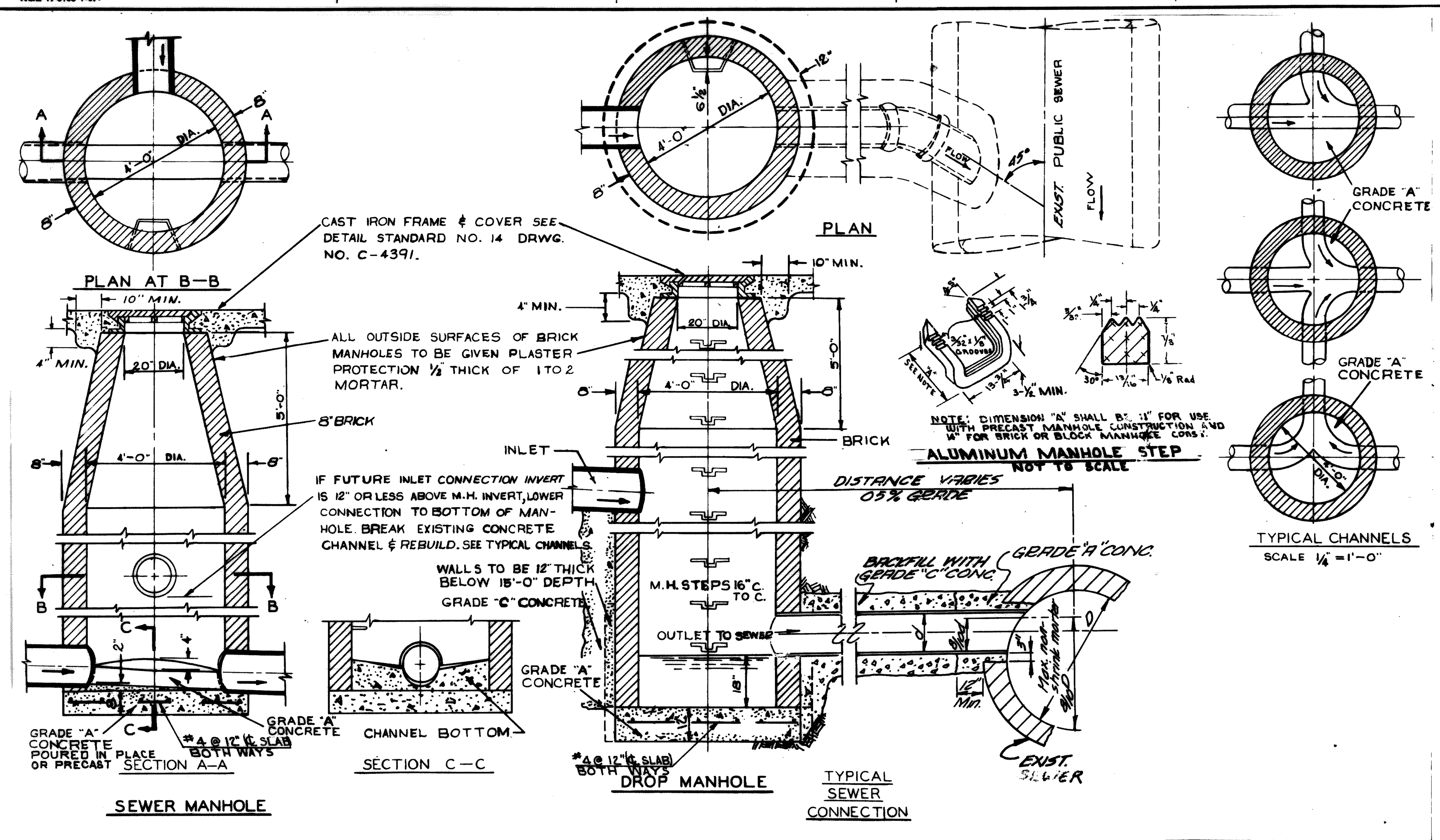


Rev'd. M.H. Steps & Base Slab			
First Add Conc. Full Section			
DESCRIPTION	DRW.	CKD.	APP. DATE
REVISIONS			

DESIGNED BY
DRAWN BY J. Clark
TRACED BY
CHECKED BY

APPROVED BY
ENGINEER OF STREETS
ASST. CITY ENGINEER
CITY ENGINEER

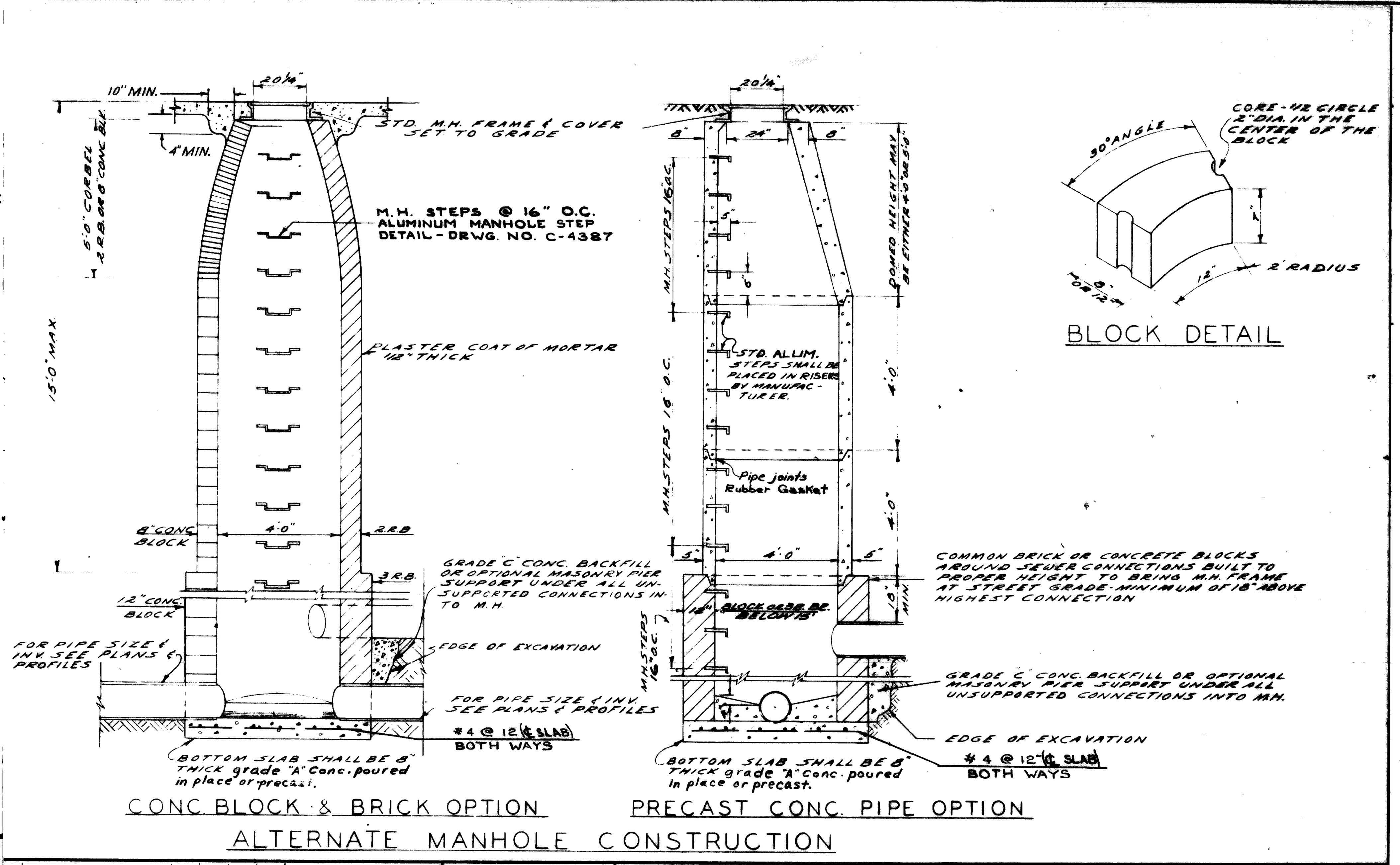
DETAILS OF STANDARD
SEWER & DROP MANHOLES

BOOK NO. PG. SCALE 3/8"=1'-0" DATE: 8-27-66

CITY OF DETROIT
DEPARTMENT OF PUBLIC WORKS.
CITY ENGINEER'S OFFICE
BUREAU OF DESIGN

DETAIL STANDARD NO. 10 DWG. NO. C-4387

1971 1970 1969 1968 1967



Revised bottom slab & steps	J.C.	G.B.	N.H.	
Changed Title				
DESCRIPTION	DRW.	CKD.	APP.	DATE
REVISIONS				

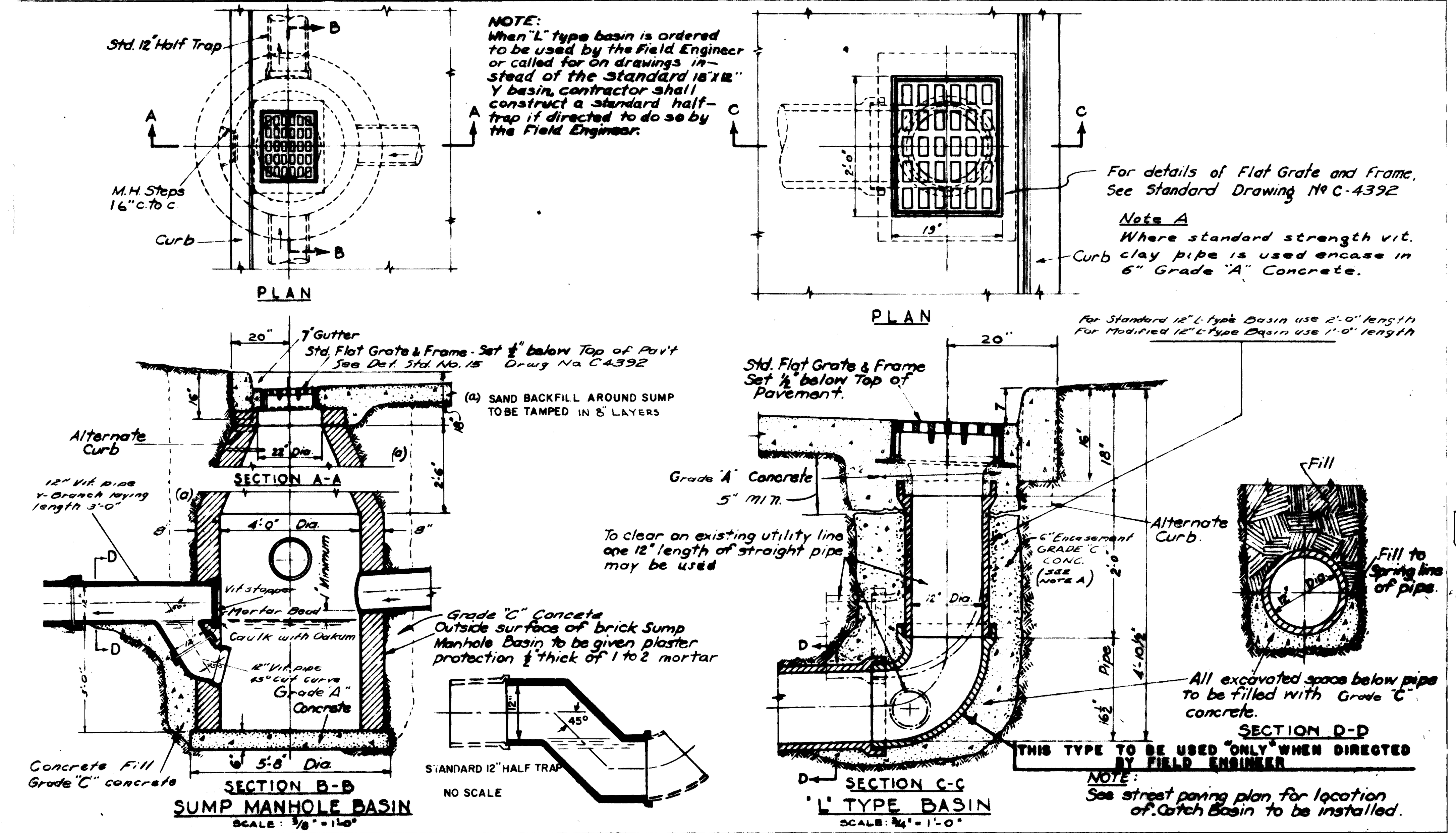
DESIGNED BY
DRAWN BY T.P. MIRIANI
TRACED BY
CHECKED BY Kawwas

APPROVED
ENGINEER OF STREETS
ASST. CITY ENGINEER
CITY ENGINEER

CITY OF DETROIT
DEPARTMENT OF PUBLIC WORKS
CITY ENGINEER'S OFFICE
BUREAU OF DESIGN
DETAIL STANDARD NO. 18

STD. SEWER MANHOLES
CONSTRUCTION ALTERNATES

BOOK NO. SCALE NONE
PAGE NO. DATE 3-29-63
DRG. NO. C-4395 A



Revised M.H. Steps	J.C.	G.B.	N.H.		
DESCRIPTION	DRW.	CKD.	APP.	DATE	
REVISIONS					

DESIGNED BY
DRAWN BY
TRACED BY
CHECKED BY Kawwas

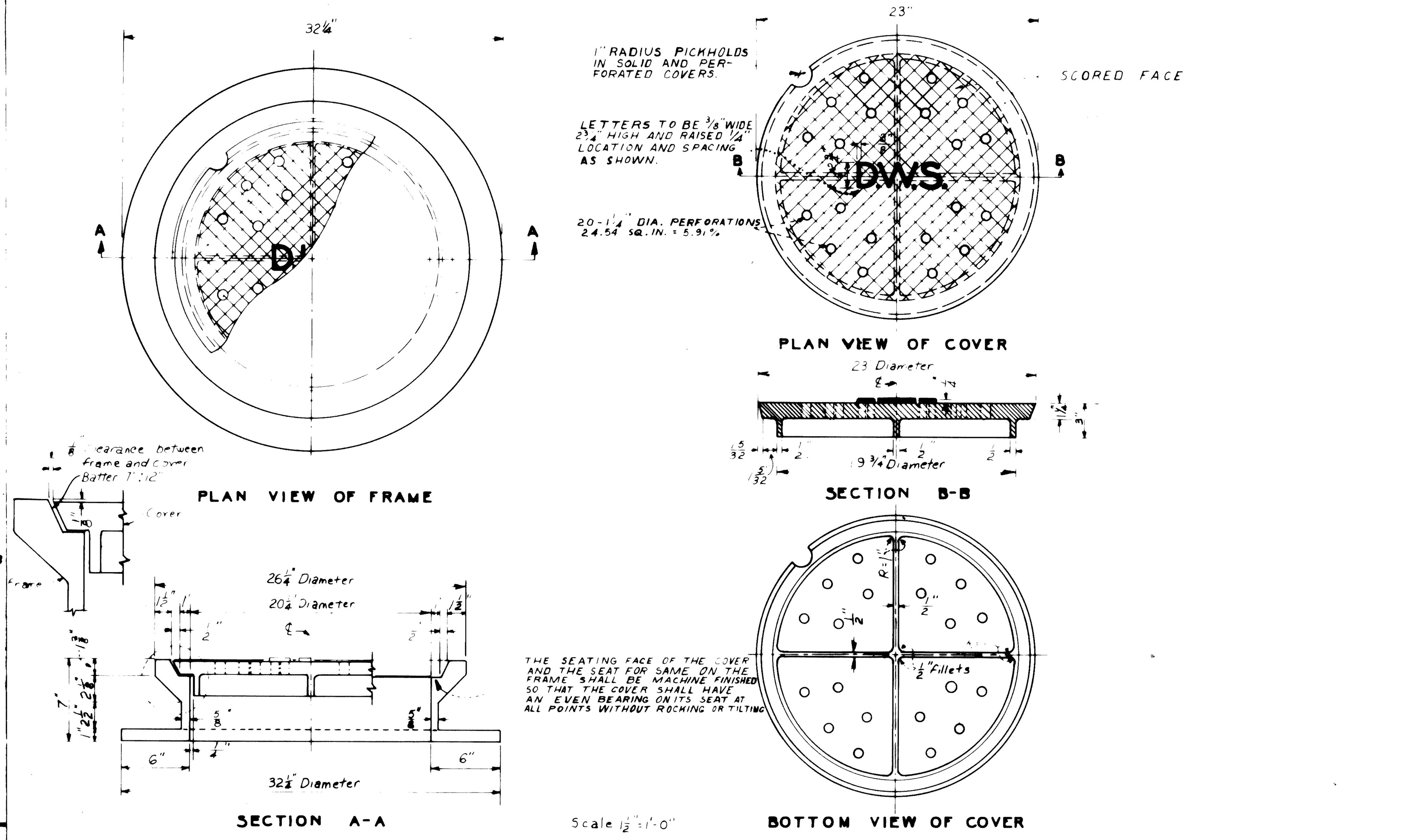
APPROVED
ENGINEER OF STREETS
ASST. CITY ENGINEER
CITY ENGINEER

TYPICAL
SUMP MANHOLE & "L" TYPE
CATCH BASINS

BOOK NO. PG. SCALE AS SHOWN DATE MAR. 2, 1959

CITY OF DETROIT
DEPARTMENT OF PUBLIC WORKS
CITY ENGINEER'S OFFICE
BUREAU OF DESIGN
DETAIL STANDARD NO. 12 DWG. № C-4388

1971 1970 1969 1968 1967 1966 1965 1964 1963 1962 1961 1960



Deleted "Detroit" From Cover			
DESCRIPTION	DRW.	CKD.	APP. DATE
REVISIONS			

DESIGNED BY
DRAWN BY Erickson
TRACED BY
CHECKED BY N. Kawwas

APPROVED
ENGINEER OF STREETS
ASST. CITY ENGINEER
CITY ENGINEER

DETAILS OF STANDARD
- MANHOLE FRAME AND COVER -

BOOK NO. SCALE: AS SHOWN DATE: OCTOBER 14, 1966

CITY OF DETROIT
DEPARTMENT OF PUBLIC WORKS
CITY ENGINEER'S OFFICE
BUREAU OF DESIGN
DETAIL STANDARD NO. 14 DWG. № C-43[illegible]

COORD.	DESCRIPTION	DRN.	CK'D.	APV'D. DATE

REVISIONS LOCATED BY COORDINATES ON SHEET

REFERENCE DRAWINGS

DESIGNED BY
DRAWN BY
TRACED BY
CHECKED BY

APPROVED:
ENGINEER OF EXPRESSWAYS

CITY OF DETROIT
CITY ENGINEERING DEPARTMENT

CIVIC CENTER PLAZA
ATWATER ST RELOCATION

MISC. DRAINAGE STRUCTURES

SHEET 21 OF 81 SHEETS
CONTRACT NO. 07105 A
ASSIG. NO. 2102 (B) X
DATE 8-11-75

R-11

QUANTITY SHEET – E

ITEMS	AS PER PLANS SHEET NO'S. TOTALS	UNITS	R-4 CONSTRUCTION SEQUENCE	R-5 REMOVALS	R-6 PLAN & PROFILES	R-8 UTILITY PLAN	W-1 WATER SYSTEM ALTERATIONS	AS CONSTRUCTED SHEET NO'S. TOTALS	UNITS	R-4 CONSTRUCTION SEQUENCE	R-5 REMOVALS	R-6 PLAN & PROFILES	R-8 UTILITY PLAN	W-1 WATER SYSTEM ALTERATIONS	
ROADWAY ITEMS															
Removing Pavement	2720	Sq Yds.		2720				6690	Sq Yds.		6690				A1016
Removing Curb	201	Lin Ft.		201				212	Lin Ft.		212				A1012
Removing Sidewalk	375	Sq Yds.		375				336	Sq Yds.		336				A1012
Removing Masonry & Concrete Structures	300	Cu Yds.		300				432	Cu Yds.		432				A1012
Abandoning Drainage Structures	5	Each		5				4	Each		4				A1012
Removing Bituminous Surface	207	Sq Yds.			207			168	Sq Yds.			168			A1012
Earth Excavation	8838	Cu Yds.			8838			10072	Cu Yds.			10072			A1012
Subgrade Undercutting with 22A Slag Backfill	1000	Cu Yds.			1000			0	Cu Yds.			0			A1012
22A Slag Backfill	1500	Cu Yds.			1500			0	Cu Yds.			0			A1012
Conc. Base Course - Nonreinf - 9" with Integral Curb	879	Sq Yds.			879			1213	Sq Yds.			1213			A1012
Bituminous Conc Levelling Course (C5A)	203	Tons			203			164	Tons			164			A1012
Bituminous Conc Wearing Course Type F	145	Tons	3		142			170	Tons			170			A1012
Bituminous Bond Coat (Not a Pay Item)	521	Gals	6		515				Gals						
Preparing Existing Pavement	Lump Sum	Lump Sum						Lump Sum	Lump Sum						
Conc. Pavement - Nonreinforced - 8"	42	Sq Yds.			42			46	Sq Yds.			46			A1012
Conc. Pavement - Reinforced - 9" with Integral Curb	150	Sq Yds.			150			0	Sq Yds.			0			A1018
Conc. Pavement - Double Reinforced - 9"	2512	Sq Yds.			2512			2517	Sq Yds.			2517			A1012
Conc. Pavement - Double Reinforced - 9" with Integral Curb	1872	Sq Yds.			1872			1893	Sq Yds.			1893			A1013
Temporary Conc. Pavement - Nonreinforced - 8"	35	Sq Yds.			35			30	Sq Yds.			30			A1012
12" Sewer C.76-III (Trench Detail 9)	68	Lin Ft.			68			73	Lin Ft.			73			A1012
12" Sewer C.76-III (Encased) (Trench Detail 9)	137	Lin Ft.			137			132	Lin Ft.			132			A1012
12" Sewer C.76-IV (Encased) (Trench Detail 9)	45	Lin Ft.			45			49	Lin Ft.			49			A1014
12" Ductile Iron Encased Pipe (Trench Detail 9)	190	Lin Ft.			190			195	Lin Ft.			195			A1014
Catch Basin "A"	1	Each			1			2	Each			2			A1001
Catch Basin "B"	5	Each			5			5	Each			5			
Manhole - Drop	1	Each			1			1	Each			1			
Adjust Drainage Structure Covers	3	Each			3			4	Each			4			A1014
12" Sewer Trap	1	Each			1			1	Each			1			
Concrete Curb Detail X	526	Lin Ft.			526			213	Lin Ft.			213			A1014
4" Concrete Sidewalk	4431	Sq Ft.			4431			4560	Sq Ft.			4560			A1014
6" Concrete Sidewalk	289	Sq Ft.			289			474	Sq Ft.			474			A1014
Sidewalk Ramps - Type I	160	Sq Ft.			160			108	Sq Ft.			108			A1014
Guard Rail Anchorage - Single	1	Each			1			1	Each			1			
Structural Guard Rail Anchorage - Type A	1	Each			1			1	Each			1			
Field Lab - Concrete Proportioning	1	Each			1			0	Each			0			A1014
Maintaining Traffic	Lump Sum	Lump Sum						1.5	Lump Sum						
Type II Barricade (Drums) Lighted	14	Each	14					14	Each	14					
Drum Guide Rail	350	Lin Ft.	350					125	Lin Ft.	125					A1014
Class A Sodding	1312	Sq Yds.			1312			1027	Sq Yds.			1027			A1014
Topsoil Surface (4" Min)	158	Cu Yds.			158			113	Cu Yds.			113			A1014
WATER SYSTEM ALTERATIONS															
12-In. Ductile Iron Water Main	934	Lin Ft.					934	942	Lin Ft.					942	A1014
12-In. Gate Valve	1	Each					1	1	Each					1	
12-In. Gate Valve Well	1	Each					1	1	Each					1	
8-In. Ductile Iron Water Main	62	Lin Ft.					62	60	Lin Ft.					60	A1014
6-In. Ductile Iron Water Main	92	Lin Ft.					92	95	Lin Ft.					95	A1014
3'-0" x 3'-0" Reinforced Conc. Encasement	573	Lin Ft.					573	571	Lin Ft.					571	A1014
2'-0" x 2'-0" Reinforced Conc. Encasement	140	Lin Ft.					140	130	Lin Ft.					130	A1014
6-In. Fire Hyd (Incl. 6-In Gate Valve, Gate Box & Related Piping)	2	Each					2	2	Each					2	
Adjust Gatewell Manhole Cover	2	Each				2		2	Each				2		
Abandon Manhole (Electrical)	4	Each			4			1				1			A1014
On the Job Training	4	Each	4					1.75		1.75					A1014
EXTRA: BULKHEAD 15" SEWER LUMP SUM @ 700.00								†700.00	DLRS						A2001
72" CHAIN LINK FENCE LUMP SUM @ 1383.40								†1,383.40	DLRS						A2002
SUPPLEMENTAL VENTILATION 1 @ 9950.00								1	UNIT						A2009
INSTALL & LATER REMOVE 6 CHAIN LINK FENCE WITH BARBED WIRE AT TUNNEL OPENINGS 1 @ 1370.00								1	$						A2010
FIREPROOFING CABLES 1 @ 3956.12								1	EACH						A2011
WIRING OF FAN INTAKE DAMPER MOTORS 1 @ 3655.25								1	EACH						A2012

CHECKED
CONTRACT SECTION
DATE

PLAN ESTIMATE BY _____ DATE _____ CHECKED BY I. KU DATE _____ DATE _____ DATA COMPLETED _____ PROJ. ENG DATE 12-11-75 HISTORY CHECKED ENTERED ON PLANS BY _____ DATE 12-11-75

ATWATER ST. RELOCATION 8-11-75 SHEET NO. 22 OF 81

CONTRACT Nº 07105A ASSIGNMENT Nº 2102 (B) X R-12

GENERAL NOTES

All Water Main construction shall be performed with materials and workmanship of the highest quality for the particular purpose and shall strictly conform to the current standards and specifications of the Detroit Metro Water Department.

Pavement removal and replacement, excavation and backfill for the entire work, including that for work to be done by the D.M.W.D., shall be done by the contractor.

The contractor shall furnish all waterworks material required for the entire work, including materials for work indicated on the drawings to be done by the D.M.W.D., except for materials for services 2-inch in diameter or smaller.

After the newly constructed Water Mains have been satisfactorily pressure tested, flushed and chlorinated, the contractor shall make all connections to existing Water Mains, unless otherwise noted or shown on the drawings.

Service connections, 2-inch in diameter or smaller, and their relocations will be made by D.M.W.D. Abandoned water services 2-inch in diameter or smaller on Existing Water Mains to remain in service will be abandoned at the Existing Water Mains by D.M.W.D. Services to be abandoned at the Existing Water Main or to be reconnected to the New Water Mains are not all shown on the plans.

Existing Water Mains, as shown, indicate approximate locations only as shown by D.M.W.D. records and no guarantee is made as to completeness or accuracy.

Exact elevations of Existing Water Mains are not known. Approximate elevations shown on the profiles are based on the assumption of 5 feet average depth. The grades of the Proposed Water Mains are subject to change to suit actual elevations of Existing Water Mains.

The locations and elevations of existing utilities are shown in accordance with available data received from utility companies. The Contractor shall expose these utilities, where required to determine actual locations.

Other utilities may be making alterations to their existing systems in the vicinity of the Water Main construction shown on the plans. These utilities should be consulted for the latest information regarding the location of their facilities.

A minimum clearance of one foot vertically and three and one half feet horizontally shall be maintained between the Water Main and other utilities, unless otherwise shown on the plans or approved by the Engineer. If a conflict is indicated between the Water Main and any other utility, that utility should be consulted.

The location of Fire Hydrants, as shown, are approximate. D.F.D. will give exact location of New or Relocated Fire Hydrants prior to installation.

Elevation Datum is City of Detroit Datum.

Pipe shall have Bell and Spigot Joints designed for sealing with a Rubber Gasket such as "Tyton" "Super Bell Tight" or approved equal except that Line Valves, Hydrant Connections and Hydrant Valves shall have leaded joints in accordance with D.M.W.D. Specifications.

The Drawings indicate the arrangement, general design and extent of the Water Main alterations. The Mains and connections are shown, more or less, in diagram and in their general locations, except where in certain cases the Drawings may include details giving the exact location and arrangement. Due to the small scale of the Drawings, it is not possible to indicate all offsets, fittings, valves and accessories that are required. The Contractor shall carefully investigate the structural and other conditions affecting all the work and shall arrange and perform his work under this Contract accordingly, furnishing and installing such items of material as may be required to meet such conditions.

In compliance with Public Act 53 of the State of Michigan (Effective Aug. 1, 1974), the Contractor shall notify in advance of construction all public and private owners having existing facilities in or near the immediate working area. For convenience the known utility owners are listed on this sheet. This listing does not, however, relieve the Contractor of the responsibility of verifying utility locations and notifying all utility owners and Miss Dig (Phone 6477-344 in Area Code 313).

The Detroit Edison Co. 2000 Second Avenue Detroit, Michigan 48226 Overhead 644-3040 Underground 962-2100	Mich. Consolidated Gas Co. One Woodward Avenue Street Department 10th. Fl. Detroit, Michigan 48226 Phone 965-2430	Mich. Bell Telephone Co. 29350 Southfield Rd., Rm. 25 Southfield, Michigan 48076 Phone 353-9942	Public Lighting Comm. 7500 Joseph Campau Detroit, Michigan 48211 Phone 875-0972

CONSTRUCTION NOTES

All Water Main work performed by the Contractor must be inspected by the D.M.W.D. during construction.

Encasements and Thrust Blocks shall be poured against undisturbed earth. Bottom 3" of Encasement may be poured separate from Encasement and used as a sub-footing.

All Encasements and Thrust Blocks shall terminate at the face of pipe bells.

Removal of abandoned Water Mains as required for clearance to construct the proposed Water Mains shall be done by the contractor.

The Contractor shall expose existing Water Mains at points of connection and verify their location prior to pipe laying, so that minimum work will be required.

Thrust Blocks will be required at all bends greater than 11¼° for C.I. or D.I. Water Mains. Vertical Thrust Blocks for all top bends will require reinforcing steel.

Contractor shall construct all Concrete Thrust Blocks and Gate Wells.

The Contractor shall perform the work required to connect or disconnect water mains at junctions with the existing system which is to remain in service, except as otherwise shown. Valve operations, installation of Hydrants connecting to existing, or new Water Mains, shall be included in the Contractors Work. Flushing and chlorination will be included in D.M.W.D. work. The Contractor shall perform all other work in conjunction with D.M.W.D. work. Contractor's work includes Earth Excavation, Disposal, Backfill, Sheeting, Bracing, Pumping and Drainage required for maintenance of trench and for disposal of waste water; Barricades, Traffic Control, Material handling and Standby assistance (including crane work required), Pavement Removal and Replacement, Thrust Blocks Encasements and Gate Wells.

