APPENDIX F – BL-A-3, Dobson to Tempe Bridge

Blue Line (A) Line Section 3, BL-A-3 Dobson to Tempe Bridge

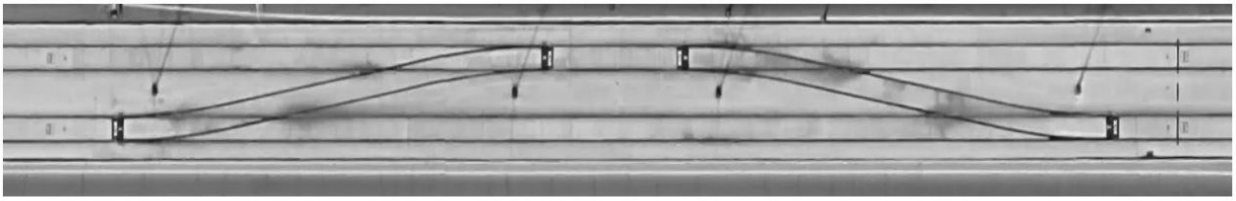
F.1 SECTION OVERVIEW

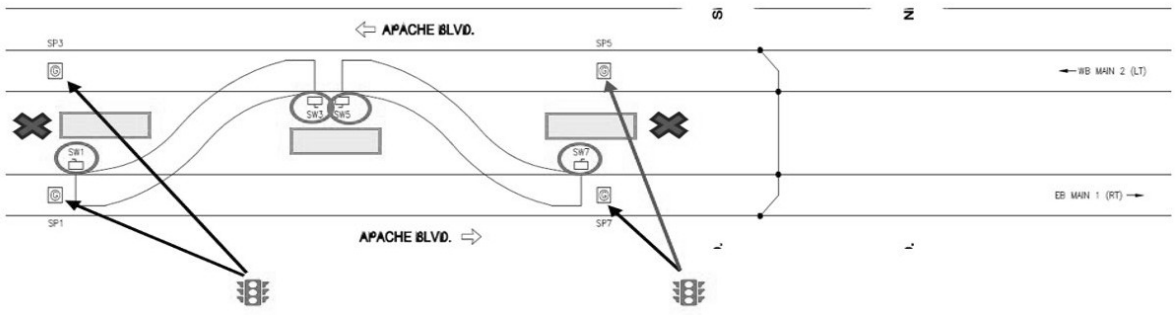
Locations: River Manual Crossover • Dorsey Interlocking • Mill Pocket • Tempe Town Lake Bridge
Line: Blue Line (A Line) – Tempe Section
Platforms:

- Sycamore / Main St – Eastbound / Westbound
- Price Rd / Apache Blvd – Eastbound / Westbound
- Smith Rd / Apache Blvd – Eastbound / Westbound
- McClintock Dr / Apache Blvd – Eastbound / Westbound
- Dorsey Ln / Apache Blvd – Eastbound / Westbound
- Veterans Way / College Ave – Eastbound / Westbound

Track Type: Double-track alignment transitioning from tangent mainline to curved alignment approaching the Mill Avenue bridge, including one manual crossover and a pocket-track configuration at Mill Interlocking.

RIVER MANUAL CROSSOVER





Manual Crossover: River (Rio Salado Parkway & River Drive)

Switch ID	Track	Description / Function
1A	Track 1	Manual facing-point crossover switch from Track 1 to Track 2 (northbound direction).
1B	Track 2	Manual trailing-point crossover paired with 1A for southbound return moves.
3A	Track 1	Manual trailing-point switch completing the crossover from Track 1 to Track 2.
3B	Track 2	Manual facing-point crossover paired with 3A for Track 2 to Track 1 movements

DORSEY CROSSOVER







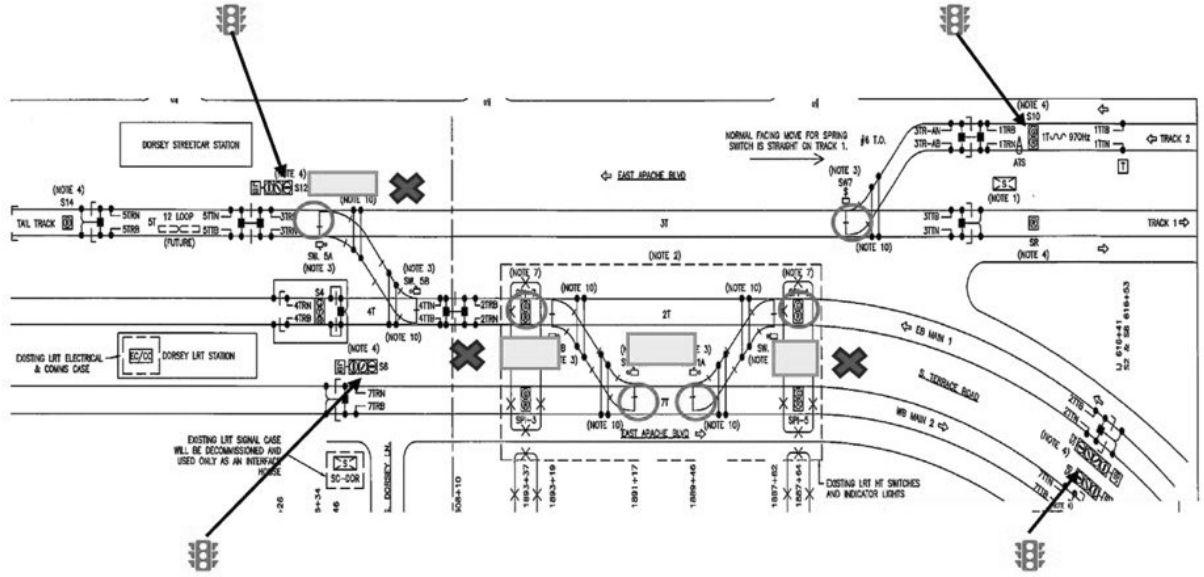


Dorsey Switch 7 Spring Switch - Streetcar

Dorsey Switch 7 Spring switch Streetcar







Crossover: Dorsey (Apache Blvd & Dorsey Lane)

