Project Name: NV DMV East Sahara Service Center
Project Identification Number: NVB17013
Project Category: Built Architecture
Type of Project: Civic
Completion Date: December 19, 2016
Type of Construction: New Construction | Type II-B, Fully Sprinklered | LEED Silver Equivalent
Materials Used: Structural Brick, CMU, Steel, Metal Panels, and Glass
Building Area: 38,569 s.f.
Site Area: 9 acres
Construction Cost: $17,897,161.00

Overview
The Department of Motor Vehicles Service Centers are public service facilities that are characterized by the need to serve large numbers of customers on a daily basis. In addition to the number of customers served, the Nevada customer profile represents several challenges including: multiple languages, disproportionate number of first time customers, customers who bring families and young children, wait time per customer, and customers requiring multiple transactions per visit. Our primary considerations in designing this facility were intuitive customer flow, apparent access to services, visibility and safety of employees, as well as providing a comfortable place for all users.

Site Design Approach
The customers experience begins upon entering the 9 acre site which has been organized to provide clear vehicular flow that is intuitively understood, separates public functions from employee spaces, and allows the existing DMV facility to the east to remain fully operational during construction.

The primary site entrance maintains a strong relationship to the main entry to the DMV to provide a clear sense of destination. The building has been set back on the site purposefully in order to allow customers time to orient themselves before they need to make a decision. Oversized signage has been designed and position to assist in wayfinding efforts for motorists traveling on Sahara Avenue. The VIN station is not visible from the entry drive so a very clear and visible signage sequence is required to provide the necessary visual cues. Landscaped pedestrian paths have been provided at strategic locations in the public parking lot to aide in providing safe passage from the car to the entry, and provide an accessible means to the public way. The entry plaza has been designed to provide a means for organizing early morning queuing lines by utilizing benches and in-grade plantings. Landscaping has been selected to meet City of Las Vegas development codes and includes low maintenance native and adaptive species.

Site parking was designed to support daily customer volume rather than the governing code. There are 328 public parking spaces and 84 permanent staff parking spaces, with an additional 65 temporary staff parking spaces. The temporary parking spaces will become permanent in the next phase of the State of Nevada’s masterplan.
Building Design Approach

The Nevada DMV East Sahara Service Center is a 38,569 g.s.f. single story building with a high volume lobby space to accommodate 2,000+ visitors per day (400 visitors at any one time). Primary considerations in the design of the facility are customer flow, access to services, visibility and safety of employees, and providing a comfortable place for all users. The lobby is the centerpiece of the facility with 48 customer service desks, testing, and camera functions surrounding the space. Supervision of the lobby and customer service desks is maintained by supervisor offices that act as a backdrop to the service desks. All other back of house functions are organized behind the supervisors offices. These back of house functions include building services, office space, restrooms, and employee breakroom and patio. The southeast corner of the building houses Hearings which is somewhat separate from the DMV itself. The Hearings area houses clerical staff and three judges with a small lobby for waiting. DMV related court cases are tried in this space and several considerations were made for employee safety including bullet resistant walls and service window within the lobby, controlled access to the offices beyond the lobby, and high windows in the judge’s chambers utilizing the same daylight-diffusing sandwich panel glazing as the main lobby clerestory.

The solution to maintaining high levels of movement, clear visual access to signage and queuing displays was to position the main entrance at one end of the long axis of the lobby space. This positioning allows queuing lines to be separated from the main waiting space and out of the traffic of other functions such as Fleet Services, Occupational Business Licensing, and the Written and Drive Testing processes. In addition, upon entering the lobby space, the customer is able to quickly distinguish where the customer service windows are and how busy the facility is. Designing for this immediate understanding has been shown to reduce the angst and stress of the customer. This arrangement also allows the Hearings group to have a distinct entry separate from the main DMV entrance.

Many of the building walls have dedicated program spaces assigned to them, reducing the opportunity to provide natural light and views at ground level. Because views and natural light have also been shown to reduce stress and provide for a more comfortable space to wait and work in, natural lighting is being introduced into the space from high windows that follow the profile of the curved roofline. Curved trusses span the length of the lobby. The clear span keeps the floor clear of columns that could interrupt the line of sight and supervision of the lobby space.
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Overview
The Nevada DMV East Sahara Service Center has been designed to be equivalent to LEED Silver utilizing the LEED 2009 for New Construction rating system. Several strategies have been implemented to not only provide an energy efficient building, but also provide a pleasant space for employees and customers.

