TEXAS UTILITIES GENERATING CO.
COMANCHE PEAK UNIT 2
CABLE TRAY HANGERS
7Q-D-6

CABLE TRAY HANGER GEOMETRY GROUPING

VOLUME I - BOOK 8

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FOR THIS BOOK

VOLUME I - BOOK 8
TEXAS UTILITIES GENERATING COMPANY
COMANCHE PEAK UNIT NO. 1

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CABLE TRAY HANGER GEOMETRY GROUPING

EBASCO Interoffice Correspondence

DATE August 20, 1985 FILE REF. SAG.TUG2.1191

TO R Alexandru/Y Latifaoglu OFFICE LOCATION 82/2WTC

DF GW SA

FROM D Fong/G Whritenour/F Hettinger OFFICE LOCATION 82/2WTC

SUBJECT TEXAS UTILITIES GENERATING COMPANY
COMANCHE PEAK SES UNIT 2
CABLE TRAY HANGER GEOMETRY CLASSIFICATION CODE

This memo and its attachment describe the systematic approach and code used to classify cable tray hangers (CTHs) by geometry for CPSES Unit 2. This approach forms the basis of the computerized CTH geometry data base compiled to facilitate the CTH design verification effort. The data base is accessed and manipulated by the APPLE computer software package APPLEWORKS, and is primarily used for the following purposes. First, it provides an efficient means of identifying the various types of CTHs for grouping purposes, and second, it provides a means of quickly identifying CTHs which require modification. As an example of the latter, all CTHs with Kl/r values greater than 200 can readily be extracted from the data base and identified by selective sorting of CTH height.

To control and centralize any comments and revisions to the classification code, David Fong is assigned custodian of the code, and as such, all comments and revisions shall be made through him or his designee.

The attachment to this memo presents in detail the geometry code used for CTH classification. The following discussion summarizes how the geometry code and data base are used. As each CTH drawing is received by SAG-NY from CAD, the hanger's geometry type and physical dimensions are classified according to standard geometry nomenclature and dimension ranges specified in the code. This data is then compiled and entered into the geometry data base. The present Comanche Peak Unit 2 data base is stored on eleven separate disk files due to floppy disk size limitations. CTH geometric properties are stored on six files (grouped by building location), and CTH drawing key dates are stored on five files (also grouped by building location). In the near future, we will attempt to store the entire data base on a single hard disk enabling a more encompassing sorting capability.

Data contained in any one file can be manipulated and sorted by any of the following key parameters: CTH identification number, geometry code symbol, building room number, elevation, CTH height, width, dead weight and group identifier, cable tray weight, key drawing dates (to CAD, field, SAG or signout), and CTH type (longitudinal, transverse or multi-directional). Data can be sorted according to a hierarchy of up to three parameters. If sorting is requested for CTHs within a particular height range, this sorting request counts as two sorting parameters. Sorting capability is especially productive when used to group similar CTHs such that a design verification analysis can be performed for only the representative envelope CTH within the group. All

CTHs so grouped are identified in the data base by a group identification number. The design verification documentation for each CTH in the group is cross-referenced to all other CTHs in the group, and identifies the representative envelope CTH for which analysis was performed.

Attachment

cc: All with Attachment
J Padalino
E Odar
G Trillo
C R Wang
R Locsin
N Tassoulas
Z T Shi
H Schoppmann
D Fong (5)
G Whritenour
F Hettinger

SAG.TUG2.1191

GEOMETRY CLASSIFICATION CODE

The CPSES Unit 2 geometry data base currently contains approximately 30 different types of cable tray hangers (CTHs). Each type is identified by a symbol defined in the geometry classification code presented in this attachment. Each symbol consists of a maximum of six characters. Table 1 lists the symbols for the geometry types currently in the data base. CTH dimensions are input into the data base to the nearest tenth of a foot as given in Table 2.

The geometry code divides CTHs into seven general categories identified by the symbols below:

Category	Symbol
Trapeze Hangers	U
. Ceiling Mounted or Floor Mounted . Wall Mounted	
L Shaped Hangers	L
. Ceiling Mounted or Floor Mounted . Ceiling (or Floor) and Wall Mounted	
Beams Supported at Both Ends	BEAM
Cantilever Beams	CANT
Triangle Types	TRIA
Direct Wall Mounted Types	WALL
Special Types	SPEC

For trapeze and L-shaped CTHS, additional characters are provided after U and L so that the geometry can be specifically defined, thus enhancing the usefulness of the geometry data base. Each of the seven categories are discussed and illustrated below.