Switch ID	Track	Description / Function
1A	Track 1	Facing-point crossover switch from Track 1 to Track 2 (eastbound direction).
1B	Track 2	Trailing-point crossover switch paired with 1A for westbound movements returning to Track 1.
3A	Track 1	Pocket-track switch allowing movement from Track 1 into center pocket or siding (east end connection).
3B	Track 2	Trailing-point crossover switch completes Track 2 to Track 1 crossover.
5A	Track 1	Pocket-track switch allowing exit from center pocket back to Track 1 (west end connection).
5B	Track 2	Facing-point mainline switch paired with 5A for routing between Track 2 and Track 1.

Crossover: Mill Pocket (Mill Avenue & Rio Salado Parkway)

Switch ID	Track	Description / Function

1A	Track 1	Facing-point crossover switch from Track 1 to Track 2 (eastbound direction).
1B	Track 2	Trailing-point crossover switch paired with 1A for westbound movements returning to Track 1.
3A	Track 1	Pocket-track switch allowing entry from Track 1 into the Mill pocket track (east connection).
3B	Track 2	Trailing-point crossover switch completing crossover from Track 2 to Track 1.
5A	Track 1	Pocket-track switch allowing exit from the Mill pocket track back to Track 1 (west connection).
5B	Track 2	Facing-point mainline switch paired with 5A for routing between Track 2 and Track 1.

Platforms:

Sycamore St & Main St	East / West
Price Rd & Apache Blvd	East / West
Smith Rd & Apache Blvd	East / West
McClintock Dr & Apache Blvd	East / West
Dorsey Ln & Apache Blvd	East / West
Dorsey Ln & Apache Blvd	East / West

Grade Crossing: University, Mission Palms, Macayo's, 1st & Ash

F.2 WORK ACTIVITY DESCRIPTION

This section includes active mainline segments, crossovers, and grade crossings extending through downtown Tempe. Multiple departments perform inspection, maintenance, and troubleshooting under full Roadway Worker Protection (RWP) coverage.

The alignment contains both tangent and curved segments with limited clearance near Mill Avenue and Tempe Bridge. Workers must occupy only designated safe zones and maintain continuous OCC coordination when on or near the trackway.
Frequent train operations in both directions and proximity to vehicular and pedestrian areas require heightened situational awareness, two-way radio communication, and adherence to all established RWP procedures.

F.3 INTERLOCKING AND POCKET PROTECTION PROCEDURES

River (Manual), Dorsey, and Mill are controlled or coordinated interlockings governed by OCC.

Protection protocols mirror those of BL-A-2:

- OCC authorization is mandatory before track entry.
- All switches must be confirmed in correspondence (visually manual, electrically for power).
- Operators are held at preceding platforms until OCC confirms route clearance.
- Red aspects provide absolute stop protection, indicating active maintenance occupancy.
- Pocket track movements at Mill require confirmation from both OCC and onsite personnel prior to switch operation.

F.4 HAZARD AWARENESS SUMMARY

Hazard	Risk Description	Mitigation / Control
Dual train approach	Simultaneous opposing movements reduce clearance awareness.	Assign lookout and maintain continuous OCC communication before authorization.
Manual switch handling (River)	Risk of misalignment or incomplete lock.	Verify manual switch position and ensure OCC acknowledgment before train movement.
Limited clearance on curves	Restricted sightlines at Mill and bridge approach.	Establish safe zones, use spotters, and maintain radio contact during movements.
Shared crossings with UPRR	Federal oversight and active freight movement nearby.	Coordinate with OCC and ensure FTA/UPRR protocols are followed before access.
Proximity to vehicle/pedestrian areas	Increased external hazards near Dorsey, Veterans Way, and Mill.	Use cones, barricades, and PPE; assign traffic control personnel when required.

Summary of Protection Controls

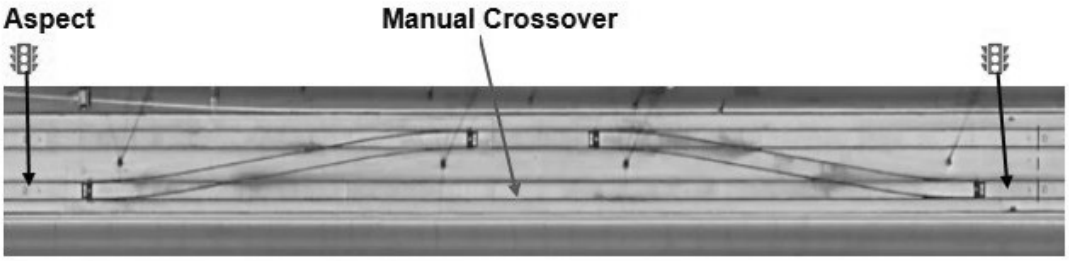
- OCC authorization required prior to any entry or movement.
- Manual switches must be confirmed and locked in proper position.
- Absolute-stop protection enforced during maintenance.
- Safe zones restricted to designated clearance areas.

