

MAPS 4

PROJECT M4-NA010 MAPS 4 ANIMAL SHELTER

PRELIMINARY REPORT
JANUARY 2024



THE CITY OF OKLAHOMA CITY

APPROVAL SHEET

PROJECT: M4-NA010
MAPS 4 ANIMAL SHELTER

Prepared by

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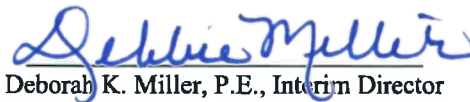


Todd Edmonds
Recommended for Approval





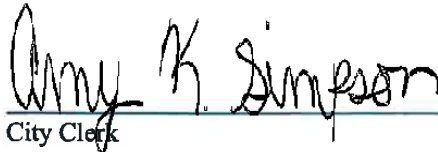
David E. Todd, P.E.
Program Manager



Deborah K. Miller, P.E., Interim Director
Public Works/Interim City Engineer

APPROVED by the Council of the City of Oklahoma City this 16TH day of JANUARY, 2024.

ATTEST:


City Clerk




Mayor

PREPARED BY:



CONNOLLY
ARCHITECTS & CONSULTANTS



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I. EXECUTIVE SUMMARY

Project Description

The Oklahoma City Animal Shelter has operated at 2811 SE 29th Street since 2001 and has significantly outgrown the facility. On January 16th, 2023, the City of Oklahoma City City council voted to commission HSEarchitects as the Architect of Record for the new MAPS 4 Animal Shelter project. The HSEarchitects-led design team includes Connolly Architects & Consultants as the shelter architect. A new facility will be constructed on the current property while the existing facility remains operational. This new facility will include larger, more comfortable and inviting common areas for the public, dedicated workspace, and meeting areas for animal control officers, larger facilities for veterinary and lab services, and larger, more durable animal holding areas that are public friendly. A new large animal barn will also be constructed for livestock. The Animal Shelter is making great strides in reducing the number of animals that are euthanized. The current live release rate is approaching 84 percent, and the goal is a 90 percent live release rate for the animals cared for by the Animal Shelter. This new facility will be designed to help reach this goal.

Site Selection

The existing Animal Shelter site is on the edge of Oklahoma City and on the border of Del City. The existing 47,000 square foot facility is on the southwest corner of the fourteen-acre city-owned property bounded by East Grant Boulevard, SE 29th Street and South Bryant Avenue. The new 68,076 square foot two-story building and 2,850 square foot barn will be located north of the current facility. The new project will be built on the existing site without interrupting the existing facility's operations. This became a considerable challenge when coupled with fitting the new building on a site with a significant change in elevation. In addition to the existing Animal Shelter facility the site also has an existing pet cemetery, Oklahoma Humane Society building, and Oklahoma City Police building that are all to remain. After several schemes were studied, a final layout was presented to and approved by the Neighborhoods Subcommittee and Citizens Advisory Board.

Project Schedule

Pending approval of this Preliminary Report in January 2024 and receipt of authorization to proceed with Final Plans and Specifications, the design will continue until the Final Plans are approved and bidding to occur in the Summer of 2024. This will enable construction to commence in the 3rd Quarter of 2024. Construction is estimated to last 18 months for a two-phase project: Phase 1) Demolition of the existing barn, construction of the new Maps 4 Animal Shelter building and its public parking and Phase 2) demolition of the existing facility, construction of the new barn, new paddocks, and new staff/fleet parking.

Preliminary Project Schedule

Task		Completion Date
Task 1	Preliminary Report Services	November 2023
	Task 1 City Council Approval	January 2024
Task 2	Final Plan Services	May 2024
	Task 2 City Council Approval	June 2024
Task 3	Bidding Services	August 2024
Task 4	Construction Administration Services	September 2024 - February 2026
Task 5	As-Built Drawing Services	March 2026



Project Budget

MAPS 4 Project Budget (per October 2022 Revisions)	
Art	\$342,600
Construction/FF&E	\$31,967,800
Contingency	\$3,178,500
Design/Test/Administration	\$6,891,503
Total	\$42,380,403

Task 1 Cost Estimate Summary

Based on the detailed estimate prepared by Pre Construction Services, Inc. for Task 1 completed on November 30, 2023. This estimate represents the projected cost to construct the current design of the project as described in this report, using current construction cost data for the local market.

PRELIMINARY COST ESTIMATE	
Substructures	\$1,574,670
Shell	\$7,929,931
Interiors	\$3,916,137
Services	\$9,817,263
Equipment & Furnishings	\$2,204,258
Special Construction & Demolition	\$270,529
Building Sitework	\$3,411,792
Grand Total for Base Bid	\$30,939,377

Refer to appendix for detailed cost estimate.

II. EVALUATION

Oklahoma City Animal Shelter mission is to promote and protect the health, safety and welfare of pets and people in OKC.

Animal Shelter Goals and Objectives

To provide OKC with quality animal adoption, animal control, lost and found, pet surrender, control and animal welfare education. These services are provided while upholding and enforcing city, state and federal Animal Shelter's governing animal welfare.

The Animal Shelter has a sheltering agreements with Del City, Valley Brook, Nichols Hills, and Tinker Air Force Base and are expected to continue. MAPS 4 Animal Shelter also has a memorandum of understanding with the Oklahoma Humane Society who has a building located on the property that will remain.

Strategic Initiatives:

1. Provide every animal the best opportunity to be reunited with its owner, or to be adopted, fostered, or rescued.
2. Provide every animal entering the OKC Animal Shelter with the best care possible while determining the most favorable disposition for the animal.
3. Educate the public about responsible pet care and ownership.
4. Protect residents of OKC from sick, vicious or injured animals.
5. Protect residents of OKC from zoonotic diseases such as rabies.
6. Protect, by either enforcement or education, animals within OKC from cruelty and neglect.
7. Enforce OKC's animal ordinances while balancing flexibility and ethical practices.
8. Foster relationships with the community, local veterinarians and partnering agencies.

Implementation Programs:

1. Proactive efforts to reunite owned animals with their owners, including taking them home.
2. Enforcement of ordinances through education before citation.
3. Continuing efforts to find an animal placement, regardless of timeframe, until resources are exhausted.
4. Animal enrichment, prioritizing mental health as much as physical health.

Staff Support

In pursuit of the mission and initiatives identified above, the Animal Shelter is currently staffed by 60 employees and volunteer support totaling 10,000 hours each year. The staff includes a superintendent, three supervisors, three levels of animal welfare officers, an office assistant, a veterinarian, and a veterinarian assistant.

This combination of staff, students and volunteers manages to meet the needs of the Animal Shelter's current program goals. The staff is stretched thin during seasonal demands, hoarding cases or when staff vacancies or student and volunteer shortages occur.



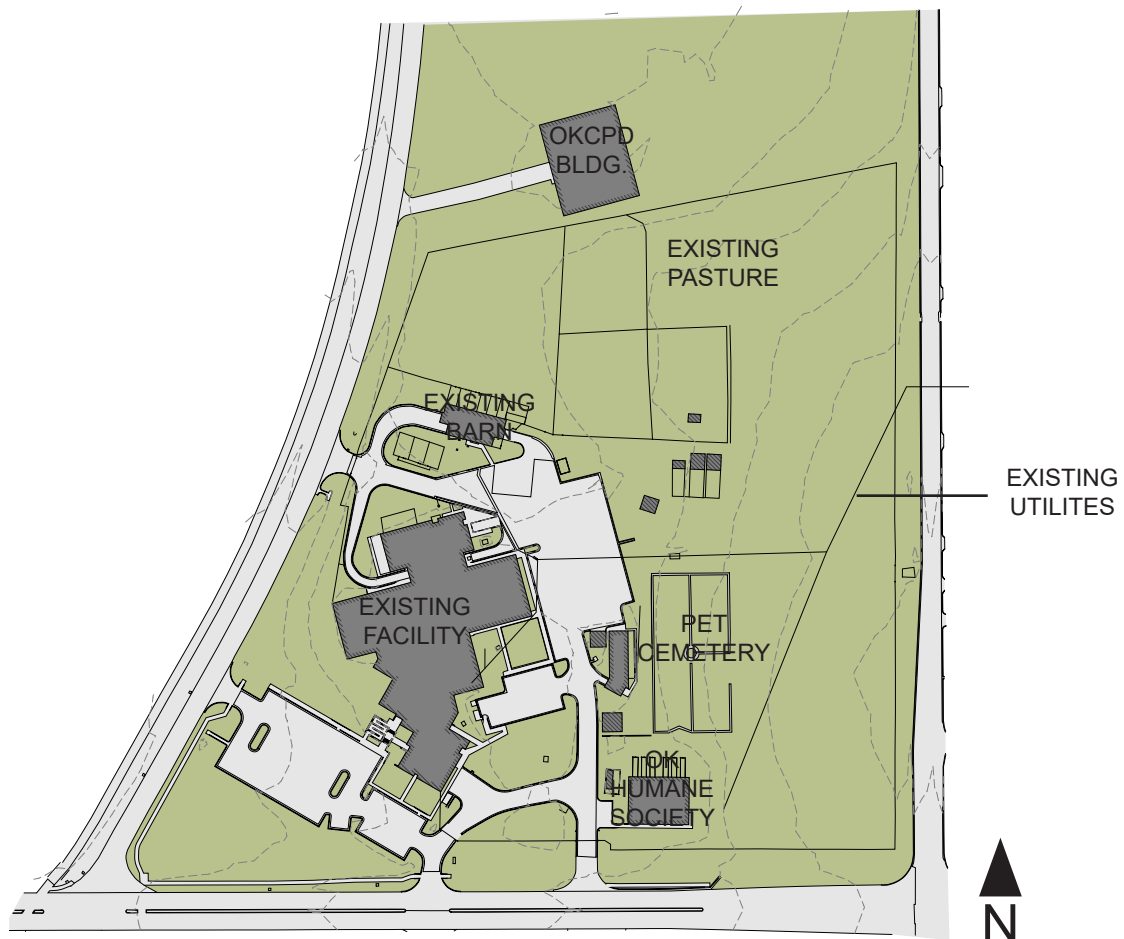
Program Expansion

While the stated mission and strategic initiatives of the Animal Shelter will continue to apply as guiding principles, in the future, programs for implementing them will need to grow as the Animal Shelter's impact in the community increases. The Animal Shelter's top priority for effecting this impact is to increase efforts to educate, encourage the community to embrace proactive pet healthcare and identification. The resulting enhanced public Animal Shelter will ensure the continued decrease of animal intake, thereby benefiting the health, safety, and welfare of animals and citizens alike.

To advance its goal for public education, the Animal Shelter requires a large, versatile space in which to do so. Such a space would also fill the need for student education, volunteer and foster orientation, staff meetings and training, Animal Shelter Advisory Committee, and subcommittee meetings.

Finally, to realize the ambitious goal of reuniting, adopting, fostering, or rescuing every animal brought to it (84% live release rate in 2022), Animal Shelter needs a new facility that reduces or eliminates the need to euthanize animals for space. This will require not only sufficient habitat capacities, but effective operations as well.

Site



The current site of the Animal Shelter is approximately 10 acres. It includes public parking to the south with staff and agency vehicle parking to the east. There is a pet cemetery located in the center of the property. There is also a drive-through horse barn and several livestock paddocks.

II. EVALUATION

Building Size

The new Animal Shelter building is 68,076 square feet not including the barn.

To achieve their current program goals and objectives, as well as meet the future needs of the community, the Animal Shelter will need a facility large enough to accommodate peak levels of animal intake, as well as spaces appropriately sized and organized to facilitate their individual functions.

Animal Habitat Quantity

OKLAHOMA CITY ANIMAL SHELTER			
ANIMAL HABITATS			
ANIMAL	EXISTING	NEW	DECREASE/INCREASE
DOG OBSERVATION	67	128	61
DOG SICK & INJURED	20	28	8
DOG STRAY	117	315	198
DOG ADOPTION	42	99	57
DOG SUBTOTAL	246	570	324
CAT ISOLATION	12	16	4
CAT SICK & INJURED	24	64	40
CAT STRAY	134	232	98
CAT ADOPTION	40	40	0
CAT SUBTOTAL	210	352	142
FERAL CAT	9	16	7
EXOTICS	4	8	4
HORSE BARN STALLS	6	6	0
TOTAL HABITATS	475	952	477

The current number of habitats is inadequate to meet the Animal Shelter's needs and the habitats are smaller than what is prescribed as appropriate by Animal Shelter Veterinarian's Shelter Design Guidelines. New habitats meet or exceed animal shelter veterinarian's shelter design guidelines. Overall dog kennel area increase is 32% and cat habitat increase is 55% in the new facility.

Materials

In order to maximize the efficient operation, aesthetic and experiential appeal, and longevity of a new facility, materials should be chosen primarily for their durability and maintainability. Sturdy, nonporous finishes last longer and are easier to clean than less robust, more absorbent materials, and can minimize the extraordinary expense of properly maintaining a shelter. Also, the fact that these materials will last significantly longer means that their potentially higher initial cost will be offset by a lower life-cycle cost, making them a greater value in the long term.

Dog habitat areas have an even greater need for durable and easily maintained materials than the balance of an animal care facility. Not only must they endure the wear and tear of their canine inhabitants, but they are regularly washed down, and have the potential to absorb undesirable odors if porous materials are chosen. Consequently, heavy-duty, nonporous, waterproof finishes such as epoxy painted concrete masonry unit (CMU) and resilient flooring are the materials of choice for kennel areas.

Another consideration for material selection, especially in public areas, is aesthetic appeal. Warm, non-institutional colors and materials will help create a vibrant atmosphere conducive to a positive experience for visitors and staff alike, which will ultimately lead to increased adoptions.



