

28-14

Mr. R. S. Chapman,
District Engineer,
New Liskeard, Dist. #14.

Attn: Mr. H. G. Potts,
Maintenance Engr.

Mr. A. G. Stermac,
Principal Foundation Engr.,
Foundation Section,
Materials & Research Division.
September 28, 1962.

INSTALLATION OF SERVICE TANK AT D.H.O. YARD AT ENGLEHART.
W.J. 62-F-110.

A service tank is planned to be erected at the D.H.O. Yard at Englehart. In order to determine the subsoil conditions at the site and decide on the type of foundation to be recommended, an investigation consisting of two sampled borings and two dynamic cone penetration tests, was carried out, at the request of the District Maintenance Engineer, in a memorandum dated August 27, 1962. Attached to this report is a sketch showing boring locations. The exact location of the installation area was pointed out by the Yard Foreman in Englehart.

Soil conditions in the area are uniform, but unfavourable as a foundation material. Underlying a layer of sand, gravel and occasional boulders of approximately 18", is a layer of silt, extending down to an approx. elevation 670'. It contains traces of organic material at its upper surface. The average value for the Standard Penetration Test is 7 blows per foot. The material in this layer is therefore in a loose state. The average values of Atterberg limit are 23% and 20%, respectively, and moisture content averages 27%. The color of the material in this layer is brown to an approx. elevation 676' and it changes to grey at farther depths.

Below this layer of silt, is a layer of clayey silt containing occasional thin seams of coarse silt material. The consistency of this layer is soft, becoming medium stiff with increasing depths. The minimum and maximum values of shear strength are 350 p.s.f. and 1040 p.s.f., respectively. The average values of Atterberg limit are 25% and 18%, respectively, and moisture content is 30%. The sensitivity defined as, the ratio of the undisturbed undrained strength to completely remolded undrained strength at the same moisture content, is 6. The color of the material in this layer is grey. The depth of this layer is undetermined. From the available geological information, the depth may be in excess of 100 feet.

Ground water level was observed to be just below the ground surface.

The total weight of the tank and proposed assembly was given as 50 tons. Considering the strength characteristics of the subsoil, the safe bearing load can be taken as 0.5 ton per sq.ft. A raft foundation is recommended, with a minimum area of 100 sq.ft. As the subsoil is highly susceptible to frost, the foundation should be carried down to a minimum of 6 feet below the ground surface, for adequate frost protection. Because of the high ground water table, tremie concrete sealing may have to be applied for the raft construction.


It is not possible to predict the exact amount of settlement that may occur due to application of the load. To minimize the effect of settlement occurring after the tank is filled to its maximum capacity, it is necessary that the following mentioned procedure is applied.

The location at which the tank is to be installed, should be preloaded with granular material to a height of 12 feet. The width at the top of this fill should be 10 ft. with the length corresponding to the length of the raft foundation contemplated. The side slopes of the fill may be allowed to take a natural course according to the angle of repose of the fill material. This fill should be kept on the site for a period of at least three weeks. The fill may then be removed and excavation for the proposed raft foundation started.

The field work, together with the preparation of the report, was undertaken by Mr. R. M. Ghadiali, of the Foundation Section.

We trust that the above given recommendations are sufficient for your future design work. However, should there be any additional questions you would like to discuss, please feel free to call on our Office.

KYL/MdeF
Attach.
cc: Foundations Office ✓
Gen. Files.


K. Y. Lo,
SUPERVISING FOUNDATION ENGR.
For:
A. G. Stermac,
PRINCIPAL FOUNDATION ENGR.

APPENDIX I.

FOUNDATION SECTION

JOB	62-F-110	LOCATION	Patrol Yard at Englehart.	ORIGINATED BY	B.M.G.
W.P.	-	BORING DATE	Sept. 14, 1962.	COMPILED BY	B.M.G.
DATUM	G.S.C.	BOREHOLE TYPE	Washboring using NX casing.	CHECKED BY	K.Y.L.

SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT ——— WL PLASTIC LIMIT ——— WP WATER CONTENT ——— W		BULK DENSITY P C T	REMARKS
ELEV. DEPTH	DESCRIPTION	SIRAT PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV SCALE	SHEAR STRENGTH P S F Field Vane Test x Unconsolidated undrained Triaxial Test o		
685'							200 400 600 800 1000		
683.5	Sand - Gravel - Boulder	P.D.							g.w.l. at El. 683.5
1'-6"									
	Silt Loose Brown to El. 676, then changing to Grey.		1	S	8	680		I O	
			2	S	6	675	x	I O	Sens=6
670						670	o	I O	119 Sens=9.5
15.0	Silt and clayey silt Med. stiff Grey.		3	T	P	675	x	I O	
			4	T	P			I O	Sens=5
662							x		
23.0	End of Borehole.					660			
						655			
						650			
						645			
						640			Cone test to El. 625' No. of blows=29.
						635			

Mr. H. G. Potts,
District Maintenance Engr.,
New Diskeard, Ontario.

Mr. A. G. Stermac,
Principal Foundation Engr.,
Materials & Research Division.

September 7, 1962.

Your Memo - August 27/62.

tallation of Service Tank at Englehart Yard

In answer to your recent memo, we are pleased to inform you that we have taken the initial step to carry out the necessary investigation.

Our Project Foundation Engineer, Mr. B. M. Chadiali, in charge of this project, will be in touch with you shortly, to discuss location and design details.

AGS/MdeF

cc: Foundations Office
Gen. Files.

A. G. Stermac
A. G. Stermac,
PRINCIPAL FOUNDATION ENGINEER

Mr. B. M. Ghadiali,
Project Foundation Engr.
Mr. A. G. Stermac,
Principal Foundation Engr.

September 6, 1962.
Installation of Service Tank
at Englehart Yard.
District #1 - New Liskeard

Bowie:-

Attached, I am sending you the memorandum written to me by Mr. H. G. Potts, District Maintenance Engineer on August 27, 1962. From the content of the memo, you will find out what is necessary. I believe that this is probably a unique opportunity for our Section to carry out the necessary investigation, and I would therefore, request you to perform whatever is necessary. I will leave it completely to your discretion to decide when and how you will do it; however, the drill that you have now, would have to be used in order to avoid any additional mobilization costs. I would also advise you to get in touch with the Maintenance Engineer in order to clarify the necessary design details and also get the precise location.

AGS/MdeF
Attach.

A. G. Stermac,
PRINCIPAL FOUNDATION ENGINEER

cc: Foundations Office ✓
Gen. Files

MEMORANDUM
New Liskeard

To: Mr. A. Rutka,
Materials & Research Engineer.

From: H. G. Potts,
Dist. Maintenance Engineer.

Att: A. G. Stermac,
Principal Foundations Engineer. DATE: August 27, 1962.

OUR FILE REF.

IN REPLY TO

SUBJECT: Installation of Service Tank at Englehart Yard.

Recently we received an 8,000 gallon storage tank (#00-121-79-88) from District #10, Bancroft, for our use in storing of bituminous materials. Our present intention is to erect this tank in our material storage yard at Englehart.

In view of the fact that the ground in this area is slightly unstable, we were wondering if your section would aid us in the design of suitable footings for the tank supports.

The attached sketches indicate the H-beam arrangement for these supports.

We realize that you may have to make a field investigation before you reach any conclusions but we can supply soil samples from various depths if they would be sufficient.

We would be pleased to hear your comments and an early reply.



H. G. Potts,
Dist. Maintenance Engineer.

HGP/na
Attached.



ONTARIO

DEPARTMENT OF HIGHWAYS

Memo to Mr. R. S. Chapman, Dist. Engr.

Date Aug. 24th, 1962.

Subject Re: Installation of
Service Tank Englehart Yard

From D. W. Bowen, Shop Foreman,

Kindly be advised that I have obtained earth samples as requested, from the area in which the 8,000 gallon service tank is to be installed at Englehart yard.

Length of tank, 25 ft. diameter 8'1" made up of
1/2" plate. approx. weight 14,900 lbs.

The stand will be made up with H. Beam
approx. weight 4,000 lbs.

Steam pipes & additional fittings
weight 1,000 lbs.

8,200 gallons of oil at 10 lb. per gal. 80,000 lbs.

Total weight. 99,900 lbs.

