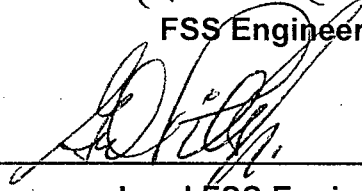
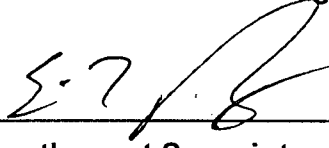


Rancho Seco
Final Status Survey Summary Report
October 31, 2007
PAP Building Exterior
Survey Unit F8040011

Prepared By:  Date: 10-31-2007
FSS Engineer

Reviewed By:  Date: 11/1/07
Lead FSS Engineer

Approved By:  Date: 11-12-07
Dismantlement Superintendent, Radiological

FINAL STATUS SURVEY SUMMARY REPORT

Survey Unit:

F8040011, PAP Building Exterior

Survey Unit Description:

Operating History: The concrete, multi-story structure was used as the primary access point into the site by workers and provided office space for the security personnel. This area was not reported to have been used for the storage of radioactive material.

Operating records and the HSA document no events with the potential for a release of radioactivity associated with this survey area.

Site Characterization: Direct measurements were made of the interior and exterior surfaces of the structure, which confirmed the absence of plant-derived radionuclides. Direct measurements showed a mean gross activity level of 2,142 dpm/100 cm² and a maximum value of 4,387 dpm/100 cm². Based on the classification procedure (DSIP-0020) and levels of gross activity reported, the area was determined to be a Class 3 area.

HSA Events: None

Survey Unit Design Information:

The Survey Unit Design Parameters are presented in Table 1 below. The survey unit and measurement locations are depicted on the maps in Attachment 1. Direct measurement locations were randomly determined and 60 m² were scanned for approximately 5% coverage. Samples of removable contamination were collected at each direct measurement location. The instrumentation used for the survey along with the MDC values are listed in Tables 2-1 and 2-2 in Attachment 2.

Table 1. Survey Unit Design Parameters

Survey Design Parameter	Value	Comment
Survey Area:	F804	PAP Building Exterior
Survey Unit:	0011	Structure Surface
Class:	3	LTP Table 5-4
SU Area (m²):	1177	
Evaluator:	Frank	
DCGL (dpm/100 cm²):	43000	Gross Activity DCGL
Area Factor:	N/A	Class 3
Design DCGL_{mc} (dpm/100 cm ²):	N/A	Class 3
LBGR (dpm/100 cm²):	21500	Default = 50% DCGL
Design Sigma (dpm/100 cm²):	196	
Type I Error:	0.05	
Type II Error:	0.05	
Predominant Nuclide:	Cs-137	
Sample Area (m²):	N/A	Class 3
Scan Area (m²):	60	
Scan Coverage (%):	5%	Class 3
Z_{1-α} :	1.645	
Z_{1-β} :	1.645	
Sign P:	0.99865	
Calculated Relative Shift:	109.6	
Relative Shift Used:	3	Uses 3.0 if Relative Shift is >3
N-Value:	11	
Design N-Value + 20%:	14	NUREG-1575 Table 5-5
Design Min Samples N:	14	Class 3
Grid Spacing L:	N/A	Class 3

Survey Results:

A total of 14 direct measurements were made in F8040011. The results including mean, median, standard deviation and range are shown in Table 2. All direct measurements were less than the DCGL. None of the scan measurements indicated areas of elevated activity. Scan activity ranged from 4229 dpm/100cm² to 4998 dpm/100cm² for roof and exterior wall surfaces, based on a surveyor efficiency of 0.5 with no background subtracted. Samples for removable surface activity were all less than 10% of the DCGL as shown in Table 3. Removable surface activity samples were counted for alpha activity and none was detected at the MDC shown in Table 2-1 of Attachment 2.

Table 2. Direct Measurement Results

Measurement ID	Gross Activity (dpm/100 cm ²)
F8040011-Q0001BD	3102
F8040011-Q0002BD	3185
F8040011-Q0003BD	3714
F8040011-Q0004BD	3859
F8040011-Q0005BD	4025
F8040011-Q0006BD	3771
F8040011-C0007BD	3761
F8040011-C0008BD	4912
F8040011-C0009BD	3745
F8040011-C0010BD	3911
F8040011-C0011BD	2739
F8040011-C0012BD	3719
F8040011-C0013BD	2319
F8040011-C0014BD	3019
Mean:	3556
Median:	3732
Standard Deviation:	638
Range:	2319 - 4912

Table 3. Removable Surface Activity Results

Measurement ID	Surface Beta Activity (dpm/100 cm ²)
F8040011Q0001SM	3.58
F8040011Q0002SM	2.29
F8040011Q0003SM	1.01
F8040011Q0004SM	1.01
F8040011Q0005SM	4.86
F8040011Q0006SM	-0.27
F8040011Q0007SM	7.42
F8040011C0008SM	6.14
F8040011C0009SM	7.42
F8040011C0010SM	8.7
F8040011C0011SM	2.29
F8040011C0012SM	-0.27
F8040011C0013SM	4.86
F8040011C0014SM	4.86
Mean:	3.85
Median:	4.22
Standard Deviation:	2.94
Range:	-0.27 to 8.7

Survey Unit Data Assessment:

The survey design required 14 direct measurements for the Sign Test. The critical value and the results of the Sign Test are presented in Table 4. The sample mean and median values were less than the DCGL. The sample standard deviation was greater than design sigma but both values of sigma result in a relative shift of greater than 3 so no additional samples were required.

