

**Cultural Heritage Evaluation
Report: Riverside Drive Bridge**




Prepared for:
The City of London
300 Dufferin Avenue
London, ON N6A 4L9

Prepared by:
Stantec Consulting Ltd.
600-171 Queens Avenue
London, ON N6A 5J7


File: 165001067
April 13, 2018

Sign-off Sheet

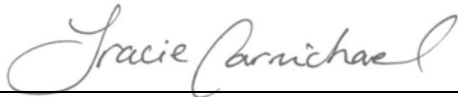
This document entitled Cultural Heritage Evaluation Report: Riverside Drive Bridge was prepared by Stantec Consulting Ltd. ("Stantec") for the account of The City of London (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by _____

(signature)

Lashia Jones, MA, CAHP
Cultural Heritage Specialist

Reviewed by _____

(signature)

Colin Varley, MA, RPA
Senior Archaeologist

Approved by _____

(signature)

Tracie Carmichael, BA, B.Ed
Senior Associate, Environmental Services

Table of Contents

EXECUTIVE SUMMARY	I
ABBREVIATIONS.....	II
1.0 INTRODUCTION	1.1
1.1 STUDY PURPOSE.....	1.1
2.0 ENVIRONMENTAL ASSESSMENT FRAMEWORK.....	2.1
2.1 REQUIREMENTS	2.1
2.2 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT PROCESS.....	2.1
2.2.1 The Process	2.1
2.2.2 Determining Project Schedule.....	2.3
3.0 METHODOLOGY	3.1
3.1 FIELD PROGRAM	3.1
3.2 REPORTING	3.1
3.3 EVALUATION OF CULTURAL HERITAGE VALUE OR INTEREST	3.1
3.3.1 Ontario Regulation 9/06	3.1
4.0 HISTORICAL SUMMARY	4.1
4.1 LOCATION AND PHYSIOGRAPHY	4.1
4.2 SURVEY AND SETTLEMENT	4.1
4.3 19 TH CENTURY DEVELOPMENT	4.2
4.4 20 TH CENTURY DEVELOPMENT	4.3
4.5 SITE HISTORY	4.3
4.6 STRUCTURE TYPE	4.14
4.7 BRIDGE DESIGNER.....	4.14
5.0 SITE DESCRIPTION	5.1
5.1 LANDSCAPE CONTEXT.....	5.1
5.2 RIVERSIDE BRIDGE	5.4
5.3 MODIFICATION.....	5.9
6.0 EVALUATION.....	6.1
6.1 INTRODUCTION.....	6.1
6.2 EVALUATION	6.1
6.2.1 Ontario Regulation 9/06	6.2
6.3 STATEMENT OF CULTURAL HERITAGE VALUE OR INTEREST	6.3
7.0 RECOMMENDATIONS.....	7.1
8.0 REFERENCES.....	8.1

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

LIST OF FIGURES

Figure 1: Study Area	3.3
Figure 2: Map of London Township, 1863	4.4
Figure 3: 1878 Map from City of London showing Study Area	4.8
Figure 4: Aerial Photograph of Study Area, 1922	4.9
Figure 5: Aerial Photograph of Study Area, 1945	4.10
Figure 6: Aerial Photograph of Study Area, 1965	4.11
Figure 7: Aerial Photograph of Study Area, 1974	4.12
Figure 8: Aerial Photograph of Study Area, 1978	4.13

LIST OF PLATES

Plate 1: Samuel Peters (Source: Grosvenor Lodge)	4.5
Plate 2: Construction of the new Riverside Bridge near completion, October 1974 (London Free Press, October 28, 1974)	4.7
Plate 3: Construction crews remove the steelwork of the old Riverside Bridge, October 1974 (London Free Press, October 9, 1974)	4.7
Plate 4: Looking west along Riverside Drive	5.1
Plate 5: Looking east along Riverside Drive	5.2
Plate 6: Looking east along Riverside Drive, showing curb, sidewalk, and bike lane. 5.2	
Plate 7: View of railway tracks looking south	5.3
Plate 8: View looking down CNR access lane southeast of the bridge.....	5.3
Plate 9: View looking north of the Riverside Bridge through vegetated area south of the bridge	5.5
Plate 10: View looking northeast beneath the bridge showing the concrete I-beam girders	5.5
Plate 11: View looking northeast beneath the bridge towards the cast in place concrete piers	5.6
Plate 12: View looking northeast across the Riverside Bridge.....	5.6
Plate 13: View looking southwest across the Riverside Bridge.....	5.7
Plate 14: View looking northwest at the expansion joint of the Riverside Bridge.....	5.7
Plate 15: Detail view of the decorative concrete impression at the end railing post 5.8	
Plate 16: Detail view of the plaque at the northeast end post of the bridge.....	5.8
Plate 17: View looking northeast along the guide rail at the bridge approach	5.9

LIST OF APPENDICES

Appendix A: Municipal Heritage Bridges Cultural, Heritage and Archaeological Resources Assessment Checklist	
Appendix B: Bridge Drawings	

Executive Summary

In 2017 the City of London retained Stantec Consulting Ltd. (Stantec) to prepare a Cultural Heritage Evaluation Report (CHER) for the Riverside Drive Bridge over the Canadian National Railway (CNR) tracks. The bridge is located Riverside Drive, approximately 750 metres east of Wonderland Road in the City of London. The bridge was constructed in 1974 and is a four-span concrete continuous beam and slab bridge that is owned and maintained by the City of London.

The Riverside Bridge did not meet any criteria under O. Reg. 9/06. **Accordingly, the Riverside Drive Bridge over the CNR tracks was found to not have cultural heritage value or interest (CHVI) since it did not meet criteria set out under O. Reg. 9/06.**

The bridge also does not have CHVI as per the requirements of the MCEA Process. No further heritage work is required and a Municipal Class Environmental Assessment Schedule 'A' or 'A+' would be appropriate from a cultural heritage perspective. If future EA projects result in alterations to surrounding properties containing structures older than 40 years, a CHER may be required to assess these properties for CHVI. To finalize this evaluation, this CHER should be submitted to the City of London for review and acceptance.

The Executive Summary highlights key points from the report only; for complete information and findings, the reader should examine the complete report.

Abbreviations

CAHP	Canadian Association of Heritage Professionals
CHER	Cultural Heritage Evaluation Report
CHVI	Cultural Heritage Value or Interest
HIA	Heritage Impact Assessment
MCEA	Municipal Class Environmental Assessment
MEA	Municipal Engineers Association
MTCS	Ministry of Tourism, Culture, and Sport
OHA	Ontario Heritage Act
O. Reg.	Ontario Regulation

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Introduction
April 13, 2018

1.0 INTRODUCTION

1.1 STUDY PURPOSE

The City of London retained Stantec Consulting Ltd. To prepare a Cultural Heritage Evaluation Report (CHER) for the Riverside Bridge over the Canadian National Railway (CNR) tracks. The bridge is located in London, Ontario approximately 750 metres east of Wonderland Road. The focus of this CHER is the bridge and its embankments, and does not include an assessment of adjacent properties.

The bridge is owned and maintained by the City of London. Constructed in 1974, the bridge is over 40 years of age and requires assessment as per the *Municipal Heritage Bridges Cultural, Heritage and Archaeological Resources Assessment Checklist* (the Checklist) released by the Municipal Engineers Association (MEA) in March 2013 and revised in April 2014 (see Appendix A) (Municipal Engineers Association 2014). In 2015, the Municipal Class Engineers Association (MCEA) Manual was further modified to provide more direction regarding bridges over 40 years old (Municipal Engineers Association 2015).

The CHER is the primary source to determine whether a property or structure is of cultural heritage value or interest (CHVI). Where CHVI is identified, the CHER includes a description of heritage attributes and a Statement of Cultural Heritage Value. The CHER also represents the foundation upon which recommendations for a Heritage Impact Assessment (HIA) are made, if necessary.

To meet these objectives, the CHER will:

- Review the historical context of the area surrounding the Study Area
- Summarize the results of the field investigation and provide photographic documentation of current conditions
- Describe the Study Area based on an understanding of the historical and current conditions
- Evaluate the CHVI of the bridge and surrounding landscape per Ministry of Tourism, Culture, and Sport (MTCS) requirements and relevant heritage frameworks
- Include a Statement of Cultural Heritage Value or Interest and description of heritage attributes where CHVI is identified
- Identify potential impacts that may be anticipated on future projects
- Provide recommendations on mitigation measures or HIA reporting processes

2.0 ENVIRONMENTAL ASSESSMENT FRAMEWORK

2.1 REQUIREMENTS

The requirement to consider cultural heritage in Class EAs is discussed in the *Municipal Class Environmental Assessment Manual* (MCEA Manual) (Municipal Engineers Association 2015) and the revised 2014 *Provincial Policy Statement* (PPS) (Government of Ontario 2014). The MCEA Manual considers the cultural environment, including built heritage resources and cultural heritage landscapes, as well as archaeological resources, as one in a series of environmental factors to be considered when undertaking a Class Environmental Assessment (EA), particularly when describing existing and future conditions, development alternatives, and determination of the preferred alternative.

The MCEA Manual further suggests that cultural heritage resources that retain heritage attributes should be identified early in the EA process and that these resources should be avoided where possible. Where avoidance is not possible, potential impacts to these attributes should be identified and minimized. Adverse impacts should be mitigated per provincial and municipal guidelines.

2.2 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT PROCESS

In 2000, the Minister of the Environment and Climate Change approved the MCEA proposed by the MEA. This included a provision to complete a heritage assessment for any bridge over the age of 40 years. Since this time, a series of amendments and clarifications have been made to the MCEA process. One of these clarifications was released in 2003 by the MEA regarding the inclusion of a 40-year threshold for schedule determination. The intent of the MEA was to provide for the protection of potentially significant bridges throughout the province; the 40-year threshold is generally accepted by both the federal and provincial authorities as a preliminary screening measure for CHVI. The MCEA Manual was most recently updated in 2015.

To provide clarity regarding the 40-year threshold for schedule determination, the MEA released guidelines in the form of a series of questions contained within a Checklist. This Checklist assists the proponent in the determination of future study requirements is provided in Appendix A. The MCEA requirements for bridges are covered in Part B of the Checklist. In this section, there are 19 "Descriptions" to which answers of "Yes" or "No" are required. Requirements for additional studies are determined based on the responses to each question. There are three basic steps to carrying out the requirements of the Checklist and these are outlined in Section 2.2.1.

2.2.1 The Process

Step 1: Undertake *Municipal Heritage Bridges Cultural, Heritage and Archaeological Checklist* (Part B) to determine if the bridge may have CHVI.

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Environmental Assessment Framework

April 13, 2018

1. If no potential for CHVI is identified, then the proposed work can be considered a Schedule A or A+ Class EA and no further investigation regarding cultural heritage is required.
 - Schedule A:
 - These projects are limited in scale, have minimal adverse environmental effects, and include a number of municipal maintenance and operational activities. These projects are pre-approved and may proceed to implementation without following the full Class EA planning process. Schedule A projects generally include normal or emergency operational and maintenance activities (Municipal Engineers Association 2015: A-3).
 - Schedule A+:
 - These projects are similar to Schedule A projects in that they are pre-approved. Where they differ is in notice issued to the public. Schedule A+ projects include municipal infrastructure projects where, although the public has no ability to change the outcome, they are notified of planned work. These EAs are typically approved by municipal councils through budget or special project funding. There is also more flexibility in the ways in which the public is notified of this work and varies greatly from one municipality to the next (Municipal Engineers Association 2015: A-4).
2. If potential for CHVI is identified, then proceed to Step 2.

Step 2: Undertake a cultural heritage evaluation of the bridge against *Ontario Regulation (O. Reg.) 9/06 of the Ontario Heritage Act (OHA)* and prepare a CHER.

1. If the bridge is determined not to contain CHVI as per O. Reg. 9/06 then the CHER should be submitted to the proponent for review and acceptance. No further work is required and an EA is not triggered from a cultural heritage perspective.
2. If the bridge is determined to contain CHVI as per O. Reg. 9/06, prior to schedule determination, further work will be required in the form of an HIA. Once the proponent understands the proposed (or potential) scope of work, proceed to Step 3.

Step 3: Undertake an HIA to assess the impacts of the proposed change/impact, identify mitigation measures, and establish a conservation strategy, if needed.

1. If no impacts to the heritage attributes identified in the CHER will result from the proposed work, then the HIA should be submitted to the proponent for review and acceptance. No further work is required and the proposed work can be considered a Schedule A or A+ EA from a cultural heritage perspective.
2. If the HIA determines that the project has the potential to impact the resource, proceed to Schedule B or C to consider alternative solutions. As part of the HIA, mitigation measures to lessen the impacts of the proposed undertaking and a conservation strategy should be prepared. The HIA should be submitted to the proponent for review and acceptance and to the MTCS for review and comment.

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Environmental Assessment Framework

April 13, 2018

- Schedule B:
 - These projects have the potential for some adverse environmental impacts. The proponent is required to undertake a screening process involving mandatory contact with directly affected public and relevant review agencies (i.e. MTCS), to ensure that they are aware of the project and that their concerns are addressed. If there are no outstanding concerns, then the proponent may proceed to implementation. Schedule B projects generally include improvements and minor expansions to existing facilities (Municipal Engineers Association 2015: A-4).
- Schedule C:
 - These projects have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the MCEA Manual. Schedule C projects require the preparation and filing of an Environmental Study Report (ESR) for review by the public and relevant agencies. Schedule C projects generally include the construction of new facilities and major expansions to existing facilities (Municipal Engineers Association 2015: A-4).

This report represents “Step 2” of the MCEA process and the result is a CHER that determines if the Riverside Drive Bridge has CHVI when evaluated against the criteria set out in O. Reg. 9/06. Based on the results of the evaluation, recommendations to proceed to “Step 3” may be made.

2.2.2 Determining Project Schedule

Generally, the MCEA Project Schedule is determined by the magnitude of the environmental impacts resulting from the project. As such, projects with minimal impacts are carried out under Schedules A or A+, projects with moderate adverse impacts are carried out under Schedule B, and projects with the potential for significant environmental effects are carried out under Schedule C.

In the case of bridges found to have CHVI, all reconstruction and/or alteration activities to the structure, or grading activities adjacent to the structure, should be carried out under Schedules B or C. As indicated in Appendix 1 of the MCEA Manual, projects involving a bridge with CHVI that cost less than \$2.4 million should be carried out under Schedule B and projects with a cost greater than \$2.4 million should be carried out under Schedule C (Municipal Engineers Association 2015). While the magnitude of the impact to the bridge and the cost of the project can be used to determine whether to proceed under Schedule B or C, the MCEA Manual notes that the divisions among project Schedules is often not distinct and proponents are encouraged to document their rationale for the selection (Municipal Engineers Association 2015: Appendix 1).

3.0 METHODOLOGY

3.1 FIELD PROGRAM

A site assessment was undertaken August 25, 2017, by Stantec Cultural Heritage Specialists Lashia Jones and Frank Smith. The weather conditions were sunny and calm. Historical research was conducted at the London Public Library and supplemented by material available through online resources. Bridge files, containing previous bridge inspection reports for the structure, were provided by Jane Fullick at the City of London.

3.2 REPORTING

The CHER was composed of a program of archival research focused on the Study Area (Figure 1). To familiarise the study team with the Study Area, local historical resources were consulted, archival documents were reviewed, and a summary of the historical background of the local area was prepared. Specifically, mapping from 1862, 1863, 1867, 1878, 1922, 1945, and 1965 was reviewed.

The metric system was adopted in Canada between 1971 and 1984. Given the construction date of the bridge, measurements would have been prepared according to imperial standards. Converting measurements that are often standardized into metric may obscure patterns and relationships between features. Therefore, when discussing dimensions of historic structures imperial units may be used. In all other areas, measuring distance for example, metric units are applied.

3.3 EVALUATION OF CULTURAL HERITAGE VALUE OR INTEREST

3.3.1 Ontario Regulation 9/06

The criteria for determining CHVI is defined by O. Reg. 9/06 of the *Ontario Heritage Act* (OHA) (Government of Ontario 2006). These criteria are considered in the EA process, as no other formal criteria for identifying CHVI is identified in the MCEA manual. This regulation considers three main indicators of cultural heritage value: design or physical value, historic or associative value, and contextual value. Each indicator contains three additional sub-criteria. A property may be considered to have CHVI if it meets one or more of the criteria in O. Reg. 9/06. These criteria are provided below, as they appear in O. Reg. 9/06 of the OHA:

1. The property has design value or physical value because it:
 - i. is a rare, unique, representative, or early example of a style, type, expression, material or construction method;
 - ii. displays a high degree of craftsmanship or artistic merit; or

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Methodology

April 13, 2018

- iii. demonstrates a high degree of technical or scientific achievement.

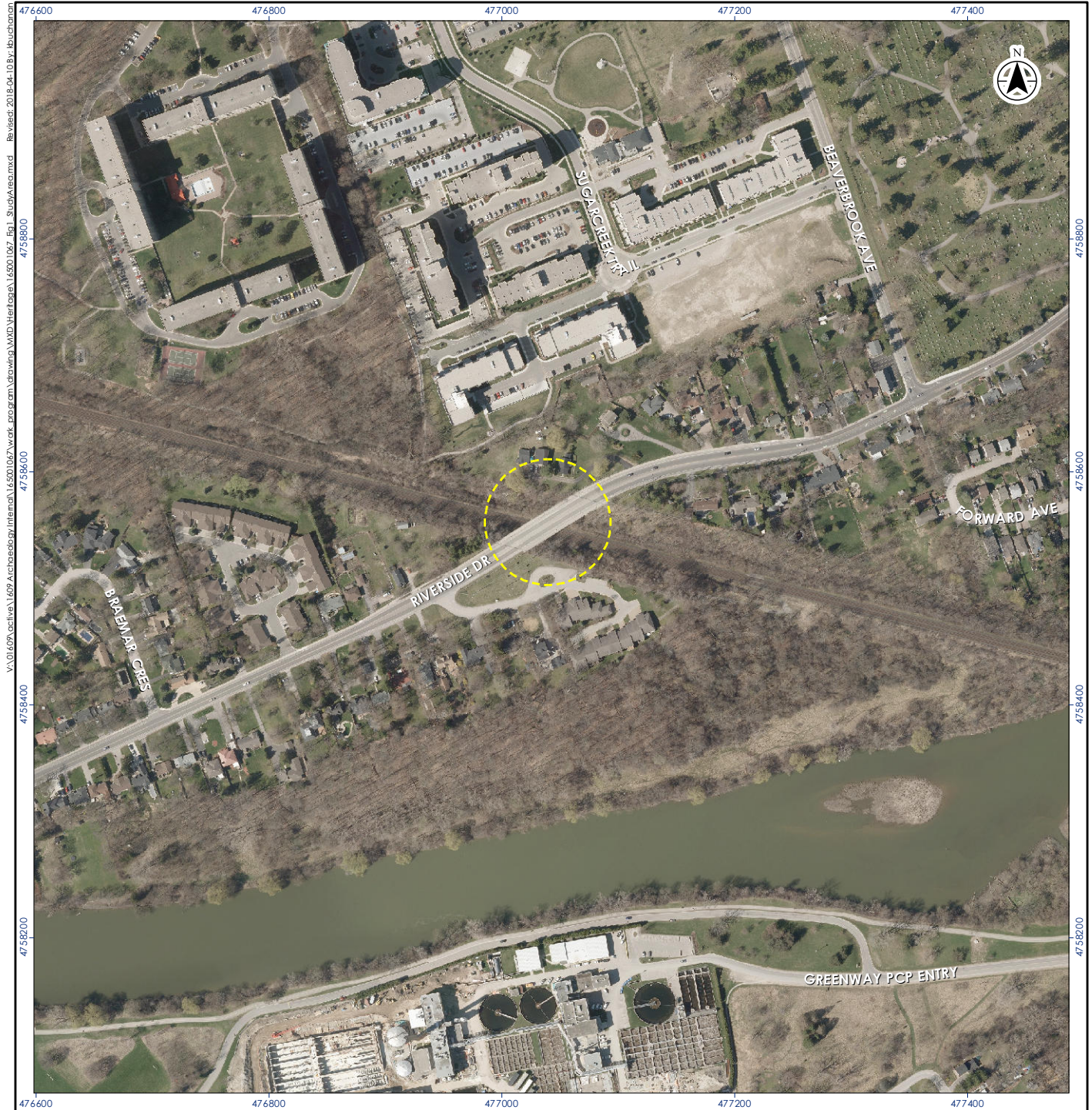
2. The property has historical value or associative value because it:

- i. has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community;
- ii. yields, or has the potential to yield, information that contributes to an understanding of a community or culture; or
- iii. demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.

3. The property has contextual value because it:

- i. is important in defining, maintaining or supporting the character of an area;
- ii. is physically, functionally, visually or historically linked to its surroundings; or
- iii. is a landmark.

(Government of Ontario 2006)



V:\01609\Gis\va\1609_Archaeology\Infra\VA\165001067\Work\Program_Growth\WMD\Verifera\165001067_Ep1_StudyArea.mxd Revised: 2018-04-10 by: lbrubaker

4758200

4758400

4758600

4758800

4758200

4758400

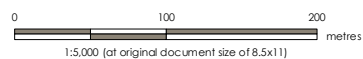
4758600

4758800

476600 476800 477000 477200 477400



Legend
 Study Area



Project Location: City of London
 165001067 REV A
 Prepared by KDB on 2018-04-10

Client/Project:
CITY OF LONDON
RIVERSIDE BRIDGE OVER CN TRACKS

Figure No.
1

Title
Study Area

- Notes**
1. Coordinate System: NAD 1983 UTM zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
 3. Orthoimagery © City of London, 2017.

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

4.0 HISTORICAL SUMMARY

4.1 LOCATION AND PHYSIOGRAPHY

The study area is located in the Caradoc Sand Plain and London Annex physiographic regions. The Caradoc Sand Plains and London Annex region is a flat sand plain extending from east London to the Strathroy area in the southwest. It is surrounded by the Stratford Till Plain to the north, the Mount Elgin Ridges to the east and the Ekfrid clay plain to the south and west. In its entirety, the region comprises approximately 482 square kilometres in southwestern Ontario. The land is generally flat with a few rolling hills. The soil in the area consists of three types: Fox fine sandy loam, which appears on the finer soils which are deep and well drained; Berrien sandy loam, a shallow layer of sand over clay, with wet subsoil; and Oshtemo sand, which appear on sand hills and dunes (Chapman and Putnam 1984: 146). The Thames River is located approximately 250 metres south of the study area and is a designated Canadian Heritage River. The study area and the Thames River are separated by residential development. The Thames River is 273 km long and drains approximately 5,825 square kilometres of land. The river rises at three distinct points; near Mitchell (North Thames), Hickson (Middle Thames) and Tavistock (South Thames). The north and south branches of the river meet at the Forks in London, just north of the study area (Quinlan 2013: 2). The well-defined river channel runs through a shallow valley, demonstrated through a history of critical flooding in the City, which was developed on land that in physiographical terms belongs to the river. This watershed area has proven from its land use history to be rich soil for agriculture development (Chapman and Putnam 1984: 139).

4.2 SURVEY AND SETTLEMENT

The Province of Upper Canada was created in 1791 to separate Canada's new English speaking settlers from the established French settlements in Quebec. John Graves Simcoe was selected as Lieutenant Governor of the newly created province. Simcoe served in the British Army during the American Revolution from 1775-1781. Upon his appointment as Lieutenant Governor in 1791, he eagerly planned to build a model British society in Upper Canada (Armstrong 1986: 18).

While studying maps of Upper Canada, he decided the provincial capital should be named London and located in the southwest. This strategic location would be too far inland for the Americans to easily attack. Simcoe and a party of men set out from Niagara in February 1793 to explore the area (Armstrong 1986: 17). Joining him on this expedition was Thomas Talbot, who later became a major colonizer and land owner in Southwestern Ontario. Simcoe was impressed when he arrived at the forks of The Thames, and confirmed his desire for the site to become the capital of the Province (London Township History Book Committee 2001a: 11). Despite Simcoe's wishes, London was still in too remote and inaccessible a location to be a capital city. Instead, the capital was moved to York (now Toronto) (Armstrong 1986: 21).

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Historical Summary

April 13, 2018

The first surveyor in the region, Abraham Iredell, reported the agricultural conditions in Southwestern Ontario to be among the finest in North America. In 1800, the London District and Middlesex County were created (London Township History Book Committee 2001a:13). Middlesex County was further divided into townships, London Township being the largest at 12 square miles. The first settler in London Township was Joshua Applegarth, who arrived in 1807, and attempted to cultivate hemp before switching to other crops (Page 1878: 5).

London Township remained almost entirely unsettled until Thomas Talbot returned, along with surveyor Mahlon Burwell, to develop the township in 1810. Talbot would eventually be instrumental in the settlement of 29 townships in Southwestern Ontario. Before the outbreak of the War of 1812, Burwell surveyed Concessions 1-6 of the township, which includes the land in the study area (London Township History Book Committee 2001a: 12). After the war ended, the rest of the township was surveyed (Page 1878: 5).

4.3 19TH CENTURY DEVELOPMENT

As London Township began to develop, residents began to clamor for access to a railroad. As early as 1831, merchants and farmers of London had proposed constructing a railroad through the town. In the 1840s planning began on a line that would run from Niagara to Detroit. The planned railroad would run through London, and many prominent Londoners helped finance the project. The Great Western Railway was chartered in 1845 and construction on the London portion of the line began in October 1847. The ground-breaking ceremony in London was led by Thomas Talbot, who was then 77 years old and still deeply involved in the development of London. In December 1853, the first train pulled into London. The train had travelled from Hamilton and arrived in six hours at an average speed of 25 mph (Armstrong 1986: 82-83).

The Township of London benefited greatly from the arrival of the railroad. London experienced a boom and became the centre of industry and finance in southwestern Ontario. This boom led to London's incorporation as a city on January 1, 1855 (Armstrong 1986: 68) Land value greatly increased in the City and township, sometimes nearly 300% between 1849 and 1856. This boom in development and investment ended in 1857.

The conclusion of the Crimean War in 1857 started a depression in the British Empire, which included Canada. The impact was particularly hard on London. By 1860, three quarters of the businesses in the city had failed and the population dropped from 16,000 to 11,000. It would take almost three decades for land values in London to rebound (Armstrong 1986: 86-87). London's economy would begin to recover when the American Civil War (1861-1865) created demand for exports to help feed and supply the Union army (Armstrong 1986: 99).

The depression of the 1850s also affected the Great Western Railway. The Great Western relied on 40-60% of its revenue from American traffic between New York and Michigan. When American companies began to consolidate their lines, rates fell for the Great Western Railway and its main Canadian competitor the Grand Trunk Railway. In 1882, the two railways merged to more effectively compete (Historica Canada 2014, 2015).

4.4 20TH CENTURY DEVELOPMENT

London Township remained largely agricultural at the turn of the 20th century. This was in part due to the City of London's tradition of annexing parts of London Township that began to become more populated.

The Grand Trunk Railway had been poorly managed and was debt ridden. Despite receiving some \$28 million in loans and subsidies from the government, in 1919 the Grand Trunk folded due to bankruptcy and was nationalized by the Dominion Government as part of the Canadian National Railway (CNR) crown corporation (Historica Canada 2014). Today, the line in the study area is still part of the CNR.

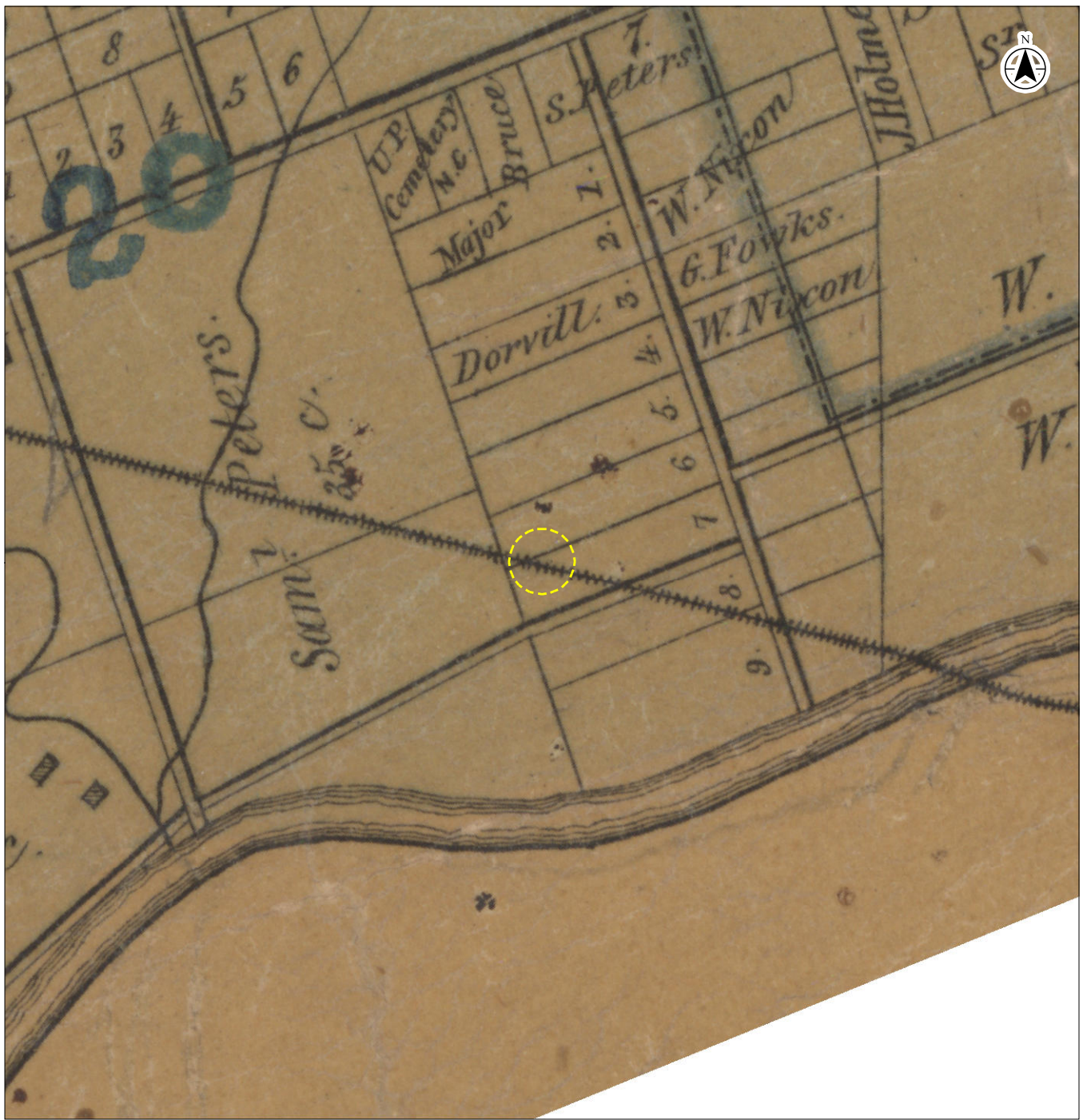
By the 1950s, the City of London was almost fully developed and needed new land to continue growth. As demand for housing in the post-war era grew, London and Westminster Townships began to see significant development along their borders with the City of London. Between 1951 and 1956 the population of London Township increased 66% (Meligrana 2000: 8). In 1958, the City began the process of annexing 57,000 acres of land in London, West Nissouri, and Westminster, and North Dorchester Townships.

Some township residents opposed annexation, and believed their taxes would increase with little in return from the City. Township officials claimed businesses chose to locate themselves in the township and should not be forced into the City. In May 1960, the Ontario Municipal Board ruled in favour of annexation and awarded 30,000 acres of land in London Township to the City. The annexation, which became effective in 1961, included the study area (Globe and Mail 1960: 10).

4.5 SITE HISTORY

The study area is located in Lots 19 and 20 of Concession 1 in the former Township of London, now part of the City of London. The lots were surveyed by Mahon Burwell just prior to the outbreak of the War of 1812. Lot 19, Concession 1 was reserved as land for London's townsite and Lot 20, Concession 1 is marked as granted in Thomas Ridout's map of London Township from the 1820s.

In the 1863 map of London by Samuel Peters (Figure 2) (Plate 1), Lot 20, Concession 1 is shown owned by Samuel Peters himself. Peters had extensive holdings throughout London Township and his property in the study area was known as 'Peter's Bush' (London Township 2001b: 378). Samuel Peters was born in about 1790 in Merton, Devonshire, England. Peters trained as a civil engineer and land surveyor and worked on the estate of Lord Clinton. He married Anne Phillips (c.1797-1887) and together they had four sons and two daughters, Hermione, Samuel, Frederick William, John, and Anne. Surveying was an in-demand profession in Upper Canada and in 1835 the family boarded the ship *Bolivar* and immigrated to Canada. Peters intended to work for the Canada Lands Company but his family instead convinced him to settle in London (London Township 2001b: 377).



Legend

- Approximate Location of Study Area

Notes

1. Historic mapping not to scale.
2. Reference: Peters, Samuel, Map of the Township of London, Canada West, 1863.



Project Location: City of London
 165001067 REV A
 Prepared by KDB on 2018-04-10

Client/Project:
 CITY OF LONDON
 RIVERSIDE BRIDGE OVER CN TRACKS

Figure No.:

2

Title:

Map of London Township, 1863

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Historical Summary

April 13, 2018

Although Peters owned land in the study area, he resided elsewhere in London Township. In 1840, Peters purchased 500 acres of land from George Goodhue, and built a residence designed by his nephew, also named Samuel Peters, called Grosvenor Lodge. The residence still stands and is operated by Heritage London Foundation (Grosvenor Lodge 2015). In the 1850s, Peters purchased significant amounts of land on the west bank of the Thames River and the area, including the study area, became known as Petersville.

Peters did not develop his property in the study area on Lot 20, Concession 1. An 1867 map of the study area shows that Peters' property was primarily woodlands comprised of red oak, white oak, cherry and maple. Red and white oak are tree species that grow at a later stage of forest succession and the property was likely old growth forest (Armstrong 1867).



Plate 1: Samuel Peters (Source: Grosvenor Lodge)

Lot 19, Concession 1 was part of the land reserved for London's townsite due to its proximity to the forks of the Thames River. However, it was left outside the boundaries of the newly created city in 1855. Historical mapping does not provide the names of the owners of these parcels, which were park lots established for suburban development. The arrival of the Great Western Railway likely interrupted any agricultural activity that was occurring in the southern portion of the lot. In 1867, the intersection of the Great Western Railway and a precursor to Riverside Drive is marked as grasslands in an 1867 map. The northern portion of the lot was agricultural and potatoes and wheat were being cultivated.

Four structures are present in this map adjacent to the intersection of the railway and the precursor to Riverside Drive. All four are noted to have between one and three rooms. The southern half of Lot 19 would remain primarily low density and agricultural until the 21st century.

The first evidence of a bridge on Riverside Drive across the railway tracks is present in a historical map from 1878 (City of London 1878) (Figure 3). This bridge crossed the railway tracks at an angle out of alignment with the road resulting in a 90-degree curve at the bridge's approach. The bridge had a steel truss under a wooden deck. The awkward approach was not a significant issue before the widespread adoption of cars. The road east of the bridge was known as Byron Road in a 1926 topographic map (Department of the Interior 1926) and Mount Pleasant Avenue

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Historical Summary

April 13, 2018

in a 1957 topographic map (Department of the Interior 1957). The nearby Beaverbrook Avenue was known as Francis Street (Moore 1898).

The study area remained predominately agricultural until after the Second World War (Figure 4) (Figure 5). By 1955, residential subdivisions had been developed on the western side of the bridge and, by 1965, residential development had occurred on the eastern side of the bridge along Mount Pleasant Avenue (Figure 6). In 1970, it became increasingly apparent that the 19th century crossing over the railway needed replacement. In May 1970, an engineer for the CNR recommended to the City that weight and speed restrictions be placed on the bridge (London Free Press, May 9, 1970). The City Engineer recommended a weight limit of 10 tons and a speed limit of 10 mph. These restrictions on an increasingly busy road were impractical for two main reasons. The London Transit Commission warned that the new busses planned for the route would be over the weight limit (London Free Press May 12, 1970). Additionally, the City's newest firetrucks were over the weight limit and would have to use an alternative crossing (London Free Press May 15, 1970).

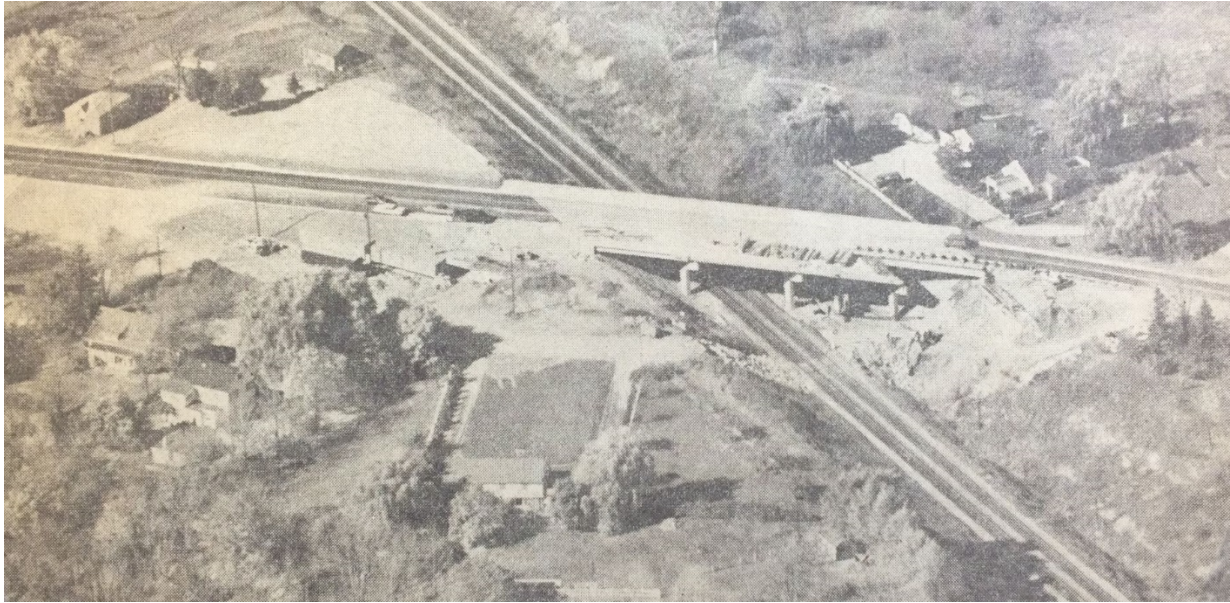
City Council met in mid-May 1970 to discuss removing the remaining half dozen wooden deck bridges in the city, Riverside Bridge included. The replacement span would be a four-lane concrete and steel bridge that would be paid for primarily by federal and provincial subsidies. In April 1974 work began on the \$700,000 replacement crossing (London Free Press April 20, 1974).

The project also included reconfiguring Riverside Drive to remove the 90 degree curves on the approaches to the former bridge (London Free Press October 9, 1974). Construction began in late spring or the summer of 1974. Aerial photography taken in April of 1974 shows the old bridge intact, and little to no signs of construction activity in the study area (Figure 7). The new bridge was completed in November 1974 (Plate 2, Plate 3). The bridge was configured as a two-lane bridge, although it was built wide enough to accommodate an expansion to four lanes.

When the project was completed the name Riverside Drive was applied to the road east of the bridge as well, which had been known as Mount Pleasant Avenue east to Wharncliffe Road and Dundas Street West east towards the Thames River. The old curved road alignment on the west side of the bridge remained (Figure 8) and was renamed Old Riverside Drive. There is no remaining trace of the original bridge alignment on the eastern side.

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

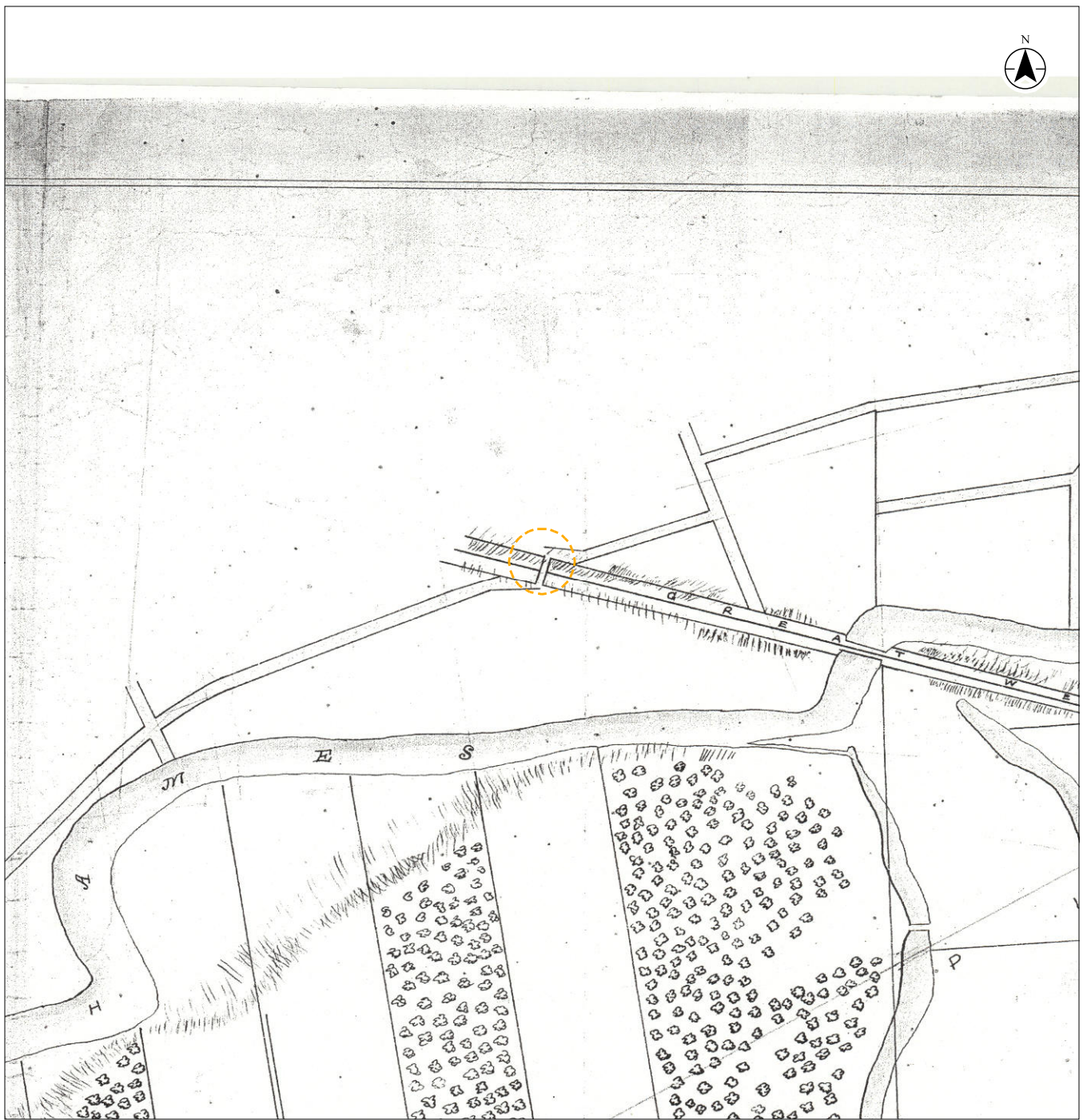
Historical Summary
April 13, 2018



**Plate 2: Construction of the new Riverside Bridge near completion, October 1974
(London Free Press, October 28, 1974)**



**Plate 3: Construction crews remove the steelwork of the old Riverside Bridge, October 1974
(London Free Press, October 9, 1974)**



Legend

 Approximate Location of Study Area

Notes

1. Historic mapping not to scale.
2. Reference: City of London, Map of Site of Proposed Waterworks for City of London at Coombs Mills & Byron, 1878.

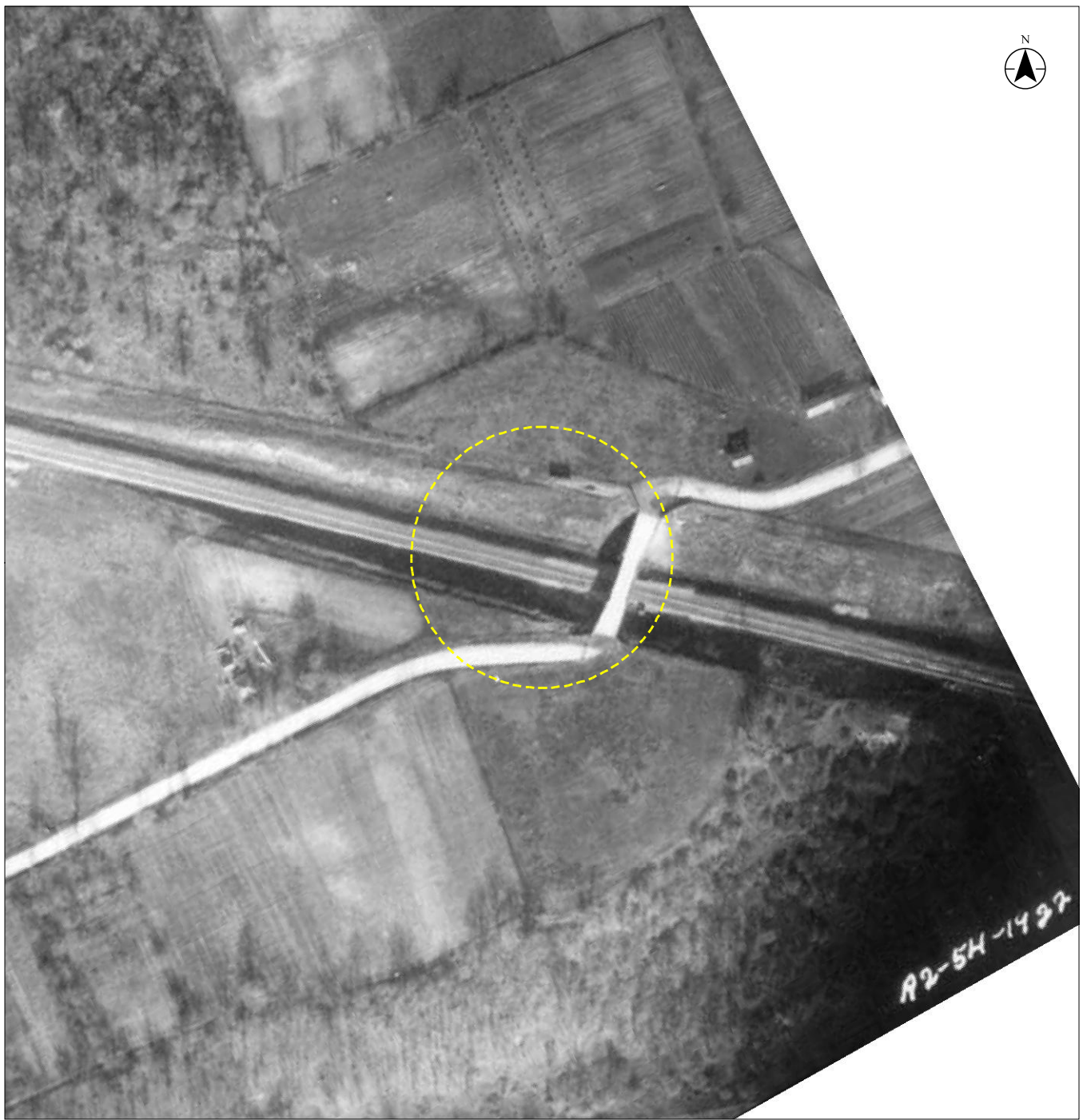


Project Location: City of London
 165001627 REV A
 Prepared by KDB on 2018-04-10

Client/Project:
 CITY OF LONDON
 RIVERSIDE BRIDGE OVER CN TRACKS

Figure No.
 3

Title
**1878 Map from City of London
 showing Study Area**



Legend

 Approximate Location of Study Area

Notes

- 1. Imagery not orthorectified and not to scale.
- 2. Reference: Department of Lands and Forests, Digitized by Western University Map and Data Centre.

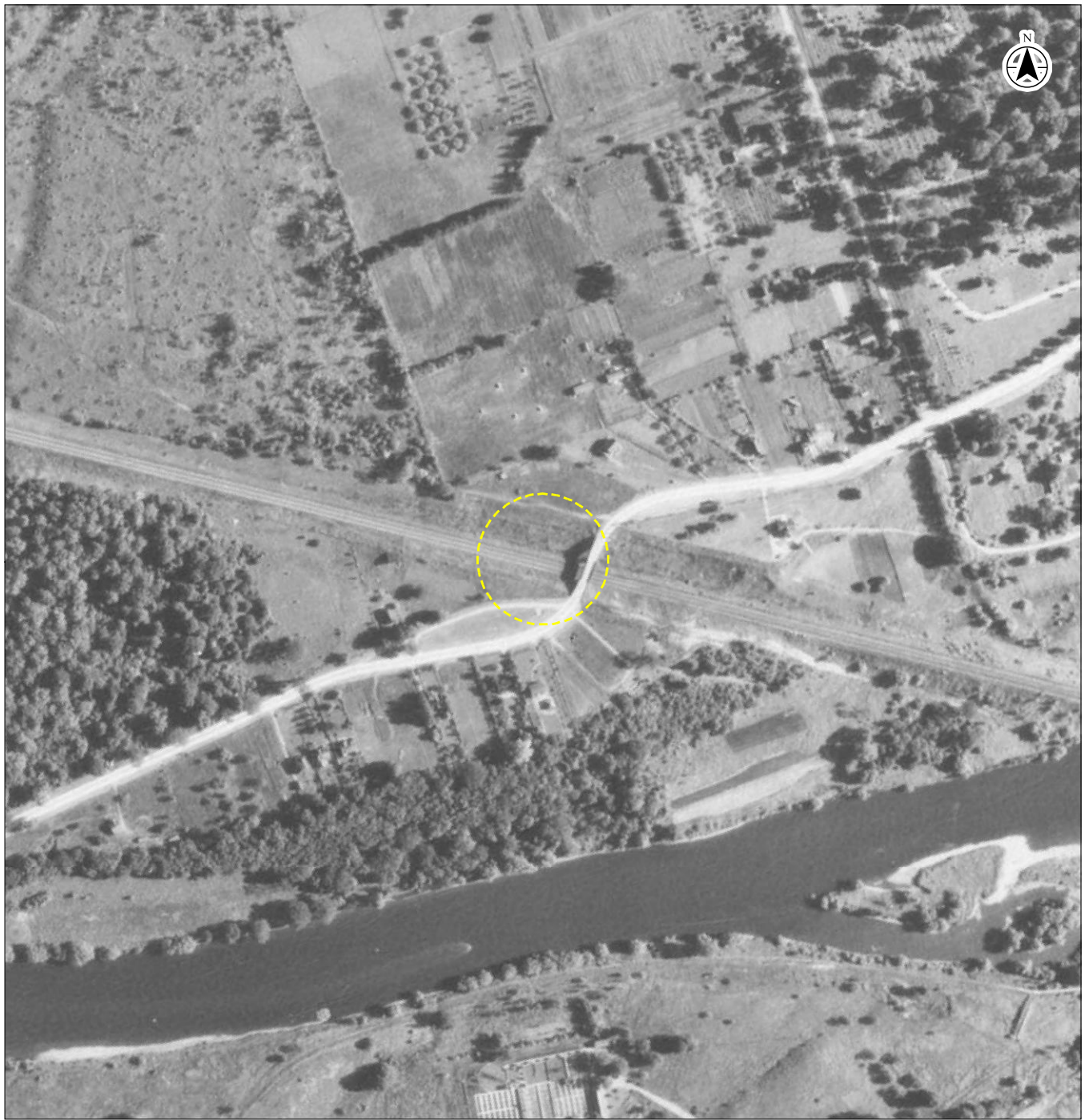


Project Location: City of London
165001067 REV A
Prepared by KDB on 2018-04-10

Client/Project:
CITY OF LONDON
RIVERSIDE BRIDGE OVER CN TRACKS

Figure No.
4

Title
Aerial Photograph of Study Area,
1922



Legend

 Approximate Location of Study Area

Notes

- 1. Imagery not orthorectified and not to scale.
- 2. Reference: Department of Planning and Development, Digitized by Western University Map and Data Centre.



Project Location: City of London
165001067 REV A
Prepared by KDB on 2018-04-10

Client/Project:
CITY OF LONDON
RIVERSIDE BRIDGE OVER CN TRACKS

Figure No.
5

Title
**Aerial Photograph of Study Area,
1945**



Legend

 Approximate Location of Study Area

Notes

- 1. Imagery not orthorectified and not to scale.
- 2. Reference: Hunting Survey Corporation, Digitized by Western University Map and Data Centre.

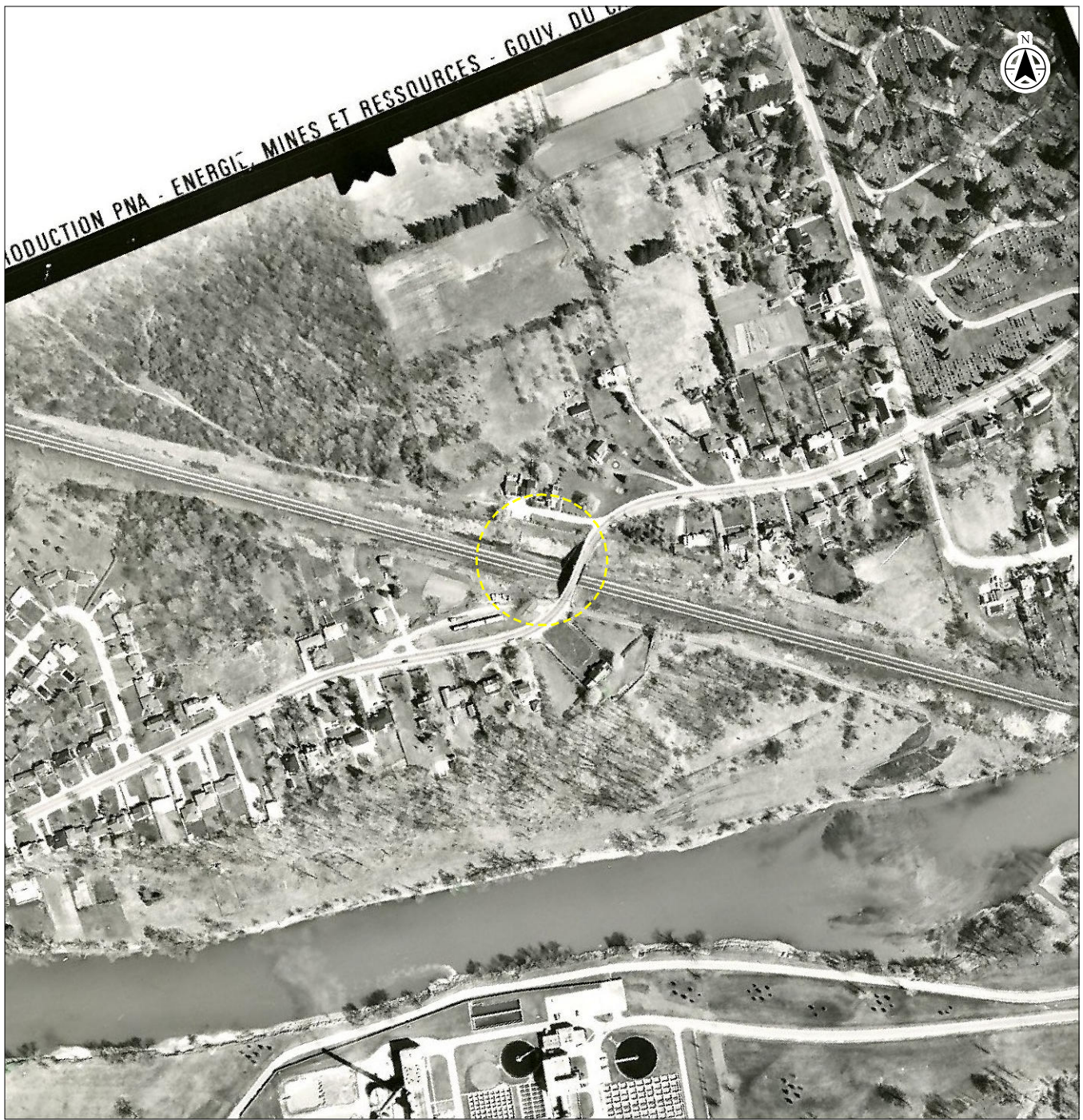


Project Location: City of London
165001067 REV A
Prepared by KDB on 2018-04-10

Client/Project:
CITY OF LONDON
RIVERSIDE BRIDGE OVER CN TRACKS

Figure No.
6

Title
**Aerial Photograph of Study Area,
1965**



Legend

 Approximate Location of Study Area

Notes

- 1. Imagery not orthorectified and not to scale.
- 2. Reference: National Air Photo Library, 1974, London 1974, Roll A23667, Photo Number 114.



Project Location: City of London 165001067 REV A
Prepared by KDB on 2018-04-10

Client/Project:
CITY OF LONDON
RIVERSIDE BRIDGE OVER CN TRACKS

Figure No.
7

Title
**Aerial Photograph of Study Area,
1974**



Legend

 Approximate Location of Study Area

- Notes**
1. Imagery not orthorectified and not to scale.
 2. Reference: Ontario Ministry of Natural Resources. 1978. London 1978 Roll 4268 Photo 103.



Project Location: City of London
 165001067 REV A
 Prepared by KDB on 2018-04-10

Client/Project: CITY OF LONDON
 RIVERSIDE BRIDGE OVER CN TRACKS

Figure No.: 8

Title: **Aerial Photograph of Study Area, 1978**

4.6 STRUCTURE TYPE

The Riverside Bridge over the CNR tracks is a four-span continuous beam and slab bridge. The bridge deck is a reinforced concrete slab deck supported by precast concrete girders.

Beam and girder bridges are one of the most common styles of bridge construction. Beam and girder construction consists of a series of solid members running longitudinally the length of the span, often with bracing between the parallel members (Heritage Resources Centre n.d.: 31). Each beam or girder is fastened to the abutments or piers and the deck is laid down on top. These bridges are more complex than a simple slab bridge, but use less material than slab bridges. Typically, beam and girder bridges are used for spans greater than 10 metres (Heritage Resources Centre n.d.:31). There are a variety of beam and girder styles, including I-Beams, Box-style and T-shape. Beam and girder bridges are usually made of concrete or steel (Heritage Resources Centre n.d.:31).

4.7 BRIDGE DESIGNER

According to a plaque located on the northeast end post, the bridge was designed by A.M. Spriet and Associates, a London-based engineering consulting firm. Spriet and Associates was established by Andrew M. Spriet in 1961. Spriet graduated from Queen's College in 1957 with a degree in Civil Engineering. By the 1970s, Spriet and Associates employed 25 people in London. Andrew Spriet was an active member of the local community and had many other business interests, including construction and automotive businesses.

The bridge was constructed by Bot Construction Limited, an Oakville based construction engineering firm. The company specializes in highway design and bridge structures, including sections of several major Ontario highways and interchanges (including Highway 417, Highway 401/410, QEW Niagara, Highway 407, and Highway 403) (Bot Construction n.d.).

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Site Description
April 13, 2018

5.0 SITE DESCRIPTION

5.1 LANDSCAPE CONTEXT

The Riverside Drive Bridge is located at the intersection of Riverside Drive and the CNR, approximately 75 metres west of the intersection of Riverside Drive and Wonderland Road, in the former Township of London, now City of London. The bridge is located in a low density residential setting, with residential properties located on the north, east, south, and west sides of the bridge (Plate 4 and Plate 5). Riverside Drive is a two-lane road paved with asphalt. The north side of Riverside Drive has a concrete curb, sidewalks, and dedicated bike lane (Plate 6). The south side has a concrete curb and no sidewalk. Riverside Drive widens as it approaches the bridge to accommodate the width of the span. The Riverside Drive Bridge is oriented in a general east-west direction and carries Riverside Drive over the CNR train tracks. The railway contains two sets of tracks within a linear corridor containing track ballast (Plate 7).

The bridge embankments and lands along the railway corridor are densely vegetated with a mix of trees and shrubs including silver maple, Norway maple, European Buckthorn, Beech, Sumac and various scrub brush and vines (Plate 7).

To the southeast of the bridge, in the area off Old Riverside Drive there is an overgrown single lane gravel laneway that runs parallel to the railway tracks and provides access to the railway for maintenance and repair purposes (Plate 8). The laneway is the property of CNR.



Plate 4: Looking west along Riverside Drive

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Site Description
April 13, 2018



Plate 5: Looking east along Riverside Drive



Plate 6: Looking east along Riverside Drive, showing curb, sidewalk, and bike lane.

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Site Description
April 13, 2018



Plate 7: View of railway tracks looking south

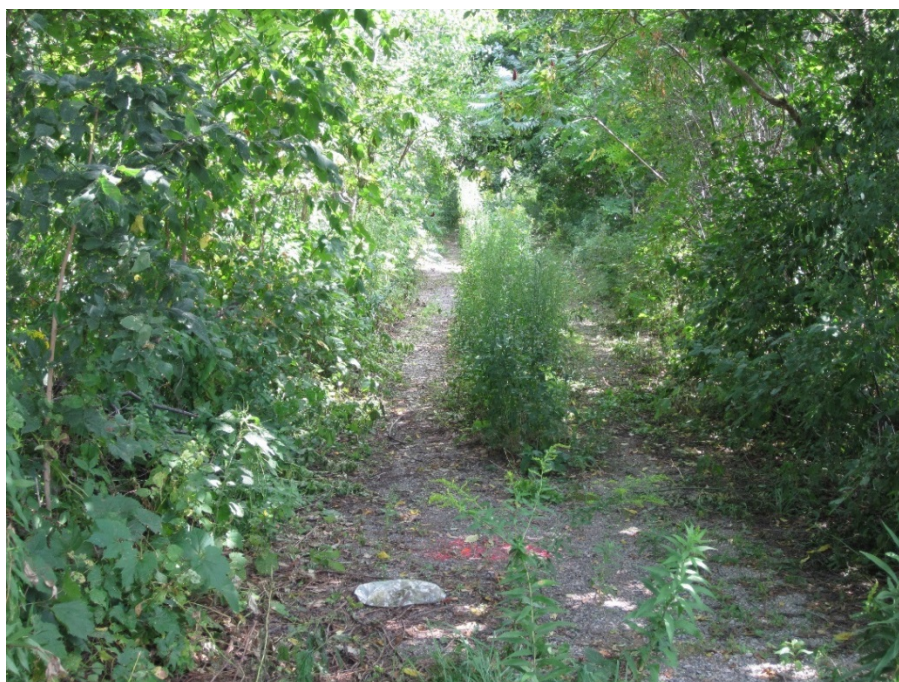


Plate 8: View looking down CNR access lane southeast of the bridge

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Site Description

April 13, 2018

5.2 RIVERSIDE BRIDGE

The Riverside Bridge over the CNR tracks is a four-span continuous beam and slab bridge, constructed in 1974. The bridge consists of a reinforced concrete slab deck supported by precast concrete I-beam girders (Plate 9, Plate 10). The bridge has cast in place concrete abutments and wingwalls, and cast in place concrete piers. The bridge piers consist of two tapered rectangular pillars joined at the top by a zig-zagged concrete lintel (Plate 11). Views of the bridge structure during the site visit were somewhat limited by vegetation and the proximity of the railway tracks. Information in this report was obtained from the site visit where feasible, and supplemented by the City's Structure Condition Report.

The bridge has a total deck area of 1626 square feet. Each span length, according to the 1974 bridge drawings, is 62 feet (measuring to the centre of the pier). The entire deck length is 248 feet. The structure width is 69 feet, measuring to the outside of the barriers. The bridge is constructed on a skew above the CNR tracks of 44 degrees.

The bridge contains an asphalt wearing surface above the deck, with raised concrete sidewalks on both sides of the bridge (Plate 12, Plate 13). The approach to the bridge also has an asphalt wearing surface with sidewalks on only the north side of the road. There are expansion joints at both ends of the bridge (Plate 14).

On either side of the bridge there is a concrete parapet wall barrier with two steel tube railings. The end posts of the railing contain a concrete parapet with a simple linear design impressed into the concrete (Plate 15). On the northeast end post a metal plaque has been installed noting the construction date, designer, builder, and municipal staff associated with the bridge (Plate 16). Flexible steel and wood post guide rails are located along the bridge approaches (Plate 17).

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Site Description
April 13, 2018



Plate 9: View looking north of the Riverside Bridge through vegetated area south of the bridge



Plate 10: View looking northeast beneath the bridge showing the concrete I-beam girders

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Site Description
April 13, 2018



Plate 11: View looking northeast beneath the bridge towards the cast in place concrete piers



Plate 12: View looking northeast across the Riverside Bridge

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Site Description
April 13, 2018



Plate 13: View looking southwest across the Riverside Bridge



Plate 14: View looking northwest at the expansion joint of the Riverside Bridge

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Site Description
April 13, 2018



Plate 15: Detail view of the decorative concrete impression at the end railing post



Plate 16: Detail view of the plaque at the northeast end post of the bridge

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Site Description
April 13, 2018



Plate 17: View looking northeast along the guide rail at the bridge approach

5.3 MODIFICATION

The bridge has undergone periodic maintenance and repair since its construction, including deck patching (1984, 1991 and 2011), gabion slope repair (1988), removal of framework at the abutment joints (1990), latex concrete deck overlay and joint replacement (1998) and curb and sidewalk repairs (2011). Overall, the modifications have been based on routine maintenance and have not substantially altered the structure type.

Evaluation
April 13, 2018

6.0 EVALUATION

6.1 INTRODUCTION

Within the EA process, O. Reg. 9/06 is typically used to identify CHVI (See Table 1). An overall summary of cultural heritage value identified in the two evaluation frameworks is provided in Section 6.3, and where applicable, a Statement of Cultural Heritage Value or Interest is provided in 6.4.

6.2 EVALUATION

Design/Physical Value

The Riverside Bridge over the CNR tracks is a four-span continuous beam and slab bridge, constructed in 1974. The bridge consists of a reinforced concrete slab deck supported by precast concrete I-beam girder. The bridge has cast in place concrete abutments and wingwalls, and cast in place concrete piers. The bridge piers consist of two tapered rectangular pillars joined at the top by a zig-zagged concrete lintel

The bridge type is not considered rare and the Riverside Bridge over the CNR tracks, constructed in 1974, is not an early example of this type of bridge. While the end railing post does have decorative impressions, they do not display a high degree of craftsmanship or scientific achievement. The bridge has not been significantly modified since its construction.

Based on the above discussion the bridge does not meet criteria of Section 1 of O. Reg. 9/06.

Historic/Associative Value

The Riverside Drive Bridge over the CNR tracks was constructed to replace an earlier crossing that had become obsolete due to weight restrictions and a sharply angled approach. Beyond this functional historical relationship, the bridge has no known historical associations with a person, event, theme, group, or belief. The original designer of the bridge is the engineering consulting firm A.M. Spriet and Associates. This firm carried out many civil engineering projects in London. The bridge, as a common design, does not demonstrate the ideas or work of a particular architect or designer who is significant to the community.

The bridge has a plaque on the northeast end post of the bridge. This plaque states the name of the bridge, officials for the City of London involved in its construction, the bridge designer, and the contractor who built the bridge. While this plaque does yield information, the information is limited and does not contribute to a broader understanding of the community or culture. The information on the plaque provides a connection to the historical development of the rail

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Evaluation
April 13, 2018

crossing and transportation routes in the city, and should be retained for installation on a future structure.

Based on the above discussion the bridge does not meet criteria of Section 2 of O. Reg. 9/06.

Contextual Value

The area is in a suburban and residential setting. The Riverside Drive Bridge over the CNR tracks has no defining features that mark it as a distinctively suburban structure, and, as such, the bridge does not support or define the area's character. While the bridge is functionally linked to its surroundings as a railroad crossing, this functional relationship is not noteworthy or unusual, nor are there any unusual physical, historical, or visual links to the surrounding area. The Riverside Drive Bridge over the CNR tracks is not a landmark in the area.

Based on the above discussion the bridge does not meet criteria of Section 3 of O. Reg. 9/06.

6.2.1 Ontario Regulation 9/06

Table 1: Evaluation of Riverside Bridge over CNR Tracks According to Ontario Regulation 9/06 of the Ontario Heritage Act

Criteria of O. Reg. 9.06	Y/N	Comments
Is a rare, unique, representative, or early example of a style, type, expression, material or construction method	N	The bridge is a four-span continuous beam and slab bridge. This bridge was a common bridge design starting in the mid-20 th century. While representative of this type of design, it does not serve as an important example of the type. Accordingly, the bridge does not meet this criterion.
Displays a high degree of craftsmanship or artistic merit	N	The bridge end railing posts have decorative impressions in the concrete, but these are not elements that display a high degree of craftsmanship or artistic merit. Accordingly, the bridge does not meet this criterion.
Demonstrates a high degree of technical or scientific achievement	N	This bridge is a common continuous beam and slab design that uses common materials at the time of construction. As such, it does not display a high degree of technical or scientific achievement. Accordingly, the bridge does not meet this criterion.
Has direct associations with a theme, event, belief, person, activity, organization, or institution that is significant to a community	N	The bridge was designed by Spriet Associates Ltd. While Spriet Associates is an organization connected to the City of London, and its founder Andrew Spriet is a person connected to the City of London, the bridge has no noteworthy or significant associations that demonstrates it as a design unique to Spriet, Spriet Associates, or the City of London. Accordingly, the bridge does not meet this criterion.

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Evaluation
April 13, 2018

Table 1: Evaluation of Riverside Bridge over CNR Tracks According to Ontario Regulation 9/06 of the Ontario Heritage Act

Criteria of O. Reg. 9.06	Y/N	Comments
Yields, or has the potential to yield, information that contributes to an understanding of a community or culture	N	The bridge has a plaque in the northeast end post of the bridge giving its date of construction and individuals and organizations involved in construction of the bridge. This information is limited in nature and does not contribute to an understanding of the community or its culture. Accordingly, the bridge does not meet this criterion.
Demonstrates or reflects the work or ideas of an architect, artist, builder, designer, or theorist who is significant to a community	N	The bridge was designed by Spriet Associates Ltd. The bridge type was a common design in the mid-20 th century and does not reflect the work or ideas of an architect, artist builder, designer or theorist significant to the community. Accordingly, the bridge does not meet this criterion.
Is important in defining, maintaining, or supporting the character of an area	N	The surrounding area is residential and suburban. There are no defining characteristics of the bridge that contribute to this character. Accordingly, the bridge does not meet this criterion.
Is physically, functionally, visually, or historically linked to its surroundings	N	While the bridge is functionally linked to its surroundings as a railroad crossing, however this functional relationship is not noteworthy or unusual, nor are there noteworthy or unusual physical, historical, or visual links to the surrounding area. Accordingly, the bridge does not meet this criterion.
Is a landmark	N	The structure is visible from Riverside Drive but is not a landmark in the area. Accordingly, the bridge does not meet this criterion.

