DC Department of General Services

DC Department of Parks and Recreation

Center for Therapeutic Recreation Program Development and Associated Services

3030 G Street SE
Washington, DC 20019

Building Conditions Assessment Report

December 10, 2014

MOODY•NOLAN
RESPONSIVE ARCHITECTURE

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Executive Summary

The building conditions assessment team, lead by Moody Nolan, was awarded by the DC Department of General Services to evaluate the existing conditions of the Center for Therapeutic Recreation (TR Center) and surrounding site. The TR Center, located at 3030 G Street, SE, Washington DC 20019 currently consists of an indoor therapeutic swimming pool, locker rooms, and a pump room below the pool deck. The study team included architects and civil, structural, mechanical & electrical engineers. A pool consultant was also present to evaluate the conditions of the pool and supporting filtration system. A hazardous materials survey was also conducted as part of the study.

The buildings and grounds were found to be well maintained, but showing signs of age as might be expected for facilities built in the mid–to-late 1970's. Of particular concern is the nearly complete lack of conformity with current handicap accessibility regulations in the Center. Other deficiencies include insufficient parking, poor vehicular site circulation, and inefficient and ineffective electrical and mechanical systems. Considering the extensive use of the property by persons with disabilities, the absence of an automatic fire suppression system should also be considered a deficiency.

It is possible to correct all of the deficiencies in the building by a renovation of the existing building, the addition of the gymnasium, and expansion of the natatorium will address the current and future needs of the TR Center. However, if there are additional funds that can be secured by DC DGS and/ or DC Department of Parks and Recreation, it is recommended that a new building be heavily considered. A new building would better meet and specifically address the current program requirements, site constraints, and future needs of the TR Center.

1. Project Overview

1.1 Background

The TR Center is located between Minnesota Avenue SE, Massachusetts Avenue SE, and Fairlawn Avenue SE. It is placed on approximately 7.43 acres and is comprised of two one-story buildings totaling approximately 22,000 square feet, a playground, basketball court, and open field and picnic area. It is flanked to the south and east by single family residences and by a heavily wooded area to the north of the site.

The TR Center is served by several bus routes along Minnesota Ave. SE and Potomac Avenue Metro station is also conveniently located approximately 1.7 miles from the center.

The TR Center provides recreation and athletic programs for residents of all ages, including adaptive programs and facilities for persons with disabilities through a continuum of specialized therapeutic recreation program services. Some of the current services and programs include the following; Leisure Life Skills Development, Adaptive Sports and Aquatics, Senior Programming, community inclusion Activities, Arts and Crafts and Cultural Activities, Special Events and Field Trips, and Holiday and Summer Camps.

The building houses more than an indoor therapeutic pool and supporting locker rooms. Besides the spacious naturally day lit lobby and public gathering space there is an indoor gymnasium with stage, several multipurpose classrooms, a weight room, break room, reading room/library, and several administration offices. The second smaller standalone building is connected by a covered breezeway and contains an open work room with restroom facilities. This building is currently used as program space for senior activities.

1.2 Methodology

The multidiscipline conditions assessment team included civil, structural, mechanical, and electrical engineers, architects, and pool consultant. There is a limited amount of existing documents that were made available for the team to review regarding the building conditions of the TR Center including a geotechnical report. Meetings were conducted with the community center staff to understand the range of current programs and activities housed in the center and to collect anecdotal information regarding the adequacy of the existing facilities. Information collected by these activities is compiled and represents our best professional opinion regarding the current conditions of the TR Center.

2. Site Conditions

2.1 General (See Appendix B for Exhibit 1.1 Survey and Exhibit 1.2 Aerial View)

The site consists of open grassed areas, access entrances, parking, seating / landscaped areas, playground areas, mini golf, paved paths, ball field, and a basketball court. The asphalt entrances, parking, paved paths, sidewalks, and brick or concrete site areas all have issues regarding cracking, wear, and general wear and tear. Asphalt and concrete are not joined correctly between paths and play areas.

There is a lack of a cohesive site plan in regards to connectivity of the facilities multiple uses, for way finding between activities, and the underutilized large area of grassed areas. The entrance and loading area at the northwest side of the building is, like the other paved areas on the site, is in worn condition: in addition it is underused and disconnected from the rest of the facility.

2.2 Handicap Accessibility

We reviewed the *Master Plan for the District of Columbia, dated September 20th 2011* that detailed ADA accessibility challenges for the TR Center along with proposing corrective measures.

We agree with the findings in the report and in addition note the following:

The site's general flat topography, where accessibility is required, allows flexibility to add additional measures where needed during the redevelopment of the project.

It is premature to recommend specific additional ADA routes, ramps, etc. at this time because of opportunities to change the buildings connection to the parking lot and the site during the next phase of the project.

Beyond repairing existing pathways to make them ADA compliant and upgrading the playground areas to be ADA compliant any additional site specific measures will be driven by redesign during the subsequent phase of the project.

2.3 Drainage Systems

2.3.1 Site Drainage

The site is currently drained to an existing closed pipe system. Multiple drop inlets were located on site and are shown on the attached survey. (See Appendix for additional information.) It is highly likely that the renovation of the TR Center will require meeting the new DDOE stormwater management in one of two ways:

1) If the cost of the construction for the project is over ½ of the assessed real estate value of the property and the building is over 5000 sq. ft., you are required to do SWM regardless of whether you do any site work. The baseline is 0.8 in. not 1.2 in. depth to determine the required volume in this case.
2) Due to the parking, site, ADA, and landscape issues it is almost certain that the 5000 sq. ft. of land disturbance will be met and the SWM plan requirements will be triggered.

The new DDOE regulations require keeping stormwater volume on site for infiltration and / or reuse. Infiltration tests will be required at multiple locations to determine soil percolation rates.

There are multiple opportunities to integrate approved DDOE strategies into the TR Center site that can combine site amenities, landscape upgrades, and water reuse strategies, including:

Permeable pavement, Bioretention, Infiltration strategies, Trees, Natural cover and Water reuse for irrigation

The most cost effective strategy most likely is to use the existing drop inlets on site as "overflow structures" for onsite strategies; therefore, avoiding building the need to build additional stormwater infrastructure.

2.3.2 Building Roof Drainage

The current roof drainage appears to be connecting below grade to the existing closed pipe system serving the building. For implementing the new DDOE regulations, the roof runoff needs to be disconnected and brought to onsite strategies for treatment, infiltration, and/or reuse, (This can be done at the roof level or at grade).

2.4 Utility Systems (See Appendix B for Exhibit 3.1 Existing Site Utility Plan)

2.4.1 Water

A flow test will need to be performed by DC Water to verify adequate pressure for any project renovation that includes plumbing. Verification will also be needed to confirm that the water connection in the street meets current DC standards.
An update is also needed for the DC Water standards meter to show it meets current DC Standards – including meter outside the building (unless a waiver is granted).

2.4.2 Sanitary

The existing sanitary line will need to be ctv'd to verify the viability / shape of the current connection. The existing sanitary pipe diameter will need to be verified by a plumbing engineer.

2.5 Fire Water Systems

A flow test is needed to determine adequate pressure of the system. Also, needed is verification of updated DC Water details / need for booster pump / siamese connection.

2.6 Parking and Pavement

Pavement for entrances and parking areas is in poor condition and needs at a minimum resurfacing. Restriping should be coordinated with an updated parking / vehicle circulation plan.

2.7 Vehicular Circulation

During the site assessment visit multiple vans were stacked up, apparently, waiting to pick up people at the center. They were blocking vehicles trying to leave the parking lot to exit the facility. The lack of a clear drop off area, clear markings, and signage makes vehicle circulation difficult. Vehicle circulation, signage, along with possible reconfiguration of lane widths / parking areas should address these concerns.

2. Site Conditions

2.8 Pedestrian Circulation

Difficulty noted with pedestrian way finding from parking areas to specific facility operations. There is a lack of signage and clear paths to site related facilities (playgrounds, ball field, and basketball court). As a result, part of site feels isolated and underutilized. Updated way finding for pedestrians would be helpful.

2.9 Ball Fields

Better integration to the overall site based on signage / lighting / updated equipment is recommended. There is potential for locating the stormwater management through new permeable surface, drainage system and / or utilizing captured stormwater for irrigation.

2.10 Playground

The playground surface should be updated based on current standards being utilized by DCPS for new / updated playgrounds at schools. Upgrade to the path surface that connects to playgrounds is also needed. The playground equipment appears to be in fair condition.

2.11 Landscaping

Bring DC Arborist to site to assess existing tree stock and complete updated landscape architecture plan to address the following: underutilized open space, site connectivity, plantings and site equipment. Finally, integrate landscape architecture into stormwater management plan.

2.12 Site lighting

A lack of site lighting is an issue. Adding lighting in parking lot and adding low level lighting along paths can help with pedestrian way finding and eliminate potential safety concerns and site connectivity. Integrating the building lighting plan into the landscape architecture plan could also be explored.

3.0 - 3.3 Building Conditions

3.1 General

The TR Center building is extremely well utilized and houses a broad range of community based activities. Despite its age and unusual layout, the basic activity rooms, gymnasium, administrative area, pool and supporting lockers are frequently used providing needs to numerous people in the community, with activities taking place in them. The pair of buildings is connected by a covered breezeway. One of the highlights of the facility is the use of natural light. The main building has numerous skylights that allow for direct daylight building. The perimeter of the building is also lined with clerestory windows. One drawback of this design is there are few direct views to the outside.

3.2 Handicap Accessibility

As part of the report the A/E team was provided with an ADA report prepared by Swanke Hayden Connell Architects in September of 2011. The thirty nine page report highlights numerous items that do not meet code. We did not review each item during our site walk to verify if items were correctly noted or if they were corrected as recommended in the report, this was not a part of our scope. We do, however, agree with the tone of the report. It is clear from the report that there were some areas that were modified, and some areas that were not. To highlight the majority of the report notes the accessibility concerns with the Men's and Women's locker rooms. In general, we find that fixing all the accessibility deficiencies in these areas will begin to address the function of the spaces more effectively.

Pool: The ramp to the whirlpool is not ADA compliant. Furthermore, the ramp is constructed of plywood and due to the water pooling in certain areas it may be deteriorating faster than anticipated. Railings are provided only on one side of the ramp. There is also not adequate clearance for wheel chair access to navigate the pool deck.

Locker Rooms: The locker rooms, though recently renovated to address wheel chair accessibility, has not addressed all issues. Though both the locker rooms have been modified since the report in 2011, to include addition showers and revised entry sequences, all items have not been fully addressed with regards to dealing with maneuverability and accessibility of clearance requirements.

Locker Room Shower/ Toilet

Locker Room Changing Area

3.0 - 3.3 Building Conditions

Ramp: The switch back ramp to the accessible toilet room and green room behind the gym stage also does not meet code in any aspect. Access is narrow and the uneven slope can prove to be challenging navigating a wheel chair along the ramp to the back areas generally used for changing area.

Exterior: Traversing the site side walk end at the vehicular entrance and exit to the site. Marked pedestrian crossing to the facility is spotty at best. Walkways are uneven in sections. There is onsite parking and handicap parking but no space that is van accessible. There is not a clear area for designated passenger drop off for cars, vans, or buses.

3.3 Architectural

3.3.1 Building Envelope

Roof: The main roof is a single ply system. It appears to have been installed recently, though not confirmed with DPR. It is difficult to determine the age of the roofing system. The roof surfaces are sloped to roof drains. After reviewing both roofs of the building, visual inspection reveals the roof appears to be properly installed, there were visible holes or gouges observed, though, there was standing water in some places. However, it is evident that there is a water problem due to the multiple locations of water damage throughout the ceiling of the building. There were multiple blisters throughout the roofs surface.

The membrane appears sound without evidence of cracking or other deterioration. The siding along the mansard roof needs a good clearing and is clearly worn but there were no observations of cracking and missing planks. Mechanical units are installed off of the roof with supports. Below the roof eve outside of the swimming pool the underside of the gypsum board soffit has been replaced multiple times. Visible water damage was observed. The source of the leak was not identified.

