*These notes are supplied to provide information on traffic signal construction plan sets regarding the City of San José’s requirements for various components and procedures related to traffic signal construction. The designer is responsible to determine the applicable notes based on the scope of the traffic signal work. Minor deviations/modifications are allowed to address specific quantities, locations, etc. only if necessary.*

GENERAL

1. Should conditions encountered during construction prevent the performance of work as delineated on this plan, the contractor shall institute remedial measures as may be required to provide a complete and fully functional system. Proposed remedial measures shall be subject to the review and prior approval of the Electrical Engineer of the San José Department of Public Works and shall be undertaken at no expense to the City.
2. Limits of new sidewalk construction shown on the plans are schematic only. The exact limits will be determined in the field by the City Engineer.
3. Equipment to be salvaged shall be delivered to the City of San José Mabury Yard at 1404 Mabury Road. The contractor shall contact the City of San José Department of Transportation at (408) 794-1969, three (3) business days in advance to arrange for acceptance of salvaged equipment.
4. A list of materials proposed by the contractor to be used on this project for street lighting and/or traffic signals including, but not limited to, luminaires, poles, conduit, conductors, pull boxes, ground rods, signal equipment and service equipment shall be submitted to the design consultant for review. The design consultant shall provide the list of materials and a copy of the manufacturers’ product specification sheets for all proposed equipment to the City of San José Project Inspector for approval prior to purchase and a minimum of two weeks prior to the start of work.
5. Contractor shall refer to the current State of California Department of Transportation (Caltrans) standard plans and specifications, including any and all Standard Plans and Standard Specifications revisions adopted by Caltrans for traffic signal poles, foundations, vehicle signals, mast arms, pedestrian signals, and luminaire arms as shown on the project plans.
6. Holes in traffic signal poles remaining after installation of new signal heads and new mounting brackets shall be repaired per City of San Jose Standard Specification 86-2.04, “Standards, Steel Pedestals and Posts.”
7. During Traffic Signal Shutdown events, traffic control setup and authorities shall remain in effect until the completion of the event, including but not limited to presence of Police, Community Service Officers, Flaggers, etc. Traffic signal shutdowns shall be limited to periods during normal working hours, Tuesday through Thursday.
8. Foundation mortar of all existing traffic signal and street light poles shall conform to CSJ standard Specifications  Section 82-2.03. If, after civil work is complete, the mortar does not conform to CSJ standards, poles shall be relocated onto a new foundation per new grade. In addition, if pull boxes need to be raised or lowered to new grade, conduit adjustments may be required so conduit entry to adjusted pull boxes conform to CSJ standards. If a traffic signal shutdown is not otherwise planned as part of this work, a shutdown will be required with the traffic signal pole relocation. All other city requirements for a signal shutdown will be enforced.

TRAFFIC SIGNAL CONTROLLER CABINET

1. Type “P” traffic signal controller cabinet shall conform to the latest City of San José Specifications. The Contractor may obtain a copy of the City’s latest type “P” controller cabinet specifications at: <https://www.sanjoseca.gov/home/showpublisheddocument/32939>

Contractors shall, at least sixty (60) calendar days prior to the date of signal activation, deliver the cabinet and all auxiliary equipment to the City of San José Department of Transportation, Traffic Signal Maintenance Section at 1404 Mabury Road for testing by City forces. The City will make the empty cabinet (minus auxiliary equipment) available for pickup by the contractor no more than thirty (30) calendar days in advance of the date of signal activation.

CONDUIT

1. Conduit 1-½ inches and larger and in runs of more than 10 feet shall have bending radii of not less than 18 inches or 12 times the inside diameter of the conduit, whichever is greater. Maximum bend of elbows into pull boxes shall be 45 degrees.
2. All conduit runs shall be installed per Section 86-2.05, “Conduit,” Subsection 86-2.05C, “Installation.”

PULL BOXES

1. For new #6 pull box installations as designated on the Project Plans, Contractor shall furnish and install lightweight composite #6 pull box cover (with bolt down) (i.e., fiberglass, polyester resin, etc.) and use pre-cast reinforced concrete pull box for each new pull box installation. For new #7 pull box installations as designated on the Project Plans, Contractor shall furnish and install lightweight composite #7 pull box cover (with bolt down) and lightweight composite #7 pull box as designated on the project plans. Cover markings shall conform to Section 86-2.06B “Cover Markings.”

Pull box extensions for installation in the ground or in sidewalk areas shall be constructed with the same material as the pull box. Pull boxes, covers, and extensions shall be of the sizes shown on the Plans and, unless indicated otherwise, shall conform to the dimensions indicated in the Standard Details. Pre-cast reinforced concrete pull boxes shall have gray plastic coated rims.

1. New Street Light pull boxes shall be CSJ standard #5 pull box unless noted otherwise.  New pull boxes shall be polymer concrete and shall have lids with a non-slip polymer top surface.  Pull box lid replacements for existing #3 ½ concrete pull boxes shall have a non-slip polymer top surface or a polyurea lining material.  All new pull boxes and replacement lids shall be theft deterrent and shall conform to ANSI/SCTE 77 Tier 22 and lids shall be secured by a minimum of two ½ - 13 threaded by 1 ½” long security bolts.  All metallic conductive parts shall be bonded by a bonding jumper with a ring terminal and a self-locking washer.

SIGNAL HEADS

1. All new vehicle signal heads shall be furnished with red, yellow, and green (Circular and/or Arrow) Light Emitting Diode (LED) modules in new vehicle signal sections. The LED modules shall conform to current State of California Department of Transportation Specifications and be listed in the current California Department of Transportation Pre-Qualified Product List for LED Traffic Signal Modules.
2. All signal heads, visors, backplates, pedestrian signal housings, pedestrian push button housings, and signal framework and mountings shall be factory-finished black.
3. All new and existing backplates must have 2-inch retroreflective strip on the face around the perimeter. The strip must be 3M Diamond Grade DG3 Series 4081 fluorescent yellow or approved equal on the Caltrans Authorized Material List for Type XI fluorescent yellow retroreflective sheeting signing and delineation materials.
4. Contractor shall furnish and install a removable full-circle metal visor conforming to ANSI Standard D-10.1 on all new vehicle signal sections. Plastic visors shall not be used.