Table 4. Data Assessment Results

Survey Results Parameter	Value	Comment
Material Background Used (dpm/100 cm ²):	N/A	Average Ambient BKG = 0
Ambient Background Used (dpm/100 cm ²):	N/A	
Actual Direct Measurements (N):	14	
Median (dpm/100 cm ²):	3732	
Mean (dpm/100 cm ²):	3556	
Direct Measurement Standard Deviation (dpm/100 cm ²):	638	Based on samples and backgrounds.
Total Standard Deviation (dpm/100 cm ²):	638	
Maximum (dpm/100 cm ²):	4912	
Material Type:	N/A	Background Subtract Not Applied
Sign Test Final N Value:	14	Class 3 No additional samples required
S+ Value:	14	
Critical Value:	10	
Sufficient Samples Collected:	Yes	
Maximum Value < DCGL:	Yes	
Median Value < DCGL:	Yes	
Mean Value < DCGL:	Yes	
Maximum Value < DCGL_{mc}:	N/A	
Total Standard Deviation <= Sigma:	Investigate	
Pass the Sign Test?	Yes	
Reject the Null Hypothesis?	Yes	No additional samples required
Does the Survey Unit Pass All Criteria?	Investigate	

Survey Unit Investigations and Results:

No investigations were required for either direct or scan measurements and no investigation results are reported.

ALARA Statement:

As stated in Chapter 4 of the LTP, as long as the residual activity within the survey unit is less than the DCGL (i.e. the survey unit average activity is less than the DCGL and the EMC criterion has been met), the ALARA criterion has been met.

Changes in Initial Survey Unit Assumptions:

The survey unit was designed as a Class 3 structure survey and the sample results are consistent with that classification. The variability of the survey results was greater than the characterization data used for survey design. No potential areas of elevated activity were detected.

Conclusion:

The FSS of this survey unit was properly designed as a Class 3 survey based on Table 5-4 of the LTP. The required number of direct measurements was made and the scan coverage met the requirement of Table 5-6 of the LTP. No direct measurements exceeded the DCGL of 43000 dpm/100 cm² and none of the removable surface activity measurements exceeded 10% of the DCGL. No investigations were required.

The direct measurement data support rejection of the null hypothesis, providing high confidence that the survey unit satisfied the release criteria and that the data quality objectives were met.

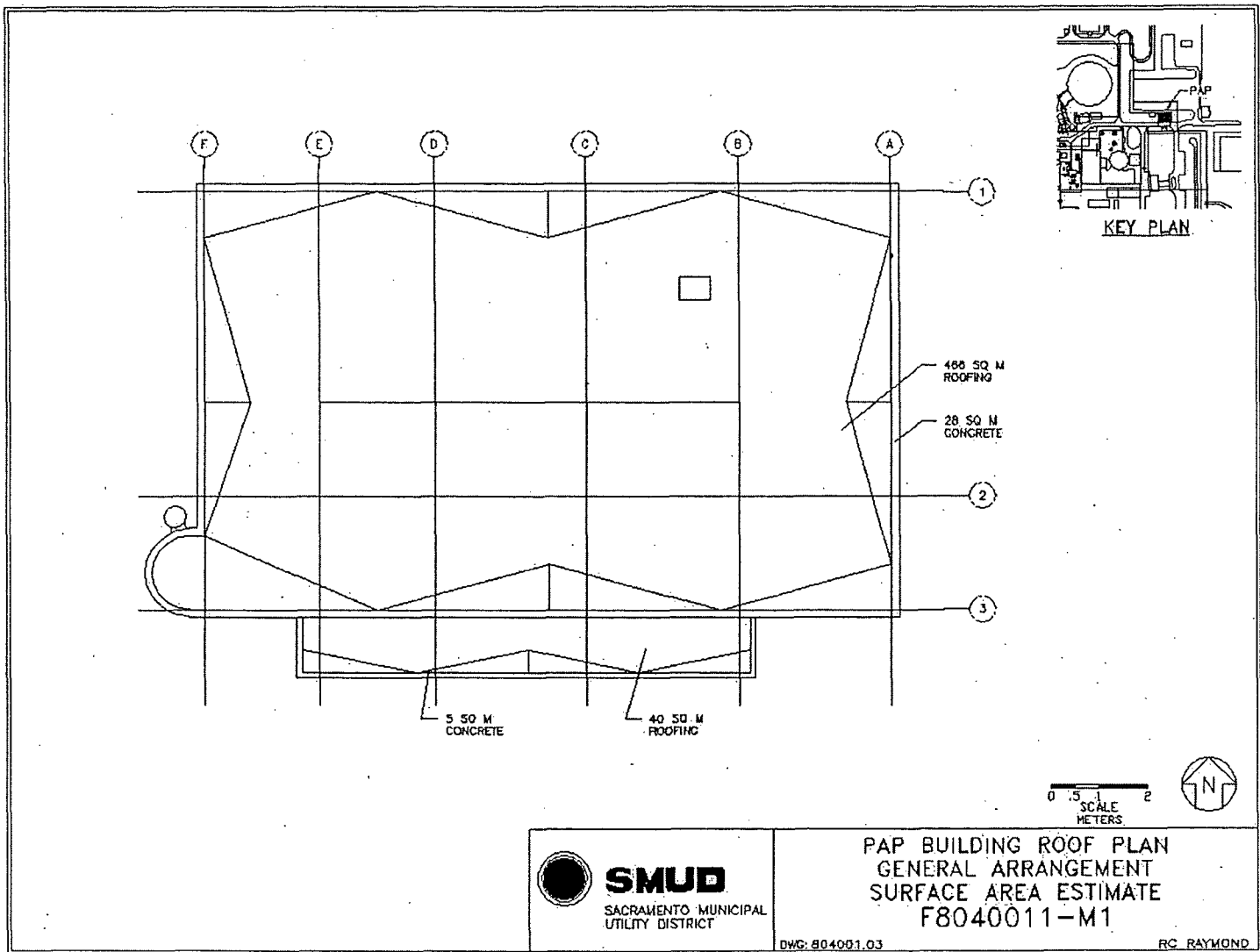
It is concluded that survey unit F8040011 meets the release criteria of 10CFR20.1402.