Eave Outside Pool

Stepped Roof Above Pool

Masonry: The exterior masonry wall appears to be in fair condition and is in reasonably good shape with only very localized and limited damage in places. There are areas that did appear to have the remnants of graffiti removed. Grout joints also appear to be in good condition for the age of the building. There are several areas where penetrations need repairing to include areas where utilities penetrate the building. There are portions

of the masonry pavers along the walkway and building perimeter that have been recently replaced. The seals between the building masonry and perimeter should be recaulked.

Utilities at building

Masonry pavers at walkway

Exterior Windows: Windows appear to be original to the building and are in fair to poor condition. A few windows were closely observed where the perimeter seal or gaskets have failed and have been “manually” fixed with duct tape in an attempt to mitigate heat loss/gain and limit water infiltration. A temporary solution could be to recaulk the window frames and joints, but it is recommended that a more energy efficient glazing system be used moving forward.

Windows at Pool

Windows at Pool (Interior)

Exterior Doors: There are several types of doors that allow access to the building. Most notable are the automated sliding bi-parting doors at the main entry to the building the doors range in size but are similar in function. The smaller building has a single sliding automated door. Though these doors continue to function as designed, there is not a vestibule. This renders the doors inefficient in regards to air infiltration. The rear pair of doors were observed to have broken glass and missing weather stripping adding to the inefficiency of the conditioned space.

There are several overhead coiling doors around the building protecting glass sliding doors. These doors were not observed to function, but it is assumed that they are used as required by activities occurring in the spaces. Finally, the main entries to the building

have a steel security gate it has been noted that this is a heavy, cumbersome gate that must be manually operated.

Main Entry Doors

3.3.2 Interior Conditions:

Generally the conditions of the interior finishes are typical of a building that has not had any major renovations. The original flooring in the building, brick, dominates the majority of the lobby and circulation space. Vinyl tile, carpet and ceramic tile are old for the most part and have outgrown their lifespan and are due for upgrades. The brick could be replaced for more conventional surfaces. Existing ceilings are antiquated 12”x12” tiles that have random missing or damaged acoustical tile. There are also water stains on the tiles throughout for the majority of the spaces.

Ceilings are recommended to be replaced in its entirety. The wall partitions require paint as there are walls with peeling paint in most places. Besides time, the biggest factor in the deterioration of the building is due to water infiltration from flooding in the basement, due to storm drain backing up, as evident of rust on the door frames to stains on the ceiling tiles. Though the roof has been recently replaced identifying the location of the leak(s) was not possible. The moisture levels in the pool area are not controlled as evident from the rust on the metal deck and structural support system in the storage room. The joist system above the pool has been repainted in recent years.

3.0 - 3.3 Building Conditions

Door Frame in Pool

Door Frame in Mechanical Space

Ceiling in Senior Center

Base in pool

3.3.3 Doors and Hardware:

The hollow metal doors and frames that serve the building are beginning to show rust and signs of general deterioration. The existing door hardware in general needs to be replaced throughout the building. The majority of the doors have grab bars on them with thumb locks located higher than standard levels. Several emergency egress doors in the gym have latch bolts and are locked. They do not release with the panic hardware. Closers and latches do not fully function or are broken or not present. A few doors operated by closers require opening forces greater than the maximum allowable.

The design team assumes that the current building received the certificate of occupancy prior to the 1991 implementation of ADA and has not been subject to major renovation since this date. Without a major renovation since 1991 and as a result the current use, the building, and related features, are assumed to have been grandfathered in and is not required to complete accessibility upgrades. It is recommended that all doors be replaced moving forward if a major renovation presents itself as an option.

3.0 - 3.3 Building Conditions

Door Hardware

Door Hardware

3.3.4 Kitchenette

The galley kitchenette has been upgraded in recent years, but high frequency of use has worn out the residential surfaces and equipment. Currently the space contains a residential grade electric stove and oven, dishwasher, microwave, and stackable washing machine and dryer. There is an exhaust hood but it is not vented. All kitchenette equipment is in need of an upgrade. The layout is rather disorganized with very little preparation surface. The P-lam is worn on the countertop and beginning to delaminate; the cabinet doors are missing hardware and some doors need to be tightened. The VCT flooring should be replaced around the work area. The pantry around the corner has shelves for storage, but adds to the chaotic layout by not being accessible for food preparation. Finally, the kitchen space has a ceiling mounted accordion door that further separates the open space adjacent to it.

Kitchenette

3.0 - 3.3 Building Conditions

3.3.5 Activity Classroom Rooms:

There are several activity rooms that house numerous functions year round. The rooms serve the following needs; art room, computer lab, weight exercise room and library. Upgrades to the room finishes for these spaces are needed as well as adequate lighting. In general the storage rooms are awkwardly sized and full to capacity. Most of the floor spaces in the various activity rooms are used to stored items thus rendering the space more inefficient.

Weight Room

Computer Lab/Classroom

3.3.6 Gymnasium:

The gym is a large space that doubles as a multipurpose room. The space is divided by a manually operated curtain. There is a concrete stage at one end of the space and a manager's office opposite the stage. The basketball court is not a regulation size and space is limited around the perimeter for spectators during games. The flooring finishes appear to be in fair condition for the multitude of uses. In discussions with the user it was communicated that there are several areas in the ceiling that leak water.

Gymnasium View of Stage

Gymnasium View from Stage

3.0 - 3.3 Building Conditions

3.3.7 Toilets

The main men's and women's toilets that serve both buildings are not ADA compliant. The accessible stalls do not have sufficient clearance for transfer to the toilet seat. The spaces do not meet the required circulation for wheel chair maneuverability as well as appropriate grab bar supports. Thermal insulation is not provided under the sink to avoid a scald hazard to wheelchair bound persons. The finishes in these areas are worn and need updating.

HC Stall

View of Sink

3.3.8 Administration

The administration offices are similar to the other classroom and activity spaces. The spaces reflect an outdated function. More space is needed to adequately meet the TR Center's current full time staff and projected staffing. More common space for general and secure storage, along with a meeting room, is needed. Regarding finishes, the wood panel walls are outdated and carpet should be replaced. Greater visibility to the outside as well as better a position to view major spaces including entry and lobby is requested for the front desk.

View from Front Desk

Office

3.4 Building Conditions - Structural

3.4.1 Building Construction Type and Systems

SK&A Structural Engineers performed a walk-thru of the existing facility on October 22, 2014 to perform a general review of the facility. Structural components were observed where visible. Structural drawings for the existing building are very limited. We have received a copy of the original foundation plan. Information noted herein is based on our walk-thru and review of existing foundation plan.

Roof framing of the facility consists of metal deck on a proprietary space frame system. Roof framing is supported on Hollow Structural Steel sections.

Framed floor construction is limited to areas above the boiler room and pool pump room. Framing consists of cast-in-place concrete on composite metal deck supported by structural steel beams and columns.

Basement walls at the boiler room and pump room appear to be cast-in-place concrete.

Foundations at the lower level consist of continuous spread footings at walls and isolated spread footings at columns. Foundations at the upper level include isolated spread footings at column locations. Walls are supported on grade beams that span to column footings.

Ground level slabs are understood to be conventional slab-on-grade construction.

3.4.2 Current Conditions Assessment

Based on our observations at the walk-thru, the existing building appears to be generally in good structural condition. No signs of significant structural deficiencies were noted. Observations are noted below.

Given the exposure conditions of natatoriums, we would have anticipated some level of deterioration to the steel framing in this area. It appears the roof deck and space frame roof framing in the natatorium may have been repainted as part of a maintenance program so no signs of deterioration were observed.
Roof framing observed in other portions of the building appeared to be in good condition.

Floor framing over the boiler room is generally in good conditions. Observation of the existing metal deck noted local pitting, rusting and deterioration. We recommend metal deck be cleaned and painted to prevent further deterioration. Localized strengthening may be required in areas of section loss.

3.5 Building Conditions - Mechanical

The purpose of this section is to address the existing mechanical systems and propose equipment for future use of the renovated facilities. In compliance with the project and program requirements the proposed equipment and systems will be selected with key consideration given towards energy efficiency, reliability, and the cost and ease of maintenance.

3.5.1 Hot Water Heating System

The existing hot water heating system is being served by two (2) hot water boilers and four (4) hot water pumps located in the basement mechanical room. The hot water passes through air handling units serving the gymnasium/offices/stage/pool, baseboard heaters and hot water coils of terminal unit. The existing pumping system is primary constant flow type.

The majority of the existing hot water heating is in average condition, including boilers, pumps, chemical feeder, expansion tank, and air separator. The existing hot water boiler, B-1, is approximately 7 years old and B-2 is approximately 13 years old. The existing hot water pumps are approximately 13 years old.

Below are pictures of the hot water boilers and the hot water pumps.

Photo 3.5.1-1: Hot Water Boilers

Photo 3.5.1-2: Hot Water Pumps

Listed below in Table 3.5-A are the characteristics of the hot water boilers.

Table 3.5-A: Existing Boilers

Unit No.	Make	Fuel Type	Input (MBH)	Output (MBH)	Boiler Horse Power	Unit Weight (lbs)
B-1	Weil McLain	Natural Gas	2,049	1,632	48.8	4205
B-2	Weil McLain	Natural Gas	2,049	1,632	48.8	4205

3.5.2 Chilled Water System

The existing chilled water system is being served by one (1) air cooled chiller and one (1) chilled water pump located in the basement mechanical room. The associated air cooled condenser is located on grade nearby the mechanical room. The chilled water passes through air handling units serving the gymnasium/offices/stage. The existing pumping system is primary constant flow type.

3.5 Building Conditions - Mechanical

The majority of the existing chilled water system is in average condition, including chiller and associated air cooled condenser, chemical feeder, expansion tank, and air separator. The existing chilled water pump appears to be in poor condition. The existing chilled water system is approximately 13 years old.

Below are pictures of the chiller, the air cooled condenser and the chilled water pump

Photo 3.5.2-1: Chiller

Photo 3.5.2-2: Chilled Water Pump

Photo 3.5.2-3: Air Cooled Condenser

Listed below in Table 3.5-B are the characteristics of the chiller.

Table 3.5-B: Existing Chiller

Unit No.	Make	Nominal Tons	Type	Refrigerant	KW/Ton @ 95 Deg. F Ambient	Unit Weight (lbs)
CH-1	TRANE	60	Scrolled	R-22	1.2	1982

Listed below in Table 3.5-C are the characteristics of the Air Cooled Condenser.

3.5 Building Conditions - Mechanical

Table 3.5-C: Existing Air cooled Condenser

Unit No.	Make	Refrigerant	Condenser Fan Motor			Unit Weight (lbs)
			Qty.	HP (Each)	KW (Each)	
CU-1	TRANE	R-22	6	1	0.9	3010

3.5.3 Air Handling and Rooftop Units

The existing air handling units (AHU-1, AHU-2 and AHU-3) are constant volume water-to-air cooling and heating units serving the gymnasium/offices/stage. The units consist of a belt driven supply fan, chilled water coil, hot water heating coil and air filter.

The existing air handling units (AHU-4 and AHU-5) are constant volume water-to-air heating only units serving the pool. The units consist of a belt driven supply fan, hot water heating coil and air filter.

The existing rooftop air handling unit (RTU-1) serving the support building is a constant volume packaged heat pump unit mounted on a roof curb. The unit consists of a belt driven supply air fan, two compressors, direct drive propeller condensing fans, condenser, and DX evaporator coils. The unit is located on the lower building roof and ducted into the auditorium stage.

The existing air handling units are in good condition, and the existing roof top unit is in poor condition. The existing air handling units are approximately four (4) years old, and the existing rooftop unit is approximately 15 years old.

Below are pictures of the air handling unit and the rooftop unit.