The Contractor shall cut and cap or plug existing Water Mains to remain in service where required.

All 4" C.I. Blow-off Assemblies, C.I. Plugs and Caps to be installed and/or removed by Contractor have not been shown on the drawings.

The Contractor shall remove all temporary C.I. Plugs, Tees and Blow-off Assemblies at points of water main connections unless otherwise specified.

The Contractor shall install all Pipe and Fittings necessary to complete the connections required on this Contract.

Proposed construction work by other Utility Companies as shown on these drawings, is in accordance with information supplied by the Utility Company. The D.M.W.D. does not guarantee the completeness or accuracy of locations of Proposed Utility Work by others. The Contractor shall make his own investigation regarding such work.

Outline of demolished building substructures as shown on the drawings are based on the best available information. We do not guarantee that these or other underground substructures are or are not present.

Existing Water Mains to be cut and abandoned for new Water Main construction shall be bulkheaded with a minimum 8" thickness of concrete or brick, mortared in place.

WATER SYSTEM ALTERATION QUANTITIES	
DESCRIPTION OF ITEM	QUANTITIES AND PAY UNIT
12-inch Ductile Iron Water Main	934 lin.ft.
12-inch Gate Valve	1 each
12-inch Gate Valve Well	1 each
8-inch Ductile Iron Water Main	62 lin.ft.
6-inch Ductile Iron Water Main	92 lin.ft.
3'-0"x3'-0" Reinforced Conc. Encasement	573 lin.ft.
2'-0"x2'-0" Reinforced Conc. Encasement	140 lin.ft.
6-inch Fire Hydrant (including 6-inch Gate Valve, Gate Box & Related Piping)	2 each

LEGEND

- New Water Main — under 24" — 24" and over
- Existing Water Main — under 24" — 24" and over
- New Water Main Connection by D.M.W.D.
- Water Mains to be abandoned
- New Gate Valve and Well
- Existing Gate Valve and Well
- New Hydrant or relocated Hydrant
- Existing Hydrant
- Existing Sewer or Drain — under 24" — 24" and over
- Gas Main
- Telephone or Telegraph Conduit or Underground Cable
- Electric Power Conduit or underground Cable
- Petroleum Products Line
- Steam Line
- Trees — Size
- Utility Pole — Owner
- Boulevard Light
- Police or Fire Alarm Box — P.B. — F.B.
- Traffic Signal
- Mail Box, Parking Meter, or small sign
- Large Sign
- Gas Stop or Drip
- Catch Basin — Proposed — Existing
- Sewer Manhole — Proposed — Existing
- Pole Anchor
- Elevation Control Monument — B.M.
- Existing Ditch
- Section Line
- Freeway Right of Way Line
- Fence
- Continuous Sidewalk

REVISIONS			
CO.OR.	DESCRIPTION	APRVD.	DATE
F			
E			
D			
C			
B			
A			

DESIGNED BY
DRAWN BY
CHECKED BY [signature] 4/28/75
8-11-75

APPROVED
[signature]
DIRECTOR OF ENGINEERING
[signature]
CHIEF ENGINEER

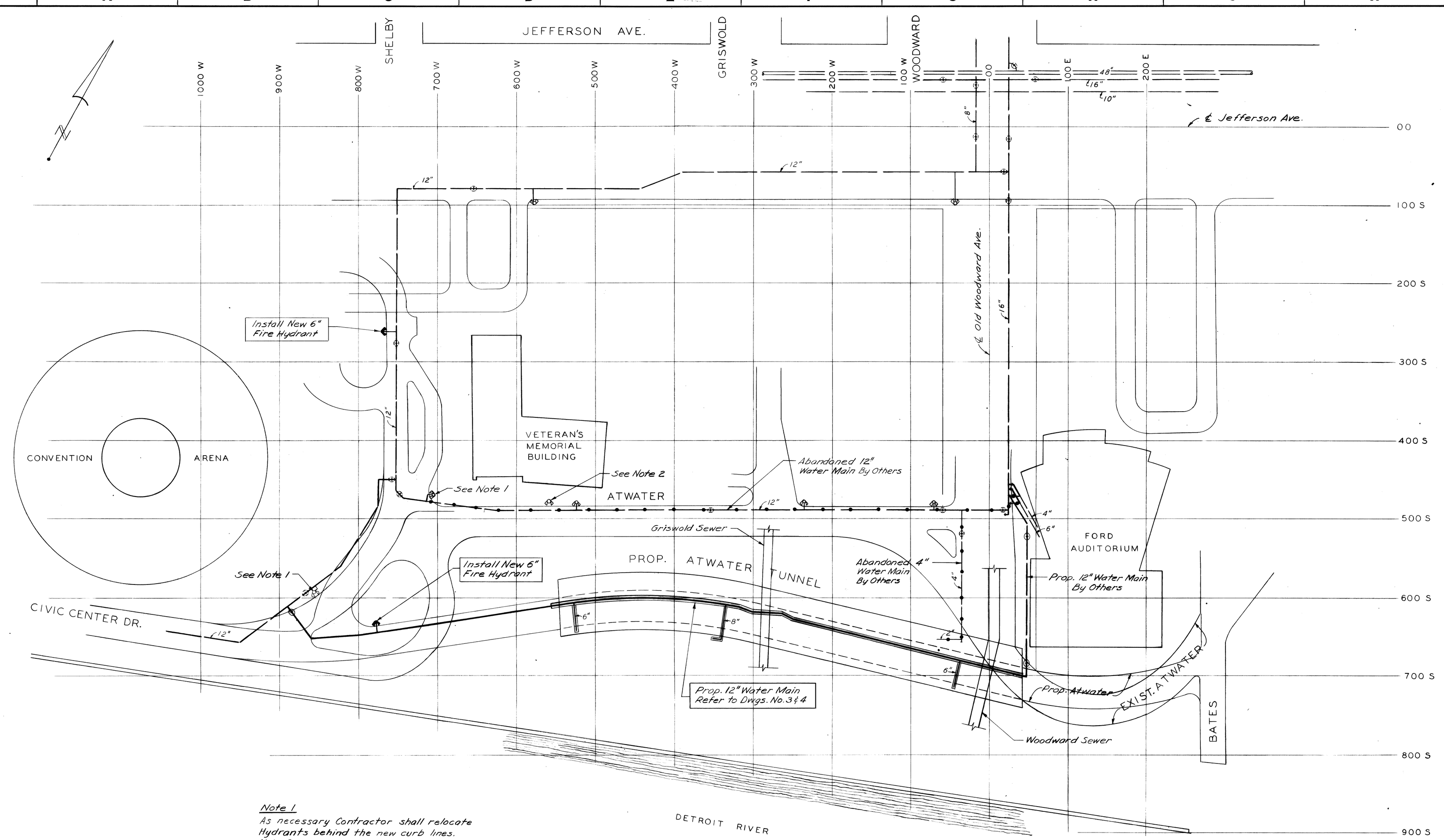
CIVIC CENTER PLAZA - PHASE II
WATER SYSTEM ALTERATIONS
GENERAL NOTES
AND QUANTITIES

SCALE
DATE FEBRUARY, 1975

DETROIT METRO WATER DEPARTMENT
ENGINEERING DIVISION

SECTION MAP | TOWN | RANGE | SECTION | PORTION CODE | WORK ORDER NO. D-010

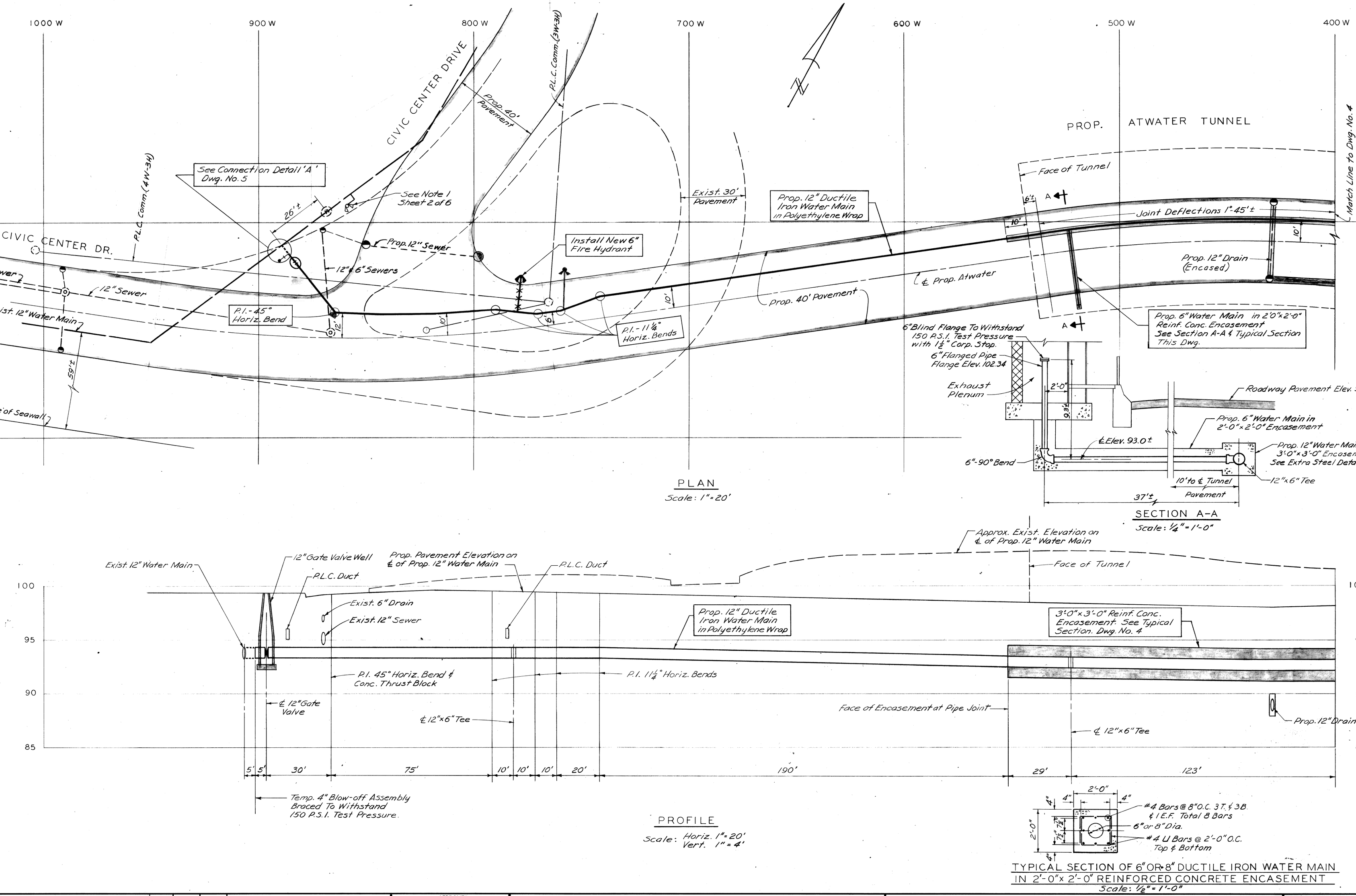
M.D.P.H. PERMIT NO.
FED. REF. NO.
CONTRACT NO.
DRAWING NO.
SHEET 23 OF 81
W-1



Note 1
As necessary Contractor shall relocate Hydrants behind the new curb lines.
Note 2
In addition to other hydrants to be removed from abandoned 12" main in Atwater, the Contractor shall remove existing high pressure hydrant.

DESIGNED BY		APPROVED	CIVIC CENTER PLAZA - PHASE II	DETROIT METRO WATER DEPARTMENT
DRAWN BY R.T.D.		W. Wilson Emmanuel	WATER SYSTEM ALTERATIONS	ENGINEERING DIVISION
CHECKED BY 1/28/75 8-11-75		DIRECTOR OF ENGINEERING	GENERAL PLAN	M.D.P.H. PERMIT NO.
CO-OR.	DESCRIPTION REVISIONS	APRVD. DATE	CHIEF ENGINEER	SCALE 1" = 60' DATE FEBRUARY, 1975
				SECTION MAP 20 J-1 · TOWN · RANGE · SECTION · PORTION CODE · WORK ORDER NO. D-010
				FED. REF. NO. · CONTRACT NO. · DRAWING NO. SHEET 24 OF 81

W-2



F				DESIGNED BY	APPROVED
E				DRAWN BY R.T.D.	
D				CHECKED BY D.V. 1/28/75	DIRECTOR OF ENGINEERING
C				8-11-75	
B					CHIEF ENGINEER
A	AS BUILT	N.O.W.	9-84		
CO-OR.	DESCRIPTION REVISIONS	DWN. APRVD.	DATE		

CIVIC CENTER PLAZA - PHASE II
WATER SYSTEM ALTERATIONS
ATWATER TUNNEL
PROPOSED 12-INCH WATER MAIN

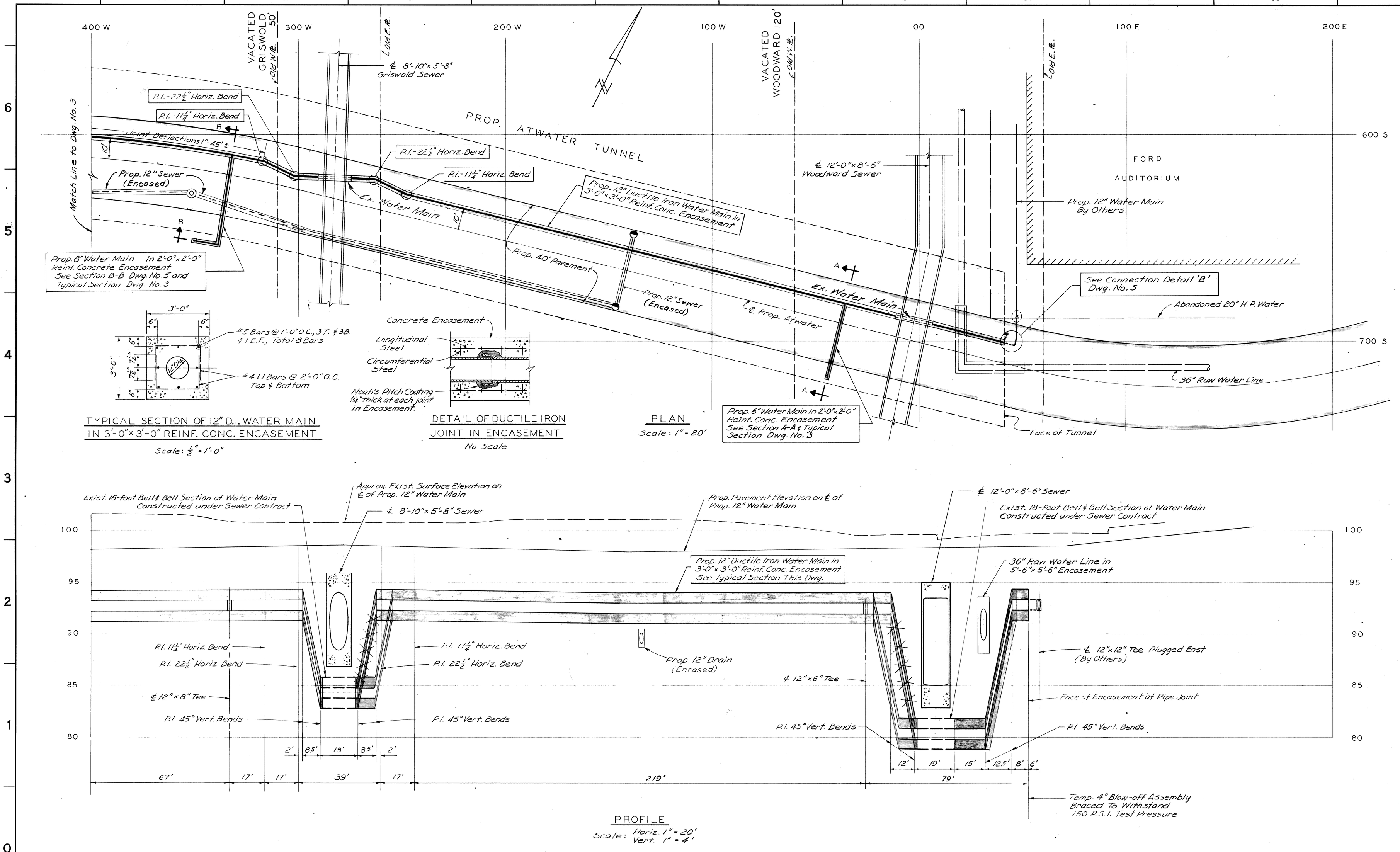
SCALE AS SHOWN DATE FEBRUARY, 1975

DETROIT METRO WATER DEPARTMENT
ENGINEERING DIVISION

M.D.P.H. PERMIT NO.
FED. REF. NO.
CONTRACT NO.

SECTION MAP	TOWN	RANGE	SECTION	PORTION CODE	WORK ORDER NO.	DRAWING NO.
20 J-1					D-010	SHEET 25 OF 81

W-3



TYPICAL SECTION OF 12" D.I. WATER MAIN IN 3'-0"x 3'-0" REINF. CONC. ENCASEMENT

Scale: ½" = 1'-0"

DETAIL OF DUCTILE IRON JOINT IN ENCASEMENT

No Scale

PLAN

Scale: 1" = 20'

PROFILE

Scale: Horiz. 1" = 20' Vert. 1" = 4'

F					
E					
D					
C					
B					
A	AS BUILT	N.O.W.		9-84	
	CO-OR.	DESCRIPTION REVISIONS	DWN.	APRVD.	DATE

DESIGNED BY

DRAWN BY R.T.D.

CHECKED BY A/C 11/28/75

8-11-75

APPROVED

H. Wilson EMB

DIRECTOR OF ENGINEERING

CHIEF ENGINEER

CIVIC CENTER PLAZA - PHASE II
WATER SYSTEM ALTERATIONS
ATWATER TUNNEL
PROPOSED 12-INCH WATER MAIN

SCALE AS SHOWN

DATE FEBRUARY, 1975

DETROIT METRO WATER DEPARTMENT
ENGINEERING DIVISION

M.D.P.H. PERMIT NO.

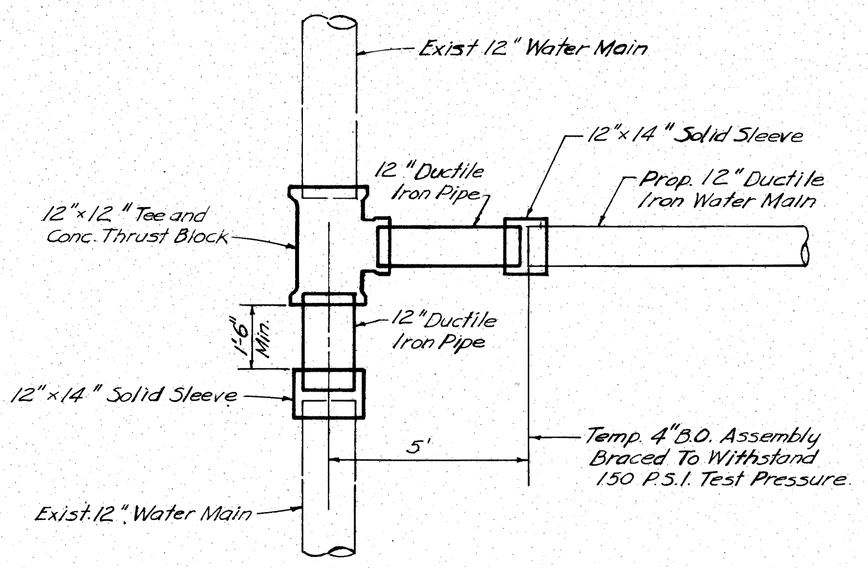
FED. REF. NO.

CONTRACT NO.

SECTION MAP	TOWN	RANGE	SECTION	PORTION CODE	WORK ORDER NO.
20 J-11					D-010

DRAWING NO. SHEET 26 OF 81

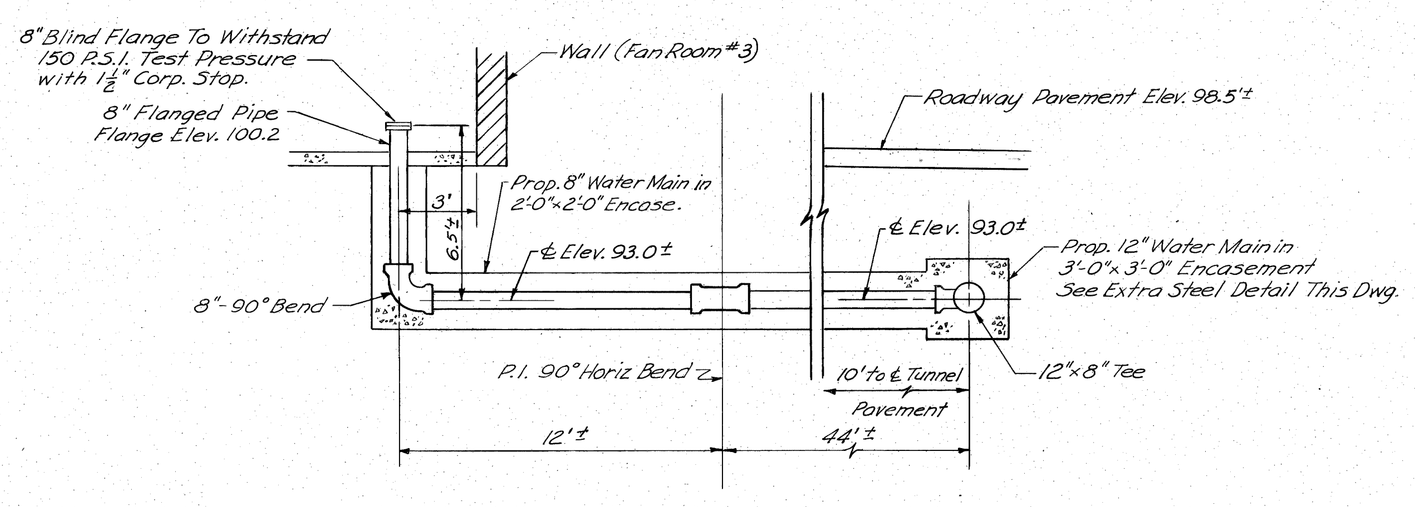
W-4



PLAN

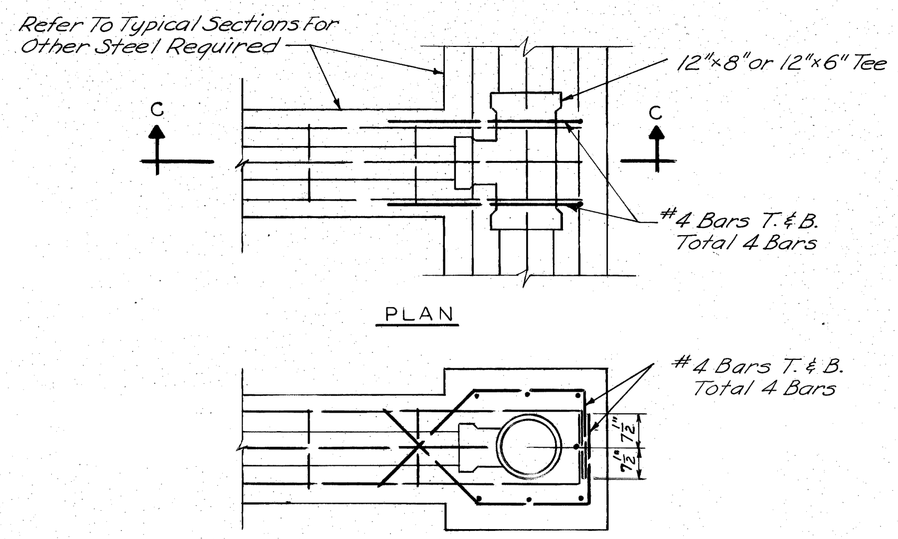
DETAIL 'A'

(Dwg. No. 3)



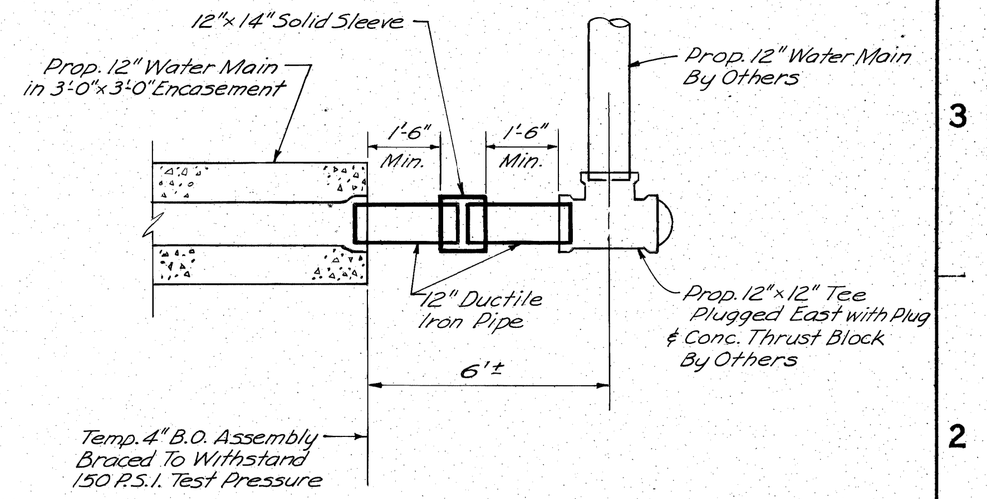
SECTION B-B

(Dwg. No. 4)



EXTRA STEEL REQUIRED FOR ENCASEMENT AT 12"x 8" AND 12"x 6" TEE

(Dwgs. No. 3 & 4)



PLAN

DETAIL 'B'

(Dwg. No. 4)

NOTE

Connection Details are typical and may require adaption to fit a particular connection.

F				
E				
D				
C				
B				
A				
	CO-OR.	DESCRIPTION REVISIONS	APRVD.	DATE

DESIGNED BY

DRAWN BY R.T.D.

CHECKED BY 1/28/75 8-11-75

APPROVED

DIRECTOR OF ENGINEERING

CHIEF ENGINEER

CIVIC CENTER PLAZA - PHASE II
WATER SYSTEM ALTERATIONS
CONNECTION AND ENCASEMENT DETAILS

SCALE NONE

DATE FEBRUARY, 1975

DETROIT METRO WATER DEPARTMENT
ENGINEERING DIVISION

SECTION MAP	TOWN	RANGE	SECTION	PORTION CODE	WORK ORDER NO.
					D-010

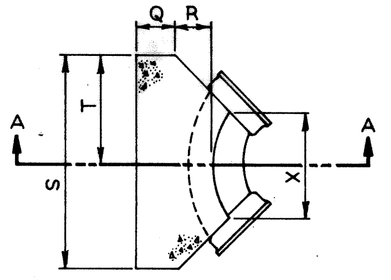
M.D.P.H. PERMIT NO.

FED. REF. NO.

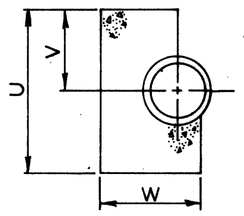
CONTRACT NO.

DRAWING NO. SHEET 27 OF 81

W-5



PLAN



SECTION A-A

SCHEDULE OF THRUST BLOCK DIMENSIONS								
BEND SIZE	Q	R	S	T	U	V	W	X
6"-22½°&45°	0'-9"	1'-0"	2'-0"	1'-0"	1'-6"	0'-9"	1'-11"	1'-4"
6"-90°	0'-9"	1'-0"	3'-0"	1'-6"	2'-0"	1'-0"	1'-11"	1'-2"
8"-22½°&45°	0'-9"	1'-0"	2'-4"	1'-2"	2'-0"	1'-0"	1'-11"	1'-4"
8"-90°	0'-9"	1'-0"	3'-4"	1'-8"	2'-6"	1'-3"	1'-11"	1'-2"
12"-22½°	0'-9"	1'-0"	2'-6"	1'-3"	2'-0"	1'-0"	2'-0"	1'-4"
12"-45°	0'-9"	1'-4"	3'-6"	1'-9"	2'-6"	1'-3"	2'-4"	1'-4"
12"-90°	0'-9"	1'-4"	5'-6"	2'-9"	3'-0"	1'-6"	2'-4"	1'-8"
16"-22½°	1'-0"	1'-8"	3'-4"	1'-8"	2'-6"	1'-3"	3'-0"	1'-2"
16"-45°	1'-0"	1'-8"	5'-4"	2'-8"	3'-0"	1'-6"	3'-0"	2'-6"
16"-90°	1'-0"	1'-8"	6'-0"	3'-0"	5'-0"	2'-6"	3'-0"	2'-8"

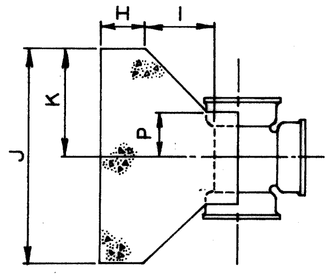
DETAIL OF STANDARD THRUST BLOCKS FOR BENDS

Not to Scale

NOTES

The bearing face of all Thrust Blocks shall be poured against undisturbed earth.

Thrust Blocks when required for vertical bends are shown by special details.