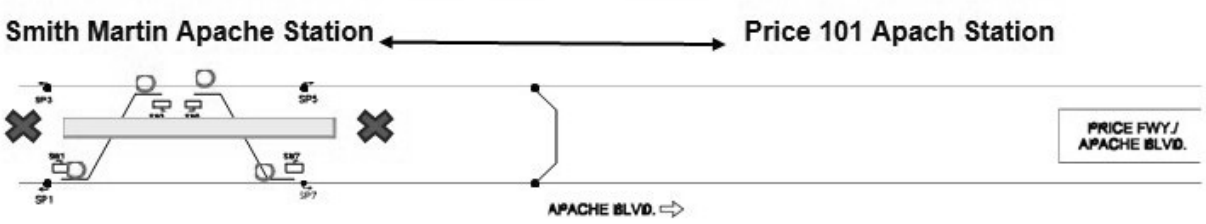
- Continuous radio contact required between field crews and OCC.
- Special caution near UPRR crossing and Tempe Town Lake Bridge.

F.5 PHOTOS/GRAPHICS

F.5.1 RIVER MANUAL CROSSOVER





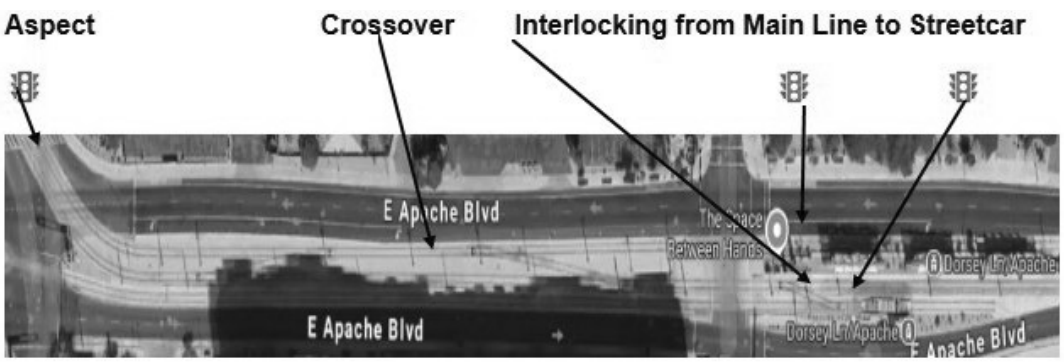


F.5.2 DORSEY CROSSOVER

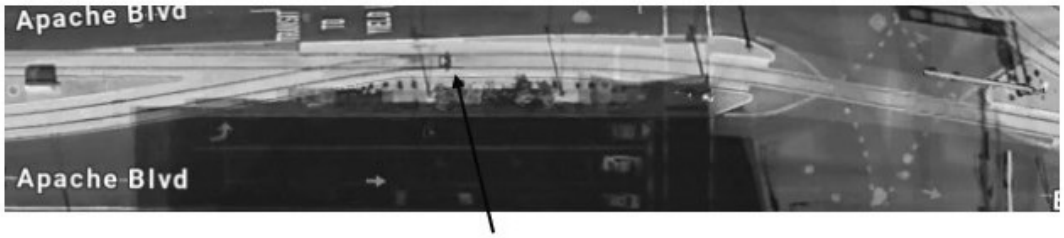






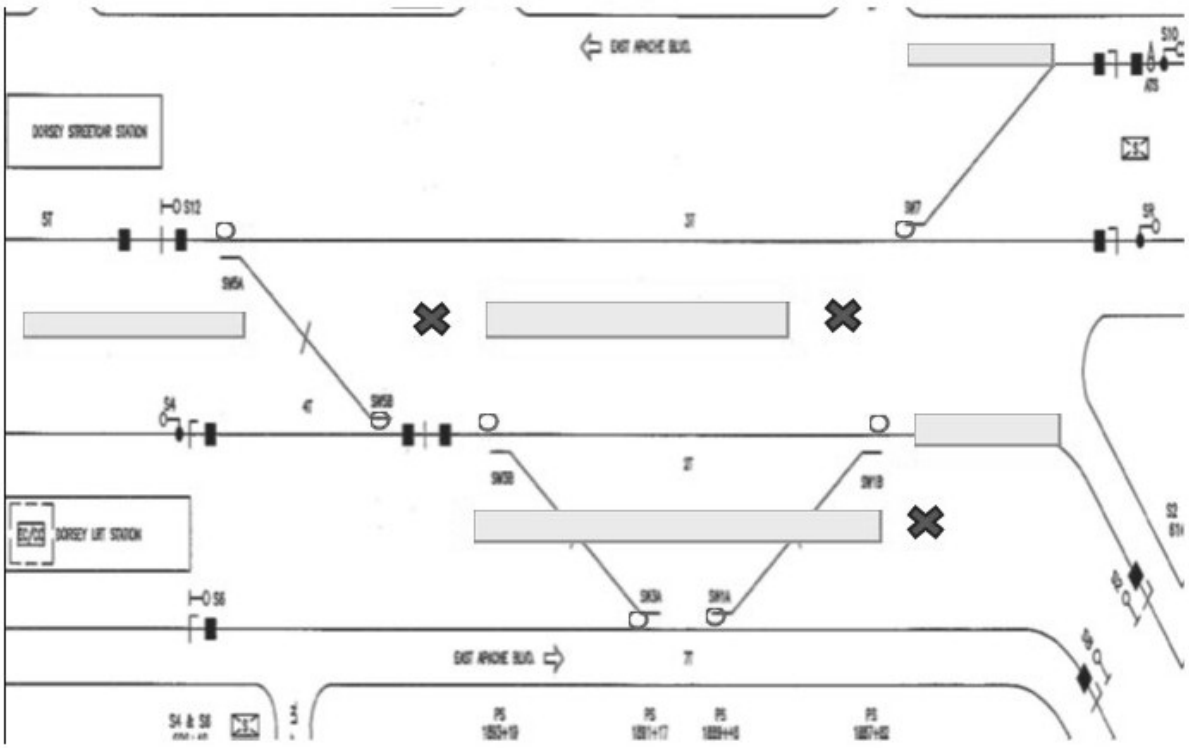


University and Rual Station ⟷ Dorsey Station



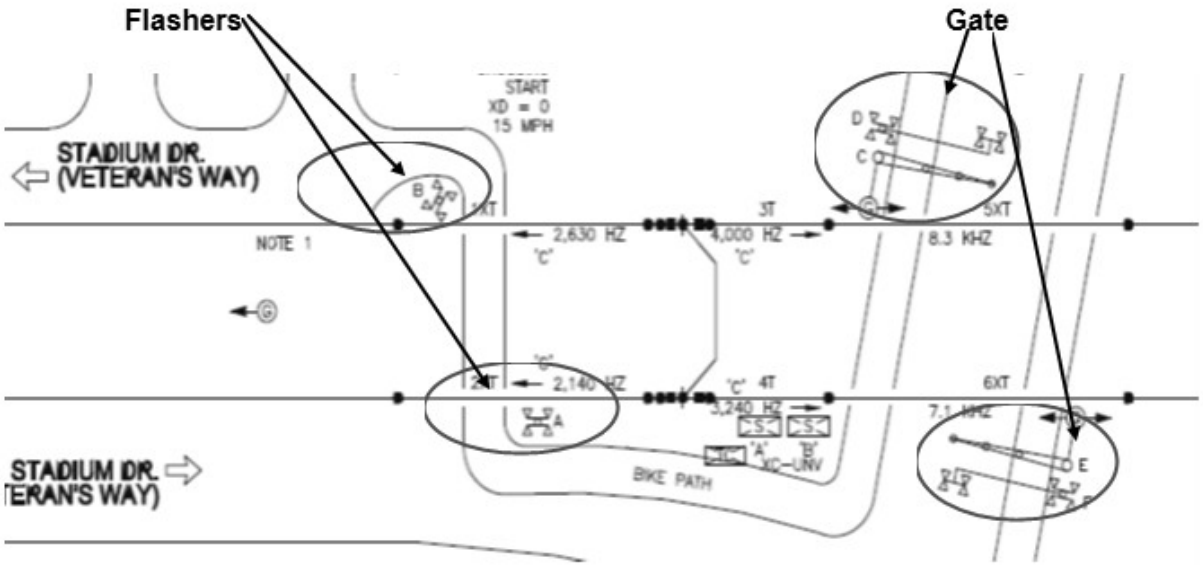
Spring switch 7 at Dorsey for Streetcar

Spring Switch 7 at Dorsey for Streetcar



F.5.3 UNIVERSITY GRADE CROSSING





Veterans Way Cruve








E 6th St
Vero
E Veterans Way
San Pablo Residence Hall
E Veterans Way
Manzanita Hall
E Veterans Way
ASU Manzanita Hall
Google Maps
University Dr



F.5.3.1 Restricted Visibility Zone – Veterans Way Curve (ASU Area)

This segment of alignment along **E. Veterans Way between S. Packard Dr. and E. 6th St.** presents **restricted visibility** conditions due to multiple geometric and environmental factors:

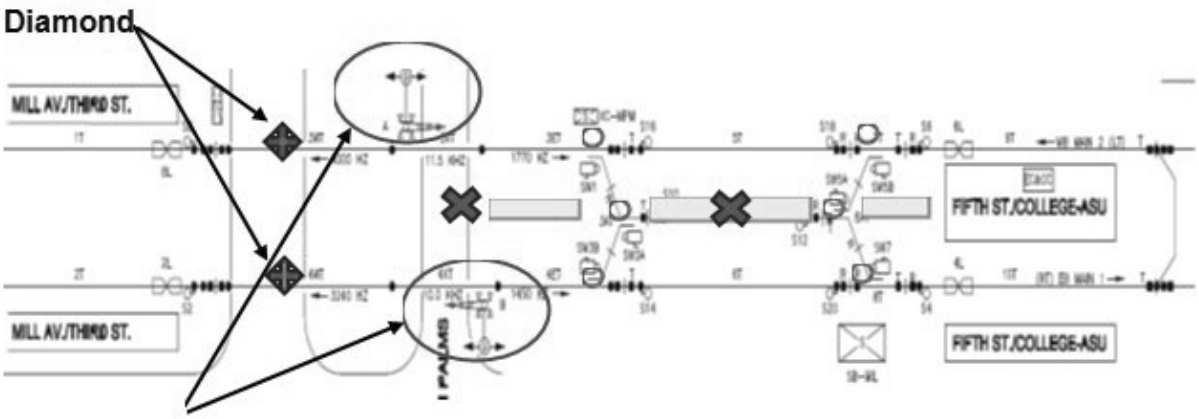
- **Tight Curvature and Reverse Alignment:**
  The track alignment transitions through a compound curve between the 6th Street curve and the Veterans Way straightaway, limiting operator sight distance in both directions.
- **Elevated Structures and Building Massing:**
  Adjacent multi-story structures (Vero Apartments, San Pablo Hall, and Manzanita Hall) create physical obstructions to line-of-sight for both train operators and roadway workers positioned near the right-of-way.
- **Mixed Traffic and Pedestrian Density:**
  The area experiences high pedestrian volumes from ASU residence halls and nearby parking garages, especially during class transition periods and events, increasing the need for heightened situational awareness.
- **Track Curve-Related Sound Reflection:**
  Due to the curve and nearby hard surfaces, the sound of approaching LRVs can be distorted or delayed, reducing the effectiveness of audible warning cues for roadway workers

