QueensWay

Existing Structural Conditions Report

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I. Description of the Rail Line

The **north segment** of the LIRR Rockaway Beach Branch (RBB) starts from just south of its divergence from the LIRR main line in Rego Park, and continues south through Forest Hills to Union Turnpike. Within this segment, the RBB passes over four intersections with existing bridges (at Fleet Street, Yellowstone Boulevard, Metropolitan Avenue, Union Turnpike), and one intersection over the active LIRR Montauk line where there is currently no bridge. Between the bridges, the RBB is elevated on earthen embankments whose elevations are approximately 20'-25' above adjacent properties and street grades. Since the mid-20th century when rail service along the RBB declined, residential properties were continuously built directly along the east and west right-of-way (ROW) lines from Fleet St. to Metropolitan Ave. At the south end of this segment, between the LIRR Montauk line and Union Turnpike, the rail line is paved over and generally serves as an empty lot for the shopping center directly east of it.

Birdseye view of North segment of RBB, looking east.

The **central segment** runs from Union Turnpike and continues south mostly through Forest Park, and then enters the neighborhood of Woodhaven, where it ends at Jamaica Avenue. Within this segment, the RBB is mostly depressed below adjacent properties and street levels in a ravine section within Forest Park. It passes underneath existing bridges carrying the Jackie Robinson Parkway, Myrtle Avenue, and Forest Park Drive. At the north end of this segment, between Union Turnpike and Forest Park, the rail line is again paved over and serves as a parking lot for the Forest View Crescent residential complex directly east of it. Near the south end of Forest Park, the rail line starts to elevate onto earthen embankments so that by the time it exits the park at the bridge over Park Lane South, it is approximately 20' above the crossing street. From this bridge, the RBB continues on an earthen embankment until it reaches the bridge intersection at Jamaica Ave. Residential properties are also continuously built along the east and west ROW's from Park Lane South to Jamaica Ave.

Birdseye view of Central segment of RBB, looking east.

The **south segment** runs from Jamaica Ave. and continues south through Woodhaven and Ozone Park to Rockaway Boulevard. Within this segment, the RBB passes over two intersections with existing bridges (at 91st Street and Atlantic Avenue), and beginning at 97th Avenue, an 111-span bridge viaduct runs south to Rockaway Blvd. Between Jamaica Ave. and Atlantic Ave., the RBB is elevated on earthen embankments whose elevations are approximately 20' above adjacent properties and street grades. The residential properties along this stretch appear to have been erected since the early half of the 20th century, based on NYC records (NYC Oasis). South of Atlantic Ave., the properties adjacent to the rail line are more commercial-oriented. Between Atlantic Ave. and 97th Ave., the triangular-shaped tract of land currently occupied by school bus parking is the former spur connection of the east-west underground LIRR Atlantic. Ave. subway line.

Birdseye view of Central segment of RBB, looking east.

II. Existing Structures along the Rail Line

A. Bridges

There are nine existing bridge structures along the RBB. Eight of the nine bridges are one-to-five span steel structures, while the viaduct structure in the south segment is a continuous 111-span steel structure. All have reinforced concrete decks supported by a steel multi-girder or girder-floorbeam framing systems. All were designed and built to carry railroad traffic, and are thus very robust structures that will easily carry the expected loads of a proposed greenway. All were built in the early part of the 20th century (from 1908 through 1924), making these structures at least over 90 years old. All have substructural reinforced concrete abutments and wingwalls that support the bridges and the embankments adjacent to the bridges. At the LIRR Montauk line, there is no bridge since the former wooden bridge collapsed long ago. A new bridge will be proposed at this location as part of this project.

The following is a description of each bridge, its structural configuration, dimensions, along with general photos.

1. Bridge over Fleet Street, BIN 7705660

This is a one-span, steel thru-girder with floorbeam framing system, with a 66' span; 26' wide.

Fleet St. - General view of bridge

Fleet St. - General view of underside of deck

Fleet St. - General view at top of deck

2. Bridge over Yellowstone Boulevard., BIN 7705670

This is a five-span, steel multi-girder framing system, skewed, with 40', 83', 45', 39', 18' spans; 26' wide

Yellowstone Blvd. - General view of bridge

Yellowstone Blvd. - General view of underside of deck

Yellowstone Blvd. - General view at top of deck

3. Bridge over Metropolitan Avenue, BIN 7705680

This is a three-span, steel thru-girder with floorbeam framing system, skewed, with 23', 65', 23' spans; 20' wide.

Metropolitan Ave. - General view of bridge

Metropolitan Ave. - General view of underside of deck

Metropolitan Ave. - General view at top of deck

4. Bridges over Union Turnpike, two separate bridges, BIN 7705421 and 7705422

For 7705421, west bridge: a one-span, steel thru-girder with floorbeam framing system, skewed, with a 65' span; 15' wide. For 7705422, east bridge: a one-span, steel thru-girder with floorbeam framing system, skewed, with a 58' span; 30' wide.

Union Tpke., east bridge - General view of bridge

Union Tpke., east bridge - General view of underside of deck

Union Tpke., west bridge - General view of bridge

Union Tpke., west bridge - General view of underside of deck

Union Tpke., east bridge - General view at top of deck

Union Tpke., west bridge - General view at top of deck

5. Bridge over Park Lane South, BIN 7705440

This is a one-span, steel thru-girder with floorbeam framing system, skewed, with a 64' span; 40.5' wide.

Park Lane South - General view of bridge

Park Lane South - General view of underside of deck

Park Lane South - General view at top of deck

6. Bridge over Jamaica Avenue, BIN 7705450

This is a one-span, steel thru-girder with floorbeam framing system, skewed, with a 70’ span; 26’ wide

Jamaica Avenue - General view of bridge

Jamaica Avenue - General view of underside of deck

Jamaica Avenue - General view at top of deck

7. Bridge over 91 Avenue, BIN 7705600

This is a one-span, steel thru-girder, with floorbeam framing system, with a 54’ span; 28’ wide.

91 Avenue - General view of bridge

91 Avenue - General view of underside of deck

91 Avenue - General view at top of deck

8. Bridge over Atlantic Avenue, BIN 7705610

This is a four-span, steel thru-girder with floorbeam framing system, with 30', 63', 63', 30' spans; 52.5' wide

Atlantic Avenue - General view of bridge

Atlantic Avenue - General view of underside of deck and platform

Atlantic Avenue - General view at top of deck and platforms

9. **Elevated Viaduct Structure from Rockaway Boulevard to 97th Ave.**

This is a 111-span, steel thru-girder with floorbeam and multi-girder framing systems, typically 60' wide. Span lengths vary as follows:

Spans 1-4 are skewed, with 21', 74', 23', 10' lengths – over **Rockaway Blvd.**

Spans 5-16 are 25' long

Spans 17-21 are skewed, with 24', 20', 47', 20', 18' lengths – over **Liberty Ave.**

Spans 22-51 are 25' long

Spans 52-55 are 19', 43', 19', 21' long – over **103 Ave.**

Spans 56-82 are 25' long

Spans 83-85 are 19', 41', 19' long – over **101 Ave.**

Spans 86-108 are 25' long

Span 109-111 are 16', 33', 15' long – over **97 Ave.**

Rockaway Blvd. - General view of bridge

Rockaway Blvd. - General view of underside of deck at 74' long span

Rockaway Blvd. - General view at top of deck

Liberty Ave. - General view of bridge

Liberty Ave. - General view of underside of deck of 47’ long span

Liberty Ave. - General view at top of of deck

103 Ave. - General view of bridge

103 Ave. - General view of underside of deck of 41’ long span

103 Ave. - General view at top of deck

101 Ave. - General view of bridge

101 Ave. - General view of underside of deck

101 Ave. - General view at top of deck

97 Ave. - General view of bridge

97 Ave. - General view of underside of deck of 16' and 33' long spans

97 Ave. - General view at top of deck

Elevated Viaduct betw. Rockaway Blvd & Liberty Ave. - General view of bridge fascia

Elevated Viaduct betw. Liberty Ave. & 103 Ave. - General view of bridge fascia

Elevated Viaduct betw. 103 Ave. & 101 Ave. - General view of bridge fascia

Elevated Viaduct betw. 101 Ave. & 97 Ave. - General view of bridge fascia

Elevated Viaduct – View of underside of typical 25' span deck (this location betw. 103 Ave. & 101 Ave.)

Elevated Viaduct – View of underside of typical 25' span deck (this location betw. 101 Ave. & 97 Ave.)

B. Earthen Embankments

The earthen embankments along the RBB generally rise up to 20'-25' high, with sides typically at 1 vertical-to-1.25 horizontal slope. Along the north segment between the north end and Metropolitan Ave., both sides slope down to neighboring backyards of residential properties. The horizontal width of the ROW in this area is quite wide and over 100'. Between Metropolitan Ave. and the LIRR Montauk line, both sides slope down to the neighboring lots of Home Depot and the Metropolitan Educational Campus. At the car wash on Metropolitan Ave., a low retaining wall cuts the slope along the west ROW. The horizontal width of the ROW in this area narrows somewhat to less than 100'.

Embankments resume again at the south end of Forest Park at Park Lane South and continue until Atlantic Ave. The horizontal width of the ROW in this central-southern segment is also narrower and less than 100'. Due to this narrower ROW, the slopes are slightly steeper, and are closer to a 1-to-1 ratio. Both sides generally slope down to neighboring streets and the backyards of residential properties.

Embankment – Typical view along north segment of RBB; backyard adjacent to ROW embankment slope (Selfridge St. & Olcott St.)

Embankment – Held by retaining wall along west ROW embankment slope (Car wash on Metropolitan Ave.)

Embankment – Typical view along north segment of RBB; embankment slope adjacent to Metropolitan Expedition Learning Schools campus

Embankment – Typical view along north segment of RBB; embankment slope adjacent to Home Depot lot

Embankment – Typical view along center segment of RBB; side slope along ROW embankment (90th Ave. betw. Jamaica & Atlantic Ave.)

C. Retaining Walls

There are only a few retaining walls that are assumed to be included as part of this project. The low-height masonry-block wall along the Metropolitan Ave. car wash was already mentioned above. At Union Tpke., there are two separate bridges with 15' high concrete retaining walls between them, at both ends of the bridge (see Union Tpke. Bridge photos). Between Atlantic Ave. and 97th Ave. along the east ROW, there is a varying height concrete retaining wall (8'-to-12' high) supporting the east-side slope of the RBB. This wall is approximately 875' long, running along 100th Street.

Retaining wall along east ROW, parallel to 100th St. (betw. 97 Ave. and Atlantic Ave.)

At the south end of the RBB at Rockaway Blvd. bridge, the south abutment of the bridge and its adjacent concrete wingwalls also support the elevated rail line. This location is the end of this project, where the active NYCT elevated subway line merges with the RBB line. We assume the limits of this project ends with the wingwalls of the bridge's south abutment; these wingwalls extend 15' beyond the south abutment, after which retaining walls (assumed not to be part of this project) continue southward.

Retaining wall south of Rockaway Blvd. bridge, along east ROW, along 100 St.

Retaining wall south of Rockaway Blvd. bridge, along west ROW, along 99 St.

D. Station Structures

Along the entire length of the RBB, there are two remnants of former train stations with platforms. One is located at Atlantic Ave., formerly known as the Woodhaven Station, and the second is located between 101st Ave. and 103rd Ave., formerly known as the Ozone Park Station. This latter station was fairly long since the Ozone Park station was an important connection point when the rail lines were active.

The former station at Atlantic Ave. consists of two concrete platforms which, away from the five-span bridge, are supported by concrete piers founded into the earthen embankment below. These platforms still have their railings and lighting poles. The length of the platforms extend north and

south to 93rd Ave and 94th Ave., respectively, and is approximately 600' long. Below on both the north and south ends of the bridge, the former street-level entrances and staircases connecting to the platforms above are currently fenced off, with the connection of the stairways to the platforms is blocked off with masonry block walls.

Platforms at Atlantic Ave. - View along top of platforms over Atlantic Ave.

Former station entrance at Atlantic Ave. - stairs at north side of Atlantic Ave.

Platforms north and south of Atlantic Ave. Bridge - View along underside of platforms.

The former Ozone Park station located between 101 Ave. and 103 Ave. also has two flanking concrete platforms, and openings for stairways at the ends of each platform, though no stairways exist anymore. The unique feature along this stretch of structure is the artistic arch treatment along the side fascia of the platforms. These arches span from pier-to-pier of the steel viaduct structure, and are steel members encased in gunite.

Platform Structure - Fascia treatment along platforms between 101 Ave. and 103 Ave.

Platform Structure - Opening in platform for former stairs, between 101 Ave. and 103 Ave.

Platform Structure – General view at platform level, between 101 Ave. and 103 Ave.

E. Railroad Utility Structures

Along the length of the RBB, there still remain a number of utility structures. Operational structures such as signal trestles, posts, and electrical towers appear throughout the RBB. Some towers were observed to have fallen, but most are still standing.

Typical signal trestle spanning over rail line.

III. Inspection Findings

A. Bridges

A general visual inspection was conducted at all bridge structures, with limited hands-on inspection at isolated locations as determined by the inspection team. Inspection was conducted to record typical and relevant conditions that should be considered for repair for the development of a rehabilitation program. Prior to inspection, the original contract bridge drawings were obtained and reviewed by the inspection team (see Appendix A for original drawings); these drawings were used for field inspection notes and forms, and new sketches were developed during the inspection as required (see Appendix B for field inspection notes).

The bridges' current conditions are generally all in fair-to-good condition, and we observed no structures that appear to need major structural rehabilitation work, such as a superstructure, substructure, or major structural component replacement. There are concerns relating to the elevated viaduct structure running from 97th Ave to Rockaway Blvd., and more discussion on this structure is made below. Most of our findings and recommended repairs will be to address potential cosmetic or safety hazard defects due to continued further deterioration, and not structural defects.

<u>Fleet St., Union Tpke., Park Lane South, Jamaica Ave., and 91st Ave.</u>

The structural condition of the bridges at Fleet St., Union Tpke., Park Lane South, Jamaica Ave., and 91st Ave. were all observed to be good. All exposed steel have lost their protective paint coatings, and exhibit light surface rusting and locations of isolated heavier corrosion that have no adverse structural implications. The underside of their concrete decks sounded solid when struck with a hammer, and generally is in good condition. This confirms our assessment that the decks at these bridges can be retained for future use.

Deck. Along the underdeck, at the interface edges between exposed steel girders and floorbeams with the concrete deck, the edge of concrete is typically broken and spalled. This is a result of past corrosion of steel at the interface and its rust expansion on neighboring thin portions of concrete, resulting in concrete breaking off. This can be seen in Photos 1 and 2. Similarly, there are numerous isolated locations where the steel bar reinforcement inside the deck and beam encasement is exposed; again, this is a result of past corrosion of the steel bars, which expand and force the thin cover of concrete over the bars to pop out, resulting in concrete spalls. This is shown in Photos 3 and 4. These defects are minor in significance; however, they cause small pieces of concrete debris to detach and possibly fall onto traffic below, representing potential safety hazards. As there was no observed signs of active or prolonged water infiltration at these defects, this corrosion is not believed to be caused by water leakage from above the deck, and instead it is due to exposure to moisture from below the deck. Our assessment is that the decks at these bridges can be maintained for future use.

Photo 1 - Typical concrete spalling along edge interface between steel and concrete (photo from Fleet St.)

Photo 2 - Concrete spalling along edge interface between steel and concrete (photo from Park Lane South, looking up at underdeck)

Photo 3 - Concrete spalling along beam's concrete encasement (photo from Jamaica Ave.)

Photo 4 – Underside of deck. Spalled concrete with exposed, lightly rusted, rebar (photo from Fleet St.)

Due to these conditions, we recommend that the underside of the concrete decks be thoroughly sounded and cleaned to remove any delaminated concrete pieces at these bridges. We also recommend that all exposed steel be sandblasted and painted, including exposed steel reinforcement..

At Park Lane South and the 91st Ave. bridge, there are some light efflorescence formations along the edges of the bottom flanges of the thru-girders with minor active leakage, as evidenced by the formation of icicles noted during the inspection. These are symptoms of water infiltration into the deck from above. See Photo 5. These conditions, however, are isolated and not considered sufficiently significant and prevalent to warrant a corrective repair, which would require removal of the ballast, brick/concrete protection layers, and waterproofing layers above the deck to properly perform the repair.

Photo 5 – Icicle formation along edge of thru-girder, with areas of white efflorescence, indicating some water leakage from above. (photo from Park Lane South)

Yellowstone Blvd., Metropolitan Ave., and Atlantic Ave.

The condition of the bridges at Yellowstone Blvd., Metropolitan Ave., and Atlantic Ave. were observed to be worse than the bridges at. Fleet St., Union Tpke., Park Lane South, Jamaica Ave., and 91st Ave. Though the conditions of their steel framing appeared to be generally good, the underside of the deck exhibited spalling with exposed reinforcement bars as a common condition throughout the spans at Yellowstone Blvd. and Metropolitan Ave., with about 30% and 20% of the underside of deck area possessing this defect, respectively. The underside of decks did generally sound solid when struck with a hammer, and were observed to be in fair condition. Due to this, and no observed significant active leakage, our assessment is that the decks at these bridges can be retained for future use.

Deck. At Yellowstone Blvd., the underside of deck outside of the fascia girders exhibited more delaminated, hollow-sounding, and spalled concrete with exposed rebars. These appears to be the result of water exposure from the fascia, and the delaminated, hollow-sounding, and spalled concrete will need to be repaired. See Photos 6 and 7.

Photo 6 – Yellowstone Blvd. bridge, underside of deck along fascia. Typical discolored, delaminated, hollow-sounding, and spalled concrete, with exposed rebar. Typical along fascia.

The underside of deck between fascia girders at Yellowstone Blvd., the entire underside of deck at Metropolitan Ave., and the underside of deck and platforms at Atlantic Ave. exhibit numerous areas where the steel bar reinforcement inside the deck is exposed; this is a result of past corrosion of the steel bars in combination with thin concrete cover over the bars or joint leakage, which results in concrete spalling off. This is shown in Photos 8-10.

Photo 7 – Yellowstone Blvd. bridge, underside of deck along fascia. Typical discolored, delaminated, hollow-sounding concrete. Typical along fascia.

Photo 8 – Yellowstone Blvd. bridge, underside of deck. Spalled concrete, with exposed rebar, due to thin cover concrete.

Photo 9 – Metropolitan Ave. bridge, underside of deck. Spalled concrete, with exposed rebar, due to thin cover concrete.

Photo 10 – Atlantic Ave. bridge, underside of platform deck. Spalled concrete, with exposed rebar, due to joint leakage.

Similar to what was observed at Fleet St., Union Tpke., Park Lane South, Jamaica Ave., and 91st Ave., the interface edges between exposed steel with the concrete deck along the underside of deck exhibited concrete edges that are broken and spalled.

Due to the above-described conditions, we recommend that the underside of the concrete decks be thoroughly sounded and cleaned to remove any delaminated concrete pieces at these bridges. We also recommend that all exposed steel be sandblasted and painted, including exposed steel reinforcement.

Steel Substructure. The base of steel columns at Yellowstone Blvd. exhibit corrosion and deterioration at their interface with concrete base encasements, which are broken due to the expansion of the column steel's rust. See Photos 11 and 12. The corrosion results in loss of structural section and capacity for the steel column, though it is not at a level that causes structural concern. These defects should, however, be addressed so that further corrosion and loss of section is prevented. *Thus for Yellowstone Blvd., we recommend that all the column base concrete encasements be replaced, and the columns with significant section loss be reinforced.* The steel substructure at Metropolitan Ave. and Atlantic Ave. were generally observed to be in good condition.

Photo 11 – Yellowstone Blvd. bridge, base of steel column is corroded, with base concrete encasement broken.

Photo 12– Yellowstone Blvd. bridge, base of steel column corrosion.

The eight bridges described above all have substructure consisting of concrete abutments and wingwalls, and three bridges (at Yellowstone, Metropolitan, and Atlantic) have steel pier columns/bents. These substructure elements were generally observed to be in good condition, with very minor defects, such as temperature/shrinkage cracking of the concrete substructure. The exposed steel piers have failed paint and light surface rusting, but are otherwise in good condition. *Sandblast cleaning and painting of the steel substructure elements is recommended.*

Photo 13 – Concrete pylon above Atlantic Ave. bridge's south abutment, east wingwall, with cracks and efflorescence.

Elevated Viaduct Bridge from 97th Ave to Rockaway Blvd.

This steel bridge structure with concrete deck is 111 spans long and is mostly encased in concrete and/or gunite throughout its length. Our inspection revealed that while the underside of the structure was observed to be generally in good condition, the concrete edges of the bridge along the fascia were generally deteriorated, and exhibits prevalent cracking, signs of water leakage, efflorescence, and spalling throughout.

Deck Fascia. This fascia concrete is in poor condition for approximately 30% of the viaduct's fascia length, with the remainder of the fascia length in better, but only fair condition. If left alone without repair or addressing, this fascia will continue to weather and deteriorate, and the concrete will continue to spall off. See Photos 14 thru 21.

Photo 14 - Typical deteriorated fascia concrete along viaduct structure with cracking and efflorescence.

Photo 15 - Typical spalling with exposed rebars along underside of fascia at viaduct structure.

Photo 16 - Typical heavy deterioration and spalling along fascia concrete at transverse joint locations along viaduct structure.

Photo 17 - Typical deterioration and broken fascia fascia concrete at transverse joint locations, viewed from above viaduct structure.

Photo 18 – View of cracking and spalling of top of fascia along viaduct structure. Note there is no ballast or fill at this portion of the structure.

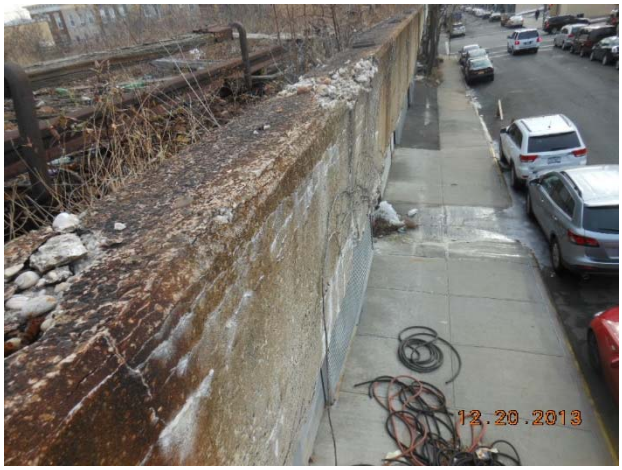


Photo 19 – View of cracking and efflorescence along top of fascia of viaduct structure.

Photo 20 – Spalling along top of fascia of viaduct structure.

Photo 21 – Large crack along top of fascia of viaduct structure.

Due to the advanced deterioration of the fascia along 30% of the viaduct's fascia's length, we would recommend replacing and reconstructing this length of fascia, with the remaining 70% to receive rehabilitation through cleaning and sealing to protect the concrete surface and mitigate against future water exposure.

Deck Underside. Access to the underside of the bridge was generally restricted only to the spans crossing the streets (at 97 Ave., 101 Ave., 103 Ave., Liberty Ave., and Rockaway Blvd.), since most of the properties underneath the bridge are occupied by commercial entities and are closed off. We were able to look into several establishments to try to determine the condition of structure, and typically observed that the beam framing system is concrete encased throughout, and generally in very good condition.

The underside of deck at bridges crossing over 97 Ave., 101 Ave., 103 Ave., Liberty Ave., and Rockaway Blvd. are all similar to each other in that they typically consist of three-span structures with only the longer middle span comprised of thru-girders with transverse floorbeam framing. Their underside of deck conditions are also similar to the conditions observed at Yellowstone. Blvd, Metropolitan Ave., and Atlantic Ave. in that while their steel framing appeared to be generally good, the underside of the deck exhibits spalling with exposed reinforcement bars as a common condition throughout the spans. Also, similar to what was observed at all other bridges, the interface edges between exposed steel with the concrete deck exhibited concrete edges that are broken and spalled. See Photos 22 to 26.

The underside of decks did generally sound solid when struck with a hammer, and were observed to be in fair condition. Due to this, and no observed significant active leakage, our assessment is that the decks at these bridges (at 97 Ave., 101 Ave., 103 Ave., Liberty Ave., and Rockaway Blvd.) can be retained for future use. *We recommend that the underside of the concrete decks be thoroughly sounded and cleaned to remove any delaminated concrete pieces at these bridges. We also recommend that all exposed steel be sandblasted and painted, including exposed steel reinforcement.*

Photo 22 – Spalling with exposed rebar in spans at 97 Ave.

Photo 23 – Spalling of concrete edges along exposed steel at 101 Ave.

Photo 24 – Spalling of beam encasement concrete due to thin cover over encasement rebar at 103 Ave.

Photo 25 – Delaminated and spalling of beam encasement concrete due to thin cover over encasement rebar at 103 Ave.

Photo 26 – Spalling underdside of deck and of beam encasement concrete due to thin cover at Liberty Ave.

Gunite on Steel Fascias and Subtructural Steel. Along the entire length of the 111 spans of the viaduct, any exposed steel was covered in a 1.5" layer of gunite, or shotcrete, which is a mortar material. This gunite dates back to the structure's original construction, and is found on the following structural components along the elevated viaduct:

- Fascia beams over the longer middle spans at the 97 Ave., 101 Ave., 103 Ave., Liberty Ave., and Rockaway Blvd. bridges
- Pier cap beams and columns for all piers in the 111-span viaduct
- All superstructure components supporting the platforms between 101 Ave. and 103 Ave., including the arched fascia beams

At the fascia beams over the longer middle spans at the 97 Ave., 101 Ave., 103 Ave., Liberty Ave., and Rockaway Blvd. bridges, the gunite is typically in fair condition, and still bonded to the steel girder it is covering. The worst condition was observed at Liberty Ave,, where large pieces of the gunite were observed to be delaminated, and was easily removed by the inspection team. This gunite can easily fall onto the vehicular traffic below. See Photo 27.

Photo 27 – Delaminated and broken gunite along bottom flange of fascia girder at Liberty Ave.

The pier columns and capbeams at the 97 Ave., 101 Ave., 103 Ave., Liberty Ave., and Rockaway Blvd. bridge crossings were all observed to be in poor condition, with many locations of broken, spalled, and missing gunite. At these locations, the mesh and underlying steel structure is exposed. See Photos 28 to 30 for typical conditions.

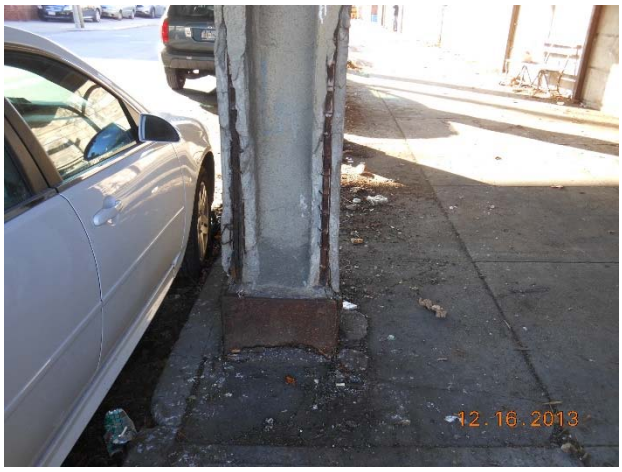


Photo 28 – Broken and missing gunite along bottom of pier column at 97 Ave.

Photo 29 – Broken and missing gunite along of pier column at 103 Ave.

Photo 30 – Broken gunite with exposed mesh along pier cap beam at 97 Ave.

In the spans between these street crossings, the general condition of the gunite on the pier substructure was observed to be much better. It should be noted again that we were only able to enter a few locations since most of the properties under the viaduct were closed off.

Between 101 Ave. and 103 Ave., the former station platform slabs are supported on pier cap beams and longitudinal arched beams along the fascia of the platforms. These supporting members are also encased in gunite, and in poor condition. See Photos 31 and 32.

Photo 31 – Gunite-covered fascia arch beams supporting the platform slabs between 101 Ave and 103 Ave.

Photo 32 – Gunite-covered fascia arch beams at pier expansion joint, between 101 Ave and 103 Ave. Note cracking along underside of platform slabs.

The gunite in all the locations described above will continue to deteriorate and delaminate over time, resulting in future falling debris hazards for passing traffic below. *We recommend that this gunite be removed in all these locations, which is a significant quantity of work. This will expose the steel that the gunite currently covers, which will need to be sandblasted and painted.*

Platforms Slabs between 101 Ave. and 103 Ave. In contrast to the former station platform slabs at Atlantic Avenue, which were inspected to be in good condition, the platforms slabs between 101 Ave. and 103 Ave. are in very poor condition. Along the entire RBB, these members are the only ones whose structural condition is suspect and cannot be relied on. The slabs exhibit prevalent cracking and efflorescence throughout its underside, many locations where holes have developed, revealing the slab reinforcement. *We recommend that these slabs cannot be retained and should be removed.* See Photos 32 to 34.

Photo 33 – Holes, spalling, and cracking along the underside of platforms slabs between 101 Ave and 103 Ave.

Photo 34 – View along top of platforms slabs between 101 Ave and 103 Ave.

Expansion Joints. There are 22 transverse expansion joints located within the 111-span viaduct structure, typically located at every fifth pier. While walking along the top of the viaduct, we observed several locations where the sliding steel plate expansion joint had been uncovered and exposed, with surrounding ballast and fill excavated, and appear to have been sealed with roofing tar and sealer. This suggests that someone in the recent past performed this work to prevent leakage of water through the joint and into the structure below. Since there was no uniformity in the work done at several joints, we believe that the occupants of each property below the joint took liberty to perform this work. At the one location below the deck where we were able to access

an expansion joint, we did observe water leakage through the joint. *Thus, we recommend that rehabilitation all expansion joints along the viaduct be performed to mitigate against water leakage into the structure below.* See Photos 35 to 36.

Photo 35 – View along top of expansion joint; note ballast has been excavated from joint.

Photo 36 – View along top of expansion joint; note ballast has been excavated from joint.

Railings. Railings along the fascia are missing along the entire length of the viaduct. Previous railing posts' anchors can be seen in the existing concrete; thus, the railings have been removed. See Photo 17. *We recommend that these railings be replaced.* (Replacement and/or installation of railings are also required at Atlantic Ave. and Yellowstone Blvd.).

Miscellaneous Conditions. At Pier 81, we observed the steel pier cap beam to be inappropriately cut for ¾ of its depth. See Photo 37. It appears that this was done to create vertical clearance underneath the structure for the occupants below. Since there is no live load on the structure, there is sufficient capacity to support existing dead loads, as there is no observed structural distress. *However, we recommend that this cap beam must be repaired.* With limited access to the underside of the structure due to closed commercial properties, we observed no other similar conditions, and assume no other locations such as this exist along the viaduct.

Photo 37 – Pier 81 cap beam is inappropriately cut. Note deck expansion joint above this cap beam.

B. Earthen Embankments

The earthen embankments exist along the following stretches of the RBB:

- Along the north segment, between the north end and the LIRR Montauk line
- From the south end of Forest Park at Park Lane South to 97 Ave.

In general, the structure, slope, and stability of the earthen embankments along the RBB were observed to be satisfactory, and no significant conditions that require correction being noted. Any rehabilitation program will need to consider effects of any proposed landscaping, walls, drainage, runoff, and erosion, especially if significant clearing of existing trees, plants, and root systems are planned.

C. Retaining Walls

There retaining walls that are assumed to be included as part of this project are:

- The low-height masonry-block wall along the Metropolitan Ave. car wash
- At Union Tpke., the concrete retaining walls between the two bridges and the wingwalls flanking each bridge
- Between Atlantic Ave. and 97th Ave. along the east ROW, the varying height concrete retaining wall supporting the east side slope of the RBB. This wall is approximately 875' long, running along 100th Street.

The low-height masonry-block wall at the Metropolitan Ave. car wash and the walls at the Union Tpke. bridges are in good condition, and do not exhibit any significant conditions worth noting.

At the varying height concrete retaining wall between Atlantic Ave. and 97th Ave. along the east ROW, the wall is in fair condition and exhibits some defects that indicate future problems may develop. This wall varies from 8' to 12' high along its length, and supports significant surcharge loading from the sloped embankment of the RBB behind it, especially at the north end near Atlantic Ave., where additional fill and debris were previously deposited onto the railway, and reaches several feet above the elevation of the adjacent platform slabs. See Photo 38. This retaining wall shows horizontal cracking along for approximately 50% of its 875' length, and a couple of locations where water is seeping through the cracks, causing localized spalling in the wall. See Photos 39 to 41. No weepholes were observed along the length of the wall, suggesting that hydrostatic pressure behind the wall will cause additional loading onto the wall. The wall was generally observed to be vertically plumb. *We recommend that continue monitoring of the wall be done, and future rehabilitation of this wall may need to be considered.*

Photo 38 – At Atlantic Ave. bridge, former station east platform at south end. Note debris piled up above the level of the platform slab (at left side of photo).

Photo 39 – Retaining wall along east side slope of railway between Atlantic Ave. and 97 Ave. Note former station platform structure above wall.

Photo 40 – Retaining wall along east side slope of railway between Atlantic Ave. and 97 Ave. Typical horizontal cracking, efflorescence, and spalling.

Photo 41 – Retaining wall along east side slope of railway between Atlantic Ave. and 97 Ave. Isolated location of spalling with water leakage from behind wall.

At the south end of the project limits, at the Rockaway Blvd. bridge, the south abutment of the bridge and its adjacent concrete wingwalls and retaining walls also support the elevated rail line. We assume the limits of this project ends with the wingwalls that are adjacent to the bridge's south abutment; these wingwalls extend 15' beyond the south abutment, after which retaining walls continue south. The abutment wingwalls are in fair condition; however, the retaining walls continuing south are in poor condition, especially along the east side on 100 St., where prevalent horizontal cracking with efflorescence exists throughout its 20' height. See Photo 42.

Photo 42 – Limits of bridge wingwall and retaining wall along east side of railway just south of Rockaway Blvd.

D. Station Structures

Station structures consist of the two remnants of former train stations with platforms. One is located at Atlantic Ave., formerly known as the Woodhaven Station, and the second is located between 101st Ave. and 103rd Ave., formerly known as the Ozone Park Station.

The former station at Atlantic Ave. consists of two concrete platforms which, away from the five-span bridge, are supported by concrete piers founded into the earthen embankment below. The length of the platforms extend north and south to 93rd Ave and 94th Ave., respectively, and is approximately 600' long. Below on both the north and south ends of the bridge, the former street-level entrances and staircases connecting to the platforms above are currently fenced off, with the connection of the stairways to the platforms blocked off with concrete block walls. The platform slabs and supporting structure throughout this station were observed to be in fair condition, and can be retained. The platform reinforced concrete slab structure exhibits numerous locations of spalled concrete with exposed rebars, as does the substructural piers. See Photos 39, 43, and 44.

Photo 43 – Underside of platform slab structure at former Atlantic Ave. station; typical spalling of reinforced concrete.

Photo 44 – Underside of platform slab structure at former Atlantic Ave. station.

We recommend that this project determine if these platforms and their substructural components will be retained and used in the future. If so, then their rehabilitation should be included, which would consist of general concrete spall repair.

The conditions of the platforms along the former Ozone Park station (between 101st Ave. and 103rd Ave.) were discussed previously under the inspection findings for the Elevated Viaduct Bridge. These platforms are in very poor condition and should be removed.

E. Railroad Utility Structures

The many steel utility structures along the length of the RBB were observed to be in good condition. They are all unpainted and exhibit surface rust. It is not likely that these structures will need any rehabilitation work, since they have no structural function.

IV. Recommendations

Throughout the preceding Inspection Findings section, we described the findings and observed defects, and generally provided recommendations for proposed work in *italics* under each subsection. The following is a summary of the recommendations.

A. Bridges

Fleet St., Union Tpke., Park Lane South, Jamaica Ave., and 91st Ave.

Deck. We recommend that the underside of the concrete decks be thoroughly sounded and cleaned to remove any delaminated concrete pieces at these bridges. We also recommend that all exposed steel be sandblasted and painted, including exposed steel reinforcement.

Yellowstone Blvd., Metropolitan Ave., and Atlantic Ave.

Deck. We recommend that the underside of the concrete decks be thoroughly sounded and cleaned to remove any delaminated concrete pieces at these bridges. We also recommend that all exposed steel be sandblasted and painted, including exposed steel reinforcement.

Steel Substructure. At Yellowstone Blvd., we recommend that all the column base concrete encasements be replaced, and the columns with section loss be reinforced. For all three bridges, and blast cleaning and painting of the steel substructure elements is recommended.

Elevated Viaduct Bridge from 97th Ave to Rockaway Blvd.

Deck Fascia. Due to the advanced deterioration of the fascia along 30% of the viaduct's fascia's length, we would recommend replacing and reconstructing this length of fascia, with the remaining 70% to receive rehabilitation through cleaning and sealing to protect the concrete surface and mitigate against future water exposure.

Deck Underside at bridges crossing over 97 Ave., 101 Ave., 103 Ave., Liberty Ave., and Rockaway Blvd. We recommend that the underside of the concrete decks be thoroughly sounded and cleaned to remove any delaminated concrete pieces at these bridges. We also recommend that all exposed steel be sandblasted and painted, including exposed steel reinforcement.

Gunite on Steel Fascias and Subtructural Steel. We recommend that gunite be removed along all locations that it exists. This will expose the steel that it currently covers, which will need to be sandblasted and painted.

Platforms Slabs between 101 Ave. and 103 Ave. We recommend that the platforms slabs be removed.

Expansion Joints. We recommend that rehabilitation all expansion joints along the viaduct be performed to mitigate against water leakage into the structure below.

Railings. We recommend that the railings be replaced. (Railings are also required at Atlantic Ave. and Yellowstone Blvd.).

Miscellaneous Conditions. We recommend that the cut cap beam at Pier 81 be repaired.

B. Earthen Embankments

We have no recommendations for work along the earthen embankments.

C. Retaining Walls

At the varying height concrete retaining wall between Atlantic Ave. and 97th Ave. along the east ROW, we recommend that continue monitoring of the wall be done.

D. Station Structures

For the former station at Atlantic Ave., we recommend that this project determine if these platforms and their substructural components will be retained and used in the future. If so, then their rehabilitation should be included.

For the former Ozone Park station (between 101st Ave. and 103rd Ave.), the platforms are in very poor condition and should be removed.

E. Railroad Utility Structures

We have no recommendations for work for the railroad utility structures.

It is recognized that funding for this project may be limited, and the project team may be forced to proposed only a limited number of recommendations for work to limit costs. Thus, the following two categories are presented to help the project team prioritize the recommended work, and identify those items of work that MUST be done, vs. work that we consider SHOULD be done, as evaluated from a structural and safety point of view.

1. <u>Defects that MUST be repaired, rehabilitated, or removed.</u>
    a. These can be structural defects that reduce the critical section of a structural member which, if allowed to continue deteriorating, will reduce its capacity to carry loads. Examples:
        i. Base of column section loss at Yellowstone Blvd, and replacement of column base concrete covers
    b. These can be non-structural defects of members that are so deteriorated that we cannot leave them alone. These defects, if allowed to continue deteriorating, may result in falling debris and safety hazards. Examples:
        i. Concrete deck/fascia along the elevated viaduct spans
        ii. Side platforms slabs between 101 Ave. and 103 Ave.
        iii. Gunite along the fascia arches below platforms between 101 Ave. and 103 Ave.
        iv. Deteriorated gunite on fascia girders and substructure at 97 Ave, 101 Ave, 103 Ave, Liberty Ave, Rockaway Blvd bridges
        v. Severely deteriorate concrete substructure

2. <u>Defects that SHOULD be repaired, rehabilitated, or removed.</u>
    a. These can be non-structural deterioration or deficiencies that are located in prominent visible locations that everyone would agree should be addressed. Examples:
        i. Blast cleaning of existing steel bridge structure, and repainting
        ii. Concrete abutment and wingwall spalling, scaling, cracking, efflorescence
        iii. Railings

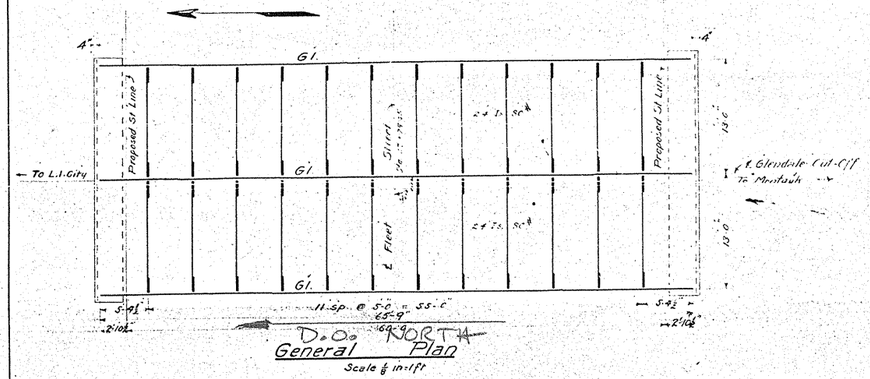
Appendix A

Original Drawings/Sketches of Bridge Structures

Original Drawings/Sketches

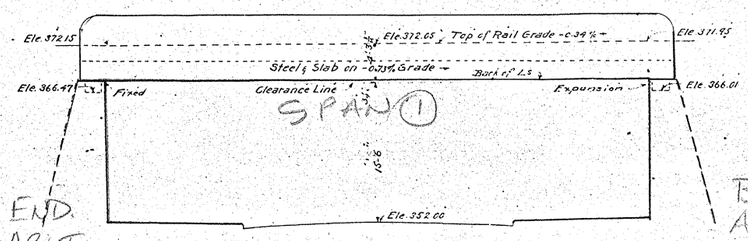
for

Fleet Street Bridge



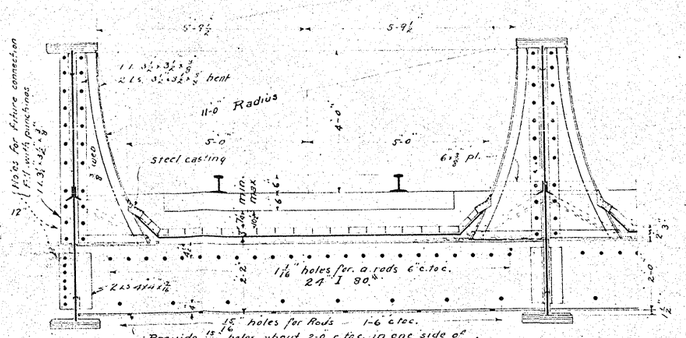
General Plan

Scale ¼ in = 1 ft



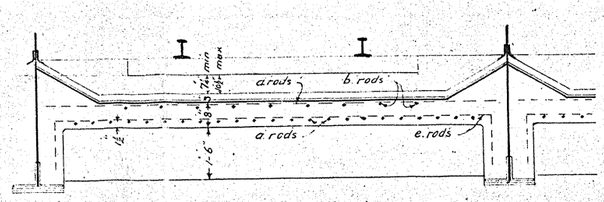
Elevation

Scale ¼ in = 1 ft.



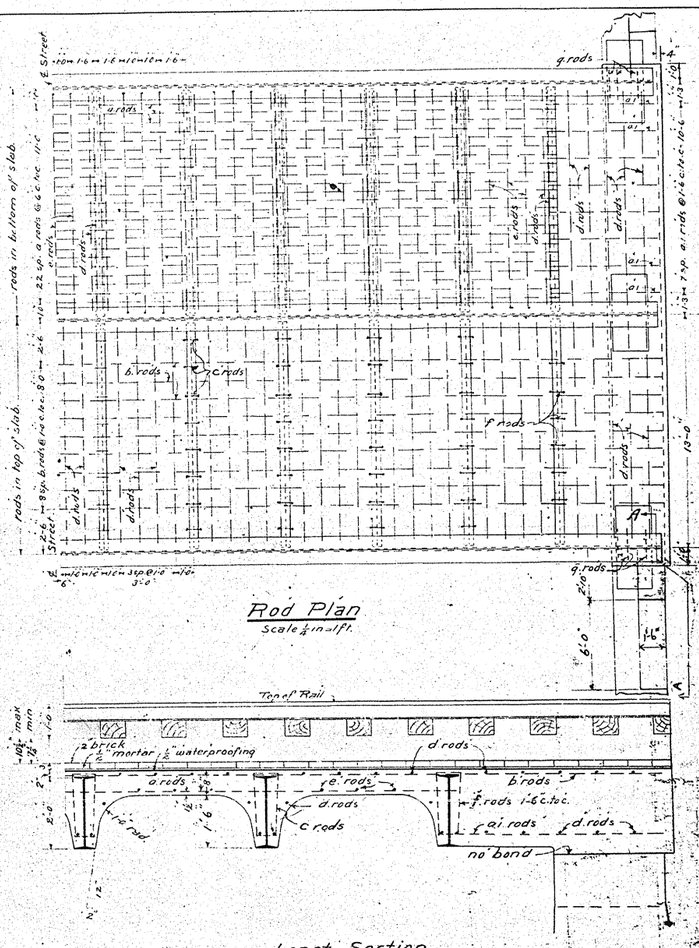
Typ. Cross Sect. at Brackets

Scale ½ in = 1 ft.



Typ. Cross Sect. through Slab

Scale ½ in = 1 ft.

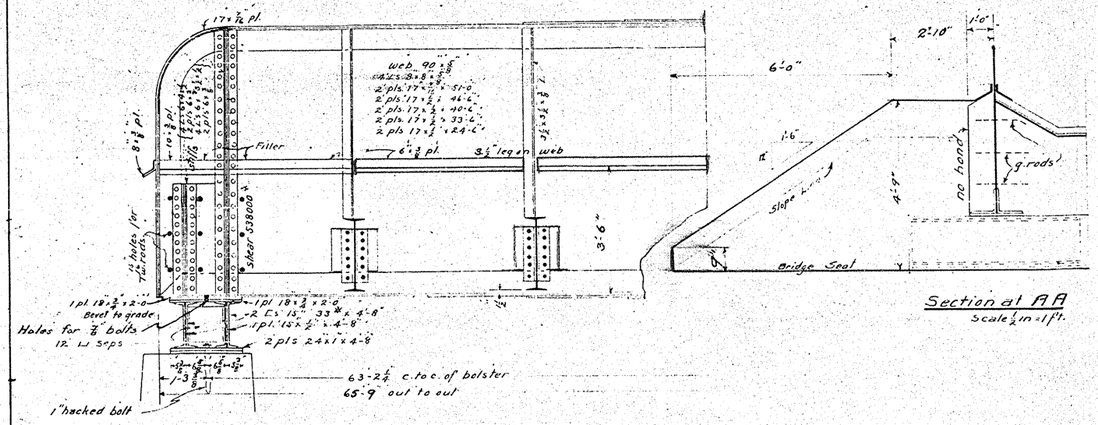


Rod Plan

Scale ¼ in = 1 ft.

Longt. Section

Scale ½ in = 1 ft.



Detail of Girder G1.

Scale ½ in = 1 ft.

Section at A A

Scale ½ in = 1 ft.

Made by W.J.A.B.

Checked by

Tie Rods Required			
No	Mark	Size	Length
92	a	⅞" Thr.	23'-0"
32	a1	⅞" "	5'-6"
34	b	⅞" "	34'-0"
24	f	¾" "	4'-6"
36	g	⅝" "	1'-6"
160	c	¾" "	5'-0"
216	d	¾" "	12'-6"
66	e	¾" "	15'-0"

INDEX OF DRAWINGS.	
Dwg. No.	Description
1	General Plan & details of steel
2	General Plan & details of foundations

85 cu yds concrete 1:3:5 - Floor Slab.
380 bags cement
44 c. yds. sand.
72 c. yds. stone 1" & under.

Filling Backwall added to Sect. A.A.

⅞" ℄ rivets
open holes 15/16" ℄ unless noted

The lines and grades of the streets shown on this plan are in accordance with the Final Map of Portions of the First, Second and Third Wards of the Borough of Queens, City of New York, dated June 1st, 1907, commonly known as the Borough Map, adopted by the Board of Estimate & Apportionment April 5th, 1909.

Approved by the Board of Estimate & Apportionment by resolution adopted Dec. 6th 1908, in accordance with provisions of Section IV of the agreement dated June 22nd 1907, between the Board of Rapid Transit Railroad Commissioners, for the City of New York, and the Long Island Railroad Company; said agreement having been approved by the Board of Estimate & Apportionment by resolution dated July 8th, 1907.

Secretary.
Board of Estimate & Apportionment

Approved F. Auryansen Bridge Engr.

Approved J.A. Savage Chief Engr.

LONG ISLAND RAILROAD

Fleet St. Bridge

On Glendale Cut-Off

GENERAL PLAN & DETAILS

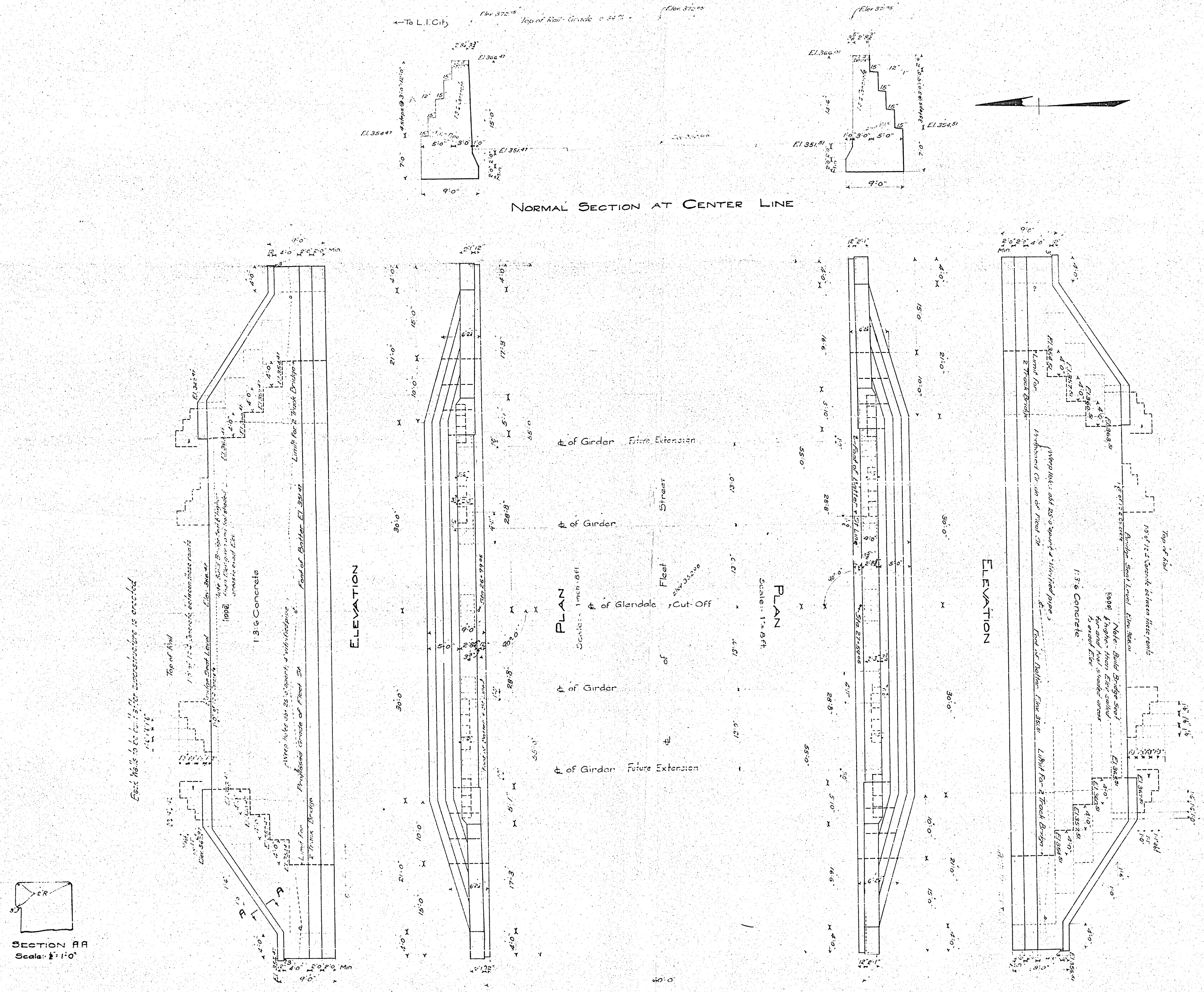
Scales as noted

Jamaica N. Y.

