



HENDERSON COUNTY DETENTION CENTER
HENDERSONVILLE, NC

FACILITY CONDITION ASSESSMENT REPORT

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HENDERSON COUNTY DETENTION CENTER FACILITY CONDITION ASSESSMENT REPORT

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CONDITION ANALYSIS

Building Description:

The existing Henderson County Detention Center is composed of a two level (first floor and mezzanine) housing area containing five housing pods and a single-story support area containing administration, magistrate, staff, intake, food preparation, medical and laundry. Also contained in the support area is a work release housing unit currently used for transportation offices, VIP program (sheriff office volunteers) and storage. The building was designed in 1999 and occupied in 2001.

Methodology:

On October 12 and 13, 2020 a team of consultants met with representatives of the Henderson County Sheriff's Office and toured the jail. Participants were:

Staff:

Cpt. Todd McCrain, Jail Administrator
Sgt. Brian Helton, Henderson County Sheriff's Office
Sgt. Brandon Godman, Henderson County Sheriff's Office
Chris Hill, Henderson County Maintenance
Mike Webb, Henderson County Maintenance
Jared McGlasson, Henderson County Maintenance (assigned to HCDC)
Mark Blevins, Henderson County Maintenance (assigned to HCDC)
Andra Carpenter, Director, Food Service Vendor

Consultants:

Steve Allan, Criminal Justice Planner and Consultant Team Manager
Larry Latimer, Security Consultant
Floyd Keels, Electrical Consultant
Chuck Hanning, Mechanical Consultant
Buddy Golson, Structural and Architectural Consultant

The consultants reviewed portions of the jail pertinent to their respective areas of expertise, interviewed detention center staff and recorded observations. The results of these efforts form the basis for this condition analysis report. The report provides a description of the area observed, the condition of building elements as of the date of the report, the life expectancy for the elements observed and any recommended renovations.

Contents

The condition assessments on the following pages are grouped in the following categories:

- Structural
- Architectural
- Mechanical
- Plumbing
- Fire Protection
- Electrical
- Physical and Electronic Security

STRUCTURAL CONDITION ASSESSMENT

A. Overview

1. The structural elements of the building include the foundations, load bearing features (walls, columns, etc.) and the roof structure (bar joists, beams, girders, etc.).

B. Support Area

1. Description

- a. The support area is a one-story structure adjacent to and contiguous with the housing area.
- b. The foundation components consist of shallow spread and strip footings throughout this portion of the facility.
- c. The floor construction consists of a 5" thick reinforced concrete slab on grade.
- d. The roof construction consists of fireproofed steel bar joists supported by steel girders/columns and reinforced masonry.
- e. The roof top mechanical equipment is supported by dedicated joists.

2. Condition

- a. Floor construction: Cracks in the concrete floor slab were observed at multiple locations. Staff reports that the cracks have been observed for over ten years. The cracks likely were caused by post construction curing and thermal differential and probably developed during or just after completion of construction. No differential settlement or moisture penetration from under slab level was observed at the cracks. (see Figure 1).



Figure 1 – Example of cracking observed in concrete floor slab.

- b. Load bearing walls: No cracks or other signs of failure were observed in the masonry bearing walls indicating adequate foundation support and the absence of bearing settlement.
- c. Roof construction: No deflection or other signs of failure was observed in steel bar joists or steel girders.
- d. Overall, no signs of major structural distress were observed.
- e. Rust accumulation was observed at exterior structural lentils. (See Figure 2).



Figure 2 – Example of rust at lintel

3. Life Expectancy
 - a. The structural components of a CMU/steel bar joist building have a life expectancy of 75+ years.
4. Recommendations for Renovation
 - a. No major structural renovations are anticipated to the support area structure of the building.
 - b. Rust accumulation at exterior structural elements should be identified, removed and painted.
 - c. Monitor cracks in the concrete floor slab for future movement and/or moisture penetration from below slab level.

C. Housing Area

1. Description
 - a. The housing area is a two-story structure adjacent to and contiguous with the support area.
 - b. The foundation components consist of shallow spread and strip footings throughout this portion of the facility.
 - c. The floor construction at the first level consists of a 5" thick reinforced concrete slab on grade.
 - d. The floor construction at the mezzanine level consists of a reinforced poured in place concrete slab and a precast concrete floor at inmate cells (provided by the prefabricated cell manufacturer and constructed off site).
 - e. The roof construction consisted of fireproofed steel bar joists supported by steel girders and load bearing CMU walls.
2. Condition
 - a. Overall, no signs of structural distress were observed within the housing pod area.

- b. Load bearing walls: No cracks or other significant failure was observed in the masonry bearing walls indicating adequate foundation support and the absence of bearing settlement.
 - c. Roof construction: No deflection or other significant failure was observed in steel bar joist or steel girders.
3. Life Expectancy
- a. The structural components of a CMU/steel bar joist building have a life expectancy of 75+ years.
4. Recommendations for Renovation
- a. Rust accumulation at exterior structural elements should be identified, removed and painted.
 - b. Monitor cracks in the concrete floor slab for future movement and/or moisture penetration from below slab level.

END OF STRUCTURAL CONDITION ASSESSMENT

ARCHITECTURE CONDITION ASSESSMENT

A. Overview

1. The architectural elements of the building include the building envelope (floor, walls and roof), the interior finishes (floor finishes, ceilings, etc.) and building equipment (food services, laundry, etc.).

B. Support Area

1. Description

- a. The support area is a one-story structure adjacent to and contiguous with the housing area.
- b. The floor construction consists of a 5" thick reinforced concrete slab on grade with vapor barrier and a 4" gravel bed.
- c. The roof system consists of fireproofed steel bar joists supported by steel girders/columns and reinforced masonry, metal deck, rigid insulation and an un-ballasted roof membrane.
- d. The exterior walls consist of 4" CMU (concrete block) veneer, 1 ¼" airspace, 1 ½" extruded polystyrene insulation, 8" reinforced CMU (concrete block) and 2" rigid perimeter insulation at foundation wall and exterior side of footings.
- e. Exterior windows are aluminum frames with fixed insulating glazing at non secure areas.
- f. Interior windows are security hollow metal frames with security glazing at secure areas.
- g. Interior ceiling finish is a metal suspension system with acoustical lay in tiles.
- h. Interior ceiling finish at the kitchen is a metal suspension system with cleanable acoustical lay in tiles.
- i. Interior ceiling finish at intake holding cells is painted concrete.
- j. Interior floor finish is resilient tile and carpet. Interior floor finish in low traffic areas such as mechanical rooms, etc. is unfinished concrete.
- k. Building Equipment (Kitchen/Laundry): Kitchen and laundry equipment is permanently installed commercial grade equipment. Most of the equipment is twenty plus years old.

2. Condition

- a. Floors (General): See Structural Condition Assessment for discussion of floor cracks. Floor finishes are in good condition but near their useful life. They are well maintained and clean.
- b. Floors (Kitchen): The floor finish in the kitchen is quarry tile. Staff reports that the floor finish has not been replaced. It is in excellent condition, well maintained and clean. No broken or damaged tile was observed. (see Figure 1).



Figure 1– Kitchen floor

- c. Floors (Magistrate): The floor finish is carpet tile and is badly worn in some areas. It is beyond useful life.
- d. Roof (General): Most of the original roofing membrane and insulation material has been replaced. Staff reports that the new roofing system is approximately two years old. It was observed to be in good condition. No apparent leaks, damage or wear was observed. (see Figure 2). Several sections of the condensate drainage piping at Mechanical Units are disconnected causing standing water on portions of the roof. This condition could result in future membrane damage. (see Figure 3).



Figure 2 – Roof at roof drain



Figure 3 – Roof at support area-Equipment drainage

- e. Exterior walls interior face (General): The interior face of exterior walls is in good condition. No evidence of water intrusion, mildew, paint failure or mold was observed.
- f. Exterior walls exterior face (General): There is evidence of caulk failure at masonry control joints on the exterior wall face at multiple locations. A specific example is the south exterior wall of the women's staff locker room. Failure to correct this condition may potentially lead to water intrusion and the deterioration of wall insulation. (see Figure 4). There is evidence of substantial quantities of mold and mildew on the exterior face of exterior walls. This condition is evident at all exterior walls but is most prevalent at north facing walls. (see Figure 5).



Figure 4– Caulking failure at masonry control joint



Figure 5– Mold and mildew on exterior walls (louver at vehicular sallyport)

- g. Interior Ceilings (General): Ceilings are in good condition in most locations. However, the ceiling tiles are near the end of useful life and should be replaced soon. Cracks and deflection were observed in some ceiling tiles. There is evidence of water intrusion at ceiling tiles in multiple locations. Staff opined that the ceiling water stains were apparent before the replacement of the roof membrane and are

likely not current. A specific example of water intrusion is at ceiling tiles adjacent to the skylight in the work release area. (see Figure 6).



Figure 6– Water damage at ceiling tile; work release.

- h. Doors (General): Substantial rust was observed on many of the exterior doors and frames. (see Figure 7).



Figure 7– Rust at exterior doors and frames.

