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SECTION 12-SAFETY, PUBLIC CONVENIENCE, AND TRAFFIC CONTROL

12-1 SAFETY

12-1.01 Safety Regulations, Programs, and Plans

Safety is a prime consideration in Agency contracts. The Contractor and all subcontractors must fully comply with all applicable Cal/OSHA, Title 8 Regulations. The Contractor, and all Subcontractors, must, upon request, submit to the Agency a copy of their Injury and Illness Prevention Program (IIPP), Code of Safe Work Practices (CSWP), Contract Specific Safety Plan (CSSP), and Task Specific Safety Plan (TSSP) for review by the Agency. The Contractor and all Subcontractors are required to fulfill the requirements of these programs or plans during the prosecution of the Work. No work must be started unless otherwise authorized by the Agency until the Agency has completed its review of required safety documents and provided written authorization to proceed.

The agency has full authority to enforce, make exceptions to, or waive requirements of any of the requested safety programs or plans on a case-by-case basis. Exceptions and or waivers will be provided in writing to the Contractor. Use of all or part of any safety and health program or plan does not relieve the Contractor of the responsibility to comply with prevailing local, state, and federal laws and regulations.

Plans must be formatted in a logical and orderly fashion, including tabs and section dividers for ease of navigation and review.

12-1.01.A Injury and Illness Prevention Program (IIPP) and Code of Safe Work Practices (CSWP)

The IIPP and CSWP must be prepared in accordance with Cal/OSHA, Title 8, Section §1509.

12-1.01.B Contract Specific Safety Plan (CSSP)

The CSSP must state the nature of the Work and the anticipated hazards, and must describe how those hazards will be mitigated to protect workers and the public. The CSSP must cover the notification of employees, subcontractors, and others working on or visiting the jobsite of foreseeable hazards and provisions for Personal Protective Equipment (PPE). The CSSP must certify that all employees have received or will receive appropriate site-specific safety and health training particular to the unique hazards of the Work. Note: Employees must be trained before starting any work activity where such training is explicitly required in the Cal/OSHA, Title 8 Regulations.

12-1.01.C Task Specific Safety Plan (TSSP)

A TSSP must be prepared for high-hazard activities including, but not limited to, excavations greater than 5 feet in depth into which an employee will descend, permit-required confined spaces, activities involving the public right-of-way, tunneling, control of hazardous energy including electrical, thermal, kinetic, and potential, critical crane lifts, erection of falsework or precast panels, work requiring the use of respiratory protection equipment (e.g., lead or asbestos work), and the use of radioactive materials or radiation generating devices. Specific requirements for TSSP's may be indicated in the Special Provisions. At a minimum, the TSSP must include the following elements as applicable to the activity:

1. A detailed description of the activity;
2. Step-by-step procedures for controlling all serious health safety hazards including Illustrations and calculations;
3. List of all Personal Protective Equipment (PPE) to be used;
4. Designation of health and safety responsibilities and authority for all key personnel;
5. Names of, and training records for, all Competent Persons, Qualified Persons, and

for all other employees performing critical tasks that require training by Cal/OSHA, Title 8 Regulations;
6. Employee medical and equipment test records pertinent to the specific task, such as respirator fit test records and medical evaluations;
7. Copies of all health and safety forms and checklists to be used in relation to the task;
8. Copies of Safety Data Sheets (SDSs) required for substances to be used; and
9. Emergency response and rescue procedures related to the task.

12-1.02 24-Hour Contact Information

The Contractor must have on record with the Agency the following 24-hour emergency contact names and numbers:

- Temporary Traffic Control Device Supplier: Supplier of all temporary traffic control devices to be used during construction.
- Contractor Representative: An employee of the Contractor having the authority to make decisions and the ability to respond to an emergency on the project at any time.
- Safety Representative: An employee of the Contractor properly trained in all workplace hazards and having the authority to make decisions regarding safety and health matters on the project and to direct the Contractor's personnel to abate any hazard identified by the Agency.

12-1.03 Illumination

Work by the Contractor during the hours of darkness or in locations where natural light is inadequate must be illuminated to conform to the applicable minimum illumination intensities established by, Cal/OSHA, Title 8, Sections §1523, §3317, §8415, the National Cooperative Highway Research Program (NCHRP) Report 476, and the approved Traffic Control Plan (TCP).

12-1.04 Personal Protective Equipment (PPE).

Cal/OSHA Title 8 Regulations for PPE must be adhered to. The Contractor must provide the required PPE to employees and must ensure that it is used and maintained in a sanitary and reliable condition.

12-1.05 Confined Spaces

12-1.05.A Contractor Responsibilities and Qualifications

Prior to any permit-required confined space entry, as defined by Cal/OSHA, Title 8, Section §5157, the Contractor must submit the following for Agency review and acceptance per Section 12-1.01.C, "Task Specific Safety Plan (TSSP)," of these Specifications:

1. The Contractor's general procedures for confined space entry;
2. A detailed description of and step-by-step procedure for the proposed work;
3. A list of names of all employees involved in the permit-required entry and each person's responsibilities and authority in connection with the entry;
4. A list of all equipment to be used including, but not limited to, respiratory, atmospheric monitoring, chemical analysis, communication, entry and retrieval, , ventilation, lighting, and power tools;
5. Copies of all forms and checklists to be used;
6. Rescue procedures, including notification, name and contact information of the emergency response agency, and method of communication;
7. Employee training records pertaining to confined spaces;
8. Employee records pertaining to the use of respiratory equipment;
9. Safety Data Sheets (SDS) for all applicable chemicals and products;
10. Hot work procedures (if applicable);
11. Lock-out/tag-out procedures (if applicable).

The Contractor's submittal must be made a minimum of 30 Calendar Days prior to any permit-required confined space entry in accordance with Section 5-8, “Contractor’s Submittals,” of these Specifications.

The Contractor will not be allowed to make a permit-required confined space entry until the Agency has reviewed and accepted the Contractor’s qualifications and proposed methods.

The Contractor must conform to the procedures established by the Contractor’s submittal during confined space operations.

