Engineering Standard

SAES-T-018 13 November 2019

Telecommunications - Symbols, Abbreviations, and Definitions

Document Responsibility: Communications Standards Committee

Contents

1 Scope

This standard describes mandatory requirements governing the symbols and abbreviations used for telecommunication facilities. The Building Industry Consulting Service International (BICSI) standard symbols, acronyms, and abbreviations is hereby recognized as Saudi Aramco Engineering Standard SAES-T-018.

Electrical, electronics, and radio symbols are not included in this standard. For these symbols, refer to the following:

IEEE 315	*Graphic Symbols for Electrical and Electronics Diagrams*
ASME Y14.15	*Electrical and Electronics Diagrams*
CCIR Report 440-1	*General Graphical Symbols for Radio Communications*

2 Conflicts and Deviations

Any conflicts between this document and other applicable Mandatory Saudi Aramco Engineering Requirements (MSAERs) shall be addressed in writing to the EK&RD Coordinator.

Any deviation from the requirements herein shall follow internal company procedure SAEP-302, Waiver of a Mandatory Saudi Aramco Engineering Requirement.

3 References

All referenced specifications, standards and codes, forms, drawings, and similar material shall be of the latest issue (including all revisions, addenda, and supplements) unless stated otherwise. Applicable references are listed below.

3.1 Saudi Aramco Documents

Saudi Aramco Engineering Procedures

SAEP-301 *Instructions for Establishing and Maintaining Mandatory Saudi Aramco Engineering Requirements*

SAEP-302 *Waiver of a Mandatory Saudi Aramco Engineering Requirement*

Saudi Aramco Engineering Standards

SAES-T-920 *Telecommunications Cable Information*

Saudi Aramco Standard Drawing

AD-036785 *Symbols Cathodic Protection*

3.2 Industry Codes and Standards

International Organization for Standardization

ISO 14617-15	*Graphic Symbols for Diagram Part15: Installation Diagrams and Network Maps*
CCIR Report 440-1	*General Graphical Symbols for Radio Communications*

Building Industry Consulting Service International (BICSI)

OSP DRM	*Outside Plant Design Reference Manual, 6th Edition*
BICSI TDMM	*BICSI Telecommunications Distribution Methods Manual, 13th Edition*
BICSI ICT	*ICT Terminology Handbook*

Institute of Electrical and Electronics Engineers

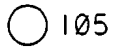
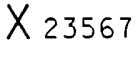
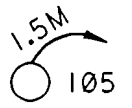
IEEE 315	*Graphic Symbols for Electrical and Electronics Diagrams*

4 Poles, Guy and Anchor Symbols, and Abbreviation

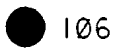
4.1 This section identifies and defines the symbols and abbreviations related to poles and associated equipment. These symbols and abbreviations are for use primarily on construction work plans and records, but may also be used on maps when necessary.

4.1.1 Place pole information as close as possible to the pole symbol. There should be no confusion as to which symbol the information governs. If the timber and treatment are not specified on the work order, it should be furnished by the placing forces.

4.1.2 Pole symbols used to identify existing plant are as follows:

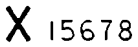
	EXISTING POLE NO. 105 SOLELY OWNED BY SAUDI ARAMCO TELECOMMUNICATIONS.
	EXISTING SAUDI ARAMCO TELECOMMUNICATIONS ATTACHMENT TO A POWER-OWNED (PDD, SEC "SCECO", ETC.) POLE NO. 23567. (FREE ATTACHMENT, RENTAL ATTACHMENT, LEASED POLE, ETC.).
	POLE TO BE REMOVED
	MOVE A SAUDI ARAMCO OWNED POLE. THE NUMBER AND ARROW INDICATE THE DIRECTION AND DISTANCE THE POLE IS TO BE MOVED.

4.1.3 Proposed poles are identified by pole number (if available), ownership, height, class, and species of timber. Proposed attachments are identified by ownership and pole number. Proposed poles and attachments are shown in the following examples:



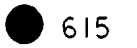
35'-5

PROPOSED 35-FOOT, CLASS 5 TO BE PLACED BY SAUDI ARAMCO TELECOMMUNICATIONS.



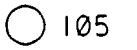
PROPOSED SAUDI ARAMCO TELECOMMUNICATIONS ATTACHMENT TO A PROPOSED POWER-OWNED (PDD, SEC "SCECO", ETC.) POLE NO.15678.

4.1.4 Existing plant that is to be removed, replaced or abandoned is shown in the following examples:



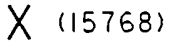
(30'-5)
35'-5

EXISTING POLE NO. 615, A 30-FOOT, CLASS 5 POLE TO BE REPLACED WITH A PROPOSED 35-FOOT, CLASS 5 POLE.



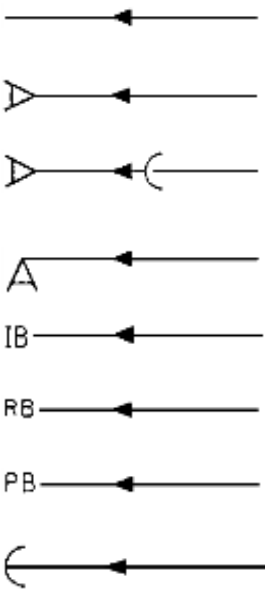
(35'-5)

EXISTING POLE NO. 105, A 35-FOOT, CLASS 5 POLE TO BE REMOVED OR ABANDONED.



SAUDI ARAMCO TELECOMMUNICATIONS ATTACHMENT BE REMOVED FROM POWER-OWNED (PDD, SEC "SCECO", ETC.) POLE NO. 15768.

4.1.5 Guy and anchor symbols used to identify existing plant are as follows:



GUY ONLY (BICSI)

GUY AND ANCHOR (BICSI)

INSULATED GUY AND ANCHOR (BICSI)

SIDEWALK GUY AND ANCHOR (BICSI)

I-BEAM ANCHOR AND GUY

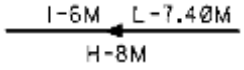
ROCK BOLT AND GUY

PUSH BRACE

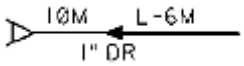
FOREIGN OWNED ANCHOR AND GUY

JOINTLY-OWNED ANCHOR

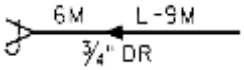
4.1.6 Proposed guy and anchor symbols used on construction work plans are identified by using the existing plant symbols drawn with heavy solid lines, as shown in the following examples:



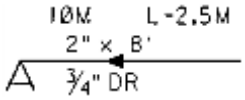
PROPOSED OVERHEAD GUY ONE 6,000 POUND STRAND WITH A 7.40 METER LEAD AND 8 METER HEIGHT OF ATTACHMENT.



PROPOSED 10,000-POUND GUY AND ANCHOR WITH A 6-METER LEAD, 1-INCH-DOUBLE-EYE ANCHOR ROD.

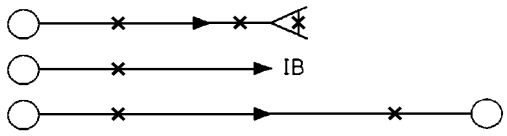


GUY ATTACHED TO AN EXISTING JOINT USED ANCHOR, A 6,000-POUND STRAND WITH A 9-METER LEAD, ¾-INCH DOUBLE-EYE ANCHOR ROD.

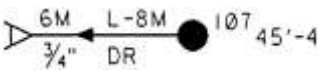


PROPOSED GUY AND SIDEWALK ANCHOR ASSEMBLY.
– DENOTE PIPE SIZE LENGTH.

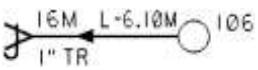
4.1.7 To indicate removal of existing guys and anchors, place an X through the guy and anchor symbol as shown in the following examples:



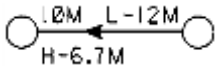
4.1.8 Addition - The following examples shows combination of pole, guy and anchor symbols:



PROPOSED SOLELY OWNED SAUDI ARAMCO TELECOMMUNICATIONS 45-FOOT, CLASS 4 POLE, 6M (6,000 POUND) GUY WITH AN 8-METERS LEAD, ¾ INCH DOUBLE EYE ANCHOR ROD.



EXISTING SAUDI ARAMCO TELECOMMUNICATIONS SOLELY OWNED POLE. PROPOSED 16M (16,000-POUND) GUY WITH 6.10 METERS LEAD AND 1-INCH TRIPLE EYE JOINT ANCHOR.

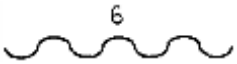
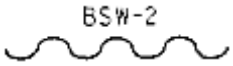
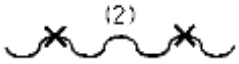
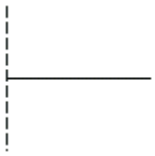
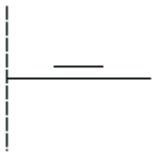
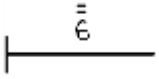


EXISTING SAUDI ARAMCO TELECOMMUNICATIONS OWNED POLES AND OVERHEAD GUY. SHOWN GRADE OF ATTACHMENT AT 6.7 METERS.

5 Cables, Wires and Grounding Symbols, and Abbreviation

5.1 Symbols and Abbreviations - Wire (Aerial Drop Wire and Buried Service Wire)

5.1.1 This practice provides information for using the symbols and abbreviations pertaining to wire plant and associated items, as indicated below:

Symbols	Explanation (Use light line if existing and dark line if proposed)
	AERIAL DROP OR WIRE PAIR. NUMERAL INDICATES NUMBER OF CIRCUITS WHEN MORE THAN ONE. GAUGE CAN BE NOTED WHEN NECESSARY.
	TWO PAIR BURIED SERVICE WIRE. TYPE OF WIRE AND NUMBER OF PAIRS ARE TO BE ENTERED ABOVE LINE.
	DROP WIRE TO BE REMOVED OR ABANDONED AS INDICATED BY A NOTE.
Wire Terminals	
	NON-PROTECTED SINGLE PAIR WIRE TERMINAL.
	PROTECTED WIRE TERMINAL.
	STATION PROTECTION WIRE TERMINAL 6 PAIRS.

5.2 Symbols and Acronyms for Cable, Terminals, Load Coil Cases, Build-out Capacitors and Carrier Repeaters

5.2.1 This section identifies and defines the symbols and acronyms used in descriptive data for:

- Cable
- Cable terminals
- Load coil cases
- Build-out capacitors
- Carrier repeaters

5.2.2 The symbols and acronyms in this section are to be used on construction drawings and records for telecommunication outside plant (OSP) facilities.

The cable sheaths and protective coverings listed in this section:

- Are not necessarily current standard material.
- Serve to identify and inform.

Refer to the SAES-T-920 for applications of types of sheath and protective covering.

5.3 Cable Designations

5.3.1 Cable designations used on work order prints for strip paper or pulp-insulated conductor cables (where existing) are indicated in the following chart.

The Chart:

- Provides the code letters used to designate the type of cable sheath.
- Describes the types of cable sheath used primarily on strip paper or pulp-insulated conductor cables.

Type of Sheath	Code Letter	Description
Aluminum	B	An aluminum sheath extruded over the cable core
Lead	L	A lead alloy sheath extruded on the cable core
Stalpeth	S	o A corrugated aluminum tape applied longitudinally without an overlap. o A corrugated steel tape with soldered longitudinal seam. o An outer extruded polyethylene jacket.

5.3.2 Cable designations used on work order prints are listed in following chart.

The Chart:

- Provides the code letters used to designate the type of cable sheath.
- Describes the types of cable sheath used only on plastic-insulated conductor cables.

Type of Sheath	Code Letter	Description
ALPETH	A	An aluminum tape with a fused clear polyethylene coating applied longitudinally with an: o Overlap o Extruded jacket of polyethylene
PAP	D	o Extruded polyethylene over the core o An outer extruded polyethylene jacket o Aluminum tape with a fused clear polyethylene coating applied longitudinally with an overlap
PASP	E	o Extruded polyethylene over the core. o Corrugated aluminum tape applied longitudinally without overlap. o Corrugated steel with soldered longitudinal seam. o Coating of thermoplastic flooding compound. o An outer extruded polyethylene jacket.
PCP	F	o Extruded polyethylene over the core. o Copper tape applied longitudinally with an overlap. o An outer extruded polyethylene jacket.
POLYPIC	P	Mylar*TM* tape over the core with an outer extruded polyethylene jacket.
PWP	K	o Extruded polyethylene over the core. o Flat steel wire flooded with asphalt. o An outer extruded polyethylene jacket.
VA	N	Aluminum shield over the cable with a polyvinyl chloride jacket.

5.3.3 Cable designations used on work prints are listed on the following chart.

The Chart:

- Provides the code letters used to designate the type of cable sheath.
- Describes cable sheath used for other cable types.

Type of Sheath	Code Letter	Description
ALVYN	T	A .20 mm aluminum tape coated on the outer side with a special adhesive coating that adheres to the overlaying black polyvinyl chloride jacket. **Note:** The coated aluminum tape is corrugated and longitudinally folded over the core tape with an overlap.
ASP	U	An aluminum tape with the following characteristics: o Encased in a corrugated steel tape with overlap. o Protected on both sides with a chemically bonded polyethylene film that is not overlapped. o Filling compound is applied: - Under the aluminum tape. o Between the aluminum tape and steel tapes. o The steel tape is flooded with - An extruded polyethylene jacket. - A thermoplastic flooding compound.
CUPETH	C	A copper tape applied longitudinally with an overlap and an extruded jacket of polyethylene.
LEPETH	G	o Extruded polyethylene over the core. o A heat-barrier tape. o An outer lead sheath.
LEPETH (Coaxial, Polyethylene)	R	o Extruded polyethylene over the core. o A paper heat-barrier tape applied over the jacket with a lead alloy sheath.
Optic (Polyvinyl - Chloride/other)	I	Fiber building cable with fire-retardant sheath. Type OFNR listing meeting UL 1666 for riser cable use.
Optic	J	Fiber building cable with fire-retardant sheath. Type OFNP listing meeting UL 910 for plenum use.
Optic (Polyethylene)	Y	An extruded polyethylene jacket. **Note:** Used on fiber optic cables.
Polyethylene Jacket	H	A lepth cable with an outer extruded polyethylene jacket.

