PROPOSED SCHEMATIC DESIGN

STRAFFORD COUNTY NURSING HOME, DOVER, NEW HAMPSHIRE

NOVEMBER 15, 2023

Warrenstreet

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November 15, 2023

Mr. George Maglaris, Chair
Strafford County Commissioners
259 County Farm Rd
Dover, NH 03820

RE: Proposed Strafford County Nursing Home - Schematic Design Presentation

Dear George,

Considerable effort has gone into verifying and developing the design for the new Riverside Rest Home. This project will be a centerpiece for the Strafford County Elderly Community. It incorporates state-of-the-art 'green' technologies including solar, geothermal and carbon neutral building materials. The floor plan focuses on staffing efficiency, and strives to deliver a warm, comfortable inviting environment for the residents. The Schematic Design Presentation is attached. In summary, please note the following:

1. The programming for all uses has been confirmed and the proposed facility is 310,889 square feet, with 268 Parking spaces, garage space for the (3) vans, with an onsite Generator.
2. The building is proposed to be (6) six stories/ 70 feet in height. (14) Fourteen feet floor to floor.
3. The building is being designed to 2021 IBC Building Code, 2018 NFPA Life Safety code, and 2022 FGI Healthcare Guidelines, the building use group is 'I-2' and the construction type is '2B' construction.
4. The planned facility has (235) single-bed resident rooms, support (215) licensed beds and the potential for a Rehab Suite.
5. The first floor relocates the "Children in Motion Daycare" supporting 57 children.
6. The facility supports an approximate 45,000 square foot roof top solar array.
7. Geothermal heating and cooling is the preferred Mechanical System subject to further design considerations.
8. The availability of Natural Gas, Water and Sewer have been confirmed and are available on site.
9. Construction Cost is projected at $150M, the opinion of probable Project cost is $172.6M.

The next steps and schedule are:

1. Approve the Civil Engineer to fast track the Site Design to get the project into the AoT State Permitting que, the desire is to start site construction in July 2024 required to meet the spending deadline of December 2025.
2. Approve the Project's Funding by end of this year 2023.
3. Interview and select the Construction Manager early 2024.
4. The building design will be completed in the late fall of 2024, with a GMP by December 2024.
5. Construction is expected to be complete by July 2027.

We look forward to questions and comments and advancing the design to completion.

Respectfully,
Warrenstreet Architects, Inc

Jonathan Halle, AIA, ASLA
Managing Member/ Principal
Architect & landscape Architect

Encl.

PROPOSED STRAFFORD COUNTY RIVERSIDE NURSING HOME, DOVER, NH

SPATIAL NEEDS & PROGRAM	Number Spaces	Area (sq.ft.)	Net Area Subtotal	REVISED 11/07/2023
LICENSED BEDS		215		Current NH DHHS License - Reviewed under 2022 FGI Guidelines
BEDS PROPOSED		234		Accomodates potential interaction and overnight for hospice families, disruptions with deaths, resident moves, potential rehab unit, and negative pressure room on each floor.

1 - FIRST FLOOR PROGRAM

Main Street

DEE BROWNE, ASST DIRECTOR

#		ROOM NAME	# RMS	SIZE	NET	NOTES
M1		VESTIBULE/ LOBBY	1	800	800	Double auto sliding doors, Air Lock, Reception Desk, Security Monitors, Panic, adjacent closet for Donations, Adjacent room for Package delivery
M2		WAITING	1	144	144	Seating for 20p, Historical Interpretive display of County Farm
M3		LIVING ROOM/GREAT ROOM	1	960	960	Seating for 50p
M4		GIFT SHOP	1	288	288	Volunteer run
M5		GIFT SHOP DISPLAY SPACE	1	200	200	To include cooler for flowers
M6		GIFT SHOP STORAGE ROOM	1	120	120	16' running shelf space
M7		GIFT SHOP CAFE	1	400	400	Self serve Coffee, tea, cold beverages, cookie, muffins
M8		CHAPEL/MEDITATION ROOM	1	900	900	Non-denominational, Seating for 80p, stain glass
M9		NOT USED	0	0	0	Activities Main Room, Counters with sinks, To have piano
M10		MULTIPURPOSE ROOM	1	900	900	To be used for Special Memorials, Events, Holidays
M11		THEATER	1	600	600	Seating for 50p
M12		NOT USED	0	0	0	
M13		NOT USED	0	0	0	
M14		LIBRARY	1	256	256	Seating for 16p
M15		FAMILY ROOM	1	210	210	Tables and chairs for 12p
M16		BOUTIQUE / CLOTHING SHOP	1	240	240	Used clothing, blankets
M17		CLOTHING STORAGE / WORK ROOM	1	120	120	16; running shelf space
M18		ATRIUM	1	5000	5,000	Biophilic Gardens
M19		POST OFFICE/ MAIL COPY	1	140	140	Two sided for Residents and Staff
M20		NOT USED	0	0	0	
M21		NOT USED	0	0	0	
M22		FAMILY DINING ROOM/CONFERENCE	1	320	320	
M23		FAMILY ROOM STORAGE	1	100	100	8' running shelving
M24		GERIATRIC SPECIALITY SHOP	1	100	100	should be near PO and Boutique
M25		PUBLIC TOILETS (M&W)	2	70	140	
M26-27-28-29		NOT USED	0	0	0	
M30		NOT USED	0	0	0	
M31		NOT USED	0	0	0	
M32		NOT USED	0	0	0	
M33		NOT USED	0	0	0	
M34		NOT USED	0	0	0	
M35		NOT USED	0	0	0	
M36		NOT USED	0	0	0	
		SMOKING ROOM AT REAR OF BUILDING				
M37		SMOKING ROOM (First Floor Rear)	1	200	200	Accesible without going through any unit
M38		PUBLIC TOILET	1	70	70	adjacent to smoking room
ST8		TIME CLOCK AND EMPLOYEE POSTINGS	2	50	100	
		MAIN STREET SUBTOTAL	**40**		**12,308**	

Garage

DEE BROWNE, ASST DIRECTOR

G1	CO7	GARAGE	3	360	1,080	Storage for 3 Vans, golf carts, Hot Box, Smoking Room, 16x12 mowing equipment storage, FIRESAFE cabinet for Gas, Greese Holding tank 6x6x5. No Lawn irrigation.
G2		EQUIPMENT ROOM	1	144	144	
G3		STORAGE	1	144	144	
F14		HOT BOX	1	100	100	
G5		SMOKING ROOM	1	144	144	
G6		TOILET	1	70	70	
		GARAGE SUBTOTAL	**8**		**1,682**	

1ST FL BEHAVIORAL - 42 BEDS

JENNIFER EMERTON, DIRECTOR OF NURISNG SERVICES

Common Areas						
C1		LIBRARY/FAMILY CONFERENCE	1	120	120	The desire is to have (2) suites of no more than 24 residents. Split Nurse station so the nurses can see both wings. No Bariatric Rooms. Residents to Have Wonderguard. (1) stand/lift machine and (1) Hoyer Lift each floor.
C2		FAMILY ROOM	1	120	120	
C3		NOT USED	0	0	0	
C4		GREAT ROOM	1	400	400	
C5		SUN ROOM	1	160	160	
C6		RESIDENT LOUNGE /LIVING ROOM	1	140	140	
C7		TOILET (PUBLIC)	3	70	210	
C8		QUIET ROOM	1	120	120	
		COMMON AREAS SUBTOTAL			**1,270**	**All areas to be complete Anti-Ligature.**
Dietary Department						
D1		DINING ROOM	1	800	800	
D2		SERVERY/ FOOD PREP	1	450	450	
D3		CAFE	2	12	24	Near Nurse Station
D4		STORAGE	1	160	160	

		DIETARY DEPARTMENT SUBTOTAL			**1,434**	**All areas to be complete Anti-Ligature.**
Staff Work Areas						
S1	N20	NURSE STATION (sub nurse in rec rm)	1	300	300	
S2	N19	UNIT MEDICATION ROOM	1	100	100	
S3	N5	NURSING SUPERVISOR OFFICE	1	100	100	
S4		WORK ROOM	1	160	160	
S5	ES10	CLEAN WORKROOM OR CLEAN SUPPLY RM	1	120	120	
S6	ES11	SOILED WORKROOM OR SOILED HOLDING RM	1	120	120	
S7		COPIER AREA	1	80	80	
S8		STAFF TOILET	2	64	128	
	SS9	CONSULT ROOM	1	100	100	
		STAFF WORK AREAS SUBTOTAL			**1,208**	**All areas to be complete Anti-Ligature.**
Resident Floor Offices						
RO1		OFFICE 1	1	100	100	
		OTHER OFFICES SUBTOTAL			**100**	**All areas to be complete Anti-Ligature.**
Resident Rooms						
R1		PRIVATE ROOM	42	320	13,440	
R2		PRIVATE TOILET/SHOWER ROOM	42	90	3,780	
R3		BATHING ROOM W/BATH	1	320	320	
		RESIDENT ROOMS SUBTOTAL			**17,540**	**All areas to be complete Anti-Ligature.**
Staff / Service / Support Areas						
S9		STAFF LOCKERS	2	60	120	
S10		SUPPLY	4	64	256	
S11		JANITOR	2	64	128	with floor sink/ bed pan flush
S12		STORAGE	2	120	240	
PP27		O2 BOTTLE STORAGE ON EACH FLOOR	1	25	25	
PP28		MINI BULK STORAGE ON EACH FLOOR	1	120	120	
		STAFF SUPPORT SUBTOTAL			**889**	**All areas to be complete Anti-Ligature.**
Service/ Support Areas						
	ES12	CLEAN LINEN STORAGE	1	120	120	
	ES13	STORAGE FOR EQUIPMENT & SUPPLIES FOR CARE AND SERVICES	1	120	120	
S13	ES15	ENVIRONMENTAL SERVICES ROOM/ RED BAG	1	25	25	Secured
S14		HANDWASHING ALCOVE	4	12	48	
S15		LINEN CART STORAGE	4	12	48	(6) 3x4 Carts
S16		CHARTING ALCOVE	4	12	48	
S17	ES14	WHEELCHAIR STORAGE ALCOVE	2	24	48	
S18		HOUSEKEEPING/ CLEAN LINEN	1	120	120	
S19		O2 STORAGE	1	64	64	
S20		TEL/DATA CLOSET	2	64	128	
S21		MECHANICAL ROOM	2	64	128	
S22		ELECTRICAL CLOSET	2	64	128	
L14		TRASH ROOM	1	70	70	
L15		HOUSEKEEPING SUPPLIES	1	140	140	
		SERVICE/SUPPORT SUBTOTAL			**1,235**	**All areas to be complete Anti-Ligature.**

Childrens Daycare

MARCY , DIRECTOR CHILDREN IN MOTION, INC (TOTAL 56 CHILDREN)

DC1		ENTRANCE VESTIBULE	1	120	120	Secured Entry, buzzer at admin desk, security window
DC2		CLASSROOM #1 WITH TOILET/SINK	1	400	400	Infant (4) 3mo-2yr
DC3		CLASSROOM #2 WITH TOILET/SINK	1	400	400	Preschool (5) 2yr-3yr
DC4		CLASSROOM #3 WITH TOILET/SINK	1	400	400	Preschool (11) 3yr-4yr
DC5		CLASSROOM #4 WITH TOILET/SINK	1	650	650	Pre-k (16) 4yr-5yr
DC6		CLASSROOM #5 WITH TOILET/SINK	1	800	800	Kindergarden (21) 5yr-6yr
DC7		ADMINISTRATION	1	200	200	
DC8		DIRECTORS OFFICE	1	120	120	1 desk and credenza, table 4 chairs
DV9		CONFERENCE ROOM	1	120	120	
DC10		KITCHEN	1	160	160	Prep Kitchen, warming cabinets, counter with sink, 2 refrig,1 freezer
DC11		STAFF LOUNGE	1	180	180	counter sink, refrig, micorwave, seating for 8p
DC12		STAFF TOILET	1	70	70	Unisex
DC13		JANITOR	1	70	70	floor sink
DC14		STORAGE ROOM	1	100	100	10' running shelving
DC15		NURSING ROOM	2	40	80	1 chair and cot
DC16		PUBLIC TOILET	1	80	80	Unisex
K12		MOTHERS ROOM	1	80	80	
		DAYCARE SUBTOTAL			**4,030**	

OUTDOOR AREAS

DEE BROWNE, ASST DIRECTOR

CO1		CHILDRENS PLAYGROUND	1		0	Area Dictated by # Children, 6' fence
CO2		REFLECTION COURTYARD	1		0	Pathway and Seating, Reflection Pond firepit, 4' fence, dog areas
CO3		SECURED MEMORY COURTYARD	1		0	60% Hard Surface, 40% grass with Partial Roof, 9' fence with curved top
CO4		RECREATION COURTYARD	1		0	Mini-Golf, Shuffle Board, Seating, 4' fence
CO5		GARDEN COURTYARD	1		0	Raised Beds, Fruit Trees, Seating, 4' fence
CO6		AMBULANCE ENTRANCE/ EXIT	1		0	Discreet Movement
		GENERATORS				Whole House natural gas with diesel backup (3) day supply.
		OUTDOOR COURTYARD SUBTOTAL			**0**	Want 6' stone dust walking path around facility, horeshoes, cabana
		FORST FLOOR PROGRAM (NET AREA)			**44,437**	

LL - LOWER LEVEL PROGRAM

Facilites

DOUG KANE, MAINTENANCE DIRECTOR

F1		MAINTENANCE SHOP	1	600	600	keys relocated from HR Office, 12' bench with vice and sink. Worktables in center of room. Currently desk for assistant. Handwashing Sink. Exhaust?
F2		MAINTENANCE STORAGE	1	800	800	45 LF running shelving 24" deep

F3		DIRECTOR OFFICE	1	120	120	(2) four drawer file cabinet
F4		ASST OFFICE	1	100	100	FUTURE (currently in Maintenance Shop w/Computer)
F5		STORAGE (CHEMICAL)	1	100	100	
F6		NOT USED	0	0	0	
F7		O2 STORAGE	1	140	140	Manifold for O2 distribution to Resident rooms
F8		WATER TREATMENT ROOM	1	120	120	Water loops to kitchen and bathrooms needs to be separate. Hard water with calcium bromide affects radiant.
F9		ELECTRICAL ROOM	1	400	400	
F11		SPRINKLER ROOM	1	200	200	Fire panel will not be proprietary
F12		HAZARDOUS WASTE DISPOSAL	1	120	120	Lockable
F13		BOILER PLANT	1	2500	2,500	
		FACILITIES SUB TOTAL	**11**		**5,200**	Paging should be integrated with phones. Requires MS4? Sewer permit, riverside is on pump system, requires muffin monster

Environmental Services

KEITH FULLER, ENVIRONMENTAL SERVICES DIRECTOR

L1	ES1	OFFICE	3	120	360	Desk, chair, and (2) chairs, tabletop copier, (2) four drawer file cab each (Two Private Offices)
L2	ES2	CHAIR MAINTENANCE	1	200	200	
L3		STAFF LOCKERS	2	100	200	
L4	ES3	HOUSEKEEPING SUPPLY	1	800	800	
	ES4	RECEIVING, HOLDING & SORTING ROOM	1	200	200	New Laundry Scale to weigh laundry being sent to jail. Space for (14) 3' x 4' carts. (1) Flushing rim sink with hose or bedpan washer. (1) Utility Sink, Waste Bin on Casters
L5	ES5	WASH/ DRY	1	200	200	Handwashing Sink (8) carts, (4) 15 gal chemical drums of laundry soap to rear of washer + (4) extra drums elsewhere in room, (3) comm washers/extractors, (1) Residential Washer, (3) comm dryers, no folder, no ironer, (8) pails chemicals *are these the same as already noted?*
	ES6	FOLDING & INSPECTION	1	200	200	(3) Folding Tables - 5' x 10', Waste Bin on Casters, Space for (6) Racks - 2' x
L6		NOT USED	0	0	0	
L7	ES7	CENTRAL CLEAN LINEN STORAGE	1	600	600	Space for (6) Rolling Hanging Racks 2' x 6', Space for (10) Rolling Shelves 2' x 6', Space for (2) Rolling Underware Carts.
L8	ES8	CENTRAL SUPPLY	1	600	600	Excess linen, custodial supplies, 4' high 50 LF 24" running shelving Space for extra carts, space for extra mattresses on rack, space for extra chair storage, space for mobility devices and personal support equipment storage
L9		NOT USED	0	0	0	
L10		CART STORAGE	1	300	300	(15) 3X4 Carts, (5) Blue underwear,
L11		STAFF TOILET	1	70	70	
L12		NOT USED	0	0	0	
L13		NOT USED	0	0	0	
L14		NOT USED	0	0	0	
L15		NOT USED	0	0	0	
L16		NOT USED	0	0	0	
L17	ES9	SEAMSTRESS ROOM	1	150	150	4X8 Table, desk, 6' running shelving
		HOUSEKEEPING SUBTOTAL	**15**		**3,880**	

Dietary/ Kitchen

KIM PERKINS, DIETARY DIRECTOR

K1		KITCHEN/ PREP	1	2000	2,000	
K2		DIRTY DISHWASH ROOM	1	1500	1,500	
K3		REFRIGERATOR WALKIN	1	1000	1,000	
K4		FREEZER WALKIN	1	800	800	
K5		STAFF LOCKERS	1	70	70	
K6		STAFF TOILETS	4	70	280	
K7		OFFICE	2	120	240	
K8		NIGHT MGR OFFICE	1	80	80	
K9		CONFERENCE ROOM	1	120	120	6P Table and (6) chairs
K10		STAFF SERVERY	1	700	700	
K11		STAFF DINING ROOM	1	1500	1,500	Seating for 80p
K12		MOTHERS ROOM	1	80	80	
		KITCHEN/ SUPPORT SUBTOTAL			**8,370**	

Procurement & Purchasing

CHERYL MOULTON, PURCHASING COORDINATOR/ JODI BROWN

PP1		DIRECTORS OFFICE	1	160	160	Jodi-Desk, Credenza, table (2) chairs, handwashing sink
PP2		CENTRAL SUPPLY OFFICE	1	120	120	In Supply Room, (2) corkboards, (2) white boards, touch-down workspace, handwashing sink
PP3		CHERYL OFFICE	1	160	160	Desk, Credenza, table (2) chairs
PP4		NOT USED	0	0	0	
PP5		COMPACTOR	2	200		Cardboard Breakdown and Trash
PP6		RECEIVING (NEW LOADING DOCKs)	1	600	600	(2) electric pallet jacks, no fork lifts, dock leveler. (2) 8x8 OH doors at truck height,
PP7		STAFF TOILET (Unisex)	1	70	70	
		CENTRAL SUPPLY				(2-sided shelving racks in cage/s)
PP8		CONCENTRATOR ROOM	1	70	70	outlets to test hepa machines and concentrators
PP9		LOCKED MED & OTC ROOM	1	100	100	(3) med supply utiltity carts near Ashley
PP10		INFECTION CONTROL	1	100	100	
PP11		INFECTION CONTROL DIRTY PRECAUTION	1	200	200	
PP12		PBE GOWN STORAGE	1	320	320	
PP13		TUB SUPPLIES	1	320	320	
PP14		PACKAGE DROP OFF AREA CAGE	1	100	100	prep counter with utiltity sink and eye wash
PP15		NIGHT DROPOFF SECURED VESTIBULE	1	80	80	Knox Box
PP16		MATTRESS STORAGE	1	200	200	Racks
PP17		NOT USED	0	0	0	
PP18		GLOVE STORAGE	1	200	200	
PP19		KN95 O2 STORAGE	1	200	200	
PP20		PURCHASE PAPER	1	100	100	

PP21		DEPARTMENT HEAD ORDER STATION	1	100	100	
PP22		COPIER AREA	1	50	50	
PP23		O2 BOTTLE STORAGE	1	100	100	Manifold distribution to Resident Rooms
PP24		ATTENDS STORAGE	1	500	500	
PP25		ATTEND CARTS	1	100	100	(5) Carts go back and forth to the Floors - loaded on same carts as Chucks from Laundry. (20 large (1) small Rubbermaid cart storage.
PP26		MED MASK STORAGE	1	70	70	
		PURCHASING TOTAL	**35**		**4,020**	
		LOWER LEVEL PROGRAM (NET AREA)			**#REF!**	

2 - SECOND FLOOR PROGRAM

Main Street

DEE BROWNE, ASST DIRECTOR

#		ROOM NAME	# RMS	SIZE	NET	NOTES
M8		CHAPEL/MEDITATION ROOM	1	900	900	Non-denominational, Seating for 80p, stain glass
M11		THEATER	1	600	600	Seating for 50p
M14		LIBRARY	1	256	256	Seating for 16p
M16		BOUTIQUE / CLOTHING SHOP	1	240	240	Used clothing, blankets
M17		CLOTHING STORAGE / WORK ROOM	1	120	120	16; running shelf space
M19		POST OFFICE/ MAIL COPY	1	140	140	Two sided for Residents and Staff
M22		FAMILY DINING ROOM/CONFERENCE	1	320	320	Seating for 16p
M23		FAMILY ROOM STORAGE	1	100	100	8' running shelving
M24		GERIATRIC SPECIALITY SHOP	1	100	100	should be near PO and Boutique
M25		PUBLIC TOILETS (M&W)	2	70	140	
		SALON/ BARBER SUITE				
M26		HAIR SALON STATIONS	3	100	300	Two chairs, 1 station for wheelchair, two wash sinks, one HC sink
M27		HAIR SALON WAITING	1	120	120	Seating for 4p
M28		HAIR SALON TOILET (UNISEX)	1	70	70	
M29		HAIR SALON WORK ROOM	1	120	120	Counter with sink
		MAIN STREET SUBTOTAL	**40**		**3,526**	

Volunteers

MARIA AYERS, VOLUNTEER COORDINATOR

AS18		VOLUNTEERS OFFICE	1	120	120	1 FT, 1 PT Shared office for 2. Adjacent to Activities or Main St. Boutique
AS19		AUXILLARY ROOM	1	200	200	(10) regular volunteers & Gardeners
AS20		TOILET	1	70	70	Unisex
AS21		KITCHENETTE	1	80	80	Counter with sink, Microwave and Full size Refrig
AS22		MEETING ROOM	1	126	126	
		ADMINISTRATION/ SUPPORT SUBTOTAL			**596**	Prefer location near Boutique on First Floor

Nursing Supervision & MDS

JENNIFER EMERTON & JENNIFER CORMIER, LINDA LAMBERT, MDS COORDINATOR

N1		DIRECTOR/ ASST OF NURSING (jen and jen)	2	140	280	Both Jens want to be in the same office
N3		ADMINISTRATIVE ASSISTANT (karen-brenda)	1	180	180	(3) cubicles for nursing admin
N4		SCHEDULING OFFICE (son)	1	120	120	
N5		NURSING SUPERVISOR OFFICE	5	120	600	On Resident Floors (does NOT get a cube in Nursing area)
N6		NURSE PRACTITIONER	1	120	120	
N7		BILLING REIMBURSEMENT	1	120	120	
N8		PAYROLL CLERK (FUTURE)	1	100	100	
N9		MDS COORDINATOR	1	120	120	Ellen, Janai, Roberta (Would prefer to be near PT/OT)
N10		MDS STAFF	4	120	480	Total 5 desks, counter with sink and minifrig (1) private office + 4 shared
N11		WOUND CARE OFFICE	1	120	120	
N12		WORK ROOM	1	280	280	Seating for 12p & Table
N13		SUPPLY CLOSET	1	70	70	
N17		STAFF TOILET	1	70	70	
		NURSING SUBTOTAL			**2,660**	

2ND FL MEMORY - 48 BEDS

JENNIFER EMERTON, DIRECTOR OF NURISNG SERVICES

Common Areas						
C1		LIBRARY/FAMILY CONFERENCE	2	120	240	No Bariatric Rooms. Residents to have Wanderguard. I stand/lift machine and one Hoyer Lift each floor.
C2		FAMILY ROOM	2	120	240	
C3		NOT USED	0	0	0	(21) residents and (6) feeders
C4		GREAT ROOM	1	400	400	
C5		SUN ROOM	2	160	320	
C6		RESIDENT LOUNGE /LIVING ROOM	1	140	140	
C7		TOILET (PUBLIC)	2	64	128	
C8		QUIET ROOM	2	120	240	
		COMMON AREAS SUBTOTAL			**1,708**	
Dietary Department						
D1		DINING ROOM	2	400	800	(24) Residents and (6) Feeders
D2		SERVERY/ FOOD PREP	1	450	450	
D3		CAFE	2	12	24	Near Nurse Station
D4		STORAGE	1	160	160	
		DIETARY DEPARTMENT SUBTOTAL			**1,434**	
Staff Work Areas						
S1	N20	NURSE STATION (sub nurse in rec rm)	1	300	300	
S2	N19	UNIT MEDICATION ROOM	1	100	100	
S3	N5	NURSING SUPERVISOR OFFICE	1	100	100	
S4		WORK ROOM	1	160	160	
S5	ES10	CLEAN WORKROOM OR CLEAN SUPPLY RM	1	120	120	
S6	ES11	SOILED WORKROOM OR SOILED HOLDING RM	1	120	120	
S7		COPIER AREA	1	80	80	

S8		STAFF TOILET	2	64	128	
	SS9	CONSULT ROOM	1	100	100	
		STAFF WORK AREAS SUBTOTAL			**1,108**	
Other Offices						
R01		OFFICE 1	1	100	100	
		OTHER OFFICES SUBTOTAL			**100**	
Resident Rooms						
R1		PRIVATE ROOM	48	320	15,360	
R2		PRIVATE TOILET/SHOWER ROOM	48	90	4,320	
R3		BATHING ROOM W/BATH	2	320	640	
		RESIDENT ROOMS SUBTOTAL			**20,320**	
Staff / Service / Support Areas						
S9		STAFF LOCKERS	2	60	120	
S10		STAFF LOUNGE	0	0	0	
S11		JANITOR	2	64	128	with floor sink/ bed pan flush
S12		STORAGE	2	120	240	
PP27		O2 BOTTLE STORAGE ON EACH FLOOR	1	25	25	
PP28		MINI BULK STORAGE ON EACH FLOOR	1	120	120	
		STAFF SUPPORT SUBTOTAL			**633**	
Service/Support Areas						
	ES12	CLEAN LINEN STORAGE	1	120	120	
	ES13	STORAGE FOR EQUIPMENT & SUPPLIES FOR CARE AND SERVICES	1	120	120	
S13	ES15	ENVIRONMENTAL SERVICES ROOM/ RED BAG	1	25	25	Secured
S14		HANDWASHING ALCOVE	4	12	48	
S15		LINEN CART STORAGE	4	12	48	(6) 3x4 Carts
S16		CHARTING ALCOVE	4	12	48	
S17	ES14	WHEELCHAIR STORAGE ALCOVE	2	24	48	
S18		HOUSEKEEPING/ CLEAN LINEN	1	120	120	
S19		O2 STORAGE	1	64	64	
S20		TEL/DATA CLOSET	2	64	128	
S21		MECHANICAL ROOM	2	64	128	
S22		ELECTRICAL CLOSET	2	64	128	
L14		TRASH ROOM	1	70	70	
L15		HOUSEKEEPING SUPPLIES	1	140	140	
		SERVICE/SUPPORT SUBTOTAL			**1,235**	
SECOND FLOOR PROGRAM (NET AREA)					**32,724**	

3 - THIRD FLOOR PROGRAM

Infection Control

CHRISTOPHER HAMILTON, INFECTION PREVENTION COORDINATOR

IC1		EMPLOYEE HEALTH OFFICER	1	120	120	(2) four drawer files, vac refrig locked on generator power, mini-frig serums
IC2		SMALL WAITING ROOM	1	100	100	
IC3		TREATMENT ROOM	1	120	120	testing desk 2 chairs overhead light, mask fittings, hand wash station, sharps container, glove dispenser, corkboard.
		INFECTION CONTROL SUBTOTAL	**3**		**340**	Wastewater testing, facial screens.

Information Technology & Security

PAUL KOPRESKI, IT DIRECTOR

IT1		DIRECTORS OFFICE	1	160	160	all IT offices need to be on back-up generator power
IT2		OFFICE STAFF	3	120	360	8' Countertop each office
IT3		STORAGE AND REPAIR	1	400	400	copier and fax, large 8x12 table, 48 LF 24" running shelving.
IT4		SERVER / TEL-DATA ROOM	1	200	200	(3) Server Racks & (1) Phone Rack. glass wall to view racks. Phone demark needs to be relocated to new building. Non-static disipating surfaces, hard surface flooring, need all new connections to all county buildings. FIRSTLIGHT is current fiber vendor. Servers need to be on dedicated backup power. Each resident floor should be discreet, nurse call, panic
		IT & SECURITY SUBTOTAL	**6**		**1,120**	

Admissions

AM1		DIRECTOR OF ADMISSIONS	1	180	180	Adjacent to Administration, Desk and Credenza with table 4 chairs
		ADMISSIONS SUBTOTAL	**1**		**180**	

Social Services

KRISTI HUGHES, SOCIAL SERVICES DIRECTOR

SS1		DIRECTOR OF SOCIAL SERVICES	2	160	320	Want to be adjacent to Admissions. (1) shared office for 2.
SS2		SOCIAL SERVICES STAFF OFFICES	4	120	480	Desk credenza and 2 chairs, whiteboards in offices
SS3		WORK SPACE W/KITCHENETTE	1	80	80	1 Copier, 1 3x6 table 8 chairs, 2 drawer file, tack board, nt 50" TV to display resident rooms
SS4		NOT USED	0	0	0	
SS5		NOT USED	0	0	0	
SS6		NOT USED	0	0	0	
SS7		NOT USED	0	0	0	
SS8		STAFF TOILET	1	70	70	
		SOCIAL SERVICES SUBTOTAL			**950**	

Administration & Billing

RAYMOND BOWER, DIRECTOR/ BRETT, BILLING COORDINATOR, MELISSA, PAULA & MICHELLE

A1		WAITING ROOM	1	160	160	Seating for 6p
A2		KITCHENETTE	1	40	40	Counter with sink, mini-frig, micro
A3		ADMINISTRATOR'S OFFICE W/TOILET	1	320	320	Desk and Credenza, large bookshelf, area with table 6p
A4		ASSISTANT ADMINISTRATORS OFFICE	1	160	160	
A5		CONFERENCE ROOM	1	225	225	Seating for 12p
A6		NOT USED	0	0	0	(4) printers, clock, no white board or corkboards, hard floors

A7		STORAGE	1	100	100	Lockable
B1		BILLING COORDINATOR	2	120	240	"U" shaped desk with (2) chairs, (1) four drawer file cab
B2		ASST BILLING COORDINATOR	1	100	100	
B3		FINANCE CLERK	1	100	100	
B4		STORAGE	1	260	260	3x3 safe for resident cash also at BANK.
B5		CONFERENCE ROOM	1	140	140	6p charis and table
B6		NOT USED	0	0	0	printer copier fax
B7		STORAGE STATATORY 7YRS	1	300	300	(20) vertical file cabinets, 20LF shelving, 2 printers, 1 box shredder, fax machine, 1 copier
		ADMINISTRATION SUBTOTAL	**13**		**2,145**	Drop box at First Floor Post Office

Administration Support Spaces

BRETT LANE, BILLING COORDINATOR / CHERILYNN MARSHALL, STAFF DEV COORDINATOR

AS1		GENERAL ADMIN CONFERENCE ROOM	1	240	240	
AS2		COPIER	1	100	100	
AS3		NOT USED	1	100	100	
AS4		NOT USED	0	0	0	
AS5		NOT USED	0	0	0	
AS6		TOILETS (STAFF)	2	70	140	
AS7		TOILETS (PUBLIC)	1	70	70	
AS8		NOT USED	0	0	0	
AS12		STORAGE	1	100	100	
AS16		OFFICE (HOTELING)	2	120	240	
AS17		NOT USED	0	0	0	
		STAFF DEVELOPMENT				Prefer to be adjacent to payroll-Personnel, will use empty resident room as SIM LAB. Equipment would be on mobile Cart.
AS13		OFFICE	1	120	120	Desk and Credenza, 2 chairs, corkboard, (4) four drawer file cabs.
AS14		TRAINING CONFERENCE ROOM	1	160	160	(2) whiteboards, (1) 80" Smart TV, (6) computer stations, 16p U-Shaped table, isolated WIFI
AS15		STORAGE ROOM	1	80	80	
					1,350	