Mechanical ventilation must be used to augment natural air circulation where necessary. Mechanical ventilation and its use must meet the following minimum requirements:

- Before ventilation is initiated, information such as restricted areas within the confined space, voids, the nature of the contaminants present, the size of the space, the capacity needs of the blower(s), the type of work to be performed, and the number of people involved, must be considered. This information, together with ventilation calculations, must be submitted with the TSSP.
- Blowers must function continuously and correctly throughout all entry activities. If a blower fails, all employees must leave the space immediately.
- The space must be purged in a manner sufficient to achieve a minimum of 6 air exchanges per hour. The Contractor must increase this air exchange rate as necessary to safeguard entrants.
- Motor vehicles and other gasoline powered equipment must not be allowed to operate near the blower air intake.
- Use of mechanical ventilation must be noted on the entry permit.

Note: Atmospheric testing must be conducted following purging, before entry, and continuously during entry. Entry may not begin until testing has demonstrated that the hazardous atmosphere has been effectively eliminated or controlled.

12-1.06 Respiratory Protection

The Contractor is required to evaluate job tasks to determine if they could result in exposure to gases, vapors, fumes, dust, mists, or other regulated substances (e.g., asbestos, lead) above legally established limits. In these situations, the Contractor must institute appropriate control measures to achieve regulatory compliance and maintain levels below the Permissible Exposure Limit (PEL). When these controls are unfeasible, respiratory protection may be necessary. If the Contractor intends to use respiratory protective equipment, such equipment must be in full compliance with Cal/OSHA, Title 8, Section §5144 “Respiratory Protection” and any other applicable regulation(s). The Contractor must submit a “Task Specific Safety Plan (TSSP),” per Section 12-1.01.C of these Specifications, for Agency review and acceptance.

12-1.07 Hazard Communication

The Contractor is required to develop, implement, and maintain a written Hazard Communication Program in order to protect employees who may use or be exposed to hazardous chemicals during the course of construction. The Contractor’s Hazard Communication Program must be in compliance with Cal/OSHA, Title 8, Section §5194.

The Contractor must provide copies of SDS’s to the Agency upon request.

12-1.08 Control of Hazardous Energy (Lockout/Tagout)

Before a Contractor or any Subcontractor performs work on a system where the unexpected energizing, start up, or release of energy could occur and cause injury or damage, the energy source must be isolated in accordance with the requirements of Cal/OSHA, Title 8, Section §3314 and of these Specifications.

When the Work requires the use of hazardous energy control procedures, the Contractor must submit a Hazardous Energy Control Plan (HECP) to the Agency for review and

acceptance per Section 12-1.01.C, "Task Specific Safety Plan (TSSP)," of these Specifications. Implementation of hazardous energy control procedures must not be initiated until the HECP has been accepted by the Agency. The HECP must outline the scope, purpose, authorization, rules, and techniques to be used for the control of hazardous energy, including, but not limited to, the following:

1. A statement of the intended use of the procedures;
2. Means of coordinating and communicating hazardous energy control activities including coordination with the facility owner and maintenance personnel;
3. Procedural steps and responsibilities for shutting down, isolating, blocking, and securing systems to control hazardous energy;
4. Procedural steps and responsibilities for the placement, removal, and transfer of lockout and tagout devices;
5. Procedural steps and responsibilities for placing and tagging, and moving or removing tags;
6. Requirements for testing the system to verify the effectiveness of isolation and lockout and tagout devices;
7. Procedures for safely responding to emergencies;
8. Requirements for transfer of authority and removal of hazardous energy control devices from the authorized employee to another individual

The Contractor must fully coordinate hazardous energy control activities with the facility owner and maintenance personnel throughout planning and implementation. Each must inform the other of their energy control procedures, ensure that their own personnel understand and comply with the procedures, and ensure that all employees affected by the hazardous energy control activity are notified when the steps outlined in the HECP are to be initiated.

A preparatory inspection must be conducted to ensure that affected personnel understand the hazards and procedures for their control.

Daily inspections must be conducted by a qualified person to ensure that all requirements of the hazardous energy control procedures are being followed.

Training must be provided to ensure that the purpose and function of the hazardous energy control procedures are understood by employees and that employees possess the knowledge and skills required for the safe application, usage, and removal of energy control devices.

12-1.09 Control of Fugitive Emissions

The Contractor must take precautions necessary to control fugitive emissions from the job site. Fugitive emissions include, but are not limited to products and chemicals, noise, and hazardous materials (such as lead or asbestos).

12-1.09.A Products and Chemicals

Where a product or chemical to be used by the Contractor has a Permissible Exposure Limit (PEL) established by Cal/OSHA, the Contractor must maintain exposure levels below the PEL. The Contractor must monitor the work area for changing conditions and the potential for exposure above the PEL. Monitoring must occur, at a minimum, during the start of work and whenever there is a change in procedure, process, or chemicals or materials used. When requested, copies of air monitoring data must be provided to the Agency and to the building owner (where applicable) and shared with building occupants. If it is unfeasible to maintain exposure levels below the PEL, the Contractor must restrict access to authorized personnel only.

12-1.09.B Noise

The Contractor must comply with applicable regulatory requirements for noise and Sacramento County Code (SCC), Title 6, Chapter 6.68 for the control of noise affecting the general public. The Special Provisions may contain specific or additional requirements. The Contractor must provide appropriate hearing protection to employees exposed to a time weighted average noise level of 90 decibels (dBA) or more and train the employees in their proper care and use.

12-1.09.C Asbestos Containing Material (ACM)

All work must be performed in compliance with current federal and state regulations, including U.S. EPA and, Cal/OSHA, Title 8, Sections §1529 and §5208, "Asbestos," the Special Provisions, Section 10-7.01 "Contaminated or Hazardous Materials," of these Specifications, and the requirements contained herein.

When the work involves the potential for exposure to ACM as defined by Cal/OSHA, Title 8, Section §1529(a), the Contractor must provide a detailed Asbestos Abatement Plan (AAP) per

Section 12-1.01.C, "Task Specific Safety Plan (TSSP)," of these Specifications. The plan must include the location and layout of decontamination areas, the sequencing of asbestos work and methods to be used to assure the safety of building occupants, workers, and visitors to the site, methods for controlling emissions in the work area and the containerization and disposal of asbestos debris, and the following:

1. Current medical examination reports for each employee of the Contractor who will be on site;
2. Documentation stating that the Contractor is currently licensed by the State of California to perform asbestos abatement work;
3. Documentation indicating timely notification to the State Department of Industrial Relations (DIR) and of project fees paid;
4. Current certificates of asbestos training for each employee of the Contractor who will be on site;
5. Current documentation of respirator training and fit testing for each employee of the contractor who will be on the site;
6. A letter from the EPA indicating an approved disposal site for ACM;
7. A list of authorized personnel to be granted access to the work area;
8. All required permits, licenses, and insurance;
9. Documentation of the Contractor's notifications to businesses and residents regarding the abatement project schedule;
10. The names and numbers of person(s) to be contacted on behalf of the Contractor in cases of an emergency.
11. Safety Data Sheets (SDSs) for chemicals that will be used or that will be present at the job site. SDSs must be provided to building occupants if chemicals or other hazardous substances are to be used in a facility or in areas where vapors or fumes could enter air intakes.