Type of Sheath	Code Letter	Description
LEPETH		**Note:** Use primarily on toll cables (strip paper or pulp-insulated conductors).
Video (lead)	V	o Creped kraft paper tape. o Extruded lead sheath. o A helically-wrapped polyethylene tape applied longitudinally with overlap. o Copper tape applied helically with overlap.
Video (Polyethylene)	W	o A helically-wrapped tape over core. o Copper tape applied longitudinally with overlap. o Copper tape applied helically with overlap. o Polyethylene tape. o An outer extruded polyethylene sheath.

5.3.4 The types of cable conductor insulation are listed in the following chart:

Commentary Note:

For fiber optic cables, the type of fiber buffer is listed.

Code Letter	Type of Conductor Insulation
B	Polyethylene-polyvinyl chloride
D	Double Paper Wrapped
E	Plastic insulated color coded
F	Fiber-optic--non-buffered/bundled
G	Fiber optic--loose buffer
H	Fiber optic--tight buffer
J	Fiber optic--ribbon
K	Foam skin insulated--color coded
L	Pulp
P	Plastic insulated, non-color coded
R	Rubber insulated
S	Single paper wrapped
T	Textile

5.3.5 The following chart shows the code letters for special types of cable:

Code Letter	Description
A	Fiber optic -- air core nondielectric
B	Filled, screened cable
C	Composite coaxial cable
D	Fiber optic -- filled dielectric
F	Filled Cable
K	Fiber optic -- air core dielectric
L	Low capacitance cable
M	Multiple unit
N	Fiber optic -- filled nondielectric
Q	Quadded cable
S	Screened cable

5.3.6 If required, use the code letters in the chart in section 5.3.3 below in place of the codes in the chart in section 5.3.3 above.

Commentary Note:

Do not use codes from both charts on the same cable designation.

5.3.7 The following chart provides the code letters and descriptions for the types of cable protective covering.

Commentary Note:

On work order prints, place the code letter behind the cable size and gauge.

Type of Covering	Code Letter	Description
Aerial tape armor	TA	Either lead or polyethylene sheath: On... It consists of.. . Lead o A bedding of impregnated jute applied directly over the lead sheath. o Two spiral wrappings of galvanized steel tape armor. Polyethylene sheath o Two layers of impregnated and reinforced paper. o Two spiral wrappings of galvanized steel tape armor.

Type of Covering	Code Letter	Description
Buried Tape Armor	BT	Lead Sheath o Impregnated paper and cushion of jute. o Two layers of steel tape o An outer covering of impregnated jute.
Corrosion Protection	CP	o An outer layer of rubber or asphalt-backed fabric tape. o Two reversed layers of impregnated and reinforced paper.
Corrugated Steel Protection	CS	A 0.15 mm of corrugated steel tape longitudinally wrapped around fiber optic cable with a positive overlap.
Double Sheath	DS	A polyethylene inner jacket covered by an aluminum shield with an extruded polyethylene outer jacket.
Gopher Tape Armor	GT	o Polyethylene sheath, armored with a 0.15 mm corrugated steel tape flooded with a thermoplastic compound.
	MG	o Outer polyethylene sheath o Welded corrugated .41 mm or.51 mm steel tape. o Flooding Compound. o Polyethylene inner sheath
Jute Protection	JU	o Asphalt compound. o Impregnated paper. o Jute covering.
Jute Protection with tape armor	JUTA	o Layer of impregnated paper. o Layer of jute filled with asphalt. o Two layers of asphalt- coated steel tapes. o Outer covering of impregnated jute finished with mica.
Lightweight armor	LA	**Note:** Similar to single-wire armor submarine except smaller sized steel wires. Either Lead or PAP Sheath: On..... It consists of..... Lead Sheath o Impregnated jute. o Layer of galvanized steel wires. o Outer layer of impregnated jute. PAP Sheath o Jute o A layer of galvanized steel wires. o An outer layer of impregnated jute.

Type of Covering	Code Letter	Description
Modified tape armor	MT	Lead sheath with: o A layer of alternate paper tapes. o Two steel tapes. o An outer covering of jute
Neoprene jacket	NJ	o For use with lead-covered cable. o Consists of a combination of neoprene filled and all-neoprene tapes that adhere tightly to the underlying sheath.
Polyethylene jacket	PJ	Polyethylene jacket extruded over lead or aluminum sheath.
Submarine double armor	DA	Submarine-type cable covered by: o Two layers of impregnated jute spiral wrapping of galvanized wire armor. o A layer of impregnated jute. o Another wrapping of galvanized wire armor spiraled in the opposite direction. o An outer covering of impregnated jute.
Submarine single armor	SA	Submarine-type cable covered by: o Two layers of impregnated jute. o A spiral wrapping of galvanized wire armor. o Impregnated jute.

5.3.8 The following chart provides the code letters for aerial cable assembled messenger support and describes the code meanings:

Letter	Description
IM	Integral messenger bonded to cable sheath with a polyethylene web (Figure 8 configuration)
ML	Cable prelashed to messenger with steel binding tape
SS	Self-supporting cable. Conductors provide required support

5.3.9 Numerals indicate the number of:

- Cable pairs and wire gauge.

  Or

- Fibers contained in the fiber optic cable.

5.4 Symbols and Codes for Cables

5.4.1 Identify cables according to the following chart by using the letter or symbol codes or the numerical codes.

Letter or Numeral	Explanation
First letter	Type of cable sheath. Refer to the following charts found in this standard in paragraphs indicated in this chart: Reference Cable sheath designations for Strip Paper or Pulp-Insulated Conductor Cables. See section 5.3.1 Cable sheath designations for Plastic-Insulated Conductor Cables. See section 5.3.2 Cable sheath designations for Other Cable Types. See section 5.3.3.
Second letter	Type of cable conductor insulation. Or In the case of fiber optics, protective fiber coating. **Note:** See "Cable Conductor Insulation" in section 5.3.4.
Third Letter	Special type cable. See "Special Type Cable" in section 5.3.5.
First, Second, third & fourth numeral(s)	Indicate the number of: o Cable pairs Or o Optical fibers When placing numerals on work prints, use the rules in the following chart:

Over 100	Indicate as actual total pairs (for example, a 300-pair and 2700-pair cable are shown as 300 and 2700)
From 25 to 75 Pair	The signifying two digits.
Of 24 or fewer pairs	Using an X for the second or third digit (for example, a 6-pair cable is designated as 6X and an 18-pair cable as 18X).
Of MAT/ICOT type cable pairs pairs and special composite cable pairs.	Indicated as actual total pairs (for example152, 455, 624).

Letter or Numeral	Explanation
Fourth and Sixth numerals *	Indicate wire gauge of cable conductors

* Replace the numerals with two letters to indicate special types of cables, as follows:

Code	Explanation
SC	Special composite cable of a mixture of gauges.
	Note: The gauge number or SC code always follows the cable pair codes.
SM	Single-mode fiber optic cable
MM	Multimode fiber optic cable.

Final letters

A two-letter code:

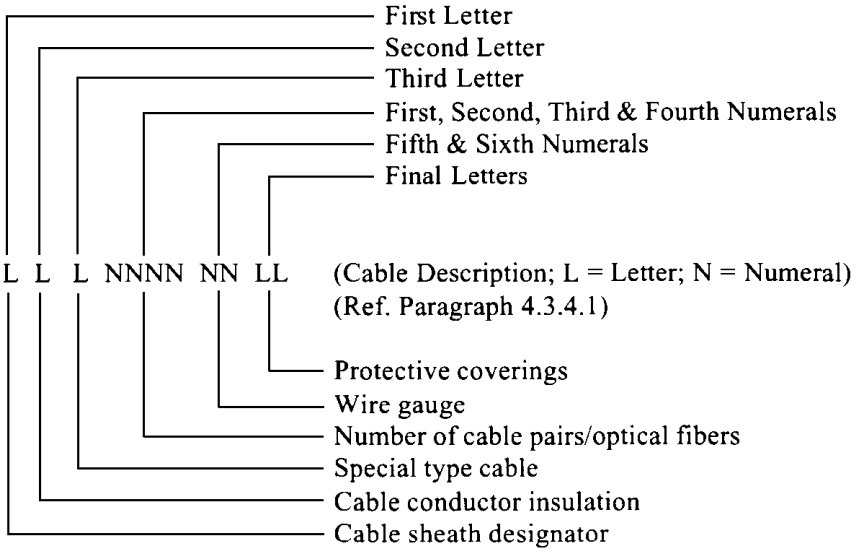
- Indicating the protective covering of the cable (See "Protective Coverings" in section 5.3.7).

Or

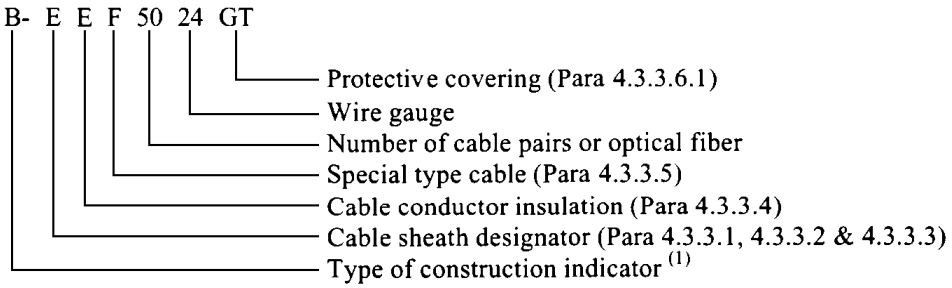
- Designating aerial messenger supports (See section 5.3.8).

Note: You must choose one two-letter code from either chart. Do not use codes from both charts in the same cable designation.

5.4.2 Addition - In summary, symbol for use in designating cables on drawings and records will be shown as illustrated below:

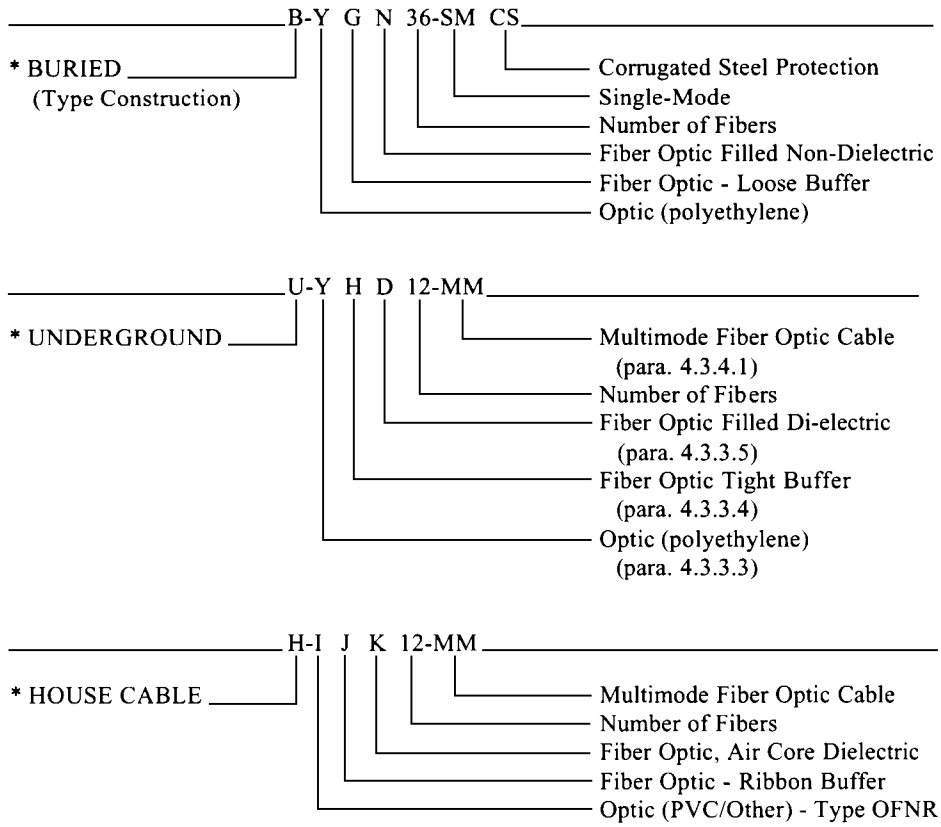


5.4.3 Addition - Shown below is an example of Typical Copper Cable designation:

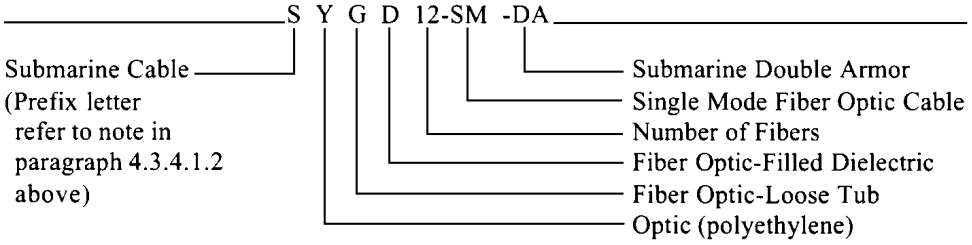


Note: (1) Prefix letter indicates type of construction; C = Aerial; B = Buried; U = Underground; S = Submarine; H = House Cable (cable inside buildings)

5.4.4 Addition - Listed below are examples for designating fiber optic cables on drawings and records (All cable lines are to be solid lines):



* Prefix letter. Refer to Note in section 5.4.3 above.



5.4.5 The following examples are applications of the cable designations described in the preceding chart. (All lines used on Drawings or Records to represent cables are to be solid line, whether aerial, buried, underground, house or submarine cables are involved).

