Hardin Visitors Information Center
Hardin, MT – Programming & Preliminary Design

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OWNER

City of Hardin

406 N Cheyenne Avenue
Hardin, MT 53034

ARCHITECT

Cushing Terrell

13 N. 23rd Street
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Cushing Terrell

PROJECT OVERVIEW:

This Visitor Center Project serves as a welcoming threshold to the wonders of Big Horn County, a place where stories, landscapes, and cultures intertwine. It is both a gateway and a gathering place, celebrating the area's deep history, diverse people, and enduring connection to the land. Every element of its design reflects a spirit of belonging, curiosity, and pride of place.

The intent is to create a living archive and active hub, where visitors can orient themselves to the landscape, explore local heritage, and engage directly with the community. The center becomes more than an informational stop, it's a launchpad for exploration, an amplifier of local voices, and a celebration of everyday beauty in Big Horn County.

The Big Horn Visitor Center stands as a bridge between past and future, land and people, local and visitor. It honors the depth of history and culture while fostering new opportunities for connection, recreation, and growth. Rooted in place, open to all, it is the heart or spoke of the wheel for the grander Big Horn experience.

ARCHITECTURAL:

Project Overview

The proposed Visitors Information Center in Hardin, Montana will be phased to realize the overall project vision over time. This package summarizes the work to date as part of the preliminary concept design.

The project will occupy a city owner parcel of 2.28-acres. The result will be a 5,113 square foot facility including a main lobby, welcome desk, exhibit gallery, community / multi-purpose space, administrative offices, restrooms, storage and infrastructure rooms to accommodate mechanical, electrical, plumbing and technology services.

Design Intent

Durable materials will be utilized to allow flexibility to grow over time.   Concrete masonry units (CMU), metal panel siding, wood accents and glass storefront are planned for the building exterior.

Design elements in the building design are intended to evoke notions of the railroad, agrarian and native American culture. Interior and exterior exhibits will create opportunities to tell stories from Big Horn County history as well as develop spaces for new memories to be created.

See design deliverable for additional information.

Cost Control

The project will utilize grant funding for design and construction of the first phase. The funds currently available are $1,026,500. This will require some intentionality in designing the facility. An elongated building form is well suited to be added onto as additional funding is available. The site design also has flexibility to manage scope and deploy elements over time.

Our team has identified 3 potential paths allowing the initial phase to capitalized on the best impact related to dollars available.

- Option 01 – Building Focused
    - Install site related infrastructure focused on building functionality only. Walking paths and other design features would be held until later phases.
        - Scope could include the parking lot and sidewalks necessary to access the building safely (handicapped parking stalls). Curb, gutter and storm drainage included, but may consider a gravel parking lot.
    - Construction of the phase 01 building design would include restrooms, mechanical spaces, vestibule and small exhibit hall / main lobby.
- Option 02 – Site Focused
    - Develop the site to create outdoor gathering spaces, parking and associated site infrastructure. Civil and landscape would be the primary focus.
    - A pavilion structure could be developed utilizing the design intend of the future project. Due to limited soil barring capacities this option would be not include enclosed or conditioned program. The building out of that would be held for future phases.
- Option 03 – Hybrid

- Right size the priorities of each option seeking to find a balance between the two. Limit site development and landscape features to specific dollar amounts to retain as many dollars as possible for the building construction.
- Poor soil conditions are expected to result in larger than typical foundation costs. This will be validated once a Geotechnical Engineers has completed their assessment of the soils.

CIVIL:

Project Overview

The proposed Big Horn Visitor Center located in Hardin, Montana aims to serve as a gateway for tourism and local engagement. Located near the downtown corridor, the approximately 2.28-acre site currently has no existing buildings or infrastructure and is used by the City of Hardin to store excess materials. The project will transform this unimproved parcel to provide parking, pedestrian connectivity, and interpretive spaces. The site will be designed to facilitate efficient vehicle circulation with convenient ingress and egress from two sides of the property and will be integrated with the existing infrastructure to reduce conflicts and minimize impacts.