- i. Doors (Magistrate): Staff reports that the exterior door leaks causing water intrusion into the building. The problem appears to be insufficient sloping of the concrete walk at the exterior side of the door and insufficient water deflection at the top of the door. An additional contributing factor is likely damaged weather stripping observed at the threshold and on the bottom of the door. (see Figure 8).



Figure 8– Door at Magistrate area.

- j. Building Equipment (Kitchen/Laundry): Staff reports that several pieces of kitchen equipment have been replaced recently and that one of the coolers has a history of multiple failures. According to staff, the kitchen equipment is serviceable for the 540 meals currently prepared daily but with any substantial increase in meals a dishwasher would be required. (see Figure 9). Staff reports that a new steam table is needed. Staff reports that the laundry equipment is operating satisfactorily.



Figure 9 – Kitchen equipment

3. Life Expectancy
 - a. See Structural Condition Assessment for life expectancy of building structure including the roof, foundations and masonry load bearing walls.
 - b. Non load bearing partitions should have a similar life expectancy as that of load bearing walls.
 - c. The expected life of the current roofing system is normally 30 years; another 25-28 years of service should be expected with normal maintenance.
 - d. Interior finishes (resilient tile, acoustical ceilings, etc.) typically have a 20-year life. Most of the finishes, although in comparatively good condition and well maintained, are at the end of their expected useful life.
 - e. Kitchen and Laundry equipment: The expected life of kitchen and laundry equipment is 20-30 years.
4. Recommendations for Renovation
 - a. Interior floor cracks should be monitored for any further movement and indications of moisture penetrating from below slab level. Failing that, the floors should be maintained as normal.
 - b. Monitor wear at interior finishes. Replace as needed.
 - c. Replace or repair condensate piping where disconnected at roof top mechanical equipment and monitor standing water on roof.

- d. Repair and re-caulk failed masonry control joints at exterior walls. Monitor masonry control joints at other locations for signs of future failure.
- e. Consider replacing problematic cooler at kitchen.
- f. Monitor kitchen and laundry equipment and replace as needed.
- g. Replace steam table at kitchen.
- h. Power wash and clean exterior walls. Consider waterproofing to control future mold accumulation.
- i. Install weather stripping at the bottom of the exterior door at Magistrates area. Consider installing an awning protection at this door.
- j. Remove rust on exterior doors and paint.
- k. Monitor ceiling tile for reoccurring water damage.

C. Housing Area

1. Description

- a. The housing area is a two-story structure adjacent to and contiguous with the support area.
- b. The floor construction at the first level consists of a 5" thick reinforced concrete slab on grade with vapor barrier and a 4" gravel bed. Interior floor finish is painted and unfinished concrete.
- c. The floor construction at the first and mezzanine levels in the male and high security woman inmate cells consists of precast concrete provided by the cell manufacturer as part of the premanufactured concrete cells.
- d. The floor construction at the mezzanine level of the lower security portion of the women's housing unit and the shower/toilet/storage portion of the men's housing units is a 5" reinforced concrete elevated slab.
- e. The roof system consists of fireproofed steel bar joists supported by steel girders/columns and reinforced masonry, metal deck, rigid insulation and an unballasted roof membrane.
- f. The exterior walls consist of 4" CMU (concrete block) veneer, 1 ¼" airspace, 1 ½" extruded polystyrene insulation, 8" reinforced CMU (concrete block) and 2" rigid perimeter insulation at foundation wall and exterior side of footings. Interior surface is painted.
- g. Exterior walls at cells consist of a sandwich panel of rigid insulation between two precast concrete panels. The interior surface is painted.
- h. Interior masonry walls are painted.
- i. Interior finish of the walls and floors in inmate showers is a liquid applied high performance membrane coating.
- j. Interior windows are security hollow metal frames with security glazing at secure areas.
- k. Exterior windows at inmate cells are security hollow meal frames with translucent security glass.
- l. Interior ceiling finish is a metal suspension system with acoustical lay-in tiles (areas with no inmate access) and painted drywall and painted concrete and high impact drywall (areas with inmate access).

2. Condition

- a. Floors (General): See Structural Condition Assessment for discussion of floor cracks. Floor finishes in are in good condition. They are well maintained and clean.

- b. Floor finish (Minimum security): The ceramic tile floor is broken in some locations. (see Figure 10).



Figure 10 – Broken ceramic floor tile.

- c. Roof (General): See Architectural Assessment Support Area for discussion of roof condition.
- d. Exterior Walls (General and including walls at cells): See Architectural Assessment for discussion of mold on exterior walls and failure of masonry control joints.
- e. Exterior Walls (minimum security housing recreation yard: The interior face of the exterior wall exhibits evidence of substantial mold and efflorescence concentration. The mold is caused by excess moisture and insufficient air movement. The efflorescence is likely caused by rain water penetration at the top of the wall. (see Figure 11).



Figure 11 – Mold and efflorescence at minimum housing recreation yard

- f. Interior walls: Interior masonry wall finishes are in good condition. Interior concrete wall finish in inmate cells is severely marked and damaged.
- g. Interior walls and floors (showers at inmate housing units): The coating on the walls and floors of the inmate housing units is in good condition. Staff reports that the coating was installed in the last two years. (see Figure 12).



Figure 12 – Coating at inmate showers.

- h. Interior windows (inmate cells): Staff reports that interior window frames at inmate cells are exhibiting substantial condensation during cold weather. This is likely due to insufficient thermal gap between the exterior and interior metal window frame. Warm humid air in the cell and the lack of air movement on the metal surface is likely

- responsible for the condensation. There is no practical or economical solution to this condition.
3. Life Expectancy
 - f. See Structural Condition Assessment for life expectancy of building structure including the roof, foundations and masonry load bearing walls.
 - g. Non load bearing partitions should have a similar life expectancy as that of load bearing walls.
 - h. The expected life of the current roofing system is normally 30 years; another 25-28 years of service should be expected with normal maintenance.
 - i. Interior finishes (resilient tile, acoustical ceilings, etc.) typically have a 20-year life. Most of the finishes, although in comparatively good condition, and well maintained, are at the end of their expected useful life.
 4. Recommendations for Renovation
 - a. Interior floor cracks should be monitored for any further movement and indications of moisture penetrating from below slab level. Failing that, the floors should be maintained as normal.
 - b. Monitor wear at interior finishes. Replace as needed.
 - c. Repair and re-caulk failed masonry control joints at exterior walls. Monitor other masonry control joints for future failure.
 - d. Power wash and clean exterior walls. Consider waterproofing to control future mold accumulation.
 - e. Remove rust on exterior doors and paint.
 - f. Replace broken ceramic floor tile at minimum housing unit.
 - g. Remove mold and efflorescence from interior side of exterior wall at minimum housing recreation yard.
 - h. Identify and repair source of water intrusion at the top of the exterior wall at minimum housing recreation yard.

END OF ARCHITECTURE CONDITION ASSESSMENT

MECHANICAL, PLUMBING AND FIRE PROTECTION

HVAC CONDITION ASSESSMENT

A. Overview

1. The existing Henderson County Jail is composed of a two level (first floor and mezzanine) housing area containing five housing pods and a single-story support area containing administration, magistrate, intake, food preparation, medical and laundry. Also contained in the support area is a work release housing unit currently used for transportation offices and storage. The building was designed in 1999 and occupied in 2001. The spaces are mainly served by packaged roof top units and roof mounted exhaust fans.

B. Support Area

1. Description of Construction
 - a. This area is served by packaged roof top units and exhaust fans.
 - b. The kitchen is served by a make-up unit and exhaust fan package.
 - c. The current control system at the facility is by Delta and is presently working. The system was last up graded in 2019.
 - d. The kitchen hood has the makeup air delivered to under the hood and not distributed out the face of the hood to the kitchen. Make up air delivered to the hood

as in this manner does not require conditioning, which is not done at the present, and makes for a cooler kitchen.



Figure 1 – Kitchen Hood

- e. Ductwork is galvanized steel with external insulation.
- f. Most of the areas have ducted returns while others have return air plenums.
- g. The roof top units serve the following areas:
 - i. RTU-5 Female Housing. This unit is manufactured by Carrier in October of 2014.
 - ii. RTU-6 Group Holding, Intake/Release, Classification, and Property Storage. The unit is manufactured by Trane in October of 2015
 - iii. RTU-7 Dormitory with smoke control fans. The unit is manufactured by Trane in October of 2015
 - iv. RTU-8 Offices, Records, and Equipment Storage. The unit was manufactured by Carrier in October of 2014.
 - v. RTU-9 Public Lobby, Video Visitation Lobby. The unit was manufactured by Trane in October of 2015.
 - vi. RTU-10 Breakroom, Armory, Sallyport, and Locker Rooms. The unit was manufactured by Trane in October of 2015.
 - vii. RTU-11 Inmate Processing, Laundry, and Nurse Station. The unit was manufactured by Trane in October of 2015.

viii RTU-12 Central Control. The unit was manufactured by Trane in August of 2015.

ix RTU-14 Kitchen. The unit was manufactured by Trane in October of 2015.

