

1
2
3
4
5

APPENDIX I2
APPENDIX E

DESIGN DRAWINGS

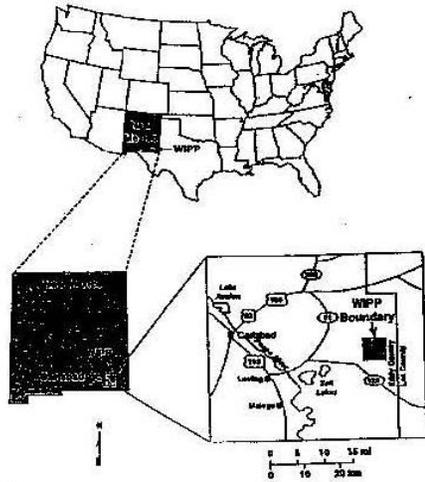
SHAFT SEALING SYSTEM
COMPLIANCE SUBMITTAL DESIGN REPORT

WASTE ISOLATION PILOT PLANT

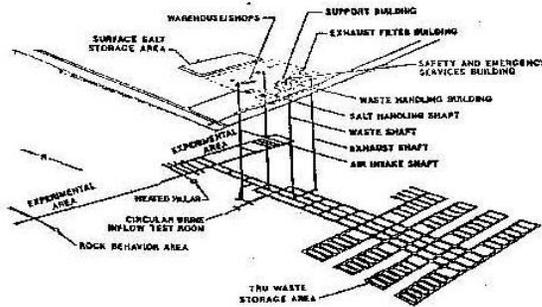
CARLSBAD, NM

SHAFT SEALING SYSTEM DESIGN

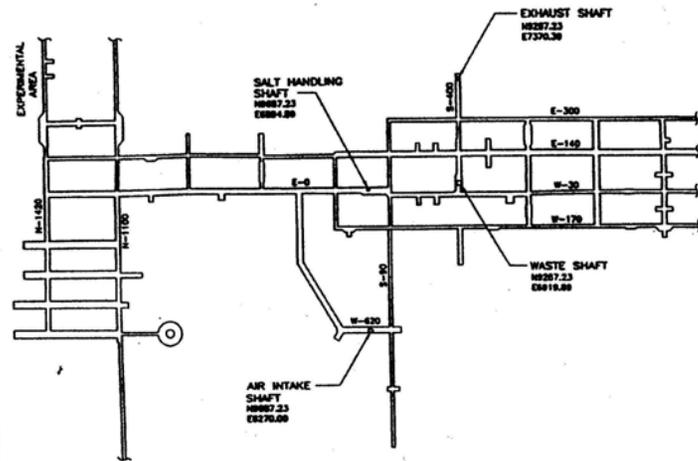
DESIGN DRAWINGS



WIPP LAYOUT



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



SHAFT SEALS LOCATION PLAN N

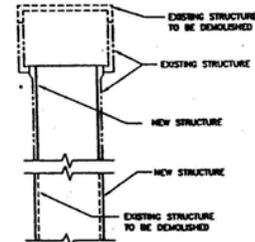
SCALE IN FEET
 0 100 200 300 400 500

GENERAL NOTES:

1. THE DRIFT NUMBERING SYSTEM (E-300, S-400, ETC.) IS BASED ON THE DIRECTION AND NOMINAL DISTANCE IN FEET THE DRIFT IS FROM THE SALT HANDLING SHAFTS DESIGNATED CENTERLINE LOCATION OF H-600, E-800, THE WIPP PLANT COORDINATE SYSTEM CENTERLINE LOCATION FOR THE SALT HANDLING SHAFT IS H-287.23, AND E-288-1.28. THE PLANT COORDINATE SYSTEM IS DESCRIBED IN WESTINGHOUSE DRAWING NO. 51-W-108-W, UNDERGROUND EXCAVATIONS, DATED 6/15/82.
2. THE AS-BUILT DIMENSIONS AND DEPTHS AND/OR ELEVATIONS SHOWN IN THESE DRAWINGS ARE NOMINAL. IN THAT DIMENSIONS MAY CHANGE DUE TO LOCAL VARIANCE OF THE STRATIFICATION, OPERATIONAL MODIFICATIONS MADE TO MAINTAIN THE CREEP CLOSURE OF THE SHAFTS, AND OTHER OPERATIONAL REQUIREMENTS. THEREFORE THE AS-BUILT DIMENSIONS AND THE PREVIOUS ELEVATIONS FOR SETTING THE SEALING SYSTEM SHALL BE VERIFIED BY FIELD SURVEYS AND EXPLORATORY CORE DRILLING DURING SITE PREPARATION FOR THE FINAL CONSTRUCTION.
3. **DRAWING NUMBERS:**
 FOR CLARITY ON DETAIL AND SECTION DESIGNATIONS, AND NOTES, ONLY THE SHEET NUMBER IS SHOWN.

LEGEND FOR PROPOSED SHAFT SEALING SYSTEM:

- SECTION**
 SECTION DESIGNATION
 SHEET ON WHICH SECTION IS DRAWN
 SHEET FROM WHICH SECTION IS TAKEN
- DETAIL**
 DETAIL DESIGNATION
 SHEET ON WHICH DETAIL IS DRAWN
 SHEET FROM WHICH DETAIL IS TAKEN
- SECTION OR DETAIL TAKEN AND DRAWN ON THE SAME SHEET, OR STANDARD SECTION OR DETAIL.



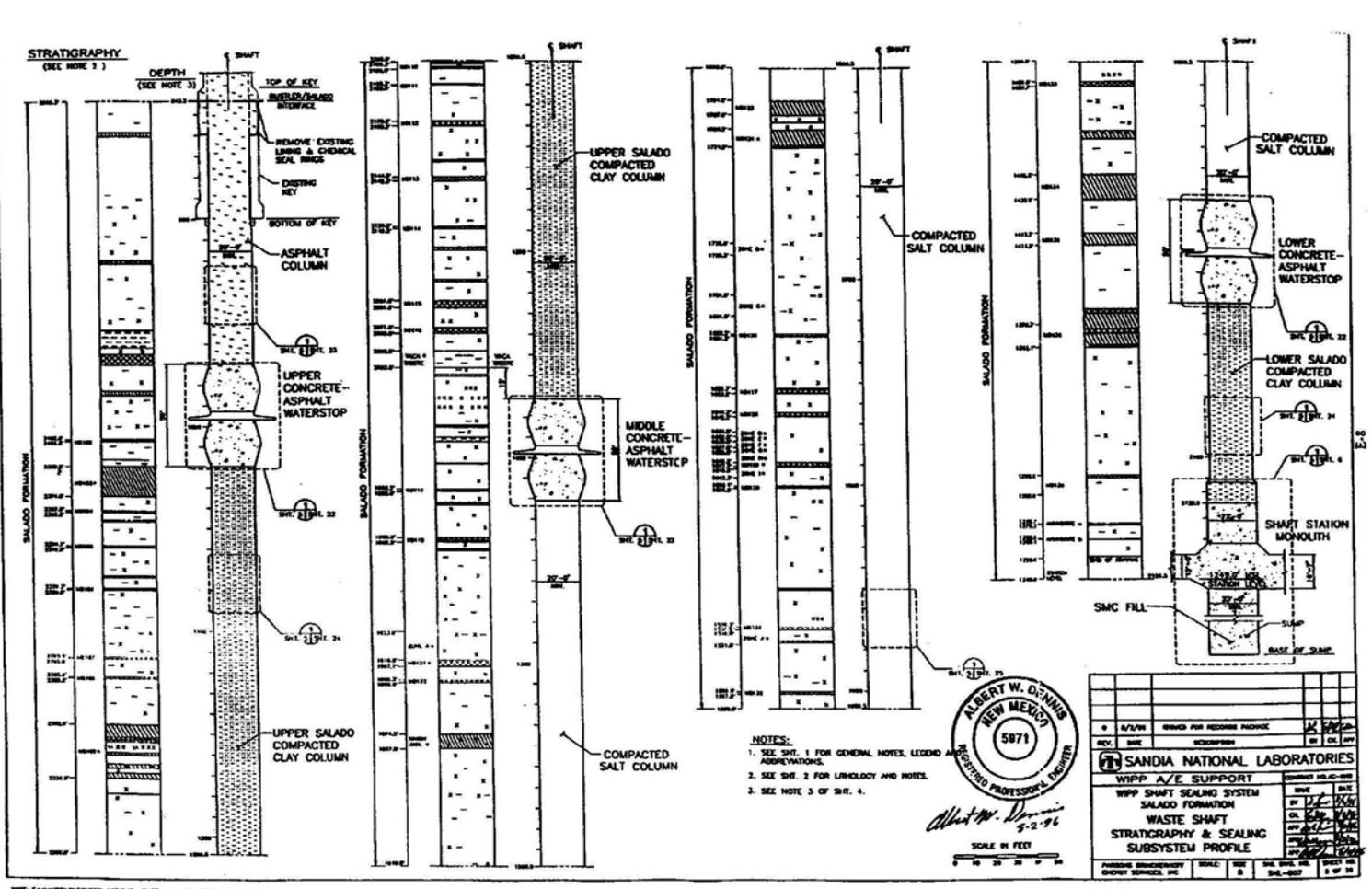
ABBREVIATIONS:

- C CENTERLINE
- CONC. CONCRETE
- CMP CORRUGATED METAL PLATE
- CONC. CONCRETE
- DOE DEPARTMENT OF ENERGY
- DWG. DRAWING
- E EAST
- EL. ELEVATION
- EXIST. EXISTING
- FT. FOOT, FEET
- HT. HEIGHT
- I.D. INSIDE DIAMETER
- IN. INCHES
- MS. MANNER BED
- MSL MEAN SEA LEVEL
- N NORTH
- NO. NUMBER
- R RADIUS
- S SOUTH
- SHT. SHEET NUMBER
- SAC SALADO MASS CONCRETE
- TYP. TYPICAL
- USGS UNITED STATES GEOLOGICAL SURVEY
- W WEST
- WHU WESTINGHOUSE WASTE ISOLATION DIVISION
- WIPP WASTE ISOLATION PILOT PLANT