Site Constraints

Existing storm/irrigation ditches run along the northern boundary and flow along the proposed sidewalk walking paths and along the back of the visitor center. Mitigation strategies include analyzing the size and condition of the existing culvert on Vanzandt Road to ensure it is sized appropriately. The culvert will need to be extended from its current length to accommodate the proposed width of the approach off Vanzandt Road into the site. Topography is relatively flat with minor depressions requiring fill, which could be achieved with the current site stockpiles if the soil is deemed adequate for fill material. From the USGS web soil survey data, the site consists primarily of Kyle silty clay (65.2%) with 0–2% slopes and areas of saline land (34.8%). Kyle silty clay is poorly drained with slow permeability, which can lead to seasonal wetness and subgrade instability. Saline soils present challenges for vegetation growth and may cause corrosion of infrastructure if not properly managed. These conditions will require careful drainage planning and soil stabilization for pavement areas. A geotechnical investigation will be necessary to further evaluate soil properties for building foundations and stormwater facilities, ensuring appropriate design measures are implemented.

Stormwater Design and Assumptions

Design criteria follow Montana DEQ Circular DEQ-8 (2024). Rainfall intensities are based on NOAA Atlas 14 PFDS data for Hardin, Montana with a 5-minute time of concentration: 3.16 in/hr for 2-year storms, 5.72 in/hr for 10-year storms, and 10.0 in/hr for 100-year storms and a 2-year, 24-hour precipitation depth of 1.62 inches, and a 100-year, 24-hour precipitation depth of 3.95 inches. Soil infiltration rates are assumed between 0.5 and 1.5 in/hr with a safety factor of 2, pending field verification from a geotechnical report. Detention sizing follows DEQ-8 Standard Plan guidance: 4,526 ft^3 total storage, which mitigates the difference between the pre and post development volume change for the 2-year, 24-hourstorm. Given the clay soils on site with assumed minimal infiltration and the site design concept, a subsurface stormwater facility located below the parking area is suggested. Detention sizing is subject to change based off impervious cover onsite.

Utilities

Existing water and sewer mains are located along N Mitchell Avenue and will serve the site. Proposed connections will tie into these mains, with final sizing and configuration determined during design. Electrical and natural gas services will be extended from nearby infrastructure and routed underground to the building. Utility design will be closely integrated with Cushing Terrell to align with the building’s operational demands and layout.

Cost Estimate

The preliminary civil cost estimate for the Hardin Visitor Center is based on the schematic site design and anticipated scope of work. At this stage, costs are developed at a high-level using unit pricing and allowances for major site components, including grading, utilities, paving, and stormwater management. These figures are intended to provide an order-of-magnitude estimate for budgeting and planning purposes and will be refined as design progresses. Please see the table below and the assumptions:

Preliminary Engineer's Estimate

DESCRIPTION	UNIT	QUANTITY	UNIT PRICE		AMOUNT	
Site Grading	LS	1	$	20,000.00	$	20,000.00
Water Service	LF	137	$	100.00	$	13,700.00
Sewer Service	LF	251	$	100.00	$	25,100.00
Stormwater	LS	1	$	41,450.00	$	41,450.00
4" Thickness of Asphalt Concrete Pavement	SY	966	$	35.00	$	33,810.00
Concrete flatwork	SF	20,821	$	10.00	$	208,210.00
Concrete curb & gutter	LF	1,864	$	25.00	$	46,600.00
Construction Survey Staking	LS	1	$	5,000.00	$	5,000.00
Construction Administration	LS	1	$	5,000.00	$	5,000.00
				TOTAL ESTIMATED COST of CONSTRUCTION	**$**	**398,870.00**
				Construction Contingency (20%)	**$**	**79,774.00**
				TOTAL ENGINEER'S ESTIMATE	**$**	**478,644.00**

Item	Key Assumptions	Inclusions	Exclusions
Site Grading (LS)	Balance on-site cut/fill; strip/stockpile 6 in topsoil; re-spread topsoil in disturbed areas; standard moisture/compaction	Mass earthwork: topsoil strip/respread; fine grading for pavements/flatwork	Rock excavation; unsuitable/over-excavation; soil stabilization; erosion control BMPs; haul off; seeding
Water Service (LF)	Depth 6.5 ft min cover; open-cut trench; native backfill; one main tap by utility	Pipe, fittings, tracer wire, thrust blocks; trenching, bedding, backfill	Meter set by utility; road bores; permits/fees
Sewer Service (LF)	Depth per invert from MEP and existing sewer main tie-in	Pipe/fittings; trenching, bedding, backfill, and manhole	Deep cuts >12 ft; dewatering; manhole rebuilds; grease/oil interceptors; taps/cores by utility
Stormwater (LS)	Minor network only: two curb inlets and two manholes, piping, boulder pit, storm swale	Structures, grates, boulder pit fill material; trenching/backfill;	

