4 SOFTWARE. CONFIGURE NEW CONTOLLER UNIT AND PROVIDE ALL NECESSARY EQUIPMENT TO ACHIEVE INTENDED OPERATION SHOWN. FURNISH AND INSTALL NEW ACCESSIBLE PEDESTRIAN SIGNAL (APS) SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, AND ALL NECESSARY WIRES AND CONNECTORS TO ACHIEVE THE INTENDED OPERATION.FURNISH AND INSTALL NEW ITERIS VANTAGE VECTOR VIDEO DETECTION SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, SLDC CABLE, MONITOR, AND MOUSE. SETUP VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER THE DIRECTION OF THE CITY REPRESENTATIVE. FURNISH AND INSTALL CAT 5E CABLE OR AS SPECIFIED BY THE MANUFACTURER'SREPRESENTATIVE TO EACH CAMERA.
4. FURNISH AND INSTALL 4-SECTION SIGNAL HEAD WITH FLASHING YELLOW ARROW. SEE DETAIL B ON THIS STREET.
5. CONTRACTOR TO REMOVE EXISTING CONTROLLER CABINET AND INSTALL WITH NO. 5 PULL BOX. MAINTAIN EXISTING ELECTRICAL CONDUIT TO EXISTING SERVICE CABINET.
6. FURNISH AND INSTALL NEW BATTERY BACK UP SYSTEM.



60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
TRAFFIC SIGNAL
PROSPECT AVENUE & KNOB HILL AVENUE

DRAWN RS	CHECKED SD	SCALE 1" = 20'
APPROVED BY ANDREW S. WINJE, P.E. CITY ENGINEER		DATE
PROJECT NO. 41490	SHEET NO. 55 OF 58 SHEETS	DRAWING NO. E-19

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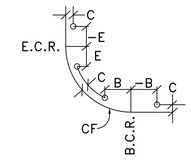
CONDUIT AND CONDUCTOR SCHEDULE

WIRE	POLE NO.	PHASE	1	2	3	4	5	6	7	8	9	10	11
12 WIRE CONDUCTOR SIGNAL CABLE (CSC) 12–#14	①	Φ2, Φ5, FYA(B), Φ2P	1	1									1
	②	Φ4, Φ8, Φ4P	1	1									
	③	Φ4, Φ4P	1	1	1								
	⑥	Φ1, FYA(A), Φ2, Φ2P	1	1	1	1	1						
	⑦	Φ1, FYA(A), Φ6, Φ6P	1	1				1	1	1	1	1	1
	⑨	Φ4, Φ8, Φ4P	1	1						1	1	1	1
	⑩	Φ8, Φ8P	1	1							1	1	1
	⑪	Φ5, FYA(B), Φ6, Φ6P	1	1								1	1
		TOTAL	8	8	2	1	1	1	1	2	3	4	5
3 WIRE CONDUCTOR SIGNAL CABLE (CSC) 3–#14	①	APS (Φ8)	1	1									1
	②	APS (Φ2)	1	1									
	④	APS (Φ2)	1	1	1	1							
	⑤	APS (Φ4)	1	1	1	1							
	⑦	APS (Φ4)	1	1				1	1	1	1	1	1
	⑧	APS (Φ6)	1	1					1	1	1	1	1
	⑩	APS (Φ6)	1	1							1	1	1
	⑪	APS (Φ8)	1	1								1	1
		TOTAL	8	8	2	2	0	1	2	2	3	4	5
#14 AWG	PEU			3	3								3
#12 AWG	IISNS			2	2			2	2	2	2	2	2
#10 AWG	LED LUMINARIES			2	2			2	2	2	2	2	2
	SIGNAL COMMON		1	1	1	1	1	1	1	1	1	1	1
	TOTAL		1	3	3	1	1	3	3	3	3	3	3
VIDEO DETECTION POWER AND VIDEO			4	4	1			1	1	1	2	2	3
EMERGENCY VEHICLE PREEMPTION			4	4	1			1	1	1	2	2	3
CONDUIT SIZE (IN.)			2–3	2–3	3	3	3	3	3	3	3	3	3
PERCENT FILL			14%	15%	10%	3%	1%	7%	9%	9%	14%	16%	12%

POLE SCHEDULE

No.	STANDARD TYPE	HEIGHT	S.M.A.	L.M.A.	LUM. LED	IISNS LEGEND	SIGNAL MOUNTING VEH	M.A.	PED	**PPB PHASE	ARROW	POLE LOCATION E	B	C	REMARKS
①	19–4–100	30'	35'	12'	165W	Knob Hill Ave	SV–1–T	MAS–4B MAS	SP–1–T	ø8	←	–10.8'		8.9'	INSTALL VEHICLE DETECTION CAMERA SYSTEM, EVP, AND DETAIL A SIGN ON S.M.A. INSTALL PEU ON LMA. SEE CONSTRUCTION NOTES 1, 2 & 4
②	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø2	→		–9.4'	9.2'	
③	19–3–100	30'	30'	12'	113W	Prospect Ave	SV–1–T	MAS	SP–1–T			0.0'		4.2'	INSTALL VEHICLE DETECTION CAMERA SYSTEM, AND EVP ON S.M.A. SEE CONSTRUCTION NOTES 1 & 2.
④	PBA POST	–	–	–	–	–		–	–	ø2	→	9.5'		2.6'	
⑤	PBA POST	–	–	–	–	–		–	–	ø4	←		15.5'	2.1'	
⑥	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T				5.7'	4.3'	
⑦	19–4–100	30'	35'	12'	165W	Knob Hill Ave	SV–1–T	MAS–4B MAS	SP–1–T	ø4	←		–4.1	8.8'	INSTALL VEHICLE DETECTION CAMERA SYSTEM, EVP, AND DETAIL A SIGN ON S.M.A. SEE CONSTRUCTION NOTES 1, 2 & 4
⑧	PBA POST	–	–	–	–	–		–	–	ø6	→	–1.42		12.6'	
⑨	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T			–12.1'		3.5'	INSTALL R28 (CA)(MOD)(TUESDAY; 11AM TO 2AM) ON THE POLE.
⑩	18–3–100	17'	30'	12'	–	Prospect Ave	SV–1–T	MAS	SP–1–T	ø6	←		–6.5'	12.7'	INSTALL VEHICLE DETECTION CAMERA SYSTEM, AND EVP ON S.M.A. SEE CONSTRUCTION NOTES 1 & 2.
⑪	1A	10'	–	–	–	–	TV–2–T	–	SP–1–T	ø8	→	–9.9'		8.4'	

ALL POLES AND EQUIPMENT ARE NEW.
IISNS = LED INTERNALLY ILLUMINATED STREET NAME SIGN.
* LED LUMINAIRE TO BE NAV NAVION LED OR CITY APPROVED EQUAL.
** PEDESTRIAN PUSH BUTTON (PPB) SHALL BE AN ACCESSIBLE PEDESTRIAN SIGNAL (APS).