Mechanical, Electrical and Plumbing Systems

Due to the potential for pungent odors and airborne disease, animal care facilities require particularly robust mechanical systems. Maintainability and reliability are critical concerns in ensuring consistent and effective operation of these systems, so the design and installation of all mechanical equipment and components should allow for easy removal, replacement, and maintenance. Each habitat area should have its own separate HVAC zone to minimize the spread of disease and odor. Animals can benefit from the introduction of fresh air where possible by screened porches for cats or overhead doors in dog habitat areas.

Electrical systems must be designed to anticipate all operational needs of a new facility. Outlets should be provided throughout the building for cleaning, maintenance, computers, appliances, and equipment, and should be especially concentrated in staff work areas. In addition, exterior electrical outlets with covers and locks should be provided for the care of the grounds. Data outlets should be provided where there may be a work area or computer, and other low voltage building system wiring such as security cameras, fire alarms, etc. should be planned for as well. In terms of lighting, an even and appealing mixture of natural and artificial light will create an interior environment that highlights the animals and promotes a feeling of openness. Exterior lighting should be efficient LED to promote security, accessibility and recognition of the site while minimizing light pollution.

Plumbing systems are another aspect of animal care facilities with unique requirements. Dog habitat areas need individual floor drains for each kennel, ample plumbing cleanouts, wall-mounted hose bibs or wire tracks for easy cleaning, and a flush sink to facilitate the disposal of animal waste. Floor drains should be placed in most animal and animal support rooms as well as all restrooms. Plumbing to accommodate commercial washers and dryers should be included in order to handle the high volume of laundry done on a continuous basis.

Sound Attenuation

A significant concern for animal care facilities, especially in canine areas, is the potential for excessive noise levels. Sound attenuation will help minimize stress levels and auditory damage to animals, staff, and the public, making the facility a more positive environment that promotes both adoptions and the wellbeing of all occupants. The hard, smooth surfaces required for long term durability and maintainability tend to reflect sound, so surfaces that are not subject to regular contact and cleaning such as ceilings and walls above kennel level should be designed to alleviate noise levels. This can be accomplished with sound attenuating materials such as acoustic plaster, wood fiber acoustic panels or acoustic ceiling tiles. In addition, sound attenuating batts in walls and above ceilings will help insulate noisy areas from the rest of the building.

II. EVALUATION

Animal Habitat Qualities

A visitors' perception of a potential pet is the fundamental experience of an effective adoption facility and should be crafted accordingly. Adoption habitats should be in a positive, open environment with high visibility and abundant natural light. Clearly separating canine and feline habitats will allow visitors to easily find their desired species and will help minimize the stress on animals from being in an unfamiliar and restrictive environment.

Displaying animals behind clear glass panels not only enhances visibility, but limits physical contact between animals and the public, thereby reducing risks to animal and public safety, the potential for the public to spread disease between animals, and the need for staff supervision. Also, displaying animals behind glass encourages adoptions by conferring a higher perceived value to the animals, similar to a glass retail display. Conventional cages or wire mesh/chain link enclosures have the opposite effect, suggesting a sense of incarceration.

Full time animal habitats can be supplemented with individual or communal display and enrichment areas. This serves the dual purpose of enhancing the animal's health and wellbeing through activity and engagement and allowing visitors to see the animals in a more dynamic context.

Animal habitats should be organized in a way that promotes functional flow as they transition between different types of habitat, from intake to adoption. This not only facilitates staff operations, but it also minimizes the stress that moving animals through a facility can cause.

Public and Staff Space

The public experience of an animal care and adoption facility will influence adoption rates and should consequently be managed very deliberately. This experience begins with the first view of the facility from the street, so visual interest or "curb appeal" should be created by the building and site elements most visible from this direction. The main public entrance to the site and building should be obvious, contributing to intuitive wayfinding. Although the lobby and adoption areas will be most prominent, other public areas should be easy to find as well. Designated spaces for the public to interact with potential adoptees, including both interior and exterior "get acquainted" areas, will not only serve an important function in the adoption process, but provide an opportunity for other visitors to see animals in a more dynamic context than the adoption habitats and encourage them to get acquainted with an animal themselves.

Staff areas and "backstage" functions should be visually and physically screened from public areas. This will not only help craft the public experience but will minimize staff interruptions and promote operational efficiency. Backstage areas should be designed with sufficient space and organized to support staff workflows.



Disaster Relief

Sizing an animal care facility's habitat capacity for a worst-case scenario would lead to unnecessary expense, both in initial construction and ongoing maintenance, and create terrible inefficiency, leaving numerous habitats unused much of the time. Instead, large, flexible spaces should be provided to accommodate extraordinary, short-term spikes in intake. These spaces can easily be used for other purposes during normal operations.

Expansion Capability

The trend in the United States animal welfare is that the general public is slowly becoming more responsible about their companion pets which has led to declining rates of impounding. This is particularly true of communities with four responses to their pet populations:

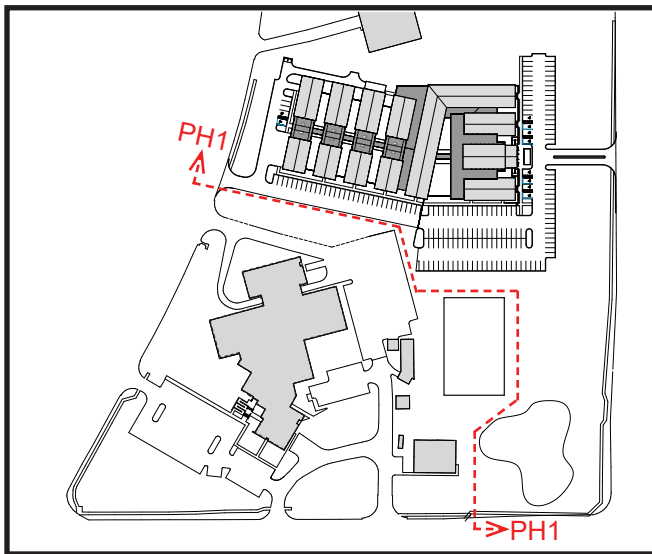
1. Enforcement of ordinances
2. An animal control agency that is visible in the community
3. Active low cost/no cost spay and neuter programs
4. Education programs

Communities with the four outlined responses is enough to offset the single digit population growth percentage of most communities. Consequently, a correctly sized facility like the MAPS 4 Animal Shelter will never need to be expanded.

III. PROGRAMMING

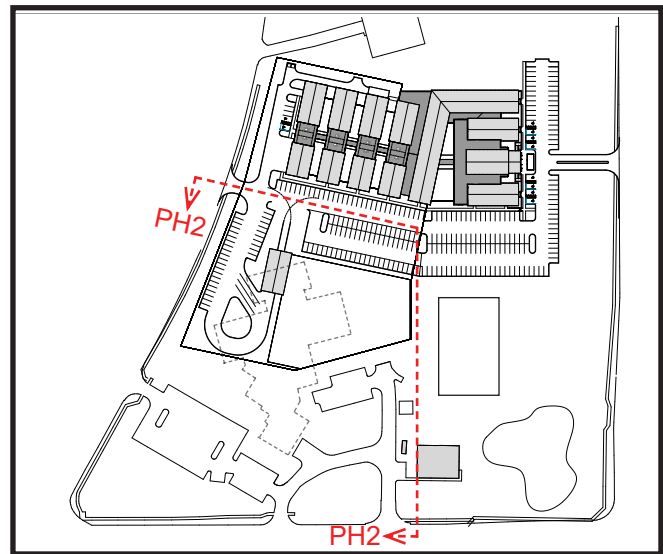
OKLAHOMA CITY ANIMAL SHELTER				PUBLIC ACCESS
EXISTING AND NEW SQUARE FOOTAGE PROGRAM				STAFF ONLY
		NET SQUARE FOOTAGE (SF)		
AREAS	SPACES	EXISTING	NEW	INCREASE
ADMINISTRATION	CONFERENCE W/ STORAGE	1,913	2418	505
	RESTROOMS	1277	1157	-120
	VOLUNTEER CORRINATORS	0	935	935
	OPEN OFFICES	0	284	284
	OFFICES	1,276	1863	587
	COPY/FILES	94	244	150
	BREAKROOM	375	657	282
	CATERING	0	140	140
	SUBTOTAL	4,935	7,823	2,888
CLINIC	PRE-OPERATION	343	529	186
	SURGERY	470	734	264
	POST-OPERATION	319	945	626
	DRUGS	60	25	-35
	READY ROOM	323	140	-183
	CAT SICK	152	265	113
	CAT INJURED	145	264	119
	DOG SICK (INFECTED & NON-INFECTED)	413	1,333	920
	EUTHANASIA & HOLDING	589	736	147
	REFRIGERATOR & FREEZER	236	164	-72
	STORAGE	0	214	214
	OXYGEN	0	85	85
	EXAM	265	223	-42
	XRAY	0	156	156
	LABORATORY/TREATMENT	300	813	513
	PHARMACY	224	90	-134
	VETERINARIAN OFFICE	301	110	-191
	LOCKERS	0	105	105
	OFFICES	181	315	134
	LAUNDRY	145	185	40
	SUBTOTAL	4,466	7,431	2,965
INTAKE	INTAKE OFFICES	0	388	388
	INTAKE EXAM	0	287	287
	CAT ISOLATION	169	183	14
	CAT STRAY	168	1587	1419
	CAT HOLDING	821	300	-521
	CAT WORKROOM	0	440	440
	CAT STORAGE/LAUNDRY	97	152	55
	WILD CARE	0	51	51
	DOG LARGE & SMALL STRAY	7,562	11827	4,265
	DOG HOLDING	418	1050	632
	FIELD EXAM	0	205	205
	FIELD INTAKE	0	256	256
	DOG LAUNDRY	0	450	450
	DOG WASHROOM	216	267	51
	SUBTOTAL	11,488	19,888	8,400
ADOPTION	LOBBY/RECEPTION	1656	4602	2946
	ADOPTION SUPERVISOR	0	104	104
	CAT ADOPTION/GET AQUAINTED	595	596	1
	EXOTICS	150	50	-100
	PUPPY PLAY	681	0	-681
	DOG GET AQUAINTED	245	240	-5
	STORAGE	0	70	70
	DOG PRE-ADOPT	3,140	0	-3,140
	DOG ADOPTION	3,407	4,966	1,559
	DOG WASHROOM	187	25	-162
	LAUNDRY	0	140	140
	SUBTOTAL	10,061	10,793	732
ANIMAL CONTROL	SALLY PORT	1,573	2,701	1,128
	DISPATCH	318	1174	856
	DOG LARGE OBSERVATION	2,901	2609	-292
	WASHROOM	50	50	0
	SUBTOTAL	4,842	6,534	1,692
BUILDING SUPPORT	STORAGE BUILDING	2,037	2,445	408
	IT/ELEC.	0	125	125
	SUBTOTAL	2,037	2,570	533
MAIN BUILDING	SUBTOTALS	35,729	52,469	16,677
	CIRCULATION, MECH, JAN	7,765	10,096	2,331
	SUBTOTAL	43,494	62,565	19,008
HORSES, LIVESTOCK, & STORAGE	BARN STALLS, DRIVE-THRU, VET STATION	2,150	2,004	-146
	BARN RESTROOM	50	64	14
	POULTRY	95	142	47
	BARN STORAGE ROOMS	325	426	101
	SUBTOTAL	2,620	2,636	16
TOTALS	MAIN BUILDING	43,494	62,565	19,008
	BARN	2,620	2,636	16
	CAMPUS GRAND TOTAL	46,114	65,201	19,024

IV. DESIGN



Phase 1:

Phase 1 includes demolition of the existing barn and pasture, and the construction of the main building, public parking, and a portion of employee parking. The existing facility will remain operational during selective demolition and construction of phase 1.



Phase 2:

Phase 2 includes the demolition of the existing facility and fleet parking, and construction of the new barn, pasture, and fleet parking. Select existing parking is proposed to remain as overflow for the animal shelter and humane society.

Preliminary Plant Palette



COLOR GUARD
YUCCA



MEXICAN FEATHER
GRASS



'BLONDE AMBI-
TION' BLUE GRAMA



SHENENDOAH
SWITCH GRASS



RUSSIAN SAGE



'BLUE ICE'
ARIZONA CYPRESS



'AERYN' TRIDENT
MAPLE



CRAPEMYRTLE
CULTIVARS



LOBLOLLY PINE



SHUMARD OAK





IV. DESIGN

First Floor Plan

The Animal Shelter operates in three distinct capacities: clinic, intake, and adoption. A separate meeting space has been requested for use outside Animal Shelter hours. Separate identifiable entrances were created for each of these to prevent the undesirable handoff of animals, as well as control traffic within the new building.

The large kennel rooms that are existing are not ideal for maintaining canine health or comfort. Instead, smaller kennel rooms with fewer kennels are proposed, thus limiting the spread of infectious disease throughout the facility and reducing noise level in each kennel room.

The kennel rooms cascade the natural slope of the site to achieve desirable grades for parking and circulation. Large retaining walls would be required without these cascading kennel rooms. The space between the kennels will be used as outdoor play yards viewable from the interior for safety while also providing desirable natural light.

