



## Slide Rail Corner Posts Models PS-XCP-XXX

*All drawings and written materials appearing herein constitute the original and unpublished work of Pro-Tec Equipment Inc., and Practical Engineering Services Inc. and the same may not be duplicated, distributed, or disclosed without prior written consent of Pro-Tec Equipment Inc.*



Practical Engineering Services, Inc.

Jackson, Michigan

CLIENT: PRO-TEC EQUIPMENT INC.

REV: 4

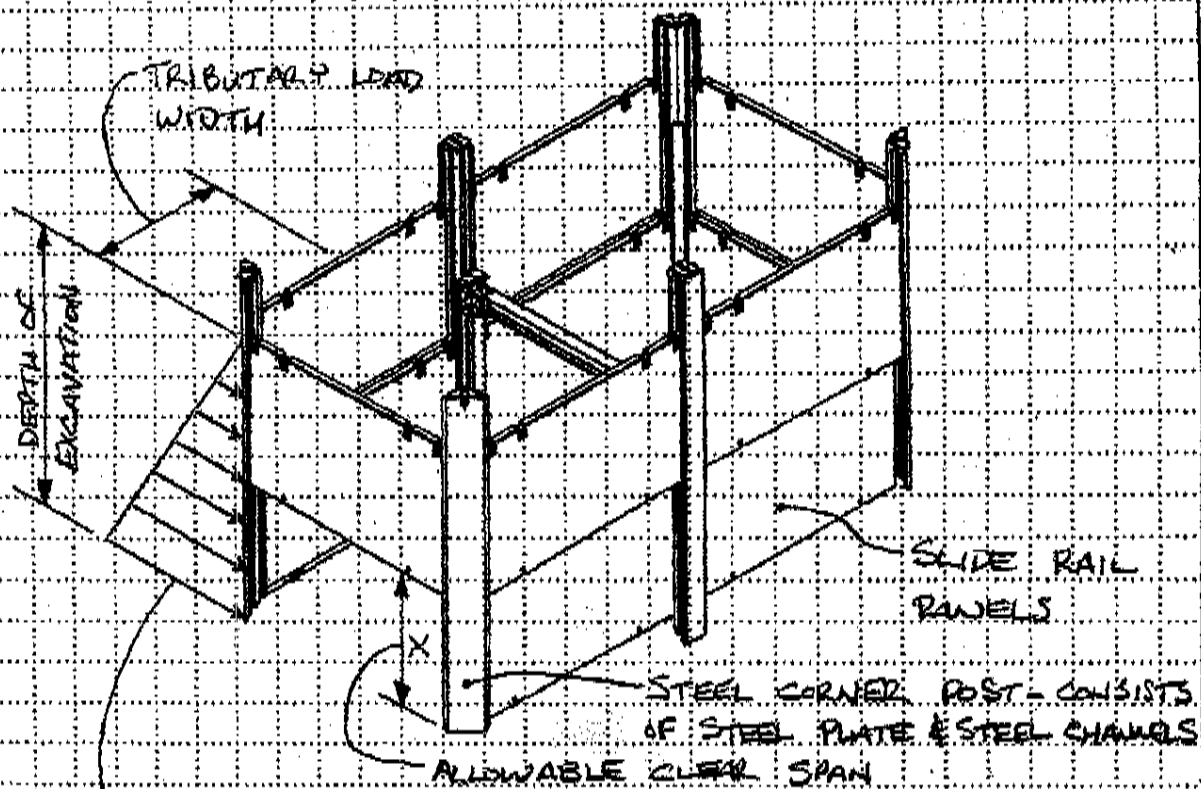
SHT 1 OF 4

PREPARED: MJM DATE: 1/30/03

CHECKED: SMJ DATE: 1/30/03

SUBJECT: SLIDE RAIL POST - BASIS OF DESIGN

PRO-TEC SLIDE RAIL CORNER POST - BASIS OF DESIGN  
(MAIN STRUCTURAL COMPONENTS)



PRESSURES =  $0.5H^2$   
SOIL TYPES A, B, C & CB0  
ENTIRE LENGTH



**Practical Engineering Services, Inc.**

Jackson, Michigan

CLIENT: PRO-TEC EQUIPMENT INC.