Oct. 9, 1908

B.H.N. 7705660

824 645



Quantities

Concrete in Abuts	592 c.y.
" " slab 1:3:5	88 c.y.
Excavation (4 ft. depth assumed)	307 c.y.
Steel (billed weight)	180,350 lbs.
Reinforcement	6450 "
Waterproofing	1800 sq. ft.
Bricks No	8100

S. Stoddard July 27 1910

V2E/178

Notes:- The abutments shown are of the full length required for a four track bridge. Dotted steps indicate the length required for 2 tracks. For the present, the abutments will be built only to the limits shown by the dotted steps.

All exposed surfaces of abutments to have Floated faces.

Elev. 300.0, L.I.R.R. datum = Elev 0.0 of Topog. Bureau of Borough of Queens.

Nov. 4/09
BACKWALLS FOR
2 TRACK BRIDGE ADDED.

Approved: F. Auryansen Bridge Engineer

Approved: J.R. Savage Chief Engineer

The lines and grades of City streets shown on this plan are in accordance with Topographical map of Portions of the First, Second, Third and Fourth Wards of the Borough of Queens, City of New York, dated June 1st, 1907, commonly known as "The Corona Map" adopted by the Board of Estimate & Apportionment April 24, 1908.

Approved by the Board of Estimate and Apportionment by resolution ... of the agreement dated June 22nd, ... between the Board of Rapid Transit Railroad Commissioners for the City of New York and the Long Island Railroad Company ... approved by the Board of Estimate and Apportionment by resolution dated July 8th, 1907.

Secretary,
Board of Estimate and Apportionment

LONG ISLAND RAILROAD

Bridge GS 32 over Fleet Street

on Glendale Cut-Off

GENERAL PLAN & DETAILS OF FOUNDATIONS

Scales as noted

Jamaica, N.Y.
Nov. 24, 1908

Bridge No. GS 62
Drawing No. 11-2

Made by: E.W.C. & E.J.S.
Checked by: F.S.D. Dec. 17th 08.

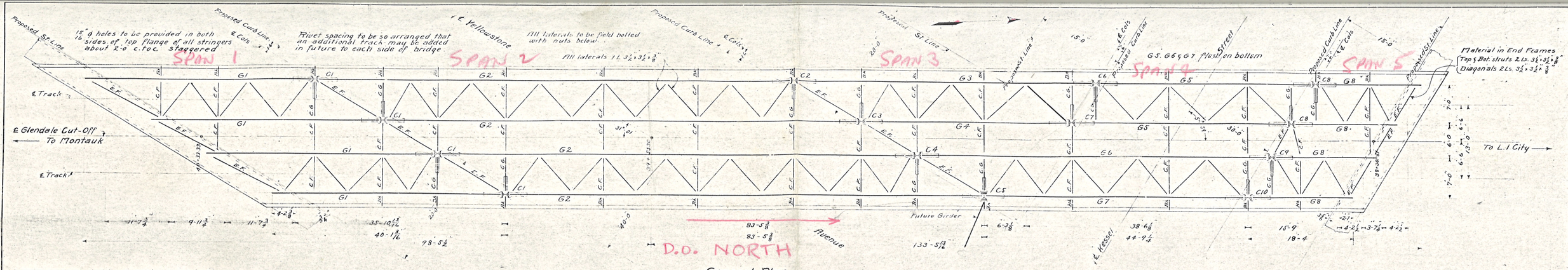
824 646

BIN # 7-70566-0

Original Drawings/Sketches

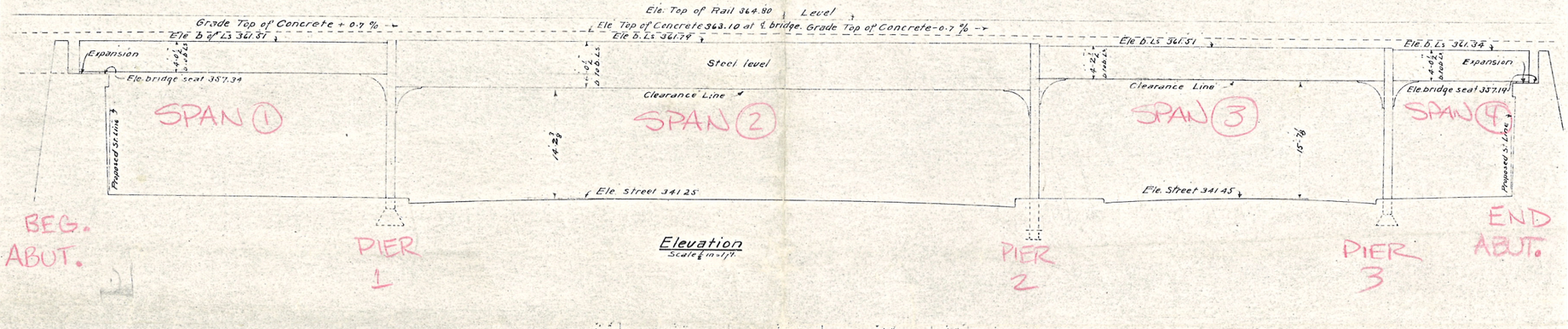
for

Yellowstone Boulevard Bridge



General Plan

Scale 1/8 in. = 1 ft.



Elevation

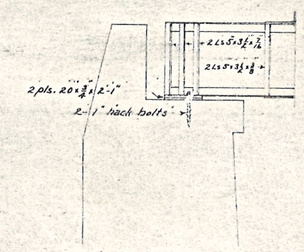
Scale 1/8 in. = 1 ft.

Stringer Schedule

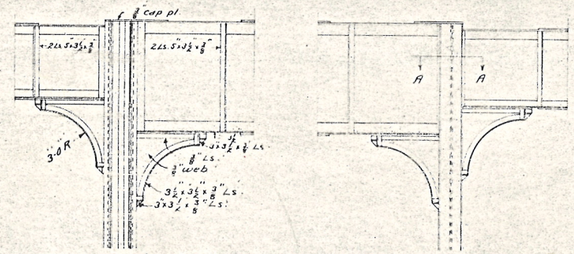
Mark	End Shear	Web	Flange Section
G1	199500	48" × 7/16	4 Ls 6"×6"×½ 2 Pl. 14" × 7/16" × 30'-0" 2 pl. 14" × ½" × 21'-0"
G2	351800	72" × ½	4 Ls. 8"×8" × ⅝ 2 pls. 18" × ⅝" × 71'-0" 2 pls. 18" × ⅝" × 63'-0" 2 pls 18" × ⅝" × 59'-6" 2 pls 18" × ⅝" × 44'-0" 2 pls 18" × ⅝" × 31'-6"
G3	242200	50" × ½	4 Ls. 6"×6" × ½ 2 pls. 14" × ½" × 43'-0" 2 pls 14" × ½" × 37'-0" 2 pls 14" × ½" × 30'-6" 2 pls 14" × ½" × 22'-0"
G4	189000	50" × ⅜	4 Ls 6"×6" × ½ 2 pls. 14" × ½" × 26'-0" 2 pls. 14" × ½" × 18'-6"
G6	271000	50" × 7/16	4 Ls. 6"×6" × ½ 2 pls. 14" × ½" × 53'-6" 2 pls. 14" × ½" × 48'-6" 2 pls. 14" × ½" × 43'-0" 2 pls. 14" × ½" × 38'-0" 2 pls. 14" × ½" × 31'-6" 2 pls. 14" × ½" × 23'-0"
G7	218900	50" × 7/16	4 Ls. 6"×6" × ½ 2 pls. 14" × ½" × 35'-0" 2 pls. 14" × ½" × 28'-0" 2 pls 14" × ½" × 20'-6"
G8	118200	48" × ⅜	4 Ls. 6"×6" × ⅜

Col. Schedule

Mark	Load	Col. Section	Col. Base	Ped. Ele.
C1	443600	1 pl. 12" × ½" 4 Ls 6"×6" × 7/16" 2 pls. 14" × ⅜" 2-15" Cs 33"	2 pls. 29" × 1 1/16" wing pls. ⅝" side Ls 6"×6" × ⅝"	338.00
C2	468600	1 pl. 12" × ½" 4 Ls 6"×6" × ½" 2 pls. 14" × ⅝" 2-15" C 33"	1 pl. 27" × 1 5/8" 6-15" B 33"	334.80
C3	420700	1 pl. 12" × ½" 4 Ls 6"×6" × ½" 2 pls. 14" × ⅝" 2-15" Cs 33"	1 pl. 27" × 1 5/8" 6-15" B 33"	334.60
C4	489800	1 pl. 12" × ½" 4 Ls 6"×6" × ½" 2 pls. 14" × ⅝" 2-15" Cs 33"	1 pl. 27" × 1 5/8" 6-15" Cs 33"	334.60
C5	1000000	1 pl. 12" × 1" 4 Ls 6"×6" × ½" 6 pls. 14" × ⅝" 2 pls. 14" × ⅝" 2-15" Cs 33"	see detail	335.50
C6	331700	1 pl. 12" × ⅞" 4 Ls 6"×6" × ½" 2-15" Cs 33"	2 pls. 29" × 1 1/16" wing pls. ⅝" side Ls 6"×6" × ⅝"	338.00
C7	283400	1 pl. 12" × ⅝" 4 Ls. 6"×6" × 7/16" 2-15" Cs 33"	2 pls. 29" × 1 3/16" wing pls. ⅝" side Ls 6"×6" × ⅝"	338.00
C8	225400	1 pl. 12" × ⅜" 4 Ls 6"×6" × 7/16" 2-15" Cs 33"	2 pls. 29" × 1 3/32" wing pls. ⅜" side Ls 6"×6" × ⅜"	339.00
C9	297300	1 pl. 12" × ⅝" 4 Ls 6"×6" × 7/16" 2-15" Cs 33"	2 pls. 29" × 1 3/16" wing pls. ⅝" side Ls 6"×6" × ⅝"	339.00
C10	249000	1 pl. 12" × ⅜" 4 Ls 6"×6" × 7/16" 2-15" Cs 33"	2 pls. 29" × 1 3/32" wing pls. ⅜" side Ls 6"×6" × ⅜"	339.00

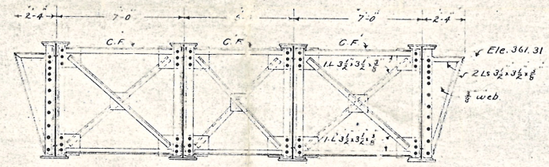


Sect. South Abutment
Scale ½ in. = 1 ft.



Typ. Col. Connection
Scale ½ in. = 1 ft.

Col. S.



Typ. Section at Cross Frames
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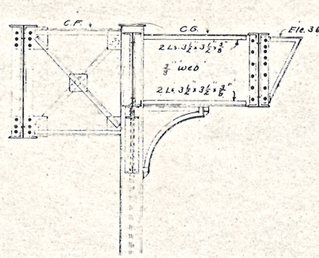
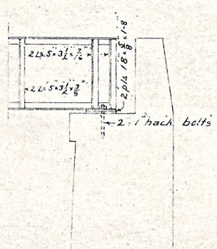
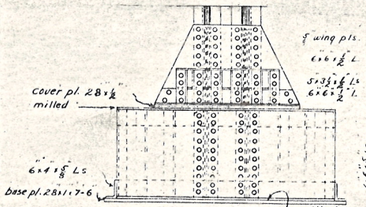


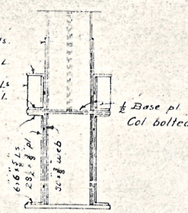
Typ. Cross Section at Col. showing solid web cross frame and bracket.
Scale ½ in. = 1 ft.

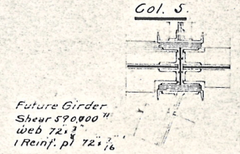


Sect. North Abutment
Scale ½ in. = 1 ft.

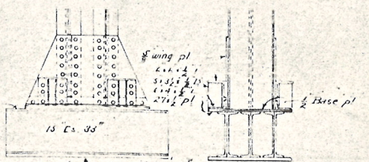


Detail Col. Base Col. G5.
Scale ½ in. = 1 ft.

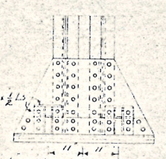




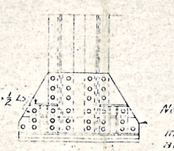
Sect at A A
Scale ½ in. = 1 ft.



Typ. Col. Base Cols. C2, C3 & C4
Scale ½ in. = 1 ft.

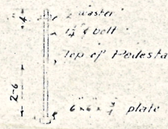


Typ. Col. Base Cols. C1
Scale ½ in. = 1 ft.



Typ. Col. Base Cols. C6 to C10
Scale ½ in. = 1 ft.

Note — This L to be riveted and milled with Col. shaft in all cases.



Detail of Anchor Bolts

Anchor bolts required
6 bolts 4'-6" C.C. Items for C5
12 " 3'-3" C2 to C4 inc.
40 " 2'-6" C6 to C10 inc.

Index of Drawings

Dr. No	Description
1	General Plan & Details of Steel
2	Plan & Details of Floor Slab
3	Kessel St. Abutment
4	" " Yellowstone Ave.
5	" " Col. Pedestals

REVISED Dec. [illegible] 1908 Ele. of Col. pedestals C6 to C10 changed
[illegible] & 114th Street Ele. changed

ERECTED IN FEBRUARY — 1909

Note
All street lines and curb lines shown on this drawing are proposed street lines and curb lines.
Ele. 300.00 of L.I.R.R. datum = Ele. 0.00 of Top. Bureau of Borough of Queens
Rivets ⅞ ø
Open holes 15/16" ø

Approved F. Auryansen
Bridge Engr
Approved [signature]
Chief Engr

[illegible] and grades of the streets shown on this plan are in accordance with the Map of Portions of the First, [illegible] of the Borough of Queens, [illegible] New York, dated June 1st, 1907, [illegible] known as "The [illegible] of the Board of Estimate & Apportionment, [illegible] 24, 1908.

Approved by the Board of Estimate & Apportionment by resolution adopted Dec. 6th, 1907, in accordance with provisions of Section IV [illegible] and an agreement dated June 2nd, 1907, between the Board of [illegible] Transit Construction Company, [illegible] of New York, and the Long Island Railroad Company, said agreement having been approved by the Board of Estimate & Apportionment by resolution dated July 8th, 1907.

[signature]
Secretary.
Board of Estimate & Apportionment

LONG ISLAND RAILROAD

Bridge GS 65 over Yellowstone Ave.

on Glendale Cut-Off

GENERAL PLAN & DETAILS OF STEEL

Scales as noted

Jamaica N. Y.

Oct. 6, 1908

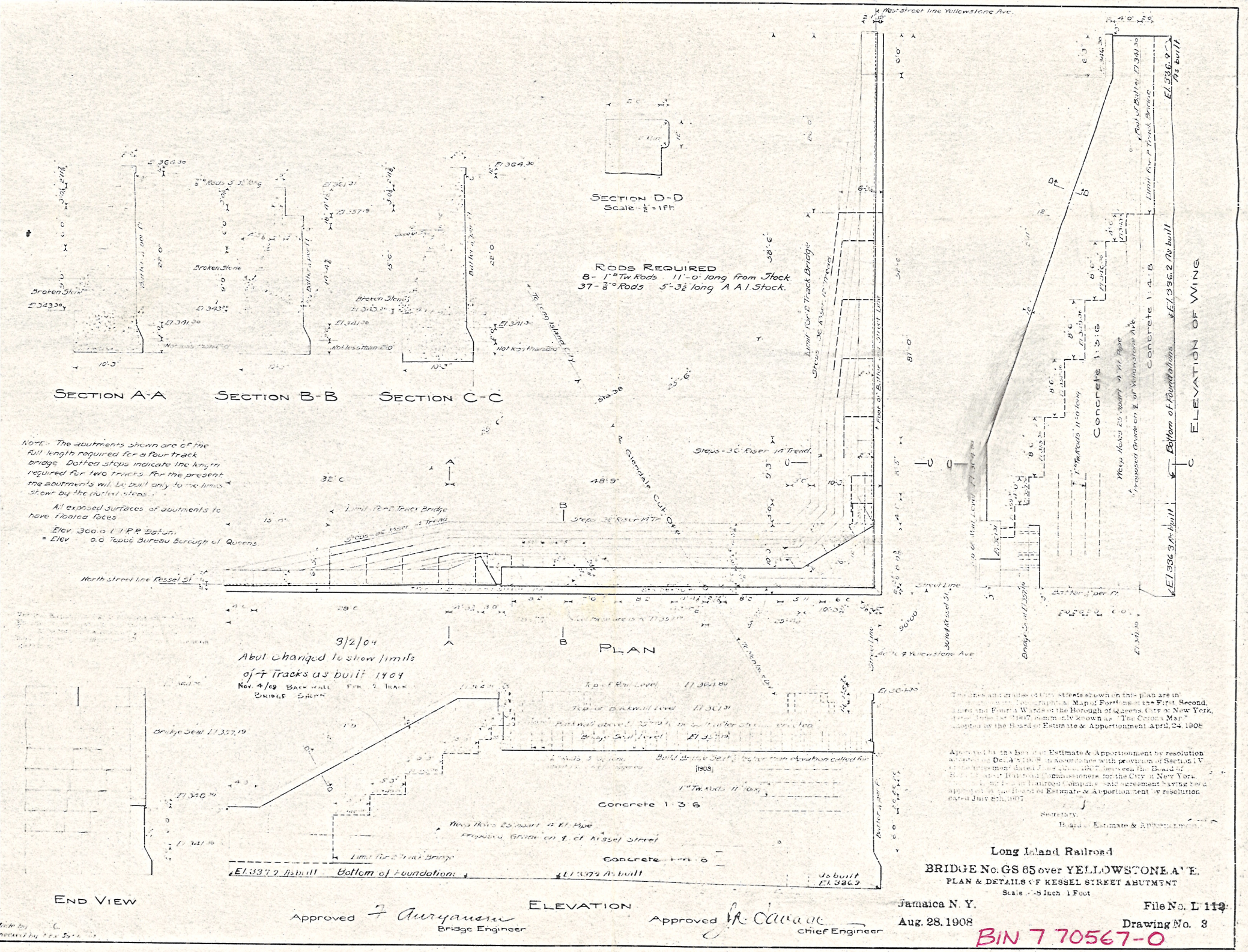
File No. GS.65 L 112

Drawing No. 1

Made by W. J. A. B.

Checked by [illegible]

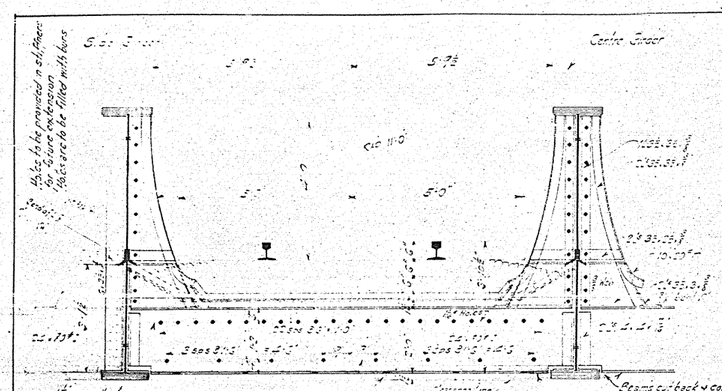
BIN 7-70567-0

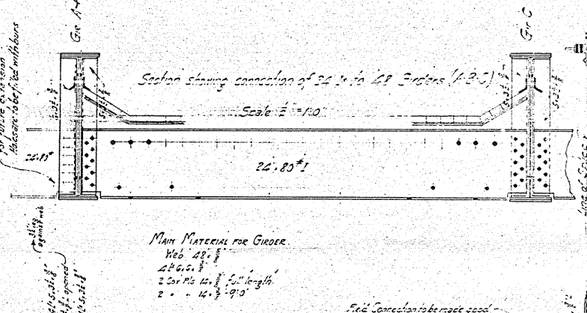

SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D
Scale = 1/2" = 1ft
RODS REQUIRED
8 - 1" Tw Rods 11'-0" long from Stock
37 - 7/8" Rods 5'-3 1/2" long A A I Stock.
NOTE:- The abutments shown are of the full length required for a four track bridge. Dotted steps indicate the length required for two tracks. For the present the abutments will be built only to the limits shown by the outer steps.
All exposed surfaces of abutments to have Roman faces
Elev. 300 is L.I.R.R. Datum.
= Elev. 0.0 Topog. Bureau Borough of Queens
North Street line Kessel St.
Limit for 2 Track Bridge
Steps - 36" Riser 14" Tread.
Glendale Cut Off R.
3/2/04
Abut changed to show limits of 4 Tracks as built 1909
Nov. 4/08 Back wall for 2 track bridge shown
PLAN
END VIEW
ELEVATION
Concrete 1:3:6
Concrete 1:3:8
ELEVATION OF WING
Bottom of Foundations
El. 337.2 As built
El. 337.4 As built
El. 336.9 As built
El. 336.2 As built
El. 336.3 As built
Approved F. Auryansen
Bridge Engineer
Approved [illegible]
Chief Engineer
Long Island Railroad
BRIDGE No. GS 65 over YELLOWSTONE AVE.
PLAN & DETAILS OF KESSEL STREET ABUTMENT
Scale - 3/8 Inch 1 Foot
Jamaica N. Y.
Aug. 28, 1908
File No. L 112
Drawing No. 3
BIN 7 70567-0
B2L 642
GS-65

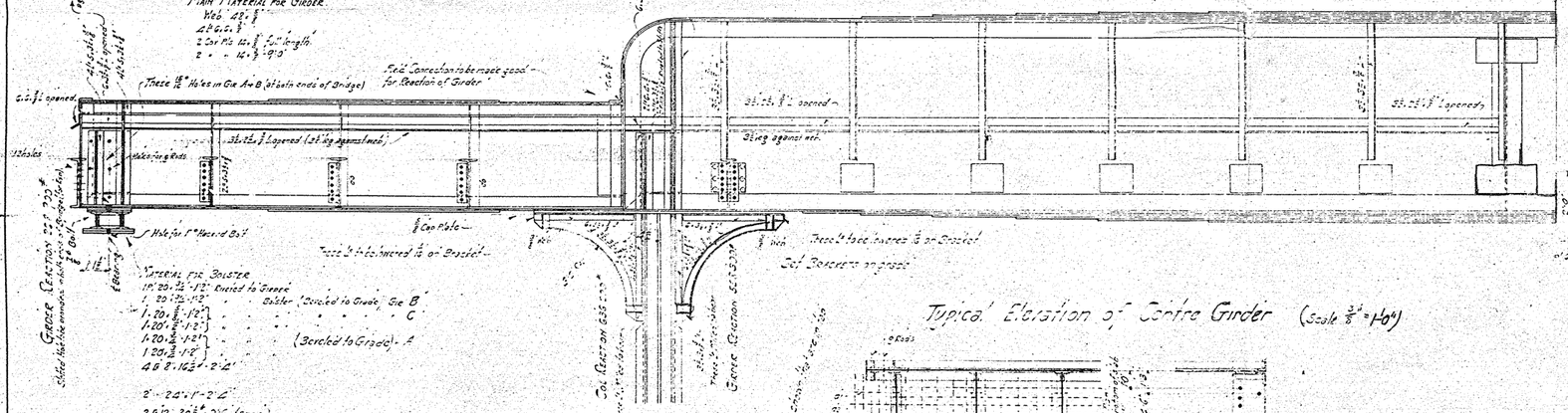
Original Drawings/Sketches

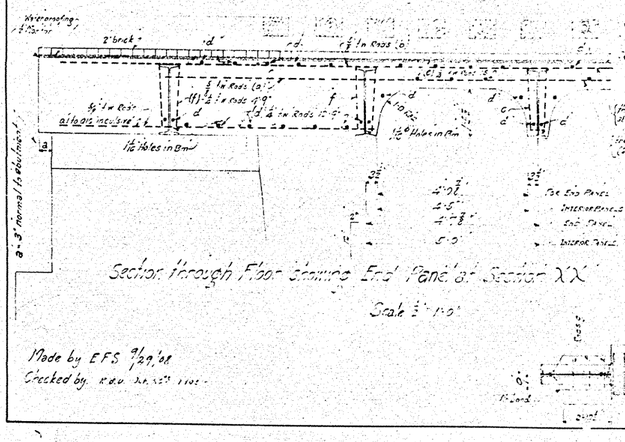
for

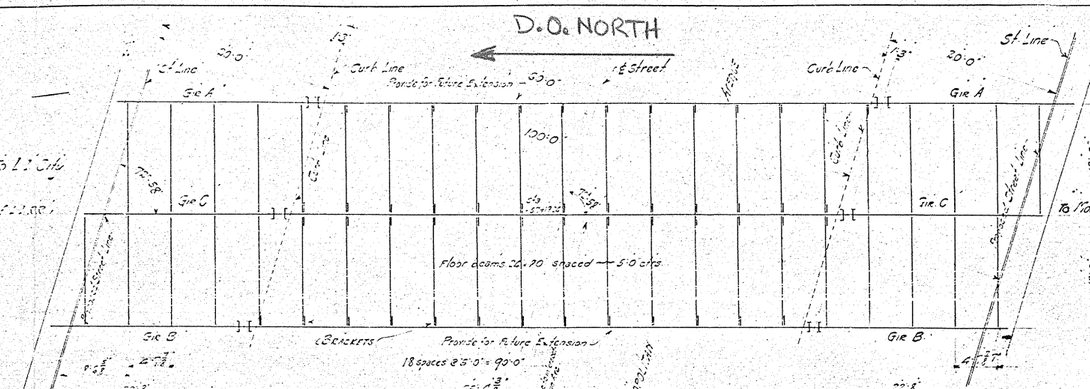
Metropolitan Avenue Bridge

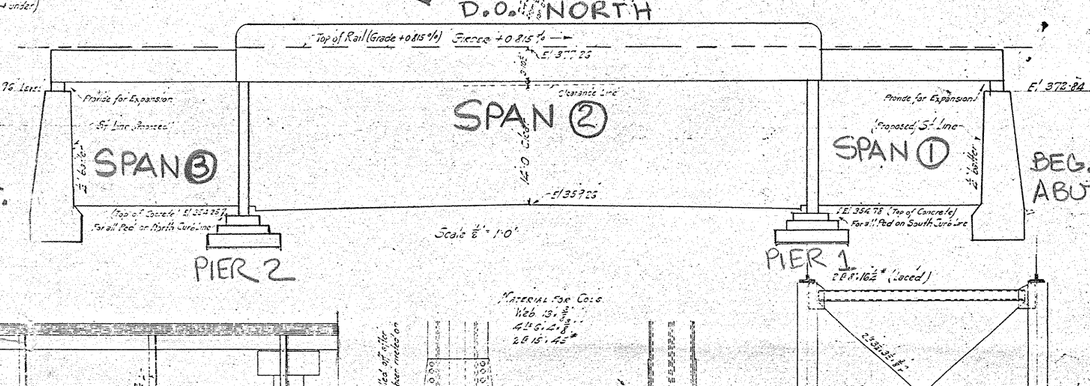


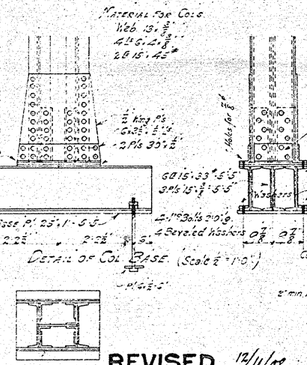


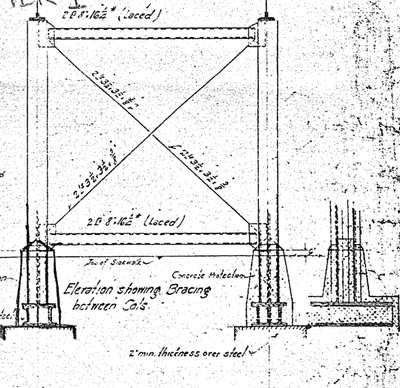












List of Rods

2	21'	1" sq. in Cass	42'-0"
2	22'	"	44'-0"
2	23'	"	46'-0"
2	24'	"	48'-0"
2	25'	"	50'-0"
2	26'	"	52'-0"
2	27'	"	54'-0"
2	28'	"	56'-0"
2	29'	"	58'-0"
2	30'	"	60'-0"
2	31'	"	62'-0"
2	32'	"	64'-0"
2	33'	"	66'-0"
2	34'	"	68'-0"
2	35'	"	70'-0"
2	36'	"	72'-0"
124	2'	5/8" sq. in Cass	248'-0"
52	6'	5/8" sq. in Cass	312'-0"
262	2'	3/4" sq. in Cass	524'-0"
2	21'	"	42'-0"
2	22'	"	44'-0"

2	23'	3/4" sq. in Rods	46'-0"
2	24'	"	48'-0"
372	2'	"	744'-0"
103	6'	"	618'-0"
64	2'	"	128'-0"
20	6'	"	120'-0"

N

To L.I. City

& Glendale Cut-Off of L.I.R.R.

156 cu yds concrete (1-3-6) (235 bags cement, 470 cu yds sand, 1332 cu yds stone (1¼ under)

13500 Bricks

335 sq yds 4 ply Hydrex felt

Main Struts and Ties

Web 25" x 7/16"
2 Ang 7" x 7" x 7/16"
(1 Pl 17-1/8" x 5/16") (1 Pl 17-1/8" x 7/16") full length strap

2	26	50'-0"
2	25	42'-6"
2	17-1/8"	38'-0"
5	25	31'-6"
2	25	23'-0"

Index of Drawings

Dr No.	Description
1	General Plan & Details of Steel
2	Erection

Erected in February-1909

Approved F. Auryansen, Bridge Engr

Approved J.R. Savage, Chief Engr

Rivets 7/8"

Holes 15/16" unless noted

Elevation 33.00 L.I.R.R. datum equals 5'-0" on Topographical Bureau of Borough of Queens.

...lines and grades of City streets shown on this plan are in accordance with Topographical Maps of Portions of the First, Second, ... Fourth Wards of the Borough of Queens, City of New York, ... June 1st 1907, commonly known as "The Corona Map" adopted by the Board of Estimate & Apportionment April 24, 1908.

...approved by the Board of Estimate & Apportionment by resolution adopted on ... in accordance with provisions of Section IV. ... the agreement dated June 2nd 1900 between the Board of Rapid Transit Railroad Commissioners for the City of New York, ... Long Island Railroad Company, said agreement having been ... by the Board of Estimate & Apportionment by resolution ... July 5th 1907

...
Secretary.
Board of Estimate & Apportionment

LONG ISLAND RAILROAD

BR. No. GS 68 on Glendale Cut-Off

over Metropolitan Ave.

GENERAL PLAN & DETAILS OF STEEL GS68

Scales 1-4 & 1-8 & 1-2 Inch = 1 Foot

Jamaica N.Y. File No. 1-1-10

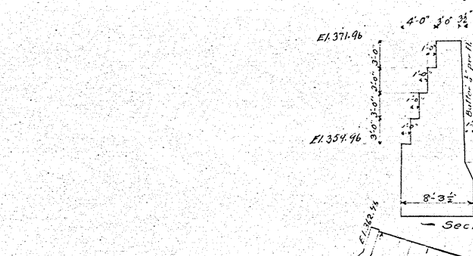
Sept. 12, 1908 Drawing No. 1

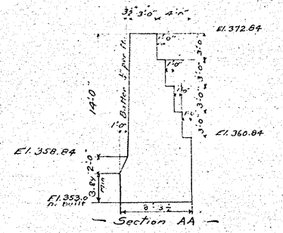
REVISED 12/11/08
Anchor Bolts Added
Col Protection Added

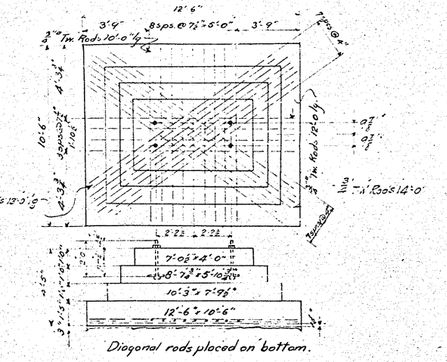
B2L 631

BIN # 7-70568-0

Top of Rail Grade + 0.615'





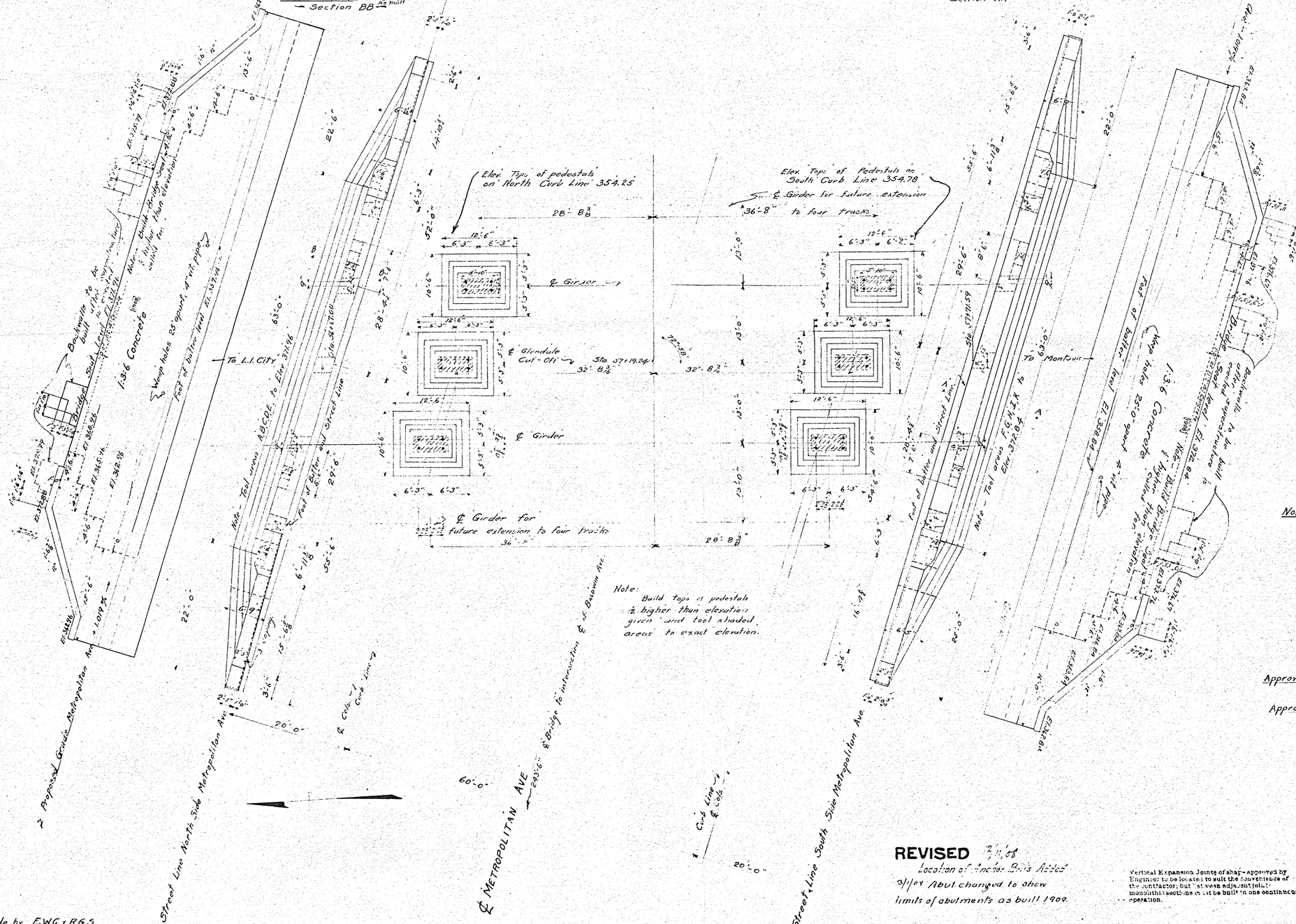


— 6 Col. Pedestals Reqd as Shown —

— Material required for Pedestals —

24 - 3/4" ø tw. rods 12'-0" long
54 - 3/4" " " 10'-0"
48 - 3/4" " " 13'-0"
48 - 3/4" " " 14'-0"
Wt. = 4056 lbs

38.2 bags cement
44 cu. yds sand.
73 cu. yds stone 1" and under.
86 cu. yds. Concrete 1:3:5



Notes:— All street lines and curb lines shown on this drawing are proposed street lines and curb lines. The abutments shown are of the full length required for a four Track Bridge. Dotted steps indicate the length required for two tracks. For the present the abutments will be built only to the limits shown by the dotted lines.
Elev. 300.00 L.I.R.R. datum equals Elev. 0.00 of Topographical Bureau of Borough of Queens.
All exposed surfaces to have floated faces.

The lines and grades of City streets shown on this plan are in accordance with Topographical Maps Nos. 1 Portions of the First, Second, Third and Fourth Wards of the Borough of Queens, City of New York, dated June 1st, 1907, commonly known as "The Corona Map" adopted by the Board of Estimate & Apportionment April 24, 1908.

Approved F. Auryansen
Bridge Engr.

Approved J. R. Waage
Chief Engr.

Approved by the Board of Estimate & Apportionment by resolution adopted on Dec. 4, 1908 in accordance with provision of Section IV. of the agreement dated June 22nd, 1903 between the Board of Rapid Transit Railroad Commissioners of the City of New York, and the Long Island Railroad Company and agreement having been approved by the Board of Estimate & Apportionment by resolution dated July 8th 1904.

Secretary
Board of Estimate & Apportionment

REVISED 2/11/08
Location of Anchor Bolts Noted
2/10/09 Abut changed to show limits of abutments as built 1909.

Vertical Expansion Joints of shape approved by Engineer to be located to suit the convenience of the contractor; but between adjacent joints of monolithic sections are to be built in one continuous operation.

LONG ISLAND RAILROAD

BR. No. GS 68 on Glendale Cut-Off

over Metropolitan Ave.

GENERAL PLAN & DETAILS OF FOUNDATIONS

Scale 1/8 Inch = 1 Foot GS 68

Jamaica N. Y. File No. 1

Sept. 12. 1908 Drawing No. 2

Made by E.W.C. & R.G.S.
Checked by [illegible]

B2L 638

BIN # 7-70568-0

Original Drawings/Sketches

for

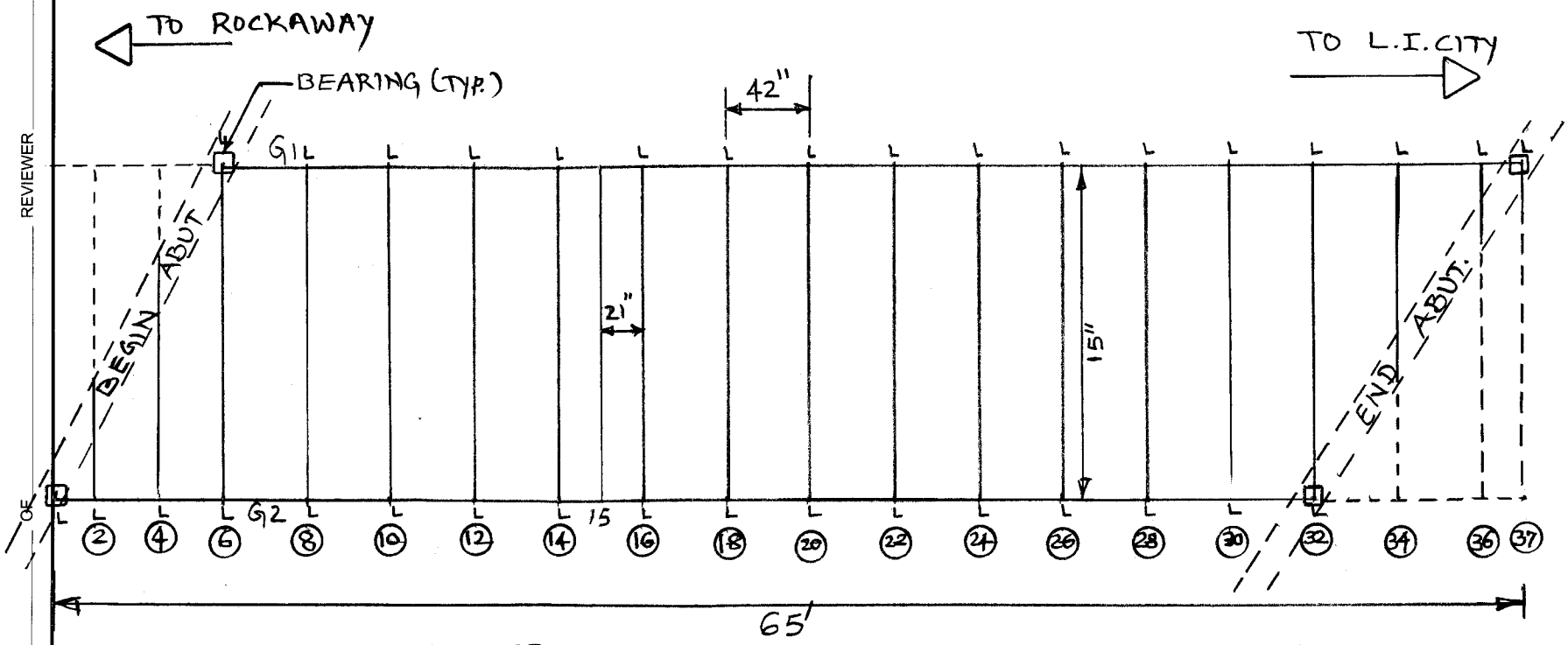
Union Turnpike Bridges

JOB TITLE UNION TURNPIKE (WEST BRIDGE (TWO GIRDER)

JOB NO. _____ CALCULATION NO. _____ ORIGINATOR BIN: 7705421 DATE _____

SHEET _____ REVIEWER _____ DATE 12/13/13

UNION TURNPIKE (WEST BRIDGE)
BIN - 7705421



L = VERTICAL STIFFENER

FLOORBEAM TO FLOORBEAM c/c = 21"

GIRDER TO GIRDER c/c = 15"

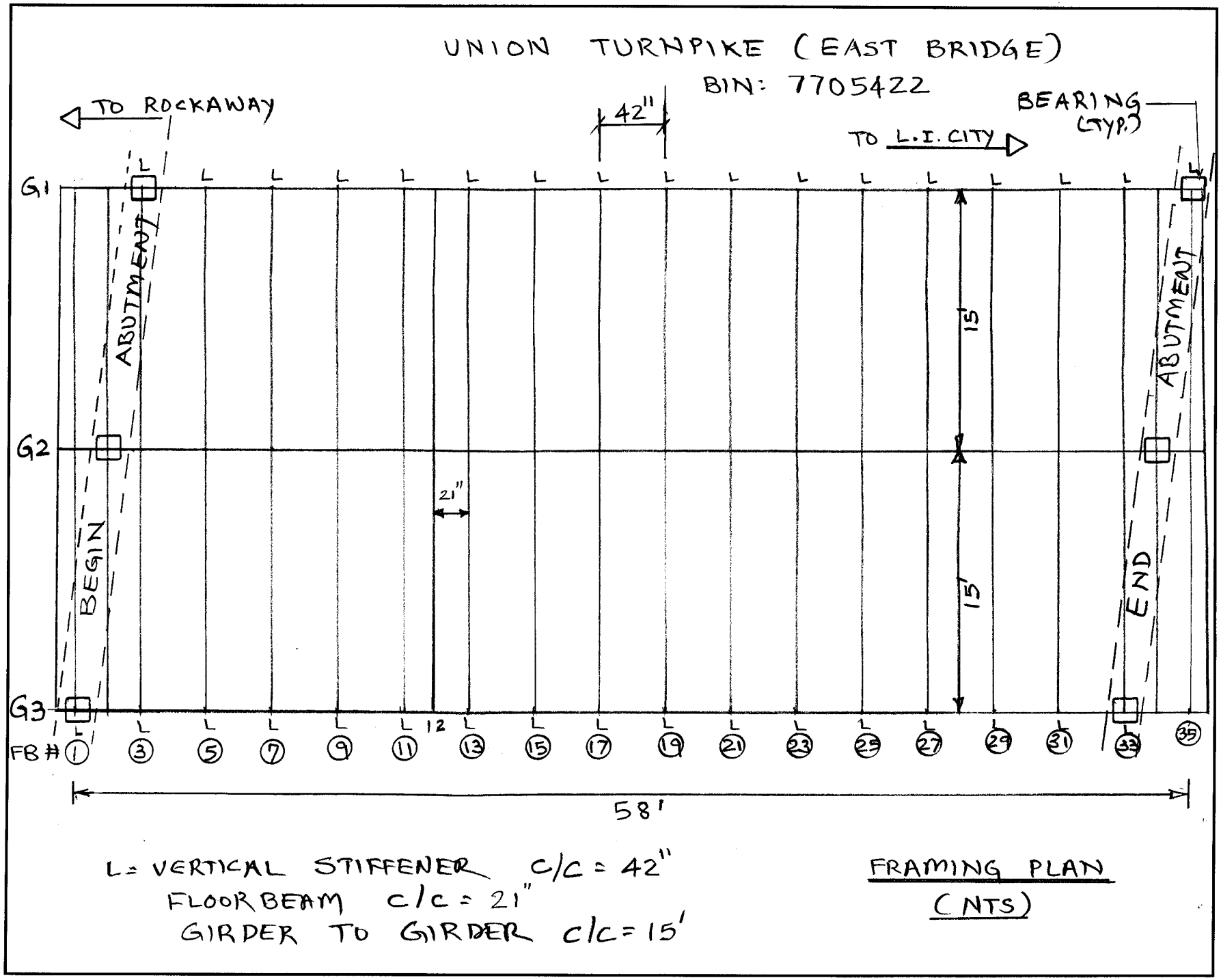
(#) FLOOR BEAM #

FRAMING PLAN
(NTS)

JOB TITLE UNION TURNPIKE (EAST BRIDGE)

JOB NO. CALCULATION NO. ORIGINATOR (3 GIRDER) DATE

SHEET BIN # 7705422 OF REVIEWER DATE 12/13/13



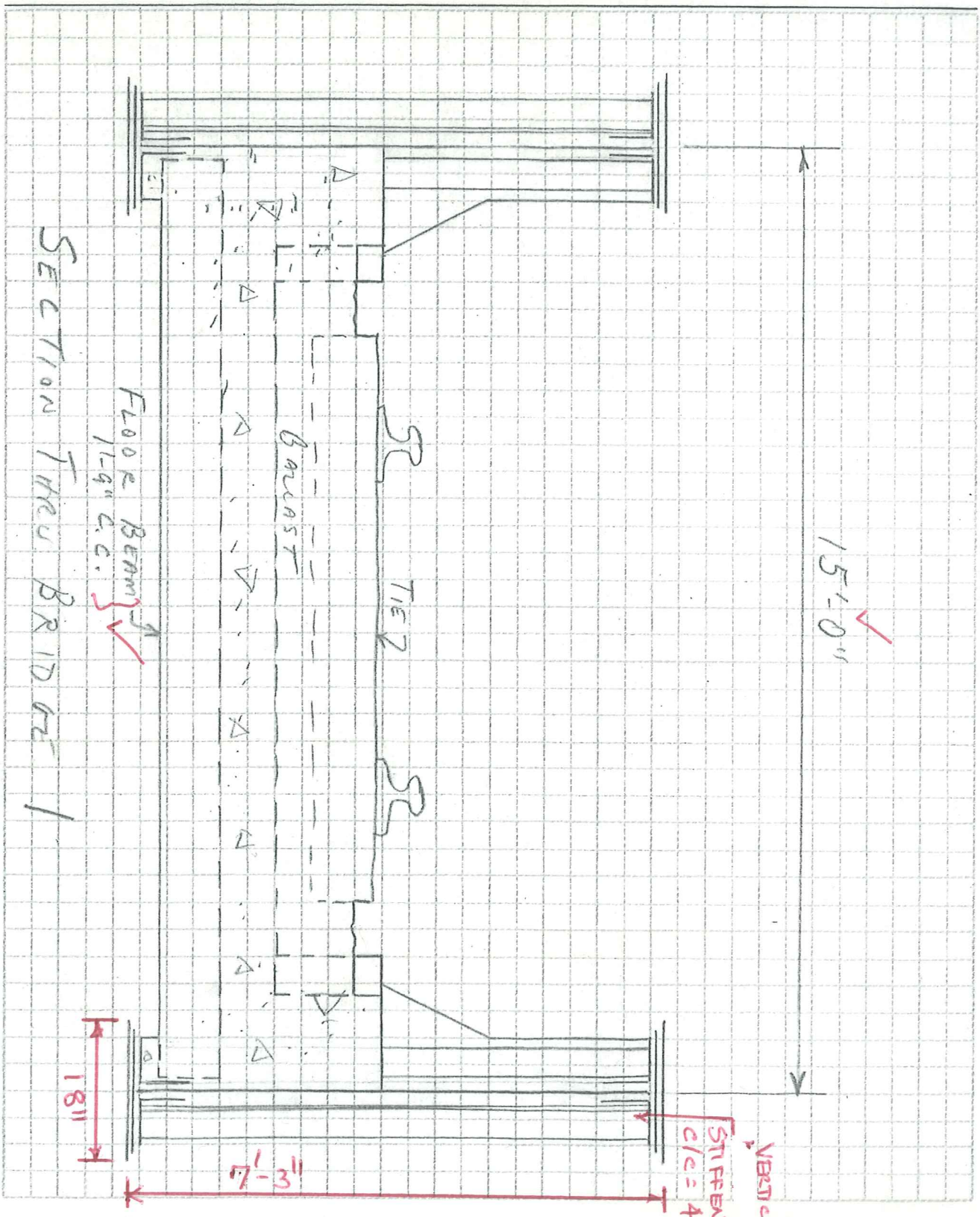
L = VERTICAL STIFFENER c/c = 42"
FLOOR BEAM c/c = 21"
GIRDER TO GIRDER c/c = 15'

FRAMING PLAN
(NTS)

TAMS

Job No. 1489
Project N.Y.C. BRIDGE INSPECTION
Subject T-70542-1
ABANDONED LIRR OVER UNION TURNPIKE - QUEENS

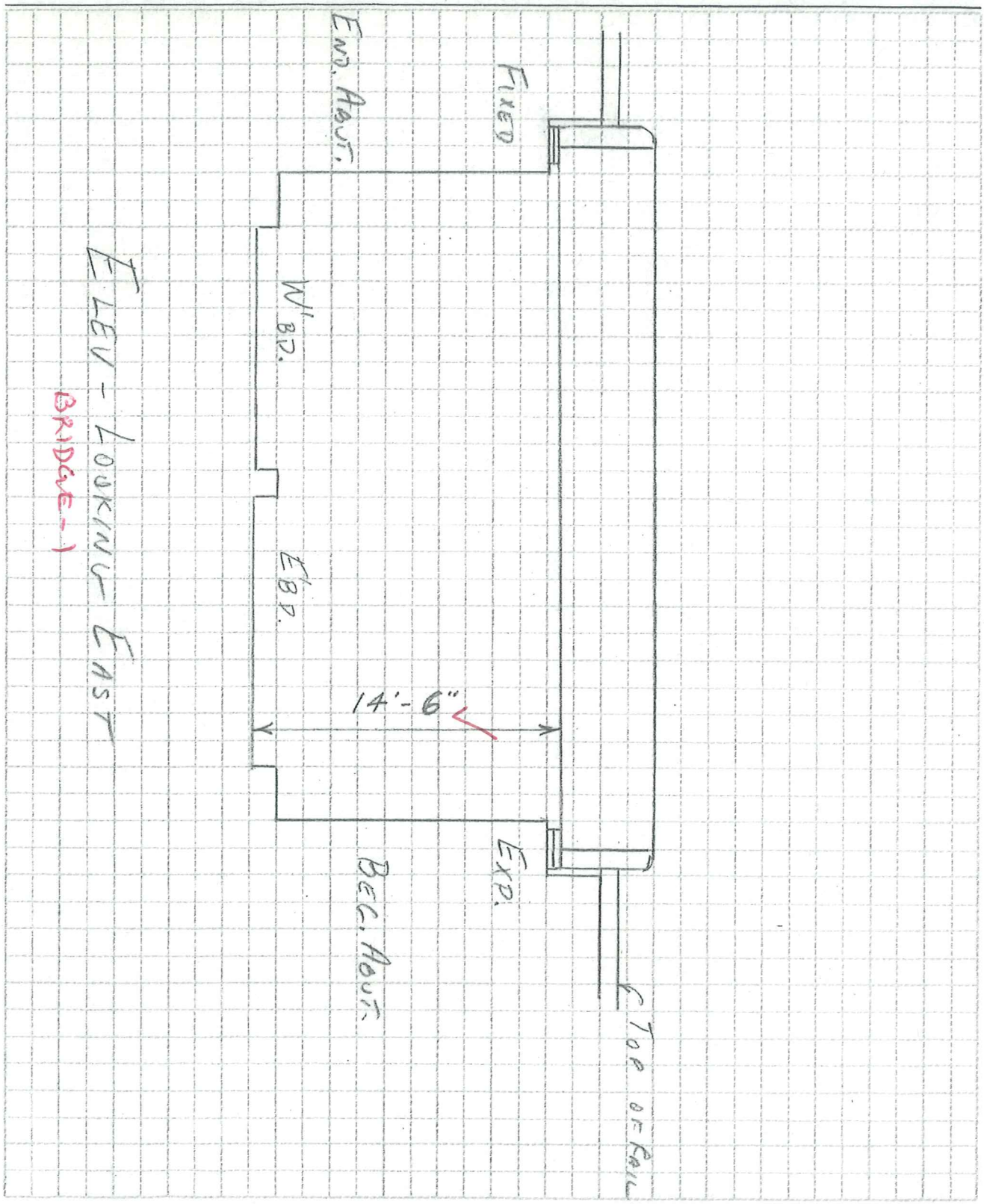
Sheet 2 of 2
Date 3/1/79
By MW
Ch'k. by



TAMS

Job No. 1489
Project NYC BRIDGE INSPECTION
Subject T-20542-1
ABANDONED LIRR OVER UNION TURNPIKE-QUEENS