PEDESTRIAN SIGNAL EQUIPMENT

1. Contractor shall furnish and install a Light Emitting Diode (LED) countdown type signal module in each new pedestrian signal housing. Modules shall be furnished with a combination Portland orange “full upraised hand”/lunar white “full walking person” and two 9 inch high digits. The LED modules shall conform to current state of California Department of Transportation (Caltrans) specifications.
2. Pedestrian signal heads shall have a front screen fabricated of polycarbonate plastic mounted in an aluminum frame in conformance with option 2 of section 86-4.03B of the current Caltrans Standard Specifications. Each pedestrian signal housing shall be provided with a 2-inch spacer between the special signal bracketing hardware and the pedestrian signal housing. The spacers will allow the pedestrian signal housing to be rotated in place after installation.
3. The contractor shall remove and salvage the existing pedestrian signal at location [#] and repair any holes remaining in the pole per section 86-2.04, ‘Standards, Steel Pedestal and Posts,’ of the City of San José Standard Specifications.
4. The contractor shall remove and salvage existing pedestrian signal modules and replace them with new countdown pedestrian signal modules as per note [#] of this sheet.
5. The contractor shall remove and salvage the audible portion of existing pedestrian signal at location [#] and cap/seal hole.
6. Accessible Pedestrian Signal System

The contractor shall furnish and install an accessible pedestrian signal system. The system shall be a Polara iDetect 3-Wire system with a Pedestrian Head Control Unit (PHCU), unless otherwise noted to Polara iDetect 2-Wire system with a Central Control Unit (CCU).

The Accessible Pedestrian Signal shall be ADA compliant and meet or exceed MUTCD 2022 requirements in Section 4E.09 through 4E.13 regarding Accessible Pedestrian Signals.

The PHCU shall be compatible to operate a 2-wire touchless push button.

The 3-wire system shall consist of a Pedestrian Head Control Unit (PHCU) or Central Control Unit (CCU) if a 2-wire system is noted to be utilized, the Accessible Pedestrian Push Button Stations (PBS) with Pole Mounting Assembly, and entire system shall be configurable from any pedestrian button over Bluetooth.

The Pedestrian Push Button Station shall meet the NEMA 250 – Type 4X Enclosure requirements. The Audible-Tactile push button shall contain a 2-inch activation area and be designed to provide both a button with a raised directional vibrating tactile arrow on the button and a variety of audible sounds for different pedestrian signal functions. The unit shall have a weatherproof speaker, and the appropriate informational sign (MUTCD # R10-3 size 9 inch x 12 inch) for each location. The external housing shall not have any polycarbonate or plastic parts. The body shall be black, UV stabilized, and weather- and chemical- resistant. The assembly shall be shockproof and rainproof in any weather condition.

* + The Central Control Unit shall meet NEMA 250 – Type 1 enclosure requirements.

Audio and System Specifications shall also include:

* Audible Locating Tone - There shall be at least three (3) field selectable locater tones to choose from.
* Audible Walk Sounds - The System shall have at least five (5) selectable audible walk sound options including a cuckoo, rapid tick, chirp, direction of travel message, and custom voice message that shall operate during the WALK interval for a user-selectable amount of time if the pushbutton is pressed. There shall be a user-selectable option to activate audible walk sounds without pushbutton actuation.
* Construction - Frame: Cast Aluminum, Powder Coated

Housing: Reinforced, UL-listed thermoplastic, black color

Message Sign: Aluminum, Powder Coated Ink Marking

Push Button: Aluminum, Powder Coated

PBS fasteners: Stainless Steel

All APS units shall be 42 inches from the center of the button to accessible pedestrian landing area. For pedestrian push button posts, APS units shall be top mounted and capped. Posts shall be modified accordingly.

1. LOOP DETECTION

Video detection shall be installed at all legs for traffic signal installations and modifications unless the City of San Jose Signal Design Team indicates otherwise. If City selects loop detection, include CSJ Vehicle Detection Loop Layout Guideline found at: <https://www.sanjoseca.gov/home/showpublisheddocument/32949>

VIDEO DETECTION

1. The contractor shall furnish and install Iteris Vantage Vector all-in-one hybrid detection sensor(s) with Vantage Next central control unit to detect vehicles on each approach of the intersection, *unless the City of San Jose Signal Design Team indicates otherwise.* The system shall consist of [#] Central Control Units (CCU), computer mouse, video monitor installed in the controller cabinet, [#] Vantage Vector all-in-one hybrid detection sensor, and all associated conductors and cabling. Equipment specifications are as follows:

**General –** The Vantage Vector, a multi sensor video detection system (MSVDS) shall utilize both video imaging and radar. The system shall detect and track vehicles on a lane-by-lane basis at distances of 500 feet from the sensor.

All equipment, cables, and hardware must be from the same manufacturer. The MSVDS shall not require any rewiring in the City’s standard P cabinet. The MSVDS shall support both TS-1 and TS-2 environments.

The system shall support industry standard Transmission Control Protocol (TCP)/Internet Protocol (IP) network protocols and be addressable by no more than two (2) IP addresses, one per CCU, for each signalized intersection. Remote communication features shall be built into the CCU. Up to four (4) sensors may be connected to a single CCU; IP video streams from each of the one to four sensors shall support RTSP (Real-Time Streaming Protocol). System shall provide the option to display vehicle detection status along with the real-time video streams. Remote device configuration can be achieved either through a web browser interface or a standalone application running on a Windows OS platform.

The MSVDS shall have the capability of monitoring phase information and passing that information and other system data such as “time” from the controller to the central control unit. The MSVDS shall also accept data from the sensors and relay that information to the controller. The unit shall provide a maximum of 64 detector outputs to the controller via the SDLC interface. The interface to the controller shall be accomplished by the use of the TS-2 SDLC port and protocol in accordance with the TS-2 specifications. The module shall be able to configured to respond to Bus Interface Unit (BIU) addresses 8, 9, 10, and 11 or a combination thereof.

The MSVDS shall be in compliance with the following industry specifications:

* *Transportation Electrical Equipment Specifications (TEES)*, August 16, 2002 (or latest edition)*,* California Department of Transportation
* *NEMA Standard Publication TS 1-1989* (or latest edition)*, Traffic Control Systems,* National Electrical Manufacturers Association
* *NEMA Standard Publication TS 2-2003, Traffic Controller Assemblies With NTCIP Requirements, Version 02.06* (or latest edition)*,* National Electrical Manufacturers Association
* **Central Control Unit (CCU)** – The CCU shall be Iteris made and supplied in a standard One (1) Rack Unit (1U) 19” rack format. There shall be brackets to allow the CCU to be mounted under the shelves where a 19” frame is not available. The CCU shall also be available as a free-standing shelf mounted unit. The following specifications shall also be met.
* **Power:** 110V or 230V, 50Hz or 60Hz supply. ≤ 20 watts.
* **Operating Temperature:** -35° F to +165° F (-34° C to +74° C). 0% ~ 95% RH
* **Surge Protection:** built-in surge suppression for each sensor input, as well as, power supplied to sensors. If fault conditions are detected, MSVDS shall safely shut down power to corresponding sensors and peripherals.
* **Interfaces:** 
  + 4x RJ-45 for detection sensors
  + 2x USB ‘A’
  + 1x HDMI (1024 x 768)
  + 1x Ethernet via RJ-45 compliant with IEEE 802.3
  + 1x SDLC connection via D-15 type compliant to NEMA TS-2 Specs.

