SEATTLE PUBLIC SCHOOLS | ONE ROOF FOUNDATION

GENERATOR STUDIO | SWIFT COMPANY TEAM

MEMORIAL STADIUM RENOVATION

LANDMARKS PRESERVATION BOARD

APRIL 02, 2025

BUILDING HISTORY + EXISTING CONDITIONS

CIVIC FIELD TO SCHOOL STADIUM:
Community pressure helped to select the final home of the school district's new stadium.

1946

The city land between Harrison and Republican streets holding Civic Field and the Civic Ice Arena was transfered to the Seattle School District as the site for their future athletic stadium.

MEMORIAL STADIUM CONSTRUCTION
The new stadium held its first event, the Seattle High School Football Jamboree, on September 26, 1947.

1947

Designed by Seattle architect George W. Stoddard and built by the Puget Sound Bridge and Dredging Company. The stadium was designed to be built in stages, with a final horse-shoe shaped stand to the west that was never built. The Memorial Wall, was an addition built several years after the completion of the stadium.

MEMORIAL WALL ADDITION
The memorial was built to honor Seattle and King County students who died during WWII.

1951

MARIANNE HANSON: Designed the war memorial while a senior at Garfield High school. Marianne went on to have several successful careers including graphic design, illustration, sculpture, theater costume design, and editorial and fiction writing.

SEATTLE'S CIVIC CENTER:
The area around Memorial Stadium was selected as the site for the Century 21 Exposition and as a future civic center.

1956

Several of the parcels surrounding the Memorial Stadium had already been acquired by the city such as McCaw Hall, then a Civic Auditorium, the National Guard Armory, and Mercer Playground (the future International fountain). The rest of the parcels were assembled through condemnation of "blighted" properties. What had been separate parcels connected by a street grid would start to become the civic center we know today, with its series of community spaces bound together by a network of green pedestrian promenades.

THE WORLD'S FAIR :
The event was the catalyst for creating the park-like city center we know today.

1962

The Memorial Stadium held the opening and closing ceremonies during the fair. The stadium field was transformed into an aquadrome which held water-skiing shows throughout the fair.

MEMORIAL NO MORE?
Disney's Imagineering made an offer to buy Seattle Center.

1988

In 1989, local veteran and activist Guy Gallipeau led a demonstration to City Hall to oppose the demolition of the War Memorial Wall. The city and school board turned down the offer which would have led to the demolishing of the Seattle Center and Memorial Stadium.

LANDMARK DESIGNATION:
In October 4, 2023, the Memorial Wall was added to the city's list of Landmark sites.

2023

The features of the memorial to be preserved included the memorial wall with associated steps, fountains, all structural walls and foundations that support the wall in situ, and the site area on which the memorial resides, including 20' of space on all sides of the wall.

A LASTING MEMORIAL:
The reconstruction of Memorial Stadium brings an opportunity for a re-connection to the Memorial Wall.

PRESENT

With the reconstruction of the stadium at its back, there is an opportunity to undertake needed updates to the appearance of the memorial, re-imagine the relationship between the wall and the community through better access, and increase opportunities to gather and reflect on the service and sacrifice made by those serving in WWII.

Marianne Hanson - 1952, Seattle
Courtesy of Simons Family

Marianne Hanson (1932-2015) was born and raised in Seattle to Swedish immigrant parents. She was a high school senior ,at Garfield High School, when she entered the design competition for the Memorial Wall. Hers was one of five finalists selected for review from 61 entries.

An interesting aspect of Hanson's design is its similarity to the primary facade of the Seattle Art Museum in Volunteer Park, designed by architect Carl F. Gould and built in 1932. The museum and the memorial wall designs share a tall, stepped wall with fluted end wall sections that partially surround fountain basins. Both designs, while based on classical forms, embody characteristics of the Art Deco and Modern styles. No specific references to the museum have been discovered, but as an art student it is likely that Hanson had seen the building from repeated visits.

After her graduation in 1950, she attended the Burnley Art School on a national art scholarship. It was during this time that she met her husband, Milton Simons (1923-1973) and Hanson left school in order to support her family. In 1953, they had their first child, Serge Simons. She later attended the University of Washington, where she graduated with a bachelor's degree, magnum cum laude, from the School of Art.

Hanson had multiple careers in graphic design, illustration, sculpture, theater costume design, and as an editorial and fiction writer. She also opened art galleries in several states. One of these was the Milann Gallery in Seattle, which Marianne founded with her husband, Milt Simons, in August 1959. Milt Simons was one of only a few Black artists showing work, playing music and directing his own gallery during that era. The 800 square foot Milann Gallery operated as a co-op, and the space also served as an art studio as well a venue for music, including performances for their jazz ensemble, The Puget Sounds, with which Hanson played piano. The gallery, which closed in 1961, occupied a former bakery space on 34th Avenue in Madrona neighborhood, one of the city's first racially integrated neighborhoods. Later, in 1968, the same space became the Black Panther Party's local headquarters. In late 1970s the Simons opened another gallery, the Origin Arts Originals, at 321 E Pine Street, which showed Milt Simons work until 1973. He died in November of that year.

From 2008-2014, Marianne Hanson wrote as an independent historian for the editorial website Blackpast.org, a site dedicated to providing comprehensive, reliable, and accurate information concerning the history of African Americans in the US and around the globe.

Hanson unveiled the Memorial Wall at its dedication on May 29th, 1951.

Memorial Wall Sketch by Marianne Hanson
Courtesy of SPS

Sources: LPB 351/23 Memorial Wall Report on Designation, https://blackartslegacies.crosscut.com/articles/milt-simons, https://www.historylink.org/file/20854, https://archive.seattletimes.com/archive/?date=19990726&slug=2973820

The City of Seattle
Landmarks Preservation Board
Mailing Address: PO Box 94649, Seattle WA 98124-4649
Street Address: 600 4th Avenue, 4th Floor

LPB 351/23

REPORT ON DESIGNATION

Name and Address of Property: **Memorial Wall (on Memorial Stadium property)**
401 5th Avenue N

Legal Description: *Specific parcel where designated Memorial Wall features and site reside:*

Parcel B: (198820-0775)
Lots 1 through 12, Block 55, D. T. Denny's Home Addition, according to the plat thereof recorded in Volume 3 of Plats, page 115, records of King County, Washington; Together with the vacated alley within said block and vacated streets adjacent; Less that portion of vacated road as described in deed to the City of Seattle recorded under Recording No. 20000718000203.

At the public meeting held on October 4, 2023 the City of Seattle's Landmarks Preservation Board voted to approve designation of the Memorial Wall at 401 5th Avenue N as a Seattle Landmark based upon satisfaction of the following standard for designation of SMC 25.12.350:

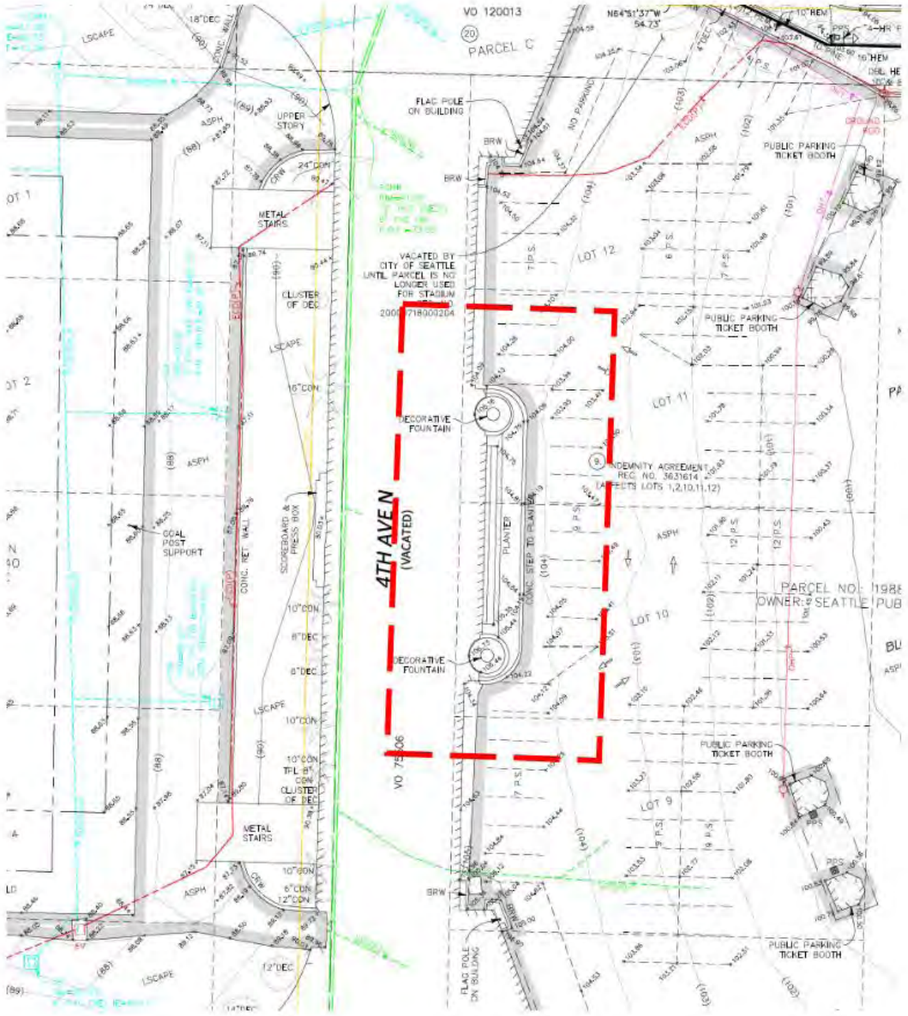
A. It is the location of, or is associated in a significant way with, an historic event with a significant effect upon the community, City, state, or nation.

C. It is associated in a significant way with a significant aspect of the cultural, political, or economic heritage of the community, City, state or nation.

D. It embodies the distinctive visible characteristics of an architectural style, or period, or of a method of construction.

E. It is an outstanding work of a designer or builder.

Administered by The Historic Preservation Program
The Seattle Department of Neighborhoods
"Printed on Recycled Paper"

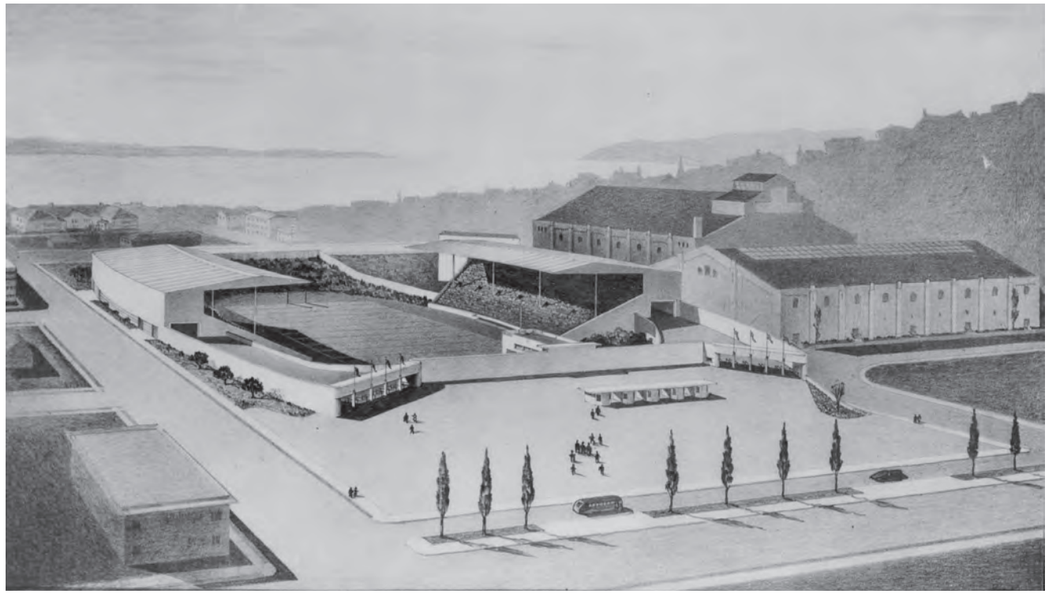


Drawing not to scale. Showing relative scale of 20' offset from memorial landmark features (dashed red line), based on confirmation of the following assumptions:

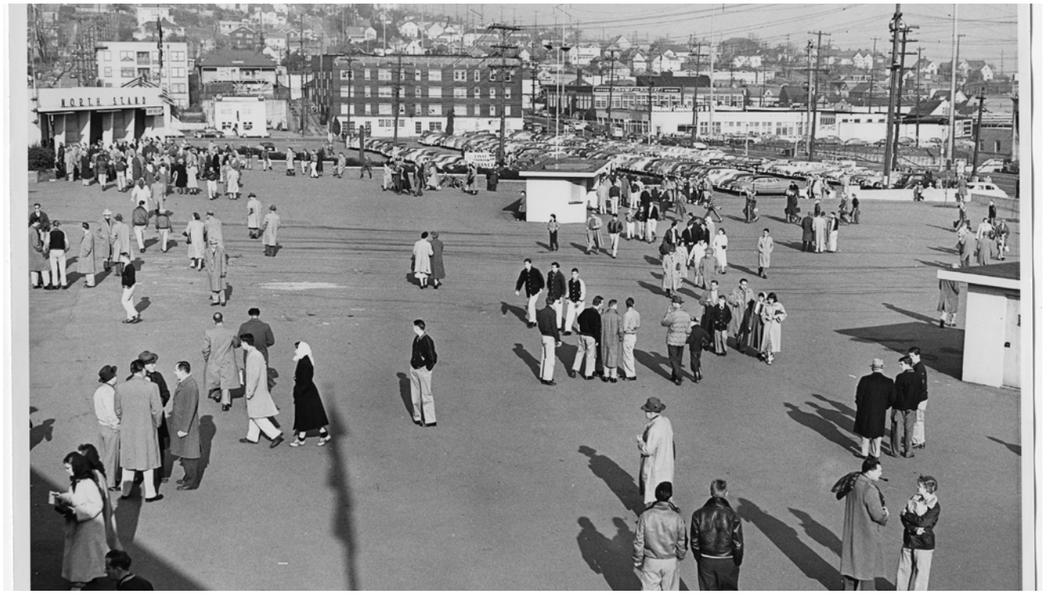
1) That dash-dot line vicinity of green line is center line of vacated right-of-way.
2) That dash-dot line vicinity of green line is division between Parcels A & B.
3) That 4th Ave N right-of-way is 66' wide, therefore half is 33'.

Memorial Landmark Features Site Plan with 20 Foot Offset
Part of the Report on Designation Documentation Package

Memorial Wall with Original Planting, 1950s
Courtesy of Paul Dorpat, Seattle Times



Architectural Drawing of Proposed Stadium by Architect George W. Stoddard, ca 1946
Courtesy of SPS Archives



East Entry Plaza and Ticket Kiosks, ca 1950
Courtesy of SPS Archives

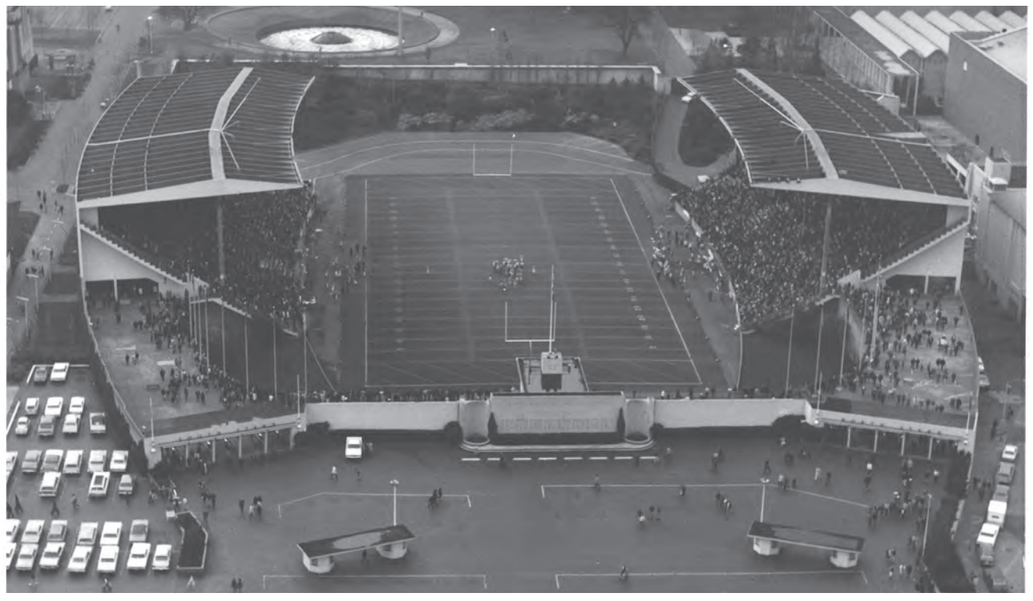
Dearborn-Massar Photograph of the Eastern Facade of Memorial Stadium, ca 1948
Courtesy of UW Special Collections

View of the Memorial Wall and Stadium Looking NW, 1957
Courtesy of Seattle Public Library

Memorial Stadium Water Ski Show Looking East at Seattle World's Fair, 1962
Courtesy of MOHAI archives

Paul Dorpat Photograph of Ceremony at the Memorial Wall, ca 1960s
Courtesy of Seattle Times

Memorial Wall Behind the Hawaii Pavilion and Gardens at Seattle World's Fair, 1962
Image Posted on Tiki Central Website

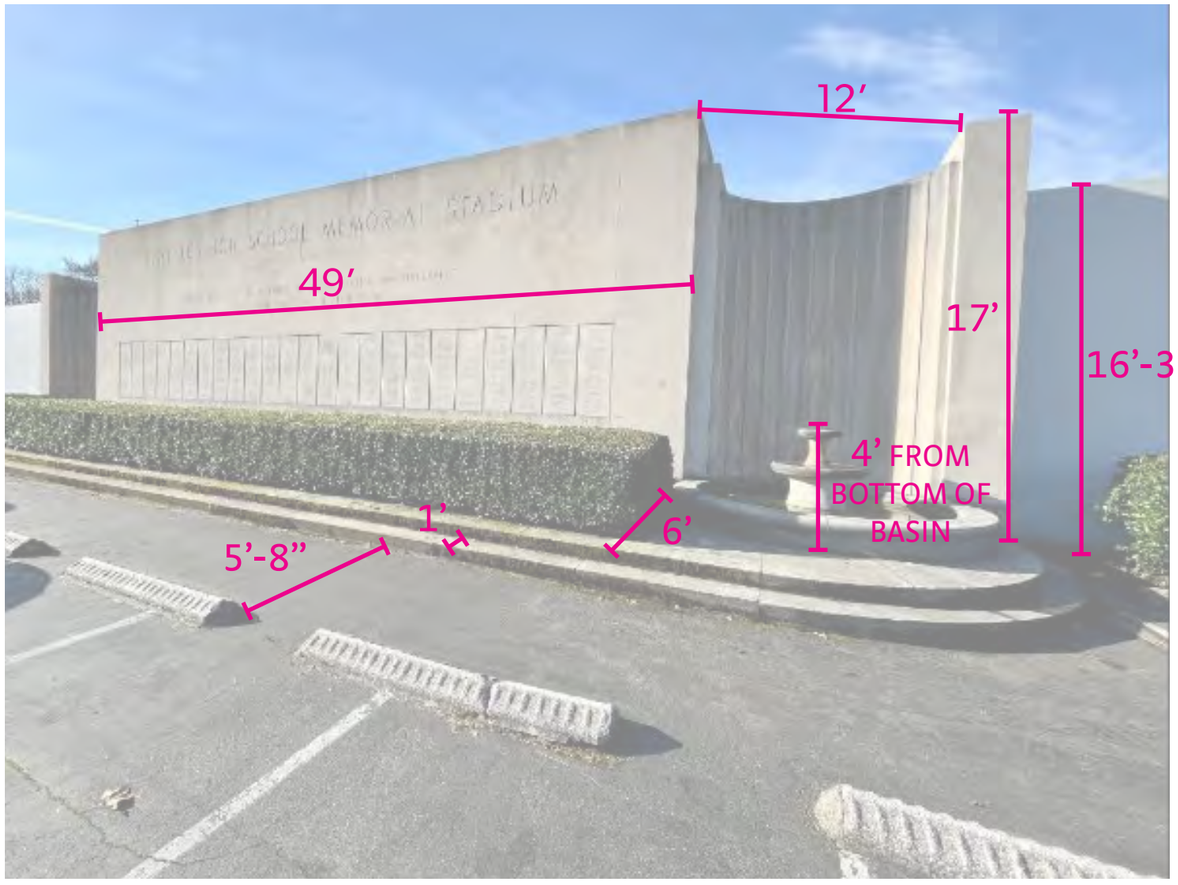


Aerial view of Stadium Looking West, ca 1967
Courtesy of SPS Archives (Photo documentation post 1960s not available from SPS.)

Eastern Stadium Facade Looking North

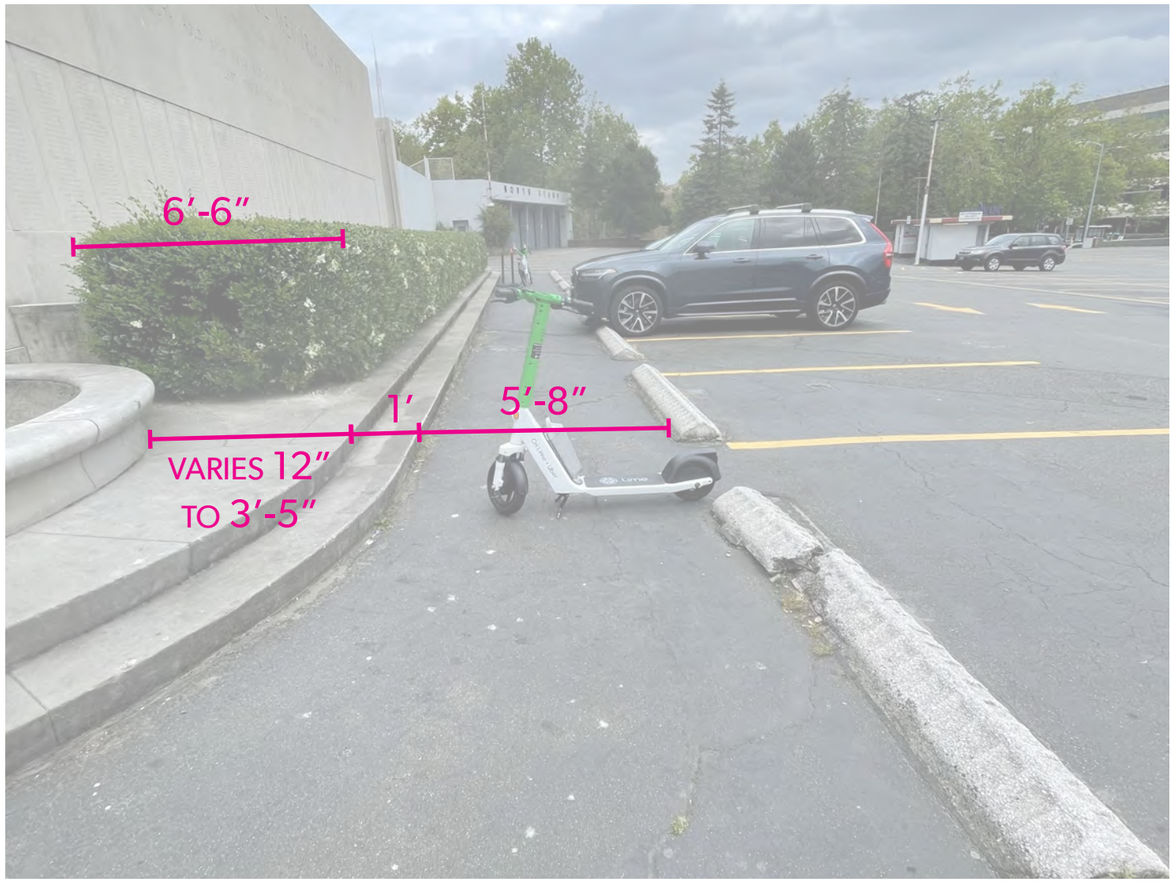
Memorial Wall View From Parking Lot

Memorial Wall Looking Southwest



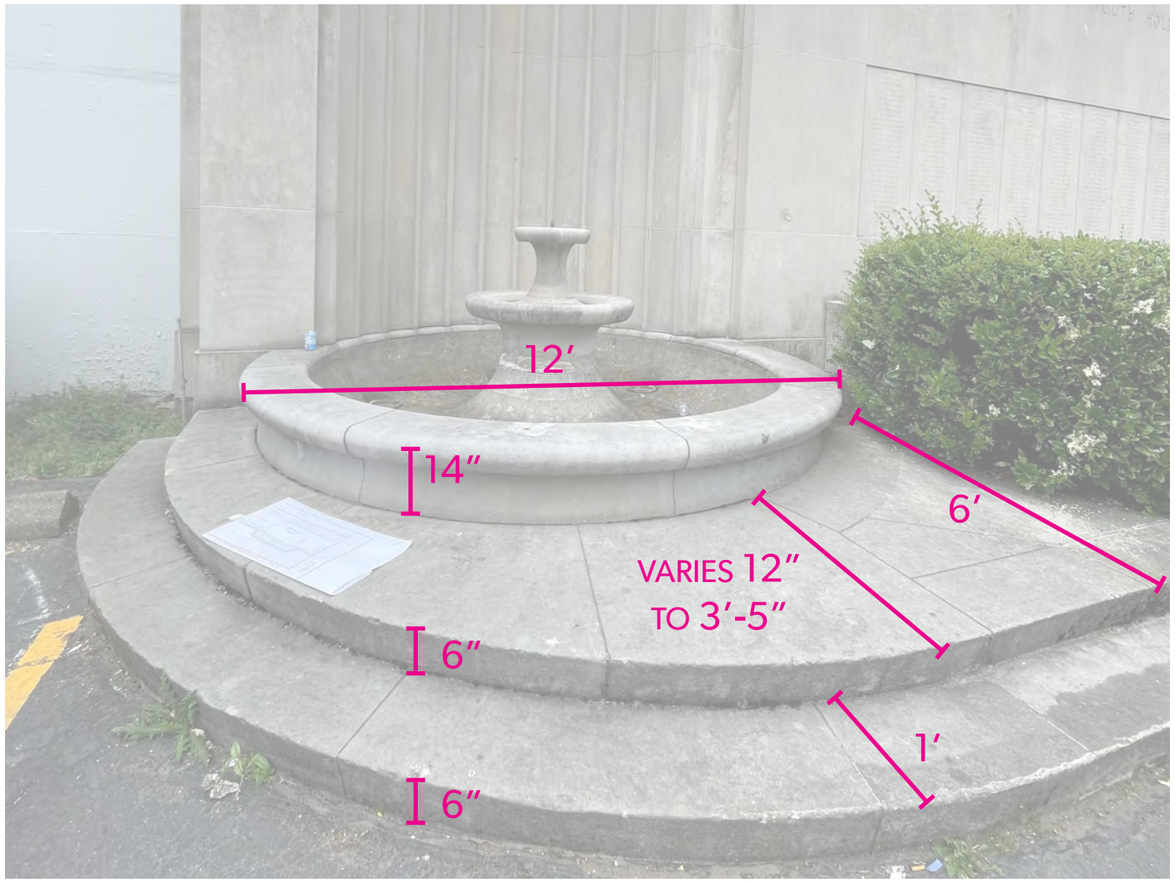
Spatial Analysis

Looking North From Memorial Wall



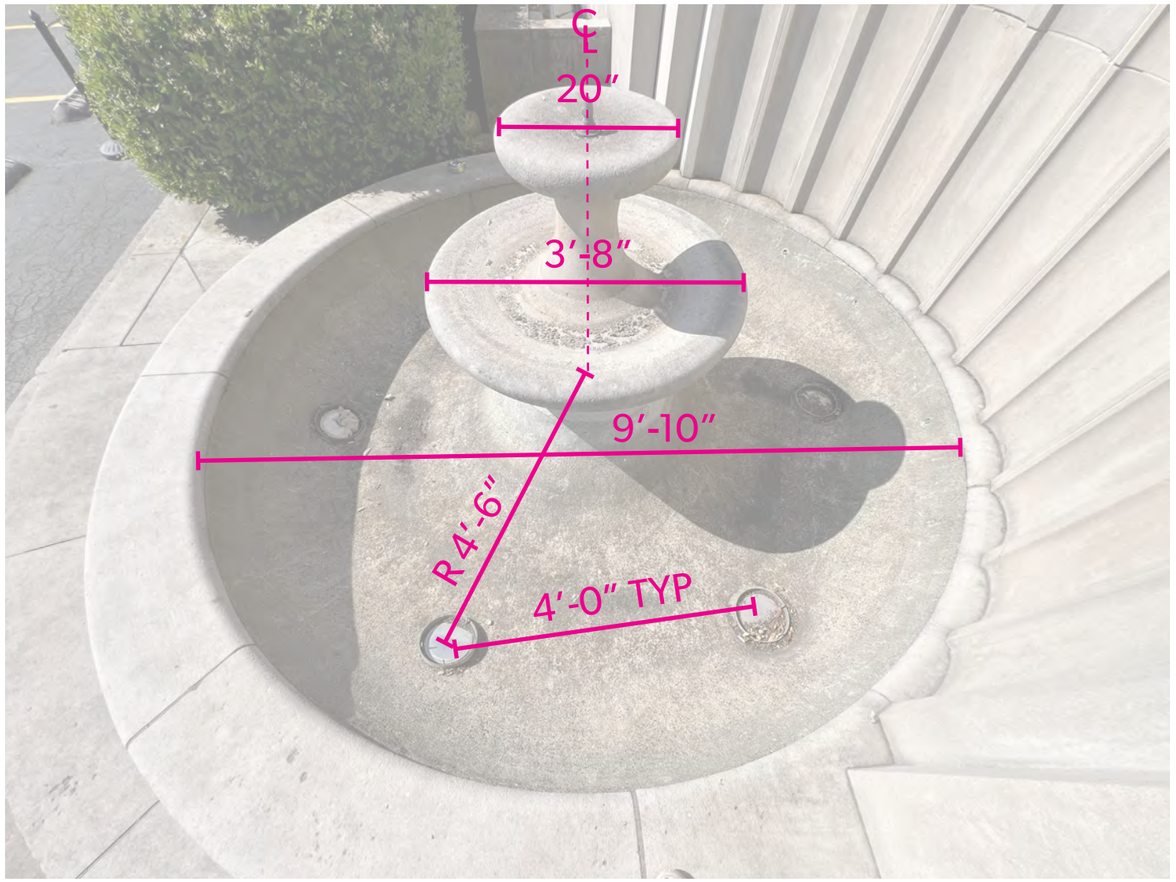
Spatial Analysis

Southern Memorial Fountain



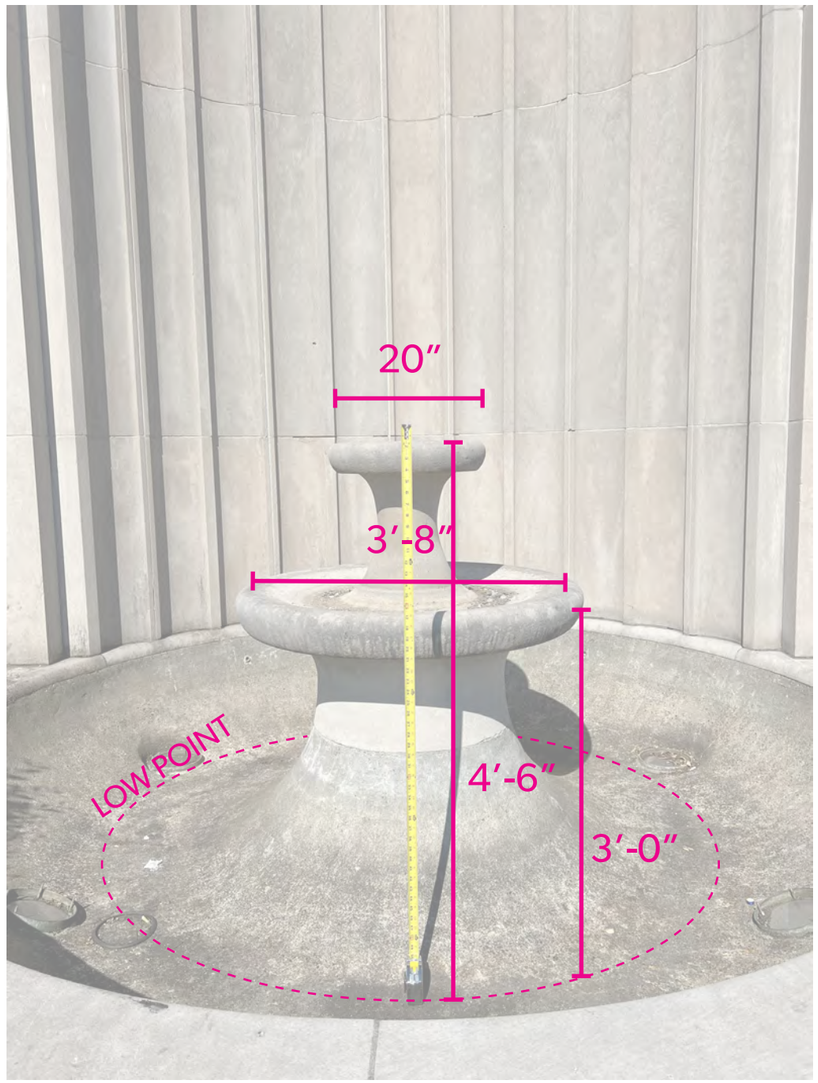
Spatial Analysis

Northern Memorial Fountain Birds Eye



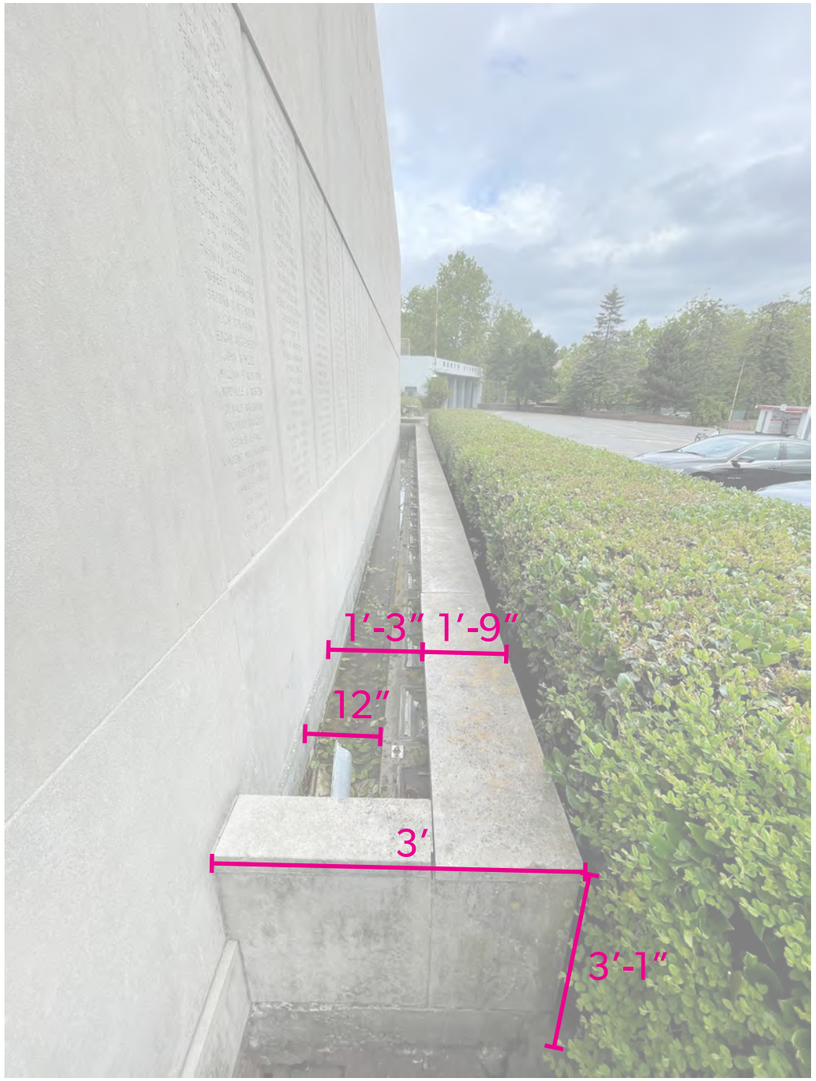
Spatial Analysis

Northern Memorial Fountain Elevation

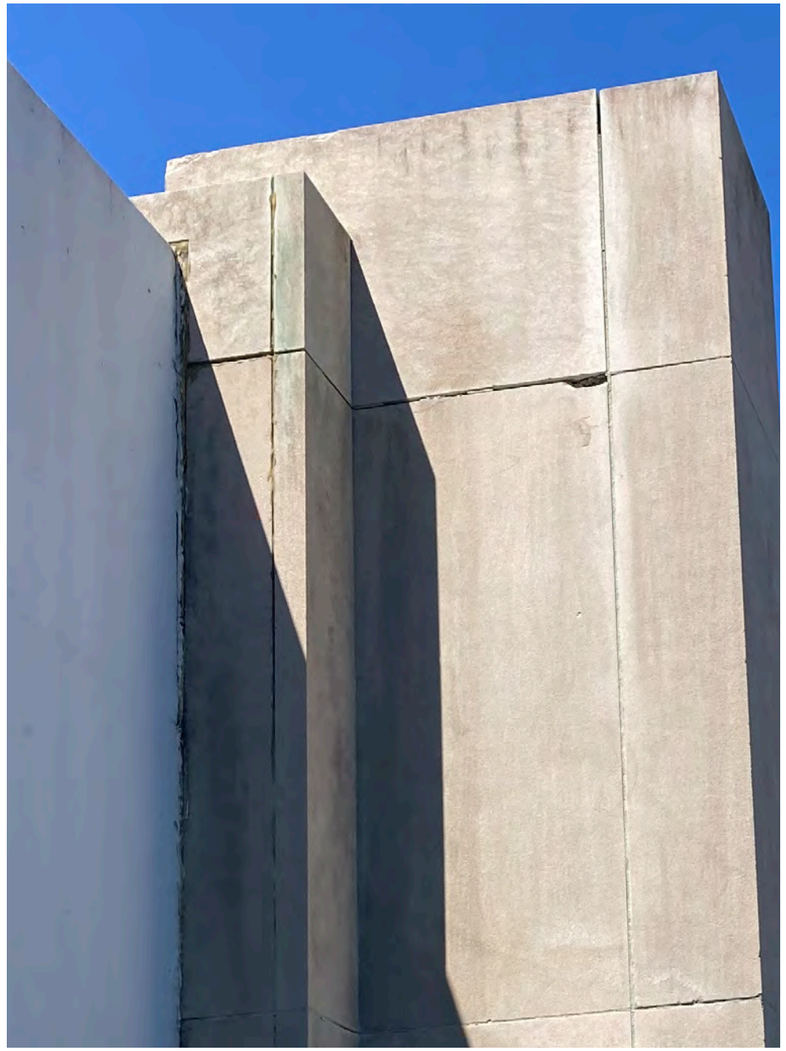


Spatial Analysis

Memorial Wall Up-Lighting Channel

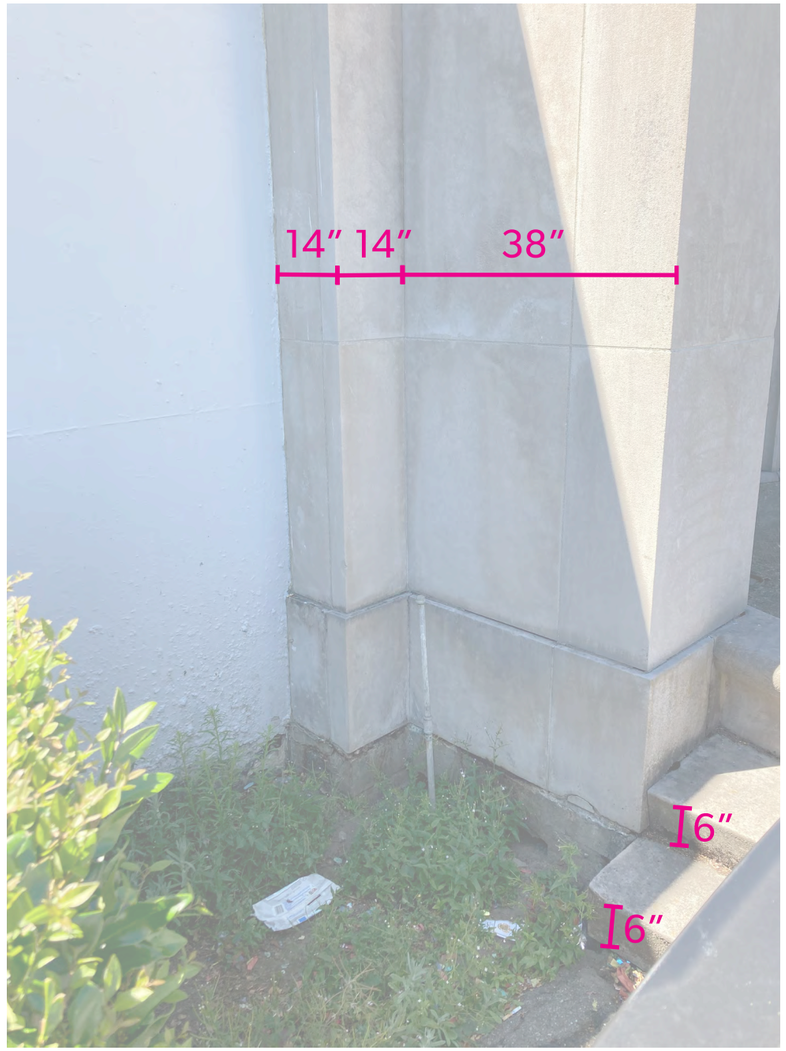


Spatial Analysis



North Memorial Stone Wall and Stadium Concrete Wall at Top of Walls - Stone Chips at Jointing

North Memorial Stone Wall and Stadium Concrete Wall at Grade - Chiping at Exposed Slab and Corner



South Memorial Stone Wall and Stadium Concrete Wall at Grade - Chiping at Exposed Slab and Corner

South Basin Steps - Nosing Chips and Discoloration

North Fountain Steps - Nosing Chips

Memorial Steps - Stone Joint, Discoloration, and Moss

South Fountain Basin Tower - Stone Markings and Discoloration

South Fountain Basin Edge - Stone Deterioration

Fountain Backdrop Fluting - Jointing and Stone Condition

North Fountain Basin - Cloudy Lenses and Debris

North Fountain Basin Lights - Fixture Hardware Condition

Memorial Wall Light - Fixture Housing and Wiring Condition

Memorial Wall Lighting Trench - Fixture Condition + Standing Water

BUILDING HISTORY + EXISTING CONDITIONS | Current Conditions - Fountain Water Inlets and Overflow - Site Photos - 2024

North Fountain Basin - Water Inlet and Outlet Locations

Water Overflow Pipes at Rim

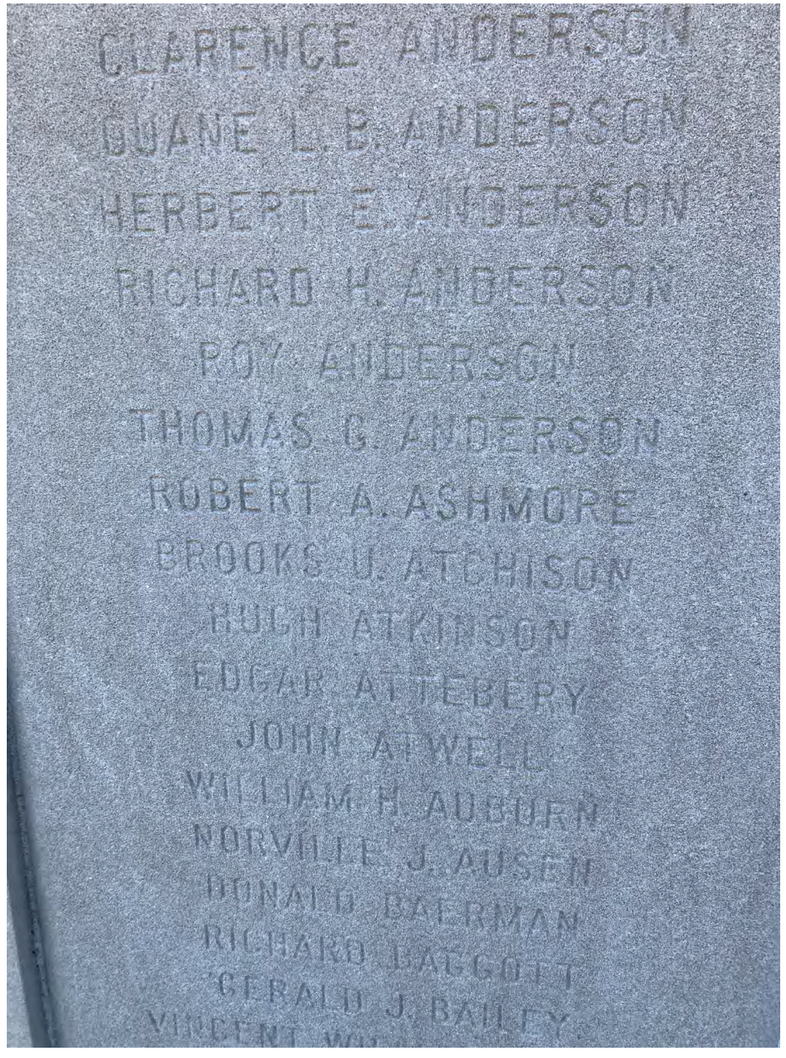
Water Outlet at Basin Low Point

Water Inlet at Pedestal Top

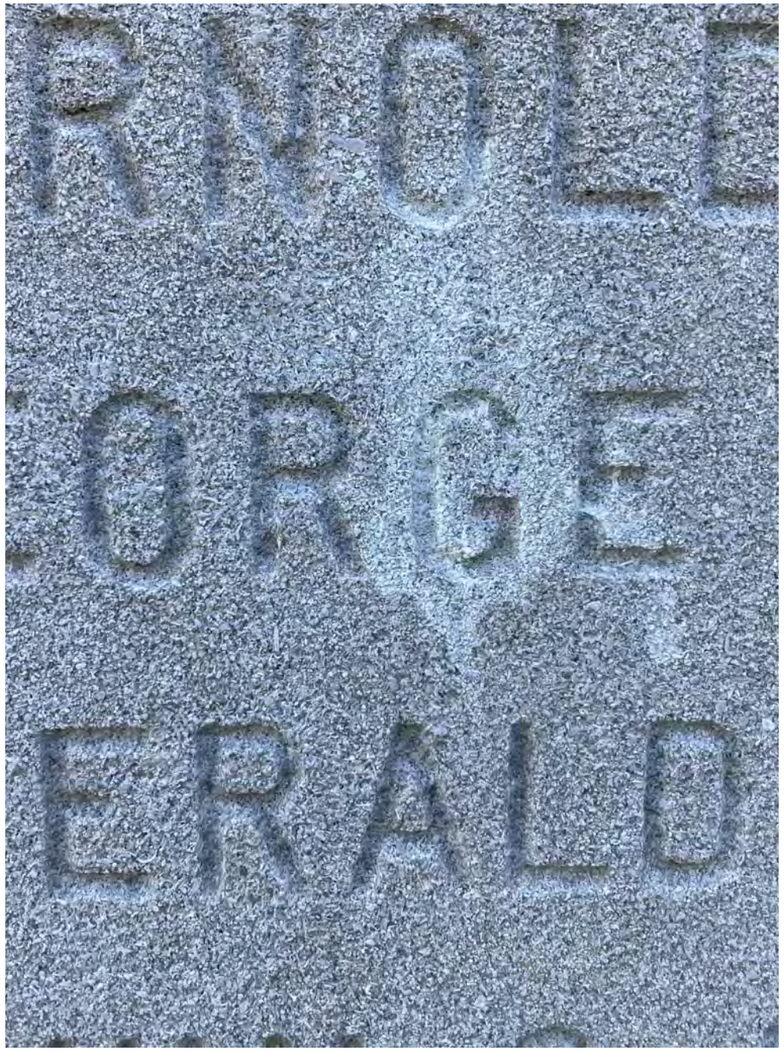
Diameter -TBD

Diameter -TBD

Diameter - TBD

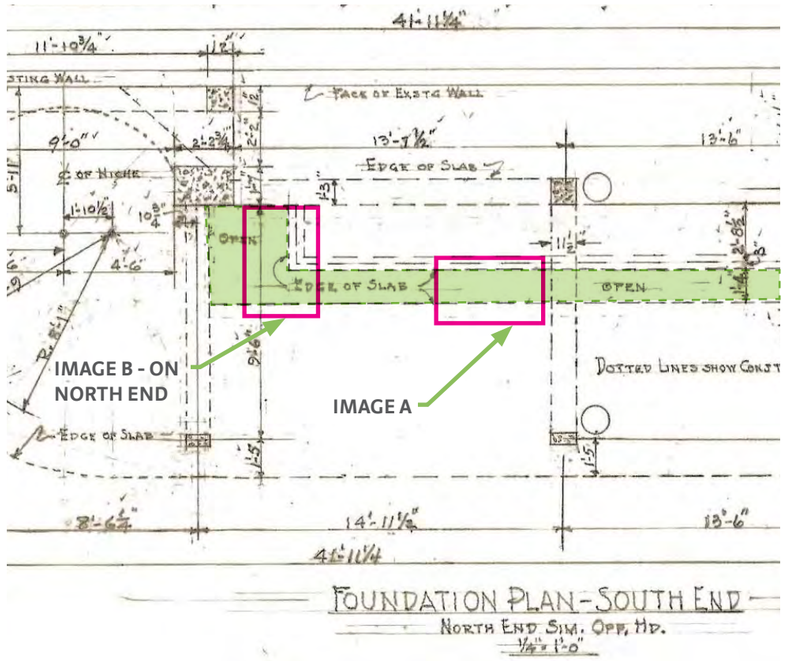


Memorial Wall Names - Stone and Engraving Typ Condition



Names Close Up - Stone Discoloration

Memorial Wall - Stone Patch Work, Two of Three



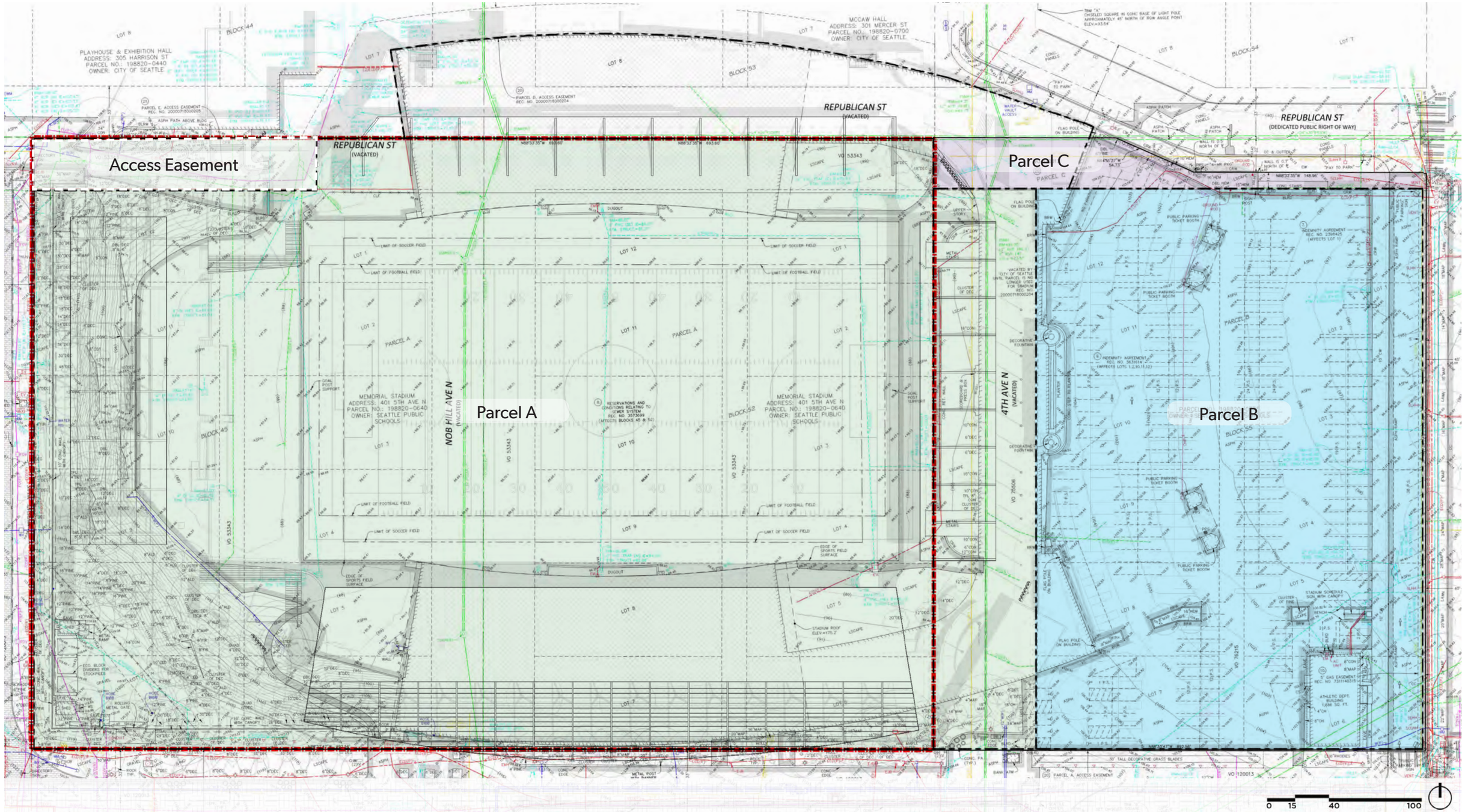
South Half Planting Area Plan - Symetrical to North

Existing Planting Area -

A: Existing Planter - Width of Planter

B: Planter at North End of Lighting Trench - Root Mass and Trash

BUILDING HISTORY + EXISTING CONDITIONS | Current Lot Lines



LANDMARKS + PROJECT OBJECTIVES

LANDMARKS PRESERVATION ORDINANCE (SEATTLE MUNICIPAL CODE)

25.12.20 - PURPOSE AND DECLARATION OF POLICY

THE CITY'S LEGISLATIVE AUTHORITY FINDS THAT THE PROTECTION, ENHANCEMENT, PERPETUATION AND USE OF SITES, IMPROVEMENTS AND OBJECTS OF HISTORICAL, CULTURAL, ARCHITECTURAL, ENGINEERING OR GEOGRAPHIC SIGNIFICANCE, LOCATED WITHIN THE CITY, ARE REQUIRED IN THE INTEREST OF THE PROSPERITY, CIVIC PRIDE AND GENERAL WELFARE OF THE PEOPLE; AND FURTHER FINDS THAT THE ECONOMIC, CULTURAL AND AESTHETIC STANDING OF THIS CITY CANNOT BE MAINTAINED OR ENHANCED BY DISREGARDING THE HERITAGE OF THE CITY AND BY ALLOWING THE UNNECESSARY DESTRUCTION OR DEFACEMENT OF SUCH CULTURAL ASSETS.

LANDMARKS ORDINANCE GOALS / OBJECTIVES

- TO DESIGNATE, PRESERVE, PROTECT, ENHANCE AND PERPETUATE THOSE SITES, IMPROVEMENTS AND OBJECTS WHICH REFLECT SIGNIFICANT ELEMENTS OF THE CITY'S CULTURAL, AESTHETIC, SOCIAL, ECONOMIC, POLITICAL, ARCHITECTURAL, ENGINEERING, HISTORIC OR OTHER HERITAGE, CONSISTENT WITH THE ESTABLISHED LONG-TERM GOALS AND POLICIES OF THE CITY.
- TO FOSTER CIVIC PRIDE IN THE BEAUTY AND ACCOMPLISHMENTS OF THE PAST
- TO STABILIZE OR IMPROVE THE AESTHETIC AND ECONOMIC VITALITY AND VALUES OF SUCH SITES, IMPROVEMENTS AND OBJECTS.
- TO PROTECT AND ENHANCE THE CITY'S ATTRACTION TO TOURISTS AND VISITORS
- TO PROMOTE THE USE OF OUTSTANDING SITES, IMPROVEMENTS AND OBJECTS FOR THE EDUCATION, STIMULATION AND WELFARE OF THE PEOPLE OF THE CITY.
- TO PROMOTE AND ENCOURAGE CONTINUED PRIVATE OWNERSHIP AND USE OF SUCH SITES, IMPROVEMENTS AND OBJECTS NOW SO OWNED AND USED, TO THE EXTENT THAT THE OBJECTIVES LISTED ABOVE CAN BE ATTAINED UNDER SUCH A POLICY.

GENERAL SYSTEM NOTES:

- CURRENT FUNCTIONALITY OF WATER FEATURE SOURCE PIPE AND DRAIN IS UNKNOWN.
- CURRENT FUNCTIONALITY OF FEATURE LIGHTING AND ELECTRICAL WIRING IS UNKNOWN.

PROJECT GOALS / OBJECTIVES

- PRESERVE, PROTECT AND HONOR EXISTING MEMORIAL WALL.
- PROTECT AND/OR REPAIR WALL, SITE , WATER FEATURES, LIGHTING FIXTURES AND CONDUIT.
- IMPROVE SURROUNDINGS IN SUCH A MANNER AS TO INCREASE THE PRESENCE OF THE MEMORIAL WALL.
- CREATE A SPATIAL BUFFER BETWEEN THE MEMORIAL WALL AND SURROUNDING PARKING TO HONOR MEMORIAL WALL AND PROVIDE PLACE FOR VIEWING AND VETERANS EVENTS.
- IMPROVE UNIVERSAL ACCESSIBILITY AND SAFE ACCESS FOR VETERANS, SPS VISITORS, AND PUBLIC.
- ABANDON WATER FUNCTION DUE TO COMPLEXITY OF RENOVATION TO MEET PLUMBING CODE AND SAFETY WHILE PROTECTING HISTORIC FEATURES.

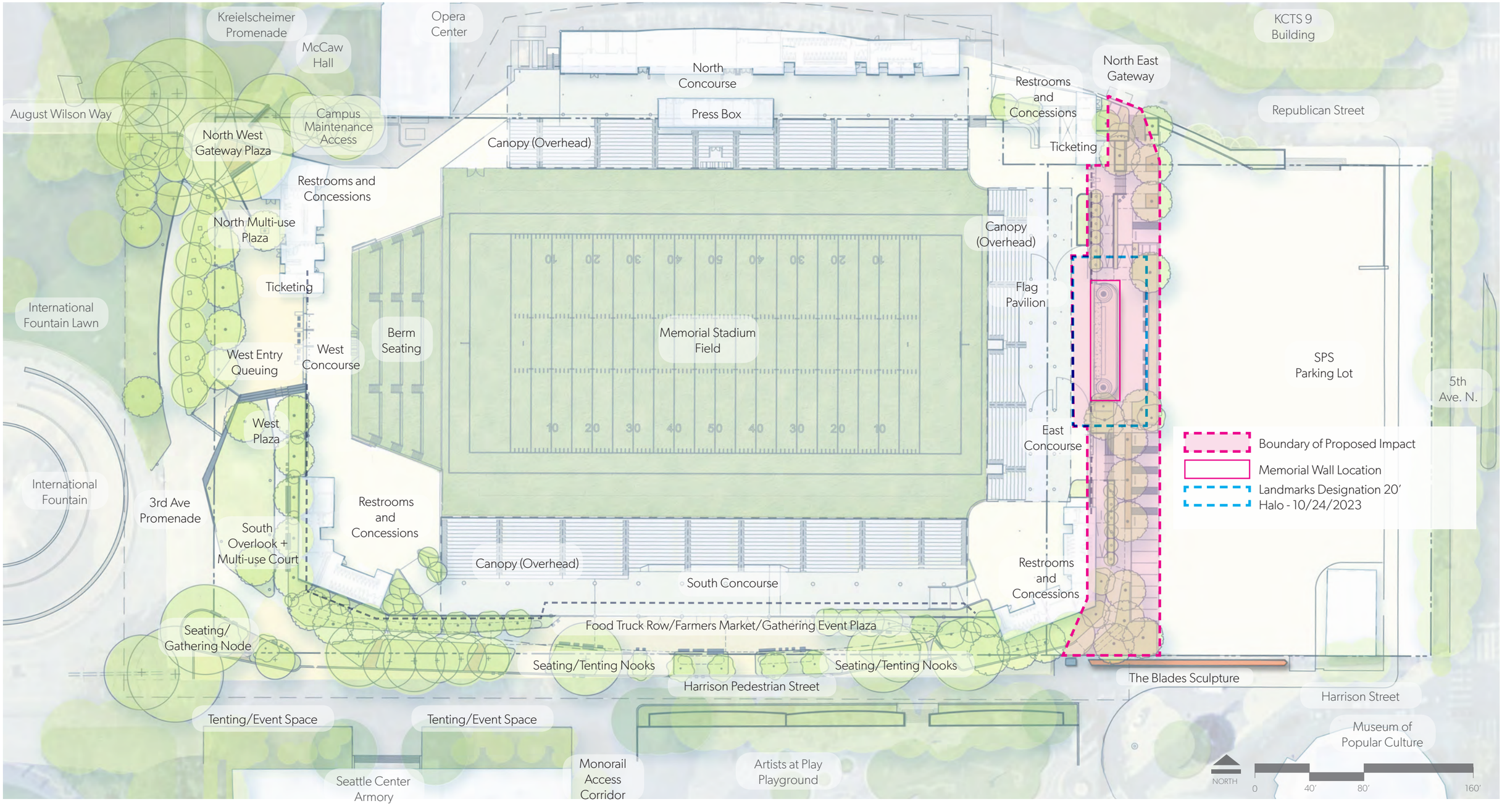
PRELIMINARY SITE PROGRAM

- INCREASE MEMORIAL ZONE AND PROVIDE PUBLIC GATHERING AREA.
- PROVIDE PEDESTRIAN AND UNIVERSAL ACCESS.
- CREATE SEPARATION OF PEDESTRIAN AND VEHICULAR ACTIVITY.

