SUNY Cortland

SUNY CORTLAND – SMITH & CASEY RESIDENCE HALLS
FINAL FEASIBILITY STUDY

Smith Tower
23 Water St, Cortland, NY 13045
Casey Tower
20 Broadway Ave, Cortland, NY 13045

June 05, 2018

GoshowArchitects

PREPARED BY:
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DASNY
DORMITORY AUTHORITY STATE OF NEW YORK

DASNY Project No. 343370

Executive Summary

Goshow Architects developed this study under contract with the Dormitory Authority of the State of New York (DASNY). The intent of this report is to provide a Feasibility Study for the Smith and Casey Residence Halls on the Cortland campus of the State University of New York.

Built in 1972, the 10-story Smith and Casey Residence Halls currently house 560 students. The existing suites do not provide kitchens and therefore these students purchase meal plans. Many upper-class students choose to live off campus rather than in a student suite. To encourage these students to stay on campus, the college is investigating the feasibility of converting the 10th floor of each tower into apartments that will include kitchens. As a result, the number of meal plans would be reduced. The university would then want to regain the meal plans lost by adding new suites and is analyzing the option of demolishing and rebuilding the connector building to include floors 3-9 to house these suites. The Goshow team has been asked to study different options for the Smith-Casey Towers.

This feasibility study will include four conceptual design options. Option One includes the alteration of the 10th floor of the two buildings into apartment units with kitchens. Option Two consists of demolishing and redesigning the center connector building between the two towers to provide additional suites and would include shared areas to encourage student interaction. Option Three would provide the estimated construction cost to demolish the entire building and rebuild a new 600-bed residence hall. Option Four is to develop a test fit for a parking garage in the existing parking lot adjacent to the Casey tower. All options would include construction cost estimates.

An important consideration of this project concerns the impact on the existing buildings during construction. The university requires the least disruption possible to minimize the displacement of housed students during construction. This feasibility study will provide SUNY Cortland with the necessary information to make an informed decision about the future of the Smith-Casey Residence Halls.

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1.0 Project Introduction

1.1 Project Goals

The goal of the project is to develop a Feasibility Study to evaluate the impact of various options on the Smith-Casey Residence Halls. This Feasibility Study will consist of four options requested by DASNY and SUNY Cortland to enable them to determine a course of action.

One of the aims of the study is to determine which is the most feasible option(s) to provide the preferred student housing while maintaining the same revenue at the Smith-Casey Towers. The four options are:

1. Design 'Apartment Style' units with full kitchens on the 10th floor for both towers. Apartments will provide as many single occupancy bedrooms as possible.

2. Demolish the connector building and design a new connector building linking the two towers from floors 1-9 which will house additional suites, shared spaces including lounges, laundry rooms and a multi-purpose student activity room for 100 occupants.

3. Demolish both towers and the connector building and determine the cost to construct a new 600-bed residence hall in the same location. This option is limited to determining the cost of demolition and new construction in the same location. No plans, sections or elevations will be developed for this option.

4. Develop a test fit for a two-story parking garage on the existing south parking lot, adjacent to the Casey Tower. This study will indicate the number of additional parking spaces which can be provided as well as the estimated construction costs for this structure.

1.2 Project Process

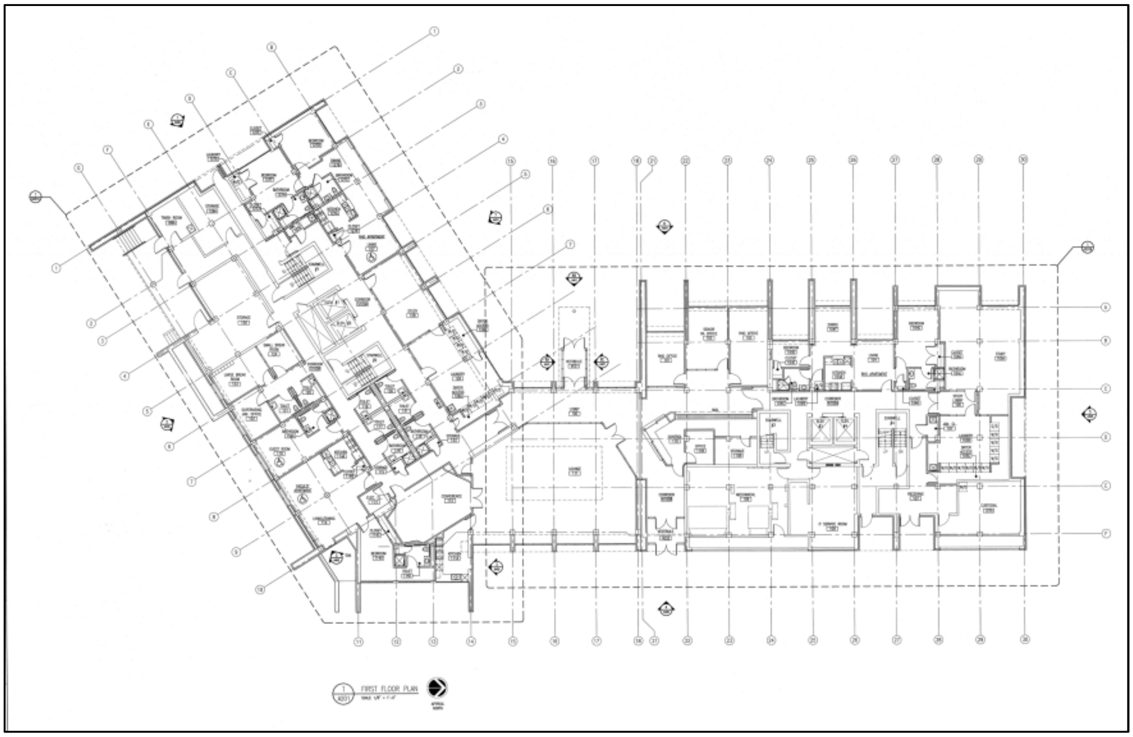
The design team was provided with a student housing market analysis report for Cortland's student housing programs that was completed in March 2017. The design team used this information to help them understand the demographics of the students at Cortland and of the future need for housing on campus. The design team, DASNY and SUNY Cortland held meetings on September 20th, 2017, February 28th, 2018, March 22nd, 2018, and April 4th, 2018 to further discuss the development of the study options. (See Appendix 7.1 for Meeting Minutes)

The process for developing the options also included several months of communication between the design team, DASNY, and SUNY Cortland. This process consisted of video conferences which enabled the design team and the client to review and develop the ideas of spatial needs, important adjacencies, and conceptual layouts. Existing drawings in pdf and autocad were sent by Cortland and used to develop the designs.

2.0 Existing Conditions

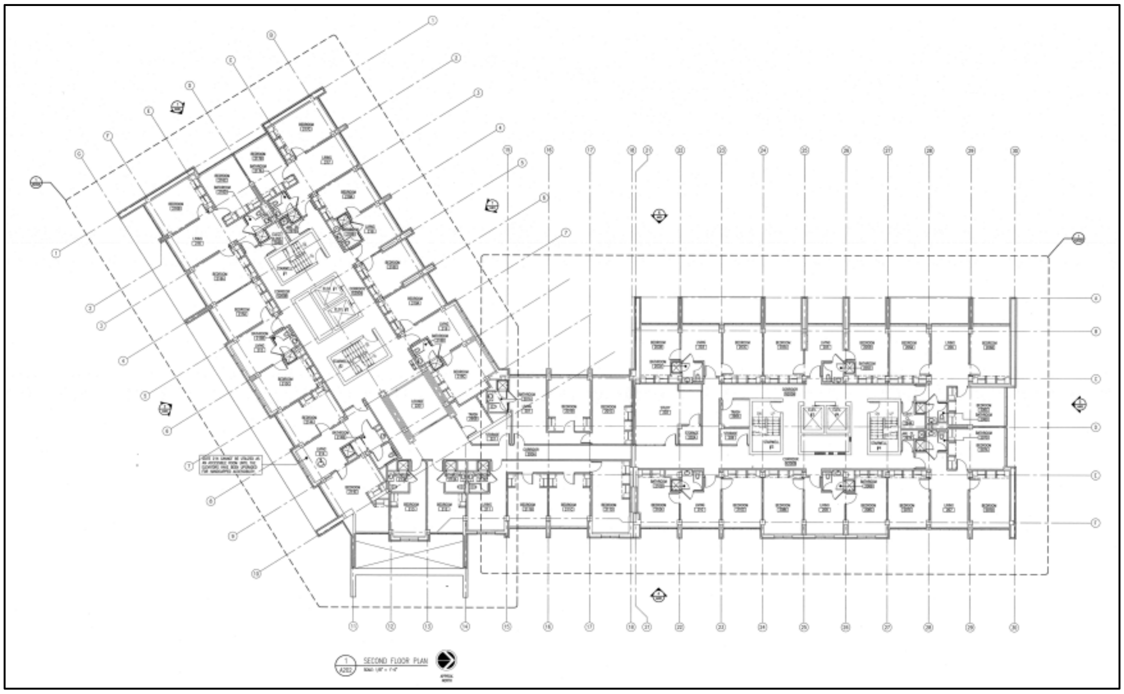
2.1 Existing Architecture

The Smith (23 Water St) and Casey (20 Broadway Ave) Residence Halls are located on the SUNY Cortland campus in New York and were built in 1972. The first floor provides primary access to both Casey and Smith Towers. Student residents are housed on floors 2-10. Two elevators and two stair towers in each tower allow access to all floors.