**Sensor –** The Vantage Vector hybrid sensor shall be supplied by Iteris. The sensor shall utilize a single shielded CAT6 cable for power, communications, and video. Cable termination at the camera shall not require crimping or special tools.

The MSVDS shall detect vehicles, bicycles, and pedestrians in real time and provide detection outputs on separate channels within the same field of view. In low-visibility conditions, the system shall be able to switch to fully radar, or constant call mode. The system shall detect speed of tracked vehicles, provide stop bar presence detection, and advance detection.

The MSVDS shall be able to calculate average speed and lane occupancy for all the video detection zones independently. This information shall be stored within the system for later retrieval.

Each detection zone shall have the ability to change its characteristics based on external inputs (e.g. signal phase). Each zone shall also be able to switch to different zone types (e.g. presence, extension, pulse, etc.) depending on the signal state.

In the MSVDS, the on-screen display for each sensor shall display the following information:

* + - * Vehicles Per Hour (VPH) per movement
      * A rolling 24-hour period of VPH
      * Occupancy
      * A rolling 24-hour period of Occupancy,
      * Average Speed of Vehicles
      * A rolling 24-hour period of Average Speed of Vehicles

The MSVDS shall support a minimum of 32 detection zones and 16 radar detection zones per sensor.

**Mounting –** The video detection camera shall be mounted on the luminaire and/or signal mast arm or pole as shown on the project plans. The mounting brackets for the camera enclosure shall be installed per the manufacturer’s specifications.

* For approaches with 1 or 2 lanes, mount the camera on the luminaire mast arm; if there is no luminaire, mount the camera on the signal mast arm. For approaches with 3 or more lanes, mount the camera on the signal mast arm approximately over the extension of the line between the left turn pocket and adjacent through lane.
* At locations where the camera enclosure is to be installed on the luminaire mast arm, it shall be mounted approximately 12 inches from the luminaire using a Pelco by Schneider Electric EM1109 bracket.

All mounting brackets shall be installed per the manufacturer’s specifications. Enclosure mounting brackets shall provide adjustments for both vertical and horizontal positioning of the camera. Camera attachments shall be designed to securely fasten the camera to the mast arm. Miscellaneous hardware shall be stainless steel or galvanized steel. The cameras and associated pole/arm attachment unit shall be designed to withstand a wind load of 90 MPH with a 30 second gust factor.

**Cable –** Asingle shielded CAT6 cable shall be used for each sensor. Shielded RJ-45 connectors shall be used where applicable. The cable, connector, stripping and crimping tool shall be approved by Iteris. Adjacent to each camera location, a steel, liquid-tight cord grip shall be installed on the underside of the signal or luminaire mast arm or side of pole to allow the cable to be routed through the mast arm and/or pole. The cord grip shall have a ¾ inch male NPT connection on one end and the correct size opening for the cable being used on the other. The appropriately sized hole shall be drilled and tapped to install the cord grip. A drip loop shall be provided in the cable. Weather stabilized nylon tie straps shall be used to secure the cable and prevent chafing.

The CAT6 shall be continuous, with no splices, from the video detection camera to the traffic signal cabinet. Contractor shall provide 10 feet of slack at the pull box adjacent to the pole that the image sensor is mounted on.

**CCTV LED Monitor -** A shelf mount, LED screen shall be connected to the MSDS via HDMI and be used to monitor, configure, and maintain the detection system. The monitor shall meet the following minimum specifications.

**Resolution** 1024 x 768

**Input** HDMI

**Screen Size (Diagonal)** 10 inches

**Aspect Ratio** 4:3

**Contrast Ratio** 600:1

**Brightness Level** 350 cd/m2

**Display Colors** 0.26 million

**Viewing Angle** 160 degrees Horizontally, 150 degrees vertically

**Response Time** 12ms

**Operation Temperature** 0° - 50° C, <70% relative Humidity

**Power** 110 VAC or 220 VAC, 50 or 60 Hz

**Approximate Mean Time** 50,000 Hours

**Between Failures (MTBF)**

**Installation –** A representative that is certified by the MSVDS manufacturer shall be on the job-site to supervise the installation and configure the MSVDS system to meet the requirements outlined in the project plans and these special provisions.

**Warranty, Maintenance, and Support –** The VIDS shall be warranted for three (3) years from when the project is accepted. During the warranty period, technical support shall be available from the supplier via telephone within 4 hours of the time a call is made by a user, and this support shall be available from factory certified personnel or factory-certified installers. During the warranty period, updates to the MSVDS software shall be available from the supplier without charge.

The MSVDS supplier shall maintain an adequate inventory of parts to support maintenance and repair of the video detection system. These parts shall be available for delivery within 30 days of placement of an acceptable order at the supplier’s then current pricing and terms of sale for said parts.

The MSVDS supplier shall maintain an ongoing program of technical support for the MSVDS. This technical support shall be available via telephone, or via personnel sent to the installation site upon placement of an acceptable order at the supplier’s then current pricing and terms of sale for on site technical support services.

Installation or training support shall be provided by a factory-authorized representative and shall be a minimum IMSA-Level II Traffic Signal Technician certified. All product documentation shall be written in the English language.

TRAFFIC SURVEILLANCE CAMERA - General

1. Contractor shall furnish and install a closed-circuit television (CCTV) surveillance camera for this intersection. The camera shall be an Axis P5655-E PTZ Network Camera System, Part No. 01682-004, featuring HDTV 1080p and 32x optical zoom. The camera shall display a clear video feed in dark settings and allow for 360 degree continual rotation and a dome type housing with a smoked lens. Camera shall be IP66, NEMA 4X and IK10 certified for harsh weather conditions. An accompanying dedicated POE injector shall be furnished with the camera, Axis Part No. T8133 Midspan 30W.
2. The Axis P5655-E PTZ Network Camera shall be mounted approximately six inches below the top of the pole shaft as shown in the plans. The mounting bracket shall consist of an Axis mounting bracket arm and backplate. Axis Part Numbers T91L61 and T91B57 respectively.
3. A ¾ inch flexible metallic liquid-tight conduit shall be installed between the port on the underside of the camera mounting bracket and a hole of appropriate diameter drilled in the side of the pole shaft. The conduit shall be constructed of helically-wound galvanized steel with PVC lining and grey PVC outer coating, Sealtight brand, or approved equal. The conduit shall be installed so as to form a drip loop approximately 12 inches below the level of the camera bracket. Galvanized steel fittings shall be used at conduit connections with the camera mounting bracket and pole shaft.