Item	Key Assumptions	Inclusions	Exclusions
4 in Asphalt Pavement (SY)	No aggregate base included; standard tack and compaction; traffic striping by others	Mix design; placement/compaction; surface tolerance; joints; cleaning/tack	Aggregate base; proof-roll/remediation; patching beyond new work; striping/signage
Concrete Flatwork (SF)	Broom finish; sawcut joints 10–12 ft; subgrade prepared by grading; no aggregate base included	Place/finish; jointing; curing; dowels at tie-ins; ADA cross-slope ≤2% in walks	Aggregate base; colored/stamped concrete; handrails; detectable warnings
Concrete Curb & Gutter (LF)	Std 6 in curb & gutter; mix of forms and machine-placed; includes transitions at drives; tie to paving	Forms/placement; contraction joints; backfill; curb cut geometry at drives	Curb ramps/detectable warnings; integral sidewalk; specialty/architectural curbs
Construction Survey Staking (LS)	One mobilization; control/bench tie-in; set stakes for grading, utilities, paving, and curb; one re-stake cycle	Layout for civil work, as-built spot shots of utilities and rims	Building corners/structural; additional re-stakes;
Construction Administration (LS)	Office support: review submittals per discipline; respond to RFIs; 3 site visits (utility installation, grading/flatwork, punch list) and inspection reports	Submittal/RFI tracking; inspection reports; punch list	Fulltime RPR; material testing; additional meetings; record drawings beyond redlines
Contingency (20%)	Covers unknowns typical of preliminary design: minor quantity growth, utility conflicts, modest price variability	Applied to construction subtotal	Major scope adds

LANDSCAPE:

Design Intent

The overall concept for this site prioritizes accessibility, environmental stewardship, and community engagement. By blending structured spaces with natural elements, the design fosters a welcoming environment that encourages interaction, experiential learning, and relaxation.

Site Organization and Access

The vehicular entrances are positioned off N Mitchell Road and 10th street. The entrance off of N Mitchell will capture the main corridor of visitor traffic while the 10th street access allows an easier turn in for trailer, RVs, and trucks pulling boats. Both access points lead to a well-defined parking area that accommodates both standard, accessible spaces, and electric vehicle parking. The looped configuration ensures efficient traffic flow and easy drop-off access near the building entrance. Pedestrian pathways provided from the parking zone create safe and intuitive connections to site features, including a respite area for travelers and any pets in the northeast corner.

Natural Integration and Sustainability

The northern edge of the site features an existing irrigation ditch, which not only can enhance the aesthetics of the site but also supports stormwater management strategies. Native plantings throughout the site reinforce ecological resilience and reduce maintenance needs. Tree clusters along the perimeter provide screening from adjacent properties while creating a sense of enclosure and privacy.

Building Placement and Orientation

The visitor center building is strategically located along the site's central axis, oriented to maximize views of the intended site elements as well as creating an East facing entry, an important element to native American culture. This placement creates a strong visual anchor while maintaining proximity to parking and outdoor gathering spaces. The building’s adjacency to landscaped areas softens its edges and integrates it into the natural context. This also allows for several outdoor educational opportunities for the user to journey through the site.

Outdoor Spaces and Programming

As the user journeys through the site, outdoor elements include native planting that highlight medicinal, edible, and cultural plants paying homage to the native American roots of the area. Continuing around the building, a thoughtfully designed landscape will represent the Bighorn Canyon and river as well as popular history and stories like that of Big Metal. Passing to the west, representations of the areas agricultural history begin to appear in the landscape. Then to the south, a large circular plaza serves as a flexible gathering space for events, outdoor learning, or informal recreation. Rock circles and patterns in the concrete will accompany all circular plazas to integrate the native American history and culture. Nearby, a series of rectangular garden plots introduce opportunities for community gardening or educational programming. Monuments in the passive areas of this landscape represent and mimic that of the Battle of Little Bighorn and can provide another educational experience of the rich history of this land. These spaces are framed by tree plantings, offering shade and seasonal interest.