6.3 STATEMENT OF CULTURAL HERITAGE VALUE OR INTEREST

The Riverside Bridge over the CNR tracks were not determined to have CHVI when evaluated according to O.Reg. 9/06. Accordingly, a statement of CHVI is not applicable.

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

Recommendations

April 13, 2018

7.0 RECOMMENDATIONS

The Riverside Bridge over the CNR tracks was evaluated against O. Reg. 9/06. The bridge did not meet any criteria under O. Reg 9/06. The Riverside Bridge over the CNR tracks is not considered to have CHVI as per the requirements of the MCEA Process. While the bridge does not demonstrate CHVI, the information on the bridge plaque provides a connection to the historical development of the rail crossing and transportation routes in the city, and should be retained for installation on a future structure.

No further heritage work is required and a Municipal Class Environmental Assessment Schedule 'A' or 'A+' would be appropriate from a cultural heritage perspective. If future EA projects result in alterations to surrounding properties containing structures older than 40 years, a CHER may be required to assess these properties for CHVI. To finalize this evaluation, this CHER should be submitted to the City of London for review and acceptance.

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

References
April 13, 2018

8.0 REFERENCES

Armstrong, R.M.. 1867. *London, C.W. Sketch of Country*.

Armstrong, Frederick. 1986. *The Forest City: An Illustrated History of London, Canada*. California: Windsor Publications.

Bot Construction. N.d. "History of Bot Construction". *About Us*. Electronic document: http://www.botconstruction.ca/about_us/history2.html Last accessed September 14, 2017.

Chapman, L.J. and Putnam D.F. 1984. *The Physiography of Southern Ontario Third Edition*, Ontario Geological Survey. Special Volume 2. Ontario: Ministry of Natural Resources.

City of London. 1878. *Map of Site of Proposed Waterworks for the City of London at Coombs Mills and Byron, Broken Front Concession Westminster*.

Department of the Interior. 1926. *Geodetic Survey of London, Sheet 81*.

Department of the Interior. 1957. *Geodetic Survey of London, Sheet 81*.

Department of Lands and Forests. 1922. *Aerial Photograph Line Number R2, Photo Number 55*.

Department of Planning and Development. June 10, 1945. *Aerial Photograph Line Number 40 Photo Number 44*.

Globe and Mail. May 13, 1960. *Approve Annexation: Population of London to Jump by 40,000*.

Government of Ontario. 2006. *O. Reg.9/06: Criteria for Determining Cultural Heritage Value or Interest*. Electronic Document: <https://www.ontario.ca/laws/regulation/060009> Last accessed: March 22, 2017

Government of Ontario. 2014. *Provincial Policy Statement*. Toronto: Ministry of Municipal Affairs and Housing.

Grosvenor Lodge. 2015. History. <http://grosvenorlodge.ca/history/>. Electronic Document. Last Accessed: September 6, 2017

Heritage Resources Centre. No date (n.d.). *Heritage Bridges Identification and Assessment Guide, Ontario 1945-1965*. Report on file at Stantec.

Historica Canada. 2014. Grand Trunk Railway of Canada. <http://www.thecanadianencyclopedia.com/en/article/grand-trunk-railway-of-canada/>. Electronic Document. Last Accessed: September 6, 2017

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

References
April 13, 2018

- Historica Canada. 2015. Grand Western Railway.
<http://www.thecanadianencyclopedia.com/en/article/great-western-railway/>.
Electronic Document. Last Accessed: September 6, 2017
- Hunting Survey Corporation. May 1, 1965. *Aerial Photograph Line Number 5, Photo Number 206*.
- London Free Press. May 9, 1970. *Riverside Overpass Restrictions Sought*.
- London Free Press. May 12, 1970. *London's Wooden Bridges Next Victims of Progress*.
- London Free Press. May 15, 1970. *Fire Trucks to Circumvent Old Bridges*.
- London Free Press. April 20, 1974. *Work on Overpass to begin Monday*.
- London Free Press. October 9, 1974. *New Bridge for Old*.
- London Free Press. October 28, 1974. *\$700,000 Overpass Nears Completion*.
- London Township History Book Committee. 2001a. *London Township: Volume 1: A Rich Heritage 1796-1997*. Aylmer, Ontario: London Township History Book Committee.
- London Township History Book Committee. 2001b. *London Township Volume 2: Families Past and Present*. Aylmer, Ontario: London Township History Book Committee.
- Meligrana, John F. 2000. The Politics of Municipal Annexation: The Case of the City of London's Territorial Ambitions during the 1950s and 1960s. In *Urban History Review* 291: 3-20.
- Moore, J.M. 1898. *Map of Lines of the London Street Ry. Co, London Water Works*. London, Ontario
- Municipal Engineers Association (MEA). 2014. *Municipal Heritage Bridges Cultural, Heritage and Archaeological Resources Assessment Checklist Revised April 11, 2014*. Electronic Document:
<http://www.municipalclassea.ca/files/Clarifications/Bridges%20Check%20List%20april%202014.pdf>. Last accessed: March 22, 2017.
- Municipal Engineers Association (MEA). 2015. *Municipal Class Environmental Assessment Manual*.
- National Air Photo Library. 1974. *London 1974, Roll A23667, Photo Number 114*.
- Ontario Ministry of Natural Resources. 1978. *London 1978 Roll 4268 Photo 103*.
- Page, H.R. & Co. 1878. *Illustrated Historical Atlas of the County of Middlesex*: Toronto, Ontario: Correll, Craig & Co. Lith. Toronto.
- Peters, Samuel. 1863. *Map of the Township of London, Canada West*.

CULTURAL HERITAGE EVALUATION REPORT: RIVERSIDE DRIVE BRIDGE

References

April 13, 2018

Quinlan, Cathy. March 2013. *The Thames River, Ontario: Canadian Heritage Rivers System Ten Years Monitoring Report 2000-2012*. Prepared for the Canadian Heritage Rivers Board.

**APPENDIX A:
MUNICIPAL HERITAGE BRIDGES
CULTURAL, HERITAGE AND
ARCHAEOLOGICAL RESOURCES
ASSESSMENT CHECKLIST**

Municipal Heritage Bridges Cultural, Heritage and Archaeological Resources Assessment Checklist

This checklist was prepared in March 2013 by the Municipal Engineers Association to assist with determining the requirements to comply with the Municipal Class Environmental Assessment. View all 4 parts of the module on Structures Over 40 Years at www.municipalclassea.ca to assist with completing the checklist.

Project Name: Riverside Drive Bridge over CNR Tracks

Location: 750 m east of Wonderland Road

Municipality: City of London

Project Engineer: Isaac Bartlett

Checklist completed by: Lashia Jones / Isaac Bartlett

Date: November 28 2017

NOTE: Complete all sections of Checklist. Both Cultural Heritage and Archaeological Sections must be satisfied before proceeding.

Part A - Municipal Class EA Activity Selection

Description	Yes	No
Will the proposed project involve or result in construction of new water crossings? This includes ferry docks.	<input type="checkbox"/> Schedule B or C	<input checked="" type="checkbox"/> Next
Will the proposed project involve or result in construction of new grade separation?	<input type="checkbox"/> Schedule B or C	<input checked="" type="checkbox"/> Next
Will the proposed project involve or result in construction of new underpasses or overpasses for pedestrian recreational or agricultural use?	<input type="checkbox"/> Schedule B or C	<input checked="" type="checkbox"/> Next
Will the proposed project involve or result in construction of new interchanges between any two roadways, including a grade separation and ramps to connect the two roadways?	<input type="checkbox"/> Schedule B or C	<input checked="" type="checkbox"/> Next

Description	Yes	No
Will the proposed project involve or result in reconstruction of a water crossing where the structure is less than 40 years old and the reconstructed facility will be for the same purpose, use, capacity and at the same location? (Capacity refers to either hydraulic or road capacity.) This include ferry docks.	<input type="checkbox"/> Schedule A+	<input checked="" type="checkbox"/> Next
Will the proposed project involve or result in reconstruction of a water crossing, where the reconstructed facility will not be for the same purpose, use, capacity or at the same location? (Capacity refers to either hydraulic or road capacity). This includes ferry docks.	<input type="checkbox"/> Schedule B or C	<input checked="" type="checkbox"/> Next
Will the proposed project involve or result in reconstruction or alteration of a structure or the grading adjacent to it when the structure is over 40 years old where the proposed work will alter the basic structural system, overall configuration or appearance of the structure?	<input checked="" type="checkbox"/> Next	<input type="checkbox"/> Assess Archaeological Resources

Part B - Cultural Heritage Assessment

Description	Yes	No
Does the proposed project involve a bridge construction in or after 1956?	<input checked="" type="checkbox"/> Next	<input type="checkbox"/> Prepare CHER Undertake HIA
Does the project involve one of these three bridge types?	<input type="checkbox"/> Rigid frame Next <input type="checkbox"/> Simple Support Next <input type="checkbox"/> Structural Steel Next	<input checked="" type="checkbox"/> Prepare CHER Undertake HIA
Does the bridge or study area contain a parcel of land that is subject of a covenant or agreement between the owner of the property and a conservation body or level of government?	<input type="checkbox"/> Prepare CHER Undertake HIA	<input checked="" type="checkbox"/> Next

Description	Yes	No
Does the bridge or study area contain a parcel of land that is listed on a register or inventory of heritage properties maintained by the municipality?	<input type="checkbox"/> Prepare CHER Undertake HIA	<input checked="" type="checkbox"/> Next
Does the bridge or study area contain a parcel of land that is designated under Part IV of the Ontario Heritage Act?	<input type="checkbox"/> Prepare CHER Undertake HIA	<input checked="" type="checkbox"/> Next
Does the bridge or study area contain a parcel of land that is subject to a notice of intention to designate issued by a municipality?	<input type="checkbox"/> Prepare CHER Undertake HIA	<input checked="" type="checkbox"/> Next
Does the bridge or study area contain a parcel of land that is located within a designated Heritage Conservation District?	<input type="checkbox"/> Prepare CHER Undertake HIA	<input checked="" type="checkbox"/> Next
Does the bridge or study area contain a parcel of land that is subject to a Heritage Conservation District study area by-law?	<input type="checkbox"/> Prepare CHER Undertake HIA	<input checked="" type="checkbox"/> Next
Does the bridge or study area contain a parcel of land that is included in the Ministry of Tourism, Culture and Sport's list of provincial heritage properties?	<input type="checkbox"/> Prepare CHER Undertake HIA	<input checked="" type="checkbox"/> Next
Does the bridge or study area contain a parcel of land that is part of a National Historic Site?	<input type="checkbox"/> Prepare CHER Undertake HIA	<input checked="" type="checkbox"/> Next
Does the bridge or study area contain a parcel of land that is part of a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?	<input type="checkbox"/> Prepare CHER Undertake HIA	<input checked="" type="checkbox"/> Next
Does the bridge or study area contain a parcel of land that is designated under the Heritage Railway Station Protection Act?	<input type="checkbox"/> Prepare CHER Undertake HIA	<input checked="" type="checkbox"/> Next

Description	Yes	No
Does the bridge or study area contain a parcel of land that is identified as a Federal Heritage Building by the Federal Heritage Building Review Office (FHBRO)	<input type="checkbox"/> Prepare CHER Undertake HIA	<input checked="" type="checkbox"/> Next
Does the bridge or study area contain a parcel of land that is the subject of a municipal, provincial or federal commemorative or interpretive plaque that speaks to the Historical significance of the bridge?	<input type="checkbox"/> Prepare CHER Undertake HIA	<input checked="" type="checkbox"/> Next
Does the bridge or study area contain a parcel of land that is in a Canadian Heritage River watershed?	<input type="checkbox"/> Prepare CHER Undertake HIA	<input checked="" type="checkbox"/> Next
Will the project impact any structures or sites (not bridges) that are over forty years old, or are important to defining the character of the area or that are considered a landmark in the local community?	<input type="checkbox"/> Prepare CHER Undertake HIA	<input checked="" type="checkbox"/> Next
Is the bridge or study area adjacent to a known burial site and/or cemetery?	<input type="checkbox"/> Prepare CHER Undertake HIA	<input checked="" type="checkbox"/> Next
Is the bridge considered a landmark or have a special association with a community, person or historical event in the local community?	<input type="checkbox"/> Prepare CHER Undertake HIA	<input checked="" type="checkbox"/> Next
Does the bridge or study area contain or is it part of a cultural heritage landscape?	<input type="checkbox"/> Prepare Cher Undertake HIA	<input checked="" type="checkbox"/> Assess Archaeological Resources

PART C - HERITAGE ASSESSMENT

Description	Yes	No
Does the Cultural Heritage Evaluation Report identify any Heritage Features on the project?	<input type="checkbox"/> Undertake HIA	<input checked="" type="checkbox"/> Part D - Archaeological Resources
Does the Heritage Impact Assessment determine that the proposed project will impact any of the Heritage Features that have been identified?	<input type="checkbox"/> Schedule B or C	<input checked="" type="checkbox"/> Part D - Archaeological Resources

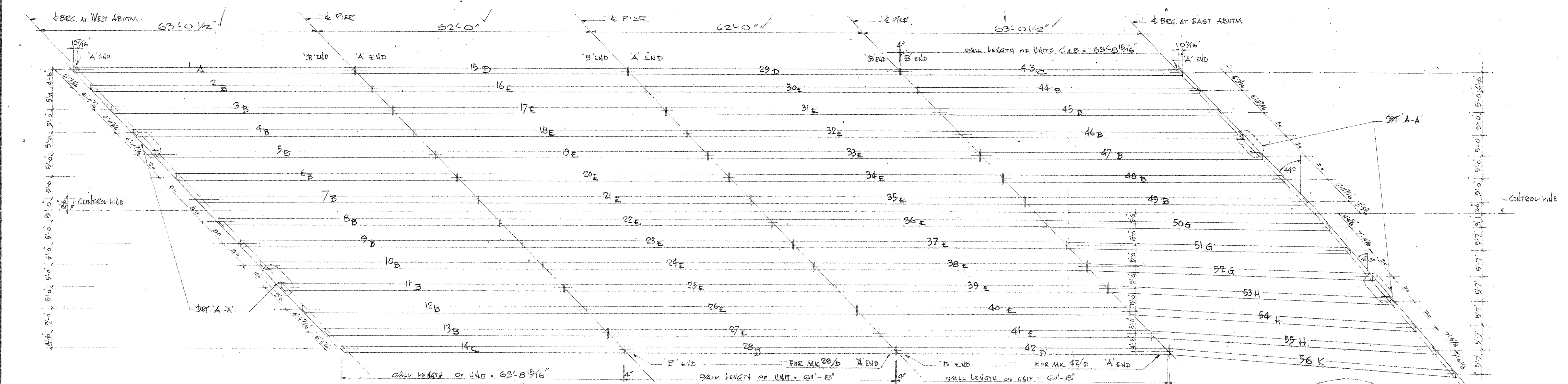
PART D - ARCHAEOLOGICAL RESOURCES ASSESSMENT

Description	Yes	No
Will any activity, related to the project, result in land impacts/significant ground disturbance?	<input type="checkbox"/> Next	<input checked="" type="checkbox"/> Schedule A - proceed
Have all areas, to be impacted by ground disturbing activities, been subjected to recent extensive and intensive disturbances and to depths greater than the depths of the proposed activities?	<input type="checkbox"/> Schedule A - proceed	<input type="checkbox"/> Next
Has an archaeological assessment previously been carried out that includes all of the areas to be impacted by this project?	<input type="checkbox"/> Next	<input type="checkbox"/> Archaeological Assessment
Does the report on that previous archaeological assessment recommend that no further archaeological assessment is required within the limits of the project for which that assessment was undertaken, and has a letter been issued by the Ministry of Tourism, Culture and Sport stating that the report has been entered into the Ontario Public Register of Archaeological Reports?	<input type="checkbox"/> Schedule A - proceed	<input type="checkbox"/> Obtain satisfaction letter - proceed

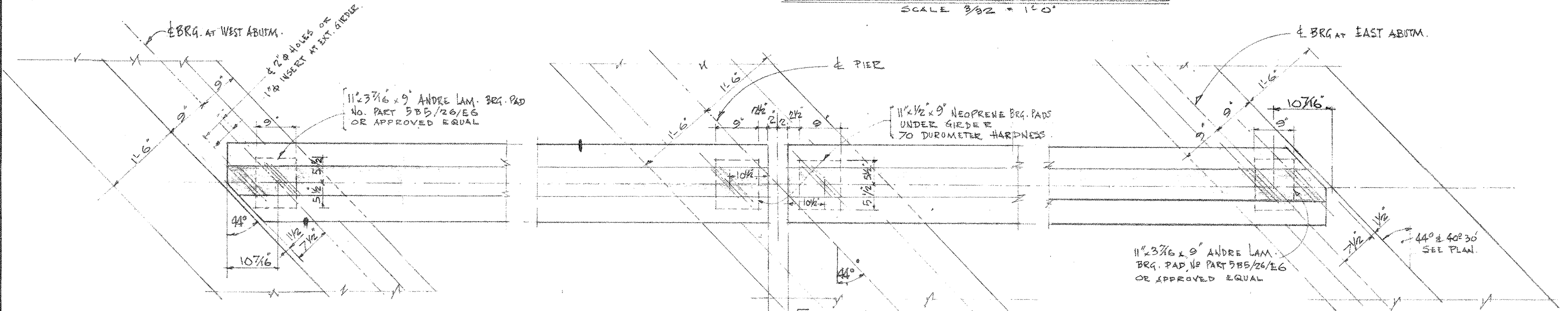
**** Include Documentation Summary in Project File****

APPENDIX B: BRIDGE DRAWINGS

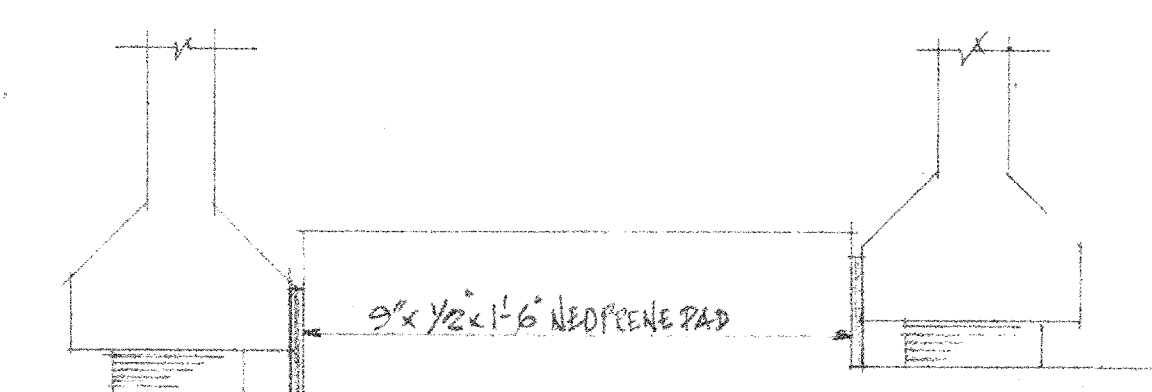
63'-0 1/2"
10 7/8"
63'-11 3/4"
2"
63'-9 7/8"



GIRDER LAYOUT
SCALE 3/32" = 1'-0"



NOTE!
THIS SPACE VARIES AT EAST PIER SOUTH HALF OF BRIDGE



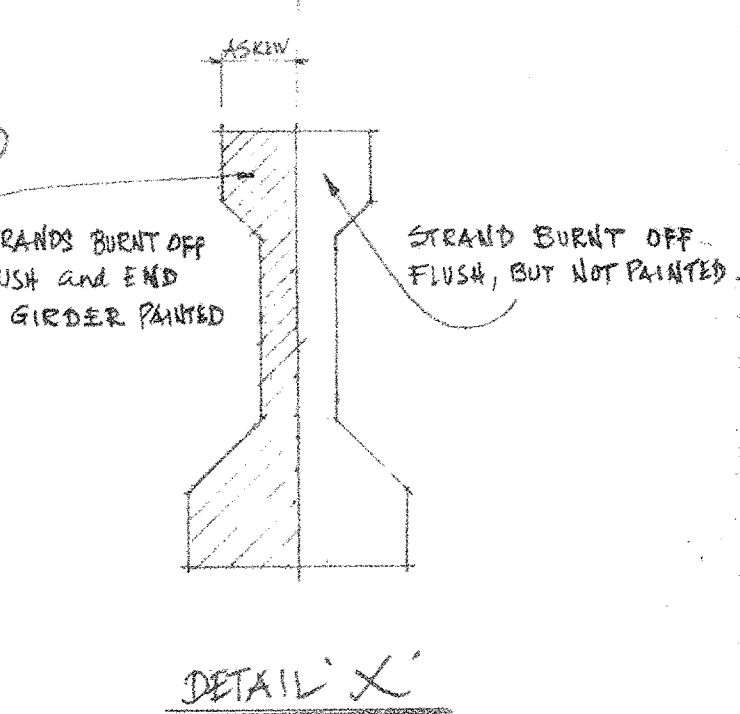
DETAIL AT A-A

PLEASE VERIFY!

GENERAL CONTRACTOR PLEASE NOTE:
THE GENERAL CONTRACTOR SHALL PROVIDE AND MAINTAIN ACCESS AND OPERATING SPACE FOR THE EQUIPMENT OF THE PRECAST CONCRETE ERECTOR. SUCH AREAS SHALL BE CAPABLE OF SUPPORTING THE ERECTOR'S CRANES AND TRUCKS.

FINISH:
EXTERIOR FACES OF GIRDER TO HAVE M.T.C. CLASS 'A' FINISH. REMAINING FACES TO BE M.T.C. CLASS 'B' FINISH. FINISH TOP FACE WITH WOOD FLOAT AND ROUGHENED BY BROOKING. MKS A, B, C, G, H, J, K - AT 'A' END SEE DET. 'X'.
'B' END & 'A' END OF REMAINING UNITS STRANDS TO BE BURNED OFF WITH 1/2 PROS. AND NOT PAINTED.

TOLERANCES:
LENGTH ± 3/8" GALL
CROSS SECTION ± 1/8" FROM EA. DIM'S. (NOT CUMULATIVE).
ALIGNMENT ± 1/8" IN ANY 10'-0"
PLACEMENT ± 1/4" OF GIVEN DIMENSIONS



SHOULD THIS DRAWING NOT BE RETURNED WITHIN _____ DAYS OF APR 9 1974 THE CONTRACT DATE MAY HAVE TO BE REVISED.
PRE-CON COMPANY

D.T.C. - TORONTO RECEIVED
APR - 9 1974
STRUCTURAL OFFICE



MINISTRY OF TRANSPORTATION AND COMMUNICATIONS ONTARIO
APPROVED APR 19 1974 PURSUANT TO THE PUBLIC TRANSPORTATION AND HIGHWAY IMPROVEMENT ACT AND THE MUNICIPAL ACT.
SITE NO. 19-264
H. Kleintuber
MUNICIPAL STRUCTURAL ENGINEER

PRE-CON COMPANY
35 RUTHERFORD ROAD S., BRAMPTON ONTARIO, TELEPHONE 457-4140

C.N.R. GRADE SEPARATION, RIVERSIDE DR., LONDON
AASHTO GIRDER LAYOUT and ERECTION DETAILS.

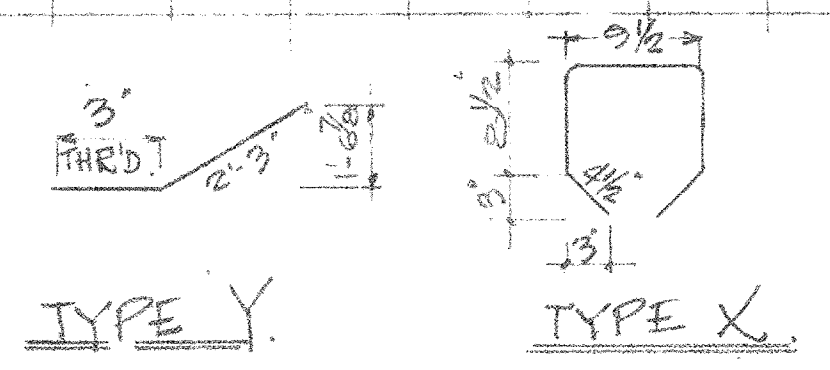
No.	DATE	DESCRIPTION	DRN	CHK	APP.	DRAWN BY	ISSUED DATE	JOB No.	DWG No.
		REVISIONS				V. G.	APR 8 1974	10799	E1

DWG. No.	REV.	No. OF UNITS REQ'D	BENDING SCHEDULE													UNIT
10799 E1		2														XS 540W
MARK	DIA.	No. PER UNIT	LENGTH	TYPE	A	B	C	D	E	F	G	H	J	K	O	
#501	#3	4	2'-0"	B										1'-0"	3"	
#401	#4	66	6'-7"	S										3'-3"	3 1/2"	
#402	#4	72	1'-1"	3		3"	9 1/2"	3"								
#403	#4	48	1'-7 1/2"	3		3"	1'-4"	3"								
#404	#4	48	1'-3"	STR.										3'-3"	4"	
#406	#4	4	20'-0"	STR.												
#407	#4	6	21'-7 1/2"	"												
#408	#4	1	21'-5 1/2"	"												
#409	#4	1	21'-1 1/2"	"												
#410	#4	8	4'-0"	"												
#411	#4	6	2'-5 1/2"	X												
#601	#6	2	20'-0"	STR.										1'-0"	3"	
#602	#6	3	21'-7 1/2"	"										3'-3"	4"	
#603	#6	1	21'-5 1/2"	"										3'-3"	3 1/2"	
#604	#6	4	4'-0"	"												
#801	#8	3	2'-6"	Y												

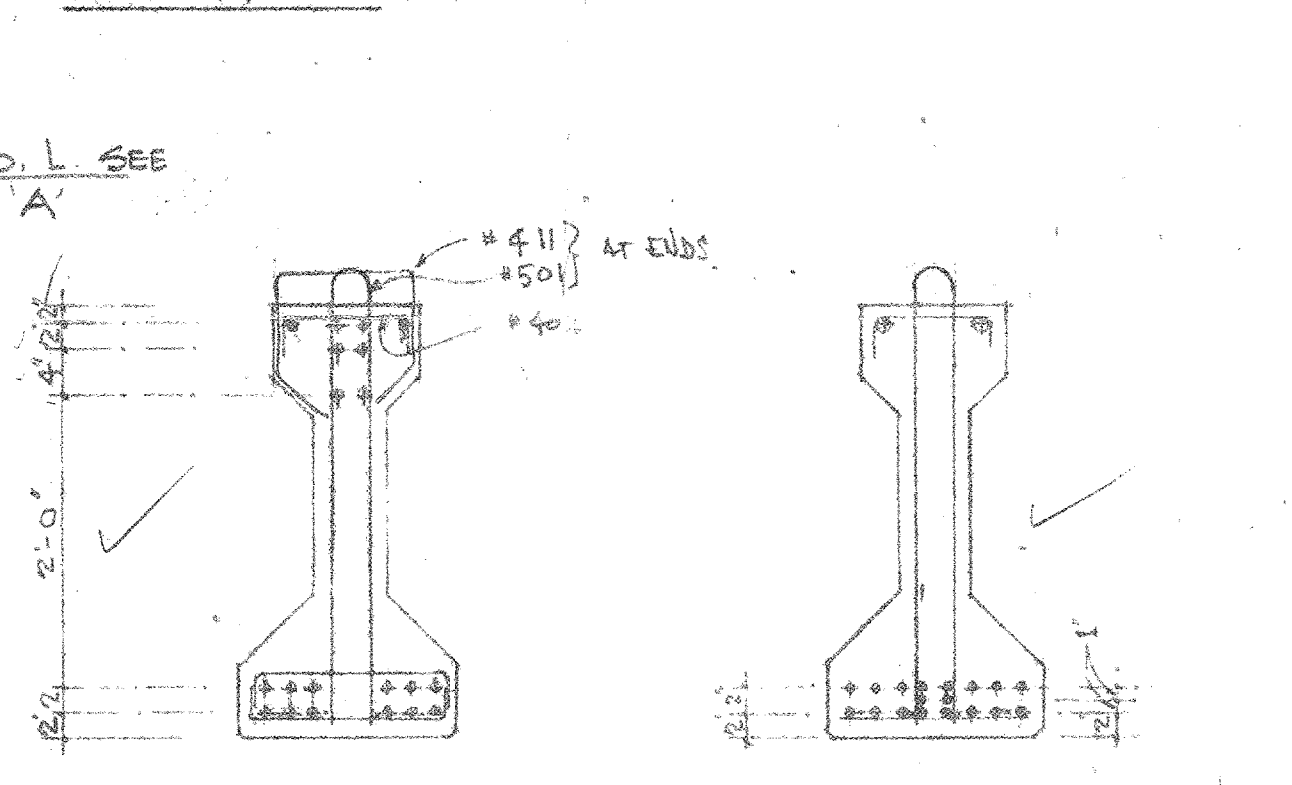
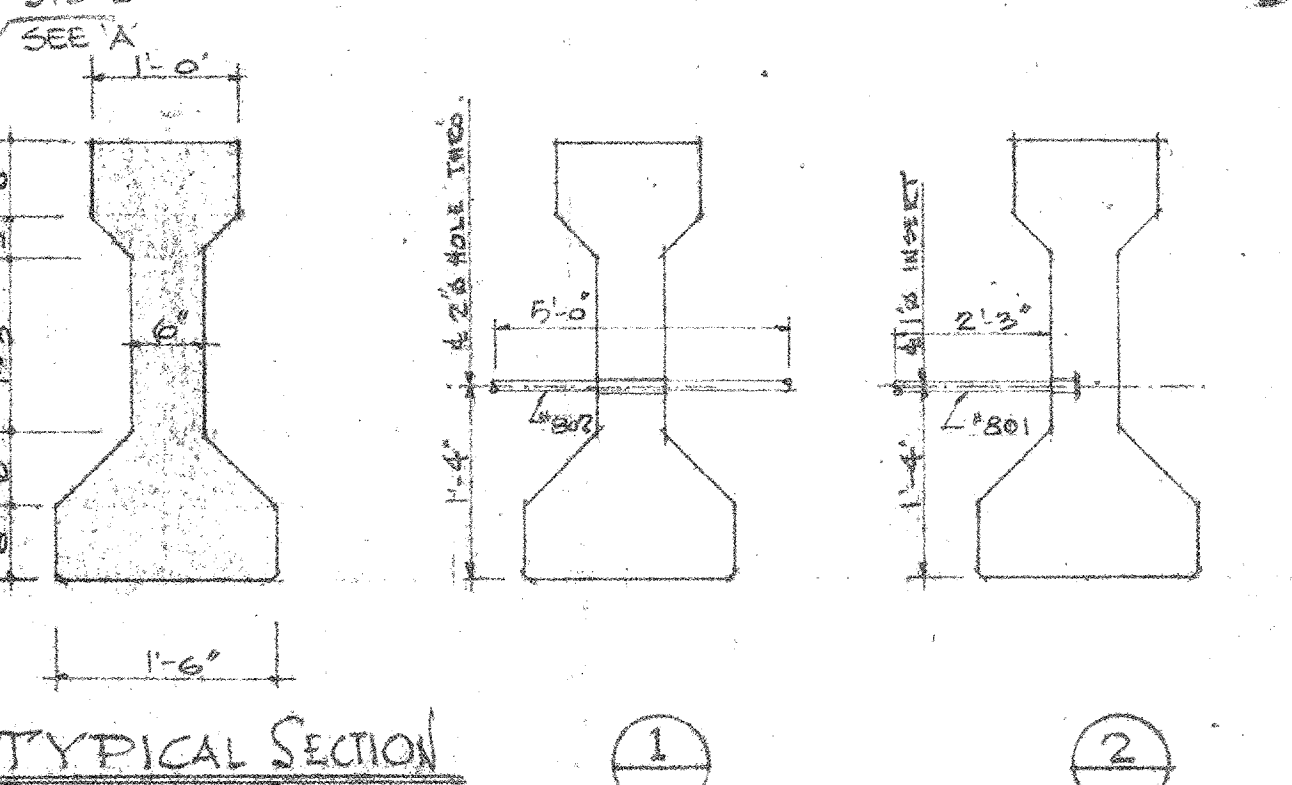
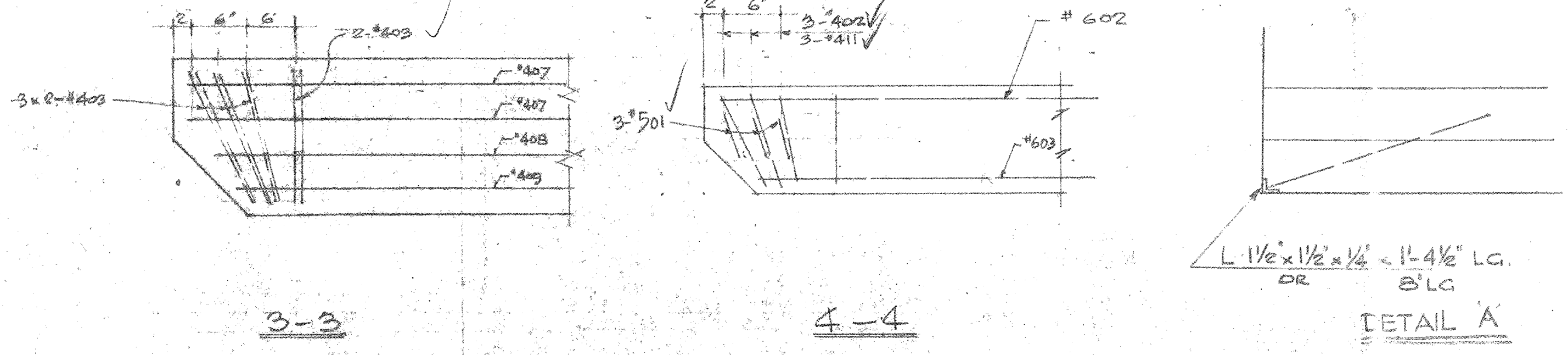
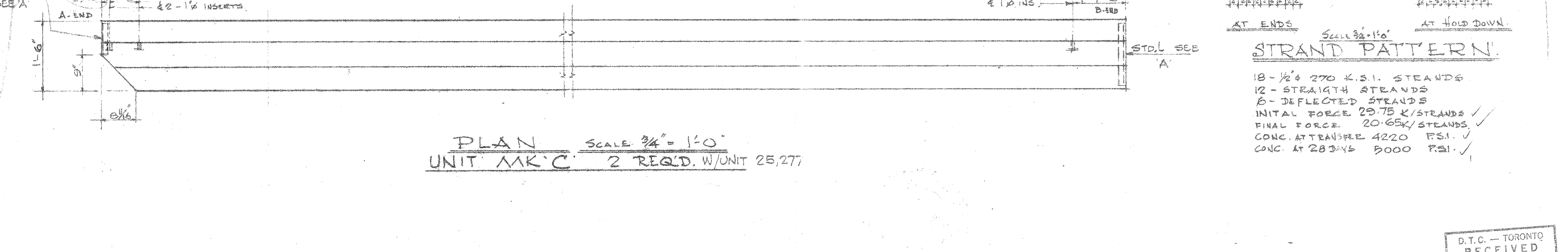
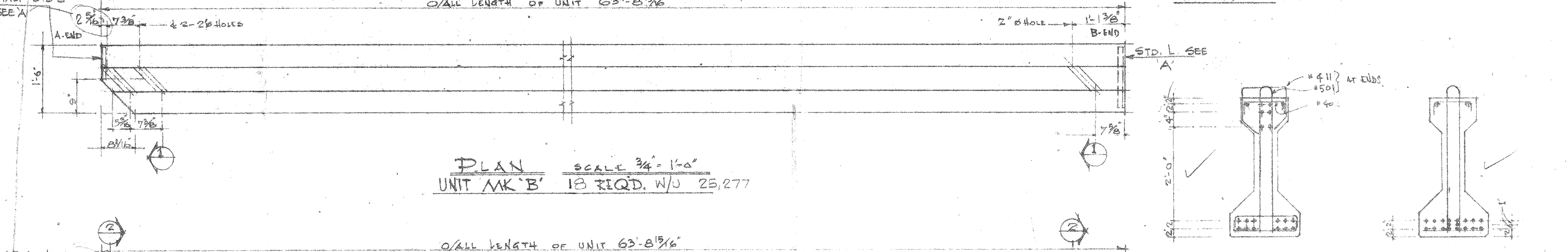
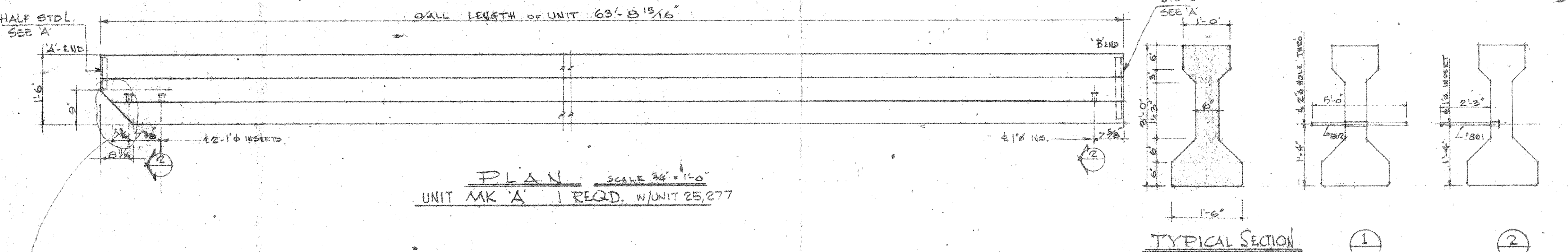
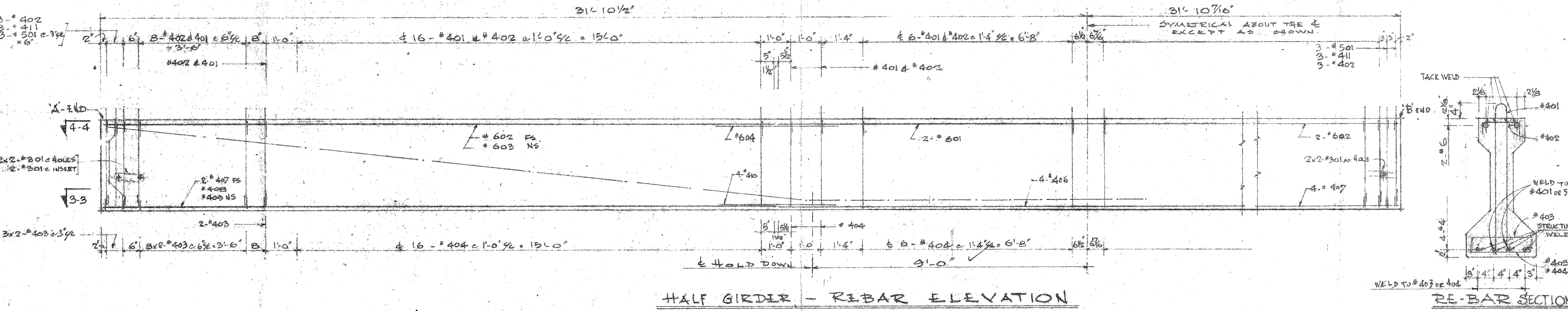
DWG. No. REV. HARDWARE - CAST IN UNIT

MARK	No. REQ'D	DESCRIPTION
#301	#3	4 2'-0" B
#501	#3	6 6'-7" S
#401	#4	66 1'-1" 3
#402	#4	72 1'-7 1/2" 3
#403	#4	48 1'-3" STR.
#404	#4	48 20'-0" STR.
#406	#4	6 21'-7 1/2" "
#407	#4	1 21'-5 1/2" "
#408	#4	1 21'-1 1/2" "
#409	#4	8 4'-0" "
#410	#4	6 2'-5 1/2" X
#601	#6	2 20'-0" STR.
#602	#6	3 21'-7 1/2" "
#603	#6	1 21'-5 1/2" "
#604	#6	4 4'-0" "
#801	#8	3 2'-6" Y

REQ'D No.	MARK	WEIGHT OF REINF. IN LBS. BLACK GALV.	WEIGHT OF UNIT IN LBS.	VOL. IN CU. FT.	FACE AREA IN SQ. FT.	STRAND LIN. FT.
1	A	955.70	-	25.307	163.27	
1B	B	978.7	-	25.307	163.27	
2	C	955.70	-			

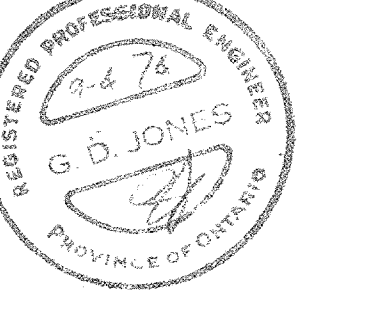


PLEASE VERIFY INCREASE BY 1"



STRAND PATTERN
 18 - 1/2" 270 K.S.I. STANDS
 12 - STRAIGHT STANDS
 6 - DEFLECTED STANDS
 INITIAL FORCE 20.75 K/STANDS
 FINAL FORCE 20.65 K/STANDS
 CONC. AT TRANSFER 4220 PSI.
 CONC. AT 28 DAYS 5000 PSI.

DESIGNED FOR APPROVAL
 SHOULD THIS DRAWING NOT BE RETURNED WITHIN _____ DAYS
 OF APR 9 1974 THE CONTRACT DATE MAY HAVE TO BE REVISED.
 PRE-CON COMPANY



D.T.C. - TORONTO RECEIVED
 APR - 9 1974
 STRUCTURAL OFFICE

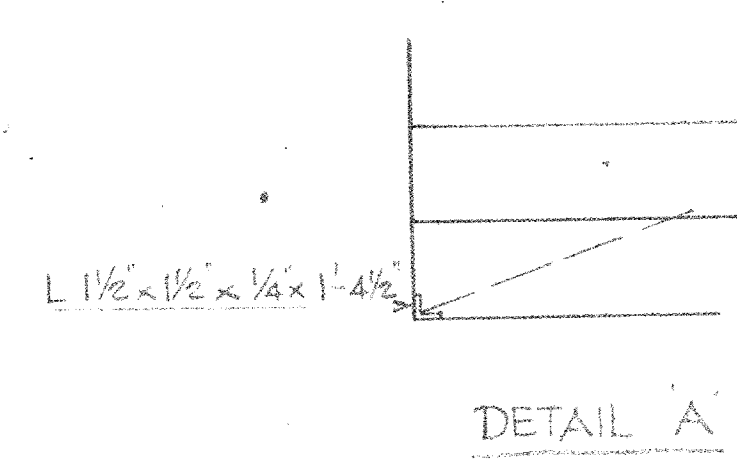
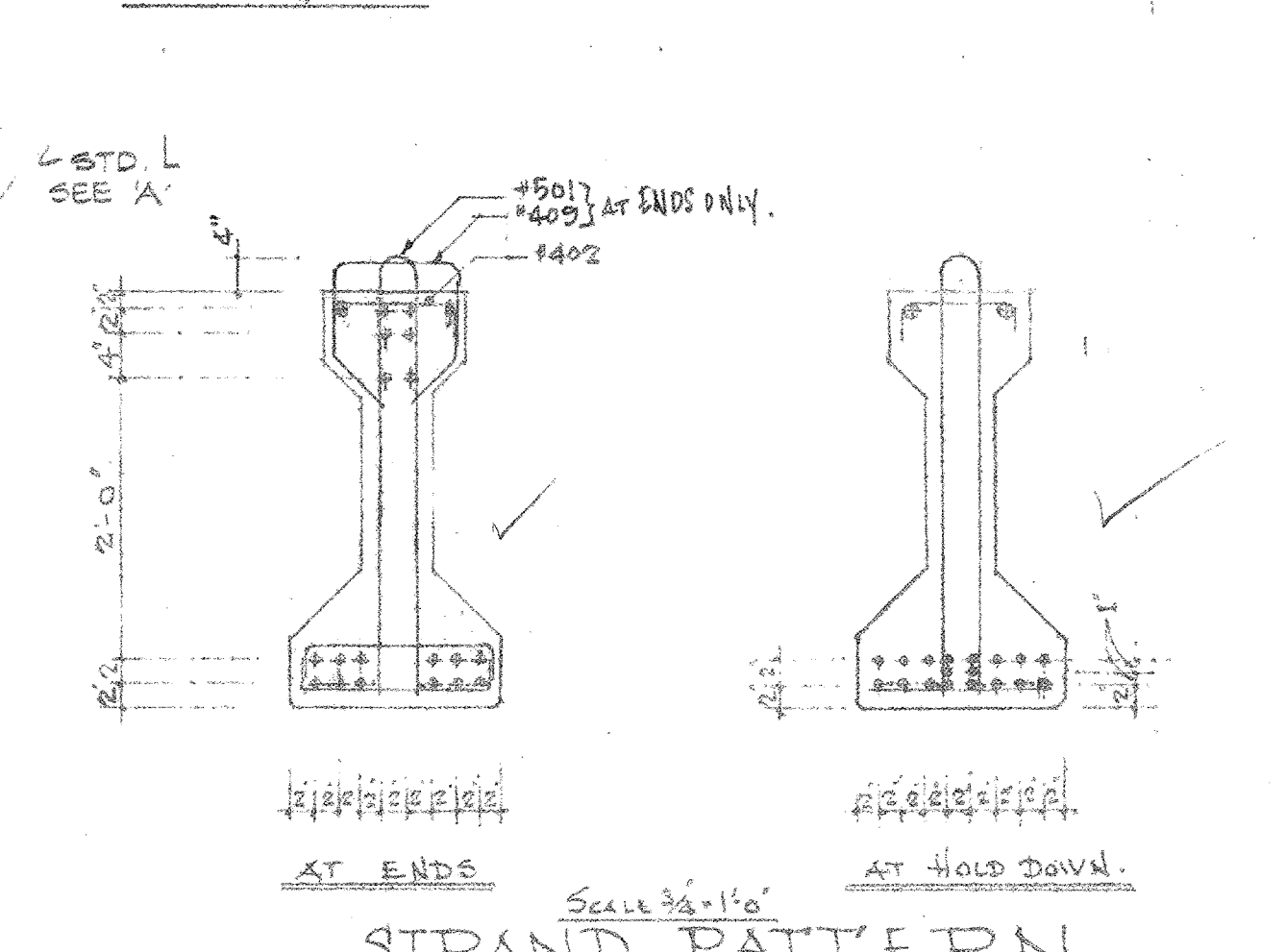
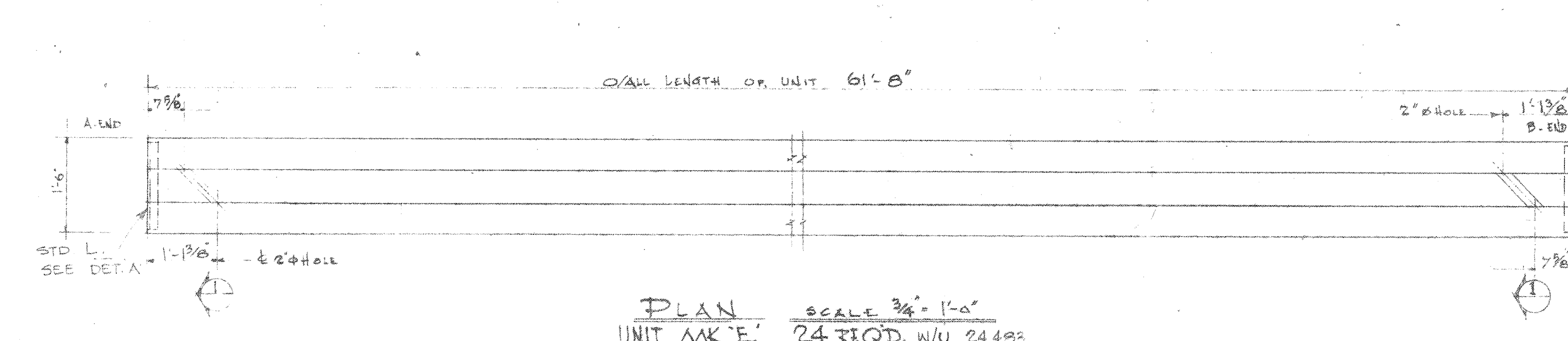
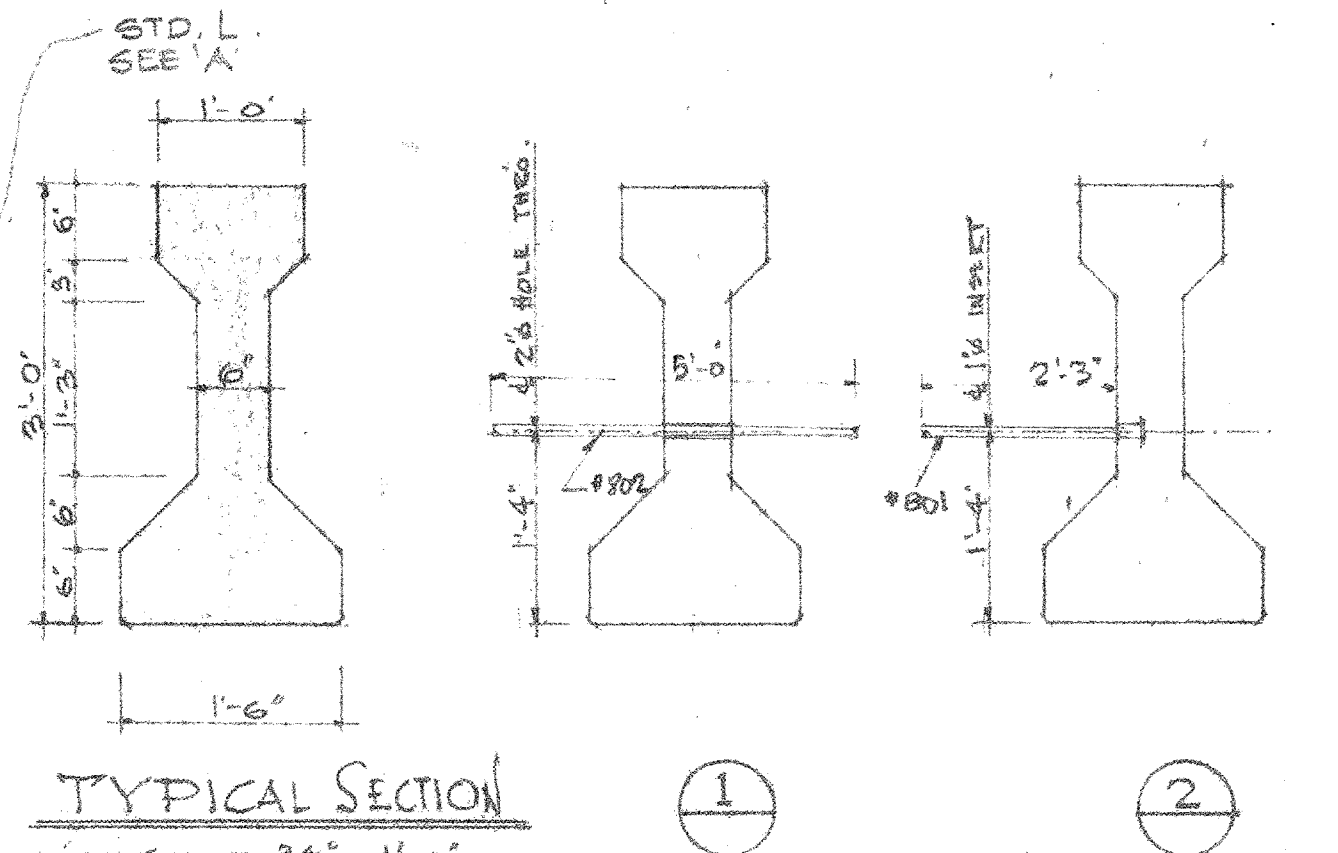
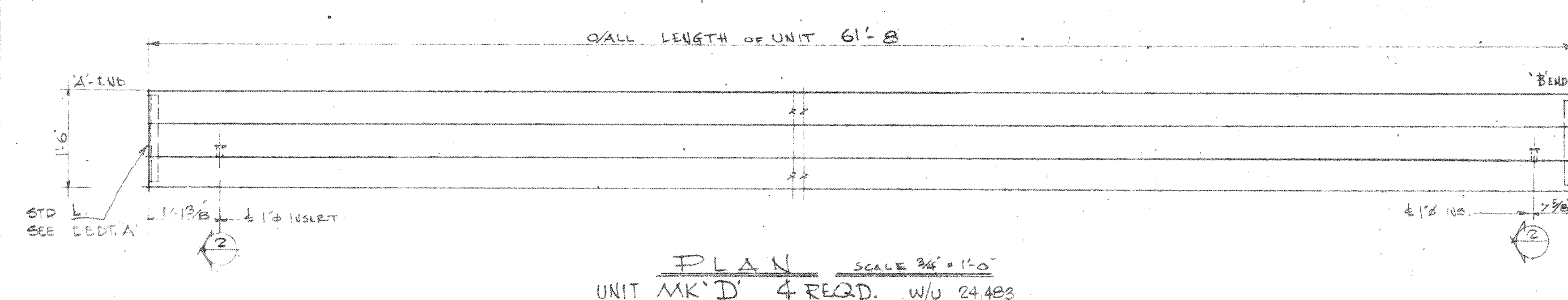
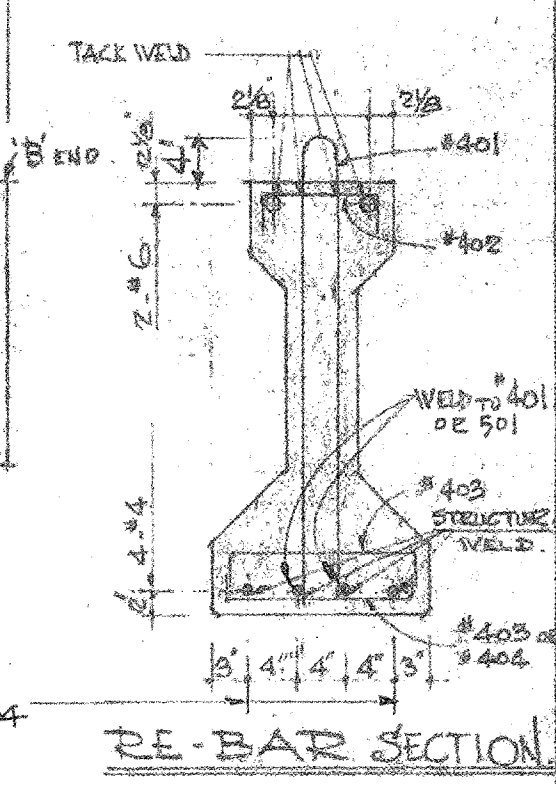
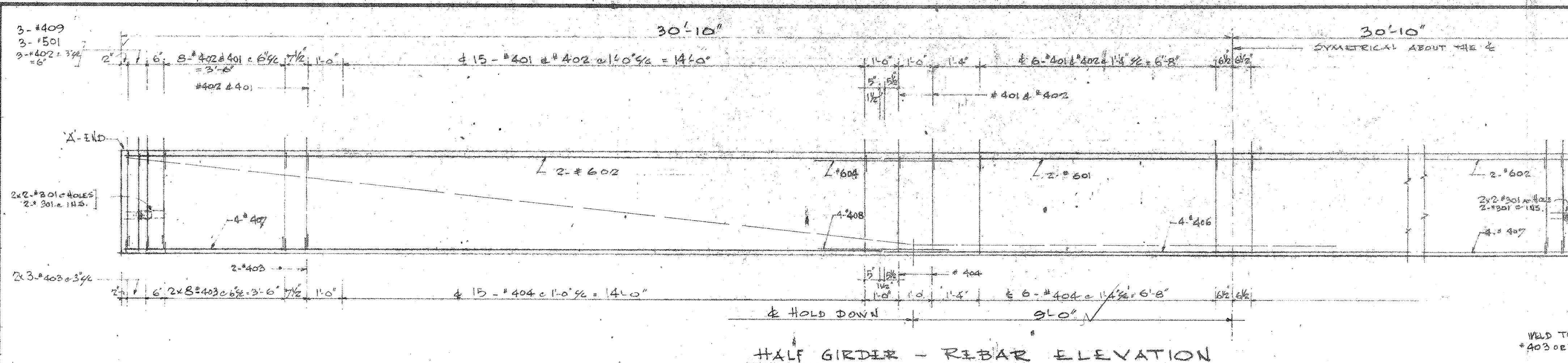
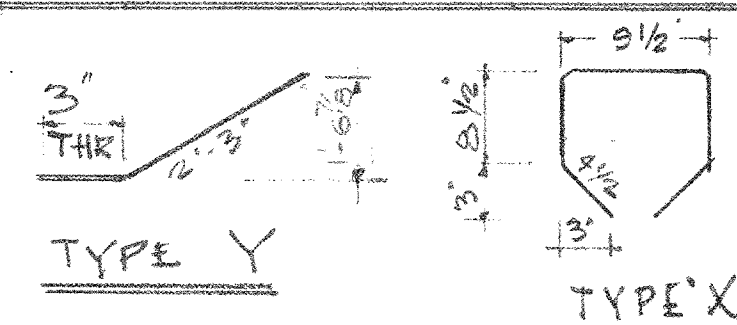
FOR LAYOUT SEE... E1
 SIGNATURE SHEET No. 19-264

PRE-CON COMPANY
 35 RUTHERFORD ROAD S., BRAMPTON ONTARIO, TELEPHONE 454-1560
 CNR GRADE SEPARATION, RIVERSIDE DRIVE - LONDON, ONT.
AASHOT GIRDER UNIT DETAILS
 FOR MK'S A, B & C

No.	DATE	DESCRIPTION	DRN/CHK/APP.	DRAWN BY	ISSUED DATE	JOB No.	DWG No.
					APR 9 1974	10799	E 2

DWG. No.		REV.	No. OF UNITS REQ'D		BENDING SCHEDULE													UNIT
10799 E1			28															AS SHOWN
MARK	DA	No PER UNIT	LENGTH	TYPE	A	B	C	D	E	F	G	H	J	K	O			
#401	#4	4	6'-6"	B											3'			
#401	#4	64	6'-7"	5											3 1/2'			
#402	#4	70	1'-1"	3		3"	9 1/2"	3"										
#403	#4	48	1'-7 1/2"	3		3"	1'-4"	3"										
#404	#4	46	1'-3"	STE														
#406	#4	4	20'-0"	STE														
#407	#4	8	20'-7"															
#408	#4	8	4'-0"															
#409	#4	6	2'-9 1/2"	X														
#501	#5	6	6'-7"	5											4'			
#601	#6	2	20'-0"	STE														
#602	#6	4	20'-7"															
#603	#6	4	4'-0"															
#801	#8	2	2'-6"	Y														
#901	#9	8	1'-6"	B											3'			
#401	#4	64	6'-7"	5											3 1/2'			
#402	#4	70	1'-1"	3		3"	9 1/2"	3"										
#403	#4	48	1'-7 1/2"	3		3"	1'-4"	3"										
#404	#4	46	1'-3"	STE														
#406	#4	4	20'-0"	STE														
#407	#4	8	20'-7"															
#409	#4	6	2'-9 1/2"	X														
#501	#5	6	6'-7"	5											4'			
#601	#6	2	20'-0"	STE														
#602	#6	4	20'-7"															
#603	#6	4	4'-0"															
#802	#8	2	5'-0"	STE														

DWG. No.		REV.	UNIT	
			HARDWARE CAST-IN	
MARK	No. REQ'D	DESCRIPTION		UNIT



REQ'D No.	MARK No.	WEIGHT OF REIN. IN LBS		VOL IN CU FT	FACE AREA IN SQ FT	STRAND CU FT
		BLACK	GALV.			
4	D	900.0	-	24480	157.94	
24	E	915.6	-	24480	157.94	

ISSUED FOR APPROVAL
 SHOULD THIS DRAWING NOT BE RETURNED WITHIN _____ DAYS OF APR 9 1974 THE CONTRACT DATE MAY HAVE TO BE REVISED.
 PRE-CON COMPANY



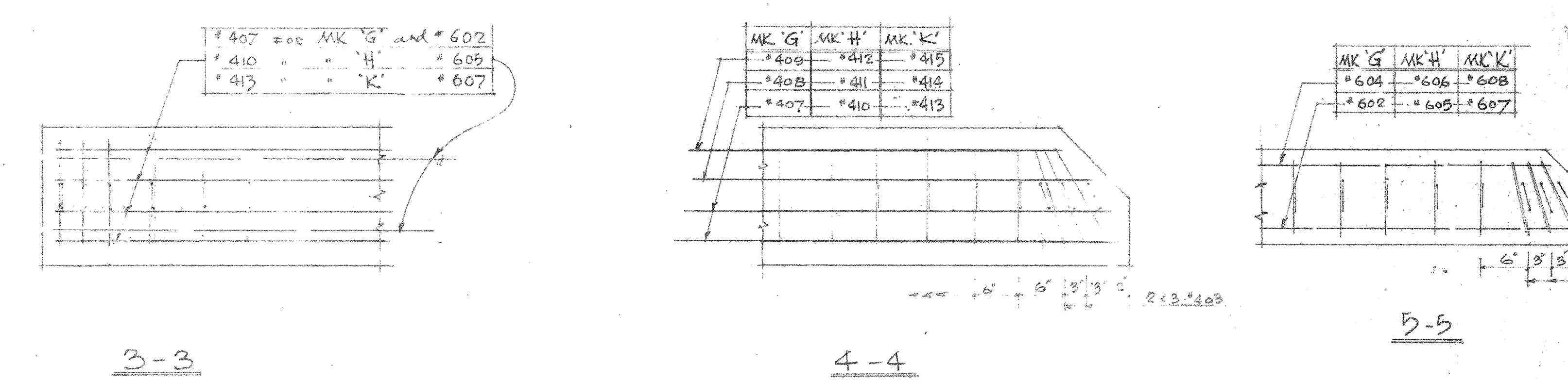
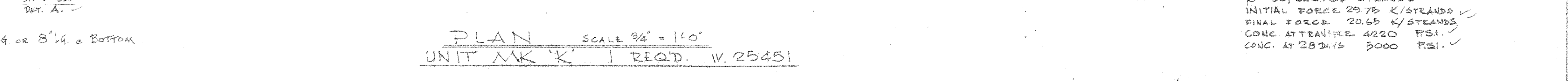
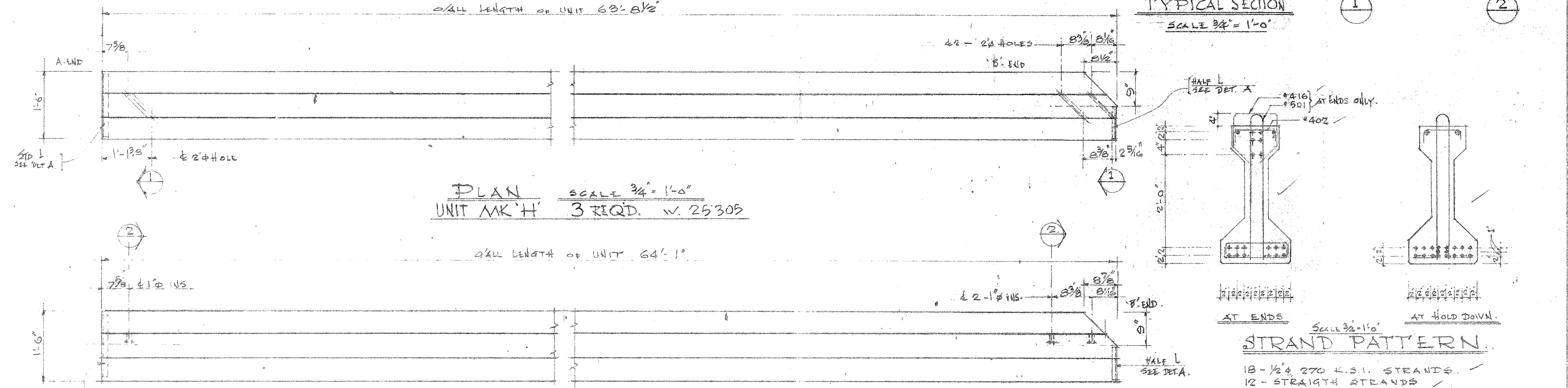
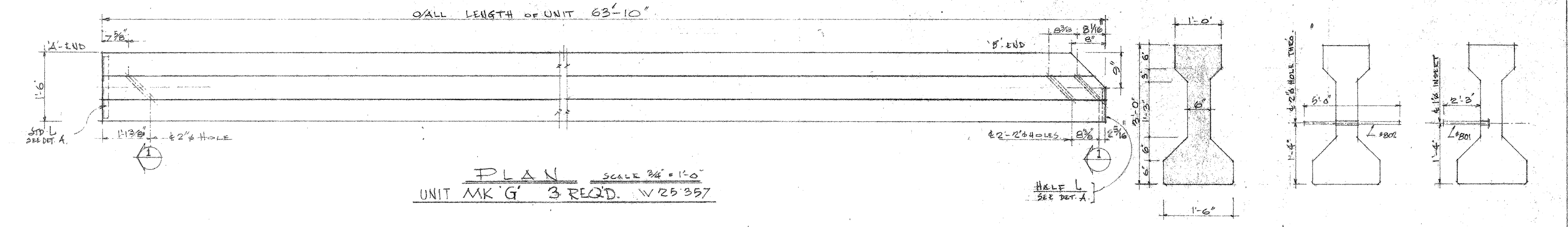
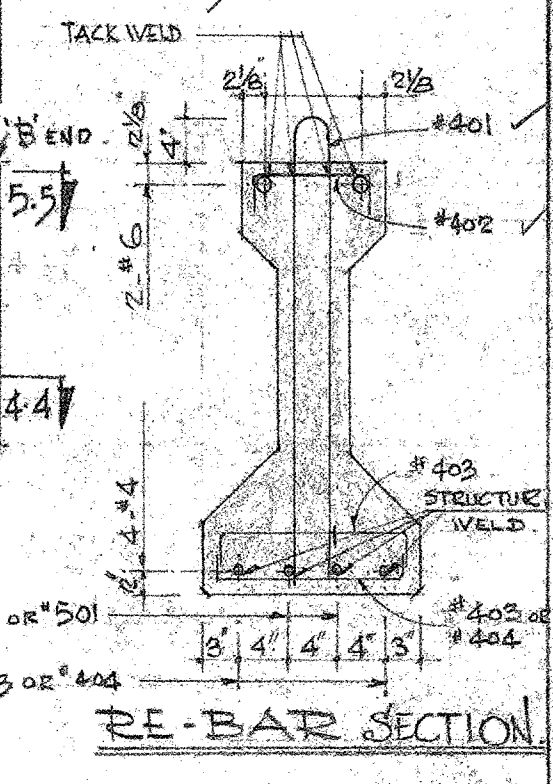
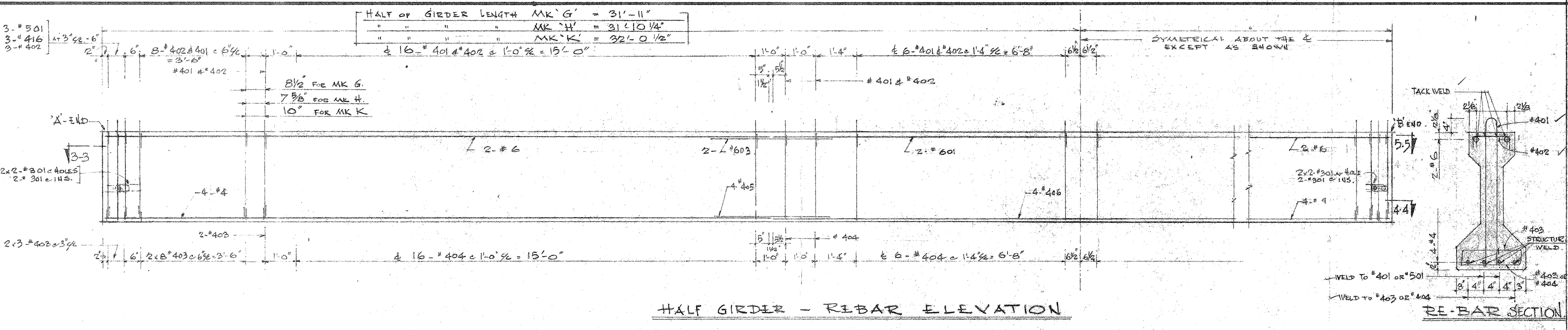
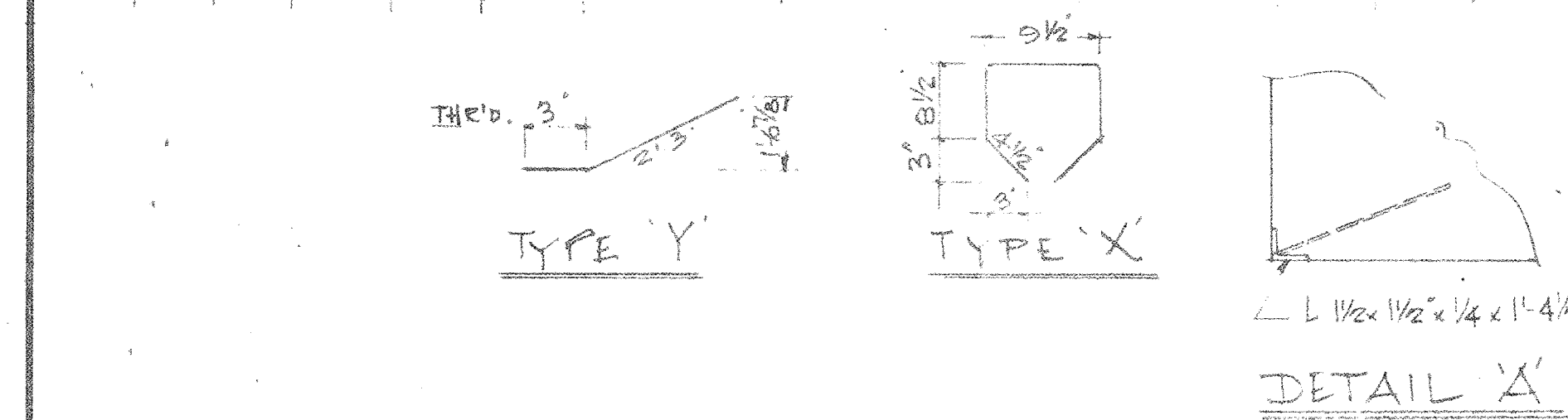
D.T.C. - TORONTO RECEIVED
 APR - 9 1974
 STRUCTURAL OFFICE

FOR LAYOUT SEE E1
 STRUCTURE SITE No. 19-264

PRE-CON COMPANY
 35 RUTHERFORD ROAD S., BRAMPTON ONTARIO, TELEPHONE 454-1560
 CNR GRADE SEPARATION, RIVERSIDE DRIVE - LONDON, ONT.
AASHTO GIRDER UNIT DETAILS
 FOR MK'S. D & E

No.	DATE	DESCRIPTION	DRN/CHK/APP.	DRAWN BY	ISSUED DATE	JOB No.	DWG. No.
		REVISIONS			APR 8 1974	10799	E3

DWG. No.		REV.	No. OF UNITS REQ'D	BENDING SCHEDULE													UNIT
10799 E4			7	AS SHOWN													AS SHOWN
MARK	DIA.	No. PER UNIT	LENGTH	TYPE	A	B	C	D	E	F	G	H	J	K	O		
#301	#3	3	2'-0"	B											1'-0"	3"	
#401	#4	66	6'-7"	B											3'-3"	3 1/2"	
#402	#4	72	1'-1"	B													
#403	#4	48	1'-7 1/2"	B													
#404	#4	48	1'-3"	STE.													
#405	#4	8	4'-0"	STE.													
#406	#4	4	20'-0"	STE.													
#407	#4	6	21'-0"	"													
#408	#4	4	21'-6"	"													
#409	#4	1	21'-2"	"													
#410	#4	6	2'-9 1/2"	X													
#411	#4	6	4'-7"	"													
#412	#4	1	21'-5"	"													
#413	#4	6	21'-7"	"													
#414	#4	1	21'-3 1/2"	"													
#415	#4	6	21'-5 1/2"	"													
#416	#4	6	2'-9 1/2"	X													
#601	#6	2	20'-0"	STE.													
#602	#6	4	4'-0"	"													
#603	#6	3	21'-7"	"													
#604	#6	1	21'-3"	"													
#605	#6	3	21'-5 1/2"	"													
#606	#6	1	21'-3"	"													
#607	#6	3	21'-5 1/2"	"													
#801	#8	3	2'-6"	Y													



REQ'D No.	MARK No.	WEIGHT OF REIN. IN LBS. BLACK GALV.	WEIGHT OF UNIT IN LBS.	VOL. IN CU. FT.	CONC. STR. IN PSI.
3	G	931.0	-	163.60	
3	H	932.2	-	162.26	
1	K	934.4	-	164.20	

D.T.C. - TORONTO RECEIVED
APR 29 1974
STRUCTURAL OFFICE

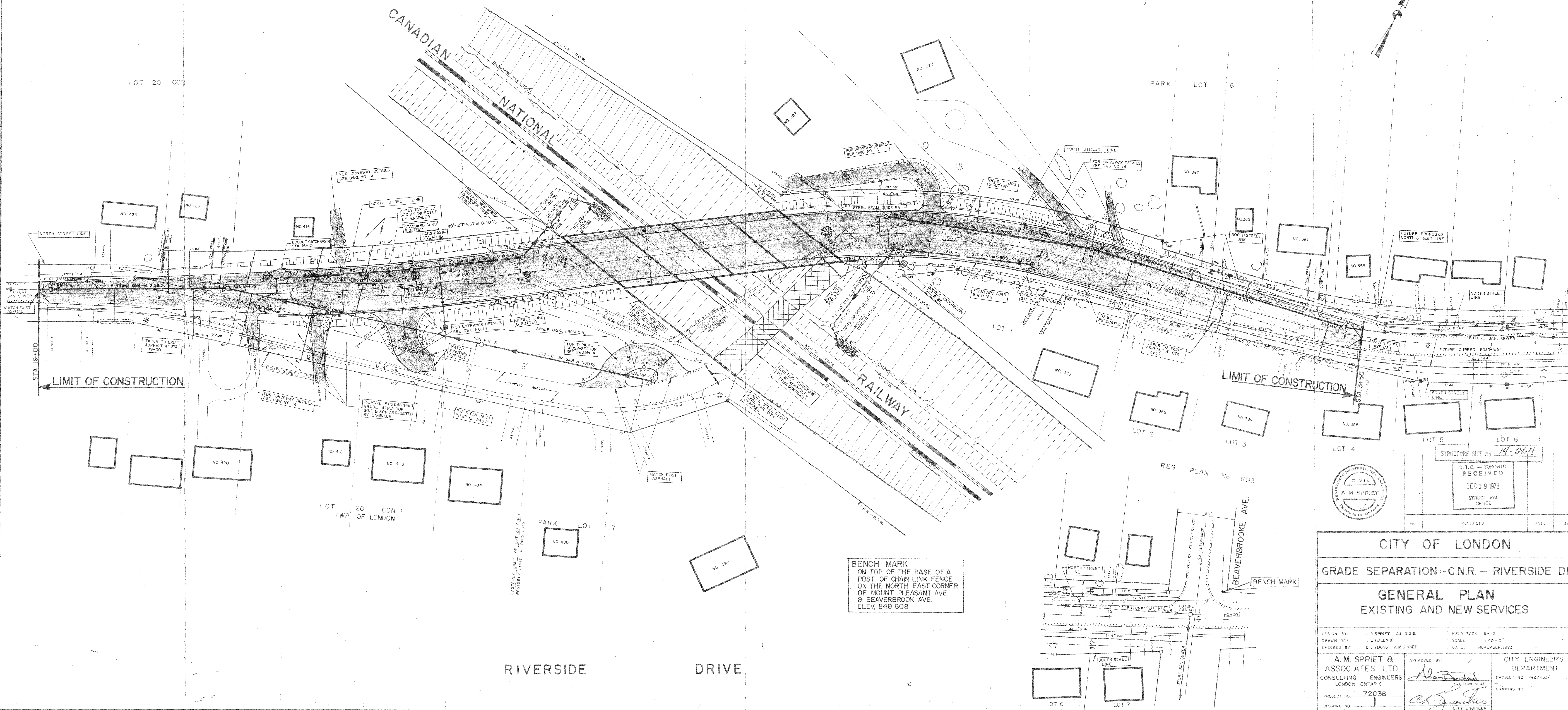
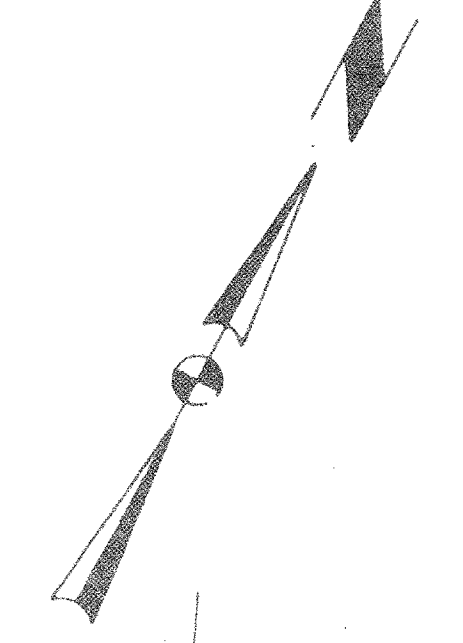


ISSUED FOR APPROVAL
SHOULD THIS DRAWING NOT BE RETURNED WITHIN _____ DAYS
OF APR 16 1974 THE CONTRACT DATE MAY HAVE TO BE REVISED.
PRE-CON COMPANY

FOR LAYOUT SEE E-1
STRUCTURE SITE No. 19-264

PRE-CON COMPANY
35 RUTHERFORD ROAD S., BRAMPTON ONTARIO.
TELEPHONE 454-1560
C.N.R. GRADE SEPARATION, RIVERSIDE DRIVE - LONDON, ONT.
AASHOI GIRDER UNIT DETAILS
FOR MK'S. G, H & K

No.	DATE	DESCRIPTION	DRN/CHK/APP.	DRAWN BY	ISSUED DATE	JOB No.	DWG. No.
					APR 15 1974	10799	E 4



BENCH MARK
ON TOP OF THE BASE OF A
POST OF CHAIN LINK FENCE
ON THE NORTH EAST CORNER
OF MOUNT PLEASANT AVE.
& BEAVERBROOK AVE.
ELEV. 848.608



STRUCTURE SITE No. 19-264
D.T.C. - TORONTO
RECEIVED
DEC 19 1973
STRUCTURAL
OFFICE

CITY OF LONDON
GRADE SEPARATION - C.N.R. - RIVERSIDE DR.