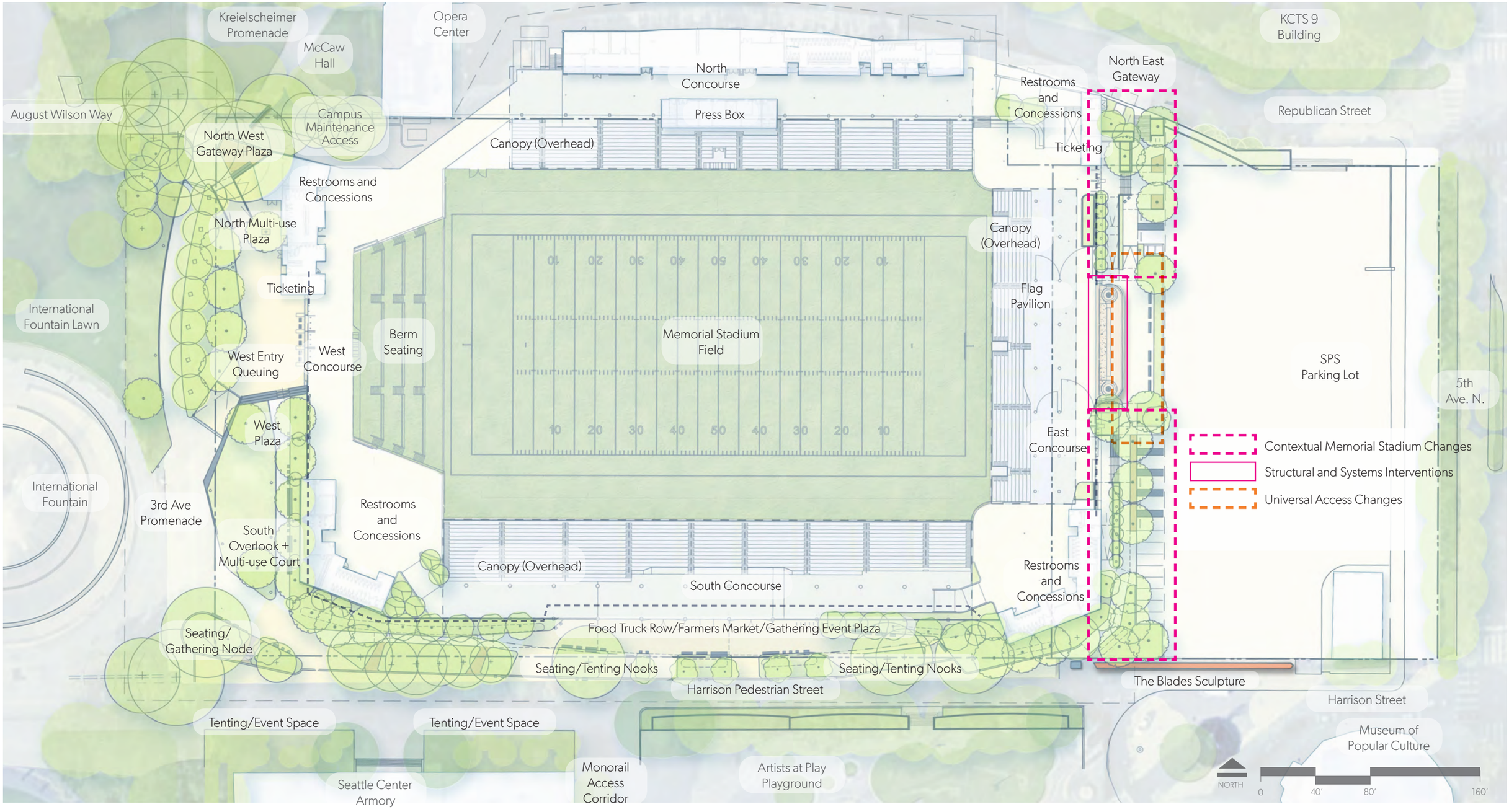
DESIGN PROPOSAL

- SITE CONTEXT
- CONTEXTUAL CHANGES
- STRUCTURAL + SYSTEM INTERVENTIONS
- SITE DESIGN + ACCESSIBILITY

SITE CONTEXT | Memorial Stadium Site Plan - Contextual Overlays

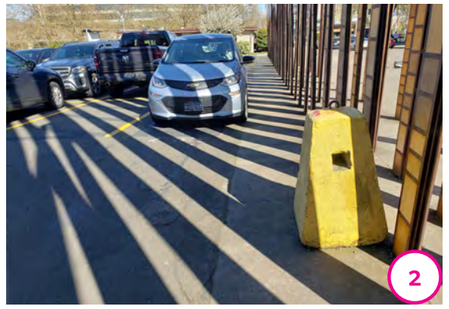


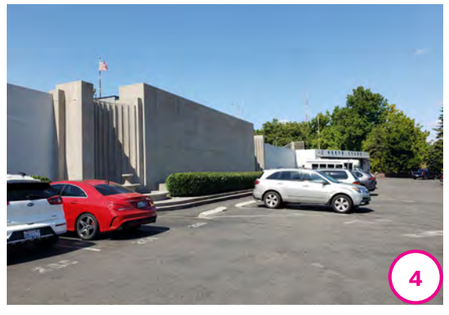
SITE CONTEXT | Memorial Stadium Site Plan - Memorial Preliminary Options Diagram

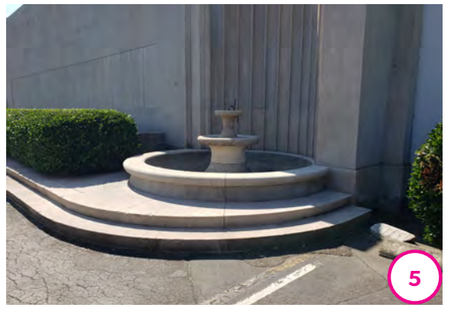


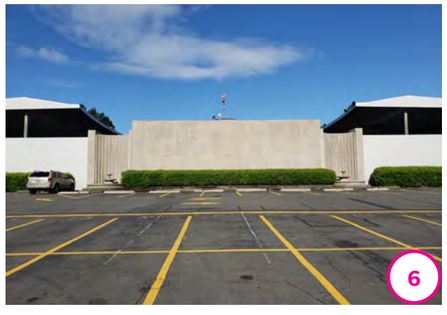
SITE CONTEXT | Existing Site Conditions

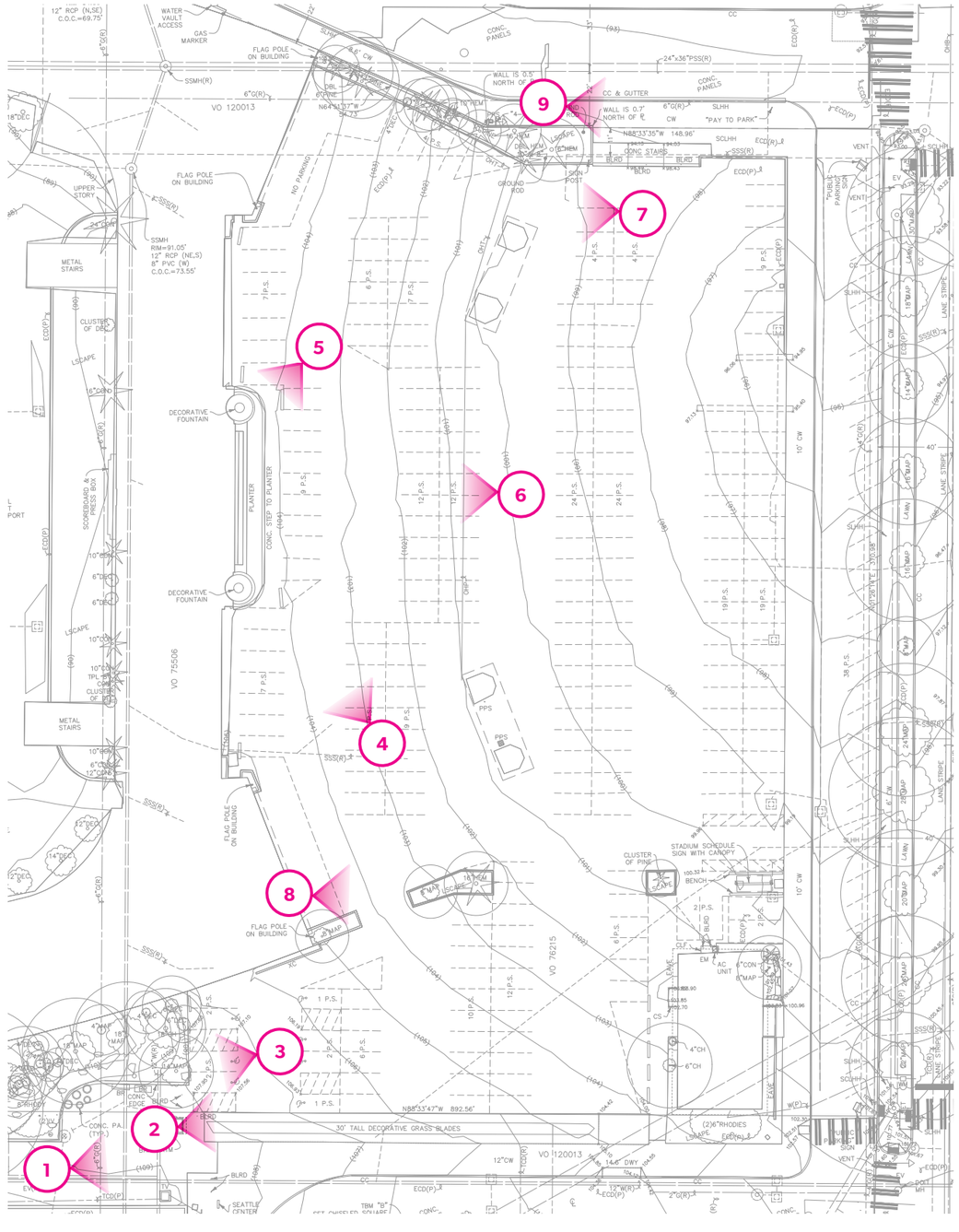
EXISTING VIEWS











CONTEXTUAL CHANGES| Proposed Memorial Stadium Site Grading

GRADING GOALS AND OBJECTIVES

Existing topography will be modified adjacent to the Memorial Wall and new stadium to provide for universal access, pedestrian routes connecting the site to the north and south of the site. The existing parking lot, adjoining sidewalks and driveways will remain at existing elevation.

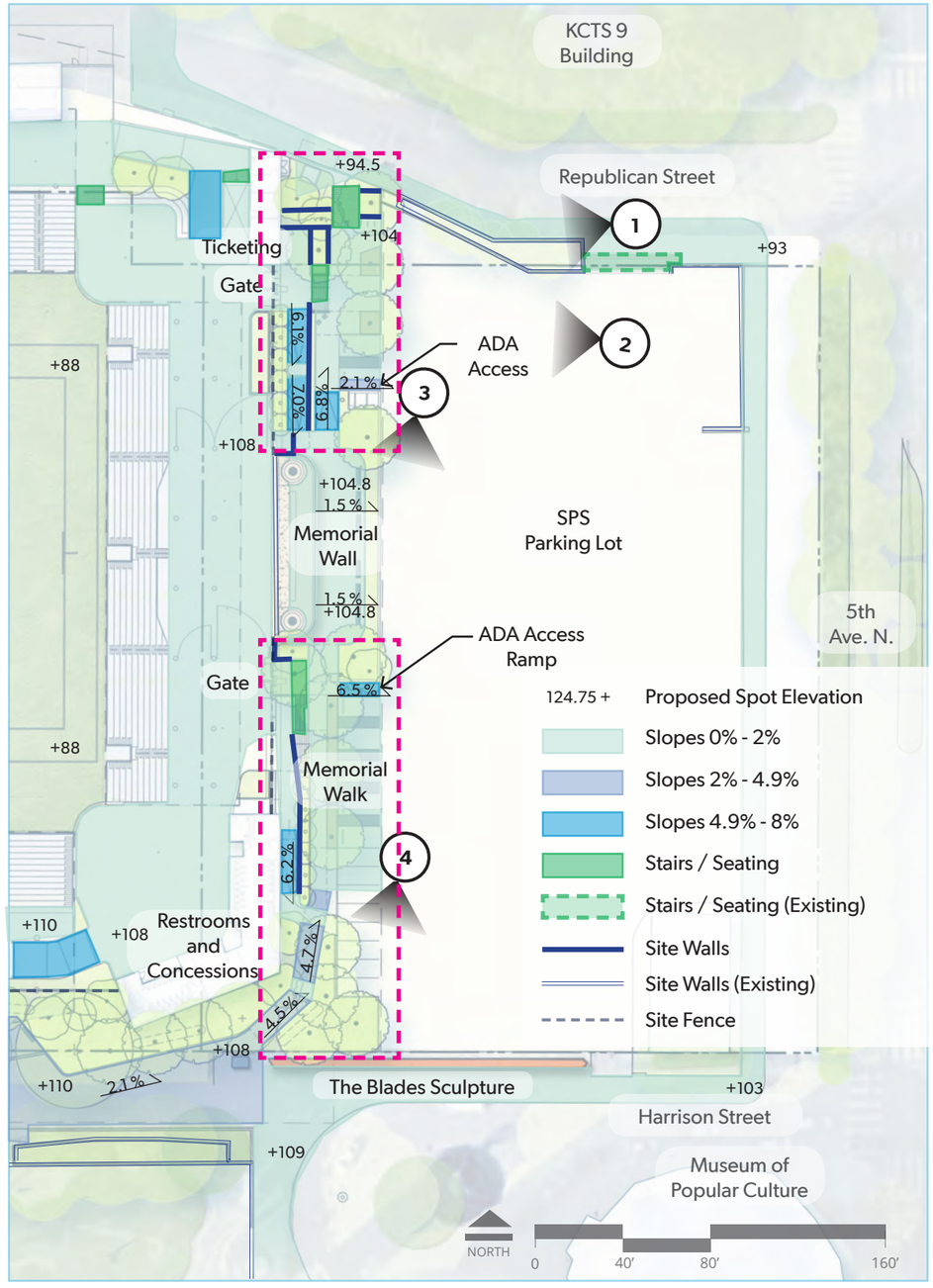
EXISTING VIEWS

Republican Street Sidewalk Wall 1

Parking Lot Existing Topography to Remain 2

Parking to be Removed From Front of Memorial 3

Parking Lot Existing Topography to Remain 4



PROJECT GOALS / OBJECTIVES

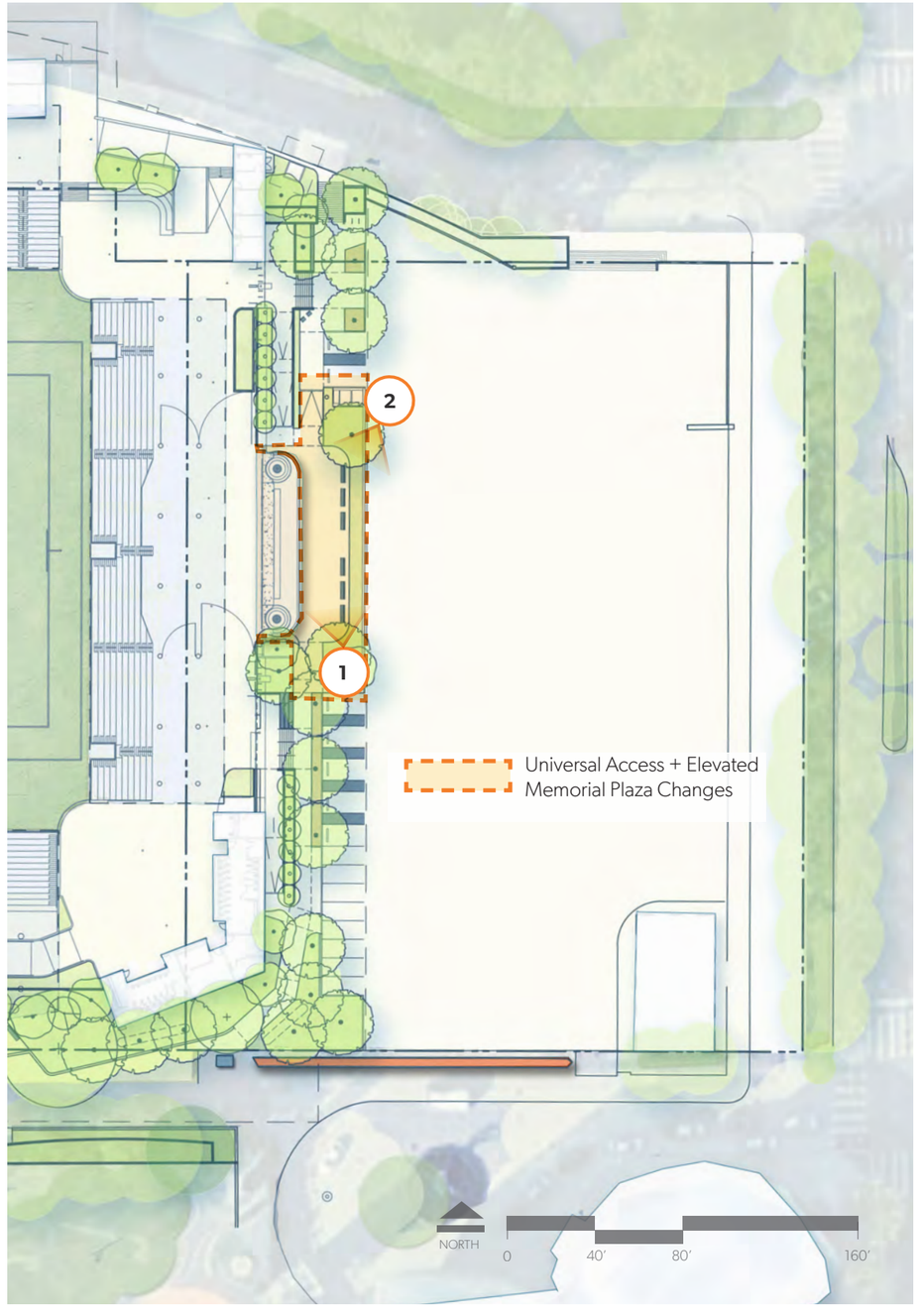
- Preserve, protect and honor existing Memorial Wall.
- Protect and/OR repair wall, site, water features, lighting fixtures and conduit.
- Improve surroundings in such a manner as to increase the presence of the Memorial Wall.
- Create a spatial buffer between the Memorial Wall and surrounding parking to honor Memorial Wall and provide place for viewing and veterans events.
- Improve universal accessibility and safe access for veterans, SPS visitors and public.

PRELIMINARY SITE PROGRAM

- Increase memorial zone and provide public gathering area.
- Provide pedestrian and universal access.
- Create separation of pedestrian and vehicular activity.

Existing View Looking North - Proposed Impact Zone

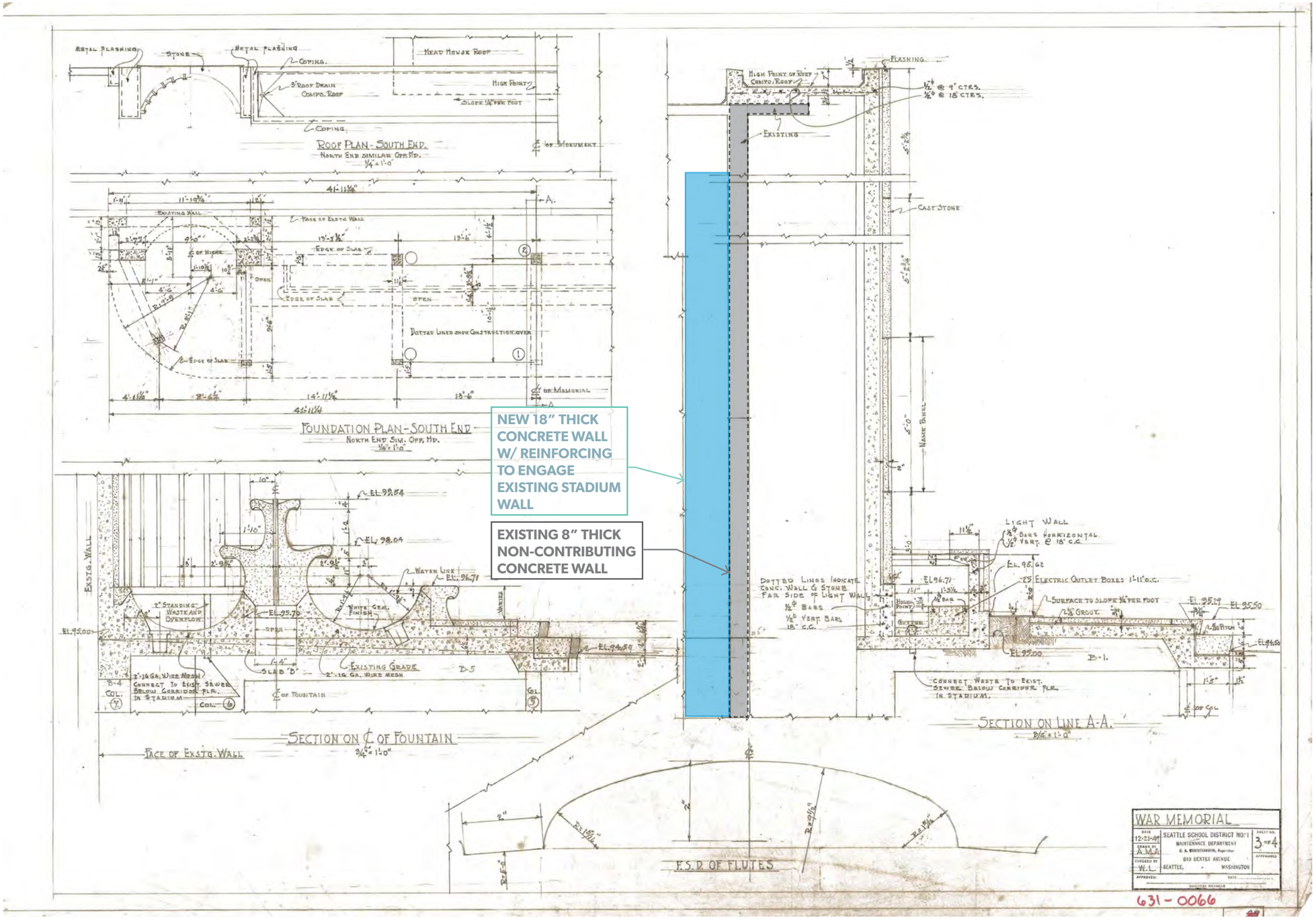
Rendered View Looking South West



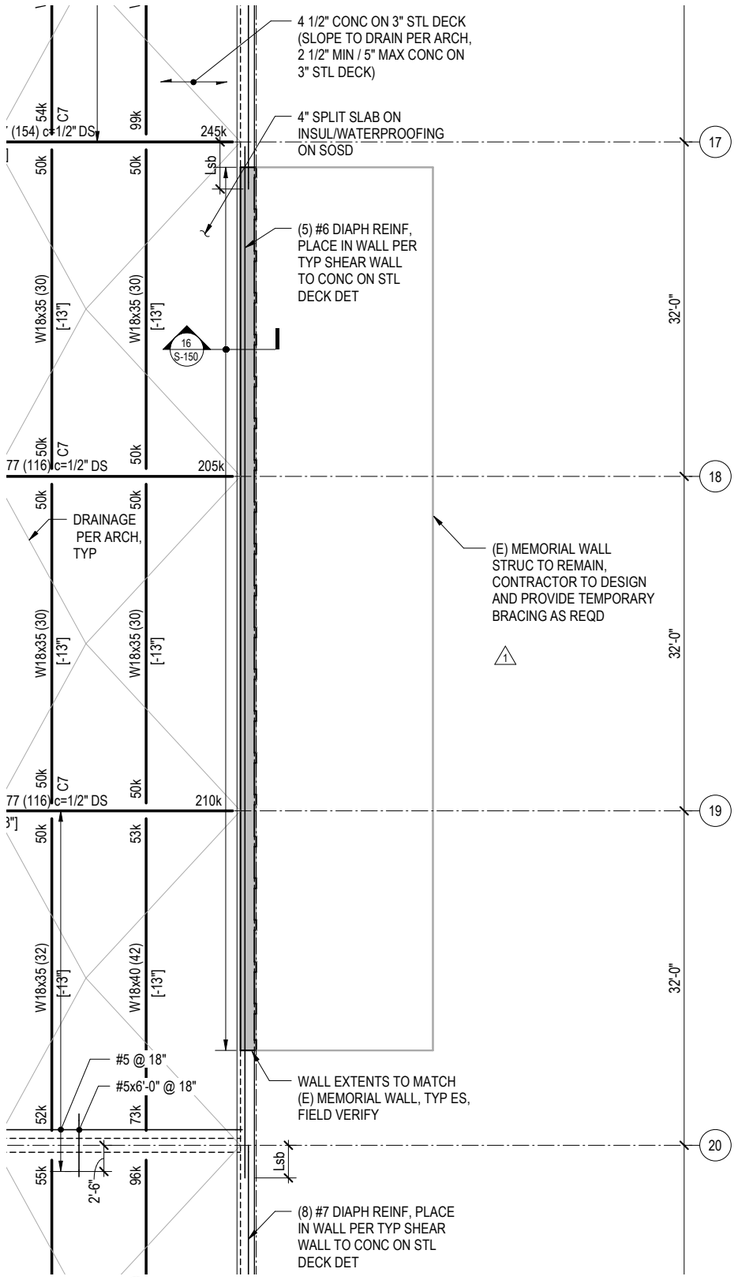
4. FINAL DESIGN

MEMORIAL WALL
TEMPORARY PROTECTION AND STRUCTURAL SUPPORT

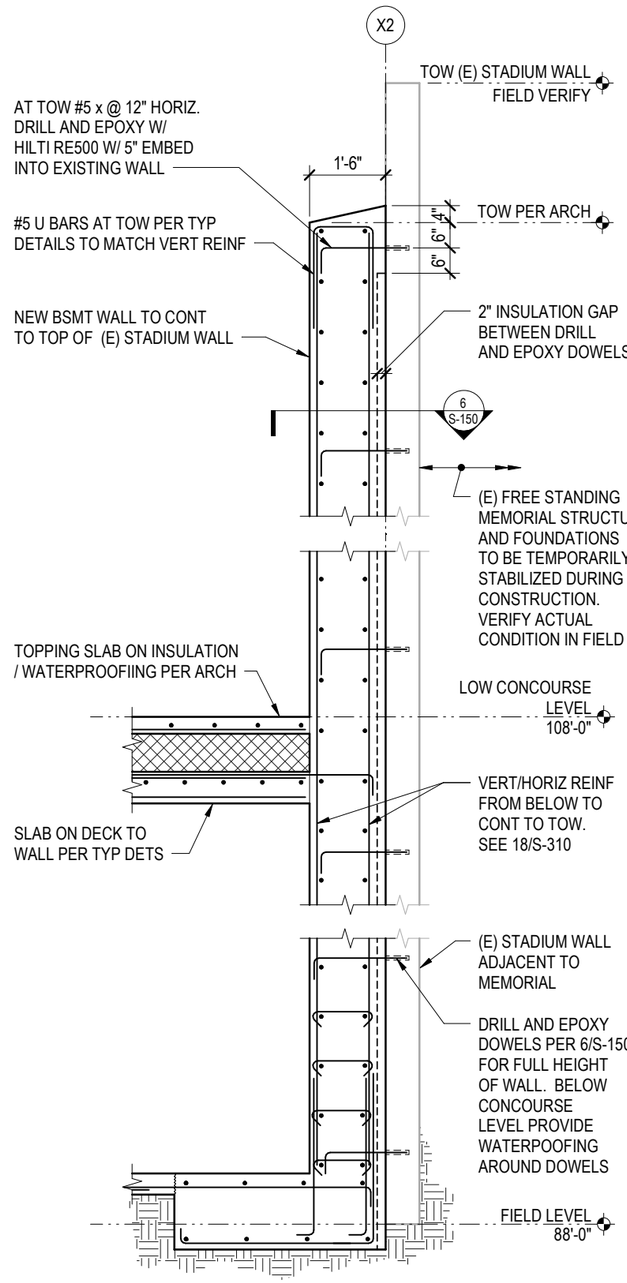
STRUCTURAL AND SYSTEM INTERVENTIONS | Original Drawings (12/21/1949) - Proposed Impact Extents



STRUCTURAL AND SYSTEM INTERVENTIONS | Proposed Memorial Wall Structural Section

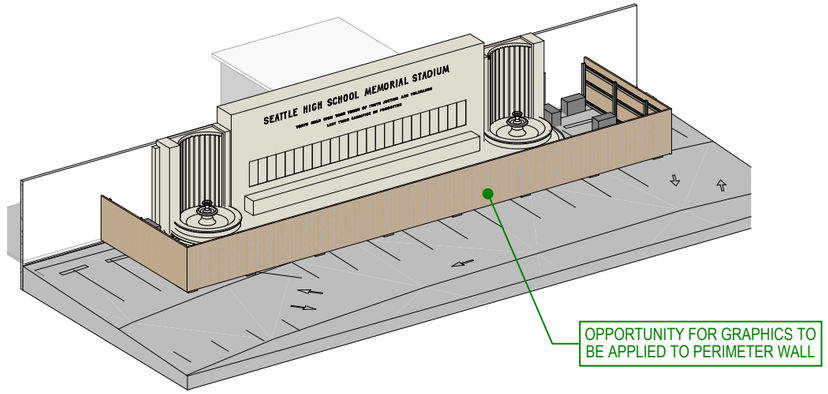


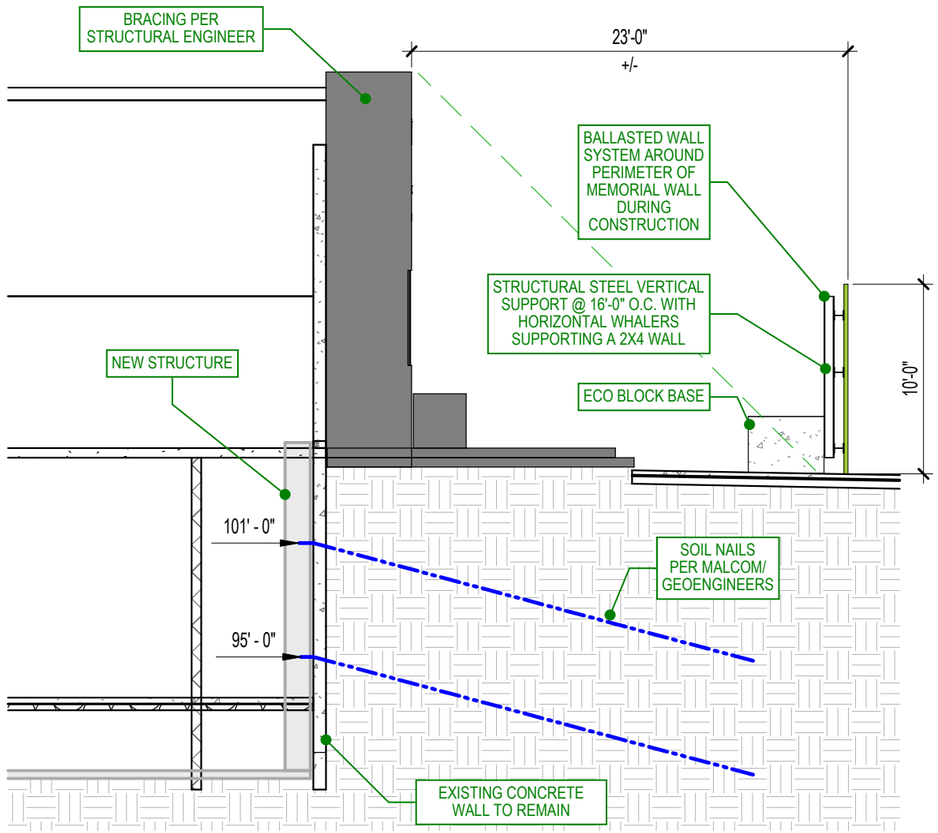
PLAN | NTS



SECTION | NTS

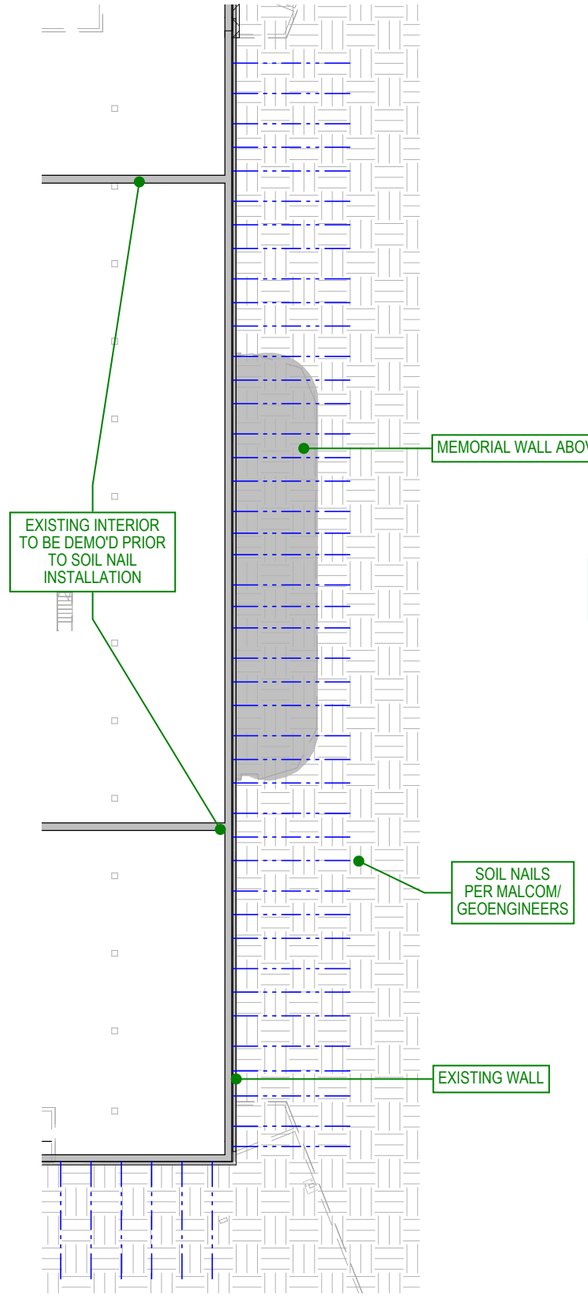
STRUCTURAL AND SYSTEM INTERVENTIONS | Proposed Memorial Wall Structural Section





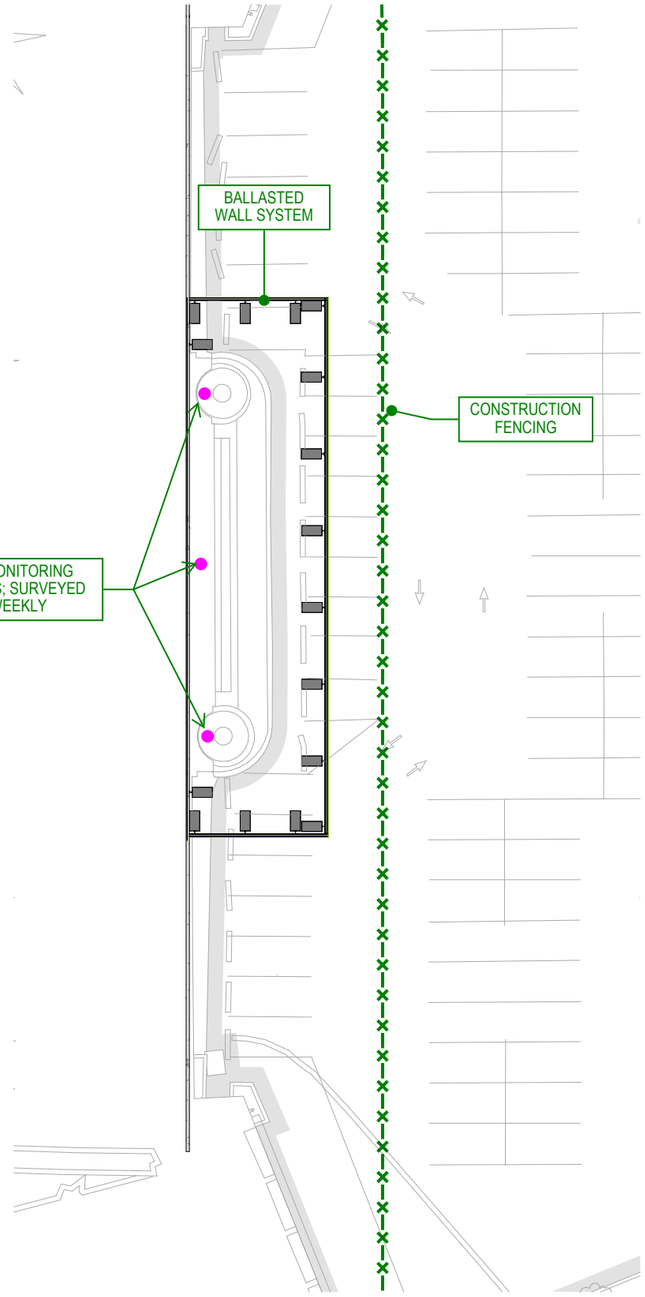
1 MEMORIAL WALL - SECTION

1/8" = 1'-0"



2 FIELD LEVEL - MEMORIAL WALL

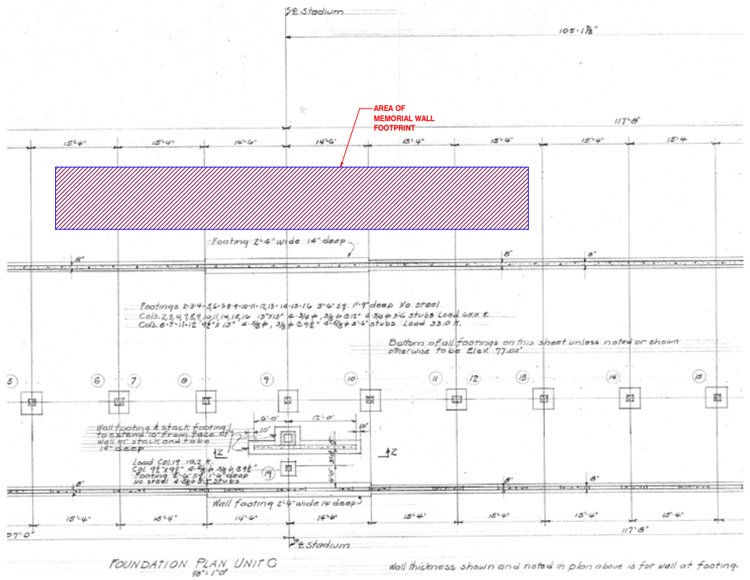
1" = 30'-0"



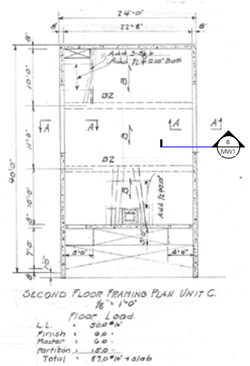
3 CONCOURSE - MEMORIAL WALL

1" = 30'-0"

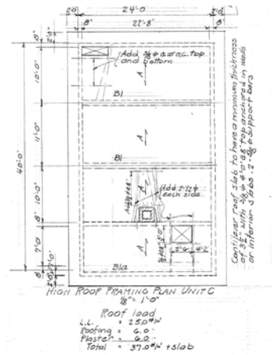
STRUCTURAL AND SYSTEM INTERVENTIONS | Memorial Wall Temporary Structural Bracing



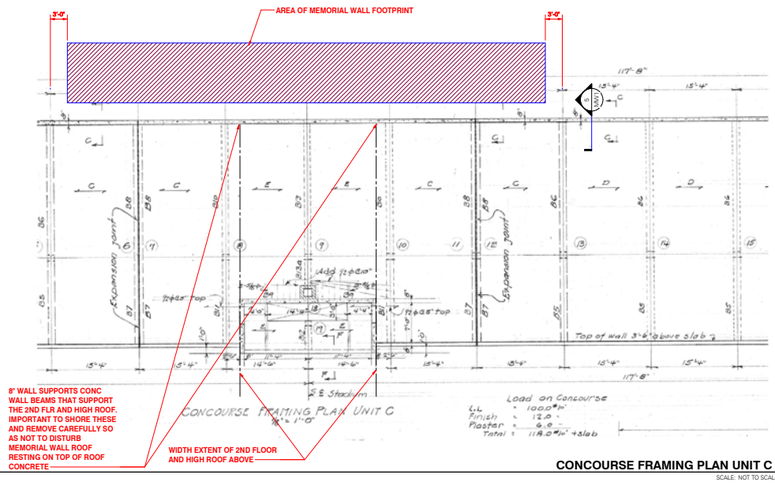
FOUNDATION PLAN UNIT C
SCALE: NOT TO SCALE



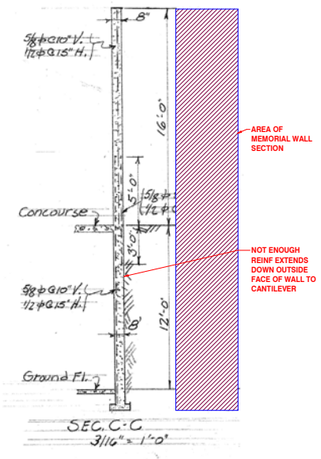
SECOND FLOOR FRAMING PLAN UNIT C
SCALE: NOT TO SCALE



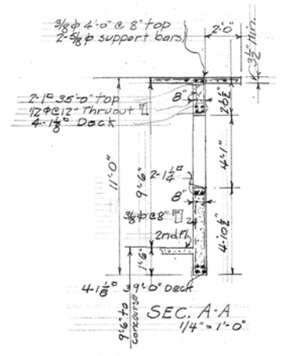
HIGH ROOF FRAMING PLAN UNIT C
SCALE: NOT TO SCALE



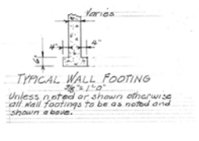
CONCOURSE FRAMING PLAN UNIT C
SCALE: NOT TO SCALE



5 SECTION C-C
SCALE: NOT TO SCALE



6 SECTION A-A
SCALE: NOT TO SCALE

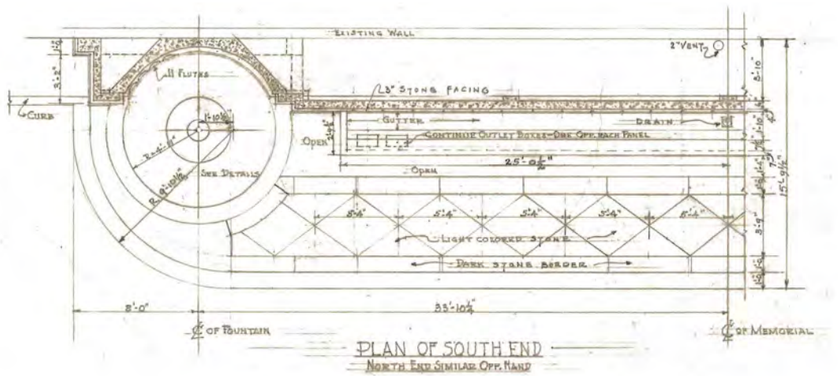


7 TYPICAL WALL FOOTING
SCALE: NOT TO SCALE

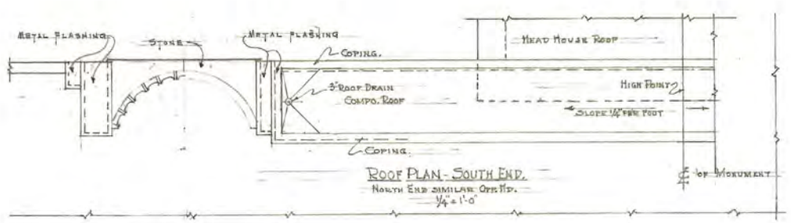
GENERAL Notes for All Structures

fs structural steel 20,000#/sq" Supervised construction. Structural steel to be fireproofed with 2" of concrete. See details for reinforcement of fireproofing.
Soil pressure 7,000.0 #/sq"
fs reinforcing 20,000.0#/sq" Intermediate grade deformed bars supported on metal chairs or well cured concrete blocks and securely wired in place with #16 double annealed iron wire
fc = 900.0#/sq" f'c = 2,000#/sq" Mix 1:2:4 five sacks of cement per cubic yard of concrete. Seven and one-half gallons of water per sack of cement. Supervised construction.
Main slab bars to have 1" of concrete cover, main beam & Col. bars 1½", main footing bars 3" main wall bars 1" on open face, 2" on earth face.
Unless noted or shown otherwise all walls to be reinforced as follows.
6" walls to have ½" @ 13" o.c. H. & V.
8" " " " " @ 10" o.c. H. & V.
10" " " " ½" @ 16" o.c. H. & V. each face
12" " " " ½" @ 13" o.c. H & V. each face
stub walls to supports with ½" @ 2'-6" stubs 15" o.c. Lap wall bars 2'-0" where spliced
At least 2-½" in bottom of all self supporting walls.
At least one bar over, under, at each side of, and diagonally at each corner of each opening in walls with one layer of steel. Two bars in similar positions in walls with two layers of steel. Diagonal bars 4'-0" long.
If openings are more than 6'-0" in each direction (horizontal & vertical) use ⅜" @ at side of, diagonal, over, and under openings.
Lap Col. bars where spliced 26 Diam in Tied Cols, 32 Diam. in Spiral Cols.
Min. lap 2'-0"
Short Hor. or Vert. bars in small wall sections to be hooked or bent as stirrups or Col. ties

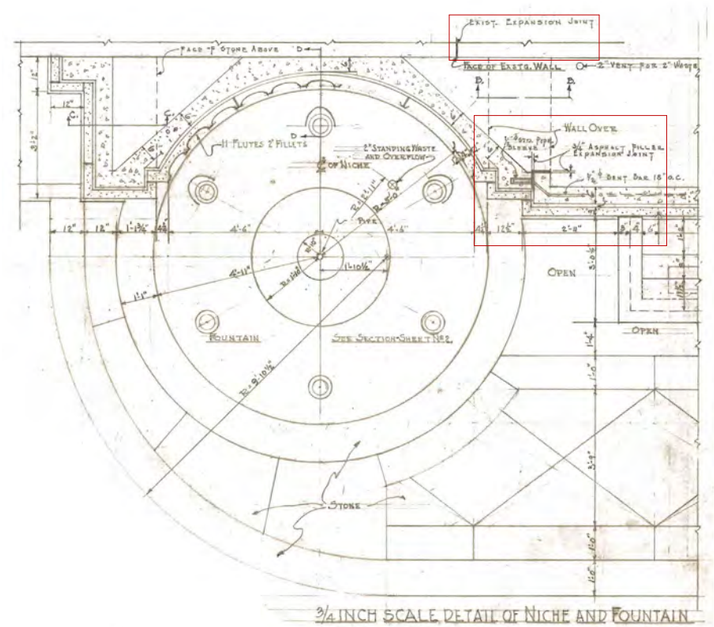
STRUCTURAL AND SYSTEM INTERVENTIONS | Memorial Wall Temporary Structural Bracing



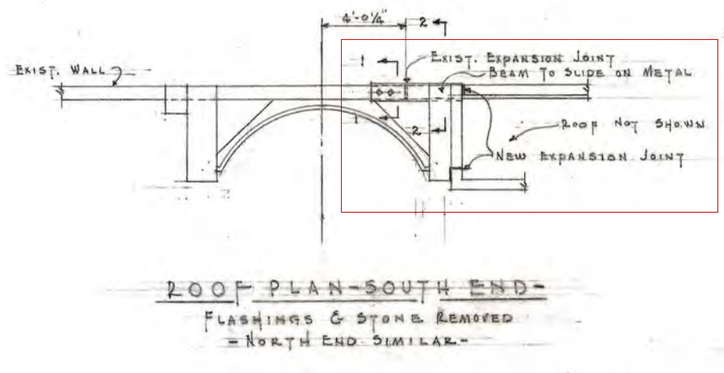
PLAN OF SOUTH END
SCALE: NOT TO SCALE



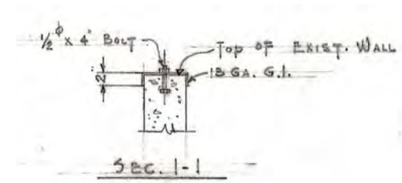
ROOF PLAN - SOUTH END
SCALE: NOT TO SCALE



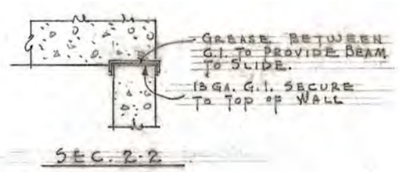
Second Floor Structural Framing Plan
SCALE: NOT TO SCALE



ROOF PLAN - SOUTH END
SCALE: NOT TO SCALE



5 SECTION 1-1
SCALE: NOT TO SCALE

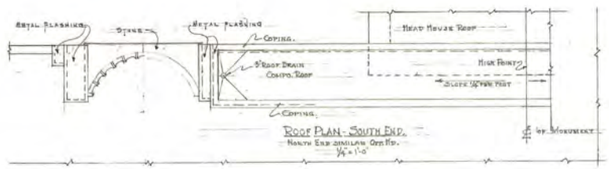


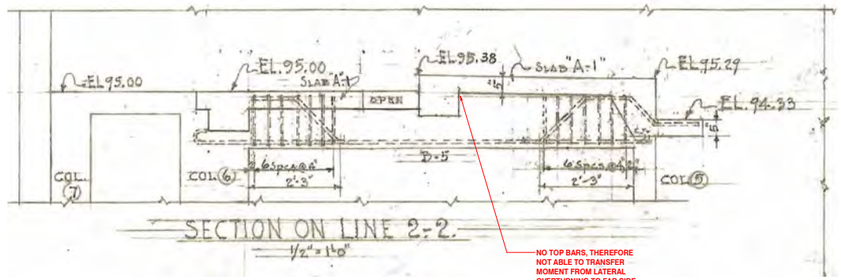
6 SECTION 2-2
SCALE: NOT TO SCALE

NOTE:

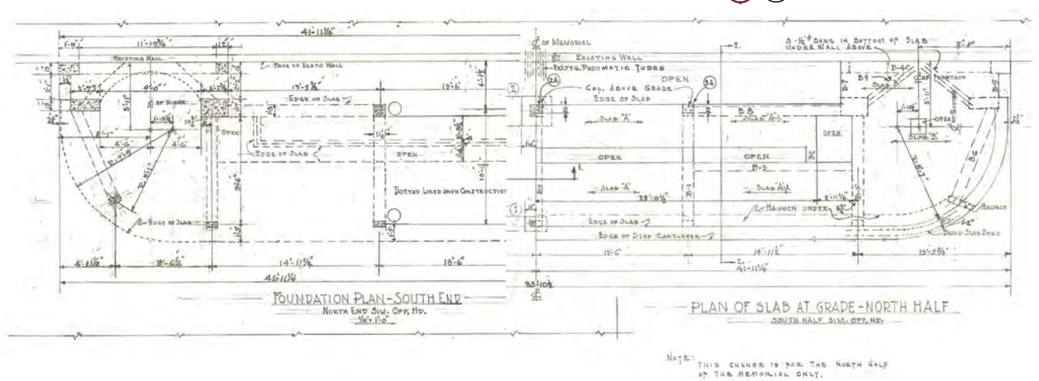
EXPANSION JOINTS EXIST AT EACH END OF THE FLAT SECTION OF WALL. EACH FOUNTAIN IS SEPARATE. THEREFORE, TREAT EACH OF THE THREE SECTIONS SEPARATELY.

STRUCTURAL AND SYSTEM INTERVENTIONS | Memorial Wall Temporary Structural Bracing

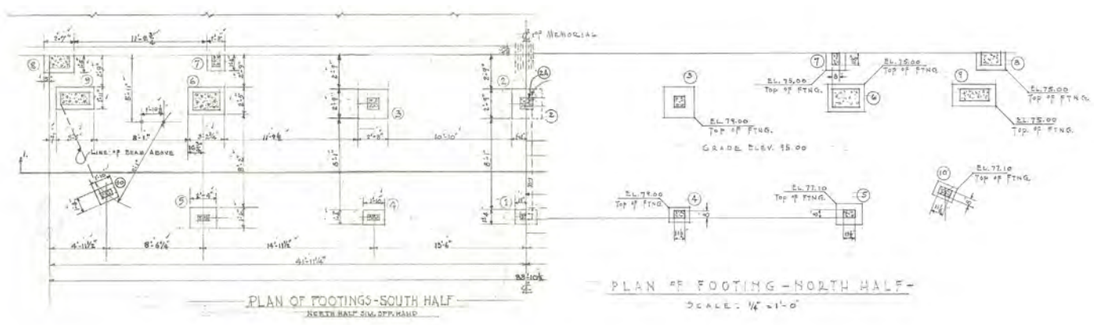




ROOF PLAN - SOUTH END SCALE: NOT TO SCALE | 4 | **SECTION ON LINE 2-2** SCALE: NOT TO SCALE

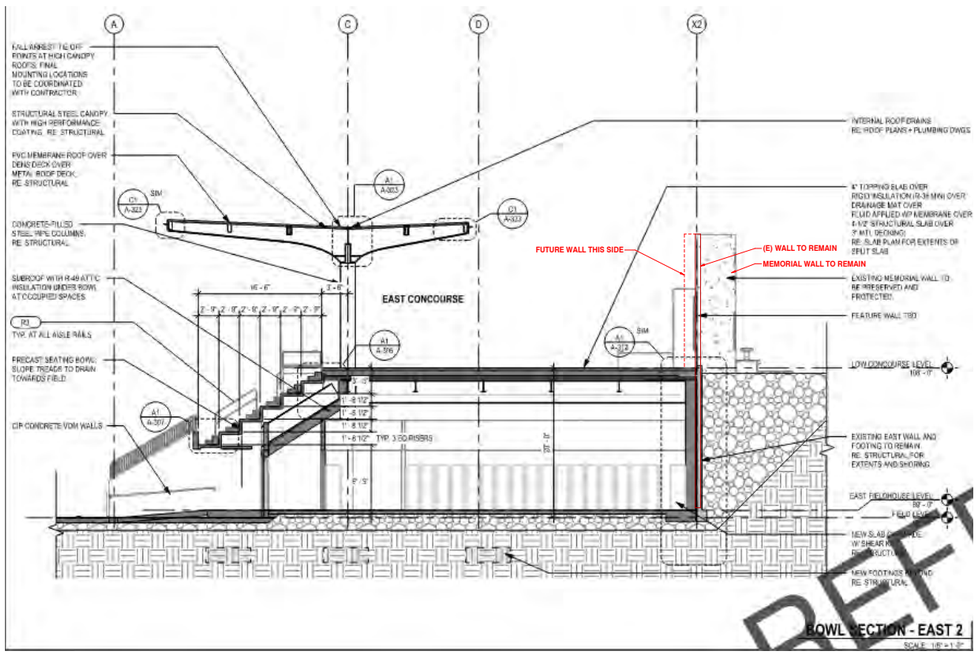


FOUNDATION PLAN - SOUTH END SCALE: NOT TO SCALE



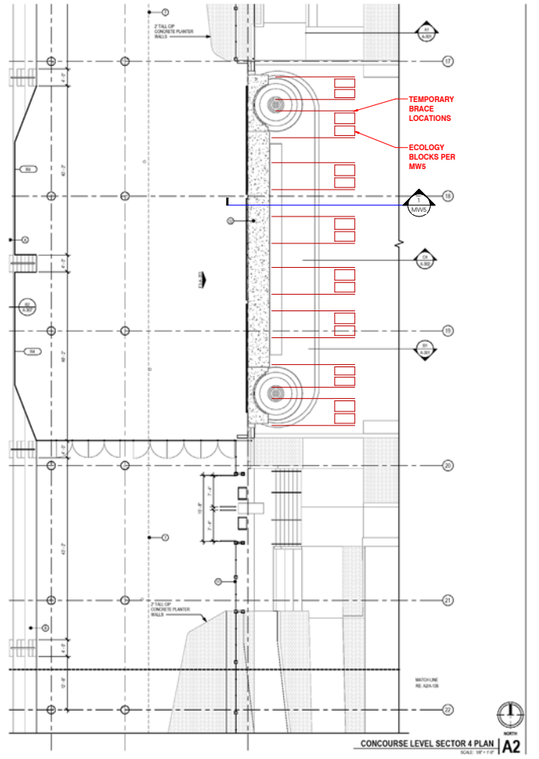
PLAN OF FOOTINGS - SOUTH HALF SCALE: NOT TO SCALE

1 **MEMORIAL WALL ELEVATION FOR REFERENCE**
SCALE: NOT TO SCALE



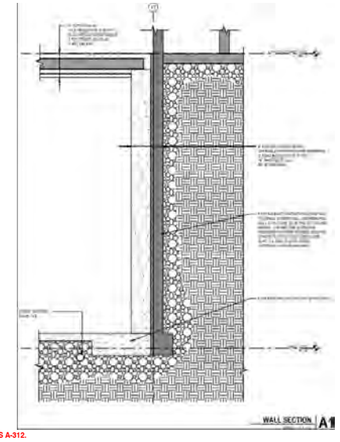
NOTE:
REFERENCE ARCH DRAWINGS A-302.

2 **BOWL SECTION - EAST 2 FOR REFERENCE**
SCALE: NOT TO SCALE



NOTE:
REFERENCE ARCH DRAWINGS A-134.

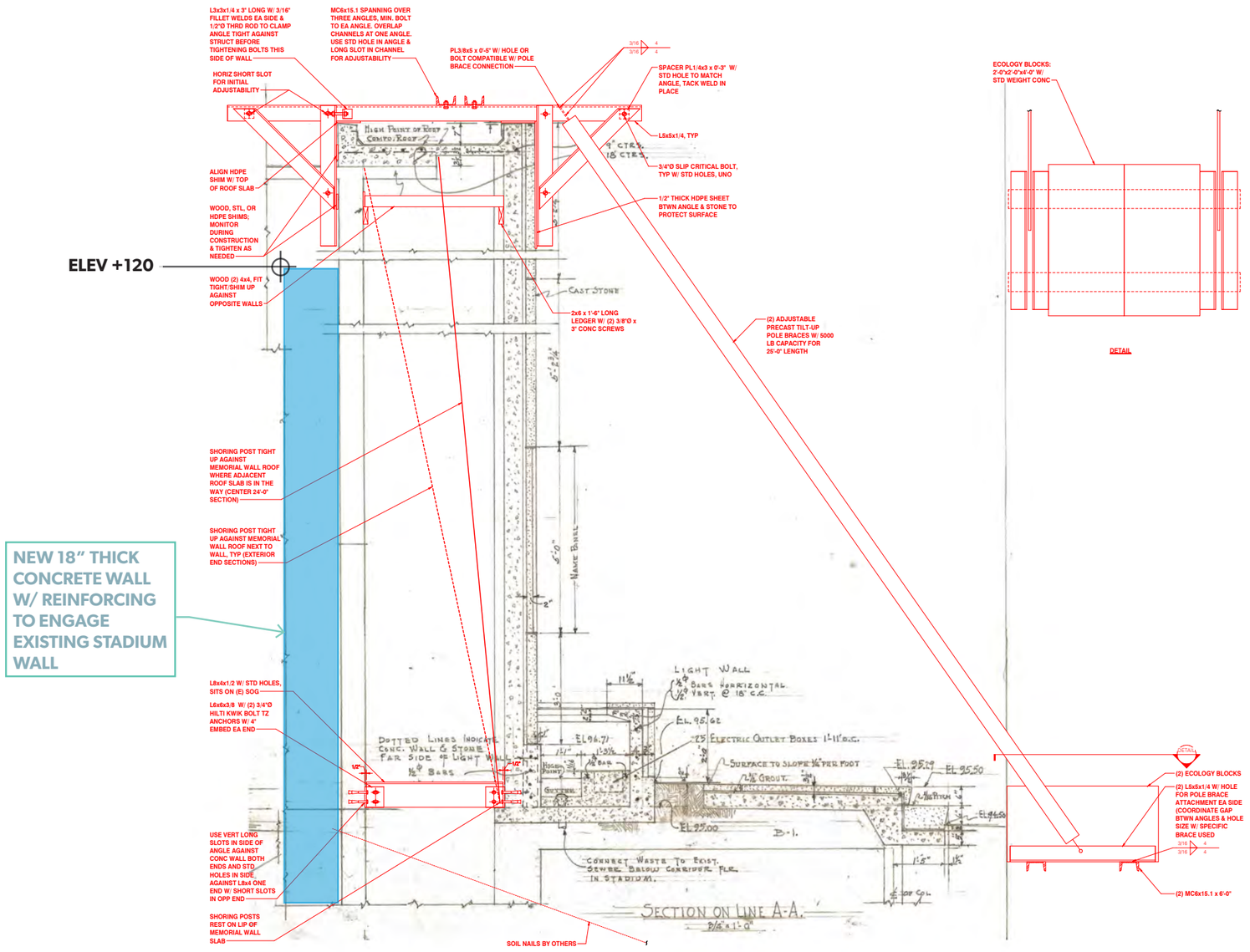
TEMPORARY BRACING PLAN
SCALE: NOT TO SCALE



NOTE:
REFERENCE ARCH DRAWINGS A-312.

4 **WALL SECTION FOR REFERENCE**
SCALE: NOT TO SCALE

STRUCTURAL AND SYSTEM INTERVENTIONS | Memorial Wall Dwgs Showing Foundations, Grade Plan and Section at Beams



NOTE:

ALL STEEL TO BE GALVANIZED, MIN Fy = 36 KSI. ALL BOLTS TO BE STAINLESS STEEL.

1 TEMPORARY BRACING SECTION FOR MEMORIAL WALL

SCALE: 1" = 1'-0"

Memorial Wall Condition Assessment and Recommended Preservation Treatments

Background Information:

The Memorial Wall was constructed in 1951 as part of the east facade of the Memorial Stadium, as a commemoration of Seattle Public Schools alumni who died in World War II. The wall is 176 feet long and 22 feet high, and is constructed of Indiana Limestone veneer panels over a concrete wall substrate. The limestone panels in the main central area have a smooth surface, with tight mortar joints and incised lettering. The lower central limestone panels are slightly recessed and have the incised names of the 762 individuals who are commemorated. There is a linear recess for lighting along the front of the wall. Semi-circular recessed areas at each end of the wall have vertically fluted stone panels which provide a backdrop for circular fountains.

Condition Assessment Summary:

In general the Memorial Wall is in good condition considering its age and weather exposure.

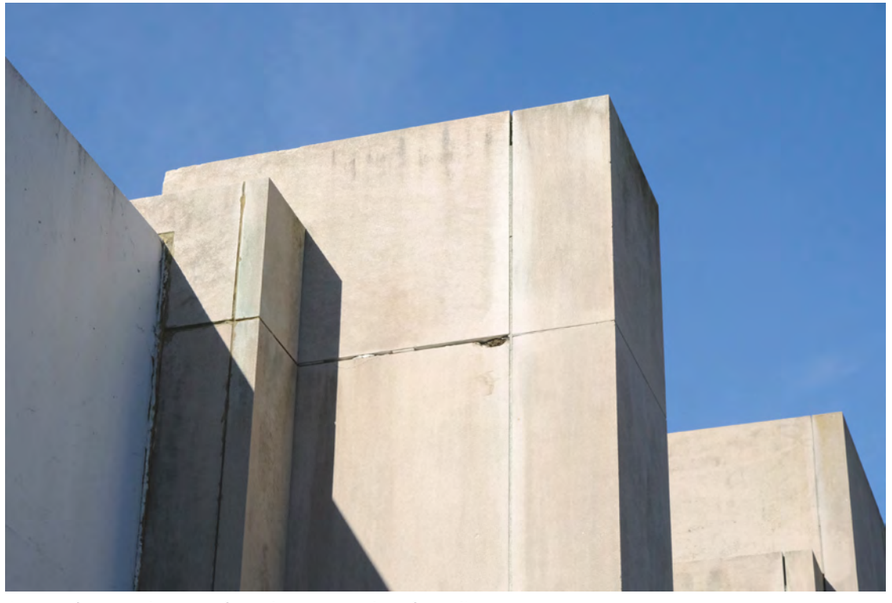
There is some mortar failure and areas of mortar loss, surface dirt and organic growth, and small localized areas of surface damage such as minor cracks and chips.

Areas of previous grafitti removal and previous surface damage repair are evident. The water fountains and the recessed light fixtures are damaged and non-operable. The hedge in front is overgrown and obsures the lower portion of the memorial.

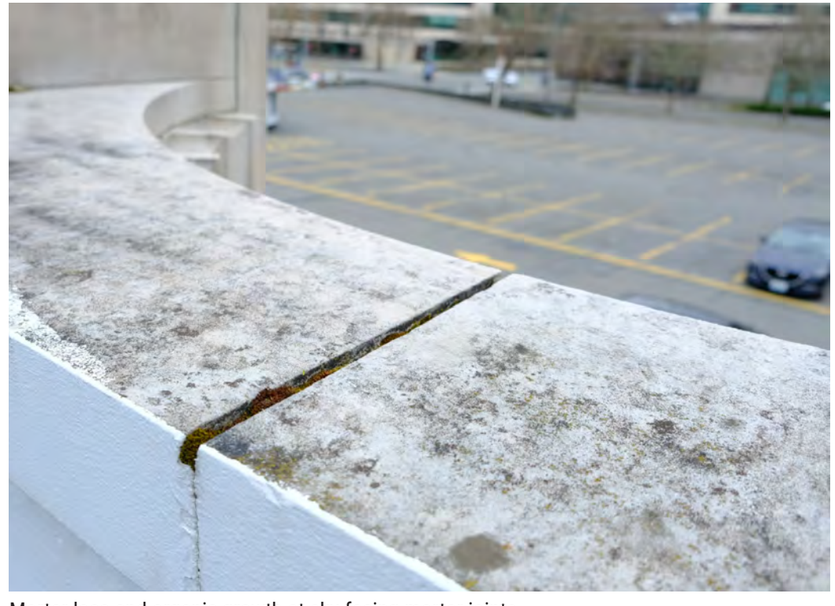
These conditions and the recommended preservation treatments are shown on the following pages.