Outdoor Spaces and Programming

The design for this triangular site emphasizes connectivity, functionality, and harmony with the surrounding landscape while maximizing the area within constraints from existing elements and possible future easements. Whether a convenient spot for a traveler passing through and in need of respite, or a community gathering spot for multipurpose activities, the site will provide the user with a relaxing journey through history.

STRUCTURAL:

Foundation System

Based on project experience in the surrounding area, the subgrade for this building is likely to consist of expansive clays in approximately the upper 5 feet below grade, with underlain compressible clays down to approximately 35 feet where the soil is expected to transition to a poorly graded gravel with silt and sand composition. Bedrock is expected to be around 45 feet to 50 feet below grade. Due to the expected nature of the existing clay soils, this building will likely have a foundation system geotechnical recommendation of either deep foundations such as driven piles, or a mat slab foundation. Either way there will likely be required over-excavation underneath the entire building footprint, potentially upwards of 5 feet.

The expected loading of this structure is not anticipated to be great, so the mat slab foundation has potential to achieve the building needs from a soil bearing and settlement mitigation perspective, as well as being the cost-friendly option between the two likely foundation system recommendations. One key design element that will need to be addressed in the schematic and design deliverable portions of the project will be how to best design and build the foundation for the phased approach of this project. With the potential 3–5-foot over-excavation, there would be potential to undermine the mat slab of the previous phase(s) during construction of the later phase(s).

There will likely be a subgrade foundation drain around the perimeter of the building sub-excavation that will need to be tied into a sump pump system. There is also a potential requirement for a non-permeable layer around the building which could affect allowable landscaping directly adjacent to the building. The non-permeable layer might consist of a layer of woven fabric with a low permeability rate overlaid with a 12–18-inch layer of clay soil. Vegetation roots will likely need to be considered.

With the importance of the exterior hardscape and overall exterior landscaping for this building, the subgrade will be an important item to address outside of the building footprint as well. Due to the expected nature of the existing clay soil, there will be high potential for soil heave. This could cause cracking and uneven surfaces in the exterior pathways around the structure, as well as throughout the parking lot. It is reasonable to expect additional work in these areas in order to mitigate adverse soil impacts to the new construction. An example of the additional work would be over-excavation of the expansive clay soils underneath the critical exterior elements, and replacement of the soil with non-frost susceptible gravel.

Building Gravity System

Based on the proposed layout and aesthetic of the building, the gravity system will consist of structural steel with exposed architectural wood. The potential for multiple roof decks, clerestory windows, exterior wall ribbon windows, and non-uniform solid interior walls all point towards a post-and-beam-based structural system rather than a bearing wall/light-framed wood construction based structural system. The columns along both the exterior walls and the interior bearing lines will be hollow structural steel (HSS) members. The roof framing will consist of structural steel wide flange beams that will accommodate the multi-sloped roof. Exterior and interior walls will be framed with cold-formed steel metal studs. These studs will be more compatible with the structural steel frame and be able to accommodate the larger proposed windows of the building better than traditional stick framed wood walls. The roof deck will be a ribbed metal deck.

Depending on the final architectural aesthetic of the building, it is expected there will be exposed glued laminated beams throughout the building. Based on the gravity system described, the glued-laminated beams will be architectural only. Detailing between the steel and glued-laminated wood will be addressed in the schematic and design portions of the project but will result in a seamless finished look between the two materials. The exterior exposure of the glued-laminated beams will need to be addressed to prevent deterioration and degradation caused by the natural elements. There are options such as preservative treatments for the wood framing, end cap plates, as well as wood species that are not susceptible to water damage such as Alaskan Yellow Cedar. These options will be vetted by the design team to ensure a long-term solution for the structure.

There is a potential for the glued-laminated beams to double as the main structural roof framing for the building. This would save on overall material cost as it would alleviate the need for some of the wide-flanged structural steel members but is dependent on the building lateral system. Connections between the HSS columns and the glued-laminated beams could be detailed to be concealed or exposed and would be tailored to the architectural design of the building. See the Building Lateral System discussion for more regarding the requirements surrounding this approach.