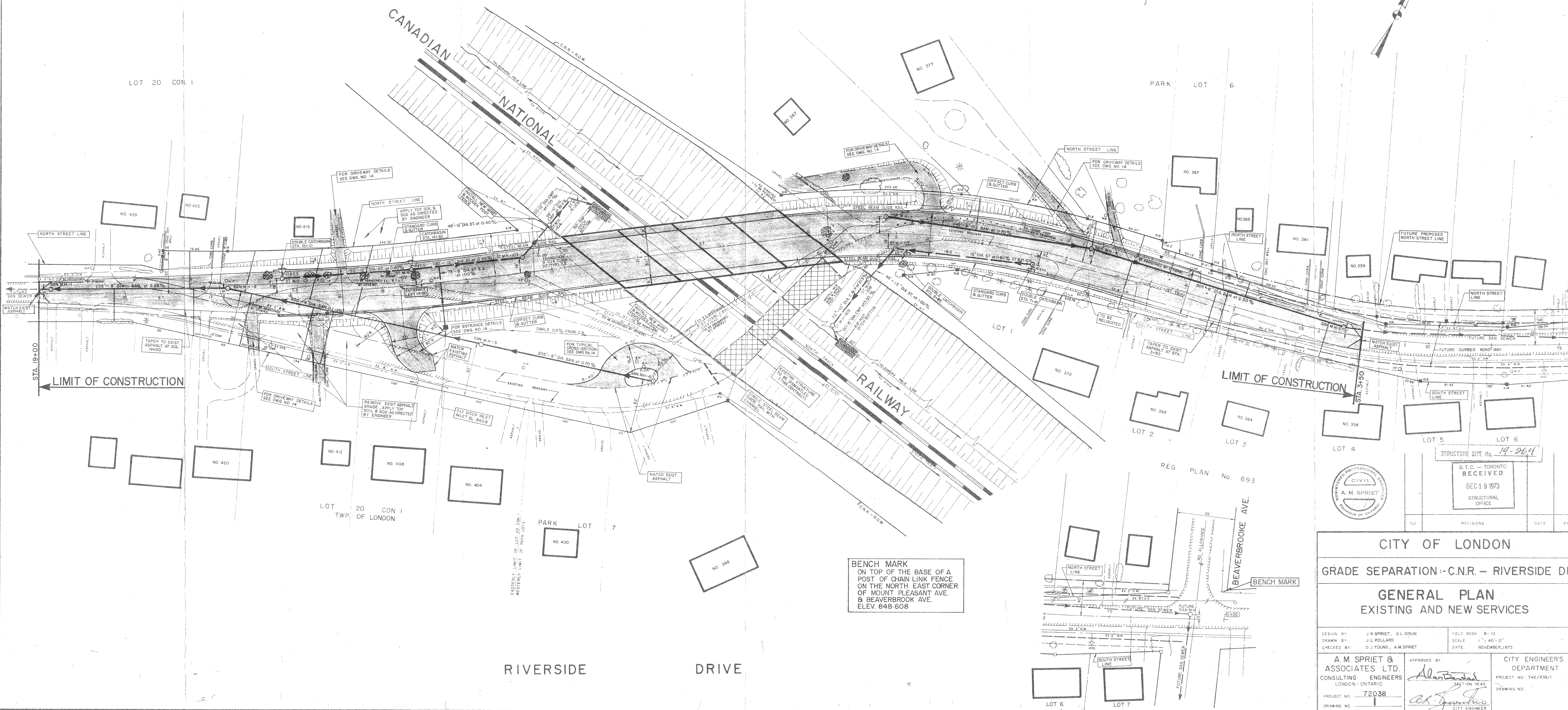
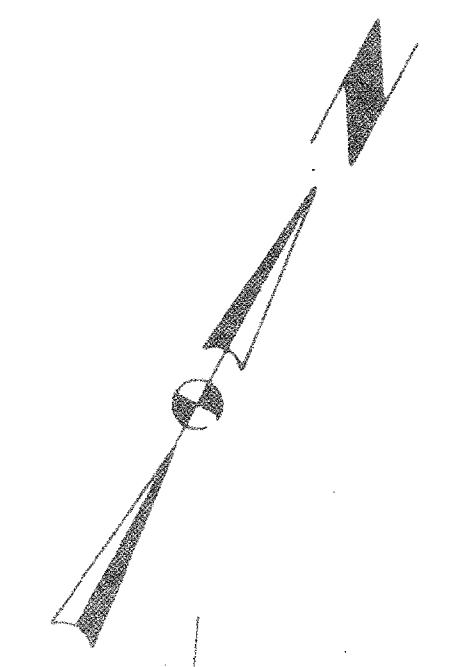
GENERAL PLAN
EXISTING AND NEW SERVICES

DESIGN BY: J.R. SPRIET, A.L. GIGAN
DRAWN BY: J.L. POLLARD
CHECKED BY: J.J. YOUNG, A.M. SPRIET
FIELD BOOK: B-12
SCALE: 1" = 40'-0"
DATE: NOVEMBER, 1973

A.M. SPRIET & ASSOCIATES LTD.
CONSULTING ENGINEERS
LONDON - ONTARIO
PROJECT NO: 72038
DRAWING NO: _____

APPROVED BY: *A.M. Spriet*
SECTION HEAD
A.M. Spriet
CITY ENGINEER

CITY ENGINEER'S DEPARTMENT
PROJECT NO: 742/R33/71
DRAWING NO: _____



BENCH MARK
ON TOP OF THE BASE OF A
POST OF CHAIN LINK FENCE
ON THE NORTH EAST CORNER
OF MOUNT PLEASANT AVE.
& BEAVERBROOK AVE.
ELEV. 848.608



STRUCTURE SITE No. 19-264
D.T.C. - TORONTO
RECEIVED
DEC 19 1973
STRUCTURAL
OFFICE

CITY OF LONDON
GRADE SEPARATION - C.N.R. - RIVERSIDE DR.

GENERAL PLAN
EXISTING AND NEW SERVICES

DESIGN BY: J.R. SPRIET, A.L. GILSON
DRAWN BY: J.L. POLLARD
CHECKED BY: D.J. YOUNG, A.M. SPRIET
FIELD BOOK: B-12
SCALE: 1" = 40'-0"
DATE: NOVEMBER, 1973

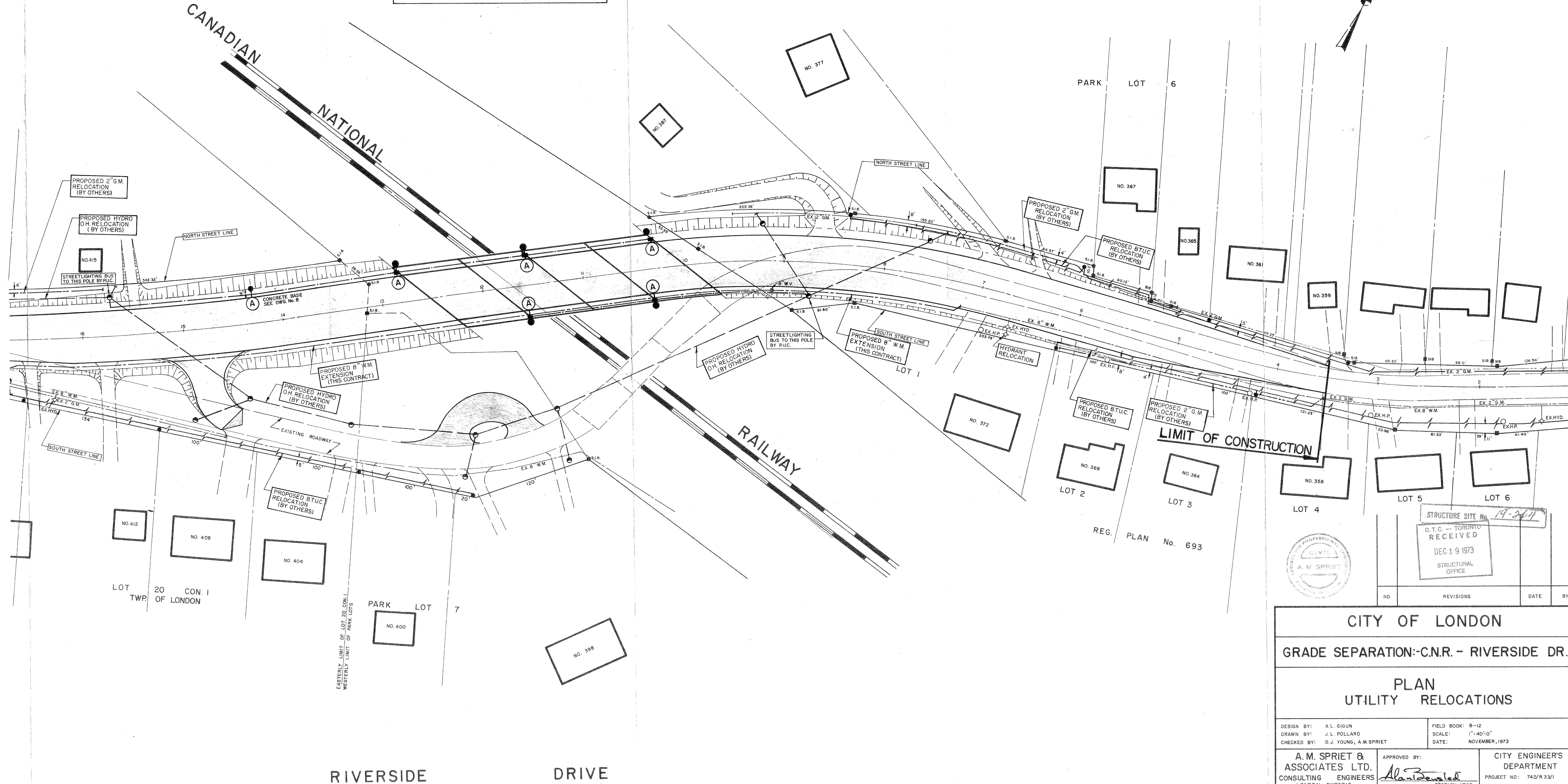
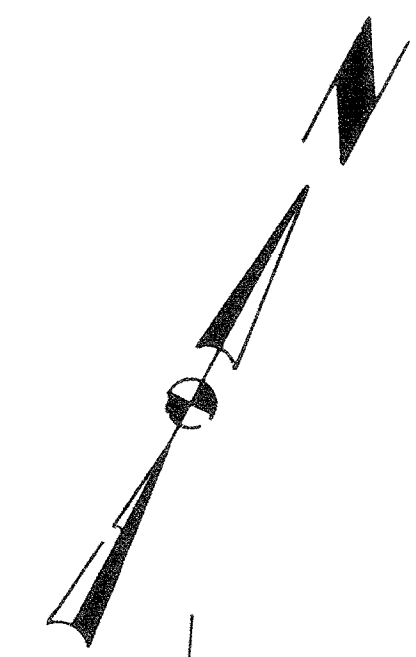
A.M. SPRIET & ASSOCIATES LTD.
CONSULTING ENGINEERS
LONDON - ONTARIO
PROJECT NO. 72038
DRAWING NO. _____

APPROVED BY: *A.M. Spriet*
SECTION HEAD
A.M. Spriet
CITY ENGINEER

CITY ENGINEER'S DEPARTMENT
PROJECT NO. 742/R33/1
DRAWING NO. _____

LIGHTING LEGEND

- 400 W. M.V. LUMINAIRE C/W ALUMINUM POLE
- PULLBOX-RIGID PVC 8" x 8" x 8" TYPE I WITH STEEL SAFETY TREAD COVER
- UNDERGROUND CONDUCTORS (2No.4AL+1No.8CU-2" C)

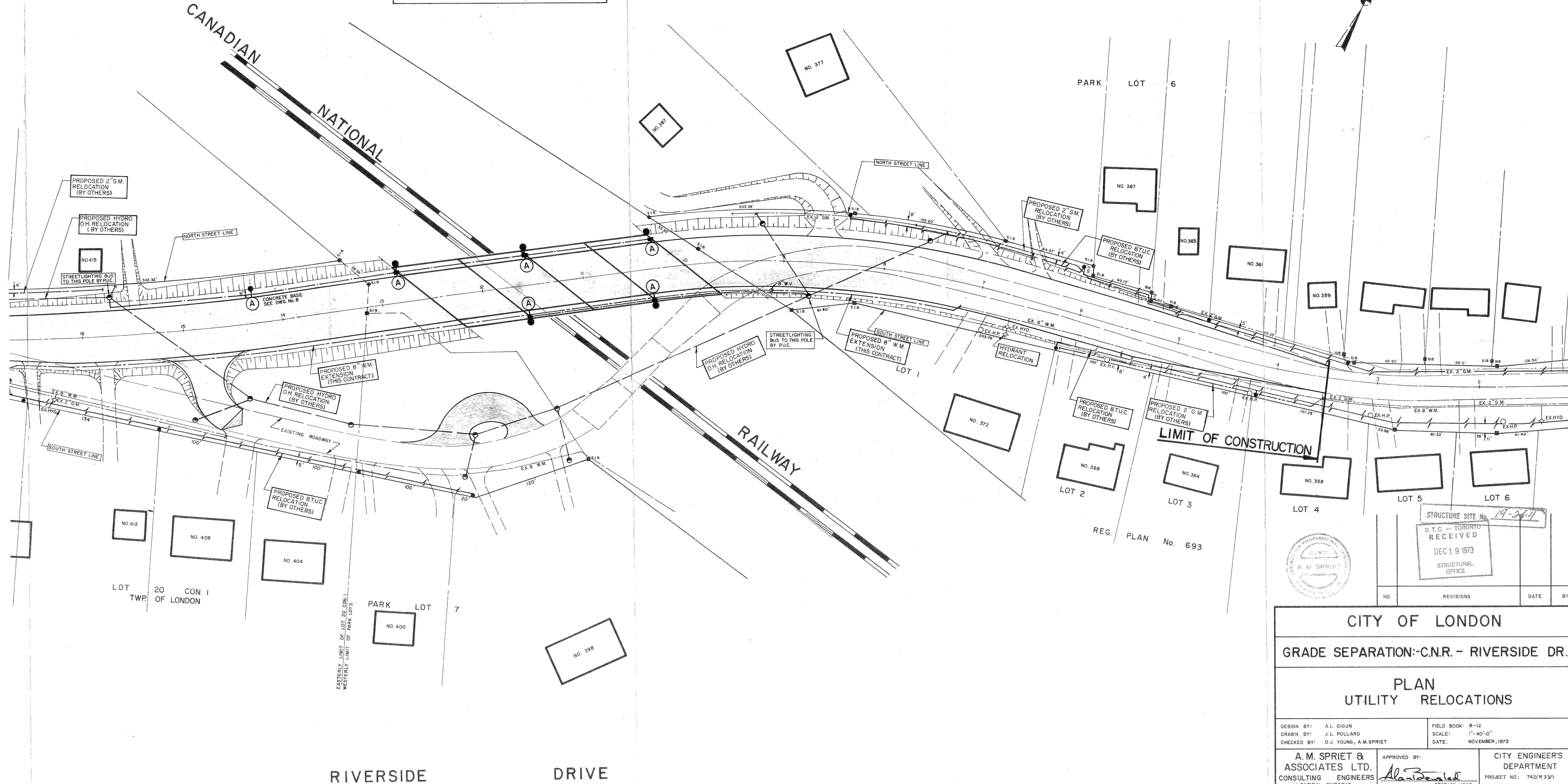
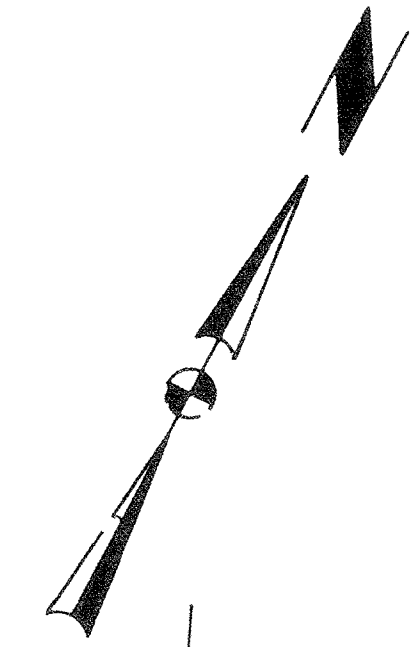


STRUCTURE SITE No. 19-361
 D.T.C. - TORONTO RECEIVED
 DEC 19 1973
 STRUCTURAL OFFICE

CITY OF LONDON			
GRADE SEPARATION:-C.N.R. - RIVERSIDE DR.			
PLAN UTILITY RELOCATIONS			
DESIGN BY: A.L. GIGUN	FIELD BOOK: B-12		
DRAWN BY: J.L. POLLARD	SCALE: 1"=40'-0"		
CHECKED BY: D.J. YOUNG, A.M. SPRIET	DATE: NOVEMBER, 1973		
A.M. SPRIET & ASSOCIATES LTD. CONSULTING ENGINEERS LONDON - ONTARIO		APPROVED BY: SECTION HEAD CITY ENGINEER	CITY ENGINEER'S DEPARTMENT PROJECT NO: 742/R 33/1 DRAWING NO:
PROJECT NO. 72038			
DRAWING NO. 2			

LIGHTING LEGEND

- 400 W. M.V. LUMINAIRE C/W ALUMINUM POLE
- PULLBOX - RIGID P.V.C. 8" x 8" x 8" TYPE I WITH STEEL SAFETY TREAD COVER
- UNDERGROUND CONDUCTORS (2No. 4AL + 1No. 8CU - 2" C)



STRUCTURE SITE No. 19-261
 D.T.C. - TORONTO RECEIVED
 DEC 19 1973
 STRUCTURAL OFFICE

NO.	REVISIONS	DATE	BY

CITY OF LONDON
 GRADE SEPARATION:-C.N.R. - RIVERSIDE DR.

PLAN
UTILITY RELOCATIONS

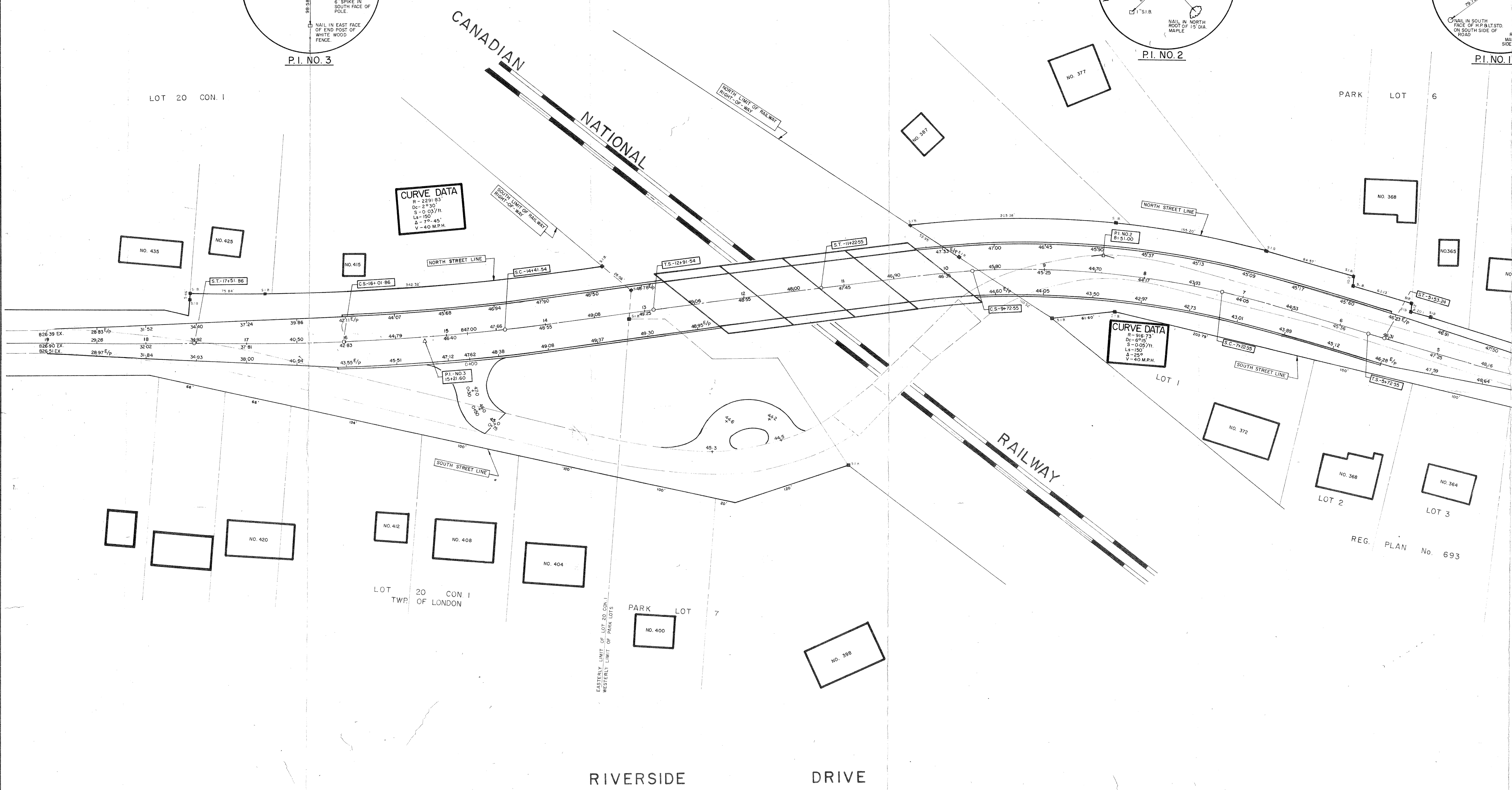
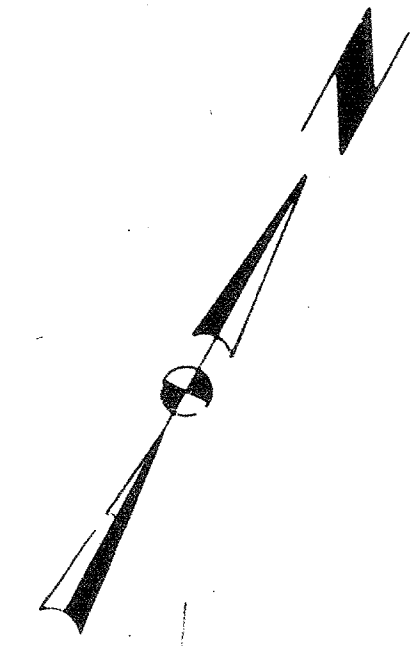
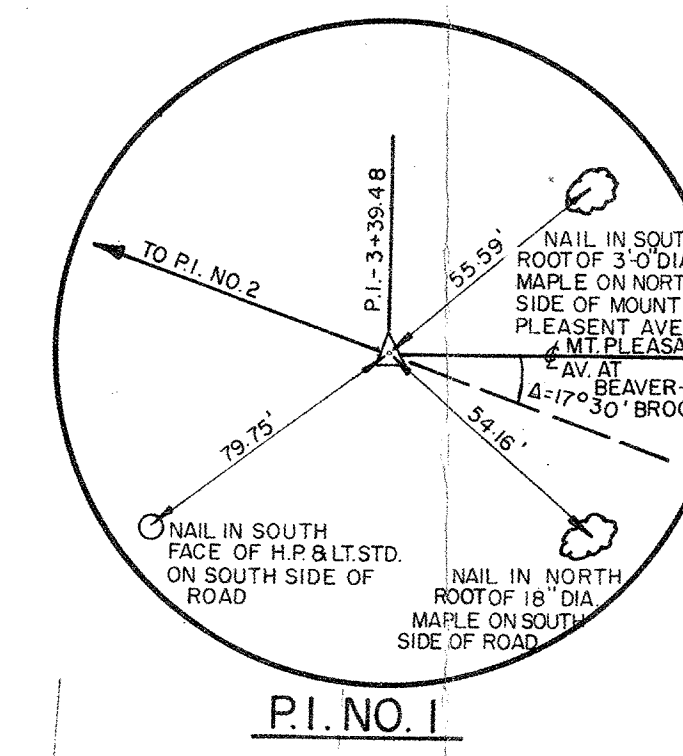
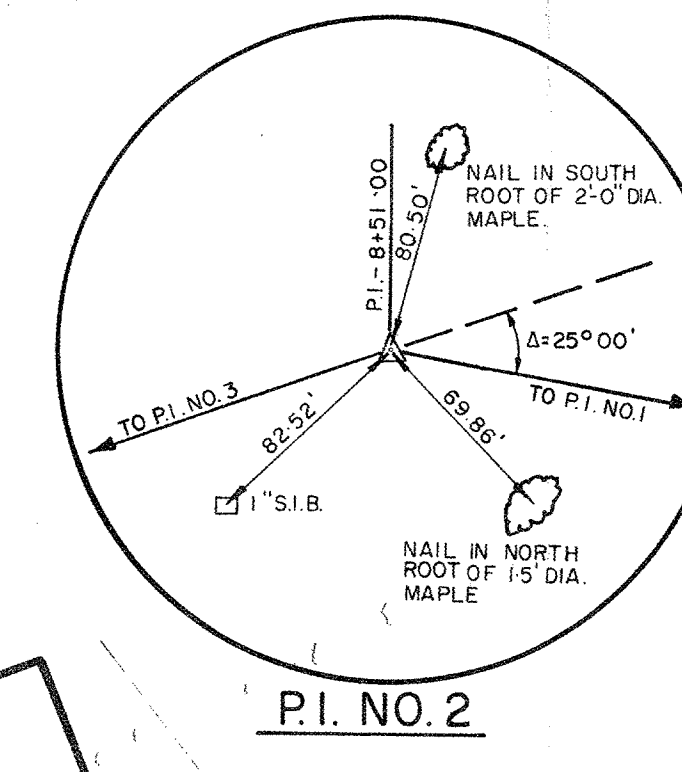
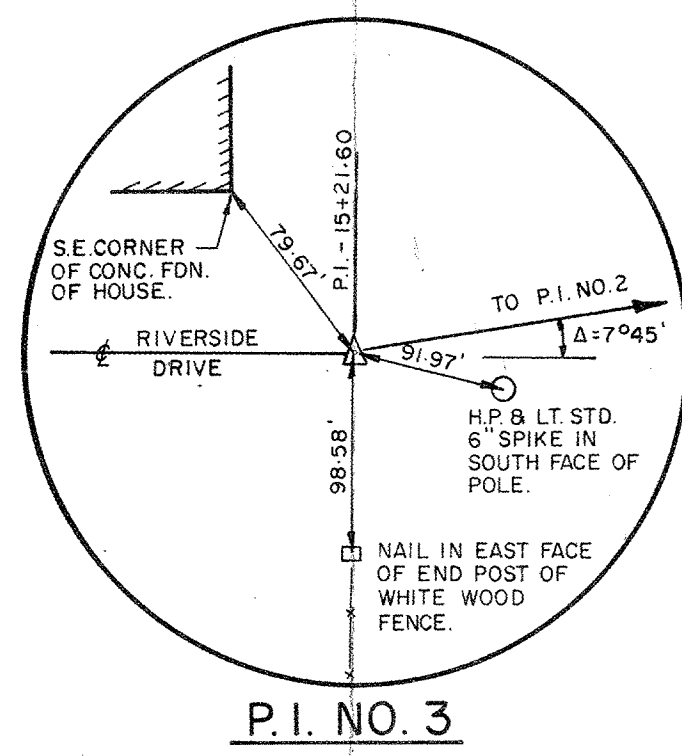
DESIGN BY: A.L. GIGUN
 DRAWN BY: J.L. POLLARD
 CHECKED BY: D.J. YOUNG, A.M. SPRIET

FIELD BOOK: B-12
 SCALE: 1" = 40'-0"
 DATE: NOVEMBER, 1973

A.M. SPRIET & ASSOCIATES LTD.
 CONSULTING ENGINEERS
 LONDON - ONTARIO

APPROVED BY: *A.M. Spriet*
 SECTION HEAD

CITY ENGINEER'S DEPARTMENT
 PROJECT NO: 742/R 33/1
 DRAWING NO: 2



CURVE DATA
R = 2291.83'
Dc = 2°30'
Ls = 0.037/ft
L = 174.45'
V = 40 MPH

CURVE DATA
R = 916.73'
Dc = 6°15'
Ls = 0.057/ft
L = 150.71'
V = 40 MPH

CURVE DATA
R = 916.73'
Dc = 6°15'
Ls = 0.057/ft
L = 150.71'
V = 40 MPH



SYNOPSIS SHEET NO. 19-264

D.T.C. - TORONTO RECEIVED
DEC 19 1973
STRUCTURAL OFFICE

CITY OF LONDON

GRADE SEPARATION - C.N.R. - RIVERSIDE DR.

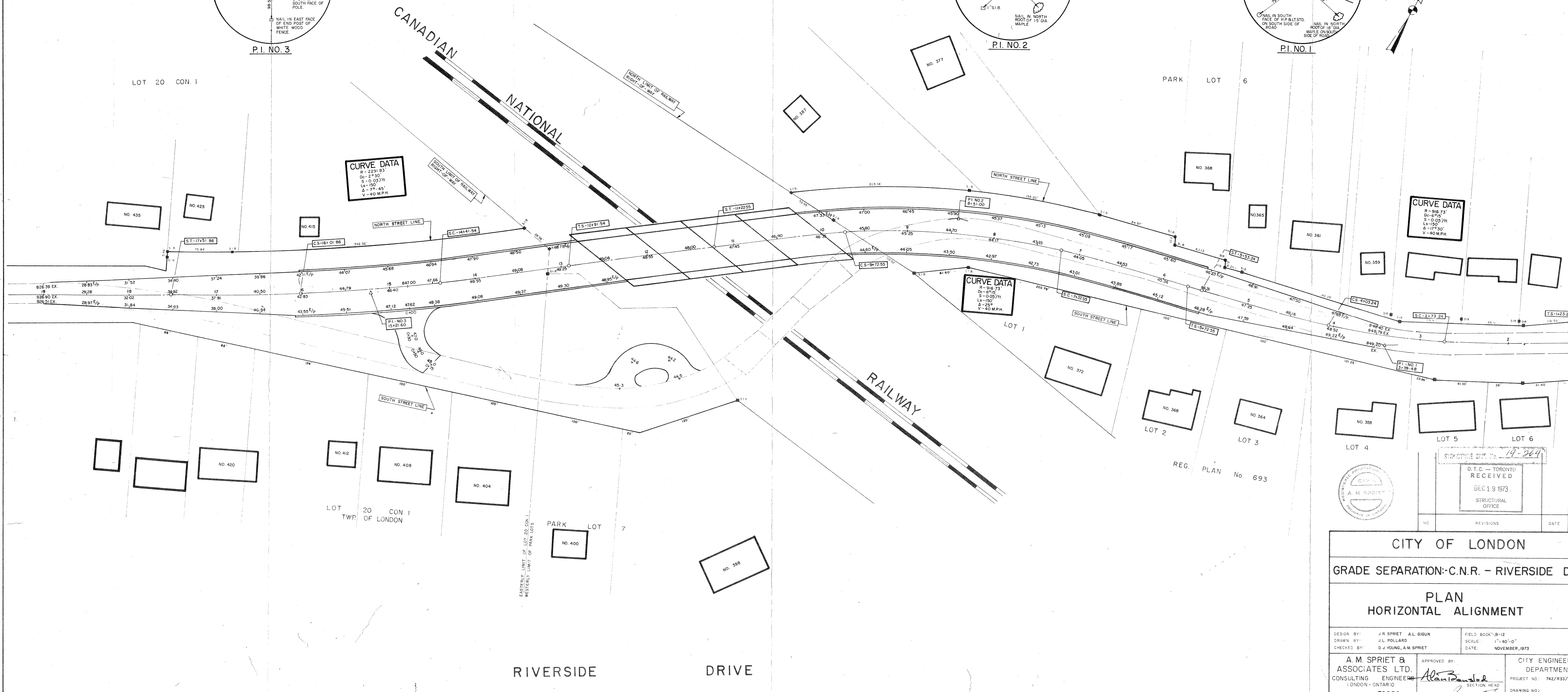
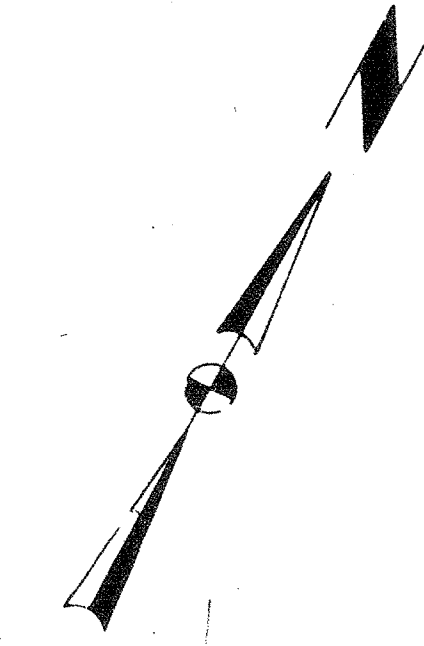
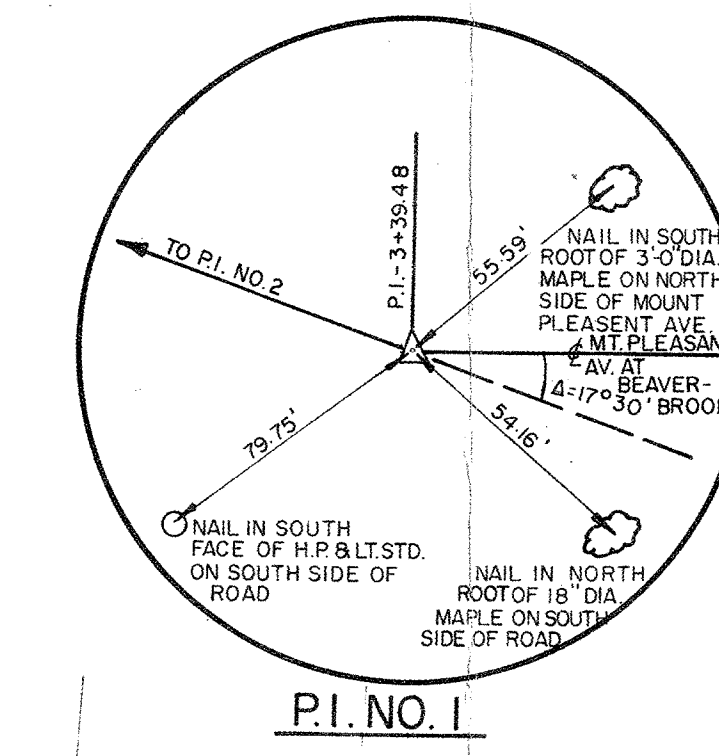
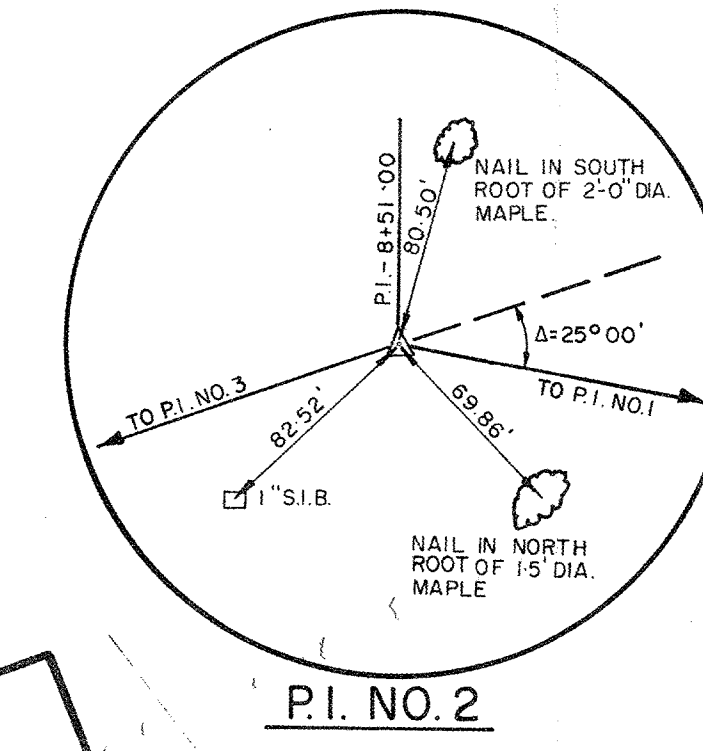
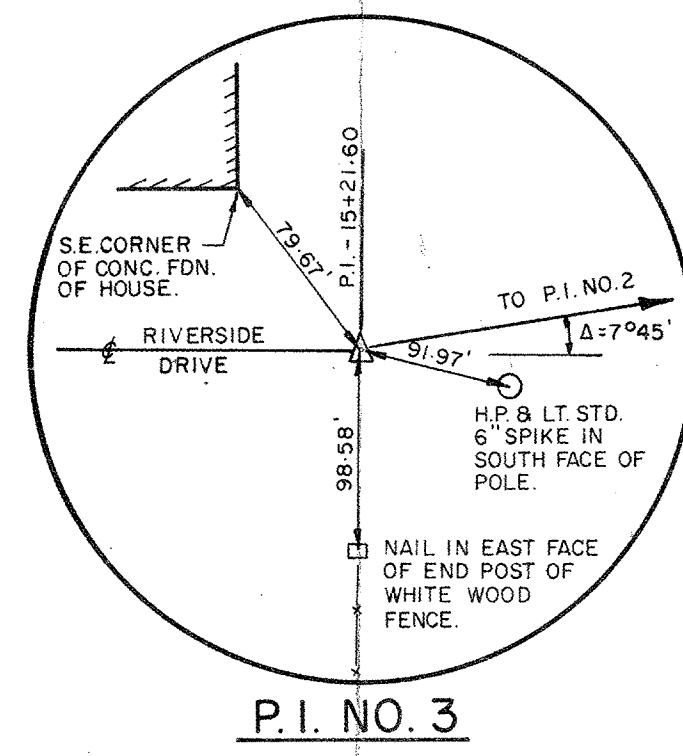
PLAN
HORIZONTAL ALIGNMENT

DESIGN BY: J.R. SPRIET A.L. GIGUN	FIELD BOOK: B-12
DRAWN BY: J.L. POLLARD	SCALE: 1" = 40'-0"
CHECKED BY: D.J. YOUNG, A.M. SPRIET	DATE: NOVEMBER, 1973

A.M. SPRIET & ASSOCIATES LTD. CONSULTING ENGINEERS LONDON - ONTARIO

APPROVED BY: *Alan B...*
SECTION HEAD

CITY ENGINEER'S DEPARTMENT
PROJECT NO: 742/R33/1
DRAWING NO: 3



CURVE DATA
 R=2291.83'
 Dc=2°30'
 S=0.03711
 Ls=190'
 Δ=17°30'
 V=40 M.P.H.

CURVE DATA
 R=916.73'
 Dc=8°15'
 S=0.05711
 Ls=190'
 Δ=17°30'
 V=40 M.P.H.

CURVE DATA
 R=916.73'
 Dc=8°15'
 S=0.05711
 Ls=190'
 Δ=17°30'
 V=40 M.P.H.



STRUCTURAL DEPT. NO. 19-264
 D.T.O. - TORONTO
 RECEIVED
 DEC 19 1973
 STRUCTURAL
 OFFICE

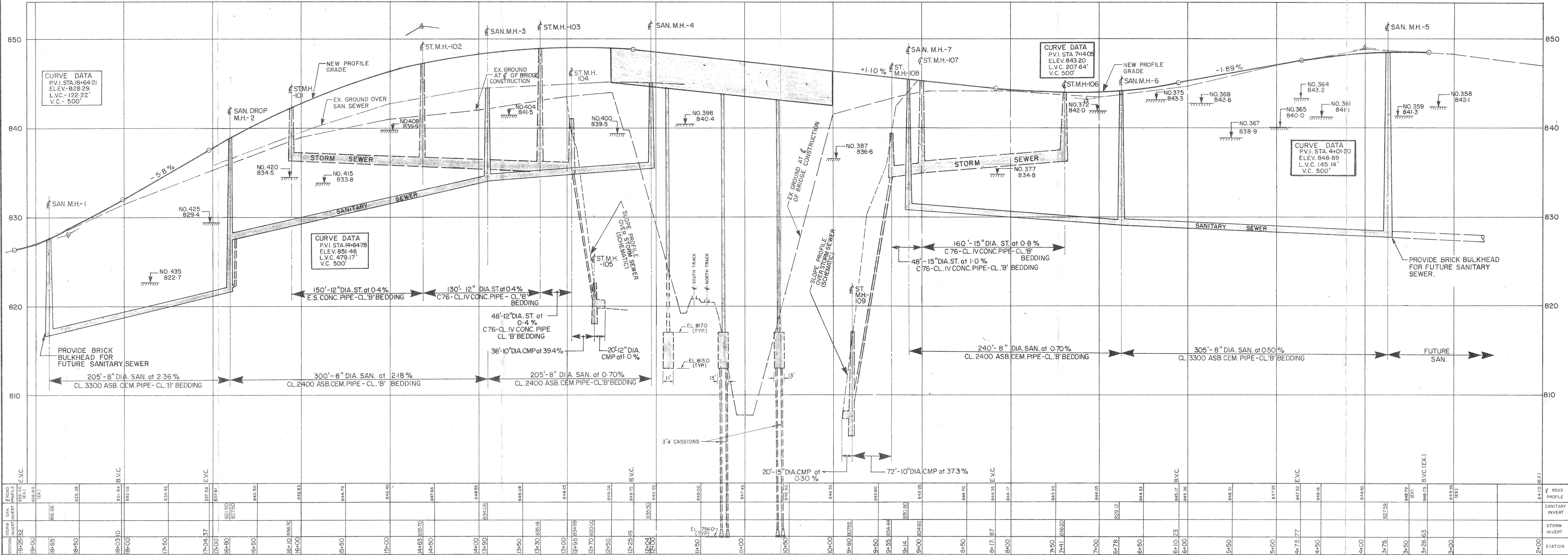
NO.	REVISIONS	DATE	BY

CITY OF LONDON
 GRADE SEPARATION-C.N.R. - RIVERSIDE DR.

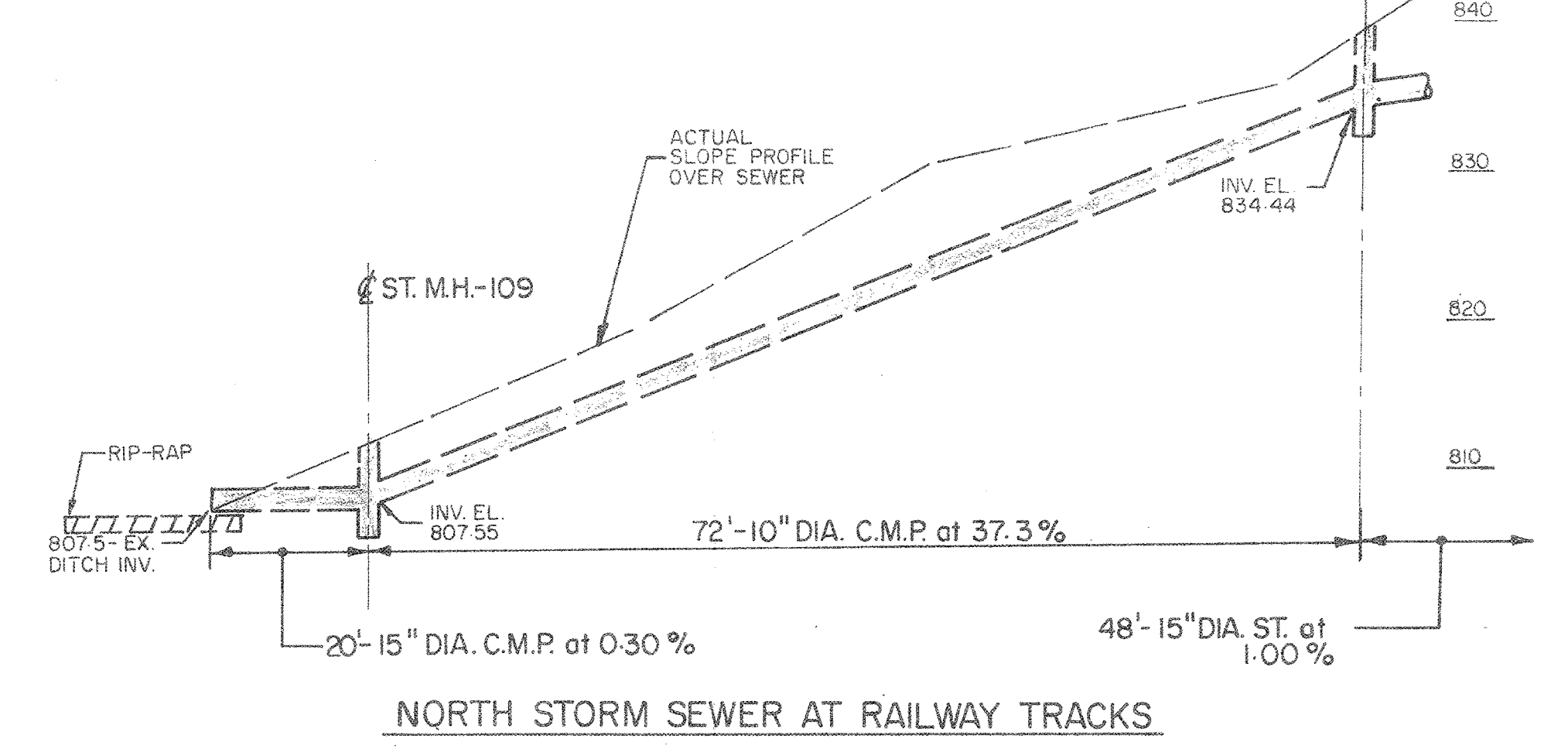
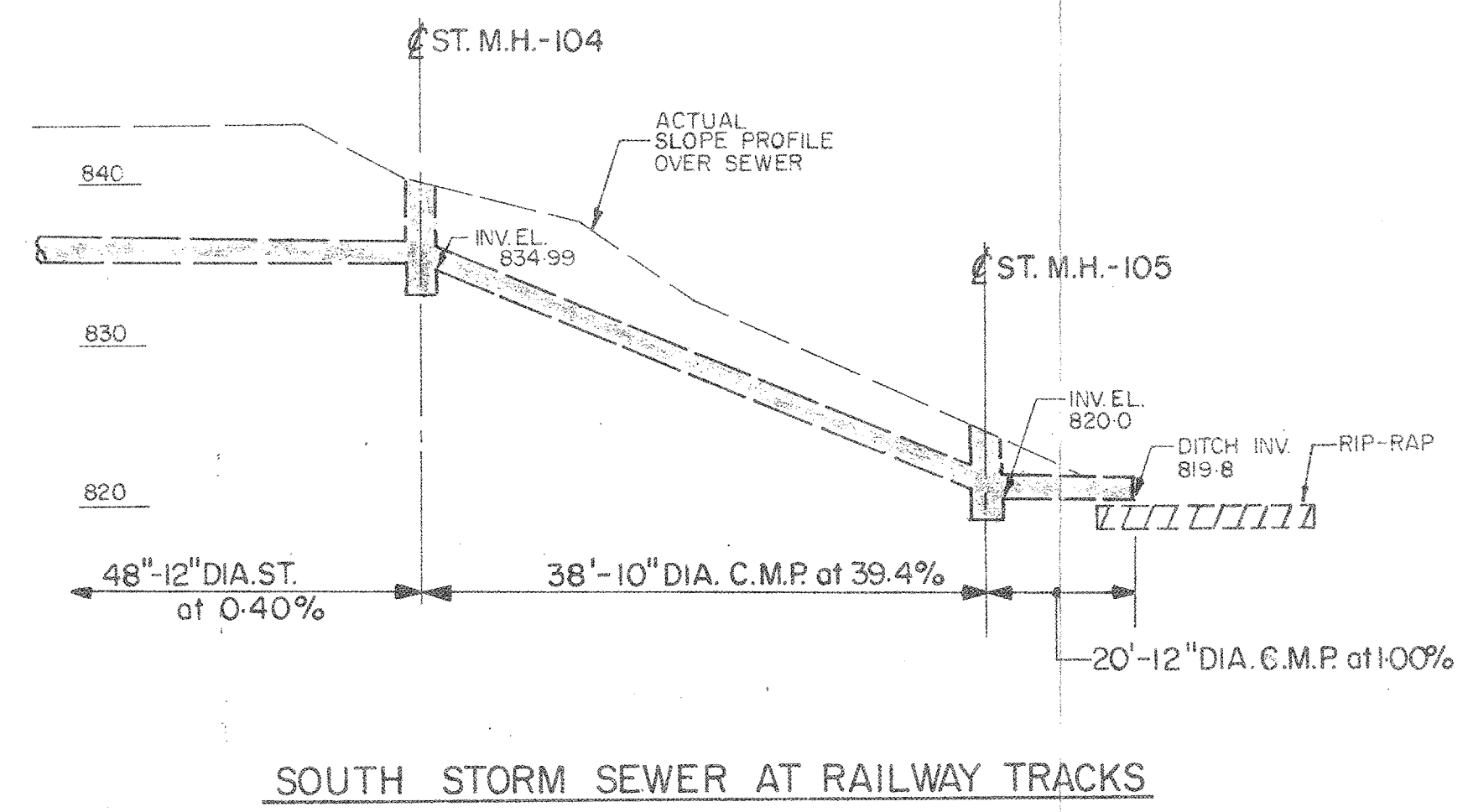
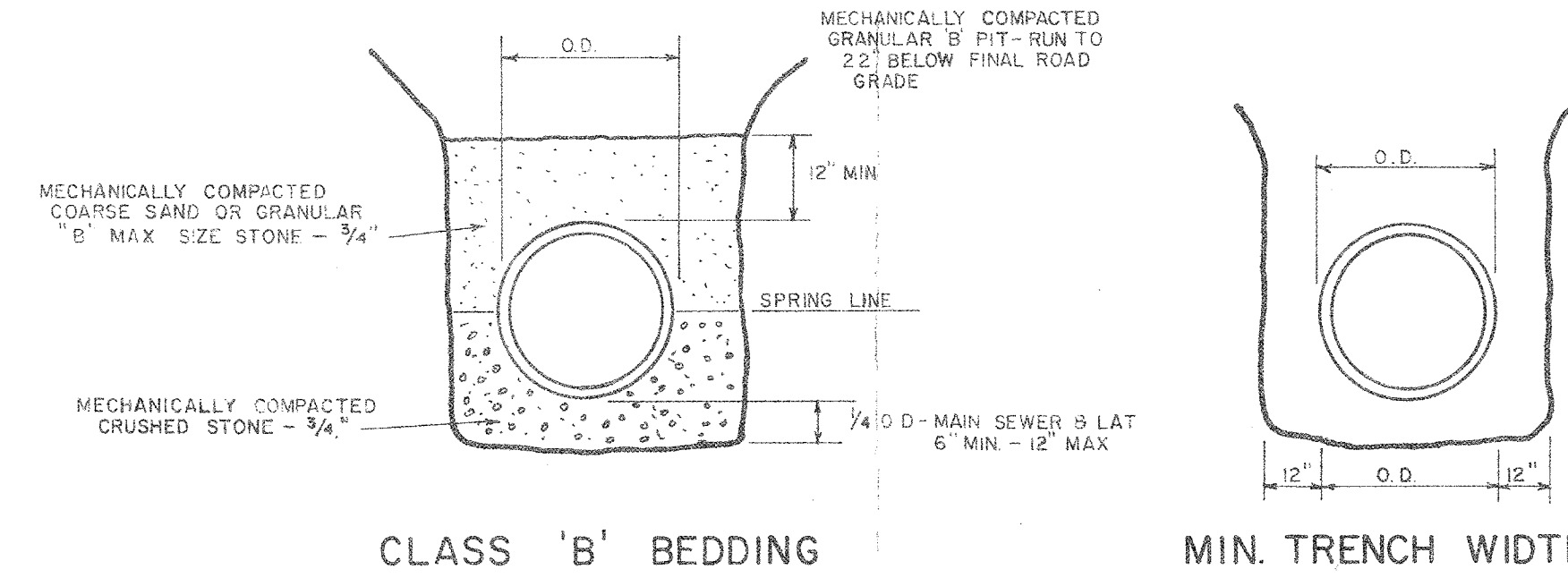
PLAN
 HORIZONTAL ALIGNMENT

DESIGN BY: J.R. SPRIET, A.L. GIGUN
 DRAWN BY: J.L. POLLARD
 CHECKED BY: D.J. YOUNG, A.M. SPRIET
 FIELD BOOK: B-12
 SCALE: 1"=40'-0"
 DATE: NOVEMBER, 1973

A.M. SPRIET & ASSOCIATES LTD.
 CONSULTING ENGINEERS
 LONDON - ONTARIO
 PROJECT NO. 72038
 DRAWING NO. 3
 APPROVED BY: *Alan Spriet*
 CITY ENGINEER
 CITY ENGINEER'S DEPARTMENT
 PROJECT NO: 742/R33/1
 DRAWING NO:



STATION	ROAD INVERT (E.A.)	SAN. INVERT (E.A.)	STORM INVERT (E.A.)	STATION	ROAD INVERT (E.A.)	SAN. INVERT (E.A.)	STORM INVERT (E.A.)
19+00	828.90	816.66	807.52	23+00	848.30	836.06	824.72
19+25	829.28	816.66	807.52	23+25	848.68	836.06	824.72
19+50	831.84	816.66	807.52	23+50	849.06	836.06	824.72
19+75	834.32	816.66	807.52	23+75	849.44	836.06	824.72
20+00	836.80	816.66	807.52	24+00	851.46	836.06	824.72



NO. REVISIONS DATE BY

CITY OF LONDON

GRADE SEPARATION-C.N.R.- RIVERSIDE DR.

VERTICAL ALIGNMENT AND SEWER PROFILES

D.T.C. - TORONTO RECEIVED
DEC 19 1973
STRUCTURAL OFFICE

DESIGN BY: J.R. SPRIET - A.L. GIGUN
DRAWN BY: J.L. POLLARD
CHECKED BY: D.J. YOUNG

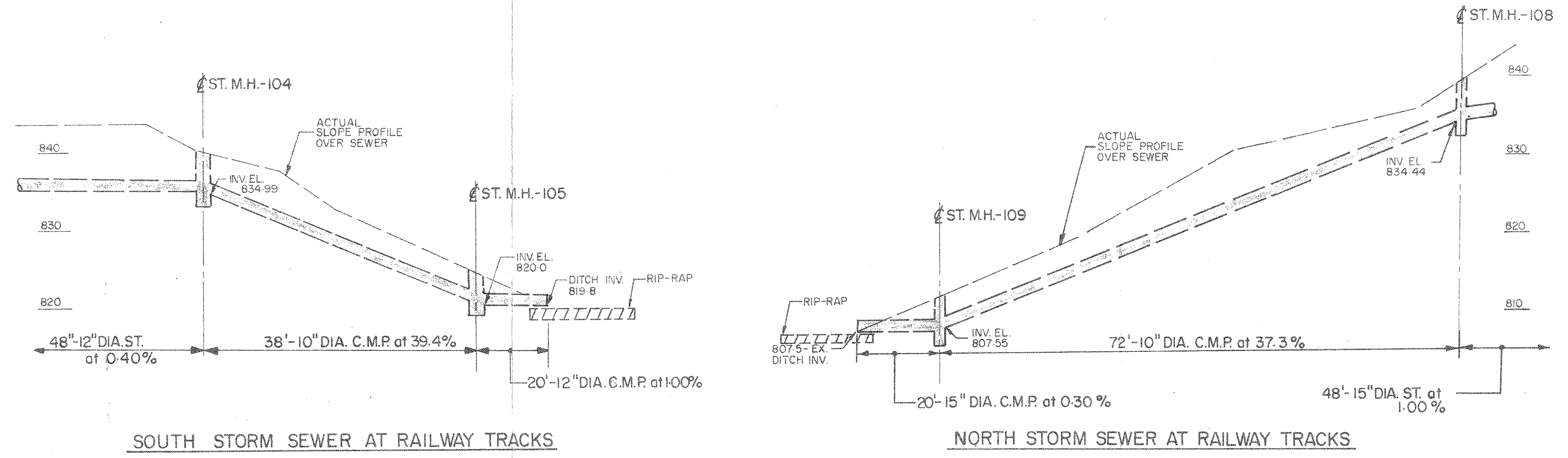
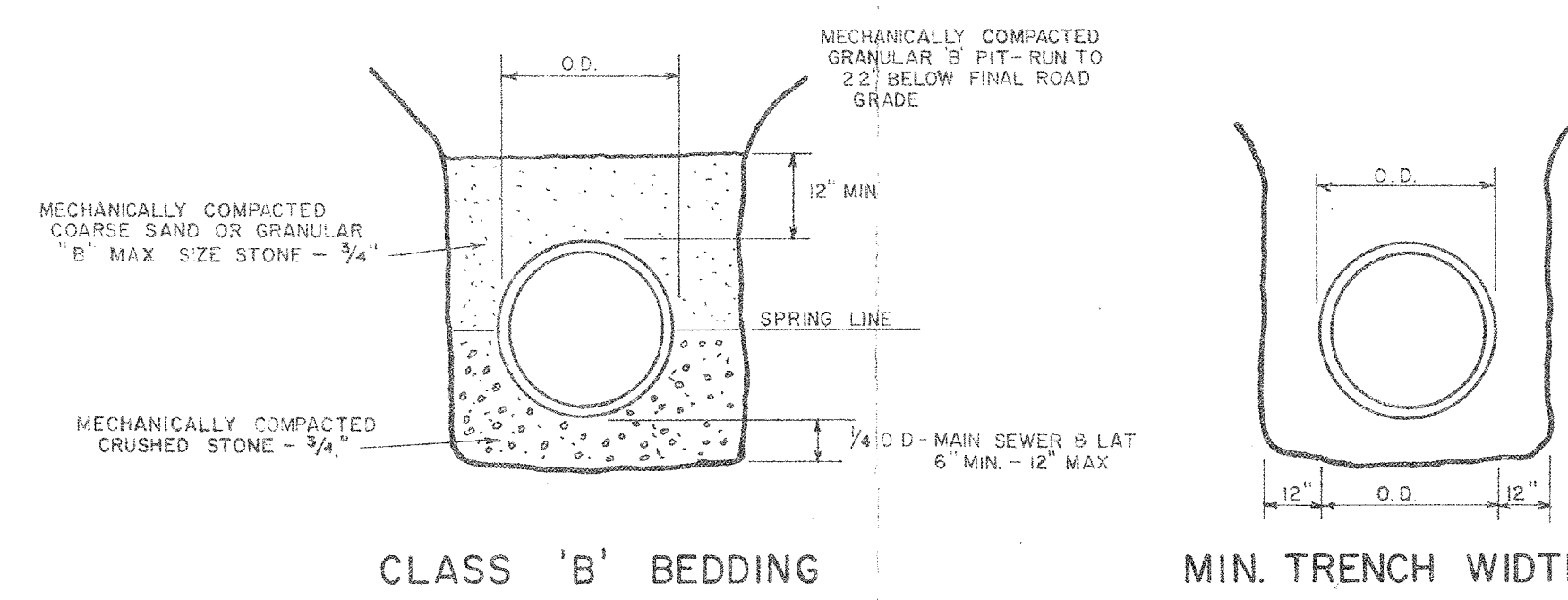
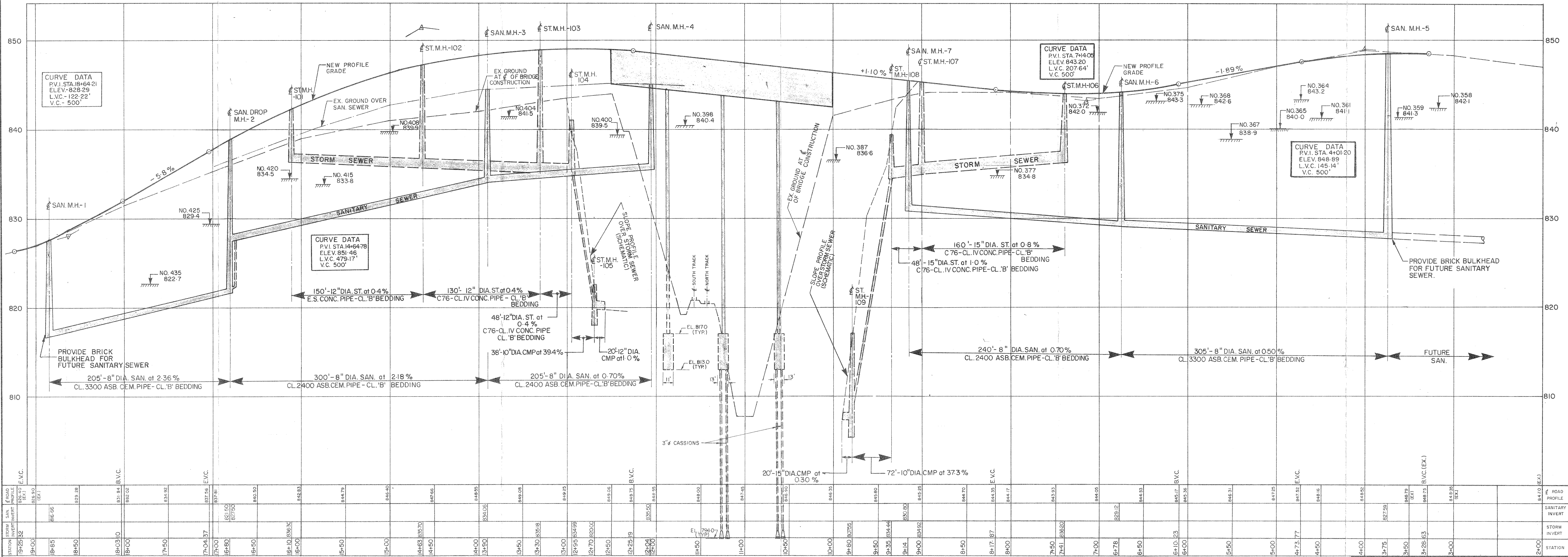
FIELD BOOK: B-12
SCALE: VERT. 1"=4', HORIZ. 1"=40'
DATE: NOVEMBER 1973

A.M. SPRIET & ASSOCIATES LTD.
CONSULTING ENGINEERS
LONDON - ONTARIO

APPROVED BY: *[Signature]*
SECTION HEAD
CITY ENGINEER

PROJECT NO. 72038
DRAWING NO. 4

CITY ENGINEER'S DEPARTMENT
PROJECT NO. 742/R33/1
DRAWING NO.



