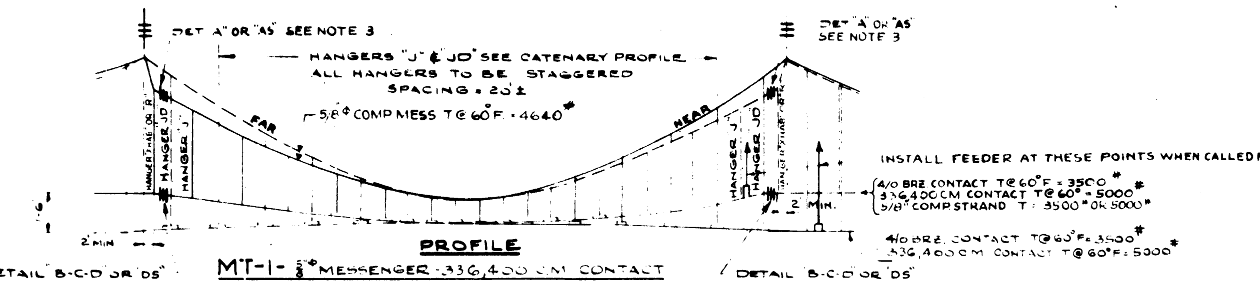
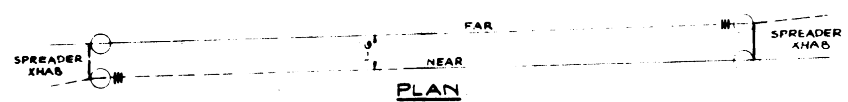


PROFILE

MT-1 - 5/8"Φ MESSENGER - 336,400 C.M. CONTACT

MT-2 - 5/8"Φ MESSENGER - 4/0 CONTACT

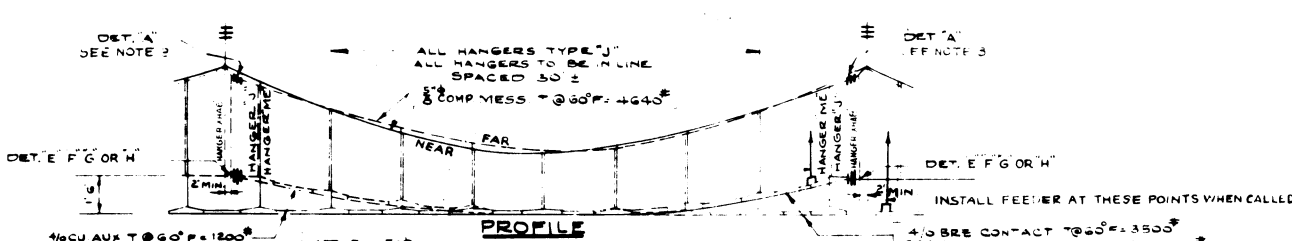


PLAN

MAIN TRACK 2-WIRE SYSTEM

BILL OF MATERIAL												
AIR BREAK	DESCRIPTION OF CONTACT WIRE		DET "A"	DET "AS"	DET "B"	DET "C"	DET "D"	DET "DS"		HANGER XHA8	HANGER R	SPREADER XHA8
MT-1a	STR ⦀ GR.	GR ⦀ STR	2	—	2	—	—	—		2	—	2
MT-1b	GR ⦀ GR	GR ⦀ GR	2	—	—	2	—	—		2	—	2
MT-1c	STR ⦀ GR	GR ⦀ GR	2	—	—	1	—	—		2	—	2
MT-2a	STR ⦀ GR	GR ⦀ STR	—	2	—	—	—	2		—	2	2
MT-2b	GR ⦀ GR	GR ⦀ GR	2	—	—	—	2	—		2	—	2
MT-2c	STR ⦀ GR	GR ⦀ GR	1	1	—	—	1	1		1	1	2