2. Condition
 - a. Overall, the HVAC equipment was in good condition. All the RTU's and many of the exhaust fans or fan motors have been replaced.
 - b. The control system was last upgraded in 2019 and appears to be in good condition.
3. Life Expectancy
 - a. The equipment has been replaced in recent years and appears to be in good condition. The Trane equipment was replaced in October of 2015 and the Carrier equipment was replaced in October of 2014. The maintenance staff at the facility has done a good job in maintaining the HVAC equipment. The life expectancy for this type of equipment is around 12 to 15 years. Therefore around 2026 the RTU's should begin to be replaced.
4. Recommendations for Renovation
 - a. On RTU-10 the Armory and Locker Rooms supply air is returned to the unit. This air should be exhausted.
 - b. RTU-6 serves the Property Storage area, and the supply air is returned to the unit. This air should be exhausted to prevent odors from returning to the unit.
 - c. Go through the code required ventilation for the facility and ensure that the current equipment is supplying the correct amount of outside.
 - d. Plan on control system upgrades.
 - e. RTU-5 has some exposed ductwork on the roof that needs to be checked for leaks in the ductwork and be reinsulated.



Figure 2 - RTU 5 – Insulation and Exposed ductwork

C. Housing Pod Area

1. Description of Construction
 - a. This area is served by packaged roof top units, roof exhaust fans and roof mounted smoke control fans. Intake hoods are also provided for the housing pod areas.
 - b. The ductwork appears to be galvanized steel with external insulation.
 - c. The roof top units serve the following areas:
 - i RTU-1 Serves Special Housing. The unit was manufactured by Carrier in October of 2014.
 - ii RTU-2 Serves Initial Housing. The unit was manufactured by Trane in October of 2015.
 - iii RTU-3 Minimum Housing. The unit was manufactured by Trane in October of 2015.
 - iv RTU-4 Serves Medium Housing. The unit was manufactured by Trane in October of 2015.
 - v RTU-13 Serves the control room. The unit was manufactured by Trane in July of 2015.
 - d. The return air is ducted back to the RTU's. There is a smoke control fan connected to the return ductwork to remove smoke from the pod upon activation.

- e. Each housing pod has a smoke control sequence in the event of fire. The system is also utilized on occasion to ventilate the space of odors.



Figure 3 – Smoke Control Panel

- 2. Condition
 - a. Overall, the HVAC equipment was in good condition. All the RTU's and many of the exhaust fans or fan motors have been replaced.



Figure 4 – Mechanical Roof Top Units

- 3. Life Expectancy
 - a. The HVAC equipment has an expected life of around 12 to 15 years. Therefore, around 2026 the RTU's will need to be replaced.
 - b. The exhaust fans will need to be replaced as failures occur.

- c. The control system usually has major upgrades every 4 or 5 years. These upgrades need to be made to keep the system current.
- 4. Recommendations for Renovation
 - a. Go through the code required and ensure the required amount of outside air is being provided by the equipment.
 - b. Plan for upgrades to the controls/Building Management System.
 - c. Go through the smoke control sequences to ensure proper operation of the systems.
 - d. Review the use of pre insulated ducts for RTU-5 to help maintain peak efficiency. A manufacturer of such product is Thermo duct.

END HVAC CONDITION ASSESSMENT

PLUMBING CONDITION ASSESSMENT

A. Overview

1. The existing Henderson County Jail is composed of a two level (first floor and mezzanine) housing area containing five housing pods and a single-story support area containing administration, magistrate, intake, food preparation, medical and laundry. Also contained in the support area is a work release housing unit currently used for transportation offices and storage. The building was designed in 1999 and occupied in 2001. The spaces are served by cast iron waste and vent lines and copper water pipe. In addition, the domestic cold, hot, and hot water return lines are extended from the Courthouse.

B. Support Area

1. Description of Construction
 - a. The water pipe in this area is copper with fiberglass insulation and cast-iron waste and vent piping.
 - b. Low pressure gas piping is installed on the low roof to serve the HVAC equipment and routed through the building to serve the kitchen, laundry, kitchen water heater, and extend up to the high roof to serve the HVAC equipment for the Housing Pods.
 - c. The water heaters serving the normal hot water needs of the support area are gas fired and located in the Courthouse.



Figure 5 – PVI Hot Water Boilers in Courthouse serving the Detention Center

d. The water heater serving the laundry, kitchen and can wash is in Mechanical Room PH104 across from the kitchen. This water heater provides 160-degree water to the areas noted.



Figure 6 – PVI Hot Water boiler serving Kitchen and Laundry in the Detention Center

2. Life Expectancy
 - a. The life expectancy of the plumbing pipe is between 50 and 75 years.
 - b. The life expectancy for the water heaters is 25 years.
 - c. The life expectancy for the plumbing fixtures and trim is around 20 to 25 years depending upon renovations of the areas that may take place.
3. Recommendations for Renovation
 - a. The water heaters and circulator pumps will require replacement in the next 10 years and should be included in the repair budget.
 - b. Upgrades to the plumbing fixtures may also need to be budgeted due to proper function and conservation of water.
 - c. The hot water return system and balancing valves should be checked to ensure proper operation of the return system to maintain hot water throughout the facility.

C. Housing Pod Area

1. Description of Construction
 - a. This area has copper water pipes and cast-iron waste and vent piping. The water heaters for the housing units are in the courthouse as noted above.
 - b. Pipe insulation is a mixture of fiberglass and Armaflex foam type insulation.
 - c. The plumbing chases in the facility seemed to be of adequate size to maintain the plumbing equipment located in them.



Figure 7 – Housing Unit Plumbing Chase (typical)

2. Condition
 - a. Overall, the plumbing equipment was in good condition.
 - b. The plumbing fixtures in the housing pods are stainless-steel and in good condition.
 - c. The maintenance areas of most concern are the fixture valve controls. These seem to occupy most of the maintenance staff time.



Figure 8 – Pneumatic Water Control Valves, Plumbing Chase

3. Life Expectancy
 - a. The life expectancy for the piping is around 50 to 75 years. This can vary due to material flushed down the drain lines.
 - b. Life expectancy for the prison faucets and flush valves is around 15 years. This can vary based on maintenance performed and abuse by the inmates.
4. Recommendations for Renovation
 - a. Research alternate type of water valve controls. One type that has had great results is a system manufactured by I-CON. This system is electric and utilizes a strain gauge in lieu of the air to activate the water valve. There is an area that has this system installed and the results should be reviewed.
 - b. Budget funds for the replacement of the faucets and flush valves to improve reliability as well as conserve water.

END PLUMBING CONDITION ASSESSMENT

FIRE PROTECTION CONDITION ASSESSMENT

A. Overview

1. The existing Henderson County Jail is composed of a two level (first floor and mezzanine) housing area containing five housing pods and a single-story support area containing administration, magistrate, intake, food preparation, medical and laundry. Also contained in the support area is a work release housing unit currently used for transportation offices and storage. The building was designed in 1999 and occupied in 2001. The spaces are served by a wet sprinkler system and 3 dry pipe systems.

B. Support Area

1. Description of Construction
 - a. The sprinkler pipe in this area is black steel.
 - b. The sprinkler heads are normal heads except in secured areas.
 - c. The kitchen hood has an Ansul chemical system to extinguish ant cooking fire under the hood.
 - d. The main wet riser is in a Mechanical Room HF108A off the loading dock. This room also houses the dry pipe system for the loading dock.



Figure 9 – Fire Protection Riser Main

- e. The other dry pipe system in the support area is in a Mechanical Room AD118 near the security and records rooms.



Figure 10 – Fire Protection Riser – Dry Pipe system

- f. A fire department connection is located near the Loading Dock PH100.



Figure 11 – Fire Department connection

2. Life Expectancy
 - a. The life expectancy of the sprinkler system is between 50 and 75 years
3. Recommendations for Renovation
 - a. Maintain all required inspections of the wet, dry and Ansul systems in the area.

C. Housing Pod Area

1. Description of Construction
 - a. The sprinkler pipe is black steel with tamper proof heads.
 - b. This is a continuation of the main wet system. The system did not appear to have zone valves to isolate areas of the housing units.
 - c. A dry pipe system is in a Storage Room HC210 on the second floor of the housing unit and serves the covered exercise area at the first-floor level.
2. Condition
 - a. Overall, the sprinkler system equipment and piping were in good condition.
 - b. There have been reports of the inmates damaging the existing security sprinkler heads.
3. Life Expectancy

- a. The life expectancy for the piping is around 50 to 75 years.
- 4. Recommendations for Renovation
 - a. Maintain all inspections for the systems.
 - b. Change out all security type sprinkler heads to a RAVEN security head to reduce damage to the sprinkler heads.

