APPENDIX G – BL-A-4, Tempe Bridge to 27th Street

Blue Line (A), Line Section 4, BL-A-4, Tempe Bridge to 27th Street

G.1 SECTION OVERVIEW

Locations: Center Parkway • Yard Entrance • 44th Sky Train • 38th St • 27th St Interlocking
Line: Blue Line (A Line) – Phoenix Section
Platforms:

- Center Parkway / Washington St – EB / WB
- 44th St / Sky Train – EB / WB
- 38th St / Washington St – EB / WB
- 24th St / Jefferson St – EB / WB
- 12th St / Jefferson St – EB / WB
- 3rd St / Washington St – EB / WB
- 27th Ave / Jefferson St – West Terminal

Track Type: Dual-track alignment transitioning from bridge approach to urban median running, with crossovers at Yard Entrance and 27th St Interlocking.

G.1.1 CROSSOVER: YARD ENTRANCE (51ST STREET – 54TH PLACE)

Switch	Track	Description / Function
1A	Track 1	Facing-point switch allowing movement from Track 1 into Yard Lead.
1B	Track 2	Trailing-point crossover switch from Track 2 to Track 1 toward Yard Lead
3	Track 1	Intermediate crossover switch supporting reverse moves toward the yard throat.
5	Track 1	Secondary switch used for yard departure alignment
7A	Track 1	Facing-point switch providing diverging route into yard connection.
7B	Track 2	Corresponding trailing-point crossover switch paired with 7A for entry/exit routing.

G.1.2 CROSSOVER: 27TH STREET (WASHINGTON & JEFFERSON ST)

Switch ID	Track	Description / Function
1A	Track 1	Facing-point switch allowing movement from Track 1 to Track 2 (eastbound diverging move).
1B	Track 2	Trailing-point crossover paired with 1A for reverse or westbound movements
3A	Track 1	Trailing-point switch completing the double crossover for Track 1 to Track 2 alignment
3B	Track 2	Facing-point switch paired with 3A for Track 2 to Track 1 movements

G.2 WORK ACTIVITY DESCRIPTION

This section encompasses the west-end Blue Line alignment from the Tempe Bridge approach through the Yard Entrance and urban corridor to 27th St. Multiple departments perform inspection, maintenance, and troubleshooting under full RWP coverage.

The area includes frequent crossover activity, restricted clearance near the yard throat, and heavy vehicle/pedestrian interfaces along Washington and Jefferson corridors. Continuous OCC coordination and strict safe-zone use are required.

G.3 INTERLOCKING AND PROTECTION PROCEDURES

- OCC authorization required prior to entering or occupying Yard Entrance or 27th St limits.
- Verify all switch correspondence visually and electrically before route is set.
- Operators held at preceding platforms until route confirmation.
- Red aspects provide absolute stop protection during maintenance.
- Manual switch work requires onsite confirmation with OCC.

Hazard Awareness Summary

Hazard	Risk Description	Mitigation / Control
Track split zones	Converging track geometry reduces clearance and safe refuge.	Establish ETO limits and two-person team minimum.
Yard lead movements	Frequent switching activity creates unexpected train movements.	Maintain continuous OCC coordination and use lookouts at entry points.

Hazard	Risk Description	Mitigation / Control
Limited visibility	Guideway walls and curvature reduce sightlines near 51st and 44th St.	Use portable lighting and assign spotters during night work.
Vehicular interfaces	Multiple roadway crossings with shared signals and gates.	Use flaggers and cones to establish protected work zones.
Heat / environment	High temperature and glare exposure along Jefferson corridor.	Implement heat-stress rotation and hydration protocols.

Summary of Protection Controls

- OCC authorization required for all track occupancy.
- Exclusive Track Occupancy or Verbal Work Limits established prior to entry.
- Minimum two-person crew for all yard lead and split track zones.
- Red aspect protection enforced when maintenance in progress.
- Continuous radio contact with OCC and adjacent interlockings.