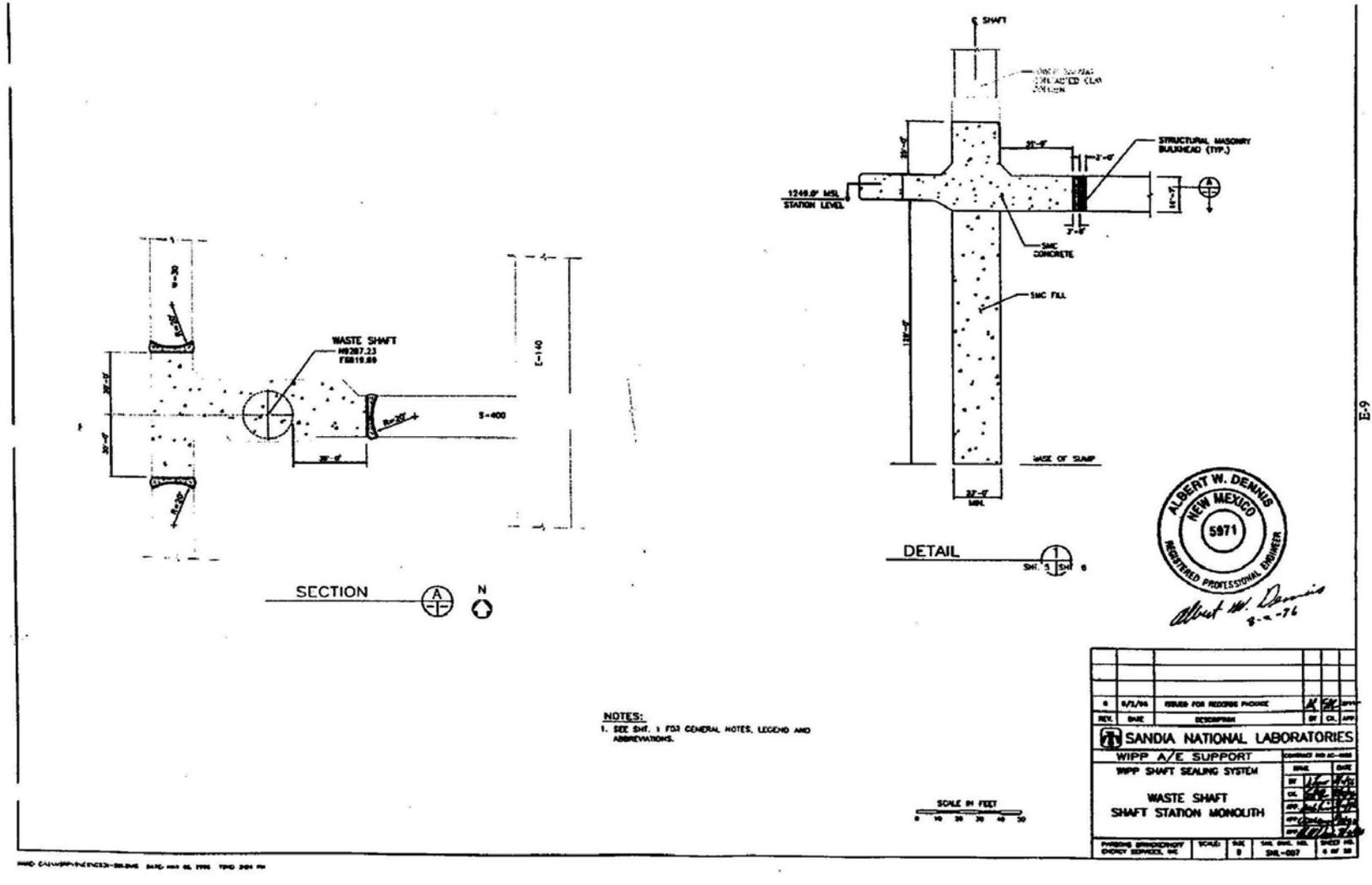


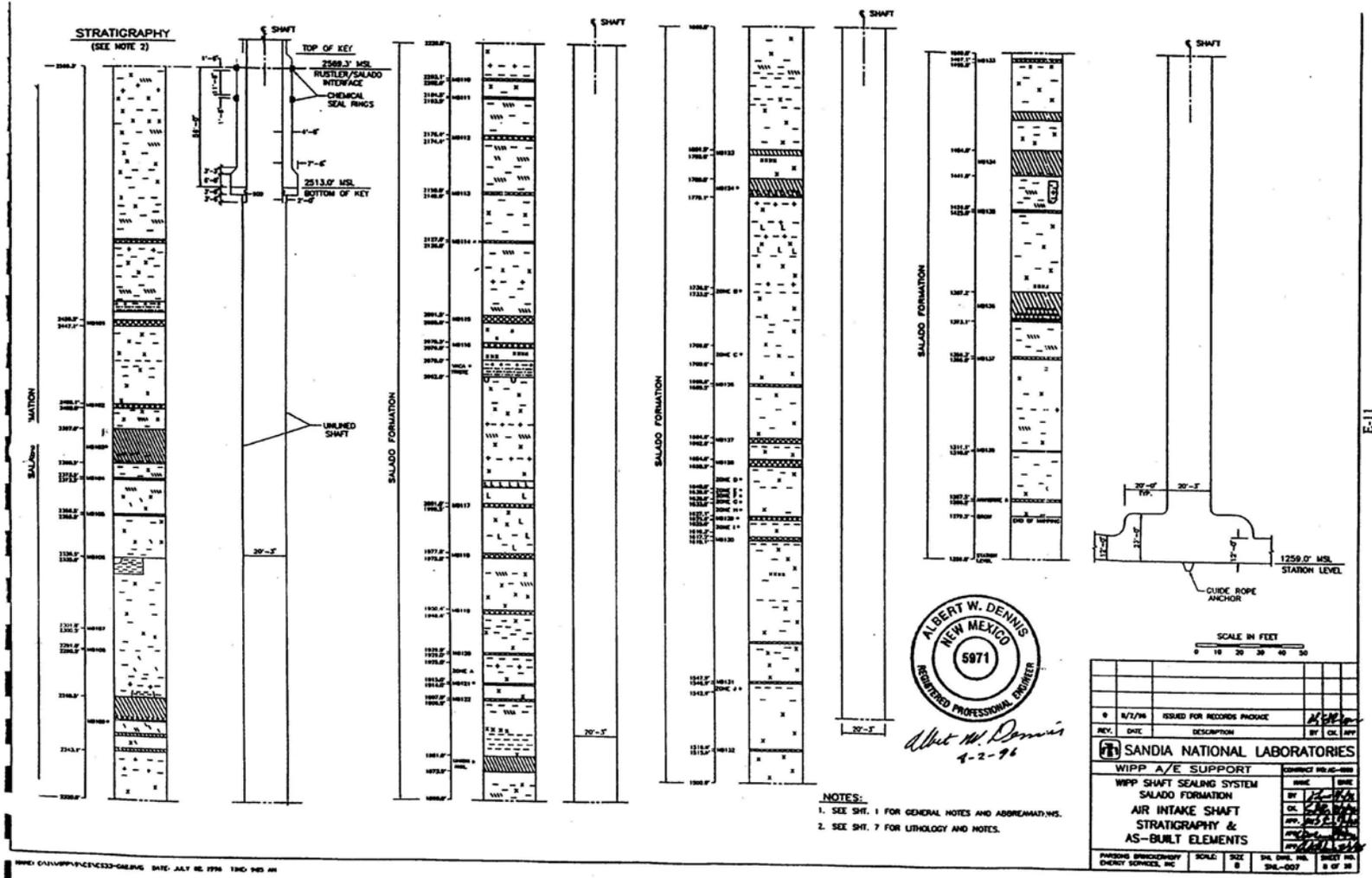
Albert W. Dennis
 9-2-09

REV.	DATE	DESCRIPTION	BY	CHK.
SANDIA NATIONAL LABORATORIES				
WIPP A/E SUPPORT				
WIPP SHAFT SEALING SYSTEM			DATE	
SHAFT LOCATION PLAN,			BY	
ABBREVIATIONS, GENERAL			CHK.	
NOTES AND LEGEND				
DESIGNED BY: DERRY BRENDEL, INC.			SCALE:	
DRAWN BY: B			SHEET NO.:	1 OF 28