3RD Floor Skilled Nursing - 48 Beds

JENNIFER EMERTON, DIRECTOR OF NURISNG SERVICES

Common Areas						
C1		LIBRARY/FAMILY CONFERENCE	1	120	120	No Bariatric Rooms. 1 stand/lift machine and 1 Hoyer Lift each floor.
C2		FAMILY ROOM	1	120	120	
C3		NOT USED	0	0	0	
C4		GREAT ROOM	1	400	400	
C5		SOLARIUM	1	600	600	
C6		RESIDENT LOUNGE /LIVING ROOM	1	140	140	
C7		TOILET (PUBLIC)	2	64	128	
C8		QUIET ROOM	1	120	120	
		COMMON AREAS SUBTOTAL			**1,628**	
Dietary Department						
D1		DINING ROOM	1	800	800	
D2		SERVERY/ FOOD PREP	1	450	450	
D3		CAFE	2	12	24	Near Nurse Station
D4		STORAGE	1	160	160	
		DIETARY DEPARTMENT SUBTOTAL			**1,434**	
Staff Work Areas						
S1	N20	NURSE STATION (sub nurse in rec rm)	1	300	300	
S2	N19	UNIT MEDICATION ROOM	1	100	100	
S3	N5	NURSING SUPERVISOR OFFICE	1	100	100	
S4		WORK ROOM	1	160	160	
S5	ES10	CLEAN WORKROOM OR CLEAN SUPPLY RM	1	120	120	
S6	ES11	SOILED WORKROOM OR SOILED HOLDING RM	1	120	120	
S7		COPIER AREA	1	80	80	
S8		STAFF TOILET	2	64	128	
	SS9	CONSULT ROOM	1	100	100	
		STAFF WORK AREAS SUBTOTAL			**1,208**	
Other Offices						
RO1		OFFICE 1	1	100	100	
		OTHER OFFICES SUBTOTAL			**100**	
Resident Rooms						
R1		PRIVATE ROOM	48	320	15,360	
R2		PRIVATE TOILET/SHOWER ROOM	48	90	4,320	
R3		BATHING ROOM	2	320	640	
		RESIDENT ROOMS SUBTOTAL			**20,320**	
Staff / Service / Support Areas						
S9		STAFF LOCKERS	1	100	100	
S10		SUPPLY	2	64	128	
S11		JANITOR	1	64	64	with floor sink/ bed pan flush
S12		STORAGE	2	120	240	
PP27		O2 BOTTLE STORAGE ON EACH FLOOR	1	25	25	
PP28		MINI BULK STORAGE ON EACH FLOOR	1	120	120	
		STAFF SUPPORT SUBTOTAL			**677**	
Service/Support Areas						
	ES12	CLEAN LINEN STORAGE	1	120	120	
	ES13	STORAGE FOR EQUIPMENT & SUPPLIES FOR CARE AND SERVICES	1	120	120	
S13	ES15	ENVIRONMENTAL SERVICES ROOM/ RED BAG	1	25	25	Secured
S14		HANDWASHING ALCOVE	4	12	48	
S15		LINEN CART STORAGE	4	12	48	(6) 3x4 Carts
S16		CHARTING ALCOVE	4	12	48	
S17	ES14	WHEELCHAIR STORAGE ALCOVE	2	24	48	
S18		HOUSEKEEPING/ CLEAN LINEN	1	120	120	
S19		O2 STORAGE	1	64	64	
S20		TEL/DATA CLOSET	2	64	128	

S21		MECHANICAL ROOM	2	64	128	
S22		ELECTRICAL CLOSET	2	64	128	
L14		TRASH ROOM	1	70	70	
L15		HOUSEKEEPING SUPPLIES	1	140	140	
		SERVICE/SUPPORT SUBTOTAL			**1,235**	
		THIRD FLOOR PROGRAM (NET AREA)			**32,687**	

4 - FOURTH FLOOR PROGRAM

Main Street

DEE BROWNE, ASST DIRECTOR

#		ROOM NAME	# RMS	SIZE	NET	NOTES
		PHYSICIANS OFFICE SUITE				
M30		CLINIC COORDINATOR	1	120	120	desk, credenza and two chairs
M31		RESIDENT TOILET (UNISEX)	1	70	70	
M32		EXAM ROOM	1	120	120	Exam Table and one chair, counter/cabs with sink
M33		DENTAL EXAM	1	120	120	Dental chair, exam light
M34		LAB	1	40	40	Counter with sink
M35		WAITING	1	100	100	chairs for 4p
M36		STORAGE	1	100	100	8' runing shelving
		MAIN STREET SUBTOTAL	**7**		**670**	Mailboxes to go to First Floor Post Office

Personnel/ Payroll/ HR

DOROTHY GROULX, LINDA FARRELL & KASSANDRA GAGNE

HR1		HUMAN RESOURCES DIRECTOR/OFFICE MGR	1	160	160	Open office concept so all three can see and hear each other, 3x3 safe, floor copier
HR2		HUMAN RESOURCES PAYROLL CLERK 1	1	120	120	Desk credenza, No Vault.
HR3		HUMAN RESOURCES PAYROLL CLERK 2	1	120	120	Future
HR4		CONFERENCE ROOM	1	224	224	chairs for 4p, Need wall for Compliance postings 4x12 30x72 work table in adjacent room
HR5		NOT USED	0	0	0	
HR6		HR RECORDS STORAGE	1	120	120	6' Binder shelf, County Vehicle Records, Locked room
HR7		KITCHENETTE	1	40	40	counter with sink and refrig
HR8		STAFF TOILET	1	70	70	Unisex
HR9		STORAGE	1	70	70	Paper supplies
		HR SUBTOTAL	**8**		**924**	Mailboxes to go to First Floor Post Office

Activities Department

KRISTINA LAPOINT, ACTIVITES DIRECTOR

AC1		ACTIVITIES ROOM W/ KITCHENETTE	1	2500	2,500	tables and chairs on rolling carts, Need floor outlets, (16) staff cubicals around perimeter
AC2		ACTIVITIES OFFICE/ REC AID	1	225	225	
AC3		DIRECTORS OFFICE	1	160	160	
AC4		WHEEL CHAIR STORAGE	1	600	600	
AC5		NOT USED	0	0	0	
AC6		STAFF TOILETS	1	70	70	
AC7		RESIDENT TOILETS	2	70	140	
AC8		WOOD WORKING/ SEWING & STORAGE	1	400	400	
AC9		CERAMICS/ KILN COUNTER W/SINK	1	300	300	
AC10		ACTIVITIES SPACE ON EACH FLOOR	5	300	1,500	Want scrolling TV at Nurse Stations, Bullitin Boards throughout, glass cabinets in hallways
AC11		STORAGE IN BASEMENT	1	600	600	
		ACTIVITIES/ SUPPORT SUBTOTAL			**6,495**	Large 200p event to occur on first floor, wants dimmable lights all areas

4TH Floor Skilled Nursing - 48 Beds

JENNIFER EMERTON, DIRECTOR OF NURISNG SERVICES

Common Areas						
C1		LIBRARY/FAMILY CONFERENCE	1	120	120	No Bariatric Rooms. 1 stand/lift machine and 1 Hoyer Lift each floor.
C2		FAMILY ROOM	1	120	120	
C3		NOT USED	0	0	0	
C4		GREAT ROOM	1	400	400	
C5		SUN ROOM	1	160	160	
C6		RESIDENT LOUNGE /LIVING ROOM	1	140	140	
C7		TOILET (PUBLIC)	2	64	128	
		COMMON AREAS SUBTOTAL			**1,068**	
Dietary Department						
D1		DINING ROOM	1	800	800	
D2		SERVERY/ FOOD PREP	1	450	450	
D3		CAFE	2	12	24	Near Nurse Station
D4		STORAGE	1	160	160	
		DIETARY DEPARTMENT SUBTOTAL			**1,434**	
Staff Work Areas						
S1	N20	NURSE STATION (sub nurse in rec rm)	1	300	300	
S2	N19	UNIT MEDICATION ROOM	1	100	100	
S3	N5	NURSING SUPERVISOR OFFICE	1	100	100	
S4		WORK ROOM	1	160	160	
S5	ES10	CLEAN WORKROOM OR CLEAN SUPPLY RM	1	120	120	
S6	ES11	SOILED WORKROOM OR SOILED HOLDING RM	1	120	120	
S7		COPIER AREA	1	80	80	
S8		STAFF TOILET	2	64	128	
	SS9	CONSULT ROOM	1	100	100	
		STAFF WORK AREAS SUBTOTAL			**1,208**	
Other Offices						
RO1		OFFICE 1	1	100	100	
		OTHER OFFICES SUBTOTAL			**100**	
Resident Rooms						

R1		PRIVATE ROOM (413)	48	320	15,360	
R2		PRIVATE TOILET/SHOWER ROOM	48	90	4,320	
R3		BATHING ROOM	2	320	640	
		RESIDENT ROOMS SUBTOTAL			**20,320**	
Staff / Service / Support Areas						
S9		STAFF LOCKERS	1	100	100	
S10		SUPPLY	2	64	128	
S11		JANITOR	1	64	64	with floor sink/ bed pan flush
S12		STORAGE	1	120	120	
PP27		O2 BOTTLE STORAGE ON EACH FLOOR	1	25	25	
PP28		MINI BULK STORAGE ON EACH FLOOR	1	120	120	
		STAFF SUPPORT SUBTOTAL			**557**	
Service/Support Areas						
	ES12	CLEAN LINEN STORAGE	1	120	120	
	ES13	STORAGE FOR EQUIPMENT & SUPPLIES FOR CARE AND SERVICES	1	120	120	
S13	ES15	ENVIRONMENTAL SERVICES ROOM/ RED BAG	1	25	25	Secured
S14		HANDWASHING ALCOVE	4	12	48	
S15		LINEN CART STORAGE	4	12	48	(6) 3x4 Carts
S16		CHARTING ALCOVE	4	12	48	
S17	ES14	WHEELCHAIR STORAGE ALCOVE	2	24	48	
S18		HOUSEKEEPING/ CLEAN LINEN	1	120	120	
S19		O2 STORAGE	1	64	64	
S20		TEL/DATA CLOSET	2	64	128	
S21		MECHANICAL ROOM	2	64	128	
S22		ELECTRICAL CLOSET	2	64	128	
L14		TRASH ROOM	1	70	70	
L15		HOUSEKEEPING SUPPLIES	1	140	140	
		SERVICE/SUPPORT SUBTOTAL			**1,235**	
FOURTH FLOOR PROGRAM (NET AREA)					**34,011**	

5 - FIFTH FLOOR PROGRAM

Physical/ Occupational Therapy Department

MIKE MORSE, PT DIRECTOR / CHRISTINA TIERNAN, OT DIRECTOR

PT1		PT EXERCISE ROOM	1	2500	2,500	#? Equipment VERIFY, Bottle fill Bubbler, (4) Treatment Tables with Curtains
PT2		PT OFFICE	5	100	500	(5) LNA cubicals, PT Kitchenette sink, refrig, coffee
PT3		DIRECTORS OFFICE	2	160	320	Desk and Credenza, 2 chairs
PT4		ASST PT DIRECTOR	2	140	280	Desk and Credenza, 2 chairs
PT5		NOT USED	0	0	0	arm rests, seat cushions, positioning devices
PT6		STORAGE	1	200	200	
PT7		STAFF TOILETS W/SHOWER	2	90	180	resident use as well
PT8		NOT USED	0	0	0	
PT9		HYDRO THERAPY	1	500	500	Whirlpool tub, mobility hot+cold, Ultrasound
PT10		RESIDENT LOUNGE	1	120	120	Seating for 6p, TV, 2 tables
POT11		PT-OT ROOM ON RESIDENT FLOORS	5	450	2,250	
OT1		OCCUPATIONAL THERAPY OFFICE	4	100	400	
OT2		NOT USED	0	0	0	Verify hydro therapy
OT3		OT/PT STORAGE	1	240	240	
OT4		OT REHAB SUITE	1	250	250	Separate designated OT Suite w/Training Kitchen, Washer&Dryer, bathroom w/ tub, bedroom (Locked Door)
OT5		WHEELCHAIR STORAGE	1	600	600	Can be located in Basement if not adjacent
		PT/ SUPPORT SUBTOTAL			**8,340**	

5TH Floor Skilled Nursing - 48 Beds

JENNIFER EMERTON, DIRECTOR OF NURISNG SERVICES

Common Areas						
C1		LIBRARY/FAMILY CONFERENCE	1	160	160	No Bariatric Rooms. 1 stand/lift machine and 1 Hoyer Lift each floor.
C2		FAMILY ROOM	1	160	160	
C3		NOT USED	0	0	0	
C4		GREAT ROOM	1	400	400	
C5		SOLARIUM	1	160	160	
C6		RESIDENT LOUNGE /LIVING ROOM	1	140	140	
C7		TOILET (PUBLIC)	2	64	128	
		COMMON AREAS SUBTOTAL			**1,148**	
Dietary Department						
D1		DINING ROOM	1	800	800	
D2		SERVERY/ FOOD PREP	1	450	450	
D3		CAFE	2	12	24	Near Nurse Station
D4		STORAGE	1	160	160	
		DIETARY DEPARTMENT SUBTOTAL			**1,434**	
Staff Work Areas						
S1	N20	NURSE STATION (sub nurse in rec rm)	1	300	300	
S2	N19	UNIT MEDICATION ROOM	1	100	100	
S3	N5	NURSING SUPERVISOR OFFICE	1	100	100	
S4		WORK ROOM	1	160	160	
S5	ES10	CLEAN WORKROOM OR CLEAN SUPPLY RM	1	120	120	
S6	ES11	SOILED WORKROOM OR SOILED HOLDING RM	1	120	120	
S7		COPIER AREA	1	80	80	
S8		STAFF TOILET	2	64	128	
	SS9	CONSULT ROOM	1	100	100	
		STAFF WORK AREAS SUBTOTAL			**1,208**	
Other Offices						
RO1		OFFICE 1	1	120	120	
		OTHER OFFICES SUBTOTAL			**120**	
Resident Rooms						

R1		PRIVATE ROOM	48	320	15,360	
R2		PRIVATE TOILET/SHOWER ROOM	48	90	4,320	
R3		BATHING ROOM	2	320	640	
		RESIDENT ROOMS SUBTOTAL			**20,320**	
Staff / Service / Support Areas						
S9		STAFF LOCKERS	1	60	60	
S10		SUPPLY	4	90	360	
S11		JANITOR	1	64	64	with floor sink/ bed pan flush
S12		STORAGE GENERAL	2	120	240	
PP27		O2 BOTTLE STORAGE ON EACH FLOOR	1	25	25	
PP28		MINI BULK STORAGE ON EACH FLOOR	1	120	120	
		STAFF SUPPORT SUBTOTAL			**869**	
Service/Support Areas						
	ES12	CLEAN LINEN STORAGE	1	120	120	
	ES13	STORAGE FOR EQUIPMENT & SUPPLIES FOR CARE AND SERVICES	1	120	120	
S13	ES15	ENVIRONMENTAL SERVICES ROOM/ RED BAG	1	25	25	Secured
S14		HANDWASHING ALCOVE	4	12	48	
S15		LINEN CART STORAGE	4	12	48	(6) 3x4 Carts
S16		CHARTING ALCOVE	4	12	48	
S17	ES14	WHEELCHAIR STORAGE ALCOVE	2	24	48	
S18		HOUSEKEEPING/ CLEAN LINEN	1	120	120	
S19		O2 STORAGE	1	64	64	
S20		TEL/DATA CLOSET	2	64	128	
S21		MECHANICAL ROOM	2	64	128	
S22		ELECTRICAL CLOSET	2	64	128	
L14		TRASH ROOM	1	70	70	
L15		HOUSEKEEPING SUPPLIES	1	140	140	
		SERVICE/SUPPORT SUBTOTAL			**1,235**	
		FIFTH FLOOR PROGRAM (NET AREA)			**34,674**	

SUMMARY OF PROGRAM SPACES

LOWER LEVEL PROGRAM (NET AREA)		44,437	
FIRST FLOOR PROGRAM (NET AREA)		44,437	
SECOND FLOOR PROGRAM (NET AREA)		32,724	
THIRD FLOOR PROGRAM (NET AREA)		32,687	
FOURTH FLOOR PROGRAM (NET AREA)		34,011	
FIFTH FLOOR PROGRAM (NET AREA)		34,674	
PROGRAM (NET AREA)		222,970	
CIRCULATION & WALLS (COMMON SF)	**35%**	**78,040**	
PROGRAM GOAL (GROSS AREA TOTAL)		**301,010**	

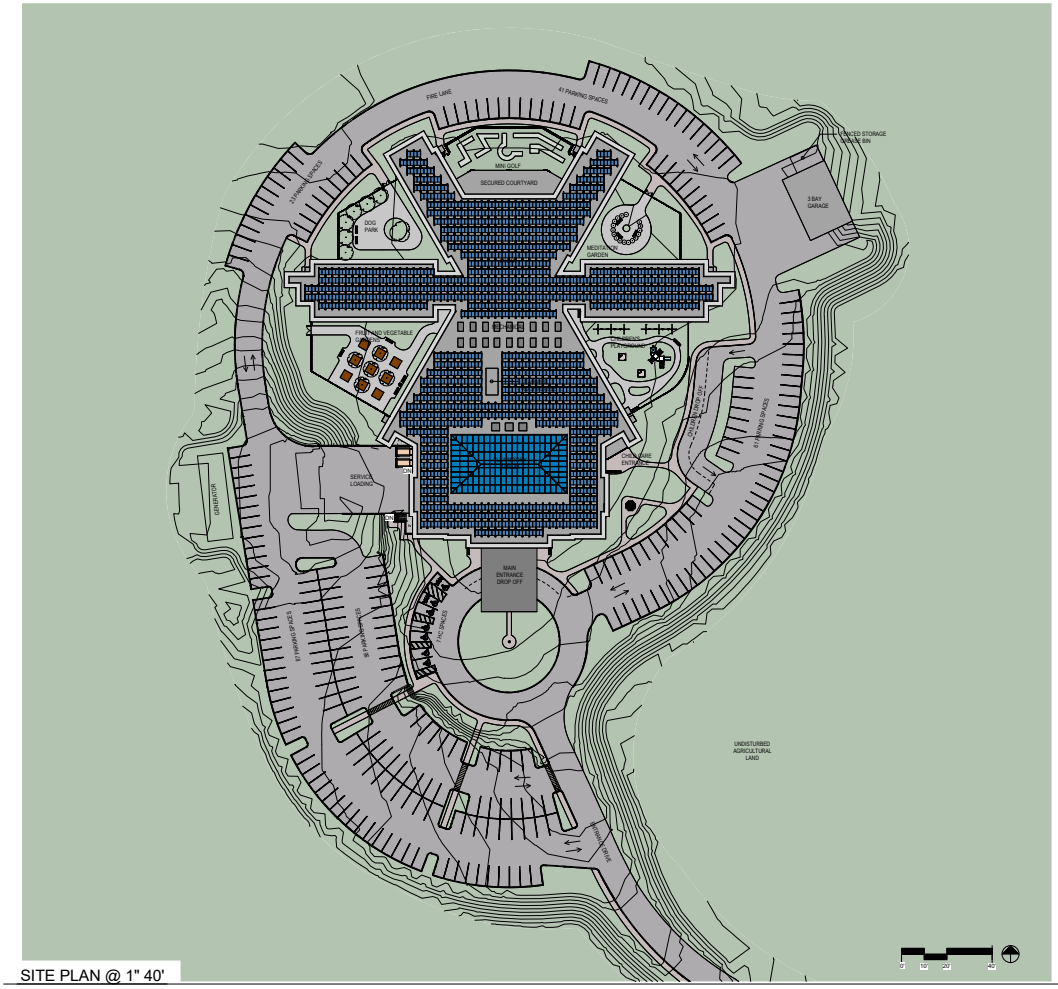
SCHEMATIC DESIGN (PLANS AND ELEVATIONS)

NOTES:

1. Where multiple rooms of the same type are listed, the average square footage is indicated. All numbers are rounded.
2. Room sizes are net interior dimensions.

GENERAL:

behaviors, hand rinse, hand free blowers, temp scan at time clocks, facial scan at lobby, Individual HVAC each floor and area, vacume toilets, Review CMS ratings.



PROJECT DATA:
(215) LICENSED BED FACILITY
(235) TOTAL BEDS AVAILABLE
310,889 SF PROPOSED FACILITY
(6) STORIES BUILDING
2B CONSTRUCTION - USE GROUP I-2
2021 IBC BUILDING CODE
2018 NFPA LIFE SAFETY CODE
2022 FGI - HEALTHCARE GUIDELINES
(268) PARKING SPACES PROVIDED
(3) LOADING DOCKS
(2) INSTALLED TRASH COMPACTORS
+/- 45,000 SF POTENTIAL SOLAR SYSTEM

UTILITIES
NATURAL GAS AVAILABLE
WATER AVAILABLE
SEWER AVAILABLE
GEOTHERMAL HEATING + COOLING

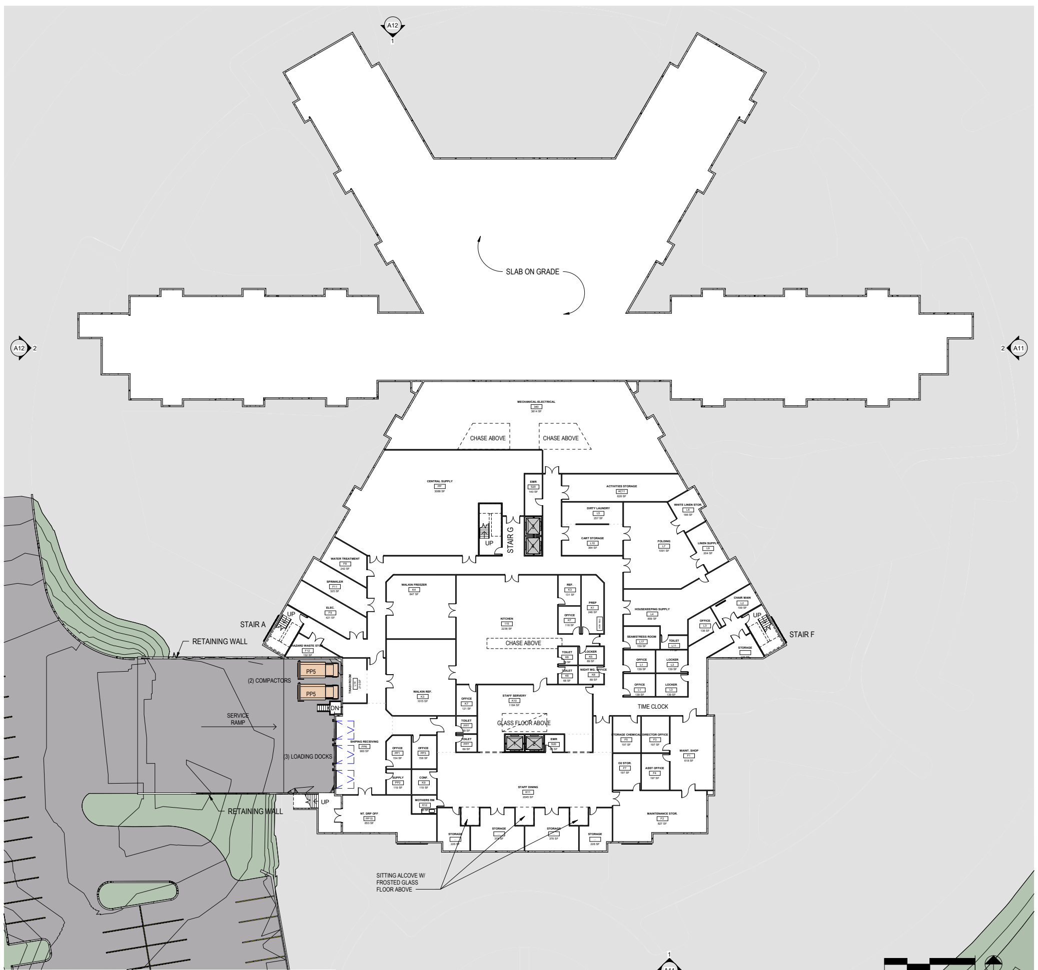
SITE PLAN @ 1" 40'

PROPOSED STRAFFORD COUNTY NURSING HOME

285 COUNTY FARM CROSS RD
DOVER, NH 03820

11/15/2023

Warrenstreet
Planning | Landscapes | Architecture | Interiors



LOWER LEVEL PLAN @ 1" = 20' (32,631 SF)

LL - LOWER LEVEL PROGRAM

Facilites

[illegible]

Environmental Services

[illegible]

Dietary/ Kitchen

[illegible]

Procurement & Purchasing

[illegible]

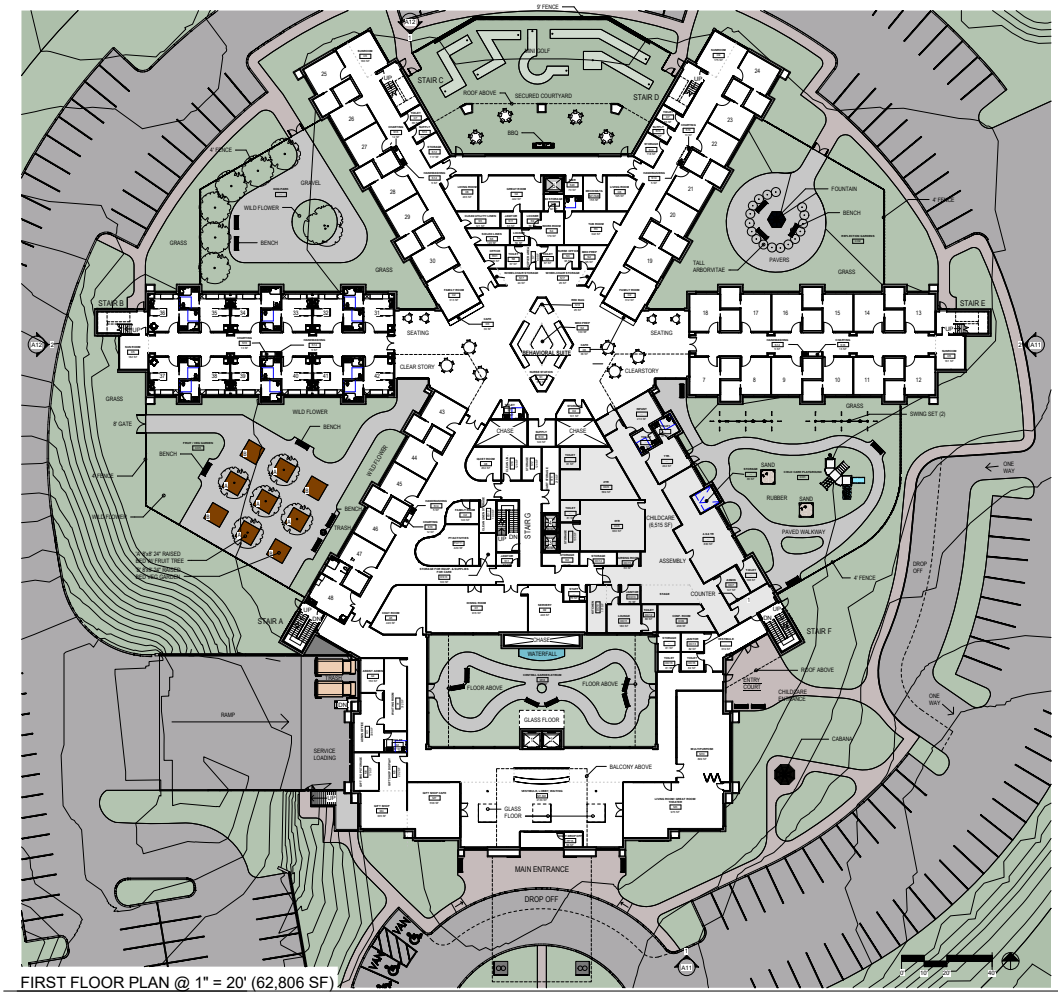
LOWER LEVEL PROGRAM (NET AREA)	21,476

PROPOSED STRAFFORD COUNTY NURSING HOME

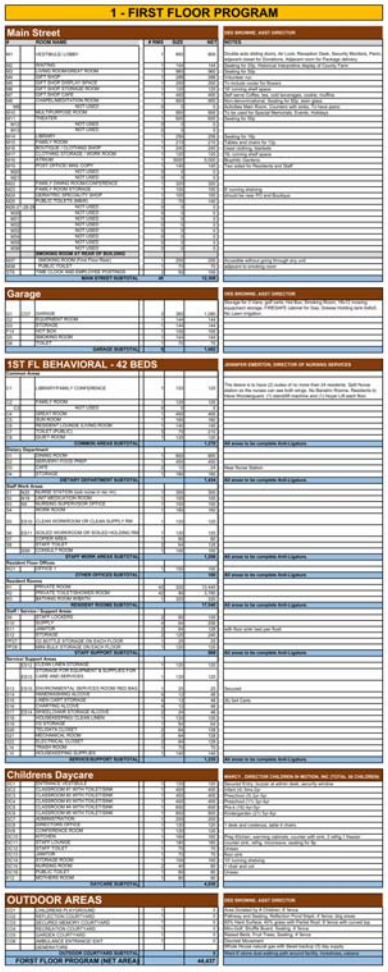
285 COUNTY FARM CROSS RD
DOVER, NH 03820

11/15/2023

Warrenstreet
Planning | Landscapes | Architecture | Interiors



FIRST FLOOR PLAN @ 1" = 20' (62,806 SF)



1 - FIRST FLOOR PROGRAM

Main Street

#	ROOM NAME	# PAX	SIZE	NET
101	VESTIBULE/LOBBY		600	600
102	RECEPTION	2	150	150
103	CONFERENCE/BOARD ROOM	12	360	360
104	STAFF WORK	2	150	150
105	STAFF WORK SHARED SPACE		200	200
106	STAFF WORK TOILET ROOM		64	64
107	STAFF SHOWER		50	50
108	STAFF LOCKER ROOM		200	200
109	MEN LOCKER		50	50
110	WOMEN LOCKER		50	50
111	MULTIPURPOSE ROOM		600	600
112	LIBRARY		600	600
113	MEN LOCKER		50	50
114	WOMEN LOCKER		50	50
115	LIBRARY		200	200
116	FAMILY ROOM	4	150	150
117	STORAGE / OVERHEAD DOOR		150	150
118	EXTERIOR STORAGE - WORK ROOM		50	50
119	LOUNGE		600	600
120	STAFF OFFICE/ MAIL ROOM	2	140	140
121	MEN LOCKER		50	50
122	WOMEN LOCKER		50	50
123	FAMILY SHARED RECREATION/PARTY		300	300
124	FAMILY ROOM EXTENSION		150	150
125	DEMENTIA SPECIALTY GARDEN		1000	1000
126	PUBLIC TOILETS (MEN)		150	150
127	PUBLIC TOILETS (WOMEN)		150	150
128	MEN LOCKER		50	50
129	WOMEN LOCKER		50	50
130	MEN LOCKER		50	50
131	WOMEN LOCKER		50	50
132	MEN LOCKER		50	50
133	WOMEN LOCKER		50	50
	SMOKING ROOM AT REAR OF BUS BAY			
134	SMOKING ROOM / PUBLIC TOILET		300	300
135	PUBLIC TOILET		150	150
136	TAXI TICKET AND START CHECK VESTIBULE		150	150
	MAIN STREET SUBTOTAL	22		12,364

Garage

#	ROOM NAME	# PAX	SIZE	NET
201	GARAGE		1,000	1,000
202	EQUIPMENT ROOM		150	150
203	MEN		150	150
204	WOMEN		150	150
205	SHOWER ROOM		150	150
206	TOILET		150	150
	GARAGE SUBTOTAL	0		1,850

1ST FL BEHAVIORAL - 42 BEDS

#	ROOM NAME	# PAX	SIZE	NET
	Common Areas			
211	LIBRARY/FAMILY CONFERENCE	4	150	150
212	FAMILY ROOM	4	150	150
213	MEN LOCKER		50	50
214	WOMEN LOCKER		50	50
215	SLEEP ROOM		150	150
216	RESIDENT COUNCIL LIVING ROOM		150	150
217	POD ST (PUBLIC)		150	150
218	STAFF WORK		150	150
	COMMON AREAS SUBTOTAL			1,100
	Dietary Department			
219	KITCHEN		600	600
220	DISH WASH ROOM AREA		400	400
221	PANTRY		150	150
222	STORAGE		150	150
	DIETARY DEPARTMENT SUBTOTAL			1,300
	Staff Work Areas			
223	NURSE STATION SUB-NODE # 1 (W/ RN)		300	300
224	STAFF WORK/CHARTING ROOM		150	150
225	NURSING SUPERVISOR OFFICE		150	150
226	MEDICATION		150	150
227	CLEAN WORK/ROOM OR CLEAN SUPPLY RM		150	150
228	SOILED WORK/ROOM OR SOILED HOLDING RM		150	150
229	LINEN CLOSET		150	150
230	PANTRY ROOM		150	150
	STAFF WORK AREAS SUBTOTAL			1,200
	Resident Time Offices			
231	DIRECTOR		150	150
	OTHER OFFICES SUBTOTAL			150
	Resident Rooms			
232	PRIVATE ROOM	1	120	120
233	PRIVATE TOILET/SHOWER ROOM	1	60	60
	RESIDENT ROOMS SUBTOTAL			180
	Staff Support Areas			
234	STAFF LOUNGE		150	150
235	LAUNDRY		150	150
236	OFFICE		150	150
237	LINEN STORAGE (IN ENVELOPE)		150	150
238	STAFF TOILET/SHOWER		150	150
	STAFF SUPPORT SUBTOTAL			900
	Service Support Areas			
239	KITCHEN EXPANSION		150	150
240	STORAGE FOR EQUIPMENT & SUPPLIES FOR LAND AND SERVICES		150	150
241	ENVIRONMENTAL SERVICES ROOM/ RED BAG		45	45
242	MAINTENANCE ROOM		150	150
243	LINEN CART STORAGE		150	150
244	CHEMICAL TOILET		45	45
245	DIRECTOR'S OFFICE		150	150
246	CONFERENCE ROOM		150	150
247	OFFICE		150	150
248	STAFF TOILET		150	150
249	MECHANICAL ROOM		150	150
250	LINEN ROOM		150	150
251	TRASH ROOM		150	150
252	ENVIRONMENTAL SERVICES		150	150
	SERVICE SUPPORT SUBTOTAL			1,995