Cable Designation (Prefix Letter to indicate type of const. is not shown)	**Explanation**
____ AE50-22 ____	o Alpeth cable o Even-count plastic-insulated conductors color coded o 50 Pair o 22 Gauge
____ TB3-300-22 ___	o Alvyn cable o Polyethylene-polyvinyl chloride insulated conductors (terminating cable) o 300 Pair o 22 Gauge
____ AE F100-22 ___	o Alpeth cable o Even-count plastic-insulated conductors color coded o Filled o 100 Pair o 22 Gauge
____ UE F50-26 GT ___	o Alpeth cable o Even-count plastic-insulated conductors color coded o Filled o 50 Pair o 26 Gauge o Gopher tape armor protective coating
____ AE100-22 GT ____	o Alpeth cable o Even-count plastic-insulated conductors color coded o 100 Pair o 22 Gauge o Gopher tape armor protective coating
____ B L100-22 JU ___	o Lead sheath cable o Single-paper wrapped insulated conductors o 100 Pair o 22 Gauge o Jute protection

Cable Designation (Prefix Letter to indicate type of const. is not shown)	Explanation
____ AE25-19 M ___	o Alpeth cable o Even-count plastic-insulated conductors o 25 Pair o 19 Gauge o Integral messenger (figure 8 configuration)
____ YGA48-MM CS ___	o Polyethylene-jacketed fiber optic o Loose-buffer o Air core-nondielectric o 48 Fiber o Multimode o Corrugated steel protection
___ 7X19 TK1, 1-7 6 COAX __	Composite LEPTH polyethylene sheath coaxial cable containing 43X-19GA and 6 Coaxial 0.375 tubes.

5.4.6 Addition - The cable designations shown above indicate conductor sizes in the American Wire Gauge (AWG) sizes only.

On cable drawings and records, cable manufactured to AWG shall be designated with the AWG designation (24, 22, etc.) and cable manufactured to metric system dimensions shall be designated with the metric designations (.5, .6, etc.) in accordance with SAEP-301 paragraph 5.2.15 and the chart below.

Conductor Size Comparisons

American Wire Gauge			Metric Wire Sizes		
AWG	Size in mm	Show on Dwg's as	Standard Size	Size in mm	Show on Dwg's as
19	0.9116	19	9	0.9000	.9
22	0.6438	22	6	0.6000	.6
24	0.5106	24	5	0.5000	.5
26	0.4049	26	4	0.4000	.4

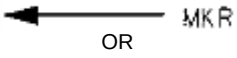
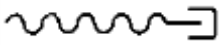
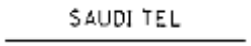
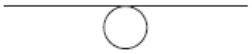
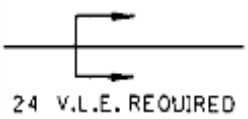
5.4.6.1 Addition - Metric Conversion Chart

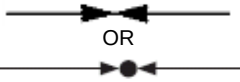
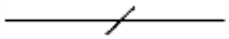
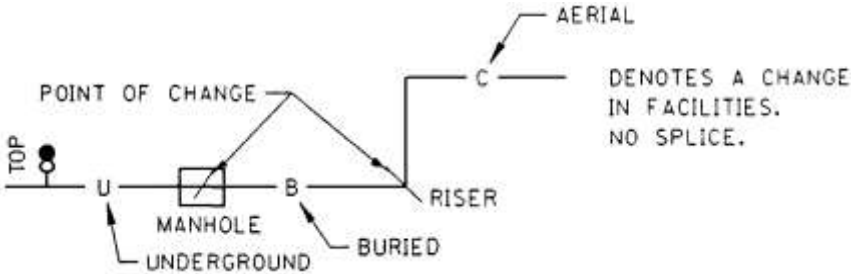
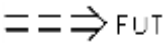
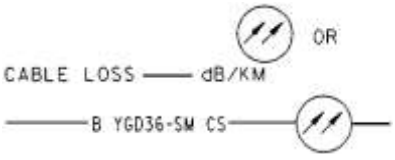
Equivalent Lengths

mm	cm	meter	kilometer	inch	foot	mile
1	0.1	0.001	10^{-6}	.03937	.003281	
10	1	0.01	10^{-5}	.3937	.032808	
1000	100	1	10^{-3}	39.37	3.28083	
106	105	1000	1	39370.	3280.83	
25.4	2.54	.0254		1	12	
304.8	30.48	.3048		12	1	
		1609.35	1.60935		5280	1

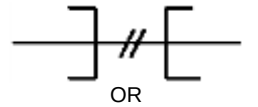
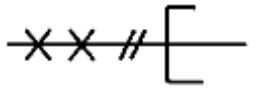
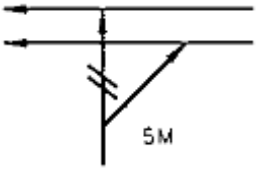
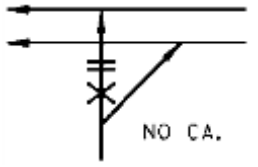
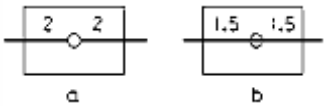
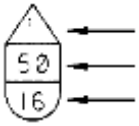
To convert from	To	Multiply by
Inches	millimeters	25.4
feet	meters	0.3048
miles	kilometers	1.6093
pounds	kilograms	0.4536
pounds per 1000 feet	kilograms per kilometer	1.4882

5.4.7 Listed in the chart below are symbols on drawings and/or records to represent cable and cable related operations and items:

Symbol	Explanation
	CABLES; AERIAL, BUILDING/HOUSE, BURIED, UNDERGROUND AND SUBMARINE CABLES ARE PRESENTED WITH SOLID LINE.
	BURIED CABLE MARKER POST LOCATION.
	BURIED CABLE MARKER POST WITH LOCATOR CAP
	CABLE REFERENCE BUBBLE AND HOOK.
	CAPPED AND MARKED BURIED SERVICE WIRE.
	ELECTRONIC MARKER.
	FOREIGN-OWNED CABLE. SHOW THE COMPANY NAME.
	LOOP IN CABLE.
	LOOP TREATMENT BOUNDARY.
	

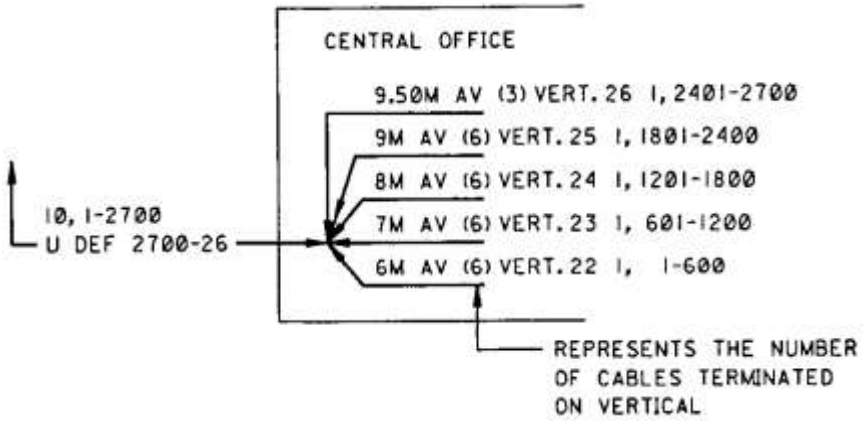
Symbol	Explanation
	SPLICE (3-WAY SHOWN) SHOWS CHANGE IN SIZE, GAUGE, TYPE, OR COUNT.
	SPLICE INDICATING CHANGE IN SIZE, GAUGE, TYPE OF CABLE, CHANGE COUNT, ETC.
	PROPOSED STRAIGHT SPLICE, STRAIGHT SPLICE, NO CHANGE IN SIZE, TYPE, GAUGE OR COUNT.
	SPLICE WITH TRENCH CABLE
	TICK MARK. DESIGNATES THE BEGINNING AND END OF A PIECE PART. SEE EXAMPLE BELOW:
	
	FEMALE CONNECTOR, FOR PRECONNECTORIZED CABLE.
	FUTURE EXTENSION.
	MALE CONNECTOR, FOR PRECONNECTORIZED CABLE.
	FIBER OPTIC CABLE SYMBOL. TWO CIRCLED DIAGONAL ARROWS AS SHOWN INDICATES A FIBER OPTIC CABLE. THE SYMBOL, WHEN USED MAY BE PLACED IN THE CABLE LINE OR JUST ABOVE IT.
	FIBER OPTIC CABLE SYMBOL SHOWING FIBER OPTIC PATCH PANEL.

Work Symbols - The cable work operation symbols are shown in the following chart:

Symbol	Explanation
	CABLE TO BE CUT AND CAPPED.
	CABLE TO BE CUT, ONE END CAPPED, THE OTHER END REMOVED.
	CABLE REQUIRED FOR TRANSFER. THE SPLICER WILL CORRECT ESTIMATED MEASUREMENTS TO AS-BUILT MEASUREMENTS.
	NO CABLE REQUIRED FOR TRANSFER.
	CABLE SPECIFIED IN THE MANHOLE (a) ALLOWS FOR SPLICING OVERLAP. THE SPLICER WILL CORRECT CABLE LENGTH ON AS-BUILT DRAWING (b) TO INDICATE ACTUAL CABLE LENGTH FROM THE CENTER OF THE SPLICE TO THE DUCT (METERS).
	CONSTRUCTION WORK LOCATION. THE FUNCTION NUMBER IS ENTERED IN THE HEXAGON. MAY BE USED TO INDICATE WORK LOCATION WHERE NO SPLICING WORK IS REQUIRED.
	SPLICING WORK LOCATION SYMBOL. THE NUMBER INSIDE THE TRIANGLE INDICATES THE LOCATION NUMBER. WHERE DESIRED, THE NUMBER COULD BE USED TO INDICATE SPLICE OPERATION SEQUENCE.
	CABLE THROW SYMBOL WORK LOCATION NUMBER OF PAIRS TRANSFERRED NUMBER OF WORKING PAIRS

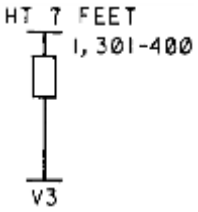
Use the symbols below to represent:

- CABLE INSTALLED ON CENTRAL OFFICE MDF WITH PRE-STUBBED PROTECTORS.
- THE AVERAGE STUB LENGTH OF THE TERMINATING CABLES FOR EACH VERTICAL.



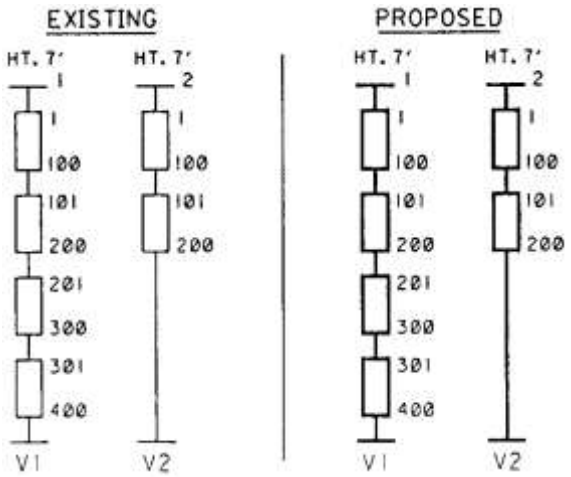
Main distribution frame (MDF) vertical with protector indicate:

- TERMINATED CABLE NUMBER AND PAIR COUNT.
- VERTICAL NUMBER
- VERTICAL HEIGHT (SHOWN HT. 7 FEET)
- TYPE OF PROTECTOR / CONNECTOR USE



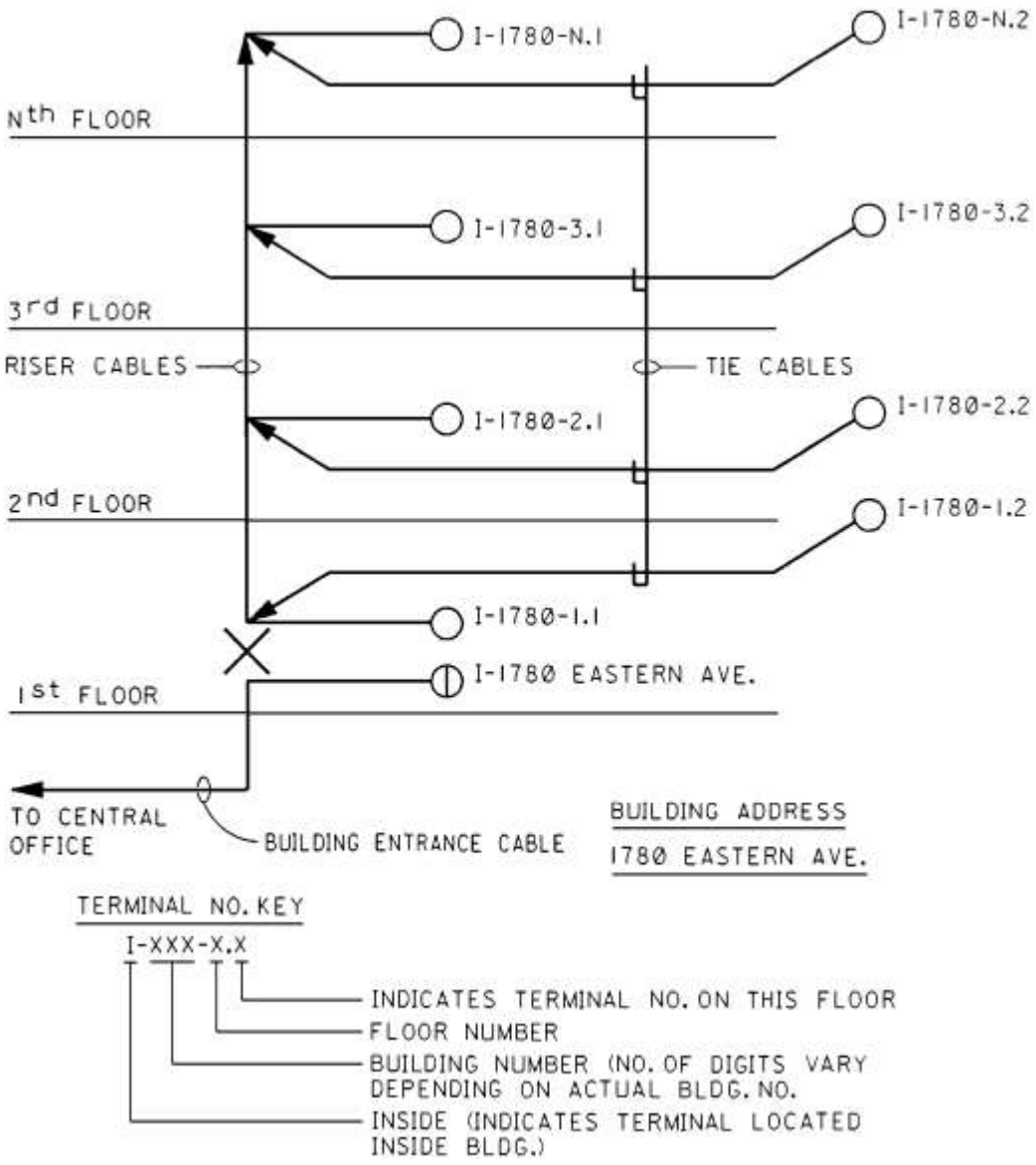
ON ALL FRAMES IN CENTRAL OFFICES, OR LARGE BUILDINGS, TERMINATIONS WILL BE DESIGNATED.