END FIRE PROTECTION CONDITION ASSESSMENT

ELECTRICAL

ELECTRICAL CONDITION ASSESSMENT

A. Overview

1. The facility is served by a 600amp, 480/277V 3-phase service where all of the main gear resides in the base building electrical room.
 - a. Sub-panels at 480/277V and 208/120V 3-phase and step-down transformers are located throughout the facility.
 - i. Each housing unit is served by 208/120V normal branch circuits 480/277V emergency branch circuits.
 - ii. Dedicated sub-panels are strategically located throughout the facility for kitchen loads, systems, and security loads, as well as housing unit loads.
2. The facility is also served by a 500kW diesel emergency generator located in the courthouse area rated for 480/277V 3-phase operation with a skid base fuel tank. The emergency generator is equipped with a mounted circuit breaker at 600amps which supplies backup power to EH1 which now serves as the MSB or main distribution panel.
 - a. All of the loads throughout the facility are backed up by emergency power and the facility is also equipped with remote battery backup emergency "bug-eye" fixtures to comply with NFPA 101 requirements for emergency egress lighting.
3. The facility also has fluorescent fixtures throughout. The fluorescent linear fixtures all appear to be 32watt T-8, 4 feet fixtures and 17 watt T-8 fixtures. The lighting is controlled via a combination of switch banks and lighting contactors with individualized lighting controller blocks located in housing control rooms.

B. Exterior

1. Description
 - a. The electrical service conductors run underground to a 500kVA 12.47kv primary 480/277V wye secondary pad-mounted transformer which feeds panel MSB which in turn feeds panel EH1 via an ASCO 7000 series automatic closed transition transfer & bypass isolation switch. The main electrical service size is technically 500amps. The service is rated for 600amps however there is a 500amp main circuit breaker that currently protects the main panel EH1. Panel EH1 distributes power to all subpanels that are throughout the facility. The emergency feeders that supply the automatic transfer switch derive their emergency power source from a 500kW Kohler Power Systems diesel-powered emergency electrical generator. The generator is located in the courthouse mechanical room area. The generator currently provides back-up power for the entire detention center.
2. Condition
 - a. Power: All the Panels are manufactured by Schneider Electric, Automatic Transfer Switch by ASCO and the generator by Kohler Power Systems. Power seems to work well and there are no obvious deficiencies in this area. There appears to have been modifications to the electrical system over time. Panel schedules and breakers are mislabeled. There is no obvious evidence of inadequate electrical capacity noted or reported. No damaged or obsolete equipment was observed.
3. Life Expectancy

- a. Electrical gear (panelboards, transformers, automatic transfer switch, generator) all appear to be in good condition
- 4. Recommendations for Renovation
 - a. Consider re-labeling breakers and providing new panel schedule indexes inside door of all electrical panelboards.



Figure 1 — 500kVA Utility Transformer that supplies power to the facility

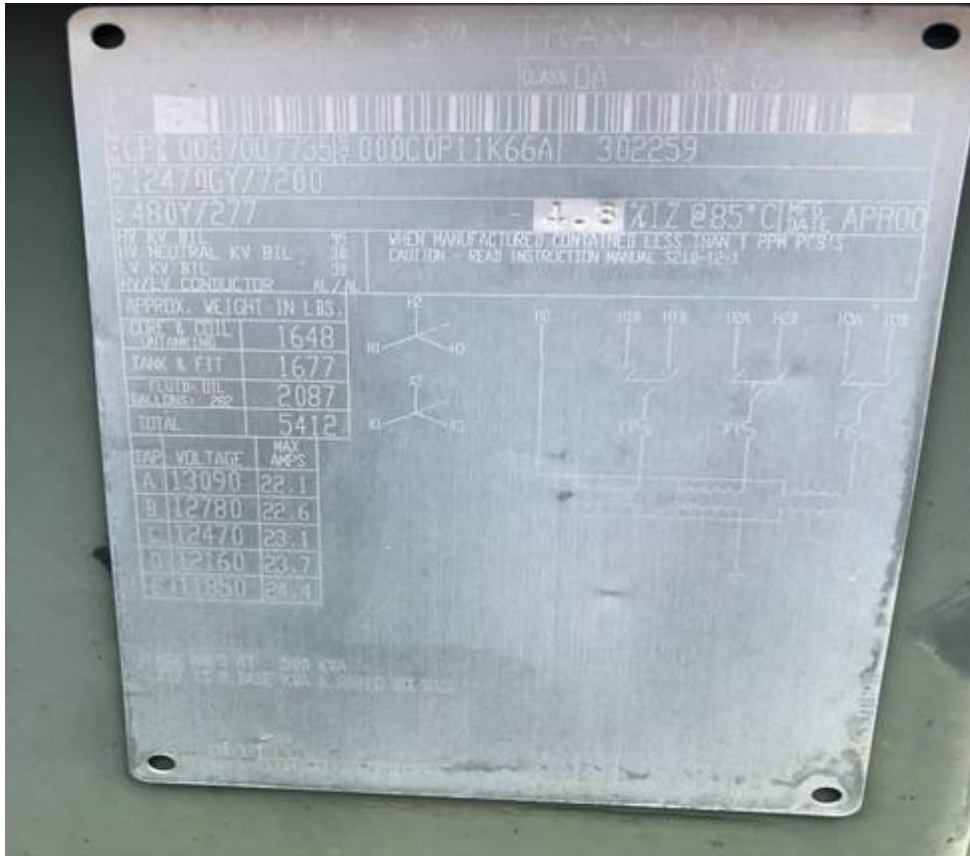


Figure 2 — 500kVA Utility Transformer nameplate rating



Figure 3 — Main Service Distribution Panel EH1



Figure 4 — 500amp main breaker for Main Service Distribution Panel EH1



Figure 5 — 500kW Emergency Generator located in Courthouse

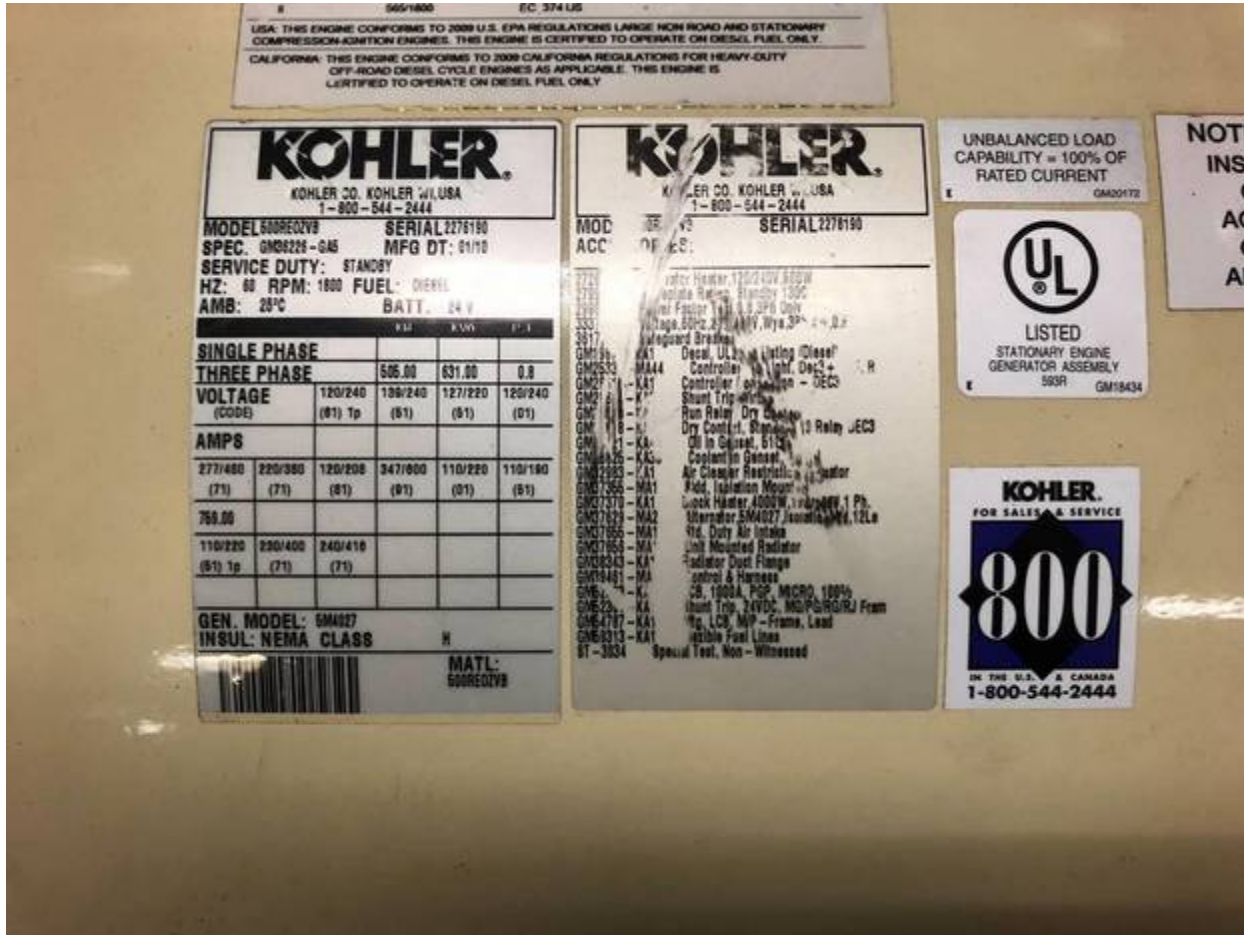


Figure 6 – Nameplate rating of 500kW Emergency Generator located in Courthouse



Figure 7 – Mislabeled panelboards in main electrical room



Figure 8 – Mislabeled panelboards in main electrical room

C. Administration

1. Description

- a. The Administration area of the detention facility consist of the Public Vestibule, Lobby, and Administrative space. The Administrative area is served by sub-panels

that are located in Electrical Room AD116. Lighting is supplied through a combination of 2, 3, and 4-lamp 32watt T-8 fluorescent fixtures.