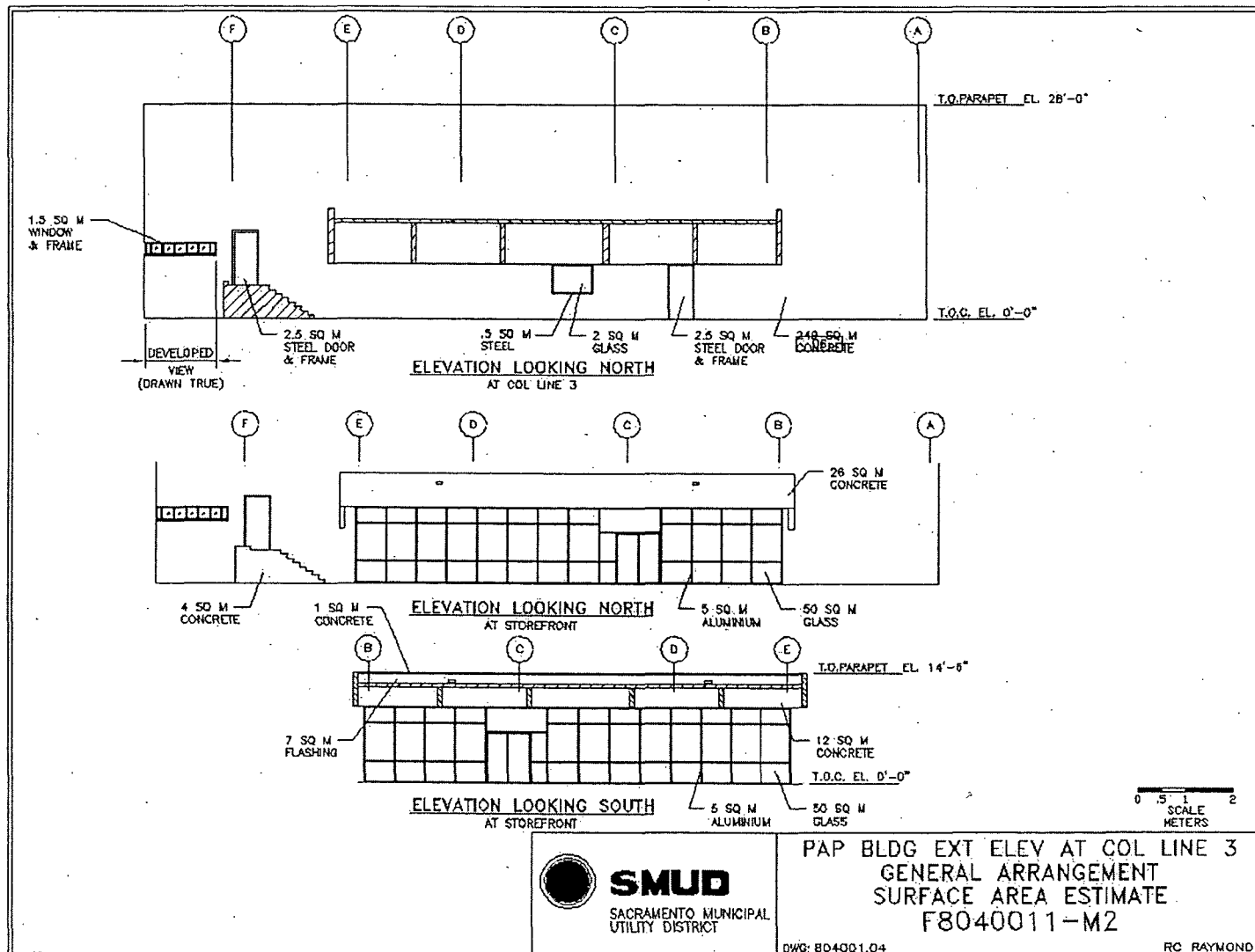
Attachment 1

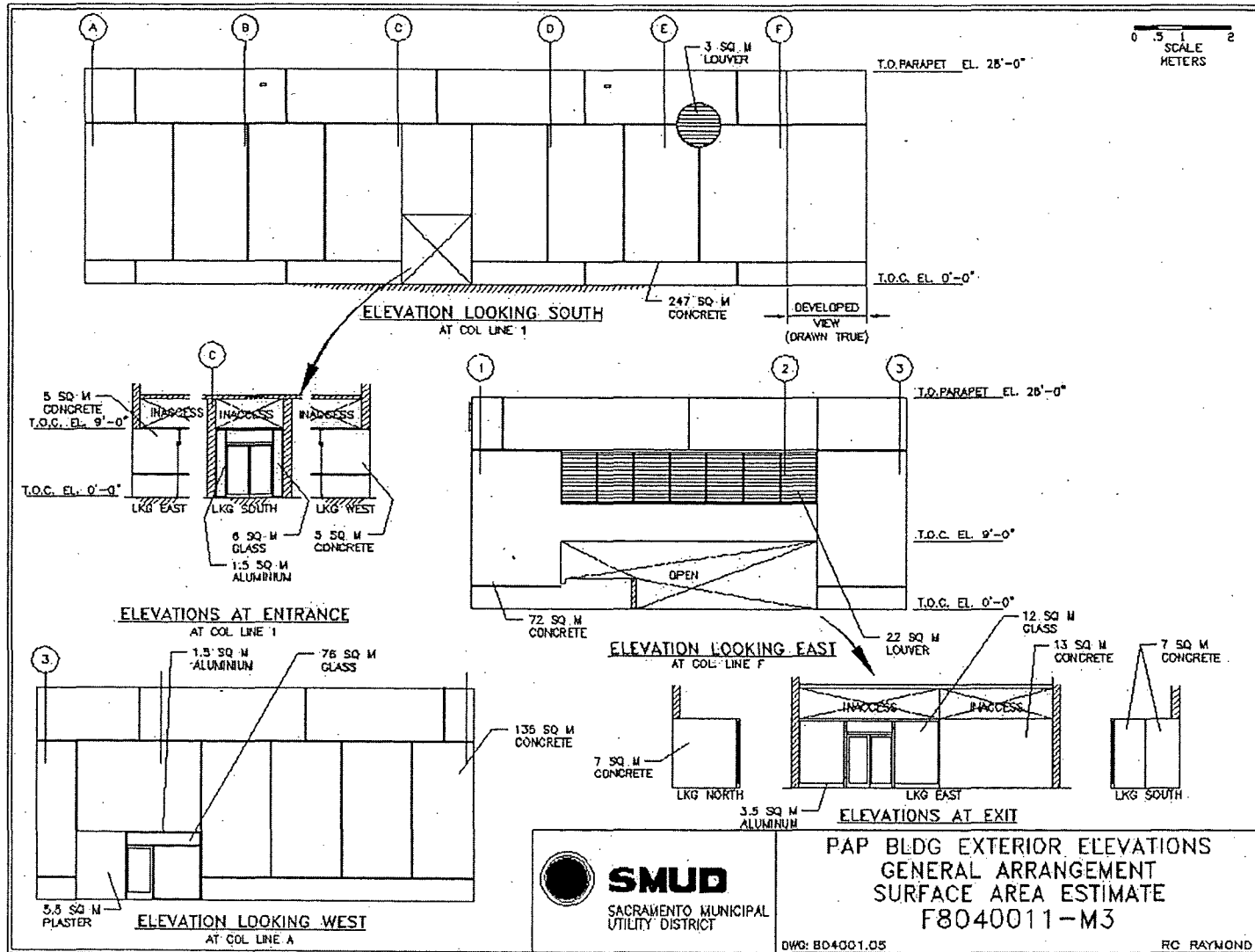
Maps

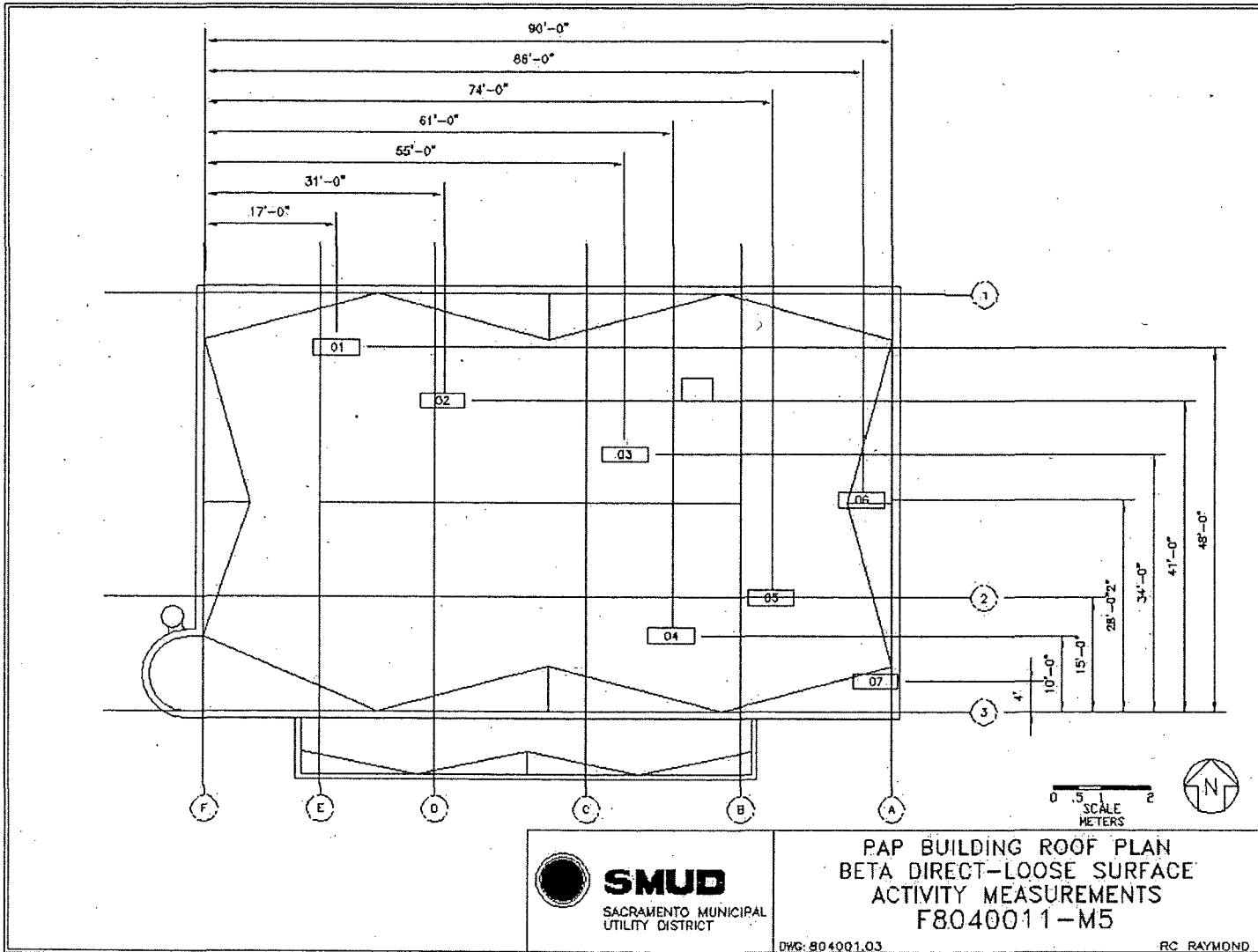
October 31, 2007