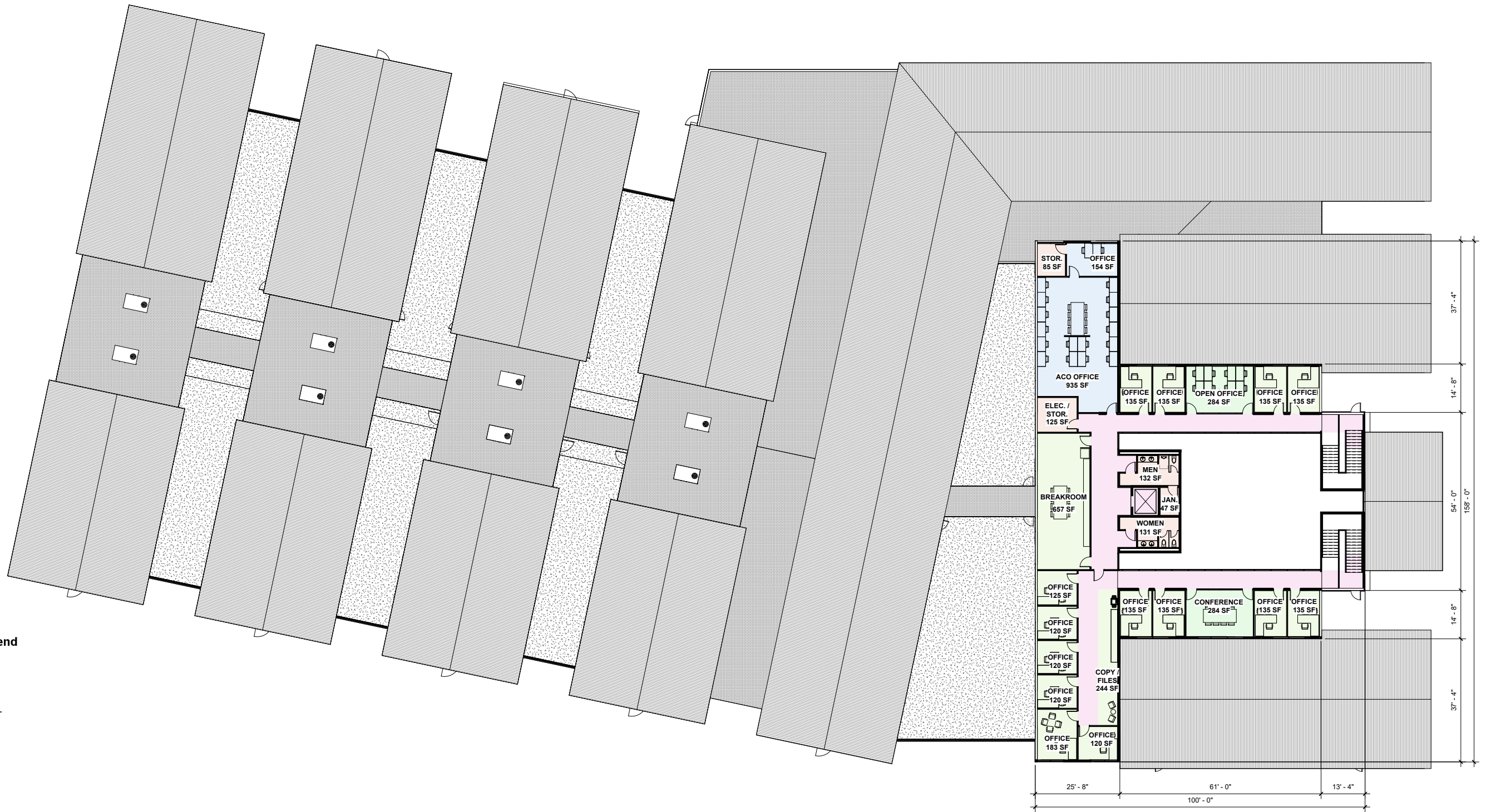


IV. DESIGN

Second Floor Plan

Administration spaces were elevated to a second floor due to limited developable site area, but also to deter public from non-public spaces. The administration spaces wrap an atrium overlooking the adoption lobby on the first floor and provide views to the site as a whole. This improves safety, security, and efficacy of the staff, patrons, and animals.





Department Legend

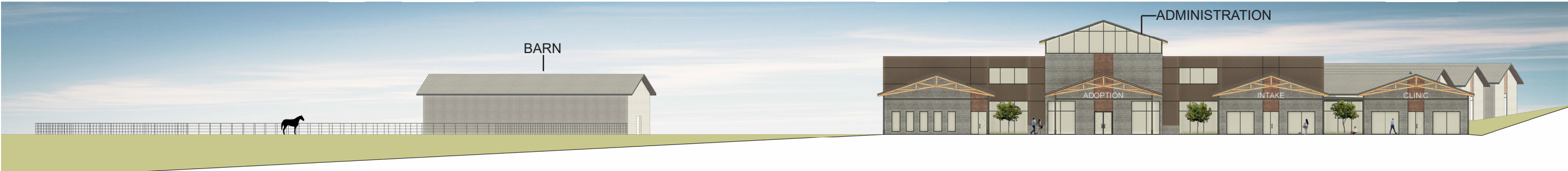
- ADOPTION
- ANIMAL CONTROL
- BUILDING SUPPORT
- CIRCULATION
- CLINIC
- INTAKE
- MEETING
- PLAY YARD
- STORAGE
- VOLUNTEER COORDINATORS

SECOND FLOOR PLAN

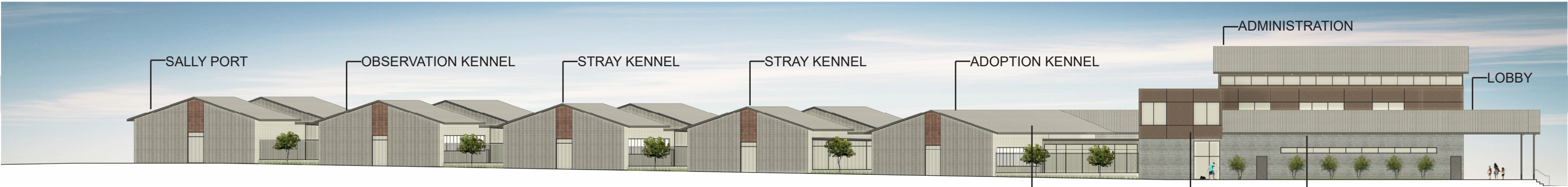
IV. DESIGN

Conceptual Building Elevations





EAST ELEVATION

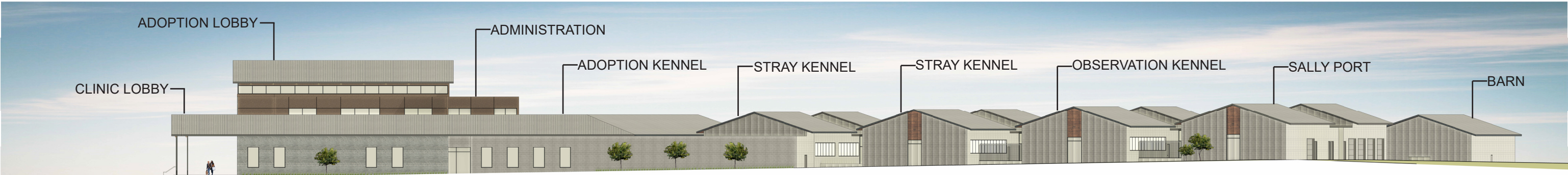


SOUTH ELEVATION

STANDING SEAM METAL ROOF STUCCO BOARD FORM CONCRETE



WEST ELEVATION



NORTH ELEVATION

IV. DESIGN

Conceptual Exterior Rendering



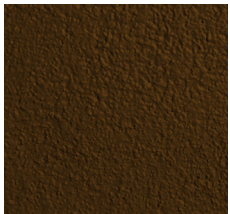
Conceptual Exterior Materials



TONGUE AND GROOVE
CEDAR WOOD



SPLIT FACE
CONCRETE BLOCK



STUCCO



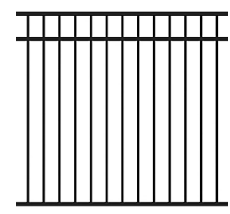
BOARD FORMED
CONCRETE



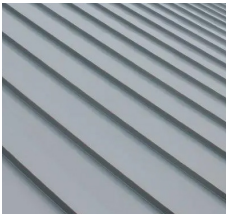
CONCRETE RETAINING
WALLS



STAINLESS RAILINGS



WROUGHT IRON
FENCING



STANDING SEAM
METAL ROOF





APPROACH FROM BRYANT



IV. DESIGN

Conceptual Exterior Rendering



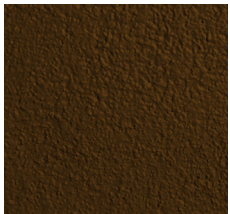
Conceptual Exterior Materials



TONGUE AND GROOVE
CEDAR WOOD



SPLIT FACE
CONCRETE BLOCK



STUCCO



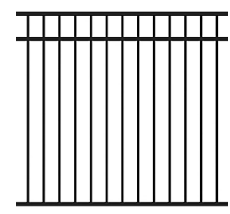
BOARD FORMED
CONCRETE



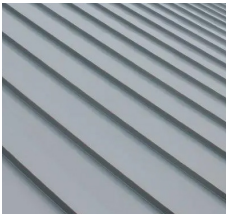
CONCRETE RETAINING
WALLS



STAINLESS RAILINGS



WROUGHT IRON
FENCING



STANDING SEAM
METAL ROOF





ADOPTION ENTRY



IV. DESIGN

Conceptual Exterior Rendering



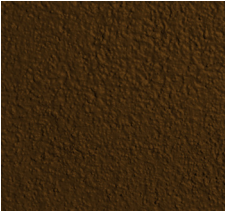
Conceptual Exterior Materials



TONGUE AND GROOVE
CEDAR WOOD



SPLIT FACE
CONCRETE BLOCK



STUCCO



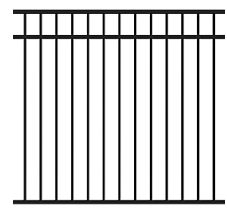
BOARD FORMED
CONCRETE



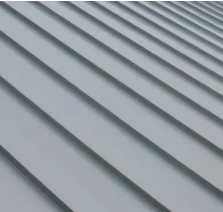
CONCRETE RETAINING
WALLS



STAINLESS RAILINGS



WROUGHT IRON
FENCING



STANDING SEAM
METAL ROOF



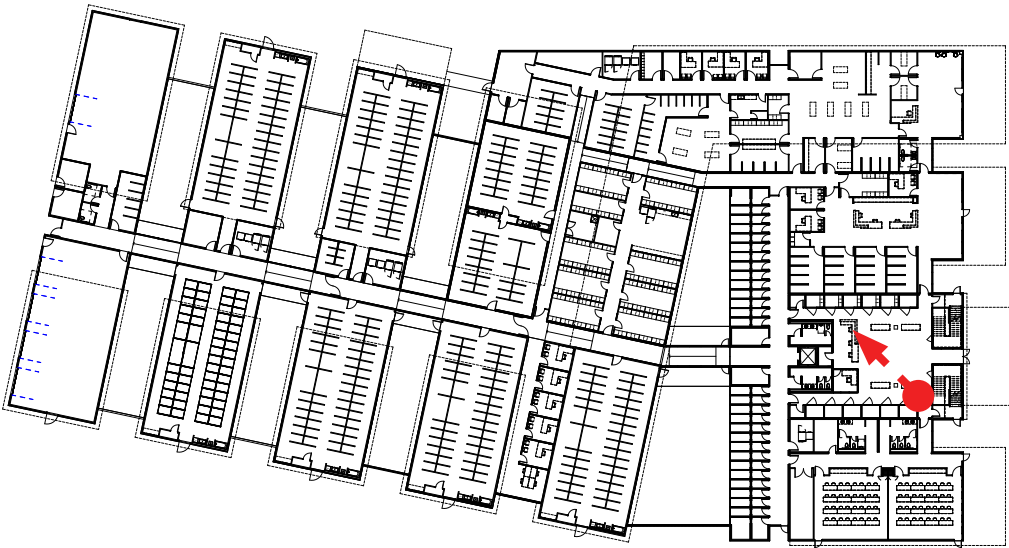


KENNEL VIEW FROM SOUTHEAST



IV. DESIGN

Conceptual Adoption Lobby Rendering and materials



Conceptual Interior Materials



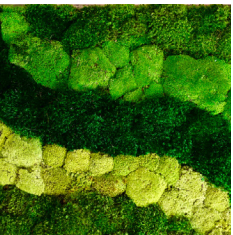
WALL COLORS



COUNTERTOP QUARTZ



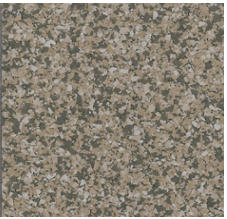
CEILING - EXPOSED WOOD DECK



BIOPHILIA - PRESERVED MOSS



FLOORING - POLISHED CONCRETE



FLOORING - EPOXY CONCRETE



LIGHTING



FURNITURE

These spaces utilize robust materials that are made to withstand chemicals and many years of heavy use. The strategic use of color throughout the new facility provides wayfinding. By incorporating the use of biophilia, it improves the health of not only the employees in the space but also the animals. Each lobby will provide a variety of durable seating.