2. Condition
 - a. Power: All the panels and associated electrical gear are manufactured by Schneider Electric. Power seems to work well and there are no obvious deficiencies in this area. There is no obvious evidence of inadequate electrical capacity noted or reported. No damaged or obsolete equipment was observed.
 - b. Lighting: The 2, 3 and 4 lamp T-8 32watt are primarily parabolic lensed lighting fixtures that are controlled via switch banks and contactors. Several of the fixtures had lamps that were non-functional in various rooms throughout the area.
3. Life Expectancy
 - a. Routine maintenance will have to be performed on the light fixtures every 6-9 months. Lamps and ballasts will constantly have to be replaced.
4. Recommendations for Renovation
 - a. Consider replacing the fixtures with LEDs or Super T8 fixtures.
 - i. Lamp life will extend 15+ years and overall lighting energy efficiency will increase by at least 20%.
 - ii. A reduction in maintenance expenses due as fixtures should not require replacement or re-lamping of fixtures for a minimum of 15 years.

D. Housing Units

1. Description
 - a. The Male Housing Units are designated A, B, C and D. The Female Housing Unit is designated Unit E. The Administrative area is served by sub-panels that are located in Electrical Rooms CC102 and PH102. Lighting is supplied through a combination of 2, 3, and 4-lamp 32watt T-8 fluorescent fixtures.
2. Condition
 - a. Power: All the panels and associated electrical gear are manufactured by Schneider Electric. Power seems to work well and there are no obvious deficiencies in this area. There is no obvious evidence of inadequate electrical capacity noted or reported. No damaged or obsolete equipment was observed.
 - b. Lighting: Lighting consists of the 2, 3 and 4 lamp security grade T-8 32watts. The light fixtures are controlled via lighting contactors with individualized lighting controller blocks located in housing control rooms. No obvious deficiencies noted.
3. Life Expectancy
 - a. Routine maintenance will have to be performed on the light fixtures every 6-9 months. Lamps and ballasts will constantly have to be replaced.
4. Recommendations for Renovation
 - a. Replace existing lighting with LEDs and Super T8s as indicated in the recommendations above for Administration. Would also consider adding battery backup to new fixtures and a select number of new replacement fixtures to increase emergency illumination levels in the event of a power outage.
 - b. Inspect the integrity of the electrical system for exposed wiring and cover plates and replace as deemed necessary.

E. Booking/Intake

1. Description

- a. Inmates enter the facility via a large vehicle sallyport. There are four roll-up doors in the sallyport which can accommodate two lanes of travel in the sallyport. From the vehicle sallyport is an entry to booking and from booking is an entry to intake. The Booking/Intake area is served by sub-panels from Electrical Room AD116. Lighting is supplied through a combination of 2, 3, and 4-lamp 32watt T-8 fluorescent fixtures as well as 100watt high pressure sodium with 100watt T-4 quartz restrike for the vehicle sallyport area.
- 2. Condition
 - a. Power: All the panels and associated electrical gear are manufactured by Schneider Electric. Power seems to work well and there are no obvious deficiencies in this area. There is no obvious evidence of inadequate electrical capacity noted or reported. No damaged or obsolete equipment was observed.
 - b. Lighting: The 2, 3 and 4 lamp T-8 32watt are primarily parabolic lensed lighting fixtures that are controlled via switch banks and contactors. Several of the fixtures had lamps that were non-functional in various rooms throughout the area.
- 3. Life Expectancy
 - a. Routine maintenance will have to be performed on the light fixtures every 6-9 months. Lamps and ballasts will constantly have to be replaced.
- 4. Recommendations for Renovation
 - a. Consider replacing the fixtures with LEDs or Super T8 fixtures.
 - i. Lamp life will extend 15+ years and overall lighting energy efficiency will increase by at least 20%.
 - ii. A reduction in maintenance expenses due as fixtures should not require replacement or re-lamping of fixtures for a minimum of 15 years.

F. Magistrate's Office

- 1. Description
 - a. The Magistrate's Office is adjacent to both Booking/Intake and the Public Vestibule. The Magistrate's Office is served by sub-panels that are located in Electrical Room AD116. Lighting is supplied through a combination of 2, 3, and 4-lamp 32watt T-8 fluorescent fixtures.
- 2. Condition
 - a. Power: All the panels and associated electrical gear are manufactured by Schneider Electric. Power seems to work well and there are no obvious deficiencies in this area. There is no obvious evidence of inadequate electrical capacity noted or reported. No damaged or obsolete equipment was observed.
 - b. Lighting: The 2, 3 and 4 lamp T-8 32watt are primarily parabolic lensed lighting fixtures that are controlled via switch banks and contactors. Several of the fixtures had lamps that were non-functional in various rooms throughout the area.
- 3. Life Expectancy
 - a. Routine maintenance will have to be performed on the light fixtures every 6-9 months. Lamps and ballasts will constantly have to be replaced.
- 4. Recommendations for Renovation
 - a. Consider replacing the fixtures with LEDs or Super T8 fixtures.
 - i. Lamp life will extend 15+ years and overall lighting energy efficiency will increase by at least 20%.

- ii. A reduction in maintenance expenses due as fixtures should not require replacement or re-lamping of fixtures for a minimum of 15 years.

G. Central Control

1. Description
 - a. Central Control is located at the hub of the public lobby, magistrate's office, administration, intake/booking and the N/S main corridor. The Central Control is served by sub-panels that are located in Electrical Room AD116. Lighting is supplied through a combination of 2, 3, and 4-lamp 32watt T-8 fluorescent fixtures.
2. Condition
 - a. Power: All the panels and associated electrical gear are manufactured by Schneider Electric. Power seems to work well and there are no obvious deficiencies in this area. There is no obvious evidence of inadequate electrical capacity noted or reported. No damaged or obsolete equipment was observed.
 - b. Lighting: The 2, 3 and 4 lamp T-8 32watt are primarily parabolic lensed lighting fixtures that are controlled via switch banks and contactors. Several of the fixtures had lamps that were non-functional in various rooms throughout the area.
3. Life Expectancy
 - a. Routine maintenance will have to be performed on the light fixtures every 6-9 months. Lamps and ballasts will constantly have to be replaced.
4. Recommendations for Renovation
 - a. Consider replacing the fixtures with LEDs or Super T8 fixtures.
 - i. Lamp life will extend 15+ years and overall lighting energy efficiency will increase by at least 20%.
 - b. Consider providing and/or relocating remote annunciator panel for the 500kW Kohler generator to Central Control. Annunciator panel should be in a constantly attended location per NFPA 110.

H. Kitchen / Laundry

1. Description
 - a. The Kitchen and Laundry are centrally located near the loading dock entrance of the facility. The Kitchen/Laundry are served by sub-panels 'ELK' and 'KL1' located in the kitchen area. Lighting is supplied through a combination of 4-lamp 32watt T-8 troffer fluorescent fixtures.
2. Condition
 - a. Power: All the panels and associated electrical gear are manufactured by Schneider Electric. Power seems to work well and there are no obvious deficiencies in this area. There is no obvious evidence of inadequate electrical capacity noted or reported. No damaged or obsolete equipment was observed.
 - b. Lighting: The 2, 3 and 4 lamp T-8 32watt are primarily parabolic lensed lighting fixtures that are controlled via switch banks and contactors. Several of the fixtures had lamps that were non-functional in various rooms throughout the area.
3. Life Expectancy
 - a. Routine maintenance will have to be performed on the light fixtures every 6-9 months. Lamps and ballasts will constantly have to be replaced.

4. Recommendations for Renovation
 - a. Consider replacing the fixtures with LEDs or Super T8 fixtures.
 - i. Lamp life will extend 15+ years and overall lighting energy efficiency will increase by at least 20%.
 - ii. A reduction in maintenance expenses due as fixtures should not require replacement or re-lamping of fixtures for a minimum of 15 years.



Figure 9 – Lamp replacement needed in several fixtures



Figure 10 — Lamp replacement needed in several fixtures

END OF ELECTRICAL ASSESSMENT REPORT

PHYSICAL AND ELECTRONIC SECURITY

GENERAL

The Henderson County Detention Center Physical and Electronic Security systems are typical for jails of this era, in fact, because the facilities division has prioritized upgrades and maintenance, the systems are in better condition and less subject to obsolescence than most 20 year old facilities.

In general, the Physical Security system consists of reinforced concrete masonry units (CMU) and Security Hollow Metal barriers with pneumatic security detention locks and sliding door operators.

The Electronic Security systems consist of IP based CCTV, Programmable Logic Controller (PLC) driven touchscreen locking control, digital intercom and paging, Simplex Fire Alarm system and a leased Video Visitation system.