Building Lateral System

The lateral system of this building will need to be able to be expanded upon as the various phases are constructed. At this conceptual design phase, the lateral system could consist of structural steel braced frames, structural steel moment frames and/or cold-formed steel shear walls sheathed with wood based structural panels (plywood or oriented-strand board). The difficulty of the lateral system will be in the building layout. The project location will have moderate design parameters from a wind and seismic perspective, which will allow common detailing practices in lieu of specialized detailing common in higher earthquake prone regions.

A potential lateral system for this structure could also be a cantilevered column system. The structure is an appropriate size to consider this approach. The benefit of using a cantilevered column system is three-fold for this project. The first reduction is laterally detailed connections, the second is there would be no required braces to architecturally maneuver around, the third would be the potential to use the architectural glued laminated beams as the main structural elements in the roof. With the cantilevered column system there are no frame elements, which means the roof members do not have to actively participate in the lateral system. The drawbacks to this approach are (1) a potential increase in design forces, (2) a potential for excessive building drifts and (3) larger columns.

Minimizing the number of lateral elements while still tying in the multiple roof decks and accommodating the exterior window layout will be the critical path for the lateral system. There is a potential to oversize the lateral elements in phase 1 so that the number of lateral elements in phase 2 is minimized. That approach may help both construction sequencing as well as reduce the overall number of lateral elements for the final overall structure. In the schematic and design phases consideration will be given to the interior wall development of the building, the window location development, and the roof deck orientation, as all will play into the lateral system moving forward into the construction document and actual construction phases of this project.

PLUMBING:

Scope Overview

Plumbing fixtures for the visitor information center will include water closets, lavatories, electric water coolers, sinks, and urinals. Based on experience on an adjacent site, foundation drainage is anticipated to be required.

Codes

The following codes form the basis of the plumbing design:

- 2021 Uniform Plumbing Code (UPC)

- 2021 International Energy Conservation Code (IECC)
- 2021 International Mechanical Code (IMC)
- 2021 International Building Code (IBC)

Domestic Water

The site is currently undeveloped, requiring a new domestic water service entrance. For planning purposes, the entrance is anticipated to be a two-inch line size to account for the fixture usage and water pressure availability. The service entrance will be made in the mechanical room areas and consist of a utility water meter and a single backflow preventer. The size of the meter and backflow preventer will be determined during design development based on the full build-out of fixtures, taking into consideration fixture type and water consumption. Piping materials will be copper with lead-free soldered joints and fittings, and low-lead content valves to comply with the UPC.

Domestic hot water will be generated by an electric storage water heater with circulation pump. The circulation pump will be controlled to operate during occupied hours only and also use a strap-on thermostat to start/stop based on piping temperature. Domestic hot water to public lavatories will be within 24 inches of the angle stop valve to comply with the IECC.

Domestic hot and cold water will be insulated with fiberglass insulation with all-service jacket to comply with the IECC and UPC. All cold water pipe size insulation will be one-inch thick. Hot water pipe insulation will range from one-inch thick to two-inches thick based on the size of the piping.

Overhead piping will be routed to be as unobtrusive as possible, grouped with sanitary vent piping serving remote fixtures.

Sanitary Waste and Vent

Sanitary waste and vent piping will be a combination of schedule 40 polyvinyl chloride (PVC) pipe and fittings and no-hub cast iron pipe and fittings. PVC pipe and fittings will be used below grade and stubbed up through the floor at each fixture; all above floor vent piping will be either no-hub cast iron piping (for use in return air plenums) or PVC (exposed to the space). Overhead piping will be routed to be as unobtrusive as possible, grouped with domestic water piping serving remote fixtures. A single vent through roof is expected to be used.

Plumbing Fixtures

Plumbing fixtures will be a mix of vitreous china and stainless steel. Restroom fixtures will be vitreous china, with stainless steel used for breakroom sinks and an electric water cooler. Water closets will be low-consumption at 1.28 gallons per flush (gpf) flush-valve type toilets. Urinals will be 0.5 gpf flush-valve fixtures, and public lavatories will be 0.5 gallons per minute (gpm) to comply with the UPC and IECC. The faucet for the breakroom sink will be a 1.5 gpm faucet.

An electric bi-level water cooler with bottle filler will be provided. The cooler will incorporate filtration to remove chlorine for taste and per- and polyfluoroalkyl substances.

Natural Gas Piping
Mechanical heating equipment is planned to be natural gas-fired. Piping for this system will be schedule 40 steel pipe with malleable iron threaded fittings and will be limited to the mechanical equipment room.