TRAFFIC SURVEILLANCE CAMERA - Wiring

1. Data/control and Power lead-in cable for the Axis P5655-E surveillance camera shall be Category **6** (Cat6) shielded cable and shall be 7953A as manufactured by Belden , or equal. Cable shall be outdoor rated, shielded, industrial Ethernet cable and shall be suitable for underground use. Copper pairs shall be 23 AWG solid copper and have solid polyolefin (PO) insulation. Cable shall have an integrated electrostatic discharge drain wire. The cable shall have a linear UV Resistant Polyvinyl Chloride (PVC) outer jacket. Outside diameter of the complete cable shall be 0.335 in. Cable shall conform with ISO/IEC 11801-1 and ANSI/TIA-568.2-D Cat6 standards. Cable shall support equipment rated for a minimum of 1 Gbps data throughput. Cable shall be UL rated for: sunlight resistance, oil resistance, and a maximum operating voltage of 600 V RMS.
2. Contractor shall terminate both camera and cabinet-ends of Cat6 cable with an RJ-45 connector per T568B wiring standard. Cat6 cable shall be connected to RJ-45 ports on camera, and POE injector’s “Data & Power” port.
3. Contractor shall provide a minimum of 10 lineal feet of Cat6 cable slack coiled in the traffic signal cabinet as shown in plans.

MAST ARM STREET NAME SIGNS

1. The contractor shall furnish and install a total of [#] mast arm-mounted street name signs. Street name sign requirements are shown on the sheet entitled “Street Name Sign Specifications and Details.”

Three (3) working days prior to the sign installation, the contractor shall notify the Project Inspector and provide the street name signs for City inspection.

DOWNTOWN SIGNAL POLES (Except Transit Mall)

*This note is to be used for pole locations where the paint is in fair condition, as determined by City Engineer.*

1. At location(s) [#] existing traffic signal poles and mast arms shall be primed and painted as follows:

* **Surface preparation:** Clean all surfaces per SSPC-SPI solvent clean. All surfaces shall be aggressively scarified. All loose coatings, contaminants and detrimental foreign matter shall be removed. Bare galvanized shall be aggressively scarified to create a uniform and dense surface profile of 1.5 to 2.0 mils.
* **Prime bare galvanized:** Tnemec Uni-bond DF series 115-33GR gray, or approved equal; 2.0 to 4.0 mils DFT.
* **Finish all surfaces:** Tnemec Enduratone series 1028-35 black, or approved equal; 2.0 to 3.0 mils DFT.
* **Total DFT:** 4.0 to 7.0 mils DFT.

This note is to be used for pole locations where the paint is in poor condition, as determined by City Engineer.

1. At location(s) [#] existing traffic signal poles and mast arms shall be primed and painted as follows:

* **Surface preparation:** Clean all surfaces per SSPC-SPI solvent clean.

All coatings on the pole from the base plate to the bottom bracket of the pole-mounted vehicle head (approximately 10 feet) are to be completely removed. Exposed galvanized surfaces shall be aggressively scarified to create a uniform and dense surface profile of 1.5 to 2.0 mils. All remaining coatings shall be sanded to roughen the surface. All loose coatings, contaminants and detrimental foreign matter shall be removed.

* **Prime bare galvanized:** Tnemec Uni-bond DF series 115-33GR gray, or approved equal; 2.0 to 4.0 mils DFT.
* **Finish all surfaces:** Tnemec Enduratone series 1028-35 black, or approved equal; 2.0 to 3.0 mils DFT.
* **Total DFT:** 4.0 to 7.0 mils DFT.

1. Shop painting of all new galvanized signal poles and mast arms to be installed shall be primed and painted as follows:

* **Surface preparation:** SSPC-SPI solvent cleaning followed by abrasive blast cleaning in compliance with ASTM D6386-99(2005) section 5.4.1, providing a surface profile of 1.0 to 2.0 mils.
* **Prime:** Tnemec Hi-Build Epoxoline II Series V69-33GR Gray, or approved equal; 2.0 to 3.0 mils DFT.
* **Finish:** Tnemec Endura-Shield Series 1095 -35GR black or approved equal; 2.0 to 3.0 mils DFT.
* **Total DFT:** 4.0 to 6.0 mils DFT.

GENERAL SIGNAL COMMUNICATIONS

1. The Contractor shall furnish and install a flexible polyester/nylon textile innerduct, MaxCell by TVC Communications as shown on the plans and installed according to the manufacturer’s recommendations. Rigid or semi-rigid innerduct is not allowed.

The polyester/nylon textile innerduct shall contain three cells and each cell shall accommodate a single cable with an outside diameter no larger than 0.85 inches. The polyester/nylon textile innerduct shall be sized to fit into the new conduit.

The polyester/nylon textile innerduct shall contain a 1250lb polyester flat woven pull tape. The pull tape shall be constructed of synthetic fiber, printed with accurate sequential footage marks.

A solid copper, polyvinyl color coated conductor (18AWG minimum) for tracing, rated for a minimum of 6 amps and 600 volts, shall be placed in the sidewall edge fold of the textile innerduct.

COPPER COMMUNICATIONS (SIC/Signal Interconnect Cable)

1. Contractor shall provide ten lineal feet of copper communications cable slack in the signal controller cabinet.
2. Contractor shall install approximately ten lineal feet of copper communications cable slack in each pull box through which the cable passes.
3. Contractor shall coil [#] lineal feet of copper communications cable in the pull box at location [#], tape the unfinished end, and label the cable. City forces will complete the installation of the cable into the controller cabinet and terminate the cable.
4. Contractor shall locate and protect existing copper communication conduits and cables from damage. The cables shall not be cut, spliced, or damaged in any way. Should damage to communication conduits or cables occur, contractor shall immediately contact the City Project Inspector, and email DOT.ITS.Support@sanjoseca.gov. Contractor shall temporarily repair the damaged cable within two (2) business days and perform permanent repairs within thirty (30) calendar days after the acceptance of the temporary repair, as approved by the City.
5. Contractor shall notify [DOT.ITS.Support@sanjoseca.gov](mailto:DOT.ITS.Support@sanjoseca.gov) a minimum of five (5) business days prior to the planned disconnect of the copper communications cable. The copper communication cable shall only be disconnected once and shall be out of service no more than five (5) consecutive business days.