Photo 3.5.3-1: AHU-1

Photo 3.5.3-2: AHU-2

3.5 Building Conditions - Mechanical

Photo 3.5.3-3: AHU-3

Photo 3.5.3-4: AHU-4

Photo 3.5.3-5: AHU-5

Photo 3.5.3-6: RTU-1

Listed below in Table 3.5-D are the characteristics of the Air Cooled Condenser

Table 3.5-D: Existing Air Handling Units

Unit No.	Serving	Make	Configuration	Nominal CFM	Fan HP	Hydronic Coils
AHU-1	Gym & Stage	Trane	Horizontal	6,000	7.5	Cooling & Heating
AHU-2	Gym	Trane	Vertical	N/A	N/A	Cooling & Heating
AHU-3	Offices	Trane	Vertical	7,000	1.5	Cooling & Heating
AHU-4	Pool	Trane	Horizontal	8,500	7.5	Heating Only
AHU-5	Pool	Trane	Vertical	1,200	1/2	Heating Only

Listed below in Table 3.5-E are the characteristics of the Air Cooled Condenser

Table 3.5-E: Existing Rooftop Unit

3.5 Building Conditions - Mechanical

Unit No.	Make	Nominal Tons	Nominal CFM	Fan HP	EER	Heating
RTU-1	York	7.5	3,000	2	9	None

3.5.4 Distribution System

The existing ductwork is installed without insulation, and the ductwork is showing signs of aging. The existing hot water and chilled water piping are insulated with fiberglass. The piping and the insulation are in poor condition and it has surpassed the expected service life defined by ASHRAE.

Below are pictures of the ductwork and hot water and chilled water piping.

Photo 3.5.4-1: Ductwork

Photo 3.5.4-2: Piping

Photo 3.5.2-3: Piping

3.5 Building Conditions - Mechanical

3.5.5 Controls

The existing thermostats and three way control valves on hot water and chilled water coils are controlled by a pneumatic control system . All other equipment such as chiller, boilers and pumps are controlled by standalone controllers with manual on/off switches.

Below is picture of the air compressor and the associated controllers.

Photo 3.5.4-1: Air Compressor

3.5.6 HVAC Proposed Systems

3.5.6.1 General Recommendations

The recommendation is to remove all existing HVAC systems in the facility and replace with new for the following reasons:

- The equipment does not meet the latest energy efficiency standards.
- The equipment cannot accommodate the program changes.
- The equipment cannot maintain the comfort level required by ASHRAE 55.

The proposed systems consist of the following:

- Option 1 – Air cooled Variable Refrigerant Flow (VRF), Air cooled single zone Variable Air Volume (VAV) units, Air cooled variable air volume Dedicated Outside Air System (DOAS) and Water/Air cooled pool conditioning unit.
- Option 2 – Geothermal Variable Refrigerant Flow (VRF), Geothermal single zone Variable Air Volume (VAV) units, Geothermal variable volume Dedicated Outside Air System (DOAS) and Geothermal pool conditioning unit.
- Option 3 – Air Cooled Variable Air Volume (VAV) units, Air cooled single zone Variable Air Volume (VAV) units, and Water/Air cooled pool conditioning unit.

3.5 Building Conditions - Mechanical

Typical equipment for all options would consist of the following: Electric heaters and exhaust fans for the lockers and bathrooms; Commercial exhaust fan and makeup air fan for the kitchen.

3.5.6.2 Option 1 – Air Cooled Variable Refrigerant Flow (VRF), Air Cooled Single Zone Variable Air Volume (VAV) Units, Air Cooled Dedicated Outside Air System (DOAS) and Water/Air Cooled Pool Conditioning Unit (PCU)

- Air Cooled Variable Refrigerant Flow (VRF) – Office, Fitness, Studio, Library.

VRF is a heating and cooling system that distributes refrigerant to multiple fan coil units serving the conditioned spaces. The natural attributes of a VRF system position it as an alternative to a chilled water system.

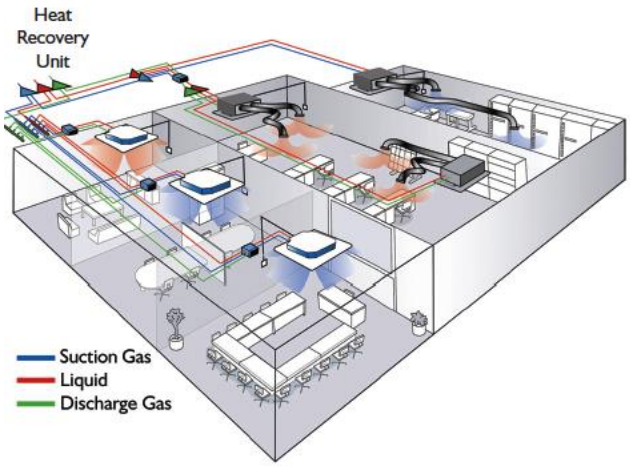


Figure 3.5-1: Variable Refrigerant Flow (VRF) System

In a typical VRF system, each space is served by an indoor unit located within or near that space. Indoor units may be mounted on the floor, wall, or in the ceiling (ductless) or in the ceiling plenum and ducted to diffusers. The spaces which would be served by the VRF system include Office, Fitness, Studio, Library, Etc...

Each indoor unit contains a refrigerant-to-air heat exchanger and a multi-speed fan. The indoor units are connected to an air-cooled outdoor unit using a common set of refrigerant pipes. Outdoor units contain compressors and condenser fans. The system basis of design is Daikin. These systems use branch connectors and a three pipe system to exchange refrigerant and take advantage of simultaneous heating and cooling of the zones.

3.5 Building Conditions - Mechanical

Figure 3.5-2: VRF Outdoor/Indoor Units

- Air Cooled Single Zone Variable Air Volume (VAV) – Gymnasium and Stage

The Single Zone VAV unit will have an integral Variable Frequency Drive (VFD), a total enthalpy wheel, natural gas heating, economizer operation, and ventilation optimization with carbon dioxide (CO2) controls.

The return air from inside the building is drawn back to the units. Some of this air is exhausted while the rest enters the rooftop unit through a return-air damper to be mixed with outdoor air that enters through a separate damper. The exhaust air will pass through an integral total enthalpy wheel. Adjacent outdoor air and exhaust air counterflow streams each flow through half of the wheel. Enthalpy wheels recover energy (sensible and latent) from the exhaust air stream to pre-condition the outdoor air stream.

- Air Cooled Dedicated Outdoor Air System (DOAS) – Office, Fitness, Studio, Library.

The Dedicated Outdoor Air System will provide fresh air to the spaces being served by VRF units. The unit will have an integrated total enthalpy wheel with modulation and bypass controls, an integrated an integral Variable Frequency Drive (VFD), natural gas heating, economizer operation and hot gas reheat.

The exhaust air will pass through an integral total enthalpy wheel. Adjacent outdoor air and exhaust air counterflow streams each flow through half of the wheel. Enthalpy wheels recover energy (sensible and latent) from the exhaust air stream to pre-condition outdoor air stream.

- Air/Water Cooled Pool Conditioning Unit

The Pool Conditioning Unit will have an integral Variable Frequency Drive (VFD), a total enthalpy wheel, a water cooled remote condenser, an air cooled remote condenser, natural gas heating, economizer operation and hot gas reheat.

The exhaust air will pass through an integral total enthalpy wheel. Adjacent outdoor air and exhaust air counterflow streams each flow through half of the wheel. Enthalpy wheels recover energy (sensible and latent) from the exhaust air stream to pre-condition outdoor air stream.

3.5 Building Conditions - Mechanical

The Pool Conditioning Unit will reject heat to the water cooled condenser in the pool water loop, when pool water temperature is below its setpoint. After pool water reaches its setpoint, the unit will reject heat to the air cooled condenser.

- Building Automation System

The building will be provided with a distributed control system or Building Automation System (BAS). The control system will be a computerized, intelligent network of electronic devices designed to monitor and control the HVAC and lighting systems in the building. The BAS core functions will be to start/stop the HVAC systems based on schedules, monitor system performance and device failures and provide malfunction alarms (via email and/or text notifications) to building engineering/maintenance staff. The rooftop units/air handling units and variable refrigerant systems will operate under their own internal controls with outputs to the BAS. The panel will have an Ethernet connection for access from a laptop and will be provided with a web based software interface that allows remote monitoring and control of the system by using a Microsoft Internet Explorer or similar software program.

- Overall System Advantages

a) Energy efficiency is inherent to the system design as well as to its method of operation
b) Zoning is accomplished by installing individual indoor units per areas served
c) Individual units provide quick response to occupancy changes
d) Individual zone comfort and control
e) Ease of installation
f) Reduced ductwork and construction
g) No extensive commissioning
h) Minimal maintenance
i) VRF system allows for higher LEED rating/points

- Overall System Disadvantages

a) Less efficient than Geothermal VRF
b) More piping than the RTU VAV option

3.5.6.3 Option 2 – Geothermal Variable Refrigerant Flow (VRF), Geothermal Single Zone Variable Air Volume (VAV) Units, Geothermal Variable Volume Dedicated Outside Air System (DOAS) and Geothermal Pool Conditioning Unit

- Geothermal Variable Refrigerant Flow (VRF) – Office, Fitness, Studio, Library, Etc.

  This is the same VRF system as detailed above with one key difference. The indoor units are connected to a geothermal outdoor unit instead of an air-cooled outdoor unit. The geothermal outdoor units will be connected to a geothermal field acting as a heat exchanger.

  A geothermal heat exchanger (sink and source) takes advantage of relatively constant ground temperatures. This is achieved by drilling numerous bore holes in a field to

extract heat for winter months and reject heat for summer months. Quantity and depth of wells will only be verified once a soil conductivity test has been performed.

Piping from geothermal wells will be connected to main supply and return headers located in basement mechanical room.

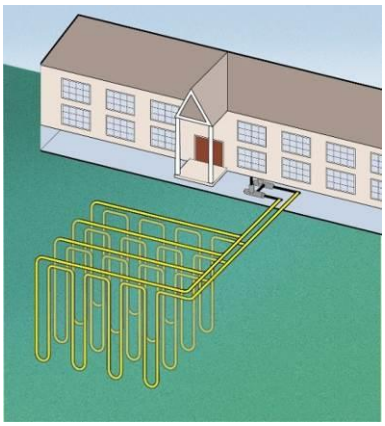


Figure 3.5-3: Example Geothermal Wells

- Geothermal Single Zone Variable Air Volume (VAV) – Gymnasium and Stage

The Single Zone VAV unit will have an integral Variable Frequency Drive (VFD), a total enthalpy wheel, heat pump operation, economizer operation, and ventilation optimization with carbon dioxide (CO_2) controls.

The return air from inside the building is drawn back to the units. Some of this air is exhausted while the rest enters the rooftop unit through a return-air damper to be mixed with outdoor air that enters through a separate damper. The exhaust air will pass through an integral total enthalpy wheel. Adjacent outdoor air and exhaust air counterflow streams each flow through half of the wheel. Enthalpy wheels recover energy (sensible and latent) from the exhaust air stream to pre-condition outdoor air stream.

The Single Zone VAV Unit will be served by the geothermal wells. Geothermal header piping will be routed to the unit.

- Geothermal Dedicated Outdoor Air System (DOAS) – Office, Fitness, Studio, Library.

The Dedicated Outdoor Air System will provide fresh air to the spaces being served by VRF units. The unit will have an integrated total enthalpy wheel with modulation and bypass controls, an integrated an integral Variable Frequency Drive (VFD), heat pump operation, economizer operation and hot gas reheat.

The exhaust air will pass through an integral total enthalpy wheel. Adjacent outdoor air and exhaust air counterflow streams each flow through half of the wheel. Enthalpy

wheels recover energy (sensible and latent) from the exhaust air stream to pre-condition outdoor air stream.

The Dedicated Outdoor Air System will be served by the geothermal wells. Geothermal header piping will be routed to the unit.

- Geothermal Pool Conditioning Unit

The Pool Conditioning Unit will have an integral Variable Frequency Drive (VFD), a total enthalpy wheel, heat pump operation, economizer operation and hot gas reheat.

The exhaust air will pass through an integral total enthalpy wheel. Adjacent outdoor air and exhaust air counterflow streams each flow through half of the wheel. Enthalpy wheels recover energy (sensible and latent) from the exhaust air stream to pre-condition outdoor air stream.

The Pool Conditioning Unit will be served by the geothermal wells. Geothermal header piping will be routed to the unit.

- Building Automation System

The building will be provided with a distributed control system or Building Automation System (BAS). The control system will be a computerized, intelligent network of electronic devices designed to monitor and control the HVAC and lighting systems in the building. The BAS core functions will be to start/stop the HVAC systems based on schedules, monitor system performance and device failures and provide malfunction alarms (via email and/or text notifications) to building engineering/maintenance staff. The rooftop units/air handling units and variable refrigerant systems will operate under their own internal controls with outputs to the BAS. The panel will have an Ethernet connection for access from a laptop and will be provided with a web based software interface that allows remote monitoring and control of the system by using a Microsoft Internet Explorer or similar software program.