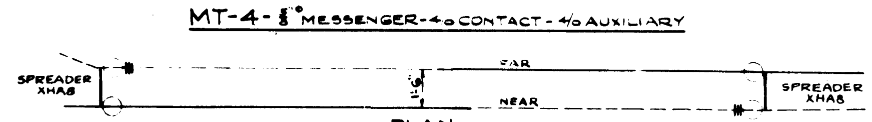
STR ⦀ GR — STRANDED WIRE ⦀ GROOVED WIRE



PROFILE

MT-3 - 5/8"Φ MESSENGER - 336,400 C.M. CONTACT - 4/0 AUXILIARY

MT-4 - 5/8"Φ MESSENGER - 4/0 CONTACT - 4/0 AUXILIARY

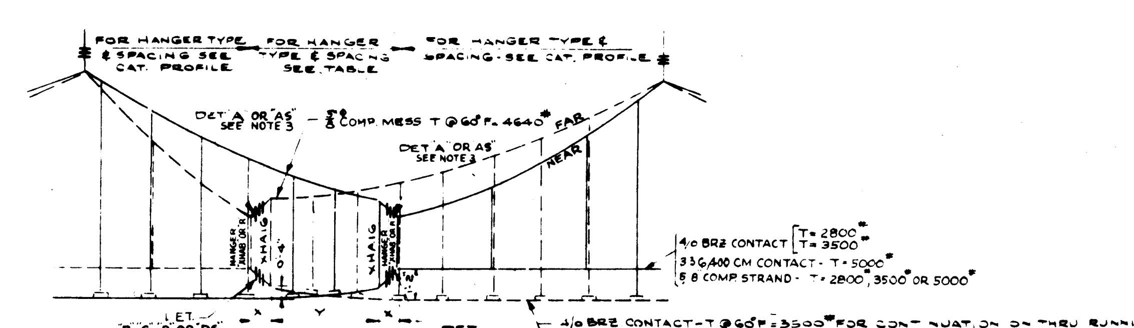


PLAN

MAIN TRACK 3-WIRE SYSTEM

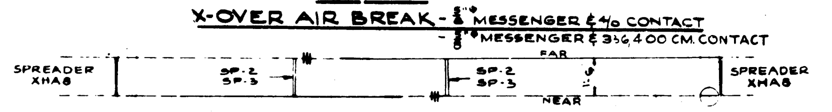
BILL OF MATERIAL											
AIR BREAK	DESCRIPTION OF CONTACT WIRE		DET "A"	DET "E"	DET "F"	DET G	DET H			HANGER XHA8	SPREADER XHA8
MT-3a	STR. ⦀ GR.	GR ⦀ STR.	2	2	—	—	—			2	2
MT-3b	GR ⦀ GR.	GR ⦀ GR	2	—	2	—	—			2	2
MT-3c	STR. ⦀ GR	GR ⦀ GR.	2	1	1	—	—			2	2
MT-4a	STR ⦀ GR.	GR ⦀ STR	2	—	—	2	—			2	2
MT-4b	GR ⦀ GR	GR ⦀ GR	2	—	—	—	2			2	2
MT-4c	STR. ⦀ GR	GR ⦀ GR.	2	—	—	1	1			2	2