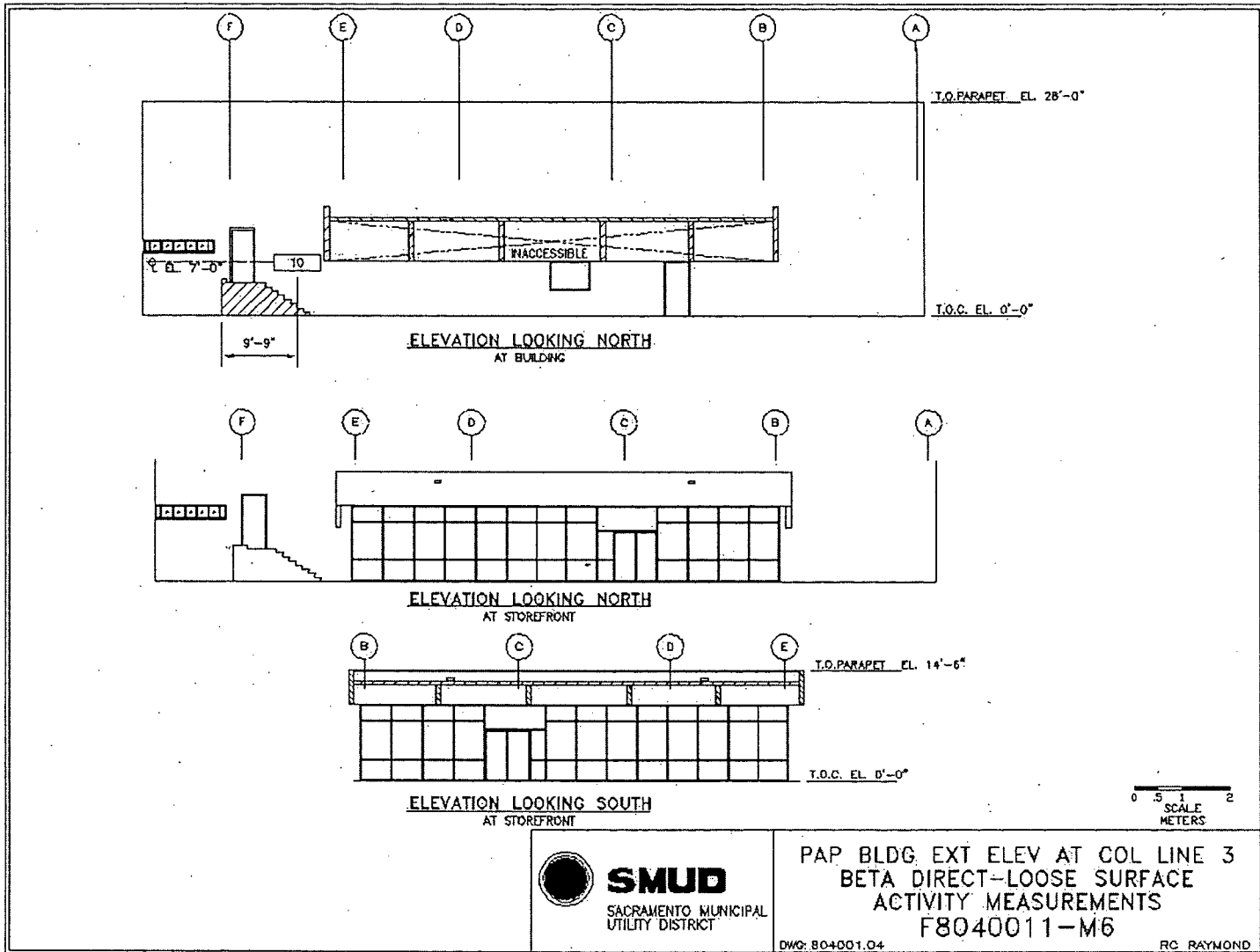
Survey Unit F8040011

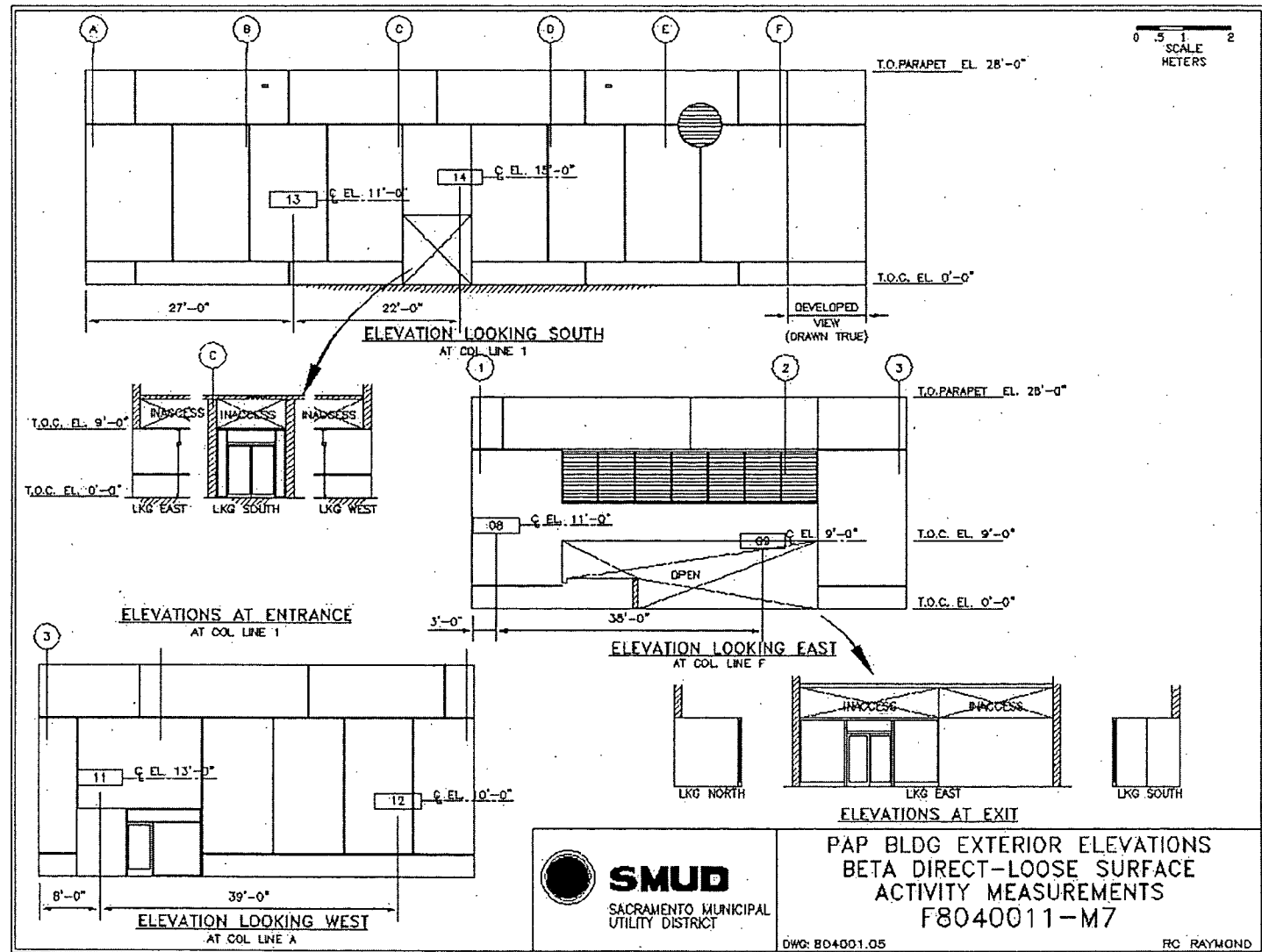


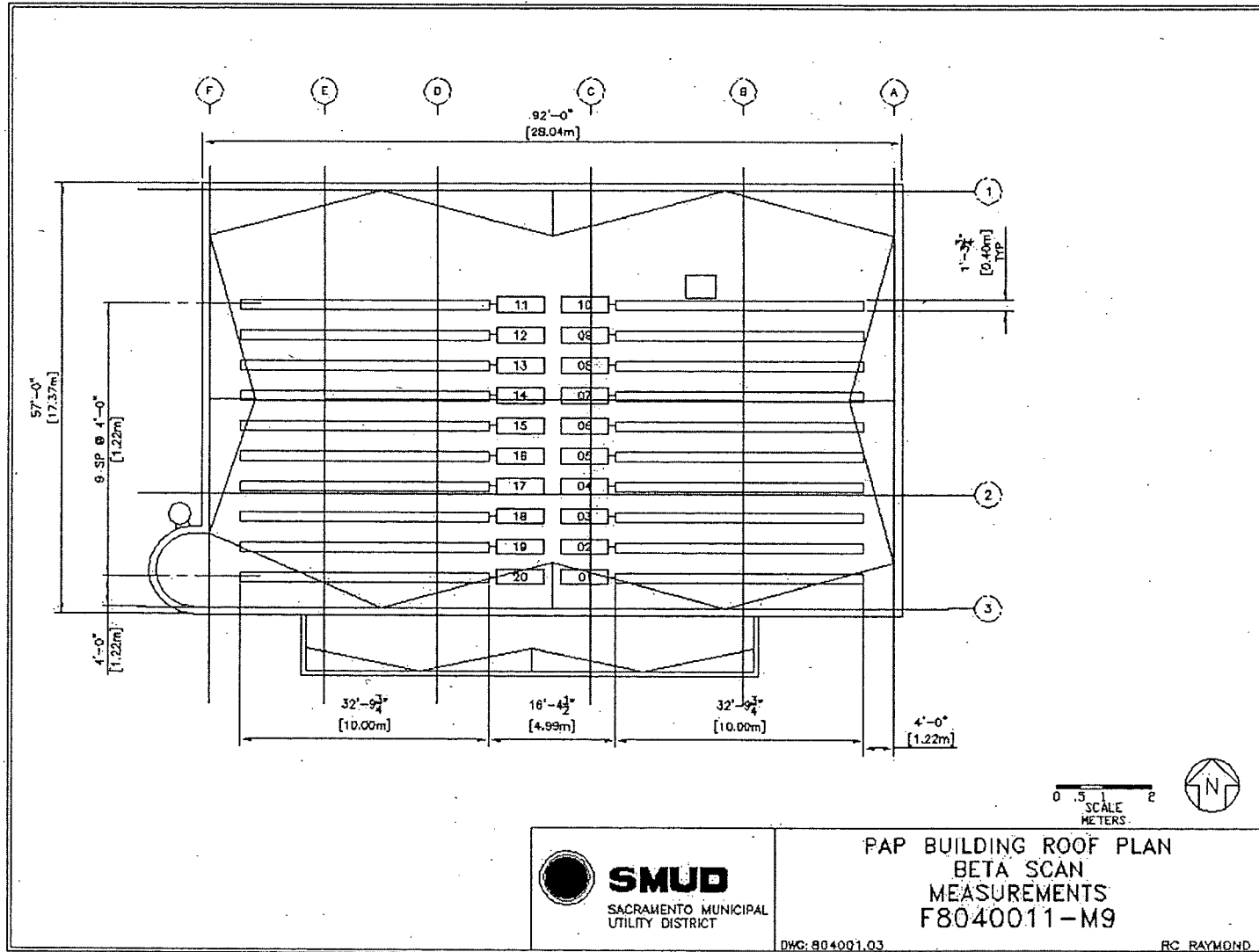


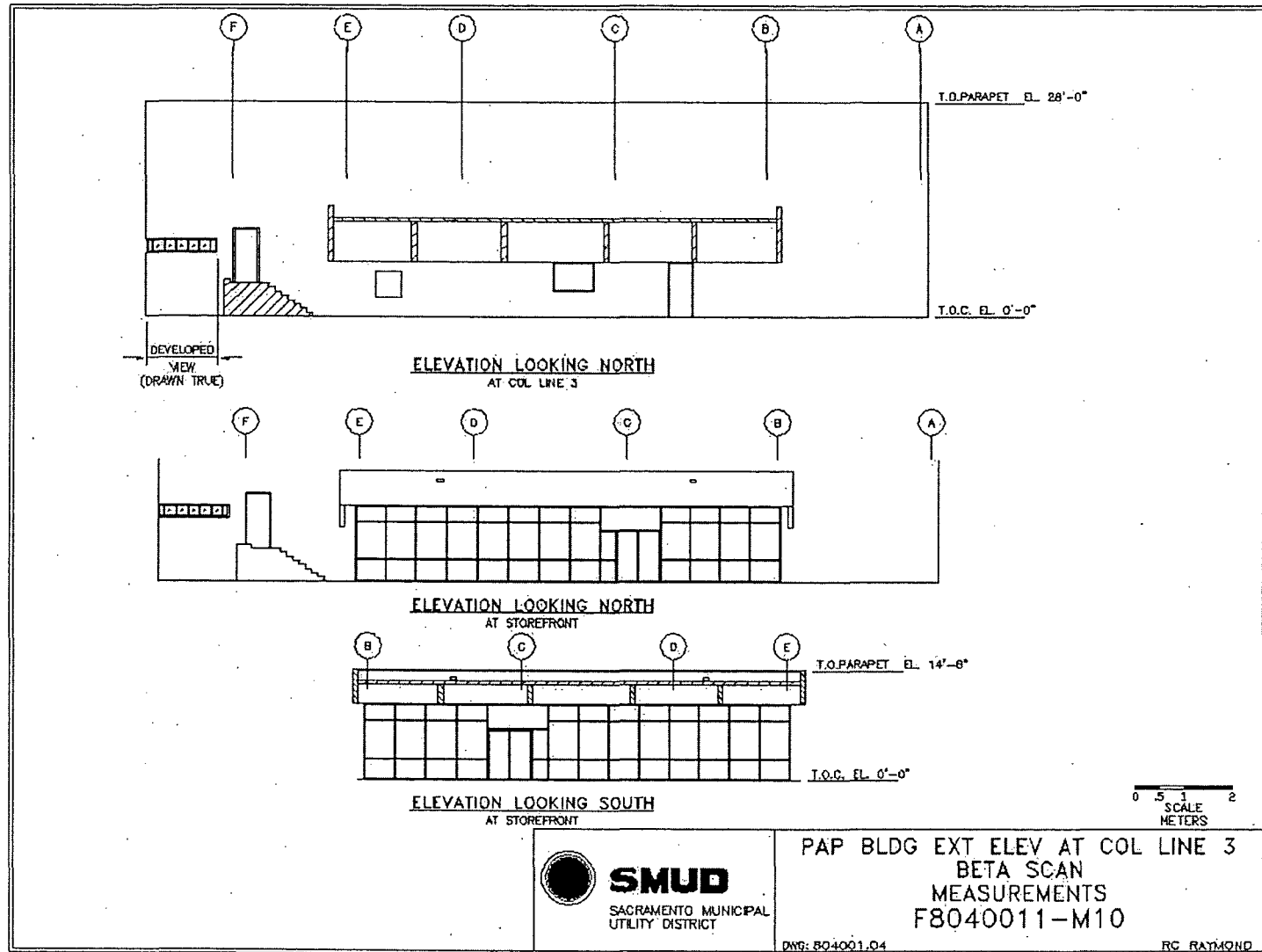