NO. _____ REVISIONS _____ DATE _____ BY _____

CITY OF LONDON

GRADE SEPARATION:-C.N.R. - RIVERSIDE DR.

VERTICAL ALIGNMENT AND SEWER PROFILES

D.T.C. - TORONTO RECEIVED
DEC 19 1973
STRUCTURAL OFFICE

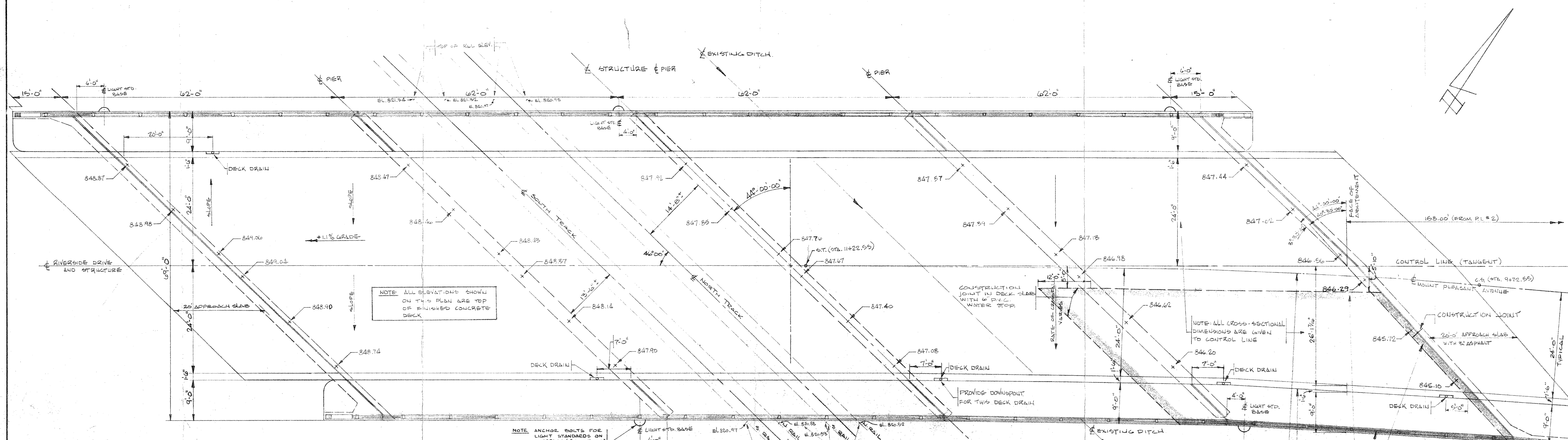
DESIGN BY: J.R. SPRIET - A.L. GIGIN
DRAWN BY: J.L. POLLARD
CHECKED BY: D.J. YOUNG

FIELD BOOK: B-12
SCALE: VERT. 1"=4', HORIZ. 1"=40'
DATE: NOVEMBER 1973

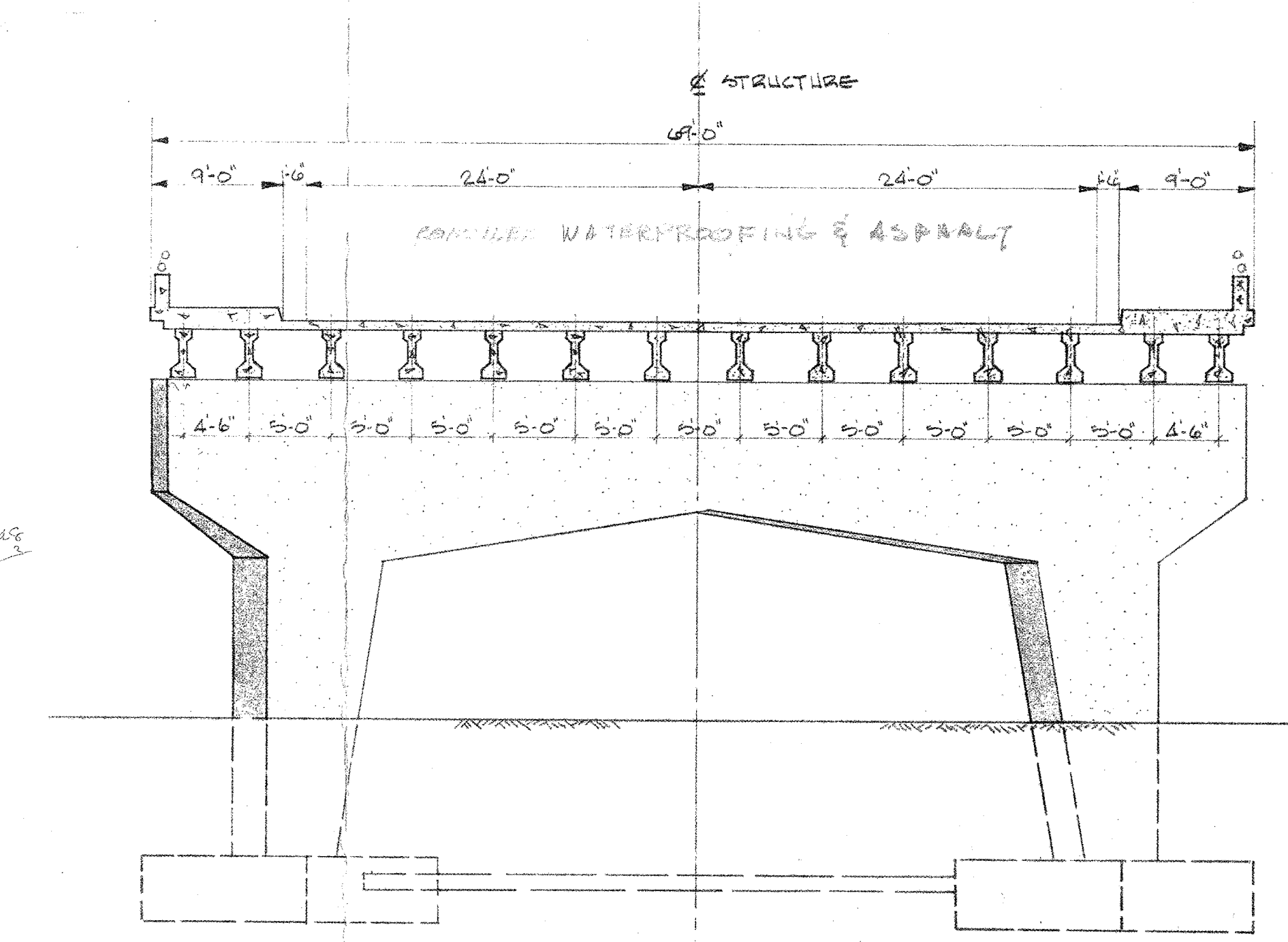
A.M. SPRIET & ASSOCIATES LTD.
CONSULTING ENGINEERS
LONDON - ONTARIO

APPROVED BY: *[Signature]*
SECTION HEAD

CITY ENGINEER'S DEPARTMENT
PROJECT NO. 742/R33/1
DRAWING NO. 4

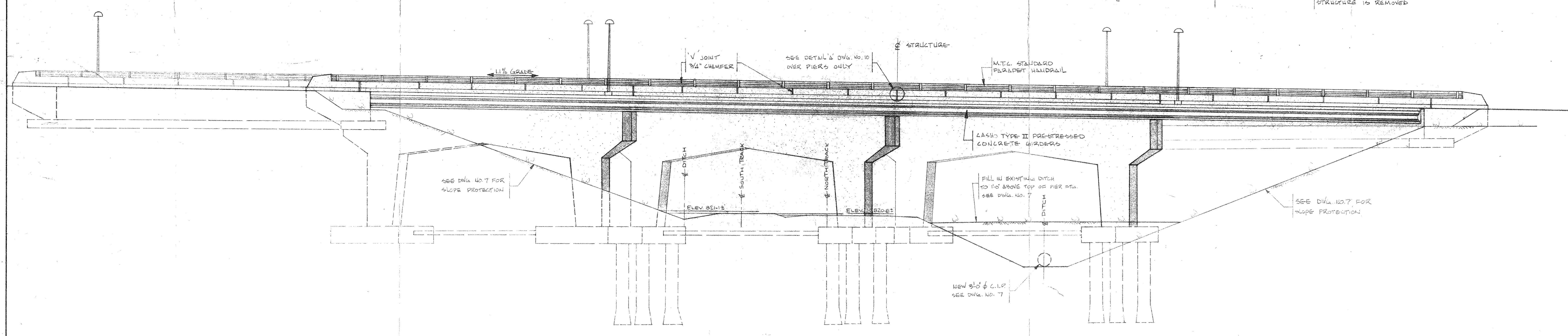


PLAN SCALE 1" = 10'-0"



TYPICAL CROSS SECTION SCALE 1/8" = 1'-0"

(EXCEPT FOR EAST HALF OF NORTH END SPAN)



ELEVATION SCALE 1" = 10'-0"

STRUCTURE SITE NO. 19-264

D.T.C. - TORONTO RECEIVED
DEC 19 1973
STRUCTURAL OFFICE

NO.	REVISIONS	DATE	BY

CITY OF LONDON
GRADE SEPARATION: C.N.R. - RIVERSIDE DR.

PLAN & ELEVATION

DESIGN BY: J.R. SPRIET	FIELD BOOK: 8-12
DRAWN BY: T. WADE	SCALE: AS SHOWN
CHECKED BY: A.M. SPRIET	DATE: NOVEMBER, 1973

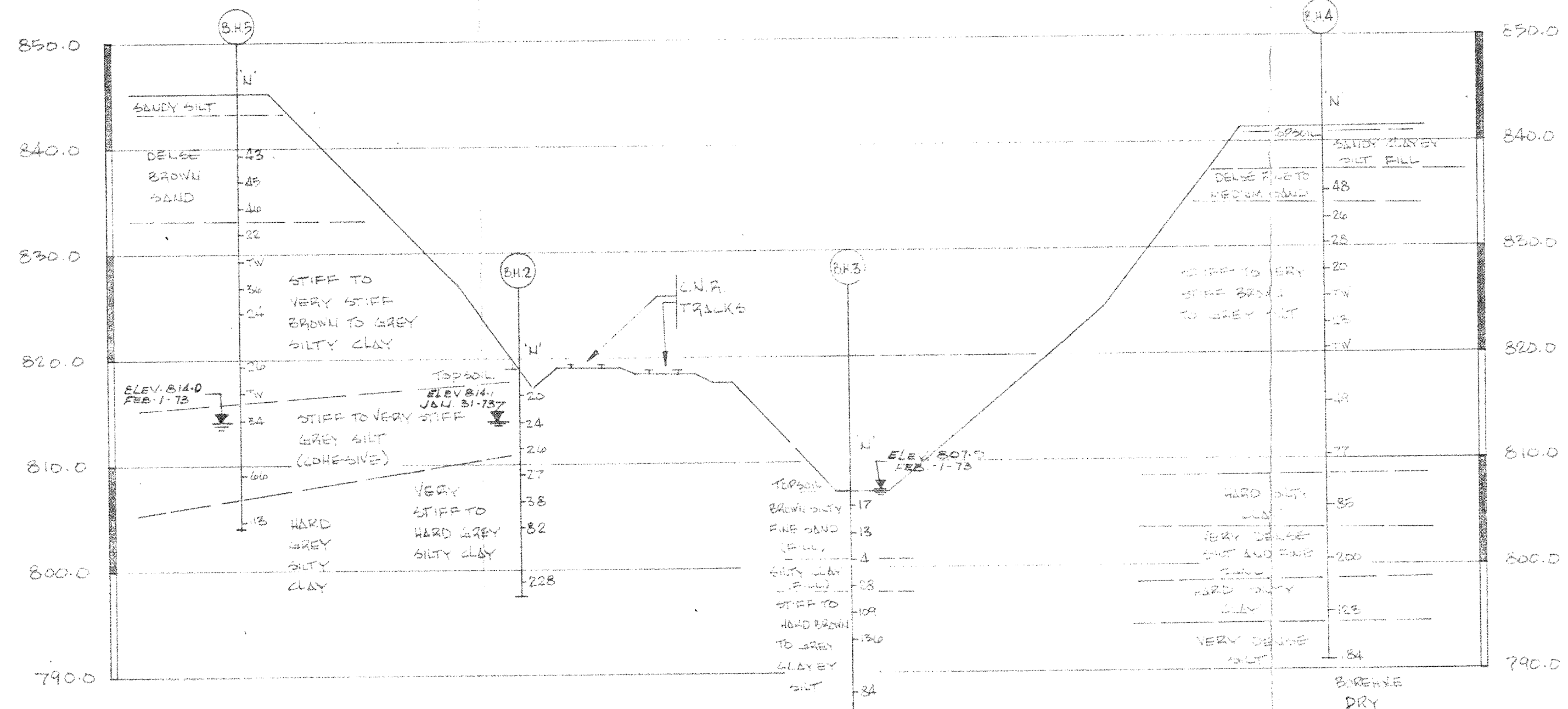
A.M. SPRIET & ASSOCIATES LTD.
ENGINEERING CONSULTANTS
LONDON - ONTARIO

APPROVED BY: *[Signature]*
SECTION HEAD
CITY ENGINEER

CITY ENGINEER'S DEPARTMENT
PROJECT NO. 742/R33/1
DRAWING NO. 5



LOCATION OF BOREHOLES SCALE 1"=40'-0"



SUBSURFACE PROFILE SCALE HOR. 1"=20'-0" VERT. 1"=10'-0"

- GENERAL NOTES
- STRUCTURE DESIGNED FOR H20-S16 LOADING.
 - WORK ON THE STRUCTURE MUST NOT BE COMMENCED UNTIL MONUMENTS TO FIX CONTROL POINTS HAVE BEEN ERECTED AND CHECKED BY THE ENGINEER.
 - STRUCTURE TO BE BUILT IN ACCORDANCE WITH M.T.C. FORM 9, REVISED, AND THE ENGINEER'S SPECIFICATIONS FOR GRADE SEPARATION, C.N.R. - RIVERSIDE DRIVE, CITY OF LONDON.
 - THE COMPLETE SOIL INVESTIGATION REPORT BY DOMINION SOIL INVESTIGATION LIMITED MAY BE EXAMINED AT THE CONSULTING ENGINEER'S OFFICE. THE CONSULTING ENGINEER DOES NOT GUARANTEE THE ACCURACY OF THIS REPORT.
 - CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON THE JOB AND REPORT ANY DISCREPANCIES TO THE ENGINEERS BEFORE PROCEEDING WITH THE WORK.
 - FOOTING DEPTHS ARE SUBJECT TO REVISION BY THE ENGINEER.
 - FOOTINGS TO BE FINISHED TO THE NEAT DIMENSIONS AND THE CONCRETE SHALL BE POURED AGAINST UNDISTURBED MATERIAL WHERE APPLICABLE.
 - NO CONCRETE SHALL BE PLACED IN THE FOOTINGS BEFORE THE CHARACTER OF THE SOIL AND EXCAVATION FOR FOOTINGS HAVE BEEN APPROVED BY THE ENGINEER.
 - CONCRETE MIX
 - (A) CONCRETE STRENGTH

DECK, CURBS AND SIDEWALKS, PARAPET WALLS AND DIAPHRAGMS:	4000 P.S.I. @ 28 DAYS
PRECAST PRESTRESSED CONCRETE BEAMS:	4220 P.S.I. @ TRANSFER 5000 P.S.I. @ 28 DAYS
FOOTINGS, PIERS, ABUTMENTS, WINGWALLS, ETC.:	3000 P.S.I. @ 28 DAYS
 - (B) ALL CONCRETE SHALL INCLUDE AN APPROVED AIR ENTRAINING AGENT.
 - (C) MAXIMUM SIZE OF AGGREGATE SHALL BE 3/4" IN DECK SLAB, CURB AND GUARDRAIL, 1 1/4" IN FOOTINGS AND 1" ELSEWHERE OR AS SPECIFIED.
 - ALL EXPOSED EDGES TO BE CHAMFERED 1" UNLESS OTHERWISE NOTED. ALL ACUTE ANGLES SHALL BE FILLETED AS INDICATED.
 - NO CONCRETE TO BE POURED BEFORE MATERIALS, FORMWORK, FALSEWORK AND REINFORCING HAVE BEEN CHECKED BY THE ENGINEER.
 - NO BACKFILL TO BE PLACED BEFORE GIRDERS ARE ERECTED AND SECURED.
 - CONSTRUCTION JOINTS NOT SHOWN ON PLANS MUST BE APPROVED BY THE ENGINEER.
 - REINFORCING STEEL TO BE MI-BOND. CLEAR COVER UNLESS OTHERWISE NOTED; 3" IN FOOTINGS AND ALL SURFACES IN CONTACT WITH EARTH OR WATER; 1" IN BOTTOM OF DECK; 2" TOP OF DECK, SIDEWALKS AND APPROACH SLABS; 1 1/2" IN PARAPET WALLS.
 - SUBMIT FOR APPROVAL FOUR (4) COPIES OF PRESTRESSED GIRDER SHOP DRAWINGS.

STRUCTURE DATA

1. NET SPAN LENGTH AND TYPE OF BRIDGE:	4 SPAN PRESTRESSED CONC. GIRDER STRUCTURE (62'-0", 62'-0", 62'-0", 62'-0" SPANS)
2. ROADWAY WIDTH ON BRIDGE:	51'-0"
3. NUMBER AND WIDTH OF SIDEWALKS:	2 - 8'-0" SIDEWALKS
4. SKEW ANGLE:	44°-00'-00"
5. TOTAL LENGTH AND TYPE OF PILING:	16 - 19'-6" LONG, 30" Ø CASPIONS
6. APPROX. VOLUME OF CONCRETE:	1430 CU. YDS.
7. APPROX. WEIGHT OF REINFORCEMENT:	129.47 TONS

FIELD INVESTIGATION MADE OCTOBER 1/73
 BY: J. R. SPRIET, P. ENG., SURVEY ENGINEER

STRUCTURE SITE No. 19-264

D.I.C. - TORONTO RECEIVED
 DEC 19 1973
 STRUCTURAL OFFICE

NO	REVISIONS	DATE	BY

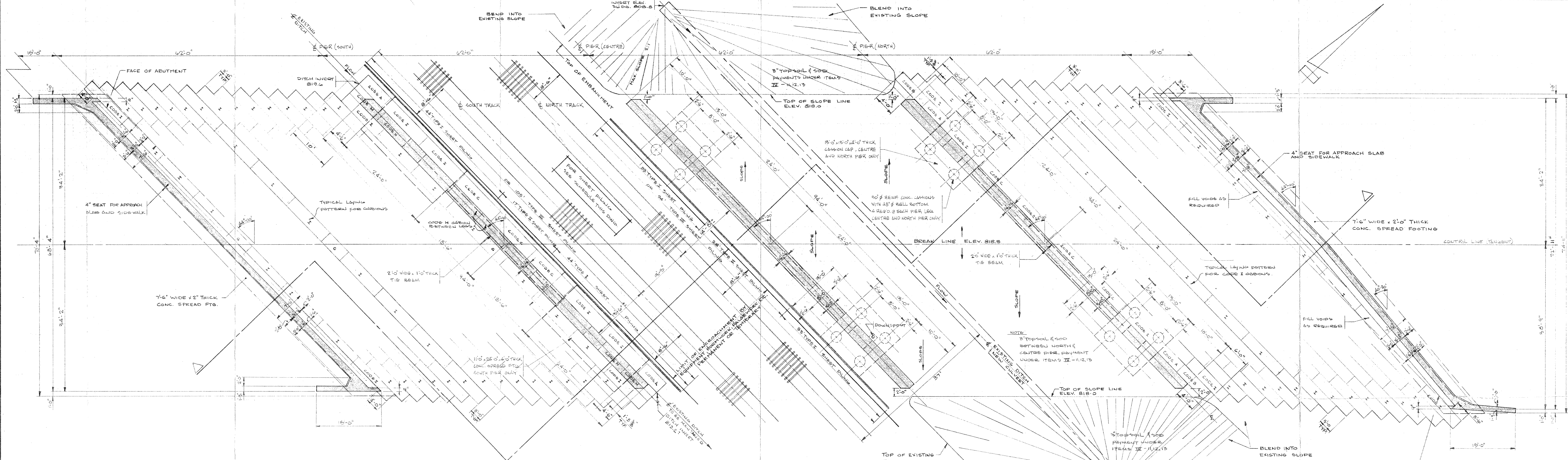
CITY OF LONDON

GRADE SEPARATION - C.N.R. - RIVERSIDE DR.

SUB-SURFACE INFORMATION AND GENERAL NOTES

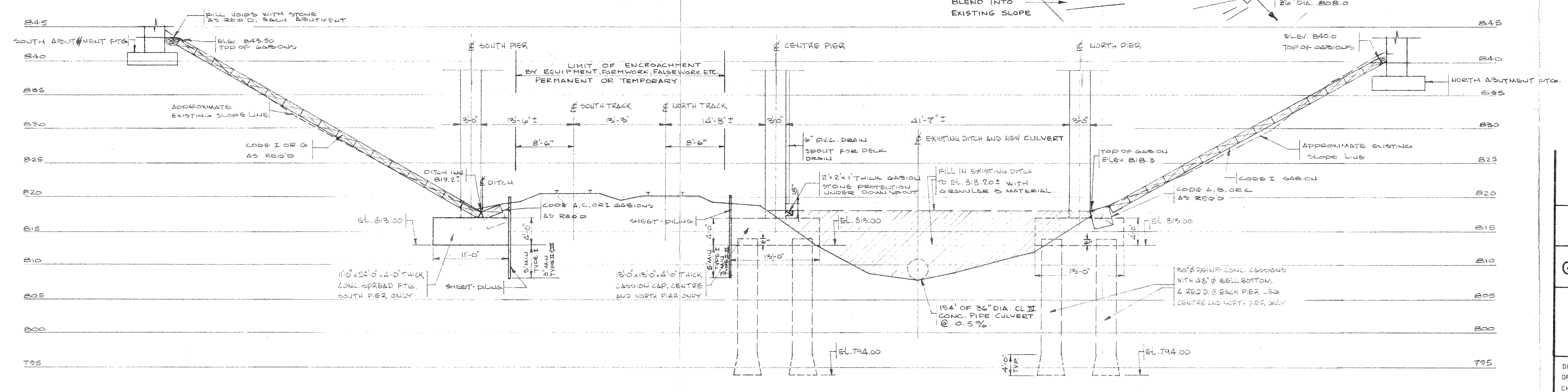
DESIGN BY J. R. SPRIET	FIELDBOOK 8-12
DRAWN BY E. B. WADE	SCALE AS NOTED
CHECKED BY A. M. SPRIET	DATE NOVEMBER 1973

A.M. SPRIET & ASSOCIATES LTD. CONSULTING ENGINEERS LONDON ONTARIO	APPROVED BY <i>A.M. Spriet</i> SECTION HEAD	CITY ENGINEER'S DEPARTMENT
PROJECT NO. 72038	<i>A.M. Spriet</i> CITY ENGINEER	PROJECT NO. 742/833/1
DRAWING NO. 6		DRAWING NO.



RIVER TYPE GABIONS				
CODE LETTER	L	W	D	No. REQ'D
A	6	3	3	4
B	9	3	3	2
C	12	3	3	7
G	6	5	1	16
H	9	3	1	10
I	12	3	1	270

SHEET PILING SCHEDULE				
TYPE	LENGTH (VERTICAL)	HORIZONTAL EXPOSED REQ'D	MINIMUM SECTION MODULUS (IN ³ /FT)	LATERAL BRACING REQ'D
I	12'	154'	11.4	NONE
II	10'	45'	11.4	NONE
III	10'	109'	3.5	2.0 W/PT. 2.0 W/O PT. ULTIMATE STRESS



D.T.C. - TORONTO RECEIVED
DEC 19 1973
STRUCTURAL OFFICE

NO	REVISIONS	DATE	BY

CITY OF LONDON
GRADE SEPARATION - C.N.R. - RIVERSIDE DR.

FOUNDATION DETAILS AND SLOPE PROTECTION

DESIGN BY: J.R. SPRIET
DRAWN BY: E.B. WADE
CHECKED BY: A.M. SPRIET

FIELD BOOK: B-12
SCALE: AS NOTED
DATE: NOVEMBER 1973

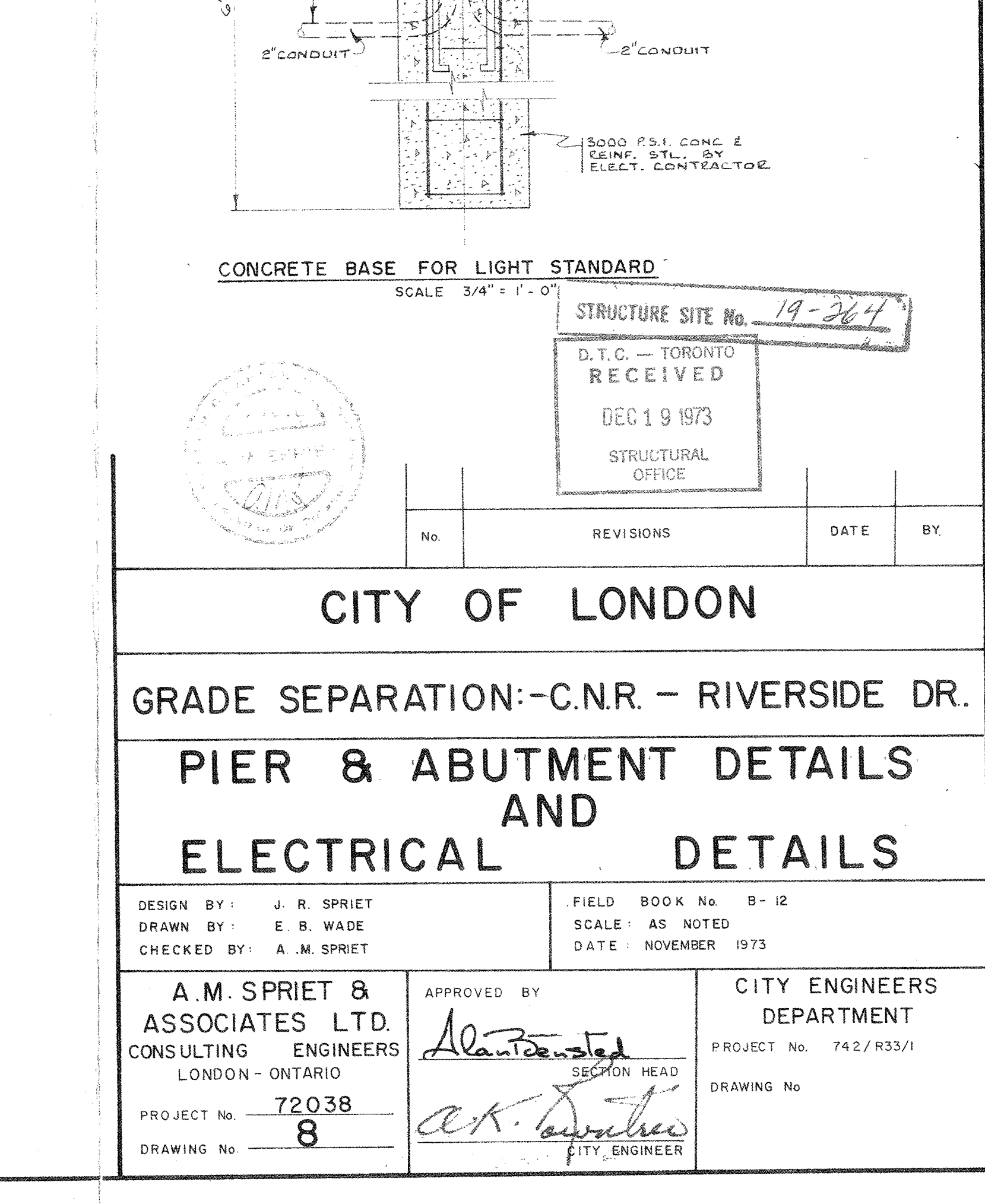
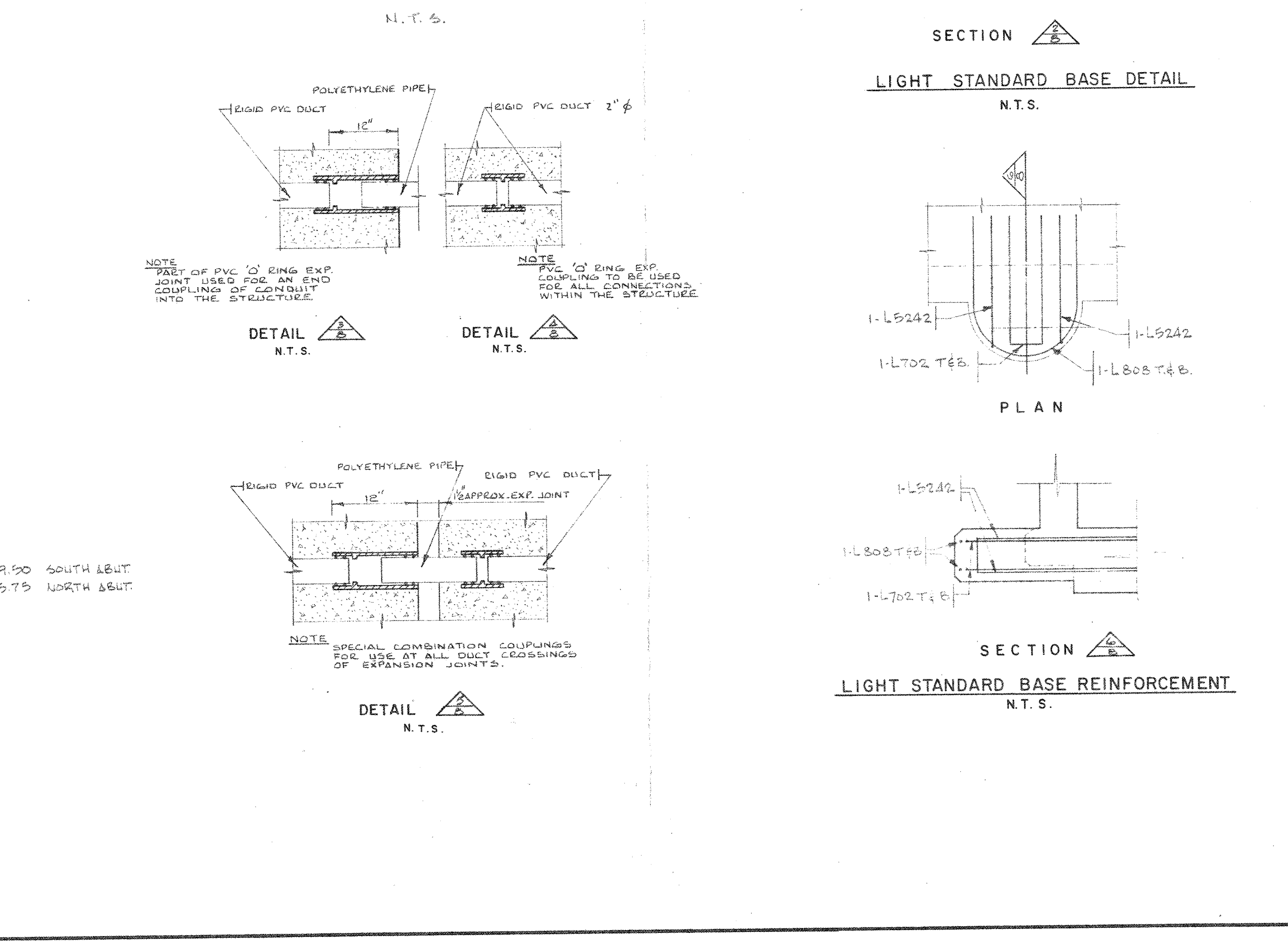
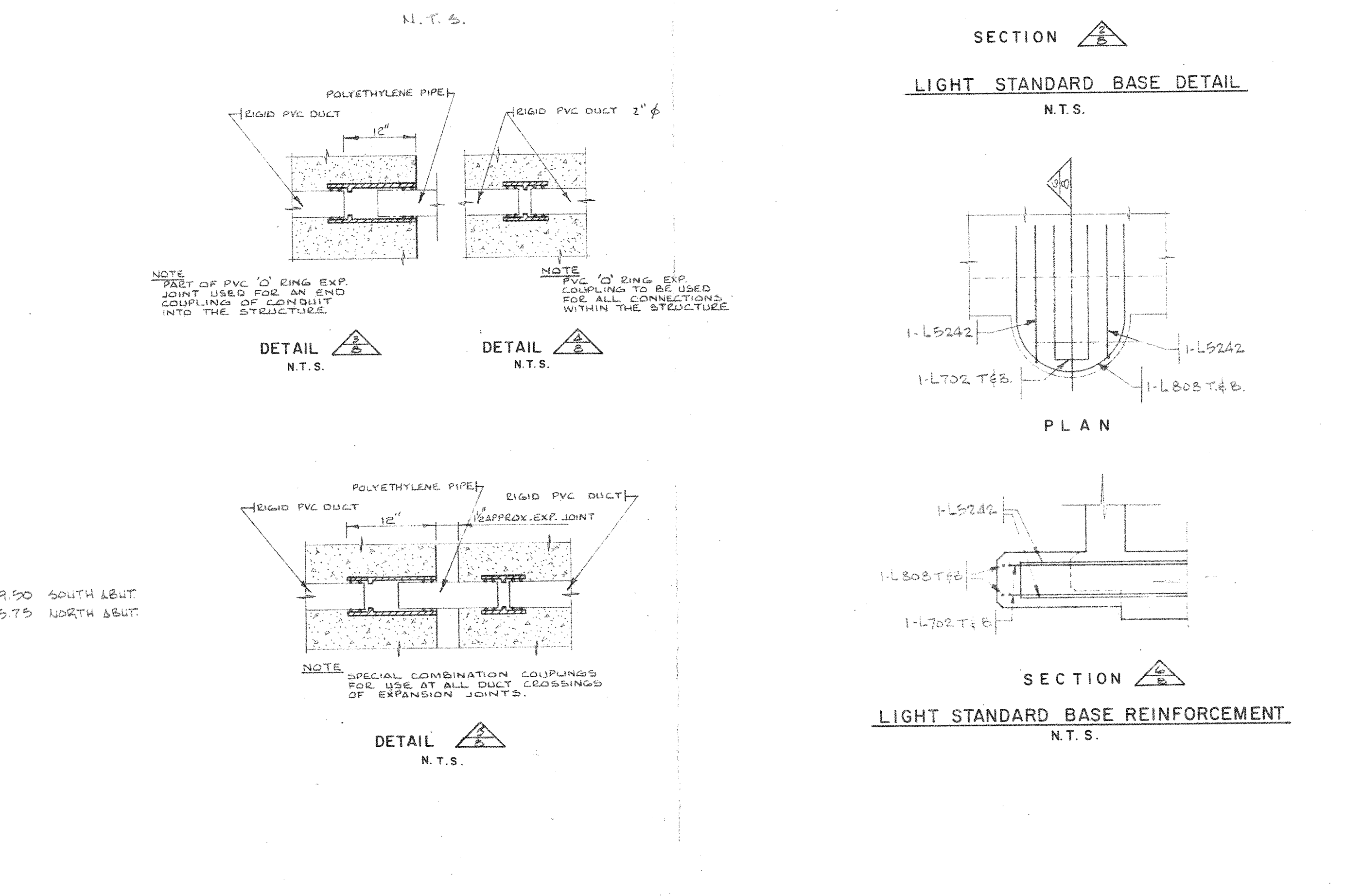
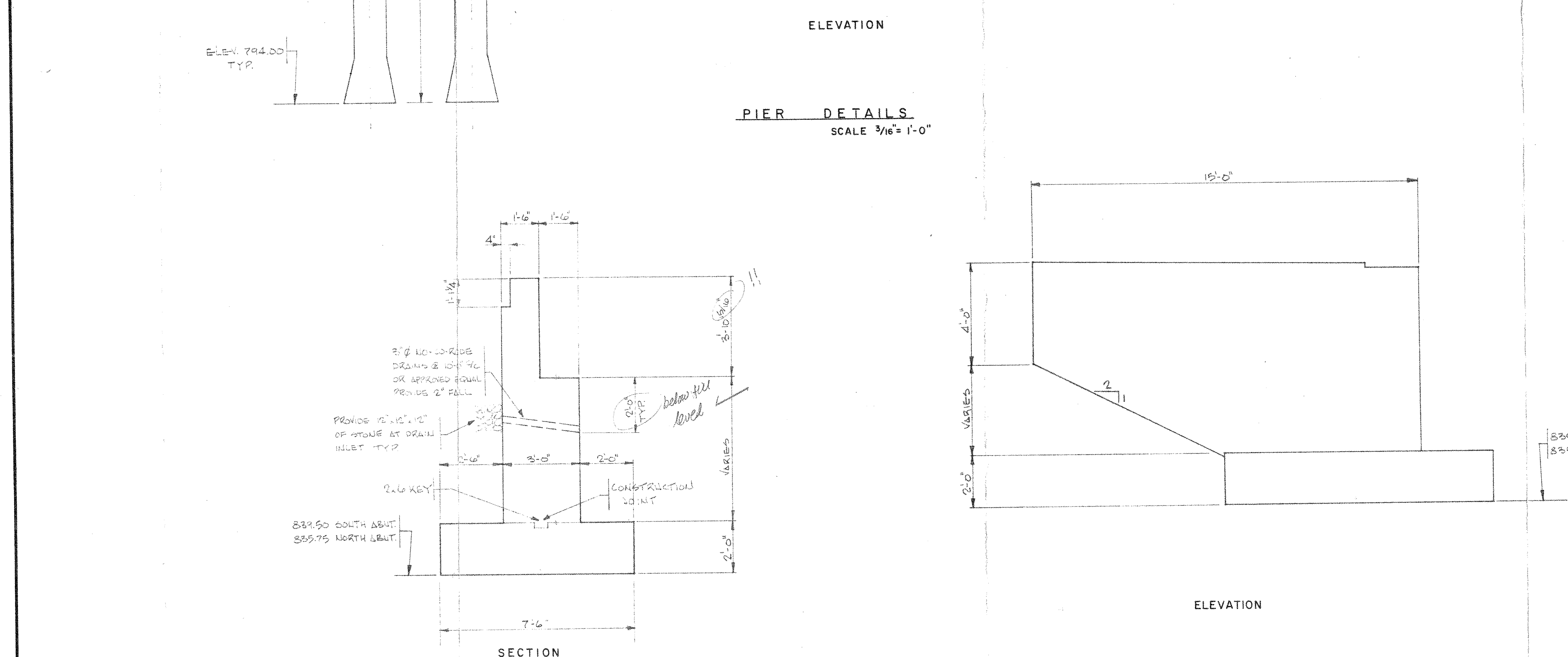
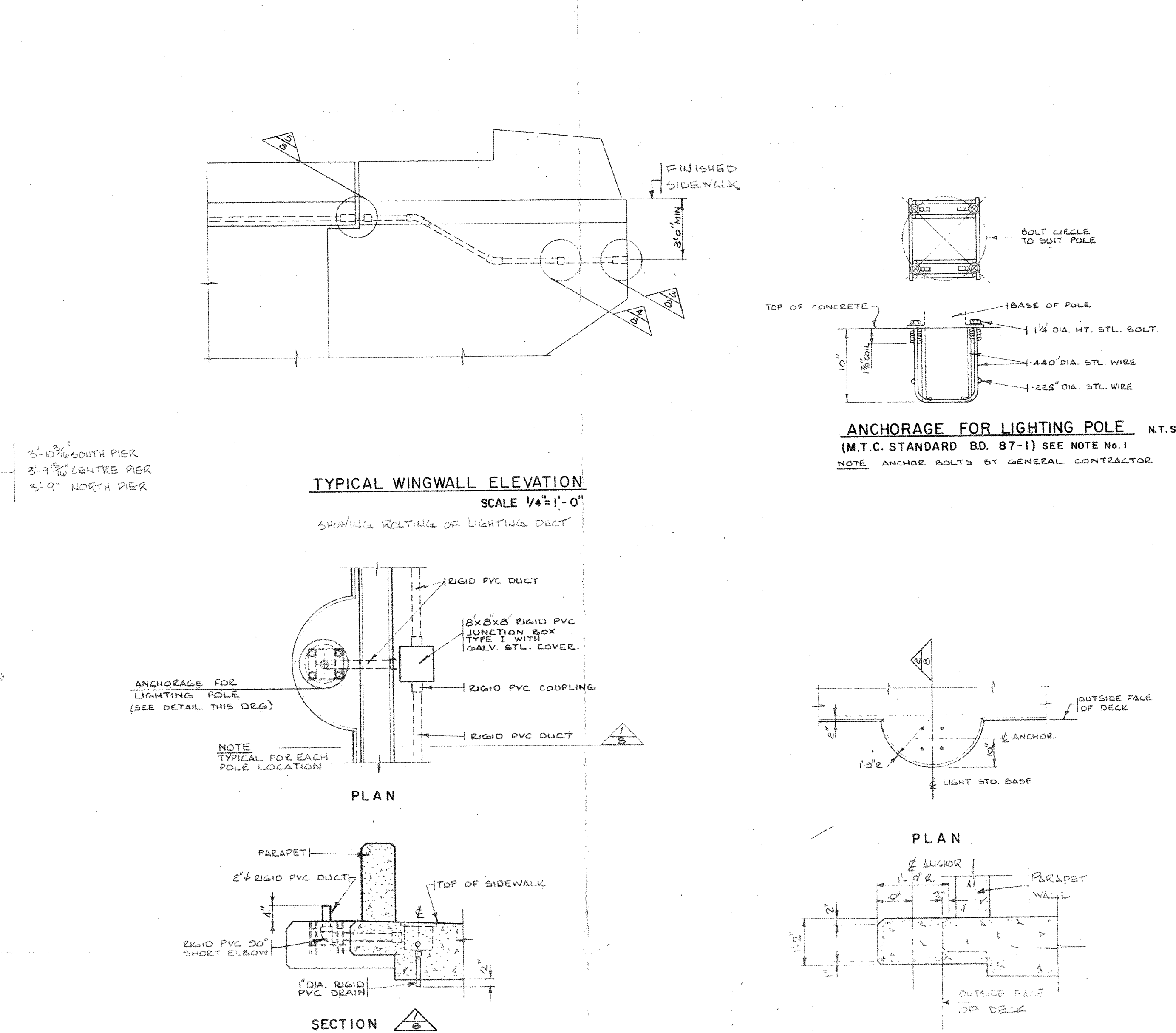
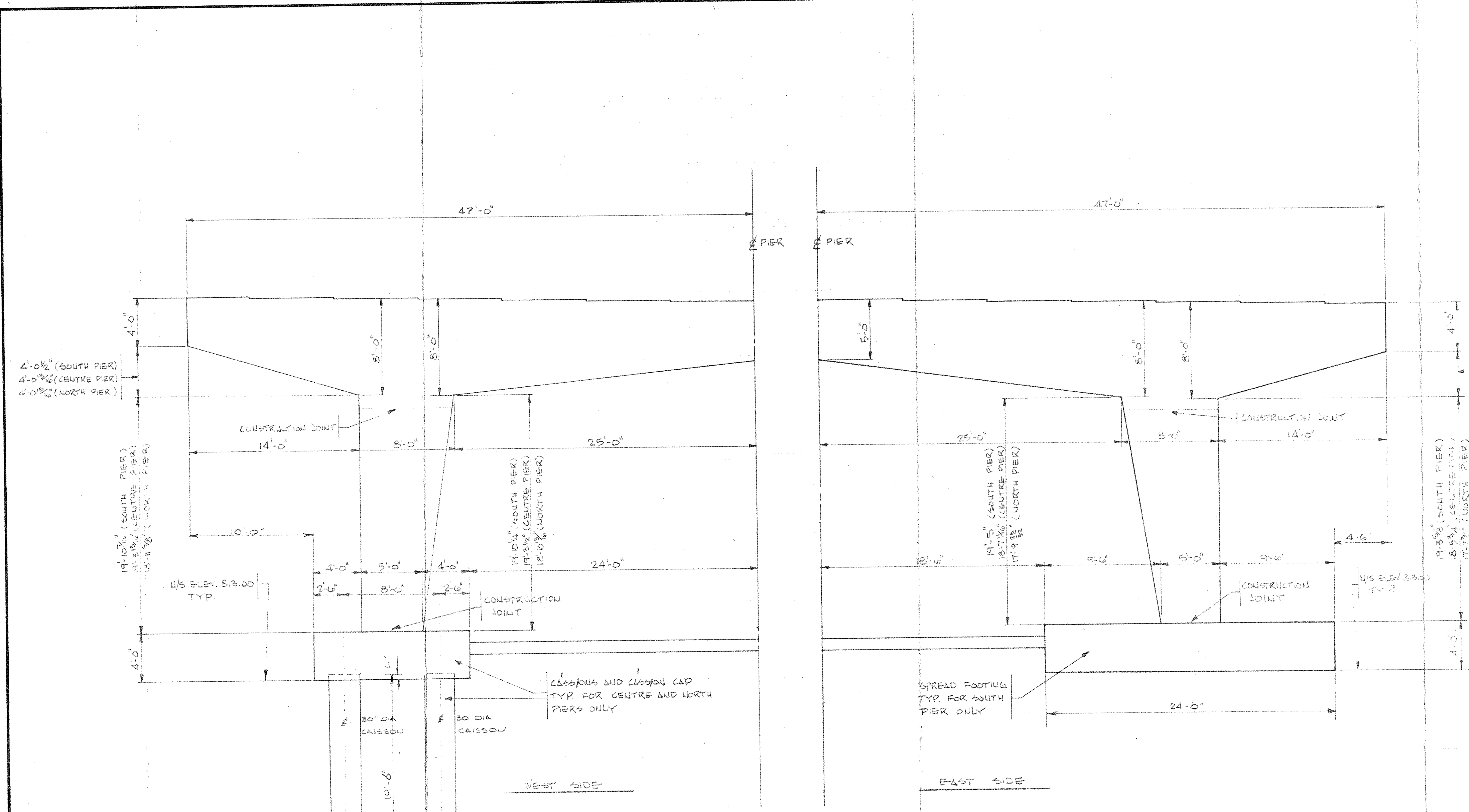
A.M. SPRIET & ASSOCIATES LTD.
CONSULTING ENGINEERS
LONDON - ONTARIO

APPROVED BY: *Ala. Bonted*
SECTION HEAD

CITY ENGINEER'S DEPARTMENT
PROJECT NO. 742/R33/1
DRAWING NO.

PROJECT NO. 72038
DRAWING NO. 7

ex. Justice
CITY ENGINEER



NOTES

- POLE ANCHOR INSET ASSEMBLIES SHALL CONSIST OF THE FOLLOWING:-
- OF DESIGN TO SUIT THE ANCHOR BOLT SPACINGS & DEPTHS REQUIRED.
- OF STRENGTH EQUAL TO THE ANCHOR BOLTS.
- THE COMPLETE UNIT (STEEL) AFTER FABRICATION INCLUDING HIGH TENSILE BOLTS & ROUND WASHERS, HOT DIPPED GALVANIZED TO C.S.A. STD. G 104.
- BOLTS, GIVEN A LIBERAL COATING OF WHITE NON-STAINING GREASE.
- INSERT THREAD DEPTH & BOLT LENGTH SIZED TO SUIT THE THICKNESS OF POLE BASE PLATES.
- PROVIDE TEMPLATE FOR USE DURING INSTALLATION TO ENSURE ACCURATE POSITIONING OF BOLTS TO SUIT POLE SUPPLIED.
- A MINIMUM OF E-75 REINFORCING BARS 2'-0" LONG, RUN THROUGH THE INSET TO PROVIDE A TIE-IN WITH THE STRUCTURE (UNLESS SHOWN OTHERWISE ON STRUCTURAL DRAWINGS)
- ANCHOR BOLT SIZE TO BE VERIFIED BY LIGHT STANDARD MANUFACTURER PRIOR TO CONSTRUCTION.

STRUCTURE SITE No. 19-264
D.T.C. - TORONTO RECEIVED
DEC 19 1973
STRUCTURAL OFFICE

No.	REVISIONS	DATE	BY

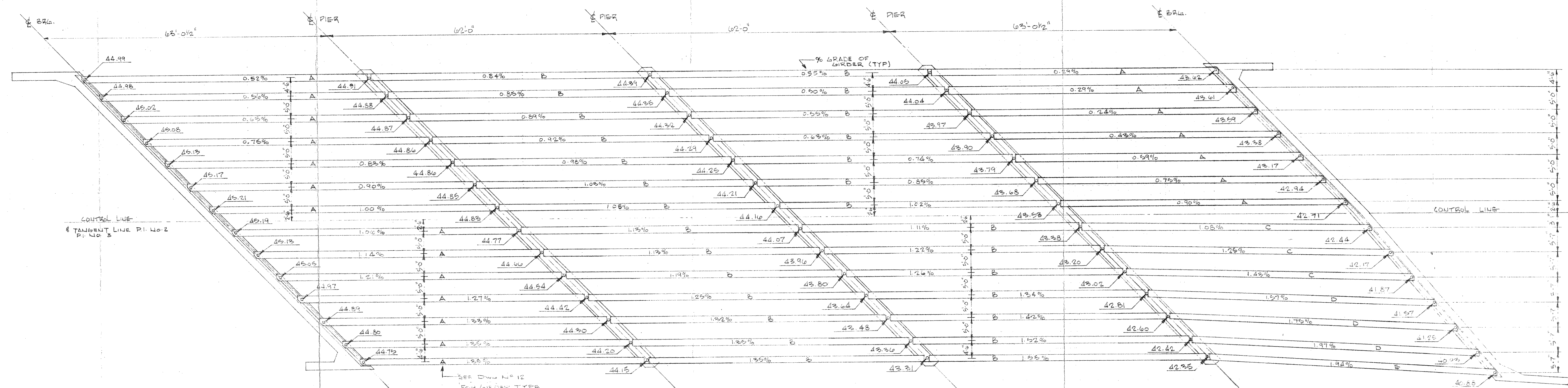
CITY OF LONDON
GRADE SEPARATION:-C.N.R. - RIVERSIDE DR.
PIER & ABUTMENT DETAILS AND ELECTRICAL DETAILS

DESIGN BY: J. R. SPRIET
DRAWN BY: E. B. WADE
CHECKED BY: A. M. SPRIET

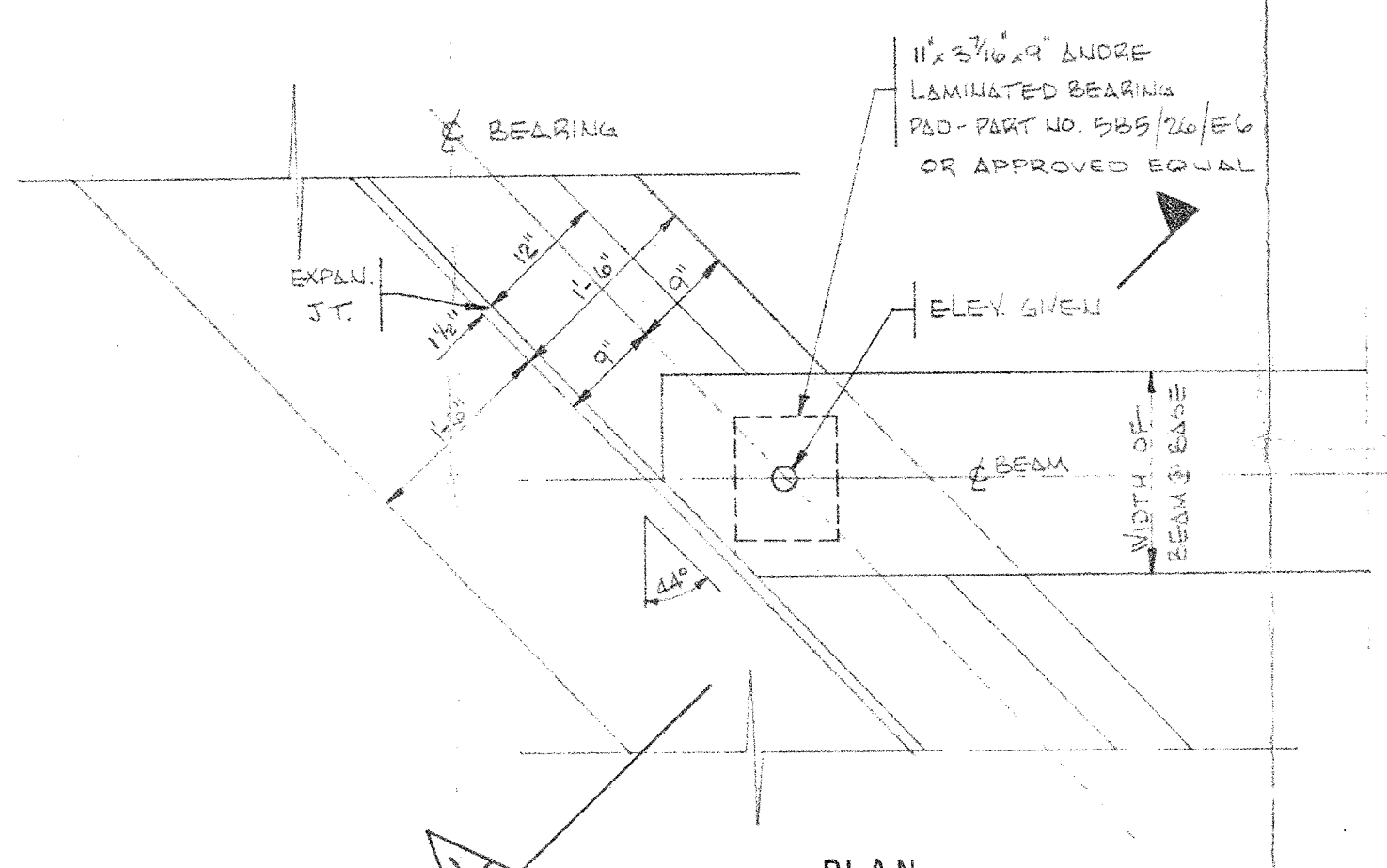
APPROVED BY: *A.M. Spriet*
SECTION HEAD

CITY ENGINEERS DEPARTMENT
PROJECT No. 742/R33/1
DRAWING No. 8

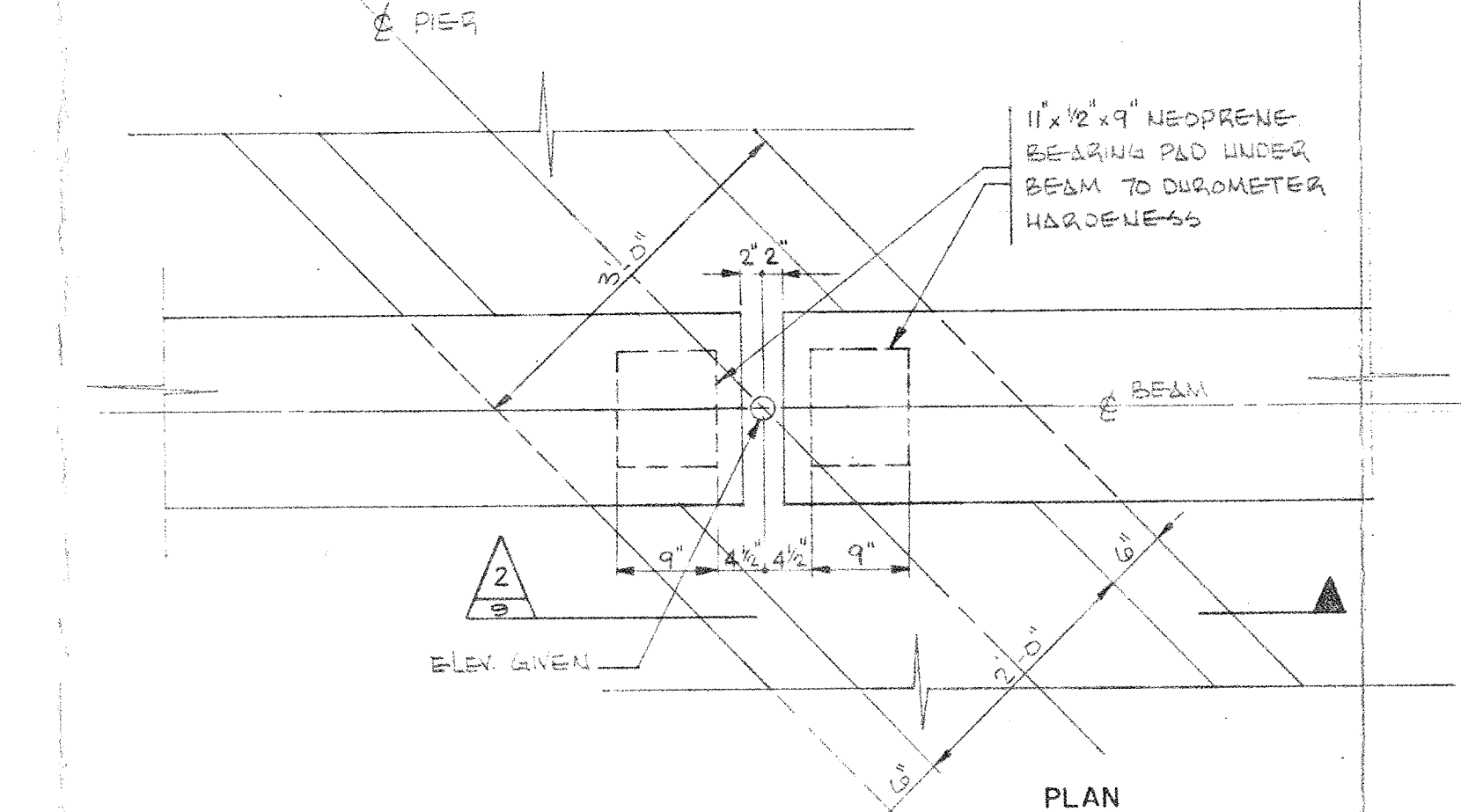
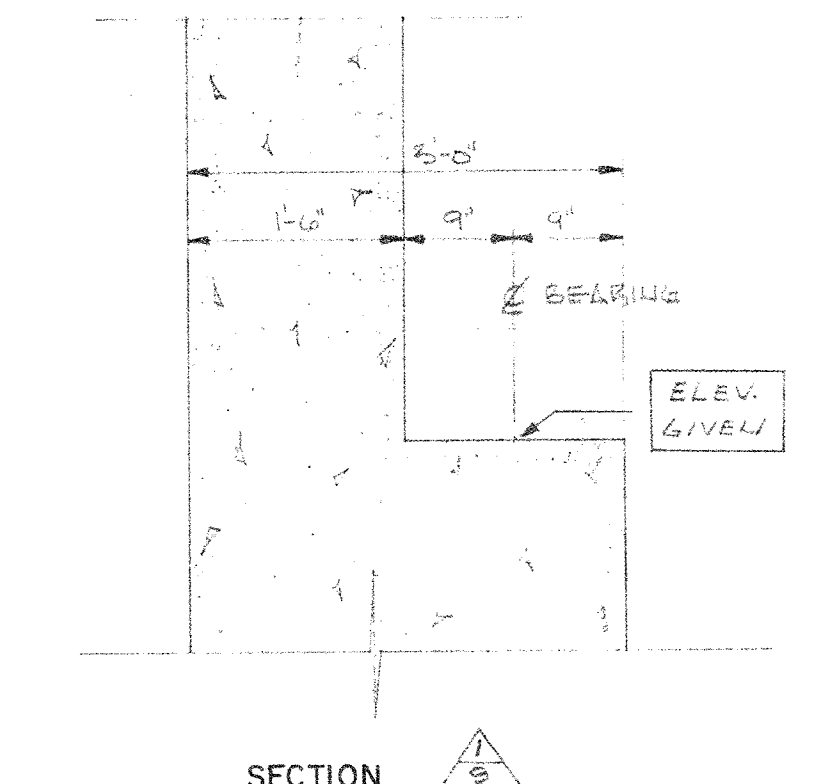
FIELD BOOK No. B-12
SCALE: AS NOTED
DATE: NOVEMBER 1973



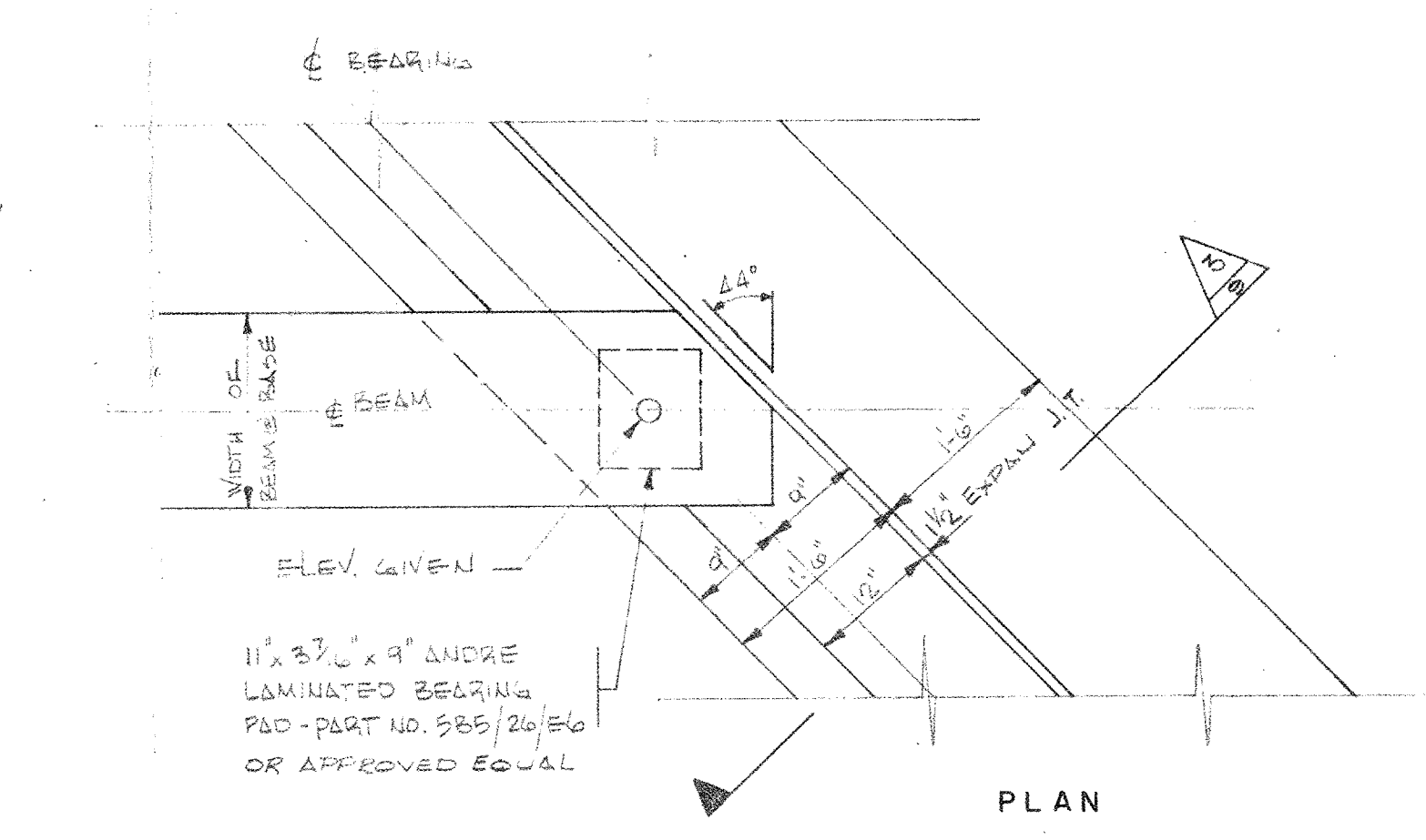
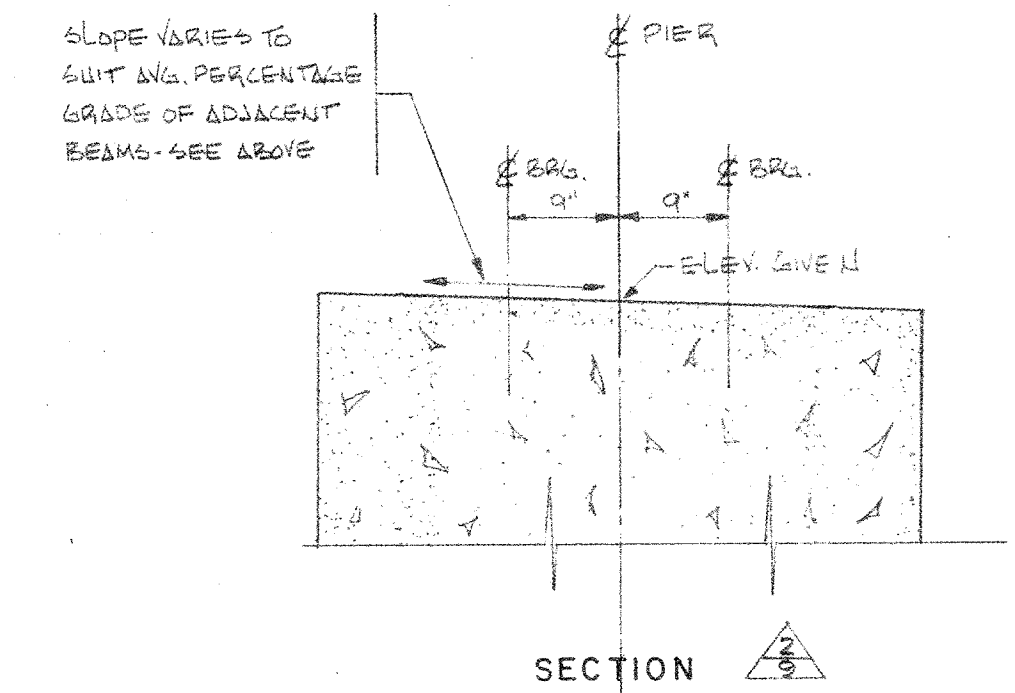
GIRDER LAYOUT PLAN
SCALE 3/32" = 1'-0"



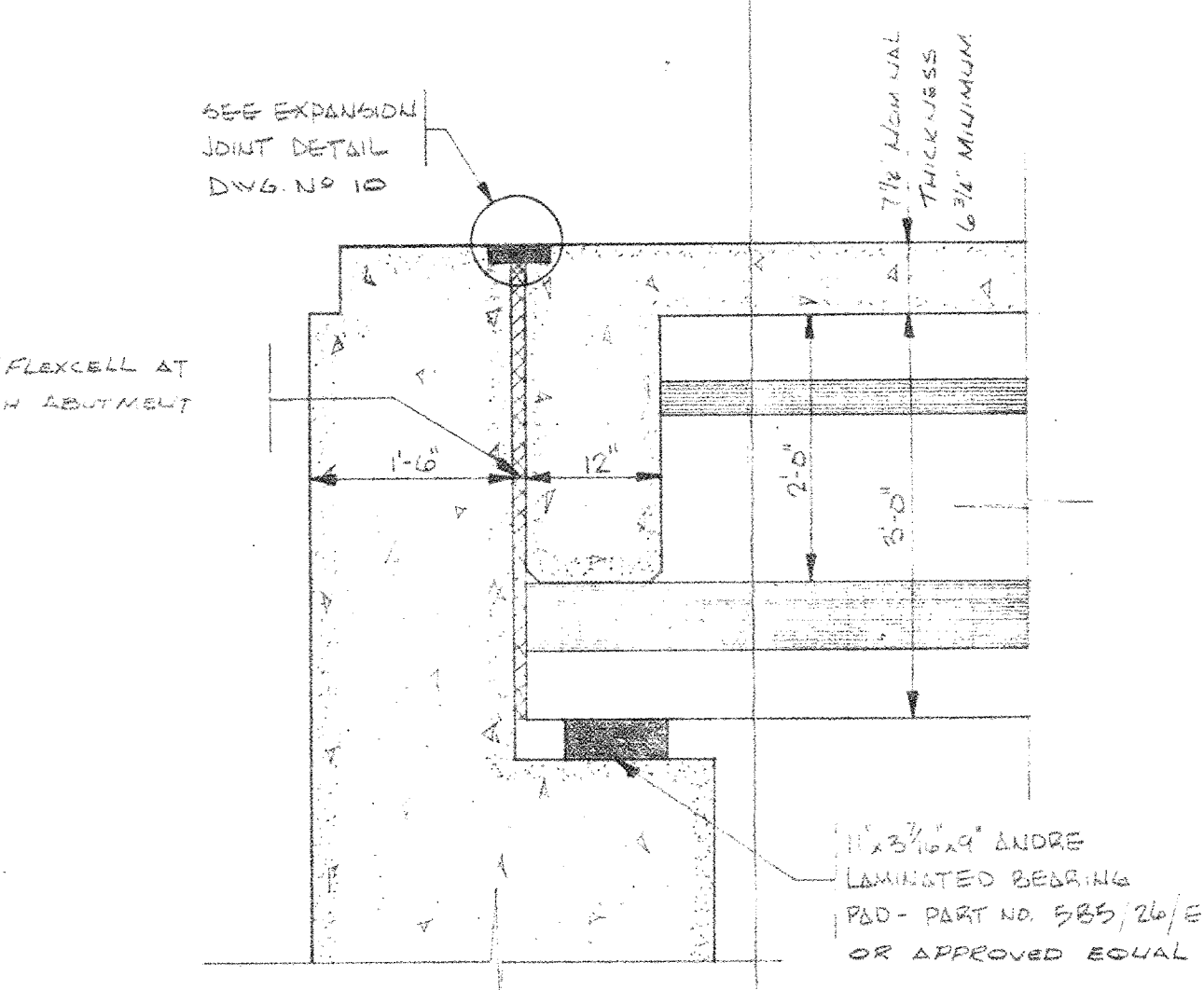
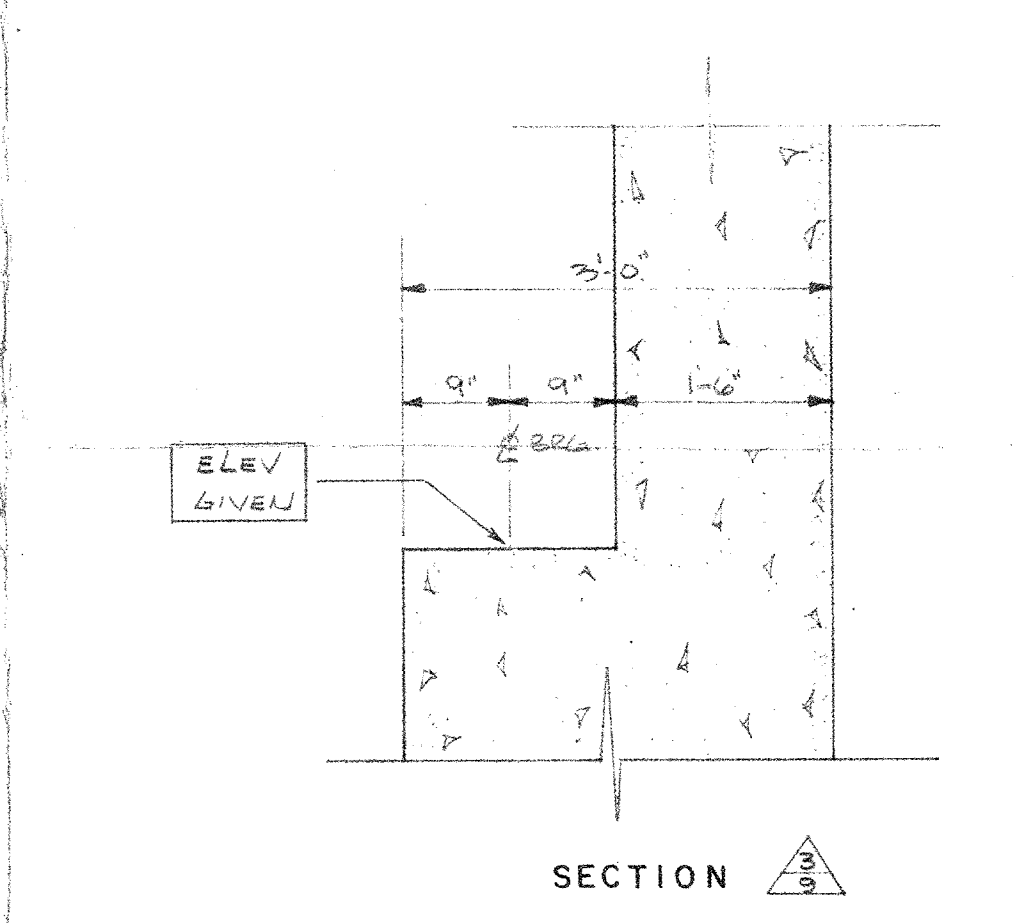
ABUTMENT BEARING DETAILS
SCALE 3/4" = 1'-0"



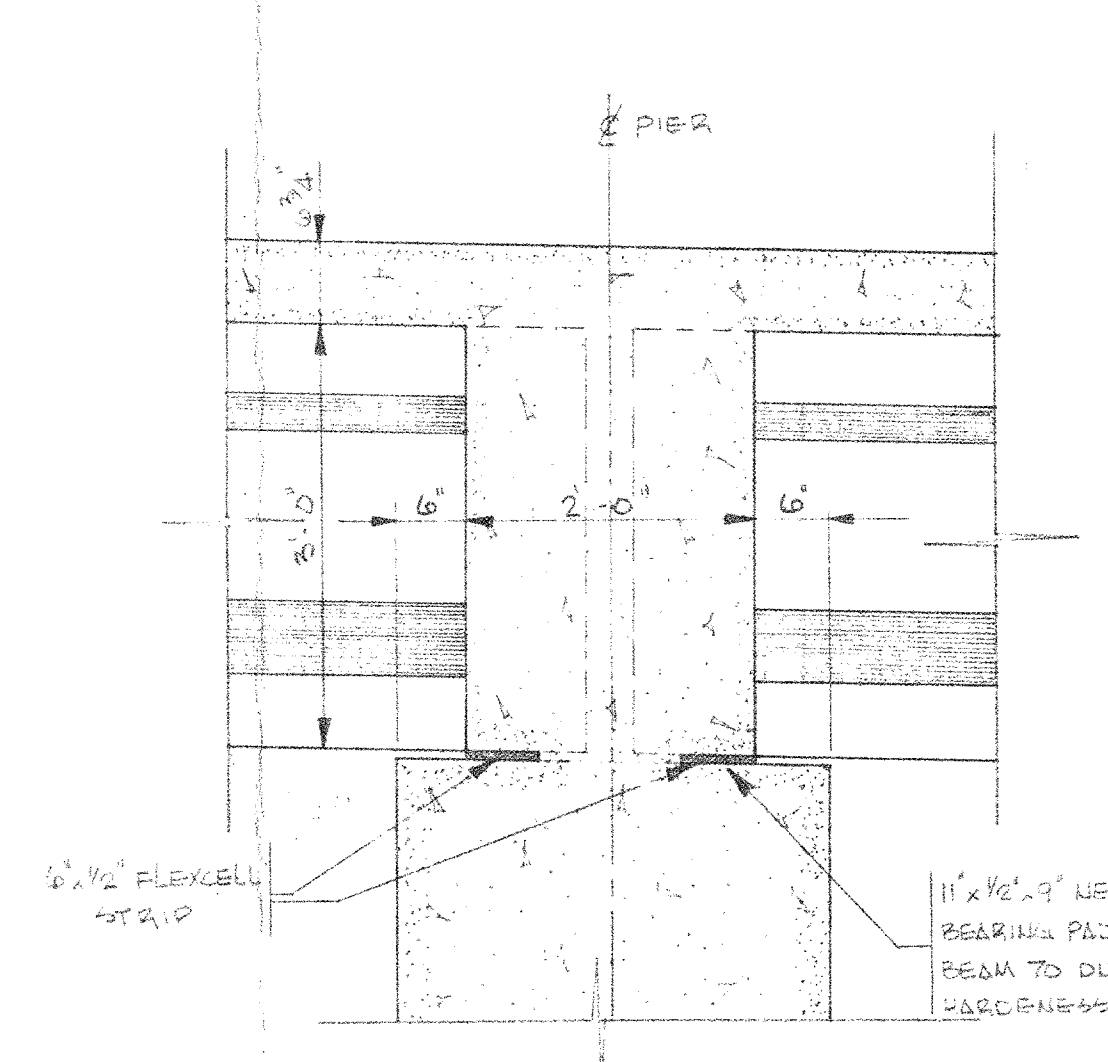
PIER BEARING DETAILS
SCALE 3/4" = 1'-0"



ABUTMENT BEARING DETAILS
SCALE 3/4" = 1'-0"



DIAPHRAGM SECTION AT ABUTMENT
SCALE 3/4" = 1'-0"



DIAPHRAGM SECTION AT PIER
SCALE 3/4" = 1'-0"

NOTE: MINIMUM VERTICAL CLEARANCE TO BE MAINTAINED DURING CONSTRUCTION TO BE 22'-6" FROM BASE OF RAIL TO UNDERSIDE OF FALSEWORK, FORMWORK, ETC.