POLE PLACEMENT DETAIL
NTS

60% SUBMITTAL (02/06/2026)
NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
TRAFFIC SIGNAL
PROSPECT AVENUE & KNOB HILL AVENUE

DRAWN	CHECKED	SCALE
RS	SD	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER
DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	56 OF 58 SHEETS	E-20

DRAWING: k:\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-17-rb-ts-pros-04.dwg PLOTTED: 2/6/2026 12:17 PM BY: Matthew

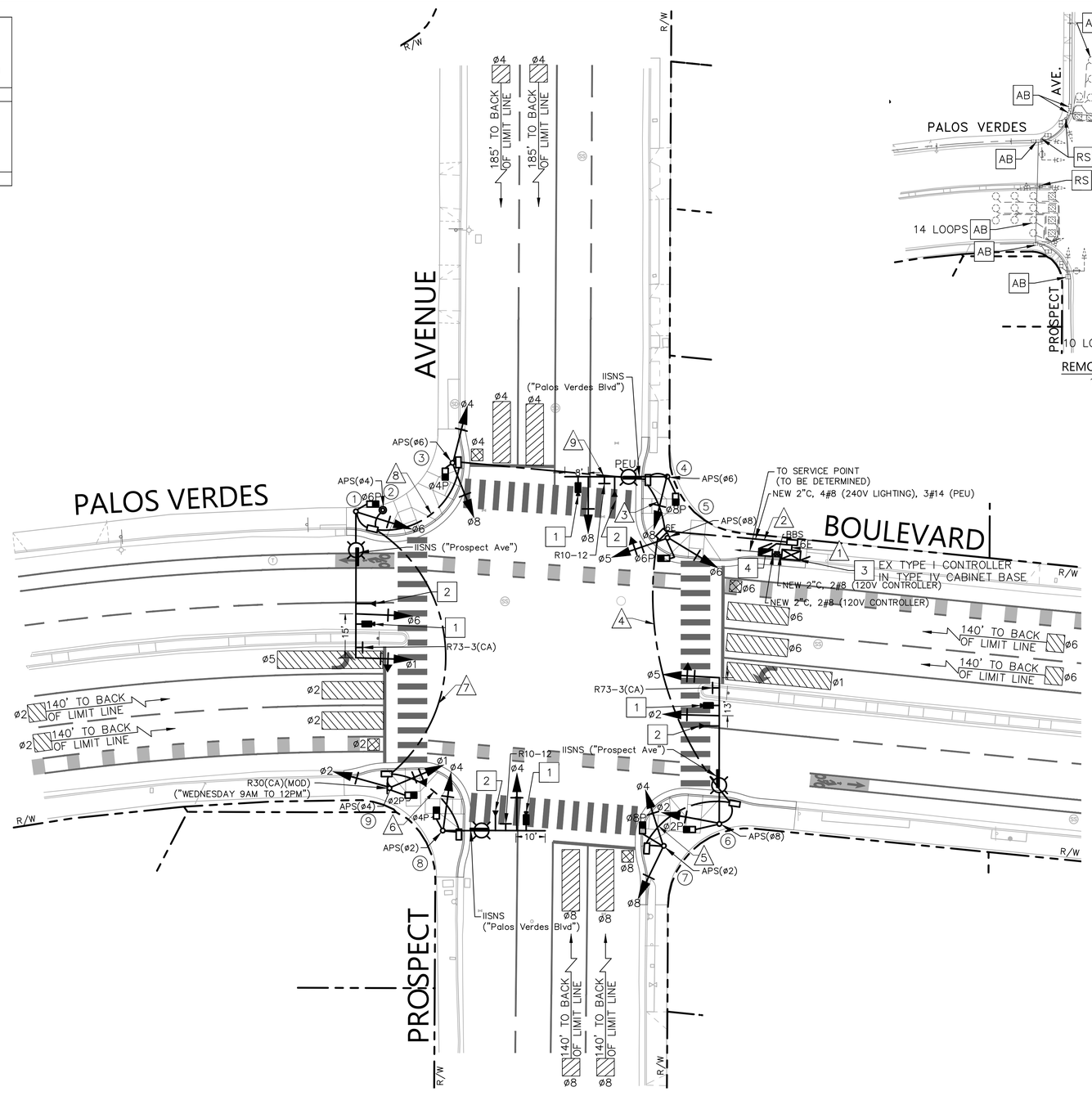
EXISTING PHASE DIAGRAM TO REMAIN

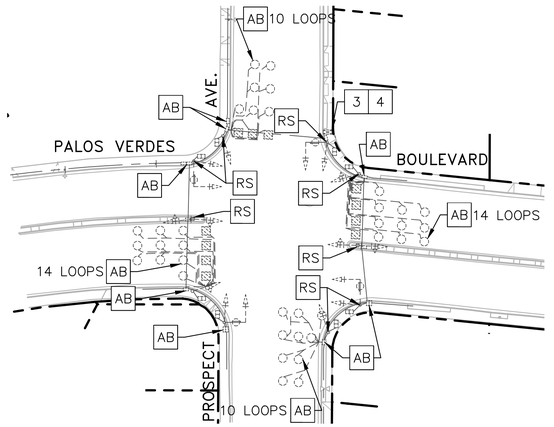
		NOT USED	PM
ø1	ø2	ø3	ø4
		NOT USED	PM
ø5	ø6	ø7	ø8

OPERATION: PROTECTED LEFT TURN FOR ø1 AND ø5
PM = PERMITTED
PERMITTED LEFT TURN FOR ø4 & ø8

LEGEND:

- VEHICLE DETECTION ZONE
- BICYCLE DETECTION ZONE
- VIDEO DETECTION CAMERA
- EMERGENCY PREEMPTION DETECTOR





REMOVAL PLAN
1"=50'

EXISTING EQUIPMENT TO BE REMOVED AND SALVAGED:

1. TYPE 1 POLE (4X)
2. TYPE XVII POLE (4X)
3. P.P.B. & POST (2X)
4. VEHICLE SIGNAL HEADS (16X)
5. PEDESTRIAN SIGNAL HEADS (8X)
6. STREET SIGNS (8X)
7. STREET NAME SIGNS (3X)
8. IISNS (4X)
9. TRAFFIC SIGNAL CABINET (1X)

EXISTING EQUIPMENT TO BE ABANDONED:

1. ALL TRAFFIC SIGNAL PULL BOXES, UNLESS OTHERWISE NOTED ON THE CONSTRUCTION NOTES
2. ALL DETECTOR LOOPS

TRAFFIC SIGNAL GENERAL NOTES:

SEE GENERAL NOTE SHEET FOR GENERAL NOTES.

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REGISTERED PROFESSIONAL ENGINEER
SHEILA AMPARO
78003
Exp 9-30-27
CIVIL
STATE OF CALIFORNIA

CONSTRUCTION NOTES:

1. FURNISH AND INSTALL ITERIS VANTAGE VECTOR VIDEO DETECTION CAMERA ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS. SEE SPECIAL PROVISIONS. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER TO CONFIGURE VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER DIRECTION OF THE CITY REPRESENTATIVE.
2. FURNISH AND INSTALL EMERGENCY VEHICLE PREEMPTION DETECTOR ON SIGNAL MAST ARM PER MANUFACTURER'S SPECIFICATIONS.
3. FURNISH AND INSTALL NEW CABINET WITH NEW TYPE 332 CABINET AND BACKUP BATTERY SYSTEM. FURNISH AND INSTALL NEW 2070 ATC CONTROLLER UNIT WITH D4 SOFTWARE. CONFIGURE NEW CONTOLLER UNIT AND PROVIDE ALL NECESSARY EQUIPMENT TO ACHIEVE INTENDED OPERATION SHOWN. FURNISH AND INSTALL NEW ACCESSIBLE PEDESTRIAN SIGNAL (APS) SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, AND ALL NECESSARY WIRES AND CONNECTORS TO ACHIEVE THE INTENDED OPERATION. FURNISH AND INSTALL NEW ITERIS VANTAGE VECTOR VIDEO DETECTION SYSTEM COMPLETE WITH CENTRAL CONTROL UNIT, SLDC CABLE, MONITOR, AND MOUSE. SETUP VIDEO DETECTION ZONES INCLUDING BICYCLE ZONES SHOWN ON PLANS PER THE DIRECTION OF THE CITY REPRESENTATIVE. FURNISH AND INSTALL CAT 5E CABLE OR AS SPECIFIED BY THE MANUFACTURER'S REPRESENTATIVE TO EACH CAMERA.
4. INSTALL NEW SERVICE CABINET TO SERVICE POINT; FINAL DESIGN WILL BE IN COORDINATION WITH SCE.