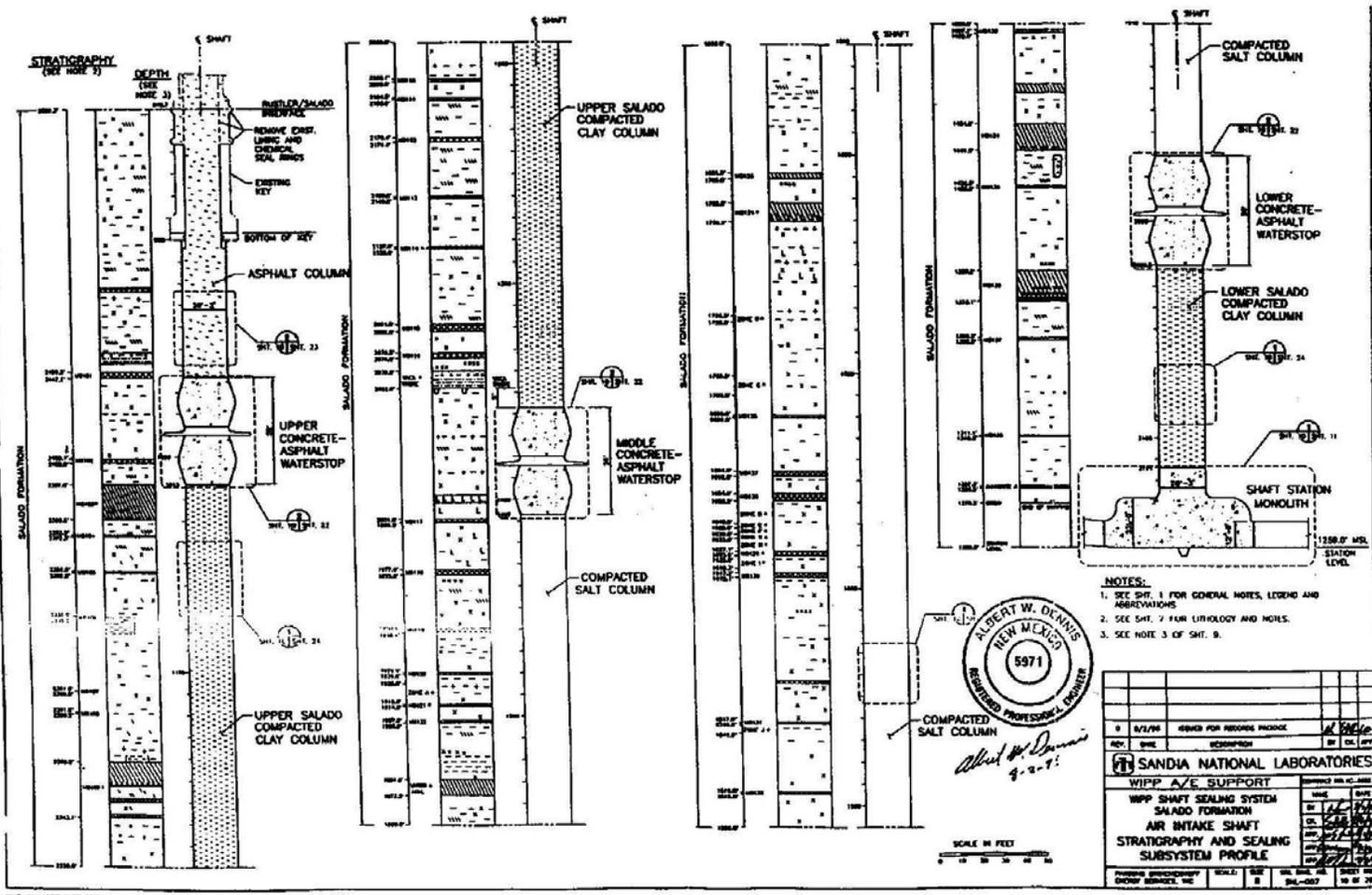


Salado Formation Waste Shaft Stratigraphy and Sealing Subsystem Profile

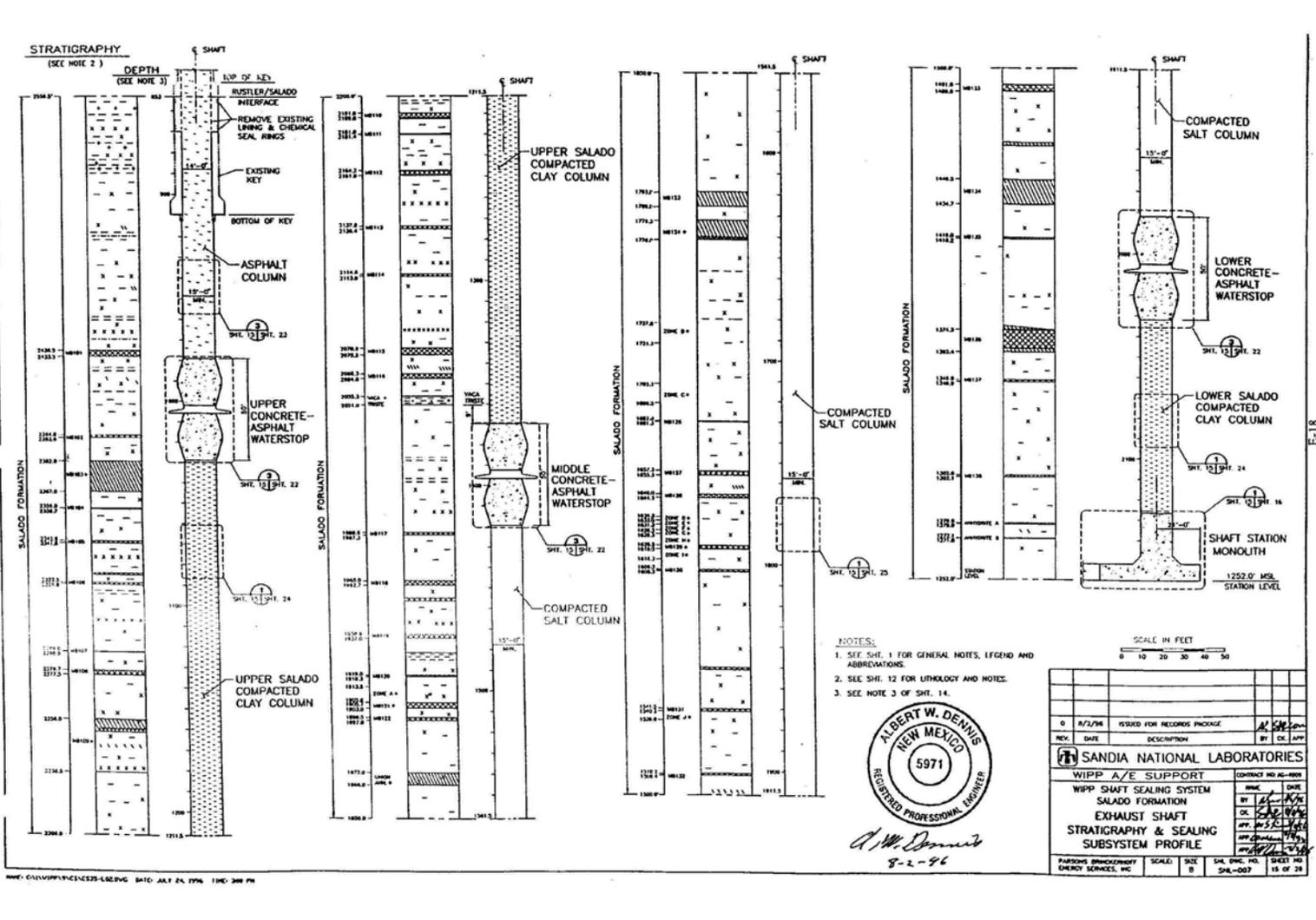




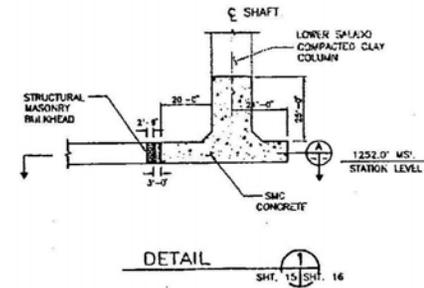
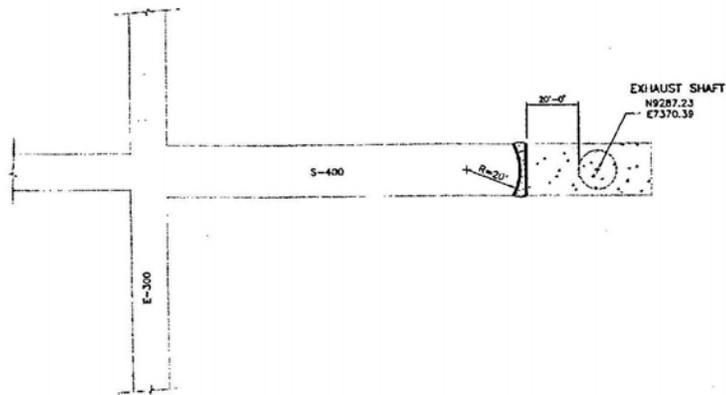
Salado Formation Air Intake Shaft Stratigraphy and AS-Built Elements



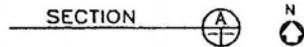
Salado Formation Air Intake Shaft Stratigraphy and Sealing Subsystem Profile



Salado Formation Exhaust Shaft Stratigraphy and Sealing Subsystem Profile



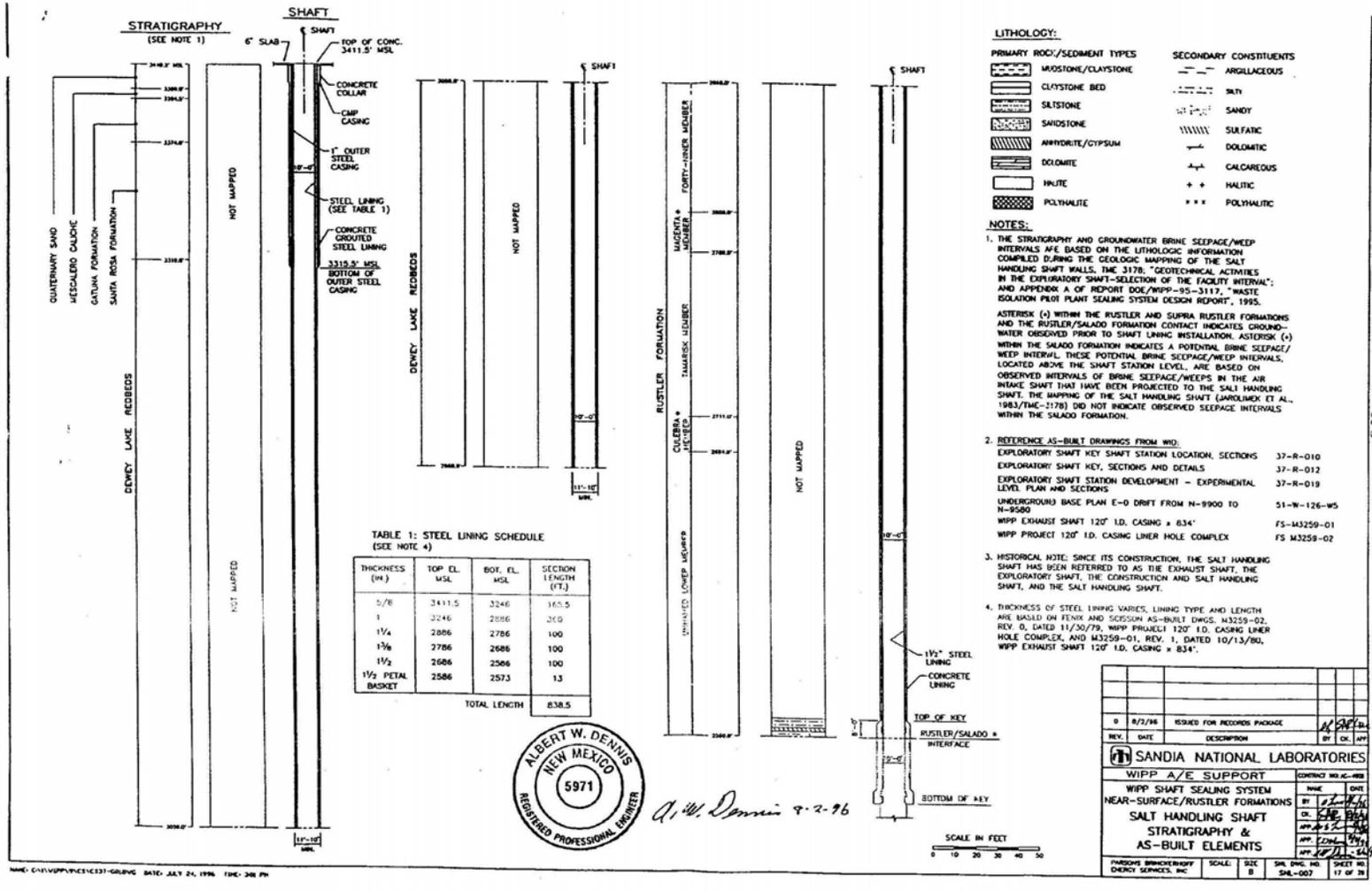
NOTES:
 1. SEE SHIT. 1 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.