D. W. Bowen
D. W. Bowen,
Shop Foreman.

#10-121-79-88 (R.M.H.)
SAH

8-10-7-1

END OF TANK

STEAM
CALC. 145.00

OUTLET

12" x 12" AIR

12" W BEAM

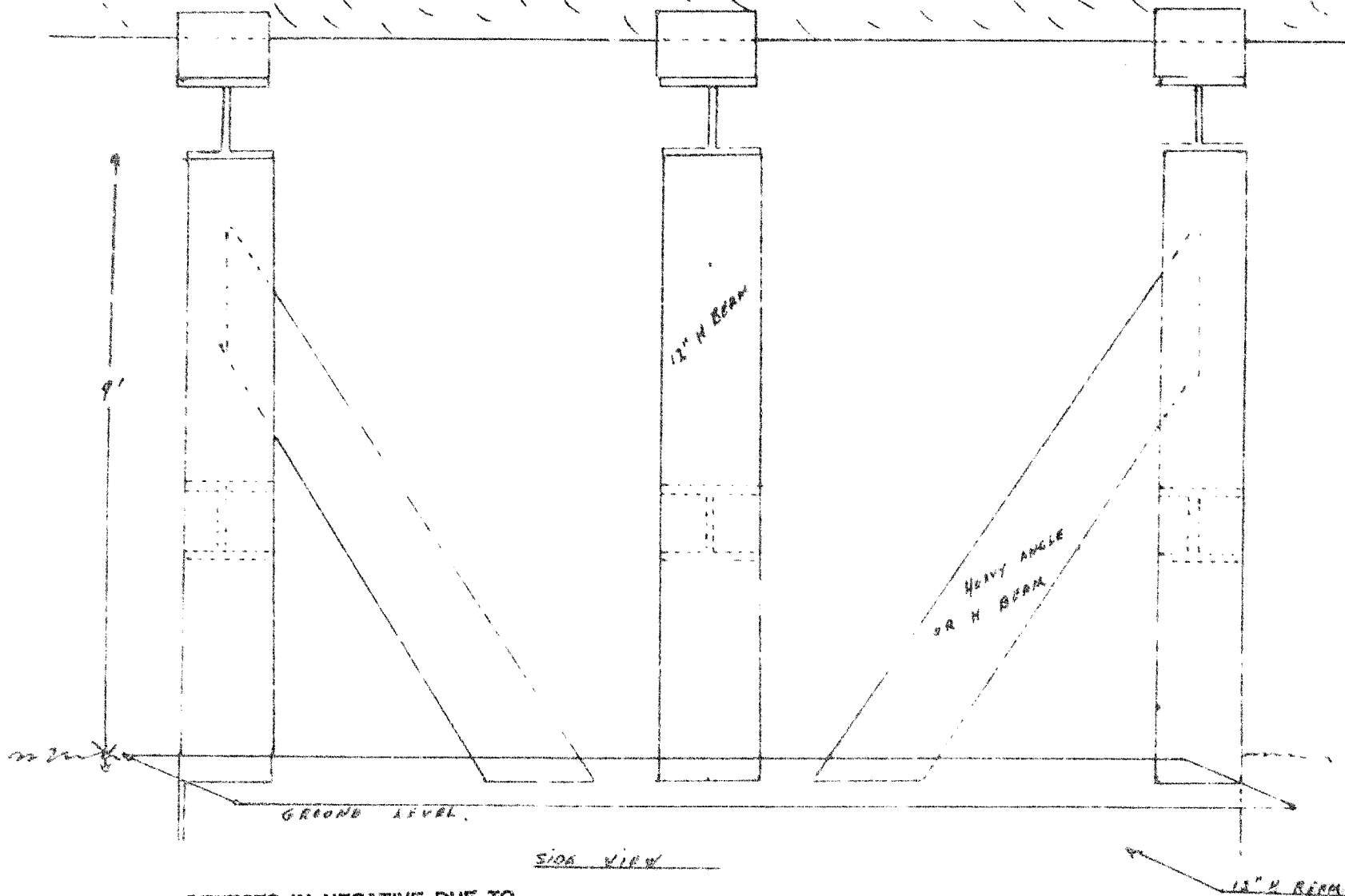
GROUND LEVEL

END VIEW 3 EQUALLY SPACED STRAPS

DEFECTS IN NEGATIVE DUE TO
CONDITION OF ORIGINAL DOCUMENT

Aug. 10/62.
D. BOWEN. PHO

TANK. 5" LINES ON OUTLET END.