Childrens Daycare

#	ROOM NAME	# PAX	SIZE	NET
253	PRESCHOOL CLASSROOM		1,000	1,000
254	TODDLER CLASSROOM		800	800
255	INFANT CLASSROOM		800	800
256	PRESCHOOL CLASSROOM		1,000	1,000
257	TODDLER CLASSROOM		800	800
258	INFANT CLASSROOM		800	800
259	DIRECTORS OFFICE		150	150
260	CONFERENCE ROOM		150	150
261	OFFICE		150	150
262	STAFF LOUNGE		150	150
263	STAFF TOILET		150	150
264	LAUNDRY		150	150
265	KITCHEN		150	150
266	TRASH ROOM		150	150
267	MECHANICAL ROOM		150	150
	DAYCARE SUBTOTAL			6,850

OUTDOOR AREAS

#	ROOM NAME	# PAX	SIZE	NET
268	PLAYGROUND (PRESCHOOL)			
269	PLAYGROUND (TODDLER)			
270	PLAYGROUND (INFANT/TODDLER)			
271	GARDEN COURTYARD			
272	GARDEN COURTYARD			
273	GARDEN COURTYARD			
	OUTDOOR COURTYARD SUBTOTAL			
	FORST FLOOR PROGRAM (NET AREA)			44,837

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285 COUNTY FARM CROSS RD
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11/15/2023

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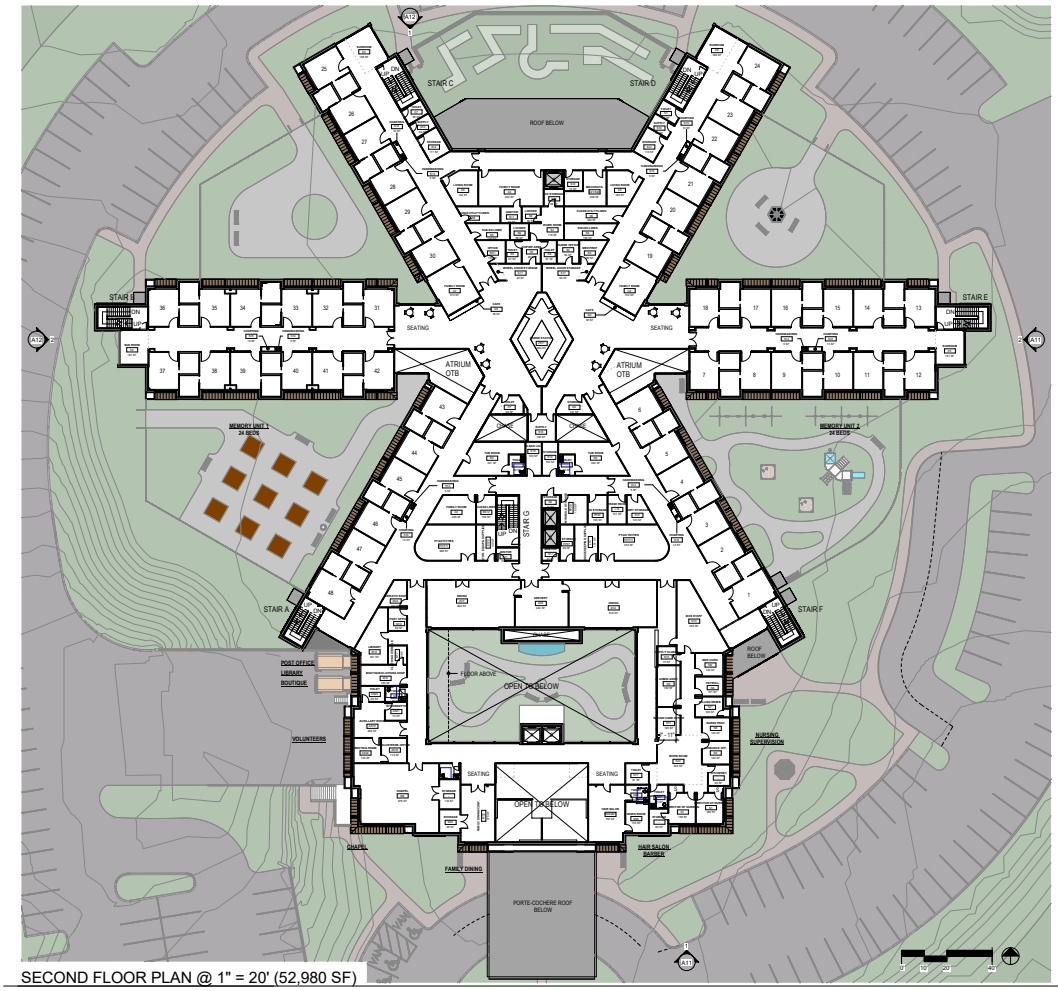

SECOND FLOOR PLAN @ 1" = 20' (52,980 SF)

2 - SECOND FLOOR PROGRAM

Main Street

#	ROOM NAME	# PER	SIZE	NET
1.01	RECEPTION/WAITING ROOM	1	300	300
1.02	FILE ROOM	1	150	150
1.03	LIBRARY	1	150	150
1.04	BOUTIQUE (+/- 10 STAFF)	1	150	150
1.05	VOLUNTEER SITEWORK - WORK ROOM	1	120	120
1.06	VOLUNTEER SITEWORK - OFFICE	1	120	120
1.07	PUBLIC TOILETS W/ BABY CHANGING	1	150	150
1.08	FAMILY DINING ENTRANCE	1	150	150
1.09	FAMILY DINING (+/- 10 SEATS)	1	150	150
1.10	HAIR SALON (+/- 3 SEATS)	1	150	150
1.11	HAIR SALON BARBER SUITE	1	150	150
1.12	HAIR SALON STORAGE	1	150	150
1.13	HAIR SALON SHAMPOO	1	150	150
1.14	HAIR SALON WORK ROOM	1	150	150
	MAIN STREET SUBTOTAL	14		2,220

Volunteers

#	ROOM NAME	# PER	SIZE	NET
2.01	VOLUNTEER OFFICE	1	120	120
2.02	FACILITY OFF / WORK	1	150	150
2.03	TOILET	1	60	60
2.04	VOLUNTEER OFF.	1	120	120
2.05	SERVING BOOM	1	150	150
	ADMINISTRATIVE SUPPORT SUBTOTAL			600

Nursing Supervision & MDS

#	ROOM NAME	# PER	SIZE	NET
3.01	NURSING SUPERVISION OFFICE	1	150	150
3.02	NURSING SUPERVISION OFFICE	1	150	150
3.03	NURSE STATION/CHARTING	1	150	150
3.04	MED. ROOM/ PHARMACY	1	150	150
3.05	MDS OFFICE - PROVIDER	1	150	150
3.06	MDS OFFICE - RN	1	150	150
3.07	MDS OFFICE - RN	1	150	150
3.08	MDS STAFF	1	150	150
3.09	NURSE LEAD OFFICE	1	150	150
3.10	NURSE ROOM	1	150	150
3.11	NURSE TOILET	1	60	60
3.12	NURSE SUPPLY	1	150	150
	NURSING SUBTOTAL			1,560

2ND FL MEMORY - 48 BEDS

#	ROOM NAME	# PER	SIZE	NET
Common Areas				
4.01	BENEFIT/FAMILY CONFERENCE	1	120	240
4.02	FAMILY ROOM	1	150	150
4.03	LIBRARY NOOK	1	150	150
4.04	GUN ROOM	1	150	150
4.05	RECEPTION / LOUNGE & DINING ROOM	1	150	150
4.06	PANTRY (PUBLIC)	1	150	150
4.07	COURT ROOM	1	150	150
	COMMON AREAS SUBTOTAL			1,140
Nursing Department				
4.08	NURSE ROOM	1	150	150
4.09	EMERGENCY OFFICE SNACK	1	150	150
4.10	CHIEF	1	150	150
4.11	DEPARTURE	1	150	150
	DEPART. DEPARTMENT SUBTOTAL			1,214
Staff Work Areas				
4.12	NURSE STATION (SAT DOES 8 TO 10)	1	150	150
4.13	UNIT SECRETARIAL ROOM	1	150	150
4.14	NURSES' SUPERVISOR OFFICE	1	150	150
4.15	NURSE ROOM	1	150	150
4.16	CLEAN WORK/ROOM OR CLEAN SUPPLY RM.	1	150	150
4.17	SOILED WORK/ROOM OR SOILED HOLDING RM.	1	150	150
4.18	LINEN SERVICE	1	150	150
4.19	STAFF TOILET	1	60	60
4.20	JANITOR'S ROOM	1	150	150
	STAFF WORK AREAS SUBTOTAL			1,560
Offices				
4.21	OFFICE 1	1	150	150
	OTHER OFFICES SUBTOTAL			150
Resident Rooms				
4.22	SINGLE ROOM	24	375	16,800
4.23	SINGLE TOILET/SHOWER ROOM	24	75	1,800
4.24	SINGLE CLOSET ROOM	24	25	600
	RESIDENT ROOMS SUBTOTAL			19,200
Staff Service - Support Areas				
4.25	STAFF LOCKER	1	150	150
4.26	STAFF LOUNGE	1	150	150
4.27	JANITOR	1	60	60
4.28	STORAGE	1	150	150
4.29	LAUNDRY & LINEN/CLEAN SUPPLY RM.	1	150	150
4.30	LAUNDRY & LINEN/SOILED RM.	1	150	150
	STAFF SUPPORT SUBTOTAL			810
Mechanical Areas				
4.31	ELEVATOR MACHINE ROOM	1	150	150
4.32	STORAGE FOR EQUIPMENT & SUPPLIES FOR CARE AND SERVICES	1	120	120
	MECHANICAL SERVICES ROOM/ RED AHU	1	60	60
	ENGINEERING/ SUPPLY	1	60	60
	ENGINEERING/ SUPPLY	1	60	60
	ENGINEERING/ SUPPLY	1	60	60
4.33	ELECTRICAL SERVICES ROOM	1	150	150
	HOUSEKEEPING CLEAN LINEN	1	60	60
	LAUNDRY	1	150	150
4.34	ELEVATOR	1	150	150
4.35	ELEVATOR	1	150	150
4.36	MECHANICAL ROOM	1	150	150
4.37	ELECTRICAL ROOM	1	150	150
4.38	TRASH ROOM	1	150	150
4.39	HOUSEKEEPING SUPPLIES	1	150	150
	HOUSE/SUPPORT SUBTOTAL			1,920
SECOND FLOOR PROGRAM (NET AREA)				32,794

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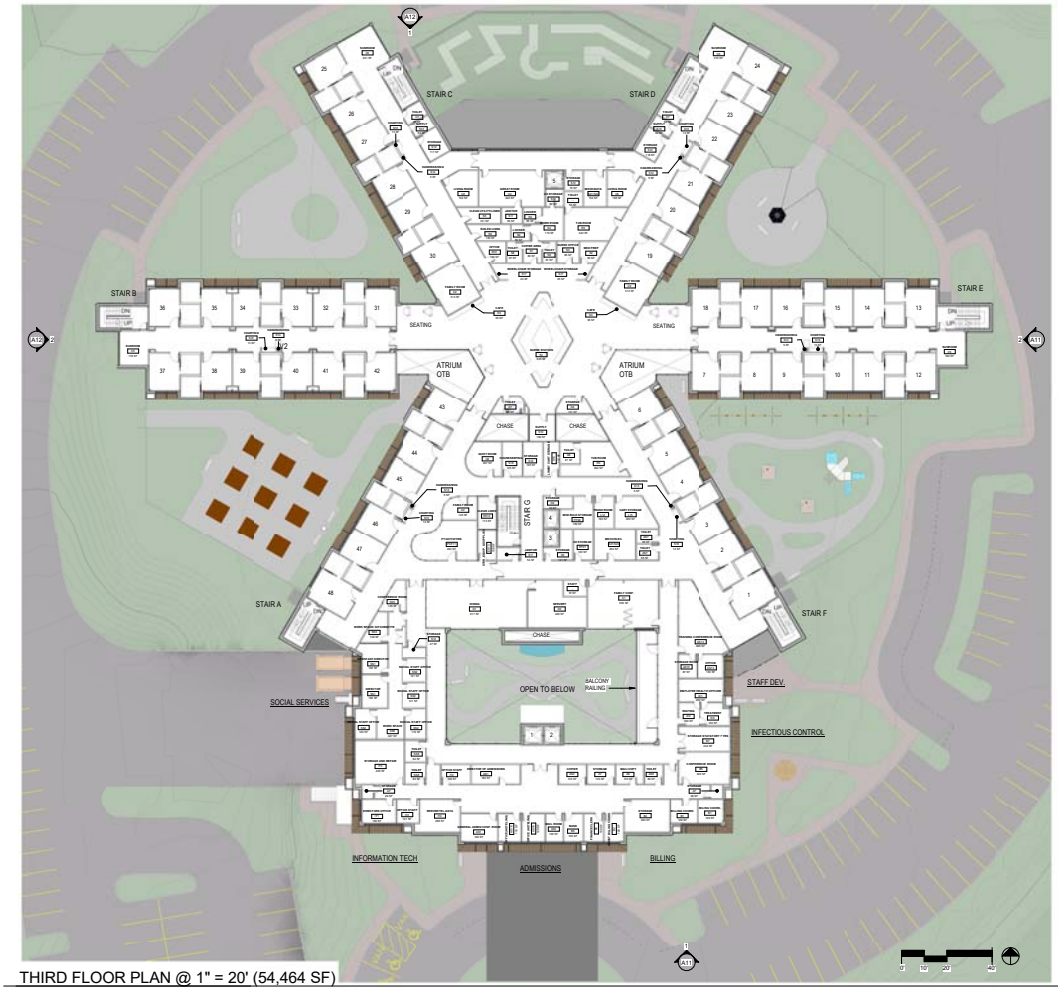

THIRD FLOOR PLAN @ 1" = 20' (54,464 SF)

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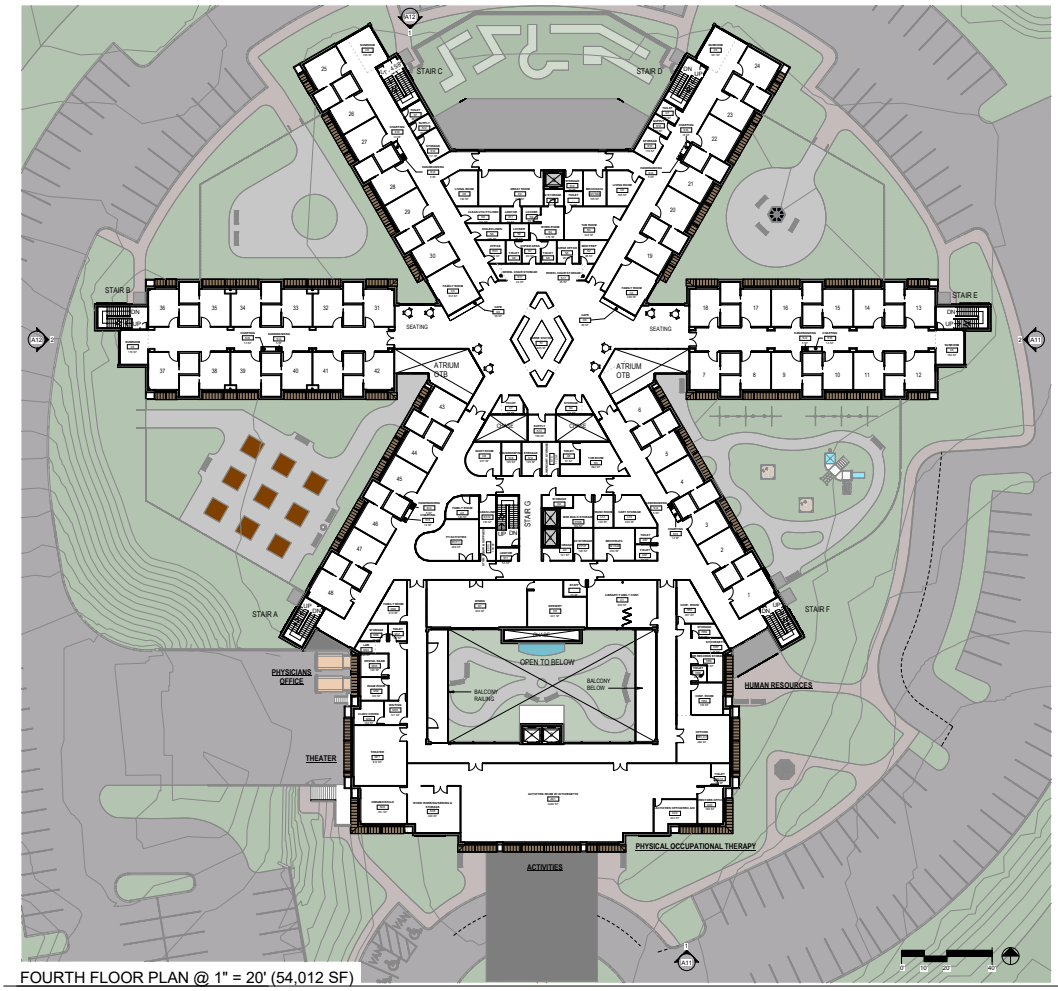

FOURTH FLOOR PLAN @ 1" = 20' (54,012 SF)

4 - FOURTH FLOOR PROGRAM

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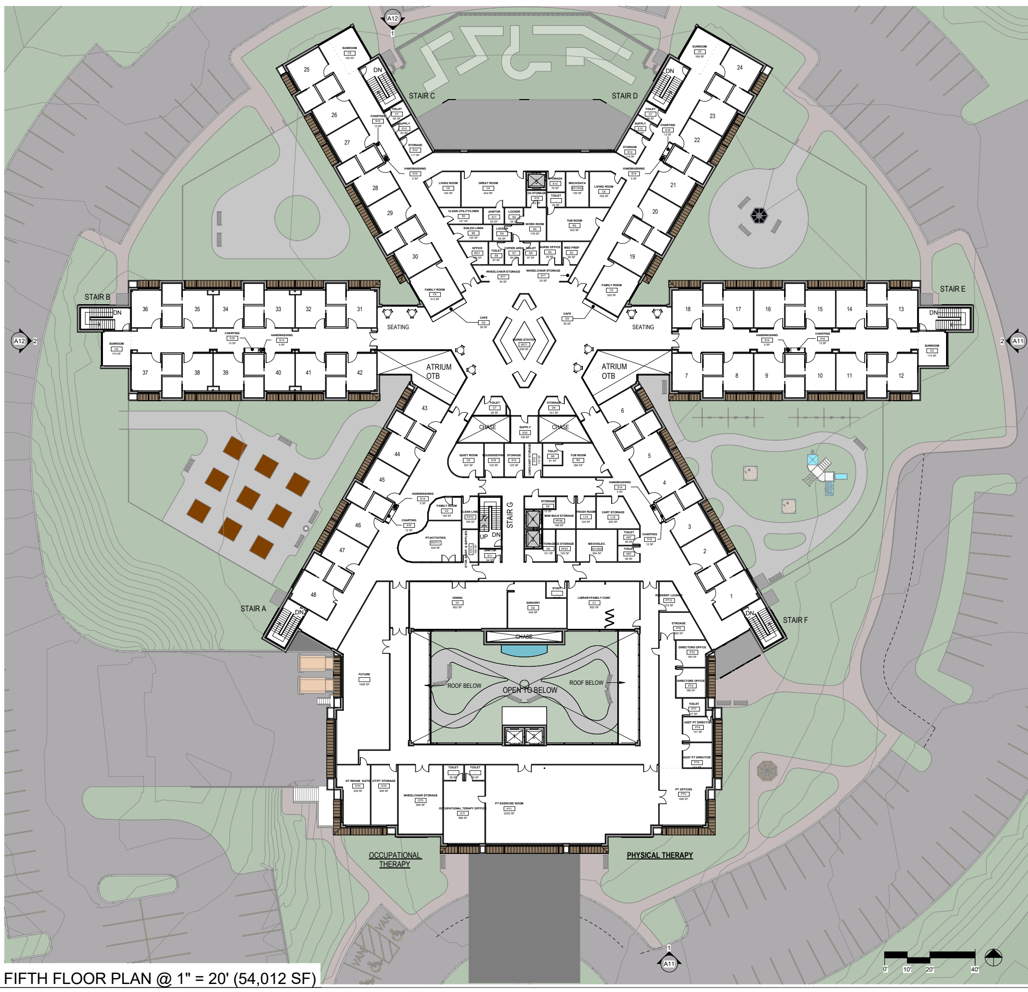

FIFTH FLOOR PLAN @ 1" = 20' (54,012 SF)

5 - FIFTH FLOOR PROGRAM

Physical/ Occupational Therapy Department

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	PT SUPPORT SUBTOTAL		[illegible]	

5TH Floor Skilled Nursing - 48 Beds

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	FIFTH FLOOR PROGRAM (NET AREA)		34,674	

SUMMARY OF PROGRAM SPACES

LOWER LEVEL PROGRAM (NET AREA)		44,437
FIRST FLOOR PROGRAM (NET AREA)		44,437
SECOND FLOOR PROGRAM (NET AREA)		32,728
THIRD FLOOR PROGRAM (NET AREA)		32,687
FOURTH FLOOR PROGRAM (NET AREA)		34,011
FIFTH FLOOR PROGRAM (NET AREA)		34,674
PROGRAM (NET AREA)		222,974
CIRCULATION & WALLS (COMMON SF)	35%	[illegible]
PROGRAM GOAL (GROSS AREA TOTAL)		301,019

SCHEMATIC DESIGN (PLANS AND ELEVATIONS)

NOTES: [illegible]

GENERAL: [illegible]

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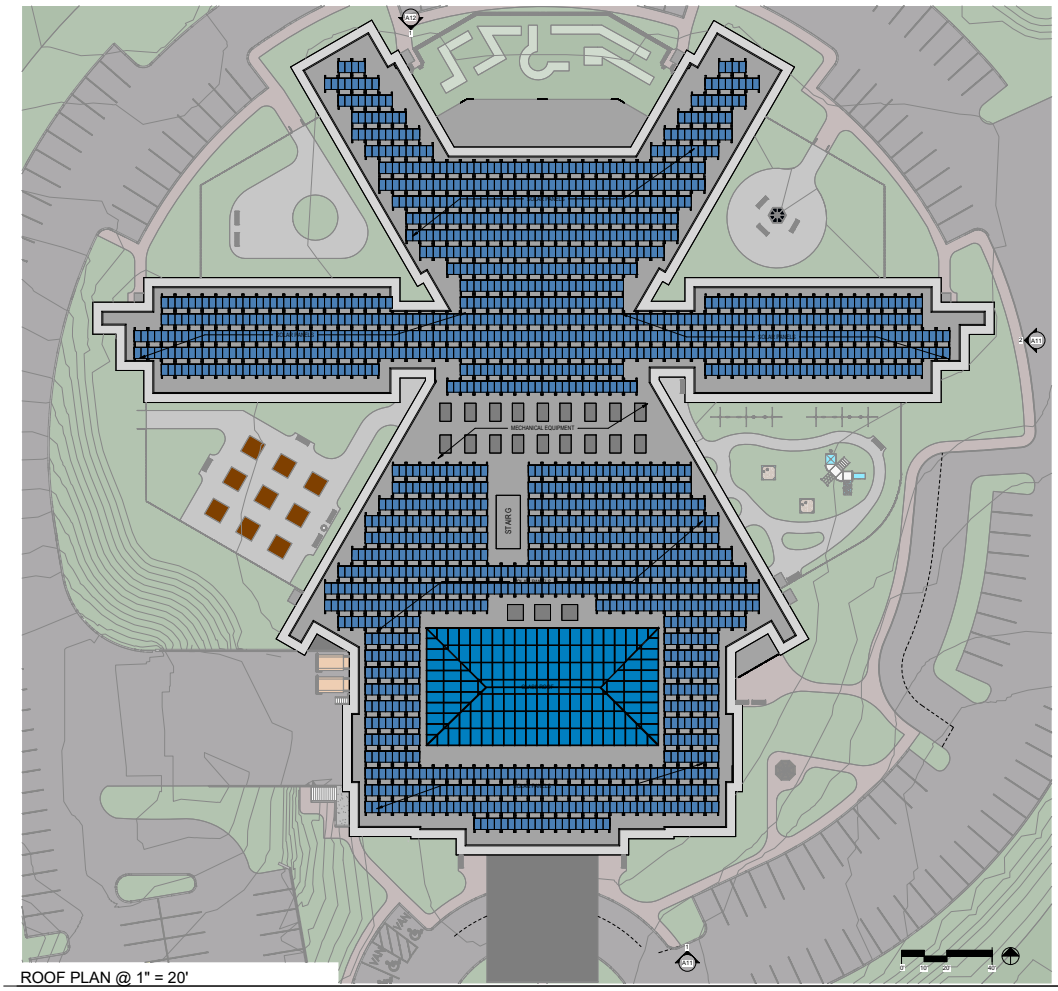

ROOF PLAN @ 1" = 20'

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SOUTH ELEVATION @ 1" = 16'

EAST ELEVATION @ 1" = 16'

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NORTH ELEVATION @ 1" = 16'

WEST ELEVATION @ 1" = 16'

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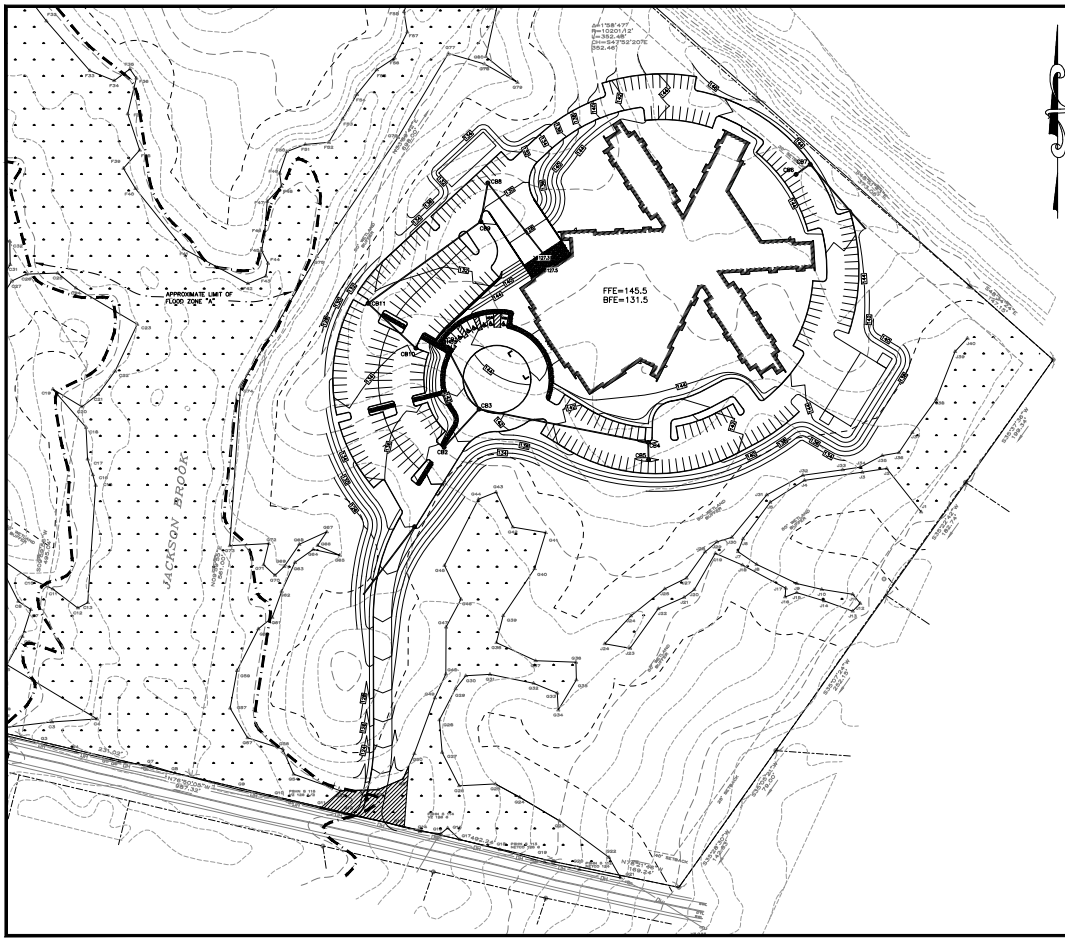

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STRAFFORD COUNTY NURSING HOME