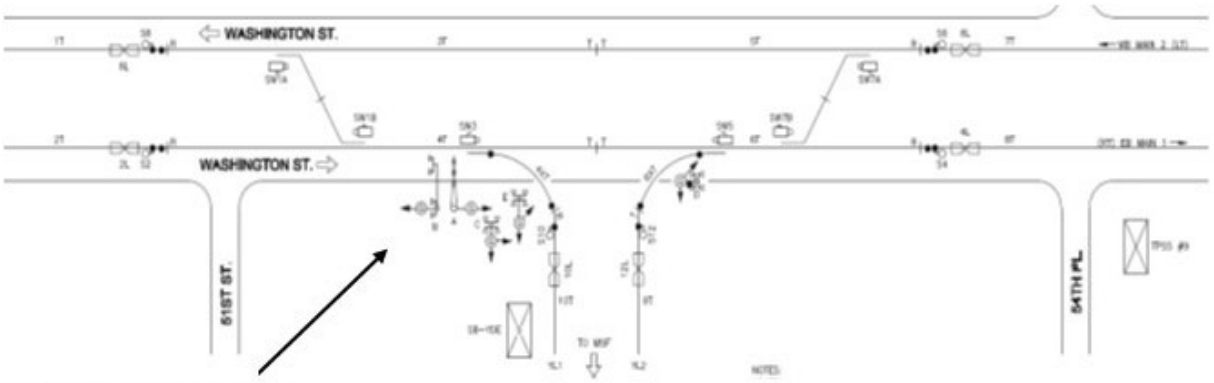
Special Hazard Area – Track Splits and Slip Ramps

Track split zones between Yard Entrance and 44th St present elevated risk due to restricted refuge and multiple switch paths. Access is permitted only under OCC track protection with a minimum of two qualified workers. Sidewalks or designated refuge areas must be used for safe clearance. All personnel must complete a site-specific briefing before entry.

Summary

The Tempe Bridge to 27th Street segment transitions from bridge structure to dense urban corridor and yard access zone. Its complex switch layout and restricted clearance require strict OCC coordination, designated safe zones, and two-person minimum crews to maintain compliance with FTA RWP standards.