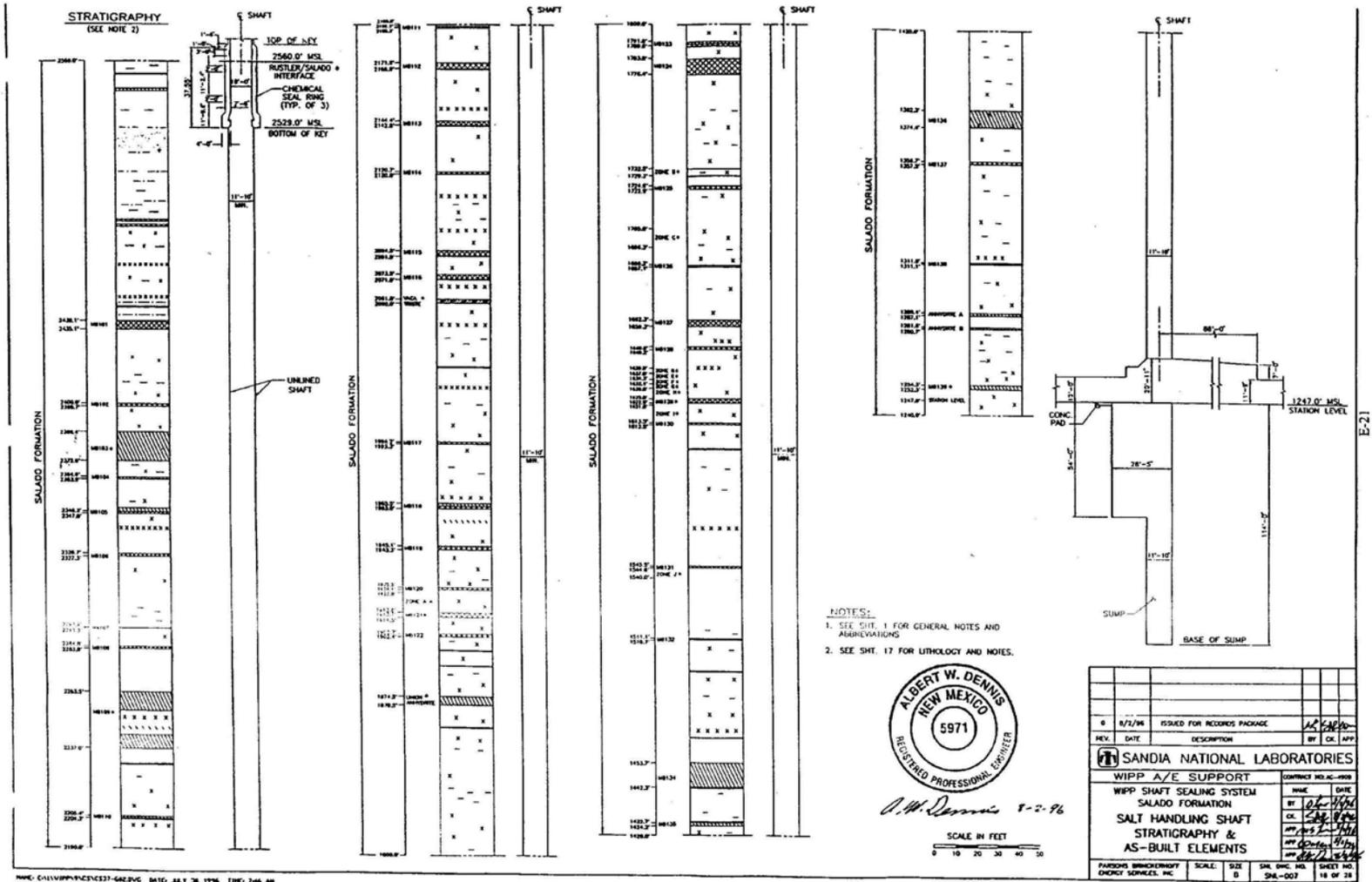
A. W. Dennis 8-2-96

REV.	DATE	DESCRIPTION	BY	CHK.	APP.
0	8/2/95	ISSUED FOR 40-GIGAS PACKAGE			
SANDIA NATIONAL LABORATORIES WIPP A/E SUPPORT WIPP SHAFT SEALING SYSTEM					
			DATE	DATE	
			BY	DATE	

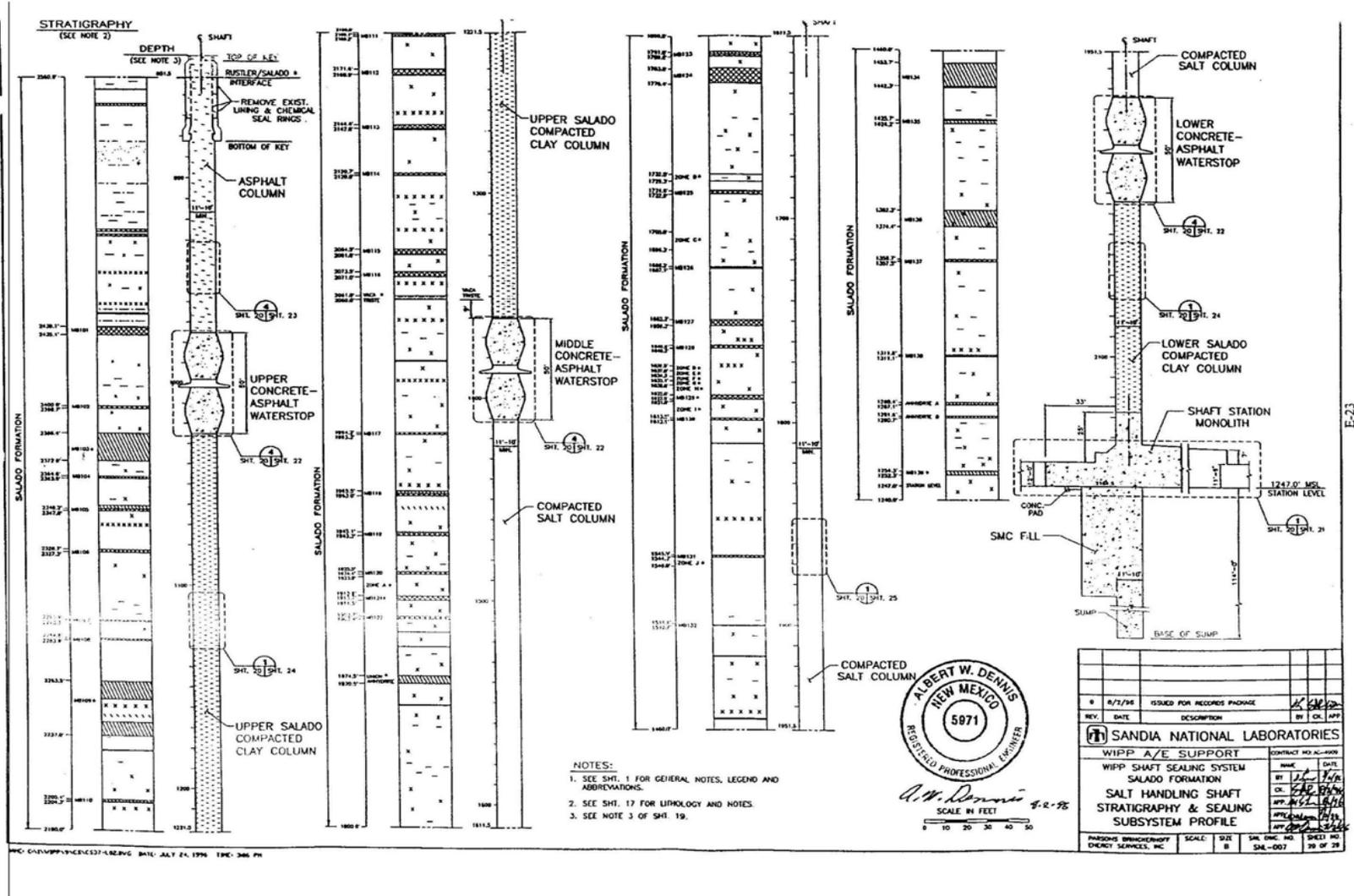
15-19



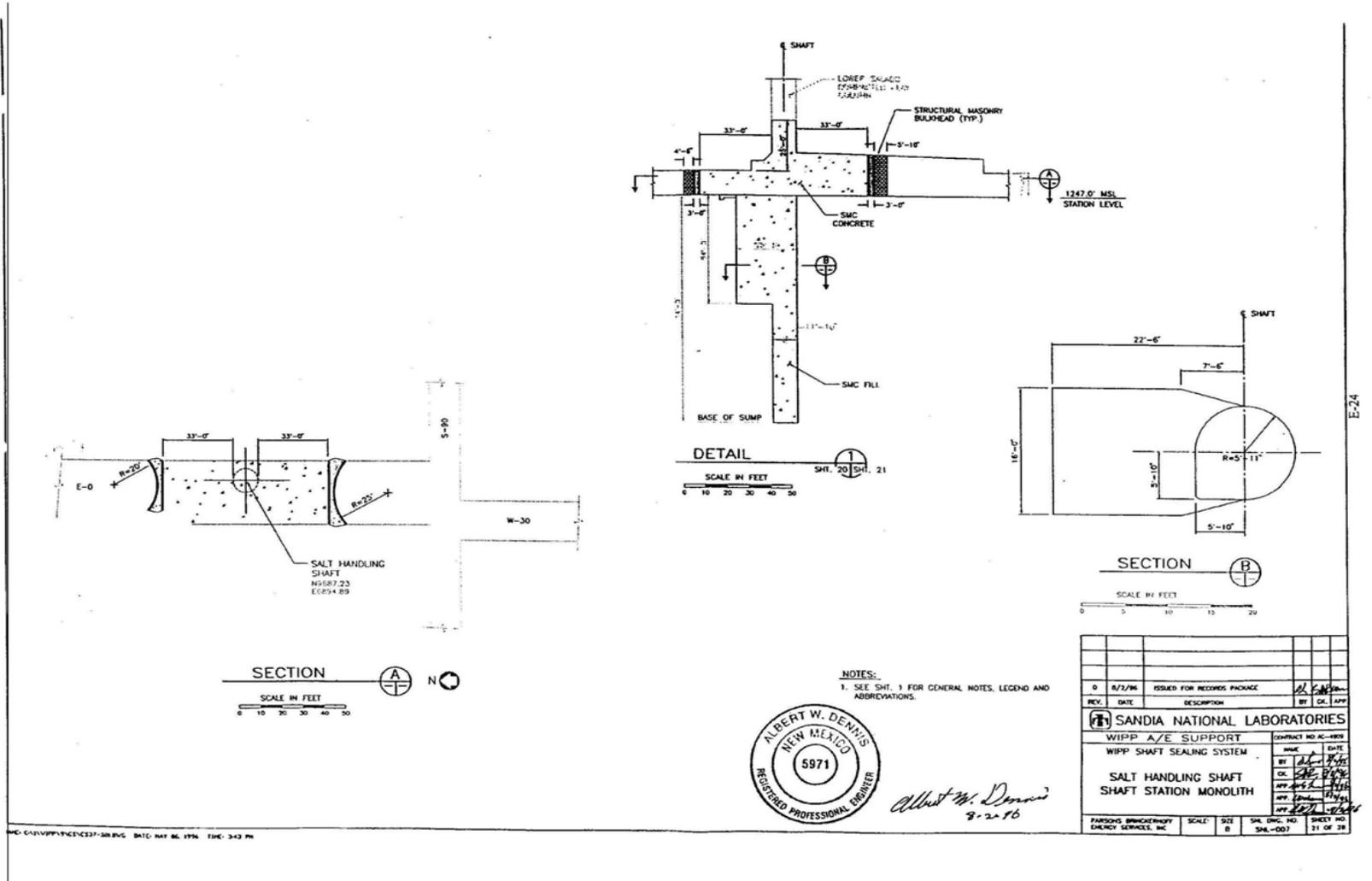
Near-Surface / Rustler Formations Salt Handling Shaft Stratigraphy and AS-Built Elements