DOVER, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION

REVISIONS

0 60' 120'
GRAPHIC SCALE

DATE:	NOVEMBER 2023
NOBIS PROJECT NO.	100475.00
DRAWN BY:	XX
CHECKED BY:	XX
CAD DRAWING FILE:	100475.00-C-300-G&D.dwg

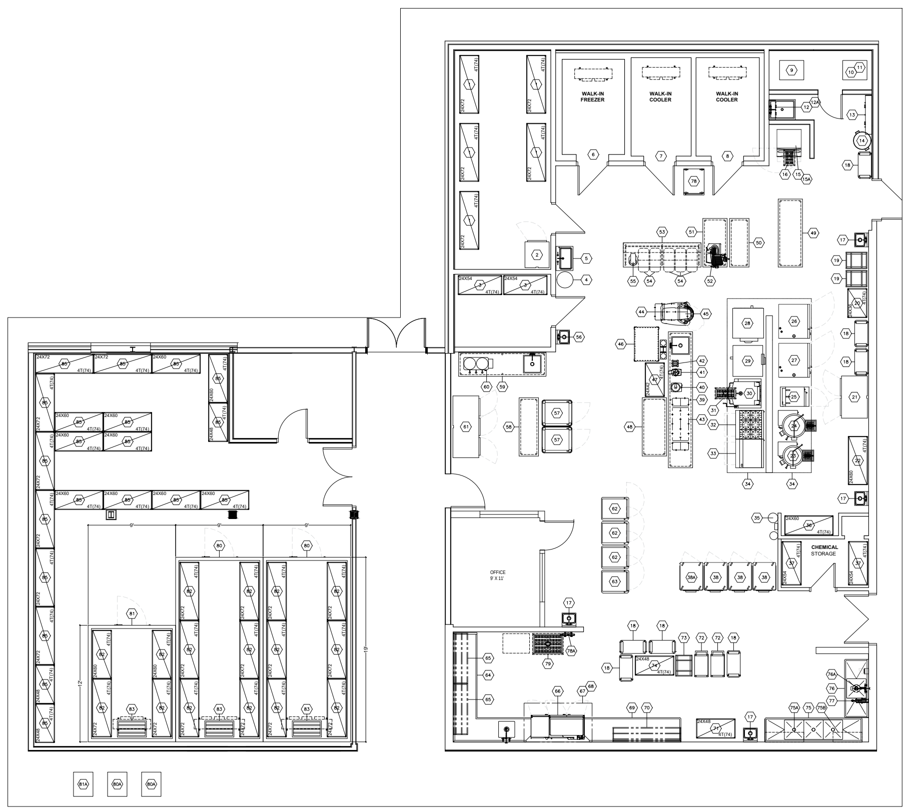
SHEET TITLE

GRADING & DRAINAGE PLAN

SHEET
####

FOODSERVICE EQUIPMENT SCHEDULE

ITEM#	QTY	DESCRIPTION	ELECTRICAL									WATER				WASTE			GAS			REMARKS
			AMPS	KW	HP	VOLTS	PHASE	DIRECT	PLUG	AFF	NEMA	COLD	AFF	HOT	AFF	DIRECT	AFF	INDIRECT	SIZE	AFF	MBTUH	
1	LOT	SHELVING – DRY STORAGE (EXIST)																				
2	1	FREEZER, 1 DOOR	9.5			120	1		X	60"	5–15P											
3	LOT	SHELVING – NON-FOOD STORAGE																				
4	1	POTATO PEELER	7.2		1/3	120	1		X	24"	5–15P											
5	1	UTILITY SINK										1/2"	12"	1/2"	12"			1–1/2"				
6	1	WALK-IN FREEZER				*		X														
6A	1	FREEZER EVAPORATOR COIL	10.3			208	1	X		DFA								3/4"				
7	1	WALK-IN COOLER				*		X														
7A	1	COOLER EVAPORATOR COIL	0.8			208	1	X		DFA								3/4"				
8	1	WALK-IN COOLER				*		X														
8A	1	COOLER EVAPORATOR COIL	0.8			208	1	X		DFA								3/4"				
9	1	FREEZER CONDENSER – WATER COOLED	10.8		2	208	3	X		DFA		5/8"	12"									
10	1	COOLER CONDENSER – WATER COOLED	6.0		3/4	208	3	X		DFA		1/2"	12"									
11	1	COOLER CONDENSER – WATER COOLED	6.0		3/4	208	3	X		DFA		1/2"	36"									
11A	LOT	CONDENSER STANDS																				
12	1	MOP SINK										1/2"	36"	1/2"	36"	3"	STUB					
12A	1	MOP/BROOM HOLDER																				
13	1	MOP/BROOM HOLDER																				
14	1	TRASH CONTAINER																				
15	1	ICE MAKER	6.1			208	1	X		72"		1/2"	72"					3/4"				
15A	1	ICE BIN																3/4"				
16	1	FLOOR TROUGH														4"	STUB					TROUGH RECESSED INTO FLOOR
17	4	HAND SINK										1/2"	12"	1/2"	12"	1–1/2"	20"					
18	LOT	UTILITY CART																				
19	LOT	SHEET PAN RACK																				
20	1	SHELVING UNIT																				
21	1	REFRIGERATOR, 2 DOOR	8.5			120	1		X	60"	5–15P											
22	1	SHELVING UNIT																				
23	1	KETTLE, 20 GAL.	5.0			120	1		X	24"	5–15P								3/4"	18"	100	
23A	2	FLOOR TROUGH														4"	STUB					TROUGH RECESSED INTO FLOOR
24	1	KETTLE, 40 GAL	5.0			120	1		X	24"	5–15P								3/4"	18"	100	
25	1	STEAMER, CONVECTION	2.0	0.3		120	1	X		24"		(2)3/4"	18"					1–1/2"	3/4"	18"	125	(1)TREATED C.W. SUPPLY, (1) UNTREATED
26	1	COMBI OVEN	3.7			208	1		X	24"	6–15P	3/4"	24"					2"	3/4"	18"	103.8	
27	1	COMBI OVEN W/STAND	3.7			208	1		X	24"	6–15P	3/4"	24"					2"	3/4"	18"	103.8	
28	1	CONVECTION OVEN, DOUBLE	(2)8.0		3/4	(2)120	1		X	36"	5–15P								(2)3/4"	18"	(2)50	
29	1	CONVECTION OVEN, DOUBLE	(2)6.0		1/2	(2)120	1		X	36"	5–15P								(2)3/4"	18"	(2)55	
30	1	TILT SKILLET	1.5			120	1	X		24"		1/2"	12"	1/2"	12"				3/4"	18"	93	
31	1	FLOOR TROUGH														4"	STUB					TROUGH RECESSED INTO FLOOR
32	1	RANGE, 6 BURNER																	3/4"	18"	188	
33	1	GRIDDLE																	3/4"	18"	92	
34	LOT	EXHAUST HOOD				*		X														
34A	LOT	EXHAUST FAN				*		X														
34B	1	MAKEUP AIR FAN				*		X											*			
35	1	FIRE SUPPRESSION SYSTEM				*		X														
36	1	SHELVING UNIT																				
37	2	SHELVING UNIT																				
38	LOT	INSULATED TRANSPORT CARTS																				
38A	1	INSULATED TRANSPORT CART																				
39	1	WORKTABLE W/PREP SINK										1/2"	12"	1/2"	12"			1–1/2"				
40	1	FOOD PROCESSOR	15.0		3	120	1		X	48"	5–20P											
41	1	FOOD PROCESSOR	7.0		1	120	1		X	48"	5–15P											
42	1	BLENDER	13.0		3.5	120	1		X	48"	5–15P											
43	1	POT RACK, CEILING-MOUNT																				
44	1	POT RACK, CEILING-MOUNT																				
45	1	MIXER, 60 QT	18.0		2–3/4	208	1	X		48"												
46	1	WORKTABLE, MOBILE																				
47	1	SHELVING UNIT																				
48	1	WORKTABLE																				
49	1	WORKTABLE																				
50	1	WORKTABLE																				
51	1	WORKTABLE																				
52	1	SLICER, AUTOMATIC	6.0		1/2	120	1		X	24"	5–15P											
53	1	WORKTABLE W/OVERSHELF																				
54	LOT	INGREDIENT BINS																				
55	1	MIXER, 5 QT	2.9		1/6	120	1		X	24"	5–15P											
56	1	HAND SINK										1/2"	12"	1/2"	12"	1–1/2"	20"					
57	2	REFRIGERATED MOBILE CABINET	8.5			120	1		X	24"	5–15P											
58	1	WORKTABLE																				
59	1	BEVERAGE COUNTER W/SINK										1/2"	12"	1/2"	12"			1–1/2"				
60	1	COFFEE BREWER	27.5	6.0		208	1	X		48"		3/8"	48"									
61	1	REFRIGERATOR, 3 DOOR	10.9			120	1		X	60"	5–15P											
	3	HEATED MOBILE CABINETS	12.5	1.5		120	1		X	24"	5–15P											
63	1	HEATED MOBILE CABINET	12.5	1.5		120	1		X	24"	5–15P											
64	1	SOILED DISHTABLE, L-SHAPED										1/2"	12"	1/2"	12"			1–1/2"				
65	LOT	DISH RACK SHELVES																				
66	1	DISHWASHER, CONVEYOR	60.6	15.0	(2)2	208	3	X		60"		1/2"	12"	1/2"	12"			2"				
	1	BOOSTER HEATER, 30kW	83.9	30.0		208	3	X		60"												
67	1	CONDENSATE HOOD, 4' X 7'																				
68	1	CONDENSATE EXHAUST FAN				*		X														
69	1	CLEAN DISHTABLE																				
70	1	DISH RACK SHELF																				
71	1	SHELVING UNIT																				
72	LOT	UTILITY CART																				
73	1	SHEET PAN RACK																				
74	1	SHELVING UNIT																				
75	1	3 COMPARTMENT SINK										1/2"	12"	1/2"	12"	(3)1-1/2"	*					*THRU GREASE TRAP
75A	1	WALL SHELF																				
75B	1	WALL SHELF																				
76	1	1 COMPARTMENT SINK										1/2"	12"	1/2"	12"			1–1/2"				
76A	1	DISPOSER	5.1		1	208	1	X		18"		1/2"	18"			1–1/2"	STUB					
77	1	HOSE REEL										1/2"	60"									
78	1	HEATED CABINET, MOBILE	16.7	2.0		120	1		X	24"	5–20P											
78A	1	WASHDOWN STATION										1/2"	48"	1/2"	48"							
79	1	FLOOR TROUGH														4"	STUB					TROUGH RECESSED INTO FLOOR
80	2	WALK-IN FREEZER	5.0			120	1	X		DFA												FOR LIGHTS/HEATERS
80A	2	FREEZER CONDENSER	33.0		2–1/2	208	1	X		DFA												
80B	2	FREEZER EVAPORATOR COIL	9.8			208	1	X		DFA								3/4"				
80C	2	DRAIN LINE HEATER	10.0			120	1		X	DFA	5–15P											
81	1	WALK-IN COOLER	5.0			120	1	X		DFA												FOR LIGHTS/HEATERS
81A	1	COOLER CONDENSER	19.0		3/4	208	1	X		DFA												
81B	1	COOLER EVAPORATOR COIL	0.8			120	1	X		DFA								3/4"				
82	LOT	SHELVING – WALK-IN																				
83	3	DUNNAGE RACK																				
84	–	–SPARE NUMBER–																				
85	LOT	SHELVING – DRY STORAGE																				



DATE	No.	REVISION

STRAFFORD COUNTY NURSING HOME
COUNTY FARM CROSS ROAD
DOVER, NH 03820

DRAWING TITLE
CONCEPT KITCHEN LAYOUT

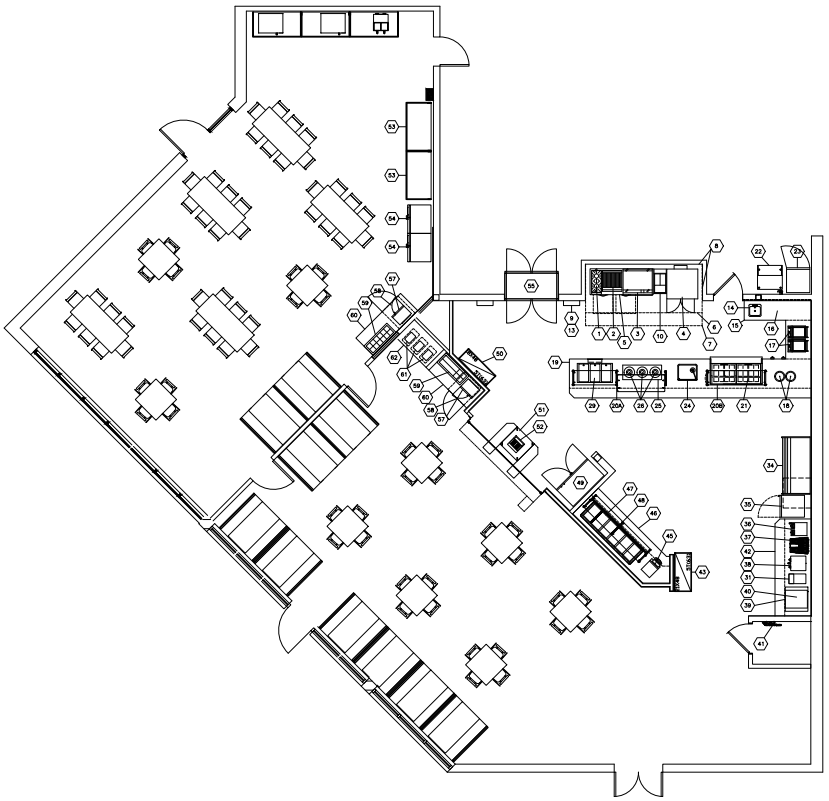
SCALE	DATE	DRAWN BY
1/4" = 1'–0"	05/22/2023	KDS

PAGE SIZE	DRAWING NUMBER
ARCH–E1	FS–0.1

Alternative Sales Corp.
Restaurant Equipment and Design
135 Route 125
Kingston, NH 03848
Tel: 603-642-3873
Fax: 603-642-5787

FOODSERVICE EQUIPMENT SCHEDULE

MK.	QTY	DESCRIPTION	ELECTRICAL								WATER					WASTE			GAS			REMARKS
			FLAMPS	KW	HP	VOLTS	PHASE	DIRECT	PLUG	AFF	NEMA	COLD	AFF	HOT	AFF	AFF	DIRECT	INDIRECT	SIZE	AFF	MBTUH	
1	1	HOT PLATE																	3/4"	18"	50	
2	1	CHARBROILER																	3/4"	18"	58	
3	1	GRIDDLE																	3/4"	18"	96	
4	1	CONVECTION OVEN	8.0		3/4	120	1		X	48"									3/4"	18"	45	
5	1	CHEF BASE, REFRIGERATED	4.5		1/4	120	1		X	24"	5-15P											
6	1	EXHAUST HOOD				120	1	X														FOR LIGHTS
7	1	MAKEUP AIR PLENUM																				
8	1	S/S WALL PANELS																				
9	1	FIRE SUPPRESSION SYSTEM				120	1	X														INTERWIRE TO ALARMS BY E.C.
10	1	FRYER																	3/4"	18"	70	
11	1	EXHAUST FAN	5.9		3	208	3	X														COORDINATE LOCATION W/G.C.
12	1	HEATED MAKEUP AIR FAN	4.6		1-1/2	208	3	X											1"		207.8	COORDINATE LOCATION W/G.C.
13	1	ELECTRICAL SYSTEM				208	3	X														INTERWIRING BY E.C.
14	1	HAND SINK, DROP-IN										1/2"	12"	1/2"	12"	1-1/2"	20"					
15	1	MILLWORK, BACK BAR COUNTER																				
16	2	WALL SHELF																				
17	2	PANINI GRILL	15.0	1.8		120	1		X	48"	5-15P											
18	2	SOUP WELL	6.7	0.8		120	1	X		24"								1/2"				I.W. TO FLOOR DRAIN
19	1	MILLWORK, SERVING COUNTER																				
20A	1	PROTECTOR CASE	0.3			120	1	X														FOR LIGHTS
20B	1	PROTECTOR CASE	0.3			120	1	X														FOR LIGHTS
21	1	SANDWICH/SALAD UNIT	4.8		1/3	120	1		X	24"	5-15P											
22	1	ICE MAKER W/FILTER	15.0			120	1		X	24"	5-15P	1/2"	24"					3/4"				
23	1	FREEZER, 1 DOOR	7.8		1/2	120	1		X	60"	5-15P											
24	1	CARVING STATION	15.0	0.75		120	1		X	24"	5-15P											
25	1	HEATED DISPLAY SURFACE	7.1	0.85		120	1		X	24"	5-15P											
26	3	HEAT LAMPS	3.2	0.375		120	1	X		DFA												
27	--	SPARE NUMBER																				
28	--	SPARE NUMBER																				
29	1	HOT FOOD WELL, DROP-IN	17.9	3.72		208	1	X		24"								1/2"				I.W. TO FLOOR DRAIN
30	--	SPARE NUMBER																				
31	1	BEVERAGE DISPENSER	8.0			120	1		X	48"	5-15P											
32	--	SPARE NUMBER																				
33	--	SPARE NUMBER																				
34	1	GRAB N' GO CASE	15.0		1	120/208-240	1		X	24"	14-20P											
35	1	FREEZER, MERCHANDISER	8.2		2/3	120	1		X	24"	5-15P											
36	1	COFFEE AIRPOT BREWER	11.4	1.32		120	1		X	48"	5-15P	1/4"	48"									
37	7	AIRPOTS																				WITH AIRPOT RACK
38	1	BREWER	354-3052-48			120/208-240	1	X		48"						3/8"	48"					
39	1	ICE/WATER DISPENSER	1.4			120	1		X	48"	5-15P	1/2"	48"					3/4"				I.W. TO FLOOR SINK
40	1	ICE MAKER	7.2			208	1	X		84"		1/2"	84"					3/4"				I.W. TO FLOOR SINK
41	1	WATER FILTER																				
42	1	MILLWORK, BEVERAGE COUNTER																				
43	1	TRAY SHELF																				
44	--	SPARE NUMBER																				
45	1	TOASTER, CONVEYOR	14.0	2.8		208	1		X	48"	6-20P											
46	1	MILLWORK, SALAD COUNTER																				
47	1	COLD FOOD WELL, DROP-IN	10.7		1/2	120	1		X	24"	5-15P							3/4"				I.W. TO FLOOR SINK
48	1	PROTECTOR CASE	0.3			120	1	X		24"												FOR LIGHTS
49	1	REFRIGERATOR, MERCHANDISER	8.5		1/2	120	1		X	24"	5-15P											
50	1	SHELVING UNIT																				
51	1	MILLWORK, CASHIER COUNTER																				
52	1	P.O.S. SYSTEM				120	1	X		24"												
53	2	VENDING MACHINES				120	1	X		24"												
54	2	REFRIGERATOR	6.0		3/5	120	1		X	24"	5-15P											
55	1	REFRIGERATOR, PASS-THRU	14.5		1/2	120	1		X	72"	5-15P											
56	--	SPARE NUMBER																				
57	2	MICROWAVE OVEN	13.0	1.55		120	1		X	48"	5-15P											
58	2	REFRIGERATOR, U/C	3.3		1/5	120	1		X	24"	5-15p											
59	2	CONDIMENT CONTAINERS																				
60	2	MILLWORK, CONDIMENT COUNTER																				
61	3	TRASH BINS																				WITH TRASH CHUTES
62	1	MILLWORK, TRASH CABINET																				



DATE	No.	REVISION

STRAFFORD COUNTY NURSING HOME
COUNTY FARM CROSS ROAD
DOVER, NH 03820

DRAWING TITLE
CONCEPT KITCHEN LAYOUT

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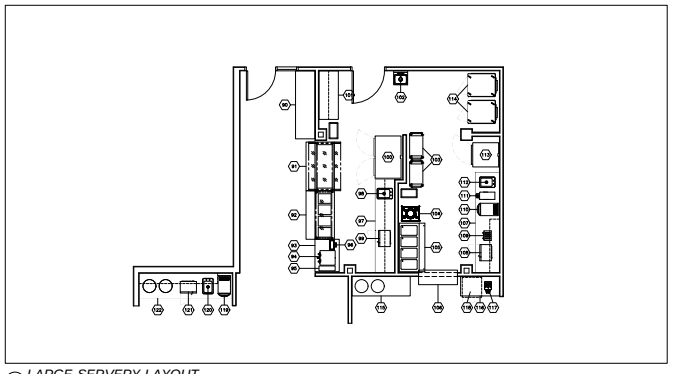
1/8" = 1'-0"	05/23/2023	KDJ
PAGE SIZE		DRAWING NUMBER
ARCH-E1		FS-0.3

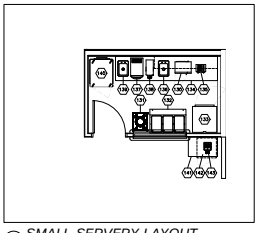
Alternative Sales Corp.
Restaurant Equipment and Design
135 Route 125
Kingston, NH 03848
Tel. 603-642-3873
Fax: 603-642-5787

FOODSERVICE EQUIPMENT SCHEDULE

ITEM#	QTY	DESCRIPTION	ELECTRICAL									WATER				WASTE			GAS				REMARKS
			AMPS	KW	HP	VOLTS	SINGLE PHASE	THREE PHASE	PLUG	AFF	NEMA	COLD	AFF	HOT	AFF	DIRECT	AFF	INDIRECT	SIZE	AFF	MBTUH		
90	1	MILLWORK, TRAY/UTENSIL COUNTER																					
91	1	COLD FOOD WELL	7.8		1/3	120	1		X	18"	5-15P							1"					
92	1	STEAMTABLE, 4 WELL	16.0	1.92		120	1		X	18"	5-20P							1"					
93	1	MILLWORK, STORAGE COUNTER																					
94	1	COFFEE BREWER	13.9	1.67		120	1	X		48"		1/4"	48"										
95	1	CUP DISPENSER																					
96	1	P.O.S. REGISTER	10.0			120	1		X	24"	5-15P												
97	1	MILLWORK, COUNTER W/CABINET																					
98	1	SINK, DROP-IN										1/2"	12"	1/2"	12"			1-1/2"					
99	1	MICROWAVE OVEN	13.4	1.0		120	1		X	48"	5-15P												
100	1	REFRIGERATOR, 2 DOOR	8.5			120	1		X	60"	5-15P												
101	1	MILLWORK, COUNTER W/CABINET																					
102	1	HAND SINK										1/2"	12"	1/2"	12"	1-1/2"	20"						
103	LOT	ALT. CART STORAGE																					
104	1	HEATED DISH DISPENSER, MOBILE	3.8	0.45		120	1		X	24"	5-15P												
105	1	STEAMTABLE, 4 WELL	23.3	2.8		120	1		X	18"	5-30P							(4)1"					
106	1	PASS-THRU SHELF																					
107	1	MILLWORK, COUNTER W/CABINET																					
108	1	MICROWAVE OVEN	13.4	1.0		120	1		X	48"	5-15P												
109	1	TOASTER, POP-UP	18.33	2.2		120	1		X	48"	5-20P												
110	1	ICE/WATER DISPENSER	6.0			120	1		X	48"	5-15P	3/4"	48"					25/32"					
111	1	COFFEE BREWER	13.3	1.6		120	1		X	48"	5-15P	1/4"	48"										
112	1	SINK, DROP-IN										1/2"	12"	1/2"	12"			1-1/2"					
113	1	REFRIGERATOR, 1 DOOR	4.9		1/5	120	1		X	60"	5-15P												
114	LOT	ALT. CART STORAGE																					
115	1	MILLWORK, TRASH COUNTER																					
116	1	MILLWORK, COUNTER																					
117	1	COFFEE SATELLITE WARMER	1.0	0.1		120	1		X	48"	5-15P												
118	1	REFRIGERATOR, UNDER COUNTER	2.0		1/6	120	1		X	24"	5-15P												
119	1	ICE/WATER DISPENSER	6.0			120	1		X	48"	5-15P	3/4"	48"					25/32"					
120	1	SINK, DROP-IN										1/2"	12"	1/2"	12"			1-1/2"					
121	1	MICROWAVE OVEN	13.4	1.0		120	1		X	48"	5-15P												
122	1	MILLWORK, TRASH COUNTER																					
123	–	–SPARE NUMBER–																					
124	–	–SPARE NUMBER–																					
125	–	–SPARE NUMBER–																					
126	–	–SPARE NUMBER–																					
127	–	–SPARE NUMBER–																					
128	–	–SPARE NUMBER–																					
129	–	–SPARE NUMBER–																					
130	1	MICROWAVE OVEN	13.4	1.0		120	1		X	48"	5-15P												
131	1	HEATED DISH DISPENSER, MOBILE	3.8	0.45		120	1		X	24"	5-15P												
132	1	STEAMTABLE, 3 WELL	17.5	2.1		120	1		X	18"	5-30P							(3)1"					
133	1	REFRIGERATOR, MERCHANDISER	7.4		1/3	120	1		X	60"	5-15P												
134	1	MILLWORK, COUNTER W/CABINET																					
135	1	TOASTER, POP-UP	18.33	2.2		120	1		X	48"	5-20P												
136	1	SINK, DROP-IN										1/2"	12"	1/2"	12"			1-1/2"					
137	1	ICE/WATER DISPENSER	6.0			120	1		X	48"	5-15P	3/4"	48"					25/32"					
138	1	COFFEE BREWER	13.3	1.6		120	1		X	48"	5-15P	1/4"	48"										
139	1	SINK, DROP-IN										1/2"	12"	1/2"	12"	1-1/2"	20"						
140	LOT	ALT. CART STORAGE																					
141	1	MILLWORK, COUNTER																					
142	1	REFRIGERATOR, UNDER COUNTER	2.0		1/6	120	1		X	24"	5-15P												
143	1	COFFEE SATELLITE WARMER	1.0	0.1		120	1		X	48"	5-15P												



LARGE SERVERY LAYOUT
SCALE: 1" = 1'-0"



SMALL SERVERY LAYOUT
SCALE: 1" = 1'-0"

DATE	No.	REVISION

STRAFFORD COUNTY NURSING HOME
COUNTY FARM CROSS ROAD
DOVER, NH 03820

DRAWING TITLE
CONCEPT SERVERY LAYOUTS

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ARCH-E1		FS-0.2

Alternative Sales Corp.
Restaurant Equipment and Design
135 Route 125
Kingston, NH 03848
Tel: 603-642-3873
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Proposed Strafford County Nursing Home

11/15/2023

Building Construction Cost Summary	GSF/ %	$ / SF	COSTS
Proposed New Construction	**310,889**	**$413.80**	**$128,645,246**
Bond, escalation, Insurance, CM Fees, Contingencies, etc	**LS**	**$22.88**	**$7,500,000**
Total SF New Building/ Budget Construction Costs	**310,889**		**$136,145,246**
CM & Escalation Design Contingency	**10.0%**		**$13,614,525**
Sub-Total (Building Cost)	**$481.71 /SF**		**$149,759,771**

Summary Project Hard Costs/ Allowances and Unknowns			
Site Costs			
Water Service/ Well Connection Fees Disconnect old services		LS	**$500,000**
Geothermal Heating and Cooling		LS	**$5,000,000**
Solar Allowance		LS	**$1,100,000**
Power Connection Fees		LS	**$150,000**
Telephone/cable		LS	**$150,000**
Hardsurface Improvements infrastructure future Housing		LS	**$0**
Off Site costs (Impact Fees)		LS	**$500,000**
Wetland mitigation		LS	**$0**
Landscape (Soft and Hardscapes)		LS	**$400,000**
Sub-Total (Site Costs)	**$25.09 /SF**		**$7,800,000**
Land Purchase			**$0**
Kitchen Equipment/ Appliances		LS	**$1,000,000**
Furniture/ Fixtures/ Equipment Pending Office Interiors Budget		LS	**$3,500,000**
Security System		LS	**$100,000**
Emergency Generator		LS	**$800,000**
Sub-Total (Land & FF&E)	**$17.37 /SF**		**$5,400,000**
Building Costs/ SF (From above)		From Above	**$149,759,771**
Owners Project Contingency		2.0%	**$2,995,195**
Sub-Total (Hard Costs)	**$524.17 /SF**		**$158,154,966**

Project Soft Costs/ Allowances		
Attorney Fees/ Bond Fees	1.00%	**$1,581,550**
Architect/ SCMEP Engineering Fees	6.00%	**$9,489,298**
GeoTech Borings Allowances	LS	**$0**
Construction Testing Allowance	LS	**$300,000**
Clerk of the Works	LS	**$0**
Interest during Construction	LS	**$0**
Hazardous Waste Mitigation	LS	**$0**
Taxes during Construction	LS	**$0**
Utility Reserve (Elec, Gas, Water, Sewer)	LS	**$250,000**
Builders Risk Insurance	LS	**$500,000**
Permitting and Building Permit Fees (State Fire Marshal)	LS	**$300,000**
Administrative Expenses	0.25%	**$395,387**
Off-Site Improvements/ Expenses	LS	**$500,000**
Traffic Study	LS	**$50,000**
Other Impact Studies	LS	**$500,000**
IBC Construction Special Inspections	LS	**$400,000**
Commissioning	LS	**$250,000**
Leeds Certification	LS	**$0**
Sub-Total (Soft Costs)	**$46.69 /SF**	**$14,516,235**
Total Opinion of Project Costs	**$555.41 /SF**	**$172,671,202**

10 Harvey Road
Bedford, NH 03110
P: (603) 624-4600
F: (603) 668-0389

harveyconstruction.com

November 14, 2023

Mr. Jonathan Halle
Principal Architect
Warrenstreet Architects Inc.
4 Crescent Street, Unit 2
Concord, NH 03303

RE: Strafford County Nursing Home – Schematic Design Budget

Dear Jonathan,

Harvey is pleased to provide the attached Estimate for the new Strafford County Nursing Home for your review. The budget estimate was based on the Schematic Design floor plans and elevations provided by Warrenstreet dated 11/9/2023, along with the MEP Narratives dated 8/11/2023 and Civil Narrative dated 9/15/2023. After evaluating all the documents and reviewing with trade partners Harvey's proposed Schematic Design Budget is currently at $149,403,075. Call it $150 million for round numbers. We are carrying a 5% CM Contingency and 5% Escalation at this time. As the plans are further developed and details are worked out, we can review those percentages as a team.

If you have any questions, please do not hesitate to contact me at any time.

Respectfully,

James Brennan
Director of Estimating
Office: (603) 624-4600
Mobile: (603) 365-5872
Email: jbrennan@hccnh.com

Group	Phase	Description	Takeoff Quantity	Total Cost/Unit	Total Amount
1000		GC'S & GR'S	30.00 mnth	380,000.00 /mnth	11,400,000
3000		CONCRETE	310,000.00 sf	15.85 /sf	4,913,272
4000		MASONRY	310,000.00 sf	4.34 /sf	1,344,906
5000		METALS	310,000.00 sf	42.71 /sf	13,238,700
6000		WOOD & PLASTIC	310,000.00 sf	6.94 /sf	2,151,500
7000		THERMAL/MOISTURE	310,000.00 sf	31.12 /sf	9,647,450
8000		OPENINGS	310,000.00 sf	28.41 /sf	8,805,440
9000		FINISHES	310,000.00 sf	47.00 /sf	14,569,670
10000		SPECIALTIES	310,000.00 sf	5.09 /sf	1,579,220
11000		EQUIPMENT	310,000.00 sf	7.00 /sf	2,170,000
12000		FURNISHINGS	310,000.00 sf	0.59 /sf	184,045
13000		SPECIAL CONST - SKYLIGHT	310,000.00 sf	3.99 /sf	1,237,000
14000		CONVEYING SYS	310,000.00 sf	4.68 /sf	1,450,000
210000		FIRE SUPPRESSION	310,000.00 sf	6.80 /sf	2,108,000
220000		PLUMBING	310,000.00 sf	23.40 /sf	7,254,000
230000		HVAC	310,000.00 sf	70.37 /sf	21,814,700
260000		ELECTRICAL	310,000.00 sf	66.48 /sf	20,609,400
310000		EARTHWORK	9.50 acre	400,000.00 /acre	3,800,000

Estimate Totals

Description	Amount	Totals	Rate	Cost Basis	Cost per Unit	Percent of Total
Labor						
Material	1,952,439				6.298 /sf	1.31%
Subcontract	126,324,864				407.500 /sf	84.55%
Equipment						
Other						
	128,277,303	**128,277,303**			**413.798 /sf**	**85.86**
Performance & Payment Bond	873,788			B	2.819 /sf	0.58%
P & P Bond Ext over 24 mths	25,655		0.020 %	T	0.083 /sf	0.02%
Builders Risk Insurance	186,754		1.250 $ / 1,000	T	0.602 /sf	0.12%
General Liability & Umbrella P	1,337,158		0.895 %	T	4.313 /sf	0.89%
Software Licenses	209,164		0.140 %	T	0.675 /sf	0.14%
Pre Construction Services %	327,275		0.250 %	T	1.056 /sf	0.22%
CM Contingency %	6,561,855		5.000 %	T	21.167 /sf	4.39%
CM Fee %	4,133,969		3.000 %	T	13.335 /sf	2.77%
Escalation %	7,470,154		5.000 %	T	24.097 /sf	5.00%
Total		***149,403,075***			***481.945 /sf***	

Group	Phase	Description	Takeoff Quantity	Total Cost/Unit	Total Amount
1000		**GC'S & GR'S**			
	1050	**General Conditions & Requirements**			
		General Conditions & Requirements	30.00 mn	380,000.00 /mn	11,400,000
3000		**CONCRETE**			
	3010	**Concrete Subs**			
		Foundation Subcontractor	2,510.00 cy	750.00 /cy	1,882,500
	3015	**Flatwork Sub**			
		Flatwork Sub SOG	61,600.00 sf	3.00 /sf	184,800
		Flatwork Sub SOG - Loading Dock	7,305.00 sf	5.00 /sf	36,525
		Flatwork Sub SOD	257,265.00 sf	2.00 /sf	514,530
	3019	**Concrete Equipment**			
		Concrete Pumps	20.00 ea	1,500.00 /ea	30,000
	3200	**Vapor Barrier**			
		Vapor Barrier 10 Mil Poly	61,600.00 sf	0.40 /sf	24,640
	3251	**Fdn Wall Concrete**			
		Foundation Wall Conc4000 psi	2,510.00 cy	175.00 /cy	439,250
	3255	**Slab Concrete**			
		Slab Conc4000 psi	5,422.00 cy	175.00 /cy	948,850
	3408	**Grout Baseplate**			
		Grout Baseplates	130.00 ea	110.00 /ea	14,300
	3450	**Perimeter Insul**			
		Perimeter Insulation	18,040.00 sf	2.50 /sf	45,100
	3810	**Reinf. Steel**			
		Buy Reinforcing Steel	251.00 tn	1,400.00 /tn	351,400
		Install Reinforcing Steel	251.00 tn	850.00 /tn	213,350
	3850	**Wire Mesh**			
		Buy Wire Mesh	325,753.00 sf	0.45 /sf	146,589
		Labor to Install Wire Mesh	325,753.00 sf	0.25 /sf	81,438
4000		**MASONRY**			
	4105	**Masonry**			
		CMU Elevator & Stair Shafts	48,166.00 sf	25.00 /sf	1,204,150
		CMU Interior Blocking	6,398.00 sf	22.00 /sf	140,756
5000		**METALS**			
	5100	**Structural Steel**			
		Structural Steel - See Back-Up)	2,517.00 tn	4,700.00 /tn	11,829,900
	5200	**Metals**			
		Misc Metals (See Back-Up)	1.00 ls	1,408,800.00 /ls	1,408,800
6000		**WOOD & PLASTIC**			
	6010	**Wood & Plastics**			
		Cafe Station	165.00 lf	400.00 /lf	66,000
		Corridor Station Casework	246.00 lf	350.00 /lf	86,100
		Nurse Station	370.00 lf	1,000.00 /lf	370,000
		Nurse Station - Back Area	130.00 lf	300.00 /lf	39,000
		Patient Room System	2,426.00 lf	400.00 /lf	970,400
		Wood & Plastics	310,000.00 sf	2.00 /sf	620,000
7000		**THERMAL/MOISTURE**			
	7120	**Waterproofing**			
		Waterproofing	15,465.00 sf	6.00 /sf	92,790
	7215	**Spray on Fireproofing**			
		Spray on Fireproofing	310,000.00 sf	0.50 /sf	155,000
	7480	**Siding**			
		Siding System w/ AVB	110,735.00 sf	60.00 /sf	6,644,100
		Composite Metal Panel Window Shading	243.00 ea	500.00 /ea	121,500
	7500	**Membrane Roofing**			
		TPO Roofing	58,220.00 sf	23.00 /sf	1,339,060
		Porte Cochere Roofing	4,400.00 sf	20.00 /sf	88,000
		Sloped Roofing	10,800.00 sf	40.00 /sf	432,000
	7840	**Firestopping**			
		Firestopping Sub	310,000.00 sf	1.50 /sf	465,000
	7920	**Joint Sealants**			
		Joint Sealants Sub	310,000.00 sf	1.00 /sf	310,000
8000		**OPENINGS**			
	8110	**Doors, Frames & Hardware**			
		Common Door (Office/Mech/Toilet/Staff)	556.00 ea	1,700.00 /ea	945,200
		Ext HM Door	14.00 ea	2,500.00 /ea	35,000
		Stairwell / Corridor Door	154.00 ea	2,500.00 /ea	385,000
		Tenant Bathroom Door	234.00 ea	1,200.00 /ea	280,800
		Tenant Door	234.00 ea	2,000.00 /ea	468,000
	8180	**Access Control Hardware**			
		Access Control Hardware	1.00 ls	100,000.00 / ls	100,000
	8200	**Overhead Doors**			
		Overhead Door Sub	3.00 ea	12,000.00 /ea	36,000
	8410	**Aluminum Entrances**			
		Ext Aluminum Door	10.00 ea	7,500.00 /ea	75,000
		Int Aluminum Door	40.00 ea	5,000.00 /ea	200,000
	8430	**Storefronts**			
		Aluminum Windows	24,682.00 sf	85.00 /sf	2,097,970
		Int Aluminum Glass Walls	29,278.00 sf	65.00 /sf	1,903,070