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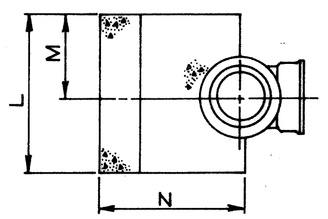
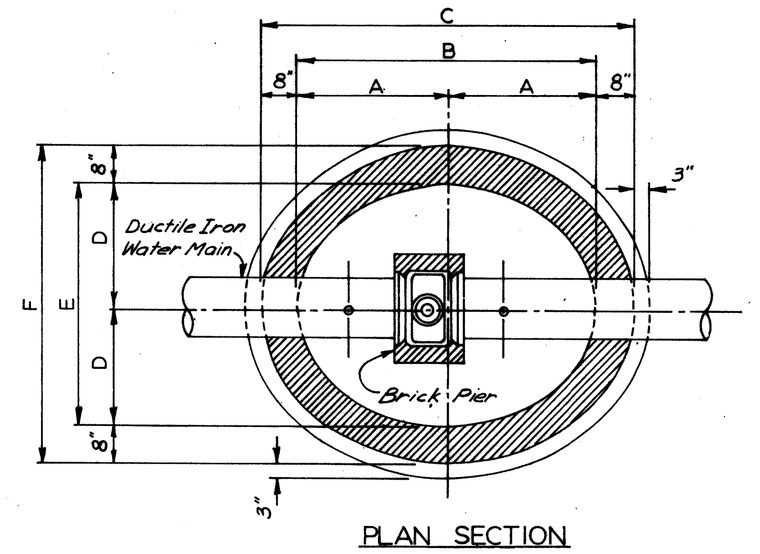


ELEVATION

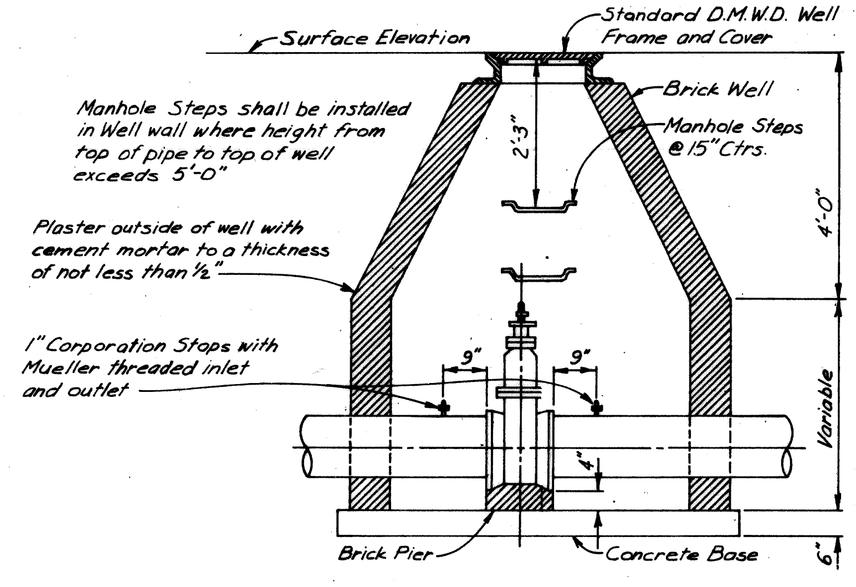
SCHEDULE OF THRUST BLOCK DIMENSIONS								
TEE SIZE	H	I	J	K	L	M	N	P
6"×6"	0'-9"	1'-0"	2'-6"	1'-3"	1'-6"	0'-9"	2'-3"	0'-6"
8"×8"	0'-9"	1'-0"	3'-0"	1'-6"	2'-0"	1'-0"	2'-3"	0'-6"
10"×10"	0'-9"	1'-2"	3'-6"	1'-9"	2'-6"	1'-3"	2'-7"	0'-7"
12"×8"	0'-9"	1'-0"	3'-0"	1'-6"	2'-0"	1'-0"	2'-5"	0'-6"
12"×12"	0'-9"	1'-4"	4'-0"	2'-6"	3'-0"	1'-6"	2'-9"	0'-8"
16"×8"	0'-9"	1'-0"	3'-0"	1'-6"	2'-0"	1'-0"	2'-9"	0'-6"
16"×12"	0'-9"	1'-4"	4'-0"	2'-0"	3'-0"	1'-6"	3'-1"	0'-8"
16"×16"	1'-0"	1'-8"	5'-0"	2'-6"	4'-0"	2'-0"	3'-8"	0'-11"

DETAIL OF STANDARD THRUST BLOCKS FOR TEES

Not to Scale



PLAN SECTION

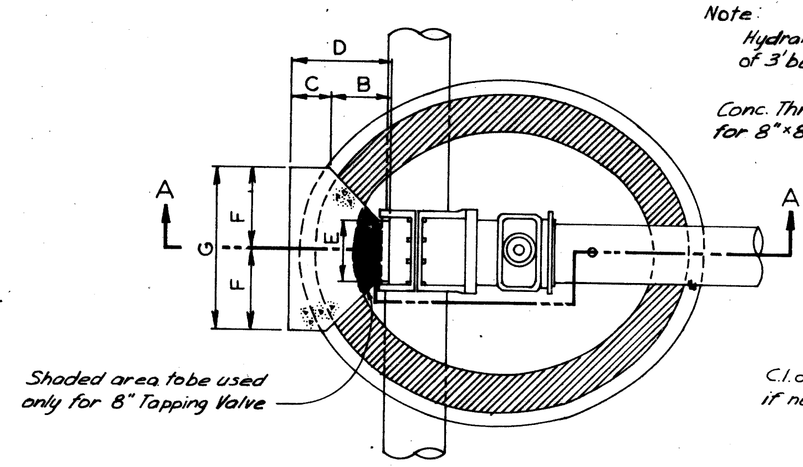


SECTION THROUGH GATE WELL

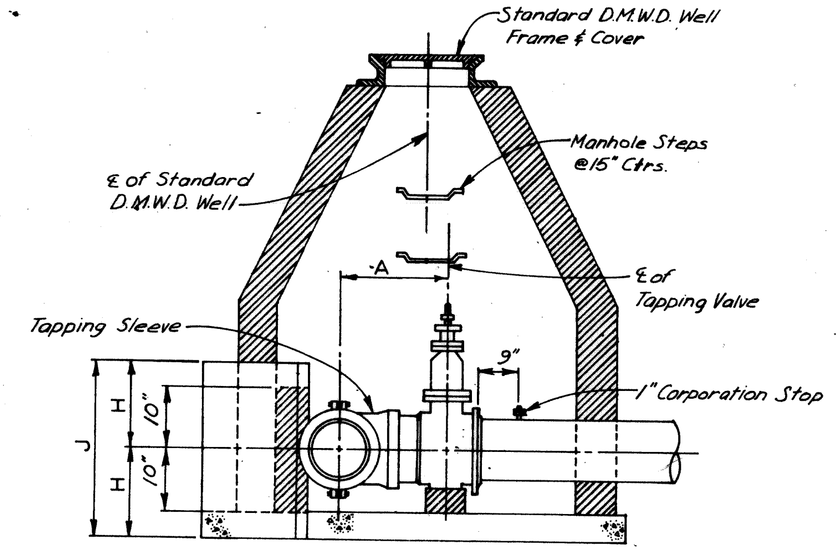
SCHEDULE OF GATE WELL DIMENSIONS						
SIZE	A	B	C	D	E	F
6"	2'-6"	5'-0"	6'-4"	2'-0"	4'-0"	5'-4"
8"	2'-6"	5'-0"	6'-4"	2'-0"	4'-0"	5'-4"
12"	2'-9"	5'-6"	6'-10"	2'-3"	4'-6"	5'-10"
16"	3'-0"	6'-0"	7'-4"	2'-9"	5'-6"	6'-10"

DETAIL OF STANDARD GATE WELLS

Not to Scale



PLAN SECTION

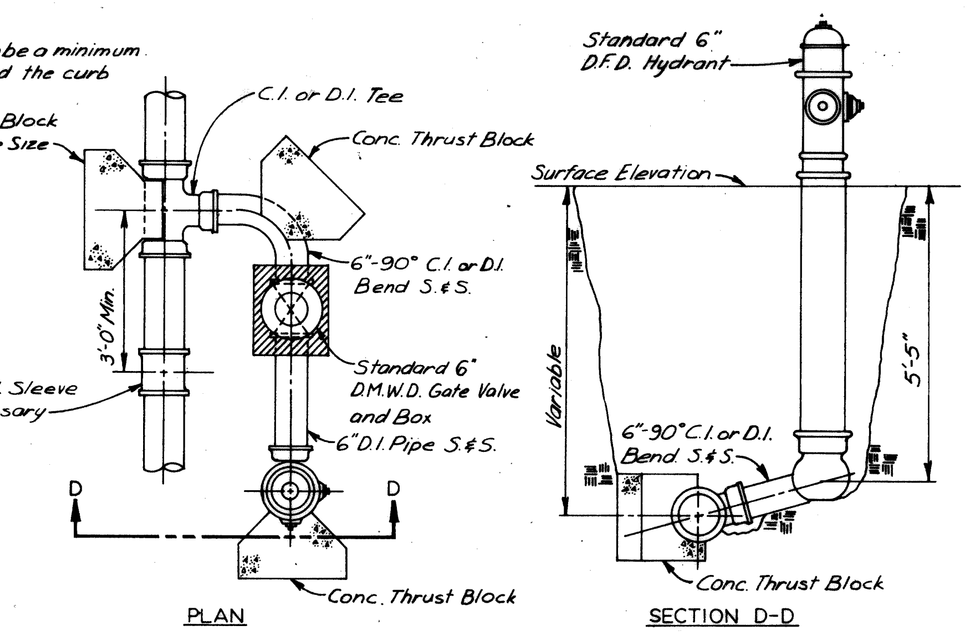


SECTION A-A

SCHEDULE OF STANDARD THRUST BLOCK DIMENSIONS FOR TAPPING VALVE								
SIZE	A	B	C	D	E	F	G	H	J
8"×8"	1'-6¾"				0'-7"				
12"×8"	1'-9"				0'-7"				
16"×8"	1'-11½"				0'-7½"				
12"×12"	1'-8¾"	1'-6"	0'-9"	2'-3"	0'-7"	1'-9"	3'-6"	1'-6"	3'-0"
16"×12"	1'-11¾"	1'-6"	0'-9"	2'-3"	0'-10½"	1'-9"	3'-6"	1'-6"	3'-0"
16"×16"	2'-2"	2'-7"	1'-0"	3'-7"	0'-10½"	2'-11"	5'-10"	1'-8"	3'-4"

DETAIL OF STANDARD THRUST BLOCKS FOR TAPPING VALVES

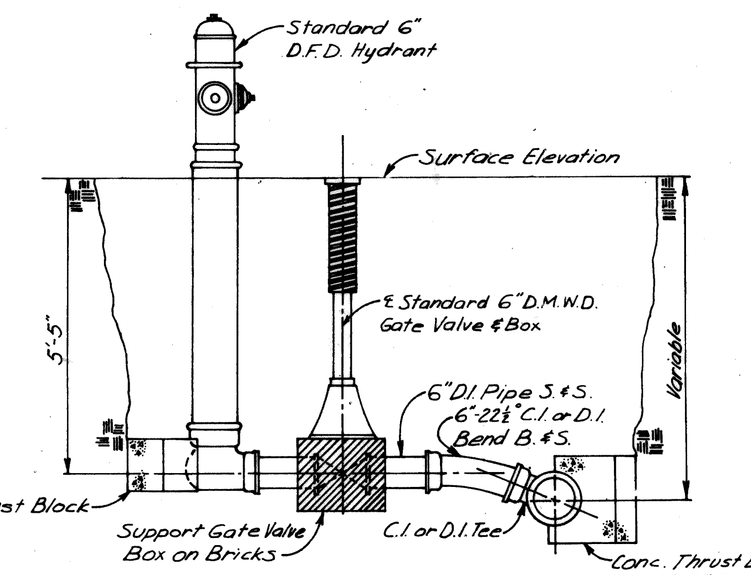
Not to Scale



PLAN SECTION D-D

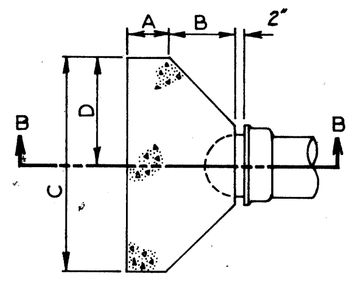
DETAIL OF 6" HYDRANT INSTALLATION OFF SET

Not to Scale

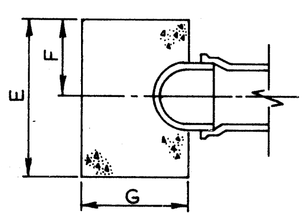


DETAIL OF 6" HYDRANT INSTALLATION STRAIGHT AWAY

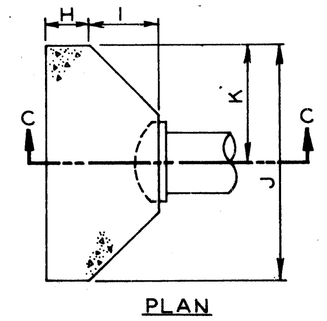
Not to Scale



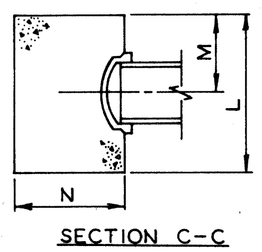
PLAN



SECTION B-B



PLAN

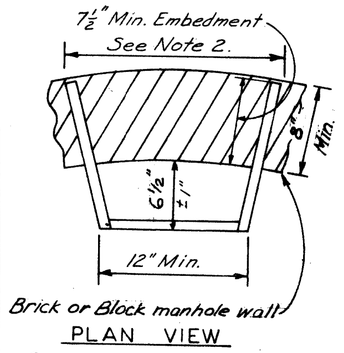


SECTION C-C

SCHEDULE OF THRUST BLOCK DIMENSIONS FOR PLUGS AND CAPS							
PLUG SIZE	A	B	C	D	E	F	G
6"	0'-9"	1'-2"	3'-0"	1'-6"	2'-0"	1'-0"	1'-11"
8"	0'-9"	1'-2"	3'-0"	1'-6"	2'-0"	1'-0"	1'-11"
12"	0'-9"	1'-4"	4'-0"	2'-0"	3'-0"	1'-6"	2'-1"
16"	1'-0"	1'-8"	5'-0"	2'-6"	4'-0"	2'-0"	2'-8"
CAP SIZE	H	I	J	K	L	M	N
6"	0'-9"	1'-2"	3'-0"	1'-6"	2'-0"	1'-0"	1'-11"
8"	0'-9"	1'-2"	3'-0"	1'-6"	2'-0"	1'-0"	1'-11"
12"	0'-9"	1'-4"	4'-0"	2'-0"	3'-0"	1'-6"	2'-1"
16"	1'-0"	1'-8"	5'-0"	2'-6"	4'-0"	2'-0"	2'-8"

DETAIL OF STANDARD THRUST BLOCKS FOR PLUGS AND CAPS

Not to Scale

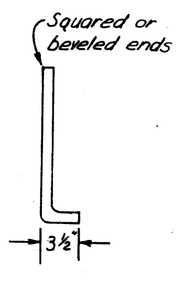


PLAN VIEW

(For use with Brick or Block M.H.)

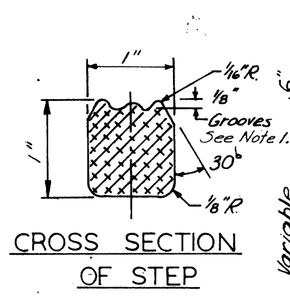
ALUMINUM MANHOLE STEP

Not to Scale



Note:

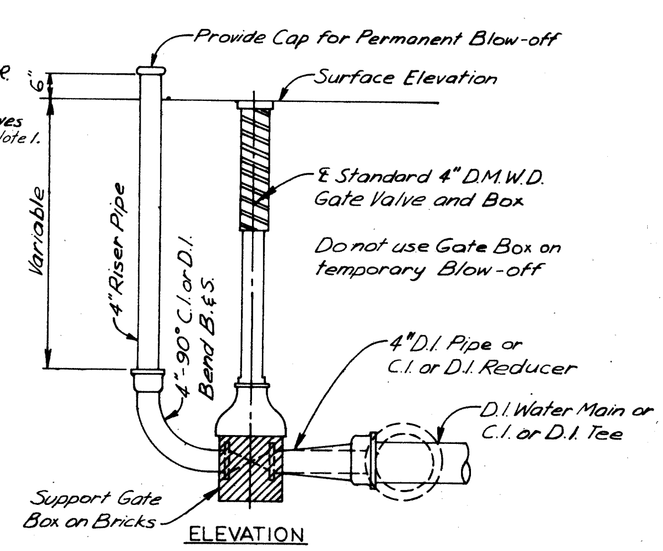
Manhole steps shall conform to the requirements for "Aluminum Alloy Extruded Bars, Rods, Shapes and Tubes", A.S.T.M. B 221 (current), Alloy 6061, Temper T-6, or approved equal.



CROSS SECTION OF STEP

Note:

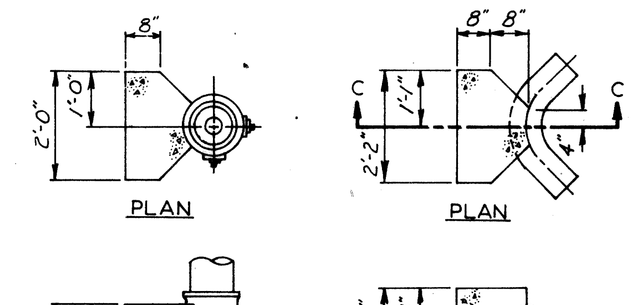
1. In lieu of grooves, alternate foot hold configurations will be considered for approval.
2. Flared legs shall be radial to the manhole wall.



ELEVATION

DETAIL OF 4" BLOW-OFF

Not to Scale



PLAN

PLAN

ELEVATION

THRUST BLOCK FOR 6" HYDRANT

Not to Scale

SECTION C-C

THRUST BLOCK FOR 6" HYDRANT BEND

Not to Scale

Note:

The bearing face of Thrust Blocks shall be poured against undisturbed earth.

F					
E					
D					
C					
B					
A					
	CO-OR.	DESCRIPTION REVISIONS	APRVD.	DATE	

DESIGNED BY

DRAWN BY R.A.C.

CHECKED BY K.T.D. DB 1/28/75

8-11-75

APPROVED

M. Nelson

DIRECTOR OF ENGINEERING

CHIEF ENGINEER

CIVIC CENTER PLAZA - PHASE II

WATER SYSTEM ALTERATIONS

MISCELLANEOUS DETAILS

SCALE AS SHOWN

FEBRUARY, 1975 DATE

DETROIT METRO WATER DEPARTMENT

ENGINEERING DIVISION

SECTION MAP	TOWN	RANGE	SECTION	PORTION CODE	WORK ORDER NO.
					D-010

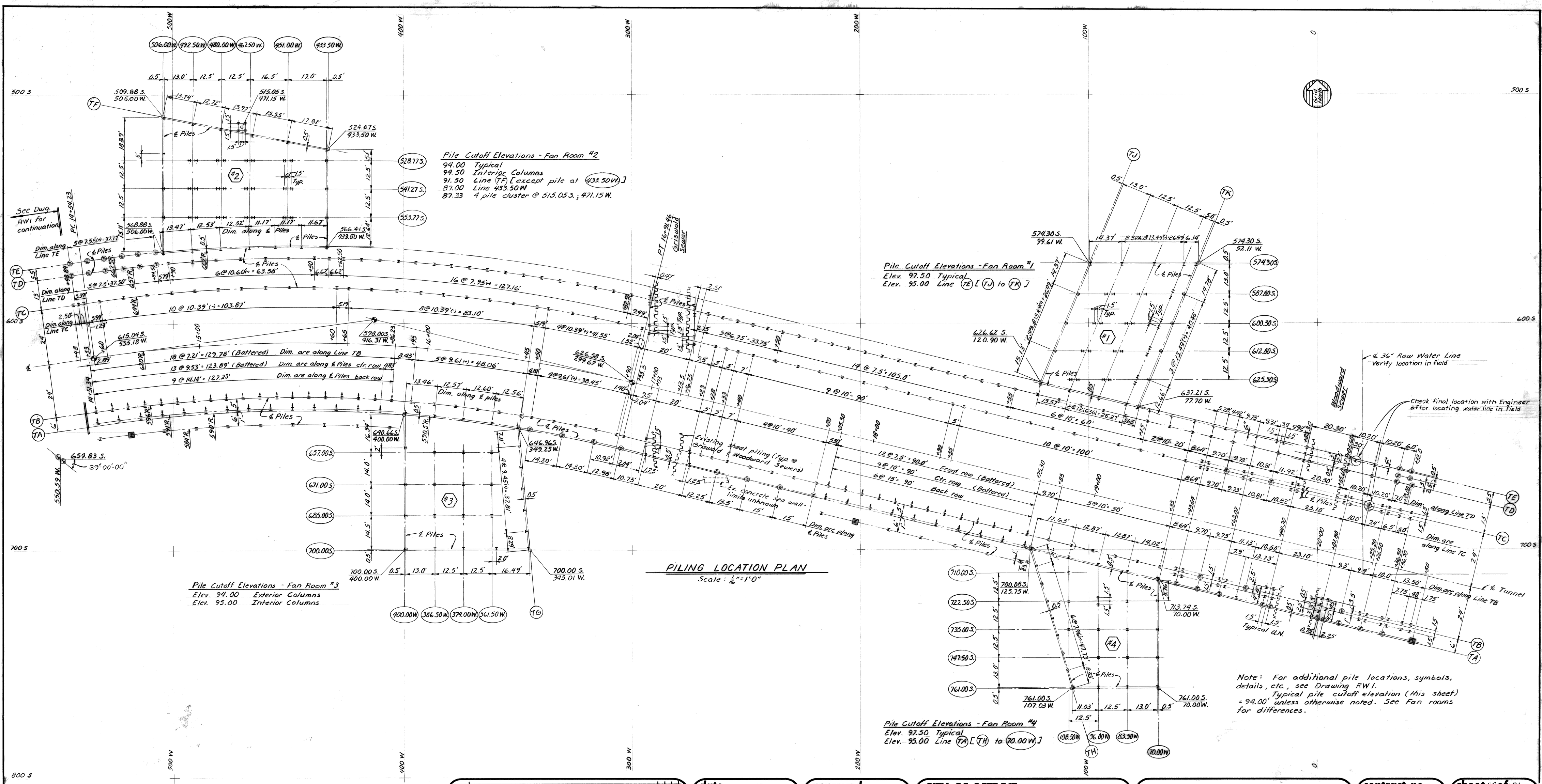
M.D.P.H. PERMIT NO.

FED. REF. NO.

CONTRACT NO.

DRAWING NO. SHEET 28 OF 81

W-6



revisions	date 8-11-75 designed Mc Guire drawn Mc Guire checked M.C.	approved T. E. McGowan STRUCTURAL ENGINEER	CITY OF DETROIT CITY ENGINEERING DEPARTMENT	ATWATER STREET RELOCATION ATWATER TUNNEL PILE LOCATION PLAN	contract no. 07105A	sheet 29 of 81 drawing no: S1

FOUNDATION PLAN

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

Note : For Anchor Bolt spacing and location - see Structural Steel Drawings S 4 & S 6 & Anchor Bolt Setting Plan
For struct. tie details - see Drawing S 3 & RW 3.
For pile details - see Drawings S 7 & RW 1.
For foundation details in Fan Rooms - see Drawings S 10 & S 12.
——"—— denotes #9 Structural Tie.
⊕ denotes reference point.
See Mech. Dwg. M-1 for pipes, etc. thru walls and footings & see Elect. Dwgs E11 & E12 for duct runs.

DETAIL A
Scale: 1/8"=1'0"

DETAIL B
Scale: 1/8"=1'0"

DETAIL C
Scale: 1/8"=1'0"

DETAIL D
Scale: 1/8"=1'0"

DETAIL E
Scale: 1/8"=1'0"

See Planter Box Dtls. for wall details and dowel locations Drawing S 14.

See E. Planter Box Details Dwg. S 16 for wall details and dowel locations.

See RW 2 for location of Structural Ties

Fdn. for S.H.E.G. Plaza Column See Dwg. S 3

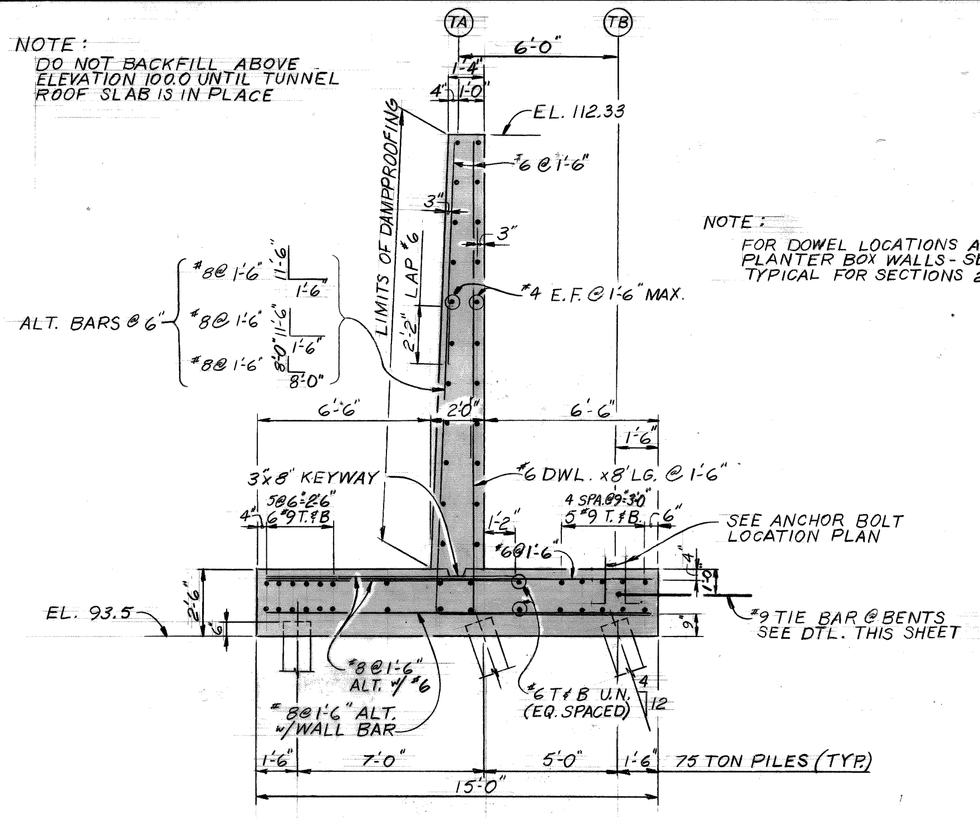
Existing sheet piling (Typ. @ Griswold & Woodward Sewers)

Griswold Sewer

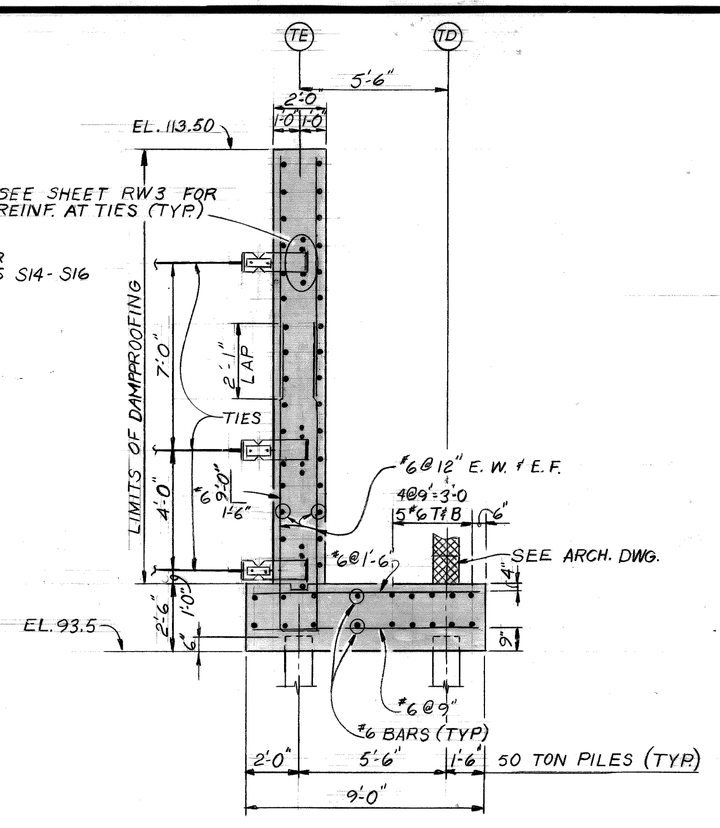
Woodward Sewer

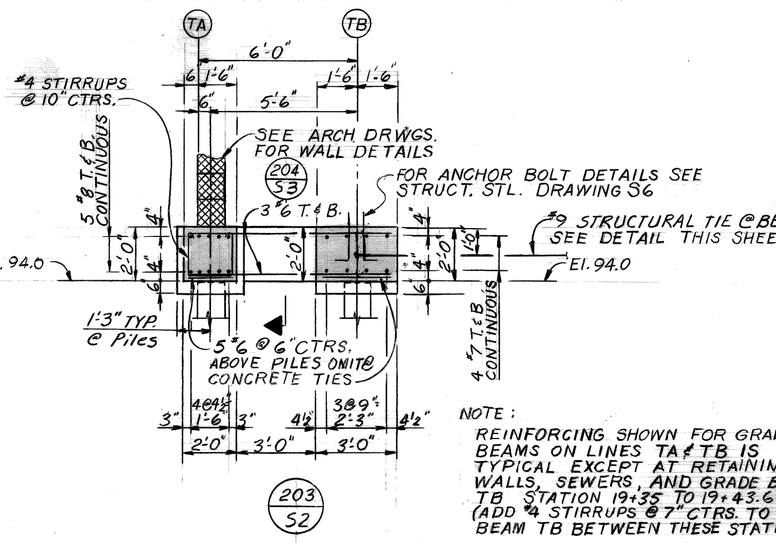
revisions	date 8-11-75 designed J. McGuire drawn J. McGuire checked M.C.	approved T. E. McSweyn STRUCTURAL ENGINEER	CITY OF DETROIT CITY ENGINEERING DEPARTMENT	ATWATER STREET RELOCATION ATWATER TUNNEL TUNNEL FOUNDATION PLAN

contract no.	sheet 30 of 81
07105 A	drawing no: S 2

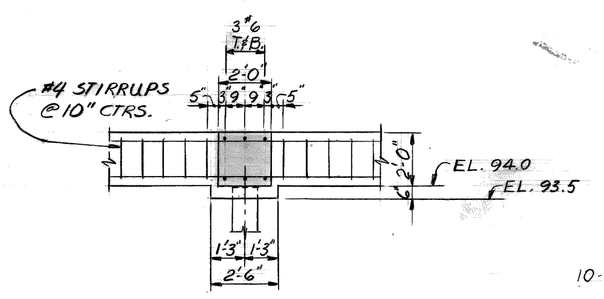


NOTE:
FOR DOWEL LOCATIONS AND SIZE FOR PLANTER BOX WALLS - SEE DRAWINGS S14 - S16
TYPICAL FOR SECTIONS 201 & 202

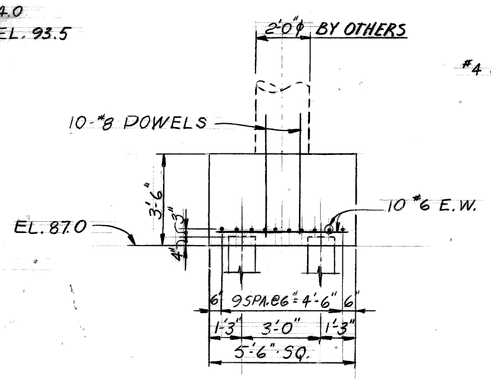




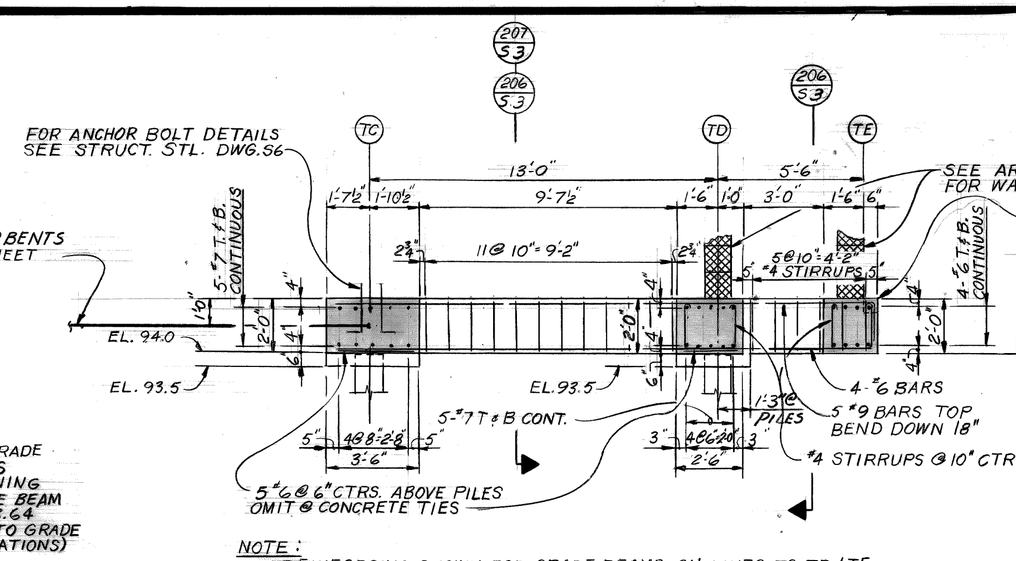
NOTE:
REINFORCING SHOWN FOR GRADE BEAMS ON LINES TA & TB IS TYPICAL EXCEPT AT RETAINING WALLS, SEWERS AND GRADE BEAM TB STATION 19+35 TO 19+43.64 (ADD #4 STIRRUPS @ 7" CTRS. TO GRADE BEAM TB BETWEEN THESE STATIONS)