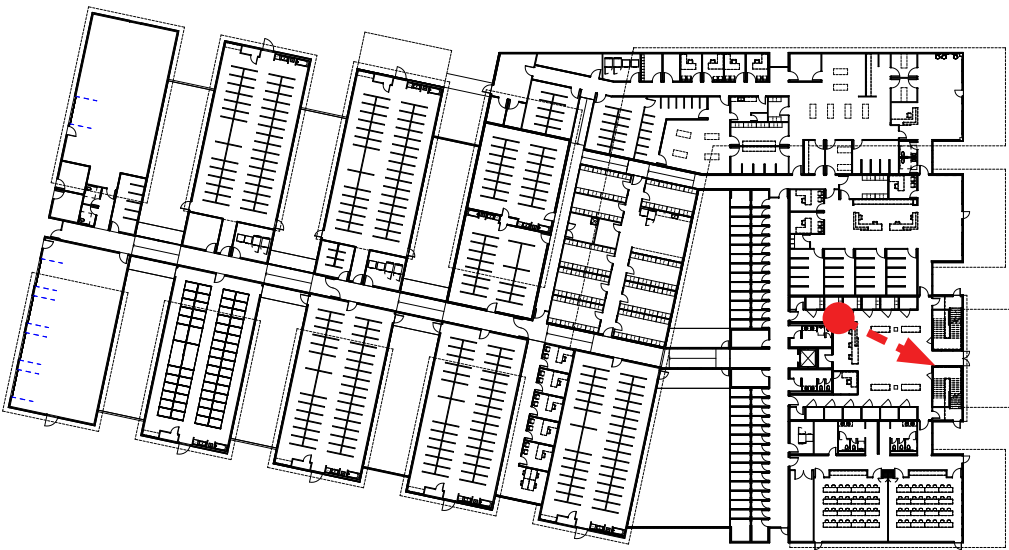




ADOPTION LOBBY LOOKING TOWARD RECEPTION

IV. DESIGN

Conceptual Adoption Lobby Rendering and materials



Conceptual Interior Materials



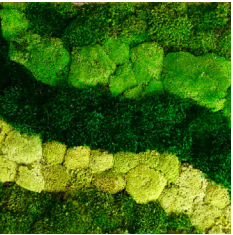
WALL COLORS



COUNTERTOP QUARTZ



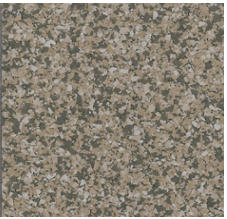
CEILING - EXPOSED WOOD DECK



BIOPHILIA - PRESERVED MOSS



FLOORING - POLISHED CONCRETE



FLOORING - EPOXY CONCRETE



LIGHTING



FURNITURE

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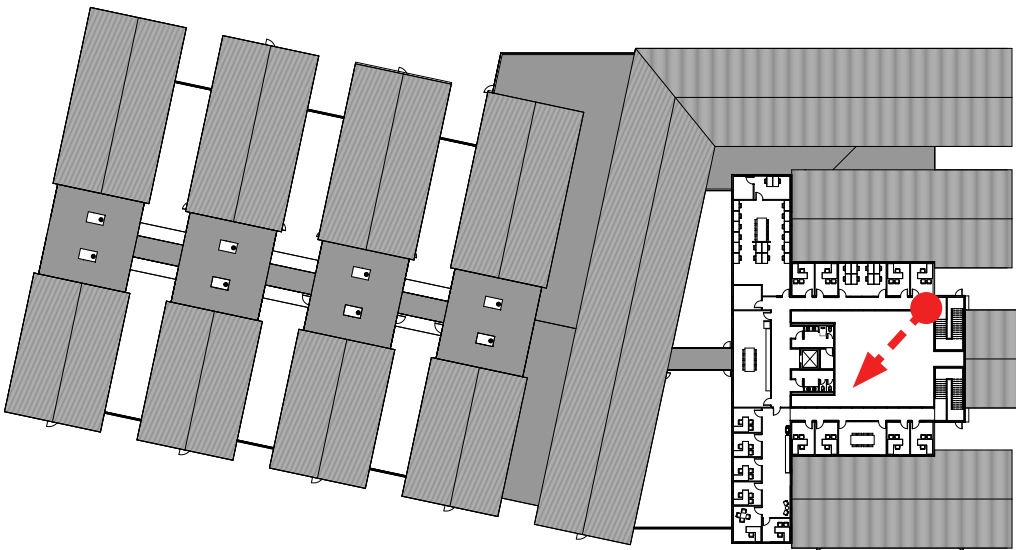




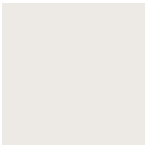
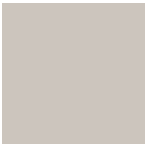
ADOPTION LOBBY LOOKING TOWARD ENTRY

IV. DESIGN

Conceptual Adoption Lobby Rendering from Second Floor



Conceptual Interior Materials



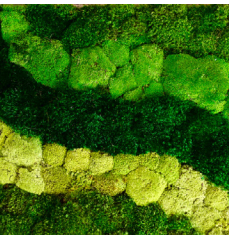
WALL COLORS



COUNTERTOP QUARTZ



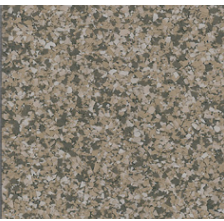
CEILING - EXPOSED WOOD DECK



BIOPHILIA - PRESERVED MOSS



FLOORING - POLISHED CONCRETE



FLOORING - EPOXY



LIGHTING



FURNITURE

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ADOPTION LOBBY FROM ADMINISTRATION SPACE ABOVE

IV. DESIGN

Conceptual Play Yard Rendering



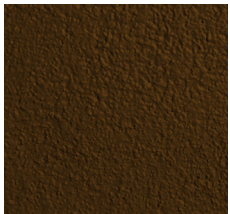
Conceptual Exterior Materials



TONGUE AND GROOVE
CEDAR WOOD



SPLIT FACE
CONCRETE BLOCK



STUCCO



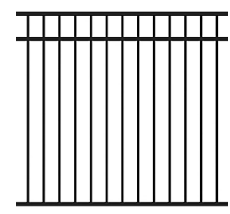
BOARD FORMED
CONCRETE



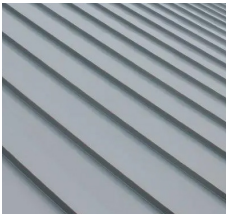
CONCRETE RETAINING
WALLS



STAINLESS RAILINGS



WROUGHT IRON
FENCING



STANDING SEAM
METAL ROOF



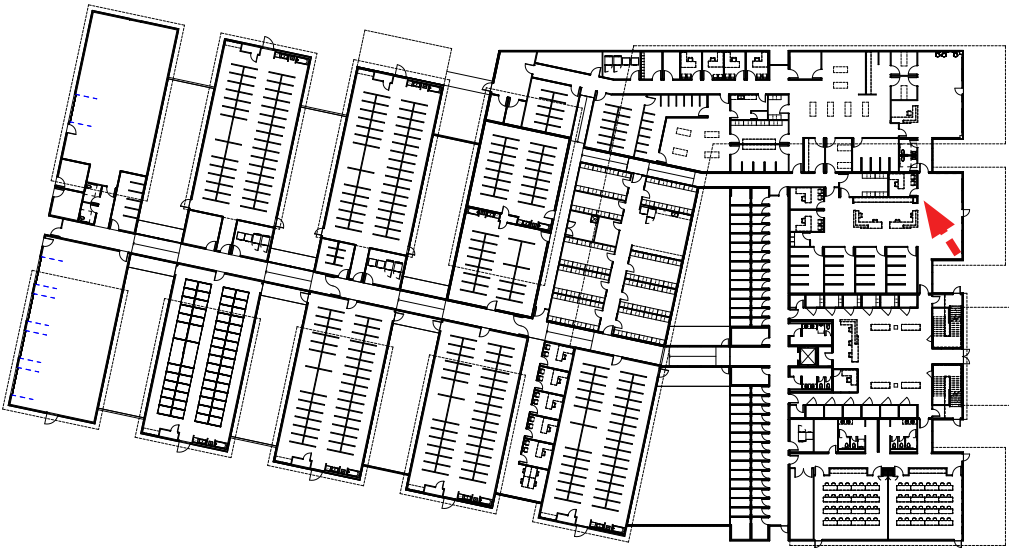


ADOPTION PLAY YARD



IV. DESIGN

Conceptual Intake Lobby Rendering and materials



Conceptual Interior Materials



WALL COLORS

CEILING - EXPOSED WOOD DECK

BIOPHILIA - POTTED PLANTS

LIGHTING

FURNITURE

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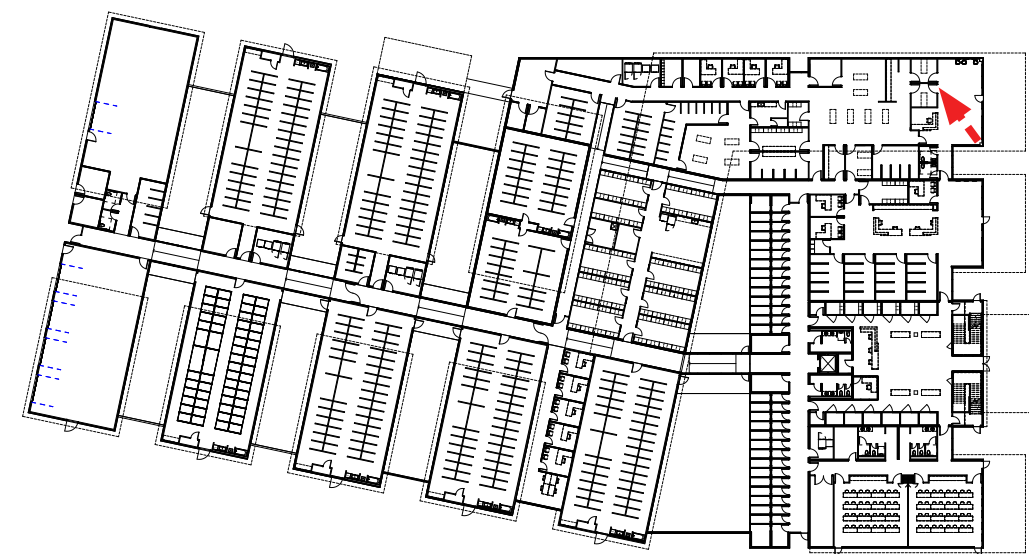


INTAKE LOBBY

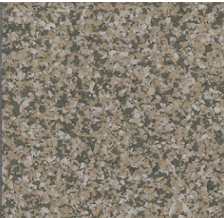


IV. DESIGN

Conceptual Clinic Lobby Rendering and materials



Conceptual Interior Materials



WALL COLORS

CEILING - EXPOSED WOOD DECK

BIOPHILIA - POTTED PLANTS

LIGHTING

FURNITURE

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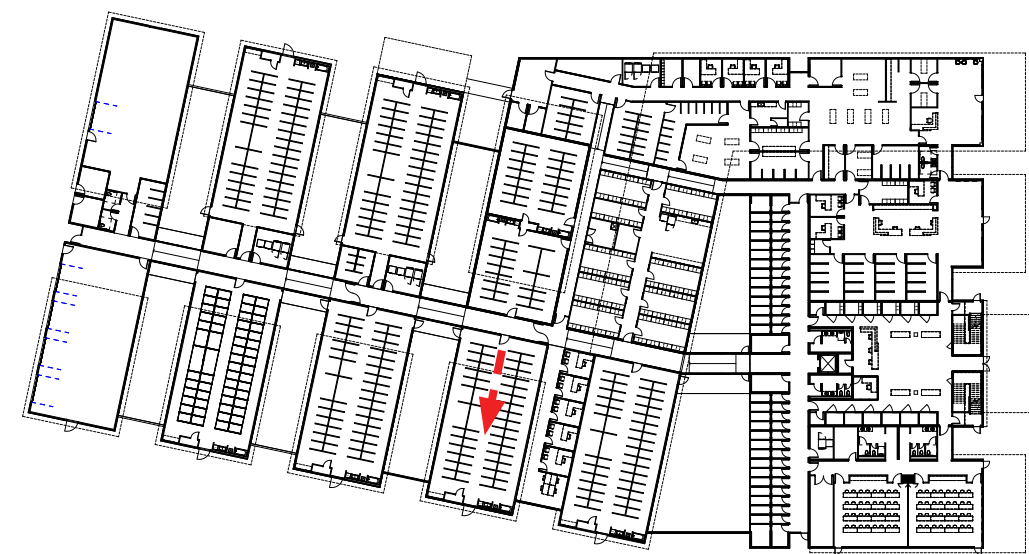