Group	Phase	Description	Takeoff Quantity	Total Cost/Unit	Total Amount
	8430	Storefronts			
		Glass Floor	370.00 sf	120.00 /sf	44,400
	8440	Curtain Wall			
		Curtain Wall	14,900.00 sf	150.00 /sf	2,235,000
9000		FINISHES			
	9252	Gyp Ext Wall Assemblies			
		Exterior Wall Assembly	150,317.00 sf	18.00 /sf	2,705,706
	9255	Gyp. Int. Wall Assemblies			
		Common Wall - 14'-0"	114,858.00 sf	10.00 /sf	1,148,580
		Corridor Wall - 14'-0"	243,456.00 sf	12.00 /sf	2,921,472
		Shaft Wall - 14'-0"	31,680.00 sf	15.00 /sf	475,200
		Tenant Wall - 14'-0"	71,589.00 sf	12.00 /sf	859,068
		Wet Wall - 14'-0"	45,268.00 sf	8.00 /sf	362,144
	9270	Drywall Ceilings/ Soffits			
		Gyp Ceiling	68,280.00 sf	6.00 /sf	409,680
		Gyp Wet Ceiling	23,000.00 sf	8.00 /sf	184,000
		Soffit Allowance	1.00 ls	100,000.00 /ls	100,000
	9500	Acoustical Ceilings			
		Backhouse ACT	17,742.00 sf	5.00 /sf	88,710
		Common ACT	161,911.00 sf	6.00 /sf	971,466
		Dietary / Kitchen / Staff ACT	18,124.00 sf	8.00 /sf	144,992
	9555	Floor Prep			
		Floor Prep	310,000.00 sf	1.00 / sf	310,000
	9600	Flooring			
		Activities Flooring	14,596.00 sf	10.00 /sf	145,960
		BOH / Storage	23,000.00 sf	3.00 /sf	69,000
		Common Bathroom Flooring	7,930.00 sf	12.00 /sf	95,160
		Common Flooring	28,522.00 sf	7.00 /sf	199,654
		Corridor/Common Flooring	93,927.00 sf	7.00 /sf	657,489
		Dietary /Kitchen /Staff	18,252.00 sf	12.00 /sf	219,024
		Facilities	6,750.00 sf	12.00 /sf	81,000
		Receiving	3,820.00 sf	5.00 /sf	19,100
		Staff Flooring	14,302.00 sf	8.00 /sf	114,416
		Stair Landings	7,426.00 sf	10.00 /sf	74,260
		Tenant Bathroom Flooring	17,133.00 sf	12.00 /sf	205,596
		Tenant Room Flooring	53,242.00 sf	7.00 /sf	372,694
		Stair Treads	864.00 ea	250.00 /ea	216,000
	9650	Flooring Base			
		Flooring Base	67,679.00 lnft	5.00 /lnft	338,395
	9900	Painting			
		Wall Paint	575,400.00 sf	1.25 /sf	719,250
		Ceiling Paint	91,427.00 sf	2.00 /sf	182,854
		Door Frame Paint	1,192.00 ea	150.00 /ea	178,800
10000		SPECIALTIES			
	10100	Visual Display Boards			
		Visual Display Boards	1.00 ls	50,000.00 /ls	50,000
	10150	Toilet Partitions			
		Toilet Partitions	1.00 ls	50,000.00 /ls	50,000
	10190	Cubicle Curtain Track			
		Cubicle Curtain Track w/ hooks	1.00 ls	25,000.00 /ls	25,000
	10260	Corner Guards			
		Wall Protection	25,000.00 sf	15.00 /sf	375,000
	10261	Ballet Bar			
		Ballet Bar	1.00 ls	5,000.00 /ls	5,000
	10310	Manufactured Fireplace			
		Manufactured Fireplace	5.00 ea	10,000.00 /ea	50,000
	10400	Signs			
		Signs	1,192.00 ea	160.00 /ea	190,720
	10500	Lockers			
		Lockers	200.00 each	500.00 /each	100,000
	10520	Firefighting Dev			
		Fire Extinguisher	110.00 ea	350.00 /ea	38,500
	10550	Postal Specialties			
		Mail Boxes & Mail Drop Slots	1.00 ea	10,000.00 /ea	10,000
	10605	Wire Mesh Partitions			
		Wire Mesh Partitions	1.00 ls	50,000.00 /ls	50,000
	10650	Folding Partitions			
		Operable Partitions	900.00 sf	50.00 /sf	45,000
	10800	Toilet Accessories			
		Toilet Accessories	295.00 ea	2,000.00 /ea	590,000
11000		EQUIPMENT			
	11050	Equipment			
		Equipment	310,000.00 sf	7.00 /sf	2,170,000
12000		FURNISHINGS			
	12020	Furnishings			
		Furnishings	310,000.00 sf	0.59 /sf	184,045
13000		SPECIAL CONST - SKYLIGHT			
	13200	Large Skylight			
		Large Skylight over Courtyard	5,810.00 sf	200.00 /sf	1,162,000

Group	Phase	Description	Takeoff Quantity	Total Cost/Unit	Total Amount
	13300	Features			
		Waterfall Feature	1.00 ea	75,000.00 /ea	75,000
14000		CONVEYING SYS			
	14020	Elevators			
		Elevators (4 Elev at 6 Stops Each, 1 at 5)	29.00 stop	50,000.00 /stop	1,450,000
210000		FIRE SUPPRESSION			
	211300	Fire-Suppression Sprinkler Systems			
		Sprinkler	310,000.00 sf	6.80 /sf	2,108,000
220000		PLUMBING			
	220100	Plumbing			
		Plumbing	310,000.00 sf	23.40 /sf	7,254,000
230000		HVAC			
	230100	HVAC			
		HVAC	310,000.00 sf	70.37 /sf	21,814,700
260000		ELECTRICAL			
	260100	Electrical			
		Electrical	310,000.00 sf	60.74 /sf	18,829,400
	265600	Site Lighting			
		Site Lighting	1.00 ls	680,000.00 /ls	680,000
	266100	Solar Array			
		Solar Array System	1.00 ls	1,100,000.00 /ls	1,100,000
310000		EARTHWORK			
	310100	Earthwork			
		Sitework	9.50 acre	400,000.00 /acre	3,800,000

Estimate Totals

Description	Amount	Totals	Rate	Cost Basis	Cost per Unit	Percent of Total
Labor						
Material	1,952,439				6.298 /sf	1.31%
Subcontract	126,324,864				407.500 /sf	84.55%
Equipment						
Other						
	128,277,303	**128,277,303**			**413.798 /sf**	**85.86**
Performance & Payment Bond	873,788			B	2.819 /sf	0.58%
P & P Bond Ext over 24 mths	25,655		0.020 %	T	0.083 /sf	0.02%
Builders Risk Insurance	186,754		1.250 $ / 1,000	T	0.602 /sf	0.12%
General Liability & Umbrella P	1,337,158		0.895 %	T	4.313 /sf	0.89%
Software Licenses	209,164		0.140 %	T	0.675 /sf	0.14%
Pre Construction Services %	327,275		0.250 %	T	1.056 /sf	0.22%
CM Contingency %	6,561,855		5.000 %	T	21.167 /sf	4.39%
CM Fee %	4,133,969		3.000 %	T	13.335 /sf	2.77%
Escalation %	7,470,154		5.000 %	T	24.097 /sf	5.00%
Total		***149,403,075***			***481.945 /sf***	

THIS DOCUMENT IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY AND IS NOT INTENDED TO INCLUDE, SUPPLEMENT, OR REPLACE ANY REQUIREMENTS AS PART OF THE CONSTRUCTION DOCUMENTS.

Mechanical
Basis of Design

Strafford County Nursing Home
Dover, NH

Update - November 3, 2023

Prepared By:

Jason Parkhurst

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Offices in Vermont, New Hampshire, Maine and New York

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Scope of Work

DuBois & King has been contracted by Warren Street Architect to design the mechanical systems for an approximately 342,000 sq. ft., 216 bed nursing home complex located in Dover, NH. Additionally, infrastructure for 24 additional beds on the 5th floor will be considered. This Basis of Design (BOD) document is provided to facilitate a discussion with the owner to determine desired features for the HVAC systems.

The facility includes nursing home, assisted living and independent living spaces.

The mechanical design will prioritize infection control, comfort and patient health above all else. Fire prevention and life safety will also be a priority. System reliability, maintenance cost, energy cost and future adaptability will all be considered for any design.

Codes, Standards, and Guidelines

Enforced

- NH Building Code and Amendments – 2018
- International Building Code (IBC) - 2018
- Uniform Fire - NFPA 1-2015
- Life Safety - NFPA 101-2015
- International Mechanical Code (IMC)- 2018
- International Energy Conservation Code (IECC) – 2018
- Federal Guidelines Institute Guidelines for design and construction of Residential Health, Care, and support facilities – FGI 2018
- ASHRAE 170 – Ventilation of Health Care Facilities - 2017
- Standard for installation of Air Conditioning Systems – NFPA 90A-2015
- Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations – NFPA 96-2017
- Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances – NFPA-211-2016

Reference

- Thermal Comfort - ASHRAE 55-2013
- Refrigerants – ASHRAE 15 & 34
- SMACNA Duct Construction

General Considerations

Infection Control

Infection sources within nursing homes consist of bacterial infections, viral infections, molds and chemicals. Outdoor air intakes will be located to minimize cross contamination possibilities. Ventilation systems will be designed with pressure relationships per table 4 (interior air) below to help control the spread of air born infectious agents between areas within the building and enable proper containment and removal of pathogens from the nursing home environment. Filtration will be designed into the system

in accordance with the interior air chart as well to clean recirculated and ventilation air. Humidity will be maintained within the ranges listed in the indoor air chart above where required.

HVAC System description

Main heating and cooling equipment - The HVAC system selection will be based on energy modeling software and owner feedback to determine the best and most cost effective system. Maintenance considerations will be taken into account as well. Natural gas is available at the site.

We have been informed that steam is not required for the facility.

The heating and cooling system will be a water source heat pump loop utilizing high efficiency water to air heat pumps located in the spaces or located in ceilings and ducted to multiple spaces depending on space zoning requirements. A low temperature heat pump loop operating between 40 deg. F and 86 deg. F could provide heating and cooling for the building. A geothermal wellfield will be utilized to maintain the temperature of the loop. A natural gas condensing gas boiler will be utilized to supplement the heat pump loop as necessary and provide redundancy for the facility. A closed circuit cooling tower located outdoors will be designed to maintain the high side temperature of the loop. Underground piping between the tower and the heat pump loop would need to be protected from freezing. The geothermal well field will be the first stage of heating or cooling for the building. The natural gas boiler and cooling tower will be second stage and utilized for redundancy.

Size of the geothermal wellfield will be determined based on available tax credits and payback periods as determined by energy modeling software. The geothermal wellfield will be a closed loop vertical borehole wellfield.

A high temperature (140 deg. F) heating water loop will provide heating to spaces that may require higher temperature water for heating of spaces.

Terminal units - The design will incorporate high efficiency water to air heat pumps (WAHP) system served by the heat pump loop. Two stage or variable speed terminal equipment will be selected where sizing allows. Extended range geothermal heat pumps will be utilized for the low water temperatures that will be seen in the heat pump loop. Heat pumps with hot gas reheat will be considered for some dehumidification control.

Kitchen Exhaust/MAU – a kitchen exhaust system will be designed in accordance with NFPA 96. A gas fired makeup air system will be designed to provide tempered makeup air to the kitchen.

Pumps – Pumps will be variable speed, controller based on differential pressure between the supply water and return water.

Controls – a building management system (BMS) will be designed for the facility to provide to monitor and manage the mechanical systems throughout the facility. Discussions with owner to determine if the owner has a preference regarding controls vendors.

Energy Recovery – Wherever possible, energy recovery devices will be utilized to recover heat from bathroom exhaust to temper the ventilation air. Energy recovery units with water source heat pumps will be utilized where possible to take advantage of tax credits that may be available.

Fire and life safety

HVAC systems will be design in accordance with IBC-2018, IMC-2018 & NFPA 1, NFPA 101 & NFPA 90A requirements. Systems will include duct fire dampers, duct smoke detectors and fire sealing where required by code. Piping penetrating fire walls will be fire sealed with fire rated fire caulking. Ducts penetrating 2 or more floors will be located in fire rated shafts.

Reliability (Equipment Life)

Given that a nursing home operates 24 hours a day, 7 days a week, 365 days a year, equipment life may be reduced from the numbers listed below which are median for all building types, and is not strictly based on nursing home data.

Expected median service life of new equipment per ASHRAE is:

- Hydronic Boilers – 25 years
- Burners – 21 years
- Cooling Towers – 20 years
- Rooftop Air Handling equipment – 15 years
- Commercial Water to Air Heat Pumps – >24 years
- Energy Recovery Ventilation Units – 20 years
- Hydronic Air Coils – 20 years
- VAV boxes – 20 years
- Fans – 20 years
- Shell and Tube Heat Exchangers – 24 years
- Pumps – 20 years base mounted/10 years inline
- Hydronic unit heaters – 25 years
- Ductwork – 30 years
- Piping – 50 years
- Insulation – 20 years
- Dampers – 20 years
- Motors – 18 years
- Controls – 15 years

Maintenance

Clearance for maintenance will be provided for equipment. Some typical maintenance requirements are listed below.

- Indoor Air Recirculation Filters – Require quarterly or semi-yearly replacement.
- Outdoor Air Intake Filters – Periodic replacement.
- Indoor Unit Coils/Filters – Regular filter replacement (2-4x/yr.) and periodic cleaning.
- Central plant equipment – Annual cleaning.
- Chemical treatment for water systems.

Operating Cost

Generally, equipment and systems will be selected to cost-effectively minimize electricity and thermal energy usage and their associated costs as well as help minimize global warming. Available filtration for individual spaces will be critical for system selection. Energy modeling software will be utilized to evaluate potential system energy consumptions to determine the final system selection. A geothermal heat pump system will continue to be investigated to minimize operating cost. Air source heat pumps (VRF) are unlikely to be considered due to reduced refrigerant volume allowances for institutional spaces. Maintenance required and associated costs will also be considered, balancing system complexity vs. potential energy savings.

Energy Recovery

Energy recovery units will be utilized wherever allowed by code to recover heat from bathroom and other local exhausts. Heat from exhaust air streams will be transferred to ventilation air prior to final tempering at terminal equipment. Any energy recovery systems will be designed to minimize possibility of transfer of contaminants from the exhaust air stream to the supply air stream. Locating energy recovery units on the roof will be considered to allow ease of maintenance. A dedicated outside air system (DOAS) will be considered to treat and dehumidify outdoor air before introducing it to the spaces. Energy recovery units providing heating and cooling will have water source heat pump coils.

Controls

A building management system (BMS) will be design for the facility. Control strategies will utilize the latest methods of reducing energy where practical. Control methods may include:

- Supply air temperature reset (based on outside air temperature)
- Water temperature reset (based on outside air temperature)
- Comparative enthalpy Economizer control
- Demand control ventilation for high occupant density spaces
- Variable speed pumping

Utility Availability

- Electrical Power – The site will have single and three phase power available. Equipment will be selected based on available utility power.
- Gas – Natural gas is available on site through Unitil. Unitil has approved the site for use of natural gas. Fossil fueled fired appliances will be used only where necessary.
- Geothermal wellfields will be provided pending owner feedback. Further investigation into tax credits and energy modeling will determine final wellfield sizing.

Sustainability

The following sustainability strategies will be pursued:

- Energy Efficiency – High efficiency water to air heat pumps, central heating and cooling equipment and ventilation energy recovery units will be selected.
- Indoor Air Quality - Minimum MERV 8 filters are required in most spaces and MERV 14 filters are required in several spaces per FGI requirements.

- Acoustic Performance – Noise data will be considered upon mechanical equipment selection. HVAC systems will be designed to minimize noise transfer into spaces. The sound level reaching the occupied spaces will be reduced through effective duct design and lining.
- Thermal Comfort – Systems will be design to meet requirements of ASHRAE Standard 55, increasing the likelihood of occupants comfort.
- Humidity Control – Careful equipment selection, system sensors and controls will be utilized to operate the HVAC systems to maintain proper space humidity where required.
- Where possible energy efficiency measures such as supply air temperature reset on VAV systems and hydronic temperature reset for variable speed pumping systems will be utilized.
- A building management system (BMS) will be designed to maximize energy efficiency through controls.

Spatial Requirements

All HVAC equipment will be located in areas:

- Readily accessible for maintenance.
- For exterior mounted equipment – In areas where aesthetics are minimally impacted and noise control can be mitigated as required.
- For interior mounted equipment - Within rooms or areas most remote from occupied areas designed to be quiet such as bedrooms.
- Where ducts penetrate more than 2 floors, fire rated shafts will be required. Wherever ducts leave the shaft, combination fire and smoke dampers will be required.

Sizing / Diversity / Redundancy

- Generally, high efficiency equipment with the lowest capacity to meet calculated loads will be selected.
- Zone Equipment (water source heat pumps) – Selected to meet maximum heating/cooling load in zone.
    - Heating Condition – Design outdoor air condition, no occupants, plug loads, or lighting, recovery from unoccupied indoor air condition.
    - Cooling Condition – Design outdoor air condition, all occupants, plug loads, and lighting, recovery from unoccupied indoor air condition.
    - Humidity control – provide electric humidification and dehumidification in spaces required to maintain humidity control.
- Redundancy – System redundancy is required by the Federal Guidelines Institute (FGI) to provide a higher level of availability during an equipment failure and during periods of equipment service.
    - Heat loop pumps – Utilize two (2) pumps piped in parallel, each pump sized for 100% system capacity to provide single failure protection.
    - Heating/cooling central equipment (boilers/chillers/cooling towers, etc.) – 100% redundancy in sizing and selection of equipment.

Outdoor Air Intakes

Minimum clearance distances from air pollution sources, and 0.5” bird screens will be included as required by ASHRAE Standard 170

Table 1

Pollution Type	Distance (ft)
General Bathroom Exhaust	25
Kitchen, Grease Laden Exhaust	25
Cooling Towers	25
Plumbing vents	25

Roof intakes shall be located min. 3 feet above roof per ASHRAE 170 requirements.

Sound transmission

Effort will be made to minimize sound transmission from mechanical systems into occupied spaces. FGI maximum noise criteria's listed below will be maintained as a maximum.

Table 2

Space Type	Max NC	Max dBA
Resident Room	40	45
Medication Rooms	35	40
Multiple Occupant residential areas	45	50
Corridor, Community Space	45	50
Conference	35	40
Community Meeting Room	30	35
Communal Dining Room	35	40
Medical or Pharmacy Waiting areas	40	45

Load Considerations

Exterior Air

The site is in Strafford County, NH, located in ASHRAE Climate Zone 5A based on ASHRAE Design Data for Dover, NH and ACCA Manual J per IECC. Values in the climate data Table below from ASHRAE 2021 Durham station 726100. ACCA Manual J values differ with Portsmouth being the closest station. Manual J utilizes 99% heating values vs. 99.6% values for ASHRAE.

ASHRAE 2021 Climate Data for Durham, NH

Table 3

Table 3 Condition		Temperature	Probability
Cooling - Summer	Dry Bulb	86.0°F	1.0%
	Wet Bulb	72.0°F	1.0%
Heating - Winter	Dry Bulb	-2.0F	99.6%

For comparison, Energy Star Values for Strafford County are 89F cooling (1%) and 0F heating (99%)

Interior Air Chart

Based on ASHRAE 170 guidelines for Nursing Home Residential Health, Care, and Support-Specific spaces:

Table 4

Table 4 Room Type	Pressure Relationship to adjacent spaces	Condition	Temperature – Dry Bulb	Humidity		Outdoor Air Min. Air changes per hour	Total Air changes per hour	All Room Air Exhausted directly to outdoors	Minimum Filter Efficiencies
				Min RH	Max RH				
Resident rooms	NR	Cooling	78°F	NR	60	2	2 *[1]	NR	MERV-14
		Heating	70°F						
Resident toilets *[2]	Negative	Cooling	78°F	NR	NR	NR	10	Yes	MERV-14
		Heating	70°F						
Resident corridors	NR	Cooling	75°F	NR	NR	NR	4	NR	MERV-14
		Heating	70°F						
Procedure rooms *[2]	Positive	Cooling	75°F	20	60	3	15	NR	MERV-14
		Heating	70°F						
Treatment Rooms	NR	Cooling	75°F	20	60	2	6	NR	MERV-8
		Heating	70°F						
Medication rooms	NR	Cooling	75°F	NR	60	2	4	NR	MERV-8
		Heating	70°F						
Exam rooms	NR	Cooling	75°F	NR	60	2	6	NR	MERV-8
		Heating	70°F						
Food preparation areas *[2]	NR	Cooling	78°F	NR	NR	2	10	NR	MERV-8
		Heating	72°F						
Dietary Storage *[2]	NR	Cooling	78°F	NR	NR	NR	2	NR	MERV-8
		Heating	72°F						
General Toilet rooms*[2]	Negative	Cooling	78°F	NR	NR	NR	10	Yes	MERV-8
		Heating	72°F						

Room Type	Pressure Relationship to adjacent spaces	Condition	Temperature – Dry Bulb	Humidity		Outdoor Air Min. Air changes per hour	Total Air changes per hour	All Room Air Exhausted directly to outdoors	Minimum Filter Efficiencies
				Min RH	Max RH				
Warewashing *2	Negative	Cooling	NR	NR	NR	NR	10	Yes	MERV-8
		Heating	NR						
Physical Therapy *2	Negative	Cooling	78	NR	NR	2	6	NR	MERV-14
		Heating	70						
Occupational Therapy	NR	Cooling	78	NR	NR	2	6	NR	MERV-14
		Heating	70						
Hair Salon *2	Negative	Cooling	78	NR	NR	NR	10	Yes	MERV-8
		Heating	70						
Soiled Utility or Soiled Holding *2	Negative	Cooling	NR	NR	NR	2	10	Yes	MERV-8
		Heating	NR						
Clean Utility	Positive	Cooling	NR	NR	NR	2	4	NR	MERV-8 *3
		Heating	NR						
Laundry, Central and personal *2	Negative	Cooling	NR	NR	NR	2	10	Yes	MERV-8
		Heating	NR						
Clean linen storage	Positive	Cooling	78	NR	NR	NR	2	NR	MERV-8
		Heating	72						
Resident Living/Activity /Dining	NR	Cooling	78	NR	60	4	4	NR	MERV-14
		Heating	70						
Bathing	Negative	Cooling	78	NR	NR	NR	10	Yes	MERV-14
		Heating	70						
Linen and Trash Chute *2	Negative	Cooling	78	NR	NR	NR	10	Yes	MERV-8
		Heating	70						

NR = No requirement

** 1 If grilles located low on walls are utilized*

**2 Air recirculated by means of room units not allowed*

[3] MERV-14 required where storing sterile equipment

Indoor air & ventilation for spaces such as offices, conference rooms, etc. will be based on IMC-2018 requirements.

People

Based on IMC-2018 the number of people per space will be in accordance with the following.

Table 5

Room	Occupant Quantity	Occupant Activity	Occupant Heat Load (Btu/hr/person)		
			Sensible	Latent	Total
Resident Rooms	2	Very Light Activity	250	200	450
Procedure Rooms	4	Very Light Activity	250	200	450
Physical Therapy	40 per 1000 SF	Moderate Activity	305	545	750
Occupational therapy	40 per 1000 SF	Light/Moderate Activity	275	275	550
Hair Salon	25 per 1000 SF	Light/Moderate Activity	275	275	550
Resident Living/Activity/Dining	100 per 1000 SF	Light Activity	250	250	500
Laundry Central	10 per 1000 SF	Moderate/Heavy Active	275	475	750

Lighting

Lighting power densities will be based on ASHRAE Fundamentals chapter 18, table 2. Some values for typical spaces are listed in the table below.

Table 6

Space	Power Density (watts/sq. ft.)
Resident Rooms LED	0.68
Procedure Room	2.25
Physical Therapy LED	0.91
Occupational Therapy LED	0.68
Hair Salon LED	0.71
Resident Living/Activity/Dining LED	0.43
Laundry/Warewashing LED	0.53
Corridors LED	0.41

HVAC Sizing Criteria

Duct Sizing Criteria

To minimize noise and pressure drop, duct is sized as follows:

- Constant Volume Systems - 0.08 in. of water per 100 ft pressure drop or 1,000 fpm max
- Variable Volume & Limited Use Systems - 0.50 in. of water per 100 ft pressure drop or 2,500 fpm max

Ductwork will be sealed per IECC and SMACNA requirements for system design pressures.

Louver Sizing Criteria

Intake louvers shall be sized and/or located to limit snow ingestion. In general, an intake velocity of 300 feet/minute (fpm) over the actual inlet free area will be utilized. Louver plenums will be pitched to drains located at the bottom of the plenum to eliminate any stagnant water that may collect.

Exhaust louvers shall be sized to maintain exit velocity of 700 fpm over the actual outlet free area.

All louvers shall be designed for high performance resistance to wind driven rain penetration

Pipe Sizing Criteria

The general range of pipe friction loss used for design of hydronic systems will be between 1 and 4 ft of water per 100 ft of pipe. To minimize noise, pressure drop (and associated pump energy) and erosion,

pipe will be sized not to exceed the following, based on ASHRAE Standard 90.1 – Piping System Design Maximum Flow Rates for Energy Conservation.

Table 7

System	Pipe Dia.	Constant Flow		Variable Flow	
		Max Water Velocity (fps)	Max Water Flow Rate (gpm)	Max. Water Velocity (fps)	Max. Water Flow Rate (gpm)
Hot Water/heat pump loop	3/4”	2.0	3.5	3.0	4.5
	1”	2.5	7.5	4.0	10.0
	1-1/4”	3.0	12.0	5.0	20.0
	1-1/2”	3.5	20.0	6.0	35.0
	2”	4.0	40.0	7.0	75.0
	2-1/2”	4.5	68.0	7.0	110
	3”	4.5	110	7.0	170
	4”	5.0	210	7.5	320
	6”	5.0	440	7.0	600

Air Criteria

Equipment air temperatures will generally be sized for the following criteria. Air will be cooled to 55°F to provide latent cooling (moisture removal). Air heating supply temperatures will be limited to avoid stratification in ceiling supply and return ductwork configurations.

Table 8

Condition	Supply Air Temperature	Return Air Temperature	Temperature Change
Cooling	55°F	75°F	20°F
Heating	90-105°F	70°F	20-35°F

Water Criteria

Glycol Systems will only be used where necessary for freeze protection.

Table 9

Condition	Supply Water Temperature Min/Max	Return Water Temperature	Temperature Change (ΔT °F)
Heat Pump loop	68F/88F	varies	8°F
Hot Water	180	150	30°F

NOTE – Performance of closed loop cooling tower to be verified to determine expected HP loop summer maximum design temperature.

THIS DOCUMENT IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY AND IS NOT INTENDED TO INCLUDE, SUPPLEMENT, OR REPLACE ANY REQUIREMENTS AS PART OF THE CONSTRUCTION DOCUMENTS.

Electrical
Basis of Design

Strafford County Nursing Home
Dover, NH

Update - November 03, 2023

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The primary purpose of this Basis of Design is to formulate an electrical design narrative to outline the proposed systems for the proposed Strafford County Nursing Home in Dover, New Hampshire.

Definition of Terms:

ADA – American Disability Act
AWG – American wire gauge, defines wire diameter and rating
EMT – Electric metallic tubing
GFCI – Ground fault circuit interruption device
HVAC – A general acronym used by mechanical engineers for heating, ventilation, and air conditioning systems
LED – Light Emitting Diode
NEC – National Electrical Code
PA – Public announcement
PVC – Polyvinyl chloride tubing
RMS – Root mean squared, mathematical formula
THWN/THHN – specific wire/cable characteristic
XHHW – specific wire/cable characteristic

Reference Codes and Standards

The NH State Building Codes as amended in accordance with BCR 300.

- International Building Code
- International Energy Conservation Code
- International Mechanical Code
- International Plumbing Code
- National Electrical Code
- State Fire Code Safe C 6000
- Lightning Protection Institute, LPI 175 Standard of Practice
- National Fire Protection Association (NFPA)
- National Electrical Manufacturers Association (NEMA)
- National Electrical Safety Code (NESC) IEEE C2
- International Electrical Testing Association (NETA), Acceptance Testing Specifications for Electric Power Distribution Equipment and Systems NFPA
- National Fire Codes (NFC)
- Telecommunications Industries Association (TIA)
- Underwriters Laboratories (UL)
- 2018 Guidelines for Design and Construction of Health Care Facilities
- IES Handbook

General Overview

The Facility will be supplied with the appropriate amount of electrical power so that the new and existing facility can operate all of its electrical needs including lighting and power loads with adequate capacity. An emergency generator will provide standby power in the event of a utility outage.

1. The facility will be supplied with three-phase power from the existing OH overhead power grid serving the current facility.
2. New pad-mounted transformers will be designed to supply the voltage and power requirements for the proposed areas of the facility's electrical equipment, devices and fixtures.
3. A new service entrance switchboard will be designed to provide normal utility power to the facility.
4. The lighting levels in each room will be calculated in order to get the total amount of wattage needed for the spaces using high performance LED lighting throughout.
5. A 480-volt and 208-volt (single and three phase) and 120-volt sources for general power will be distributed to the different electrical distribution systems throughout the facility. In addition to Normal Power Distribution, there will be a Life Safety Branch power distribution, and an Equipment Branch Power distribution system.
6. The facility will have a Natural Gas Standby Generator Set connected to the building to provide power to the entire facility during extended periods of time. This generator can provide power during high peak times as well to help offset the peak demand of the facility and lower the overall utility charges.
7. The facility will also be provided with a Diesel Emergency Generator with self-contained fuel tank. The storage capacity for the generator will be determined during design and maybe either be 72 or 96 hours based upon average load capacity. This generator will provide life safety, critical branch, and equipment branch power for short term outages.
8. The design will provide emergency power to as much equipment and systems as possible in order to provide reliable back-up power in the event of a utility power outage.
9. The communication systems (fiber) will include a new service entrance for data/telephone line for telephone/data/building management/and fire alarm.
10. CATV services will also be provided with the new service entrance.
11. The data/communications/security system will be coordinated with the County and facility and IT staff. The new systems will be provided per their guidelines and requirements.
12. The HVAC system will be supplied with 480V three-phase power as well as 208Y/120-voltage sources to provide heating and ventilation to the entire building.
13. Metering of the building's electrical service is essential for monitoring energy consumption and taking an active role in energy conservation. Metering and sub-metering systems will be provided as part of the design.

Operating Environment

The power and communication systems environment should be maintained at a nominal 55 to 80 degree Fahrenheit level. The communication system (telephone, data systems and networks, fire alarm) will be per the standards for data and networking.

Electrical Load Calculations

Square Footage	Total
Nursing Home	289,556

Watts Per Sq. Ft.	Lighting	Devices	HVAC	Misc.	Total
Nursing Home	0.75	1.6	4	1	7.35

Watts Total	Lighting	Devices	HVAC	Misc.	Total
Nursing Home	217,167	463,290	1,158,224	289,556	2,128,237
				Total KW	2,128

Assumptions

There are a few assumptions and limitations that the design team has considered. The project will require a 3-phase power supply, which is available from the site distribution system. We are assuming a thirty-inch working surface height, from the floor, in order to calculate the lighting levels for each area and room. All designs will comply with the State of New Hampshire codes and standards as referenced as well as the National Electrical Code (NEC) and 2018 Guidelines for Design and Construction of Health Care Facilities.

Electrical Service and Distribution

1. The proposed primary electric service shall be derived from a new riser pole located near the existing service pole line on County Farm Cross Road. Two trade size 5 Schedule 80 PVC direct buried sand encased conduits shall be routed from the pole to new pad mounted transformer(s) located at building and from there to distribute power to the facility.
2. The pad mounted transformer(s) shall be compartment type, dead-front with bushing wells, self-cooled, for mounting on a pad and shall comply with the latest applicable standards.
    a. The average temperature rise of the windings, measured by the resistance method, shall be 55/65°C when the transformer is operated at rated kVA output. The transformer shall be capable of being operated at rated load in a 30° C average, 40°

C maximum ambient, as defined by IEEE C57.12.00ä without loss of service life expectancy.

b. The size of the pad-mounted transformers will be determined based upon the loads of the facility and could range in the 1500 to 2000 kVA size for the main building and 150 to 300 kVA size for the residence buildings.
c. Determination will be made based upon utility rates whether the transformer will be owned and maintained by the County or it will be provided by Eversource, the local serving utility.
d. Coolant and insulating fluid shall be classified as 'Less-Flammable' fluid recognized as a fire safeguard in Section 15 of the National Electrical Safety Code (Accredited Standards Committee C2) for generation and distribution substations. Fluid shall be equal to Envirotemp FR3 fluid that meets the National Electrical Code Section 450-23 requirements as a listed less-flammable liquid and covered by OSHA Article §1910.305, Section 5(v). Envirotemp FR3 fluid shall be FM Global accepted and Underwriters Laboratories Classified "Less-Flammable" per NEC Article 450-23, fitting the definition of a Listed Product per NEC.

3. All MV work will either be part of the project if the facility is primary metered at either the street or at the point of termination from overhead to underground. If the transformers are provided by Eversource, the metering would be on the secondary side of the transformer. All MV work will conform to the local serving utility requirements and guidelines.
    a. The primary cable will be EPR cable and shall be 15 kV single 1/0AWG aluminum conductors, shielded at 105 degrees C and rated with a 133% insulation level.
    b. The strand screen shall be extruded semi-conducting EPR meeting or exceeding the electrical and physical requirements of ICEA S-68-516, AEIC CS6, and UL 1072.
    c. The shield shall be 5 mil thick bare copper tape helically applied with a 12-1/2% overlap.
    d. The jacket shall be a polyvinyl chloride (PVC) jacket. The cable shall be UL listed as Type MV-105 in accordance with UL 1072.
    e. Each MV feeder shall consist of three single-conductor cables, plus a ground wire as described hereinafter, or a three-conductor cable with an integral ground.
    f. Where EPR cable is installed, it shall have a copper ground conductor installed with the phase conductors. The ground conductor shall be No. 1/0 AWG minimum in accordance with NEC Article 250-51 and Table 250-94.
    g. All MV splices and terminations shall be custom made at each location by an experienced cable splicer using customized splicing and termination kits from a reputable cable manufacturer.