STRUCTURE SITE NO. 19-264



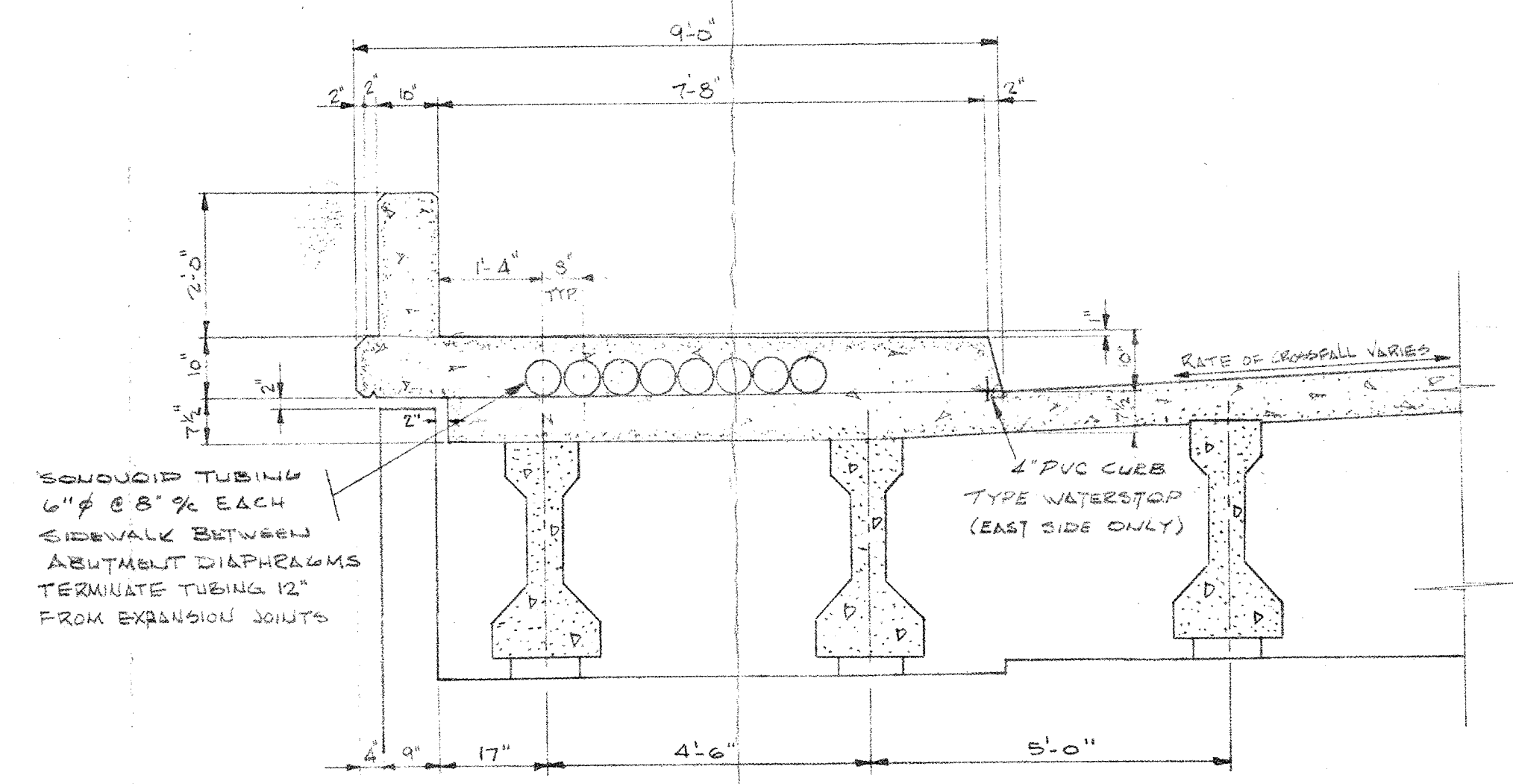
D.T.C. - TORONTO RECEIVED
DEC 19 1973
STRUCTURAL OFFICE

NO.	REVISIONS	DATE	BY

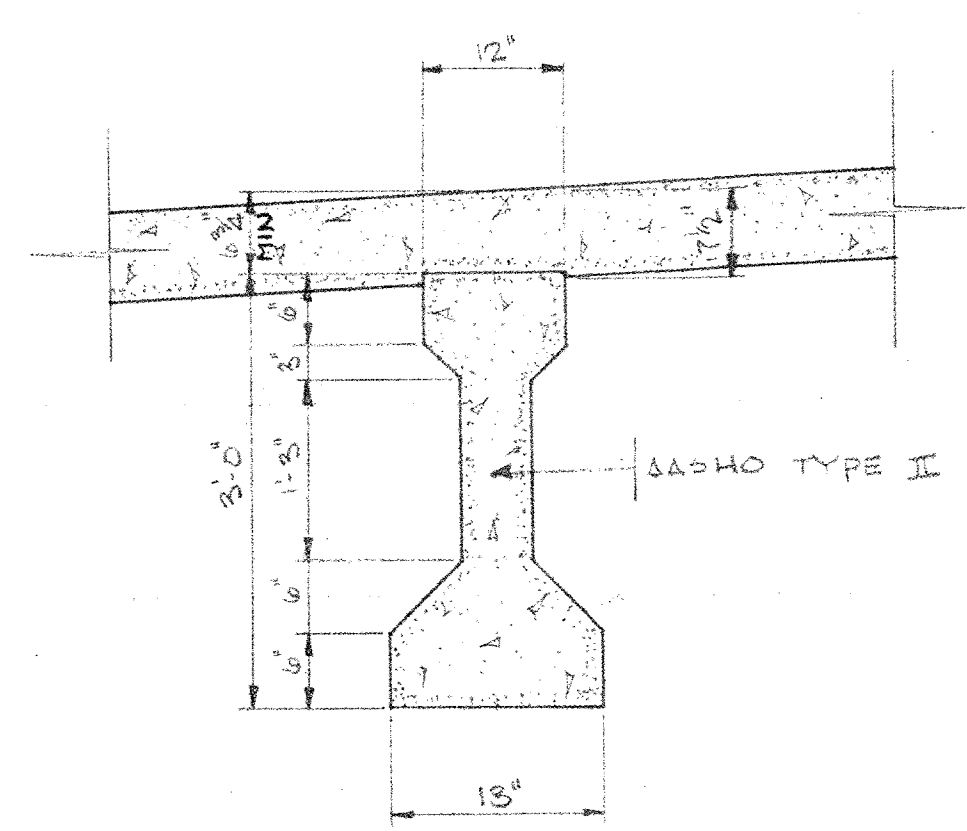
CITY OF LONDON
GRADE SEPARATION - C.N.R. - RIVERSIDE DR.

GIRDER LAYOUT
PLAN & DETAILS

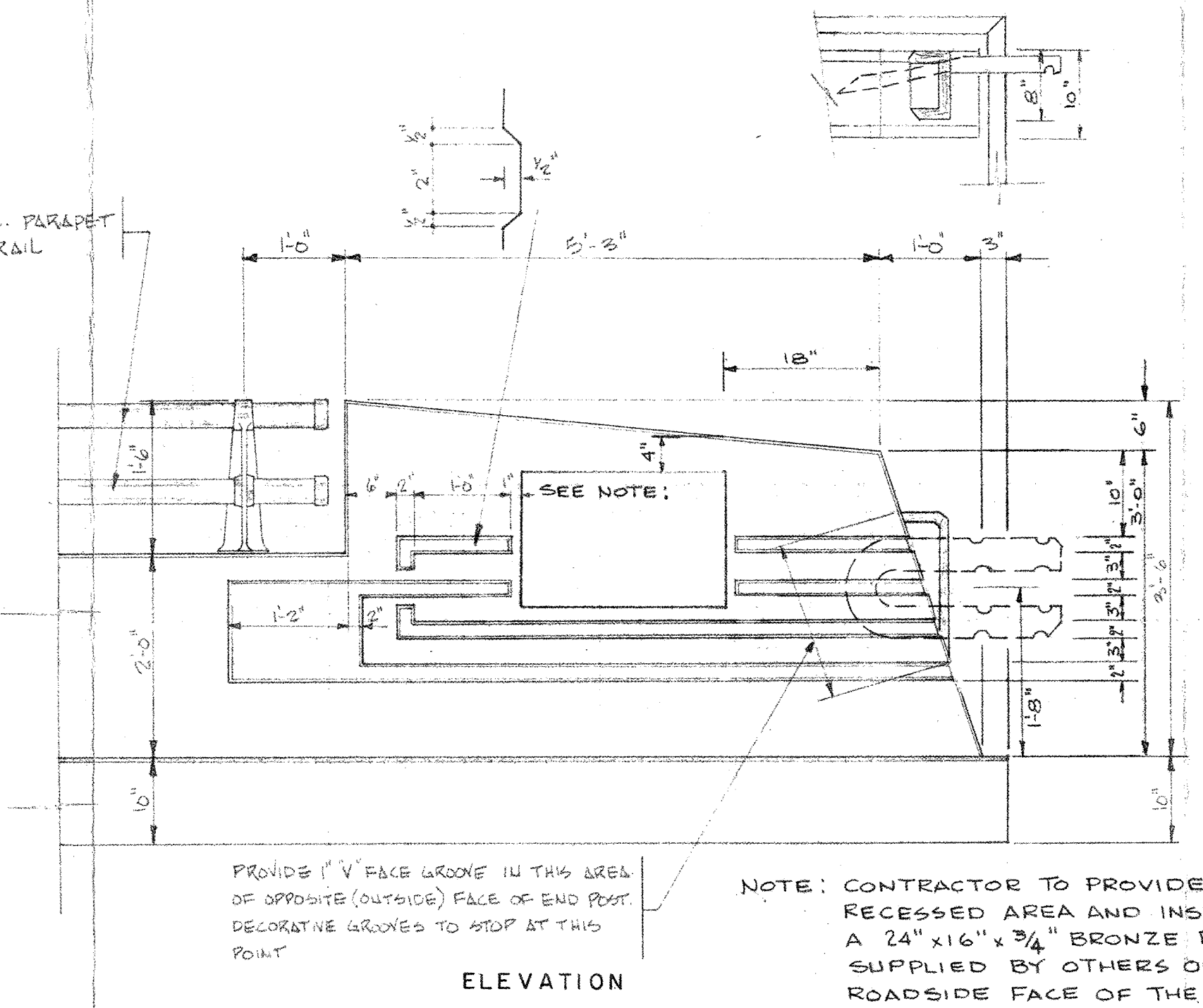
DESIGN BY J.R. SPRIET	FIELD BOOK B-12
DRAWN BY E.B. WADE	SCALE AS NOTED
CHECKED BY A.M. SPRIET	DATE NOVEMBER 1973
APPROVED BY <i>A.M. Spriet</i> SECTION HEAD	
CITY ENGINEER'S DEPARTMENT	
PROJECT NO. 742/R33/11	
DRAWING NO. 9	



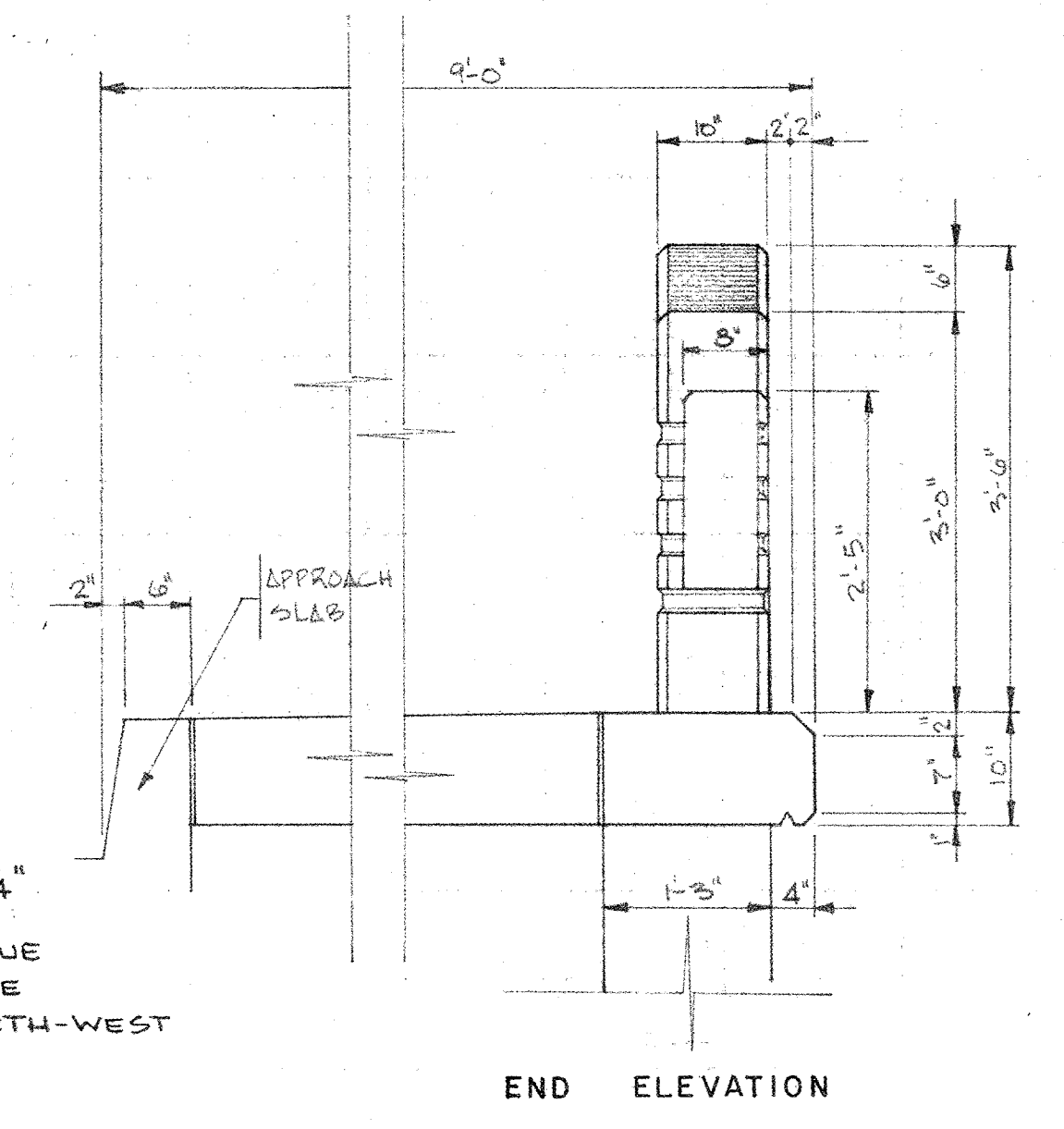
CURB & PARAPET WALL DETAIL
SCALE 1/2"=1'-0"



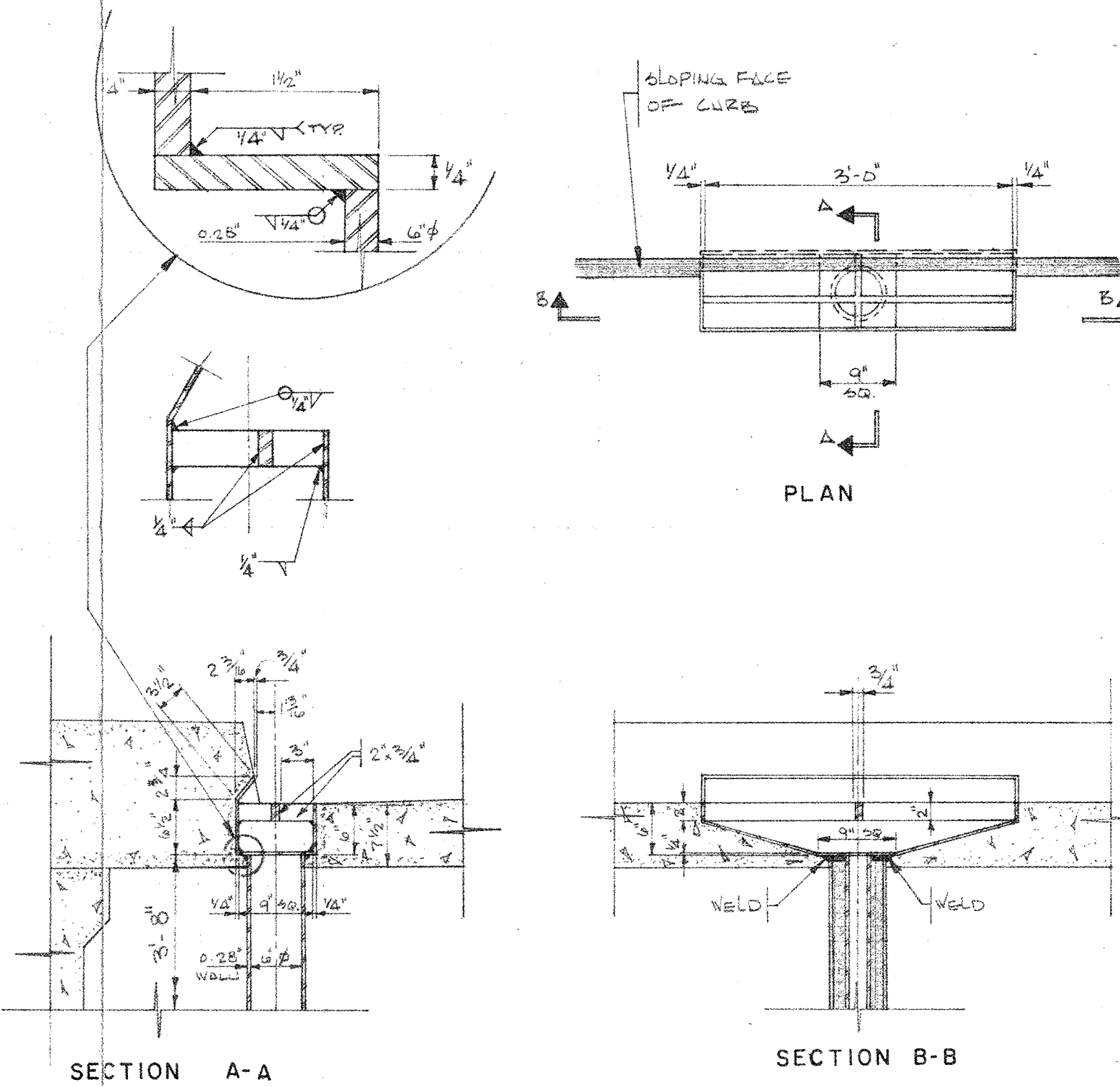
PRECAST GIRDER DETAIL
SCALE 3/4"=1'-0"



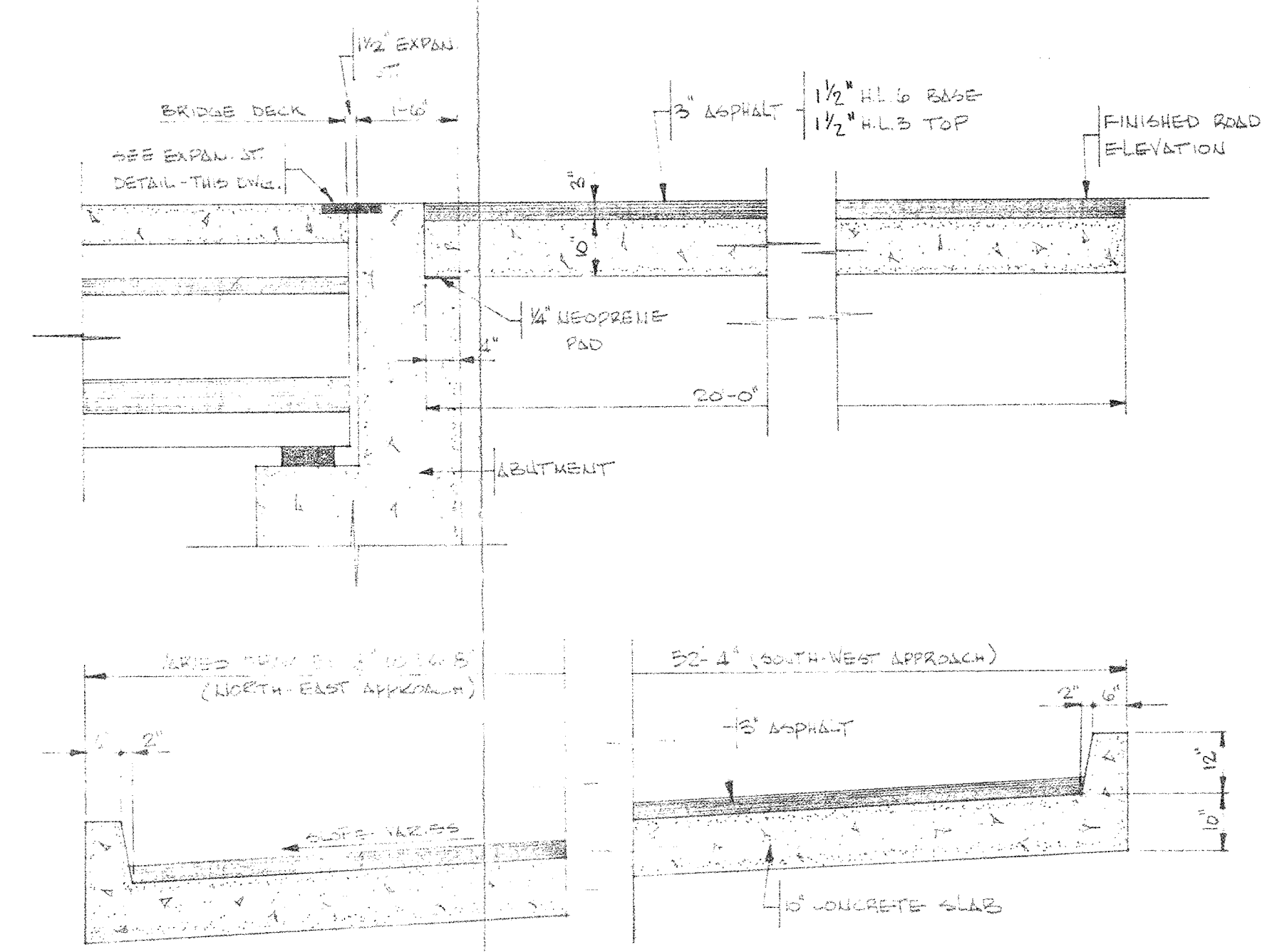
ELEVATION
END POST DETAIL
SCALE 3/4"=1'-0"



END ELEVATION

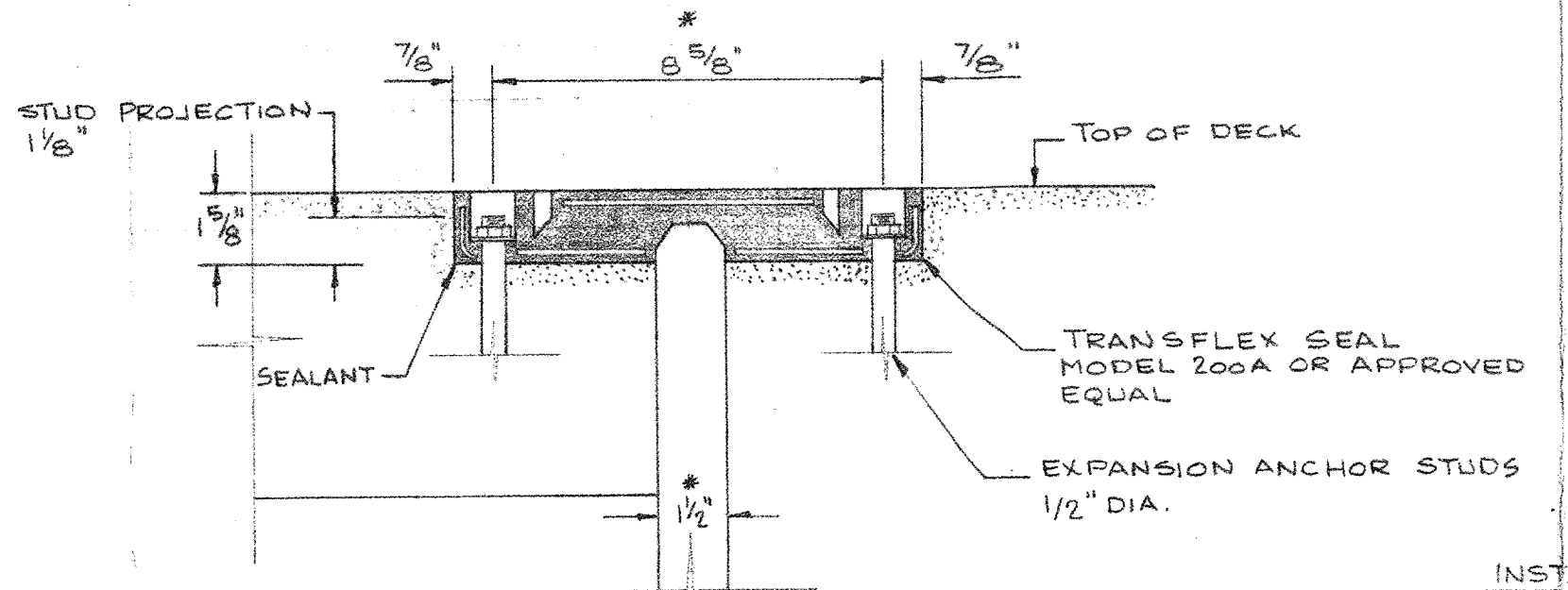


SECTION A-A
SECTION B-B



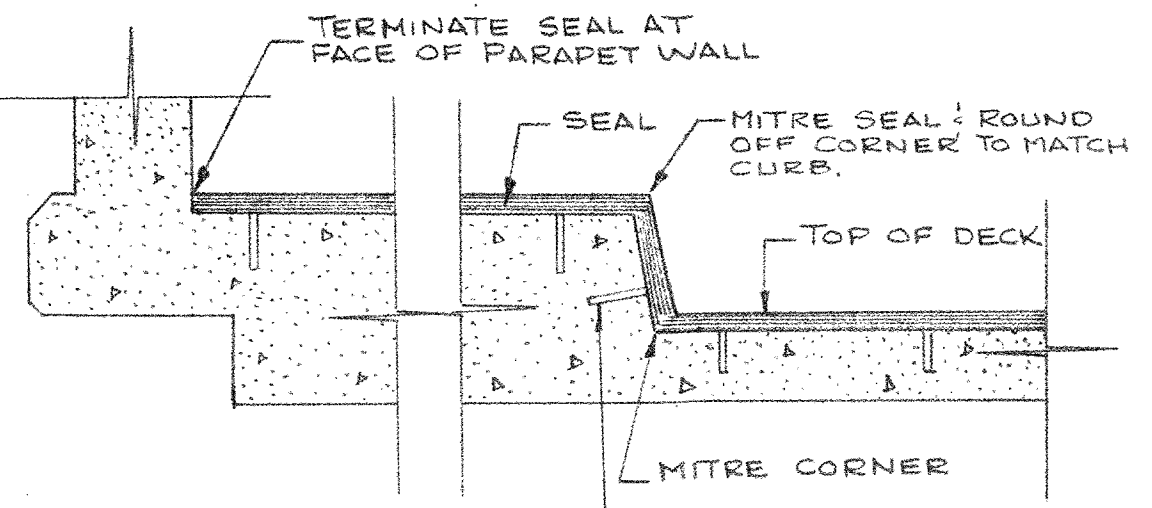
DECK DRAIN DETAILS
SCALE 3/4"=1'-0"

- NOTE:**
1. DRAIN MAY BE A CASTING OR A WELDMENT IN CONFORMANCE WITH A.S.T.M. SPECIFICATIONS A-27-60 GRADE B5-35 OR C-6 SPECIFICATIONS A164.
 2. 6" OUTLET PIPE - IN CONFORMANCE WITH A.S.T.M. SPECIFICATION A100 60T
 3. WELDING - IN CONFORMANCE WITH C.S.A. SPEC. G 40.4
 4. HOT DIP GALVANIZING TO BE DONE AFTER FABRICATION IN CONFORMANCE WITH C.S.A. SPEC. G 164



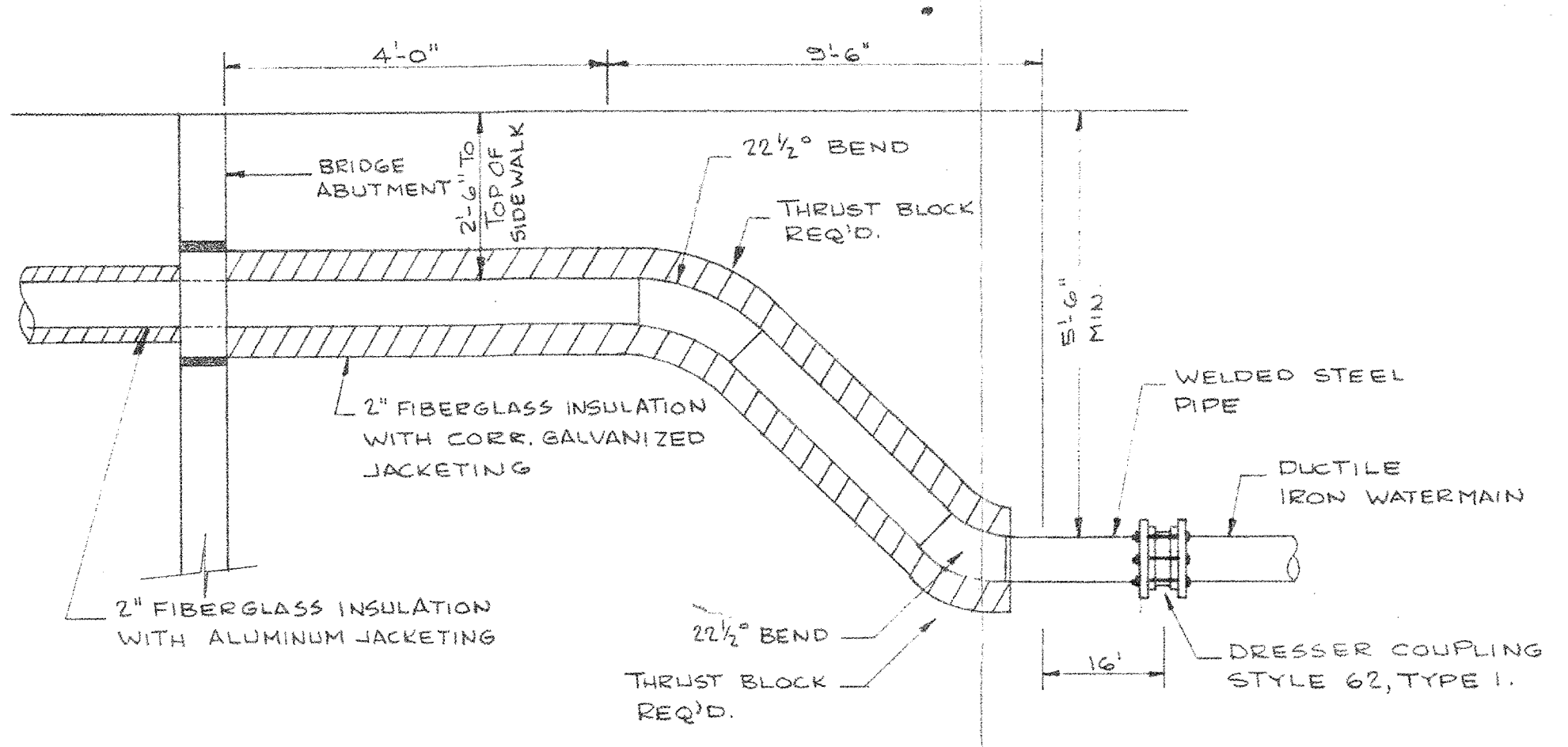
SEAL DETAIL
SCALE 3/4"=1'-0"

- INSTALLATION:**
- ALL DIMENSIONS MARKED WITH AN ASTERISK (*) ARE @ 60° F AND SHALL BE ADJUSTED TO SUIT AMBIENT TEMPERATURE AT TIME OF CASTING ABUTMENT BACK WALL.
 - LOCATE ALL STUD HOLES USING 3/4" PLYWOOD TEMPLATE. DRILL 1/2" HOLES 2 1/2" DEEP.
 - SET EXPANSION ANCHOR STUDS.
 - APPLY SEALANT 1/8" THICK BY 3" WIDE IN RECESS FOR EXPANSION JOINT AND AT ENDS OF JOINT SEAL SECTIONS.
 - SET 6" SECTION OF JOINT SEAL AND TIGHTEN NUTS TO 40 FT./LBS.
 - RETIGHTEN NUTS TO 40 LBS. APPROX. 1/2 HOUR AFTER INITIAL TIGHTENING.

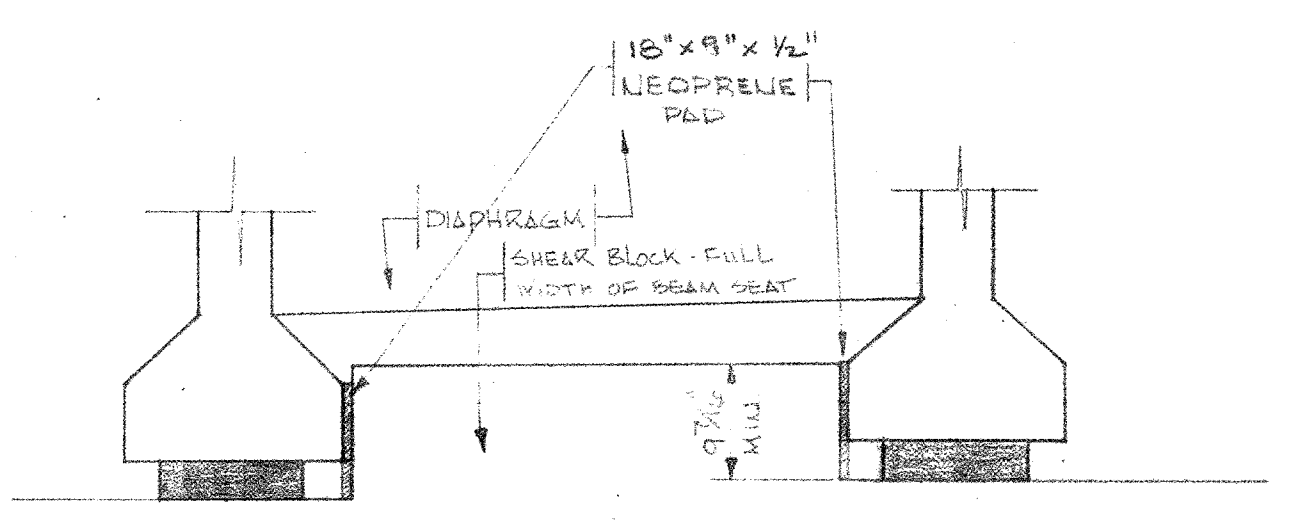


CURB DETAIL

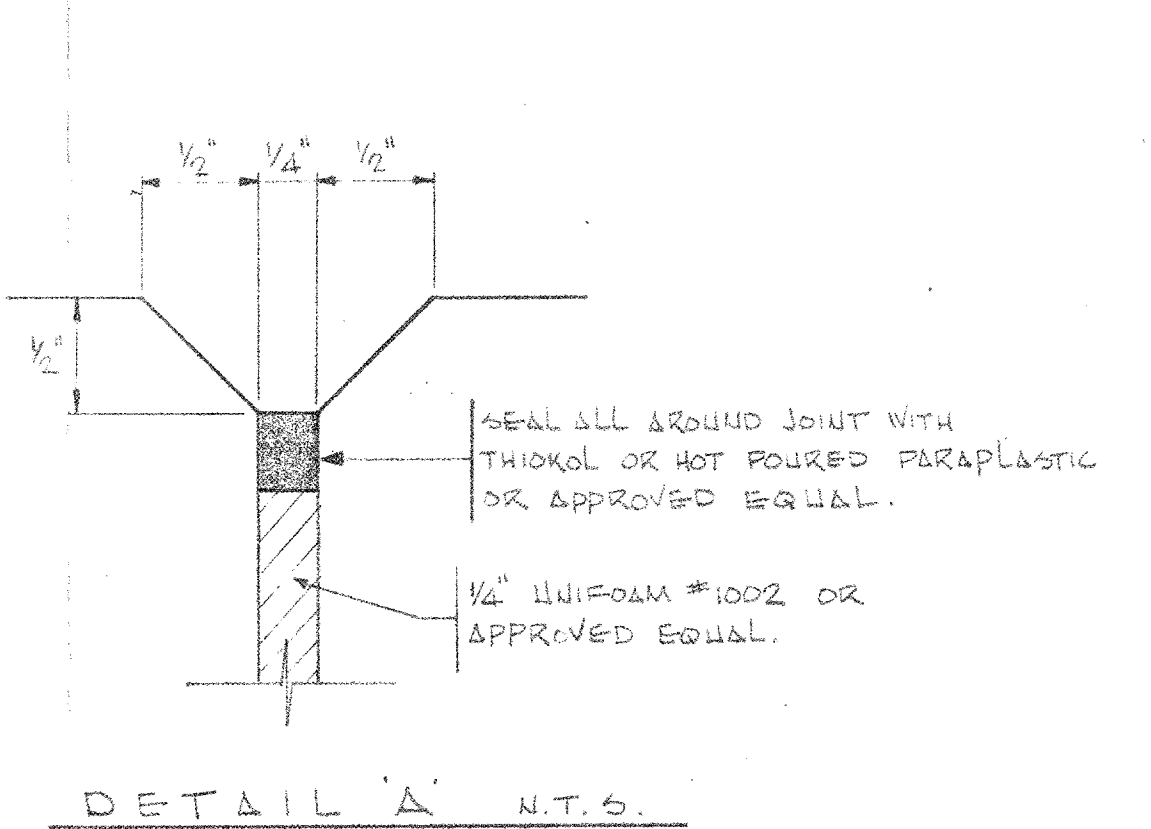
EXPANSION JOINT DETAILS
SCALE 3/4"=1'-0"



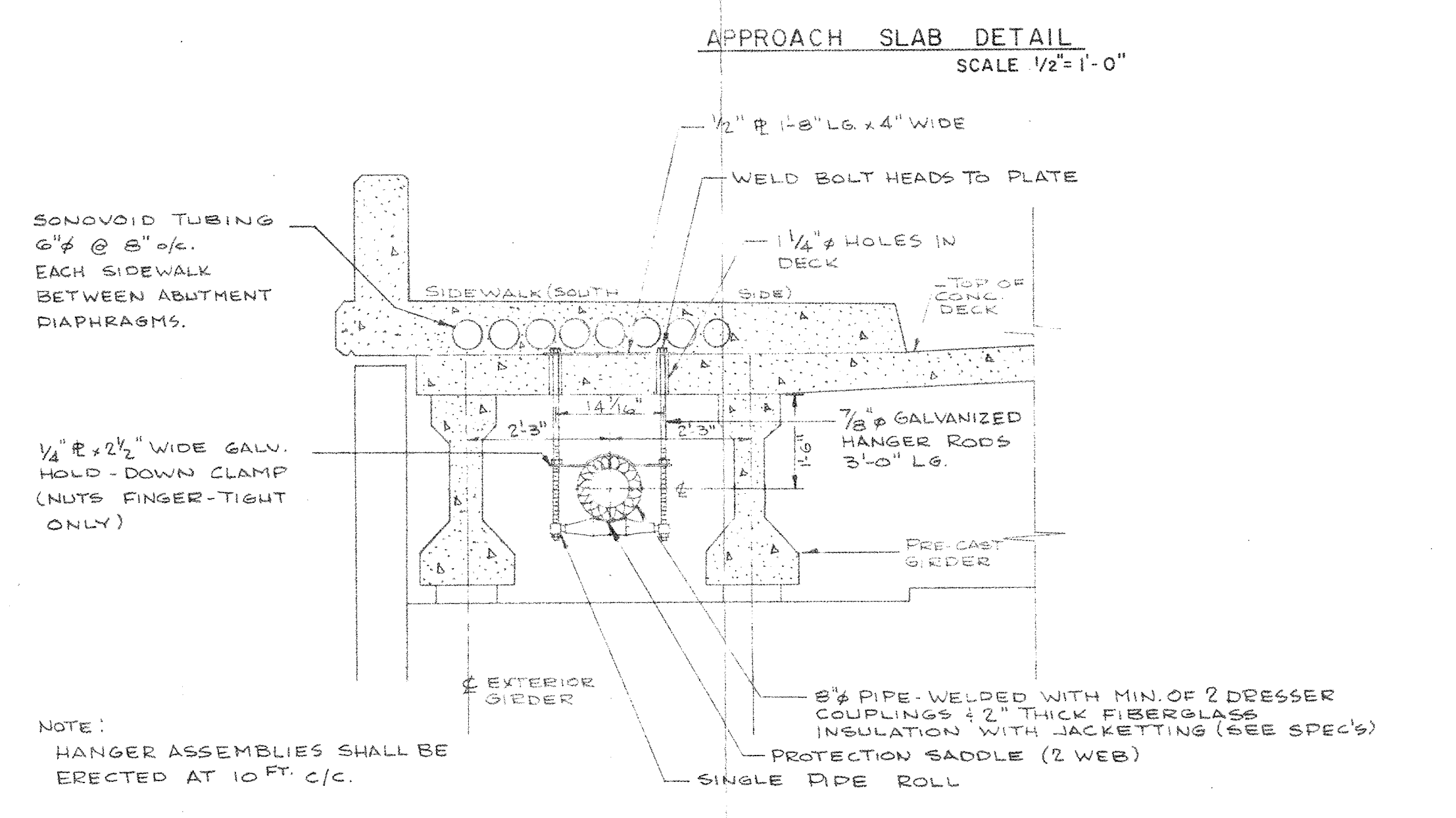
WATERMAIN DETAIL AT ABUTMENTS
N.T.S.



SHEAR BLOCK DETAIL
SCALE 3/4"=1'-0"



DETAIL A' N.T.S.



WATERMAIN HANGER DETAIL
N.T.S.

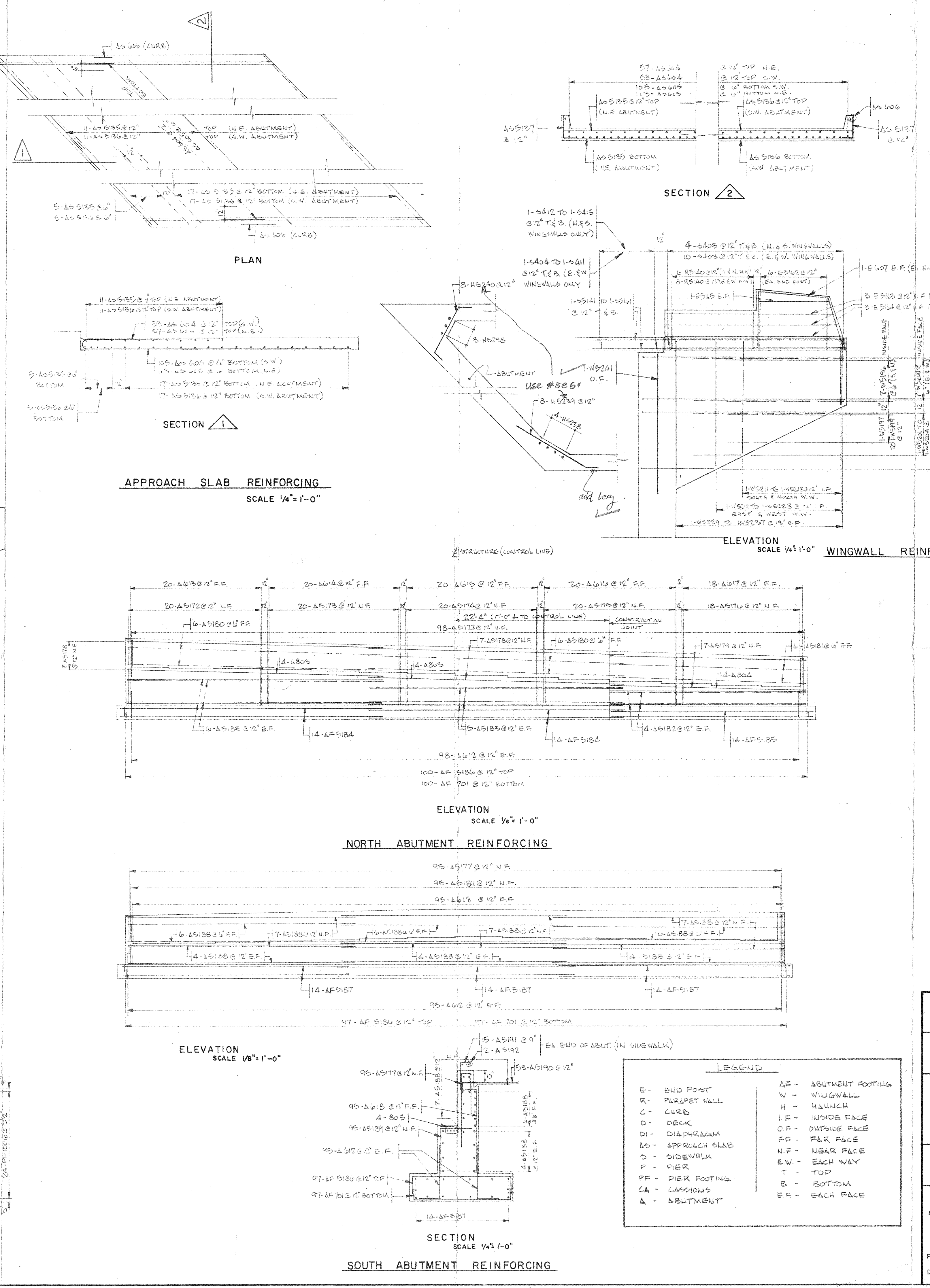
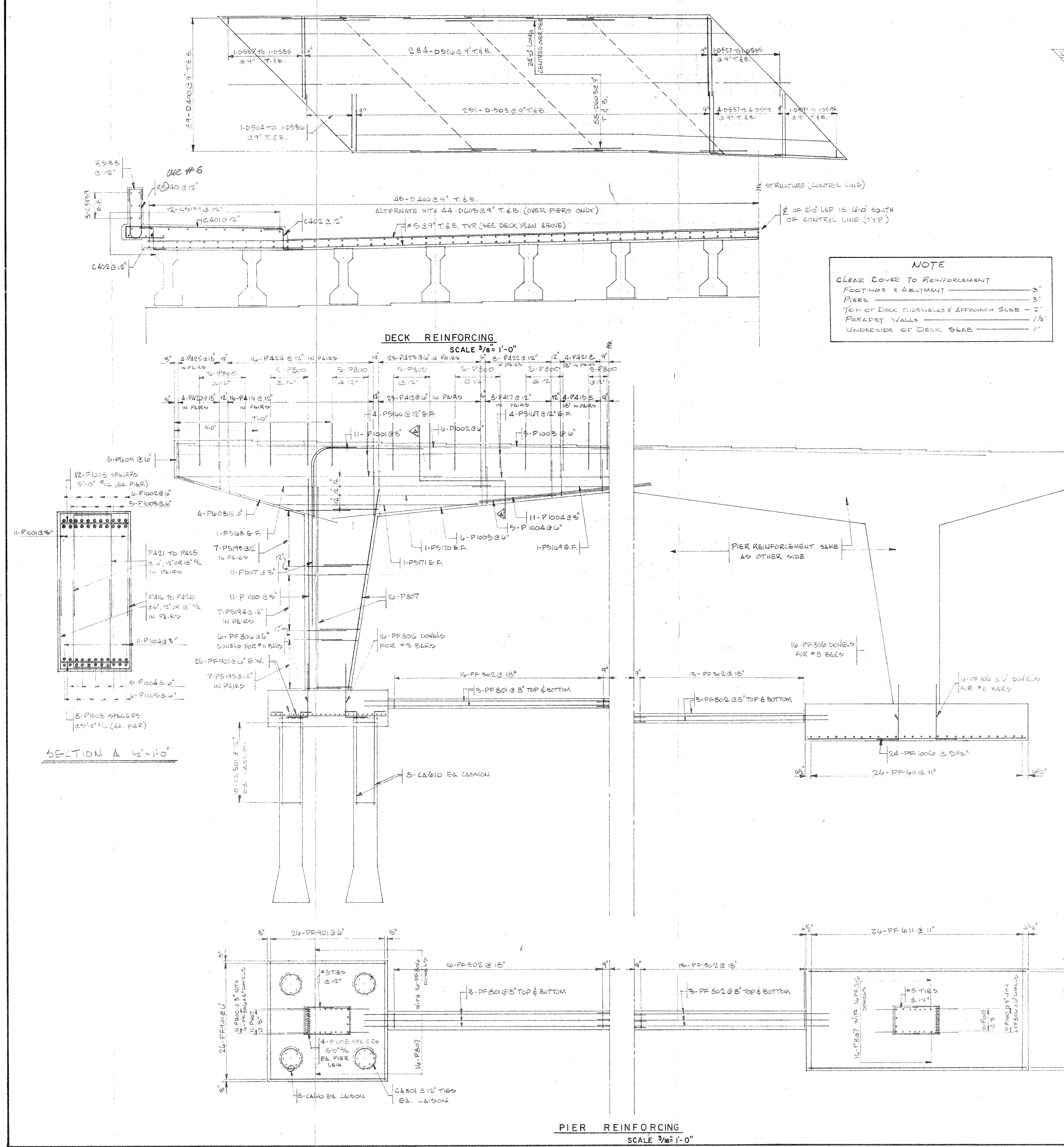
STRUCTURE SITE NO. 19-264

D.T.C. - TORONTO RECEIVED			
DEC 19 1973			
STRUCTURAL OFFICE			
NO	REVISIONS	DATE	BY

CITY OF LONDON
GRADE SEPARATION - C.N.R. - RIVERSIDE DR.

MISCELLANEOUS DETAILS

DESIGN BY J.R. SPRIET	FIELDBOOK B-12
DRAWN BY E.B. WADE	SCALE AS NOTED
CHECKED BY A.M. SPRIET	DATE NOVEMBER 1973
A.M. SPRIET & ASSOCIATES LTD. CONSULTING ENGINEERS LONDON ONTARIO PROJECT NO. 72038 DRAWING NO. 10	
APPROVED BY <i>Alan Spriet</i> SECTION HEAD <i>A.M. Spriet</i> CITY ENGINEER	
CITY ENGINEER'S DEPARTMENT PROJECT NO. 742 / R33/1 DRAWING NO.	



WINGWALL LOCATION PLAN
FOR REINFORCEMENT DETAILS

SECTION
SCALE 3/8" = 1'-0"

SECTION
SCALE 1/4" = 1'-0"

SECTION
SCALE 1/4" = 1'-0"

STRUCTURE SITE NO. 19-264

D.T.C. - TORONTO RECEIVED
DEC 19 1973
STRUCTURAL OFFICE

NO.	REVISIONS	DATE	BY

CITY OF LONDON
GRADE SEPARATION - C.N.R. & RIVERSIDE DR.
GENERAL REINFORCEMENT DETAILS

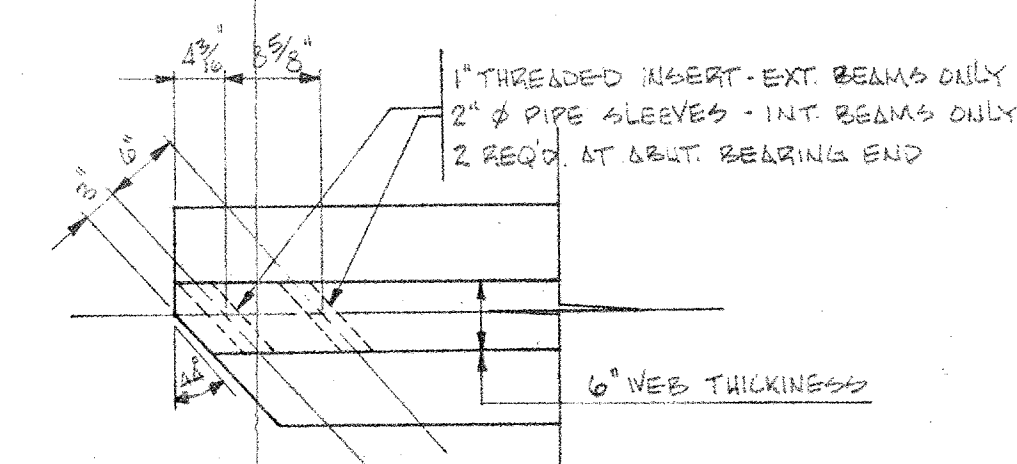
DESIGN BY J. R. SPRIET
DRAWN BY E. B. WADE
CHECKED BY A. M. SPRIET

FIELDBOOK 8-12
SCALE AS NOTED
DATE NOVEMBER 1973

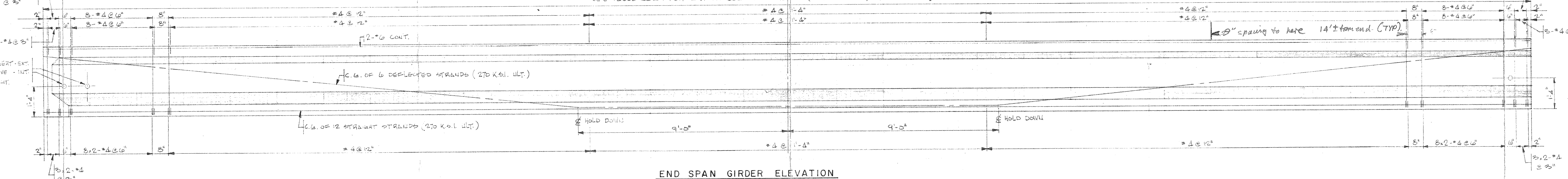
A. M. SPRIET & ASSOCIATES LTD.
CONSULTING ENGINEERS
LONDON ONTARIO
PROJECT NO. 72038
DRAWING NO. 11

APPROVED BY
Al. B. [Signature]
SECTION HEAD
CITY ENGINEER

CITY ENGINEER'S DEPARTMENT
PROJECT NO. 742/R33/1
DRAWING NO.

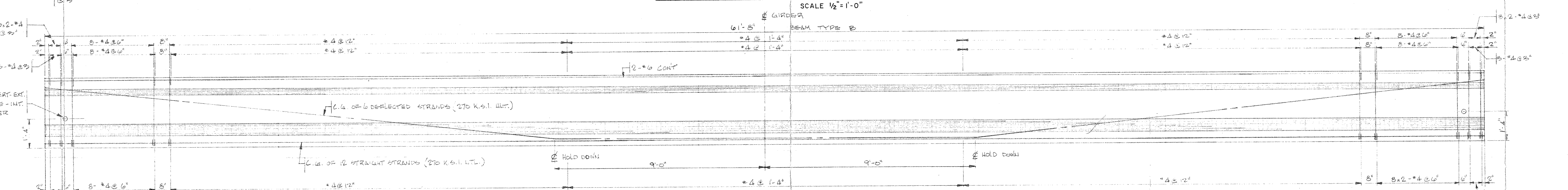


PLAN



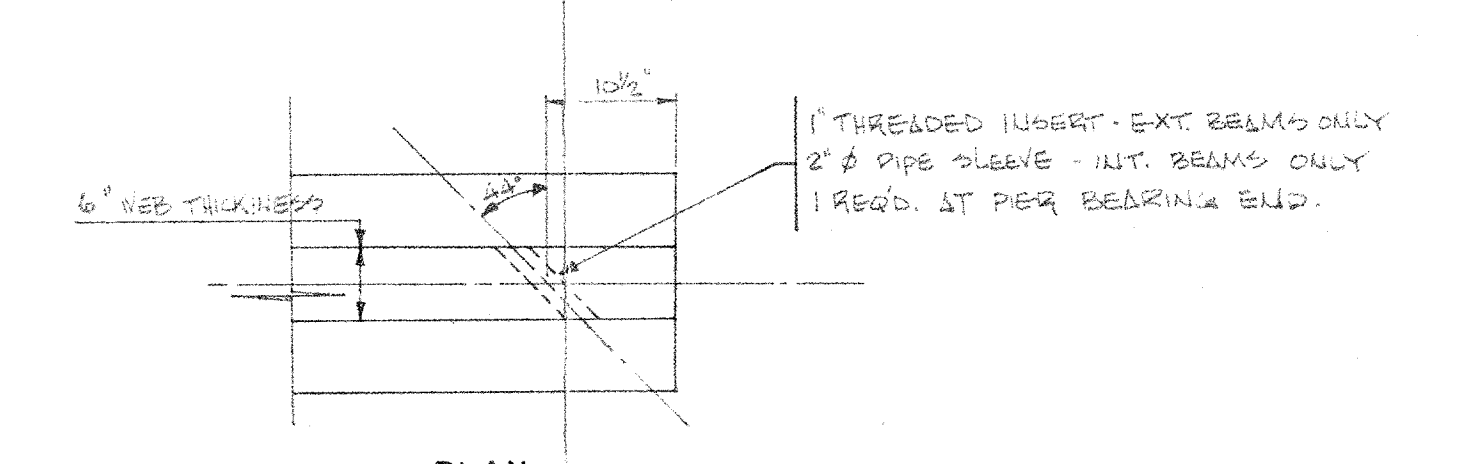
END SPAN GIRDER ELEVATION

SCALE 1/2"=1'-0"

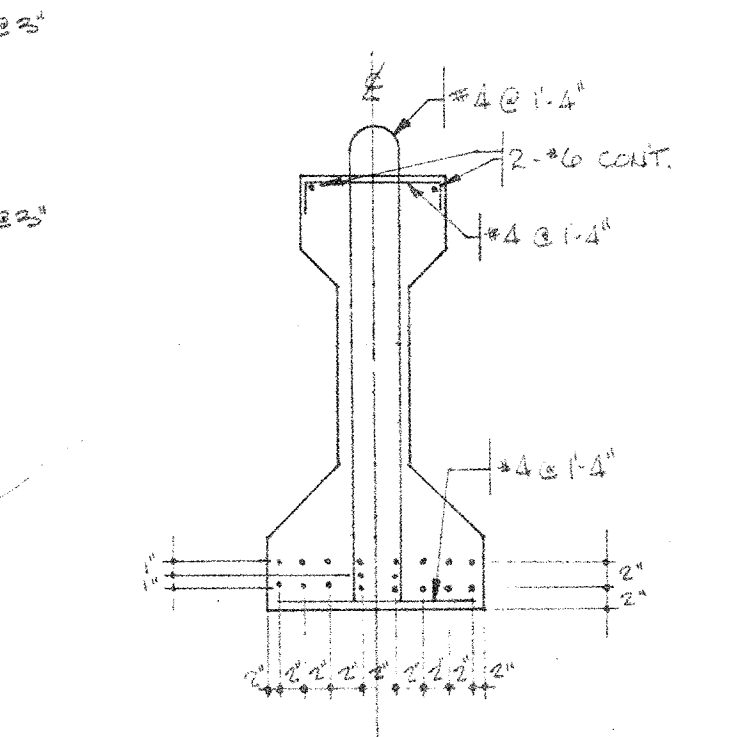


CENTRE SPAN GIRDER ELEVATION

SCALE 1/2"=1'-0"

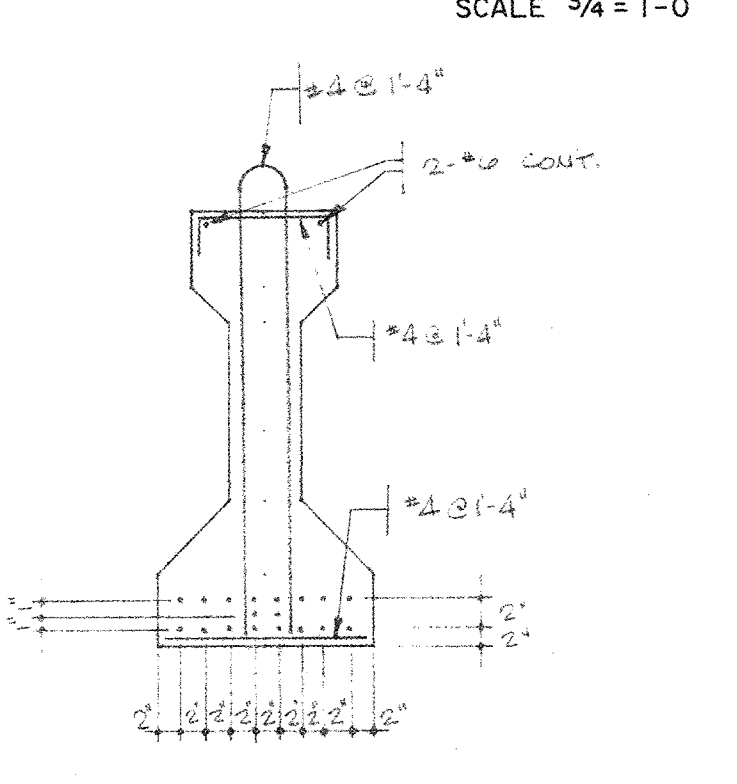


PLAN



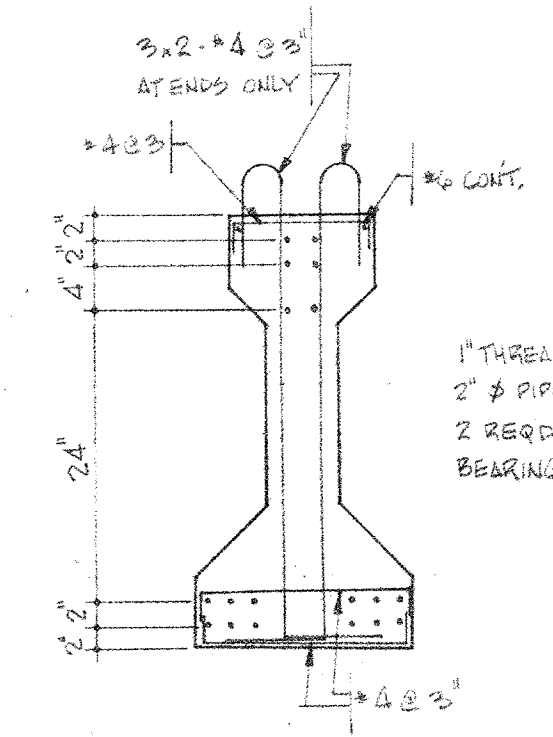
SECTION AT CENTRE

Lading Force = 25.75k
Assumed Rind Force = 25.65k
1/2" strands.
INFORMATION OBTAINED
BY PHONE.



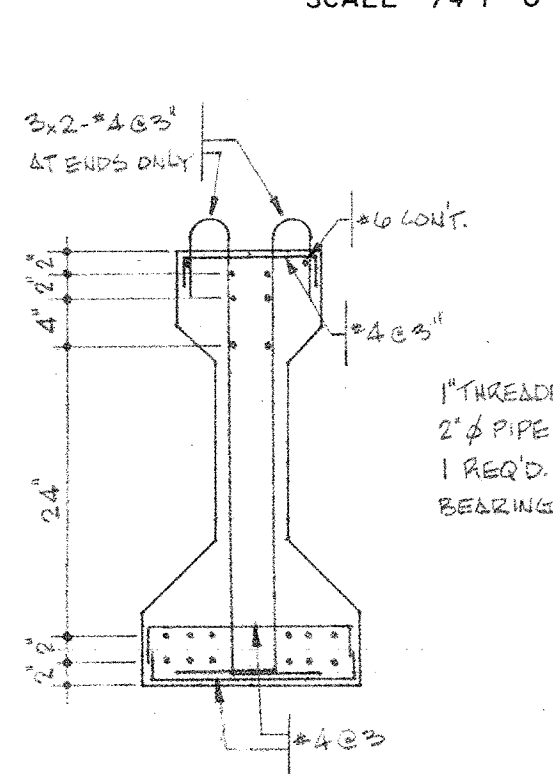
SECTION AT CENTRE

SCALE 3/4"=1'-0"



SECTION AT END

SCALE 3/4"=1'-0"



SECTION AT END

SCALE 3/4"=1'-0"

MARK	TYPE	LENGTH	No REQ'D.	WEIGHT LBS EA.
A	II	53'-8 1/2"	21	24,477
B	II	61'-8"	28	29,678
C	III	15'-9 3/4"	3	24,504
D	III	13'-8 3/4"	3	24,457
E	II	55'-7 3/4"	1	24,440

STRUCTURE SITE No. 19-264

D.T.C. - TORONTO RECEIVED
DEC 19 1973
STRUCTURAL OFFICE

NO	REVISIONS	DATE	BY

CITY OF LONDON
GRADE SEPARATION - C.N.R. - RIVERSIDE DR.