STR ⦀ GR — STRANDED WIRE ⦀ GROOVED WIRE



PROFILE

X-OVER AIR BREAK - 5/8"Φ MESSENGER & 4/0 CONTACT
- 5/8"Φ MESSENGER & 336,400 CM. CONTACT



NOTE
OMIT SP-3 WHEN INSULATOR IS 20' OR LESS FROM SUPPORT

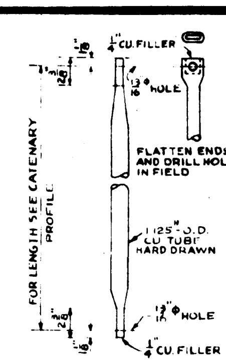
PLAN

BILL OF MATERIAL																			
AIR BREAK	DESCRIPTION OF CONTACT WIRE		Z	X	Y	DET. "A"	DET. "AS"	DET "B"	DET. "C"	DET. "D"	DET. "DS"	HANGER "XHA8"	HANGER "R"	HANGER "XHA16"	HANGER "JD" OR "J"	HGR. "JC" OR "XHA16L"	SP-2	SP-3	SP-XHA8
XO65A	5/8" COMP ⦀ 336,400	336,400 ⦀ 5/8" COMP	65'	10'	5 SPACES @ 9'	2	—	2	—	—	—	2	—	2	6 SEE NOTE ①	—	2	2	2
XO60A	"	"	60'	10	5 SPACES @ 8'	2	—	2	—	—	—	2	—	2	6 "	—	2	2	2
XO50A	"	"	50'	10	5 SPACES @ 6'	2	—	2	—	—	—	2	—	2	6	—	2	2	2
XO65B	336,400 ⦀ 336,400	336,400 ⦀ 336,400	65'	10'	5 SPACES @ 9'	2	—	—	2	—	—	2	—	2	6 SEE NOTE ①	—	2	2	2
XO60B	"	"	60'	10'	5 SPACES @ 8'	2	—	—	2	—	—	2	—	2	6 "	—	2	2	2
XO50B	"	"	50'	10'	5 SPACES @ 6'	2	—	—	2	—	—	2	—	2	6 "	—	2	2	2
XO65C	5/8" COMP ⦀ 336,400	336,400 ⦀ 336,400	65'	10'	5 SPACES @ 9'	2	—	1	1	—	—	2	—	2	6 SEE NOTE ①	—	2	2	2
XO60C	"	"	60'	10'	5 SPACES @ 8'	2	—	1	1	—	—	2	—	2	6 "	—	2	2	2
XO50C	"	"	50'	10'	5 SPACES @ 6'	2	—	1	1	—	—	2	—	2	6 "	—	2	2	2
XO60D	5/8" COMP ⦀ 4/0	4/0 ⦀ 5/8" COMP	60'	7.5'	5 SPACES @ 9'	—	2	—	—	—	2	—	2	2	6 SEE NOTE ①	—	2	2	2
XO50D	"	"	50'	7.5'	5 SPACES @ 7'	—	2	—	—	—	2	—	2	2	6 "	—	2	2	2
XO40D	"	"	40'	7.5'	5 SPACES @ 5'	—	2	—	—	—	2	—	2	2	—	6 SEE NOTE ②	2	2	2
XO30D	"	"	30'	5'	5 SPACES @ 4'	—	2	—	—	—	2	—	2	2	—	6 "	2	2	2
XO60E	4/0 ⦀ 4/0	4/0 ⦀ 4/0	60'	7.5'	5 SPACES @ 9'	2	—	—	—	2	—	2	—	2	6 SEE NOTE ①	—	2	2	2
XO50E	"	"	50'	7.5'	5 SPACES @ 7'	2	—	—	—	2	—	2	—	2	6	—	2	2	2
XO40E	"	"	40	7.5'	5 SPACES @ 5'	2	—	—	—	2	—	2	—	2	—	6 SEE NOTE ②	2	2	2
XO30E	"	"	30	5'	5 SPACES @ 4'	2	—	—	—	2	—	2	—	2	—	6 "	2	2	2
XO60F	5/8" COMP ⦀ 4/0	4/0 ⦀ 4/0	60'	7.5'	5 SPACES @ 9'	1	1	—	—	1	1	1	1	2	6 SEE NOTE ①	—	2	2	2
XO50F	"	"	50'	7.5'	5 SPACES @ 7'	1	1	—	—	1	1	1	1	2	6 "	—	2	2	2
XO40F	"	"	40'	7.5'	5 SPACES @ 5'	1	1	—	—	1	1	1	1	2	—	6 SEE NOTE ②	2	2	2
XO30F	"	"	30'	5'	5 SPACES @ 4'	1	1	—	—	1	1	1	1	2	—	6 "	2	2	2

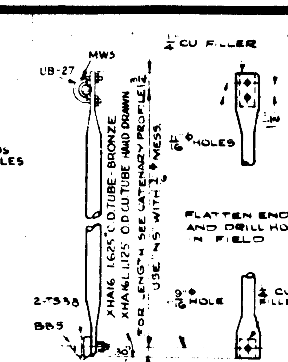
NOTE ① - USE "JD" IN HIGH SPEED AREA. USE "J" IN SLOW SPEED AREA.

NOTE ② - USE "XHA16L" WHEN CALLED FOR ON CATENARY PROFILE.

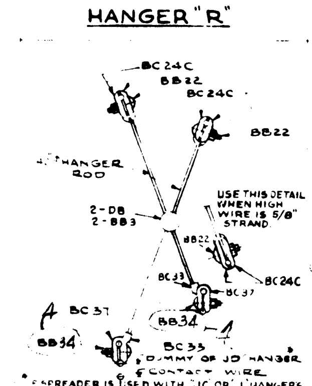
NOTE 3 - WHENEVER INSULATORS SLOPE UPWARD FROM "R" OR XHA8 HANGER OR NOTE "REVERSE INSULATORS" APPEARS ON CATENARY PROFILE, SUBSTITUTE ASSEMB. "AR" FOR "A" AND "ASR" FOR "AS"



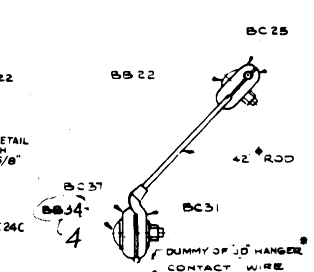
HANGER "R"



