ATTACHMENT ~~I~~ G2
APPENDIX E

DESIGN DRAWINGS

SHAFT SEALING SYSTEM
COMPLIANCE SUBMITTAL DESIGN REPORT

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Unlimited Release
Printed August 1996

Distribution
Category UC-721

Waste Isolation Pilot Plant
Shaft Sealing System
Compliance Submittal Design Report

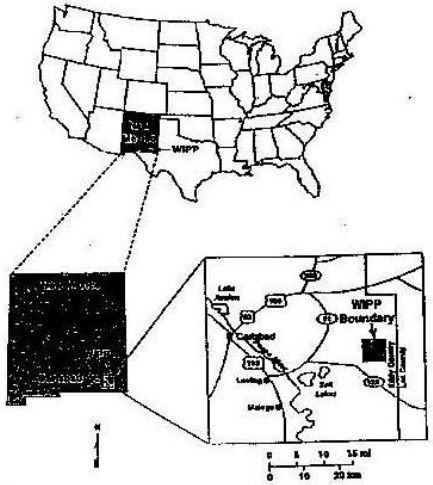
Volume 2 of 2:
Appendix E

Repository Isolation Systems Department
Sandia National Laboratories
Albuquerque, NM 87185

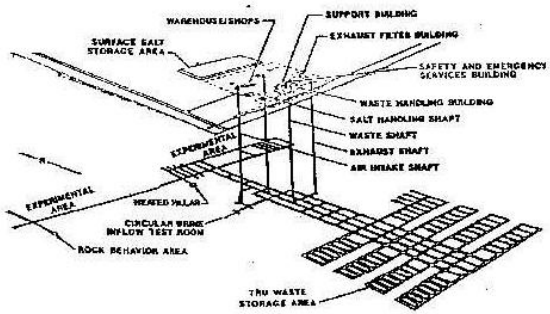
ABSTRACT

This is the second volume of a two-volume report describing a shaft sealing system design for the Waste Isolation Pilot Plant. This appendix contains detailed drawings of the shaft sealing system and its components.

1



WIPP LAYOUT



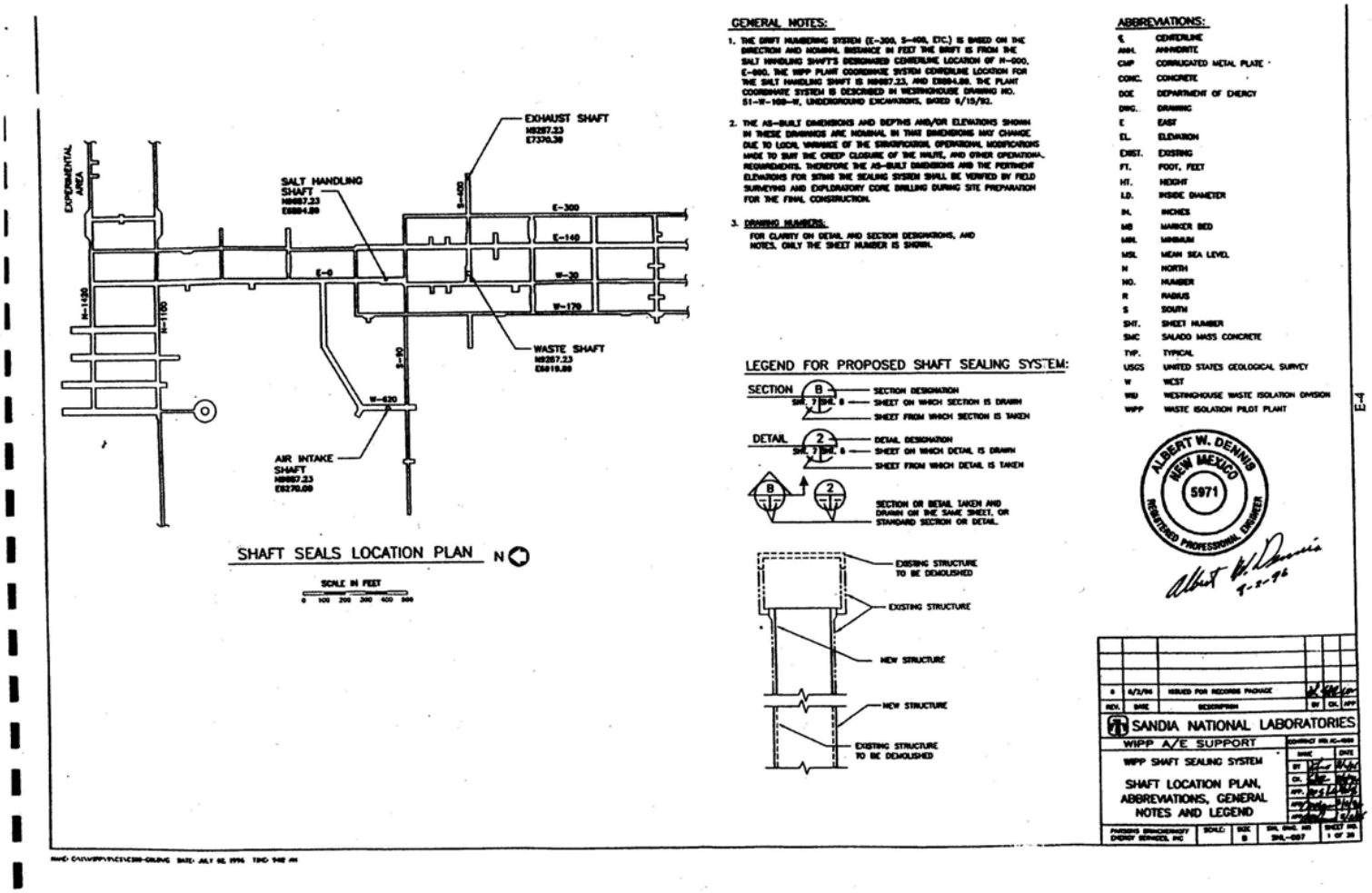
WASTE ISOLATION PILOT PLANT

CARLSBAD, NM

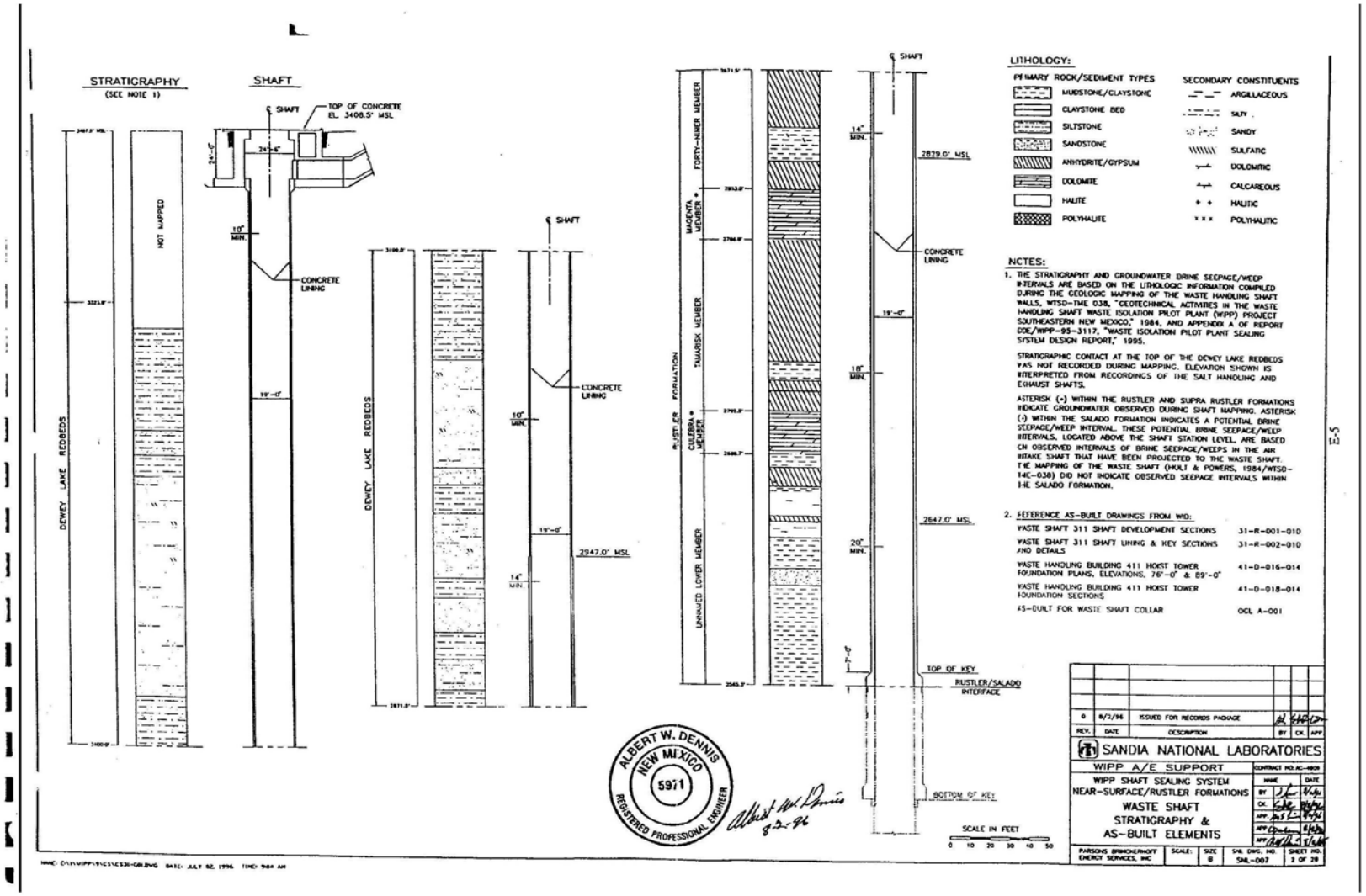
SHAFT SEALING SYSTEM DESIGN

DESIGN DRAWINGS

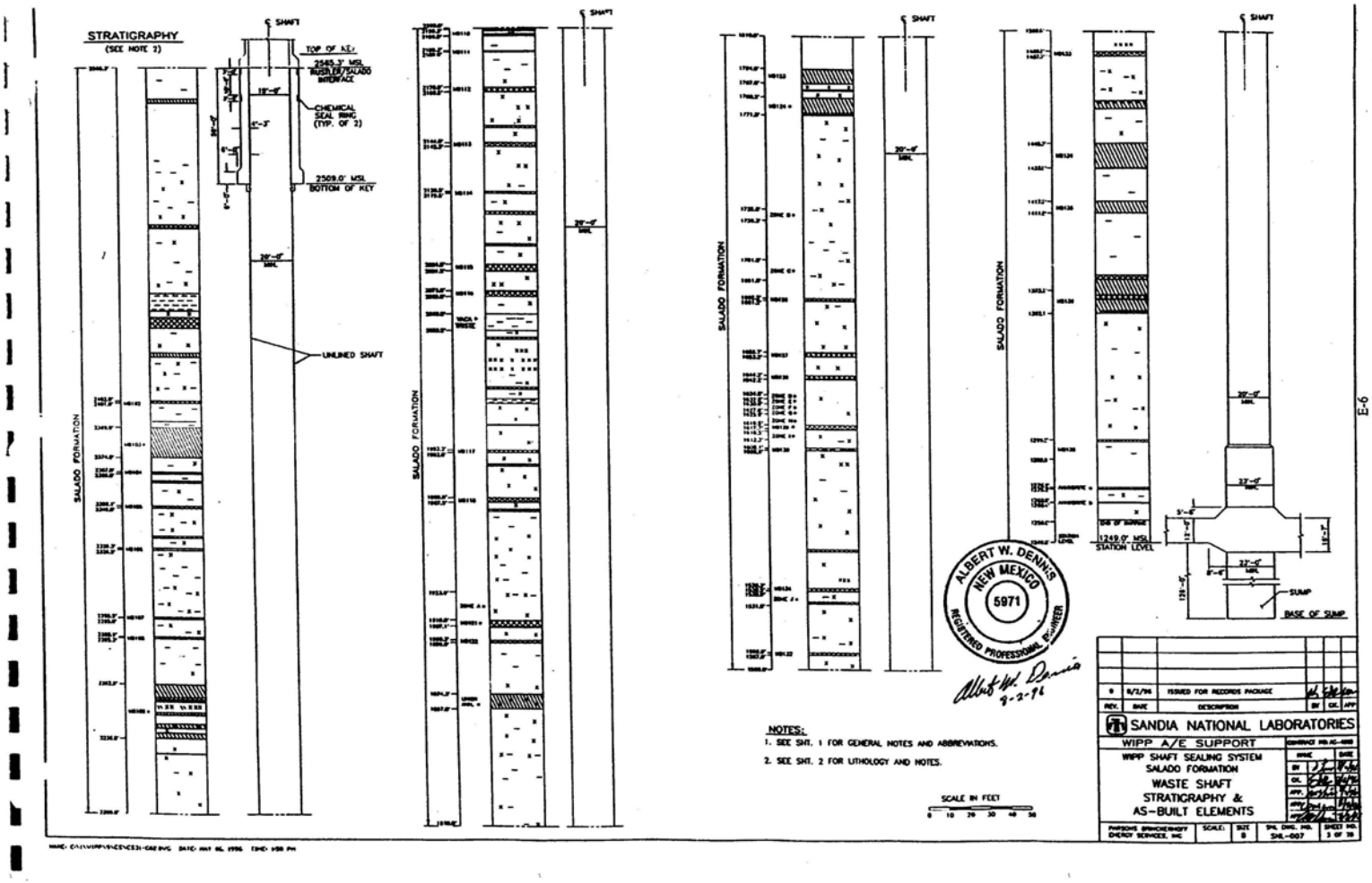
DRAWING NUMBER	TITLE
SNL-007 1 OF 28	WIPP SHAFT SEALING SYSTEM SHAFT LOCATION PLAN, ABBREVIATIONS, GENERAL NOTES AND LEGEND
SNL-007 2 OF 28	WIPP SHAFT SEALING SYSTEM NEAR-SURFACE/RUSTLER FORMATIONS WASTE SHAFT STRATIGRAPHY & AS-BUILT ELEMENTS
SNL-007 3 OF 28	WIPP SHAFT SEALING SYSTEM SALADO FORMATION WASTE SHAFT STRATIGRAPHY & AS-BUILT ELEMENTS
SNL-007 4 OF 28	WIPP SHAFT SEALING SYSTEM NEAR-SURFACE/RUSTLER FORMATIONS WASTE SHAFT STRATIGRAPHY & SEALING SUBSYSTEM PROFILE
SNL-007 5 OF 28	WIPP SHAFT SEALING SYSTEM SALADO FORMATION WASTE SHAFT STRATIGRAPHY & SEALING SUBSYSTEM PROFILE
SNL-007 6 OF 28	WIPP SHAFT SEALING SYSTEM WASTE SHAFT SHAFT STATION MONOLITH
SNL-007 7 OF 28	WIPP SHAFT SEALING SYSTEM NEAR-SURFACE/RUSTLER FORMATIONS AIR INTAKE SHAFT STRATIGRAPHY & AS-BUILT ELEMENTS
SNL-007 8 OF 28	WIPP SHAFT SEALING SYSTEM SALADO FORMATION AIR INTAKE SHAFT STRATIGRAPHY & AS-BUILT ELEMENTS
SNL-007 9 OF 28	WIPP SHAFT SEALING SYSTEM NEAR-SURFACE/RUSTLER FORMATIONS AIR INTAKE SHAFT STRATIGRAPHY & SEALING SUBSYSTEM PROFILE
SNL-007 10 OF 28	WIPP SHAFT SEALING SYSTEM SALADO FORMATION AIR INTAKE SHAFT STRATIGRAPHY & SEALING SUBSYSTEM PROFILE
SNL-007 11 OF 28	WIPP SHAFT SEALING SYSTEM AIR INTAKE SHAFT SHAFT STATION MONOLITH
SNL-007 12 OF 28	WIPP SHAFT SEALING SYSTEM NEAR-SURFACE/RUSTLER FORMATIONS EXHAUST SHAFT STRATIGRAPHY & AS-BUILT ELEMENTS
SNL-007 13 OF 28	WIPP SHAFT SEALING SYSTEM SALADO FORMATION EXHAUST SHAFT STRATIGRAPHY & AS-BUILT ELEMENTS
SNL-007 14 OF 28	WIPP SHAFT SEALING SYSTEM NEAR-SURFACE/RUSTLER FORMATIONS EXHAUST SHAFT STRATIGRAPHY & SEALING SUBSYSTEM PROFILE
SNL-007 15 OF 28	WIPP SHAFT SEALING SYSTEM SALADO FORMATION EXHAUST SHAFT STRATIGRAPHY & SEALING SUBSYSTEM PROFILE
SNL-007 16 OF 28	WIPP SHAFT SEALING SYSTEM EXHAUST SHAFT SHAFT STATION MONOLITH
SNL-007 17 OF 28	WIPP SHAFT SEALING SYSTEM NEAR-SURFACE/RUSTLER FORMATIONS SALT HANDLING SHAFT STRATIGRAPHY & AS-BUILT ELEMENTS
SNL-007 18 OF 28	WIPP SHAFT SEALING SYSTEM SALADO FORMATION SALT HANDLING SHAFT STRATIGRAPHY & AS-BUILT ELEMENTS
SNL-007 19 OF 28	WIPP SHAFT SEALING SYSTEM NEAR-SURFACE/RUSTLER FORMATIONS SALT HANDLING SHAFT STRATIGRAPHY & SEALING SUBSYSTEM PROFILE
SNL-007 20 OF 28	WIPP SHAFT SEALING SYSTEM SALADO FORMATION SALT HANDLING SHAFT STRATIGRAPHY & SEALING SUBSYSTEM PROFILE
SNL-007 21 OF 28	WIPP SHAFT SEALING SYSTEM SALT HANDLING SHAFT SHAFT STATION MONOLITH
SNL-007 22 OF 28	WIPP SHAFT SEALING SYSTEM CONCRETE-ASPHALT WATERSTOP IN SALADO FORMATION
SNL-007 23 OF 28	WIPP SHAFT SEALING SYSTEM ASPHALT COLUMN
SNL-007 24 OF 28	WIPP SHAFT SEALING SYSTEM UPPER AND LOWER SALADO COMPACTED CLAY COLUMNS
SNL-007 25 OF 28	WIPP SHAFT SEALING SYSTEM COMPACTED SALT COLUMN
SNL-007 26 OF 28	WIPP SHAFT SEALING SYSTEM CONCRETE PLUG
SNL-007 27 OF 28	WIPP SHAFT SEALING SYSTEM RUSTLER COMPACTED CLAY COLUMN
SNL-007 28 OF 28	WIPP SHAFT SEALING SYSTEM COMPACTED EARTHEN FILL AND CONCRETE PLUG