FIBER OPTIC COMMUNICATIONS

1. Contractor shall exercise caution to avoid damaging existing fiber optic cable(s). In the event that a fiber optic cable is damaged, contractor shall be responsible for replacing the entire segment of the fiber optic cable from [location] to [location] and include, but not be limited to, splicing of any existing branch fiber optic cables, labeling, and testing per current City’s provisions.
2. Upon the occurrence of damage to existing fiber optic cables, the Contractor shall immediately contact the Agency inspector, DOT Infrastructure Maintenance at (408) 794-1900, and email DOT.ITS.SUPPORT@SANJOSECA.GOV. The damaged cable shall be temporarily repaired and full communications restored within X (#) hours of the damage occurrence. The temporary repair shall be undertaken in the nearest pull box/junction box, slack permitting. If the Agency inspector determines that insufficient slack is available, then a new pull box/junction box shall be installed at the location of the cable damage.
3. The contractor shall notify [DOT.ITS.Support@sanjoseca.gov](mailto:DOT.ITS.Support@sanjoseca.gov) a minimum of ten (10) business days prior to the planned disconnect of the fiber optic cable. Services on the impacted fiber optic cable shall not be impacted for longer XXX (X) consecutive business days.
4. Fiber optic trunk, branch, and lateral cables (trunks refer to large capacity cables for main network backhaul, while branches refer to medium capacity cables traversing along streets and connected to trunks or other branches) shall be Corning 060EUF-T4101D20 or equal. The final strand count and transmission type (single or multi-mode) shall be indicated in the project plans. Cable shall be indoor/outdoor or outdoor rated; have a polyethylene outer jacket, non-armored dielectric central membrane; be duct type, loose tube, with a water-blocked core that is dry to the touch; and contain 12 fibers per tube. The cable shall have an operating temperature range of -40ºC to +70ºC (-40ºF to +158ºF) and meet or exceed Tensile Loading, Drip, Repeated Impact, Compressive Loading, and Bending/Flexing tests set forth by these following documents:
   * CFR, Title 7, Chapter XVII, Part 1755, Sec. 1755.900, RUS Specification for Filled Fiber Optic Cables
   * ANSI/ICEA S-56-434-1983, Polyolefin Insulated Communications Cables for Outdoor Use, Reaffirmed October 18, 1991
   * TIA/EIA-598-A, Optical Fiber Cable Color Coding (ANSI/TIA/EIA-598-A-95)
   * TIA/EIA-455-28C, FOTP-28 - Method for Measuring Dynamic Tensile Strength and Fatigue Parameters of Optical Fibers by Tension (ANSI/EIA-455-28C-99)
   * EIA/TIA-455-82B, FOTP-82 - Fluid Penetration Test for Fluid-Blocked Fiber Optic Cable (ANSI/EIA/TIA-455-82B-92)
   * TIA/EIA-455-95, FOTP-95 - Absolute Optical Power Test for Optical Fibers and Cables
   * EIA-359-A-1, Colors for Color Identification and Coding (See ANSI C83.1)
   * EIA/TIA-455-81A, FOTP-81 - Compound Flow (Drip) Test for Filled Fiber Optic Cable (ANSI/EIA/TIA-455-81A-91)
   * TIA/EIA-455-25B, FOTP-25 - Repeated Impact Testing of Fiber Optic Cables and Cable Assemblies (ANSI/TIA/EIA-455-25B-96)
   * TIA/EIA-455-41A, FOTP-41 - Compressive Loading Resistance of Fiber Optic Cables (ANSI/TIA/EIA-455-41A-93)
   * TIA/EIA-455-33A, FOTP-33 - Fiber Optic Cable Tensile Loading and Bending Test (ANSI/EIA-455-33A-87)
   * TIA/EIA-455-104A, FOTP-104 - Fiber Optic Cable Cyclic Flexing Test (ANSI/TIA/EIA-455-100A-89, R99)
5. Fiber Optic Strands within the finished fiber optic cable shall meet the following requirements:

|  |  |
| --- | --- |
| **Single Mode Fiber Optic Strands** | |
| Property | Requirement |
| ***GEOMETR*Y** | |
| **CORE DIAMETER** | 8.3 µm (nominal) |
| **CLADDING DIAMETER** | 125 µm ± 1.75 µm |
| **CORE TO CLADDING CONCENTRICITY** | ≤ 0.7 µm |
| **CORE OVALITY** | 6% MAX |
| **COATING DIAMETER** | 250 µm ± 15 µm |
| ***OPTICAL*** | |
| **TYPE** | Step Index |
| **NUMERICAL APERTURE** | 0.13 |
| **ATTENUATION COEFFICIENT**  @ 1,310 nm  @ 1,550 nm | ≤ 0.4 db/km  ≤ 0.3 db/km |
| **DISPERSION**  @ 1,310 nm  @ 1,550 nm | 3.2 ps/nm-km  17 ps/nm-km |

|  |  |
| --- | --- |
| **Multi Mode Fiber Optic Strands** | |
| Property | Requirement |
| ***GEOMETR*Y** | |
| **CORE DIAMETER** | 62.5 µm ± 3.0 µm |
| **CLADDING DIAMETER** | 125 µm ± 1.75 µm |
| **CORE TO CLADDING CONCENTRICITY** | 32 µm |
| **CORE OVALITY** | 6% max |
| **COATING DIAMETER** | 250 µm ± 15 µm |
| ***OPTICAL*** | |
| **Type** | Graded Index |
| **NUMERICAL APERTURE** | 0.275 ± 0.015 |
| **ATTENUATION COEFFICIENT**  @ 850 nm  @ 1,300 nm | ≤ 3.5 dB/km  ≤ 1.5 dB/km |
| **MINIMUM BANDWIDTH**  @ 850 nm  @ 1,300 nm | 160 MHz-km  500 MHz-km |
| **DISPERSION**  Zero Dispersion Wavelength  Zero Dispersion Slope |  |

1. Fiber optic pre-terminated cables shall be used for “lateral” drops or as noted on project plans. Factory pre-terminated fiber optic cable shall be R&M Wall Mount / Fiber Drop Terminator Panel RCG-MBDULD4I12ADA-S or approved equal, with an appropriate length of 24-strand single-mode fiber optic cable as shown in these project plans and accommodate the specified slack outlined on plans. It shall be the contractor’s responsibility to verify project plan requirements and adjust the product number accordingly. The 24-strand fiber optic cable shall meet the property requirements as outlined by City of San Jose Department of Transportation (DOT).