PHYSICAL AND ELECTRONIC SECURITY CONDITION ASSESSMENT

A. Systems Overview

1. Physical Security
 - a. Elements

Security Doors – Detention doors in the facility are security hollow metal with Southern-Folger pneumatic detention locks/hardware (see Figures 1-3).



Figure 1 – Sliding Security Hollow Metal door & hardware (typical)

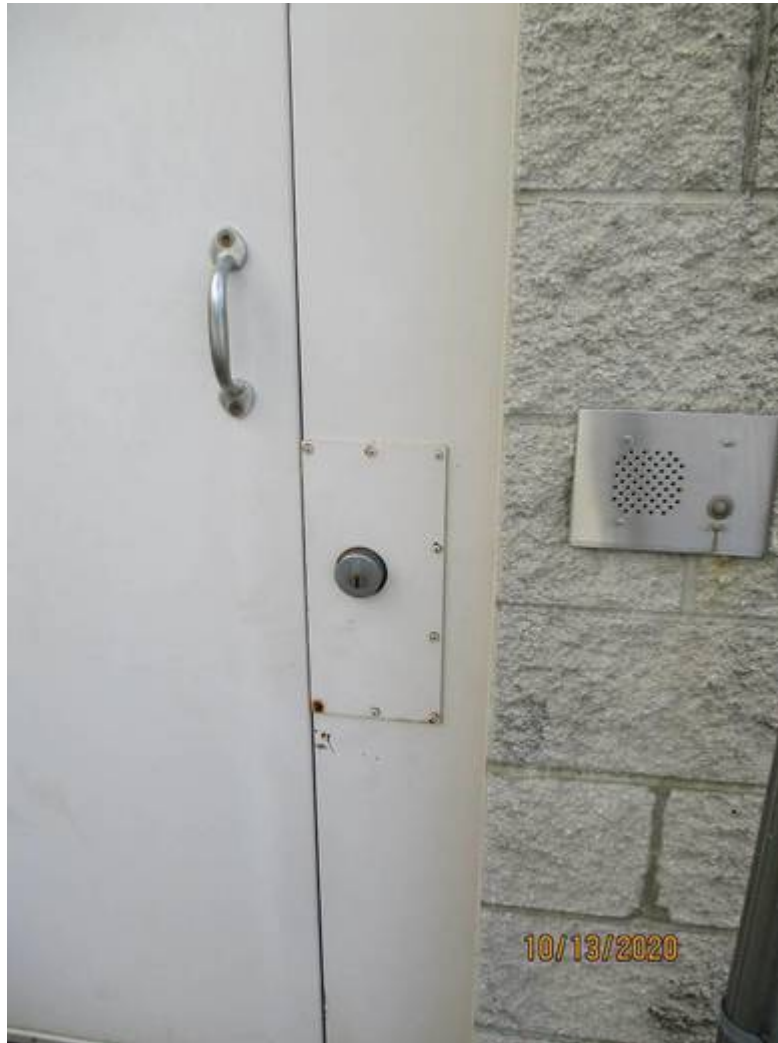


Figure 2 — Swinging Security Hollow Metal door & frame mounted hardware (typical)



Figure 3 — Security Hollow Metal Door with mechanical hardware (Equipment Room)

- i. Security Hollow metal doors and frames are rated by ASTM F 1450/1592 and ANSI/NAAMM HMMA-863 standards to withstand physical abuse from battering rams and attack with tools. The doors and frames installed at the Henderson County Detention Center in detention areas have been built to these standard as in effect at the time of design in 1999.
- ii. All of the Security doors and frames are in good condition – some show signs of minor surface rusting (see Figure 8).
- iii. The detention hollow metal partition frames, view lites and doors have security glazing of various thicknesses using 1 ¼” glazing stops to achieve 1” net engagement on all sides. All of the glazing appears to be well maintained.
- iv. Except at the public parking lot, the facility is surrounded by a 10’ chain link fence in good condition – this is not the primary security barrier but a demarcation of the detention center property. The facility primary security barrier is the detention areas exterior walls. At the public parking side, the facility is separated by a decorative black picket fence approx. 5’0” in height.

- v. The Southern-Folger pneumatic detention locks and sliding door hardware (operators) have been maintained by the facility despite, as the facility staff reports, the fact that some parts are no longer available from the manufacturer. The facility staff has worked to locate local vendors that can repair the obsolete parts.
- vi. Most detention lock manufacturers, including Southern-Folger Co, do not change model numbers of their locks as they make improvements to the components and design so while the current model numbers for the sliding door operators (8050L at cells, 8065L at corridors), for swinging doors with 7" jambs (10120AP) and for swinging doors with 2" jambs (10300P) are the same as the model numbers for the locks and operators found at the Henderson County Detention Center, they are not part for part matches with the 20 year old existing products.
- vii. The air system for the pneumatic locks is in good condition and has been well maintained by the facility. The air is clean and dry and has never been compromised by contamination. Facility maintenance staff's attention to the air system maintenance is commendable— lack of air system maintenance is the primary cause of failure in pneumatic locking systems.
- viii. The air system consists of two each Gardner Denver R Series compressors controlled in lead/lag configuration. Compressed air is passed through a refrigerant air dryer (Hankison SPX Flow). Facility staff indicates that the manifold connections and connections within the sliding door housings are problematic for air leaks at the fittings. They have commented that a hard line manifold in the cell sliding door housings would have greatly improved reliability. Each housing unit has an emergency reserve air tank that will cycle the locks/operators at least once even if the air system is offline. See Figures 4, 5, 6 and 7.



Figure 4 — Gardner Denver Locking Pneumatic Air System Compressor



Figure 5 — Locking Pneumatic Air system refrigerant dryer



Figure 6 — Locking Pneumatic Air system manifold (typical)



Figure 7— Locking Pneumatic Air System Emergency Reserve tank

- ix. Some exterior openings have minor surface rust on the security hollow metal and locking device covers – see Figure 8.



Figure 8 — Surface rusting on an exterior security door and frame.

- b. Condition, Life Cycle and Recommendations
 - i. The security hollow metal doors and frames have at least 25 – 30 years of life yet to be realized. These component, properly installed and maintained will last the life of the building. They are in good condition and should last their full rated life.
 - ii. In the near future, exterior doors should be sanded, primed and finish painted to eliminate the surface rust and prevent future damage to the door skins and frames.
 - iii. Although the facility has made a herculean effort to keep the pneumatic locks/operators operational, the obsolescence of the air cylinders has made the system problematic for some time. The system condition is fair but should be replaced. Several lock manufacturers offer lock/sliding device “drop in” replacements which utilizes existing housings or door preps but replaces the internal components. The problem with replacing pneumatic locks/operators with an electromechanical lock/operator is that the pneumatic lock/devices require very little electrical energy to operate so field wiring size (gauge) is often insufficient to power replacement electro-mechanical locks and operators. An additional engineering study would be required to determine an adequate solution but the obvious solution is to pull out existing conductors and pull in new sufficient to carry the load. This presumes that the wiring can be pulled out (under slab conduits are often very difficult to re-use). Another possible solution suggested by staff is to run electrical circuits to each door lock/operator and use the existing wiring only to operate a relay module that will switch the operating voltage. Both solutions have merit but feasibility must be explored by additional investigation.
 - iv. The pneumatic air system, particularly the compressors, are well past their expected life. Although they have been well maintained, the components of the reciprocating compressors will fail with time and they are beyond their recommended replacement cycle. Since they are running in lead/lag mode both compressors have been exposed to the same wear. If the county elects to continue to use pneumatic locks, these compressors and controls should be replaced within the next budget cycle. The refrigerant air dryer system has a much shorter life cycle (generally 5 years) and has been replaced by facility maintenance several times.
2. Electronic Security and Life Safety
 - a. Elements
 - i. Fire Alarm System - Simplex 4100ES Fire Alarm System with three remote annunciators form the basis of the life safety fire alarm system (see Figures 9 and 10). The remote annunciator panels are located in the Vestibule AD100, Administration Lobby AD107, and the Loading Dock PH100. The main Fire Alarm panel is located in Central Control IN120.



Figure 9 — Simplex 4100 Fire Alarm Panel in Central Control Room



Figure 10 – Fire Alarm System Remote Annunciator Panel (typical)

- ii. Locking Control System – an Omron CS1 SYSMAC series Programmable Logic Controller (PLC) based Locking Control System is found in the Security Electronics Equipment room IN124. See Figure 11.



Figure 11 — PLC Locking Control System in Security Electronics Equipment room

- iii. Locking Control User Interface - The user interface control panels are ELO 2200L/Dell Optiplex 9020 Touchscreen workstations. There are six touchscreen locking control work stations – they are located in Central Control, 2 each in Male Housing Unit control (Pods A/B and C/D), Women’s Unit E Control, Admin Office and Magistrates Office. See Figure 12.



Figure 12 — Touch screen control panel (work station) in control rooms (typical)

- iv. Auxiliary Control - Omron remote Input/Output (I/O) ERT-1 modules are used in Central Control and the Housing Unit to operate lighting and inmate telephone circuits. See Figure 13.