- Overall System Advantages

a) Energy efficiency is inherent to the system design as well as to its method of operation
b) Geothermal efficiencies are a step above air-cooled unit efficiencies
c) Zoning is accomplished by installing individual indoor units per areas served
d) Individual units provide quick response to occupancy changes
e) Individual zone comfort and control
f) Reduced ductwork
g) Geothermal VRF system allows for highest LEED rating/points

- Overall System Disadvantages

a) Requires large plot of land for geothermal field
b) Higher first cost with additional piping, pumps, and construction
c) Requires an additional vault to be created
d) Longer payback period for initial cost.

3.5.6.4 Option 3 – Air Cooled Variable Air Volume (VAV) Units, Air Cooled Single Zone Variable Air Volume (VAV) Units, and Water/Air Cooled Pool Conditioning Unit (PCU)

- Variable Air Volume VAV System – Office, Fitness, Studio, Library, Etc.

The rooftop units will have an integral Variable Frequency Drive (VFD), a total enthalpy wheel, economizer operation, static pressure optimization and ventilation optimization with carbon dioxide (CO_2) and occupancy sensor controls. These units will provide constant temperature air to variable air volume terminal units with electric reheat.

The supply air will be distributed through ductwork that will be located in the ceiling plenum above each floor. The supply ductwork will deliver air to each of the VAV terminal units and then introduced into the zones through supply-air diffusers. Each independently controlled zone will have a VAV terminal unit that varies the quantity of air delivered to maintain the desired temperature in that zone. The air will return from the zones through ceiling mounted return-air grilles and travel through the open ceiling plenum to the central return duct that directs this return air back to the rooftop unit.

The return air from inside the building is drawn back to the units. Some of this air is exhausted while the rest enters the rooftop unit through a return-air damper to be mixed with outdoor air that enters through a separate damper. The exhaust air will pass through an integral total enthalpy wheel. Adjacent outdoor air and exhaust air counterflow streams each flow through half of the wheel. Enthalpy wheels recover energy (sensible and latent) from the exhaust air stream to pre-condition outdoor air stream.

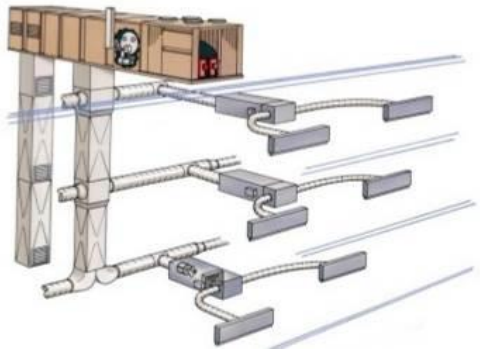


Figure 3.5--4: Typical VAV System

- Air Cooled Single Zone Variable Air Volume (VAV) – Gymnasium and Stage

The Single Zone VAV unit will have an integral Variable Frequency Drive (VFD), a total enthalpy wheel, natural gas heating, economizer operation, and ventilation optimization with carbon dioxide (CO_2) controls.

The return air from inside the building is drawn back to the units. Some of this air is exhausted while the rest enters the rooftop unit through a return-air damper to be mixed

with outdoor air that enters through a separate damper. The exhaust air will pass through an integral total enthalpy wheel. Adjacent outdoor air and exhaust air counterflow streams each flow through half of the wheel. Enthalpy wheels recover energy (sensible and latent) from the exhaust air stream to pre-condition outdoor air stream.

- Air/Water Cooled Pool Conditioning Unit

The Pool Conditioning Unit will have an integral Variable Frequency Drive (VFD), a total enthalpy wheel, a water cool remote condenser, an air cooled remote condenser, natural gas heating, economizer operation and hot gas reheat.

The exhaust air will pass through an integral total enthalpy wheel. Adjacent outdoor air and exhaust air counterflow streams each flow through half of the wheel. Enthalpy wheels recover energy (sensible and latent) from the exhaust air stream to pre-condition outdoor air stream.

The Pool Conditioning Unit will reject heat to the water cooled condenser in the pool water loop, when pool water temperature is below its setpoint. After pool water reaches its setpoint, the unit will reject heat to the air cooled condenser.

- Building Automation System

The building will be provided with a distributed control system or Building Automation System (BAS). The control system will be a computerized, intelligent network of electronic devices designed to monitor and control the HVAC and lighting systems in the building. The BAS core functions will be to start/stop the HVAC units based on schedules, monitor system performance and device failures and provide malfunction alarms (via email and/or text notifications) to building engineering/maintenance staff. The rooftop system units will operate under their own internal controls with outputs to the BAS. The panel will have an Ethernet connection for access from a laptop and will be provided with a web based software interface that allows remote monitoring and control of the system by using a Microsoft Internet Explorer or similar software program.

- Overall System Advantages

a) Zoning is accomplished by installing variable air volume terminal units
b) Central Systems
c) No water/refrigerant piping

- Overall System Disadvantages

a) Less energy efficient than other options
b) Takes up more roof space and floor space for shafts
c) Large quantities of ductwork
d) Takes up large areas of ceiling plenum
e) Less system redundancy

3.5.7 System Recommendations

The recommended system is Option 1 – Air Cooled Variable Refrigerant Flow (VRF), Air Cooled Single Zone Variable Air Volume (VAV) Rooftop Unit, Air Cooled Dedicated

3.5 Building Conditions - Mechanical

Outside Air System (DOAS) and Air/Water Cooled Pool Conditioning Unit. This overall system is highly efficient and is meeting or exceeding industry standards and energy rating systems. It provides the flexibility and comfort to heat and cool simultaneous as needed, while also limiting overall construction cost and space requirements.

3.6 Building Conditions - Electrical

The purpose of this section is to assess the condition of the existing electrical systems and evaluate its capacity to meet the requirements of the proposed future use of the facility. In compliance with the project scope and program requirements the proposed equipment and systems will be selected with key consideration given towards energy efficiency, reliability and the cost and ease of maintenance.

3.6.1 Existing Conditions

3.6.1.1 Overall

The overall condition of the electrical system appears to be in fair condition. The building's electrical system is approximately 40 years old. Considering its age, replacement parts may not be readily available and have reached the end of their useful life.

3.6.1.2 Incoming Electrical Service

Electrical service to the building is derived from an underground incoming duct banks terminated in a 2000-ampere main service distribution switchboard via a current transformer cabinet (CT). The switchboard is rated at 2000A, 208/120V, 3-Phase, 4 Wire, which is circuit breaker type, is manufactured by Square D and is located in main building electrical room.

The main switchboard consists of a C/T Compartment, Main Service Switch section and one (1) distribution section. There is a tap ahead of service disconnect switch for emergency power with 100 amps disconnect switch. The main service distribution switchboard is original to the building and is in fair condition and has reached the end of its useful life. Due to its age, replacement parts are no longer manufactured and may not be readily available.

The existing service is designed for maximum building electrical utilization and has a power density of approximately 23.0 volt-amps per square foot. This is more than adequate for today's building electrical requirements and it can support the electrical loads of the proposed new constructions.

The main electric room is in violation of the current code (NFPA 70-Article 110.26), as the number of entrances to working spaces for equipment rated 1200 amperes or more and over 6 feet wide. The required working clearance in front of the switchboard is also in violation of NFPA 70-Article 110.26.

3.6 Building Conditions - Electrical

Photo 3.6.1-1: Main Switchboard and Distribution Section

3.6.1.3 Normal Power Distribution System

The Main Distribution Section in Switchboard provides power to the Distribution Panelboards “DP1” and “DP2” and branch panelboards. Distribution Panelboard “DP1” of 800A, 120/208V, 3 Phase, 4 Wire is located in the Main Electrical room opposite wall to the switchboard and is original and in fair condition. “DP1” provides power to branch panelboards “LP3, “LP4” and “LP5”. These panelboards are located either in the corridors or closet which provides power throughout the building. The panelboards are original to the building construction. These panelboards are in fair condition and do not have adequate spaces or spares for additional circuits should they be required in the future to add more equipment.

Distribution Panelboard “DP2” is located in the Store Room of the adjacent building that provides power to branch panelboard “LP6” and all the electrical loads of that building.

3.6.1.4 Emergency Power Distribution

The Main Distribution Section in Switchboard provides power to the Distribution Panelboards “DP1” and “DP2” and branch panelboards. Distribution Panelboard “DP1” of 800A, 120/208V, 3 Phase, 4 Wire is located in the Main Electrical room opposite wall to the switchboard and is original and in fair condition. “DP1” provides power to branch panelboards “LP3, “LP4” and “LP5”. These panelboards are located either in the corridors or closet which provides power throughout the building. The panelboards are original to the building construction. These panelboards are in fair condition and do not have adequate spaces or spares for additional circuits should they be required in the future to add more equipment.

Distribution Panelboard “DP2” is located in the Store Room of the adjacent building that provides power to branch panelboard “LP6” and all the electrical loads of that building.

3.6.1.5 Lighting System

The existing building is illuminated throughout with fluorescent lighting fixtures using T8 and T12 lamps and controlled via local switches. There were quite a bit of light fixtures

that were not working and the rooms were dark. Lighting foot-candle levels in some areas are inadequate. They do not comply with the lighting level requirements in the Illuminating Engineering Society of North America (IESNA).

Photo 3.6.1-3 & 4: Typical Light Fixtures in Kitchen and Office Spaces

Photo 3.6.1-5 & 6: Typical Light Fixtures in Pool and Gymnasium

3.6.1.6 Fire Alarm System

The existing fire alarm control panel is located in the Main Electrical Room. The system appears to be in a fairly good condition and well maintained compared to rest of the systems. Fire alarm audio-visual devices and manual pull stations are installed. However, fire alarm devices are not installed throughout and it does not meet the coverage which is a violation per code requirements.

3.6 Building Conditions - Electrical

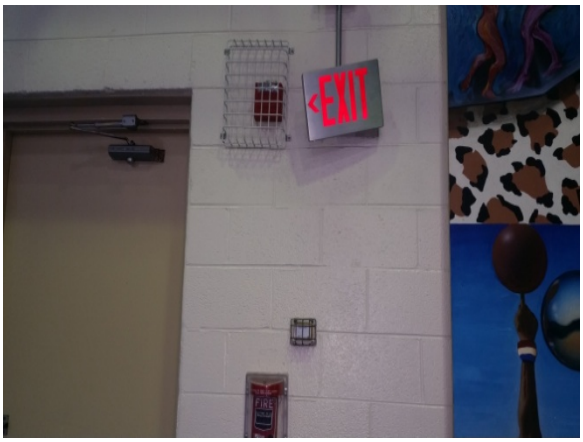


Photo 3.6.1-7 & 8: Existing Fire Alarm Control Panel, Manual Pull Station and Audio Visual Device

3.6.2 Proposed Systems

3.6.2.1 Incoming Electrical Service and New Power Distribution System

Considering the age and the availability of the replacement parts, it is recommended that the entire power distribution system be removed and replaced with same capacity. Provide new main electrical room to house the new switchboard. Utilize existing secondary duct bank and extend to the new switchboard location via service trough. Provide new electrical closet on Ground Level to house the branch electrical panelboards.

Replace all feeders, branch wiring and wiring devices (receptacles and switches) that are more than 40 years old. Replace all electrical equipment and feeders that are more than 40 years old. This will include virtually the entire system including the switchboard, panelboards and disconnect switches.

The new main switchboard will be rated at 2000 amps, 208/120 volt, 3 phase, 4 wire. The main switchboard will carry UL label and listing for the service entrance equipment and will be also provided with the Transient Voltage Suppression System (TVSS) protection. The exact size of the distribution system breakers' configuration in the main switchboard will be finalized during design phase, based on actual connected loads and the new loads for the new construction.

The new main switchboard and the panels will be provided with copper bus bars and fully rated neutral and ground bus bars. All new panels will be fed using new copper conductors/feeders in the new conduit system. The entire system will be grounded in accordance with the current code guidelines. As required by NEC 2011, Article 110.26(F), all switchboards, distribution boards, and panelboards shall be located in the dedicated spaces and protected from physical damage, tampering or unauthorized access.

Dedicated branch distribution panels shall be designed to separate the mechanical, lighting and miscellaneous power loads in the building.

