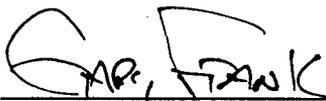
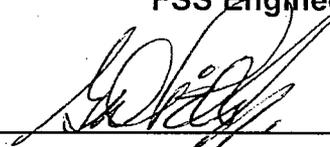
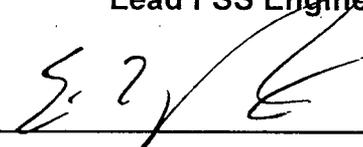


Rancho Seco
Final Status Survey Summary Report
November 5, 2007
Secondary Alarm Station Exterior
Survey Unit F8560001

Prepared By:  Date: 11-5-2007
FSS Engineer

Reviewed By:  Date: 11/5/07
Lead FSS Engineer

Approved By:  Date: 11-13-07
Dismantlement Superintendent, Radiological

FINAL STATUS SURVEY SUMMARY REPORT

Survey Unit:

F8560001, Secondary Alarm Station Exterior

Survey Unit Description:

Operating History: This concrete structure is currently being used to house the secondary security alarm function. Operating records and the HSA document no occurrences of a radioactive material release within this survey area.

Site Characterization: Direct measurements were made of the interior and exterior surfaces of the structure that confirmed the absence of plant-derived radionuclides. Direct measurements interior showed a mean gross activity level of 300 dpm/100 cm² and a maximum value of 2,636 dpm/100 cm². Direct measurements exterior showed a mean gross activity level of 293 dpm/100 cm² and a maximum value of 4,197 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 61 m² were scanned for approximately 34% 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:	F856	Secondary Alarm Station
Survey Unit:	0001	Exterior
Class:	3	Structure Surface
SU Area (m ²):	179	LTP Table 5-4
Evaluator:	Frank	
DCGL (dpm/100 cm ²):	43000	Gross Activity DCGL
Area Factor:	N/A	Class 3
Design DCGL _{emc} (dpm/100 cm ²):	N/A	Class 3
LBGR (dpm/100 cm ²):	21500	Default = 50% DCGL
Design Sigma (dpm/100 cm ²):	4317	
Type I Error:	0.05	
Type II Error:	0.05	
Predominant Nuclide:	Cs-137	
Sample Area (m ²):	N/A	Class 3
Scan Area (m ²):	61	
Scan Coverage (%):	34%	Class 3
Z _{1-α} :	1.645	
Z _{1-β} :	1.645	
Sign P:	0.99865	
Calculated Relative Shift:	4.9	
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 F8560001. 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 1962 to 3058 dpm/100 cm², based on a surveyor efficiency of 0.5 and 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)
F8560001-C0001BD	2531
F8560001-C0002BD	2350
F8560001-Q0003BD	831
F8560001-C0004BD	2412
F8560001-Q0005BD	827
F8560001-Q0006BD	874
F8560001-C0007BD	2334
F8560001-C0008BD	2355
F8560001-Q0009BD	843
F8560001-C0010BD	2334
F8560001-C0011BD	2371
F8560001-C0012BD	2495
F8560001-C0013BD	2417
F8560001-Q0014BD	966
Mean:	1853
Median:	2342
Standard Deviation:	764
Range:	827 - 2531

Table 3. Removable Surface Activity Results

Measurement ID	Surface Beta Activity (dpm/100 cm²)
F8560001C0001SM	1.01
F8560001C0002SM	7.42
F8560001Q0003SM	6.14
F8560001C0004SM	2.29
F8560001Q0005SM	2.29
F8560001Q0006SM	7.42
F8560001C0007SM	-1.55
F8560001C0008SM	2.29
F8560001Q0009SM	8.7
F8560001C0010SM	2.29
F8560001C0011SM	7.42
F8560001C0012SM	7.42
F8560001C0013SM	1.01
F8560001Q0014SM	6.14
Mean:	4.31
Median:	4.22
Standard Deviation:	3.25
Range:	-1.55 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 less than the design standard deviation 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):	2342		
Mean (dpm/100 cm ²):	2066		
Direct Measurement Standard Deviation (dpm/100 cm ²):	472		
Total Standard Deviation (dpm/100 cm ²):	472		Based on samples and backgrounds.
Maximum (dpm/100 cm ²):	2531		Background Subtract Not Applied
Material Type:	N/A		
Sign Test Final N Value:	14		Class 3
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:	Yes		
Pass the Sign Test?	Yes		
Reject the Null Hypothesis?	Yes		
Does the Survey Unit Pass All Criteria?	Yes		

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 less 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.