1. Trapeze Hangers

Trapeze hangers are divided into two types, those connected to either the ceiling or floor, and those connected to the wall. These types are denoted with a symbol consisting of up to 6 characters, where the first character is always U. Additional characters after U are added according to the rules below, in the order presented. Trapezes connected to both ceiling and wall, or floor and wall, are classified as special.

1a. Ceiling-Mounted or Floor-Mounted Trapezes

- The second character specifies the number of tiers which are loaded with cable trays but do not have any interior inplane bracing members attached. The number of trays per tier is immaterial. If there are no such tiers, this number is omitted.

- The next two characters, a T followed by a number, specify the number of tiers which have neither trays nor interior inplane bracing members attached. If there are no such tiers, these characters are omitted.

- The next two characters, a B followed by a number, specify the number of tiers without trays which have interior inplane bracing members attached. If there are no such tiers, these characters are omitted.

- The next two characters, a Z followed by a number, specify the number of tiers which have both trays and interior inplane bracing members attached. If there are no such tiers, these characters are omitted.

- The next characters, either L or BL, denote that the hanger can resist longitudinal loads. The L character signifies that the hanger resists longitudinal loads because its vertical posts are oriented such that their strong axis opposes longitudinal loads. BL signifies that the hanger resists longitudinal loads because it has out-of-plane bracing attached. For both types, heavy duty tray clamps are required. If the hanger cannot resist longitudinal loads, these characters are omitted.

- Note that since any hanger symbol is limited to a maximum of six characters, all of the above characters obviously cannot be used to describe a very complex hanger geometry. Generally, all of the above characters are not required to classify a particular hanger geometry. However, if more than six characters are required then the T character set shall be omitted. Typical ceiling-mounted trapeze hangers are illustrated in Figures 1 to 8.

1b. Wall-Mounted Trapezes

- Wall-mounted trapezes are predominantly single tier hangers, some of which are externally braced back to the wall in the plane of the hanger. Unbraced wall-mounted trapeze hangers are denoted by the symbol UW; braced ones are denoted by UBW (see Figures 9 and 10).

- In addition, some wall-mounted trapezes are braced with out-of-plane members. These are classified as special.

2. L Shaped Hangers

- All L shaped hangers are described by a symbol beginning with the character L followed by a second character equal to the number of tiers. If the hanger has only one tier, this second character is omitted.

- For L hangers attached to both ceiling and wall, or floor and wall, the character W follows the first two characters specified above.

- For all L hangers, subsequent characters are used to denote the types of bracing and longitudinal load sustaining capability present, if any. Hangers with inplane bracing are denoted by two characters, a B followed by the number of inplane bracing members. Capability to sustain longitudinal loads is denoted by characters L and BL as described in (1a) above.

- Typical L shaped hangers are illustrated in Figures 11 to 16.

3. Beam, Cantilever, Triangle and Wall Type Hangers

Beam, cantilever, triangle and wall type hangers are simply denoted by the symbols BEAM, CANT, TRIA and WALL respectively, with no additional characters to distinguish variations of each type. The geometry data base does, however, contain for all hangers a separate entry which defines the type of load resistance and function the hanger provides (L, T, M for longitudinal, transverse and multi-directional, respectively). Figures 17 to 22 illustrate the above type hangers.

4. Special Hangers

Hangers whose geometry cannot be described by the above code are classified as special hangers denoted by the symbol SPEC.