F.5.4 MILL POCKET



F.5.5 MISSION PALMS GRADE GROSSING





Mission Palms Grade Crossing

F.5.6 MACAYO'S CURVE

Macayo's Curve



Diamond Streetcar Crosses Mainline

Quit Zone

F.5.6.1 Quiet Zone – Ash Avenue / 3rd Street Curve (Tempe)

Location: Between W. 3rd Street and Ash Avenue curve adjacent to the ADP building and Ash Avenue parking structure.
Line: Tempe Streetcar – Downtown Tempe alignment.

Operational Environment

Quiet Zone Designation:
This segment operates within an FRA-approved Quiet Zone, where routine train horn use is restricted to minimize noise impact on surrounding residential and commercial properties. Train operators rely on bell-only operation, except in emergency or special circumstances (e.g., imminent hazard or roadway worker on track).

Alignment Characteristics:
The alignment forms a tight S-curve transitioning between W. 3rd Street and Ash Avenue. Limited sightlines are caused by:

- Building obstructions (ADP Tower and Ash Avenue Garage).
- Track curvature creates restricted forward visibility.
- Tree coverage and street furniture near the right-of-way.

Track Configuration:

- Single-track street-running segment.
- Embedded rail in a shared roadway environment with vehicle and pedestrian interfaces.
- Multiple signalized intersections and pedestrian crosswalks within 300 feet.

Risk Factors

Hazard Type	Descriptions	Contributing Factors
Reduced Auditory Warning	Absence of routine horn use may limit pedestrian or driver awareness of approaching LRVs	FRA Quiet Zone compliance limits audible alerts
Restricted Sight Distance	Curvature and roadside obstructions reduce operator and roadway worker visibility	S-curve geometry, adjacent parking garage, and tree canopy
Pedestrian Crossflow	High foot traffic from nearby businesses and parking structures	ADP building, downtown access paths, and nightlife venues
Confined Workspace	Narrow trackway and minimal clearance from curbs and roadway	Embedded single-track within shared right-of-way

Recommended Safety Controls

OCC Coordination:
All maintenance or inspection activities must be reported to OCC with explicit mention of the Quiet Zone to ensure appropriate train handling and bell-only operations.

Enhanced Visual Warning:
Use portable flashing beacons, flags, or cones when personnel are in or near the alignment to compensate for reduced auditory cues.

Watchperson Requirement:
A qualified lookout is mandatory due to restricted visibility and reduced horn protection.

Restricted Hours for Work:
When feasible, schedule activities during low-traffic periods (e.g., early morning or late evening) to minimize pedestrian and vehicular conflicts.

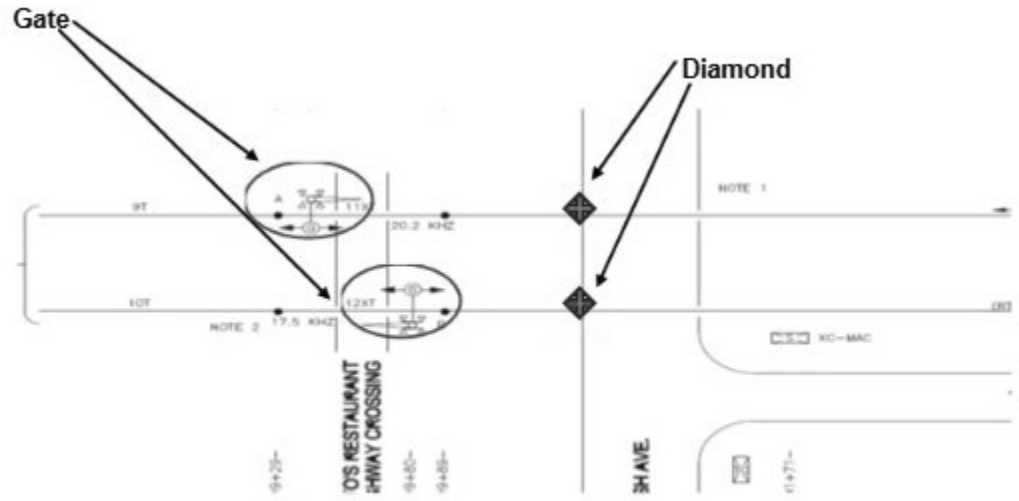
Continuous Communication:
Maintain open radio contact with OCC and adjacent intersections during all on-track movements.

Key Takeaway
This location combines Quiet Zone restrictions, tight curvature, and high pedestrian exposure, requiring maximum situational awareness, visual alerting devices, and strict RWP compliance during any roadway worker activity.

F.5.7 MACAYO'S CROSSING







F.5.8 1ST STREET / ASH AVE CROSSING - THIS CROSSING IS REGULATED BY THE FRA



Looking West at 1st St and Ash Crossing



1st Avenue / Ash Avenue Crossing – FRA / FTA Shared Regulated Crossing

Location: W. 1st Avenue & Ash Avenue, Tempe
Line: Tempe Streetcar Alignment
Crossing Type: At-grade signalized crossing with shared gate control systems

Crossing Overview
This location represents a shared rail-grade crossing jointly regulated by the Federal Transit Administration (FTA) and Federal Railroad Administration (FRA).