The factory pre-terminated distribution panel shall be constructed of 16-gauge 304 Stainless Steel with stainless hardware, use 24 **LC** fiber connectors that are qualified to Telcordia/Bellcore GR-326-Core Issue #3 requirements, have two mountable faces, contain an integrated cover/mounting bracket that removes easily for full access without disturbing cable routing, and provide a protection shroud for fiber patch cord connectors.

Panels shall be mounted with a minimum of four (4) inches of clearance from the panel’s connection port to allow for proper connection of jumper cables. If it is not possible to mount the panel following the clearance requirement due to lack of space in the cabinet, contractor shall notify City of issue.

1. Splice enclosure shall be made of injection molded high-density thermoplastic; be waterproof, rodent proof, and re-enterable; and accommodate all the fiber cables to be spliced at a splice location, including additional cable entry points for future expansion. Splice enclosure shall be sufficient in size to accommodate the splices shown on the Project Plans and still capable of adding additional splices for future expansion. Splice closures shall be complete with splice organizer trays, brackets, plugs, clips, cable ties, seals, and sealant. The splice enclosure shall be designed with a neoprene gasket and cable sealing system that allows re-entry without re-entry kits/supplies.

The splice enclosure shall be suitable for use in an underground fiber optic pull box as specified on the Project Plans. Splice enclosure shall be “dome” style and allow for entry of cables on a single end of the enclosure to facilitate ease of coiling slack in the pull box. The splice closure shall provide the capability to accommodate only certain spliced fibers in the cable while the other fibers remain continuous through the closure (also known as “midspan access”). The splice enclosure shall be tested in accordance with Telcordia/Bellcore GR-771-CORE, “Generic Requirements for Fiber Optic Splice Closures.”

The placement and attachment of optical fibers in the splice tray shall be such that there is no discernible tensile force on the optical fiber. Each bare fiber shall be individually restrained in the splice tray and shall have two complete wraps in the splice tray. Care shall be exercised to not induce pinches (microbends) or tight bends (macrobends) on these fibers. Cable manufacturer’s suggested bend radius shall not be exceeded.

Cables and tubes entering the enclosure shall be clearly labeled indicating direction, and use. Fiber strand labels shall clearly distinguish associated tube, direction, and use.

Location of the splice enclosures shall be as shown on the Project Plans. Following splicing, the Contractor shall ensure that the underground splice closures are sealed watertight in accordance with the manufacturer recommendations. The splice enclosure shall be secured, if available, the rack and hook assembly in such a manner that the front end cap of the closure is six (6) inches lower than the opposite end. Contractor shall ensure that cable bend radius are within suggested limits and no cables are at risk of being impacted by the pull box’s lid when closing.

1. Installation of new fiber optic cable shall only occur once the fiber optic cable reel acceptance test, outlined in these notes, has been reviewed by the city. The removal and re-installation of fiber optic cable shown in these plans, shall only occur once the fiber optic cable baseline test, outlined in these notes, has been reviewed by the city.

The work to disconnect, remove, re-install, and re-splice existing fiber optic cables shall be coordinated with The City of San Jose Department of Transportation (DOT) Operations Division at [DOT.ITS.Support@sanjoseca.gov](mailto:DOT.ITS.Support@sanjoseca.gov). Contractor shall notify agency a minimum of thirty (30) calendar days prior to the day of any fiber optic cable removal/re-installation work is scheduled. Notices shall be communicated to Department of Transportation (DOT) Operations Division [DOT.ITS.Support@sanjoseca.gov](mailto:DOT.ITS.Support@sanjoseca.gov) with written confirmation.

Any impacts to live fiber connections will be closely monitored. Contractors shall notify [DOT.ITS.Support@sanjoseca.gov](mailto:DOT.ITS.Support@sanjoseca.gov) upon completion of restoring impacted connections and await confirmation of restoration. Testing shall not begin until services are restored.

In each pull box where a fiber optic cable is installed and where a splice closure is not being installed, a minimum of twenty (20) linear feet of slack shall be placed in the pull box. In each pull box where a fiber optic cable is installed and where the fiber optic cable will enter an installed splice closure is and proposed to be installed splice closure, a minimum of fifty (50) linear feet of slack shall be provided at each splice enclosure fiber cable entry point. In a traffic signal cabinet where a fiber optic lateral cable is installed, a minimum of ten (10) linear feet of slack shall be provided.

During cable installation, the bend radius shall be maintained at a minimum of twenty (20) times the outside diameter of the cable. In all pull boxes, the cable shall be routed as needed to avoid violating the minimum-bending radius. After installation, the bend radius shall be maintained at a minimum of ten (10) times the outside diameter of the cable.

During installation the Contractor must keep a log that notes the footage marking on the cable at every pull box. This will help determine the exact location of problems along the cable run during the testing. The log shall present the information in sequential order and in table format listing the street and distance to the nearest cross street. This log shall be submitted to the Engineer after all the fiber optic cable has been installed and before performing any fiber optic cable testing.

1. Fiber optic cable splicing shall only occur once the ITS representative is sufficiently notified and approved of the work.

All technicians performing splices shall be certified as a Certified Fiber Optics Splicing Specialist (CFOS/S) by the Fiber Optic Association (FOA) or approved equal. Contractor shall submit to the Agency for approval the resumes with references of people who will be performing splices. Splices shall be performed only by experienced personnel with experience including successful completion of no less than 2,000 fusion splices. Only those individuals approved by the Agency shall be allowed to make fiber optic splices.

The Contractor shall keep accurate records of existing splices and of each new splice at each splice location. City will provide records of existing records, but it shall be the Contractor’s responsibility to verify field conditions and notify differences from records. The Contractor shall accurately complete the City furnished “Splice Location Worksheet” and submit the completed worksheet with the fiber optic cable “Final Acceptance Test”.

1. General Testing Requirements

Contractors shall contact [DOT.ITS.Support@sanjoseca.gov](mailto:DOT.ITS.Support@sanjoseca.gov) and be assigned an authorized

representative to provide guidance and oversee fiber tests. The representative will direct contractors to perform the necessary tests required and answer any questions contractors may have.

The Contractor shall perform all fiber optic testing in the presence of the Engineer and/or City Inspector. Any testing performed by the Contractor and not witnessed by the Engineer and/or Inspector shall not be accepted; and thus, re-testing shall be performed at no cost to the City.

All technicians testing cable shall be certified as a Certified Fiber Optics Testing Specialist (CFOS/T) by the Fiber Optic Association (FOA) or approved equal. Contractor shall submit to the Engineer for approval proof of FOA certification for each of the technicians performing testing.