3.6 Building Conditions - Electrical

3.6.2.2 New Emergency Power Distribution System

New emergency diesel generator will be provided to backfeed the life safety related loads and the essential power equipment. Size will be determined during the design phase. The incoming service feeders will be tapped in the Emergency Tap Section to feed the emergency loads. New generator will be sized based on the total connected loads plus 25% spare capacity. Multiple Automatic Transfer Switches (ATS) will be provided, one for the Code and Life Safety associated loads, one for the essential power loads and one for Fire Pump (if provided depending on the result of the water pressure test). The ATS serving the life safety loads will feed the new emergency power panel (EL). Panel EL will be rated at 225 amp, 277/480 volt, 3 phase, 4 wire with a main breaker and feed all the code required emergency lighting and new Fire Alarm Control Panel. The ATS serving power loads will include a small step down transformer (T-E). The transformer T-E will feed 100 amp, 120/208 volt emergency power panel (EP) with a main breaker. Panel EP will feed 120/208 volt power circuits.

3.6.2.3 Lighting System

The lighting system for the building shall be designed to conserve energy and minimize glare while still providing a pleasant, comfortable and functional environment. The guidelines set forth by the Illuminating Engineering Society (IESNA) shall be used to establish target-maintained illumination levels throughout all spaces. Specific influences of glare, task complexity, surface reflectance characteristics, ceiling brightness, and usage shall be addressed with this procedure.

The general lighting throughout the facility in both interior and exterior spaces will be provided utilizing energy efficient LED fixtures throughout the building and fluorescent lighting fixtures equipped with electronic drivers and energy efficient lamps in utility spaces.

The recommended fluorescent lighting fixtures will utilize 4-foot long cool white fluorescent lamps. Additionally, the lamps shall have low mercury content and be T5 linear, 28 watt with a 3,500K color temperature, minimum 82 CRI, 2800 lumen output and rated for 20,000 hours of life expectancy. Fluorescent fixtures shall further be equipped with solid-state electronic ballasts having less than 10% THD. LED fixtures shall be rated for minimum 50,000 hours of life expectancy.
Lighting for utility spaces, such as mechanical, electrical and telecom rooms will consist of 4'-0" surface and/or pendant mounted fluorescent strip fixtures.

Lighting for offices and other general service areas will consist of recessed mounted 2'x2' or 2'x4', direct/indirect type fluorescent fixtures.

Where dual switching is proposed the fixtures will be equipped with 50% step-dimming ballasts. Similarly, the fixtures controlled by dimmer switches will be provided with the dimming ballasts, as recommended by the fixture manufacturer.

Emergency lighting shall be provided throughout all interior areas of egress accomplished by select light fixtures fed via the emergency power supply. Exit sign fixtures shall be strategically located and provided throughout all interior areas of egress as well. Exit signs shall be specified with a LED light source and red color lettering.

3.6 Building Conditions - Electrical

Exterior light fixtures attached to the building shall be controlled via a photocell and time clock. The photocell shall be located on the roof, facing north. The light fixtures will provide adequate illumination near the building entrances and exits to create safe and secure pathways. The new fixtures located near the exit doors out of the building will be wired to the emergency power panel as per the current IBC (International Building Code) requirements.

3.6.2.4 Miscellaneous Wiring Devices

All lighting will be controlled by occupancy sensors with manual override switches to control all interior non-emergency lighting in all spaces. The system will consist of wall or ceiling-mounted sensor devices that operate in conjunction with relay units which in turn send the signals to control the lighting circuits serving the room. With the room lighting circuits active via the occupancy sensors, local wall switches shall be provided for subsequent control to adjust light levels and create lighting scenes in each space. The sensors using a combination of ultrasonic and passive-infrared technology will be used throughout.

The passive-infrared technology detects heat motion and needs to “see” the person moving for activation. These sensors prevent false activation, which may result from air motion produced by HVAC systems. The dual technology sensors also limit inappropriate deactivation, which may result when small movements are not detected. All sensors will be equipped with time delay, sensitivity adjustment, and daylight compensation features.

Similarly, the occupancy sensors utilizing the ultrasonic technology will be considered for all the toilets. Ultrasonic sensors typically detect changes in the air pressure produced by the occupants in the space and do not need to “see” the occupants for the activation.

New duplex convenience receptacles will be provided throughout the building as required complying with the requirements of each space on an as needed basis and per new space/furniture layout. New corridors will have duplex outlets with a minimum of 50-feet on center. One duplex receptacle will be provided in each utility and storage room. All special devices will be provided for data and other special equipment. All computer and special data equipment will be wired on dedicated circuits. Additionally, outlets will be provided within 25 feet of all mechanical equipment mounted either on the roof or outside the building. All receptacles exposed to the weather will be in NEMA 3R enclosures and protected from the ground fault interrupter type breakers. The ground fault interrupter type receptacles will be provided within 6-feet of new sink areas.

All new motors will be provided with new motor controllers and disconnect switches. All mechanical equipment and motors will be provided with the fused or non-fused safety switches, based on the actual name plate data and vendor’s requirements. All motor controllers will be NEMA Size 1 in a NEMA One enclosure, unless required otherwise due to the environmental conditions. All disconnect switches will be heavy duty, NEMA Type 1 or 3R, depending on the environment at the installed location. All fans or fractional HP motors will be wired via motor rated switches with thermal overload protection.

3.6 Building Conditions - Electrical

All branch circuit wiring will be with 600 volt rated copper conductors, type THHN or THWN, minimum #12 AWG in minimum 3/4-inch conduits. All interior wiring will run in EMT (Electrical Metallic Tubing) unless required otherwise by the code. All exterior exposed conduits will be GRS (Galvanized Rigid Steel) and all exterior underground conduits will be PVC Schedule 40, unless required otherwise by the code.

3.6.2.5 Fire Alarm System

Replace the fire alarm system with an intelligent zoned, voice evacuation, fully addressable system, which accommodates current life safety standards and meets the requirements of current local and national fire codes and the provision of the ADA. New Fire Alarm Control Panel (FACP) with 90- minute battery backup and a Fire Alarm Annunciator Panel (FAAP) will be provided along with all related devices and control and monitoring system. The FACP will be provided in the main electrical room, while the FAAP will be located near the main entrance. New fire alarm manual pull stations will be provided within 5-feet of the designated exit doors and in the exits pathways. New fire alarm audio/visual devices will be provided throughout the building, in compliance with the present code. New smoke detectors will be provided in all spaces, including all the utility and storage rooms. New Duct mounted smoke detectors will be provided in all HVAC units as required by code. All sprinkler system devices will be tied to the FACP and fire alarm system.

3.7 Building Conditions - Plumbing

The purpose of this section is to address the existing plumbing systems and propose equipment for future use of the renovated facilities. In compliance with the project and program requirements the proposed equipment and systems will be selected with key consideration given towards energy efficiency, reliability and the cost and ease of maintenance.

3.7.1 Domestic Cold Water System

The existing Domestic cold water system at the main building is a 2-inch water service with meter that enters the water service room #124 at the front of the building. There is not a backflow preventer device installed. The domestic cold water system serves all plumbing fixtures within the building including external hose bibs. All domestic cold water piping is copper tubing with wrought copper fittings. All domestic cold water piping is insulated but there is damaged insulation in some areas.

The existing domestic water system at the small adjacent building, Activity Room #160, is an independent 1-1/2 inch water service. It also does not a backflow preventer device installed.

Photo 3.7.1-1: Water Meter

Photo 3.7.1-2: Pressure Reducing Valve

3.7.2 Domestic Hot Water System

The existing domestic hot water system is two gas fired storage tank type systems with combustion air intake and exhaust. System #1 is a 100 gallon storage tank, 120,000 BTUH input and a recovery capacity of 136.72 Gallons per hour. System #2 is 100 gallons storage, 199,900 BTUH input and a recovery capacity of 230.18 Gallons per hour. The existing water

heaters are new and were recently installed. The existing water heaters satisfy the existing domestic hot water demand with very little residual capacity available. The existing water heater system is equipped with a hot water circulating pump for temperature maintenance. The existing circulating pump is also new and recently installed. All domestic hot water piping is copper tubing with wrought copper fittings. All domestic hot water piping is insulated.

The small building is equipped with a water heater in Room 171. This water heater is outdated.

Photo 3.7.2-1: Water Heaters Main Building

Photo 3.7.2-2: Water Heaters Small Building

3.7.3 Sanitary Drainage Piping

The sanitary drainage piping within the building is predominately hub and spigot cast iron. The 4-inch sanitary building drain exits the building below the basement slab and leaves to the front of the building. Most of the sanitary drainage system is not exposed for observation but what could be observed does not show significant signs of wear or damage. The existing sanitary building drain system should be inspected internally by video scoping to determine interior condition.

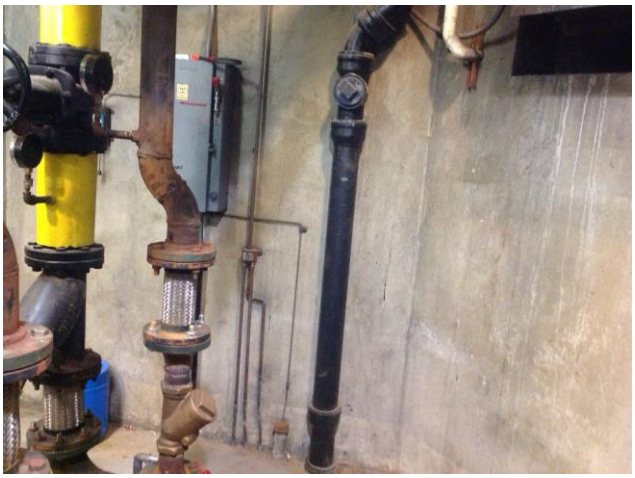


Photo 3.7.3-1: 4-inch Sanitary Building Drain

3.7 Building Conditions - Plumbing

3.7.4 Strom Drainage System

The storm drainage system consists of roof drains and rain leaders. The 4-inch rain leaders exit the building below the first floor slab. Most of the storm drainage system is not exposed for observation but what could be observed does not show significant signs of wear or damage. The interior storm system piping is insulated as required. Each existing storm rain leader and building drain should be inspected internally by video scoping to determine interior condition.

Photo 3.7.4-1: Storm Drainage Piping

3.7.5 Natural Gas System

The existing natural gas system serves boilers, water heaters, and HVAC equipment. The existing natural gas system consists of schedule 40 black steel piping with welded fittings for 3-inch pipe and above, and screwed fittings for 2-inch pipe and below. The existing natural gas piping does not show significant wear and damage. The majority of the gas piping is not painted yellow. The gas meter is located on the south side of the building.

Photo 3.7.5-1: Natural Gas Meter

3.7 Building Conditions - Plumbing

3.7.6 Plumbing Fixtures

3.7.6.1 Lavatories

The lavatories in the main building are vitreous china counter mounted lavatories with sensor operated faucets. The lavatories in the small adjacent building are vitreous china wall mounted lavatories with sensor operated faucets.

3.7.6.2 Water Closets

All water closets throughout are vitreous china wall mounted water closets with 1.6 gallons per flush sensor operated flush valves except toilet rooms 167 and 168 are floor mounted tank type water closets.

3.7.6.3 Urinals

Urinals are all vitreous china wall mounted with 1.0 gallons per flush sensor operated flush valves.

3.7.6.4 Janitor's Sinks

Janitor's Sinks are located in the boiler room on the lower level, first floor main building and in the adjacent building.

3.7.6.5 Classroom Sinks

There are two classroom sinks in the small adjacent building. They are stainless steel counter mounted with gooseneck faucets.

The plumbing fixtures do not show significant signs of wear or damage.