1 Shaft Location Plan, Abbreviations, General Notes and Legend Sheet 1 of 28



Near-Surface/Rustler Formations Waste Shaft Stratigraphy and AS-Built Elements Sheet 2 of 28



Salado Formation Waste Shaft Stratigraphy and AS-Built Elements

Sheet 3 of 28

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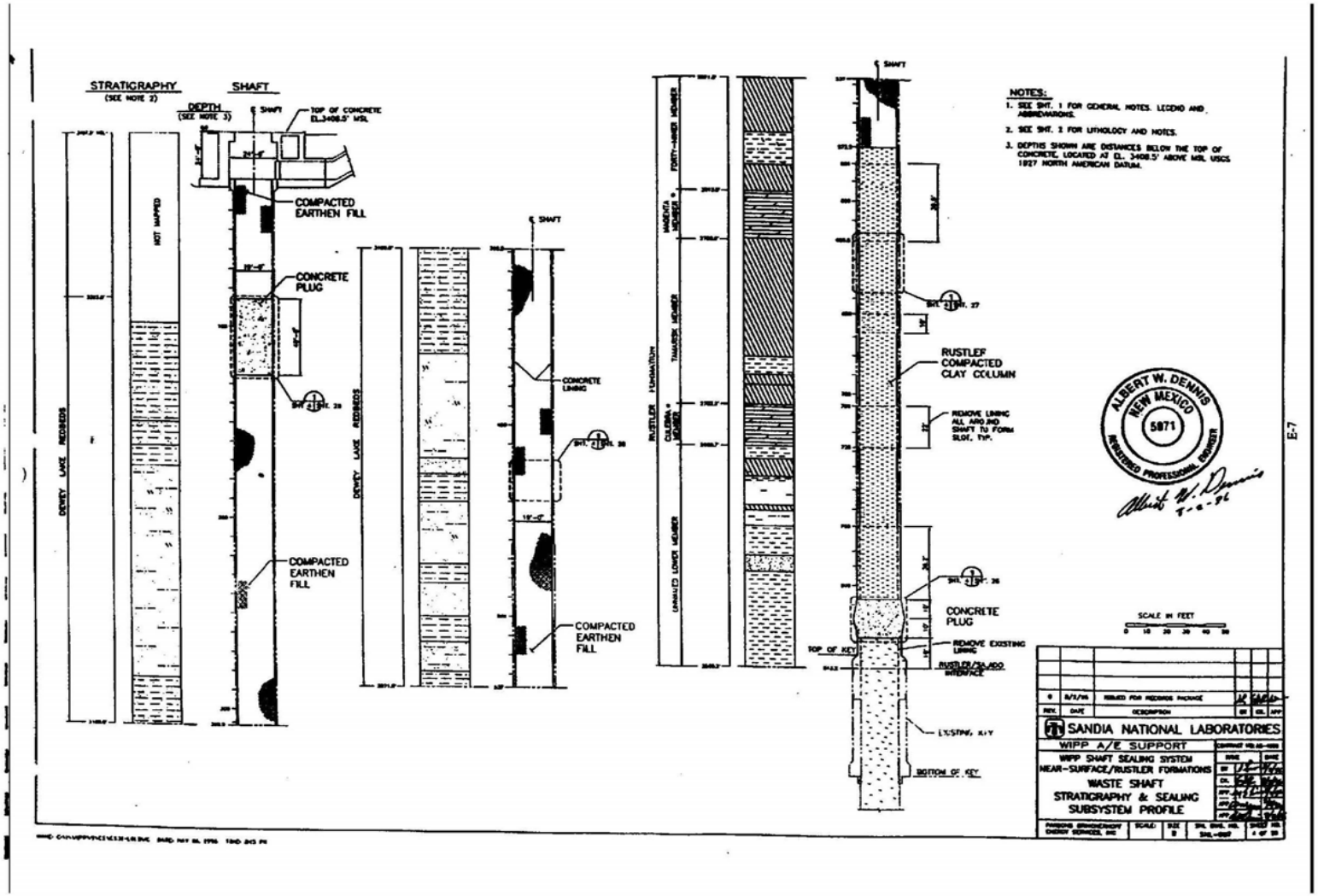
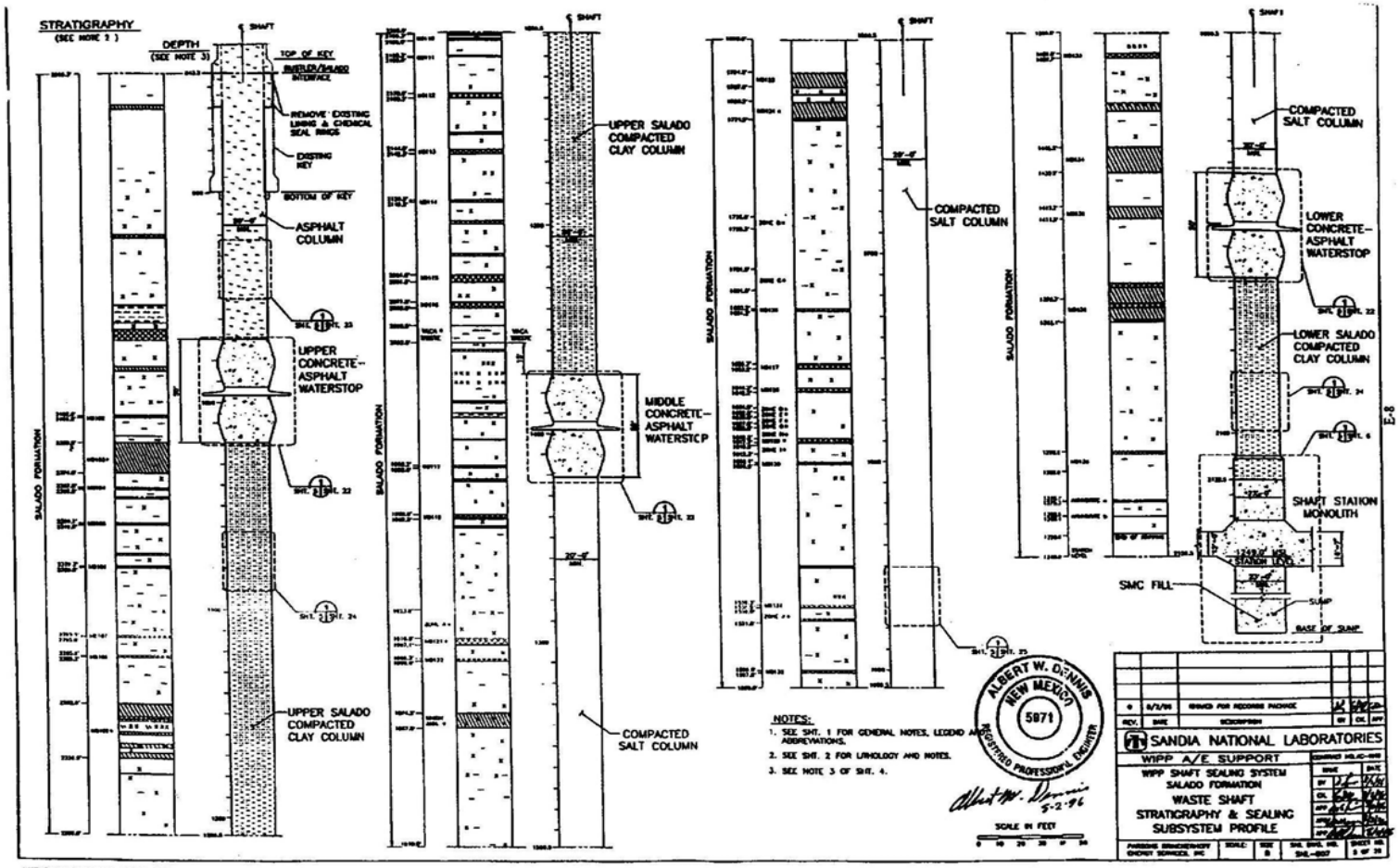


Near-Surface/Rustler Formations Waste Shaft Stratigraphy and Sealing Subsystem Profile Sheet 4 of 28



Salado Formation Waste Shaft Stratigraphy and Sealing Subsystem Profile Sheet 5 of 28

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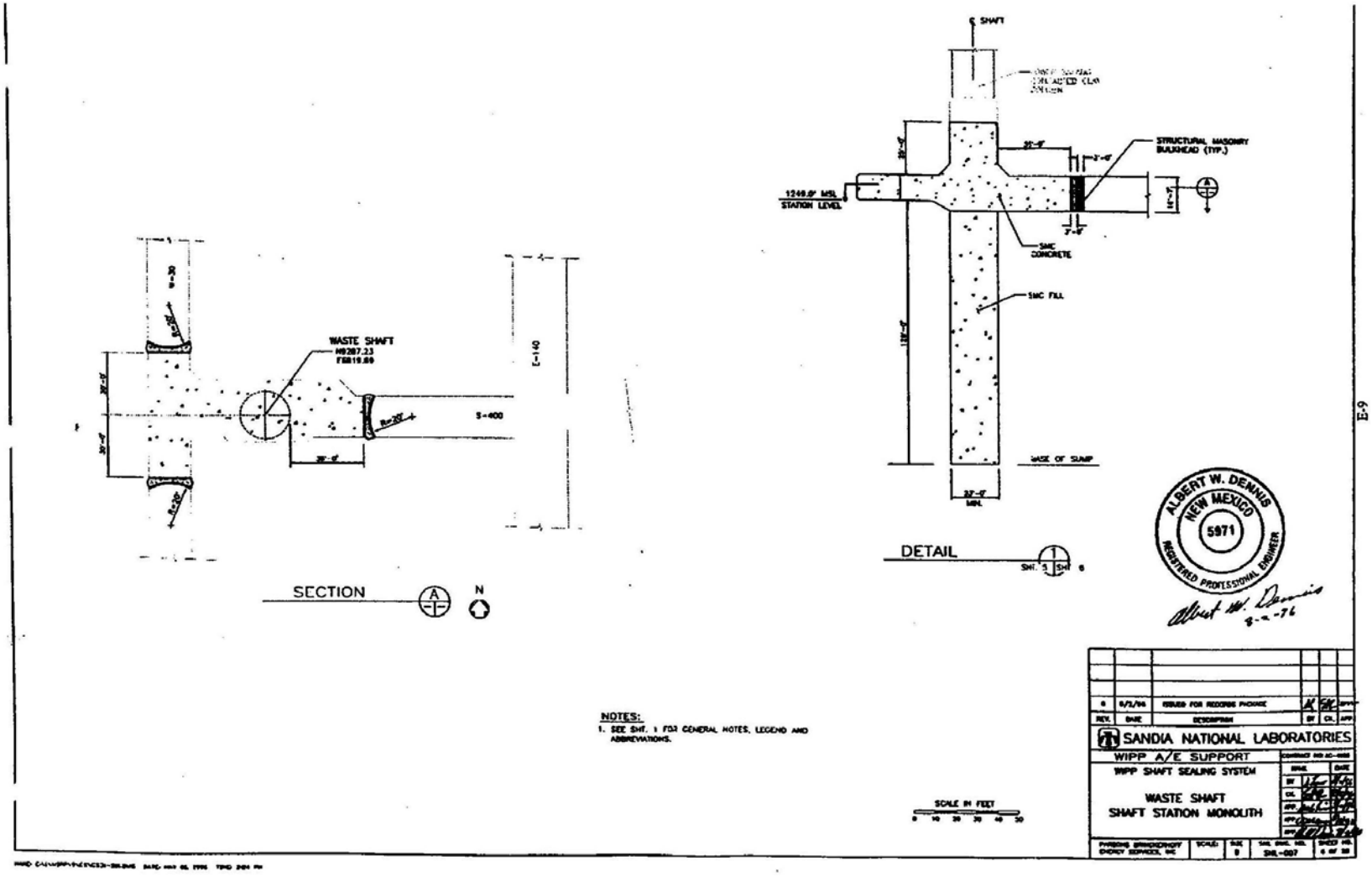
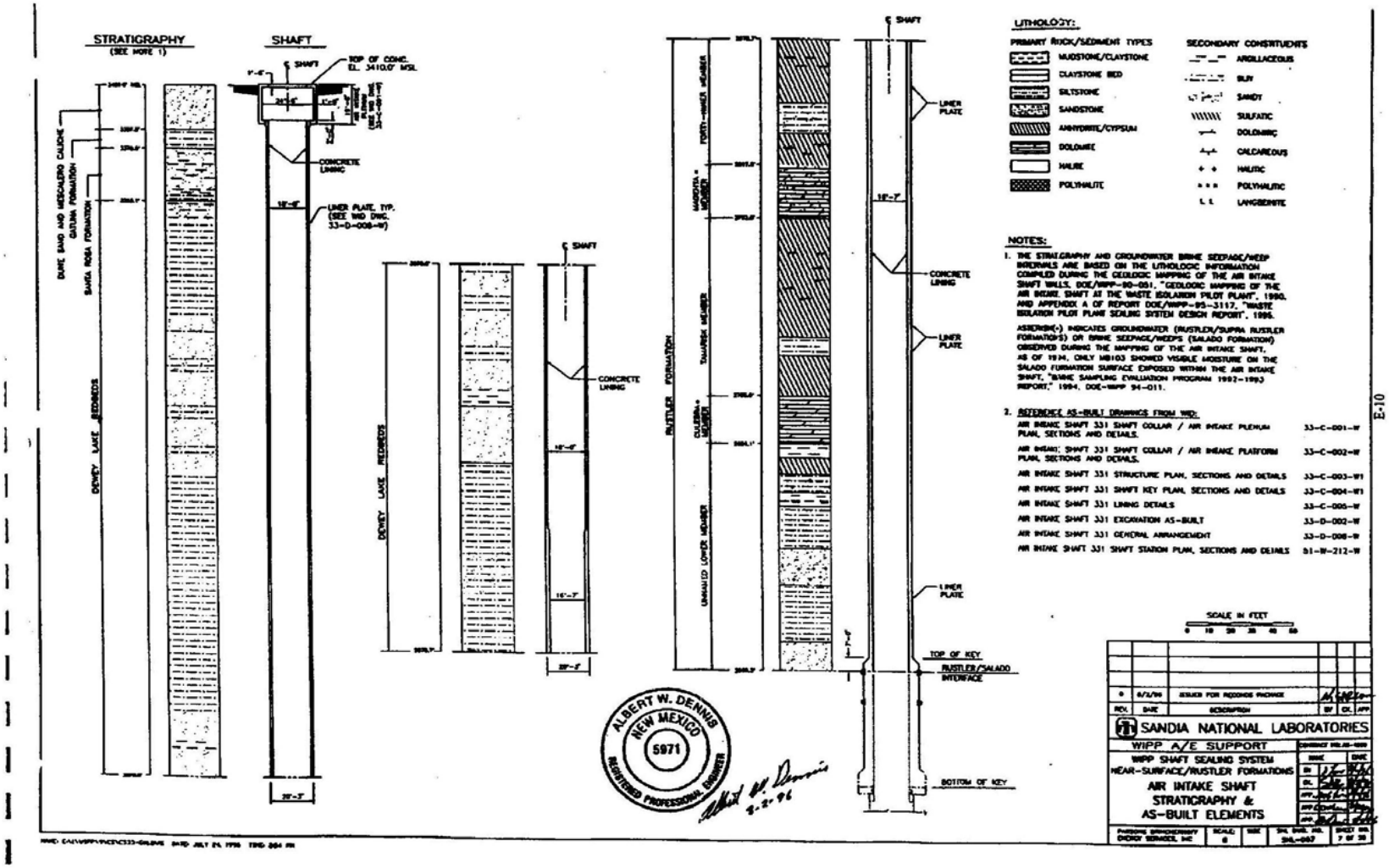