The crossing's warning system and gate mechanisms are interconnected with the adjacent Union Pacific Railroad (UPRR) freight crossing, creating a combined control environment requiring coordination between Valley Metro, UPRR, and City of Tempe Traffic Operations.

Key features include:
Active flashing-light signals, audible bells, and automatic gate arms shared between the UPRR and Tempe Streetcar circuits.
Dual regulatory oversight requiring compliance with both FTA Roadway Worker Protection (RWP) and FRA 49 CFR Part 234 requirements.
Street-running embedded rail integrated into a multimodal corridor with adjacent vehicular and pedestrian movements.

F.5.8.1 Safety and Operational Considerations

- Joint Regulatory Interface:
  Any roadway worker presence within or adjacent to this crossing requires prior coordination with both Operations Control Center (OCC) and UPRR Dispatch. Shared circuits mean gate activation timing is dependent on freight and streetcar detection logic.
- Automatic Warning System Integration:
  The warning system operates under interconnected approach circuits; unauthorized occupation can cause false activations or suppress required warnings for freight trains.
- Limited Clearance and Obstructions:
  The gate swing envelope, adjacent traffic lanes, and nearby structures limit workspace. Personnel must remain clear of moving gates and always maintain full situational awareness.
- Urban Visibility Constraints:
  Office buildings, landscaping, and curvature near the intersection reduce line-of-sight visibility for both operators and workers, increasing the need for active lookout protection

Recommended Controls

Control Measures	Descriptions
Joint Authorization	Secure joint clearance from OCC and UPRR Dispatch before entering the work zone or interfering with warning circuits
Exclusive Track Occupancy (ETO)	Establish ETO limits when performing inspection or maintenance affecting active control equipment.
Flagger / Lookout Protection	Deploy qualified watchpersons on both east- and westbound approaches to provide train-approach warnings.
Restricted Work Zone	Keep all personnel, tools, and vehicles outside gate arm travel paths and clear of active pedestrian zones
Pre-Job Briefing	Conduct site-specific briefing outlining FRA / FTA jurisdiction, OCC communication protocols, and gate safety boundaries
Whistle Board	Notify employees train is on approach

Summary

The 1st Avenue / Ash Avenue Crossing is a critical interface between Valley Metro operations and Union Pacific Railroad. Due to its shared activation system and dual regulatory oversight, all work requires precise communication, coordinated authorization, and enhanced roadway worker protection measures to maintain compliance and ensure safety

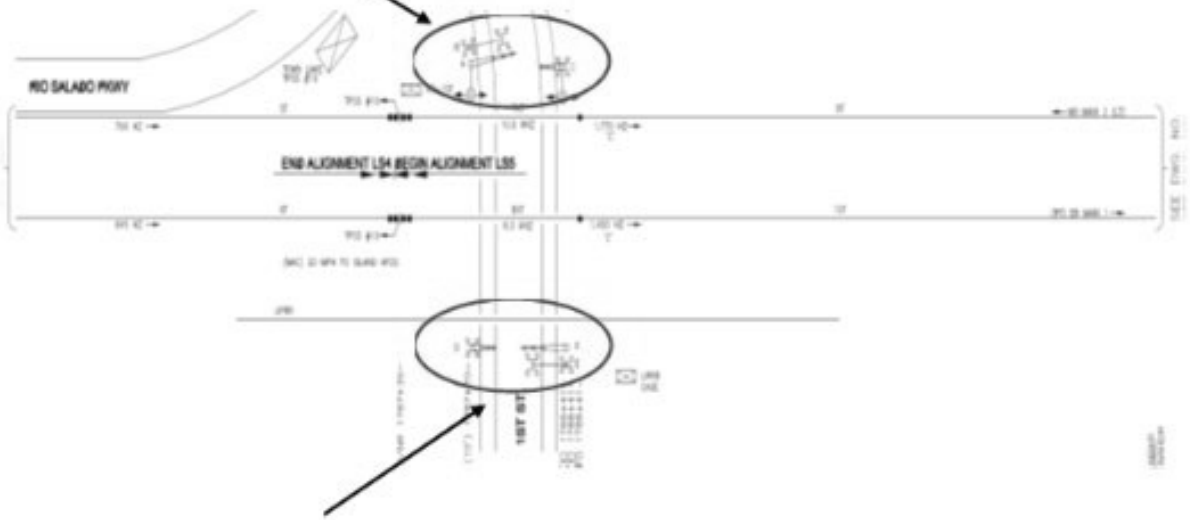
Looking East from 1st & Ash Crossing Down Tempe Bridge





***This location is a shared crossing with Union Pacific Railroad and falls under the jurisdiction and regulatory authority of the Federal Transit Administration (FTA).**

Valley Metro Gate



Union Pacific Crossing

Tempe Town Lake Bridge

F.5.9 TEMPE TOWN LAKE

F.5.9.1 Bridge

Looking West



Looking East



F.5.9.2 Bridge Approach; Underpass

Location: West side of Tempe Town Lake Bridge, under the deck structure adjacent to Mill Avenue
Line: Blue Line (A Line) – Tempe Bridge Segment
Section Type: Enclosed underpass and bridge approach

Area Overview

This section consists of a dual-track concrete underpass and bridge approach beneath the deck structure connecting Mill Avenue to the Tempe Town Lake bridge span.

The area transitions from tunnel-like enclosure to open-air bridge deck and contains multiple expansion joints requiring periodic inspection and lubrication by track maintenance personnel.

Key characteristics include:
Confined, low-clear environment with limited ambient lighting and restricted escape routes.
Curved alignment and gradient affecting operator visibility and safe walking distance.
Noise reflection and echo within the structure, reducing the effectiveness of audible cues from approaching trains.
Proximity to water and structural expansion elements, which require specialized maintenance procedures.

