

PEDESTRIAN FOOTBRIDGE VERTICAL ACCESS OPTIONS



THE CITY OF
CHEBOYGAN

DECEMBER 21, 2022
HRC Job No. 20210958



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Table of Contents

Section I – Executive SummaryPage I-1

Section II – Existing Conditions Assessment.....Page II-1

Section III – Options and Recommendations.....Page III-1

Appendix:

Report Data:

- Basement Tech Construction (Estimate #1098, dated 4/7/21), 2 pages
- Great Lakes Water Levels (1918 – 2022), US Army Corp of Engineers, 1 page
- NOAA/NOS/CO-OPS water level data for dates that waterproofing was installed, 1 page
- Otis Elevator Company, Service Proposal dated 1/11/22 - (Piston replacement – one elevator), 3 pages

Existing UPEA Reference Drawings:

- Sheet C102 – Proposed Site Plan
- Sheet C401 – Bridge Foundation Section
- Sheet S102 – Foundation Plan and Sections
- Sheet A101 – Stair Tower Floor Plans

Vertical Access Options - Concept Ramp Design Sheets:

- Sheet C-1 – Overall Site Aerial ADA Ramp Options at 1:12 Slope
- Sheet C-2 – Overall Site Aerial ADA Ramp Options at 1:16 Slope
- Sheet W-1 – Washington Park Ramp Option 1 Plans and Elevation
- Sheet W-2 – Washington Park Ramp Option 2 Enlarged Plan, Elevation
- Sheet W-3 – Washington Park Ramp Option 3 Plans and Elevation
- Sheet W-4 – Washington Park Ramp Option 4 Plans and Elevation

Section I - Executive Summary

Background

In late 2009, early to mid-2010, the City Downtown Development Authority (DDA) obtained bids for and had constructed, the pedestrian elevator/stair towers and footbridge over the Cheboygan River. This structure connects Washington Park on the west side of the River with Major City Park, located on the east side of the River. Over the years, the City has experienced water infiltration into the elevator pits in both the east and west structures. The long term, on-going exposure to water in the pits and moisture in the elevator shafts has led to the deterioration of the elevator hydraulic fluid piping, cab/car piston jacks, conduit and other elements within the elevator enclosures, specifically within the lower shaft area. The elevators are out-of-service and unusable due to the past history and present conditions.

An attempt was made to waterproof the pits from inside the elevator pit area in July 2021 but these measures have not been entirely successful and the interior pit waterproof coating is failing. The City believes that water is still seeping into the pits.

The purpose of this Report is to review options for either repair/replacement of the existing elevator components or, to construct new ADA accessible ramps to serve each side of the pedestrian bridge. Based on the information HRC has reviewed, there is no immediate or cost effective solution to fix the elevators and get them back into service. There are limited (and costly) solutions for addressing the existing problems as follows:

- Solution 1 - Resolve the elevator pit water infiltration; repair the elevator equipment, budget estimate \$435,000
- Solution 2 - Construct pedestrian ramps for footbridge access, budget estimate \$6 Million to \$8 Million
- Solution 3 – Construct new elevator/ stair towers, budget estimate \$2.5 Million to \$4.5 Million

Recommendations:

Solution 1 is not long term and may not be effective due to the present conditions of elevator stair/towers that would require further investigation and concrete masonry unit (CMU) foundation condition assessment. If the City wants to ultimately eliminate the elevators, then Solution 2 needs to be pursued. If the City is willing to maintain and operate an elevator based vertical means of access the pedestrian bridge, then Solution 3 is the recommended option.

Next Steps for City Action:

- Contact the waterproofing contractor who performed the work in 2021 and enforce the 3-year warranty that was provided with the original work.
- Discuss and consider the findings and recommendations of this Report.
- Consider potential sources for funding the selected Solution.

Section II - Existing Conditions Assessment

Project Background:

In late 2009, early to mid-2010, the City Downtown Development Authority (DDA) obtained bids for and had constructed, the pedestrian elevator/stair towers and footbridge over the Cheboygan River. This structure connects Washington Park on the west side of the River with Major City Park, located on the east side of the River. Based on the history of the City park facilities outlined in the City's Parks & Recreation 5 Year Plan, this project was 66-2/3% funded by two Vibrant Small Cities Grants that were consolidated into a Community Development Block Grant and a 33-1/3% match from the DDA.

Over the years, the City has experienced water infiltration into the elevator pits in both the east and west structures. This began at some point after construction and HRC understands that, as the water levels fluctuated, infiltration was happening on a regular basis. The City would pump water from the pits when it was observed. With the historically higher lake levels that started to occur around 2015, pumping of the pits became unsustainable. (See the chart for Great Lakes Water Levels 1918 – 2022 in the Appendix for reference.)

The long term, on-going exposure to water in the pits and moisture in the elevator shafts has led to the deterioration of the elevator hydraulic fluid piping, cab/car piston jacks, conduit and other elements within the elevator enclosures, specifically within the lower shaft area. Hydraulic fluid has leaked from the corroded piping; the City had the fluid removed and the pits cleaned, but the elevators are out-of-service and unusable due to the past history and present conditions.

An attempt was made to waterproof the pits from inside the elevator pit area in July 2021. The City solicited quotations for the work and received 2 bids. They hired Basement Tech Construction to perform these services. (See Basement Tech Construction's quotation in the Appendix.) Based on the description of the work, the pit lower concrete masonry units (CMU) block walls were injected with a chemical grout, as well as the joint along the wall-to-pit floor concrete slab. Additionally, a parge coat of Xypex (which is a cementitious waterproofing product) was applied to the lower pit CMU wall surfaces and along the wall-to-slab interface. Since this work has been completed, HRC understands from City staff that the water infiltration has been reduced but the City is not certain that it is resolved because dampness (i.e. discoloration in the wall areas) and some liquids are still visible within the pit areas, at times. As of late October 2022, the Xypex coating on the walls was delaminating and peeling off, indicating that water is still penetrating the CMU foundation walls from the exterior.

Because the elevators are both out-of-service and locked into position on the upper floors of both stair towers, components within the shaft and above the car cabs are not accessible for observation.

The purpose of this Report is to review options for either repair/replacement of the existing elevator components or, to construct new ADA accessible pedestrian ramps to serve each side of the pedestrian bridge.

Assessment Overview:

HRC's existing conditions assessment is based upon the following:

- The City was able to provide:
 - The original 2009 bidding documents drawings for the "Pedestrian Footbridge Over Cheboygan River" prepared by UPEA Engineers & Architects. These drawings did not include the elevator and equipment/piping related mechanical installations, which were apparently designed, provided and installed "By Others." Within this Report, reference to these 2009 documents is noted as the "Drawings." There is a hand written note on the cover sheet of the set labeling the Drawings "Record Copy" but none of the individual sheets bear that notation in the title blocks. We know that field changes were made in the visible, above ground structure (as noted below under Elevator/Stair Towers section below), so these Drawings do not reflect the actual As-Built conditions, in their entirety. The construction relative to the below grade elevator pit foundations, piling, concrete pile cap, stone backfill, etc. may, or may not, be as shown on the documents. We will assume for the purpose of this Report that these buried elements were constructed as shown.
 - Quotation of services from Basement Tech Construction and photos provided during the waterproofing installation.
 - Otis Elevator repair quotation for piston and jack shaft replacement.
- Visual site observations made in September 2022.
- Water level research data from NOAA for Lake Huron and US Army Corps of Engineers month Great Lakes Water Levels.
- Information obtained from discussion with the Otis Elevator mechanical technician who has serviced these units in the past.

Where a Drawing, Sheet or data reference is referred to within this Report, see the Appendix for that information.

Applicable Codes:

It should be noted that HRC's recommendations for the improvements outlined in this Report are based upon the requirements of the current 2015 Michigan Building Code (2015 MBC) and its related references. The original design, based on the Code information shown on the Drawings, was regulated under the requirements of the 2009 International Building Code (2009 IBC.)

Park Property Sites:

Washington Park is a small site but the City has recently acquired the marina property and parking lot to the north. The new north portion is currently separated from the original park area by a fence. Expansion for new construction on this site is limited due to the compact size of the property and existing Chamber of Commerce and Visitors Bureau building, located centrally in the park.

There is a mural wall display along the south side of the park, that extends approximately 100 lineal feet in an east/west direction. Also to the south, there is a former restaurant business that faces the River with views north across the park

and east across the River. The elevator/stair structure on the west side of the River sits approximately centered along the east limits of this park.

To the north of the side of the park, between the marina property and the Chamber of Commerce Building, the UPEA reference Drawings indicate that there is an underground natural gas line and telephone services running through the park and under the River. The location of these utilities (and whether or not they are still active) would need to be determined and taken into consideration, when locating ramp access elements. There would appear to be limited locations on the Washington Park side of the River, to potentially relocate these utilities, if necessary.

Major City Park is a large urban park of approximately 20 acres in size with one-half (1/2) mile of River frontage. Although this park has far more available land for new construction than does Washington Park, most of the available expansion space is the south of the current elevator/stair structure.

Ball diamond facilities and parking take up most the park to the east side of the River and a public boat launch is located on the north end of the park. The property line for the north park boundary is located just past the boat launch.

As noted above for Washington Park, the same natural gas and telephone services are noted on the UPEA Drawings to cross under the River on the north side of the boat launch and extend eastward. The location of these utilities (and whether or not they are still active) would need to be determined and taken into consideration, when locating ramp access elements. Depending on what the easement width is for these utilities, it may be possible to locate ramp elements parallel to the utility easement or relocate the utilities on east side of the River.

See the property aerial Sheet C-1 and reference Drawing C102 in the Appendix for the general park areas around the elevator/stair towers.

Elevator /Stair Towers

Both elevator/stair towers appear to be the same design (opposite hand), above grade, constructed from concrete masonry units (CMU). The structures are 2 stories in height and each has a steel stair that wraps around the exterior of the elevator tower. (See Drawing A101 for the original floor plans.) Small CMU single-room additions were added under the stairways on the land-side of both towers that are not shown on the original Drawings. These rooms are the Machine Rooms for the elevators. They contain the hydraulic pump and elevator controls. The original floor plan design showed the Machine Rooms for the elevators to be located above the Lobby level, accessed from the stairway. This design location was not compatible with the use of the hydraulic elevators that got installed and the additional enclosures had to be constructed at grade level to make the elevator installation feasible. The elevator door shaft locations were also modified during construction and are not as shown on the Drawings.

The elevator pits were designed and constructed from hollow core CMU. The architectural wall sections call for the CMU to have been grouted solid when installed. The CMU sits on a large concrete pile cap under each elevator/stair tower structure. The concrete cap is shown to be 4 foot thick concrete. (See Drawing S102 for reference, Sections C1 and C4.) It is unknown why CMU was selected as the material for the pit construction and not poured-in-place concrete with a waterstop embedded in the joint between the pit walls and the pile cap. CMU, even if grouted solid, will not provide watertight construction. There are no notes on the Drawings calling for exterior waterproofing of the CMU and it is unknown whether or not any was installed. With the foundation structure this close to the River and the elevator pit bottoms at essentially the same elevation, or lower than the water level in the River, it is not known why

the pit foundations were designed as shown on the Drawings. Because the City indicated that leakage into the pits has been on-going for years, (prior to the 2021 waterproofing attempt), we have to assume that there is either no exterior waterproofing or, if there is waterproofing, it was rendered ineffective overtime, as the water levels in the River rose higher and the ground around the foundation CMU became saturated.

Additionally, elevator pits are usually designed with sump structures and sump pumps that can activate when water is present. The Drawings do not show sump pits in the construction but a sump pump was shown on Electrical design Drawings. HRC understands that there are no sump pumps in the current elevator pits.

As described earlier, water infiltration into the elevator pits in both the east and west structures has led to the deterioration of the elevator hydraulic fluid piping, cab/car piston jacks, conduit and other elements within the elevator shafts. Based on HRC's discussions with City staff and the Otis technician, this on-going water leakage, over time, is the primary cause of the equipment corrosion and deterioration.

To understand the criticality of why the watertightness of the elevator/stair tower foundation construction is important, one needs to understand what is likely going on, below grade, based on the design Drawings. Refer to the Section on the page II-5, taken from the original Drawing C401. This Section represents the west side structure, in Washington Park.

As noted prior, the bottom of the elevator pit is the top of the concrete pile cap. This structure is shown to be elevation 579.50. The water level in the River is shown as "Varies" but lake levels have been recorded as high as elevation 582.81 in July, 2020 according to NOAA data from the Mackinaw City Weather Station. The soil borings used for the west side structure design data were drilled in May 1981 and indicated ground water encountered at elevation 576.30, approximate 28 years prior to construction.

According to US Army Corps of Engineers lake level data, the long term average annual water elevation for Lake Michigan-Huron is around elevation 579.00 – see the chart Great Lakes Water Levels (1918-2022) in the Appendix. The mean monthly level varies, but rose significantly from around 2014 to mid-year in 2020.

According to the daily NOAA data for the days that the waterproofing was being installed (see chart, July 26 to July 28, 2021 – see the Appendix), the lake water level exceeded elevation 579.50 several times, placing it above the bottom of the elevator pit.

Just because the water levels rise in the River though, does not mean that the ground water immediately against the elevator/stair structure foundation rises at the same rate. However, over time, as the River levels trend higher, so does the groundwater level around the foundation because water leaks through the sheet piling, which is not watertight.

6A



3/8"-1" washed stone. Can be round and or crushed. The Aggregate Resources and 4th street mines have about 50% crush stone in their 6A. The Quincy and Midway mine has round. Used for concrete. Works well for drain fields and septic tanks.

From Aggregate Resources

Section III – Options and Recommendations

General:

There are limited solutions for addressing the leaking elevator pits and restoring ADA accessibility to the pedestrian footbridge:

- Solution 1 - Resolve the elevator pit water infiltration; repair the elevator equipment.
- Solution 2 - Construct pedestrian ramps for footbridge access.
- Solution 3 – Construct new elevator/ stair towers.

These options describe general concepts and have multiple elements that need to be addressed; costs to implement will vary widely depending upon the actual, physical conditions that are found and solution approach selected.

A fourth alternative was considered that entailed the filling in the elevator pits to “grade” level then raising the building First Floor by 4 to 5 feet, essentially bringing the pits out of the ground. For access to the raised height First Floor, an exterior ramp would be needed. Inside each tower, the concrete floor slab that forms what was the original “Machine Rooms” floor would need to be cut out in order to provide headroom for the raised First Floor. An elevator shaft door opening for the new First Floor would need to be provided in the Lobby wall.

All of these modifications negatively impact the structural design and stability of the building. Even if they were deemed feasible, the elevator equipment would still need to be fixed, as well as modified for the revised car travel distance within the shaft enclosure. To ultimately make such significant changes to the existing structures would likely cost in range of \$1.5 to \$2.5 million and the City would still have the elevators and maintenance of them, to deal with. It has already been noted that the existing construction does match the design Drawings and field revisions were made that are not documented on the plans. In order to assess the true viability of this “fourth” alternative option, a much more extensive structural assessment and investigation of both towers would be necessary, including masonry testing, access into the elevator pits and above the car level; radar scanning of the CMU walls to locate resteel, determine the presence of grout, etc. Such extensive activities are beyond the scope of this Report.

Option “Order of Magnitude Budget Costs” (OMB) as presented herein are in 2022 dollars and contain a 30% contingency. They are provided for the City’s reference only, in order to put the various options and potential scope of work into perspective when considering the solutions presented.

Solution 1 - Resolve the Elevator Pit Water Infiltration; Repair the Elevator Equipment:

The water infiltration needs to be addressed, if Solution 1 is pursued.

HRC recommends that the initial next steps to addressing this problem are as follows, in order of progression:

1. The City needs to contact the Basement Tech Construction, the Contractor hired to perform the waterproofing in 2021, because the quotation indicated that a 3 year warranty was provided for this work. Basement Tech Construction needs to review and respond to the delamination of the Xypex coating and the City concerns

that seepage is still occurring. Basement Tech Construction has an obligation to honor the warranty and the City needs to pursue this matter with them.

2. Have City staff hand dig down along the perimeter of the elevator shaft foundation in the grass area, and expose the top 12" -24" of the CMU foundation wall to see if an exterior waterproofing membrane or coating was installed at the time of construction. Photo document materials, if any are found. If waterproofing is present, this will affect the approach and cost to potentially implementing further waterproofing efforts, as described herein.

While there were no visible signs of distress in the masonry exterior of the elevator towers (as of HRC's site visit in September 2022), prior to spending any further money on the elevators and elevator pits, verify the structural condition of the buried pit foundation walls as follows:

3. Hire a materials testing consultant to take core samples from the CMU foundation walls within the elevator pits and analyze them. This will assist in determining whether or not freeze/thaw cycles have affected the masonry foundation over the years if it was saturated with water. Have consultant visually inspect interior and exterior of the CMU wall construction while on-site. The core samples would be small diameter with the holes patched solid using suitable waterproofing materials. As with any elevator shaft entry procedures, the City will need to hire Otis in order to have a stand-by technician present for the shaft entries.
4. If the testing in item 3 indicates that the CMU foundation is structurally sound material, have Otis perform an assessment of the elevator car cabs and all elevator related equipment, both within the shafts and in the Machine Rooms, to determine current conditions and repairs needed. (Based on information from both the City and Otis, their elevator technician reviewed the east pit and a quotation was provided, dated January 11, 2022 for piston replacement with new jack shaft assemblies. This quotation did not address replacing the leaking hydraulic piping. It also only address one elevator – not both of them.) As time has passed and both pits have been subject to leakage and piping corrosion, both elevator installations and equipment require a current inspection by a licensed elevator technician. Inspections should include full height of the shaft and above the car – in the headroom space – to full define the scope of the equipment repairs.

Additional Waterproofing Efforts:

Depending on Basement Tech Construction's response to the unsatisfactory performance of their waterproofing efforts, additional waterproofing measures may be a consideration, if the CMU is found to be structurally sound material. *(For the purpose of this Report, we will assume that it is suitable and sound; assessment and review of conditions found contrary are beyond the scope of HRC's current services for this assignment.)*

As described in Section II, the initial attempt to waterproof from inside the pits was a reasonable first step. It provided what is called "negative side" waterproofing which essentially is an effort to keep the water out of the pits from the inside, by creating a physical barrier. It was the least intrusive and an economical initial attempt to solve this problem. The negative side "injection/coating" approach taken is typically a secondary, remedial solution, where water infiltration is still an issue after construction, and excavation of the perimeter, to access the exterior face of the foundation wall, is difficult to achieve.

As part of our research for this Report, HRC consulted RAM Construction Services who specialize in commercial/industrial waterproofing, including foundation issues. Based on the Drawings and photos we provided for

their review, they agree that an attempt at negative side waterproofing would have been one of their initial recommendations for consideration also; however, a discussion regarding the pros/cons and likelihood of success, and understanding of the dynamics of the fluctuating water levels, would have been part of their considerations for the City.

HRC notes that Basement Tech Construction's quotation did not specifically call out what injection grout materials were to be used by product name with composition, series or mix formula data so we cannot comment on the suitability of the actual materials (or workmanship) used for the installation, only the generic approach to attempting to solve the problem, i.e. approaching it from the interior side of the pits.

Exterior "Positive Side" Waterproofing:

The most successful waterproofing installations are obtained by waterproofing the exterior of a structure, not the interior. As noted above, when you attempt to waterproof from the interior, it is called negative side waterproofing and it is a remedial measure used after a leak has already occurred. Positive side waterproofing is the most effective approach because it blocks the water before it reaches the foundation wall construction and interior of a structure.

There are different ways to achieve positive side waterproofing. Two common methods are:

- Option 1 -Sheet type materials installed on the exterior side of the foundation.
- Option 2 - Ground injection with bentonite type materials to cover the foundation.

Waterproofing Option 1 - Sheet Type Materials Installed on the Exterior Side of the Foundation:

Exterior side sheet waterproofing materials include rubberized membranes and/or bentonite sheet products that are applied to the perimeter of a foundation. The perimeter needs to be excavated and the foundation walls exposed for this type of installation. For the elevator pits, it would be a significant undertaking to expose the shaft foundation walls and only 3 of the 4 walls are accessible from the exterior of the structure. The 4th wall is under the Lobby floor (along the sill wall at the entrance to the elevator shaft) so the Lobby floor slab would need to be removed. Additionally, because the Machine Rooms at grade were added, (and not shown on the original Drawings), it is not known what type of foundation was placed under these walls and how it abuts the foundation of the elevator pits. The waterproofing installation needs to be continuous and not interrupted by the foundation walls from the Machine Rooms.