Note: A copy of all Asbestos Waste Manifests must be submitted to the Agency.

12-1.09.D Removal and Disposal of Asbestos Concrete Pipe (ACP)

The disturbance of ACP is regulated under Cal/OSHA, Title 8, Section §1529. In addition, the following applies:

1. No ACP is to be disturbed unless first authorized by the Agency.
2. The Contractor is responsible to employ the means, methods, and techniques required to ensure that all ACP is removed in a manner such that it remains intact (indurated). When it is unfeasible to remove ACP without making the material friable, the Contractor must submit an AAP for review and approval by the Agency.
3. Any disturbance of greater than 100 sq. ft. of ACP requires the Contractor to be

registered for asbestos-related work. Exception: Contractors with employees and supervisors who have received the prescribed 4-hour ACP training by a Cal-OSHA certified training provider may non-destructively remove greater than 100 sq. ft. of ACP without the asbestos-related work registration. Employees must have a current certificate of training from an accredited training provider.

4. Wet-cutting, snap-cutting, or a “clean break” of the pipe by an excavator is considered non-destructive. Abrasive (dry) sawing of ACP is a specifically "prohibited activity.”
5. Any operation that crushes or otherwise renders ACP friable requires that the work be done by a registered contractor.
6. If more than 260 linear feet of ACP is to be removed, and upon removal will become friable, a National Emission Standards for Hazardous Air Pollutants (NESHAPS) notification must be filed.
7. Non-friable ACP waste must be packaged (6-mil waste bags or wrapped in 6-mil poly sheeting and taped to be leak proof) and disposed of at a classified landfill that accepts asbestos waste. The Contractor must submit to the Agency a certificate of disposal to verify that the waste was legally disposed of. If underground sections of ACP are to be abandoned in place, they must be left intact and non-friable (indurated).

12-1.09.E Lead

The Contractor is responsible for complying with all applicable federal, state, and local regulations and standards for lead-related work. This includes, Cal/OSHA, Title 8, Section §1532.1). The Contractor must provide a detailed Lead Abatement Plan (LAP) per Section 12-1.01.C, “Task Specific Safety Plan (TSSP),” of these Specifications for Agency review and approval.

12-1.10 Tunnel Safety

The Contractor must be aware of any Work that may be under the jurisdiction of the Tunneling Safety Orders (TSO), Title 8, Sections §§8400 – 8568. It is the Contractor’s responsibility to apply for and obtain any permits and licenses and to comply with all applicable laws and regulations. When the work involves tunneling under the jurisdiction of the TSO’s, the Contractor must provide a detailed Tunnel Safety Plan (TSP), in compliance with Section 12-1.01.C (TSSP) of these Specifications. As required by TSO Section §8406, a Certified Safety Representative and Certified Gas Tester must be designated by the Contractor and identified in the TSSP.

12-2 PUBLIC CONVENIENCE AND SAFETY

12-2.01 Public Convenience

Work within public streets and/or roadway rights-of-way must be done in an expeditious manner and cause as little inconvenience to the traveling public as possible. Vehicles, bicycles, and pedestrians must be allowed to pass at all times except during an emergency closure. See Section 7-8, “Peak Hours, Hours of Darkness, Holidays and Weekends,” of these Specifications for time limitations. The surface of roadways open to the public must be kept in a smooth, even condition, free of humps and depressions, satisfactory for the use of public traffic at all times as determined by the Agency.

Temporary facilities used by the Contractor to perform the Work or store or stage material or equipment must not be installed or placed where they will interfere with the free and safe passage of public vehicular, bicycle, or pedestrian traffic.

12-2.02 Pedestrian and Bicyclist Access

The Contractor must not block the movement of pedestrian or bicyclist traffic. The Contractor must provide for pedestrian and bicycle traffic by phasing construction operations and/or by providing alternative pedestrian and bicyclist access through or adjacent to construction areas. Proper advance notice signage with reasonable detours must be installed and maintained through all phases of construction. Access to pedestrian and bicycle devices at traffic signals must be maintained at all times. Pedestrians must never be diverted into a portion of the street used for vehicular traffic or on to private property unless proper barriers, delineation, and adequate signage are in place. Pedestrian and bicycle access must consist of 4 foot wide bridges across trenches and 4 foot wide passageways through construction areas. Hand railings for pedestrians must be provided when required by the Americans with Disabilities Act (ADA) on each side of each bridge or passageway to protect pedestrians from hazards caused by construction operations or adjacent vehicular traffic.

12-2.02.A Pedestrians (Temporary Alternate Circulation Path)

When crosswalk or other pedestrian facilities are temporarily closed or relocated, temporary alternate circulation paths are required to be provided by the Contractor to achieve the maximum accessibility feasible under existing conditions. The alternate paths are to be accessible to all pedestrians, including those with visual impairments.

12-2.02.A(1) Components

A Temporary Alternate Circulation Path (hereafter referred to as “path” or “pathway”) must consist of one or more of the following components: walkways, ramps, and landings, blended transitions, crosswalks, and pedestrian overpasses and underpasses. Elevators, platform lifts, stairways, and escalators must not be part of a path. Components of a path must comply with the applicable portions of these Specifications.

12-2.02.A(2) Continuous Width

Unless otherwise approved by the Agency, the minimum continuous and unobstructed clear width of a path must be 4 feet, exclusive of the width of the pedestrian barricades and channelizing devices. If the alignment of the temporary path does not allow for a minimum continuous and unobstructed clear width of 4 feet, the width may be reduced upon written approval of the Agency. Where a path turns or changes direction, it must accommodate the continuous passage of a wheelchair or scooter. As with street or highway design for vehicles, additional maneuvering width or length may be needed along curved or angled routings, particularly where the grade exceeds 5 percent. Individual segments of paths must have a minimum straight length of 4 feet.