Waste Shaft Station Monolith

Sheet 6 of 28



Near-Surface / Rustler Formations Air Intake Shaft Stratigraphy and AS-Built Elements Sheet 7 of 28

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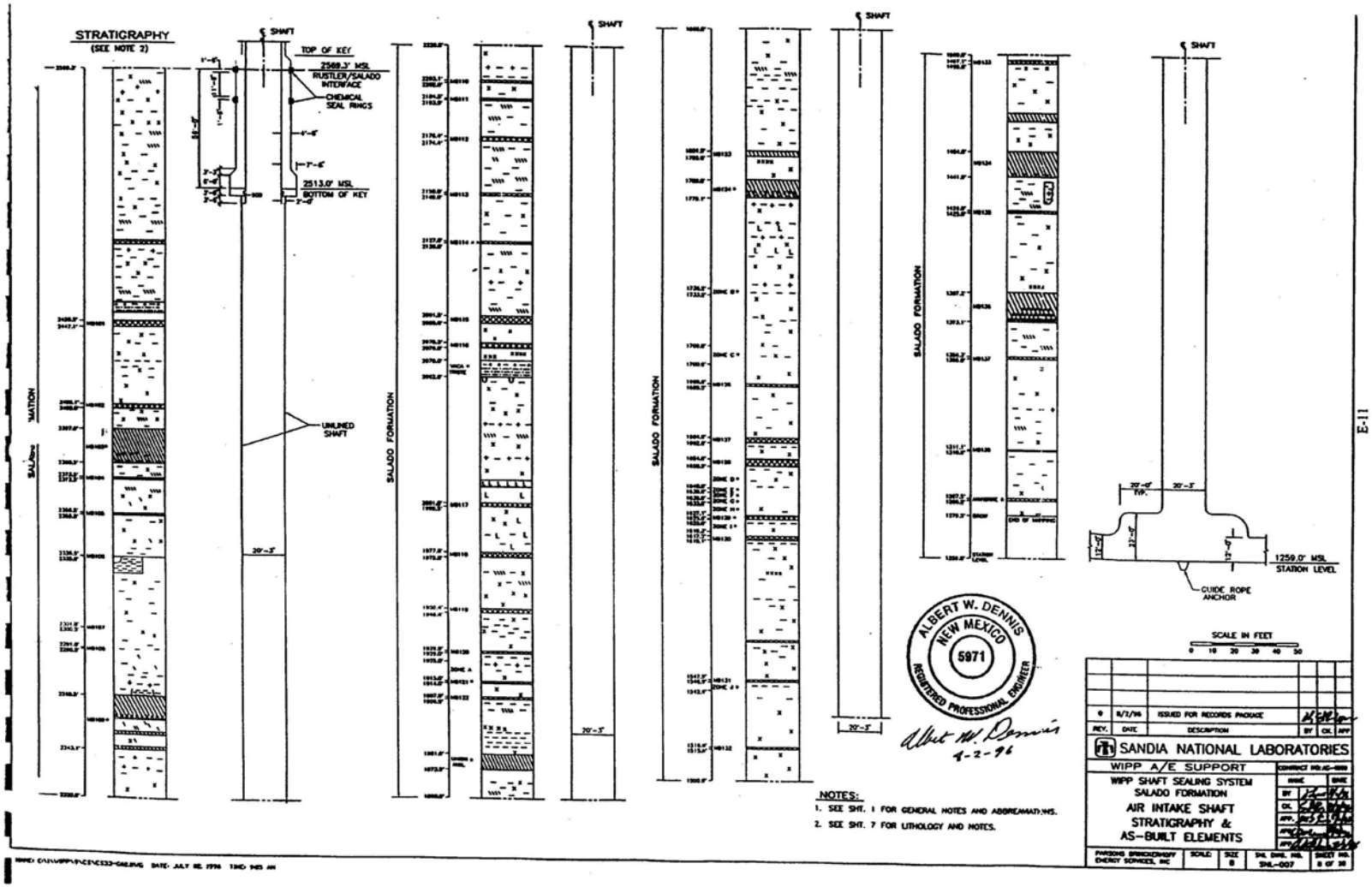
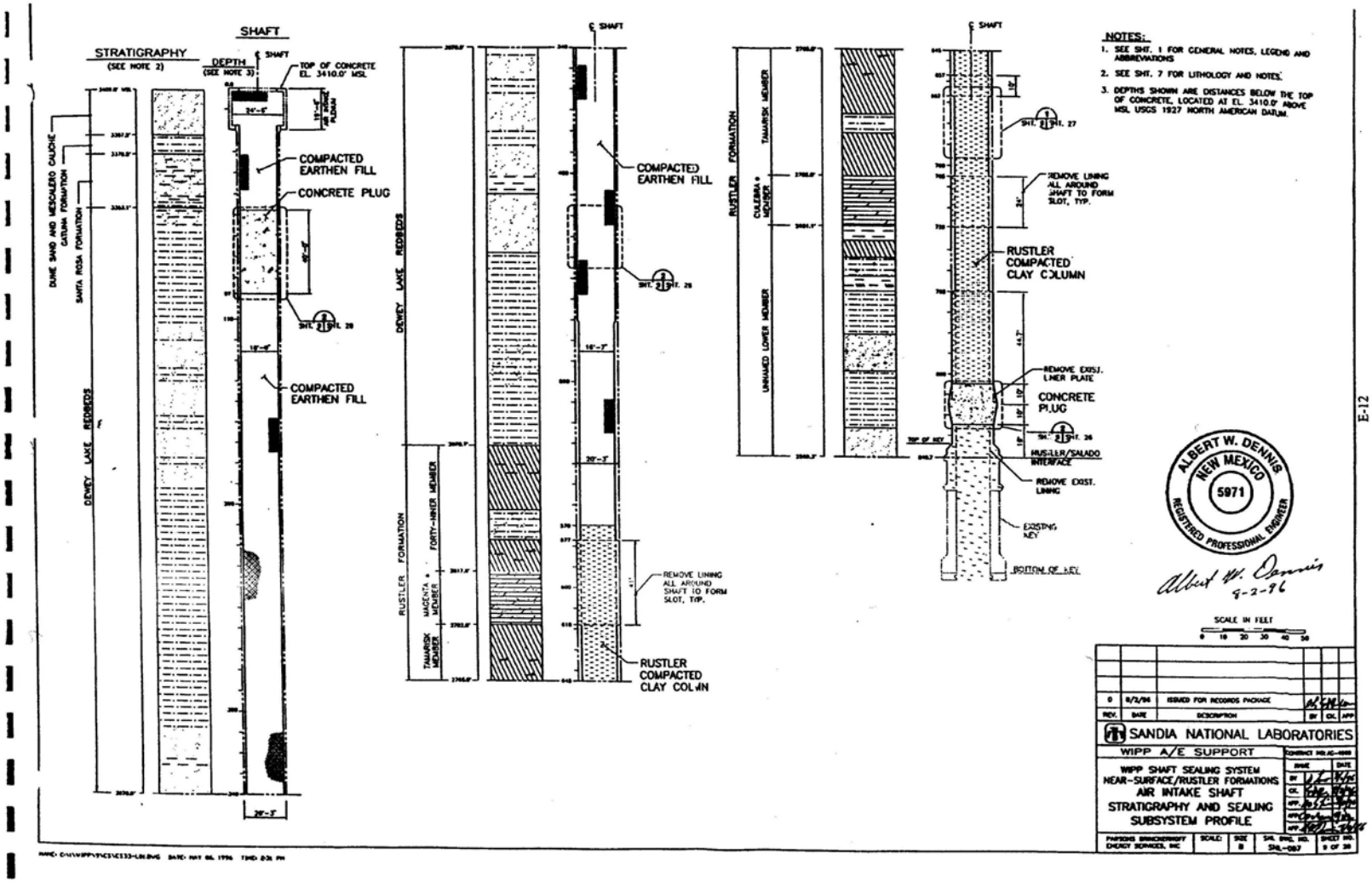


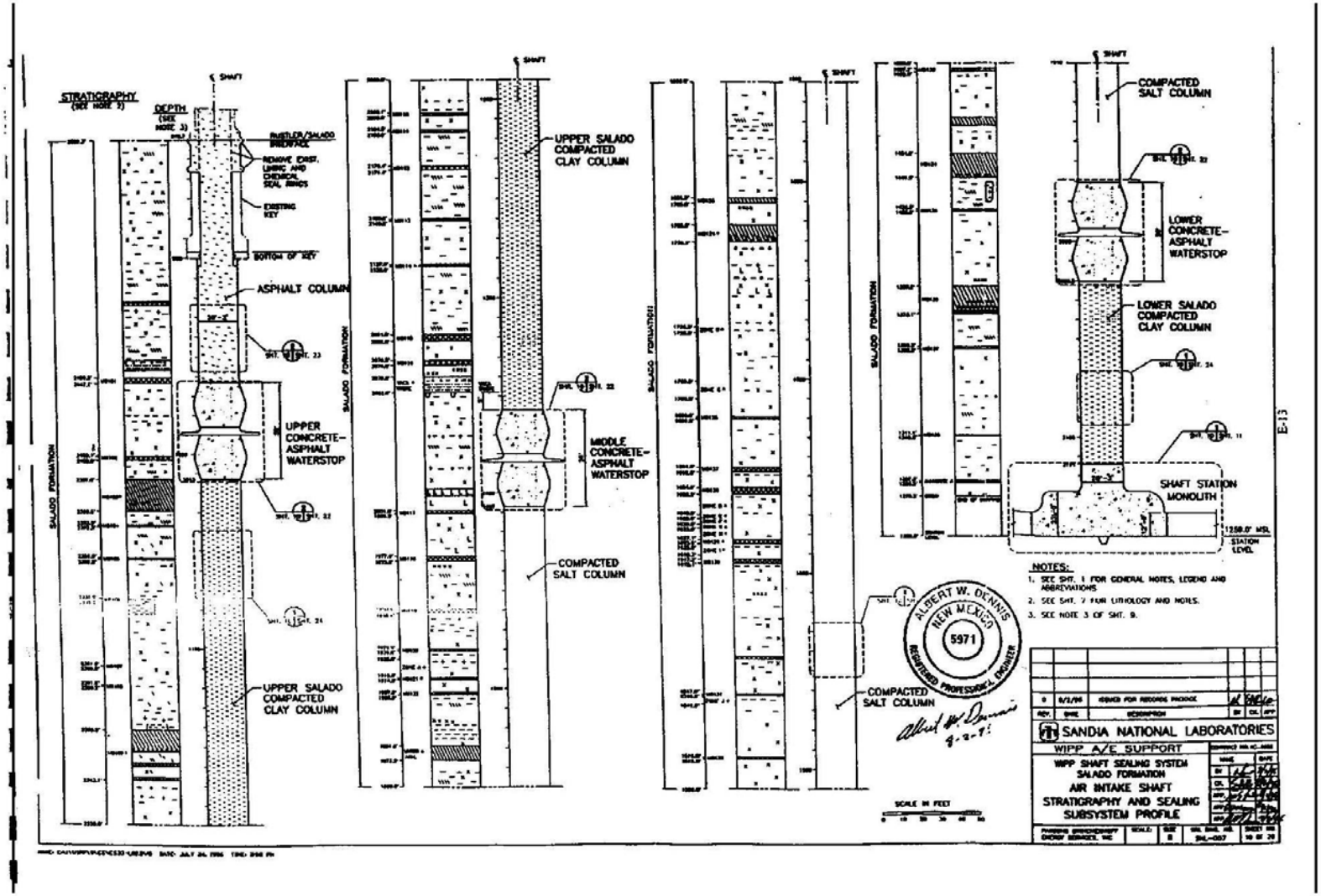
Salado Formation Air Intake Shaft Stratigraphy and AS-Built Elements

Sheet 8 of 28

1



Near-Surface / Rustler Formations Air Intake Shaft Stratigraphy and Sealing Subsytem Profile Sheet 9 of 28



Salado Formation Air Intake Shaft Stratigraphy and Sealing Subsytem Profile Sheet 10 of 28