BUILDINGWORK
architecture design preservation

MEMORIAL WALL CONDITIONS | Assessment



Areas of mortar loss, surface damage, and surface dirt



Mortar loss and organic growth at sky-facing mortar joints

Areas of mortar loss

Areas of mortar loss, surface dirt, and organic growth

MEMORIAL WALL CONDITIONS | Assessment

Areas of mortar loss, surface damage, and organic growth

Surface damage with a previous repair patch that has failed

Areas of mortar loss, stone cracking, and surface dirt

Areas of mortar loss

Areas of surface damage, organic growth, and dirt

Areas of surface damage, organic growth, and dirt

Areas of mortar loss, surface dirt, organic growth at walking surface pavers

Areas of mortar loss and surface dirt

Preservation Scope and Methods:

- **Clean all surfaces of the stone**
  Specifications to comply with
  NPS Preservation Brief 1 *Cleaning Treatments for Historic Masonry*
  Recommended Cleaning Product: Atlas Preservation D2 Biological Solution

- **Install new mortar**
  At areas of mortar loss. Specifications to comply with
  NPS Preservation Brief 2 *Repointing Mortar Joints in Historic Masonry*
  Match existing joint tooling.
  Product: US Heritage Group; Type N mortar, color matched

- **Repair the water fountains and replace the light fixtures to restore operability**

- **Remove and replace the hedge to restore visibility and access to the wall**

*****POTENTIAL ANTI-GRAFFITI COATING SHALL BE CONSIDERED AND SUBMITTED AS A SEPARATE CERTIFICATE OF APPROVAL APPLICATION*****

BUILDINGWORK
architecture design preservation

4. FINAL DESIGN

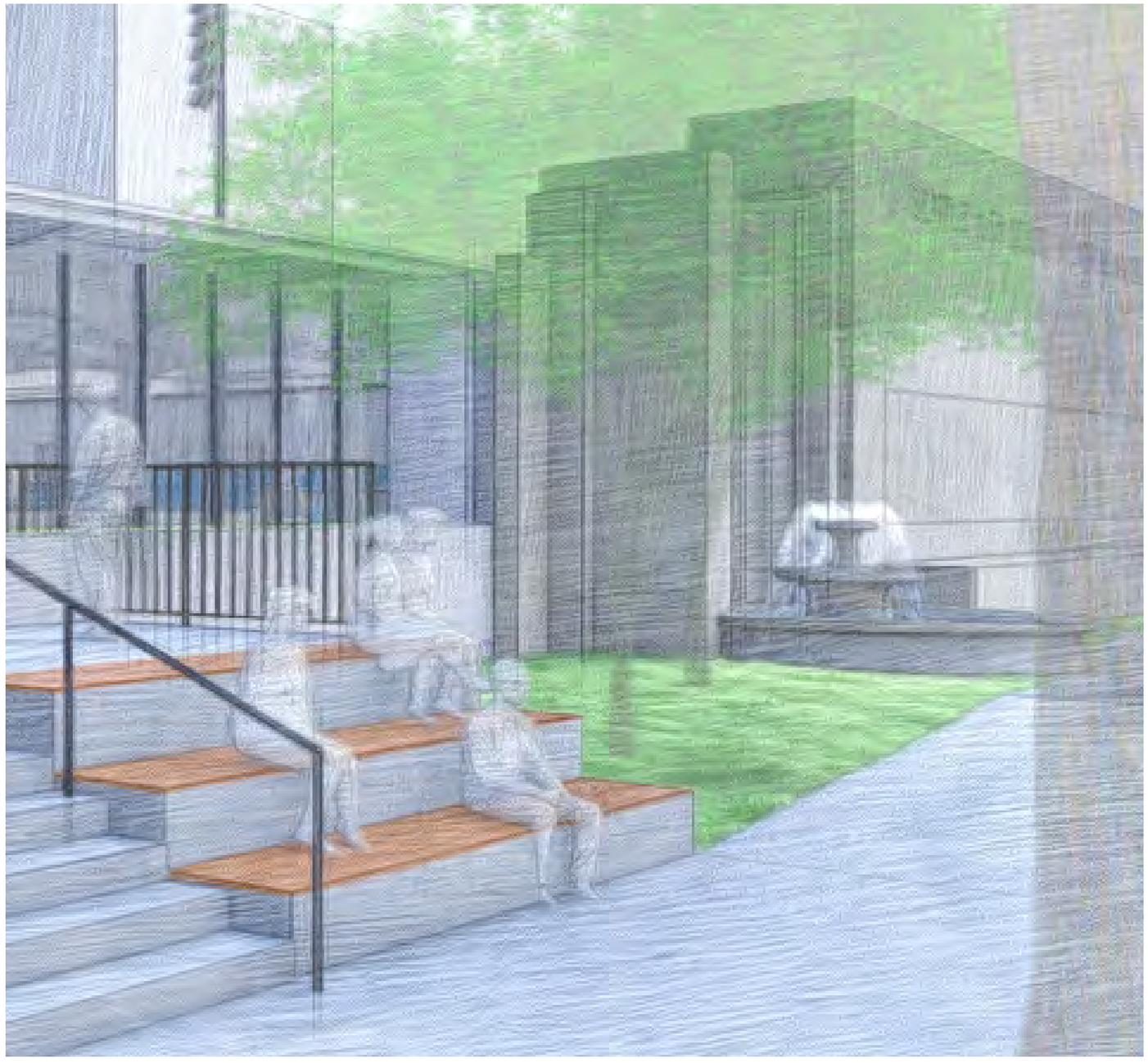
MEMORIAL WALL FINAL DESIGN

Rendered View Looking West

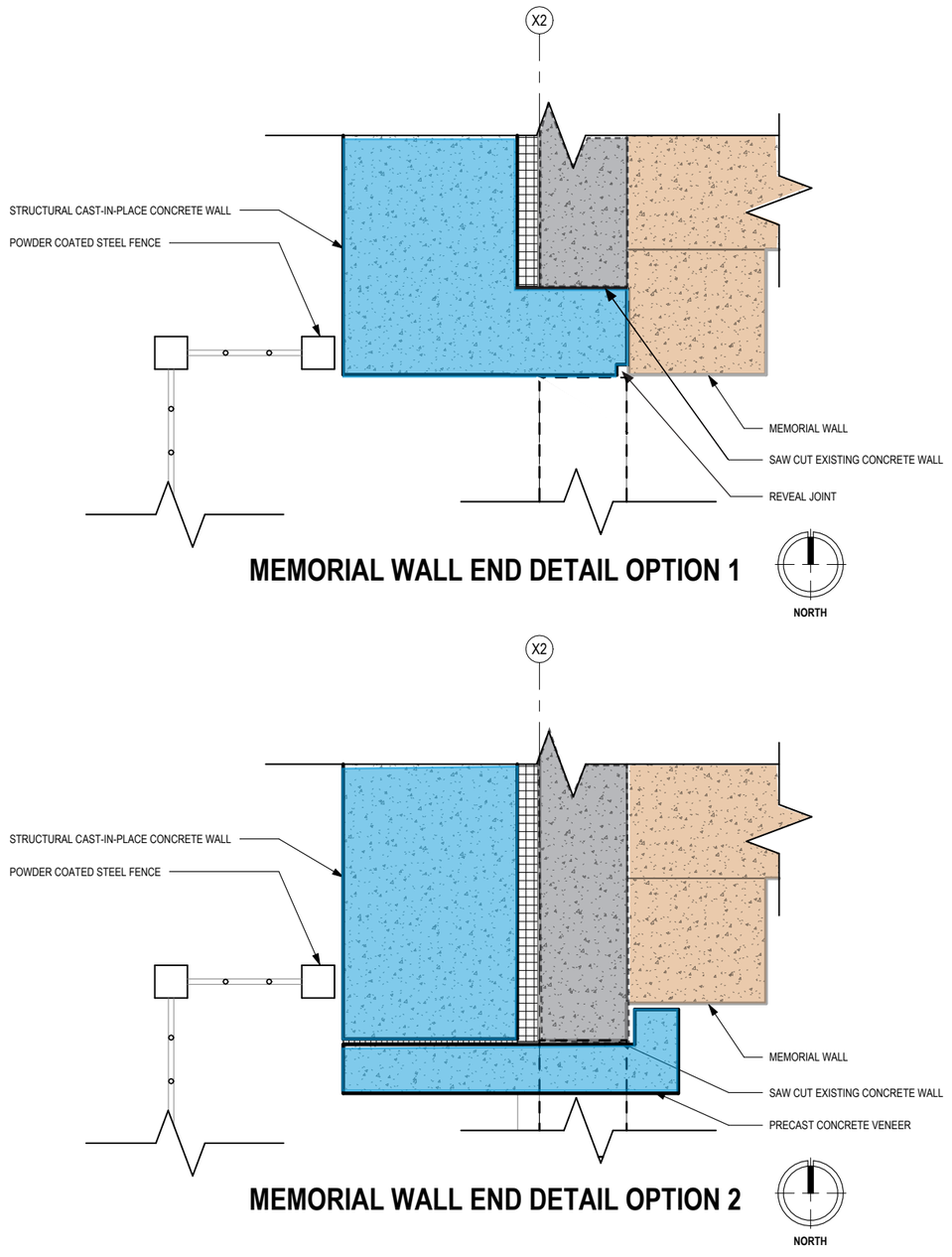
Rendered View Looking Southwest

Rendered View Looking Northwest

DESIGN INTERVENTION | Memorial Wall End Cap Detail Options

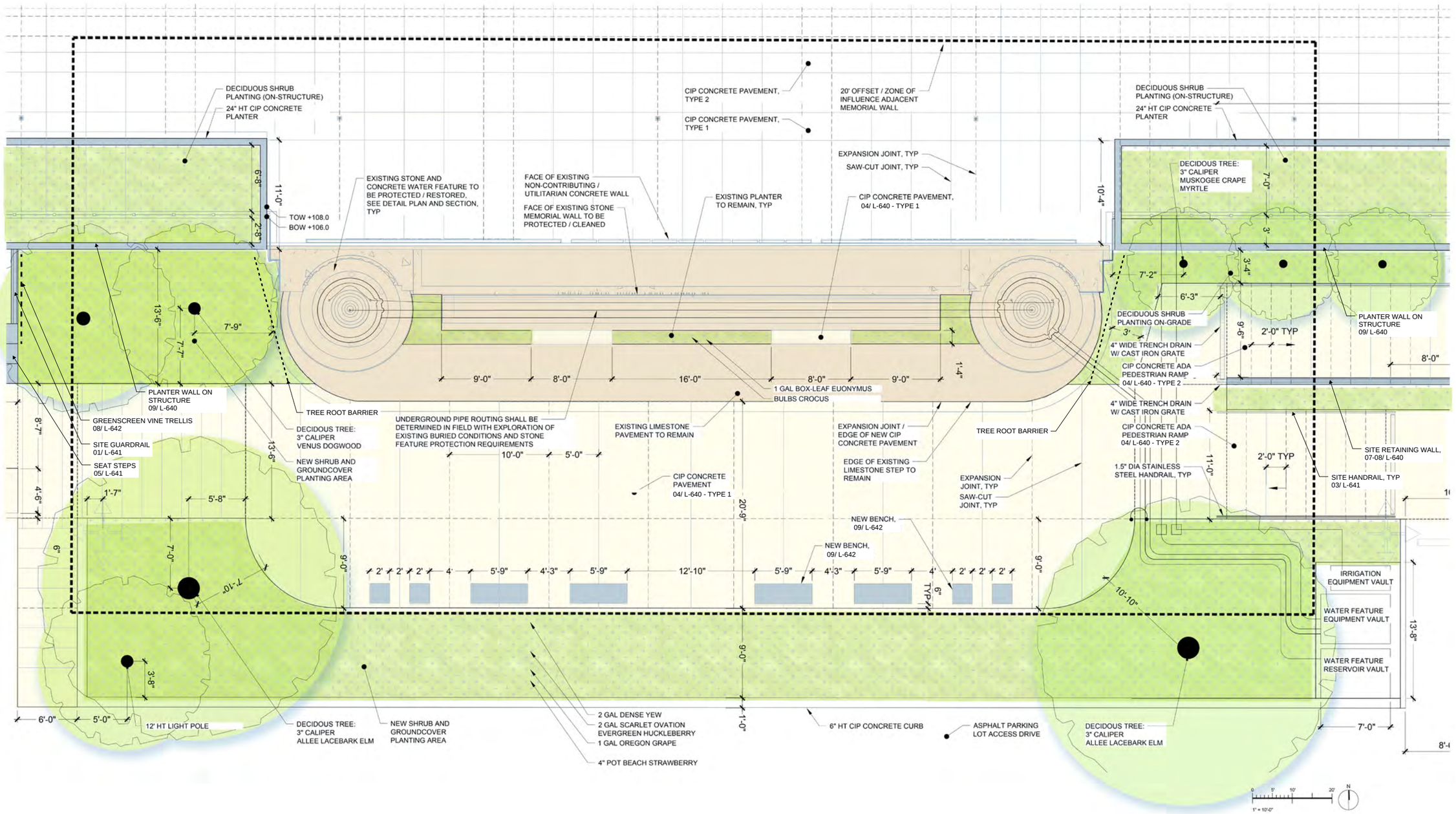


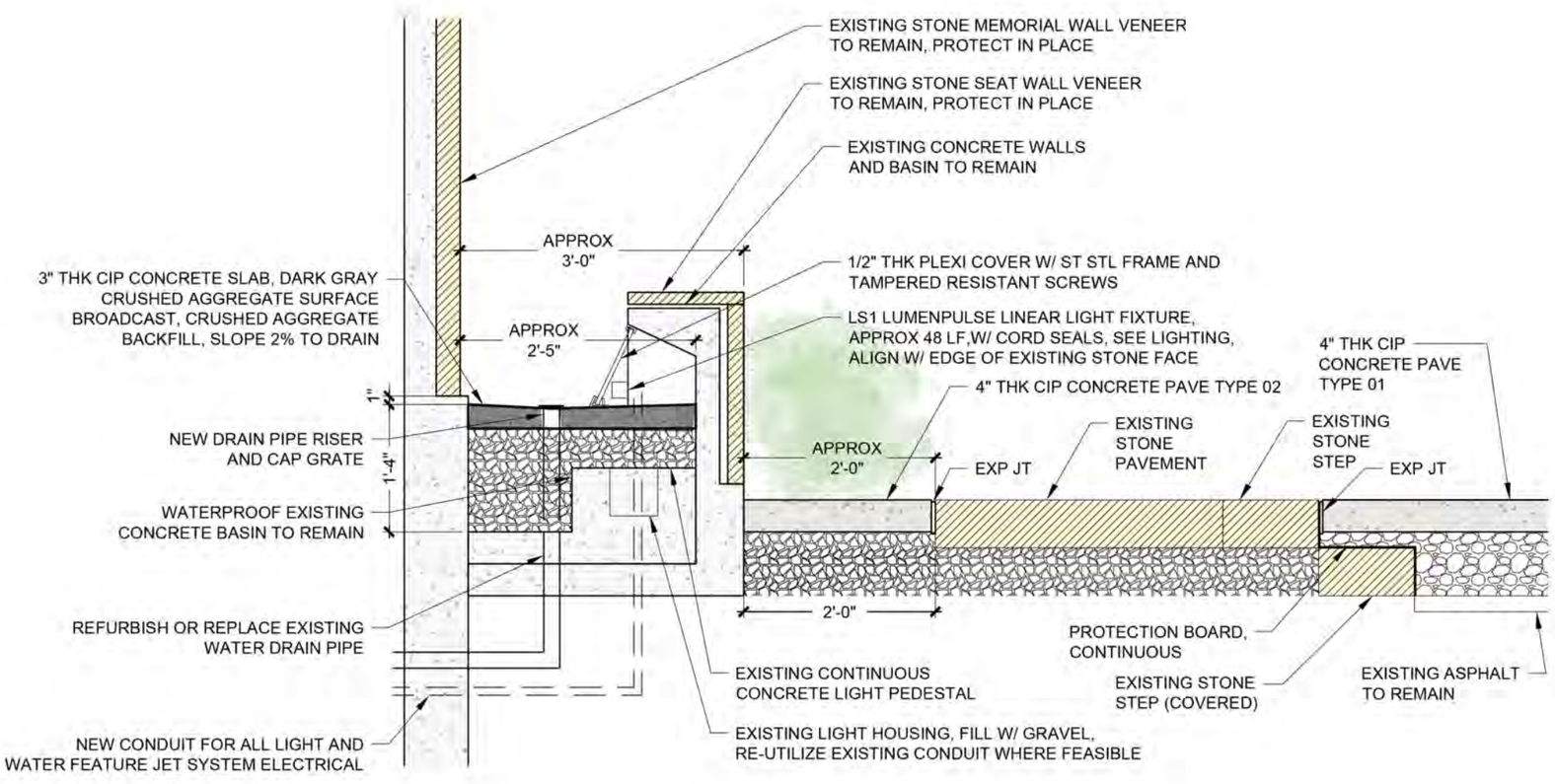
Rendered View Looking Northwest



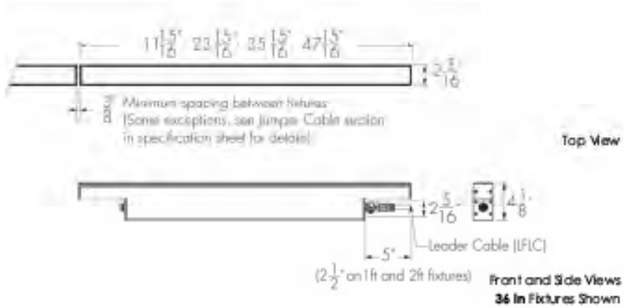
*****Final drawings will be revised to reflect the construction conditions and submitted as a separate Certificate of Approval application*****

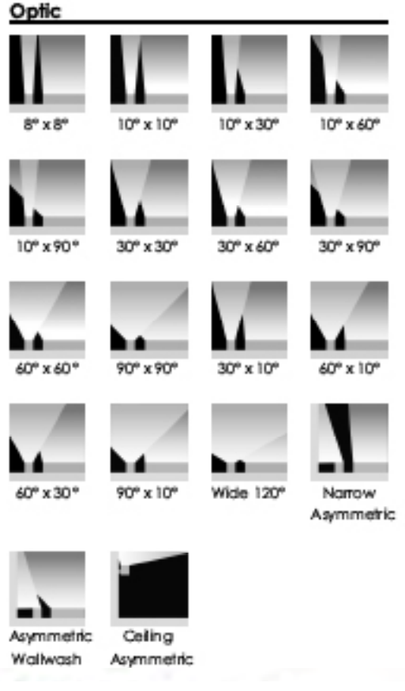
DESIGN INTERVENTION | Memorial Plan Final Design



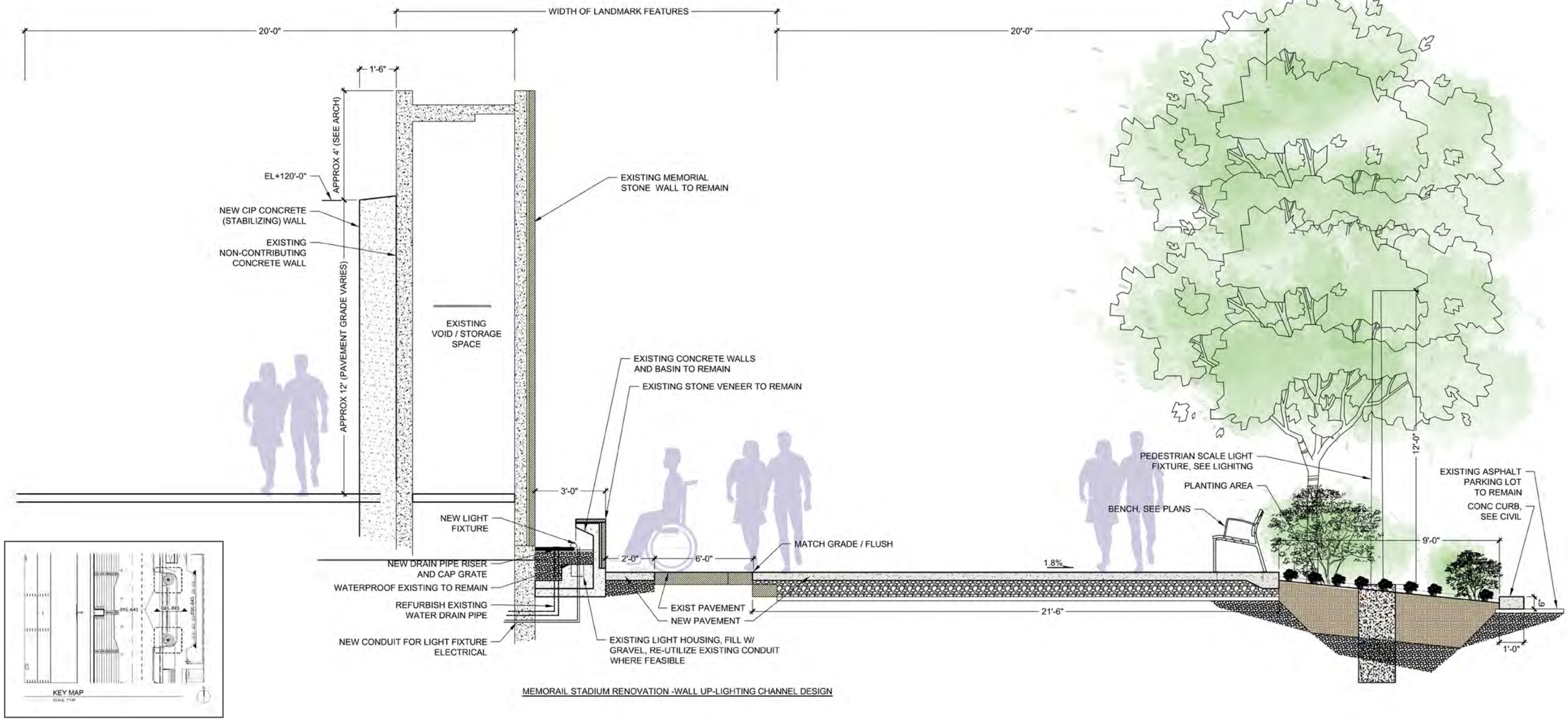


01 LIGHT CHANNEL ENLARGED DETAIL

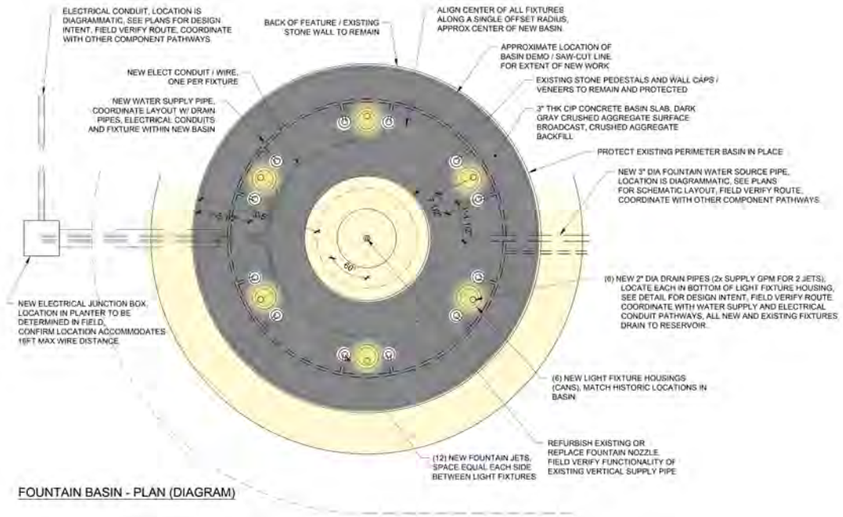




DESIGN INTERVENTION | Memorial Section Final Design

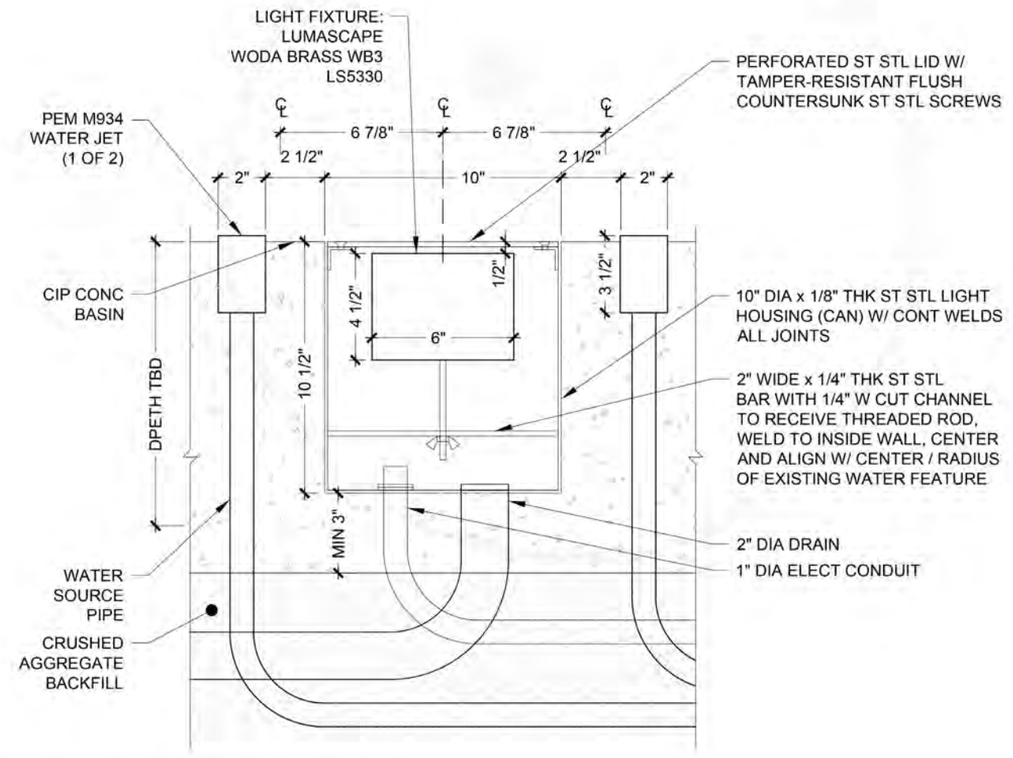


MEMORAIL STADIUM RENOVATION -WALL UP-LIGHTING CHANNEL DESIGN



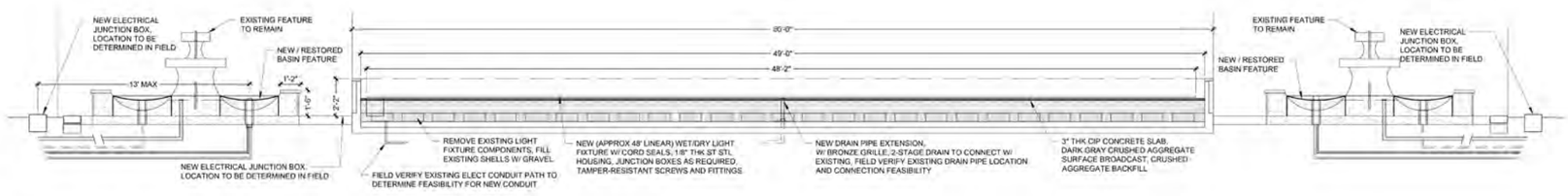
01 FOUNTAIN BASIN RENOVATION

SCALE: 3/4" = 1'-0"



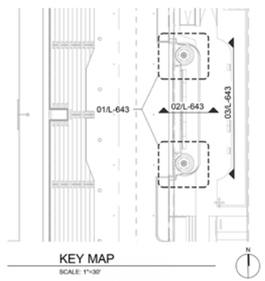
02 WATER FEATURE JETS/ LIGHT CAN

SCALE: 3" = 1'-0"

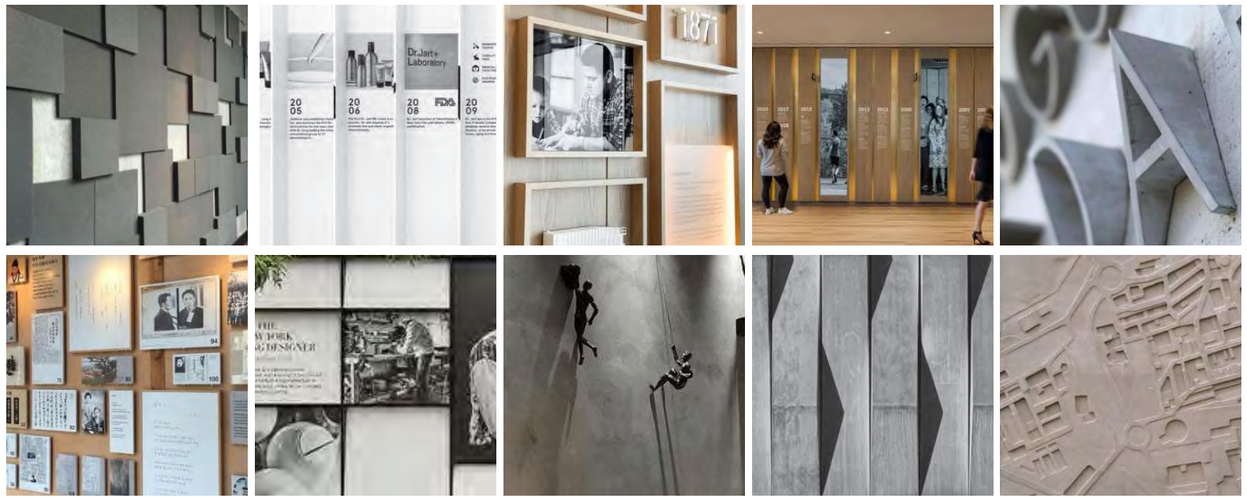


03 LINEAR BASIN AND FEATURES - ELEVATION

SCALE: 1/2" = 1'-0"



MEMORIAL WALL | Non-Contributing Wall - West Facing Facade



Celebrate the history and culture of Memorial Stadium and Seattle Public Schools. Create opportunities to continue expanding and updating as time passes.

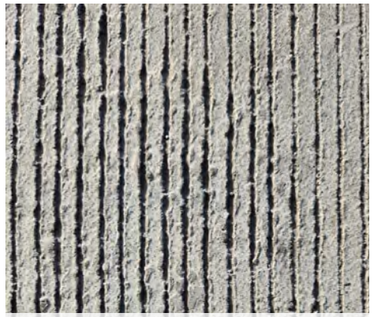
City of Seattle
Seattle Public Schools
People
Live Music
Historic Moments
World's Fair
Hall of Fame
Origins
Obscura

*****FINAL DRAWINGS WILL BE REVISED TO REFLECT THE CONSTRUCTION CONDITIONS AND SUBMITTED AS A SEPARATE CERTIFICATE OF APPROVAL APPLICATION*****

Concept design for west (non-contributing) side of Memorial Wall only

DESIGN INTERVENTION | New Materials Reference

RAKED CONCRETE



BROOM FINISH

WATER FEATURE BASIN

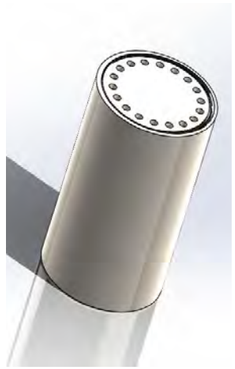
FENCE

REPLACEMENT NOZZLE

FOUNTAIN LIGHTING

WALL UPLIGHTING

FOUNTAIN DISPLAY EFFECT EXAMPLE



FOUNTAIN WATER JET

FOUNTAIN DISPLAY EFFECT EXAMPLE

MUSKOGEE CREPE MYRTLE

VENUS DOGWOOD

ALLEE(R) LACEBARK ELM

JAPANESE SNOWBELL

OREGON GRAPE

EVERGREEN HUCKLEBERRY

VARIEGATED EUONYMUS

DENSE YEW

SILVERVEIN CREEPER

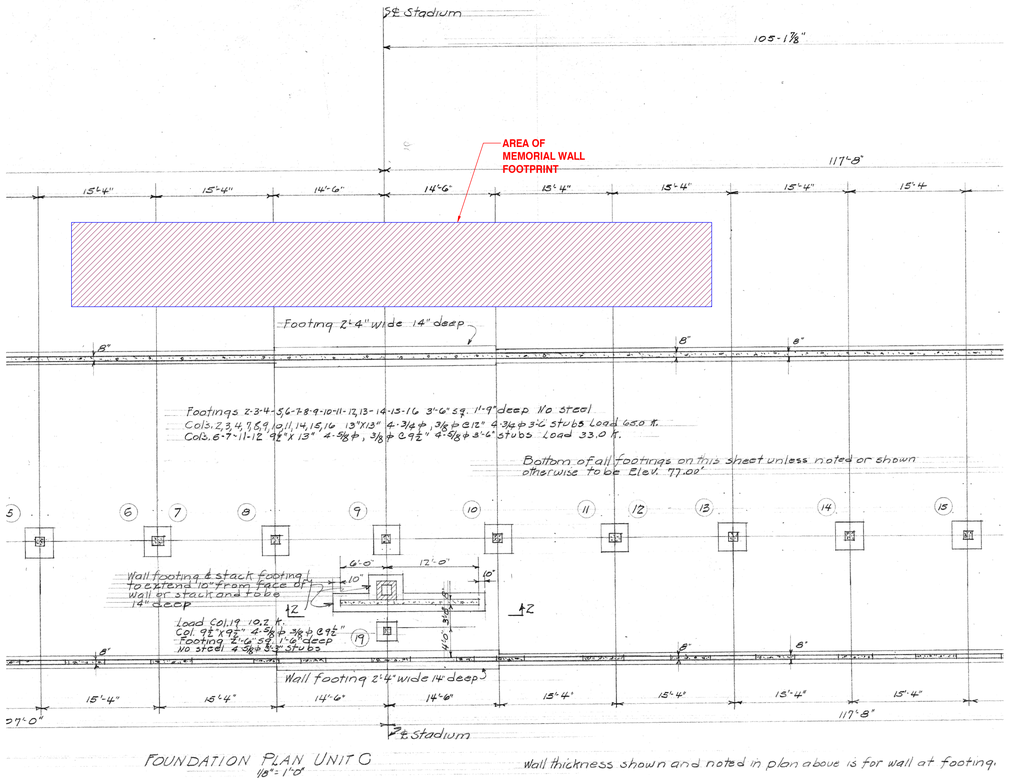
BEACH STRAWBERRY

AUTUMN CROCUS

JEANNE D'ARC DUTCH CROCUS

DESIGN INTERVENTION | Benches - Neoliviano

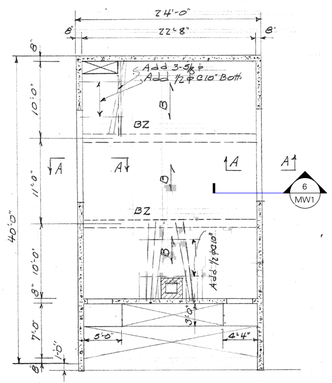
5. CONSTRUCTION DRAWINGS



FOUNDATION PLAN UNIT C
1/8" = 1'-0"

Wall thickness shown and noted in plan above is for wall at footing.

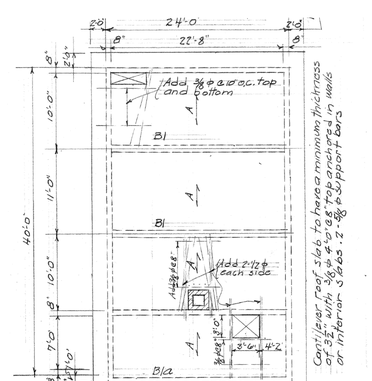
FOUNDATION PLAN UNIT C
SCALE: NOT TO SCALE



SECOND FLOOR FRAMING PLAN UNIT C
1/8" = 1'-0"

Floor Load
L.L. = 500#/ft²
Finish = 9.0 "
Plaster = 6.0 "
Partition = 15.0 "
Total = 87.0#/ft² + slab

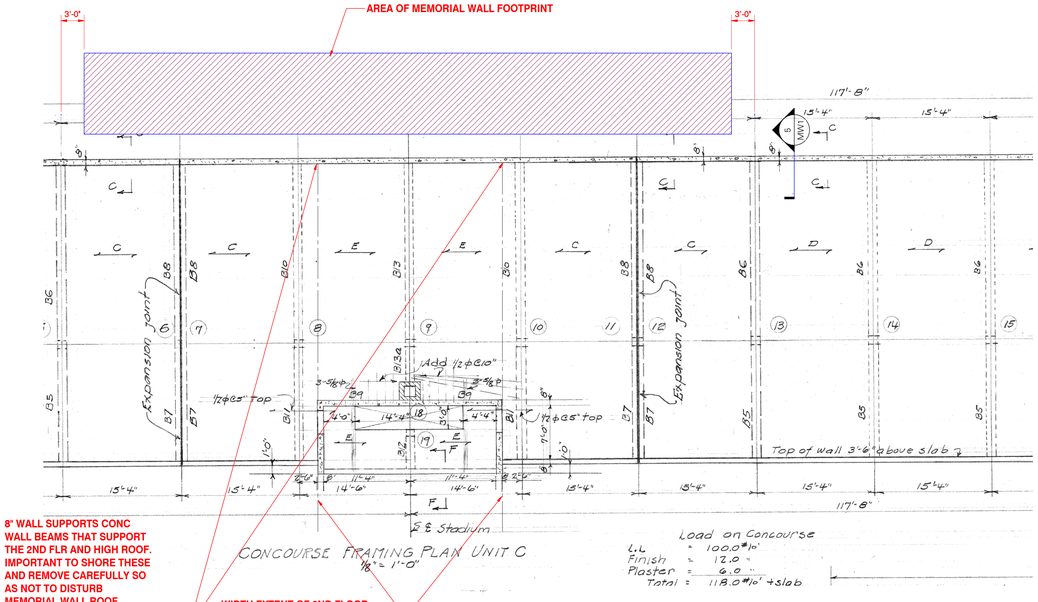
SECOND FLOOR FRAMING PLAN UNIT C
SCALE: NOT TO SCALE



HIGH ROOF FRAMING PLAN UNIT C
1/8" = 1'-0"

Roof load
L.L. = 250#/ft²
Roofing = 6.0 "
Plaster = 6.0 "
Total = 37.0#/ft² + slab

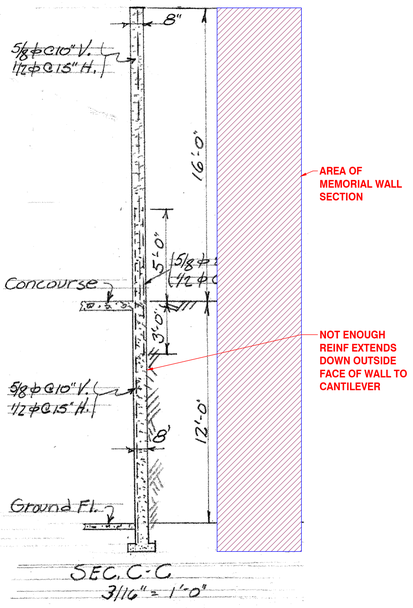
HIGH ROOF FRAMING PLAN UNIT C
SCALE: NOT TO SCALE



CONCOURSE FRAMING PLAN UNIT C
1/8" = 1'-0"

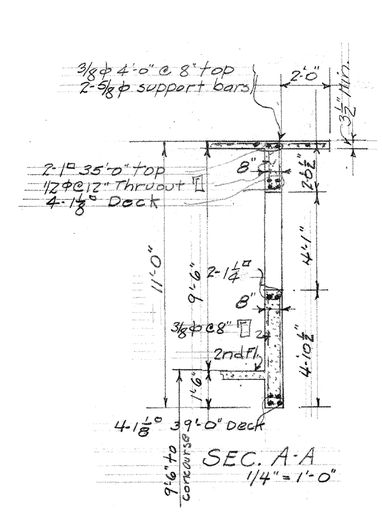
Load on Concourse
L.L = 100.0#/ft²
Finish = 12.0 "
Plaster = 6.0 "
Total = 118.0#/ft² + slab

CONCOURSE FRAMING PLAN UNIT C
SCALE: NOT TO SCALE



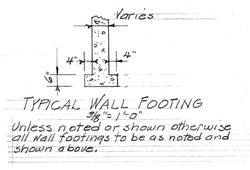
SEC. C-C
3/16" = 1'-0"

5 SECTION C-C
SCALE: NOT TO SCALE



SEC. A-A
1/4" = 1'-0"

6 SECTION A-A
SCALE: NOT TO SCALE



TYPICAL WALL FOOTING
3/8" = 1'-0"

Unless noted or shown otherwise all wall footings to be as noted and shown above.

7 TYPICAL WALL FOOTING
SCALE: NOT TO SCALE

GENERAL NOTES FOR ALL STRUCTURES

fs structural 20,000.0#/in² Supervised construction. Structural steel to be fireproofed with 2" of concrete. See details for reinforcement of fireproofing.
Soil pressure 7,000.0 #/ft²
fs reinforcing 20,000.0#/in² Intermediate grade deformed bars supported on metal chairs or well cured concrete blocks and securely wired in place with #16 double annealed iron wire
fc = 900.0#/in² f'c = 2000#/in² Mix 1:6 Five sacks of cement per cubic yard of concrete. Seven and one-half gallons of water per sack of cement.
Supervised construction
Main slab bars to have ½" of concrete cover, main beam & Col. bars 1½", main footing bars 3", main wall bars 1" on open face, 2" on earth face.
Unless noted or shown otherwise all walls to be reinforced as follows.
6" walls to have ½ ϕ @ 13" o.c. H. & V.
8" " " " @ 10" o.c. H. & V.
10" " " " ½ ϕ @ 16" o.c. H. & V. each face
12" " " " ½ ϕ @ 13" o.c. H. & V. each face
Stub walls to supports with ½ ϕ 2'-6" stubs 15" o.c. Lap wall bars 2'-0" where spliced
At least 2-½ ϕ in bottom of all self supporting walls.
At least one bar over, under, at each side of, and diagonally at each corner of each opening in walls with one layer of steel. Two bars in similar positions in walls with two layers of steel. Diagonal bars 4'-0" long.
If openings are more than 6'-0" in each direction (horizontal & vertical) use ⅜ ϕ at side of, diagonal, over, and under openings.
Lap Col. bars where spliced 26 Diam. in tied Cols, 32 Diam. in Spiral Cols. Min. lap 2'-0"
Short Hor. or Vert. bars in small wall sections to be hooked or bent as stirrups or Col. ties

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Project Status

MEMORIAL STADIUM

MEMORIAL WALL TEMPORARY BRACING

ISSUES AND REVISIONS

NO	DATE	DESCRIPTION

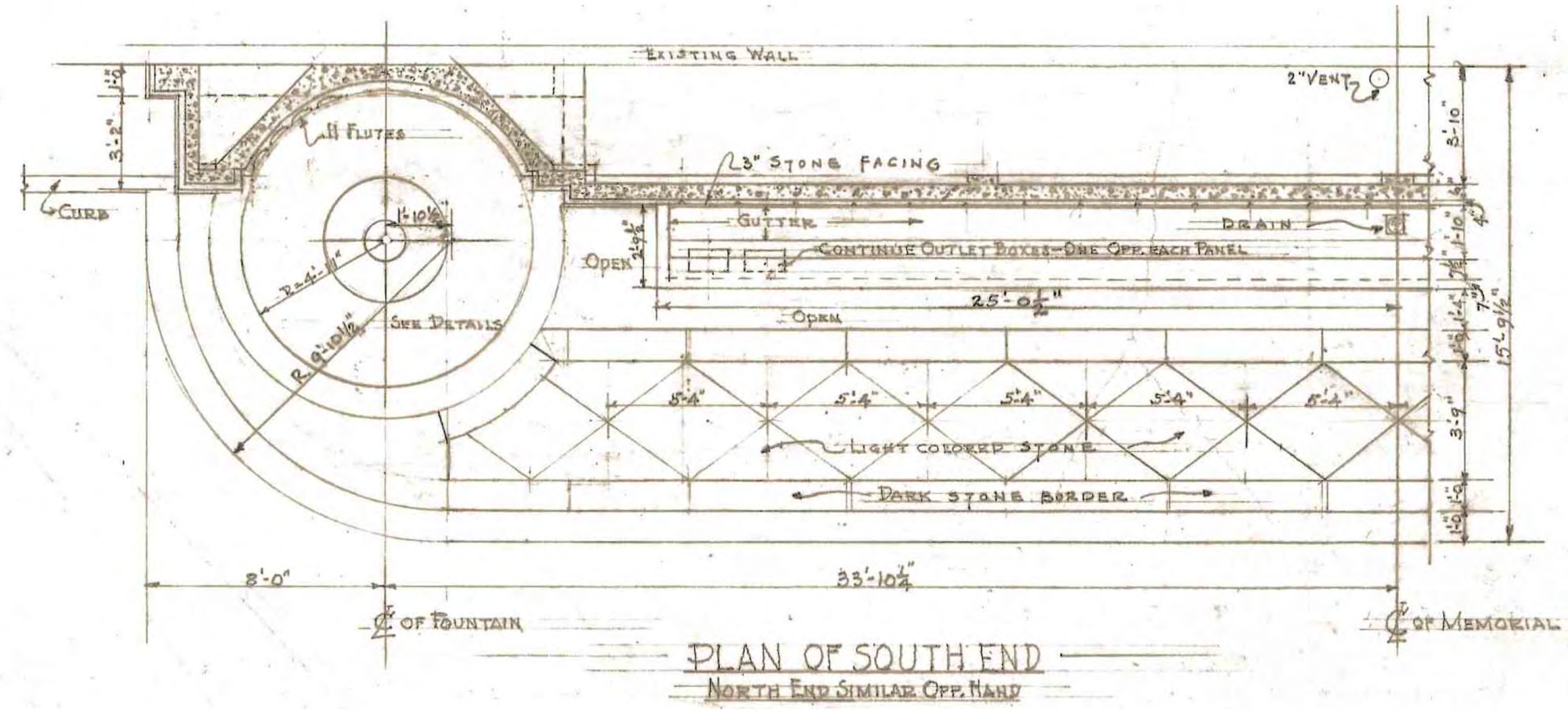
Project No.:	25011-0120
Proj. Manager:	SE
Drawn:	SE
Reviewed:	SE
Dwg. Check:	SE
Date:	03/21/25
Scale:	AS NOTED

SHEET TITLE

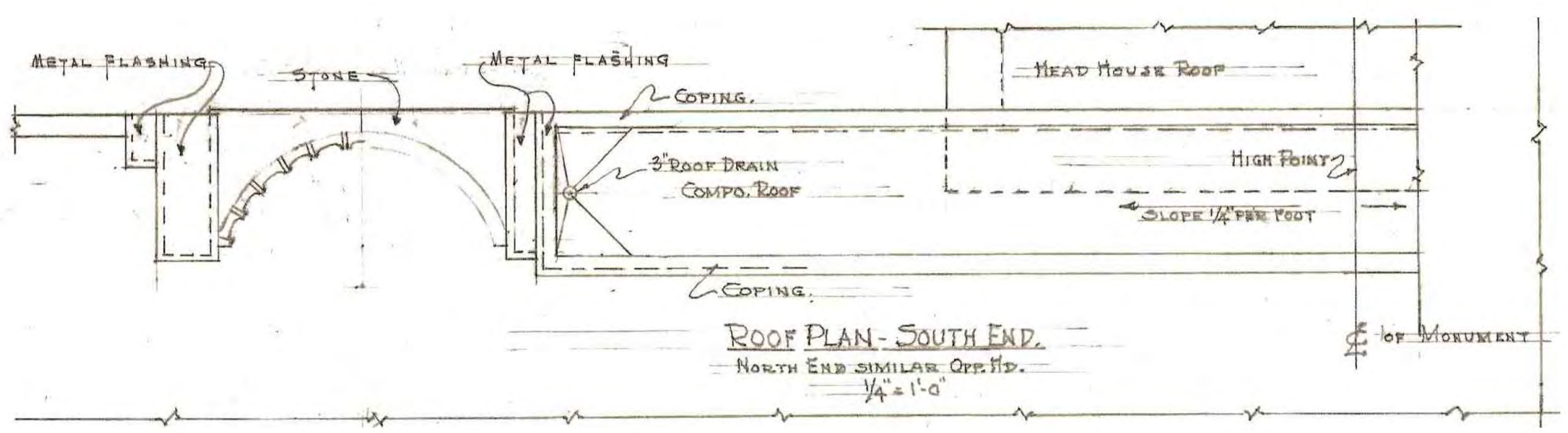
ORIGINAL STADIUM STRUCTURAL DRAWINGS

SHEET NUMBER

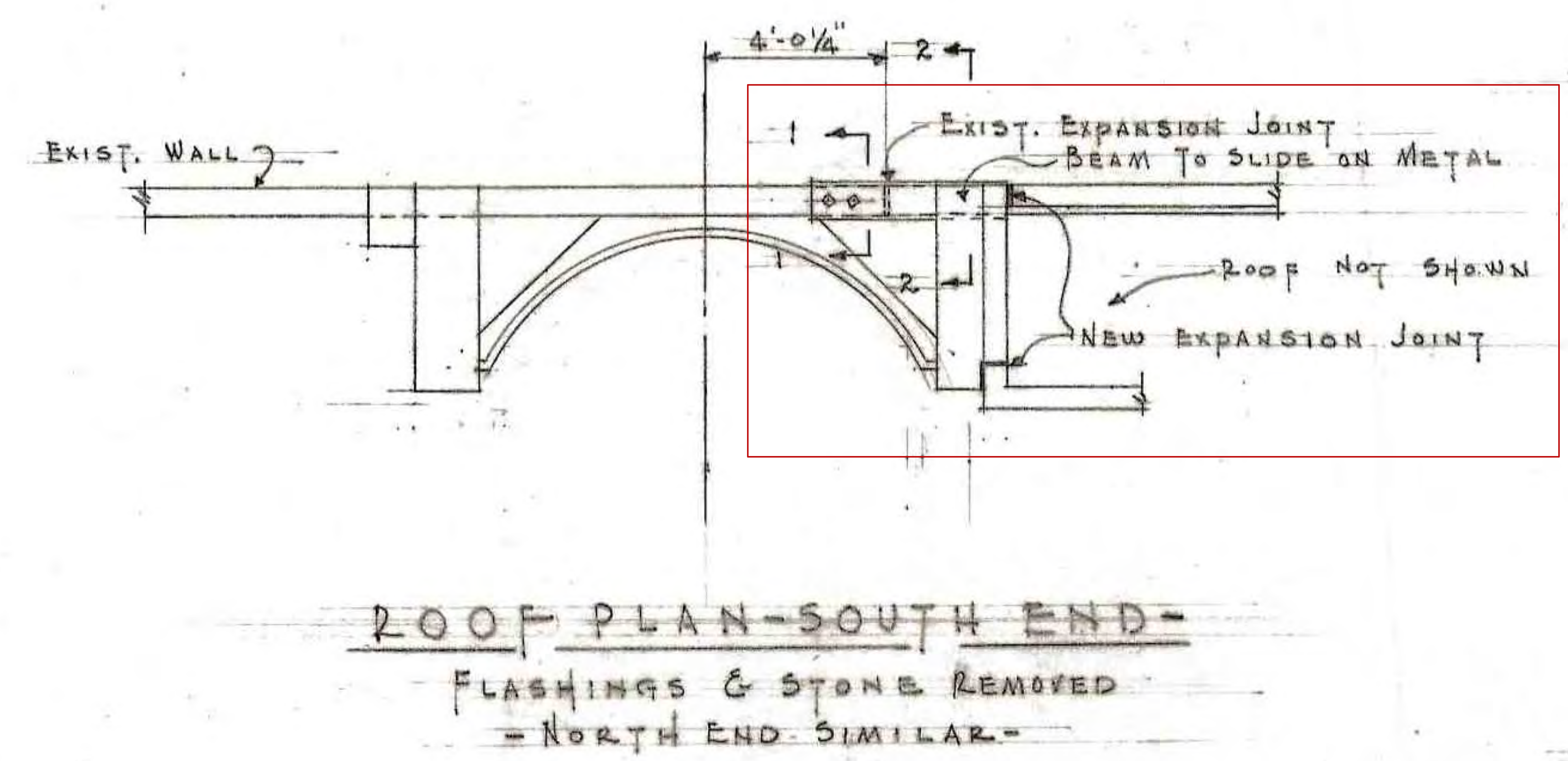
MW1



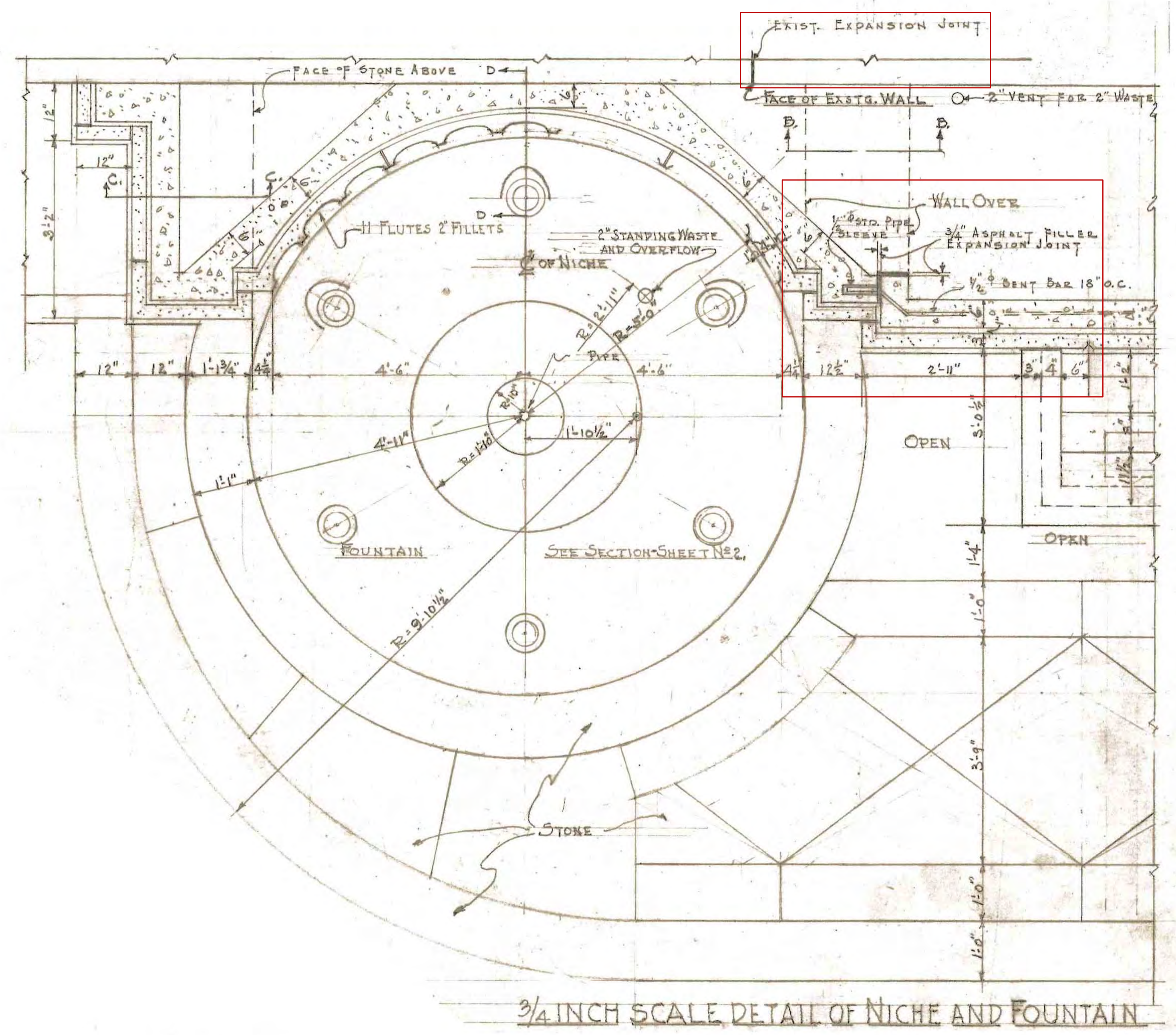
PLAN OF SOUTH END
SCALE: NOT TO SCALE



ROOF PLAN - SOUTH END
SCALE: NOT TO SCALE



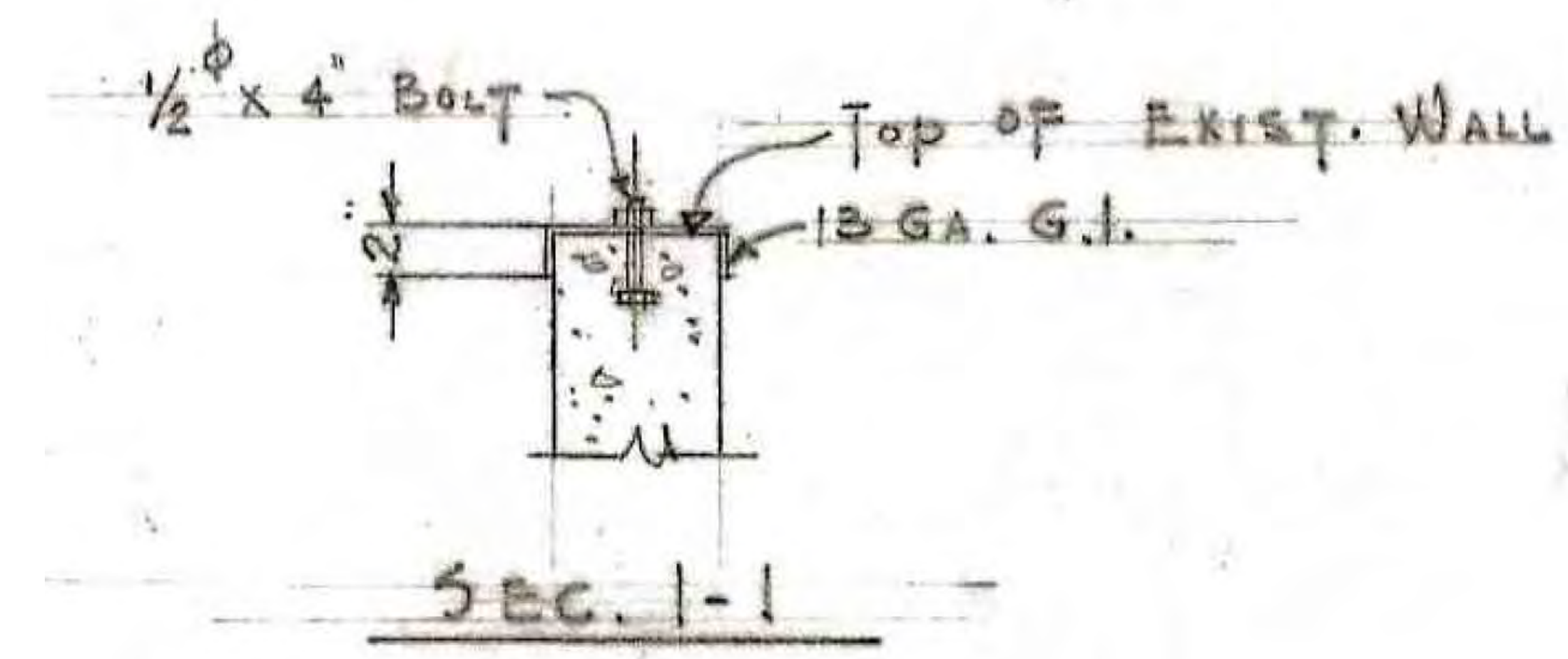
ROOF PLAN - SOUTH END
SCALE: NOT TO SCALE



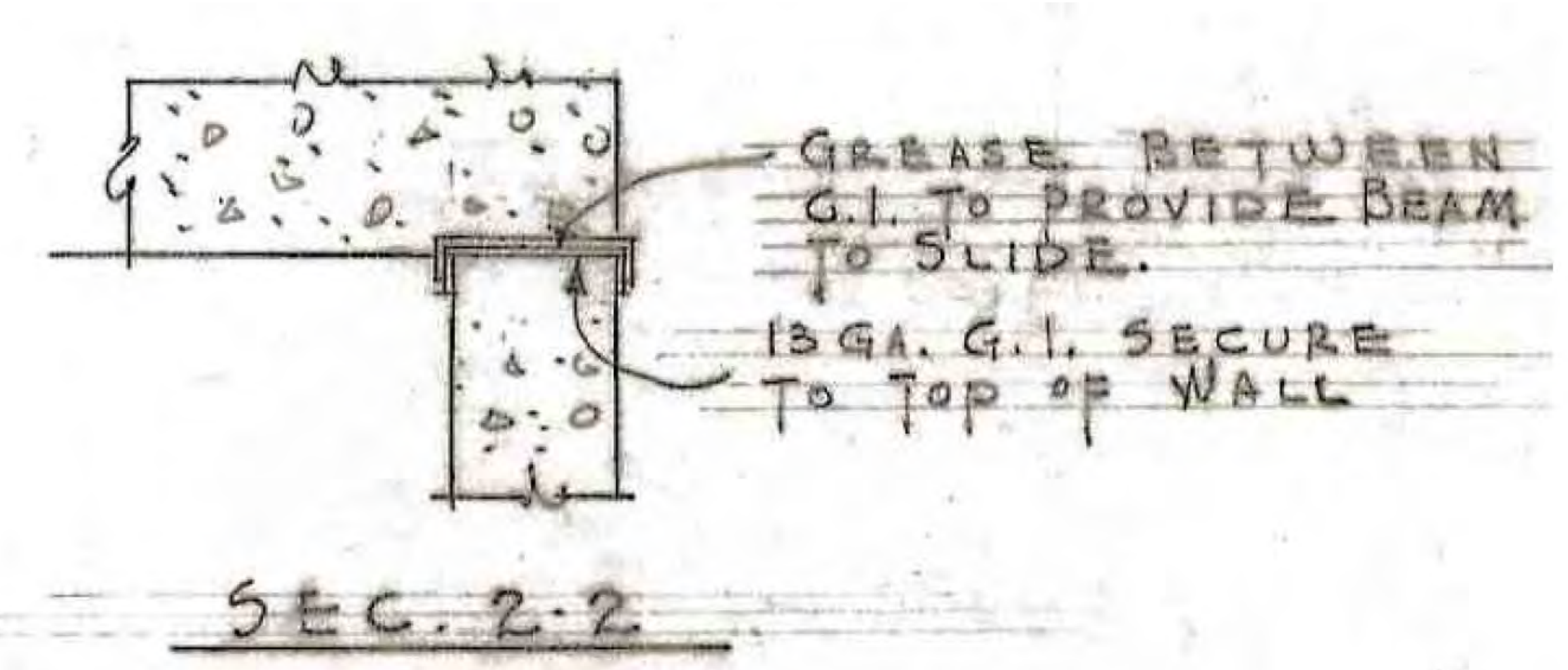
Second Floor Structural Framing Plan
SCALE: NOT TO SCALE

NOTE:

EXPANSION JOINTS EXIST AT EACH END OF THE FLAT SECTION OF WALL. EACH FOUNTAIN IS SEPARATE. THEREFORE, TREAT EACH OF THE THREE SECTIONS SEPARATELY.