N

20 0 20 40
scale 1" = 20' feet

REVISIONS	
DATE	DESCRIPTION

CITY OF REDONDO BEACH
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL COMMUNICATION AND NETWORK SYSTEM - PHASE 2
TRAFFIC SIGNAL
PROSPECT AVENUE & PALOS VERDES BOULEVARD

DRAWN KW/MO	CHECKED SD	SCALE 1" = 20'	
APPROVED BY ANDREW S. WINJE, P.E. CITY ENGINEER		DATE	
PROJECT NO. 41490	SHEET NO. 57 OF 58 SHEETS	DRAWING NO. E-21	

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CONDUCTOR SCHEDULE

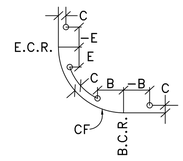
WIRE	POLE NO.	PHASE	1	2	3	4	5	6	7	8	9
12 WIRE CONDUCTOR SIGNAL CABLE (CSC) 12-#14	①	Φ1, Φ6, Φ6P	1	1	1					1	1
	②	Φ4, Φ8, Φ4P	1	1	1						1
	③	Φ8, Φ8P	1	1	1						
	④	Φ5, Φ6, Φ6P	1	1							
	⑤	Φ2, Φ5, Φ2P	1	1		1					
	⑥	Φ4, Φ8, Φ8P	1	1		1	1				
	⑦	Φ4, Φ4P	1	1	1			1	1	1	1
	⑧	Φ1, Φ2, Φ2P	1	1	1				1	1	1
		TOTAL	8	8	5	2	1	1	2	3	4
3 WIRE CONDUCTOR SIGNAL CABLE (CSC) 3-#14	①	APS (Φ4)	1	1	1					1	1
	②	APS (Φ6)	1	1	1						1
	③	APS (Φ6)	1	1	1						
	④	APS (Φ8)	1	1							
	⑤	APS (Φ8)	1	1		1					
	⑥	APS (Φ2)	1	1		1	1				
	⑦	APS (Φ2)	1	1	1			1	1	1	1
	⑧	APS (Φ4)	1	1	1				1	1	1
		TOTAL	8	8	5	2	1	1	2	3	4
#14 AWG	PEU			3	3						
#12 AWG	IISNS			2	2	2		2	2	2	2
#10 AWG	LED LUMINARIES			2	2	2		2	2	2	2
	SIGNAL COMMON		1	1	1	1	1	1	1	1	1
	TOTAL		1	3	3	3	1	3	3	3	3
VIDEO DETECTION POWER AND VIDEO			4	4	3	1		1	1	2	2
EMERGENCY VEHICLE PREEMPTION			4	4	3	1		1	1	2	2
CONDUIT SIZE (IN.)			2-3	2-3	4	3	3	3	3	3	3
PERCENT FILL			4%	15%	12%	9%	2%	7%	9%	14%	16%

ALL CABLES AND CONDUITS ARE NEW

POLE SCHEDULE

No.	STANDARD TYPE	HEIGHT	S.M.A.	L.M.A.	LUM. LED	IISNS LEGEND	SIGNAL MOUNTING VEH	M.A.	PED	PPB** PHASE	ARROW	POLE LOCATION E	B	C	REMARKS
①	29-5-100	30'	50'	15'	166W*	Prospect Ave	SV-1-T	MAS MAS	SP-1-T	–	–	-6.4'	–	6.2'	INSTALL VIDEO DETECTION SYSTEM, EVP, AND R73-3(CA) ON S.M.A.
②	PBA POST	–	–	–	–	–	–	–	–	ø4	←	2.25'	–	8.6'	
③	1A	10'	–	–	–	–	TV-2-T	–	SP-1-T	ø6	→	–	4.85'	3.95'	
④	24-4-100	30'	35'	12'	129*	Palos Verdes Blvd	SV-1-T	MAS	SP-1-T	ø6	←	-12.6'	–	8.7'	INSTALL VIDEO DETECTION SYSTEM, EVP, AND R10-12 ON S.M.A. INSTALL SIGNAL HEAD ON S.M.A. 10 FEET FROM END OF POLE. INSTALL PEU ON L.M.A.
⑤	1A	10'	–	–	–	–	TV-2-T	–	SP-1-T	ø8	→	–	5.4'	4.7'	
⑥	29-5-100	30'	50'	15'	166W*	Prospect Ave	SV-1-T	MAS MAS	SP-1-T	ø8	←	-11.3'	–	9.4'	INSTALL VIDEO DETECTION SYSTEM, EVP, AND R73-3(CA) ON S.M.A.
⑦	1A	10'	–	–	–	–	TV-2-T	–	SP-1-T	ø2	→	–	-2.8'	7.8'	
⑧	24-4-100	30'	35'	12'	129W*	Palos Verdes Blvd	SV-1-T	MAS	SP-1-T	ø2	←	-6.3'	–	7.4'	INSTALL VIDEO DETECTION SYSTEM, EVP, AND R10-12 ON S.M.A. INSTALL SIGNAL HEAD ON S.M.A. 10 FEET FROM END OF POLE.
⑨	1A	10'	–	–	–	–	TV-2-T	–	SP-1-T	ø4	→	–	-10.5'	6.7'	INSTALL R30(CA)(MOD) ON POLE.

ALL POLES AND EQUIPMENT ARE NEW.
IISNS = LED INTERNALLY ILLUMINATED STREET NAME SIGN.
* LED LUMINAIRE TO BE NAV NAVION LED OR CITY APPROVED EQUAL.
** PEDESTRIAN PUSH BUTTON (PPB) SHALL BE AN ACCESSIBLE PEDESTRIAN SYSTEMS (APS).



POLE PLACEMENT DETAIL
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N

20 0 20 40
scale 1" = 20' feet

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CITY OF REDONDO BEACH
CALIFORNIA
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ENGINEERING SERVICES DIVISION

REDONDO BEACH TRAFFIC SIGNAL
COMMUNICATION AND NETWORK SYSTEM - PHASE 2
TRAFFIC SIGNAL
PROSPECT AVENUE & PALOS VERDES BOULEVARD

DRAWN	CHECKED	SCALE
KW/MO	SD	1" = 20'

APPROVED BY
ANDREW S. WINJE, P.E. CITY ENGINEER
DATE

PROJECT NO.	SHEET NO.	DRAWING NO.
41490	58 OF 58 SHEETS	E-22

DRAWING: K:\2024\241992_redondo_beach_traffic_signal_communication\eng-1\dwg\sheets\241992-25-rb-ts-pros-03.dwg PLOTTED: 2/6/2026 11:28 AM BY: Matthew

Administrative Report

J.3., **File #** PWSS26-0535 **Meeting Date:** 4/27/2026

To: **PUBLIC WORKS, SAFETY, AND SUSTAINABILITY COMMISSION**

From: DEPARTMENT OF PUBLIC WORKS

TITLE

RECEIVE AND FILE REPORT ON THE FULTON PLAYFIELD MULTI-BENEFIT INFILTRATION PROJECT, JOB NO. 60280

EXECUTIVE SUMMARY

The Fulton Playfield Multi-Benefit Infiltration Project (Project) is included in the updated and City Council approved Watershed Management Program (WMP) as a priority project. The design of the Project is now complete, and the bid ready construction documents, plans and specifications were approved by City Council on April 21, 2026. The Project will be advertised for competitive bidding on April 28, 2026. The Engineer's construction estimate for the project is $6.6 million. Construction is expected to begin in the summer of 2026 and is estimated to take 120 working days to complete.

BACKGROUND

The City of Redondo Beach, in collaboration with the Cities of Hermosa Beach, Manhattan Beach and Torrance, along with the Los Angeles County Flood Control District (LACFCD) formed the Beach Cities Watershed Management Group to develop a WMP to comply with the municipal separate storm sewer system (MS4) permit requirements. The WMP defined a set of projects and activities each jurisdiction would undertake to reduce pollution entering the ocean in compliance with standards set by the Regional Water Quality Control Board. The City Council approved the first WMP on June 16, 2015 and approved the updated WMP on June 8, 2021. The updated WMP includes the Fulton Project as a priority regional project for reducing the potential for pollutants being discharged into the Santa Monica Bay.