HANGER XHA16
HANGER XHA16L

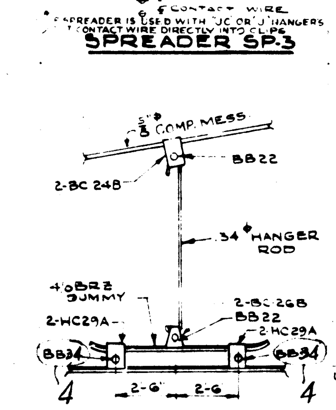


SPREADER SP-3

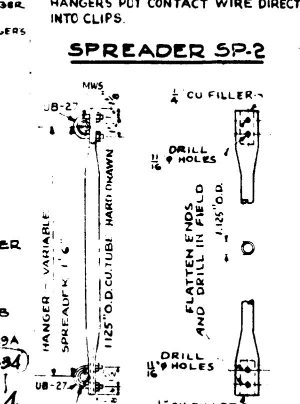


* IF SPREADER IS USED WITH "JC" OR "J" HANGERS PUT CONTACT WIRE DIRECTLY INTO CLIPS.

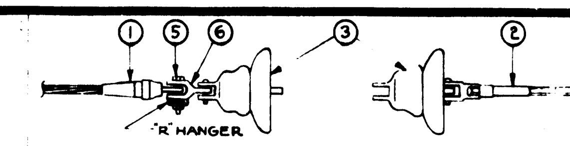
SPREADER SP-2



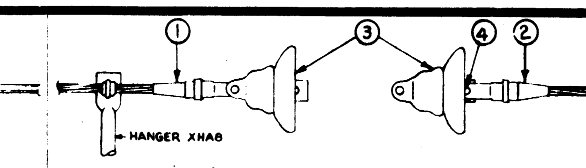
DETAIL "JD"



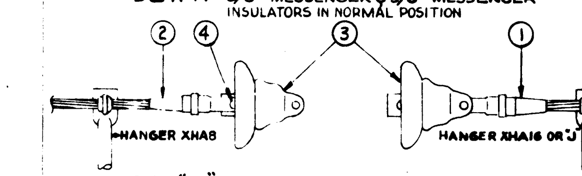
HANGER XHA8
SPREADER XHA8



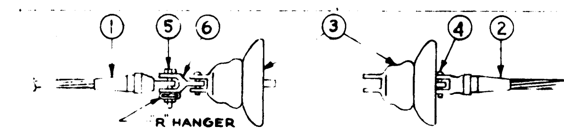
DET. "DS" - 5/8"Φ COMP. STRAND & 4/0 CONTACT



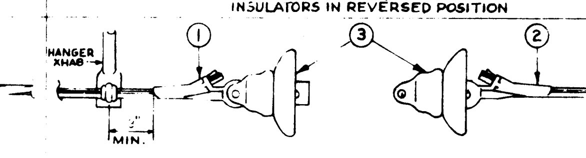
DET. "A" - 5/8"Φ MESSENGER & 5/8"Φ MESSENGER
INSULATORS IN NORMAL POSITION



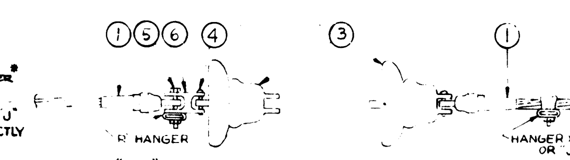
DET. "AR" - 5/8"Φ MESSENGER & 5/8"Φ MESSENGER
INSULATORS IN REVERSED POSITION



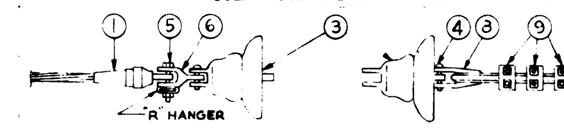
DET. "AS" - 5/8"Φ MESSENGER & 5/8"Φ MESSENGER - SPECIAL
INSULATORS IN NORMAL POSITION



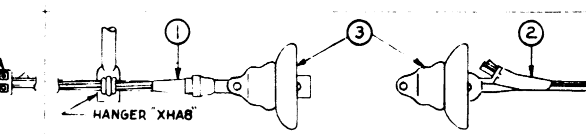
DET. "C" - 336,400 C.M. CONTACT & 336,400 C.M. CONTACT
DET. "D" - 4/0 CONTACT & 4/0 CONTACT
DET. "F" - 4/0 AUX. - 336,400 C.M. CONTACT & 4/0 AUX. - 336,400 C.M. CONTACT
DET. "H" - 4/0 AUX. - 4/0 CONTACT & 4/0 AUX. - 4/0 CONTACT