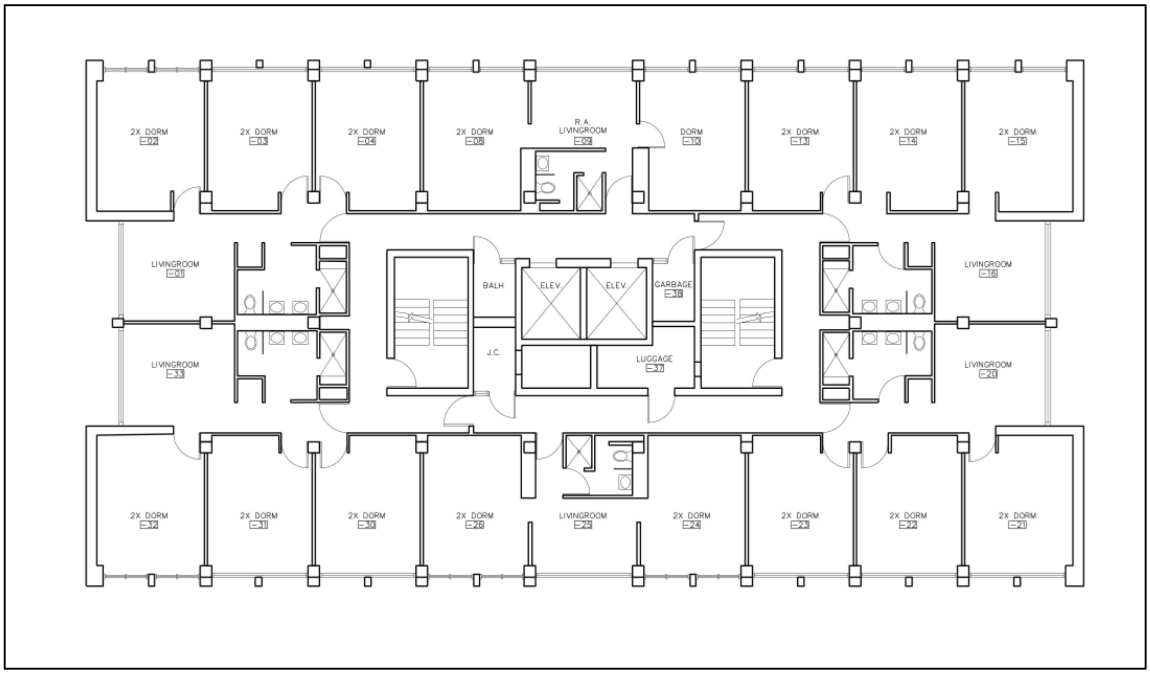
1. Existing First Floor

The Smith and Casey buildings are connected on the first and second floors. The first floor contains staff housing, mechanical and storages spaces as well as a recreation lounge, study lounges, conference room, a student staff office, the RHD offices and student mailboxes. The recreation lounge is equipped with a pool table, ping pong table and big screen TVs. Vending machines are located on the first floor. College ID is required for payment. There are laundry facilities on the first floor in each tower. The cost for use is included in the dining plan. There is a kitchen located on the first floor equipped with a sink, stove/oven and a microwave. The entire building is wireless Internet accessible. The halls are also open for winter sports athletes over winter break.



2. Existing Second Floor

The second floor elevation is 14’-0” above the first floor and provides bedroom suites. It is the only student residence floor to connect the two towers. 52 beds (with meal plans) are provided on this floor of the Smith and Casey buildings with 12 more beds (with meal plans) in the connector, totaling 64 beds (with meal plans) for the second floor. Internal study and lounge rooms are available for student use.

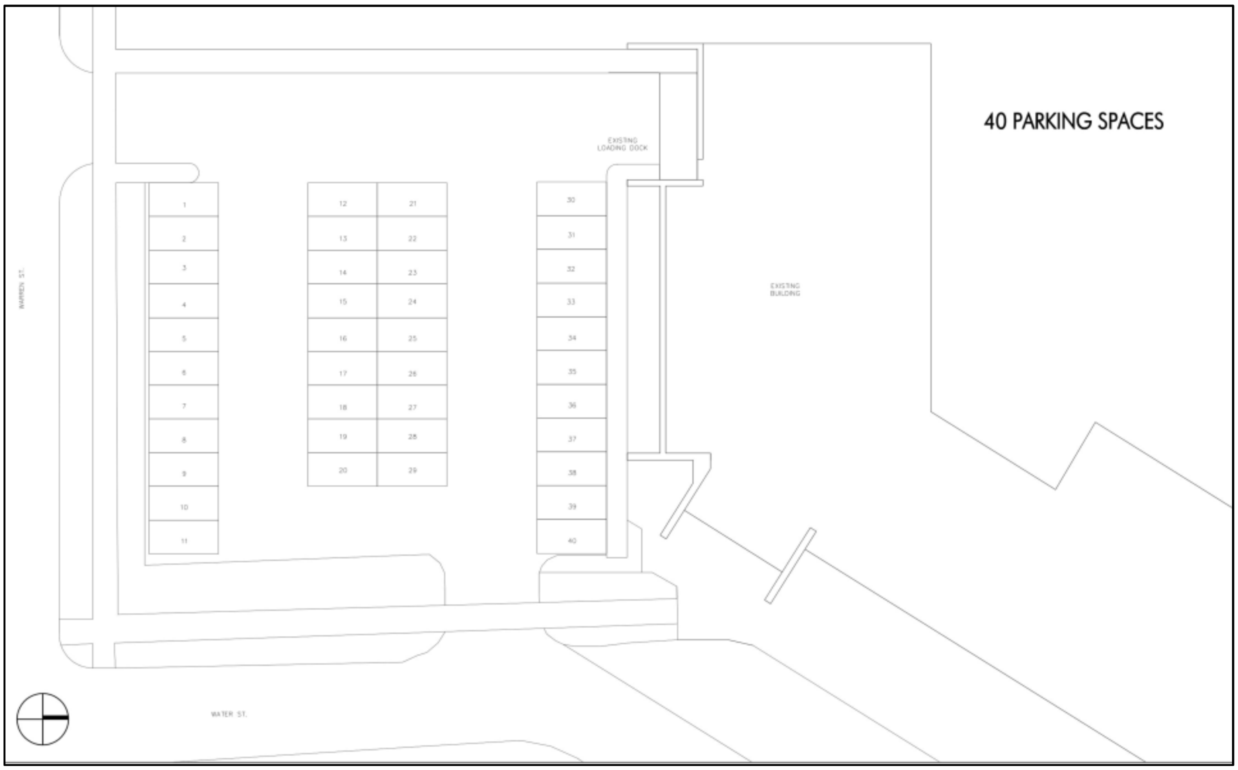


3. Typical Existing Floor Plan- 3-10

The third through tenth floors of the Smith and Casey buildings are not connected but have identical layouts. The floor-to-floor elevation is 8'-8". There is a total of 31 beds (with meal plans) per tower, totaling 62 beds per floor for eight floors resulting in 496 beds with required meal plans for the third through tenth floors of Smith and Casey. The Smith-Casey towers have a total of 560 beds (with meal plans). The typical suite has two students sharing a bedroom and living area with a bathroom with a toilet, sink, and shower. The Casey Tower also offers a Gender Inclusive special interest housing option.

2.2 Existing Parking

The existing parking lot holds 40 spaces. A loading dock with access to the Casey building is at the back of the parking lot. Cars and trucks enter the parking lot on Water street and may exit onto Broadway avenue. The lot is 15,400 square feet.



2.3 Existing Site

The site surrounding the existing towers and parking lot is fully developed with concrete sidewalks, granite curbs, and asphalt paving. There are walkway lights near the entries, landscaping, and several trees in front of the Casey-Smith link. A gas line enters the Casey tower on the south eastern corner. The site utilities are generally located in Water Street which passes the site on the east and they do not appear to be in conflict with the work.

2.4 Existing Structure

Smith-Casey Towers are a concrete framed structure, composed of two flanking ten story towers (Tower A and B) and a two story, center connecting wing. There is a basement under the Towers and a partial basement/utility tunnel under the Connector wing.

2.4.1 Superstructure:

The roof and typical floor framing of the towers is a 6" concrete flat plate. The framing for each tower is identical. The slabs are supported on 16" x 16" concrete columns.

The second level and first floor for the towers, and the first floor of the Connector wing over the basement area is an 8" concrete flat plate.

The roof and the second level floor of the connector link is framed with a 30" x 30" concrete waffle slab, with 4-½" slabs and 6" wide x 20" deep joists (24-½" total depth).

There is a 1" building expansion joint between the connector wing and Tower B.

2.4.2 Foundation:

The first floor for the Connector wing and the basement floors of the towers are framed with 6" slabs on grade. There is a 4" perforated foundation drain that runs around the perimeter of the basement level slab on grade.

The foundation system utilizes typical strip and spread footings with an allowable soil bearing capacity of 6000 psf. The center stair/elevator shaft walls are supported on a 2'-3" thick mat footing.

2.4.3 Lateral:

The lateral system for the towers is composed of concrete shear walls located around the center stair and elevator shafts.

At the time the building was constructed, seismic loading was not included in the building code, therefore the building would have been designed only for wind loads.

2.4.4 Floor/Roof Elevations:

The following elevations are provided for reference:

Basement Floor: 35'-6"
First Floor: 49'-6"
Second Floor: 63'-6"
Connector Roof: 77'-1"
Three Floor: 77'-6"
Four Floor: 86'-2"
Five Floor: 94'-10"
Sixth Floor: 103'-6"
Seventh Floor: 112'-2"
Eighth Floor: 120'-10"
Ninth Floor: 129'-6"
Tenth Floor: 138'-2"
Roof: 146'-10"

2.4.5 Existing Design Loads:

Roof Live Load (Snow): 40 psf
Typical Floor Live Load: 40 psf + 20 psf partition allowance
Second and First Floor Live Load: 100 psf + 20 psf partition allowance

2.5 Existing Mechanical

2.5.1 Existing Hydronic Heating System

- Located in the basement of Casey Tower are two (2) Bryan Flexible Water Tube Boilers, model #RV-400-W-FDG. Each boiler is rated for an output of 3,200,000 Btuh at 80% efficiency. Both boilers are natural gas fired.
- Also located in the basement of Casey Tower are two (2) sets of circulating pumps designated as HWP-A3, HWP-A4, HWP-1, and HWP-2.
  - HWP-A3: Flow (gpm) and head (ft) are unknown
  - HWP-A4: Flow (gpm) and head (ft) are unknown
  - HWP-1: 167 gpm at 28 ft of head; 5 HP
  - HWP-2: 167 gpm at 28 ft of head; 5 HP
  - It's assumed that these are piped up in a primary/back-up configuration.
  - Based on the site investigations, these pumps are not on variable frequency drives and are constant flow.
- Located next to pumps HWP-A3 and HWP-A4 is a Bell and Gossett pressurized expansion tank (model #B300) for the hydronic heating system.