REV:  $\phi$

SHT 2 OF 4

PREPARED: MJM DATE: 1/30/03

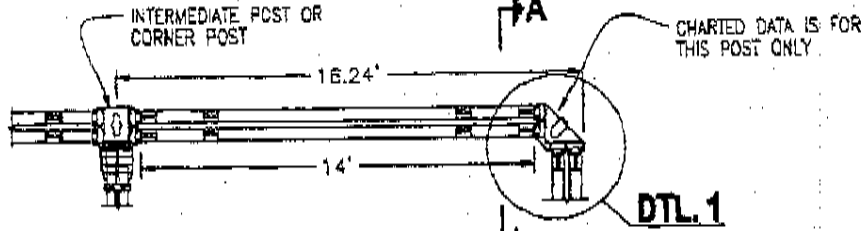
CHECKED: SMJ DATE: 1/30/03

SUBJECT: SLIDE RAIL POST - BASIS OF DESIGN

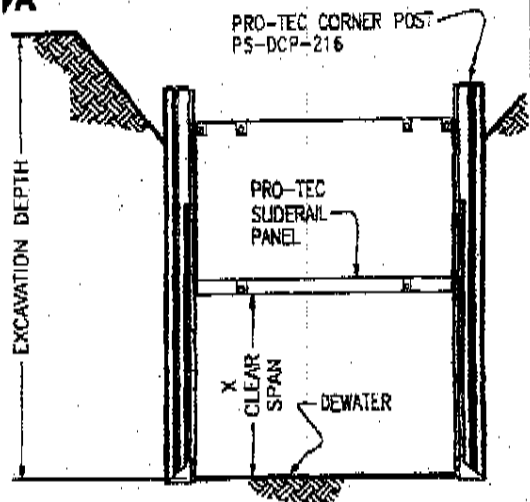
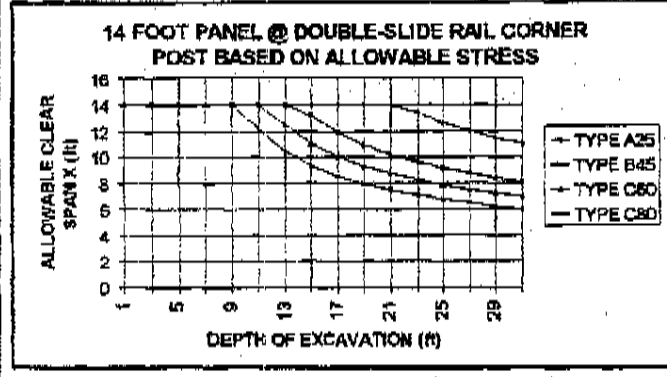
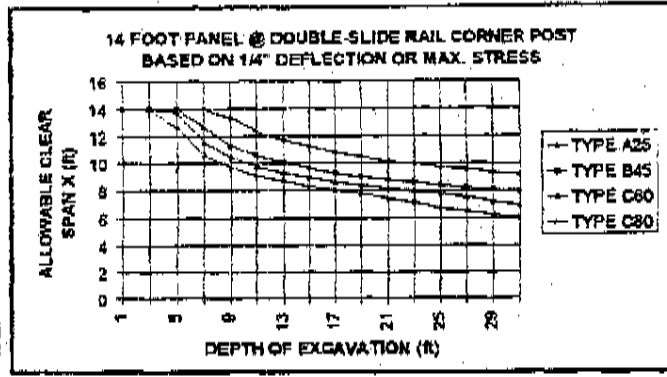
BASIS OF DESIGN - CONTINUED

UTILIZING 50 KSI (MINIMUM) YIELD STRENGTH FOR STEEL, THE SLIDE RAIL CORNER POST STRUCTURAL COMPONENTS ARE DESIGNED AS FOLLOWS:

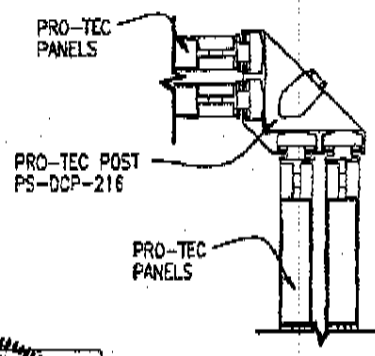
- SECTION PROPERTIES ARE DETERMINED
- SOIL PRESSURES ARE TRANSFERRED ALONG SLIDE RAIL PANELS TO POST LOADING ON POST SECTION CONSIDERED AS A CANTILEVER BELOW PANEL OPENINGS (X)
- BASED ON THE CORNER POST SECTION PROPERTIES AND PRESSURES THE MAXIMUM CLEAR SPAN "X" IS DETERMINED AND CHARTED IN OSHA TYPE A, B, C & CD SOILS
  - SOIL TYPE A = 25 psf per ft. of depth
  - B = 45 psf " " " "
  - C = 60 psf " " " "
  - CD = 80 psf " " " "
- CHARTER GENERATED SPREADSHEETS WERE DEVELOPED THAT DETERMINE THE MAXIMUM CLEAR SPAN "X" BELOW THE ADJACENT PANEL BASED ON AN ALLOWABLE 0.25" DEFLECTION AND OR ALLOWABLE STRESS REQUIREMENTS OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION.



CHARTED DATA IS FOR THIS POST ONLY.



**SECTION "A-A"**




**DETAIL 1**

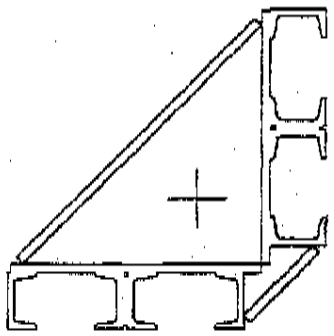
- NOTES:**
- 1) ALL EXCAVATIONS SHALL BE IN ACCORDANCE WITH OSHA CFR 29, PART 1926, SUBPART P, JULY 1997.
  - 2) SOILS CLASSIFICATION SHALL BE IN COMPLIANCE WITH APPENDIX A IN OSHA CFR 29, PART 1926, SUBPART P. LATERAL EARTH PRESSURE SHALL BE DETERMINED AS FOLLOWS: (NOT INCLUDING SURCHARGE)
    - TYPE A25 SOIL > 25 PSF x EXCAVATION DEPTH
    - TYPE B45 SOIL > 45 PSF x EXCAVATION DEPTH
    - TYPE C60 SOIL > 60 PSF x EXCAVATION DEPTH
    - TYPE C80 SOIL > 80 PSF x EXCAVATION DEPTH
  - 3) SOIL ABOVE TOP OF SHORING PANEL TO BE SLOPED TO OSHA REGULATIONS.
  - 4) SLIDE FRAME MUST REMAIN IN PLACE WHILE SHORING PANEL IS IN EXCAVATION.
  - 5) SHORING PANEL MAY BE HELD 2' ABOVE THE BOTTOM OF THE TRENCH, HOWEVER LOADING SHALL BE DETERMINED FOR FULL TRENCH DEPTH.
  - 6) USE RAIL PINS TO STOP FRAME FROM SLIDING ABOVE HEIGHT X.
  - 7) INSTALLATION PROCEDURES SHALL BE IN ACCORDANCE WITH MANUFACTURER REQUIREMENTS.
  - 8) CONSTRUCTION SAFETY RESPONSIBILITY OF THE CONTRACTOR.

STATE OF MICHIGAN  
**SCOTT M. GILLETT**  
 ENGINEER  
 NO. 32040  
 LICENSED PROFESSIONAL ENGINEER  
 DATE: 3/7/04

MODEL:	PS-DCP-216
RAIL LENGTH:	18.00 ft
SECTION MODULUS:	101.4 in <sup>3</sup>
MATERIAL Fy =	50 ksi

**PRO-TEC Equipment Inc.**  
 P.O. Box 130 1280 Liberty Dr. Charlotte, NC 28213 (517) 541-0300 1-800-222-1222

Dwg # SKETCH		SCOTT M GILLET P.E.	
App. SMG		PREPARED UNDER THE RESPONSIBLE SUPERVISION OF	
Date 3/7/01		7331 Browns Lake Rd Jackson, Michigan 49201	
TITLE MATERIAL PROPERTIES PS-DCP-216 SLIDE RAIL CORNER POST		 <b>Practical Engineering Services, Inc.</b>	
P.O.#: PRO-TEC EQUIPMENT INC.			