1. Displacement Ventilation System (Lobby)

Displacement ventilation systems provide distinct benefits of improved indoor air quality, superior acoustical performance, and reduced energy use. Displacement ventilation systems typically use a higher supply air temperature of 64°F to 68°F which greatly increases the potential for free cooling utilizing the outside air economizer. The Sahara DMV utilizes underground ductwork with diffusers mounted near floor level. The diffusers are integrated into casework within the lobby which also serves as a writing surface for customers to fill out paperwork. The air flows at a low velocity causing a thermal stratified space with vertical movement toward the return. The return air is integrated into the top of the soffit that surrounds the lobby and identifies the service counters.

2. Energy Management Control System

The building is controlled and monitored through a web-accessible building energy management control system. The system controls the chilled water plant, heating hot water plant, air handling units, dedicated fan-coil units, unit heaters, general exhaust fans, domestic hot water recirculating pumps, electrical distribution panels, as well as exterior and interior lighting.

3. Energy Reduction

- 24% overall energy reduction from base building requirements (ASHRAE 90.1-2010) by design. Actual performance has shown an even higher overall energy reduction
- Efficient light fixtures designed to be 16% better than the baseline
- Lobby lighting is controlled through photocells allowing the fixtures to automatically dim or turn off when the space is illuminated by daylight
- High efficiency air handling system utilizing fan-wall technology with an outside air economizer
- High efficiency VFD chillers and 94% efficient condensing type hot water boilers

4. Reduction in Water Use

24% reduction in water use in plumbing fixtures and 78% reduction utilizing water efficient landscaping when compared to baseline building requirements.

5. Other sustainable features to note:

- Priority parking provided for low-emitting and fuel efficient vehicles
- Project is located within a ½ mile of at least 10 basic services, has pedestrian access to Sahara Avenue, and is adjacent to two bus stops
- 60 mil PVC white membrane roof is utilized with a reflectance of 0.63 and emittance of 0.86 and an R-30 insulation value, exceeding code minimum
- Walls are insulated to R-10.5 and insulated exterior doors are utilized
- FSC wood utilized for finish carpentry and wood acoustical paneling
- Use of low emitting adhesives and sealants, paints and coatings, flooring systems, and composite wood products
- High performance, daylight-diffusing sandwich panel glazing at the clerestory with a U-value of 0.47 and a SHGC of 0.24
- Regional and materials with recycled content have been utilized
- Ductwork was sealed and protected during construction and an indoor air flush out was performed prior to occupancy

SUSTAINABLE DESIGN INTENT AND INNOVATION
Overview

Recognizing the need for the DMV to be constructed of highly durable, long lasting, and low maintenance materials, the building envelope has been designed as a load bearing masonry exterior wall system. The exterior masonry is insulated with 2” rigid insulation on z-furring channels. The low roof system consists of polyisocyanurate board insulation over metal deck. A minimum insulation value of R-20 was required, but based on the energy reduction strategies identified early in the design phase, R-30 has been utilized for all roof insulation. The roofing material is a high emissivity 60 mil PVC roof. The membrane laps over the CMU parapet and is concealed under a metal parapet cap. The roof slope is ½” per foot minimum. Fenestration in the masonry system consists of thermally broken storefront window frames with 1-inch insulated, low-e coated glazing.

Exterior Materials

Building material protection strategies were developed through discussion and review of intensely used customer areas. Split-faced CMU was used from finish grade to 4’-0” above finish floor to deter customers from leaning against the wall and scuffing it with their shoes. Honed CMU was utilized above 4’-0” and glazed CMU was also utilized for color. Structural brick was worked into the scheme in order to tie in to the campus. The existing Bradley building is constructed of brick and the National Guard building, while not part of the State’s campus, is also located on the block and also has a brick exterior. A clerestory storefront system with daylight-diffusing sandwich panels is used to illuminate the lobby space while clear glass is utilized at ground level to identify the entry and allow transparency from inside to outside. Metal panels are also utilized toward the back of the building to tie in the service areas consisting of the VIN inspection canopy, mechanical screens, and emissions testing building with drive through bays.

Interior Materials

Like the exterior materials, the interior materials need to be durable, long lasting, and low maintenance due to the volume of customers served daily. At the same time, the design team focused on creating a pleasant space for employees and customers. The existing facility had issues with poor acoustics, cleanliness of flooring, and durability of restroom finishes. The new facility solved the acoustic problem in the lobby by utilizing acoustic metal deck along with FSC certified wood acoustical wall panels. These panels are perforated with acoustical batts behind, which improves the quality of space from a sound perspective, as well as from an aesthetic perspective by bringing a sense of warmth into the main lobby. The floor in the lobby is ground and polished concrete. This material was chosen for multiple reasons, including its aesthetics and easy cleanability, which only requires a mop and bucket. It is also low maintenance, with the top sealer coat only needing to be reapplied every 5-8 years. The finishes in the restrooms were also a major concern, which were addressed by the design team via use of a resinous epoxy flooring with integral cove base and fiber reinforced laminate (FRL) panels with solid phenolic resin toilet partitions. Graffiti can easily be cleaned from the toilet partitions as well as FRL panels, which was the main concern in the restrooms. The design team was able to vary the color and size of the FRL panels to create a warmer, less sterile feel.