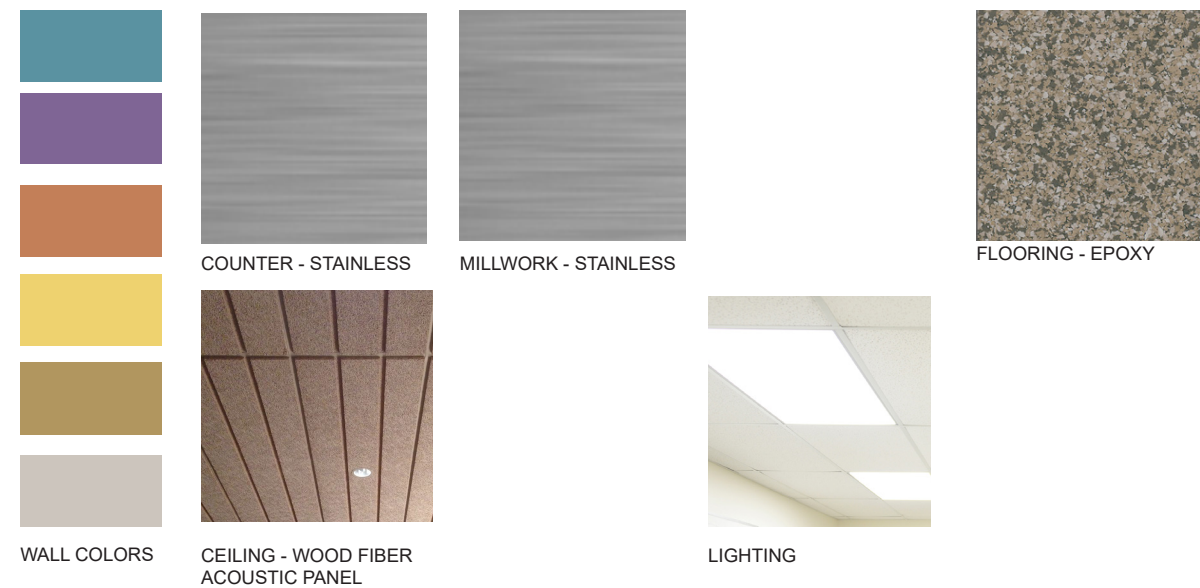
CLINIC LOBBY

IV. DESIGN

Conceptual Kennel Rendering and materials



Conceptual Interior Materials



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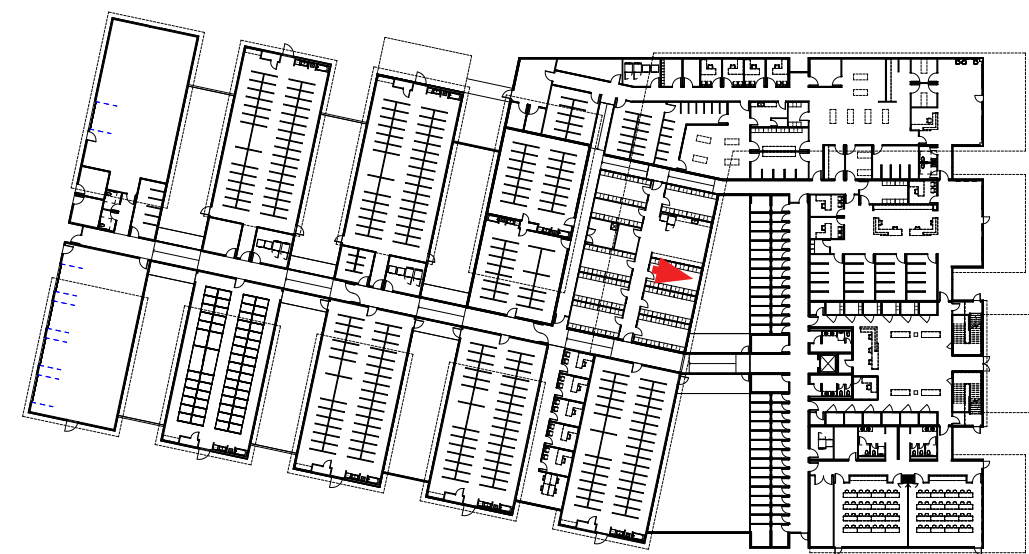


STRAY DOG KENNELS

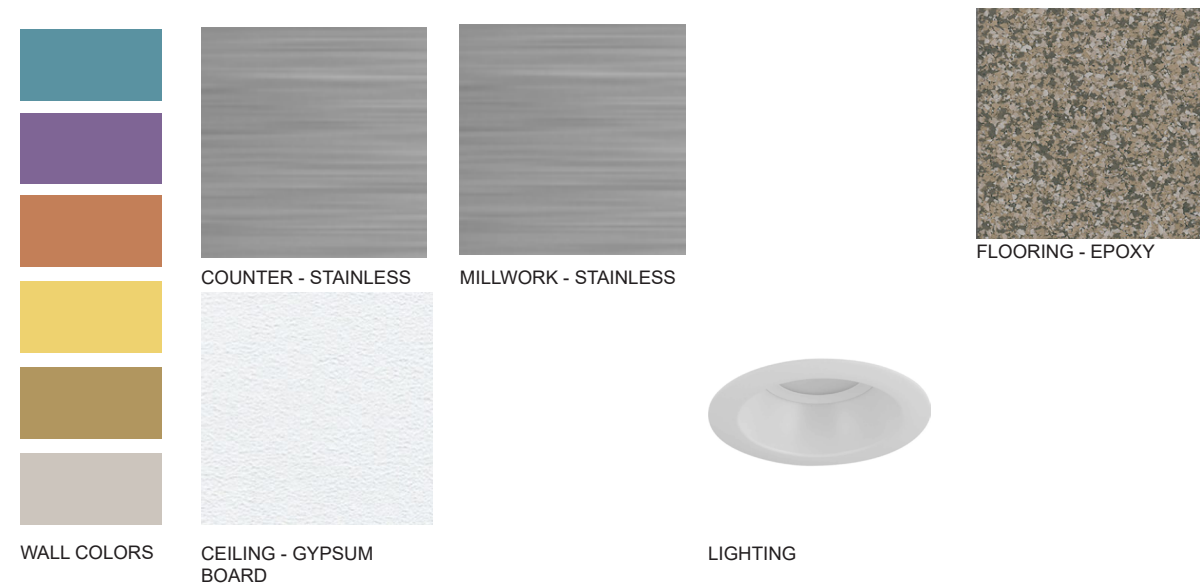


IV. DESIGN

Conceptual Cat Condo Rendering and materials



Conceptual Interior Materials



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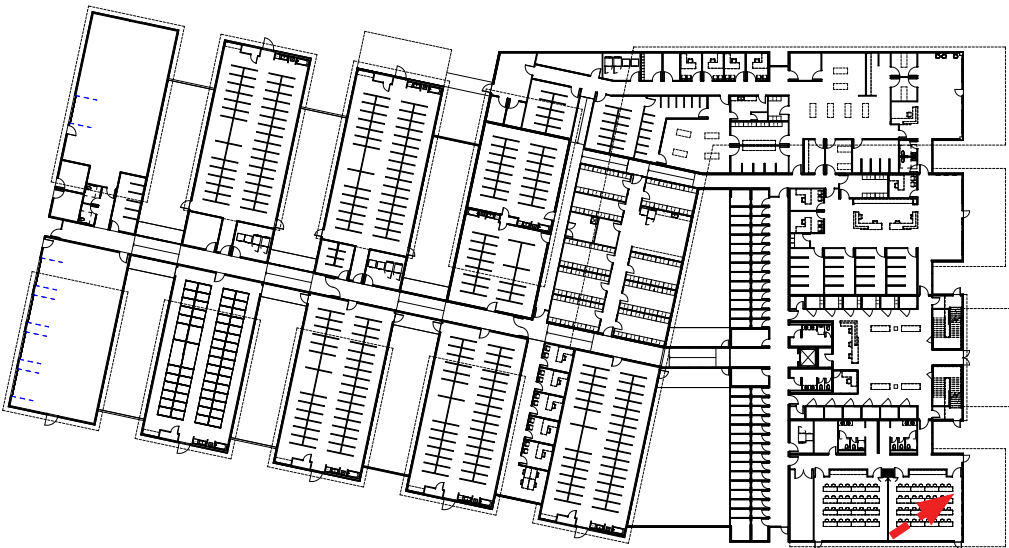




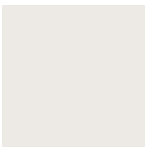
STRAY CAT HABITATS

IV. DESIGN

Conceptual Meeting Room Rendering and materials



Conceptual Interior Materials



WALL COLORS

CEILING -
ACOUSTICAL TILE

LIGHTING

FURNITURE - STACKING
CHAIRS

FURNITURE - NESTING
TABLES

These spaces utilize robust materials that are made to withstand chemicals and many years of heavy use. The strategic use of color throughout the new facility provides wayfinding. By incorporating the use of biophilia, it improves the health of not only the employees in the space but also the animals.



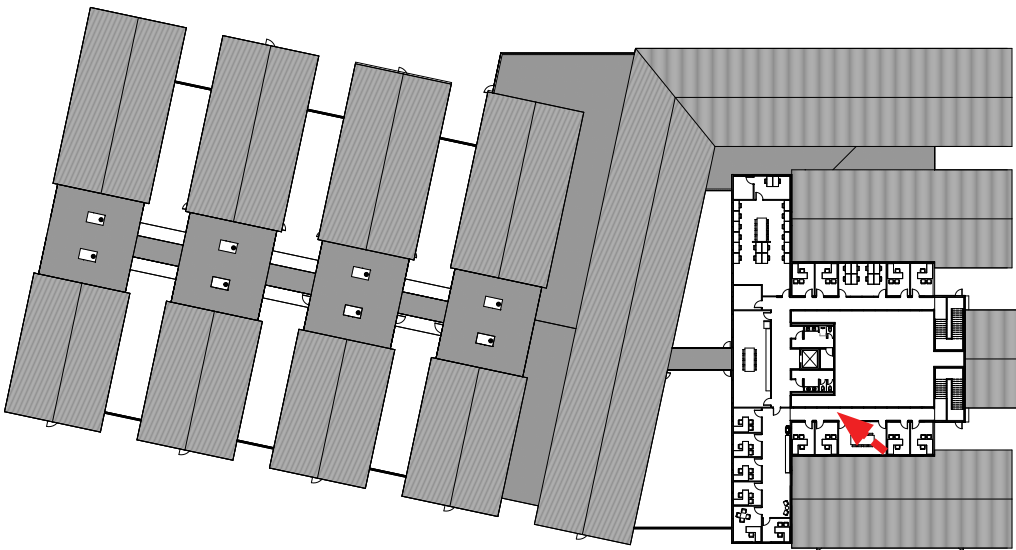


COMMUNITY MEETING ROOM

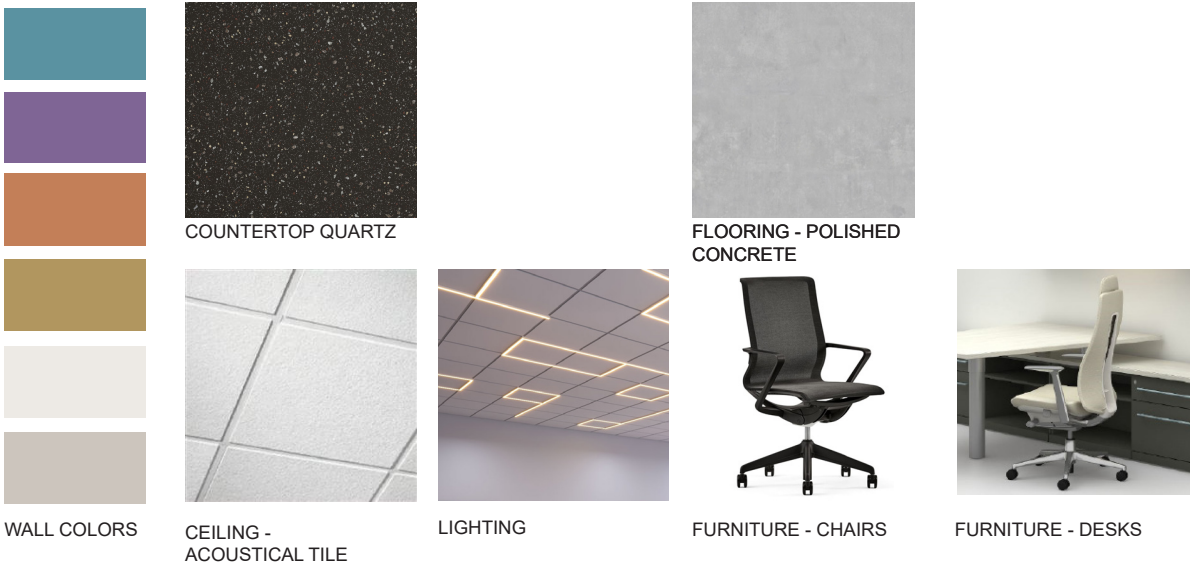


IV. DESIGN

Conceptual Conference Room Rendering and materials



Conceptual Interior Materials



These spaces utilize robust materials that are made to withstand chemicals and many years of heavy use. The strategic use of color throughout the new facility provides wayfinding. By incorporating the use of biophilia, it improves the health of not only the employees in the space but also the animals.





ADMINISTRATION CONFERENCE ROOM

V. NARRATIVES

CODE REVIEW

APPLICABLE CODES:

2018 International Building Code (IBC)
National Electrical Code (NEC)
International Mechanical Code (IMC)
International Plumbing Code (IPC)
International Fire Code (IFC)
National Fire Protection Agency (NFPA)
2009 American National Standards Institute (ANSI)
2010 Americans wotj Disability Act (ADA)

OCCUPANCY CLASSIFICATION:

Business (B)
Assembly (A-3)

CONSTRUCTION CLASSIFICATION & FIRE RESISTANCE RATING:

Type IIB	
Primary Structural Frame:	0 hours
Bearing Walls Exterior:	0 hours
Bearing Walls Interior:	0 hours
Nonbearing Walls/Partitions Exterior:	0 hours
Non-bearing Walls/Partitions Interior:	0 hours
Floor Construction and Associated Secondary Members:	0 hours
Roof Construction and Associated Secondary Members:	0 hours
Exterior Walls Based on Fire Separation Distance:	
X < 5 ft.:	1 hour
5 ft. ≤ X < 10 ft.:	1 hour
10 ft. ≤ X < 30 ft.:	0 hours
X ≥ 30 ft.:	0 hours

REQUIRED SEPARATION OF OCCUPANCIES:

Assembly - Business:	1 hour
----------------------	--------

GENERAL BUILDING HEIGHTS:

Business (B) (Sprinklered)	
Allowable:	75 ft.
Actual:	41 ft.
Assembly (A-3) (Sprinklered)	
Allowable:	75 ft.
Actual:	21 ft. 6 in.



CODE REVIEW (CONTINUED)

BUILDING AREA:

Business (B) (Sprinklered Multi-story)	
Allowable:	69,000 sf.
Actual:	64,376 sf.
Assembly (A-3) (Sprinklered)	
Allowable:	38,000 sf.
Actual:	3,700 sf.