Area: 40.80505072  
 Perimeter: 160.00187748  
 Bounding box: X: -7.02034000 Y: -10.24203000  
 Centroid: X: -0.00000371 Y: -0.00000229  
 Moments of inertia: X: 1038.43708280 Y: 1038.43708280  
 Product of inertia: XY: 479.44732960  
 Radii of gyration: X: 5.04467431 Y: 5.04467431  
 Principal moments and X-Y directions about centroid:  
 I: 558.98975320 along [0.70710678 0.70710678]  
 J: 1517.88441240 along [-0.70710678 0.70710678]

**PRO-TEC - SLIDE RAIL SYSTEM - DOUBLE CORNER - PS-DCP-216**



# Slide Rail Panels Models PS-P-XXX

*All drawings and written materials appearing herein constitute the original and unpublished work of Pro-Tec Equipment Inc., and Practical Engineering Services Inc. and the same may not be duplicated, distributed, or disclosed without prior written consent of Pro-Tec Equipment Inc.*



**Practical Engineering Services, Inc.**  
Jackson, Michigan

REV:

SHT / OF 2

PREPARED: *SMZ*

DATE: —

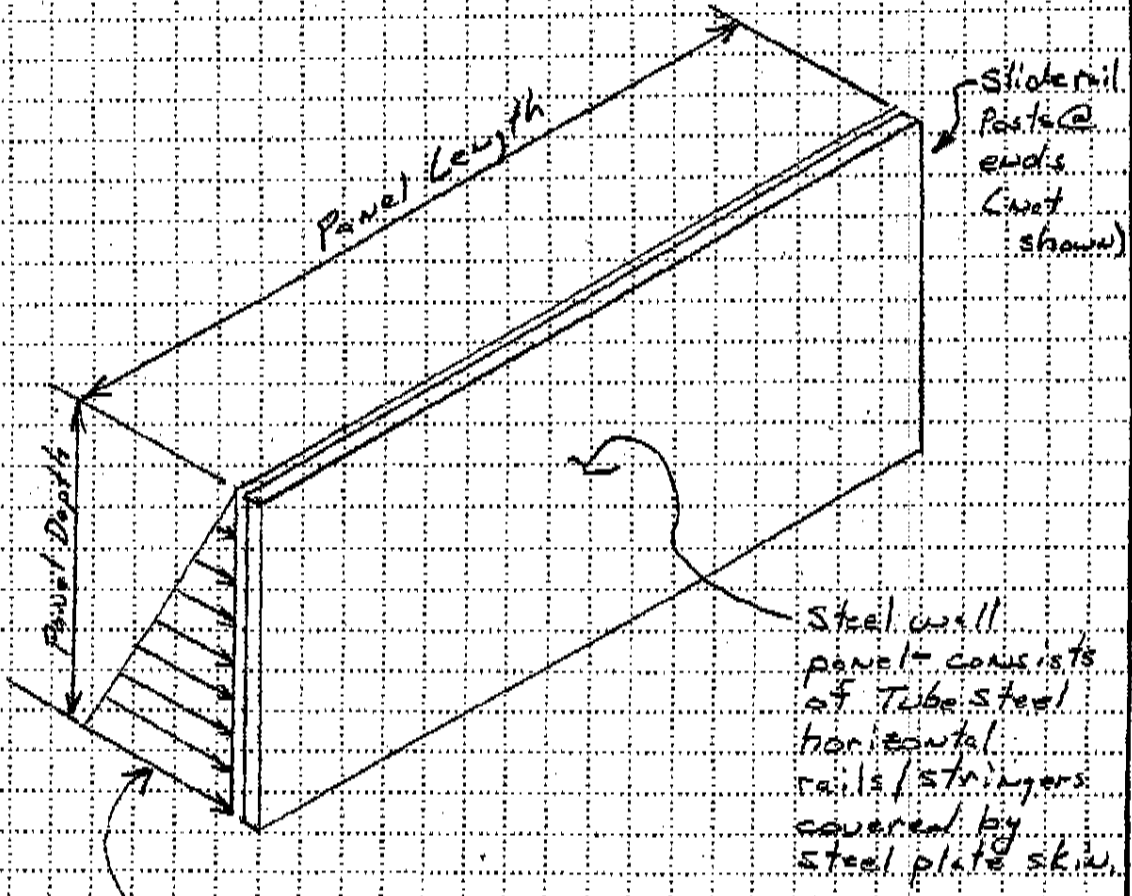
CLIENT: *Pro-Tec Equipment*

CHECKED: *MJM*

DATE: —

SUBJECT: *Slide rail System*

*Pro-TEC Slide Rail Panels - Basis of Design  
(Main Structural Components)*



*Pressures = OSHA  
Soil Types A, B, C  
entire length*

PRO-TEC EQUIPMENT, INC. (517) 541-0303 FAX (517) 541-0329

SA: SR814PAN

DATE: 2/03/02

SR8

14

40KE

SLIDE RAIL PANEL RATINGS

DESIGN FOR SLIDE RAIL PANEL WITH 4 HORIZONTAL STRINGERS  