EXAMPLE SHOWS VERTICAL BLOCK PLACED ON VER-I (COUNT FOR BLOCK WOULD BE DETERMINED BY SIZE & TYPE OF BLOCK AND SHOWN ON WORK PRINT).



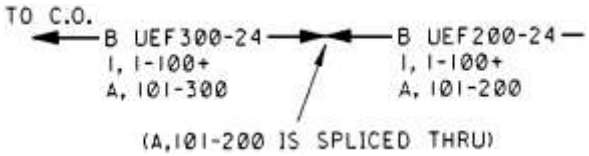
5.4.8 Addition

Terminal Addressing - Buildings

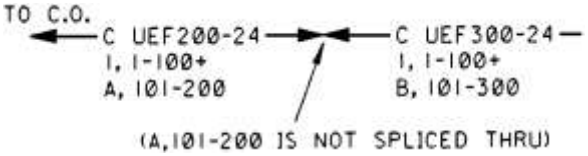


5.4.9 Addition

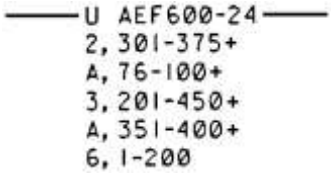
Cable Count Examples:



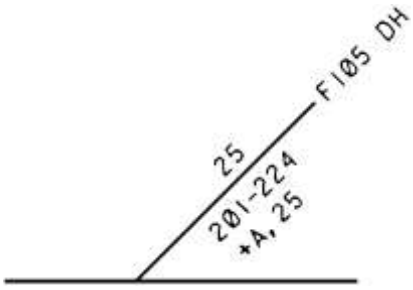
DEAD PAIR IN A CABLE COMPLEMENT WILL CARRY AN ALPHABETICAL DESIGNATION (A, B, C, D, ETC.). THE SPLICER, ENGINEER AND RECORDS WILL TREAT THIS DESIGNATION THE SAME AS IF IT WERE A CABLE NUMBER. THIS EXAMPLE INDICATES THAT CABLE A, 101-200 IS SPLICED THROUGH AT THE INTERMEDIATE SPLICE.



THIS EXAMPLE INDICATES THAT CABLE A, 101-200 IS NOT SPLICED THROUGH TO CABLE B, 101-200.

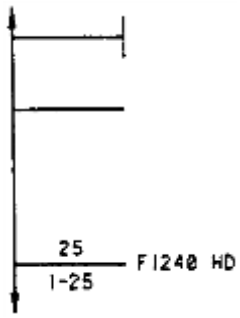


DEAD PAIRS IN A CABLE (I.E., SHEATH COUNT OF CABLE) WILL BE SHOWN IN THE EXACT ORDER THAT THEY APPEAR IN THE CABLE.

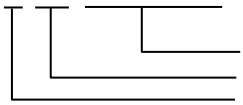


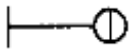
INDIVIDUAL DEAD CABLE PAIRS MAY BE IDENTIFIED BY THE EXACT ORDER OF COUNT THEY APPEAR IN.

5.5 The following chart depicts terminal symbols. Proposed terminals are drawn using a heavy weight line:

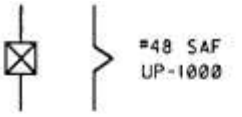
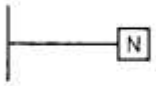
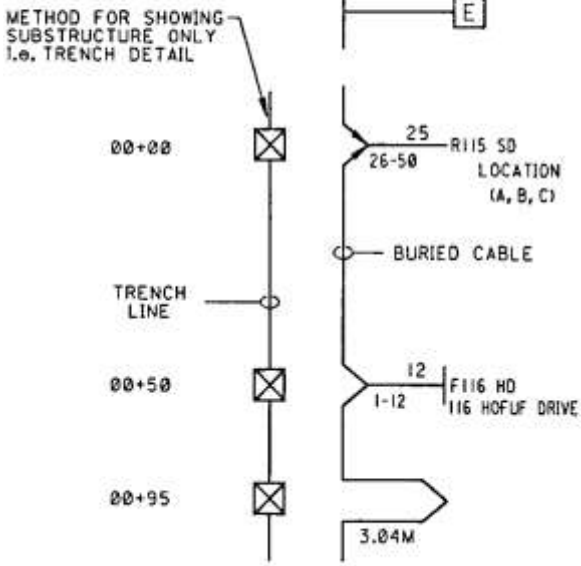
Symbol	Explanation
	• AERIAL/BURIED PROT. TERMINAL. • FIXED COUNT. • AERIAL/BURIED UNPROT. TERMINAL. • FIXED COUNT. TYPICAL UNPROTECTED TERMINAL • SIZE OF TERMINAL ON THE STEM. • COUNT OF THE TERMINAL. • TERMINAL ADDRESS.

TERMINAL ADDRESS (TERMINAL OUTSIDE BUILDINGS)
EXAMPLE:
F 1240 HOFUF DRIVE

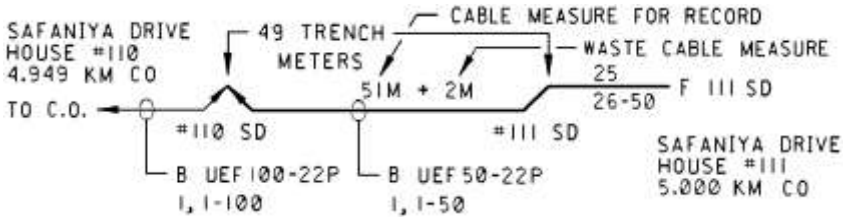


	• BUILDING TERMINAL. • PROTECTED. • FIXED COUNT.
	• BUILDING TERMINAL. • UNPROTECTED. • FIXED COUNT.
	TYPICAL BUILDING TERMINAL • SIZE AND TYPE OF TERMINAL -25 PAIR NC. • COUNT OF TERMINAL • BUILDING NUMBER – 1840. • TERMINAL NUMBER – I-1840 • ("I" INDICATES TERMINAL LOCATED INSIDE BUILDING) • FLOOR NUMBER – 3.I ("I" INDICATES IT'S THE FIRST TERMINAL ON THE THIRD FLOOR)

5.5.1 Terminal and closure symbols used on direct buried cables are shown in the chart below.

Symbol	Explanation
	LOOP THROUGH PEDESTAL. • INSTALL AS A SPLICE CLOSURE ONLY. • NO TERMINAL BLOCKS. • CONSIDERED AS A CLOSURE FOR RECORD PURPOSES.
	• FIXED COUNT. • NON-REENTERABLE SUBSURFACE TERMINAL.
	• SUBSURFACE REENTERABLE TERMINAL. • FIXED COUNT.
	• UNPROTECTED TERMINAL IN PEDESTAL. • FIXED COUNT. • PEDESTAL NUMBER. • PEDESTAL LOCATION. A) STREET NAME (SAFANIYA DRIVE) B) BUILDING NUMBER C) KM. FROM C.O. • PROTECTED TERMINAL IN PEDESTAL. • FIXED COUNT. • PEDESTAL/CLOSURE OFFSET 3.04 METERS (10') FROM BURIED MAIN CABLE RUN WITH CABLE LOOPED THROUGH IT.
	• SYMBOL FOR PEDESTAL/CLOSURE PROPOSED SHOWN WITH HEAVY LINE.

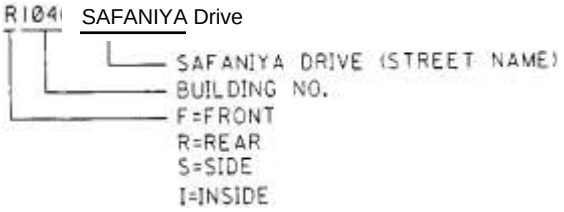
EXAMPLE OF A BURIED CABLE EXTENSION.



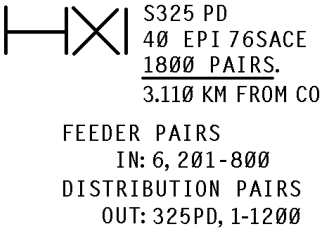
Terminal symbols continue

Symbol	Explanation
	X – CONNECT TERMINAL INDICATE: • TERMINAL ADDRESS. • TYPE. • CAPACITY. • IN AND OUT.

TERMINAL ADDRESS EXAMPLE:



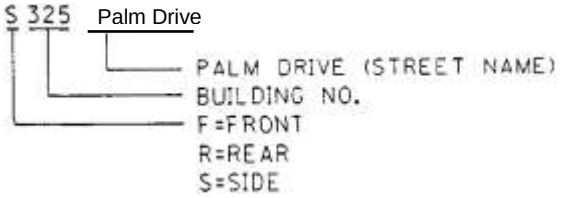
NOTE: THE OUT CABLE NUMBER OF A CROSS-CONNECT TERMINAL IS DETERMINED BY THE TERMINAL ADDRESS NUMBER.



FAP INTERFACE CONNECTOR. INDICATE:

- TERMINAL ADDRESS.
- TYPE.
- CAPACITY.
- KM FROM C.O.
- IN AND OUT.

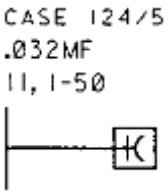
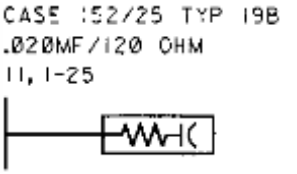
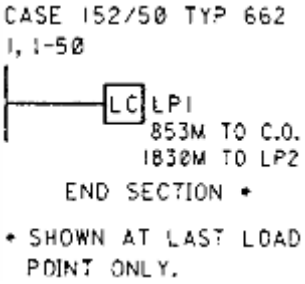
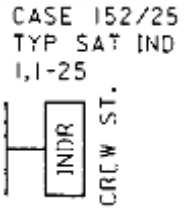
TERMINAL ADDRESS EXAMPLE:



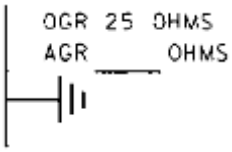
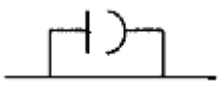
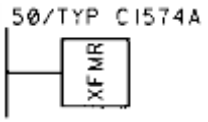
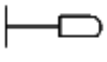
Commentary Note:

Saudi Aramco official full street name shall be used for terminals address which can be obtained from http://saasd.aramco.com.sa/Glossary/Categories.asp

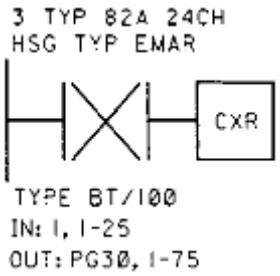
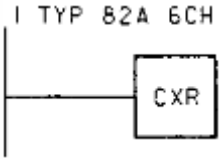
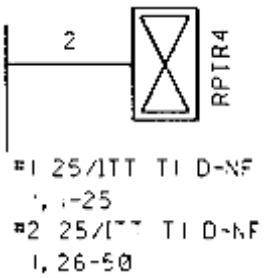
5.5.2 The following chart provides the symbols for load coil cases, build-out capacitors, and build-out lattice network:

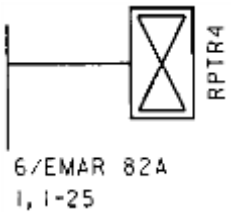
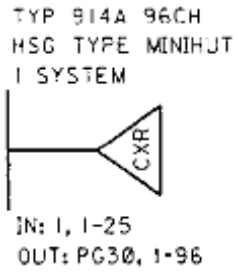
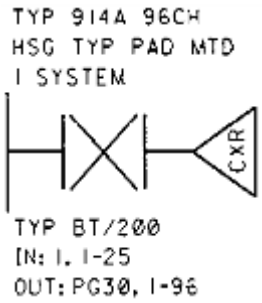
Symbol	Explanation
	BUILD-OUT CAPACITOR CASE. INDICATE THE: • TYPE OF CASE. • QUANTITY OF CAPACITORS. • CAPACITANCE IN MF (MICROFARADS). • COUNT OF TERMINATED CABLE PAIRS.
	BUILD-OUT LATTICE NETWORK CASE. INDICATE THE: • TYPE OF CASE. • QUANTITY AND VALUE OF CAPACITORS IN MF (MICROFARAD). • RESISTANCE. • COUNT OF TERMINATED CABLE PAIRS.
	LOAD CASE. INDICATE THE: • LOAD POINT NUMBER FROM C.O. • BACK SPAN DISTANCE TO C.O./LP. • TYPE OF CASE. • QUANTITY OF COILS. • TYPE OF COILS. • COUNT OF TERMINATED CABLE PAIRS. • DISTANCE TO NEXT LOAD POINT. • ON LAST LOAD POINT SHOW DISTANCE TO THE END OF CABLE. [914M (3000 FEET) OR GREATER] **NOTE:** INDICATE SAME SYMBOL AND EXPLANATIONS WHEN LOAD COIL IS ENCLOSED IN SPLICE.
	INDUCTOR: • TYPE CASE. • QUANTITY. • TYPE. • CABLE COUNT.