Foundation Drainage
Anticipated site conditions will require a perimeter foundation drain tile into an exterior sump to minimize building foundation and slab concerns. A duplex sump pump will discharge the ground water into the site civil storm water management system.

MECHANICAL:

Codes
The following codes form the basis of the plumbing design:

- 2021 International Energy Conservation Code (IECC)
- 2021 International Mechanical Code (IMC)
- 2021 International Building Code (IBC)
- 2021 International Fire Code (IFC)
- 2022 ASHRAE Standard 62.1 Acceptable Indoor Air Quality

Heating and Air Conditioning
The approximately 5,000 square foot facility will be served with (3) gas fired furnaces with integral evaporator cooling coils. Two Furnaces will be installed in construction phase one, and a third furnace is planned for installation during construction phase two. The furnaces will be in a centralized mechanical room. Condensing units will be ground mounted on the North side outside the mechanical room. Furnaces will be zoned based on the building orientation for thermal comfort. One 5-ton, 2,000 CFM gas furnace will serve the North side of the building from the storage room to the Women’s restroom. This furnace will be sized and ductwork prepared to handle the planned phase 2 and 3 North side rooms including the office, break room and meeting room. A second 2,000

CFM 5-ton gas furnace will be dedicated to the southeast portion of the building to serve the Phase one Atrium, Exhibit area and Main Lobby. Ductwork will be mostly concealed and run above the rooms on the north side of the Atrium with diffusers to throw air across the Atrium to the Gallery and Lobby. Low return grilles will be placed on the mechanical room wall to return air from the Atrium. A space in the mechanical room will be reserved in phase 1 for a future third furnace. This furnace will be planned for installation in phase two. This 5-ton furnace will serve the Atrium and Exhibit Gallery planned for phase two and phase three. This future furnace be ducted in a similar manner to the furnace serving the phase one gallery.

The furnaces will be a minimum of 90% efficient and the cooling system will have a minimum seasonal efficiency rating of 14 SEER. Ductwork will be galvanized sheet metal follow SMACNA Standards and humidification will be provided to maintain humidity requirements for the exhibit areas.

Ventilation

A 1000 CFM energy recovery ventilator (ERV) will be provided to supply pre-heated outside air to the furnace system for distribution throughout the building. The ventilator will pull its exhaust air from the restrooms and discharge through a louver on the North side of the building. The ERV will be ceiling hung in the mechanical room.

ELECTRICAL:

Codes and Standards:

The building Electrical systems will be designed in accordance with the following current building codes:

- 2021 IBC International Building Code
- 2021 IMC International Mechanical Code
- 2021 IFC International Fire Code
- 2021 IECC International Energy Conservation Code

The electrical design will also follow the latest adopted edition of the following guidelines and standards.

- NFPA 70 – National Electrical Code
- NFPA 72 – National Fire Alarm Signaling Code.

Power Distribution

Utility primary will be coordinated with Bighorn Power Cooperative in Hardin Cooperative to a pad mount transformer for serving the building. A new main panel and potential sub-panel will be installed in the building electrical room to serve the building electrical power and lighting loads. Power distribution will be installed to exterior power pedestals as needed for food trucks, events and RV hookups.

Lighting

LED lighting technology will be provided for all interior lighting, with more utilitarian fixtures in back of house type areas. Decorative type lighting fixtures, coordinated with the interiors package.

Interior lighting controls will utilize occupancy sensors, smart wall switches and smart wall dimmers to comply with energy code requirements and allow for flexibility for users to adjust levels as necessary. Other special use areas will utilize wall stations with lighting zones and time functions. Corridor areas will be designed with occupancy sensing and dim down to a set level when no occupants are present. OR rooms will be provided with sealed LED light fixtures designed for producing high light levels required in an OR room.

Per the NEC and IBC codes, Emergency lighting will be provided a lighting inverter for powering exit signage, emergency egress lighting and exterior building entrance/exits with emergency egress lighting. Lighting fixtures with battery backup will be provided where required per IBC and NEC codes (i.e., trauma, resuscitation, mechanical rooms, etc.).

LED exterior lighting will be provided for building entrances, building accent, pathways and parking lot areas. All exterior lighting will be designed with cut-off type optics to prevent glare and to uphold dark sky standards. Light levels will be designed at a minimum for area security and for security cameras to capture images adequately. Flagpole lighting will also be provided to accent the United States, SEARHC and Alaska State flags.