TABLE 1

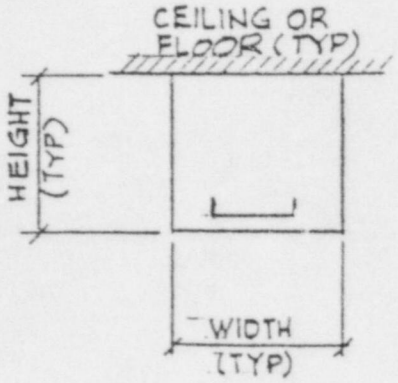
BONFile: A
Report: AA

X	1	2	3	4	5	6	7	8	9
1	U1	U2	U3	U4	U5B1	UW	L	BEAM	
2	U1T1	U2T1	U3T1	U4T1	U5B2	UBW	L2	SPEC	
3	U1T2	U2T2	U3T3	U4B1	U5B1BL		L3	TRIA	
4	U1B1	U2T3	U3B1	U4B2			L1W	WALL	
5	U1B2	U2B1	U3B2	U4B3			L2W	CANT	
6	U1B3	U2B2	U3B3	U4T1B1			L3W		
7	U1T1B1	U2B3	U3T1B1	U4T2B3			L2B1		
8	U1T1B2	U2T1B1	U3B1BL	U4B1BL			L2WBL		
9	U1T2B1	U2T1B2	U3T2	U4B2BL			LB		
10	U1T2B2	U2T1B3	U3T1B2	U4T1B3					
11	U1B1BL	U2T2B2	U3BL	U4B2BL					
12	U1B2BL	U2T2B1	U3B2BL						
13	U1BL	U2BL							
14	U1L	U2T1BL							
15	U1T1BL	U2B1L							
16	U1Z1	U2T1L							
17	U1T2BL	U2L							
18	U1T1L	U2B1BL							
19									
20									

TABLE 2

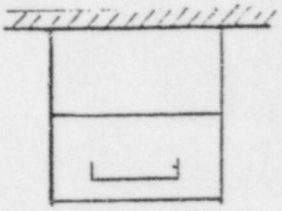
STANDARD FRACTIONS	MEASUREMENTS (IN INCHES)	
0.0	0	8/16"
.1	9/16"	1 12/16"
.2	1 13/16"	3"
.3	3 1/16"	4 3/16"
.4	4 4/16"	5 6/16"
.5	5 7/16"	6 9/16"
.6	6 10/16"	7 12/16"
.7	7 13/16"	9"
.8	9 1/16"	10 3/16"
.9	10 4/16"	11 6/16"
1.0	11 7/16"	12"