Exterior side waterproofing may be feasible, if the CMU foundation can be exposed and dried out enough to receive the waterproofing, but would be difficult to achieve, given the site conditions and the addition of the Machine Rooms. Keeping the excavation open and dry long enough to accomplish the work would require on-going dewatering measures due to the proximity of the River. If this work was attempted, it would be best completed when the River is at its lowest seasonal level. Additional work items would include:

- Remove any exterior waterproofing materials that may be present on the foundation
- Removing and replacing the concrete pavement/sidewalk adjacent to the building
- Removing and reinstalling the steel stairs
- Remove and replace the stair foundation, if it impedes the waterproofing installation

Installation of exterior side sheet waterproofing is the most likely method to achieve success from a waterproofing standpoint, but is also the most costly and complex method due to the preparation and excavation necessary. Its benefit is due to the fact that you can physically see the foundation wall structure and the concrete pile cap below it so that the waterproofing laps, seams, terminations, etc. can be installed to address the actual constructed conditions and properly

sealed. The inherent complexity of opening up the excavation adjacent to the River and keeping it dry long enough to dry out the CMU before the membrane application makes the potential unforeseen conditions a risk to this approach.

- **For Waterproofing Option 1, allow a cost budget range of : \$180,000 to \$220,000**

Waterproofing Option 2 - Ground Injection With Bentonite Type Materials To Cover The Foundation:

Another method of “remedial waterproofing”, but for the exterior face of the foundation, is the use of bentonite containing materials injected into the ground. BENTOGROUT for example, is a CETCO product made from a proprietary blend of bentonite and polymers, formulated for sealing water leaks.

This specialized slurry mixture is injected into the ground along a foundation wall using hollow rods to place the material at specific depths and in a specific spacing interval. The application premise is that the material flows, under pressure, from the hollow rods and covers the exterior surface of the structure with a thick layer (typically 1/2 inch or greater) and stops water penetration at the wall surface. Limitations of the material include proper installation (given the depth and rod spacing); also, the slurry material cannot bridge cracks or gaps larger than 1/8 inch. Because this material is injected into the ground, the installer cannot see the distribution and flow of it; as well as whether or not there may be cracks or gaps in the CMU foundation on the exterior face that the material cannot bridge. Also, if there are existing exterior waterproofing materials installed already on the CMU, they may affect the ability of the grout barrier material to effectively cover the face of the CMU.

Installation of ground injection with bentonite type materials is more cost effective than excavation and installation of sheet materials. Assuming that only the elevator pit perimeter is injection grouted, that would mean that a section of the Lobby floor will need to be removed along the face of the elevator shaft to access the foundation wall under the floor; also where sidewalk abuts the building, strips of concrete will need to be sawcut and removed to insert the rods and verify that the material is installed up to grade level.

A limitation of this method is that it is not possible visually verify the completeness of the installation. It is also unknown how the foundation walls for the Machine Room additions abut the corner of the elevator pit, so that interface may not receive a suitable coating of product. As a remedial method though, it may be more effective than the original negative side waterproofing installation.

- **For Waterproofing Option 2, allow a cost budget range of: \$120,000 to \$160,000**

Positive Side Waterproofing Summary Recommendations:

Option 2 is the most practical approach to positive side waterproofing but neither option is guaranteed to be successful, immediately or long term. It may also not be effective if there are existing waterproofing materials on the exterior face of the CMU that prevent the bentonite from flowing freely. The waterproofing measures may need to be re-done over time because the elevator pits are only approximately 4 feet deep below grade so they fall within the freeze/thaw zone of the ground and are subject to this cyclical weathering.

Elevator Equipment Repairs:

Once the pits have been re-waterproofed, the work of Solution 1 is not done yet. Both elevators will need to be assessed by an elevator technician to determine what repairs are necessary to get them back into service. Only a

licensed elevator technician is authorized to perform such inspections. Due to the fact that both cars have been out of service for so long, the entire shaft should be inspected so that all components of the elevator assembly (above the car, below the car, within the car and within the Machine Rooms) are observed and reviewed.

Based on information HRC has been given from the City, both elevators have deteriorated and leaking hydraulic piping. In addition to the corroded piping, there are deteriorated electrical conduits in the shafts that should also probably be replaced.

In January 2022, Otis Elevator provided the City with a quotation for replacement of the 2nd stage pistons, with complete new jack assemblies for the east elevator. This quotation, for only one elevator unit, was approximately \$46,000 and did not include hydraulic piping replacement or electrical conduit and wire work.

In addition to the cost of the re-waterproofing efforts, the elevator repairs are another expense. Budgeting for this item needs to include, the updated Otis Elevator assessment, replacement of the deteriorated hydraulic piping, replacement of corroded conduit and wire; new hydraulic fluids; elevator permitting and elevator shaft access services.

- **For the elevator equipment repairs, allow a cost budget range of: \$225,000 to \$275,000**

Solution 1 - Resolve the elevator pit water infiltration; repair the elevator equipment:

- **OMB Cost Summary:**
 - **Waterproofing (Option 2)** **\$160,000**
 - **Repair Elevators** **\$275,000**
 - **Total for Solution 1** **\$435,000**

Considerations/Limitations to this Solution:

Implementing additional exterior waterproofing would only be recommended if the CMU pit walls are found not deteriorated. Waterproofing will need to be maintained and the effectiveness monitored on a regular basis to ensure that the elevator pits remain dry; the waterproofing may also simply not be effective if the materials cannot seep around and seal the foundation CMU. Even if repaired, the elevators will continue to require regular maintenance and service and, at some point in time, the original components will need to be replaced.

Solution 2 - Construct Pedestrian Ramps for Footbridge Access:

Constructing pedestrian ramps to reach the footbridge is another solution for vertical access. This would allow the elevators and interior lobby spaces of the tower structures to be taken out of service (or demolished.) It is the most costly solution but is also the least maintenance intensive, long term sustainable solution. Even if the elevator pits are successfully waterproofed and the elevators rebuilt, there will always be on-going maintenance, inspections and repairs necessary for both elevator towers, including wear and tear on the equipment, lobby doors, lobby interiors, lighting, etc. As is, even if both elevators were operational at this point, they would be approximately 12 years old. The life expectancy of an elevator is generally 20 to 25 years, assuming regular maintenance; certain components will wear out sooner than this and environmental factors also affect the life expectancy.

General Ramp Layout Parameters:

Any type of ramp solution will be a large structure and of significant visual impact in the park spaces, due to size.

The Americans With Disabilities Act (ADA) requires a ramp slope of no steeper than 1:12 (8.33%.) While this slope is practical for most users, it is not practical for all users. A ramp slope of 1:16 (6.25%) to 1:20 (5%) is navigable by a broader range of people. (Slopes less than 1:20 are not considered ramps.)

A pedestrian ramp for the footbridge has to accommodate the needs of walkers, cyclists, wheelchair and mobility scooter users. Mobility scooters have a typical incline range of approximately 6% to 12%. This varies based on the number of wheels, weight distribution and configuration of the scooter unit.

Also, a ramp cannot rise vertically more than 30 inches without having flat landing surface. The ramp option examples provided in the Appendix are based on using two different slopes for demonstration purposes to show the footprint required for construction. (See Sheets C-1 and C-2 for aerial view layouts.)

A minimum ramp width of 6 feet is recommended so that pedestrians can pass, traveling in both directions. Where landings occur, these could be made wider than the ramp width to allow for people to rest, look out over the park and River. Landing elements also could be used to provide locations for display of art elements, as an extension of the on-going Art Vision Cheboygan and Cheboygan Area Arts Council efforts underway in the park.

Ramp Design and Aesthetics Considerations

In addition to the configuration and layout of the ramp and landings, durability and aesthetics need to be considerations. With the intent that the ramps are to replace the elevators, the ramp structures need to be constructed from low maintenance materials and withstand harsh winter conditions. Steel and concrete are envisioned as the basic construction elements due to their durability and span capability, between supports into the ground. There are a wide range of structure types, from pre-fabricated ramp sections to custom designed elements that can span from support pier to support pier. The visual appearance can range from being a basic, functional ramp to incorporating unique architectural design elements.

The ramp segments would essentially be designed like bridge sections, spanning from support to support. Common framing types are “beam” and “truss” style.

Beam type supported ramp segments are represented in the concept option elevations included with this Report. Beam style is the most common pedestrian ramp/bridge design for spans up to around 40 feet, which is the maximum ramp section length between landings (at a 1:16 slope) as depicted in our concept ramp layouts included in the Appendix. Beam style use a structural element, such as precast concrete, wood or steel, underneath the structure to span the distance from support to support. They are typically cheaper than truss solutions, but have shorter spans. Beam style structures allow for architectural design options for the guardrail because it is not a structural element of the span, as is with a truss style, as explained below.



Photo 1, Above: Customrock Formliner “Random Cut Stone” pattern used on beam and truss style pedestrian bridge in Fox River, IL.



Photo 2, Above: Truss style bridge stone pattern and stained concrete coloration/pattern at Dodge Park, Sterling Heights, MI.

Truss style designs are the go-to solution for pedestrian bridges for a good reason. They have an extremely efficient engineered design for spanning a gap. Truss bridge designs can accommodate spans up to about 200 feet. Main framing construction material options include galvanized, painted, or weathered steel as well as fiberglass. Decking can be wood or concrete. For use as ramp segments, the truss bridge frames would span from landing support to landing support, similar to the representation we’ve shown for the elevation views on the concept layouts, Sheets W-1 through W-4. The truss steel framing members also double as the guardrail support so this limits the flexibility for architectural design of a guardrail system.

Both beam style and truss style framing are potential solutions for spanning the distance between landings. Regardless of the structural system selected, the following are also considerations for the project.

Ramp design attributes include:

- Integration into the park area – allowing for continued use of the boardwalk, fishing pier and public marina/dock areas.
- Aesthetic harmony with the existing bridge, as well as with current and future park amenities that may be planned.
- Use of color where appropriate. Concrete surfaces can also be stained to soften appearance and integrate the materials with the surroundings.

- Potential use of form liners on concrete surfaces to create texture, pattern, visual interest and artistic elements. (Refer to Photos 1 and 2 for bridge framing type examples as well as the use of color, pattern and concrete formliner materials.)
- Integration of the ramps into the existing trail and sidewalk systems in both parks. The ramps would become part of the pedestrian experience of traveling from one side of the River to other. As noted prior, the landings could be used for incorporation of art displays, landscaping, seasonal flowers etc. to create an interactive experience for the users as they traverse the structure.
- Ramp layout – compact footprint or long, linear path of travel.

While each park area has different ramp placement considerations to address, design aesthetics are common to both locations. From a durability standpoint, steel and/or concrete construction materials are recommended.

Park Specific Design Considerations for Ramp Locations

Washington Park:

Washington Park is the smaller of the two parks. It is bordered on the north by the marina property recently purchased by the City and to the south by the former Boathouse restaurant business that fronts the River.

- The Chamber of Commerce Building sits central to the park.
- The boardwalk area along the east side of the park needs to remain accessible to visitors and boaters, and not blocked off by the ramp.
- The marina slips to the north are to remain in-use.
- The former Boathouse restaurant property is currently being evaluated by the Owner for redevelopment but the intent is to remain as a restaurant venue in some capacity. It is a consideration for layout that the ramp not completely block the views of the River, to the north, from the restaurant, if possible.
- Ramp placement may impact existing underground electrical which will need to be relocated as required for layout.
- Existing park picnic tables, lighting fixtures and possibly the gazebo may need to be relocated for integration into the overall layout, with the ramp.

Based on the above considerations, there are two recommended general locations for a ramp in Washington Park:

1. Linear layout, located east/west along the south side of the park.
2. Compact layout, located to the north end of the park, next to the boardwalk.

Refer to Sheets C-1 and C-2 for these general locations. Regardless of where the ramp is located, the overall Washington Park will require some level of design reconfiguration for master planning layout.

Major City Park:

Major City Park is the larger of the two parks. The property line to the north is located just past the boat launch. The park extends south with more than ½ mile of River frontage. Fishing piers are located along the River and a Children's Trail is currently being developed to the south of the fishing piers. Baseball diamonds and parking comprise most of the remaining developed areas to the east on this site.

As noted in the Existing Conditions section, natural gas and telephone services are indicated on the UPEA Drawings to cross under the River on the north side of the boat launch and may impact ramp placement to the north area in Major City Park. The location of these utilities (and whether or not they are still active) would need to be determined and taken into consideration, when locating ramp access elements.

Ramp placement considerations on this site include:

- Location of natural gas and telephone utilities, serviceability of these and what the easement width is.
- Is a portion of the property north of the current fence line (north of the gas main) available, at least to the extent needed for a ramp?
- The boat launch to remain where located.
- Fishing piers to remain accessible to visitors.
- Maintain a pedestrian path of travel from the bridge, south to the Children's Trail.
- Boat ramp parking may need to be relocated and park vehicular drives reconfigured to accommodate ramp placement to the north of the property.
- Pavement revisions and parking reconfiguration will require modification to the storm sewer system in the affected areas, for ramp placement to the north or to the south side of the bridge.



Artistic bench element – Major City Park



Pavilion at entrance to Children's Trail

Based on the above considerations, there are two recommended locations for a ramp in this park:

1. Linear layout, located east/west along the north side of the park, if location can be coordinated with natural gas and telephone services and/or additional portion of property to the north is obtained by the City.
2. Compact layout, located south of the bridge, adjacent to the River.

Refer to Sheets C-1 and C-2 for these general locations. Regardless of where the ramp is located, the overall Major City Park will require some level of design reconfiguration for master planning layout to incorporate the existing recreational elements on this site and vehicular traffic.

Summary for Solution 2:

- In Washington Park, locating a ramp along the south side of the property is the most cost effective placement. There is open space and no known major underground utilities in the area. This will require the relocation of some park tables, sidewalk and lighting bollards but these are not overly costly impacts to the project. Some trees will likely need to be removed to allow construction for the ramp.



Washington Park - Recommended ramp location, south side of the property.

- In Major City Park, locating a ramp along the north side of the park may be desirable from the perspective that it does not impact the built facilities already present to the south. The potential conflict with the buried natural gas piping and telephone cables make this location challenging though. Assuming that the City does not acquire any additional property to the north and that the utilities are a conflict, then placing a compact layout ramp, south of the bridge, is the most cost effective placement. Parking areas, sidewalk and some site storm/underground electrical work will be necessary to accommodate this location.



Major City Park – Recommended ramp location, south of the elev/stair tower.

- Additional consideration is whether or not the City desires to demolish the existing elevator/stair tower structures at each end of the bridge, if pedestrian ramps are built. With ramps, neither the stairs nor the elevator shafts are necessary. HRC understands that there are telecommunications, camera equipment and electrical power (serving the bridge over the River) in each tower that would need to be relocated.



Second Floor landing is supported by CMU wall of elev/stair tower.

Also, Based on the existing UPEA Drawings for the original project, the bridge over the River is supported on piers separate from the elevator/stair tower CMU construction; however, the Second Floor landing (at the bridge elevation – see photo) is supported by the CMU wall construction. Modifications to or the re-supporting of the landing level will be necessary. It might also be integrated into the upper level of the proposed ramp.

For the purposes of budget planning, we have included demolition of the towers and re-supporting the landings in the costs presented below. Further evaluation of the supporting nature of the existing CMU construction and bridge pier interface would need to occur during design.

Solution 2 - Construct pedestrian ramps for footbridge access (and demolish the elevator/stair towers)

- **OMB Cost Summary:**
 - **Construct Pedestrian Ramps/Demolish Towers** **\$6 million to 8 million**

Considerations/Limitations to this Solution:

Initial cost is the biggest hurdle and inflation increases will impact this budget over time, as the planning process to further define, scope and fund such a project will be a long term activity. Building ramps is the only low maintenance, long term solution to providing ADA access to the existing footbridge over the River.

Solution 3 – Construct New Elevator/Stair Towers:

Building new elevator/stair towers, raising the elevator pits above grade and installing all new elevator equipment is another option.

The existing structures would be torn down and new foundations built on the existing piles. (The existing foundation design would need to be reviewed to see if was adequate to receive the new construction, or if additional piling and expanded pile cap are necessary, based on current Building Codes.)

The new tower design would elevate the First Floor above grade so that the elevator pit bottoms were essentially at grade level. Foundations would be constructed from reinforced concrete and the elevator pits waterproofed from the exterior side for protection. The tower configuration could also accommodate newer elevator technology, that which does not require a Machine Room.

New, short height ramps would need to be designed for access necessary to reach the elevated First Floor level. Adding these elements will require re-configuring sidewalks and landscaping in order to incorporate them into each location.

The existing precast concrete landing at the bridge level would be replaced because is currently supported by the exterior wall at each tower.

It may be possible that the footprint of the new towers will smaller than the existing if an indoor lobby arrangement is not utilized and the elevators exit onto a weather protected area. The design might be more utilitarian than the existing, or resemble the current structure with a gabled metal roof that ties the design into the bridge features. Given the variability of design possibilities, as well as the potential for needing to make revisions in the existing foundation construction, the costs for Solution 3 will vary widely. Even when construction is completed, the City will still have elevators that need to be maintained and monitored so the costs related to equipment maintenance and the potential for breakdowns, will not go away.

Solution 3 - Construct new elevator/stair towers

- **OMB Cost Summary:**
 - **Construct New Elevator/Stair Towers** **\$2.5 million to 4.5 million**

Considerations/Limitations to this Solution:

Although less costly than building pedestrian ramps, this solution still leaves the City with elevators that need to be monitored and maintained on a regular basis. If the existing foundations are found to be insufficient for the supporting the new construction, projected project costs could escalate rapidly.

Conclusion:

There is no immediate or cost effective solution to fix the elevators and get them back into service. The pit waterproofing needs to be effective in order to keep the pits dry - a condition required prior to repairing and making the elevators operational. The feasibility of effectively waterproofing the pits is questionable, based on the fact that they were constructed from CMU, are surrounded by porous materials and are located adjacent to River. With variable water levels, the River surface is known to be at (or above) the level of the elevator pit floors so battling seepage and leaks will be an on-going issue.

Even if effective waterproofing is achieved, various elevator components and mechanical piping still need to be repaired, then maintained on a regular basis. At this point in time, the original elevator equipment and controls are approximately 12 years old and will likely need to be replaced or rebuilt within the next 5 to 10 years, due to age and deterioration from the unfavorable climate conditions within the elevator shaft. (To completely replace or rehabilitate the elevator assemblies will likely cost \$125,000 to \$175,00 for each elevator, thus, that alone, is a significant cost.)

- If the City wants to ultimately eliminate the elevators, then Solution 2 – building pedestrian ramps – should be selected.
- If the City is willing to maintain and operate an elevator based vertical means of access the bridge, then Solution 3 - replacing the towers - is the recommended option.