5 **SECTION 1-1**
SCALE: NOT TO SCALE



6 **SECTION 2-2**
SCALE: NOT TO SCALE

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Project Status

MEMORIAL STADIUM

MEMORIAL WALL TEMPORARY BRACING

ISSUES AND REVISIONS

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Project No.:	25011-0120
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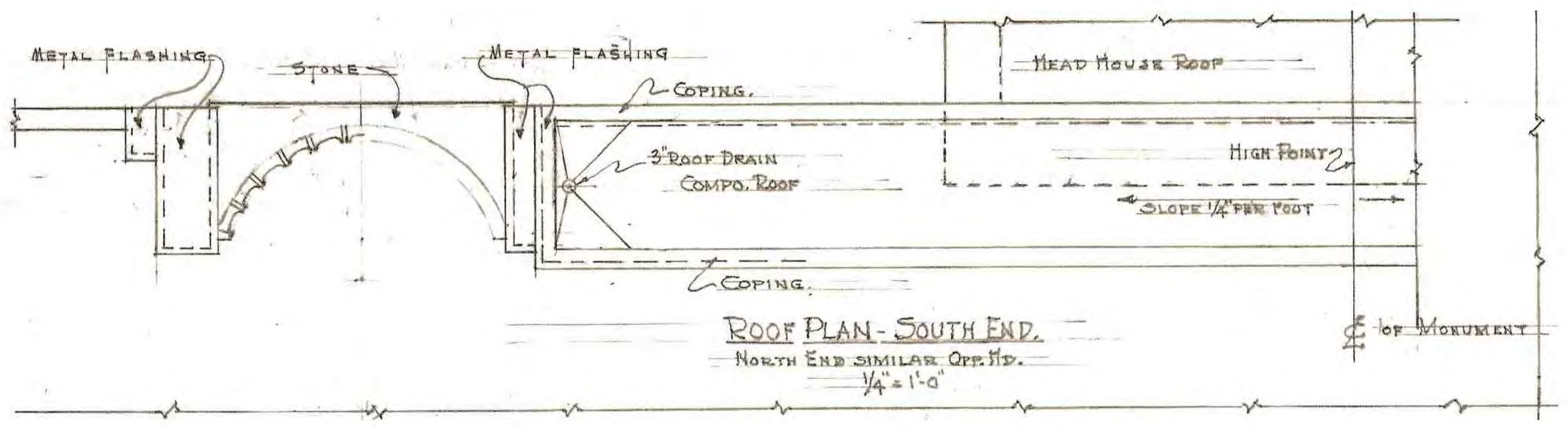
Dwg. Check:	SE
Date:	03/21/25
Scale:	AS NOTED

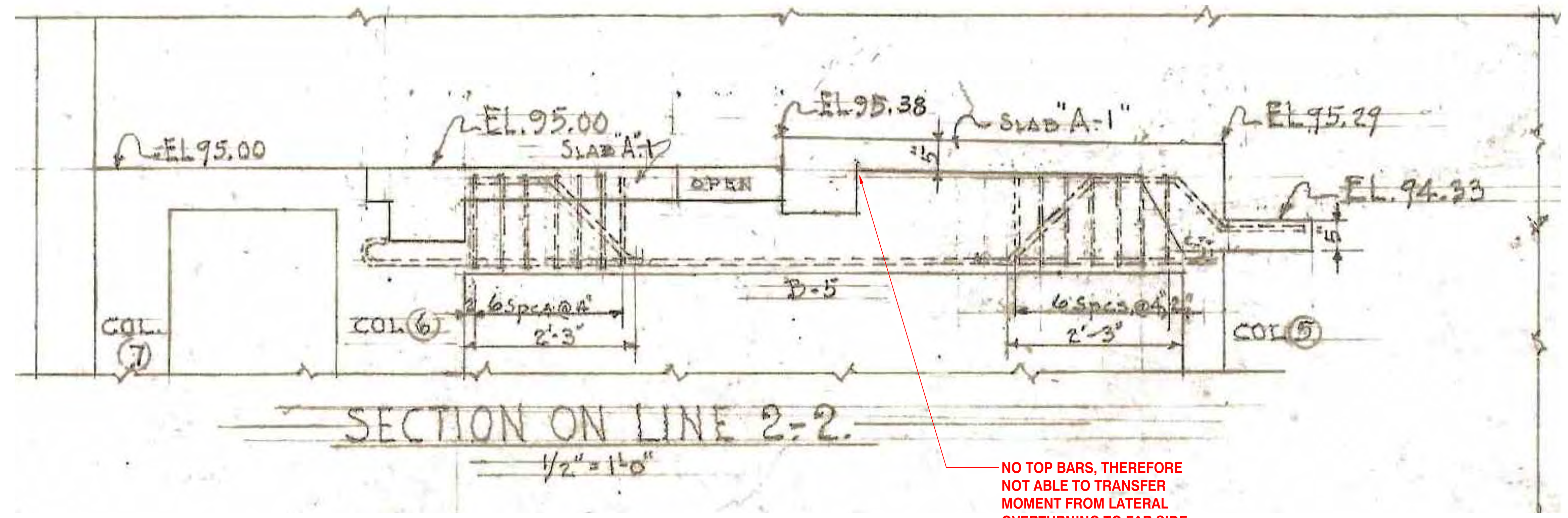
SHEET TITLE

MEMORIAL WALL DRAWINGS SHOWING EXPANSION JOINT

SHEET NUMBER

MW2





NO TOP BARS, THEREFORE NOT ABLE TO TRANSFER MOMENT FROM LATERAL OVERTURNING TO FAR SIDE FOUNDATIONS IN ONE DIRECTION

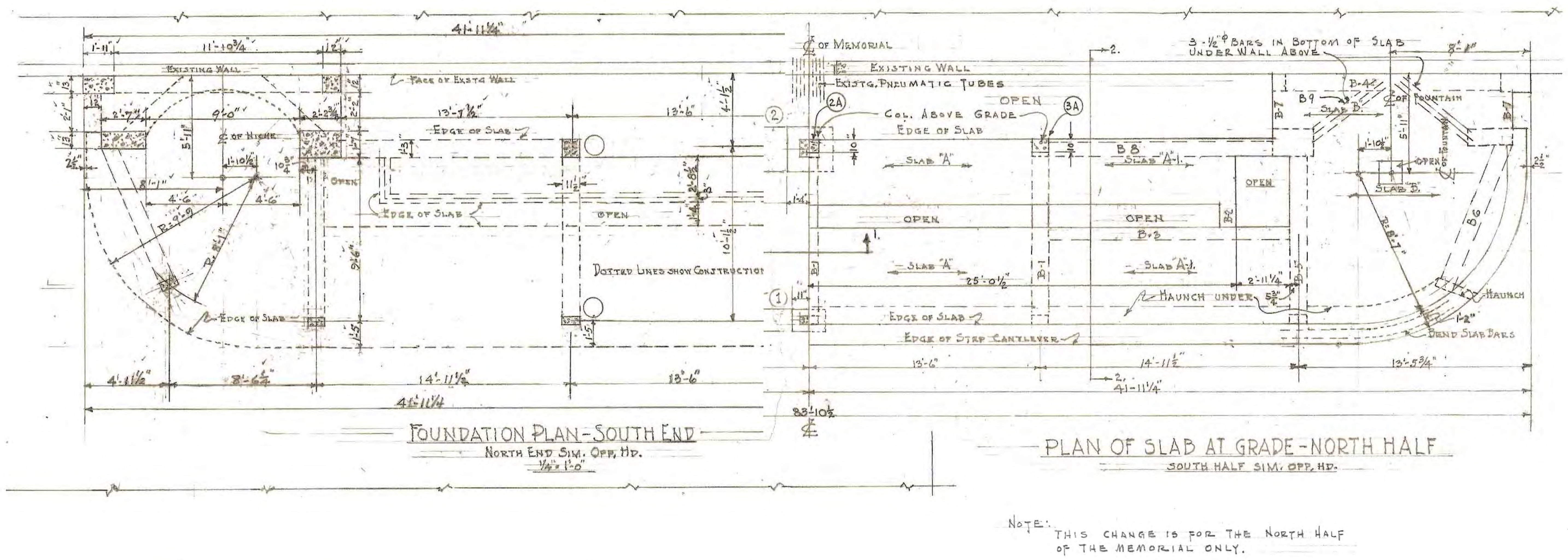
ROOF PLAN - SOUTH END

SCALE: NOT TO SCALE

4

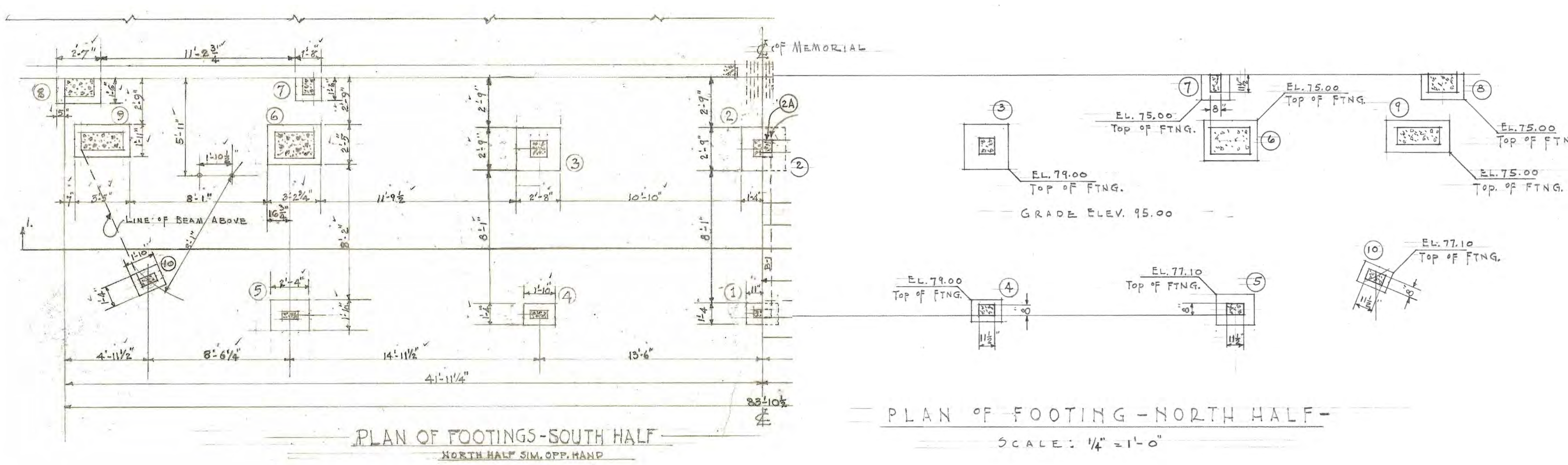
SECTION ON LINE 2-2

SCALE: NOT TO SCALE



FOUNDATION PLAN - SOUTH END

SCALE: NOT TO SCALE



PLAN OF FOOTINGS - SOUTH HALF

SCALE: NOT TO SCALE

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Date:	03/21/25
Scale:	AS NOTED

SHEET TITLE

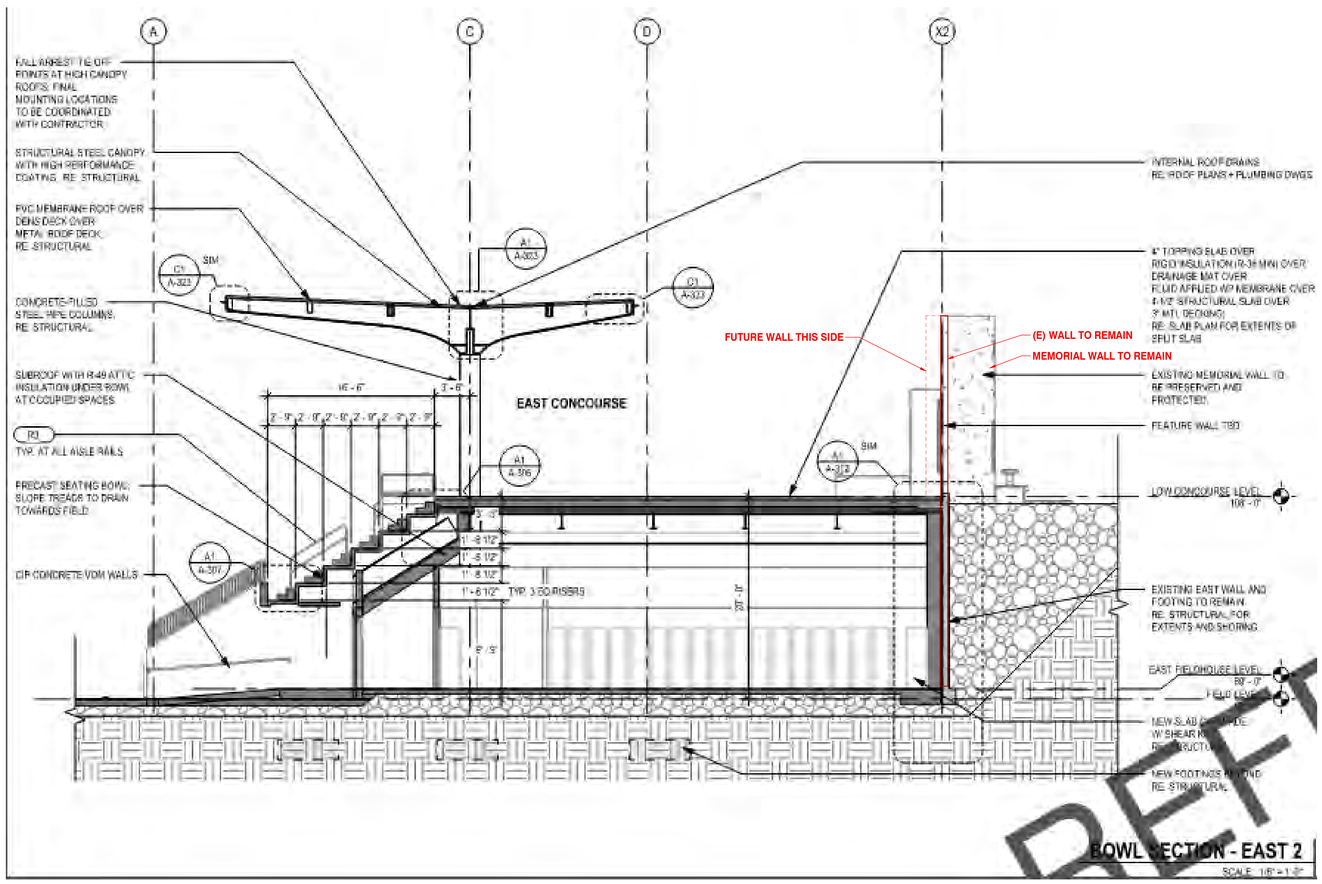
MEMORIAL WALL DRAWINGS SHOWING FDNS, GRADE PLAN & SECTION AT SUPPORTING BEAMS

SHEET NUMBER

MW3

1 MEMORIAL WALL ELEVATION FOR REFERENCE

SCALE: NOT TO SCALE



BOWL SECTION - EAST 2

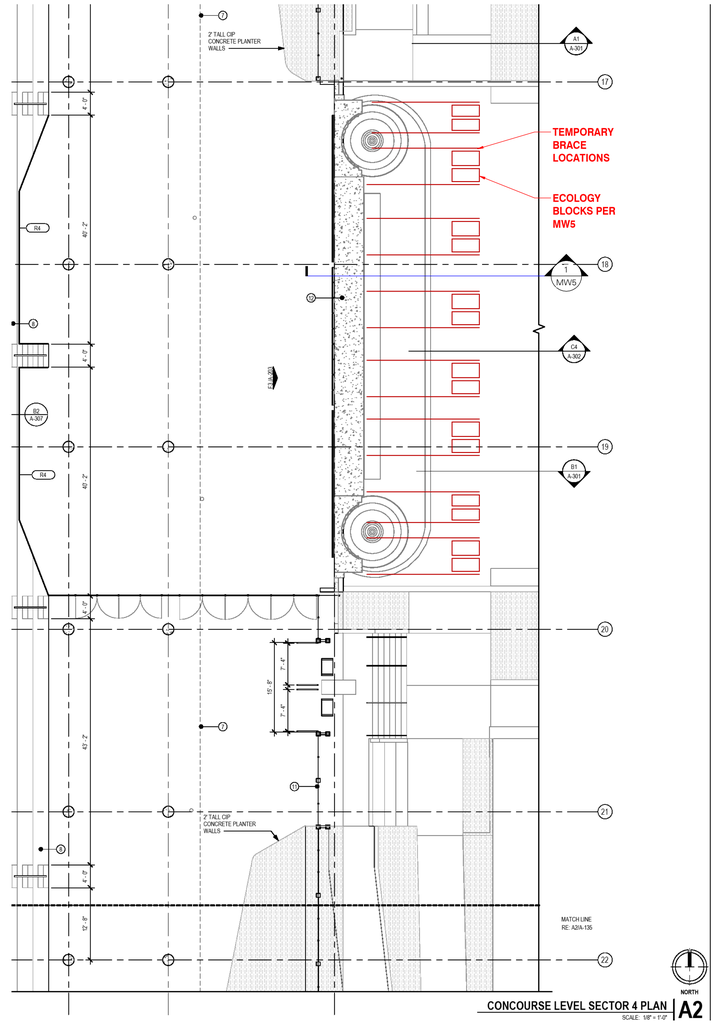
SCALE: 1/8" = 1'-0"

NOTE:

REFERENCE ARCH DRAWINGS A-302.

2 BOWL SECTION - EAST 2 FOR REFERENCE

SCALE: NOT TO SCALE



CONCOURSE LEVEL SECTOR 4 PLAN

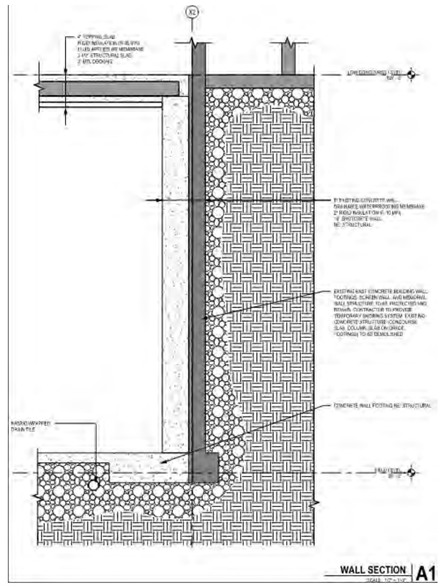
SCALE: 1/8" = 1'-0"

NOTE:

REFERENCE ARCH DRAWINGS A-134.

TEMPORARY BRACING PLAN

SCALE: NOT TO SCALE



WALL SECTION

SCALE: 1/2" = 1'-0"

NOTE:

REFERENCE ARCH DRAWINGS A-312.

4 WALL SECTION FOR REFERENCE

SCALE: NOT TO SCALE

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Project Status

MEMORIAL STADIUM

MEMORIAL WALL TEMPORARY BRACING

ISSUES AND REVISIONS

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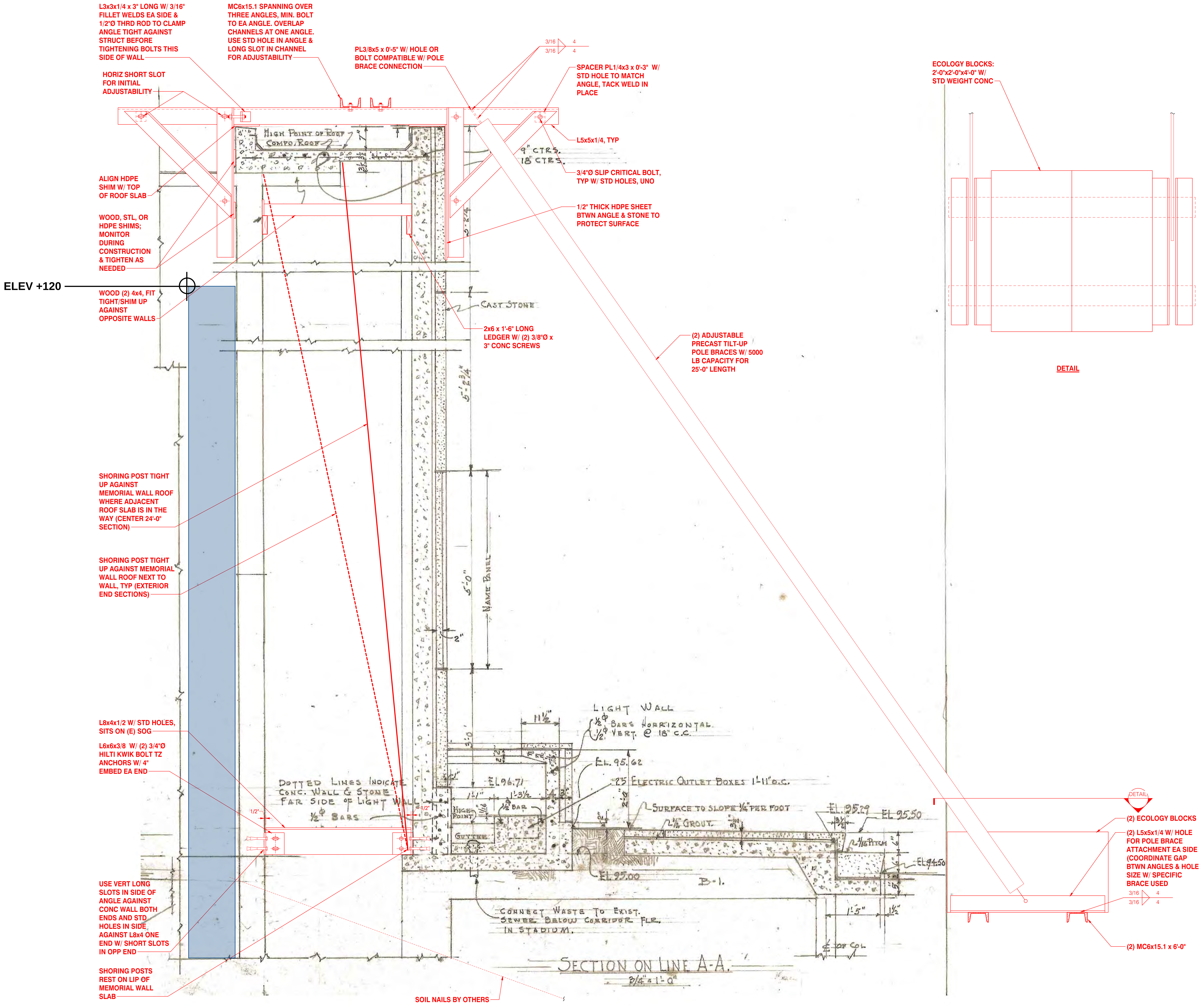
Drawn:	SE
Reviewed:	SE
Dwg. Check:	SE
Date:	03/21/25
Scale:	AS NOTED

SHEET TITLE

ARCH PLAN, SECTION & MEMORIAL WALL ELEVATION FOR REFERENCE W/ BRACING PLAN

SHEET NUMBER

MW4



BRACING SECTION AT 8'-0"OC MAX

NOTE:

ALL STEEL TO BE GALVANIZED, MIN Fy = 36 KSI. ALL BOLTS TO BE STAINLESS STEEL.

1 TEMPORARY BRACING SECTION FOR MEMORIAL WALL

SCALE: 1" = 1'-0"

PREPARED BY
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Project Status

MEMORIAL STADIUM

MEMORIAL WALL TEMPORARY BRACING

ISSUES AND REVISIONS

NO	DATE	DESCRIPTION

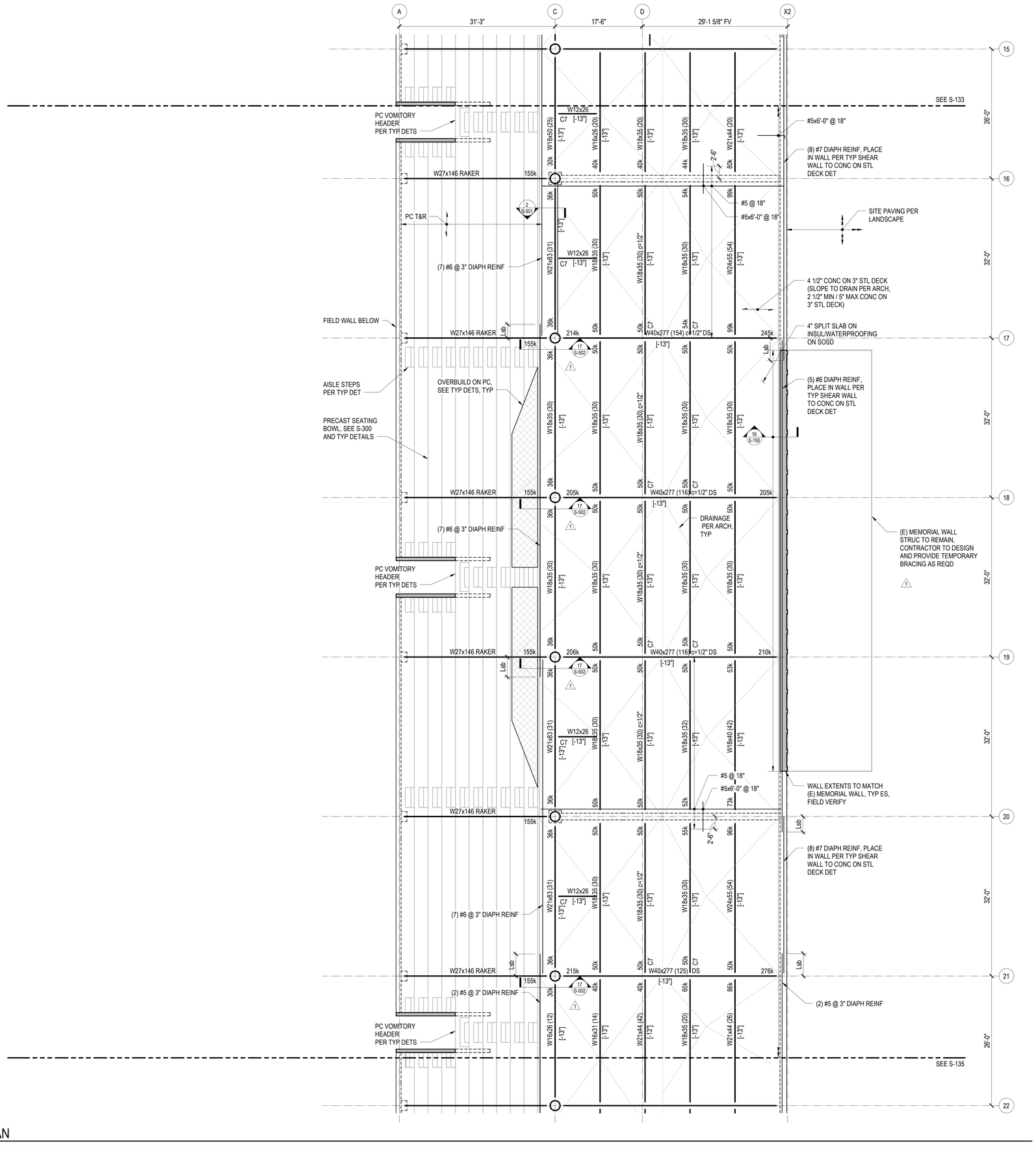
Project No.:	25011-0120
Proj. Manager:	SE
Drawn:	SE
Reviewed:	SE
Dwg. Check:	SE
Date:	03/21/25
Scale:	AS NOTED

SHEET TITLE

SECTION

SHEET NUMBER

MW5

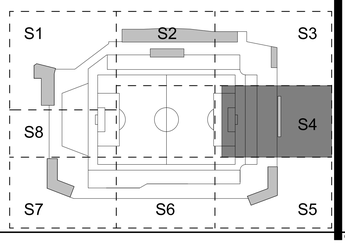


NOTES:

1. SEE S-103 FOR CONCOURSE LEVEL NOTES.

CONCOURSE LEVEL SECTOR 4 PLAN

1/8" = 1'-0"



NORTH

GENERATOR STUDIO

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LANDSCAPE ARCHITECT
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FSC INC.
8675 W 96TH ST
OVERLAND PARK, KS 66212

ATHLETIC FIELD DESIGN
D.A. HOGAN & ASSOCIATES, INC.
1450 114TH AVE SE
BELLEVUE, WA 98101

LIGHTING DESIGN
DARK LIGHT DESIGN
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STAMP BOX

ENGINEER: KRISTA SEAMAN
LICENSE NO. 22000553

NOT FOR CONSTRUCTION

SEAL

MEMORIAL STADIUM RENOVATION

369 REPUBLICAN ST SEATTLE, WA 98109

GMP Addendum 1

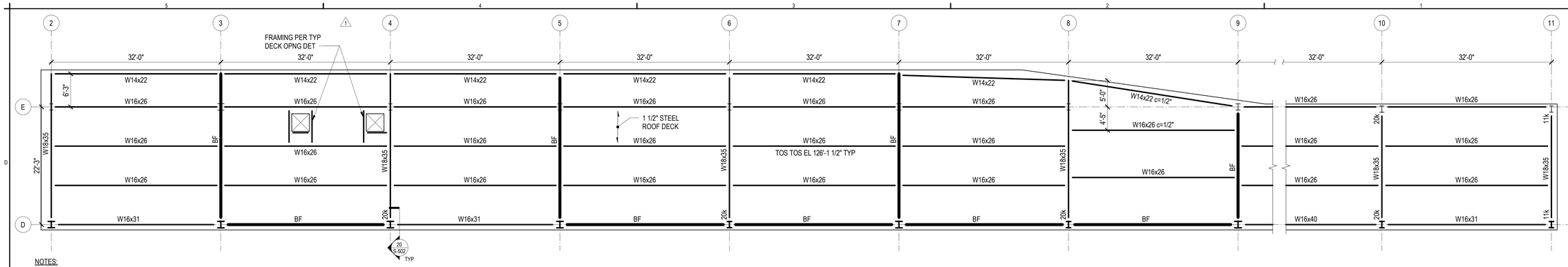
ISSUE DATE:	04.17.2025
REV	DESCRIPTION / DATE
1	GMP Addendum 1 / 04.17.2025

PROJECT NO. B1881.00
DRAWN BY: DWS
CHK'D BY: KRS
SHEET TITLE

CONCOURSE LEVEL SECTOR 4 PLAN

S-134

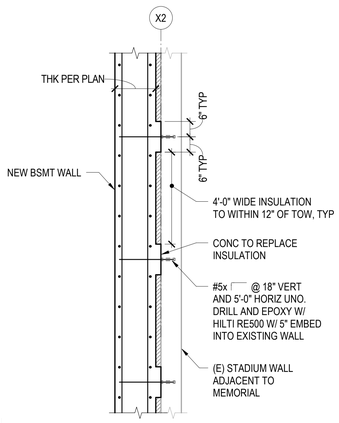
5/7/2025 11:05:29 PM



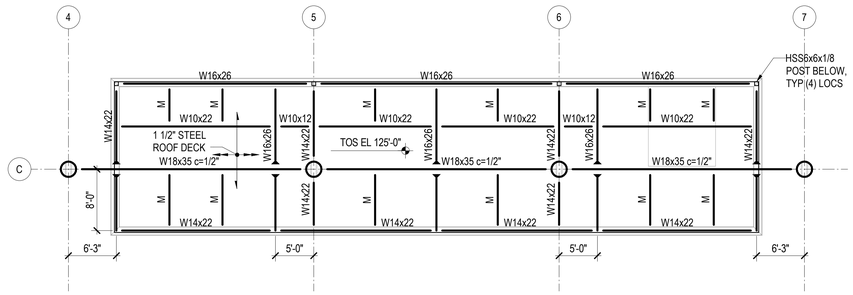
NOTES:

1. SEE S-104 FOR ROOF LEVEL NOTES.

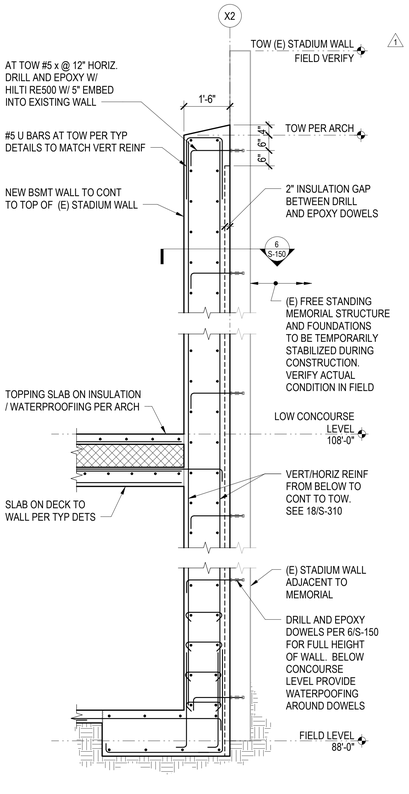
1 LOW ROOF LEVEL PLAN
1/8" = 1'-0"



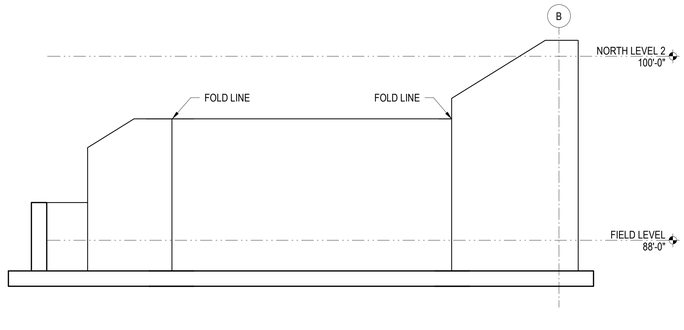
6 SECTION
1/2" = 1'-0"



7 PRESS BOX ROOF PLAN
1/8" = 1'-0"



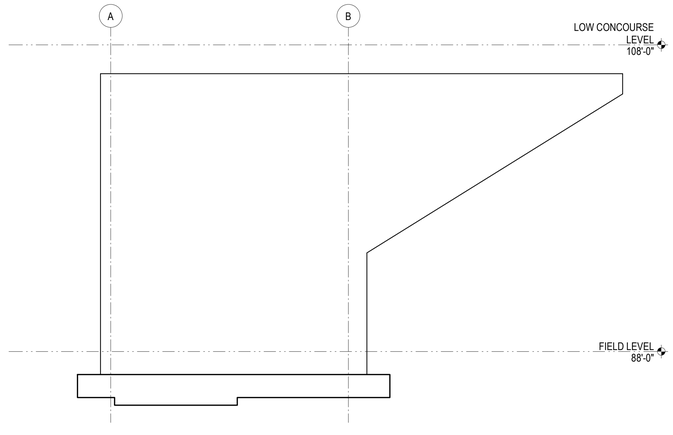
16 SECTION
1/2" = 1'-0"



NOTES:

1. REFERENCE ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS.

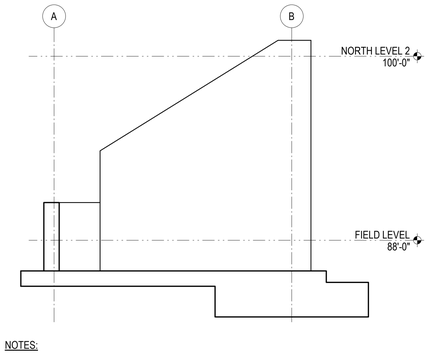
17 NORTH STANDS VOMITORY WALL
1/4" = 1'-0"



NOTES:

1. REFERENCE ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS.

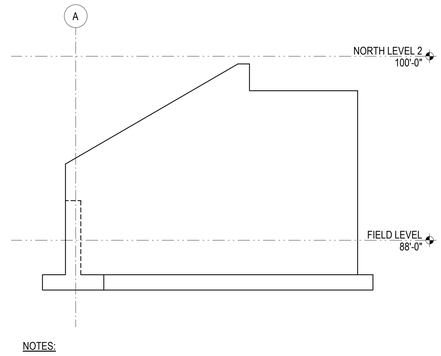
14 NORTH STANDS WALL ELEVATION
1/4" = 1'-0"



NOTES:

1. REFERENCE ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS.

19 NORTH STANDS VOMITORY WALL
1/4" = 1'-0"



NOTES:

1. REFERENCE ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS.

20 EAST STANDS VOMITORY WALL
1/4" = 1'-0"

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MEMORIAL STADIUM RENOVATION

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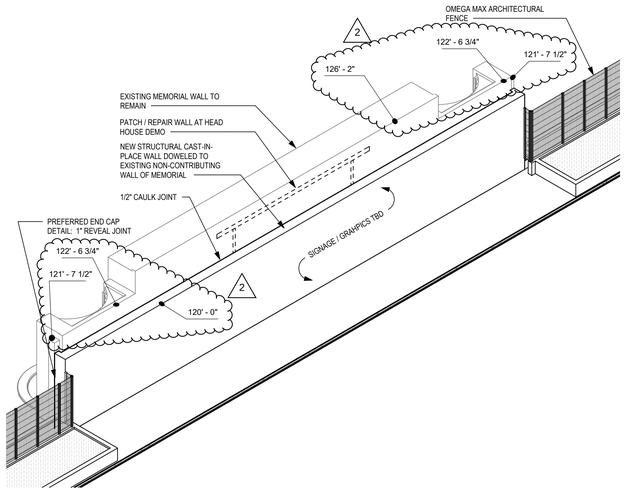
PROJECT NO. B1881.00
DRAWN BY: DWS
CHK'D BY: KRS
SHEET TITLE

ELEVATIONS AND PARTIAL PLANS

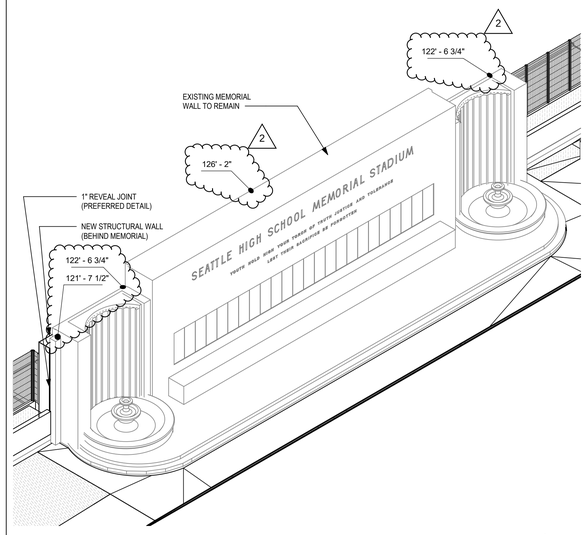
S-150

5/7/2025 11:05:02 PM

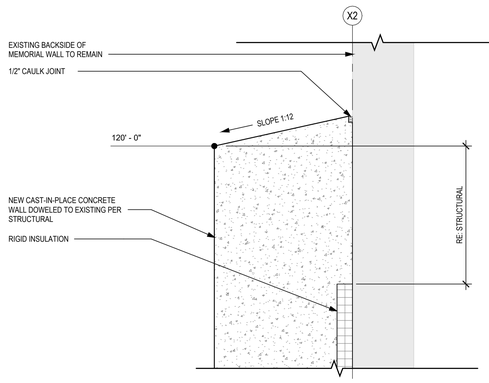
*****Final drawings will be revised to reflect the construction conditions and submitted as a separate Certificate of Approval application*****



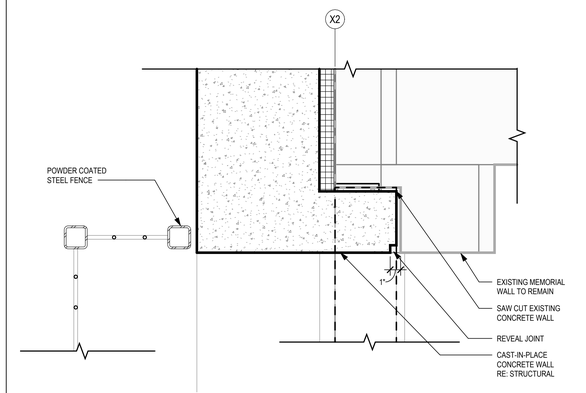
MEMORIAL WALL - BACK | C4
SCALE:



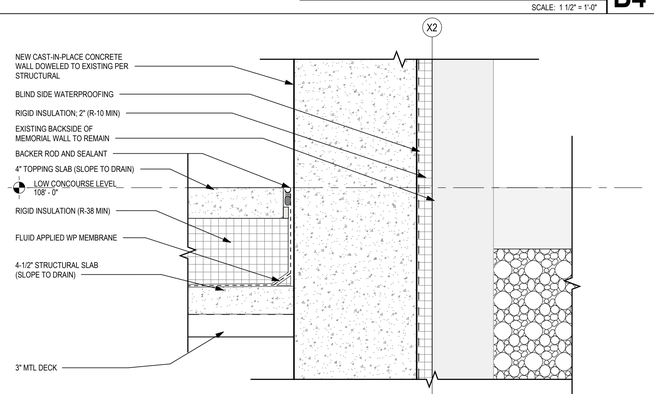
MEMORIAL WALL - FRONT | C3
SCALE:



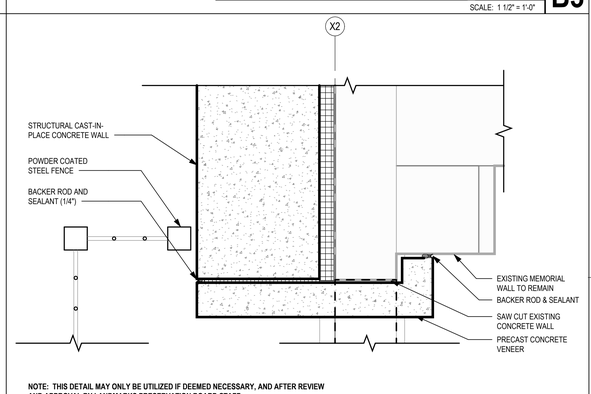
MEMORIAL WALL PARAPET SECTION DETAIL | B4
SCALE: 1 1/2" = 1'-0"



PLAN DETAIL - MEMORIAL END WALL_PRIMARY | B3
SCALE: 1 1/2" = 1'-0"

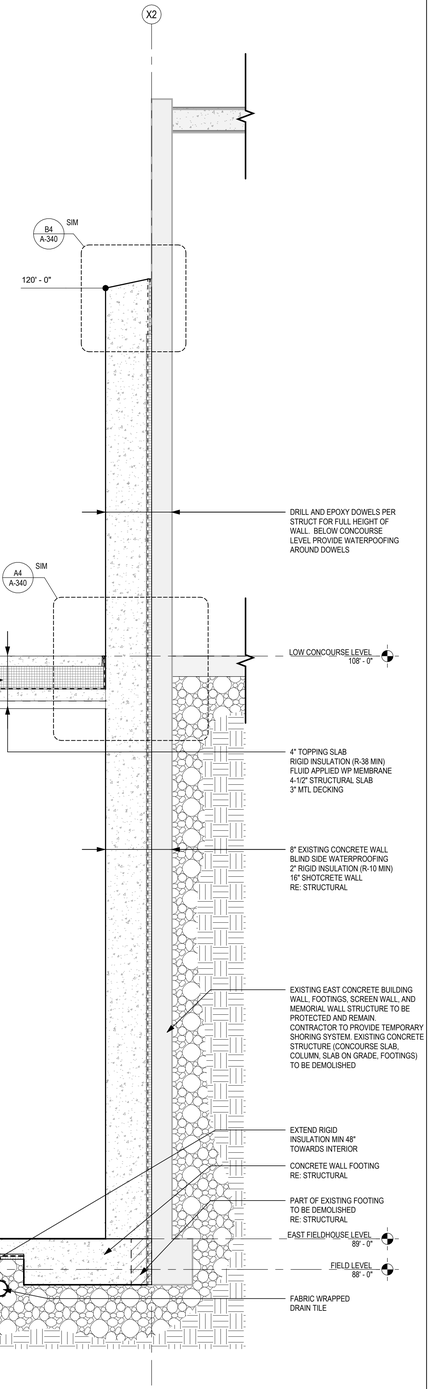


MEMORIAL WALL BASE SECTION DETAIL | A4
SCALE: 1 1/2" = 1'-0"

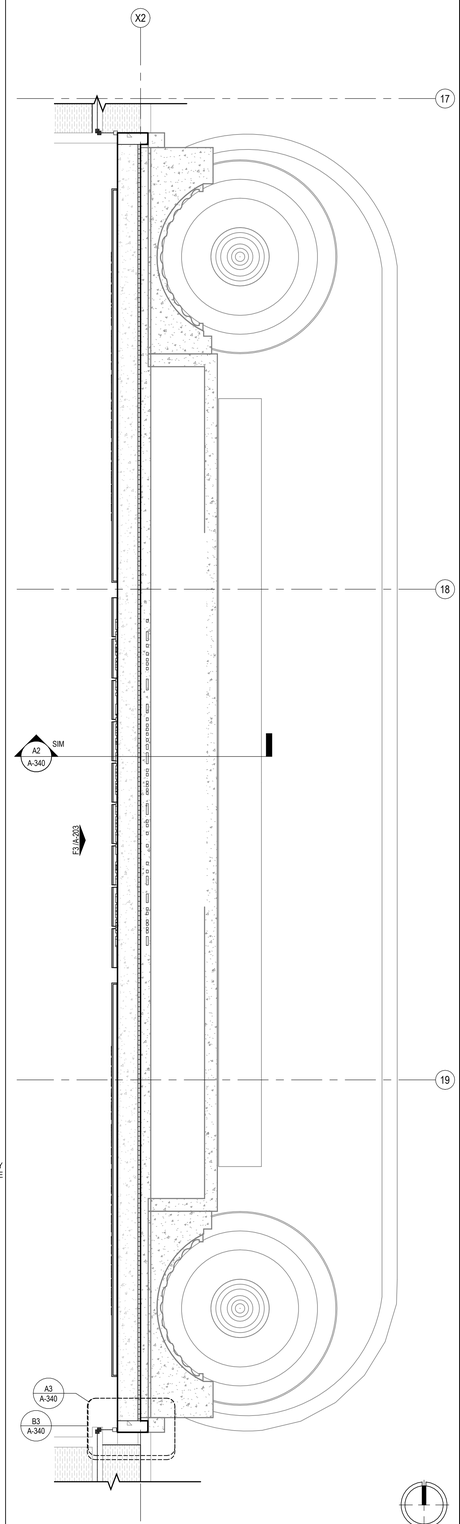


NOTE: THIS DETAIL MAY ONLY BE UTILIZED IF DEEMED NECESSARY, AND AFTER REVIEW AND APPROVAL BY LANDMARKS PRESERVATION BOARD STAFF.

PLAN DETAIL - MEMORIAL END WALL - ALTERNATE | A3
SCALE: 1 1/2" = 1'-0"



WALL SECTION | A2
SCALE: 1/2" = 1'-0"



MEMORIAL WALL ENLARGED PLAN | A1
SCALE: 1/4" = 1'-0"

OWNER
SEATTLE PUBLIC SCHOOLS
2445 3RD AVE S
SEATTLE, WA 98134
SEATTLESCHOOLS.ORG

DEVELOPER
MEMORIAL STADIUM REDEVELOPMENT MSR, LLC
10601 5TH AVE NE, SUITE 100
SEATTLE, WA 98125

ARCHITECT
GENERATOR STUDIO, LLC
1615 BALTIMORE AVE
KANSAS CITY, MO 64108
816.333.6527
GENERATORSTUDIO.COM

CIVIL & STRUCTURAL ENGINEER
MAGNUSSON KLEMENCIC ASSOCIATES
1301 5TH AVE, SUITE 3200
SEATTLE, WA 98101
206.292.1200
MKA.COM

LANDSCAPE ARCHITECT
SWIFT COMPANY
3131 WESTERN AVE, SUITE M423
SEATTLE, WA 98121
206-632-2038
SWIFTCOMPANY.COM

LIFE SAFETY CONSULTANT & FIRE SUPPRESSION
FSC INC.
8675 W 96TH ST
OVERLAND PARK, KS 66212

ATHLETIC FIELD DESIGN
D.A. HOGAN & ASSOCIATES , INC.
1450 114TH AVE SE
BELLEVUE, WA 98101

LIGHTING DESIGN
DARK LIGHT DESIGN
1511 3RD AVE SUITE 700
SEATTLE, WA 98101

CM/GC & DESIGN-BUILD MEP/AV/IT
SELLEN CONSTRUCTION
227 WESTLAKE AVE N
SEATTLE, WA 98121
206-682-7770
SELLEN.COM

STAMP BOX

ARCHITECT: MIKE KRESS
LICENSE NO. 12779

NOT FOR CONSTRUCTION

SEAL

MEMORIAL STADIUM REDEVELOPMENT

369 REPUBLICAN ST SEATTLE, WA 98109

ISSUE DATE: 05.08.2025

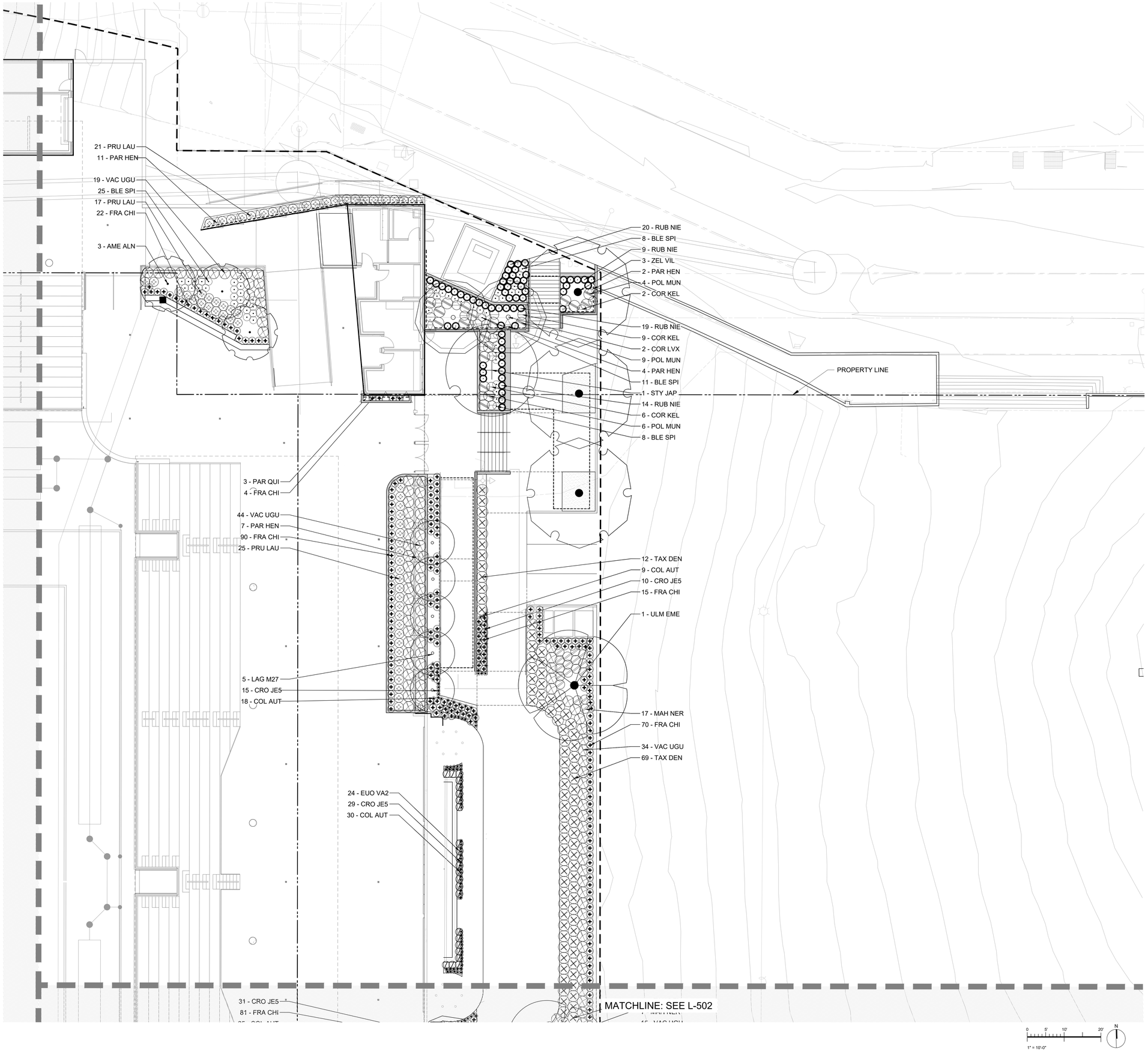
REV	DESCRIPTION	DATE
2	LANDMARKS REVISION 2	05.08.2025

PROJECT NO. 23018
DRAWN BY: Author
CHK'D BY: Checker
SHEET TITLE

MEMORIAL WALL DETAILS

A-340

5/8/2025 4:00:38 PM



PLANTING NOTES:

1. SEE L-506 AND L-507 FOR PLANT SCHEDULES.
2. EXISTING TREES REQUIRING PROTECTION SHALL BE MAINTAINED IN ACCORDANCE WITH CITY OF SEATTLE REQUIREMENTS. SEE TREE PROTECTION, SALVAGE, AND DEMOLITION NOTES SHEET L-100.
3. TREE REPLACEMENT RATIO REQUIREMENTS SHALL BE PER CITY OF SEATTLE CODE. 3:1 REPLACEMENT FOR TREES ON PUBLIC PROPERTY AND 1:1 REPLACEMENT FOR TREES ON PRIVATE PROPERTY. ASSUME OFF-SITE TREE PLANTING SHALL BE REQUIRED TO MEET THE REQUIREMENTS.
4. TREE AND PLANT MATERIALS SHALL BE LOCALLY GROWN (LOWER PUGET SOUND REGION), HEALTHY, FULLY FORMED, NURSERY GROWN, WELL-ROOTED, OF NORMAL GROWTH AND HABIT AND BE GUARANTEED TRUE TO SIZE, NAME, AND VARIETY AND FREE FROM DISEASE OR INFESTATION.
5. TREES SHALL HAVE UNIFORM BRANCHING, SINGLE STRAIGHT TRUNKS, (UNLESS SPECIFIED AS MULTI-STEMMED), AND THE CENTRAL LEADER INTACT AND UNDAMAGED. BALLED AND BURLAPPED STOCK SHALL HAVE BEEN ROOT-PRUNED AT LEAST ONCE WITHIN THE PREVIOUS TWO YEARS. CONTAINER STOCK SHALL BE FULLY ROOTED BUT NOT ROOT-BOUND.
6. TREES SHALL BE MINIMUM 3" CALIPER UNLESS OTHERWISE NOTED. LOCATION AND SPACING AS ILLUSTRATED.
7. SHRUBS SHALL BE MINIMUM #3 CONTAINER UNLESS OTHERWISE NOTED. SPACING OF SHRUBS SHALL RANGE FROM 24" OC TO 36" OC.
8. VINES SHALL BE MINIMUM 2 GAL AND LOCATED AT 8' OC.
9. CONIFEROUS TREES SHALL BE NURSERY GROWN, FULL AND STRAIGHT, WITH UNIFORM BRANCHING AND A NATURAL NON-SHEARED FORM. ORIGINAL CENTRAL LEADER MUST BE HEALTHY AND UNDAMAGED. MAXIMUM GAP BETWEEN BRANCHING SHALL NOT EXCEED 9 INCHES, AND LENGTH OF TOP LEADER SHALL NOT EXCEED 12 INCHES.
10. CONTRACTOR SHALL REMOVE ALL INVASIVE VEGETATION IN AREAS OF NEW CONSTRUCTION AND RESTORATION AREAS.
11. PLANT SUPPLIER SHALL WARRANTY THE PLANT MATERIAL FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE. ALL REPLACED PLANTS SHALL HAVE A ONE-YEAR WARRANTY BEGIN AT THE TIME OF REPLACEMENT.
12. IF REPLACEMENT OF PLANT MATERIAL IS NECESSARY DUE TO CONSTRUCTION DAMAGE OR PLANT FAILURE PER SPECIFICATIONS WITHIN ONE YEAR OF INSTALLATION, THE SIZES, SPECIES, AND QUANTITIES SHALL BE EQUAL TO DAMAGED OR UNSUITABLE PLANTS, OR AS INDICATED ON THE PLANS.
13. MULCH IN ALL NEW PLANT BEDS SHALL BE 2" DEPTH UNLESS OTHERWISE NOTED.
14. MULCH IN RESTORATION OR PROTECTED AREAS SHALL BE 3" DEPTH UNLESS OTHERWISE NOTED. MULCH EXTENTS SHALL BE IN AREAS OF DISTURBANCE AND WHERE CONSTRUCTION ACTIVITIES INTERACT WITH THE EXISTING FOREST.
15. SEE DETAIL 02/L-610 FOR SOIL PREPARATION
16. SOIL CELLS SHALL BE USED TO SUPPORT PAVEMENT IN AREAS IMMEDIATELY ADJACENT NEW TREE ALIGNMENTS IN LOCATIONS INDICATED ON PLANS. ASSUME SOIL CELLS AREAS FOR EACH TREE SHALL CONSIST OF A MATRIX 2-UNITS DEEP, 3 UNITS WIDE, AND 10 UNITS LONG. SOIL CELLS SHALL BE FILLED WITH 3-WAY TOPSOIL AND INCLUDE CONTINUOUS PERFORATED UNDERDRAIN PIPES AT THE BASE OF THE SOIL PROFILE, AND CONTINUOUS PERFORATED AERATION PIPES WITHIN THE SOIL PROFILE, ALONG THE LENGTH OF EACH TREE ALIGNMENT.
    16.1. BASIS OF DESIGN: CITYGREEN STRATAVAULT.
17. FIELD PLAY SURFACE SHALL BE DESIGNED AND SPECIFIED BY OTHER.

GENERATOR STUDIO

CLIENT
SEATTLE PUBLIC SCHOOLS
2445 3RD AVE S
SEATTLE, WA 98134
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STAMP BOX

ARCHITECT: MIKE KRESS
LICENSE NO. 12779

NOT FOR CONSTRUCTION

SEAL

MEMORIAL STADIUM RENOVATION

369 REPUBLICAN ST SEATTLE, WA 98109

LANDMARKS PRESERVATION BOARD CERTIFICATE OF APPROVAL

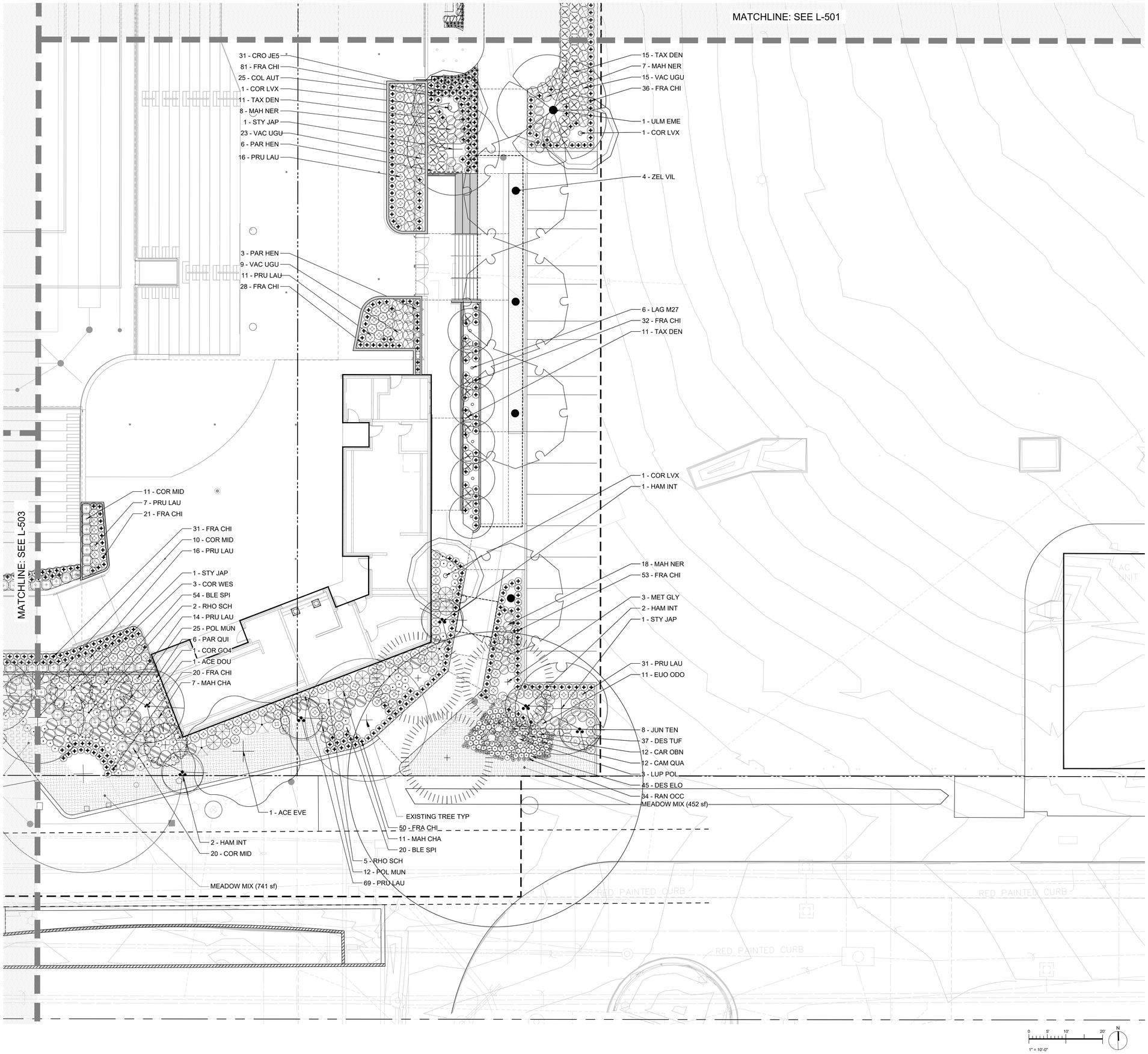
ISSUE DATE: 04.04.2025

REV	DESCRIPTION	DATE

PROJECT NO. 23018
DRAWN BY: xx
CHK'D BY: xx
SHEET TITLE

PLANTING PLAN

L-501



PLANTING NOTES:

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    16.1. BASIS OF DESIGN: CITYGREEN STRATAVAULT.
17. FIELD PLAY SURFACE SHALL BE DESIGNED AND SPECIFIED BY OTHER.

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SEAL

MEMORIAL STADIUM RENOVATION

369 REPUBLICAN ST SEATTLE, WA 98109

LANDMARKS PRESERVATION BOARD CERTIFICATE OF APPROVAL

ISSUE DATE: 04.04.2025

REV	DESCRIPTION	DATE

PROJECT NO. 23018
DRAWN BY: xx
CHKD BY: xx

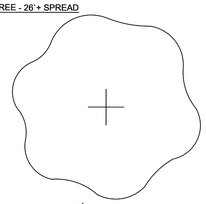
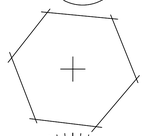
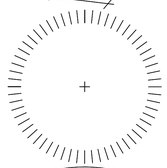
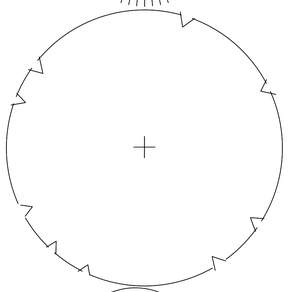
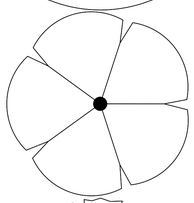
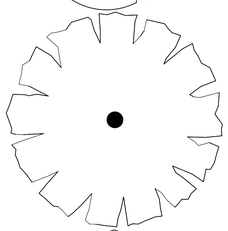
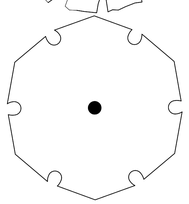
SHEET TITLE

PLANTING PLAN

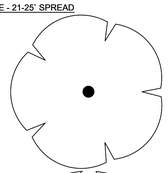
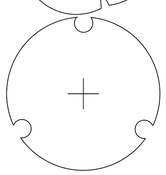
L-502

TREE SCHEDULE

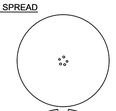
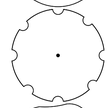
LARGE TREE - 26' + SPREAD

SYMBOL	CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT
	ACE EVE	1	ACER CAMPESTRE 'EVELYN'	QUEEN ELIZABETH™ HEDGE MAPLE	B & B, 3" CAL MIN
	LIR FAS	8	LIRIODENDRON TULIPIFERA 'FASTIGIATA' 8 MATCHING	COLUMNAR TULIP POPLAR	B & B, 3" CAL MIN
	MET GLY	6	METASEQUOIA GLYPTOSTROBOIDES	DAWN REDWOOD	B & B, 3" CAL MIN
	QUE BIC	4	QUERCUS BICOLOR SPECIMEN TREES	SWAMP WHITE OAK	B & B, 5" CAL MIN
	ULM EME	8	ULMUS PARVIFOLIA 'EMER II' 6 MATCHED AND 2 MATCHED	ALLEE® LACEBARK ELM	B & B, 3" CAL MIN
	ZEL GRE	1	ZELKOVA SERRATA 'GREEN VASE'	GREEN VASE JAPANESE ZELKOVA	B & B, 3" CAL MIN
	ZEL VIL	7	ZELKOVA SERRATA 'VILLAGE GREEN' 7 MATCHED	VILLAGE GREEN JAPANESE ZELKOVA	B & B, 3" CAL MIN

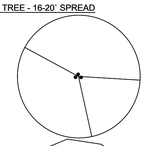
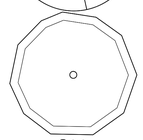
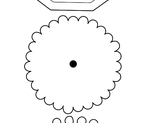
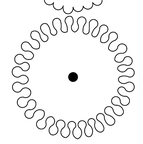
MEDIUM TREE - 21-25' SPREAD

SYMBOL	CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT
	CER CAN	9	CERCIS CANADENSIS 9 MATCHED	EASTERN REDBUD	B & B, 3" CAL MIN
	STY JAP	4	STYRAX JAPONICUS	JAPANESE SNOWBELL	B & B, 3" CAL MIN

SMALL TREE - 8-15' SPREAD

SYMBOL	CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT
	ACE CIR	9	ACER CIRCINATUM MULTI-STEM 3 MIN	VINE MAPLE	B & B, 1.5" CAL STEMS, MIN 10' HT
	AME ALN	3	AMELANCHIER ALNIFOLIA	SERVICEBERRY	B & B, 2" CAL MIN, 10' HT
	AME SER	7	AMELANCHIER `AUTUMN BRILLIANCE` MULTI-STEM 3 MIN	AUTUMN BRILLIANCE SERVICEBERRY	B & B, 1.5" CAL STEMS, MIN 10' HT
	COR WES	7	CORYLUS CORNUTA MULTI-STEM 3 MIN	WESTERN HAZELNUT	20 GAL, 10' HT MIN
	HAM INT	14	HAMAMELIS X INTERMEDIA 'ARNOLD PROMISE' MULTI-STEM 3 MIN	ARNOLD PROMISE WITCH HAZEL	20 GAL, 10' HT MIN
	LAG M27	11	LAGERSTROEMIA INDICA X FAURIEI 'MUSKOGEE' SINGLE STEM	MUSKOGEE CRAPE MYRTLE	B & B, 2" CAL MIN

SMALL/MEDIUM TREE - 16-20' SPREAD

SYMBOL	CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT
	ACE DOU	5	ACER GLABRUM DOUGLASII MULTI-STEM 3 MIN	DOUGLAS MAPLE	B & B, 1.5" CAL STEMS, MIN 10' HT
	COR LVX	7	CORNUS KOUSA X NUTTALLII 'VENUS'	VENUS DOGWOOD	B & B, 2" CAL MIN
	LAG LSH	4	LAGERSTROEMIA INDICA X FAURIEI 'SARAH'S FAVORITE'	SARAH'S FAVORITE CRAPE MYRTLE	B & B, 2" CAL MIN
	MAG VIC	1	MAGNOLIA GRANDIFLORA 'VICTORIA'	VICTORIA SOUTHERN MAGNOLIA	B & B, 2" CAL MIN

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369 REPUBLICAN ST SEATTLE, WA 98109

LANDMARKS PRESERVATION BOARD CERTIFICATE OF APPROVAL

ISSUE DATE: 04.04.2025

REV	DESCRIPTION	DATE

PROJECT NO. 23018
DRAWN BY: xx
CHKD BY: xx
SHEET TITLE

TREE SCHEDULE

L-506

PLANT SCHEDULE

SYMBOL	CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT	SPACING
SHRUBS						
	BLE SPI	266	BLECHNUM SPICANT	DEER FERN	#1 CONT	24" o.c.
	CAM QUA	124	CAMASSIA QUAMASH	SMALL CAMAS	BULB	12" o.c.
	CAR OBN	152	CAREX OBNUPTA	SLOUGH SEDGE	#1 CONT	18" o.c.
	COR MID	265	CORNUS SANGUINEA 'MIDWINTER FIRE'	MIDWINTER FIRE BLOODTWIG DOGWOOD	#5 CONT	36" o.c.
	COR KEL	31	CORNUS STOLONIFERA `KELSEYI`	KELSEY DOGWOOD	#3 CONT	30" o.c.
	COR GO4	14	CORYLOPSIS SPICATA 'GOLDEN SPRING'	GOLDEN SPRING WINTER HAZEL	#5 CONT	96" o.c.
	DES TUF	361	DESCHAMPSIA CESPITOSA	TUFTED HAIR GRASS	#1 CONT	18" o.c.
	DES ELO	380	DESCHAMPSIA ELONGATA	SLENDER HAIRGRASS	#1 CONT	18" o.c.
	EUO ODO	139	EUONYMUS ALATUS 'ODOM'	LITTLE MOSES DWARF BURNING BUSH	#3 CONT	30" o.c.
	EUO VA2	24	EUONYMUS JAPONICUS MICROPHYLLUS 'VARIEGATA'	VARIEGATED BOX-LEAF EUONYMUS	#1 CONT	24" o.c.
	JUN TEN	124	JUNCUS TENUIS	PATH RUSH	#1 CONT	18" o.c.
	LUP POL	35	LUPINUS POLYPHYLLUS	LARGE-LEAVED LUPINE	#1 CONT	30" o.c.
	MAH NER	192	MAHONIA NERVOSA	OREGON GRAPE	#1 CONT	30" o.c.
	MAH CHA	30	MAHONIA X MEDIA 'CHARITY'	CHARITY MAHONIA	#3 CONT	48" o.c.
	POL MUN	161	POLYSTICHUM MUNITUM	WESTERN SWORD FERN	#3 CONT	36" o.c.
	PRU LAU	656	PRUNUS LAUROCERASUS 'MOUNT VERNON'	MOUNT VERNON ENGLISH LAUREL	#1 CONT	30" o.c.
	RAN OCC	400	RANUNCULUS OCCIDENTALIS	WESTERN BUTTERCUP	#1 CONT	12" o.c.
	RHO SCH	13	RHODODENDRON SCHLIPPENBACHII	ROYAL AZALEA	#5 CONT	60" o.c.
	TAX DEN	118	TAXUS X MEDIA `DENSIFORMIS`	DENSE YEW	#3 CONT	36" o.c.
	VAC UGU	144	VACCINIUM OVATUM `VACSID1`	SCARLET OVATION™ EVERGREEN HUCKLEBERRY	#3 CONT	36" o.c.
BULB						
	COL AUT	82	COLCHICUM AUTUMNALE	AUTUMN CROCUS	BULB	12" o.c.
	CRO JE5	85	CROCUS VERNUS 'JEANNE D'ARC'	JEANNE D'ARC DUTCH CROCUS	BULB	12" o.c.
GROUND COVERS						
	FRA CHI	1,376	FRAGARIA CHILOENSIS	BEACH STRAWBERRY	4" POT	24" o.c.
	RUB NIE	86	RUBUS CALYCINOIDES	CREEPING BRAMBLE	#1 CONT	24" o.c.
VINES						
	PAR HEN	37	PARTHENOCISSUS HENRYANA	SILVERVEIN CREEPER	#1 CONT	36" o.c.
	PAR QUI	27	PARTHENOCISSUS QUINQUEFOLIA	VIRGINA CREEPER	#1 CONT	36" o.c.

SYMBOL	QTY	BOTANICAL NAME	COMMON NAME	CONT	SPACING
GROUND COVERS					
	3,642	FRAGARIA CHILOENSIS	BEACH STRAWBERRY	4" POT	12" o.c.
	7,972 SF	SEATTLE CENTER TURF SOD 38% BANDALORE PERENNIAL RYEGRASS 31% MONSIEUR PERENNIAL RYEGRASS 25% SR4700 PERENNIAL RYEGRASS	PERENNIAL RYEGRASS BLEND	SOD	
	9,809 SF	SPS TURF SOD 60% PERENNIAL RYEGRASS 25% REED CREEPING FESCUE 15% BLUEGRASS	DROUGHT TOLERANT BLEND	SOD	

MEADOW MIX — 3,981 SF

TO INCLUDE EQUAL QUANTITIES OF SPECIES IN 1 GAL WITH INTERSEEDING 25% AREA WITH SEED MIX.

BOD NATIVE SEED MIX OF GRASSES, BOD NORTHWEST MEADOWSCAPES NATIVE POLLINATOR MIX

.