CEILING OR FLOOR MOUNTED TRAPEZES



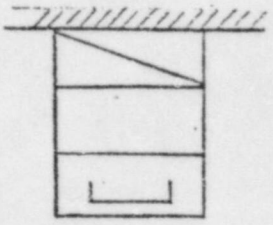
U1

FIG. 1



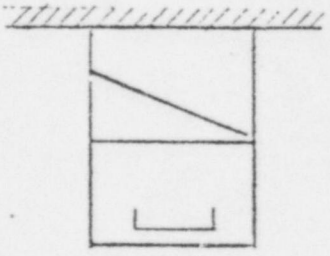
U1T1

FIG. 2



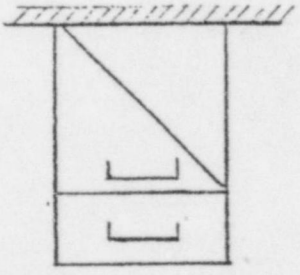
U1T1B1

FIG. 3



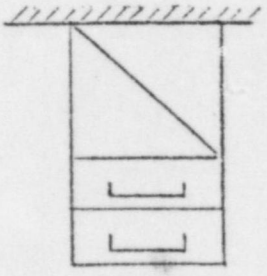
U1B1

FIG. 4



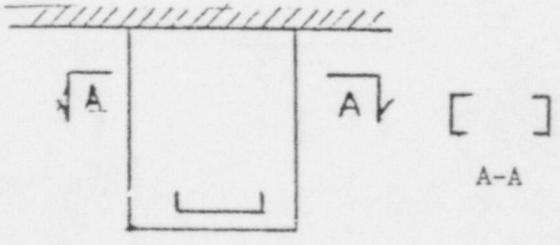
U1Z1

FIG. 5



U2B1

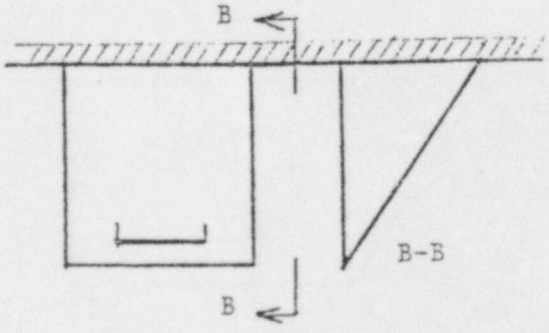
FIG. 6



A-A

U1L

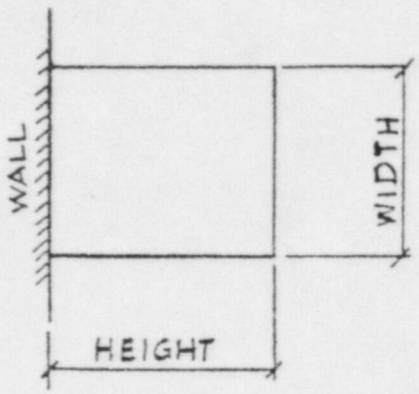
FIG. 7



U1BL