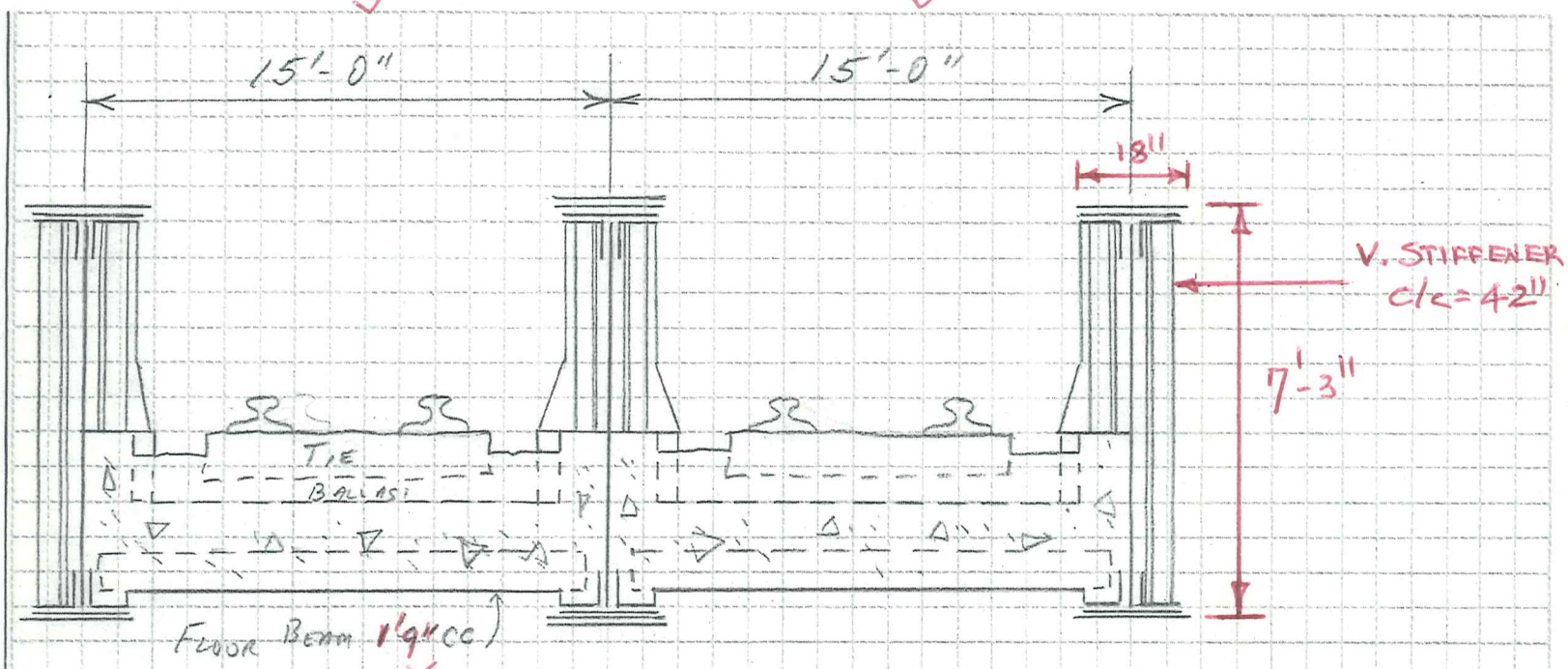
Sheet 1 of 2
Date 3/1/79
By MW
Ch'k. by



TAMS

Job No. 1489
Project N.Y.C. Bridge Inspection
Subject 7-10542-2 Abandoned LIRR over Union Turnpike - Queens

Sheet 1 of 2
Date 3/1/79
By MWW
Ch'k. by

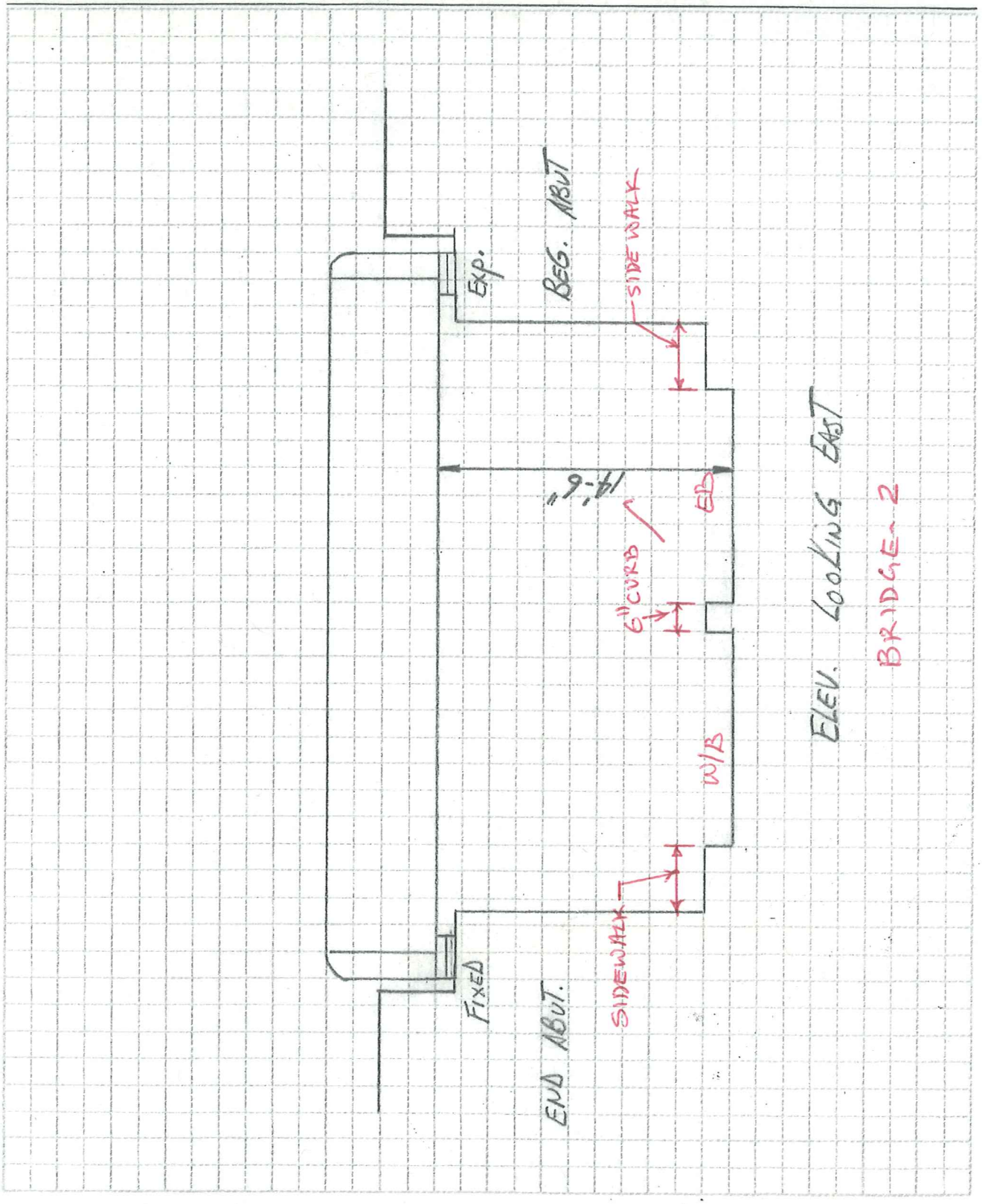


SECTION THRU BRIDGE 2

TAMS

Job No. 1489
Project N.Y.C. BRIDGE INSP.
Subject 7-70542-2
ABANDONED LIRR OVER UNION TURNPIKE

Sheet 1 of 2
Date 3/1/79
By B.L.
Ch'k. by M.W.



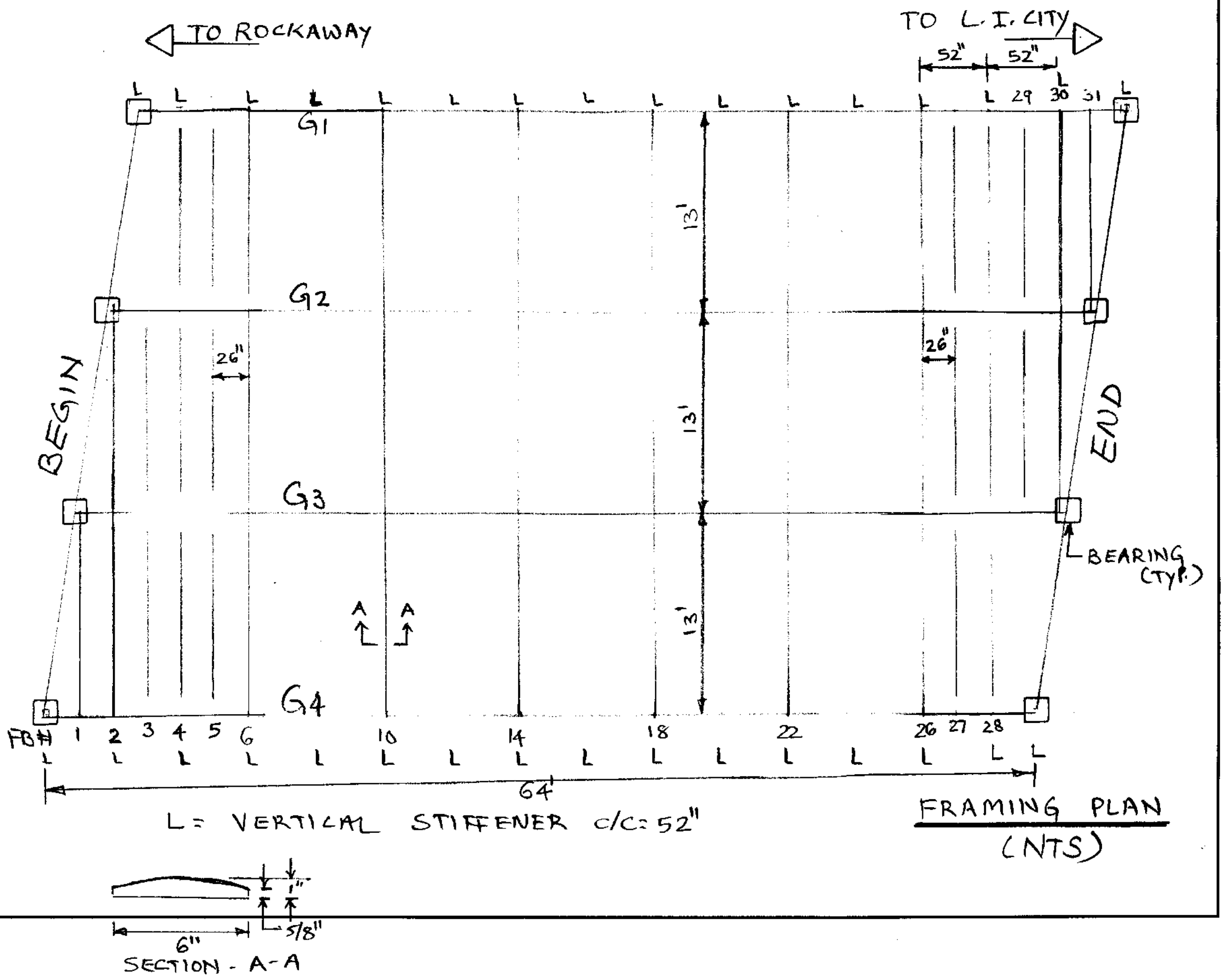
Original Drawings/Sketches

for

Park Lane South Bridge

JOB TITLE PARK LANE SO.
JOB NO.
SHEET
OF
CALCULATION NO.
ORIGINATOR
REVIEWER
DATE
DATE 12/13/13

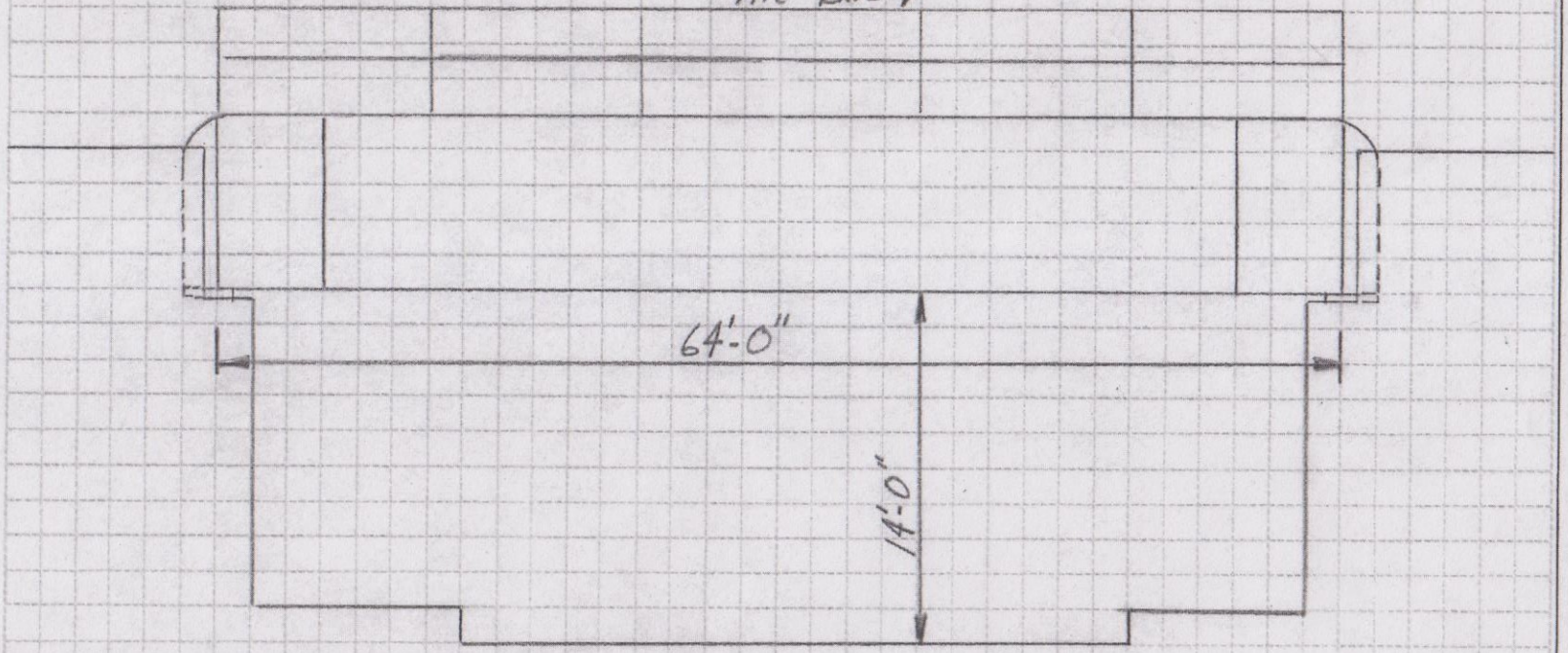
PARK LANE SO. BIN - 7705440



NOTE: ① TOTAL 50'L x 1"D x 2-4" W SURFACE SPALL, CRACK WITH EFFLORESCENCE NOTED AT ALONG THE GIRDERS.

② FEW SURFACE SPALL (< 5% DECK AREA) NOTED BETWEEN THE FB's.

③ FH (13'H) x 1/8" W CR. NOTED AT END ABUT UNDER LEFT FASCIA GIRDER.



ELEV. LOOKING EAST

* BRIDGE POSTED VERTICAL CLEARANCE FOR 12'-8"

TAMS

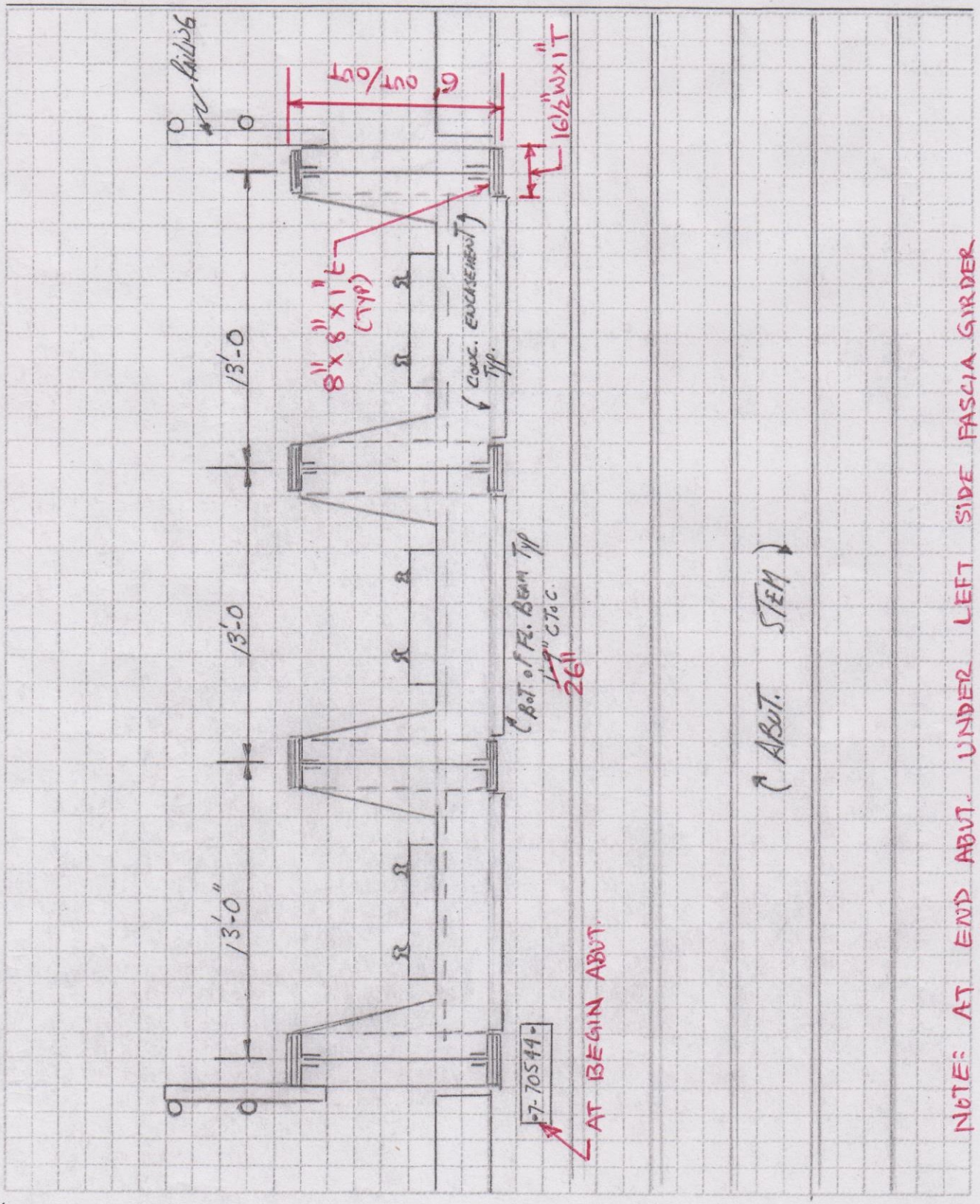
Job No. 1489
Project N.Y.C. BRIDGE INSPECTION
Subject 7-7D544.0
ABANDONED LIRR OVER PARKLANE SOUTH - QUEENS

Sheet 1 of 2
Date 3/1/79
By BL
Ch'k. by

TAMS

Job No. 1489
Project N.Y.C. BR. INSP
Subject PARK LANE So. LIRR
7-70544-0

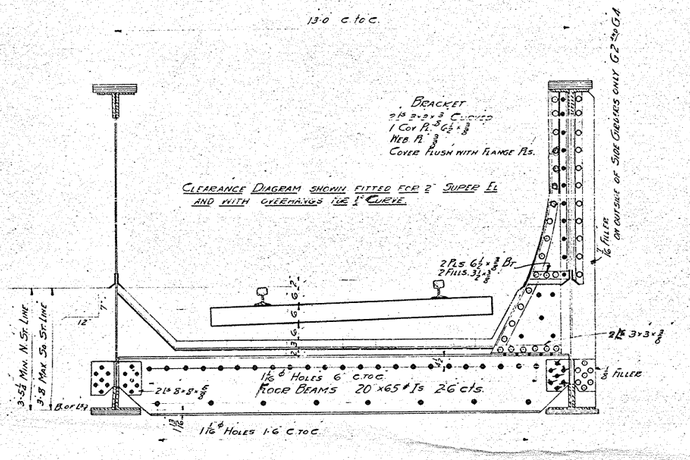
Sheet 2 of 2
Date 3/2/79
By BLC
Ch'k. by



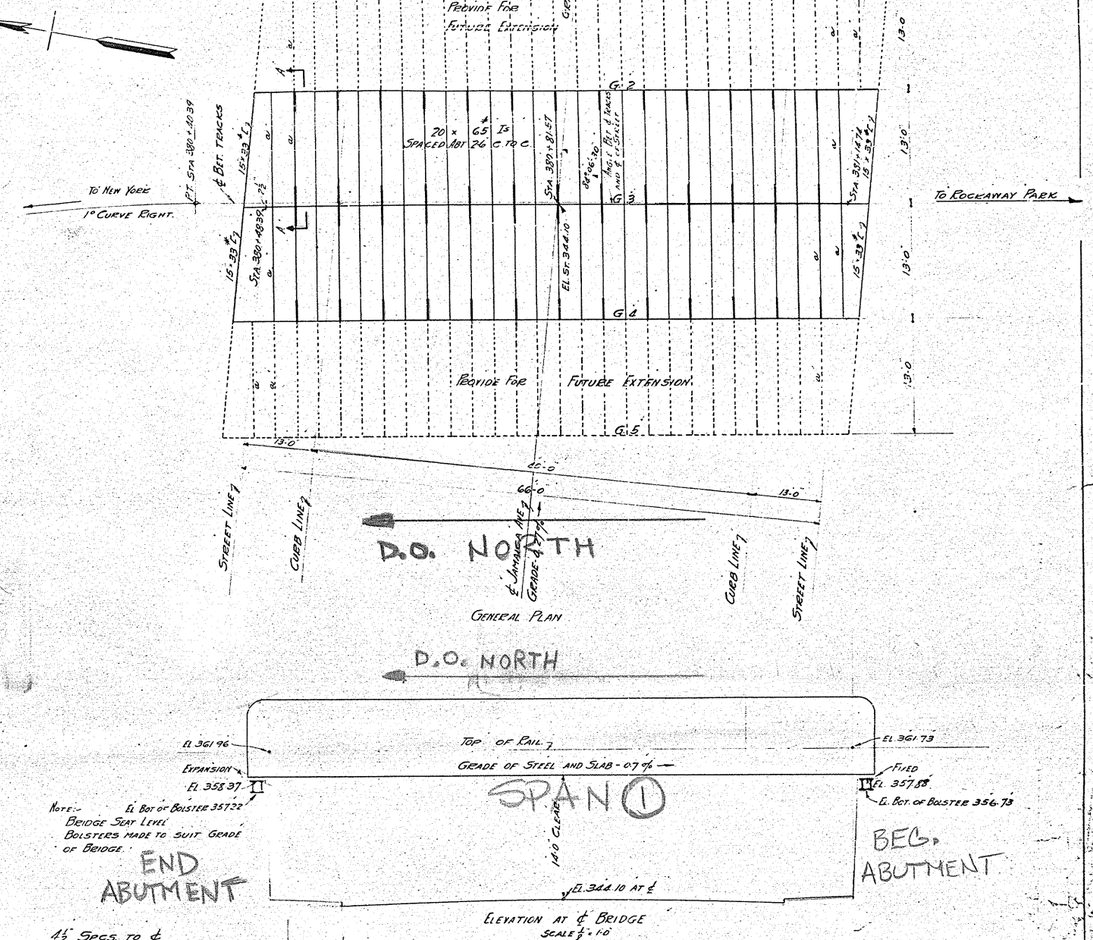
Original Drawings/Sketches

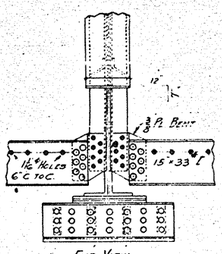
for

Jamaica Avenue Bridge



Cross Section "A A"

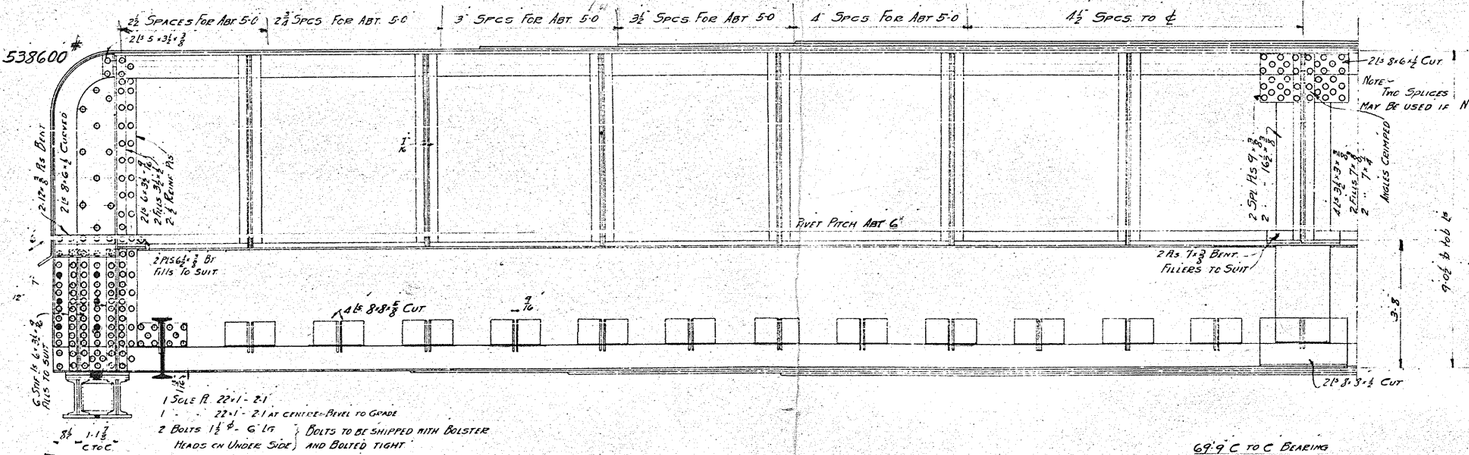




End View

Bolster

1 Mas Pl. 24"x 1" - 3.9
1 Top Pl. 27"x 3/8" - 2.1 planed
4 L 12"x 35# - 3.9
2 Pls 12"x 5/8" - 3.9
2 Hack Bolts 1 1/2" ⌀ - 1.3



69'-9" c to c Bearings

Girder G 3.

Main Material Top Flange	2 Ls 8"x 6"x 1" Full Length	Bot Flange 2 Ls 8"x 6"x 1" Full
	1 Cov. Pl. 15"x 5/8" Full	1 Cov. Pl. 18"x 5/8" - 51'-0"
	1 - - 15"x 5/8" - 47'-0"	1 Cov. Pl. 15"x 5/8" - 42'-0"
	1 - - 15"x 5/8" - 39'-0"	1 Cov. Pl. 15"x 5/8" - 30'-0"
	1 - - 15"x 5/8" - 29'-0"	Interm Stifs 4 1/2"x 3 1/2"x 5/16"
Web - 108"x 1/2"		2 Fills 7 1/2"x 5/8"
Standard Floor Beam Conn. Ls	8"x 8"x 5/8" Cut.	2" - 7 1/2"x 5/8"
Umbrellas 2 Pls. 7 1/2"x 3/8" Bent.		

Same Material for Girders G. 2 & G. 4

Erection Completed in August - 1913

Skilled Holes - North end
Round - South

Made By A.F.A. J.P.
Checked By W.R.C. Mar 15th 1912

Note
Rivets 7/8" ⌀ - Open Holes 7/8" ⌀ except as noted
All Holes for Future Connections Filled.
Spec's L.I.R.R. 1912.

El 300.00 L.I.R.R. Datum - El 0.00
Topog Bue Book of Queens

Correct J. Murray Allen Bridge Engr.
Correct W. R. Cole C.E. Prin. Asst Engr.
Approved [illegible] Chief Engr.

Vol. 821 Page 539

APPROVED BY
PUBLIC SERVICE COMMISSION
APRIL 12th. 1912.

LONG ISLAND RAILROAD.

Rockaway Beach Division

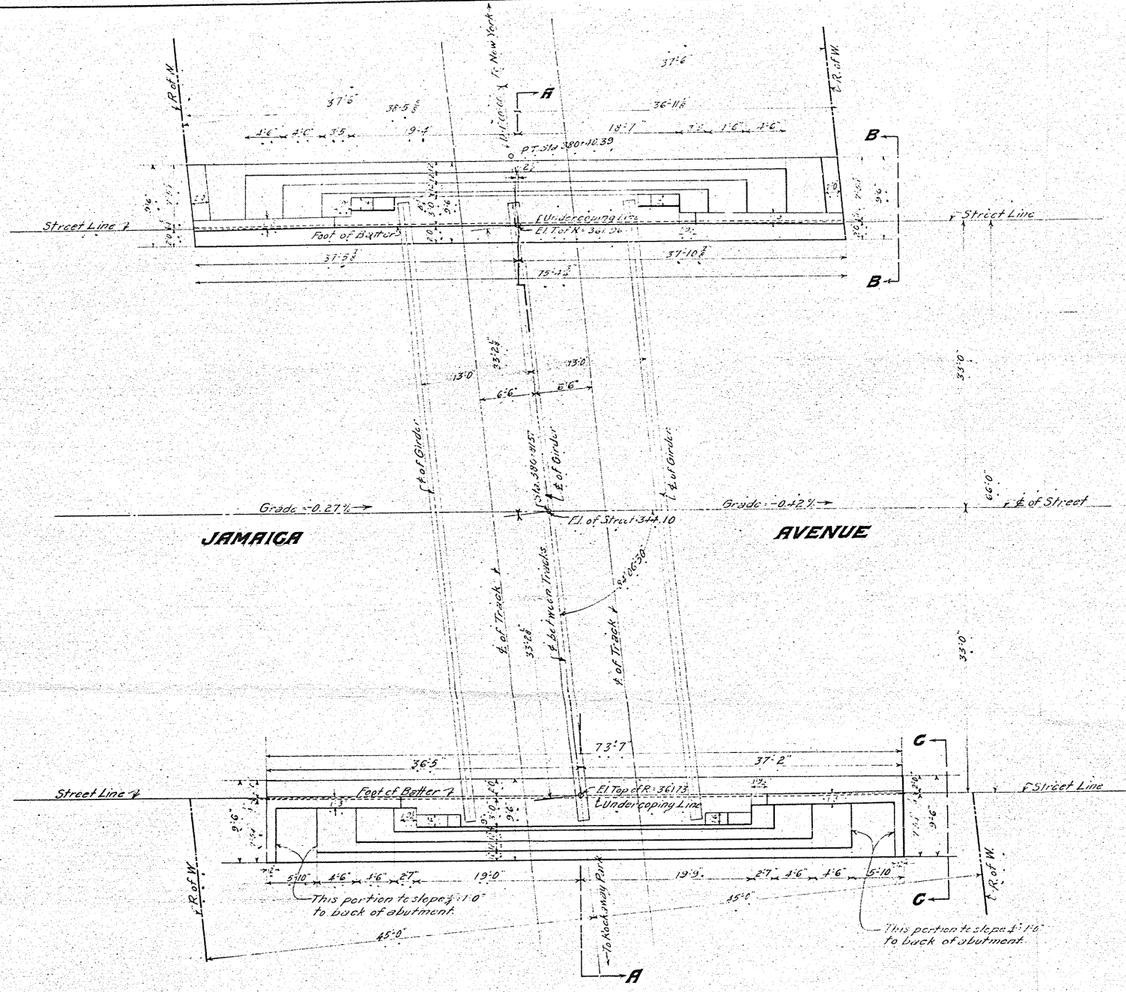
Jamaica Ave. Bridge

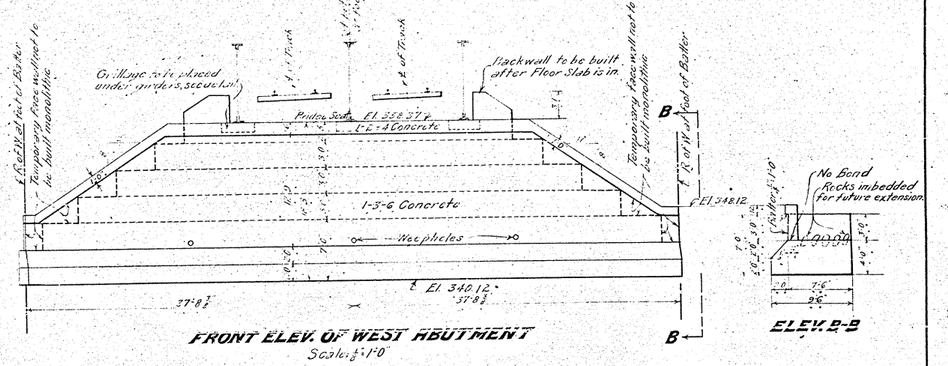
PLAN & DETAILS OF STEEL
Scales 1-8 & 1-2 In.=1 Ft.

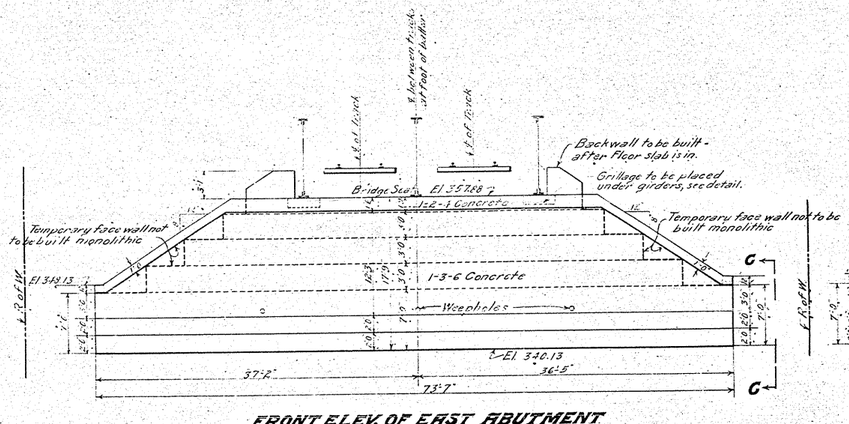
Jamaica, N. Y.
Mar. 8, 1912.

Bridge No. R 72.
Drawing No. 1.

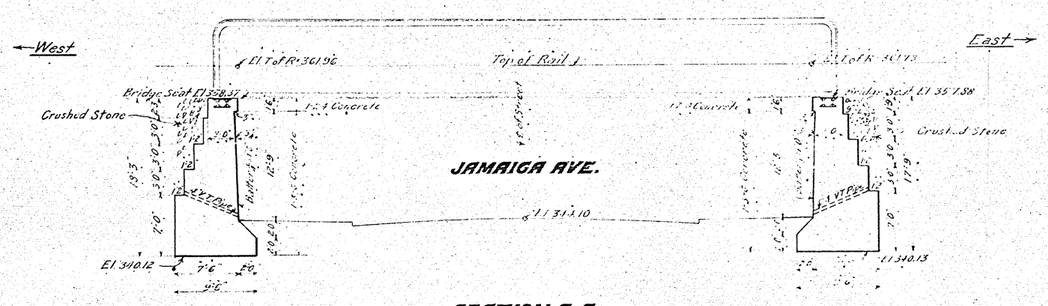
BIN # 7-70545-0

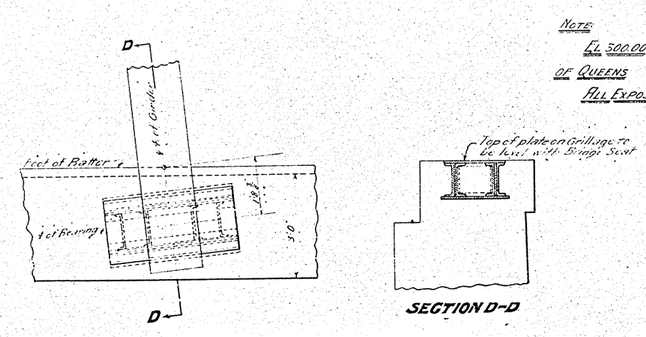






Note.- Temporary face wall not to be bonded to abutment. In steps back of face wall one man stones shall be imbedded for bonding of future extension.





CORRECT J. Aunyaume BRIDGE ENG'R.

CORRECT F.R. Gallo PRIN. ASST ENGR

APPROVED J.R. Maag CHIEF ENG'R.

Note:
El 300.00 L.I.R.R. DATUM = El 0.00 OF TOPOG. BUR OF BOR. OF QUEENS
ALL EXPOSED SURFACES TO BE FLOATED

APPROVED BY
PUBLIC SERVICE COMMISSION
JUNE 21st. 1912.

LONG ISLAND RAILROAD

Rockaway Beach Branch

Jamaica Ave. Bridge

PLAN & DETAILS OF MASONRY
Scales as noted

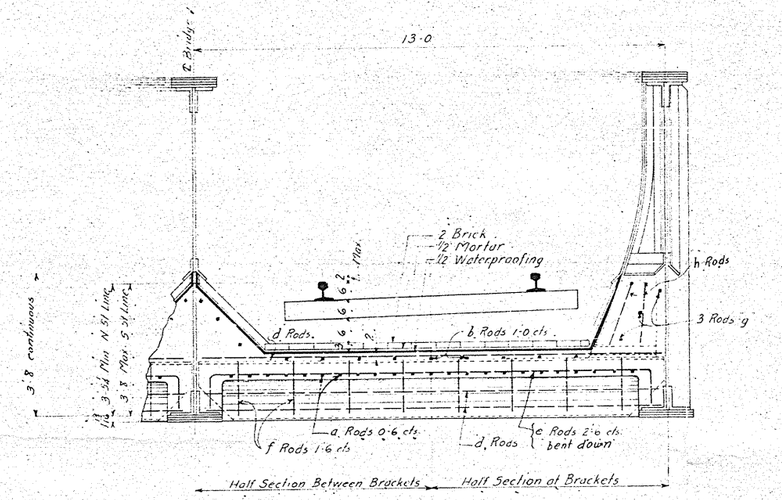
Jamaica N. Y. — Bridge No. R 72

May. 24, 1912. — Drawing No 3

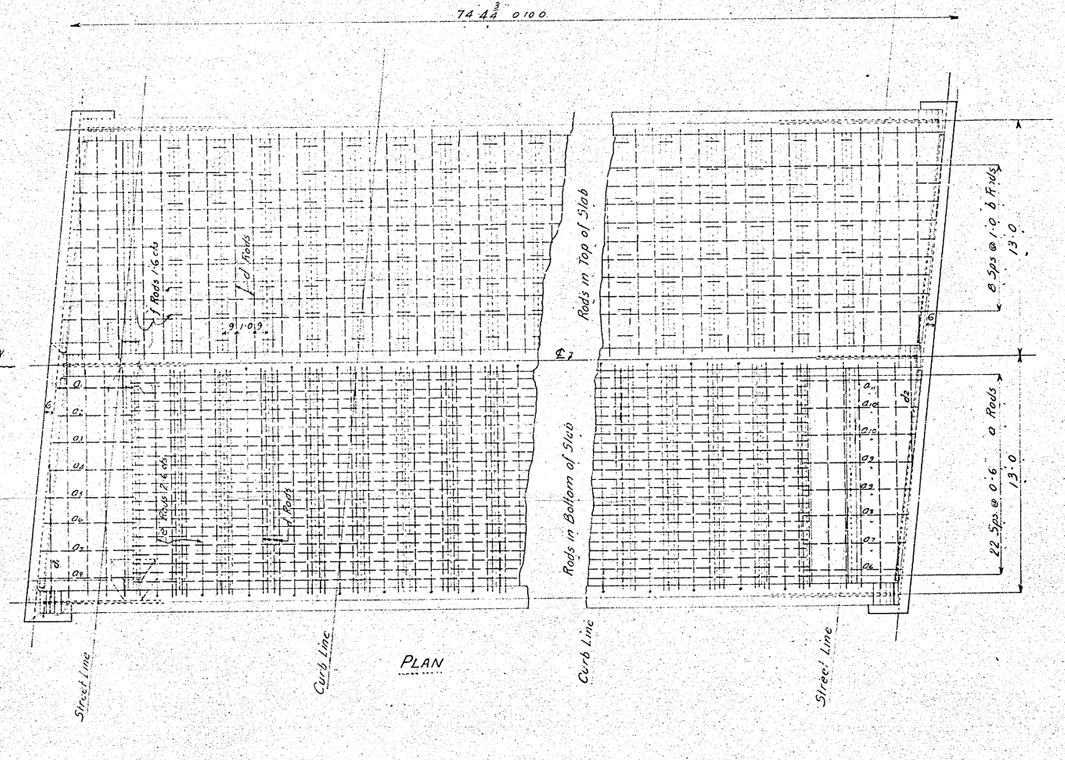
Made by H.I.D
Checked by A.E.N.

821 542

BIN # 7-70545-0



TYPICAL SECTION.
(looking North).
Scale ½ = 1·0



PLAN

Rods Required in Slab

Mark	No.	Size	Length
a	138	½ " Tw	22·3
a1	2	½ "	5·6
a2	2	½ "	5·9
a3	2	½ "	6·0
a4	2	½ "	6·3
a5	2	½ "	6·6
a6	4	½ "	6·9
a7	4	½ "	7·0
a8	4	½ "	7·3
a9	4	½ "	7·6
a10	4	½ "	7·9
a11	2	½ "	8·0
b	54	¼ "	26·0
d	338	¼ "	12·6
e	50	¼ "	14·6
f	384	¼ "	4·0
g	36	¼ " Tw	26·0
d1	2	¼ "	8·0
d2	2	¼ "	6·0
To wing & round ends of Girders	12	¼ "	10·0
	12	¼ "	6·0
i	32	¼ "	3·6
h	112	¼ "	4·0

Quantities

128 cu yds Concrete 1:3:5

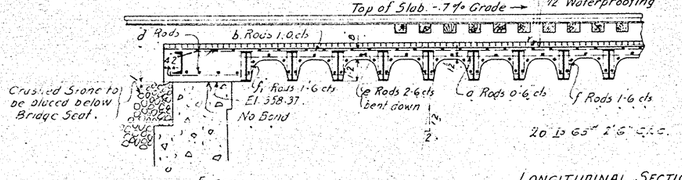
Cement 568 Bags

Sand 66 cu yds

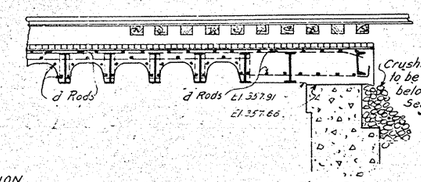
Stone 109 cu yds (1 and under)

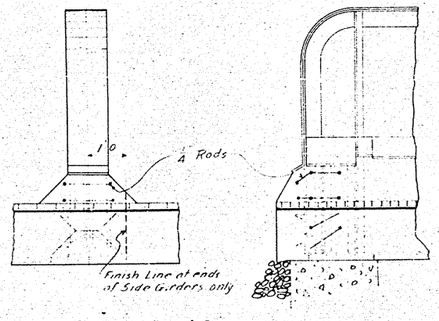
10,000 Brick

2250 sq ft Waterproofing



LONGITUDINAL SECTION.
(along ℄)
Scale ½" 1·0





Detail of Ends of Girders
Scale ½" 1·0

Revised May 22 1916

Quantities

Concrete Abuts.	530 cu yds
Concrete Slab	108 cu yds
Excavation	254 cu yds
Steel (rolled wt.)	236380 #
Reinforcement	4860 #
Waterproofing	2275 sq ft
Brick	10000
4" V.T. Drain Pipe	42 lin ft

Correct: F. Amyand Bridge Engr.

Correct: J. J. Cain Co Prin. Ass't Engr.

Approved: I. R. Lucas Chief Engr.

APPROVED BY
PUBLIC SERVICE COMMISSION
JUNE 21st. 1912.

LONG ISLAND RAILROAD.

Rockaway Beach Division

Jamaica Ave. Bridge

DETAILS OF SLAB

Scales as noted

Jamaica N. Y. Bridge No. R 72

May. 20, 1912. Drawing No. 2

Mode RFS

Checked A.F.A.

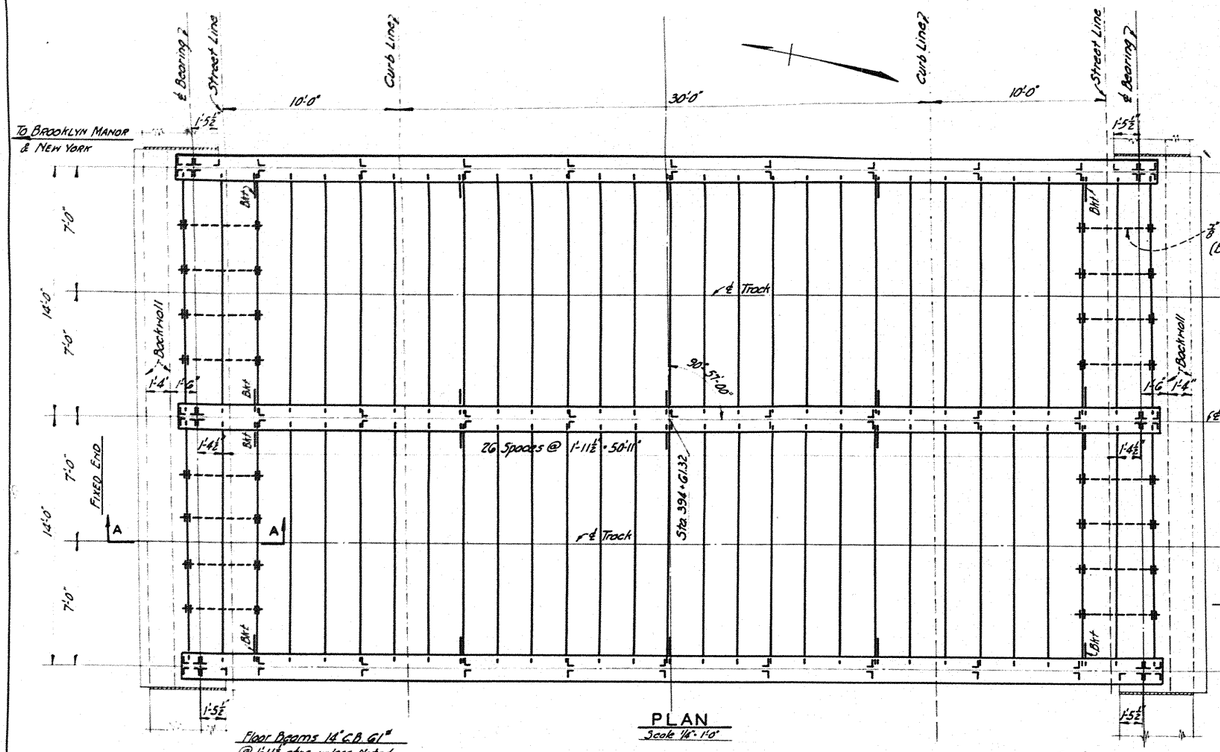
821 541

BIN# 7-70545-0

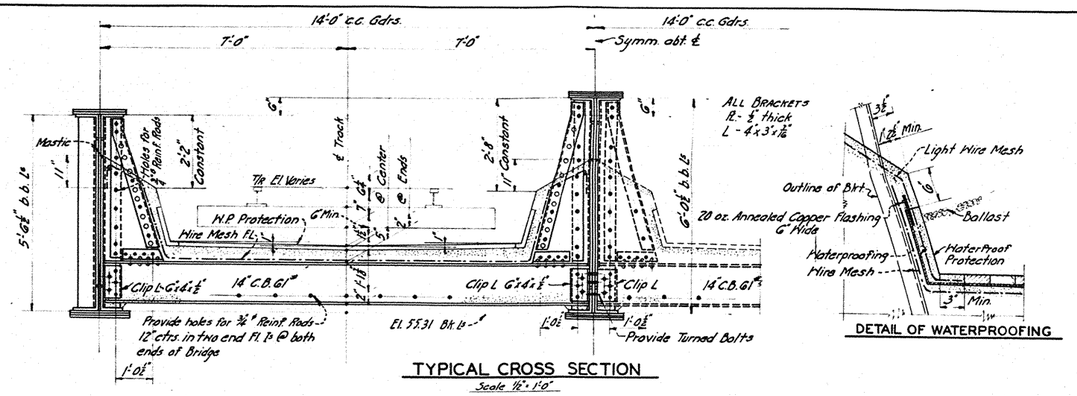
Original Drawings/Sketches

for

91 Avenue Bridge

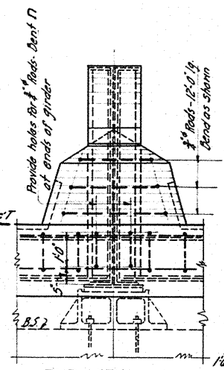


PLAN
Scale 1/16" = 1'-0"

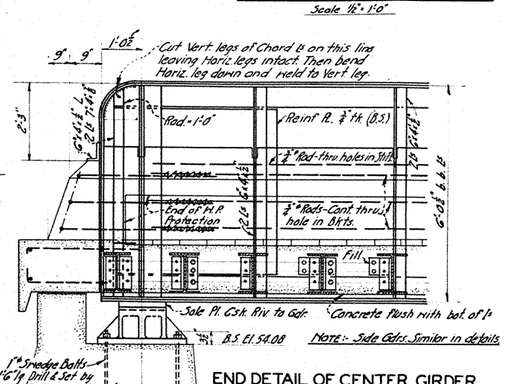


TYPICAL CROSS SECTION
Scale 1/16" = 1'-0"

DETAIL OF WATERPROOFING



END VIEW



END DETAIL OF CENTER GIRDER
Scale ½" = 1'-0"

FLOOR BEAMS

Max Moment =	116,400 Ft. Lbs.
Max Shear =	31,840 Lbs.
Section Modulus Reqd. - 14" C.B. 61# =	89.08" 92.1"

CENTER GIRDER G-1

Bottom Flange		Top Flange	
⅝ Web	8.44" Net	⅝ Web	11.25" Gross
2 Lt 8"x8"x1"	26.00 "	2 Lt 8"x8"x1"	30.00 "
1 Cov. 20"x⅜" - F.L.	15.74 "	1 Cov. 10"x⅜" - F.L.	13.50 "
1 Cov. 20"x⅜" - 36"	15.74 "	1 Cov. 18"x⅜" - 33"	13.50 "
1 Cov. 20"x⅜" - 26"	13.50 "	1 Cov. 18"x⅜" - 24"	11.25 "
	79.42" Net		79.50" Gross

Max Shear = 686, 680#
Web Plate = 72"x⅜"
End Stiffs = 4 Lt 6"x6"x⅝" + 2 Pls 6"x1⅛"

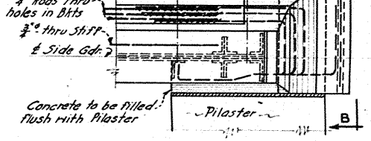
Max Mom. = 8,566,000 Ft Lbs
Actual Stress - Bott Flg = 17,907 #/in²
" Top Flg = 17,960 #/in²
Allowable Stress = 18,000 #/in²

SIDE GIRDER G-2 & G-3

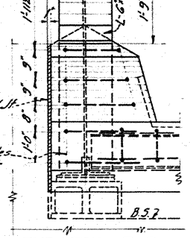
Bottom Flange		Top Flange	
⅛ Web	4.62" Net	⅛ Web	6.19" Gross
2 Lt 8"x8"x⅞"	21.18 "	2 Lt 8"x8"x⅞"	26.46 "
1 Cov. 20"x⅜" - F.L.	13.50 "	1 Cov. 18"x⅜" - F.L.	13.75 "
1 Cov. 20"x⅜" - 36"	13.50 "	1 Cov. 18"x 1⅛" - 29"	14.63 "
1 Cov. 20"x⅞" - 26"	11.24 "		63.03" Gross
	64.04" Net		

Max Shear = 372,570#
Web Plate = 66"x⅜"
End Stiffs = 4 Lt 6"x6"x⅞"

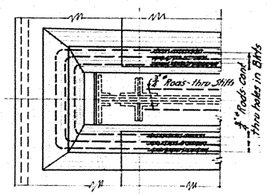
Max Mom. = 4,456,000 Ft Lbs.
Actual Stress - Bott Flg. = 12,650 #/in²
" " Top Flg. = 12,860 #/in²
Allowable Stress = 12,800 #/in²



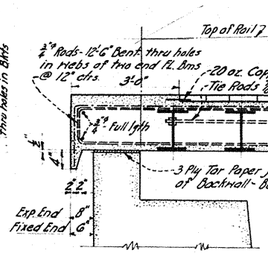
PLAN
At Ends of Side Gdrs.