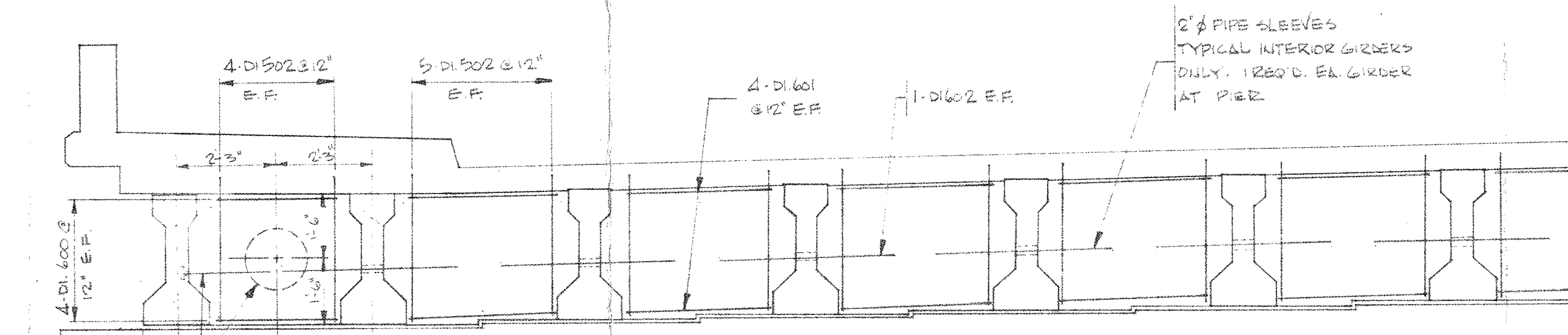
DIAPHRAGM AND GIRDER REINFORCEMENT

DESIGN BY: J. R. SPRIET
DRAWN BY: E. B. WADE
CHECKED BY: A. M. SPRIET

FIELDBOOK: B-12
SCALE: AS NOTED
DATE: NOVEMBER 1973

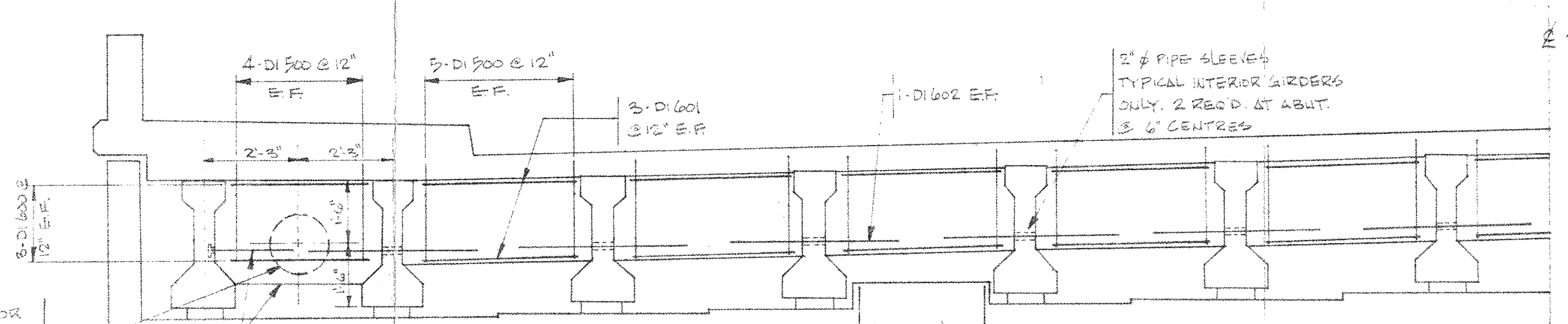
APPROVED BY: *Alan B... SECTION HEAD*
A.M. SPRIET & ASSOCIATES LTD. CONSULTING ENGINEERS LONDON ONTARIO
PROJECT NO. 72038
DRAWING NO. 12

CITY ENGINEER'S DEPARTMENT
PROJECT NO. 742/833/1
DRAWING NO. _____



DIAPHRAGM REINF. AT PIER

SCALE 3/8"=1'-0"



DIAPHRAGM REINF. AT ABUT.

SCALE 3/8"=1'-0"

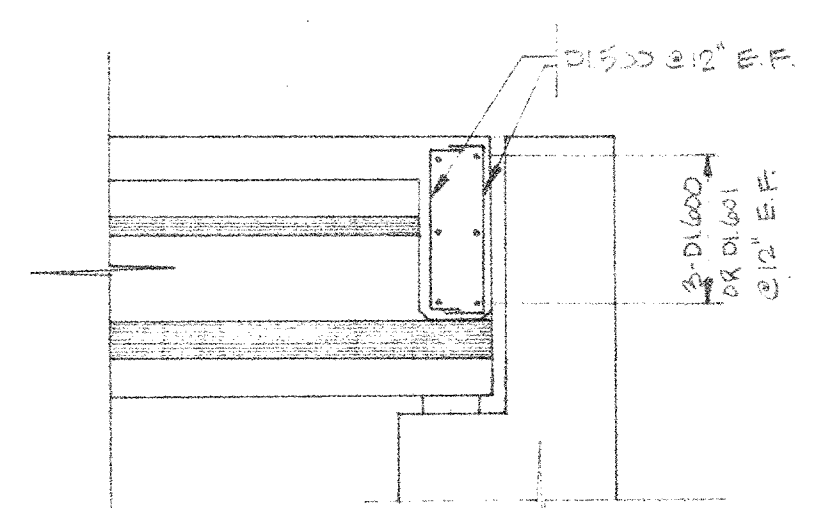
PROVIDE 18" HOLE FOR WATERMAN INSTALLATION LONGITUDINAL AXIS TO BE PARALLEL TO GIRDER

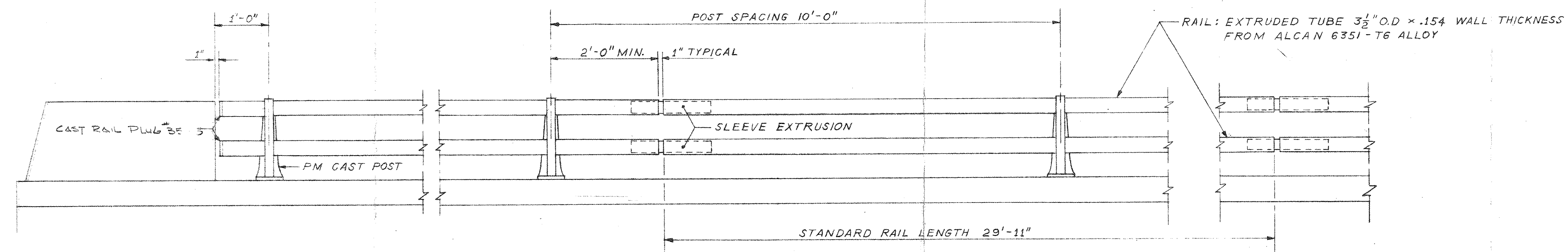
PROVIDE 8" HOLE FOR WATERMAN INSTALLATION LONGITUDINAL AXIS TO BE PARALLEL TO GIRDER

TO PROVIDE OF WATERMAN INSTALLATION LOWER 1/2 OF DIAPHRAGM IN THIS BAY ONLY 6" BY 6" MIN

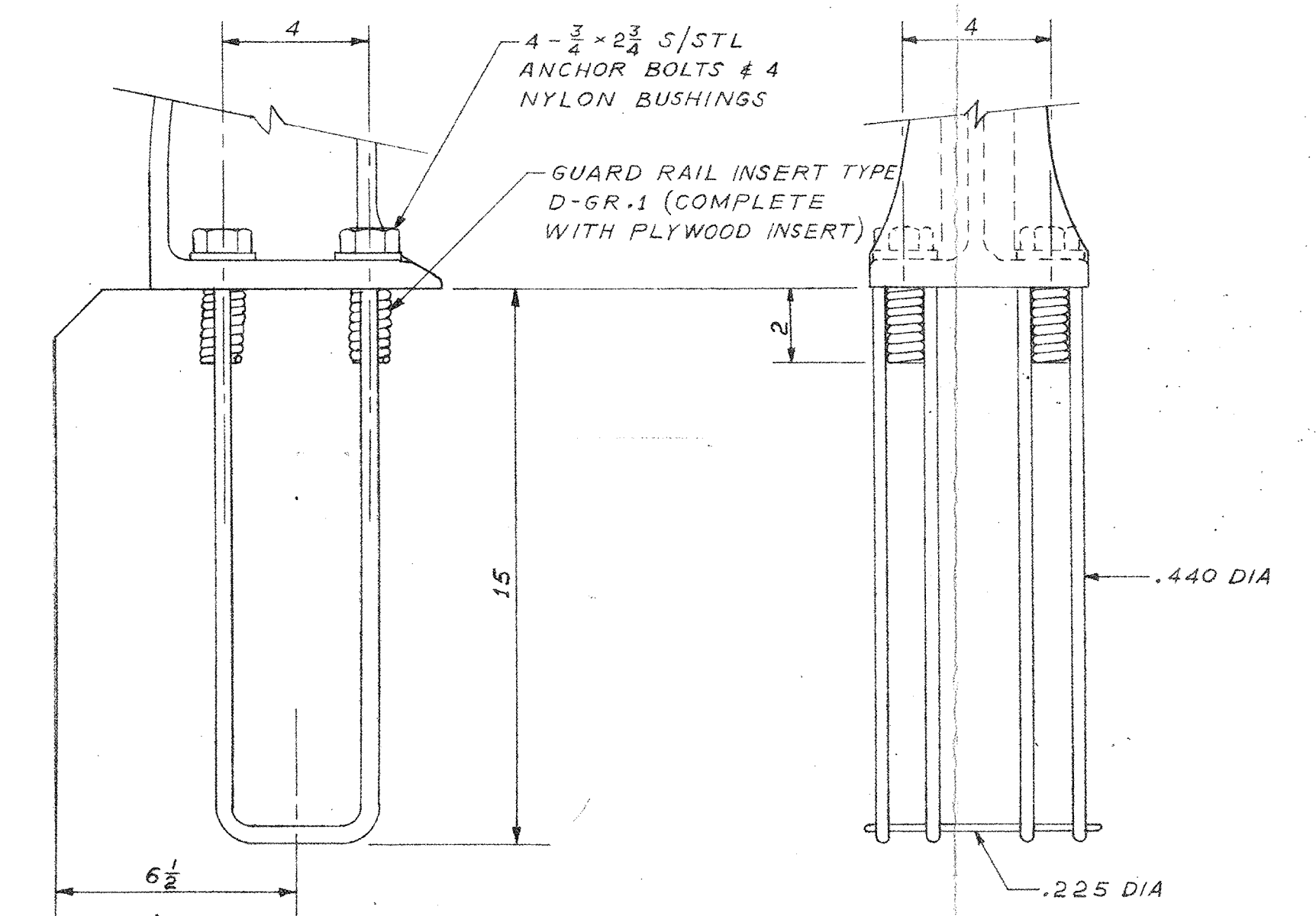
2" PIPE SLEEVES TYPICAL INTERIOR GIRDERS ONLY. 2 REQ'D. AT ABUT. 3 @ CENTRES

1 1/2 x 2' 0" ANCHOR BOLTS IN 1" THREADED INSERT TYPICAL FOR EXTERIOR GIRDERS ONLY 2 REQ'D. AT ABUT. 2 @ CENTRES

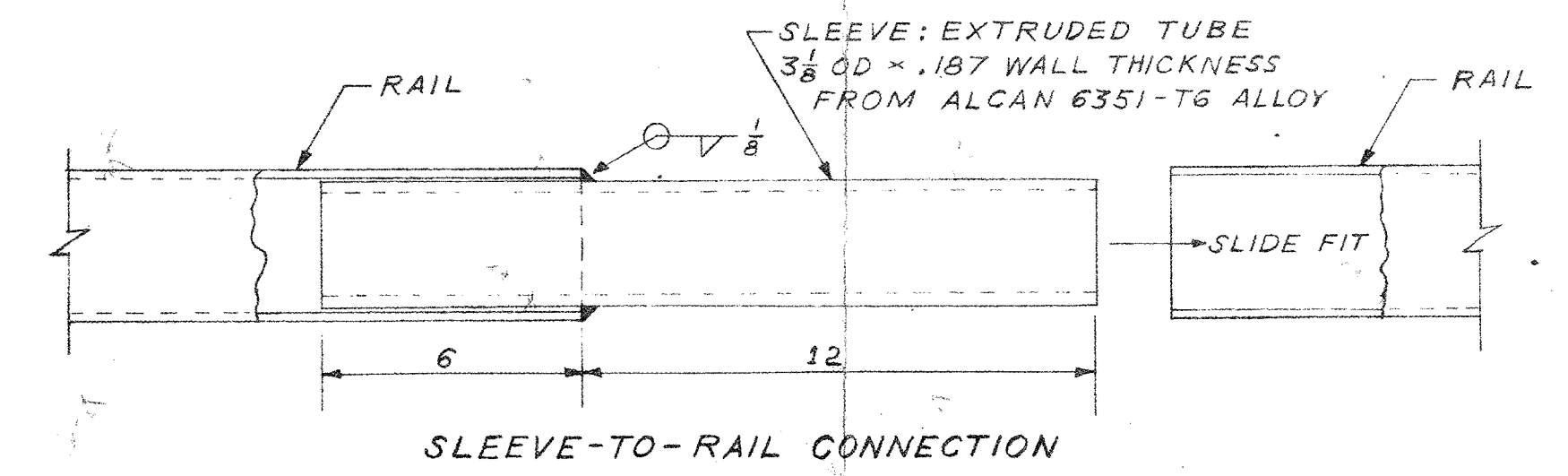




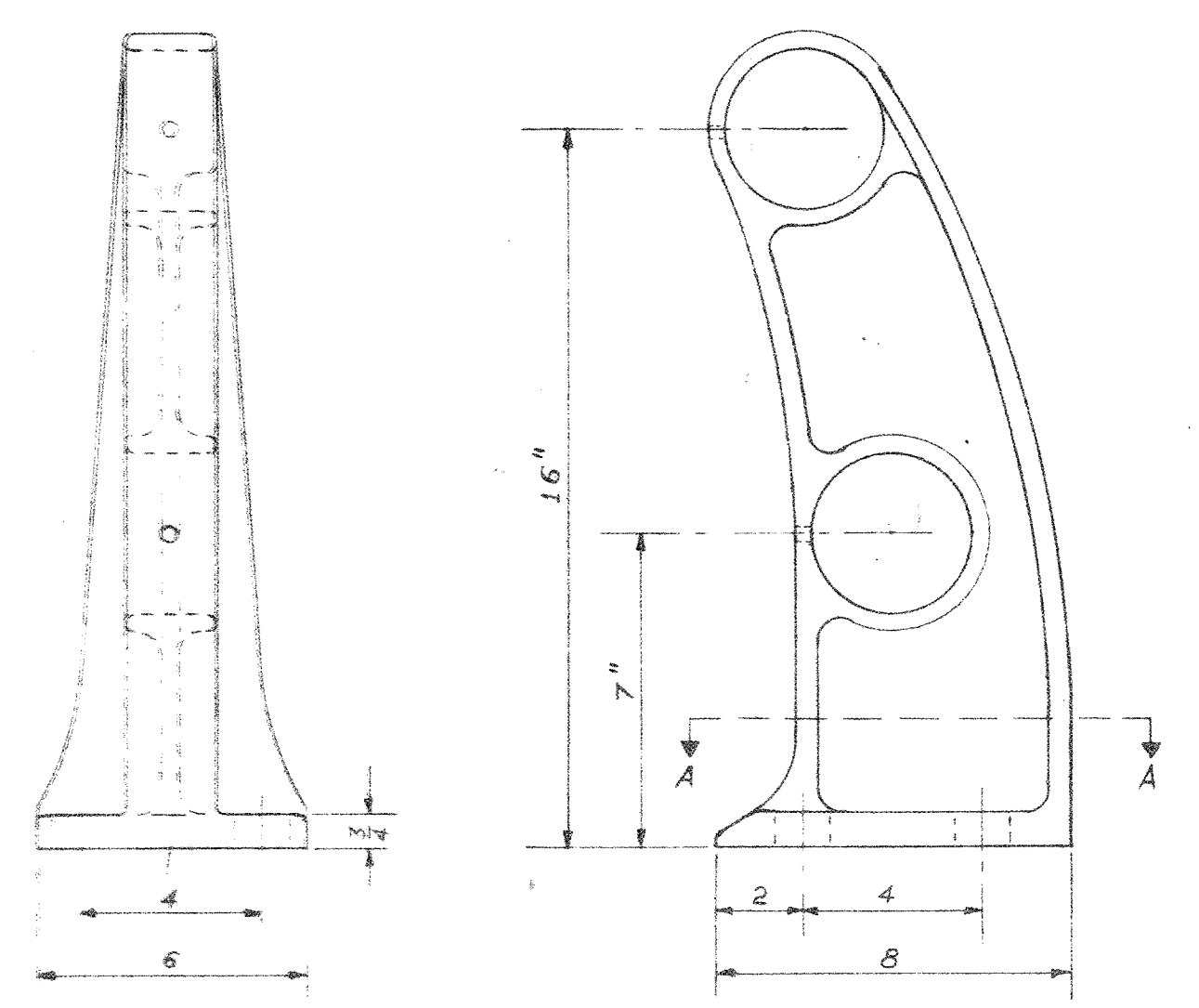
TWO-RAILER (TYPE G-216) POST SYSTEM - ELEVATION
 MANUFACTURED BY GRENVILLE CASTINGS LIMITED - MERRICKVILLE, ONTARIO



ANCHORAGE DETAIL

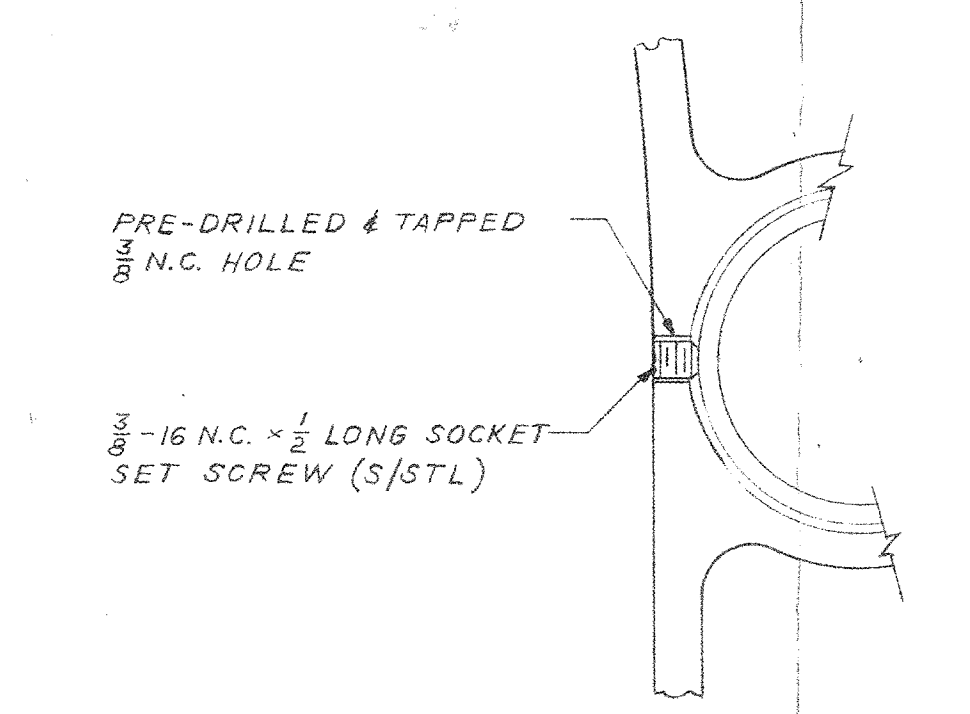


SLEEVE-TO-RAIL CONNECTION

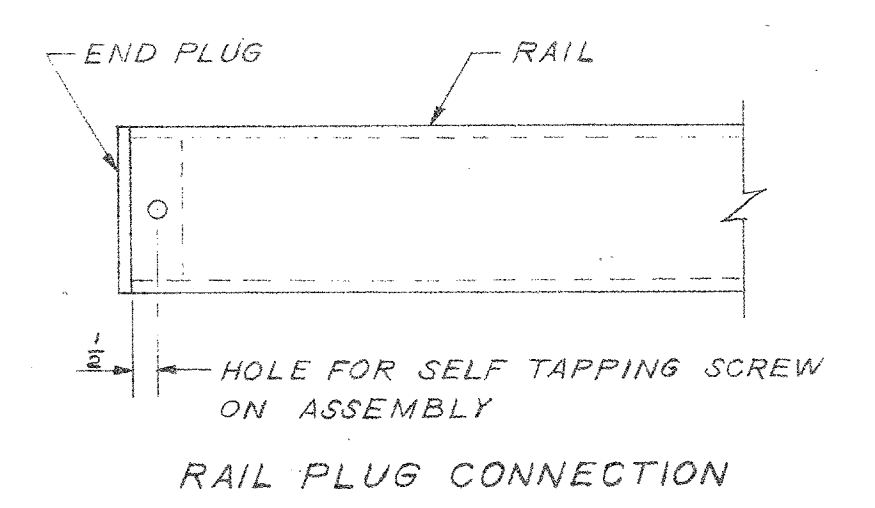
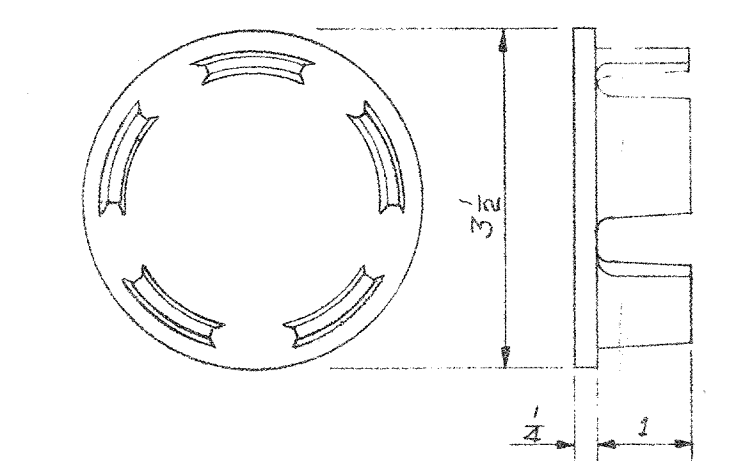


POST IS PERMANENT-MOULD CAST FROM AA-A344-T4 ALUMINUM ALLOY (ALCAN INGOT ALLOY 44026)

TWO-RAILER (TYPE G-216) POST - DETAILS



RAIL-TO-POST CONNECTION



QUANTITY	DESCRIPTION	PART NO.
	POSTS	G-216
	RAIL PLUGS	35,188
	ANCHORAGE INSERTS	ACROW-RICHMOND
	RAIL WITH SPLICE	40'-0" LENGTHS
	RAIL WITHOUT SPLICE	() LENGTHS

- GENERAL NOTES:
- THE UNDERSIDE OF THE POST BASES SHALL BE PAINTED WITH CA 50 BITUMINOUS PAINT. THE MINIMUM THICKNESS SHALL BE 20 MILS. - PAINTING BY INSTALLER.
 - GUARD RAIL ANCHORAGE SHALL BE ACROW-RICHMOND TYPE D-GR-1 AS SHOWN OR EQUAL. INSERTS SHALL BE CADMIUM PLATED TO 0.0002 IN.
 - RAIL POSTS SHALL BE SET PERPENDICULAR TO PROFILE GRADE.
 - ALL POSTS TO BE SET VERTICAL.
 - RAILS TO BE PARALLEL TO TOP OF CONCRETE.

D.T.C. - TORONTO RECEIVED
 DEC 19 1973
 STRUCTURAL OFFICE

STRUCTURE SITE No. 19-264

NO.	REVISIONS	DATE	BY

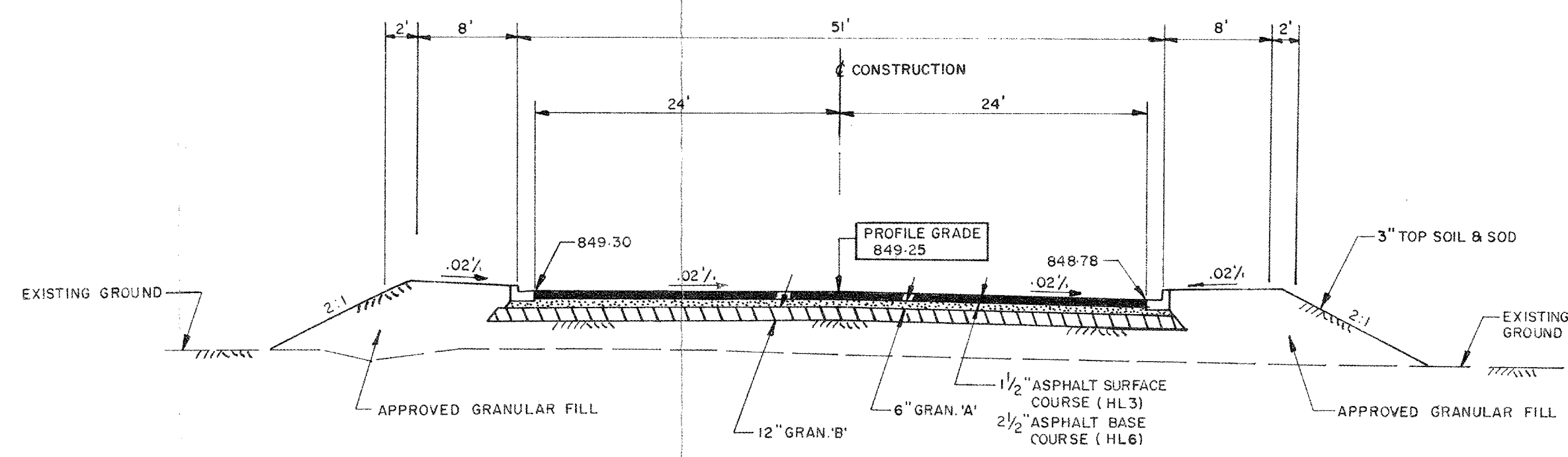
CITY OF LONDON
 GRADE SEPARATION:-C.N.R. - RIVERSIDE DR.
 STD. ALUMINUM & STEEL
 PARAPET RAIL

DESIGN BY: J.R. SPRIET	FIELD BOOK: B-12
DRAWN BY: E.B. WADE	SCALE: AS NOTED
CHECKED BY: A.M. SPRIET	DATE: NOVEMBER 1973

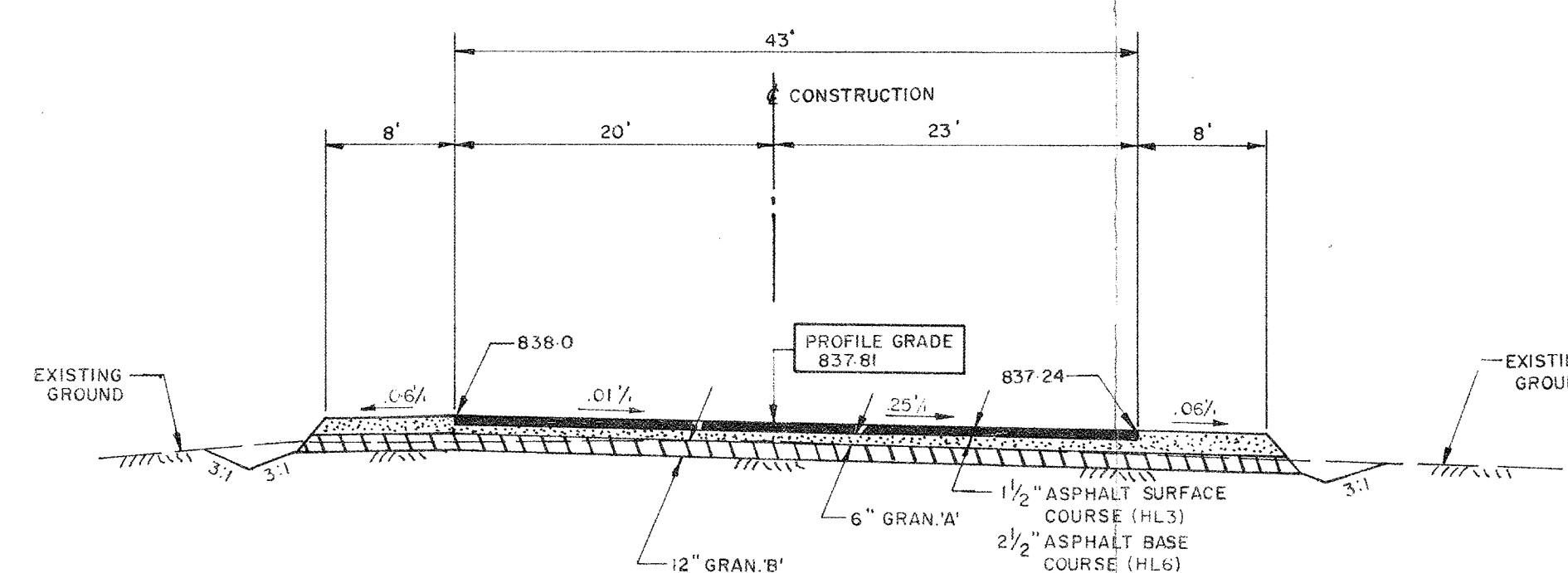
APPROVED BY: *A.M. Spriet*

A.M. SPRIET & ASSOCIATES LTD.
 CONSULTING ENGINEERS
 LONDON - ONTARIO

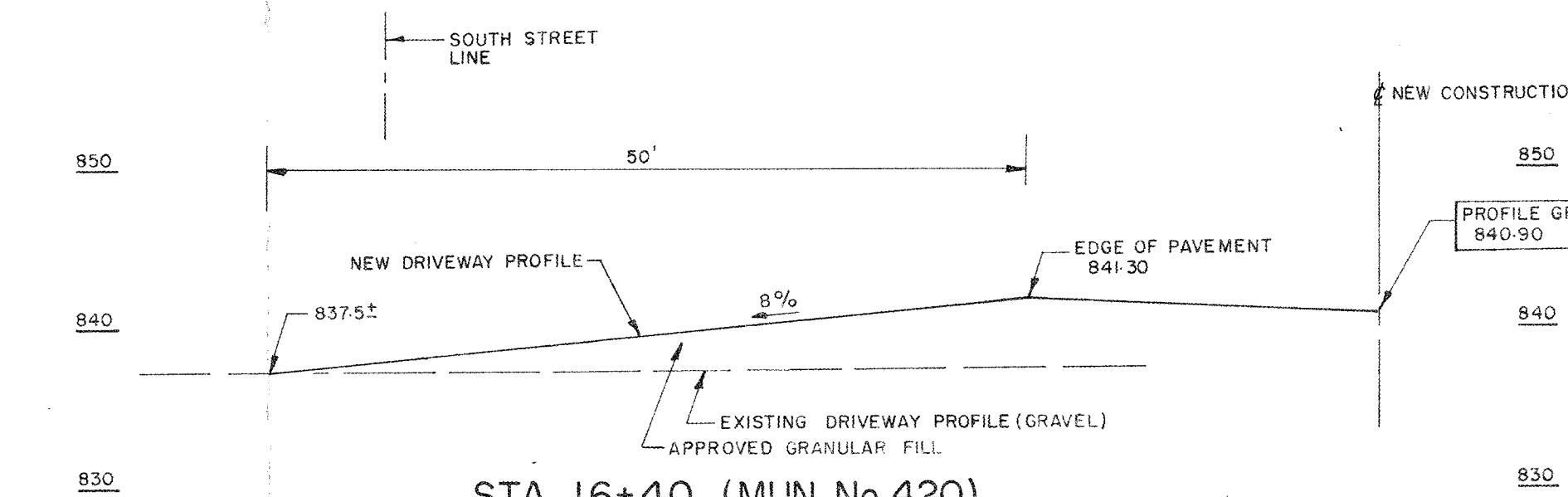
CITY-ENGINEER'S DEPARTMENT
 PROJECT NO. 742/R33/1
 DRAWING NO. 13



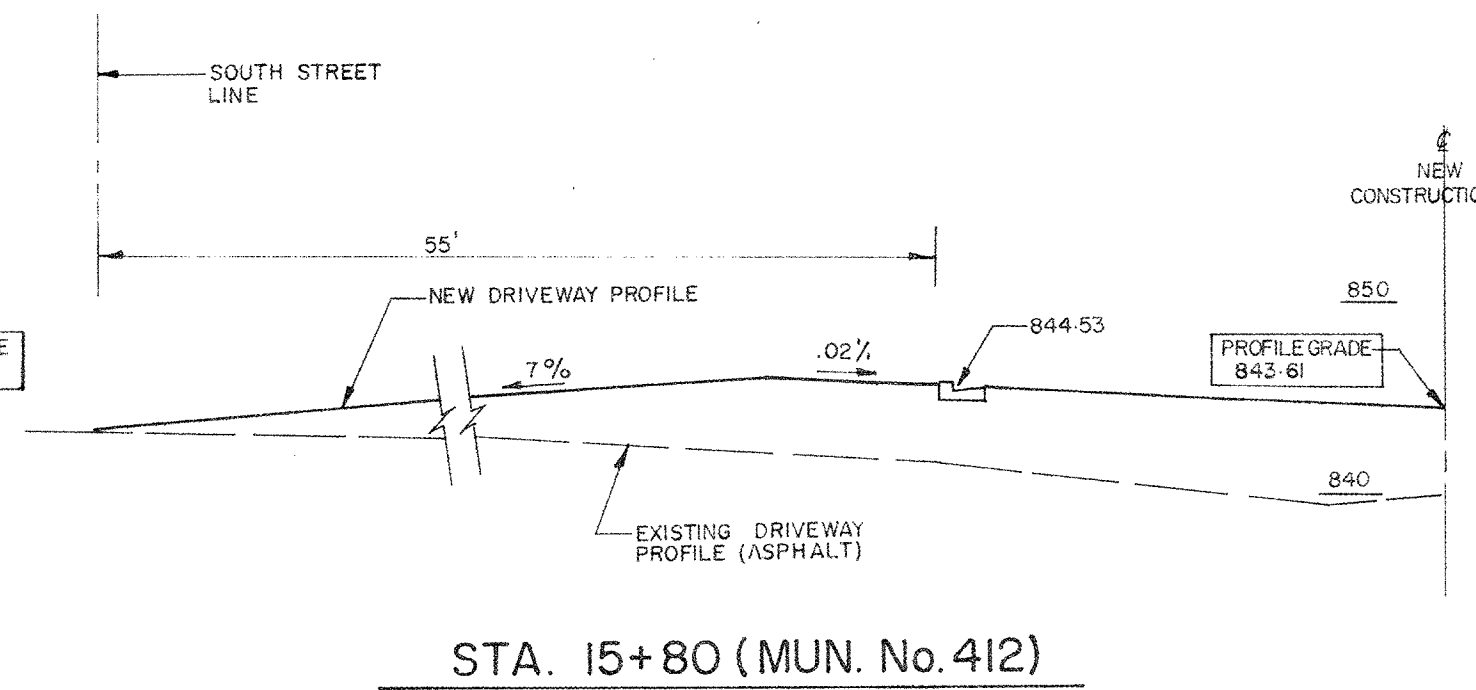
CROSS-SECTION STA. 13+00



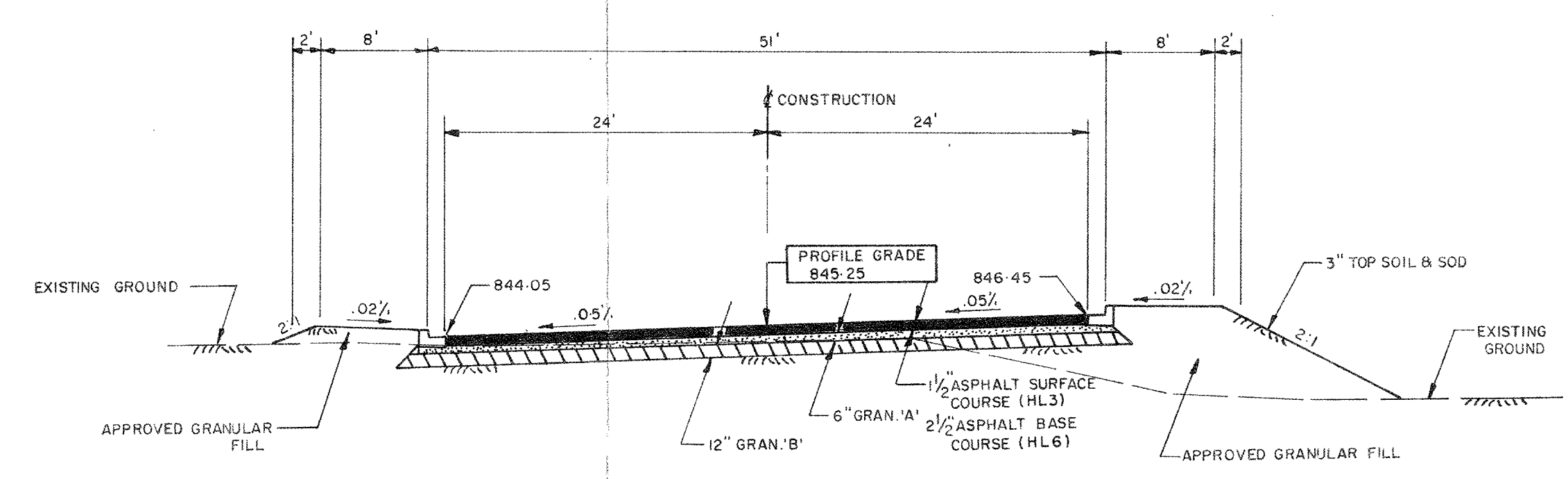
CROSS-SECTION STA. 17+00



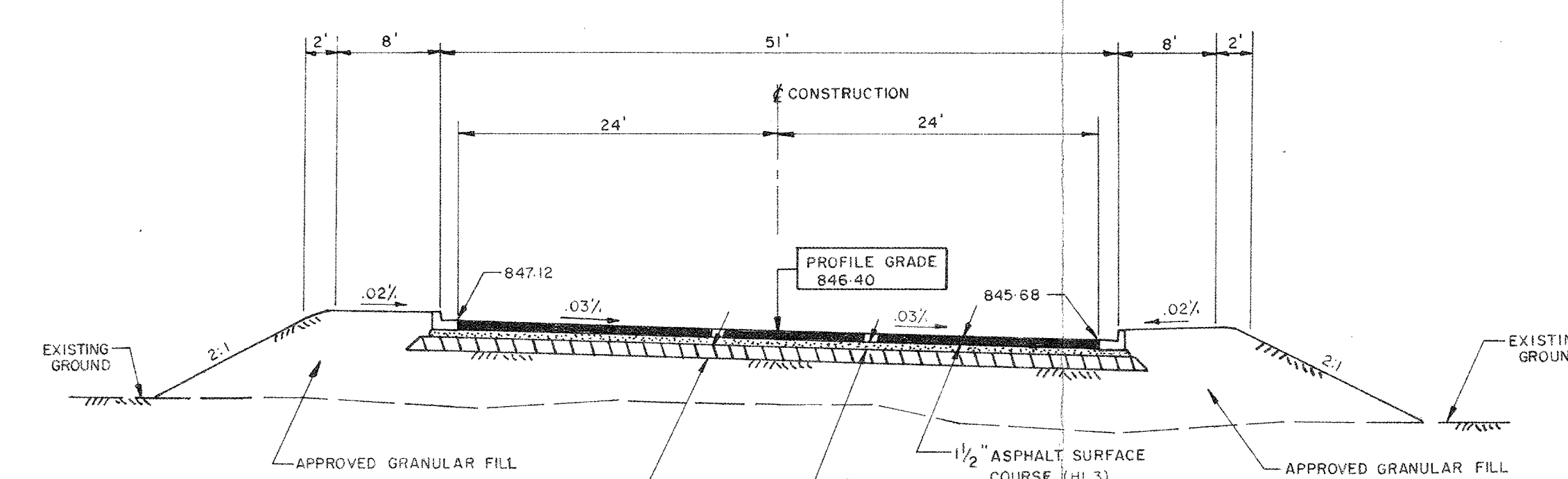
STA. 16+40 (MUN. No. 420)



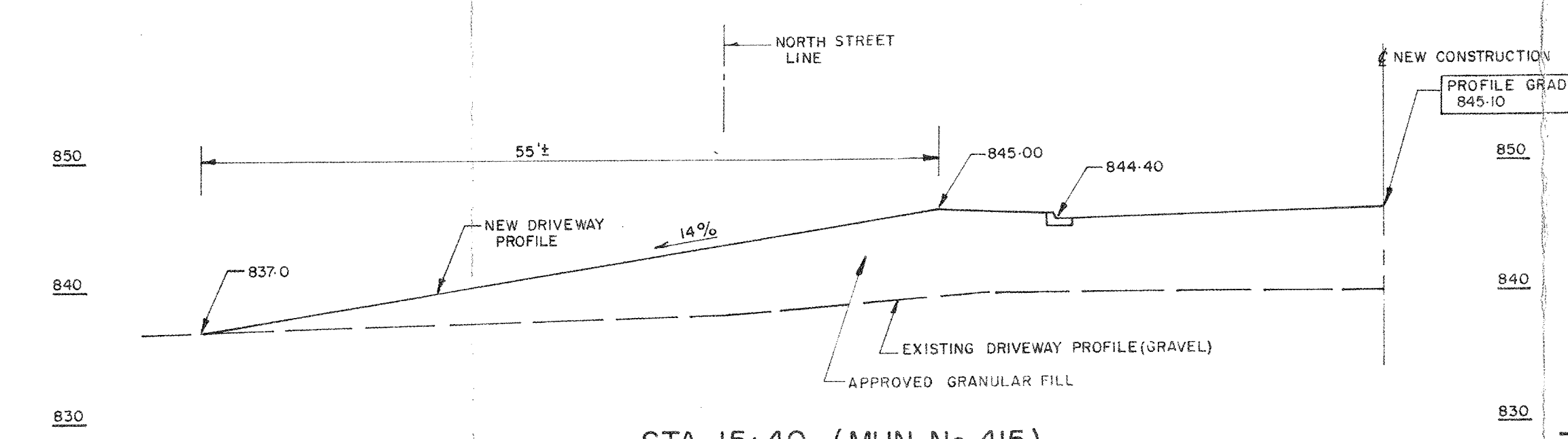
STA. 15+80 (MUN. No. 412)



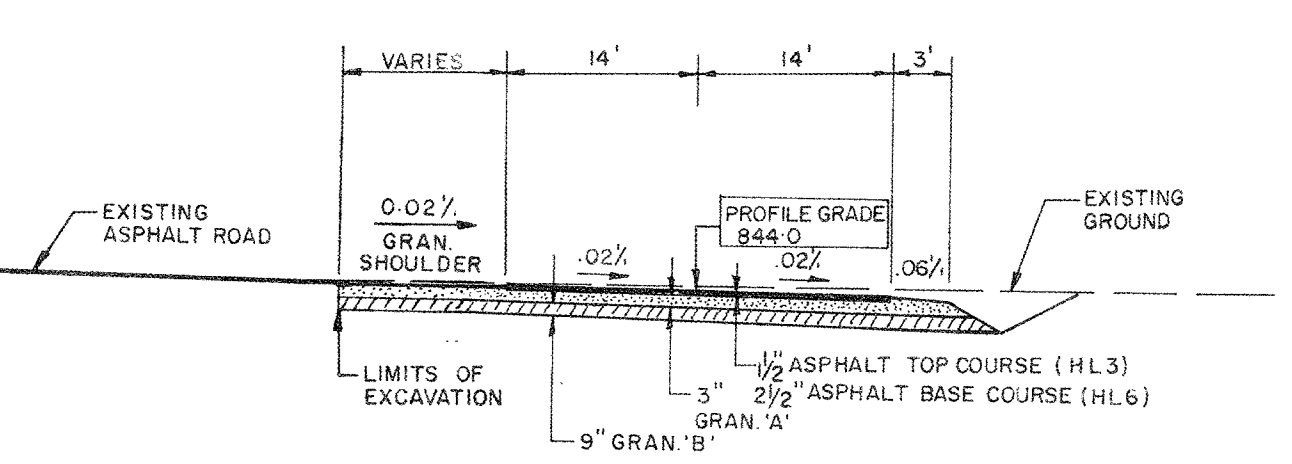
CROSS-SECTION STA. 9+00



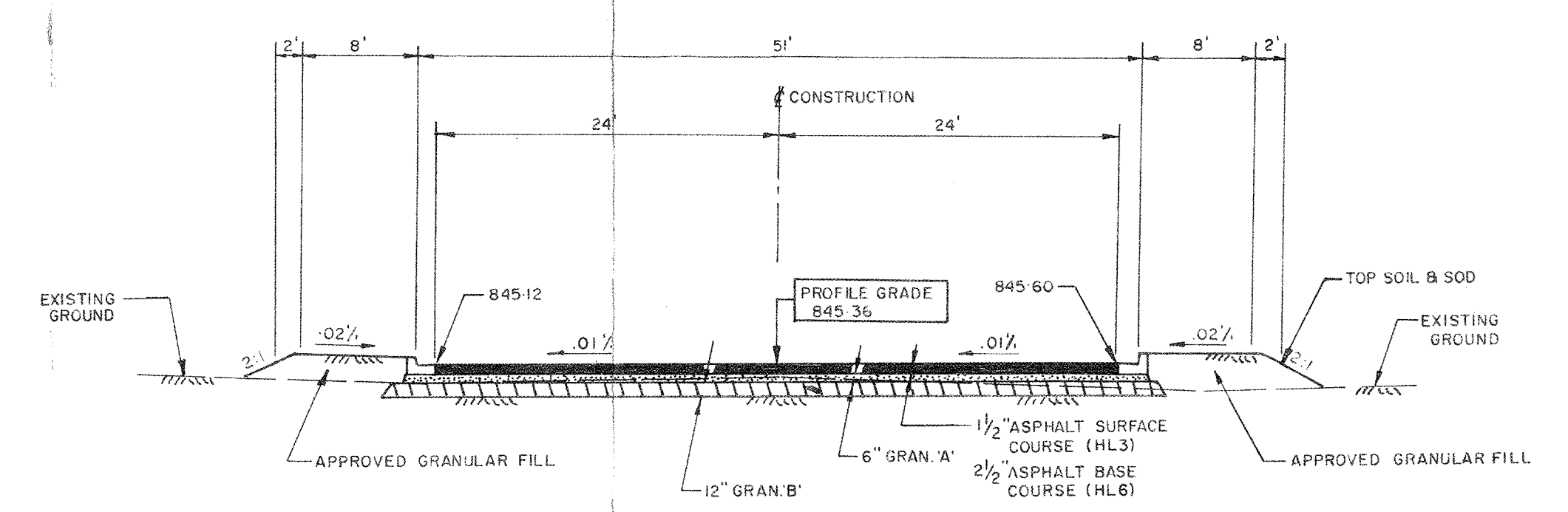
CROSS-SECTION STA. 15+00



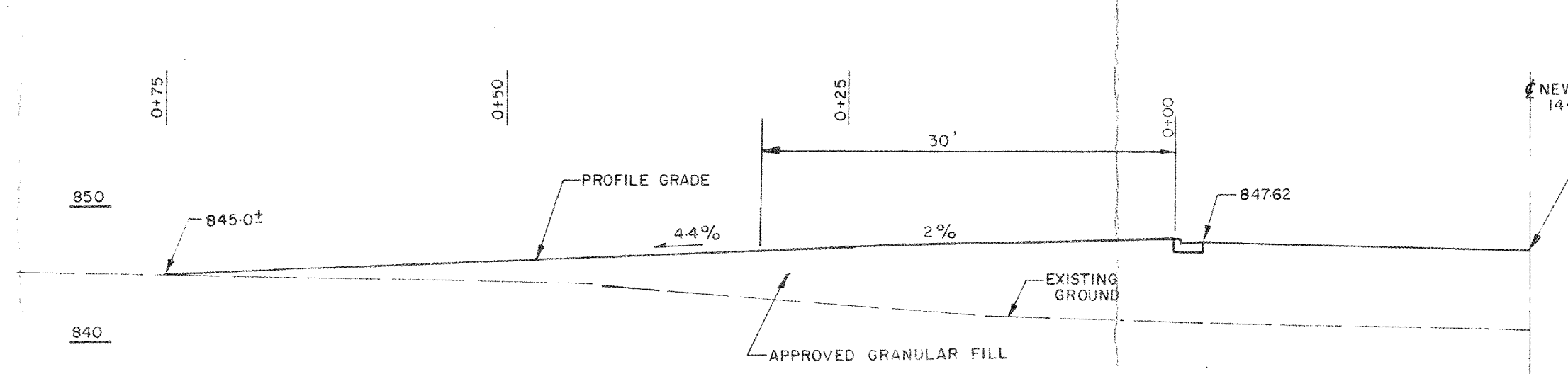
STA. 15+40 (MUN. No. 415)



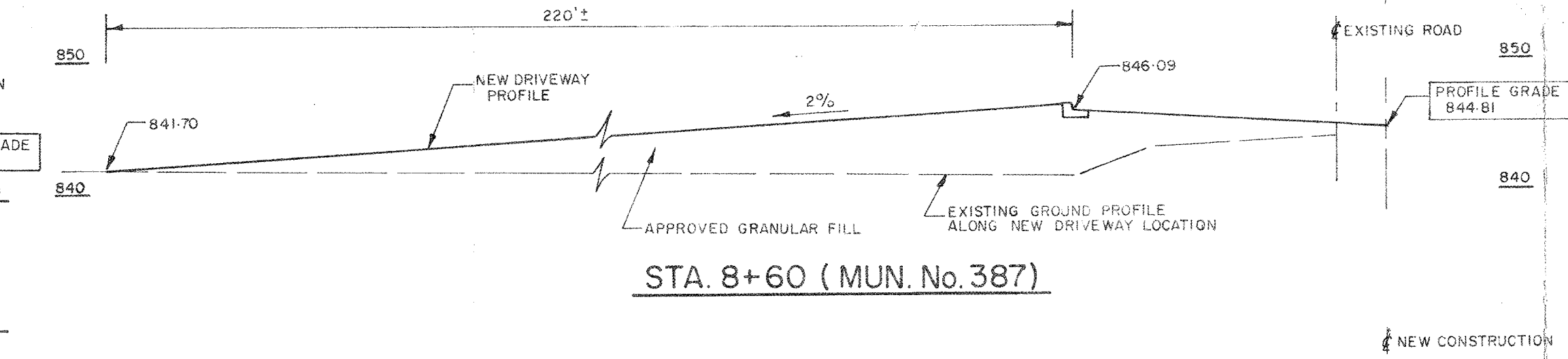
TYPICAL CROSS-SECTION OF TURNING CIRCLE 100'± SOUTH OF STA. 12+00



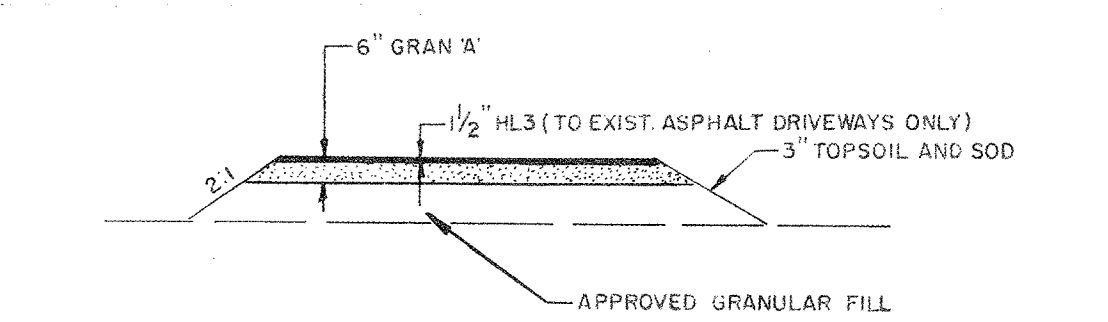
CROSS-SECTION STA. 6+00



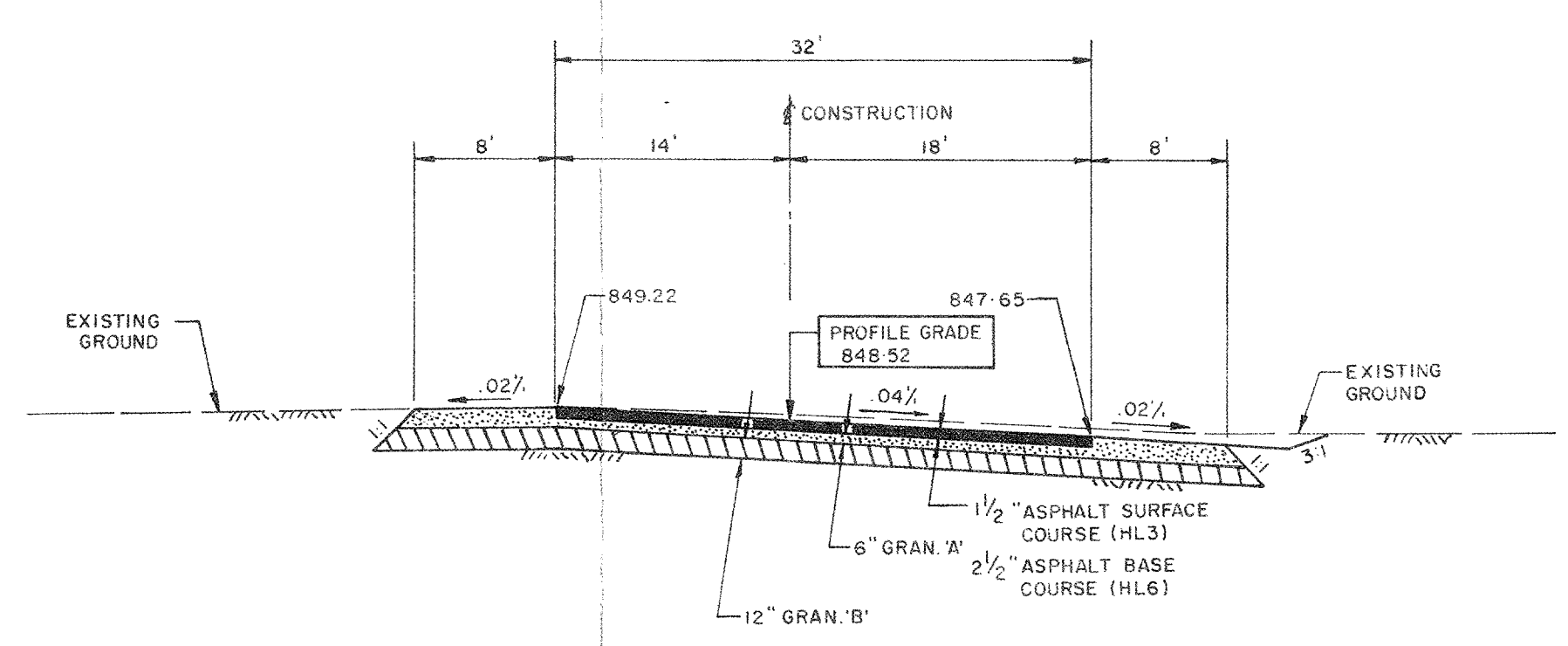
ENTRANCE PROFILE



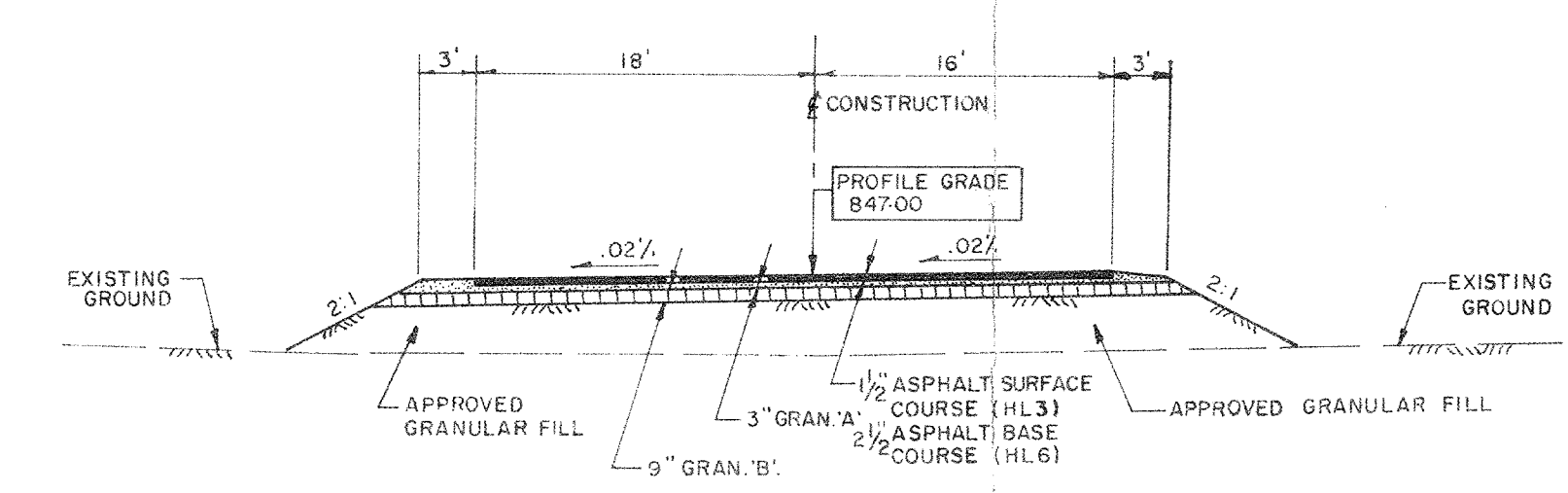
STA. 8+60 (MUN. No. 387)



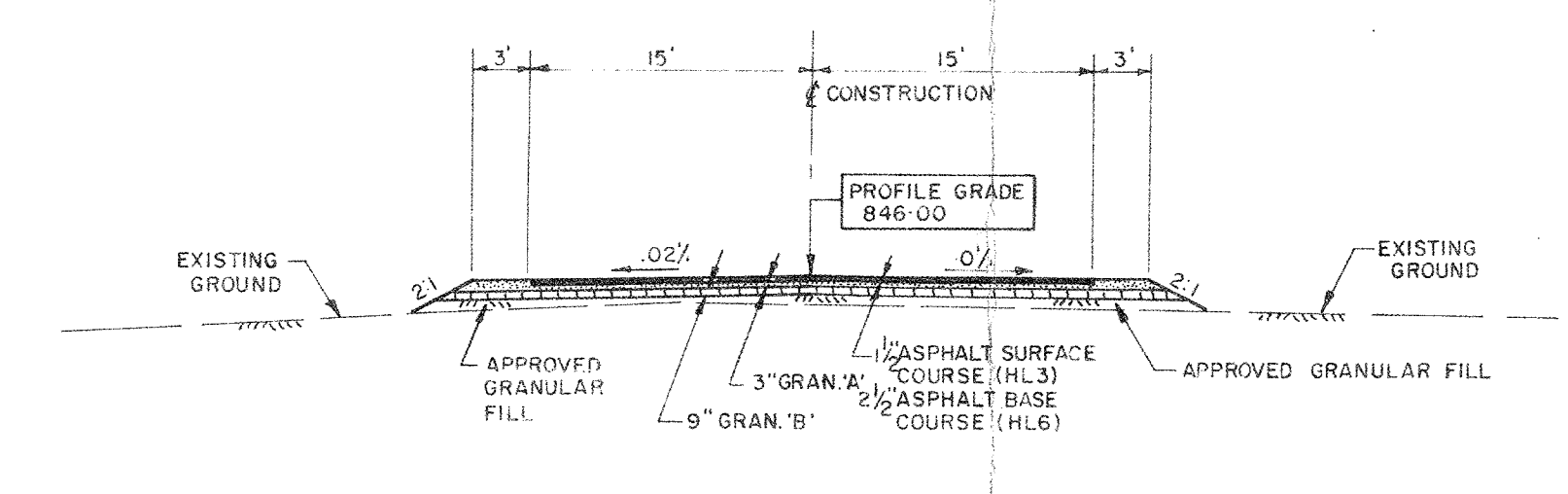
TYPICAL DRIVEWAY CROSS-SECTION



CROSS-SECTION STA. 4+00
ROADWAY CROSS-SECTIONS

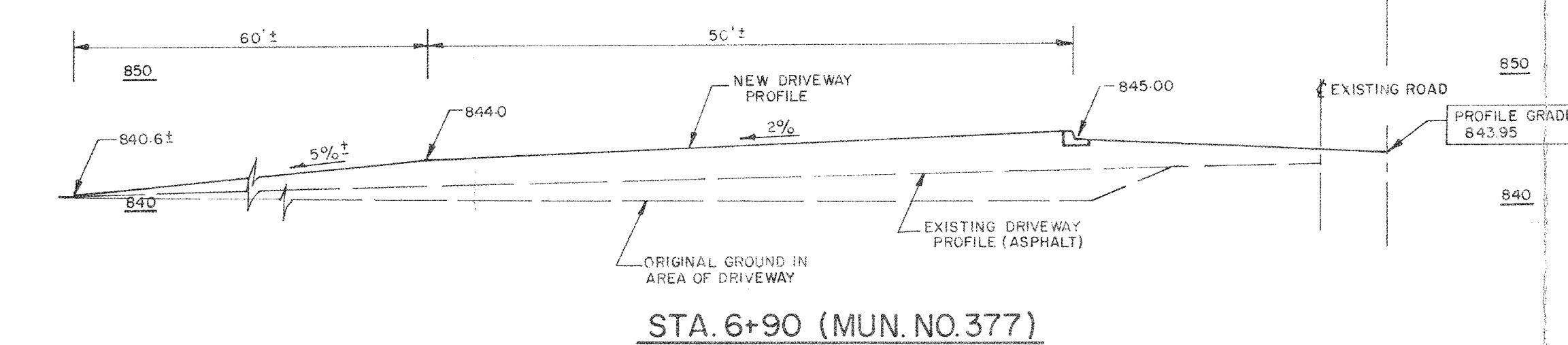


CROSS-SECTION STA. 0+30

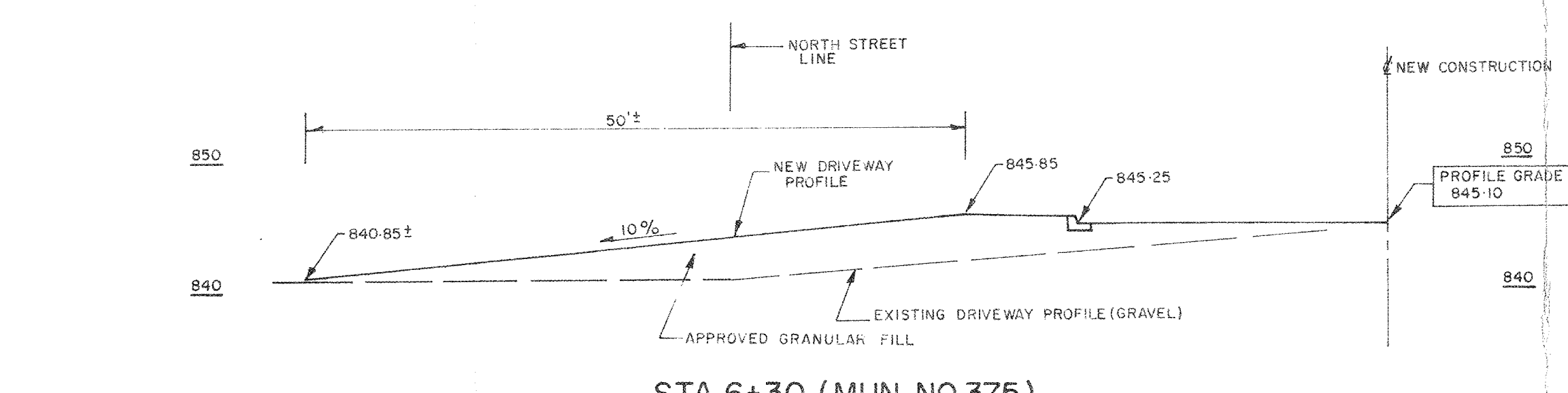


CROSS-SECTION STA. 0+50

ENTRANCE DETAILS AT STA. 14+80 LEFT



STA. 6+90 (MUN. No. 377)



STA. 6+30 (MUN. No. 375)

DRIVEWAY ENTRANCE PROFILES

STRUCTURE SITE NO. 19-264

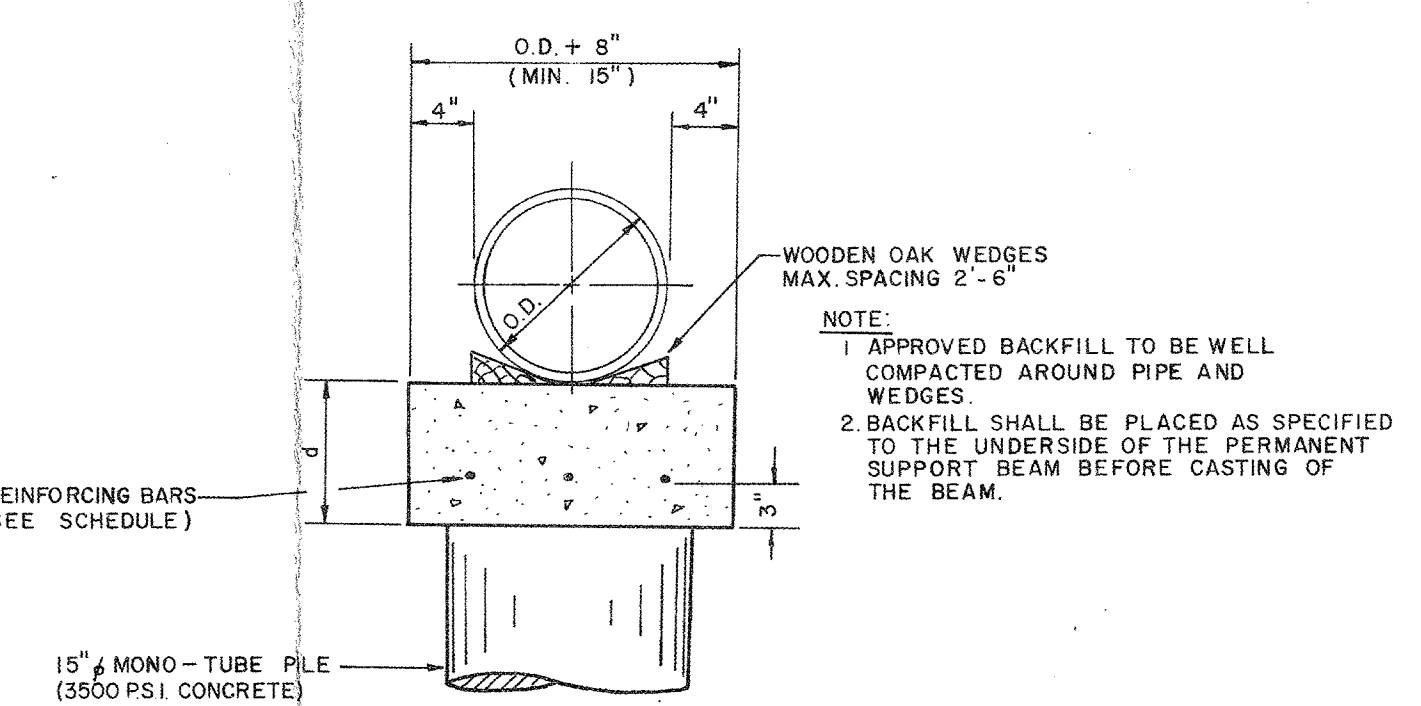
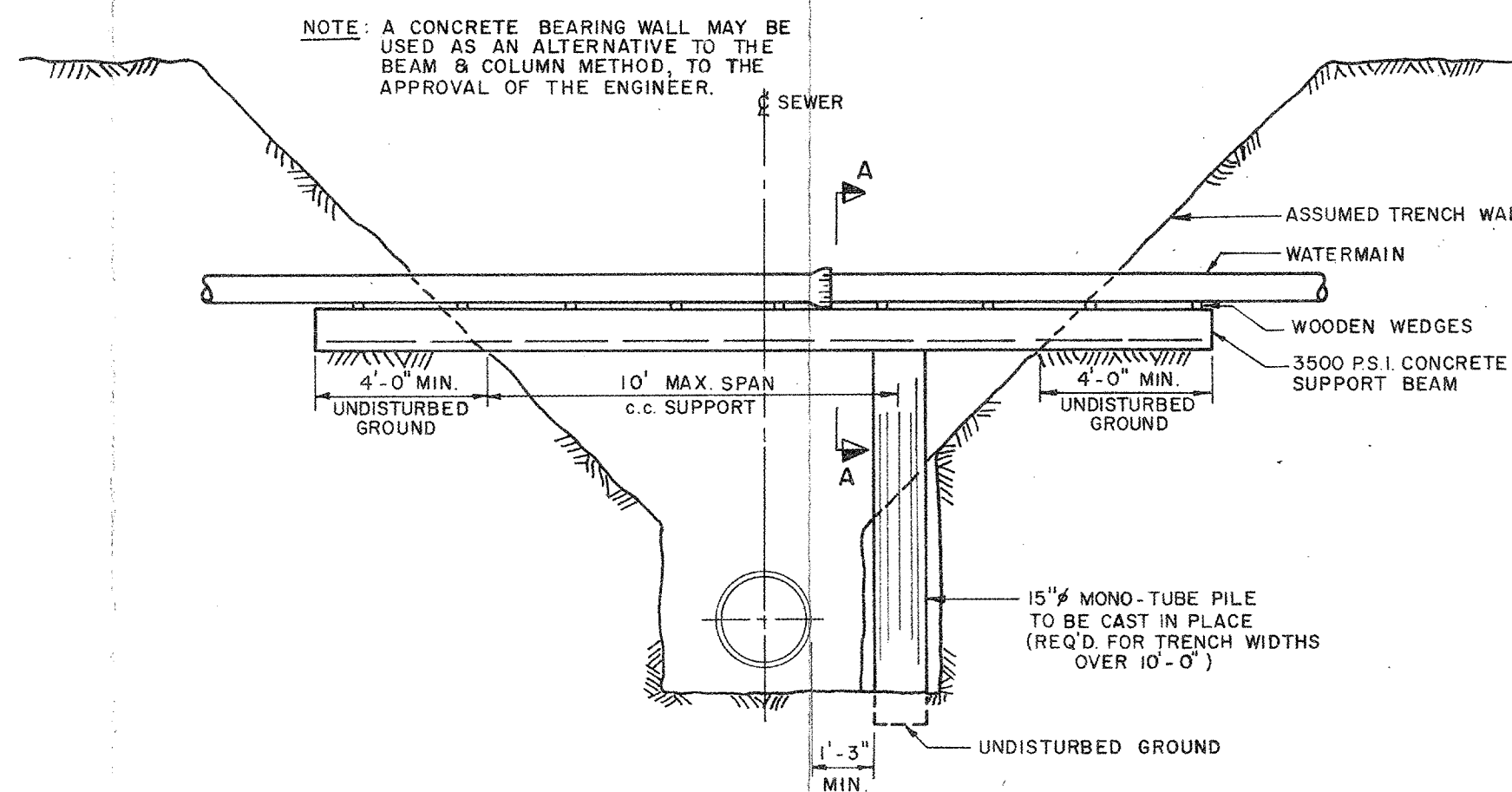
D.T.C. TORONTO RECEIVED			
DEC 19 1973			
STRUCTURAL OFFICE			
NO.	REVISIONS	DATE	BY

CITY OF LONDON
 GRADE SEPARATION - C.N.R. - RIVERSIDE DR.
 MISCELLANEOUS DETAILS
 ROADWAY CROSS-SECTIONS & DRIVEWAY PROFILES

DESIGN BY: A.L. GIGUN	FIELD BOOK: B-12
DRAWN BY: J.L. POLLARD	SCALE: 1" = 10'-0" VERT & HORIZ.
CHECKED BY: D.J. YOUNG	DATE: NOVEMBER, 1973
A.M. SPRIET & ASSOCIATES LTD. CONSULTING ENGINEERS LONDON - ONTARIO	APPROVED BY: <i>[Signature]</i> SECTION HEAD CITY ENGINEER
PROJECT NO: 72038 DRAWING NO: 14	CITY ENGINEER'S DEPARTMENT PROJECT NO: 742/R33/1 DRAWING NO:

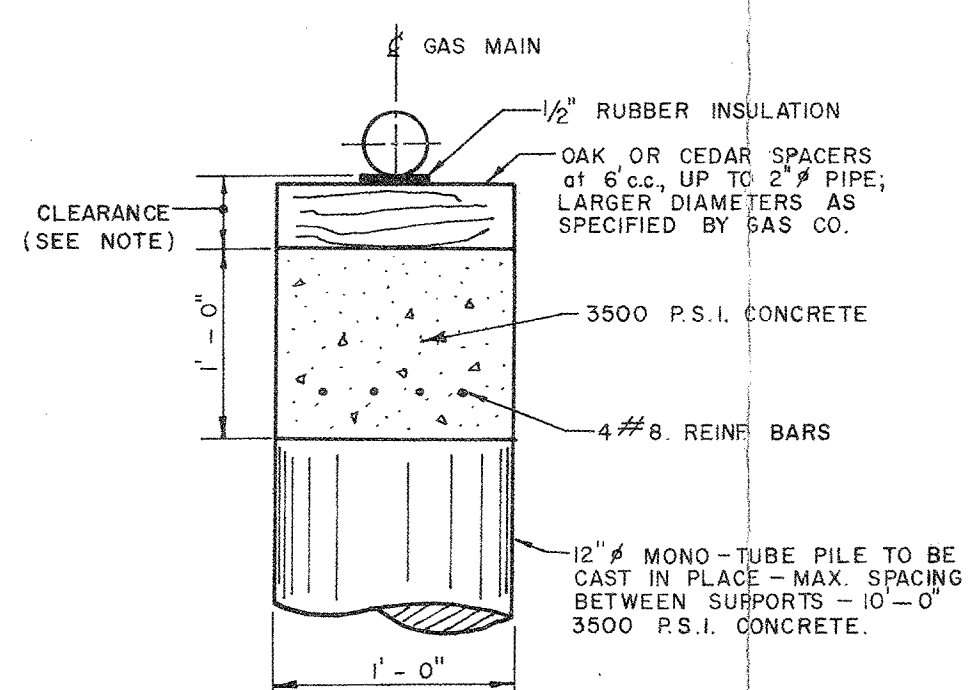
WATERMAIN SUPPORT BEAM SCHEDULE

O.D.	TRENCH WIDTH	d	BARs REQ'D
LESS THAN 12"	2'-0" TO 7'-0"	9"	3 NO. 6
	GREATER THAN 7'-0"	12"	4 NO. 8
12" TO 24"	7'-0" TO 12'-0"	9"	3 NO. 7
	GREATER THAN 12'-0"	12"	5 NO. 8
30" AND OVER	TO BE CONSIDERED INDIVIDUALLY		



SECTION A-A

P.U.C. STANDARD DETAILS OF PERMANENT SUPPORT BEAM FOR LATERAL WATERMAINS
N.T.S.