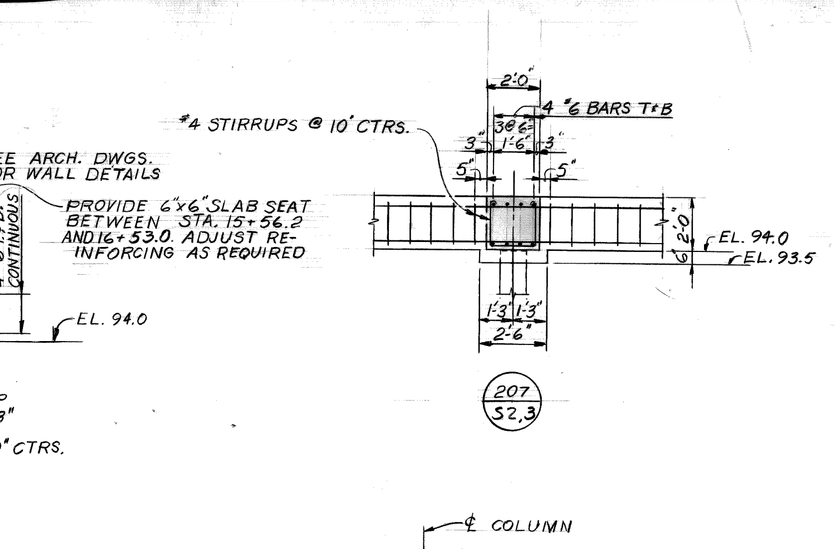
NOTE:
REINFORCING SHOWN IS TYPICAL FOR ALL CONCRETE TIES BETWEEN LINES TA & TB

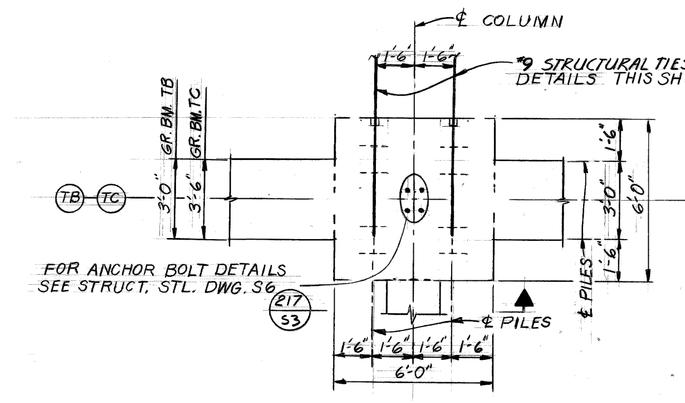


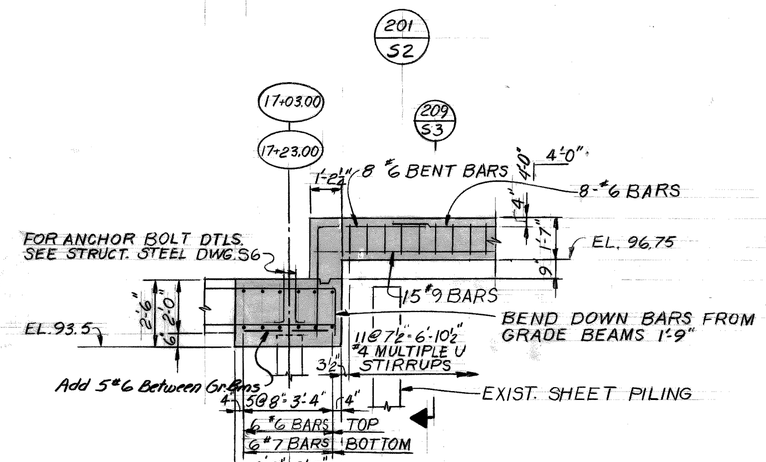
FOUNDATION FOR SH. #6 PLAZA COLUMN
COORD. 515.05 S 471.15 W

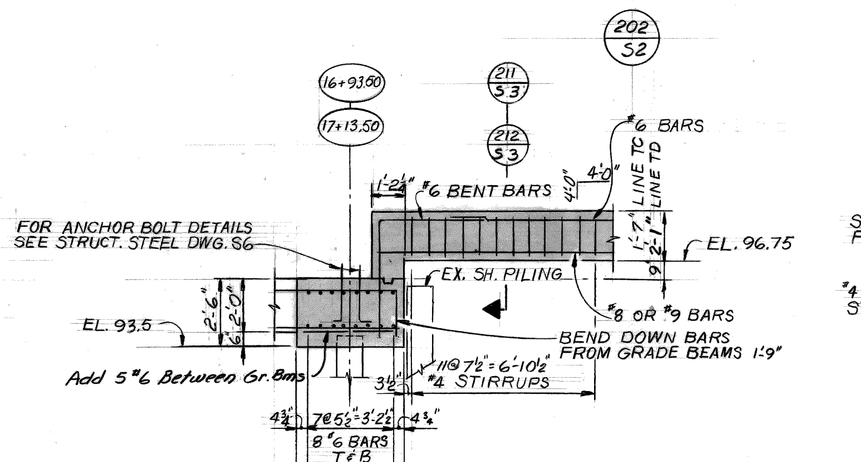


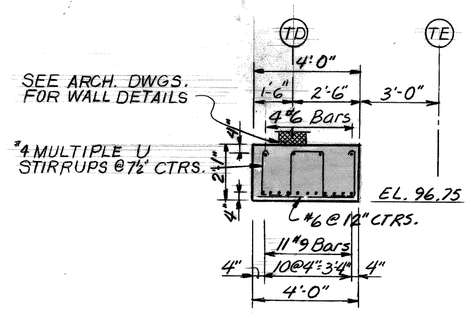
NOTE:
REINFORCING SHOWN FOR GRADE BEAMS ON LINES TC, TD & TE IS TYPICAL EXCEPT AT RETAINING WALLS AND SEWERS AND GRADE BEAM TE STA. 19+10.0 TO 20+23.0. SEE SECTION 216 FOR DETAILS BETWEEN THESE STATIONS

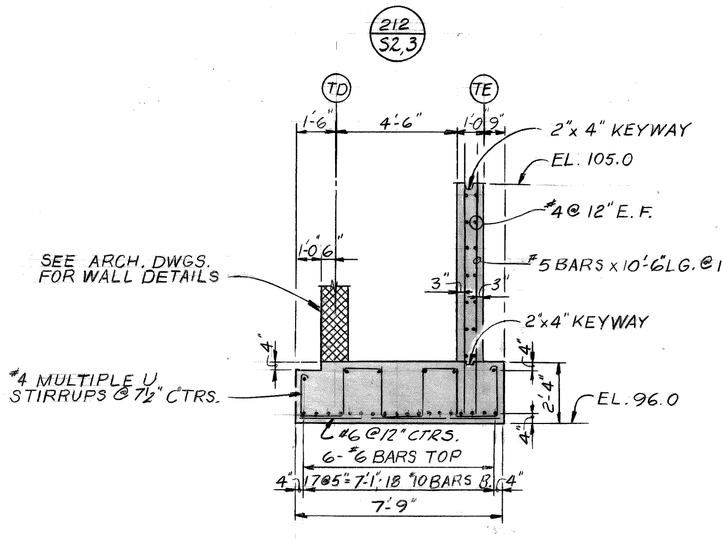


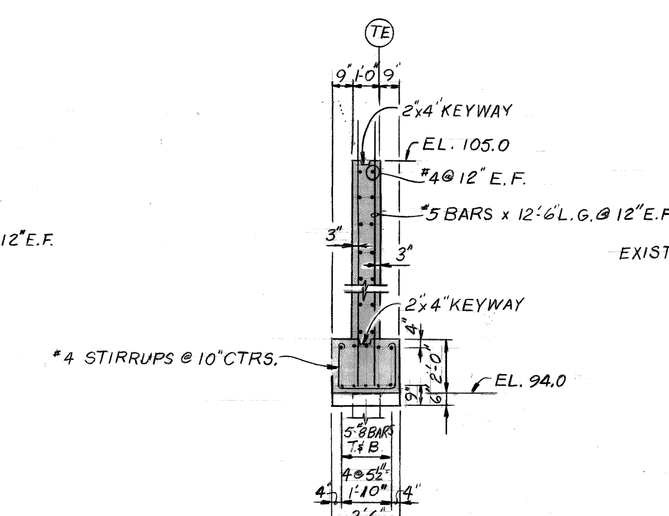


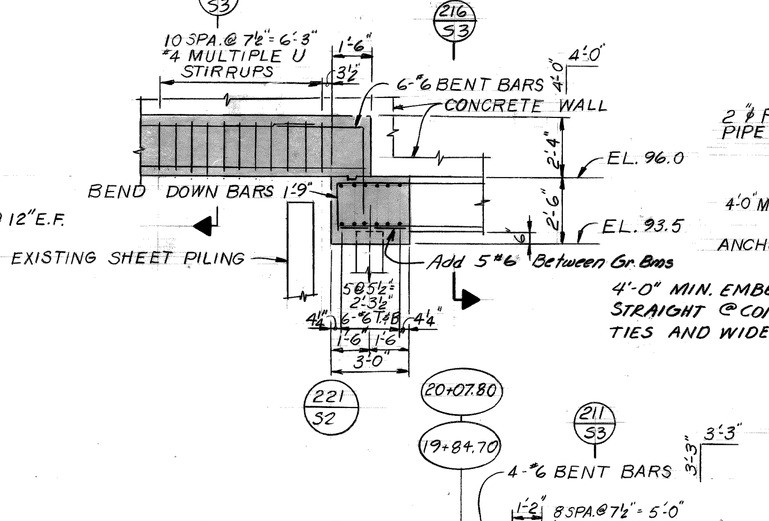


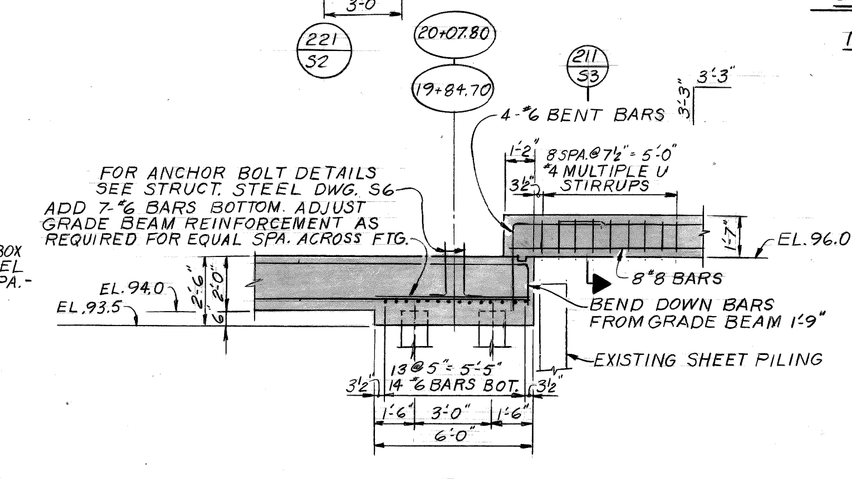


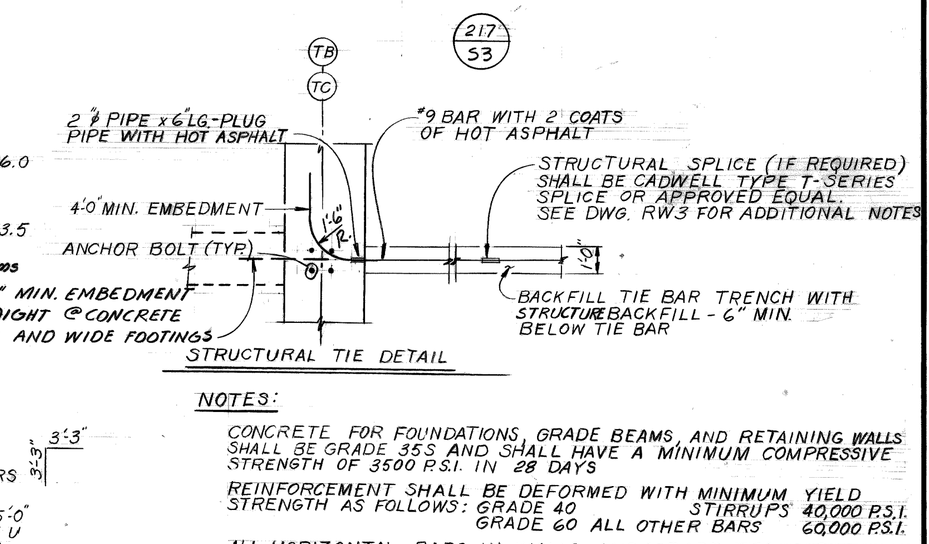


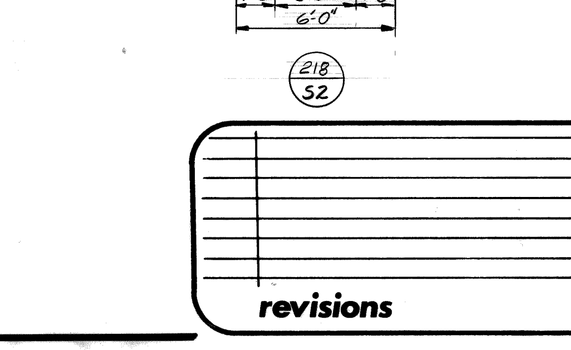


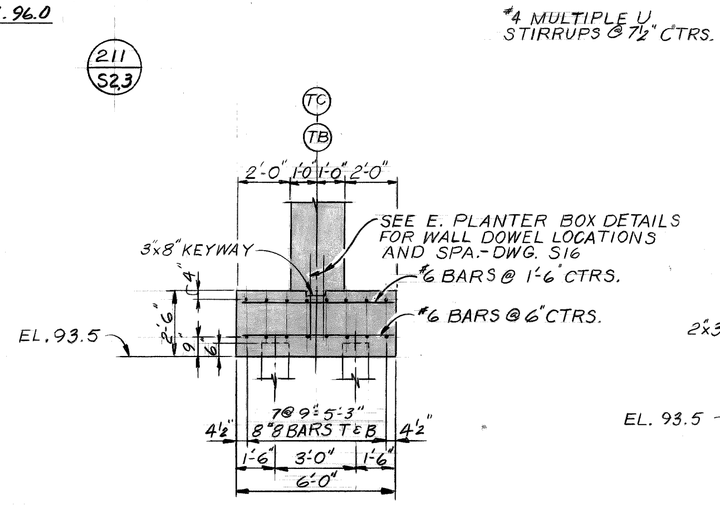


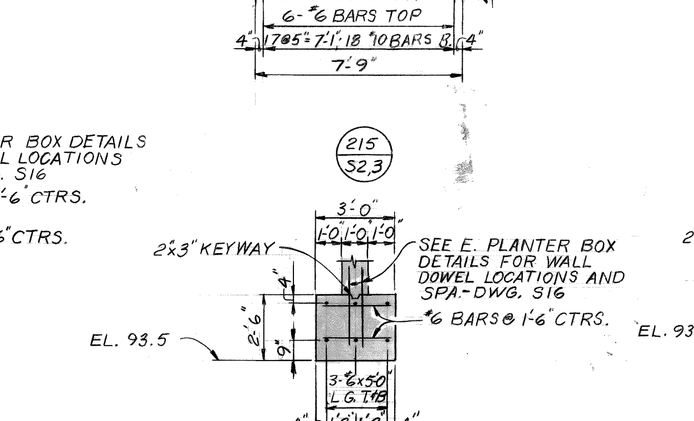


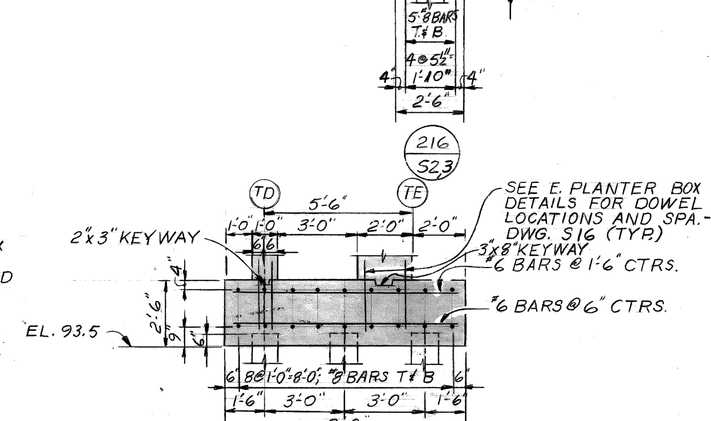


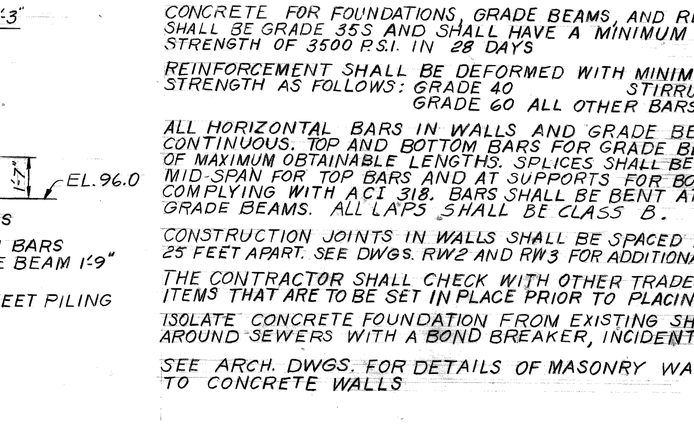












NOTE:
REINFORCING SHOWN IS TYPICAL FOR ALL CONCRETE TIES BETWEEN LINES TC TO & TE BETWEEN STATIONS 15+66.2 TO 16+33.0 & 17+36.5 TO 18+55.0 FOR REINFORCING AT OTHER LOCATIONS SEE SECTION 207

NOTES:

CONCRETE FOR FOUNDATIONS, GRADE BEAMS, AND RETAINING WALLS SHALL BE GRADE AS S AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3500 P.S.I. IN 28 DAYS.

REINFORCEMENT SHALL BE DEFORMED WITH MINIMUM YIELD STRENGTH AS FOLLOWS: GRADE 40 STIRRUPS 40,000 P.S.I.
GRADE 60 ALL OTHER BARS 60,000 P.S.I.

ALL HORIZONTAL BARS IN WALLS AND GRADE BEAMS SHALL BE CONTINUOUS. TOP AND BOTTOM BARS FOR GRADE BEAMS SHALL BE OF MAXIMUM OBTAINABLE LENGTHS. SPLICES SHALL BE LOCATED AT MID SPAN FOR TOP BARS AND AT SUPPORTS FOR BOTTOM BARS COMPLYING WITH ACI 318. BARS SHALL BE BENT AT ALL ENDS OF GRADE BEAMS. ALL LAPS SHALL BE CLASS B.

CONSTRUCTION JOINTS IN WALLS SHALL BE SPACED A MAX. OF 25 FEET APART. SEE DWGS. RW2 AND RW3 FOR ADDITIONAL WALL DETAILS.

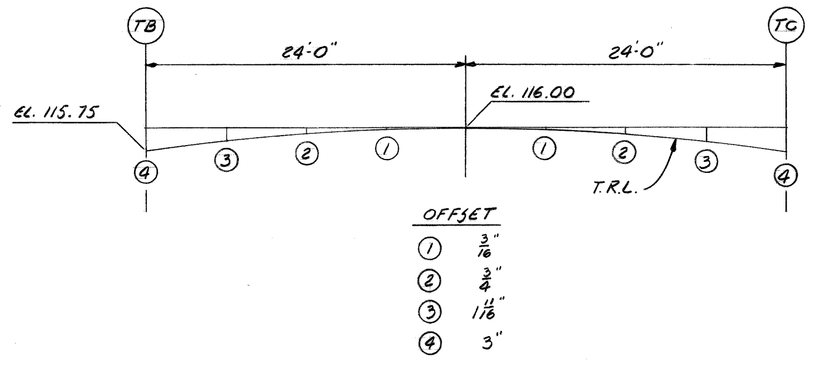
THE CONTRACTOR SHALL CHECK WITH OTHER TRADES FOR EMBEDDED ITEMS THAT ARE TO BE SET IN PLACE PRIOR TO PLACING OF CONCRETE.

ISOLATE CONCRETE FOUNDATION FROM EXISTING SHEET PILING AROUND SEWERS WITH A BOND BREAKER, INCIDENTAL TO CONCRETE

SEE ARCH. DWGS. FOR DETAILS OF MASONRY WALL ANCHORS TO CONCRETE WALLS

Scale: ¼" = 1'-0"

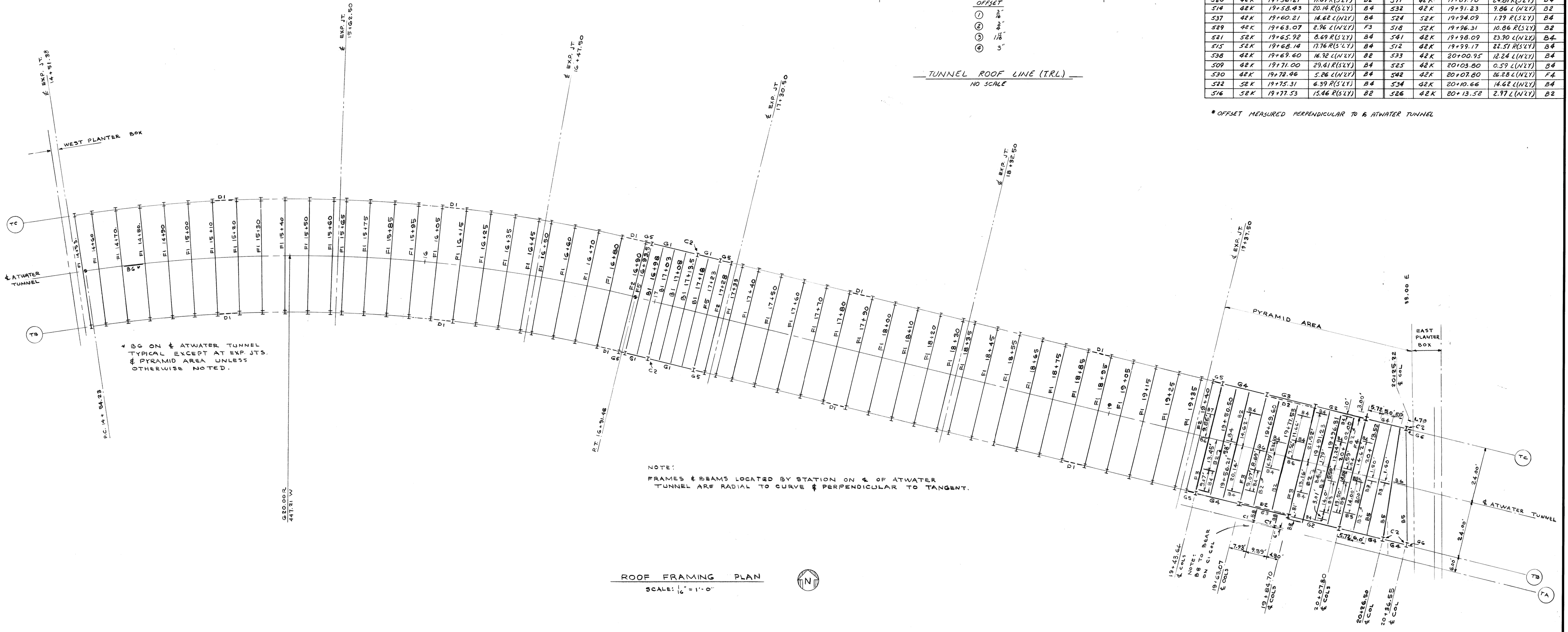
revisions	date 8-11-75 designed M. Guire drawn Gorbacz checked M.C.	approved T. E. McStewan STRUCTURAL ENGINEER	CITY OF DETROIT CITY ENGINEERING DEPARTMENT	ATWATER STREET RELOCATION ATWATER TUNNEL TUNNEL FOUNDATION DETAILS	contract no. 07105 A	sheet 31 of 81 drawing no: S3



TUNNEL ROOF LINE (TRL)
NO SCALE

COLUMN LOADS FROM PYRAMID STRUCTURE									
POINT NO.	LOAD	LOCATION STATION	LOCATION OFFSET *	SUPPORT BEAM	POINT NO.	LOAD	LOCATION STATION	LOCATION OFFSET *	SUPPORT BEAM
535	42K	19+40.79	9.86 L(N'LY)	B7	539	42K	19+78.99	19.22 L(N'LY)	B4
527	42K	19+43.69	1.80 R(S'LY)	F3	510	42K	19+80.39	27.11 R(S'LY)	B4
519	42K	19+46.50	13.45 R(S'LY)	B4	531	42K	19+81.85	7.56 L(N'LY)	B4
513	42K	19+48.72	22.52 R(S'LY)	B4	523	52K	19+84.70	6.09 R(S'LY)	F3
536	42K	19+50.50	12.24 L(N'LY)	B2	517	52K	19+86.92	13.16 R(S'LY)	B4
528	42K	19+53.35	0.58 L(N'LY)	B4	540	42K	19+88.38	21.52 L(N'LY)	B4
520	42K	19+56.21	11.07 R(S'LY)	B2	511	42K	19+89.78	24.81 R(S'LY)	B4
514	42K	19+58.43	20.14 R(S'LY)	B4	532	42K	19+91.23	9.86 L (N'LY)	B2
537	42K	19+60.21	14.62 L(N'LY)	B4	524	52K	19+94.09	1.79 R(S'LY)	B4
529	42K	19+63.07	2.96 L(N'LY)	F3	518	52K	19+96.31	10.86 R(S'LY)	B2
521	52K	19+65.92	8.69 R(S'LY)	B4	541	42K	19+98.09	23.90 L(N'LY)	B4
515	52K	19+68.14	17.76 R(S'LY)	B4	512	42K	19+99.17	22.51 R(S'LY)	B4
538	42K	19+69.60	16.92 L(N'LY)	B2	533	42K	20+00.95	12.24 L(N'LY)	B4
509	42K	19+71.00	29.41 R(S'LY)	B4	525	42K	20+03.80	0.59 L(N'LY)	B4
530	42K	19+72.96	5.26 L(N'LY)	B4	542	42K	20+07.80	26.28 L(N'LY)	F4
522	52K	19+75.31	6.39 R(S'LY)	B4	534	42K	20+10.66	14.62 L(N'LY)	B4
516	52K	19+77.53	15.46 R(S'LY)	B2	526	42K	20+13.52	2.97 L(N'LY)	B2

* OFFSET MEASURED PERPENDICULAR TO ℄ ATWATER TUNNEL

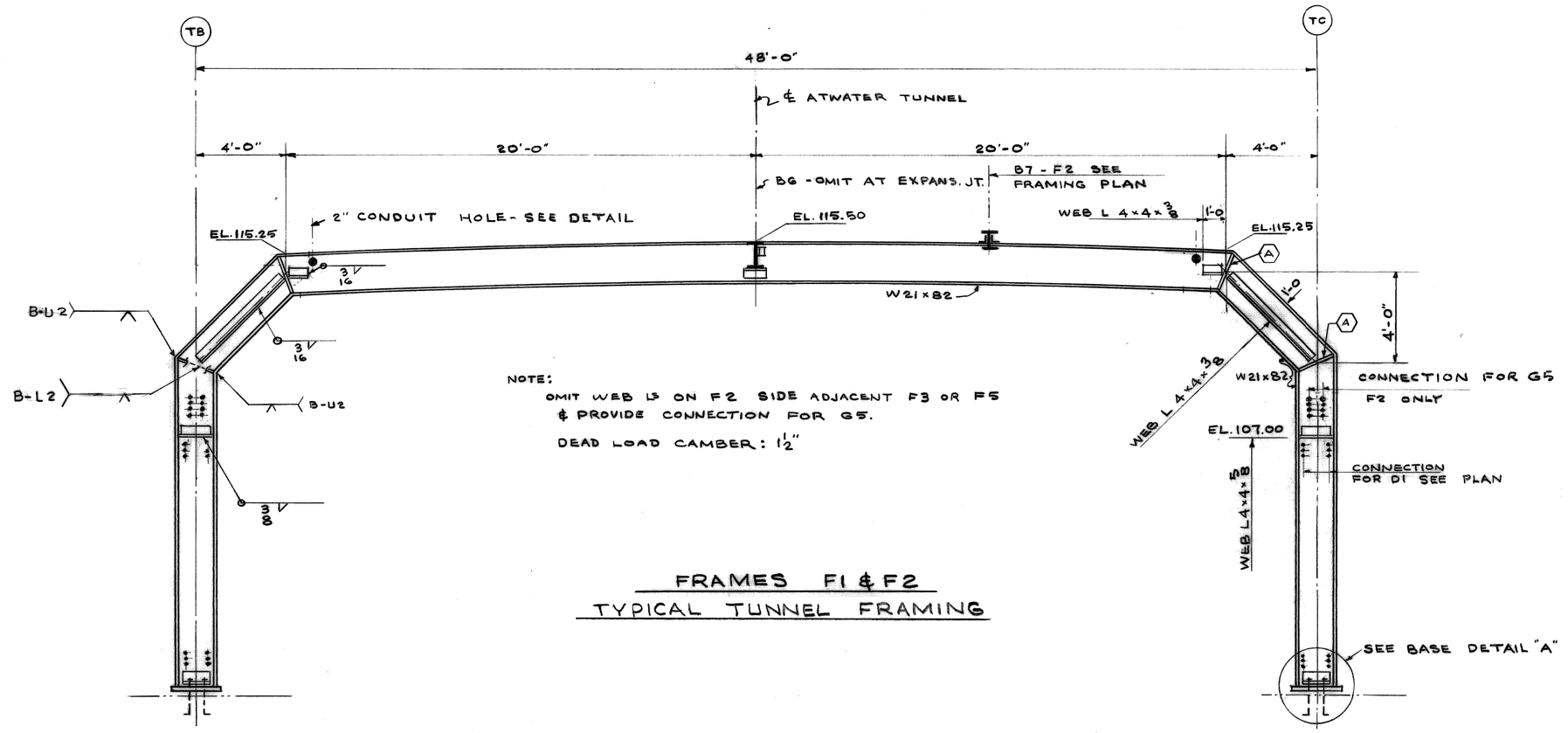


* BG ON ℄ ATWATER TUNNEL TYPICAL EXCEPT AT EXP. JTS. & PYRAMID AREA UNLESS OTHERWISE NOTED.