The Americans with Disabilities Act Accessibility Guidelines (ADAAG) Section 4.4 “Provisions for Protruding Objects” apply across the entire width of the path.

12-2.02.A(3) Width at Passing Spaces

Paths that are less than 4 feet in clear width must provide passing spaces at maximum intervals of 200 feet. Paths at passing spaces must be 4 feet wide for a distance of 5 feet.

12-2.02.A(4) Walkway Grade and Cross Slope

Unless otherwise approved by the Agency, the pathway surface must be level and navigable and must not have a slope greater than 12 to 1 or a cross slope greater than 2 percent.

12-2.02.A(5) Surface

All slip-resistant surfaces must have a surface static coefficient of friction of 0.50 per ASTM C 1028.

The surface of the path must be firm, stable, slip resistant, and detectable as defined by the CA/MUTCD. The pathway must be constructed of portland cement concrete, asphalt concrete, slip-resistant plywood, slip-resistant steel plates or other materials acceptable to the Agency.

Dirt is not an acceptable surface. Slip-resistant plywood used for a walkway must have a minimum thickness of 1-1/8 inches and must be thoroughly supported to provide a firm stable surface.

Surface discontinuities must not exceed 1/2 inch maximum. Changes in level up to 1/4 inch may be vertical and without edge treatment. Vertical discontinuities between 1/4 and 1/2 inch maximum must be beveled at 1 to 2 minimum. The bevel must be applied across the entire level change. Changes in level greater than 1/2 inch must be accomplished by means of a ramp that complies with California Code of Regulations, Title 24, Part 2, Chapter 11B, Section 1127B.5, and ADAAG 4.7.

12-2.02.A(6) Location

Sidewalks at the construction location may be closed with adequate detours. Detour routes must be limited to existing sidewalks, private properties, crossings at roadway intersections, and sections of the roadway isolated from vehicular and bicyclist traffic by means of a barrier, and specifically designated for pedestrian traffic as approved by the Agency. To the maximum extent feasible, the alternate circulation path must be provided on the same side of the street as the disrupted route.

Pedestrians may be detoured onto private property only if written permission from the property owner, which includes indemnification of the County for any liability arising from the use of the pedestrian detour, is first obtained. The documentation must be provided to the Agency upon request.

12-2.02.A(7) Protection

Where the temporary alternate circulation path is exposed to adjacent construction, excavation drop-offs, traffic, or other hazards, it must be demarcated with barricades, channelizing devices, concrete barriers, or other temporary traffic control devices necessary to provide clear guidance, separation and a safe path for pedestrians.

When it is necessary to block pedestrian travel at the departure curb to close a crosswalk due to construction activities, curb ramp access to the perpendicular crosswalk must be maintained at all times. This may require additional pedestrian channelization if only a single diagonal curb ramp serves the corner.

During working hours, at least one Contractor employee must be assigned the responsibility to escort pedestrians in need of assistance through and/or around the construction site. The assigned pedestrian escort must be appropriately trained and equipped. The employee assigned this responsibility may also participate in other construction activities; however, they must be aware that acting as a pedestrian escort is their primary responsibility.

12-2.02.A(8) Lighting

The pathway must be provided with lighting with sufficient wattage to provide adequate illumination and a safe and secure environment for pedestrians. When existing artificial lighting does not sufficiently illuminate the path or there is no artificial lighting, temporary lighting must be installed.

12-2.03 Written Notification To Residences and Businesses

The Contractor must notify, in writing, residents and business establishments along the route of the Work at least 10 Working Days prior to road closures and at least 3 Working Days prior to placing parking restrictions or planned disruption of any ingress and/or egress. The notice provided to the residences or businesses must include, at a minimum, a schedule of closures with estimated closure times, the closure location, an alternate route or detour, and the name and 24-hour phone number of a contact person employed by the Contractor.

12-2.04 Access To Driveways, Houses, and Buildings

Safe and passable pedestrian, bicyclist, and vehicular access must be provided and maintained to fire hydrants, homes, commercial and industrial establishments, churches, schools, parking lots, service stations, motels, fire and police stations, hospitals, and all similar facilities and establishments. Access must be navigable, continuous, and unobstructed unless otherwise approved by the agency.

When abutting property owner's mutual access is to be eliminated, repaired, or replaced under the Contract, the existing access must not be closed until the replacement access facilities are completed and functional.

12-2.05 Property Damage

Any property damage caused by the Contractor must be repaired immediately at the Contractor's expense to the satisfaction of the Agency.

12-2.06 Erection of Signs To Facilitate Passage of Vehicles

The Contractor must erect such warning and directional signs as necessary, or as directed by the Agency, for facilitating the passage of public traffic through or around the Work and the approaches. Warning and directional signs must comply with these Specifications and the California Manual on Uniform Traffic Control Devices (CA/MUTCD).

12-2.07 Traffic Obstructions, Delays, and Inconveniences

Public traffic must be permitted to pass through the Work, and the Contractor must conduct operations that offer the least possible obstruction, delay, and inconvenience to the public, except where authorized by the Agency or in an emergency situation where access may endanger the public. See Section 7-8, "Emergency Repairs," of these Specifications for criteria on what constitutes an emergency.

12-2.08 Work On Private Property

The Contractor must obtain written permission from the owner of any privately owned property prior to beginning any work, storing materials, or otherwise conducting any operations on the property. Written approval from the property owner must be on file with the Agency before any operations are permitted on the property.

12-2.09 Hazardous Conditions Created

Whenever the Contractor's operations create a condition hazardous to pedestrians, bicyclists, or the traveling public, the Contractor must, at the Contractor's own expense, furnish, erect, and maintain any fences, covers, temporary traffic barriers, barricades, lights, signs, and other temporary traffic control devices necessary, or as directed by the Agency, to prevent accidents or damage or injury to the public or property.

12-3 PUBLIC SAFETY AND TRAFFIC CONTROL

12-3.01 General

Traffic controls must be installed in accordance with the latest edition of the "California Manual on Uniform Traffic Control Devices" (CA/MUTCD), the National Cooperative Highway Research Program (NCHRP) Report 476 (nighttime traffic controls), the approved Traffic Control Plan (TCP), the project special provisions, these Specifications, and all other supporting, applicable, and referenced standards, documents, or manuals.