Total Actual: 68,076 sf.

OCCUPANT LOAD:

Accessory Storage:	
Area: 3,638 sf. x 300 sf/occ. = 13 occupants	
Assembly - Standing Space:	
Area: 1,911 sf. x 5 sf./occ. = 383 occupants	
Business:	
Area: 62,527 sf. x 150 sf. = 417 occupants	

Total Occupant Load: 813 occupants

PLUMBING FIXTURES:

Business (B):	
Water Closets (Men): 5 Water Closets	
Water Closets (Women): 5 Water Closets	
Lavatories: 4 Lavatories per Gender	
Drinking Fountains: 5 Drinking Fountains	

Assembly (A-3):	
Water Closets (Men): 2 Water Closets	
Water Closets (Women): 3 Water Closets	
Lavatories: 1 Lavatories per Gender	
Drinking Fountains: 1 Drinking Fountain	

Total Required:	
Water Closets (Men): 7 Water Closets	
Water Closets (Women): 8 Water Closets	
Lavatories: 10 Lavatories per Gender	
Drinking Fountains: 6 Drinking Fountain	

V. NARRATIVES

CIVIL

EXISTING SITE

The project site is located in Oklahoma City, north of S.E. 29th Street, west of S. Bryant Avenue and east of E. Grand Boulevard. It is in the Southeast (SE) Quarter of Section 12, T11N, R3W, I.M. in Oklahoma County, Oklahoma.

The project site is currently home to the existing Oklahoma City Animal Welfare offices, Oklahoma City Animal Shelter, an Oklahoma Humane Society office, an animal cemetery and associated site improvements. There is a ridge through the center of the site with roughly half of the site sloping to southwest and the remainder to the southeast.

SITE UTILITIES

1. SANITARY SEWER

- a. There is an existing 8-in sanitary sewer line running through the site serving the existing facility that drains off-site to the east. There is an existing grinder pump that all existing service lines run to before entering the City sanitary sewer system. It is anticipated the same will be necessary of the new facility.
- b. The existing sanitary sewer service lines and pump will need to remain in place and functional during the initial phase of development to ensure that the existing facility remains operational.

2. WATER

- a. There is an existing dead-end waterline partially along the S.E. 29th Street frontage and a water main along S. Bryant Avenue available to serve the site with domestic water, fire protection and irrigation. It is anticipated that new fire hydrant(s) will need to be installed to obtain the required fire coverage.
- b. The existing facility is fed from the waterline to the south along S.E. 29th Street that will need to remain in place and functional during the initial phase of development to ensure that the existing facility remains operational.

3. STORM SEWER

- a. There is a limited amount of existing storm sewer on-site that daylights to existing bar ditches surrounding the site.
- b. There is one (1) storm sewer crossing under S. Bryant Avenue to the east and one (1) storm sewer crossing under E. Grand Boulevard to west. Both are on the southern side of the project site north S.E. 29th Street.

4. ELECTRIC (OG&E)

- a. There are existing overhead electrical lines along the S.E. 29th Street and S. Bryant Avenue.
- b. The existing facility and site lighting is fed from the south and will need to remain in place and functional during the initial phase of development to ensure that the existing facility remains operational.

5. TELECOMMUNICATIONS (COX COMMUNICATIONS)

- a. It appears that Cox Communications has existing lines on OG&E's power poles along the perimeter of the site, as noted above.
- b. The existing facility is served through an underground service line from the south that will need to remain in place and functional during the initial phase of development to ensure that the existing facility remains operational.



V. NARRATIVES

CIVIL (CONTINUED)

6. GAS (ONG)

- a. There is a gas line along the south side of the project just north of S.E. 29th Street, as well as an existing line along the east side of S. Bryant Avenue.
- b. The existing facility serviced from the south and will need to remain in place and functional during the initial phase of development to ensure that the existing facility remains operational.

DRAINAGE & DETENTION

The project site is located within a detention required area. Through the existing site is developed, a pre- and post- impervious analysis will be completed once the site plan is finalized to determine the amount of increase in impervious area and if in fact detention will be required. Should detention be required, it will be generally located at the southeast corner of the site adjacent to the historic low along S. Bryant Avenue just north of S.E. 29th Street.

PROPOSED BUILDINGS, SIDEWALKS & PARKING

The project facility will consist of multiple new buildings with associated drives and parking. Access to the site will be from S. Bryant Avenue and E. Grand Boulevard.

ADA parking and accessible paths will maintain a maximum 2% cross slope and all ramps provided will meet ADA requirements.

Due to extreme grade change across the site, a retaining wall may be necessary along the north side of the property along the existing OHP building.

Pending final grading of the site, additional retaining walls may be necessary to achieve desired drive, parking lot and sidewalk grades.

The barn, pasture, adjacent drive and parking will be constructed, after the new main facility has become fully operational and the existing facility can be demolished and replaced with said improvements, as shown on the site plan.

The site will be required to meet the requirements of the City of Oklahoma City and Oklahoma Department of Environmental Quality regarding storm water pollution prevention.

Permits for construction will be issued through the City of Oklahoma City.

V. NARRATIVES

STRUCTURAL

The structural design of the proposed facility will prioritize the safety of the occupants and showcase the expression of regional materials and systems with an eye toward future flexibility.

1. CODES AND STANDARDS

- a. Building Codes
 - 2018 International Building Code (IBC)
 - ASCE 7-16 | Minimum Design Loads for Buildings and Other Structure
 - ICC 500-14 | Standard on the Design and Construction of Storm Shelters
- b. Material Codes
 - ACI 318-14 | American Concrete Institute "Building Code Requirements for Structural Concrete"
 - AISC 360-16 | American Institute of Steel Construction "Specification for Structural Steel Buildings"
 - TMS 402-16 | Building Code for Masonry Structures
 - AISI S100-16 | American Iron and Steel Institute "Specifications of the Design of Cold Formed Steel Structural Members"

2. DESIGN LOADS

- a. Dead Loads

Self-weight of the structure	Actual weights of materials
Collateral Dead Loads	15-25 psf
- b. Live Loads

Offices 50 psf	
Lobbies and first-floor corridors	100 psf
Corridors above first floor	80 psf
Roofs	20 psf
Handrails	200 lb. at top of rail
	50 plf along top of rail
- c. Risk Category

It is assumed the total occupant load will not exceed 250 per 2018 IBC, Table 1604.5	II
--	----
- d. Snow Loads

Ground Snow Load	10 psf
Importance Factor - Is	1.0
Exposure Category	C
Exposure Factor - Ce	0.9
Thermal Factor - Ct	1.0
- e. Wind Loads

Basic Wind Speed	109 mph
Exposure Category	B
Risk Category	II
Wind Directionality Factor - Kd	0.85
- f. Seismic Loads

Site Class (assumed, pending Geotech report)	B
Seismic Design Category (assumed, pending Geotech report)	B
Importance Factor	1.0
Ss	0.31
S1	0.081
SDS	0.186
SD1	0.043



STRUCTURAL (CONTINUED)

3. GEOTECHNICAL

- a. Geotechnical Consultant
- b. Report number
- c. Date

W2 Engineering
G010-23
October 3, 2023

FOUNDATION SYSTEMS (as noted in the referenced Geotechnical Report)

1. GEOTECHNICAL

- | | |
|-------------------------------------|---|
| a. Recommended foundation system | Shallow Spread Footings |
| b. Allowable bearing pressure | 2,500 psf in select fill
6,000 psf in native soils |
| c. Approved bearing material | Approved fill or native soils |
| d. Anticipated settlement | 1" |
| e. Minimum column footing width | 24" (Assumed) |
| f. Minimum continuous footing width | 18" (Assumed) |
| g. Minimum bearing depth | 24" below adjacent grade (Assumed) |

2. SLABS-ON-GRADE

- a. It is expected that a concrete slab-on-grade system will be used at the ground level of the structure.
- b. A 5" thick slab-on-grade will be supported over a 4" layer of aggregate over at least 12" of new structural fill.

3. OTHER FOUNDATION STRUCTURES

- a. Additional foundational elements included in the project will be cast-in-place concrete stem walls and retaining walls at on-grade ramps and/or stairs, and elevator pits.
- b. Any subgrade structures, such as elevator pits, will likely require waterproofing and perimeter drain systems to mitigate water intrusion.

SUPERSTRUCTURE

1. The proposed structural system will primarily utilize structural steel columns supporting composite steel beams at the second floor and open-web steel joists at the roof.
 - a. Composite steel beams are expected to be spaced 6-8 ft. on center
 - b. Open-web joists are expected to be spaced at 5 ft. on center.
2. The second floor will consist of a 4" concrete slab over 1.5" composite deck (total thickness of 5.5") with headed shear studs welded to beams and the roof will consist of 1.5" wide-rib deck.
3. Elevator shafts and stairs for fire egress may be enclosed using load-bearing 8" reinforced concrete masonry units (CMU).
4. Exterior walls are expected to be framed with cold-formed stud framing and storefront or curtainwall glazing systems.
 - a. Additional structural steel wind girt and column framing will be provided as required to adequately support the selected glazing system.
 - b. The design of cold-formed steel framing will be delegated to the manufacturer's engineer. As evidence of this, the manufacturer's engineer shall submit sealed engineering calculations.
5. Additional steel framing elements included on the building may be exterior canopy/shade structures, rooftop screen walls, rooftop equipment support, mechanical/dumpster enclosures, and structures accommodating wind or solar power equipment.
6. The structural steel fabricator shall design simple shear connections for steel -to-steel connections. As evidence of this, the fabricator's engineer shall submit sealed engineering calculations.

V. NARRATIVES

STRUCTURAL (CONTINUED)

7. Large exterior canopies as well as the main public lobby spaces are anticipated to be constructed of exposed wood trusses with exposed plank decking.
8. Portions of the main building are also anticipated to be constructed of a single level of cast-in-place board-formed concrete supporting structural steel second floor as well as portion of the second floor steel superstructure.
9. Select areas of the facility with enhanced durability requirements (such as the kennels, sally port, and storage areas) will be constructed of load-bearing CMU with either cold-formed steel or open-web bar joists.
10. LATERAL LOAD RESISTING SYSTEMS
 - a. The metal roof deck and second floor composite metal deck(s) will be utilized as a horizontal diaphragm to distribute the lateral loads to the lateral force resisting system.
 - b. The lateral force resisting system is expected to be a combination of braced frames, CMU shear walls, and moment frames.
 - (1) Braced frames and CMU shear walls will be utilized wherever possible to provide maximum efficiency.
 - (2) Moment frame will only be used where lateral support is necessary but braced frames or shear walls are not feasible.



MECHANICAL

The MEP design of the proposed facility will prioritize the health and safety of the occupants and create a more comfortable and welcoming environment for visitors. Utility costs and maintenance will also be considered during design.

1. CODES AND STANDARDS

a. Building Codes

2015 International Building Code (IBC)
2015 International Mechanical Code (IMC)
2009 International Energy Conservation Code (IEC)
2015 International Fire Code (IFC)
2009 International Fuel Gas Code (IFGC)
Oklahoma City supplemental Codes
Authority Having Jurisdiction (AHJ) – City of Oklahoma City Development Services

2. MECHANICAL DESIGN CONDITIONS

a. Outside Design Conditions

2021 ASHRAE Fundamentals – Will Rogers World Airport, Oklahoma City, Ok
WMO#: 723530
0.4% Cooling Conditions: 100.6°F DB, 73.9°F WB
0.4% Dehumidification Conditions: 84.1°F DB, 74.5°F WB
99.6% Heating Conditions: 14.6°F DB
ASHRAE Climate Zone: 3A

b. Indoor Design Criteria

Room Type	Cooling Temp.	Heating Temp.	Humidity	Pressurization	AC/H	% OSA
Kennels	75°F	65°F	30% – 70%	Negative	12	100%
Cattery	75°F	65°F	30% – 70%	Negative	18	100%
Isolation	75°F	65°F	30% – 70%	Negative	12	100%
Euthanasia	72°F	72°F	N/A	Negative	N/A	100%
Surgery	72°F	72°F	N/A	Positive	N/A	N/A
Public Corridor	75°F	65°F	N/A	Positive	N/A	100%
Offices	72°F	72°F	N/A	Positive	N/A	N/A

MECHANICAL (CONTINUED)

MECHANICAL SYSTEMS

1. HEATING, VENTILATION, AND AIR CONDITIONING

- a. The animal spaces are anticipated to be served by 100% Dedicated Outside Air Units (DOAS). Energy Recovery Ventilators (ERV) with solid core sensible heat exchangers will be used on the exhaust system for the Kennels and Cat spaces and be tied back into the DOAS units. Units are to be packaged rooftops with DX cooling, natural gas heating, and with modulating hot gas reheat for humidity control. Units will be single zone, but with a temperature sensor and humidity sensor in each kennel or cat space to provide averaging HVAC controls. Kennel and Cat spaces to have filtered exhaust grilles to protect upstream equipment.
- b. The common corridor separating the Kennels and/or Cat spaces is anticipated to be served by a DOAS for corridor conditioning and to provide make-up air to ensure the Kennels and Cat spaces are negatively pressured in relation to Human areas.
- c. The offices, vestibules, common spaces, and community rooms are to be served by Variable Air volume packaged rooftops with DX cooling, natural gas heating, and variable air volume terminal boxes with electric reheat to provide space zoning.
- d. Restrooms will be exhausted through roof mounted exhaust equipment.
- e. All isolation rooms and the euthanasia room will be exhausted through separate exhaust fans and systems shall be completely separate from other mechanical systems.
- f. The loading area will be heating only, utilizing radiant gas heaters, and will have dedicated purge exhaust fan that is controlled by CO sensor located in space.