G.4 GRADE CROSSING: 51ST STREET GRADE CROSSING

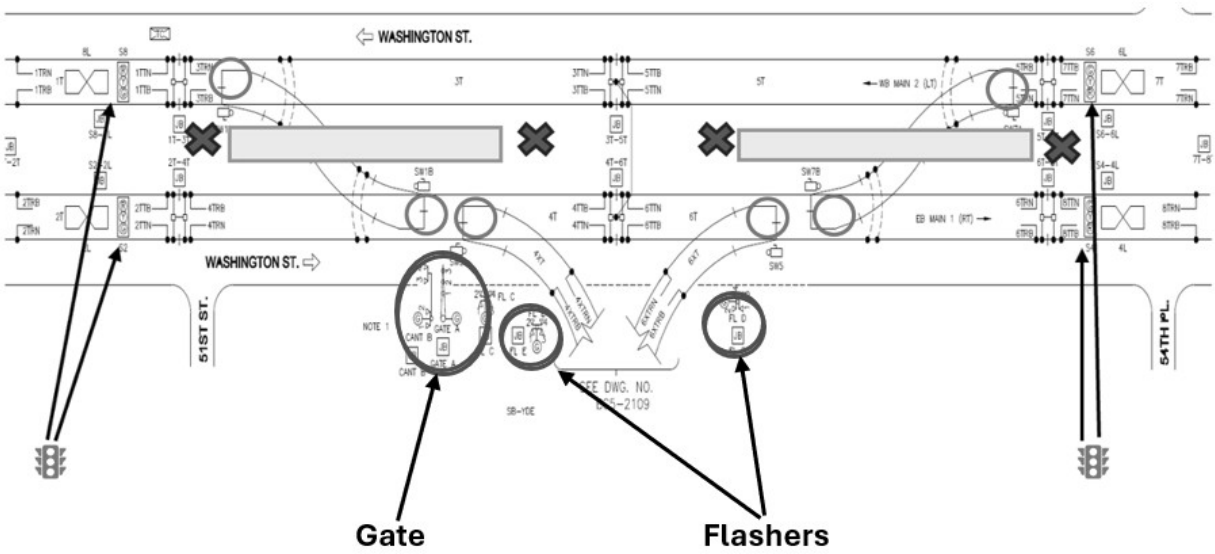


51st Grade Crossing



Yard Entrance Crossover





Yard Exit Crossover







G.5 44TH STREET – SKY TRAIN



G.6 STATE ROUTE 143 OVERPASS





Hazard Assessment: SR-143 Overpass Crossing

Location: Light Rail Alignment beneath SR-143 Overpass
Section Type: At-grade light-rail alignment under elevated freeway structure
Surrounding Features: Multi-leg intersection, on/off ramps, pedestrian crosswalks, limited shoulder access

G.6.1 HAZARD IDENTIFICATION

Hazard ID	Category	Description	Potential Consequences
H-143-01	Visibility / Sightline	Freeway structure and columns obstruct view between train operators, roadway workers, and vehicle drivers.	Increased risk of roadway worker strikes, missed visual signals, and operator reaction delays.
H-143-02	Confined Vertical Clearance	Limited overhead clearance and narrow under-bridge spacing restrict safe positioning for personnel and work vehicles.	Physical injury due to clearance contact, or equipment damage.

Hazard ID	Category	Description	Potential Consequences
H-143-03	Traffic Interaction	High-volume intersection with traffic turning, merging freeway ramps, and queuing vehicles near the guideway.	Vehicle-to-train conflicts, intrusion into work zones, and unpredictable driver movements.
H-143-04	Signal Visibility / Communication	Overhead bridge obstructs view of traffic and train signals; potential radio shadow under structure.	Delayed OCC communication or missed signals.
H-143-05	Environmental / Lighting Conditions	Intense shadow contrast and low visibility under the bridge; glare transition at approaches.	Operator or worker vision impairment, increased risk of trip/fall or struck-by events.
H-143-06	Pedestrian Conflicts	Pedestrian crossings adjacent to abutments and narrow refuge areas.	Worker distraction, pedestrian intrusions into guideway.
H-143-07	Stormwater / Surface Hazards	Water accumulated during rainfall, creating slick rail and pavement.	Slip hazard, traction loss for vehicles and LRVs.
H-143-08	Heat Entrapment / Limited Airflow	Bridge structure traps heat; minimal ventilation during summer.	Elevated risk of heat stress to roadway workers.

G.6.2 RISK EVALUATION

Hazard ID	Likelihood	Severity	Risk Rating	Notes
H-143-01	Likely	Major	High	Persistent obstruction: mitigations required each access.
H-143-02	Occasional	Moderate	Medium	Clearance awareness and cones/barriers required.
H-143-03	Likely	Major	High	Requires active flagging or ETO for any on-track work.
H-143-04	Occasional	Major	High	Ensure redundant comms (radio and hand signals).
H-143-05	Frequent	Moderate	Medium	Lighting plan or auxiliary illumination recommended.
H-143-06	Occasional	Moderate	Medium	Pedestrian control measures during maintenance.
H-143-07	Occasional	Minor	Low–Medium	Inspect and clear drains prior to work.

Hazard ID	Likelihood	Severity	Risk Rating	Notes
H-143-08	Frequent	Moderate	Medium	Enforce hydration and heat-stress plan.

G.6.3 MITIGATION AND CONTROL MEASURES

Engineering Controls

- Install or verify adequate lighting under the structure for nighttime work.
- Use temporary traffic barriers or cones to isolate work vehicles and personnel from turning traffic.
- Verify drainage and surface conditions before work begins.