12-3.02 Responsibility For Safety

It is the Contractor's responsibility to provide for public safety and traffic control. The Agency may review the Contractor's operations and inform the Contractor if an unsafe or hazardous condition is observed. The Contractor may be directed verbally or via Field Instruction, letter, or other means to abate the hazard. The Contractor must comply with directives for hazard abatement immediately or within the timeframe imposed by the Agency.

12-3.03 Passage of Emergency Vehicles

The Contractor must provide for the uninterrupted passage of emergency vehicles through or around the Work zone at all times regardless of the controlled traffic conditions in place at the time. Exception: The roadway was previously approved for complete closure (e.g., bridge replacement) and where required and advance notification has been provided.

12-3.04 Furnishing, Installing, and Maintaining Temporary Traffic Controls

Signs, lights, barriers, fences, barricades, and other facilities must be furnished, erected and maintained by the Contractor to provide adequate warning and guidance to the public of conditions to be encountered during road construction at all hours of the day or night. Traffic control devices must be placed before beginning work and must be removed from the right-of-way at the end of each day or shift, or, for long-term closures, when no longer needed, and must be placed so as to not obstruct bicycle lanes and pedestrian facilities.

Traffic control devices furnished and erected by the Contractor must not obscure the visibility of, nor conflict in intent, meaning, and/or function with, existing signs, lights, or traffic control devices.

Used Temporary Traffic Control Devices will be considered satisfactory if approved by the Agency before placement. ATSSA's Quality Guidelines for Temporary Traffic Control Devices and Features must be used as a guide.

12-3.04.A Temporary Traffic Barriers (TTB)

The four (4) primary functions of TTBs are:

1. To keep vehicular traffic from entering work areas, such as excavations or material storage sites;
2. To separate workers, bicyclists, and pedestrians from motor vehicle traffic;
3. To separate opposing directions of vehicular traffic; and
4. To separate vehicular traffic, bicyclists, and pedestrians from work and/or structures such as falsework for bridges and other exposed unyielding objects.

TTB is required where any of the following conditions exist:

A. Excavations – When the near edge of an excavation is 15 feet or less from the edge of the traveled way, except when:

1. Excavations are covered with steel plates or concrete covers of adequate thickness to prevent accidental entry by traffic or the public;
2. Excavations are less than 1 foot deep;
3. Excavations have side slopes, where the slope is 4 to1 (horizontal: vertical) or less (excluding existing roadside ditches);

4. Excavations are protected by an existing barrier or railing.

B. Unprotected Unyielding Obstacles – Whenever the work includes installation of a substantial fixed object such as bridge falsework, or whenever the Contractor removes a portion of an existing protective railing and does not replace the railing during the same day, or whenever the roadway alignment changes and subsequently encroaches onto an existing fixed obstacle in such that it creates a significant hazard to the traveling public.

C. Material and Equipment Storage - Whenever unyielding material or heavy equipment is allowed to be stored within 15 feet of the traveled way.

TTBs are approved for use by the Agency through the Traffic Control Plan (TCP) submittal process. Where approved, TTBs must be installed in full compliance with the following:

1. TTB's must be approved by the Agency through a Certificate of Compliance before being placed in the public right-of-way.
2. TTB's must meet the requirements of NCHRP Report 350, Test Level 3 (TL-3) criteria, unless otherwise approved by the Agency.
3. The TTB System must be of sufficient length to completely shield the entire drop-off area or obstacle
4. Exposed surfaces of new and used TTB segments must be freshly coated with white paint prior to their first use on the project and periodically repainted to remove marks from vehicle strikes and graffiti when requested by the agency.
5. TTB segments must be in new or like-new condition free of chips, cracks, or structural steel deformation or loss that may compromise the designed characteristics of the segment. Connecting eyes must be straight and undamaged. Rejection of TTB segments is at the sole discretion of the Agency.
6. Maintain a minimum 2-foot offset between the traveled lane and the TTB and between the excavation and the TTB . If the excavation/barrier minimum separation is not possible, and lateral movement cannot be tolerated, the TTB must be anchored to the road surface as indicated in Detail T3 of the Caltrans Standard Plans. Note: Placing the TTB on a grout bed can provide a mechanical interlock to prevent movement and may be used as an alternative method for anchoring if approved by the Agency.
7. TTB's must be set on a firm, stable foundation graded to provide a uniform bearing throughout the entire length of each segment.
8. Abutting TTB ends must be placed and maintained in alignment without substantial offset to one another.
9. Adjacent TTB segments must be properly connected as indicated on Detail T3 of the Caltrans Standard Plans.
10. Where the TTB system is placed on a curve and the radius is too severe to properly connect the segments, the Barrier must be backed continuously with earth fill as indicated on Detail T3 of the Caltrans Standard Plans.
11. The approach end of the Barrier must be tapered away from the road at a 8 to1 or flatter angle and must be shielded from traffic through one of the following methods:
    I. Bury the end of the TTB in an earthen slope so no abrupt end exists.
    II. Extend the end of the TTB to a point 15 feet or more beyond the edge of the traveled way (ETW).
    III. Install a crash cushion array at the approach end of the TTB system meeting the requirements of Section 12-3.04.B of these Specifications.
12. If a TTB system is to be placed within 10 feet of the traveled way, the Contractor must provide Barrier reflectors fastened to each segment and evenly spaced using one of the following methods:
    I. High strength, two component, quick-set bonding epoxy.
    II. A mechanical system (stainless steel, galvanized or zinc plated) consisting of an internal thread flush anchor, hex bolt, lock and flat washers.

The retro-reflective sheeting must be white (silver) or yellow (amber) in color and applied to one or both sides of the reflector as necessary based on TTB application (traffic separation). The number and placement of reflectors may vary depending on site conditions.

13. The approach end of a TTB system must have a Caltrans P-marker or Caltrans R-Marker installed as appropriate for conditions. If the TTB is placed on a skew, a Type P Marker must also be installed at the skew point nearest the traveled way.
14. The Barrier System must be removed from the right-of-way when no longer required on the project or when directed by the Agency.

12-3.04.B Crash Cushions

Crash Cushions must meet the requirements of NCHRP Report 350, Test Level 3 criteria as crashworthy devices.

The appropriate Crash Cushion array from Caltrans Standard Plans T1A, T1B, or T2 must be used based on the posted speed and location of the barrier or fixed object to be attenuated. A manufacturer-designed Crash Cushion array may be used if approved in advance by the Agency.