DEFECTS IN NEGATIVE DUE TO
CONDITION OF ORIGINAL DOCUMENT

AUG 10/62
R.H.G. D.B.W.

102 OCT 5 AM 3:56

61914

Phoned

DOWN LISK 2 OCT 5/62 9.00A U R G E N T

A G STERMAC PRINCIPAL FOUNDATION ENGR

FOUNDATION SECTION MATERIALS AND RESEARCH

RE: INSTALLATION OF SERVICE TANK AT DHO YARD-ENGLEHART W.J. 62-F-110
WE HAVE RECEIVED A QLS DY REPORT ON THE ABOVE NOTED STORAGE TANK. IS YOUR
SECTION OR ANY OTHER SECTION WORKING ON THE DESIGN OF THE FOOTING FOR
THIS TANK. DO YOU CONCUR WITH THE SKETCHES THAT WE SUBMITTED IN OUR
MEMO OF AUGUST 27

IF YOU CONCUR, WHAT ARE YOUR RECOMMENDATIONS AS TO THE CONNECTION OF
THESE SUPPORTS TO THE FOOTING AND DESIGN OF THE FOOTING ITSELF

H G POTTS MAINTENANCE ENGINEER

DP

[Signature]
10/10/62

2 OCT 5 PM 12:13

C2069

L

LINK DOWN 4 OCT 5/62 12:00P VR

NR H G POTTS, MAINT ENG

SUBJECT: RE. INSTALLATION OF SERVICE TANK DNO YARD ENGLEHART

W J 62-F-110

THE DESIGN OF SUPPORTS AND FOOTINGS BEING A STRUCTURAL PROBLEM IS NOT PERFORMED BY THIS SECTION. WE SUGGEST YOU GET IN TOUCH WITH THE BRIDGE DESIGN SECTION. BRUCE DAVIS. GIVEN OUR REPORT ALL DIMENSIONS AND LOADS THEY COULD PROVIDE THE NECESSARY DESIGN DRAWINGS.