DOUBLE WALL WITH KNIFE EDGE

ENTER TOTAL HEIGHT OF PANEL IN INCHES 84.25  
 ENTER HEIGHT OF UPPER TUBE IN INCHES 12.00 (INCLUDES 8X4X1/2 TOP TUBE)  
 ENTER HEIGHT OF SECOND TUBE IN INCHES 4.00  
 ENTER HEIGHT OF THIRD TUBE IN INCHES 4.00  
 ENTER HEIGHT OF BOTTOM TUBE IN INCHES 6.00  
 ENTER HEIGHT OF KNIFE EDGE IN INCHES 8.00

HEIGHT OF INSIDE SPACE IN INCHES 60.25  
 ENTER HEIGHT OF UPPER SPACE IN INCHES 22.00  
 ENTER HEIGHT OF MIDDLE SPACE IN INCHES 18.00 (CHECK MATH!)  
 ENTER HEIGHT OF LOWER SPACE IN INCHES 19.00

ENTER WIDTH OF TUBE IN INCHES 4.0000  
 ENTER PLATE THICKNESS IN INCHES 0.2500  
 WIDTH OF PANEL IN INCHES 4.6000

ENTER TOTAL LENGTH OF PANEL IN INCHES 168.00 14.00 FEET  
 ENTER LOAD INSET DIMENSION 4.00  
 LENGTH OF SPAN FOR DESIGN IN INCHES 180.00

ENTER TYPE OF TUBE

UPPER 4X4X1/4 SECOND 4X4X1/4 THIRD 4X4X1/4 LOWER 6X4X5/16

ENTER I FOR EACH TUBE (CAUTION IX OR IY)

UPPER 8.22 SECOND 8.22 THIRD 8.22 LOWER 28.70 (INC. KE IY)

ENTER STEEL STRENGTH IN PSI 55000

PROPERTIES	UPPER	SECOND	THIRD	LOWER
I TOTAL IN <sup>4</sup>	57.95	63.60	60.21	59.22
S TOTAL IN <sup>3</sup>	25.75	28.27	25.75	26.52
P AVERAGE PSF	2272	2379	2298	2272
D AVERAGE INCHES	62.75	59.00	56.00	61.75

STRINGER RATINGS	UPPER	SECOND	THIRD	LOWER	DEPTH (FEET)
AT 25 PSF	2384	2402	2371	2236	39
AT 45 PSF	2522	2500	2429	2265	50
AT 60 PSF	2625	2574	2473	2274	38