5.5.3 The symbols for cable grounding, bonding, and protection are provided in the chart below:

Symbol	Explanation
	BOND CABLE TO STRAND OR OTHER CABLE.
	BOND AND GROUND CABLE.
	BOND AND GROUND TO POWER NEUTRAL OR MULTI-GROUNDED NEUTRAL.
	GROUND (SHOW N OR MGN IF GROUND IS TO POWER GROUND).
	GROUND WITH DRIVEN GROUND RODS: • SPECIFY THE OBJECTIVE GROUND RESISTANCE (OGR). • RECORD THE ACTUAL GROUND RESISTANCE (AGR) WHEN THE GROUND IS INSTALLED.
	PGR-POWER GROUND ROD. TGR-TELEPHONE GROUND ROD.
	GROUND BAR
	INSULATING JOINT WITH NOISE SUPPRESSION CAPACITOR ACROSS THE JOINT.
	NEUTRALIZING TRANSFORMER: • QUANTITY OF TRANSFORMERS. • TYPE OF TRANSFORMERS.
	* RECTIFIER – INDICATES CATHODIC PROTECTION RECTIFIER. **NOTE:** SHOW OWNERSHIP BY A NOTE.
	* ANODE – INDICATES A SACRIFICIAL ANODE. * FOR CATHODIC PROTECTION SYMBOLS REFER TO DWG. #X AD-036785.

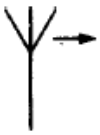
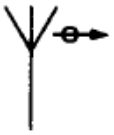
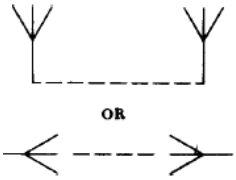
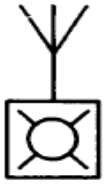
5.5.4 The symbols for carrier repeater housings and associated equipment are listed below:

Symbol	Explanation
	ANALOG CARRIER DEVICE WITH X-CONNECT. INDICATE THE: • TYPE OF CARRIER. • NUMBER OF SYSTEMS. • NUMBER OF CHANNELS. • X-CONNECT TYPE. • X-CONNECT CAPACITY. • IN AND OUT COUNT. • PG = PAIR GAIN
	ANALOG SUBSCRIBER CARRIER CHANNELS OR PAIR GAIN SYSTEMS (MXU, DMS-I, ETC.) ARE INSTALLED IN A FIELD TERMINAL. INDICATE THE: • TYPE OF CARRIER. • NUMBER OF SYSTEMS. • NUMBER OF CHANNELS. • CABLE PAIRS ASSIGNED. • ANY OTHER PERTINENT INFORMATION.
	CARRIER REPEATER LOCATION. **NOTE:** THE NUMBER ON THE SYMBOL STEM IS THE QUANTITY OF HOUSINGS SPLICED TO AN INDIVIDUAL CABLE. FOR EACH HOUSING, INDICATE THE: • HOUSING NUMBER. • CAPACITY OF THE HOUSING. • CABINET/HOUSING TYPE. • CABLE NUMBER AND COUNT OF TERMINATED CABLE PAIRS FOR EACH HOUSING.

Symbol	Explanation
	CUSTOMER CARRIER REPEATER LOCATION. REPEATERS ARE INSTALLED IN A WEATHER-PROOF HOUSING. ADJACENT TO THE SYMBOL, INDICATE THE: • QUANTITY OF REPEATERS. • TYPE OF HOUSING. • HOUSING NUMBER. • TYPE OF CARRIER. • CABLE NUMBER AND COUNT OF TERMINATED CABLE PAIRS.
	DIGITAL SUBSCRIBER CARRIER CHANNELS OR PAIR GAIN SYSTEMS INSTALLED IN A FIELD TERMINAL. INDICATE THE: • TYPE OF CARRIER. • NUMBER OF CHANNELS. • NUMBER OF SYSTEMS. • IN AND OUT COUNT.
	DIGITAL CARRIER DEVICE WITH X-CONNECT. INDICATE THE: • TYPE OF CARRIER. • NUMBER OF CHANNELS. • NUMBER OF SYSTEMS. • LOCATION. • X-CONNECT TYPE. • X-CONNECT CAPACITY. • IN AND OUT COUNT. • DISTANCE FROM C.O.

5.6 This section provides symbols to be used on work orders, construction work plans, maps, records, etc., for CATV, ETV, CCTV and ITV RF systems.

5.6.1 Following is a list of symbols and descriptions for antenna and headend (IEEE 315):

Symbol	Description
 OR 	YAGI-ANTENNA IEEE 315 sec. 2.3
	ANTENNA WITH HORIZONTAL POLARIZATION IEEE 315 sec. 2.3
	ANTENNA WITH VERTICAL POLARIZATION IEEE 315 sec. 2.3
	ANTENNA WITH CIRCULAR POLARIZATION IEEE 315 sec. 2.3
	RADIO LINK WITH ANTENNA IEEE std. 315 sec. 3.2
	EARTH STATION
	LIGHTNING PROTECTION
	PARABOLIC ANTENNA
	HEADEND

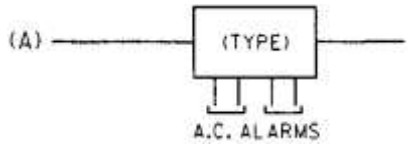
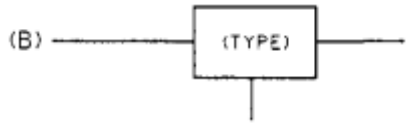
5.6.2 Following is a list of symbols for cables and their descriptions:

Symbol	Description
(A)	0.375 PCA.
(B)	0.750 CA.
(C)	0.500 CA.
(D)	0.412 CA.
(E)	RG-59 CA.

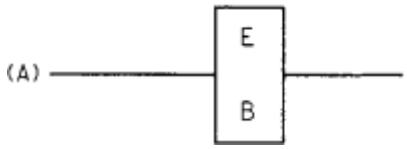
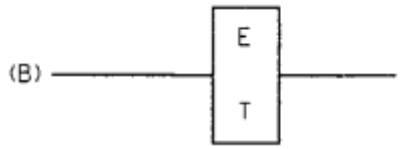
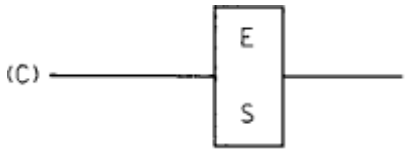
5.7 Following is a list of symbols and descriptions for amplifiers:

Symbol	Description
(A-1)	TRUNK LINE AMPLIFIER (W/O AGC)
(A-2)	TRUNK LINE AMPLIFIER (E/W AGC)
(A-3)	TRUNK LINE AMPLIFIER (W/O AGC, E/W BRDGING AMP. AND 4-WAY SPLITTER)
(A-4)	TRUNK LINE AMPLIFIER (E/W AGC, BRDGING AMP. AND 3-WAY SPLITTER)
(B)	INTERMEDIATE BRIDGING (E/W 2-WAY SPLITTER)
(C)	LINE EXTENDER AMPLIFIER
(D)	A-C BLOCKING CONNECTION

5.8 Following is a list of symbols and descriptions for power equipment:

Symbol	Description
	POWER SUPPLY
	POWER COMBINER

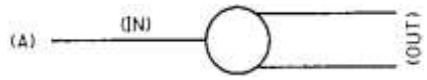
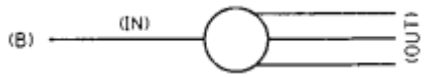
5.9 Following is a list of symbols and descriptions for equalizers:

Symbol	Description
	BASIC EQUALIZER
	THERMAL EQUALIZER
	SPECIAL EQUALIZER

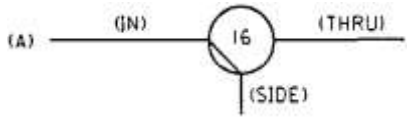
5.10 Following is a list of symbols and descriptions for attenuators (dB value is shown inside symbol):

Symbol	Description
	IN-LINE FLAT ATTENUATOR
	IN-LINE CABLE EQUIVALENT ATTENUATOR

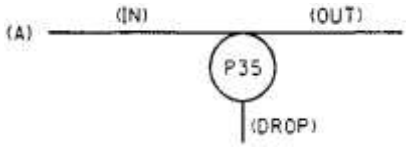
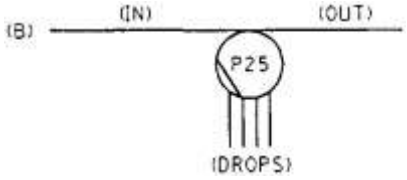
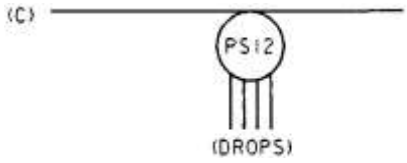
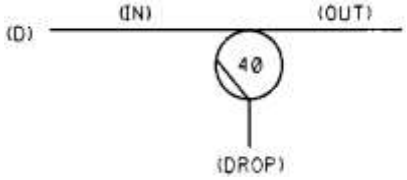
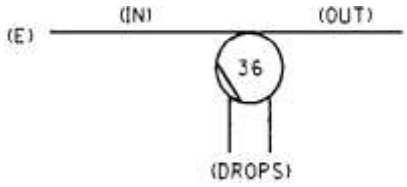
5.10.1 Following is a list of symbols and descriptions for line splitters:

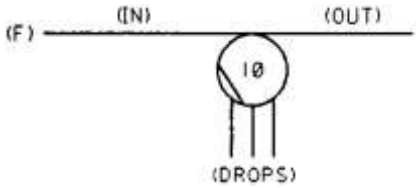
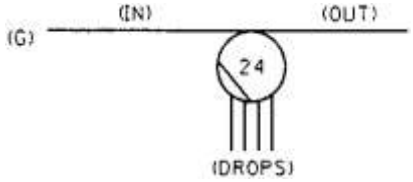
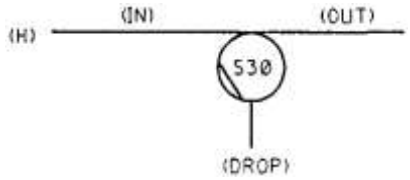
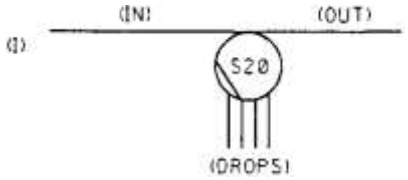
Symbol	Description
	LINE SPLITTER (2 WAY)
	LINE SPLITTER (3 WAY)

5.10.2 Following is a list of symbols and descriptions for directional coupler (dB value is shown inside symbol):

Symbol	Description
	DIRECTIONAL COUPLER

5.10.3 Following is a list of symbols and descriptions for taps (dB value is shown inside symbol, also preceded by P for pressure type and S for sloped type):

Symbol	Description
	TAP, PRESSURE TYPE, BACK MATCHED (SINGLE)
	MULTI-TAP, PRESSURE TYPE, DIRECTIONAL COUPLER, (4-WAY)
	MULTI-TAP, PRESSURE TYPE, SLOPED, (4-WAY)
	TAP, IN-LINE DIRECTIONAL COUPLER (SINGLE)
	MULTI-TAP, IN-LINE, DIRECTIONAL COUPLER, (2-WAY)

Symbol	Description
	MULTI-TAP, IN-LINE, DIRECTIONAL COUPLER, (3-WAY)
	MULTI-TAP, IN-LINE, DIRECTIONAL COUPLER, (4-WAY)
	TAP, IN-LINE, SLOPED, DIRECTIONAL COUPLER, (SINGLE)
	TAP, IN-LINE, SLOPED, DIRECTIONAL COUPLER, (4-WAY)

5.10.4 Following is a list of symbols and descriptions for terminations:

Symbol	Description
	TERMINATION (75Ω)
	TEST POINT (INCLUDES 75Ω TERMINATIONS)

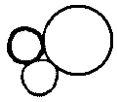
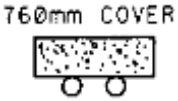
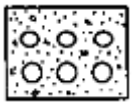
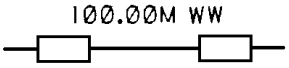
6 Conduit and Manholes Symbols and Abbreviation

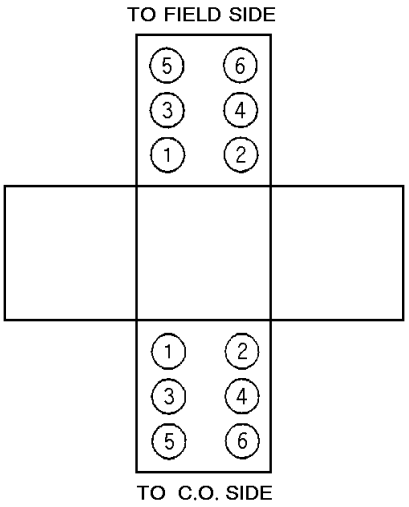
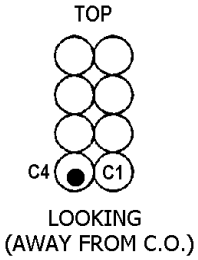
6.1 This section identifies and defines the symbols and abbreviations related to underground conduit and manholes. Use these symbols and abbreviations on:

- Construction work permits.
- Maps.
- Records.

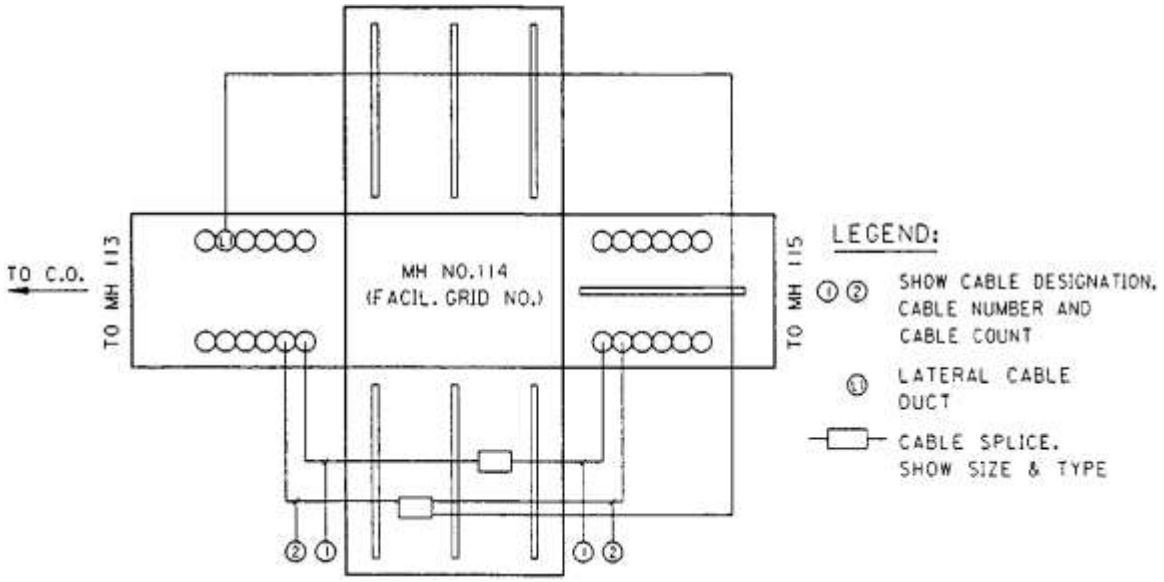
Refer to section 6.2 below for symbols and abbreviations used with building conduit, and for additional miscellaneous symbols.