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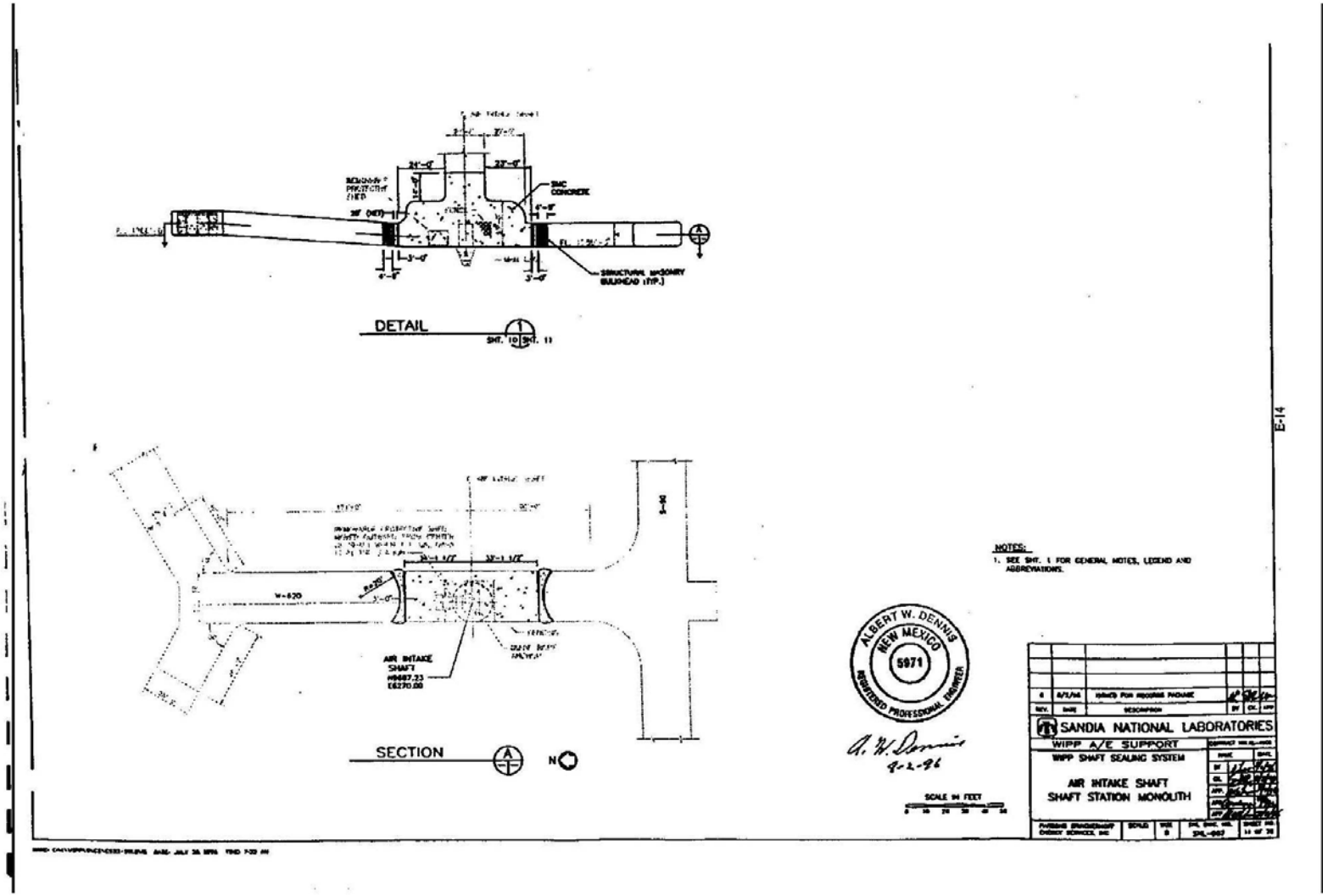

Air Intake Shaft Station Monolith

Sheet 11 of 28

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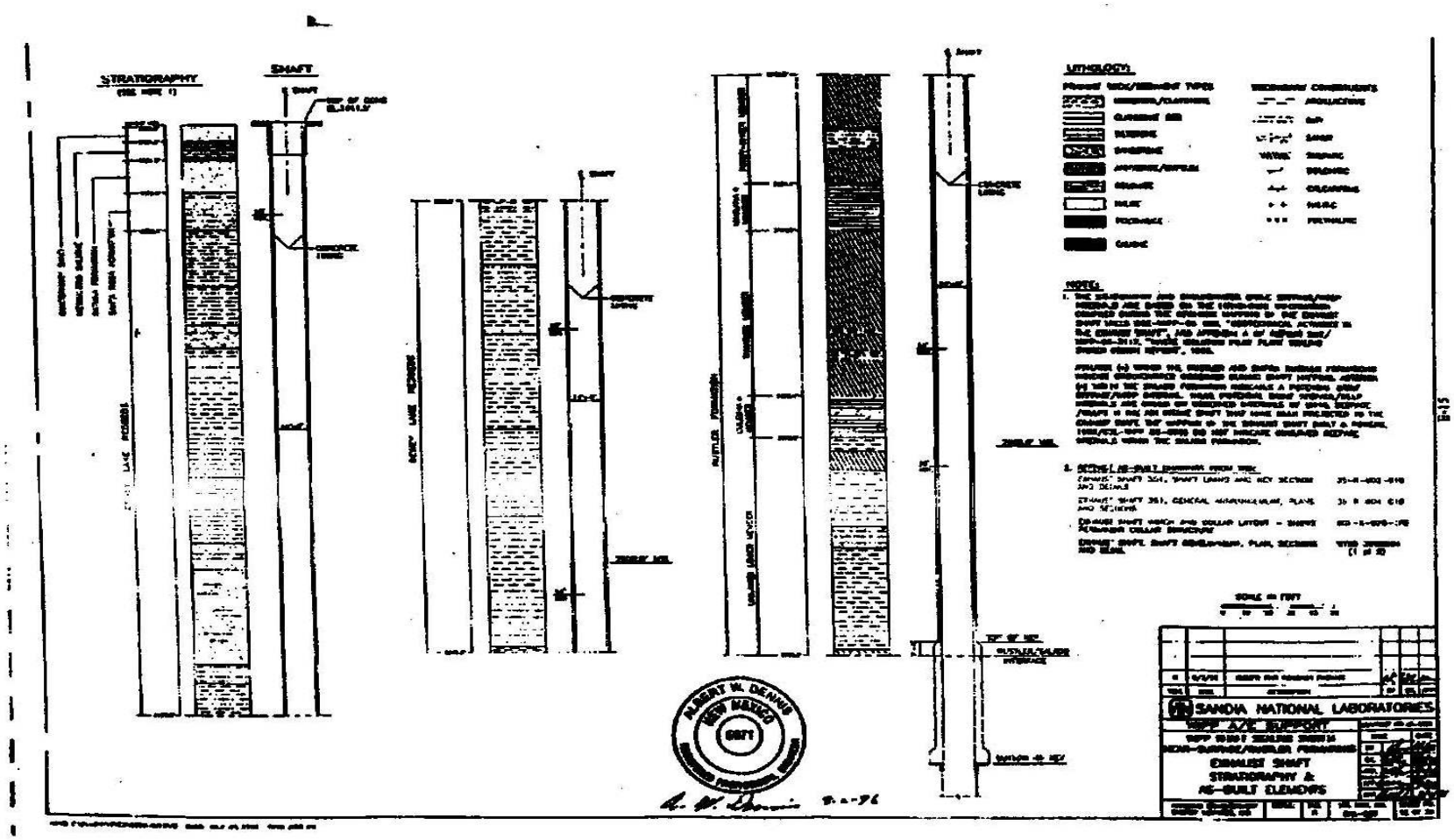
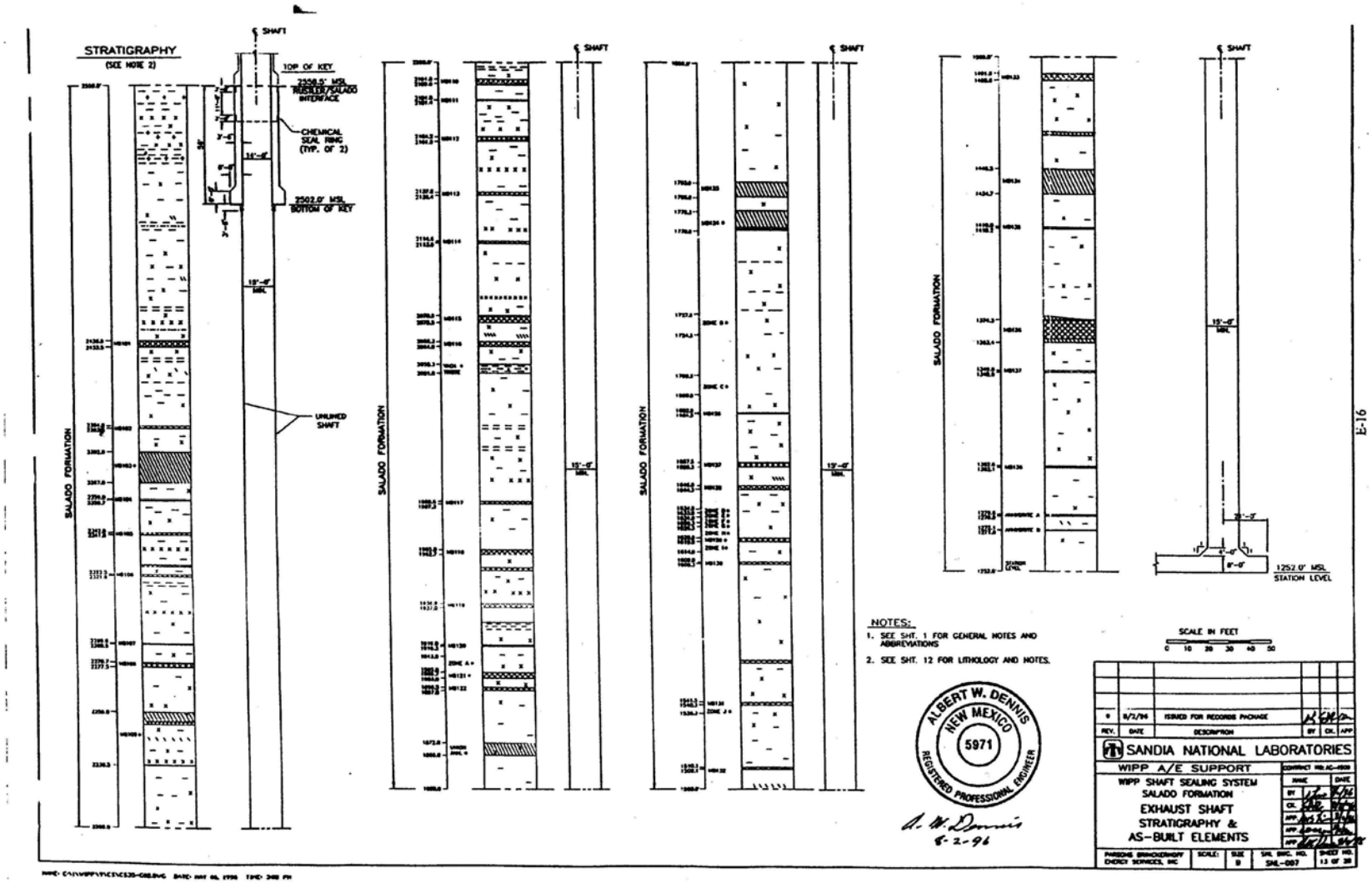


Near-Surface / Rustler Formations Exhaust Shaft Stratigraphy and AS-Built Elements Sheet 12 of 28