Fulton Playfield is an open green space and play area at the southeast corner of the intersection of Ripley Avenue and Rindge Lane. The playfield is adjacent to an 8.5-foot by 10-foot LACFCD storm drain that runs under Ripley Avenue and connects directly to the Herondo Storm Drain on 190th St, which drains into the Santa Monica Bay. An underground flood control retention basin underlies the western half of the playfield and provides approximately 6.4 acre-feet of passive storage to help relieve flooding during storm events. Drainage from approximately 440 acres in the City of Redondo Beach and 25 acres in the City of Manhattan Beach is tributary to the basin. The Project proposes to add infiltration elements to the existing flood control basin in order to transform it into a regional water quality project, while still maintaining its flood control capacity and function. The Project will also incorporate a variety of other benefits. Parkway greening via the installation of ocean-friendly rain gardens is proposed along the southeasterly side of Ripley Avenue to capture and treat street flows that aren't currently tributary to the detention basin. An exhibit showing project elements is attached.

The Project was added to the City's CIP in FY 2022-23. On April 18, 2023, the City Council approved the second amendment to the Agreement with Geosyntec Consultants, Inc. for services related to planning, environmental documentation, community outreach, and final design of the Project. The Project was declared to be categorically exempt under CEQA in August 2023 with notice sent to the State and the Los Angeles County Clerk that same month, see attached documents. A community meeting was held on February 2024 to share conceptual plans with neighbors, residents, and other interested parties at the school adjacent to the playfield. A meeting summary is attached to this report. Public feedback was adopted into the design elements that involved use of the park.

Due to its integration with the LACFCD facilities, approval of the design was also required from the Los Angeles County Department of Public Works. Approval of the conceptual plan was achieved in July 2024 and the final design review of the plans was completed by Los Angeles County Public Works in December 2025. The bid-ready plans and specifications have now been finalized and are ready for competitive bidding. City Council approved the plans and specifications and authorized the City Clerk to advertise the project for bids. The plans and specifications are available for review at the plans and specifications review area located behind the Engineering permit counter at the City Hall and will be advertised and posted online on April 28, 2026.

The Engineer's construction estimate for the project is $6,600,000. Construction is expected to begin in late summer of 2026 and is anticipated to take 120 working days to complete. Additional community outreach is planned when the construction phase commences.

To provide funding for the project, staff applied for funds under the then newly adopted LA County Measure W (Safe Clean Water Act) program. On November 21, 2022, the LACFCD Board approved the FY 2022-2023 Stormwater Investment Plan that included initial funding for the Project in the amount of $4,292,138. The transfer Agreement for these funds was completed on May 18, 2023. To address the total estimated construction cost, a Project Modification Form (PMR) requesting additional funding in the amount of $4,010,000 was submitted to LACFCD in October 2024. The request was approved by the County during FY 2025-2026. As a result, the Project is now fully funded using Safe Clean Water (SCW) grants totaling $8,302,138. The Table below shows a summary and tentative disbursement schedule:

Fiscal Year	Approved Funding	Increase Amount Requested	Revised Funding	Comment
FY 22-23	$93,000		$93,000	Received
FY 23-24	$2,073,000		$2,073,000	Received
FY 24-25	$1,683,000		$1,683,000	Expected in Apr 2026
FY 25-26	$50,500	$2,449,500	$2,500,000	Expected in Jun 2026
FY 26-27	$46,500		$46,500	Expected in Dec 2026
FY 27-28	$346,138	$1,560,500	$1,906,638	Expected in Dec 2027
Total	$4,292,138	$4,010,000	$8,302,138	

Therefore, it is recommended that the PWSSC receive and file this report.

COORDINATION

Project planning has been coordinated by the Public Works Department and the Beach Cities Watershed Management Group.

FISCAL IMPACT

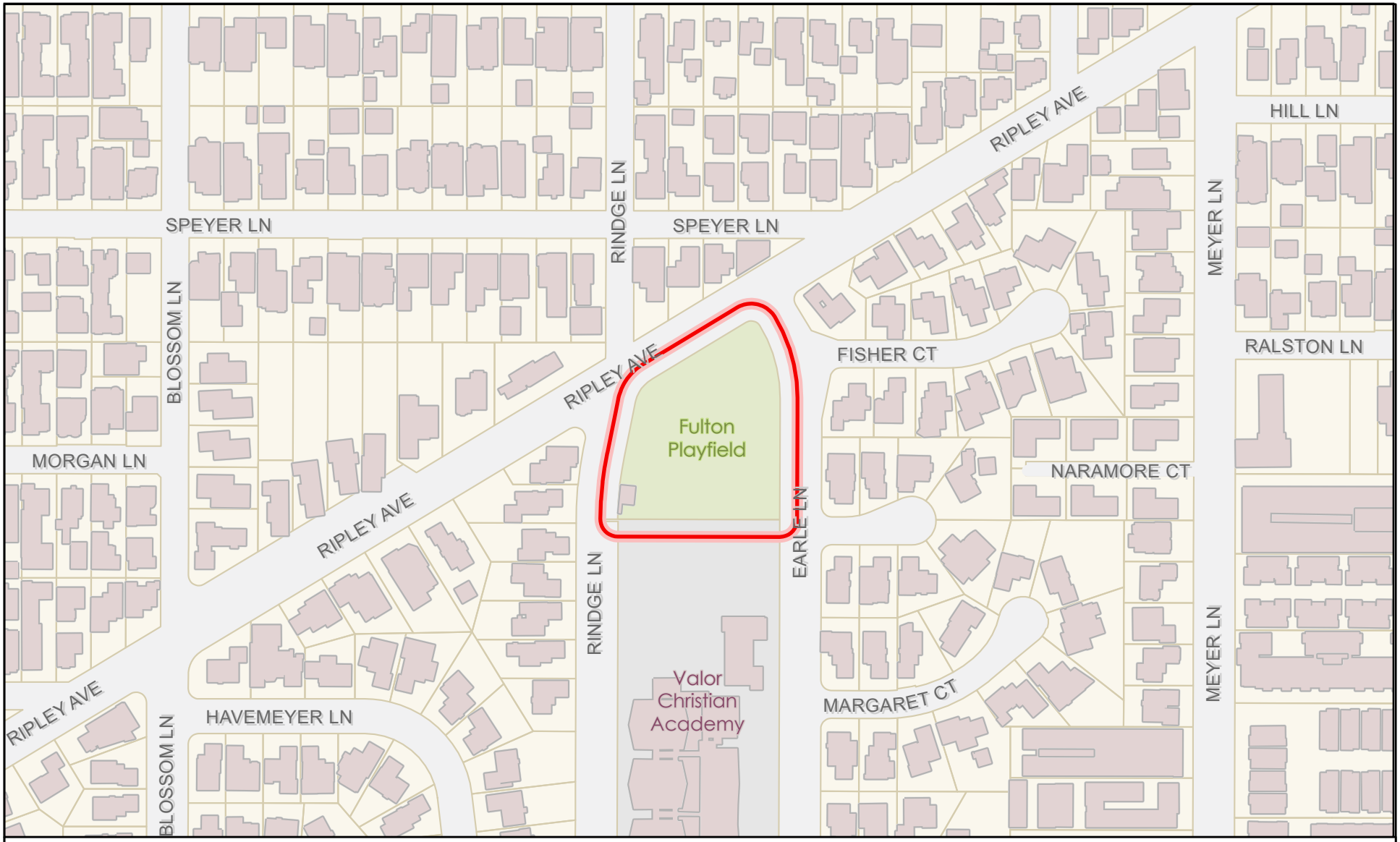
The Project is funded entirely through Regional Safe Clean Water grant funds totaling $8,302,138. Grant payments will be disbursed to the City based on the outlined schedule above, and any unspent funds will be returned to SCW. It is likely that the construction schedule will precede the final year of the grant distribution cycle, requiring the City to advance up to $1.9M in funding for a single fiscal year. Staff from the Public Works and Finance Departments will coordinate this advancement, if needed, to ensure there is capacity in the CIP Budget to carry the cost prior to reimbursement. Funding for the Project is included in the Fulton Playfield Infiltration Project #60280.