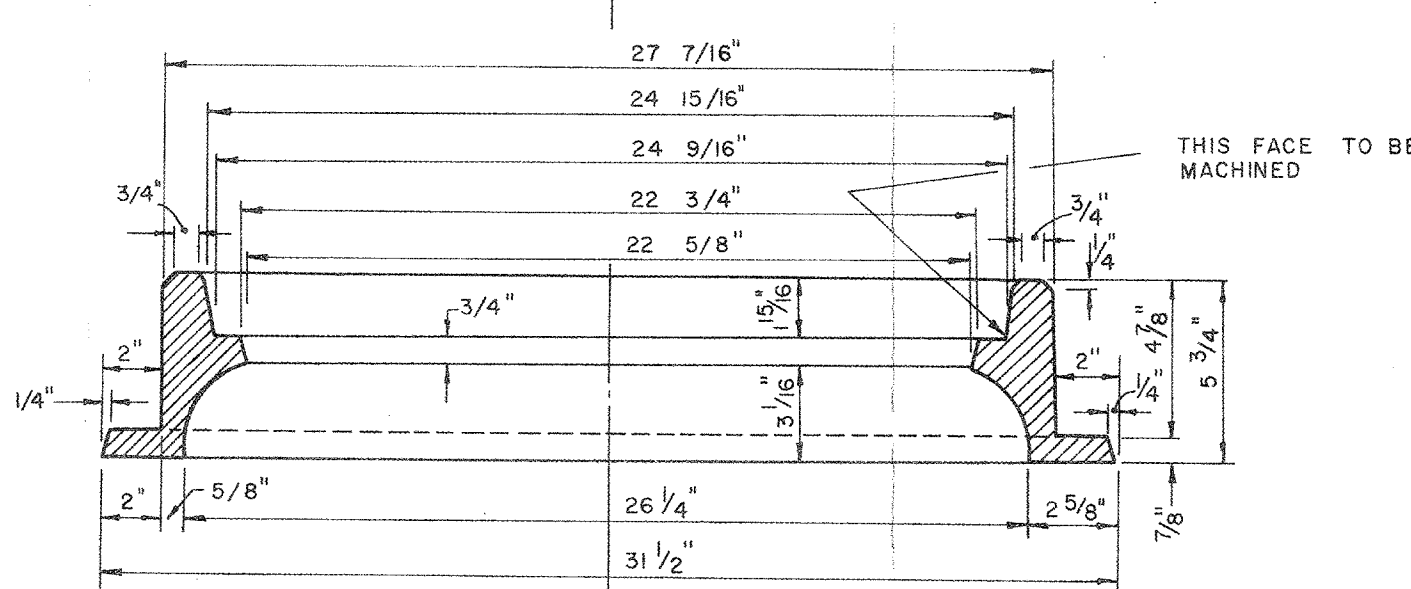
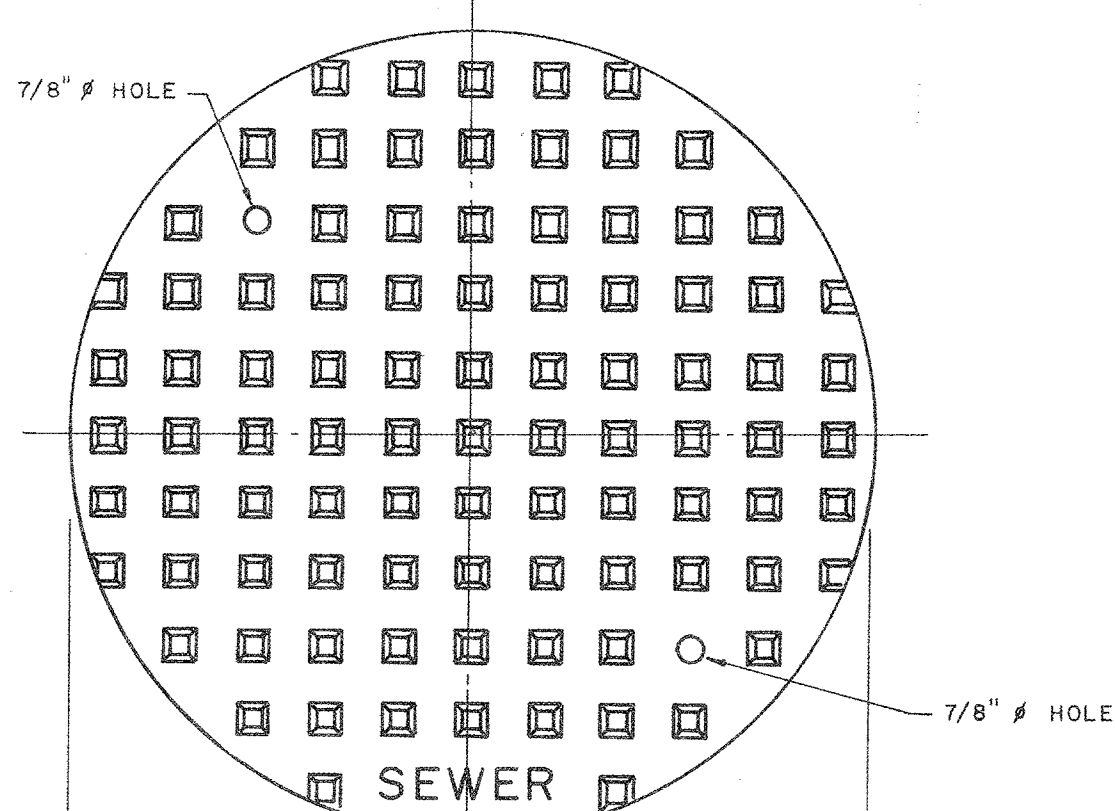
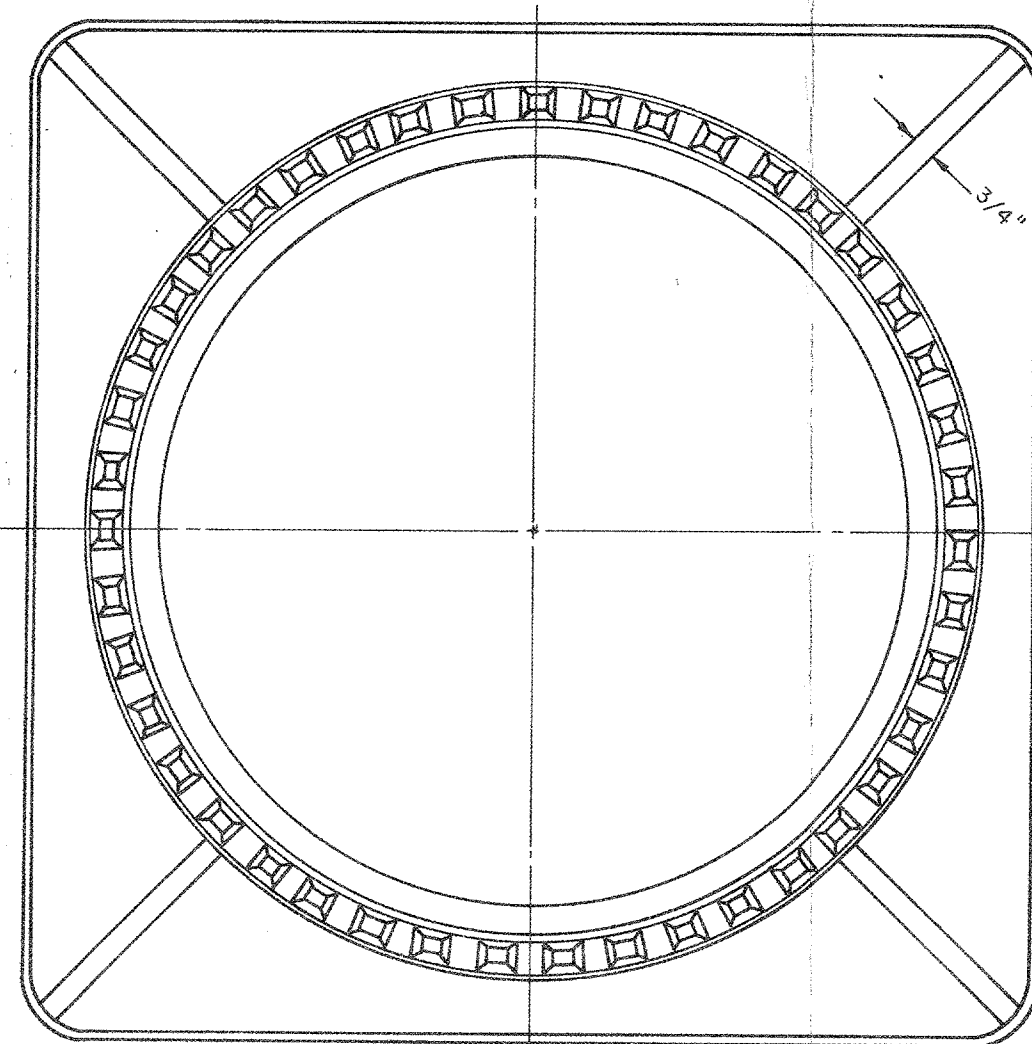
- NOTES:**
- WHEN TRENCH WIDTH IS LESS THAN 10', A TIMBER BEAM AND POST SUPPORT, APPROVED BY THE GAS INSPECTOR, SHALL BE USED.
 - CLEARANCES SHALL BE AS FOLLOWS:

O.D.	CLEARANCE
2" & SMALLER	2"
2" TO 4"	4"
4" TO 10"	8"
 - ALL GAS PIPE COATINGS SHALL BE INSPECTED BY GAS CO. INSPECTOR PRIOR TO BACKFILLING.
 - SUPPORT BEAMS SHALL BE SUPPORTED BY 4'-0" OF UNDISTURBED GROUND ON EACH SIDE OF TRENCH.
 - APPROVED BACKFILL SHALL BE WELL COMPACTED AROUND PIPE AND SPACERS.
 - BACKFILL SHALL BE PLACED AS SPECIFIED TO THE UNDERSIDE OF THE BEAM, BEFORE PLACING BEAM.

PERMANENT SUPPORT BEAM FOR LATERAL GAS MAINS (TRENCH WIDTH AT CROSSING 10' OR GREATER)
N.T.S.

DETAILS OF PERMANENT SUPPORT STRUCTURES FOR ALL OTHER LATERAL UNDERGROUND STRUCTURES, DUCTS AND CONDUITS SHALL CONFORM WITH THE REQUIREMENTS OF THE UTILITIES CONCERNED AND APPROVED BY THE ENGINEER.

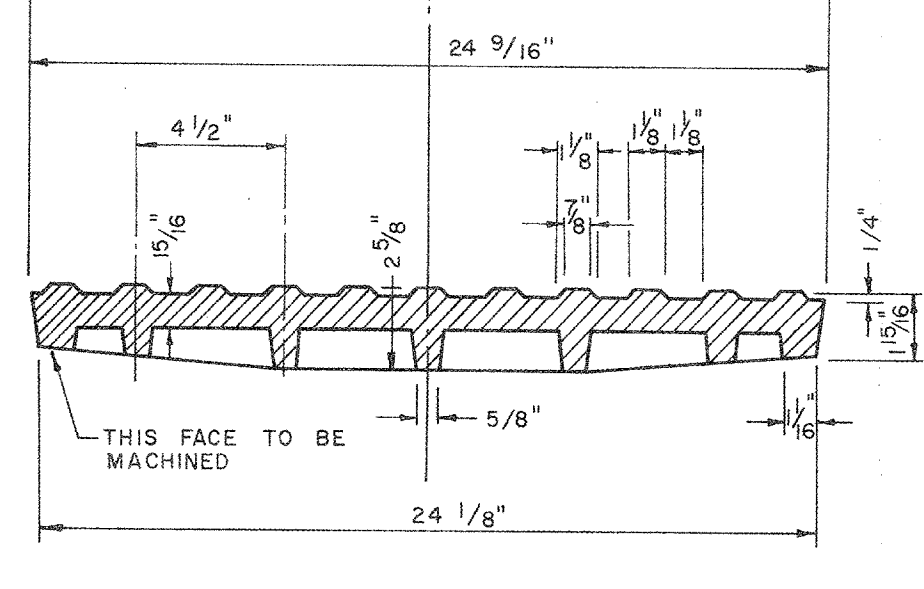
- NOTES:**
- ALLOWABLE TOLERANCES DIMENSIONS 12" OR LESS: ± 1/8" DIMENSIONS OVER 12" UP TO AND INCLUDING 36": ± 1/4"
 - MARKING a "SEWER" IS TO BE CAST IN RAISED LETTERS AS SHOWN b THE INITIALS OR MARK OF MANUFACTURER ARE TO BE DISTINCTLY CAST IN RAISED LETTERS ON THE FRAME AND UNDERSIDE OF THE COVER.
 - THE TOTAL WEIGHT OF FRAME AND COVER 400 POUNDS (APPROXIMATELY)
 - ALL CAST IRON TO MEET A.S.T.M. DESIGNATION A48 CLASS 30 B FOR GRAY IRON CASTINGS.



FRAME

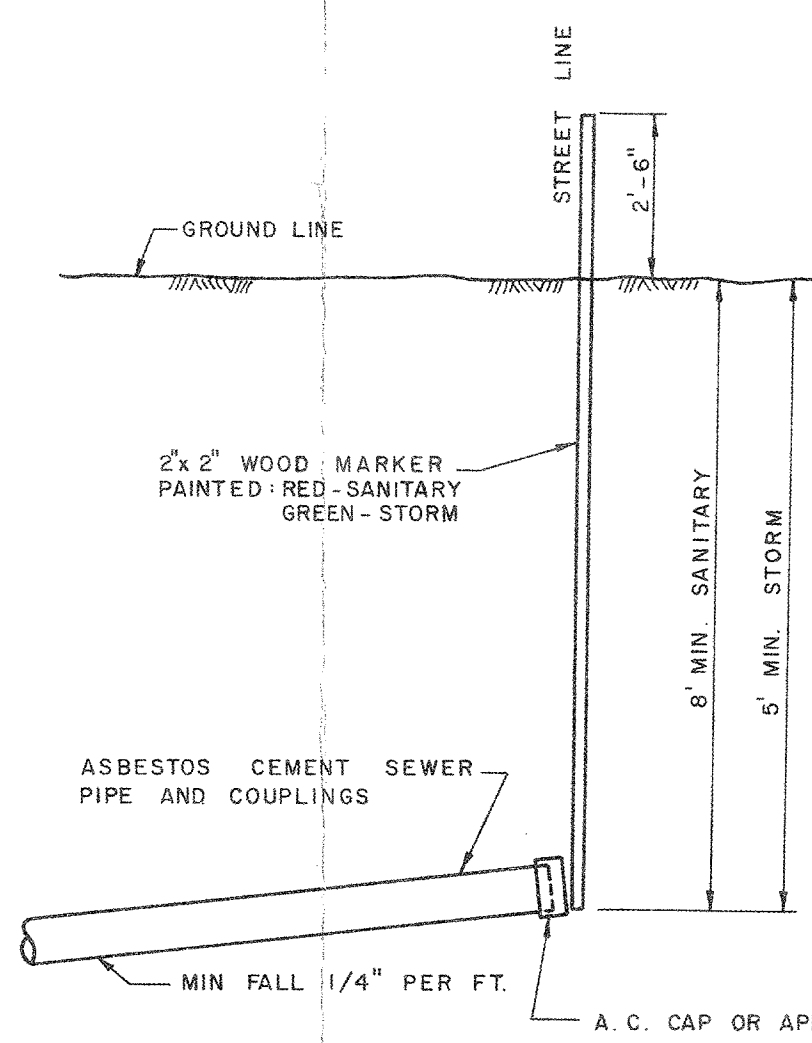
STANDARD MANHOLE COVER & FRAME

SCALE 2" = 1'-0"



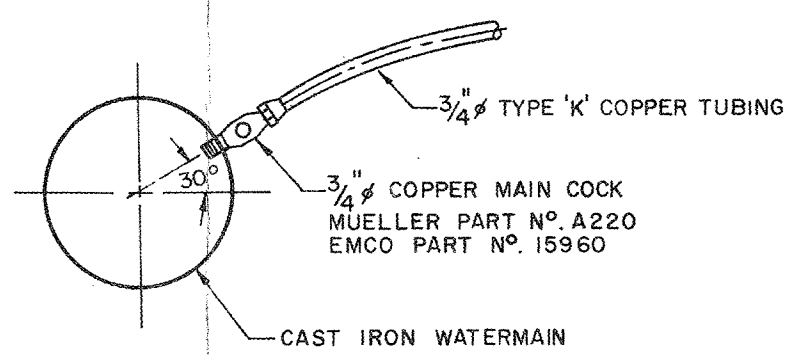
COVER

PRIVATE DRAIN CONNECTION AT STREET LINE
N.T.S.

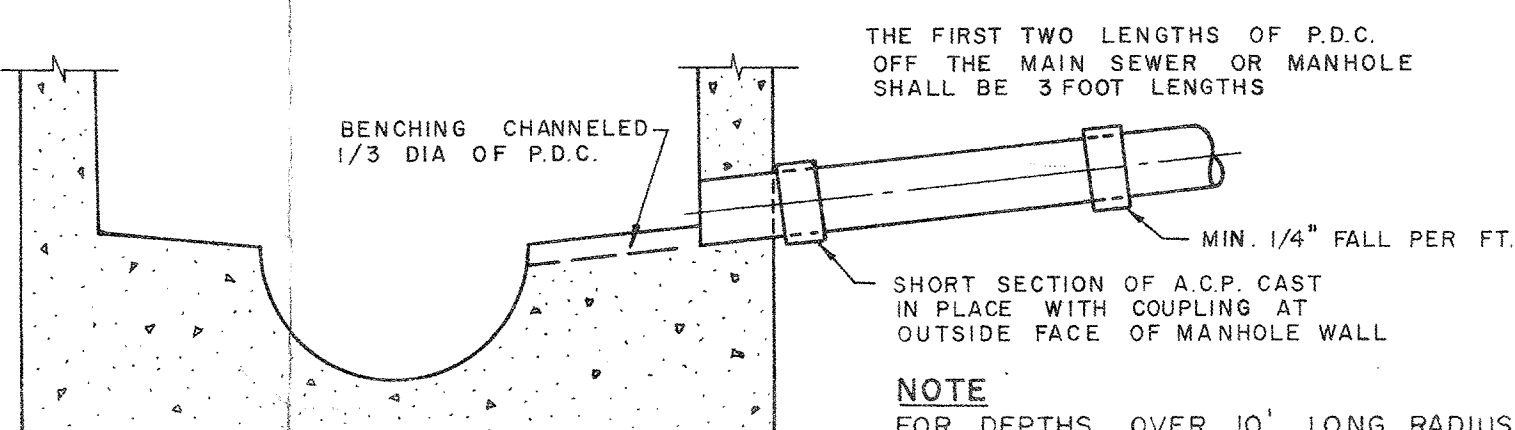
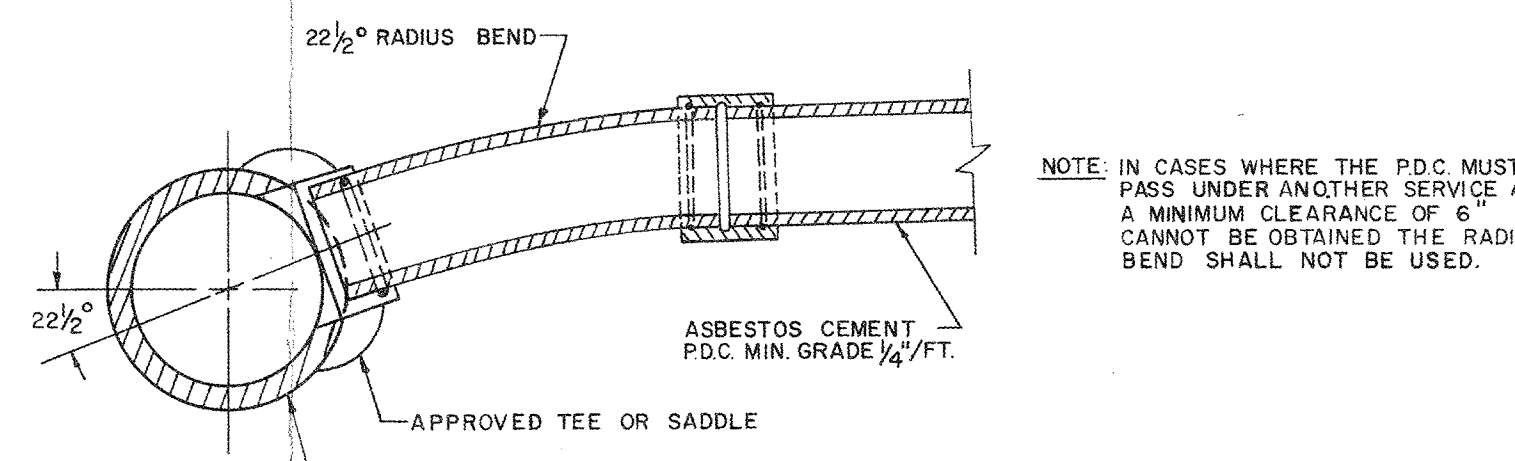


N.T.S.

STANDARD INSTALLATION FOR 3/4" WATER SERVICE
N.T.S.



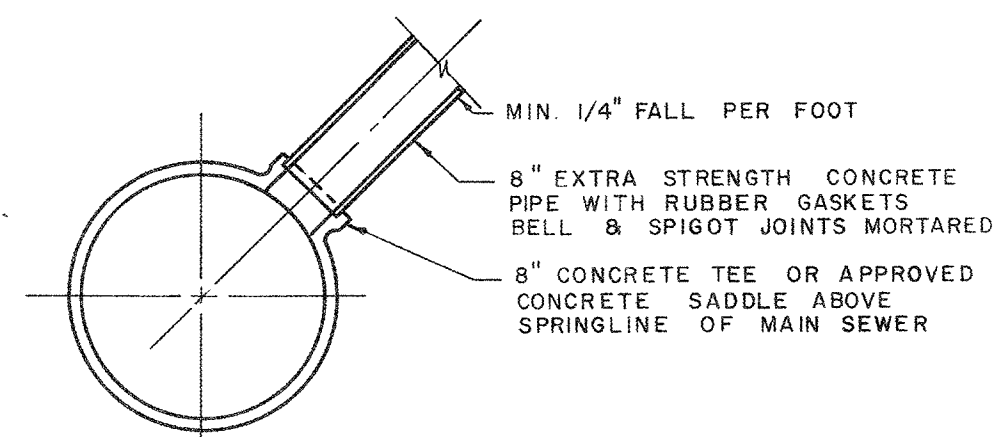
CONNECTION TO MAIN SEWER



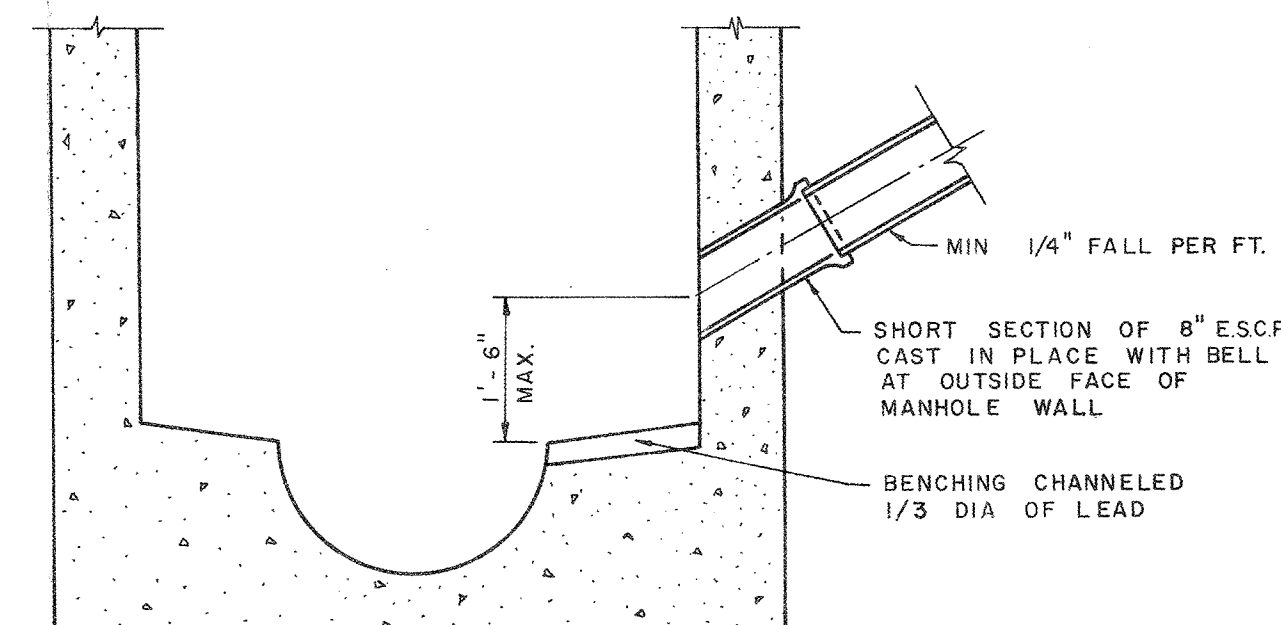
PRIVATE DRAIN CONNECTIONS AT MAIN SEWER AND AT MANHOLE
N.T.S.

N.T.S.

TO MAIN SEWER

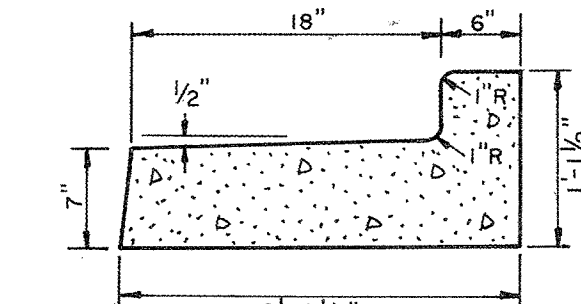
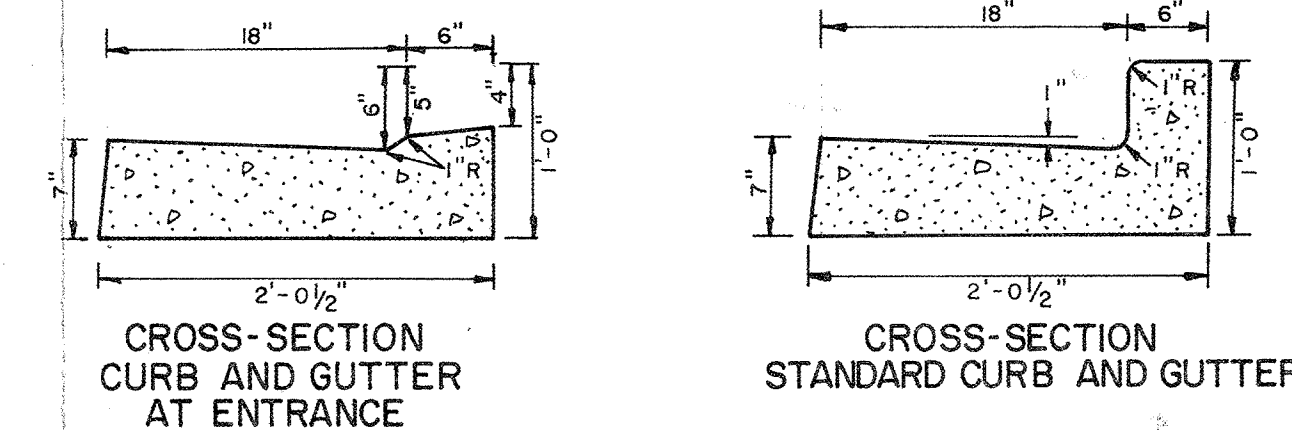


TO MANHOLE



CATCH BASIN CONNECTIONS AT MAIN SEWER AND AT MANHOLE
N.T.S.

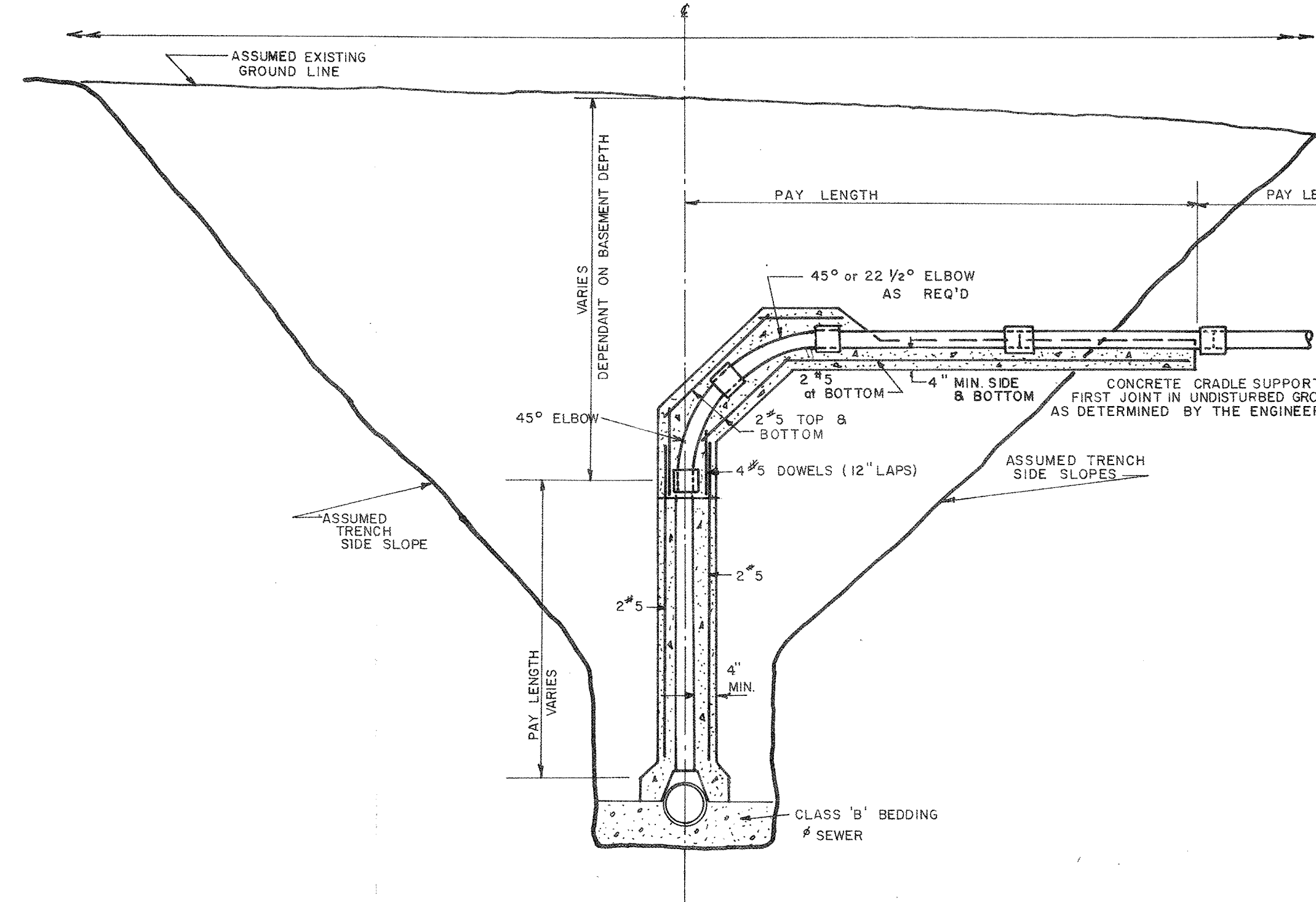
N.T.S.



CROSS-SECTION OFFSET CURB AND GUTTER

CONCRETE CURB AND GUTTER
N.T.S.

N.T.S.



DETAIL OF VERTICAL RISER
N.T.S.

N.T.S.

STRUCTURE SITE NO. 19-264

D.T.C. - TORONTO RECEIVED
DEC 19 1973
STRUCTURAL OFFICE

NO. REVISIONS DATE BY

CITY OF LONDON

GRADE SEPARATION:-C.N.R.- RIVERSIDE DR.

MISCELLANEOUS SEWER DETAILS

DESIGN BY: A.L. GIGUN
DRAWN BY: J.L. POLLARD
CHECKED BY: D.J. YOUNG

FIELD BOOKS: B-12
SCALE: AS NOTED
DATE: NOVEMBER, 1973

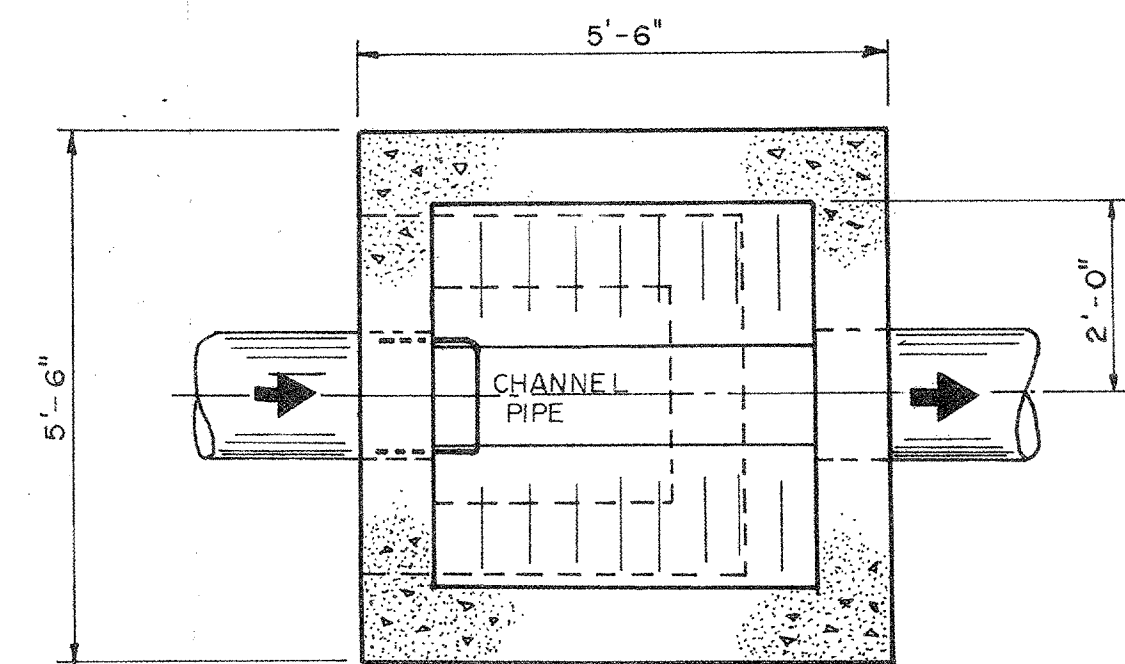
A. M. SPRIET & ASSOCIATES LTD
CONSULTING ENGINEERS
LONDON ONTARIO

APPROVED BY:
Alan Spriet
SECTION HEAD

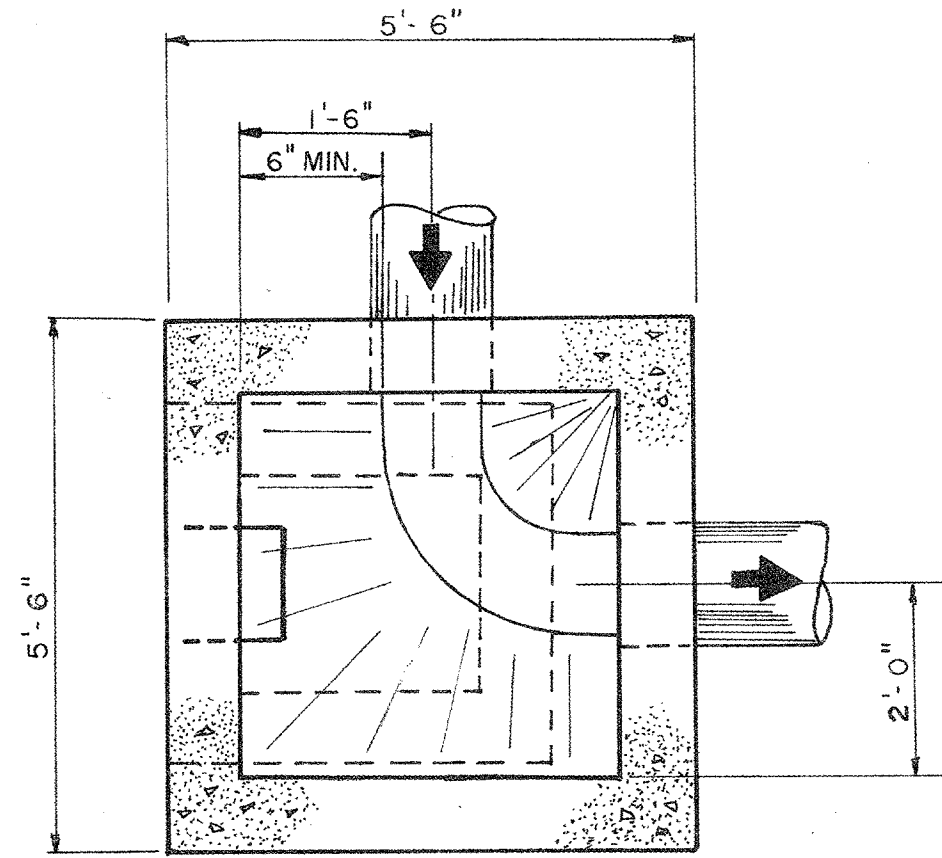
CITY ENGINEER'S DEPARTMENT
PROJECT NO.: 742 / R33/A
DRAWING NO.:

PROJECT NO.: 72038
DRAWING NO.: 15

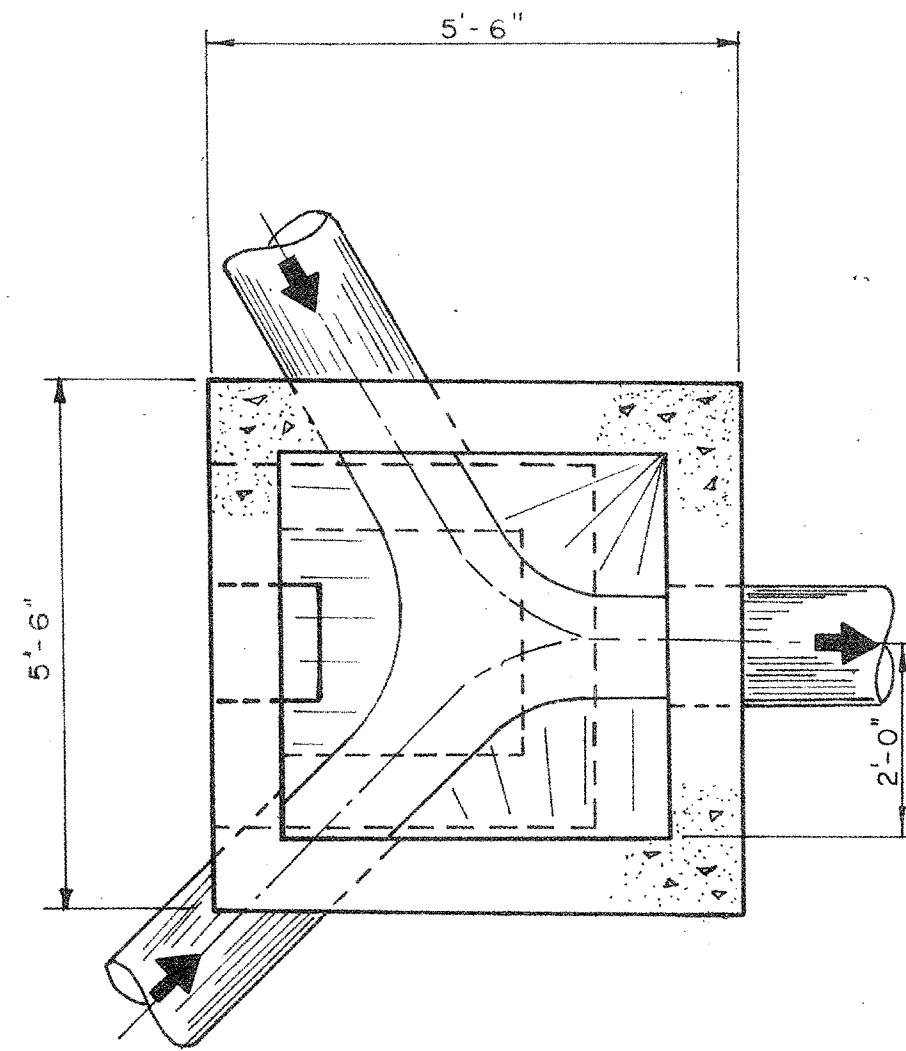
CITY ENGINEER



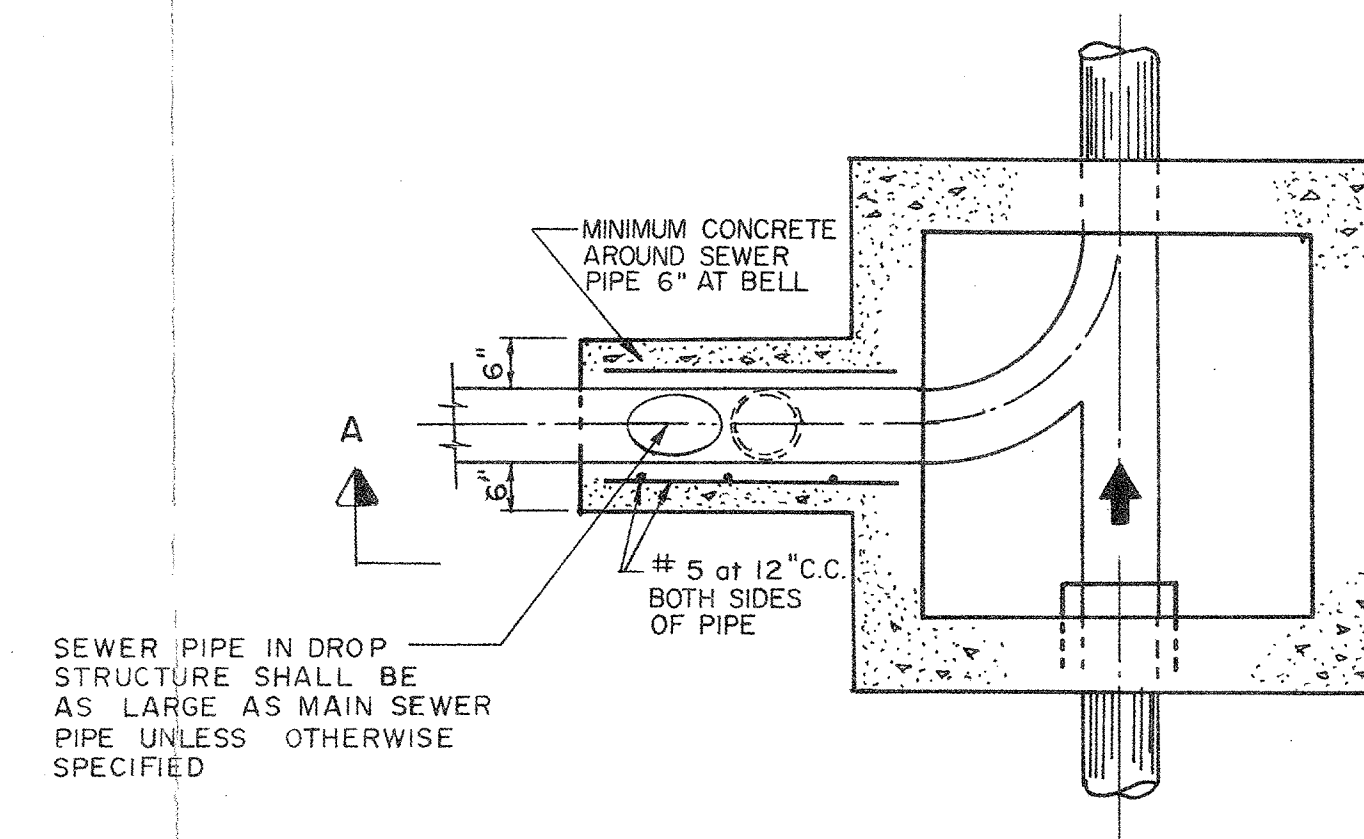
TYPICAL THROUGH-FLOW



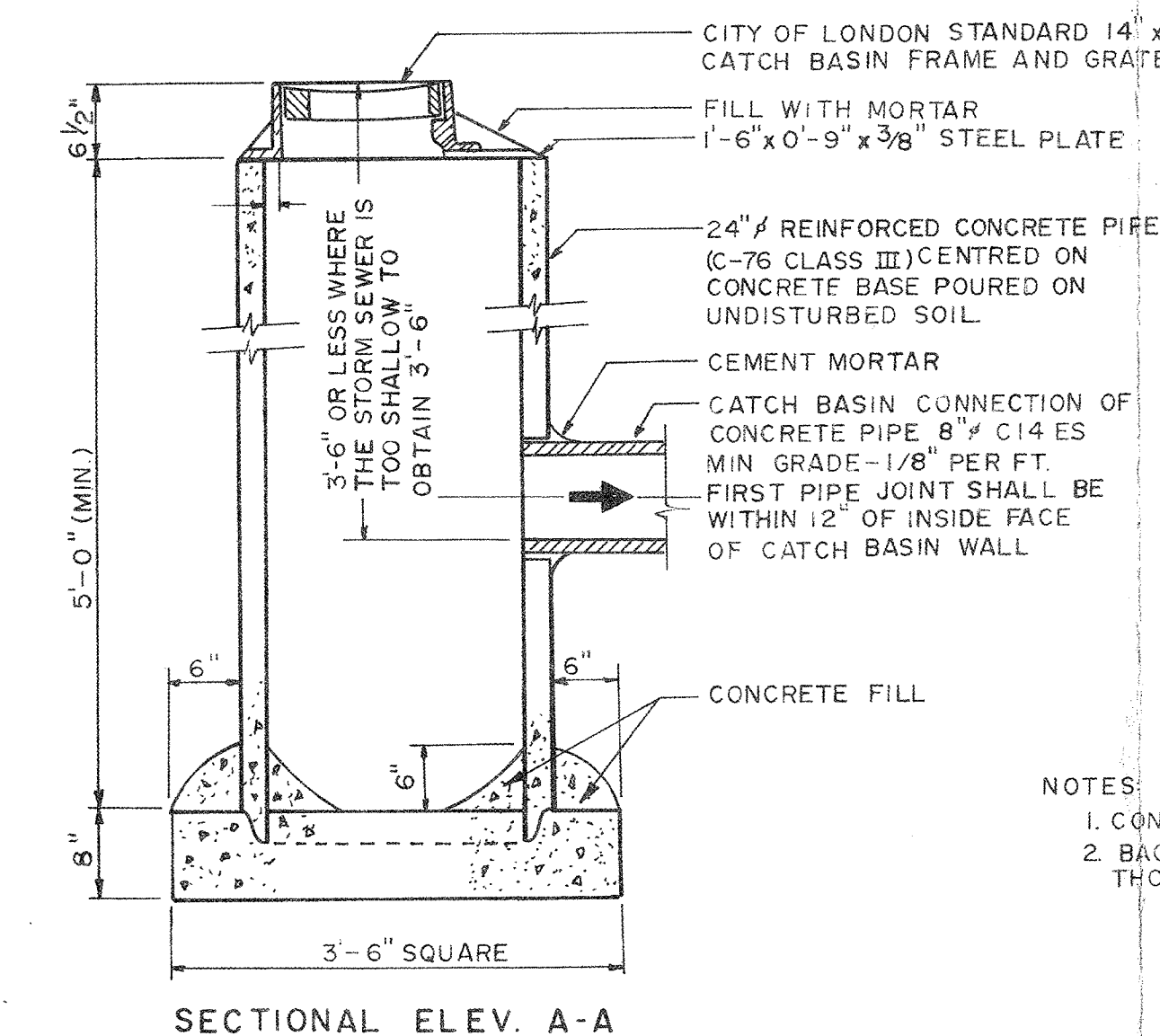
TYPICAL 90° BEND



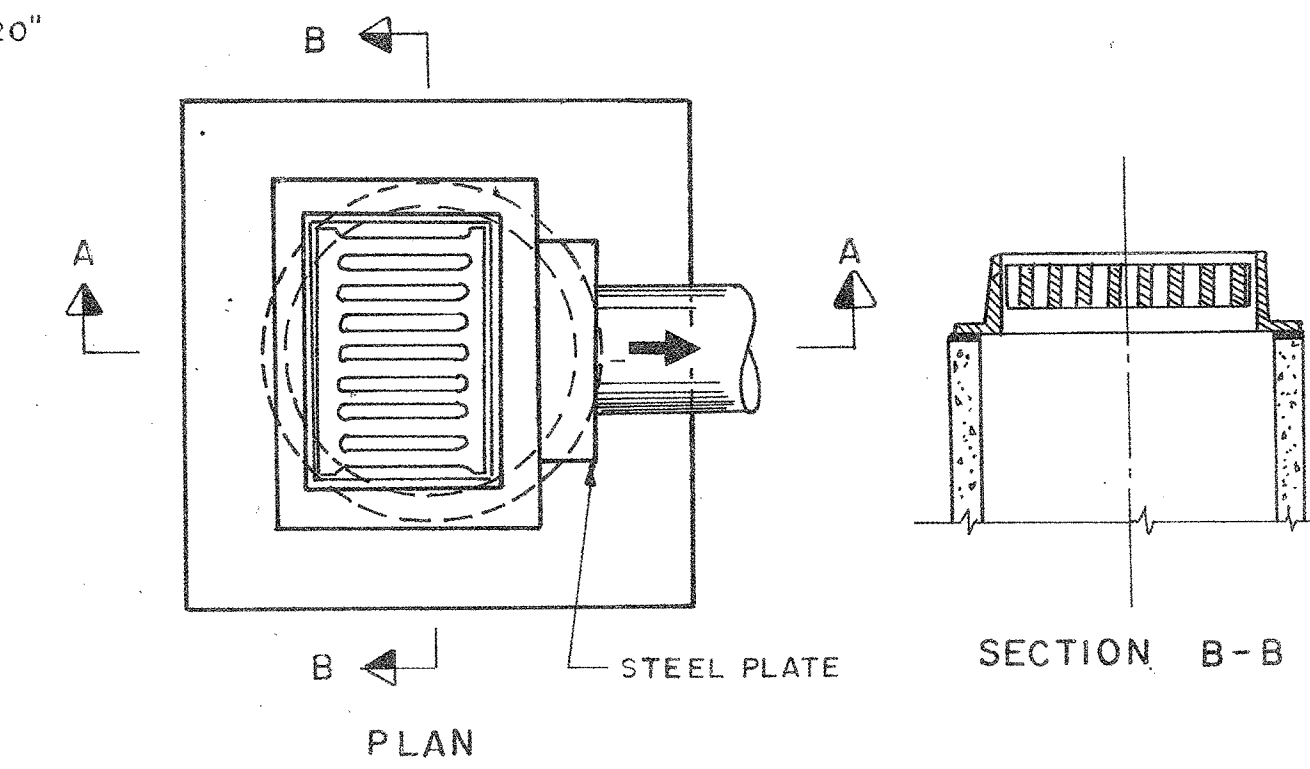
TYPICAL DOUBLE ANGLE JUNCTION



SECTIONAL PLAN B-B



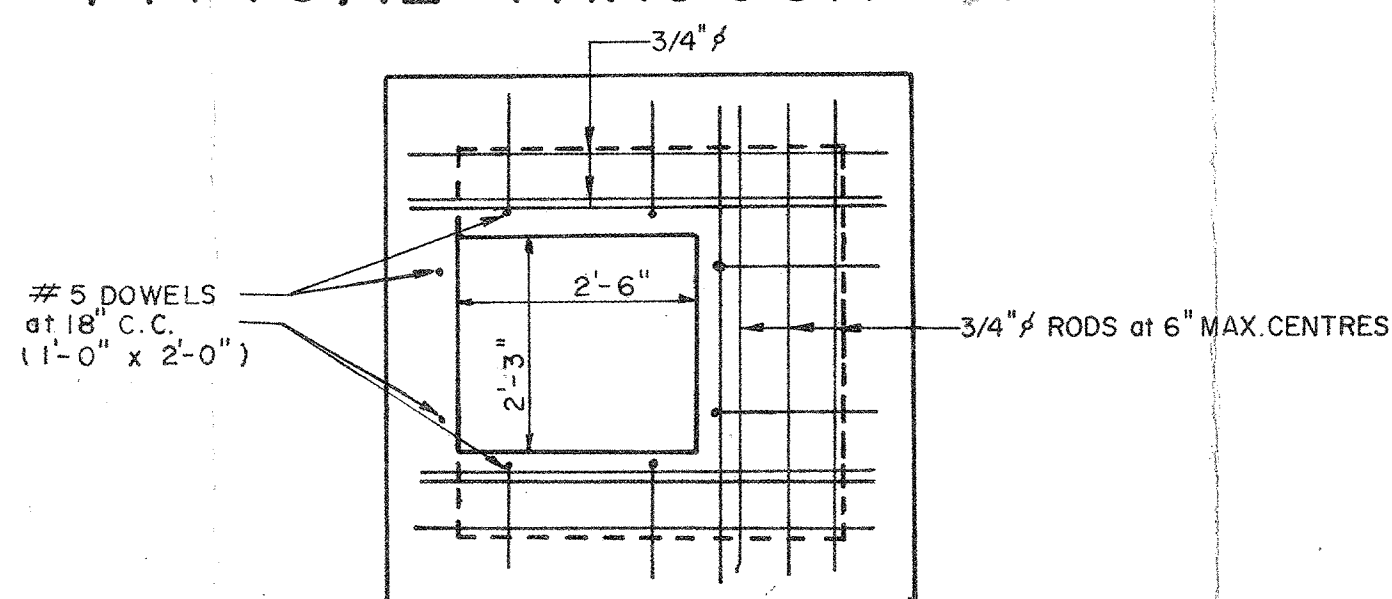
SECTIONAL ELEV. A-A



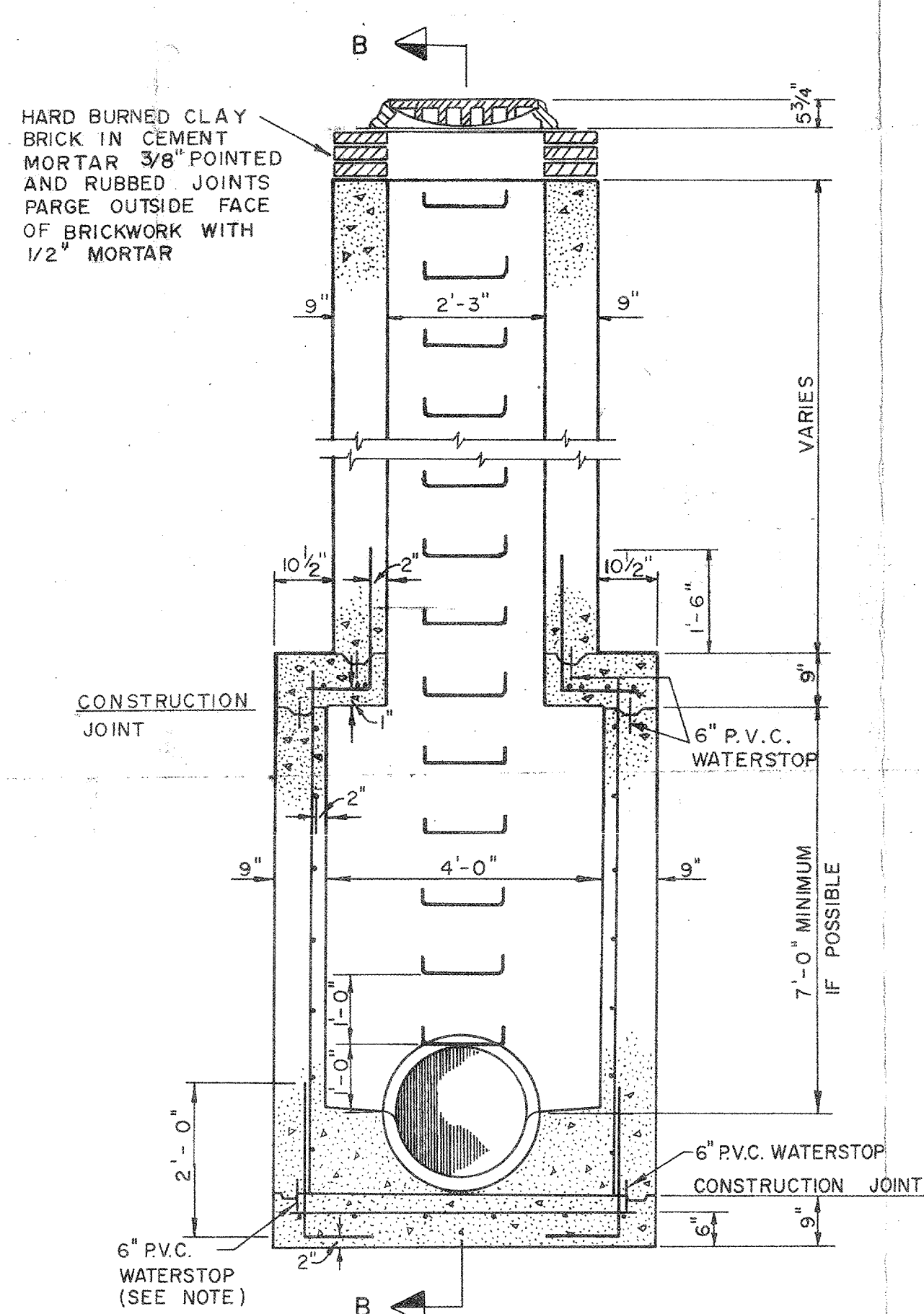
STANDARD CATCH BASIN

SCALE 3/4" = 1'-0"

- NOTES:
1. CONCRETE TO BE 3000 P.S.I. AT 28 DAYS
 2. BACKFILL AROUND CATCH BASIN TO BE THOROUGHLY COMPACTED

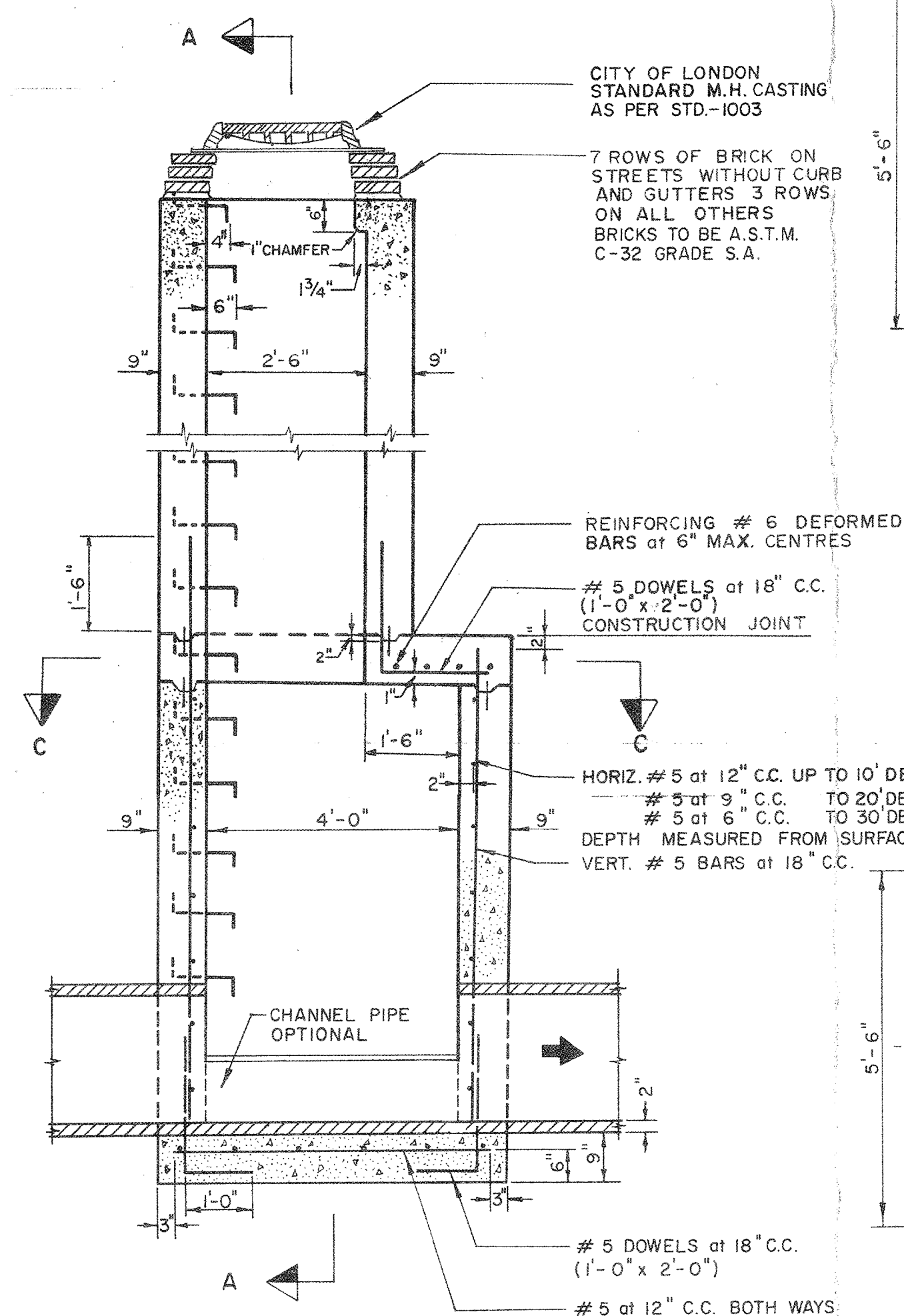


SECTIONAL PLAN C-C
SLAB REINFORCING

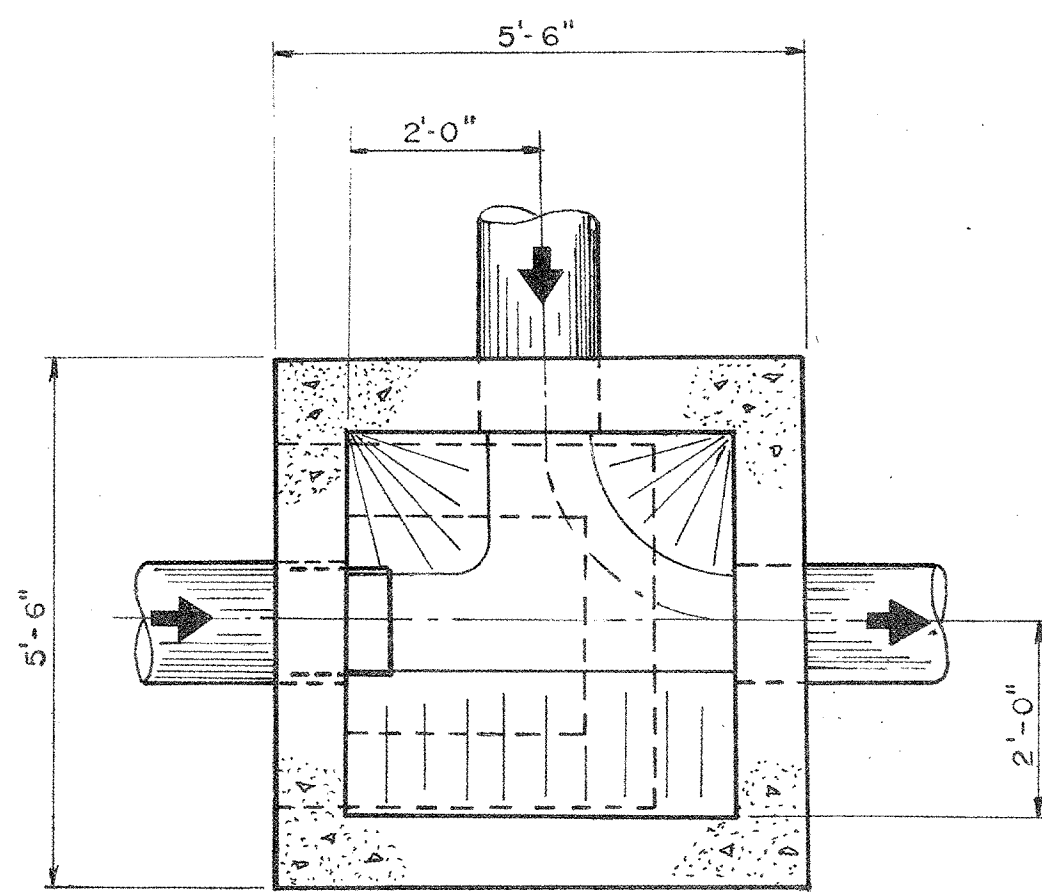


SECTIONAL ELEV. A-A

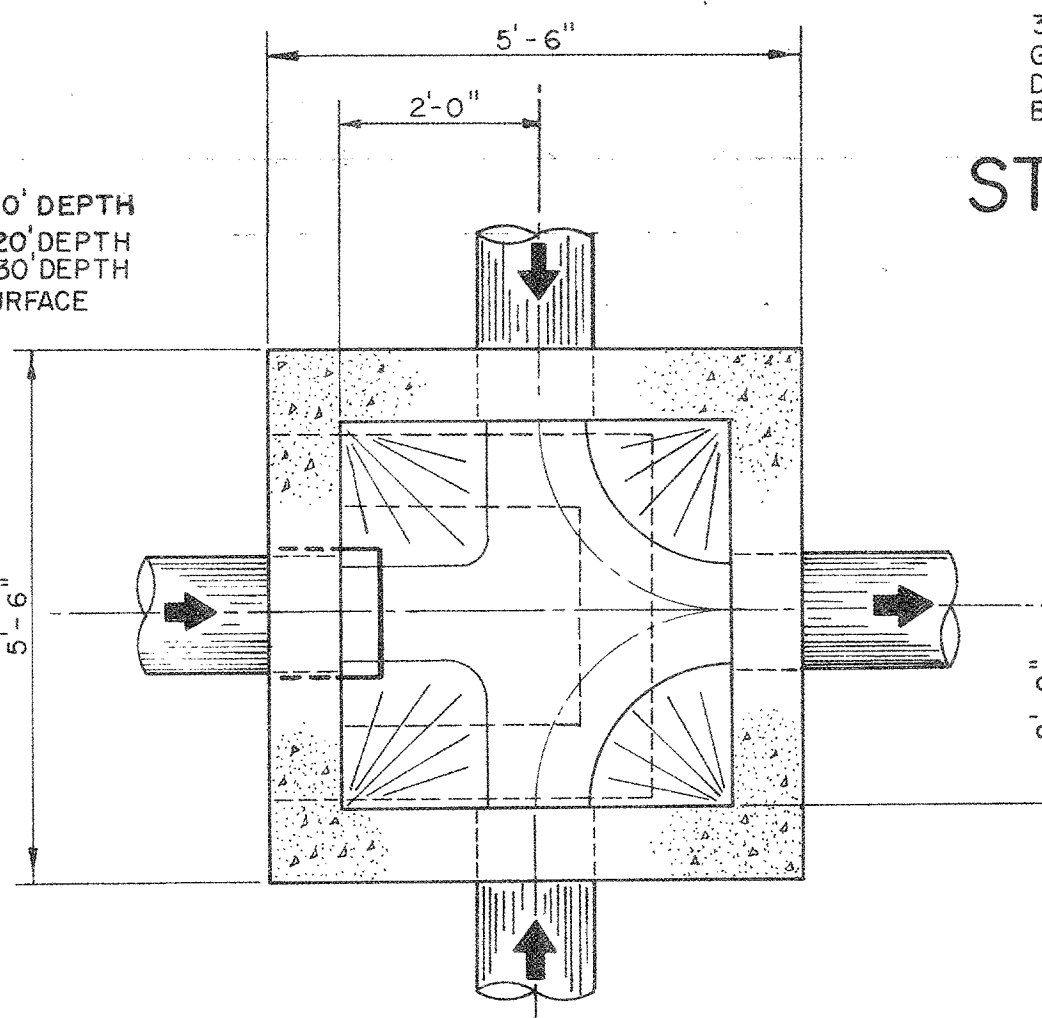
TYPICAL MANHOLE FOR PIPES 8" TO 27"