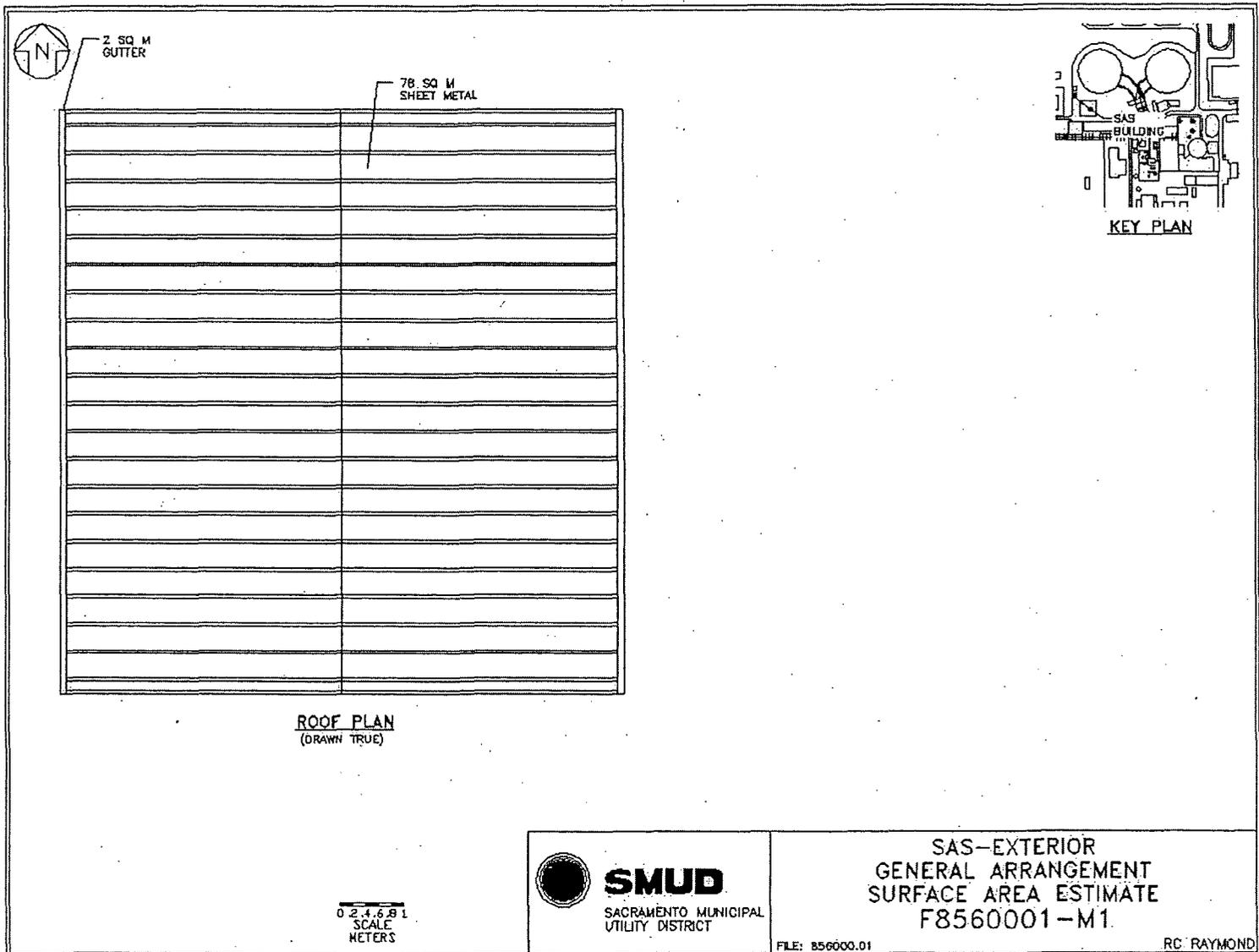
It is concluded that survey unit F8560001 meets the release criteria of 10CFR20.1402.