Next Steps for City Action:

- Contact Basement Tech Construction and enforce the warranty that was provided with the original waterproofing services.
- Investigate whether or not there is existing waterproofing on the exterior of the CMU.
- Understand the CMU core testing recommendations and further discuss these services.
- Discuss and consider the findings and recommendations of this Report.
- Consider potential funding sources including:
 - State and Federal Grant Programs, such as:
 - Transportation Alternatives Program (TAP) Grants
 - MDNR Grants (Trust Fund)
 - FEMA - Building Resilient Infrastructure & Communities (BRIC) Grants
 - Community Development Block Grants (CDBG)
 - Private Businesses and Individuals
 - Philanthropic Organization/Foundation

Appendix

Report Data:

- Basement Tech Construction (Estimate #1098, dated 4/7/21), 2 pages
- Great Lakes Water Levels (1918 – 2022), US Army Corp of Engineers, 1 page
- NOAA/NOS/CO-OPS water level data for dates that waterproofing was installed, 1 page
- Otis Elevator Company, Service Proposal dated 1/11/22 - (Piston replacement – one elevator), 3 pages

Existing UPEA Reference Drawings:

- Sheet C102 – Proposed Site Plan
- Sheet C401 – Bridge Foundation Section
- Sheet S102 – Foundation Plan and Sections
- Sheet A101 – Stair Tower Floor Plans

Vertical Access Options - Concept Ramp Design Sheets:

- Sheet C-1 – Overall Site Aerial ADA Ramp Options at 1:12 Slope
- Sheet C-2 – Overall Site Aerial ADA Ramp Options at 1:16 Slope
- Sheet W-1 – Washington Park Ramp Option 1 Plans and Elevation
- Sheet W-2 – Washington Park Ramp Option 2 Enlarged Plan, Elevation
- Sheet W-3 – Washington Park Ramp Option 3 Plans and Elevation
- Sheet W-4 – Washington Park Ramp Option 4 Plans and Elevation

Basement Tech Construction

Basement.Tech@yahoo.com



ADDRESS

Jason Karmol
CITY OF CHEBOYGAN
403 N. Huron ST
Cheboygan, MI 49721 US

Estimate 1098

DATE 04/07/2021

| ACTIVITY | QTY | RATE | AMOUNT |
|---|-----|------|--------|
| Cheboygan Arena Chamber Of Commerce 124 N Main St Cheboygan, MI 49721 United States | | | |

| ACTIVITY | QTY | RATE | AMOUNT |
|---|-----|----------|--------------------|
| <p>Negative side waterproofing</p> <p>Elevator Pit #1: Customer will pump all fluids from pit. Decrease and acid wash pit V-chip floor and wall joints intersection Drill 3/8 holes into floor and wall joint intersection Set ports Inject Chemical grout Install concrete Cove around floor and wall joints Inject cinderblocks 3 feet up a round pit with chemical to grout. Apply a heavy coat of Xypex to walls and floor.</p> <p>Elevator Pit #2: Customer will pump all fluids from pit. Decrease and acid wash pit V-chip floor and wall joints intersection Drill 3/8 holes into floor and wall joint intersection Set ports Inject Chemical grout Install concrete Cove around floor and wall joints Inject cinderblocks 3 feet up a round pit with chemical to grout. Apply a heavy coat of Xypex to walls and floor.</p> <p>Basement Tech will provide all necessary equipment and material for the jobs. All work includes a three-year warranty</p> <p>Sales person: Byron Webb</p> | 2 | 7,780.00 | 15,560.00 |
| TOTAL | | | \$15,560.00 |

Accepted By

Accepted Date

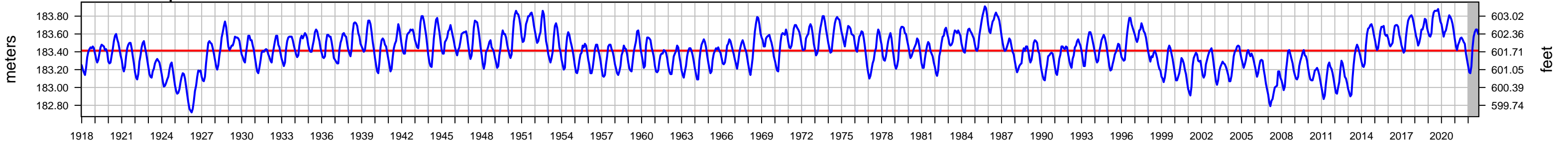


Data from: US Army Corp of Engineers

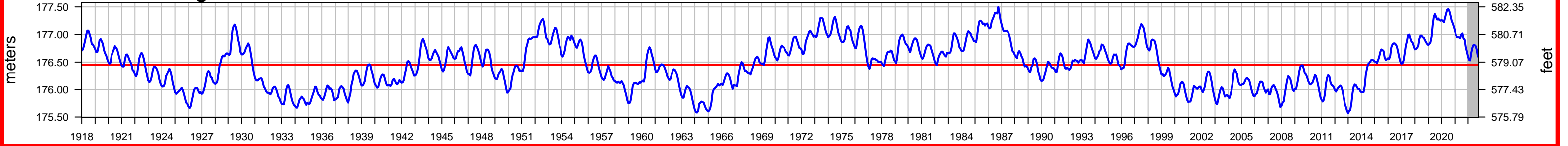
Great Lakes Water Levels (1918–2022)

— Monthly Mean Level — Long Term Average Annual

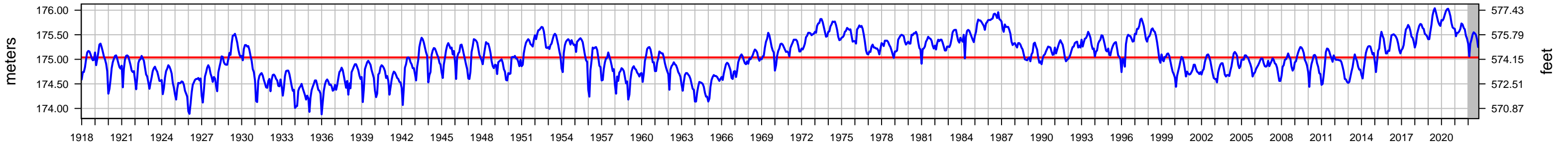
Lake Superior



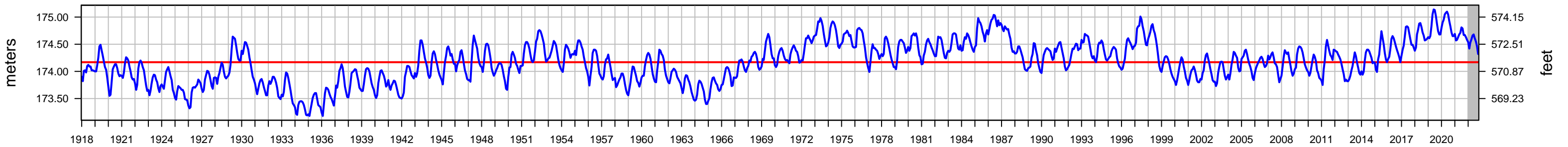
Lake Michigan–Huron



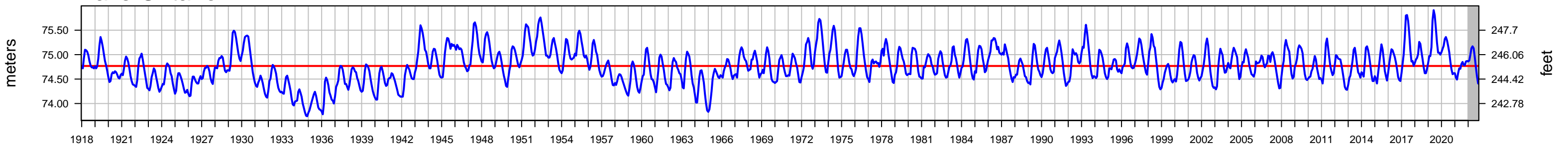
Lake St. Clair



Lake Erie



Lake Ontario

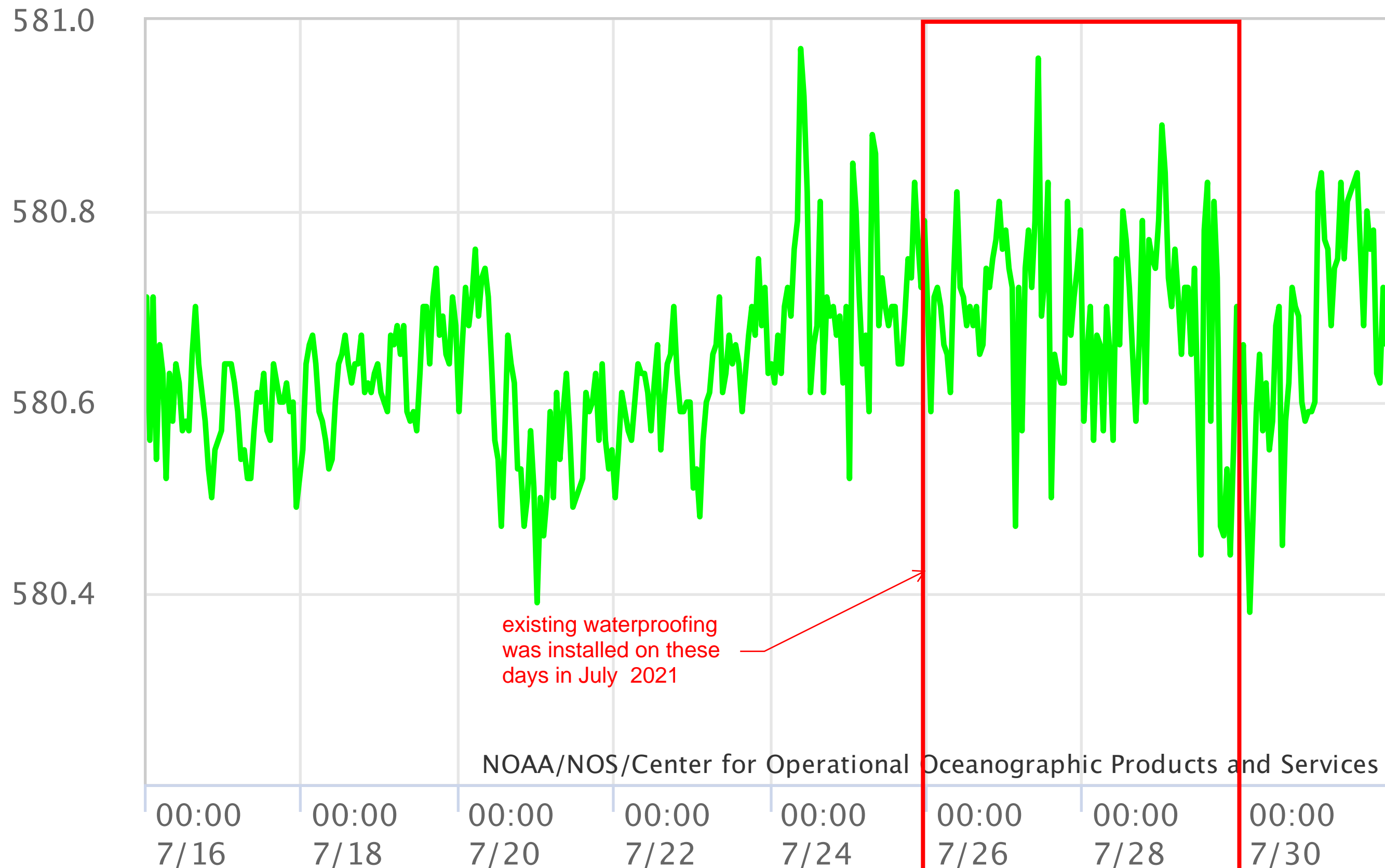


The monthly average levels are based on a network of water level gages located around the lakes. Elevations are referenced to the International Great Lakes Datum (1985).

Water levels have been coordinated through 2021. Values highlighted in gray are provisional.

NOAA/NOS/CO-OPS
Verified Hourly Heights at 9075080, Mackinaw City MI
From 2021/07/16 00:00 LST/LDT to 2021/07/31 23:59 LST/LDT

Height in feet (IGLD 1985)



— Verified **— Preliminary**



Made to move you

DATE: 01/11/2022

TO:
CHEBOYGAN WALKING BRIDGE
Po Box 39
202 Bacus St
Cheboygan, MI 497210039

FROM:
Otis Elevator Company
1777 C S Garfield Ave
Traverse City, MI 49686

EQUIPMENT LOCATION:
CHEBOYGAN WALKING BRIDGE
201 West Elm
Cheboygan, MI 49721

Michaela Watson
Phone: 2315778827
Fax: 8603530327

PROPOSAL NUMBER: MQW210921053957

MACHINE NUMBER(S) : F62223

CUSTOMER DESIGNATION(S) :ELV2

Otis Elevator will provide parts and labor necessary to replace the 2nd stage pistons with new complete jack assemblies. We will adjust for proper operation after repair.

All material provided shall be manufactured and installed in accordance with the ASME A17.1 Safety Code for Elevators and Escalators.

If an alteration permit is required to complete the work, Otis will be responsible for paying permit fees, requesting permit, and scheduling inspection. The customer will be responsible for paying local inspection fees if applicable.

An Otis Representative will contact you to schedule the work. All work will be performed during regular working days and hours of the Elevator Trade.

Lead time on material is 6- 8 weeks.

PRICE: \$ 45,790.00
Forty-five thousand seven hundred ninety dollars

This price is based on a **fifty percent (50 %)** downpayment in the amount of **\$ 22,895.00.**

PAYMENT TERMS:

- The base proposal price is contingent upon receiving a pre-payment of 50% of the base contract amount.
- The pre-payment amount is due in full prior to ordering material and/or mobilizing.

In the event 100% of the contract price is not paid up front, we must be paid the remaining balance no later than the completion of work. Final invoice will be submitted once work is scheduled

Otis Service and Repair Order

This proposal, including the provisions printed on the last page(s), and the specifications and other provisions attached hereto shall, when accepted by you below and approved by our authorized representative, constitute the entire contract between us, and all prior representations or agreements not incorporated herein are superseded.

Submitted by: Michaela Watson
Title: Account Manager
E-mail: michaela.watson@otis.com

Accepted in Duplicate

CUSTOMER

Approved by Authorized Representative

Date: _____

Signed: _____

Print Name: _____

Title _____

E-mail: _____

Name of Company _____

Otis Elevator Company

Approved by Authorized Representative

Date: _____

Signed: _____

Print Name: Megan Yaksic

Title General Manager

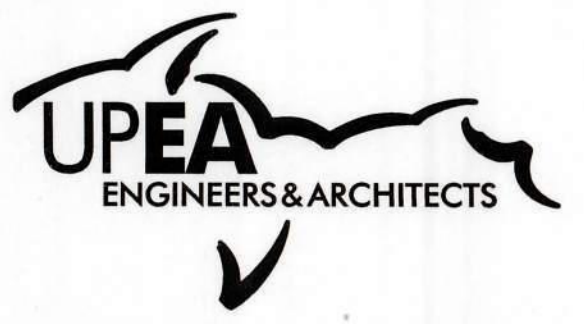
Principal, Owner or Authorized Representative of Principal or Owner

Agent: _____
(Name of Principal or Owner)

Otis Service and Repair Order

TERMS AND CONDITIONS

1. The work shall be performed for the agreed price plus any applicable sales, excise or similar taxes as required by law.
2. In addition to the agreed price, you shall pay to us any future applicable tax imposed on us, our suppliers or you in connection with the performance of the work described.
3. This quotation is subject to change or withdrawal by us prior to acceptance.
4. We warrant to you that the work performed by us hereunder shall be free from defects, not inherent in the quality required or permitted, in material and workmanship for one (1) year from the date of substantial completion. We used commercially reasonable efforts to ensure that the EMS Panorama 2.0 software provided to you is free from viruses and vulnerabilities that may be exploited by third parties. Our duty and your remedy under this warranty are limited to our correcting any such defect you report to us within the warranty period by, at our option, repair or replacement, provided all payments due under the terms of this contract have been made in full. All parts used for repair or replacement under this warranty shall be good quality and furnished on an exchange basis. Printed circuit boards used for replacement parts under this warranty may be refurbished boards. Exchanged parts become our property. This warranty shall be voided if said defect is caused by your breach or negligence or unauthorized access or manipulation of the system.
5. We shall perform the work during our regular working hours of our regular working days unless otherwise agreed in writing. You shall be responsible for providing suitable storage space at the site for our material.
6. You shall obtain title to all the equipment, excluding the software, furnished hereunder when final payment for such material is received by us.
7. Any drawings, illustrations or descriptive matter furnished with the proposal are submitted only to show the general style, arrangement and dimensions of the equipment.
8. Payments shall be made as follows: A down payment of hundred percent (100%) of the price shall be paid after we have completed processing your equipment requirements, and orders are placed; the balance shall be paid on completion if the work is completed within a thirty day period. If the work is not completed within a thirty day period, monthly progress payments shall be made based on the value of any equipment ready or delivered, if any, and labor performed through the end of the month less a five percent (5%) retainage and the aggregate of previous payments. The retainage shall be paid when the work is completed. We reserve the right to discontinue our work at any time until payments shall have been made as agreed and we have assurance satisfactory to us that subsequent payments will be made when due. Payments not received within thirty (30) days of the date of invoice shall be subject to interest accrued at the rate of eighteen percent (18%) per annum or at the maximum rate allowed by applicable law, whichever is less. We shall also be entitled to reimbursement from you of the expenses, including attorney's fees, incurred in collecting any overdue payments.
9. Any material removed by us in the performance of the work shall become our property.
10. Our performance is conditioned upon your securing any required governmental approvals for the installation of any equipment provided hereunder and your providing our workmen with adequate electrical power at no cost to us with a safe place in which to work, and we reserve the right to discontinue our work in the building whenever in our opinion working conditions are unsafe. If overtime work is mutually agreed upon and performed, an additional charge thereof, at our usual rates for such work, shall be added to the contract price. The performance of our work hereunder is conditioned on your performing the preparatory work and supplying the necessary data specified on the front of this proposal or in the attached specification, if any. Should we be required to make an unscheduled return to your site to begin or complete the work due to your request, acts or omissions, then such return visits shall be subject to additional charges at our current labor rates.
11. We shall retain a security interest in all material furnished hereunder and not paid for in full. You agree that a copy of this Agreement may be used as a financing statement for the purpose of placing upon public record our interest in any material furnished hereunder, and you agree to execute a UCC-1 form or any other document reasonably requested by us for that purpose.
12. Except insofar as your equipment may be covered by an Otis maintenance or service contract, it is agreed that we will make no examination of your equipment other than that necessary to do the work described in this contract and assume no responsibility for any part of your equipment except that upon which work has been done under this contract.
13. Neither you nor we shall be liable to the other party hereto for any loss, damage or delay due to any cause beyond your or our reasonable control, including, but not limited to, acts of government, strikes, lockouts, fire, explosion, theft, floods, riot, civil commotion, war, malicious mischief or actors, or act of God; provided, however, that, should loss of or damage to our material or work occur at the site, you shall compensate us therefor unless such loss or damage results from our acts or omissions.
14. We do not agree under our warranty to bear the cost of repairs or replacements due to vandalism, abuse, misuse, neglect, normal wear and tear, modifications not performed by us, improper or insufficient maintenance by others, or any cause beyond our control.
15. We shall conduct, at our own expense, the entire defense of any claim, suit or action alleging that, without further combination, the use by you of any equipment provided hereunder directly infringes any patent, but only on the conditions that (a) we receive prompt written notice of such claim, suit or action and full opportunity to assume the sole defense thereof, including settlement and appeals, and all information available to you for such defense; (b) said equipment is made according to a specification or design furnished by us; and (c) the claim, suit or action is brought against you. Provided all of the foregoing conditions have been met, we shall, at our own expense, either settle said claim, suit or action or shall pay all damages, excluding special, consequential damages (INCLUDING DAMAGES FOR LOSS OF PROFITS, DAMAGES TO ANY COMPUTER, DEVICE, OR SYSTEM, LOSS OF DATA, GOODWILL, USE OR OTHER LOSSES), indirect damages, punitive damages, and costs awarded by the court therein and, if the use or resale of such equipment is finally enjoined, we shall at our option, (i) procure for you the right use of the equipment, (ii) replace the equipment with equivalent noninfringing equipment, (iii) modify the equipment so it becomes noninfringing but equivalent, or (iv) remove the equipment and refund the purchase price (if any) less a reasonable allowance for use, damage or obsolescence.
16. THE EXPRESS WARRANTIES SET FORTH IN THIS AGREEMENT ARE THE EXCLUSIVE WARRANTIES GIVEN: WE MAKE NO OTHER WARRANTIES EXPRESS OR IMPLIED, AND SPECIFICALLY MAKE NO WARRANTY OF MERCHANTABILITY, OF FITNESS FOR ANY PARTICULAR PURPOSE, OR THAT THE SOFTWARE IS FREE FROM VIRUSES OR VULNERABILITIES WHICH MAY BE EXPLOITED BY A THIRD PARTY; AND THE EXPRESS WARRANTIES SET FORTH IN THIS AGREEMENT ARE IN LIEU OF ANY SUCH WARRANTIES AND ANY OTHER OBLIGATION OR LIABILITY ON OUR PART.
17. Your remedies set forth herein are exclusive and our liability with respect to any contract, or anything done in connection therewith such as performance or breach thereof, or from the manufacture, sale, delivery, installation, repair or use of any equipment furnished under this contract, whether in contract, in tort, in warranty or otherwise, shall not exceed the price for the equipment or services rendered.
18. It is agreed that after completion of our work, you shall be responsible for ensuring that the operation of any equipment furnished hereunder is periodically inspected. The interval between such inspections shall not be longer than what may be required by the applicable governing safety code. By accepting delivery of parts incorporating software you agree that the transaction is not a sale of such software but merely a license to use such software solely for operating the unit(s) for which the part was provided, not to copy or let others copy such software for any purpose whatsoever, to keep such software in confidence as a trade secret, and not to transfer possession of such part to others except as a part of a transfer of ownership of the equipment in which such part is installed, provided that you inform us in writing about such ownership transfer and the transferee agrees in writing to abide by the above license terms prior to any such transfer.
19. Our work shall not include the identification, detection, abatement, encapsulation or removal of asbestos, polychlorinated biphenyl (PCB), or products or materials containing asbestos, PCB's or other hazardous substances. In the event we encounter any such product or materials in the course of performing work, we shall have the right to discontinue our work and remove our employees from the project until you have taken the appropriate action to abate, encapsulate or remove such products or materials, and any hazards connected therewith, or until it is determined that no hazard exists (as the case may require). We shall receive an extension of time to complete the work hereunder and compensation for delays encountered as a result of such situation.
20. This Agreement constitutes the entire understanding between the parties regarding the subject matter hereof and may not be modified by any terms on your order form or any other document, and supersedes any prior written or oral communication relating to the same subject. Any amendment or modifications to this Agreement shall not be binding upon either party unless agreed to in writing by an authorized representative of each party. Both parties agree that any form issued by you that contains any terms that are inconsistent with those contained herein shall not modify this Agreement, nor shall it constitute an acceptance of any additional terms.