Photo 3.7.6-1: Typical Water Closet

Photo 3.7.6-2: Typical Counter Lavatories

3.7 Building Conditions - Plumbing

Photo 3.7.6-3: Typical Urinals

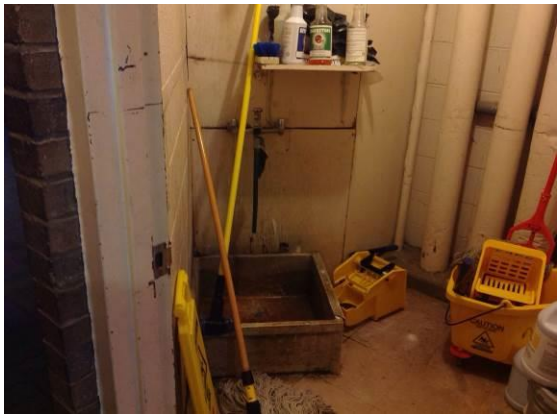


Photo 3.7.6-4: Typical Janitor's Sink

Photo 3.7.6-5: Bathrooms 166 & 167

Photo 3.7.6-6: Classroom Sink

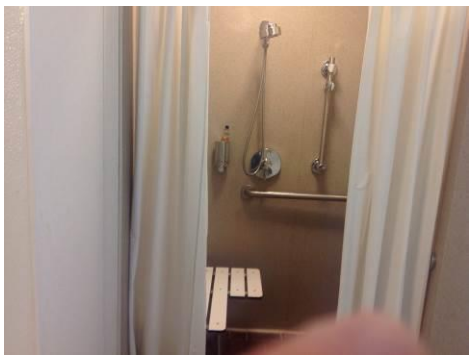


Photo 3.7.6-7: Typical Shower

Photo 3.7.6-8: Drink Fountain

3.7.7 General Recommendations

The recommendations for the new renovation are as follows:

- Replace all damaged piping insulation.
- Replace the water heater in the small adjacent building.

3.7 Building Conditions - Plumbing

- Video scope the building drains to assess the interior condition of the sanitary and storm drainage systems. Include the storm rain leaders.
- Provide required backflow prevention devices on the incoming water supply.
- Provide an automatic wet pipe sprinkler system.
- Replace the first floor janitor's closet.
- Replace water closet 1.6 GPF flush valves with 1.28 GPF flush valves.
- Provide 0.5 GPM flow restrictors on lavatories.
- Provide 1.5 GPM shower heads.
- Replace urinal 1.0 GPF flush valves with 0.5 GPF flush valves.

3.8 Building Conditions – Safety and Security

Besides the main gates at the entries to the buildings the TR Center relies on traditional locks on exterior doors. Electronic security such as cameras and intrusion detection is not present. The center desires a security system with cameras.

3.9 Building Conditions - Pool

3.9.1 Pool and Spa Data

Swimming Pool:

- Surface Area = 1,256 SF
- Perimeter = 154'
- Dimensions = 47' long x 23' long with irregular geometry
- Depth Range = 2'-4" to 8'-0"
- Volume = 39,940 gallons (field measured)
- Estimated Flow Rate = 110 GPM (from impact flow meter)
- Code Required Flow Rate = 97 GPM
- Estimated Turnover Rate = 5.3 HRS
- Code Required Turnover Rate = 6 HRS
- Concrete Shell with Gutter (now with a pool liner and converted to a skimmer pool)
- Bromine (Sanitizer)
- Carbon Dioxide (pH Buffer)

Spa:

- Surface Area = 36 SF (from signage)
- Perimeter = 24' (from signage)
- Dimensions = 9' – 6" long x 6' – 6" long; oval shape
- Depth Range = 2'-10"
- Volume = 600 gallons (from signage)
- Estimated Flow Rate = 63 GPM (max. flow for filter; no working flow meter)
- Code Required Flow Rate = 20 GPM
- Estimated Turnover Rate = .16 HRS
- Code Required Turnover Rate = .5 HRS
- Fiberglass Residential quality spa shell
- Bromine (Sanitizer)
- Carbon Dioxide (pH Buffer)

3.9.2 Existing Pool History

The Center for Therapeutic Recreation was constructed in the early 1970's and has been serving the needs of the community and specialized community for many years. The aquatic components within the Center for Therapeutic Recreation include a multi-purpose therapy and exercise pool and a hydrotherapy spa.

The swimming pool was originally constructed as a concrete pool with a gutter. After years of use, the pool was converted with aluminum panels placed over the concrete with a liner including the gutter which was covered over and two skimmers were added as overflow devices in lieu of the gutter. The pool does not appear to have ever had an appropriately sized surge tank to operate with the gutter pool. Likewise, the two skimmers are not adequate to serve the overflow of the pool in the current configuration.

3.9.3 Pool, Spa and Deck Observations

3.9 Building Conditions - Pool

The pool is irregularly shaped and incorporates the following features – a sloped entry with one handrail, floor mounted parallel therapy bars, a wing wall with a barrier separating the shallow area from the deep area, and a gated entry to the 1:3 slope to the deeper area of the pool.

The deep area of the pool and a portion of the shallow area of the pool have fixed stainless steel barriers at the perimeter of the pool deck. This in not code compliant as a 4' wide deck or unobstructed access to the pool shall be around 90 percent of the pool perimeter. It was reported by staff that the barriers were installed after a wheelchair patron accidentally rolled into the deep area of the pool.

The one main drain has been updated to VGB drain covers. Two 18" x 18" PVC main drain covers were installed on the 18" x 36" main drain.

The vinyl liner system has historically had a life of approximately 7 years. The current liner has been in place 7 years and has delaminated in places, been repaired in places, and all of the markings are severely faded. The existing pool vinyl liner system has reached the end of its life.

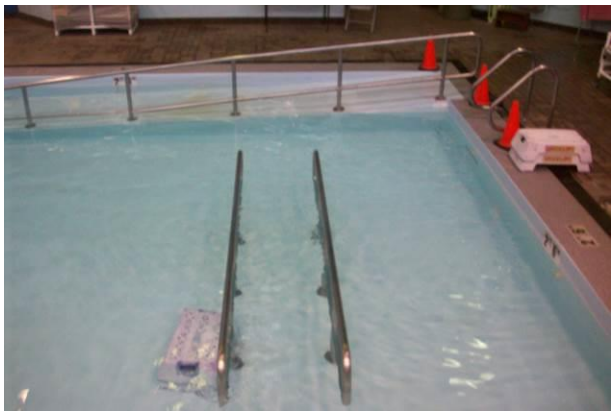
The pool depth markings do not always accurately measure the water depth of the pool. There are no underwater markings for change of slope or to mark underwater edges.

The pool area has adequate deck space although a significant portion of the deck space is utilized as storage area for a wide variety of deck equipment and activity equipment.

The spa only has deck space at the spa entry. The rest of the perimeter of the spa is restricted thus not conforming to the industry standard which is that a minimum of 50% of the spa perimeter opens up to accessible deck.

Depth markings for the spa are located vertically on the interior surface of the spa, but are not located on the adjacent deck as required by code.

The spa has a rotational timer switch for hydrotherapy jet activation. It doesn't have an emergency stop switch to deactivate the hydrotherapy pump and the recirculation pump as is required by code. An audible alarm and light are required at the spa to notify those in the area that the spa recirculation pump has been turned off.



Sloped Entry and Parallel Bars

Restricted Deck Access at Deep Area of Pool

3.9 Building Conditions - Pool

3.9.4 Pool and Spa ADA Accessibility

The pool has been modified from an original concrete construction with an aluminum pool placed internal to the concrete pool shell with a liner over the aluminum. The aluminum and liner add additional thickness to the pool perimeter thus visually eliminating the deck slot drain which is adjacent to the back of the pool shell. Additionally, the additional thickness makes the entire pool perimeter non-ADA accessible as there is a vertical break around the perimeter of the pool.

There are four points of egress from the pool including one slope entry and three recessed steps. The sloped entry is not ADA accessible as there is a handrail on one side of the sloped entry. The recessed steps are not code compliant as the dimension from the top step to the deck exceeds code due the retrofit of the gutter pool to an aluminum lined pool.

The spa is separate from and elevated above the pool deck with a ramp leading to the spa area. The ramp is non-ADA compliant as the slope exceeds the slope allowed, there is a handrail only on one side, and that handrail is not continuous.

The spa is a fiberglass spa which is not a typical materials selection for a community recreation facility and the spa itself does not provide for ADA accessibility into the spa.

Pool Liner – Non Compliant ADA Pool Edge

Underwater Gate Access to Deep Area of Pool

Non-Compliant Recessed Steps

Skimmer Overflow – One of Two

3.9 Building Conditions - Pool

Ramp to Spa – Not ADA Accessible

Fiberglass Spa Structure

No Deck Space, No Deck Markings

Spa Timer, No Emergency Stop

3.9.5 Mechanical Room Observations

The pool mechanical room is located in a below grade basement space. The equipment for the pool and spa has been updated as required for operations and overall is in good condition.

There swimming pool recirculation pump is a 5 hp Pentair Challenger pump with integral strainer. The pump is in good condition. The suction side piping to the pump does not meet code as there is a 3" pipe from the main drains and a 1-1/2" pipe from the skimmers. The pool only has two skimmers which is less than the number of skimmers required by code, and the piping from the skimmers is undersized to meet the requirements of the code which requires the piping from skimmers be sized to process 100% of the turnover rate through the skimmers.

The swimming pool recirculation pump has a Vac Alert device installed on the suction side of the pump. This along with the VGB approved covers on the single main drain provides the two levels of entrapment protection for compliance with VGB requirements.

A high rate sand filtration system, two Pentair Triton TR140C filters, is utilized for the pool. The filters are in good condition as they had the sand replaced in 2013 and any laterals that were broken were replaced at that time as well. The filters utilize multi-port valves and the backwash goes to sanitary sewer through an air gap. The backwash line does not have a flow meter which is industry standard and would monitor the flow rate of the backwash process.

3.9 Building Conditions - Pool

The piping within the pool equipment room is SCH 40 PVC piping of which some is color coded and some is labeled. The valves on the piping are number and tagged for the majority of the valves on the piping systems.

The spa has a 3 hp Pentair Challenger recirculation pump and a 2 hp Pentair Whisperflow pump for the hydrotherapy jets. Both pumps are in good condition.

A high rate sand filtration system, a Pentair Triton TR60 filter, is utilized for the pool. The filter is in good condition as it had the sand replaced in 2013 and any laterals that were broken were replaced at that time as well. The filter utilizes a multi-port valve and the backwash goes to sanitary sewer through an air gap. The backwash line does not have a flow meter which is industry standard and would monitor the flow rate of the backwash process.

Both the pool and spa are heated by Coates electric pool heaters of which both are in good condition. Electric heaters are an expensive way to heat the pool and spa water. Both electric heaters are in good condition and have been added in an update to the heating systems. Overhead piping remains in place that indicates pool and spa heating was originally provided through water to water heating systems.

Pool chemicals used are bromine and carbon dioxide. The bromine feeders are erosion feeders each appropriately sized for the pool and the spa. The carbon dioxide tanks are free standing tanks located in the middle of the room. Industry standard requires the carbon dioxide tanks to be secured, typically by a chain.

The two water chemistry controllers are new within the last year and are in excellent condition. There was a discrepancy in the measured water temperatures and the water temperatures displayed by the water chemistry controllers. It is recommended that all water parameters on the controllers be calibrated.

The chemicals are stored in the pool equipment room on a pallet. There have been modifications in adding an exhaust system in the pool equipment room to capture chemical vapors and exhaust them from the pool mechanical room.

The pool fill for both the pool and spa is a manual process of filling the pool through a dedicated over the deck pool fill and filling the spa from a hose connection to a hose bib from the pool deck.

The spa has an impact flow meter that is missing the float indicator and is located in a piping configuration not approved by the flow meter manufacturer. The swimming pool has a correctly located flow meter which is readable.

The swimming pool has an error in the piping from the erosion bromine feeder back to the pool recirculation piping. Instead of connection to the return line feeding back to the pool, this pipe is connected to the piping on the suction side of the recirculation pump. There are two significant concerns with this. First, the elevated bromine levels are being recirculated through the pump and pool heater which can shorten the life of the pool equipment. Second, this provides higher bromine or ORP reading to the water chemistry controller than what is actually being provided in the pool. The relocation of this bromine piping from the suction side of the recirculation pump to the recirculation return piping to the pool should be completed as soon as possible.