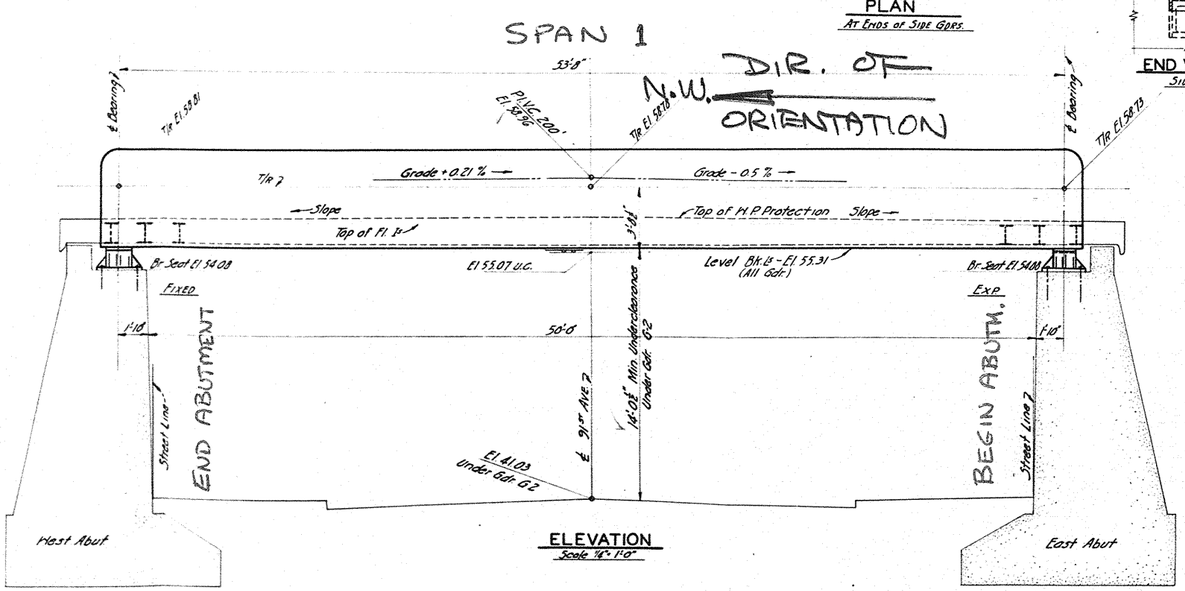
END VIEW - B-B
Side Girders



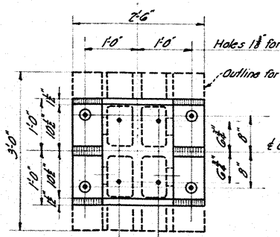
PLAN



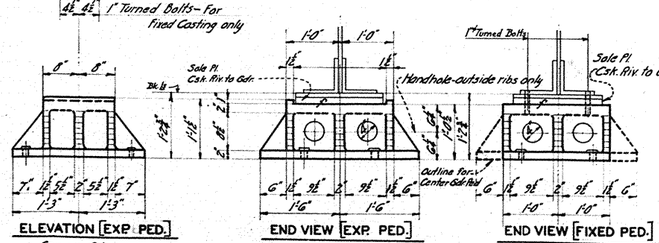
SECTION A-A
Scale ½" = 1'-0"



ELEVATION
Scale 1/16" = 1'-0"



Center Pedestals	Side Pedestals.
Area Reqd in Base = 1144" @ 600 #/in²	Area Reqd in Base = 621" @ 600 #/in²
Actual Area of Base = 1080" @ 636 #/in²	Actual Area of Base = 720" @ 517 #/in²



ELEVATION [EXP. PED.] CENTER GDR.

END VIEW [EXP. PED.] CENTER GDR.

END VIEW [FIXED PED.]

PEDESTALS ANNEALED CAST STEEL
Scale ¾" = 1'-0"

NOTES

Design and Manufacture of Structural Steel shall be in Accordance with A.R.E.A. Specifications for Steel Bridges dated 1935.
Loading: P.R.R. Specifications 1928.
Material: As per A.S.T.M. Std. Specifications for Steel Bridges A7-34.
All Reinforcing for Superstructure to be in Accordance with A.S.T.M.-A15 Structural Steel.

Wire Mesh - Where Wire Mesh is called for, use Expanded Metal .075"x 3.25"/100" or 4½"x 8 Ga. Welded Wire Fabric.
Paint - All Structural Steel to receive a shop coat of approved Red Lead on all surfaces.

Waterproofing - See special Specifications.
Rivets - ⅞" ϕ Open Holes 1⅛" unless noted.
Field Paint - Two coats of Battleship Grey or similar Light Color and to conform to special Specifications.

BIN 7-70560-0

STEEL & CONCRETE

SHEET 1 OF 2 | TRANSIT COMM. CASE Nº 3236 | 46205

LONG ISLAND RAILROAD

ROCKAWAY BEACH BR. BRIDGE Nº R-75

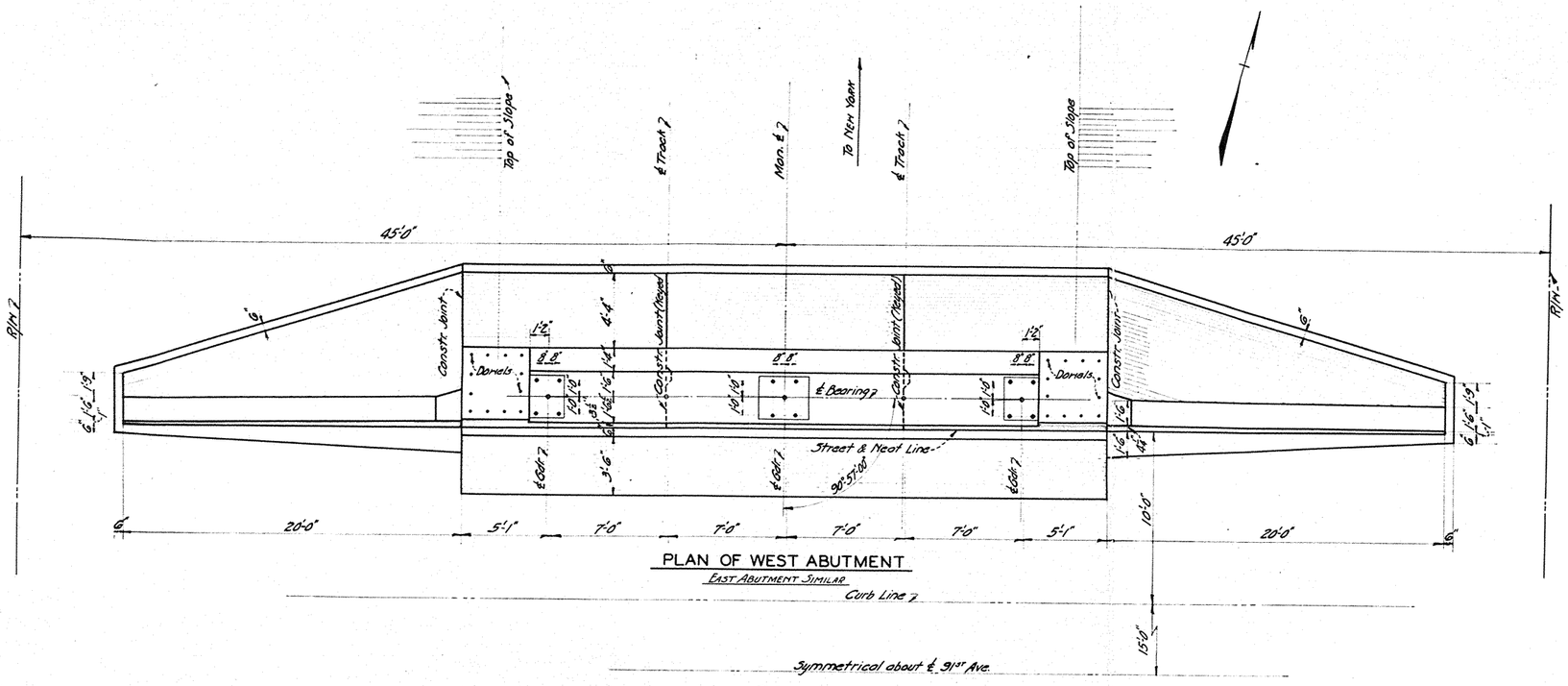
PROPOSED BRIDGE OVER 91ST AVE. (POPLAR ST.)

BROOKLYN MANOR. N.Y.

OFFICE ENGR. BRDGS. & BLDGS. SCALE AS NOTED
NEW YORK
CORRECT APPROVED

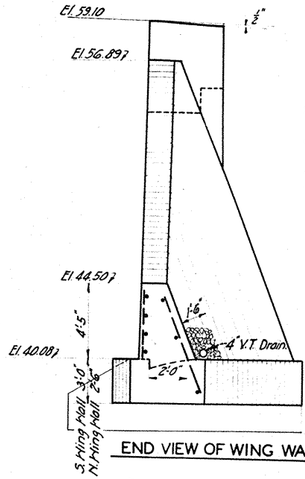
REVISED ENGR. BRDGS. & BLDGS. CHIEF ENGR. N.Y. ZONE.

Super. L.F. Nixon
Dftm. A.C.S.
Traced C.S. Fernandes

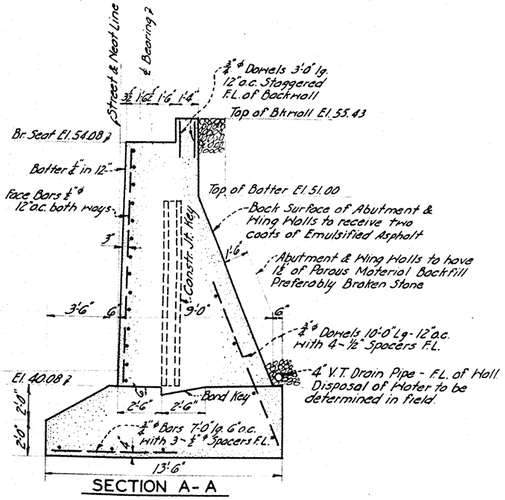


PLAN OF WEST ABUTMENT

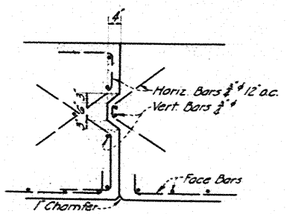
EAST ABUTMENT SIMILAR



END VIEW OF WING WALL



SECTION A - A



KEYED CONSTR. JOINT

SCORING

GENERAL NOTES

All exposed corners to be chamfer 1".
Back surfaces of Abutments and Wing Walls to receive two coats of Emulsified Asphalt.
Abutments and Walls to be backed thruout with 1½ ft. of Perous material, preferably broken stone.
All Vertical Joints between Bridge Slab and Wall to be 1" Approved Asphalt Plank. The Joint between Bridge Slab and Top of Backwall to be 3 Ply Tar Paper.
All Elevations refer to LONG ISLAND RAILROAD Datum.

BIN 7-70560-0

MASONRY

SHEET 2 OF 2	TRANSIT COMM. CASE Nº 3236	46205

LONG ISLAND RAILROAD

ROCKAWAY BEACH BR. BRIDGE Nº R-75

PROPOSED BRIDGE OVER 91ST AVE. POPLAR ST.

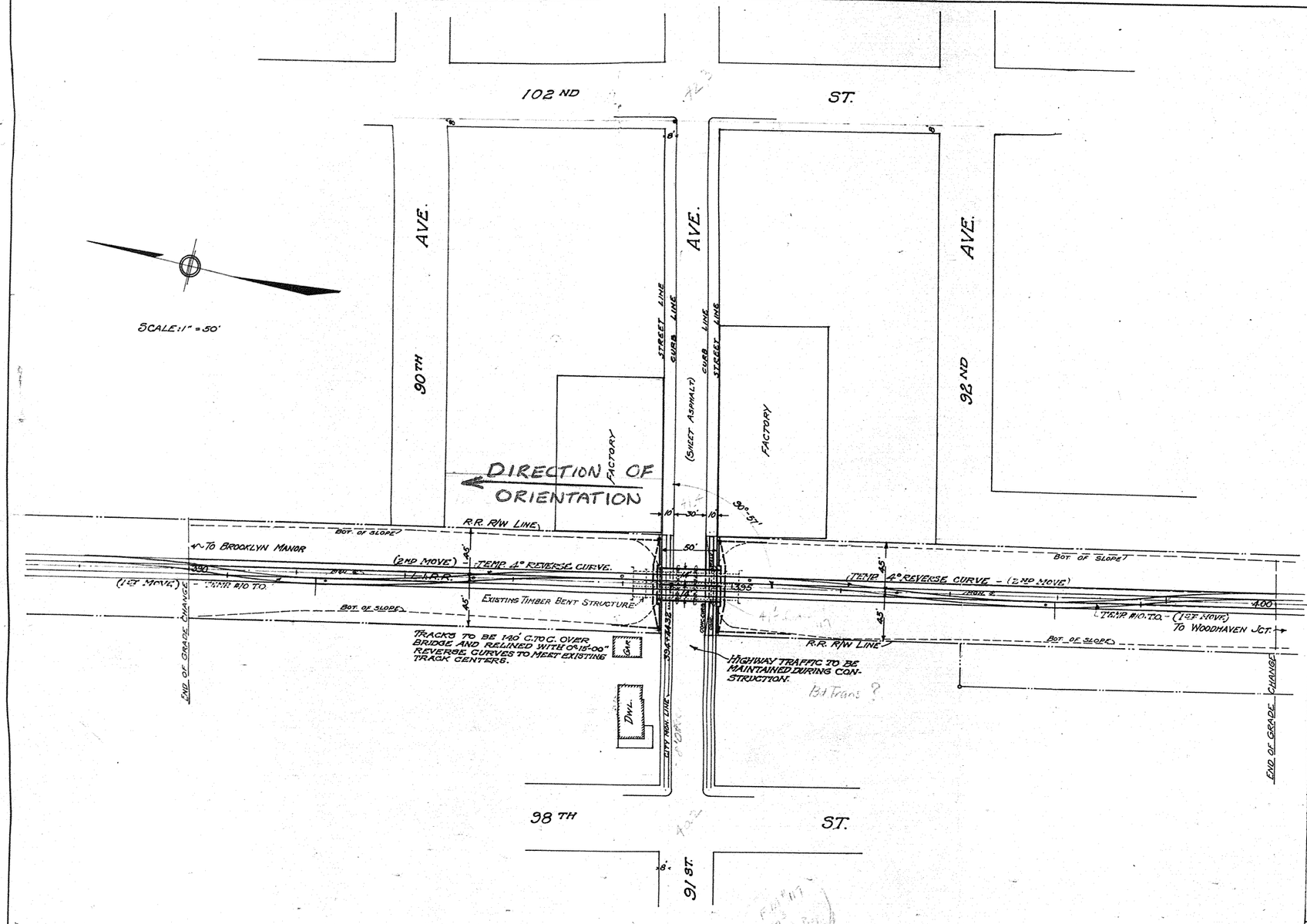
BROOKLYN MANOR, N.Y.

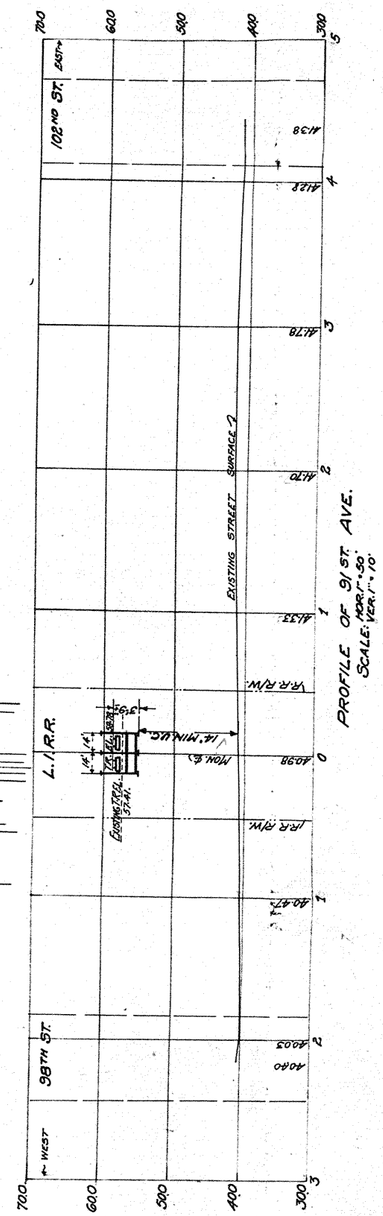
OFFICE - ENGR. BRDGS. & BLDGS. SCALE 1/4" = 1'-0"
NEW YORK.
CORRECT APPROVED

ENGR. BRDGS. & BLDGS. CHIEF ENGR. N.Y. ZONE.

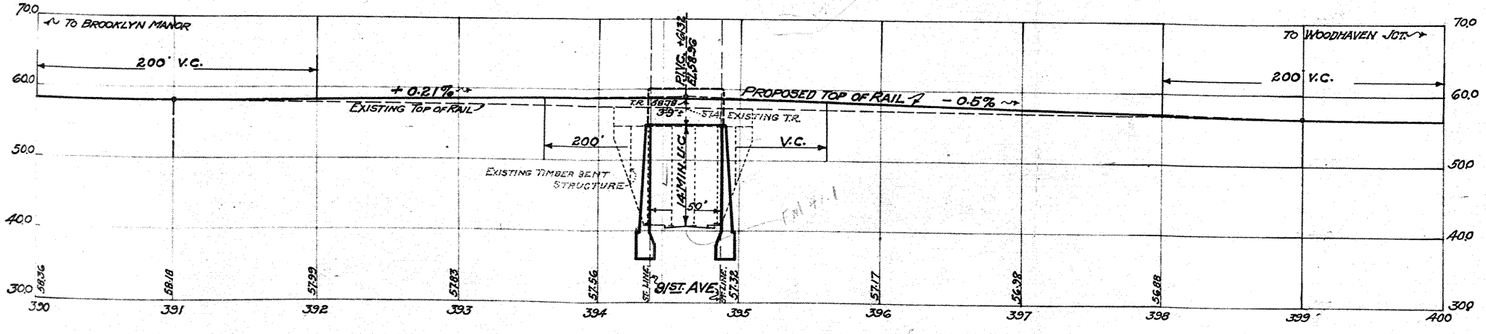
Super. Rec'n
Chief Eng'r
Record
J. U. Condon

J. H. Carlsen
J. U. Condon





PROFILE OF 91 ST. AVE.
SCALE: HOR. 1" = 50'
VER. 1" = 10'



PROFILE OF RAILROAD
SCALE: HOR. 1" = 50'
VER. 1" = 10'

MADE BY, L.N. Tagg
CHECKED BY, A.L. Hyslop

CORRECT:

ASSISTANT ENGINEER.

BIN 7-70560-0

47608

THE L.I. LONG ISLAND RAILROAD COMPANY

ROCKAWAY BEACH BRANCH

PROPOSED RECONSTRUCTION OF BRIDGE No. R 75 AT 91 ST. AVENUE (POPLAR ST.)

BROOKLYN MANOR, N.Y.

TRANSIT COMMISSION CASE No. 3236.

SCALE: 1" = 50'
OCT. 3, 1935

OFFICE OF CHIEF ENGINEER,
PENNSYLVANIA STATION, N.Y.C.

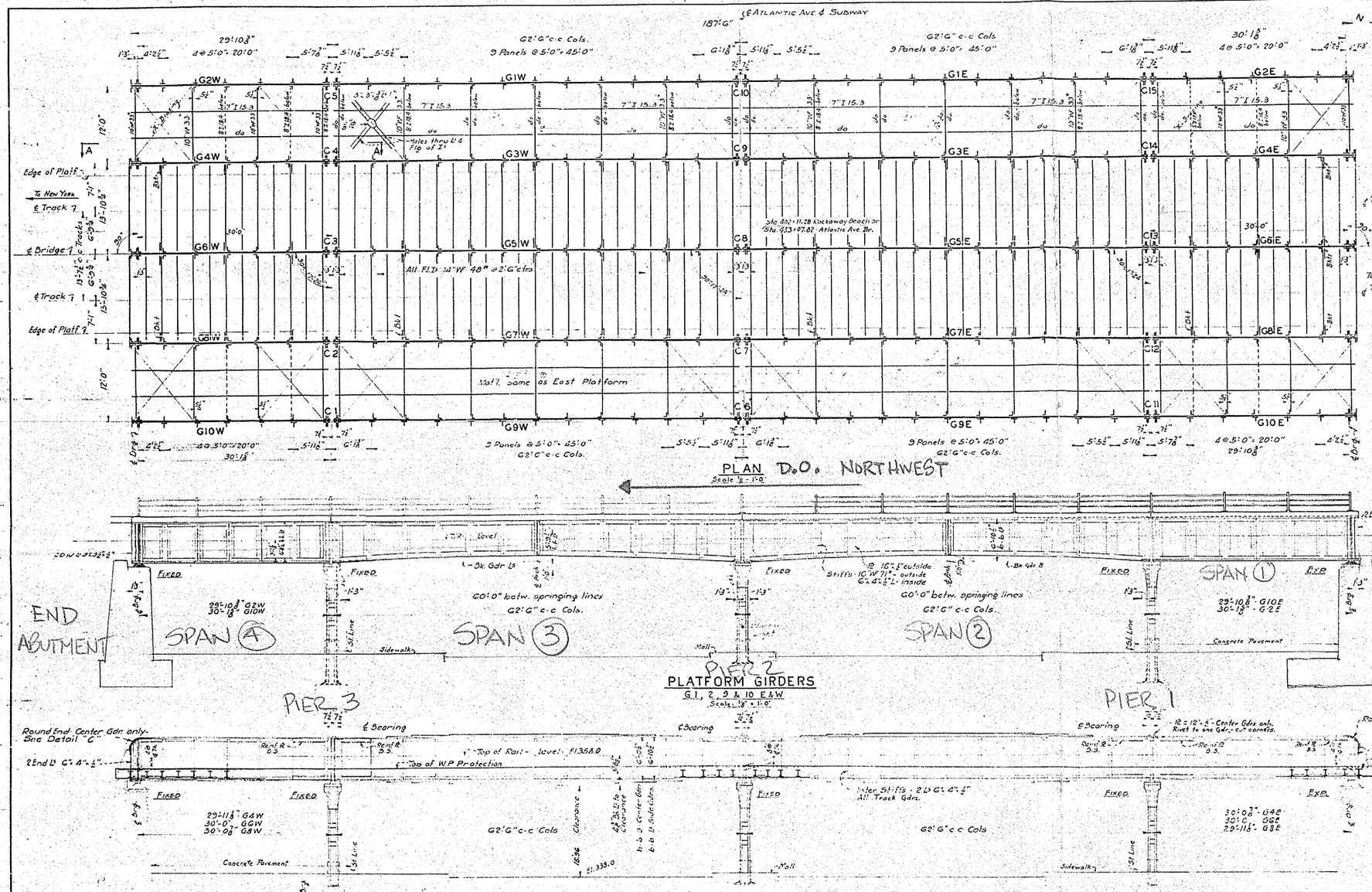
APPROVED:

CHIEF ENGINEER.

Original Drawings/Sketches

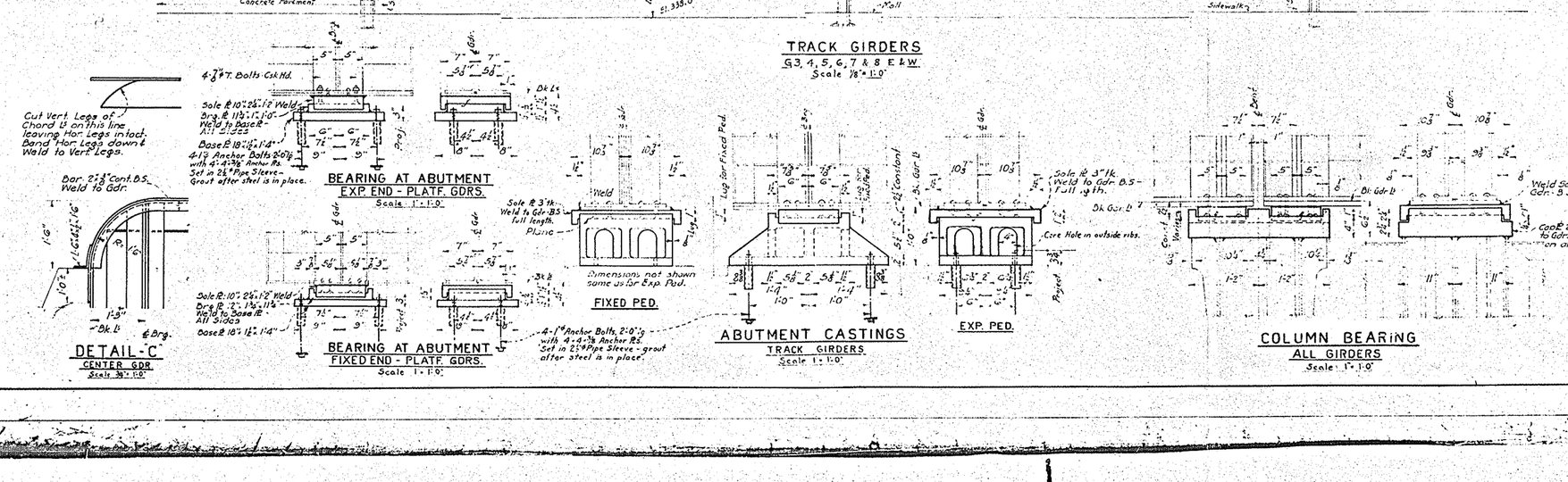
for

Atlantic Avenue Bridge

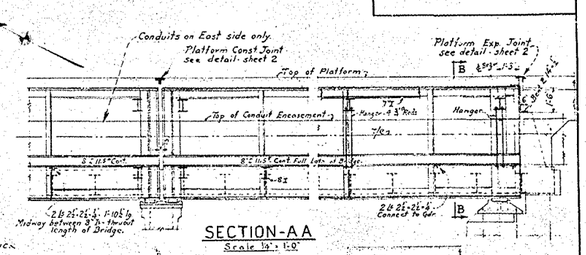


PLAN D.O. NORTHWEST
Scale ⅛" = 1'-0"

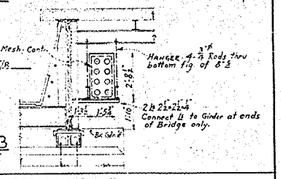
PLATFORM GIRDERS
G1, 2, 9 & 10 E&W
Scale ⅛" = 1'-0"



TRACK GIRDERS
G3, 4, 5, 6, 7 & 8 E&W
Scale ⅛" = 1'-0"



SECTION-AA
Scale ½" = 1'-0"



SECT-BB
Scale ½" = 1'-0"

GIRDER SCHEDULE

MARK	BENDING MOMENT - FT LBS.	END SHEAR - LBS.	MATERIAL					
			WEB PL	4 ANGLES	TOP COV PLS	BOTT COV PLS	END STIFFS
G5E - G5W	8,332,000	566,000	72"×⅜"	6"×6"×1"	18"×½" - FL 18"×⅝" - 45'-0" 18"×¾" - 37'-0" 18"×¾" - 26'-0"	18"×½" FL 18"×⅝" - 45'-0" 18"×¾" - 37'-0" 18"×¾" - 26'-0"	4L's 6"×6"×1" 2 Pls 6"×1"
G3E - G3W G7E - G7W	5,263,000	353,000	82"×½"	6"×6"×⅞"	14"×¾" - FL 14"×½" - 50'-0" 14"×⅝" - 38'-0"	14"×¾" FL 14"×½" - 50'-0" 14"×⅝" - 38'-0"	4L's 5"×5"×1"
G1E - G1W G9E - G9W	880,000	56,000	82"×½"	6"×6"×½"	14"×½" FL	14"×½" FL	4L's 5"×3½"×⅜"
G6E - G6W	2,168,000	315,000	72"×½"	6"×6"×½"	18"×½" FL	18"×½" FL	4L's 6"×6"×⅞"
G4E - G4W G8E - G8W	1,344,000	193,000	82"×½"	6"×6"×½"	14"×½" FL	14"×½" FL	4L's 5"×5"×⅝"
G2E - G2W G10E - G10W	203,000	27,000	82"×½"	6"×6"×½"	14"×½" FL	14"×½" FL	4L's 5"×5"×⅝"
TRACK FLOOR Is	104,000	31,250 - for Conn. ℓs to Gdr. - 14"WF48# @ 2'-6" ctrs.					

GENERAL NOTES SUPERSTRUCTURE

DESIGN AND MANUFACTURE: A.R.E.A. SPECIFICATIONS FOR STEEL BRIDGES 1935.
MATERIAL: A.S.T.M STD SPECIFICATIONS FOR STEEL BRIDGES A7-34.
LOADING: COOPERS E50
REINFORCING: N.B. BARS STRUCTURAL GRADE.
WIRE MESH: SHALL BE WELDED WIRE FABRIC 4"×4"-#8 WIRE; FOR WRAPPING FRAMES AND WHERE LIGHT WIRE MESH IS CALLED FOR, USE 4"×4"-#10 WIRE.
SHOP PAINT: ALL STRUCTURAL STEEL TO RECEIVE A SHOP COAT OF APPROVED RED LEAD ON ALL SURFACES.
FIELD PAINT: - SEE SPECIAL SPECIFICATIONS.
WATERPROOFING: FOR DECK, SEE SPECIAL SPECIFICATIONS.
FLASHING: TO BE 20 oz. ANNEALED COPPER, 6" WIDE.
RIVETS: - ⅞" ϕ, OPEN HOLES - ⅞" ϕ UNLESS NOTED.
CONCRETE: FOR DECK AND PLATFORM STRUCTURE TO BE 3000# MIXTURE FURNISHED IN ACCORDANCE WITH P.R.R. SPECIFICATION C.E. 77(d). ALL CONCRETE TO BE MECHANICALLY VIBRATED. ALL EXPOSED CORNERS AND CONSTRUCTION JOINTS TO BE CHAMFERED ¾" UNLESS OTHERWISE NOTED. ALL REINFORCING TO BE 2" FROM SURFACE UNLESS OTHERWISE NOTED.
COLUMNS: AXIS NORMAL TO CENTER LINE OF ATLANTIC AVE. ALL COLUMNS TO BE FILLED WITH 2500# CONCRETE FLUSH WITH OUTSIDE OF BATTEN BS AS SHOWN ON DETAIL, SHEET 4.
PEDESTALS: TO BE ANNEALED CAST STEEL.
FOR SECTION AT BENTS, SEE SHEET 4.

FRAMING PLAN

SHEET 3 | TRANSIT COMM. CASE 2711 | 46265

LONG ISLAND RAILROAD
ROCKAWAY BEACH BRANCH BRIDGE R-76

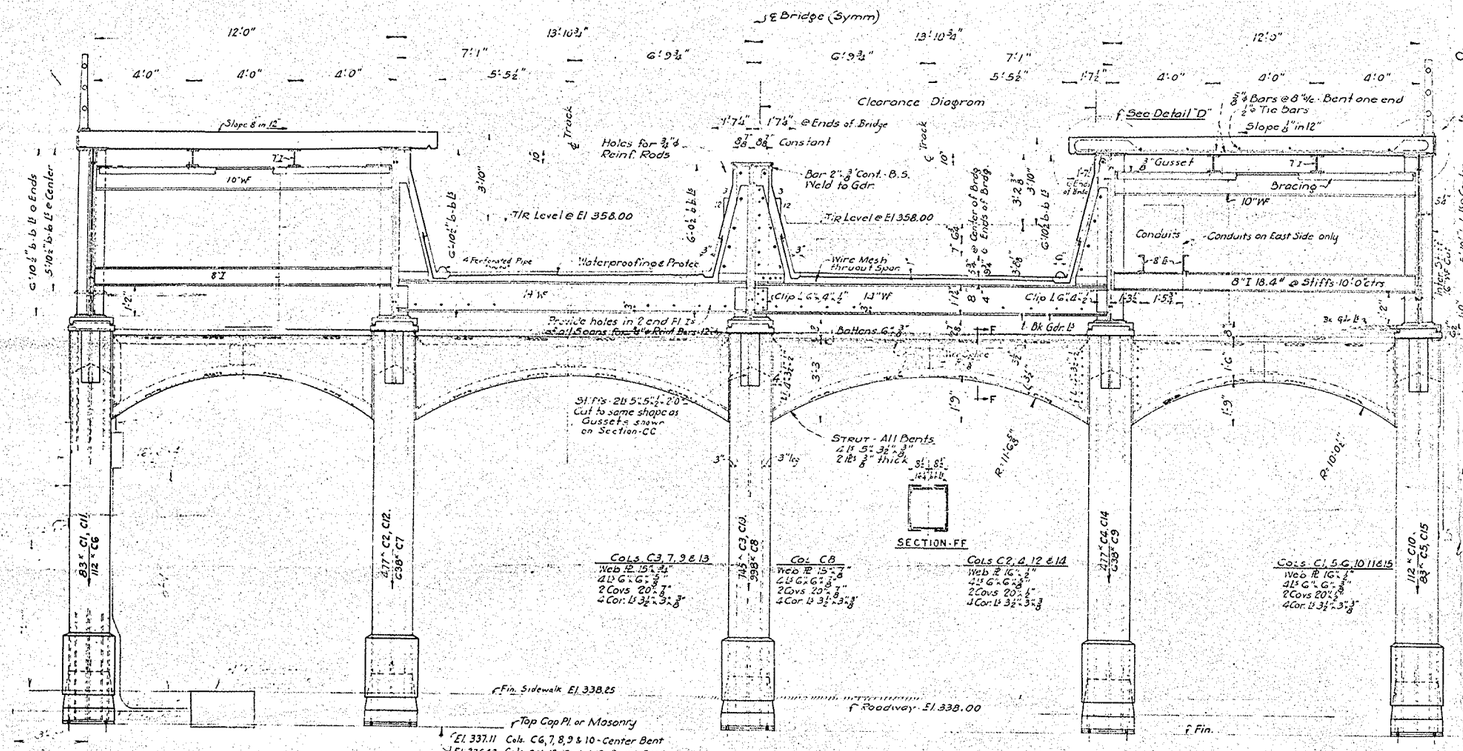
ATLANTIC AVE. IMPROVEMENT
EAST NEW YORK TO JAMAICA

OFFICE ENGR. BRDGS. & BLDGS. SCALE AS NOTED
NEW YORK, N.Y.
CORRECT APPROVED

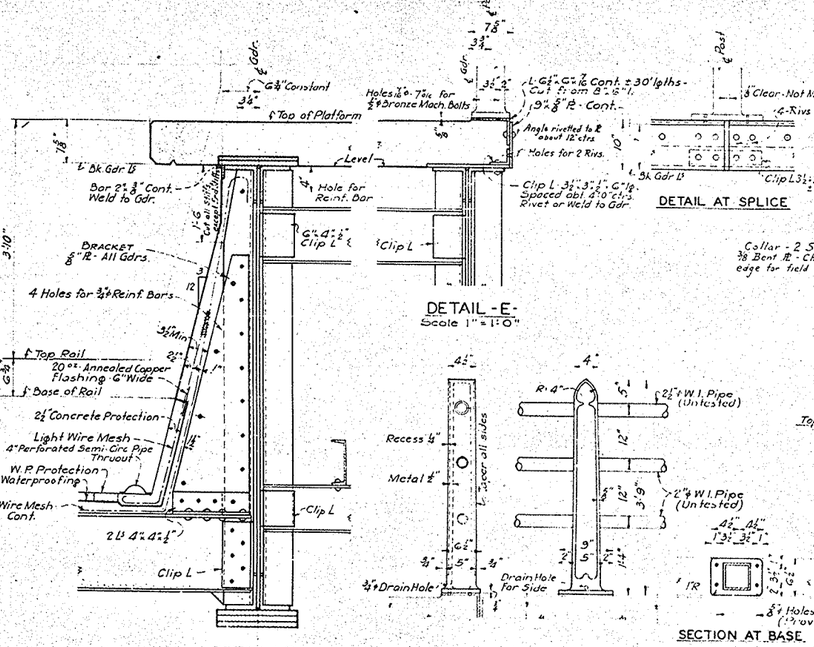
12/27	
Feb 28 '40	
Feb 1 1940	
REVISED	ENGR. BRDGS. & BLDGS. CHIEF ENGR.

FOR STATE RECORD
FILED No. 982 DWG No. 982

BIN# 7-70561-0



SECTION AT BENTS
LOOKING NORTH
Scale ⅜" = 1'-0"



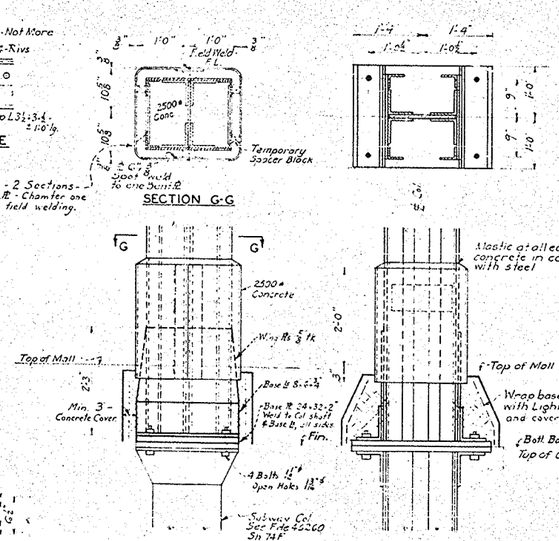
DETAIL - E -
Scale 1" = 1'-0"

DETAIL AT SPLICE

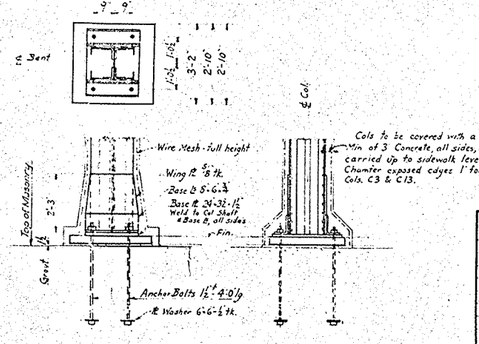
DETAIL - D
Scale 1" = 1'-0"

SECTION AT BASE

DETAIL OF MALLEABLE IRON POST
Scale 1" = 1'-0"



BASE DETAIL
Cols C6 to C10
Scale ¾" = 1'-0"



BASE DETAIL
COLS. C1 to C5 & C11 to C15
Scale ⅜" = 1'-0"

Cols. C1, 5, 11 & 15	2'-2"	Billet 26"x36"x1½"
" C2, 4, 12 & 14	2'-6"	" 30"x36"x2"
" C3 & C13	3'-2"	" 38"x38"x3"

Note
For General Note See Sh 1 & 3

APPROVED
TRANSIT COMMISSION
DATED MAR 26 1940

STEEL DETAILS

SHEET 4 | TRANSIT COMM. CASE Nº 2711 | 46265

LONG ISLAND RAILROAD
ROCKAWAY BEACH BR. BRIDGE R-76

ATLANTIC AVE. IMPROVEMENT
EAST NEW YORK TO JAMAICA

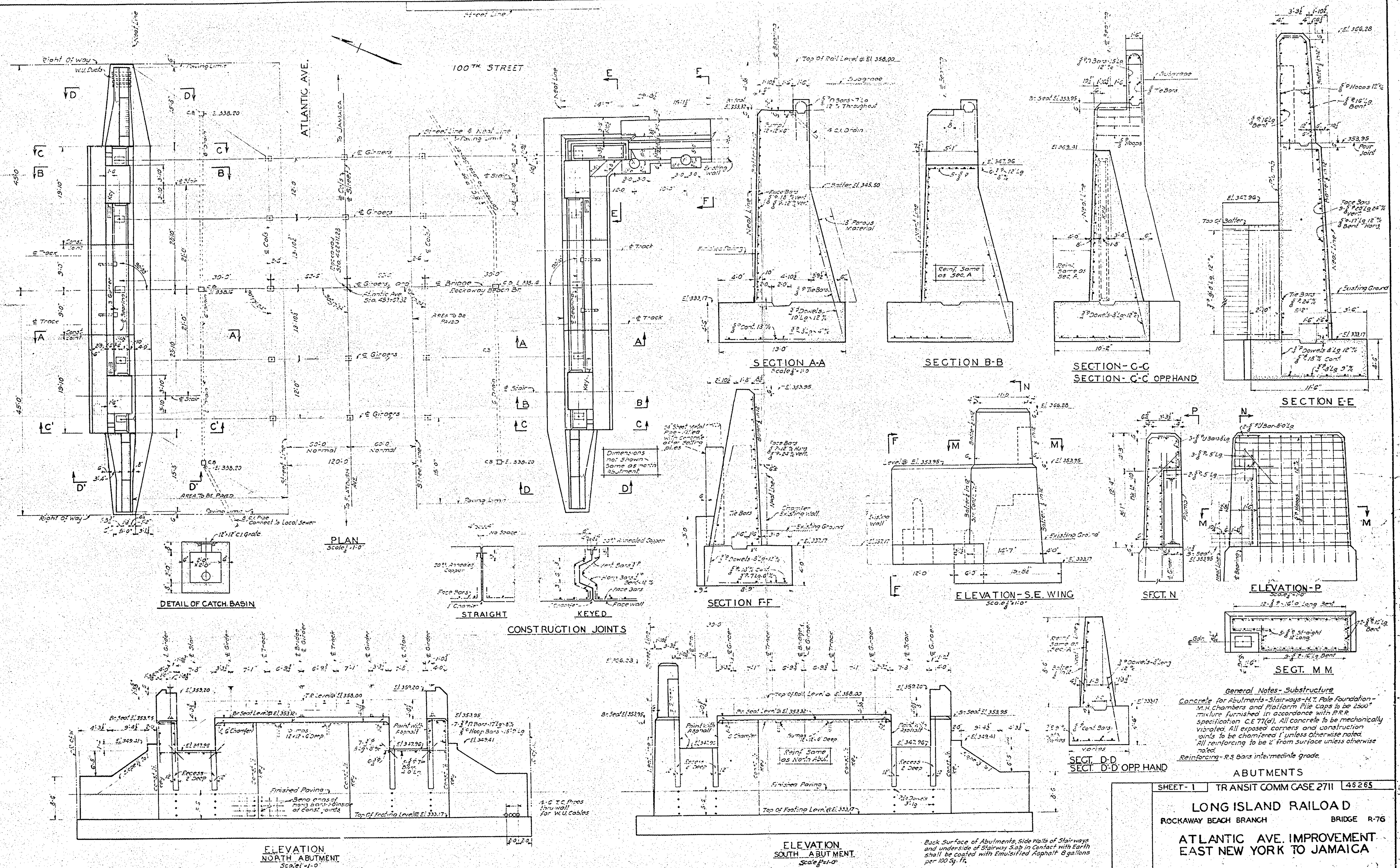
OFFICE ENGR. BRDGS & BLDGS, NEW YORK, N.Y.
SCALE AS NOTED

Feb 24, 1940 CORRECT
Feb 1, 1940 REVISED
ENGR. BRDGS & BLDGS

APPROVED
CHIEF ENGR.

FOR OFFICE RECORD
Bridge No. 82L Drwg No. 339

BIN # 7-70561-0



General Notes - Substructure

Concrete for Abutments - Stairways - H.T. Pole Foundation - M.H. Chambers and Platform Pile caps to be 2500# mixture furnished in accordance with P.R.R. specification C.E. 77(d). All concrete to be mechanically vibrated. All exposed corners and construction joints to be chamfered 1" unless otherwise noted. All reinforcing to be 2" from surface unless otherwise noted.

Reinforcing - R.S. Bars intermediate grade.

Back Surface of Abutments, Side Walls of Stairways and underside of Stairway Slab in Contact with Earth shall be coated with Emulsified Asphalt 8 gallons per 100 Sq. ft.

All Elevations Refer to L.I.R.R. datum which is 297.275 feet below Mean Sea Level at Sandy Hook - U.S.C & G Survey.

ABUTMENTS

SHEET - 1 | TRANSIT COMM CASE 2711 | 46265

LONG ISLAND RAILROAD

ROCKAWAY BEACH BRANCH — BRIDGE R-76

ATLANTIC AVE. IMPROVEMENT
EAST NEW YORK TO JAMAICA

OFFICE ENGR BRDGS & BLDGS — SCALE AS NOTED

NEW YORK N.Y.

CORRECT — APPROVED

ENGR. BRDGS. & BLDGS. — CHIEF ENGR.

REVISED: Mar. 27, 1940; Feb. 20 1940; Feb. 1 1940

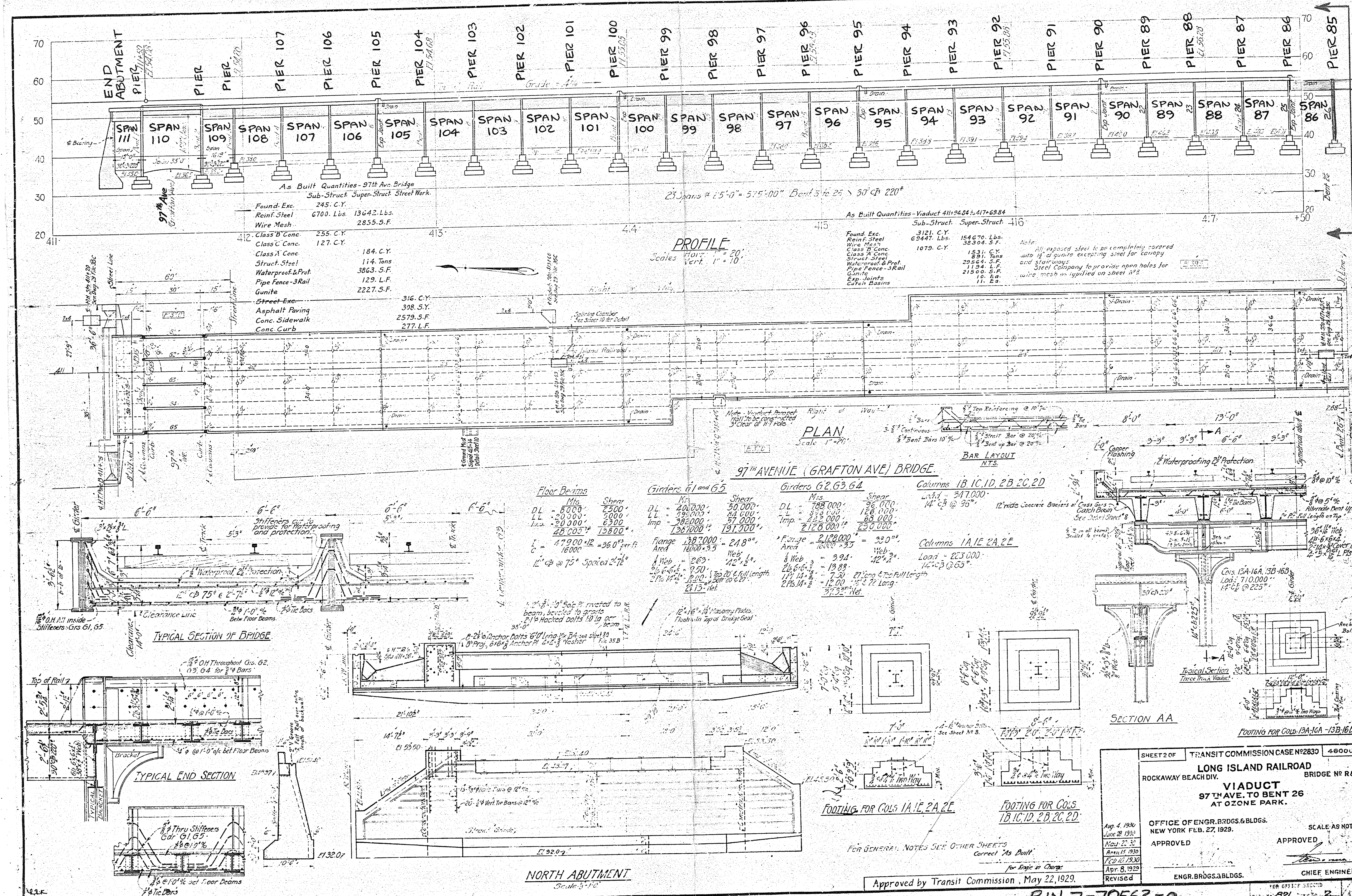
FOR OFFICE RECORD — File No. 821 Drwg. No. 330

BIN # 7-70561-0

Original Drawings/Sketches

for

Elevated Viaduct Bridge Spans



As Built Quantities - 97th Ave. Bridge

	Sub-Struct.	Super-Struct.	Street Work.
Found. Exc.	245. C.Y.		
Reinf. Steel	6700. Lbs.	13642. Lbs.	
Wire Mesh		2855. S.F.	
Class "B" Conc.	255. C.Y.		
Class "C" Conc.	127. C.Y.		
Class "A" Conc.		184. C.Y.	
Struct. Steel		114. Tons	
Waterproof. & Prot.		3863. S.F.	
Pipe Fence - 3 Rail		129. L.F.	
Gunite		2227. S.F.	
Street Exc.			316. C.Y.
Asphalt Paving			308. S.Y.
Conc. Sidewalk			2579. S.F.
Conc. Curb			277. L.F.

As Built Quantities - Viaduct 411+94.84 to 417+69.84

	Sub-Struct.	Super-Struct.
Found. Exc.	3121. C.Y.	
Reinf. Steel	69447. Lbs.	154670. Lbs.
Wire Mesh		38304. S.F.
Class "B" Conc.	1079. C.Y.	
Class "A" Conc.		1531. C.Y.
Struct. Steel		891. Tons
Waterproof. & Prot.		29564. S.F.
Pipe Fence - 3 Rail		1194. L.F.
Gunite		21500. S.F.
Exp. Joints		10. Ea.
Catch Basins		11. Ea.

Approved by Transit Commission, May 22, 1929.

SHEET 2 OF — TRANSIT COMMISSION CASE No 2830 — 46000

LONG ISLAND RAILROAD
ROCKAWAY BEACH DIV. — BRIDGE No R80

VIADUCT
97TH AVE. TO BENT 26
AT OZONE PARK.

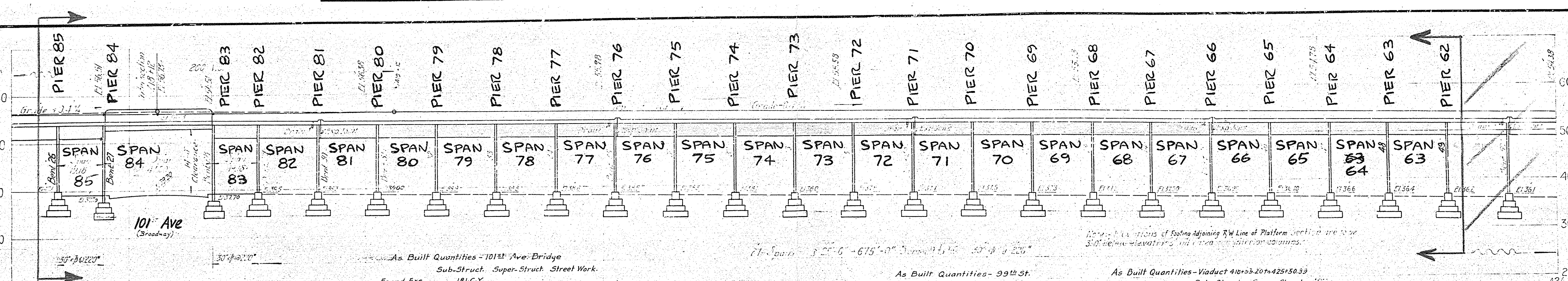
OFFICE OF ENGR. BRDGS. & BLDGS.
NEW YORK FEB. 27, 1929.
SCALE AS NOTED

APPROVED — ENGR. BRDGS. & BLDGS.
APPROVED — CHIEF ENGINEER.