Contractor shall test fiber optic cables as follows:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| REQUIRED FIBER OPTIC CABLE TEST | NEW FIBER OPTIC CABLE | NEW FIBER OPTIC LATERAL | EXISTING FIBER OPTIC CABLE SPLICED INTO | REMOVED & RE-INSTALLED FIBER OPTIC CABLE/ LATERAL |
| BASELINE TEST |  |  | X | X |
| CABLE REEL ACCEPTANCE TEST | X |  |  |  |
| CABLE INSTALLATION ACCEPTANCE TEST | X |  |  |  |
| FINAL ACCEPTANCE TEST | X | X | X | X |

Please note that each cable interacted with during a project will require the corresponding test shown above, and multiple columns may apply for a single project.

Bi-directional OTDR and OTLS (Power Meter) shall be performed on all tested fibers when possible.

Testing wavelengths for both testing methods shall be 1310 (± 20 nm) and 1550 nm (± 20 nm).

All test results shall be summarized on a City-furnished testing form. In addition to the completed testing form, Contractors shall also provide test results in both raw files and pdf reports. Location endpoints and tracefiles shall be clearly labeled in the following format:

**FAT-XXXXX TO XXXXX-MMDDYY**

(a) - (b) - (c)

|  |  |  |
| --- | --- | --- |
| (a) TEST TYPE | (b) FIBER CABLE INFO | (c) DATE |
| BAT (BASELINE ACCEPTANCE TEST) | END-TO-END LOCATION | DATE |
| CRAT (CABLE REEL ACCEPTANCE TEST) | REEL ID | DATE |
| CIAT (CABLE INSTALLATION ACCEPTANCE TEST) | CABLE SEGMENT | DATE |
| FAT (FINAL ACCEPTANCE TEST) | END-TO-END LOCATION | DATE |

Contractors shall develop and submit a test plan to the City for review that outlines the sequential steps required to perform fiber optic testing and schedule for each fiber test. No testing shall be performed until Contractor’s test plan has been approved by the City. Contractors shall also notify City at least 5 days prior to performing any tests and coordinate with an authorized City representative to be present during testing.

WIRELESS COMMUNICATIONS

1. Contractor shall provide a minimum of 10 lineal feet of Cat6 cable, sealed, labeled, and coiled at the pole top and exiting the same pole quadrant as shown on the plans. City forces will furnish and install the wireless communication radio.
2. Contractor shall furnish a minimum of 10 lineal feet of Cat6 cable, sealed, labeled, and coiled in the traffic signal controller cabinet.
3. Category **6** (Cat6) shielded cable and shall be C6CMXFS-1864BK as manufactured by Primus Cable, or equal. Cable shall be outdoor rated, shielded, industrial Ethernet cable and shall be suitable for underground use. Copper pairs shall be 23 AWG solid copper and have solid polyolefin insulation. Cable shall have an integrated electrostatic discharge drain wire. The cable shall have a linear UV Resistant low density polyethylene (LDPE) outer jacket. Outside diameter of the complete cable shall be 0.31 in and feature a minimum bend radius of 8x outside diameter or less. Cable shall conform with ISO/IEC 11801 and ANSI/TIA-568.2-D standards. Cable shall support equipment rated for a minimum of 1 Gbps data throughput. Cable shall be UL rated for: sunlight resistance, oil resistance, and a maximum operating voltage of 300 V RMS.

SERVICE CABINET:

1. Electrical service cabinet installations shall conform to the Provisions of Section 86-2.11, “Service,” of the Standard Specifications, the Standard Details, and these Plans.
2. Service cabinets shall have interrupting capacity equal or greater than the available short circuit current available, but the minimum interrupting capacity shall be 10,000 amperes.
3. Contractor shall provide a service cabinet arc flash hazard label as required by the California Electric Code, 2016 edition. An arc flash hazard analysis shall be performed by a registered electrical engineer and shall include a shock hazard analysis. All calculations and any other information as part of the arc flash hazard analysis shall be submitted to the City for review.
4. Contractor shall also provide a service cabinet label showing the maximum available fault current and the date it was calculated.
5. Contractor shall provide Electrical Utility Service Equipment Requirements Committee (EUSERC) number as part of the material submittal for the service cabinet. Service cabinet shall be acceptable to the utility service provider.

STREET LIGHT SYSTEM *(Only add notes, if there is an existing Gateway)*

1. Streetlight Segment Control Wiring Requirements:

Contractor shall pull to the top of the pole and provide a service loop for segment controller power cable and segment controller communication cable; coil 20 linear feet slack of segment controller power cable in the service cabinet; and 20 linear feet slack of segment controller communication in the traffic signal controller cabinet. All cable ends shall be labeled, protected from damage and unintentional energization.

1. Power lead-in cable for streetlight segment controller shall contain four (4) 14 AWG stranded copper conductors, have PE insulation, a PVC jacket, and meet International Municipal Signal Association (IMSA) specification 19-1; Anixter PN 2E-1404 or equivalent. Power conductors shall be colored black, white, red, and green. The fourth conductor, red, shall be labeled “spare.” Prior to mounting the devices, the contractor shall allow City of San José Inspector to inspect the devices for proper labeling of the conductors.
2. Category **6** (Cat6) shielded cable and shall be C6CMXFS-1864BK as manufactured by Primus Cable, or equal. Cable shall be outdoor rated, shielded, industrial Ethernet cable and shall be suitable for underground use. Copper pairs shall be 23 AWG solid copper and have solid polyolefin insulation. Cable shall have an integrated electrostatic discharge drain wire. The cable shall have a linear UV Resistant low density polyethylene (LDPE) outer jacket. Outside diameter of the complete cable shall be 0.31 in and feature a minimum bend radius of 8x outside diameter or less. Cable shall conform with ISO/IEC 11801 and ANSI/TIA-568.2-D standards. Cable shall support equipment rated for a minimum of 1 Gbps data throughput. Cable shall be UL rated for: sunlight resistance, oil resistance, and a maximum operating voltage of 300 V RMS.

TESTING

1. Insulation resistance of the traffic signal system shall be tested using the following procedure:

* Confirm that all field connections in vehicle heads, pedestrian heads and other indications are terminated.
* Terminate all field wires for vehicle heads, pedestrian heads, and other indications in the traffic signal controller cabinet.
* Connect one test lead of the megger to the neutral field wires and the other test lead to the main grounding wire.
* Perform the MEG test and read the results to the Project Inspector.

New installations shall have an insulation resistance of not less than 10 megohms.

Signal modifications require an insulation resistance test prior to any work being conducted and the resulting value recorded by the City Project Inspector. Following the completion of the modification work, the insulation resistance shall be checked and the resulting value must be equal or better than the recorded insulation resistance value prior to the modification.