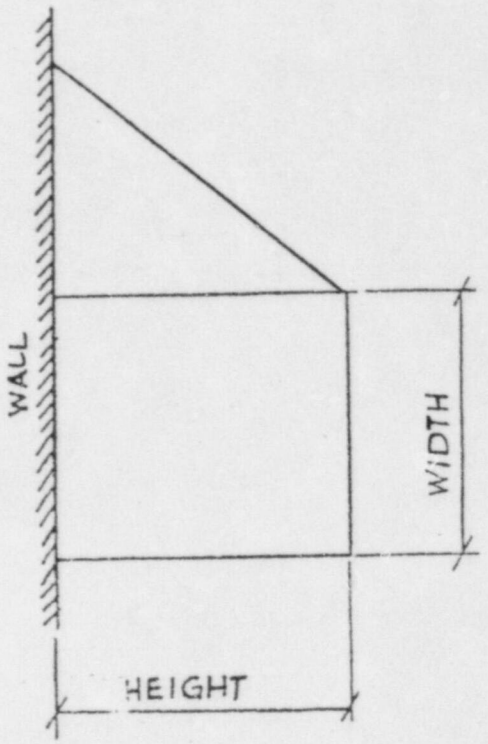
FIG. 8

WALL MOUNTED TRAPEZES



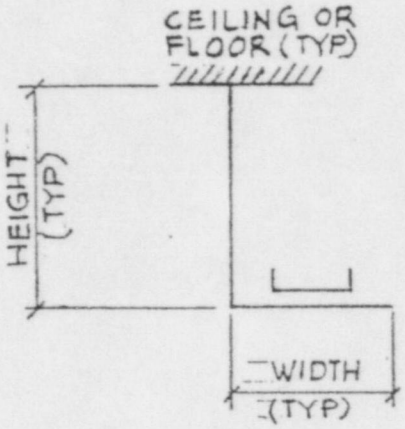
UW

FIG. 9



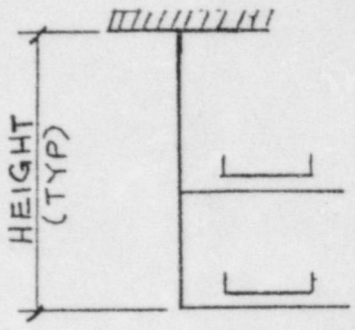
UBW

FIG. 10



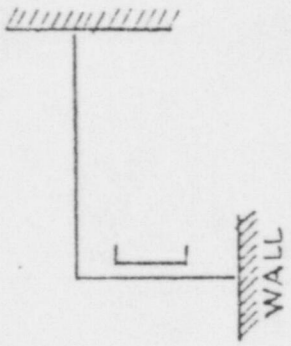
L

FIG. 11



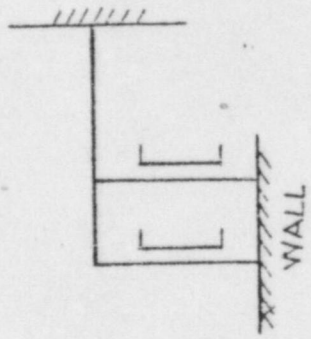
L2

FIG. 12



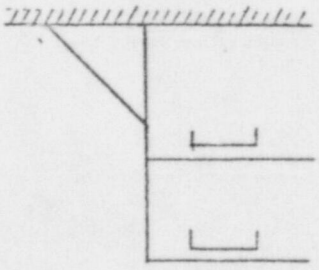
LW

FIG. 13



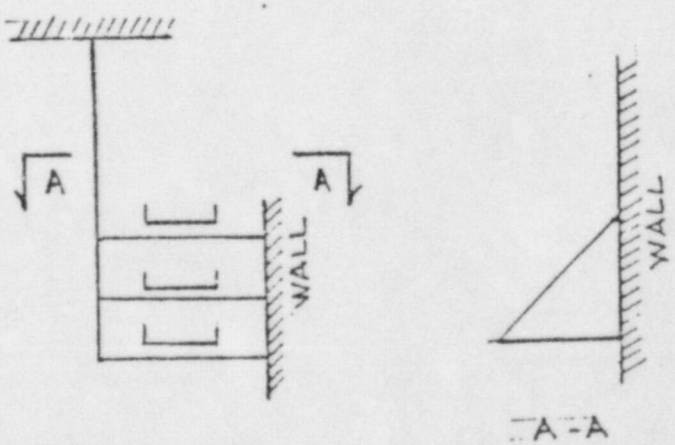
L2W

FIG. 14



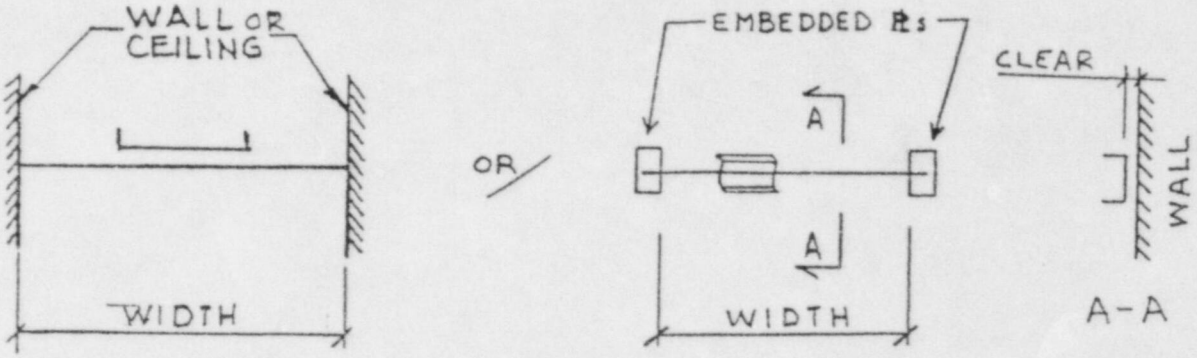
L2B1

FIG. 15