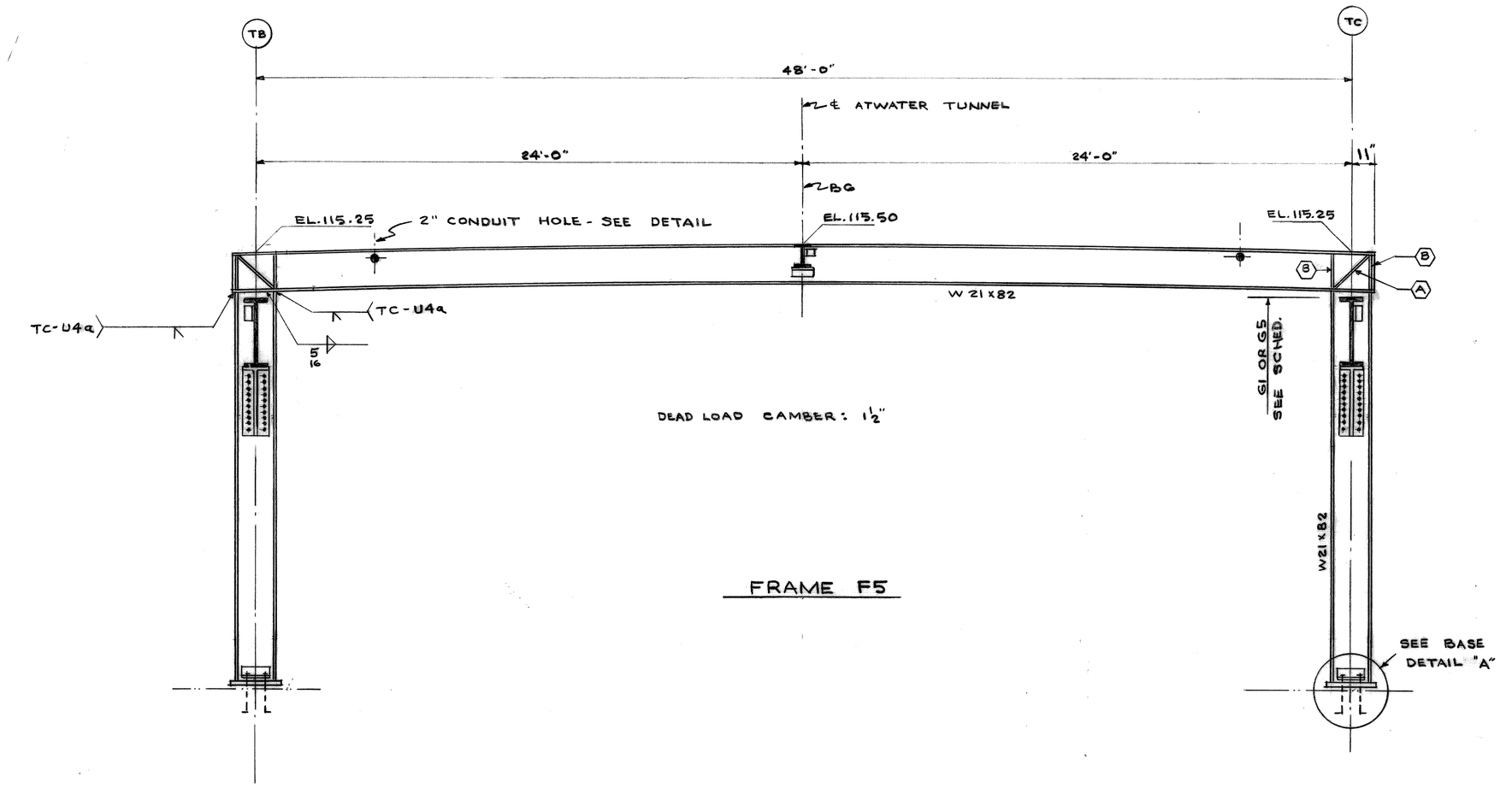
NOTE:
FRAMES & BEAMS LOCATED BY STATION ON ℄ OF ATWATER TUNNEL ARE RADIAL TO CURVE & PERPENDICULAR TO TANGENT.

ROOF FRAMING PLAN
SCALE: 1/8" = 1'-0"

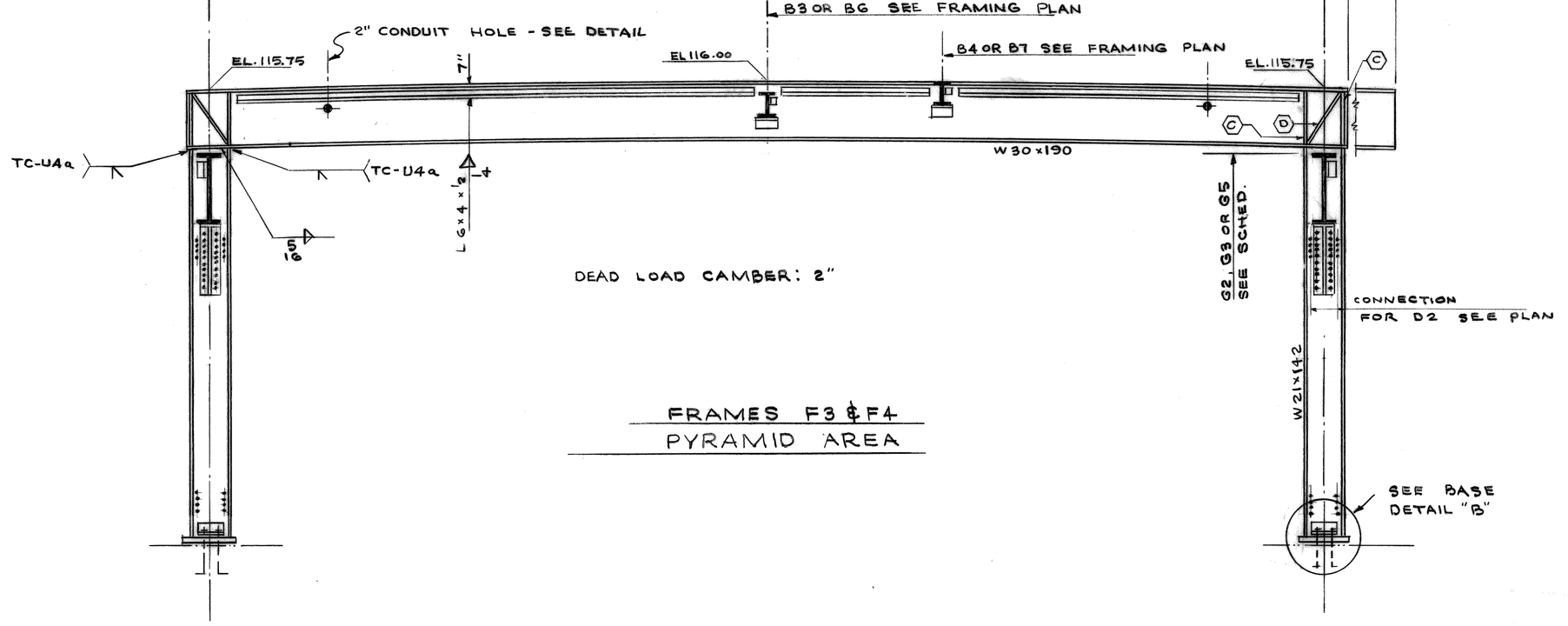
revisions	date 8-11-75 designed T.M. drawn T.M. & A.G. checked M.C.	approved T. E. McStravick STRUCTURAL ENGINEER	CITY OF DETROIT CITY ENGINEERING DEPARTMENT	ATWATER STREET RELOCATION ATWATER TUNNEL STEEL FRAMING PLAN	contract no. 07105 A	sheet 32 of 81 drawing no: S 4



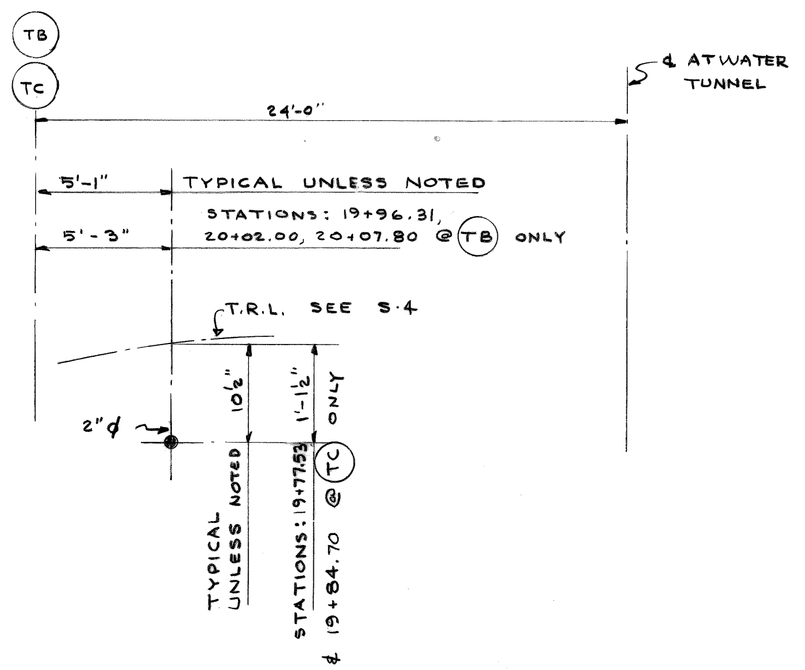
FRAMES F1 & F2
TYPICAL TUNNEL FRAMING



FRAME F5



FRAMES F3 & F4
PYRAMID AREA



CONDUIT HOLE DETAIL
FOR ALL FRAMES &
BEAMS B1, B2, & B5

FRAME STIFFENER SCHEDULE				
MARK	DESCRIPTION	MATERIAL	END WELD	WEB WELD
(A)	DIAGONAL STIFFENER	PL ¾ x 4"	TC-U5b	5/16
(B)	FLANGE STIFFENER	PL ⅞ x 4¼"	TC-U4a	5/16
(C)	DIAGONAL STIFFENER	PL 1¼ x 7"	TC-U5b	5/16
(D)	FLANGE STIFFENER	PL 1¼ x 7"	TC-U4a	5/16

SCALE: ¼" = 1'-0"

revisions

date 8-11-75
designed T. M.
drawn T.M & A.G.
checked M.C.

approved
T. E. McElwain
STRUCTURAL ENGINEER

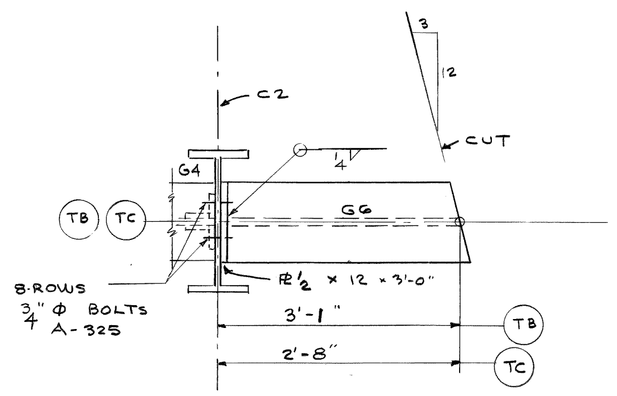
CITY OF DETROIT
CITY ENGINEERING DEPARTMENT

ATWATER STREET RELOCATION
ATWATER TUNNEL

STEEL FRAME DETAILS

contract no. 07105 A

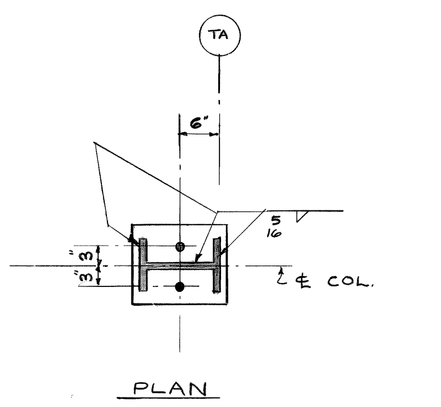
sheet 33 of 81
drawing no: S 5



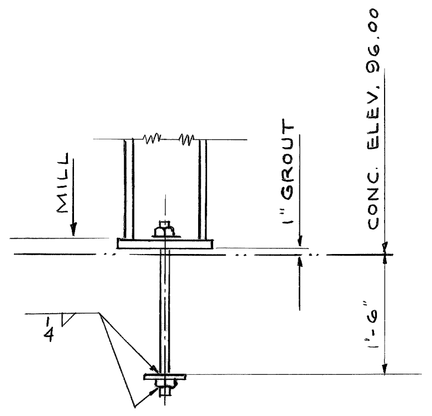
PLAN

GIRDER G6 DETAIL

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



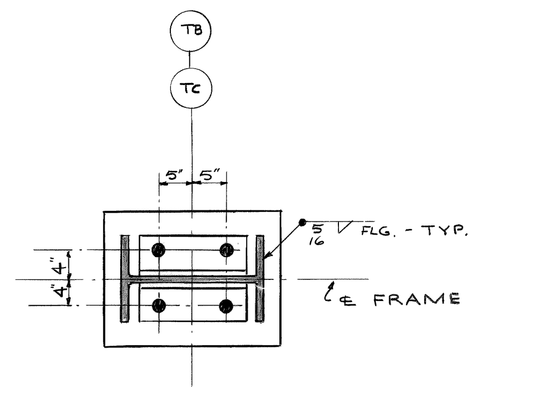
PLAN



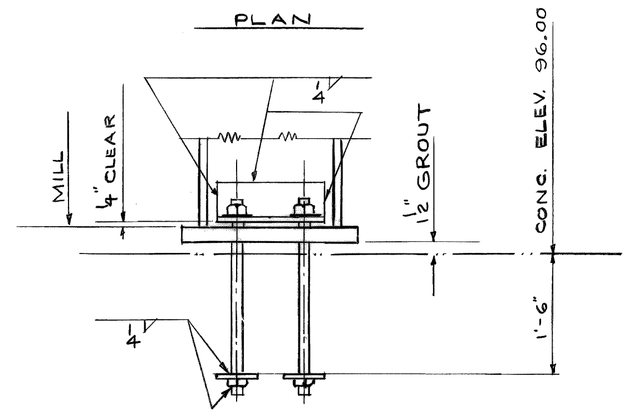
ELEVATION

BASE MAT'L.
PL 1" × 12 × 1'-2"
2 1" ϕ ANCHOR BOLTS
2 PL 1/2 × 6 × 8"

DETAIL "C"



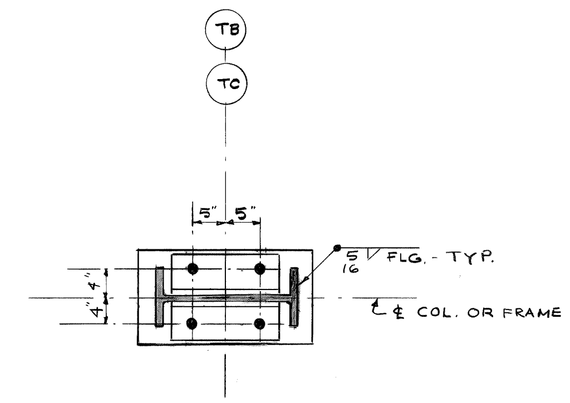
PLAN



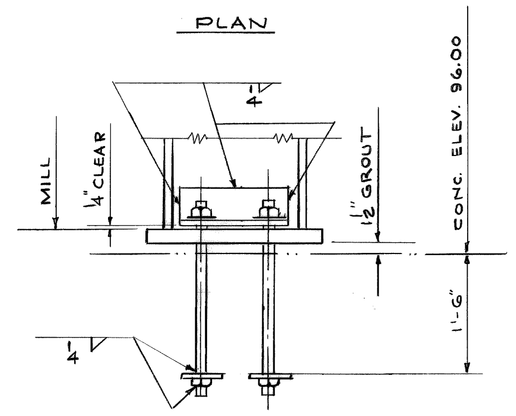
ELEVATION

BASE MAT'L.
PL 2 × 1'-8 × 2'-2"
2 L 6 × 6 × 3/4 × 1'-4"
4 - 1 1/4" ϕ ANCHOR BOLTS
4 - PL 1/2 × 6 × 6"

DETAIL "B"



PLAN



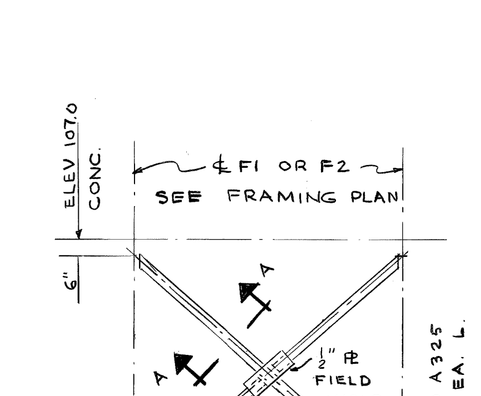
ELEVATION

BASE MAT'L.
PL 1 1/2 × 1'-2" × 2'-2"
2 L 6 × 6 × 5/8 × 1'-4"
4 - 1" ϕ ANCHOR BOLTS
4 - PL 1/2 × 6" × 6"

DETAIL "A"

COLUMN BASE DETAILS

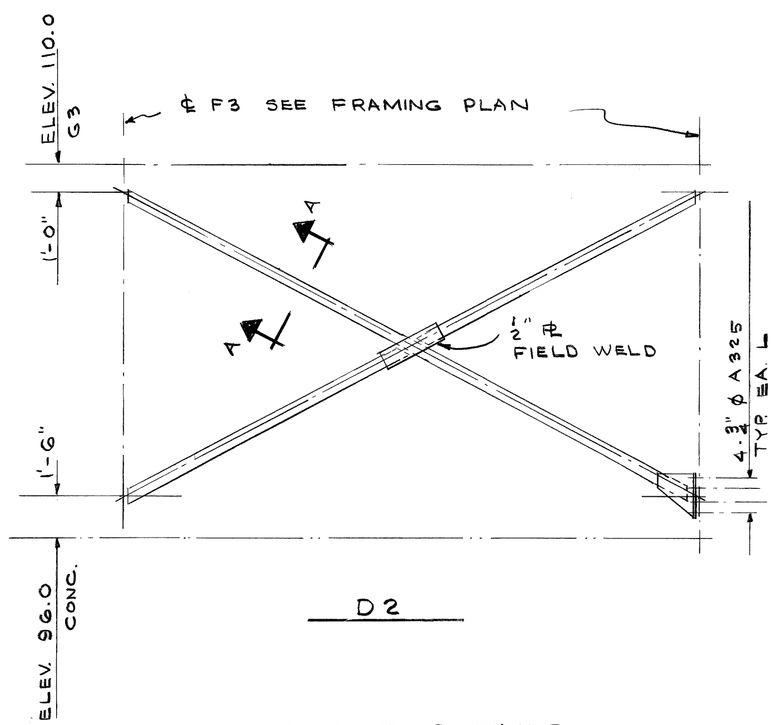
SCALE: 3/4" = 1'-0"



SECTION A-A

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

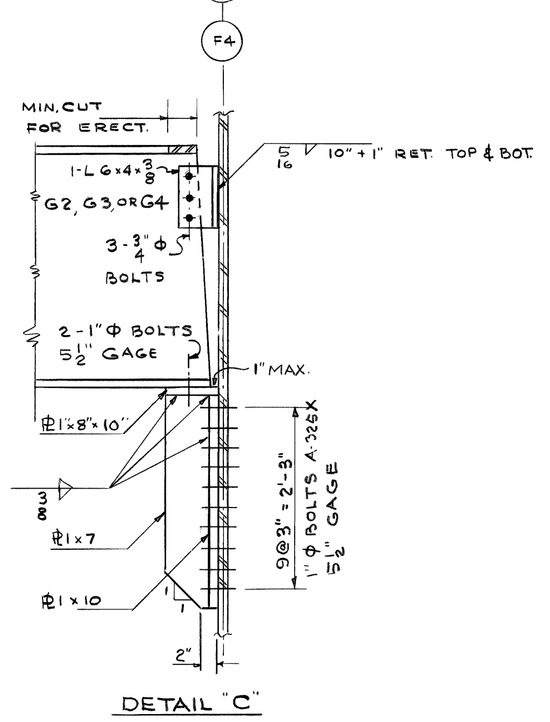
D1



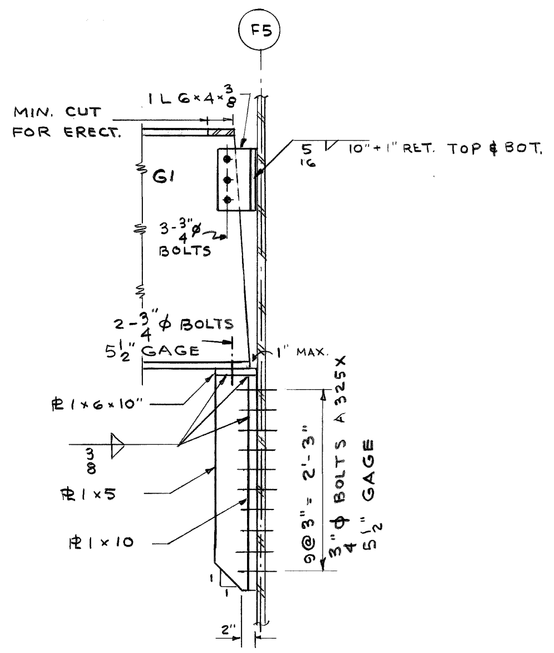
D2

BRACING DETAILS

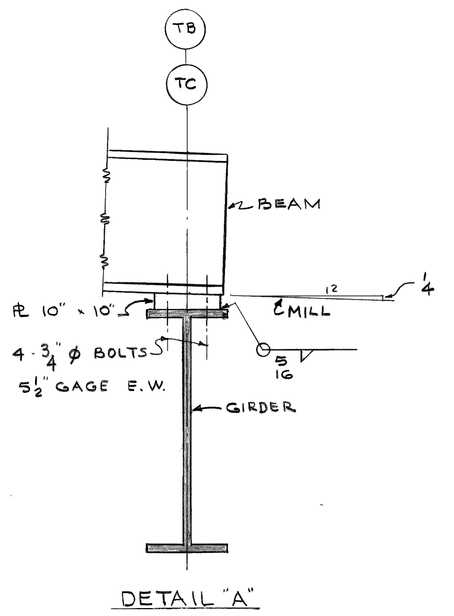
SCALE: 1/4" = 1'-0" UNLESS NOTED



DETAIL "C"



DETAIL "B"



DETAIL "A"

BEAM & GIRDER SEAT CONNECTION DETAILS

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

MATERIAL SCHEDULE

MARK	SHAPE	SECTION	ELEVATION	* CAMBER	REACT.	CONNECTION	REMARKS
B1	I	W 21 × 82	T. R. L. - 6"	5"	35^K	SEAT "A" @ G1 STD. FRAMED BEAM CONN - 6 ROWS 3/4" ϕ BOLTS @ C2	SEE CONDUIT HOLE DETAIL
B2	T	W30 × 210 + 2 L 8 × 4 × 1/2 STOP L @ BEAM CONN.	T. R. L.	5"	150^K	SEAT "A" @ G2, G3, & G4	CONT. 4 WELD TOP & BOT. 4" LEG L. - EXTEND AT 19+91.23 - SEE PLAN. SEE CONDUIT HOLE DETAIL
B3	I	W 12 × 53	T. R. L. - 6"	—	50^K	SEAT @ F4 STD. FRAMED BEAM CONN. @ B2 & B5	WALL SUPPORT
B4	I	W 12 × 53	T. R. L.	—	50^K	SEAT @ F3 & F4 STD. FRAMED BEAM CONN. @ B2	FUTURE COL. SUPPORT
B5	I	W 24 × 160	T. R. L. - 6"	5"	100^K	SEAT "A" @ G4 STD. FRAMED BEAM CONN. @ C2	SEE CONDUIT HOLE DETAIL
B6	I	W 12 × 27	T. R. L. - 6"	—	35^K	SEAT CONN. @ FRAMES. STD. FRAMED BEAM CONN @ BEAMS	TYPICAL @ ℄ TUNNEL UNLESS NOTED.
B7	I	W 12 × 53	T. R. L.	—	50^K	SEAT @ F2 & F3 COPE @ F2	2 - 3/4" ϕ BOLTS F2.
B8	I	W 12 × 53	115.00	—	50^K	SEAT @ C2. W12 × 53 SECTION SEAT @ G3	FUTURE COL SUPPORT
C1	I	W 12 × 40	—	—	100^K	SEE COLUMN BASE DETAIL "C"	PL 1 × 12 × 1'-0" CAP PL
C2	I	W 21 × 82	—	—	250^K	SEE COLUMN BASE DETAIL "A"	
G1	I	W 36 × 135	113.25	—	100^K	SEAT "B" @ F5 STD. FRAMED BEAM CONN. @ C2.	COPE TOP FLG. FOR ERECTION
G2	I	W 36 × 194	113.00	—	225^K	SEAT "C" @ F3 & F4	COPE TOP FLG. FOR ERECTION
G3	I	W 36 × 150	113.00	—	180^K	SEAT "C" @ F3	COPE TOP FLG. FOR ERECTION
G4	I	W 36 × 135	113.00	—	180^K	SEAT "C" F3 & F4 STD. FRAMED BEAM CONN @ C2	COPE TOP FLG. FOR ERECTION
G5	I	W 24 × 100	109.00	—	50^K	STD. FRAMED BEAM CONN.	MATCH ADJACENT FRAMING.
G6	I	W 36 × 135	113.00	—	—	SEE GIRDER G6 DETAIL	CANTILEVER - SEE DETAIL

* INCLUDES 3" FOR T.R.L. PROFILE

GENERAL NOTES

DESIGN SPECIFICATIONS:
1. 1969 A.I.S.C. LATEST EDITION
2. STRUCTURAL STEEL FRAMES SHALL CONFORM TO PART 2 A.I.S.C SPECIFICATIONS FOR PLASTIC DESIGN
3. M.D.S.H. STD. SPECIFICATIONS FOR HIGHWAY CONSTRUCTION 1973.

MATERIAL: ASTM A-572 GRADE 50 EXCEPT ANCHOR BOLTS AND BASE PLATES WHICH SHALL BE ASTM A-36.

WELDING:
1. PROCESS - E 70 XX
2. GROOVE WELDS SHALL BE TESTED IN ACCORDANCE WITH SECTION 504.16 OF M.S.H.D STD. SPEC.
3. SURFACES OF ALL WELDS SHALL HAVE AS-WELDED SURFACES THAT ARE REASONABLY SMOOTH AND UNIFORM.

STRUCTURAL STEEL CONTR. SHALL FURNISH ANCHOR BOLTS AND ANCHOR BOLT SETTING PLAN TO FDN. CONTR. ANCHOR BOLTS SHALL BE SET FIRMLY TO A TEMPLATE AND THE ENGINEER SHALL VERIFY LOCATION, ELEVATION, AND PROJECTION OF ANCHOR BOLTS BEFORE CONC. IS POURED.

GROUT: NON-SHRINK IN ACCORDANCE WITH SECTION 7.02 OF M.D.S.H. STD. SPEC.

HOLES IN FRAMES SHALL BE DRILLED AND REAMED IF WITHIN 1'-6" OF WELDED JOINTS

FIELD CONNECTIONS: 3/4" ϕ A325F UNLESS NOTED.

STRUCTURAL STEEL CONTR. SHALL FURNISH ADEQUATE TEMPORARY BRACING AS REQ'D.

PAINTING: EPOXY SYSTEM FOR SHOP AND FIELD COATS WITH SAND BLAST SURFACE PREPARATION. SEE SPECIFICATION - SPECIAL PROVISIONS FOR PAINTING.

LOADING:	TUNNEL PROPER		PYRAMID AREA
2" GRANITE	27		—
1" MORTAR	10		—
2 3/4" CONC. MAT	34		34
1/4" M.W.P.	2		2
CONC. SLAB (7")	88	(8")	100
STEEL BM.	10		35
LIGHTS - MECH.	4		4
DEAD LOAD	175 P.S.F		175 P.S.F
LIVE LOAD	100 P.S.F		100 P.S.F

CONC. SLABS ARE DESIGNED FOR AN ALTERNATE CONCENTRATED LOAD OF 5.0^K.