Salado Formation Salt Handling Shaft Stratigraphy and AS-Built Elements

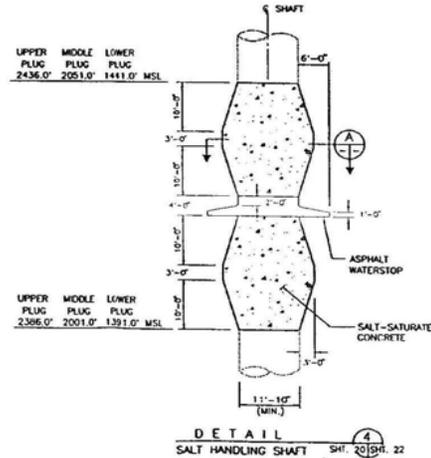
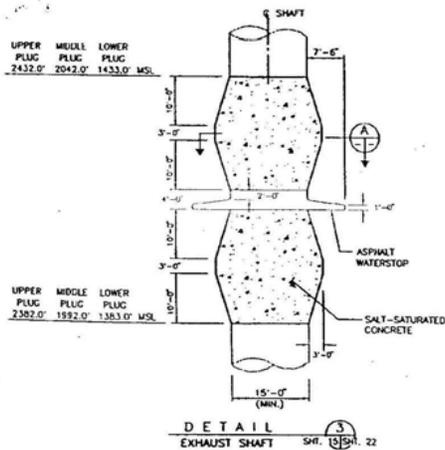
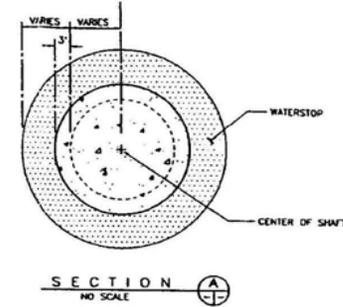
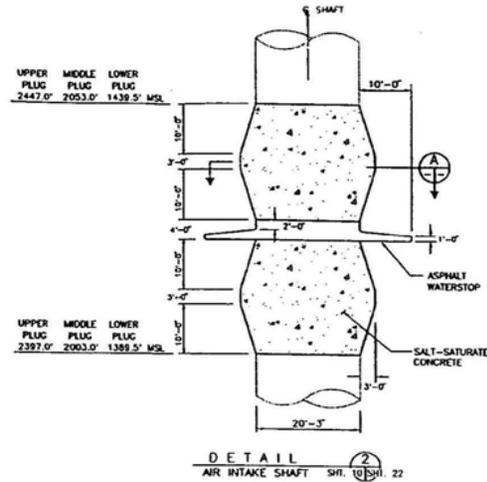
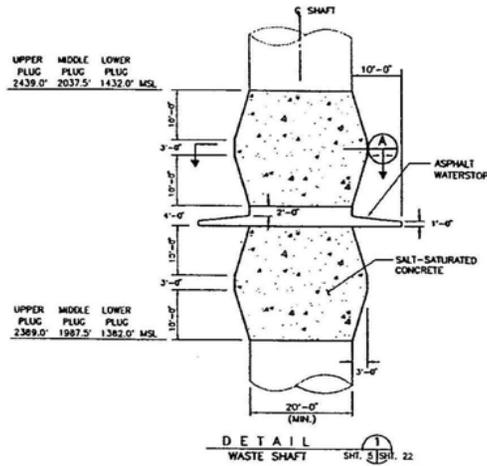


Salado Formation Salt Handling Shaft Stratigraphy and Sealing Subsystem Profile



Salt Handling Shaft Shaft Station Monolith

Sheet 21 of 28



Albert W. Dennis
 1-2-76

SCALE IN FEET
 0 5 10 15 20 25

REV.	DATE	ISSUED FOR	DESCRIPTION	BY	CHK	APP
0	8/2/09	ISSUED FOR RECORDS PACKAGE				
SANDIA NATIONAL LABORATORIES WIPP A/E SUPPORT WIPP SHAFT SEALING SYSTEM CONCRETE-ASPHALT WATERSTOP IN SALADO FORMATION						
PARSONS BRINCKERHOFF ENERGY SERVICES, INC.		SCALE:	SHEET:	SHEET NO.:	SHEET NO.:	SHEET NO.:
		8	22	007	007	22 OF 28

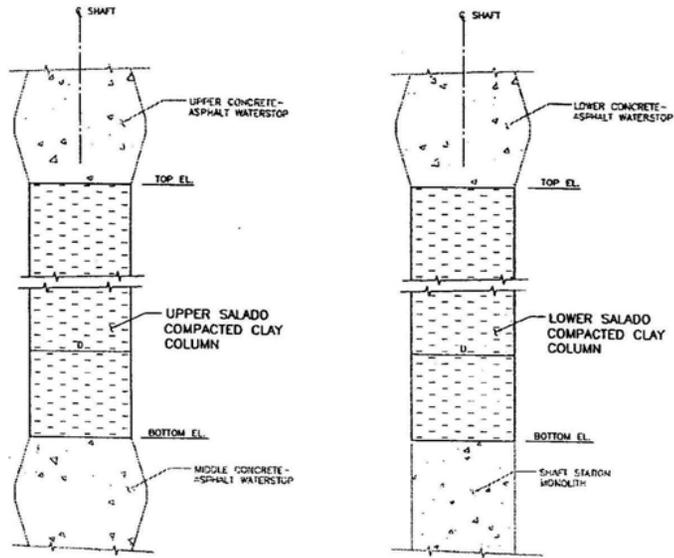


TABLE 1

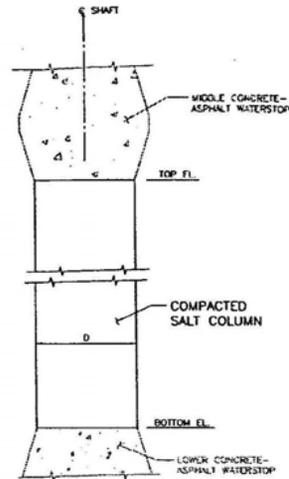
SHAFT	NOMINAL SHAFT DIAMETER D	UPPER SALADO COMPACTED CLAY COLUMN			LOWER SALADO COMPACTED CLAY COLUMN		
		TOP EL. (FT. MSL)	BOTTOM EL. (FT. MSL)	TOTAL HT. (FT.)	TOP EL. (FT. MSL)	BOTTOM EL. (FT. MSL)	TOTAL HT. (FT.)
WASTE	20'-0"	2389.0	2037.5	351.5	1382.0	1286.0	96.0
AIR INTAKE	20'-3"	2397.0	2053.0	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

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



Albert W. Dennis
 9-2-96

0	8/2/96	ISSUED FOR RECORDS PACKAGE	BY: [Signature]
REV.	DATE	DESCRIPTION	BY: [Signature]
SANDIA NATIONAL LABORATORIES			
WIPP A/E SUPPORT		CONTRACT NO. AC-889	
WIPP SHAFT SEALING SYSTEM			
BY:	DATE:	NAME:	
CK:			
UPPER AND LOWER SALADO COMPACTED CLAY COLUMNS			
PARSONS BRINCKERHOFF ENERGY SERVICES, INC.	SCALE:	SHEET NO.:	SHEET 24 OF 28



DETAIL
 SEE TABLE 1 FOR DETAILS
 NO SCALE

SH. 5 SH. 25
 SH. 10
 SH. 15
 SH. 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



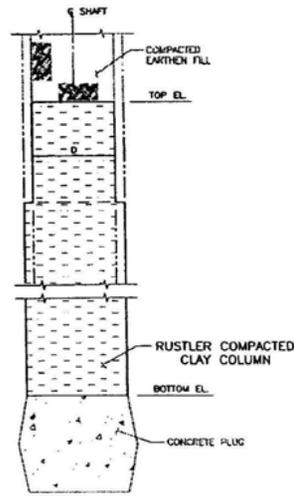
Albert W. Dennis
 8-2-96

REV.	DATE	DESCRIPTION	BY	CHK.	APP.
0	8/2/96	ISSUED FOR RECORDS PACKAGE	AL	SKC	
SANDIA NATIONAL LABORATORIES					
WIPP A/E SUPPORT				CONTRACT NO. AG-4828	
WIPP SHAFT SEALING SYSTEM				NAME	DATE
COMPACTED SALT COLUMN				BY	8/2/96
				CK	SKC
				APP	SKC
				APP	SKC
				APP	SKC
PARSONS BRINCKERHOFF ENERGY SERVICES, INC.		SCALE	SIZE	SHE. ENG. NO.	SHEET NO.
			B	SHE.-007	25 OF 28

E-28

WIPP Shaft Sealing System Concrete Plug

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



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

TABLE 1

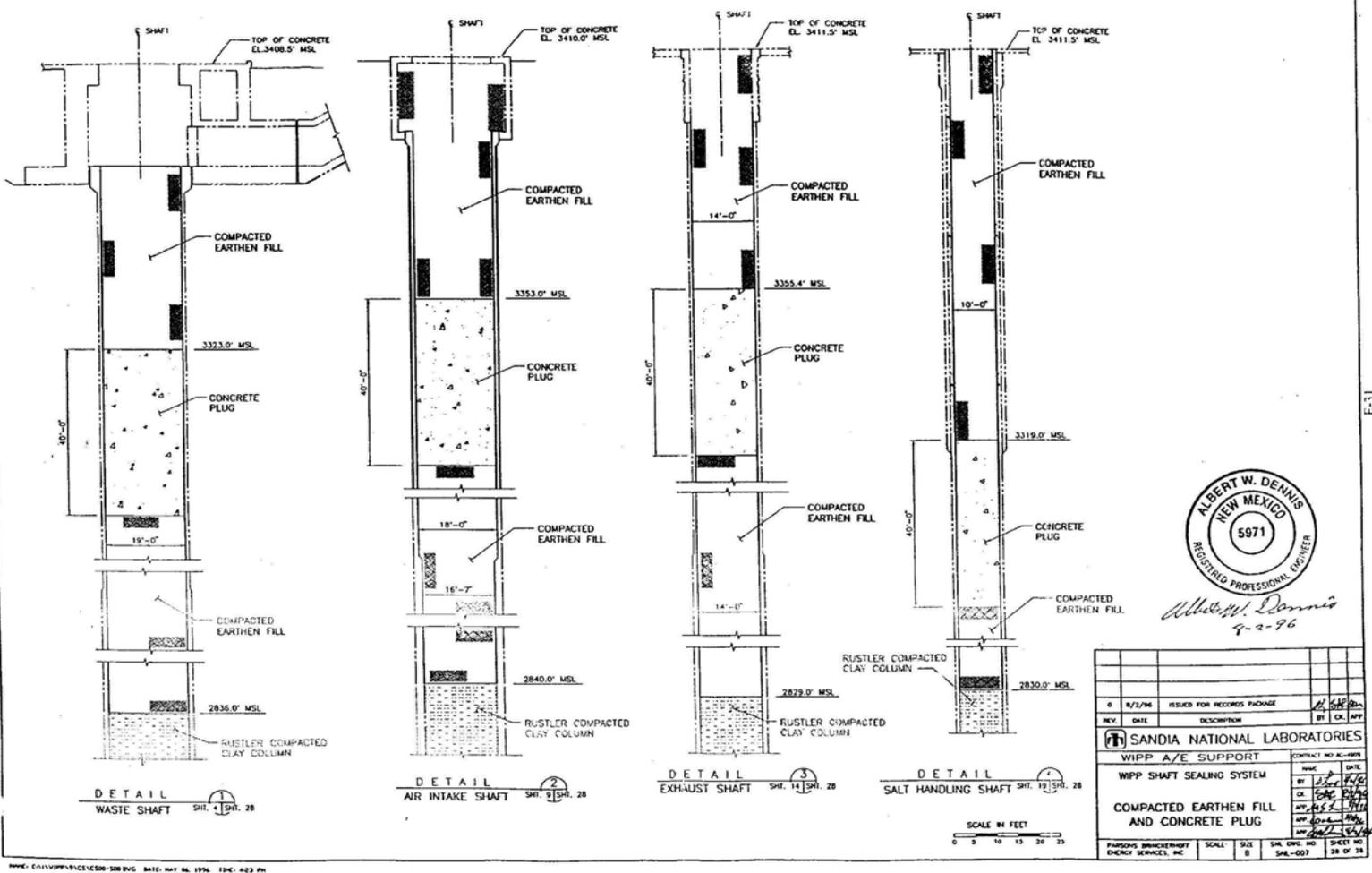
SHAFT	NOMINAL SHAFT DIAMETER D	RUSTLER COMPACTED CLAY COLUMN		
		TOP EL. (FT. MSL)	BOTTOM EL. (FT. MSL)	TOTAL HT. (FT.)
WASTE	19'-0"	2836.0	2601.3	234.7
AIR INTAKE	16'-7"	2840.0	2605.3	234.7
EXHAUST	14'-0"	2829.0	2594.5	234.5
SALT HANDLING	10'-0"	2830.0	2596.0	234.0