Funding from SCW		**Expenditures**	
Planning	$ 93,000	Geosyntec Contract	$ 437,900
Design	$ 369,000	Construction	$ 6,600,000
Construction	$ 7,491,138	O & M	$ 349,000
O & M	$ 349,000	Contingency	$ 660,000
		Inspection &CM	$ 255,238
Total	$ 8,302,138	Total	$ 8,302,138

ATTACHMENTS

- Location Map

- Project Elements - Fulton Playfield Infiltration Project #60280
- Meeting Notes - Community Meeting, February 15, 2024
- Presentation Slides



Project Location

N

Fulton Playfield Multi-Benefit Infiltration Project, Job No. 60280

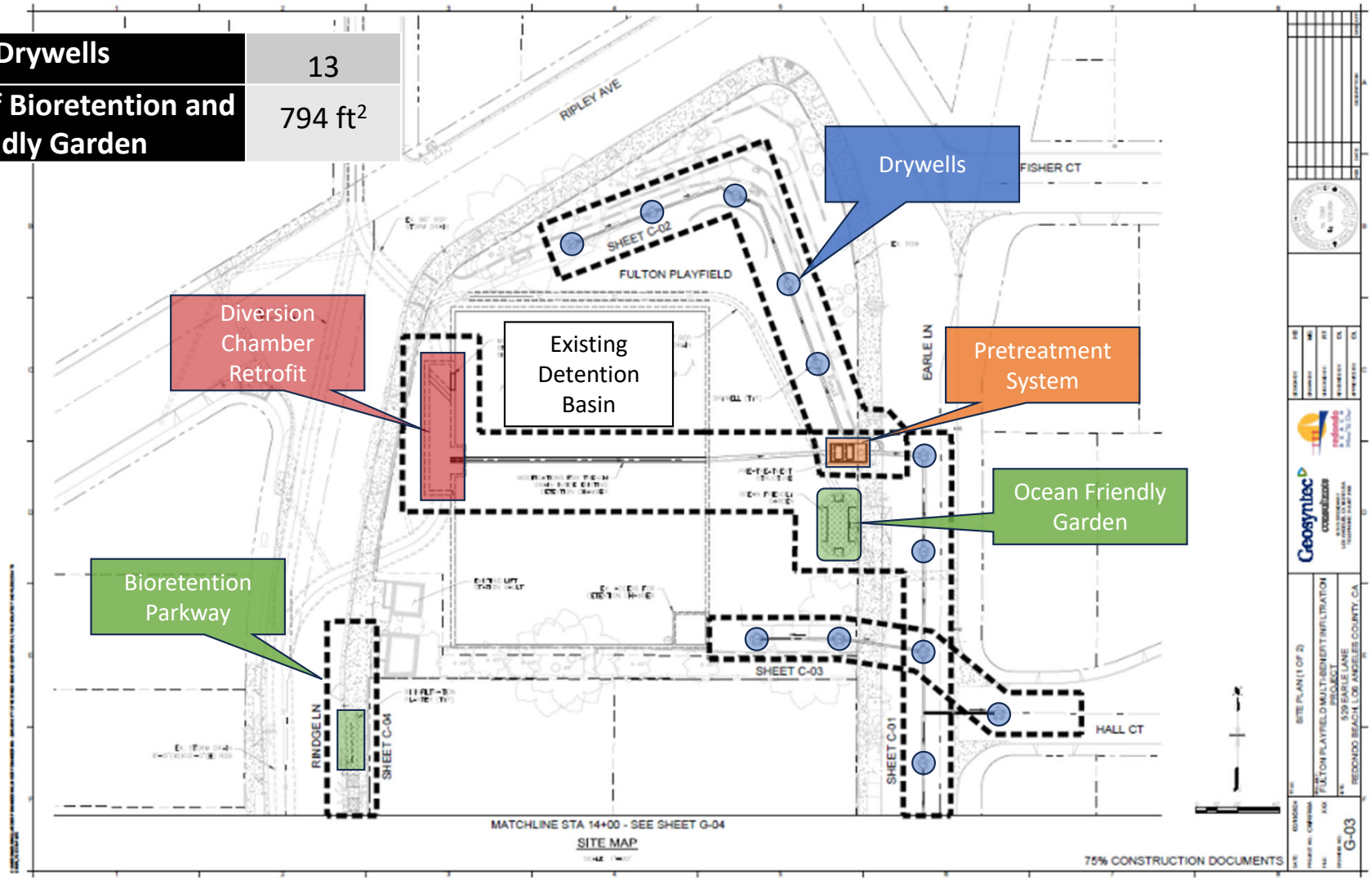
REDONDO BEACH

Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet

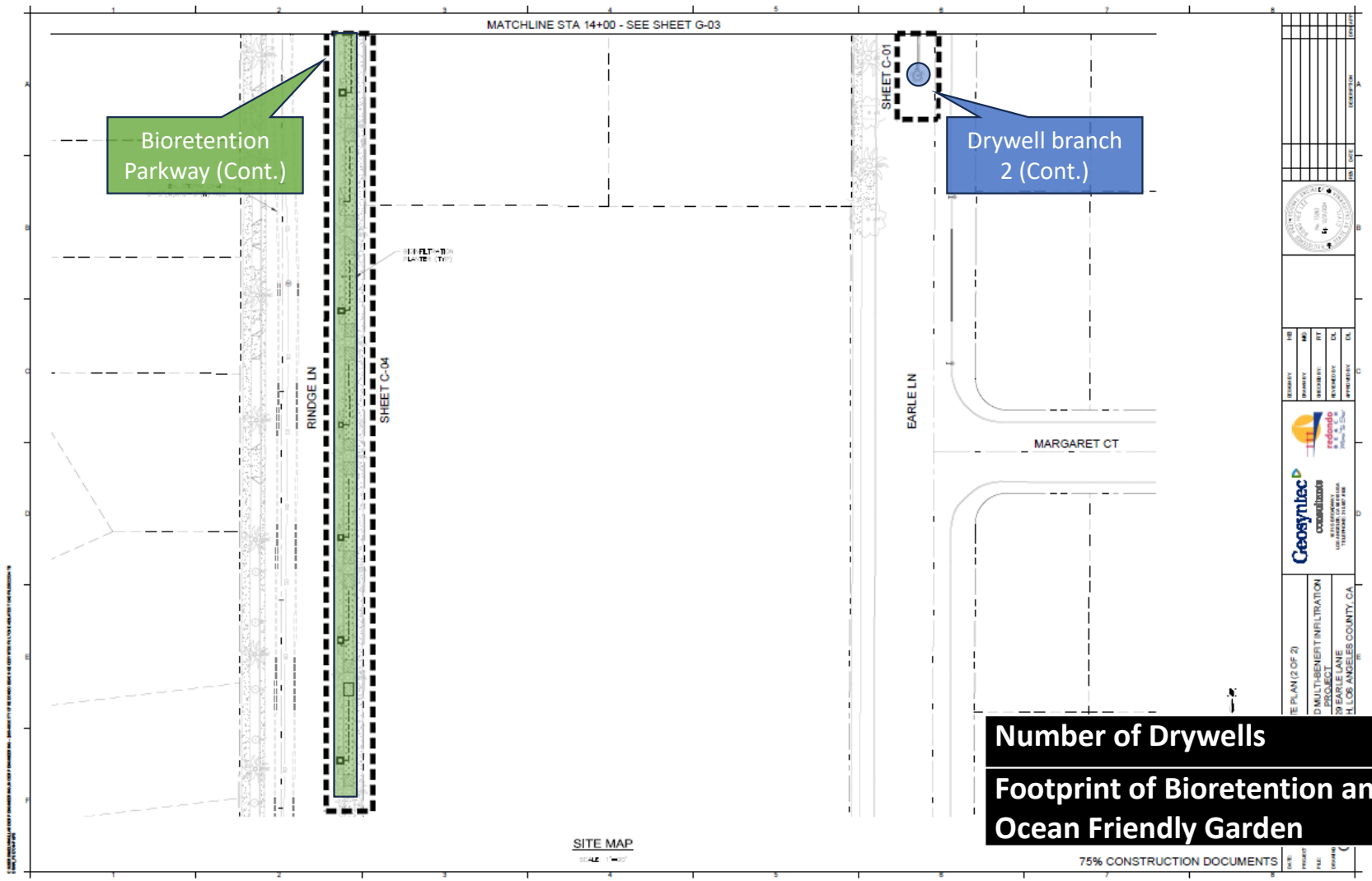
Exported: 3/31/2026

Project Components

Number of Drywells	13
Footprint of Bioretention and Ocean Friendly Garden	794 ft^2



Project Components



Number of Drywells	13
Footprint of Bioretention and Ocean Friendly Garden	794 ft^2

City of Redondo Beach
Valor Christian Academy
Thursday, February 15, 2024

Community Meeting Summary

On Thursday, February 15, 2024, Murakawa Communications and Geosyntec Consultants held a meeting with the local Redondo Beach residents and stakeholders of the Fulton Playfield. The purpose of the meeting was to discuss the project scope and potential BMPs to be installed while also outlining our goals to meet watershed requirements for this region. While we provided the latest design updates to the attendees, we also allotted time for public feedback and to address any concerns.