**ENGINEERING
ARCHITECTURE
PLANNING
SURVEYING
ENVIRONMENTAL**

100 PORTAGE STREET
HOUGHTON, MI 49931
(906) 482-4810

102 W. WASHINGTON, SUITE 217
MARQUETTE, MI 49855
(906) 228-6061

2906 N. STEPHENSON AVE., SUITE 2
IRON MOUNTAIN, MI 49801
(906) 563-5407

707 ASHMIN STREET
SAULT STE. MARIE, MI 49783
(906) 636-0511

1701 DUNLAP AVE., SUITE B
MARINETTE, WI 54143
(715) 732-4188

PROJECT TITLE:
**PEDESTRIAN
FOOTBRIDGE OVER
CHEBOYGAN RIVER**

OWNER:
**CITY OF
CHEBOYGAN**

PROJECT LOCATION:
**CHEBOYGAN,
MICHIGAN**

| | |
|--------------------|----------|
| BIDDING DOCUMENTS | 04/09/09 |
| FINAL REVIEW | 03/23/09 |
| PRELIMINARY REVIEW | 01/21/09 |
| ISSUED FOR: | DATE: |

PROJECT NO: C123-28362
DESIGNED BY: G.R.K.
DRAWN BY: GH
CHECKED: G.R.K.
APPROVED: G.R.K.

**PROPOSED
SITE
PLAN**

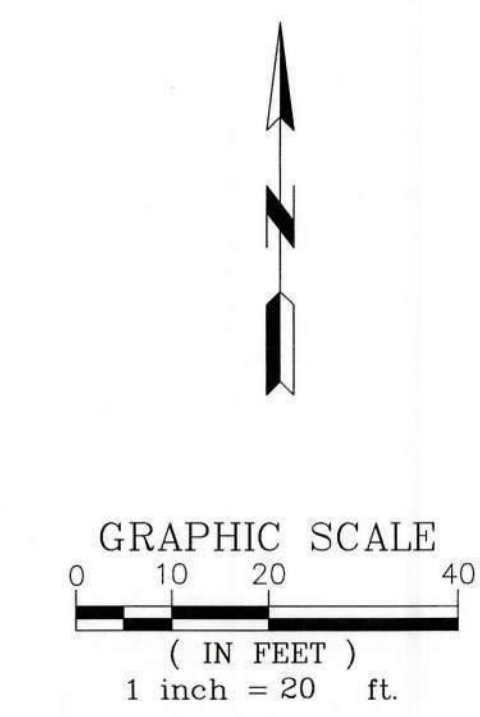
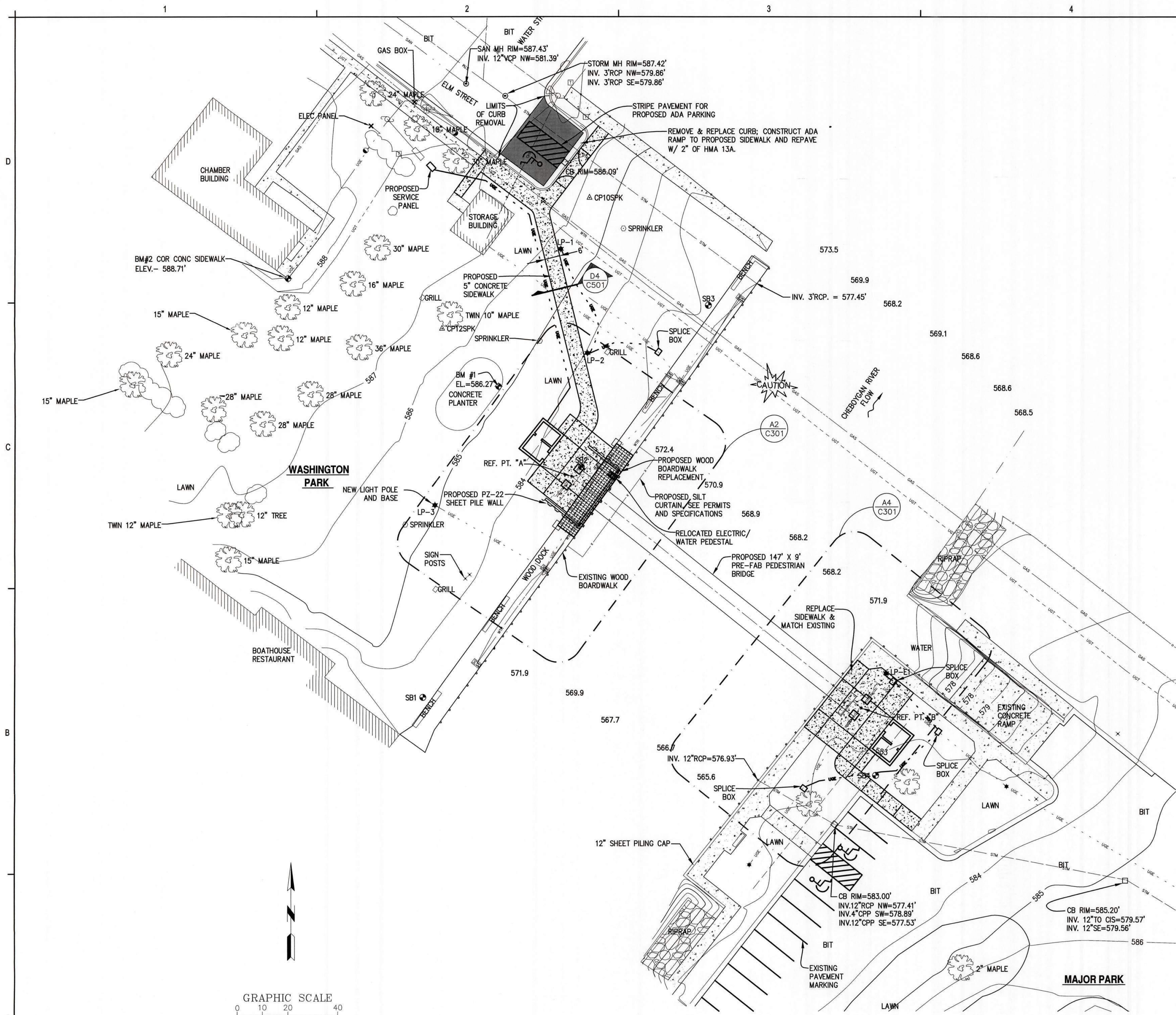
C102

LEGEND:

- ○ DRAINAGE STRUCTURE
- ⊙ MANHOLE
- STM — STORM SEWER
- SAN — SANITARY SEWER
- WTR — WATER MAIN
- UGT — UNDERGROUND TELEPHONE
- OHE — OVERHEAD ELECTRIC
- GAS — GAS
- PROPOSED HMA PAVEMENT
- ▨ CONCRETE SIDEWALK
- FENCE
- ★ LIGHT POLE
- ⊙ UTILITY POLE
- ⊙ TELEPHONE PEDESTAL
- ⊙ CONTROL POINT
- ⊙ GUY WIRE
- ☁ BUSH
- ⊙ WATER/ELECTRIC PEDESTAL
- ⊙ ELECTRIC PEDESTAL
- ⊙ SOIL BORING
- ⊙ BENCH MARK
- EXISTING UNDERGROUND ELECTRIC
- PROPOSED UNDERGROUND ELECTRIC
- ☁ TREE DECIDUOUS

REFERENCE POINTS

| I.D. | DESCRIPTION | NORTHING | EASTING |
|------|----------------|-----------|-----------|
| 524 | REF. POINT "A" | 4889.6082 | 4992.7998 |
| 525 | REF. POINT "B" | 4797.8191 | 5107.9402 |



A3 PROPOSED SITE PLAN
SCALE: 1" = 20'

P:\123-28362-Cheboygan City Footbridge over River\DWG\C102.dwg 10/2009 10:13:10 AM GH

PROJECT TITLE:
**PEDESTRIAN
FOOTBRIDGE OVER
CHEBOYGAN RIVER**

OWNER:
**CITY OF
CHEBOYGAN**

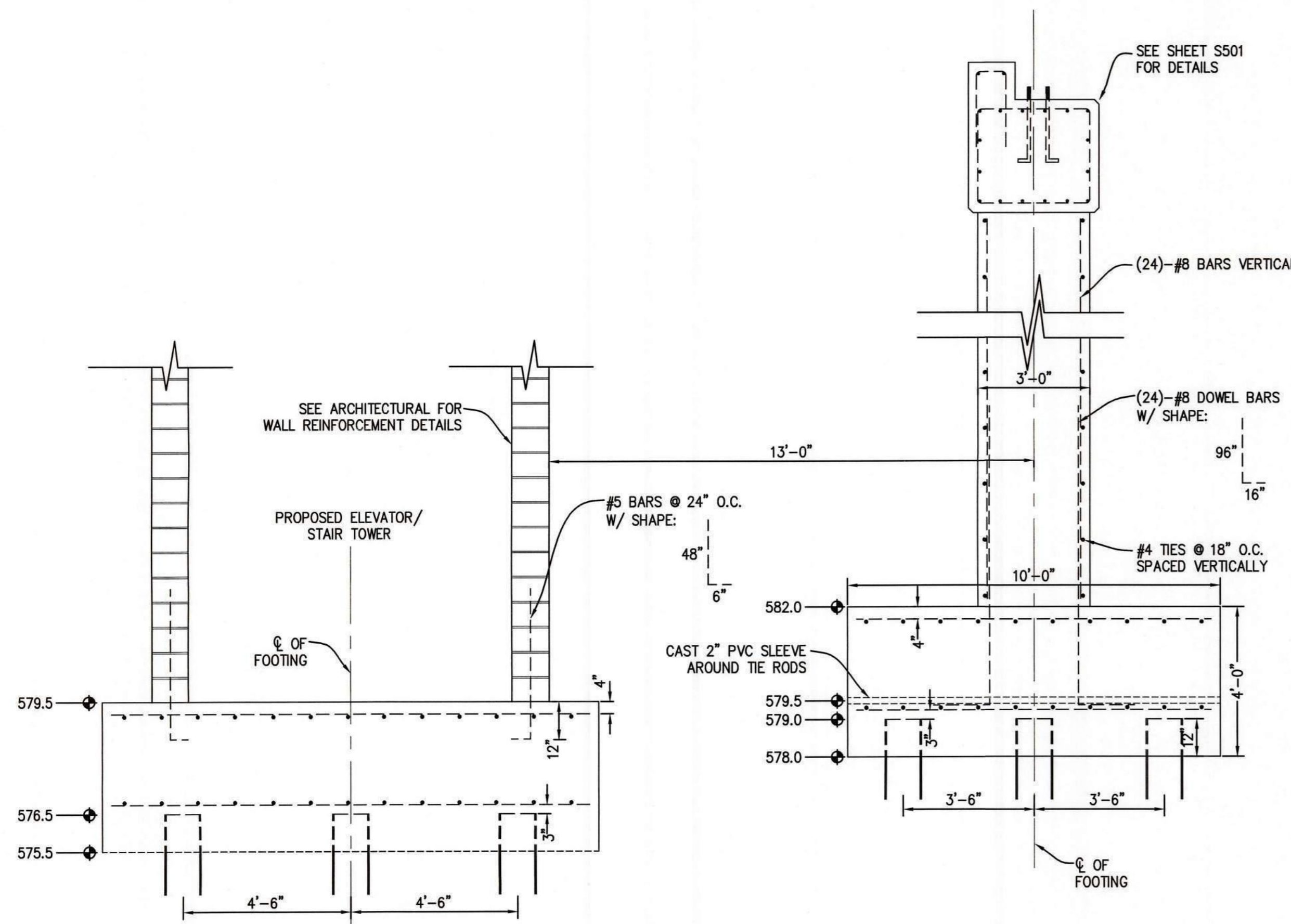
PROJECT LOCATION:
**CHEBOYGAN,
MICHIGAN**

| | |
|--------------------|----------|
| BIDDING DOCUMENTS | 04/09/09 |
| FINAL REVIEW | 03/23/09 |
| PRELIMINARY REVIEW | 01/21/09 |
| ISSUED FOR: | DATE: |

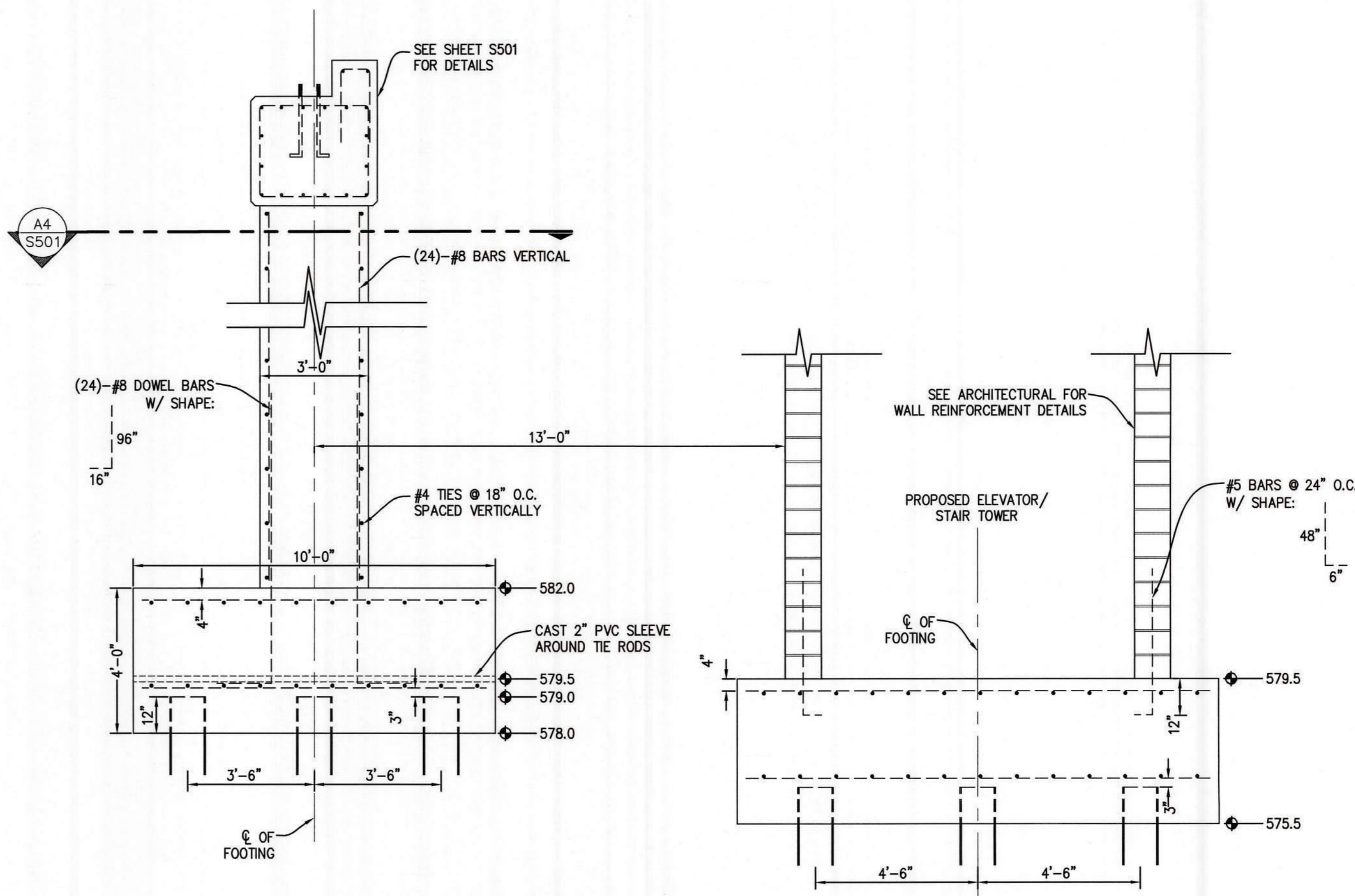
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|--------------|------------|
| PROJECT NO: | C123-28362 |
| DESIGNED BY: | G.R.K. |
| DRAWN BY: | GH |
| CHECKED: | G.R.K. |
| APPROVED: | G.R.K. |

**FOUNDATION
PLAN AND
SECTIONS**

S102

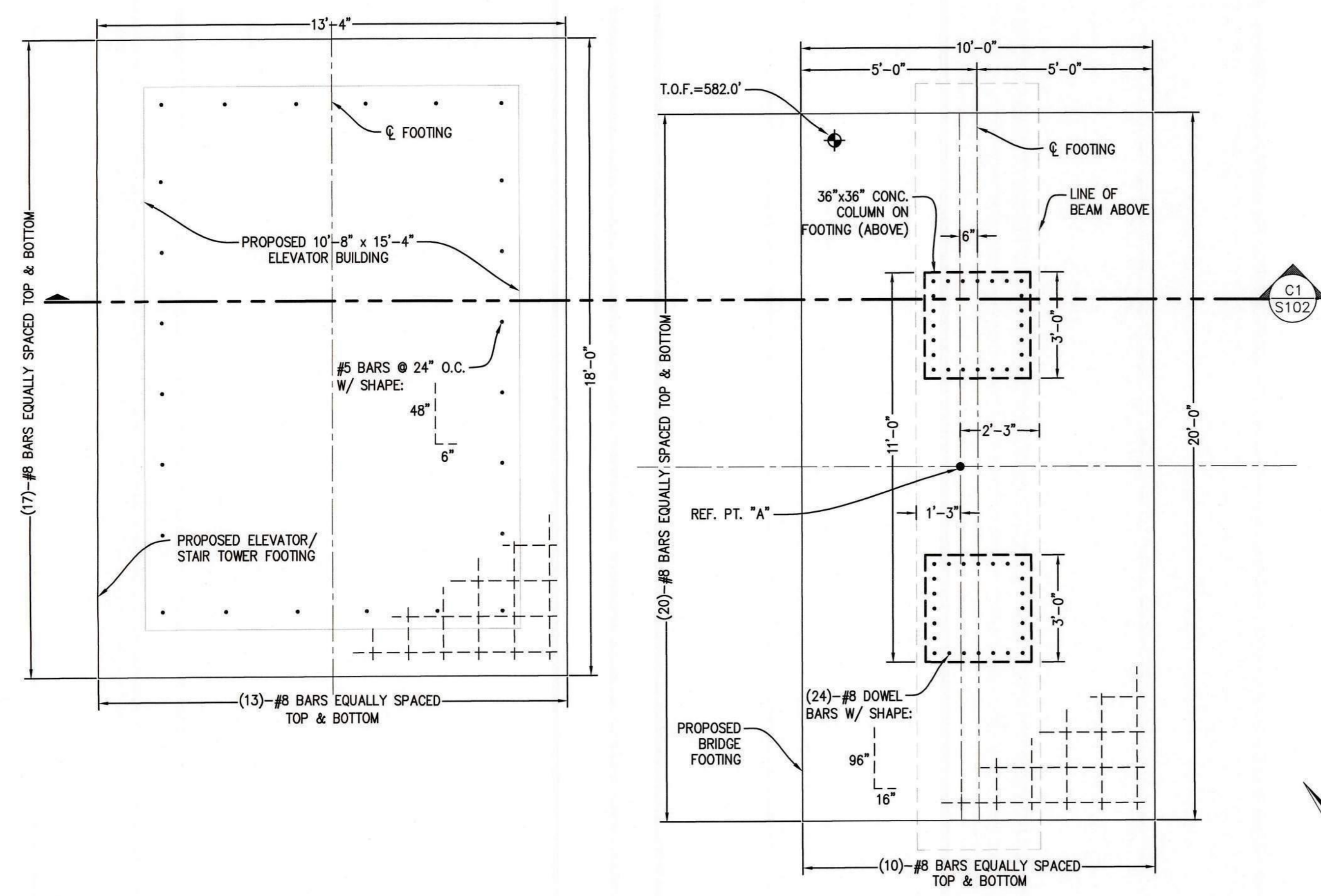


C1 WEST SIDE FOOTING SECTION
SCALE: 3/8" = 1'