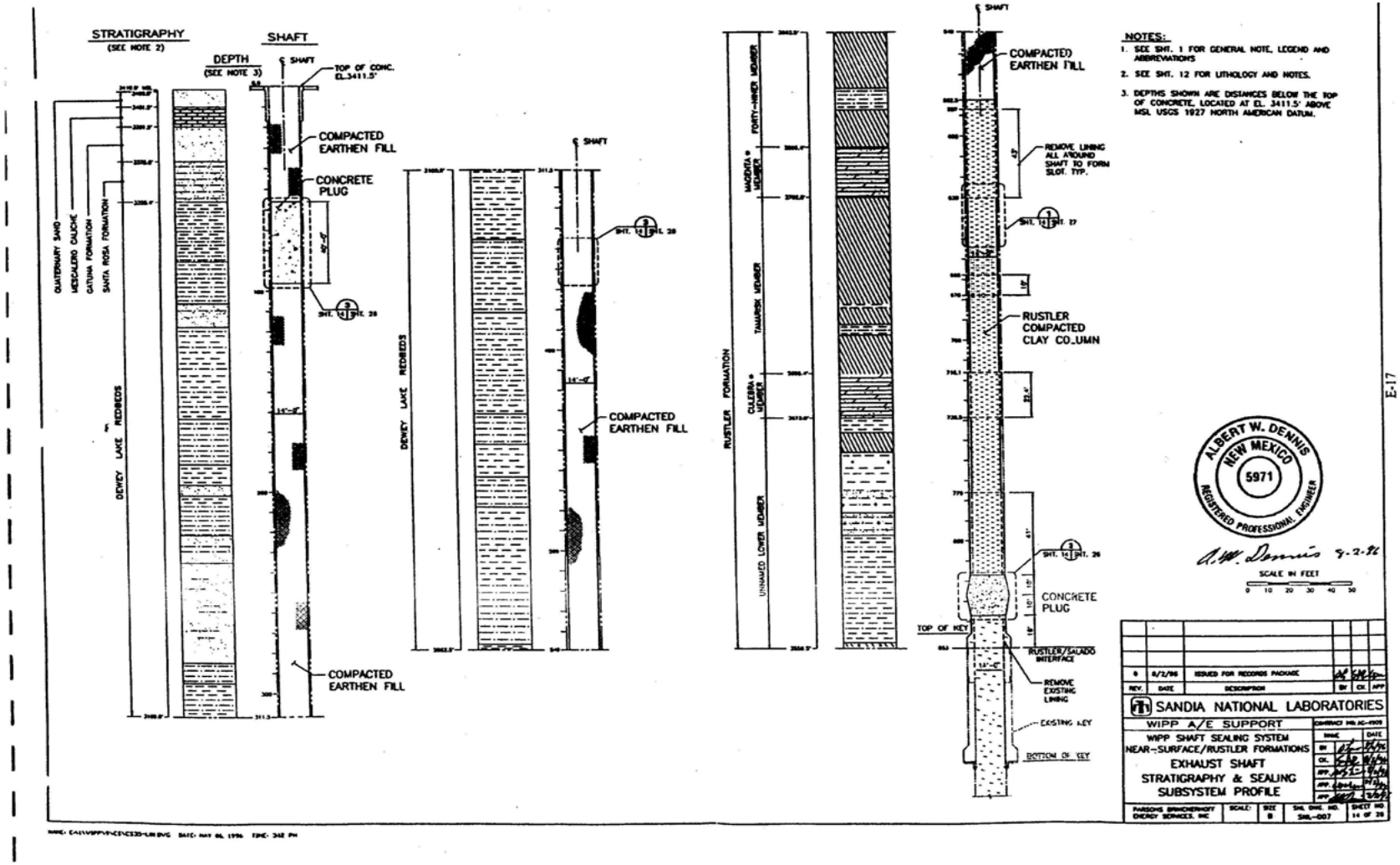
1



Salado Formation Exhaust Shaft Stratigraphy and AS-Built Elements

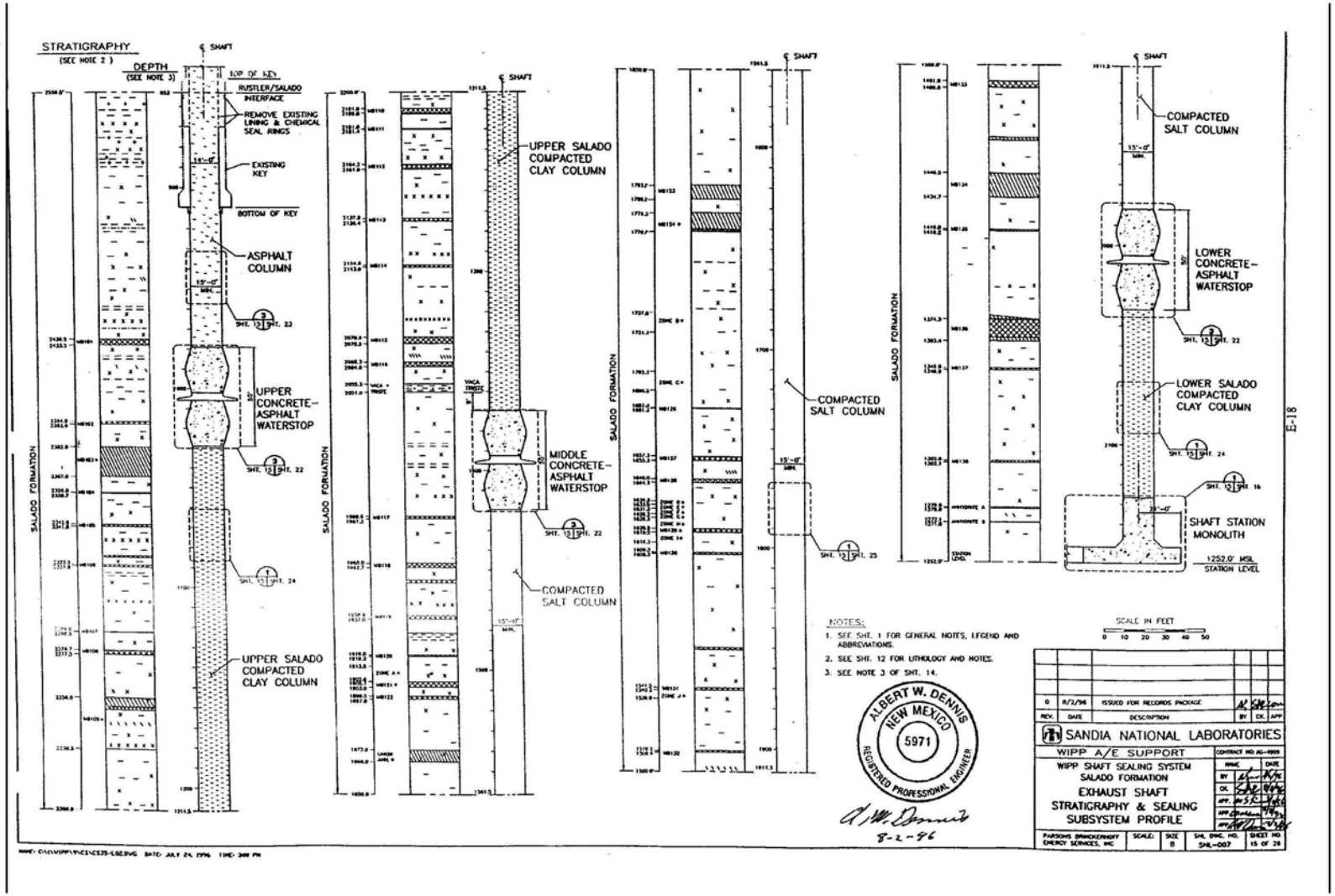
Sheet 13 of 28

1



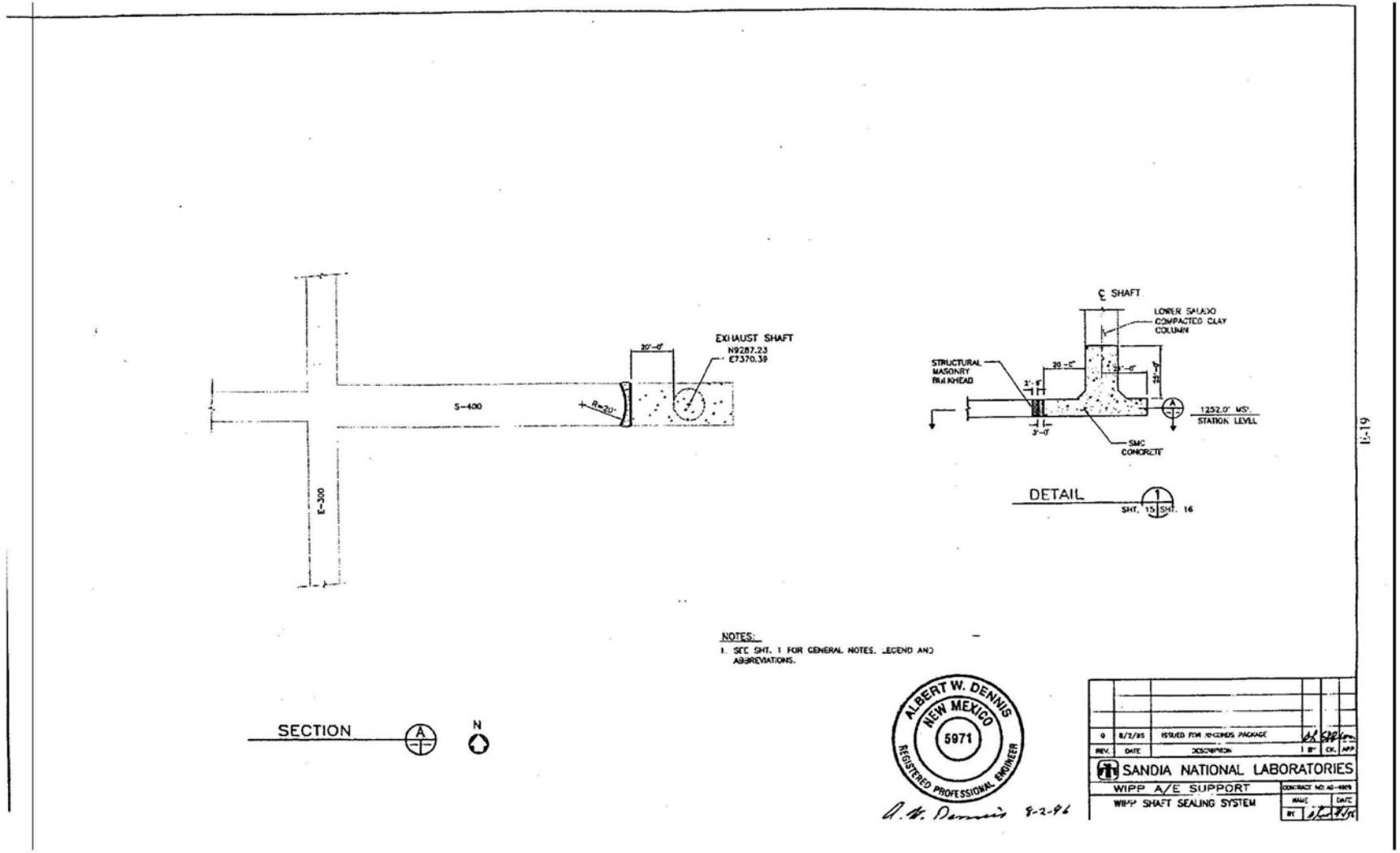
Near-Surface / Rustler Formations Exhaust Shaft Stratigraphy and Sealing Subsystem Profile Sheet 14 of 28

1



Salado Formation Exhaust Shaft Stratigraphy and Sealing Subsystem Profile Sheet 15 of 28

1



Exhaust Shaft Station Monolith

Sheet 16 of 28

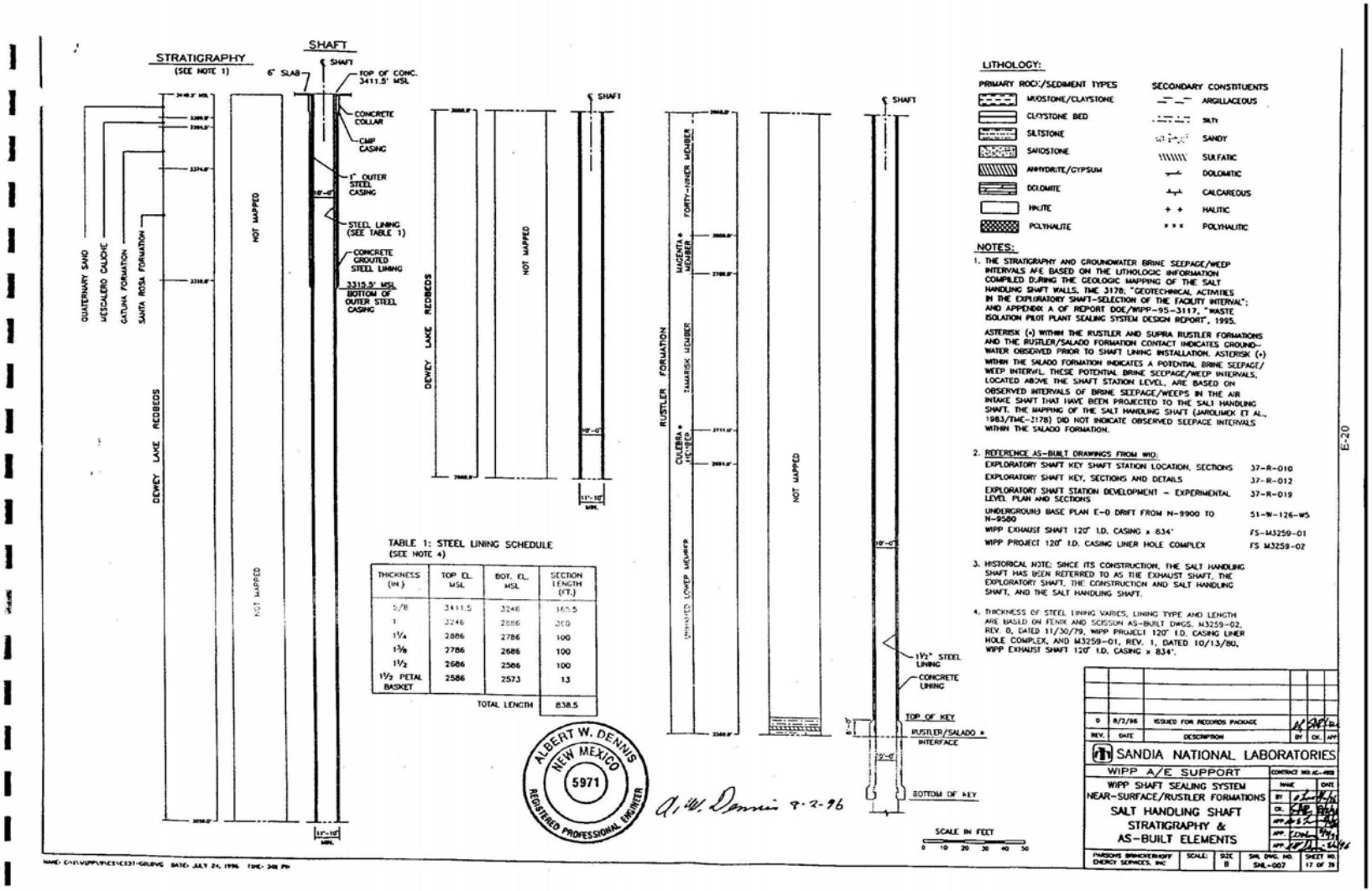
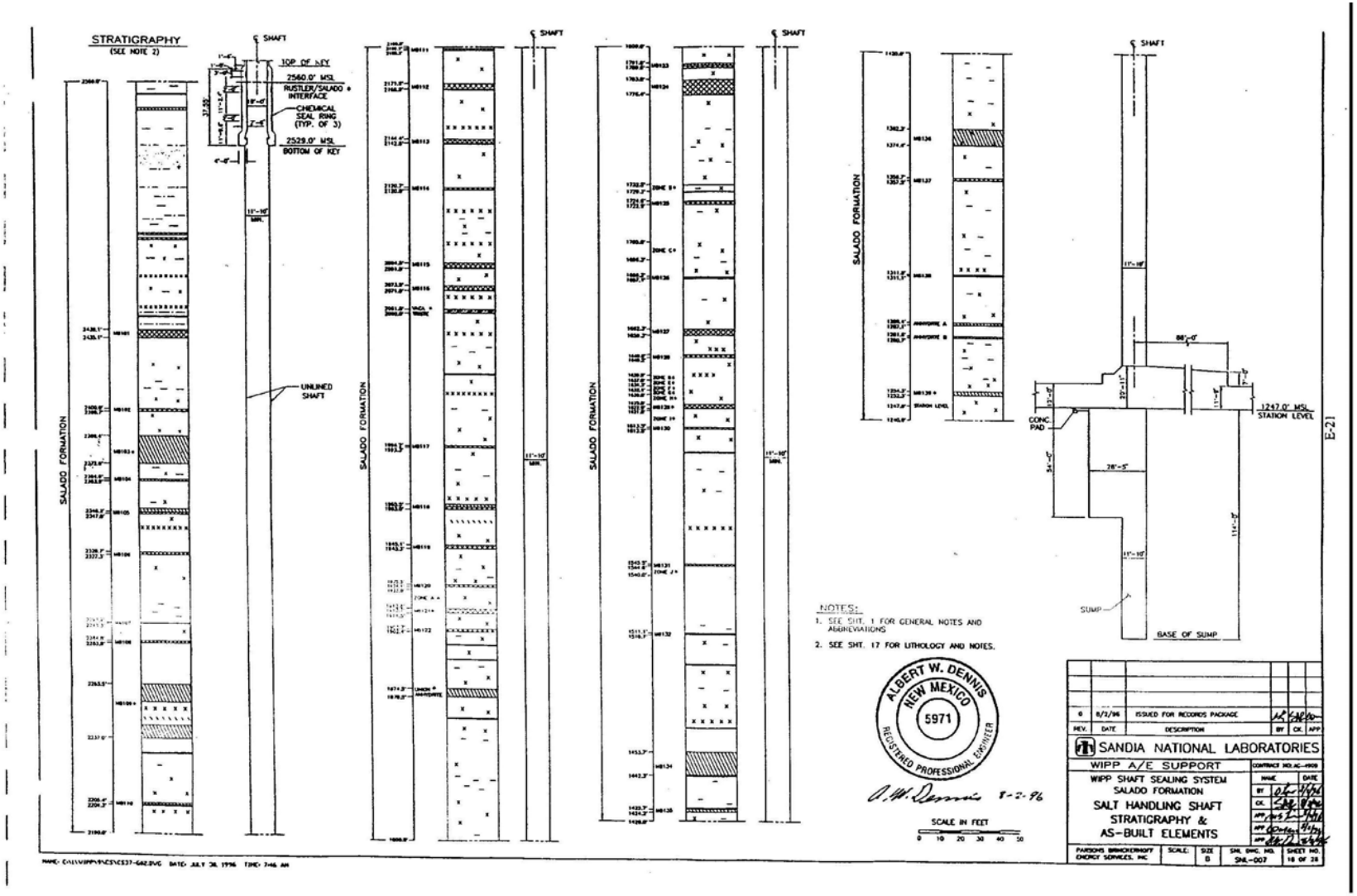


TABLE 1: STEEL LINING SCHEDULE
(SEE NOTE 4)

THICKNESS (IN.)	TOP EL. MSL	BOT. EL. MSL	SECTION LENGTH (FT.)
5/8	3411.5	3246	165.5
1	3246	2886	300
1¼	2886	2786	100
1⅜	2786	2686	100
1½	2686	2586	100
1½ PETAL BASKET	2586	2573	13
		TOTAL LENGTH	838.5