Presenters included Curtis Fang (Geosyntec), Haley Bauer (Geosyntec), Ashwini Bhide (City of Redondo Beach), and Josh Melendez (Murakawa Communications).

An attendee list is attached separately. It was estimated that over 20 people were in attendance for the meeting, and not all attendees signed in. Below is a list of items that were discussed during the meeting:

Project Overview:

- We provided an update on the latest design elements for the project and remaining activities needed to complete the design phase.
- Provided historical context on the existing stormwater infrastructure and the need to expand upon its capabilities.
- Updated the community about anticipated dates for design phase completion and anticipated construction dates.
- Inquired attendees about any surface park improvements they would like to see implemented.
- Allotted time for Q&A.

Key Concerns

- Playfield impacts
    - Residents voiced their concerns about losing any amount of green space from this project.
        - We ensured that any enhancements/improvements on the existing infrastructure will be implemented in the subsurface space, while the surface green space will be restored in kind.
    - Space is used for all types of stakeholders and community members, with Valor Christian Academy and LAUSD also utilizing the space for their students. Residents want

to keep this arrangement in place as many students and other neighborhood children use the space for recreation.
    - While some residents requested for some planters (or bio-retainable gardens) around the perimeter of the playfield, the overwhelming majority stated that they would prefer to keep the green space as-is following the completion of this project.
        - We anticipate that other neighborhood residents share this same viewpoint.
        - For any surface improvements or additions, it should not take away any green space.
    - Residents did not want any trees to be removed from the area.
        - We confirmed that trees will not be removed.
- Construction impacts
    - Attendees voiced their concerns about the duration of the construction and how long stakeholders will not be able to use this space.
        - Residents stated that there was previous projects at the playfield that resulted in significant restricted access to the park.
    - Residents requested that construction equipment/vehicle be staged on Rindge Lane
        - Earle Lane has been used in previous projects for staging/parking, but residents complained that they vehicles take up significant parking space, especially since street sweeping occurs on this street.
        - Earle Lane residents also stated that construction vehicle mobilization on their street increases dust and vibration impacts.
    - Residents requested that construction vehicles utilize Rindge Lane as the primary point of ingress/egress to the project area.
    - Attendees inquired about our site investigation preparations and how we determined if performing work on this playfield is feasible.
        - Some had concerns about the type of sediment in this area that may cause unforeseen circumstances during construction.
        - We confirmed that geotechnical surveys have been performed for this area and ongoing review and analysis will continue to ensure that this project meets safety standards.
- Parking impacts
    - Residents preferred if construction staging/parking occur on Rindge Lane instead of Earle Lane as this will minimize street parking impact to those living around Earle Lane.
    - Most property owners also have their own designated driveways.
- Other Comments/Concerns
    - Attendees inquired about the reasoning behind why Fulton Playfield was selected for this project as opposed to other parks in the nearby area.
        - We relayed that this is due to watershed capabilities, which was affirmed by pre-construction surveys of the area.
        - Some
    - Many had follow-ups concerns about the safety of this project, with respect to the conditions of the soil/land and to the proximity of residents' homes to the project area.

- We reaffirmed that we will continue to keep the community updated with latest designs and project developments as we do not anticipate starting construction until at least 2028.

# # #

Fulton Playfield Multi-Benefit Infiltration Project

Stormwater Quality Project for Santa Monica Bay

REDONDO BEACH

Public Works Department
Engineering Services Division
April 28, 2026

Background

Beach Cities Watershed Management Group

High-Priority Project

- Primary pollutant of concern: bacteria

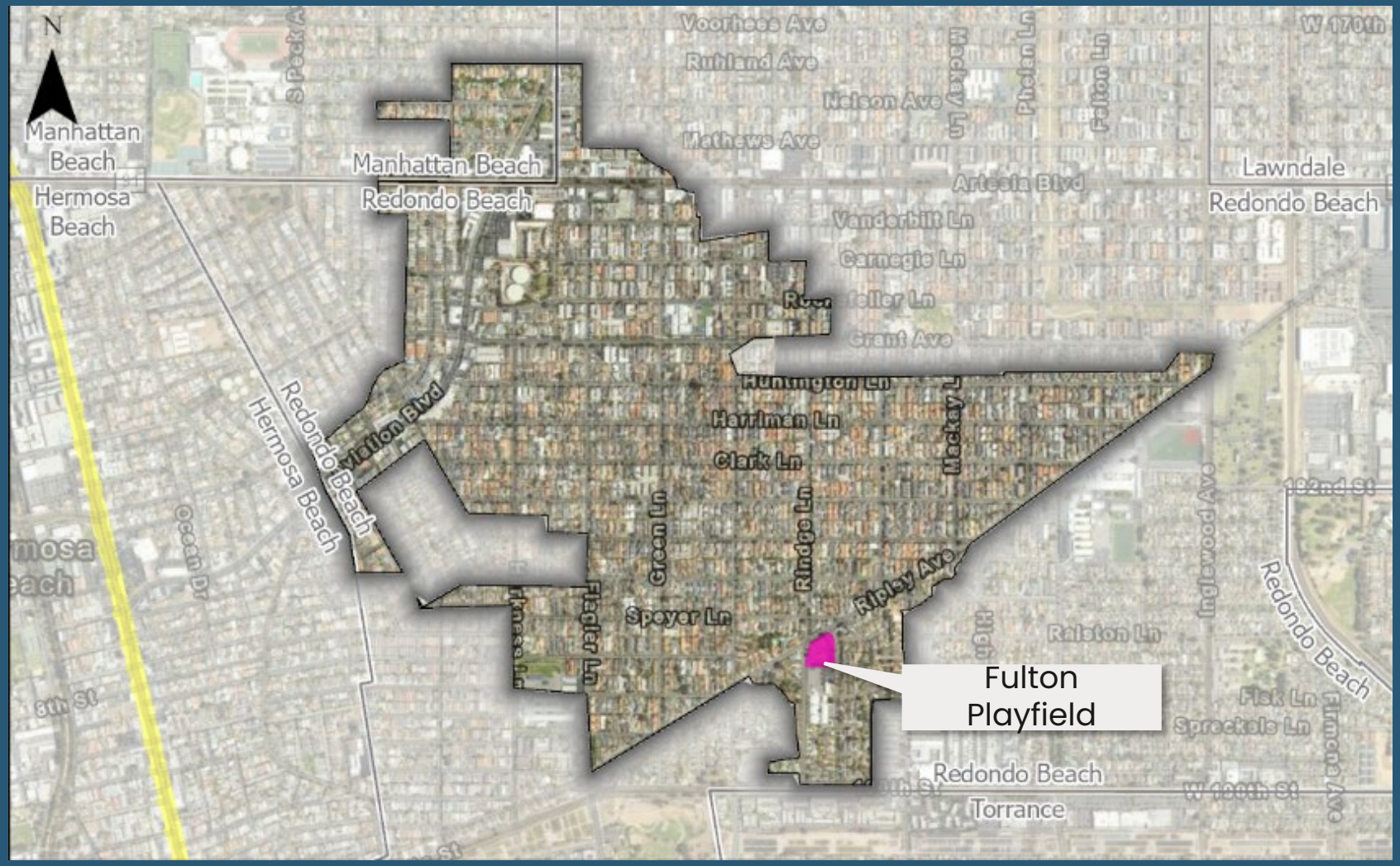
Project Lead: City of Redondo Beach

REDONDO BEACH

Project Drainage Area = 465 Acres

Key Benefits:

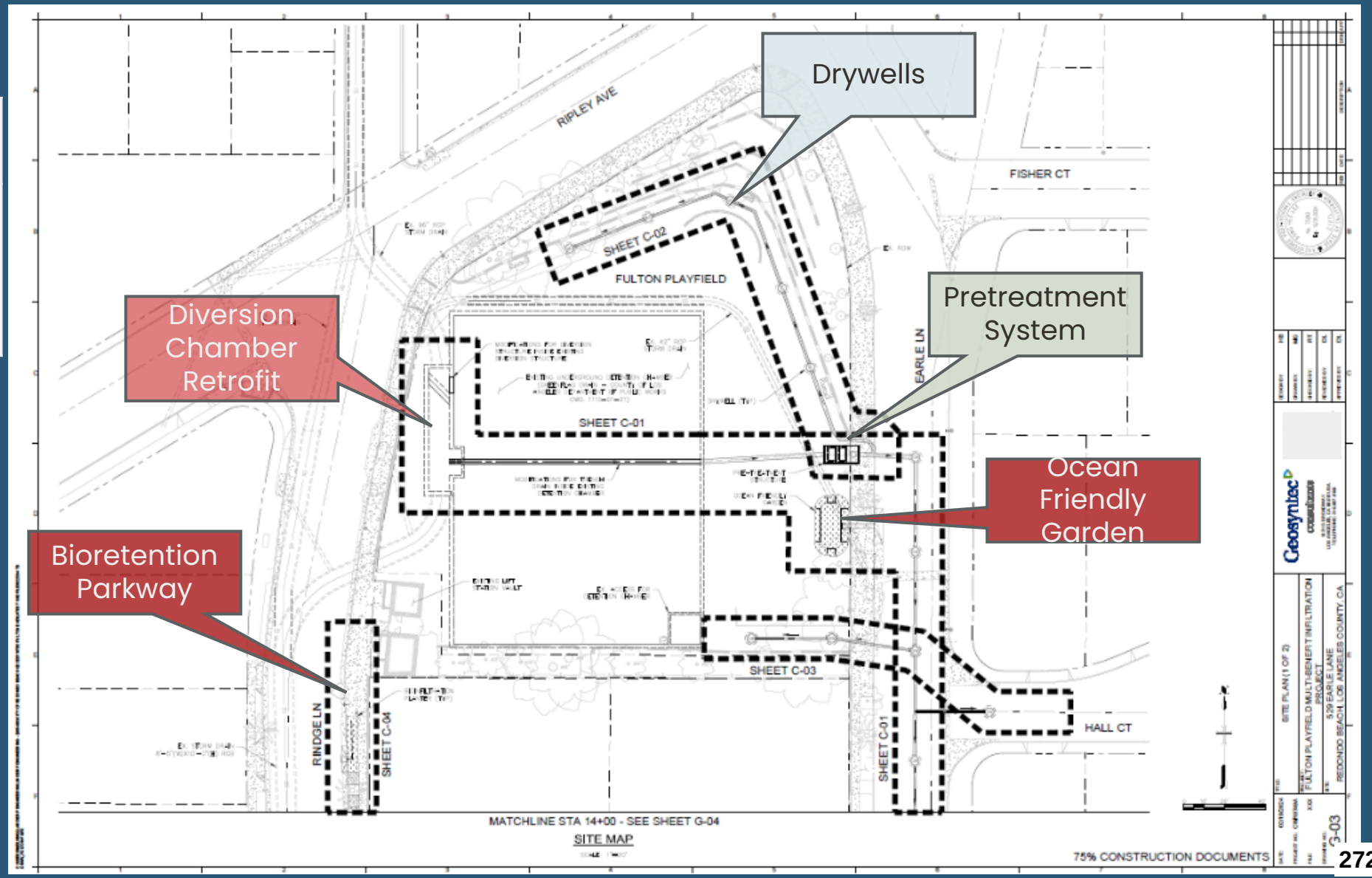
- Pollution Capture
- Flood Management
- Park Enhancement
- Heat Island Effect Reduction
- Vegetation Increase



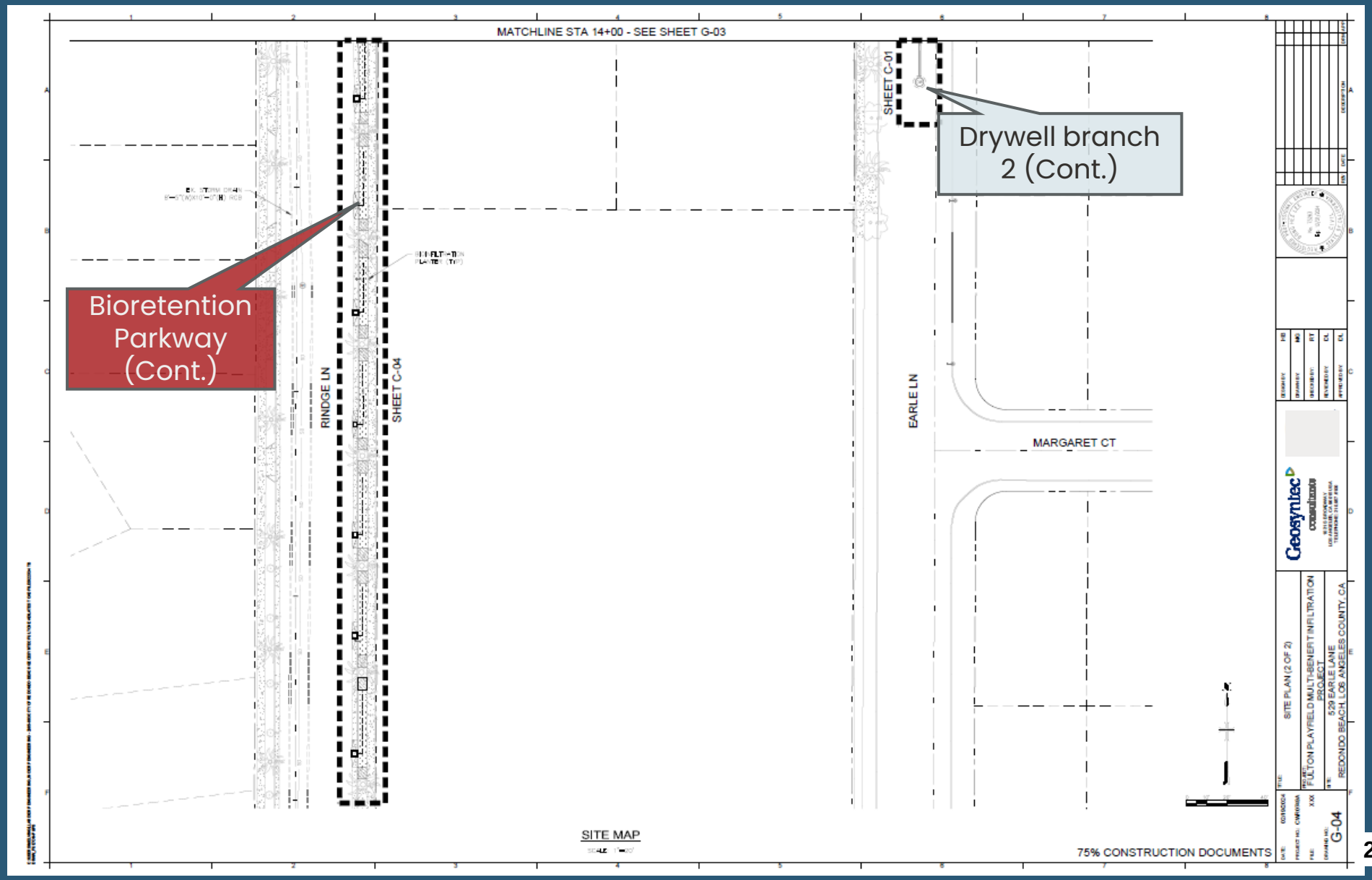
Existing Site Conditions

Project Components (north)