ACHILLEA MILLEFOLIUM / COMMON YARROW	43	#1 CONT
CAMASSIA LEICHTLINII / GREAT CAMAS	43	#1 CONT
CAMASSIA QUAMASH / SMALL CAMAS	43	#1 CONT
CLARKIA AMOENA / FAREWELL TO SPRING	43	#1 CONT
COLLOMIA GRANDIFLORA / LARGE-FLOWERED COLLOMIA	43	#1 CONT
DESCHAMPSIA CESPITOSA / TUFTED HAIR GRASS	43	#1 CONT
ERIGERON SPECIOSUS / SHOWY FLEABANE	43	#1 CONT
ERIOPHYLLUM LANATUM / WOOLLY SUNFLOWER	43	#1 CONT
FESTUCA IDAHOENSIS ROEMERI / ROEMER'S FESCUE	43	#1 CONT
GILIA CAPITATA / BLUE THIMBLE FLOWER	43	#1 CONT
LIMNANTHES ALBA / MEADOWFOAM	43	#1 CONT
LUPINUS BICOLOR / MINIATURE LUPINE	43	#1 CONT
LUPINUS POLYPHYLLUS / LARGE-LEAVED LUPINE	43	#1 CONT
LUPINUS RIVULARIS / RIVERBANK LUPINE	43	#1 CONT
PLECTRITIS CONGESTA / SHORTSPUR SEABLUSH	43	#1 CONT
POTENTILLA GRACILIS / SLENDER CINQUEFOIL	43	#1 CONT
PRUNELLA VULGARIS / SELF-HEAL	43	#1 CONT
RANUNCULUS OCCIDENTALIS / WESTERN BUTTERCUP	43	#1 CONT
SIDALCEA CAMPESTRIS / MEADOW CHECKERBLOOM	43	#1 CONT

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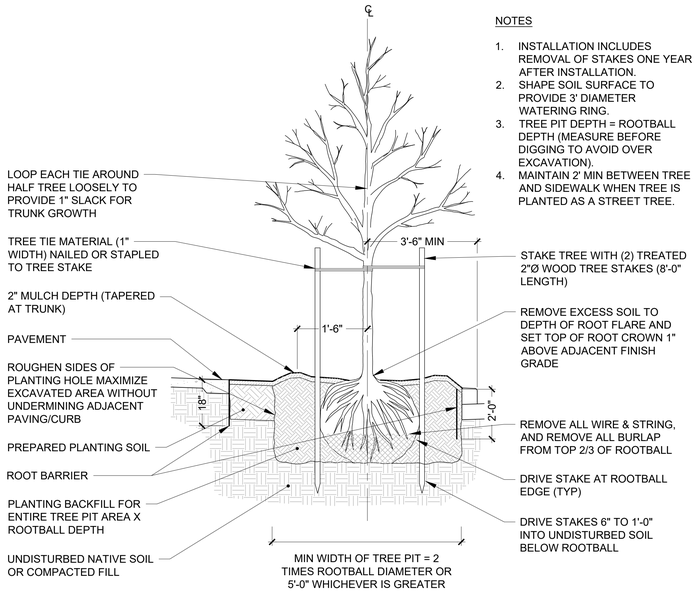
PLANTING SCHEDULE

L-507

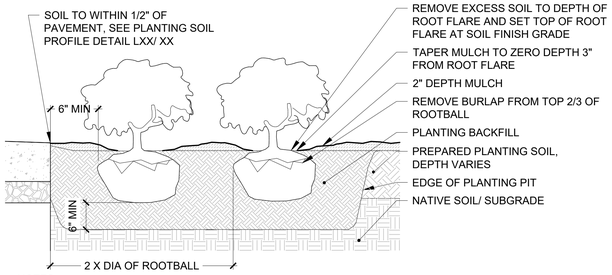


NOTES

1. INSTALLATION INCLUDES REMOVAL OF STAKES ONE YEAR AFTER INSTALLATION.
2. SHAPE SOIL SURFACE TO PROVIDE 3' DIAMETER WATERING RING.
3. TREE PIT DEPTH = ROOTBALL DEPTH (MEASURE BEFORE DIGGING TO AVOID OVER EXCAVATION).
4. MAINTAIN 2' MIN BETWEEN TREE AND SIDEWALK WHEN TREE IS PLANTED AS A STREET TREE.

03 TYP DECIDUOUS TREE PLANTING

SCALE: 1" = 1'-0"

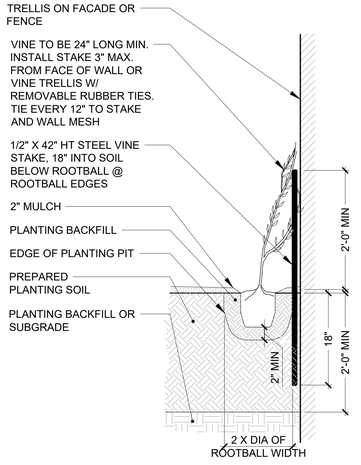


NOTES

1. PROVIDE PEDESTAL TO SUPPORT WEIGHT OF SHRUB IF PLANT IS BALLED AND BURLAPPED OR GREATER THAN 5 GALLON CONTAINER SIZE.
2. ENSURE SHRUB ROOT FLARE DOES NOT SETTLE BELOW TOP OF SOIL.

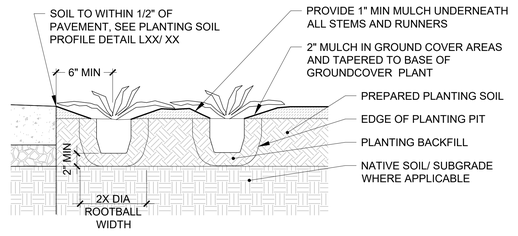
05 TYP SHRUB PLANTING

SCALE: 1" = 1'-0"



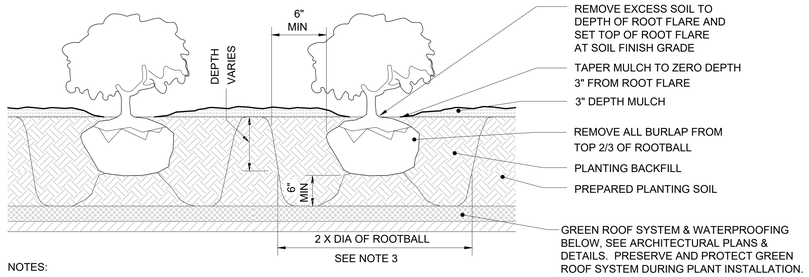
06 VINE PLANTING

SCALE: 1" = 1'-0"



08 GROUNDCOVER PLANTING

SCALE: 1" = 1'-0"



NOTES:

1. PROVIDE PEDESTAL TO SUPPORT WEIGHT OF SHRUB IF PLANT IS BALLED AND BURLAPPED OR GREATER THAN 5 GALLON CONTAINER SIZE.
2. ENSURE SHRUB ROOT FLARE DOES NOT SETTLE BELOW TOP OF SOIL.
3. WHERE POCKET PLANTING, DOUBLE PLANT PIT SIZE

09 SHRUB PLANTING ON STRUCTURE

SCALE: 1" = 1'-0"

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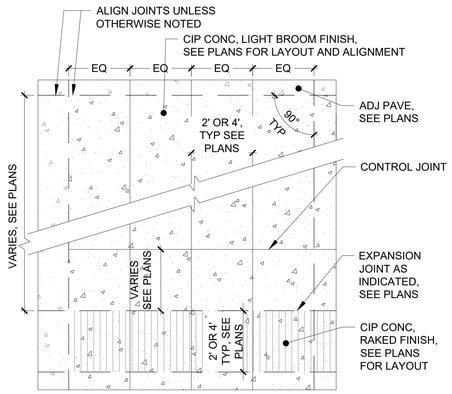
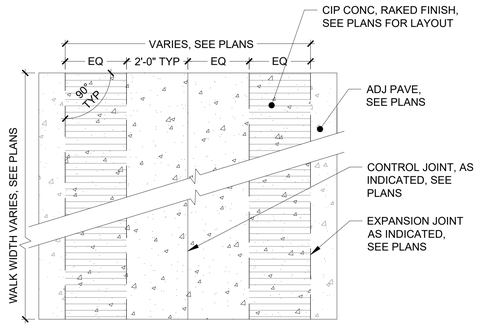
PLANTING DETAILS

L-610



TYPE 1 - PLAN

NOTES:
1. FOR PEDESTRIAN VS VEHICULAR RATED TYPE A ZONES, SEE CIVIL

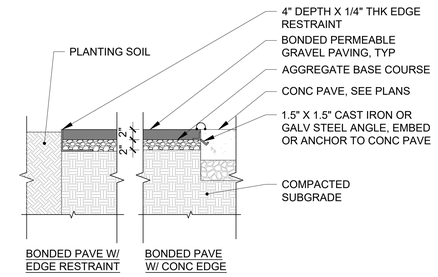


TYPE 2 - PLAN

NOTES:
1. CIP CONC FOR RAMPS AND SLOPED CONCRETE WALKS.
2. INCLUDES THICKENED EDGE/ DOWN TURN CURB FOR HANDRAIL EMBEDS.

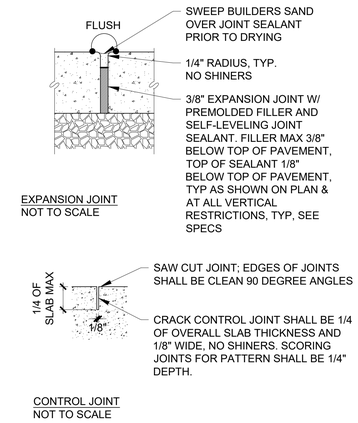
04 CONCRETE PAVING FINISH TYPES

SCALE: 1" = 1'-0"



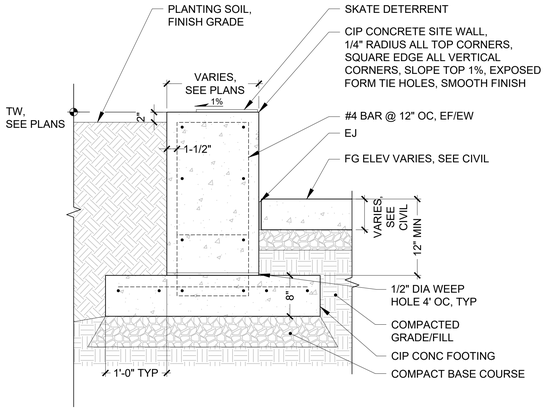
02 PERMEABLE BONDED GRAVEL

SCALE: 1" = 1'-0"



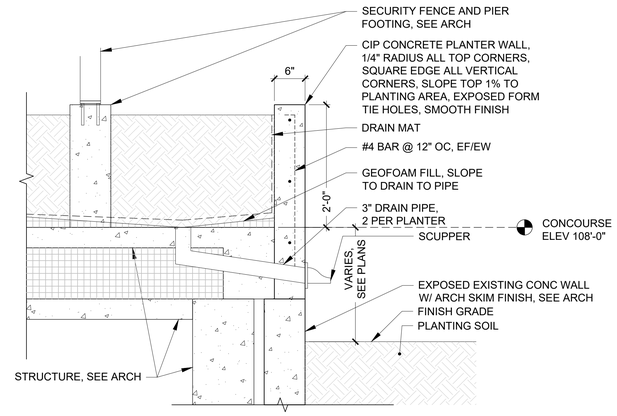
03 CIP CONC JOINT DETAILS

SCALE: 3" = 1'-0"



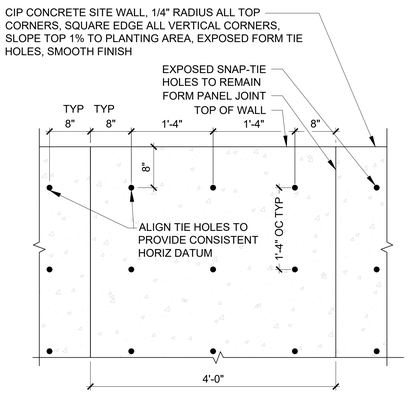
05 CIP CONC SEATWALL ON GRADE

SCALE: 1" = 1'-0"



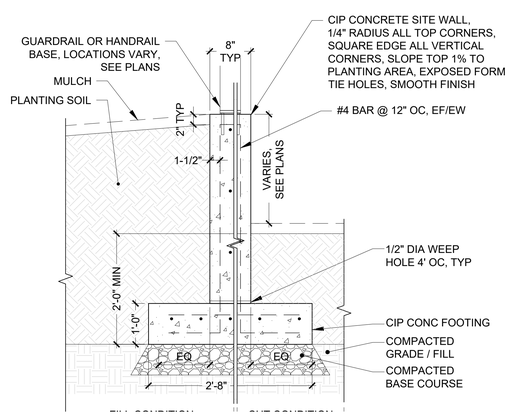
09 PLANTER WALL ON STRUCTURE - ADJACENT PLANTING

SCALE: 1" = 1'-0"



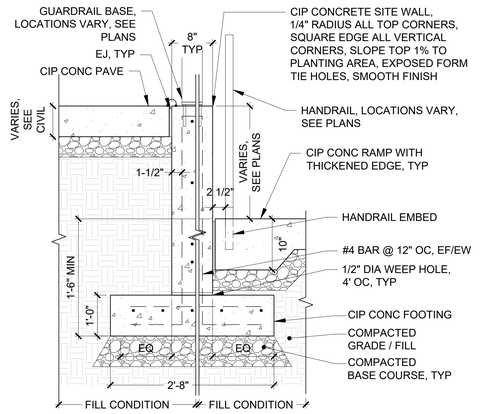
06 WALL FORMWORK DETAIL

SCALE: 1" = 1'-0"



07 SITE RETAINING WALL AT PLANTING

SCALE: 1" = 1'-0"



08 SITE RETAINING WALL AT HARDSCAPE

SCALE: 1" = 1'-0"

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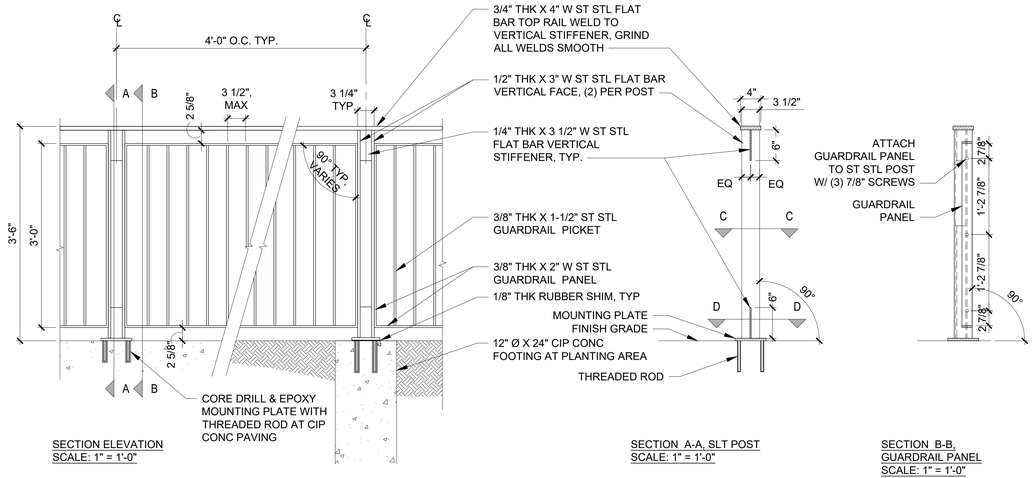
L-640



SECTION ELEVATION
SCALE: 1" = 1'-0"

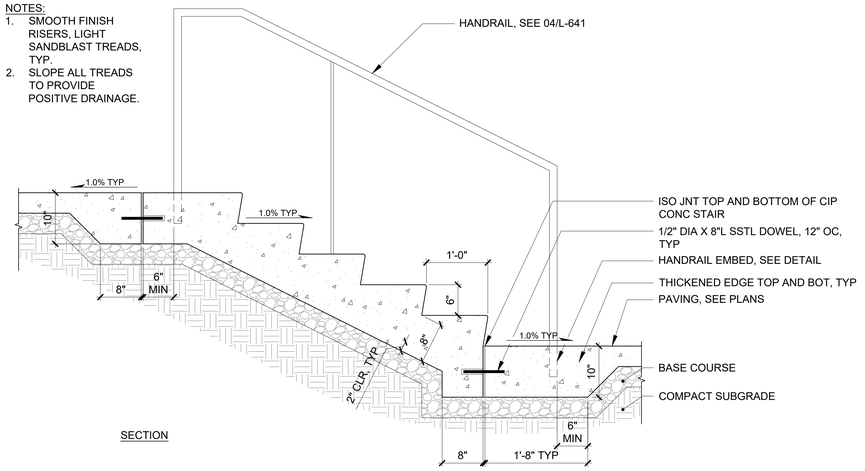
SECTION A-A, SLT POST
SCALE: 1" = 1'-0"

SECTION B-B, GUARDRAIL PANEL
SCALE: 1" = 1'-0"

01 SITE GUARDRAIL

SCALE: 1" = 1'-0"

NOTES:
1. SMOOTH FINISH RISERS, LIGHT SANDBLAST TREADS, TYP.
2. SLOPE ALL TREADS TO PROVIDE POSITIVE DRAINAGE.



SECTION

03 CIP CONC SITE STAIR TYPICAL

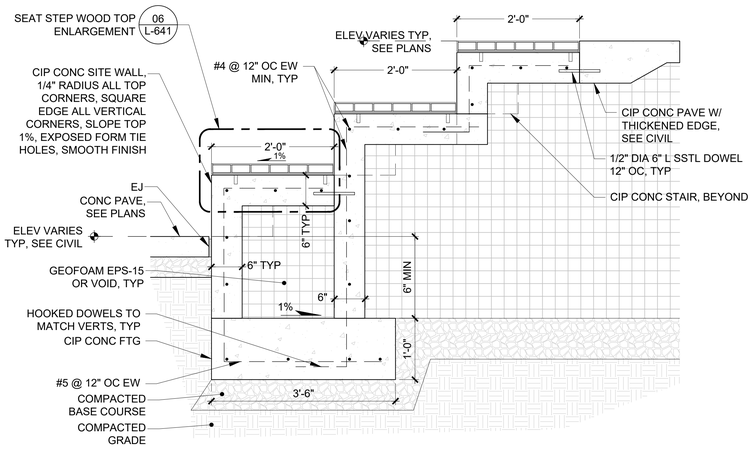
SCALE: 1" = 1'-0"

NOTES:

1. ALL HANDRAIL COMPONENTS TO BE STAINLESS STEEL WITH LIGHT SANDBLAST FINISH.
2. SEE SITE SECTIONS FOR HANDRAIL DIMENSIONS AND INTERMEDIATE POST LAYOUT.
3. FIELD VERIFY STAIR AND HANDRAIL LENGTHS PRIOR TO FABRICATION.

04 SITE HANDRAIL

SCALE: 1" = 1'-0"



NOTE:
1. TYPICAL DETAIL, NUMBER OF STEPS VARIES, SEE PLANS FOR TOP OF SEAT ELEVATIONS.

05 CIP CONC SEAT STEPS

SCALE: 1" = 1'-0"

TYP SECTION

06 SEAT STEP WOOD TOP ENLARGEMENT

SCALE: 1 1/2" = 1'-0"

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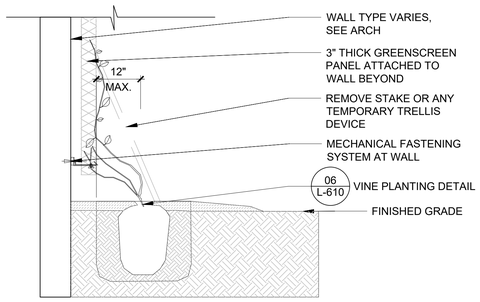
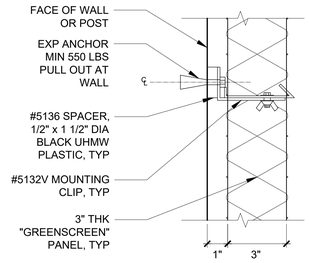
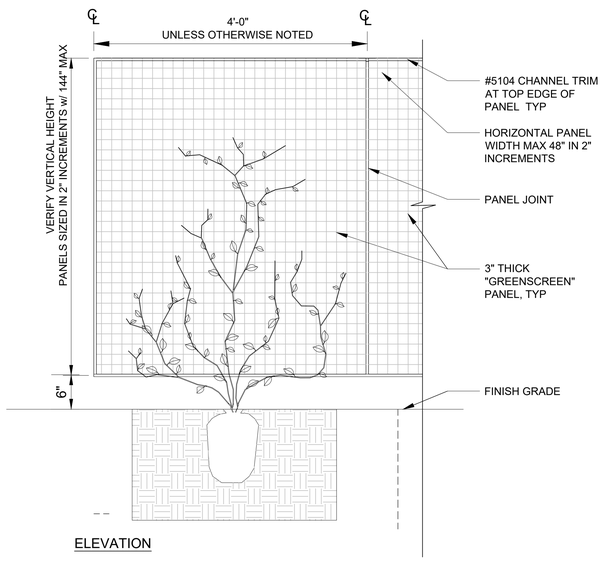


SECTION



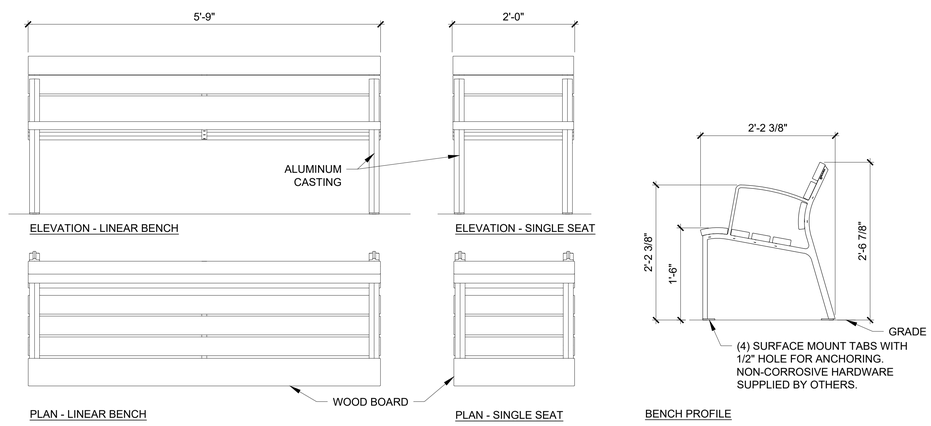
MECHANICAL FASTENING SYSTEM AT WALL
SCALE: NTS



ELEVATION

08 GREENSCREEN VINE TRELLIS

SCALE: 1" = 1'-0"



09 NEOLIVIANO BENCH

SCALE: 1" = 1'-0"

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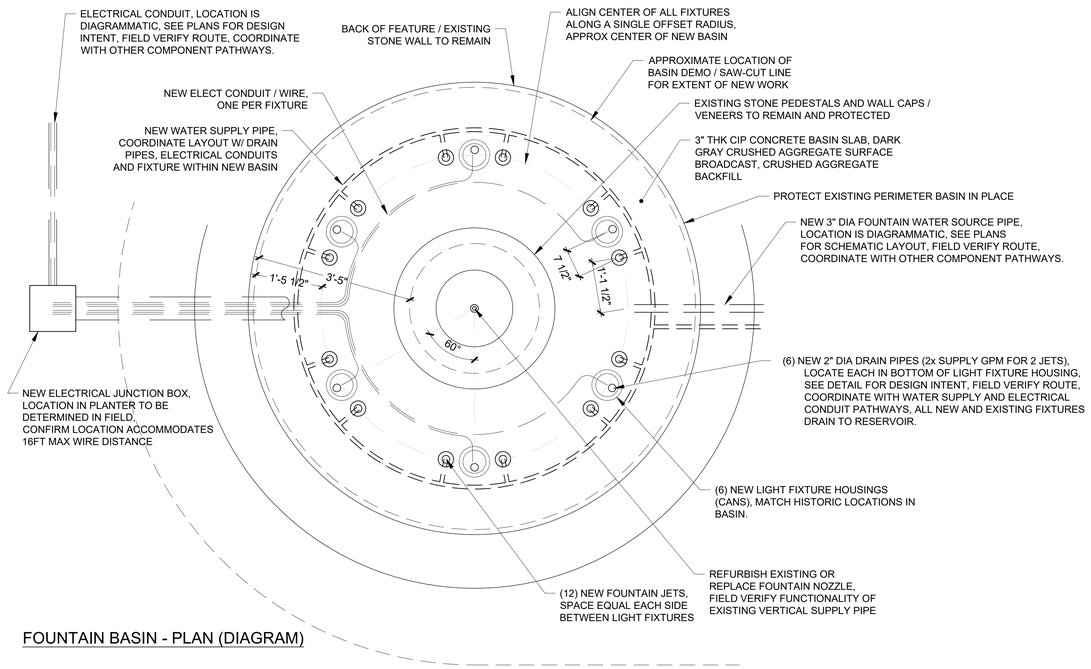
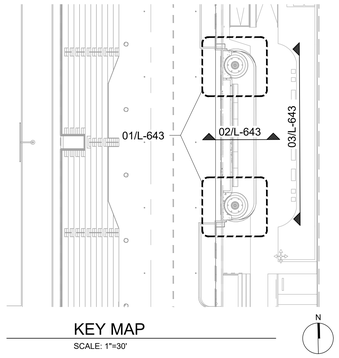


FOUNTAIN BASIN - PLAN (DIAGRAM)



KEY MAP

SCALE: 1"=30'

GENERAL WATER FEATURE NOTES - BASIS OF DESIGN:

WATER FEATURE IMPROVEMENT SHALL CONSIST OF THE FOLLOWING FEATURES ON (2) BOTH ENDS OF THE MEMORIAL WALL:

CENTRAL SPOUT RESTORATION:

1. CLEAN AND REFURBISH OR REPLACE THE EXISTING VERTICAL PIPE AND BRONZE FITTING TO PROVIDE A 6"-9" HEIGHT WATER DISPLAY AT THE TOP OF THE EXISTING UPPER BASIN.

LOWER BASIN JETS:

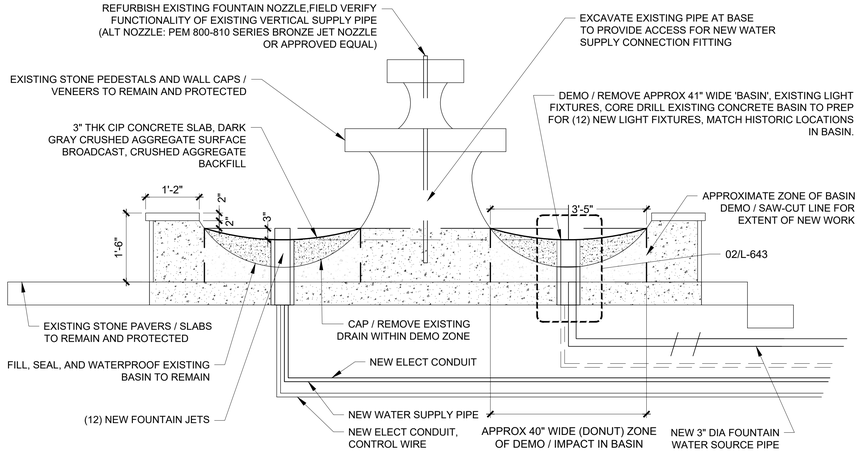
1. PROVIDE (6) DISPLAY JETS, PIPE, AND ASSOCIATED FITTINGS TO PROVIDE A 6"-9" HEIGHT WATER DISPLAY AT THE BOTTOM OF THE EXISTING LOWER BASIN, EXPOSED FIXTURES AND FITTING SHALL BE BRONZE, OR STAINLESS STEEL.
2. ALL EXPOSED FITTINGS SHALL BE LOW-PROFILE AND TAMPER-RESISTANT.
3. PROVIDE 2" DIA DRAIN PIPE WITHIN EACH LIGHT FIXTURE HOUSING AND CONNECT TO RESERVOIR VIA GRAVITY SYSTEM. FINAL ROUTE SHALL BE FIELD VERIFIED BY SYSTEM DESIGN-INSTALLER.

GENERAL NOTES:

1. PROVIDE CLEAN-OUT OUTSIDE EACH BOWL FEATURE WITH BRONZE GRILLE AND TAMPER-RESISTANT SCREW ATTACHMENT TO FLANGE.
2. SYSTEM SHALL BE DESIGNED TO RUN CONTINUOUSLY AND RE-CIRCULATE WITH A MAXIMUM WATER DEPTH IN THE BASIN OF 3, DURING OPERATION.
3. BASIN SHALL COMPLETELY DRAIN USING GRAVITY INTO RESERVOIR TANK IF DISPLAY JETS ARE NOT IN OPERATION.
4. RESERVOIR TANK SHALL BE LOCATED AND ORIENTATED PER PLANS. CHANGES TO SIZE AND LOCATION REQUIRE REVIEW AND APPROVAL WITH LANDSCAPE ARCHITECT.
5. COORDINATE ALL WATER SUPPLY PIPE, DRAIN PIPE, AND ELECTRICAL CONDUIT AS ILLUSTRATED IN PLANS TO AVOID CONFLICTS WITH TREE INSTALLATION AND FUTURE ROOT ZONES. UTILIZE PVC SLEEVES TO PROVIDE ADDITIONAL PROTECTION OF UNDERGROUND ELEMENTS WITHIN FUTURE TREE ROOT ZONE.
6. INSTALL ROOT BARRIER ALONG ALL UNDERGROUND ELEMENTS WITHIN 10 FEET OF PROPOSED TREES.

CODE COMPLIANCE:

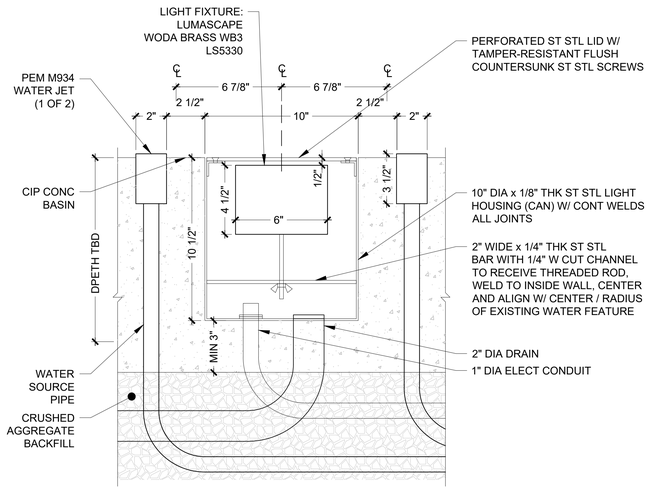
1. ALL NEW AND REFURBISHED SYSTEM COMPONENTS SHALL MEET CURRENT PLUMBING AND ELECTRICAL CODES.



FOUNTAIN BASIN - SECTION

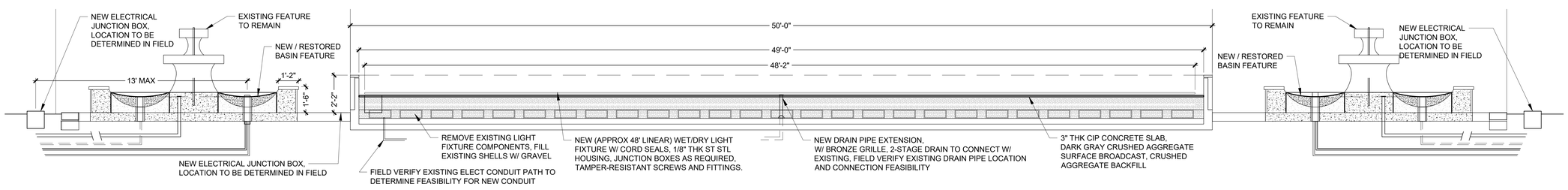
01 ##########

SCALE: ##########



02 WATER FEATURE JETS/ LIGHT CAN

SCALE: 3" = 1'-0"



03 ##########

SCALE: ##########

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LICENSE NO. 12779

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MEMORIAL STADIUM RENOVATION

369 REPUBLICAN ST SEATTLE, WA 98109

LANDMARKS PRESERVATION BOARD CERTIFICATE OF APPROVAL

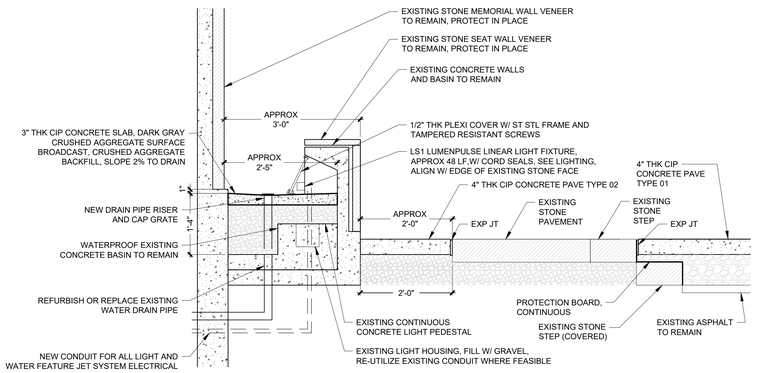
ISSUE DATE: 04.04.2025

REV	DESCRIPTION	DATE

PROJECT NO. 23018
DRAWN BY: xx
CHK'D BY: xx
SHEET TITLE

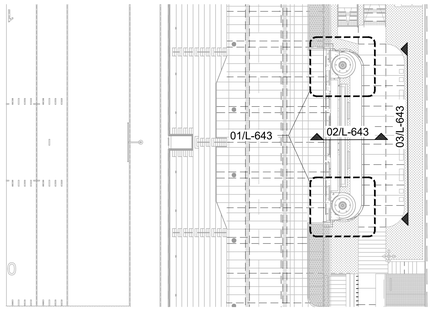
MEMORIAL WALL DETAILS

L-650



01 LIGHT CHANNEL ENLARGED DETAIL

SCALE: 3/4" = 1'-0"



KEY MAP

SCALE: 1"=30'

GENERAL WATER FEATURE NOTES - BASIS OF DESIGN:

WATER FEATURE IMPROVEMENT SHALL CONSIST OF THE FOLLOWING FEATURES ON (2) BOTH ENDS OF THE MEMORIAL WALL:

CENTRAL SPOUT RESTORATION:

1. CLEAN AND REFURBISH OR REPLACE THE EXISTING VERTICAL PIPE AND BRONZE FITTING TO PROVIDE A 6"-9" HEIGHT WATER DISPLAY AT THE TOP OF THE EXISTING UPPER BASIN.

LOWER BASIN JETS:

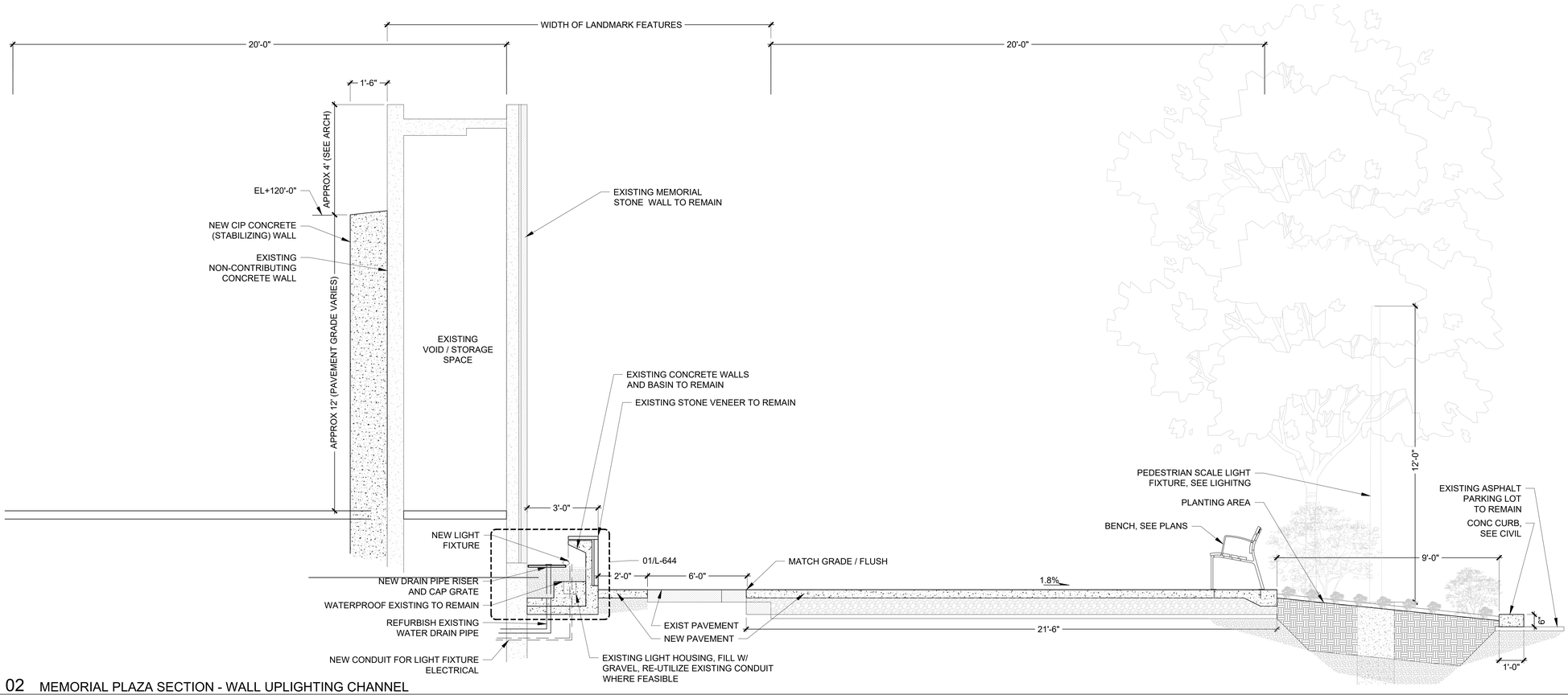
1. PROVIDE (12 x 2) DISPLAY JETS, PIPE, AND ASSOCIATED FITTINGS TO PROVIDE A 6"-9" HEIGHT WATER DISPLAY AT THE BOTTOM OF THE EXISTING LOWER BASIN. EXPOSED FIXTURES AND FITTING SHALL BE BRONZE, OR STAINLESS STEEL.
2. ALL EXPOSED FITTINGS SHALL BE LOW-PROFILE AND TAMPER-RESISTANT.
3. PROVIDE 2" DIA DRAIN PIPE WITHIN EACH LIGHT FIXTURE HOUSING AND CONNECT TO RESERVOIR VIA GRAVITY SYSTEM. FINAL ROUTE SHALL BE FIELD VERIFIED BY SYSTEM DESIGN-INSTALLER.

GENERAL NOTES:

1. ALL PIPING BETWEEN THE WATER FEATURES AND THE EQUIPMENT SPACE / RESERVOIR SHALL BE INSTALLED DEAD LEVEL OR SLOPED DOWN TOWARD THE EQUIPMENT SPACE/RESERVOIR UNLESS OTHERWISE INDICATED ON THESE DRAWINGS
2. MINIMUM CONDUIT SIZE SHALL BE 3/4" TRADE SIZE UNLESS OTHERWISE INDICATED ON THESE DRAWINGS.
3. PROVIDE DRAIN CLEAN-OUT OUTSIDE EACH BOWL FEATURE WITH BRONZE GRILLE AND TAMPER-RESISTANT SCREW ATTACHMENT TO FLANGE.
4. PROVIDE UNIONS AND/OR FLANGES AS REQUIRED TO FACILITATE REMOVAL OF ALL VALVES AND EQUIPMENT.
5. SYSTEM SHALL BE DESIGNED TO RUN CONTINUOUSLY AND RE-CIRCULATE WITH A MAXIMUM WATER DEPTH IN THE BASIN OF 3" DURING OPERATION.
6. BASIN SHALL COMPLETELY DRAIN USING GRAVITY INTO RESERVOIR TANK IF DISPLAY JETS ARE NOT IN OPERATION.
7. RESERVOIR TANK SHALL BE LOCATED AND ORIENTATED PER PLANS. CHANGES TO SIZE AND LOCATION REQUIRE REVIEW AND APPROVAL WITH LANDSCAPE ARCHITECT.
8. COORDINATE ALL WATER SUPPLY PIPE, DRAIN PIPE, AND ELECTRICAL CONDUIT AS ILLUSTRATED IN PLANS TO AVOID CONFLICTS WITH TREE INSTALLATION AND FUTURE ROOT ZONES. UTILIZE PVC SLEEVES TO PROVIDE ADDITIONAL PROTECTION OF UNDERGROUND ELEMENTS WITHIN FUTURE TREE ROOT ZONE.
9. ALL METALLIC FASTENERS, INSERTS, BRACKETS, SUPPORTS, ETC. IN THE WATER FEATURE (S), WHETHER SUBMERGED OR NOT, SHALL BE STAINLESS STEEL, BRONZE, OR COPPER AS INDICATED. PLATED, UN-PLATED, OR PAINTED FERROUS PARTS ARE NOT PERMITTED IN ANY SUBMERGED ELECTRICAL APPLICATION FOR THIS WORK.
10. INSTALL ROOT BARRIER ALONG ALL UNDERGROUND ELEMENTS WITHIN 10 FEET OF PROPOSED TREES.

ELECTRICAL AND PLUMBING CODE COMPLIANCE:

1. ALL NEW AND REFURBISHED SYSTEM COMPONENTS SHALL MEET CURRENT PLUMBING AND ELECTRICAL CODES.
2. CONDUIT RUNS AND ENCLOSURES (EXCEPT CIRCUIT BREAKER AND CONTROL PANEL BOARDS) CONTAINING CIRCUITS PROTECTED BY GFCI TYPE CIRCUIT BREAKERS SHALL NOT CARRY NON-GFCI PROTECTED CIRCUITS.
3. INSTALL AND CONNECT A CODE SIZE INSULATED OR BARE COPPER GROUNDING CONDUCTOR IN ALL CONDUIT RUNS. PERMANENTLY GROUND AND BOND TRANSFORMERS, ELECTRICAL CABINETS, MOTORS, CONDUITS, AND METAL IN AND AROUND THE WATER FEATURE (S) PER NEC 680.54.
4. EQUIPOTENTIAL BONDING AND GROUNDING IS REQUIRED BY NEC 250 AND 680 FOR ALL ELECTRICALLY CONDUCTIVE MATERIALS LOCATED IN AND AROUND THE WATER FEATURE (S). THIS INCLUDES ITEMS THAT MAY BE UNRELATED TO THE WATER FEATURE (S) SUCH AS METAL TRIM, LAMP POSTS, OR RAILINGS. THIS BONDING AND GROUNDING WORK IS THE RESPONSIBILITY OF THE INSTALLING WATER FEATURE ELECTRICAL CONTRACTOR.
5. ALL WIRING AND EQUIPMENT INSIDE THE EQUIPMENT SPACE ARE TO BE SUITABLE FOR CORROSIVE ENVIRONMENTS PER NEC 680.14



02 MEMORIAL PLAZA SECTION - WALL UPLIGHTING CHANNEL

SCALE: 1/2" = 1'-0"

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LANDSCAPE ARCHITECT: BARBARA SWIFT
LICENSE NO. 369

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MEMORIAL STADIUM RENOVATION

369 REPUBLICAN ST SEATTLE, WA 98109

GMP ADDENDUM 1

ISSUE DATE:	04.17.2025

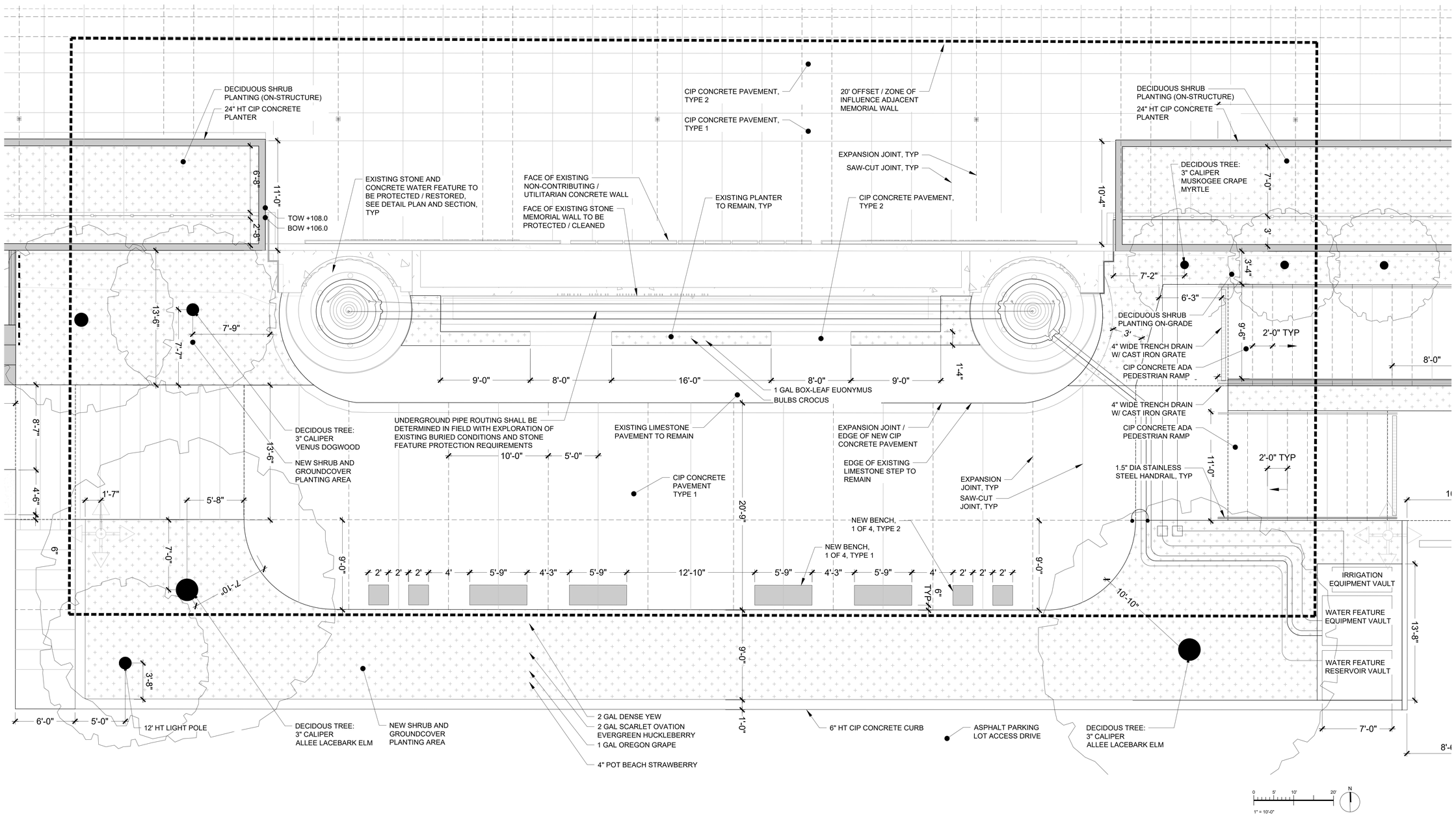
REV	DESCRIPTION	DATE

PROJECT NO.	23018
DRAWN BY:	RN, TB
CHK'D BY:	RN, TB

SHEET TITLE

MEMORIAL WALL DETAILS

L-651



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MEMORIAL STADIUM RENOVATION

369 REPUBLICAN ST SEATTLE, WA 98109

LANDMARKS PRESERVATION BOARD CERTIFICATE OF APPROVAL

ISSUE DATE: 04.04.2025

REV	DESCRIPTION	DATE

PROJECT NO. 23018
DRAWN BY: xx
CHK'D BY: xx
SHEET TITLE

MEMORIAL ENLARGED PLAN

L-210

6. PRODUCT CUT SHEETS

NeoLiviano Bench

Product Data Sheet

The NeoLiviano bench is a lyrical variation on NeoRomantico. Lighter in structure and form it has arms for extra comfort. Its slim profile coupled with a strong cast aluminum structure and wood slat seat and back make it versatile seating for both public and private spaces.

Bench

- Benches are available backed or backless.
- Bench can be freestanding, surface mounted, or embedded.
- Supports come in an anodized finish with no color options.
- Center arm option available for 118" bench only.
- Available only in Jarrah and Domestically Sourced Thermally Modified Ash (DSTMA)

Finishes

- Anodized Aluminum Finish for Supports.
- Unfinished Exterior Woods.
- Interior Woods with LF-80 Finish.

Designed by Miguel Milá for Urbidermis

Click here for patent information related to this product.

Backed	Style	Depth	Width	Height	Product Weight
	24"	26.5"	24"	31"	47 lb
	69"	26.5"	69"	31"	96 lb
	118"	26.5"	118"	31"	155 lb
	118" w/ center arm	26.5"	118"	31"	157 lb

Backless	Style	Depth	Width	Height	Product Weight
	24"	19.5"	24"	17"	27 lb
	59"	19.5"	59"	17"	51 lb
	118"	19.5"	118"	17"	96 lb

Visit landscapeforms.com for more information. Specifications are subject to change without notice. Landscape Forms supports the Landscape Architecture Foundation at the Second Century level.

landscapeforms.com | specify@landscapeforms.com

Specification Sheet

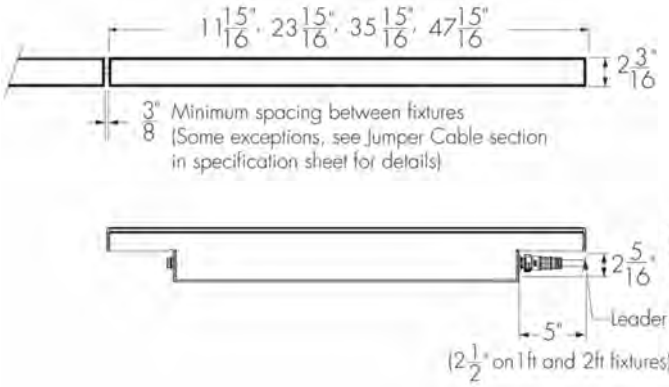
Lumenfacade

Max
Continuous Run
LFM-CR

WHITE AND STATIC COLORS

Project Name _____ **Qty** _____

Type _____ **Catalog / Part Number** _____



Top View

Front and Side Views
36 in Fixtures Shown

Photometric Summary (22 W/ft)

Symmetric

	Delivered Output (lm)	Intensity (Peak cd)
8°x8°	7,602	263,370
10°x10°	7,546	177,057
10°x30°	7,389	53,191
10°x60°	8,235	34,119
10°x90°	7,622	16,605
30°x30°	7,247	20,690
30°x60°	7,209	10,898
30°x90°	6,667	7,599
60°x60°	7,151	6,492
90°x90°	6,983	4,331
30°x10°	7,025	46,242
60°x10°	7,296	29,035
60°x30°	7,166	12,296
90°x10°	6,948	16,830
W (120°)	5,623	1,933

Asymmetric

NAS	7,024	93,225
WW	6,710	11,503
CAS	5,606	10,839

Based on 4000K, 4ft [1218mm], DMX/RDM control.
Photometric performance is measured in compliance with IESNA LM-79-08.
8x8, 10x10, 10x30, 10x60, 10x90, 30x30, 30x60, 30x90, 60x60, 90x90, 30x10, 60x10, 60x30, 90x10, W and CAS optics tested with CL lens.
NAS and WW optics tested with HFR lens.

Description

The Lumenfacade Max Continuous Run supplies you with beautiful, clean white light and static colours through our in-house designed optics that can compliment the Lumenfacade Pure while supplying extra features and higher output.

Features

Length (nominal)	**12:** 12 in , **24:** 24 in , **36:** 36 in , **48:** 48 in
Color and Color Temperature	**22K:** 2200K **27K:** 2700K **30K:** 3000K **35K:** 3500K **40K:** 4000K **RD:** Red **GR:** Green **BL:** Blue **AMB:** Phosphor Converted Amber (PC Amber)
Vibration Rating	**NVR:** No Vibration Rating Required **VRN:** Vibration Rated for Normal Applications **VRBO:** Vibration Rated for Bridge and Overpass
Fixed Mounting Options	**FX:** Fixed Mounting (0˚ Pivot Limit)

Optic


8° x 8°


10° x 10°


10° x 30°


10° x 60°


10° x 90°


30° x 30°


30° x 60°


30° x 90°


60° x 60°


90° x 90°


30° x 10°


60° x 10°


60° x 30°


90° x 10°


Wide 120°


Narrow Asymmetric


Asymmetric Wallwash


Ceiling Asymmetric

Color and Color Temperature


2200K


2700K


3000K


3500K


4000K


Red


Green


Blue


Phosphor Converted Amber (PC Amber)

Control

ON/OFF

0-10V

DALI 2 T6

DMX/RDM

Continuously Adjustable Mounting Options	**SM:** Slim Adjustable Mounting Continuously Adjustable (110˚ Pivot Limit) **WMC3:** Wall Mounting Continuously Adjustable, 3.5 in to Optical Center (130˚ Pivot Limit) **WMC12:** Wall Mounting Continuously Adjustable, 12 in to Optical Center (180˚ Pivot Limit) **WMC24:** Wall Mounting Continuously Adjustable, 24 in to Optical Center (180˚ Pivot Limit)	**WMC1:** Wall Mounting Continuously Adjustable, 1.5 in to Optical Center (180˚ Pivot Limit) **WMC6:** Wall Mounting Continuously Adjustable, 6 in to Optical Center (170˚ Pivot Limit) **WMC18:** Wall Mounting Continuously Adjustable, 18 in to Optical Center (180˚ Pivot Limit)
Incrementally Adjustable Mounting Options	**WMi1:** Wall Mounting Incrementally Adjustable by 6˚, 1.5 in to Optical Center (180˚ Pivot Limit) **WMi6:** Wall Mounting Incrementally Adjustable by 6˚, 6 in to Optical Center (170˚ Pivot Limit) **WMi18:** Wall Mounting Incrementally Adjustable by 6˚, 18 in to Optical Center (180˚ Pivot Limit)	**WMi3:** Wall Mounting Incrementally Adjustable by 6˚, 3.5 in to Optical Center (130˚ Pivot Limit) **WMi12:** Wall Mounting Incrementally Adjustable by 6˚, 12 in to Optical Center (180˚ Pivot Limit) **WMi24:** Wall Mounting Incrementally Adjustable by 6˚, 24 in to Optical Center (180˚ Pivot Limit)
Optical Accessories	**LV:** Radial Louver **LVAS:** Radial Louver Asymmetric **VS:** Visor **SH:** Shield	
Warranty	5-year limited warranty	

Performance

Maximum Delivered Output	4,958 lm (10 W/ft, 48 in fixture, 4000K CRI 80+, 10° x 60°, CL Lens, DMX/RDM) 8,235 lm (22 W/ft, 48 in fixture, 4000K CRI 80+, 10° x 60°, CL Lens, DMX/RDM)
Maximum Delivered Intensity	158,579 cd at nadir (10 W/ft, 48 in fixture, 4000K CRI 80+, 8° x 8°, CL Lens, DMX/RDM) 263,370 cd at nadir (22 W/ft, 48 in fixture, 4000K CRI 80+, 8° x 8°, CL Lens, DMX/RDM)
Illuminance at Distance	Minimum 1 fc at 398 ft (10 W/ft, 48 in fixture, 4000K CRI 80+, 8° x 8°, CL Lens, DMX/RDM) Minimum 1 fc at 513 ft (22 W/ft, 48 in fixture, 4000K CRI 80+, 8° x 8°, CL Lens)
Color Consistency	2 SDCM

WHITE AND STATIC COLORS

Finish


Black Sandtex®


Bronze Sandtex®


Silver Sandtex®


Smooth White


Textured Black


Textured Bronze Non-Metallic


Textured Medium Gray


Textured Green

Textured White


Custom Color & Finish

Certifications






Lumen Maintenance	For 22K, 27K, 30K, 35K, 40K: L70 (10K) > 60,000 hrs Ta 25 °C (TM-21 reported) L70 > 150,000 hrs Ta 25 °C (projected)* L90 (10K) = 55,600 hrs Ta 25 °C (TM-21 reported) L90 = 55,600 hrs Ta 25 °C (projected)* *Estimated based on in-situ case temperature and LM-80 report For RD, GR, BL, AMB: L70 (15K) > 90,000 hrs Ta 25 °C (TM-21 reported) L70 > 150,000 hrs Ta 25 °C (projected)* L90 (15K) = 55,400 hrs Ta 25 °C (TM-21 reported) L90 = 55,400 hrs Ta 25 °C (projected)* *Estimated based on in-situ case temperature and LM-80 report
Color Rendering	CRI 80+ (applicable to 22K, 27K, 30K, 35K and 40K color temperatures only) Consult factory for CRI 90+

Physical

Housing Material	Low copper content extruded aluminum
Lens Material	Tempered glass
Hardware Material	Stainless steel
End Cap Material	Die cast aluminum
Gasket Material	Silicone
Surface Finish	**XD:** Luminaire treated with extra-durable, multi-step finish: zirconium pretreatment completed with corrosion-resistant primer and electrostatically-applied, powder coat paint finish
Weight	4.5 lbs (12 in fixture) 7.5 lbs (24 in fixture) 11.5 lbs (36 in fixture) 14.5 lbs (48 in fixture)

Electrical and Control

Voltage	120 to 277 volts (UL certification) 220 to 240 volts (CE certification, Class I)
Wattage	**10W:** 10 W/ft , **22W:** 22 W/ft
Control	**NO:** On/Off Control , **DIM:** 0-10V Dimming , **DALI:** DALI 2 T6 Control , **LT:** Lumentalk , **DMX/RDM:** DMX/RDM Enabled
Inrush Current (Peak)	Meets NEMA-410 requirements (Based on voltage and control specifications, consult factory for details)

Environmental

Storage Temperature	-40 °F to 185 °F
Start-up Temperature	-40 °F to 122 °F
Operating Temperature	For 10 W/ft fixtures: -40 °F to 122 °F For 22 W/ft fixtures: -40 °F to 104 °F

Ingress Protection Rating	IP66 IP67 (suitable for applications with temporary immersion in water only (no permanent immersion), proper drainage around the fixture is required). Consult factory for details
Impact Resistance Rating	IK07 (CL lens), IK07 (HFR lens), IK06 (FR lens) Consult factory for IK08 lens option
Application Wind Speed	Luminaires were designed based on AASHTO 2013 standard to ensure highest quality and safety. Installation should be validated by a local project engineer to ensure the luminaires are suitable for the wind speed and exposure of the specific application
Environment	Wet location

Accessories (Order Separately)

Cables	**LFLC:** Lumenfacade Leader Cable **LFJC:** Lumenfacade Jumper Cable **LFTJ:** Lumenfacade T-Junction

Photometric Information

10 W/ft (3000K)

Symmetric	Delivered Output (lm)	Intensity (Peak cd)
8°x8°	4,243	147,002
10°x10°	4,212	98,826
10°x30°	4,124	29,689
10°x60°	4,596	19,044
10°x90°	4,254	9,268
30°x30°	4,045	11,548
30°x60°	4,024	6,083
30°x90°	3,721	4,241
60°x60°	3,992	3,624
90°x90°	3,898	2,417
30°x10°	3,921	25,810
60°x10°	4,072	16,206
60°x30°	4,000	6,863
90°x10°	3,878	9,394
W (120°)	3,139	1,079
Asymmetric		
NAS	3,921	52,034
WW	3,745	6,421
CAS	3,129	6,050

Based on 3000K, 48 in, DMX/RDM control configuration.

22 W/ft (3000K)

Symmetric	Delivered Output (lm)	Intensity (peak cd)
8°x8°	7,047	244,144
10°x10°	6,996	164,132
10°x30°	6,849	49,308
10°x60°	7,634	31,628
10°x90°	7,065	15,393
30°x30°	6,718	19,180
30°x60°	6,683	10,102
30°x90°	6,180	7,044
60°x60°	6,629	6,018
90°x90°	6,473	4,014
30°x10°	6,512	42,866
60°x10°	6,763	26,915
60°x30°	6,643	11,398
90°x10°	6,440	15,601
W (120°)	5,213	1,792
Asymmetric		
NAS	6,511	86,419
WW	6,220	10,664
CAS	5,197	10,048

Based on 3000K, 48 in, DMX/RDM control configuration.

Photometric performance is measured in compliance with IESNA LM 79-08.
8x8, 10x10, 10x30, 10x60, 10x90, 30x30, 30x60, 30x90, 60x60, 90x90, 30x10, 60x10, 60x30, 90x10, W and CAS optics tested with CL lens. NAS and WW optics tested with HFR lens.

10 W/ft (4000K)

Symmetric

	Delivered Output (lm)	Intensity (Peak cd)
8°x8°	4,577	158,579
10°x10°	4,544	106,608
10°x30°	4,449	32,027
10°x60°	4,958	20,543
10°x90°	4,589	9,998
30°x30°	4,363	12,458
30°x60°	4,341	6,562
30°x90°	4,014	4,575
60°x60°	4,306	3,909
90°x90°	4,205	2,607
30°x10°	4,230	27,843
60°x10°	4,393	17,482
60°x30°	4,315	7,404
90°x10°	4,183	10,133
W (120°)	3,386	1,164

Asymmetric

NAS	4,229	56,132
WW	4,040	6,926
CAS	3,375	6,526

Based on 4000K, 48 in, DMX/RDM control configuration.

22 W/ft (4000K)

Symmetric

	Delivered Output (lm)	Intensity (Peak cd)
8°x8°	7,602	263,370
10°x10°	7,546	177,057
10°x30°	7,389	53,191
10°x60°	8,235	34,119
10°x90°	7,622	16,605
30°x30°	7,247	20,690
30°x60°	7,209	10,898
30°x90°	6,667	7,599
60°x60°	7,151	6,492
90°x90°	6,983	4,331
30°x10°	7,025	46,242
60°x10°	7,296	29,035
60°x30°	7,166	12,296
90°x10°	6,948	16,830
W (120°)	5,623	1,933

Asymmetric

NAS	7,024	93,225
WW	6,710	11,503
CAS	5,606	10,839

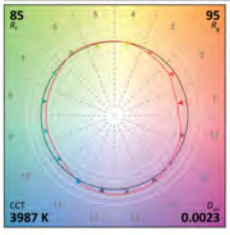
Based on 4000K, 48 in, DMX/RDM control configuration.

Photometric performance is measured in compliance with IESNA LM 79-08.
8x8, 10x10, 10x30, 10x60, 10x90, 30x30, 30x60, 30x90, 60x60, 90x90, 30x10, 60x10, 60x30, 90x10, W and CAS optics tested with CL lens. NAS and WW optics tested with HFR lens.

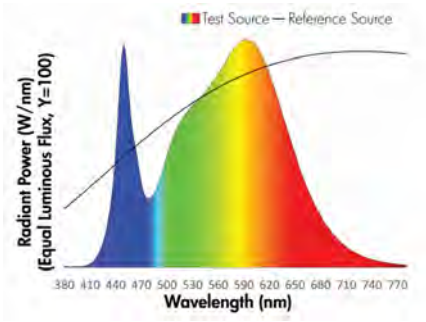
Chromaticity Data

TM-30 - 4000K

CCT	CIE		TM-30	
4000K	R_a	82	85	R_f
	R_9	3	95	R_g

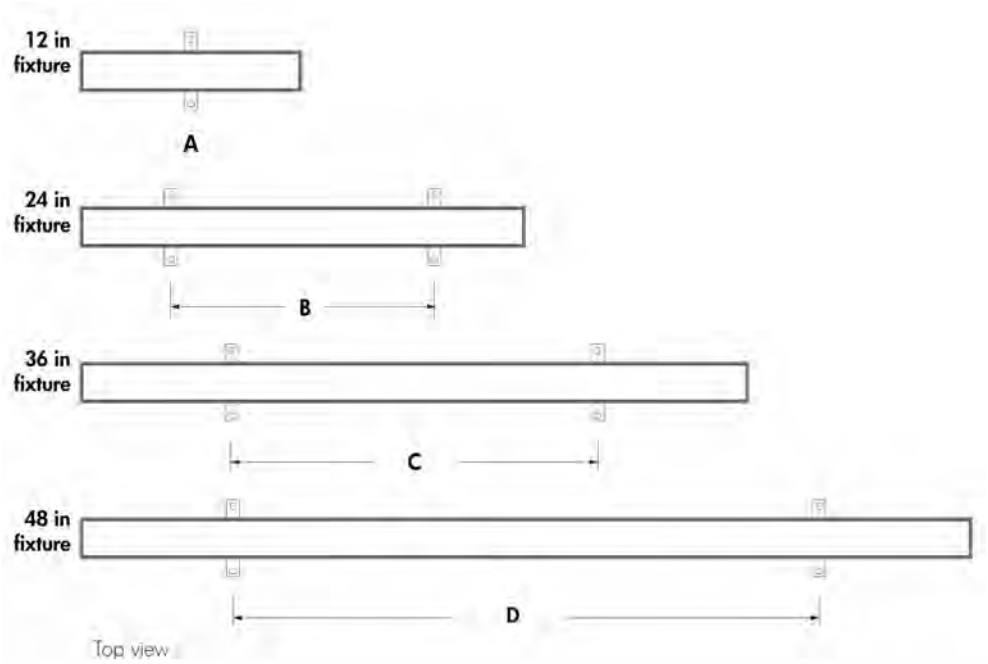


Spectral Power Distribution



Refer to the TM-30 and Spectral Power Distribution Guide on the website for information on other color temperatures.

Mounting Bracket Placement (Minimum and Maximum Distances)



A - Bracket in the center of the fixture
B - Minimum 14 in to maximum 17 in
C - Minimum 20 1/2 in to maximum 23 1/2 in
D - Minimum 30 1/2 in to maximum 33 1/2 in

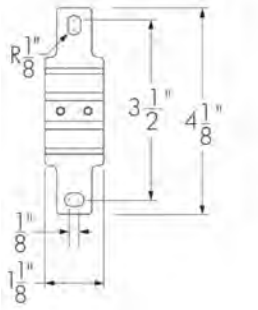
FX mounting brackets shown.

The mounting bracket(s) must be centered on fixture and as symmetrical as possible. Distances must be respected for all installations.

Mounting Options

FX - Fixed Mounting

FX - Mounting Hole Pattern

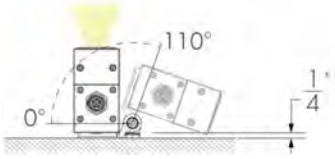


One mounting bracket provided for 12 in fixtures. Two mounting brackets provided for 24 in, 36 in and 48 in fixtures.

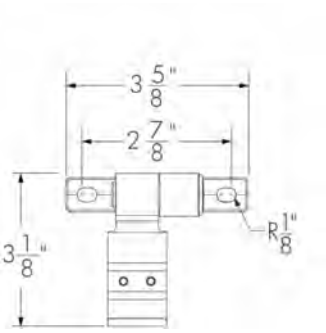
Weight of one FX Mounting Bracket: 0.11 lbs. Weight of two FX Mounting Brackets: 0.22 lbs.