Attachment 1

Maps

November 5, 2007

Survey Unit F8560001



ROOF PLAN
(DRAWN TRUE)

0 2 4 6 8 1
SCALE
METERS

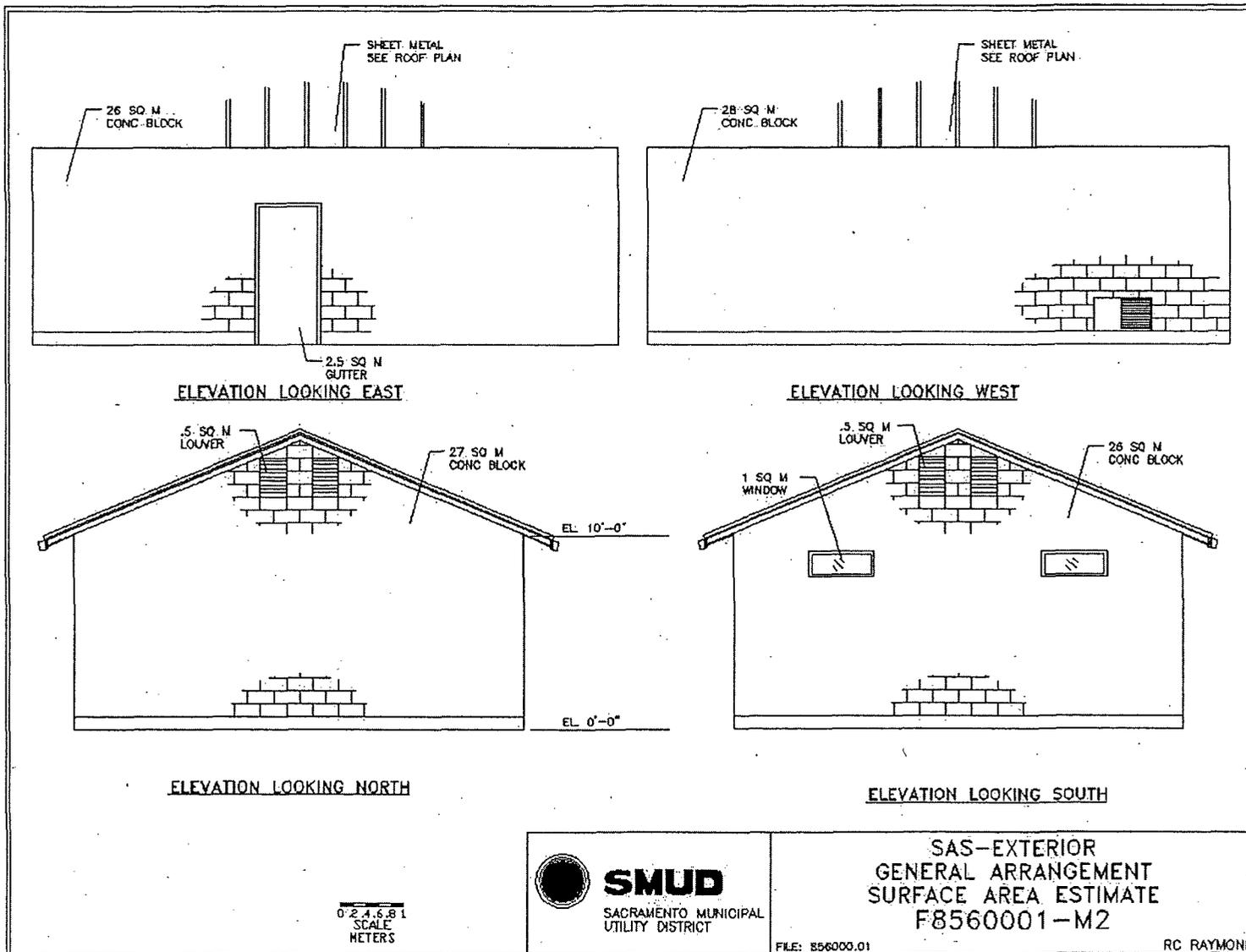


SMUD
SACRAMENTO MUNICIPAL
UTILITY DISTRICT

SAS-EXTERIOR
GENERAL ARRANGEMENT