2.5.2 Existing Hydronic Distribution System

- The hydronic heating system serves the following equipment:

Casey Tower

- Heating coil in make-up air unit (MUA-1) located in the basement.
- Heating coil in Cabinet Fan #1 (6,000 cfm) located in the basement, serving the ground floor and lobby floor.
- Heating coil in Cabinet Fan #2 (4,800 cfm) located in the basement, serving corridor areas on typical floors 3 thru 10. The tenth floor is providing with a 2 kW electric reheat coil.
- In 2009, a renovation of the ground and lobby floors occurred in which variable air volume boxes with hot water reheat coils and duct mounted hot water reheat coils were provided on the discharge side of Cabinet Fan #1. Renovation to the ground floor included a Faculty Apartment, an RHD Apartment, and other miscellaneous spaces while the lobby floor had been renovated to include student bedrooms.
- There is an existing 1" heating hot water supply and return riser that serves the renovation work completed in 2009.

Smith Tower

- A Graham System Reheat Plate Heat Exchanger, model #WFX-12, located in the basement is used for generating domestic hot water to both Smith and Casey Towers. At the time of the site investigation, the heating hot water supply temperature into the heat exchanger was 160 deg. F and the hot water return temperature out of the heat exchanger was 130 deg. F.
- Heating coil in Cabinet Fan #4 (6,000 cfm) located in the basement, serving the ground floor and lobby floor.
- Heating coil in Cabinet Fan #5 (4,800 cfm) located in the basement, serving corridor areas on typical floors 3 thru 10. The tenth floor is providing with a 2 kW electric reheat coil.
- In 2009, a renovation of the ground and lobby floors occurred in which variable air volume boxes with hot water reheat coils and duct mounted hot water

reheat coils were provided on the discharge side of Cabinet Fan #4. Renovation to the ground floor included a Senior RA Office, an RHD Office, an IT Service Room, and other miscellaneous spaces while the lobby floor had been renovated to include student bedrooms.
- o There is an existing 2-1/2" heating hot water supply and return riser that serves the renovation work completed in 2009.

2.5.3 Existing Chilled Water System

- Located in the basement of Smith Tower is a water-cooled chiller. This provided chilled water to ACU-1 and ACU-2 located on the ground floor. ACU-1 and ACU-2 served various spaces on the ground floor. In 2009, when this floor was renovated, the supply air ductwork off of both ACU-1 and ACU-2 was modified. During the site investigation, we were informed that this chiller has not been operated in many years. The corresponding air-cooled tower is up on the roof adjacent to the penthouse.
- General Exhaust Fan Systems:
  - o Located throughout the building are multiple general exhaust and return air fans. They are dedicated to areas such as the laundry room, the kitchen, and other common areas.
- Perimeter Heating Units
  - o Located along the entire exterior perimeter of each space is 277 volt electric baseboard heating units.

2.6 Existing Fire Protection

2.6.1 Existing Standpipe System

- Fire service is an existing 6" combination domestic/fire service that enters the Smith tower basement mechanical room

- The existing fire protection system within the complex is a wet standpipe system. There are building sprinklers on the first and second floors.

- A fire pump within the smith tower basement mechanical room provides required water pressure for standpipe risers for both towers.

- Each tower stair tower has a 4" standpipe riser with 2-1/2" hose connection at each level.

- The standpipe system appears to be in good condition, at present it is unknown when the fire pump was last tested.

- Existing sprinklers were noted on the ground and lobby levels, in existing janitor rooms and storage rooms. The sprinklers are supplied from the standpipe risers at each level.

2.7 Existing Electrical

2.7.1 Power

- The building is fed from a 13.8 Kilo-Volt (KV) campus distribution feeder labeled PF-2A through an S&C 15 KV loop switch located in the basement Electrical Room of Smith Tower. The S&C loop switch feeds a double ended unit substation located in the sane room. The double ended unit substation is configured in a Main-Tie-Main setup. Both sides of the unit substation are comprised of a 1500 Kilo-Volt Ampere (KVA) rated, 13,800 KV to 480Y/277V, three phase, four wire transformer, main breaker and distribution breakers. The two side of the unit substations are connected with a tie switch. Both Casey and Smith Towers are fed out of this electrical equipment.
- The 480V section of the unit substation are equipped with digital meters. The meter for Substation 'A' indicated a peak demand of 611 Amps (A). The meter for Substation 'B' indicated a peak demand of 822A.
- The is served by a generator that provides emergency power for lighting, elevators and the fire pump.
- The 480V system is stepped down to 208Y/120V, three phase, four wire through multiple dry type transformers located throughout the building.
- A majority of the building's heating system is electrically powered which makes up a significant portion of the building's existing electrical load.

2.7.2 Lighting

- The interior lighting system is comprised of recessed and surface mount fluorescent lighting throughout the building. The exterior lighting system is comprised of building mount high pressure sodium/metal halide type light fixtures.
- The existing bedrooms contain no overhead lighting.
- The lighting systems, while serviceable, are not energy efficient. It is recommended to provide LED lighting in renovated areas of the building.

2.7.3 Telephone/Data

- The Telephone/Data systems enter the building in the basement of Smith Tower.
- The Data network consists of Vertical fiber optic with horizontal copper network cabling originating from the IT closets located throughout the building.

2.7.4 Fire Alarm

- The building protected by a fully addressable Simplex 4100U fire alarm control panel.
- Addressable pull stations, smoke detectors, heat detectors, duct detectors and control/monitor modules are located throughout the building connected to signaling line circuits.
- Notification devices are located throughout the building powered from Notification Appliance Circuit (NAC) panels.
- The 4100U panel is connected to the Keltron campus monitoring multiplexing system.

2.7.5 Security

- The building is equipped with a Best Access Control System.

2.8 Existing Plumbing

2.8.1 Existing Domestic Water Service

- The water service is a 6” combined domestic/fire service that includes a 6” reduced pressure backflow assembly within the Smith tower basement mechanical room.
- The existing backflow assembly looks in good condition, it is unknown as to when it was last tested.
- The existing water service meter looks new and in good condition.
- The domestic cold water system incorporates a booster pump system to provide a system pressure at the pump of 103 psi.
- A recent installation provided a water softener system for the cold water. The existing water softener in the Casey tower mechanical room was discontinued and abandoned in place. A second smaller water softener system was added for the heating system boiler system.
- No deficiencies were noted.

2.8.2 Existing Sanitary Service

- The existing building towers sanitary drains collectively discharge thru an 8” sanitary main drain to the public sanitary system, at 1% slope the 8” main would have a fixture flow capacity of 1600 fixture units.
- The existing sanitary system is cast iron piping.
- No deficiencies were noted.

2.8.3 Existing Water Distribution

- The existing water distribution system provides multiple water risers (cold/hot & HW return) to serve the bathroom groups on each floor for each tower.
- No deficiencies were noted.

2.8.4 Existing Domestic Hot Water

- The existing hot water system has two 1000 gallon HW storage tanks with electric coil heat in the Smith tower and one 1000 gallon HW storage tank with electric coil in the Casey tower.
- The HW storage tank in Casey tower and one of the two HW storage tanks in the Smith tower are shut down or/and disconnected. Only one of the HW storage tanks in the Smith tower is being used for both towers.
- The existing electric heaters in all three HW storage tanks are shut-off.
- In conjunction with the one existing electric heater currently being used, a plate/frame heat exchanger was installed in the Smith tower mechanical room to generate domestic hot water, the heat exchanger utilizes boiler water to generate domestic HW at 140 degrees with a mixing valve to circulate 120 degree HW thru both towers.
- No deficiencies for HW supply within the building towers were noted.

3.0 Conceptual Studies

3.1 Option 1- Proposed 10th Floor Apartment Units

3.1.1 Design Option A (See Appendix 7.2 SK-01 Opt A)

This option explored the combination of doubles and singles in apartments. There are 6 apartments consisting of two 7-person apartment with 1 double and 5 singles, and four 2-person apartments with a double. Each apartment offers a kitchen, living room, and bathroom. The 7-person apartment offers two bathrooms. The new bathrooms are designed to use the existing chases. Cortland determined that no more than 6 people sharing one apartment.

3.1.2 Design Option B: Final (See Appendix 7.2 SK-01.1 Opt B)

This option has 6 handicap accessible apartments. In each tower, apartments range in size from two 5-person apartments with single bedrooms, two 2-person apartments with single bedrooms, and two 2-person apartments in a double bedroom. Each apartment will include a shared living area, kitchen, and handicap accessible bathroom with a shower. Each kitchen will accommodate a microwave, sink, dishwasher, refrigerator, and oven with a stove top. A Schluter shower system, with a tile floor and solid polymer surface, is preferred. The two 5-person apartments accommodate a larger living room, larger kitchen with two refrigerators, and an additional bathroom with one sink and one toilet. The new bathrooms are designed to use the existing chases.

3.2 Option 2- New Connector Building

3.2.1 Proposed First Floor (See Appendix 7.2 SK-2)

Following meetings with the design team, DASNY and Cortland, it was determined that an RA & RHD office will replace the study room in the Casey Tower. In addition, the faculty bedroom and guest bedroom will merge into one faculty bedroom. On the first floor of Smith, the RHD office will be converted into a kitchen and the laundry room will become a study room. The new connector will provide a lobby as well as a flexible 100-person meeting space with moveable partitions. The existing floor-to-floor elevation of 14'-0" will be maintained to match the existing towers.