4. All multiple duct runs between MV equipment shall be minimum 5” PVC Schedule 40 ducts with a concrete encasement.
5. The encasement has steel reinforcement in a plane just below the lowest row of ducts where the duct run spans disturbed earth, where it enters manholes and buildings (out to 5 ft.), and where it crosses under heavily traveled roadways. The spacing between ducts is 3in. in all directions.
6. The ducts shall be 30 in. minimum clear below grade or top of roadway.
7. Duct runs shall be sloped from the higher manhole entrance to the lower transformer vaults with no intermediate low spots.
8. The secondary service entrance conductors will be routed from the secondary side of the pad mounted transformers underground to the main switchboard “MSB” located on the Lower Level in the Main Electric Room.
9. The service entrance conductors shall consist of two (2) each of six (6) sets of 4”, Schedule 40 PVC conduits (concrete encased) with 4 -600 kcmil (copper) conductors in each with two (2) spare 4” conduits included to each main breaker.
10. The main service switchboard would be equal to a Square D QED-LV Type rated 3000 Ampere, 480Y/277 volt, 65 KAIC, having a main circuit breaker with solid state trips and interchangeable trip plugs including long term, short term, instantaneous, and ground fault protection, and include a 60KA per mode/120KA per phase seurge protection on the bus. This switchboard will serve the following loads either from the switchboard or via distribution panels:
    a. Life Safety Branch via transfer switch (normal power supply).
    b. Equipment Branch transfer switch (i.e. optional standby) normal power.
    c. Elevators.
    d. HVAC equipment.
    e. Boilers.
    f. Domestic water pumps.
    g. Interior and exterior lighting.
    h. Receptacle panelboards.
    i. HVAC loads.
    j. HVAC power panelboards.
    k. Receptacle sub-panelboards.
11. All feeders will be in conduit. Service conductors shall be copper, Type XHHW (below grade). Feeders shall be type THHN/THWN (above grade), all other wiring shall be copper conductors, and all conductors will be stranded.
12. Distribution panels will be equal to Square D I-line type, and generally be rated at 600A or 800A.

13. Branch circuits shall be run in EMT conduit above grade. PVC may be used for branch circuits and feeders below slab. Conduit shall be metallic to provide a redundant ground path above grade.
14. PVC conduit is not acceptable except as noted below. PVC conduit may be used in underground applications and shall be used in duct banks and for feeders.
15. The couplings used on electrical metallic tubing (EMT) shall be rain tight compression type. Set screw couplings shall not be allowed.
16. The minimum conduit size shall be ¾". Flexible metal conduit (Greenfield) shall be used for lighting fixture connections (whips) only.
17. Liquid-tight, flexible metal conduit shall be used for connections to equipment subject to vibration, noise transmission, or movement.
18. Lighting fixture connections shall be made with minimum 4 ft. and maximum 6 ft. lengths of flexible metal conduit in accordance with NEC 410-67.
19. The use of hospital grade type MC Cable may be used in limited areas such as existing walls and ceilings where access is restricted.
20. Surface Metal Raceway Surface metal raceway shall be metallic; plastic is not acceptable. The standard is Wiremold, but shall only be used when concealing branch circuits is not available.
21. Emergency circuits shall be wired in separate conduit systems from normal circuits.
22. Power and communications shall be in separate conduits.
23. For circuiting purposes, a maximum of six (6) receptacles shall be connected to a circuit. This allows a future expansion of two (2) receptacles per circuit. Computers (PCs) shall be limited to three per 20 A circuit. Printers shall be limited to two (2) per 20 A circuit. Computer and printer receptacles shall not be connected to the same circuit.
24. Hospital grade receptacles, as well as ground fault circuit interrupter type receptacles, will be provided in all patient care areas.
25. Tamper resistant ground fault circuit interrupter type duplex convenience receptacles with "while-in-use" type exterior covers at HVAC equipment, and at egress doors around the building exterior perimeter will be provided.
26. Standard tamper resistant duplex convenience receptacles shall be installed in the building core. Color and style by Architect.
27. General rule of thumb will be a minimum one (1) receptacle per wall in all finished spaces. Offices will typically have one (1) receptacle per wall space and in areas of desks or equipment quad type receptacles will be furnished.
28. Ground fault circuit interrupter type duplex convenience receptacles at electric water coolers, elevator machine room and pit, in toilet rooms and in any other locations where water hazards may exist. Any other areas as required by code.

29. Floor mounted poke-thru devices with furniture feed fittings to serve modular furniture locations will be limited but will be determined by the Architect. Modular furniture systems with the vendor input will be coordinated and the design will provide appropriate 5-wire or 8-wire configuration and multi-pole circuit breakers in associated branch circuit panelboards to properly serve group workstations as required by code.
30. All wiring methods as required by the latest edition of the NEC.
31. Loads must be confirmed and adjusted as necessary to conform to the final mechanical, plumbing, and elevator system designs.
32. The information to be supplied on the panelboard schedules will include data necessary to order the equipment and all data needed to completely identify the loads. Once installed, the following information to be clearly shown shall include the following:
    a. Panel name and panel source
    b. Typewritten panel board directory
33. All panelboards will be of door-in-door design, equal to Square D type NQ, copper bus. Ratings shall be a minimum of 22k AIC unless noted otherwise. Panelboard circuit breakers shall be bolt-on type. Plug-in-type breakers are not acceptable.
34. The design documents will include the following information:
    a. Top feed or bottom feed.
    b. Main circuit breaker (MCB) or main lugs only (MLO).
    c. Surface or recessed mounting.
    d. Trip rating, frame rating, and number of poles of each breaker.
    e. The AIC rating of the panel; series rating is not acceptable.
    f. The identification of the load and the room name.
    g. The estimated connected load in watts.
    h. The estimated connected load in volt amperes (or KVA) per circuit.
    i. Panel total connected KVA and Amps.

Emergency Power System

1. As outlined in Article 517 - Health Care Facilities in the National Electric Code the following systems will be designed for the facility, the life safety and critical branch systems are identified as essential electrical systems for healthcare facilities:
2. Life safety branch – a system of feeders and branch circuits, supplying power for lighting receptacles and equipment that is essential for life safety. Typically, those systems include exit signage, emergency lighting (interior and exterior), fire alarm systems, communications systems and related life safety systems.
3. Critical branch – a system of feeders and branch circuits supplying power for ask illumination, fixed equipment, related for patient care. These systems would typically support patient room and exam rooms (receptacles) that are related to patient care.

4. Equipment branch – a system of feeders and branch circuits that are arranged, for delayed or automatic connection to serve as an alternate power source for equipment (typically the heating plants, air conditioning, and those systems that are considered necessary during the disruption of normal power).
5. As a minimum, elevator(s) shall be equipped with battery lowering system. The elevators typically will not be able to operate during a power outage, but will only lower to lowest level and open its doors. Discussion will be needed whether an elevator is selected to be connected to the equipment branch so that it would operate during disruption of normal power (TBD).
6. Battery Storage system for providing storage capacity for Solar PV generation, to provide backup to selected systems as well as electrical utility peak shaving capabilities to help offset the electrical utility demand charges and save operating costs.
7. In addition, the following loads will be supplied with independent battery back-up systems:
    a. Security system.
    b. Communication system.
    c. Fire alarm systems.

Grounding System

1. The design will include a grounding system in accordance with NEC Article 250 and all authorities having jurisdiction. Provide an electrode grounding conductor to the service entrance side of the metal main water line. Provide a #4/0 AWG copper (CU) electrode grounding conductors and associated bonding jumper at the main entrance locations.
2. Design will include a copper grounding system consisting of a Telecommunication Main Grounding Bar (TMGB) and Telecommunication Grounding Bars (TGB).

Lighting Systems

1. Full building lighting controls shall be provided to meet current International Energy Conservation Code – latest State Adopted edition, minimum energy efficiency requirements.
2. Controls shall include; automatic shutoff, space controls and controls for specialized lighting and applications. Lighting control devices shall be provided to accommodate light levels and functionality of lighting per Energy Code requirements.
3. A lighting control system shall be provided on each floor level networked together for access from either the HVAC control system (BACNet) or through stand-alone software system or via a wireless system. A scheduled and occupancy sensor control scheme in open office spaces will provide greater flexibility to achieve energy savings.
4. Energy conservation will include LED lighting for all lighting fixtures.

a. Ceiling recessed lighting fixtures for general lighting will be 24 in x 24 in, or 24 in x 48 in LED type equal to Lithonia ACL series (where adequate space is available above the ceiling – generally only at the first floor level) and Lithonia EPANL LED for areas with minimal ceiling cavities (all other floors) with layouts to be coordinated with the Architect.
b. The fixtures will have an efficacy in excess of 90+ lumens per watt (LPW).
c. Programmable lighting control will include wireless controls equal to nLight AIR Wireless with an integrated RIO module as part of each luminaire where applicable.
d. All lighting will be LED.
e. The IES recommends a minimum light source color rendering index (CRI) rating of 80 for interior spaces at senior facilities - preferably higher in specific spaces such as hobby areas, dining rooms, and elsewhere color accuracy, discrimination, and appearance are important. The IES also recommends a slightly higher correlated color temperature (CCT). A high CRI and slightly higher CCT (e.g., 3000K instead of 2700K), which can help mitigate loss of color discrimination that occurs with age.
f. Occupancy Sensors Occupancy sensors will be in conference rooms, bathrooms, and offices.
g. Ultrasonic type sensors and/or passive infrared-type sensors shall be utilized in enclosed rooms such as bathrooms (non-patient), offices, and conference rooms. Ceiling-mounted, ultrasonic and switch replacement, passive infrared units shall be specified depending on the room configuration.
h. Dual technology will be specified in lieu of a single technology for all installations unless this would lead to miss-application of a technology.
i. Lighting control localized switching shall be provided in lieu of large-area switching.
j. Multilevel s and dimming will be provided where appropriate.
k. Day lighting spaces within buildings with large amounts of exterior glass or skylights shall utilize photocell control of electric lighting.
l. Lobbies as well as exterior offices will be a good example for the use of day lighting opportunities.
m. Adjustable photocells will include overriding control to allow for cloud cover and twilight.
n. Dimming of fixtures in response to a photocell will be specified.
o. Exit signs will be LED type exit signs and Exit Signs shall have a minimum 10-year warranty. Fixtures shall either be edge glow style in finished spaces and white polycarbonate in unfinished spaces. Both shall have red letters.
p. All patient rooms will have multi-level lighting levels and night lights in patient rooms and bathrooms.

Recommended Lighting Levels for Areas Unique to Nursing Homes

Minimum Foot Candles on Tasks At Any Time1

		Foot Candles
Administrative Spaces: General Office, Medical Records, Conference/interview area/room(s)		*50*
Corridors – Nursing Areas:	Day: Night:	*20* *10*
Dietary		*50*
Elevators		*15*
Examination Rooms		*50*
Employee:	Lounge(s): Locker Room(s):	*50* *20*
Linens:	Sorting soiled linen: Central clean linen supply: Linen room(s)/closets	*30* *30* *10*
Stairways		*15*
Lobby area(s):	Receptionist: General:	*30* *20*
Physical therapy		*30*
Occupational therapy area(s):	Work benches/tables: Work area – general:	*50* *30*
Speech therapy		*30*
Resident Lounge(s):	Reading General	*30* *15*
Resident dining area(s)		*30*
Resident care area(s):	Room/bed/toilet/reading: General:	*30* *15*
Nursing station(s):	Desk, medication area, nourishment center: General: Corridors day/night (see "corridors" above):	*50* *30* *20 - 10*
Mechanical-electrical room/space:		*30*
Utility room:	Clean and soiled	*30*
Janitor's closet		*15*
Storage – general		*20*
Toilet – bathing – shower facilities		*30*
Barber and beautician areas		*50*
Waiting area(s):	Reading General	*30* *20*

q. Wall sconces and some decorative lighting will be used in open areas such as lobbies and corridors.
r. Night setback for patent corridors will be included as part of the general sequence for lighting controls.

Emergency Lighting

1. Emergency Lighting: Both emergency lighting and exit signs per the National Fire Protection Association (NFPA), the Life Safety Code (LSC). Section 7.9 addresses those construction, protection, and occupancy features necessary to minimize danger to life from

fire, including smoke, fumes, or panic, and establishes minimum criteria for the design of egress facilities so as to allow prompt escape of occupants from buildings or, where desirable, into safe areas within buildings. Emergency lighting facilities for means of egress shall be provided in accordance with Section 7.9 for the following:

2. Buildings or structures where required in Chapters 11 through 42. (6) of the LSC. New egress and exit doors shall include also include interior designated aisles, corridors, ramps, and passageways leading to an exit. For the purpose of 7.9.1.1, exit discharge shall include only designated stairs, ramps, aisles, walkways, and escalators leading to a public way. Section 7.9.1.3 where maintenance of illumination depends upon changing from one energy source to another, a delay of not more than 10 seconds shall be permitted.
3. Provide exterior lighting to comply with item 1 (above) for all new and existing exits.
4. Emergency illumination shall be provided for not less than 1½ hours in the event of failure of normal lighting. Emergency lighting facilities shall be arranged to provide initial illumination that is no less than an average of 1 ft.-candle (10.8 lux) and, at any point, not less than 0.1 ft.-candle (1.1 lux), measured along the path of egress at floor level. Illumination levels shall be permitted to decline to not less than an average of 0.6 ft.-candle (6.5 lux) and, at any point, not less than 0.06 ft.-candle (0.65 lux) at the end of the 1½ hours.
5. A maximum-to-minimum illumination uniformity ratio of 40 to 1 shall not be exceeded. New emergency power systems for emergency lighting shall be at least Type 10, Class 1.5, Level 1, in accordance with NFPA 110, Standard for Emergency and Standby Power Systems. Section 7.9.2.3
6. The emergency lighting system shall be arranged to provide the required illumination automatically in the event of any interruption of normal lighting due to any of the following: (1) Failure of public utility or other outside electrical power supply. (2) Opening of a circuit breaker or fuse. (3) Manual act(s), including accidental opening of a switch controlling normal lighting facilities.

Exterior Lighting

1. Lighting level will meet and maintain illumination levels and meet the latest requirements of IESNA. Exterior lighting will be provided for security and safe passage (2.0 fc min at walkways and at entry/exit doors), building mounted and low-height (16’ max) poles will be specified at new parking and drive areas required to adequately illuminate the parking lot and drives.
2. All lighting shall be full-cutoff design, night-sky compliant and LED. Pole mounted fixtures will be equal to Resonance 1.0 LED post-top Luminaire (Small) by Antique Street Lamps matching the existing type and style.

3. A photometric calculation will be provided and a site plan drawing with iso-illuminance contours including mounting to spacing ratios as well as minimum/maximum foot-candle levels conforming to the project's requirements for the review process will be provided during the design development phase.

Fire Alarm System

1. A fully addressable fire alarm system with internal battery back-up shall be provided.
2. Initiation devices shall be manual pull stations, sprinkler system flow and tamper switches, smoke detectors where required, and duct smoke detectors. All devices shall be located according to the IBC, NFPA 72, and the Americans with Disabilities Act (ADA).
3. The Fire Alarm Control Panel (FACP) shall be located in an area of the facility that is not being planned and for renovation. A fire alarm annunciator panel will be located at the main entrance to the building or at a location designated by the Architect and as approved by the fire department.
4. The system shall include, but not be limited to the following features, functions and/or elements:
    a. Master system CPU including all fire detection control modules.
    b. Circuit interface panels including all modules.
    c. Power supplies, batteries and battery charger.
    d. Surge protectors.
    e. Equipment enclosures and document enclosure.
    f. Intelligent addressable devices including, but not limited to, manual pull stations, heat detectors, smoke detectors, alarm monitoring modules, and supervised control modules.
    g. Audible and visual notification appliances.
    h. Wiring and raceway.
    i. Installation, testing, system certification and personnel training.
    j. All software and firmware required in providing a complete and fully operational system.
    k. Initiation of any of the devices above shall cause the following operations to occur:
        i. Initiate the required audible and visual alarms.
        ii. Automatically notifies the local fire municipality.
        iii. Display the individual device, which was initiated.
        iv. Shut down HVAC systems and operates dampers as scheduled.
        v. Activate the Elevator Recall System

Lightning Protection System

1. A Lightning Risk Assessment Calculation will be completed according to NFPA No. 780 and more than likely a lightning protection system will be required for the building. This system is not a requirement of the NFPA, however, the Owner's insurance company may require or provide discounts for installing the system and we would recommend it.
2. We would request as an alternative that a lightning protection system on the roof of the building should be consideration by the Owner as an add alternate dependent on the Lightning Risk Assessment Calculation.
3. Down conductors shall be connected to driven ground rods and a ground ring. Blunt tip type air terminals on the appropriate break away bases shall be provided. The lightning protection system shall be a UL Master Label system.
4. Aluminum cables shall be used on the roof top and copper conductors in the earth with a bi-metal connector connecting each type of conductor. The type of roofing connections and the type of adhesive for the bases and fasteners with the roofing contractor will need to be compatible with the roofing material. Cables shall be secured every 3 feet.
5. The down cables shall be concealed in the new construction as far as possible.

Data, Telecom and CATV System

1. The Building will require a Demarcation Service Entrance backboard located in the Main Electric/Telecom Room on the First Floor to terminate all incoming Telecom services.
2. Cables (voice/data/television/internet) and allow extension of services throughout the building. Two (2) trade Size 4, Schedule 40 PVC conduits will be provided from the main Elec/Telecom Room to a new Telecom manhole located across the facility at the eastern side of the building out along the parking lot perimeter and connect into existing manhole system on the south side of Wagner Road to provide pathways for the Telephone and Data Services Service Providers to the Service Entrance Demarcation Backboard. One (1) of the 4" conduits shall be filled with 4" 3-cell Maxcell-innerducts.
3. Provide two (2) 4' conduit sleeves between stacked Telecom Rooms on 2nd floor through the 4th floor with fire stop plugs.
4. An engineered J-hook system should be provided to support all voice/data cabling/CATV wiring where no cable trays are provided at a maximum support distance of 3-4' apart.
5. Provide 18" wide ladder rack in each Telecom room above equipment racks for support of data and voice cabling within Telecom rooms.
6. Provide floor poke-thru devices with furniture feed fittings to distribute voice/data cabling into modular furniture locations. Conference Room and Office walls shall be provided with back boxes and conduits stubbed into accessible ceilings.

Structured Cabling System

1. Telecom closets shall be vertically stacked on each floor of each building to serve telephone/data connections within a 300-foot zone. Provide ¾" thick fire treated plywood on one wall of each Telecom Room for mounting of miscellaneous security and fire alarm SNAC panels.
2. Structured Cabling for voice/data/CATV shall be provided and terminated in Telecom Closets. The Main Telecom/Server Room in the lower level shall be provided for a with three (3) 19" Equipment relay racks bolted to the floor. Each Telecom Room on floors 1, 2, 3 and 4 shall be provided with one (1) 19" equipment rack.
3. A 6" vertical wire management channel, horizontal wire managers, and 48-port Category 6 patch panels in quantities required to terminate all horizontal cable runs served plus 25% spare capacity. Provide for an 18" ladder rack above all equipment racks for cable management within the Main Telecom Room.
4. Each workstation and Offices shall be provided with two (2) Category 6e, RJ45 data jacks. Category 6e cable shall be used for data/telephone connections, RG-6U plenum rated cable for CATV connections.
5. Wireless LAN: Provide two (2) Cat. 6e data outlets terminated above accessible ceilings within a 100' to 75' circumference throughout the building for WLAN coverage. Provide in-ceiling bracket and rated surface mounted box, Leviton #49223-CBC and #41089-2P or equals.
6. Backbone Cabling: Provide 12-strand, 50/125 micron, Riser rated fiber optic cable from Main Communications closet in lower level dedicated to each Telecom closet stacked on each floors 1, 2, 3, and 4 of the building in a star configuration. Terminate and test all strands utilizing duplex SC style connectors and fiber optic patch panels.
7. The Main Telecom/Server Room shall be equipped with (8) dedicated 20Amp circuits each serving 20A, 120V twist-lock receptacles, (2) at each rack. Each of the Telecommunications Rooms shall be equipped with two (2) 20 amp dedicated circuits serving 20A twist-lock receptacles for the rack. In addition, the Main and each Telecom Room will be provided with two (2) separate 120V, dedicated 20A circuit each serving two (2) quadraplex receptacles on each of two (2) walls.
8. All Network Electronics and Rack-mounted UPS units shall be provided by the Owner.
9. A request to the mechanical engineer shall be made to provide a cooling system for the Main Telecom/Server Room and Telecom Rooms on floors 1 thru 4. The estimated heat gain for the Main Telecom Room will be determined based upon equipment.
10. The estimated heat gains for Telecom Rooms on floors 1 thru 4 is estimated at 4,500 BTU/Hr.

11. An analog telephone service connection is required for fire alarm, elevators, and other building related services. Category 6 cable for data/telephone connection for house needs shall be terminated at the lower level floor Telecom Room.
12. CATV will enter main Telecom Room and be extended to each floor serving Telecom Rooms. Provide RG-11 trunk cable as backbone cabling and RG-6 CATV outlets with F type connectors on a faceplate to all Television locations identified by Owner.

Security System

1. Electric door strikes, door contacts, motion sensors, or fixed IP type cameras and card readers shall be strategically installed to provide a basic level of security for the general building entrances and at lobbies. Conduits, wiring and junction boxes shall be provided for the security system.
2. The Owner's input will be needed for these systems and the extent of systems. A meeting will need to be scheduled to review options and include the Owner's and Architect's input.
3. All necessary interface modules, devices and wiring for the fire alarm system interface shall be provided.
4. The access control, intrusion detection and CCTV camera system shall be integrated through one software package over the local area network with access to the internet to allow for on-site or off-site monitoring of these systems.
5. The IP type CCTV system shall use software and computer hardware to record video images to a video recording server either on site or at a remote location.
6. Low voltage cabling shall be provided at locations for CCTV cameras.
7. All cables shall be plenum rated unless installed in conduit.

Emergency Two-way Communication Systems

1. A determination will be made if this system is required and will be determined by the Architect.
2. A two-way communications system shall be provided at each elevator landing on accessible floors that are one or more stories above or below the story of exit discharge to comply with IBC section 1007.8.
3. The system shall be audible and visual and shall have signage with instructions on the operation of the system.
4. The master station shall be installed at the same location as the fire alarm system annunciator panel where first responders will answer calls to the building.
5. If the location of the master station does not have an attendant 24 hours per day, the system shall be capable of dialing out to a monitoring agency or 911.

Nurse Call System

1. A UL listed nurse call system with bathroom stations, room stations, call cords, pillow speakers, workflow stations and corridor lights as well as central nurse's stations by floor will be a Rauland Responder 5000 series, TekTone 400P or approved equal.
2. The system shall include a touch screen master stations with handset and desk mounted housing as well as reporting software and related hardware.
3. Specific requirements will be determined with the Owner.

Patient Wandering System

1. A single platform wander management and access control system shall be provided specific doors with specific requirements to be determined with the Owner.
2. The system will be equal to Stanley's Wander Guard Blue, Accutech or approved equal product.

Electrical Requirements for Mechanical Systems

1. The equipment, materials, accessories and services required for the complete and installation of all systems as indicated in the mechanical specifications and required by the mechanical engineer's design.
2. High-efficiency motors shall be high-efficiency motors and shall be specified for all applications.
3. The work shall basically include but is not necessarily limited to:
    a. Provide all conduit, wiring and connections for mechanical boiler system including boiler controls and hot water pumps.
    b. Provide all conduit, wiring and connections for mechanical rooftop units.
    c. Provide all conduit, wiring and connections for mechanical unit heaters or cabinet heaters as required.
    d. Provide all conduit, wiring and connections for mechanical exhaust systems as required.
    e. Each mechanical equipment will be provided with a local fused disconnect switch with properly sized overcurrent fuses per the equipment manufacturer's requirements. Nema 1 for indoor and Nema 3R for exterior.
    f. Provide power source and termination for mechanical control panels as required by Division 23.
    g. Provide power source, terminations and fire alarm system elements for all smoke dampers. Refer to the HVAC Systems Division 23 for the quantity requirements.
    h. Provide wire and place into service duct type photoelectric smoke detectors in mechanical systems ductwork. Provide all wiring, terminations and interfaces

between the duct detector and motor controller. The EC will turn detectors over to mechanical contractor for installation. The EC will wire and test.

i. Where smoke dampers are provided by the mechanical contractor, furnish, wire and place into service duct type detectors for each damper, and provide power and control wiring for the damper including control modules.

Electrical Requirements for Plumbing Systems

1. The design will include all necessary equipment, materials, accessories and services required for the complete and installation of all systems as indicated in the plumbing and fire protection specifications. The work shall basically include but is not necessarily limited to:
    a. Provide all conduit, wiring and connections for electric water heaters and associated pumps.
    b. Provide all conduit, wiring and connections for electric water coolers.
    c. Provide all conduit, wiring and connections for duplex package sewage pumps in Lower Level.
    d. Provide power source, terminations and fire alarm system elements to monitor all tamper and flow switches from sprinkler system.

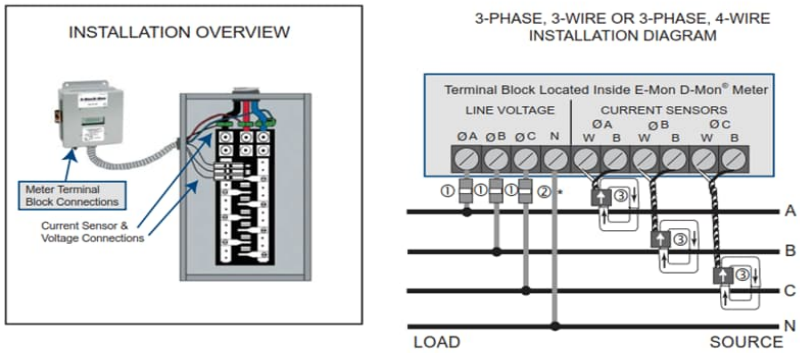
Design Calculations

1. Calculations - The electrical design will include the submittal of the following design calculations:
2. Lighting calculations showing required and designed foot-candles.
3. Estimated switchboard, transfer switch and panel board loading (including 25% extra as a projection of future building loads)
4. A projection/summation of the panel board loads to justify the sizing of the transformers and service entrance.
5. A short-circuit analysis to determine the AIC rating of the system components.
6. A preliminary coordination study to determine the circuit breaker settings and system coordination.

Metering

1. Metering shall be provided on the line side of each secondary main overcurrent devices and at each essential emergency feeder.
2. Options exist with metering systems, our recommendation is to connect into the building management system via BACnet or Modbus (dependent on the communications protocol) as to provide monitoring, trending, an analysis of the electrical systems.

3. Our recommendation is the use of E-Mon D-Mon class 3400 series meter or equal. The general features we would recommend include a minimum 4-line large display showing:
    a. kWh.
    b. kW demand (with peak date & time).
    c. Power factor per phase.
    d. Real-time load in kW.
    e. Amps per Phase.
    f. Volts per phase.
    g. On-board set-up option for: - IP address - Meter date/time - Load Control Settings - ID codes for EZ7, Modbus and BACnet.
    h. There would also be optional expanded features that can include:
        i. Load control option for load control/shedding.
        ii. Two Pulse outputs (one kWh and one kVARh).



Typical Metering Installation

Electrical Closets

1. Electrical closets generally contain branch circuit panelboards. The closets require adequate space for code-required clearances, lighting, ventilation, and two duplex receptacles.
2. Holes in the floors of electrical closets shall be sealed with approved fire-stopping and be watertight.
3. Normal power (lighting, receptacles and related equipment) will be in a separate electrical closet separated from the Life Safety and Criterial panelboards on each floor.

Work Space

1. The following clearances are required on new projects around secondary switchgear:
    a. 3 ft. in front minimum (may be shared with opposite facing gear).
    b. Maintain code minimum clearances at all panels and electrical equipment per Article 100 of the NEC.

Testing

1. Acceptance testing of primary cable, primary switches, transformers, secondary switchgear, motor controls, generators, and automatic transfer switches shall be performed in accordance with the NETA.
2. In addition to specific test requirements for systems indicated hereinafter, all equipment components and systems shall be tested as follows:
    a. Polarity: A verification of polarity shall be made, and it shall be ensured that all fuses, circuit breakers and control devices are connected in the line side (hot) conductors only. Bayonet and Edison socket lamp holders shall have their outer shell connected to the neutral.
    b. Polarity of all receptacles shall be verified.
    c. Insulation
        i. This test shall be made before the installation is complete. The installation may be divided into sections containing up to 50 outlets. A DC voltage of 1000 VDC shall be applied for the measurement of insulation resistance.
        ii. When insulation resistance must be determined with all switchboards, panelboards, fuse holders, switches and overcurrent devices in place, the insulation resistance when tested at 500 VDC shall be no less than 1 megohm for No. 14 and No. 12 AWG and 250k ohm for circuits 25 amps and above. Perform insulation resistance test of each cable with respect to ground and adjacent cable.
3. Where apparatus is disconnected for the tests, the insulation resistance between the case of framework and all live parts of each item of fixed apparatus shall be measured separately and shall be not less than 0.5 megohm.
4. Phase Balancing: All feeders are branch circuits shall be connected to panelboards, main distribution panels, and switchboard, so that loads are distributed equally on all phases.
5. Panels: Test the panels and related type equipment as follows:
    a. 1000 volt D.C. insulation test.
    b. Current transformer polarity test.
    c. Polarity test on main connection using 1000-volt megger test - phase - phase.
    d. 1000-volt megger test - phase – earth.
    e. Simulation of all control functions.
    f. Trip and close operations.
    g. The entire switchboard shall be subjected, after completed assembly, to a high potential test of the switchboard to rated voltage plus 1,000 volts. Any defects which develop shall be corrected and the manufacturer shall certify that the equipment has been subjected to the high potential test and no ground or crosses are indicated.

6. Distribution Cables
    a. All main distribution cables shall be subjected to 1000-volt megger tests between phase - phase and phase - earth. The minimum resistance acceptable shall be 1 megohm measured under damp conditions.
    b. Tests on cables shall be carried out after installation and jointing.

7. Lighting
    a. Demonstrate to Owner's Representative that all lighting, ballasts, wiring, and equipment are in proper operating condition. All fixtures shall be complete with clean and undamaged conditions.
8. Adjustments
    a. Adjustments of the system shall be accomplished to the complete satisfaction of the Owner’s Representative at the time installation is complete.
9. Checks are intended to begin upon completion of a component or equipment installation. Testing generally occurs later when systems are energized or nearing that point. Beginning system testing before full completion, does not relieve the Subcontractor from fully completing the system as soon as possible, including all construction checklists and may require retesting portions of the system once all components are fully functioning.
10. Items, conditions or functions to be inspected, verified or tested, the checks and testing method given and a place provided with results recorded.
11. Acceptance criteria (or reference by specific table where the acceptance criteria is found).
12. For each procedure, list the technician performing check or test and company, witnesses of the tests and dates of tests.
13. The test procedures for dynamic equipment like lighting controls, emergency generator or fire alarm shall contain more step-by-step procedures with expected responses similar to the sample test provided as a supplement to Division 01. The test procedures and forms for more static components like panel boards, switch gear, circuit breakers, transformers, etc., can be more checklist-like in format. For each piece of equipment, checks and test procedures and their documentation record forms may be different documents or combined in the same document, but checks and tests should be grouped.
14. At the Commissioning Authority's discretion, if large numbers or repeated deficiencies are encountered, the Subcontractor shall test and troubleshoot all remaining systems at issue on their own before commissioning with the Commissioning Authority will resume.
15. Sampling for Identical Units. When there are a number of identical units, at the Commissioning Authority’s discretion, some or all procedures of a test for a piece of equipment or assembly may be omitted when these same tests on other pieces of identical equipment or assemblies were conducted without deficiency.

16. The following paragraphs define the testing requirements for each type of system or feature that is a part of the project. The Commissioning Authority shall use this information to develop specific testing procedures for each of the systems to be commissioned. The Subcontractor shall be responsible for support, execution and coordination of these tests as described in the project specifications including intersystem tests and interlocks with systems in Divisions other than Division 26.
17. The following requirements apply to all electrical systems and features that are to be commissioned when referenced below. Tests shall:
    a. Verify functionality and compliance with the design intent for each individual sequence module in the sequences of operation. Verify proper operation of all control strategies, energy efficiency and self-diagnostics features by stepping through each sequence and documenting equipment and system performance. Test every step in every written sequence and other significant modes, sequences and operational features not mentioned in written sequences; including startup, normal operation, shutdown, scheduled on and off, unoccupied and manual modes, safeties, alarms, over-rides, lockouts and power failure.
    b. Verify all alarm and high and low limit functions and messages generated on all points with alarm settings.
    c. Verify integrated performance of all components and control system components, including all interlocks and interactions with other equipment and systems.
    d. Verify shut down and restart capabilities both for scheduled and unscheduled events (e.g. power failure recovery and normal scheduled start/stop).
18. Verify all energy saving control strategies.
19. Verify that monitoring system graphics are representative of the systems and that all points and control elements are in the same location on the graphic as they are in the field.
20. Verify operator control of all commandable control system points including proper security level access. When testing procedures for commissioned equipment are listed in NETA Acceptance Testing Specifications for Electric Power Distribution Equipment and Systems the NETA test procedures shall be part of the testing requirements of this specification. Additional testing procedures may be listed in this specification.
21. Systems shall accomplish their intended function and performance.
22. When testing procedures for commissioned equipment are listed in NETA Acceptance Testing Specifications for Electric Power Distribution Equipment and Systems the NETA performance criteria shall apply.
23. Emergency Generator System
    a. Apply applicable common testing requirements and acceptance criteria.
    b. Test according to NETA 7.22.1 and NFPA 110 5.13 and per Division 01 Section "Special Procedures."

c. Record all data and results.