2. DUCTWORK

- a. All supply and exhaust ductwork in animal spaces shall be hard ducted.
- b. All supply and exhaust ductwork in animal spaces shall be externally insulated. Internally lined ductwork is not acceptable for any animal spaces. Round double wall insulated spiral ductwork shall be provided in any exposed structure spaces.
- c. General exhaust ductwork shall be uninsulated, except within 15' of the fan for sound attenuation shall be internally lined.
- d. Return ducts shall not be insulated.
- e. The intent of ductwork design shall minimize exposed horizontal ductwork where possibly to aid in dust collection on ductwork.

3. DIFFUSERS/GRILLES

- a. All grilles and diffusers shall be aluminum, factory painted as indicated on plans.
- b. Exhaust grilles in the animal kennels shall be filter grilles that are mounted low on wall.



V. NARRATIVES

ELECTRICAL

ELECTRICAL SYSTEMS

1. ELECTRICAL SERVICE AND DISTRIBUTION

- A. Anticipated electrical service is approximately 1600 Amp 277/480V Distribution panel. Step down transformers to be located in each electrical room.
- B. Service entry panel will be fitted with a surge suppression device (SPD).
- C. Electrical room to be dedicated for distribution panelboard to serve equipment loads on both floors with a distribution panel on each floor.

2. EMERGENCY POWER

- A. Two existing diesel generators are anticipated to be retapped from 208V to 480V to correspond with new building voltage. Generators will be controlled in via kirk key gear to meet maintenance backup requirements. The generators will serve the following:
 - a. Fire pump controller with integral transfer switch. (if required)
 - b. A 4-pole automatic transfer switch (ATS) will serve life safety loads:
 - i. One egress elevator per bank. Provide battery lowering on the rest. (if required)
 - ii. Fire Alarm system
 - iii. Area of Rescue system
 - iv. Powered egress doors (if required)
 - v. Access control system
 - vi. Egress Lighting
 - 1. Exit signs will have integral batteries
 - 2. Lighting will be switched via dimmed state transfer device (Meyers EPC-DF-LS). Lighting is anticipated to be set to 25% output.
 - c. A 4-pole automatic transfer switch (ATS) will serve the following optional standby loads:
 - i. IT and comm rack loads.
 - ii. BAS
 - iii. Kitchen cooler/freezer(s)

3. FEEDERS AND BRANCH CIRCUIT WIRING

- A. All feeders and branch circuits will be copper, including service conductors from utility transformer into the building. All homerun circuits, underground runs, in slabs runs, outdoor or exposed to view inside the spaces shall be installed in conduits.
- B. MC Cable will be utilized in the following scenarios.
 - a. Lighting whips less than 6ft
 - b. MC cable will be allowed for branch circuits in concealed areas within room. Homeruns shall be in conduit.
- C. Conduits shall be schedule 40 PVC where installed underground / under slab, rigid galvanized steel (RGS) when installed outdoors or subject to physical damage. Electrical metallic tubing (EMT) can be utilized otherwise.
- D. Floorboxes (4-6 gang) are to be provided in the conference rooms. Round covers to be provided.

4. BUILDING GROUNDING

- A. The electrical distribution system throughout the facility shall be grounded in accordance NEC Article 250. The grounding electrode system for this purpose will include the following items:
 - a. One driven ground rod installed near or within the footprint of the service entrance equipment
 - b. Domestic water and natural gas service piping.
 - c. Building steel
- B. Ground bar per telecom room.

ELECTRICAL (CONTINUED)

5. BUILDING EXTERIOR AND SITE LIGHTING

- A. Standard fixtures will be utilized at building entries and surrounding site for security and for personnel safety.
- B. LED 4000K color temperature.
- C. The exterior lighting will be automatically controlled to turn on at dusk and off at dawn.

6. BUILDING POWER DEVICES

- A. Tamper proof receptacles will be provided throughout the facility.

7. BUILDING INTERIOR LIGHTING

- A. LED technology is intended to be used throughout the facility. Lighting selections will be coordinated with the Architectural design. Fixture types will be minimized for ease of maintenance. Effort will be made to follow illumination levels recommended by Illumination Engineering Society (IES) guidelines.
- B. Fixture types
 - a. IT/Elec/Mech/Equipment/Sally Port/Storage – 4' lensed strip
 - b. Restrooms – 6" recessed can with wall sconces on each side of faucet(s) and linear recessed ceiling light over waterclosets.
 - c. Conference/Training rooms – Linear LED Lighting
 - d. Stairwells – wall mounted up/down lights with (2) pendants in the middle of the stair.
 - e. Offices/Clinic/Surgery - 2 X 4 LED lay-in fixtures
 - f. Kennel Areas - 2 X 4 LED flat panel fixtures
 - g. Lobbies - Circular LED pendants, linear LED up lighting, 6" LED cans
- C. 3500K color temperature in common spaces
- D. DLC listed to pursue energy rebates.
- E. A networked lighting system will provide lighting control to meet IECC and owner guidelines. Wattstopper DLM or equivalent.
 - a. Space types and control intent
 - i. Private offices – Dual-technology occupancy sensor with dimming control.
 - ii. Corridors, stairs, lobbies, bathrooms, vestibules - Occupancy sensor control with timeclock integration. Night light dimming down to 1% output.
 - iii. Conference rooms – Occupancy sensor, dimming with 2 zones.
 - iv. Service areas – Vacancy sensor, except where safety is a concern.
 - v. Parking lots – Photocell and occupancy sensor per fixture, dimming after midnight.

8. LOW VOLTAGE SYSTEMS

General

- A. Telecom room shall have 3/4" AC plywood painted 8' AFF on all walls. Cable tray and telecom racks will be located in the room per the City requirements.
- B. CEC will design infrastructure for all low voltage systems. Infrastructure shall consist of cable tray, conduit, boxes, pull strings and power. The exact requirements of these systems shall be coordinated with the MAPS and Low Voltage system representatives.
- C. All IT equipment shall be specified according to the current version 3.0.0 of the City of Oklahoma City IT Standards for New Construction or Remodeling.

Access Control

- A. Assume centralized power supply to serve interior doors. Room level access control may be Wi-Fi or POE.

Fire Alarm

- A. Addressable horn based system.



V. NARRATIVES

PLUMBING

1. DOMESTIC WATER SERVICE

- a. It is anticipated that a new 3" domestic water service will be provided to meet IPC requirements.
- b. The building service line will have a reduced pressure zone (RPZ) backflow preventor . All domestic water piping shall be copper with soldered joints.
- c. Additional Backflow preventors will be provided as required for cross contamination from irrigation or hose bibbs.
- d. Domestic water heater shall be gas fired, tank type water heater. Water shall be stored at 140 °F and circulated around the facility with a recirculation pump.

2. WASTE/STORMWATER

- a. It is anticipated that a new 6" sanitary sewer line will be provided to serve the building and then connected to City sewer main.
- b. All waste piping below grade to be cast iron.
- c. Trench drains shall be installed between back-to-back individual kennels, or at the back of single individual kennels. The trench drain shall extend 6" beyond outside edge of kennel on either side. Drains will be connected to sanitary sewer system.
- d. Every room within animal spaces shall have a floor drain with a trap seal.
- e. The sally port will have trench drains located at each garage bay. A centralized waste line will route to a sand/oil interceptor outside of the building before connecting to the sanitary sewer main.
- f. Stormwater is to be removed from building using architectural scuppers and downspouts. Stormwater will then be captured as part of site civil scope. The design intent shall be to have no interior storm drains routed through the building.

3. PLUMBING FIXTURES

- a. Plumbing fixtures shall be located per architectural drawings.
- b. All water closets to be floor mounted with manually operated flush valves.
- c. Public lavatory and sink faucets to be hardwired sensor operated. Staff only lavatory and sink faucets to be manually operated.
- d. A flush valve is to be installed on the interior wall of the animal housing areas with trench drains to flush out trench drains with water for cleaning.
- e. Hose bibbs will be provided in each outdoor space accessible to animals for cleaning. Roof hydrants to be placed on the roof for equipment cleaning.

4. GAS PIPING

- a. The building will be served from a new gas line from the utility located on site.
- b. Currently anticipated gas loads include DOAS units, Radiant heaters in loading area, and Domestic water heater.
- c. An incinerator will be installed and will be fuel fired.

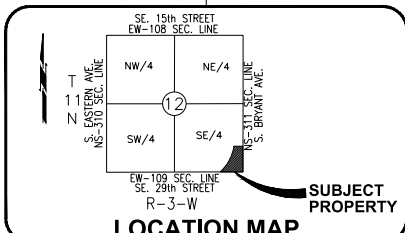
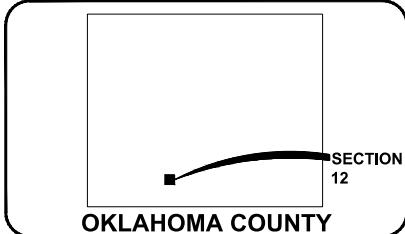
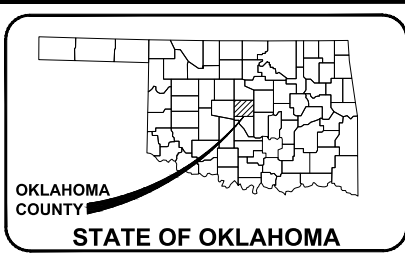
5. FIRE PROTECTION

- a. It is anticipated that the building will be fully sprinkled.
- b. A flow test will need to be conducted to determine if a fire pump shall be needed for the building.

VI. APPENDIX

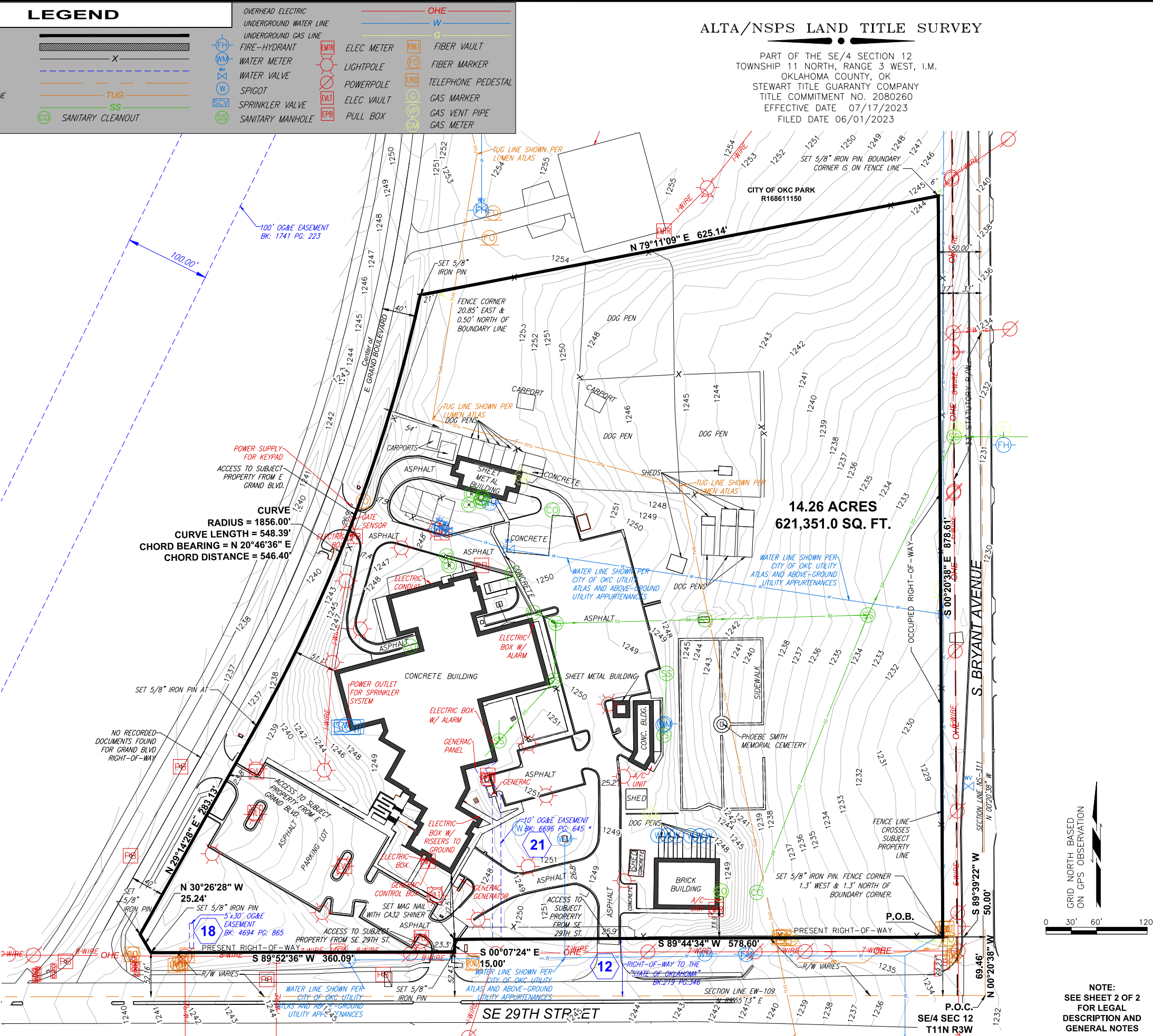
ALTA SURVEY





- SURVEY CONTROL DATA**
- HORIZONTAL DATUM IS THE OKLAHOMA STATE PLANE COORDINATE SYSTEM, N.A.D. 83(2011) LAMBERT PROJECTION, NORTH ZONE ADJUSTED TO N.G.S. STATE PLANE COORDINATES, UTILIZING OPUS.
A. ACCURACY - 3RD ORDER OR BETTER
 - BEARINGS:
THE BEARINGS SHOWN HEREIN OR HEREON ARE GRID BEARINGS DERIVED FROM THE USC & GS OKLAHOMA PLANE COORDINATE SYSTEM AND ARE NOT ASTRONOMICAL.
 - VERTICAL CONTROLS:
A. LEVEL DATUM IS NGS, NAVD 88, TAKEN FROM ADJUSTED PRIMARY CONTROL UTILIZING DIFFERENTIAL LEVELING TECHNIQUES.
B. ACCURACY - 3RD ORDER OR BETTER