Albert W. Dennis
 9-2-96

REV.	DATE	ISSUED FOR RECORDS PHONE	BY	CHK	APP
0	8/2/96				
SANDIA NATIONAL LABORATORIES WIPP A/E SUPPORT WIPP SHAFT SEALING SYSTEM RUSTLER COMPACTED CLAY COLUMN					
PARSONS BRINCKERHOFF ENERGY SERVICES, INC.			SCALE:	SHEET NO. 8	SHEET NO. 27 OF 28

E-30



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

0	8/2/96	ISSUED FOR RECORDS PACKAGE	BY: [Signature]
REV.	DATE	DESCRIPTION	BY: [Signature]
SANDIA NATIONAL LABORATORIES			
WIPP A/E SUPPORT			
WIPP SHAFT SEALING SYSTEM		DATE	BY
COMPACTED EARTHEN FILL AND CONCRETE PLUG		10/1/96	[Signature]
FARRONS BRIDGEMORTH ENERGY SERVICES, INC.		SHEET NO.	28 OF 78
SCALE: 1/4" = 1'-0"		SHEET NO.	SAL-007

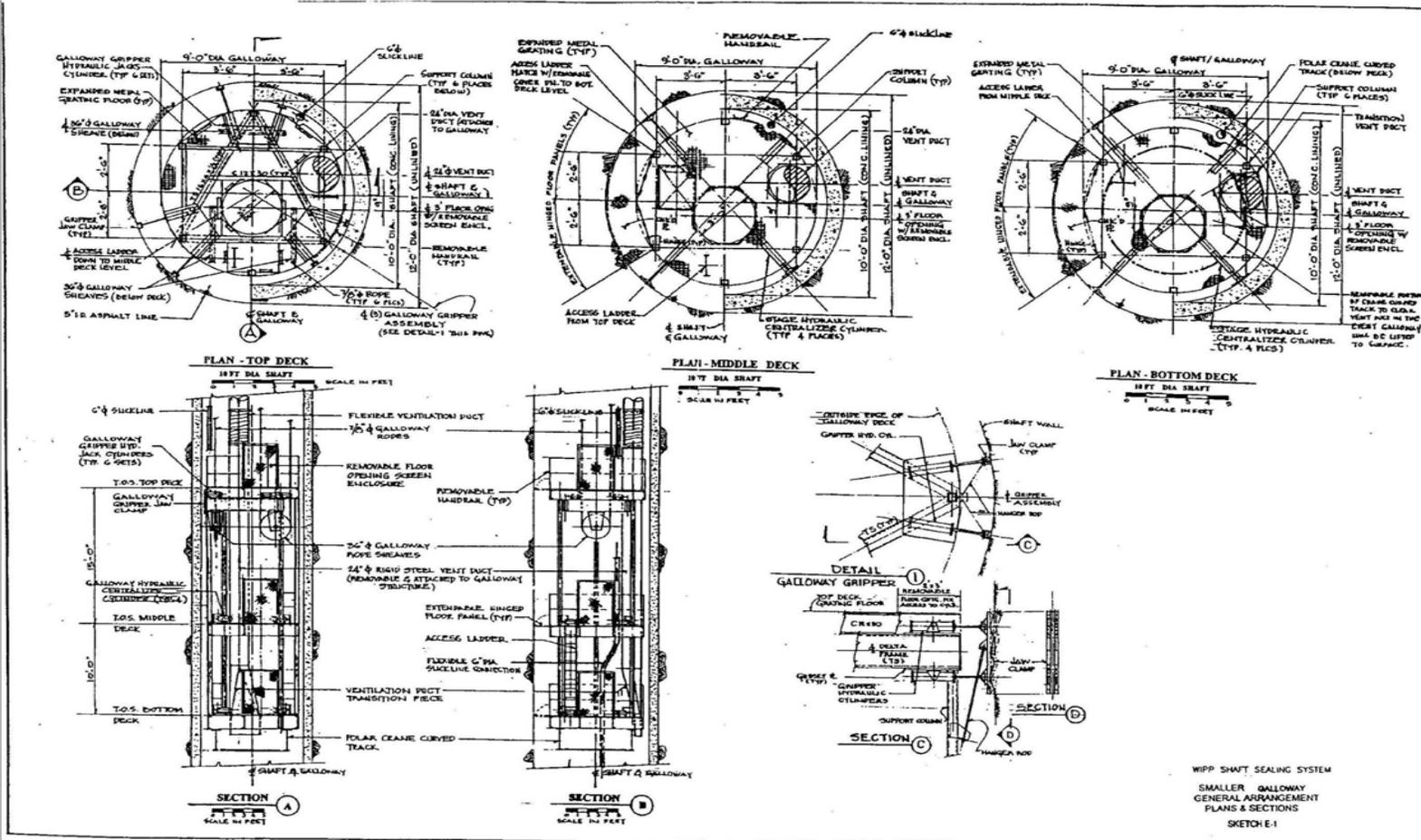
Compacted Earthen Fill and Concrete Plug

Sheet 28 of 28

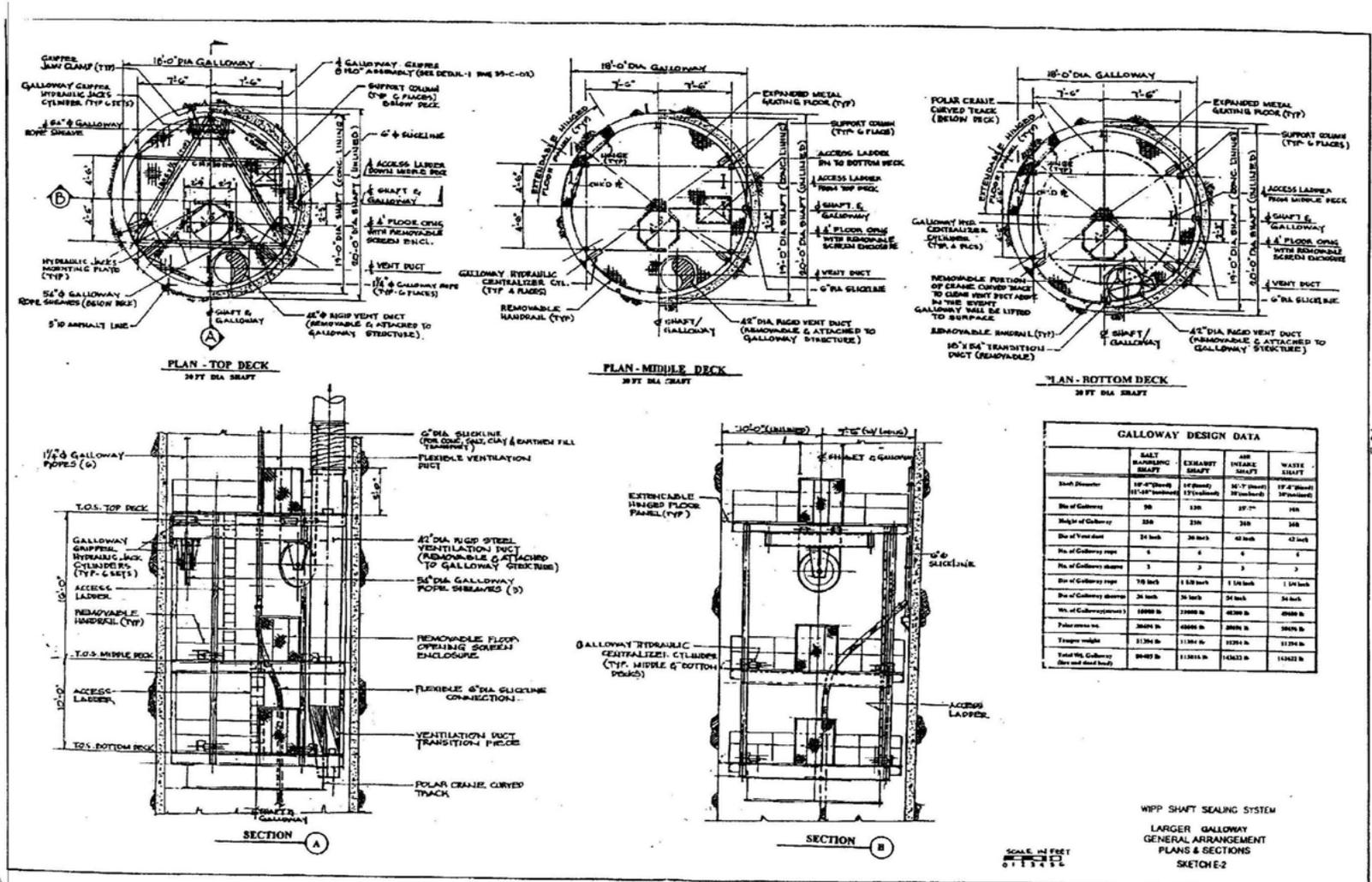
WASTE ISOLATION PILOT PLANT
CARLSBAD, NM
SHAFT SEALING SYSTEM DESIGN
EQUIPMENT AND CONSTRUCTION SKETCHES