24. Fire Alarm:
    a. Apply applicable common testing requirements and acceptance criteria.
    b. Test the fire alarm and Smoke Detection systems according to NFPA 110-1999 7-1 through 7-2, and specification Division 28 Sections.
    c. Document all test procedures and results. A fire alarms system printout of the test annunciation record is not sufficient documentation.
    d. Verify all fire alarm panel functions, alarms and troubles.
    e. Verify all functions in the Fire Alarm Response Matrix, including remote communications.
    f. Verify resetting of all equipment affected by an alarm.

End of Basis of Design

DIVISION 26 - 27 - 28 ELECTRICAL TABLE OF CONTENTS

End of Specification Table of Content

THIS DOCUMENT IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY AND IS NOT INTENDED TO INCLUDE, SUPPLEMENT, OR REPLACE ANY REQUIREMENTS AS PART OF THE CONSTRUCTION DOCUMENTS.

Plumbing
Basis of Design

Strafford County Nursing Home
Dover, NH

November 03, 2023

Prepared By:

Jason Parkhurst

DuBois & King inc.

85 Main St., Springfield, VT 05156 802.591.4326 www.dubois-king.com

Offices in Vermont, New Hampshire, Maine and New York

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Scope of Work

DuBois & King has been contracted by Warren Street Architects to design a plumbing system for an approximately 342,000 sq. ft., 216 bed nursing home complex located in Dover, NH. Additionally, infrastructure for adding 24 additional beds on the 5th floor will be considered. This Basis of Design (BOD) document is provided to identify the Owner desired features for the Plumbing systems.

The plumbing design will prioritize infection control and patient health above all else. Fire and life safety will also be considered a priority. System reliability, maintenance cost, energy cost and future adaptability will all be considered for any design.

Plumbing systems for this building include domestic hot and cold water, domestic hot water recirculation systems, waste and vent systems, and storm drainage systems.

Codes, Standards, and Guidelines

Enforced

- NH Building Code and Amendments – 2018
- International Building Code (IBC) - 2018
- Uniform Fire - NFPA 1-2015
- Life Safety - NFPA 101-2015
- Standard for the Installation of Sprinkler Systems – NFPA-13-2016
- National Fuel Gas Code – NFPA-54-2018 as amended by Saf-FMO 300
- Energy Efficiency – IECC 2018
- NH Hospital Facilities Design Code - 2018
- Federal Guidelines Institute Guidelines for design and construction of Residential Health, Care, and support facilities – FGI 2018
- Standard for installation of Air Conditioning Systems – NFPA 90A-2015
- International Plumbing Code
- International Energy Conservation Code - 2018
- ADA Standards for accessible design - 2010

General Considerations

Infection Control

Legionella pneumophila is a waterborne bacteria that is a major concern in nursing facilities. Because legionella's growth temperature range is approximately 70 deg. F to 120 deg. F, it is important to maintain water heater tank temperatures at 140 deg. F minimum to kill legionella and constantly recirculate water to prevent stagnation. Mixing valves will temper the water to be distributed to the fixtures. A continuous recirculation system within the domestic hot water system will circulate water to maintain temperature in the loop and help minimize stagnant water in the domestic hot water piping. Additionally, it is important that the buildings air conditioning system be provided with a properly designed and installed condensate drainage system.

Fire and life safety

A fire sprinkler system will be designed in accordance with NFPA 13. The sprinkler system will consist of multiple risers serving a wet pipe sprinkler system. Sprinkler heads will be recessed or semi-recessed at locations with finished ceilings. Areas that may experience temperatures that drop below freezing will be protected with a dry-pipe sprinkler system. Sprinkler standpipes will be required in accordance with NFPA 14. A water pressure test will be required to determine if a fire pump will be required. If a fire pump is required, a system will be designed in accordance with NFPA requirements.

Plumbing systems will be design per IBC-2018, IPC-2018 & NFPA 1, NFPA 101 & NFPA 90A requirements. Piping penetrating fire walls will be fire sealed with fire rated fire caulking.

Storm drains will incorporate both primary and emergency backup drains.

Reliability (Equipment Life)

Given that a nursing home operated 24 hours a day, 7 days a week, 365 days a year, equipment life expectancy may be reduced as the following information is based on data from all building types and is not limited to data from nursing homes.

Expected median service life of new equipment per ASHRAE is:

- Pumps – 10 years inline
- Piping – 50 years
- Insulation – 20 years
- Motors – 18 years
- Controls – 15 years

All domestic hot, cold & recirculation piping will be type L copper. Sanitary waste and vent and storm drainage piping will be cast iron. Storm drainage piping that runs through the building will be insulated.

Maintenance

Clearance for maintenance will be provided for equipment. Plumbing fixtures will be selected in an effort to minimize maintenance requirements.

Domestic hot water

Domestic hot water will be centralized, generated by the central heating plant through indirect heat exchangers. Consideration will be given to alternate forms of heating domestic water such as water source (water to water) heat pump and solar water heating. Any domestic hot water system will store water at a temperature of 140 deg. F minimum before being tempered to a reduced temperature of 110 deg. F before being sent to the plumbing fixtures. Some kitchen fixtures and laundry equipment may require 140 deg. entering domestic water, requiring multiple mixing valves.

Utility Availability

- Electrical Power – The site will have single and three phase power available. Equipment shall be selected based on available utility power.
- Gas – Natural gas is be available on the site through Unitil. Unitil to confirm they can meet the load requirements of the building. Fossil fueled fired appliances will be used only where necessary.

- Water – domestic water is available from the town. Volume available to be determined.
- Sewer – Sewer piping will be routed to the town sewer. Existing piping locations and sizes to be determined.

Plumbing fixtures

White vitreous china and/or stainless steel plumbing fixtures will be selected throughout the building. All plumbing fixtures will be ADA compliant. Floor mounted or wall hung water closets will be selected based on discussions with the owner and owner preference. Water closets will be ADA dual flush. Flush valve toilets will be utilized in centralized areas. Flush tank type water closets may be utilized in resident rooms. Public lavatories will be wall hung or counter insert with single handle low flow, electronic metered faucets or faucets with wrist blade handles where applicable. If electronic faucets are utilized, they must be capable of functioning during loss of power. Lavatories at resident toilet rooms will be counter insert with low flow ADA single handle faucets. Showers will be ADA roll-in type or ADA transfer with pressure balanced mixing valves and hand held shower heads located per ADA requirements. Showers will drain to a linear trench drain along the exterior of the shower. Drinking fountains throughout the building will meet ADA requirements.

Handwashing sink faucets will be 8.5" above the bottom of the basin in resident rooms and 10" above bottom of basin in all other areas per FGI requirements. Hand washing sinks used by nursing staff will allow hands free operation.

All floor drains will be provided with trap primers to prevent sewer gases from entering the space in the event the drains are not utilized for a significant period of time.

Hose bibbs will be located around the perimeter of the building for maintenance purposes.

Drainage

A storm drainage system will be designed for flat roofs in accordance with the International Plumbing Code. An emergency roof drain system will be designed where required. Emergency roof drains will be routed separately from primary roof drains and discharge to a location that would normally be observed by maintenance personnel.

Kitchen waste will be routed indirectly through a grease trap where required by the International Plumbing Code.

Sustainability

The following sustainability strategies will be pursued:

- Energy Efficiency – High efficiency water heaters.
- Low flow plumbing fixtures will be utilized.
- Dual flush water closets
- Consideration will be given to solar water heating
- Consideration will be given to water source heat pump water heating

Sizing / Diversity / Redundancy

- Redundancy – System redundancy is required by the Federal Guidelines Institute (FGI) to provide a higher level of availability during an equipment failure.

- Water heaters – Utilize two (2) water heaters piped in parallel, each water heater sized for 100% system capacity to provide single failure protection.

Plumbing Sizing Criteria

Pipe Sizing Criteria

Sizing for all domestic hot and cold water piping systems will be in accordance with Appendix E of the International Plumbing Code 2018. Domestic water piping systems will be copper type L.

Sizing for waste and vent piping systems will be in accordance with chapters 7 & 9 of the International Plumbing Code 2018. Waste and vent piping systems will be cast iron no hub.

Sizing for storm drainage piping will be in accordance with chapters 11 & Appendix B of the international plumbing code 2018. Emergency roof drains will be

MILLER ENGINEERING & TESTING INC.

GEOTECHNICAL / SOIL BORINGS / ENVIRONMENTAL / SOILS / CONCRETE / MASONRY / STEEL / ROOFING / ASPHALT INSPECTION

Mail all correspondence to: 100 SHEFFIELD ROAD · PO BOX 4776 · MANCHESTER, NH 03108-4776 · TELEPHONE (603)668-6016 · Fax (603)668-8641

October 4, 2023

Mr. Jonathan Halle, AIA
Warrenstreet Architects
4 Crescent Street, Unit 2
Concord, New Hampshire 03303

RE: Geotechnical Engineering Letter
Proposed Strafford County Nursing Home
County Farm Road
Dover, New Hampshire Project 23.108.NH

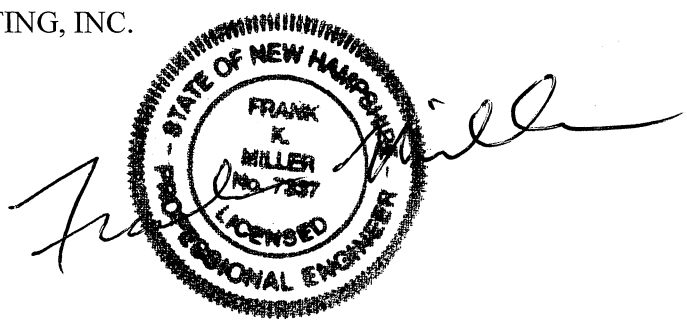
Dear Mr. Halle:

We have completed our geotechnical engineering investigation for the Strafford County Nursing Home project planned for the "Erik Drive Site" off County Farm Road in Dover, NH. The details of our subsurface observations, geotechnical evaluations, and building foundation and pavement design recommendations are provided in our report titled "Geotechnical Engineering Report Strafford County Nursing Home County Farm Road, Dover, New Hampshire", dated October 3, 2023.

In summary, our test borings indicate naturally occurring subsurface soil conditions are present from the ground surface at all locations explored in the project area. The subgrade bearing layers for the building foundation and pavements consist of hard clay, dense glacial till soils, and bedrock. In our opinion, these subsurface layers are suitable for supporting conventional reinforced concrete spread footing foundations and concrete floor slabs for the building; and should provide a suitable subgrade for driveways and surface parking areas. The geotechnical report should be reviewed for our complete geotechnical analysis, evaluation, and recommendations.

We hope this letter and our geotechnical report are helpful to you and the project team. Please contact me if you have any questions.

Sincerely,
MILLER ENGINEERING & TESTING, INC.



Frank K. Miller, P.E.
Vice President

GEOTECHNICAL ENGINEERING REPORT
PROPOSED STRAFFORD COUNTY NURSING HOME
County Farm Road
Dover, New Hampshire

October 3, 2023

Project No. 23.108.NH

PREPARED FOR:

Warrenstreet Architects
4 Crescent Street, Unit 2
Concord, New Hampshire 03303

PREPARED BY:

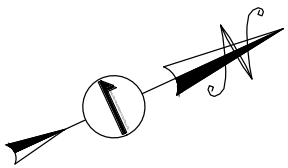
Miller Engineering & Testing, Inc.
100 Sheffield Road, P.O. Box 4776
Manchester, New Hampshire 03108

NOTES

1. This plan is a reproduction of portions of "100475.00-Borings Plan, Dover, NH", (received August 22, 2023) by Nobis Group of Concord, NH.
2. A geotechnical engineer from Miller Engineering & Testing, Inc. inspected the test borings.
3. Exploration locations were established by others and using the tape and pace method.

KEY

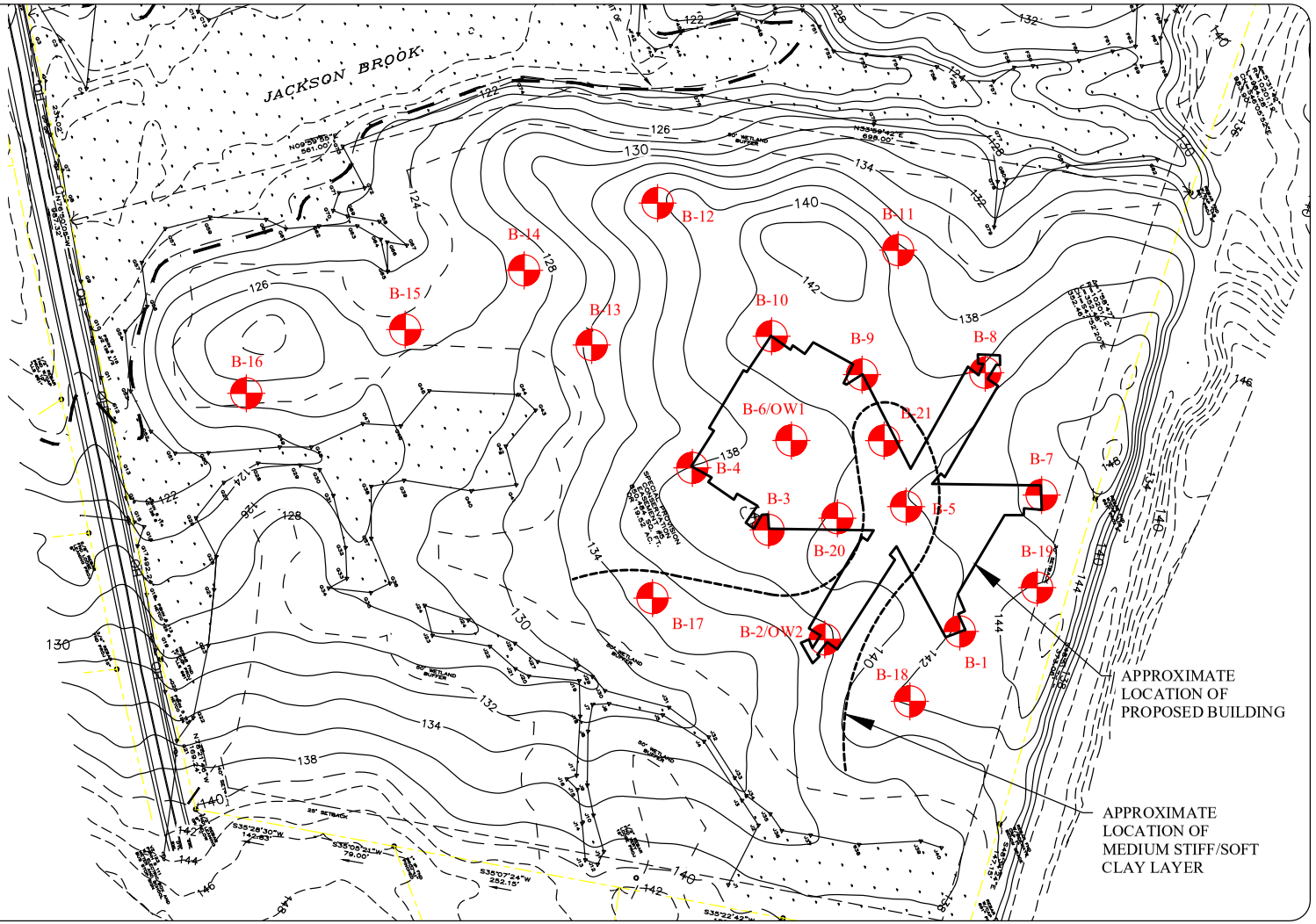
Approximate Boring Location



GRAPHIC SCALE

120 0 60 120 240

(IN FEET)



MILLER ENGINEERING & TESTING, INC.

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MANCHESTER, NEW HAMPSHIRE 03108
TEL (603) 668-6016 // FAX (603) 668-8641

Strafford County Nursing Home
Dover, NH
September 2023
Project No. 23.108.NH

SUBSURFACE EXPLORATION LOCATION PLAN

FIGURE No. 1

MILLER ENGINEERING & TESTING INC.

GEOTECHNICAL / SOIL BORINGS / ENVIRONMENTAL / SOILS / CONCRETE / MASONRY / STEEL / ROOFING / ASPHALT INSPECTION

October 3, 2023

Mr. Jonathan Halle, AIA
Warrenstreet Architects
4 Crescent Street, Unit 2
Concord, New Hampshire 03303

RE: Geotechnical Engineering Report
Proposed Strafford County Nursing Home
County Farm Road
Dover, New Hampshire Project 23.108.NH

Dear Mr. Halle:

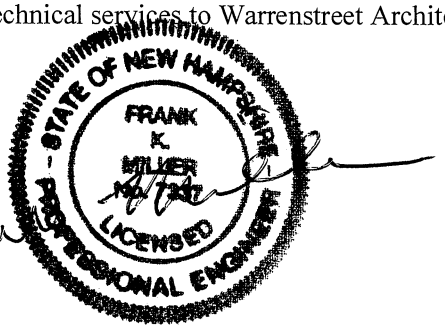
This Geotechnical Engineering Report presents our findings and recommendations for the Strafford County Nursing Home project proposed for the "Erik Drive Site" off County Farm Road in Dover, New Hampshire. The subsurface conditions at the Site generally consisted of organic topsoil and subsoil materials, overlying naturally occurring glaciomarine clay deposits and glacial till comprised of silty sand and gravel material. The clay formation is generally highly overconsolidated due to desiccation, but we did encounter an area beneath the northern section of the proposed basement and east-wing locations of the building, where the clay appears soft to medium stiff and slightly overconsolidated. Groundwater was encountered in most of the Site test borings, at depths between 4 and 10 feet below grade; stabilized groundwater levels were approximately 3 to 4.9 feet below grade.

The topsoil and subsoil materials will have to be stripped from the Strafford County Nursing Home Building footprint and pavement areas; and the underlying clay and glacial till soils will be excavated to design subgrade. The stiff to hard clay layer and underlying glacial till soils and bedrock should provide adequate support to a conventional shallow spread footing foundation system for the proposed building, depending on the structural loads. However, the soft to medium stiff clay formation (encountered at test borings B-2, B-5 and B-21) is unsuitable beneath the basement level (FFE-128) spread footings, since this layer could consolidate excessively under anticipated footing pressures. The soft clay zone was relatively localized and close to the estimated bottom of footing elevations (basement area); therefore, excavation and replacement of the clay with structural fill appears feasible. The layer may remain beneath the lower-level (i.e., basement) floor and upper-level (i.e., slab-on-grade area) spread footings and floors, since these loads will be imposed on the hard clay at a higher elevation (FFE-142).

Localized areas (eastern side of the site) of slightly overconsolidated clay could require preloading with proposed embankment fill layers to induce consolidation prior to building structures and final pavement surfaces in this area. Since the clay layer is slightly to heavily overconsolidated, compression is likely to occur relatively quickly. Additional geotechnical evaluation is warranted to address the potential for consolidation-related settlements once proposed site grading and finish floor elevations are finalized.

We appreciate the opportunity to provide these geotechnical services to Warrenstreet Architects. If you have any questions, please contact us.

Very truly yours,
MILLER ENGINEERING & TESTING, INC.



Frank K. Miller, P.E.
Executive Vice President

TABLE OF CONTENTS

1.0 INTRODUCTION

Miller Engineering & Testing, Inc. has prepared this Geotechnical Engineering Report for the Strafford County Nursing Home project being proposed off County Farm Road in Dover, New Hampshire (known as the "Erik Drive Site"). This evaluation was completed in general accordance with our proposal, dated July 31, 2023 (Ref. File 219-23), and consisted of the following work tasks:

1. Performing a site reconnaissance and subsurface exploration program with a series of test borings at the location of the proposed Strafford County Nursing Home site;
2. Evaluating the subsurface conditions and performing geotechnical engineering analyses to develop recommendations for the design and construction of the proposed project; and
3. Summarizing the exploration program and engineering evaluation in this Project Geotechnical Report.

Presented herein is a description of the proposed project and site, subsurface conditions, and the geotechnical implications on design and construction. The contents of this report are subject to the limitations in Appendix A.

2.0 SITE AND PROPOSED CONSTRUCTION

The Site consists of an approximate 19.5-acre parcel of land (Special Provision Conservation Easement #5) located on the east side of Jackson Brook and north side of County Farm Road in Dover, New Hampshire.

2.1 *Existing Conditions*

The Site property is an open field at approximate elevations of 122 to 148 feet above Mean Sea Level (MSL), with localized high points in the north and northwestern portions of the property (Figure 1). The ground gently slopes toward the southeast, toward Jackson Brook on the west boundary and wetland areas along the easterly property boundary. Most of the proposed project footprint has been used as agricultural fields. Final Existing Conditions Plans and the civil engineering design had not been completed at the time this report was prepared.

2.2 *Proposed Development*

The project consists of constructing a 5-story nursing home building with driveways and surface parking lots in the central portion of the Site property. Figure 1 is our Subsurface Exploration Location Plan based on the current Site design, as prepared by Warrenstreet Architects and Nobis Group of Concord, New Hampshire. The Nursing Home Building would be five stories

high with a partial basement and a footprint of approximately 57,000 square feet. The project Civil Engineer, Nobis Group, has determined the upper-level slab-on-grade floor slab will have an elevation of approximately 142 feet MSL; and a lower-level basement FFE of approximately 128. However, the final design finish floor elevations (FFE) were not available during preparation of this report. Vehicle access would be from County Farm Road.

It is our understanding that the structural engineering design of the proposed Strafford County Nursing Home project has not yet been completed; structural loads were not available at the time this report was prepared.

3.0 SUBSURFACE EXPLORATION PROGRAM

The subsurface conditions at the site were characterized by advancing a series of test borings through the overburden soil formations in the footprint of the proposed building, driveways, and surface parking lot areas. The subsurface exploration program was performed to:

- Characterize the nature and consistency of the soil formations at the Site and provide samples for visual classification;
- Perform Standard Penetration Tests to estimate the relative density and cohesive consistency of the in-place soil units;
- Estimate the engineering properties of the subgrade soils and provide recommendations needed for designing the foundation elements; and
- Determine the depths to competent soil and/or bedrock, and the depth of the groundwater table.

The locations and approximate elevations of the test borings were determined, prior to the test boring operation, using a GPS survey performed by Richard D. Bartlett & Associates, LLC of Concord, New Hampshire (project surveyor).

3.1 *Test Borings*

We advanced 21 test borings designated B-1 through B-21 in building, driveway and parking lot areas August 31 and September 6, 2023.

All the Site borings were drilled with a truck-mounted Diedrich model D-50 hydraulic or a track-mounted CME model 45 rotary drill rig utilizing a 2¼-inch inside-diameter hollow-stem auger to bore the holes. Soil samples were generally collected at 5-foot intervals from the ground surface to the bottoms of the borings. Soil samples were collected using 2-inch outside-diameter split-spoon samplers during Standard Penetration Tests; the Tests were performed with a 140-pound hammer dropping 30 inches in general accordance with ASTM Standard D 1586.

Our field engineer monitored the subsurface explorations, measured groundwater levels, and prepared test boring logs. Soil samples were placed in sealed, labeled containers and returned to

our office for further evaluation and laboratory testing. The test boring logs are included as Appendix B.

We installed 2-inch diameter PVC observation wells in test borings B-2 (OW-2) and B-6 (OW-1) in order to provide for measurements of stabilized groundwater levels below the Nursing Home Building footprint.

3.2 *Laboratory Testing*

We determined the gradation and plasticity characteristics of the soil formations by testing samples of the soils from selected Site test borings for their laboratory grain-size distributions, Atterberg limits, and natural moisture content. The tests were performed in our geotechnical laboratory; the laboratory reports for these samples are attached as Appendix C. The geotechnical laboratory tests were performed in general accordance with the applicable ASTM standards.

4.0 SUBSURFACE CONDITIONS

We reviewed the published geologic mapping to provide some basic information on the geologic conditions at the Site:

- The surficial geology of the Site and surrounding vicinity has been mapped as the glaciomarine deposits of the Presumpscot Formation, which underlies much of New Hampshire's seacoast region. These soils consist of thin, shallow-water marine silts and clays that were deposited on the former sea floor. The marine clay and silt layers are typically found above glacial till and bedrock[1].

- The bedrock geology map depicts the Site as being underlain by the Purple biotite-quartz-feldspar granofels or schist and interbeds of calc-silicate granofels of the Berwick Formation, which forms the bedrock in the New Hampshire Seacoast region.

4.1 *Subsurface Soils*

Subsurface conditions at the Site were characterized by drilling into the unconsolidated overburden soil formations at selected locations within the proposed Strafford County Nursing Home property. Figure 1 illustrates the existing site layout and the test boring locations.

The Site test borings were drilled to a maximum depth of 25.3 feet below the existing ground surface where refusal was encountered. Results from the test borings indicate that the subsurface conditions at the Site consist of surficial layers of organic topsoil and subsoil over a naturally

[1] Goldsmith, R. 1989. Surficial geologic map of Dover West Quadrangle Strafford County, New Hampshire. N.H.

occurring marine clay deposit. The marine clay soil layer directly overlies glacial till and probable bedrock. Table 1 is a summary of the subsurface conditions.

The general characteristics of the subsurface layers at the Site are described below in order of increasing depth below the ground surface; refer to the boring logs in Appendix B for more detailed soil descriptions at specific locations and depths.

Surficial Layers

All the test borings were advanced through topsoil and subsoil layers at the existing ground surface, which ranged in thickness from approximately 12 to 24 inches. Localized areas of thicker topsoil could be encountered during construction. The topsoil consists of dark brown fine sand and organic silt with roots; and the subsoil consists of soft brown, fine sand and silt intermixed with roots.

Glaciomarine Silt and Clay

The majority of the test borings encountered a silty clay formation that we interpret to be the glaciomarine sea floor deposits of the Presumpscot Formation (USCS designation: CL). Our test borings generally penetrated the full thickness of these marine clay deposits, which were 21 feet deep at test boring B-2; and 4 to 18 feet deep at locations of B-3 and B-5, respectively. Standard penetration testing indicated that the glacial marine deposits exhibited a hard cohesive consistency in the uppermost 10 feet, or so, and medium stiff to soft cohesive consistency below 10 feet from the surface. Laboratory testing (Appendix C) indicates that the silt and clay soils have:

- Natural water contents of 27.7% to 36.2%, by dry weight. The deeper samples represent soils below the groundwater elevation.
- Liquid limits of 32 to 41, and plasticity indices of 9 to 18, indicating the marine soils consist of Low Liquid Limit Clay.

Boring/ Sample No.	Sample Depths (feet below grade)	Water Content (%)	Liquid Limit	Plasticity Index
B-1/S-3	4 - 6	29.0	38.5	16.5
B-2/S-8	16 - 18	36.2	31.7	11.0
B-5/S-3	4 - 6	28.6	37.4	14.1
B-5/S-7	14 - 16	32.6	36.2	14.6
B-10/S-3	4 – 6	30.9	39.2	14.8
B-13/S-3	4 – 6	27.9	40.4	16.1
B-16/S-3	5 – 7	29.8	40.8	17.6
B-21/S-5	14 – 16	27.7	33.7	8.9

Standard penetration testing indicates that the hard clay soil formation is generally in a heavily over-consolidated condition, which was caused by desiccation. The top of a soft to medium stiff clay layer was encountered between 9 and 11 feet below the surface at borings B-2, B-5, and B-21, which were advanced within the proposed building area. The soft to medium stiff portion of the layer was about 7 to 11 feet thick at these boring locations. None of the remaining test borings encountered soft clay within the building footprint.

We estimated the unconfined compressive strength of the clay formation by Torvane testing on semi-undisturbed samples from the test borings. Testing indicated that the cohesive strength of the overconsolidated zones of these soils ranged from 2.5 to 5.0 tons per square foot (tsf), with an average of approximately 4.0 tsf. The unconfined compressive strength within the slightly overconsolidated zones at B-2 and B-5 ranged from 1.5 to 2.0 tsf.

Glacial Till Deposit

Many of the test borings in the building area encountered dense glacial till soil deposits directly beneath the marine clay layer. The top of the glacial till stratum ranged from 4 feet deep (boring B-3) to 21 feet deep (boring B-2). The glacial till consisted of brown, fine to coarse sand, some to little gravel, and silt material. The top of the glacial till layer was significantly deeper at B-2, B-5, and B-21 than other boring locations, indicating a valley was naturally filled-in with marine clay. The glacial till layer was encountered at test borings B-11 and B-12 (western portion of the site) directly beneath the subsoil layer at about 2 feet below the surface.

4.2 *Drilling Refusal/Presumed Bedrock Surface*

Drilling refusal, the depth below which the hollow-stem auger was not able to penetrate the deeper geologic formations, was encountered at all boring locations in the building footprint, at depths, below the existing grades, between 8.5 feet in B-3 to 25.3 feet in B-2. We estimate that the drilling refusals were encountered at elevations between 131.5 and 111.7 feet MSL in borings B-3 and B-2, respectively. The variation in refusal depths indicates a subsurface ravine (now filled-in with marine clay) exists beneath the central section of the building area. It is our opinion that the drilling refusals were likely on bedrock and not on large boulders; however, rock core sampling would be needed to verify the elevation of bedrock with certainty (bedrock coring was outside our work scope).

4.3 *Groundwater*

Groundwater was encountered in most of the Site test borings, at depths below the existing ground surface between 3 feet (in B-2) and 10 feet (in B-12). It is our opinion that these groundwater depths do not represent stabilized water levels; clay-rich soil formations respond and equilibrate slowly to changes. We installed two groundwater observation wells to provide groundwater levels under stabilized conditions, which are summarized in the table below.

Test Boring/ Monitoring Well No.	Ground Elevation (feet MSL)	Depth to Water (feet)		Groundwater Elevation (feet MSL)	
		9/01/2023	9/06/2023	9/01/2023	9/06/2023
B-2/OW-2	137	4	3.0	133	134
B-6/OW-1	139	4	4.9	135	134.1

It is our opinion that these groundwater depths represent semi-stabilized water levels. It should be noted, the soil samples were very damp to saturated at relatively shallow elevations indicating groundwater might be trapped at various elevations depending on surface infiltration patterns. This variation in groundwater levels is caused by the low permeability of the marine clay deposits. Fluctuations in groundwater levels should be anticipated due to variations in precipitation, snowmelt, site development, and other environmental conditions. Groundwater levels at other times, therefore, could be different from those observed and recorded during this exploration program. Groundwater levels could fluctuate by several feet during the annual hydrologic cycle.

5.0 ENGINEERING EVALUATION

Our investigation and engineering analyses indicate that the subsurface conditions at the Site are favorable for design and construction of a conventional shallow spread footing foundation system to support the proposed Strafford County Nursing Home Building, after removing and replacing any unsuitable soils below the proposed building footprint areas. The foundation elements for the proposed buildings could be supported directly on the naturally occurring dense glacial till deposit soils and solid bedrock (lower-level basement area); and the hard clay layer (ground floor slab-on-grade level), following preparations made in accordance with this report.

The test boring results indicated that the glaciomarine silt and clay formation is generally heavily overconsolidated in the uppermost 10 feet below existing ground surface elevations, with limited areas in a slightly overconsolidated condition below a depth of 10 feet. The overconsolidated hard clay soils are capable of supporting spread footings and limited engineered fill embankments that could be needed to raise the grades of the development. Where softer clay exists at footing grade (i.e., footing locations in the north area of the basement), this material should be excavated to the dense glacial till elevation, and be replaced with compacted structural fill. Reference should be made to the Generalized Subsurface Profiles provided in Figures 2, 3, and 4 for observations at the test boring locations; however, the actual limits of the softer clay

layer must be defined during the full-scale excavation process. Alternatively, the spread footings could be lowered to the glacial till elevation. The glacial till layer was encountered at elevation 124 (B-5) and 126 (B-21) in the northern section of the basement level.

Results of preliminary settlement analyses indicate long-term consolidation related settlement could exceed 1 inch where proposed embankment fills exceed 5 feet in thickness. Once the site grading plan is available, a final assessment of long-term settlement can be made.

6.0 DESIGN RECOMMENDATIONS

Based on the subsurface explorations and our geotechnical evaluations, we present the following recommendations for the design of the proposed Strafford County Nursing Home in Dover, New Hampshire.

6.1 *Foundation System – Building – Slab-on-Grade and Basement Levels*

The Site subsurface conditions are generally suitable for a shallow foundation system, consisting of isolated spread footings (under columns) and continuous, strip footings (below interior and exterior load-bearing walls) to support the proposed building. The building footprint must be cleared and grubbed of the organic topsoil and subsoil layers to expose the undisturbed, naturally occurring hard silty clay soils, which are considered to be the uppermost suitable bearing strata for the upper-level (assuming FFE of 142) spread footings.

The lower-level basement area (assuming FFE of 128) excavations will encounter dense glacial till soil, bedrock, and soft clay at spread footing elevations. The dense glacial till and bedrock layers are suitable for support of spread footings; however, the soft/medium stiff clay should be excavated and replaced with structural fill to support foundations. Where softer clay exists at footing grade (i.e., footing locations in the north area of the basement), this material should be excavated to dense glacial till elevation, and be replaced with compacted structural fill. Figure 5 illustrates the soft zone excavation limits beneath basement spread footings. Alternatively, the spread footing could be lowered to the glacial till elevation. The glacial till layer was encountered at elevation 124 (B-5) and 126 (B-21) in the northern section of the basement level.