DET. "ASR" - 5/8"Φ MESSENGER & 5/8"Φ MESSENGER - SPECIAL
INSULATORS IN REVERSED POSITION

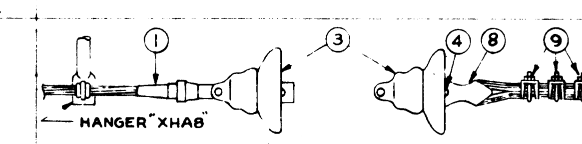


DET. "DSA" - 5/8"Φ COMP. STRAND & 4/0 CONTACT



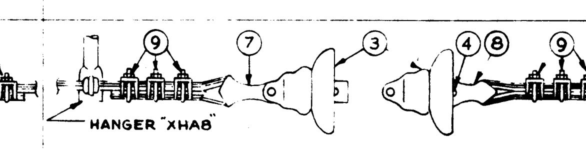
DET. "B" - 5/8"Φ COMP. STRAND & 336,400 C.M. CONTACT
DET. "E" - 5/8"Φ COMP. STRAND & 4/0 AUX. - 336,400 C.M. CONTACT
DET. "G" - 5/8"Φ COMP. STRAND & 4/0 AUX. - 4/0 CONTACT

ALTERNATE ASSEMBLIES - TO BE USED WHEN O.B. FITTINGS ARE NOT AVAILABLE.



DET. "BA" - 5/8"Φ COMP. STRAND & 336,400 C.M. CONTACT
DET. "EA" - 5/8"Φ COMP. STRAND & 4/0 AUX - 336,400 C.M. CONTACT
DET. "GA" - 5/8"Φ COMP. STRAND & 4/0 AUX - 4/0 CONTACT

ALTERNATE ASSEMBLIES - TO BE USED WHEN O.B. FITTINGS ARE NOT AVAILABLE



DET. "CA" - 336,400 C.M. CONTACT & 336,400 C.M. CONTACT
DET. "DA" - 4/0 CONTACT & 4/0 CONTACT
DET. "FA" - 4/0 AUX. - 336,400 C.M. CONTACT & 4/0 AUX. - 336,400 C.M. CONTACT
DET. "HA" - 4/0 AUX. - 4/0 CONTACT & 4/0 AUX. - 4/0 CONTACT

ALTERNATE ASSEMBLIES - TO BE USED WHEN O.B. FITTINGS ARE NOT AVAILABLE.

BILL OF MATERIAL - HANGER & SPREADER ASSEMBLIES							
PIECE MARK	DWG NO.	"R" HANGER	"XHA16" "XHA16L" HANGER	"SP-2" SPREADER	"SP-3" SPREADER	"JD" HANGER	"XHA8" HANGER
BC-24C	ET-1086-E	—	—	—	4	—	—
BC-25	ET-1088-E	—	—	2	—	—	—
BC-31	ET-1080-E	—	—	1	—	—	—
BC-33	ET-1081-E	—	—	—	2	—	—
BC-37	ET-1083-E	—	—	1	2	—	—
TS-38	ET-238-E	—	2	—	—	—	—
~~BB-3~~	ET-148-E	—	—	—	2	—	—
BB-34 (4)	ET-148-E	—	—	1	2	2	—
BB-5	ET-146-E	—	1	—	—	—	—
BB-22	ET-148-E	—	—	1	2	2	—
1.125 CU. TUBE	THIS DWG	*	*	—	—	—	*
1/4" CU FILLER	THIS DWG	2	2	—	—	—	2
42"Φ HANGER ROD HOOK & THREAD TYPE	ET-1096E	—	—	Δ	Δ	—	—
DB	14E-100	—	—	—	2	—	—
UB-27	ET-146E	—	1	—	—	—	2
34"Φ HANGER ROD HOOK TYPE	ET-1096-E	—	—	—	—	*	—
HC-29A	ET-1029-E	—	—	—	—	4	—
BC-26B	ET-1078-E	—	—	—	—	2	—
4/0 DUMMY 6'-0" LG.		—	—	—	—	1	—
1.625 CU TUBE	THIS DWG.	—	*	—	—	—	—
MWS	ET-170-E	—	1	—	—	—	2
BC-24B	ET-1087-E	—	—	—	—	2	—

* SEE CATENARY PROFILE FOR LENGTH.
Δ CUT IN FIELD.