For proper hardware selection, use the dimensions of the mounting option, the weight and EPA values of the mounting option, and the weight and EPA values of the fixture and accessories for your engineering calculations.

SM - Slim Adjustable Mounting



SM - Mounting Hole Pattern



Not suitable when fixture is exposed to wind.

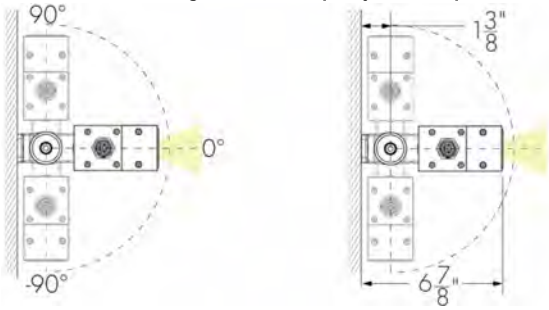
One mounting bracket provided for 12 in fixtures. Two mounting brackets provided for 24 in, 36 in and 48 in fixtures.

Weight of one SM Mounting Bracket: 0.26 lbs. Weight of two SM Mounting Brackets: 0.53 lbs.

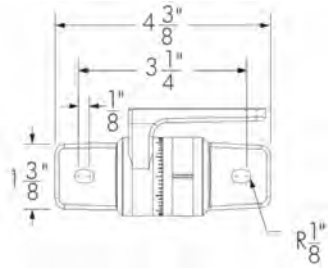
No vibration rating. Not suitable for bridge and overpass applications.

For proper hardware selection, use the dimensions of the mounting option, the weight and EPA values of the mounting option, and the weight and EPA values of the fixture and accessories for your engineering calculations.

WMC1 - Wall Mounting Continuously Adjustable, 1.5 in to Optical Center
WMi1 - Wall Mounting Incrementally Adjustable By 6˚, 1.5 in to Optical Center

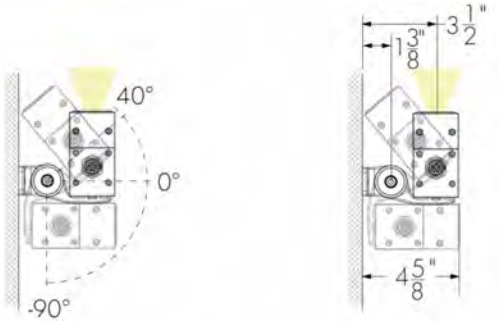


WMC1 WMi1 - Mounting Hole Pattern

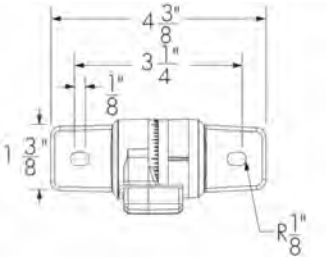


Weight of one WMC1/WMi1 Mounting Bracket: 0.62 lbs.
Weight of two WMC1/WMi1 Mounting Brackets: 1.23 lbs.

WMC3 - Wall Mounting Continuously Adjustable, 3.5 in to Optical Center
WMi3 - Wall Mounting Incrementally Adjustable by 6˚, 3.5 in to Optical Center



WMC3 WMi3 - Mounting Hole Pattern

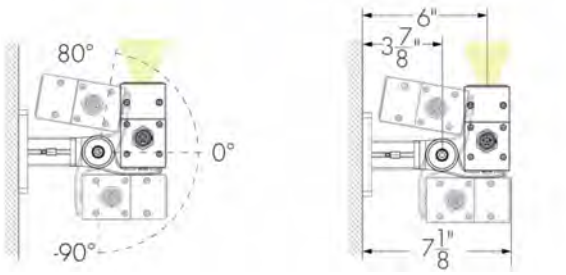


Weight of one WMC3/WMi3 Mounting Bracket: 0.62 lbs.
Weight of two WMC3/WMi3 Mounting Brackets: 1.23 lbs.

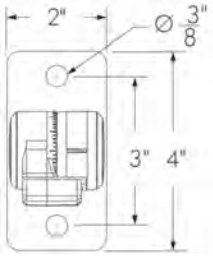
One mounting bracket provided for 12 in fixtures. Two mounting brackets provided for 24 in, 36 in and 48 in fixtures.

For proper hardware selection, use the dimensions of the mounting option, the weight and EPA values of the mounting option, and the weight and EPA values of the fixture and accessories for your engineering calculations.

WMC6 - Wall Mounting Continuously Adjustable, 6 in to Optical Center
WMi6 - Wall Mounting Incrementally Adjustable by 6˚, 6 in to Optical Center

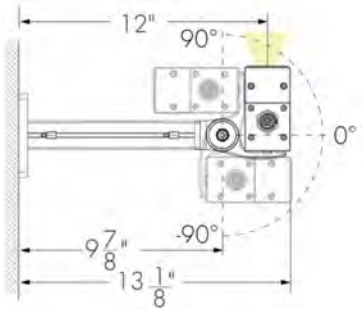


WMC6 WMi6 - Mounting Hole Pattern

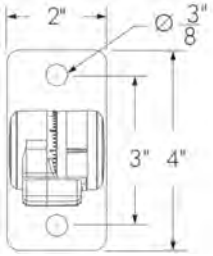


Weight of one WMC6/WMi6 Mounting Bracket: 1.21 lbs.
Weight of two WMC6/WMi6 Mounting Brackets: 2.43 lbs.

WMC12 - Wall Mounting Continuously Adjustable, 12 in to Optical Center
WMi12 - Wall Mounting Incrementally Adjustable by 6˚, 12 in to Optical Center

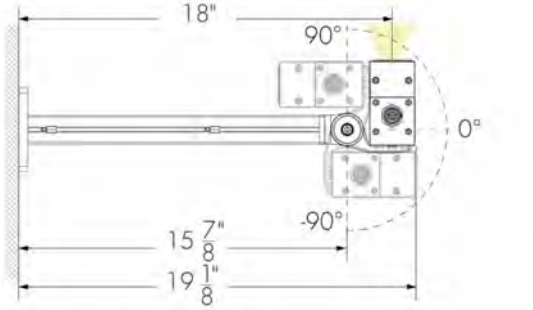


WMC12 WMi12 - Mounting Hole Pattern

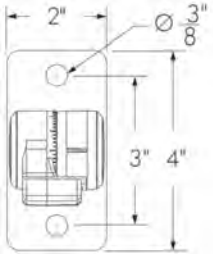


Weight of one WMC12/WMi12 Mounting Bracket: 1.72 lbs.
Weight of two WMC12/WMi12 Mounting Brackets: 3.44 lbs.

WMC18 - Wall Mounting Continuously Adjustable, 18 in to Optical Center
WMi18 - Wall Mounting Incrementally Adjustable by 6˚, 18 in to Optical Center



WMC18 WMi18 - Mounting Hole Pattern

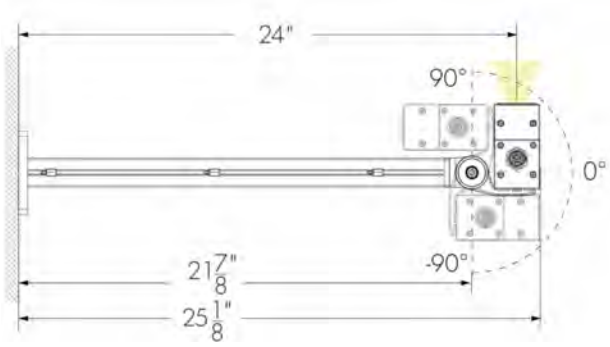


Weight of one WMC18/WMi18 Mounting Bracket: 2.31 lbs.
Weight of two WMC18/WMi18 Mounting Brackets: 4.63 lbs.

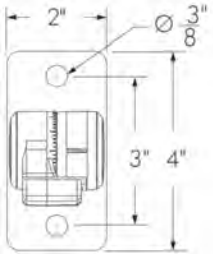
One mounting bracket provided for 12 in fixtures. Two mounting brackets provided for 24 in, 36 in and 48 in fixtures.

For proper hardware selection, use the dimensions of the mounting option, the weight and EPA values of the mounting option, and the weight and EPA values of the fixture and accessories for your engineering calculations.

WMC24 - Wall Mounting Continuously Adjustable, 24 in to Optical Center
WMi24 - Wall Mounting Incrementally Adjustable by 6˚, 24 in to Optical Center



WMC24 WMi24 - Mounting Hole Pattern

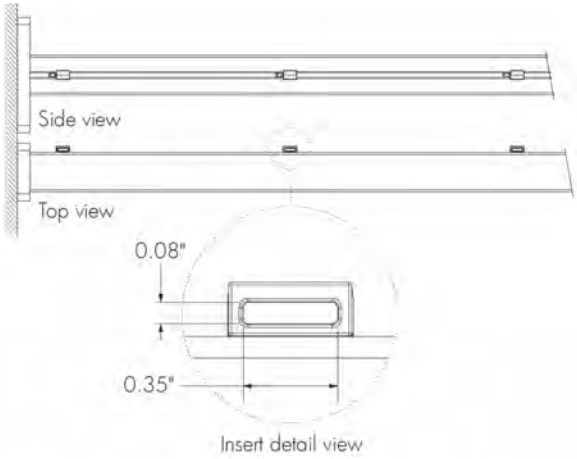


Weight of one WMC24/WMi24 Mounting Bracket: 2.87 lbs.
Weight of two WMC24/WMi124 Mounting Brackets: 5.73 lbs.

One mounting bracket provided for 12 in fixtures. Two mounting brackets provided for 24 in, 36 in and 48 in fixtures.

For proper hardware selection, use the dimensions of the mounting option, the weight and EPA values of the mounting option, and the weight and EPA values of the fixture and accessories for your engineering calculations.

Cable Management System For Wall Mounting Brackets

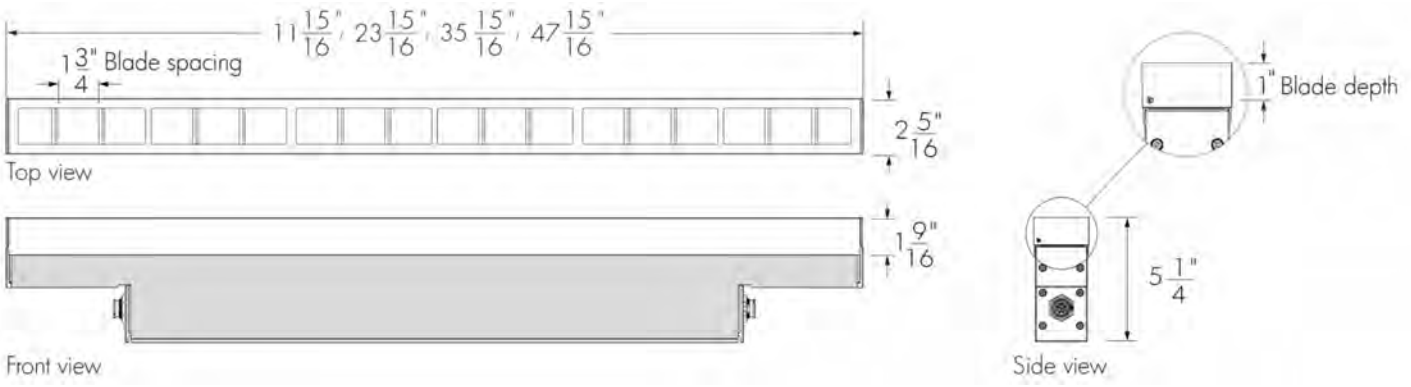


1 cable attachment provided for WMC6 and WMi6 mounting arms.
2 cable attachments provided for WMC12, WMi12, WMC18 and WMi18 mounting arms.
3 cable attachments provided for WMC24 and WMi24 mounting arms.

Maximum cable tie size: 0.35 in width, 0.08 in thickness.
Cable ties for outdoor applications are recommended, provided by others.

Accessories

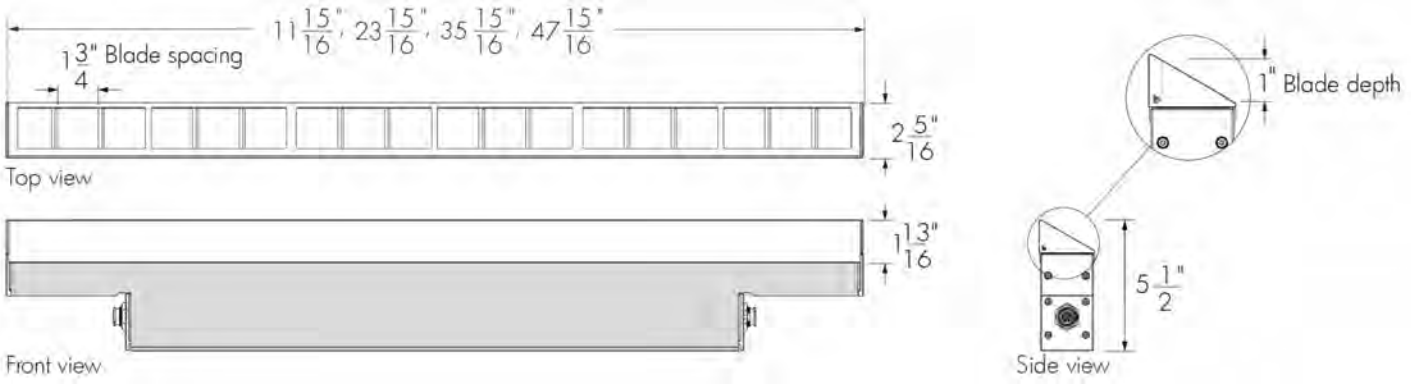
LV - Radial Louver



- A Radial Louver will affect beam distribution. Consult factory for application support.
- The Radial Louver is field installable. The Radial Louver can be combined with the Shield accessory; all other combinations are not possible.
- The exterior finish of the accessory will match the finish specified in the fixture order code (interior surface painted matte black).
- Not suitable for NAS, CAS and WW optics.
- Consult EPA Guide in the specification sheet for engineering calculations.

Weight of 12 in accessory: 0.65 lbs, and 24 in accessory: 1.25 lbs, weight of 36 in accessory: 1.75 lbs, weight of 48 in accessory: 2.3 lbs.
Note: the weight of the accessory is in addition to the weight of the fixture.

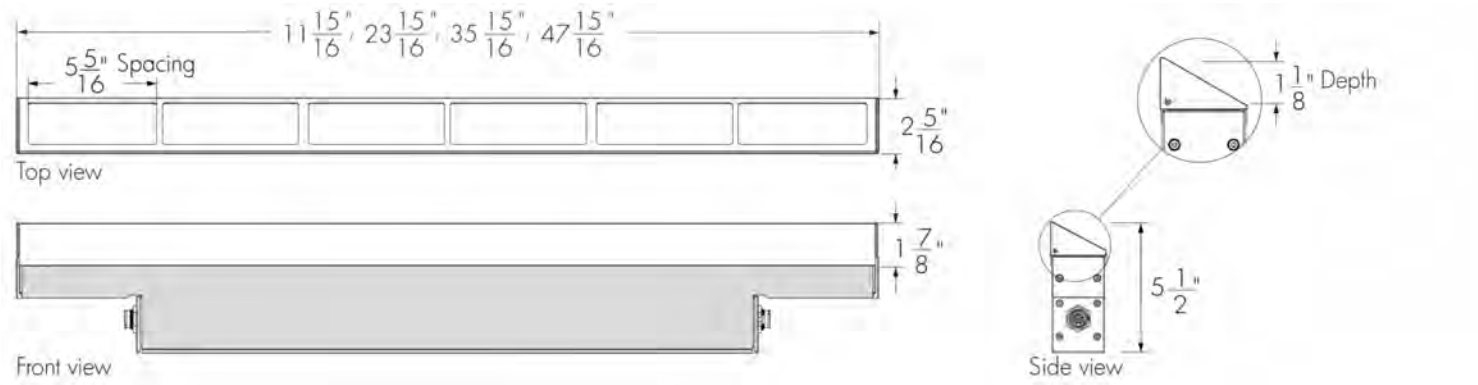
LVAS - Radial Louver Asymmetric



- A Radial Louver Asymmetric will affect beam distribution. Consult factory for application support.
- The Radial Louver Asymmetric is field installable. The Radial Louver Asymmetric can be combined with the Shield accessory; all other combinations are not possible.
- The exterior finish of the accessory will match the finish specified in the fixture order code (interior surface painted matte black).
- Consult EPA Guide in the specification sheet for engineering calculations.

Weight of 12 in accessory: 0.5 lbs, weight of 24 in accessory: 1 lbs, weight of 36 in accessory: 1.3 lbs, weight of 48 in accessory: 1.7 lbs.
Note: the weight of the accessory is in addition to the weight of the fixture.

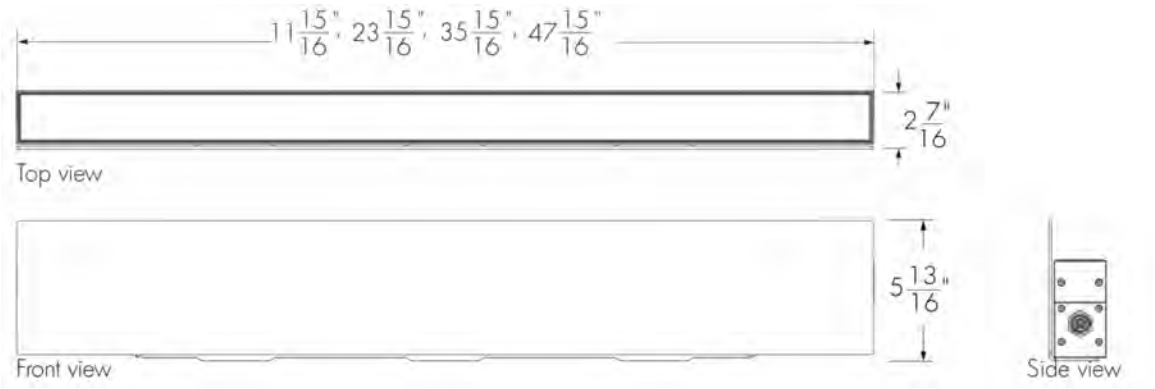
VS - Visor



- A Visor will affect beam distribution. Consult factory for application support.
- The Visor is field installable. The Visor can be combined with the Shield accessory; all other combinations are not possible.
- The exterior finish of the accessory will match the finish specified in the fixture order code with the exception of the inside surface of the Visor end caps, which are painted the same colour as the fixture. Interior surface painted matte black.
- Consult EPA Guide in the specification sheet for engineering calculations.

Weight of 12 in accessory: 0.4 lbs, weight of 24 in accessory: 0.8 lbs, weight of 36 in accessory: 1.2 lbs, weight of 48 in accessory: 1.5 lbs.
Note: the weight of the accessory is in addition to the weight of the fixture.

SH - Shield



- A Shield will affect beam distribution. Consult factory for application support.
- The Shield is field installable. The Shield can be combined with the Louver, Louver Asymmetric or Visor accessories.
- No vibration rating available. The Shield can be installed in zones with wind speeds up to 120 mph. Consult factory for zones with wind speeds higher than 120 mph.
- The exterior finish of the accessory will match the finish specified in the fixture order code (interior surface painted matte black).
- Consult EPA Guide in the specification sheet for engineering calculations.

Weight of 12 in accessory: 2.5 lbs, weight of 24 in accessory: 4.75 lbs, weight of 36 in accessory: 7.25 lbs, weight of 48 in accessory: 9.5 lbs.
Note: the weight of the accessory is in addition to the weight of the fixture.

Lens and Optics Combinations Table (22K, 27K, 30K, 35K, 40K)

Lens/Optics	8x8	10x10	10x30	10x60	10x90	30x30	30x60	30x90	60x60	90x90	30x10	60x10	60x30	90x10	W	NAS	WW	CAS
CL Clear Lens	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	⊗	⊗	✔
HFR Half-Frosted Lens	✔	✔	✔	✔	✔	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	✔	✔	⊗
FR Frosted Lens	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔

✔ Lens option
⊗ Not available

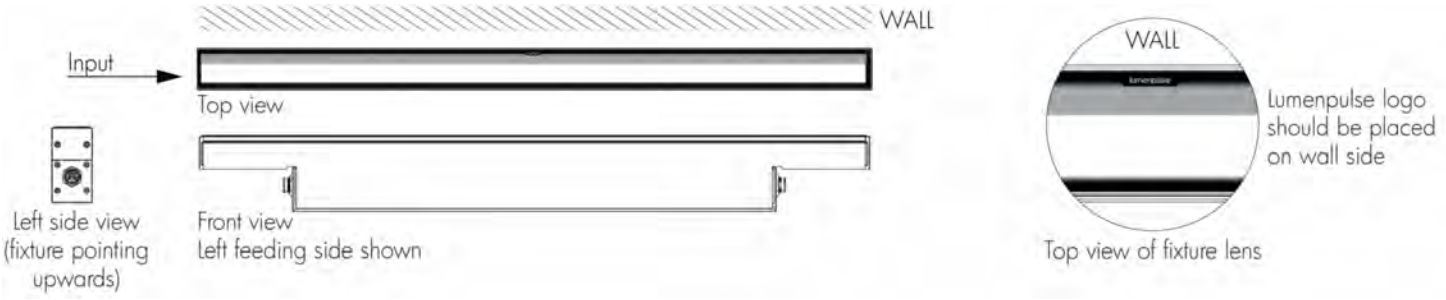
Lens and Optics Combinations Table (RD, GR, BL, AMB)

Lens/Optics	10x10	10x30	10x60	10x90	30x30	30x60	30x90	60x60	90x90	30x10	60x10	60x30	90x10	W	NAS	WW	CAS
CL Clear Lens	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	⊗	✔
HFR Half-Frosted Lens	✔	✔	✔	✔	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	✔	✔	⊗
FR Frosted Lens	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔

✔ Lens option
⊗ Not available

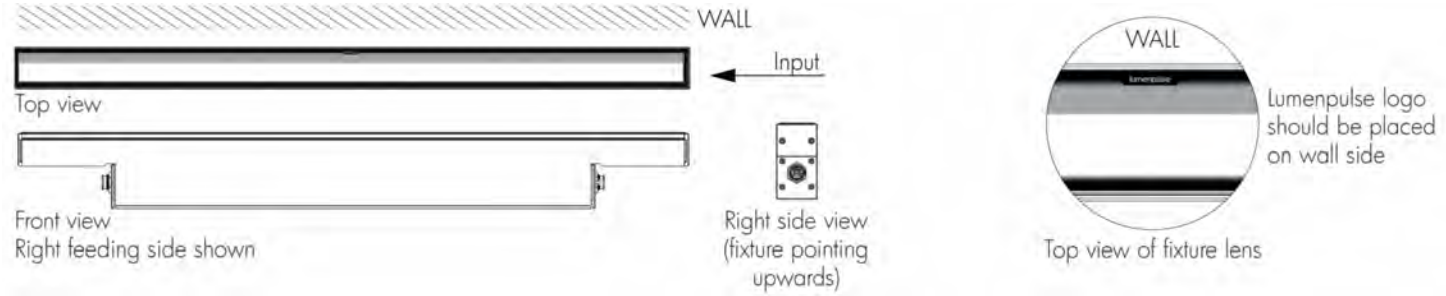
Half-Frosted Lens Details

Left Feeding Side



- Position frosted side of the lens and Lumenpulse logo along the wall.
- Fixture's feeding side is based on uplight installations. Feeding sides are reversed when fixture is used in a downlight application.

Right Feeding Side



- Position frosted side of the lens and Lumenpulse logo along the wall.
- Fixture's feeding side is based on uplight installations. Feeding sides are reversed when fixture is used in a downlight application.

Ceiling Asymmetric Optic Details

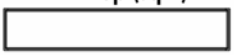
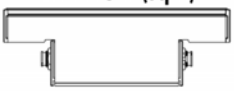
- Always position Lumenpulse logo on lens along the wall.
- Fixture's feeding side is based on uplight installations. Feeding sides are reversed when fixture is used in a downlight application.
- **Ceiling Asymmetric optic guidelines:** 18 in minimum setback, 1:5 setback/canopy depth ratio (based on CL lens).

Narrow Asymmetric and Asymmetric Wallwash Optics Details

- Position frosted side of the lens and Lumenpulse logo along the wall.
- Fixture's feeding side is based on uplight installations. Feeding sides are reversed when fixture is used in a downlight application.
- **Narrow Asymmetric optic guidelines:** 12 in minimum setback,1:10 setback ratio (based on HFR lens).
- **Asymmetic Wallwash optic guidelines:** 6 in minimum setback,1:8 setback ratio (based on HFR lens).

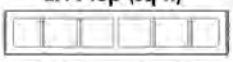
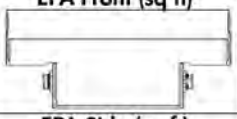
EPA Guide - Fixture

Fixture

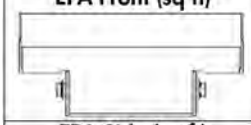
	12 in	24 in	36 in	48 in
EPA Top (sq ft) 	0.237	0.476	0.715	0.954
EPA Front (sq ft) 	0.339	0.784	1.124	1.569
EPA Side (sq ft) 	0.082	0.082	0.082	0.082

EPA Guide - Fixture with Accessory

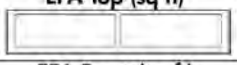
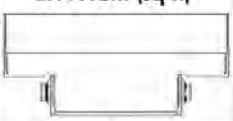
Fixture With Radial Louver Accessory

	12 in	24 in	36 in	48 in
EPA Top (sq ft) 	0.237	0.476	0.715	0.954
EPA Front (sq ft) 	0.464	1.036	1.503	2.075
EPA Side (sq ft) 	0.100	0.100	0.100	0.100

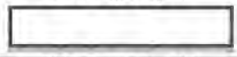
Fixture With Radial Louver Asymmetric Accessory

	12 in	24 in	36 in	48 in
EPA Top (sq ft) 	0.237	0.476	0.715	0.954
EPA Front (sq ft) 	0.476	1.060	1.539	2.123
EPA Side (sq ft) 	0.092	0.092	0.092	0.092

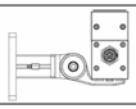
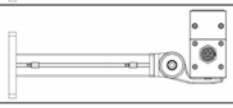
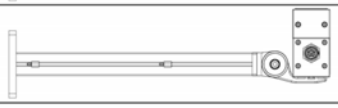
Fixture With Visor Accessory

	12 in	24 in	36 in	48 in
EPA Top (sq ft) 	0.237	0.476	0.715	0.954
EPA Front (sq ft) 	0.476	1.060	1.539	2.123
EPA Side (sq ft) 	0.092	0.092	0.092	0.092

Fixture With Shield Accessory

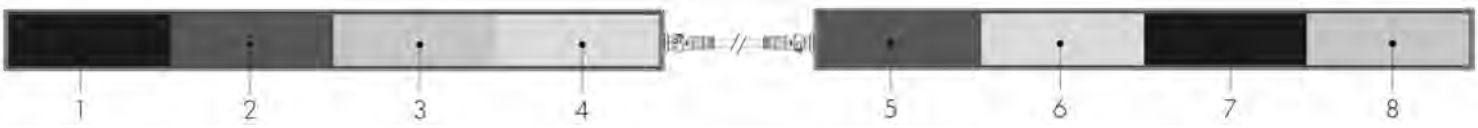
	12 in	24 in	36 in	48 in
EPA Top (sq ft) 	0.237	0.476	0.715	0.954
EPA Front (sq ft) 	0.926	1.859	2.791	3.723
EPA Side (sq ft) 	0.082	0.082	0.082	0.082

EPA Guide - Mounting Option

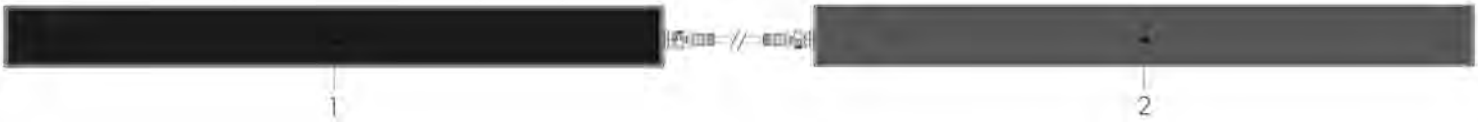
	EPA Top/Side (sq ft)	
FX	N/A	
SM	0.01	
WMC1 WMi1	0.05	
WMC3 WMi3	0.04	
WMC6 WMi6	0.06	
WMC12 WMi12	0.14	
WMC18 WMi18	0.21	
WMC24 WMi24	0.29	

Resolution Details

DMX/RDM Control, Resolution Per Foot: Each 12 in Section is Addressed Independently
DMX Addresses:



DMX/RDM Control, Resolution Per Fixture: Each Fixture is Addressed Independently
DMX Aaddresses:



- 48 in fixtures shown.
- Applicable for DMX/RDM control option only. Fixture resolution can be configured on-site within the LumenID V3 software. A DMX/RDM enabled CBX is required.

Wiring Color Code

NO, DIM, DALI and LT Control (XC3P2D)

UL Color Code	Use
Green	Ground
Black	Line
White	Neutral
Purple	0-10V + / Data +
Orange	0-10V - / Data -

DMX/RDM Control (XC3P3D)

UL Color Code	Use
Green	Ground
Black	Line
White	Neutral
Red	Data +
Orange	Data -
Gray	Signal Common

Maximum Fixture Run Length Table

On/Off Control (NO)

Lumenfacade Max 10W/ft

Voltage	120V	230V	277V
Maximum Run of Fixtures	112ft	268ft	324ft

Lumenfacade Max 22W/ft

Voltage	120V	230V	277V
Maximum Run of Fixtures	64ft	128ft	152ft

Based on 48 in fixtures, NO (on/off) control, 25 ft leader cable for an end-to-end run with 2 ft jumper cables between fixtures. Refer to Typical Wiring Diagrams for Control Protocol specific run length rules.

DMX/RDM Control (DMX/RDM)

Lumenfacade Max 10W/ft

Voltage	120V	230V	277V
Maximum Run of Fixtures	112ft	128ft	128ft

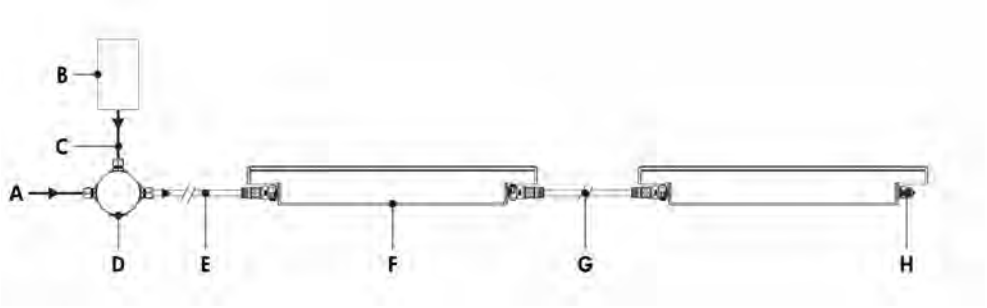
Lumenfacade Max 22W/ft

Voltage	120V	230V	277V
Maximum Run of Fixtures	64ft	128ft	128ft

Based on 48 in fixtures, DMX/RDM control, 25 ft leader cable for an end-to-end run with 2 ft jumper cables between fixtures. Refer to Typical Wiring Diagrams for Control Protocol specific run length rules.

Typical Wiring Diagrams

NO - On/Off Control, DIM - 0-10V Dimming and DALI - DALI 2 T6 Control



A - Power input (120 to 277V, wiring by others)
B - Dimmer/controller (for DIM and DALI control options, by others)
C - Data input (for DIM and DALI control options, wiring by others)
D - Junction box (by others)
E - Leader Cable (LFLC XC3P2D)
F - Lumenfacade Max Continuous Run (LFM-CR)
G - Sealing End Cap

Consult factory for specific applications and maximum fixture count/cable length recommendations.

DIM Control:

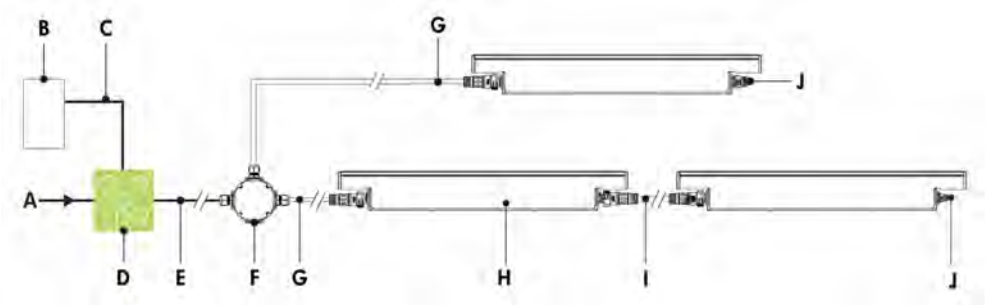
- 0-10V mA ratings: passive dimmer (Current Sink): 3mA per fixture, active dimmer (Current Source): 0.5mA per fixture.
- Less than 1% minimum dimming value

DALI Control:

- 64 DALI addressable device limitation (each fixture is an addressable device).
- DALI does not allow for control by foot, only by fixture.
- Commissioning may be required based on the selection of 3rd party DALI controller. Controller and commissioning provided by others.
- Less than 1% minimum dimming value.

Refer to installation instructions for additional wiring details and wiring diagram with Lumenfacade T-Junction accessory.

Lumentalk (LT)

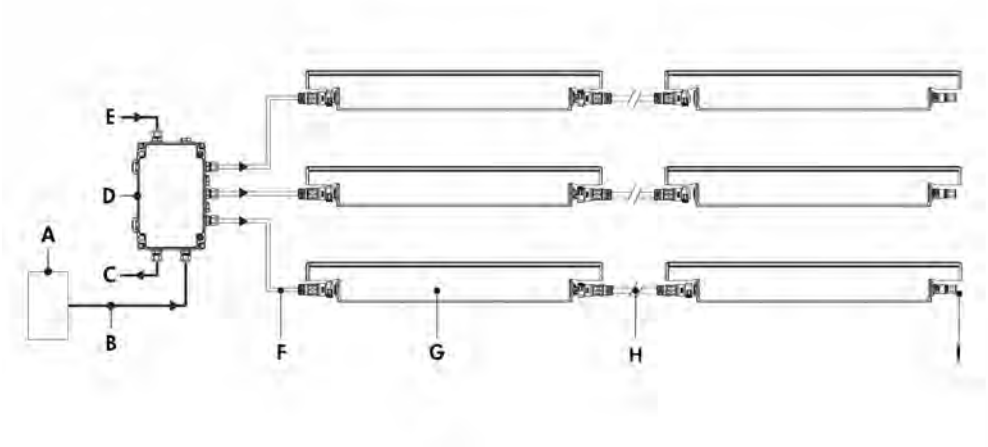


A - Power input (120 to 277V, wiring by others)
B - Dimmer/controller (order separately from Lumenpulse, or by others)
C - Data wiring (by others)
D - Lumentranslator 2 (LTL2-DIM, -DMX, -TRIAC, -DALI)
E - Power wiring (by others)
F - Junction box (by others)
G - Leader Cable (LFLC XC3P2D)
H - Lumenfacade Max Continuous Run LFM-CR
I - Jumper Cable (LFJC XC3P2D)
J - Sealing End Cap

Refer to installation instructions for additional wiring details and wiring diagram with Lumenfacade T-Junction accessory.

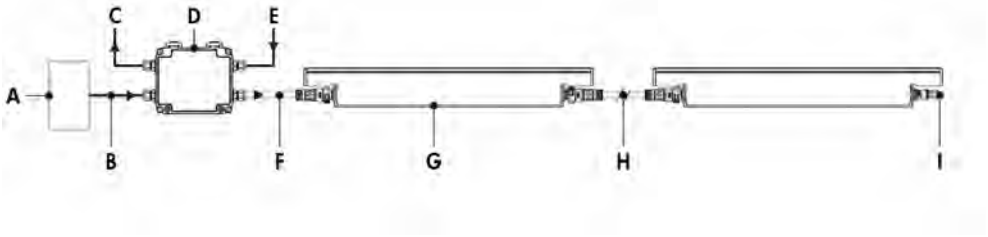
- Consult factory for specific applications and maximum fixture count/cable length recommendations.
- For DMX applications: 1 DMX controller per Lumentalk network, maximum of 48 DMX channels per Lumentalk network (minimum step transition update rate is 1 second, minimum fade time between two colors is 1 minute). Consult factory for applications that require additional capabilities.
- Maximum of 1 transmitter (Lumentranslator or Lumenlink) per system.
- No third-party fixtures allowed on the same circuit.
- Consult factory for DALI Lumentalk applications.

Star Layout (DMX/RDM)



A - Third-party DMX/RDM controller
B - Data input (Belden 9841 or equivalent, by others)
C - Data output to next CBX (optional, not isolated/not boosted)
D - CBX-ST
E - Power input (120 to 277V, wiring by others)
F - Leader Cable (LFLC XC3P3D)
G - Lumenfacade Max Continuous Run (LFM-CR)
H - Jumper Cable (LFJC XC3P3D)
I - DMX/RDM Terminator

Daisy Chain Layout (DMX/RDM)



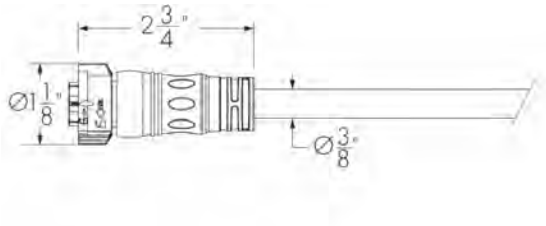
A - Third-party DMX/RDM controller
B - Data input (Belden 9841 or equivalent, by others)
C - Data output to next CBX (optional, not isolated/not boosted)
D - CBX-DS
E - Power input (120 to 277V, wiring by others)
F - Leader Cable (LFLC XC3P3D)
G - Lumenfacade Max Continuous Run (LFM-CR)
H - Jumper Cable (LFJC XC3P3D)
I - DMX/RDM Terminator

Refer to installation instructions for additional wiring details.

- Consult CBX installation instructions for additional wiring details.
- 1000 ft maximum DMX/RDM "Bus" length.
- 1 DMX universe = 128 @ 3-channel controllable segments.
- Maximum of 4 DMX/RDM repeaters/CBX cascading in line.
- Maximum of 6 outputs per CBX-ST; maximum of 1 output per CBX-DS.

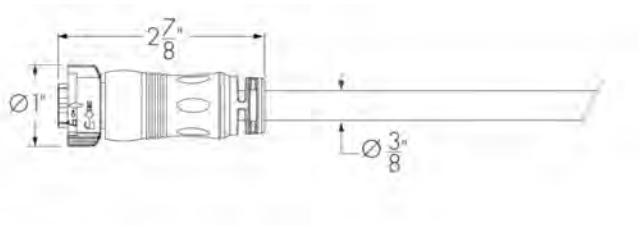
Leader Cable (Order Separately)

LFLC - Lumenfacade Leader Cable (XC3P2D)



UL version shown. Consult European specification sheet for CE cable details.

LFLC - Lumenfacade Leader Cable (XC3P3D)



UL version shown. Consult European specification sheet for CE cable details.

LFLC-**TYPE-CERTIFICATION-VOLTAGE-LENGTH-CONNECTOR/CABLE TYPE-CONNECTOR SHAPE-CABLE/CONNECTOR COLOR**

Please specify:
NO, DIM, DALI, LT applications:
TYPE: CR/CH (Continuous Run or Continuous Horizontal); **CERTIFICATION**: UL or CE; **VOLTAGE:** 120_277; **LENGTH**: 10 ft, 25 ft, 50 ft, 100 ft, 150 ft or 200 ft; **CONNECTOR/CABLE TYPE:** XC3P2D (5x 16AWG X-lock size); **CONNECTOR SHAPE:** 180D (Straight Connector); **CABLE/CONNECTOR COLOR**: BK (Black) or WH (White) (connectors are the same color as the specified cable color).

A waterproof sealing end cap is mandatory for any unused connector. One (1) included with every CR/CH XC3P2D Leader Cable.

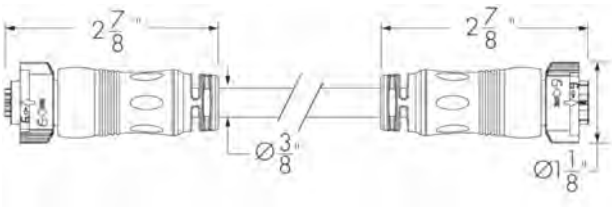
DMX/RDM applications:
TYPE: CR/CH (Continuous Run or Continuous Horizontal); **CERTIFICATION**: UL or CE; **VOLTAGE:** 120_277; **LENGTH**: 10 ft, 25 ft, 50 ft, 100 ft, 150 ft or 200 ft; **CONNECTOR/CABLE TYPE:** XC3P3D (3x14AWG + 3x24AWG X-lock C-size); **CONNECTOR SHAPE:** 180D (Straight Connector) or 90D (90° Angle Connector); **CABLE/CONNECTOR COLOR**: BK (Black) or WH (White) (connectors are the same color as the specified cable color).

A DMX/RDM terminator is mandatory at the end of a fixture run. One (1) included with every CR/CH XC3P3D Leader Cable.

- Consult Lumenfacade Leader cable specification sheet for all available cable lengths and additional information.

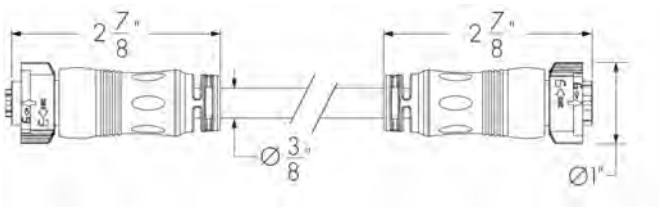
Jumper Cable (Order Separately)

LFJC - Lumenfacade Jumper Cable (XC3P2D)

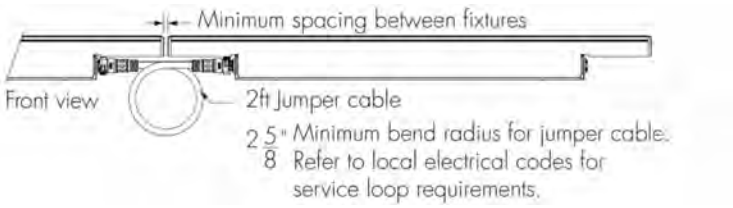


UL version shown. Consult European specification sheet for CE cable details.

LFJC - Lumenfacade Jumper Cable (XC3P3D)



UL version shown. Consult European specification sheet for CE cable details.



LFJC-**CERTIFICATION-VOLTAGE-LENGTH-CONNECTOR/CABLE TYPE-CONNECTOR SHAPE-CABLE/CONNECTOR COLOR**

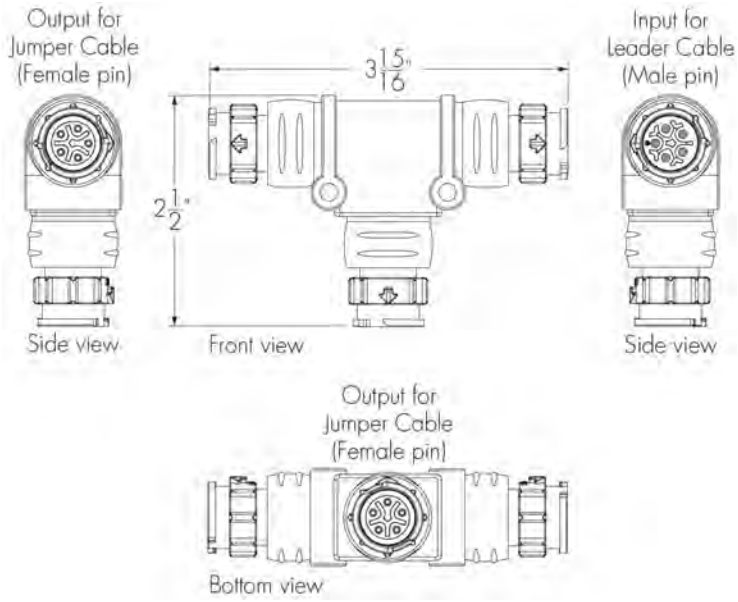
Please specify:
CERTIFICATION: UL or CE; **VOLTAGE:** 120_277; **LENGTH**: 1 ft, 2 ft, 5 ft, 10 ft, 25 ft or 50 ft; **CONNECTOR/CABLE TYPE:** XC3P2D (5x 16AWG X-lock size) or XC3P3D (3x14AWG + 3x24AWG X-lock C-size); **CONNECTOR SHAPE:** 180D (straight connector); **CABLE/CONNECTOR COLOR**: BK (Black) or WH (White) (connectors are the same color as the specified cable color).

- Suitable for dimming/data and non-dimming applications.
- Consult Lumenfacade Jumper Cable specification sheet for additional information.

- For closely spaced fixtures, a minimum jumper cable length of 2 ft is recommended to accommodate a cable loop between fixtures.
- Minimum spacing for 36 in and 48 in fixtures in a row: 0.35 in.
- Minimum spacing for 12 in and 24 in fixtures at the end of a fixture run, next to 36 in and 48 in fixtures: 0.35 in.
- Minimum spacing for 12 in and 24 in fixtures in a row: 2.75 in.
- Minimum bend radius 2.56 in.

T-Junction (Order Separately)

LFTJ - Lumenfacade T-Junction (XC3P2D)
Available For NO, DIM, DALI and LT Control Options Only



LFTJ-**CONNECTOR/CABLE TYPE-CABLE/CONNECTOR COLOR**

Please specify:
CONNECTOR/CABLE TYPE: XC3P2D (5x 16AWG X-lock size); **CABLE/CONNECTOR COLOR**: BK (Black) or WH (White).

- Suitable for dimming/data and non-dimming applications with LFM fixtures.
- Consult factory for guidelines on the use of T-Junctions in a fixture run.
- Consult Lumenfacade T-Junction specification sheet for additional information.

- The T-Junction accessory can be used to connect a feed input, with a throughput to a localized run of fixtures and an output to the rest of your installation.
- Waterproof sealing end cap is mandatory for any unused connector. One (1) included with every T-Junction accessory.

Control Systems (Order Separately)

LTN2 - Lumentone™ 2

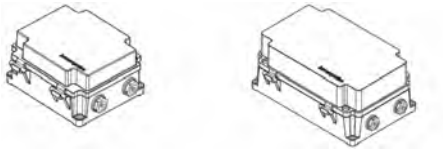
Lumentone 2 is a simple pre-programmed DMX 512 controller with a push button rotary dial and live feedback.

PHAROS - Pharos® Kit

The Pharos kit, available for 1 or 2 DMX universes, allows for complete control of large lighting installations. 2 DMX universes kit shown.

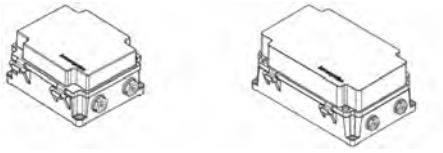
Control Boxes (Order Separately)

CBX-DMX/RDM - DMX/RDM Enabled (Daisy Chain or Star Configuration)



DMX/RDM control box. Up to six power and data outputs to fixtures or fixture runs. Consult CBX specification sheet and installation instructions for details. Lumenterminators provided with CBX (2x for daisy chain configuration, 6x for star configuration), consult factory to order spares.

CBX-ENET - Ethernet Enabled (Daisy Chain or Star Configuration)



Ethernet control box. Up to four power and data outputs to fixture or fixture runs. Consult Ethernet CBX specification sheet and installation instructions for details.

Diagnostic And Addressing Tools (Order Separately)

LID - LumenID

LumenID is a diagnostic and addressing DMX/RDM tool. It must be specified on all DMX applications. Consult LID specification sheet for details.

LID-LT - LumentalkID

LumentalkID is a diagnostic and addressing tool. It must be specified for all Lumentalk (LT) applications. Consult LID-LT specification sheet for details.

How to Order

Housing	Type	Certification	Voltage	Length	Wattage	Color and Color Temperature	Color Rendering [7]	Optic	Lens
LFM Lumenfacade Max	**CR** Continuous Run	**UL** UL Compliant [1] **CE** CE Compliant (Class I) [2] [3]	**120_277** 120 volts to 277 volts [4] **230** 220 to 240 volts [5]	**12** 12 in [4] [6] **24** 24 in **36** 36 in **48** 48 in	**10W** 10 W/ft **22W** 22 W/ft [7]	**22K** 2200K **27K** 2700K **30K** 3000K **35K** 3500K **40K** 4000K **RD** Red [8] [9] **GR** Green [8] [9] **BL** Blue [8] [9] **AMB** Phosphor Converted Amber (PC Amber) [8] [9]	**80** CRI 80+ [10]	**8x8** 8° x 8° [7] [11] **10x10** 10° x 10° [11] **10x30** 10° x 30° **10x60** 10° x 60° **10x90** 10° x 90° **30x30** 30° x 30° [12] **30x60** 30° x 60° [12] **30x90** 30° x 90° [12] **60x60** 60° x 60° [12] **90x90** 90° x 90° [12] **30x10** 30° x 10° [12] **60x10** 60° x 10° [12] **60x30** 60° x 30° [12] **90x10** 90° x 10° [12] **W** Wide 120° [12] **NAS** Narrow Asymmetric [13] [14] **WW** Asymmetric Wallwash [15] **CAS** Ceiling Asymmetric [12]	**CL** Clear Lens [16] **HFR** Half-Frosted Lens [17] **FR** Frosted Lens [18]

Notes:

1. Available for 120_277 voltage option only.
2. Available for 230 voltage option only.
3. Available for 24 in, 36 in and 48 in fixture lengths only.
4. Available for UL certification only.
5. Available for CE certification only.
6. The 12 in length is available for 120_277V voltage option only.
7. Available for 22K, 27K, 30K, 35K and 40K color temperatures only.
8. Available for 10x10, 10x30, 10x60, 10x90, 30x30, 30x60, 30x90, 60x60, 90x90, 30x10, 60x10, 60x30, 90x10, W, NAS, WW and CAS optics only.
9. Available for 10 W/ft version only.
10. Consult factory for CRI 90+.
11. For best results use a miminum 3 in setback from surface. Contact factory for application support.
12. Can be combined with a CL or FR lens only.
13. Can be combined with a HFR or FR lens only for 22K, 27K, 30K, 35K and 40K color temperature options only.
14. Can be combined with a CL, HFR or FR lens for RD, GR, BL, AMB static colors.
15. Can be combined with a HFR or FR lens only.
16. When CL lens is combined with NAS or CAS optic, LF or RF feeding side must be specified.
17. When HFR lens is specified, LF or RF feeding side must be specified.
18. When FR lens is combined with WW, NAS or CAS optic, LF or RF feeding side must be specified.

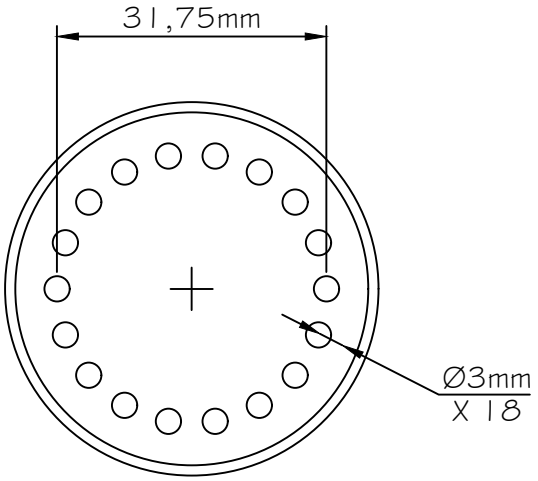
How to Order

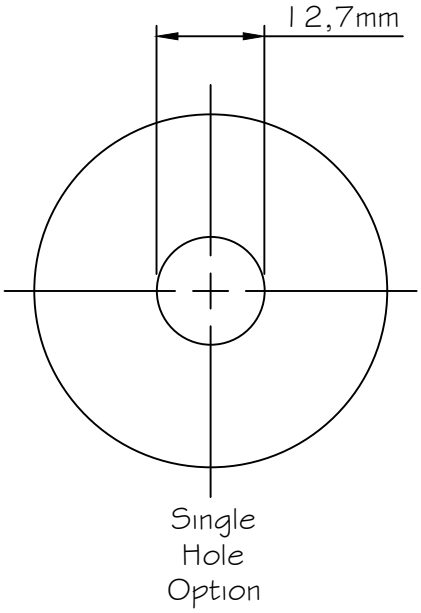
Feeding Side	Control	Vibration Rating	Mounting Option [26]	Environment	Finish	Accessories [38] [39]	Buy America.n Act
NF No Feed Information Required **LF** Left Feeding Side **RF** Right Feeding Side	**NO** On/Off Control **DIM** 0-10V Dimming [19] **DALI** DALI 2 T6 Control [19] [20] **LT** Lumentalk [19] [21] **DMX/RDM** DMX/RDM Enabled [19] [22]	**NVR** No Vibration Rating Required [23] **VRN** Vibration Rated for Normal Applications [24] **VRBO** Vibration Rated for Bridge and Overpass [25]	**SM** Slim Adjustable Mounting Continuously Adjustable (110° Pivot Limit) [27] [28] **FX** Fixed Mounting (0° Pivot Limit) [29] **WMC1** Wall Mounting Continuously Adjustable, 1.5 in to Optical Center (180° Pivot Limit) [28] [30] **WMi1** Wall Mounting Incrementally Adjustable by 6°, 1.5 in to Optical Center (180° Pivot Limit) [29] **WMC3** Wall Mounting Continuously Adjustable, 3.5 in to Optical Center (130° Pivot Limit) [28] [30] **WMi3** Wall Mounting Incrementally Adjustable by 6°, 3.5 in to Optical Center (130° Pivot Limit) [29] **WMC6** Wall Mounting Continuously Adjustable, 6 in to Optical Center (170° Pivot Limit) [28] [31] **WMi6** Wall Mounting Incrementally Adjustable by 6°, 6 in to Optical Center (170° Pivot Limit) [32] **WMC12** Wall Mounting Continuously Adjustable, 12 in to Optical Center (180° Pivot Limit) [28] [31] **WMi12** Wall Mounting Incrementally Adjustable by 6°, 12 in to Optical Center (180° Pivot Limit) [32] **WMC18** Wall Mounting Continuously Adjustable, 18 in to Optical Center (180° Pivot Limit) [28] [31] **WMi18** Wall Mounting Incrementally Adjustable by 6°, 18 in to Optical Center (180° Pivot Limit) [32] **WMC24** Wall Mounting Continuously Adjustable, 24 in to Optical Center (180° Pivot Limit) [27] [28] **WMi24** Wall Mounting Incrementally Adjustable by 6°, 24 in to Optical Center (180° Pivot Limit) [27] [28]	**XD** Extra durable multi-step finish [33] [34]	**BK** Black Sandtex® **BRZ** Bronze Sandtex® **SI** Silver Sandtex® **WH** Smooth White **BKTX** Textured Black **BRZTX** Textured Bronze Non-Metallic **GRATX** Textured Medium Gray **GRNTX** Textured Green **WHTX** Textured White **CC** Custom Color & Finish [35] [36] [37]	**NA** No accessory **LV** Radial Louver [40] **LVAS** Radial Louver Asymmetric **VS** Visor **SH** Shield [27] [41]	**BAA** Buy America.n [4] [42]

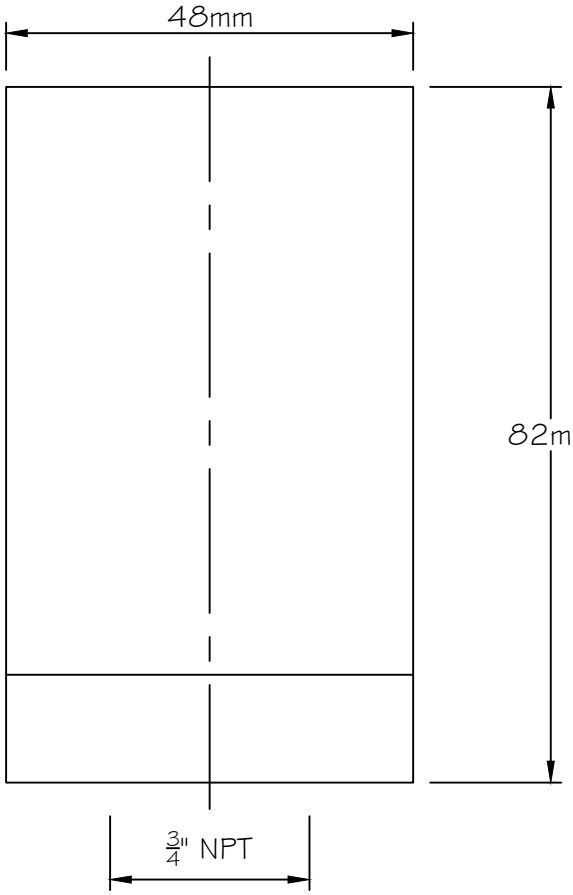
Notes:

4. Available for UL certification only.
19. Minimum dimming value is less than 1%.
20. DALI Type 6 controller required, provided by others.
21. A Lumentranslator 2 (LTL2) and LumentalkID (LIDLT) must be specified for Lumentalk applications. Consult Lumentranslator 2 and Lumentalk pages and specification sheets for details.
22. A Control Box (CBX) and LumenID (LID) must be specified.
23. Available for all mounting options.
24. Available for FX, WMC1, WMi1, WMC3, WMi3, WMC6, WMi6, WMC12, WMi12, WMC18 and WMi18 mounting options.
25. Available for FX, WMi1, WMi3, WMi6, WMi12 and WMi18 mounting options.
26. One mounting bracket provided for 12 in fixtures. Two mounting brackets provided for 24 in, 36 in and 48 in fixtures.
27. Available with NVR vibration rating only.
28. Not suitable for bridge and overpass applications.
29. Vibration tested in accordance with ANSI 136.31 2018 at 3Gv.
30. Vibration tested in accordance with ANSI 136.31 2018 at 1.5Gv.
31. Vibration tested in accordance with ANSI 136.31 2018 at 2.3Gv.
32. Vibration tested in accordance with ANSI 136.31 2018 at 4.6Gv.
33. Zirconium pretreatment completed with corrosion-resistant primer and electrostatically-applied powder coat paint finish.
34. For natatorium or full salt spray applications, consult factory.
35. Lumenpulse offers a wide selection of RAL CLASSIC (K7) colors with a smooth texture and high-gloss finish. Please consult factory for a list of available K7 colors, other RAL textures and glosses, or to match alternate color charts. Final color matching results may vary.
36. Setup charges apply for RAL colors. Consult factory for details.
37. Longer lead times can be expected for custom RAL color finishes.
38. SH accessory can be combined with LV, LVAS or VS accessories. All other combinations are not possible.
39. The exterior finish of the accessory will match the finish specified in the fixture order code (interior surface painted matte black).
40. Available for 8x8, 10x10, 10x30, 10x60, 10x90, 30x30, 30x60, 30x90, 60x60, 90x90, 30x10, 60x10, 60x30, 90x10 and W optics only.
41. Not suitable for bridge and overpass applications. The Shield can be installed in zones with wind speeds up to 120 mph. Consult factory for zones with wind speeds higher than 120 mph.
42. Contact your Lumenpulse Sales Representative for more information on order volume details.

Performance					
Head	3'	5'	7'	9'	11'
GPM	12	15	16	21	23
Head ft	6	16	21	26	31







Single orifice option

Notes:
- Material: Bronze or 316 STN. Steel
- Angle adjustable after Installation.

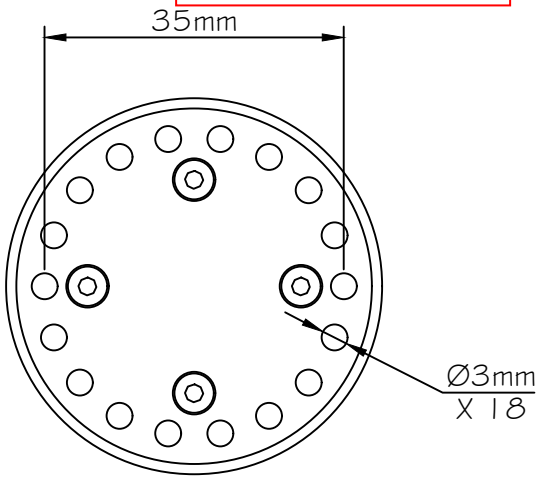
No adjustment option

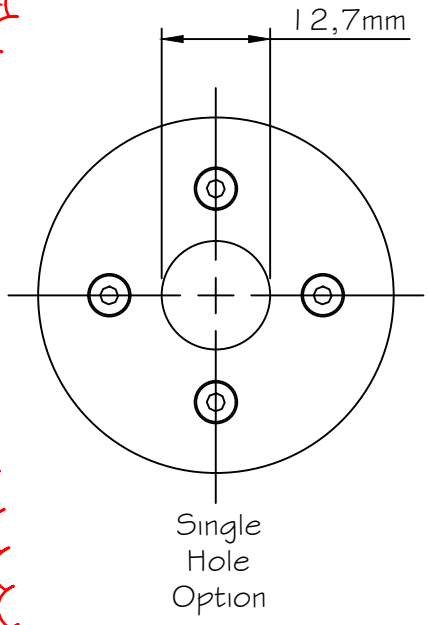
PEM FOUNTAIN CO.	M934 column effect nozzle	
	2012	Made in Canada

Performance

Head	3'	5'	7'	9'	11'
GPM	12	15	16	21	23
Head ft	6	16	21	26	31

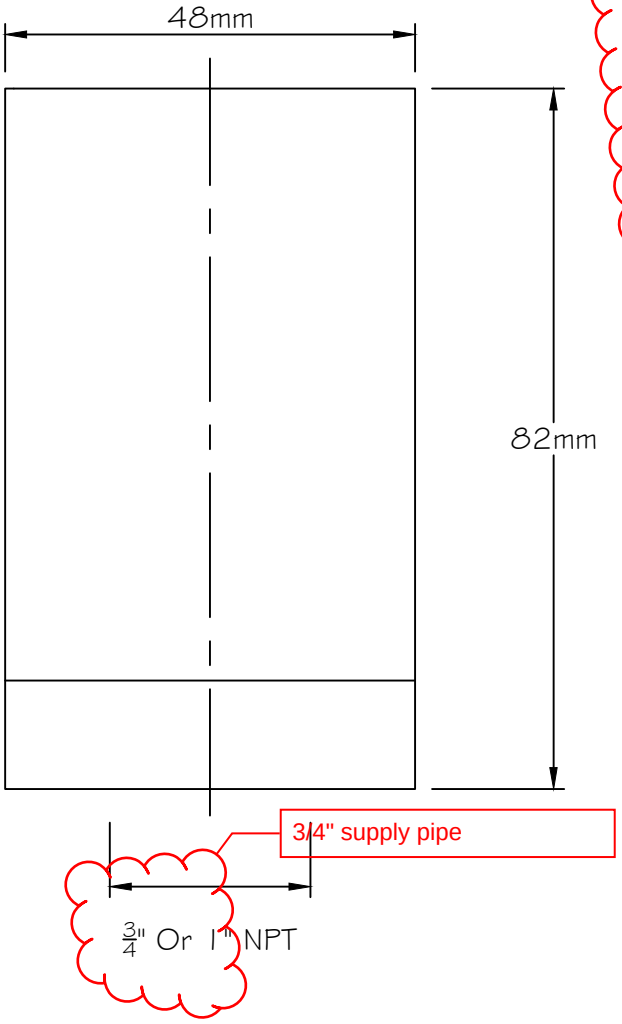
~5 GPM per fixture





Single orifice option

Notes:
- Material: Bronze or 316 STN. Steel
- Angle adjustable after Installation.



With adjustment option

PEM FOUNTAIN CO.	M934
Copyright © by PEM Company	2012
Made in Canada	

The Woda Brass WB3, is a pair of high-performance projectors that are precision-engineered for reliability in underwater, wet/dry, and dry applications. These luminaires are constructed from premium, corrosion-resistant brass and feature an impressive output of up to 2,600 lumens.

The Woda WB3 offers a range of configurable options, including RGBW (with royal blue) and static white CCTs, multiple beam angles, and additional glare control accessories. It ensures precise illumination of water features, sculptural installations, architectural elements, and landscapes, whether submerged or on land.

Easy-to-install with a 1 or 2 hole fixing mount yoke, the Woda WB3 is IP68 factory-sealed, for permanent submersion of up to 33' (10m). Enhance any lighting project with the technical capabilities and elegance of the Woda WB3 , unlocking a realm of design possibilities.