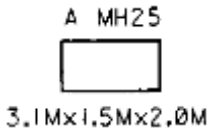
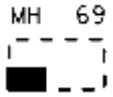
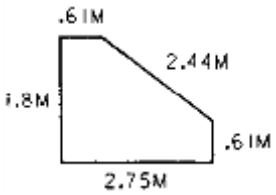
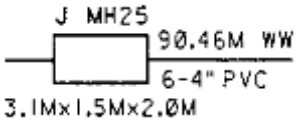
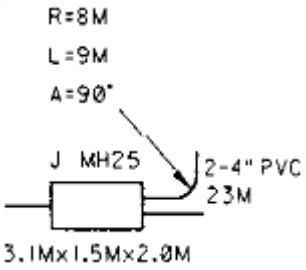
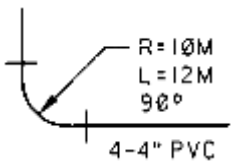
6.2 The following chart shows the commonly used underground conduit and manhole symbols: (Proposed symbols are the same as existing except symbols are drawn with heavy line).

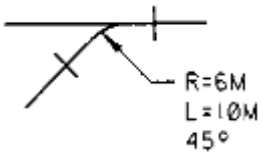
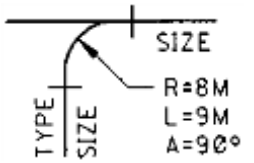
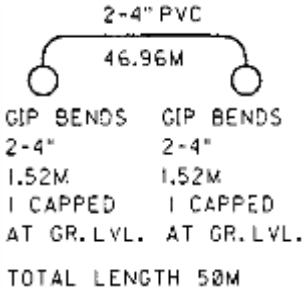
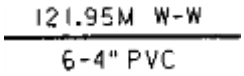
Symbol	Explanation
	LATERAL POLE WITH RISER CONDUITS.
	CONCRETE COVER OVER DUCTS. **NOTE:** THE COVER IS THE VERTICAL DISTANCE FROM THE SURFACE GRADE OF THE GROUND OR PAVING TO THE TOP OF THE UNDERGROUND STRUCTURE INVOLVED.
	DUCTS ARE ENTIRELY ENCASED IN CONCRETE.
	METHOD OF INDICATING TRENCH METER OF CONDUIT WALL-TO-WALL. **NOTE:** USE THIS SYMBOL WITH CONDUIT MEASUREMENTS APPLY BETWEEN THE INSIDE SURFACE OF ADJACENT MANHOLE WALLS.

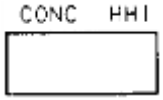
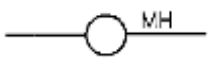
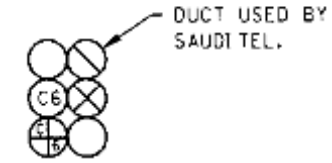
Symbol	Explanation
	METHOD OF IDENTIFYING DUCTS IN DUCT RUN.
	SINGLE UNDERGROUND DUCTS IN MULTIPLE FORMATIONS SHOWING PROPOSED DUCT OCCUPANCY, FOR CABLE 4 AND SHOWING EXISTING CABLE NO 1 DUCT OCCUPANCY.

TYPICAL MANHOLE FOLD OUT DRAWING AND CABLE FACILITY
(SHOWN SPLAYED DUCTS FORMATION, DOUBLE BAY RACKING)



Symbol	Explanation
	MANHOLE WITH INSIDE DIMENSIONS: 1. LENGTH. 2. WIDTH. 3. HEADROOM. 4. MANHOLE TYPE. 5. MANHOLE NUMBER.
	MANHOLE OUTLINE. AREA THAT IS FILLED IN REPRESENTS ACTUAL LOCATION OF MANHOLE.
	IRREGULAR SHAPE MANHOLE **NOTE:** SYMBOLS FOR OTHER IRREGULAR SHAPES MAY BE DEVELOPED TO INDICATE MH SHAPE AND DIMENSIONS.
2.75Mx1.8Mx0.61Mx 2.44Mx0.61Mx2M HR	MANHOLE DIMENSIONS ARE EXPRESSED BY INSIDE MEASUREMENTS, STARTING WITH THE LONGEST SIDE AND READING CLOCKWISE AND LEAVING HEADROOM LAST.
	MAIN UNDERGROUND CONDUIT AND MANHOLE. MANHOLE TEXT INDICATES MANHOLE: • TYPE. • NUMBER. • DIMENSIONS. CONDUIT TEXT INDICATES: • DISTANCE WALL-TO-WALL. • NUMBER OF DUCT. • DIAMETER OF DUCT. • TYPE OF CONDUIT.
	MAIN UNDERGROUND CONDUIT, MANHOLE AND LATERAL.
	CONDUIT BEND, SHOW ANGLE AND RADIUS OF BEND. SHOW TYPE, SIZE AND NUMBER OF CONDUITS.

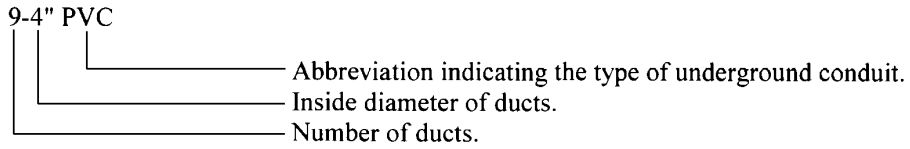
Symbol	Explanation
	INTERCEPTING BEND 45 DEGREES. SHOW RADIUS OF BEND.
	Y COUPLING. SHOW RADIUS OF BEND. EXAMPLE: R = RADIUS IN METER L = LENGTH IN METER A = ANGLE IN DEGREE
	UNDERGROUND CONDUIT DIP LATERAL FROM POLE-TO-POLE, POLE-TO-BUILDING, ETC. SHOW MANHOLE WALL-TO-POLE, POLE-TO-BUILDING, ETC., MEASUREMENTS.
	UNDERGROUND CONDUIT. TEXT INDICATES: • TYPE OF CONDUIT. • DIAMETER OF DUCT. • NUMBER OF DUCTS. • LENGTH WALL-TO-WALL.
	CROSS SECTION OF UNDERGROUND CONDUIT THAT CONTAINS SUBDUCTS. • SMALL CIRCLE INDICATES NUMBER OF SUBDUCTS. • SHOW NUMBER AND SIZE WITH THE NOTE I.E., 3-1' SUBDUCTS.

Symbol	Explanation
NOTE: A HANDHOLE IS A BELOW GRADE ENCLOSURE TO SMALL FOR A MAN TO ENTER.	 HANDHOLE. TEXT INDICATES HANDHOLE: • TYPE. • NUMBER.
	 FOREIGN UNDERGROUND CONDUIT AND MANHOLE OF OTHER WIRE USING UTILITY.
	 DUCT LEASED OR USED BY A FOREIGN COMPANY OR A GOVERNMENT AGENCY. **NOTE:** THE DUCT MUST BE LABELED TO INDICATE COMPANY OR AGENCY NAME.
EXAMPLE: DUCT SYMBOLS 	 DUCT OCCUPIED BY SAUDI ARAMCO CABLE NO. 6. **NOTE:** THE SYMBOL WITHIN THE CIRCLE SHOWS CABLE NUMBER DESIGNATION.
	 BLANK TERMINATOR
	 VACANT DUCT
	 DUCT LEASED OR USED BY SAUDI ARAMCO IN FOREIGN-OWNED CONDUIT SYSTEM.

6.2.1 Use the abbreviations listed in the following chart to indicate the underground conduit type:

Abbreviation	Type of Underground Conduit
FD	Fiber duct
MPD	Multiple plastic duct
PVC	Polyvinyl Chloride duct
HDPE	High-Density Polyethylene duct
HDD	Horizontal Directional Drilling duct

6.2.2 Use the numerical codes listed in the following chart to identify underground conduit:

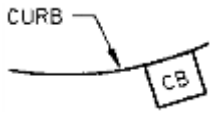
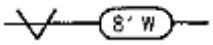
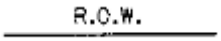
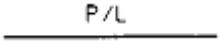
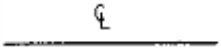
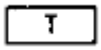
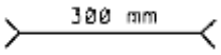
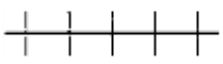
Numerical Code	Explanation
	

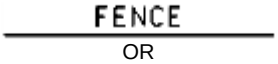
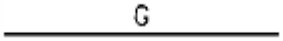
6.3 Letter Codes Underground conduit abbreviations

Identify subsurface facilities of other utilities. Agencies, etc., using the codes listed in the following chart:

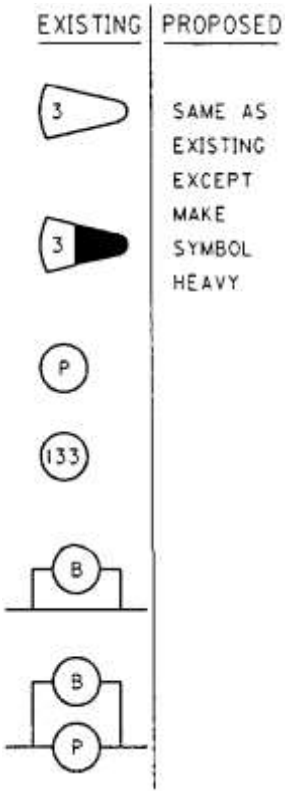
Code Letters	Type of Facility
CATV	Cable Television
E	Electric
G	Gas
PL	Pipe line
PO	Privately owned
S	Sewer
w	Water

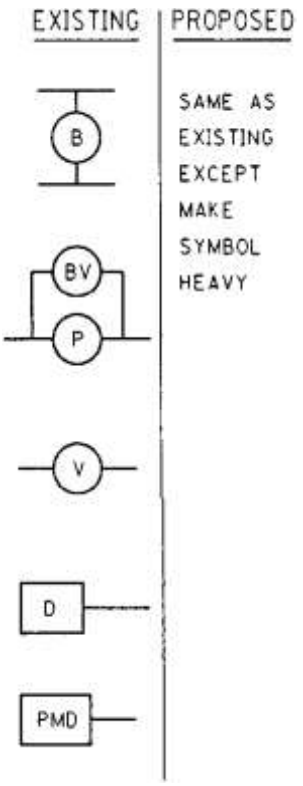
6.4 The miscellaneous symbols used on underground conduit construction drawings are shown in the following chart:

Symbol	Explanation
	CATCH BASIN AT CURB
	WATER LINE VALVE IN LINE
	RIGHT-OF-WAY LINE
	PROPERTY LINE
	CENTER LINE
	TRAFFIC LIGHT SIGNAL POST.
	TRAFFIC LIGHT CONTROL, PEDESTAL MOUNTED.
	TRAFFIC LIGHT CONTROL, UNDERGROUND.
	SIGN POST, STREET, ROAD, STOP, ETC.
	ELECTRIC TRANSFORMER.
	CULVERT (SIZE INDICATED).
	TREE OR BUSHES (TRUNK DIAMETER INDICATED).
	SURFACE RAILROAD TRACKS.

Symbol	Explanation
	FLOW LINE.
 OR	FENCE LINE.
	FOREIGN COMPANY LINE/FACILITY. **NOTE:** THE LETTER INDICATES THE TYPE: • G = GAS • E = ELECTRICITY • T = TELEPHONE • CATV = CABLE TV • S = SEWER • SW = SWEET WATER • RW = RAW WATER • AC = CENTRAL AIR CONDITIONING COOLANT PIPE.

6.4.1 The symbols listed below are those most commonly used in cable pressurization work:

Symbol	Explanation
	PRESSURE PIPELINE NUMBER WITH THE DIRECTION OF AIR FLOW INDICATED BY THE POINT OF THE SYMBOL. PRESSURE PIPELINE NUMBER WITH THE DIRECTION OF AIR FLOW INDICATED BY THE POINT OF THE SYMBOL. (COLOR CODED AS REQUIRED). PRESSURE DAM IN AERIAL, UNDERGROUND, OR BURIED CABLE. PRESSURE CONTACTOR WITH NUMBER TO INDICATE THE NUMBER OF THE CONTACTOR. BYPASS (PLASTIC TUBING) TO CIRCUMVENT RESTRICTION. BYPASS (PLASTIC TUBING) INSTALLED TO BYPASS PRESSURE DAM.

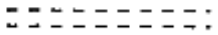
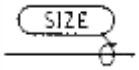
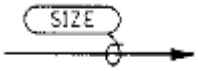
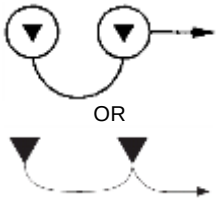
Symbol	Explanation
	BYPASS (PLASTIC TUBING) BETWEEN TWO CABLES. BYPASS VALVE WITH SHUTOFF INSTALLED IN PIPELINE AROUND PRESSURE DAM. PRESSURE-TESTING VALVE IN CABLE, SPLICE CLOSURE, OR BURIED TERMINAL HOUSING. AIR DRYER (REFRIGERATOR OR COMPRESSOR-DEHYDRATOR TYPE). POLE-MOUNTED AIR DRYER.

7 Miscellaneous Symbols and Acronyms

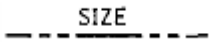
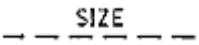
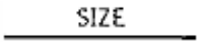
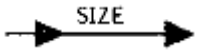
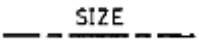
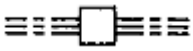
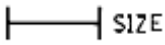
7.1 Miscellaneous Symbols and Abbreviations BIC/BICSI

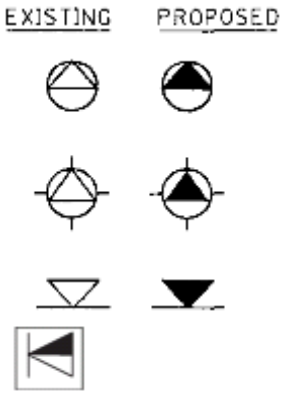
7.1.1 This section includes miscellaneous symbols and abbreviations that will be useful in preparing construction work plans and will have limited use in developing and maintaining permanent plant records.