Administrative Controls

- Require OCC coordination for all track access; recommend Exclusive Track Occupancy (ETO) when performing work directly beneath the overpass.
- Utilize watchperson/lookout positioned outside the shaded zone with clear line of sight.
- Conduct pre-work job briefing addressing visibility, radio shadow, and emergency egress.
- Enforce heat-stress mitigation and lighting transition awareness during long-duration activities.

PPE / Training Requirements

- High-visibility Class 3 apparel with reflective striping visible under artificial lighting.
- Portable lighting or personal illumination devices for workers.
- Heat-stress PPE (cooling vests, hydration kits) during summer months.

Residual Risk

After implementing the above controls, the residual risk rating for this area is assessed as Medium (Acceptable with continuous monitoring) under FTA RWP tolerances.

G.7 27TH STREET CROSSOVER






2416
DO NOT CROSS TRACKS



Hazard Assessment: Washington Street (Cesar Chavez / Curve Alignment)

Location: Washington Street – East of 24th Street, adjacent to Cesar Chavez School
Line Section: Blue Line (A Line) – Central Phoenix Segment
Track Type: Curved double-track alignment transitioning from tangent (straight) to curve
Environment: Adjacent school zone, high pedestrian activity, limited line of sight

G.7.1 HAZARD IDENTIFICATION

Hazard ID	Category	Description	Potential Consequences
H-WA-01	Curved Alignment / Blind Spot	The track curvature limits train operator visibility of roadway workers and vice versa, particularly in eastbound direction.	Increased risk of roadway worker strikes or delayed clearance response.
H-WA-02	Adjacent School Zone	School entrances, crosswalks, and pedestrian crossings within proximity of the guideway.	High risk of pedestrian intrusion and distraction during arrival/dismissal.
H-WA-03	Limited Shoulder / Safe Zone	Minimal lateral clearance between curb line, OCS poles, and light-rail guideway.	Restricted worker refuge area; limited space for equipment or vehicle staging.
H-WA-04	Vehicular Turning Conflicts	Jefferson and Washington intersections include complex turn movements and right turns that cross near the guideway.	Increased probability of vehicle encroachment or mirror strikes to workers or trains.
H-WA-05	Surface Conditions / Drainage	Slight grade changes and debris accumulation in curve section, especially near the vacant lot.	Slip, trip, or derailment hazard during wet or debris-filled conditions.
H-WA-06	Pedestrian Activity / Distraction	Students, parents, and pedestrians frequently cross or walk parallel to tracks near Cesar Chavez campus.	Potential trespassing or inattentive pedestrian incidents during school hours.
H-WA-07	Limited Escape Path	Between retaining wall/fence line and guideway—minimal clearance for rapid egress.	Worker entrapment in emergency or train approach scenario.

G.7.2 RISK EVALUATION

Hazard ID	Likelihood	Severity	Risk Rating	Notes
H-WA-01	Likely	Major	High	Curved geometry and blind spot persist along full segment.
H-WA-02	Frequent	Major	High	Occurs daily during school hours; pedestrian supervision needed.
H-WA-03	Likely	Moderate	Medium–High	Enforce safe-zone designation before access.
H-WA-04	Occasional	Moderate	Medium	Use cone tapering and temporary signage.
H-WA-05	Occasional	Moderate	Medium	Inspect and clean debris prior to work.
H-WA-06	Frequent	Major	High	Requires crossing guards or traffic control when active.
H-WA-07	Occasional	Major	High	No natural escape path; lookout mandatory.

G.7.3 MITIGATION AND CONTROL MEASURES

Engineering Controls

- Install or mark designated Safe Zones on the outer curve side away from train overhang.
- Maintain clear sidewalks and pedestrian barriers near the school frontage.
- Verify and maintain track drainage and debris removal schedule.

Administrative Controls

- All RWP activities should be scheduled outside of school peak hours (7–9 AM, 2–4 PM).
- Require OCC notification and lookout assignment due to curvature visibility limitations.
- Deploy temporary signage or traffic control cones along adjacent lanes for awareness.
- Establish clear radio identifiers (A Line, track 1 or 2) and confirm lookouts' location prior to entry.