Revised: Apr. 8, 1929; Feb 10, 1930; April 15, 1930; May 22, 30; June 28, 1930; Aug. 4, 1930

BIN 7-70562-0

FOR OFFICE RECORD File No. 826 Dwg No. 2



Note: Elevations of Footing Adjoining R/W Line of Platform Section are to be 3.0' below elevations ... interior columns.

As Built Quantities – 101st Ave. Bridge

	Sub-Struct.	Super-Struct.	Street Work.
Found. Exc.	181. C.Y.		
Reinf. Steel.	9537. Lbs.	17402. Lbs.	
Wire Mesh		5315. S.F.	
Class B Conc.	76. C.Y.		
Class C Conc.			
Class A Conc.		232. C.Y.	
Struct. Steel		164. Tons	
Waterproof. & Prot.		5513. S.F.	
Pipe Fence – 3 Rail		76. L.F.	
" " – 1 Rail		99. L.F.	
Gunite		2642. S.F.	
Street Exc.			451. C.Y.
Asphalt Paving			341. S.Y.
Conc. Sidewalk			2313. S.F.
Conc. Curb			226. L.F.

PROFILE
Scale Horiz. 1" = 20' Vert. 1" = 10'

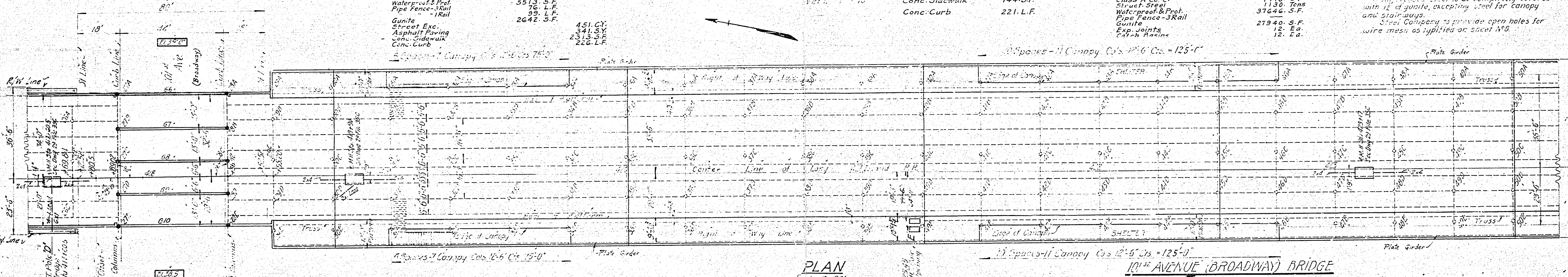
As Built Quantities – 99th St. Street Work

Street Exc.	69. C.Y.
Asphalt Paving	182. S.Y.
Conc. Sidewalk	144. S.F.
Conc. Curb	221. L.F.

As Built Quantities – Viaduct 418+53.20 to 425+50.33

	Sub-Struct.	Super-Struct.
Found. Exc.	1612. C.Y.	
Reinf. Steel	95278. Lbs.	174259. Lbs.
Wire Mesh		24023. S.F.
Class "B" Conc.	1112. C.Y.	
Class "A" Conc.		1418. C.Y.
Struct. Steel		1130. Tons
Waterproof. & Prot.		37646. S.F.
Pipe Fence – 3 Rail		
Gunite		27940. S.F.
Exp. Joints		12. Ea.
Catch Basins		12. Ea.

Notes:
All exposed steel to be completely covered with 1½" of gunite, excepting steel for canopy and stairways.
Steel Company to provide open holes for wire mesh as typified on sheet Nº8.



PLAN
Scale 1" = 20'

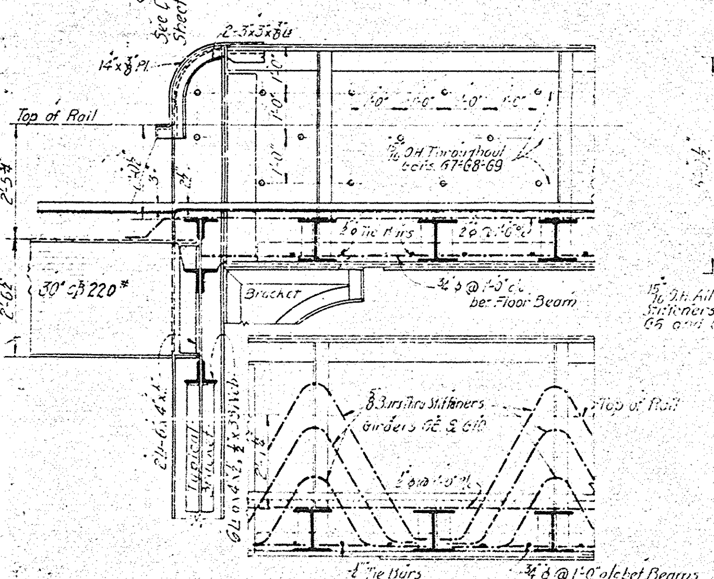
101st AVENUE (BROADWAY) BRIDGE

Girders G6 and G10 — Moments: D.L. = 890,000#, L.L. = 1,055,000, Imp. = 570,000, Total 2,515,000#. Shear: 77,000#, 125,000, 81,000, 283,000#.
$\frac{2,515,000 \times 12}{16,000 \times 60} = 31.4$ □" — Web 60 x ½"

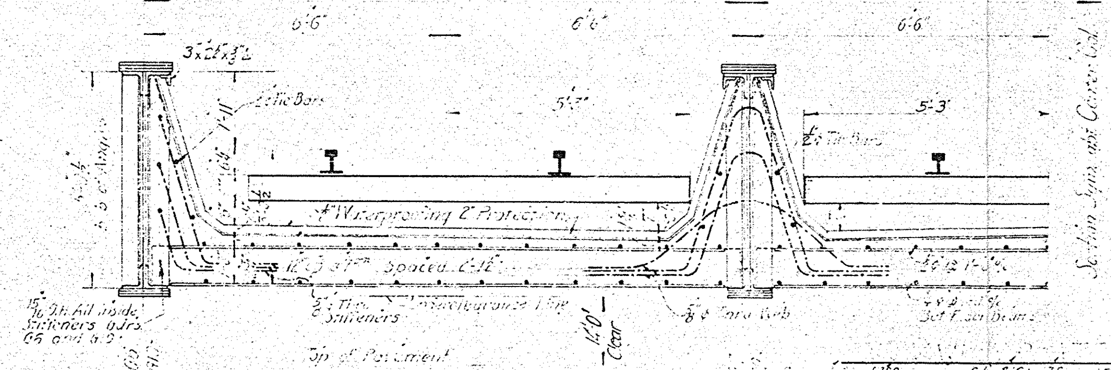
Girders G7, G8, G9 — Mts: D.L. = 1,770,000#, L.L. = 1,580,000, Imp. = 540,000, Total 3,894,000#. Shear: 152,000#, 187,500, 85,700, 425,200#.
$\frac{3,894,000 \times 12}{16,000 \times 60}$ = 49.5 □" — Web 60 x ½"

Floor Beams — Mts: D.L. = 7,980, L.L. = 20,000, Imp. = 20,000, Total 47,980. Shear: 2420, 5000, 6250, 13670.
12" I @ 35# Spaced 2'-7½"

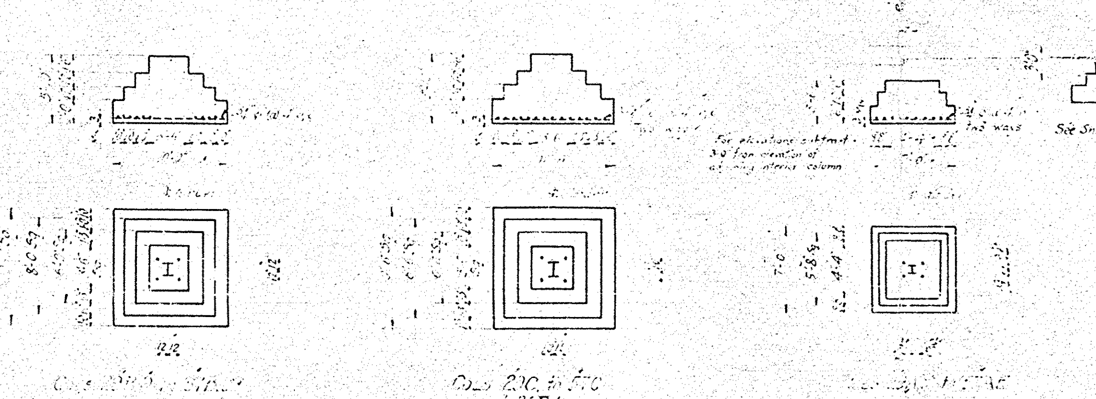
Columns 27A, 27E, 28A, 28E — Load = 287,000. 14" H @ 125#
Column 26C — Load = 400,000. 14" H @ 175#
Columns 27B,C,D, 28B,C,D — Load = 448,000. 14" H @ 165#



TYPICAL SECTION THRU. END OF GIRDERS



TYPICAL SECTION OF MAIN SPAN
101st Ave. Bridge

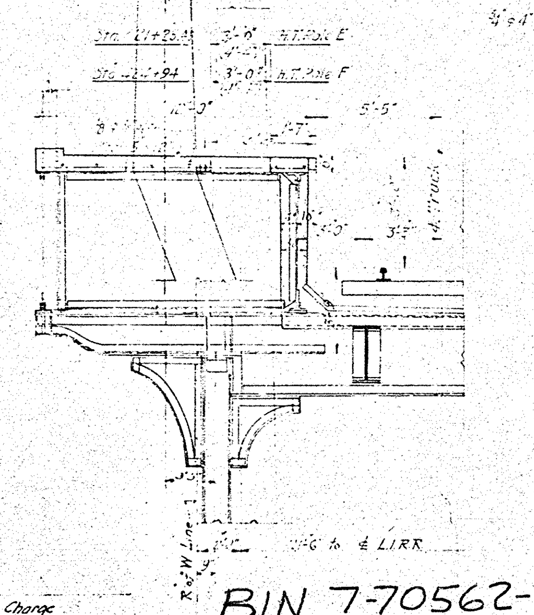


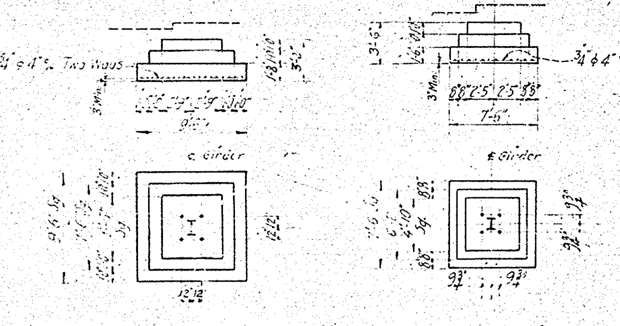
See Sheet 3 for Column Protection

Correct "As Built"

for Engr. in Charge

GENERAL NOTES:-
Specifications A.R.E.A. 1920 For Railroad Bridges Reamed Work.
Rivets ⅞" Open Holes 15/16".
Loading Coopers E 60.
Concrete Mixture for Bridge Floor and Platform Slabs to be 1:2:4. Column Footing 1:2½:5.
Reinforcing Bars to be round deformed structural grade A.S.T.M. Specifications Serial 1514. All bars to be 2" from surface of concrete unless otherwise noted.
Paint all surfaces not covered by concrete with one Shop Coat of Red Lead (Patterson Sargent).
All Elevations reference to Queens Boro Datum.





FOOTING FOR COLS. 27B, 27C, 27D, 28B, 28C, 28D

FOOTING FOR COLS. 27A, 28A, 27E, 28E

BIN 7-70562-0

PLATFORM OPENING FOR H.T. POLES E & F

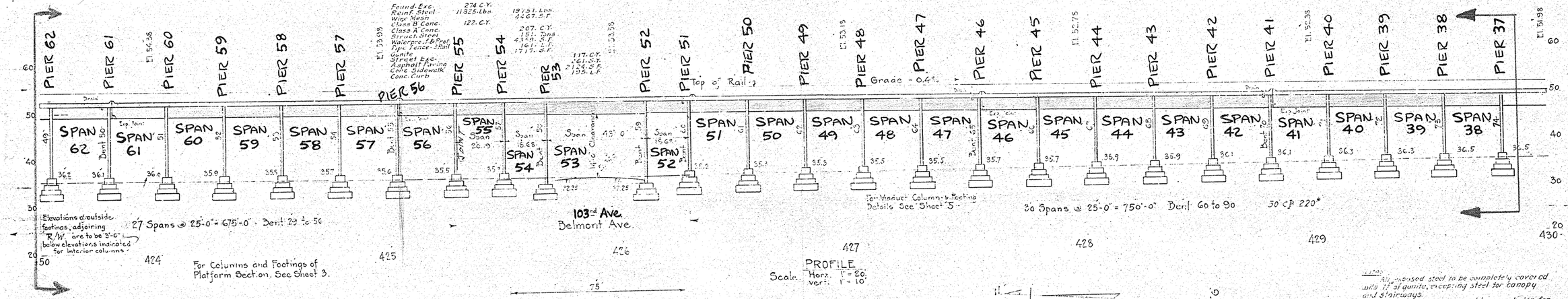
Approved by Transit Commission, May 22, 1929.

SHEET 3 OF	TRANSIT COMMISSION CASE Nº2830	46000	
	LONG ISLAND RAILROAD		
	ROCKAWAY BEACH DIV.	BRIDGE Nº R80	
	VIADUCT 101ST AVE. TO BENT 50 AT OZONE PARK.		
June 27, 1930 / June 5, 1930 / Apr 28-30 / Apr 24-30 / Apr. 8, 1929 / Revised	OFFICE OF ENGR. BRDGS. & BLDGS. NEW YORK FEB. 27, 1929.	SCALE AS NOTED	
	APPROVED — ENGR. BRDGS. & BLDGS.	APPROVED — CHIEF ENGINEER.	

FOR OFFICE RECORD File No. 821 Sheet No. 3

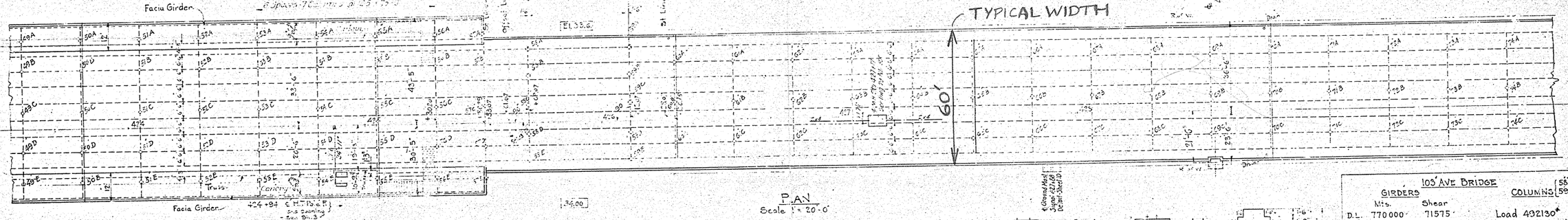
As Built Quantities - 103rd Ave. Bridge.

	Sub-Struct.	Super-Struct.	Str. et Work
Found. Exc.	274 C.Y.		
Reinf. Steel	11325. Lbs.	197511. Lbs.	
Wire Mesh		4467. S.F.	
Class B Conc.	122. C.Y.		
Class A Conc.		207. C.Y.	
Struct. Steel		151. Tons	
Waterpro. F & Pref.		4359. S.F.	
Pipe Fence - 3 Rail		761. L.F.	
Granite		1771. S.F.	
Street Exc.			117. C.Y.
Asphalt Paving			761. S.Y.
Conc. Sidewalk			2134. S.F.
Conc. Curb			195. L.F.

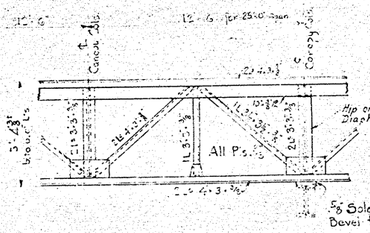


PROFILE
Scale Horz. 1" = 20'
vert. 1" = 10'

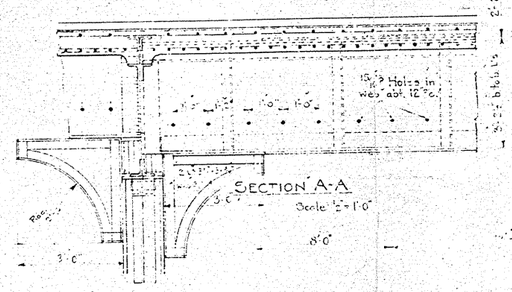
All exposed steel to be completely covered with 1" of gunite, excepting steel for canopy and stairways. Steel Company to provide open holes for drainage as typified on sheet 2.

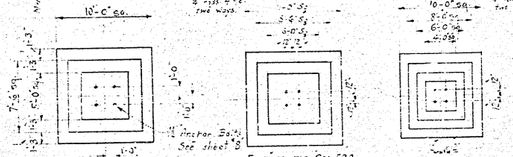


PLAN
Scale 1" = 20'-0"



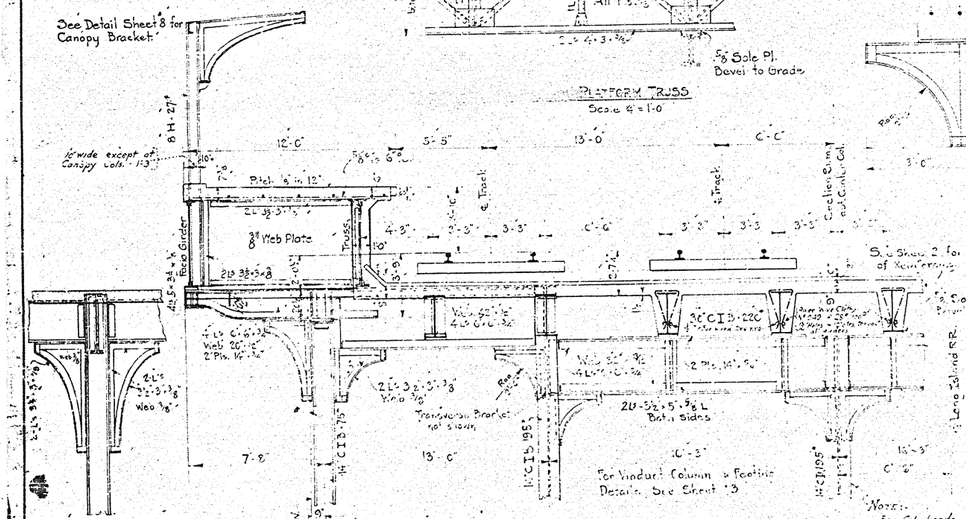
PLATFORM TRUSS
Scale 1/4" = 1'-0"





FOOTINGS FOR COLUMNS 58 A B C D E / 59 B C D E
Scale 1/8" = 1'-0"

FOOTINGS FOR 61 B. - 62 B.



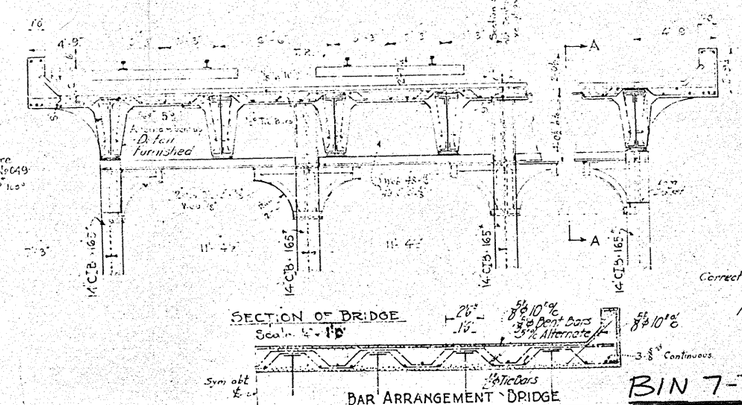
LONGITUDINAL BRACKETS ON COLS. D & D'

PLATFORM SECTION
Scale 1/4" = 1'-0"

See Sheet 2 for layout of Reinforcing

For Viaduct Column & Footing Details See Sheet 5

Notes: For Col. Loads see sheet 3



SECTION OF BRIDGE
Scale 1/4" = 1'-0"

BAR ARRANGEMENT BRIDGE

BIN 7-70562-0

103 AVE BRIDGE

GIRDERS	Mts.	Shear	COLUMNS 58 A B C D E / 59 B C D E
D.L.	770000	71575	Load 492130#
L.L.	928250	99175	14" CB @ 165#
Imp.	512000	59750	
	2210250	230500	COLUMN 59A
Flange Area:	2210250 - 12000 x 38.5	= 43"	Load 590000#
1/8 Web (36" x 3/8")		3.56	14" I. 195#
2-Ls 6" x 6" x 3/4"		13.88	
2-Pls. 14" x 3/4"		18.00	36" x 30" long
1-Pl. 14" x 5/8"		7.50	21" long
		42.94"	

GENERAL NOTES:
Specifications A.R.E.A. 1920 for Railroad Bridges. Reamed Work.
Loading: Coopers - E-50
Rivets 7/8", Open holes 15/16"
Concrete mixture for Bridge floor and Platform slabs to be 1:2:4
Column footings to be 1:2½:5
Reinforcing bars to be deformed of structural grade complying with ASTM Spec. Serial 1514.
Bars 1½" from surface of concrete unless otherwise noted
Paint all surface not covered by concrete with one shop coat of "Hullead" (Patterson Sargent)
All Elevations refer to Queens Boro Datum

Columns	61 B.	62 B.
Load	715000#	Load 532000#
14" CB	225#	14" CB 195#

Approved by Transit Commission, May 22, 1929

SHEET 4 OF TRANSIT COMMISSION CASE No. 2830 | 46000

LONG ISLAND RAILROAD
ROCKAWAY BEACH DIV. BRIDGE No. R 80.

VIADUCT
103RD AVE. TO BENT 74
AT OZONE PARK.

OFFICE OF ENGR. BRDGS. & BLDGS.
NEW YORK FEB. 27, 1929.

SCALE AS NOTED

APPROVED

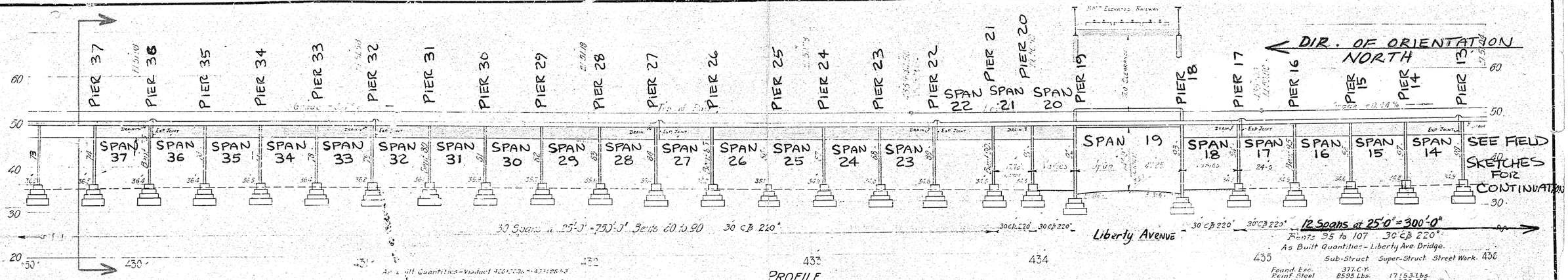
ENGR. BRDGS. & BLDGS.

APPROVED

CHIEF ENGINEER.

June 28 1929	
June 3 1929	
May 22 1929	
Apr 8, 1929	
Revised	

Filed in Office of Engr. Brdgs. & Bldgs. 52L Sht. No. 4



As Built Quantities – Viaduct 426 to 433 & 433 to 435

	Sub-Struct.	Super-Struct.
Found. Exc.	1735. C.Y.	
Reinf. Steel	94154. Lbs.	216006. Lb.
Wire Mesh		30000 S.F.
Class B Conc.	1516. C.Y.	
Class A Conc.		1323. C.Y.
Struct. Steel		1245. Tons
Waterproof & Pr. L.		41641. S.F.
Pipe Fence - Sk. 1		29396. S.F.
Gunite		14. Ea.
Exp. Joints		16. Ea.
Catch Basins		

As Built Quantities – Liberty Ave. Bridge.

	Sub-Struct.	Super-Struct.	Street Work.
Found. Exc.	377 C.Y.		
Reinf. Steel	8595 Lbs.	17153 Lbs.	
Wire Mesh		1872 S.F.	
Class B Conc.	132. C.Y.		
Class A Conc.		236. C.Y.	
Struct. Steel		167 Tons	
Waterproof & Prot.		5579. S.F.	
Pipe Fence - Skrail		77. L.F.	
" Rail		101. L.F.	
Gunite		2650. S.F.	
Street Exc.			789. C.Y.
Asphalt Paving			550. S.Y.
Conc. Sidewalk			2016. S.F.
Conc. Curb			185. L.F.

Girders G11 & G15

	Moments	Shear
DL	839.000"	71.500
LL	1,072.000	105.000
Imp	607.002	64.000
	2518.000"	240.500

Flange 2 518.000 = 314.0" sq. Area 16.000 · 5

Web: ⅜ Web · 375 · 60-½
2 L's 6-6-⅝ · 11.72
1 Pl 14-½ · 6.00 · 2.22" long
2 Pl 14-⅛ · 10.50 · 2.30 1-37 Full length
31.97 Net

Girders G12, G13, G14

	Mts	Shear
DL	1,610,000	137,000
LL	1,610,000	158,000
Imp	625,000	70,000
	3845,000	365,000

Flange 3,845,000 = 43.9 sq. Area 16,000 · 5

Web: ⅜ Web · 470 · 60-⅜
2 L's 8-8-½ · 18.38
1 Pl 12-⅜ · 9.00 · 2.22 long
2 Pl 18-½ · 16.00 · 2.30 1-37 Full length
48.08 Net

Columns 92A 92E 93A 93E.
Load = 297,000#
14" C B 145

Columns 92B 92C 92D 93B 93C 93D
Load = 418,000#
14" C B 175

Girders (See Profile)

	Moments	Shear
D.L.	244,000"	47,000
L.L.	381,000	71,000
Imp	229,000	47,000
	854,000"	165,000

I/C = 304000 · 12 / 16,000 = 678"³
30 C B 220" = 676.3"³

Center Cols.
3B to 12B Incl.
17B to 25B Incl.
63B to 91B Incl. 60B
94B to 108B Incl.
Total Load = 758000

14" C B 135"

Outside Cols.
3A.C to 12A.C incl.
17A.C to 25A.C incl. 26A.C. 60A.C to 91A.C incl.
94A.C to 107 A.C incl. 109A
Total Load = 715,000#

14" C B 225

Floor Beams

	Moments	Shear
D.L.	7.880"	2420
L.L.	20.000	5000
Imp	20.000	6250
	47.880"	13,670

I/C = 47880 · 12 / 16,000 = 35.8" per'

12" C B 75" Spaced 2'-7½" ctrs.

Footing for
3A.C to 12A.C. incl.
17A.C to 25A.C. incl.
60A.C to 91A.C. incl.
94A.C to 107A.C. incl. 109A

Footing for
3B to 12B Incl.
17B to 25B Incl.
63B to 91B Incl.
94B to 108B Incl. 60B

Correct "As Built"
for Engr in Charge

BIN 7-70562-0

Approved by Transit Commission, May 22, 1929.

SHEET 5 OF	TRANSIT COMMISSION CASE №2830 46000

LONG ISLAND RAILROAD
ROCKAWAY BEACH DIV. BRIDGE № P 80
VIADUCT
LIBERTY AVE. TO BENT 98
AT OZONE PARK.

OFFICE OF ENGR. BRDGS. & BLDGS.
NEW YORK FEB. 27, 1929.
APPROVED
ENGR. BRDGS. & BLDGS.

SCALE AS NOTED
APPROVED
CHIEF ENGINEER

June 2, 1930	
June 5 1930	
May 22, 1930	
Apr 10 30	
Feb 10 1930	
Apr. 8, 1929	
Revised	

File No. 821

TAMS

Job No. 1489

Project N.Y.C. BRIDGE INVENTORY & INSPECTION

Subject N.Y.C.A. - VIADUCT (L.I.R.R.) @ OZONE PARK

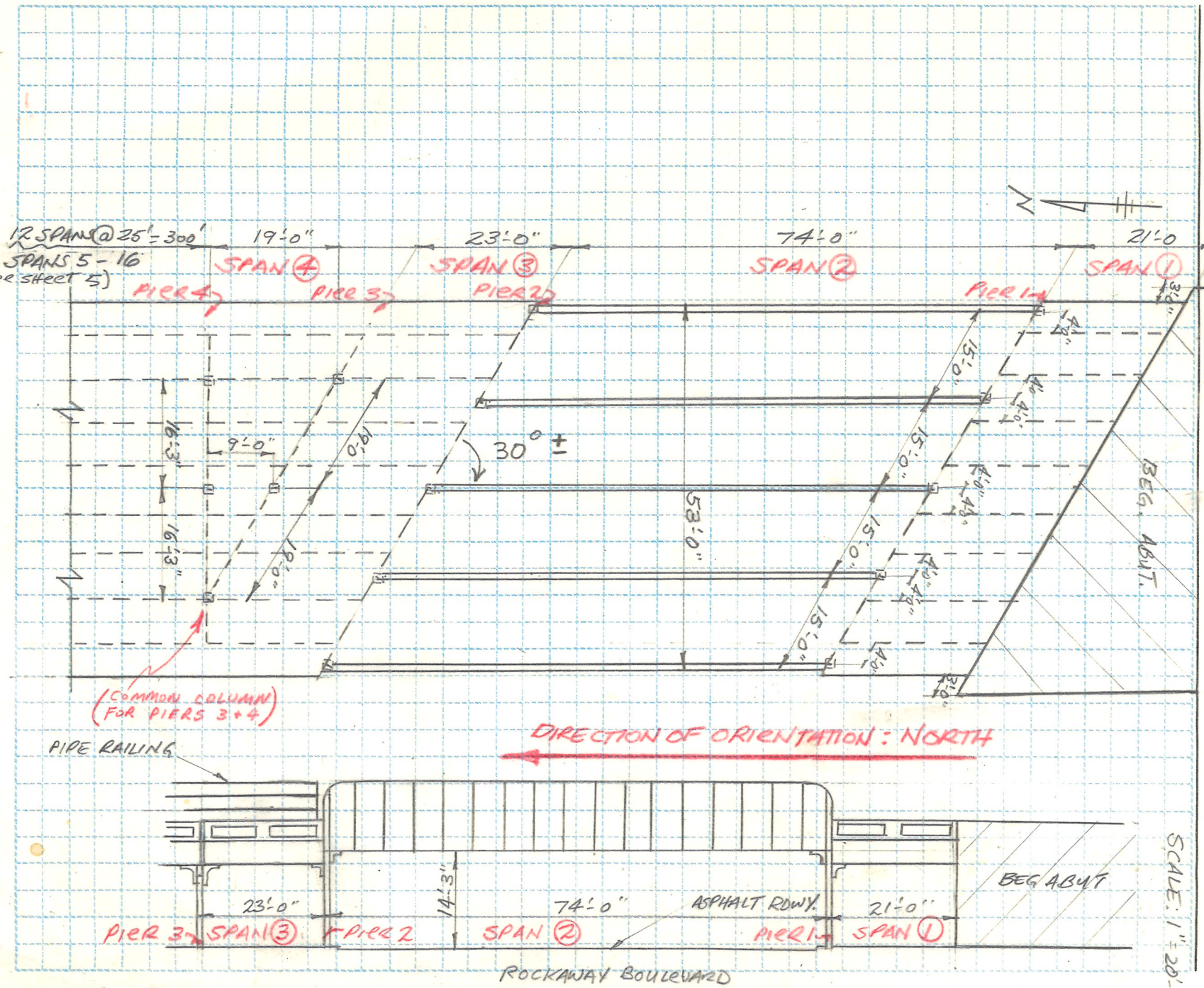
BIN 7-70562-0

Sheet ____ of ____

Date 3-6-79

By J. RODRIGUEZ

Ch'k. by ____



WEST ELEVATION

Appendix B

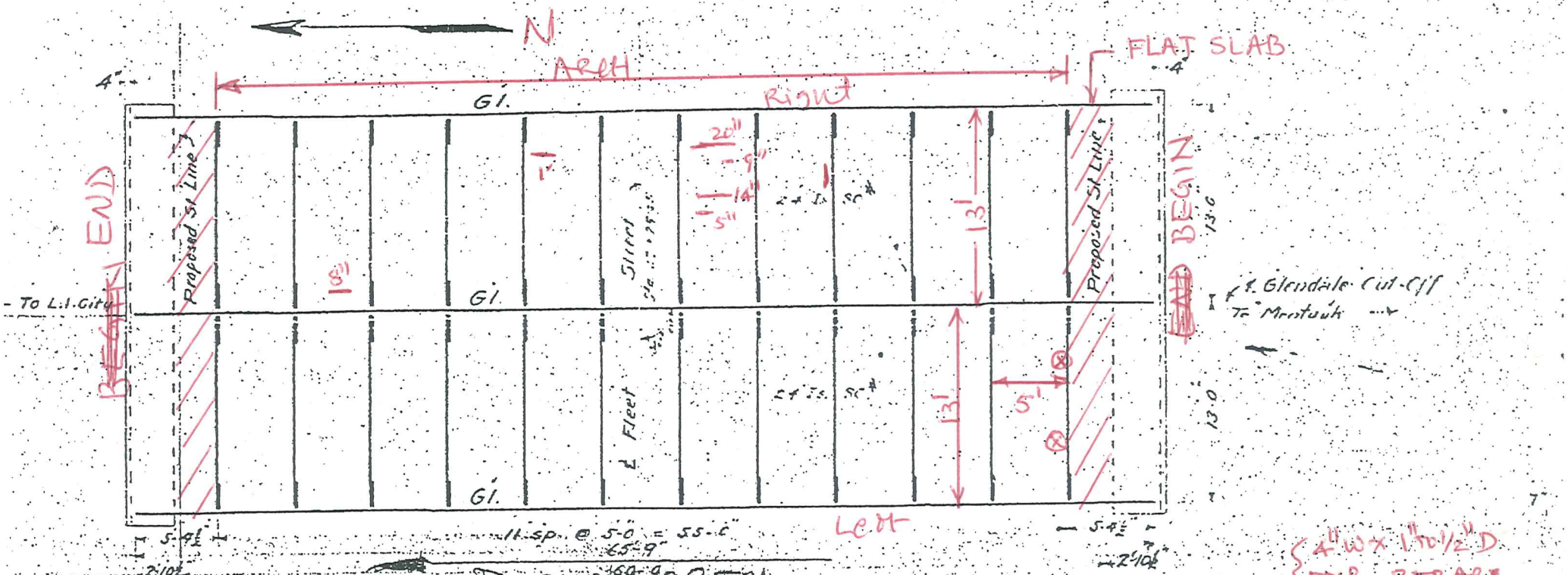
Inspection Field Notes

Inspection Field Notes

for

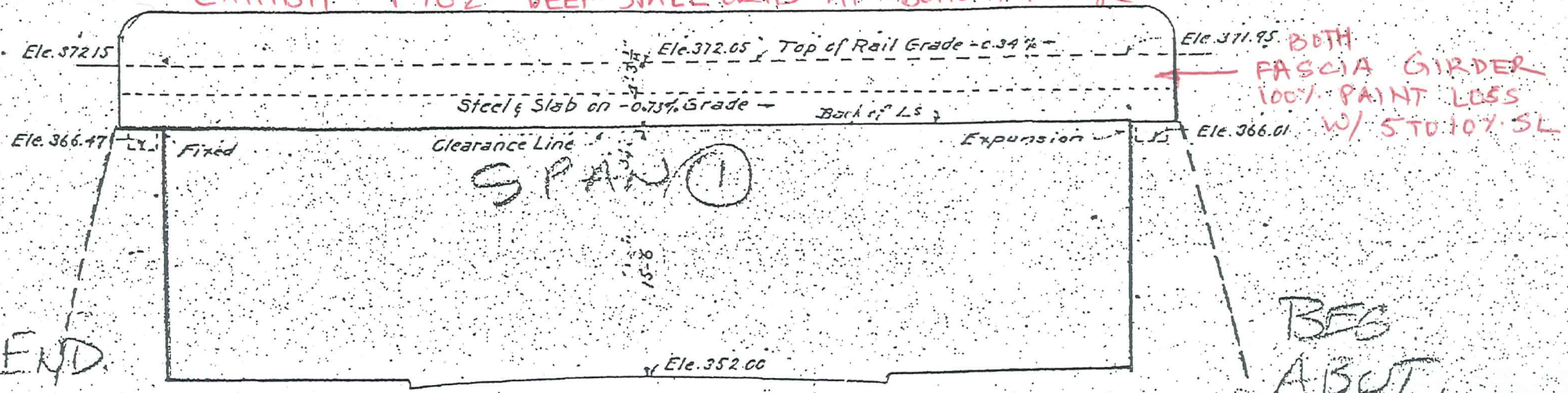
Fleet Street Bridge

FLEET ST.



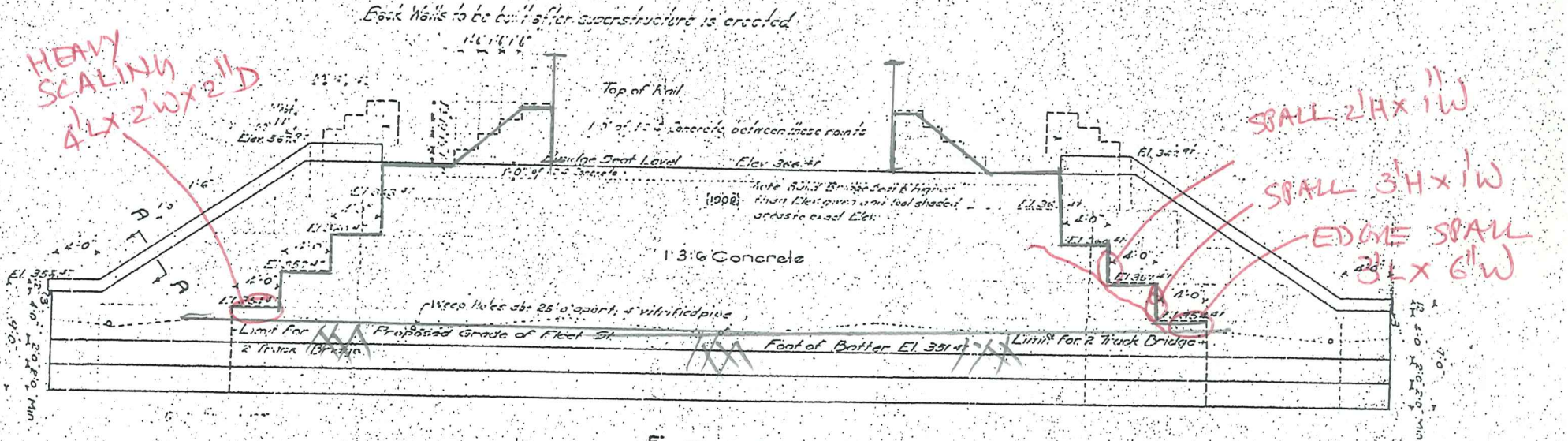
4" W x 1" to 1½" D EXP. REBARS ⊗ " " o/c VERTICAL FACE ABOUT 6" L

⊗ ALONG ALL THREE GIRDER & ALONG ALL FB'S ~~EXHIBIT~~ 1" to 2" DEEP SPALL OR HS AT Bottom Flange



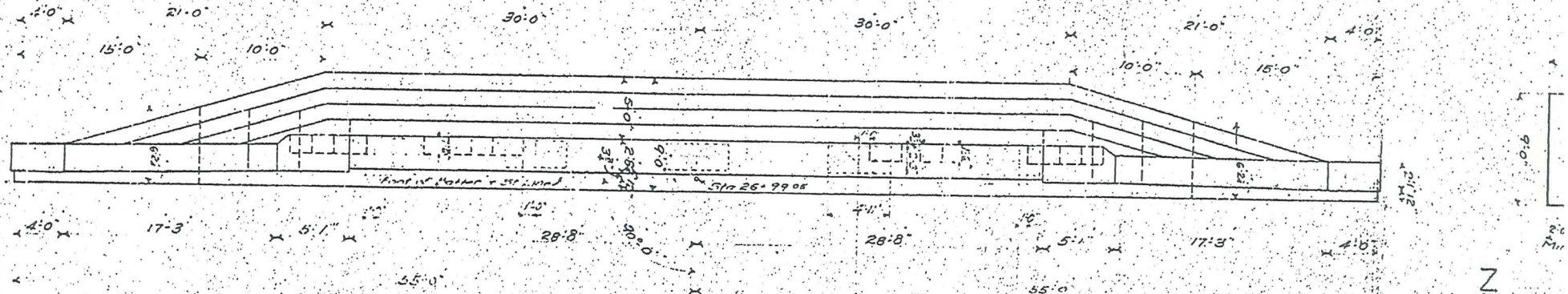
BOTH FASCIA GIRDER 100% PAINT LOSS W/ 5 TO 10% SL

FLEET ST.



ELEVATION

END ABUT.

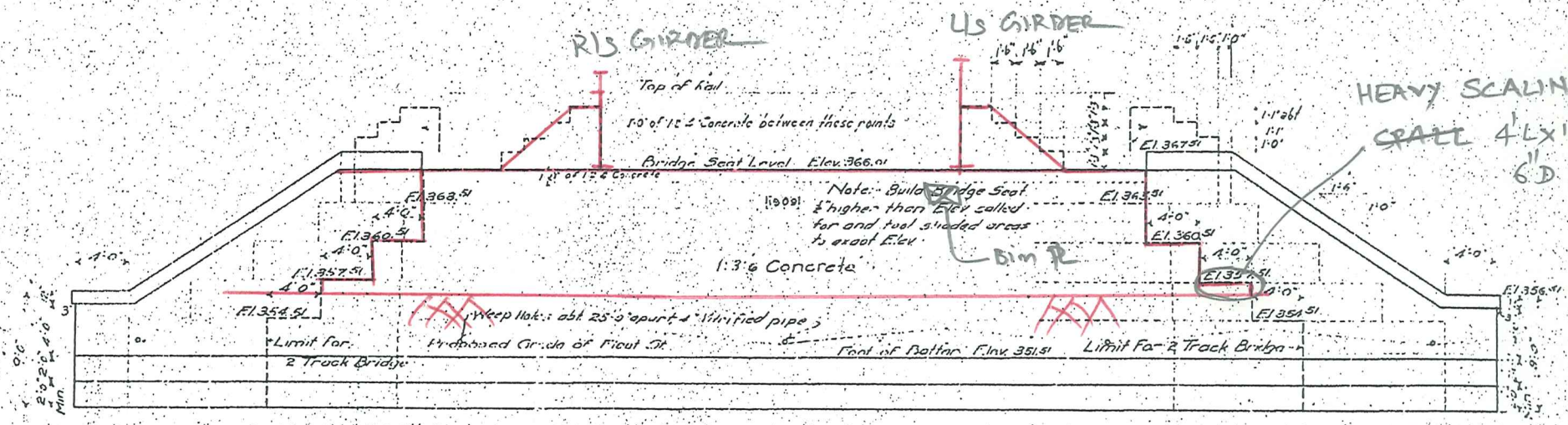


PLAN

Scale: 1 inch = 8 ft.

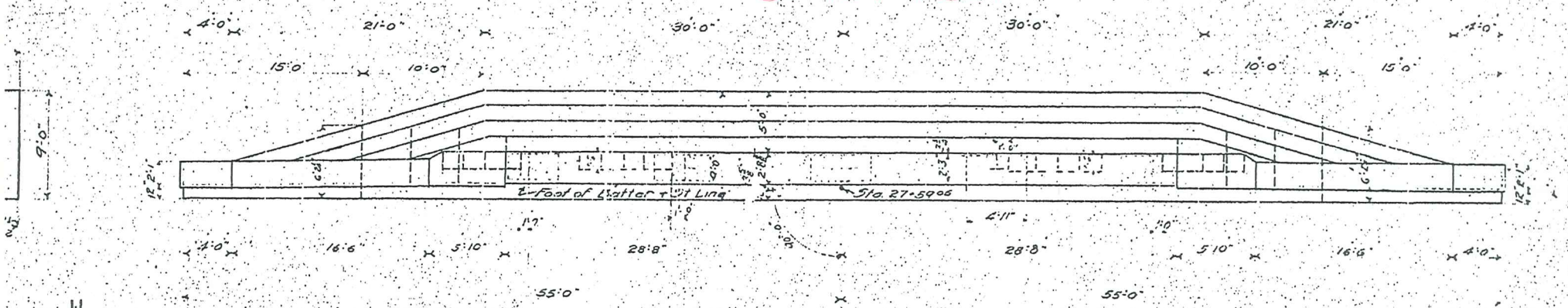
NORMAL SECTION

FLEET ST.



ELEVATION

BEGIN ABT



PLAN

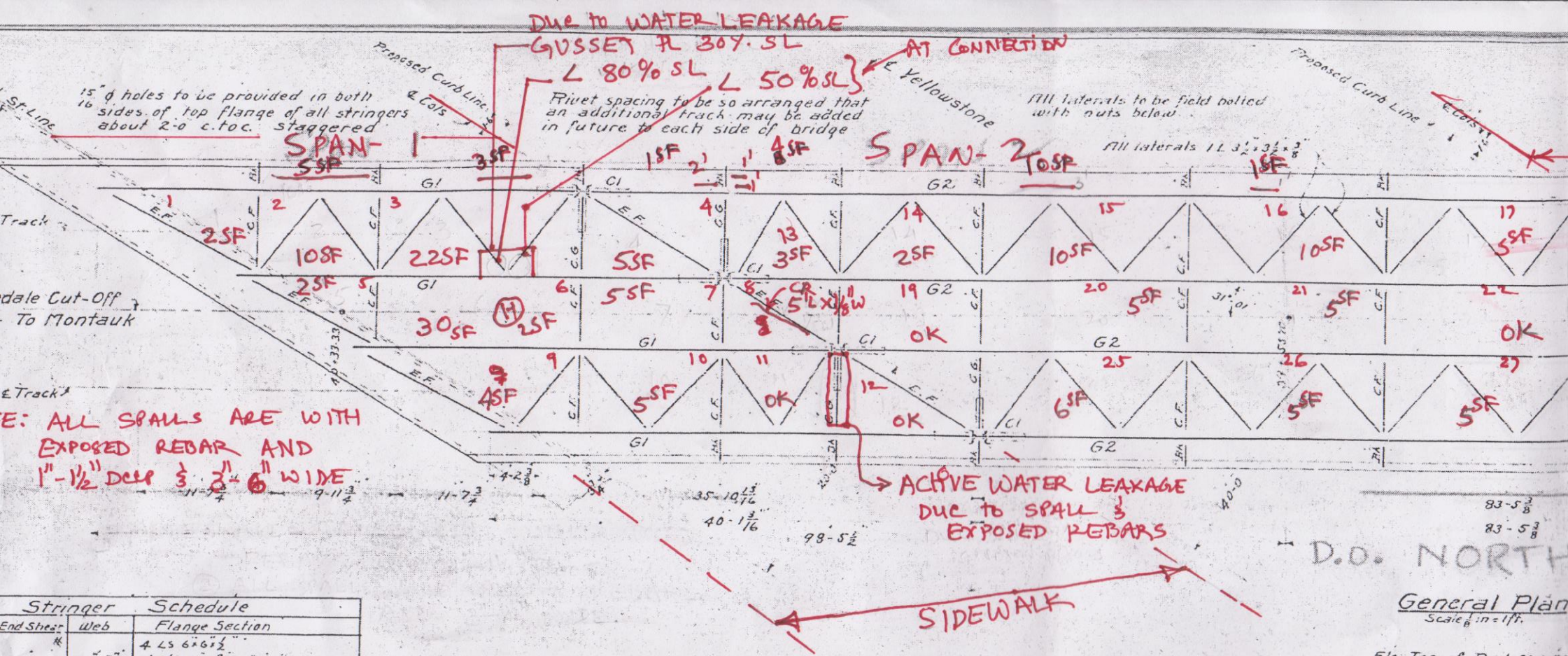
Scale:- 1" = 8 ft.

CENTER LINE

Inspection Field Notes

for

Yellowstone Boulevard Bridge



General Plan

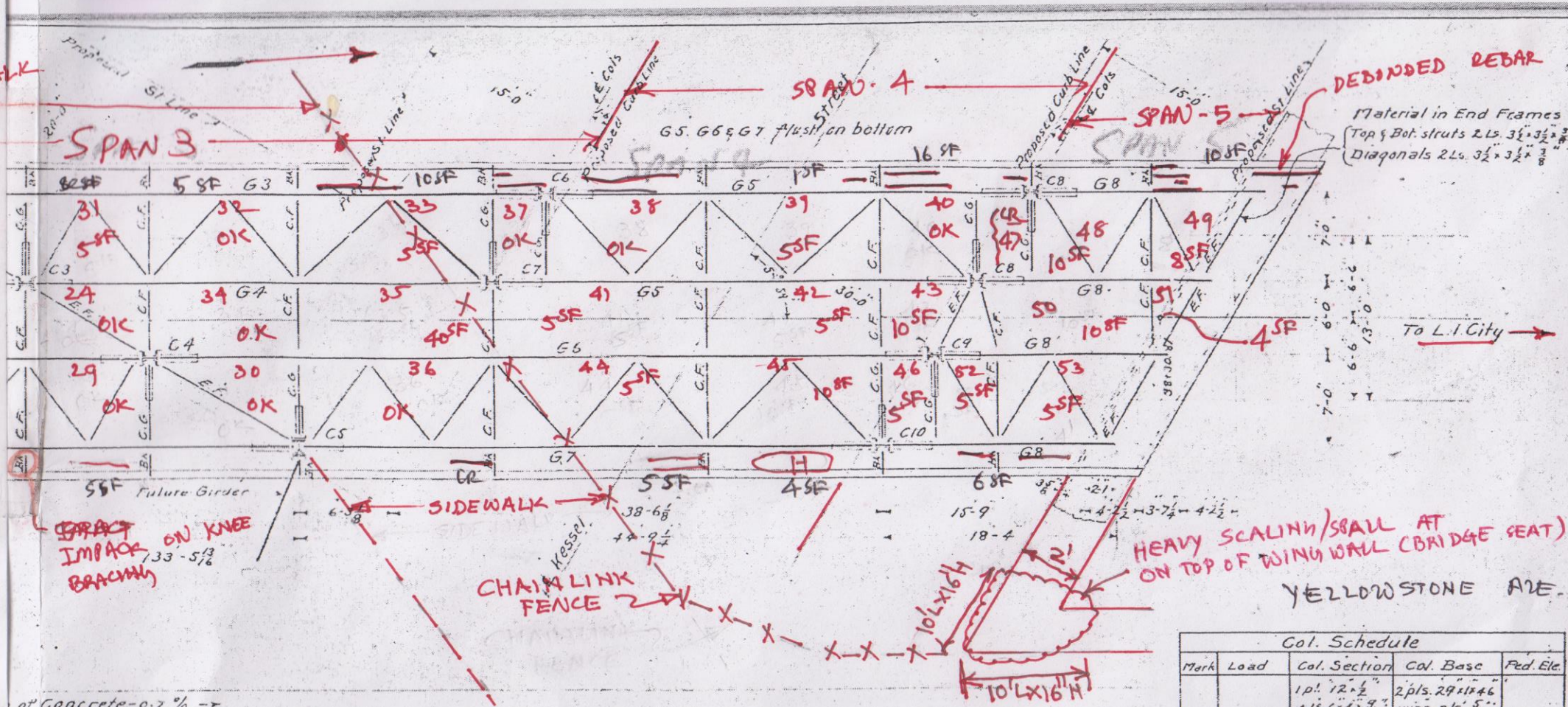
Scale ⅛ in = 1 ft.