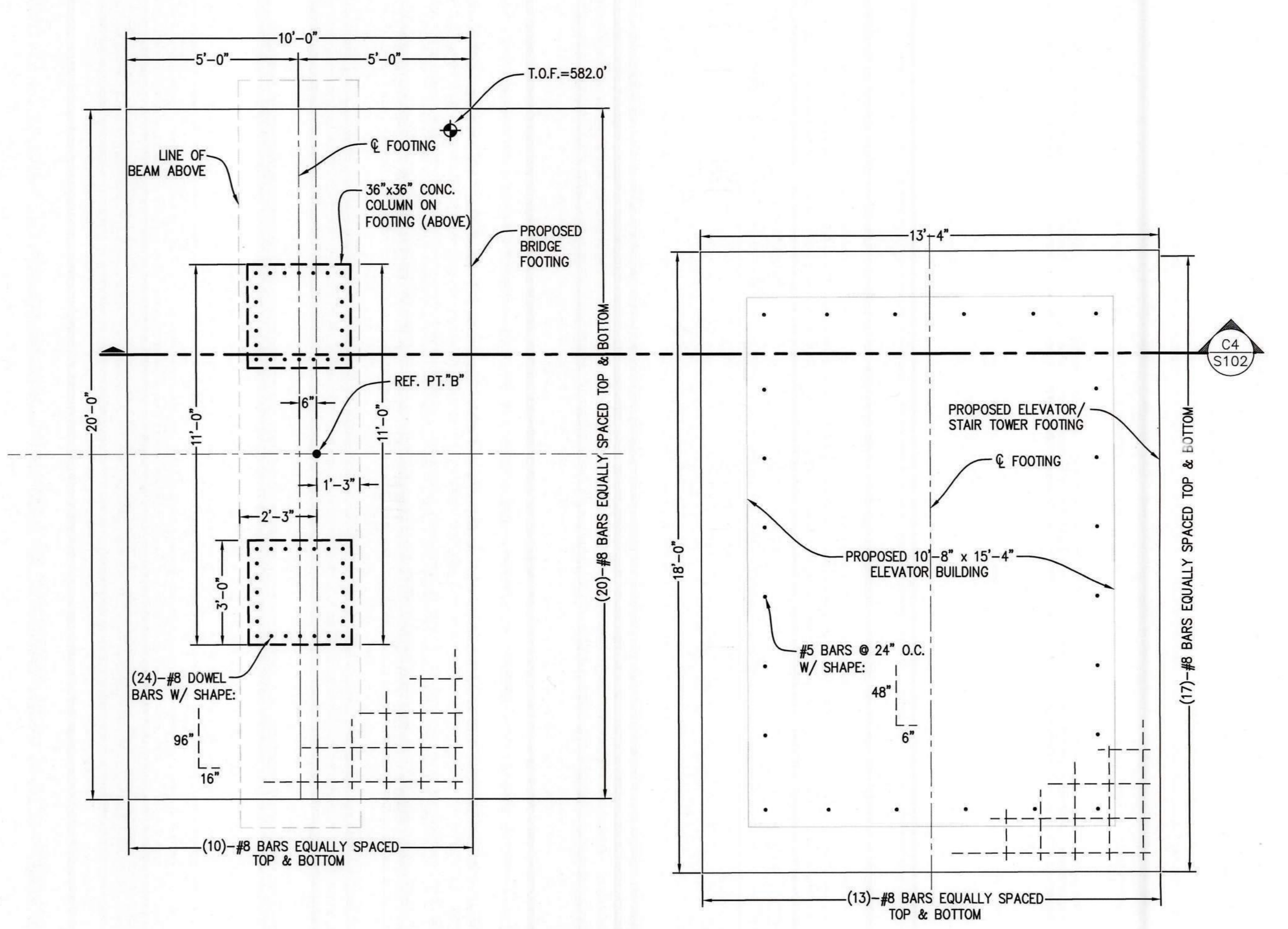


C4 EAST SIDE FOOTING SECTION
SCALE: 3/8" = 1'

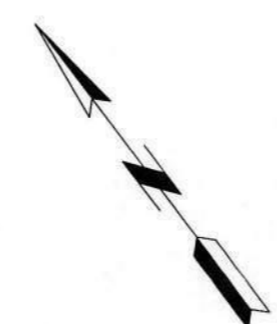
NOTE:
CONTRACTOR SHALL INSTALL "UFER"
GROUNDING ON FOUNDATION REINFORCEMENT.
(SEE ELECTRICAL & INSTALL PER CODE)



A1 WEST SIDE FOOTING PLAN
SCALE: 3/8" = 1'



A4 EAST SIDE FOOTING PLAN
SCALE: 3/8" = 1'



P:\023\28362\Cheboyan_C1_People.dwg User: bhp\pdp1023\023\023.dwg, 03/20/09 10:51:41 AM, gh

**PROJECT TITLE:
PEDESTRIAN
FOOTBRIDGE OVER
CHEBOYGAN RIVER**

**OWNER:
CITY OF
CHEBOYGAN**

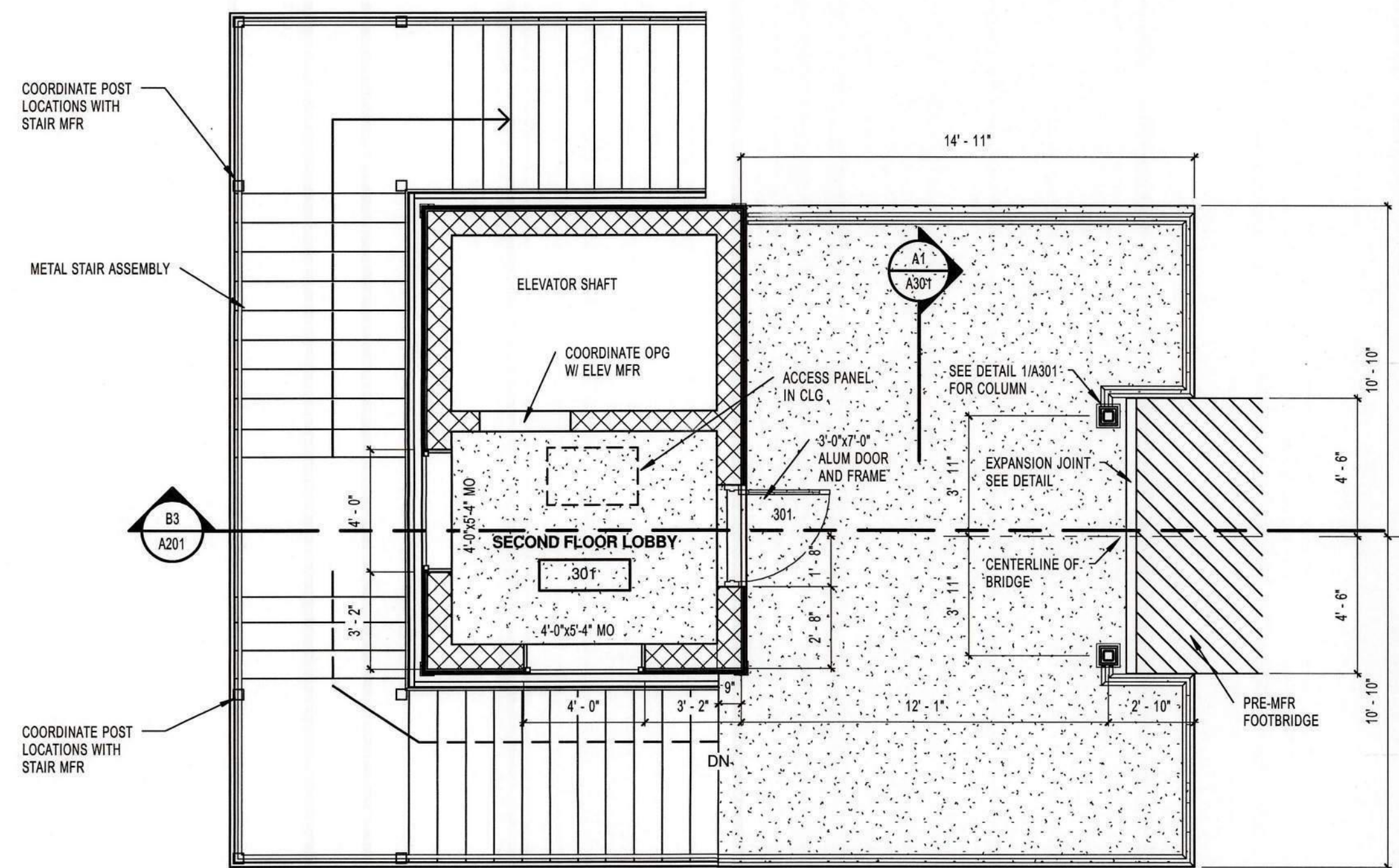
**PROJECT LOCATION:
CHEBOYGAN,
MICHIGAN**

| | |
|-------------------|----------|
| BIDDING DOCUMENTS | 04/09/09 |
| FINAL REVIEW | 03/23/09 |
| ISSUED FOR: | DATE: |

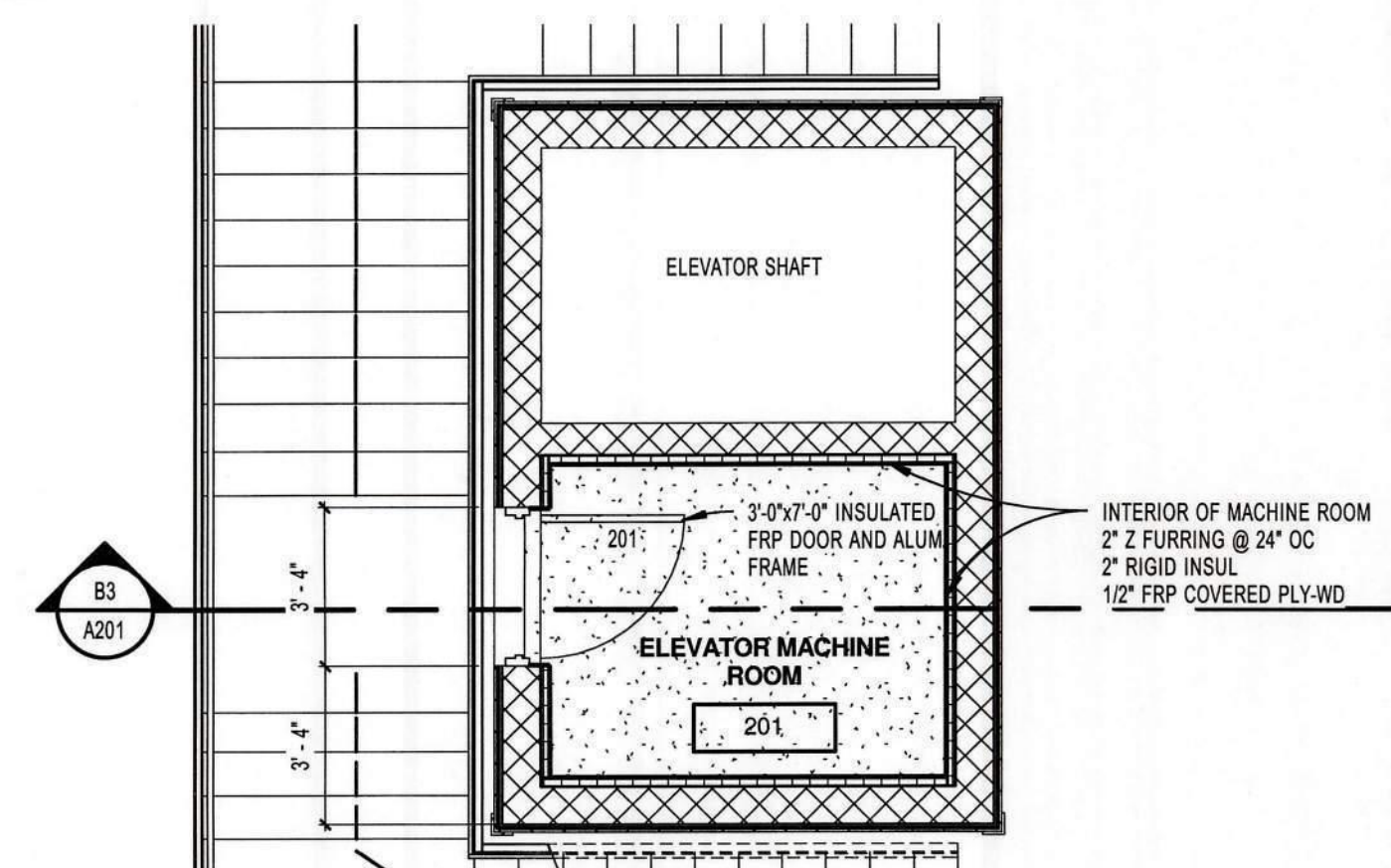
| | |
|--------------|------------|
| PROJECT NO: | C123-28362 |
| DESIGNED BY: | KRC |
| DRAWN BY: | JAS |
| CHECKED: | KRC |
| APPROVED: | GRK |

**STAIR TOWER FLOOR
PLANS**

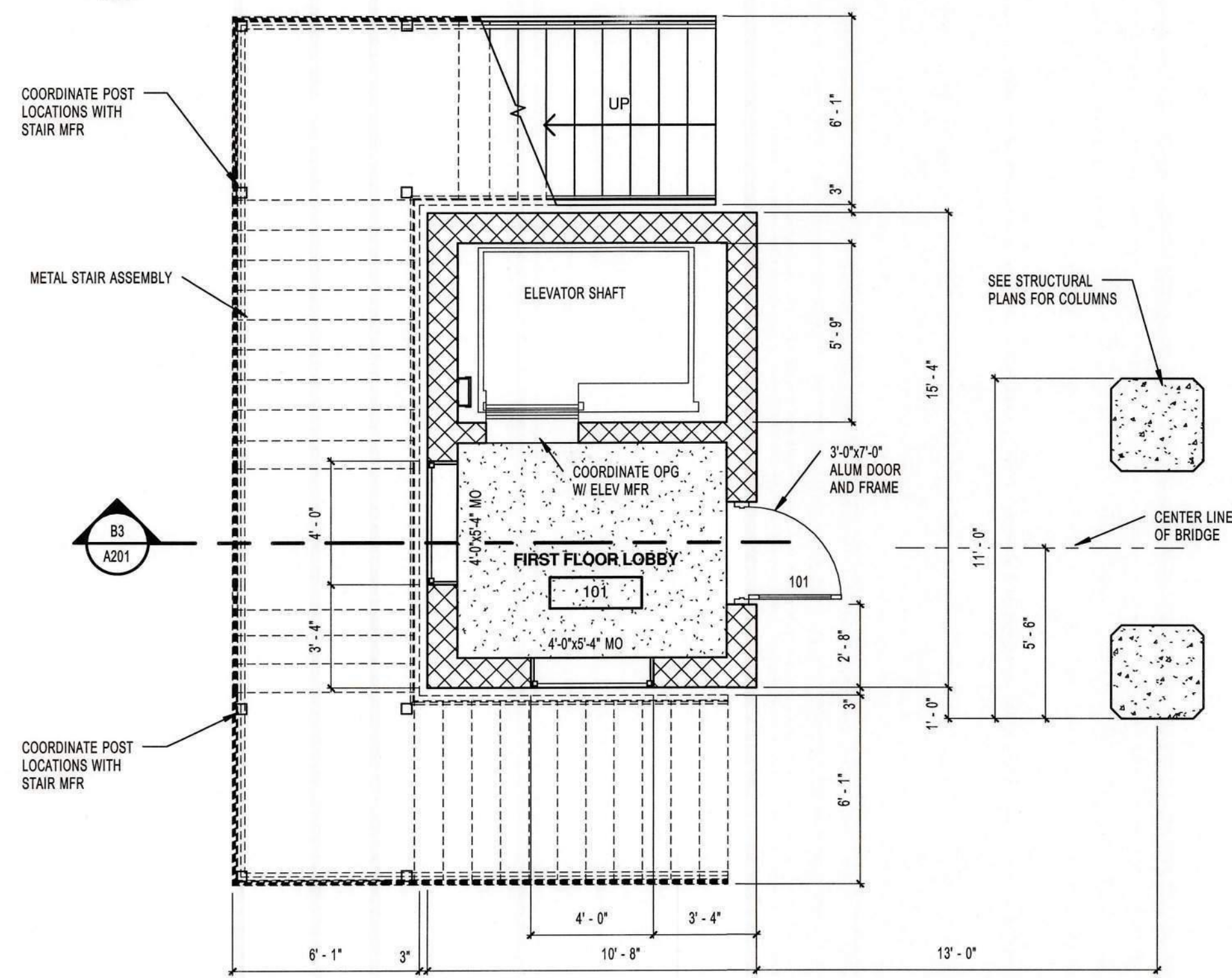
A101



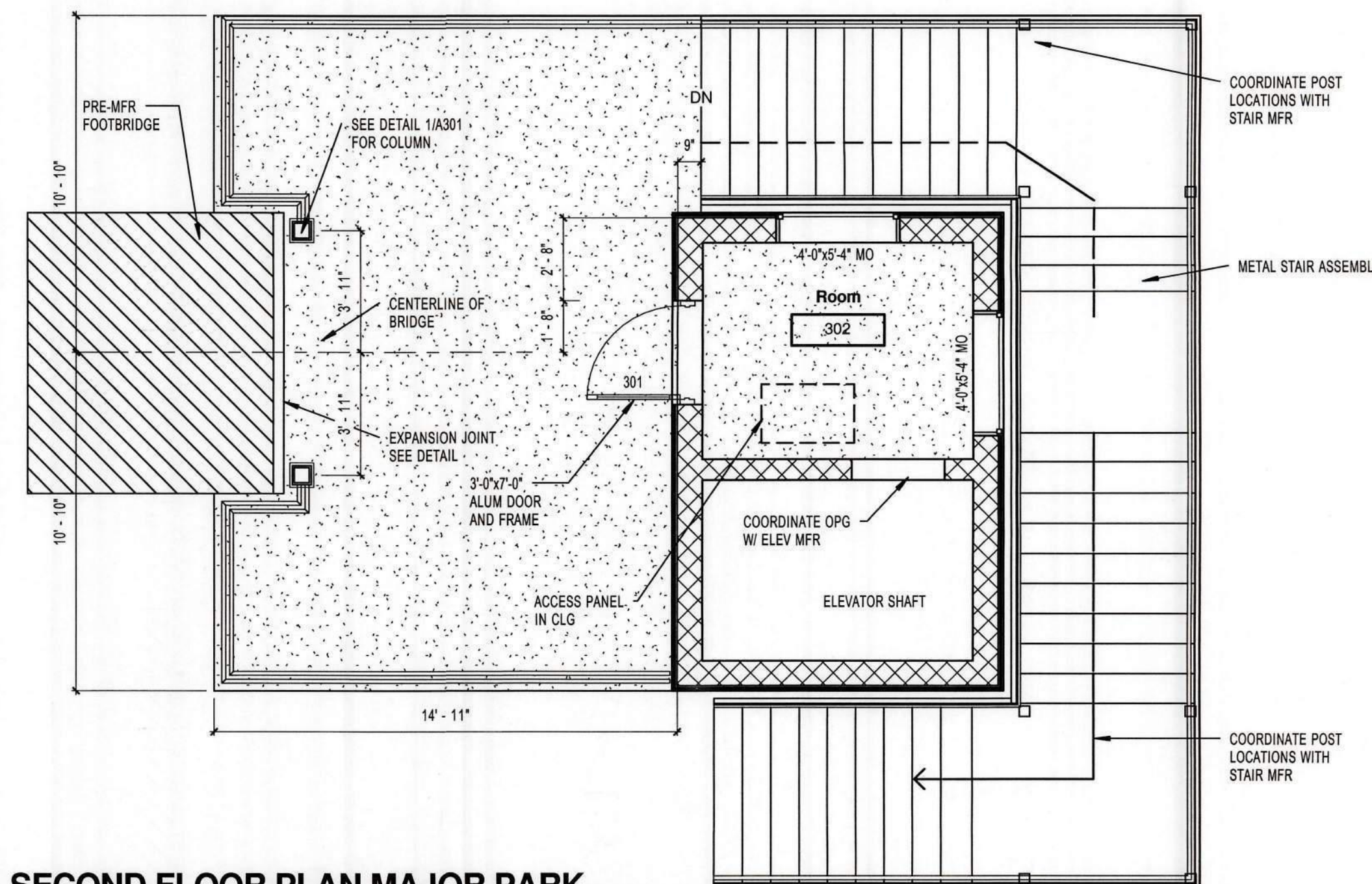
C4 SECOND FLOOR PLAN WASHINGTON PARK
1/4" = 1'-0"



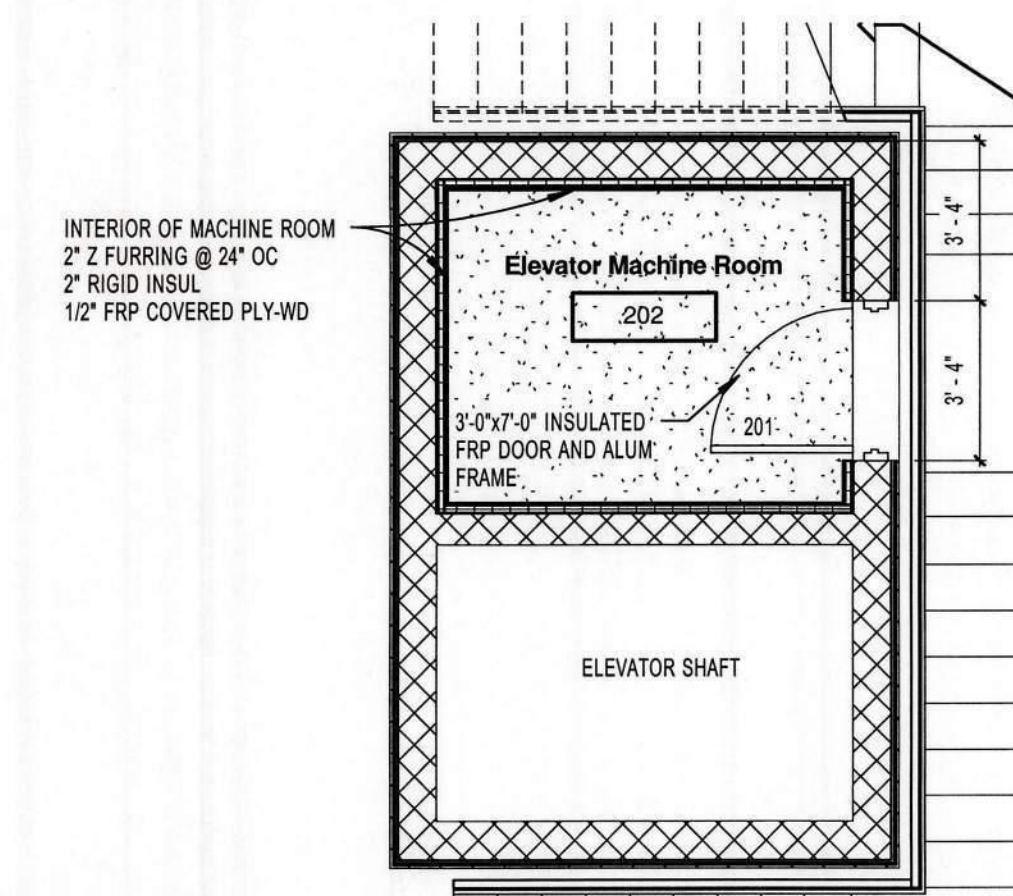
B4 MACHINE ROOM PLAN WASHINGTON PARK
1/4" = 1'-0"