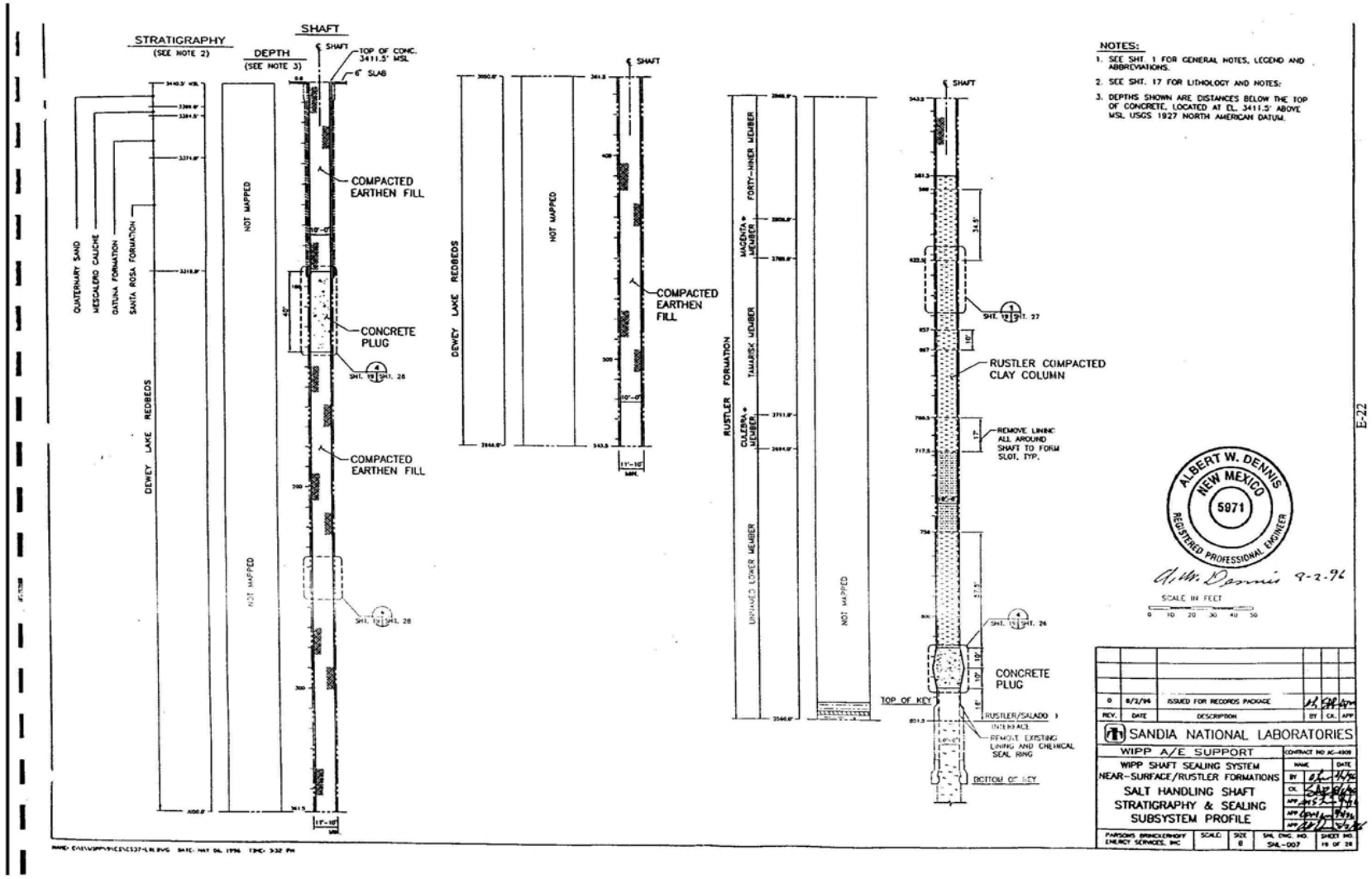
Near-Surface / Rustler Formations Salt Handling Shaft Stratigraphy and AS-Built Elements Sheet 17of 28

1



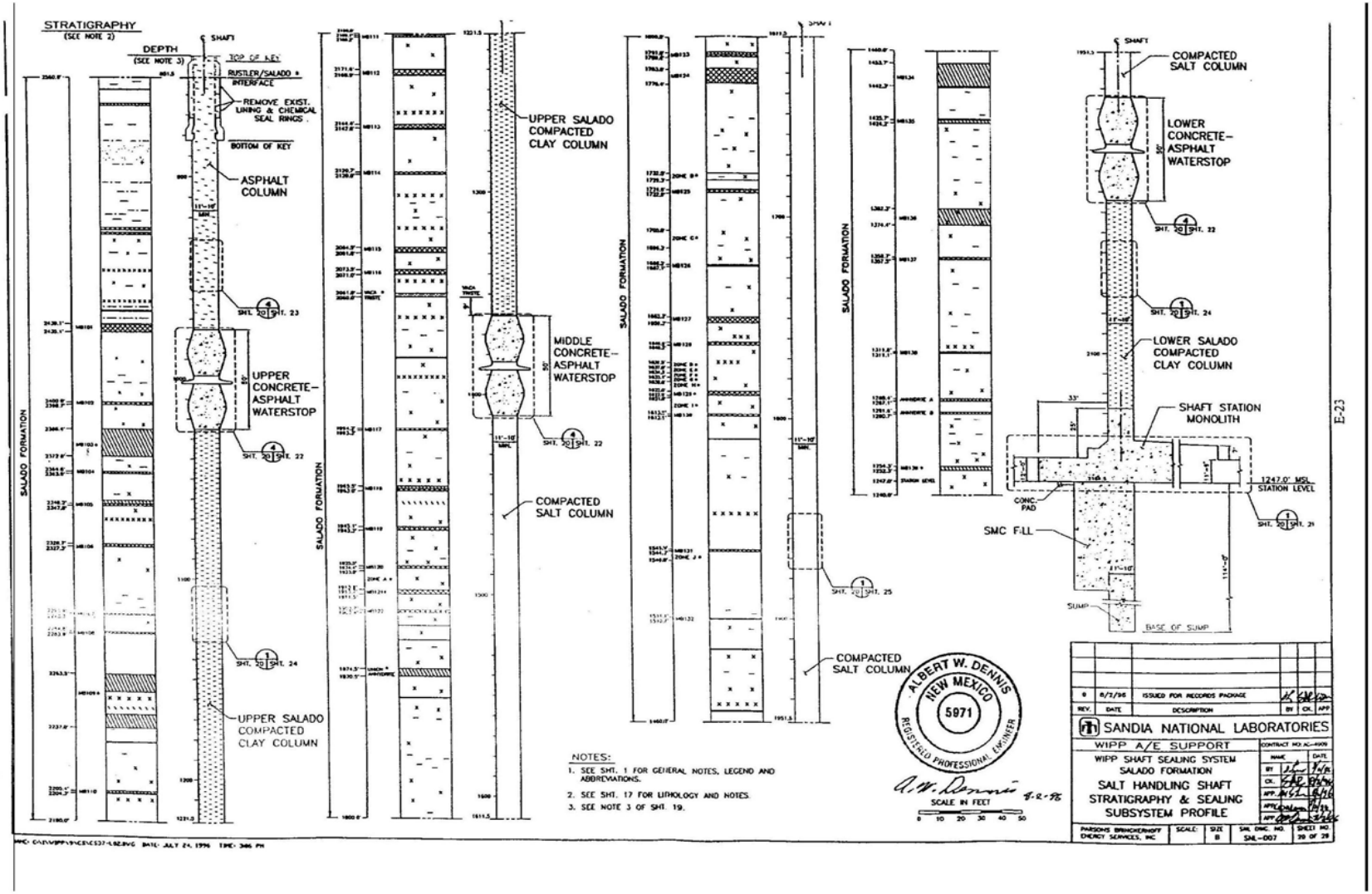
Salado Formation Salt Handling Shaft Stratigraphy and AS-Built Elements

Sheet 18 of 28

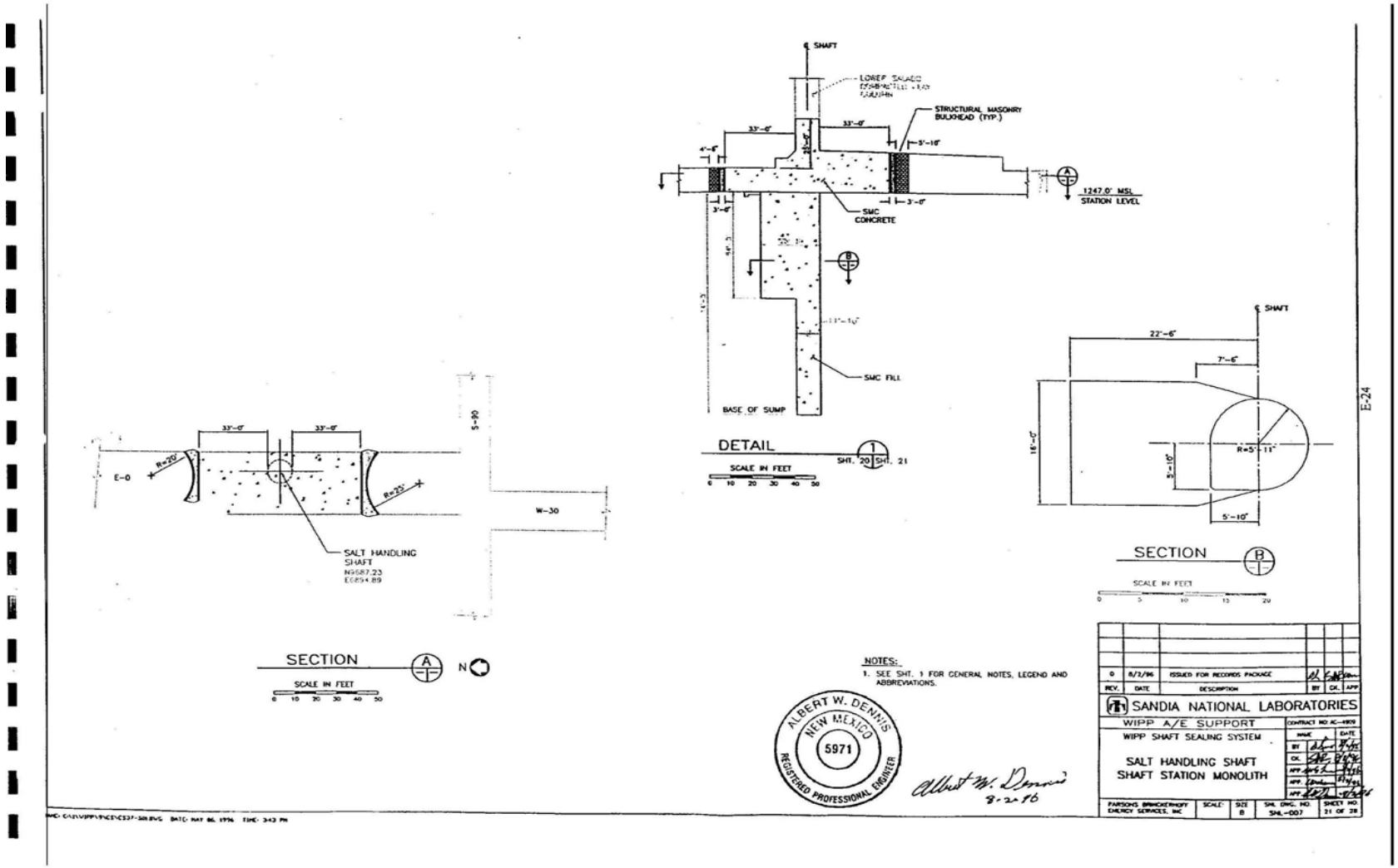


Near-Surface / Rustler Formations Salt Handling Shaft Stratigraphy and Sealing Subsystem Profile Sheet 19 of 28

1



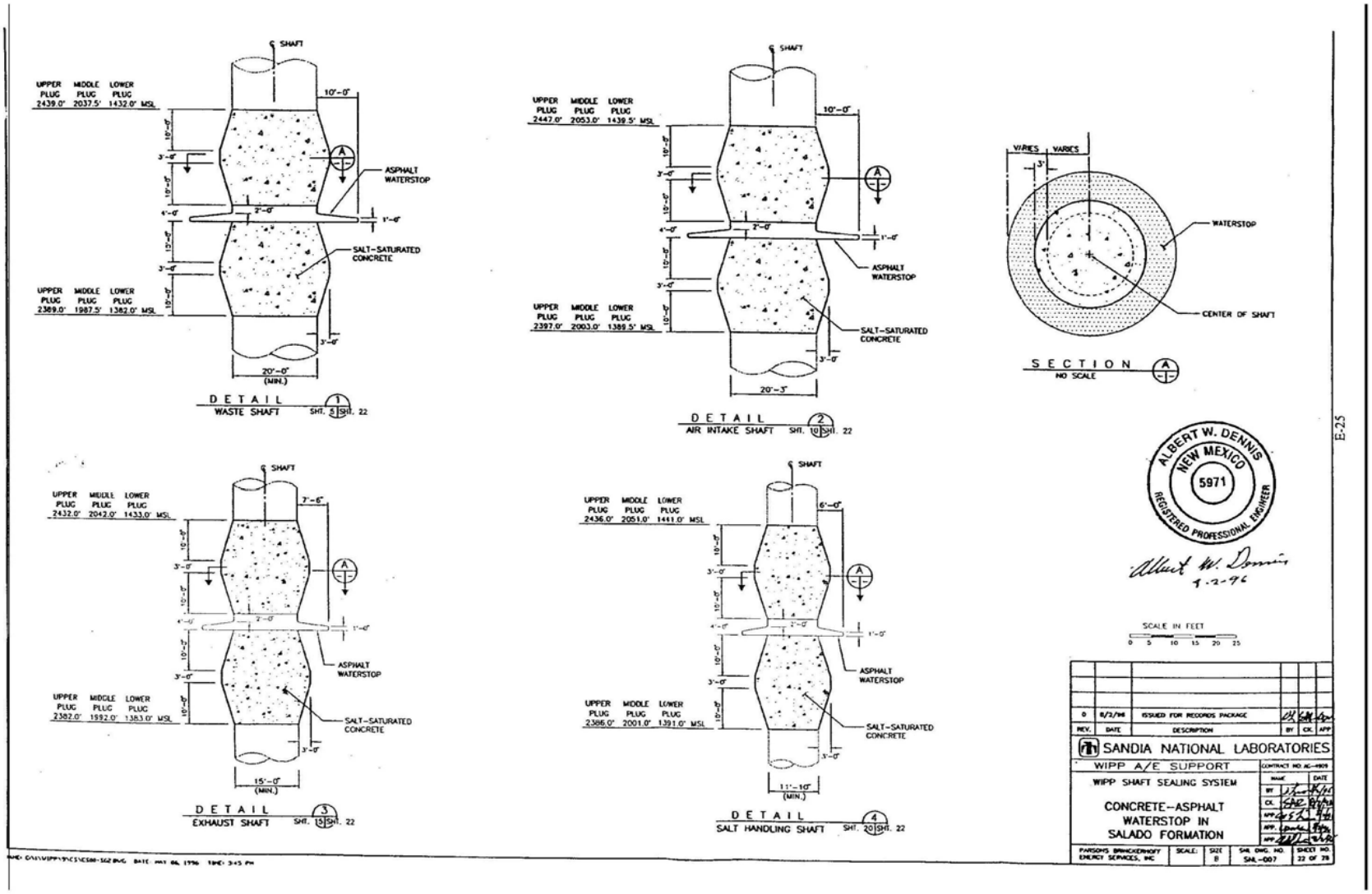
Salado Formation Salt Handling Shaft Stratigraphy and Sealing Subsystem Profile Sheet 20 of 28