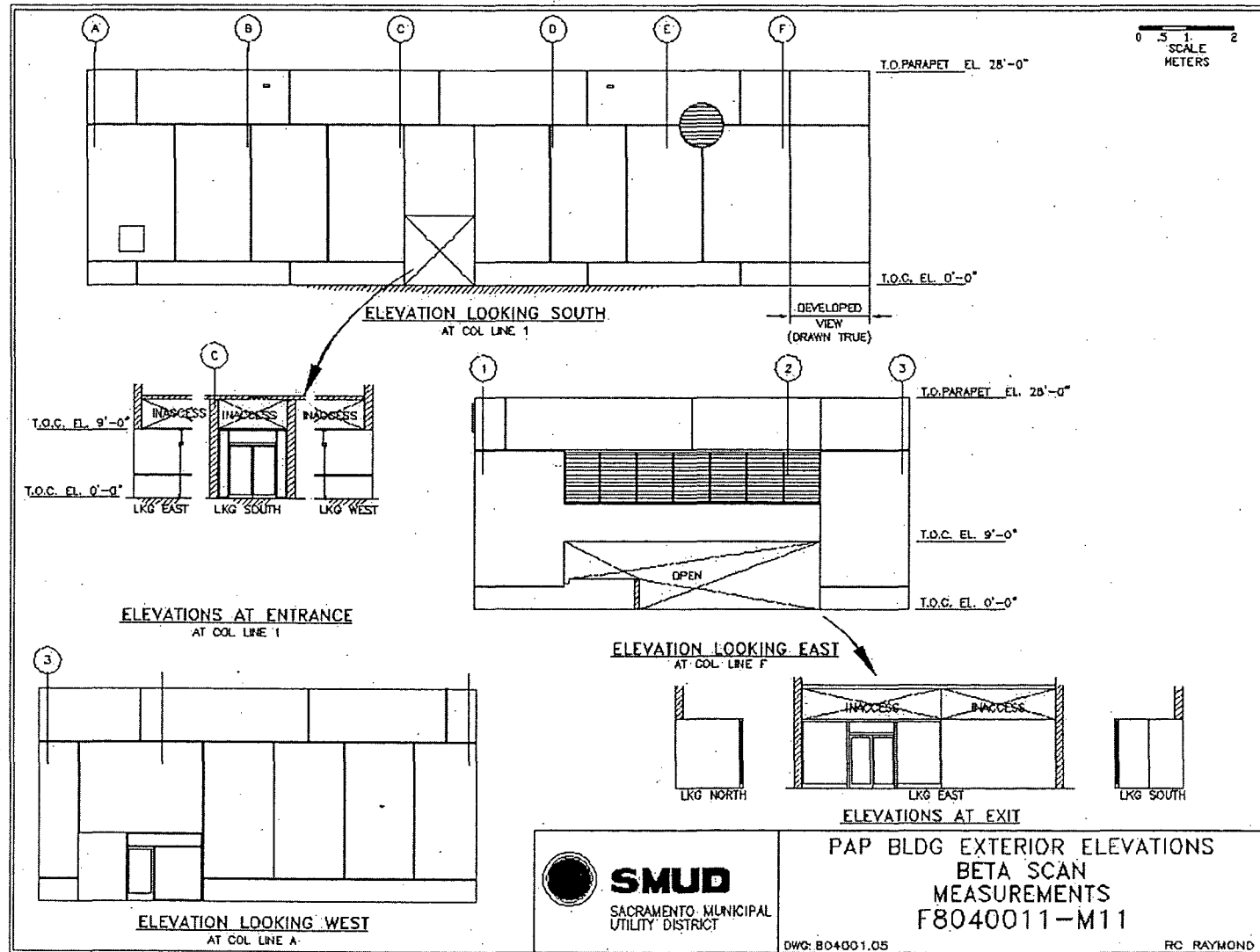












Attachment 2

Instrumentation

October 31, 2007

Survey Unit F8040011

Table 2-1. Survey Unit Instrumentation

Instrument Model; Serial No.	Detector Model; Serial No.	MDC Static (dpm/100 cm²)	MDC Scan (dpm/100 cm²)
M2350; 193715	43-68B; 160703	433	1033
M2350; 142499	43-37; 148502	198	616
Tennelec; 0401171	N/A	5 dpm α , 11 dpm β	N/A

Table 2-2. Investigation Criteria and DCGL

Parameter	Value (dpm/100 cm²)
Investigation Criteria - Direct	21500
Investigation Criteria – Scan	21500
DCGL _w	43000
DCGL _{EMC}	N/A

Attachment 3

Investigation

October 31, 2007

Survey Unit F8040011

(none required)

Attachment 4
Data Assessment
October 31, 2007
Survey Unit F8040011