BATTERY BACK UP NOTE *(Where existing)*

1. The BBS system for signalized intersections shall have the following equipment salvaged and re-deployed at the existing location:
   * BBS Side-Mount Cabinet (Econolite)
     1. Side-mount cabinet will be standalone
     2. For traffic cabinet relocation, side-mount cabinet will also be relocated (new foundation required)
   * 1 Battery String
     1. 4 Z5 13-80 Series Monobloc 3600WH XRT batteries
   * XRT Battery Intelligent Management System (IMS)
   * UPS 1500W (Inverter)
   * PIM (Power Interface Module)
   * All necessary components, cabling, and accessories shall be included for proper connection and operation of BBS system with existing traffic cabinets.

TRANSIT SIGNAL PRIORITY *(Where existing)*

1. Contractor shall furnish and install a Transit Signal Priority (TSP) system for this intersection. The TSP system shall be an EMTRAC system, consisting of a EMTRAC ST-9283 Priority Detector, EMTRAC omni-directional antenna, mounting bracket, and complete antenna cable assembly. The TSP antenna shall be mounted on the [QUADRANT] oriented vertically at least one foot from other metal structures and at a height of at least 16 feet.
2. Data/control lead-in cable for the TSP antenna shall be Belden RF195 low loss coaxial cable for a cable run less than 100 feet.
3. Data/control lead-in cable for the TSP antenna shall be Belden RF300 coaxial cable for a cable run greater than 100 feet.

MAINTAINING EXISTING AND TEMPORARY ELECTRICAL SYSTEMS

1. Maintaining existing and temporary electrical system shall conform to the provisions of Section 86-1.05, “Maintaining Existing and Temporary Electrical Systems,” of the Standard Specifications.

Where facilities are to remain open to the public use, existing electrical systems (signal, lighting, or other systems), or approved temporary replacement thereof, shall be kept in effective operation for the benefit of the public during the progress of the work, except when a shutdown is permitted to allow for alterations or final removal of the systems. Traffic signal shutdowns shall be limited to periods during normal working hours, or as specified in these Special Provisions. Street lighting systems shutdown shall not interfere with the regular lighting schedule, unless otherwise permitted by the Engineer.

Working drawings for temporary electrical systems necessary to complete the work and maintain existing electrical systems and their function shall be submitted for review. Working drawings shall show all materials, the layout and details necessary to understand the scheme of the drawing. The working drawing shall include description and location of materials used. Materials shall include poles, conductors, conduits, pull boxes, luminaires, traffic heads and any other materials needed to build the temporary electrical system.

Temporary electrical systems shall be built as per all the requirements for a permanent electrical installation. Materials to be used will be the same as for the permanent installation and should have been previously reviewed and allowed to be used by the Engineer. If there are additional materials to be used that has not been reviewed, Contractor shall provide material submittals for review prior to installation.

The engineer’s review of the working drawings of the temporary electrical systems shall not relieve the contractor of any responsibility to conform to the City’s requirements.

Contractor shall display emergency contact information that is available for 24 hours and 7 days a week until project is accepted by the City. The emergency contact information shall be displayed on an electrical emergency contact information sign. The electrical emergency contact information sign shall be the same size as the project information sign. The location of the signs shall be coordinated with the City inspector and will be visible from all directions to the project site. Emergency contact information shall include emergency contact names and phone numbers. A live person shall always be available to answer. Answering machines or voicemail shall not be allowed. The emergency response time shall be addressed within 30 minutes from the first call received.

TEMPORARY ELECTRICAL CONNECTION OF PG&E SERVICE

1. Where a new service equipment cabinet shall be provided for the construction or modification of an existing Traffic Signal System, installation shall follow the plans, guidelines and procedures set forth in the “*Traffic Signal Activation & PG&E Service Disconnect/Reconnect Process*” document and general schematic located on the City of San Jose Public Works online document resource: <https://www.sanjoseca.gov/home/showpublisheddocument/110468/>

Contractor will provide a proposed drawing showing the construction of the temporary service connection to be reviewed and approved by the Engineer, as required. Working drawing shall show all materials, layout, and details necessary to understand the scheme of the drawing. The working drawing shall include description and location of materials used. Materials shall include poles, conductors, conduits, pull boxes, luminaires, traffic heads and any other materials needed to build the temporary electrical system.

Where applicable, the engineer’s review of the working drawings of the temporary electrical systems shall not relieve the contractor of any responsibility to conform to the City’s requirements.

VTA RELATED PROJECTS

1. The contractor must obtain a Construction Access Permit from the Santa Clara Valley Transportation Authority (VTA) Permit and Utility Locating Services at (408) 321-5856 prior to start of construction. Any access to enter or cross the track way and all work performed within 10 feet of the nearest rail or VTA Overhead Contact System (OCS) shall require a VTA Restricted Access Permit. Permits are available through the Light Rail Restricted Access Permit Office, at (408) 546-7608. All permits and training fees must be paid prior to a permit being issued or Safety Training being performed. In cases such as urgent work or emergencies, the contractor agrees to pay all required permit and training fees, prior to the start of construction.

Prior to commencement of work, within 10 feet of the nearest rail or OCS, all workers must **attend**and **complete**a basic Rail Safety Training class on how to safely perform work on a VTA owned/controlled rail right of way. Every work crew must have an Employee-In-Charge (EIC) - Advanced Trained person on site at all times. Once the appropriate fees are paid to VTA, Rail Safety classes may be scheduled by contacting the Light Rail Technical Training Department at (408) 297-1204. (Training fees apply per person, contact VTA for current fees) Contractors must attend Track Allocation Meetings, as necessary for contractor and light rail operational needs. These meetings will detail contractor activities and resolve any conflicts regarding any such activities within VTA Right of Way. The Track Allocation Meetings are held at the Guadalupe Light Rail Division located at 101 West Younger Ave, San José CA. 95110.

Traffic control shall conform to the provisions of Section 7-1.09, “Public Safety” and Section 12, “Construction Area Traffic Control Devices,” of the City of San José Standard Specifications. Construction shall be organized so as to cause the least possible inconvenience to traffic. Traffic control and detours used shall conform to the principles set forth by the current edition of the STATE OF CALIFORNIA BUSINESS, TRANSPORTATION AND HOUSING AGENCY, DEPARTMENT OF TRANSPORTATION “Manual of Traffic Controls,” and as directed by the Engineer. The contractor must submit a Traffic Control Plan, two weeks prior to start of construction, to the City of San José Project Inspector and to Cheryl D. Gonzales, VTA Assistant Superintendent-Transit Communications, who can be contacted at (408) 546-7608.