

<b>AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT</b>				1. CONTRACT ID CODE	PAGE OF PAGES 1   10
2. AMENDMENT/MODIFICATION NO. 0002	3. EFFECTIVE DATE 24-Jan-2008	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO.(If applicable)		
6. ISSUED BY AFGHANISTAN ENGINEER DISTRICT US ARMY CORPS OF ENGINEERS KABUL APO AE 09356	CODE W917PM	7. ADMINISTERED BY (If other than item 6)		CODE	<b>See Item 6</b>
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)		X	9A. AMENDMENT OF SOLICITATION NO. W917PM-08-R-0016		
		X	9B. DATED (SEE ITEM 11) 28-Dec-2007		
			10A. MOD. OF CONTRACT/ORDER NO.		
			10B. DATED (SEE ITEM 13)		
CODE	FACILITY CODE				
<b>11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS</b>					
<input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended, <input checked="" type="checkbox"/> is not extended.					
Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning <u>1</u> copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.					
12. ACCOUNTING AND APPROPRIATION DATA (If required)					
<b>13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.</b>					
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.					
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).					
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:					
D. OTHER (Specify type of modification and authority)					
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.					
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)					
The purpose of this amendment for solicitation W917PM-08-R-0016 is to answer questions from the offerors, incorporate Appendix A1, B, and C, and to incorporate a revised section 00010. The due date is still 12 February 2008.					
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.					
15A. NAME AND TITLE OF SIGNER (Type or print)			16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)		
			TEL: _____ EMAIL: _____		
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA		16C. DATE SIGNED	
_____ (Signature of person authorized to sign)		BY _____ (Signature of Contracting Officer)		24-Jan-2008	

## SECTION SF 30 BLOCK 14 CONTINUATION PAGE

## SUMMARY OF CHANGES

The following have been added by full text:

QUESTIONS & ANSWERS # 2

QUESTIONS & ANSWERS (Q&A)  
W917PM-08-R-0016  
2/209th Facilities ANA Kunduz Installation  
24 Jan 08

**RFI#6**

Q18 - According to the scope of work, the power plant must be designed for the entire master plan (base bid and option and future facilities). However, we do not understand that whether the contractor is responsible for the supply and installation of the power plant (generators, fuel tanks for base and option bids) for the entire master plan. Will you please clarify this to us?

**A18 –Section 01010, paragraphs 4.5: 4.5.1, 4.5.2 & 4.5.3 adequately addressed this question. Additional clarification is not required. The contractor is responsible for a thorough review of the entire RFP package.**

**RFI #7**

Q19 - Please provide appendices and drawings that are mentioned in Amendment 01.

**A19 – Please refer to amendment#2 for floor plans.**

**RFI #8**

Q20 – Amendment #1 refer to attached appendix sheets; please provide missing drawings/appendix sheets.

**A20- Please refer to answer #19.**

Q21 - Amendment #1 provides CLIN Items 00304, and 0030 for Sewage Treatment Plant, however the Garrison Optional Bid does not have a Sewage Treatment Plan CLIN Item. Please clarify.

**A21 –Optional line item 0030 of RFP Bid Schedule for sewage collection system and wastewater treatment system and effluent disposal shall be designed to accommodate the additional 900 personnel *plus* 25% as specified in the technical proposal.**

Q22 - Amendment #1 does not provide CLIN Item for the ETTC Guard Towers and the ETTC Parking Lot. Please provide.

**A22 – Section 00010 has been revised: Item 000410 “ETT Camp Perimeter Wall, Gate Guard Towers & Parking for 100 vehicle”**

**RFI #9**

Q23 – Amendment #1, page 3/39, AED response to question #10, A10 states that "Floor plan drawings are included in this amendment". We did not receive the Floor plans.

**A23 –Please refer to answer #19 above.**

**Amendment #2**

**00010 – Bid Schedule:** Delete section 00010 in its entirety and replace with revised section 00010.

SECTION 00010 - SOLICITATION CONTRACT FORM

The following have been added by full text:

SECTION 00010 REVISED 2

**SECTION 00010  
PROPOSAL SCHEDULE**

The Contractor shall provide a price for all items, including those labeled, “Optional Items.” The Government will evaluate the Contractor’s entire proposal to determine which CLINs represent the best value to the Government.

No.	Description Qty	Unit	Unit Price	Total Amount
<b>1. Base Proposal:</b>				
<b>0001 Design Program:</b>				
000101	Design Costs	LS	xxx	\$_____
000102	Site Survey / Master Planning	LS	xxx	\$_____
000103	As-Built Drawings Costs Not to Exceed	LS	xxx	<u>\$50,000</u>
<b>Sub-Total Design Program:</b>				<b>\$_____</b>
<b>0002 Corps of Engineers Facilities</b>		<b>LS</b>	<b>xxx</b>	<b>\$_____</b>

**0003 Site Development / Improvements:**

000301	Mobilization/De Mobilization Costs	LS	xxx	\$ _____
000302	Grading Costs	LS	xxx	\$ _____
000303	Water Well, Storage and Distribution System	LS	xxx	\$ _____
000304	Sewage Treatment Plant & Sewer System	LS	xxx	\$ _____
000305	Prime Power Plant/Distribution & Fuel System	LS	xxx	\$ _____
000306	Force Protection Perimeter	LS	xxx	\$ _____
000307	Road Network (Gravel finish) (Approx 3 Km) & Sidewalk (Approx 2 Km)	LS	xxx	\$ _____
000308	Solid Waste Collection Point	LS	xxx	\$ _____
<b>Sub-Total Site Developments / Improvements:</b>				<b>\$ _____</b>

**0004 Buildings & Building Complexes (Infantry Battalion & DFAC):**

000401	Infantry Barracks Type A (4).	4	xxx	\$ _____
000402	Infantry Barracks Type B (5).	5	xxx	\$ _____
000403	Infantry Barracks Toilet/Shower /Ablution Facility (2)	2	xxx	\$ _____
000404	DFAC Number 1	LS	xxx	\$ _____
000405	Embedded Training Team Barracks (2)	2	xxx	\$ _____
000406	Embedded Training Team Storage Building	LS	xxx	\$ _____
000407	Embedded Training Team DFAC # 2	LS	xxx	\$ _____

000408	Interpreter Barracks (1) With MWR	LS	xxx	\$ _____
000409	Interpreter Compound Storage Bldg.	LS	xxx	\$ _____
000410	ETT Camp Perimeter Wall, Gate Guard Towers & Parking for 100 vehicles	LS	xxx	\$ _____

**Sub-Total Buildings & Building Complexes:** \$ \_\_\_\_\_

**TOTAL BASE BID ITEMS:** \$ \_\_\_\_\_

## 2. Optional Battalion Bid Items:

0005	Solid Waste Collection Point	LS	xxx	\$ _____
0006	Battalion Storage	LS	xxx	\$ _____
0007	POL Building	LS	xxx	\$ _____
0008	Motor Pool	LS	xxx	\$ _____
0009	BOQ Type A Facilities (1)	LS	xxx	\$ _____
0010	BOQ Type B Facilities (1)	LS	xxx	\$ _____
0011	Battalion HQ Building	LS	xxx	\$ _____
0012	Brigade HQ Building	LS	xxx	\$ _____
0013	Communications Building	LS	xxx	\$ _____
0014	Vehicle Re-fueling Point	LS	xxx	\$ _____
0015	Bunkers	LS	xxx	\$ _____
0016	Anti-vehicle Trench	LS	xxx	\$ _____
0017	Access Road (Gravel finish) Approximately 5 Km	LS	xxx	\$ _____
0018	Infantry Type A (1 each) Barracks	LS	xxx	\$ _____

0019	Infantry Type A (1 each) Barracks	LS	xxx	\$_____
0020	Infantry Type A (1 each) Barracks	LS	xxx	\$_____
0021	Infantry Type A (1 each) Barracks	LS	xxx	\$_____
0022	Infantry Type A (1 each) Barracks	LS	xxx	\$_____
0023	Infantry Type A (1 each) Barracks	LS	xxx	\$_____
0024	Infantry Type B (1 each) Barracks	LS	xxx	\$_____
0025	Infantry Type B (1 each) Barracks	LS	xxx	\$_____
0026	Infantry Type B (1 each) Barracks	LS	xxx	\$_____
0027	Infantry Type B (1 each) Barracks	LS	xxx	\$_____
0028	Infantry Type B (1 each) Barracks	LS	xxx	\$_____
0029	Infantry Type B (1 each) Barracks	LS	xxx	\$_____
0030	Sewage Treatment Plant & Sewer System (to support additional 900 people)	LS	xxx	\$_____

**TOTAL BATTALION OPTIONAL BID ITEMS:** \$\_\_\_\_\_

### 3. Brigade and Garrison Optional Bid Items:

0031	Infantry Type B (3 each) Barracks	LS	xxx	\$_____
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0032	Toilet/Shower/Laundry/Ablution Facility	LS	xxx	\$ _____
0033	Garrison HQ Building	LS	xxx	\$ _____
0034	BOQ Type A (1 each)	LS	xxx	\$ _____
0035	BOQ B Facilities (3 each)	LS	xxx	\$ _____

**TOTAL ALL BRIGADE AND GARRISON  
OPTIONAL BID ITEMS:**

\$ \_\_\_\_\_

**TOTAL PROPOSAL:**

(total of all above costs – Base and all Options)

\$ \_\_\_\_\_

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**PROPOSAL SCHEDULE NOTES**

1. Offeror shall submit prices on all items.
2. Only one contract for the entire schedule will be awarded under this solicitation. This project will be awarded as a lump sum contract. This Proposal Schedule is an accounting tool for allocating funds to applicable budget.
3. Costs associated with this project shall include design and construction costs, site development, and utility installation.
4. **DESIGN COSTS DEFINITION:** Design costs shall consist of preparation of master planning and site designs, plans, design analysis, drawings, and specifications.
5. **NON-DESIGN COSTS DEFINITION:** Non-design costs shall include the following: initial site visits; field, topographic, property, boundary, utility, and right-of-way surveys; subsurface explorations and borings; feasibility, functional, and economic studies and other investigations; preparation or verification of as-built drawings; preparation of general and development criteria; preparation of general and feature design memoranda; services of consultants where not specifically applied to the preparation of working drawings or specifications; construction phase services; models, renderings, or photographs of completed designs; reproduction of designs for review purposes; and travel and per diem allowances in connection with the above excludable services.

6. **COST LIMITATION:** The established design cost limitation for all Design Costs, as defined in paragraph 4, shall not exceed 6 percent of the total construction cost.
7. **SEPARATION OF WORK:** All work for Design and Construction shall be included in all Proposal Items.
8. **EVALUATION OF OPTIONS:** The award will be made to the offeror whose proposal represents the best overall value to the Government. For pricing purposes the Government will evaluate both the Base Proposals and Option Proposals. The Government is not obligated to exercise the options.
9. **EXERCISE OF OPTIONAL BID ITEMS:** Optional bid items (if any) may, at the option of the Government, be added to the contract at any time within 180 calendar days after award of Base Proposal.
10. **Period of performance** is 300 calendar days from receipt of notice to proceed for the base items and 210 calendar days for all optional items. Liquidated damages are assessed at \$3,115.00 per day for every day of delay past the period of performance of either Base Items or Option Items.

-END OF SECTION-

#### SECTION 00800 - SPECIAL CONTRACT REQUIREMENTS

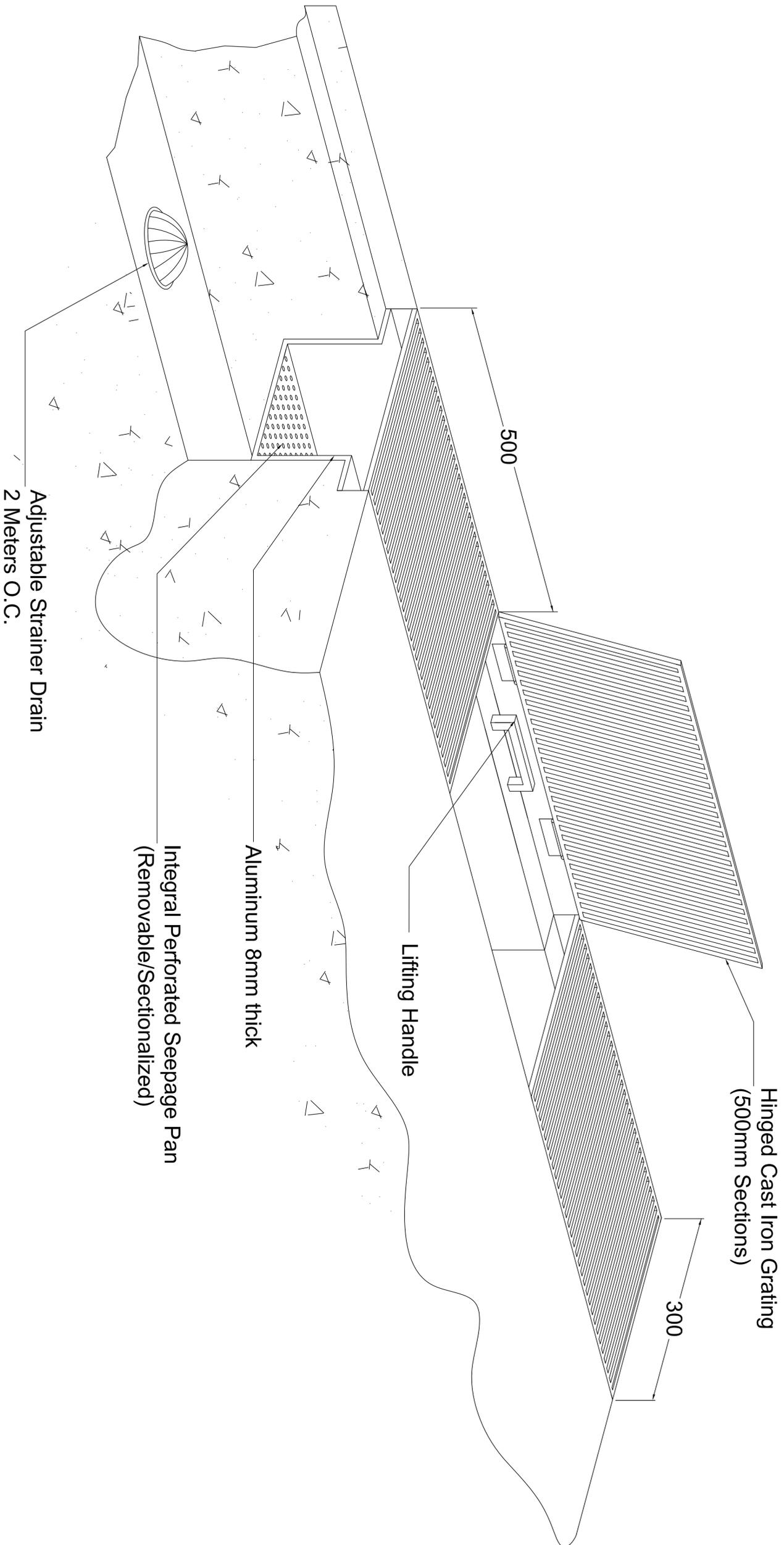
The following have been added by full text:

ATTACHMENTS REVISED

Attachments

Appendix A	Section 01335a, Drawings, and Map
Appendix A1	Additional Drawings
Appendix B	Additional Drawings
Appendix C	Additional Drawings

(End of Summary of Changes)



# FLOOR TRENCH DETAIL

TRENCH DRAIN DETAIL	 US ARMY CORPS OF ENGINEERS <b>AFGHAN ENGR DISTRICT</b>	Project number	<b>MECH</b>
		Date: 30 JULY 2007	
		Checked by	Scale

**ATTACHMENT A**  
**FIRE PROTECTION AND LIFE SAFETY CODE REVIEW**

Instructions: The information outlined in this document shall be used to provide the minimum requirement for development of Fire Protection and Life Safety Code submittals for each building in a project. Additional and supplemental information may be used to further develop the code review. Provide information for each bracket illustrated. Applicable code chapters and paragraphs are indicated in parenthesis. Insert N/A in brackets which are "not applicable".

- 1.1. Project Name and Location: [       ]
- 1.2. Building Name: [       ]
- 1.3. Applicable Codes and Standards
  - 1.3.1. Unified Facilities Criteria (UFC) 1-200-01, General Building Requirements, 31 July 2002.
  - 1.3.2. Unified Facilities Criteria (UFC) 3-600-01, Design: Fire Protection Engineering For Facilities, 17 April 2003
  - 1.3.3. International Building Code (IBC) 2003: for fire resistance requirements, allowable floor area, building height limitations and building separation distance requirements, except as modified by UFC 3-600-01.
  - 1.3.4. National Fire Protection Association (NFPA) 101 Life Safety Code (latest edition): for building egress and life safety and applicable criteria in UFC 3-600-01.
- 1.4. Occupancy Classification: [       ]  
(IBC chapters 3 and 4)
- 1.4. Construction Type: [       ]  
(IBC chapter 6)
- 1.5. Area Limitations: [       ]  
(IBC chapter 5, table 503)
- 1.6. Allowable Floor Areas: [       ]  
(IBC section 503, 505)
- 1.7. Allowable area increases: [       ]  
(IBC section 506, 507)
- 1.8. Maximum Height of Buildings: [       ]  
(IBC section 504)
- 1.9. Occupancy Separations: [       ]  
(IBC table 302.3.2)
- 1.10. Fire Resistive Requirements (IBC table 601, 602)
  - 1.10.1. Exterior Walls - [\_\_\_\_\_] hour rating
  - 1.10.2. Interior Bearing walls - [\_\_\_\_\_] hour rating
  - 1.10.3. Structural frame - [\_\_\_\_\_] hour rating
  - 1.10.4. Permanent partitions - [\_\_\_\_\_] hour rating
  - 1.10.5. Shaft enclosures - [\_\_\_\_\_] hour rating
  - 1.10.6. Floors & Floor-Ceilings - [\_\_\_\_\_] hour rating
  - 1.10.7. Roofs and Roof Ceilings - [\_\_\_\_\_] hour rating
- 1.11. Portable Fire Extinguishers, fire classification and travel distance: [       ]  
(NFPA 10)
- 1.12. Enclosure Protection and Penetration Requirements. - Opening Protectives and Through Penetrations. (IBC Section 712, 715 and Table 715.3.)
  - 1.12.1. Mechanical rooms, exit stairways, storage rooms, janitor closets: [\_\_\_\_\_] hour rating.  
(IBC Table 302.1.1)
  - 1.12.2. Fire Blocks, Draft Stops, Through Penetrations and Opening Protectives: [       ]
- 1.13. Fire Dampers. Describe where fire dampers and smoke dampers are to be used including any requirements for smoke dampers at air handling units: [       ]  
(IBC Section 716 and NFPA 90A).
- 1.14. Detection Alarm and Communication Requirements: [       ]  
(UFC 3-600-01, (Chapter 5); NFPA 101 para. 3.4 (chapters 12-42); NFPA 72)
- 1.15. Interior Finishes (classification): [       ]  
(NFPA 101 para. 10.2.3 and NFPA 101 para. 7.1.4)

1.16. Means of Egress

1.16.1. Separation of Means of Egress: [       ]  
(NFPA 101 chapters 7 and 12-42; NFPA 101 para. 7.1.3)

1.16.2. Occupant Load: [       ]  
(NFPA 101 para. 7.3.1 and chapters 12-42)

1.16.3. Egress Capacity (stairs, corridors, ramps and doors): [       ]  
(NFPA 101 para. 7.3.3)

1.16.4. Number of Means of Egress: [       ]  
(NFPA101, para. 7.4 and chapters 12-42)

1.16.5. Dead end limits and Common Path of Travel: [       ]  
(NFPA 101, para. 7.5.1.6 and chapters 12-42)

1.16.6. Measurement of Travel Distance to Exits: [       ]  
(NFPA 101, para. 7.6 and chapters 12-42)

1.16.7. Discharge from Exits: [       ]  
(NFPA 101, para. 7.7.2)

1.16.8. Illumination of Means of Egress: [       ]  
(NFPA 101, para. 7.80)

1.16.9. Emergency Lighting: [       ]  
(NFPA 101, para. 7.9)

1.16.10. Marking of Means of Egress: [       ]  
(NFPA 101 para. 7.10)

1.17. Certification of Fire Protection and Life Safety Code Requirements. (Note: Edit the Fire team membership if necessary). Preparers of this document certify the accuracy and completeness of the Fire Protection and Life Safety features for this project in accordance with the attached completed form(s).

1.18. Designer of Record. Certification of Fire protection and Life Safety Code Requirements. (Note: Edit the Fire team members if necessary). Preparers of this document certify the accuracy and completeness of the Fire Protection and Life Safety features of this project.

Fire Protection Engineer of Record:

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Signature and Stamp

Date

OR

Architect of Record:

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Signature and Stamp

Date

Mechanical Engineer of Record:

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Signature and Stamp

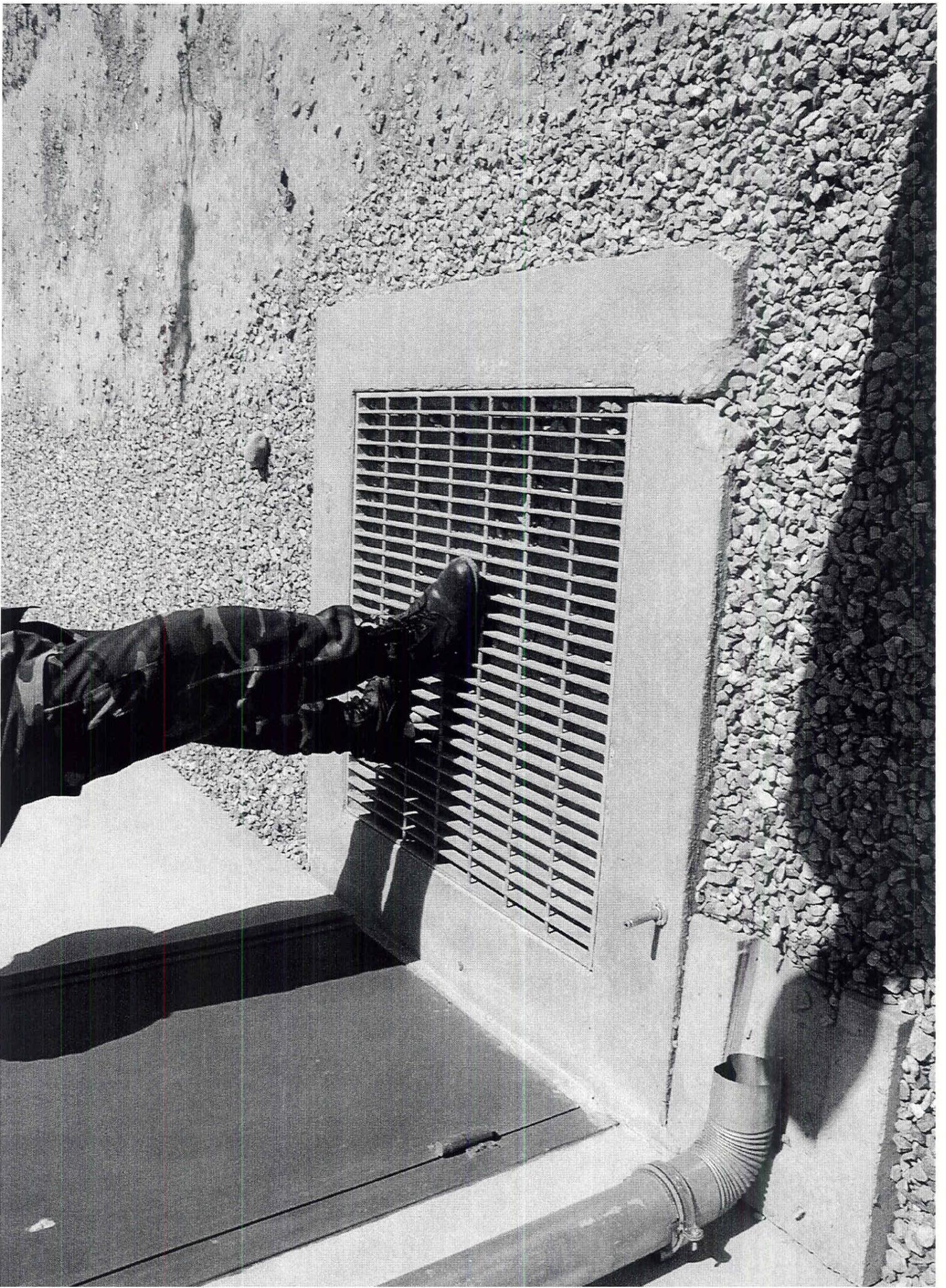
Date

Electrical Engineer of Record:

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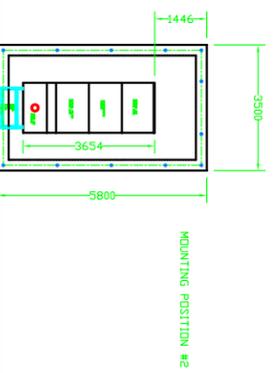
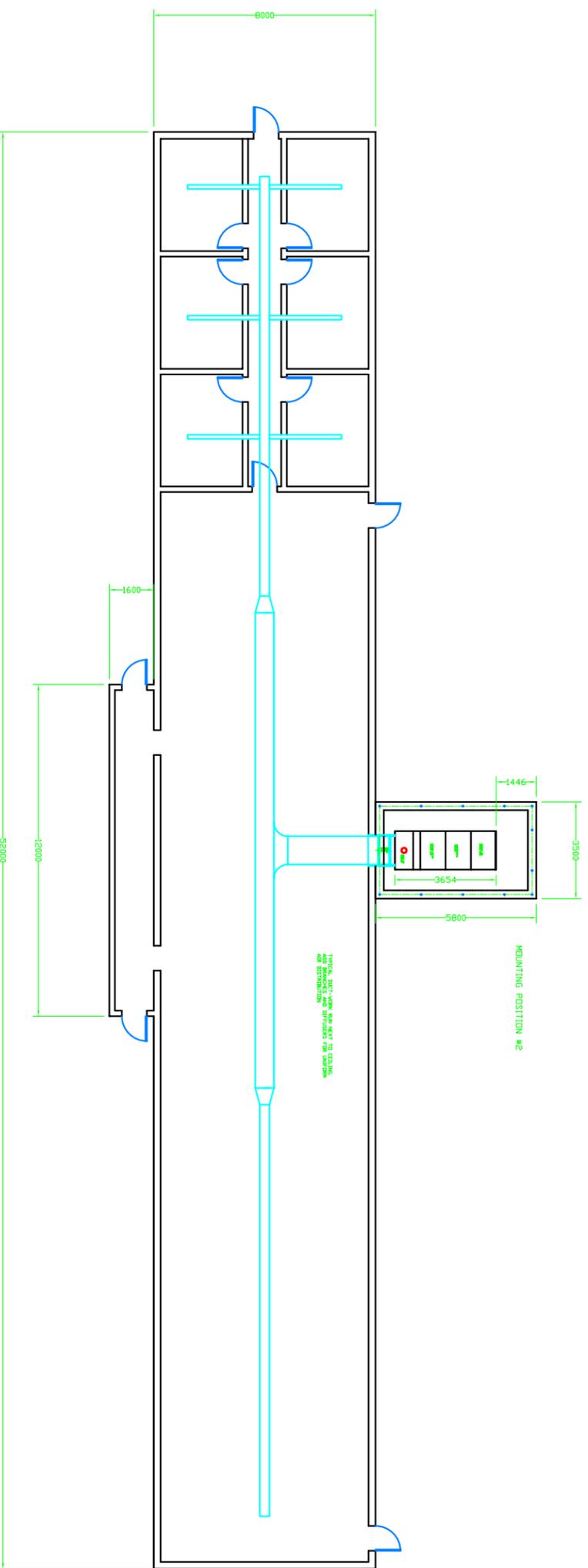
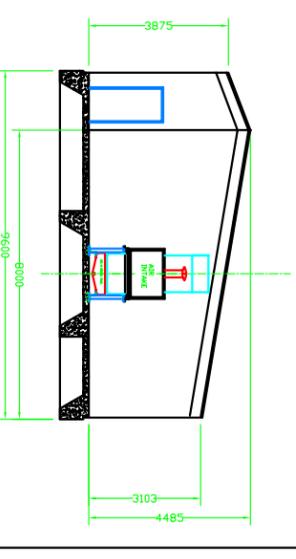
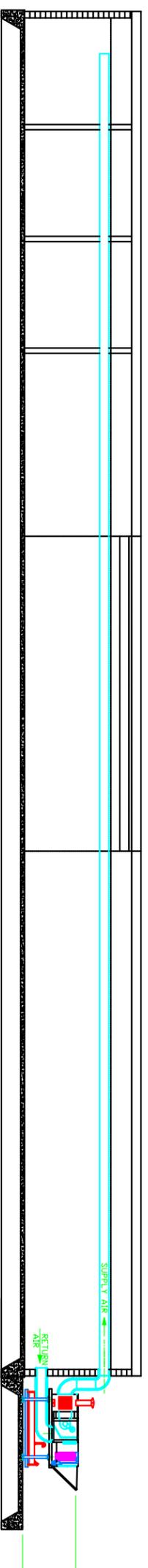
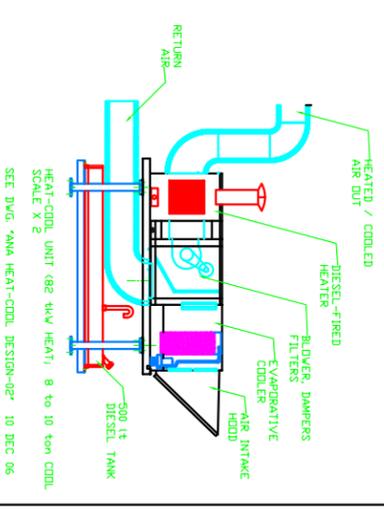
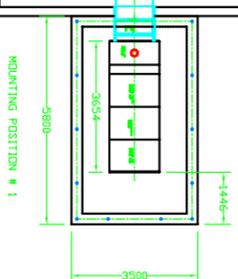
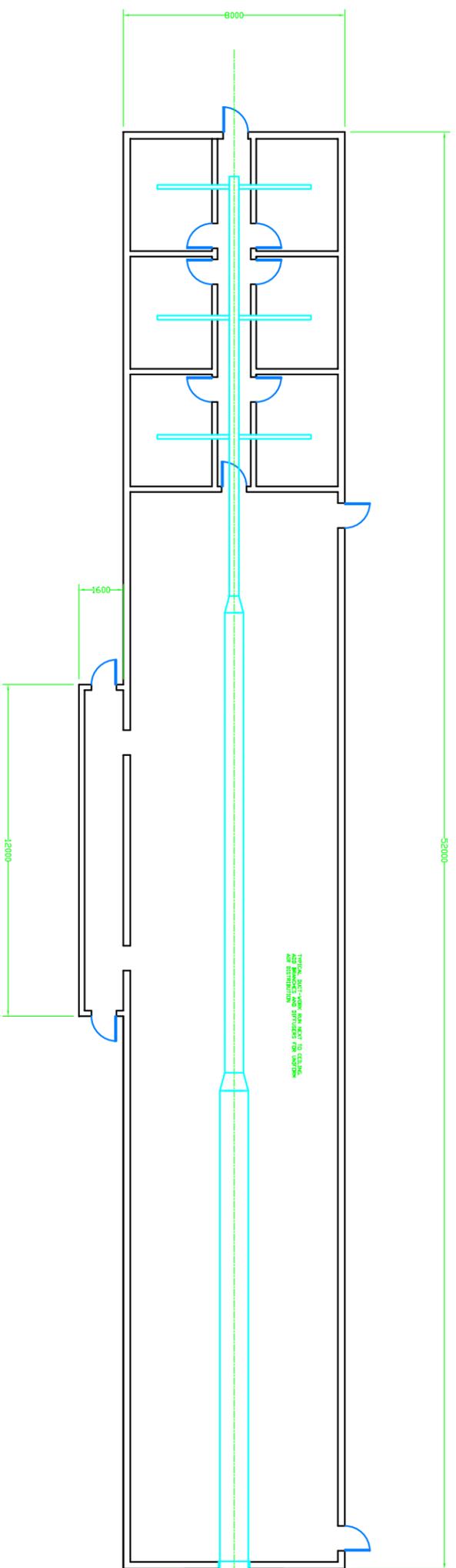
Signature

Date

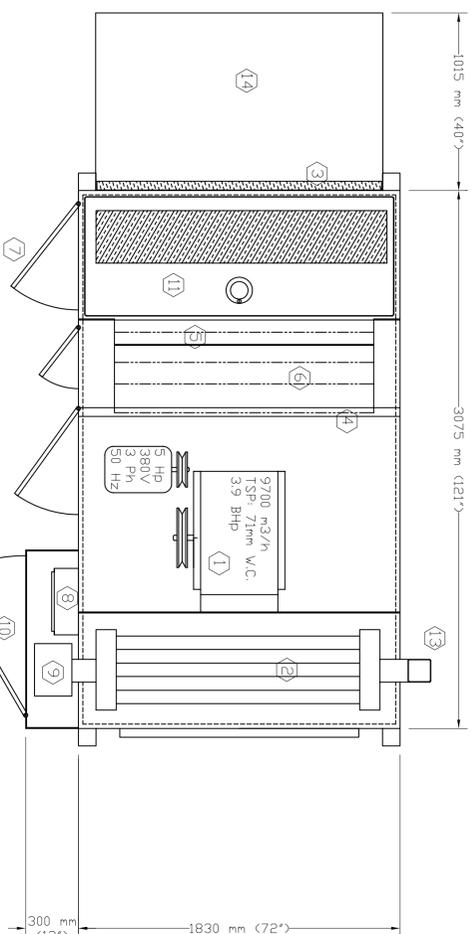


Evap Dwg.





HEAT DESIGN FOR ANA MILITARY COMPOUNDS.  
 TYPICAL DUCT-WORK FOR BARRACKS.  
 File :: ANA HEAT-COOL DUCT-01 :: 16 DEC 06  
 M. HORTON



CONSTRUCTION: 18g (1.3mm) CASING, 22g (0.85mm) LINER IN HEAT EXCHANGER SECTION. INSULATION, 1" (25mm) @ 1.5 lb/ft³ ENAMEL FINISH. APPROX. WT. 2700 lb (1227 kg)

AAON MODEL: DT-30/SW/HV : 102 tkw INPUT  
SCALE X 2

THE HEAT-COOL-UNIT MUST BE FACTORY BUILT FROM A SINGLE MANUFACTURER.

AAON MODEL No. DT-30/SW/HV, AAON INTERNATIONAL, DR. EQUAL, E-mail: ABILLID@AARONINTERNATIONAL.COM, TEL: USA, 623-433-9880

- 1 3/4" FAN & MOTOR: 5700 CFM (9700 m³/h), 2.69 kW (3.61 HP) @ ESP 0.5" (13mm) W.C. TSP 2.80" (71mm) W.C., FAN SIZE 18/13 (466/330), DIM. 3.9 BHP (2.91 kW) MOTOR 5 HP (3.73 kW), 2 SPEED, 380V/3/50HZ, TFC, MIN. 40°C AMBIENT
- 2 AAON INDIRECT-FIRED STAINLESS-STEEL HEAT EXCHANGER, INPUT 350 MBH (102 tkw), DIESEL FUEL, AIR TEMP. RISE 48 °F (27 °C)
- 3 2" (50mm) 30% EFF. WASHABLE PRE-FILTERS.
- 4 2" (50mm) 30% EFF. PLEATED FINAL-FILTERS.
- 5 OUTSIDE AIR DAMPER with ACTUATOR.
- 6 RETURN AIR DAMPER with ACTUATOR.
- 7 ACCESS DOORS (TYP), HINGED with CAMLOCK
- 8 ELECTRICAL PANEL
- 9 DIESEL FUEL BURNER - RIELLO 40 (NO. 2 FUEL OIL), FIRING RATE 145 TD (2.95 gph (3.49 TD 117 l/h)), CAPACITY 203 TD 413 MBH (60 TD 120 tkw) FUEL PRESSURE 100 TD 200 PSIG (6.90 TD 1380 kPa).
- 10 ELECTRICAL & PIPING VESTIBULE
- 11 EVAPORATIVE COOLING SECTION, EVAP. PADS: 12" CELDEK MEDIA @ 85% EFF. COMPLETE WITH WATER-PUMP, FLOAT-VALVE, DISTRIBUTORS & PIPE.
- 12 STAINLESS-STEEL SUMP TANK with 3/4" NPT DRAIN PIPE & BLEED-OFF OVERFLOW (to prevent mineral build-up in evap. water).
- 13 BURNER EXHAUST CHIMNEY 5" x 5" (125 x 125 mm).
- 14 OUTDOOR AIR INTAKE HOOD with BIRDSCREEN

AAON MODEL No. DT-30/SW/HV (DWG. PIM-3788), VT. 2700 lb (1220 kg)  
CONTACT: ANDREW J. BILLID, AAON INTERNATIONAL, A/J ASSOCIATES, INC.  
3120 WEST CAREFREE HIGHWAY, PHOENIX, AZ 85086, TEL: 623-433-9880  
E-MAIL: ABILLID@AARONINTERNATIONAL.COM  
HEAT-COOL-UNITS MANUFACTURED BY AAON CANADA, LEAD TIME 16 TO 18 WEEKS FOR UP TO 100 UNITS ORDERED AT ONE TIME. FACTORY IS LOCATED IN BURLINGTON, ONTARIO, CANADA.

NOTE: SIZING CALC'S ARE GENERAL, AND NOT FOR ANY PARTICULAR HEAT-COOL-UNIT

\*\*\*\*\* SIZING CALCULATIONS \*\*\*\*\*

AIR HANDLING HEATER UNIT RATING (INPUT):  
350,000 Btu/h / 3413 \* 103 tkw \* 0.80 EFF = 82 tkw DUT  
DIESEL HWY: 44.8 MJ/kg \* 2383 Kcal/lb \* 0.86 kg/l \* /  
860 Kcal/lb/HW = 107 tkw/HW fuel \* 0.80 heater eff =  
856 tkw-HW/duel/HW fuel

MAX FUEL RATE = 82 tkw / 856 tkw-HW/HW = 958 (L/H) \*  
24 h/day = 230 (L/day) = TANK, 600 (L) / 230 = 2.6 days

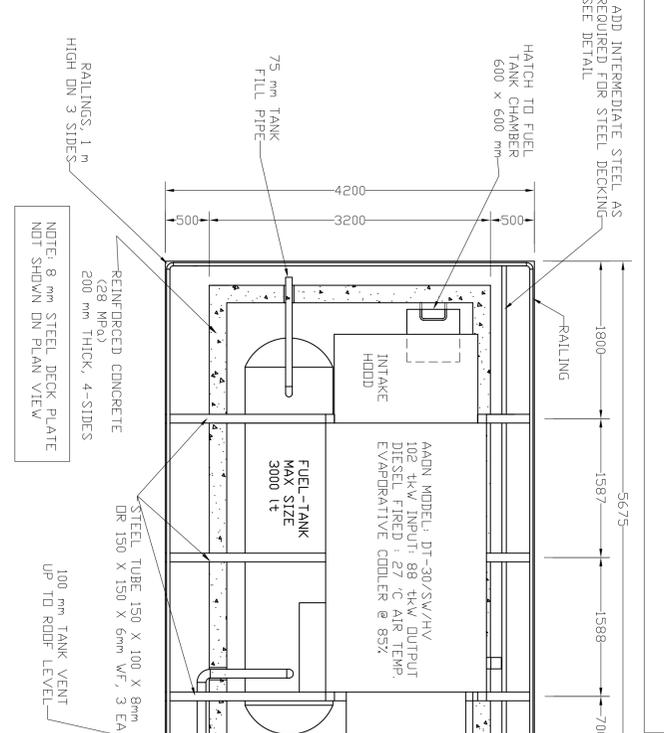
REQUIRED AIR FLOW @ 45 °C, RETURN AIR 20 °C  
TYPICAL SUPPLY AIR 45 °C, RETURN AIR 20 °C  
CFM @ 11.1m³/m³ @ 26.9 m³/s (70.2 CFM)  
SUPPLY & RETURN AIR DUCTS: 1024 m x 0.35 m = 0.398 m²  
EQUIV. DIA. = 13 \* (0.024 \* 0.35) / 0.625 = 1.024 m (33.6")  
ACTUAL AIR VEL. = 2.69 m³/s / 0.356 m² = 7.51 (24.3) fpm (1480 fpm) (TYPICAL) APART = 1500 fpm, GEN. OFFICE = 2200 fpm  
FRICTION VEL. = 2.69 m³/s / 0.314 m² = 8.57 m/s  
/ 66.9 m³/s²/0.61 = 113 Pa/m \* 0.02 = 0.16 mmWC / 1in  
n OF EQUIVALENT LENGTH

82 tkw out / 0.15 tkw = 547 m² floor  
0.669 m³/s²/0.61 = 108.492 m³/s/m²  
0.669 m³/s²/0.61 = 108.492 m³/s/m²  
EVAPORATIVE COOLING AIR FLOW

INTERNATIONAL MECHANICAL CODE 2008

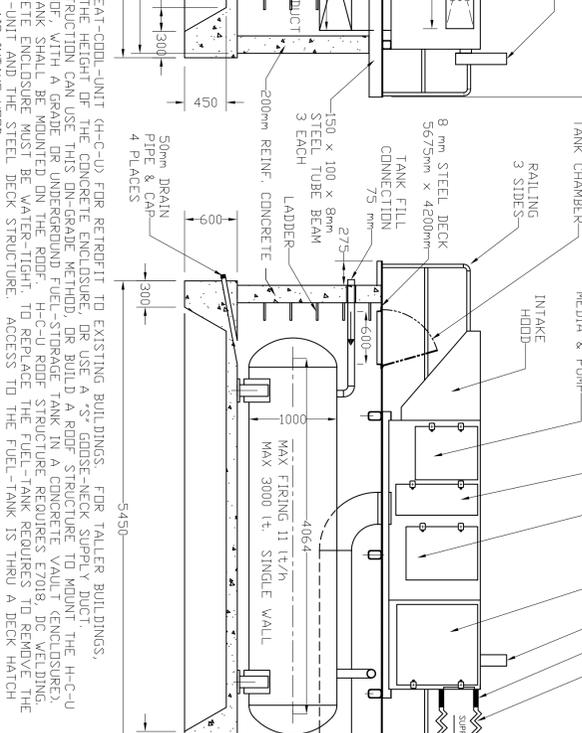
SECT. 918.2, MINIMUM AREA OUTSIDE & RETURN AIR DUCTS, WASH-AIR FORMING, NOT LESS THAN UNIT: 350,000 Btu/h / 3413 MJ/kg = 82 tkw  
REQUIRED AREA = 4418 m²/HW \* 82 tkw = 361,000 m²  
AVAIL. AREA = 1024m \* 395mm = 364,000 m²

COOLING CAPACITY AT 96 = 36 °C  
WATER FLOW @ 5.0 °C ΔT = 0.82 \* 240 = 197 gpm  
q = 1.22 \* 2.69 m³/s \* 35 = 240°C = 596  
tkw \* 0.864 ton/HW = 84 ton COOLING

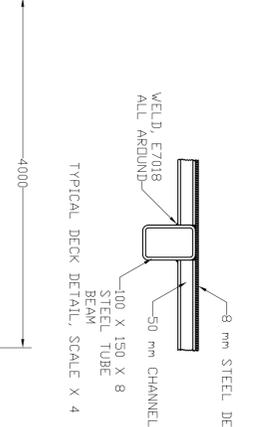


APPX. CONCRETE 28 MPa, FOUNDATION-SLAB: 6.5 m³ ENCLOSURE-WALLS: 6.0 m³ AT 15" HIGH

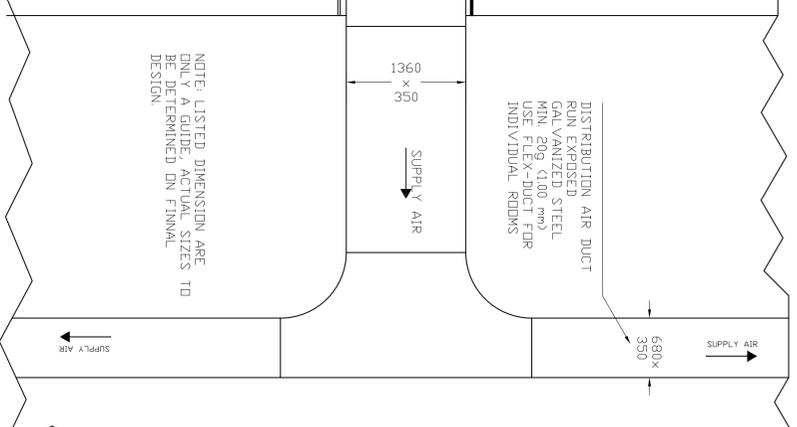
ADD INTERMEDIATE STEEL AS REQUIRED FOR STEEL DECKING SEE DETAIL



TYPICAL HEAT-COOL-UNIT (H-C-U) FOR RETROFIT TO EXISTING BUILDINGS. FOR TALLER BUILDINGS, INCREASE THE HEIGHT OF THE CONCRETE ENCLOSURE. OR USE A "S" GOOSE-NECK SUPPLY DUCT. NEW CONSTRUCTION CAN USE THIS ON-GRADE METHOD. OR BUILD A ROOF STRUCTURE TO MOUNT THE H-C-U ON THE ROOF, WITH A GRADE OR UNDERGROUND FUEL-STORAGE TANK IN A CONCRETE VAULT (ENCLOSURE). NO FUEL-TANK SHALL BE MOUNTED ON THE ROOF. H-C-U ROOF STRUCTURE REQUIRES E7018, DC WELDING. THE CONCRETE ENCLOSURE MUST BE WATER-TIGHT. TO REPAIR THE FUEL-TANK REQUIRES TO REMOVE THE HEAT-COOL-UNIT AND THE STEEL DECK STRUCTURE. ACCESS TO THE FUEL-TANK IS THRU A DECK HATCH UNDER THE AIR INTAKE HOOD.

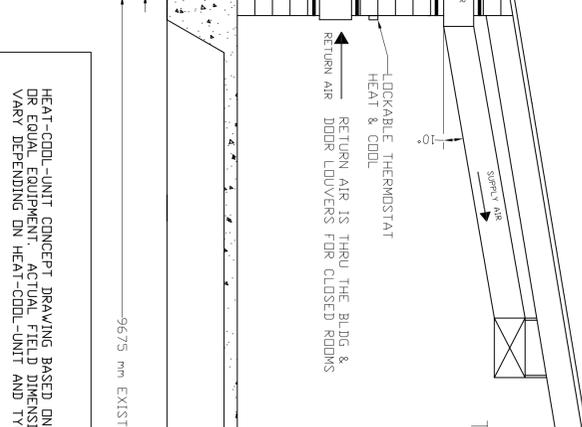


8 mm STEEL DECK  
WELD, E7018 ALL AROUND  
100 X 150 X 8 STEEL TUBE  
BEAM  
TYPICAL DECK DETAIL, SCALE X 4

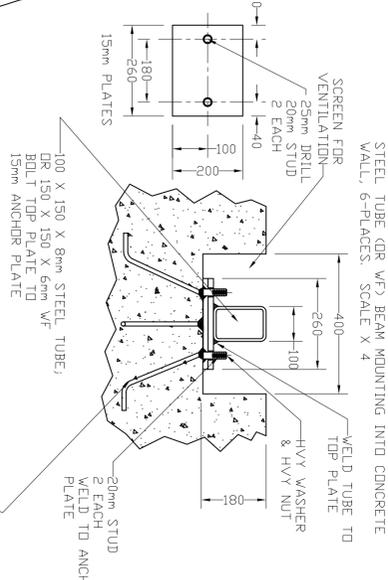


NOTE: LISTED DIMENSIONS ARE TO ONLY A GUIDE, ACTUAL SIZES TO BE DETERMINED ON FINAL DESIGN

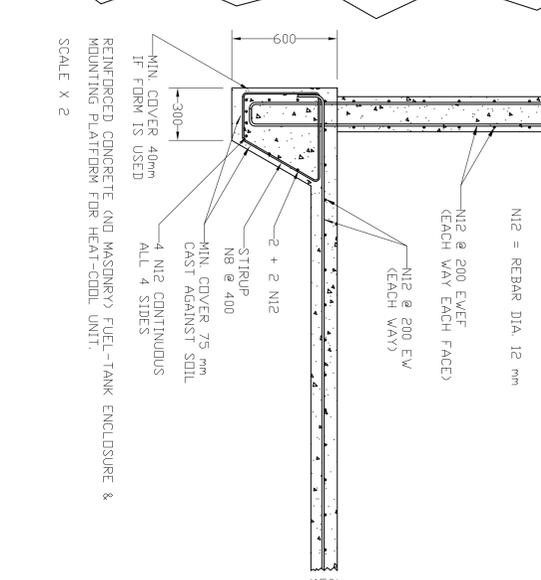
WARNING: IF THE HEAT-COOL-UNIT IS ROOF MOUNTED, THE DIESEL FUEL TANK MUST BE GROUND-LEVEL OR UNDERGROUND INSTALLED IN A REINFORCED CONCRETE VAULT. ROOF STORAGE OF FUEL IS PROHIBITED. STRUCTURAL ARC-WELDING FOR ROOF HEAT-COOL-UNIT MOUNTING MUST BE WITH E7018 ELECTRODES, USING A DC WELDING-MACHINE WITH PRECISE ARC VOLTAGE/RANGE CONTROL. AC WELDERS AND E6013 ELECTRODES ARE PROHIBITED.



TYPICAL BARRACKS

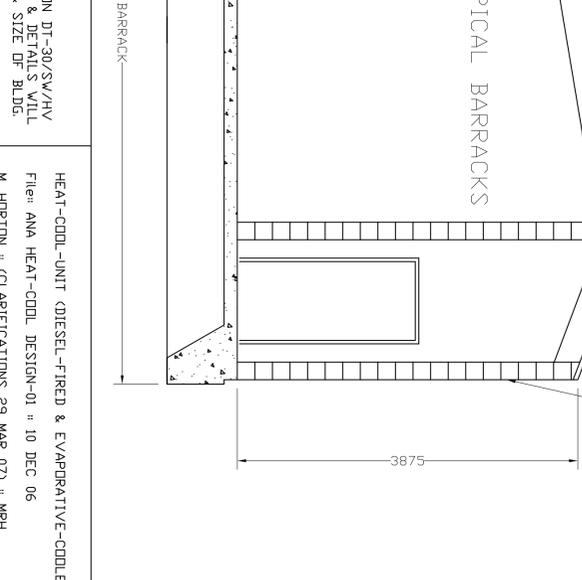


STEEL TUBE (DR WF) BEAM MOUNTING INTO CONCRETE WALL, 6-PLACES, SCALE X 4



INSTALLATION OF HEAT-COOL-UNITS (H-C-U)

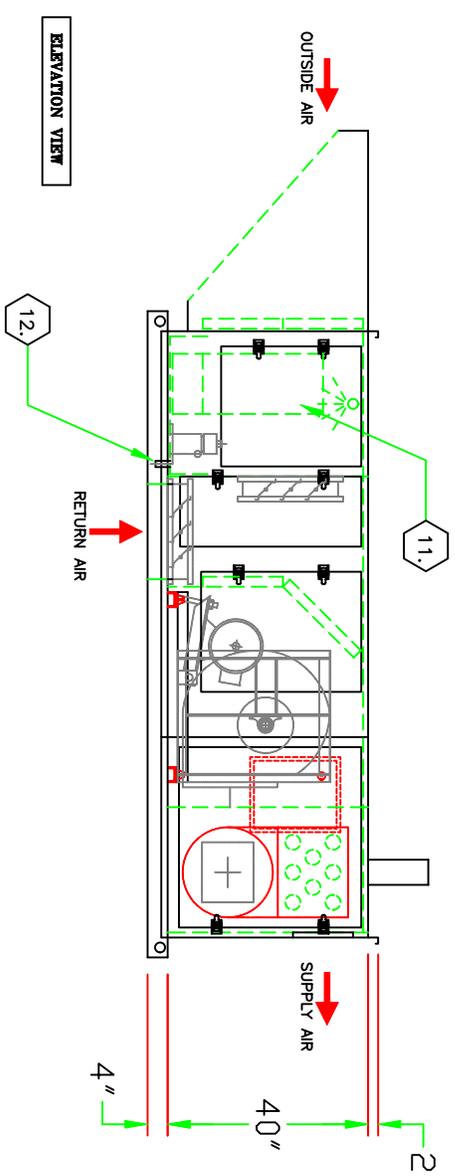
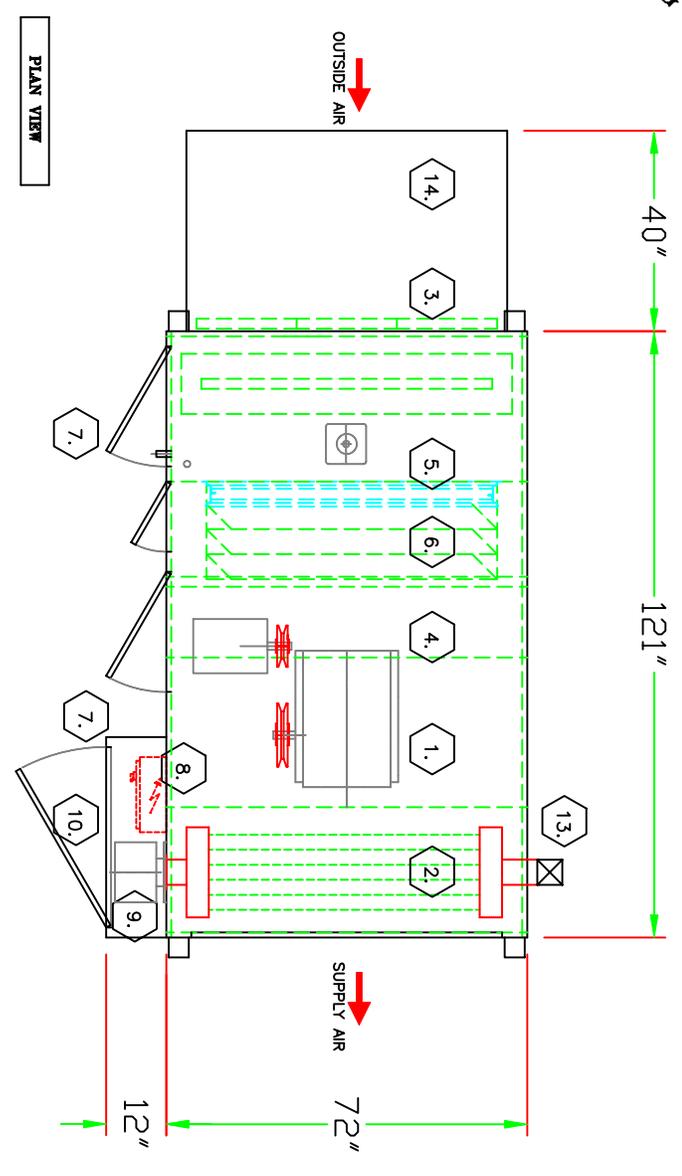
FOR INSULATED WALLS OF 25 m²-K/m² (8.20) & INSULATED ROOFS OF 5.3 m²-K/m² (18.30) AND AT 0.15 tkw/m² FLOOR AREA, DNF (D) 88 tkw HEAT-COOL-UNIT FOR EACH 500 TD 600 m² OF BLDG FLOOR AREA. FOR BLDGS UNDER 250 m² USE SPLIT-PAC HEAT-PUMPS. FOR MAINTENANCE SHOPS USE ONE (1) H-C-U FOR 250 TD 300 m² OF FLOOR AREA TO ACCOUNT FOR INCREASED VENTILATION.



HEAT-COOL-UNIT CONCEPT DRAWING BASED ON AAON DT-30/SW/HV DR EQUAL EQUIPMENT. ACTUAL FIELD DIMENSIONS & DETAILS WILL VARY DEPENDING ON HEAT-COOL-UNIT AND TYPE & SIZE OF BLDG.

HEAT-COOL-UNIT (DIESEL-FIRED & EVAPORATIVE-COOLED) DR EQUAL EQUIPMENT. ACTUAL FIELD DIMENSIONS & DETAILS WILL VARY DEPENDING ON HEAT-COOL-UNIT AND TYPE & SIZE OF BLDG.