7.1.2 The architectural symbols and abbreviations used on drawings covering communication facilities are shown below:

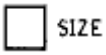
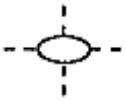
Symbol	Meaning
* 	OUTLET WITH CONDUIT STUB-UP OR STUB-DOWN AS NOTED.
* 	TELEPHONE TERMINAL BOARD, SIZE AS NOTED.
* 	TELEPHONE TERMINAL CABINET.
* 	LARGE (FEEDER) UNDERFLOOR DUCT, TRENCH HEADER, OR HEADER DUCT.
* 	STANDARD (DISTRIBUTION) UNDERFLOOR DUCT OR CELLULAR FLOOR CELL.
	CONDUIT.
	TO TTB: HOME RUN CONDUIT TO TELEPHONE TERMINAL BOARD.
	TO TTB: TWO FLOOR OUTLETS, 1-INCH HOME RUN TO TTB AND OUTLET BOXES TIED TOGETHER WITH CONDUIT.

NOTE: * ADDITIONAL SYMBOLS FROM THE LATEST BICSI MANUAL

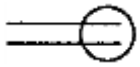
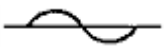
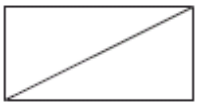
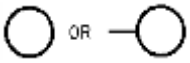
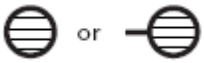
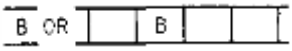
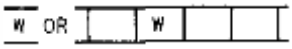
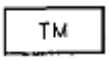
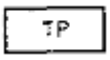
Symbol	Meaning
	CABLE EXPOSED.
	CONDUIT.
	CONDUIT CONCEALED IN CEILING OR WALL.
	CONDUIT HOME RUN.
	CONDUIT CONCEALED IN FLOOR.
	CONDUIT FOR PLACING GROUND WIRE.
	CONDUIT BACKBONE.
	UNDERFLOOR DUCT AND JUNCTION BOX, TRIPLE SYSTEM (NUMBER OF LINES ENTERING A BOX IN THE HEADER DUCT RUN INDICATE NUMBER OF SYSTEMS TELEPHONE, ELECTRIC, TV, ETC.).
	BACKBONE SLEEVE.

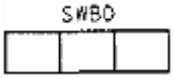
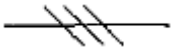
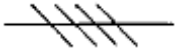


NOTE: PLACE 'T' OR 'D' BESIDE OUTLET SYMBOLS.
T = TELEPHONE (VOICE)
D = DATA

Symbol	Meaning
	CEILING DROP POLE.
	SWITCHBOARD.
	PULL BOX.
	TRENCH HEADER FEED ON CELLULAR OR UNDERFLOOR DUCT SYSTEM.
	HEADER DUCT WITH ACCESS UNIT ON CELLULAR OR UNDERFLOOR DUCT SYSTEM.
	TELEPHONE PANEL (ENTRY AND SECURITY).

7.1.3 Electrical Symbols - BICSI

Symbol	Meaning
	DUPLEX RECEPTACLE OUTLET.
 OR 	WALL SWITCH.
	INDIVIDUAL FLUORESCENT FIXTURE.
	CONTINUOUS ROW FLUORESCENT FIXTURE.
	2 x 2 Fluorescent light
	2 x 4 Fluorescent light
 OR  	INCANDESCENT FIXTURE. LIGHTING PANEL.
	POWER PANEL.
	BUSWAY.
	WIREWAY.
	TRANSFORMER.
	TRANSFORMER – MANHOLE OR VAULT.
	TRANSFORMER PAD.

Symbol	Meaning
	SWITCHBOARD.
	THREE NO. 12 WIRES.
	FOUR NO. 12 WIRES.

7.2 This section includes BICSI acronyms and symbols to update symbology information (Refer to BICSI Chapter 17).

Acronym	Explanation
A	
ac	alternating current
ACR	attenuation-to-crosstalk ratio
A-D or A/D	analog-to-digital conversion
ADSL	asymmetric digital subscriber line
ADSS	all-dielectric self-supporting
A/E	architect or engineer
AEC	architect/engineer/contractor
ALPETH	aluminum polyethylene
ALVYN	aluminum polyvinyl chloride
ANSI	American National Standards Institute
AP	access provider
APT	American pipe thread
APWA	American Public Works Association
ARPAP	Aluminum, resin, polyethylene ,aluminum,
ARPASP	Aluminum, resin, polyethylene, aluminum,
ASCII	American standard code for
ASP	aluminum, steel, polyethylene
ASTM®	American Society for Testing
ATIS	Alliance for Telecommunications Industry
ATM	asynchronous transfer mode
AT&T	American Telephone & Telegraph
AWG	American wire gauge
OSP	Design Reference Manual, 4th
Glossary	
B	
BC	bonding conductor
BCT	bonding conductor for telecommunications
BD	building distributor
BER	bit error rate
BLSR	bidirectional line switched ring

BOCA	Building Officials and Code
BOMA	Building Owners Managers Association
BRI	basic rate interface
BRISDN	basic rate integrated services
BSI	British Standards Institution
C	
CACSP	coated aluminum, coated steel,
CAD	computer-aided design
CALPETH	coated aluminum, polyethylene
CASP	coated aluminum, steel, polyethylene
CATV	community antenna television (cable
CCTV	closed circuit television
CD	campus distributor
CDF	combined distribution frame
CDM	code division multiplexing
CDMA	code division multiple access
CDO	community dial office
CEC	Canadian Electrical Code
CENELEC	Comité Européen de Normalisation
Standardization)	
CEV	controlled environment vault
CF	cellular floor
CFM	cubic feet per minute
CFR	Code of Federal Regulations
CGA	Common Ground Alliance
ckt	circuit
CLEC	competitive local exchange carrier
CMR	communications riser cable
CO	central office
codec	coder/decoder
COE	central office equipment
COT	central office terminal
CPAMS	cable pressurization automatic monitoring
CPE	customer premises equipment
CPM	critical path method
CPMS	cable pressure monitoring system
CSA	Canadian Standards Association
CSI	Construction Specifications Institute
CUE	concrete universal enclosure
D	
D-A	or D/A digital-to-analog conversion
dB	decibel
DB	direct-buried
DB	ductbank
dBm	decibel milliwatt

dc	direct current
demarc	demarcation point
DEPIC	dual-expanded plastic insulated conductor
DLC	digital loop carrier
DNR	Department of Natural Resources
DoC	Department of Commerce
DoT	Department of Transportation
OSP	Design Reference Manual, 4th
Glossary	
DP	demarcation point
DP	demultiplexer
DSL	digital subscriber line
DSX	digital signal cross-connect
DTE	data terminal equipment
DWDM	dense wave division multiplexing
E	
EB	encased buried
E&C	engineering and construction
EF	entrance facility
EMC	electromagnetic compatibility
EMI	electromagnetic interference
EP	entrance point
ER	equipment room
F	
FD	floor distributor
FOCIS	Fiber Optic Connector Intermateability
freq	frequency
FS	factor of safety
FSO	free space optic
FTTH	fiber to the home
FTTN	fiber to the node
FTTP	fiber to the premise
FTTx	fiber to the x
G	
ga	gauge
GACAN	gauge coding area number
GHz	gigahertz
GND	ground
GPR	ground potential rise
GVWR	gross vehicle weight rating
H	
HC	horizontal cross-connect
HDD	horizontal directional drilling
HDG	heavy-duty galvanized
HDPE	high-density polyethylene

HDSL	high bit-rate digital subscriber
HDTV	high-definition television
HFC	hybrid fiber/coaxial
HH	handhole
HVAC	heating, ventilating, and air
Hz	hertz
I	
IC	intermediate cross-connect
ICC	International Code Council
ICEA	Insulated Cable Engineers Association,
ID	identification
ID	inside diameter
IDC	insulation displacement
IEC	International Electrotechnical Commission
ILEC	incumbent local exchange carrier
IOR	index of refraction connector
IRWA	International Right-of-Way Association
ISDN	integrated services digital network
ISO	International Organization for Standardization
ITS	information transport systems
ITU-T	International Telecommunication Union-Telecom
IXC	interexchange carrier
K	
km	kilometer
kPa	kilopascal
kV	kilovolt
L	
LAN	local area network
laser	light amplification by stimulated
LATA	local access and transport
LBO	line buildout
LCE	limited common element
LEC	local exchange carrier (now
LED	light-emitting diode
LLDPE	linear low-density polyethylene
LoS	line of sight
M	
MAN	metropolitan area network
Mb/s	megabit per second
MC	main cross-connect
MCF	million conductor feet
MDF	main distribution frame
MDPE	medium density polyethylene
MF	pipe manifold
MGN	multiground neutral

MH	maintenance hole
MHz	megahertz
mi	mile
MM	multimode
MMF	multimode fiber
modem	modulator/demodulator
MOP	method of procedure
MPD	multiple plastic duct
MPP	modular patch panel
MRIL	maximum recommended installation load
MSDS	Material Safety Data Sheet
MTBF	mean time between failure
mux	multiplex; multiplexer
N	
NEC®	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association,
NGDLC	next generation digital loop
NI	network interface
NIU	network interface unit
NRTL	nationally recognized testing laboratory
NVP	nominal velocity of propagation
O	
OAU	optimum air usage
OCSI	One Call Systems International
OD	outside diameter
ODN	optical data network
OEM	original equipment manufacturer
OLT	optical line termination
OLTS	optical loss test set
ONT	optical network terminal
OPE	outside plant engineer
OPGW	optical power ground wire
OSHA	Occupational Safety and Health
OSP	outside plant
OTDR	optical time domain reflectometer
P	
PABX	private automatic branch exchange
PAP	polyethylene, aluminum, polyethylene
PASP	polyethylene, aluminum, steel, polyethylene
PBX	private branch exchange
PCM	pulse code modulation
PE	polyethylene
PE	professional engineer
PERT	program evaluation review technique

PIC	plastic insulated conductor
PLR	plant locator record
PM	project manager
PMI®	Project Management Institute®
PO	purchase order
POF	plastic optical fiber
POI	point of interface
PON	passive optical network
POP	point of presence
POTS	plain old telephone service
PRCS	permit-required confined space
PRI	primary rate interface
psi	pounds per square inch
PTP	point-to-point
PVC	polyvinyl chloride
PVDF	polyvinylidene fluoride
R	
RCDD®	Registered Communications Distribution Designer
RDUP	Rural Development Utilities Program
RF	radio frequency
RFI	radio frequency interference
RFI	request for information
RFP	request for proposal
RFQ	request for quote
RH	relative humidity
rms	root mean square
ROM	rough-order of magnitude
RR	railroad
RT	remote terminal
RTV	room temperature vulcanization
RUS	Rural Utilities Service
R/W	right-of-way
S	
SC	subscriber connector
SCC	Standards Council of Canada
SCFD	standard cubic foot per
SCFH	standard cubic foot per
SCMD	standard cubic meter per
SCMH	standard cubic meter per
SCTE	Society of Cable Telecommunications
SDSL	symmetrical digital subscriber line
SE	station equipment
SFF	small form factor
SI	International System of Units
SLC	subscriber loop carrier

SM	singlemode
SMDR	station message detail recording
SMF	singlemode fiber
SNR	signal-to-noise ratio
SONET	synchronous optical network
SoW	scope of work
SP	service provider
SRL	structural return loss
SR/WA	senior right-of-way agent
STALPETH	steel, aluminum, polyethylene
T	
TB	terminal block
T&C	terms and conditions
TDE	tube distribution enclosure
TDM	time-division multiplexing
TDMA	time division multiple access
TDR	time domain reflectometer
TDU	tube distribution unit
TELCO	telephone company
TERM	terminal
TGB	telecommunications grounding busbar
TIA	Telecommunications Industry Association
TMGB	telecommunications main grounding busbar
TR	telecommunications room
TSB	Telecommunications Systems Bulletin (formerly
U	
UG	underground
UL®	Underwriters Laboratories Inc.®
ULC	Underwriters Laboratories of Canada
UM	unsoldered mechanical
UP	universal pedestal
UPSR	unidirectional path switched ring
V	
V	volt
VDL	vertical down lead
VDSL	very high bit-rate digital
Vrms	volts root mean square
W	
WBS	work breakdown structure
WiFi	wireless fidelity
WLAN	wireless local area network
WLL	wireless local loop
WMAN	wireless metropolitan area network
WPAN	wireless personal area network
WWAN	wireless wide area network

X	
xDSL	x digital subscriber line
XPE	expanded polyethylene
XPE-PVC	expanded polyethylene-polyvinyl chloride
Z	
ZWP	zero water peak

7.3 Addition

All symbols describing existing, proposed and removal of telecommunication outside plant (OSP) facilities should be distinguished as follows:

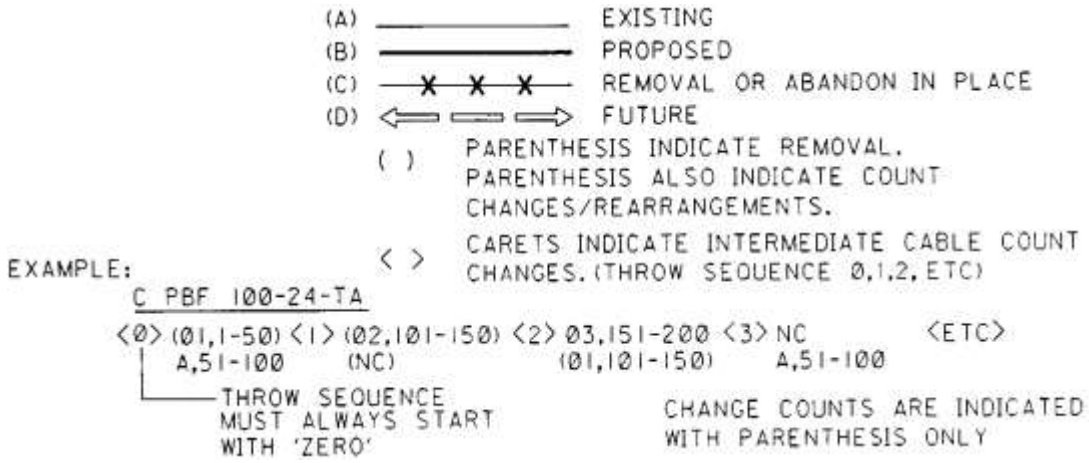
a) Existing: All symbols of this category are fine line and open symbols.

b) Proposed addition or modification to all symbols of this category are heavy lines and solid symbols.