SURFACE AREA ESTIMATE
F8560001-M1

FILE: 856000.01

RC RAYMOND

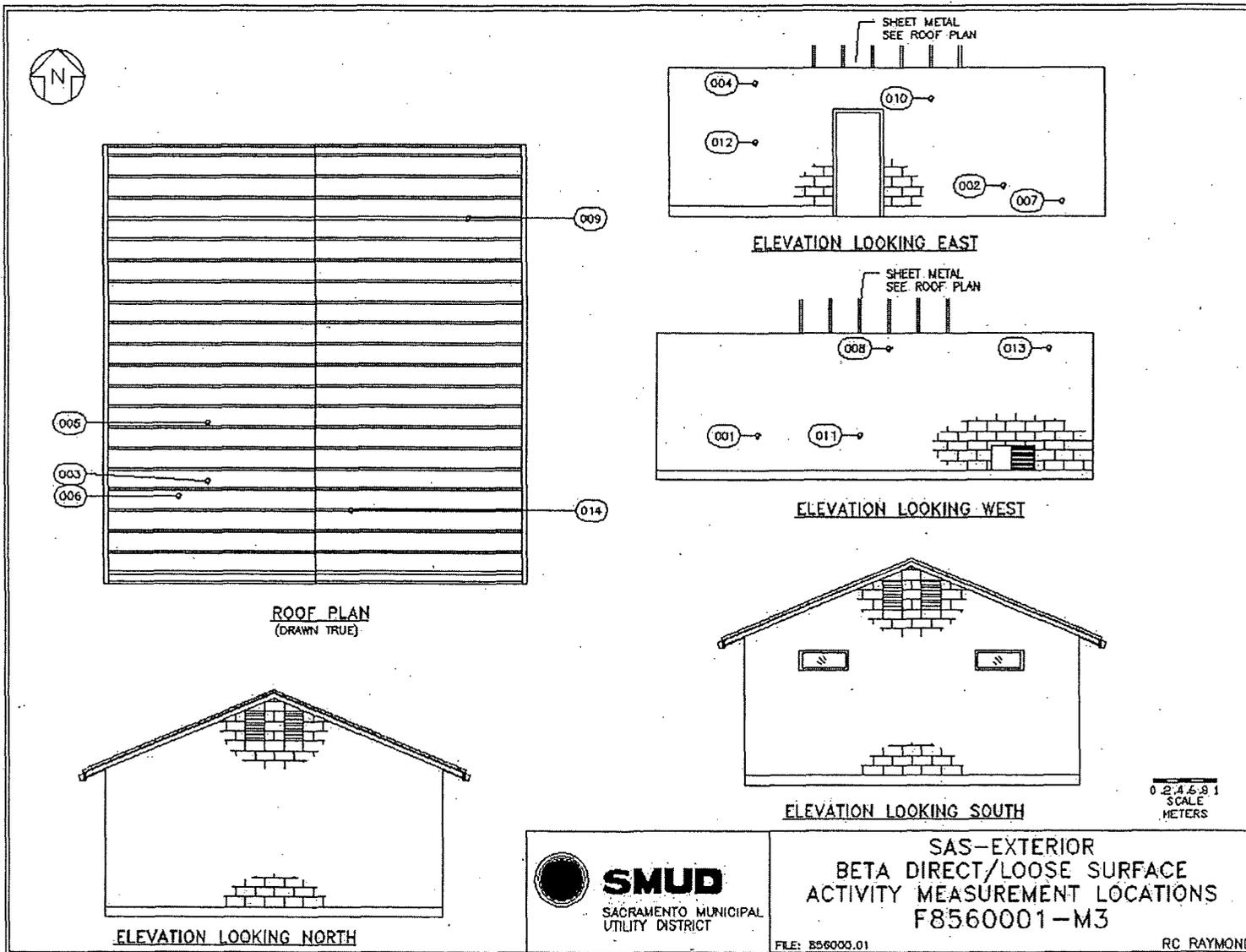


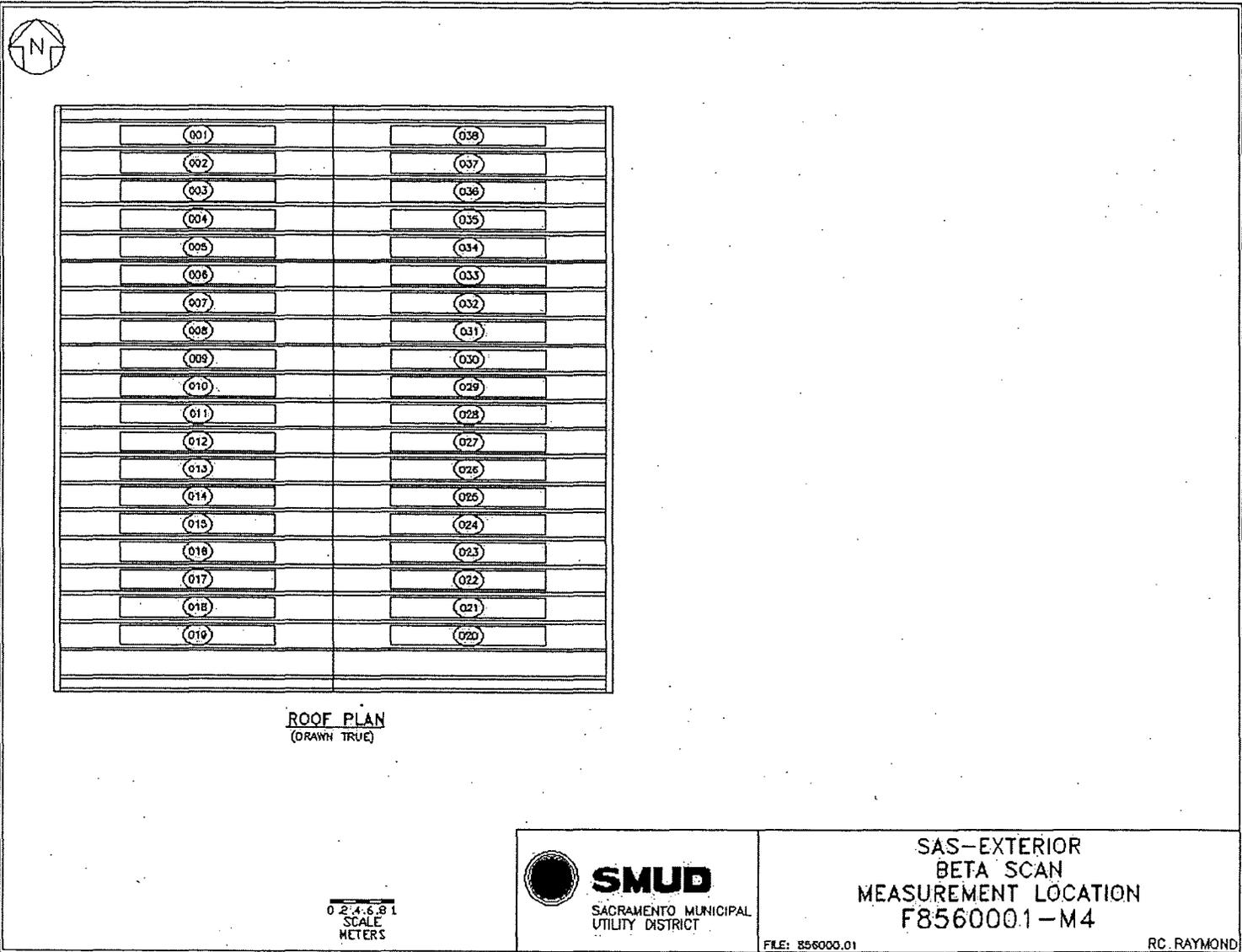
SMUD
SACRAMENTO MUNICIPAL
UTILITY DISTRICT

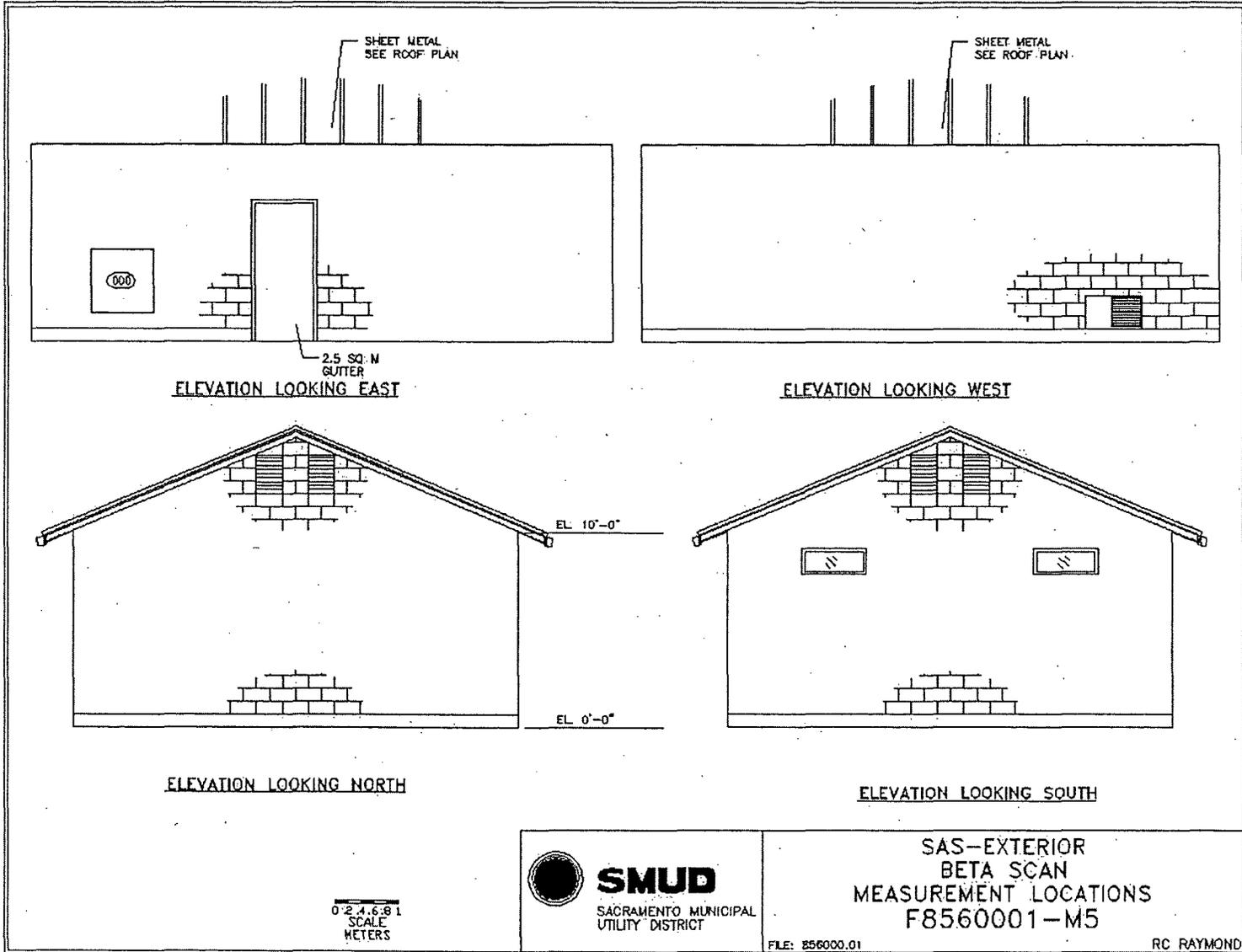
SAS-EXTERIOR
GENERAL ARRANGEMENT
SURFACE AREA ESTIMATE
F8560001-M2

FILE: 856000.01

RC RAYMOND







Attachment 2

Instrumentation

November 5, 2007

Survey Unit F8560001

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; 203465 Concrete	43-68B; 148458	433	1033
M2350, 203465 Metal	43-68B, 148458	257	612
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

November 5, 2007

Survey Unit F8560001

(none required)

Attachment 4
Data Assessment
November 5, 2007
Survey Unit F8560001