3.9 Building Conditions - Pool

Swimming Pool Filters

Spa Recirculation Pump and Filter

Water Chemistry Controller – New Equipment

Spa Fill – Cross Connection with Pool

Electrical Power Panels

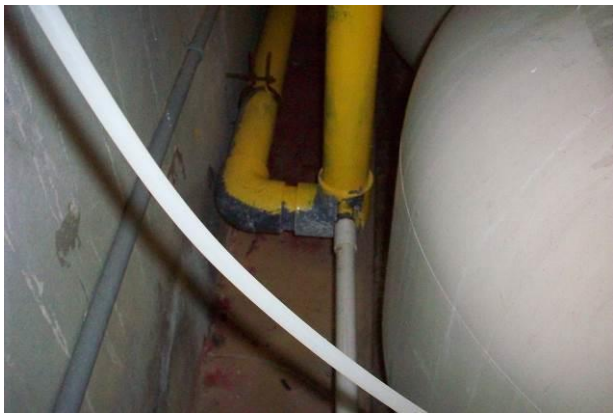
Electric Heaters for Both Pool and Spa

3.9 Building Conditions - Pool

Carbon Dioxide – Unsecured

Spa Erosion Bromine Feeder

Chemical Storage on Pallet



Bromine Feed to Suction Side of Recirc Pump

3.9.6 Conclusion

The pool and spa at the Center for Therapeutic Recreation are over 30 years old and are significantly compromised by their original design and renovation work that has occurred over the years. The pool does not meet current code in a variety of ways including the overflow system, piping system, egress requirements, ADA requirements and the liner is failing and needs replaced. The spa does not meet code in deck requirements and emergency stop requirements for both pumps. Both the pool and spa do not comply with ADA accessibility requirements to access the perimeter of the pool and spa or to enter the pool and spa. The pool mechanical room is in good condition for current operations as there has been continued investment in updated pool systems. The extent of renovation and the amount of demolition and reconstruction required to make this facility code compliant is so significant that we would recommend replacing both the pool and spa as new with updates to meet current and future programming needs.

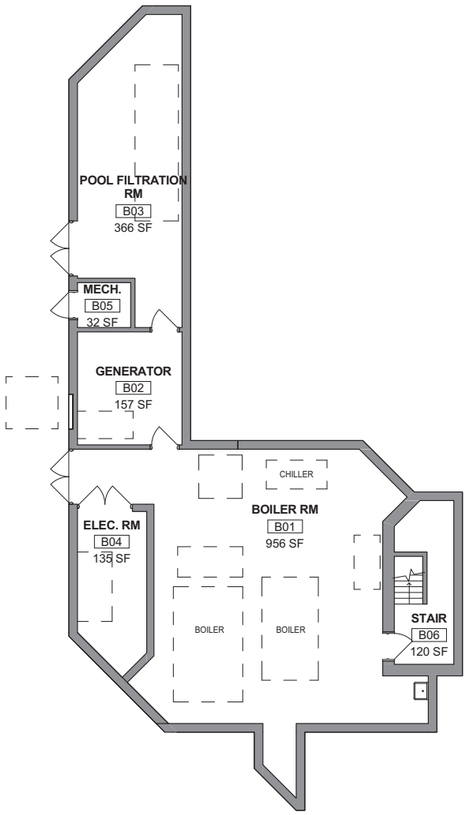
3.10 Hazardous Materials

A hazardous materials survey was conducted October 2014 by ECS Capitol Services and issued under separate cover to DC DGS. The surveyed areas included offices, locker rooms, storage rooms, bathrooms, showers, kitchen, pool room, closets, hallways, stairwells, and mechanical rooms. Exterior areas included the facades of both buildings.

3.11 Phase I Environmental Site Assessment

A Phase I Environmental Site Assessment was conducted October 2014 by ECS Capitol Services. Based on the report, further investigation may be required.

Appendix A: Existing Floor Plans



Room Schedule		
Number	Name	Area
B01	BOILER RM	956 SF
B02	GENERATOR	157 SF
B03	POOL FILTRATION RM	366 SF
B04	ELEC. RM	135 SF
B05	MECH.	32 SF
B06	STAIR	120 SF
102	STOR.	149 SF
103	MECH.	136 SF
105	POOL	3470 SF
106	MEN'S SHOWER	231 SF
107	MEN'S LOCKER	227 SF
109	JAN	34 SF
110	LIFEGUARD RM.	121 SF
111	OFFICE	154 SF
112	GREEN RM.	191 SF
113	WOMEN'S SHOWER	258 SF
114	WOMEN'S LOCKER	302 SF
115	STAIR	117 SF
116	TOILET	59 SF
117	STOR.	91 SF
118	VESTIBULE	47 SF
119	CORRIDOR	197 SF
120	HALL WAY	172 SF
121	GYM.	3929 SF
122	STAGE	357 SF
123	TOOL STOR.	46 SF
124	STOR./MECH.	63 SF
126	CLOSET	13 SF
127	OFFICE	151 SF
129	ELEC./STOR.	50 SF
130	ASSEMBLY STOR.	76 SF
131	STOR.	49 SF
134	LOBBY	3405 SF
135	COMPUTER LAB/STOR.	567 SF
136	STOR.	46 SF
137	ART&STOR.	54 SF
138	ARTS CRAFT / VIDEO RM	417 SF
139	STOR.	70 SF
140	BREAK RM / MEETING RM	398 SF
141	KITCHENETTE	94 SF
142	CLOSET	36 SF
143	WEIGHT RM	677 SF
144	CLOSET	21 SF
145	MECH.	45 SF
146	HVAC	56 SF
147	WOMEN	124 SF
148	MEN	119 SF
149	LIBRARY	185 SF
150	PRINT/COPY	138 SF
151	RECEPTION	204 SF
152	OFFICE	239 SF
153	CLOSET	8 SF
154	OFFICE	176 SF
155	TOILET	53 SF
156	JAN	88 SF
157	CORRIDOR	239 SF
158	VESTIBULE	46 SF
159	HVAC	32 SF
160	ACTIVITY RM.	1350 SF
161	CLOSET	7 SF
163	STOR.	38 SF
166	TOILET	47 SF
167	TOILET	48 SF
170	LOBBY	165 SF
171	MECH.	53 SF
172	TOILET	32 SF
173	ELEC.	50 SF
Grand total		21781 SF

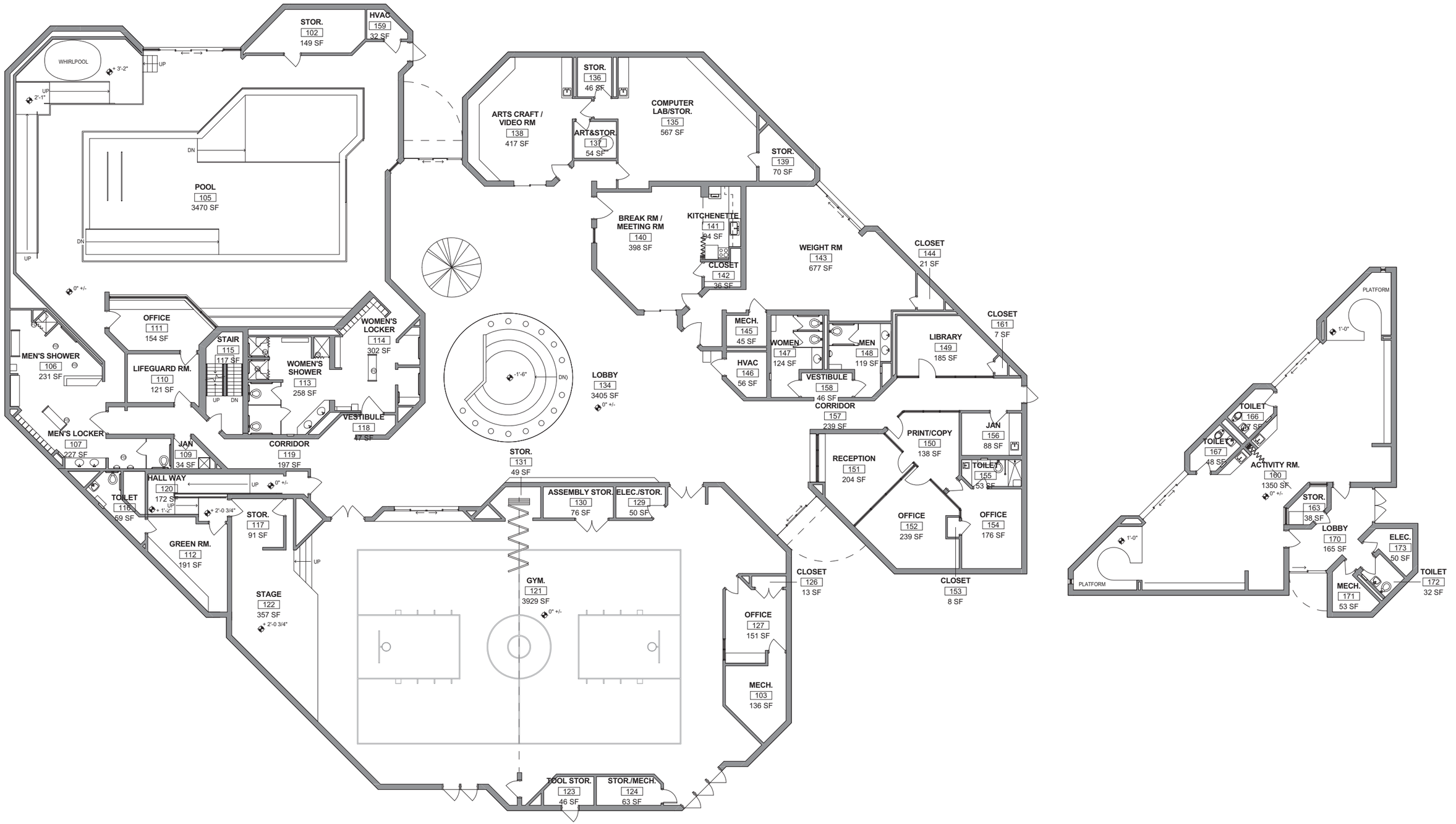
1/8" = 1'-0"
0 8' 12' 16' 20'

11/5/2014

MOODY•NOLAN
RESPONSIVE ARCHITECTURE

LOWER LEVEL
CENTER FOR THERAPEUTIC RECREATION

DGS THE DEPARTMENT OF GENERAL SERVICES
DPR DC DEPARTMENT OF PARKS AND RECREATION



11/5/2014

1/8" = 1'-0"

0 8' 12' 16' 20'