3.2.2 Proposed Second Floor (See Appendix 7.2 SK-03)

The second-floor connector building will add 4 double bedrooms on the floor (8 beds). A kitchenette with a microwave, oven with stovetop and sink will be provided. An additional lounge space, a collaborative space, and a laundry will also be provided. The collaborative space consists of media walls with built in monitors that students can write on to encourage interaction. There are 52 beds (with meal plans) existing in the towers of the second floor. The new connector building will increase the second-floor total to 60 beds (with meal plans) beds.

3.2.3 Proposed Typical Floor Plan: 3rd through 9th Floors

3.2.3.1 Design Option A: (See Appendix 7.2 SK-04 Opt. A)

This option explored an open plan lounge allowing students to freely walk through. The connector is separated from the existing buildings by doors. The enclosed kitchenette and quiet room are located off the open lounge. A collaborative space is incorporated into the lounge which offers a lounge space on every floor. Cortland considered this layout impractical and preferred the enclosed lounge. This option was not further developed.

3.2.3.2 Design Option B: Final (See Appendix 7.2 SK-04.1 Opt. B)

The third through ninth tower floors will have the same layout. A new building will be designed to connect the Smith and Casey towers. To permit access to the connector, the existing suites in Casey closest to the new connection will no longer be suites and will share a public bathroom. One of the corner suites in Smith will also become individual bedroom suite with a shared bathroom. A mixture of suites and dormitory rooms was preferred by the college. The connector building will house an enclosed lounge area that seats approximately 35-40 students and has access to a controlled access kitchenette. The kitchenette will be equipped with a microwave, oven with stovetop and sink. The lounge can open into the hallway with sliding doors. Four more double bedrooms will be added with access to public ADA bathrooms. The laundry room will be equipped with one washer and one dryer. A quiet study room will take over an existing double bedroom and expand into the new connector building. This new connector building will increase the Smith-Casey beds (with meal plans) total to 536.

BED COUNTS								
		SMITH		CASEY		CONNECTOR		TOTALS
	FLOOR	RA	BEDS (WITH MEAL PLANS)	RA	MEAL PLAN BEDS	RA	BEDS (WITH MEAL PLANS)	
EXISTING	2nd Fl	1	26	1	24	2	10	64
	3-10 Floors	1	30	1	30	X	X	62 (x 8)
	64+(8 Floors x 62 Beds) =							560
OPTION 2 PROPOSED	2nd Fl	1	26	1	24	0	8	60
	3-9 Floors (OPT A & B)	1	28	1	30	0	8	68 (x 7)
	60 Beds + (7 Floors x 68 Beds) =							536

3.3 Option 3- New Residence Hall

This option includes demolishing both towers and the connector building and providing the cost to construct a new 600-bed residence hall in the same location. This option is limited to determining the cost of demolition and new construction at this site. No plans, sections or elevations have been developed for this option.

3.4 Option 4- Parking Garage Test Fit *(See Appendix 7.2 SK-05 & SK-06)*

Total Parking Spaces: 52 Parking Spaces plus 3 Handicap Parking Spaces

The most common circulation system used in free-standing parking structures in North America is the continuous ramp, where sloping floors with aisles and parking off both sides of the aisle offer access to the parking spaces and the circulation route. The basic continuous sloping floor configuration is called the single-helix or scissors ramp. However, due to site constraints this system was not feasible and limited the parking design to square footage ratio. Instead of a parking ramp, we designed a smaller 2-lane ramp with a maximum slope of 1:8 and one transition ramp at either ends with 1:16 slopes to minimize bottoming out per IBC 406.4.4. The remaining square footage of the parking structure permits a total of 52 parking spaces plus 3 handicap parking spaces.

This parking structure test fit included the demolition and removal of the truck-loading dock.

For occupancy classification this parking structure, according to IBC 311.3, falls under low-hazard storage group S-2. Separation guidelines follow residential group R-2. Our design was placed approx. 13'-3" from the exterior edge of the wall of the adjacent Casey Residence Hall. Per code one means of egress for the parking structure is required for every 200 feet or more of travel distance.

Accessibility requirements mandate that the parking structure contain 3 accessible parking spaces for every 51-75 non-ADA parking spaces. According to IBC 1106.5, for every 6 or fraction thereof, at least 1 space needs to be ADA van accessible, which results in one required ADA van parking space for this test fit. ADA parking widths must measure a minimum 8'-0" in width with a 5'-0" adjacent aisle (ADA van accessible aisles measure up to 8'-0" in addition to the parking space).

The floor-to-floor height of the parking structure is 9'-6". This height permits the minimum 7'-0" clearance required by code. This floor-to-floor height also accommodates accessible handicap van parking and drop off zones.

The column-spacing was designed for optimization of parking spaces and the minimum 26'-0" width clearance for vehicle turning radius for two-way lanes. The design proposes a north-south column spacing of 25'-6" and east-west column spacing of 34-0". The thickness of the beam and floor slab is approx. 1'-6" to accommodate two levels of parking. This layout is the most efficient in achieving more parking spaces per square foot, while alleviating traffic at the entrance/exit points by using two-way lanes. It also uses 90-degree parking (45-degree angled parking produced the exact same parking count).

4.0 Design Recommendations

4.1 Architectural

4.1.1 Building Design:

1. Example of Double Height Space.

The new brick connector building will both pay homage to, and enhance the existing layout and design of the Smith-Casey Towers. The new rooms in the addition will closely follow the existing layout of the rooms on the typical floors.

2. Example of first floor outdoor area with building overhang.

A vestibule provides sheltered entry into the new lobby on the first floor. Key cards can provide restricted access to areas in the building. A double height space offers views to the new second floor lounge.

The primary focus of the new first floor connector will be the 100-person meeting space that can be divided into smaller areas by moveable partitions. The apartment structure above expands east beyond the first floor supported by approximately 14'-0" high columns creating a sheltered outdoor area allowing the meeting space to flow outside during the warm weather.

The typical connector residence floor will provide new meeting areas, including quiet and lounge spaces, to encourage student engagement and enhance student life at Cortland as well as kitchen and laundry facilities.

3. Example of Collaborative Space.

The second floor, which will benefit from the original 14'-0" floor-to-floor elevation, will have an additional lounge with views of the campus and the new lobby below. An adjacent collaborative area can be formed by media walls with built-in interactive drawing monitors.

Following the DASNY College and University Residence Hall Design Guidelines, materials will be selected based on economy, durability, and in collaboration with Cortland. The GA team is dedicated to providing sustainable design in all facets of the project and exploring the opportunity for LEED certification.

4.1.2 Codes and Regulatory Requirements

As outlined in the DASNY College and University Residence Hall Design Guidelines, Code Review for the rules and regulations by which this project would be designed and built with respect to the Health, Safety, and Welfare of its occupants will follow:

New York State Uniform Fire Prevention and Building Code, including:
- Building Code of New York State
- Fire Code of New York State
- Plumbing Code of New York State
- Mechanical Code of New York State
- Fuel Gas Code of New York State
- Property Maintenance Code of New York State
- Residential Code of New York State
- Existing Building Code of New York State

Energy Conservation Construction Code of New York State

Executive Order 111 – Energystar Appliances

New York State Department of Environmental Conservation, including:
- Air Emissions
- Flood Plain
- Stormwater

New York State Department of Labor
- Industrial Code Rule 4: Construction, Installation, Inspections and Maintenance of Low Pressure Boilers; Construction of Unfired Pressure Vessels
- Industrial Code Rule 36: Places of Public Assembly
- Industrial Code Rule 56: Asbestos

Americans with Disabilities Act

Americans with Disabilities Act Accessibility Guidelines

ICC/ANSI A117.1-2003, as referenced by the New York State Uniform Fire Prevention and Building Code

4.1.3 Passive House Design

In reviewing our feasibility analysis for Smith Casey Residence Halls, it has become clear the need to take a careful look at mitigating energy expenditures of both the new addition and the two existing towers. The reasons are as follows:

1. Smith and Casey are both heated by electric resistance heating; the exterior walls are moderately insulated; Cortland is located in upstate NY with severe winters; therefore, too much money is spent heating these buildings;
2. Energy codes are getting stricter every year; the new addition will have to be well insulated with an efficient heating system (not electric resistance heat);
3. This suggests a different heating system for the addition (with boiler and hot water delivery most likely) from the electric system in Smith and Casey;
4. The emerging NYS goal is 80/50: 80% reduction in carbon footprint by the year 2050; it's hard to achieve that with current boiler technologies;
5. The exterior brick walls of Smith and Casey are in need of some repair; there are techniques to add insulation and a new skin outboard of the brick;
6. LEED Silver as a basis of design does not require the energy reductions which would benefit Cortland financially.

An existing program can bring Smith-Casey up-to-date with current codes and reduce operating expenditures. It is called Passive House (PH). The PH principals are simple in concept:

1. Super-insulate the exterior envelope, meaning exterior walls which can be 10" to 12" thick, with triple-glazing at windows, and sealing the envelope to prevent air infiltration;
2. Recirculate conditioned air, mixing inside and outside air, to improve indoor air quality and healthful living;
3. With the envelope sealed and insulated, heating and cooling loads are so reduced that it is practical to heat and cool using electric power, saving the cost of a boiler and delivery system.
4. In a renovation of an existing building (Smith or Casey), leaving the brick in place and constructing a new insulated façade can update and refresh the building's look and, for Cortland, offer a new image that students would love.

The downside is the notion that building or renovating to PH standards is expensive. There have been several studies that show that the cost is typically less than **10%**, an amount that can have a relatively short payback period in saved heating/cooling costs. PH standards have surprisingly been incorporated into a number of affordable housing projects in NYC. A college or affordable housing developer/sponsor who will own the building for many years has an incentive to reduce maintenance costs wherever possible. The best time to do so is at the outset of the design process, when sustainable strategies can be incorporated.

4.2 Site

The sitework involved with the either project will consist largely of restoration of disturbed items such as sidewalks, curbs, pavement, lighting, and landscaping. The restoration would utilize the same materials. Reconstruction would include the provision of accessible ramps and walks at the tower link and the parking garage. No utility restorations or improvements are anticipated at this time.