PSF RATINGS

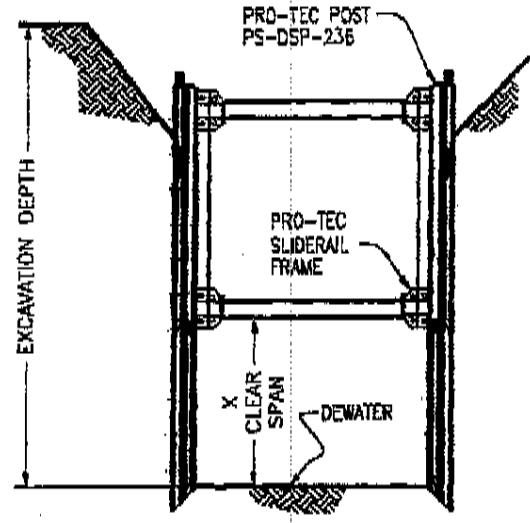
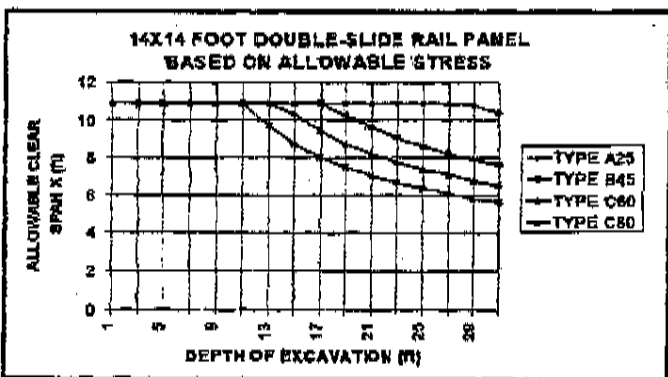
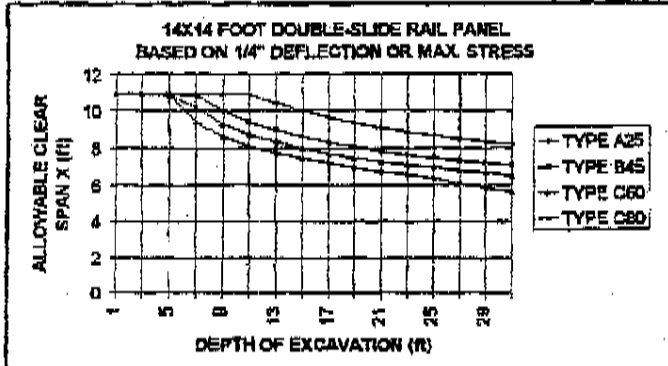
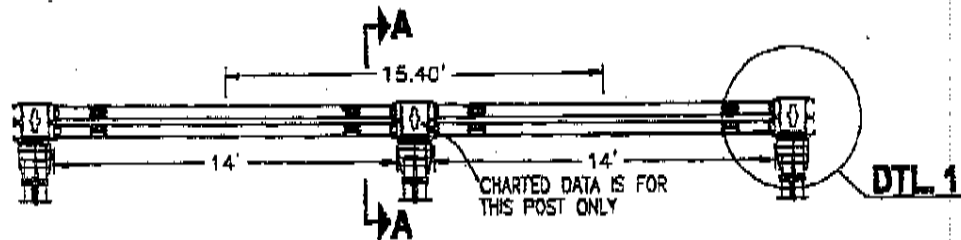
AT 25 PSF 2236

AT 45 PSF 2265

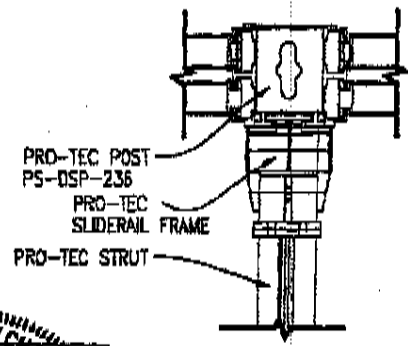
AT 60 PSF 2274

THIS PROGRAM COMPUTES THE MAXIMUM PSF AND DEPTH RATINGS FOR THE  
 HORIZONTAL PANEL MEMBERS ONLY. CONSIDERATION OF THE TOP 8X4 TUBE  
 IS NOT INCLUDED. CONSIDERATION OF THE BOTTOM KNIFE EDGE IS INCLUDED.





**SECTION "A-A"**



**DETAIL 1**

- NOTES:**
- 1) ALL EXCAVATIONS SHALL BE IN ACCORDANCE WITH OSHA CFR 29, PART 1926, SUBPART P, JULY 1997.
  - 2) SOILS CLASSIFICATION SHALL BE IN COMPLIANCE WITH APPENDIX A IN OSHA CFR 29, PART 1926, SUBPART P. LATERAL EARTH PRESSURE SHALL BE DETERMINED AS FOLLOWS: (NOT INCLUDING SURCHARGE)  
 TYPE A25 SOIL > 25 PSF x EXCAVATION DEPTH  
 TYPE B45 SOIL > 45 PSF x EXCAVATION DEPTH  
 TYPE C60 SOIL > 60 PSF x EXCAVATION DEPTH  
 TYPE C80 SOIL > 80 PSF x EXCAVATION DEPTH
  - 3) SOIL ABOVE TOP OF SHORING PANEL TO BE SLOPED TO OSHA REGULATIONS.
  - 4) SLIDE FRAME MUST REMAIN IN PLACE WHILE SHORING PANEL IS IN EXCAVATION.
  - 5) SHORING PANEL MAY BE HELD 2' ABOVE THE BOTTOM OF THE TRENCH, HOWEVER LOADING SHALL BE DETERMINED FOR FULL TRENCH DEPTH.
  - 6) USE RAIL PINS TO STOP FRAME FROM SLIDING ABOVE HEIGHT X.
  - 7) INSTALLATION PROCEDURES SHALL BE IN ACCORDANCE WITH MANUFACTURER REQUIREMENTS.
  - 8) CONSTRUCTION SAFETY RESPONSIBILITY OF THE CONTRACTOR.