MOODY•NOLAN
RESPONSIVE ARCHITECTURE

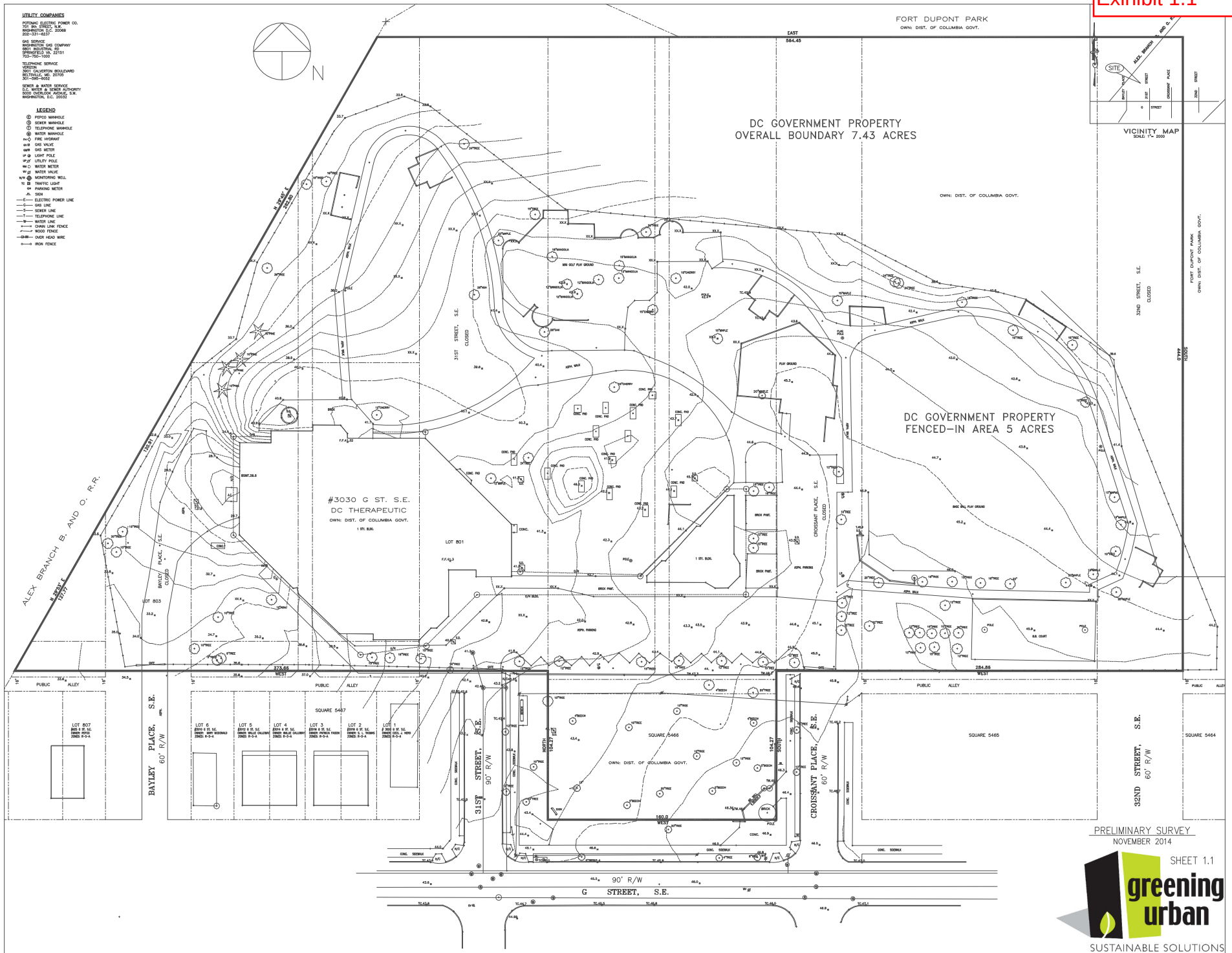
FIRST FLOOR PLAN
CENTER FOR THERAPEUTIC RECREATION

DGS THE DEPARTMENT OF GENERAL SERVICES
DPR DC DEPARTMENT OF PARKS AND RECREATION

Appendix B: Civil Site Exhibits

Exhibit 1.1 Site Survey
Exhibit 1.2 Site Aerial View
Exhibit 1.3 Site Utility Plan
Exhibit 1.4 Potential Stormwater Impact for Development

Exihibit 1.1



No.	DESCRIPTION	NAME	DATE
	REVISIONS		

FLOOD ZONE "A-4" (MINIMAL)
FEMA PANEL 110001 0023B

DRAWN R.P.
DESIGNED
CHECKED
SCALE 1"= 20'

AAH CONSULTANTS LLC
ENGINEERS SURVEYORS CONSULTANTS
4200 FORBES BLVD, SUITE 203
LANHAM, MARYLAND 20706
(301) 429-1750(PH) 429-1757 (FAX)

DC THERAPEUTIC
3030 G STREET, S.E.

20 0 20 40 60
Scale 1" = 20'

TOPOGRAPHIC SURVEY
PT. OF SQUARE 5467,5466,5465 & 5464
WASHINGTON, DC.

DATE 11-07-14
SHEET 1 OF 1
JOB No. 14-203

Exihibit 1.2

AERIAL VIEW
NOVEMBER 2014

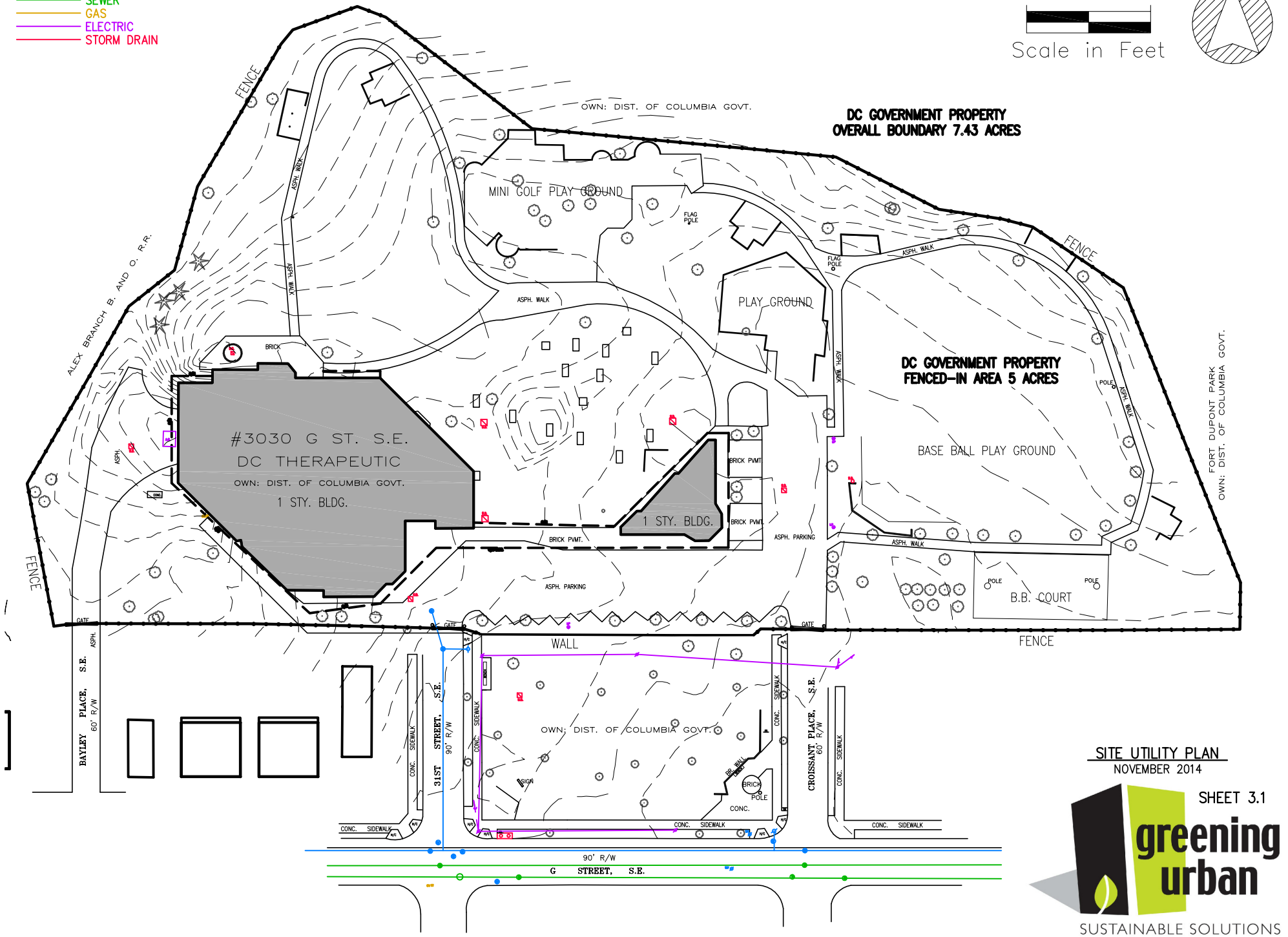
SHEET 2.1

greening urban
SUSTAINABLE SOLUTIONS

Exihibit 1.3

WATER
SEWER
GAS
ELECTRIC
STORM DRAIN

0 80
Scale in Feet



SITE UTILITY PLAN
NOVEMBER 2014

SHEET 3.1

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SUSTAINABLE SOLUTIONS

Exihibit 1.4

LIST OF POTENTIAL SWM METHODS

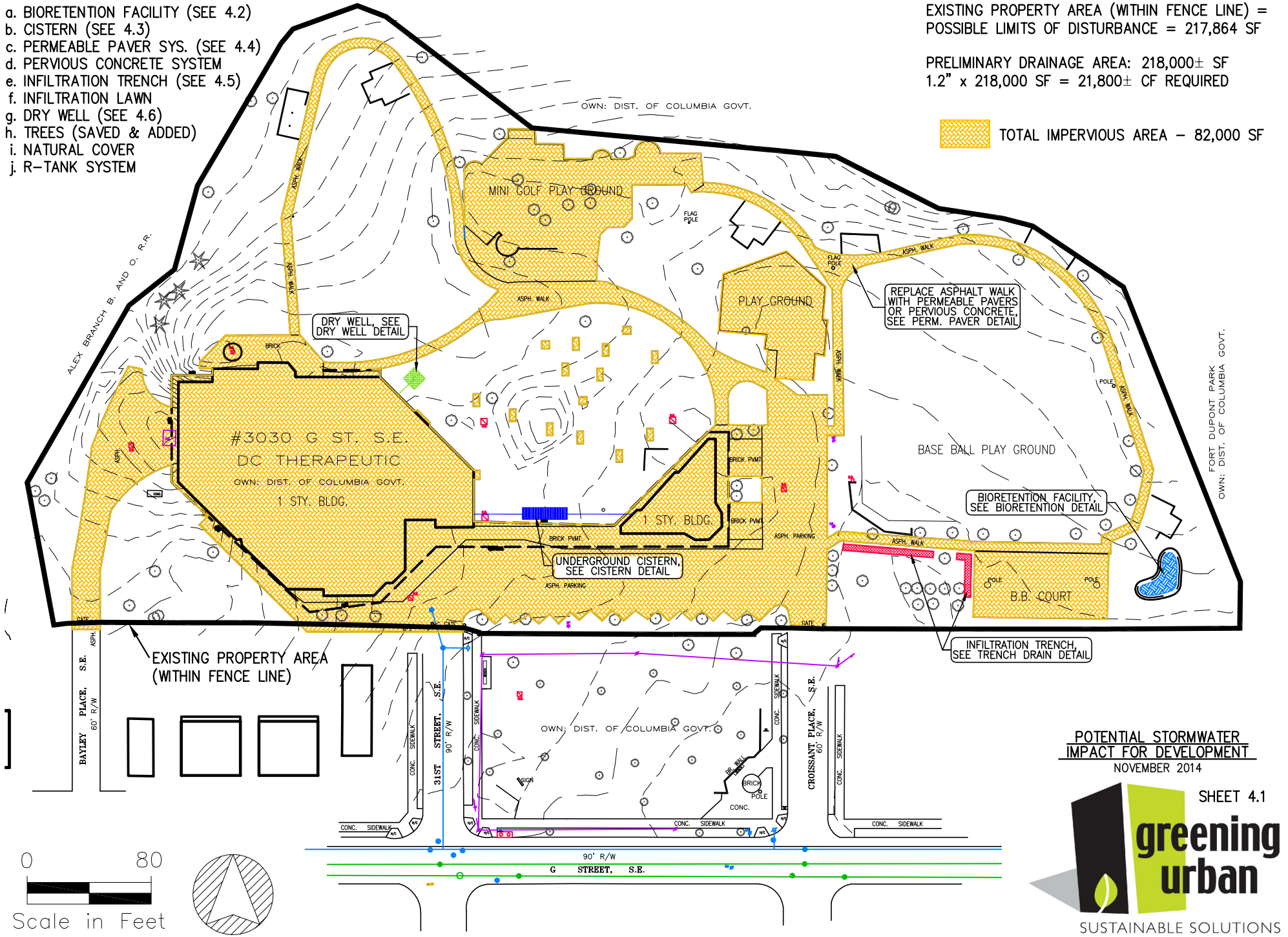
a. BIORETENTION FACILITY (SEE 4.2)
b. CISTERN (SEE 4.3)
c. PERMEABLE PAVER SYS. (SEE 4.4)
d. PERVIOUS CONCRETE SYSTEM
e. INFILTRATION TRENCH (SEE 4.5)
f. INFILTRATION LAWN
g. DRY WELL (SEE 4.6)
h. TREES (SAVED & ADDED)
i. NATURAL COVER
j. R-TANK SYSTEM

PRELIMINARY STORMWATER MANAGEMENT CALCULATIONS

EXISTING PROPERTY AREA (WITHIN FENCE LINE) =
POSSIBLE LIMITS OF DISTURBANCE = 217,864 SF

PRELIMINARY DRAINAGE AREA: 218,000± SF
1.2" x 218,000 SF = 21,800± CF REQUIRED

TOTAL IMPERVIOUS AREA – 82,000 SF



POTENTIAL STORMWATER IMPACT FOR DEVELOPMENT

NOVEMBER 2014

SHEET 4.1

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SUSTAINABLE SOLUTIONS