SEE SH. 34 FOR COLUMN LOADS FROM PYRAMID STRUCTURE

revisions

date 8-11-75
designed T. M.
drawn T.M.
checked M.C.

approved
T. E. McGowan
STRUCTURAL ENGINEER

CITY OF DETROIT
CITY ENGINEERING DEPARTMENT

ATWATER STREET RELOCATION
ATWATER TUNNEL

STRUCTURAL STEEL DETAILS

contract no. 07105 A

sheet 34 of 81
drawing no: S 6

GENERAL NOTES

ELEVATIONS SHOWN ARE FINAL ELEVATIONS. STEEL BEAMS HAVE BEEN CAMBERED FOR TOTAL DEAD LOAD.

PROVIDE CLASS B LAP SPLICES IN ACCORDANCE WITH ACI 318-71. LAP CONTINUOUS TOP BARS AT MID-SPAN. LAP CONTINUOUS BOTTOM BARS AT SUPPORT.

REINFORCING STEEL SHALL CONFORM TO ASTM A615 GRADE 60.

ALL CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4000 PSI. WHITE CONCRETE SHALL BE PLACED WITHIN THE LIMITS SHOWN ON THE DRAWINGS. ALL OTHER CONCRETE SHALL BE GRADE 405.

ALL ITEMS EMBEDDED IN WHITE CONCRETE SUCH AS HANGER INSERTS, PIPES, BAR CHAIRS, ETC., SHALL BE PLASTIC OR PLASTIC COATED.

THE CONTRACTOR SHALL CHECK WITH OTHER TRADES FOR EMBEDDED ITEMS THAT ARE TO BE SET IN PLACE PRIOR TO PLACING OF CONCRETE. SEE MECH. DRAWING M4 FOR HANGER INSERT SCHEDULE.

PROVIDE DETAILS IN ACCORDANCE WITH ACI 315-74.

FOR TUNNEL ROOF LOADS SEE DRWG # 36.

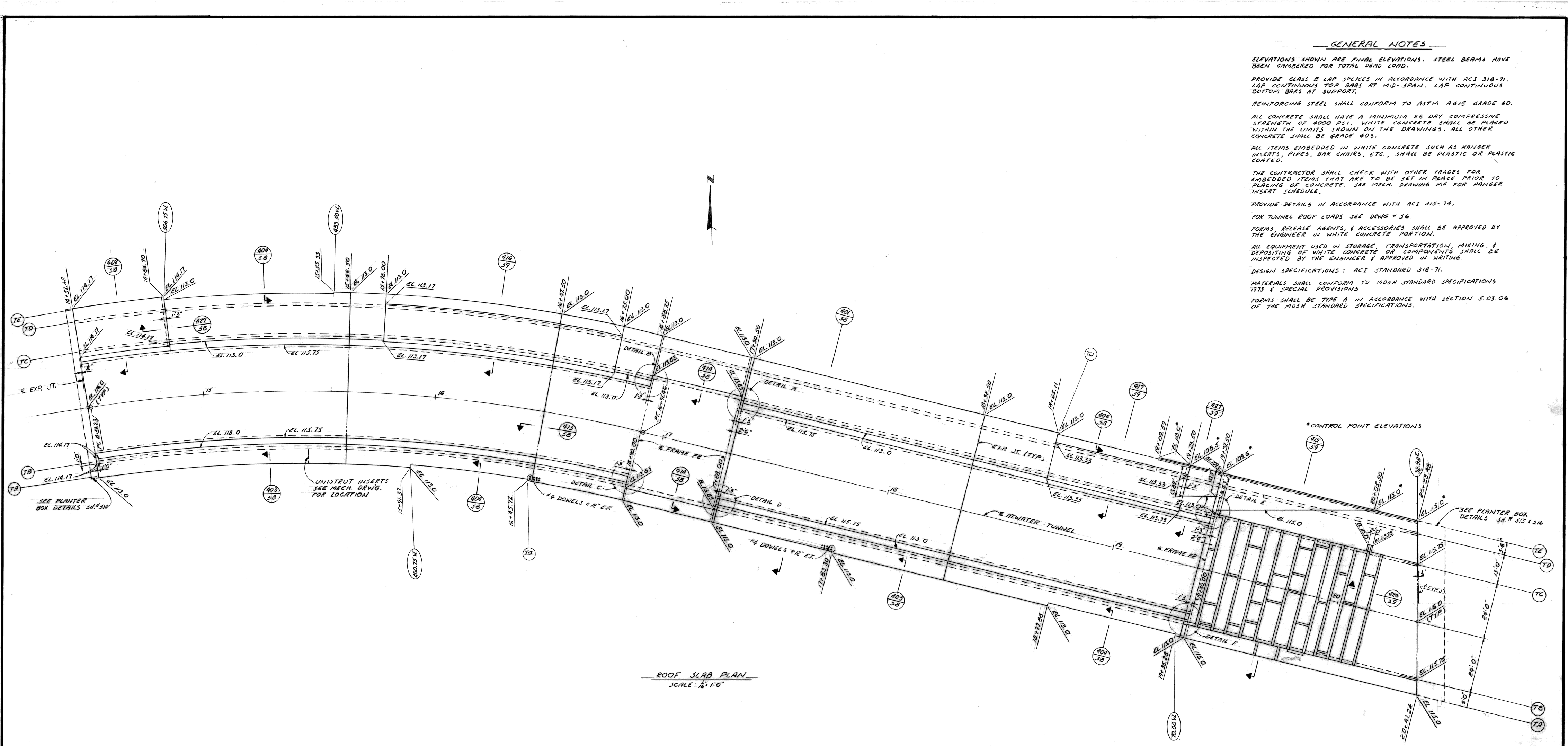
FORMS, RELEASE AGENTS, & ACCESSORIES SHALL BE APPROVED BY THE ENGINEER IN WHITE CONCRETE PORTION.

ALL EQUIPMENT USED IN STORAGE, TRANSPORTATION, MIXING, & DEPOSITING OF WHITE CONCRETE OR COMPONENTS SHALL BE INSPECTED BY THE ENGINEER & APPROVED IN WRITING.

DESIGN SPECIFICATIONS: ACI STANDARD 318-71.

MATERIALS SHALL CONFORM TO MDSH STANDARD SPECIFICATIONS 1973 & SPECIAL PROVISIONS.

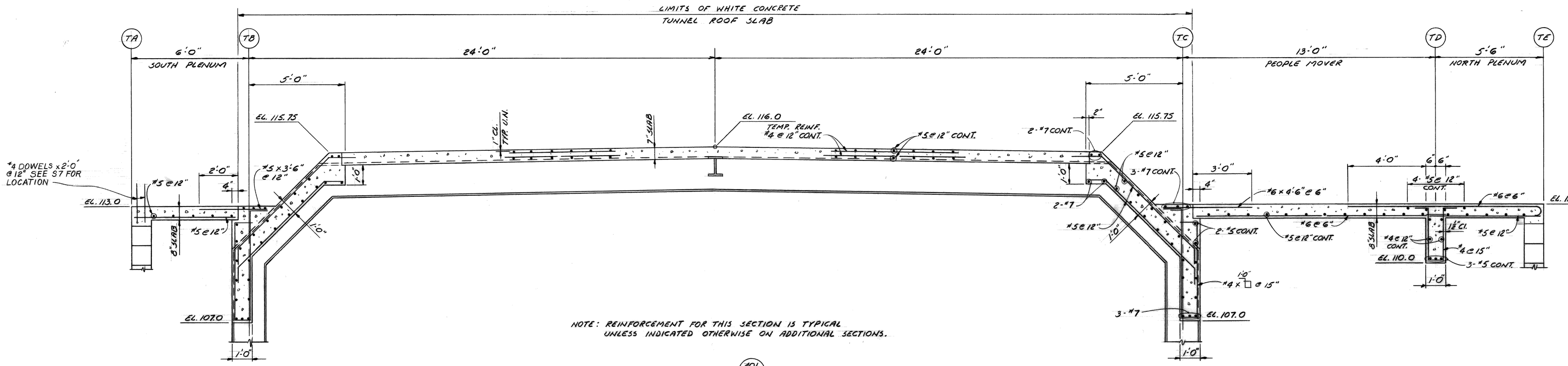
FORMS SHALL BE TYPE A IN ACCORDANCE WITH SECTION S.03.06 OF THE MDSH STANDARD SPECIFICATIONS.

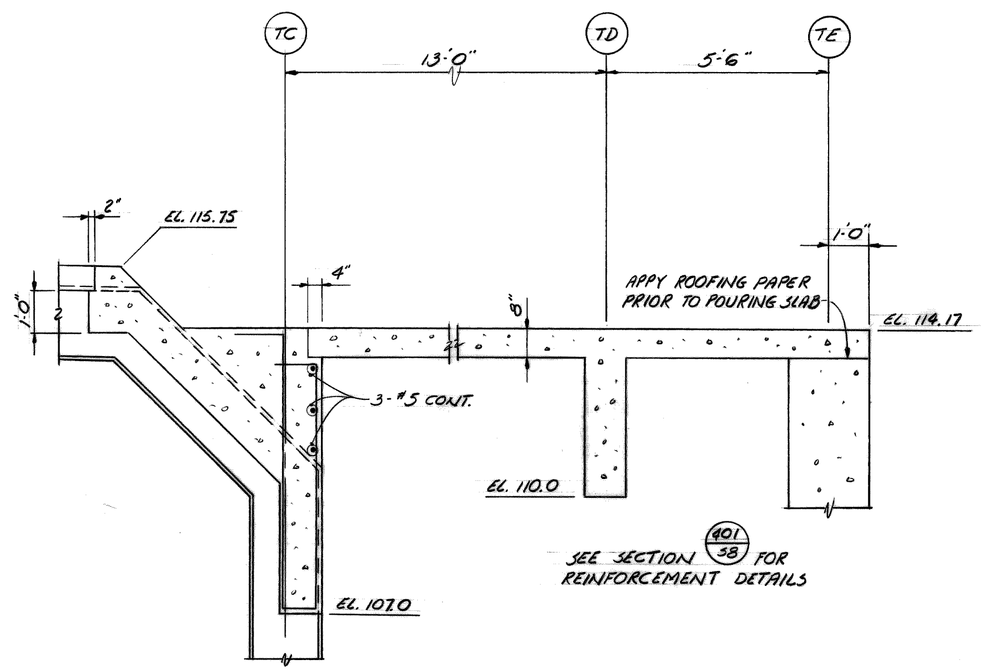


*CONTROL POINT ELEVATIONS

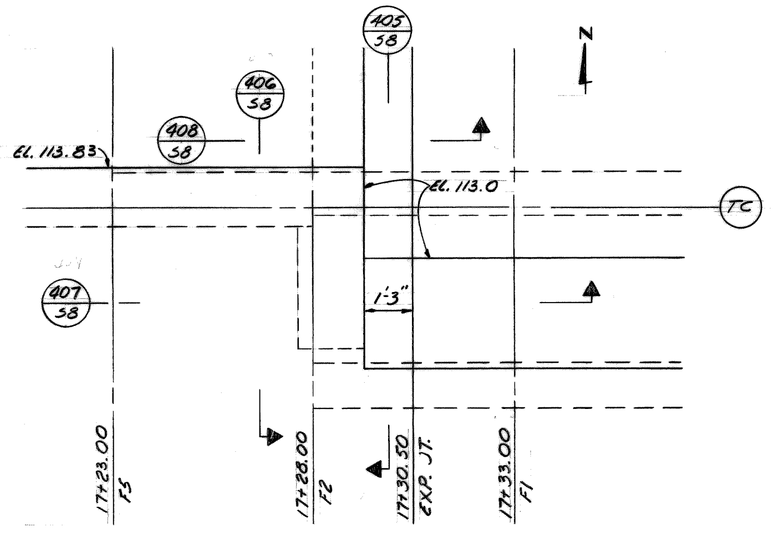
ROOF SLAB PLAN
SCALE: 1/16" 1'-0"

revisions	date 8-11-75 designed R. Bunce drawn A.G. checked R.B.	approved T.E. McGowan STRUCTURAL ENGINEER	CITY OF DETROIT CITY ENGINEERING DEPARTMENT	ATWATER STREET RELOCATION ATWATER TUNNEL TUNNEL ROOF SLAB PLAN	contract no. 07105 A	sheet 35 of 81 drawing no: S 7

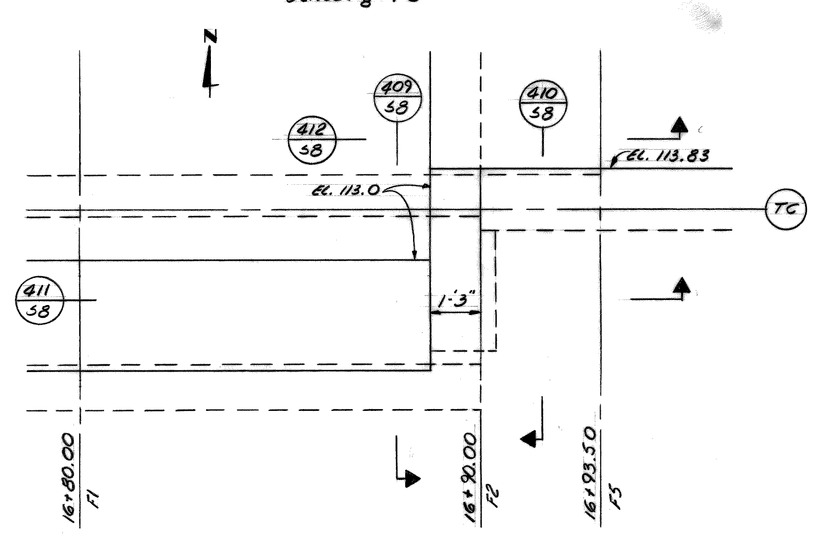




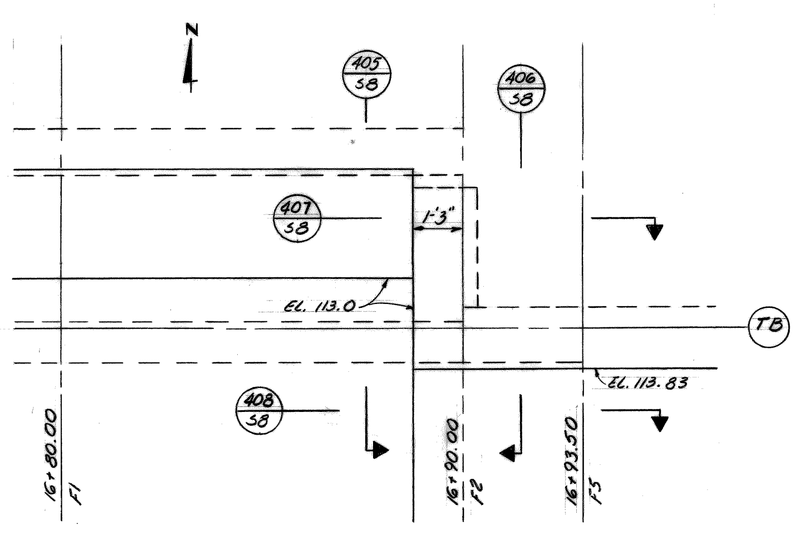
SECTION 401/37
SCALE: 3/8" = 1'-0"



DETAIL A



DETAIL B



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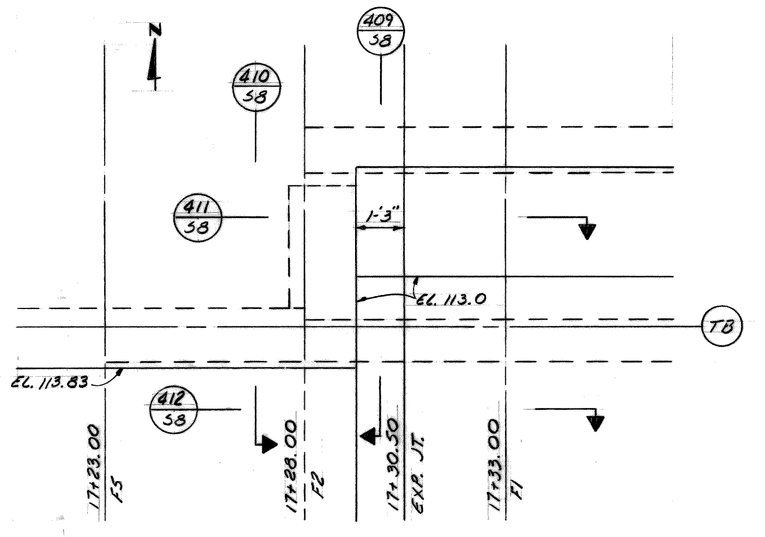
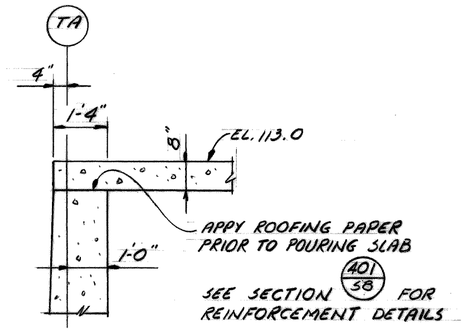


DETAIL D

SECTION 402/37
SCALE: 3/8" = 1'-0"



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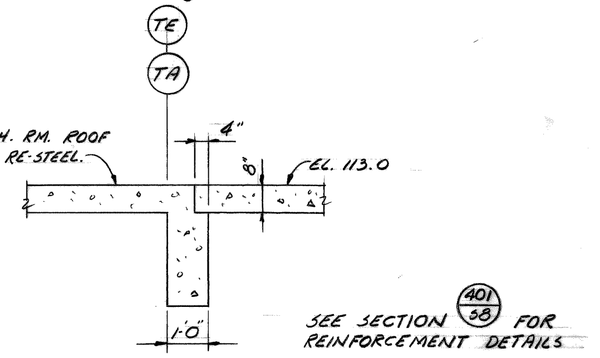
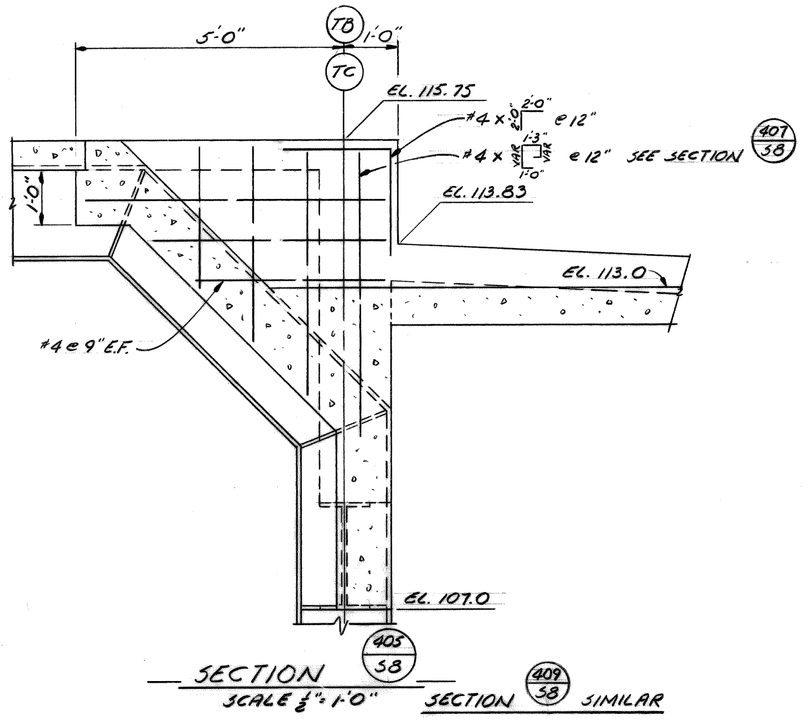
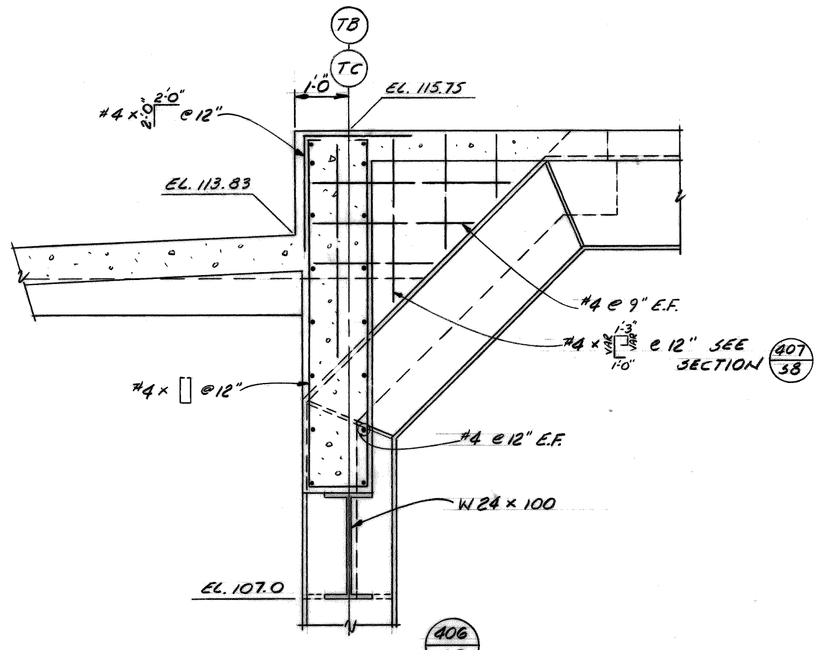
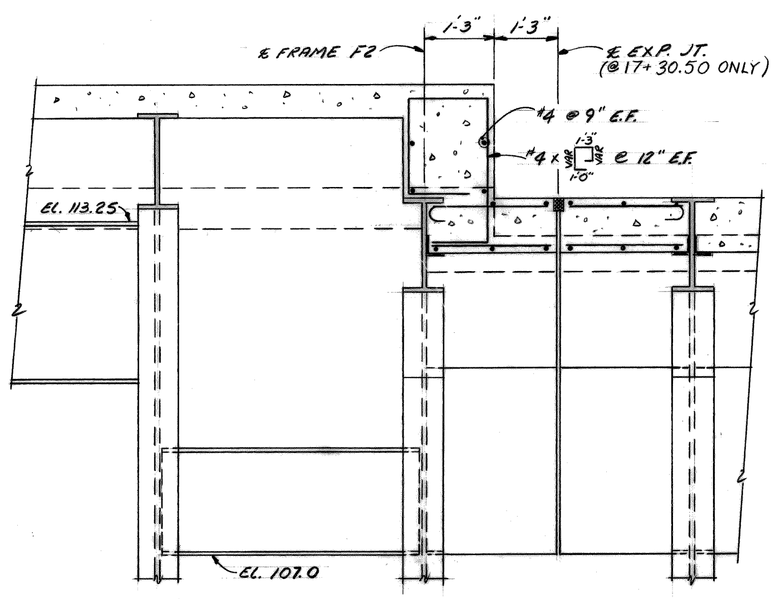




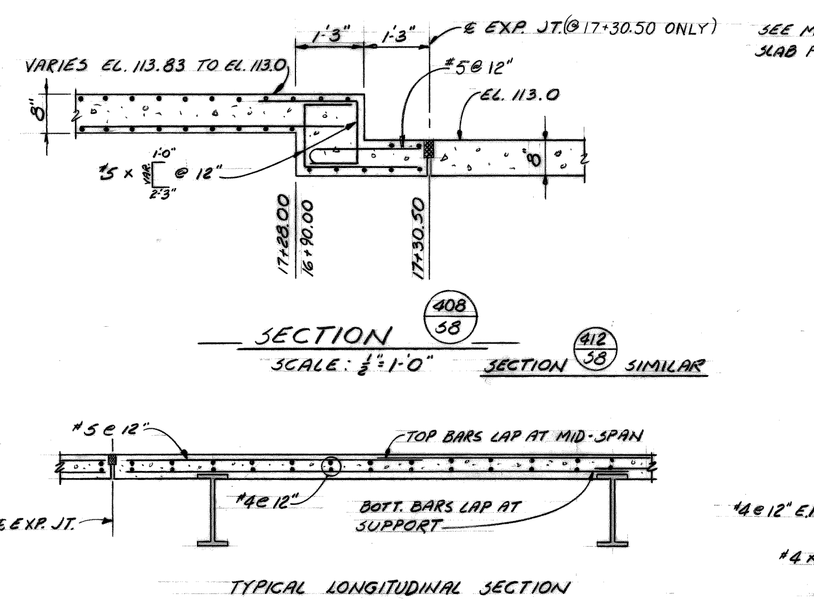
SECTION 405/38
SCALE: 3/8" = 1'-0"
SECTION 409/38 SIMILAR



SECTION 406/38
SCALE: 3/8" = 1'-0"
SECTION 410/38 SIMILAR



SECTION 407/38
SCALE: 3/8" = 1'-0"
SECTION 411/38 SIMILAR

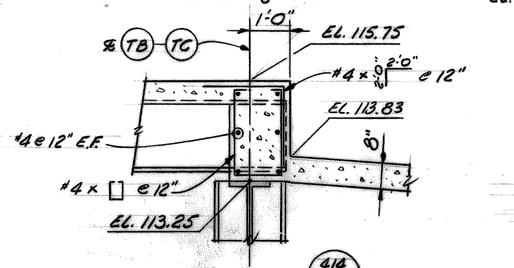


SECTION 408/38
SCALE: 3/8" = 1'-0"
SECTION 412/38 SIMILAR

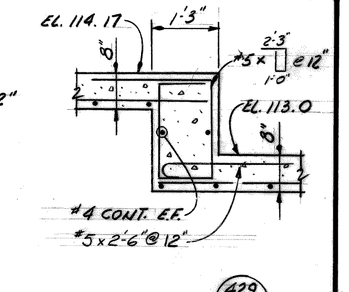
TYPICAL LONGITUDINAL SECTION

SECTION 413/37
SCALE: 3/8" = 1'-0"

SECTION 408/37
SCALE: 3/8" = 1'-0"

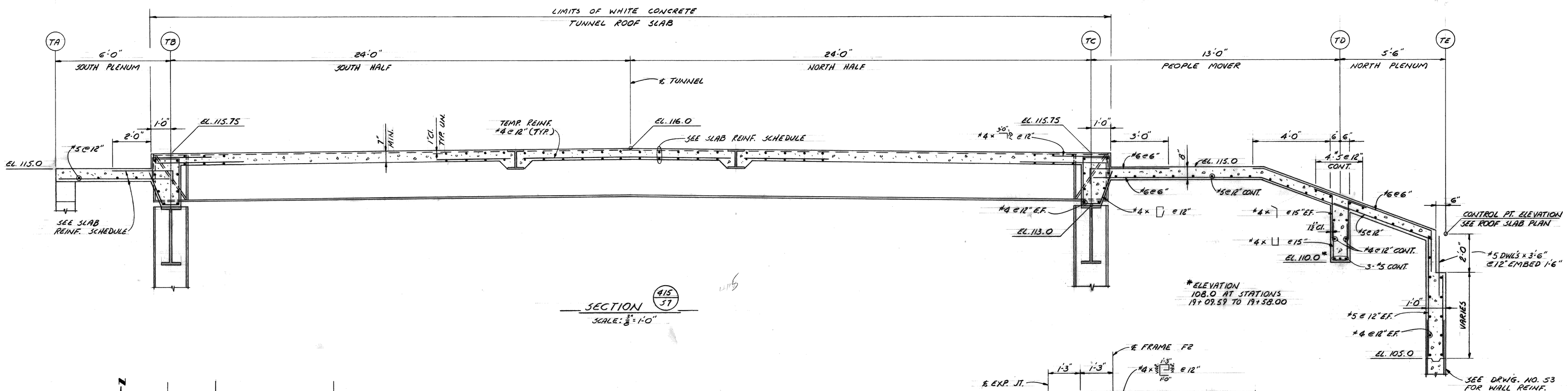


SECTION 414/37
SCALE: 3/8" = 1'-0"



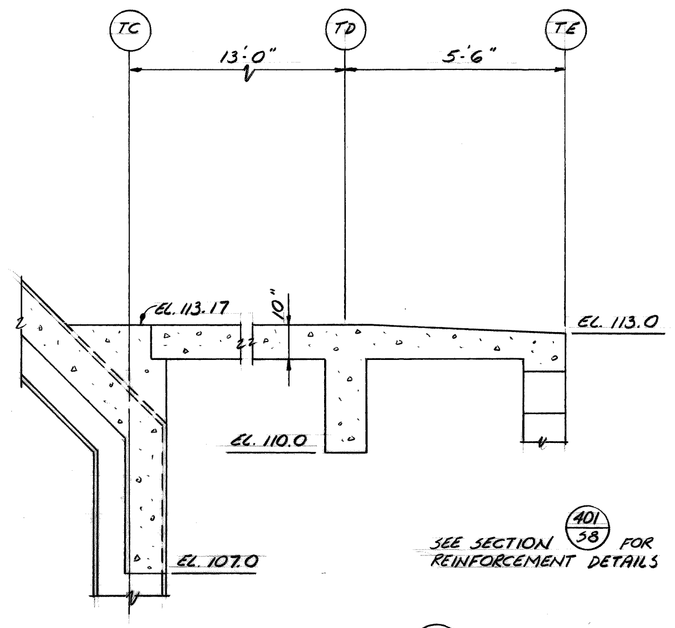
SECTION 429/37
SCALE: 3/8" = 1'-0"

revisions	date 8-11-75	approved T. E. McGowan STRUCTURAL ENGINEER	CITY OF DETROIT CITY ENGINEERING DEPARTMENT	ATWATER STREET RELOCATION ATWATER TUNNEL TUNNEL ROOF SLAB DETAILS
	designed R. Bunce			contract no. 07105 A
	drawn A.G.			sheet 36 of 81 drawing no: S8
	checked R.B.			