BILL OF MATERIAL — PREFERRED ASSEMBLIES												
ITEM	DESCRIPTION	DET. "A" "AR"	DET. "AS"	DET "B"	DET. "C"	DET. "D"	DET. "DS"	DET. "E"	DET "F"	DET. "G"	DET. "H"	DET ASR
①	EYE END SOCKET	MF3	MF3	MF3	OB-336400	OB-4/0	MF3	MF3	OB 4/0 336400	MF3	OB 4/0 4/0	2-MF3
②	CLEVIS END SOCKET	MF1	MF1	OB-336400	OB-336400	OB-4/0	OB-4/0	OB 4/0 336400	OB 4/0 336400	OB 4/0 4/0	OB 4/0 4/0	—
③	INSULATOR	3-A2	3-A2	3-A2	3-A2	3-A1	3-A1	3-A2	3-A2	3-A2	3-A2	3-A2
④	PIN	NP5	NP5	—	—	—	—	—	—	—	—	NP5
⑤	BOLT	—	BG5	—	—	—	BG5	—	—	—	—	BG5
⑥	ADAPTER	—	ND2	—	—	—	ND2	—	—	—	—	ND4

BILL OF MATERIAL — ALTERNATE ASSEMBLIES										
ITEM	DESCRIPTION		DET. "BA"	DET. "CA"	DET. "DA"	DET. "DSA"	DET. "EA"	DET. "FA"	DET. "GA"	DET. "HA"
①	EYE END SOCKET		MF3	—	—	MF3	MF3	—	MF3	—
③	INSULATOR		-A2	3-A2	3-A1	3-A1	3-A2	3-A2	3-A2	3-A2
④	PIN		NP5	NP5	NP2	NP2	NP5	NP5	NP5	NP5
⑤	BOLT		—	—	—	BG5	—	—	—	—
⑥	ADAPTER		—	—	—	ND2	—	—	—	—
⑦	EYE END THIMBLE SHACKLE		—	S7A	S9	—	—	S12	—	S12
⑧	CLEVIS END THIMBLE SHACKLE		S8	S8	S10	S10	S11	S11	S11	S11
⑨	WIRE CLIPS		3-5/8"	6-5/8"	6-1/2"	3-1/2"	3-1/2" 3-5/8"	6-1/2" 6-5/8"	6-1/2"	12-1/2"

REFERENCE DRAWINGS

SOCKETS
MF1 - - - ET-662-E
MF3 - - - ET-662-E

INSULATORS
INSULATOR A1 - - - 11B-1201
INSULATOR A2 - - - 11B-1201

PINS & BOLTS
NP2 - - - 11B-1206
NP5 - - - 11B-1206
BG5 - - - ET-145-E

THIMBLE SHACKLES
S7A - - - 14E-86
S8 - - - 14E-85
S9 - - - 14E-87
S10 - - - 14E-88
S11 - - - ET-44-E
S12 - - - ET-45-E

O.B. CLAMP - EYE END

WIRE SIZE	CAT. NO.	O.B. DWG. NO.
336,400		24057
4/0	20723	21782
4/0 / 336,400		22309
4/0 / 4/0		22312

O.B. CLAMP - CLEVIS END

WIRE SIZE	CAT. NO.	O.B. DWG. NO.
336,400		[illegible]
4/0	20720	14000
4/0 / 336,400		[illegible]
4/0 / 4/0		22313

MISCELLANEOUS
ND2 - - - ET 449-E
1/2" WIRE CLIP - - - ET 556-E
5/8" WIRE CLIP - - - ET 556-E
ND4 - - - ET 394-F

NOTE 4
O.B. [illegible] BRASS CO.

THIS DRAWING SUPERSEDES
DRAWINGS ET-800-C & ET-890-C
AND PART OF DWG. 11B-1292

ISSUE NO.	DATE	DWN	CHKD	CORRECT	REMARKS	APPR
4	3-26-71	RAL			REV. BILL OF MATERIALS	
3	4-12-55	JRS	RDT	HK	336,400 C.M. wire added to [illegible]	
2	9-14-49				GENERAL REVISION	
1	3-8-47				ORIGINAL	

SCALE

GIBBS HILL INC.
CONSULTING ENGINEERS
NEW YORK

ET-1102-C-4

THE PENNSYLVANIA RAILROAD
ELECTRIFIED TERRITORY

DOUBLE MESSENGER
AIR BREAK DETAILS

PHILADELPHIA

C

CHIEF OF MOTIVE POWER — ELECTRICAL ENGINEER

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