Figure 13 — Lighting Controls in Central Control (typical of lighting and phone controls)

- v. Surge Protection – The main security equipment power is protected by a Northern Technologies TCS 100 C two stage surge protection device in the Security Electronics Equipment room IN124. The primary stage protection is silicone avalanche diodes and secondary stage protection is metal oxide varistors. See Figure 14. Ditek modules are used for signal line circuit protection where signal lines exit the building envelope.



Figure 14 — Northern Technologies Surge Protection Device

- vi. Other Components - The field side isolation and connections are by Phoenix Contacts and arranged in logical sequence on metal backplanes of NEMA 1 cabinets located in Security Electronic Equipment IN124. The system runs on a physically isolated Cat 5e data network. – see Figure 15.

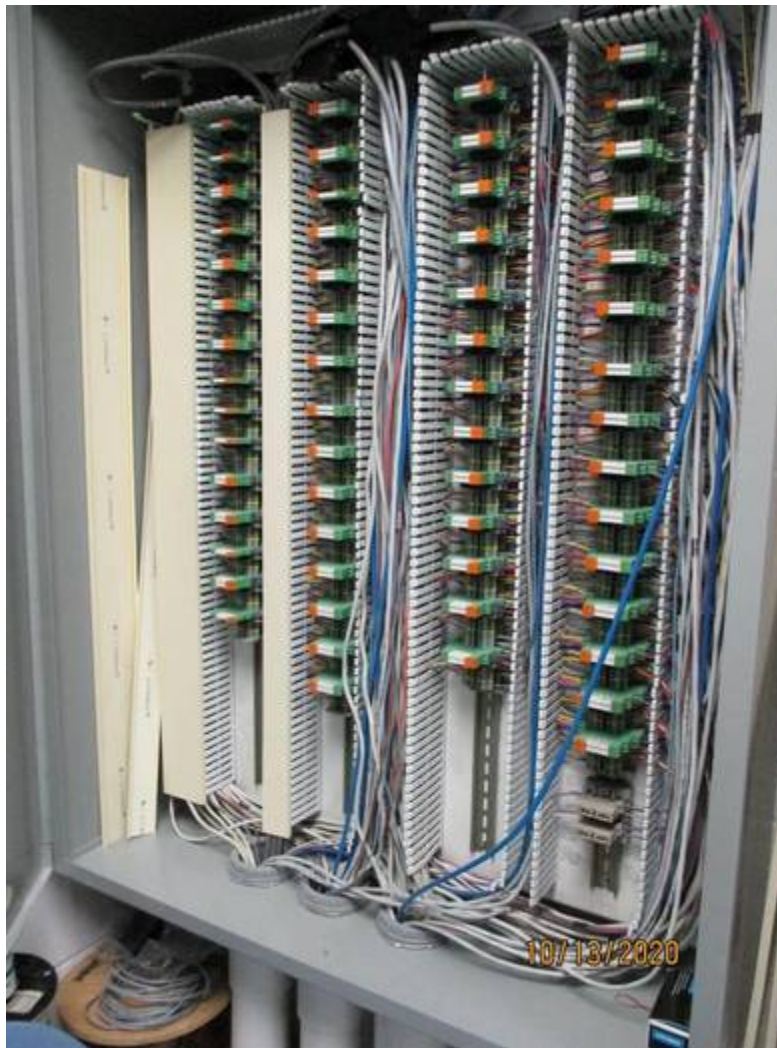


Figure 15— Locking Control Relay Cabinet (typical)

- vii. Programmable Logic Controllers are industrial computers used for manufacturing and process control. In recent decades, they have been the most popular choice for detention controls because they are easy to program, built for rugged, harsh environments, can be modified easily and are almost maintenance free.

- viii. The user interface touchscreen workstations make use of a graphical “map” or “floorplan” of the facility (or a portion thereof) and touch active icons to allow control and status monitoring of the locking control system. The software which drives the touchscreens is called Human Machine Interface (HMI) software. The most popular HMI software is WonderWare – a product of Schneider Electric. It is likely the product being used at Henderson County Detention Center but this could not be confirmed since it would require taking a work station offline and such action is beyond the scope of this study.
- ix. An Emerson Uninterruptible Power System (UPS) is located in the Security Electronics Equipment room to ensure that short power outages will not cause an interruption in service for the Locking Control System. See Figure 16.



Figure 16 — Emerson UPS in Security Electronics Equipment Room

- x. Video Visitation - The Henderson County Detention Center leases their Video Visitation equipment which is placed in the visitation center (adjacent to the

lobby) and in each housing unit (see Figure 17)



Figure 17 – Leased Video Visitation Station in the visitation center

- x. Intercom and Paging System – the Intercom and Paging system is a hybrid analog/digital product of Harding Instruments Company. The Harding DXL system is very robust and is the most popular system for detention environments. The system consists of the head end equipment in the Security Electronic Equipment room IN124 and field staff stations (intercom stations) and speakers for the Public Address system – see Figures 18 and 19.



Figure 18– Harding DXL Intercom and Public Address system



Figure 19— Intercom Staff Station (typical)

- xii. Video Surveillance System – the Henderson County Detention Center has an IP based digital Closed Circuit TV system (IP-CCTV). Twenty external cameras and 75 internal cameras are strategically placed to allow for processing facility traffic and monitoring inmate activities.
- xiii. Video Management System - The software control system for the IP-CCTV system is a Video Management System (VMS) package and network attached video storage by Tyco exacqVision Z Series. The VMS is located in the Main Distribution Frame (MDF) room in Administration (previously Records AD117).
- xiv. Cameras - Except for the exterior pole mounted cameras, the cameras are Tyco American Dynamics Illustra series digital dome cameras. The pole mounted cameras are manufactured by Sony and are analog converted to digital. The IP-CCTV system has its own physical network and each camera is routed to data switches in the MDF and Security Electronic Equipment IN124.
- xv. IP-CCTV User Interface - Cameras are monitored by Dell Optiplex 9020 desktop computers and Dell Monitors. The cameras can be called up for view on the spot monitor by manual selection of the camera icon on the touchscreen controls or by automatic call-up upon selection of an intercom station. See Figures 20, 21, 22 and 23.
- xvi. Surge Protection and Back-up - The IP-CCTV VMS is backed up by a APS UPS for short outages. Ditek modular surge protection devices are used to protect exterior cameras and camera circuitry from surge and transients on the power and signal lines.



Figure 20— exaccqVision Video Management System in the MDF



Figure 21— Interior dome style IP-CCTV cameras (typical)



Figure 22— Pole mounted IP-CCTV Cameras (typical)



Figure 23— IP-CCTV Spot Monitor at control stations (typical)

- b. Condition, Life Cycle and Recommendations
 - i. Fire Alarm System – the Simplex 4100ES fire alarm was installed in 2015 by TYCO (Simplex-Grinnell). Properly maintained, these units should last up to 15 years and they generally fail to obsolescence. The fire alarm system should still have approximately 10 years of useful life, if not more.
 - ii. Locking Control System PLC – the original locking control system was replaced in 2008 by Southwestern Communication Systems out of Decatur, Alabama. This is when the Omron SYSMAC CS1G was installed. The CS1 series is an old line for OMRON dating back to the early 2000s. While it is still active in the Omron line and supported by them, it's "long in the tooth" for a PLC system. Even if Omron continues to support it into the future, the 12 years on this PLC installation is near the end of its normal life cycle. Recommend a PLC and associated software/hardware replacement within the next 5 years.
 - iii. Locking Control System Touchscreens – under the 2008 controls renovation, Southwestern Communication Systems installed graphic (hardline) panels in all but central control which contained the only touchscreen workstation. In 2015, Tyco (Simplex Grinnell) replaced all of the 2008 control panels with new ELO 2200L/Dell 9020 workstations. These workstations are in excellent condition and require minimal maintenance. Recommend quarterly cleaning of the workstations CPU housing to avoid the accumulation of dust inside the PC.
 - iv. Locking Control Systems Surge Protection – the Northern Technologies surge protection device serving the power for the integrated security systems is very old and should be replaced. Northern Technologies was purchased by Emerson in 2000 and they eventually phased out their production line in favor of the SOLA Surge Protection Devices. Recommend replacement of the Northern Technologies Surge Protection Device in the next budget cycle.
 - v. Intercom and Public Address System – the Harding DXL Intercom and Paging system was installed by TYCO Simplex Grinnell in 2015. This is the current model of the Harding line for use in detention environments. It is in excellent condition and requires very little maintenance. No recommendations for the Intercom/Public Address system.
 - vi. Video Surveillance System – the Henderson County Detention Center CCTV system has experience three upgrades over its history. Originally analog cameras were installed and in the 2008 upgrade by Southwestern Communications, system cameras were changed to Vicon 910 series but they were still analog cameras. The current cameras are the product of TYCO American Dynamics Illustra line. These were replaced in 2015 and the system was upgraded to IP-CCTV system. The TYCO exacqVision Video Management System was added and is the current supported product of the manufacturer. New Dell Optiplex 9020 desktop PCs and monitors were added to create video viewing stations at each control post. This system is in good condition and is fully operational. Recommend quarterly cleaning of the workstations CPU housing to avoid the accumulation of dust inside the PC.