Elevation

Scale ⅛ in = 1 ft.

Stringer Schedule

End Shear	Web	Flange Section
99500	48" × 7/16"	4 Ls 6×6×½ 2 pl. 14 × 7/16 × 30-0 2 pl. 14 × ½ × 21-0
351800	72" × ½"	4 Ls. 8×8×⅝ 2 pls. 18 × 9/16 × 71-0 2 pls. 18 × 9/16 × 63-0 2 pls 18 × 9/16 × 54-6 2 pls 18 × ½ × 44-0 2 pls 18 × ½ × 31-6
242200	50" × ½"	4 Ls. 6×6×⅝ 2 pls. 14 × ½ × 43-0 2 pls 14 × ½ × 37-0 2 pls 14 × ½ × 30-6 2 pls 14 × ½ × 22-0
89000	50" × 3/8"	4 Ls 6×6×½ 2 pls. 14 × 7/16 × 26-0 2 pls. 14 × 3/8 × 18-6
71000	50" × 9/16"	4 Ls 6×6×⅝ 2 pls. 14 × 9/16 × 53-6 2 pls. 14 × ½ × 48-6 2 pls. 14 × ½ × 43-0 2 pls. 14 × ½ × 38-0 2 pls. 14 × ½ × 31-6 2 pls 14 × ½ × 23-0
18900	50" × 7/16"	4 Ls 6×6×⅝ 2 pls. 14 × ½ × 35-0 2 pls. 14 × ½ × 28-0 2 pls 14 × 7/16 × 20-6
18200	48" × 3/8"	4 Ls. 6×6×⅜



Col. Schedule				
Mark	Load	Col. Section	Col. Base	Fnd. Ele.
C1.	443,600	1 pl. 12 x ½" 4 Ls 6 x 4 x 9/16" 2 pls. 14 x 3/8" 2-15" Cs 33#	2 pls. 29" x 1" x 46" wing pls. 5/8" side Ls 6" x 6" x 5/8"	338.00
C2.	468400	1 pl. 12 x ½" 4 Ls 6 x 4 x 5/8" 2 pls. 14 x 3/8" 2-15" C 33#	1 pl. 27" x 1" x 54" 6-15" C 33#	334.00
C3.	420700	1 pl. 12 x ½" 4 Ls 6 x 4 x ½" 2 pls 14 x 3/8" 2-15" Cs 33#	1 pl 27" x 1" x 54" 6-15" C 33#	334.00
C4.	489800	1 pl. 12" x 5/8" 4 Ls. 6 x 4 x 5/8" 2 pls. 14" x 3/8" 2-15" Cs. 33#	1 pl. 27" x 1" x 54" 6-15" Cs. 33#	334.00
C5.	1000000	1 pl. 12 x 5/8" 4 Ls 6 x 4 x 5/8" 6 pls 14 x 3/8" 2 pls 14 x 5/8" 2-15" Cs 33#	see detail	335.50
C6.	331700	1 pl. 12 x 9/16" 4 Ls 6 x 4 x 5/8" 2-15" Cs 33#	2 pls. 29" x 1" x 36" wing pls. 5/8" side Ls 6" x 6" x 5/8"	338.00
C7	283400	1 pl. 12 x 3/8" 4 Ls. 6 x 4 x 9/16" 2-15" Cs 33#	2 pls 29" x 1" x 36" wing pls. 5/8" side Ls 6" x 6" x 5/8"	338.00

UNDERSIDE DECK — Yellowstone

	BAY - 1		BAY 2		BAY - 3	
		SF		SF		SF
SPAN · 1	1 6×7×5% =	2	5 5×6×5% =	2	9 11×7×5% =	4
	2 9×7×15% =	10	6 16×6×30% =	30	10 11×7×5% =	5
	3 16×7×20% =	22	7 11×6×5% =	5	11 OK	
	4 11×7×5% =	35	8 CRACK 5'L×1/8"W		12 OK	
		39		37		9

= (90 SF) -

	BAY - 1		BAY · 2		BAY · 3	
SPAN · 2	13 9×7×5% =	3	19 ~~6~~ OK		25 15×7×5% =	6
	14 11×7×10% =	2	20 15×6×5%	4	26 15×7×20% =	3
	15 15×7×5% =	6	21 15×6×5%	4	27 15×7×30% =	3
	16 15×7×5% =	6	22 OK		28 11×7×5% =	4
	17 15×7×5% =	35	23 OK		29 OK	
	18 11×7×5% =	4	24 9 OK		30 OK	
		26		8		16

= (50 SF)

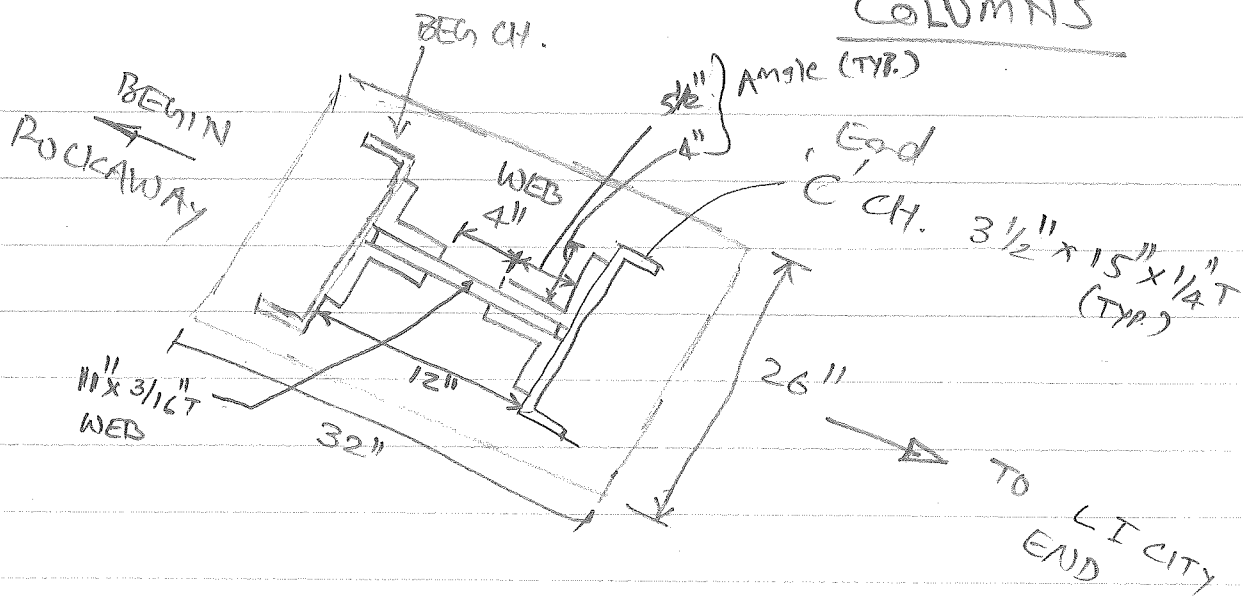
	BAY 1		BAY 2		BAY 3	
SPAN · 3	31 9×7×5% =	4	34 OK		36 OK	
	32 ~~11×7~~ OK		35 14×6×50%	40		
	33 14×7×5% =	5				
		9		40		(50 SF)

SPAN · 4	37	~~4×7×~~ OK = -	41	15×6×5% = 5	44	15×7×5% = 5
	38	~~11×7×~~ OK = -	42	12×6×5% = 4	45	12×7×10% = 8
	39	12×7×5% = 5	43	10×6×15% = 9	46	4×~~7~~×15% = 4
	40	7×7× OK = -				(40 SF)

SPAN · 5	47	1/16" CRACK + EFF 10. ~~2×7×~~	50	14×6×10% = 8	52	4'×7'×5% = 2
	48	13×7×10% = 9	51	4×6×15% = 4	53	10'×7'×5% = 9
	49	8×7×10% = 6				(40 SF)

+ FASCIA = (90 SF)

Yellow Stone Columns



		Col #1	Col #2	Col #3	Col #4
P1	WEB	4"x2"H Hole	4"x1"H Hole	15% SL	4"x3"H Hole
	BEG CH.	35% SL.	20% SL	15% SL	20%
	END CH	60% SL + 1 LEG 100% 8"x8"H	20% SL	15% SL	20%
	ANGLE	SPALL @ BASE ←	10-15% SL @ BASE →		

P2	WEB	4"x3"H Hole	OK	OK	OK
	BEG CH.	20% SL	OK		
	END CH.	20% SL	IMPACT ON RTS		
	ANGLE	←	10-15% SL →		

	Col. 1	Col. 2		
P.3	OK	WEB 4"x1"H Hole		
		BEG CH 20%	X	X
		END CH 20%		

	Col #1	2	3	4
P4				
BEG CH →	WEB 25% x 3"H 50% SL @ BOTH LEGS FOR 2"H	WEB 25% BOTH LEGS 50% x 2"H	75% SL	35% SL
End CH. →	WEB 25% BOTH LEG 100% x 4"H HOLE			
WEB	4"H x 4"W HOLE	1"H x 10% SL	10% FOR 1"H	15%
Angles	10-15% SL @ BASE	→		
		SPALL ON CONC. ENCAVEMET ALL AROUND	SPALL ON ENCA. ON LEFT & END SIDE FOR FULL WIDTH	

Inspection Field Notes

for

Metropolitan Avenue Bridge

METROPOLITAN AVE.

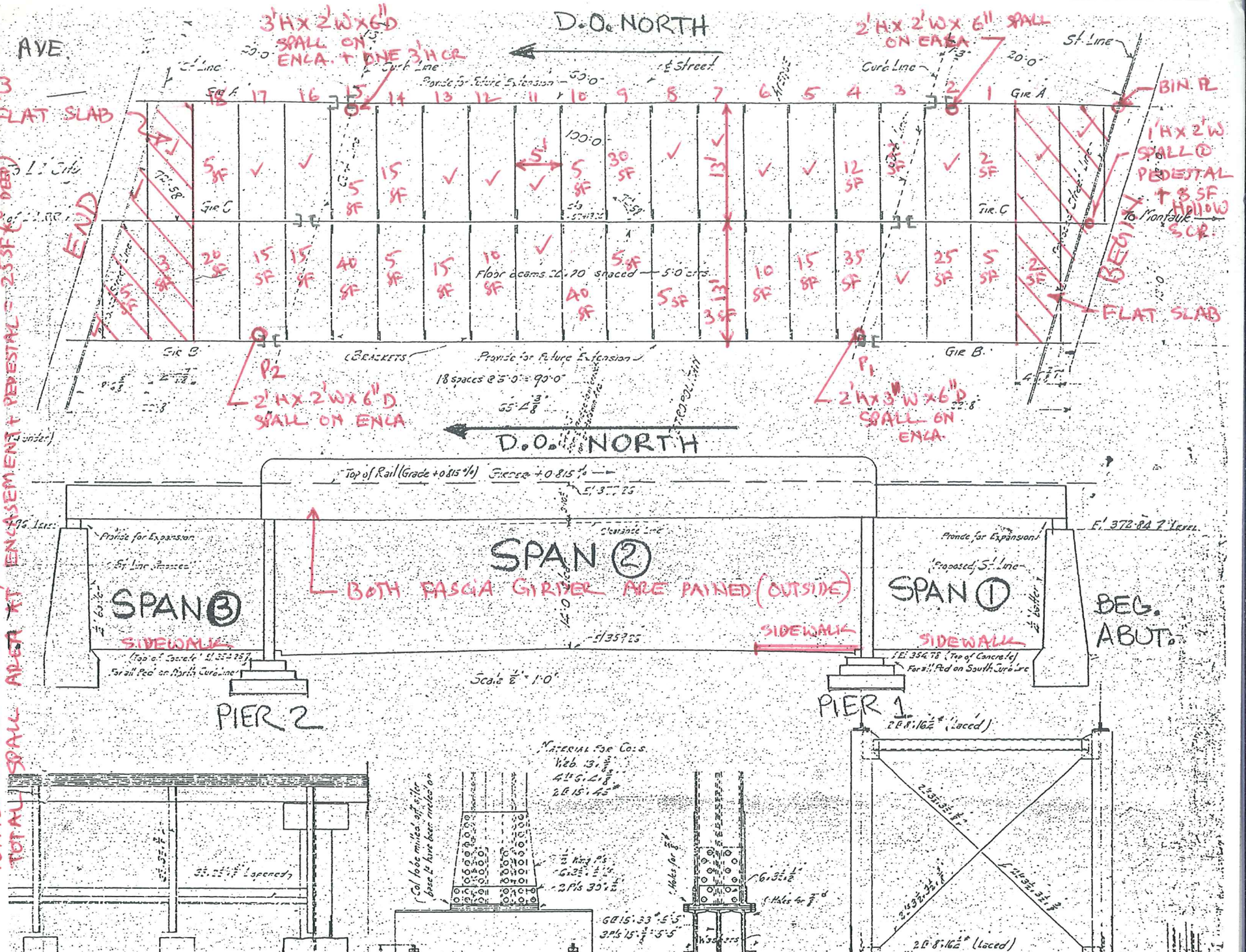
12/11/13

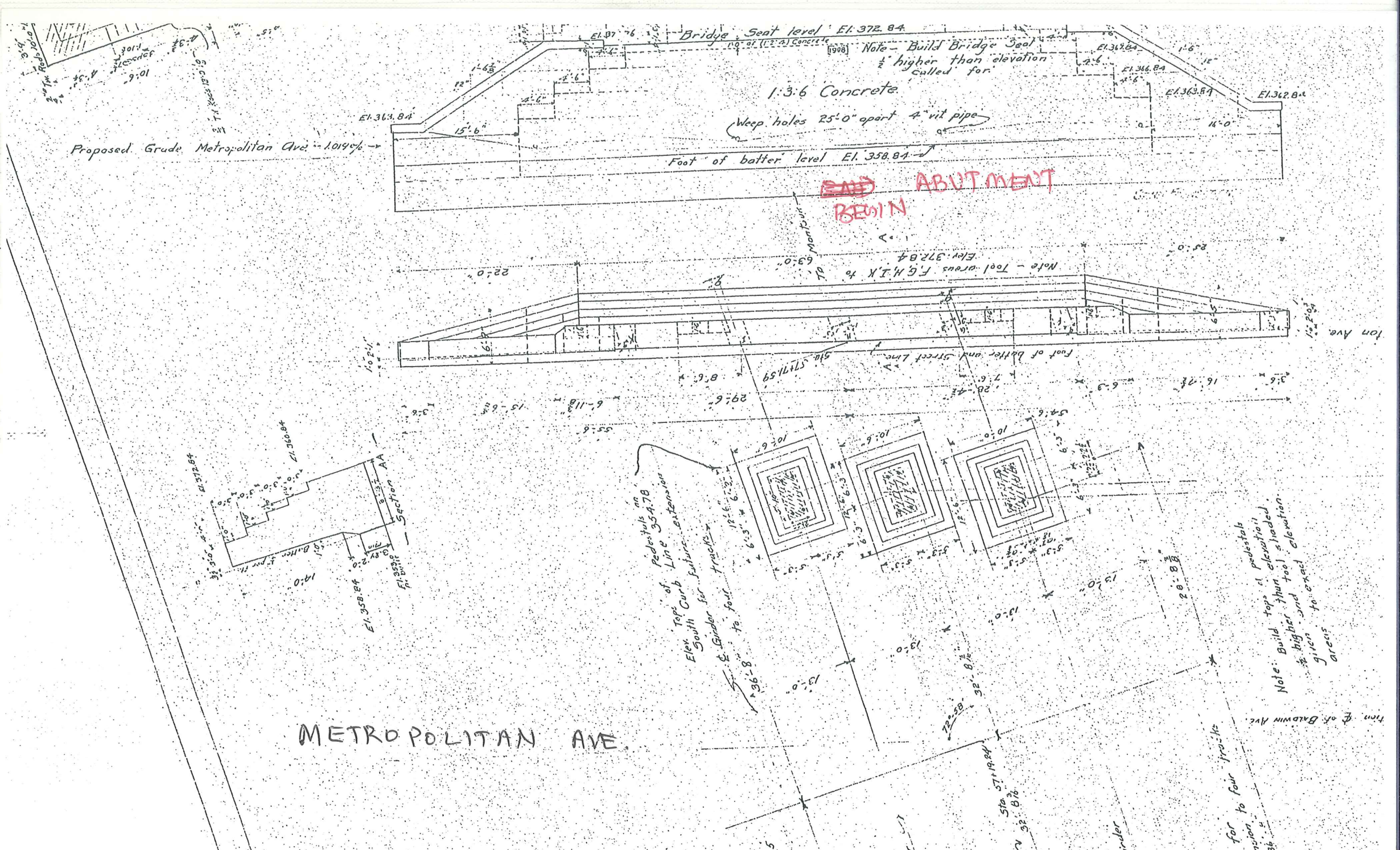
NOTE: ① BOTH FASCIA GIRDERS & BOTH ABUT. ARE PAINTED.

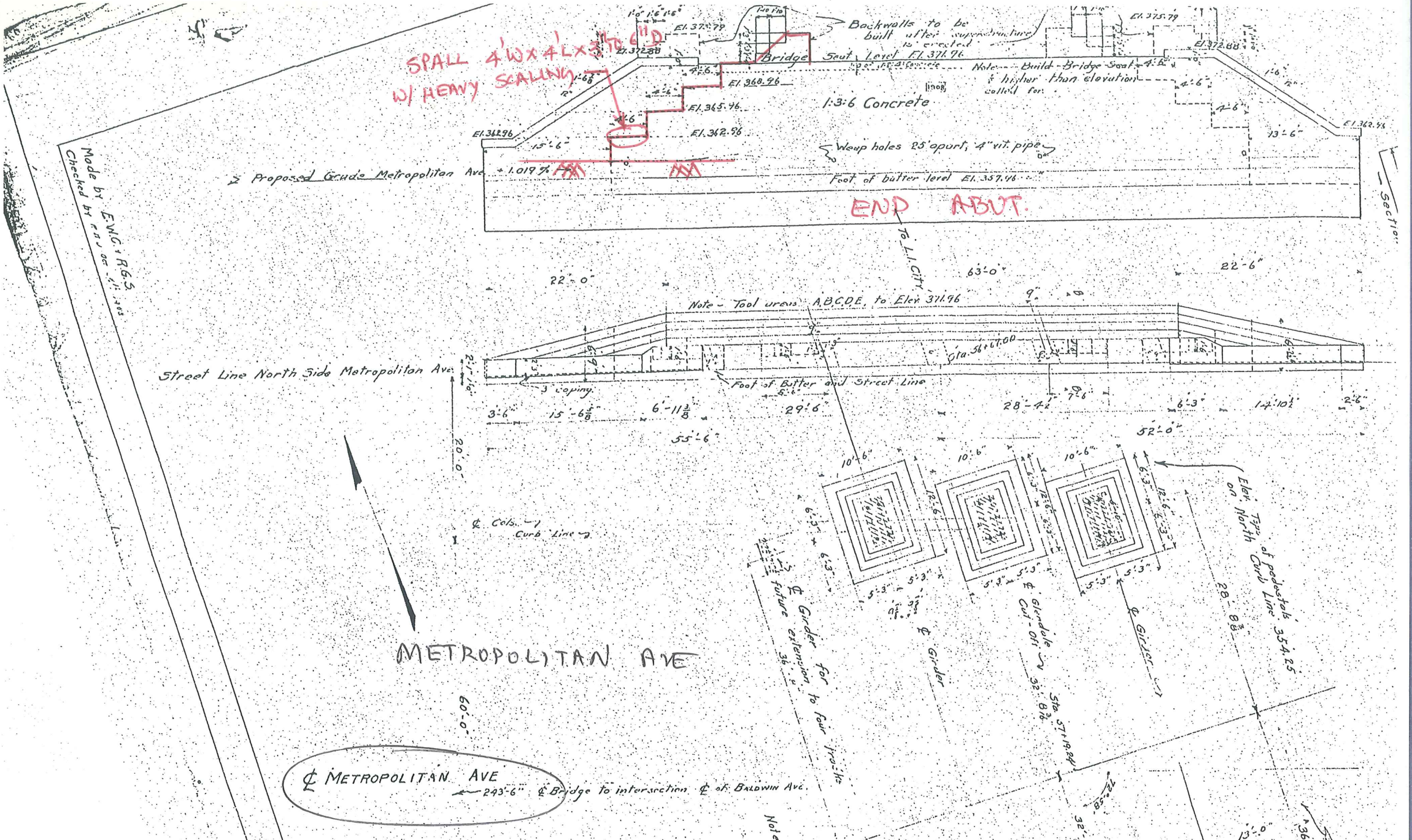
② ALL SPALLS ARE WITH EXPOSED REBARS AND ARE 1" TO 1½" DEEP.

③ SOME LOOSE DELAMINATED CONC. ABOVE BOTH SIDEWALKS ARE REMOVED DURING THIS INSP.
LOOSE DELAMINTED (10 TO 15 SF) ARE NOTED ABOVE
ACTIVE TRAVELING LANE.

TOTAL SPALL AREA W/EXPOSED REBAR = 360 SF
TOTAL SPALL AREA AT ENCASEMENT + PEDESTAL = 25 SF (6" DEEP)




Bridge Seat level El. 372.84
Note – Build Bridge Seat ½" higher than elevation called for
1:3:6 Concrete.
Weep holes 25'-0" apart 4" vit pipe
Foot of batter level El. 358.84
Proposed Grade Metropolitan Ave. – 1.01¢%
BEGIN ABUTMENT
Note – Tool grass F.G.H.I.X to El. Elev. 372.84
Foot of batter on Street Line
Section A-A
Ped'stals No. 35 & 78
Elev. Top Curb of Line extension South
Sta. 37+19.84
Sta. 36+8
Note: Build top of pedestals ½" higher than tool stadded grass to exact elevation.
METROPOLITAN AVE.


SPALL 4'W x 4'L x 3'D 6"D
W/ HEAVY SCALING
Backwalls to be built after superstructure is erected
Bridge Seat Level El. 371.96
Note - Build Bridge Seat 4" higher than elevation called for.
1:3:6 Concrete
Weep holes 25' apart, 4" vit. pipe
Proposed Grade Metropolitan Ave. + 1.019%
Foot of Batter level El. 357.96
END ABUT.
Section
To L.I. City
Note - Tool areas A.B.C.D.E. to Elev. 371.96
Sta. 56+67.00
Street Line North Side Metropolitan Ave.
Coping
Foot of Batter and Street Line
Elev. 375' on North Curb Line of pedestals 354.25
℄ Girder for future extension to four tracks
℄ Girder
℄ Glendale Cut Off
℄ Girder
Sta. 57+19.84
℄ Cols.
Curb Line
METROPOLITAN AVE
60'-0"
℄ METROPOLITAN AVE
243'-6" ℄ Bridge to intersection ℄ of BALDWIN AVE.
Made by E.W.C. & R.G.S.
Checked by R.R.J. Oct. 1, 1903

Inspection Field Notes

for

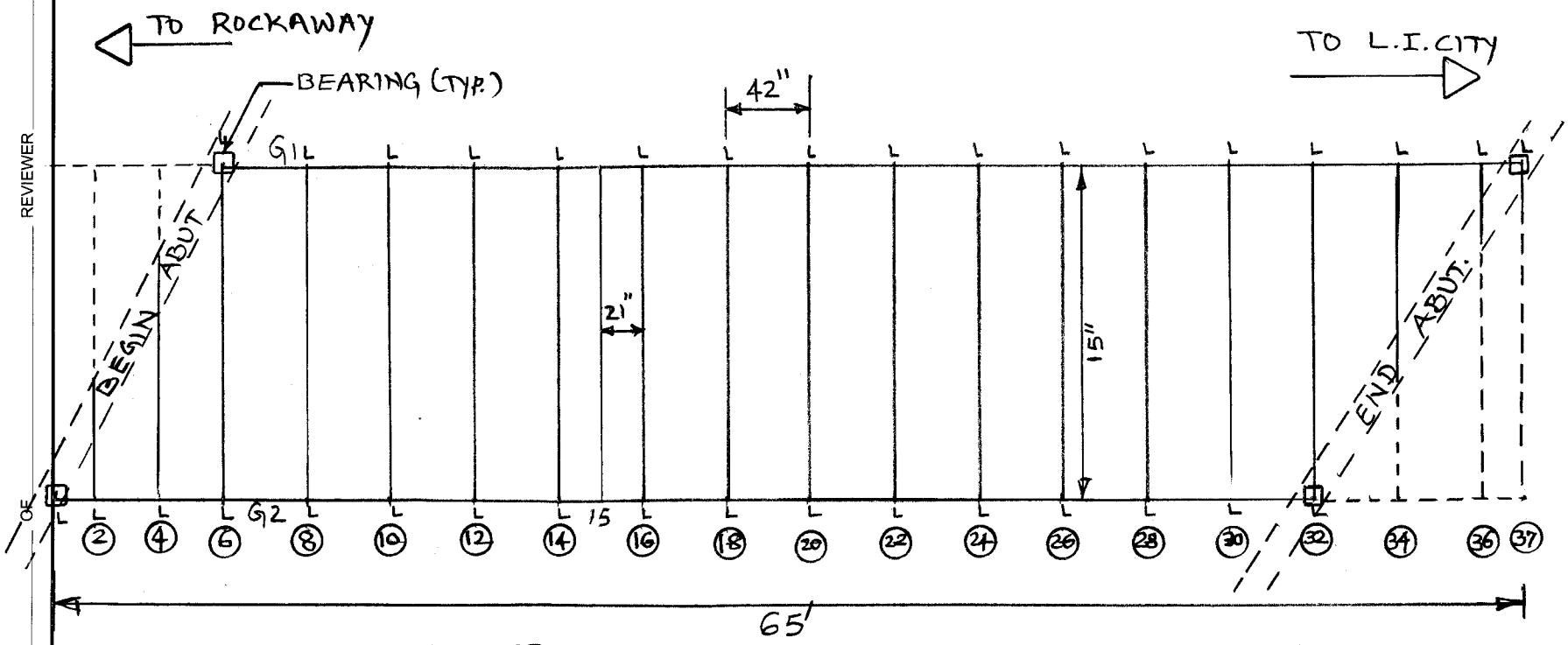
Union Turnpike Bridges

JOB TITLE UNION TURNPIKE (WEST BRIDGE (TWO GIRDER)

JOB NO. _____ CALCULATION NO. _____ ORIGINATOR BIN: 7705421 DATE _____

SHEET _____ REVIEWER _____ DATE 12/13/13

UNION TURNPIKE (WEST BRIDGE)
BIN - 7705421



L = VERTICAL STIFFENER

FLOORBEAM TO FLOORBEAM c/c = 21"

GIRDER TO GIRDER c/c = 15"

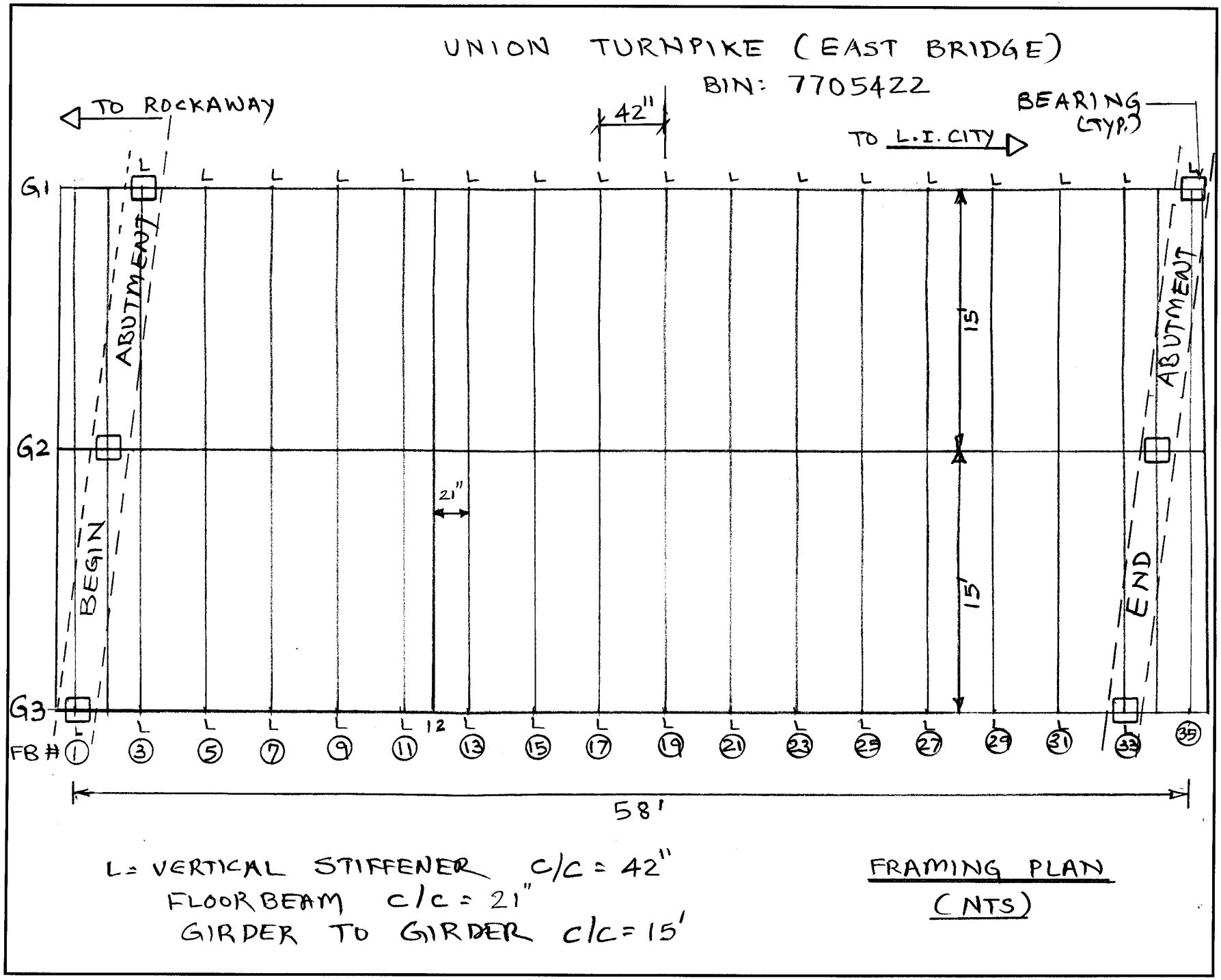
(#) FLOOR BEAM #

FRAMING PLAN
(NTS)

JOB TITLE UNION TURNPIKE (EAST BRIDGE)

JOB NO. CALCULATION NO. ORIGINATOR (3 GIRDER) DATE

SHEET BIN # 7705422 OF REVIEWER DATE 12/13/13



L = VERTICAL STIFFENER c/c = 42"
FLOOR BEAM c/c = 21"
GIRDER TO GIRDER c/c = 15'

FRAMING PLAN
(NTS)

TAMS

Job No. 1489. Sheet ____ of ____

Project N.Y.C. DEP. Inspections

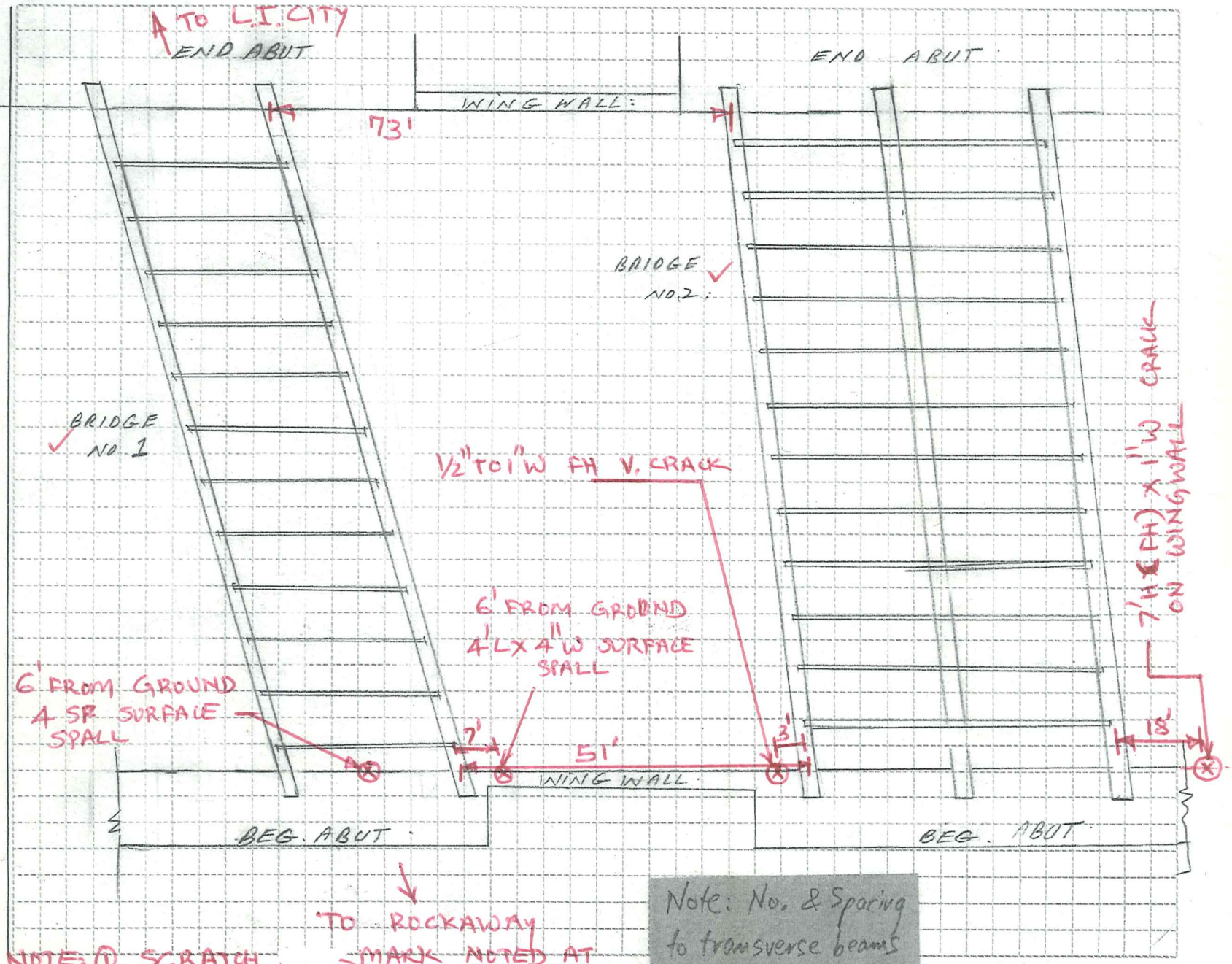
Subject ERA Mtng. Plan. UNION TPKE

BIN # 7-70542-1,2.

Date 3/23/79 Ch'k. by ____

By KChan.

12/11/13



NOTE: ① SCRATCH. UNDERSIDE BUT NO IMPACT DAMAGE

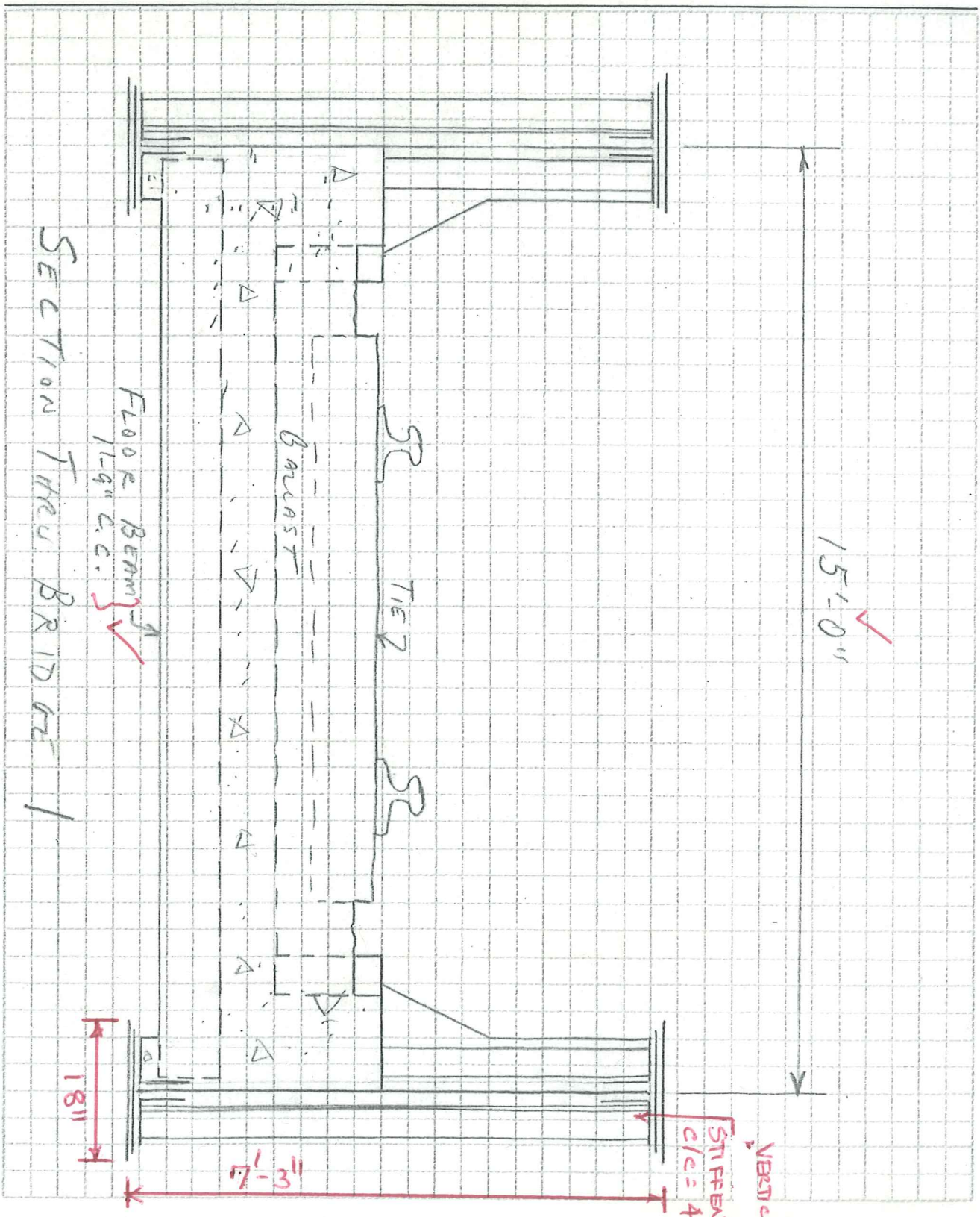
② 5% UNDERSIDE AREA OF EACH BIDGE HAVE SURFACE SPALL, NO EXPOSE REBARS, All SPALL MOSTLY ALONG THE FB's.

Note: No. & Spacing to transverse beams are shown incorrectly. (More beams spaced closer together)

TAMS

Job No. 1489
Project N.Y.C. BRIDGE INSPECTION
Subject T-70542-1
ABANDONED LIRR OVER UNION TURNPIKE - QUEENS

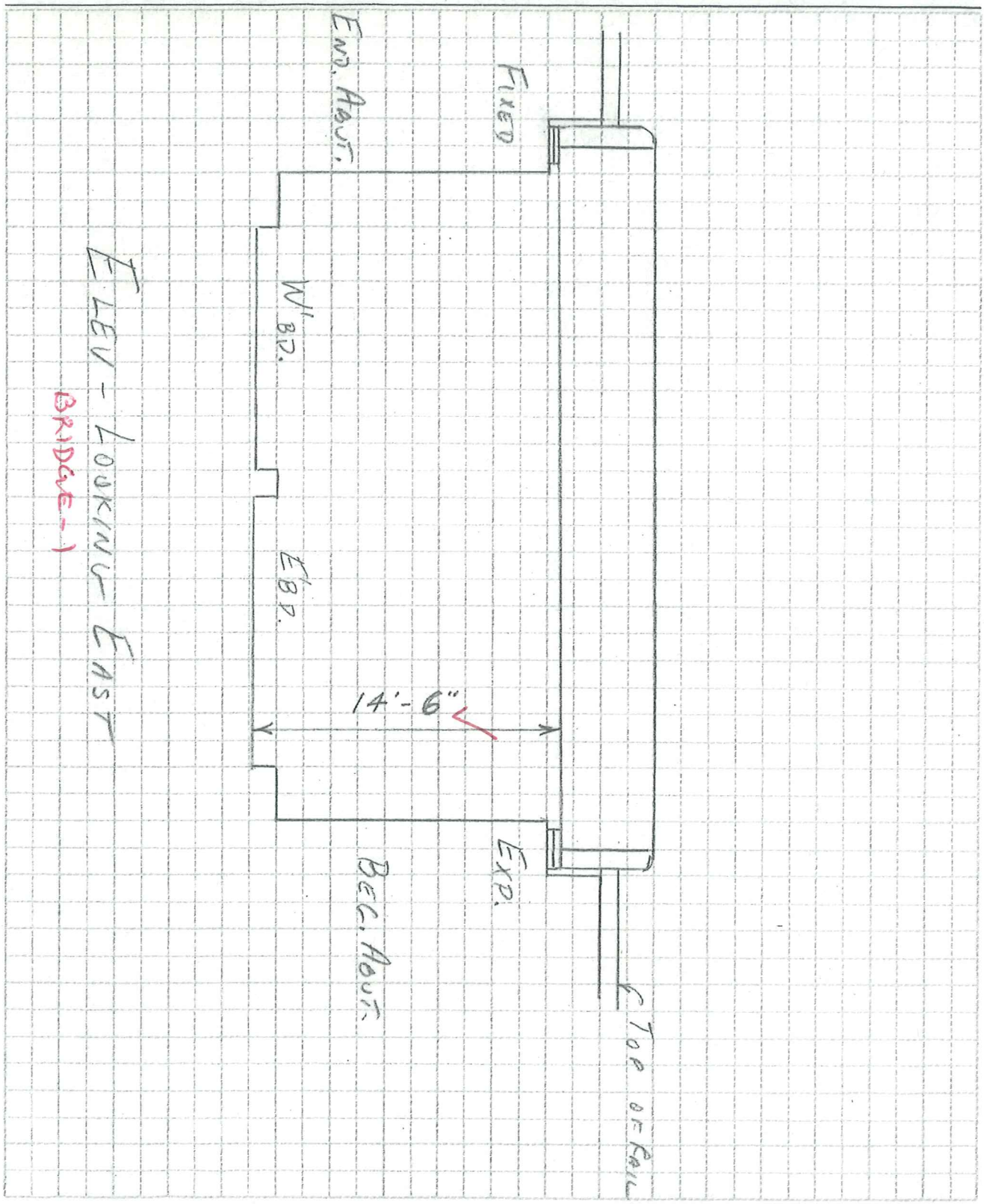
Sheet 2 of 2
Date 3/1/79
By MW
Ch'k. by



TAMS

Job No. 1489
Project NYC BRIDGE INSPECTION
Subject T-20542-1
ABANDONED LIRR OVER UNION TURNPIKE-QUEENS

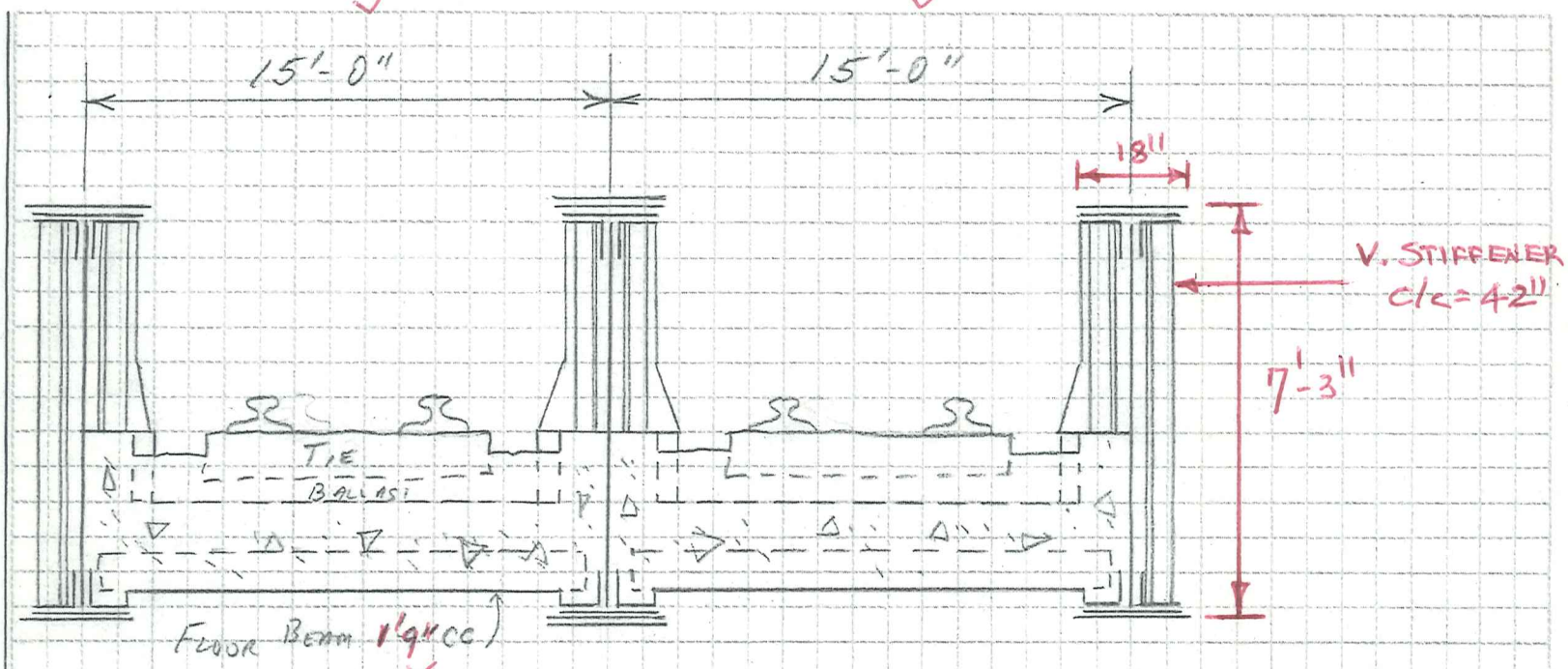
Sheet 1 of 2
Date 3/1/79
By MW
Ch'k. by



TAMS

Job No. 1489
Project N.Y.C. Bridge Inspection
Subject 7-10542-2 Abandoned LIRR over Union Turnpike - Queens

Sheet 1 of 2
Date 3/1/79
By MWW
Ch'k. by

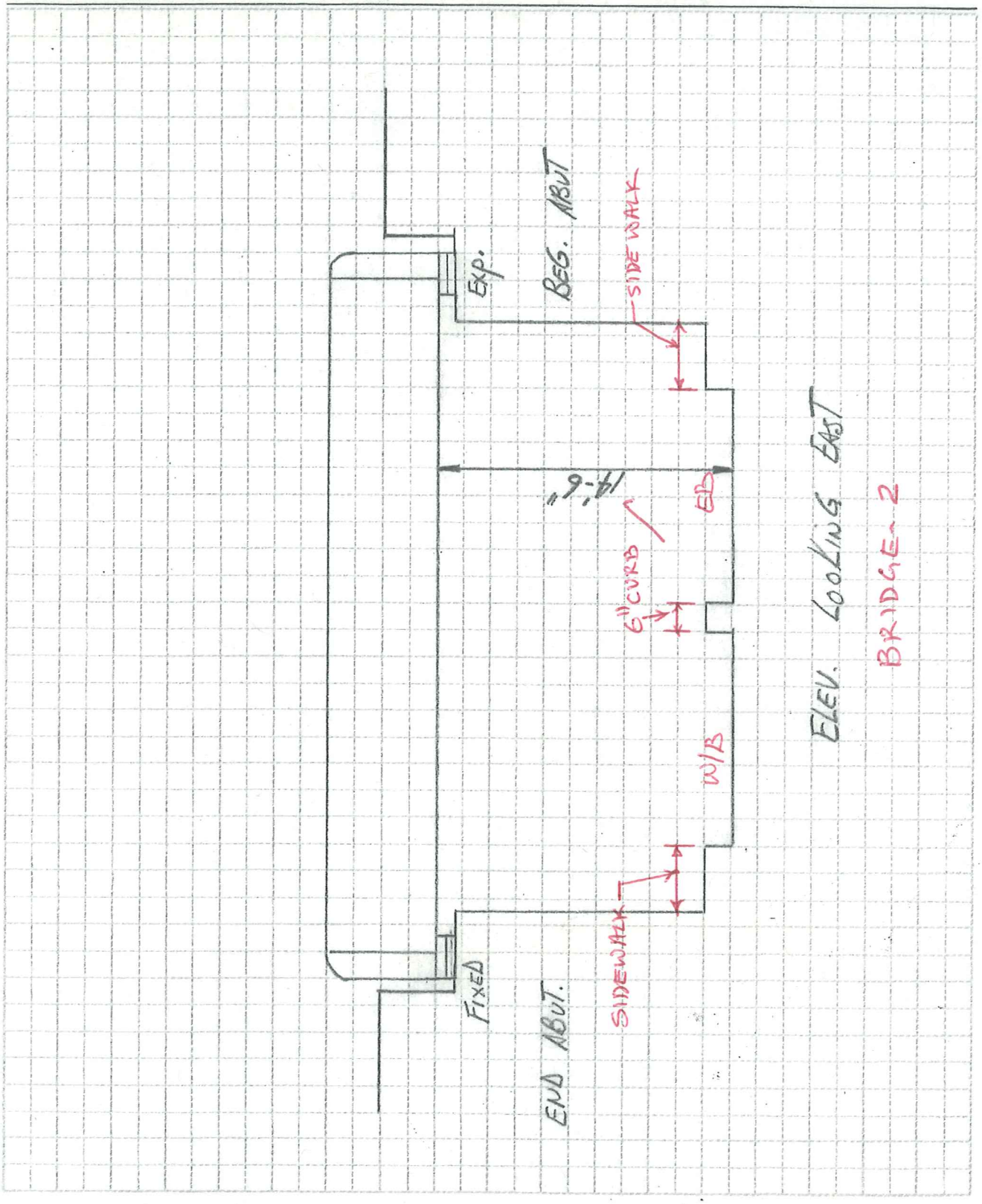


SECTION THRU BRIDGE 2

TAMS

Job No. 1489
Project N.Y.C. BRIDGE INSP.
Subject 7-70542-2
ABANDONED LIRR OVER UNION TURNPIKE

Sheet 1 of 2
Date 3/1/79
By B.L.
Ch'k. by M.W.