A crash cushion array must be furnished, installed, and maintained as shown on the project plans and/or TCP, the Caltrans Standard Plans, and in conformance with the manufacturer's recommendations and the following:

1. If a fixed object or the approach end of a TTB is less than 15 feet from the traveled way, a temporary crash cushion array is required unless otherwise approved by the Agency.
2. Crash Cushions must be in new or like new condition when installed.
3. Any Crash Cushion that is damaged to the extent that it cannot perform as intended and as specified by the manufacturer must be immediately (within 24 hours) repaired or replaced by the Contractor.
4. Crash Cushion Modules must be filled to the proper level (based on placement within the array) and with the appropriate material (generally ASTM C-33 Concrete Sand). Any module found to be improperly filled or filled with unacceptable material (e.g., cobbles, aggregate base, dirt, trash or other non-approved materials) must be immediately removed from the roadway and replaced with a properly-filled Module.
5. Cone inserts, where required, must be placed in each module and in the proper orientation as indicated by the manufacturers' specifications.
6. Lids must be correctly fastened and maintained in place at all times. Water must not be allowed to enter the module and mix with the sand.
7. When a Crash Cushion array is no longer required, all modules must be removed from the right-of-way by the Contractor.
8. The surface on which a Crash Cushion array is installed must be smooth, flat, and compacted (usually asphalt).
9. The module at the approach end of a temporary Crash Cushion array must have a Caltrans P-marker or Caltrans R-Marker installed as appropriate for conditions.
10. Temporary Crash Cushion arrays must not encroach into the traveled way.
11. The Contractor must repair any pavement damaged by the installation or removal of a Crash Cushion array.

12-3.05 Inadequate Traffic Controls and After-Hour Maintenance and Repairs

Should the Contractor appear negligent in furnishing and maintaining sufficient traffic control devices or protective measures or fail to provide flaggers as necessary to control traffic, the Agency may direct the Contractor, at the Contractor's expense, to abate the hazard. See Section 4-5, "Field Instructions or Other Written Directives," of these Specifications, regarding requirements for compliance with directives.

Should the Agency point out the inadequacy of warning devices and protective measures, that action does not relieve the Contractor from responsibility for public safety or abrogate the

obligation to furnish and pay for these devices and measures.

Should the Contractor fail to properly furnish or maintain traffic controls or correct a hazard caused by inadequate or inappropriate traffic control, the Agency will abate the hazard. Expenses to abate the hazard will be deducted from a progress payment. If the Contractor is unavailable to perform after-hour maintenance and repair to traffic control devices, the Agency will make all necessary repairs to safeguard motorists, bicyclists, and pedestrians, and deduct all costs from a progress payment.

12-3.06 Competent Flaggers

The Contractor must provide flaggers to control traffic when necessary or requested by the Agency. Flaggers must be trained as required by Cal/OSHA, Title 8, Section §1599. The Contractor must be prepared to provide verification of such training to the Agency when requested. If in the opinion of the Agency a flagger is not performing in a manner that is conducive to the safe passage of vehicles, bicyclists, and/or pedestrians, the Contractor will be directed to immediately find a replacement flagger.

12-3.07 Construction Signs

The Contractor is responsible for supplying, installing, and maintaining all construction signs and posts. Regulatory signs or guide signs will be supplied, erected, and maintained by the Agency, but must be protected from damage from construction activities by the Contractor through the duration of the project.

12-3.08 Temporary Bridging of Excavations and Trenches

1. The use of steel plates must be approved by the Agency prior to installation.
2. Steel plates, in the roadway, must have the name and 24-hour emergency telephone number of the contractor responsible for maintaining the plates stenciled on the roadway pavement adjacent to the plates. Painted text must be in white lettering using chalk- based paint. The text must be neatly stenciled lettering, a minimum 5 inches in height, and must be maintained in legible condition for the duration of plate placement.
3. Steel plate width and thickness requirements:
   a. 18 inches or less in width - minimum thickness of 3/4 inch.
   b. Greater than 18 to 72 inches in width - minimum thickness of 1 inch.
   c. The thickness of steel plates for trench widths exceeding 72 inches must be established through an analysis completed by a licensed professional engineer.
4. Whenever steel plates are used to cover an excavation on roadways with two or more lanes in each direction, on roadways with a 45 mph or greater posted speed, or where the related work is to take place for longer than 2 weeks, the steel plates must be inlayed or recessed into the existing pavement, milling out the pavement surface to ensure that the top of the plate matches existing elevations of the adjacent pavement surface. Steel plates must be large enough to allow a minimum of 1 foot of bearing on all sides of the trench.
5. Whenever steel plates are used to cover an excavation on other roadways, they may be placed on top of the asphalt with transitional ramps of MC250 asphalt mix against vertical edges of the plates. Ramping must be accomplished to provide a minimum angle of approach of 12 to 1, providing a smooth, gradual transition between the pavement and the plate. Steel plates must be anchored to the roadway surface with pins or spikes on the 4 outermost corners. Additional pins must be placed as necessary to assure the steel plates are secured. Pins must be installed such that they do not protrude above the plate surface any more than is necessary to anchor the plate and must not create a hazard for the motoring or pedestrian public. Steel plates must be welded together (when necessary) to prevent shifting/bouncing. The steel plates must extend beyond the edge of the trench at least 18 inches, but no more than 30 inches, on all sides. Corners of steel plates must not protrude into the

traveled way creating a hazard to motorists, bicyclists, or pedestrians.

6. Steel plates must have a nonskid surface static coefficient of friction of 0.35 per California Test 342 for all steel plates within traveled roadway, and 0.50 per ASTM C1028 for steel plates in pedestrian pathways or crossings. When required by the Agency, the Contractor must certify in writing to the Agency that steel plates used in the Work meet the required static coefficient of friction.
7. The length of a series of plates running parallel to traffic wheel paths must not exceed 30 feet unless approved in writing by the Agency or noted in the TCP or contract drawings.
8. Trench walls and adjacent soils must be sufficiently stabilized prior to the use of steel plates for bridging.
9. For conditions that require a support structure (e.g., wide excavation with multiple steel plates, I-Beams, sheet piles, etc.), the system must be designed by a registered professional engineer and submitted to the Agency for approval before use.
10. Where the Street surface is uneven, plates must be bedded on MC250 asphalt mix.
11. Steel plates must be installed to operate within minimum noise levels as indicated in Sacramento County Code, Section 6.68, "Noise Control."
12. Steel plates cannot remain on the roadway for longer than 7 Calendar Days unless approved in writing by the Agency.
13. BUMP (W8-1) warning signs must be properly posted and maintained in advance of all roadway plates placed on the surface of the pavement.
14. The Contractor is responsible for maintaining the steel plates to allow for the safe passage of vehicles until the roadway is properly back-filled and patched.
15. The Contractor is responsible for damages or injuries that occur as a result of the plates being placed in the roadway. The Contractor must reimburse the Agency any costs for emergency repairs.