SECTIONAL ELEV. B-B

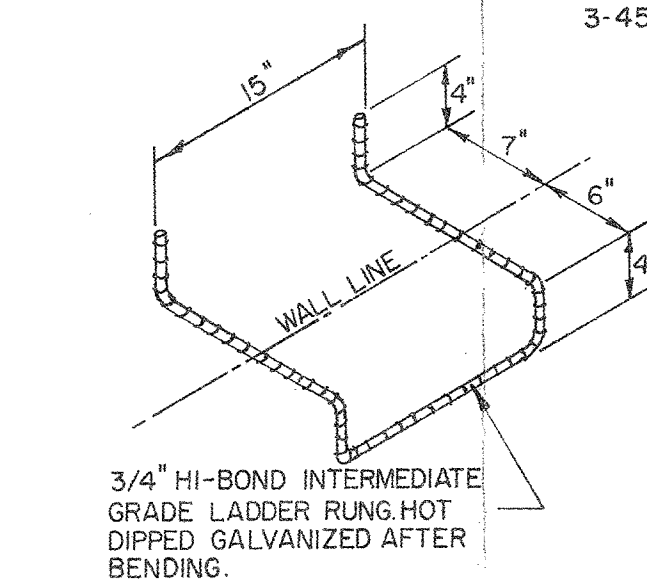


TYPICAL SINGLE JUNCTION

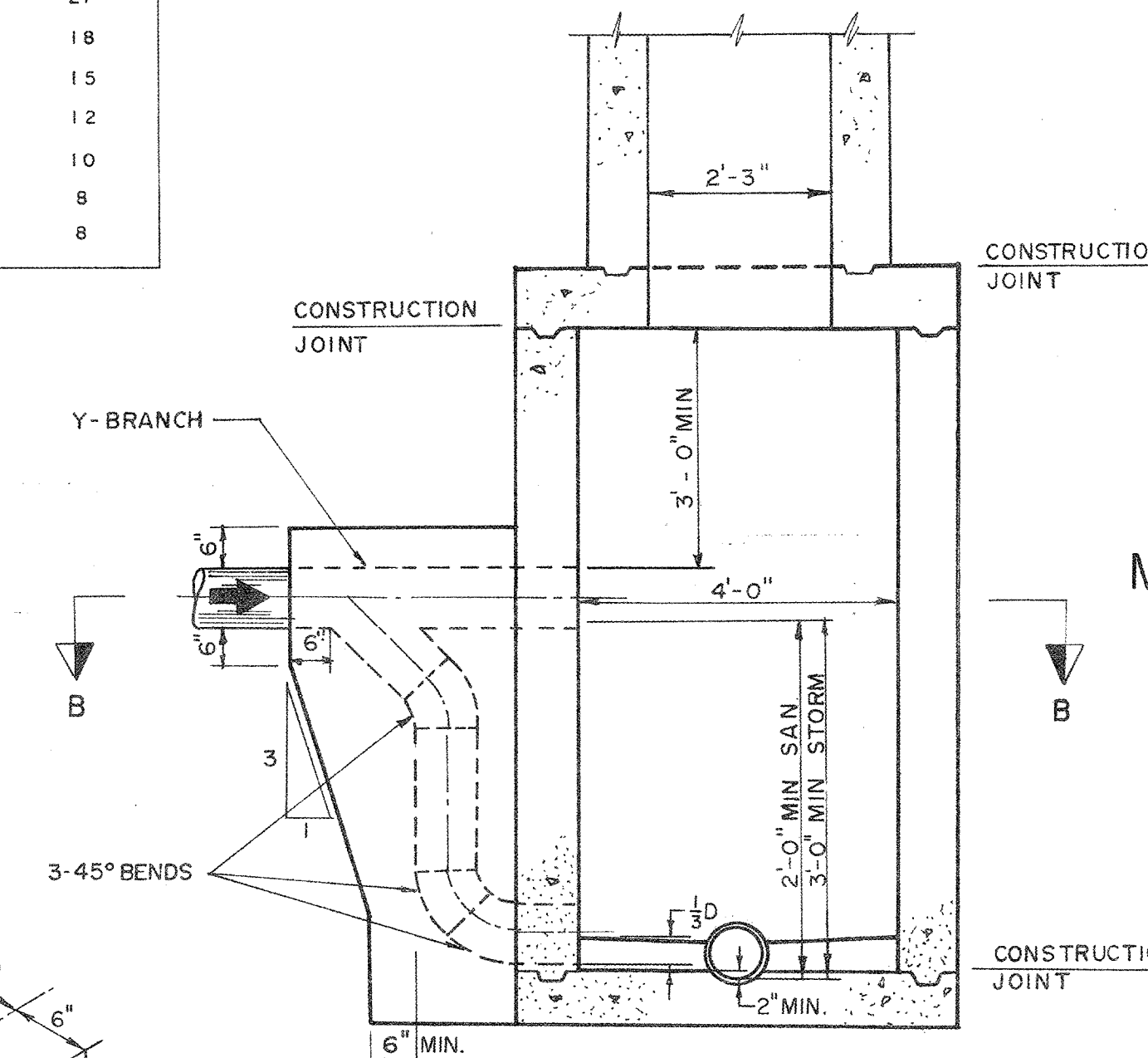


TYPICAL DOUBLE JUNCTION

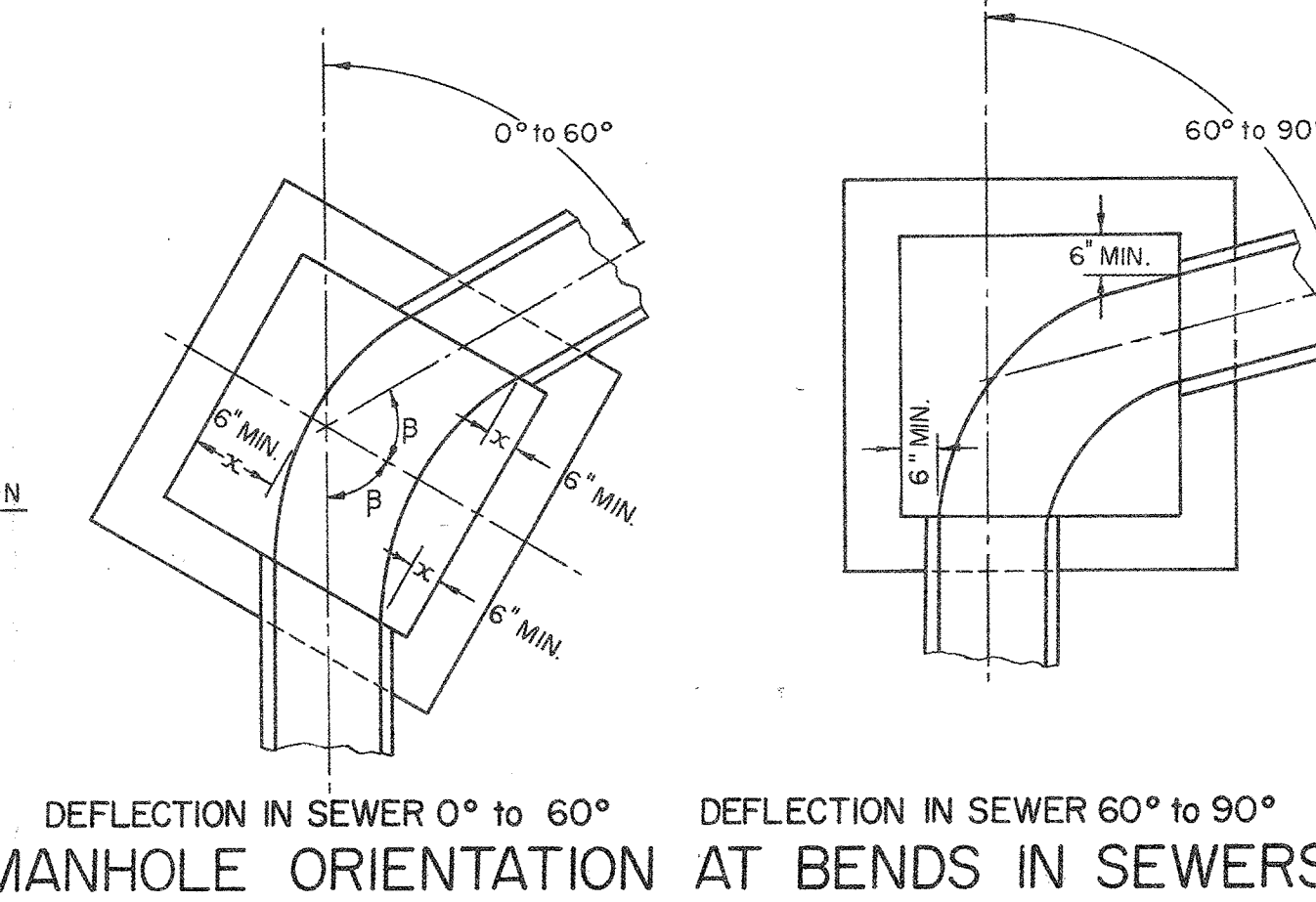
SIZE OF DROP PIPES	
D ₁	D ₂
27	21
24	21
21	18
18	15
15	12
12	10
10	8
8	8



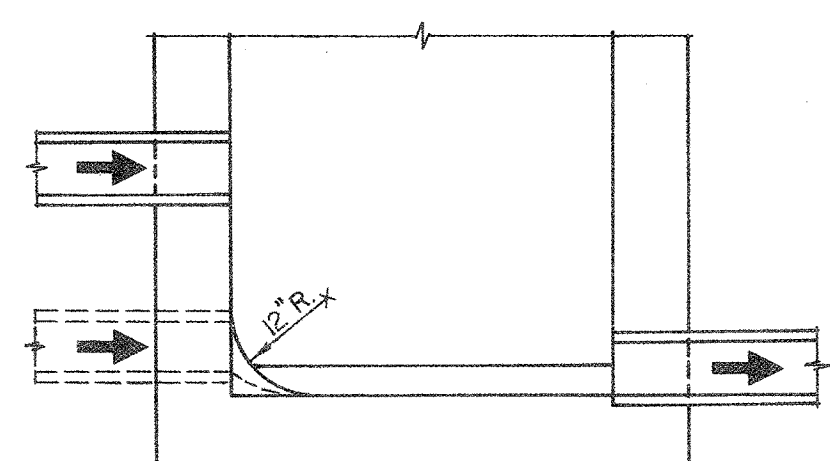
STEP DETAIL



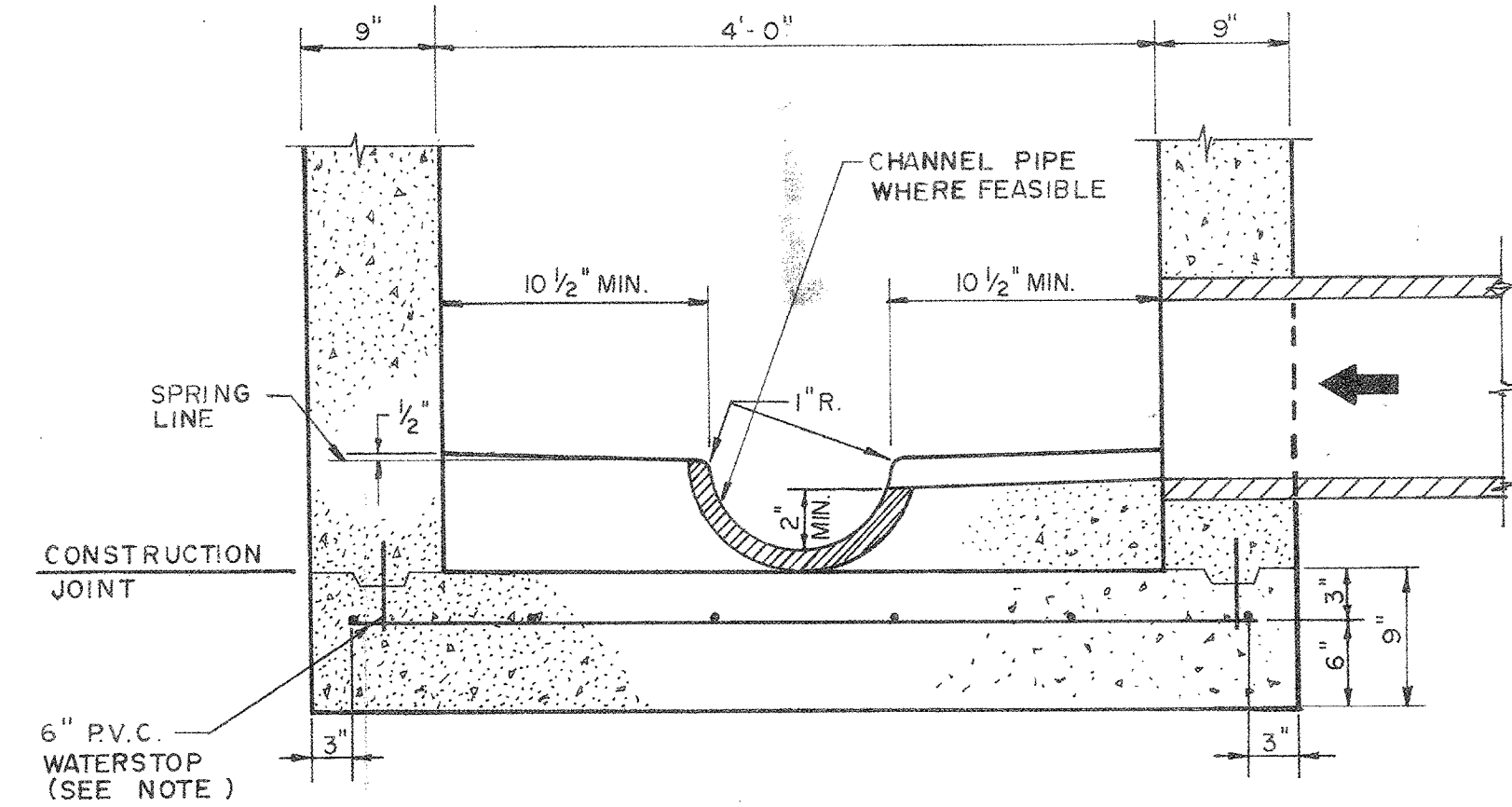
SECTIONAL ELEV. A-A
TYPICAL DROP STRUCTURE



DEFLECTION IN SEWER 0° TO 60°
MANHOLE ORIENTATION AT BENDS IN SEWERS



FILLET BELOW DROPS
IN MANHOLES



TYPICAL SECTION AT MANHOLE
BOTTOM

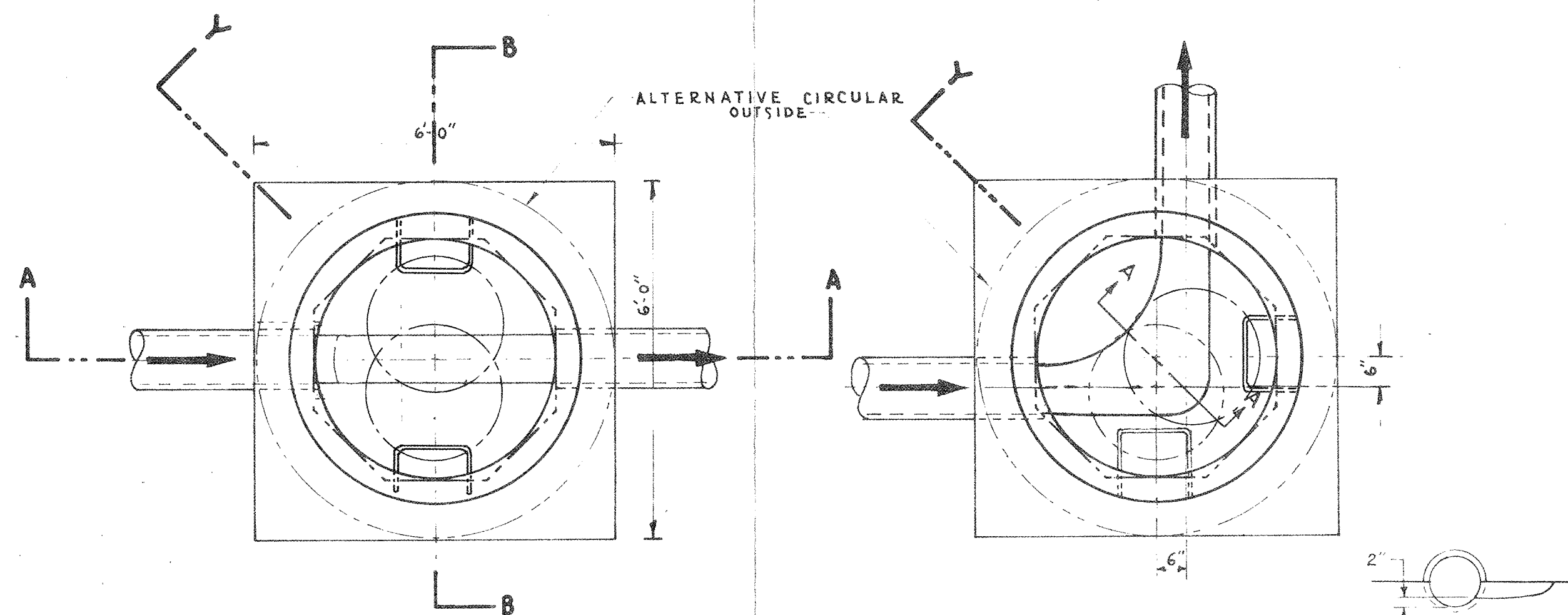
SCALE 1" = 1'-0"

- NOTES:
1. LIFTS NOT TO EXCEED 8'-0" IN HEIGHT
 2. ALL CONSTRUCTION JOINTS IN CONCRETE TO HAVE 6" P.V.C. WATERSTOP
 3. WATERSTOPS IN CONSTRUCTION JOINTS MAY BE OMITTED IN DRY TRENCH CONDITIONS UPON APPROVAL FROM THE CITY ENGINEERS DEPARTMENT IN WRITING.
 4. ALL CONCRETE TO BE 3000 P.S.I. AT 28 DAYS.
 5. CITY OF LONDON STANDARD MANHOLE FRAME AND COVER CANADA IRON FOUNDRIES LIMITED DS-579 (2 HOLE) OR AN APPROVED EQUAL.
 6. ALL SPLICES TO BE 12" MINIMUM.
 7. ALL SPACES BETWEEN BRICKS ARE TO BE COMPLETELY FILLED WITH MORTAR.
 8. DROP STRUCTURE TO BE CONSTRUCTED WHEN THE DIFFERENCE IN INVERT ELEV. IN A MANHOLE IS: 2'-0" OR MORE FOR SAN SEWERS, 3'-0" OR MORE FOR STORM SEWERS.
 9. ALL MANHOLE FRAMES SHALL BE ADJUSTED TO THE FINISHED ROAD GRADE BY MEANS OF METAL SHIMS AT EACH CORNER. METAL SHIMS ARE TO BE AT LEAST 3" x 8" AND THEIR THICKNESS IS TO BE DETERMINED BY THE ADJUSTMENT REQUIRED.
 10. ON STREETS WITH CURBS AND GUTTERS THE SPACE BELOW THE MANHOLE FRAME AND COVER IS TO CONTAIN ONE OF THE FOLLOWINGS:
 - a. 1 ROW OF BRICK, A.S.T.M. C-32, GRADE M.A.
 - b. 1 TO 3 ROWS OF BRICKS, A.S.T.M. C-32, GRADE S.A.
 - c. CONCRETE CHIMNEY WITHOUT BRICKS, OR WITH BRICKS AS NOTED ABOVE.
 11. WHEN THE DROP FROM AN INCOMING INVERT TO THE TOP OF THE MANHOLE BENCHING EXCEEDS 5'-0", CORBELS SHALL BE PLACED ON THE TWO WALLS ADJACENT TO THE LADDER RUNGS. THESE CORBELS ARE TO BE 3'-6" BELOW THE INVERT OF THE INCOMING SEWER.

D.T.C. - TORONTO RECEIVED			
DEC 19 1973			
STRUCTURAL OFFICE			
STRUCTURE SITE No. 19-264			
NO.	REVISIONS	DATE	BY
4	SHIMS @ No. of ROWS OF BRICKS	NOV '67	M.V.
3	MANHOLE ORIENTATION AT BENDS	MAY '67	M.V.
2	FILLET BELOW DROPS	JULY '66	M.V.
1	CORBELS IN MANHOLES	JULY '66	M.V.

CITY OF LONDON
GRADE SEPARATION - C.N.R. - RIVERSIDE DR.
MANHOLE & CATCH BASIN DETAILS
FOR PIPE SIZES 8" TO 27"

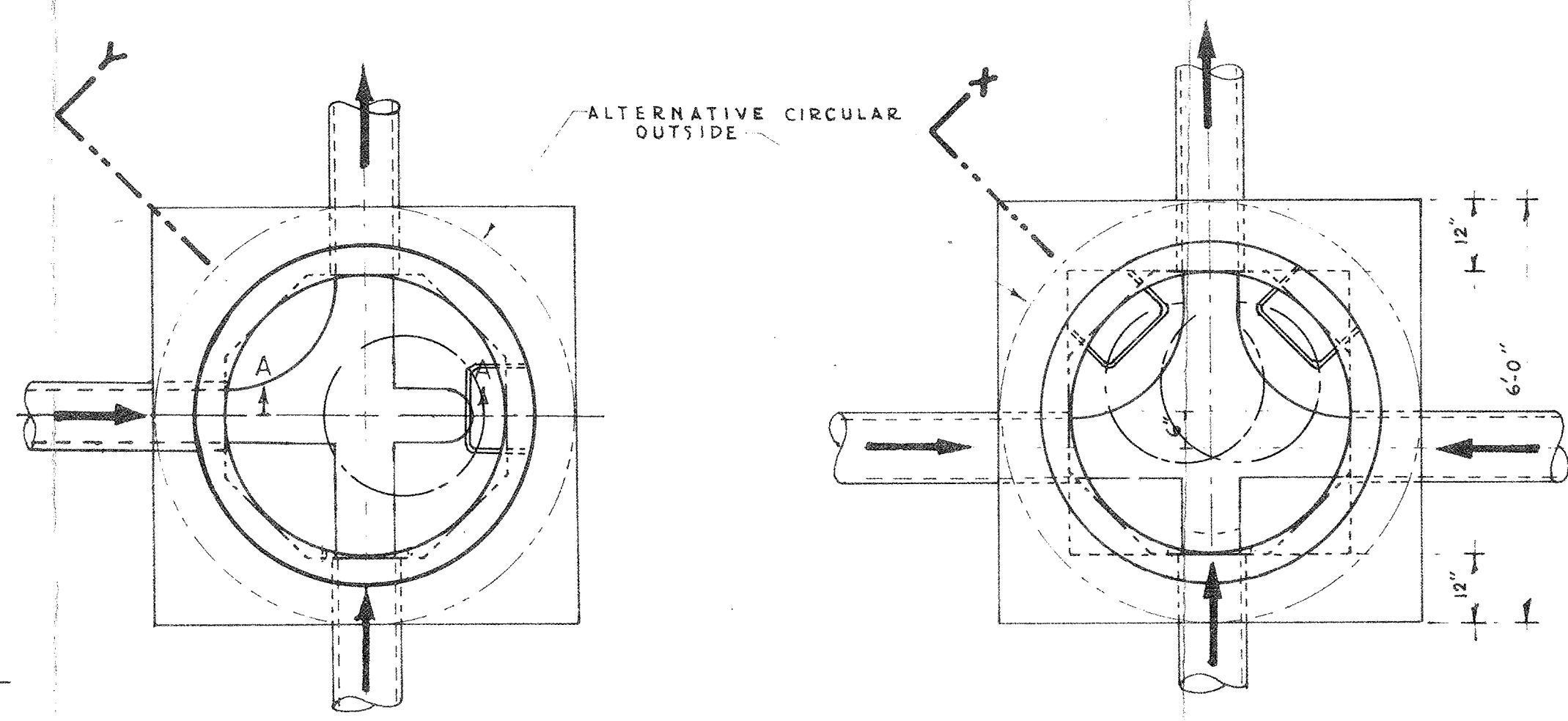
DESIGN BY: CITY ENGINEER'S DEPARTMENT	FIELD BOOKS: B-12
DRAWN BY:	SCALE: 1/2" = 1'-0" @ AS NOTED.
CHECKED BY:	DATE: NOVEMBER, 1973.
A. M. SPRIET & ASSOCIATES LTD. CONSULTING ENGINEERS LONDON ONTARIO	APPROVED BY: [Signature]
PROJECT NO.: 72038	CITY ENGINEER'S DEPARTMENT PROJECT No. 742/R33/1
DRAWING NO.: 16	DRAWING NO.: STD-1006



TYPICAL BASE

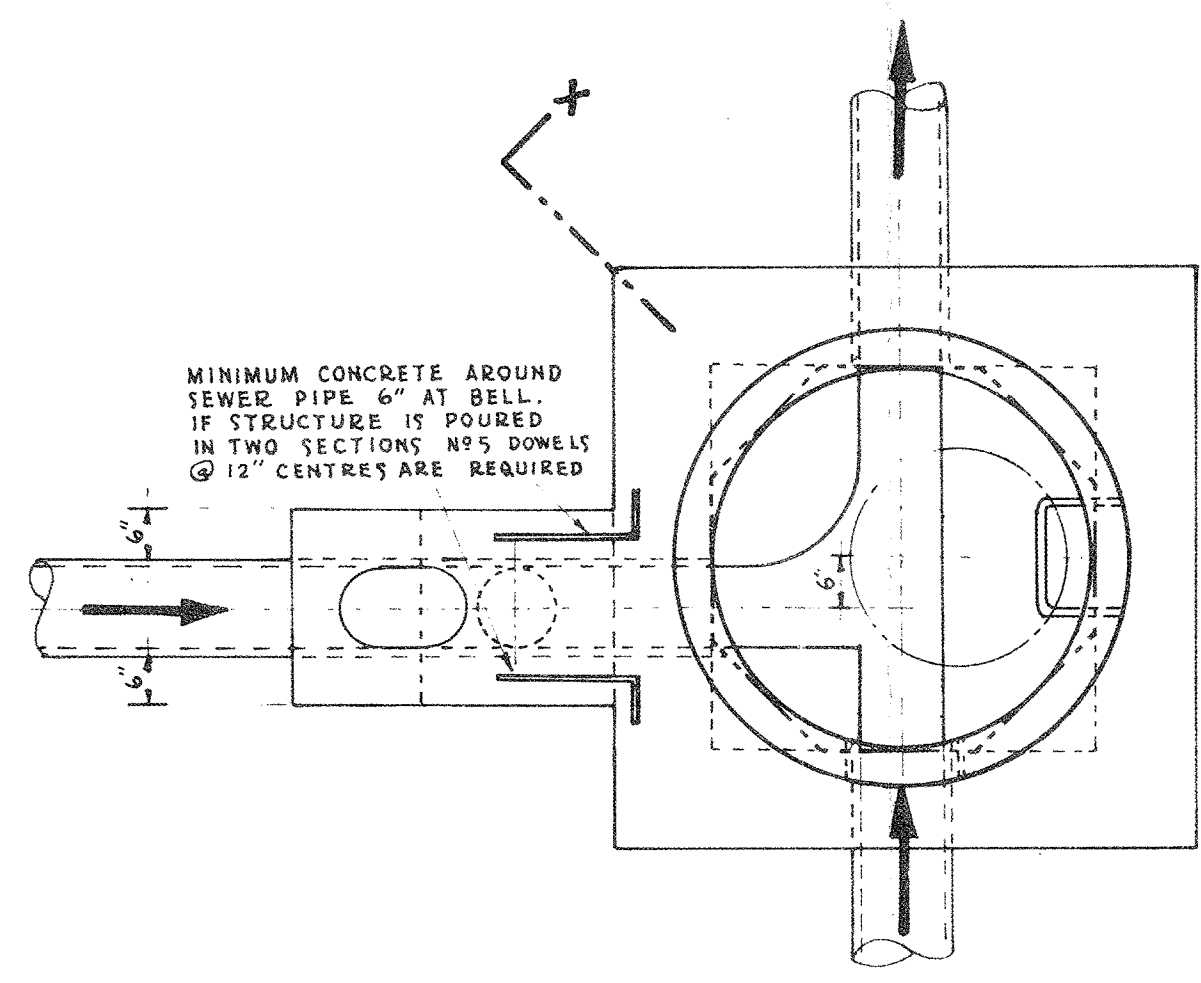
TYPICAL 90° BEND

SECTION A-A



TYPICAL SINGLE JUNCTION

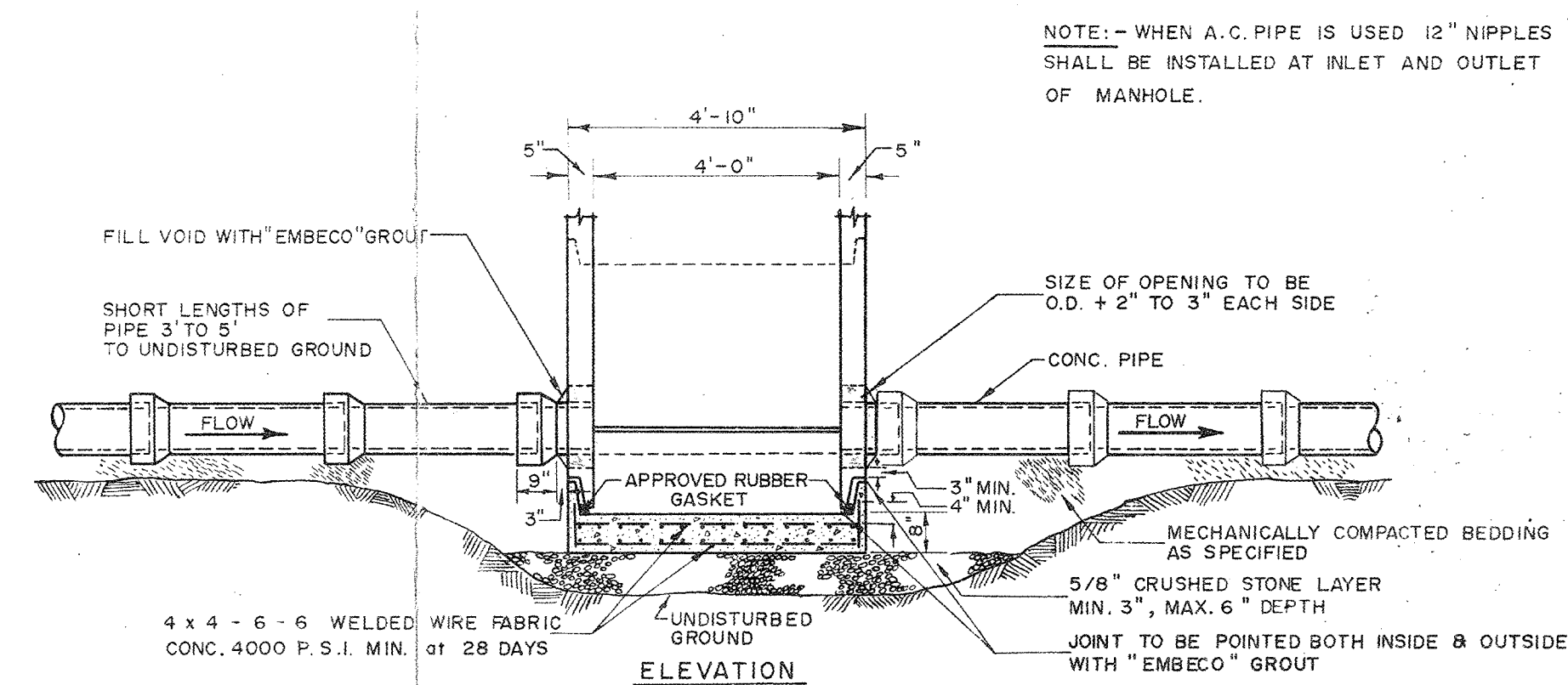
TYPICAL DOUBLE JUNCTION



TYPICAL DROP STRUCTURE

SIZE OF DROP PIPES	
D ₁	D ₂
27	21
24	21
21	18
18	15
15	12
12	10
10	8
8	8

TYPICAL CORBEL



STANDARD PRE-CAST MANHOLE BASE ALTERNATIVE FOR PIPE SIZES 8" TO 18"

SCALE: 3/8" = 1'-0" FOOT

NOTES

- For sewers larger than 18" diameter, City of London drawing STD-1007 shall be used.
- Poured base and walls to extend 6" above the crown of the highest pipe.
- Concrete to be a minimum of 3000 p.s.i. @ 28 days.
- City of London Standard manhole frame and cover STD-1003.
- All brick to meet the current City of London Standard see Specifications.
- All spaces between bricks are to be completely filled with mortar.
- All precast manhole sections to meet the current A.S.T.M. C 478 specifications.
- All construction joints in concrete to have 6" waterstop.
- Waterstops in construction joints may be omitted in dry trench conditions upon approval from the City Engineer's Department.
- Drop structures to be constructed when the manhole is difference in invert elevations in a manhole is 2'-0" or more for Sanitary Sewers, 3'-0" or more for Storm Sewers.
- When the drop from an incoming invert to the top of the manhole benching exceeds 5'-0", corbels shall be placed on the two walls adjacent to the ladder rungs. These corbels are to be 3'-6" below the invert of the incoming sewer.
- All manhole frames shall be adjusted to the finished road grade by means of metal shims at each corner. Metal shims are to be at least 3" x 8", and their thickness is to be determined by the adjustment required.
- On streets with curbs and gutters the space below the manhole frame and cover is to contain one of the followings:
 - 1 row of brick, A.S.T.M. C-32, Grade M.A.
 - 1 to 3 rows of bricks, A.S.T.M. C-32, Grade S.A.
 - concrete chimney without bricks, or with bricks as noted above.

PRECAST CONCRETE MANHOLES SIZES

PIPE SIZE	M.H. INSIDE DIA.	M.H. WALL THICKNESS
8" - 18"	48"	5" MIN.
21" - 24"	60"	6" MIN.
27" - 36"	72"	7" MIN.
39" - 48"	84"	8" MIN.

D.T.C. - TORONTO RECEIVED
 STRUCTURE SITE No. 19-264
 DEC 19 1973
 STRUCTURAL OFFICE

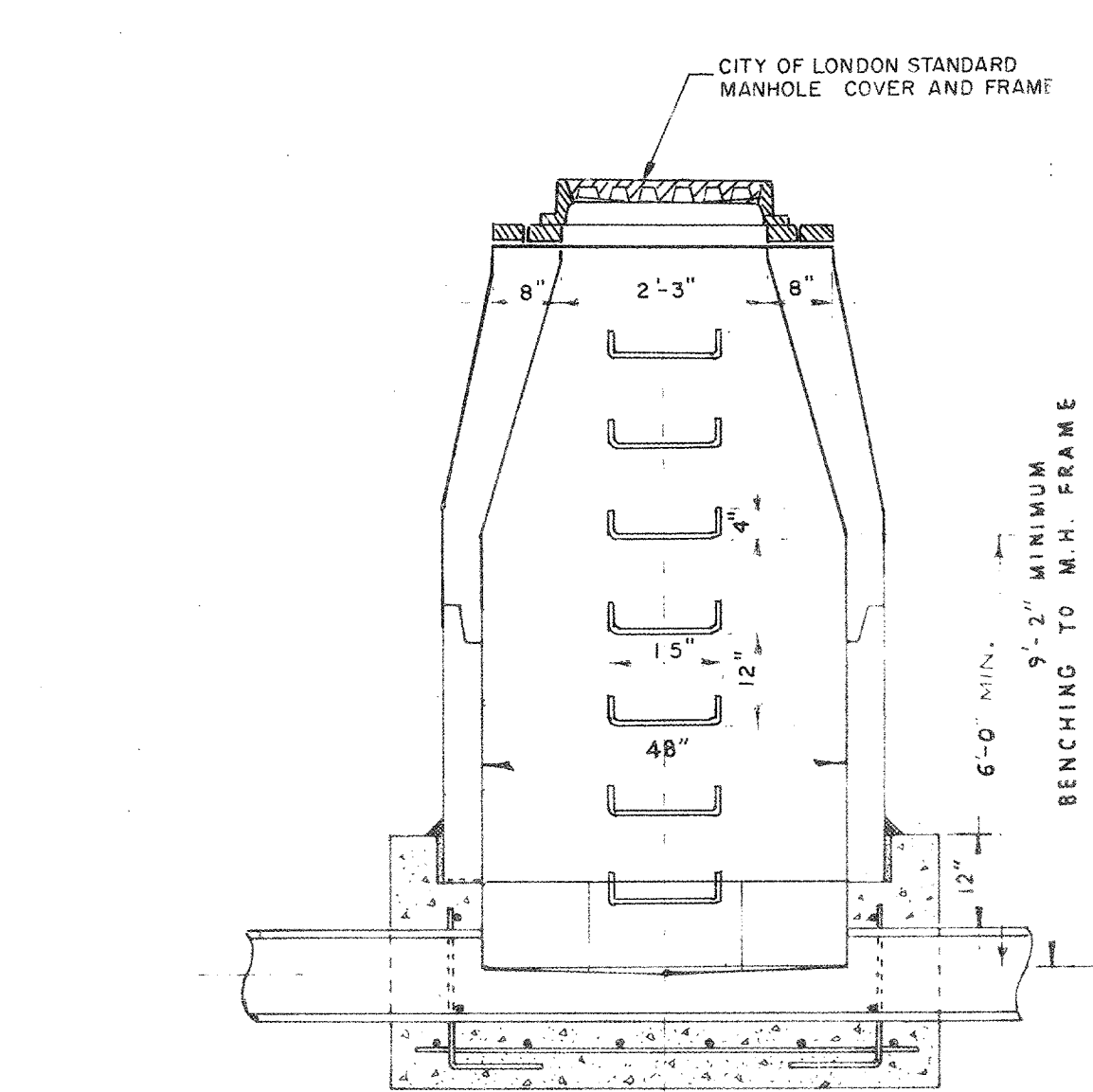
NO.	REVISIONS	DATE	BY
4	M.H. STEP RELOCATION - M.H. SIZES	MAY 73	S.W.S.
3	STD. PRE-CAST MANHOLE BASE	NOV'68	WRBHG.
2	SHIMS & No OF ROWS OF BRICKS	DEC'67	M.V.
1	DROP STRUCTURES & CORBELS	AUG'66	M.V.

CITY OF LONDON
 GRADE SEPARATION - C.N.R. - RIVERSIDE DR.
 STANDARD PRE-CAST CONCRETE MANHOLES FOR PIPE SIZES 8" TO 18"

DESIGN BY: CITY ENGINEER'S DEPARTMENT
 DRAWN BY: []
 CHECKED BY: []
 PROJECT NO.: 72038
 DRAWING NO.: 17

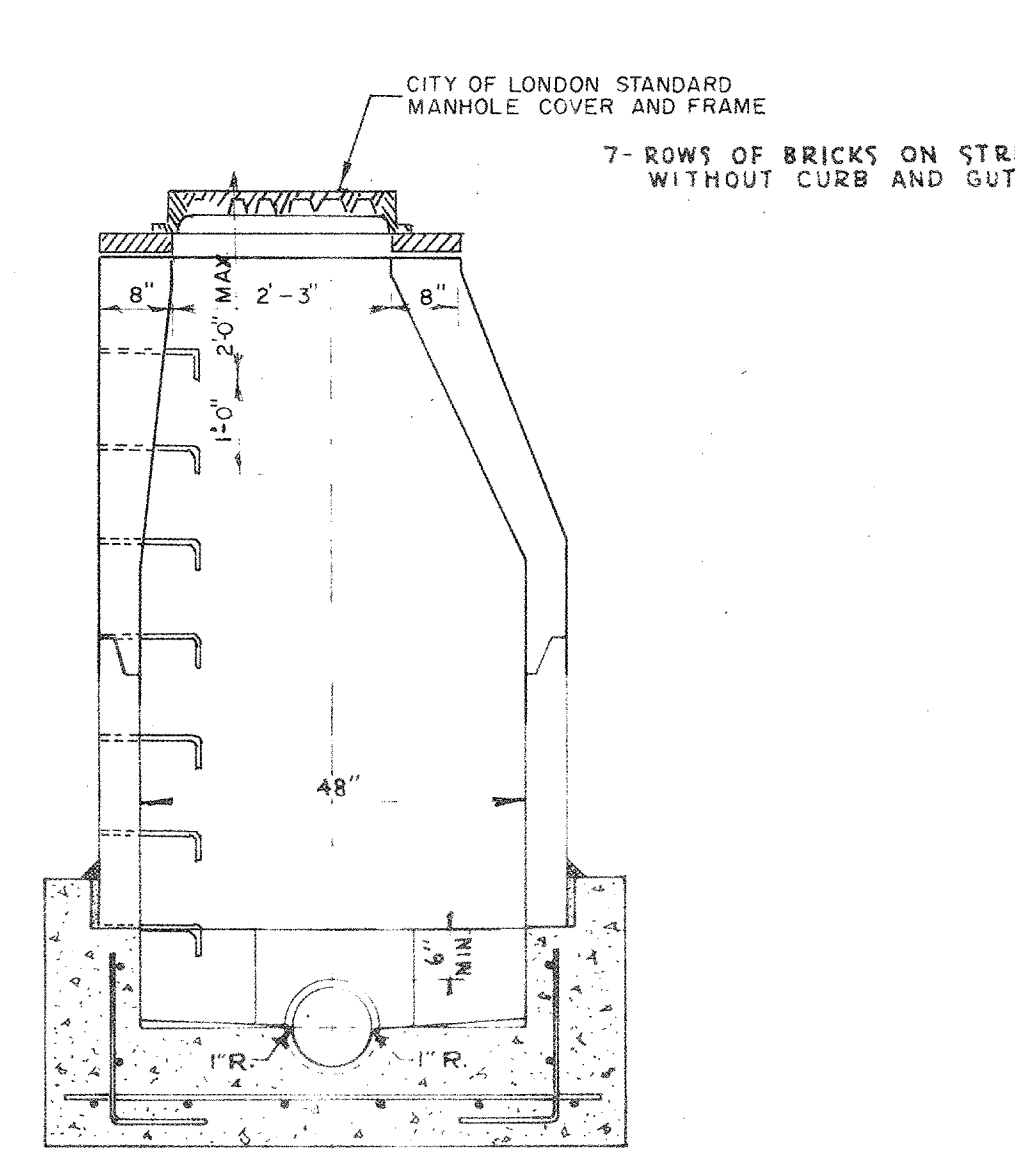
FIELD BOOK: NO 8-12
 SCALE: AS NOTED
 DATE: NOVEMBER, 1973.

APPROVED BY: [Signature]
 CITY ENGINEER'S DEPARTMENT
 PROJECT NO.: 742/R33/1
 DRAWING NO.: STD-1009

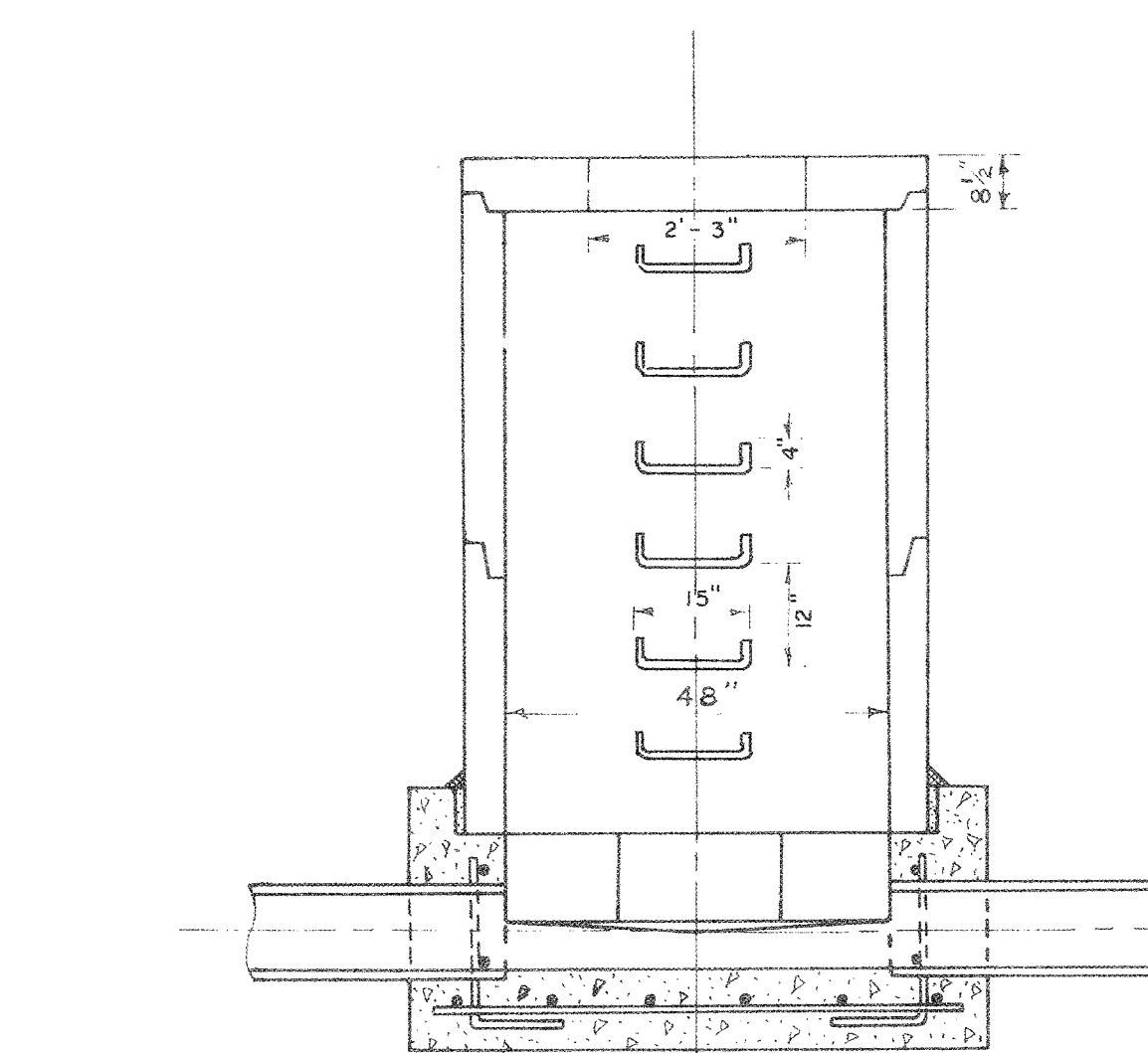


SEC A-A

TYPICAL TAPERED ECCENTRIC TOP OCTAGONAL BASE

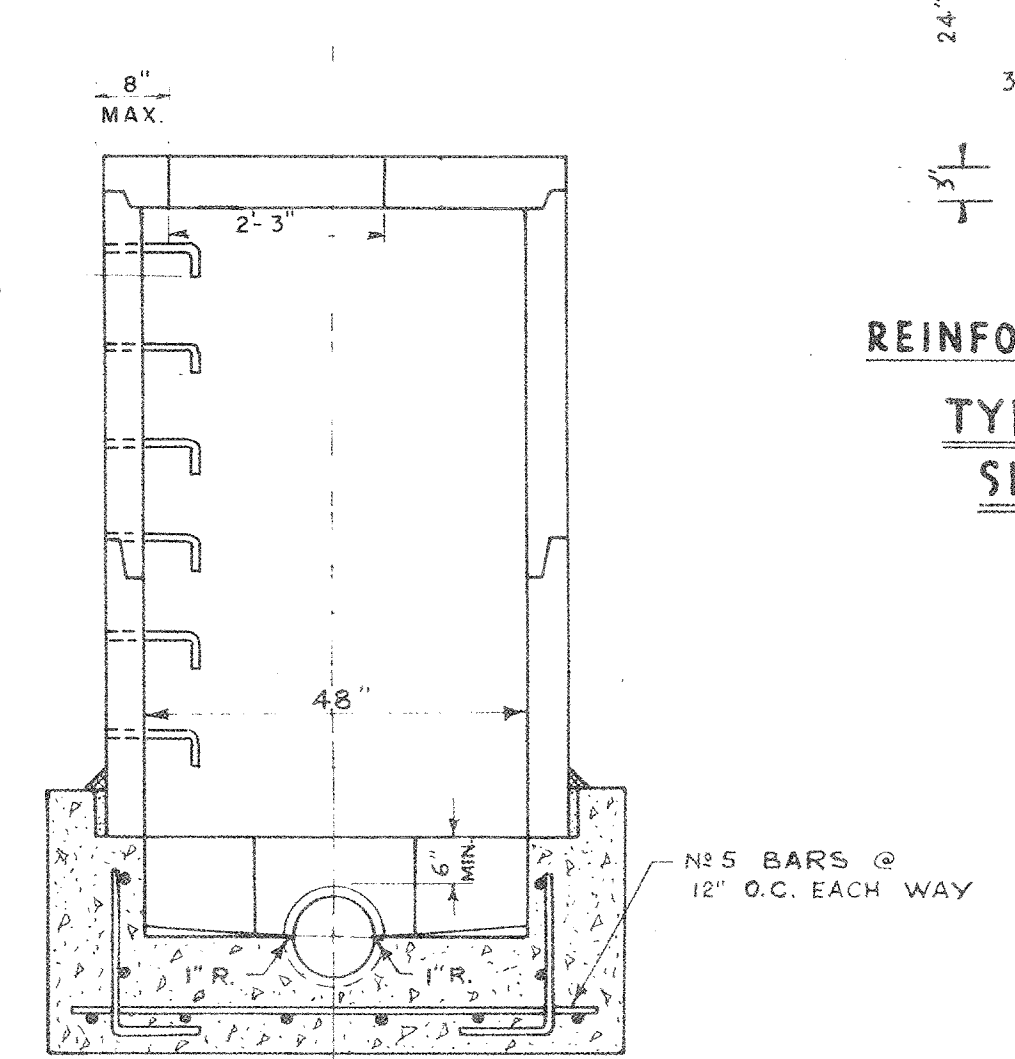


SEC B-B

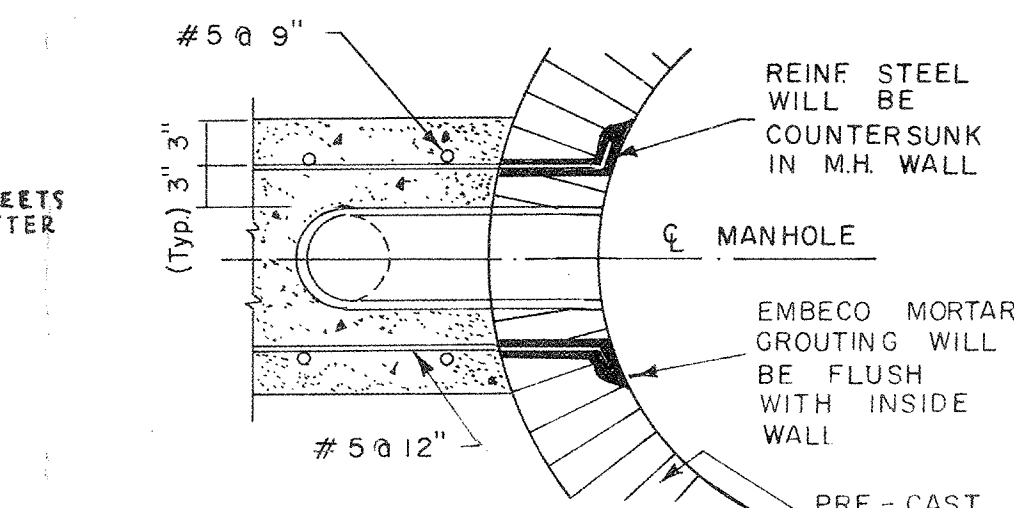


SEC A-A

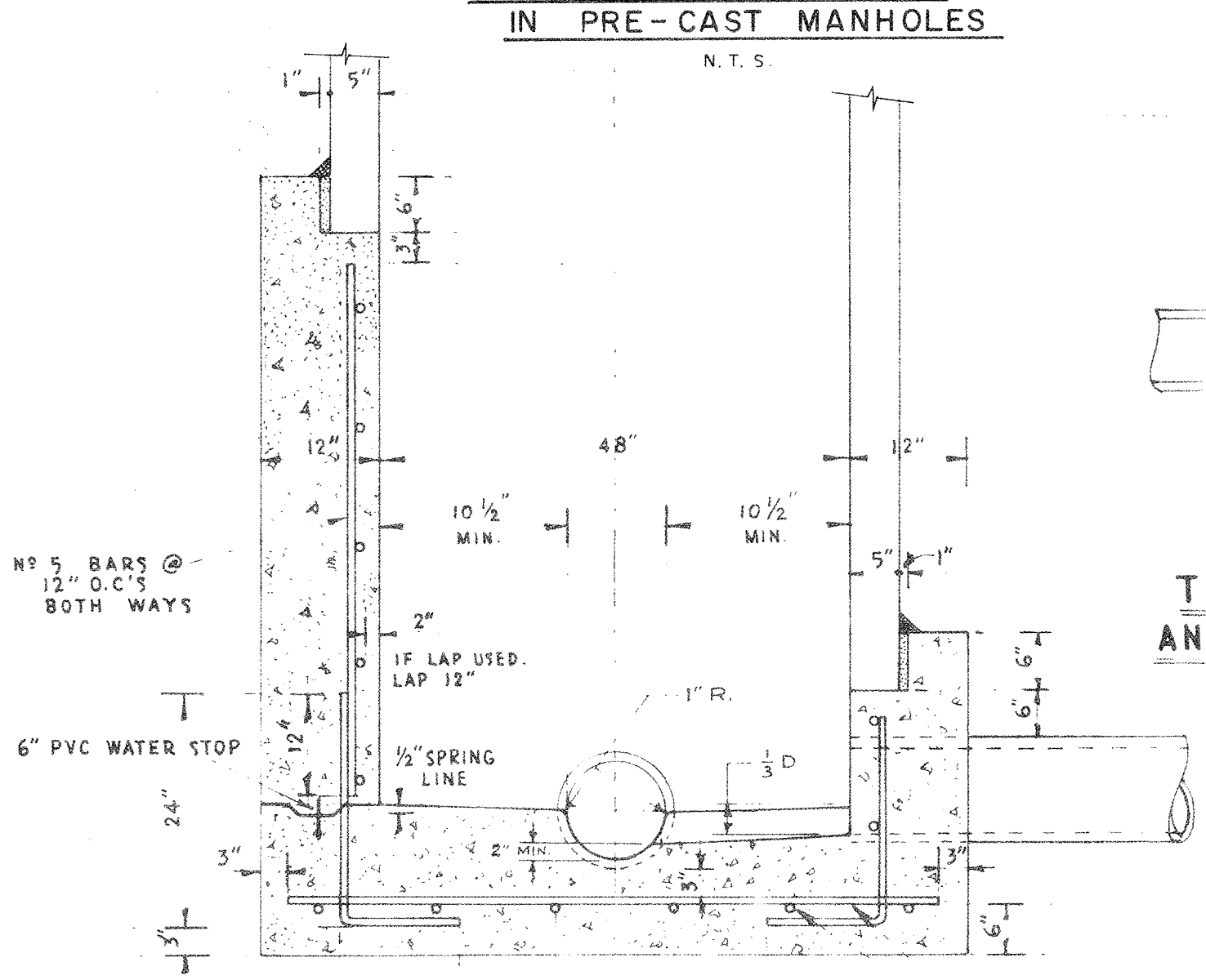
TYPICAL ECCENTRIC TOP OCTAGONAL BASE FOR SEWERS 8" TO 18" DIAMETER



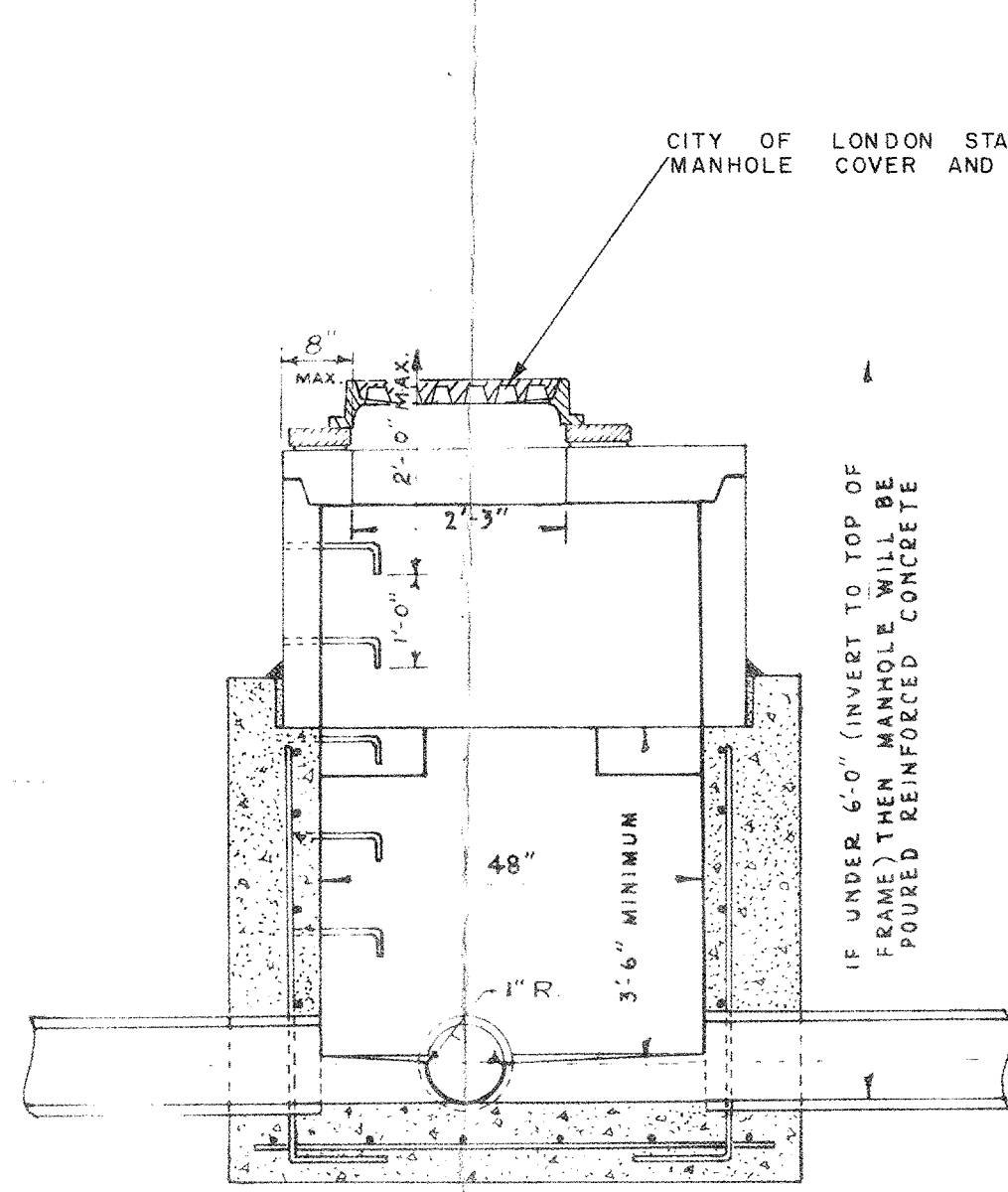
SEC B-B



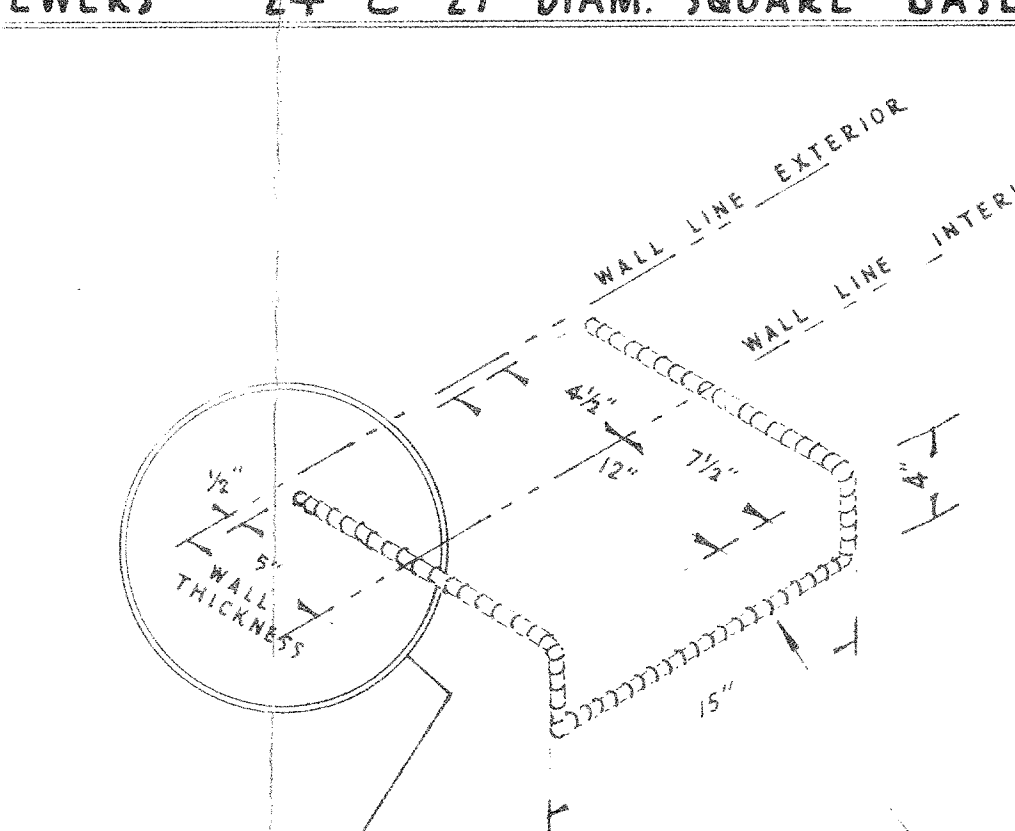
STEEL ARRANGEMENT FOR DROP STRUCTURES IN PRE-CAST MANHOLES N.T.S.



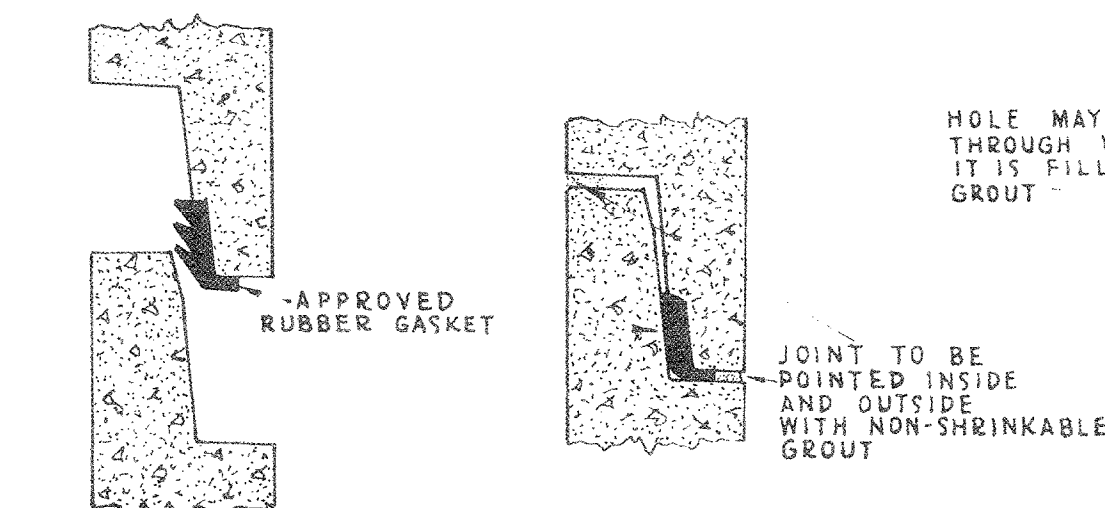
REINFORCING LAPPED NO LAPPING OF REINFORCING TYPICAL SECTION AT MANHOLE BOTTOM SHOWING BENCHING AND REINFORCING SCALE: 3/4" = 1'-0"



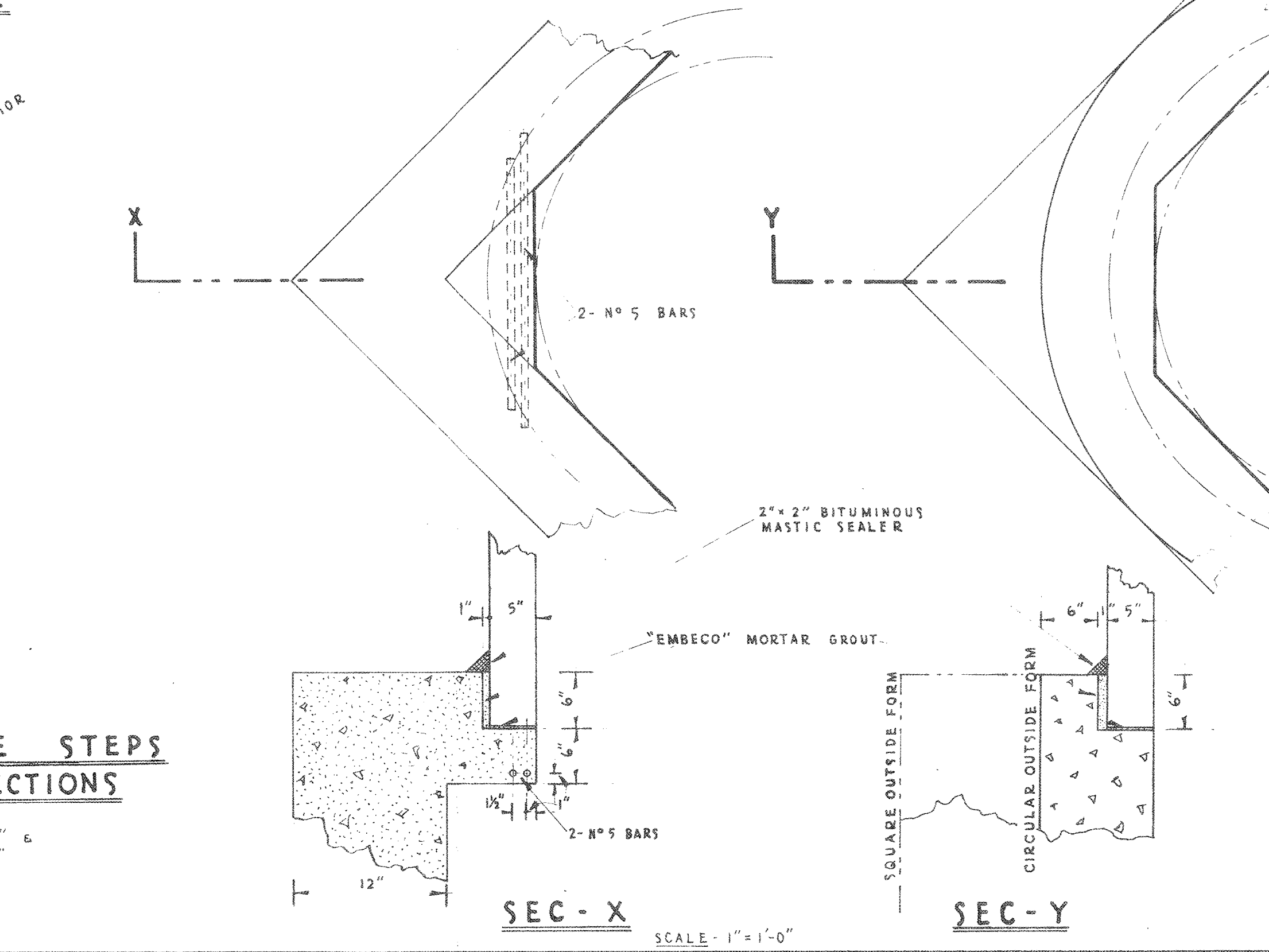
TYPICAL FOR DOUBLE JUNCTION AND SEWERS - 24" & 27" DIAM SQUARE BASE



STANDARD MANHOLE STEPS FOR PRECAST SECTIONS SCALES: 1/2" = 1'-0" & 3/4" = 1'-0"



TYPICAL JOINT



SEC - X

SEC - Y

SCALE: 1" = 1'-0"