STATE OF MICHIGAN  
**SCOTT M. GILLETT**  
 ENGINEER  
 NO. 32040  
 LICENSED PROFESSIONAL ENGINEER

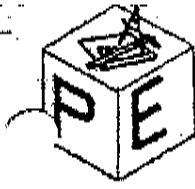
DATE: 3/7/01



**PRO-TEC Equipment Inc.**  
 P.O. Box 130 1890 Liberty Dr., Charlotte, NC 28213 (771) 341-0323 1-800-293-1225

MODEL:	PS-DSP-236
RAIL LENGTH:	19.67 ft
SECTION MODULUS:	171.0 in <sup>3</sup>
MATERIAL Fy =	50 ksi

	<b>Practical Engineering Services, Inc.</b> Jackson, Michigan	REV:	SHT 2 OF 2
		PREPARED: <i>SMJ</i>	DATE: -
CLIENT: <i>Pro-Tec Equipment</i>		CHECKED: <i>WJM</i>	DATE: -
SUBJECT: <i>Slide rail System</i>			
<i>Basis of Design - Continued</i>			
<p>Utilizing 55ksi (minimum) yield strength for steel, the slide rail panel structural components are designed as follows:</p> <ul style="list-style-type: none"> <li>- Section properties are determined for each steel stringer/panel skin location of the wall panel.</li> <li>- Soil pressures are transferred along wall panel to the ends located at the slide rail posts. Pressures on wall sections considered as simply supported beam elements.</li> <li>- Based on the wall section properties and pressures, the maximum depth of the panel is determined in OSHA Type A, B, C soils.           <ul style="list-style-type: none"> <li>Soil Type A = 2.5 psf per ft. of depth</li> <li>B = 4.5 psf per ft. of depth</li> <li>C = 6.0 psf per ft. of depth</li> </ul> </li> <li>- Computer generated spreadsheets were developed that determine the maximum depths and pressures per allowable stress requirements of the American Institute of Steel Construction.</li> <li>- Attached are computer spreadsheets for Pro-Tec models.</li> </ul>			



**Practical Engineering Services, Inc.**

7331 Brower Lake Rd. • Jackson, MI 49201-6332  
PH: (517) 789-5488 • FAX: (517) 789-5011

Email: [peengineer@aol.com](mailto:peengineer@aol.com)

February 17, 2002

Mr. Frank Balhuff  
Pro-Tec Equipment, Inc.  
P.O. Box 130  
Charlotte, MI 48813

**SUBJECT: Slide Rail Panel Ratings**

Dear Mr. Balhuff:

Enclosed are maximum depth ratings for the following Slide Rail Panels:

**MODEL NUMBERS**

**48" Deep Panels**

- PS-P-410-NK
- PS-P-412-NK
- PS-P-414-NK
- PS-P-416-NK
- PS-P-418-NK
- PS-P-420-NK
- PS-P-422-NK
- PS-P-424-NK

**96" Deep Panels**

- PS-P88-KE
- PS-P810-KE
- PS-P812-KE
- PS-P814-KE
- PS-P816-KE
- PS-P818-KE
- PS-P820-KE
- PS-P822-KE
- PS-P824-KE

← 10' Panel

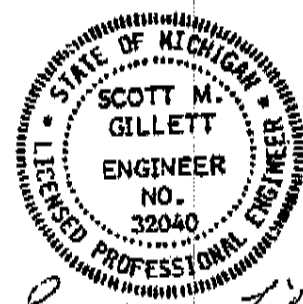
EXD' BASE PANELS

The above depth ratings were determined by modifying the Trench Shield tabulated spreadsheet. The original tabulated spreadsheets were prepared previously by a Registered Professional Engineer. The enclosed spreadsheets indicate the allowable depths and pressures for main components of the Slide Rail Panels. Minor components and connections have been determined by others. Please note that fabrication inspection will not be conducted by this office and the responsibility for safety during fabrication, shipping and utilization of the panels will be by others.