In sidewalk areas, one and 1-1/8 inches plywood with a skid-resistant surface and a static coefficient of friction of 0.50 per ASTM C 1028 may be substituted for steel plating where the excavation is less than 2 feet deep and when authorized by the Agency. Transitional ramps of MC250 asphalt mix must be installed against vertical edges in the direction of pedestrian traffic (both up and down-stream). Ramping must be accomplished to provide a minimum angle of approach of 12 to 1, providing a smooth, gradual transition between the sidewalk and the plate. Plywood must extend beyond the edge of the trench. Any overlap (where multiple sheets are used) must be a minimum of 12 inches. The plywood must not protrude past the sidewalk edge into the traveled lane.

Vehicular travel over backfilled but unpaved excavations is not allowed. The Contractor must provide a temporary surface suitable for driving consisting of at least 2 inches of plant mix asphalt over 6 inches of aggregate base, concrete slurry (completely cured), or traffic plates placed over the excavated area of sufficient width and thickness as indicated in this Section.

12-3.09 Entering and Leaving the Construction Zone

Construction equipment must enter and leave the roadway by moving in the direction of public traffic. All movements of workmen and construction equipment on or across lanes open to public traffic must be performed in a safe manner that will not endanger the workmen or the public.

12-3.10 Existing Traffic Signal and Lighting Systems, Signs and Pavement Markings

Existing traffic signal and lighting systems must be kept in operation. When traffic signal shutdown is permitted by the Agency, the Contractor must notify the Agency at least 5 Working Days prior to shut down. Traffic signal detectors accidentally cut or damaged must be repaired or replaced by the Contractor at the Contractor's expense and be operational within 24 hours. When traffic signals are approved for shutdown, the Contractor must control traffic by use of flaggers as directed by the Agency.

Existing signs and pavement markings must be maintained by the Contractor and must not be removed or altered without Agency approval.

12-3.11 Bus Stops

If construction operations will obstruct a bus stop, the Contractor must notify Sacramento Regional Transit (RT) 48 hours in advance of beginning that portion of the Work and make arrangements agreeable with RT to provide an alternate location where people can safely board the bus.

12-3.12 Removal of Spillage From Roadway

The Contractor must immediately remove any spillage resulting from their operations along or across any public traveled way.

12-3.13 Road Edge Drop-off

A road edge drop-off is defined as an elevation difference between lanes or the edge of the traveled lane and shoulder as traversed by the wheel of a motor vehicle.

Although not always feasible, a transitional ramp with appropriate signs and delineation is preferred over other methods (barrier or open drop-off with warning signs and delineation).

Where the drop-off is between lanes and overlay or paving operations cannot be completed within the allowable lane closure time, a transitional ramp is required if the drop-off is greater than 0.08 foot. Taper edges that are transverse to the direction of traffic at a 20:1 (horizontal:vertical) slope or flatter. Taper edges that are longitudinal to the direction of traffic at a 4:1 (horizontal:vertical) slope or flatter.

For drop-offs between the edge of the traveled lane and the shoulder that are greater than

0.15 foot, the ramp must be constructed at a 4:1 (horizontal:vertical) or flatter slope. Ramp material must be fully compacted and compatible with the material in the excavated area. This applies only to drop-offs created by construction or permit and utility operations. Drainage ditches are not to be considered as drop-offs.

Placement of all signs and channelizing devices must be as indicated in Part 6 Temporary Traffic Control of the California MUTCD. Install portable delineators or tubular markers throughout the drop-off condition spaced at intervals indicated in Table 6F-102, or closer as directed by the Agency. Channelizing devices must be "glue-down" type when requested by the Agency Channelizing devices used to separate opposing directions of traffic must be yellow with retro-reflective banding. Where the drop-off condition is greater than 0.15 foot and up to 0.25 foot install Low Shoulder (W8-11) signs. Where the drop-off condition is greater than 0.25 foot but less than 1.0 foot place No Shoulder (C-31A) signs. Sign spacing must be as indicated in Table 6C-1. Whenever a drop-off is 1.0 foot or greater in depth, barrier protection is required in compliance with Section 12-3.04.A of these Specifications unless otherwise approved by the Agency.

12-4 TRAFFIC CONTROL PLANS (TCP)

The Contractor shall submit a Traffic Control Plan (TCP) for review for any work requiring modifications of existing traffic patterns. The TCP shall include provisions for vehicular, bicyclist, and pedestrian access. Each TCP must be developed in accordance with the latest version of the California Manual on Uniform Traffic Control Devices (CA/MUTCD). The basic objective of the TCP is to permit the Contractor to work within the public right-of-way efficiently and effectively, while maintaining a safe, uniform flow of traffic. Both construction work and public interest must be given consideration when developing the TCP.

Construction traffic controls for qualified streets shall be provided in conformance with the latest Sacramento County Department of Transportation Traffic Control Templates, which can be found through the Department of Transportation website. These templates satisfy many of the locations/situations typically encountered, but not all. If the Contractor chooses to use a TCP template they should become familiar with the General Conditions and must first confirm its applicability to the location/situation and its use with the Agency. The use of any other TCP requires review and approval prior to proceeding with work within the public right-of-way. The TCP must be provided to the Agency for review and approval at least 20 Working Days prior to its

implementation unless otherwise approved by the Engineer or modified by the Special Provisions. The Contractor is solely responsible for submitting any proposed TCP or modification and obtaining the Agency's approval. Copies of the approved TCP must be onsite at all times.