The remainder of the spaces outside of the public areas are finished simply in zero VOC paint, carpet with high recycled content and the ability to be recycled at the end of its life, as well as embossed sheet vinyl which is easily cleaned and masks scuffing. The sheet vinyl product is also GreenAir formulated and FloorScore certified.
Do I have to go to the DMV to renew my license this year?

The lines! The smell! The paperwork! The horror of it all!!!
DON'T FRET DEAR, THE SAHARA DMV IS NOT SO BAD...

...AT LEAST IT'S DAYLIT.

...ALRIGHT, I WOULD LIKE TO RE-TAKE MY PICTURE. THE LAST ONE WAS TERRIBLE!
**DETAIL SECTION**

**DISPLACEMENT DIFFUSER/COUNTER**

- Counter/HVAC Distribution - (6) Locations in Lobby
- 48” x 24” Displacement Diffuser - (4) Per Side
- Discharge Opening with Wire Mesh Screen
- Floor Level
- Air Supply from Underground Ductwork

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**EAST/WEST SECTION**

**DISPLACEMENT VENTILATION**

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**DESIGN STRATEGIES**
DAYLIGHTING STUDIES

LUX

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DEC 21 @ 9AM
MARCH 21 @ 9AM
JUNE 21 @ 9AM

DEC 21 @ 12PM
MARCH 21 @ 12PM
JUNE 21 @ 12PM

DEC 21 @ 3PM
MARCH 21 @ 3PM
JUNE 21 @ 3PM

EAST/WEST SECTION
DAYLIGHTING

DESIGN STRATEGIES
Energy Use Intensity
DMV Service Buildings in Southern Nevada

Energy Use Intensity (KBTU/ft²):
- DMV Henderson: 145.0 Site
- DMV North Decatur: 309.4 Source
- DMV Sahara: 351.3 Source
- DMV West Flamingo: 551 Site
- DMV Site: 148.8 Source
- DMV Site: 342.3 Source
The NV DMV is performing better than predicted during the design phase using energy modeling.
LIGHTING TIED TO DAYLIGHT SENSORS

ACOUSTIC METAL DECK

DAYLIGHT DIFFUSING SANDWICH PANEL GLAZING

FSC CERTIFIED WOOD ACOUSTICAL WALL PANELS

DISPLACEMENT VENTILATION SYSTEM

LOBBY
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<td>CUSTOMER PARKING</td>
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<td>3</td>
<td>EMPLOYEE PARKING</td>
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<td>4</td>
<td>DMV MAIN ENTRANCE</td>
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<td>5</td>
<td>PARALLEL PARKING COURSE</td>
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<tr>
<td>6</td>
<td>MOTORCYCLE TEST COURSE</td>
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<tr>
<td>7</td>
<td>EXISTING DMV (NOW DEMOLISHED)</td>
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<tr>
<td>8</td>
<td>EXISTING BRADLEY BUILDING</td>
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</tbody>
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**SITE PLAN**

- **ATLANTIC STREET**
- **SAHARA AVENUE**
Customer Circulation - Leaving Facility

- Patio
- Employee Break
- RR
- Admin
- Staff Dvlp.
- Mech
- Strg
- Conf.
- IT
- Supervisors
  - Fs Mgr
- Service Counters
- Vin
- Vin Customer Flow
- Drive Test
- Test
- Disp
- OBL
- Id/Cam
- Written Testing
- Amenities
- Lobby
- Hearing
- CED
- D
- T
- T
- N
- By
- To
- C
- M
- R
- A
- F
- I
- L
- P
- A
- S
- F
- I
- L

Public Parking

Customer Circulation - Leaving Facility
# DESCRIPTION
1. ENTRY
2. SELF SERVE KIOSKS
3. LOBBY/WAITING
4. CONCESSIONS
5. WRITTEN TESTING
6. CAMERA STATION
7. HEARINGS
8. MECHANICAL/ELECTRICAL
9. EMPLOYEE BREAK AREA
10. VIN INSPECTION
11. EMISSIONS BAY
Roger was right! The Sahara DMV wasn’t so scary...

Later that evening...

...and the daylight really made my driver’s license picture look swell!