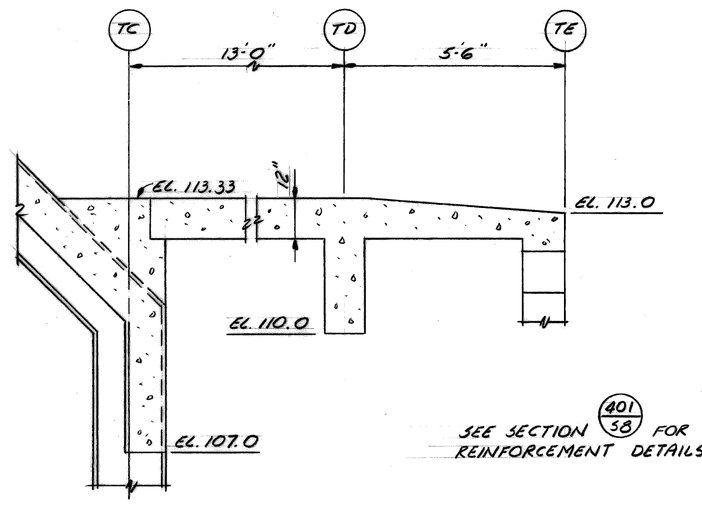
SECTION (415/37)
SCALE: 3/8" = 1'-0"

*ELEVATION 108.0 AT STATIONS 19+09.59 TO 19+58.00



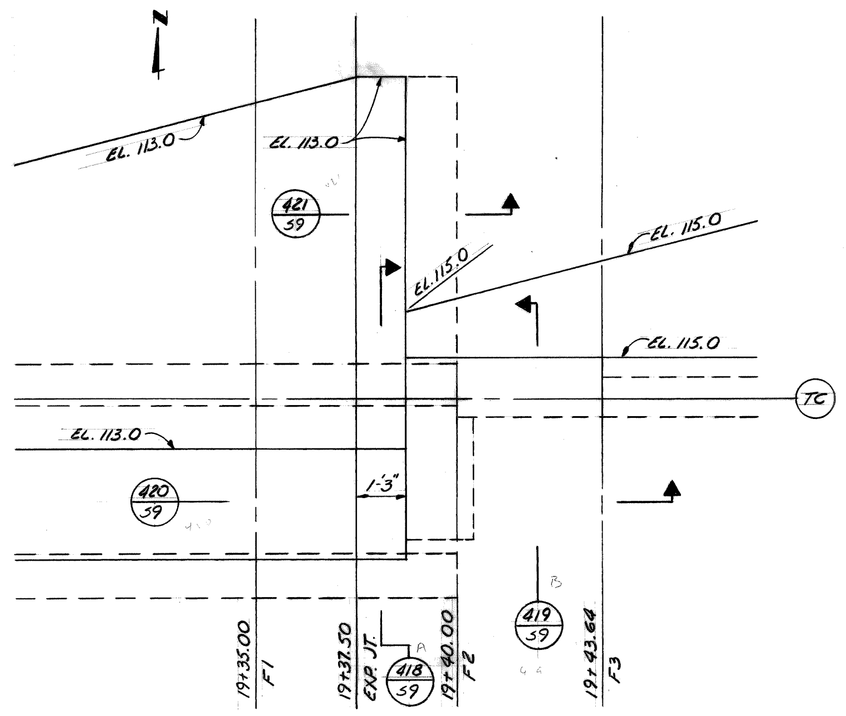
SEE SECTION (401/38) FOR REINFORCEMENT DETAILS

SECTION (416/37)
SCALE: 3/8" = 1'-0"

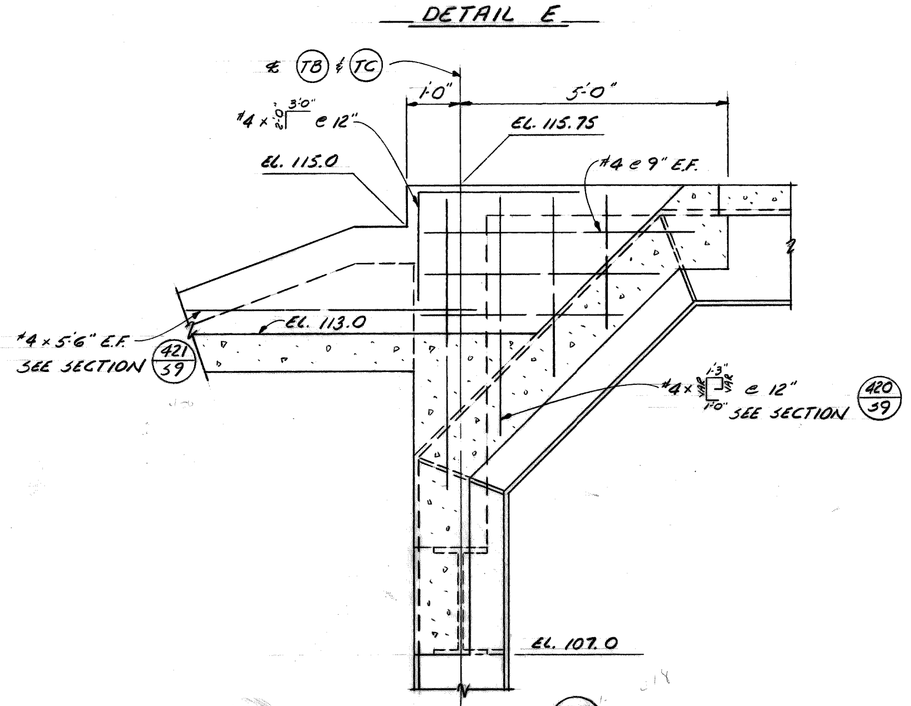


SEE SECTION (401/38) FOR REINFORCEMENT DETAILS

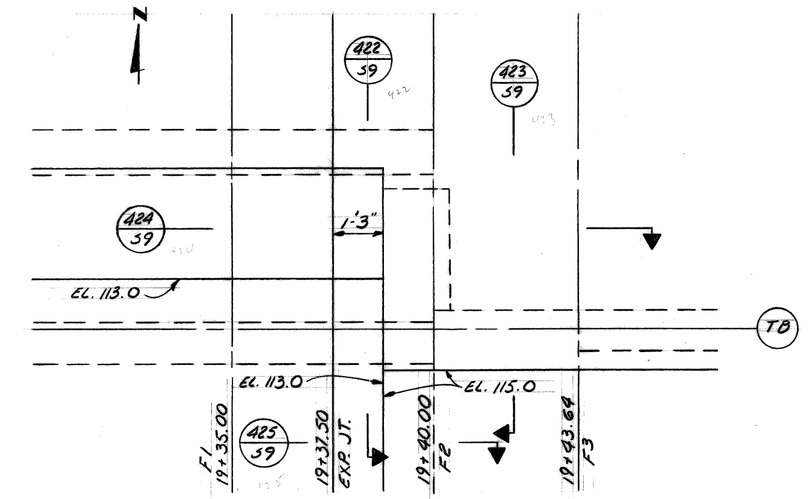
SECTION (417/37)
SCALE: 3/8" = 1'-0"



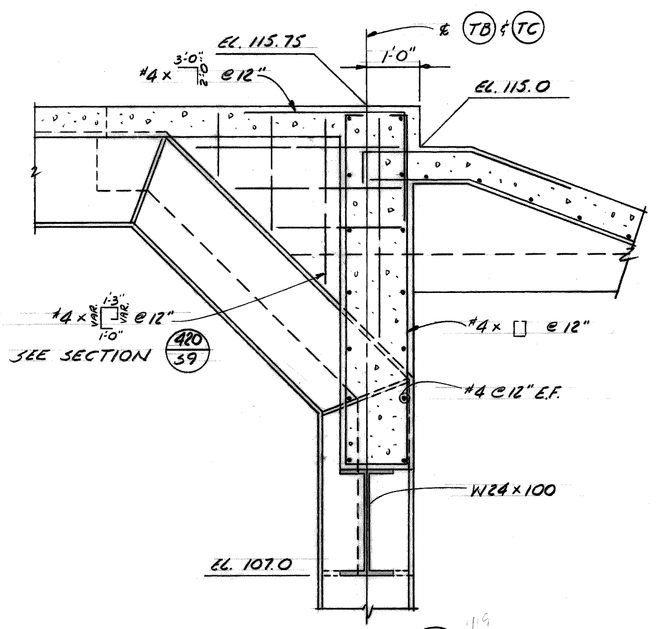
DETAIL E



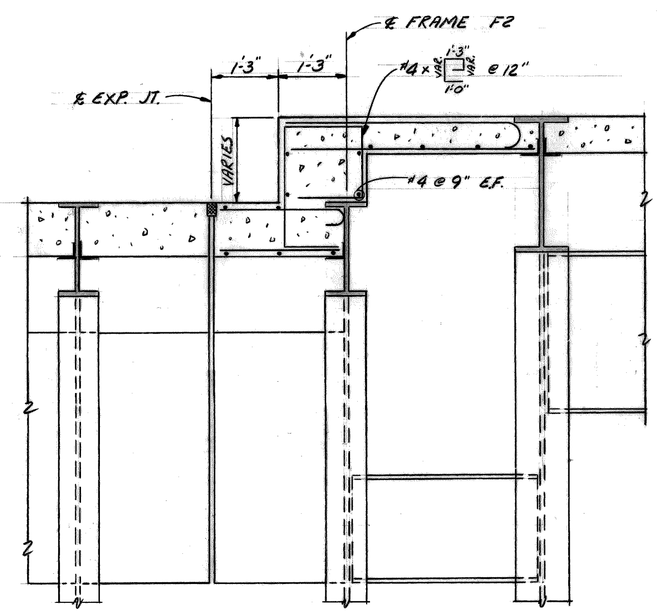
SECTION
SCALE: 3/8" = 1'-0"
(428/39) SIMILAR



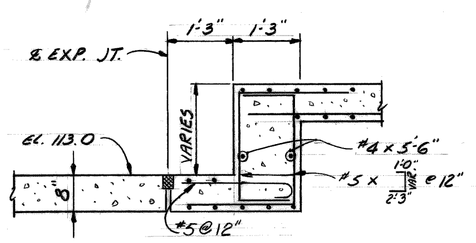
DETAIL F



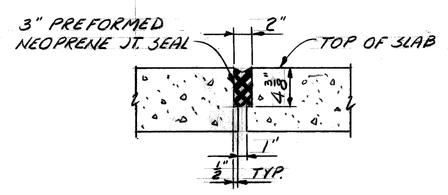
SECTION (419/39)
SCALE: 3/8" = 1'-0"
(423/39) SIMILAR



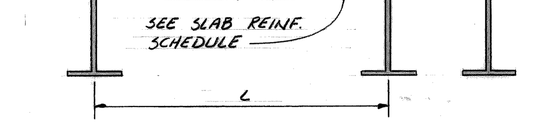
SECTION (420/39)
SCALE: 1/2" = 1'-0"
(424/39) SIMILAR



SECTION (421/39)
SCALE: 1/2" = 1'-0"
(425/39) SIMILAR

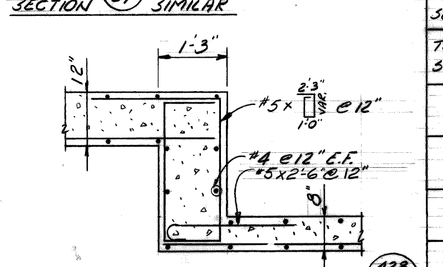


EXPANSION JT. DETAIL
SCALE: 1"=1'-0"



LONGITUDINAL SECTION AT PYRAMID

SECTION (426/37)
SCALE: 3/8" = 1'-0"



SECTION (428/39)
SCALE: 3/8" = 1'-0"

SLAB REINFORCEMENT SCHEDULE		
LOCATION	SIZE & SPACING	STATION
TUNNEL ROOF SLAB - FULL WD.	#5 @ 12" BOTT #5 @ 12" TOP	14+51.34 TO 19+37.50
TUNNEL ROOF SLAB - FULL WD.	#6 @ 12" BOTT #5 @ 12" TOP	19+37.50 TO 19+91.23
TUNNEL ROOF SLAB - N. HALF	#6 @ 12" BOTT #5 @ 12" TOP	19+91.23 TO 32.92 E.
TUNNEL ROOF SLAB - S. HALF	#6 @ 6" BOTT #5 @ 12" TOP	19+91.23 TO 32.92 E.
SOUTH PLENUM	#5 @ 12" BOTT #5 @ 12" TOP	14+51.34 TO A+ 91.23
SOUTH PLENUM	#5 @ 6" BOTT #5 @ 6" TOP	19+91.23 TO 32.92 E.
PEOPLE MOVER	#6 @ 6" BOTT #6 @ 6" TOP	14+51.34 TO 32.92 E.
NORTH PLENUM	#5 @ 12" BOTT #6 @ 6" TOP	14+51.34 TO 32.92 E.

revisions

date	8-11-75
designed	R. Bunce
drawn	A.G.
checked	R.B.

approved
T. E. McSweeney
STRUCTURAL ENGINEER

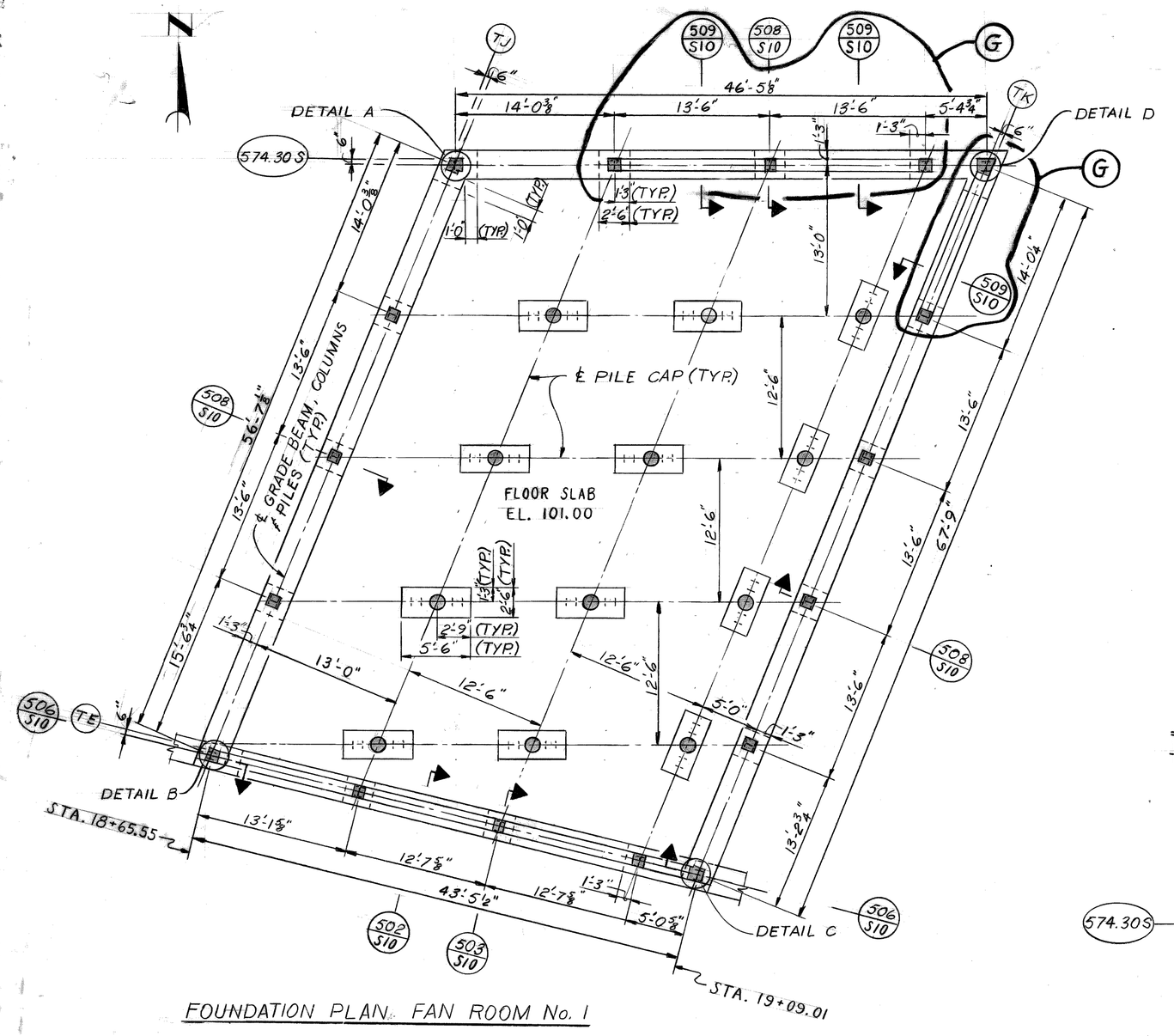
CITY OF DETROIT
CITY ENGINEERING DEPARTMENT

ATWATER STREET RELOCATION
ATWATER TUNNEL

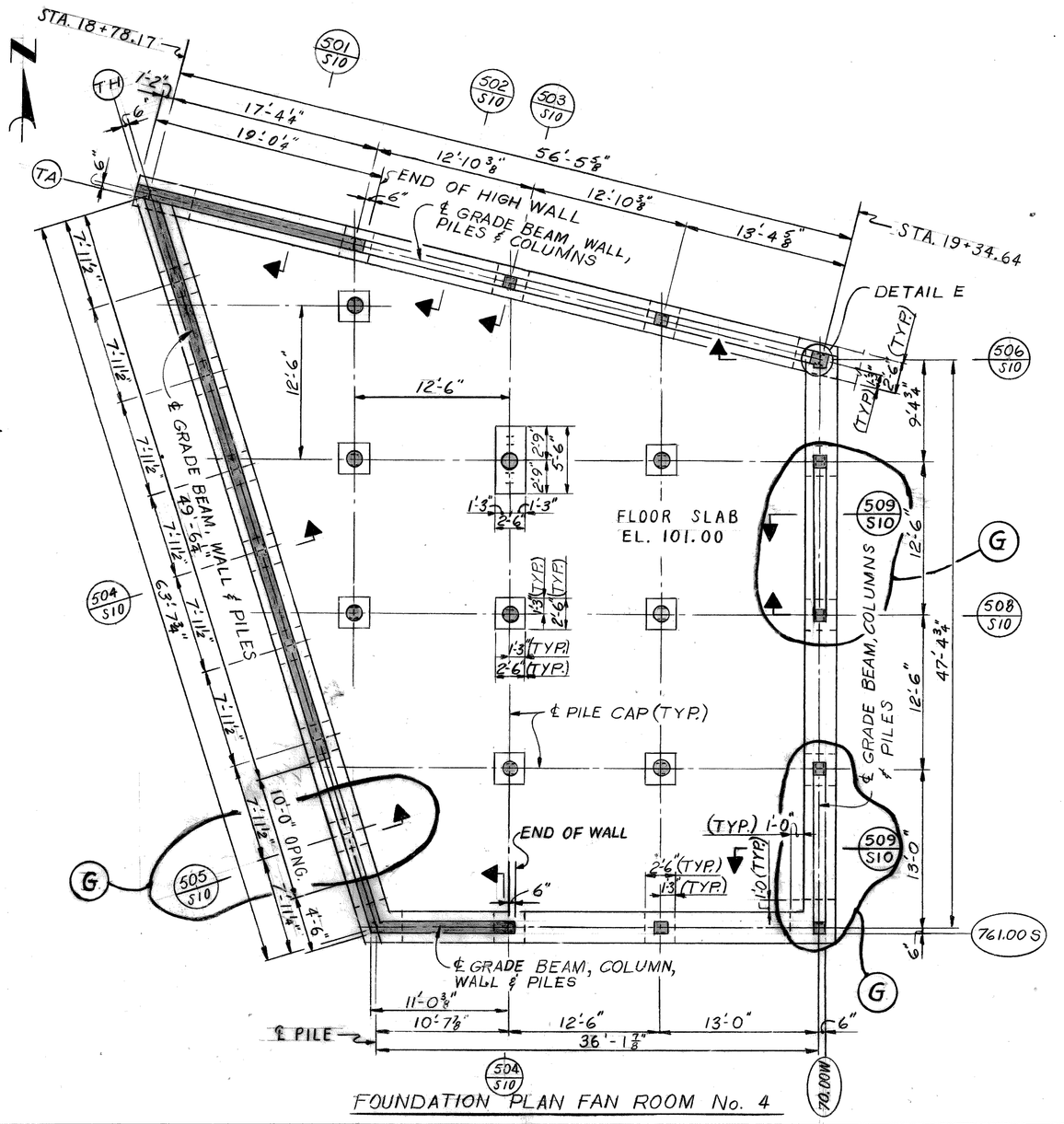
TUNNEL ROOF SLAB DETAILS

contract no. 07105A

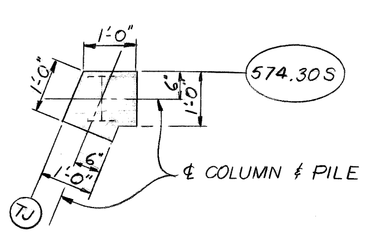
sheet 37 of 81
drawing no: S 9



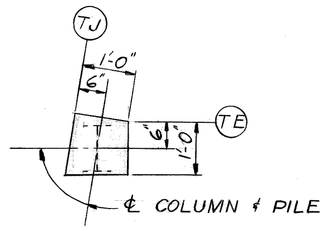
FOUNDATION PLAN. FAN ROOM No. 1



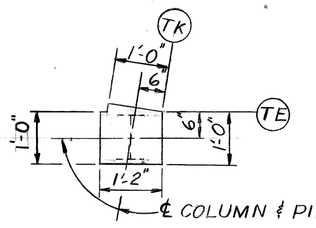
FOUNDATION PLAN FAN ROOM No. 4



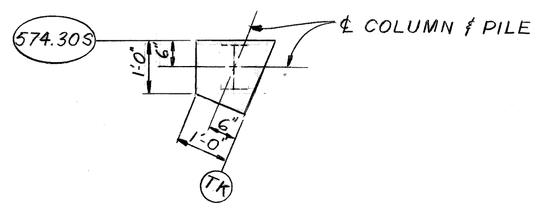
DETAIL A



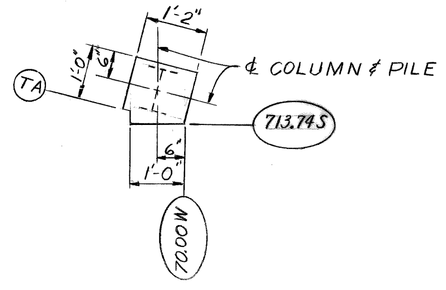
DETAIL B



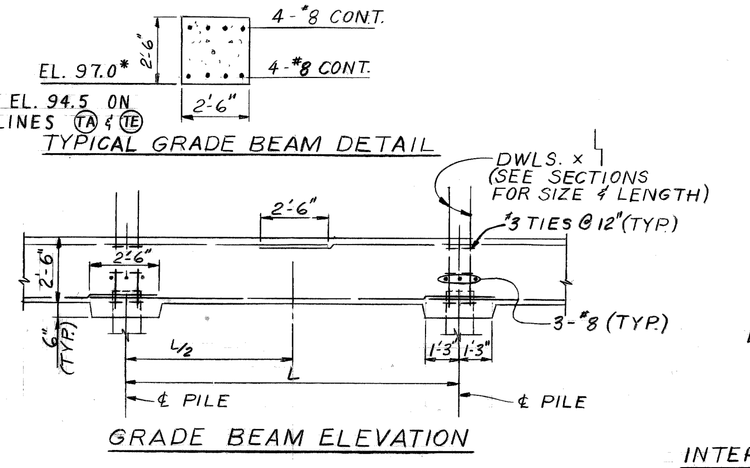
DETAIL C



DETAIL D

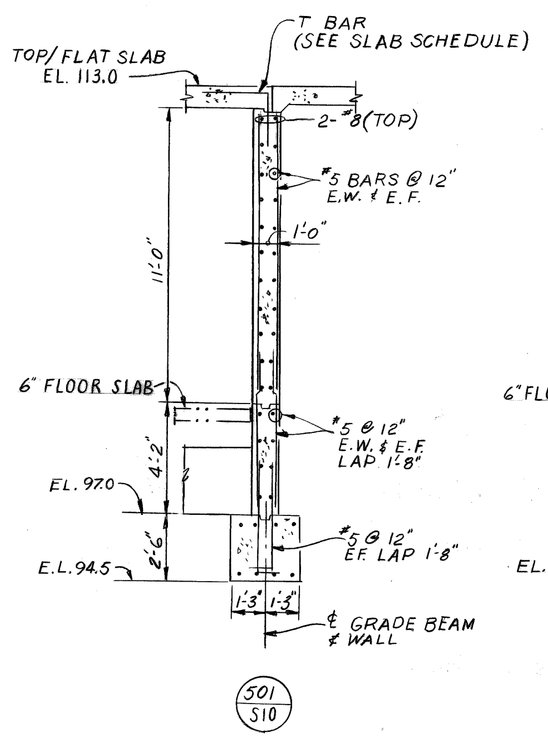


DETAIL E

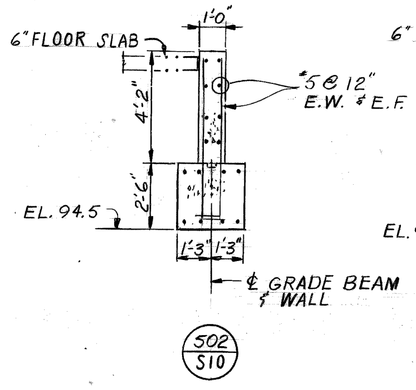


TYPICAL GRADE BEAM DETAIL

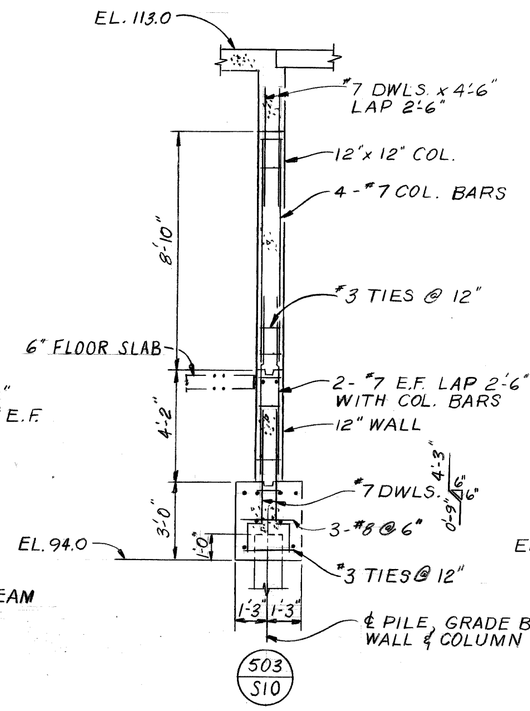
GRADE BEAM ELEVATION



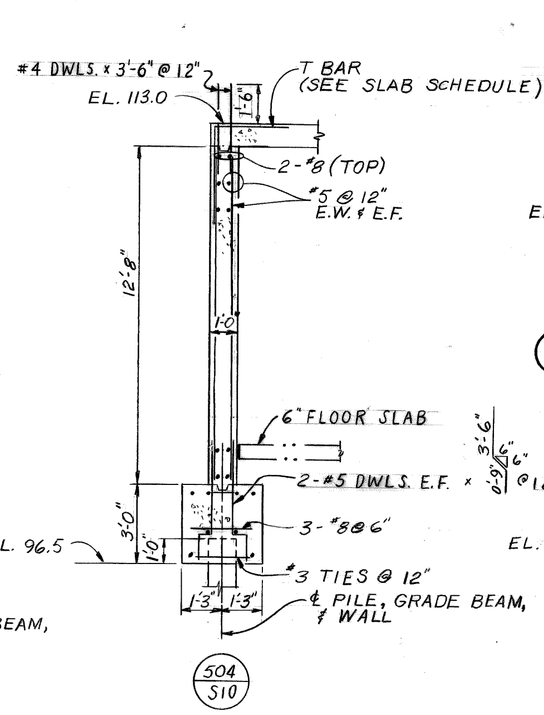
501 S10



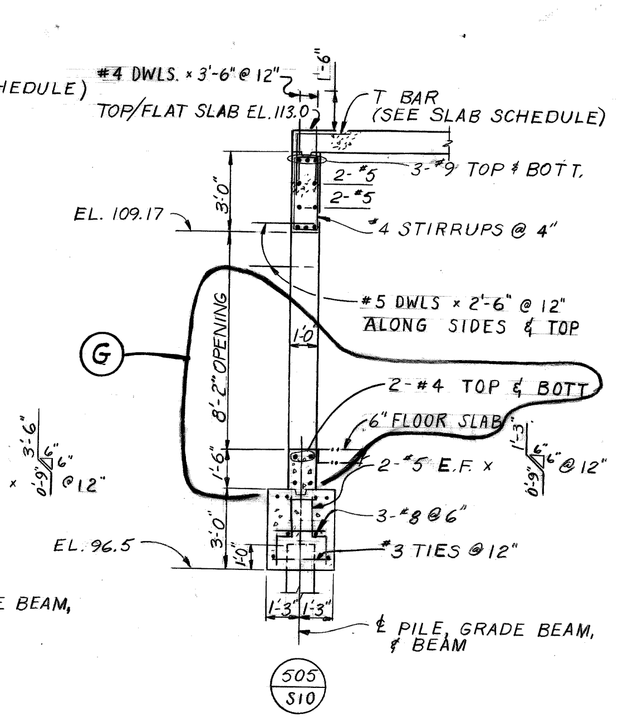
502 S10



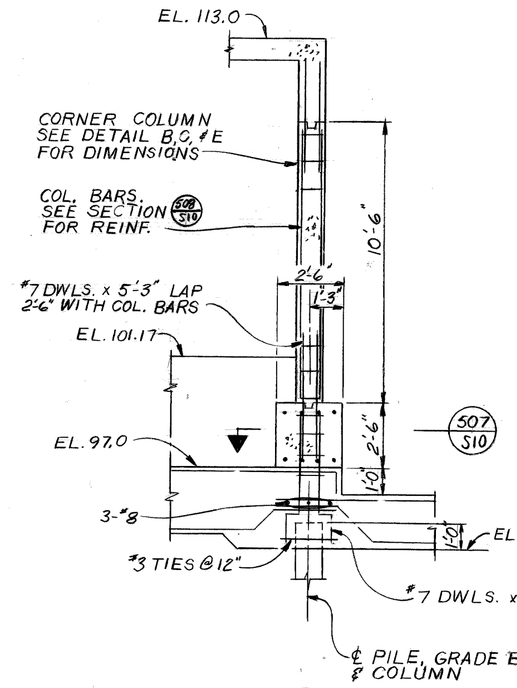
503 S10



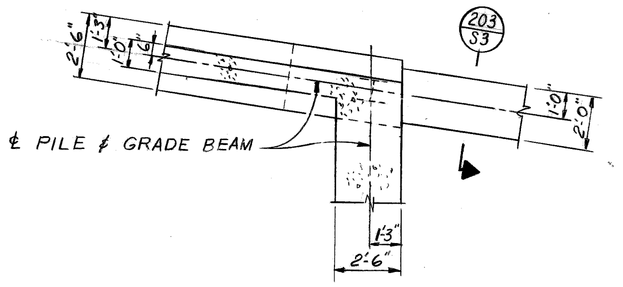
504 S10



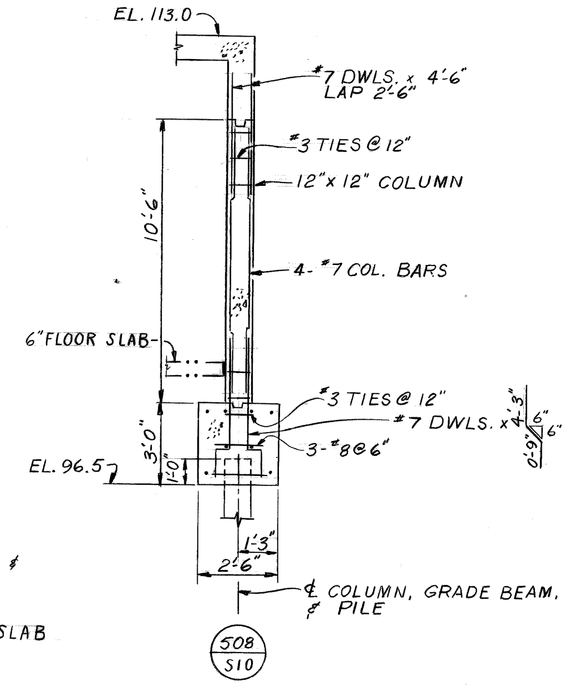
505 S10



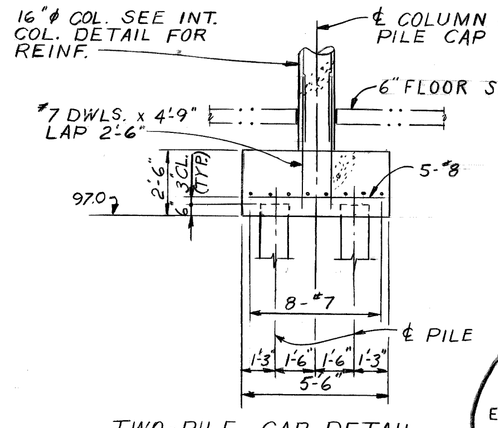
507 S10



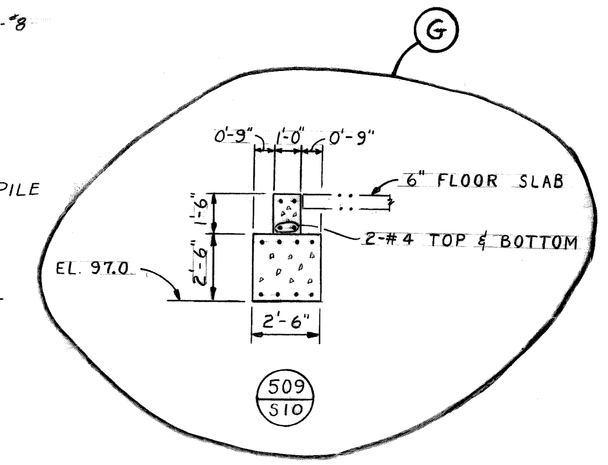
507 S10



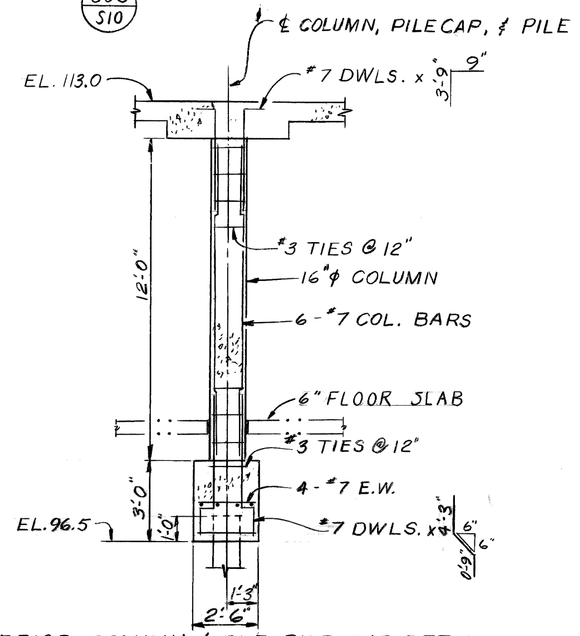
508 S10



TWO-PILE CAP DETAIL



509 S10



INTERIOR COLUMN & ONE-PILE CAP DETAIL

MAXIMUM COLUMN LOAD (INCL. GRADE BM.)			
ROOM	INTERIOR		EXTERIOR
	2-PILE CAP	1-PILE CAP	1-PILE CAP
1	200 K	—	150 K
4	175 K	150 K	150 K