Salt Handling Shaft Shaft Station Monolith

Sheet 21 of 28

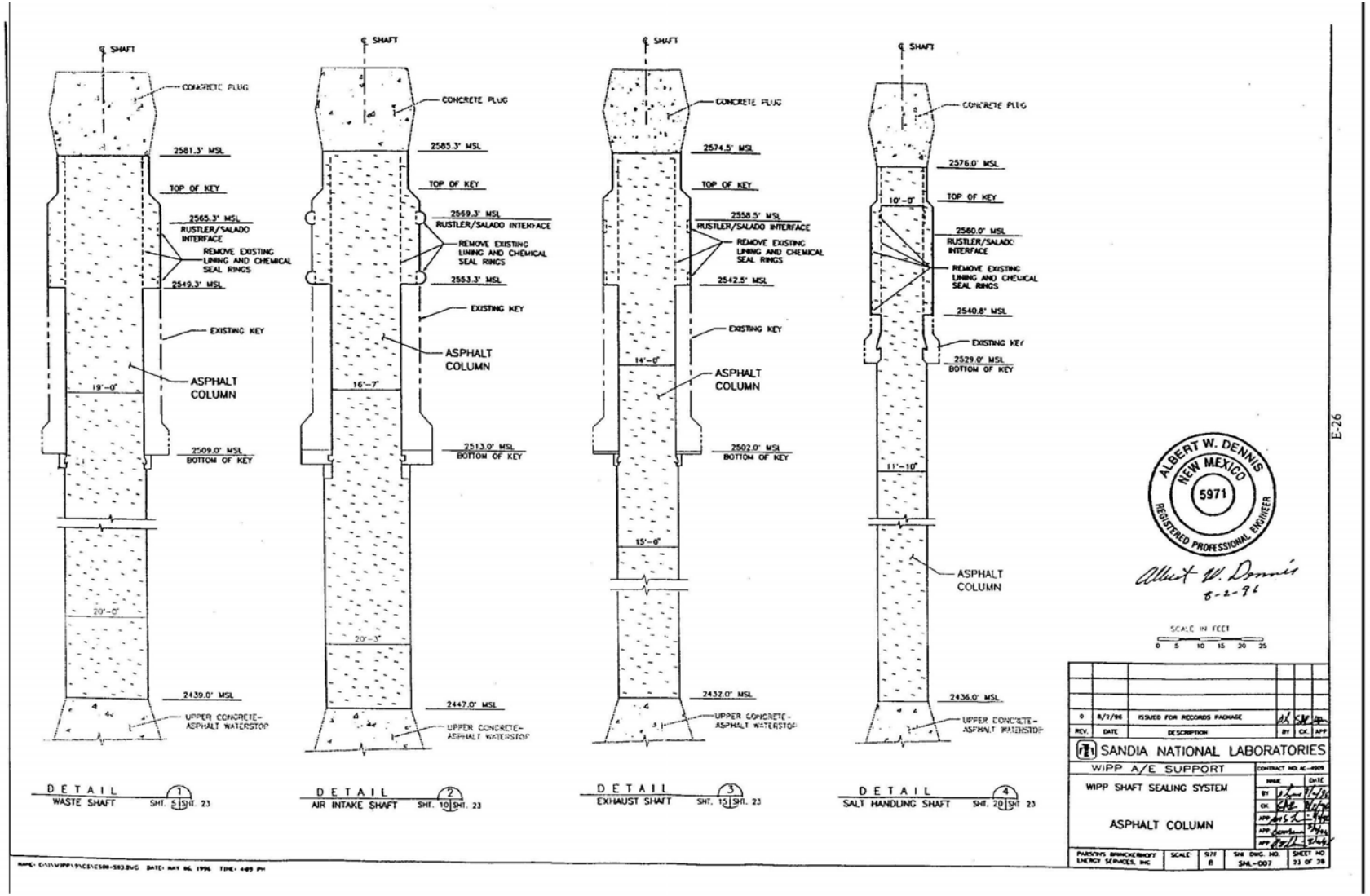
1



Concrete-Asphalt Water Stop in Salado Formation

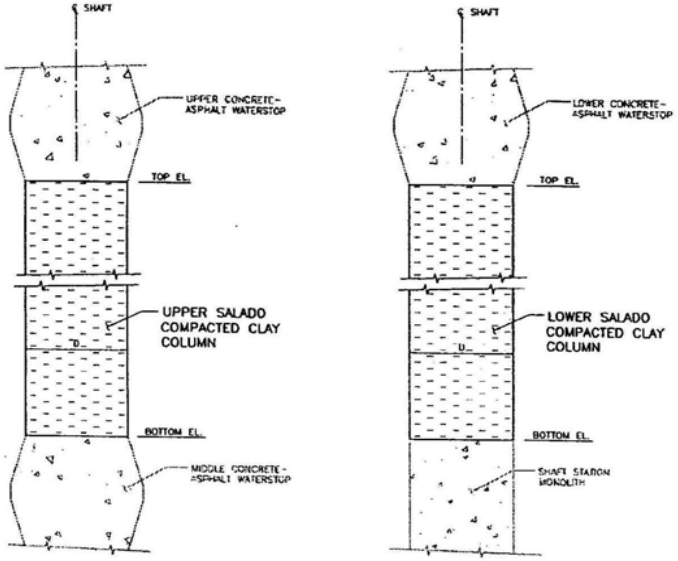
Sheet 22 of 28

1



Asphalt Column

Sheet 23 of 28



DETAIL 1
SEE TABLE 1 FOR DETAILS
NO SCALE
SHT. 5 SHT. 24
SHT. 10
SHT. 15
SHT. 20

TABLE 1

SHAFT	NOMINAL SHAFT DIAMETER D	UPPER SALADO COMPACTED CLAY COLUMN			LOWER SALADO COMPACTED CLAY COLUMN		
		TOP EL. (FT. MSL)	BOTTOM EL. (FT. MSL)	TOTAL HT. (FT.)	TOP EL. (FT. MSL)	BOTTOM EL. (FT. MSL)	TOTAL HT. (FT.)
WASTE	20'-0"	2389.0	2037.5	351.5	1382.0	1286.0	96.0
AIR INTAKE	20'-3"	2397.0	2053.0	344.0	1389.5	1296.0	93.5
EXHAUST	15'-0"	2382.0	2042.0	340.0	1383.0	1285.0	98.0
SALT HANDLING	11'-10"	2386.0	2051.0	335.0	1391.0	1284.0	107.0

E-27

ALBERT W. DENNIS
NEW MEXICO
5971
REGISTERED PROFESSIONAL ENGINEER
Albert W. Dennis
9-2-96

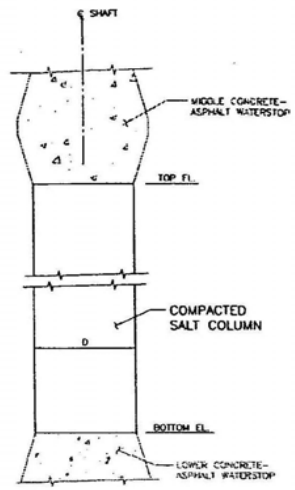
REV.	DATE	DESCRIPTION	BY	CK.	APP
0	8/2/96	ISSUED FOR RECORDS PACKAGE			

SANDIA NATIONAL LABORATORIES
WIPP A/E SUPPORT
WIPP SHAFT SEALING SYSTEM
UPPER AND LOWER SALADO COMPACTED CLAY COLUMNS
PARSONS BRINCKERHOFF ENERGY SERVICES, INC
SCALE:
SIZE B
SNL DWG. NO. SNL-007
SHEET NO. 24 OF 28

Upper and Lower Salado Compacted Clay Columns

Sheet 24 of 28

1



DETAIL 1
SEE TABLE 1 FOR DETAILS
NO SCALE
SHT. 5 SHT. 25
SHT. 10
SHT. 15
SHT. 20

TABLE 1

SHAFT	NOMINAL SHAFT DIAMETER D	COMPACTED SALT COLUMN		
		TOP EL. (FT. MSL)	BOTTOM EL. (FT. MSL)	TOTAL HT. (FT.)
WASTE	20'-0"	1987.5	1432.0	555.5
AIR INTAKE	20'-3"	2003.0	1439.5	563.5
EXHAUST	15'-0"	1992.0	1433.0	559.0
SALT HANDLING	11'-10"	2001.0	1441.0	560.0

E-28

ALBERT W. DENNIS NEW MEXICO 5971 REGISTERED PROFESSIONAL ENGINEER
Albert W. Dennis 8-2-96

REV.	DATE	DESCRIPTION	BY	CK.	APP
0	8/2/96	ISSUED FOR RECORDS PACKAGE			

SANDIA NATIONAL LABORATORIES
WIPP A/E SUPPORT
WIPP SHAFT SEALING SYSTEM
COMPACTED SALT COLUMN
PARSONS BRINCKERHOFF ENERGY SERVICES, INC. | SCALE: | SIZE B | SNL DWG. NO. SNL-007 | SHEET NO. 25 OF 28

Compacted Salt Column

Sheet 25 of 28

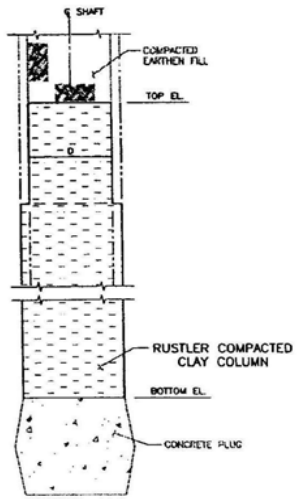
1

WIPP Shaft Sealing System Concrete Plug

Drawing SNL 007 26 of 28 not currently available. Drawing is not displayed in the Permit.

WIPP Shaft Sealing System Plug Sheet 26 of 28

1



DETAIL 1
SEE TABLE 1 FOR DETAILS
NO SCALE
SHT. 4 SHT. 27
SHT. 9
SHT. 14
SHT. 19

TABLE 1

SHAFT	NOMINAL SHAFT DIAMETER D	RUSTLER COMPACTED CLAY COLUMN		
		TOP EL. (FT. MSL)	BOTTOM EL. (FT. MSL)	TOTAL HT. (FT.)
WASTE	19'-0"	2836.0	2601.3	234.7
AIR INTAKE	16'-7"	2840.0	2605.3	234.7
EXHAUST	14'-0"	2829.0	2594.5	234.5
SALT HANDLING	10'-0"	2830.0	2596.0	234.0

ALBERT W. DENNIS
NEW MEXICO
5971
REGISTERED PROFESSIONAL ENGINEER

Albert W. Dennis
8-2-96

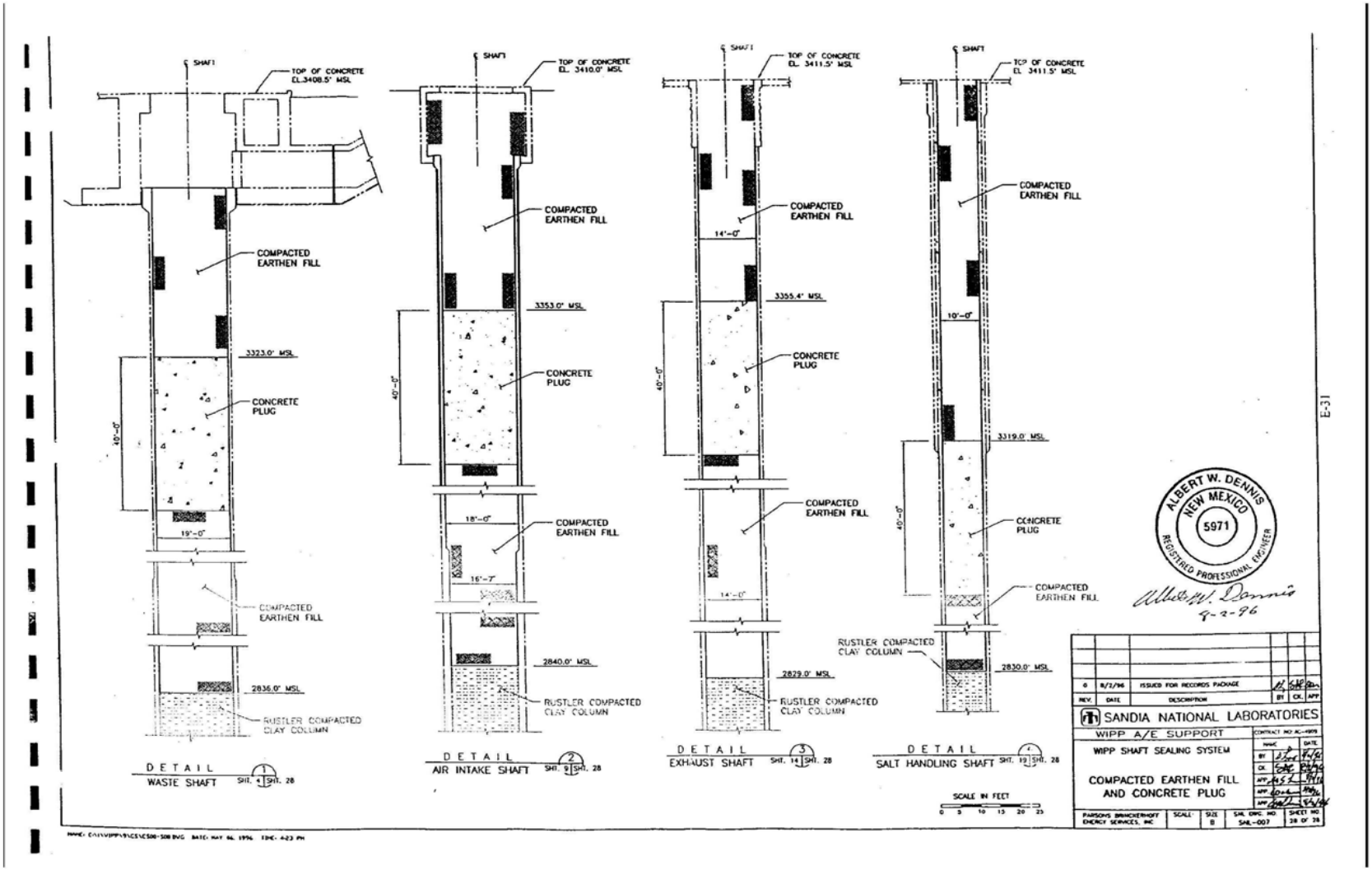
E-30

REV.	DATE	DESCRIPTION	BY	CK.	APP.
0	8/2/96	ISSUED FOR RECORDS PACKAGE			

SANDIA NATIONAL LABORATORIES
WIPP A/E SUPPORT
CONTRACT NO AC-4000
WIPP SHAFT SEALING SYSTEM
RUSTLER COMPACTED CLAY COLUMN
NAME DATE
BY
CK.
APP.
APP.
APP.
PARSONS BRINCKERHOFF ENERGY SERVICES, INC
SCALE:
SIZE B
SNL DWG. NO SNL-007
SHEET NO. 27 OF 28