M. HORTON \* CLARIFICATIONS 29 MAR 07 \* MRH



1.	S/A FAN & MOTOR ASSEMBLY: SUPPLY AIR: 5,700 CFM ESP: 0.50" W.C. TSP: 2.80" W.C. FAN SIZE: 18/13 FC, DIDW BHP: 3.9 MOTOR: 5 hp, 2-SPEED, 360V/3/50HZ
----	---

2.	AAON INDIRECT-FIRED SS. HEAT EXCHANGER INPUT: 350 MBH OUTPUT: 300 MBH DIESEL FUEL TEMP. RISE: 48 F
----	--

3.	2", 30% EFF. WASHABLE PRE-FILTERS
4.	2", 30% EFF. PLEATED FINAL-FILTERS

5.	OUTSIDE AIR DAMPER c/w ACTUATOR
6.	RETURN AIR DAMPER c/w ACTUATOR

7.	ACCESS DOORS (TYP.) TYPE: HINGED c/w CAMLOCK
8.	ELECTRICAL PANEL

9.	DIESEL FUEL BURNER - RIELLO 40 (NO. 2 FUEL OIL BURNER) FIRING RATE: 1.45 - 2.95 GPH CAPACITY: 203 - 413 MBH PRESS. 100 - 200 PSIG
10.	ELECTRICAL & PIPING VESTIBULE

11.	EVAPORATIVE COOLING SECTION EVAP.PADS: 12" CELDEK MEDIA % EFF.: 85% c/w WATER PUMP, FLOAT-VALVE, DISTRIBUTOR(S) and PIPE
-----	--

12.	SS. SUMP TANK c/w 3/4" NPT DRAIN PIPE and BLEED-OFF OVERFLOW
-----	--

13.	OUTDOOR CHIMNEY: 5" X 5"
14.	OUTDOOR AIR INTAKE HOOD c/w BIRDSCREEN

CONSTRUCTION:  
18 GA. CASING  
22 GA. LINER IN HEAT EXCHANGER SECTION  
1" 1 1/2 lbs./cu.ft. INSULATION  
4" STRUCTURAL STEEL TUBE BASE  
AIR DRY EMAMEL GREY FINISH

APPROX. WEIGHT: 2,700 LBS

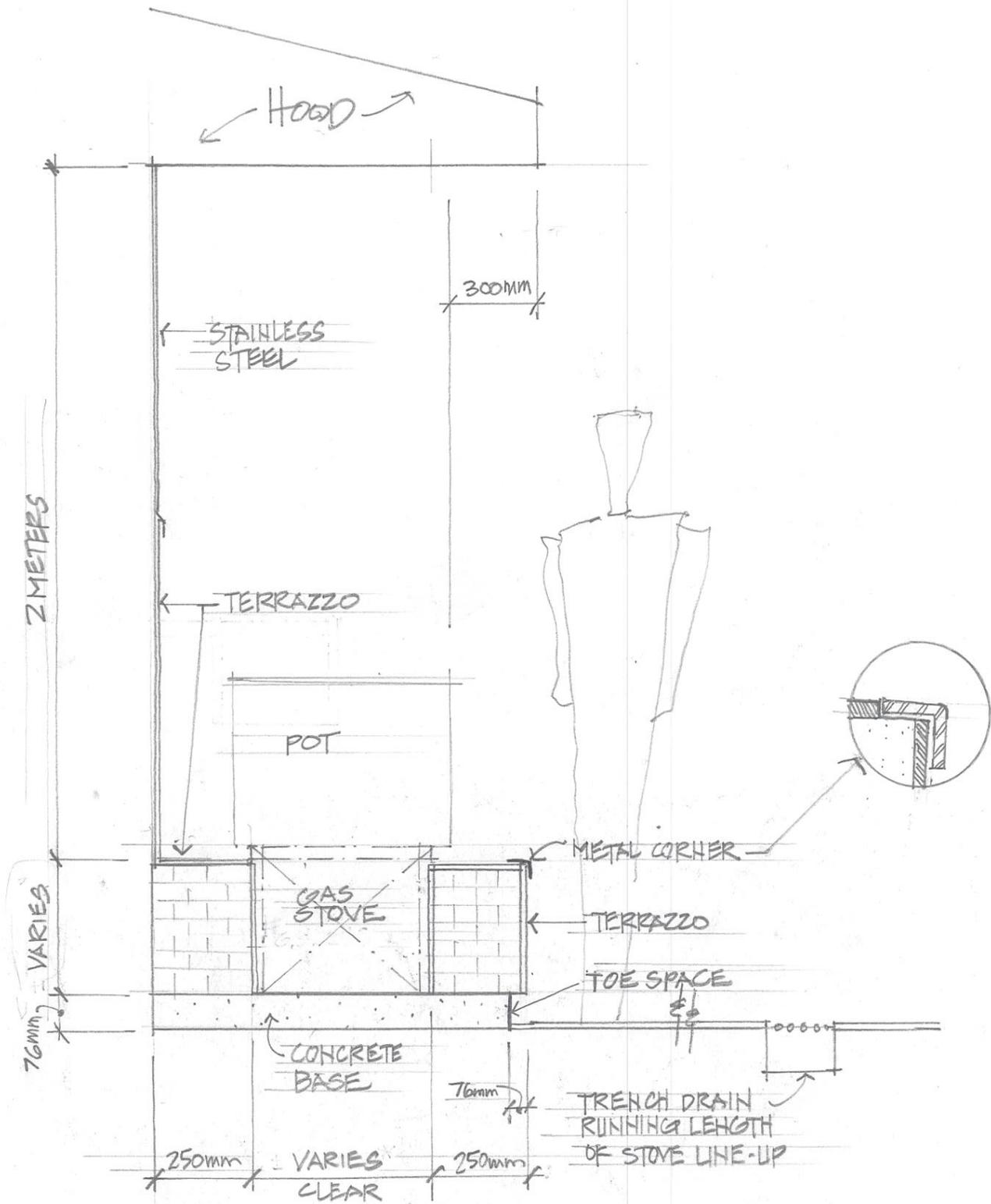
**AAON®**

PROJECT NAME:  
**ANA**

MODEL No: **DT-30/SW/HV.**

DATE:	DWG No:	PRN BY:	TAG No:
02/14/07	PDM-3788	G.L.	MUA
			REVISION No: --

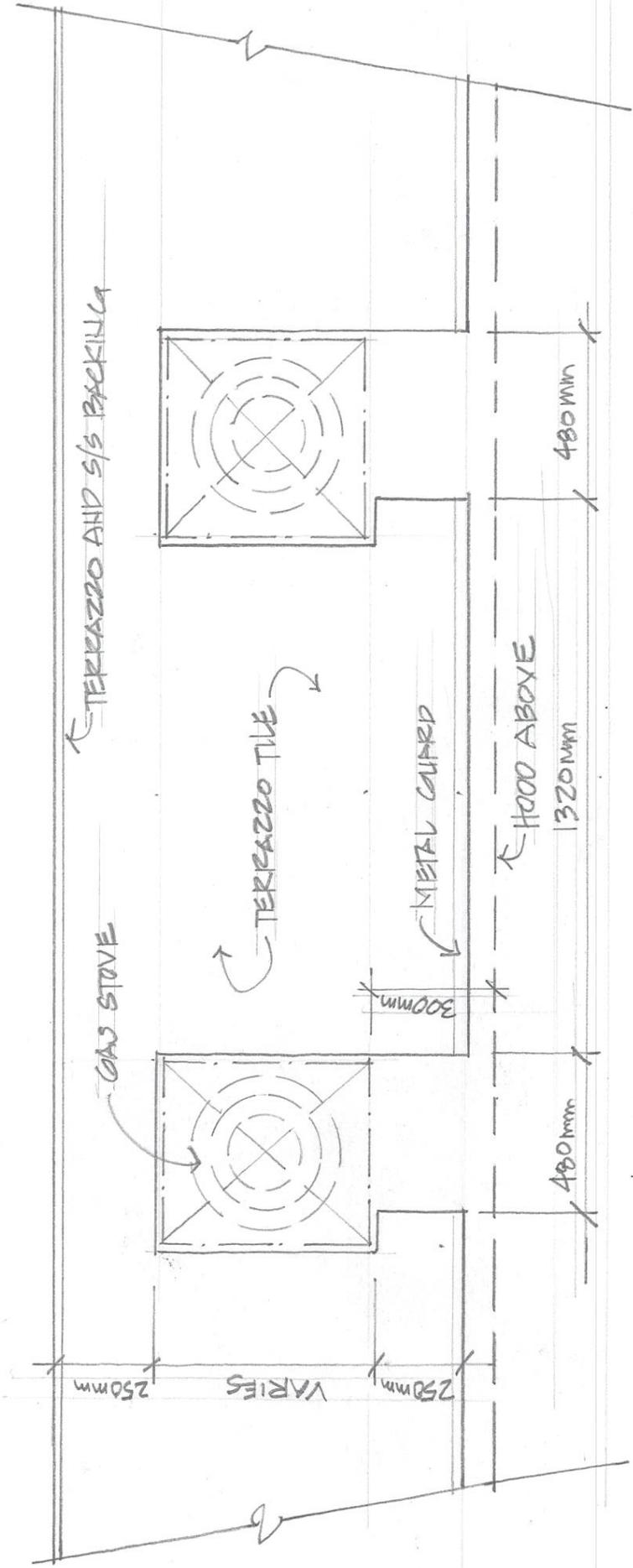
NO.	BY:	DATE:	REVISION:



GAS STOVE SECTION SCALE:  $\frac{3}{4}'' = 1'-0''$

NOTES:

- 1. GAS STOVE SIZE VARIES WITH MODEL TYPE.



GAS STOVE PLAN SCALE: NTS.

Propane stove photo



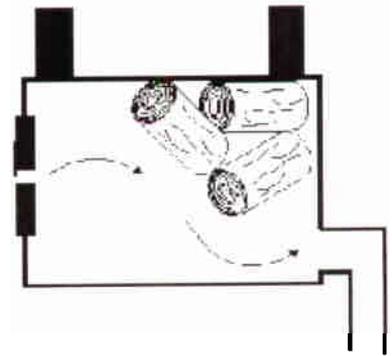
→ Introduction

→ The emphasis through history

← Hot water from wood

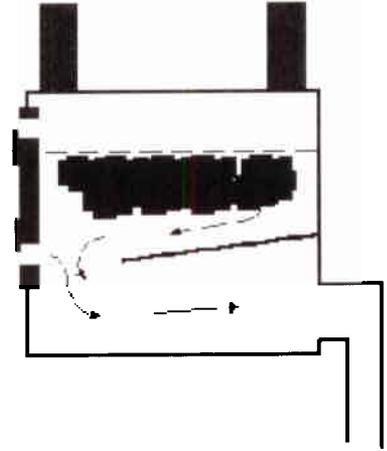
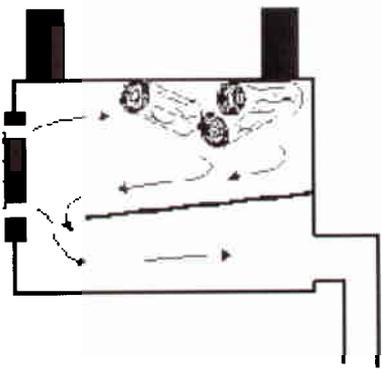
# Stove designs

There are many types of stove. In this section we will look at a few of the basic designs. Most of the more sophisticated stoves are developments of these simple ones.



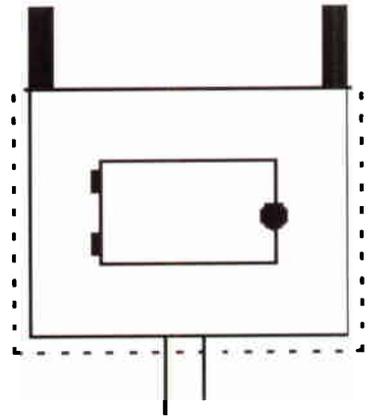
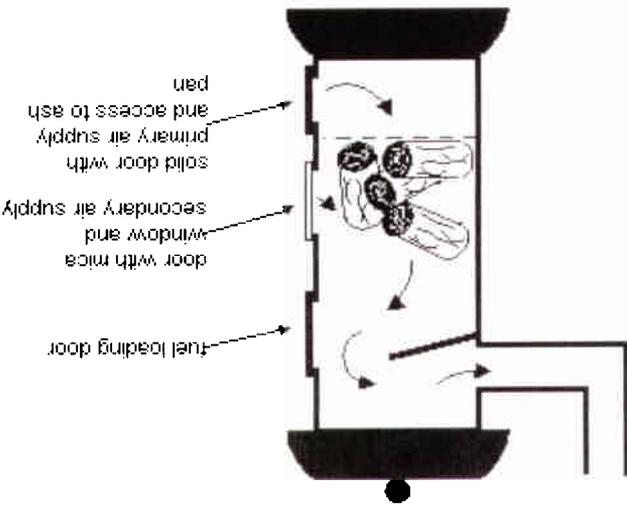
This is the most basic design of *box stove*. As it has a solid bed, it is only suitable for burning wood. Fuel is loaded from the front, and the air for combustion enters through an adjustable hole in the fuel door. The wood burns from the front of the stove towards the back.

The simple box stove shown above is rarely found these days. If you buy a wood burning box stove now, it will probably resemble the design shown here. A baffle provides a longer flame path, thus extracting more heat from the gases. Note the primary and secondary air supplies, for more complete combustion.



If a stove is to burn coal it needs a grate. The primary air supply is below the grate, the secondary air supply is above the burning coals. Wood will also burn satisfactorily on a grate, but is best on a solid bed. So-called multi-fuel stoves have a removable grate, or one in which the gaps can be closed by a lever (so you can switch from one fuel to the other while the stove is lit).

This is a typical *cylinder stove*. It is the same basic layout as the previous stove, except that the combustion chamber is taller and more compact. Often this type of stove has a cooking surface under a removable cover at the top.

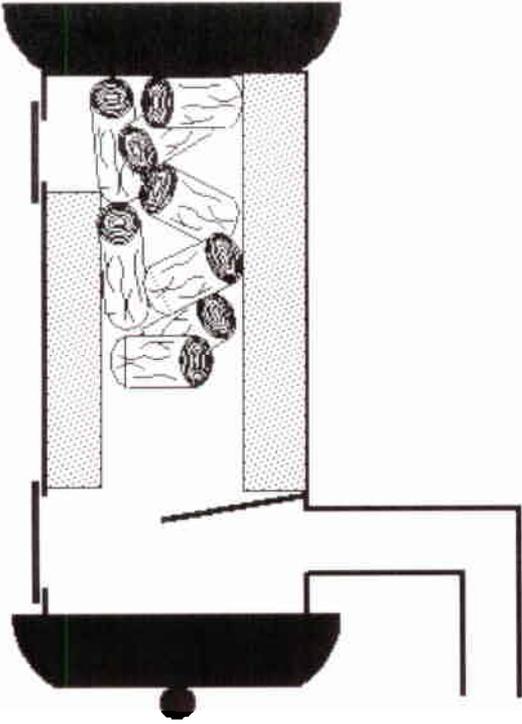


Some stoves have a perforated outer skin which stays cool to the touch.

A similar arrangement is used to increase the convected heat output.

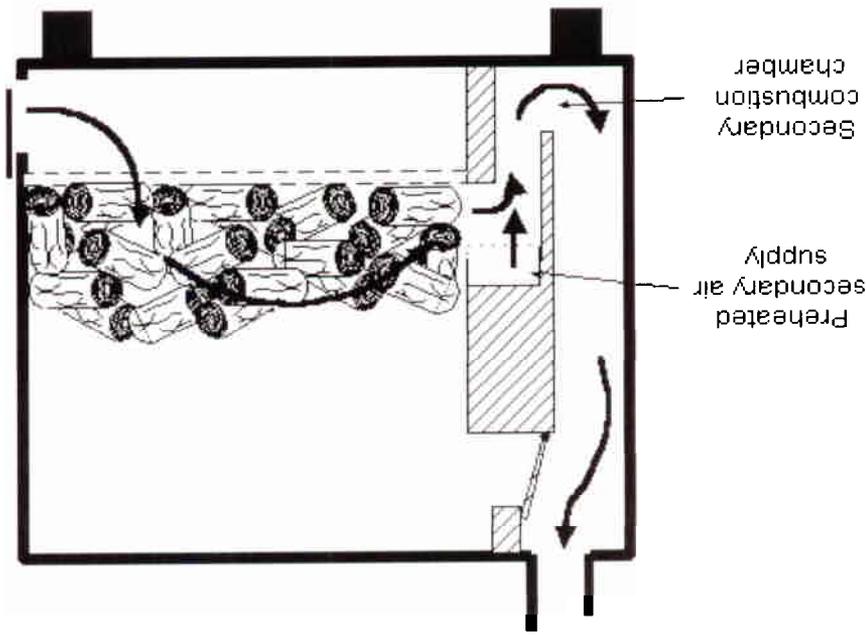
The *slow combustion stove* uses a tall, compact, well insulated combustion chamber. The shape of the combustion chamber keeps the burning pieces of fuel in close proximity with each other. The insulation keeps the temperature inside high even at very slow burn rates, thus keeping it afloat.

They do not usually have a grate or secondary air supply, so are best for wood, garden waste, rubbish, etc. They can be very efficient.



Smoke production can be greatly reduced by more thorough combustion of the particulates and volatile products. The stove shown to the left uses quite a sophisticated design to achieve this. During lighting and warm-up the flap at the entrance to the flue is left in the horizontal position, allowing a conventional air flow through the stove. When the flue is hot and drawing well, the flap is moved into the position shown, which switches the stove into its "smokeless" mode.

The smoke is reduced in two ways. Firstly, it is drawn back down through the burning fuel, increasing the contact it has with hot surfaces and thus burning more smoke particles. After that it is mixed with preheated secondary air and further combustion of the residual gases takes place in the secondary combustion chamber. The secondary air is normally ducted through pipes which run around the fuel bed from the front of the stove, raising it to quite a high temperature.



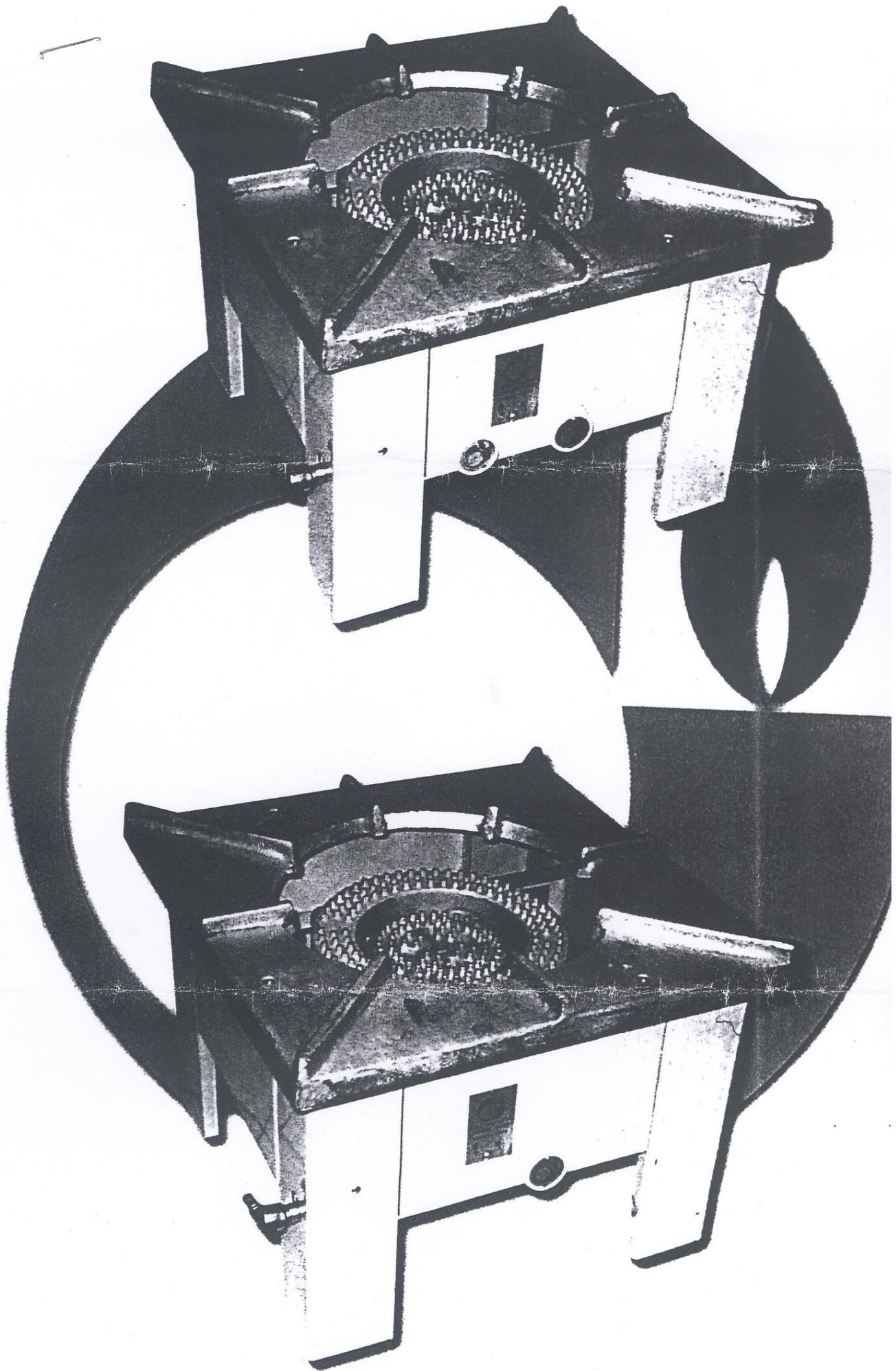
Introduction

The fireplace through history

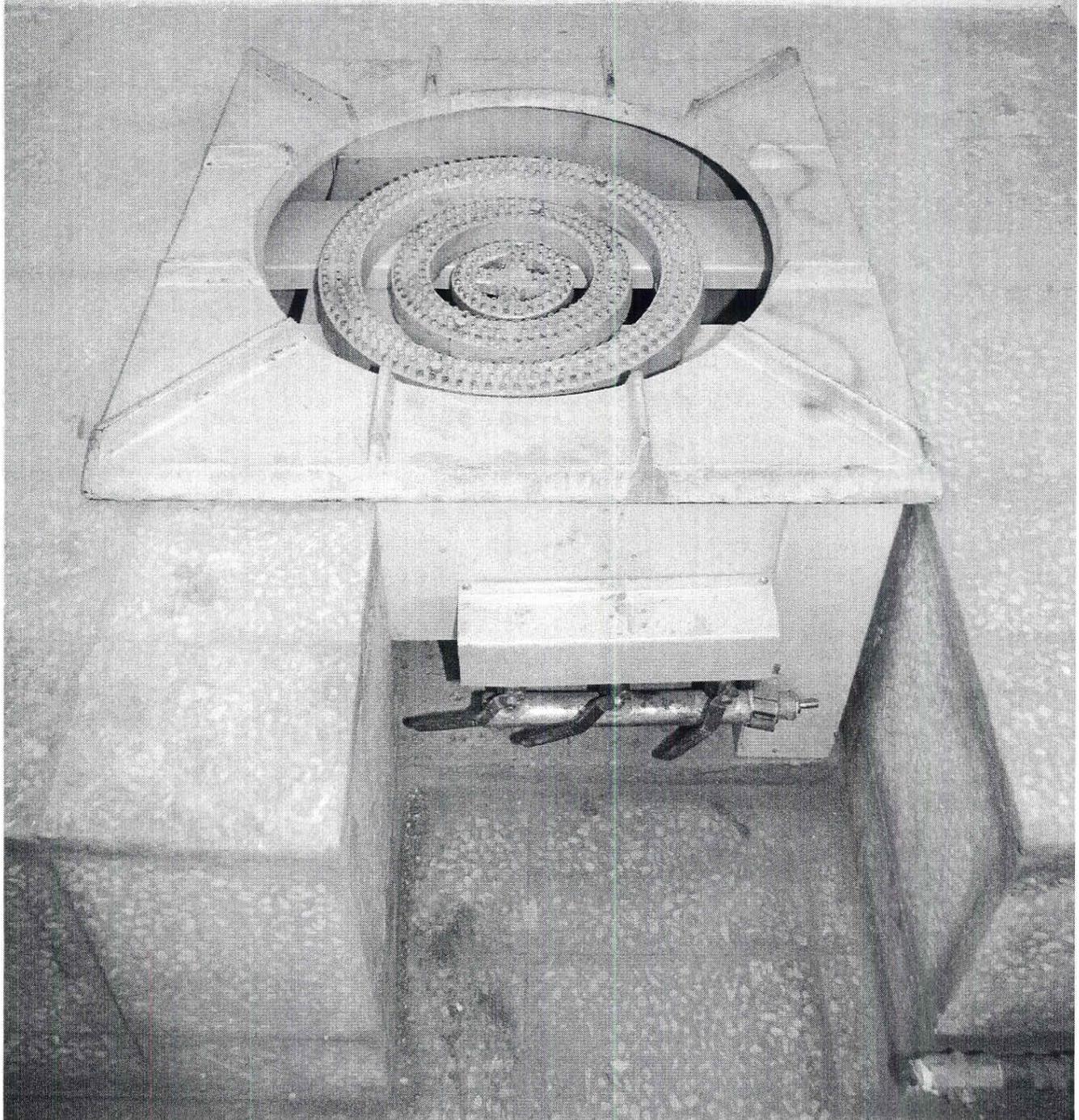
Hot water from wood

Information provided: Steve Hackery, Last updated 3rd June 2000.

Copyright protected on all pictures and words except where stated.