FAN ROOM NOTES:

CONCRETE:
GRADE 35S, f'_c = 3500 P.S.I. – FOUNDATIONS, GRADE BEAMS, & SLABS ON GRADE.
GRADE 40S, f'_c = 4000 P.S.I. – ROOF SLABS, COLUMNS, & CONC. WALLS.

DOWELS INDICATED ON DRAWINGS ARE TO BE OF SAME SIZE AND QUANTITY AS VERTICAL BARS.

CONCRETE REINFORCING STEEL:
A.S.T.M. A615-72, A616-72, OR A617-72 MIN. YIELD 60,000 P.S.I.
W.W.F. SHALL BE A.S.T.M. A-185.

UNLESS OTHERWISE SHOWN OR NOTED, PROVIDE 2-#5 (1 EACH FACE) AROUND UNFRAMED OPENINGS IN CONCRETE WALLS AND SLABS. PLACE BARS PARALLEL TO SIDES OF OPENINGS AND EXTEND THEM 24" BEYOND CORNERS.

PROVIDE EQUIPMENT BASES AND SUPPORTS AS REQUIRED COMPLYING WITH APPROVED EQUIPMENT SHOP DRAWINGS.

LOCATE ALL SLEEVES, OPENINGS, EMBEDDED ITEMS, ETC. WHICH ARE INDICATED ON THE DESIGN DRAWINGS. THE CONTRACTOR SHALL ALSO CHECK WITH OTHER TRADES TO MAKE SURE THE SLEEVES, OPENINGS AND EMBEDDED ITEMS THAT ARE TO BE PROVIDED AND SET BY THEM ARE IN PLACE PRIOR TO THE PLACING OF CONCRETE IN THE AREA INVOLVED.

PROVIDE CORNER BARS #2 @ 2'-0" AT EXTERIOR CORNERS OF CONCRETE WALLS SAME SIZE AND ℄ SPACING AS HORIZONTAL REINFORCEMENT

PROVIDE DETAILS IN ACCORDANCE WITH ACI 315-74.

SEE ARCH. DRAWINGS FOR LOCATION OF INTERIOR WALLS, CURBS, FLOOR DRAINS, & MASONRY WALL ANCHOR DETAILS.

FOR PILE LOCATIONS AND DETAILS SEE DRAWING NO. S1.

SLABS ON GRADE: SEE DRAWING NO. S12 FOR DETAILS.
W.W.F. SHALL BE 6 x 6 - W3 x W3 DEPRESSED 1½" FROM TOP.
CONTROL JOINTS SHALL BE PLACED AT A MAXIMUM OF 25' SPACING OR 400 SQ. FT. BY AREA.
CONSTRUCTION JOINTS NOT INTENDED TO ACT AS CONTROL JOINTS SHALL BE PARALLEL TO AND NOT LESS THAN 5 FT. FROM A CONTROL JOINT AND CAST IN SUCH A MANNER THAT ABUTTING SLABS ARE BONDED. SLABS SHALL BE POURED IN A CHECKERBOARD FASHION.
PROVIDE ½" PREMOLDED FIBER ISOLATION JOINTS AROUND ALL INTERIOR COLUMNS, SLABS ON GRADE OR WHERE ELSE SHOWN ON PLANS.
PROVIDE A MINIMUM 6" "BACKFILL (C.I.P.)" UNDER ALL SLABS ON GRADE.

DAMPPROOFING:
DAMPPROOFING SHALL BE APPLIED TO THE BACK OF ALL WALLS RECEIVING BACKFILL.

THICKENED SLAB:
PROVIDE THICKENED SLAB UNDER ALL NON-BEARING WALLS AND UNDER EQUIPMENT PADS AS SHOWN ON DRWGS. A5, A6, M7 & M8.

revisions			
7-12-76	G. CONCRETE PEDESTAL AT DOOR OPENINGS.		

date 8-11-75
designed R. Bunce
drawn L. G./R.B.
checked R. B

approved
T. E. McGowan
STRUCTURAL ENGINEER

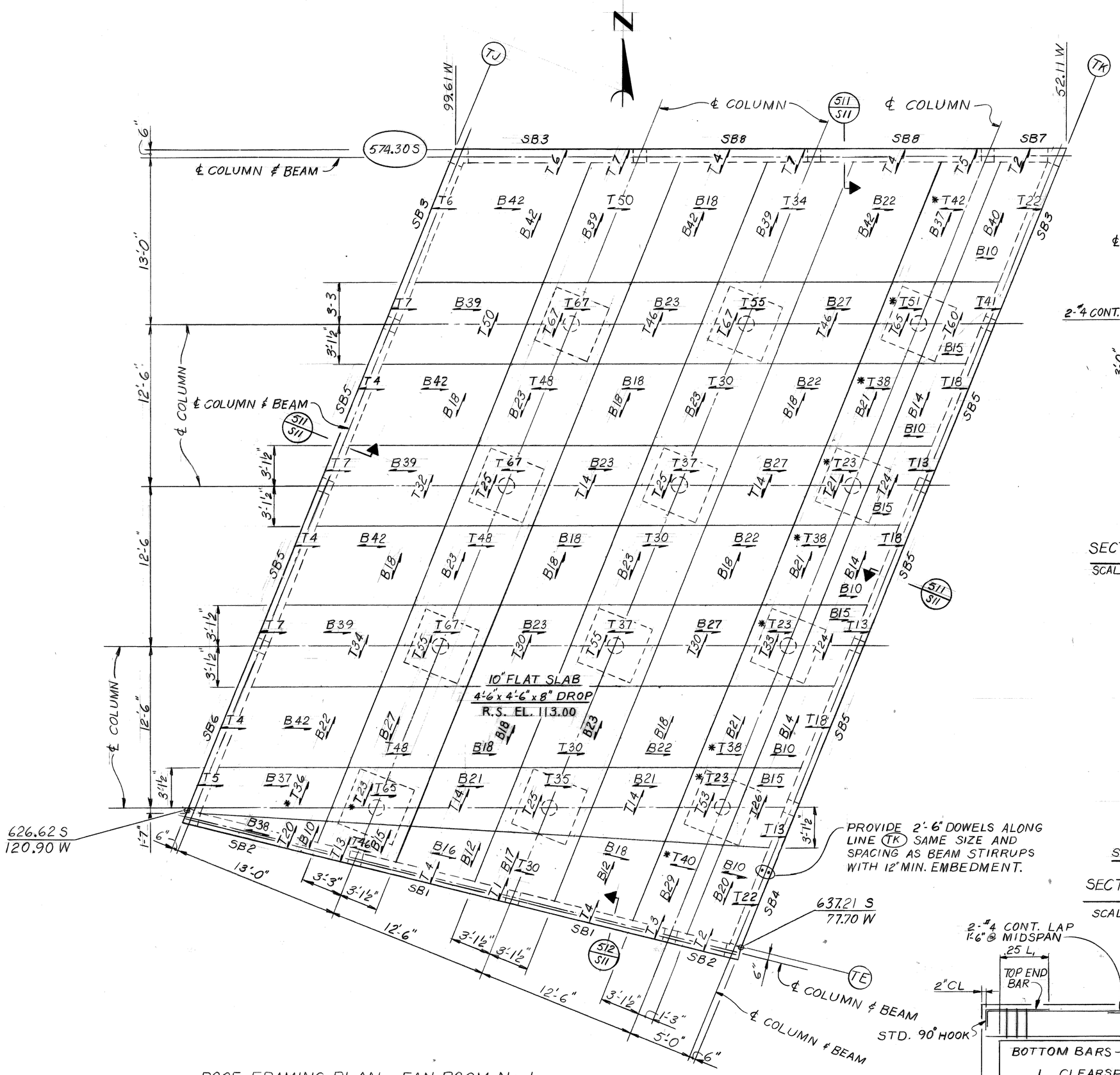
CITY OF DETROIT
CITY ENGINEERING DEPARTMENT

ATWATER STREET RELOCATION
ATWATER TUNNEL

MECHANICAL ROOMS 1 & 4
FOUNDATION PLAN

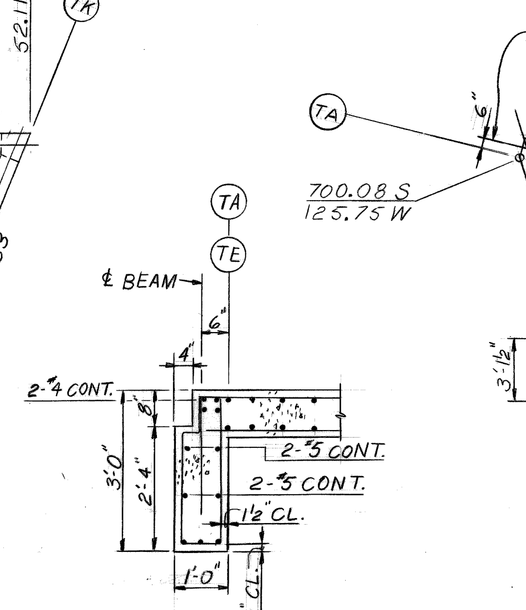
contract no. 07105 A

sheet 38 of 81
drawing no: S10



ROOF FRAMING PLAN - FAN ROOM No. 1

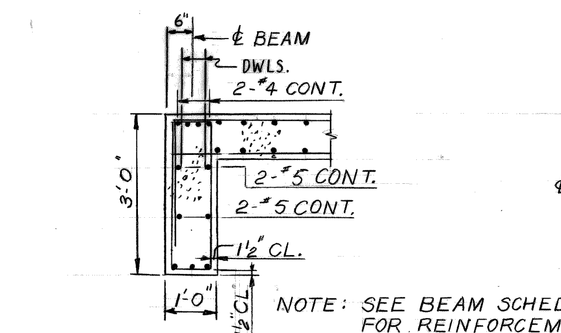
SCALE : 3/16" = 1'-0"



SB1 & SB2

SECTION (S11 / S11)

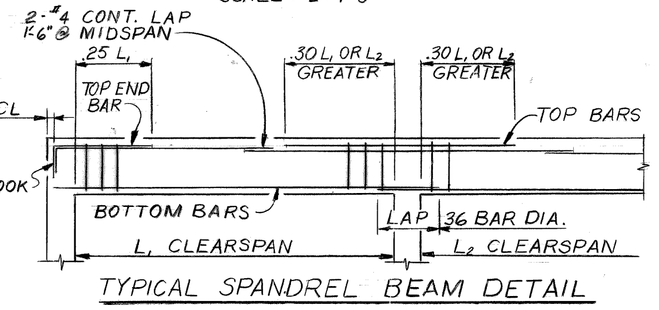
SCALE : ½" = 1'-0"



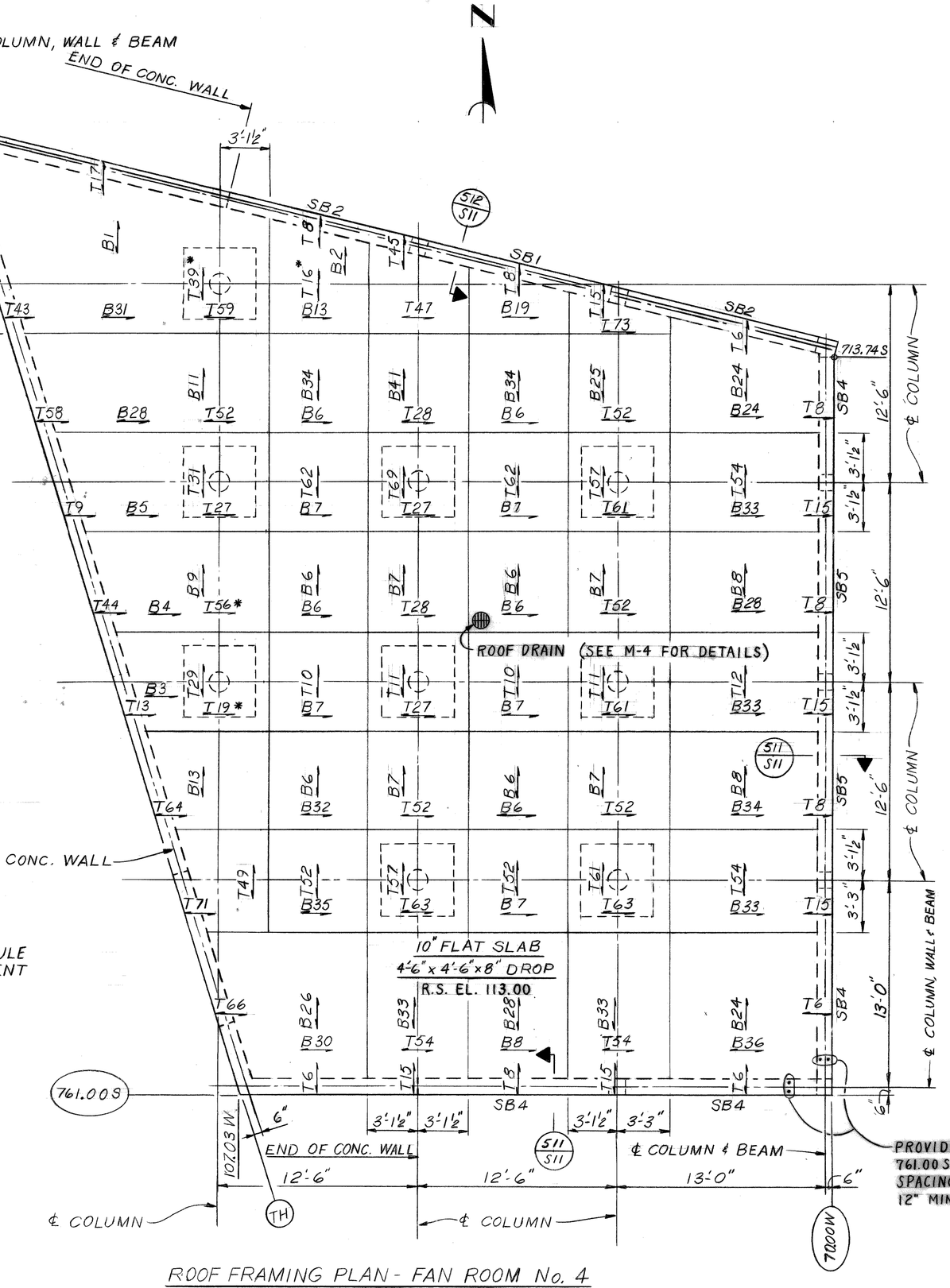
SB3 THRU SB8

SECTION (S11 / S11)

SCALE : ½" = 1'-0"

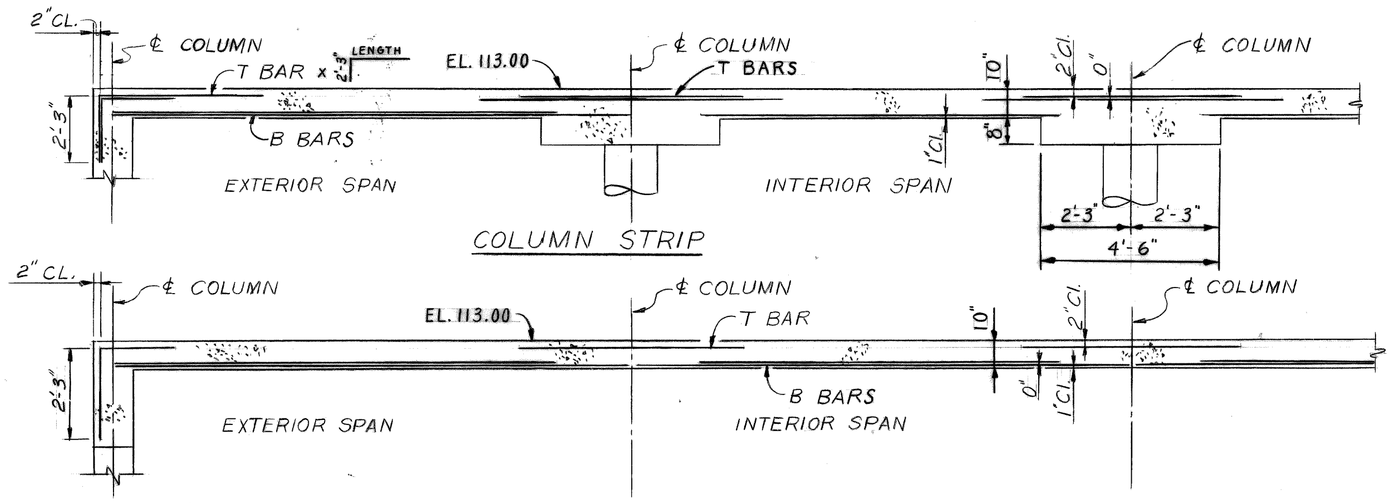


TYPICAL SPANDREL BEAM DETAIL



ROOF FRAMING PLAN - FAN ROOM No. 4

SCALE : 3/16" = 1'-0"



NOTE:

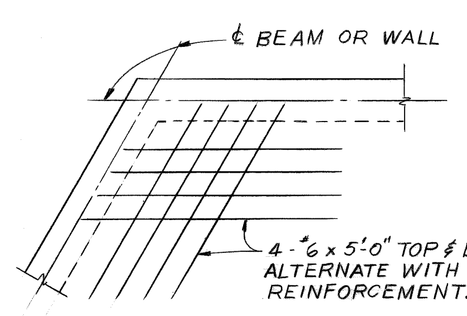
INTERIOR SPANS:

1. CENTER TOP REINFORCEMENT OVER COLUMNS
2. CENTER BOTTOM REINFORCEMENT BETWEEN COLUMNS

EXTERIOR SPANS:

1. EXTEND ASTERISK (*) BARS FULL LENGTH OF EXTERIOR SPAN, SPLICE WITH LONG BARS AT EXTERIOR SUPPORT

BAR PLACING SEQUENCE		
SEQ. / RM.	RM. #1	RM. #4
BOTTOM BARS	E-W	N-S
BOTTOM BARS	N-S	E-W
TOP BARS	E-W	E-W
TOP BARS	N-S	N-S



TYPICAL CORNER DETAIL

BEAM SCHEDULE						
MARK	SIZE	BOTTOM	TOP	TOP END	STIRRUPS THRU OUT	REMARKS
SB1	12 x 36	3-#6	2-#7 2-#4 CONT.		#4@10"	TOP STEEL IN TWO LAYERS
SB2	12 x 36	3-#6	2-#7 2-#4 CONT.	2-#7	#4@10"	TOP STEEL IN TWO LAYERS
SB3	12 x 36	3-#7	2-#8 2-#4 CONT.	2-#7	#4@10"	
SB4	12 x 36	3-#6	2-#7 2-#4 CONT.	2-#7	#4@10"	
SB5	12 x 36	3-#6	2-#7 2-#4 CONT.		#4@10"	
SB6	12 x 36	3-#8	2-#9 2-#4 CONT.	2-#7	#4@10"	
SB7	12 x 36	3-#6	2-#8 2-#4 CONT.	2-#7	#4@10"	
SB8	12 x 36	3-#6	2-#8 2-#4 CONT.		#4@10"	

SLAB SCHEDULE									
	BOTTOM BARS					TOP BARS			
MARK	SIZE	LONG BARS NO.	LONG BARS LENGTH	SHORT BARS NO.	SHORT BARS LENGTH	MARK	SIZE	LONG BARS NO	LONG BARS LENGTH	SHORT BARS NO.	SHORT BARS LENGTH
B1	#4	9	6'-3"	8	5'-6"	T1	#4	4	3'-0"	4	2'-6"
B2	#4	4	5'-3"	3	4'-6"	T2	#4	5	3'-6"		
B3	#5	4	6'-0"	4	5'-6"	T3	#4	3	3'-6"	3	3'-0"
B4	#5	4	7'-0"	3	6'-3"	T4	#4	7	3'-6"		
B5	#5	4	9'-9"	4	8'-9"	T5	#4	4	4'-6"	4	3'-3"
B6	#5	4	12'-0"	3	8'-9"	T6	#4	10	3'-6"		
B7	#5	8	10'-6"			T7	#4	5	4'-6"	6	3'-3"
B8	#5	4	12'-0"	4	8'-9"	T8	#4	7	4'-0"		
B9	#5	9	10'-6"			T9	#5	4	3'-9"	4	3'-0"
B10	#6	4	5'-6"	4	5'-0"	T10	#4	9	5'-6"		
B11	#5	12	10'-6"			T11	#5	5	9'-6"	6	8'-6"
B12	#6	4	8'-9"	3	7'-9"	T12	#4	14	5'-6"		
B13	#5	8	12'-9"			T13	#6	4	3'-0"	4	2'-6"
B14	#6	2	13'-0"	2	9'-6"	T14	#4	12	5'-9"		
B15	#6	7	6'-3"			T15	#6	4	4'-9"	4	3'-6"
B16	#6	3	13'-0"	2	9'-6"	T16	#4	6	9'-6"*	5	9'-0"
B17	#6	8	9'-6"			T17	#6	12	5'-0"	11	3'-6"
B18	#6	4	13'-0"	4	9'-6"	T18	#5	4	3'-0"	3	2'-3"
B19	#6	3	12'-0"	2	9'-3"	T19	#6	4	10'-6"*	7	10'-3"
B20	#7	2	12'-0"	2	10'-6"	T20	#5	5	3'-0"	5	2'-3"
B21	#6	6	12'-0"			T21	#6	4	10'-9"	4	9'-0"
B22	#7	4	13'-0"	4	9'-6"	T22	#5	6	3'-0"	4	2'-6"
B23	#6	8	12'-0"			T23	#6	4	10'-9"*	8	9'-9"
B24	#7	4	13'-0"	3	11'-3"	T24	#5	6	5'-9"		
B25	#7	4	12'-6"	4	11'-3"	T25	#6	5	11'-0"	6	9'-6"
B26	#7	5	13'-0"	5	11'-3"	T26	#5	7	5'-9"		
B27	#7	8	12'-6"			T27	#6	5	11'-3"	5	10'-0"
B28	#7	4	13'-6"	3	11'-9"	T28	#5	9	5'-9"		
B29	#7	6	13'-3"			T29	#6	7	11'-3"	7	9'-6"
B30	#7	4	14'-6"	4	12'-6"	T30	#5	10	5'-9"		
B31	#7	5	13'-6"	5	12'-0"	T31	#6	10	11'-3"	10	10'-0"
B32	#7	4	15'-6"	3	13'-6"	T32	#5	12	5'-9"		
B33	#7	8	14'-3"			T33	#6	4	12'-0"	5	10'-0"
B34	#8	4	13'-0"	3	11'-3"	T34	#5	16	5'-9"		
B35	#7	4	14'-6"	4	13'-0"	T35	#6	5	12'-0"	6	10'-6"
B36	#8	4	13'-0"	4	11'-3"	T36	#5	5	10'-3"*	6	9'-3"
B37	#8	3	14'-0"	3	12'-6"	T37	#6	6	12'-0"	7	10'-3"
B38	#8	2	14'-0"	1	12'-0"	T38	#5	4	10'-6"*	7	9'-9"
B39	#8	4	14'-0"	4	12'-6"	T39	#6	12	12'-0"*	8	10'-6"
B40	#8	2	14'-0"	2	12'-0"	T40	#5	6	10'-6"*	7	9'-6"
B41	#8	4	15'-6"	4	14'-0"	T41	#7	4	3'-6"	4	2'-9"
B42	#8	4	14'-0"	4	12'-0"	T42	#5	6	10'-6"*	10	10'-0"
						T43	#7	8	5'-3"	8	4'-6"
						T44	#6	4	3'-0"	3	2'-3"
						T45	#7	5	5'-9"	4	4'-3"
						T46	#6	9	6'-0"		
						T47	#7	5	9'-0"	5	6'-6"
						T48	#6	11	6'-0"		
						T49	#7	4	9'-3"	4	6'-9"
						T50	#6	16	6'-0"		
						T51	#7	4	11'-3"*	7	11'-0"
						T52	#6	10	6'-6"		
						T53	#7	4	12'-9"	4	10'-6"
						T54	#6	14	6'-6"		
						T55	#7	5	12'-9"	6	10'-9"
						T56	#6	3	9'-9"*	5	9'-6"
						T57	#7	6	13'-3"	6	11'-6"
						T58	#7	7	4'-6"		
						T59	#7	9	13'-3"	8	11'-9"
						T60	#7	6	6'-0"		
						T61	#7	6	14'-3"	6	12'-0"
						T62	#7	9	6'-9"		
						T63	#7	5	15'-3"	6	12'-9"
						T64	#9	7	5'-3"		
						T65	#8	4	16'-3"	5	13'-6"
						T66	#9	10	5'-3"		
						T67	#8	5	16'-3"	6	13'-6"
						T69	#8	6	17'-6"	6	13'-6"
						T71	#9	4	6'-0"	4	5'-3"
						T73	#9	3	12'-3"	2	8'-9"

NOTE :

ODD NUMBERED BARS INDICATE COLUMN STRIP

EVEN NUMBERED BARS INDICATE MIDDLE STRIP

revisions

date 8-11-75

designed R. Bunce

drawn L. G.

checked R. B.

approved

T. E. McGowan

STRUCTURAL ENGINEER

CITY OF DETROIT
CITY ENGINEERING DEPARTMENT

ATWATER STREET RELOCATION
ATWATER TUNNEL

MECHANICAL ROOMS 1 & 4
ROOF FRAMING PLAN

contract no. 07105 A

sheet 39 of 81

drawing no: S 11

QUANTITY CHANGES		
Rev.	ITEM	QUANT.
A	CONC. 355	+4.3 C.Y.
A	REINF. STEEL	+358 lbs

ELEC. DUCT SCHEDULE		
Mark	Opening	℄ Elev.
D1	30"x 18"	92.5
D2	12" x 18"	92.5
D3	12" x 30"	92.5

6-10-76	E. REVISED DIM.
5-28-76	C. LENGTHEN CABLE VAULT IN ROOM 2.

revisions

date 8-11-75
designed R. Harlan
drawn R. Harlan
checked

approved T. E. McGowan, STRUCTURAL ENGINEER

CITY OF DETROIT
CITY ENGINEERING DEPARTMENT

ATWATER STREET RELOCATION
ATWATER TUNNEL

MECHANICAL ROOMS 2 & 3
FOUNDATION AND FLOOR PLAN

contract no. 07105A

sheet 40 of 51
drawing no: S12