Performance (29 W Option)

Static White & Color[1]	Lumen Output (lm)	Efficacy (lm/W)	Peak Intensity (cd)
3,000 K (80 CRI)	2,390	85	42,800
4,000 K (80 CRI)	2,590	92	46,300

[1] Lumen output values are based on a 29 W luminaire with 10° lens

Dynamic Color[2]	Lumen Output (lm)	Efficacy (lm/W)	Peak Intensity (cd)
RGBW (4,000 K) with Royal Blue	1,530	55	25,900

[2] Lumen output values are based on a 29 W luminaire with 10° lens

Performance (15 W Option)

Static White & Color[1]	Lumen Output (lm)	Efficacy (lm/W)	Peak Intensity (cd)
3,000 K (80 CRI)	1,330	95	23,800
4,000 K (80 CRI)	1,440	103	25,700

[1] Lumen output values are based on a 15 W luminaire with 10° lens

Dynamic Color[2]	Lumen Output (lm)	Efficacy (lm/W)	Peak Intensity (cd)
RGBW (4,000 K) with Royal Blue	880	62	14,400

[2] Lumen output values are based on a 15 W luminaire with 10° lens

Beam Angles	10°, 13°, 20°, 33°, 47°, 20° x 66°, 66° x 20°

powersync™ easyglow™ cooldrive™ microantileach™
opticlear™ humantouch™ electropolish+™

Products and specifications are subject to change without notice.
LS5330-240219

Electrical

Power Consumption	< 15 W, < 29 W
Lifetime	15W: > 179,506 hours @ 95°F (35°C) Water Temperature (B10, L90, TM21 Projected) 29W: > 179,506 hours @ 95°F (35°C) Water Temperature (B10, L90, TM21 Projected)
Input Voltage	Low Voltage 30 Vdc
Thermal Management	CoolDrive™ onboard thermal monitoring and control

Control

Interface	Lumascape **PowerSync™**
Protocols	DMX/RDM, Artnet[1], 0-10 V (sink or source)[2]
PWM Frequency	2 kHz flicker-free dimming to 0.1%
RDM Functionality	PowerSync enabled Lumascape luminaires are shipped with a default RDM personality which provides smooth dimming control. For different dimming characteristics or to enable other special functionalities, the default personality can be changed through industry standard DMX/RDM.
Systems	Range of third-party controllers

[1] Some protocols require additional hardware. For more information and other available protocols contact Lumascape.
[2] Not available for color-changing or tunable white

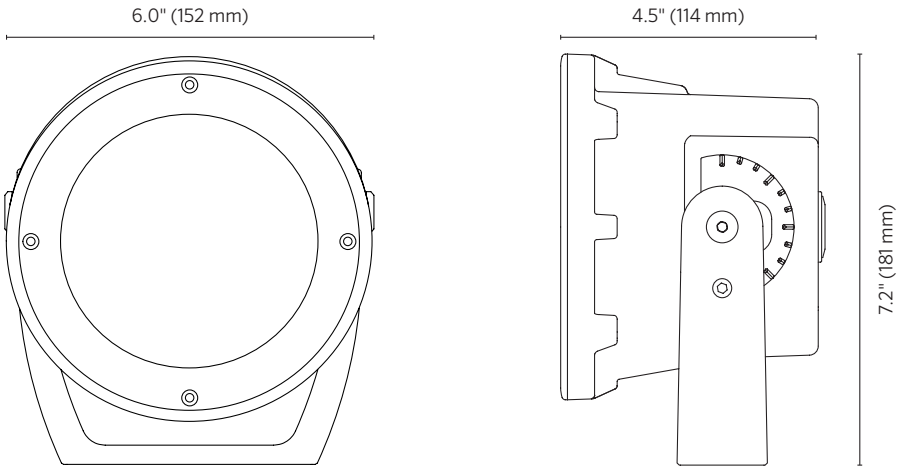
Physical

Housing	Die-cast brass
Installation	Surface-mounted
Adjustable	Multi-positional
Ambient Operating Temperature	-4°F to 122°F (-20°C to 50°C)
Water Temperature	-4°F to 95°F (-20°C to 35°C)
Weight	10.4 lb (4.7 kg)

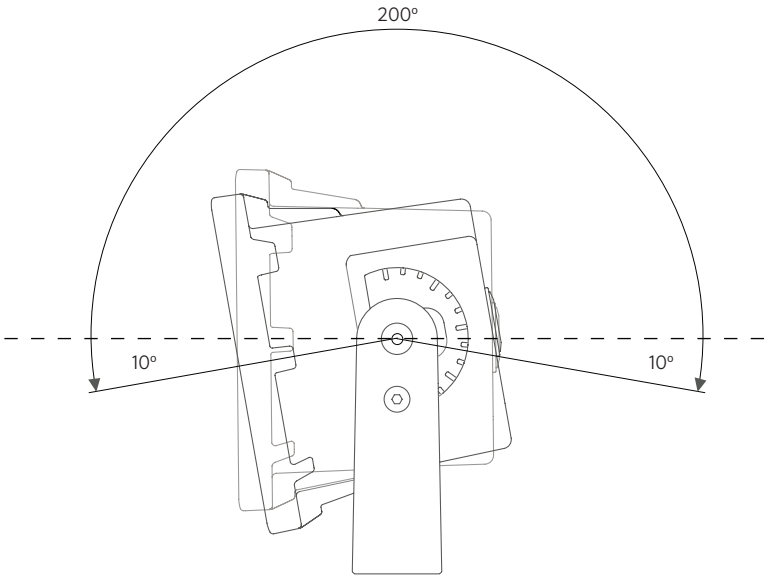
Certification & Compliance

IP Rating	IP68 to 33' (10 m)
IK Rating	IK8
Environment	**15 W & 29 W:** Submersible **15 W Only:** Wet/Dry, Dry locations
Certifications	UL, CE, RCM, FCC

Dimensions



Luminaire Tilt



Specification Matrix

LS5330 – [ ] [ ] [ ] [ ] [ ] [ ] [ ]

Power Consumption	Code
15 W	15D
29 W	29D

Static White & Color	Code
3,000 K (80 CRI)	830
4,000 K (80 CRI)	840

Dynamic Color	Code
RGBW with Royal Blue	4BW

Beam Angles	Code
10°	VN
13°	NR
20°	NM
33°	ME
47°	WD
20° x 66°	WH
66° x 20°	WV

Glare Control	Code
No Louver	N
Snoot Array Louver	S
Honeycomb Louver	H

Input Voltage	Code
30 Vdc (International)	07
30 Vdc (North America)	13

Control	Code
Non-Dimmable	ND[1]
PowerSync®	PS[2]

[1] For single colour, non-dimming applications only.
[2] Required for all dimming and colour changing applications. LS6540 Data Injector is required (order separately).

Cable Length	Code
16 ft (5 m)	016

Accessories

PowerSync Low Voltage 30-48 Vdc Data Injector

Translates control signals into a digital format, delivering integral power and data to intelligent LED luminaires. This allows highly-granular addressing and high-speed digital control of every luminaire, using only three wires. The data injector is DIN rail mountable designed to be installed in a switchboard, next to the power supply and circuit breaker that is supplying power to the controlled lighting circuit. Accepts a growing list of standard protocols (0-10 V, DMX/RDM) for simple integration with a wide selection of control systems using these industry standard protocols.

Note:

PowerSync Data Injector ships with three (3) hardwired terminators and one (1) hardwired DMX terminator.

LS6550	–	2D

Product	Code
Data Injector PS4	LS6550

Control	Code
DMX/RDM, 0-10 V Input	2D

Pool, Spa and Fountain Power Supply

Combines power and dimming control into a single convenient unit. Specifically approved for pool, spa and fountain luminaires up to 30 Vdc, this power supply accepts 0-10 V or DMX protocols, with the ability to fine tune dimming output. The diecast aluminium housing features a 9-step surface treatment process, including two layers of powdercoat, making it perfect for poolside locations or other locations where corrosion/exposure is of concern. Conforms to the UL379 pool, spa and fountain power unit standard.

Suitable for use in North America Only

LS6510	–	30V		240W		04		PD		

Output Voltage	Code
30 V Secondary	30V

Light Engine	Code
240 W	240W

Input Voltage	Code
120 Vac, 50/60 Hz	04

Controls	Code
PowerSync	PD[1]

[1] Suitable for non-dimmable applications

Finish	Code
Black	BL
Anthracite Gray	AG
Basalt Gray	BT
Graphite Gray	GH
Anodic Silver	SL
White	WT
Dark Bronze	DB
Latte	LT
Dark Aluminum	DA
Custom RAL	CC[1]

[1] RAL color required

Wet Location Power Supply

Specifically approved for low voltage LED luminaires up to 30 Vdc, this power supply unit accepts 0-10 V or DMX protocols, with the ability to fine-tune dimming output. This makes it easier to use with many other manufacturer's luminaires. The die-cast aluminium housing features a 9-step surface treatment process, including two layers of powder-coat, making the LS6520 perfect for poolside locations or other locations where corrosion or exposure is of concern.

Suitable for use in North America Only

LS6520	–	30V			09		PD		

Output Voltage	Code
30 V Secondary	30V

Light Engine	Code
120 W	120W
240 W	240W
320 W	320W

Input Voltage	Code
120-277 Vac, 50/60 Hz	09

Controls	Code
PowerSync	PD[1]

[1] Suitable for non-dimmable applications

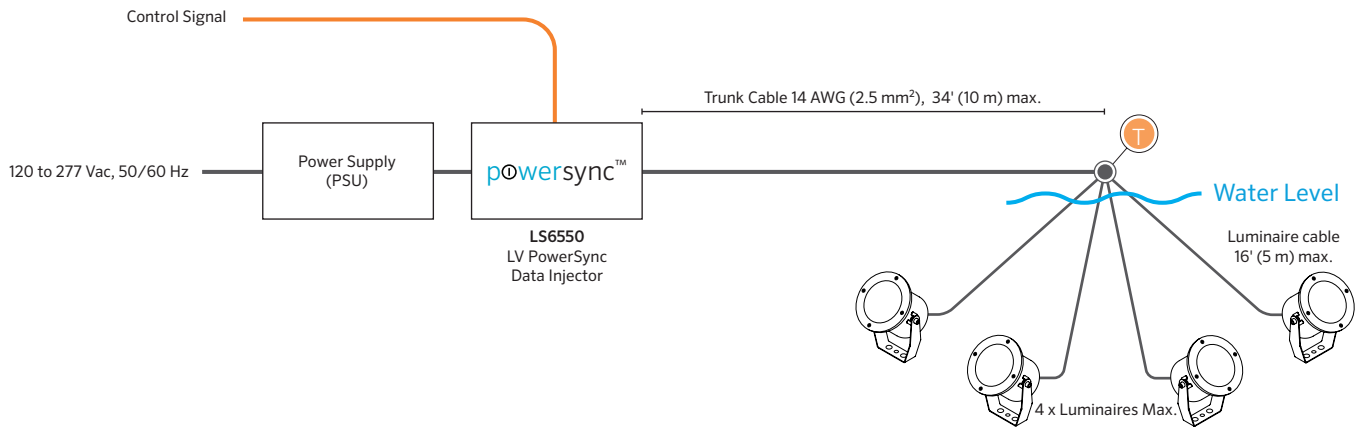
Finish	Code
Black	BL
Anthracite Gray	AG
Basalt Gray	BT
Graphite Gray	GH
Anodic Silver	SL
White	WT
Dark Bronze	DB
Latte	LT
Dark Aluminum	DA
Custom RAL	CC[1]

[1] RAL color required

Star Topology – Recommended for Underwater Applications

International Market

Circuit Limits – Dimmable and Color-Changing via PowerSync™



- Refer to "Transformer Compatability Table", for maximum number of luminaires
- Calculations based on 14 AWG (2.5 mm²) trunk cable, and 16' (5 m) luminaire cable from junction to fittings.
- Always observe local electrical codes for branch circuit current limitations
- For other configurations, contact Lumascape.

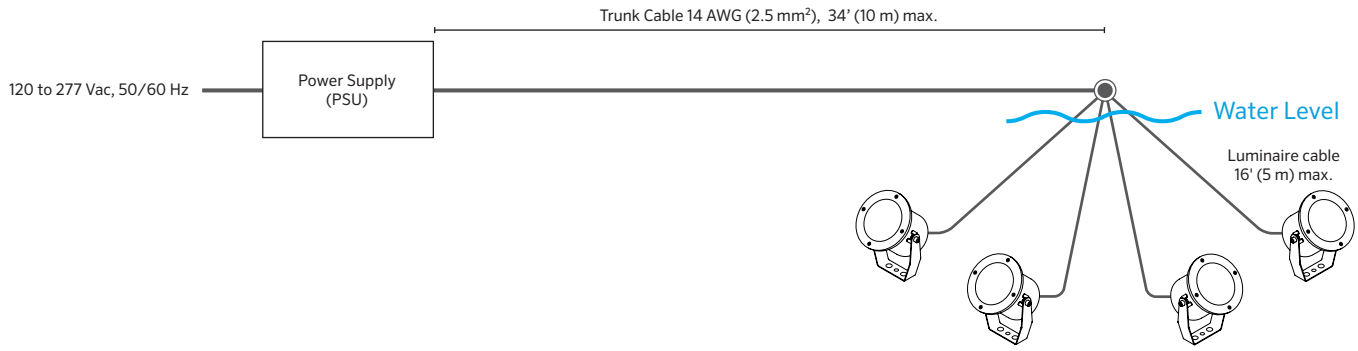
Transformer Compatability Table

Supply Voltage	Luminaire Power	Max. Leader Cable Length from Power Supply to First Luminaire	Maximum Number of Luminaires per Power Supply		
			120 W	240 W	320 W
30 Vdc	15 W	34' (10 m)	4	4	4
	29 W	34' (10 m)	3	4	4

Terminator

Use PowerSync™ terminator, supplied with PowerSync Injector to terminate inside junction box.

Circuit Limits – Non-Dimmable, Single Color Only



- Refer to "Transformer Compatability Table", for maximum number of luminaires
- Calculations based on 14 AWG (2.5 mm²) trunk cable, and 16' (5 m) luminaire cable from junction to fittings.
- Always observe local electrical codes for branch circuit current limitations
- For other configurations, contact Lumascape.

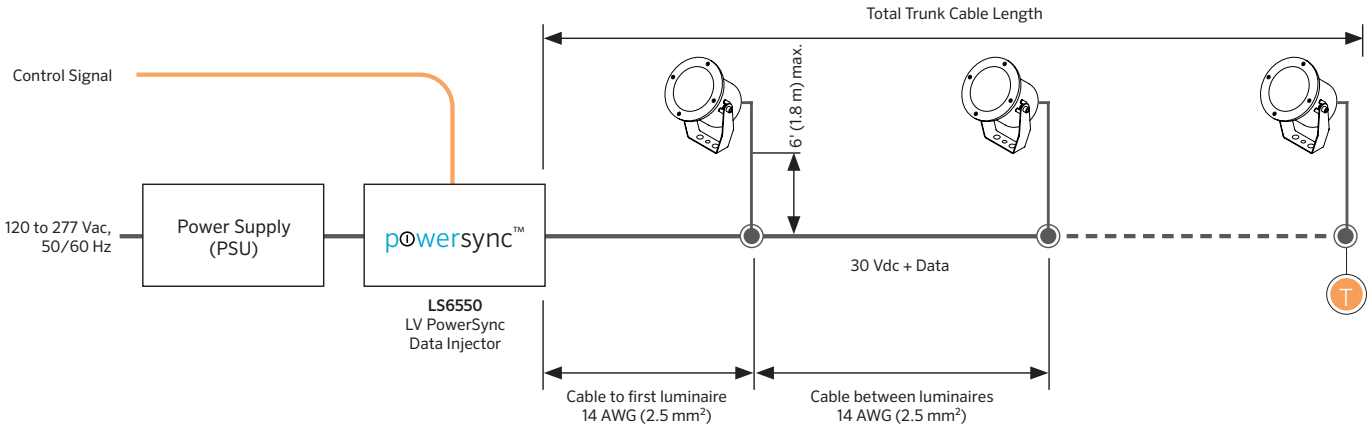
Transformer Compatability Table

Supply Voltage	Luminaire Power	Max. Leader Cable Length from Power Supply to First Luminaire	Maximum Number of Luminaires per Power Supply		
			120 W	240 W	320 W
30 Vdc	15 W	34' (10 m)	6	12	16
	29 W	34' (10 m)	3	6	8

Trunk Topology – Recommended for Above Water Applications

International Market

Circuit Limits – Dimmable and Color-Changing via PowerSync™



- Refer to "Transformer Compatability Table", for maximum number of luminaires
- Calculations based on 14 AWG (2.5 mm²) trunk cable, and 16' (5 m) trunk cable between luminaires.
- Always observe local electrical codes for branch circuit current limitations
- For other configurations, contact Lumascape.

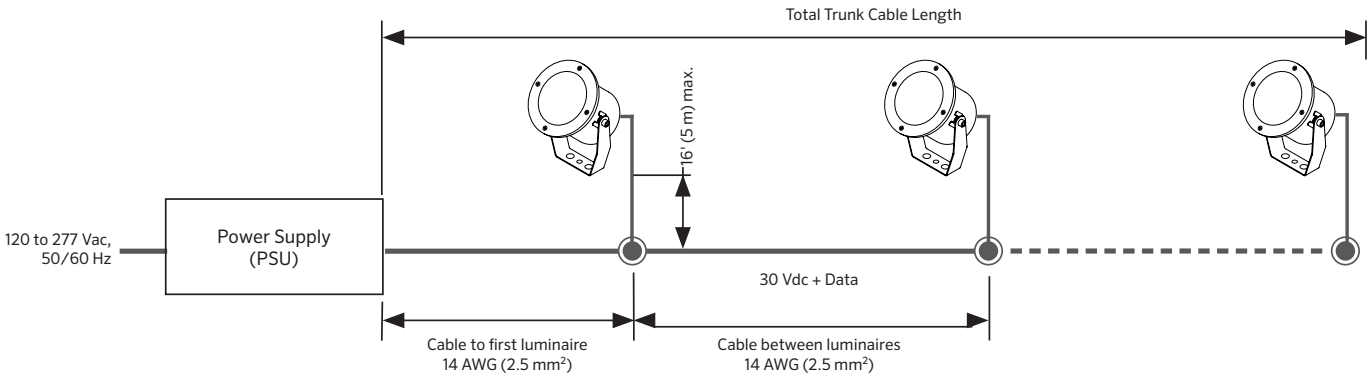
Transformer Compatability Table

Supply Voltage	Luminaire Power	Max. Leader Cable Length from Power Supply to First Luminaire	Maximum Number of Luminaires per Power Supply		
			120 W	240 W	320 W
30 Vdc	15 W	50' (15 m)	6	8	8
		98' (30 m)	6	7	7
		164' (50 m)	5	5	5

Terminator

Use PowerSync™ terminator, supplied with PowerSync injector to terminate last luminaire in chain.

Circuit Limits – Non-Dimmable, Single Color Only



- Refer to "Transformer Compatability Table", for maximum number of luminaires
- Calculations based on 14 AWG (2.5 mm²) trunk cable, and 16' (5 m) trunk cable between luminaires.
- Always observe local electrical codes for branch circuit current limitations
- For other configurations, contact Lumascape.

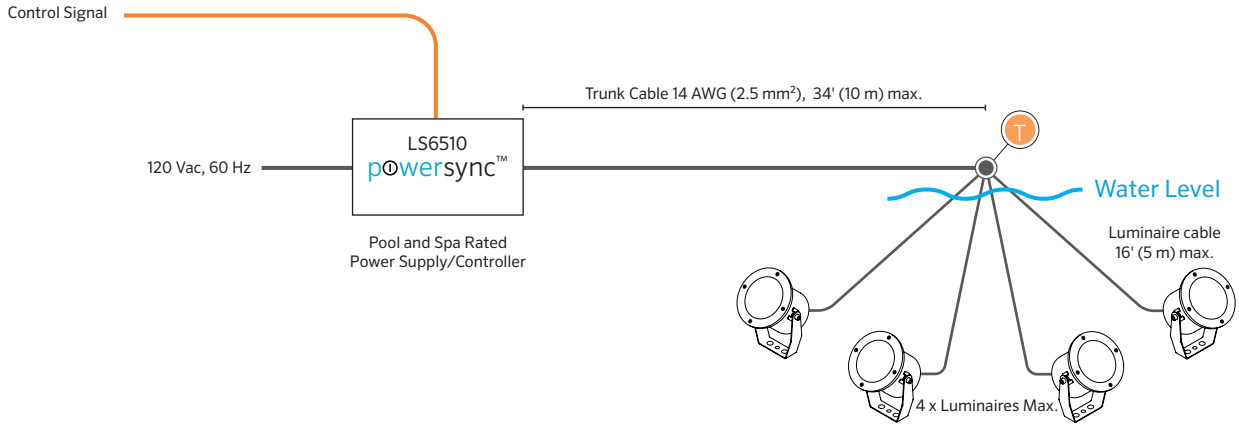
Transformer Compatability Table

Supply Voltage	Luminaire Power	Max. Leader Cable Length from Power Supply to First Luminaire	Maximum Number of Luminaires per Power Supply		
			120 W	240 W	320 W
30 Vdc	15 W	50' (15 m)	6	11	11
		98' (30 m)	6	9	9
		164' (50 m)	6	7	7

Star Topology – Recommended for Underwater Applications

North American Market

Circuit Limits – Dimmable and Color-Changing via PowerSync™



- Refer to "Transformer Compatability Table", for maximum number of luminaires
- Calculations based on 14 AWG (2.5 mm²) trunk cable, and 16' (5 m) luminaire cable from junction to fittings.
- Always observe local electrical codes for branch circuit current limitations
- For other configurations, contact Lumascape.

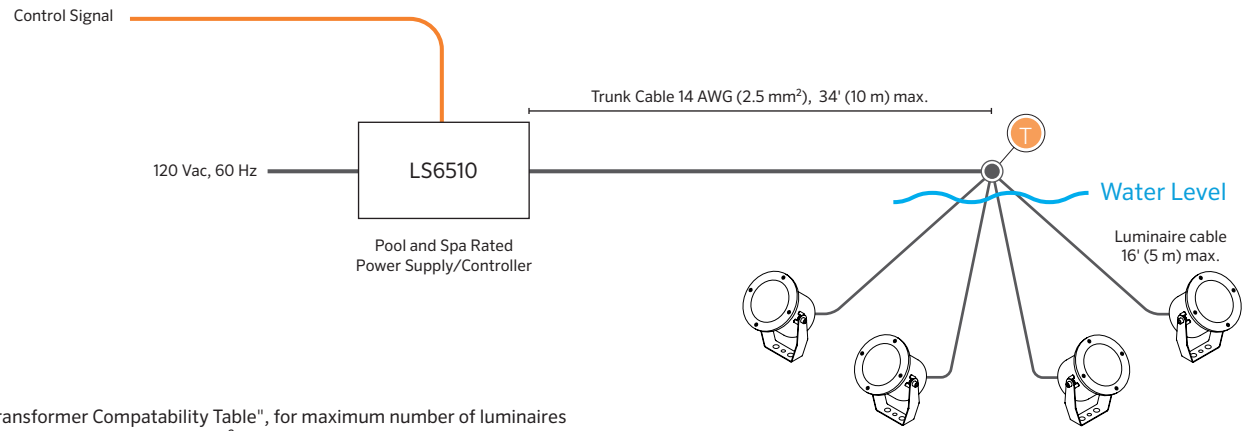
Transformer Compatability Table

Supply Voltage	Luminaire Power	Max. Leader Cable Length from Power Supply to First Luminaire	Maximum Number of Luminaires per Power Supply
			240 W
30 Vdc	15 W	34' (10 m)	4
	29 W	34' (10 m)	4

Terminator

Use PowerSync™ terminator, supplied with PowerSync Injector to terminate inside junction box.

Circuit Limits – Non-Dimmable, Single Color Only



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- Calculations based on 14 AWG (2.5 mm²) trunk cable, and 16' (5 m) luminaire cable from junction to fittings.
- Always observe local electrical codes for branch circuit current limitations
- For other configurations, contact Lumascape.

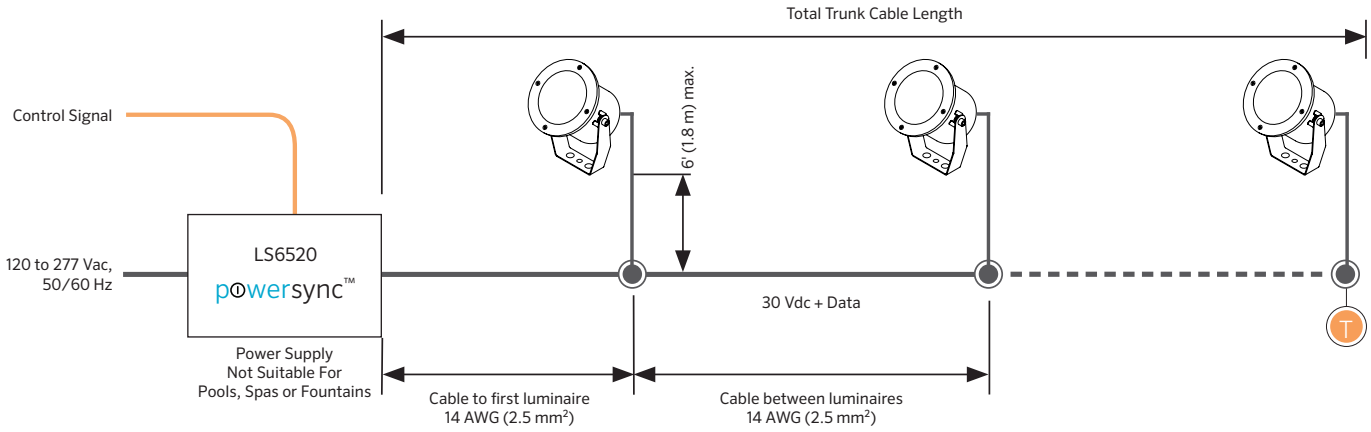
Transformer Compatability Table

Supply Voltage	Luminaire Power	Max. Leader Cable Length from Power Supply to First Luminaire	Maximum Number of Luminaires per Power Supply
			240 W
30 Vdc	15 W	34' (10 m)	10
	29 W	34' (10 m)	5

Trunk Topology – Recommended for Above Water Applications

North American Market

Circuit Limits – Dimmable and Color-Changing via PowerSync™



- Refer to "Transformer Compatability Table", for maximum number of luminaires
- Calculations based on 14 AWG (2.5 mm²) trunk cable, and 16' (5 m) trunk cable between luminaires.
- Always observe local electrical codes for branch circuit current limitations
- For other configurations, contact Lumascape.

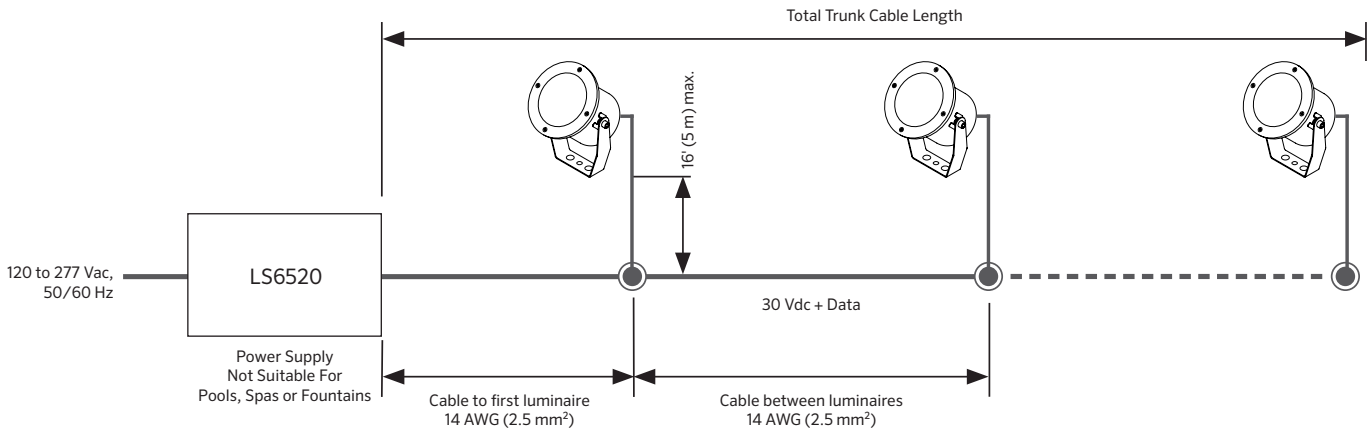
Transformer Compatability Table

Supply Voltage	Luminaire Power	Max. Leader Cable Length from Power Supply to First Luminaire	Maximum Number of Luminaires per Power Supply		
			120 W	240 W	320 W
30 Vdc	15 W	50' (15 m)	6	6	6
		98' (30 m)	5	5	5
		164' (50 m)	3	3	3

Terminator

Use PowerSync™ terminator, supplied with PowerSync injector to terminate last luminaire in chain.

Circuit Limits – Non-Dimmable, Single Color Only



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- Calculations based on 14 AWG (2.5 mm²) trunk cable, and 16' (5 m) trunk cable between luminaires.
- Always observe local electrical codes for branch circuit current limitations
- For other configurations, contact Lumascape.

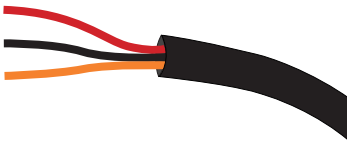
Transformer Compatability Table

Supply Voltage	Luminaire Power	Max. Leader Cable Length from Power Supply to First Luminaire	Maximum Number of Luminaires per Power Supply		
			120 W	240 W	320 W
30 Vdc	15 W	50' (15 m)	6	9	9
		98' (30 m)	6	7	7
		164' (50 m)	6	6	6

Luminaire Wire Colors & Designations

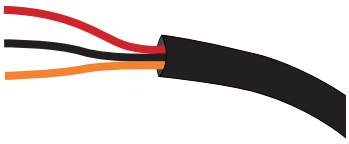
Low Voltage 30 Vdc + PowerSync™

Designation	Color
Positive	Red
Negative	Black
Data	Orange



Low Voltage 30 Vdc Non-Dimmable

Designation	Color
Positive	Red
Negative	Black
Data	Not Used

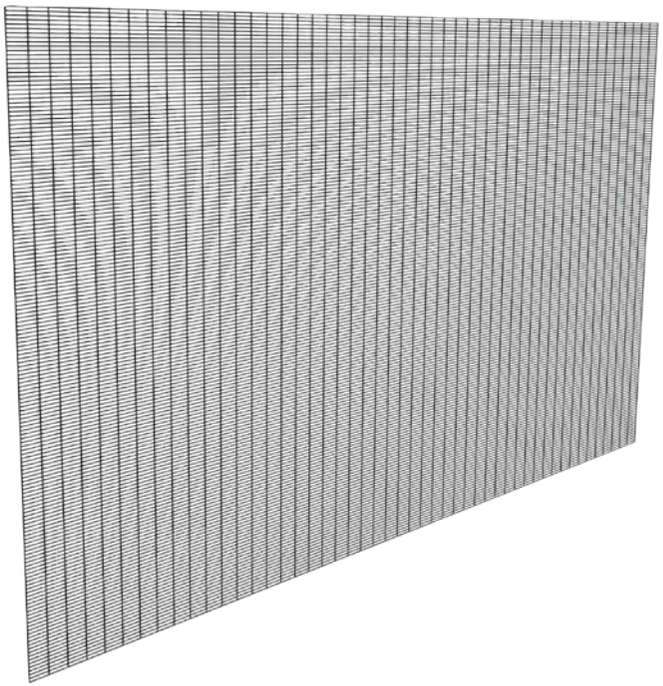


OMEGA **MAX** DOUBLE WIRE

WHEN LOOKING FOR FENCING SOLUTIONS ON STADIUM OR SPORT FIELDS, LOOK NO FURTHER

Many options from low security to high security and crowd control. Our projects include professional sport stadiums, higher-education stadiums, sport fields and community sport complexes. Let the games begin!

HIGH SECURITY



OMEGA **MAX**
DOUBLE WIRE

PANEL

HEIGHT	48 3/16", 72 3/16", 96 3/16", 120 3/16" (1223, 1832.6, 2442, 3052 mm). Stackable
LENGTH	93 3/16" (2366 mm)
FINISH	Pre-galvanized + polyester powder coated

MESH

SPACING C/C	1/2" x 3" (12.7 mm x 76.2 mm)

GAUGE

HORIZONTAL WIRE	1 x 8 GA (4 mm) + 1 additionnal wire 8 GA (4 mm) every c/c 6" (152.4 mm)
VERTICAL WIRE	1 x 8 GA (4.00 mm)

SQUARE POST

DIMENSIONS	3" or 4" (76.2 or 101.6 mm)
BRACKETS	Flat Bar (±1/2" (12.7 mm) allowance) with tamper proof nut Spider bracket (±1/2" (12.7 mm) allowance) with tamper proof self drilling screws
CAPS	Standard square cap

GAP BETWEEN PANEL/GROUND : 1" (25.4 mm)

» p.20 | p.21

COLORS

STANDARD COLOR

Signal Black
RAL : 9004

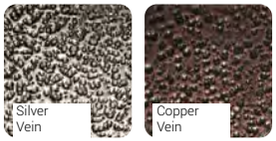
Choose from our standard and optional colors or hundreds of custom colors from the RAL selection. Select light colors, such as white or yellow, and be seen from a distance. Darker colors, such as brown or green, blend with the background.

OPTIONAL COLORS*

GLOSS

METALLIC

VEIN



TEXTURED CORTEN LOOK

TEXTURED

* Additional charges will apply.

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COMPLIANT TO ASTM F2919 STANDARD

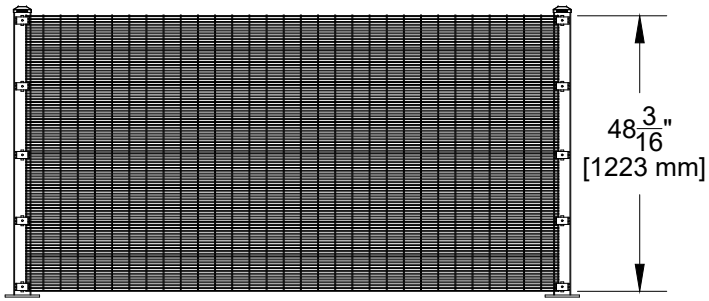
AFA CFIA ACIC ASLA AAPQ

FSC

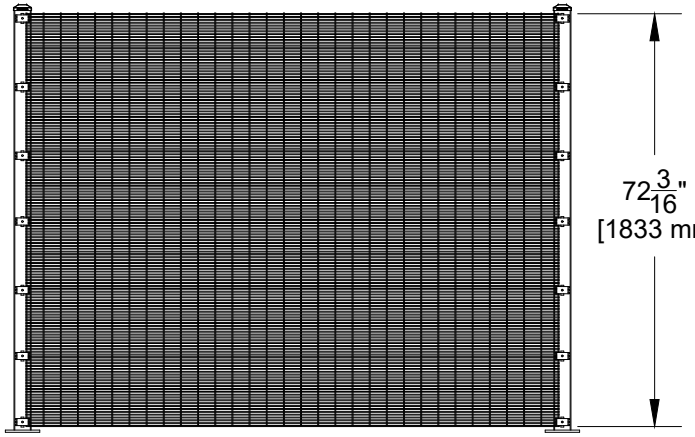
C-OMEGA-NA-EN01-V06

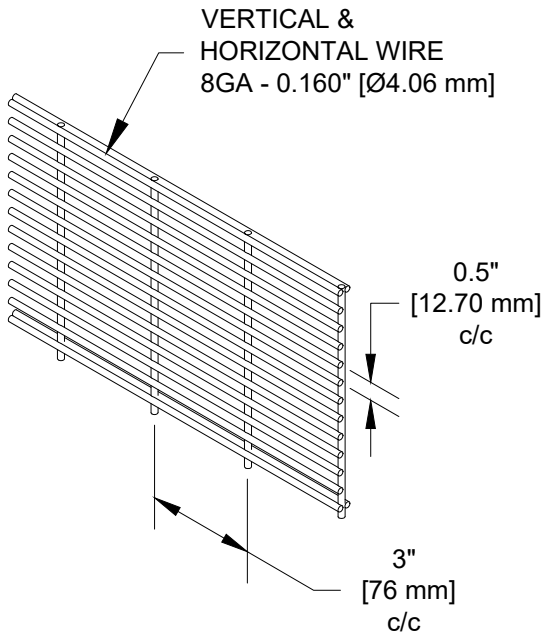
OMEGA MAX PANELS - SPIDER BRACKET

4' PANEL (65 lb/ 29.5 kg)

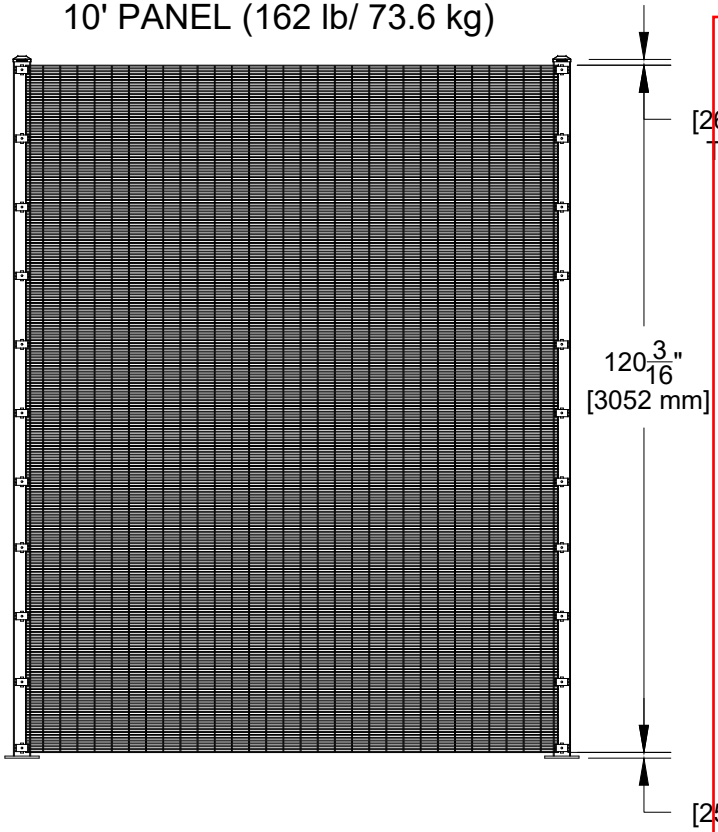


6' PANEL (97.5 lb/ 44.3 kg)

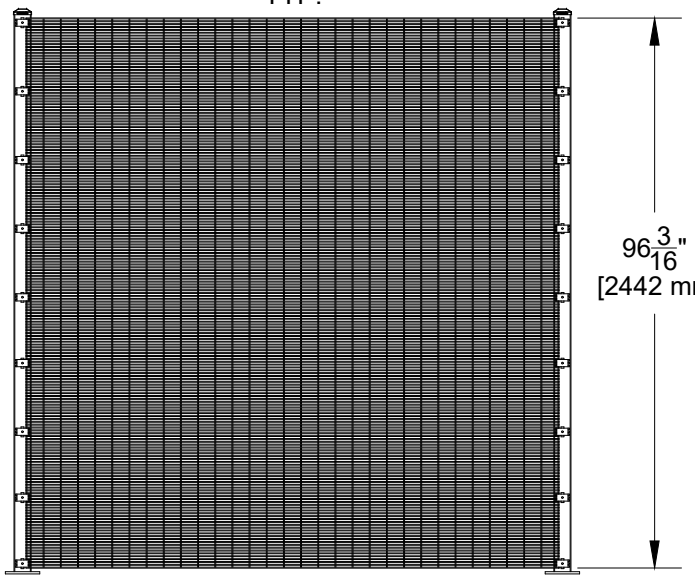




10' PANEL (162 lb/ 73.6 kg)



8' PANEL (130 lb/ 59.1 kg)



PRODUCT	PRODUCT NUMBER
4' PANEL	C-AC48DBK
6' PANEL	C-AC72DBK
8' PANEL	C-AC96DBK
10' PANEL	C-AC120DBK
SPIDER BRACKET	C-ACBRDKBK

*For special color, BK becomes SP

PANEL HEIGHT	NUMBER OF SPIDER BRACKET KITS PER POST
4' (1.2 m)	5
6' (1.8 m)	7
8' (2.4 m)	9
10' (3.0 m)	11

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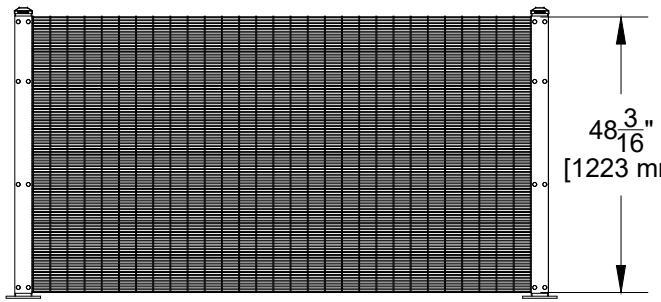
AC-01

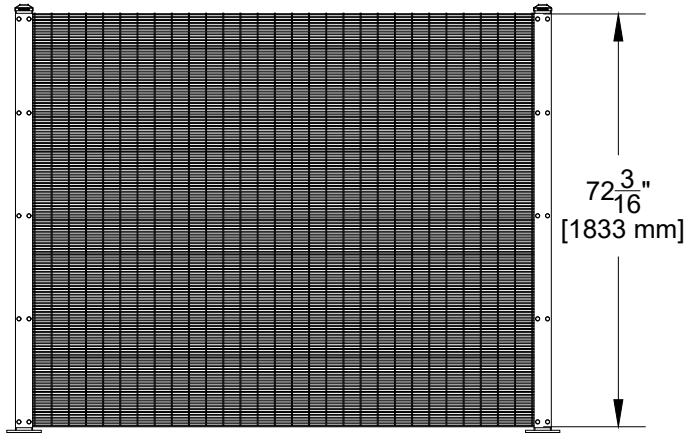
REVISION : 03/21

OMEGA MAX PANELS - FLAT BAR

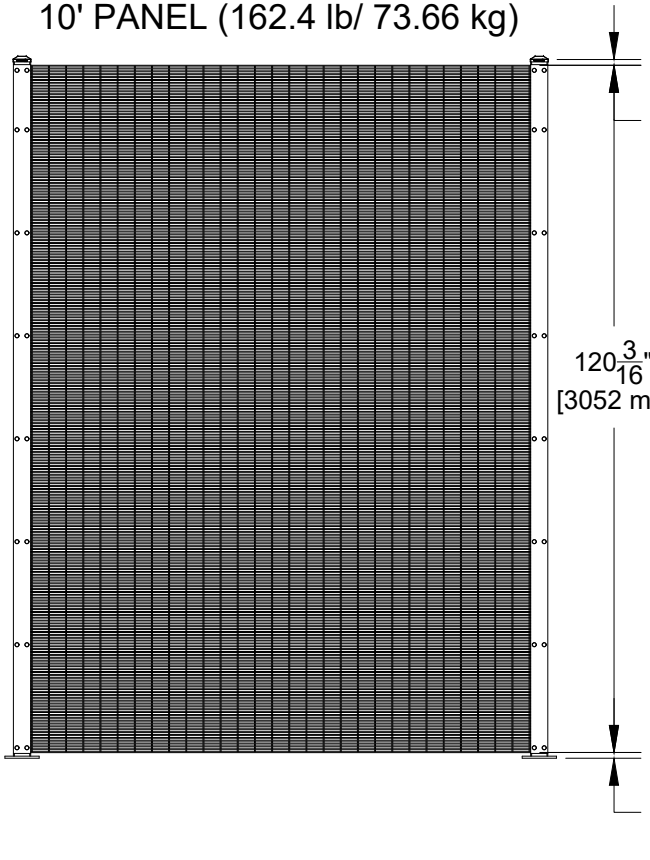
4' PANEL (65 lb/ 29.5 kg)



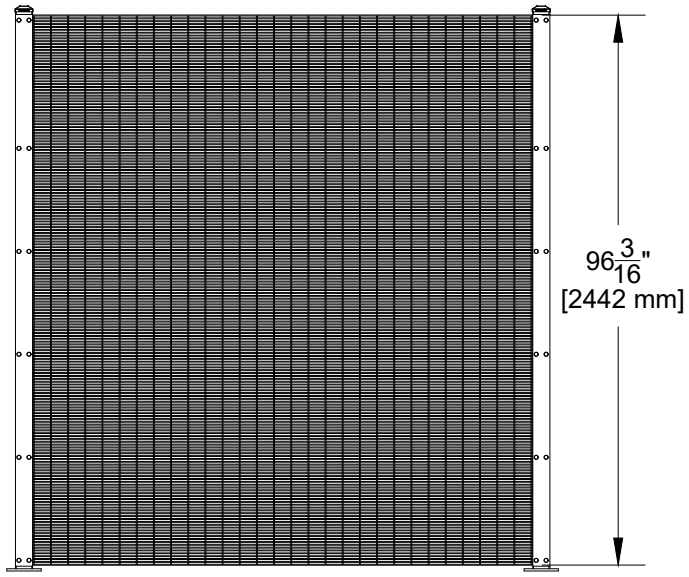
6' PANEL (97.5 lb/ 44.3 kg)

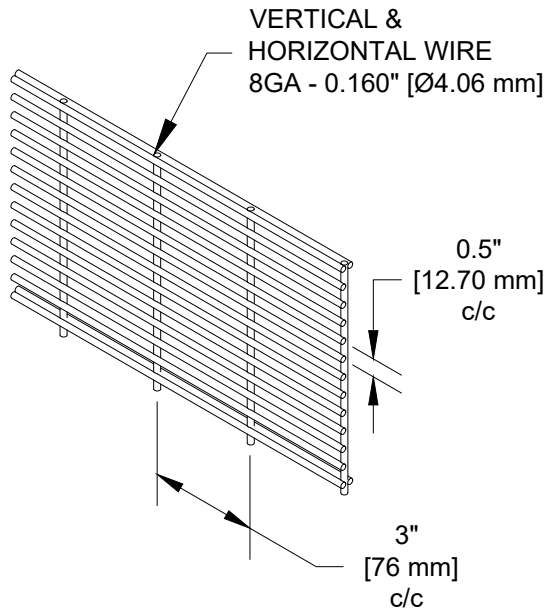


10' PANEL (162.4 lb/ 73.66 kg)



8' PANEL (130 lb/ 59.1 kg)





PRODUCT	PRODUCT NUMBER
PANNEAU 4'	C-AC48DBK
PANNEAU 6'	C-AC72DBK
PANNEAU 8'	C-AC96DBK
PANNEAU 10'	C-OM120DBK
FLAT BAR	C-AC*FB*KBK

*Depend on the size of the post

PANEL HEIGHT	NUMBER OF BOLTS & NUTS PER POST
4' (1.2 m)	8
6' (1.8 m)	10
8' (2.4 m)	12
10' (3.0 m)	16

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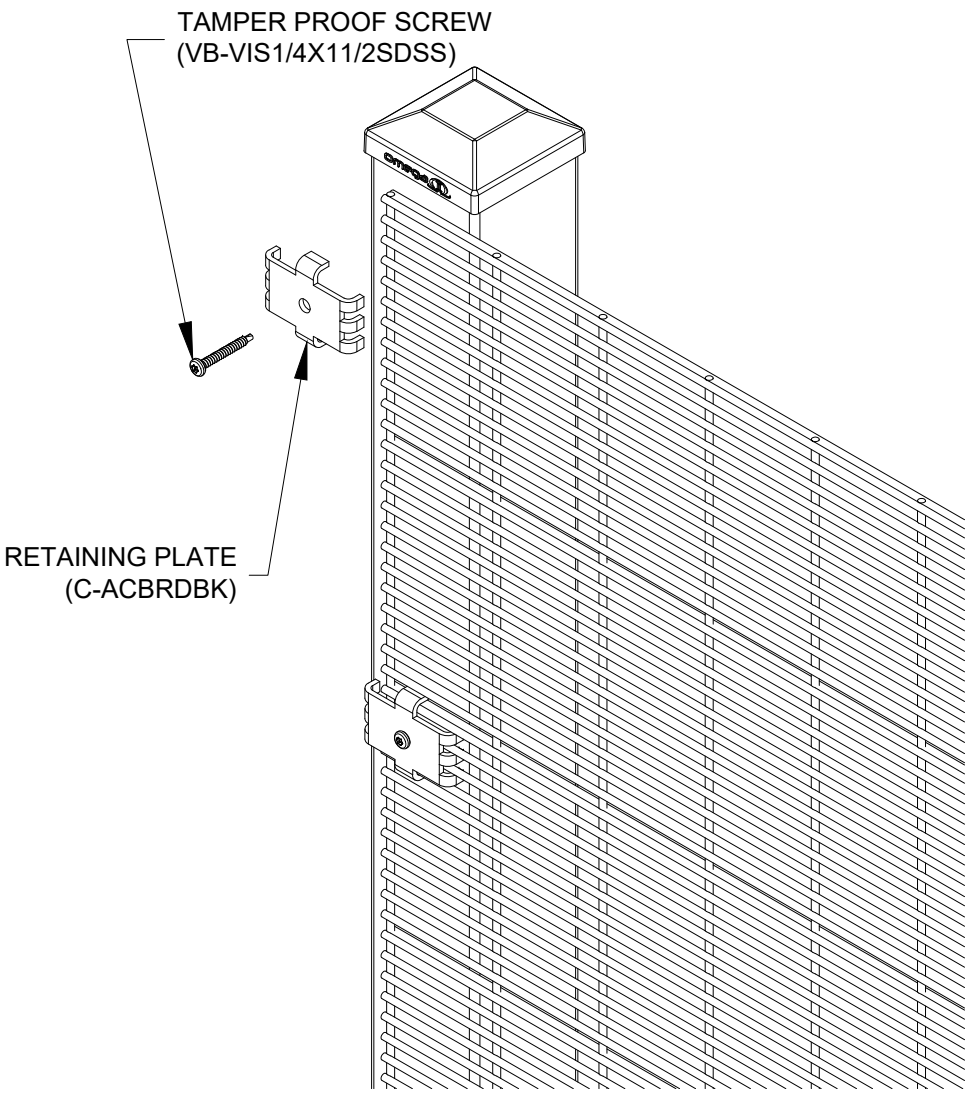
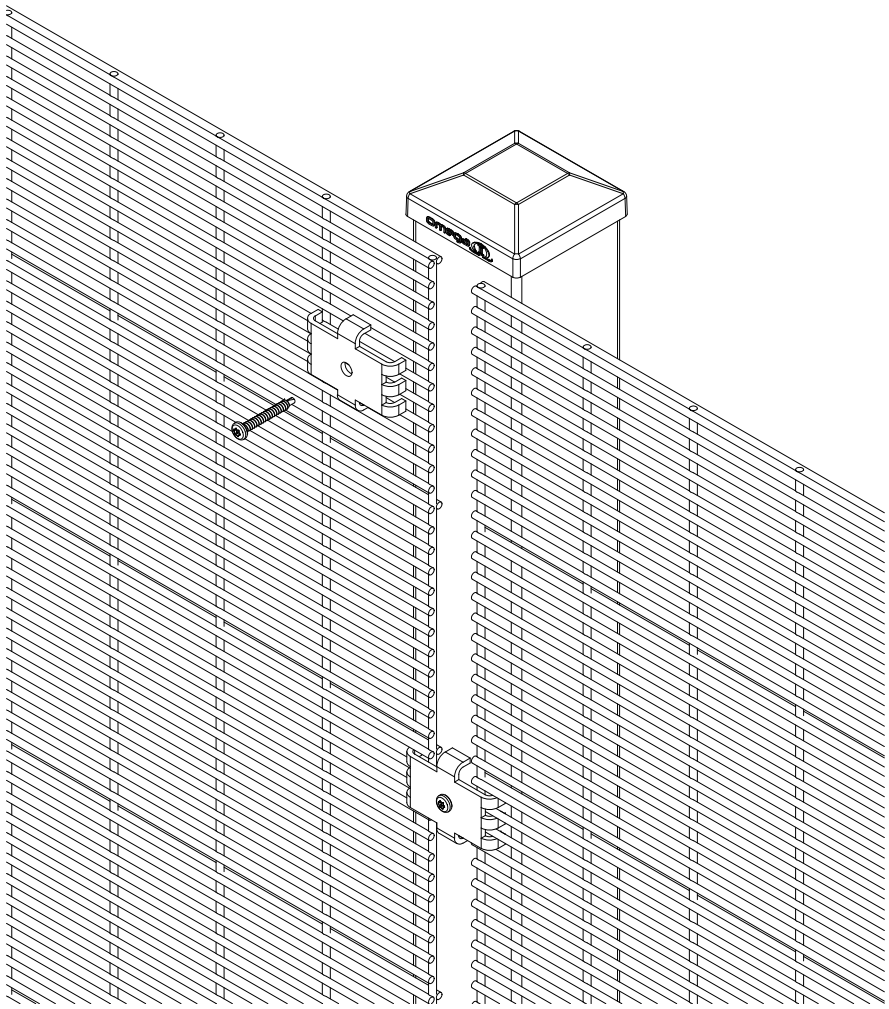
OMEGA MAX PANELS SPIDER BRACKET KITS

SPIDER BRACKET KIT END OF LINE INSTALLATION



SPIDER BRACKET KIT INTERMEDIATE POST INSTALLATION



NOTE :
3/16" PILOT HOLE MUST BE DRILLED BEFORE USING SELF-DRILLING SCREWS

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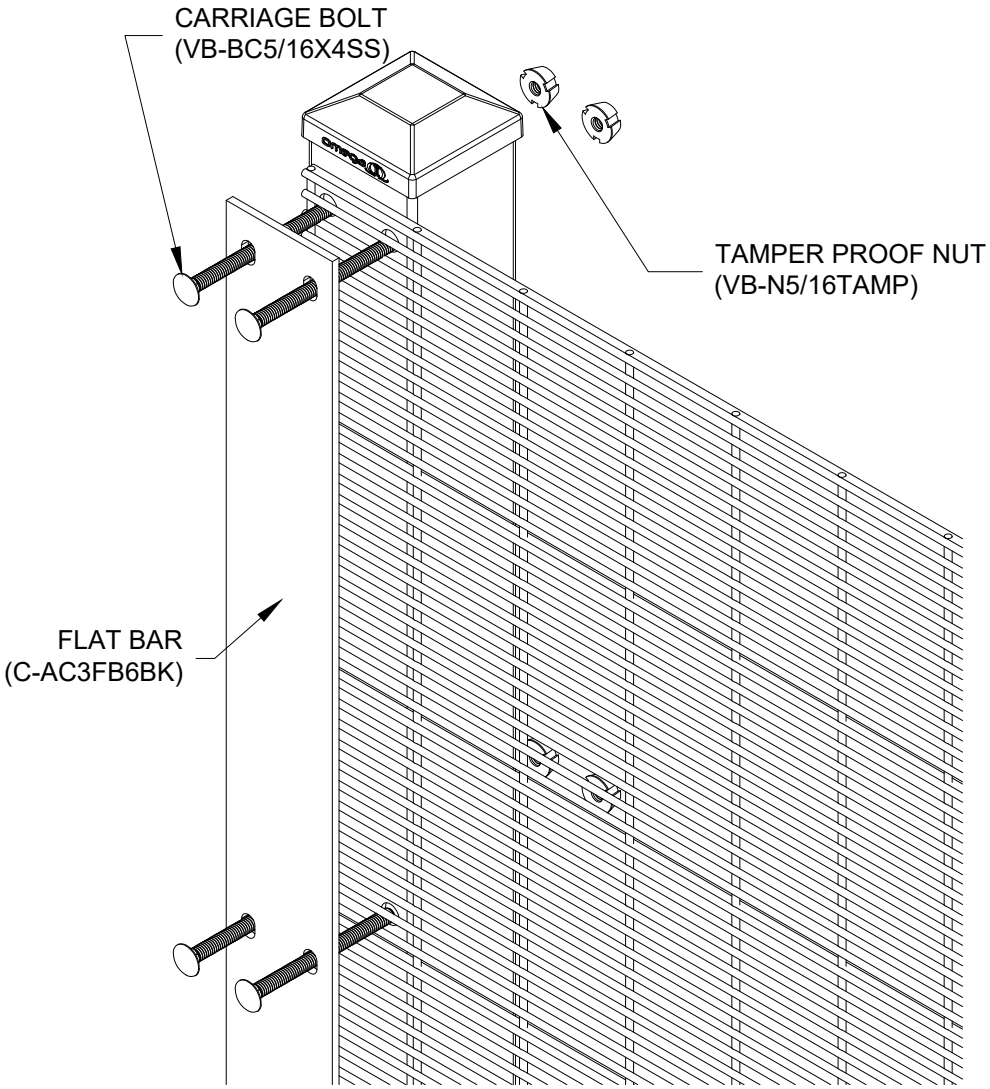
AC-03

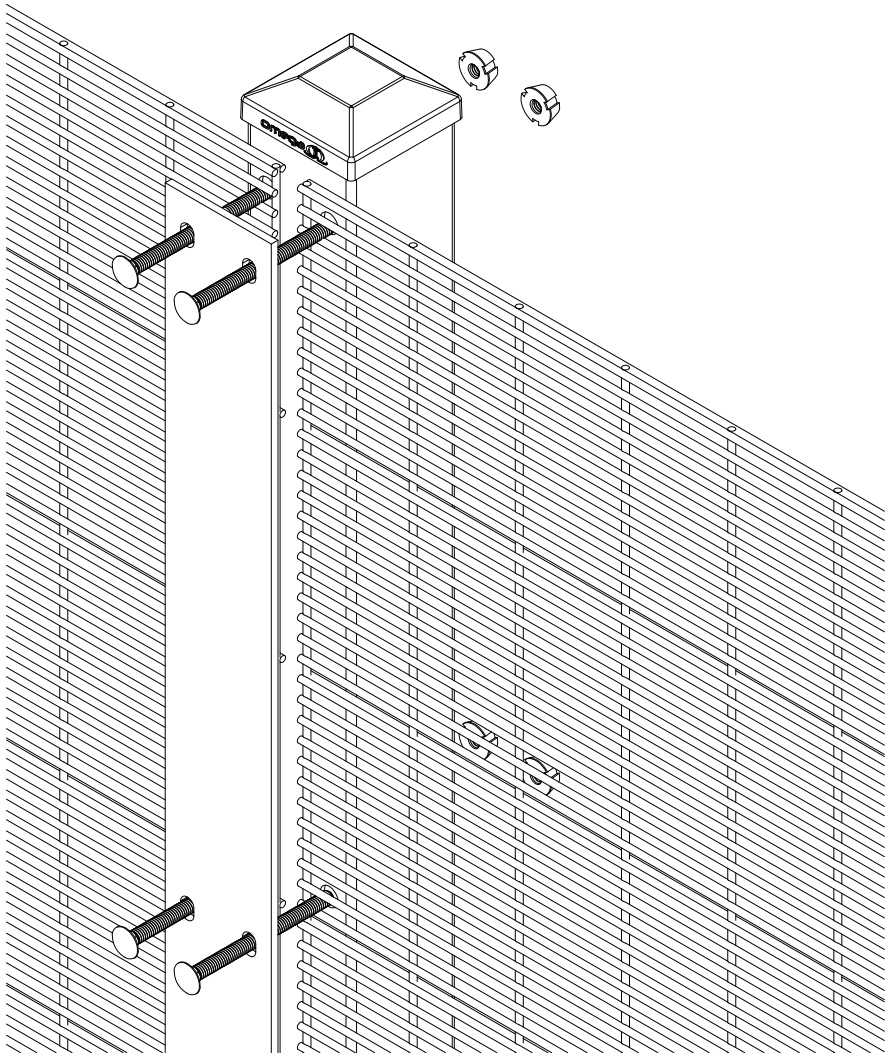
REVISION : 04/21

OMEGA MAX PANELS FLAT BAR KITS

FLAT BAR SUPPORT KITS END POSTS



FLAT BAR SUPPORT KITS INTERMEDIATE POST



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AC-04

REVISION : 04/21

OMEGA MAX PANELS BRACKET SUPPORT INSTALLATION

SQUARE POST INSTALLATION WITH SPIDER BRACKET KITS.

GRADING

THE GROUND SHALL BE GRADED ALONG THE FENCE LAYOUT TO OBTAIN A UNIFORM SURFACE BETWEEN THE FENCE POSTS.

INSTALLATION

INSTALL THE FENCE ALONG THE SPECIFIED LAYOUT ACCORDING TO THE DRAWINGS. THE FENCE PANEL SHALL BE INSTALLED TO MAINTAIN A CLEAR MINIMUM DISTANCE OF 1 in. (25 mm) AND A MAXIMUM DISTANCE OF 2 in. (50 mm) FROM THE GROUND SURFACE. HOLES FOR POSTS SHALL BE AT LEAST 8 in. (200 mm) IN DIAMETER AND AT LEAST 42 in. (1070 mm) DEEP.

NOTE: CERTAIN LAYOUTS MIGHT ASK FOR PANELS BEING INSTALLED A FEW INCHES (MILLIMETERS) INTO THE GROUND, THUS REQUIRING DIGGING TO APPROPRIATE DEPTH BEFORE PLUMBING PANELS.

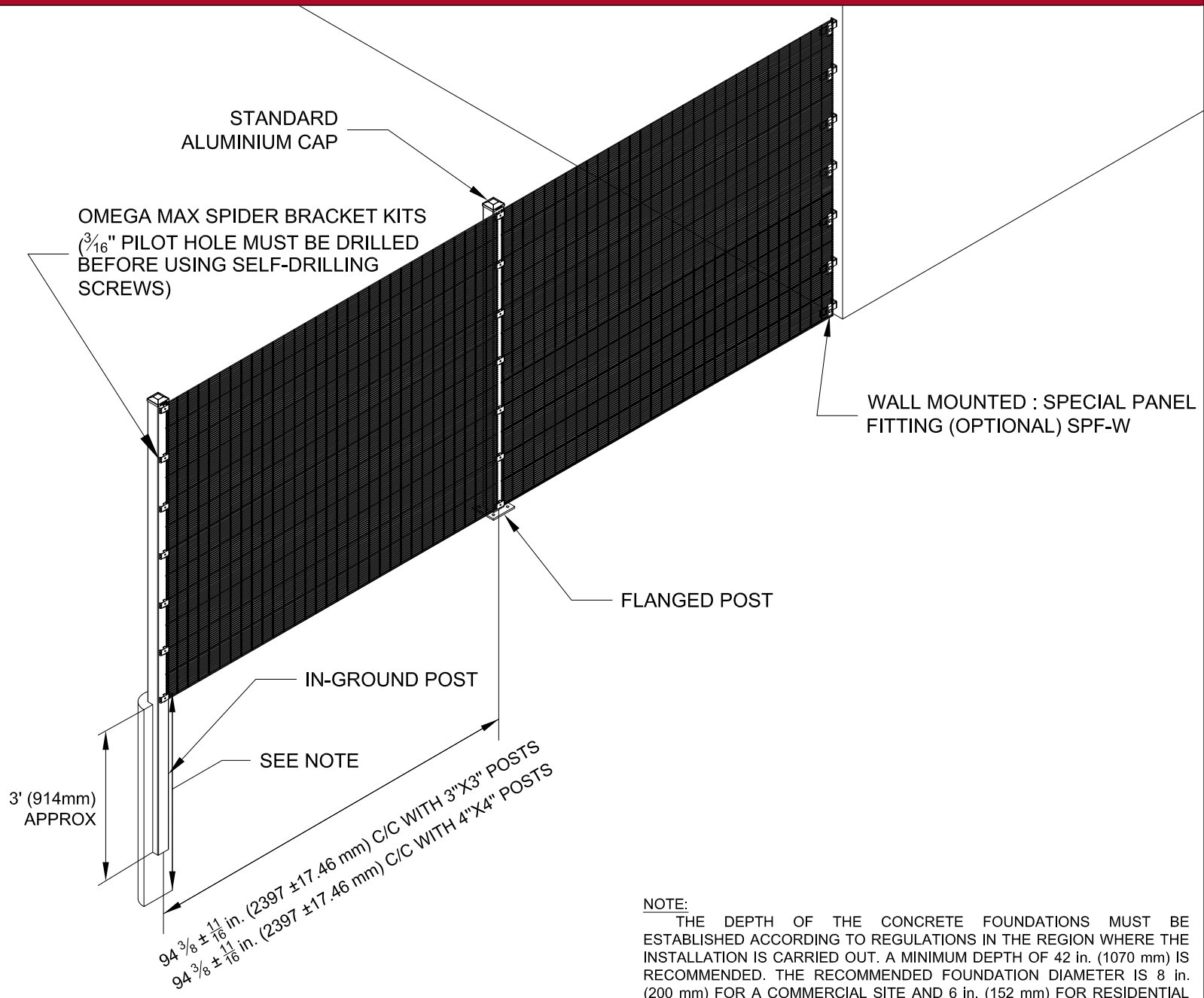
POSTS SHALL BE ADEQUATELY SUPPORTED WITHIN THE CONCRETE FORMS TO MAINTAIN THE REQUIRED POSITIONING AND PRESCRIBED LEVEL UNTIL CONCRETE HAS SET. ALL NECESSARY ANCHORS AND POSTS SHALL BE AT A MINIMUM DEPTH OF 36 in. (914 mm) INTO THE GROUND.

-FOR POST INSTALLATION WITH BRACKETS AND SCREWS, POSTS SHALL BE INSTALLED AT THE C/C CORRESPONDING TO THE DIMENSION OF YOUR POST

ON SLOPED GROUND THE FENCE PANELS SHALL BE INSTALLED IN STEPPED FASHION. SQUARE HOLES SHALL BE CUSTOM-PIERCED FOR THIS PARTICULAR FENCE INSTALLATION. FOR VERY STEEP SLOPES, IT WILL BE NECESSARY TO PREPARE LONGER POSTS AND SHORTER PANELS IN ORDER TO MINIMIZE SPACING BETWEEN PANEL BOTTOM AND GROUND.

IF PANELS OR POSTS ARE FIELD-CUT, A ZINC-RICH PRIMER SHALL BE APPLIED TO THE EXPOSED ENDS, FOLLOWED BY A PAINT TOUCH-UP WITH MANUFACTURER'S MATCHING COLOR PAINT.

PANELS SHALL BE INSTALLED WITH HORIZONTAL WIRES FACING INWARDS OR FACING OUTWARDS, ACCORDING TO CUSTOMER'S INSTRUCTIONS.



NOTE:
THE DEPTH OF THE CONCRETE FOUNDATIONS MUST BE ESTABLISHED ACCORDING TO REGULATIONS IN THE REGION WHERE THE INSTALLATION IS CARRIED OUT. A MINIMUM DEPTH OF 42 in. (1070 mm) IS RECOMMENDED. THE RECOMMENDED FOUNDATION DIAMETER IS 8 in. (200 mm) FOR A COMMERCIAL SITE AND 6 in. (152 mm) FOR RESIDENTIAL INSTALLATION. REGULATIONS OF THE REGION TAKES PRECEDENCE OVER THE SPECIFICATIONS MENTIONED ABOVE.

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OMEGA MAX PANELS FLAT BAR INSTALLATION

SQUARE POST INSTALLATION WITH FACE FLAT BAR.

GRADING

THE GROUND SHALL BE GRADED ALONG THE FENCE LAYOUT TO OBTAIN A UNIFORM SURFACE BETWEEN THE FENCE POSTS.

INSTALLATION

INSTALL THE FENCE ALONG THE SPECIFIED LAYOUT ACCORDING TO THE DRAWINGS. THE FENCE PANEL SHALL BE INSTALLED TO MAINTAIN A CLEAR MINIMUM DISTANCE OF 1 ¼ in. (32 mm) AND A MAXIMUM DISTANCE OF 2 in. (50 mm) FROM THE GROUND SURFACE. HOLES FOR POSTS SHALL BE AT LEAST 8 in. (200 mm) IN DIAMETER AND AT LEAST 42 in. (1070 mm) DEEP.

NOTE: CERTAIN LAYOUTS MIGHT ASK FOR PANELS BEING INSTALLED A FEW INCHES (MILLIMETERS) INTO THE GROUND, THUS REQUIRING DIGGING TO APPROPRIATE DEPTH BEFORE PLUMBING PANELS.