Track Maintenance Activity

Typical roadway worker activities within this section include:

- Inspection and lubrication of bridge expansion joints to prevent noise, friction, and mechanical wear.
- Track fastener and rail seat inspection within the enclosed tunnel and transition zone.
- Drainage and walkway cleaning due to moisture accumulation and limited airflow.

These tasks require roadway workers to walk along the protected walkway adjacent to the rail alignment under the structure, maintaining direct communication with the Operations Control Center (OCC).

Hazards and Environmental Risks

Hazard Type	Description	Contributing Factors
Restricted Clearance	Limited headroom and lateral space; restricted ability to step clear during train movements.	Structural design of the deck tunnel.
Reduced Visibility	Low lighting and shadows from structure columns obscure sightlines.	Enclosed concrete ceiling and support beams.
Auditory Distortion	Sound reflections may cause misjudgment of train distance.	Tunnel acoustics and noise echo.
Slippery or Uneven Walking Surface	Potential moisture from expansion joint maintenance or condensation.	Proximity to lake and enclosed airflow.
Limited Egress Options	Only two access points at north and south tunnel ends.	Confined layout

Recommended Controls

Control Measure	Description
OCC Coordination	All access and track occupancy must be authorized by OCC prior to entry. Continuous communication required.
Train Approach Warning (TAW)	Qualified lookout stationed outside the tunnel at both north and south ends.
Lighting Equipment	Workers must use portable, intrinsically safe lighting to enhance visibility.
High-Visibility Apparel	ANSI Class 3 reflective PPE mandatory due to low light and restricted space.
Work Hours	Prefer early morning or daylight hours to reduce shadow hazards and glare transitions.
Fall / Slip Mitigation	Maintain clear walking path and avoid standing water or grease overspill.

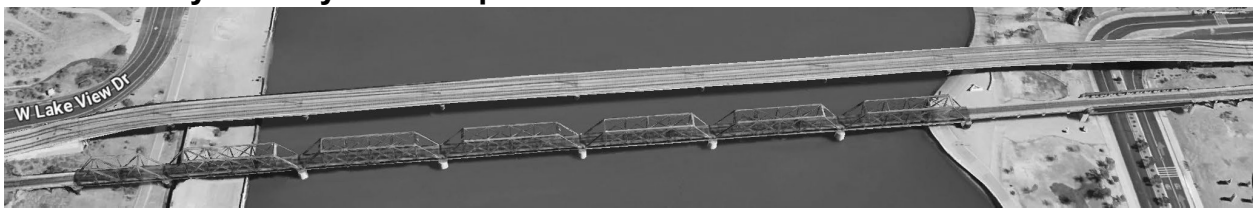
Summary

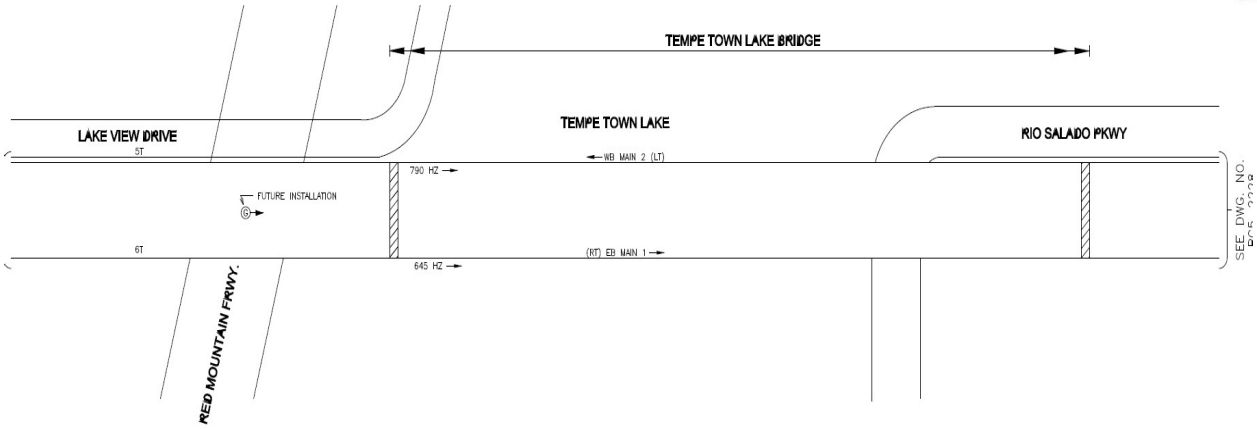
The Tempe Town Lake Underpass and Bridge Approach represent one of the system's most confined and acoustic challenging maintenance environments.

Track inspectors performing expansion joint lubrication or walkway inspections must maintain continuous OCC communication, utilize portable lighting, and coordinate dual lookout protection to ensure safe operations.

View facing north toward Tempe Town Lake Bridge showing bridge approaching trackway and transition to open-air alignment.

View facing south under the deck structure showing confined track alignment and side walkway used by track inspectors.





F.5.9.3 Tempe Town Lake Bridge – Midspan Safe Zone

Location: Between Red Mountain Freeway and Rio Salado Parkway (Tempe Town Lake Bridge Span)
Line: Blue Line (A Line) – Bridge Segment
Track Configuration: Dual-track, open bridge structure with center walkway

Area Overview

The Tempe Town Lake Bridge spans approximately 790 Hz (eastbound) and 645 Hz (westbound) track circuit segments across the lake. This structure supports two mainline tracks (EB Main 1 and WB Main 2) with a central raised walkway designated as a protected Safe Zone for roadway worker access and emergency progress.