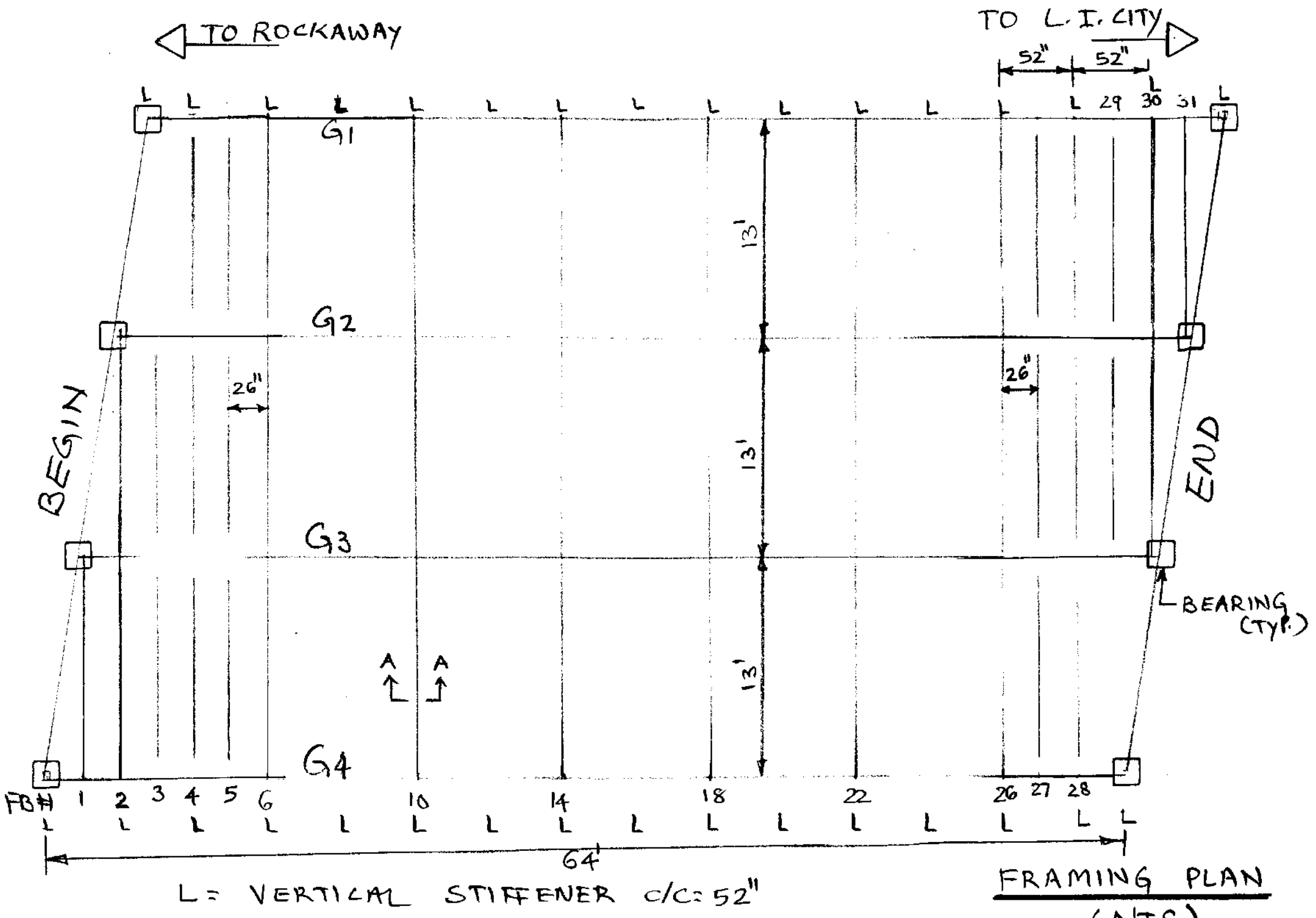
Inspection Field Notes

for

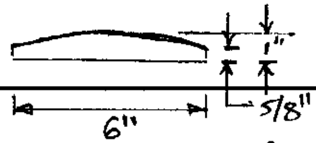
Park Lane South Bridge

JOB TITLE PARK LANE SO.
JOB NO.
SHEET
CALCULATION NO.
OF
ORIGINATOR
REVIEWER
DATE
DATE 12/13/13

PARK LANE SO. BIN - 7705440



FRAMING PLAN
(NTS)

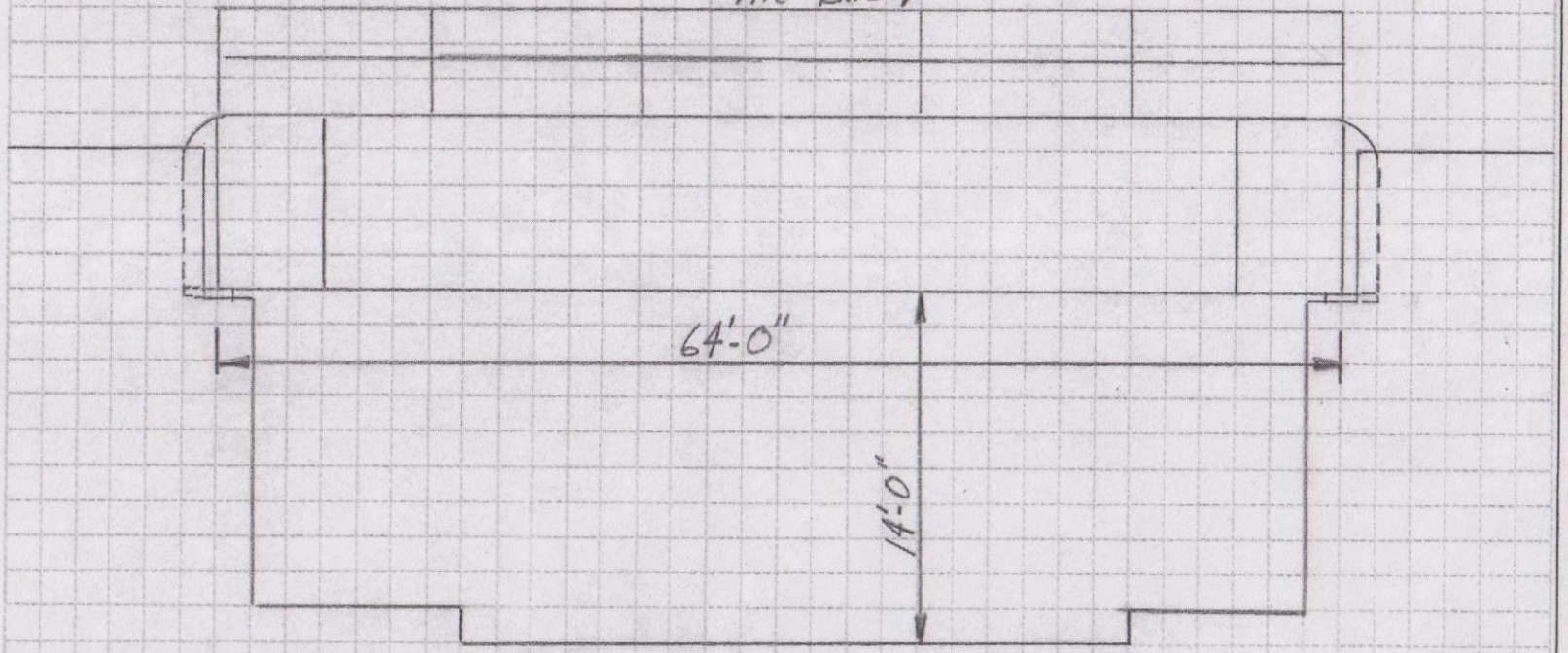


SECTION - A-A

NOTE: ① TOTAL 50'L x 1"D x 2-4" W SURFACE SPALL, CRACK WITH EFFLORESCENCE NOTED AT ALONG THE GIRDERS.

② FEW SURFACE SPALL (< 5% DECK AREA) NOTED BETWEEN THE FB's.

③ FH (13'H) x 1/8" W CR. NOTED AT END ABUT UNDER LEFT FASCIA GIRDER.



ELEV. LOOKING EAST

* BRIDGE POSTED VERTICAL CLEARANCE FOR 12'-8"

TAMS

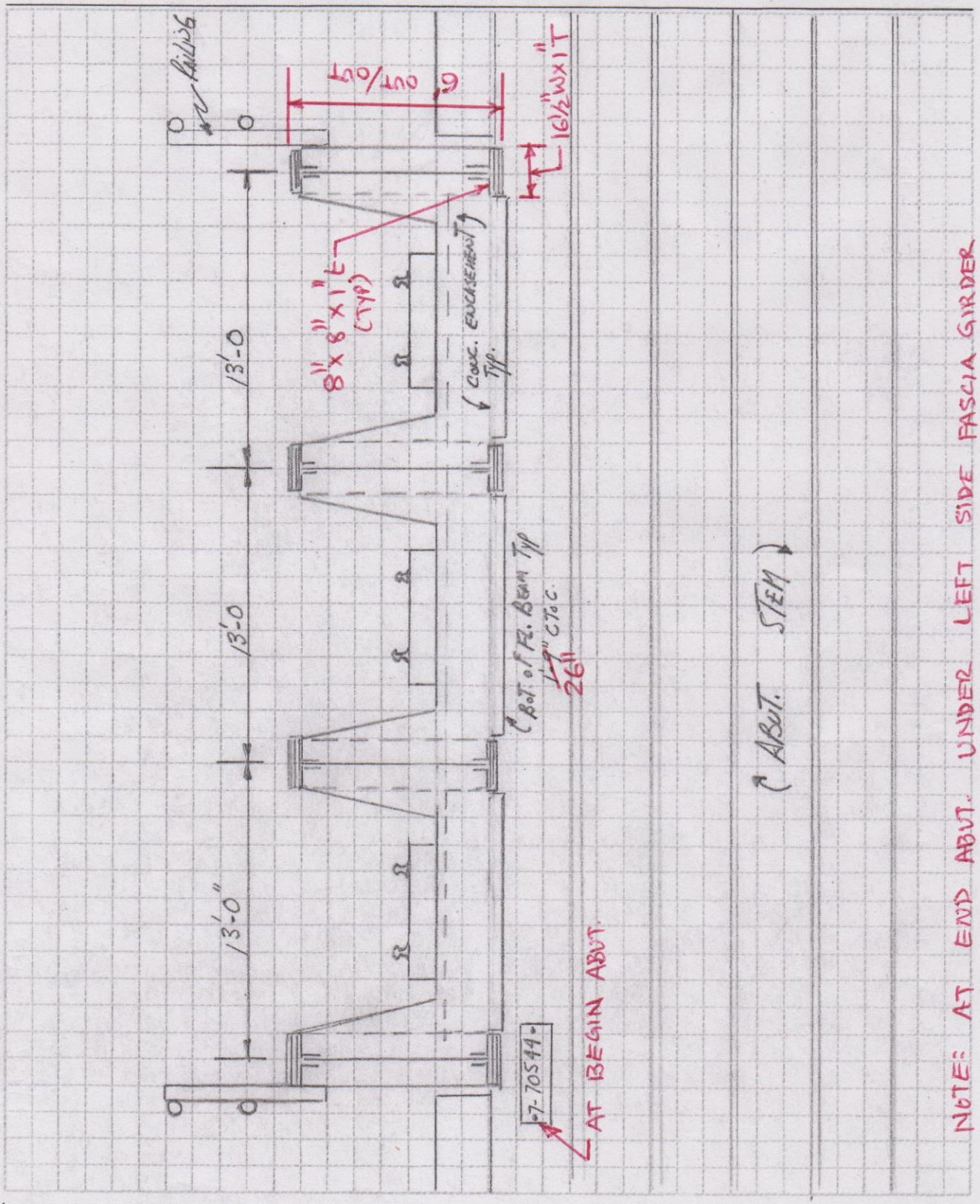
Job No. 1489
Project N.Y.C. BRIDGE INSPECTION
Subject 7-7D544.0
ABANDONED LIRR OVER PARKLANE SOUTH - QUEENS

Sheet 1 of 2
Date 3/1/79
By BL
Ch'k. by

TAMS

Job No. 1489
Project N.Y.C. BR. INSP
Subject PARK LANE So. LIRR
7-70544-0

Sheet 2 of 2
Date 3/2/79
By BLC
Ch'k. by



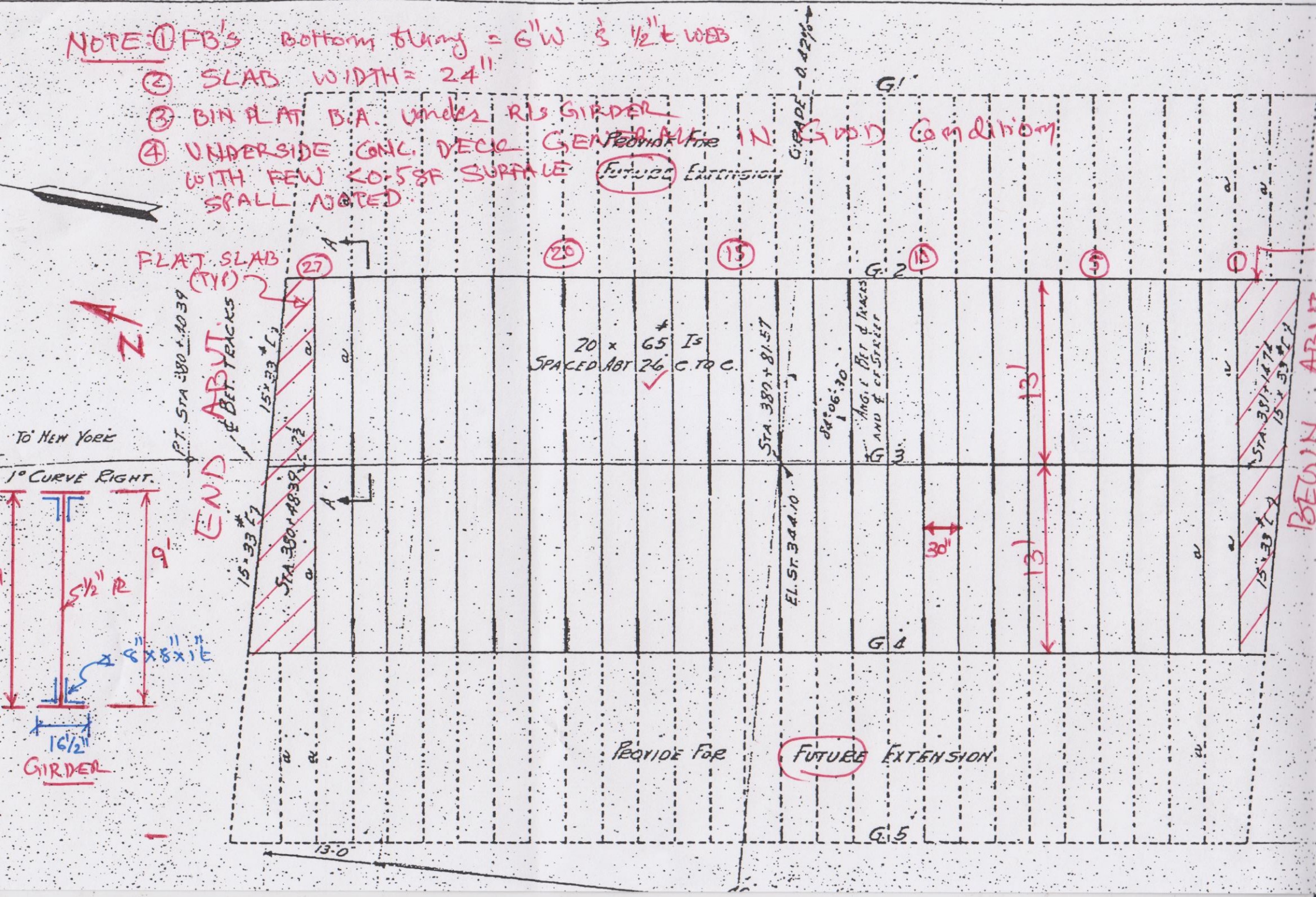
Inspection Field Notes

for

Jamaica Avenue Bridge

JAMAICA

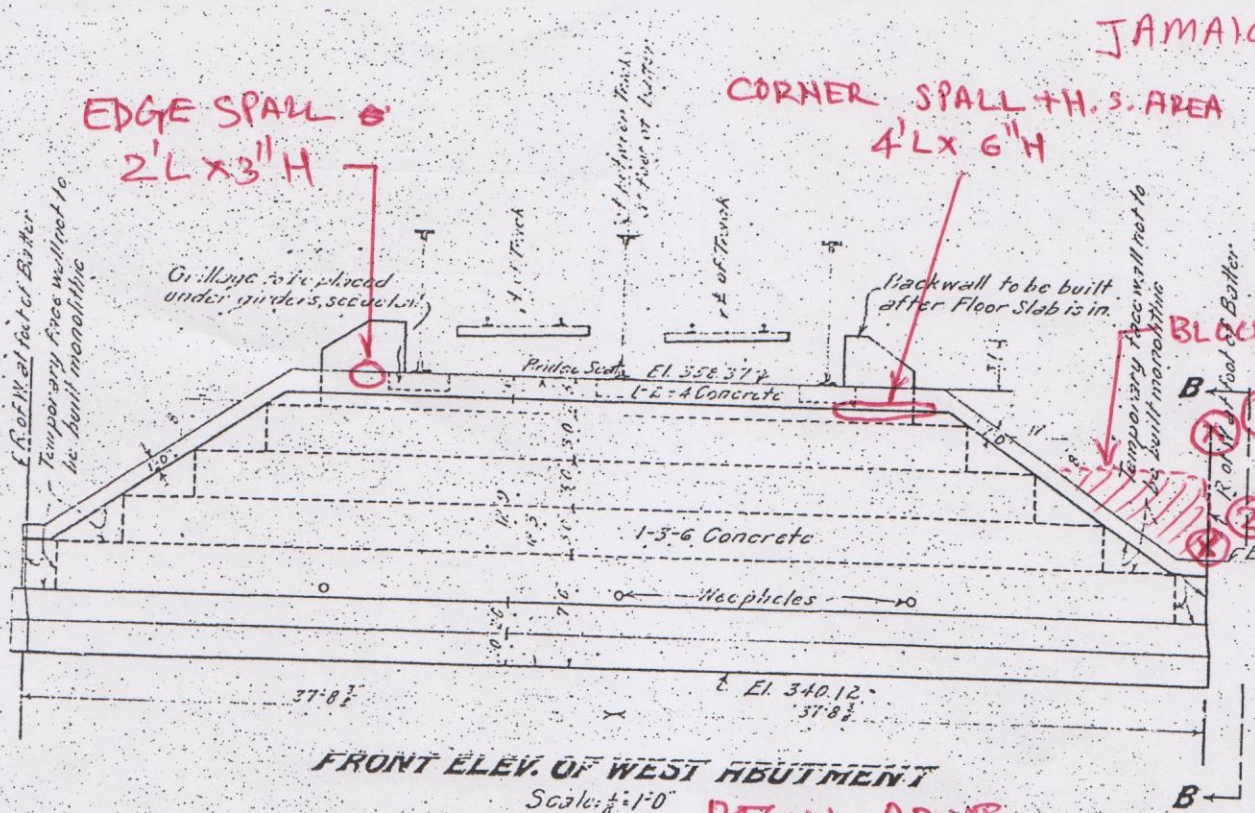
NOTE: ① FB's Bottom flang = 6"W x 1/2"t WEB
② SLAB WIDTH = 24"
③ BIN PLAT. B.A. Under RIB GIRDER
④ UNDERSIDE CONC. DECK GENERALLY IN GOOD CONDITION WITH FEW <0.5SF SURFACE SPALL NOTED.



JAMAICA AVE

EDGE SPALL @ 2'L x 3"H

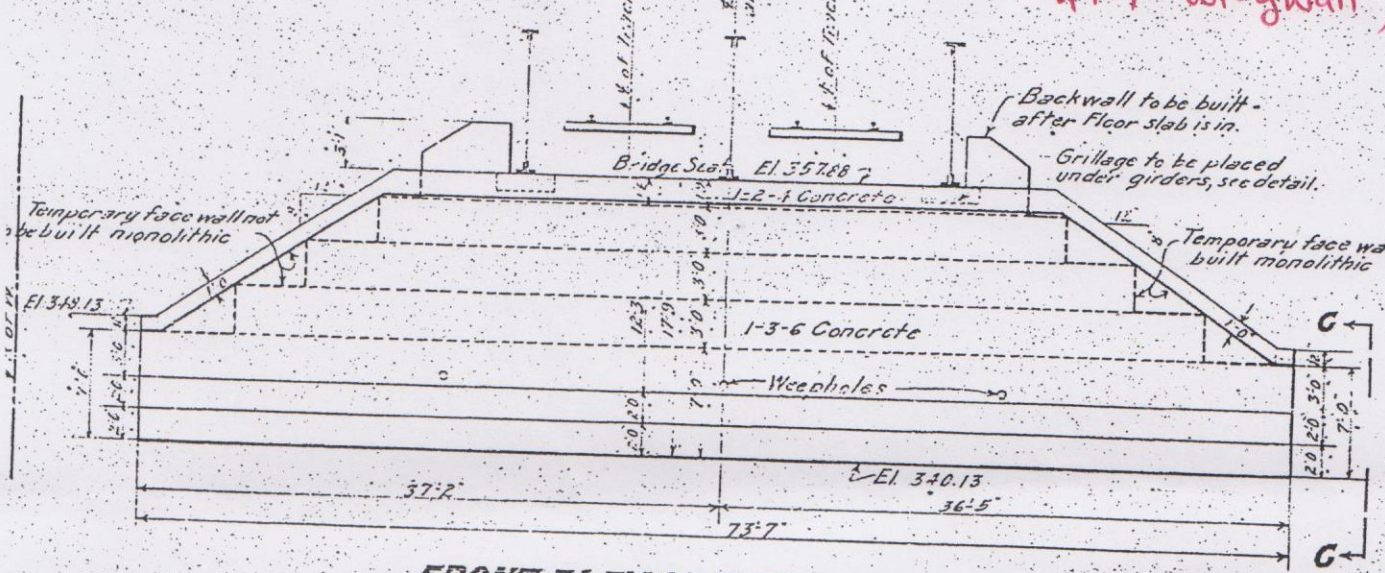
CORNER SPALL + H.S. AREA 4'L x 6"H



FRONT ELEV. OF WEST ABUTMENT
Scale: ⅛"=1'-0"

BEGIN ABUT.

(*) TWO FH V. CR (1/8" W) ON BEGIN LEFT W/W
1 - 6' (FH) x 2-3" W CR ON BLOCK PAVING WALL, 10' FROM CORNER
2 - 15" FROM CORNER (2½' in BLOCK WALL & 5'H in WingWall)
1"W x 7½' H CRACK



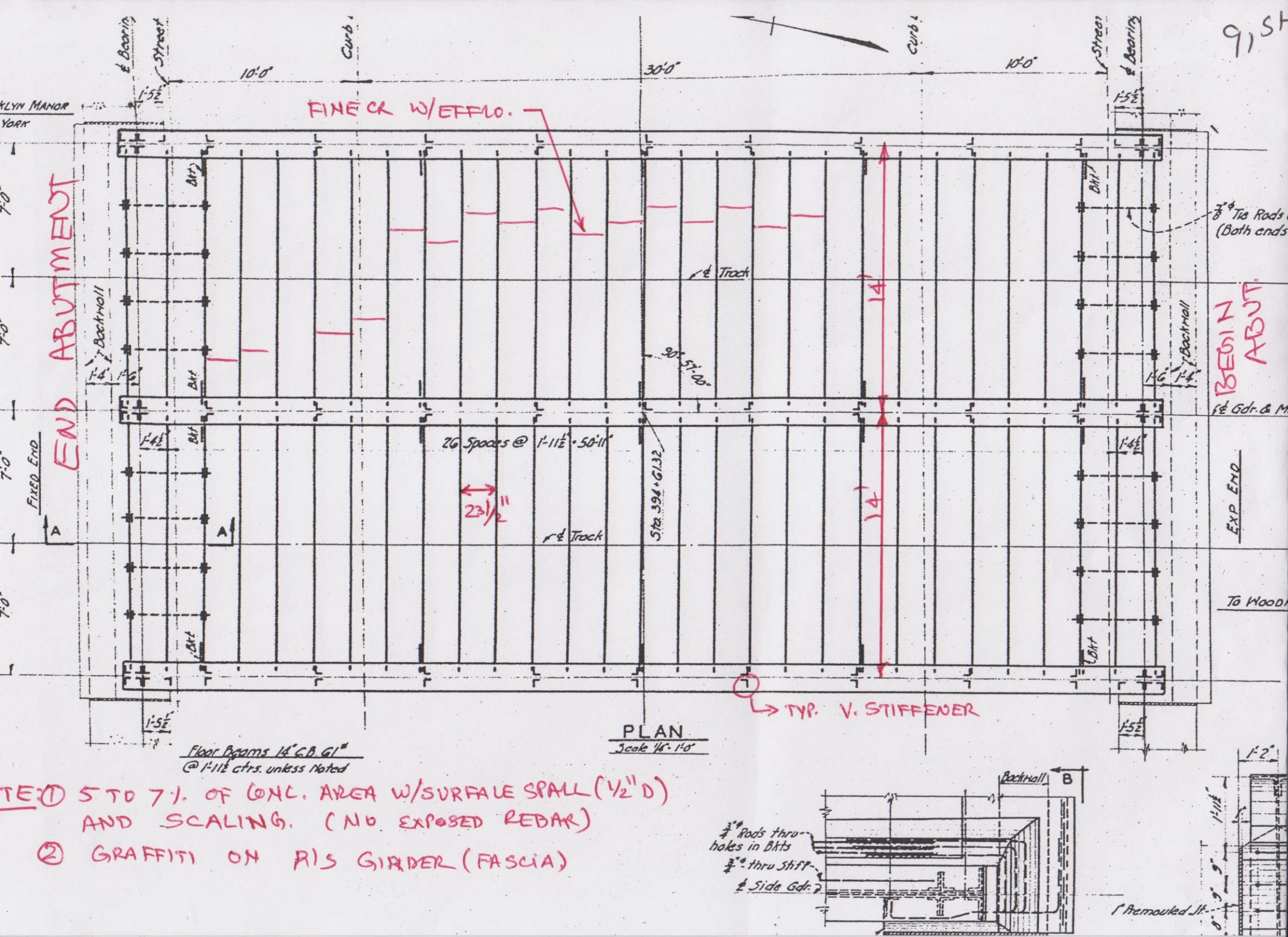
FRONT ELEV. OF EAST ABUTMENT
Scale: ⅛"=1'-0"

ary face walls not to be bonded to abutment.
k of face wall one

Inspection Field Notes

for

91 Avenue Bridge



NOTE: ① 5 TO 7% OF CONC. AREA W/SURFACE SPALL (½" D) AND SCALING. (NO EXPOSED REBAR)

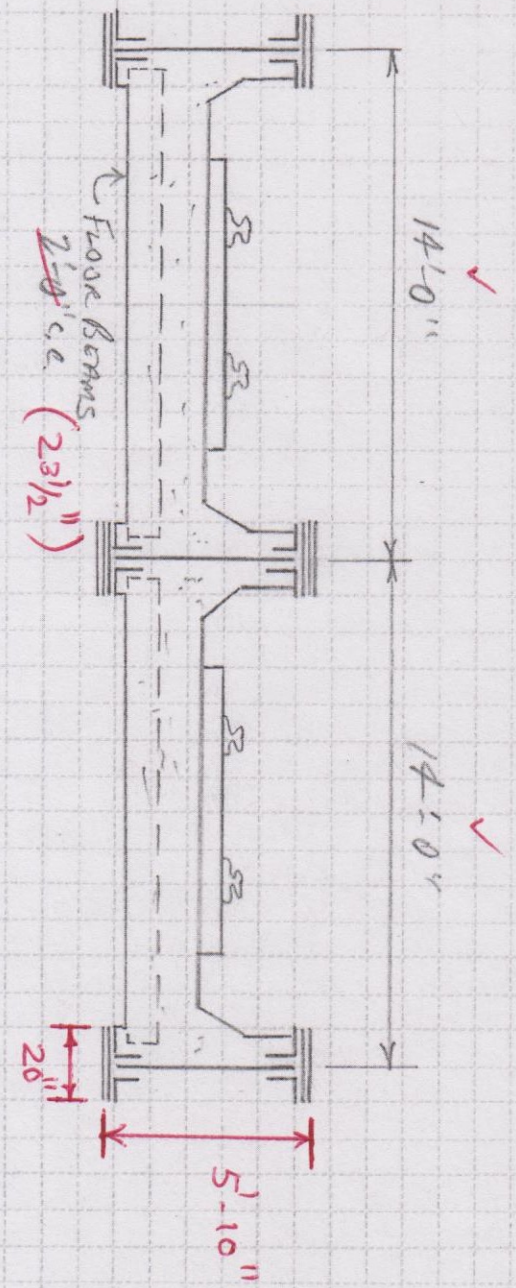
② GRAFFITI ON R/S GIRDER (FASCIA)

TAMS

Job No. 1489
Project N.Y.C. BRIDGE INSPECTION
Subject I-70 560-0
LIRR - ABANDONED - OVER 91ST AVE - QUEENS

Sheet 2 of 2
Date 3/5/79
By MW
Ch'k. by

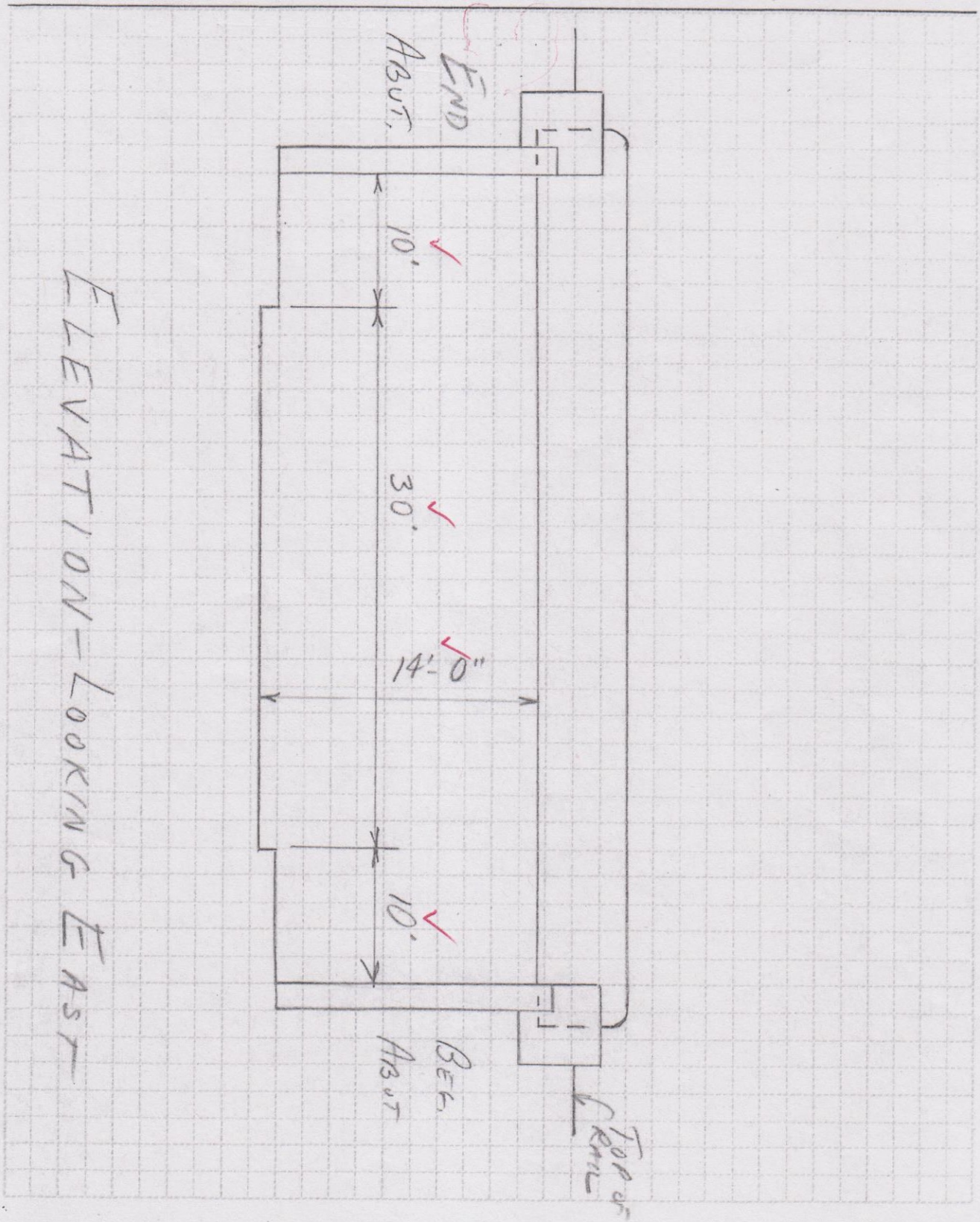
SECTION THRU BRIDGE - LOOKING NORTH



TAMS

Job No. 1489
Project N.Y.C. BRIDGE INSPECTION
Subject 7-70560-0
LIRR-ABOND MED OVER 91ST AVE.-QUEENS

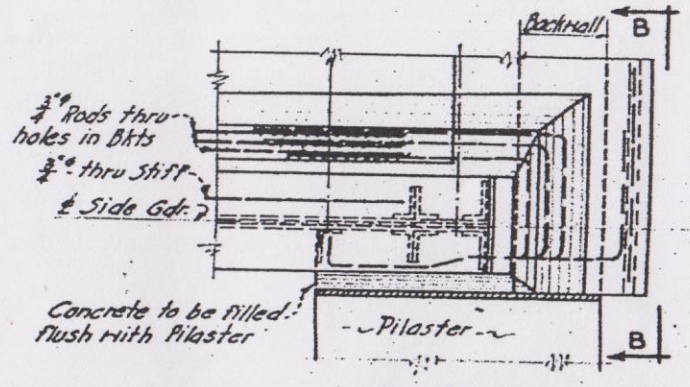
Sheet 1 of 2
Date 3/5/79
By MW
Ch'k. by



Floor Beams 14" G.B. 61#
@ 1'-11½ ctrs. unless noted

Scale ¼" = 1'-0"

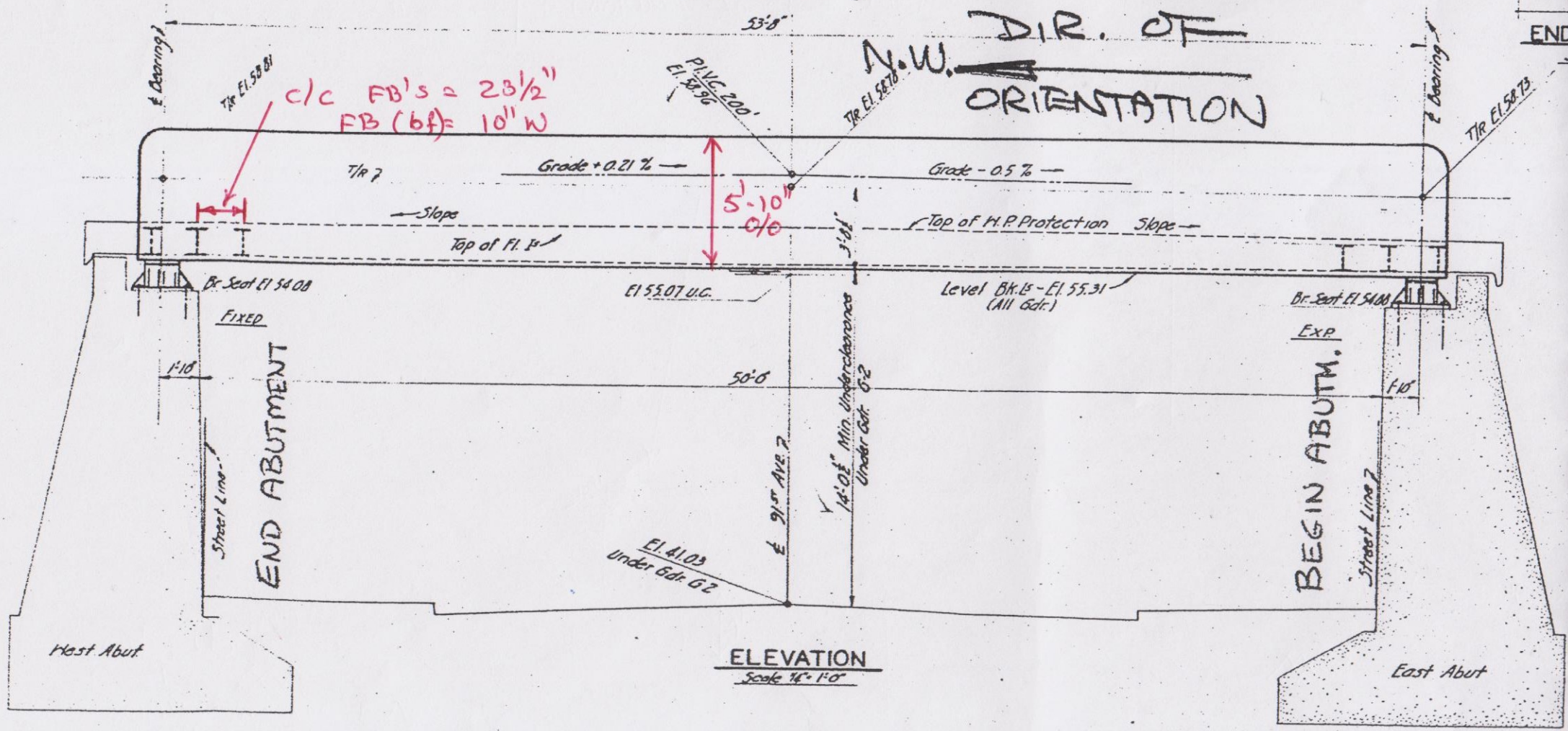
91 ST AVE



PLAN
AT ENDS OF SIDE GDRS.

SPAN 1

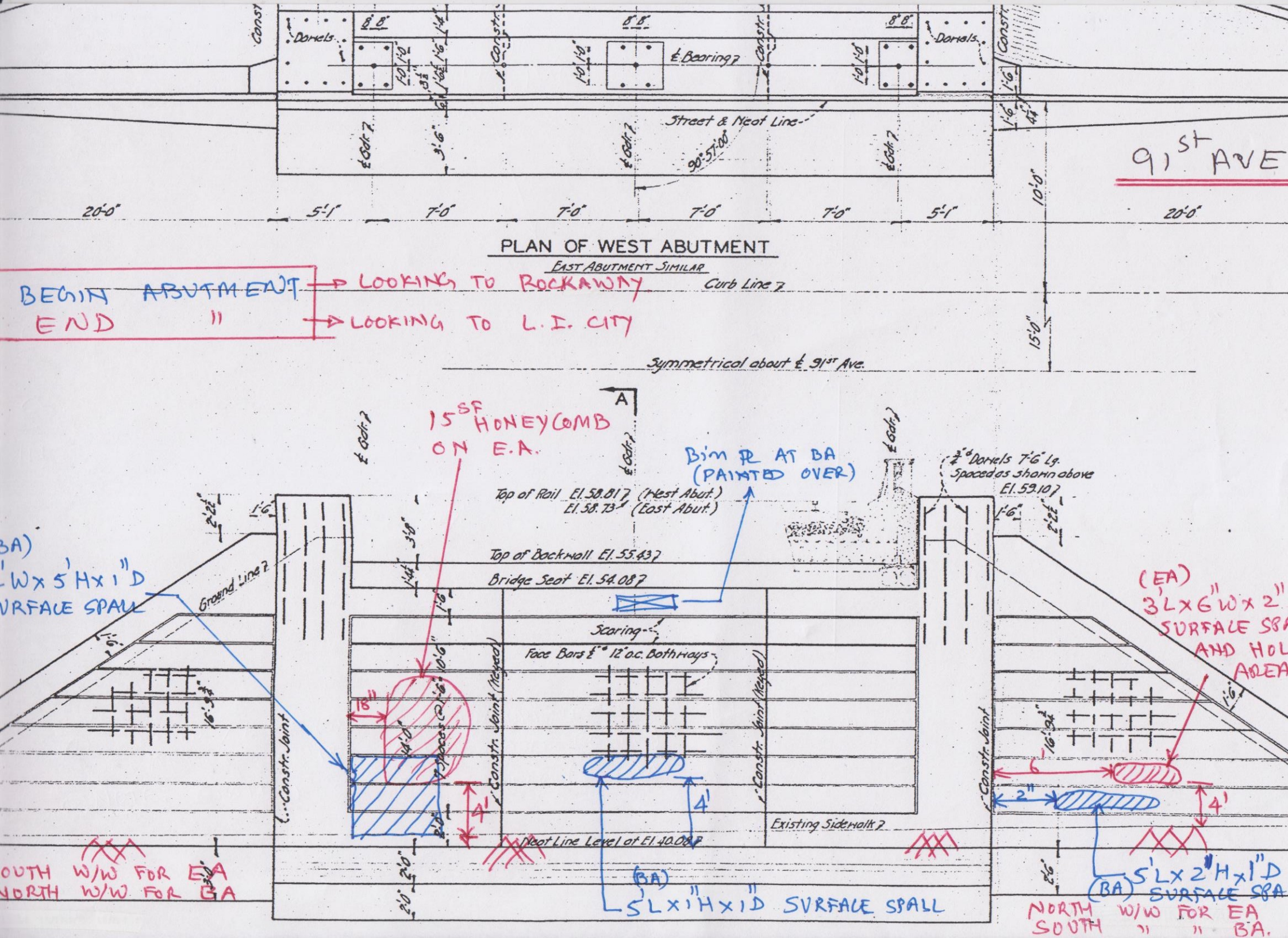
N.W. DIR. OF ORIENTATION



ELEVATION
Scale ¼" = 1'-0"

END

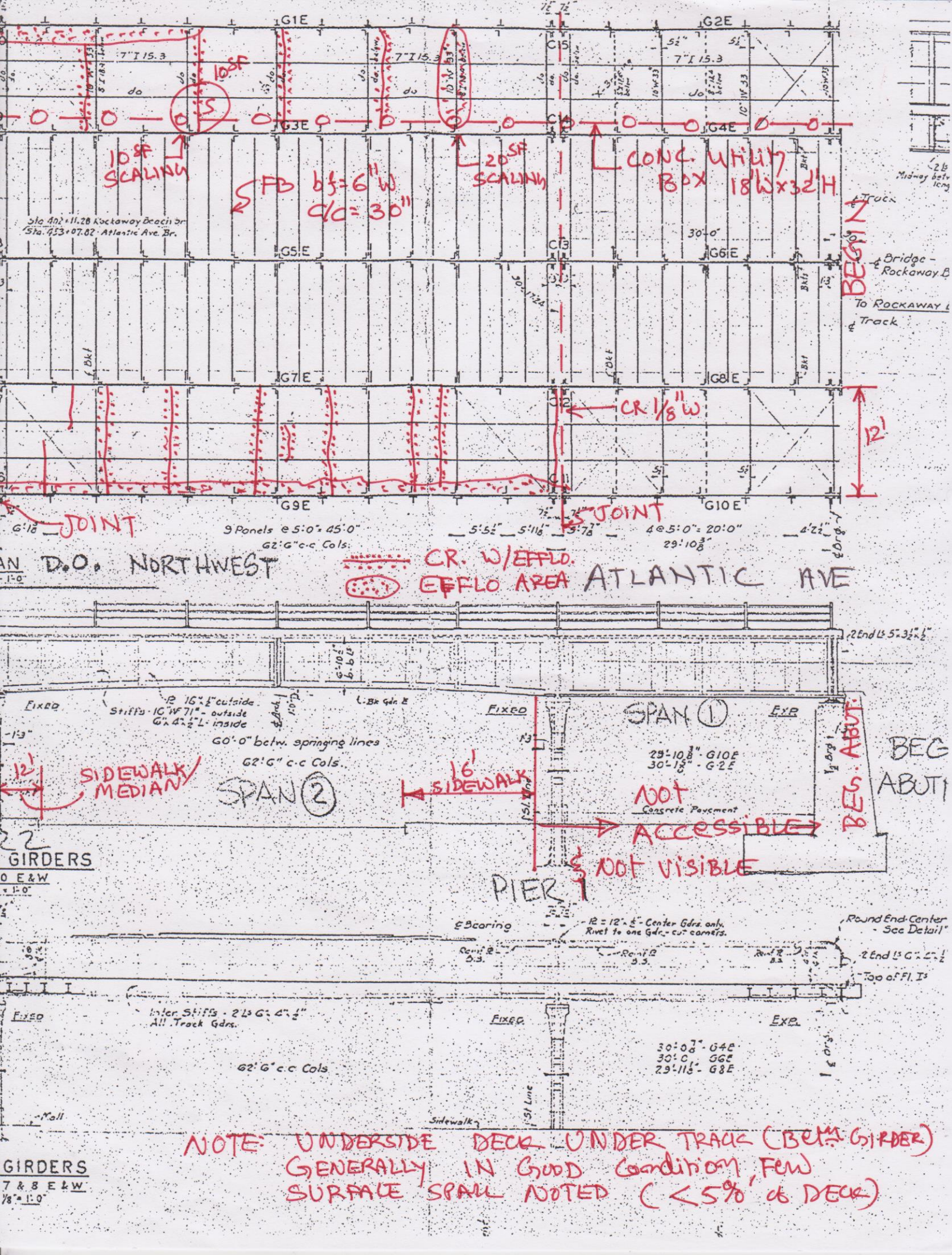
Scan of U.S. Paradise


Const.
Dorels
8'-8"
℄ Bearing
Const.
Street & Neat Line
90°-57'-00"
℄ Girder
91ST AVE
20'-0"
5'-1"
7'-0"
7'-0"
7'-0"
7'-0"
5'-1"
10'-0"
20'-0"
PLAN OF WEST ABUTMENT
EAST ABUTMENT SIMILAR
BEGIN ABUTMENT → LOOKING TO ROCKAWAY
END " → LOOKING TO L.I. CITY
Curb Line
15'-0"
Symmetrical about ℄ 91st Ave.
A
15SF HONEYCOMB ON E.A.
Bim ℞ AT BA (PAINTED OVER)
Top of Rail El. 58.81 (West Abut.)
El. 58.73 (East Abut.)
Top of Backwall El. 55.43
Bridge Seat El. 54.08
Scoring
Face Bars ℄ 12" o.c. Both Ways
Constr. Joint (Keyed)
Ground Line
Existing Sidewalk
Neat Line Level at El. 40.08
18"
4'
(BA) 5'L x 1"H x 1"D SURFACE SPALL
(EA) 3'L x 6"W x 2" SURFACE SPA AND HOL AREA
5'L x 2"H x 1"D SURFACE SPA
(BA)
SOUTH W/W FOR EA
NORTH W/W FOR BA
NORTH W/W FOR EA
SOUTH " " BA.

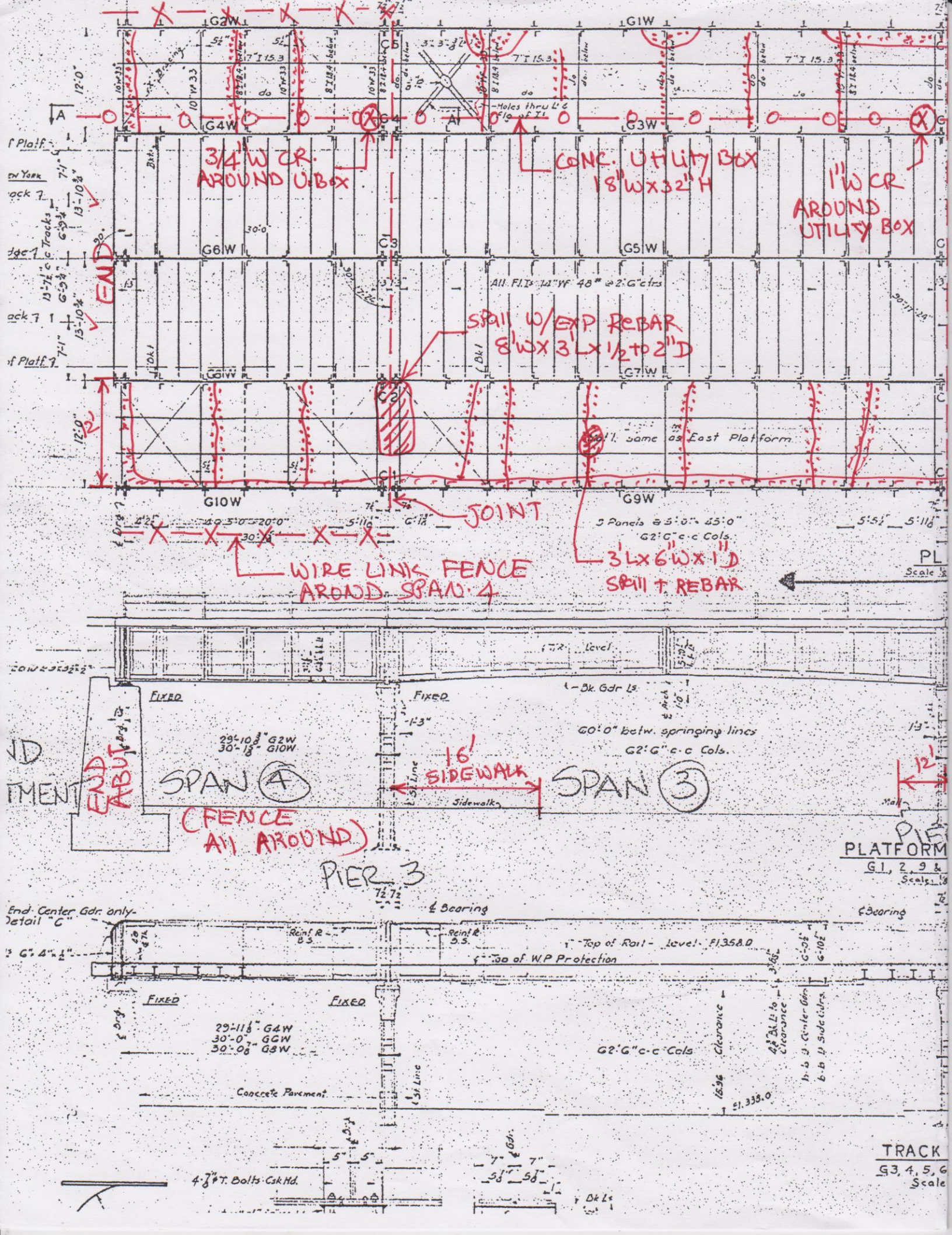
Inspection Field Notes

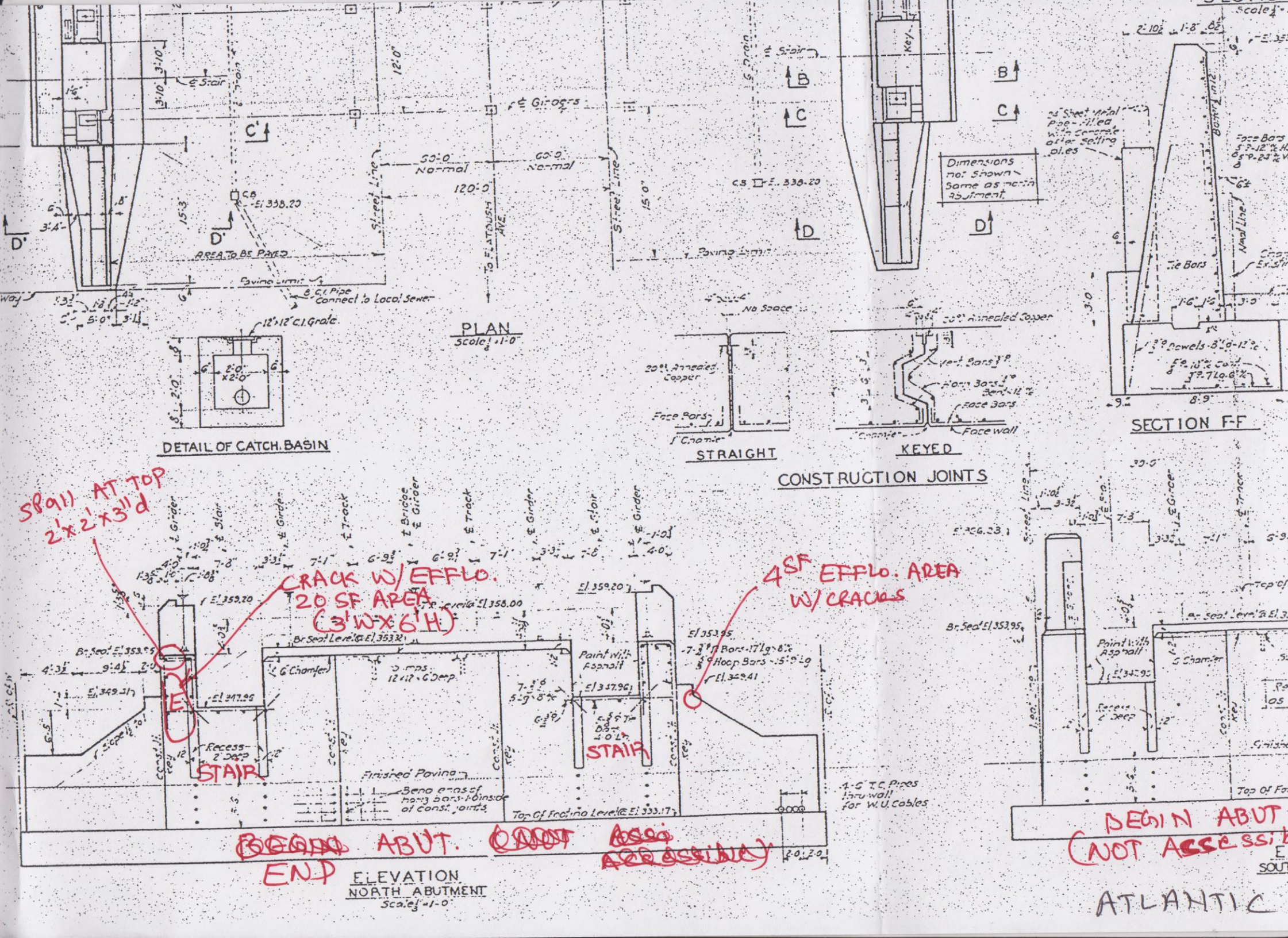
for

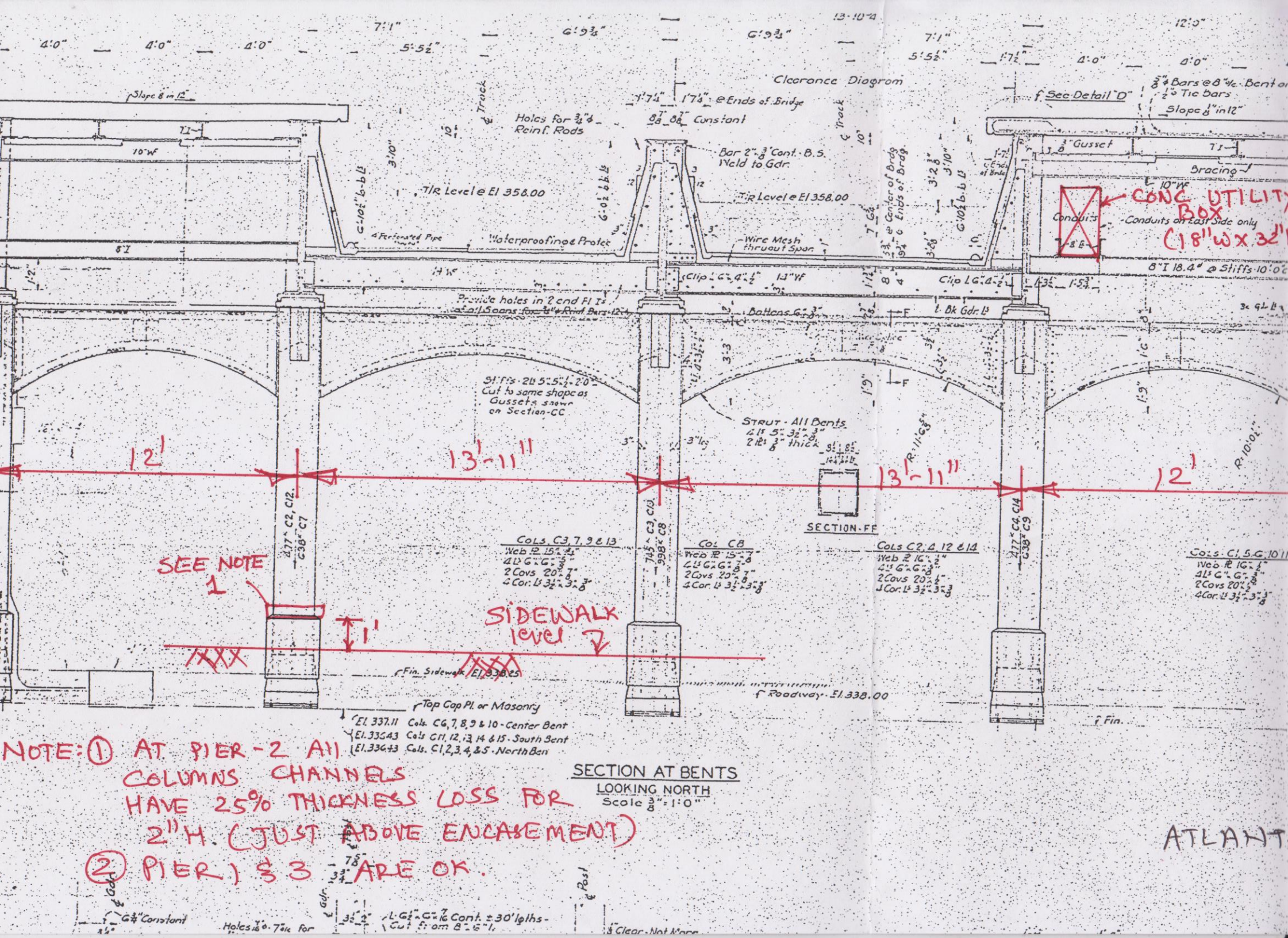
Atlantic Avenue Bridge



NOTE: UNDERSIDE DECK UNDER TRACK (BETW. GIRDER) GENERALLY IN GOOD CONDITION, FEW SURFACE SPALL NOTED (<5% of DECK)


3/4" W CR. AROUND U. BOX
CONC. UTILITY BOX 18"W x 32"H
1" W CR AROUND UTILITY BOX
END
SPALL W/EXP REBAR 8'W x 3'L x 1/2 to 2"D
JOINT
WIRE LINK FENCE AROUND SPAN 4
3'L x 6"W x 1"D SPALL W/ REBAR
PL
END ABUTMENT
SPAN 4
(FENCE ALL AROUND)
16' SIDEWALK
SPAN 3
PIER 3
PLATFORM G1, 2, 9 &
TRACK G3, 4, 5, 6
Concrete Pavement
4-7/8" T. Bolts Csk Hd.