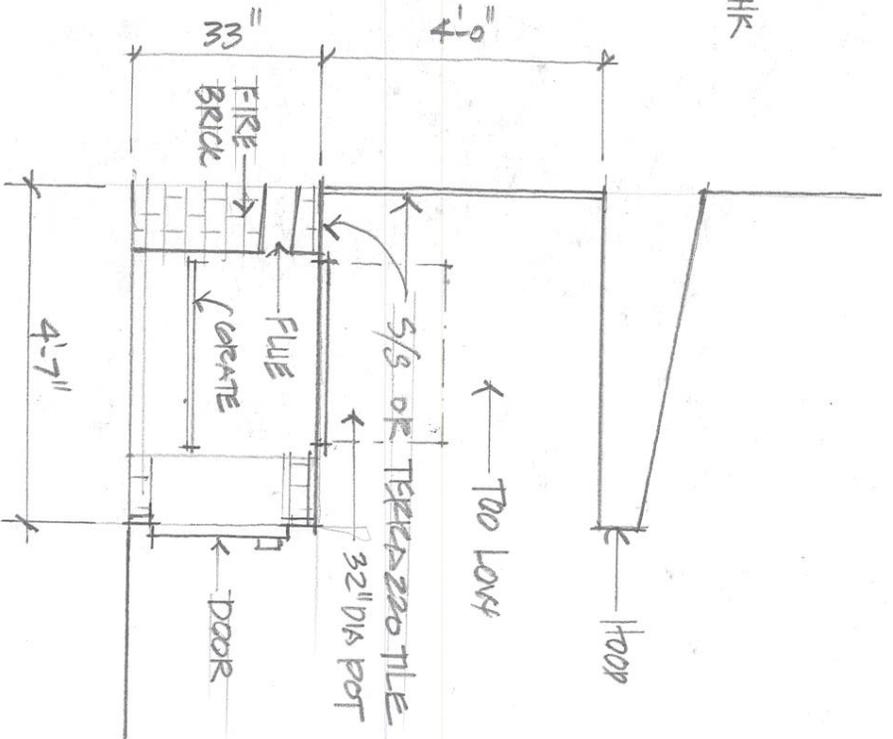
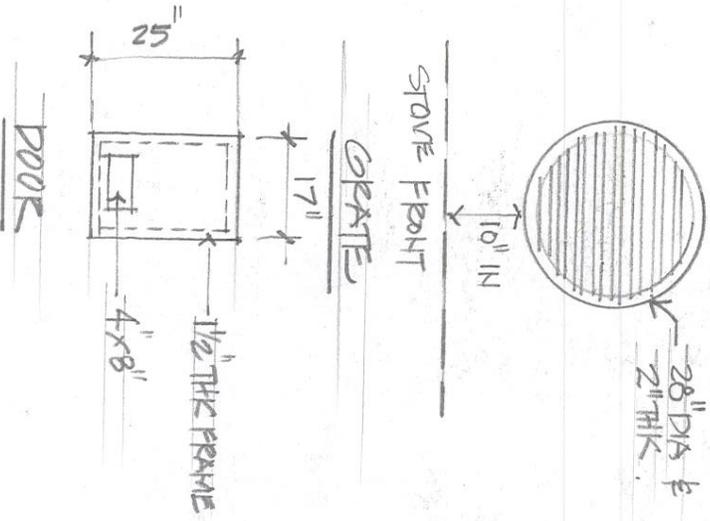
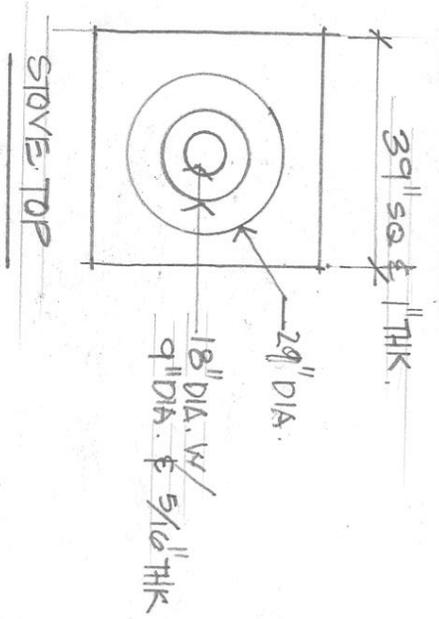


Stove Photo

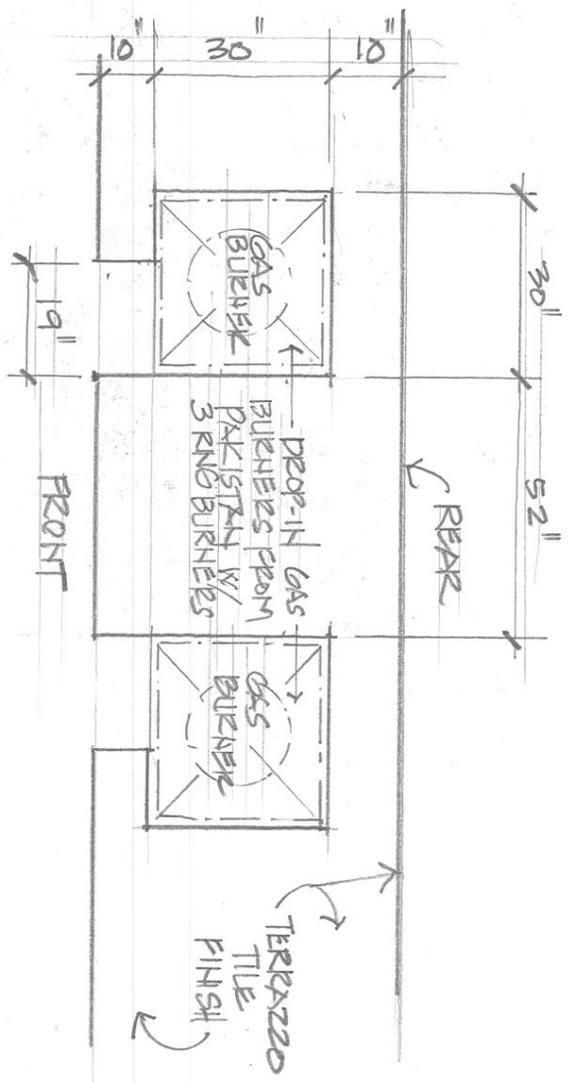
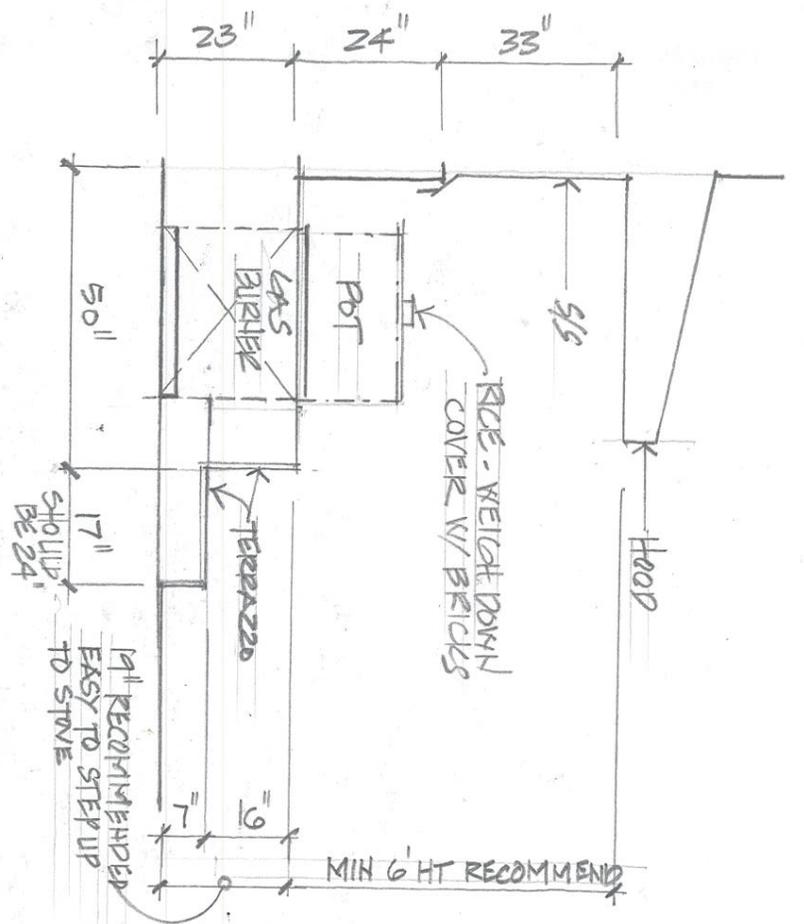


- NOTES:
1. THE DRAWINGS PROVIDE GENERAL GUIDANCE FOR WOOD BURNING STOVES. THESE DRAWINGS MAY BE MODIFIED BY THE CONTRACTOR AS THEY DETERMINE NECESSARY TO SUIT LOCAL CONDITIONS.
  2. THE PRIMARY INTENT FOR THE DRAWINGS IS TO SHOW THAT THE EXHAUST STACK MUST EXTEND DIRECTLY UP FROM THE FIREBOX. BENDS OR HORIZONTAL FLUE IS NOT ACCEPTABLE.
  3. 15 MM CAST IRON INSERTS ARE PROVIDED TO PREVENT DAMAGE TO THE FIRE BRICK LINING
  4. MINIMIZE FIREBOX VOLUME AS MUCH AS POSSIBLE TO CONCENTRATE HEAT UPWARD TO THE COOKING POTS
  5. 25 MM CAST IRON PLATE OR COOKING POT MUST BE PLACED OVER THE OPENING DURING LIGHTUP OF THE FIREWOOD TO PREVENT SMOKE FROM ENTERING THE KITCHEN.
  6. THIS WOOD STOVE DESIGN WILL ELIMINATE SMOKE IN THE KITCHEN.
    - A. PULL DAMPER ROD OUT DURING KINDLING AND LIGHTING OF FIRE WOOD
    - B. SMOKE WILL BE DIVERTED STRAIGHT FROM THE FIREBOX TO THE FLUE STACK
    - C. ADJUSTABLE VENTS ON THE FRONT (INSIDE OF DFAC) OR BACK DOOR (OUTSIDE OF DFAC) CAN BE USED TO REGULATE MAKEUP AIR
    - D. UPPER CAST IRON DOORS USED TO LOAD WOOD
    - E. LOWER CAST IRON DOORS TO REGULATE AIR AND TO REMOVE ASH.
    - F. ONCE THE WOOD IS AT FULL FLAME, AND THERE IS LITTLE SMOKE FROM THE CHIMNEY, CLOSE DAMPER BY PUSHING THE ROD IN
    - G. THE SMOKE AND HEAT IS NOW DIVERTED DOWNWARD INCREASING CONTACT WITH THE HOT FLAMES AND THEREFORE BURN MORE SMOKE PARTICLES
  7. DAMPER ASSEMBLY MAY BE REMOVED AT THE DISCRETION OF USER TO SIMPLIFY OPERATION
  8. 25 MM CAST IRON GRID PLATE MAY DETERIORATE DUE TO HIGH HEAT AND MAY NEED TO BE REPLACED ON A PERIODIC BASIS.

<b>WOOD STOVE DESIGN</b>	US ARMY CORPS OF ENGINEERS		<b>DETAIL-6</b>
		Date: 19 April 2007	
		Drawn by: CN and JR	
<b>GENERAL NOTES</b>	<b>AFGHAN ENGR DISTRICT</b>	Checked by	Scale AS NOTED

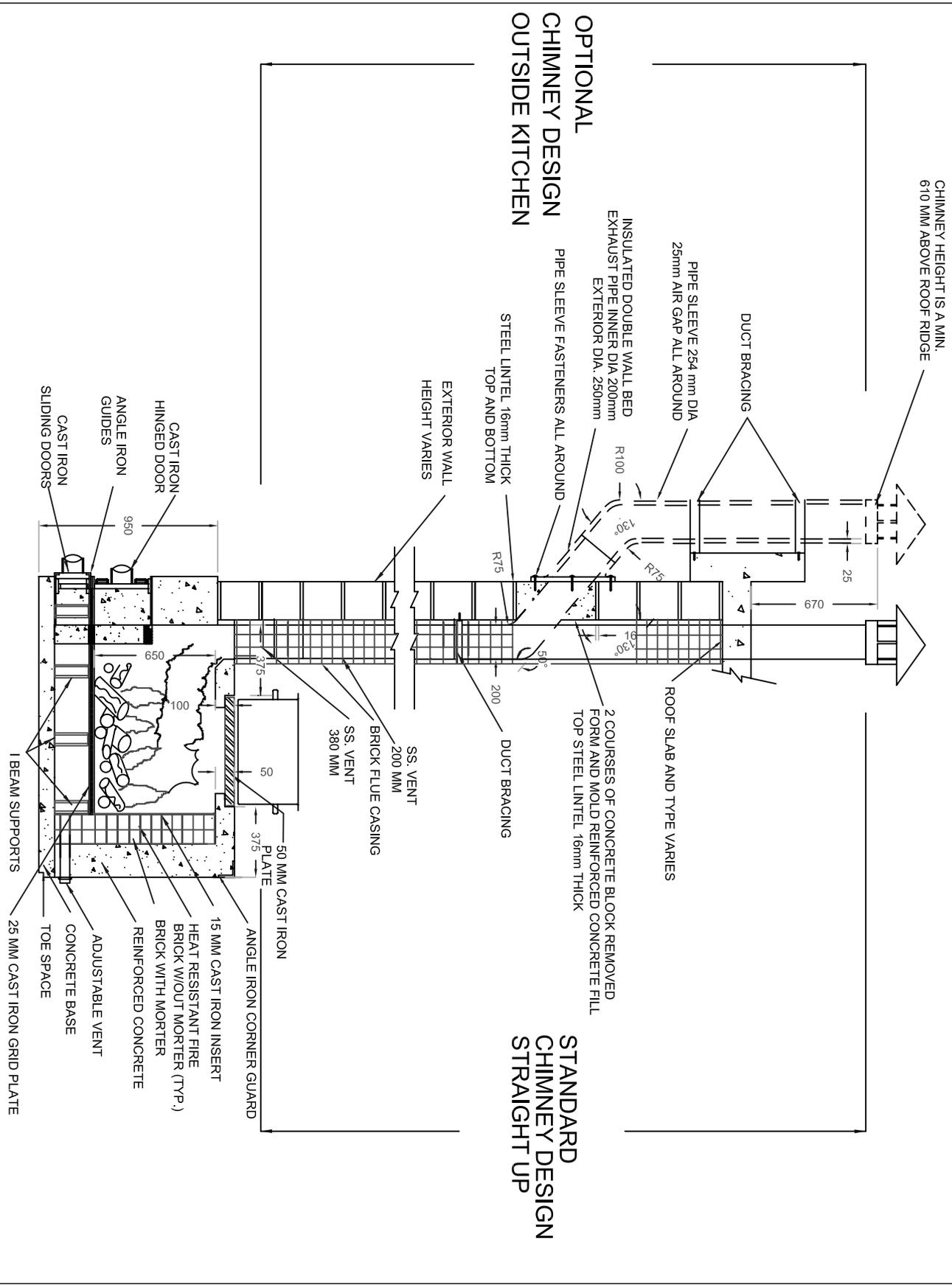


WOOD STOVE  
(POL. E. CHICKI APPERISION)

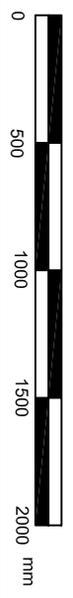


GAS BURNERS  
(POL-E. CHARKI PRISON)

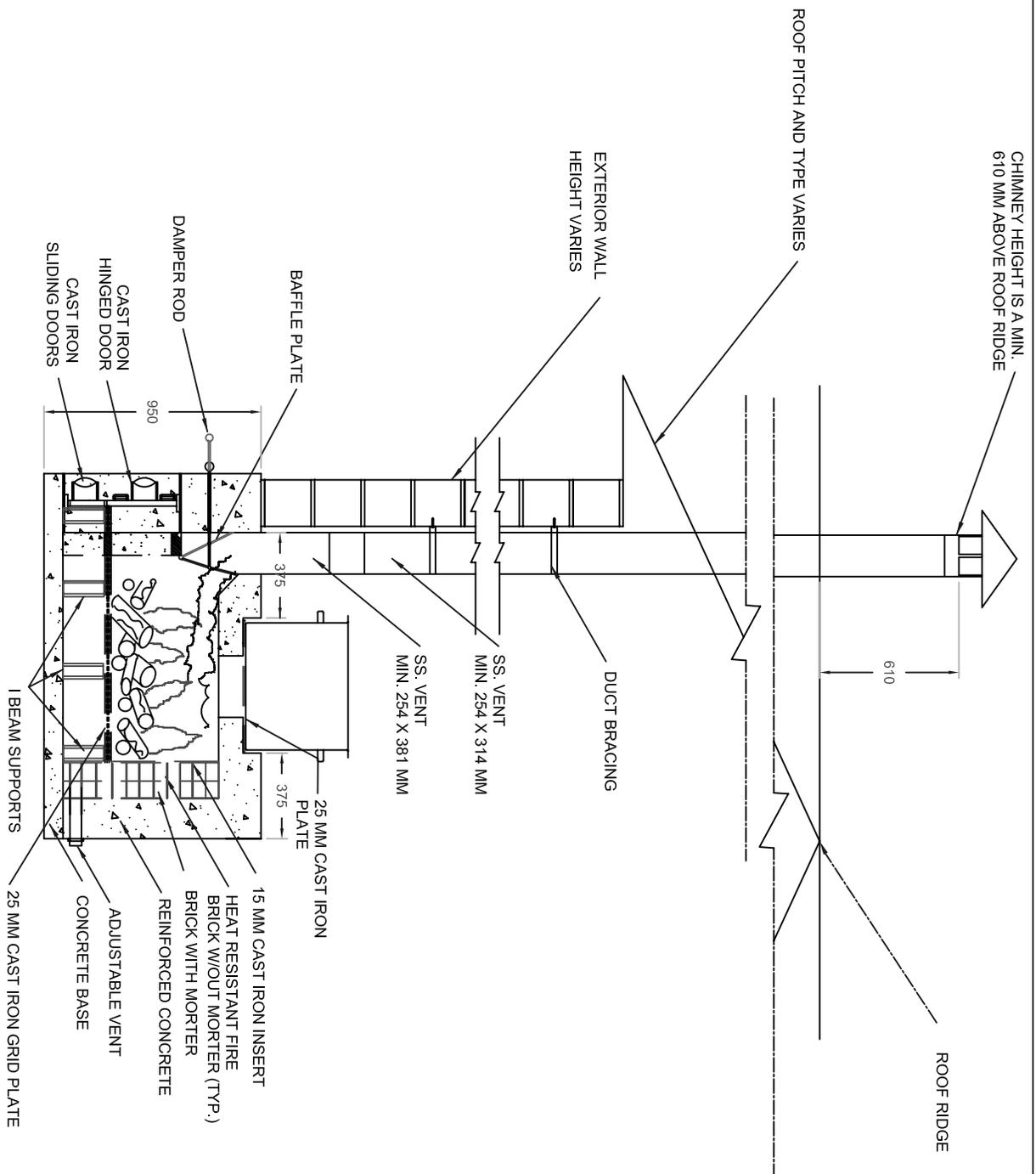
- NOTES:
1. 70Kilo GAS/DAY, 6-8 BURNERS @ CE HRS COOKING & 2 OVENS
  2. OVEN SIZE: 48" DIA. X 36" HIGH w/ 18" TOP OPENING
  3. POT SINKS: 3' X 3' X 18" DEEP TO HAVE 180° WATER RING
  4. STOVES: 8 STOVES PER 1000 PEOPLE
- PROVIDE TRENCH DRAIN  
HOSE BIBBS HOSE REELS,  
LARGE WATER HEATER,  
NON-SLIP FLOORING



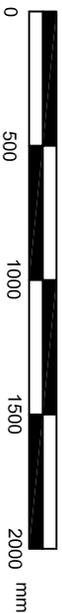
# WOOD STOVE SECTION A-A



WOOD STOVE DESIGN	US ARMY CORPS OF ENGINEERS	Date: 19 April 2007	<b>DETAIL-2</b>
		AFGHAN ENGR DISTRICT	
SECTION VIEW		Drawn by: CN and JR	
		Checked by	



# WOOD STOVE SECTION A-A



WOOD STOVE DESIGN

SECTION VIEW

US ARMY CORPS OF ENGINEERS



AFGHAN ENGR DISTRICT

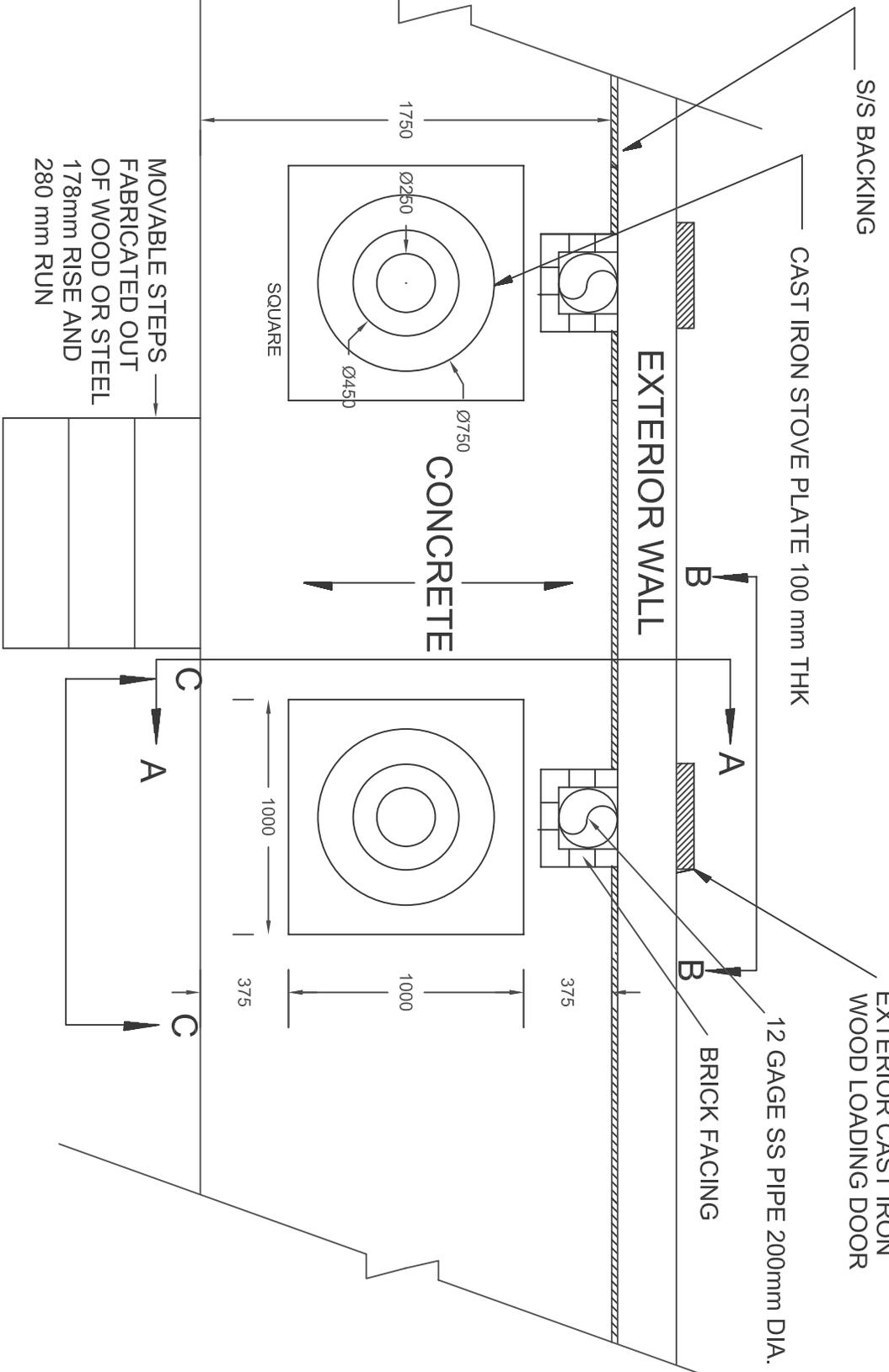
Date: 19 April 2007

Drawn by: CN and JR

Checked by

DETAIL-2

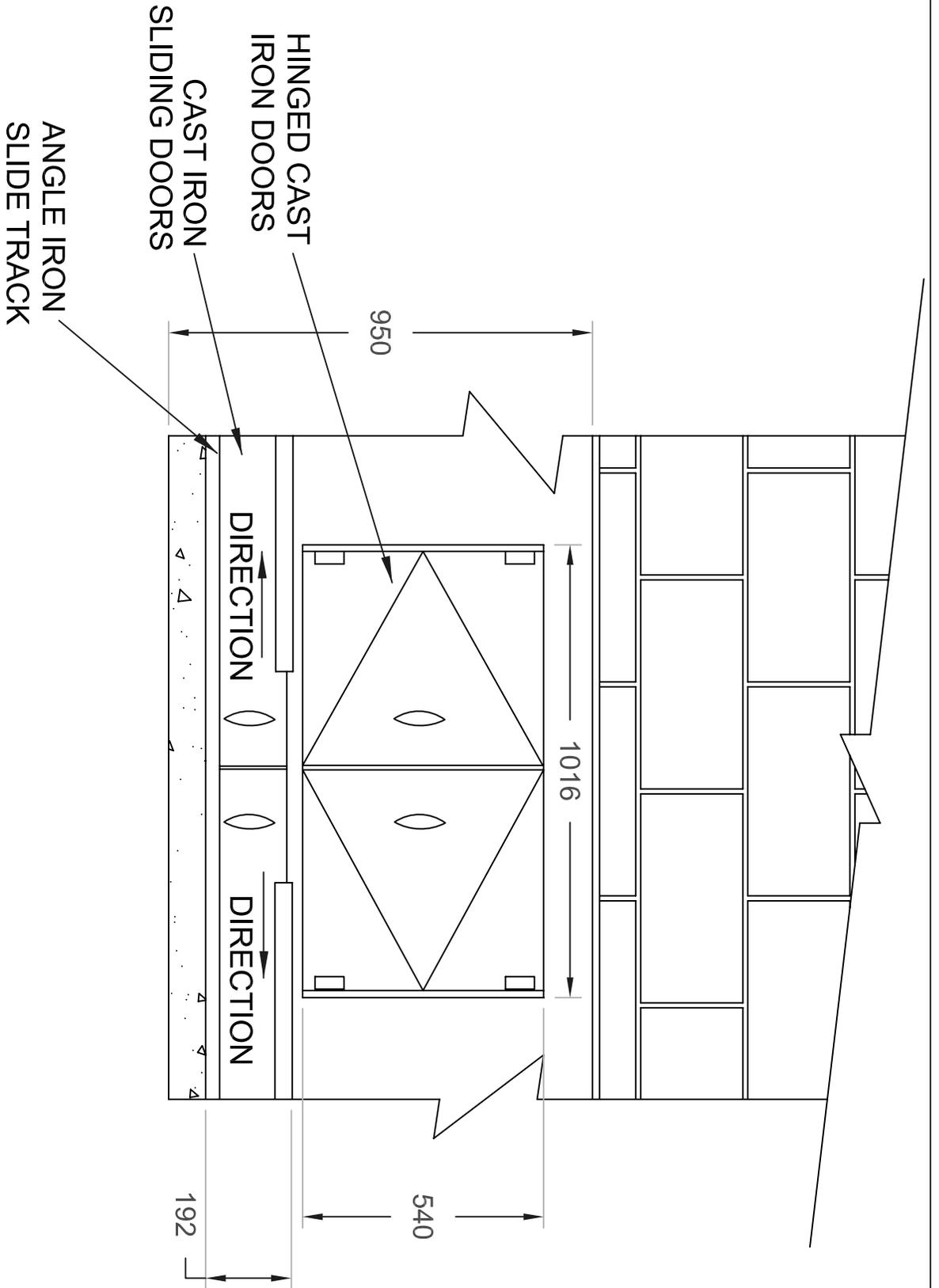
Scale AS SHOWN



WOOD STOVE PLAN VIEW



WOOD STOVE DESIGN	US ARMY CORPS OF ENGINEERS <b>AFGHAN ENGR DISTRICT</b>	Date: 19 April 2007	<b>DETAIL-1</b>
		Drawn by: CN and JR	
		Checked by	
PLAN VIEW			



**WOOD STOVE SECTION B-B  
EXTERIOR WALL SECTION**



**WOOD STOVE DESIGN**

PLAN VIEW

US ARMY CORPS OF ENGINEERS



**AFGHAN ENGR DISTRICT**

Date: 19 April 2007

Drawn by: CN and JR

Checked by

**DETAIL-3**

Scale AS SHOWN

# **APPENDIX B**

**SAMPLE SPECIFICATIONS**

**SMARTTANK SPECIFICATIONS**

# SMARTTANK



## PRODUCT CATALOG 2003

# SMARTTANK



## A SMART WAY TO GO !

A SmartTank system is a pre-engineered fully assembled code compliant package delivered to your site for easy installation. Simply provide a concrete pad with electrical service and your ready to go. We'll even provide pad and electrical drawings suited to your application. An environmentally friendly economical alternative.



## FEATURES & BENEFITS

- ◆ Pre-Engineered Package
- ◆ Code Compliant
- ◆ Easy Installation
- ◆ 30 Year Warranty
- ◆ Economical
- ◆ Consistent Quality

## STANDARD EQUIPMENT

- ◆ Dual Wall Fire Rated Tank
- ◆ Electronic Dispenser
- ◆ Submersible Pump
- ◆ Low Mount Fill with Containment
- ◆ Mechanical Gauge
- ◆ Leak Monitor
- ◆ Overfill Prevention Valve
- ◆ Emergency Venting
- ◆ Decals
- ◆ Grounding
- ◆ Fire Extinguisher
- ◆ Electrical Control System with E-Stop

## OPTIONS & ACCESSORIES

- ◆ Flameshield & FireGaurd Tank Options
- ◆ Multi Product Compartment Tanks
- ◆ 15-40 GPM Models
- ◆ Aviation Fueling Packages
- ◆ Fuel Management Solutions
- ◆ Electronic Gauging
- ◆ Generator Fuel Supply
- ◆ Intermodal Shipping

# SMARTTANK

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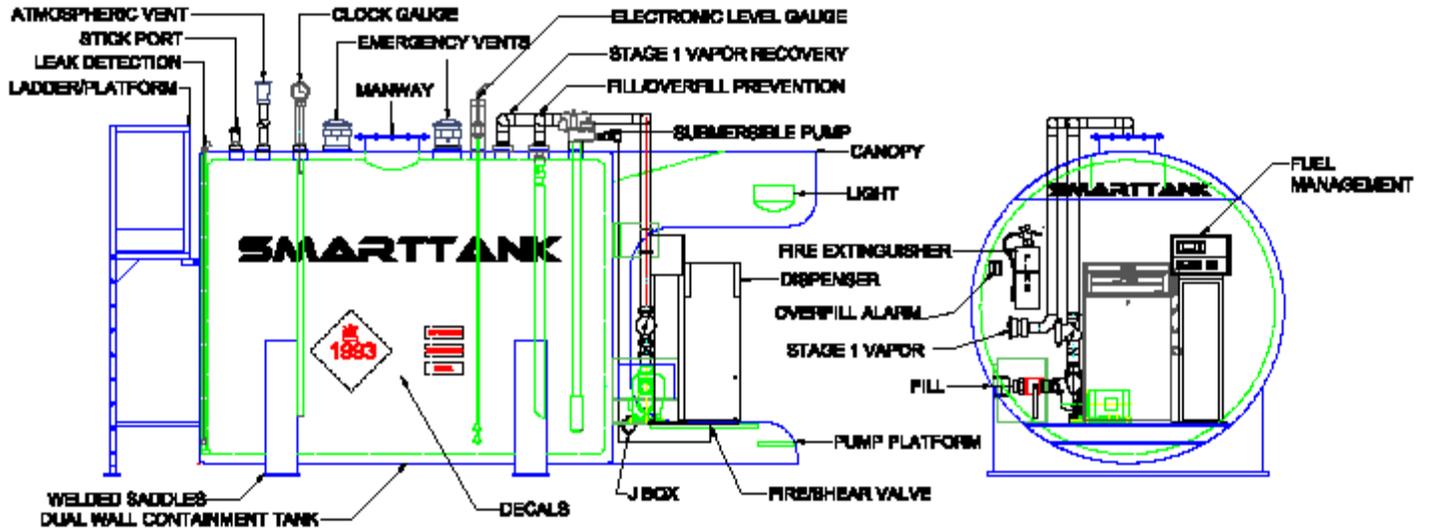
**CAD DETAILS ..... 25**

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# SMARTTANK

## SYSTEM OVERVIEW



*Shown with Optional Components*

# SMARTTANK

## MODEL SELECTION

### FLAMESHIELD VS. FIRE GUARD

The Flameshield tank complies with the requirements of NFPA. The FireGuard tank complies with the requirements of the Uniform Fire Code. Most states adopt one code or the other. UFC is popular out west, NFPA in the east.