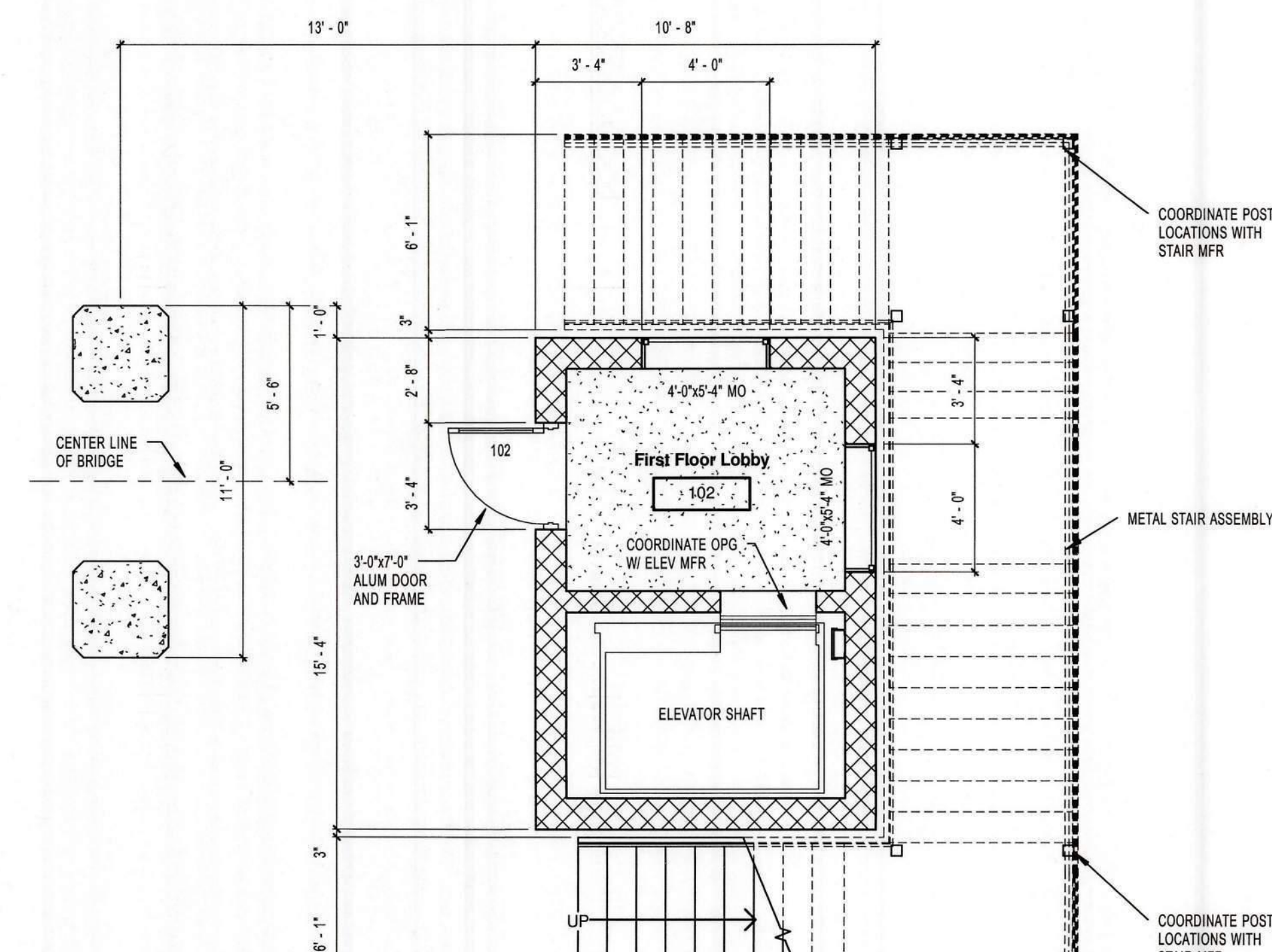
A4 FIRST FLOOR WASHINGTON PARK
1/4" = 1'-0"



3 SECOND FLOOR PLAN MAJOR PARK
1/4" = 1'-0"




2 MACHINE ROOM PLAN MAJOR PARK
1/4" = 1'-0"



1 FIRST FLOOR MAJOR PARK
1/4" = 1'-0"



HRC
HUBBELL, ROTH & CLARK, INC
 CONSULTING ENGINEERS SINCE 1915
 BUHL BLDG, STE 1650 535 GRISWOLD
 DETROIT, MI 48226-3698
 PHONE: (313) 965-3330
 WEB SITE: www.hrcengr.com



| | |
|----------|----------------------------|
| 12-21-22 | FINAL REPORT |
| DATE | ADDITIONS AND/OR REVISIONS |
| DESIGNED | JMG |
| DRAWN | JMG |
| CHECKED | JMG |
| APPROVED | JBV |

**CITY OF CHEBOYGAN
 PEDESTRIAN BRIDGE
 VERTICAL ACCESS OPTIONS**

OVERALL SITE AERIAL
 ADA RAMP OPTIONS
 AT 1:12 SLOPE

| | |
|----------------|-----------|
| HRC JOB NO. | SCALE |
| 20210958 | AS NOTED |
| DATE | SHEET NO. |
| SEPTEMBER 2022 | C-1 |
| | OF |

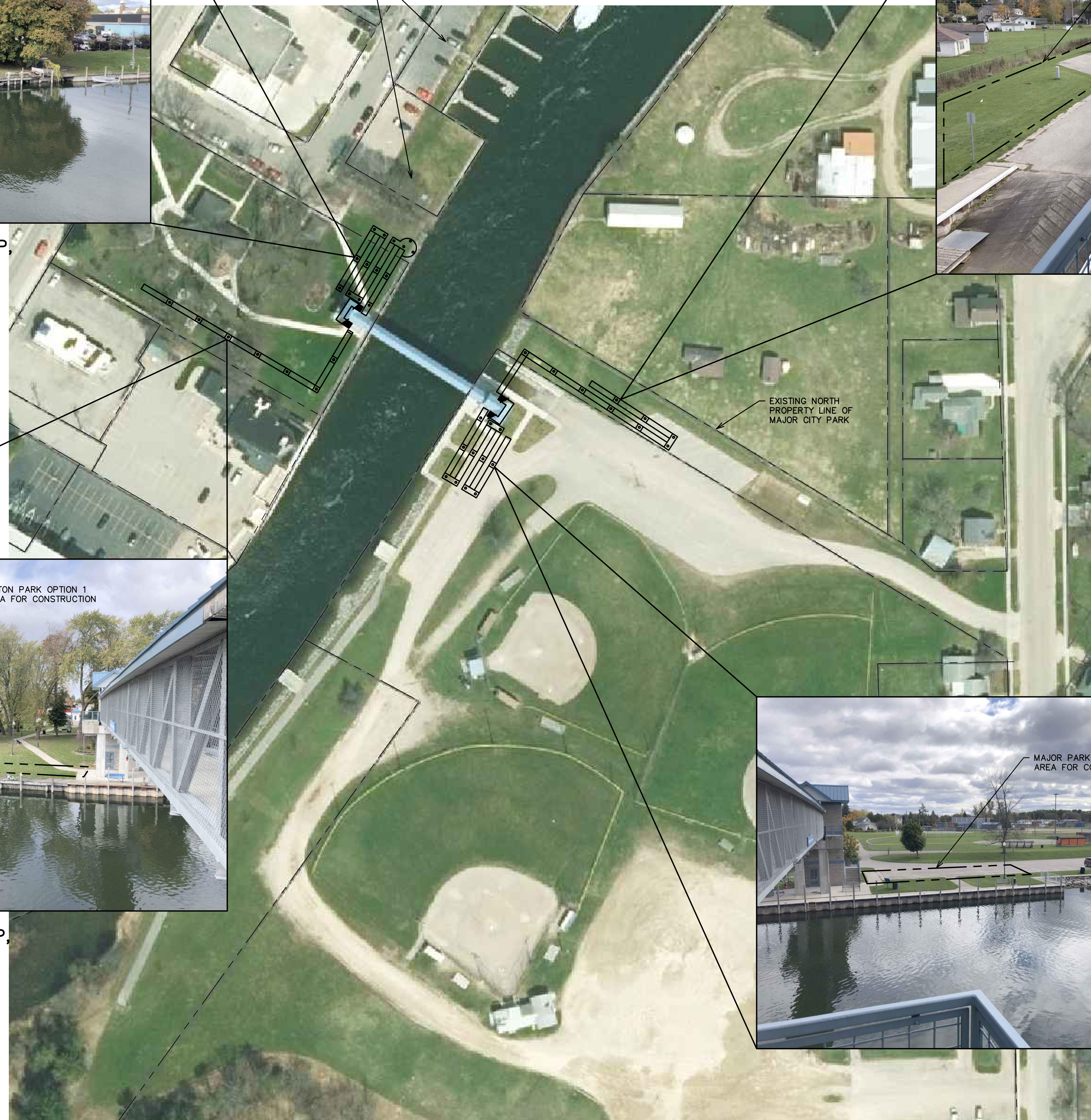


CITY HAS ACQUIRED THIS PROPERTY NORTH OF WASHINGTON PARK

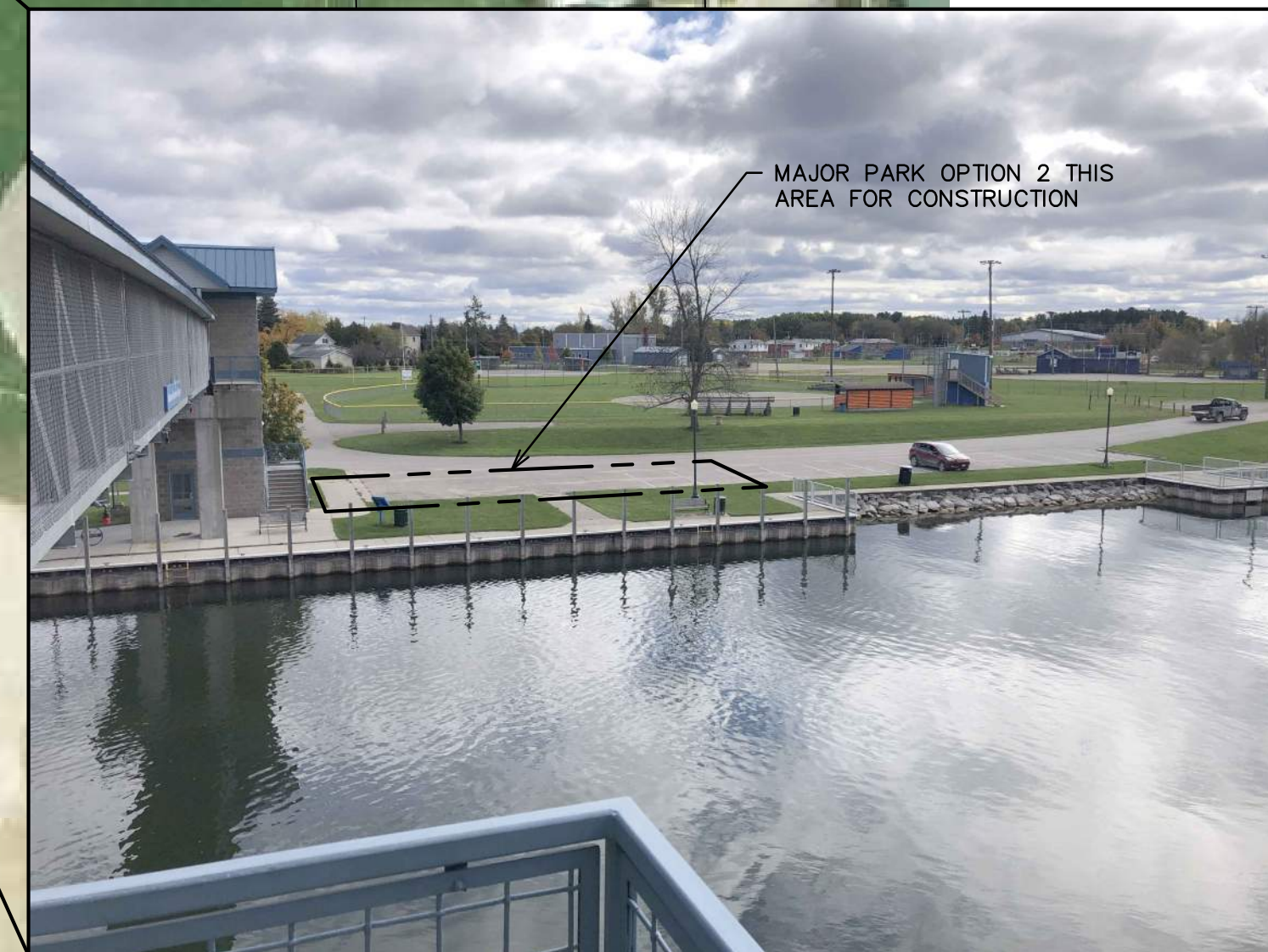


WASHINGTON PARK – OPTION 2 RAMP, SEE SHEET W-2 FOR EXAMPLE

MAJOR CITY PARK – OPTION 1 RAMP (EXAMPLE W-1 IS SIMILAR WITH SWITCHBACK AT LANDING)



WASHINGTON PARK – OPTION 1 RAMP, SEE SHEET W-1 FOR EXAMPLE



MAJOR CITY PARK – OPTION 2 RAMP, (EXAMPLE W-2 IS SIMILAR)

SITE PLAN WITH RAMPS AT 1:12 SLOPE

SCALE: 1/64" = 1'-0"





WASHINGTON PARK – OPTION 3 RAMP, SEE SHEET W-3 FOR EXAMPLE



WASHINGTON PARK – OPTION 4 RAMP, SEE SHEET W-4 FOR EXAMPLE

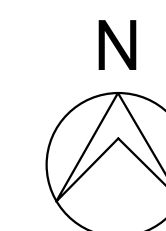


MAJOR CITY PARK – OPTION 3 RAMP (EXAMPLE W-3 IS SIMILAR)



MAJOR CITY PARK – OPTION 4 RAMP (EXAMPLE W-4 IS SIMILAR)

SITE PLAN WITH RAMPS AT 1:16 SLOPE
SCALE: 1/64" = 1'-0"

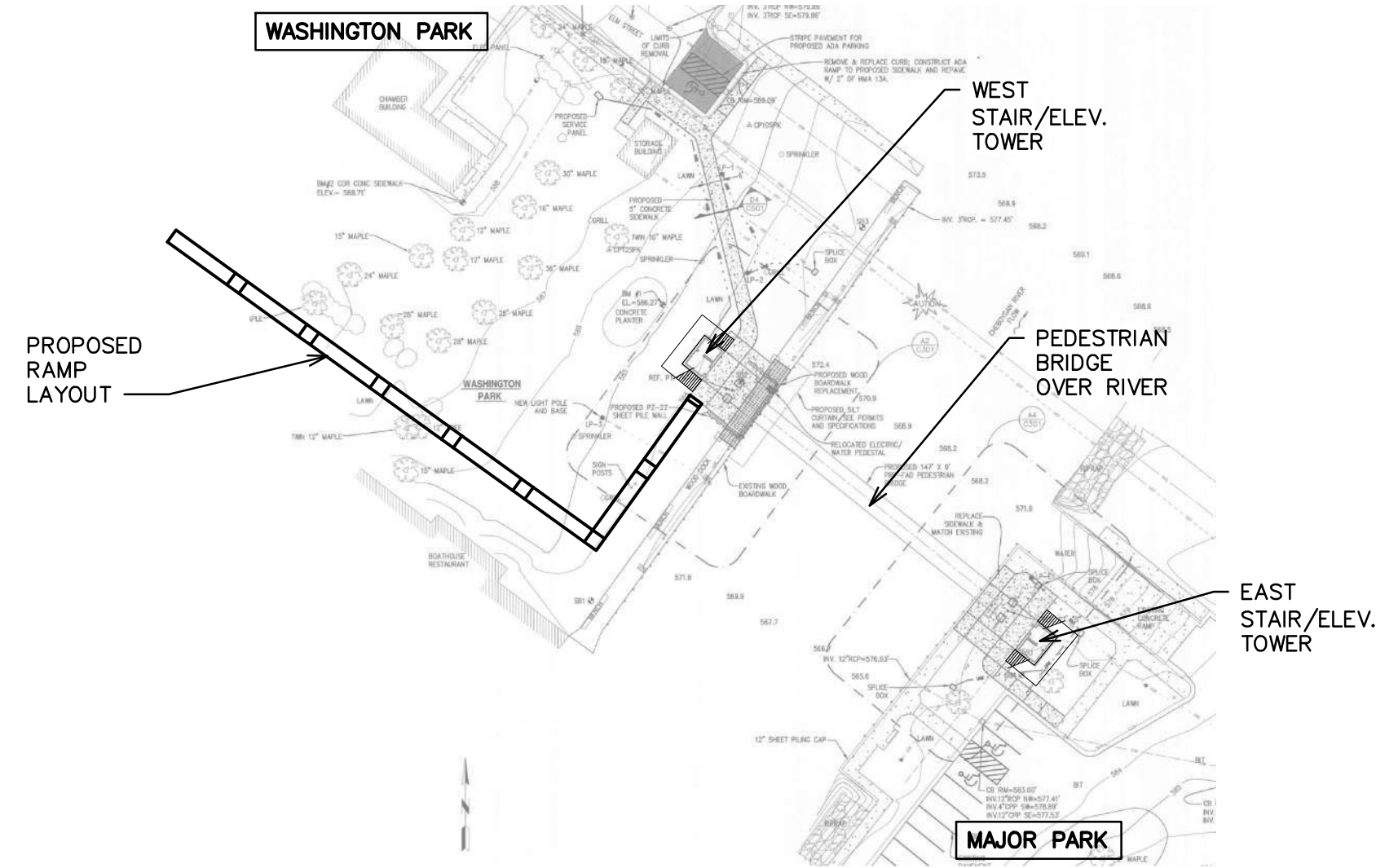


| | |
|----------|----------------------------|
| 12-21-22 | FINAL REPORT |
| DATE | ADDITIONS AND/OR REVISIONS |
| DESIGNED | JMG |
| DRAWN | JMG |
| CHECKED | JMG |
| APPROVED | JBV |

**CITY OF CHEBOYGAN
PEDESTRIAN BRIDGE
VERTICAL ACCESS OPTIONS**

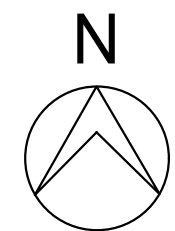
OVERALL SITE AERIAL
ADA RAMP OPTIONS
AT 1:16 SLOPE

| | |
|----------------|-----------|
| HRC JOB NO. | SCALE |
| 20210958 | AS NOTED |
| DATE | SHEET NO. |
| SEPTEMBER 2022 | C-2 OF |



WASHINGTON PARK RAMP SITE PLAN

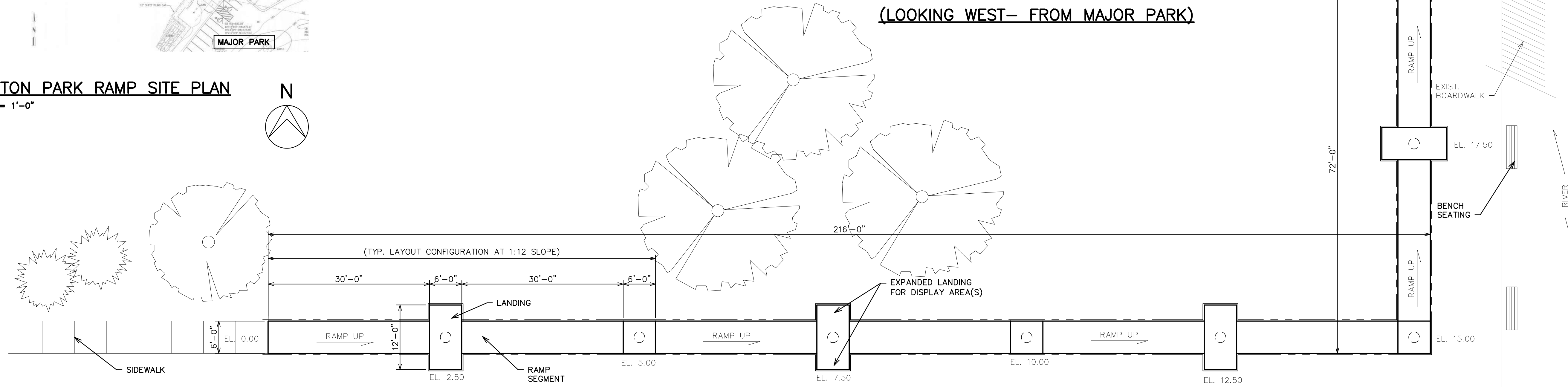
SCALE: 1/64" = 1'-0"