Bedrock areas (basement level) should be over-excavated at least 12-inches below footing elevation and filled with ¾-inch crushed stone to provide some cushioning for the foundation.

Engineering analyses indicate that the foundation elements constructed on the hard clay, dense glacial till and bedrock subsurface layers should be designed using an allowable net bearing pressure of 4,000 pounds per square foot (2.0 tons per square foot). Isolated spread footings and continuous strip footings should be a minimum of 3.0 feet wide. If smaller width footings are to be used, the allowable net bearing pressure should be reduced in direct proportion to the reduction in footing width.

An allowable net bearing pressure of 4,000 psf should limit total settlements below footings to less than 1 inch. Differential settlement between adjacent footings should be less than 0.75 inch. Angular distortion beneath continuous wall footings should be less than 0.002 feet/foot. **These settlement analyses assume embankment fill layers will be less than 5 feet thick beneath the building footprint. If embankment fill layers are greater than 5 feet, deep-seated compression of the clay may contribute significantly to long-term settlement. Final settlement analyses should be performed once the FFE and structural loads have been determined.**

Foundation elements of the building that will be exposed to subfreezing temperatures should be constructed at a depth of 4 feet below the final exterior grades to provide frost protection.

Lateral forces can be resisted by the shear developed at the base of the footings. Base shear should be calculated using a coefficient of friction of 0.45 for concrete cast directly a 12-inch-thick layer of ¾-inch crushed stone placed on stable, compacted silty clay, dense glacial till and solid bedrock. A filter fabric separator (Mirafi 140N, or equal) should be installed between any crushed stone and soil materials.

6.2 *Slabs-on-Grade*

The subsurface conditions beneath the surficial organic layers are suitable for constructing reinforced concrete slabs-on-grade for the building. The uppermost 12 inches of material beneath the slab-on-grade should consist of Base Course Fill that conforms to the gradation specification in Table 2. This material should be placed in one loose lift and should be compacted to a minimum of 95 percent of its maximum dry density, as determined by ASTM D1557. A modulus of subgrade reaction (K_V) of 150 psi/inch should be used to proportion slabs-on-grade when constructed on Base Course Fill.

6.3 *Seismic Considerations*

The building will be founded within dense glacial till soils, medium stiff to hard silt and clay formations, and bedrock. These layers are sufficiently dense so as to theoretically preclude seismically induced liquefaction during the design regional seismic event. Accordingly, design provisions for liquefaction are not necessary at this Site.

The New Hampshire State Building Code (2018 International Building Code) requires that all structures be designed to withstand the forces generated by the maximum credible earthquake based on the soil and rock conditions. The soil profile beneath the proposed Building constitutes a “stiff soil profile,” and we assign the Site a Seismic Site Class of D.

6.4 *Groundwater and Drainage Issues*

Unstabilized groundwater levels in the test borings ranged in depth between 4 and 10 feet below the existing ground surface. Groundwater levels in the monitoring wells ranged from 3 to 4.9

feet below grade (elevations 135 to 134.1 feet MSL). Due to the impermeable nature of the soils that will form the subgrade and the depth of the groundwater level, is our opinion that the building should be constructed with perimeter foundation drains and a vapor barrier. At this time, it is also our opinion that subslab drains are necessary beneath the basement level floor, based on geotechnical considerations.

Foundation Drains and Basement Slab Underdrains

The perimeter foundation drainage system should consist of 4-inch diameter, rigid polyvinyl chloride (PVC) SDR35 pipe with perforations of ¼ to ½ inch (openings should be oriented downward). The drain lines should be surrounded by a minimum of 6 inches of ¾-inch crushed stone wrapped in a nonwoven geotextile filter fabric (Mirafi 140N or approved equivalent). The foundation drains should be placed adjacent to the exterior sides of the spread footings at a minimum depth of 4 feet below adjacent exterior grades to protect against frost.

The basement should have an underdrainage and waterproofing system to ensure the lower level is dry. The underdrain system could consist of an 18-inch-thick layer of ¾-inch crushed stone placed directly below the basement floor slab. The stone layer should be completely separated from any soil material using filter fabric. Four (4)-inch diameter, rigid polyvinyl chloride (PVC) SDR35 pipe with perforations of ¼ to ½ inch (openings should be oriented downward) would be installed 30-feet apart in the lower third of the stone layer. The pipes would discharge into a pump station location selected by the Architect. The pipe layout must be coordinated with the structural and architectural drawings, and discharge sump-pumps and appropriate locations should be designed by the mechanical and civil consultants.

Where possible, the foundation drains should be pitched down at a minimum slope of 0.5 percent in the direction of flow. Cleanouts should be provided at every other 90-degree bend in order to provide for future flushing the system as needed. The foundation drains should be gravity drained to daylight or to a suitable system outlet, as designed by the project civil engineer in consideration of all applicable municipal, state, and federal regulations. Roof downspouts should be separately tight-lined to their discharge outlets and should not be connected to the foundation drain system.

Vapor Retarder

The vapor retarder should consist of polyethylene 10-mil thick sheeting (Griffolyn Type 65 or approved equal). The sheeting should be overlapped at least 12 inches at the joints and joined by a manufacturer approved sealant/adhesive. All utility penetrations should be sealed to the vapor retarder in order to render them water tight. Continuous water stops should be used to create water-tight joints between foundation walls and footings, and at all cold joints along the foundation walls and footings. The type of water stop and its installation should be specified by the project architect and/or structural engineer.

The project architect and/or structural engineer should confirm the relative location of the vapor retarder and take its placement into account in the design curing specification for the slab-on-grade.

The vapor retarder installation should be sequenced to minimize the potential for water to be trapped between the slab and the vapor retarder. Precipitation runoff should be directed away from prepared slab areas to prevent free water from collecting on the vapor barrier.

6.5 *Foundation Walls and Loading Docks*

Foundation walls for the building and loading docks (if included) should be designed as retaining walls using "at-rest" earth pressure conditions (restrained walls not allowed to rotate). The earth pressure diagrams can be developed using these design fluid weights, which assume that the walls would be backfilled using Select Granular Fill and the walls will be constructed with drains at foundation elevations. The geotechnical design parameters for foundation walls are:

DESIGN PARAMETERS	
ϕ (select granular backfill)	35º
c (select granular backfill)	0 psf
γ (select granular backfill)	135 pcf
Net allowable bearing pressure	4,000 psf
Equivalent fluid weight (at-rest earth pressure condition, restrained walls)	60 pcf
Equivalent fluid weight (active earth pressure condition, unrestrained walls)	40 pcf
Coefficient of sliding friction (between concrete and compacted natural subgrade soils)	0.45

In addition to differential earth pressure, surcharge pressures should be applied to the foundation walls where appropriate. This uniformly distributed surcharge pressure can be resolved into a force (per linear foot of wall length), which would act at a depth of one-half the wall height below the upper-level exterior grades. The surcharge force should be calculated using the following expression:

$F_S = ½ * P * H$; where
F_S = surcharge force
P = live and dead load from the surcharge (psf)
H = height of wall (ft)

The walls should achieve wall stability factors of safety of 2.0 (for overturning), 1.5 (for sliding), and 1.5 for overall ("global") stability. A maximum bearing pressure of 4,000 pounds per square foot should be used for wall stability analysis and footing design.

Lateral forces would be resisted by the shear developed at the base of the footings. Base shear should be calculated using a coefficient of sliding friction of 0.45 for concrete cast directly on the subgrade soils (compacted naturally occurring silty sand deposit soils).

6.6 *Grades and Slopes*

The Site is being planned for property underlain by Presumpscot Formation silt and clay soils. These soils are generally in an overconsolidated condition and are capable of supporting limited engineered fills and structural loads. The total height of engineered fills should not exceed 5 feet, when composed of typical Clean Granular Fill materials, so as to not exceed the maximum past pressure of the clay. The Site could, however, be developed with higher engineered fills if preloading/surcharging or light-weight fill concepts are employed. ***Higher engineered fills or use of light-weight fills would require additional geotechnical evaluation.***

Note that test borings B-2, B-5, B-17, and B-21 encountered a zone of softer clay layer that should be further evaluated to determine the impact of loads from engineered embankment fills;

there could be other localized zones of soft clay at the Site that were not encountered in our test borings. The final design grades in these areas should not be raised more than 5 feet above the existing grades without additional geotechnical evaluation. Areas with softer clay soils that will be developed with engineered fills could be pre-loaded to reduce the potential for excessive long-term settlement.

The glacial till and hard clay soil deposits could be exposed in cut slopes. Cuts in these naturally occurring soil layers should be constructed with slopes no steeper than 3H:1V. It is unlikely that bedrock will be exposed in the cut slope areas.

Unreinforced engineered fill slopes constructed from the silty fine sand deposit soils and/or compacted Clean Granular Fill from off-site borrow sources should be designed at maximum slope angles of 3H:1V. Final slopes should be protected from erosion using riprap or an erosion control matting system.

6.7 *Flexible (Asphalt) Pavements and Exterior Walkways*

Asphalt pavements for the proposed project were designed in accordance with procedures developed in the "AASHTO Guide for the Design of Pavement Structures" (1993 and 1998). These analysis methods were used in conjunction with the results of the test borings to determine the recommended pavement section thicknesses that will adequately support the anticipated traffic loading intensity. In addition to traffic loading and intensities, the AASHTO analysis method also considers subgrade strength, environmental effects, and serviceability requirements. In our pavement section design, we have assumed that all the new pavements will be constructed on properly prepared silty sand deposit soils following excavation to the design lines and grades.

Traffic loading data were not available for our analysis. We have assumed that the standard-duty pavements, which are generally the proposed paved parking areas, will be subjected only to traffic loadings from passenger vehicles. We have also assumed that the heavy-duty pavements will be needed in the driveways that convey vehicles to the parking areas, and trucks and buses to the loading areas and sally port, and that these traffic loadings will be only from passenger vehicles and delivery trucks (we anticipate that loads due to loaded tractor trailers and buses will be a minor amount of the total loading). Other design parameters were:

20-year design life Reliability – 90% Standard Error – 0.45 ΔPSI – 2.0

Our analysis indicates that the loading intensities should be supported by the minimum asphalt pavement section thicknesses shown below. These design thicknesses should be reviewed once the final facility design has been advanced to provide expected traffic loadings.

PAVEMENT COMPONENT	MINIMUM REQUIRED THICKNESS (INCHES)	
	HEAVY DUTY	STANDARD DUTY
Hot Mix Asphalt, ⅜" Wearing Course (NHDOT Item 403.11)	1.5	1.0
Hot Mix Asphalt, ¾" Binder Course (NHDOT Item 403.11)	2.5	2.0
Aggregate Base (NHDOT Item 304.3, Crushed Gravel)	6	6
NHDOT Item 304.2 Bank Run Gravel	18	12
Total Pavement Structure Section	28	21

NOTE: NHDOT materials as specified in the current New Hampshire Department of Transportation *"Standard Specifications for Roads and Bridges"*.

The silty clay soils have low permeability, are moisture sensitive, and frost susceptible; therefore, at least 4 feet of free-draining granular fill should be placed beneath exterior walkways to reduce frost heaving.

7.0 EARTHWORK AND CONSTRUCTION RECOMMENDATIONS

Based on the subsurface explorations and our geotechnical evaluations, we present the following recommendations for the construction of the proposed Strafford County Nursing Home project in Dover, New Hampshire.

7.1 *Subgrade Preparations*

Topsoil and subsoil were encountered at test boring locations, and we consider these soils to be unsuitable for supporting the proposed foundation elements and pavements; the undisturbed, naturally occurring stiff to hard, silty clay/clayey silt and dense glacial till layers are considered to be the uppermost suitable bearing strata for this construction, and excavation to remove the unsuitable soils should be continued to expose the undisturbed hard clay and glacial till deposit soils below the building footprints and all foundation elements.

All topsoil, subsoil, debris, frozen soils, and loose or disturbed soils should be excavated and removed from all proposed foundation bearing zones and slab areas to the lateral limits defined by a one horizontal to one vertical (1H:1V) line sloped down and away from the bottom outside edges of foundation elements. All subsurface utilities and abandoned foundations, if applicable, should be located and removed, and the removal should include the associated backfill materials.

The granular portions of the glacial till soil materials could potentially be reused as raise-in-grade fills outside the building footprints. These materials should be overexcavated, separated from the topsoils, and subsoils, and stockpiled, placed, and compacted in accordance with this

report. These soils are moisture sensitive and frost-susceptible; and therefore, will require moisture conditioning to facilitate compaction.

Following stripping of unsuitable soils, the exposed subgrade soil should be compacted with at least four complete passes of a 10-ton vibratory drum roller. Silty Clay soil subgrades that are saturated or pump and weave during rolling should be excavated and replaced with Select Granular Fill material that is compacted to at least 95% of its maximum dry density as determined by ASTM Standard D 1557, or compacted ¾-inch crushed stone. The depth of undercutting and type of backfill material should be selected with consideration of the proposed use (i.e., buildings or pavements) and the soil and weather conditions encountered during construction. Crushed stone should be placed in 12-inch maximum loose lifts, wrapped in a geotextile filter fabric (Mirafi 140N or approved equal), and compacted to ensure stability.

The contractor is responsible for construction means and methods and should anticipate the need for methods to prevent disturbance, softening, or rutting of subgrades, or damage to overlying soils resulting from construction traffic. Care must be taken to avoid disturbing subgrades by keeping construction traffic off of subgrades during wet conditions and/or inclement weather until a firm fill layer has been placed.

Final foundation and subgrade preparation should include re-compaction of bearing surfaces. Care should be taken to limit disturbance to bearing surfaces prior to placement of concrete. Any loose, softened, or disturbed material should be removed and replaced with compacted structural fill prior to placement of concrete. Excavated subgrades should not be left exposed overnight unless the weather forecast calls for above-freezing, clear conditions.

7.2 *Earthwork in Wet Environments*

The silt and clay soils have a high fines content (silt and clay fractions combined) and are considered to be moisture sensitive and frost susceptible. Care must be taken to avoid disturbing prepared subgrade areas by keeping construction traffic off silty sand subgrades during wet conditions and/or inclement weather until a firm fill layer has been placed. To reduce disturbance of exposed subgrade soils, it will be important to divert runoff, provide positive grading to shed seepage and runoff, and to compact exposed subgrades to reduce rutting, ponding, and surface water infiltration.

The native soils that will be encountered during construction are sensitive to moisture and difficult to place and compact during wet weather and freezing conditions. In fact, the natural moisture contents, measured in the laboratory, of the clay soils are close to the Liquid Limit; therefore, these soils must be dried considerably to reach the optimum moisture content in order to be used in embankment fills for the driveways and parking lots. Clay soils that are more than 2 percent over the optimum moisture content will not be suitable for reuse as structural fill and may need to be exported from the Site.

7.3 *Temporary Excavations*

Construction site safety, means and methods, and sequencing of construction activities is the sole responsibility of the contractor. Under no circumstances should the following information be interpreted to mean that Miller Engineering & Testing, Inc. is assuming responsibility for construction site safety, trench protection, or the contractor's responsibilities. Such responsibility is not being implied and should not be inferred.

All temporary excavations should be performed according to Occupational Safety and Health Administration (OSHA) Standards (29 CFR 1926 Subpart P). It is our opinion that the fill materials and the undisturbed silty fine sand deposit soils are OSHA Type C soils, and temporary unbraced excavations should be cut no steeper than 1½H:1V under dry or dewatered conditions.

7.4 *Dewatering and Runoff Control*

Where encountered in the Site test borings, unstabilized groundwater levels were at depths between 4 and 10 feet below the existing ground surface, and approximately 3 to 4.9 feet below grade (elevations 135 to 134.1 feet MSL) in the monitoring wells. We anticipate that groundwater will be encountered during foundation and building construction.

Should groundwater be encountered during construction, inflows should be controlled in order for earthwork to be completed "in the dry". The contractor should anticipate the need for controlling runoff during wet periods; pumping from open sumps will likely provide adequate control of water within excavations during construction.

Subgrade soils that become unstable should be undercut and replaced with structural fill or crushed stone, as necessary. Surface water runoff should be directed away from excavations to reduce dewatering efforts and to protect subgrades from becoming soft and unstable. Temporary detention ponds, trenches, ditches, and dewatering sumps should not be made in areas to be filled.

7.5 *Placement of Granular Engineered Fills*

Engineered fills could be required to achieve the design grades in several areas of the proposed Site development. Table 2 is the gradation specifications for soils to be used in the engineered fills at the Site. The different granular fill types should be used as follows:

1. Select Granular Fill should be used for engineered fills below the building footprint areas, in foundation bearing zones, and as backfill around the foundation elements. Materials used as Select Granular Fill should have the gradation in Table 2. An acceptable alternative is NHDOT Item 304.3 (Crushed Gravel).

2. Clean Granular Fill should be used for engineered fills below roadway, parking, and other non-structural areas, and should have the gradation shown in Table 2. An acceptable alternative is NHDOT Item 304.2 (Gravel).

3. Base Course should be used for the uppermost fill below the building slab-on-grade (Table 2). An acceptable alternative is NHDOT Item 304.33 (Crushed Aggregate for Shoulders).

All granular fills should be placed in 12-inch maximum loose lifts and should be compacted to a minimum of 95% of the material's maximum dry density, as determined by ASTM D 1557 (modified Proctor test) and verified with field density testing (ASTM D 6938 or equivalent method). Lift thickness should be a maximum of 6-inch (loose) when compacted with hand-guided equipment.

7.6 *Reuse of Site Materials*

A preliminary assessment of the suitability of using the on-site soils as engineered fills in the proposed construction is based on the soil classifications, laboratory test results, and observations at the Site. The suitability of these materials is summarized below.

1. Topsoils and subsoils are suitable for reuse on-site only within landscaped areas.

2. The inorganic silt and clay soils are not suitable for on-site re-use as structural fill below the building footprints due to their high moisture content and excessive fines content, and frost susceptibility potential. These soils could be suitable for re-use as raise-in-grade fills in driveway and parking lot embankments and landscaped areas. **The silt and clay soils that will be encountered during construction are sensitive to moisture and difficult to place and compact during wet weather and freezing conditions. In fact, the natural moisture contents of the silt and clay soils are close to the liquid limit; therefore, these soils must be dried to the optimum moisture content in order to be used in embankment fills for the pavement embankments. Silty soils that have excessive moisture content will not be suitable for reuse as fill and may need to be exported from the Site**.

Materials to be used as the engineered fills, base course below the slab-on-grade, and as the pavement base course will need to be imported to the Site. Representative samples of all

materials proposed for use as fills should be submitted for testing during construction to compare their gradation characteristics to the requirements of the project specifications, and to establish their optimum water contents and maximum dry densities (modified proctor testing, ASTM Standard D 1557). The geotechnical engineer must approve use and reuse of on-site or borrow soils for use as engineered fills. Use of materials as engineered fills assumes that the moisture content of the material will be strictly controlled in order to allow for proper placement and compaction. Proper compaction of the on-site soils could be difficult or impractical during cold, wet weather conditions when drying soil materials is infeasible.

7.7 *Special Inspections*

In accordance with the State Building Code, special inspections are necessary during subgrade preparation and placement of fill within building footprint areas. The project geotechnical engineer should be engaged to make appropriate site visits during the excavation and subgrade preparations to confirm that our assumptions regarding subsurface conditions (which were based on a limited number of borings) were reasonably representative and that our recommendations are being properly interpreted and followed.

8.0 RECOMMENDATIONS

Based on our geotechnical evaluation, we offer the following recommendations for additional geotechnical design evaluation:

1. This report was prepared without benefit of a final civil site design. Once the site design has been completed, we should be engaged to review this report (and revise it, if necessary) during the final design phase of the Strafford County Nursing Home facility.

2. This report was prepared without the final structural design. Once this design has been completed, we should be engaged to review this report (and revise it, if necessary) during the final design phase.

3. Groundwater levels should be measured in the monitoring wells installed during this evaluation at monthly intervals until the final design has been completed.

9.0 FINAL DESIGN AND CONSTRUCTION MONITORING

A qualified geotechnical engineer should be retained to provide engineering services during the excavation and construction phases of this project. This will become particularly important relative to the excavation of unsuitable materials, and the placement and compaction of

engineered fills. This will also allow for design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction. The adequacy of fill compaction should be determined by field density testing as the fill is placed and compacted.

Representative samples of all backfill materials should be submitted to Miller Engineering & Testing, Inc. for testing to establish their optimum water contents and maximum dry densities, and to compare their gradation characteristics with the project specifications. In this manner, compaction criteria can be developed which will provide the materials with adequate strength and minimal distortion.

Lastly, we recommend that we be retained to assist in preparation of the project earthwork specifications and to review final design plans, specifications, and design submittals. In the event that any changes in the nature, design, or locations of the proposed project are planned, the conclusions and recommendations in this report will not be considered valid unless the changes are reviewed and conclusions of the report modified or verified in writing by Miller Engineering & Testing, Inc.

LIMITATIONS

Explorations

1. The analyses, recommendations and designs submitted in this report are based in part upon the data obtained from subsurface explorations. The nature and extent of variations between these explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretation of widely spaced explorations and samples; actual soil transitions are probably more gradual. For specific information, refer to the boring logs.

3. Water level readings have been made in the drill holes at times and under conditions stated on the boring logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, and other factors differing from the time measurements were made.

Review

4. It is recommended that this firm be retained to review final design plans and specifications. In the event that any changes in the nature, design, or location of the structures are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of the report modified or verified in writing by Miller Engineering & Testing, Inc.

Construction

5. It is recommended that this firm be retained to provide soils engineering services during the excavations and foundation construction phases of the work. This is to observe compliance with the design concepts, specifications, or recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

Use of Report

6. This report has been prepared for the exclusive use of **Warrenstreet Architects** for the **Proposed Strafford County Nursing Home project** on **County Farm Road** in **Dover, New Hampshire** in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

7. This soil and foundation engineering report has been prepared for this project by Miller Engineering & Testing, Inc. This report was completed for design purposes and may be limited in its scope to prepare an accurate bid. Contractors wishing a copy of the report may secure it with the understanding that its scope is limited to design considerations only.

Jonathan Halle

From: Dan Weeks <dweeks@revisionenergy.com>
Sent: Friday, November 10, 2023 11:51 AM
To: Jonathan Halle; James Brennan; Sheldon Rogers
Cc: kkelley@hccnh.com
Subject: Re: Warrenstreet - Strafford

Based on the estimate I received from Jonathan of ~40,000 SF roof space that should be open and available for solar, we're projecting a max size solar array that would cost ~$1.1 million fully installed before incentives. We're assuming a fully-adhered rubber membrane roof (e.g. EPDM) and structural capacity for 5-7 PSF for the installed system. We also assume the electrical service will be 480V with 600A or higher (should not require any expansion over what you will already spec).

Thanks,
Dan

Dan Weeks
Vice President, Business Development | Employee-Owner

Direct: +1 603-264-2877

ReVision Energy, a Certified B Corp
Locations in Maine, New Hampshire & Massachusetts

From: Jonathan Halle <jh@warrenstreet.coop>
Date: Friday, November 10, 2023 at 8:25 AM
To: James Brennan <jbrennan@hccnh.com>, Sheldon Rogers <sr@warrenstreet.coop>, Dan Weeks <dweeks@revisionenergy.com>
Cc: kkelley@hccnh.com <kkelley@hccnh.com>
Subject: Re: Warrenstreet - Strafford

Yes we need to add an allowance for the solar in the base number. I am copying Dan weeks with Revision asking that he reply with a budget to carry.

Get Outlook for iOS

From: James Brennan <jbrennan@hccnh.com>
Sent: Friday, November 10, 2023 8:05:18 AM
To: Sheldon Rogers <sr@warrenstreet.coop>; Jonathan Halle <jh@warrenstreet.coop>
Cc: kkelley@hccnh.com <kkelley@hccnh.com>
Subject: RE: Warrenstreet - Strafford

Just want to confirm that we are not carrying the cost of solar in our number correct? We haven't before so I just want to make sure we are on the same page.

Please mail the completed form and required material to:

New Hampshire Division of Historical Resources
State Historic Preservation Office
Attention: Review & Compliance
19 Pillsbury Street, Concord, NH 03301-3570

RECEIVED SEP 1 1 2023

DHR Use Only	
R&C #	14572 NH
Log In Date	9/11/23
Response Date	10/25/23
Sent Date	10/31/23

Request for Project Review by the New Hampshire Division of Historical Resources

☐ This is a new submittal
☒ This is additional information relating to DHR Review & Compliance (R&C) #: 14572

GENERAL PROJECT INFORMATION

Project Title Strafford County Nursing Home

Project Location County Farm Road

City/Town Dover Tax Map B1 Lot # B0020-000000

NH State Plane - Feet Geographic Coordinates: Easting 1180471 Northing 263053
(See RPR Instructions and R&C FAQs for guidance.)

Lead Federal Agency and Contact *(if applicable)* NA
(Agency providing funds, licenses, or permits)
Permit Type and Permit or Job Reference #

State Agency and Contact *(if applicable)*

Permit Type and Permit or Job Reference #

APPLICANT INFORMATION

Applicant Name Raymond Bower, Strafford County Administrator

Mailing Address 259 County Farm Rd., Suite 204 Phone Number 603-516-4100

City Dover State NH Zip 03820 Email rbower@co.strafford.nh.us

CONTACT PERSON TO RECEIVE RESPONSE

Name/Company Jonathan Halle/Warrenstreet Architects

Mailing Address 4 Crescent St., Unit 2 Phone Number 225-0640

City Concord State NH Zip 03303 Email jh@warrenstreet.coop

This form is updated periodically. Please download the current form at www.nh.gov/nhdhr/review. *Please refer to the Request for Project Review Instructions for direction on completing this form.* Submit one copy of this project review form for each project for which review is requested. Please include a self-addressed stamped envelope. Project submissions will not be accepted via facsimile or e-mail. This form is required. Review request form must be complete for review to begin. Incomplete forms will be sent back to the applicant without comment. Please be aware that this form may only initiate consultation. For some projects, additional information will be needed to complete the Section 106 review. All items and supporting documentation submitted with a review request, including photographs and publications, will be retained by the DHR as part of its review records. Items to be kept confidential should be clearly identified. For questions regarding the DHR review process and the DHR's role in it, please visit our website at: www.nh.gov/nhdhr/review or contact the R&C Specialist at marika.s.labash@dncr.nh.gov or 603.271.3558.

PROJECTS CANNOT BE PROCESSED WITHOUT THIS INFORMATION 14572

Project Boundaries and Description

- ☐ Attach the Project Mapping ***using EMMIT or relevant portion of a 7.5' USGS Map.*** *(See RPR Instructions and R&C FAQs for guidance.)*
- ☐ Attach a detailed narrative description of the proposed project.
- ☐ Attach a site plan. The site plan should include the project boundaries and areas of proposed excavation.
- ☐ Attach photos of the project area (overview of project location and area adjacent to project location, and specific areas of proposed impacts and disturbances.) *(Informative photo captions are requested.)*
- ☐ A DHR records search must be conducted to identify properties within or adjacent to the project area. Provide records search results via EMMIT or in **Table 1.** *(Blank table forms are available on the DHR website.)* Please note, using EMMIT Guest View for an RPR records search does not provide the necessary information needed for DHR review.
  EMMIT or in-house records search conducted on / / .

Architecture

Are there any buildings, structures (bridges, walls, culverts, etc.) objects, districts or landscapes within the project area? ☐ Yes ☐ No
If no, skip to Archaeology section. If yes, submit all of the following information:

Approximate age(s):

- ☐ Photographs of ***each*** resource or streetscape located within the project area, with captions, along with a mapped photo key. (Digital photographs are accepted. All photographs must be clear, crisp and focused.)
- ☐ If the project involves rehabilitation, demolition, additions, or alterations to existing buildings or structures, provide additional photographs showing detailed project work locations. (i.e. Detail photo of windows if window replacement is proposed.)

Archaeology

Does the proposed undertaking involve ground-disturbing activity? ☐ Yes ☐ No
If yes, submit all of the following information:

- ☐ Description of current and previous land use and disturbances.
- ☐ Available information concerning known or suspected archaeological resources within the project area (such as cellar holes, wells, foundations, dams, etc.)

Please note that for many projects an architectural and/or archaeological survey or other additional information may be needed to complete the Section 106 process.

DHR Comment/Finding Recommendation *This Space for Division of Historical Resources Use Only*

☐ Insufficient information to initiate review. ☐ Additional information is needed in order to complete review.

☐ No Potential to cause Effects ☑ No Historic Properties Affected ☐ No Adverse Effect ☐ Adverse Effect

Comments: _____

If plans change or resources are discovered in the course of this project, you must contact the Division of Historical Resources as required by federal law and regulation.

Authorized Signature: Nadine Miller, DS/HPO Date: 10/25/23

NH DIVISION OF HISTORICAL RESOURCES ARCHAEOLOGICAL CONCURRENCE FORM

Date : 10/11/23	**Site no.**	**RPR #** 14572
Project : Construct nursing home, County Farm Cross Road		**Federal/State #**
Report title : Phase IA Archaeological Sensitivity Assessment, Strafford County Nursing Home Project, Dover, NH		
Lead government agency : TA		
Other parties : MAC, Warrenstreet		

NEPA and Sec. 106 of the NHPA require consultation with the SHPO to ensure the review of all actions covered by these acts relative to historical and cultural properties. The review should focus on the project's impacts pertinent to this act.

FOR MORE INFORMATION CONTACT: Marika Labash, Review & Compliance Archaeologist, (603-271-3558)

COMMENTS: Please check one. Additional comments should be included below or on a separate sheet.

✓ **CONCUR** with results of Study and recommendation of no further testing.

____ **CONCUR WITH CONDITION** (Indicate major reservations about the project and the specific substantive changes or modifications desired.)

____ **TECHNICAL COMMENTS**

DHR Authorized Signature

R+C Archaeologist
Title

10-23-23
Date

Warrenstreet
Planning | Architecture | Landscapes | Interiors

February 27, 2023

RE: DESIGN TEAM ROSTER – Strafford County Nursing Home Design Effort

DESIGN TEAM CONTACT LIST

1. **Architect – Project Facilitator**
   Warrenstreet Architects, Inc
   27 Warren St, Concord, NH 03301
   Contact: Jonathan Halle, AIA, ASLA
   (603) 738-9004
   jh@warrenstreet.coop

2. **Civil Engineer**
   Nobis Group
   18 Chenell Dr, Concord, NH 03301
   Contact: Chris Nadeau
   (603) 224-4182
   CNadeau@nobis-group.com

3. **Surveyor**
   Richard D. Bartlett & Associates, LLC
   214 N. State St, Concord, NH 03301
   Contact: Mark Sargent
   (603) 225-6770
   msargent@richardbartlett.com

4. **Geo-Technical**
   Miller Engineering & Testing, Inc
   100 Sheffield Rd, PO Box 4776, Manchester, NH
   Contact: Frank Miller, PE
   (603) 668-6016
   fmiller@millerengandtesting.com

5. **Wetland/ Soils/Wildlife**
   Stoney Ridge Environmental, LLC
   8 Kiana Rd, Alton, NH 03809
   Contact: Cindy Balcius
   (603) 776-5825
   cbalcius@stoneyridgeenv.com

6. Phase 1 Environmental
   SRW Environmental Consulting, LLC
   143 Rochester Hill RD, Rochester, NH 03867
   Contact: Todd Shaeffer
   (603) 330-3537
   todd@srwnh.com

7. Historic Preservationist
   LM Preservation
   6 Field Pond DR, Reading, MA 01867
   Contact: Lisa Mausolf
   (781) 944-5958
   lmausolf@att.net

8. Archaeology
   Monadnock Archaeological Consulting, LLC
   144 Greenwood Rd, Dublin, NH 03444
   Contact: Robert Goodby
   (603) 563-8123
   rgoodby@monadnock.com

9. Mechanical/Electrical/Plumbing Engineer
   Dubois & King, Inc
   85 Main St, Springfield, VT05156
   Contact: Elijah Daniels, PE
   (802) 591-4326
   edaniels@dubois-king.com

10. Commissioning Agent
    Ben Fowler Consulting
    PO Box 211, Burlington, VT 05402
    Contact, Ben Fowler
    (802) 861-7550
    info@benfowlerconsulting.com

11. Fire Protection Engineer
    SFC Engineering partnership, Inc
    183 Rockingham RD, Suite 3E, Windham, NH 03087
    Contact: Jeff Murphy, PE
    (603) 647-8700
    jmurphy@sfceng.com

12. Structural Engineer
    TFM Moran, Inc
    48 Constitution Ave, Bedford, NH 03110
    Contact: Paul Sbacchi, PE
    (603) 472-9747
    psbacchi@tfmoran.com

13. Kitchen Designer
    Alternative Sales Corp.
    135 Rt 125, Kingston, NH 03848
    Contact: Phillip Basiliere
    (603) 339-8377
    PBasiliere@Alternativesales.net

14. Cost Advisor
    Harvey Construction, Inc
    10 Harvey Rd, Bedford, NH 03110
    Contact: Keith Kelley
    (603) 624-4600
    kkelley@hccnh.com

Should there be any questions, Please contact me directly, my cell is (603) 738-9004.
Thank You!

Respectfully,
WARRENSTREET ARCHITECTS

Jonathan Halle, AIA, PLA
Architect & Landscape Architect
Managing Member

Warrenstreet

Planning | Landscapes | Architecture | Interiors

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(603) 225-0640 www.warrenstreet.coop