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

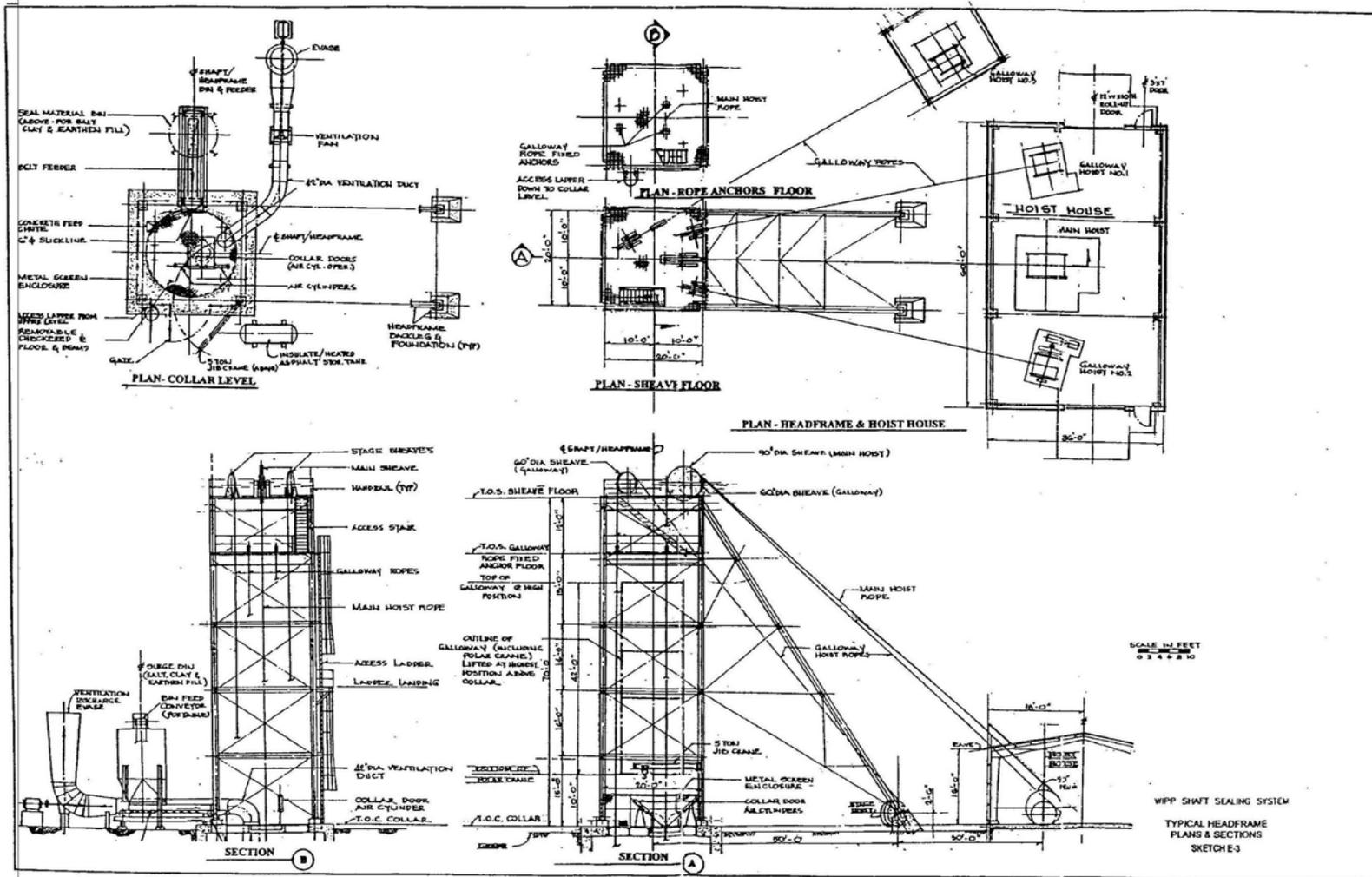
E-32



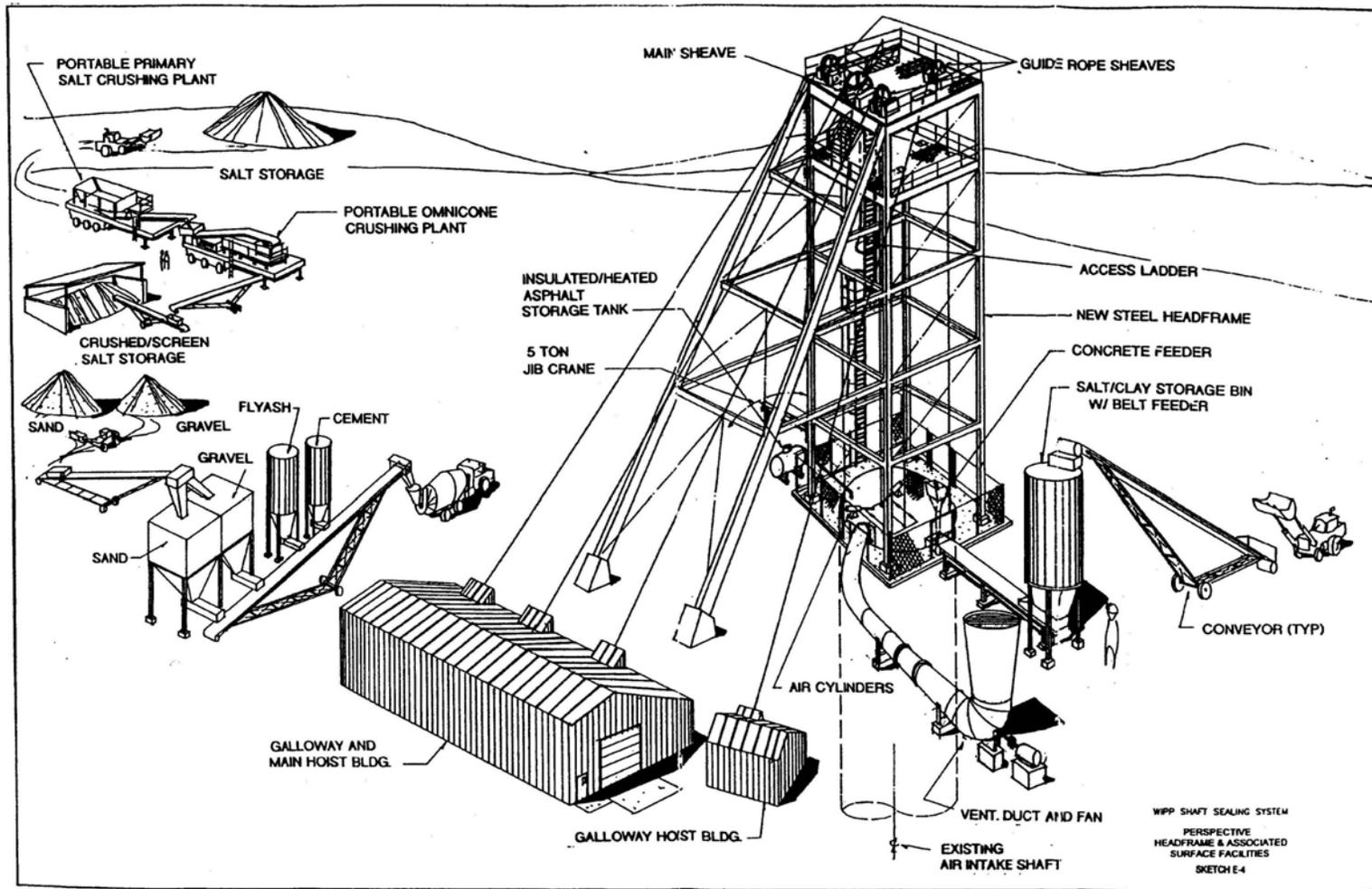
WIPP Shaft Sealing System Smaller Galloway General Arrangement Plans and Sections



WIPP Shaft Sealing System Larger Galloway General Arrangement Plans and Sections



WIPP Shaft Sealing System Typical Headframe Plans and Sections



1

WIPP Shaft Sealing System Typical Headframe and Associated Surface Facilities

WIPP
UC721 Distribution List

Federal Agencies

US Department of Energy (4)
Office of Civilian Radioactive Waste Mgmt.
Attn: Deputy Director, RW-2
Acting Director, RW-10
Office of Human Resources & Admin.
Director, RW-30
Office of Program Mgmt. & Integ.
Director, RW-40
Office of Waste Accept., Stor., & Tran.
Forrestal Building
Washington, DC 20585

Attn: Project Director (2)
Yucca Mountain Site Characterization Office
Director, RW-3
Office of Quality Assurance
101 Convention Center Drive, Suite #P-110
Las Vegas, NV 89109

US Department of Energy
Albuquerque Operations Office
Attn: National Atomic Museum Library
P.O. Box 5400
Albuquerque, NM 87185-5400

US Department of Energy
Research & Waste Management Division
Attn: Director
P.O. Box E
Oak Ridge, TN 37831

US Department of Energy (8)
Carlsbad Area Office
Attn: G. Dials
D. Galbraith (3)
M. Matthews
M. McFadden
R. Lark
J. A. Mewhinney
P.O. Box 3090
Carlsbad, NM 88221-3090

US Department of Energy
Office of Environmental Restoration and
Waste Management
Attn: J. Lytle, EM-30
Forrestal Building
Washington, DC 20585-0002

US Department of Energy (3)
Office of Environmental Restoration and
Waste Management
Attn: M. Frei, EM-34, Trevion II
Washington, DC 20585-0002

US Department of Energy
Office of Environmental Restoration and
Waste Management
Attn: S. Schneider, EM-342, Trevion II
Washington, DC 20585-0002

US Department of Energy (2)
Office of Environment, Safety & Health
Attn: C. Borgstrom, EH-25
R. Pelletier, EH-231
Washington, DC 20585

US Department of Energy (2)
Idaho Operations Office
Fuel Processing & Waste Mgmt. Division
785 DOE Place
Idaho Falls, ID 83402

US Environmental Protection Agency (2)
Radiation Protection Programs
Attn: M. Oge
ANR-460
Washington, DC 20460

Boards

Defense Nuclear Facilities Safety Board
Attn: D. Winters
625 Indiana Ave. NW, Suite 700
Washington, DC 20004

Nuclear Waste Technical Review Board (2)
Attn: Chairman
S. J. S. Parry
1100 Wilson Blvd., Suite 910
Arlington, VA 22209-2297

State Agencies

Attorney General of New Mexico
P.O. Drawer 1508
Santa Fe, NM 87504-1508

Environmental Evaluation Group (3)
Attn: Library
7007 Wyoming NE, Suite F-2
Albuquerque, NM 87109

Metropolitan Water District of Southern Calif.
Attn: J. Narvaiz
P.O. Box 54153
Los Angeles, CA 90071-3123

NM Energy, Minerals, and Natural
Resources Department
Attn: Library
2040 S. Pacheco
Santa Fe, NM 87505

NM Environment Department (3)
Secretary of the Environment
Attn: Mark Weidler
1190 St. Francis Drive
Santa Fe, NM 87503-0968

NM Bureau of Mines & Mineral Resources
Socorro, NM 87801

NM Environment Department
WIPP Project Site
Attn: P. McCasland
P.O. Box 3090
Carlsbad, NM 88221

Laboratories/Corporations

Battelle Pacific Northwest Laboratories (2)
Attn: R. E. Westerman
R. Romac, MS P8-38
P.O. Box 999
900 Battelle Blvd.
Richland, WA 99352

Brookhaven National Laboratory
Attn: F. D. Moskowitz
Environmental & Waste Technology
Center
Building 830
Upton, NY 11973

Harnischfeger Corp.
Phonex Engineering Services
Attn: R. Luebke
2969 S. Chase Avenue
Milwaukee, WI 53207-6408