Unless the Contractor uses a provided template or unless otherwise approved by the Agency, the TCP must:

1. Be on 24 by 36 inch or 11 by 17 inch sheets.
2. Be legible and standardized, using computer generated graphics.
3. Show all proposed construction signs, barricades, flaggers, delineation and other traffic control devices required to provide appropriate temporary traffic control for the Work.
4. Indicate the name, address, and telephone number of the person responsible for designing the TCP.
5. Be signed and stamped by a Registered Civil Engineer, Registered Traffic Engineer, ATSSA certified Traffic Control Design Specialist, or C-31 Licensed Contractor.
6. Include the name and telephone number of the 24-hour contact person representing the Contractor for implementation of temporary traffic controls.
7. Indicate the Contract number, encroachment permit number, or the name of the improvement project.
8. Indicate the duration of the construction work (Calendar Days) and the requested work hours (example -- 8:00am to 3:30pm).
9. Indicate a north arrow.
10. Show and label all streets in the vicinity.
11. Show all existing traffic signals and traffic control signs and indicate any proposed operational changes (e.g., placing signal lights on flash, or covering signal lights temporarily).
12. Show existing striping, pavement markings, painted crosswalks and bike lanes. Include total roadway widths, individual lane widths, bike lane widths, median dimensions, etc.
13. Show existing curbs, gutters, sidewalks, driveways and intersections in the construction work zone.
14. Indicate posted speed limits.
15. Show location and dimensions of the construction work zone.
16. Show work area and materials storage area (if applicable).
17. Label all taper lengths and widths, delineator spacing, and sign spacing.
18. Include a legend to define all symbols and designate them with current CALTRANS nomenclature.
19. Show all parking restriction zones and signs.
20. Show signs and barricades to be used to direct pedestrians or bicyclists through or around the Work.

Traffic lanes for public use must be at least 10 feet in width. Whenever feasible, an additional 4 feet must be provided for a bicycle lane. If it is not feasible to provide a separate bicycle lane, the Contractor must post signage before the construction area stating, "SHARE the Road with Bicyclists." Additionally, when the lane is shared, the Contractor must post signage for a maximum speed limit of 25 MPH in the shared lane.

The Contractor must notify the Engineer in advance of the Contractor's desire to change any existing traffic patterns in accordance with a previously approved TCP. Once a TCP has been approved by the Agency, for traffic pattern changes that do not require a road closure, the Contractor shall provide the Agency with a minimum of 5 Working Days' notice, unless otherwise approved or deemed an emergency lane closure by the Agency. For all road closures, the Contractor shall provide the Agency with a minimum of 20 Working Days' notice prior to the desired closure date, unless otherwise approved or deemed an emergency road closure.

12-5 BARRICADING OPEN TRENCHES

Any excavation permitted by the Agency to be left open must be barricaded with Type I, Type II, or Type III barricades with retro-reflective tape and flashers, as approved or directed by the Agency. Signs stating "OPEN TRENCH" must be posted when directed by the Agency. Open excavated areas must be barricaded with at least 2 Type III barricades at the end of the excavation that faces oncoming traffic. Any excavation within 8 feet of the traveled way, not protected by a barrier approved by the Agency as indicated in Section 12-3.13, “Road Edge Drop-off,” of these Standard Specifications, must be backfilled at the end of the work shift provided with a transitional ramp, or plated in accordance with Section 12-3.08, "Temporary Bridging of Excavations and Trenches,” of these Specifications.

12-6 EXCAVATION AND TRENCH SAFETY

Contractors that plan to excavate must follow the requirements of the California Code of Regulations (Cal/OSHA), Title 8, California Code of Regulations, Section 1541 Article 6 “Excavations” as applicable to the work.

12-6.01 Permit

The Contractor must obtain a permit from the Division of Industrial Relations per Labor Code Section 6500, as specified in Cal/OSHA, Title 8, Article 2, Sections §§341 – 341.5, for all excavations 5 feet or deeper into which an employee is required to descend. The permit must be kept at the construction site at all times.

12-6.02 Shoring, Bracing, Shielding, and Sheeting

In accordance with Labor Code Section 6705, in advance of excavation of any trench or trenches 5 feet or more in depth, with a total value of $25,000 or more, the Contractor must submit to the Agency a detailed plan showing the design of shoring, bracing, sloping, or other provisions for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If the plan varies from the shoring system standards, the plan must be prepared by a California registered civil or structural engineer. A signed copy of the detailed plan must be on site at all times during excavation work. The Contractor's submittal must be made a minimum of 5 Calendar Days prior to any excavation work in accordance with Section 5-8, “Contractor’s Submittals,” of these Specifications.

Nothing in this Section can be deemed to allow the use of a shoring, sloping, or protective system less effective than that required by Cal/OSHA, Title 8, Article 6 “Excavations.” Nothing in this Section can be construed to impose tort liability on the Agency or any of its employees. These systems must support the sides of the excavation and prevent soil movement that could cause injury to persons or structures. Any damage resulting from a lack of adequate shoring, bracing, shielding or sheeting must be repaired at the Contractor's expense.

A Competent Person, as defined in Cal/OSHA, Title 8, Section §1504, “Definitions,” must be on site at all times when the Contractor's employees are working within the excavation.

The price bid for work that requires an excavation of 5 feet or deeper (or less if conditions warrant) must include the cost of adequate sheeting, shoring and bracing, or equivalent method conforming to applicable safety orders, unless a separate bid item is included in the bid form.

12-6.03 Contaminated Soil Management

If the Contractor is performing excavation work at a site where there is evidence, or historical data to indicate, that the soil is contaminated with oil, fuel, or other such hazardous materials, the Contractor is required to adhere to the regulatory requirements that govern the excavation and disposal of contaminated soil. These requirements include provisions for work zone delineation and control, handling of contaminated debris, storage of excavated soil, personal protective equipment, equipment decontamination, and air monitoring. See Section 10-7 Contaminated and Hazardous Materials or Environments of these Specifications for additional information.

The Contractor is required to stop work and implement the appropriate emergency response

procedures in the event that field observation (e.g. odor, discoloration/staining, oily sheen) indicates that contaminated soil has been encountered. If the Contractor fails to stop work and implement appropriate emergency response procedures, the Agency may stop the work, and the Contractor is responsible for impacts to the Work due to the Agency stoppage.

When requested by the Agency, the Contractor must develop and implement a Spill Prevention Control and Countermeasure (SPCC) Plan. The Contractor's SPCC Plan will describe the procedures and equipment used to minimize spills, leaks, or releases of oil or hazardous materials. In addition, the Plan must address the reporting and response procedures in the event of an incident.