It is always imperative to get an approval from the local fire marshall on the system you propose to install.

### TANK CAPACITY

Consider the following when selecting tank capacity.

- √ Can I get discount on full loads of fuel ?
- √ What is a "full load" ? (7-10,000 gallons)
- √ What is your throughput (usage) ?
- √ How long does it take to get fuel delivered ?
- √ 5% is lost in the top of the tank on overfill prevention and 5% from the bottom as the pump is set above the water and debris zone.
- √ Is the fuel going to sit for more than 6 months ? (Consider using additives)
- √ Codes limit single tank capacity to 12,000 gallons. Variances must be sought for larger tanks.

Note: A majority of the systems we sell are 12,000 gallons.

### OPTIONS

**Single Compartment vs. Dual Compartment** - You can split the tank into separate compartments for multiple products. Example: A 12,000 Gallon tank with 4,000 Gallons Gasoline and 8,000 Gallon Diesel.

**Dispensing Packages** - A second dispensing platform can provide multiple fueling positions. Two products can be dispensed on one end with a dual product dispenser as well.

**Internal Tank Lining** - A standard tank is bare steel. A corrosion inhibiting internal lining can be installed. This option is almost always selected on Jet Fuel. A good liner is expensive as the tank is welded on the inside and the finish blasted to prepare for the application of the coating. (Some competitors will do linings without this surface preparation, we won't) Internal corrosion is a problem if water bottoms are not removed. A water sumping system is also available.

**Pump Systems** - We often do custom pump systems for bottom loading trucks, transferring fuel to multiple remote dispensers, diesel fuel generator day tank supply, etc. Please ask a sales engineer about anything special.

**Fuel Management** - We offer several fuel management system solutions from unattended retail credit card to fleet keys, pin numbers, buying clubs, etc. We will also pre-install a customer supplied proprietary system.

# SMARTTANK

## FIREGUARD TANK

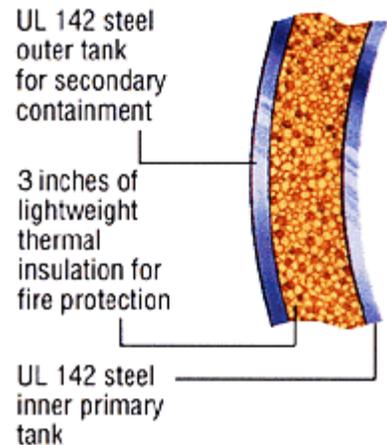
Fireguard™ offers the safety of UL 2085 steel secondary containment - plus lightweight convenience.

Fireguard™ features a super lightweight insulation within the interstice, reducing total tank weight by more than half so it can be easily relocated! The porous insulation material allows migration of any liquid through the interstice to the monitoring point. Unlike plastic liners, the steel double wall design provides 110% UL-listed secondary containment. And Fireguard™ comes delivered as a complete unit with Steel Tank Institute Quality Assurance built in.

*Now UL 2085 Listed using 3" of lightweight insulation between 2 walls of steel.*



- ◆ Monitoring tube for interstitial leak detection, 2-hour fire rating
- ◆ Meets 1994 Uniform Fire Code for "Protected Tank" Appendix IIF
- ◆ UL 2085 listed for "Insulated Secondary Containment - Protected Type" ASTs
- ◆ Meets NFPA 30/30A codes (reduced separation distance)
- ◆ Inner and outer steel tanks built to UL 142
- ◆ UL Listed Secondary Containment
- ◆ STI licensed and made to STI quality standards
- ◆ No exposed concrete no spalling or cracking
- ◆ 30-year limited warranty
- ◆ UFC Appendix IIF ballistics protection
- ◆ UFC Appendix IIF impact protection



# SMARTTANK

## FLAMESHIELD

The Flameshield™ fire-resistant aboveground storage tank is manufactured with a tight-wrap double-wall design. Standard features include tested 2-hour fire resistance, built-in secondary containment and interstitial monitoring capability.

Double wall design offers integral secondary containment which can be tested for tightness on site throughout tank life. Interstitial space can be monitored for leak detection. Primary storage tank and secondary containment compatible with a wide range of fuels and chemicals. Built to nationally-recognized STI standards with strict third-party quality control inspection program. Customized compartments can be provided for cost effective multi-product storage. Capacities up to 50,000 gallons.

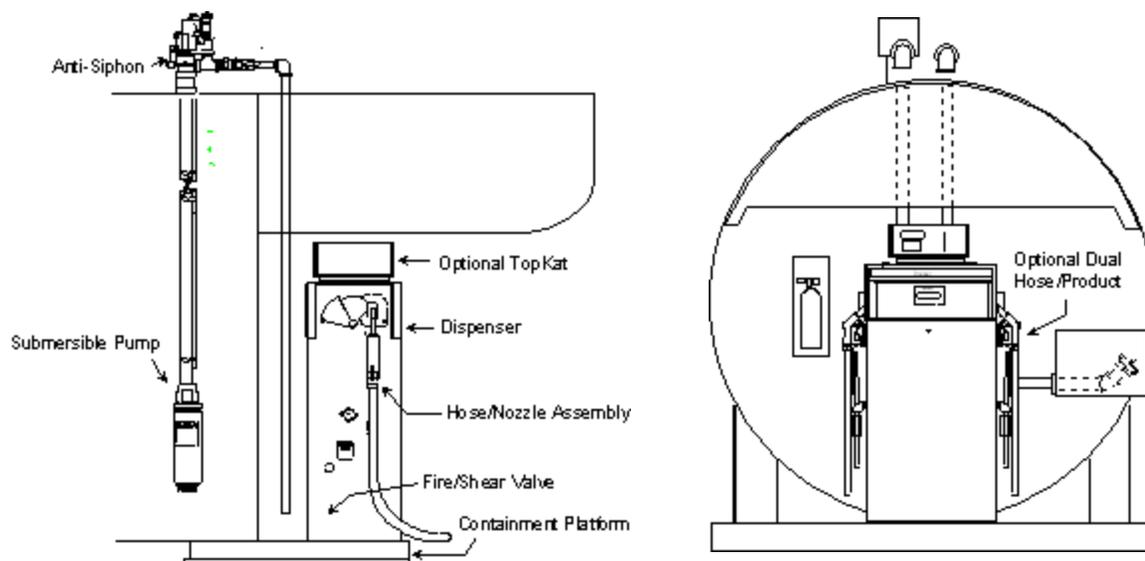


- ◆ Tested by Southwest Research Institute to SwRI 97-04 requirements for fire-resistant tank performance
- ◆ Complies with NFPA 30A fire-resistant tank requirements.

Capacity In Gallons	No. of Saddles	Dimensions		Inner Tank		Outer Tank		Weight
		Diameter	Length	Head	Shell	Head	Shell	
300	2	3' 2"	5' 0"	12 Ga.	12 Ga.	10Ga.	12 Ga.	595
500	0	4' 0"	5' 4"	12 Ga.	12 Ga.	10Ga.	12 Ga.	1,036
500	3	4' 0"	5' 4"	10Ga.	10Ga.	10Ga.	12 Ga.	1,203
500	2	4' 0"	5' 4"	7 Ga.	7 Ga.	10Ga.	12 Ga.	1,321
1,000	2	4' 0"	10' 8"	10Ga.	10Ga.	10Ga.	10Ga.	1,830
1,000	2	4' 0"	10' 8"	7 Ga.	7 Ga.	10Ga.	10Ga.	2,473
1,500	2	5' 4"	9' 0"	7 Ga.	7 Ga.	10Ga.	10Ga.	2,665
2,000	2	5' 4"	12' 0"	7 Ga.	7 Ga.	10 Ga.	10Ga.	3,260
3,000	3	5' 4"	18' 0"	7 Ga.	7 Ga.	10 Ga.	10Ga.	4,461
4,000	3	5' 4"	24' 0"	7 Ga.	7 Ga.	10Ga.	10Ga.	5,788
4,000	2	8' 0"	10' 6"	5/16"	1/4"	7 Ga.	10Ga.	6,608
5,000	2	8' 0"	13' 4"	5/16"	1/4"	7 Ga.	10Ga.	7,666
5,000	3	6' 0"	23' 10"	5/16"	1/4"	7 Ga.	10Ga.	8,358
6,000	2	8' 0"	16' 0"	5/16"	1/4"	7 Ga.	10Ga.	8,761
6,000	3	6' 0"	28' 8"	5/16"	1/4"	7 Ga.	10Ga.	9,824
8,000	3	8' 0"	21' 4"	5/16"	1/4"	7 Ga.	10Ga.	10,913
10,000	4	8' 0"	26' 8"	5/16"	1/4"	7 Ga.	10Ga.	12,831
10,000	2	10' 0"	17' 0"	5/16"	1/4"	1/4"	7 Ga.	13,583
12,000	4	8' 0"	32' 0"	5/16"	1/4"	7 Ga.	10Ga.	14,887
12,000	3	10' 0"	20' 6"	5/16"	1/4"	1/4"	7 Ga.	15,527
15,000	4	8' 0"	40' 0"	5/16"	1/4"	7 Ga.	10Ga.	18,256
15,000	3	10' 0"	25' 6"	5/16"	1/4"	1/4"	7 Ga.	17,710
20,000	4	10' 0"	34' 0"	5/16"	1/4"	1/4"	7 Ga.	22,980
25,000	4	10' 6"	38' 9"	5/16"	1/4"	1/4"	7 Ga.	27,391
30,000	5	10' 6"	46' 6"	5/16"	1/4"	1/4"	7 Ga.	31,975

# SMARTTANK

## PUMP PACKAGES - GAS AND DIESEL FLEET



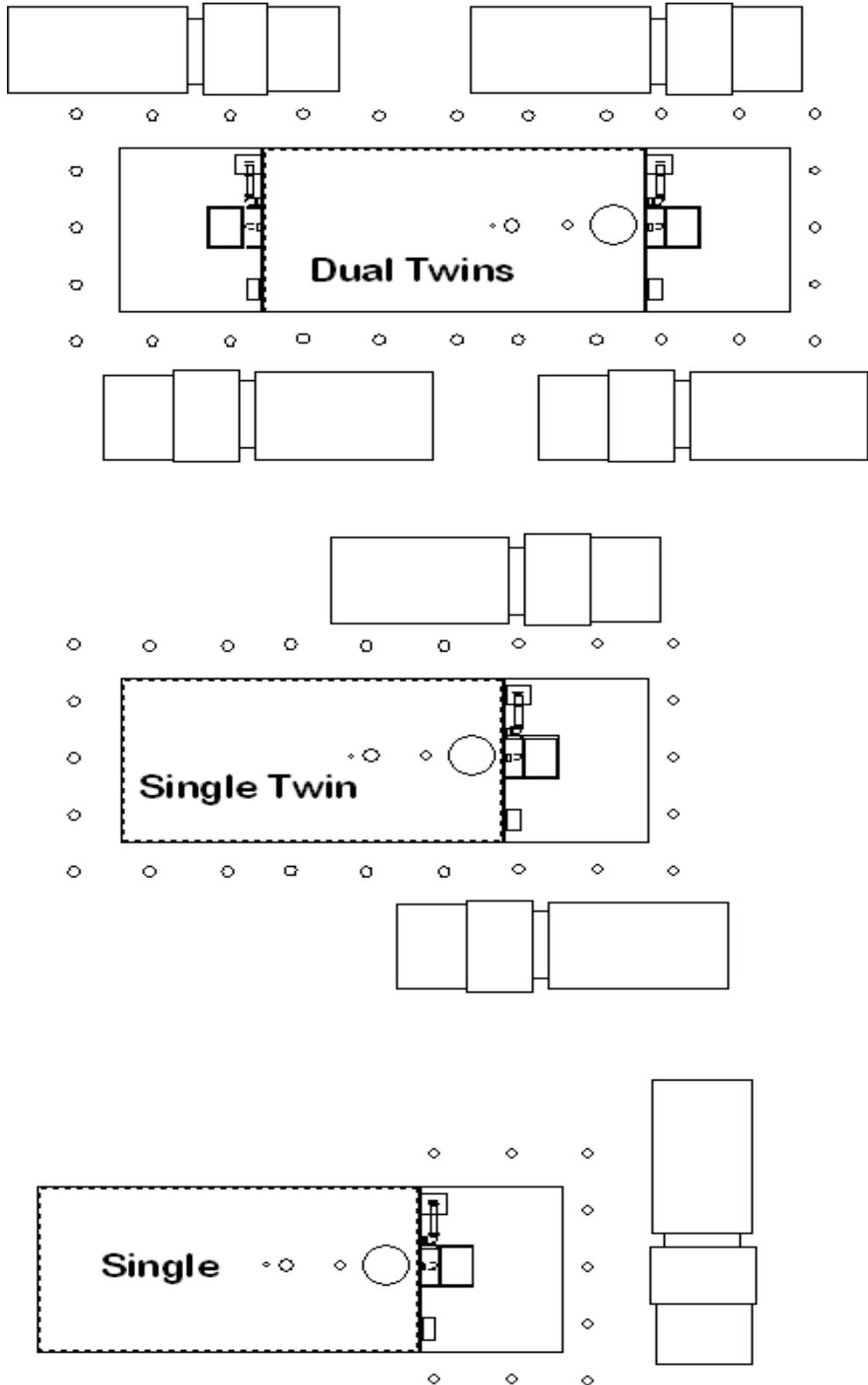
Model	Single/Twin	1 or 2 Products	Max GPM	STP's	STP Size	Hose Size
9852AX	Single	1	15	1	3/4 HP	3/4"
9852AXTW-1	Twin	1	15	1	3/4 HP	3/4"
9852AXTW-2	Twin	2	15	2	3/4 HP	3/4"
<b>9853AX</b>	<b>Single</b>	<b>1</b>	<b>22</b>	<b>1</b>	<b>3/4 HP</b>	<b>1"</b>
9853AXTW-1	Twin	1	22	1	3/4 HP	1"
9853AXTW-2	Twin	2	22	2	3/4 HP	1"
9840AX	Single	1	40	1	3/4 HP	1.5"
9850AX	Single	1	50	1	3/4 HP	1.5"
9850AXTW1	Twin	1	50	1	3/4 HP	1.5"
9850AXTW-2	Twin	2	50	2	2 HP	1.5"

Note: Diesel foams if splash dropped at more than 28 gpm.

Note: 9853AX is standard system.

# SMARTTANK

## SITE LAYOUTS



# SMARTTANK

## GASBOY 9800 SERIES DISPENSERS

- ◆ Heavy duty, reliable dispensing equipment designed specifically for the demanding requirements of fleet fueling.
- ◆ 15 to 50 GPM models
- ◆ Single or twin hoses/products.
- ◆ Large 1" back lighted LCD displays provide easy viewing.
- ◆ Simple reliable electronics mean low maintenance.



## SPECIFICATIONS

**Finish:** Top and Sides painted black. Front and back panels painted white. Black bezel with black overlay graphic.

**Construction:** Top carbon steel panel. Front, back and side, hot-dipped galvanized.

**Register:** 1" Backlit LCD Display, Volume in Gallons Only.

**Totalizer:** Displayed on LCD by magnetic switch activation.

**Pulser:** Dual Phase with 1000:1 with error detection.

**Meter:** Three piston positive displacement. Tested and calibrated.

**Approvals:** UL Listed, FCC.

Model	Single/Twin	1 or 2 Products	Max GPM
9852AX	Single	1	15
9852AXTW-1	Twin	1	15
9852AXTW-2	Twin	2	15
9853AX	Single	1	22
9853AXTW-1	Twin	1	22
9853AXTW-2	Twin	2	22
9840AX	Single	1	40
9850AX	Single	1	50
9850AXTW1	Twin	1	50
9850AXTW-2	Twin	2	50

# SMARTTANK

## AVGAS / MARINA DISPENSER

- ◆ 35/60/80 GPM Configurations
- ◆ 1" , 1½" or 2" Internal Reel Options
- ◆ Electric or Spring Rewind
- ◆ Liquid Controls PD Meter
- ◆ Internal Dual-element Filters
- ◆ Resale Accurate
- ◆ Stainless Steel Enclosure
- ◆ Commercial or Retail Electronic Display
- ◆ Powder Coated Frame and Face
- ◆ Optional ALL Stainless Steel Construction



The **Fuelhouse Dispenser** is a versatile, high speed, reel equipped dispenser designed toward marine and aviation applications. With flow rates up to 80 gpm and various hose reel configurations available, the Fuelhouse dispenser can fill almost any requirement you have.

**FH-510** series dispensers are capable of fuel delivery rates up to 35 GPM. The units contain a 1½" positive displacement rotary meter, a 1½" solenoid valve, inlet filter assembly and a 1" hose reel. The hose reel is available with capacities of 85' and 130'. Although both reel sizes are available with electric hose return, the smaller reel has the option of spring rewind. The nozzle boot can accommodate a 7H or 1290-style nozzle (contact factory for other nozzle types).

**FH-515** series dispensers are capable of fuel delivery rates up to 60 GPM. The units contain a 1½" positive displacement rotary meter, a 2" solenoid valve, dual element filter assembly and a 1½" hose reel. The hose reel is available with capacities of 50' and 100'. Although both reels sizes are available with electric hose return, the smaller reel has the option of spring rewind. The nozzle boot can accommodate a 7H or 1290-style nozzle (contact factory for other nozzle types).

**FH-720** series dispensers are capable of fuel delivery rates up to 80 GPM. The units contain a 2" positive displacement rotary meter, a 2" solenoid valve, dual element filter assembly and a reel for 2" hose. The hose reel has a capacity of 50' and is only available with electric rewind. The nozzle boot can accommodate a 7H or 1290-style nozzle (contact factory for other nozzle types).

**Commercial electronic** dispensers units are fitted with a 6 digit backlit LCD display and a nonresettable electro-mechanical totalizer. A programmable volume pulse output is standard.

**Retail electronic** dispensers calculate both volume and money. Six digit, backlit LCD displays are provided for both volume and money readouts. The price per gallon display is 4 digits and 0.5" high. The pulse output from the dispenser is programmable for either money or volume. When set for volume pulse output, the resolution is programmable for 1, 10, or 100 pulses per gallon.

# SMARTTANK

## AVIATION FILTRATION

**Positive Water Protection filters for removal of water and dirt from AvGas and Jet Fuel**

- ◆ **Positive Water Removal:** Aquacon cartridges remove free and emulsified water from fuels and oils.
- ◆ **Positive Water Holding:** Filtered water is chemically locked-in and can't be squeezed out.
- ◆ **Effective Dirt Removal:** 98%+ efficiency for 1, 5, or 25 micrometer particles.

## SPECIFICATIONS:

**Recommended maximum flow rate:** 5 to 50 GPM

**Maximum operating pressure:** 150 psi

**Material:** Cast aluminum head, carbon steel shell with epoxy-painted exterior and interior, stainless steel clamp band

**Inlet/Outlet connection:** 1-1/2" FPT Inlet/Outlet face-to-face: 7-1/2" Closure Seal: Viton

**Height:** 19" with draincock

**Weight:** 10 lbs.

**Hardware included:** Buna-N lid gasket (replacement part number ATG0986), 1/8" brass petcock vent valve and 1/2" draincock



## DESCRIPTION

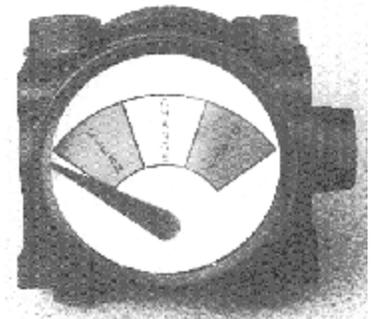
*Patented Aquacon® filter cartridges have a unique high capacity inner filter media which removes all free and emulsified water from hydrocarbon fuels down to less than 5 ppm in the effluent. Absorbed water is chemically locked into this media and cannot be squeezed out.*

When a cartridge reaches its water holding capacity, its accordion pleats swell shut and block the flow. This "positive shutoff" prevents any water-laden fuel from passing downstream through the saturated cartridge. This causes an increase in the differential pressure which signals the operator to change the cartridge. Solid contaminants are removed by the cartridge's two particulate filter media layers. The pleated accordion style design provides a large surface area for maximum dirt holding capacity. Models are offered for particulate filtration down to either 5 or 1 micrometer size with 98% plus efficiency. Performance is not affected by the presence of surface active agents.

## DIFFERENTIAL PRESSURE GAUGE

When the needle is in the green zone of the gauge during normal flow, the differential pressure is less than 15 psid across the installed element, and the element does not need to be changed out.

When the needle is in the red zone, the differential pressure is more than 15 psid and the element should be changed out. It has reached its recommended maximum pressure differential.



# SMARTTANK

## SUBMERSIBLE PUMP

Submersible pumps are known for providing years of trouble free performance. FSI prefers submersible pumps over suction pumps as pumps push liquid better than they pull it. Submersible pumps also benefit from being liquid cooled and electrically efficient. The dependability of a submersible pump is unequalled.



## SPECIFICATIONS

**Pump Motor:** 3/4 H.P. Centrifugal type.

**Thermally protected:** Automatic thermal overload turns motor off at approximately 205° F (95 °C) and resets on at approx. 115° F (45° C).

**Liquid Compatibility:** Standard units compatible with fuel mixtures containing up to 15% ethanol or methanol with gasoline and 20% MTBE, 20% ETBE, or 17% TAME with gasoline, and diesel fuels.

**Check Valve:** 2 3/4" (70mm) diameter constructed of aluminum and steel with fluorocarbon seal.

**Pressure Relief Valve:** Standard valve is set to relieve static line pressure at 35-50 PSI (2.38 to 3.4 bar), reseals above 20 PSI (1.36 bar).

**Air Eliminator:** Returns air to tank with one way check valve to prevent back flow.

**Seal Elastomers:** All wetted seals on standard units use Viton®.

**Approvals and/or Listings:** UL, CSA, BASEEFA, TUV, SAA, BKI, INMETRO, TIIS, KHK, FTZU, others pending.

**Quality Certification:** FE Petro is an ISO 9001 Certified Manufacturer.

# SMARTTANK

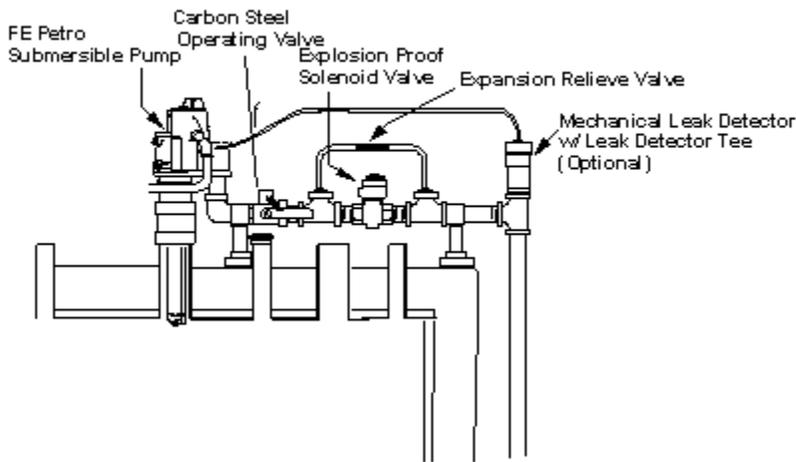
## ANTI-SIPHON SYSTEM

### DESCRIPTION

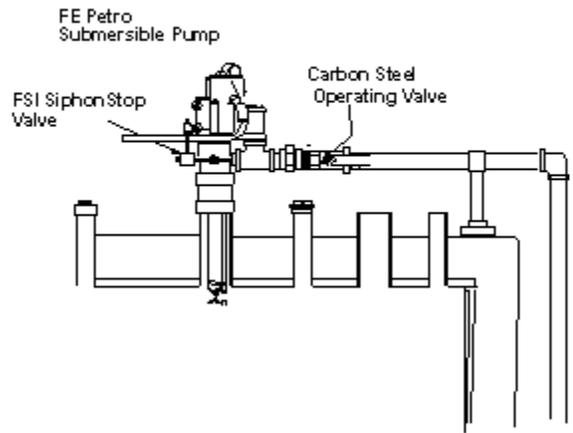
The FSI Siphon Stop is a siphon prevention device used on submersible pumps for aboveground storage tank installation. It replaces the traditional solenoid valve system currently used by the industry.

The system is designed to break a vacuum. It works in conjunction with the submersible pump “tank test port” to allow air to enter the line in a negative pressure situation. It will prevent the tanks contents from siphoning through the submersible pump. Thermal expansion is relieved via the standard STP pressure relieving system. The fail safe design will prevent siphoning even with failed seals. (The failed seals will cause a leak detector to “trip” giving indication that service needs to be performed.)

Solenoid System

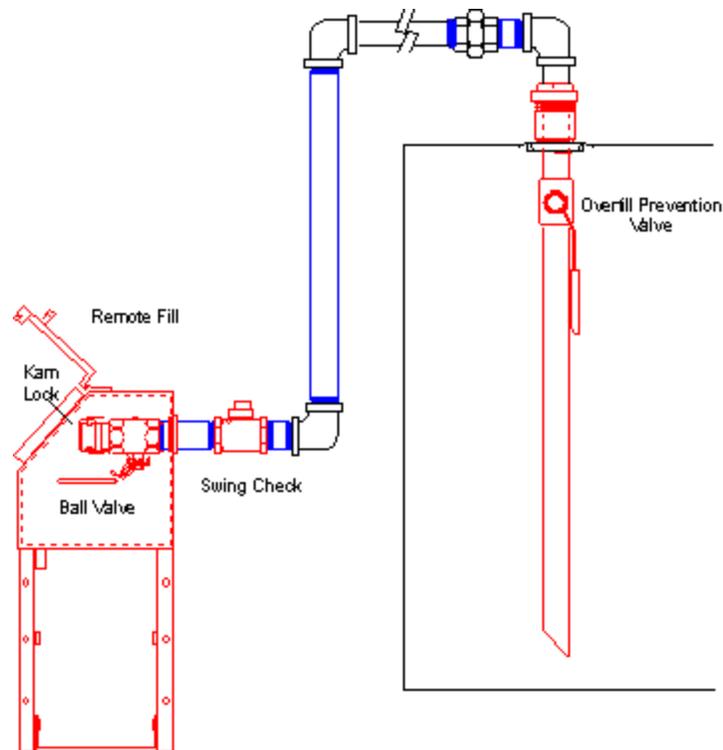


Siphon Stop System



# SMARTTANK

## HIGH CAPACITY REMOTE FILL PACKAGE



### SPECIFICATIONS

**Remote Fill Container:** 15 Gallon capacity, 12 ga. steel construction, fuel resistant epoxy powder coat finish, drain with locking ball valve, UL Listed.