POSTS SHALL BE ADEQUATELY SUPPORTED WITHIN THE CONCRETE FORMS TO MAINTAIN THE REQUIRED POSITIONING AND PRESCRIBED LEVEL UNTIL CONCRETE HAS SET. ALL NECESSARY ANCHORS AND POSTS SHALL BE AT A MINIMUM DEPTH OF 36 in. (914 mm) INTO THE GROUND.

-FOR POST INSTALLATION WITH FLAT BAR SUPPORT AND BOLTS, POSTS SHALL BE INSTALLED AT THE C/C CORRESPONDING TO THE DIMENSION OF YOUR POST

ON SLOPED GROUND THE FENCE PANELS SHALL BE INSTALLED IN STEPPED FASHION. SQUARE HOLES SHALL BE CUSTOM-PIERCED FOR THIS PARTICULAR FENCE INSTALLATION. FOR VERY STEEP SLOPES, IT WILL BE NECESSARY TO PREPARE LONGER POSTS AND SHORTER PANELS IN ORDER TO MINIMIZE SPACING BETWEEN PANEL BOTTOM AND GROUND.

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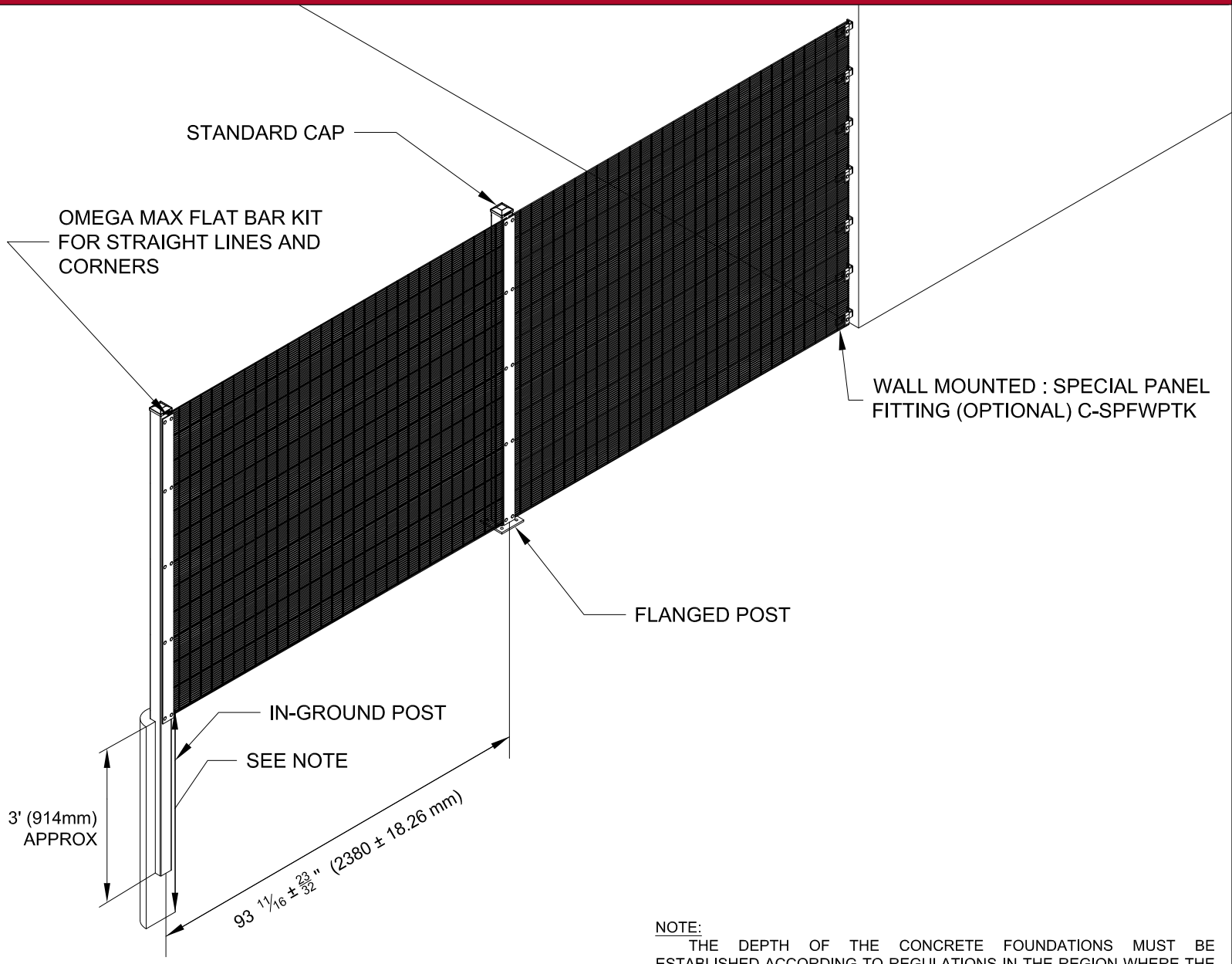

NOTE:

THE DEPTH OF THE CONCRETE FOUNDATIONS MUST BE ESTABLISHED ACCORDING TO REGULATIONS IN THE REGION WHERE THE INSTALLATION IS CARRIED OUT. A MINIMUM DEPTH OF 42 in. (1070 mm) IS RECOMMENDED. THE RECOMMENDED FOUNDATION DIAMETER IS 8 in. (200 mm) FOR A COMMERCIAL SITE AND 6 in. (152 mm) FOR RESIDENTIAL INSTALLATION. REGULATIONS OF THE REGION TAKES PRECEDENCE OVER THE SPECIFICATIONS MENTIONED ABOVE.

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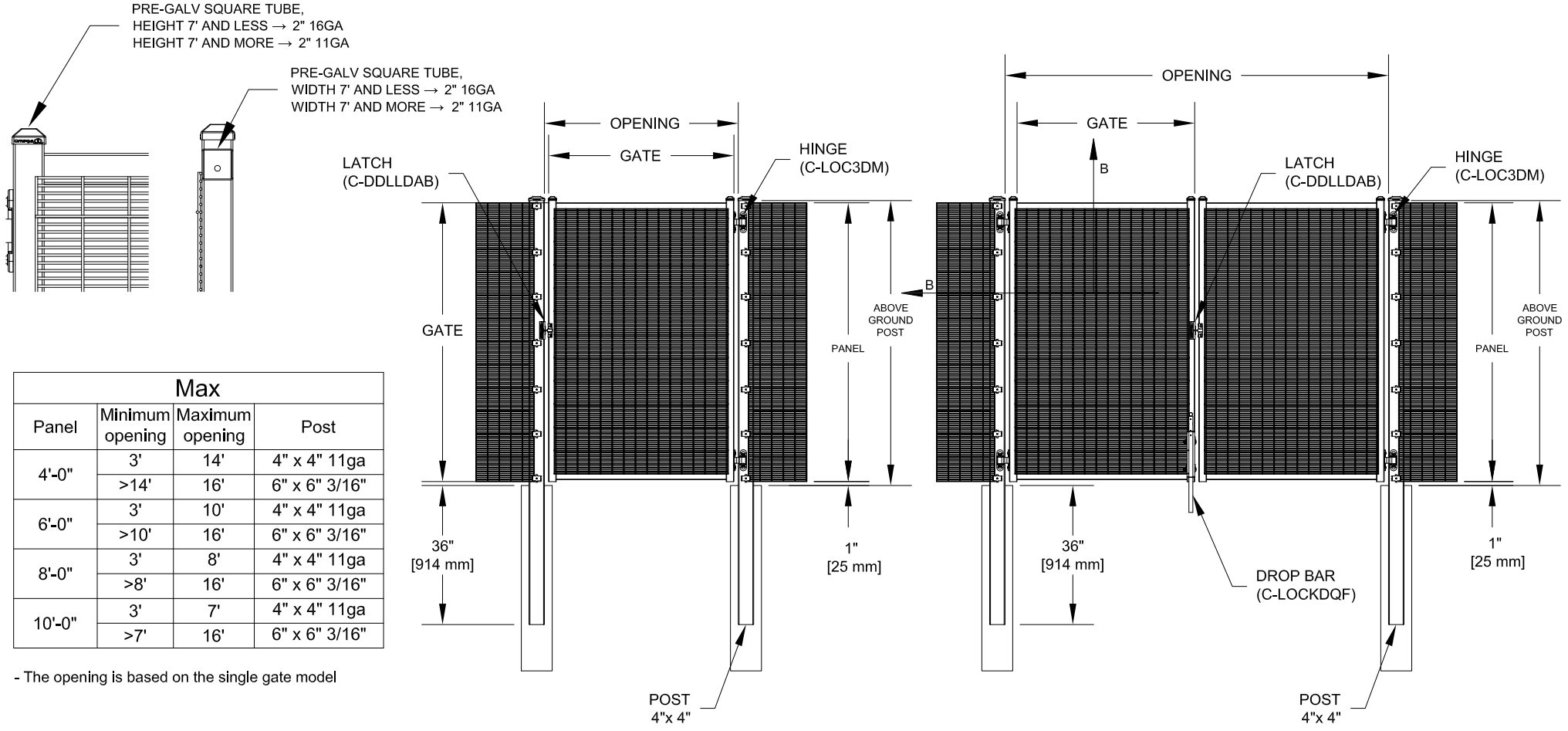
OMEGA MAX SINGLE & DOUBLE SWING GATE WITH SPIDER BRACKET

SECTION B-B
FRAME & PANEL



Max			
Panel	Minimum opening	Maximum opening	Post
4'-0"	3'	14'	4" x 4" 11ga
	>14'	16'	6" x 6" 3/16"
6'-0"	3'	10'	4" x 4" 11ga
	>10'	16'	6" x 6" 3/16"
8'-0"	3'	8'	4" x 4" 11ga
	>8'	16'	6" x 6" 3/16"
10'-0"	3'	7'	4" x 4" 11ga
	>7'	16'	6" x 6" 3/16"

- The opening is based on the single gate model

HINGES AND LATCHES CAN BE
INSTALLED ON EITHER SIDE

NOTE:
THE DEPTH OF THE CONCRETE FOUNDATIONS MUST BE ESTABLISHED ACCORDING TO REGULATIONS IN THE REGION WHERE THE INSTALLATION IS CARRIED OUT. A MINIMUM DEPTH OF 42 in. (1070 mm) IS RECOMMENDED. THE RECOMMENDED FOUNDATION DIAMETER IS 8 in. (200 mm) FOR A COMMERCIAL SITE AND 6 in. (152 mm) FOR RESIDENTIAL INSTALLATION. REGULATIONS OF THE REGION TAKES PRECEDENCE OVER THE SPECIFICATIONS MENTIONED ABOVE.

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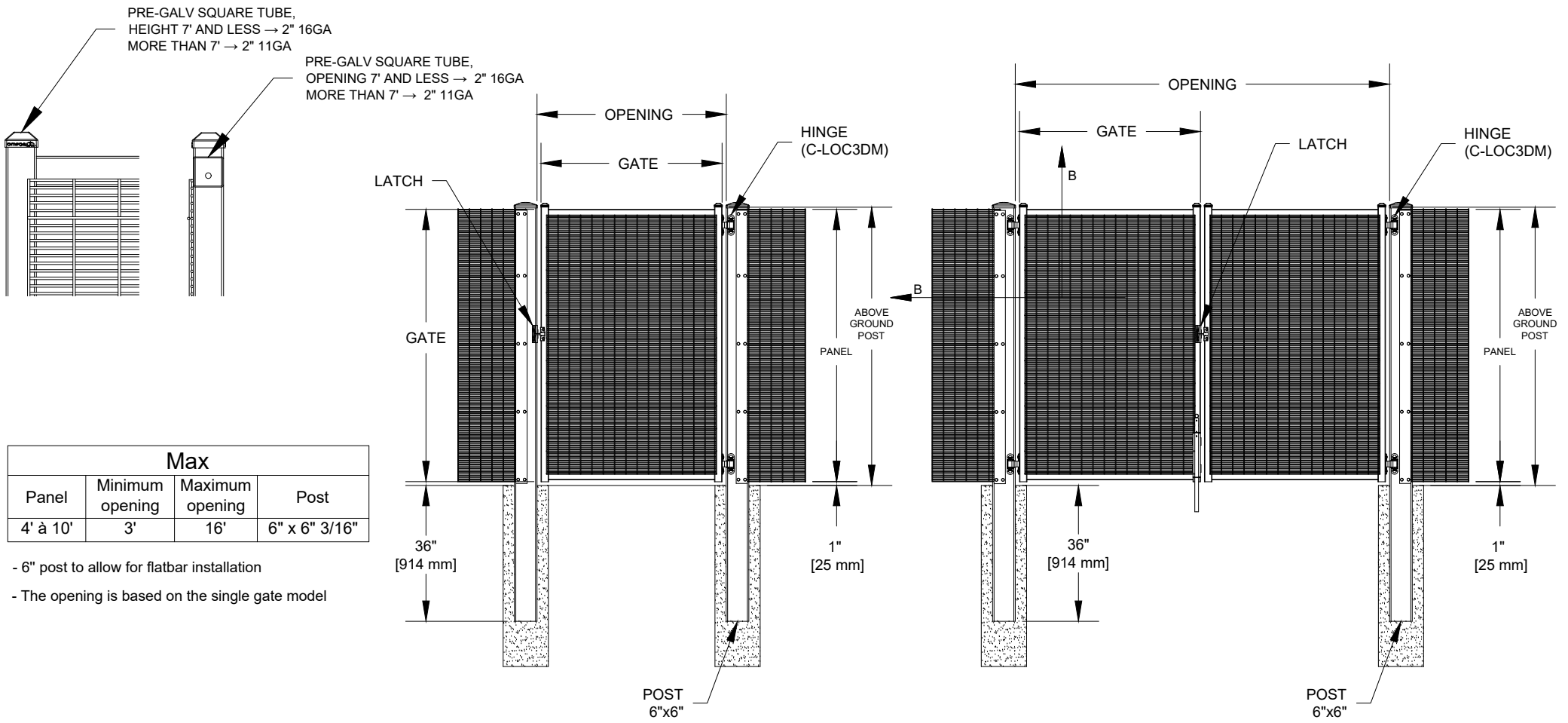
OMEGA MAX SINGLE & DOUBLE SWING GATE WITH FLAT BAR

SECTION B-B
FRAME & PANEL



Max			
Panel	Minimum opening	Maximum opening	Post
4' à 10'	3'	16'	6" x 6" 3/16"

- 6" post to allow for flatbar installation
- The opening is based on the single gate model

HINGES AND LATCHES CAN BE
INSTALLED ON EITHER SIDE

NOTE:
THE DEPTH OF THE CONCRETE FOUNDATIONS MUST BE ESTABLISHED ACCORDING TO REGULATIONS IN THE REGION WHERE THE INSTALLATION IS CARRIED OUT. A MINIMUM DEPTH OF 42 in. (1070 mm) IS RECOMMENDED. THE RECOMMENDED FOUNDATION DIAMETER IS 8 in. (200 mm) FOR A COMMERCIAL SITE AND 6 in. (152 mm) FOR RESIDENTIAL INSTALLATION. REGULATIONS OF THE REGION TAKES PRECEDENCE OVER THE SPECIFICATIONS MENTIONED ABOVE.

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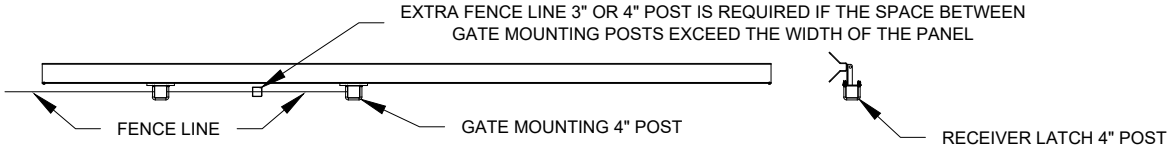
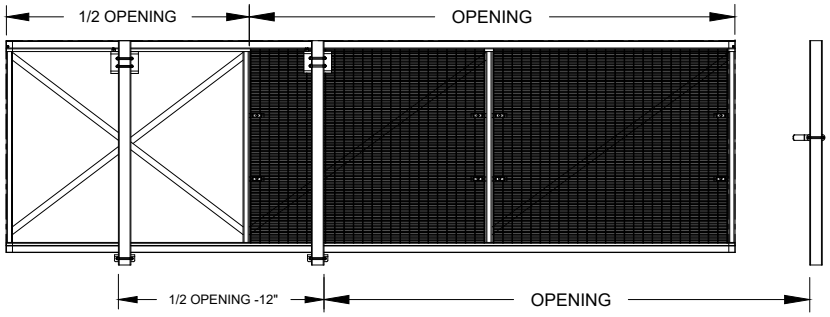
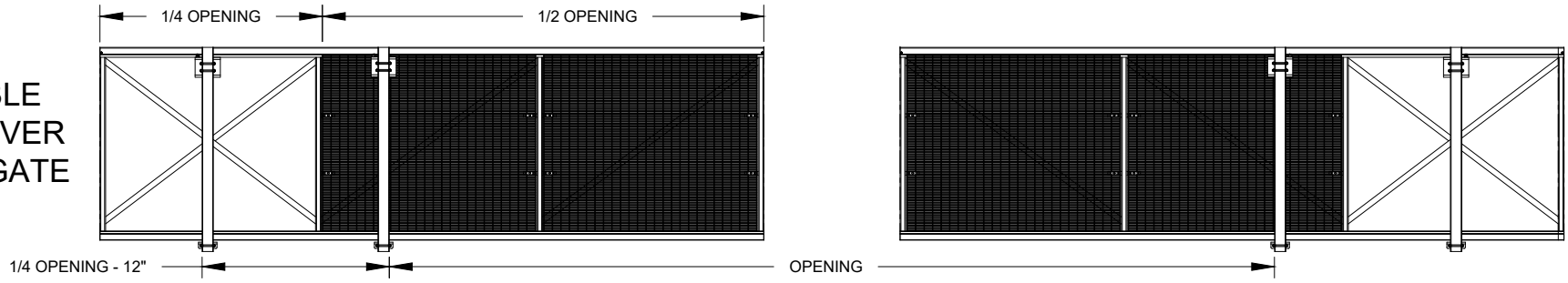
OMEGA MAX CANTILEVER SLIDE ALUMINIUM GATE



SINGLE CANTILEVER SLIDE GATE



DOUBLE CANTILVER SLIDE GATE



TUBE BRACED CANTILEVER SLIDE:

THE ALUMINUM CANTILEVER GATES ARE CONSTRUCTED WITH AN UPPER AND LOWER TRACK, FABRICATED FROM OF 6061-T6 ALUMINIUM ALLOY EXTRUSIONS. THE UPPER AND LOWER TRACKS SHALL BE WELDED AND/OR BOLTED TO 2"X2"X.125". EACH FRONT SECTION SHALL HAVE ONE DIAGONAL BRACE OF 1"X2"X.125 WALL ALUMINUM TUBE. EACH TAIL SECTION OF THE GATE SHALL BE X-BRACED WITH TWO 1"X2"X.125 WALL ALUMINIUM TUBE. OUR STANDARD COLORS UTILIZED AN EPOXY-VINYL PAINT PRIMER WITH AN ACRYLIC SURFACE COATING. BOTH COATINGS ARE APPLIED IN ONE LAYER BY SPRAY PAINT PROCESS. THE FABRIC SHALL BE HELD IN PLACE BY CARRIAGE BOLTS & NUTS.. GATES WITH BARBWIRE SHALL USE BRACE BANDS AND BOLTS TO HOLD THE WIRE IN PLACE. ALUMINUM CANTILEVER GATES ARE AVAILABLE IN ALUMINUM ONLY AND CAN BE ORDERED AS MODULAR/KNOCK-DOWN GATES, IDEAL FOR TRANSPORTING TALL GATES. THESE COME READY TO ASSEMBLE WITH ALL HOLES PREDRILLED FOR 1/2" BOLTS, WHICH ARE SUPPLIED FOR ASSEMBLY.

GATE POSTS:

THE 4" POSTS ARE MADE OF GALVANIZED STEEL. PROVIDE 1 LATCH POST AND 2 SUPPORT POSTS FOR SINGLE SLIDE GATE AND 4 SUPPORT POSTS FOR DOUBLE SLIDE GATES.

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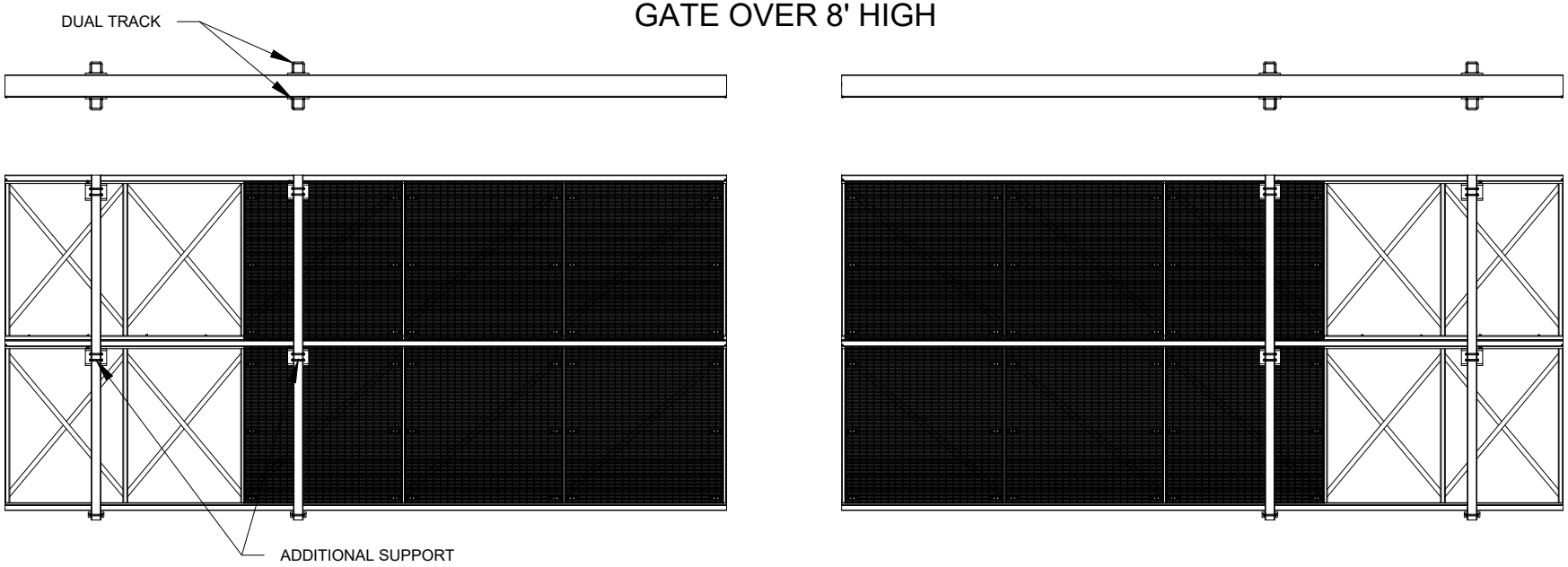
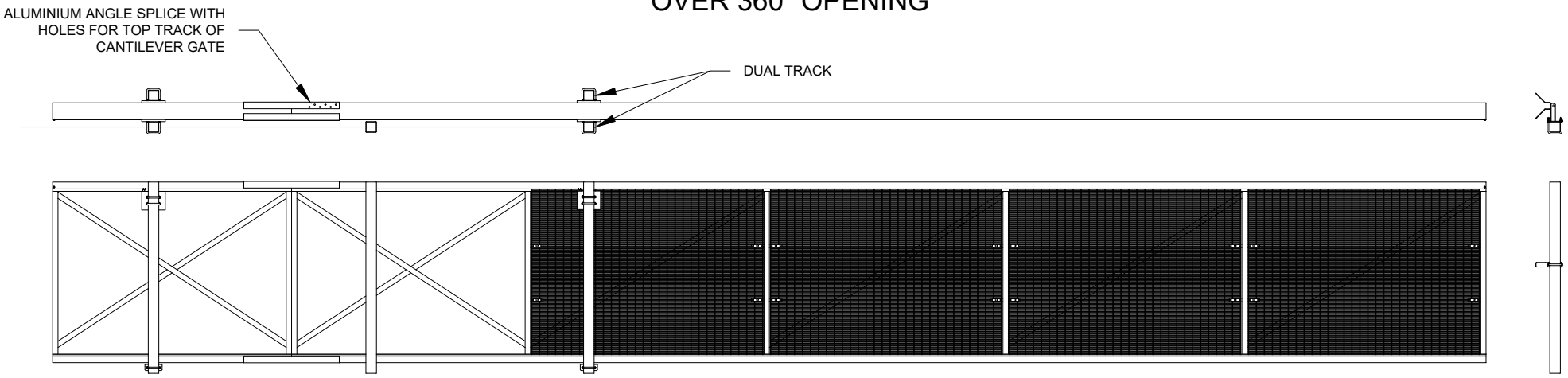
REVISION : 04/21

OMEGA MAX CANTILEVER SLIDE ALUMINIUM GATE CUSTOM SIZES

CANTILEVER DOUBLE SLIDE GATE OVER 8' HIGH



CANTILEVER SLIDE GATE OVER 360" OPENING



SURFACE COATING

ALL GATES HAVE A PAINT PRIMER APPLIED TO THE FRAME. AFTERWARDS AN ACRYLIC SURFACE COATING (STANDARD BLACK OR ANY OPTIONAL COLOR) IS APPLIED IN ONE LAYER BY SPRAY PAINT PROCESS. FOR MORE INFORMATION, PLEASE REFER TO SPECIFICATIONS.

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AC-10

REVISION : 04/21

7. PRESERVATION SPECIFICATIONS

BUILDINGWORK
architecture design preservation

April 28, 2025

Responses to LPB Correction Letter for comments related to preservation of the Memorial Wall

Comment 2:

- Correct that the reference for graffiti resistant coating is NPS Preservation Brief 38.
- Specs for graffiti resistant coating have been removed from this C of A application.
- Note that the Memorial Wall stone is Indiana limestone, not Wilkeson sandstone.

Comment 8:

- Product data for Atlas D2 cleaning solution is attached. This product works well on historic stone and masonry, including limestone and granite.
- Edits made to the spec about water pressure.
- Added to the spec that alterations or substitutions require LPB approval.
- Added to the spec that cleaning mock up requires LPB review and approval.

Comment 9:

- Note that the Memorial Wall is Indiana limestone and that the steps and paving are granite.
- We have not done a mortar test yet. Mortar testing will be performed by the contractor.
- Added to the spec that alterations or substitutions require LPB approval.
- Added to the spec that cleaning mock up requires LPB review and approval.

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D/2 Biological Solution

Discover the D/2 difference!

D/2 Biological Solution is a biodegradable, easy to use liquid that removes stains from mold, algae, mildew, lichens and air pollutants. It is effective on marble, granite, limestone, brownstone, travertine, masonry, terra cotta, concrete, stucco, wood, and other architectural surfaces including monuments, sculpture and headstones. A contact time of only 10 to 15 minutes followed by scrubbing with a soft nylon or natural bristle brush will loosen most biological and air pollutant staining.

D/2 Biological Solution is effective for removing harmful biological and air pollutant staining from many building materials including masonry, marble, granite, limestone, brownstone, travertine, terra cotta, concrete, stucco, wood, canvas and vinyl & aluminum siding.

Features and Benefits

- **Fast acting**: 10 to 15 minutes contact time for great results.
- **Biodegradable**
- **Contains no acids, salts, or chlorine**
- **pH neutral**
- **Will not etch metals or glass**
- **Safer to use around plantings**
- **Is not a hazardous material and requires no special handling or protection**
- **Use full strength, no in-field mixing required**
- **Shelf life of 5 years**

Application Procedures

Always do a spot test sample before proceeding with project. D/2 works best when air and surface temperatures are 45°F or above. Use D/2 undiluted for best results. In the event of excessive plant exposure, rinse all plants and water in all planted ground areas.

Immediate Result Method

1. Apply D/2 Biological Solution with a brush, roller, hand pump sprayer (garden style pump sprayer) or low pressure power sprayer.
2. Allow undiluted D/2 to remain on the surface 10-15 minutes.
3. Apply additional D/2 as necessary to maintain a wet surface.
4. Scrub with soft nylon or natural bristle brush. **DO NOT USE METAL BRUSH.**
5. Lightly mist with water and continue scrubbing.
6. Rinse thoroughly with clean, potable water.

No Scrub/No Rinse Method

1. Apply D/2 Biological Solution with a brush or pump sprayer to a dry surface. Do not pre-wet the surface.
2. Allow to dry. Repeat if there are heavy biological stains.

D/2 works with the elements and results occur within one week to one month depending on severity of growth and weather conditions. The surface will become cleaner over time as the subsurface biological stains release.

Safety Information

D/2 Biological Solution is non-mutagenic, and contains no carcinogenic compounds as defined by NTP, IARC, or OSHA. It is considered essentially non-toxic by swallowing, as it has an oral LD50 of 2.0 g/kg of body weight. No special ventilation is required during use.

D/2 Biological Solutions, Inc. | PO Box 3746, Westport, MA 02790 | (917) 693-7441 | d2bio.com

Packaging and Coverage

D/2 Biological Solution is available in 1 gallon and 5 gallon containers, and 55 gallon drums. The area that can be treated with one gallon of D/2 will vary considerably as a function of the nature and extent of biological deposits, as well as the physical characteristics of the surface. Typical coverage to remove medium deposits will vary from 250 to 350 square feet per gallon.

Technical Data

Physical Form . . . . . Transparent, low viscosity liquid

Color . . . . . Almost colorless

pH 9.5

Specific Gravity 1.01g/cc

Solubility in Water . . . . . Complete

Vapor Pressure . . . . . 25 mm Hg @ 20°C

Notice: The information contained herein is based on our own research and the research of others, and it is provided solely as a service to help users. It is believed to be accurate to the best of our knowledge. However, no guarantee of its accuracy can be made, and it is not intended to serve as the basis for determining this product's suitability in any particular situation. For this reason, purchasers are responsible to make their own tests and assume all risks associated with using this product.

10/2012

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SECTION 04 01 40 – HISTORIC STONE MASONRY CLEANING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes stone cleaning as follows:
1. Stone Cleaning procedures and processes.
2. Cleaning exposed sandstone surfaces.
3. Protection of non-masonry surfaces during the cleaning process.

B. Related Sections:
1. Section 04 01 40.62 MORTAR REMOVAL/REPOINTING

1.02 REFERENCES

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Definitions:

Low-Pressure Spray: 100 to 400 psi

Masonry Treatment Requirement, (MTR)

Construction Laborer: An individual that assists in the general construction activities at the project site. Activities include but are not limited to: creating a safe working environment, debris removal, equipment and tool preparation, cleaning work areas, delivering materials, organizing work areas, and moving plank or scaffolding in the process of the work.

Construction Laborers are not permitted to engage in direct labor activities that involve the use of skill-trade tools that come in contact with historic masonry materials on this project.

Saturation Coefficient: Ratio of the weight of water absorbed during immersion in cold water to weight absorbed during immersion in boiling water; used as an indication of resistance of masonry units to freezing and thawing.

Restoration Worker: An individual that has satisfied the education and qualifications required (in the restoration industry/union/trade school/or associations) to attain a skill-trade position/title that includes: Journeyman, Apprentice, Mason, Stonemason, Bricklayer, Plasterer, Tile Setter, Cement Mason, or Pointers/Cleaners/Caulkers.

Training Oversight Committee: A group of the historic stone masonry training certificate program's primary stakeholders formed to develop, monitor, and approve the training certificate program plan within the framework of ASTM E2659-18 Standard Practice for Certificate Programs.

Skill-Trade Training Certificate: An individual skill-trade restoration worker who has been issued a certificate after successfully meeting the training program's requisites.

Supervision Training Certificate: An individual supervisor who has been issued a certificate after successfully meeting the training program's requisites.

Training Certificate Program Plan: A documented plan created by the certificate issuer that includes the essential elements of program design, development, implementation, and evaluation.

Training Certificate Program Process: All activities by which the certificate issuer establishes that a restoration worker or supervisor fulfills specified requisites to earn a certificate, including but not limited to skill-trade prerequisites, completion of training components, evaluation of learner attainment of intended learning outcomes, and the certificate decision.

Supervisor: Any individual that is responsible for the over-sight and supervision of skill-trade restoration workers engaged in the direct activities to deliver a Masonry Treatment Requirement (MTR) for this project. These individuals may include but are not limited to: project owners, intern owners, owner's representatives, owner project managers, general contractor's superintendents, masonry foreman, subcontractor's project manager, masonry superintendent, and owners of contracting companies.

Training Summary Report: A written report issued by the ASTM E2659-18 certificate issuer / training instructor that describes in detail the approach, techniques, tools, materials, and methods to accomplish a Masonry Treatment Requirement (MTR).

C. Reference Standards: Applicable provisions of the most recent adopted editions of the following standards shall apply to the work of this Section:

National Park Service	Preservation Brief No. 1: Assessing Cleaning and Water Repellent Treatments for Historic Masonry Buildings, 2000
ASTM E2659-18	Standard Specification for Certificate Programs

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination: The contractor is responsible for the coordination of ordering materials and procuring equipment necessary for the onsite training components. The MTR-5 Cleaning training component is one day in length eight (8) hours.

1. Coordinate limestone cleaning with public circulation patterns at project site. Some work is located near public circulation patterns. Public circulation patterns cannot be closed off entirely, and in places can be only temporarily redirected around small areas of work. Plan and execute the Work accordingly.

B. Pre-Installation Meetings: Two (2) weeks prior to the mobilization of the project site, arrange a meeting with Architect to submit the Quality-Control Program and discuss the project schedule as it pertains to the onsite training requirements.

C. Sequencing and Scheduling: The Work of this Section shall precede the other MTRs identified in the construction documents. Order cleaning materials at earliest possible date to avoid delaying completion of the Work.
   a. Order cleaning products immediately after approval of mockups. Take delivery of and store at project site a sufficient quantity to complete project.
   b. Perform sandstone cleaning work according to the sequence established in the Quality-Control Program.

D. Any changes, alterations, or substitutions to this specification require review and approval from the architect and the Seattle Landmarks Preservation Board.

1.04 SUBMITTALS

A. Submit in accordance with Contract Documents Shop Drawings, Product Data, and Samples:
   1. Product Data: D2 Biological Solution
   2. Samples: D2 Biological Solution

3. Certificates/Test Reports/Evaluation Reports: Skill-Trade Certificates: Submit written ASTM E2659-18 project training skill-trade certificates from a qualified Historic Masonry Preservation Consultant/Training Program Instructor verifying that each skill-trade restoration worker (as defined in 1.02 REFERENCES) has successfully completed the requisites from the on-site training component specific to the masonry treatment requirement (MTR) assigned to them individually.
   a. Individual skill-trade restoration workers earn skill-trade certificates when requisites are successfully completed at the conclusion of training. The skill-trade certificates are non-transferable, cannot be earned by a company, and are valid only for the duration of the project.

   b. Restoration workers that have earned skill-trade certificates are not permitted to delegate, teach, instruct, or supervise other personnel in the learning outcomes and requisites of the completed training component.

   c. A skill-trade certificate can be invalidated/cancelled by the ASTM E2659-18 training program oversight committee if the individual restoration worker is not able to consistently fulfill the training program requisites according to the on-site training program plan.

   d. A construction laborer as defined in 1.01 REFERENCES cannot earn a skill-trade certificate.

   Supervisor Certificates: Submit written ASTM E2659-18 project training supervisor certificates from a qualified Historic Masonry Preservation Consultant/Training Program Instructor verifying that each supervisor (as defined in 1.01 REFERENCES) has successfully completed the requisites from the on-site training component specific to the masonry treatment requirement (MTR) assigned to them individually.
   e. Individual supervisors earn supervisor certificates when requisites are successfully completed at the conclusion of training. The supervisor certificates are non-transferable, cannot be earned by a company, and are valid only for the duration of the project.

   f. Individuals that earn a supervisor certificate must attend the entire on-site training component and participate in observing the skill-trade restoration workers in the process of the work. Supervisors must be engaged in the training session and complete the written testing and evaluate individual restoration worker performance in the required test panels with the training instructor.

   g. A supervisor certificate cannot be earned from partial or incomplete participation in the training component.

   h. A supervisor certificate is required to monitor compliance to the quality standards of workmanship, tool choice, and approach to specific tasks as defined in each individual training component for the specified masonry treatment requirements (MTR) of this project.

4. Qualification Data for Stone Restoration Firm: The contracting firm must submit in writing at least 5 individual projects completed in the last 5 years' which they have been the primary masonry specialist. A contractor must perform work with 5 years' documented successful experience in comparable historic stone masonry restoration projects in size, age, and material and who employ personnel skilled in the restoration treatments and rehabilitation process and operations indicated. The written submission must include the following:
   1) Name and address of project;
   2) Client name, address and phone number;
   3) Date of project completion;

4) Age of building and whether it was listed on the National Register of Historic Places or is designated as a Historic Landmark;
5) How the work scope was specifically delivered to comply with the Secretary of the Interior's Standards for Rehabilitation;
6) Size of project, in terms of square feet of stone masonry restored; and
7) List of materials used on the project (including names and manufacturers).

5. Warranties:

B. Closeout: Submit in accordance with Contract Documents:
1. Operation and Maintenance Data:
2. Warranty Documentation:
3. Record Documentation:
4. Maintenance Materials:

1.05 QUALITY ASSURANCE

A. Qualifications:
1. Manufacturer (Supplier) Qualifications: Source Limitations: Obtain each type of material for stone restoration from one source with resources to provide materials of consistent quality in appearance and physical properties.
2. Quality-Control Program: Prior to beginning Work, prepare a written quality-control program for this project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging masonry. Include provisions for supervising performance and preventing damage due to worker fatigue. Allow two (2) weeks for review and approval process. Do not proceed without written approval of plan. The Owner's Quality Control representative and the Architect shall review work on a regular basis for conformance with the approved Quality-Control Program. The Quality-Control Program shall, at a minimum, include the following items:

1) Describe the ASTM E2659-18 on-site training program. Include training certificate issuer name and qualifications with specific requisites established to meet the masonry treatment requirements (MTR) identified in the project documents.

2) Describe the method of mobilization and access to work areas.

3) Describe methods of protecting surrounding sandstone, roof, steps, walkways, windows, doors, historic plaques, and building trim as well as surrounding landscape. Submit drawings of protection when requested by the Architect.

4) Describe the work procedures, materials, and tools for cleaning sandstone as specified.

5) Describe the sequence of masonry treatment requirements (MTR).

6) Describe the methods for cleaning, application method of cleaning chemicals, dwell times, agitation requirements, tools, equipment, water pressure, fan tip, distance from wall surface, temperature of water, and rinse methods.

7) Describe the methods of wastewater containment.

8) Describe the methods for removal of sealer from stone surfaces.

b. Restoration Program: Prepare a written, detailed description of materials, methods, equipment, and sequence of operations to be used for cleaning work including protection of surrounding materials and project site.

1) If materials and methods other than those indicated are proposed for any phase of restoration work, add to the Quality-Control Program a written description of such materials and methods, including evidence of successful use on comparable projects, and demonstrations (test panels) to show their effectiveness for this project and worker's ability to use such materials and methods properly.

c. On-Site Historic Masonry Training Program: Submit written documentation of an ASTM E2659-18 training program, which complies with the masonry treatment requirements of this project. At a minimum the training program shall include all masonry treatment requirements (MTR) listed on the drawings and the removal of existing mortar and replacement mortar installation.

1) Include training certificates from a Historic Masonry Consultant – Training Program Instructor verifying that all restoration workers, installers, supervisors, project managers, and foreman have successfully completed the requisites from the on-site historic masonry training program specific to the restoration treatments assigned to them individually and specified for this project.

2) All restoration workers must obtain project-training certificate(s) in order to work on this project. Project training certificates are earned by individual workers and issued with the understanding that they are for limited time use, enforceable only to this specific project and for a masonry treatment requirement (MTR). A company cannot earn the certificates. They are non-transferable and only valid for the restoration treatment specified. For example: this project has defined nine (9) masonry treatment requirements (MTR) in the scope that will require nine separate on-site training sessions for issuance of the required project training certificates. The contractor has the flexibility to assign workers that are most proficient in the skills required for the specified MTR. It is not necessary, nor a requirement of this specification, that all restoration workers obtain all project certificates offered.

3) The contractor is responsible for materials, equipment, mobilization, tools, and contractor labor cost for the training program.

4) The Owner reserves the right to remove any restoration workers from the project site who do not meet the standards and performance criteria as described in this Section.

5) The means and methods provided in the on-site historic masonry-training program are for the Contractor's use and benefit and do not imply that those specific means and methods are required. If the contractor's trained and qualified personnel provide an equally satisfactory test panel that complies with the project drawings and specifications and is acceptable to the Architect and Owner, alternate means and methods may be allowed.

d. Cleaning Program: Prepare a written cleaning program that describes cleaning process in detail, including materials, methods, and equipment to be used, protection of surrounding materials, and control of runoff during operations.

1) If materials and methods other than those indicated are proposed for any phase of restoration work, add to the Quality-Control Program a written description of such materials and methods, including evidence of successful use on comparable projects, and demonstrations to show their effectiveness for this project and worker's ability to use such materials and methods properly.

e. Cleaning and Repair Appearance Standard: Cleaned and repaired surfaces are to have a uniform appearance as viewed from 20 feet (6 m) away by Architect. Perform additional stain removal, general cleaning, and spot cleaning of small areas that are noticeably different, so that surface blends smoothly into surrounding areas.

B. Mock-Ups: Prepare a mockup of cleaning at the parapet to include the cornice detail approximately eight (8) feet to demonstrate aesthetic effects and set quality standards for materials and execution and processes of application. Prepare a mockup of the sealer removal process and procedures to approximately eight (8) feet on the south elevation to demonstrate aesthetic effects and set quality standards for materials and execution and processes of removal.
   a. Test methods on samples of adjacent materials for possible adverse reactions. Do not use methods known to have deleterious effect.
   b. Allow a waiting period of not less than seven (7) days after completion of sample cleaning to permit a study of sample panels for negative reactions.
   c. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   d. Mockups must be reviewed and approved by the Seattle Landmarks Preservation Board staff before starting subsequent work.
   e. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

D. Substitutions: If alternatives to the methods and materials indicated are proposed for any phase of the sandstone restoration treatments, the Contractor shall provide written descriptions and programs of testing and install all test panels samples and mock-ups to demonstrate the effectiveness of the alternatives for use on this project. The contractor must provide documentation showing compliance with the requirements for substitutions and the following information:
   1) Coordination information, including a list of changes to other work that will be necessary to accommodate the substitution.
   2) A comparison of the substituted products and materials with specified products and methods, including performance, weight, size, durability, and visual effect.
   3) Certification that the substitution conforms to the contract documents and is appropriate for the applications indicated. Material substitution requests must be accompanied by independent laboratory test reports from a lab designated by the Architect to establish equivalent performance levels and specification compliance. The Architect shall designate the testing lab, and the party requesting the substitution shall pay for the testing.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of Section 01 66 00, Delivery, Handling and Storage, and following:
   1. Deliver materials to project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of product.

1.07 PROJECT SITE CONDITIONS

A. Weather Limitations: Proceed only when existing and forecasted weather conditions permit sandstone cleaning work to be performed according to manufacturers' written instructions and specified requirements.
   a. Hot-Weather Requirements: Protect sandstone when temperature and humidity conditions produce excessive evaporation of water from surfaces. Provide artificial shade and wind breaks and use cooled materials as required to minimize evaporation. Do not apply D2 Biological Solution to sandstone with temperatures of 90 deg. F (32 deg. C) and above unless otherwise indicated.
   b. For manufactured repair materials, perform work within the environmental limits set by each manufacturer.
   c. Cold-Weather Requirements: Clean sandstone surfaces only when air temperature is 40 deg. F (4 deg. C) and above and is predicted to remain so for at least seven (7) days after completion of cleaning.

1.08 WARRANTY

A. Provide warranties in accordance with Contract Documents, and following:

PART 2 - PRODUCTS

2.01 CLEANING MATERIALS

A. Atlas Preservation, 122 Spring Street B1, Southington, CT 06489, Phone: 860-426-3111. Product: D2 Biological Solution

B. Description:
   1. D2 Biological Solution is a biodegradable, easy to use liquid that removes stains from mold, algae, mildew, lichens, and air pollutants from stone masonry.

2.02 ACCESSORIES

A. Pressure washer capable of delivering 165 deg. F water through a fan tip 40-degree nozzle for the D/2 Biological Solution application.

B. Pressure washer capable of delivering 200 deg. F water through a fan tip 40-degree nozzle for the removal of the sealer from sandstone surfaces.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify installation conditions as satisfactory to receive work of this Section. Do not install until unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

3.02 APPLICATION

A. Application of D2 Biological Solution in accordance with manufacturer's directions for existing conditions.

B. D2 Biological Solution (undiluted) applied to dry limestone surfaces using a pump sprayer bottom to top.

C. Immediately following the application of D2 Biological Solution use wood scrapers to remove excess biological growth on the sandstone and mortar joint surfaces.

D. Dwell time shall be 20 minutes from initial application.

E. Once the 20-minute dwell time is reached, use a nylon brush to agitate the wall surface.

F. Use a bucket of water, keeping the brush wet while agitating in circular motions.

G. Rinse with water at a temperature not to exceed 165 deg. F, using a pressure washer at a maximum 400 psi, with a 45-degree fan tip, rinsing a distance of 20-inches from the wall surface.

H. Allow the wall surface to dry for 1 hour (in direct sunlight at 70 deg. F) before repeating B through G.

I. Repeat B through H for a second application of D2 Biological Solution. Use the nylon brush on the heavily stained areas on the second application.

J. Apply a third application of undiluted D2 Biological Solution directly to the dry Wilkeson sandstone surface and allow to penetrate and remain without rinsing.

K. Remove existing sealer from Wilkeson sandstone surfaces with hot water (200 deg. F), with 5 gallons per minute flow, at a pressure of 800 psi, at a distance of 20-inches from wall.

L. Only restoration workers that hold a Project Training "MTR-5 Cleaning Certificate" will be permitted to work on the scope of this treatment as defined.

3.03 FIELD (SITE) QUALITY CONTROL

A. Proceed with cleaning in an orderly manner; work from bottom to top of each scaffolding width and from one end of each elevation to the other. Maintain a wet wall surface on cleaned areas to prevent additional cleaner penetration through rapid absorption.

B. Do not use wire brushes or brushes that may cause damage to the sandstone surface.

C. Use spray equipment that provides controlled application at a volume and pressure indicated, measured at the spray tip. Adjust pressure and volume to ensure that cleaning methods do not damage sandstone.

D. Equip units with pressure gauges.

E. For water spray application, use fan-shaped spray tip that disperses water at an angle of 45 degrees. Never use a tip with an angle of less than 15 degrees.

F. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, carvings, sculpture, and architectural sandstone detailing and that produces an even effect without streaking of damaging sandstone surfaces.

G. Unless otherwise indicated, hold spray nozzle at least 20 inches from surface of sandstone and apply water in horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.

3.04 ADJUSTING CLEANING

A. Adjust cleaning operations to reflect current project site conditions. The quality of the cleaning results shall be in strict accordance with the approved field mock-ups. Perform cleaning operations during favorable weather conditions. Adjust cleaning operations to permit effective use of specified products and procedures.

3.05 SCHEDULES

A. Schedule MTR-5 Cleaning prior to the execution of other MTRs specified.

END OF SECTION

Section 04 01 50 – Historic Stone Mortar Removal and Repointing

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes:
1. MTR-6 Mortar and Sealant Removal
2. MTR-7 Repainting, Mortar Installation

B. Related Sections:
1. Section 04 01 40.52 STONE CLEANING

1.02 REFERENCES

A. Definitions:

Masonry Treatment Requirement, (MTR)

Construction Laborer: An individual that assists in the general construction activities at the project site. Activities include but are not limited to: creating a safe working environment, debris removal, equipment and tool preparation, cleaning work areas, delivering materials, organizing work areas, and moving plank or scaffolding in the process of the work.

Construction Laborers are not permitted to engage in direct labor activities that involve the use of skill- trade tools that come in contact with historic masonry materials on this project.

Saturation Coefficient: Ratio of the weight of water absorbed during immersion in cold water to weight absorbed during immersion in boiling water; used as an indication of resistance of masonry units to freezing and thawing.

Restoration Worker: An individual that has satisfied the education and qualifications required (in the restoration industry/union/trade school/or associations) to attain a skill-trade position/title that includes: Journeyman, Apprentice, Mason, Stonemason, Bricklayer, Plasterer, Tile Setter, Cement Mason, or Pointers/Cleaners/Caulkers.

Training Oversight Committee: A group of the historic stone masonry training certificate program's primary stakeholders formed to develop, monitor, and approve the training certificate program plan within the framework of ASTM E2659-18 Standard Practice for Certificate Programs.

Skill-Trade Training Certificate: An individual skill-trade restoration worker who has been issued a certificate after successfully meeting the training program's requisites.

Supervision Training Certificate: An Individual supervisor who has been issued a certificate after successfully meeting the training program's requisites.

Training Certificate Program Plan: A documented plan created by the certificate issuer that includes the essential elements of program design, development, implementation, and evaluation.

Training Certificate Program Process: All activities by which the certificate issuer establishes that a restoration worker or supervisor fulfills specified requisites to earn a certificate, including but not limited to skill-trade prerequisites, completion of training components, evaluation of learner attainment of intended learning outcomes, and the certificate decision.

Supervisor: Any individual that is responsible for the over-sight and supervision of skill-trade restoration workers engaged in the direct activities to deliver a Masonry Treatment Requirement

(MTR} for this project. These individuals may include but are not limited to: project owners, intern owners, owner's representatives, owner project managers, general contractor's superintendents, masonry foreman, subcontractor's project manager, masonry superintendent, and owners of contracting companies.

Training Summary Report: A written report issued by the ASTM E2659-18 certificate issuer / training instructor that describes in detail the approach, techniques, tools, materials, and methods to accomplish a Masonry Treatment Requirement (MTR).

B. Reference Standards: Applicable provisions of the most recent adopted editions of the following standards shall apply to the work of this Section:

ASTM E2659-18	Standard Specification for Certificate Programs
National Park Service	Preservation Brief No. 2 "Repointing Mortar Joints in Historic Masonry Buildings" 1998
ASTM C150-18 ASTM	Standard Specification for Portland Cement
C207-18 ASTM C144-	Standard Specification for Hydrated Lime for Building Purposes
18 ASTM C270-19ae1	Standard Specification for Aggregate for Masonry Mortar Standard
	Specification for Mortar for Unit Masonry

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination: The contractor is responsible for the coordination of ordering materials and procuring equipment necessary for the onsite training components. The MTR-6 Mortar and Sealant Removal and MTR-7 Repointing, Mortar Installation training components are each one-half day in length for a total of eight (8) hours combined.

B. Pre-Installation Meetings: Two (2) weeks prior to the mobilization of the project site arrange a meeting with Architect to submit the Quality-Control Program, and discuss the project schedule as it pertains to the onsite training requirements.

C. Sequencing and Scheduling: Order mortar materials at earliest possible date to avoid delaying completion of the Work.
   a. Order products immediately after approval of mockups. Take delivery of and store at project site a sufficient quantity to complete project.
   b. Perform repointing work according to the sequence established in the Quality-Control Program.

D. Any changes, alterations, or substitutions to this specification require review and approval from the architect and the Seattle Landmarks Preservation Board.

1.04 SUBMITTALS

A. Submit in accordance with Section 01 33 10, Submittal Procedures:
   1. Product Data: Pre-blended, Type O Mortar, Type N Mortar
   2. Shop Drawings:
   3. Samples: Provide a sample of each mortar for mock up approval
   4. Certificates: Skill-Trade Certificates: Submit written ASTM E2659-18 project training skill-trade certificates from a qualified Historic Masonry Preservation Consultant/Training Program Instructor verifying that each skill-trade restoration

worker (as defined in 1.02 REFERENCES) has successfully completed the requisites from the on-site training component specific to the masonry treatment requirement (MTR} assigned to them individually.

a. Individual skill-trade restoration workers earn skill-trade certificates when requisites are successfully completed at the conclusion of training. The skill-trade certificates are non-transferable, cannot be earned by a company, and are valid only for the duration of the project.

b. Restoration workers that have earned skill-trade certificates are not permitted to delegate, teach, instruct, or supervise other personnel in the learning outcomes and requisites of the completed training component.

c. A skill-trade certificate can be invalidated/cancelled by the ASTM E2659-18 training program oversight committee if the individual restoration worker is not able to consistently fulfill the training program requisites according to the on-site training program plan.

d. A construction laborer as defined in 1.02 REFERENCES cannot earn a skill-trade certificate.

Supervisor Certificates: Submit written ASTM E2659-18 project training supervisor certificates from a qualified Historic Masonry Preservation Consultant/Training Program Instructor verifying that each supervisor (as defined in 1.02 REFERENCES) has successfully completed the requisites from the on-site training component specific to the masonry treatment requirement (MTR} assigned to them individually.

e. Individual supervisors earn supervisor certificates when requisites are successfully completed at the conclusion of training. The supervisor certificates are non- transferable, cannot be earned by a company, and are valid only for the duration of the project.

f. Individuals that earn a supervisor certificate must attend the entire on-site training component and participate in observing the skill-trade restoration workers in the process of the work. Supervisors must be engaged in the training session and complete the written testing and evaluate individual restoration worker performance in the required test panels with the training instructor.

g. A supervisor certificate cannot be earned from partial or incomplete participation in the training component.

h. A supervisor certificate is required to monitor compliance to the quality standards of workmanship, tool choice, and approach to specific tasks as defined in each individual training component for the specified stone treatment requirements of this project.

5. Samples: Repointing Mortar, Factory Blended
6. Qualification Data for Stone Restoration Firm: The contracting firm must submit in writing at least 5 individual projects completed in the last 5 years' which they have been the primary masonry specialist. A contractor must perform work with 5 years' documented successful experience in comparable historic stone masonry restoration projects in size, age and material and who employ personnel skilled in the restoration treatments and rehabilitation process and operations indicated. The written submission must include the following:
    1) Name and address of project;
    2) Client name, address and phone number;
    3) Date of project completion;
    4) Age of building and whether it was listed on the National Register of Historic Places or is designated as a Historic Landmark;

5) How the work scope was specifically delivered to comply with the Secretary of the Interior's Standards for Rehabilitation;
6) Size of project, in terms of square feet of stone masonry restored; and
7) List of materials used on the project (including names and manufacturers).

B. Closeout: Submit in accordance with provisions of Section 01 78 00, Closeout Submittals

1.05 QUALITY ASSURANCE

A. Qualifications:
1. Manufacturer (Supplier) Qualifications: Source Limitations: Obtain each type of material for stone restoration from one source with resources to provide materials of consistent quality in appearance and physical properties.
2. Quality-Control Program: Prior to beginning Work, prepare a written quality-control program for this project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging masonry. Include provisions for supervising performance and preventing damage due to worker fatigue. Allow two (2) weeks for review and approval process. Do not proceed without written approval of plan. The Owner's Quality Control representative and the Architect shall review work on a regular basis for conformance with the approved Quality- Control Program. The Quality-Control Program shall, at a minimum, include the following items:

1) Describe the ASTM E2659-18 on-site training program. Include training certificate issuer name and qualifications with specific requisites established to meet the masonry treatment requirements (MTR) identified in the project documents.

2) Describe the method of mobilization and access to work areas.

3) Describe the work procedures, materials, and tools for sandstone repointing as specified.

4) Describe the sequence of masonry treatment requirements (MTR).

5) Describe the methods for sandstone repointing, techniques and tools used for mortar removal, application method of replacement mortar, joint profile finishing, and curing and protection of finished work.

6) Describe the methods of dust containment during the work of this Section.

7) Describe the method and approach to removing previous patching materials from the face of the sandstone.

8) Describe the procedure for mixing repointing mortar.

b. Restoration Program: Prepare a written, detailed description of materials, methods, equipment, and sequence of operations to be used for repointing work including protection of surrounding materials and project site.

1) If materials and methods other than those indicated are proposed for any phase of restoration work, add to the Quality-Control Program a written

description of such materials and methods, including evidence of successful use on comparable projects, and demonstrations (test panels) to show their effectiveness for this project and worker's ability to use such materials and methods properly.

c. On-Site Historic Masonry Training Program: Submit written documentation of an ASTM E2659-18 training program, which complies with the masonry treatment requirements of this project. At a minimum the training program shall include all masonry treatment requirements (MTR) listed on the drawings and the removal of existing mortar and replacement mortar installation.

1) Include training certificates from a Historic Masonry Consultant - Training Program Instructor verifying that all restoration workers, installers, supervisors, project managers, and foreman have successfully completed the requisites from the on-site historic masonry training program specific to the restoration treatments assigned to them individually and specified for this project.

2) All restoration workers must obtain project training certificate(s) in order to work on this project. Project training certificates are earned by individual workers and issued with the understanding that they are for limited time use, enforceable only to this specific project and for a masonry treatment requirement (MTR). A company cannot earn the certificates. They are non- transferable and only valid for the restoration treatment specified. For example: this project has defined eight (8) masonry treatment requirements (MTR) in the scope that will require eight separate on-site training sessions for issuance of the required project training certificates. The contractor has the flexibility to assign workers that are most proficient in the skills required for the specified MTR. It is not necessary, nor a requirement of this specification, that all restoration workers obtain all project certificates offered.

3) The contractor is responsible for materials, equipment, mobilization, tools, and contractor labor cost for the training program.

4) The Owner reserves the right to remove any restoration workers from the project site who do not meet the standards and performance criteria as described in this Section.

5) The means and methods provided in the on-site historic masonry-training program are for the Contractor's use and benefit and do not imply that those specific means and methods are required. If the contractor's trained and qualified personnel provide an equally satisfactory test panel that complies with the project drawings and specifications and is acceptable to the Architect and Owner, alternate means and methods may be allowed.

B. Mock-Ups (Field Samples): Erect sample areas in existing walls unless otherwise indicated, to demonstrate quality of materials, and workmanship.
1. Mortar Removal: Rake out joints in one (1) separate area as indicated for each type of repointing required. Area shall be twelve (12) square feet (3 ft. x 4 ft.) in dimension.
2. Sealant Removal: Remove sealant at granite steps, three (3) treads, three (3) feet in length.

3. Repainting, Mortar Installation: Rake out joints in one (1) separate area as indicated for each type of repainting work required and repaint with specified mortar. Area shall be twelve (12) square feet (3 ft. x 4 ft.) in dimension.

Prepare mockups of repainting to demonstrate aesthetic effects and set quality standards for materials and execution and processes of installation.

a. Test methods on samples of adjacent materials for possible adverse reactions. Do not use methods known to have deleterious effect.
b. Allow a waiting period of not less than seven (7) days after completion of sample repainting to permit a study of sample panels for negative reactions.
c. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
d. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
e. Mockups must be reviewed and approved by Seattle Landmarks Preservation Board staff before starting subsequent work.

E. Substitutions: If alternatives to the methods and materials indicated are proposed for any phase of the stone restoration treatments, the Contractor shall provide written descriptions and programs of testing and install all test panels samples and mock-ups to demonstrate the effectiveness of the alternatives for use on this project. The contractor must provide documentation showing compliance with the requirements for substitutions and the following information:

1) Coordination information, including a list of changes to other work that will be necessary to accommodate the substitution.
2) A comparison of the substituted products and materials with specified products and methods, including performance, weight, size, durability, and visual effect.
3) Certification that the substitution conforms to the contract documents and is appropriate for the applications indicated. Material substitution requests must be accompanied by independent laboratory test reports from a lab designated by the Architect to establish equivalent performance levels and specification compliance. The Architect shall designate the testing lab, and the party requesting the substitution shall pay for the testing.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of Section 01 66 00, Delivery, Handling and Storage, and following:
1. Deliver materials to project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of product.

1.07 PROJECT SITE CONDITIONS

A. Weather Limitations: Proceed only when existing and forecasted weather conditions permit stone repair and restoration work to be performed according to manufacturers' written instructions and specified requirements.
a. Hot-Weather Requirements: Protect sandstone when temperature and humidity conditions produce excessive evaporation of water from surfaces. Provide artificial shade and wind breaks and use cooled materials as required to minimize evaporation. Do not apply mortar materials to sandstone with temperatures of 90 deg. F (32 deg. C) and above unless otherwise indicated.
b. For manufactured repair materials, perform work within the environmental limits set by each manufacturer.
c. Cold-Weather Requirements: Repaint sandstone only when air temperature is 40 deg. F (4 deg. C) and above and is predicted to remain so for at least seven (7) days after completion of the repainting.

B. Prevent repointing mortar from staining the face of the masonry or other surfaces to be left exposed.

C. Cover partially completed work when not in progress.

D. Protect sills, ledges and projections from droppings.

1.08 WARRANTY

A. Provide warranties in accordance with Section 01 78 00, Closeout Submittals

PART 2 - PRODUCTS

2.01 REPOINTING MORTAR MATERIAL

A. Repointing Mortar Materials:
1. U.S. Heritage Group, Inc., 3516 Kastner Ave., Chicago, IL 60641 Phone: 773-286- 2100. Products: Custom Repointing Mortar, Type O; Custom Repointing Mortar, Type N.
2. Mutual Materials, 3150 29th Ave., SW, Tumwater, WA 98512 Phone: 360-357-3343. Products: Custom Repointing Mortar, Type O; Custom Repointing Mortar Type N.

B. Mortar Formulations:

Limestone: ASTM C270, Proportion Specification, Type 0, Pre-blended: A repainting mortar consisting of one (1) part portland cement, two (2) parts hydrated lime and eight (8) parts sand pre-blended with color pigments packaged in three and one-half (3.5) gallon buckets or bags ready to use.

1. Product: Subject to compliance with requirements, provide the following:

a. U.S. Heritage Group, Inc.; Type O Mortar, Fine Sand (custom color).
b. Mutual Materials; Type O Mortar, Fine Sand (custom color).

B. Mixing: Mix material in a clean, mechanical batch mixer or five (5) gallon bucket using a paddle drill. The mortar should resemble the consistency of stiff brown sugar prior to use. Mortar shall be used within two and one-half (2.5) hours after initial mixing. Retempering with water is permitted.

C. Do not use admixtures in mortar unless otherwise indicated.

D. Pigments: The use of pigments to color the mortar is permitted. The pigment percentage must not exceed ten percent (10%) of the weight of the lime putty in the mix formulation.

E. Portland cement, ASTM C150-18

F. Hydrated Lime, ASTM C207-18

G. Aggregate, ASTM C144-18

H. Mortar, Custom Color: The contractor is responsible for extracting a sample of mortar sending it into the manufacturer and obtaining a factory-produced mortar that is approved by the Architect and Consultant.

I. Mortar Proportions: Mix mortar materials in the following proportions:

1. Repainting Mortar for Limestone: One (1) part portland cement, two (2) parts hydrated lime and eight (8) parts sand, measured by volume.

2.02 SOURCE QUALITY CONTROL

PART 3 • EXECUTION

3.01 EXAMINATION

A. Verify installation conditions as satisfactory to receive work of this Section. Do not install until unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

3.02 PREPARATION

B. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from sandstone restoration work.

1. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of restoration and cleaning work.

B. Prevent repainting mortar from staining face of surrounding sandstone and granite and other surfaces.

1. Cover sills, ledges, and projections to protect from mortar droppings.
2. Keep wall area covered below rebuilding and repainting work to discourage mortar from adhering.
3. Immediately remove mortar in contact with exposed sandstone and granite and other surfaces.
4. Clean mortar splatters from scaffolding at end of each day.

3.03 INSTALLATION/APPLICATION

A. MTR-6 Mortar and Sealant Removal: General:
1. Repoint all joints in areas indicated as within the scope of work.
2. Joints where they have been filled with substances other than approved mortar.
3. Joints indicated as sealant-filled joints.
4. Remove sealant from granite steps and replace with specified mortar.

B. MTR-6 Mortar and Sealant Removal: Rake out joints according to procedures described in the National Park Service Preservation Brief No. 2, "Repointing Mortar Joints in Historic Masonry Buildings."

1. Remove mortar from masonry surfaces 2.5 times the width of the joint. Within the raked-out joints provide reveals with square backs to expose masonry for contact with repointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
2. Do not spall edges of masonry units or widen joints. Replace or patch damaged masonry units as directed by Architect.
3. Mechanically remove all sealant using nylon wheels at low rpm.
4. Only restoration workers that hold a Project Training "MTR-6 Mortar and Sealant Removal Certificate" will be permitted to work on the scope of this sandstone / granite restoration treatment as defined.

C. Notify Architect of unforeseen detrimental conditions including voids in mortar joints, excessive joint widths, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.

D. MTR-7 Repointing, Mortar Installation Limestone: Walls / Steps should be presoaked with water 1O minutes prior to repointing. Walls should be permitted to draw up the moisture to a saturated surface dry condition (SSD) with no standing water present prior to application of the repointing mortar.

1. Prepare the repointing mortar with enough water to produce a brown-sugar consistency to enable compaction.
2. Select proper tools to enable satisfactory workmanship without smearing mortar on the surface of the sandstone and granite masonry.
3. Mortar joints that are deeper than 1.5 inches will require several lifts during application. Each lift shall not exceed ¾ inch in depth.
4. Walls should be misted with water for the duration of at least 3 minutes at the end of the day after initial installation and two (2) days thereafter, for a total of three (3) days. Keep newly repointed walls from drying out too quickly.
5. Only restoration workers that hold a Project Training "MTR-7 Repointing, Mortar Installation Certificate" will be permitted to work on the scope of this stone restoration treatment as defined.
6. Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.

3.04 FIELD (SITE) QUALITY CONTROL

A. Inspectors: Owner will engage qualified independent inspectors to perform inspections and prepare test reports. Allow inspectors use of lift devices and scaffolding, as needed, to perform inspections.
   1. Architect's Project Representatives: Architect will assign project representatives to help carry out Architect's responsibilities at the site, including observing progress and quality of portion of the Work completed. Allow Architect's project representatives use of lift devices and scaffolding, as needed, to observe progress and quality of portion of the Work completed.
   2. Notify Architect's project representatives in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until Architect's project representatives have had reasonable opportunity to make inspections and observations of work areas at lift device or scaffold location.

END OF SECTION