4.3 Structural

4.3.1 Option 1: Proposed 10th floor Apartments

The alterations of the existing building would be considered a Level 2 Alteration per the International Existing Building Code (IEBC) since the alterations would not affect more than 50% of the building area.

Structurally, the building is exempt from having to meet current code gravity loading requirements unless structural elements must support additional gravity loads as a result of the alterations. In that case, the affected elements would need to comply with current code requirements. The alterations are not expected to affect the lateral loads or the lateral resisting system for the building so the building is exempt from having to meet current code lateral loading requirements.

4.3.2 Option 2: New Connector Building

Includes demolishing and redesigning the center connector building between the two towers to provide additional dorm rooms and more shared program areas. This would be considered a horizontal addition per the IEBC.

The addition would need to be designed in accordance with the current code requirements, including seismic design. In order to ensure that the existing buildings do not have to be upgraded to current code requirements, the addition would need to be isolated from each tower with building expansion joints and would need to have an independent lateral system to resist code required wind and seismic loads.

4.3.3 Option 3: New Residence Hall

The complete demolition of the building and construction of a new facility. In this case, the building would be designed to meet all of the requirements of the NYS Uniform Code, including the provisions of the International Building Code (IBC).

In either case (addition or new building), a geotechnical analysis would need to be performed to provide earthwork recommendations and a seismic site class.

4.4 Mechanical

NOTE: the equipment sizes indicated in this section are based on engineering assumptions, general code requirements, and typical design standards. HVAC load calculations will be performed to correctly size the mechanical equipment.

4.4.1 Option 1: Proposed 10th floor Apartments

- Remove the existing electric baseboard heat from the entire floor.
- Remove the 6" x 6" exhaust duct and 10"x6" exhaust air register from the core toilet rooms (-05, -17, -19, and -34). The existing exhaust air duct risers in these spaces are to remain in order to keep the exhaust from the lobby and floors 3 thru 10 active. Powered roof exhausters, which provides the toilet room exhaust, are also to remain active.
- Remove the 6" x 6" exhaust duct and 6" x 6" exhaust air register from toilet rooms (-11 and -27). The existing exhaust air duct risers in these spaces are to remain in order to keep the exhaust from floors 3 thru 10 active. Powered roof exhausters, which provides the toilet room exhaust, are also to remain active.
- The 8" x 6" exhaust duct and 6" x 6" exhaust air registers in Janitor (-36), Tub (-35), Trash (-38), and Luggage (-37) are to remain. The existing 16" x 8" exhaust air duct riser in the core Mechanical space is to remain in order to keep the exhaust from floors 3 thru 10 active. The in-line exhaust fan in the penthouse, which serves this exhaust air ductwork, is to also remain active.
- Provide wall-to-wall electric baseboard heat on the exterior wall of each one of the new bedrooms (singles and doubles) as well as on the exterior wall of the Living Rooms.
- Provide 75 cfm exhaust air out of each new toilet room provided on the tenth floor. Provide 4" x 4" exhaust air duct and 4" x 4" exhaust air registers in each space. Reconnect to the existing powered roof exhausters exhaust air duct risers.
- Provide range hoods over each Apartment cooking range. Provide 3" exhaust duct from each hood to the exterior wall and terminate with a 3" wall cap.

4.4.2 Option 2: New Connector Building

- Provide wall-to-wall electric baseboard heat on the exterior wall of each one of the new double bedrooms as well as on the exterior walls of the common areas. All electric baseboard heat to be controlled by unit mounted thermostats.
  - One alternative to electric baseboard would be to provide a natural gas boiler on the ground floor. Provisions would have to be provided for a small mechanical room.
    - The high efficiency boiler would be sized for roughly 1,000 MBH output.
    - The hydronic distribution mains (hot water supply and return) would be 3" copper.
    - The hydronic baseboard would be 3/4" copper tube with aluminum fins.
    - In addition to the boiler, base-mounted pumps would be required. Two (2) pumps would be installed in parallel in a primary/backup configuration.
    - Hydronic accessories such as balancing valves, shut-off valves, an air separator, and expansion tank will also be required.
- Provide 150 cfm exhaust air out of each toilet room bank. Each toilet room will be provided with 75 exhaust air. Provide 4" x 4" exhaust air duct and 4" x 4" exhaust

air registers in each toilet room. Route a 16” x 12” exhaust air riser up thru the common plumbing chase to a powered rooftop exhauster sized for 1,200 cfm.

- Provide dedicated dryer exhaust off of each one of the combination washer/dryer units shown in the connection.
- An all-electric, heating only, indoor air handler will be required to provide make-up air to the connector. For the purpose of this feasibility study, it would be sized for approximately 2,500 cfm with 75 kW of electric heat.
    - The make-up air would be required to replace the air exhausted by the toilet room exhaust fan(s) and the clothes dryers.
    - Electric re-heat coils may be required in the branch ductwork. For the purpose of the feasibility study, it’s assumed that there is a 1.0 kW electric duct heater on each floor of the connector. The electric duct heater will be controlled by wall mounted thermostats.
- Mechanical ventilation (make-up air) will be needed to support the 100 person communal spaces. The ventilation air, per 100 person communal space, would be 2,000 cfm.
    - Assuming there would be one (1) communal space per floor, this would require two (2) 10,000 cfm outdoor energy recovery ventilators. Galvanized supply and return distribution ductwork would be required as well as ceiling mounted supply and return grilles.
- There were no considerations made for providing air conditioning in the new connector building.

4.4.3 Geothermal Heat Pump

SUNY Cortland has requested research of a geothermal heat pump system as a possible energy source for these buildings. Before this can be fully evaluated, test bores would be required to determine the soil conditions and heat transfer coefficient. Multiple bores of 250 ft to 300 ft deep would be required. Once this work is done, a Geothermal Consultant would be required to review this data, determine if there is enough green space, then size and layout the ground loop.

4.4.4 Life Cycle Cost Analysis – Building Infrastructure (Electric vs. Natural Gas)

This analysis could be provided in the event the option is chosen to demolish both towers, demolish the connector building, and provide in its place a 600-bed residence hall in the same location. The following information would be required to move forward with a life cycle cost analysis.

- Confirmation from the local utility that they have the natural gas capacity and pressure to support a new building.

- Two (2) years of natural gas and electric usage of Casey and Smith Towers, including the connector.

- An estimate would have to be developed comparing the construction cost of an all-electric building to one supplied with natural gas fired equipment.

- An energy model would be required to calculate comparative operating costs.

4.5 Electrical

4.5.1 Option 1: Proposed 10th floor Apartments

Power

- New power feeders shall be provided for the infill to provide power to new panelboards, HVAC and plumbing equipment.

Lighting

- LED lighting with lighting controls shall be provided in the renovated areas.

Telephone/Data

- Existing Telephone/Data infrastructure shall be reused where possible.

Fire Alarm

- New fire alarm Signaling Line Circuits and Notifications circuits from the new fire alarm system shall be provided for the Link Infill and connected to pull stations, detectors and other initiating devices as well as notification devices. This new fire alarm system shall connect into the existing Keltron campus monitoring multiplexing system.

Security

- Access control modifications are not required for this option

4.5.2 Option 2: New Connector Building

Power

- New power feeders shall be provided for the connector to provide power to new panelboards.

Lighting

- LED lighting with lighting controls shall be provided in the renovated areas.

Telephone/Data

- Existing Telephone/Data infrastructure shall be extended into the renovated areas.

Fire Alarm

- New fire alarm Signaling Line Circuits and Notifications circuits shall be provided for the new connector building and connected to pull stations, detectors and other initiating devices as well as notification devices.

Security

- Access control modifications are not required for this option.

4.6 Plumbing

4.6.1 Domestic Water service

- For both options 1 & 2, there will be no revisions to the domestic water service.

4.6.2 Sanitary Service

- For options 1 & 2, the existing building towers sanitary drain system/risers will remain.
- For option 1 – Proposed 10th floor Apartments, the proposed renovations are within the same footprint as the existing toilet rooms. The existing sanitary drain/vent system piping for the 10th floor bathrooms will be adapted for the new bathroom layout and kitchen sink renovations. Piping work to be estimated for fixture rough-in only, existing risers to remain.
- For option 2 – New Connector Building for floors 2 through 10, provide new 4" sanitary and 4" vent stack risers from basement to 9th floor with new 4" VTR. Approximately 150 lf of sanitary drain and 100 lf of vent stack. Including fixture rough-in.

4.6.3 Water Distribution

- For options 1 & 2, the existing water distribution system water risers (cold/hot & HW return) serving the bathroom groups on each floor for each tower will remain.
- The existing hot water storage tank(s) will remain, the existing plate & frame heat exchanger system will remain.
- The existing water softeners will remain.
- For option 1 – 10th floor renovations, the proposed bathroom renovations are within the same footprint as the existing toilet rooms. The existing cold/hot water piping for the 10th floor bathrooms will be adapted for the new bathroom layout and kitchen sink renovations. Piping work to be estimated for fixture rough-in only, existing risers to remain.
- For option 2 – connector link infill for floors 2 thru 10, provide new 2-1/2" cold water, 1-1/2" hot water and ¾" HW return risers from basement to 10th floor with new isolation valves connecting to existing cold, hot and hot water return system piping in basement mechanical room. Approximately 150 lf of insulated piping for each supply and return. A separate HW return pump will be provided back to the existing storage tank. Hot & cold water fixture rough-in would be added to the overall riser piping.

4.6.4 Plumbing Fixtures

- For option 1 & 2 – New water efficient plumbing fixtures will be wall hung flush valve type toilets and counter type lavatories with manual faucets. ADA compliant fixtures will be provided.
- Option 1 – Kitchen sinks will be ADA compliant without sprayers, single lever faucets. There will be 6 kitchens on the 10th floor.
- All showers are tile showers, new showers will be tile constructed.
- 10th floor renovations will provide 6 ADA bathrooms with single shower, water closet, and lavatory. There will be two half bathrooms consisting of a water closet and lavatory only.