**Truck Adaptor:** 3" Kamlock Aluminum Part A Coupler with Dust Plug with color coded API compliant product label.

**Ball Valve:** 3" Carbon Steel Body, Stainless Ball, Teflon Seals, Locking, UL Listed.

**Check Valve:** Cast Iron, UL Listed.

**Overfill Prevention Valve:** 3" Aluminum, 200 GPM Rated Capacity, Activates at 95% Tank Capacity with anti-splash aluminum drop tube.

**Piping:** 3" Welded Schedule 40 Black Carbon Steel.

# SMARTTANK

## TANK VENTING

Each tank needs an atmospheric vent and an emergency vent. Dual wall tanks require two emergency vents; one for the primary tank and one for the secondary tank. The secondary emergency vent is sized to match the primary emergency vent. Loose bolt manways can also be substituted as the primary tank emergency vent.

**Atmospheric Tank** — A storage tank that has been designed to operate at pressures from atmospheric through 1.0 PSIG (760 mm Hg through 812 mm Hg) measured at the top of the tank (NFPA 30 Pg. 30-8). Pressure not to exceed 1.0 PSIG under normal operation, and 2.5 PSIG under emergency conditions (PEI RP-200).

**Emergency Venting** — Emergency Vent (pressure relief only) used on Aboveground Storage Tanks, as a code requirement, to help prevent the tank from becoming over-pressurized and rupturing if exposed to fire. UL Listed.

**Pressure Relieving Devices** — Defined in NFPA 30 2-3.6.4, where entire dependence for emergency relief is placed upon pressure relieving devices, the total venting capacity of both normal and emergency vents shall be enough to prevent rupture of the shell or bottom of the tank if vertical, or of the shell or heads if horizontal.

**Atmospheric Vents** - Two types of atmospheric vents are used. Diesel fuel and oils use an open atmospheric vent. Gasoline uses a pressure/vacuum vent. Pressure/vacuum vents serve multiple purposes including reducing vapor loss and enabling vapor recovery systems .

Capacity Gallons	Diameter	Length	Wetted Area	Req'd Vent Capacity (CFH)	Emergency Vent Size (Inches)	Atmospheric Vent Size (Inches)
280	36"	5'-2"	47	49,520	3	2
300	38"	5'-0"	49	51,640	3	2
500	48"	5'-5"	69	72,650	4	2
530	46"	6'-0"	71	74,750	4	2
550	48"	6'-0"	75	78,950	4	2
1,000	48"	10'-8"	119	124,950	6	2
1,000	64"	6'-0"	109	114,450	4	2
1,500	64"	9'-0"	147	154,350	6	2
2,000	64"	12'-0"	184	193,200	6	2
2,500	64"	15'-0"	222	223,320	6	2
3,000	64"	18'-0"	259	243,680	6	2
3,000	6'-0"	14'-0"	240	233,400	6	2
4,000	64"	24'-0"	335	281,100	6	2
4,000	6'-0"	19'-0"	311	270,060	6	2
5,000	8'-0"	13'-4"	326	276,960	6	2
6,000	8'-0"	16'-0"	376	300,480	8	2
8,000	8'-0"	21'-4"	477	344,340	8	2
10,000	8'-0"	27'-0"	584	385,920	8	2
10,000	9'-0"	21'-0"	540	369,200	8	2
10,000	10'-0"	17'-0"	518	360,840	8	2
10,000	10'-6"	15'-7"	515	359,700	8	2
12,000	8'-0"	32'-0"	678	420,080	8	3
12,000	9'-0"	25'-0"	625	401,000	8	3
12,000	10'-0"	20'-6"	600	392,000	8	3
12,000	11'-0"	17'-0"	583	385,540	8	3
15,000	8'-0"	40'-0"	829	470,990	8	3

# SMARTTANK

## MECHANICAL GAUGE

The Morrison Fig. 818 Clock Gauge is used for measuring liquid level in aboveground storage tanks. Readout format is on a standard 12 hour clock face. Small hand represents feet and the large hand inches. Gauge can be read up to 20-30 ft. away to within 1/8". Maximum measurement capability is 12 feet. The gauge can be rotated 360 after mounting. The standard float will pass through a 2" opening.

## SPECIFICATIONS

**Body:** Aluminum with 2" NPT Connection

**Float:** Stainless Steel

**Cable:** Stainless Steel

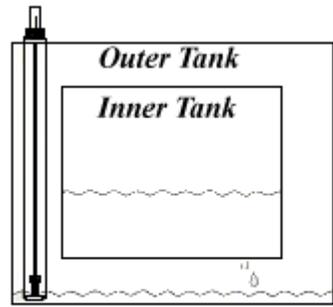


*Optional High Level Alarm*



# SMARTTANK

## LEAK GAUGE



*When Gauge on a system with an interstitial tube*



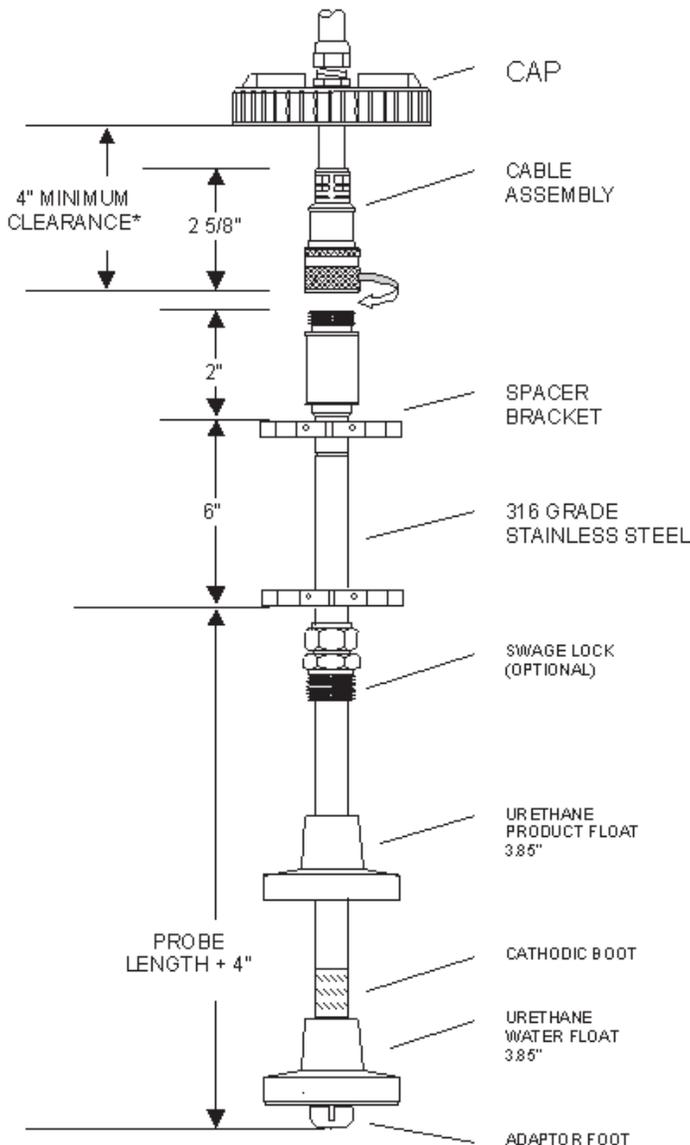
Direct mechanical action to detect leakage of the inner tank.

# SMARTTANK

## ELECTRONIC MONITORING

The OEL8000II is a comprehensive tank-gauging and leak-detection system that will simultaneously monitor product levels, water levels, temperatures and leaks in up to eight tanks.

The OEL8000II accepts up to 44 Bright Eye Series sensors for distinguishing product from water or for simply detecting the presence of liquid. Bright Eye sensors are networked and utilize 4-wire technology. Each sensor knows its own identity and location, which is displayed along with alarm conditions on the OEL8000II's backlit LCD display.



## SPECIFICATIONS

- ◆ 8 Magnetostrictive Probe Input
- ◆ Bright Eye Series Sensor Inputs
- ◆ 4 RS-232 Ports
- ◆ 1 RS-485 Port
- ◆ 4x40 Character Digital Display
- ◆ Networked 4 Wire Sensor Technology
- ◆ Accepts up to 6 Option Boards
- ◆ Flash Prom Technology
- ◆ Battery-backed Memory
- ◆ Capable of accepting up to 44 Bright Eye sensors
- ◆ U.L. Listed - CE and CUL listed

## OPTIONS

- Fax / Modem
- Windows Software
- Thermal Printer

# SMARTTANK

## FUEL MANAGEMENT SOLUTION

TopKAT uses smart keys for identification and access. The durable, injection-molded keys fit on the vehicle key ring for convenient accessibility. TopKAT limits the fuel type, amount dispensed, number of fuelings per day, and even checks for odometer reasonability. Cumulative vehicle, employee, and department fuel usage and MPG reports are provided for fleet management. A built-in printer option allows standalone island operation, or TopKAT communicates remotely to a terminal or PC. An optional PCMCIA card feature provides backup and restore capability for system files. PC software is also available for the backup and restore function, as well as remote communication.



With an internal report printer option, TopKAT allows completely standalone island operation, or it communicates remotely to a PC. This innovative, key-based unit, handles up to 500 vehicles and 500 employees, and provides cumulative vehicle, employee, and department fuel usage reports. TopKAT even performs odometer reasonableness checks to help ensure valid odometer entries.

*Optional Pedestal*



# SMARTTANK

## AVIATION FUELING TERMINAL

### TOUCH-N-GO AVIATION FUEL TERMINAL

*WHY YOUR CUSTOMERS WILL LOVE AUTOMATED FUELING:  
WHAT AN AVIATION FUEL TERMINAL CAN DO FOR YOU:*

- ◆ Permit 24-hour operation
- ◆ Allows more competitive pricing
- ◆ Increases net profits
- ◆ Reduced labor cost
- ◆ Increase sales volume
- ◆ Ease your Accounting Burden with Advanced Account Management
- ◆ Create incentives with Volume Discounts.
- ◆ Track Inventory with Automatic Inventory
- ◆ Available any time, day or night
- ◆ More convenient
- ◆ Easy and safe to use
- ◆ Quick turn-around
- ◆ Lower fuel cost
- ◆ Point of Sale Discounting



# SMARTTANK

## SITE MANAGER

Designed specifically for the SmartTank System in compliance with the National Electric Code, NFPA and UFC. System includes branch circuit panel board, pump motor starter, disconnect relays, pump running indicator, panel disconnect, with maintained mushroom head push button, optional area light H-O-A and photocell (not shown).

Shipped loose and installed 20-100 feet away from tank.

## SPECIFICATIONS

Enclosure: NEMA 4X Fiberglass  
 Power Requirements: 30 amp 240V Single Phase  
 All components are UL listed.  
 Disconnects all fueling system circuits per NFPA 70 -514



## FACTORY PRE-WIRED OPTION

Optional factory pre-wired using premium quality mineral insulated, flexible, fire rated, UL Listed cable. A junction box provides connection to user supplied conduit between the tank and the tank controller. Color coded connections eliminate guess work.

*Note: Communication wiring to fuel management and or leak detection and level monitoring systems require additional conduits to tank.*



# SMARTTANK

## FOUNDATION PLANNING

A SmartTank weighs approximately 1.5/lbs per gallon. Add the weight of the fuel at 7.5 lbs/gallon and you see you have a very heavy piece of equipment to support. If your site has good stable soil (2800 psf +) you may be able to use some of the following design examples. If your site is "soupy" or you're not sure you should enlist the services of a professional engineer.

Three common foundation systems;

**Crushed Stone Only** - This option does not anchor the tank. Optional Runner Skids are added to the tank to spread the load.

**Concrete Piers** - Two piers are used to support the saddles. These piers are typically 36 inches wide by the tank diameter plus a foot on each side (3'x10' or 3'x12') by 12" deep. These typically provide adequate structural support. They do not provide floatation protection.

**Concrete Slab / Tank Shadow** - A 6" pad is placed on crushed stone. Wire mesh re-inforcement is also used. The pad size correlates to the tanks width by length. An apron of 2-3' all the way around the tank is often done as a walkway.

**Concrete Slab w/ Bollards** - A concrete pad is provided that extends beyond the bollards by 12".

**Seismic Zone 4** - An 18" pad with reinforcement. Tank saddles are anchored.

Our CAD department provides site specific drawings including conduit stub up locations, bollard placement, etc.

### IMPORTANT NOTE:

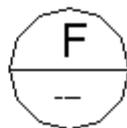
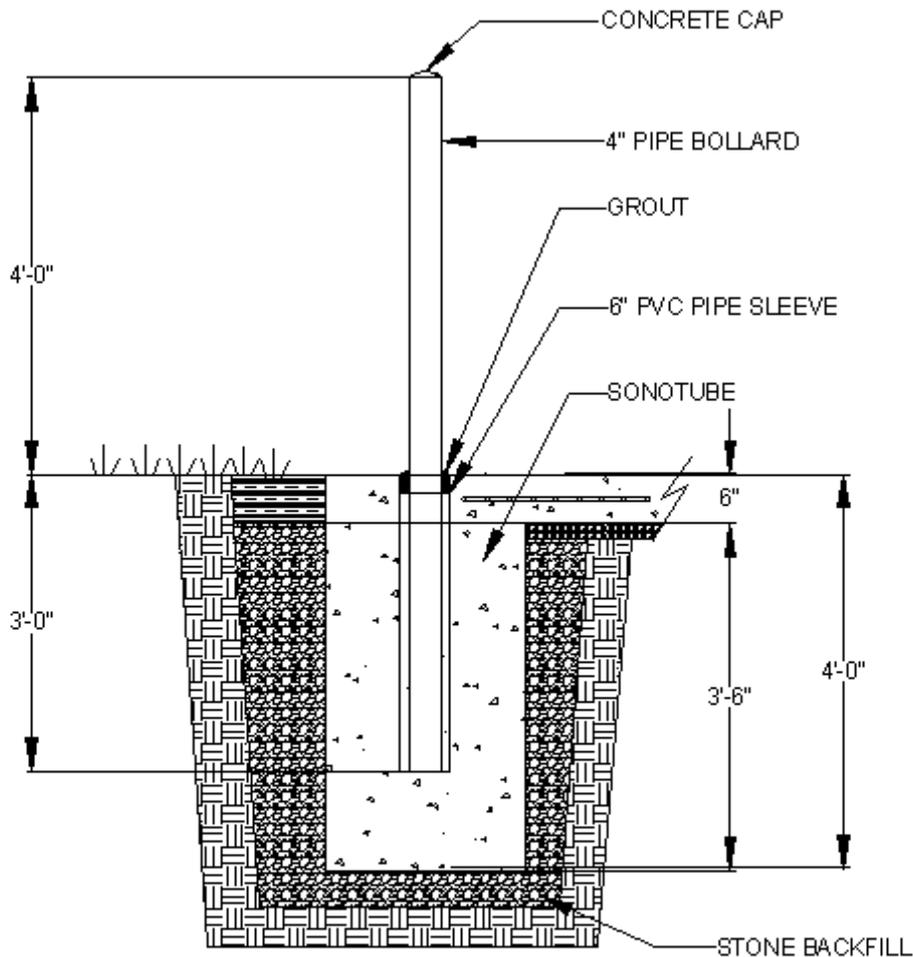
NFPA requires vehicle impact protection bollards be placed 5 feet from the tank on maximum 4' centers.

*"K Rail" or "Jersey Barrier" precast concrete systems are often substituted. These can often be placed right next to the tank, are maintenance free, economical, and well suited for the application.*

# SMARTTANK

## CAD DETAILS

We have full CAD and specification files available. Please contact a sales engineer to request/discuss what you need.



**BOLLARD DETAIL**

# SMARTTANK

## MINI-SMARTTANK

The Mini SmartTank system is a pre-engineered fully assembled code compliant package delivered to your site for easy installation. Simply provide a concrete pad with electrical service and your ready to go. We'll even provide pad and electrical drawings suited to your application. An environmentally friendly economical alternative.

### FEATURES & BENEFITS

- ◆ Pre-Engineered Package
- ◆ Code Compliant
- ◆ Easy Installation
- ◆ 30 Year Warranty
- ◆ Economical
- ◆ Consistent Quality

### GASBOY MODEL 72 PUMP



### STANDARD FEATURES

**DELIVERY RATE** - Up to 18 GPM

**REGISTER** - 4-wheel push-button reset. Includes 7-digit master totalizer.

**METER** - Nutating disc phenolic measuring chamber in aluminum die cast housing. Adjustable calibration +/- .5% at full flow.

**PUMPING UNIT** - Self-priming, direct drive rotary vane. 23 PSI (1.6 bars) stainless steel bypass valve. Check valve with pressure relief valve.

**STRAINER** - 100 mesh nylon.

**MOTOR AND POWER REQUIREMENTS** - Explosion-proof, 1/3 HP, 1725 RPM, 115 VAC, 60 Hz motor with thermal overload protection and auxiliary AC line.

• Vacuum breaker located in the discharge casting to prevent accidental siphoning when the nozzle is open and lower than the product level.



### STANDARD EQUIPMENT

- ◆ Dual Wall Fire Rated Tank
- ◆ Electronic Dispenser
- ◆ Top Mount Fill with Containment
- ◆ Alarm Clock Mechanical Gauge
- ◆ Leak Monitor
- ◆ Overfill Prevention Valve
- ◆ Emergency Venting
- ◆ Decals
- ◆ Fire Extinguisher



Project Name:

## General Information

Status  Completed  Suspended

RONCO Task #:	671/06	IMAMA ID: (UN use)	
Report date:	8/12/07	Data entry date: (UN use)	
Reported by:	Mohamad Hakim	Data entry by: (UN use)	
		Total size of clearance area:	1323000m <sup>2</sup>
		Total sub surface cleared:	1323000m <sup>2</sup>
		Total surface cleared:	1323000m <sup>2</sup>
Organization:	RONCO	Clearance Depth:	100cm
Task Start Date:	25/10/07	Total Work Hours:	10641 Hours
Task End Date:	08/12/07	Client:	
Project Contract No	W917PM-07-D-0001-0006 IDIQ	Team Name	T4/S2/T1/S4/T7/S5

Methods and Technologies Used:  Manual  Mechanical  MDD  Combined

Uncleared area left:  Yes  No

Uncleared area marking:  Official signs  Fenced  None  Several  Local signs

Description of uncleared area:

Clearance Type  BAC  RCL BAC  M/F  RCL M/F  EOD  
 Reconstruction  RCL Reconstruction  Special Task Other  Special Task Other

Quality Control carried out by:

Quality control method  Manual  Dog  Mechanical  Combination

## Location

Region:	North	District:	Kunduz City
Province:	Kunduz	Village/City:	Dasht Qndari
Dist from nearest Village/City:	15Km	Local Name:	Gr Guzar Nasri

**Coordinates should be in Lat/Long WGS84 DD MM SS.S / UTM**

Long :

Lat :

Coord. fixed by:  DGPS  GPS or  
Map with  < 30m or  > 30m accuracy

**Coordinates to the Bench Mark(BM)** **Coordinates to the Start Point (SP)**

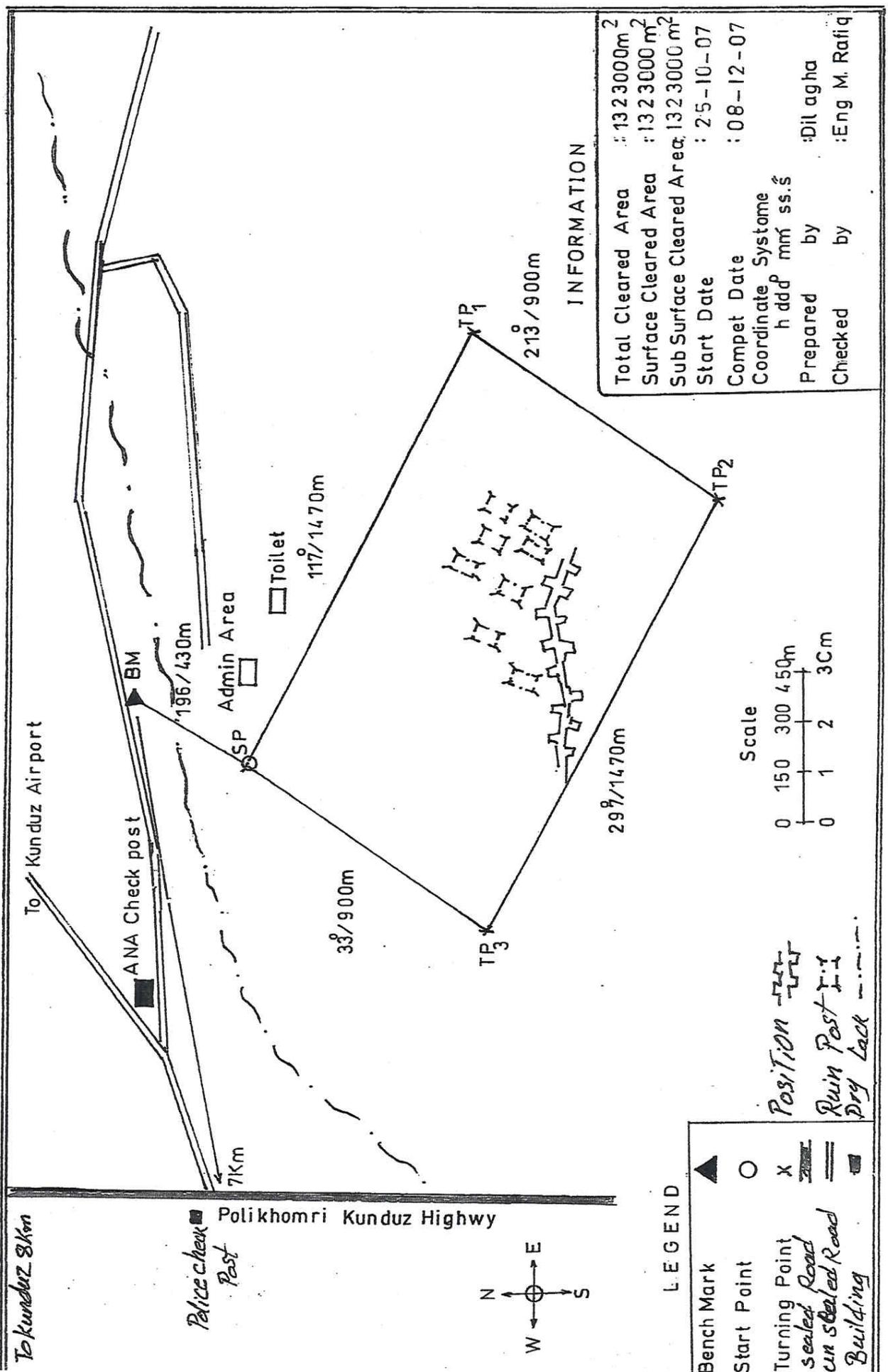
Long : E=068 55 19.3 Long : E=068 55 13.6

Lat : N=36 39 18.0 Lat : N=36 39 05.1

Coordinates fixed by  GPS  DGPS







INFORMATION

Total Cleared Area	: 1323000m <sup>2</sup>
Surface Cleared Area	: 1323000m <sup>2</sup>
Sub Surface Cleared Area	: 1323000m <sup>2</sup>
Start Date	: 25-10-07
Compet Date	: 08-12-07
Coordinate System	hddd mm ss.s
Prepared by	: Dil agha
Checked by	: Eng M. Rafiq

TASK NUMBER: PROJECT ANA GARRISOM KUNDUZ 671/ 06
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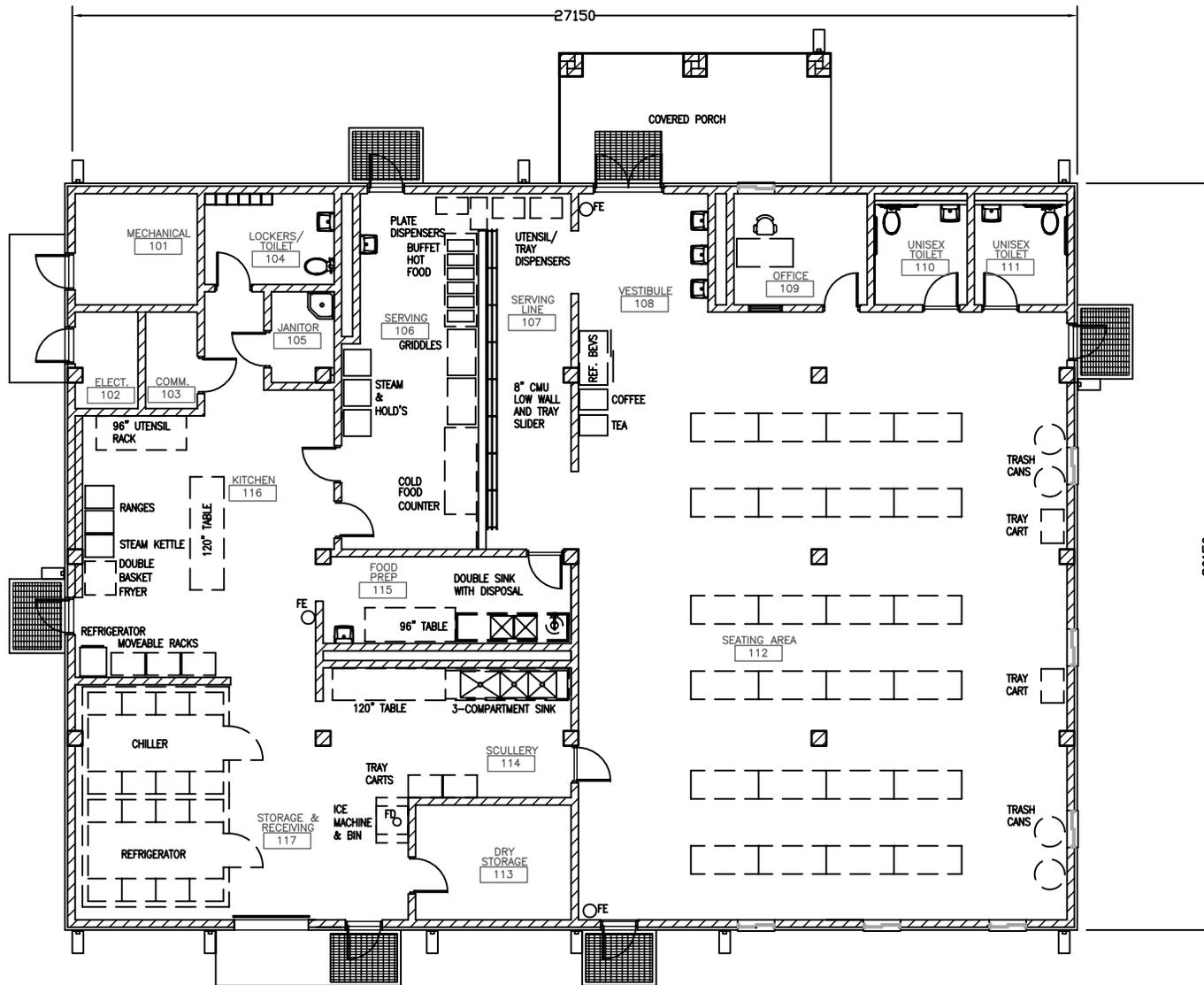
Drawing #:
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The table below shows the coordinate of points of reference

Point of reference	Latitude N	Longitude E	MGRS	
			Easting	Northing
BM	36° 39' 18.0"	068° 55' 19.3"	42S VT93030	56603
SP	36° 39' 05.1"	068° 55' 13.6"	92890	56207
TP1	36° 38' 41.3"	068° 56' 05.2"	94170	55474
TP2	36° 38' 17.7"	068° 55' 43.7"	93634	54746
TP3	36° 38' 41.1"	068° 54' 52.1"	93634	54746