The bridge serves as a critical connection between the Rio Salado Parkway alignment to the east and Lake View Drive / Red Mountain Parkway to the west.

Due to its open-water exposure, the area is subject to wind, glare, and environmental noise, requiring careful coordination for inspection and maintenance activities.

Safe Zone Description

The Safe Zone is located between the two mainline tracks on the elevated bridge deck. It provides a continuous, protected walkway with sufficient lateral clearance to allow roadway workers to safely stand clear of passing trains under normal operating conditions.

Key Features:
Continuous concrete walkway separating WB Main 2 and EB Main 1 tracks.
Elevated safety railing on both sides of the bridge structure.
Adequate lateral clearance for personnel to stand clear within dynamic envelopes when trains pass on either track.
Designated access from both east and west bridge approaches under OCC authorization.

Operational Hazards

Hazard Type	Description	Contributing Factors
High Wind Exposure	Gusts across the open water can affect stability or balance of personnel.	Bridge elevation over Tempe Town Lake.
Environmental Noise	Wind and water noise can reduce ability to hear train approach.	Ambient environmental conditions.
Restricted Access Points	Entry/exit only at Lake View Dr. (west) and Rio Salado Pkwy (east).	Limited egress options.
Limited Cover	No overhead shelter; direct exposure to heat and sun.	Bridge deck design.
Narrow Walkway	Central Safe Zone must not be obstructed by tools or materials.	Clearance requirements for dynamic envelope.

Recommended Controls

Control Measure	Description
OCC Authorization	Required before entering bridge alignment; specify “Tempe Bridge – Midspan Safe Zone.”
Two-Person Minimum	Personnel must work in pairs with continuous radio contact.
Weather Assessment	Check wind advisories or excessive heat warnings prior to entry.
Portable Radios & PPE	Use high-visibility Class 3 apparel and secure radios/hard hats against wind gusts.
Material Handling Restrictions	No loose or lightweight equipment permitted due to risk of falling debris.
Designated Safe Zone Use Only	Remain strictly within central walkway during train movements.

Summary

The Tempe Town Lake Bridge Midspan Safe Zone provides a designated protected walkway for roadway worker protection between active mainline tracks.

All work must be authorized by OCC, conducted by qualified employees, and performed under strict wind and weather protocols to maintain safety in this elevated, high-exposure environment.

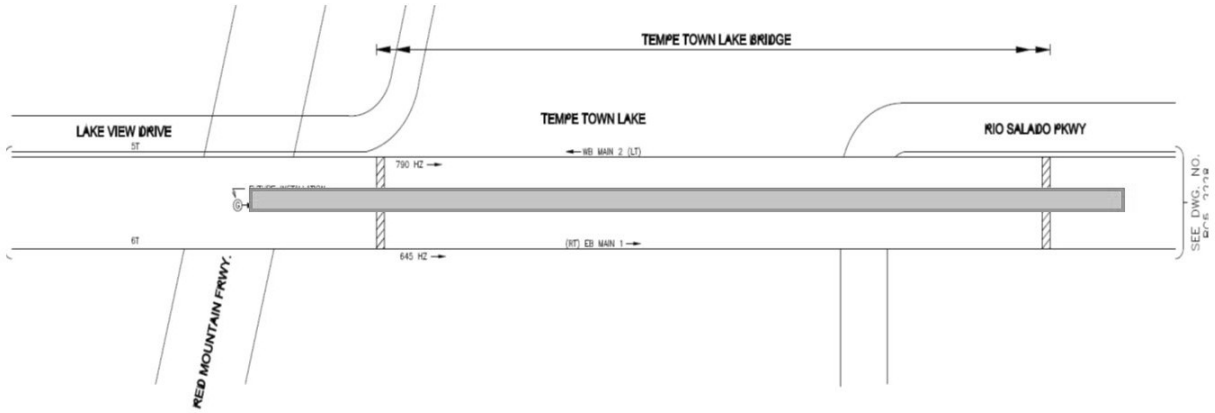


Figure 5.13.5-A: Track schematic showing EB Main 1 and WB Main 2 alignment with designated Safe Zone between tracks (Tempe Town Lake Bridge).

F.5.10 CENTER PARKWAY STATION

Looking East from Center, Controlled by flashers

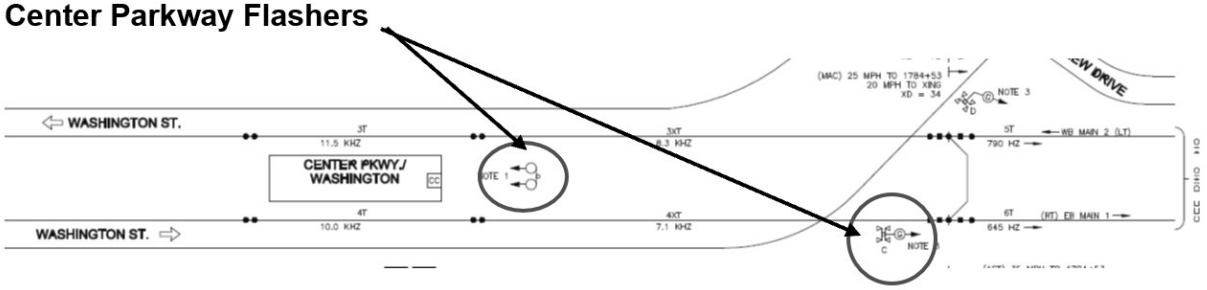


Center Parkway Flashers





Center Parkway Flashers



■ ■ ■