B. Equipment by Area

1. Exterior

- a. The exterior of the Henderson County Detention Facility is segregated into public and secure functions. The secure functions are conducted on the East, West and

- North sides of the facility. Public access is located south in the vehicle parking lot and SE for the Vestibule and Public Lobby. The loading dock which serves the facility, kitchen and laundry is located on the center east side of the facility. Main mechanical and electrical rooms are located off the dock. Maintenance is located in a metal utility building east of the main facility and at the end of the loading dock drive.
- b. Security Equipment – the facility is surrounded on the west, north and east side by a 10' chain link fence. The southern part of the facility faces the public parking lot – it is segregated by an approximately 6' metal picket fence and vehicle gate entry. The entire building perimeter and much of the grounds are monitored by 20 closed circuit television cameras. At various entry points into the facility Security Hollow Metal and pneumatic detention locks protect the facility perimeter. Intercoms are provided at select exterior doors to facility staff access. One of the three Fire Alarm System Remote Annunciator Panels is located at the Loading Dock.
2. Administration
 - a. The Administration area of the detention facility contains the Public Vestibule, Lobby, Administrative space and the network Main Distribution Frame (MDF) room. The MDF is a converted storage room – recommend modifying the room to match its current function. This would require adding automatic closers and card access to the doors, deleting wet sprinklers in the space, outfitting the room with a dry agent fire extinguishing system, evaluate if additional air conditioning is required and affix proper signage for an IT space. The current wet fire protection system will ruin the network components if it is ever activated.
 - b. Security Equipment - Intercoms and Paging speakers allow for verbal communication. IP-CCTV cameras monitor the Vestibule and Lobby. Hollow Metal and Security Hollow Metal doors control access from the Lobby to the Administration Area, Main Circulation corridor and the Control Room. Storefront glazing and doors separate the Vestibule and Lobby and Vestibule and Magistrate's area. The south wall of the Vestibule is the location of one of the Fire Alarm System's Remote Annunciator Panels. A second Remote Annunciator Panel is located in the Administration Lobby adjacent to the restroom door. The Video Visitation center is on the north side of the Lobby and the Video Visitation host equipment is located in the Administration MDF. Also located in the MDF is the IP-CCTV head end equipment and storage (TYCO exacqVision VMS). The Administration area also has a small control station for Lobby entrance from the Vestibule and Lobby to Administration Lobby traffic. Recommend considering re-design of the MDF to meet modern server room standards including fire extinguishing and rating specific to the function. Also recommend that the IP-CCTV components be re-located to the Security Electronics Equipment room IN124 so access to this critical security component is more restrictive.
 3. Housing Units - Male
 - a. The Male Housing Units are designated A, B, C and D. The A and B units contain 24 each secure cells and have direct access to covered and open exercise yards (within the building perimeter). The C and D units are dormitory units which too have direct access to shared exercise yards. Unit access is via the main S/E/W corridor junction and security sallyports at each unit.
 - b. Security Equipment – the A and B units of male housing have security hollow metal doors and frames with pneumatic detention sliding door operators. The C and D

Units have security hollow metal doors and frames at dorm entries and exits and at view lites in the primary security walls. In all four units, Intercoms and Paging stations/speakers/horns allow for verbal communication. IP-CCTV cameras monitor the dayroom spaces and exercise yards. Access to the unit is via a sallyport in which two interlocked doors must be passed. Under normal operations, only one door in a sallyport configuration can be opened at a time. Emergency override allows both doors to open simultaneously. The C and D units have conduit built into the slab for future direct supervision control stations – see Figure 24. The C and D Unit line of sight from housing control is challenging – direct supervision would provide for much better supervision of the dormitory inmates.



Figure 24— Male Housing Unit C future Direct Supervision control box (typical also of D Unit)

4. Housing Unit - Female
 - a. The Female Housing Unit is designated Unit E. It contains both 8 each secure cells and has direct access to a covered and exercise yard (within the building perimeter) and a small dormitory. The female dormitory unit also has direct access to the covered exercise yard. Unit access is via the main N/S corridor via a security sallyport.
 - b. Security Equipment - the Female housing cell sub-unit has security hollow metal doors and frames with pneumatic detention sliding door operators. The dormitory sub-unit also has security hollow metal doors and frames at dorm entries and exits and at view lites in the primary security walls. Intercoms and Paging stations/speakers/horns allow for verbal communication. IP-CCTV cameras monitor the dayroom spaces and exercise yards. Access to the unit is via a sallyport in which two interlocked doors must be passed. Under normal operations, only one

- door in a sallyport configuration can be opened at a time. Emergency override allows both doors to open simultaneously. The E Unit currently features direct supervision of the dormitory sub-unit, however, line of sight from housing control is challenging for the cells and exercise yards. The cells are behind and to the left of the unit officer and the exercise yard is directly behind the control post. Even CCTV view are difficult in the cell sub-unit since the cameras must look at the cell fronts from an oblique angle. Recommend that alternative control locations be explored or, at the least, investigate if additional cameras would improve the unit officer's line of sight.
5. Booking/Intake
 - a. Inmates enter the facility via a large vehicle sallyport. There are four roll-up doors in the sallyport which can accommodate two lanes of travel in the sallyport. From the vehicle sallyport is an entry to booking and from booking is an entry to intake. Booking and Intake are separated by a full security hollow metal glazed partition. All inmate accessible areas are equipped with security hollow metal doors and frames. There is one safety cell in the intake area. Release and Intake have a common path of travel to and from the vehicle sallyport. There is one cell dedicated to Female Intake at the rear of the intake area.
 - b. Security Equipment – the Booking/Intake area has security hollow metal doors and frames with pneumatic detention sliding and swing door operators/locks. Central Control has line of sight visibility into the Booking/Intake areas and Central Control operates the security functions for these areas. Intercoms and Paging stations/speakers/horns allow for verbal communication. IP-CCTV cameras monitor the vehicle sallyport, exterior approach and Booking/Intake. Internal access to Booking/Intake is via a single sliding door off the main N/S corridor. The orientation of central control faces North – away from Booking/Intake. Recommend the addition of a control workstation at Intake to shed some load from Central Control and to allow more efficient processing of inmates into and out of the facility.
 6. Magistrate's Office
 - a. The Magistrate's office is adjacent to both Booking/Intake and the Public Vestibule. The configuration of the space allows the Magistrate's staff to interact with detainees and the public without having direct contact with them.
 - b. Security Equipment – there is little security equipment in the Magistrate's office except for a small control station to operate the public side electric doors and intercom to allow for verbal communication. No recommendations for this area.
 7. Central Control
 - a. Central Control is located at the hub of the public lobby, magistrate's office, administration, intake/booking and the N/S main corridor.
 - b. Security Equipment - Central Control equipment is in good condition, with its three major systems having been upgraded in 2015.
 - i. The locking control system was upgraded by TYCO Simplex-Grinnell in 2015 from a single Touchscreen workstation to a modern 22" Touchscreen workstation with integrated IP-CCTV and intercom/paging.
 - ii. TYCO Simplex-Grinnell also installed a new Simplex 4100ES Fire Alarm System in 2015.
 - c. Recommendations – the Central Control officer must monitor activity and traffic almost 270 degrees around the post. This is very difficult to do well – especially since the central control post is oriented due north. Recommend that activities

- behind Central Control (Intake and Booking) be delegated to a control panel at the Intake counter by way of adding another control workstation at that post.
8. Kitchen/Laundry
 - a. The Kitchen and Laundry are centrally located near the loading dock entrance of the facility. The Kitchen is in exceptionally good condition, it is clean and obviously well maintained. Likewise, the Laundry is in good condition for its age.
 - b. Security Equipment – The kitchen and laundry do not have secure entrances from the E/W corridor and N/S corridor respectively. They are both monitored by IP-CCTV cameras and feature paging system speakers for communication. No recommendations for these spaces.
 9. Work Release Center
 - a. The Work Release dormitory on the SE side of the facility has been converted to use as an office for Transportation Officers, office for County SO Volunteers (VIPs) and for storage.
 - b. Security Equipment – since this space has not been used for security or detention purposes the only remaining security equipment are some IP-CCTV cameras and a few security hollow metal doors and frames with pneumatic security swing door locks. No recommendation for this area unless future plans are developed to re-purpose the space for facility support or housing.
 10. Security Electronics Equipment Room
 - a. The Security Electronics Equipment Room is centrally located on the main N/S corridor. It contains the vast majority of security equipment head end systems including
 - i. PLC Locking Control cabinets and relay boxes
 - ii. IP-CCTV system (except for the VMS system)
 - iii. Intercom and Paging System
 - iv. Uninterruptable Power Supply
 - v. Surge Protection Devices
 - vi. Pneumatic air system distribution manifold for local doors
 - b. Security Equipment – the security equipment which forms the basis of the security functions for the facility are found in this space. Each is discussed in detail in the systems sections of this report above. Please refer to that section for condition assessment and recommendations regarding security electronic systems.

END OF PHYSICAL AND ELECTRONIC SECURITY CONDITION ASSESSMENT

END OF CONDITION ASSESSMENT REPORT