(LOOKING EAST)

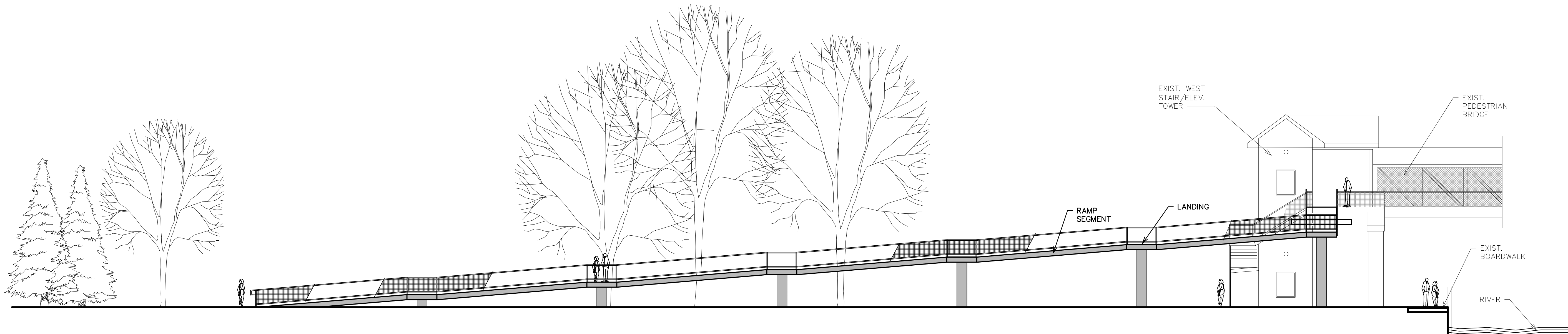
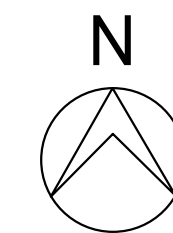


(LOOKING WEST- FROM MAJOR PARK)



WASHINGTON PARK RAMP AT 1:12 SLOPE - OPTION 1 ENLARGED PLAN

SCALE: 3/32" = 1'-0"



WASHINGTON PARK RAMP AT 1:12 SLOPE - OPTION 1 ELEVATION (LOOKING NORTH FROM SOUTH PROPERTY LINE)

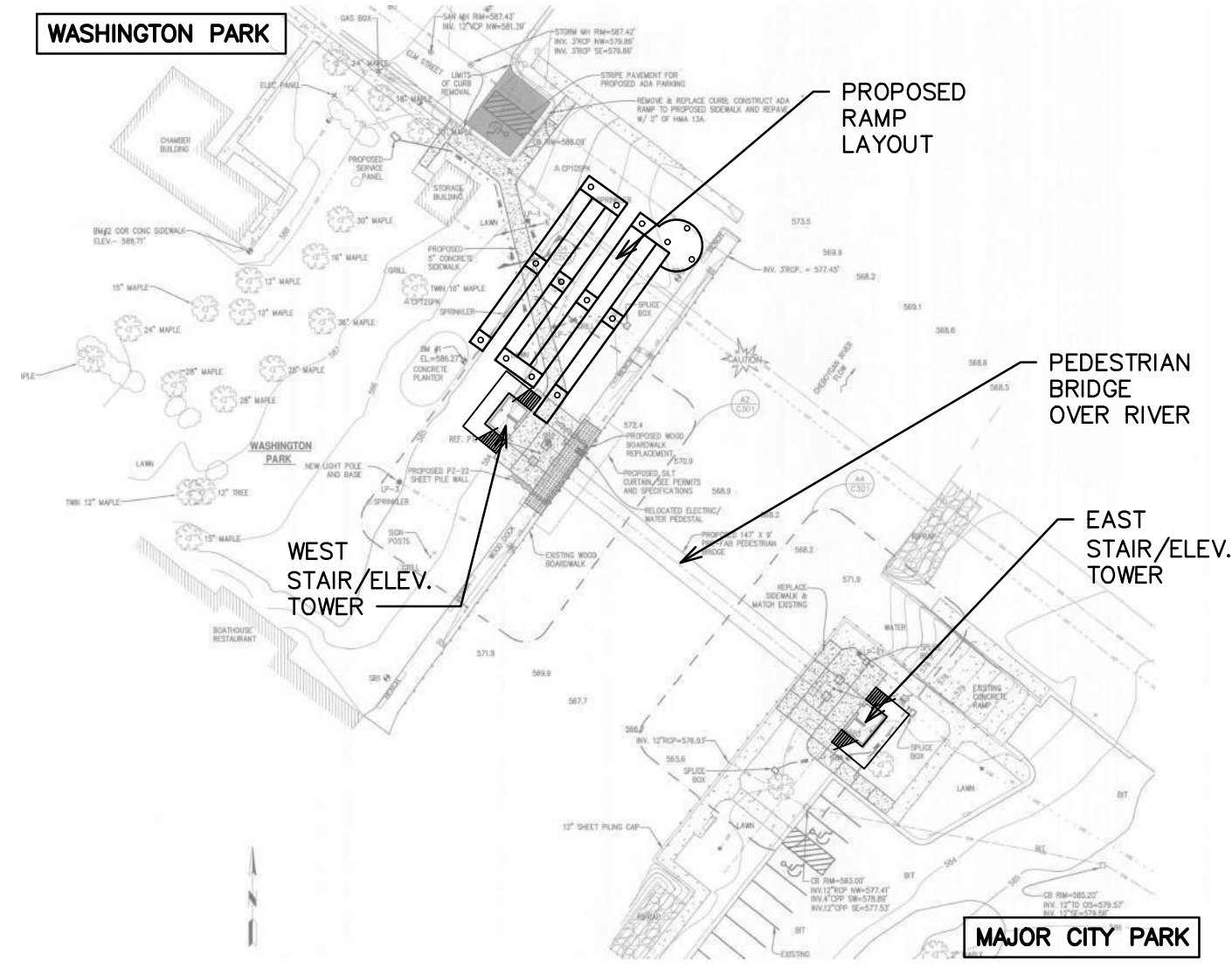
SCALE: 3/32" = 1'-0"

| | |
|--------------|----------------------------|
| 12-21-22 | FINAL REPORT |
| DATE | ADDITIONS AND/OR REVISIONS |
| DESIGNED JMG | |
| DRAWN JMG | |
| CHECKED JMG | |
| APPROVED JBV | |

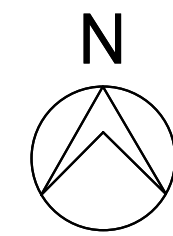
CITY OF CHEBOYGAN PEDESTRIAN BRIDGE VERTICAL ACCESS OPTIONS

WASHINGTON PARK RAMP OPTION 1 (1:12 SLOPE) PLANS AND ELEVATION

| | |
|-------------------------|---------------------|
| HRC JOB NO. 20210958 | SCALE AS NOTED |
| DATE SEPTEMBER 2022 | SHEET NO. W-1 OF |



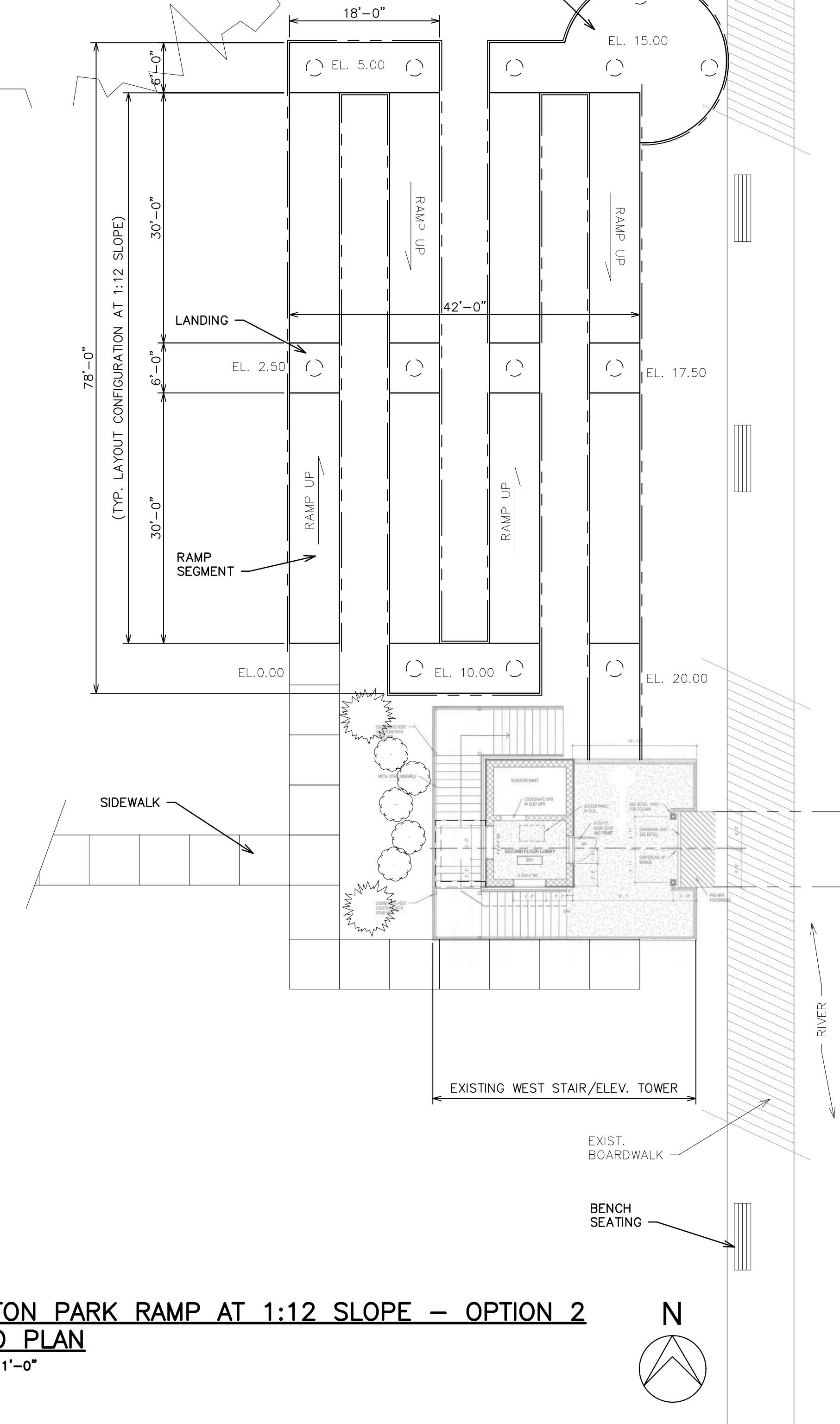
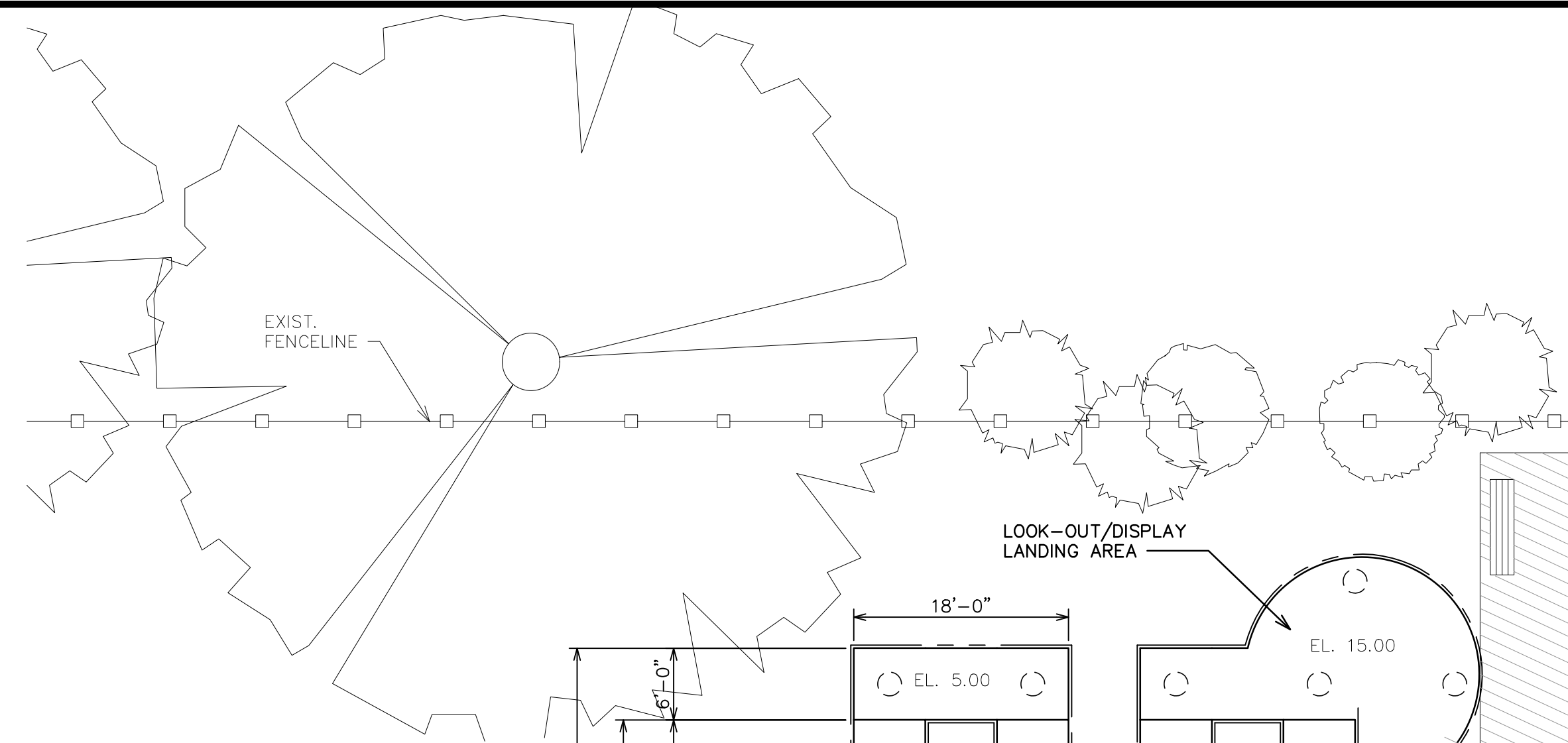
WASHINGTON PARK RAMP SITE PLAN
SCALE: 1/64" = 1'-0"



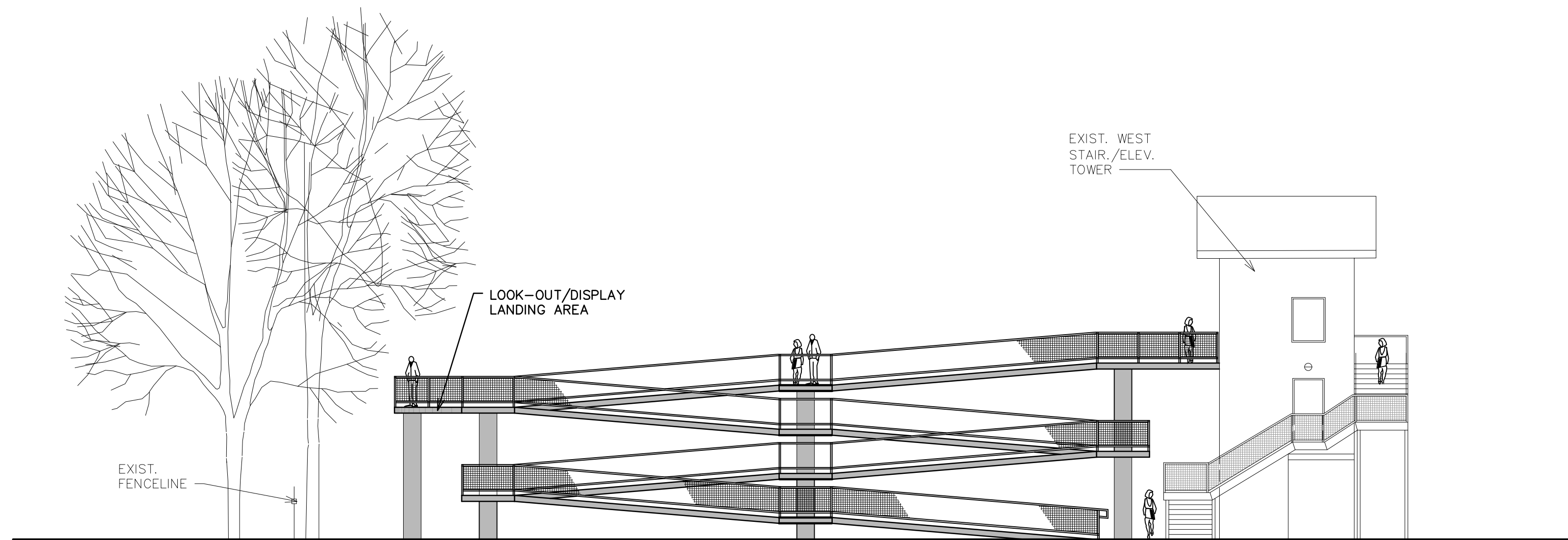
(LOOKING EAST)



(LOOKING SOUTH)



WASHINGTON PARK RAMP AT 1:12 SLOPE - OPTION 2 ENLARGED PLAN
SCALE: 1/32" = 1'-0"



WASHINGTON PARK RAMP AT 1:12 SLOPE - OPTION 2 ELEVATION (LOOKING EAST)
SCALE: 1/32" = 1'-0"

| 12-21-22 | FINAL REPORT |
|----------|----------------------------|
| DATE | ADDITIONS AND/OR REVISIONS |
| DESIGNED | JMG |
| DRAWN | JMG |
| CHECKED | JMG |
| APPROVED | JBV |

**CITY OF CHEBOYGAN
PEDESTRIAN BRIDGE
VERTICAL ACCESS OPTIONS**

WASHINGTON PARK RAMP
OPTION 2 (1:12 SLOPE)
ENLARGED PLAN, ELEVATION

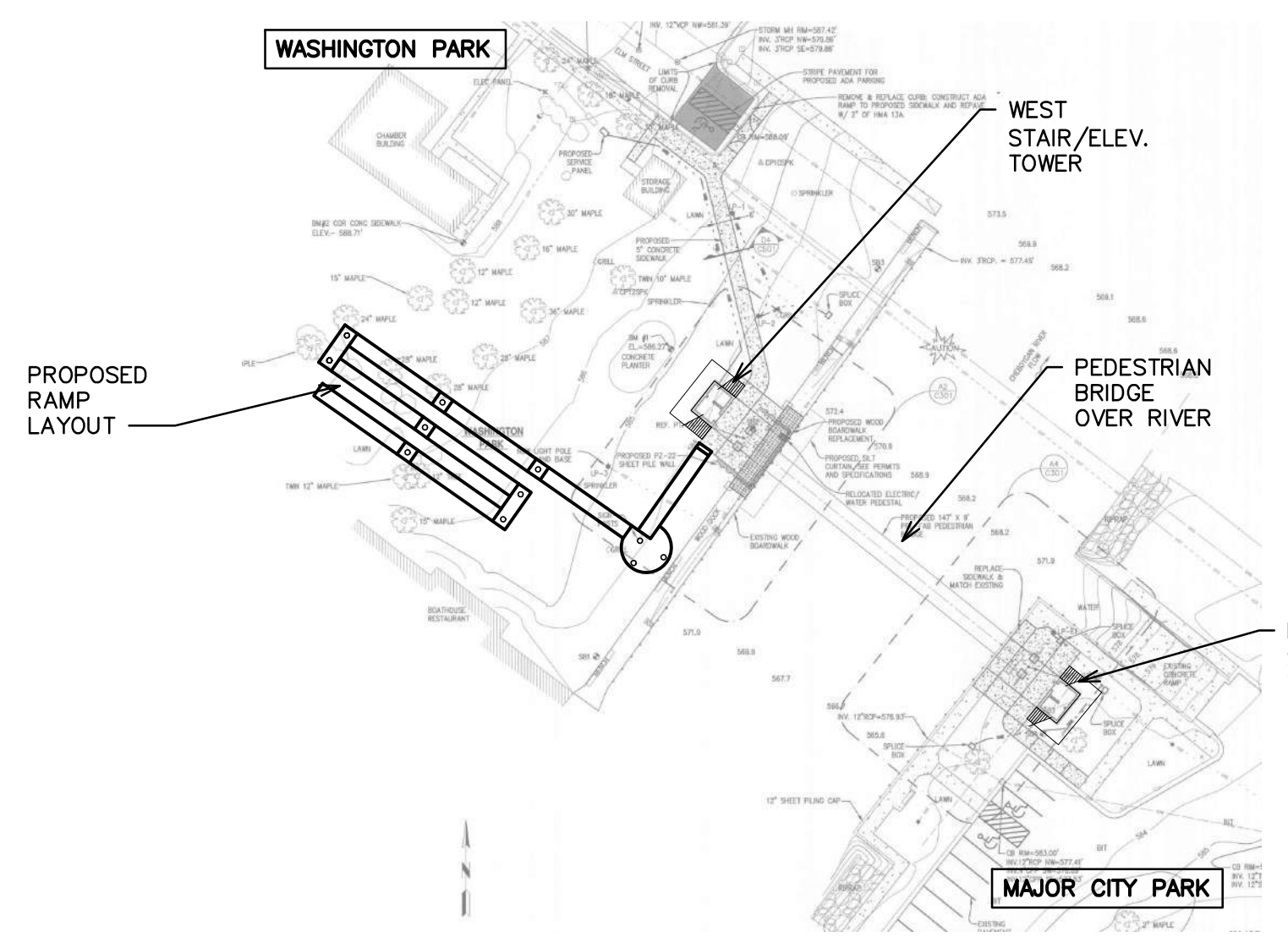
| | |
|-------------------------|-------------------------------|
| HRC JOB NO. 20210958 | SCALE AS NOTED |
| DATE SEPTEMBER 2022 | SHEET NO. W-2 OF |

| | |
|----------|----------------------------|
| 12-21-22 | FINAL REPORT |
| DATE | ADDITIONS AND/OR REVISIONS |
| DESIGNED | JMG |
| DRAWN | JMG |
| CHECKED | JMG |
| APPROVED | JBV |