Exterior lighting controls will be designed for flexibility in control. All lighting will be turned on via photocell with potential for override and with flexibility to turn off certain portions of lighting at set times. In addition, parking lot area lighting will be designed with the capability for group-controlled dimming when no cars or occupants are present to save energy. Exterior light poles will be mounted on a concrete base, and poles will be equipped with a provision for a potential security camera with 1" conduit stub from the pole to a ground box adjacent the pole.

Fire Alarm and Detection

A Fire Alarm system will be designed for the building in accordance with the IFC and NFPA 72. This system will consist of a full coverage smoke detection system, speaker and visible notification throughout and monitoring of the fire sprinkler system. Smoke duct detection will be installed in return ducts of air handling equipment for shutdown or zone isolation during smoke conditions. Fire smoke dampers will be monitored and closed up upon detection of smoke. A main fire alarm panel is anticipated at the main entrance.

COMMUNICATIONS & AUDIOVISUAL:

Project Overview

The technology design for the Big Horn Visitor Center located in Hardin, Montana focuses on providing robust infrastructure to support security, communications, and audiovisual needs while allowing flexibility for future expansion. Systems will be integrated with architectural and MEP designs to ensure seamless coordination and functionality. Below are options for the city to consider for the building.

Structured Cabling and Connectivity

The backbone cabling will include voice, data, and CATV infrastructure:

- Voice: Category 3 UTP copper
- Data: OM4 multimode and OS2 single-mode fiber optic
- CATV: Hardline coaxial copper

Horizontal cabling will consist of Category 6 UTP for voice/data and RG-6 quad-shielded coaxial for CATV, with RG-11 used for longer runs. Wireless access points will be spaced for full coverage, supporting 802.11ac connectivity. Technology rooms will be sized for current and future needs, with proper clearances and cable management systems.

Termination and Grounding

Fiber, voice, and CATV backbones will terminate in designated panels and cabinets. Horizontal cabling will terminate on RJ-45 patch panels. A comprehensive grounding and bonding system will be installed in all technology rooms.

Audiovisual Systems

AV systems will be provided in common spaces per owner standards, with input locations coordinated during design.

Cost Estimate

The schematic cost for technology systems is estimated at $12.50 per square foot. This figure includes structured cabling, security systems, audiovisual components, and backbone infrastructure. The estimate is preliminary and will be refined as project objectives and system requirements are further defined during design development.

SECURITY:

This Schematic Design Narrative outlines the security strategy for the Big Horn Visitor Center. The design utilizes Crime Prevention Through Environmental Design (CPTED) principles to enhance natural surveillance, improve territorial reinforcement, and create safe, intuitively navigable public spaces. Special considerations include long response times, open-access interpretive landscape zones, high-value RV and trailer parking areas, and the need to support visitor comfort while mitigating security risks.

The following Good, Better, and Best tiered security plans provide scalable options that align with project goals, budget, and operational expectations. Each tier addresses controlled vehicular access, lighting, camera coverage, restroom CPTED requirements, and design considerations for critical outdoor features such as the irrigation ditch corridor and event spaces.

- BEST Security Plan (Option 1)
  - Controlled Vehicle Entrance
    - Single-controlled entry point with the following features
      - License Plate Reader (LPR) camera for vehicle tracking.

        - Curbed and narrowed approach creating a natural choke point.
        - Pedestrian-scale lighting on both sides of the entry lane.
        - Speed-mitigation such as raised table or S-curve geometry.
        - Celebrated entry feature providing natural access control.
- Parking Lots
    - Lighting
        - Full-cutoff LED lighting achieving 1 fc average-maintained illumination.
        - 20–25 ft poles to eliminate shadowing between vehicles.
        - ADA/EV Parking spaces with lighting.
        - Distribution aligned with camera visibility.
    - Cameras
        - Hybrid thermal-visible or varifocal cameras for full-lot coverage.
        - Analytics for loitering, intrusion, and tampering.
        - Camera poles mounted at 20–25 ft.
- RV/Boat/Trailer Parking
    - Lighting
        - 20–25 ft poles at perimeter corners.
        - Illumination minimizing shadows between tall vehicles.
        - Minimum 1 fc average-maintained lighting.
- Monitoring
    - Hybrid thermal-visible camera providing complete-lot visibility.
    - Analytics for loitering and vehicle tampering.
    - Pole height of 25–30 ft for unobstructed views.
    - Irrigation Ditch Corridor
    - Vegetation Thinning
        - Vegetation shall remain ≤ 30 inches.
        - Trees limbed to 7 ft to preserve sightlines.
        - Removal of dense shrubs to eliminate concealment.
    - Lighting
        - Pedestrian-scale fixtures along pathway edge.
        - Horizontal light distribution across ditch slopes.