A G STERNAC, PRIN FOUNDMT ENG MAT & RES DIV

LLC

[Handwritten signature]
11/15

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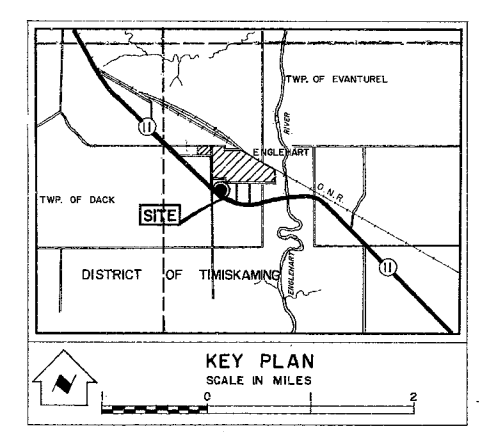
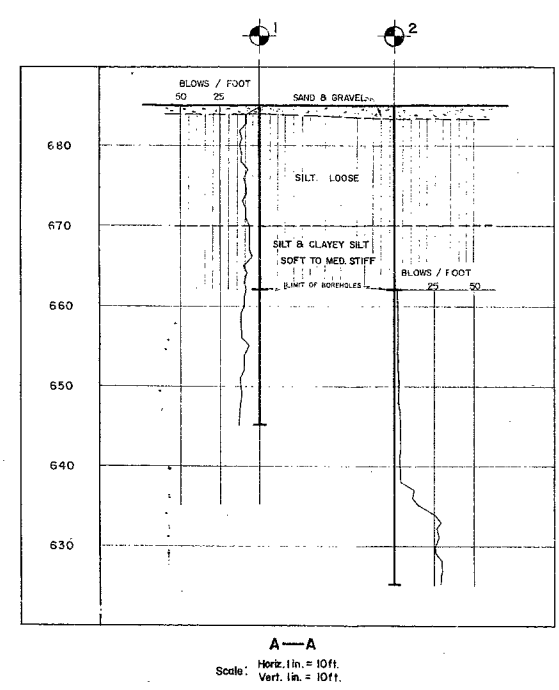
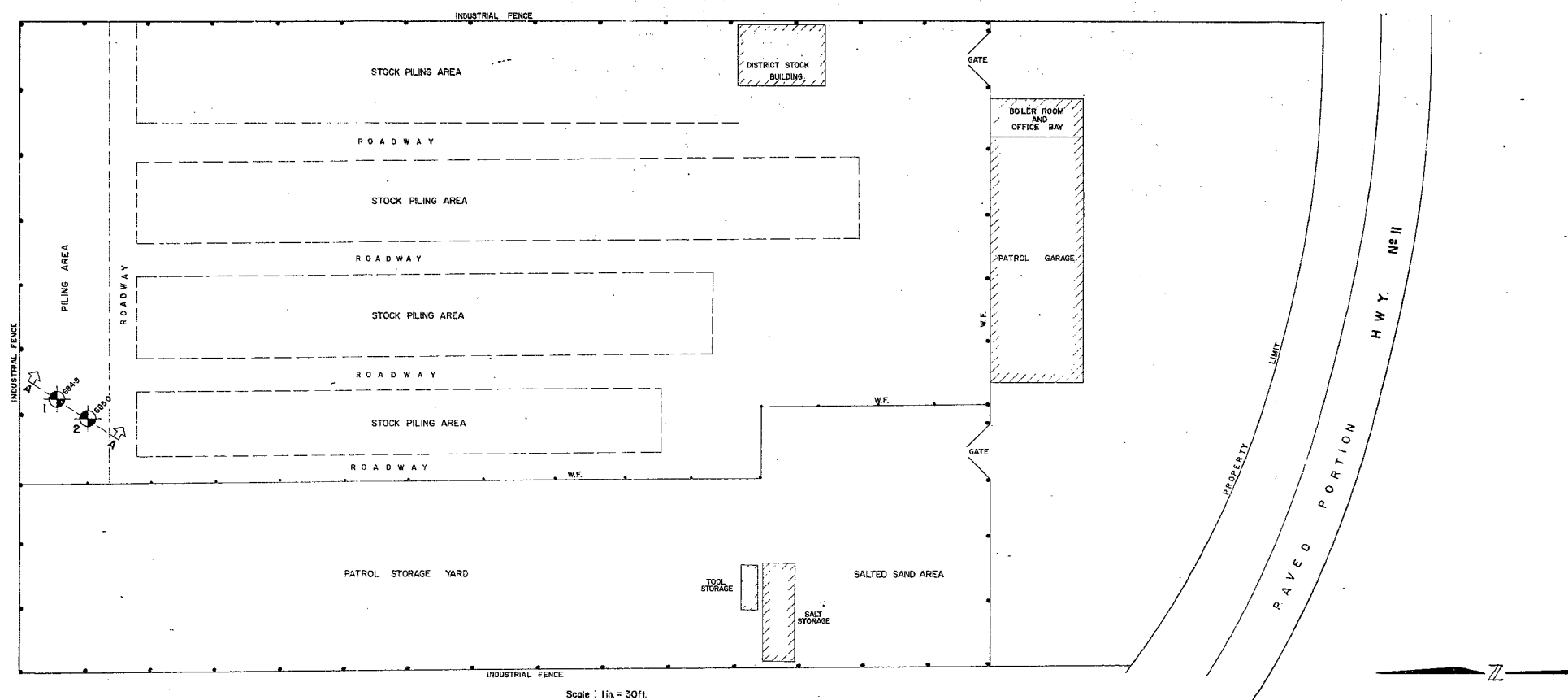
#62-F-110

ENGLEHART

PATROL YD.

BITUMINOUS

SERVICE TANK



31 M13W
E. 524000
N. 529750
2.17

Bore & Cone Penetration Holes Shown Thus —●—

NOTE:
The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence and may be subject to considerable error.

DEPARTMENT OF HIGHWAYS - ONTARIO		
MATERIALS & RESEARCH SECTION		
BITUMINOUS SERVICE TANK		
ENGLEHART PATROL YARD		
ORIGINATED B. GHADIALI	DISTRICT NO. 14	DATE SEPT. 28, 1962
DRAWN	W.P. NO.	JOB NO. 62-F-110
CHECKED	SCALE	DRAWING NO.
APPROVED	AS SHOWN	62-F-110 A