NAME: G:\S\WIPP\S\CS\CS00-S07.DWG DATE: MAY 06, 1996 TIME: 4:21 PM

1 Rustler Compacted Clay Cloumn Sheet 27 of 28



Compacted Earthen Fill and Concrete Plug

Sheet 28 of 28

1

WASTE ISOLATION PILOT PLANT

CARLSBAD, NM

SHAFT SEALING SYSTEM DESIGN

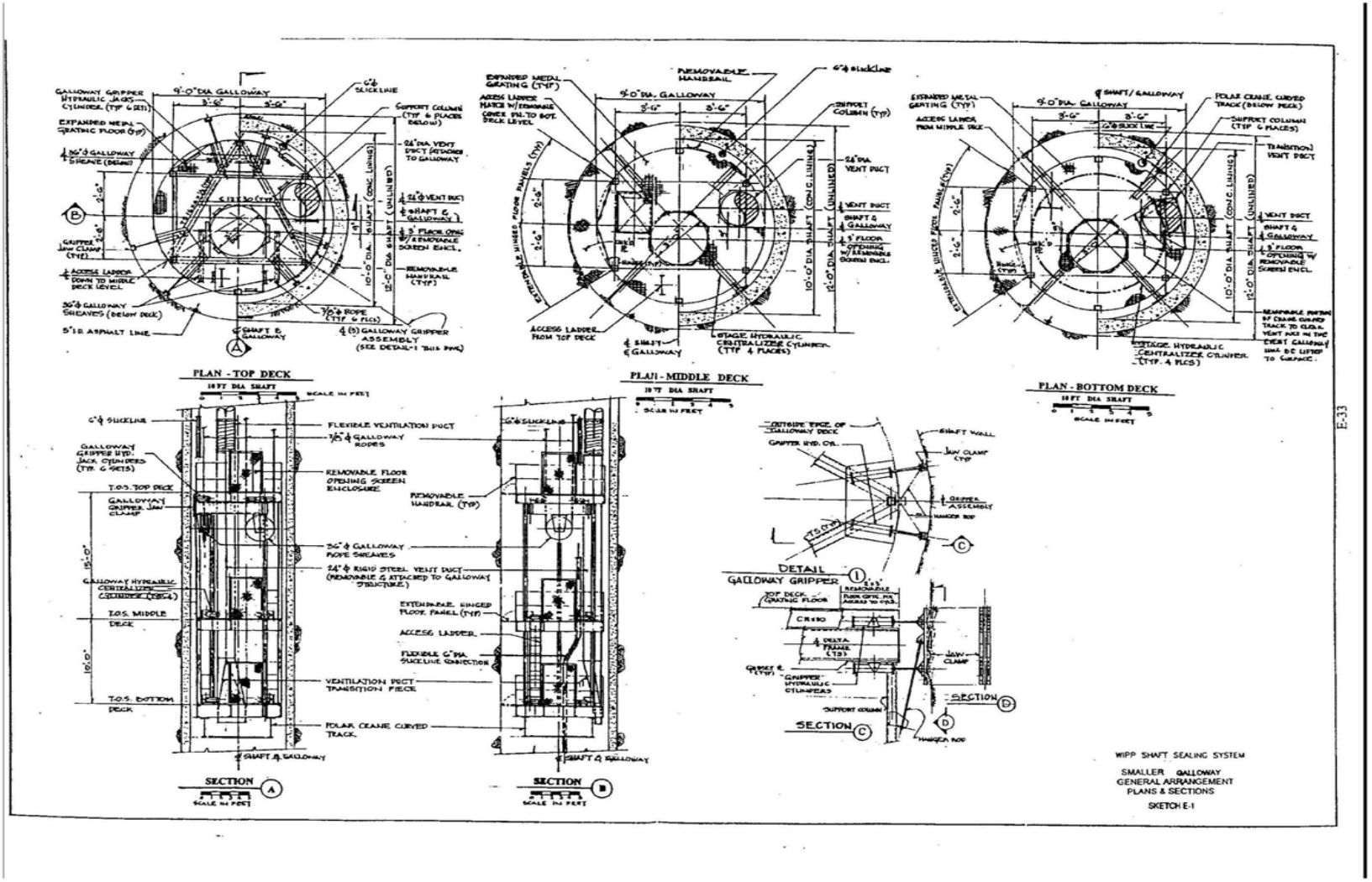
EQUIPMENT AND CONSTRUCTION SKETCHES

E-32

DRAWING NUMBER	TITLE
SKETCH E-1	WIPP SHAFT SEALING SYSTEM SMALLER GALLOWAY GENERAL ARRANGEMENT PLANS AND SECTIONS
SKETCH E-2	WIPP SHAFT SEALING SYSTEM LARGER GALLOWAY GENERAL ARRANGEMENT PLANS AND SECTIONS
SKETCH E-3	WIPP SHAFT SEALING SYSTEM TYPICAL HEADFRAME PLANS AND SECTIONS
SKETCH E-4	WIPP SHAFT SEALING SYSTEM PERSPECTIVE HEADFRAME AND ASSOCIATED SURFACE FACILITIES

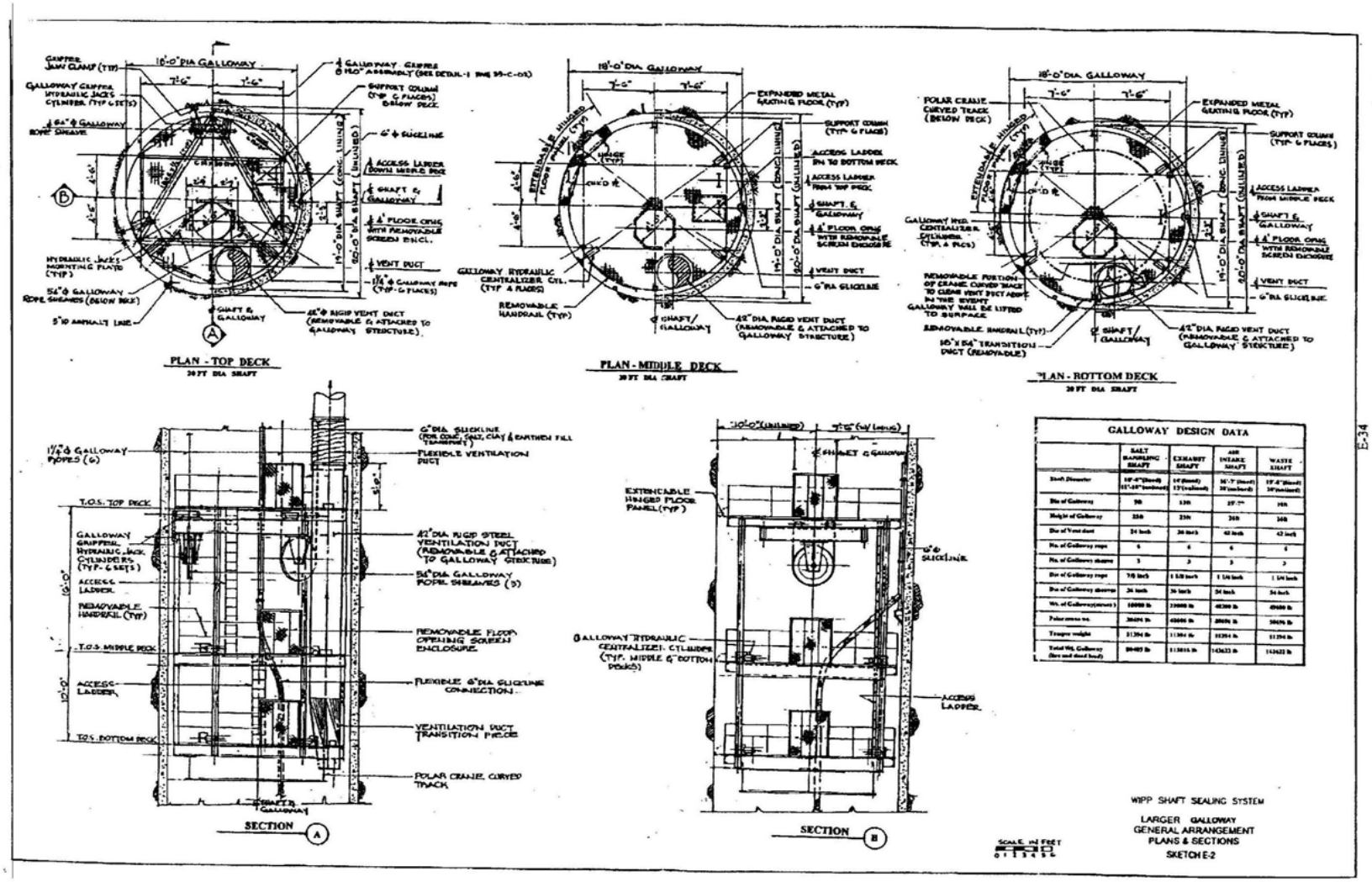
List of Sketches

1

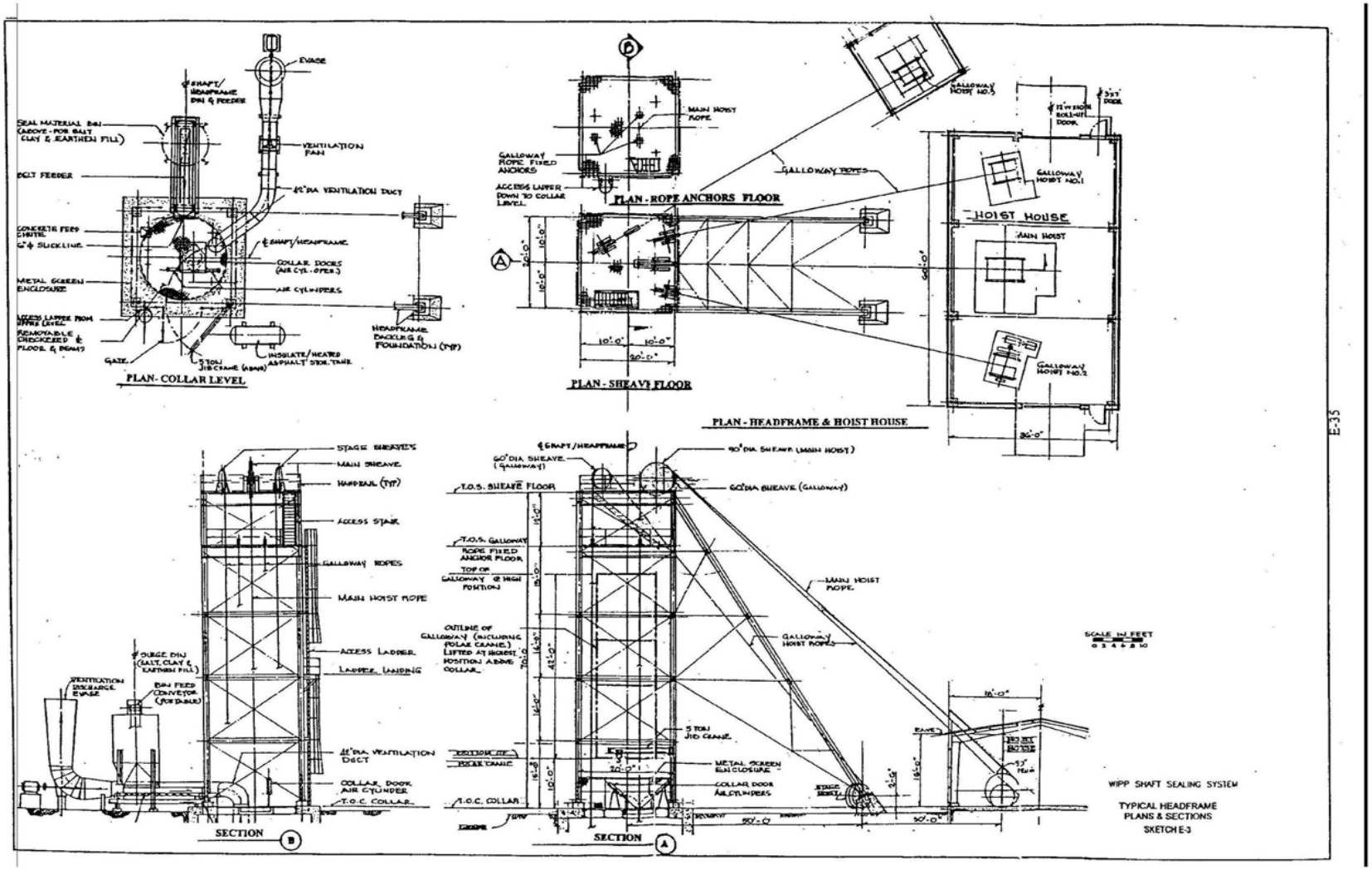


WIPP Shaft Sealing System Smaller Galloway Genral Arrangement Plans and Sections

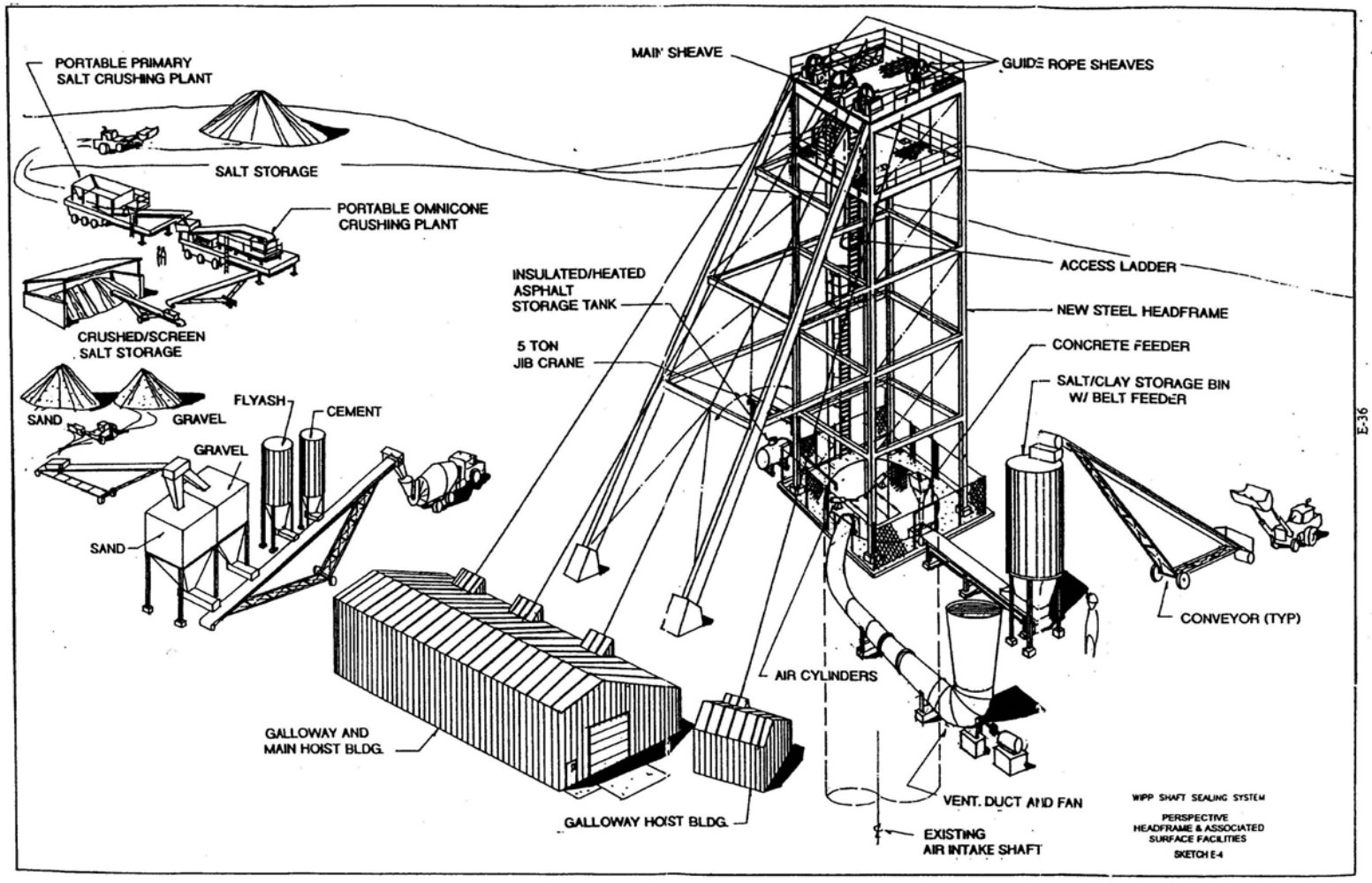
1



WIPP Shaft Sealing System Larger Galloway General Arrangement Plans and Sections



1 WIPP Shaft Sealing System Typical Headframe Plans and Sections



WIPP Shaft Sealing System Typical Headframe and Associated Surface Faclities

WIPP
UC721 Distribution List

Federal Agencies

US Department of Energy (4)
Office of Civilian Radioactive Waste Mgmt.
Attn: Deputy Director, RW-2
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