      - Bollard-mounted lights in recessed or steep areas.
  - Restroom Design
    - General CPTED Requirements
      - Layout supports visibility and safety while preserving privacy.
      - Entrances use L-shaped or offset design to avoid direct line-of-sight.
      - No recessed alcoves or blind corners near entries.
    - Lighting
      - Uniform LED lighting eliminating interior shadowing.
      - Minimum 10 foot-candles at floor level.
      - Bright, low-glare lighting at entrances supporting corridor camera visibility.
    - Cameras (Exterior Only)
      - Overt cameras monitoring restroom entrances.
      - Full coverage in all lighting conditions.
      - Cameras not placed directly above restroom signage to preserve privacy.
    - Access Control and Hardware
      - Emergency access hardware for staff.
      - Occupancy indicators on gender-neutral restrooms.
      - Anti-vandal hardware and tamper-resistant fasteners.
    - Interior Layout & Fixtures
      - Minimum 12-inch stall bottom gap for emergency checks.
      - Sinks partially visible from entry threshold (without exposing stalls).
      - Vandal-resistant soap dispensers, dryers, and fixtures.
- BETTER Security Plan (Option 2)
  - Controlled Vehicle Entrance
    - Single entry without LPR integration.
    - Standard lighting at vehicle approach.
    - Wayfinding provided by signage or art installation.
  - Parking Lots
    - Lighting
      - Standard LED illumination.

            - Reduced pole count compared to Best option.
        - Cameras
            - Standard varifocal cameras.
            - Monitoring without analytics.
    - RV/Boat/Trailer Parking
        - Lighting
            - Standard lot lighting with reduced uniformity.
            - Lighting primarily along path-to-entry areas.
        - Monitoring
            - One or two cameras covering entrances/exits.
            - Basic NVR recording.
    - Irrigation Ditch Corridor
        - Basic vegetation pruning near walkways.
        - Limited lighting near high-traffic areas.
    - Restroom Design
        - Basic CPTED layout maintaining clear entry visibility.
        - Standard LED lighting with minimal shadowing.
        - Exterior corridor camera coverage.
        - Standard commercial-grade hardware.
        - Vandal-resistant fixtures where feasible.

- GOOD Security Plan (Baseline)
    - Controlled Vehicle Entrance
        - Single vehicular entry defined by curbing and signage.
        - No monitoring or speed-control elements.
    - Parking Lots
        - Lighting
            - Basic LED poles at perimeter.
            - Lighting primarily at main entry approach.
        - Cameras
            - Fixed camera observing lot entry.
            - Limited building-mounted cameras.
    - RV/Boat/Trailer Parking
        - Minimal lighting.

        - Cameras strategically placed in high traffic areas
    - Irrigation Ditch Corridor
        - Basic vegetation maintenance.
        - No dedicated lighting included.
    - Restroom Design
        - Standard layout with basic CPTED considerations.
        - Standard lighting at entry only.
        - Dedicated camera coverage at high traffic areas.
        - Standard commercial fixtures and hardware.

The Big Horn County Visitor Center is envisioned as a safe, welcoming, and accessible destination for residents, visitors, and travelers. This Security Schematic Design Narrative applies Crime Prevention Through Environmental Design (CPTED) principles to strengthen natural surveillance, improve visibility, and support intuitive wayfinding throughout the site while maintaining the aesthetic and cultural character of the campus. The tiered Good, Better, and Best security options provide scalable strategies for lighting, surveillance, access control, and restroom design, as well as focused recommendations for unique areas such as the irrigation corridor and RV/boat/trailer parking. These recommendations are designed to enhance safety, reduce vulnerabilities, and ensure the facility operates efficiently and confidently as a valued gateway to the region.