Ian Clelland
6656 N. Amdahl Dr.
Tucson, AZ 85704

INTERA, Inc.
Attn: G. A. Freeze
1650 University Blvd. NE, Suite 300
Albuquerque, NM 87102

INTERA, Inc. (6)
Attn: J. F. Pickens
V. Kelley
M. Reeves
W. Statham
J. Beach
D. Fryar
INTERA WIPP Library
6850 Austin Center Blvd., Suite 300
Austin, TX 78731

INTERA, Inc.
Attn: J. Lee, YMP PA Dept.
1261 Town Center Drive
Las Vegas, NV 89134

INTERA, Inc.
Attn: W. Stearnud
P.O. Box 2123
Carlsbad, NM 88221

Istasca Consulting Group, Inc.
Attn: John Timacci
Thresher Square East
708 South Third Street, Suite 310
Minneapolis, MI 55415

Los Alamos National Laboratory
Attn: B. Erdai, INC-12
P.O. Box 1663
Los Alamos, NM 87544

Morton International, Morton Salt
Attn: H. W. Diamond
Morton International Building
100 N. Riverside Plaza,
Randolph Street at the River
Chicago, IL 60606-1597

Parsons Brinckerhoff Energy Services, Inc.
Attn: W. S. Roman
One Penn Plaza
New York, NY 10119

Parsons Brinckerhoff Energy Services, Inc. (2)
Attn: B. W. Lawrance
C. D. Maun
M. S. Lin
303 Second Street
Suite 850 North
San Francisco, CA 94107

Distribution - 1

Waste Isolation Pilot Plant
 Hazardous Waste Facility Permit
 Renewal Application
 September 2009

Parsons Brinckerhoff International, Inc.
 Attn: Mary Ann Novak
 700 11th Street, NW, Suite 710
 Washington, DC 20001

Phillips Mining, Geotechnical & Grouting
 Attn: Stephen Phillips
 8640 North Glenhurst Place
 Tucson, AZ 85704

RE/SPEC, Inc. (5)
 Ann: L. Van Sambeek (3)
 G. Callahan
 M. Loken
 J. Ratigan
 T. Pfeifle
 3824 Jet Drive
 P.O. Box 725
 Rapid City, SD 57709

RE/SPEC, Inc.
 Attn: Angus Robb
 4775 Indian School NE, Suite 300
 Albuquerque, NM 87110-3927

Science Applications International Corp.
 Attn: W. Thompson
 15000 W. 6th Avenue, Suite 202
 Golden, CO 80401

Tech Keps, Inc. (3)
 Attn: J. Chapman (1)
 L. Robledo (2)
 5000 Marble NE, Suite 222
 Albuquerque, NM 87110

Westinghouse Electric Corporation (5)
 Attn: Library
 J. Epstein
 J. Lee
 B. A. Howard
 R. Kehrmann
 P.O. Box 2078
 Carlsbad, NM 88221

S. Cohen & Associates
 Attn: Bill Thurber
 1355 Beverly Road
 McLean, VA 22101

National Academy of Sciences,
 WIPP Panel

Howard Adler
 Oxyrase, Incorporated
 7327 Oak Ridge Highway
 Knoxville, TN 37931

Bob Andrews
 Board of Radioactive Waste Management
 GF456
 2101 Constitution Ave.
 Washington, DC 20418

Rodney C. Ewing
 Department of Geology
 University of New Mexico
 Albuquerque, NM 87131

Charles Fairhurst
 Department of Civil
 and Mineral Engineering
 University of Minnesota
 500 Pillsbury Dr. SE
 Minneapolis, MN 55455-0220

B. John Garrick
 PLG Incorporated
 4590 MacArthur Blvd., Suite 400
 Newport Beach, CA 92660-2027

Leonard F. Konikow
 US Geological Survey
 431 National Center
 Reston, VA 22092

Carl A. Anderson, Director
 Board of Radioactive Waste Management
 National Research Council
 HA 456
 2101 Constitution Ave. NW
 Washington, DC 20418

Christopher G. Whipple
 ICF Kaiser Engineers
 1800 Harrison St., 7th Floor
 Oakland, CA 94612-3430

John O. Blomeke
 720 Clubhouse Way
 Knoxville, TN 37909

Sue B. Clark
 University of Georgia
 Savannah River Ecology Lab
 P.O. Drawer E
 Aiken, SC 29802

Konrad B. Krauskopf
 Department of Geology
 Stanford University
 Stanford, CA 94305-2115

Della Roy
 Pennsylvania State University
 217 Materials Research Lab
 Hastings Road
 University Park, PA 16802

David A. Waite
 CH₂ M Hill
 P.O. Box 91500
 Bellevue, WA 98009-2050

Thomas A. Zordon
 Zordas Associates, Inc.
 3807 Edinburg Drive
 Murrysville, PA 15668

Universities

Harvey Mudd College
 Attn: M. Cardenas
 Department of Engineering
 Claremont, CA 91711

New Mexico State University
 Waste-management Education & Research
 Corporation.
 Attn: R. Bhada
 P.O. Box 3001
 Las Cruces, NM 88003-8001

University of California
 Department of Mechanical and Environmental
 Engineering
 Attn: E. Marschall
 University of California
 Santa Barbara, CA 93106

University of Nevada-Reno
 Department of Mining Engineering
 Mackay School of Mines
 Attn: J. Daamen
 Reno, NV 89557

University of New Mexico
 Center for Radioactive Waste Management
 Attn: W. Lutz
 209 Faris Engineering Building
 Albuquerque, NM 87131-1341

University of New Mexico
 Department of Civil Engineering
 Attn: J. C. Stormont
 Albuquerque, NM 87131-1351

University of New Mexico
 Geology Department
 Attn: Library
 141 Northrop Hall
 Albuquerque, NM 87131

University of Washington
 College of Ocean & Fishery Sciences
 Attn: G. R. Heath
 583 Henderson Hall, HN-15
 Seattle, WA 98195

Libraries

Thomas Brannigan Library
 Attn: D. Dresp
 106 W. Hadley St.
 Las Cruces, NM 88001

Government Publications Department
 Zimmerman Library
 University of New Mexico
 Albuquerque, NM 87131

New Mexico Junior College
 Pannell Library
 Attn: R. Hill
 Lovington Highway
 Hobbs, NM 88240

New Mexico State Library
 Attn: N. McCallan
 325 Don Gaspar
 Santa Fe, NM 87503

New Mexico Tech
 Martin Speere Memorial Library
 Campus Street
 Socorro, NM 87810

WIPP Public Reading Room
 Carlsbad Public Library
 101 S. Halagueño St.
 Carlsbad, NM 88220

Foreign Addresses

Atomic Energy Canada Ltd. (5)
 Whiteshell Laboratory
 Attn: Neil Chandler
 Glenn McCrank
 B. Goodwin
 Malcolm Gray
 Maria Onefrei
 Pinawa Manitoba, CANADA ROE 1L0

Distribution - 2

Francois Chenevier (2)
 ANDRA
 Route de Panorama Robert Schumann
 B.P. 38
 92266 Fontenay-aux-Roses, Cedex
 FRANCE

Claude Sombret
 Centre d'Etudes Nucleaires
 de la Vallee Rhone
 CEN/VALRIHO
 S.D.H.A. B.P. 171
 30205 Bagnols-Sur-Ceze, FRANCE

Commissariat a L'Energie Atomique
 Attn: D. Alexandre
 Centre d'Etudes de Cadarache
 13108 Saint Paul Lez Durance Cedex
 FRANCE

Bundesanstalt für Geowissenschaften und
 Rohstoffe (2)
 Attn: M. Langer
 M. Wallner
 Postfach 510 153
 D-30631 Hannover, GERMANY

Bundesministerium für Forschung und
 Technologie
 Postfach 800 706
 5300 Bonn 2, GERMANY

Forschungszentrum Karlsruhe GmbH
 Institut für Nukleare Entsorgungstechnik
 Attn: E. Korthaus
 Postfach 3640, D-76021 Karlsruhe
 Bundesrepublik Deutschland
 GERMANY

Gesellschaft für Anlagen und Reaktorsicherheit
 (GRS)
 Attn: B. Bales
 Schwertnergasse 1
 D-50667 Cologne, GERMANY

Grundbau Und Felsbau GmbH
 Attn: W. Witke
 Henricistraße 50
 52072 Aachen, GERMANY

Institut Für Gebirgsmechanik
 Attn: W. Minkley
 Friederikensstraße 60
 04279 Leipzig, GERMANY

Institut Für Tief Lagerung
 Attn: K. Kuhn
 Theodor-Heuss-Strasse 4
 D-3300 Braunschweig, GERMANY
 Shingo Tashiro
 Japan Atomic Energy Research Institute
 Tokai-Mura, Ibaraki-Ken, 319-11
 JAPAN

Netherlands Energy Research Foundation ECN
 Attn: J. Prij
 3 Westerduinweg
 P.O. Box 1
 1755 ZG Petten
 THE NETHERLANDS

Universiteit Utrecht
 Department of Geology (HPT-lab)
 Attn: C. J. Spiers
 PO Box 80021
 NL-3508 TA Utrecht
 Budapestlaan 4
 THE NETHERLANDS

Svensk Kambransleforsorjning AB
 Attn: F. Karlsson
 Project KBS (Kambranslesakerhet)
 Box 5864
 S-102 48 Stockholm
 SWEDEN

Nationale Genossenschaft für die Lagerung
 Radioaktiver Abfälle (2)
 Attn: S. Vomvoris
 P. Zuidema
 Hardstrasse 73
 CH-5430 Wettingen
 SWITZERLAND

AEA Technology
 Attn: J. H. Rees
 D5W/29 Culham Laboratory
 Abingdon, Oxfordshire OX14 3DB
 UNITED KINGDOM

AEA Technology
 Attn: W. R. Rodwell
 044/A31 Wimfrith Technical Centre
 Dorchester, Dorset DT2 8DH
 UNITED KINGDOM

AEA Technology
 Attn: J. E. Tinson
 B4244 Harwell Laboratory
 Didcot, Oxfordshire OX11 0RA
 UNITED KINGDOM

MS	Org.	Internal
0483	5165	R. E. Stinebaugh
0706	6113	J. K. Linn
1320	6719	E. J. Nowak
1322	6121	J. R. Tillerson (10)
1322	6121	E. H. Ahrens (2)
1322	6121	A. W. Dennis (10)
1322	6121	F. D. Hansen
1322	6121	L. D. Hurtado
1322	6121	M. K. Knowles
1324	6115	P. B. Davies
1325	6852	L. S. Costin
1325	6852	R. E. Finley
1328	6749	D. R. Anderson
1328	6741	H. N. Jow
1328	6849	M. F. Fewell
1328	6849	P. Vaughn
1335	6705	M. Chu
1341	6748	J. T. Holmes
1395	6800	L. Shephard
1395	6707	M. Marietta
1395	6841	V. H. Slaboszewicz
1330	6752	B. J. Pierson (2)
1330	6752	NWM Library (100)
9018	8523-2	Central Technical Files
0899	4414	Technical Library (5)
0619	12630	Review and Approval Desk, For DOE/OSTI (2)

Distribution - 3

SAND96-1326/2
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.