You may call me at (517) 789-5488 with any questions.

Sincerely,

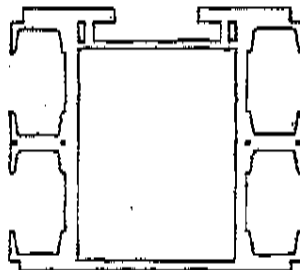
Scott M. Gillett, P.E.  
President



Scott M. Gillett  
2/17/02

**PRO-TEC - SLIDE RAIL SYSTEM - DOUBLE POST - PS-DSP-236**

Area: 50.5619  
 Perimeter: 155.7305  
 Bounding box: X: -7.9375 -- 7.9375  
                   Y: -7.3966 -- 6.6749  
 Centroid: X: -0.0006  
            Y: 0.0000  
 Moments of inertia: X: 1264.7506 Sx = 171.00 in<sup>3</sup>  
                       Y: 1351.8371  
 Product of inertia: XY: -0.1948  
 Radii of gyration: X: 5.0014  
                       Y: 5.1707  
 Principal moments and X-Y directions about centroid:  
                           I: 1264.7502 along [1.0000 -0.0022]  
                           J: 1351.8375 along [0.0022 1.0000]

**Practical Engineering Services, Inc.**
 7331 Browns Lake Rd.  
 Jackson, Michigan 49201

P.O.#: PRO-TEC EQUIPMENT INC.

 TITLE  
 MATERIAL PROPERTIES  
 PS-DSP-236 SLIDE RAIL  
 POST

PREPARED UNDER THE RESPONSIBLE SUPERVISION OF

SCOTT M. GILLET P.E.

App. SMG

Date 3/7/01

Dwg # SKETCH

Sht. 1 OF 1

PROTEC EQUIPMENT, INC. (517) 541-0303 FAX (517) 541-0329

SA:SR414PAN

DATE:2/17/02

SR4 14 4DNK

DESIGN FOR SLIDE RAIL PANEL WITH 2 HORIZONTAL STRINGERS  
DOUBLEWALL WITHOUT KNIFE EDGE

ENTER TOTAL HEIGHT OF BOX IN INCHES 48.00  
ENTER HEIGHT OF UPPER TUBE IN INCHES 12.00 (INCLUDES 6X4X1/2 TOP TUBE)  
ENTER HEIGHT OF BOTTOM TUBE IN INCHES 12.00 (INCLUDES 6X4X1/2 BOT. TUBE)  
ENTER HEIGHT OF KNIFE EDGE IN INCHES 0.00 (ZERO IF NONE)  
HEIGHT OF INSIDE SPACE IN INCHES 24.00

ENTER WIDTH OF TUBE IN INCHES 4.0000  
ENTER PLATE THICKNESS IN INCHES 0.2500  
WIDTH OF PANEL IN INCHES 4.5000

ENTER TOTAL LENGTH OF PANEL IN INCHES 168.00 14.00 FEET  
ENTER LOAD INSET DIMENSION 4.00  
LENGTH OF SPAN FOR DESIGN IN INCHES 160.00

ENTER TYPE OF TUBE  
UPPER 4x4x1/4 LOWER 4x4x1/4  
ENTER I FOR EACH TUBE (CAUTION box OR lyy) (TS8X4 NOT INCLUDED)  
UPPER 8.22 LOWER 8.22

ENTER STEEL STRENGTH IN PSI 55000

PROPERTIES	UPPER	LOWER
I TOTAL IN4	60.21	60.21
S TOTAL IN3	26.78	26.76
P AVERAGE PSF	2202	2202
D AVERAGE INCHES	36.00	12.00

STRINGER RATINGS	UPPER	LOWER	DEPTH (FEET)
AT 25 PSF	2277	2227	89
AT 45 PSF	2337	2247	60
AT 60 PSF	2382	2262	38

PSF RATINGS	PSF
AT 25 PSF	2227
AT 45 PSF	2247
AT 60 PSF	2262

THIS PROGRAM COMPUTES THE MAXIMUM PSF AND DEPTH RATINGS FOR THE HORIZONTAL PANEL MEMBERS ONLY. CONSIDERATION OF THE TOP AND BOTTOM 6X4 TUBE IS NOT INCLUDED.