PPE / Training Requirements

- High-visibility Class 3 apparel with reflective and fluorescent contrast.
- Mandatory hearing protection during train approach and work within curve.
- Lookout personnel trained to maintain continuous line of sight at curve apex.
- Lone Worker must communicate with OCC to notify that the worker has cleared the track

Residual Risk

After applying all mitigation measures, the residual risk for this location remains Medium (Acceptable with Continuous Monitoring) requiring active lookout use and strict adherence to safe-zone boundaries.

G.7.4 TRACK SPLITS AND SLIP RAMPS

Track Splits

Condition:
Track splits – locations where two tracks diverge, converge, or interlock—present elevated safety risks due to limited clearance, multiple train movement paths, and restricted visibility caused by curvature, guideway walls, or OCS poles. These areas typically lack Safe Zones of Refuge, requiring heightened coordination and situational awareness from all roadway workers.

Hazard Description:

Walking inspections within track split areas expose roadway workers to opposing train movements, blind spots, and reduced sightlines along both tracks. Because these areas have no designated refuge or defined escape path within the guideway, workers are at increased risk if an unauthorized or unanticipated train movement occurs.

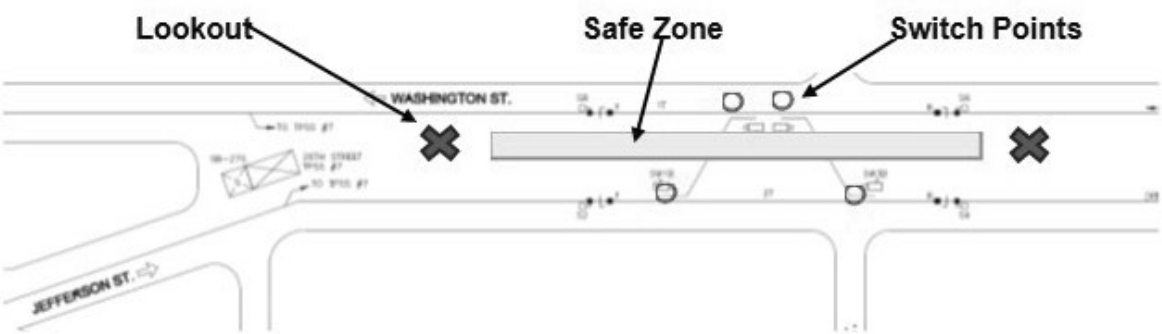
The only safe area of refuge in most track split zones is the adjacent sidewalk, which provides separation from both train and roadway vehicle movements.

Safety Requirements:
- **Access Control**: Entry is permitted only under OCC Track Protection, established through direct communication and confirmation with the Operations Control Center.
- **Lookout Limitation:** Lookout protection alone is not permitted within track split zones due to the combination of blind spots and absence of safe refuge.

- **Team Requirement:** A minimum of two qualified roadway workers (inspector and safety watch) must be present during any walking inspection or maintenance activity conducted in these areas.
- **Visibility and Positioning:** Maintain constant visual contact between workers. Stay clear of all active track movement paths and never position yourself between parallel or converging rails.
- **Refuge Location**: When trains or roadway traffic are present, the sidewalk area is the only acceptable safe zone of refuge. Workers must relocate to this area before any train movement is authorized.
- **OCC Coordination:** The Operations Control Center must confirm that all tracks are secured, exit inhibits are applied, and no active or pending train movements exist before authorizing access.
- **Work Planning:** Conduct a thorough pre-job briefing identifying known blind zones, curvature limits, and sidewalk refuge locations prior to entering the area


Crossover
Washington St
Washington St
Washington St
Washington St
S 25th St
S 27th St
El Paso - Los Angeles Limousine Express
VSS-Valley Spring Service
E Jefferson St
E Jefferson St
E Jefferson St

Aspect


Lookout
Safe Zone
Switch Points
WASHINGTON ST.
JEFFERSON ST.

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