4.7 Fire Protection

4.7.1 Existing Standpipe System

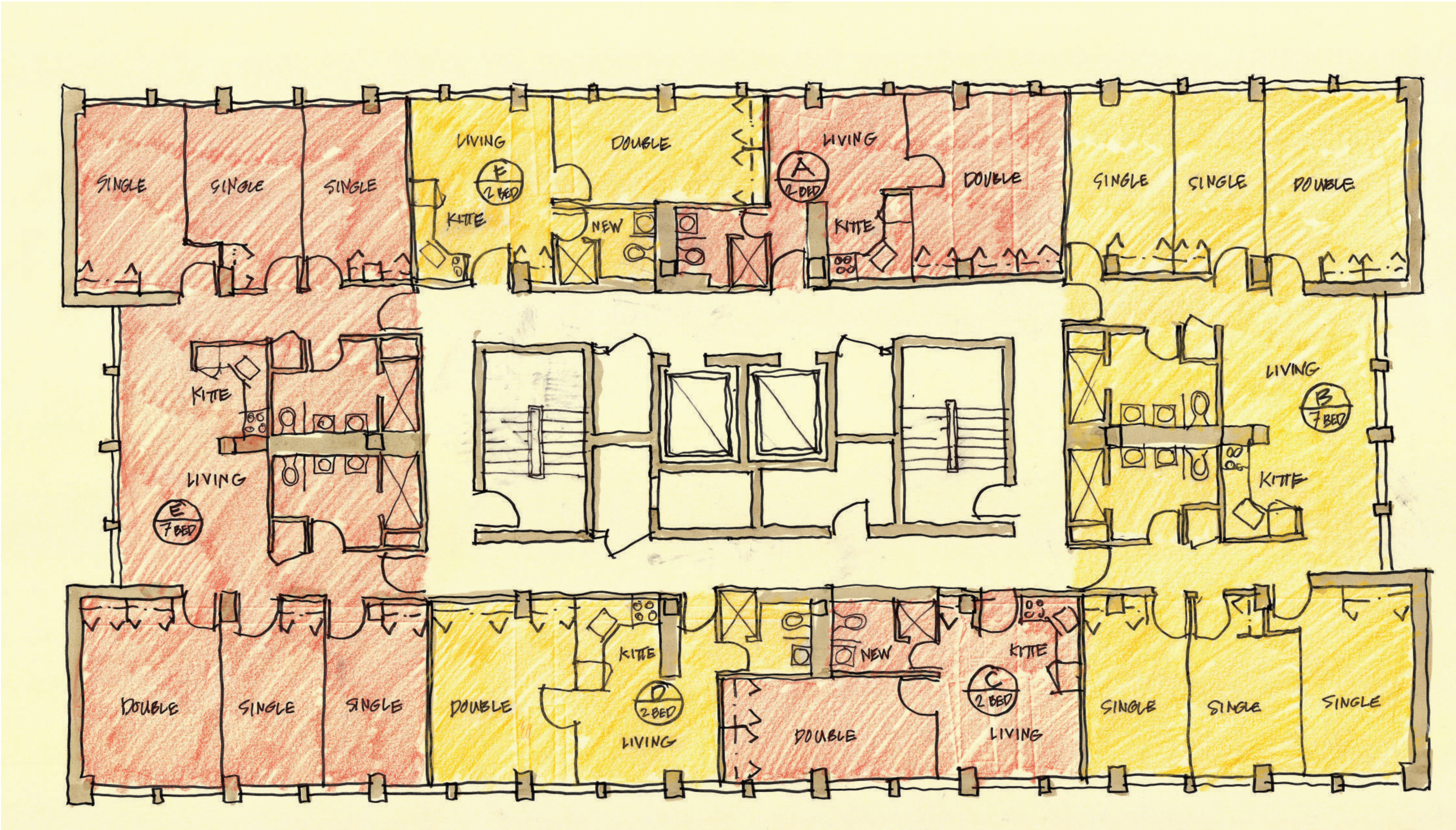
- Option 1 – Proposed 10th Floor Apartments
  - There will be no changes to the existing standpipe system.
- Option 2
  - The New Connector Building, the existing standpipe system will remain, the existing hose stations/stair towers provide adequate coverage on the proposed connector.
- In a previous college project within Dragon Hall, a fire pump was sized and installed that would accommodate the standpipes in Casey-Smith Hall. As part of this project scope would be to eliminate the existing fire pump in Casey Hall and to extend the existing 6” supply piped from Dragon Hall into Casey Hall mechanical room and connect to the existing standpipe system.

5.0 Separate Renovation Work

The following information was provided by DASNY and Cortland. This is separate renovation work. Please refer to the line item in the cost estimate.

Scope of Work: Casey-Smith Towers floors 3 through 9

- Rebuild showers with Schluter system, replace bathroom fixtures, new tiling
- Replace flooring throughout (carpet in corridors and common areas, VCT in bedrooms)
- Patch/Paint walls throughout
- Patch/Paint ceilings throughout
- Replace doors/door hardware throughout
- Install overhead lights in bedrooms
- Replace windows throughout
- Install raceway/outlets at desk height in bedrooms
- Install new Fire Alarm equipment throughout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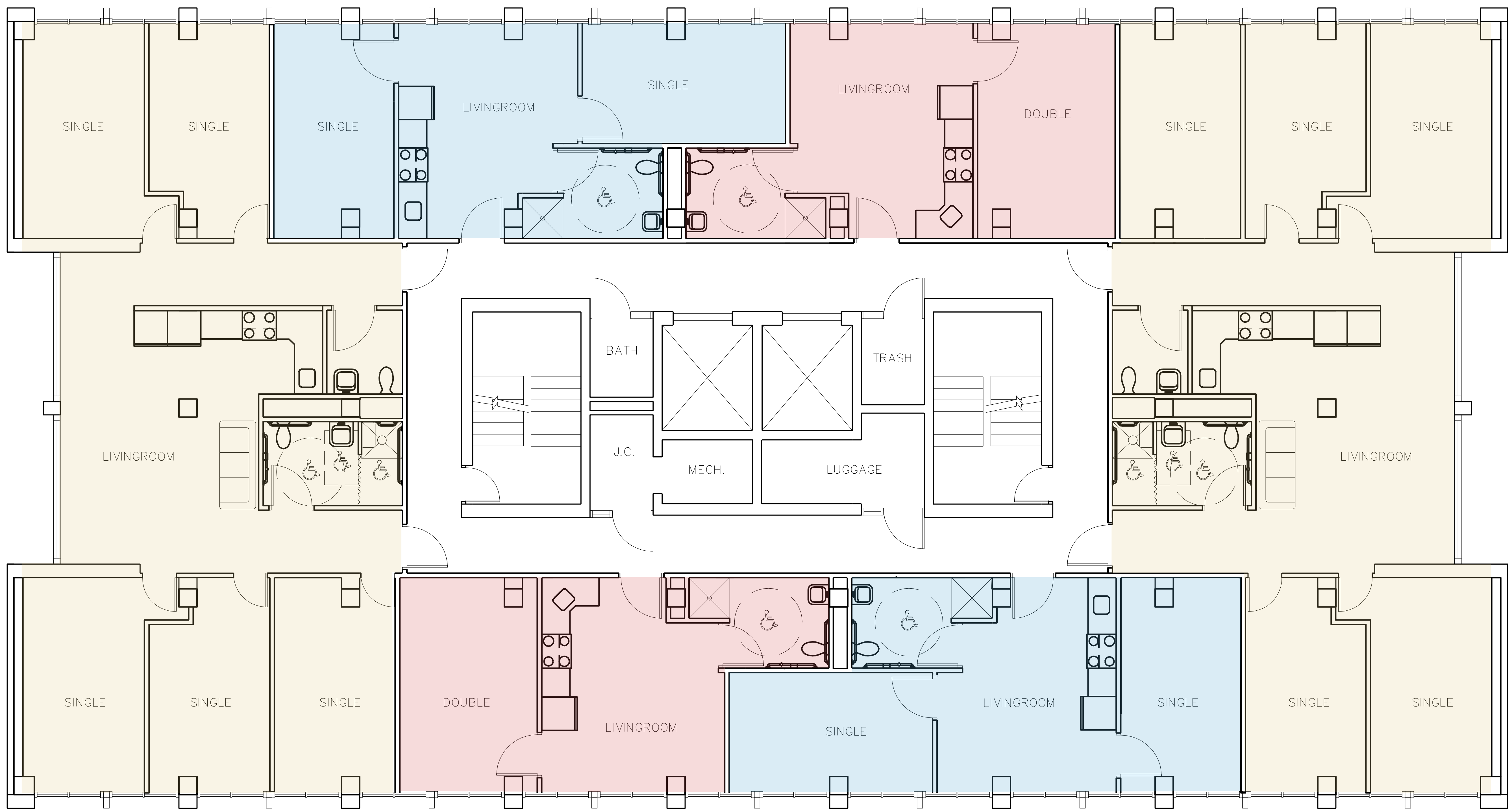

GoshowArchitects SMITH-CASEY 10TH FLOOR APARTMENTS OPT B 1/8"=1' 05/24/2018 SK-01.1

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SMITH-CASEY OPTION 2- PROPOSED FIRST FLOOR