PLAN
Scale 1/8" = 1'-0"
DETAIL OF CATCH BASIN
STRAIGHT
KEYED
CONSTRUCTION JOINTS
SECTION F-F
ELEVATION
NORTH ABUTMENT
Scale 1/4" = 1'-0"
SPALL AT TOP
2'x2'x3"d
CRACK W/EFFLO.
20 SF AREA
(3'W x 6'H)
4SF EFFLO. AREA
W/ CRACKS
BEGIN ABUT.
END
BEGIN ABUT
(NOT ACCESSIBLE)
ATLANTIC



NOTE: ① AT PIER-2 All COLUMNS CHANNELS HAVE 25% THICKNESS LOSS FOR 2"H. (JUST ~~ABOVE~~ ENCASEMENT)

② PIER) S 3 ARE OK.

ATLANT

Inspection Field Notes

for

Elevated Viaduct – 97 Avenue Bridge

WEIDLINGER ASSOCIATES INC
CONSULTING ENGINEERS

☐ MEETING MINUTES
☐ FIELD OBSERVATION
☐ TELEPHONE LOG
☐ MEMORANDUM
☐ DESIGN NOTES

PROJECT	
WAI NUMBER	
BY	DATE
CHECKED BY	DATE

TO	
FIRM	
PHONE	FAX
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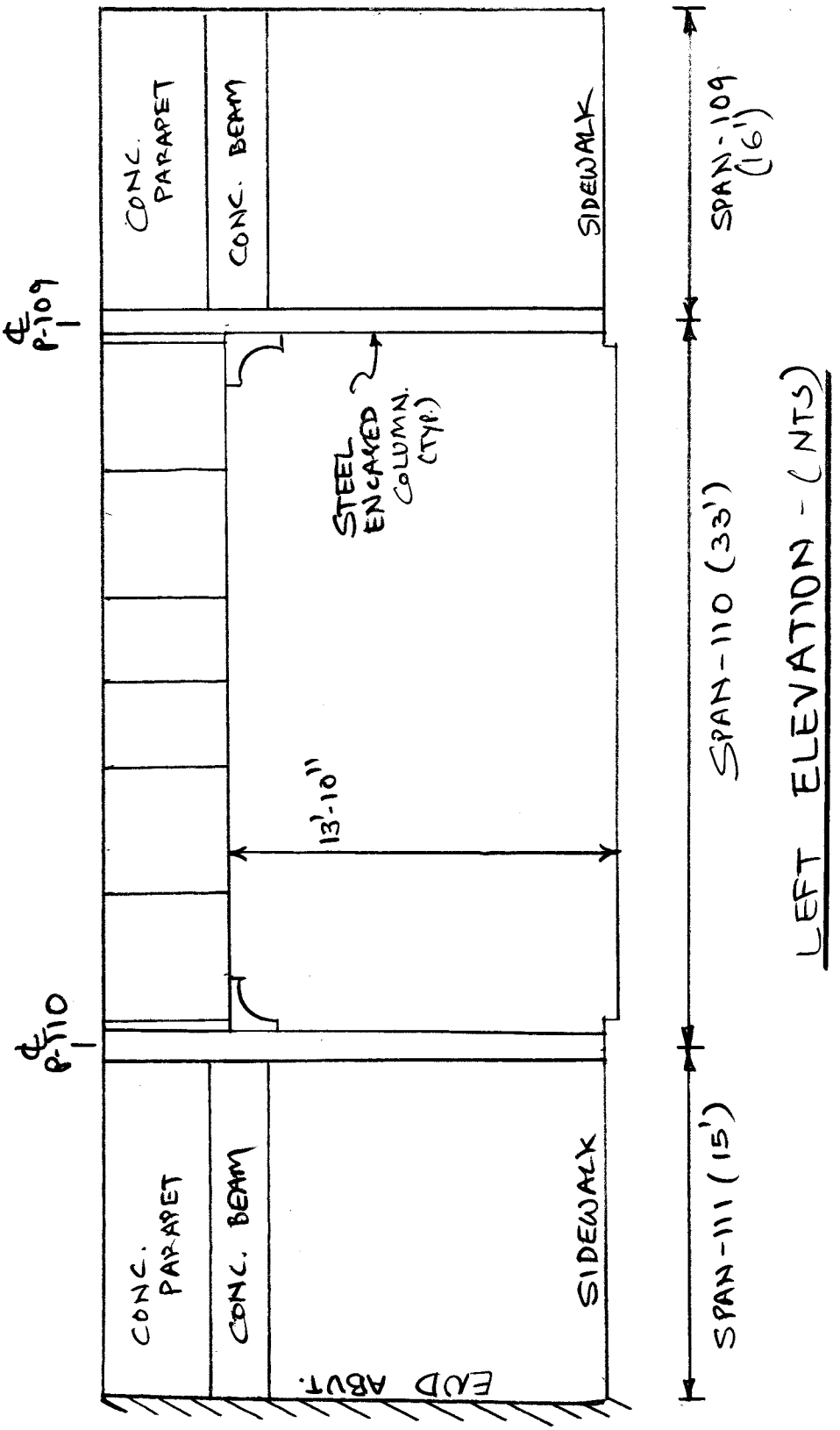
97TH AVE.



LEFT ELEVATION - (NTS)

ACTION

DISTRIBUTION

WEIDLINGER ASSOCIATES INC

CONSULTING ENGINEERS

☐ MEETING MINUTES
☐ FIELD OBSERVATION
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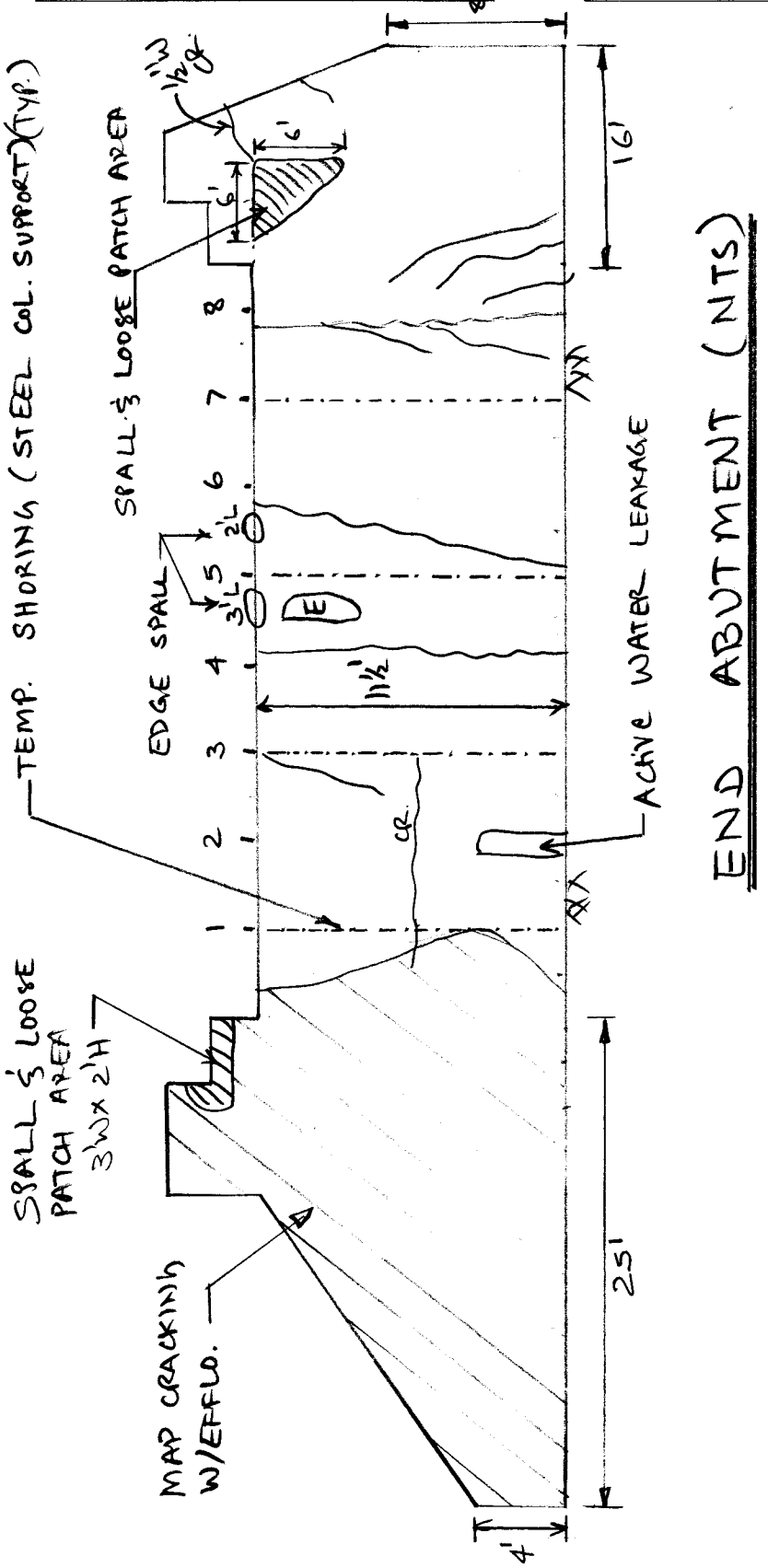
97TH AVE.

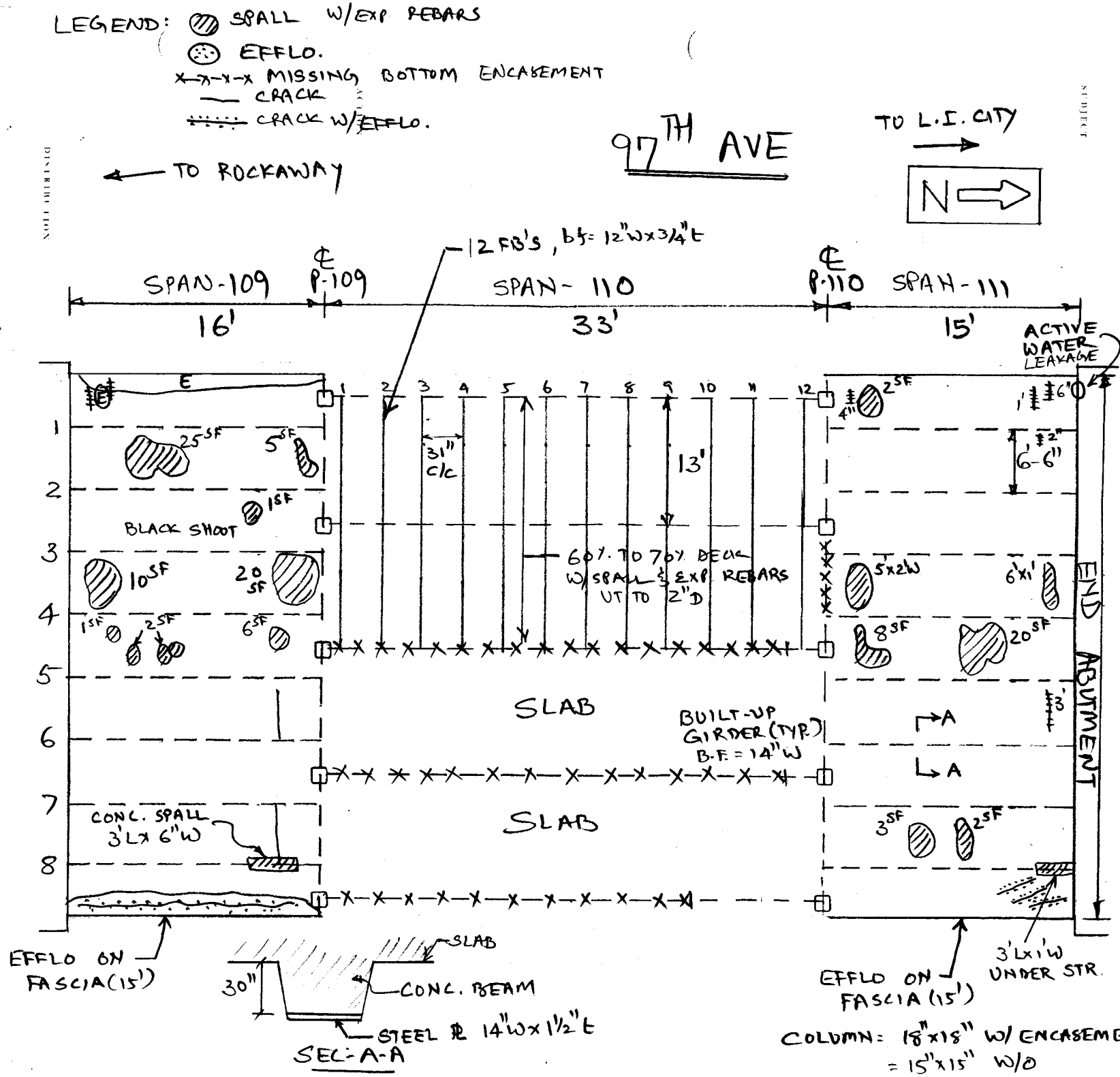


END ABUTMENT (NTS)

E - EFFLORESCENCE AREA.

ACTION

DISTRIBUTION


LEGEND: SPALL W/EXP REBARS
EFFLO.
MISSING BOTTOM ENCASEMENT
CRACK
CRACK W/EFFLO.
97TH AVE
TO ROCKAWAY
TO L.I. CITY
N
12 FB's, bf= 12"W x 3¼"t
SPAN-109
16'
℄ P-109
SPAN- 110
33'
℄ P-110
SPAN-111
15'
ACTIVE WATER LEAKAGE
END ABUTMENT
31" c/c
13'
6'-6"
60% TO 70% DECK W/ SPALL & EXP REBARS UT TO 2"D
SLAB
SLAB
BUILT-UP GIRDER (TYP.) B.F. = 14"W
A
A
BLACK SHOOT
CONC. SPALL 3'L x 6"W
EFFLO ON FASCIA (15')
EFFLO ON FASCIA (15')
3'Lx1'W UNDER STR.
SLAB
30"
CONC. BEAM
STEEL PL 14"W x 1½"t
SEC-A-A
COLUMN: 18"x18" W/ ENCASEMENT
= 15"x15" W/O
25SF
5SF
1SF
10SF
20SF
1SF
2SF
6SF
2SF
6"
2"
5x2W
6'x1'
8SF
20SF
3'
3SF
2SF
DISTRIBUTION
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WEIDLINGER ASSOCIATES INC
CONSULTING ENGINEERS

Inspection Field Notes

for

Elevated Viaduct – 101 Avenue Bridge

WEIDLINGER ASSOCIATES INC
CONSULTING ENGINEERS

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☐ MEETING MINUTES
☐ FIELD OBSERVATION
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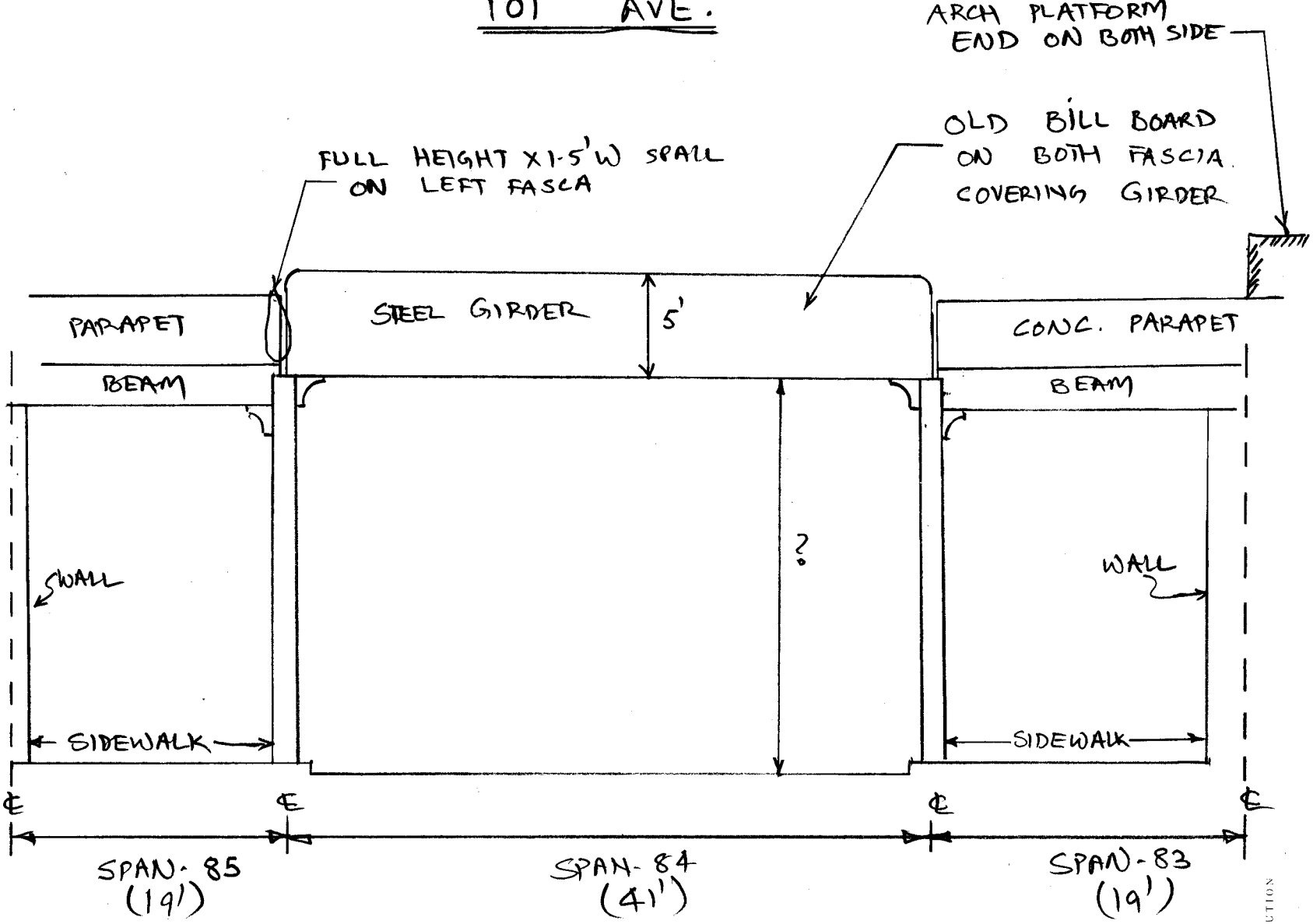
ACTION

DISTRIBUTION

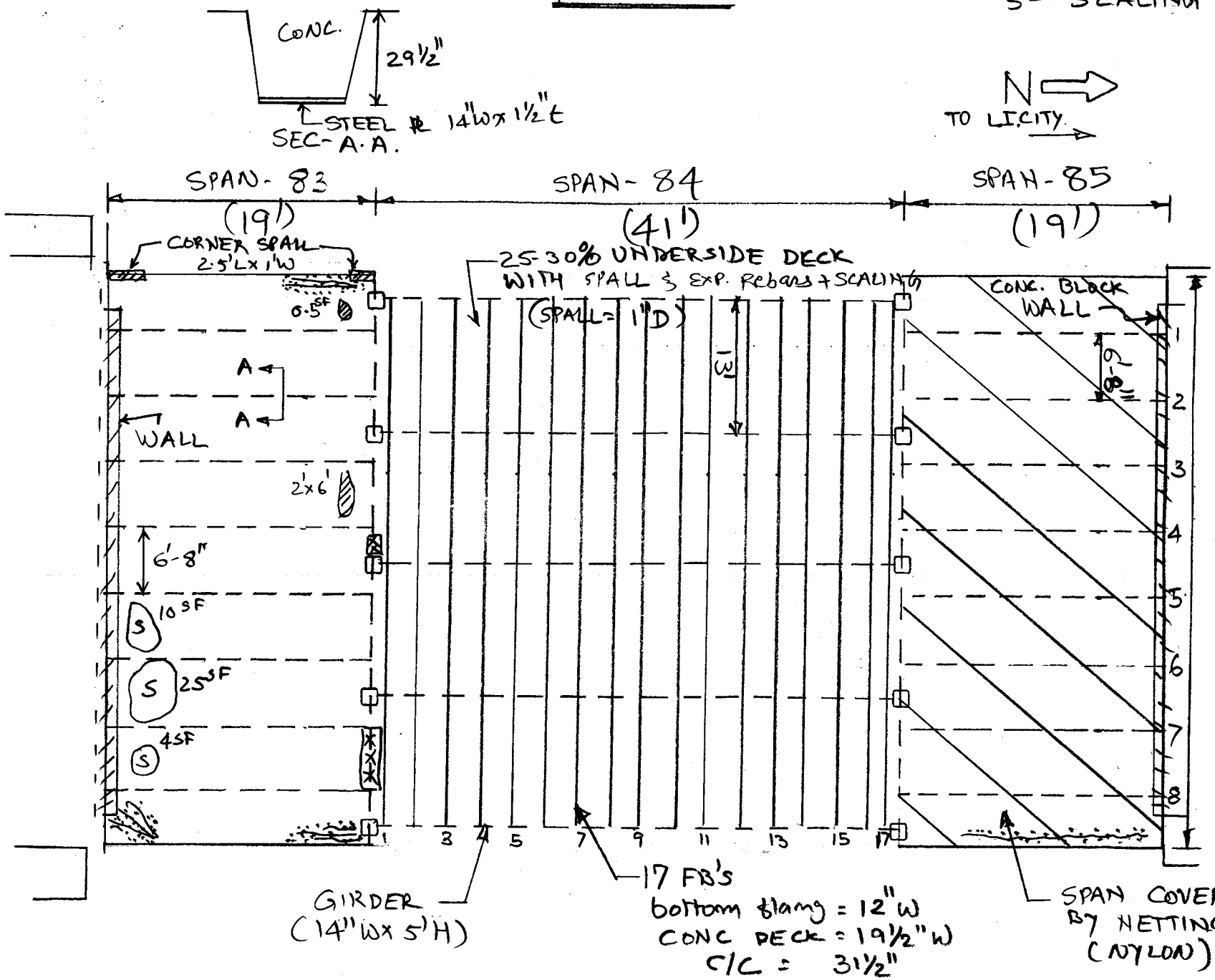
101ST AVE.



LEFT ELEVATION (NTS)

LEGEND:- SPALL W/EXP. REBAR (1"D)
CR. W/EFFLO
MISSING BOTTOM ENCASEMENT
S- SCALING

101 AVE



WEIDLINGER ASSOCIATES INC
CONSULTING ENGINEERS

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101 AVE.
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Inspection Field Notes

for

Elevated Viaduct – 103 Avenue Bridge

WEIDLINGER ASSOCIATES INC
CONSULTING ENGINEERS

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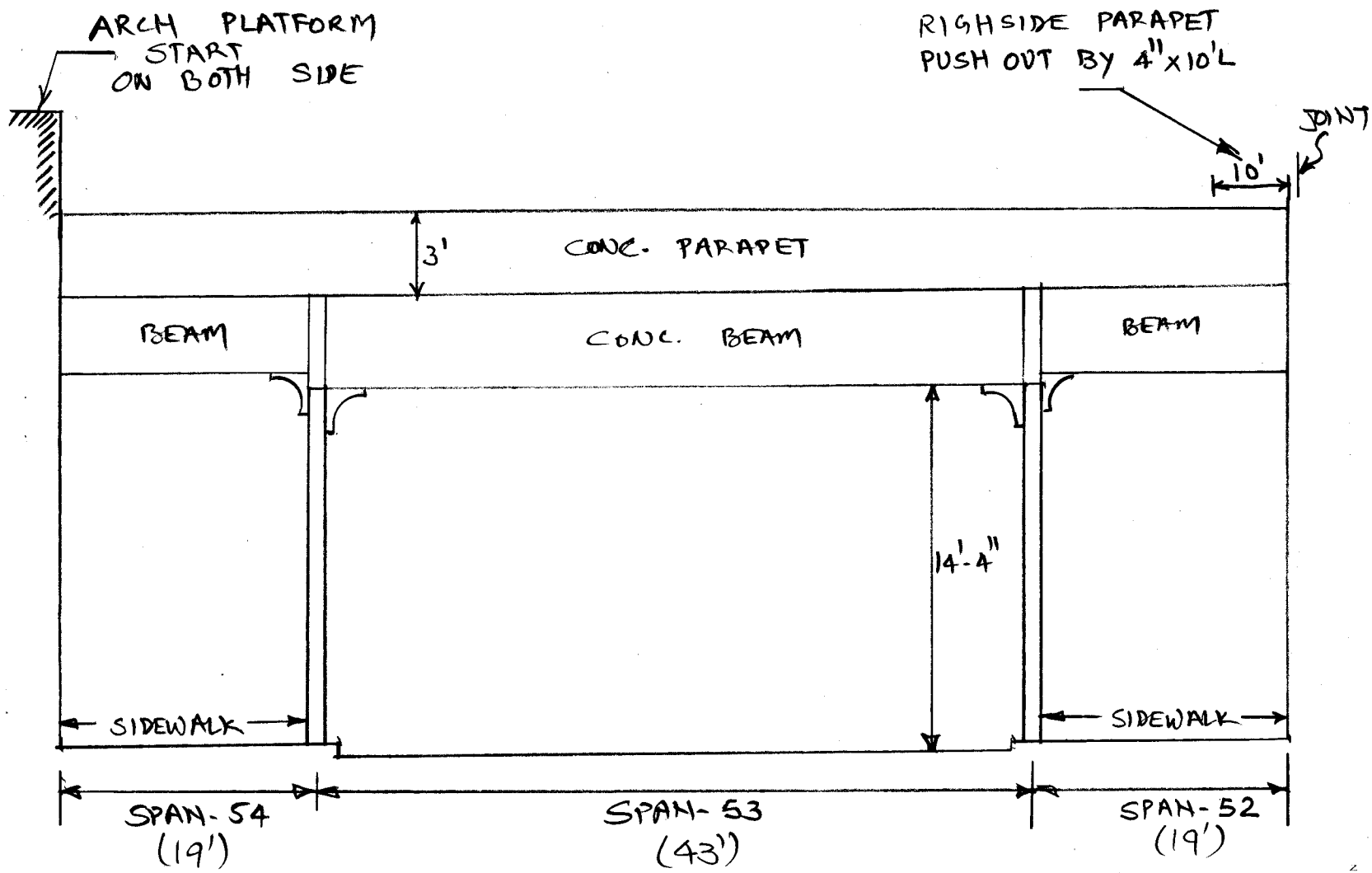
ACTION

DISTRIBUTION

103RD AVE



NOTE: SPAN 49-51 ARE PARKING LOT AND GENERALLY IN OK CONDITION.

LEFT ELEVATION (NTS)

WEIDLINGER ASSOCIATES INC
CONSULTING ENGINEERS

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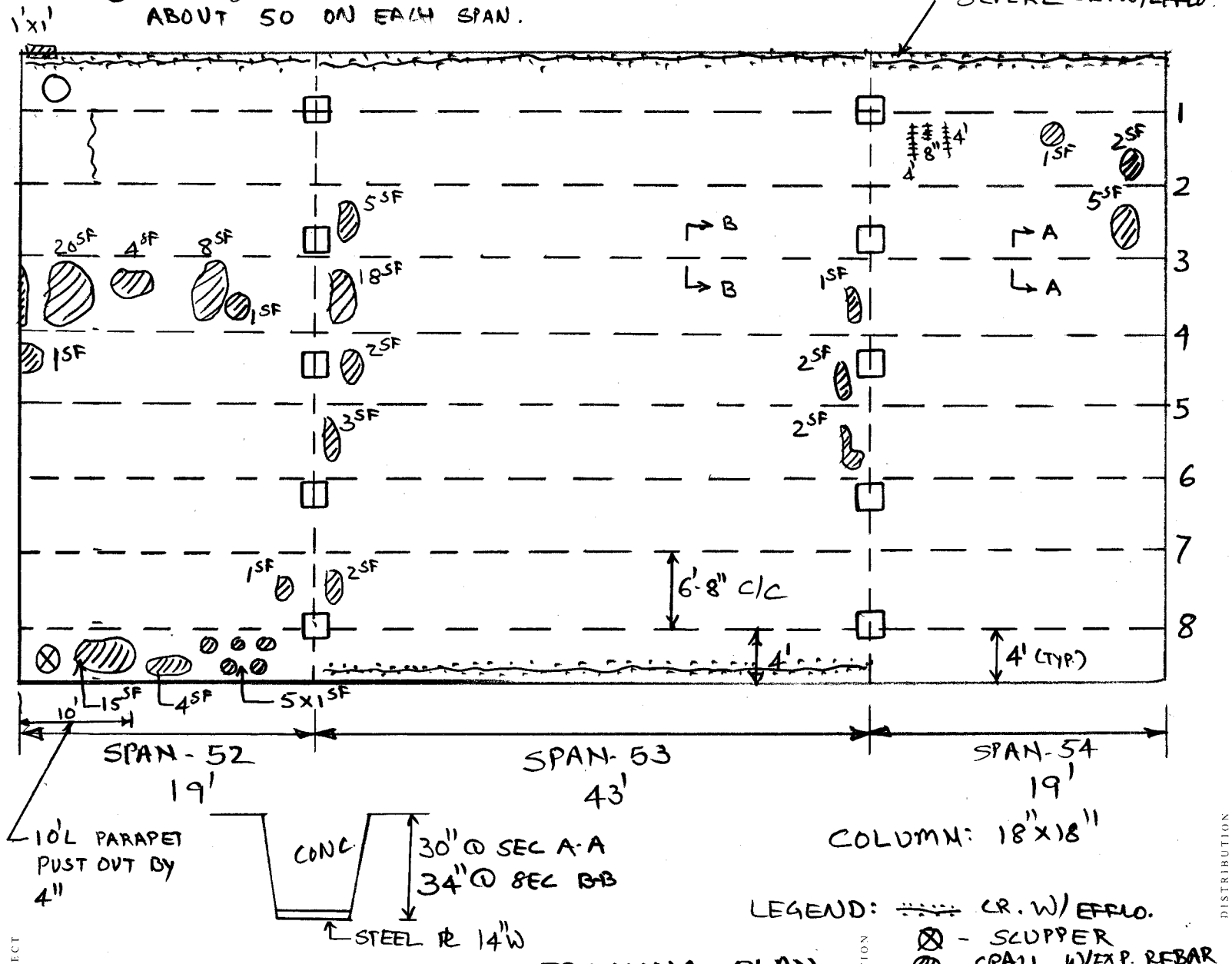
SUBJECT

NOTE: ① ABOUT 10-15% DELAMINATED CONC. AREA NOTED IN ALL THREE SPANS.

② SPALL ON VERTICAL FACE OF FB'S (0.2 TO 0.3 SF x 3 1/4" D) ABOUT 50 ON EACH SPAN.

N ⇨ TO L.I. CITY



FRAMING PLAN
(NTS)

ACTION

DISTRIBUTION

Inspection Field Notes

for

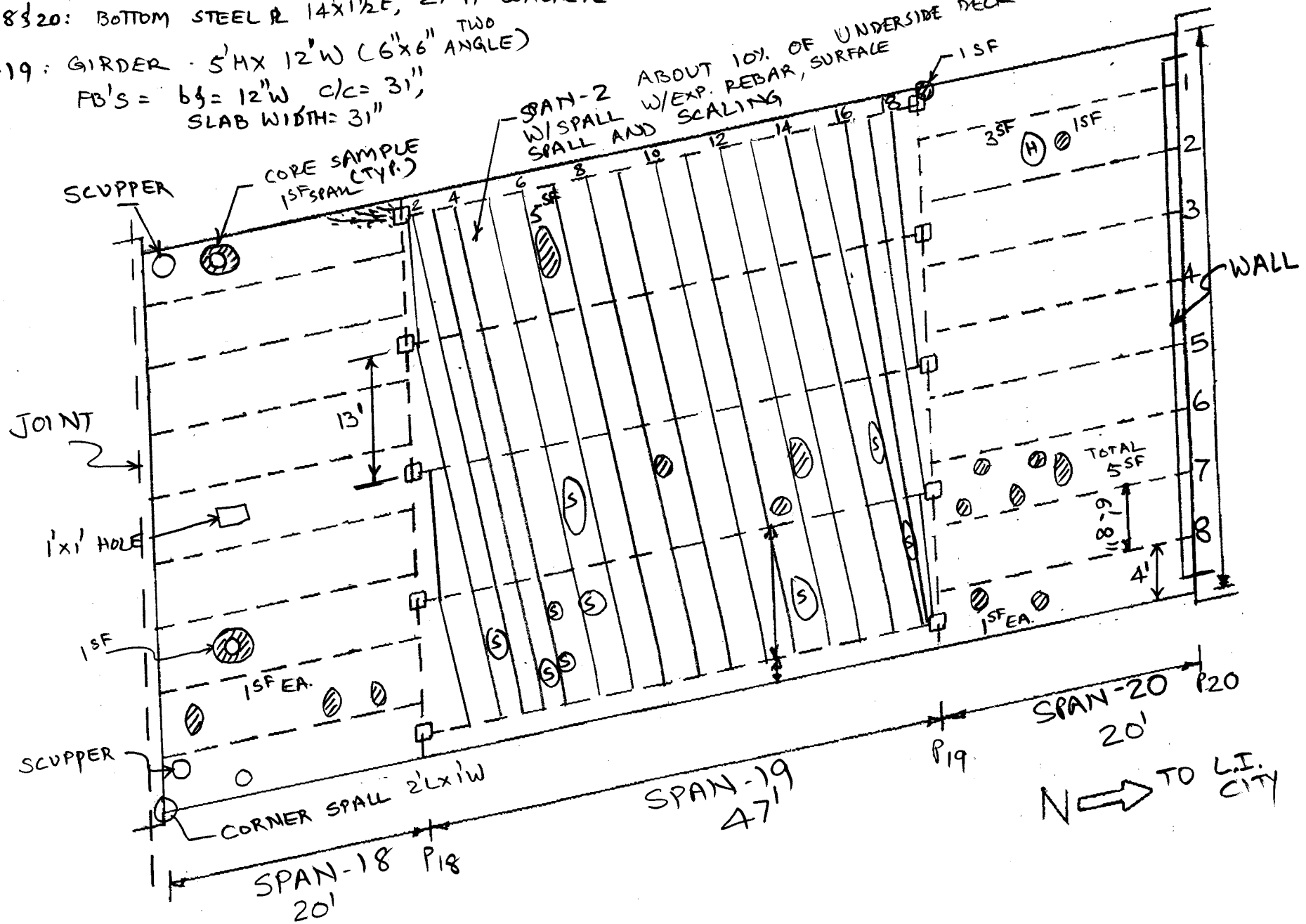
Elevated Viaduct – Liberty Avenue Bridge

LIBERTY AVE.

12/18/13

SPAN 18 & 20: BOTTOM STEEL @ 14"x1½"t, 27"H CONCRETE

SPAN-19: GIRDER - 5'HX 12'W (6"x6" TWO ANGLE)
PB'S = b.f = 12"W c/c = 31";
SLAB WIDTH = 31"



WEIDLINGER ASSOCIATES INC
CONSULTING ENGINEERS

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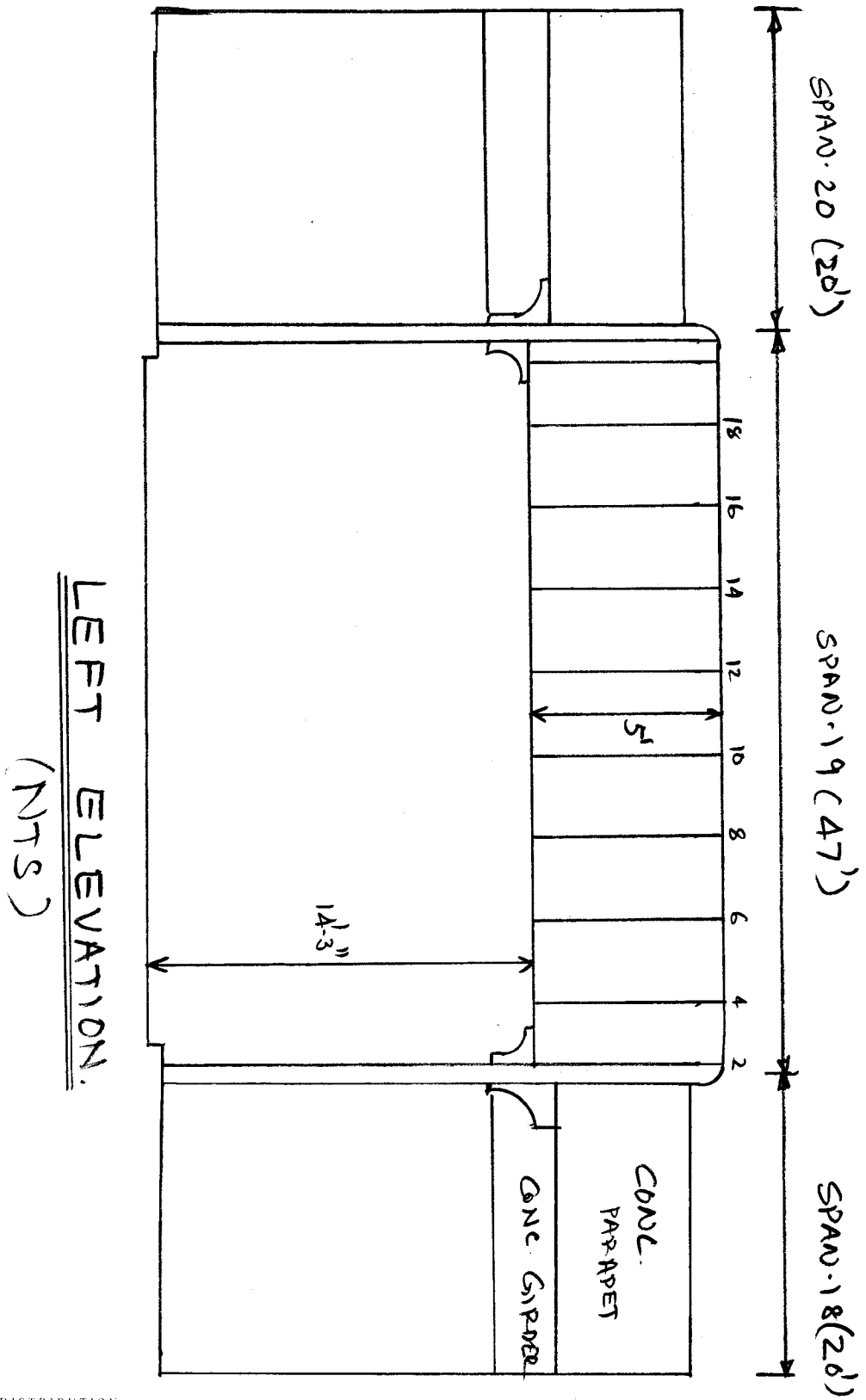


LEFT ELEVATION. (NTS)

LIBERTY AVE

ACTION

DISTRIBUTION

Inspection Field Notes

for

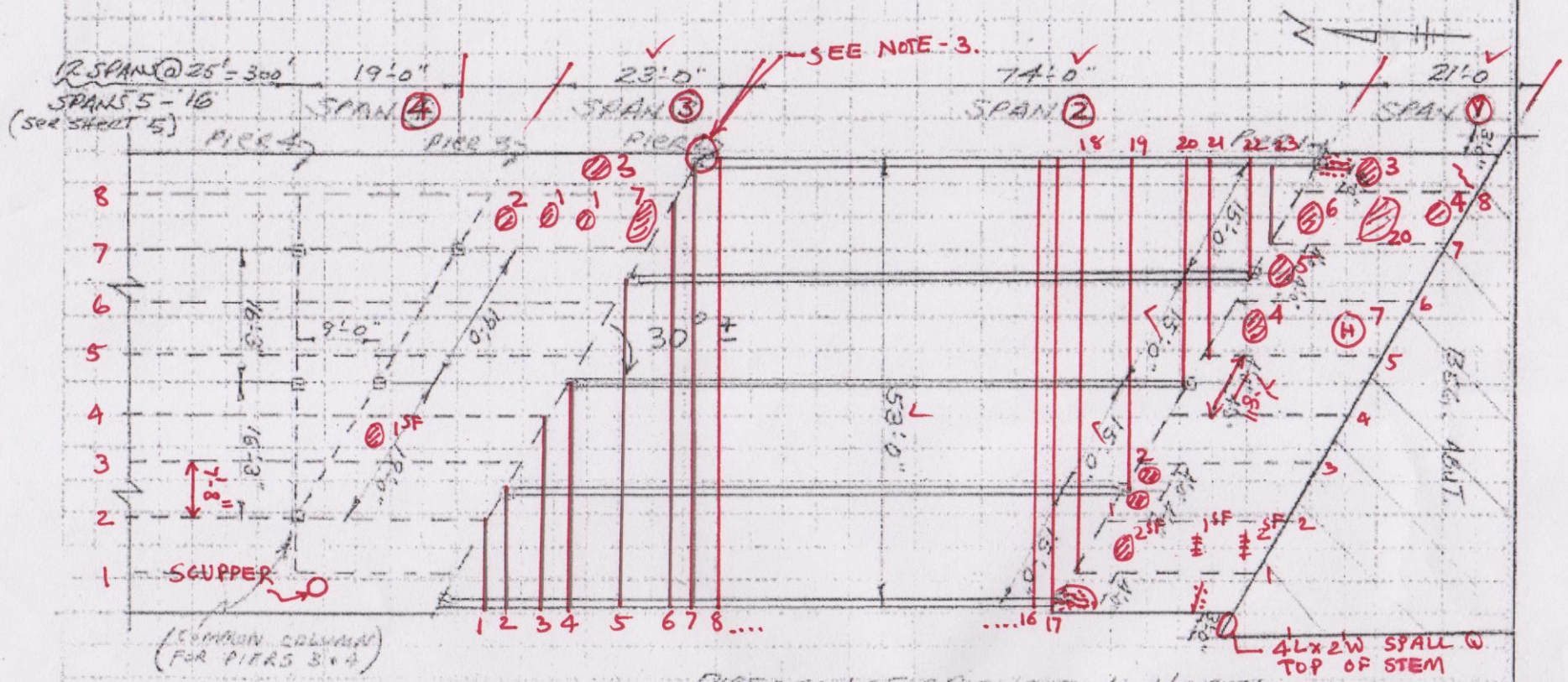
Elevated Viaduct – Rockaway Boulevard Bridge

12/18/13

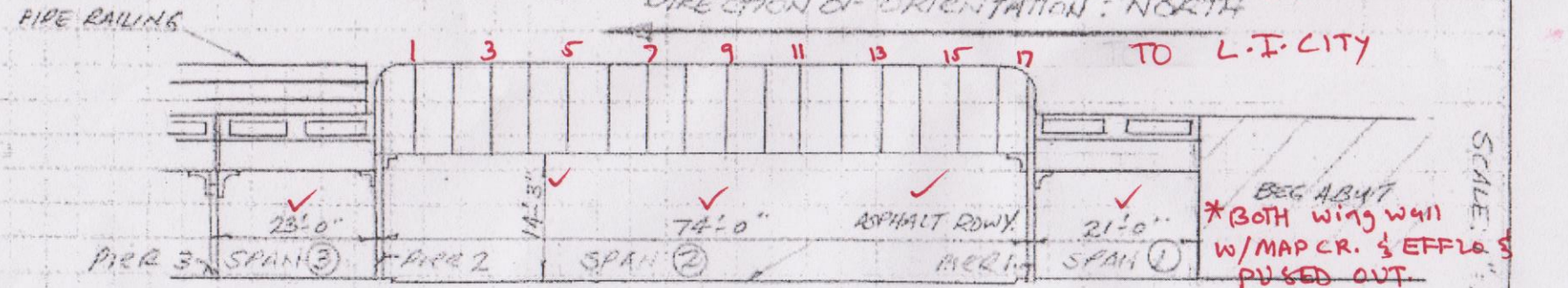
NOTE: ① SPAN 2 - UNDERSIDE DECK WITH ABOUT ~~25 SQ.~~ 30 SF SPALL WITH EXP. REBAR (1½" D) ~~ADDED~~

② Bill Board on Right Fascia.

③ SPAN 3, At P. 2 Right Parapet 5'L x 3" to 4" Push Out.



DIRECTION OF ORIENTATION: NORTH



ROCKAWAY BOULEVARD

WEST ELEVATION (LEFT)

ROCKAWAY AVE.

WEIDLINGER ASSOCIATES INC
CONSULTING ENGINEERS

TO	ROCKAWAY AVE.
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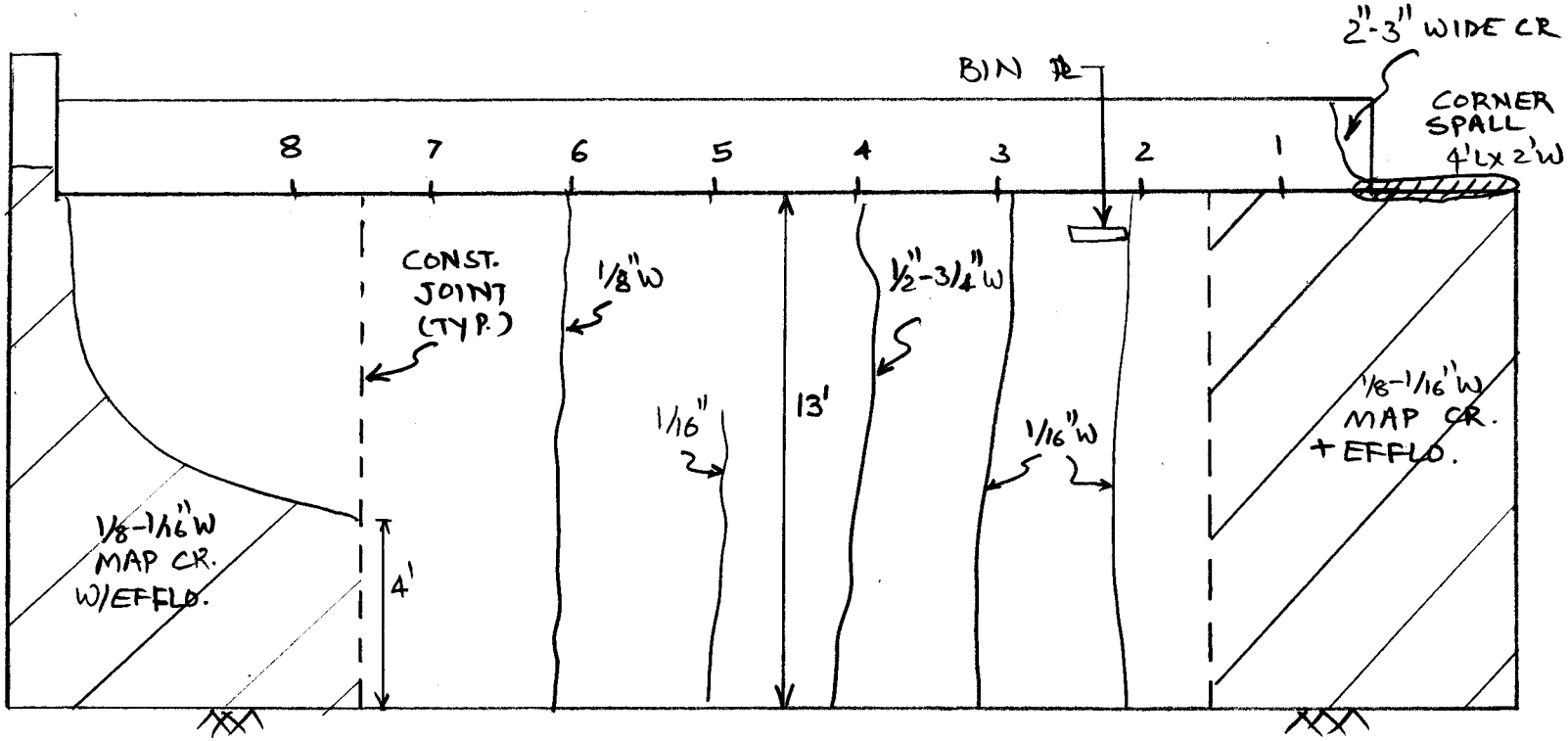
ROCKAWAY BLVD.



BEGIN ABUTMENT (NTS)

ACTION

DISTRIBUTION