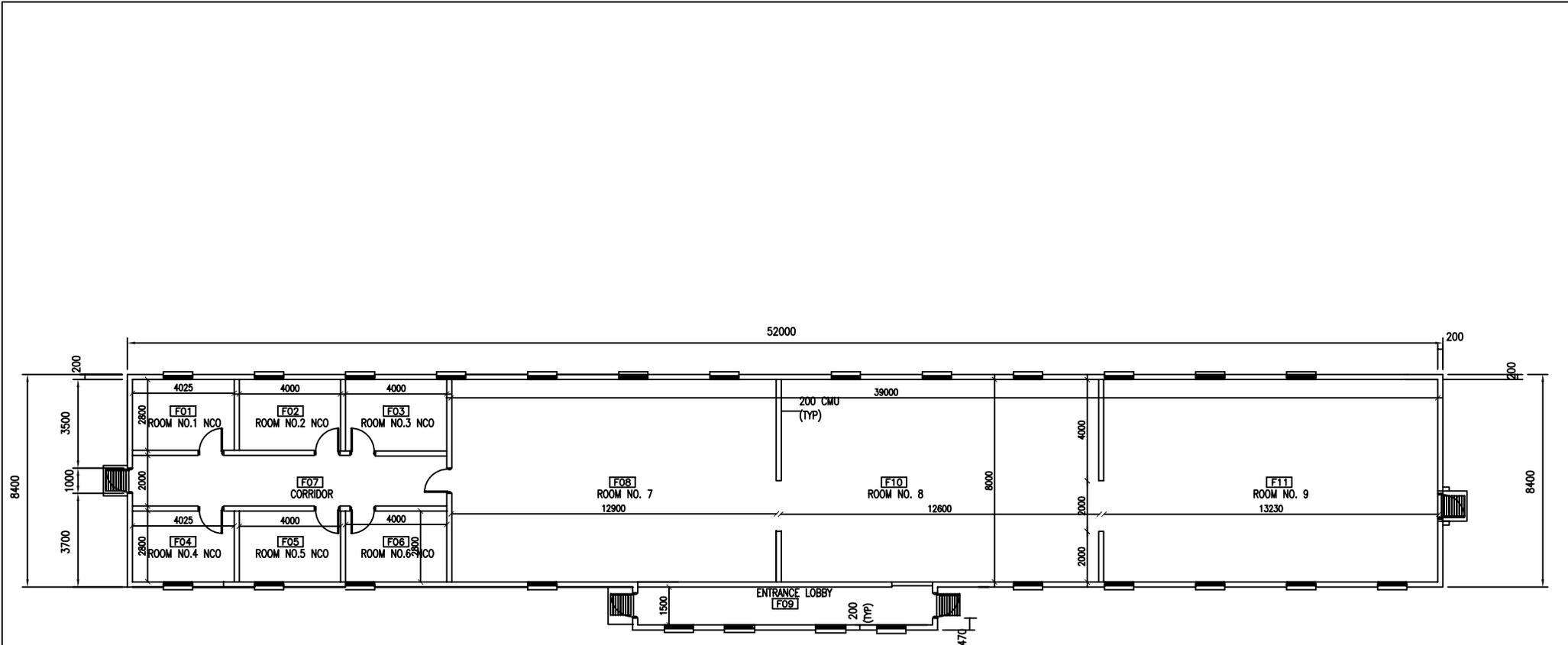


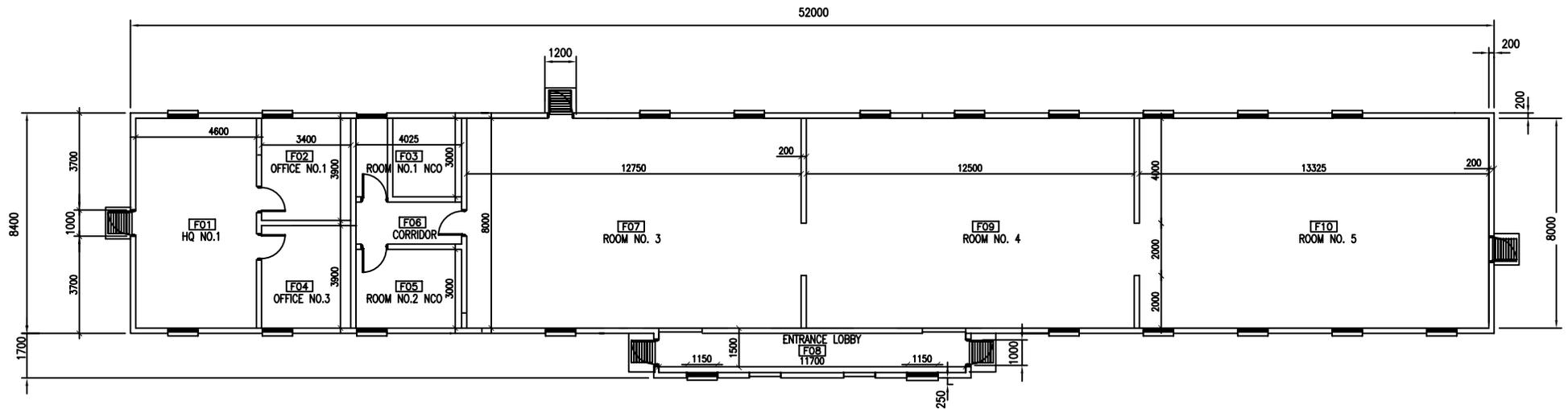


2/209th HQ FACILITIES, ANA KUNDUZ INSTALLATION

APPENDIX D

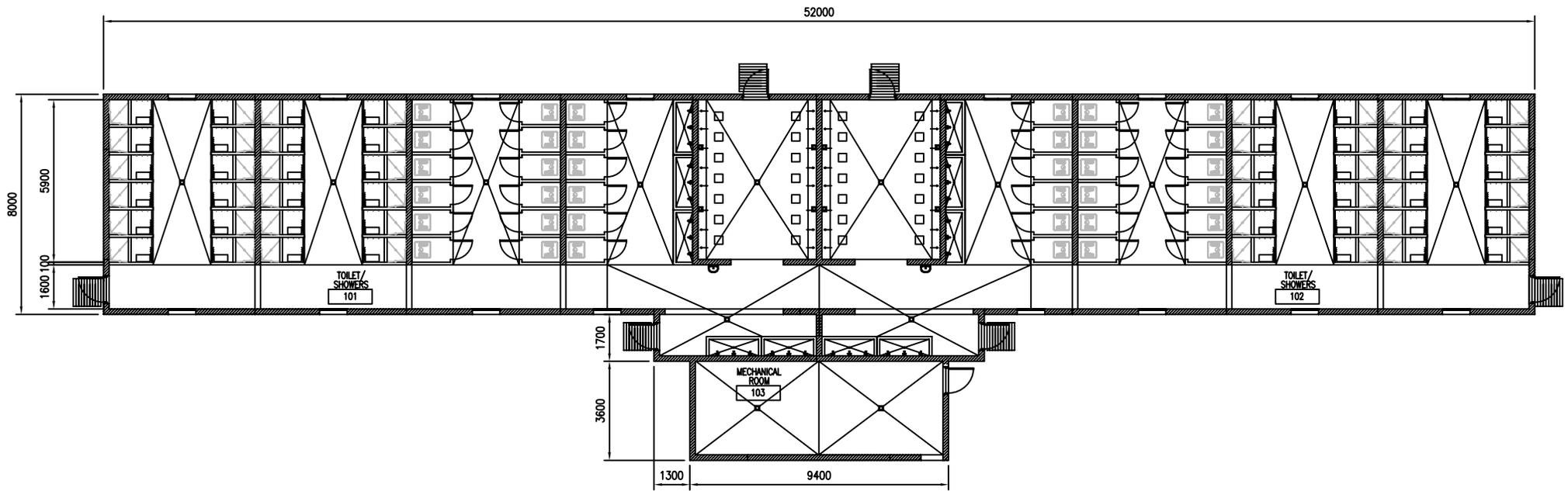






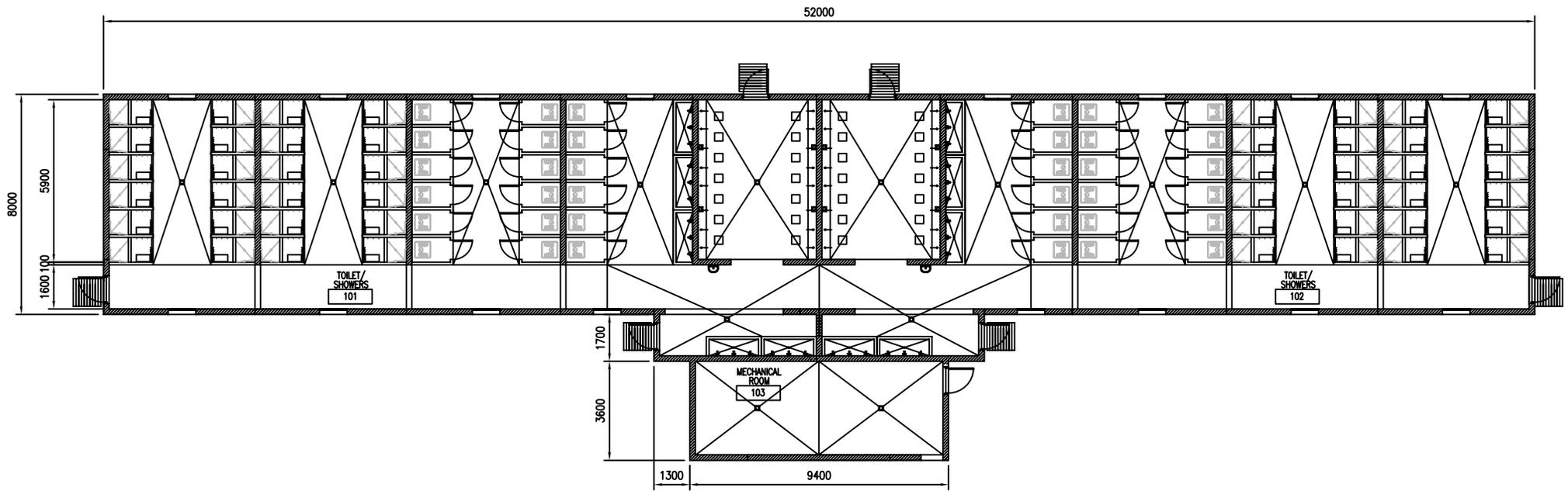
**2/209th HQ FACILITIES, ANA KUNDUZ INSTALLATION**

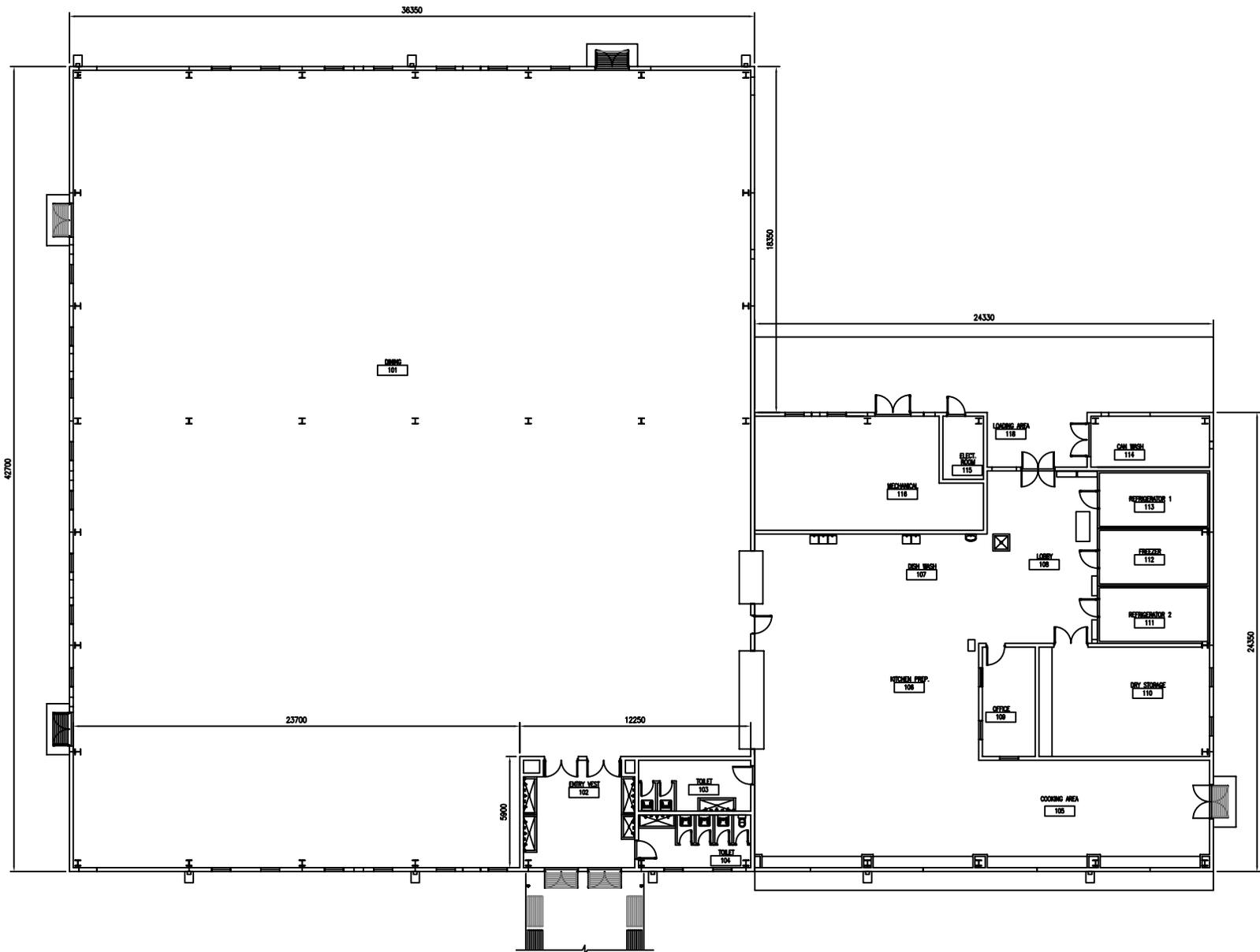
**APPENDIX H**



2/209th HQ FACILITIES, ANA KUNDUZ INSTALLATION

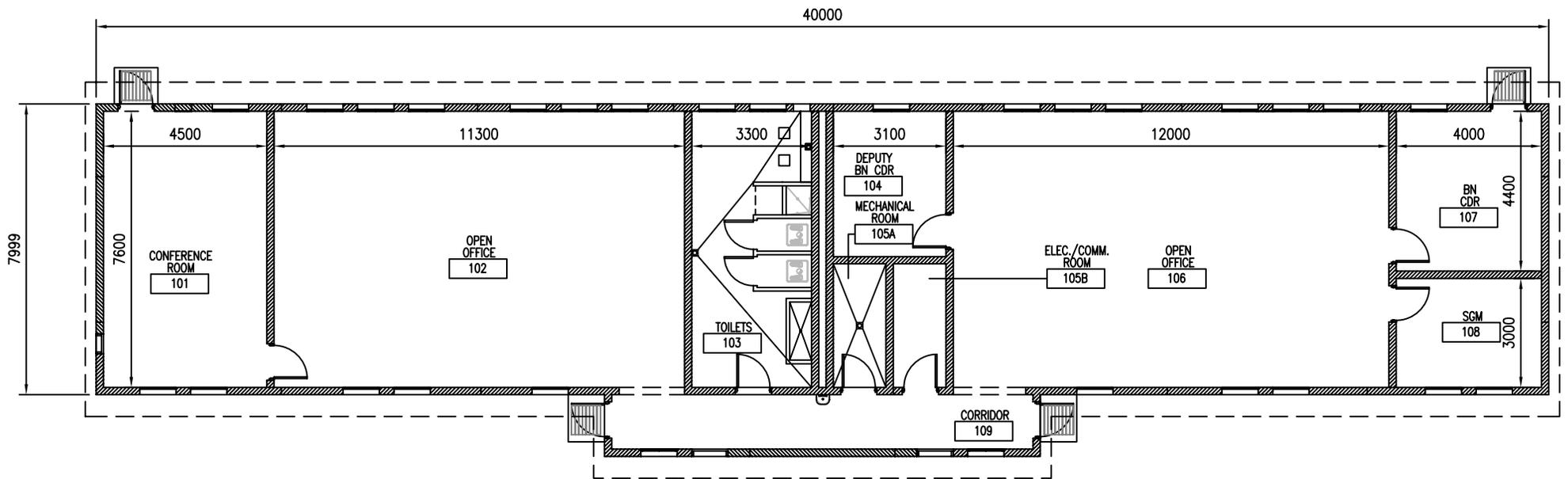
APPENDIX I





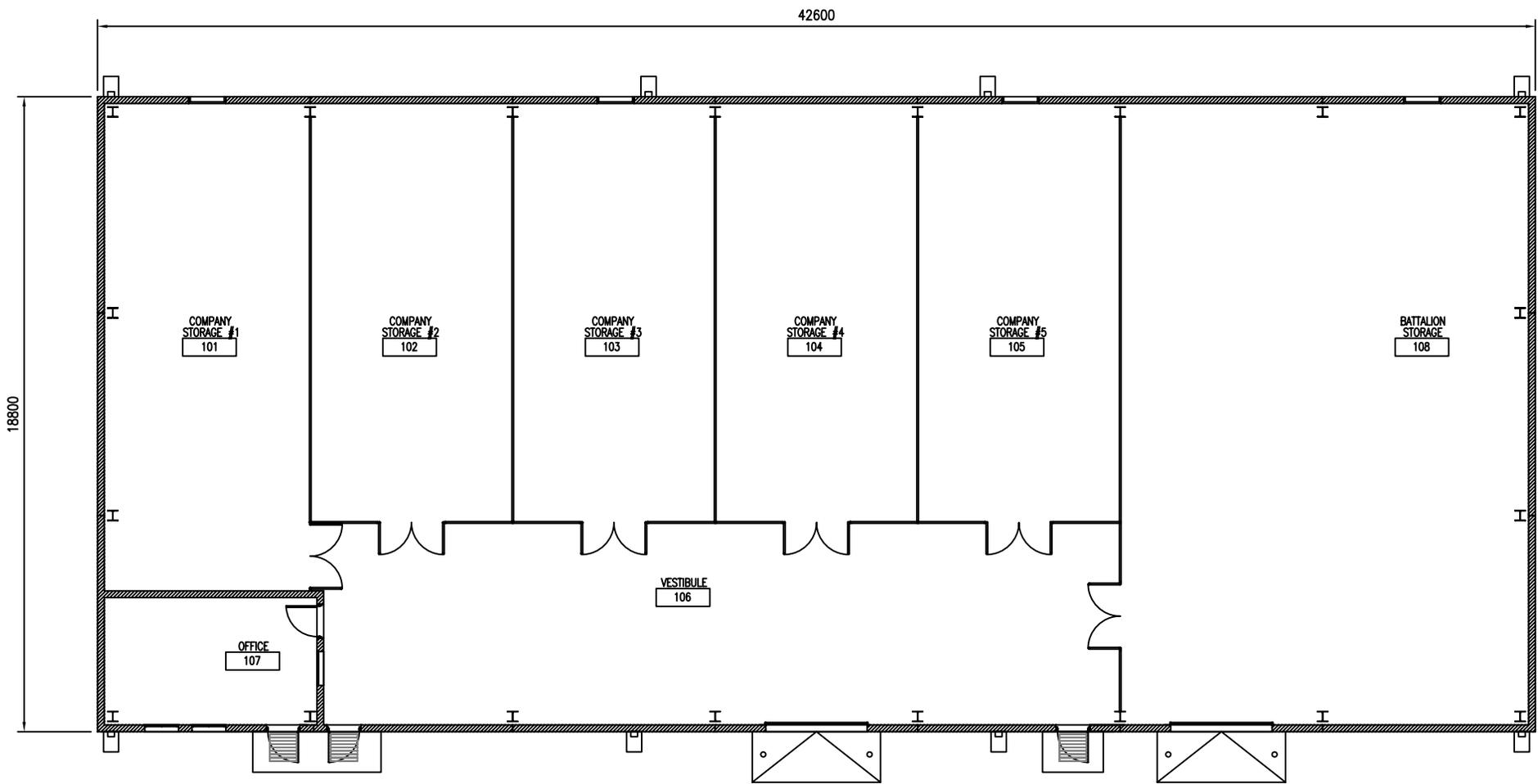
**2/209th HQ FACILITIES, ANA KUNDUZ INSTALLATION**

**APPENDIX J**



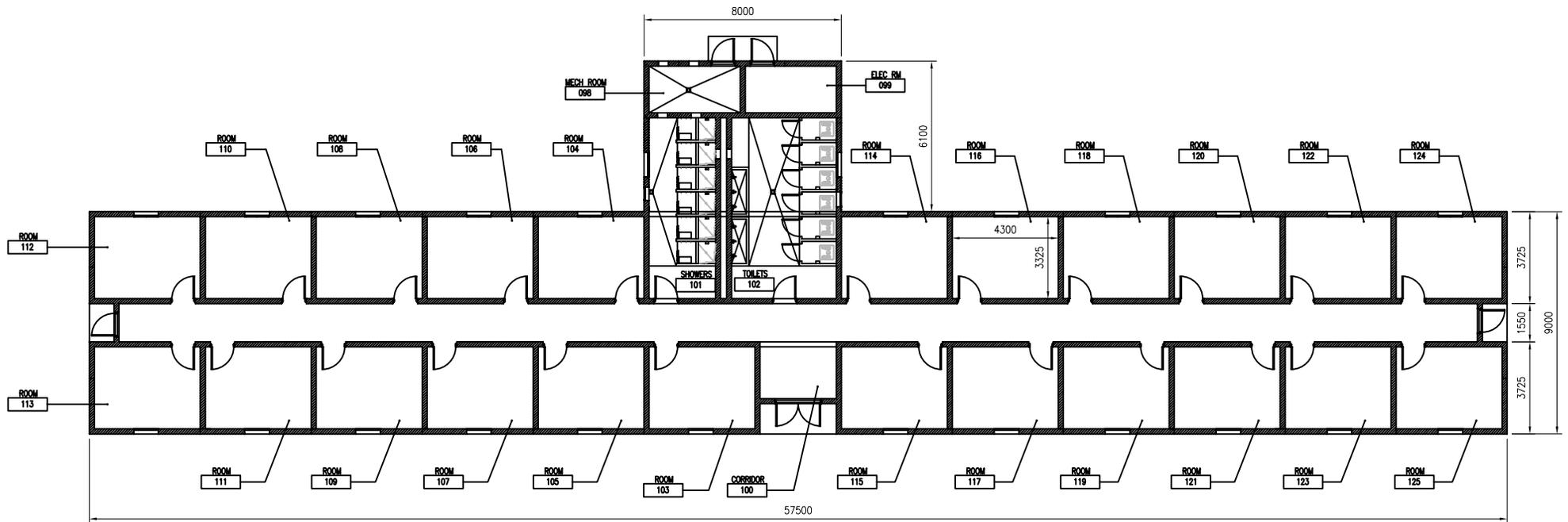
2/209th HQ FACILITIES, ANA KUNDUZ INSTALLATION

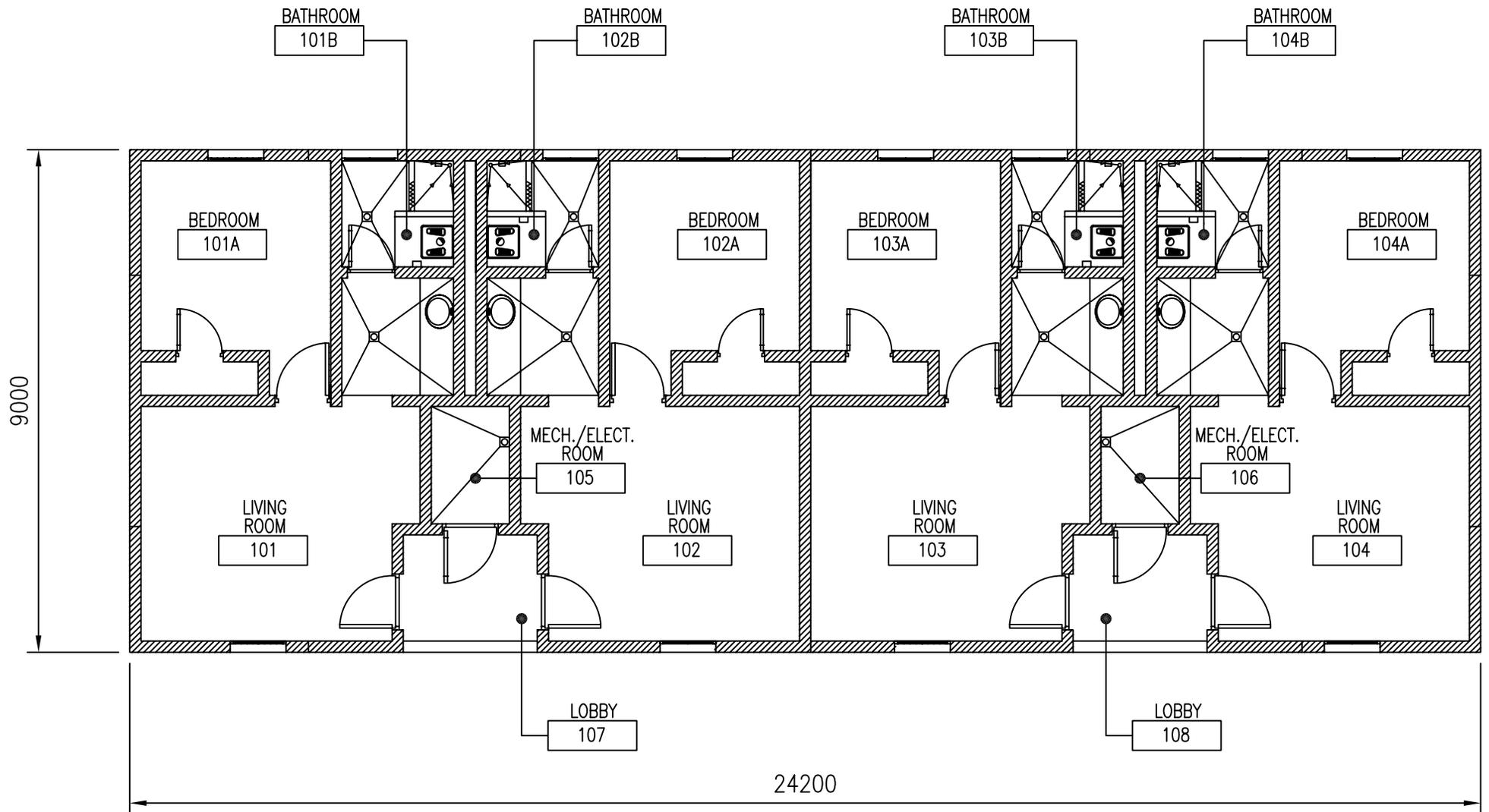
APPENDIX K



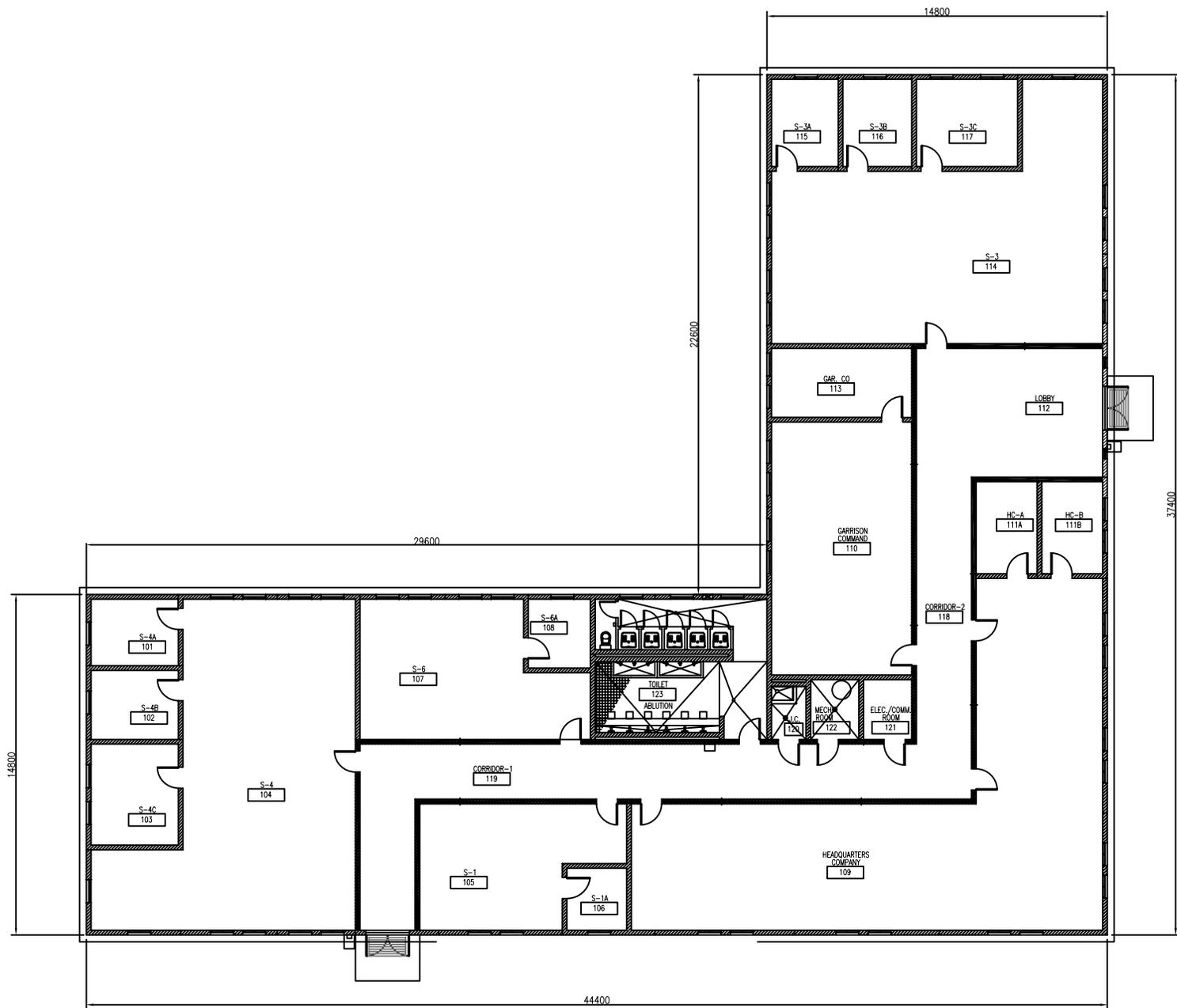
2/209th HQ FACILITIES, ANA KUNDUZ INSTALLATION