**CITY OF CHEBOYGAN
PEDESTRIAN BRIDGE
VERTICAL ACCESS OPTIONS**

**WASHINGTON PARK RAMP
OPTION 3 (1:16 SLOPE)
PLANS AND ELEVATION**

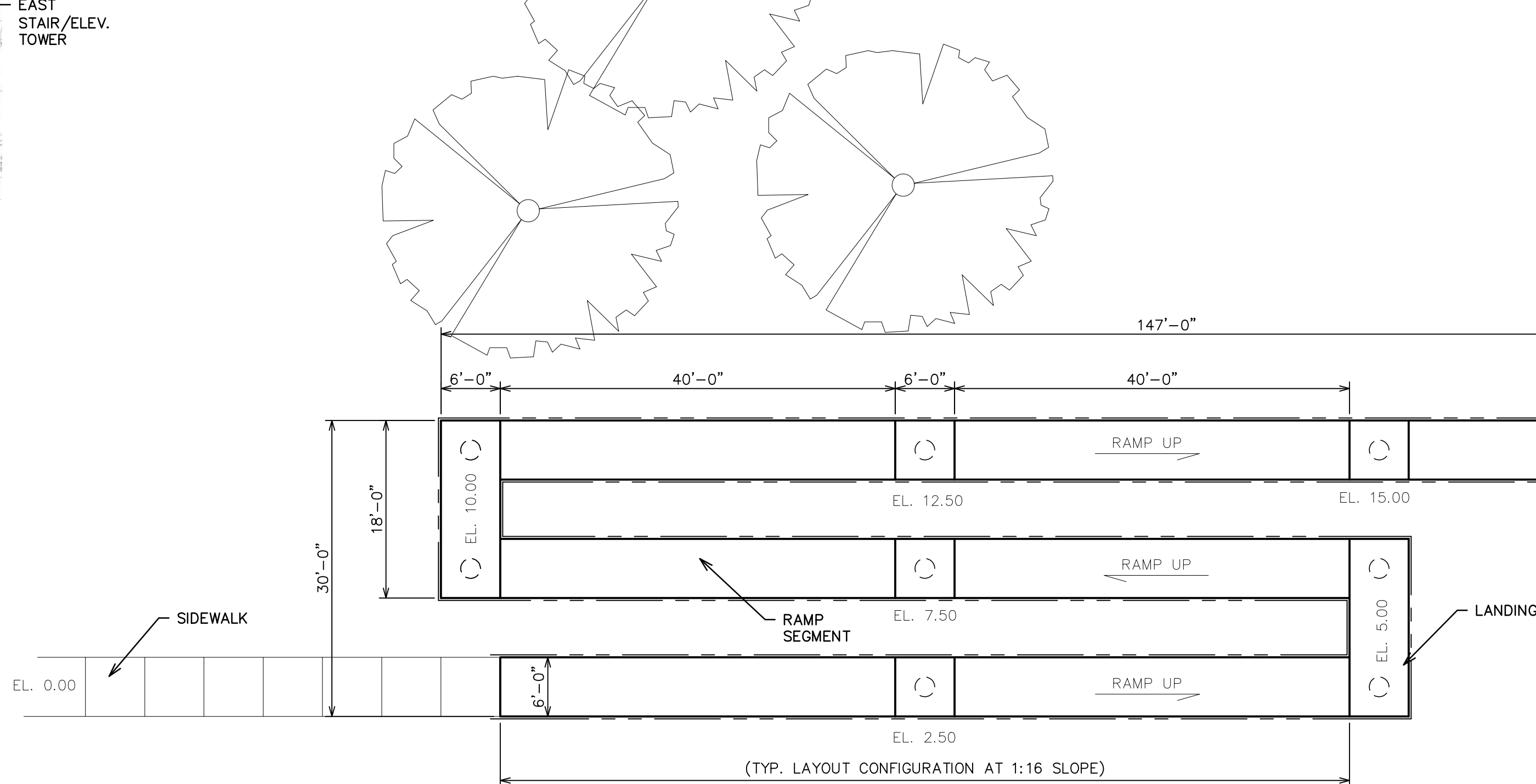
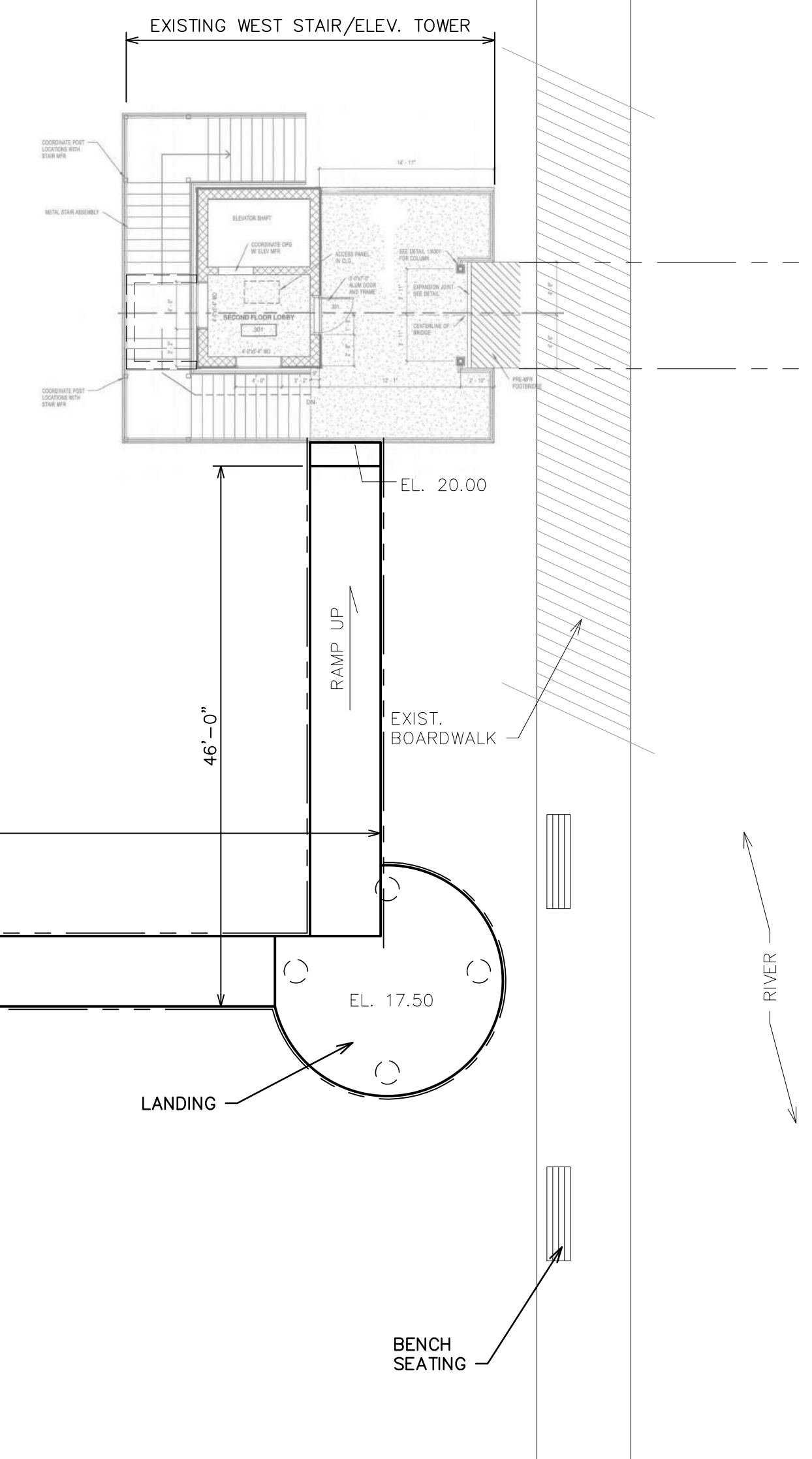
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| HRC JOB NO. 20210958 | SCALE AS NOTED |
| DATE SEPTEMBER 2022 | SHEET NO. W-3 OF |



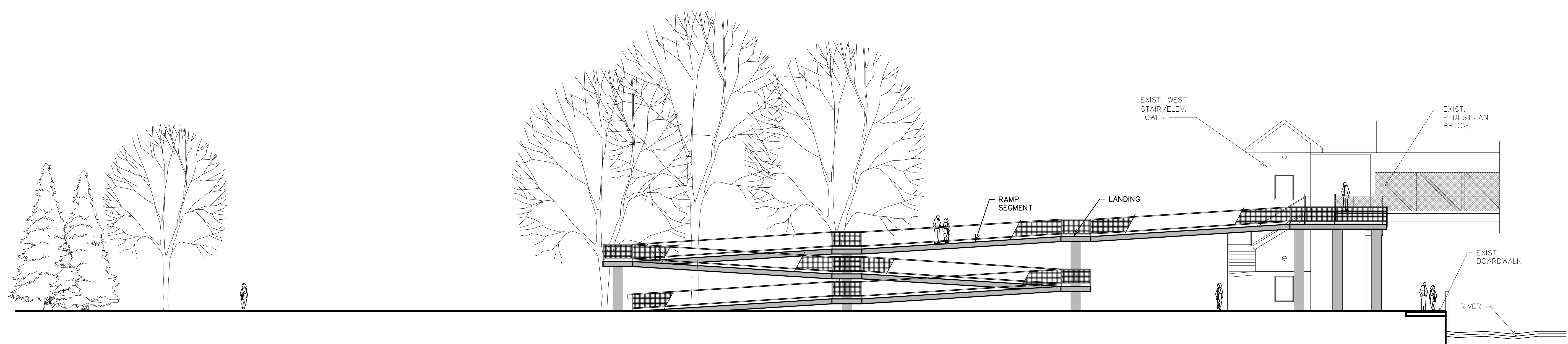
WASHINGTON PARK RAMP SITE PLAN
SCALE: 1/64" = 1'-0"



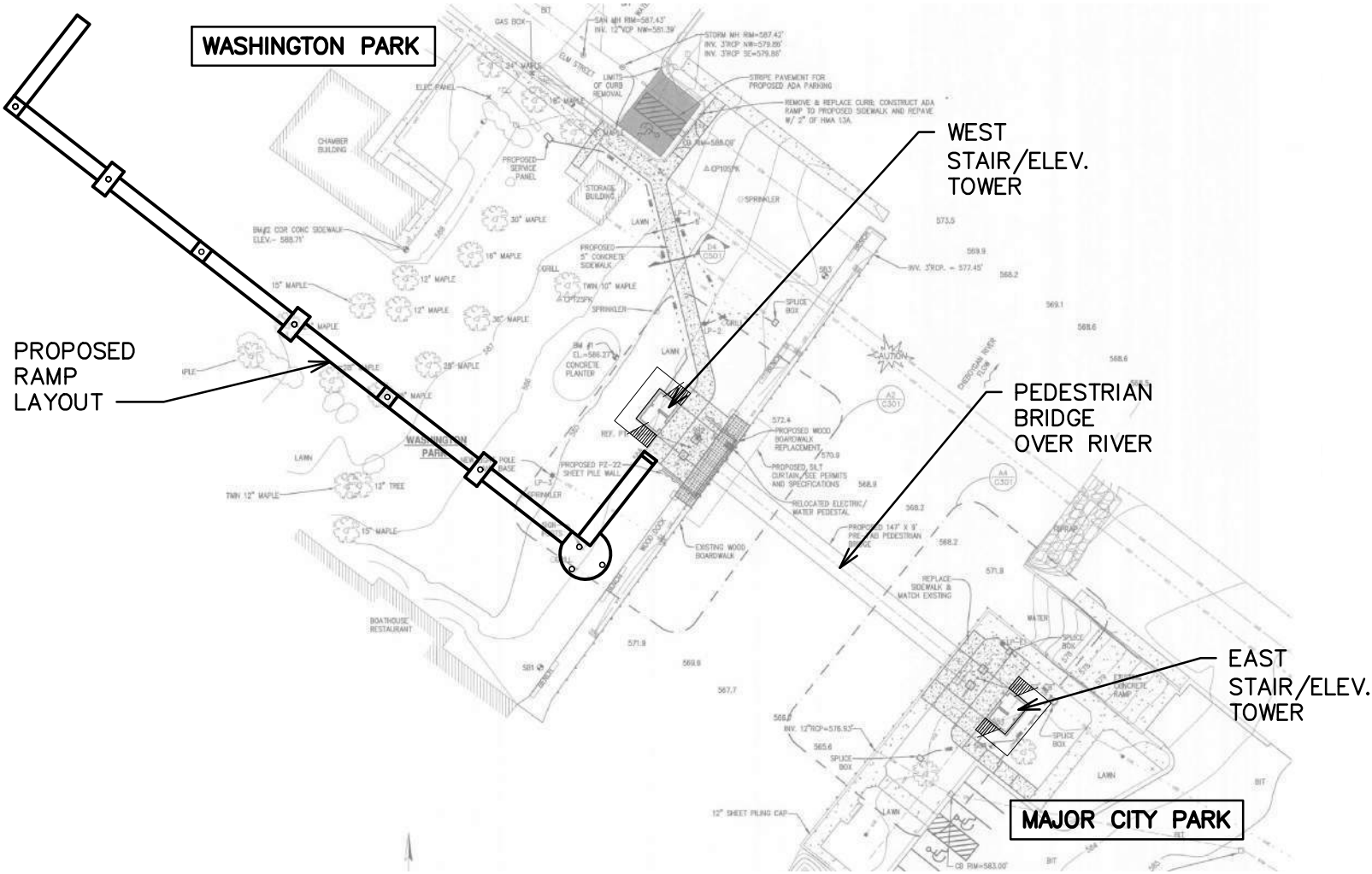
(LOOKING WEST— FROM MAJOR CITY PARK)



**WASHINGTON PARK RAMP AT 1:16 SLOPE – OPTION 3
ENLARGED PLAN**
SCALE: 3/32" = 1'-0"



**WASHINGTON PARK RAMP AT 1:16 SLOPE – OPTION 3
ELEVATION (LOOKING NORTH FROM SOUTH PROPERTY LINE)**
SCALE: 3/32" = 1'-0"

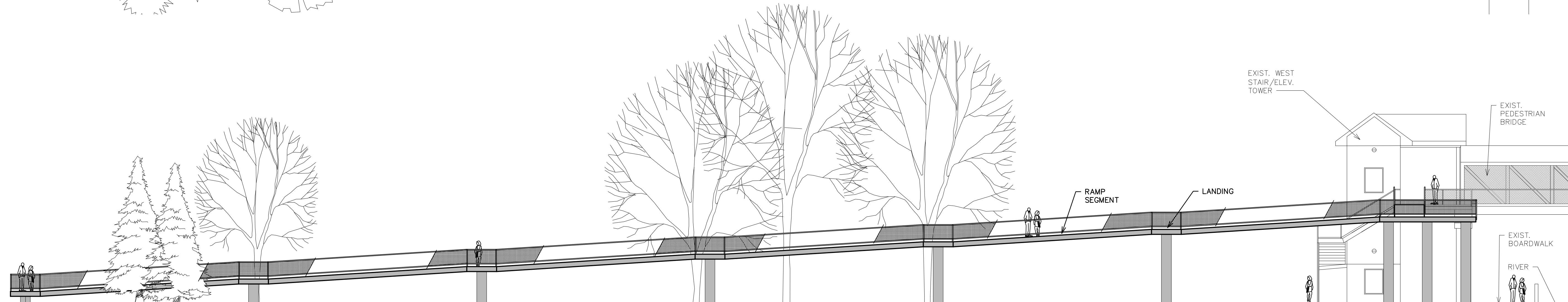
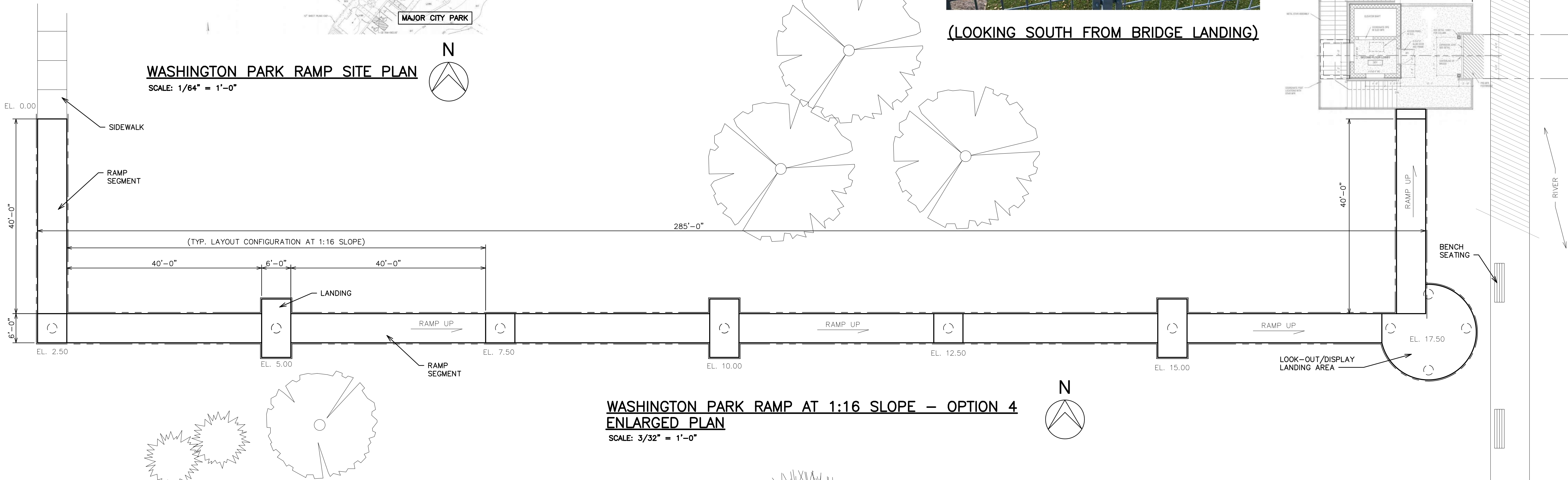


(LOOKING WEST ALONG SOUTH PROPERTY LINE)



(LOOKING SOUTH FROM BRIDGE LANDING)

WASHINGTON PARK RAMP SITE PLAN
SCALE: 1/64" = 1'-0"



WASHINGTON PARK RAMP AT 1:16 SLOPE - OPTION 4
ELEVATION (LOOKING NORTH FROM SOUTH PROPERTY LINE)
SCALE: 3/32" = 1'-0"

| 12-21-22 | FINAL REPORT |
|--------------|----------------------------|
| DATE | ADDITIONS AND/OR REVISIONS |
| DESIGNED JMG | |
| DRAWN JMG | |
| CHECKED JMG | |
| APPROVED JBV | |

CITY OF CHEBOYGAN
PEDESTRIAN BRIDGE
VERTICAL ACCESS OPTIONS

WASHINGTON PARK RAMP
OPTION 4 (1:16 SLOPE)
PLANS AND ELEVATION

| | |
|-------------------------|------------------------|
| HRC JOB NO. 20210958 | SCALE AS NOTED |
| DATE SEPTEMBER 2022 | SHEET NO. W-4 OF |