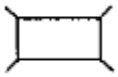
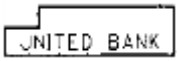
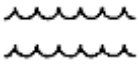
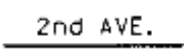
c) Removal or abandon in place: All symbols of this category are superimposed with an "X" indicating that they are being removed from plant.

d) Planned future installation: Indicated by thin parallel lines.

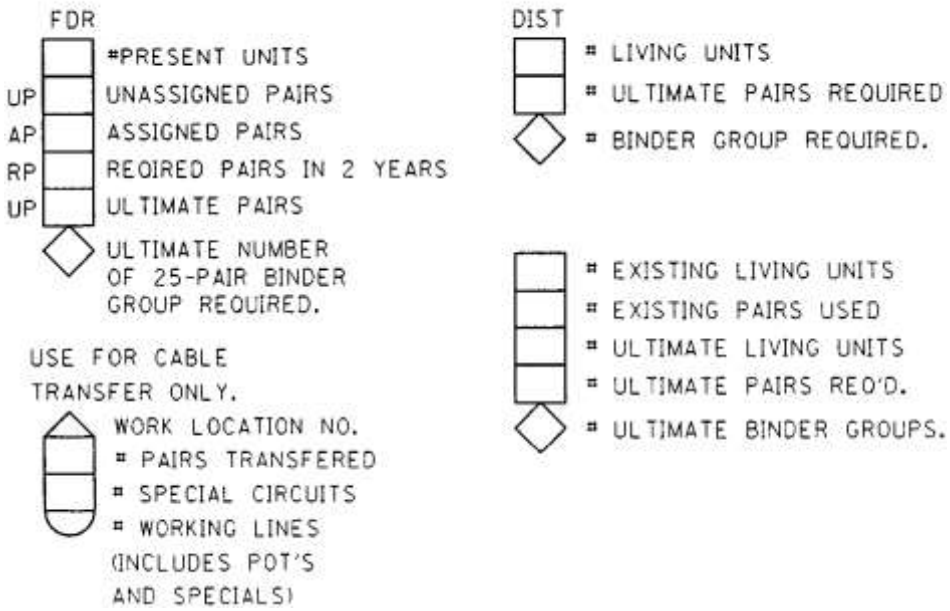
The following chart shows examples of the symbols that indicate plant type:

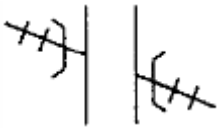
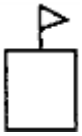


7.4 Miscellaneous Symbols

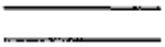
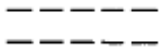
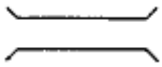
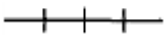
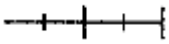
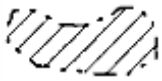
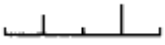
Symbol	Explanation
	BRIDGE.
	BUILDINGS.
	WATER.
	WATER (FLOWING)
	STREET CENTER LINE.
	CEMETERY.

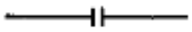
FACILITY AREA PLAN (FAP) FILL BOXES

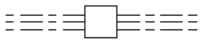
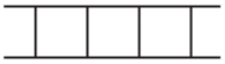


Symbol	Explanation
	CAUTION SYMBOL USED TO FLAG A SAFETY HAZARD OR TO ADD ANY REQUIRED INFORMATION.
	HOSPITAL.
	RAILROAD UNDERPASS.
	WATER TOWER.
	CENTRAL OFFICE.
	SCHOOL.
	MOSQUE.
	VACANT HOUSE.

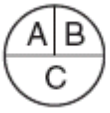
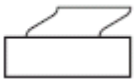
7.5 Addition Landbase Miscellaneous Symbols

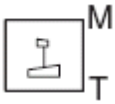
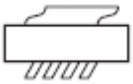
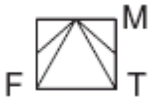
Symbol	Explanation
	PAVED ROAD
	DIRT ROAD
	BRIDGE
	ROAD UNDER CONSTRUCTION
	TRAIL
	GUARD RAIL
	MEDIAN BARRIER
	RAILROAD
	RETAINING WALL
	SHORE LINE
	STREAM
	DIKE
	SABKHAH
	POND
	MUD FLAT
	DAM
	DITCH

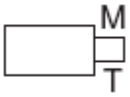
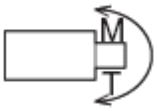
Symbol	Explanation
	EXPOSED PIPELINE
	BURIED PIPELINE
	PIPERACK
	TREE LINE
	GATE VALVE
	POWER LIGHT & LEADER
	FIRE HYDRANT
	VALVE
	POWER LIGHT
	ANTENNA
	TANK
	TRANSMISSION TOWER
	TRANSMISSION TOWER WITH LEADERS
	CATCH BASIN
	SWAMP
	PALM
	WELL
	FLARE
	STANDPIPE
	Telecommunications outlet with conduit stub-up
	Large (feeder) underfloor duct, trench header, or header duct, (BICSI)
	Standard (distribution) underfloor duct, or

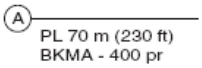
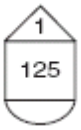
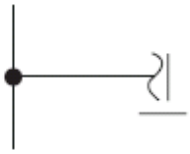
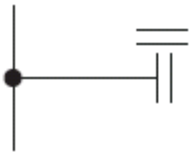
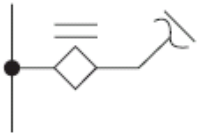
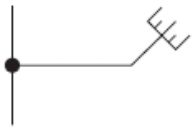
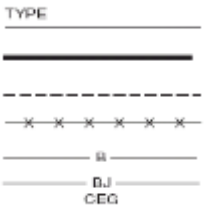
	cellular floor duct, (BICSI
	Underfloor duct and junction box, triple system (number of lines entering a box in the header duct run indicates number of systems telephone, electric, television, etc.), (BICSI)
	Conduit to floor outlet placed in slab, (BICSI)
	Sleeve (size and type as noted), (BICSI)
	Cross-connect, (BICSI)
	Dual drop containing one voice and one data cable, (BICSI)
	Single drop containing one data cable, (BICSI)
	Single drop containing one voice cable
	Single drop containing one voice cable mounted using wall phone receptacle
	Single drop containing one CATV location, TV Location (BICSI)
	Ceiling mounted poke thru location from above, (BICSI)
	Ceiling outlet, (BICSI)
	Poke thru location to ceiling below, (BICSI)
	Open ladder rack mounted, (BICSI)
	Center spline cable tray, (BICSI)
	Center spline one-sided mounted cable Tray, (BICSI)
	Cable tray, (BICSI)
	Cable tray (size as indicated), (BICSI)
	Backbone conduit for copper, (BICSI)

BFC — BFC	Backbone conduit for fiber, (BICSI)
BC — BC	Backbone conduit, (BICSI)
OF — OF	Optical fiber backbone, (BICSI)
COP — COP	Copper backbone, (BICSI)
COAX — COAX	Coaxial backbone, (BICSI)
TN — TN	Legacy thicknet cabling, (BICSI)
R — R	Interior pathways ring run, (BICSI)
ST — ST	Interior pathways strand, (BICSI)
J — J	J hooks, (BICSI)
	Duplex receptacle outlet, (BICSI)
	Wall switch, (BICSI)
	Individual fluorescent fixture, (BICSI)
	Continuous row fluorescent fixture, (BICSI)
ELEC PANEL	Electrical power panel
J	Junction box
T	Thermostat
	Multiwire splice
	Lightning protection
	Boundary line
	Legacy boundary line
	Ceiling access panel
A	Electronic door opener
MD	Electronic motorized door activation motion detector
	Push button (1170 mm [46 in] above finished floor)
TV	Television location
TC	Television location wired to call system
C	Copier network box (457 mm [18 in]) above finished floor
DL	Electromagnetic door lock
DS	Electromagnetic door strike with monitoring contact

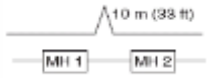
DM	Magnetic door switch
CR	Security system card reader
MD	Motion detector
KB	Security system magnetic lock key bypass switch (1170 mm[46 in]) above finished floor
CC	Closed-circuit surveillance camera outlet (2.3 mm [7.5 ft]) above finished floor
K	Security system keypad entry station (1170 mm [46 in]) above finished floor
CM	Closed-circuit surveillance television monitor (1170 mm [46 in])above finished floor
	Device reference (A = drawing sheet; B = detail; C = device/zone number)
	Card access reader
	Biometric access control device
	Keypad device
	Card reader with keypad
	Card reader with time and attendance
	Field panel
	Control panel
	Central processing unit
	Keyboard
	Printer
	Power supply

	Audio device
	Turnstile
	Revolving door
	Traffic arm
	Vehicle loop detector
	Security window screen
	Intercom
	2-Way radio microphone
	Cellular transmitter
	Telephone dialer
	Optical fiber module
	Document destroyer
	Motion detector
	Bi-static beam sensor
	Glass break sensor
	Security screen with alarm

	Screening device
	Monitor
	Camera
	Camera with pan/tilt/zoom
	Video control keyboard
	Video multiplexer
	Video motion detector
	Recorder
	Automatic monitoring switch
	Manually operated switch
	Push button
	Relay switch
	Electric lock
	Exit device
	Power transfer hinge
	Video intercom
	Camera with card reader

	Camera with keypad
	Video intercom master
	Primary protector, not cross-connected
	Placing stamp
	Splice and splice number
	Transferred pairs in splice
	Fixed-count terminal block spliced to cable
	Ready-access type connecting block; pairs terminated on a fixed-count basis
	Protected fixed-count type terminal block spliced to cable
	Protected block spliced to cable with pairs terminated on a ready-access type connecting block
	Optical fiber cable termination
	Cable or wire (denote type) Proposed cable Future cable Cable to be removed Buried cable Buried in joint trench (C = communications;

E = electric; G = gas)

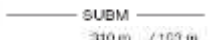


Cable slack (denote slack length)

Underground duct or cable with maintenance hole

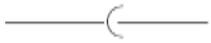
Sheath type, gauge, installation type, and pairs (greater than or equal to 100 pairs)—3 indicates the number of 100-pair complements

Cable containing less than 100 pairs

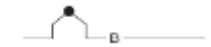


Submarine cable

Point on cable (other than splice) where a division of measurement or point of record is required

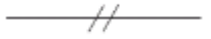


Isolation gap

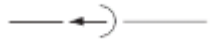


Splice, buried cable, in pedestal

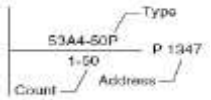
Encapsulated splice



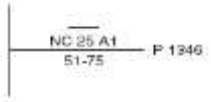
Pairs out and ends cleared in splice enclosure



Insulating joint



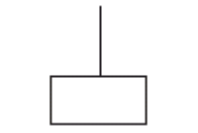
Fixed-count terminal



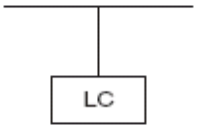
Fixed-count terminal with cable protection

Fixed-count terminal without cable protection

Interface with moisture plug



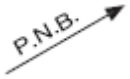
Case with factory-equipped stub



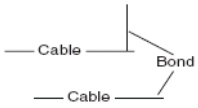
Load coils and case

Ground to multi-ground neutral vertical ground wire

Power multi-ground neutral



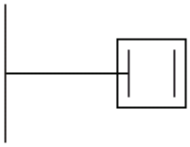
Power neutral bond



Bond between separate metallic cable shields

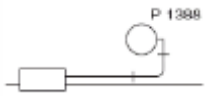
Repeater station—two way

Capacitor (wire diagram)

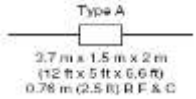


Buildout capacitors located in case

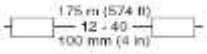
Multiplexer



Underground conduit, maintenance hole, and subsidiary conduit to pole P1388



Proposed maintenance hole type, length, width, headroom, and type of frame and cover



Trench meters (feet) and conduit type of duct

Direct-buried wire

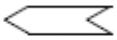
Center line

Drop pole

Existing pole with power of 230 V or less attached (includes street light poles)

Existing pole with power of 480 V or more attached

Existing pole (of any voltage) with a mounted power transformer or switch

	Other buried utility
	Extreme caution
	Future plant extension
	Flag referring to a specific note concerning the indicated location
	Fence of any type
	Fire hydrant
	Gas or water valve
	Buried cable closure
	OSP cable interface with cross-connect field
	Placing operation
	Drop location
	Existing location to be rewired
	Public telephone
	Wall telephone
	Secure wall telephone
	Building automation outlet
	Horizontal fiber to the desktop
	Security panel
	Emergency telephone
	Drop location with blank plate
	Future telephone location

Ceiling-mounted telephone location

Fire alarm panel

Security or fire alarm dialers

Floor mounted

Revision Summary

30 June 2014	Revised the Next Planned Update, reaffirmed the content of the document, and reissued as major revision.
17 July 2019	Revised the Next Planned Update, (1) referencing latest international standards, and (2) replace/delete international standard which is in-active/withdraw.
13 November 2019	Editorial revision to remove cancelled SAEP-103.

Summary of Change (rev. 17 July 2019)

No.	Paragraph No.	Change Type (New, Modification,..)	Technical Change(s)
1	3.2	Replaced	Removal of ASME Y14.15, Electrical and Electronics Diagrams standard which superseded by ISO 14617-15 (Graphic symbols for Diagram_Part15: Installation diagrams and network maps).
2	3.2	Add	BICSI ICT Terminology Handbook was added as reference.
3	3.2	Delete	[Delete] UL 910 - withdraw from international standards list with no replacement – source IHS website.