APPENDIX L



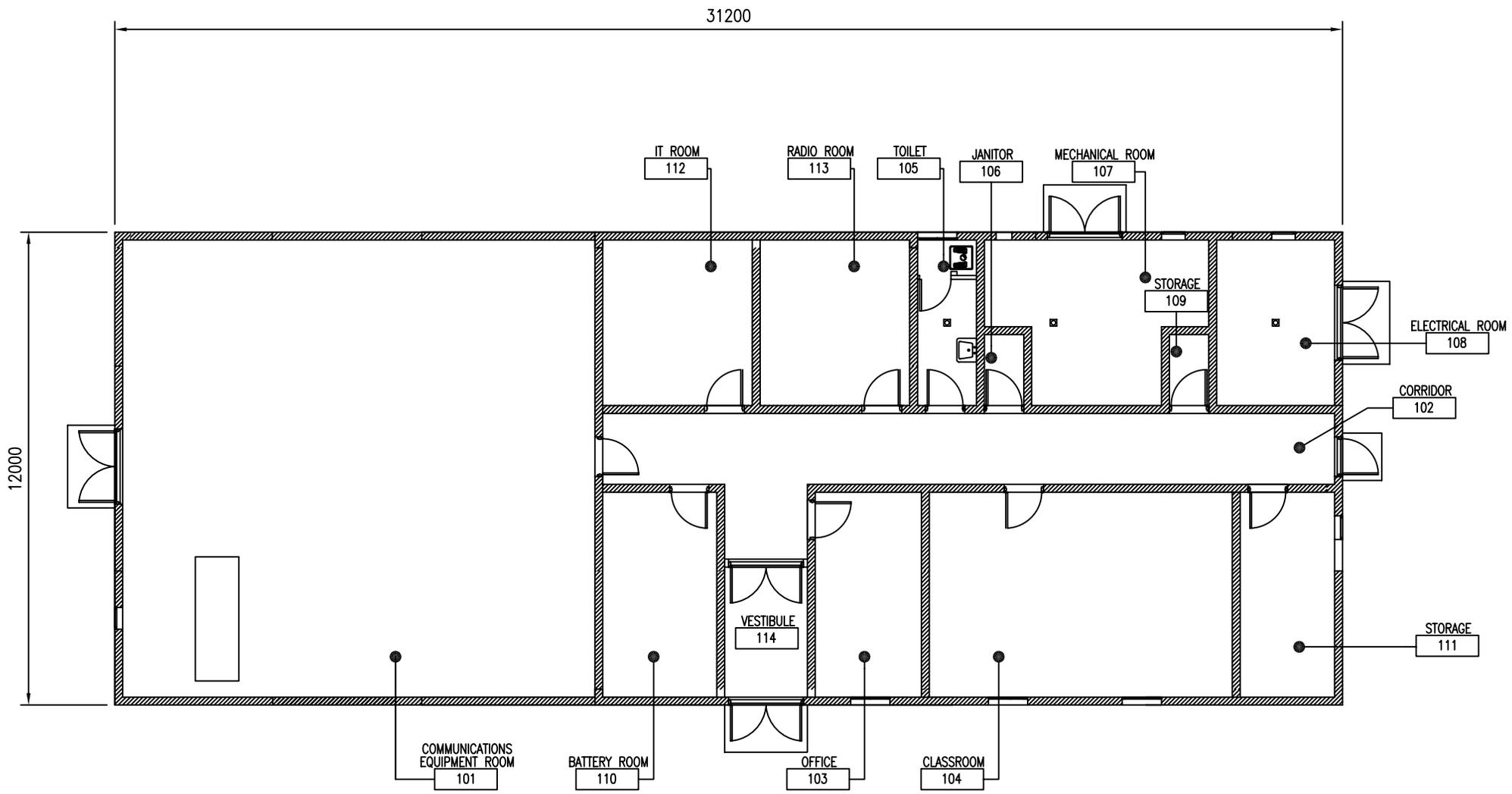


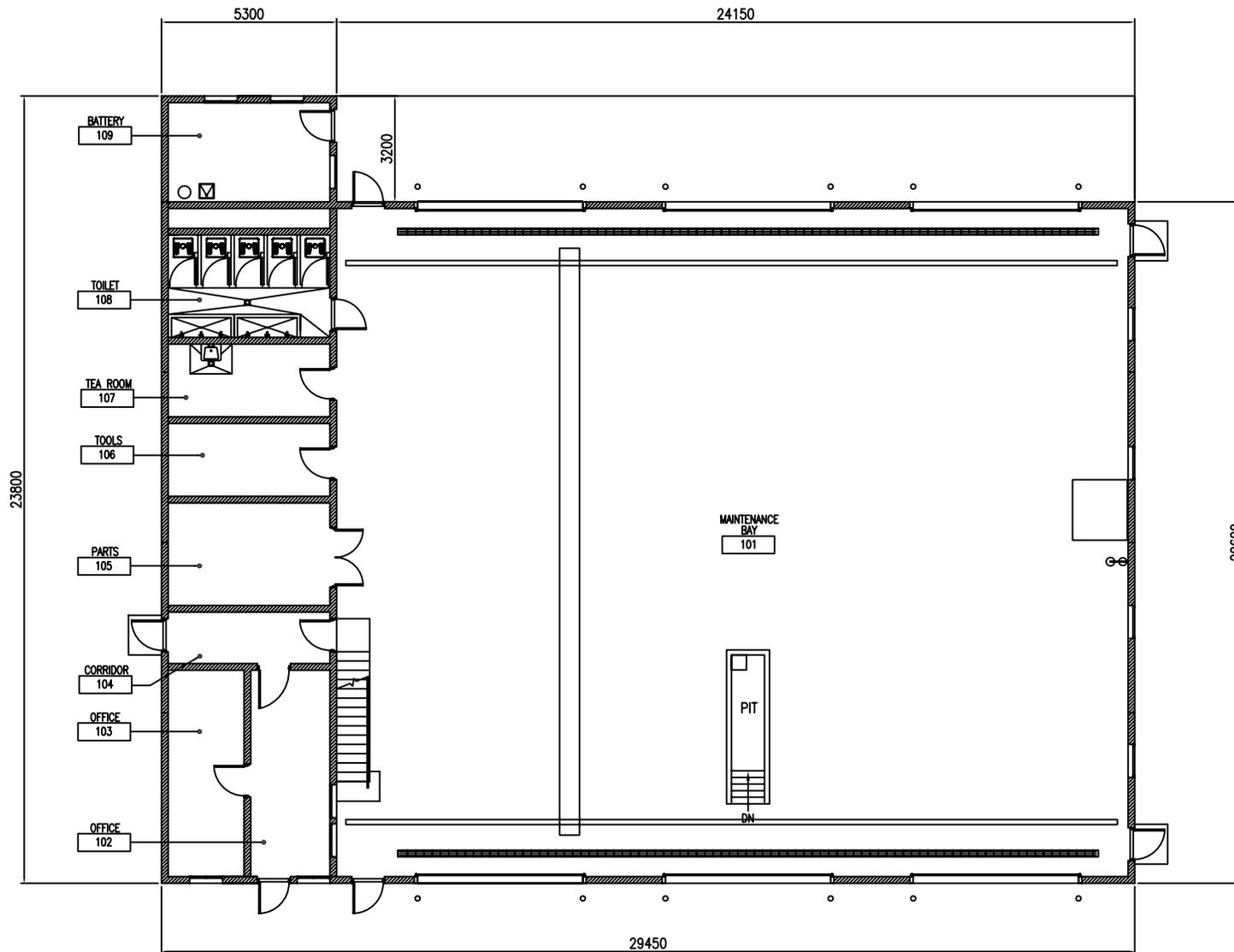




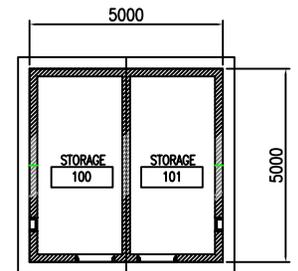
2/209th HQ FACILITIES, ANA KUNDUZ INSTALLATION

APPENDIX P

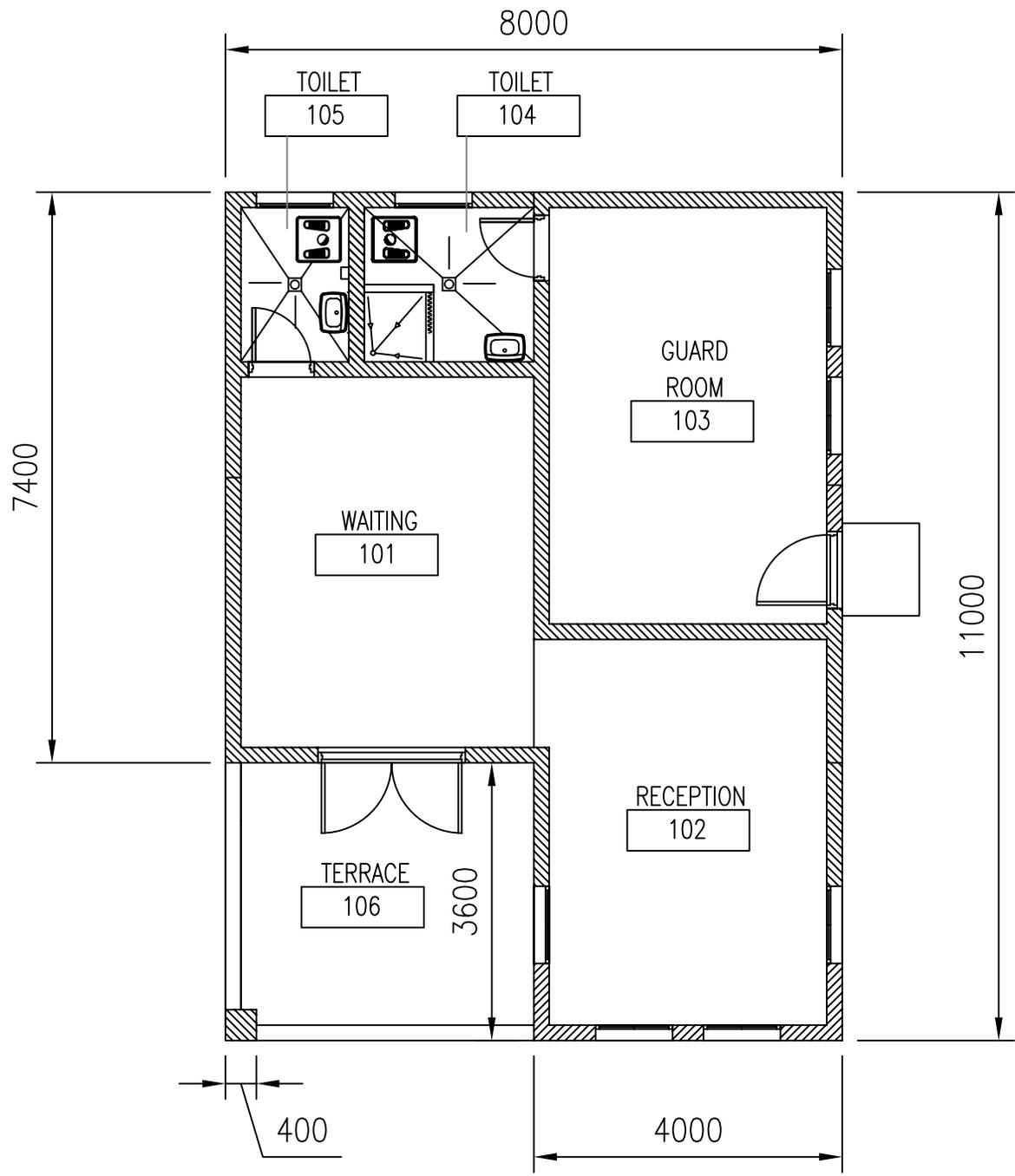


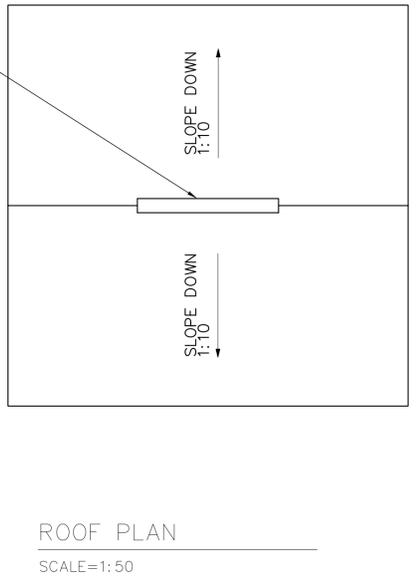
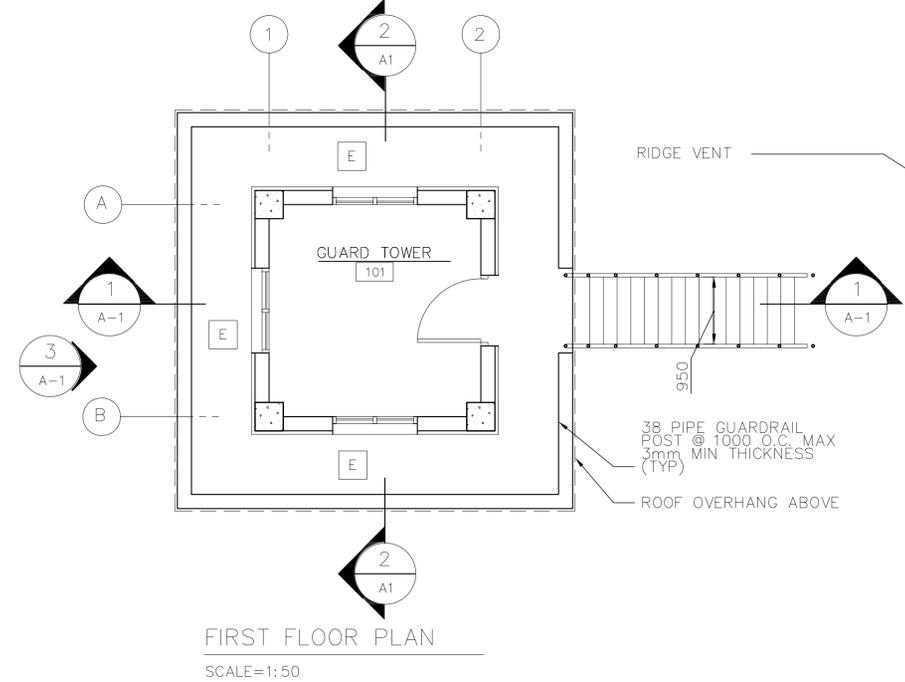
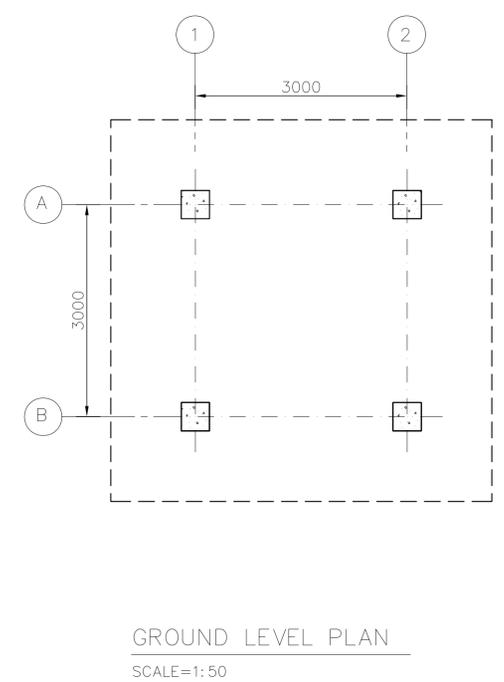
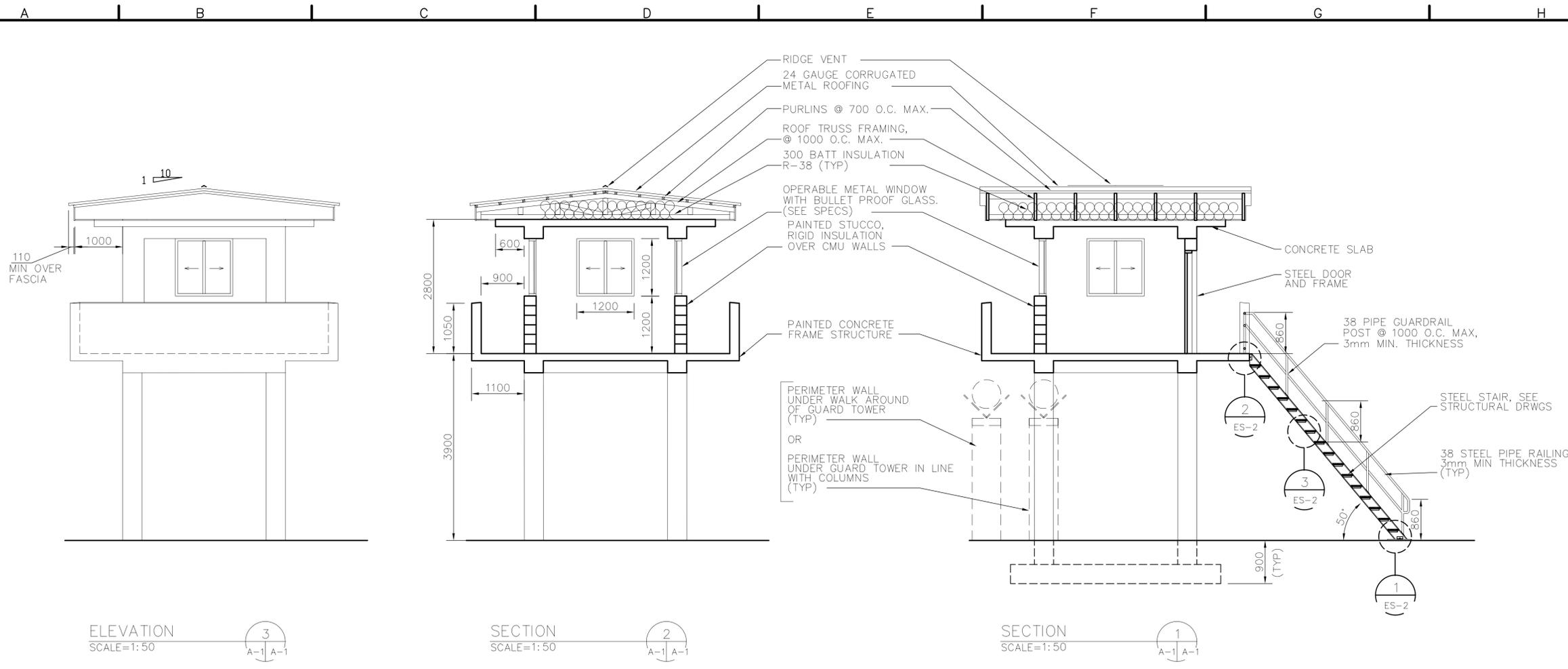


3 BAY MAINTENANCE GARAGE



POL





NOTE:  
 1. Provide window units meeting UL 752, level 5, but no less than 16 mm laminated single glazed. This standard shall apply to all window units within guard shack, guard house, guard tower, and guard rooms in Headquarters Building.

AFGHAN NATIONAL POLICE COMPANY COMPOUND VARIOUS, AFGHANISTAN		DESIGNED BY: DATE: 01-25-07	REVISIONS
GUARD TOWER		SUBMITTED BY: PHILIP L. DANIELLO	03/04/2007
FLOOR PLAN, SECTION ELEVATION AND ROOF PLAN		CHK BY: HMH	SYMBOL
SHEET REFERENCE NUMBER: E-1		FILE NO: AF0609 E-AR01P	DATE
US Army Corps of Engineers Transatlantic Programs Center		DESCRIPTION	DATE

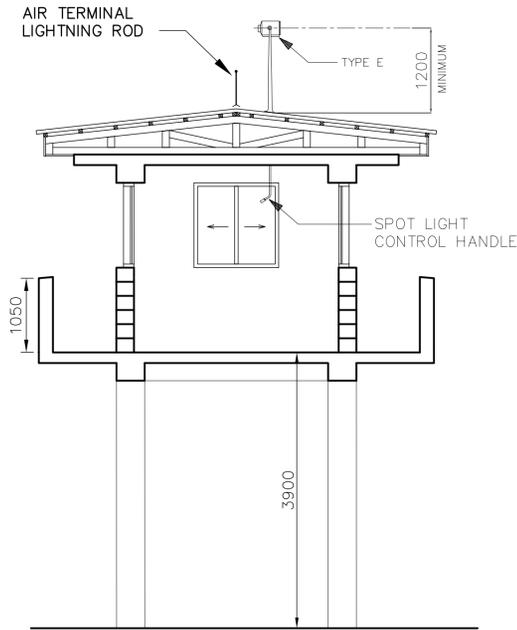
UNLESS OTHERWISE NOTED, LINEAR DIMENSIONS SHOWN ARE IN MILLIMETERS.





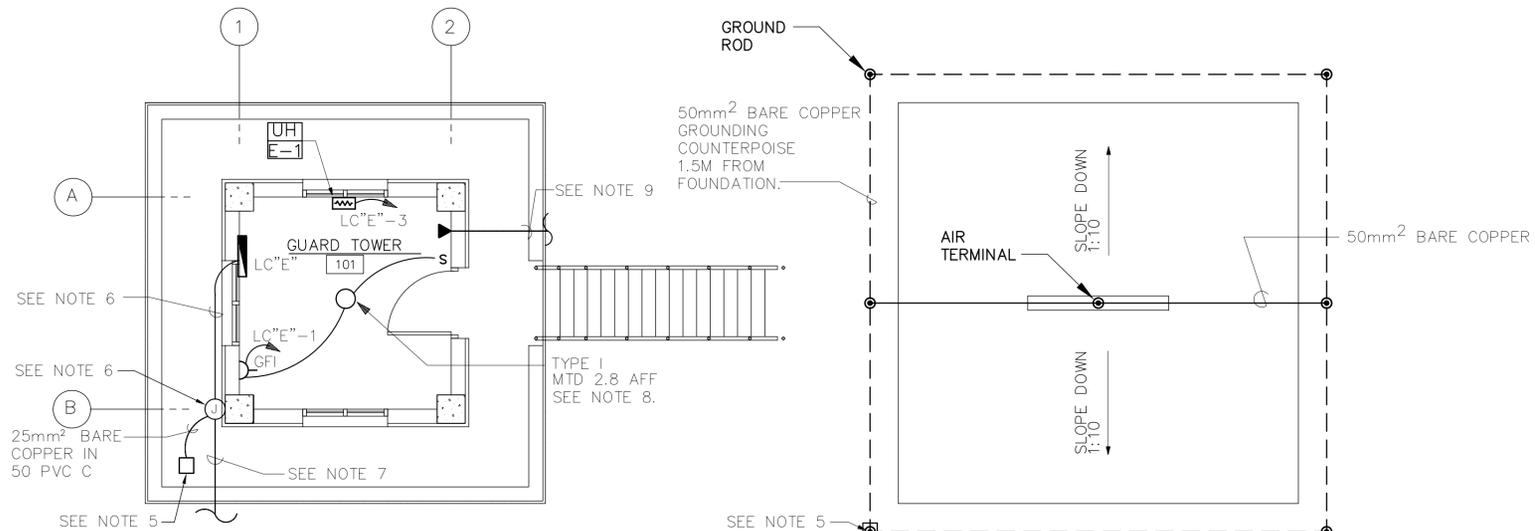






**SPOTLIGHT MOUNTING DETAIL**

NOT TO SCALE



**LIGHTING & POWER**

NOT TO SCALE

**GROUNDING SYSTEM**

NOT TO SCALE

**NOTES:**

- FOR LEGEND, ABBREVIATIONS AND LIGHT FIXTURE SCHEDULE SEE DRAWING SE-1.
- COORDINATE LOCATION OF ALL ELECTRICAL DEVICES AND EQUIPMENT WITH ALL OTHER TRADES.
- ALL WIRING SHALL BE IN CONCEALED OR SURFACE MOUNTED METAL CONDUIT.
- PLAN IS TYPICAL FOR ALL GUARD TOWERS 1-4. GUARD TOWERS #1, 3, & 4 ARE POWERED FROM PPSB. GUARD TOWER #2 IS POWERED FROM THE GUARD HOUSE PANEL LC"D", SEE GUARD HOUSE PANEL SCHEDULE DRAWING E-1.
- FOR GROUNDING ROD ACCESS BOX DETAIL SEE SHEET SE-3.
- PROVIDE 50 METAL C WITH TWO 16mm<sup>2</sup> COPPER CONDUCTORS AND 16mm<sup>2</sup> COPPER GROUNDING CONDUCTOR TO JUNCTION BOX. FOR JUNCTION BOX DETAIL SEE SHEET SE-5.
- FOR CONTINUATION TO SECONDARY DISTRIBUTION SYSTEM SEE DRAWINGS XE-1 AND XE-2.
- PROVIDE A MANUFACTURER SUPPLIED RED, BLUE, AND BLACK LIGHT FIXTURE GLOBE.
- PROVIDE SCH 80 PVC 25mm C STUBBED OUT 1.5M BEYOND GUARD TOWER FOUNDATION AND 600 BFG TO BE TIED INTO SITE COMM CH AND DIRECT BURIED DUCT SYSTEM.

LOAD CENTER "E" GUARD TOWER #1, 2, 3, & 4

40 AMP MAIN CIRCUIT BREAKER, 220V, 1 PH, 2W, 50 HZ, 100A BUS, 10000 AIC

CKT. NO.	TRIP AMPS	NO. POLES	WIRE MM <sup>2</sup>	GND <sup>2</sup> MM <sup>2</sup>	CONDUIT MM	LOAD SERVED	LOAD-V.A.
1	20	1	4	4	20	LIGHTING & RECEPTACLES	280
2	20	1	4	4	20	SPOT LIGHT, 1000W	1000
3	25	1	6	6	20	ELECT.HEAT GUARD SHACK#2	4000
4	20	1				SPARE	500
5	20	1				SPARE	500
6						SPACE	
7						SPACE	
8						SPACE	
TOTAL CONN. LOAD							6280

TOTAL CONN. LOAD 6.3 KVA.  
80 %DEMAND = EST. DEMAND LOAD: 5.0 SERVED FROM: PPSB

UNLESS OTHERWISE NOTED, LINEAR DIMENSIONS SHOWN ARE IN MILLIMETERS.



REVISIONS	DATE	APP
03/04/2007		

DESIGNED BY: DLF	DATE: 01-25-07
OWN BY: FHG	SUBMITTED BY: MICHAEL HOWELL
CHK BY: RMS/DK	CHECKED: BDT
	FILE NO.: AF0609 E-EL01PN

US Army Corps of Engineers  
 Transatlantic Programs Center

AFGHAN NATIONAL POLICE  
 COMPANY COMPOUND  
 VARIOUS, AFGHANISTAN  
 GUARD TOWER  
 LIGHTING & POWER PLAN

SHEET REFERENCE NUMBER:  
**E-1**