Number of Drywells	13
Footprint of Bioretention and Ocean Friendly Garden	794 ft^2



Project Components (south)



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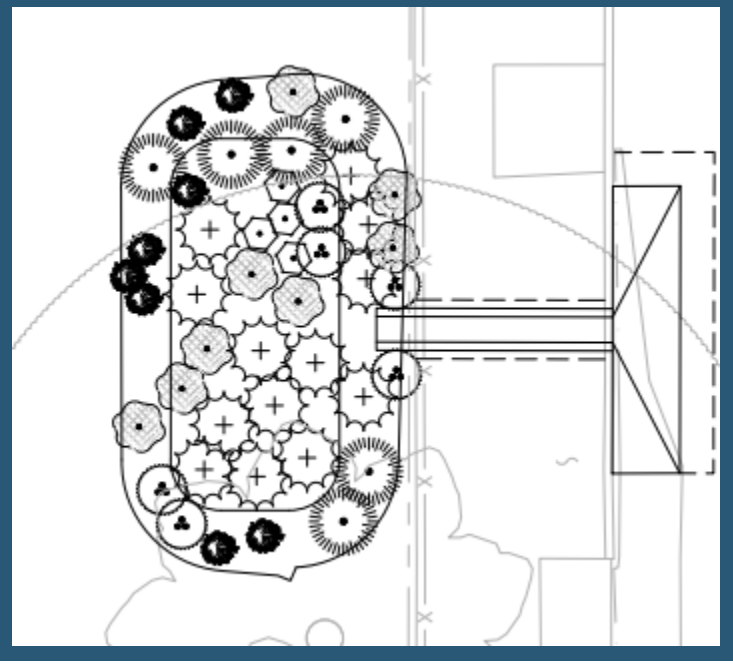
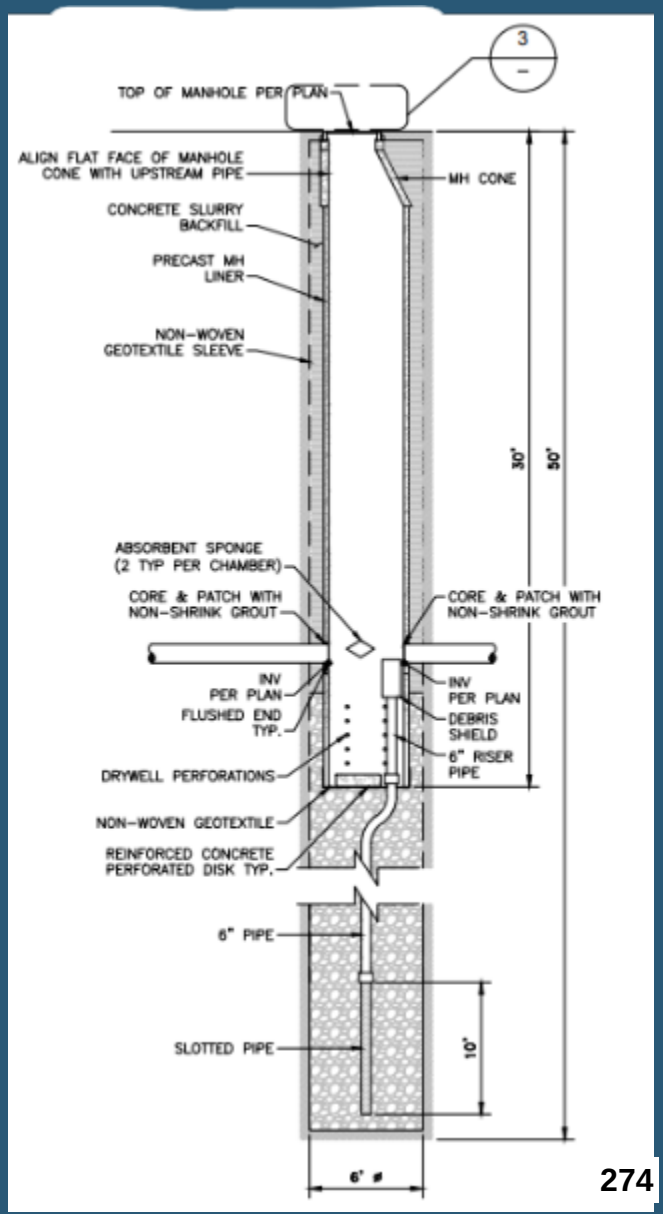
Project Achievements

24-hr Stormwater Management Capacity	19.2 ac-ft
Average Annual Runoff Captured	150 ac-ft/year
Average Annual Bacteria Captured	3.33 E+13 MPN/year
Average Annual Zinc Captured	19.2 lbs/year

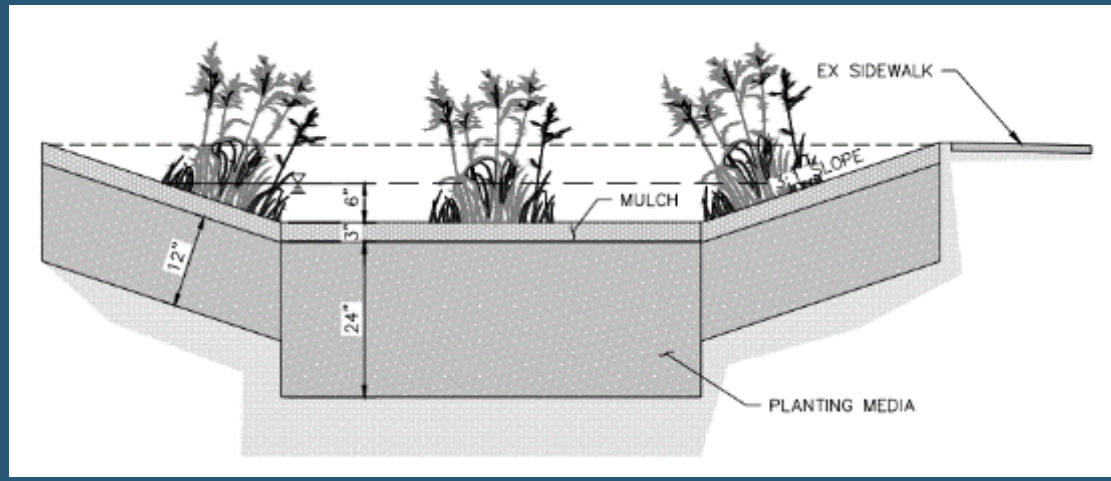
Ocean Friendly Garden



13 Drywells



350 Linear Feet of Bioretention Parkway



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Community Outreach

Project Introduction Meeting - February 2024 at Valor Christian Academy

Topics Presented

- Need and Reason for the Project
- Design elements and construction activities
- Impacts on playfield and parking

Resident Feedback & Design Integration:

- Residents preferred preservation of all existing green space
- No preference for additional park improvements - exercise equipment
- Final design includes community preferences

Next Meeting - Project Construction Details – Date TBD

Measure W Funding Schedule

Fiscal Year	Awarded Funding	Cumulative Funding
FY 22-23	$93,000	$93,000
FY 23-24	$2,073,000	$2,166,000
FY 24-25	$1,683,000	$3,849,000
FY 25-26	$2,500,000	$6,349,000
FY 26-27	$46,500	$6,395,500
FY 27-28	$1,906,638	$8,302,138
TOTAL	$8,302,138	

The project is funded entirely from Regional Safe Clean Water Grant Funds

REDONDO BEACH

Estimated Project Schedule

Bid Phase	April – May 2026
Award Construction Contract	June 2026
Construction Phase (120 working days)	September 2026 – April 2027
Accept Project as Complete	Summer 2027

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RECOMMENDATION

- Receive and file the report and presentation