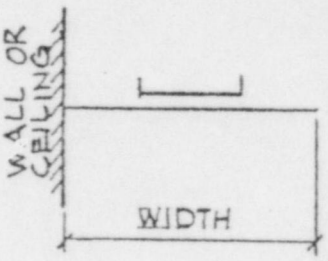


L3WBL

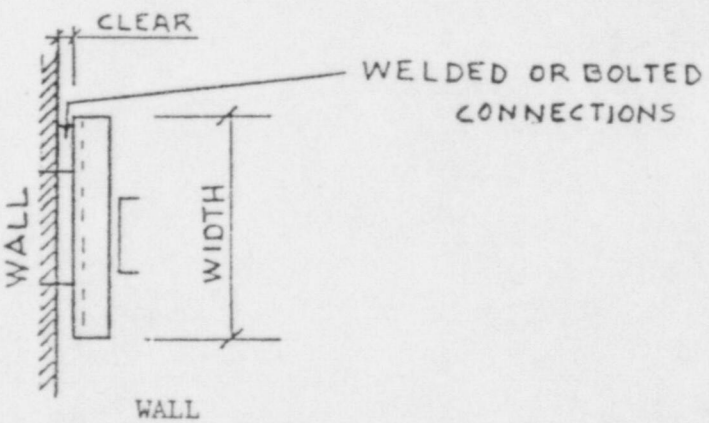
FIG. 16



BEAM
Fig. 17

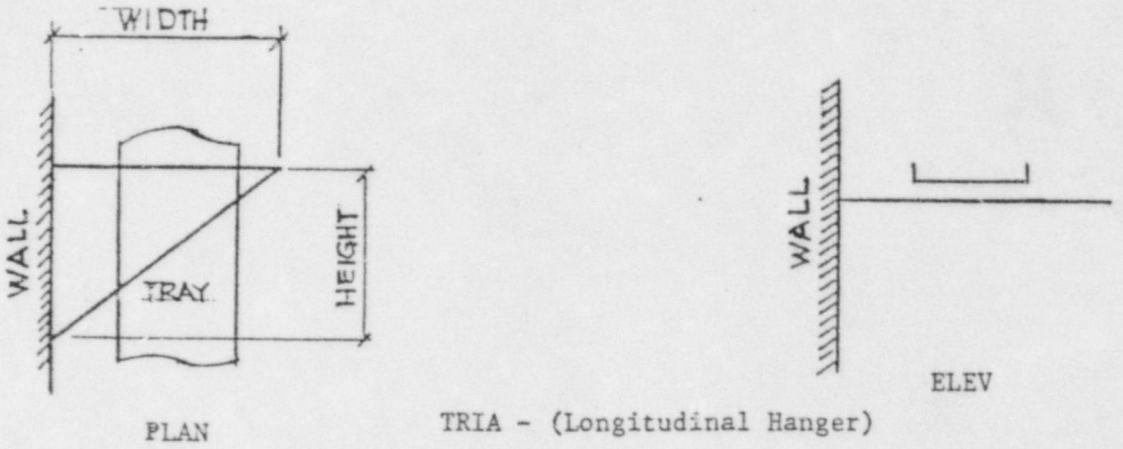


CANT
FIG. 18



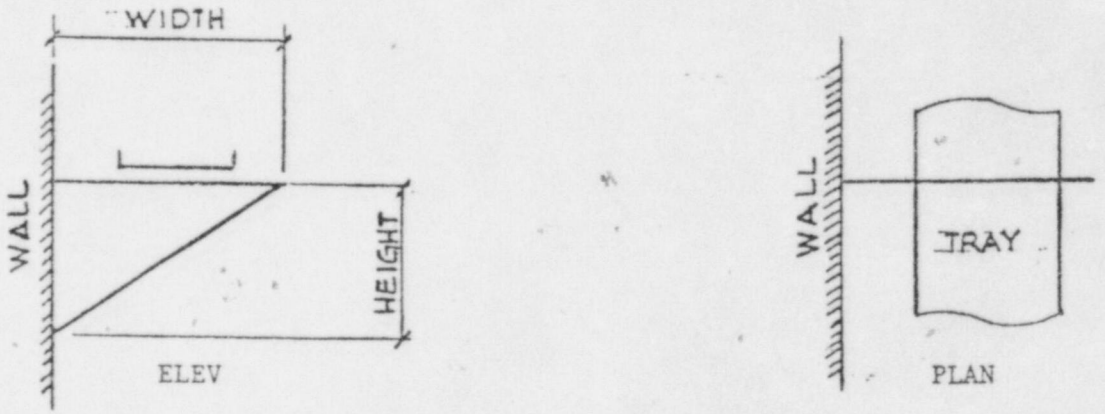
WALL
FIG. 19

NOTE: Triangle hangers shown may be rotated 90° on wall



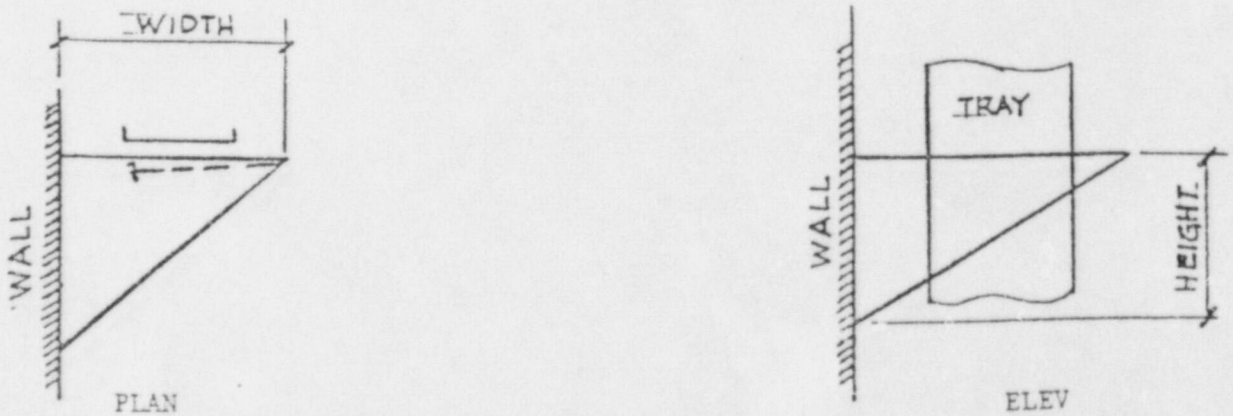
TRIA - (Longitudinal Hanger)

FIG. 20



TRIA - (Transverse Hanger)

FIG. 21



TRIA - (Multidirectional Hanger)

FIG. 22