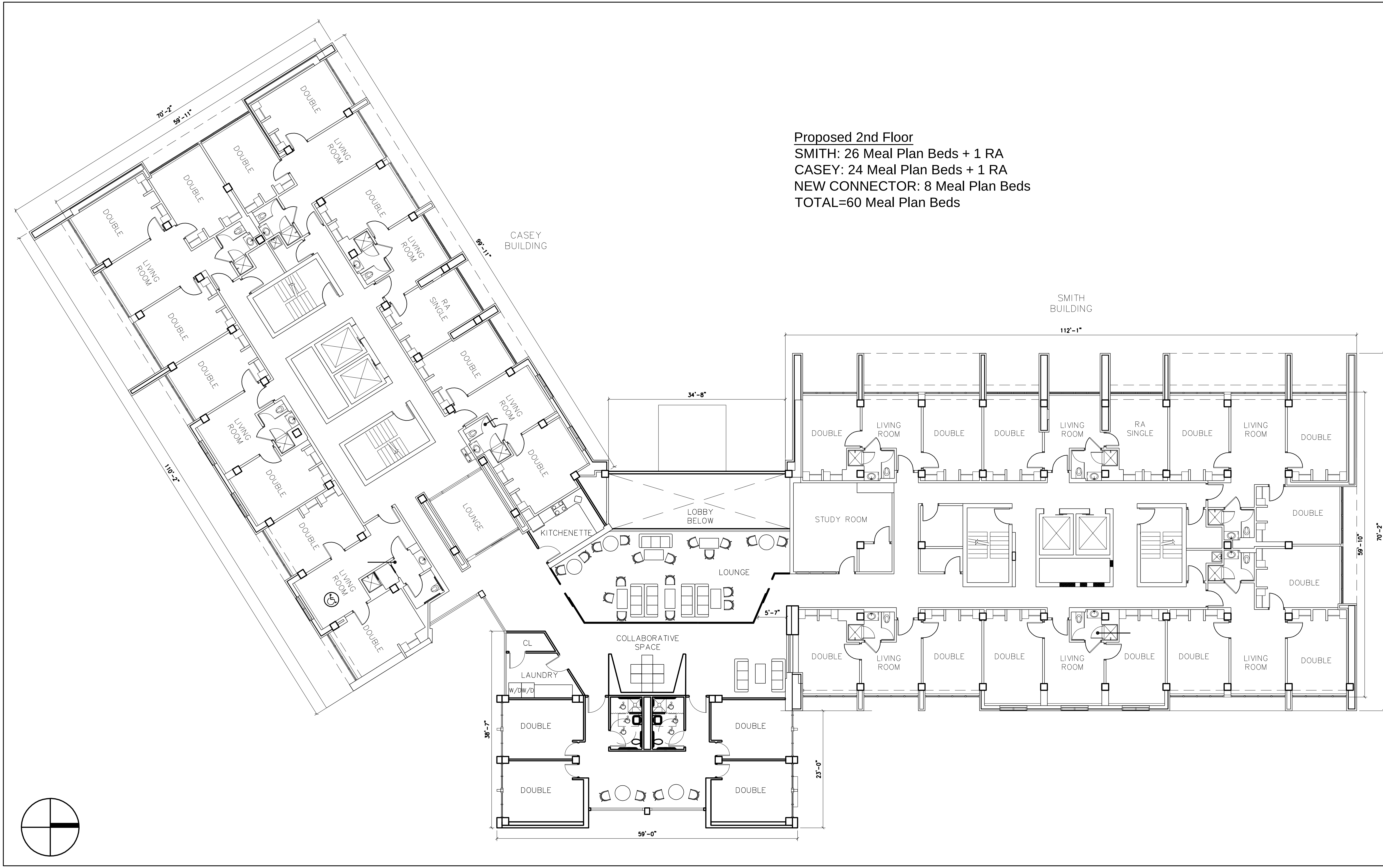
NTS

05/24/2018

SK-02

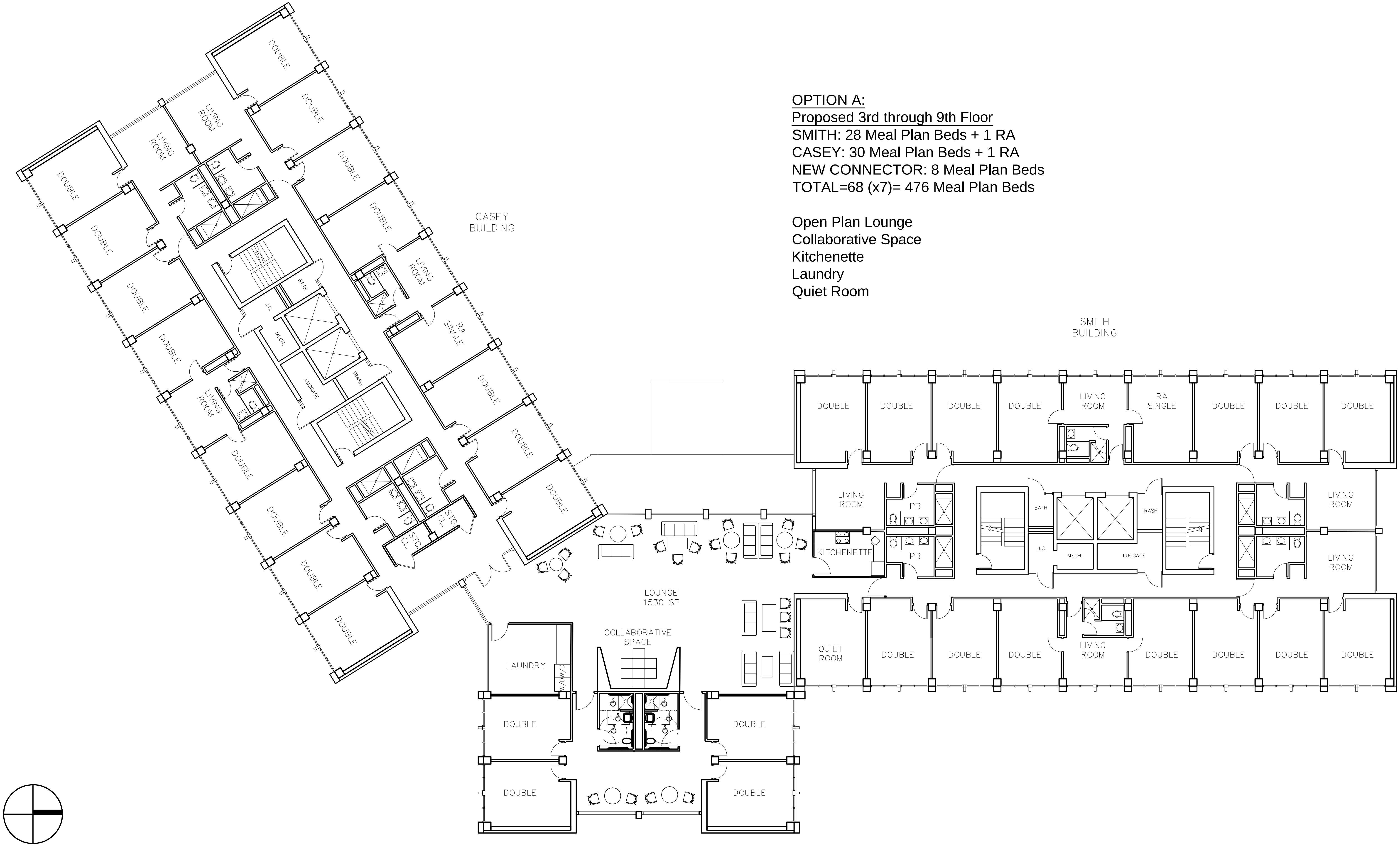
Proposed 2nd Floor

SMITH: 26 Meal Plan Beds + 1 RA
CASEY: 24 Meal Plan Beds + 1 RA
NEW CONNECTOR: 8 Meal Plan Beds
TOTAL=60 Meal Plan Beds

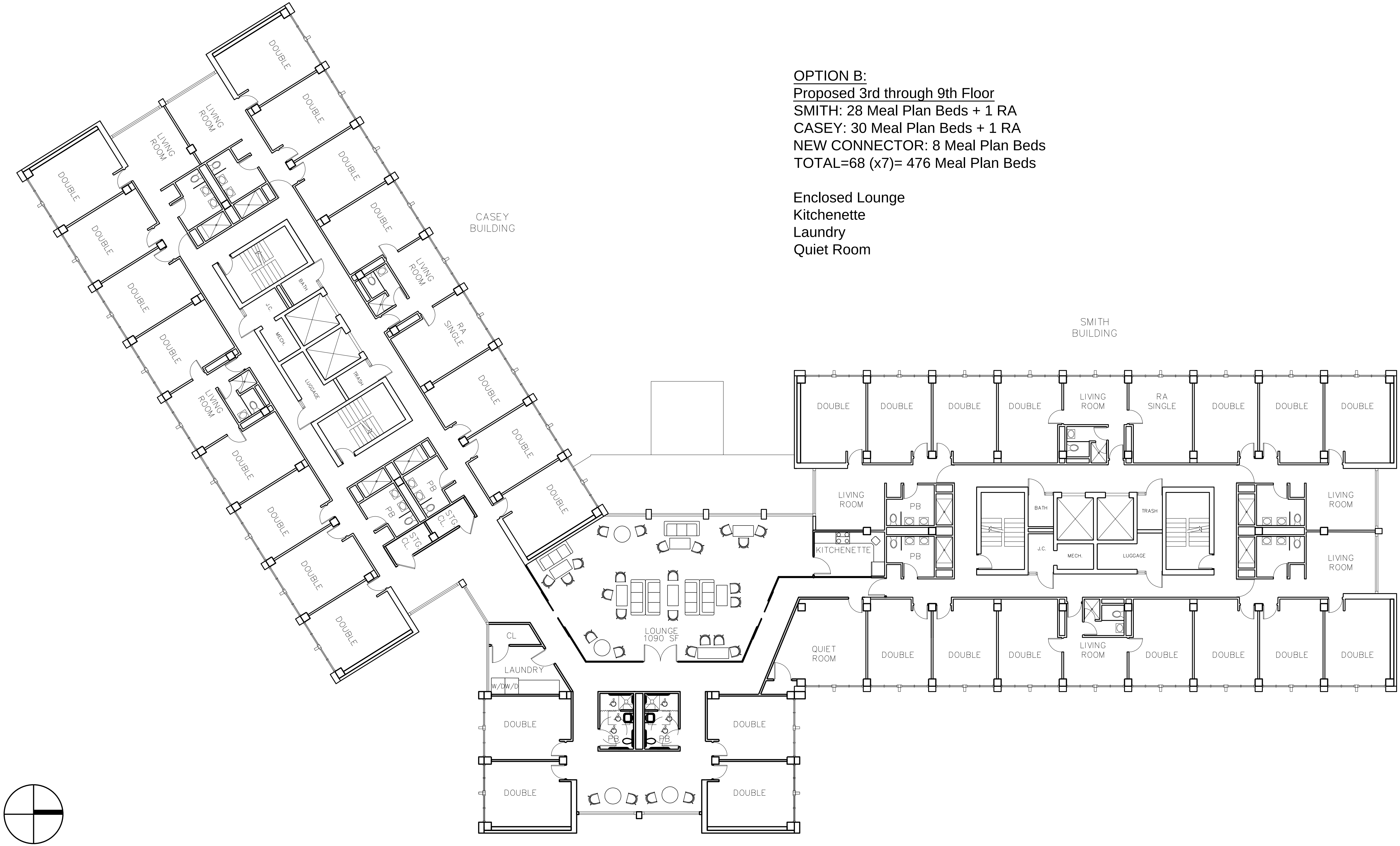


OPTION A:
Proposed 3rd through 9th Floor
SMITH: 28 Meal Plan Beds + 1 RA
CASEY: 30 Meal Plan Beds + 1 RA
NEW CONNECTOR: 8 Meal Plan Beds
TOTAL=68 (x7)= 476 Meal Plan Beds

Open Plan Lounge
Collaborative Space
Kitchenette
Laundry
Quiet Room



GoshowArchitects SMITH-CASEY OPTION 2- PROPOSED 3RD THROUGH 9TH FLOORS OPT A NTS 05/24/2018 SK-04



<u>OPTION B:</u>
<u>Proposed 3rd through 9th Floor</u>
SMITH: 28 Meal Plan Beds + 1 RA
CASEY: 30 Meal Plan Beds + 1 RA
NEW CONNECTOR: 8 Meal Plan Beds
TOTAL=68 (x7)= 476 Meal Plan Beds

Enclosed Lounge
Kitchenette
Laundry
Quiet Room

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SMITH-CASEY OPTION 2- PROPOSED 3RD THROUGH 9TH FLOORS OPT B

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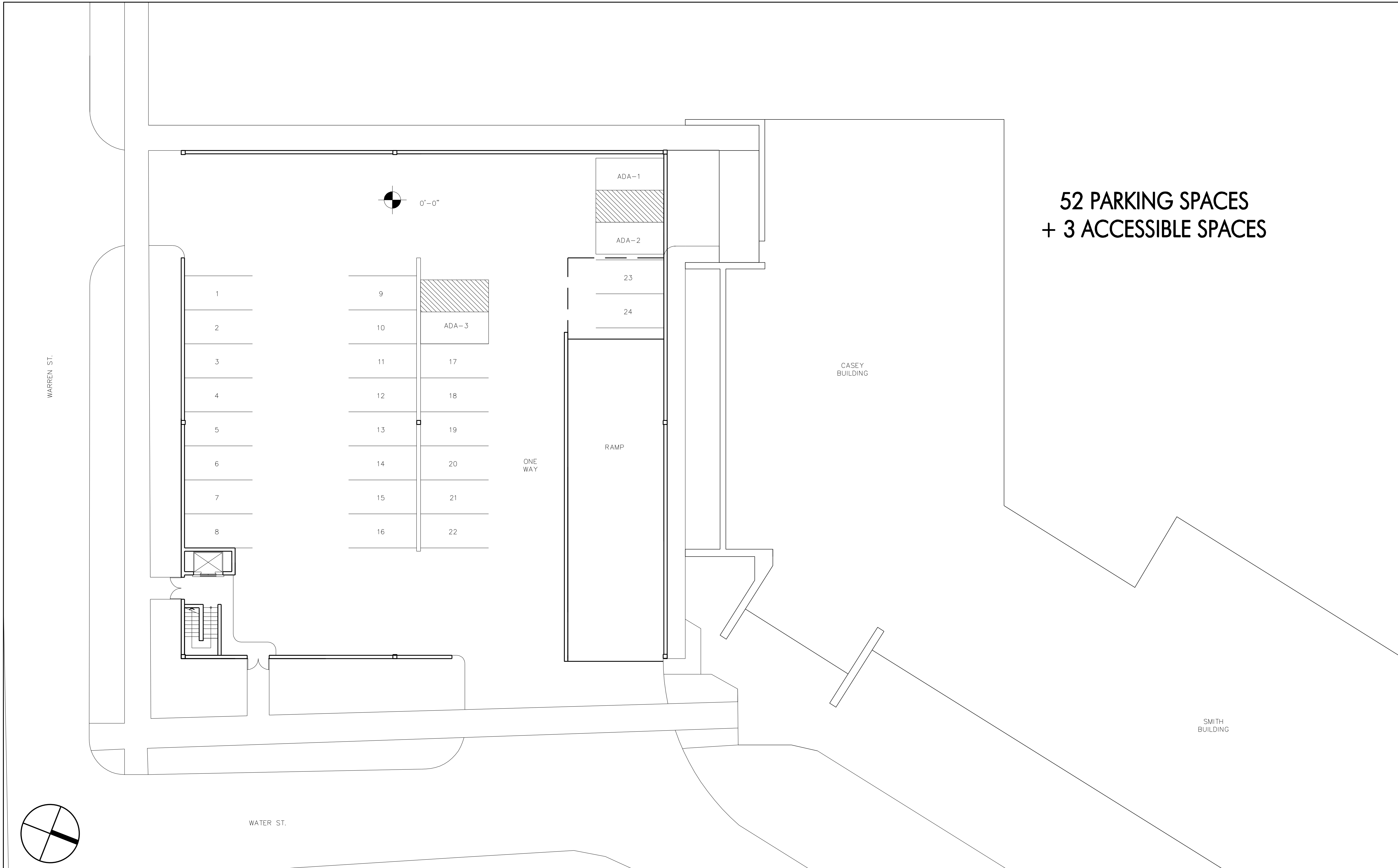
SK-04.1



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SMITH-CASEY OPTION 4 PARKING GARAGE TEST FIT- LEVEL 1

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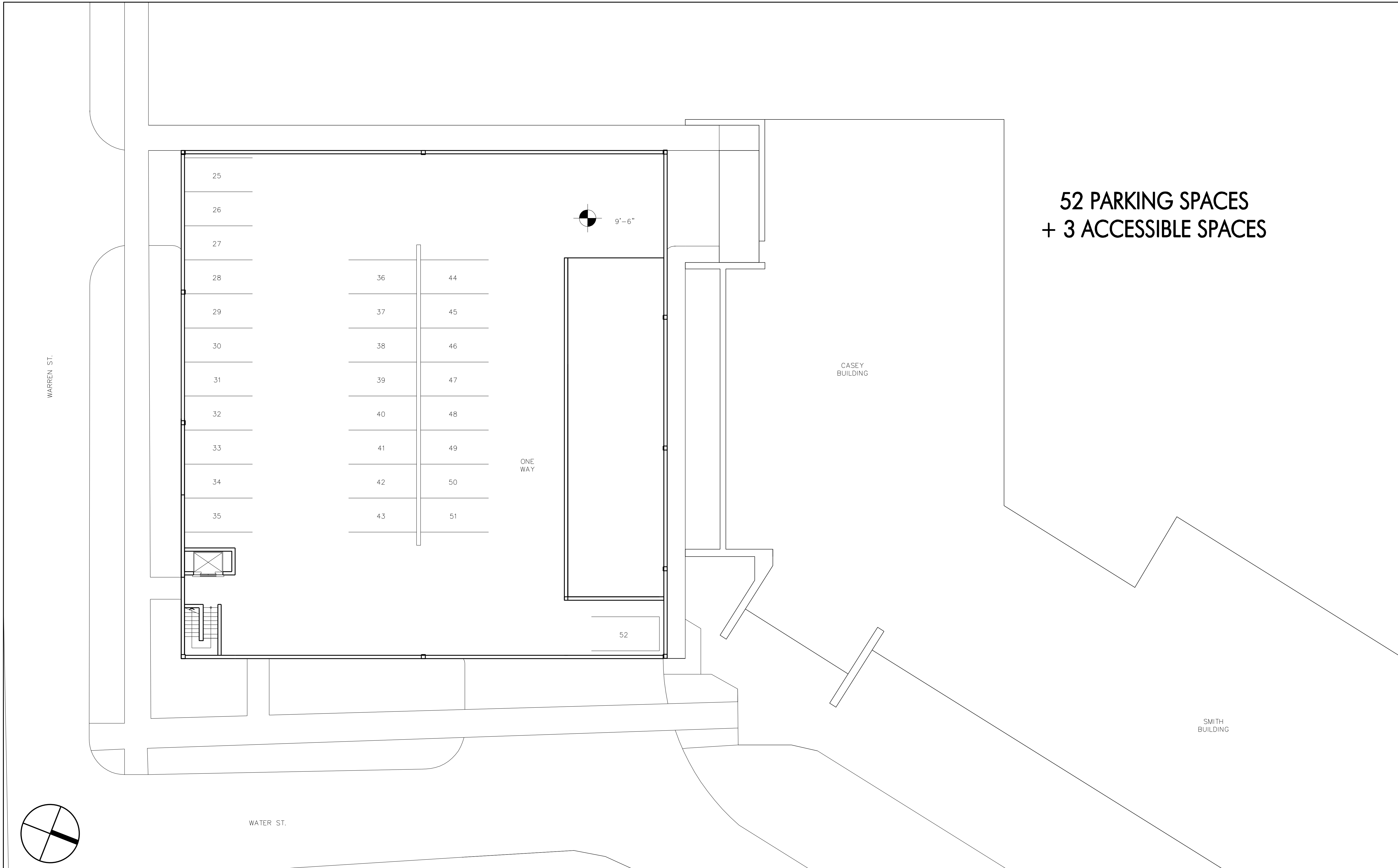
SK-05



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SMITH-CASEY OPTION 4 PARKING GARAGE TEST FIT- LEVEL 2

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05/24/2018

SK-06


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