- TITLE COMMITMENT EXCEPTIONS THAT ARE BLANKET IN NATURE OR DO NOT HAVE DEFINABLE LIMITS.**
- COVENANTS ESTABLISHED VIA WARRANTY DEED. BOOK: 420 PAGE: 81 AFFECTS THE SE/4 OF SECTION 12, T-11-N, R-3-W INCLUDING SUBJECT PROPERTY.
 - UNRECORDED EASEMENT/RIGHT OF WAY IN FAVOR OF CITIES SERVICES GAS COMPANY, EVIDENCED BY ASSIGNMENT IN FAVOR OF OKLAHOMA NATURAL GAS COMPANY. BOOK: 976 PAGE: 145 AFFECTS THE SE/4 OF SECTION 12, T-11-N, R-3-W INCLUDING SUBJECT PROPERTY.
 - UNDERGROUND SANITARY SEWER LINE EVIDENCED BY PERMIT. BOOK: 3157 PAGE: 212 AFFECTS ALL OF SECTION 12, T-11-N, R-3-W INCLUDING SUBJECT PROPERTY.
 - UNDERGROUND PIPELINE EVIDENCED BY QUIT CLAIM AND BILL OF SALE IN FAVOR OF CHICKASAW TELEPHONE COMPANY. BOOK: 6340 PAGE: 1321 AFFECTS THE E/2 OF SECTION 12, T-11-N, R-3-W INCLUDING SUBJECT PROPERTY.
 - TERMS, PROVISIONS, AND CONDITIONS OF LICENSE AGREEMENT BOOK: 6401 PAGE: 405 AND SUBJECT TO FORM OF ASSIGNMENT AND BILL OF SALE. BOOK: 13965 PAGE: 1785 AFFECTS THE E/2 OF SECTION 12, T-11-N, R-3-W INCLUDING SUBJECT PROPERTY.



CA 32
EXP. 6-30-2024

FIELD: 06-01-2023
DATE: 08-03-2023
REV. DATE:

PARTY CHIEF: DH
DRAWN BY: EM
REVIEWED BY: DMS

AM
DS
DMS

CEC CORPORATION
GEOSPATIAL DIVISION

OKLAHOMA CITY, OKLAHOMA 73142

4555 W. MEMORIAL ROAD

SHEET NO.

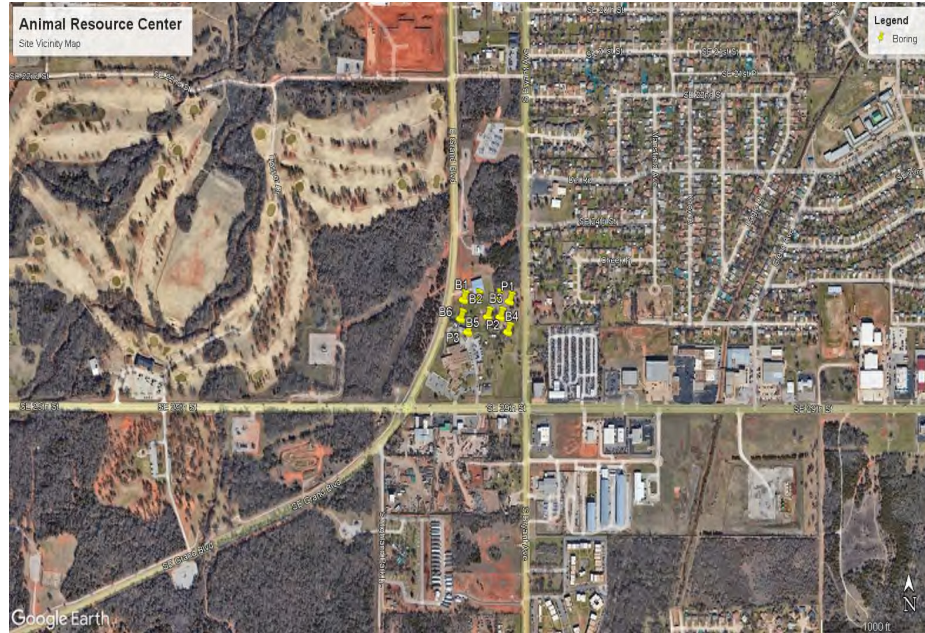
CEC NO.
230076

VI. APPENDIX

GEOTECH REPORT



MAPS 4 ANIMAL RESOURCE CENTER



PREPARED FOR:
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420 W. Main Street, Suite 700
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PROJECT NO. G010-23
OKLAHOMA CERTIFICATE OF AUTHORIZATION 6411
EXPIRES 6/30/2024
October 3, 2023

A handwritten signature in blue ink, likely of Arvel Le Roy Williams Jr., located at the bottom right of the page.

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Geotechnical Engineering



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Project Information

W2 Engineering, Inc. is pleased to present this “Subsurface Exploration Report” for the proposed animal resource center with planned concrete masonry unit (CMU) construction located at 2700 S. Bryant Avenue in Oklahoma City, Oklahoma. This report documents the following:

- Authorization for Services
- The Project Scope
- Field Exploration
- Laboratory Testing
- Engineering Evaluation and Recommendations
- Reliance Information and Limitations of this Report

Client and Authorization

This project was authorized by Mr. Todd Edmonds, AIA or HSE Architects, via acceptance of our proposal G022-23 and the budget approved by the City of Oklahoma City. Boring locations were developed by the structural engineer and as documented in various e-mails between HSA and **W2**.

Project Description

A proposed animal resource center with planned concrete masonry unit (CMU) construction near the intersection of SE 29th and Grand Blvd in south east Oklahoma City, Oklahoma. The site is planned for cut and fill operations with the primary cut being on the north and east side of the site with a shallow retaining wall of up to 5 feet (7 feet with foundations) along the north side of the planned cut. There are two (2) parking areas one on Grand Blvd. and the other on Bryant. Based on the project scope, we anticipate that maximum column loads on the order of 60-75 kips and maximum continuous footing loads (wall) of up to 3 kips per lineal foot for the structure. In the event that actual loads or design conditions differ significantly from those used in our evaluation, it may be necessary to contact **W2** to revisit our recommendations.

The approximate site location is depicted on the “Site Vicinity Map” included as Appendix “A.”

Field Exploration

The following sections document the results and observations of our field exploration conducted on August 31, September 1 and September 5, 2023.

Site Description

The proposed project is located at near the intersection of SE 29th and Grand Blvd in southeast Oklahoma City, Oklahoma.

At this time the site slopes from the northwest corner to the south side and southeast corner of the facility with an estimated maximum elevation changes along the property borders as follows:

Property Corner	Estimated Elevation (Feet MSL)
Northwest	1254
Southwest	1241
Northeast	1246
Southeast	1224

Based on these elevations, and the last provided site plan, elevation changes are estimated at 3-5 feet cut on the north side of the structure and 2 - 3 feet fill on the south side of the structure. The paving area on the south and east are anticipated to have relatively minor cut and fill.

The typical slope of is approximately 3.48% towards the south and east from the high elevation on the northwest corner.

Boring Information

Nine (9) borings were drilled at the subject site. A total of twenty one (21) Standard Penetration Tests (SPTs) were performed. The results of our SPTs are indicated on the boring logs contained in Appendix "C." Two (2) generalized soil strata exhibiting similar engineering properties were encountered at the project site:

Boring No.	Depth(ft)
B1	10.2
B2	10.2
B3	10.1
B4	10.4
B5	10.3
B6	10.5
P1	5.3
P2	5.2
P3	5.3

Stratum 1 - This stratum was visually classified as a reddish brown sandstone high exhibited a low plasticity. It was encountered in a slightly moist condition and in a hard consistency in all borings underneath the topsoil and extended to an approximate depth of 6 feet. Boring B4 appeared to be in an area where wood chips and animal waste from the animal enclosures and paddocks were spread. This stratum was classified by the Unified Soil Classification System as CL. **W2** is describing this material as a sandstone due to match the description typical of the geological materials mapped for this location.

Stratum 2 - This stratum was visually classified as a orange red sandy shale which exhibited a medium plasticity. It was encountered in a slightly moist condition and in a hard consistency. This soil was encountered in borings B1-B6 extending from approximately 6 feet to the full depth explored in these borings. This stratum was classified by the Unified Soil Classification System as CL. A thin gray lens of siltstone was encountered overlying this stratum in boring B1-B6.

The information above and the boring logs contained in Appendix “C” of this report represent an engineering interpretation and generalization of the soil conditions encountered at the site based on the borings drilled and laboratory tests performed. The transition between strata is gradual.

In the event that differing soil conditions are encountered in excavations at the site, **W2** Engineering, Inc. should be immediately contacted to evaluate the significance of any variations.

Hard/Dense Stratums

All of the stratums described above should be considered hard and dense exhibiting SPT refusal with less than 6 inches penetration for 50 blows within 5 feet of the surface. These stratums were encountered in the borings at the approximate depths shown on the boring logs in Appendix “C.”

Groundwater

Groundwater was not encountered during the time of drilling. Borings were left open a minimum of 48 hours to observe groundwater conditions and then backfilled.

Groundwater levels should be anticipated to fluctuate seasonally and with precipitation. Please note that groundwater can be present, at the depth explored, especially during or following periods of significant precipitation perching on the interface between the various layers.

Laboratory Testing

During drilling, samples were sealed in moisture proof containers and then transported to our laboratory for further evaluation and testing. Upon arrival in the laboratory the samples were visually classified by one of our project engineers into representative soil stratum as discussed in the *Field Exploration* section of this report. Based on the project scope and the soils encountered, the following laboratory tests were performed:

Summary of Laboratory Testing	
Test	Number Performed
Moisture Content	21
Atterberg Limits (Liquid and Plastic Limits)	9
Wet Wash -#200	9
Proctor Compaction	1
California Bearing Ratio(CBR)	1

The results of these laboratory tests are documented on the Boring Logs contained in Appendix “C” and/or in the Laboratory Test Results provided in Appendix “D”.

Engineering Evaluation and Recommendations

The following sections provide our engineering evaluation and recommendations for the subject project based on the project scope, the estimated column and wall loads, the results of our field exploration, laboratory testing and our understanding of the construction methods typically used in the state of Oklahoma. Our evaluation and recommendations are as follows:

Expansive Soil

The potential vertical rise (PVR) or heave of the soils encountered at the site were evaluated based on the procedures described in AASHTO T258 “Determining Expansive Soils.” Based on the visual classification of the soils and the results of our laboratory testing, the estimated PVR for this site is **negligible** for the existing moisture conditions which is considered a dry soil profile and for a moist or wet soil profile.

Site Earthwork Considerations

The following recommendations are for subgrade preparation and areas to receive select fill:

Ripping and Excavation of Intermediate Materials

The dominate soils on this site are classified as ‘intermediate materials.’ This type of material is common in the state of Oklahoma and especially in central Oklahoma. They are colloquially described as “red bed” in some earthwork circles.

Intermediate materials, in Oklahoma, are typically lacustrine deposits that have both rock and soil characteristics. Typically, in situ, the material will behave as very soft to soft rocks and when excavated, exposed to weathering, or left in the open, will decay. The pace of decay depends on the amount of cementation (typically carbonate cementation) present in the intermediate material. The quantity of cementation also determined the ‘rippability’ of the intermediate materials. Poorly cemented materials are more easily rippable than materials that are well cemented. Standard Penetration test (SPT) results

can give you an indirect estimate of the rippability of these materials. Most published documentation on rippability uses the shear wave velocity to evaluate the rippability of intermediate or rock formations.

W2 used a correlation of the SPT results to estimate the shear wave velocity.

Based on our test results and correlation, the majority of the materials found on this site will require either a large hydraulic breaker or a very large bull dozer and a single ripping hook, equivalent to a Caterpillar D9 or D10. All equipment used in excavations on this site needs to be appropriately sized and use 'rock' teeth on buckets or excavations points. There will be isolated strata or areas that will not be as difficult to rip, but we have been conservative in the sizing of equipment required for excavations.

There are observable outcrops of 'well cemented' sandstone on the northwest side and northeast side of the subject property. Well cemented sandstone may require either chemical or explosive pre-splitting. The need for this should be evaluated during the excavation process after the large hydraulic breaker is used to the greatest extent practicable. The outcrops may be isolated columnar formations that are common in the Garber sandstone/shale geology mapped and found during our subsurface exploration at this site. It is also possible that the outcrops are a relatively thin shelf of material that has softer material over and underlying the outcrops.

When properly processed, the materials may be used as select fill. However, any excavated materials that cannot be processed should not be in fill. Especially any materials larger than 3-inches in diameter i.e., cobble and boulder size. The outcrops are anticipated to be material that cannot be processed.

Subgrade Preparation

All areas under sidewalks, pavements, foundations, and floor slabs or areas that will receive select fill should be prepared prior to construction. The exposed subgrade soils at the site should be:

- Scarified to a minimum depth of 8 inches or until organic materials are removed from the exposed soils. On the cut side of the site in the native intermediate materials the scarification is not required. On the east side of the proposed building, near B4, there are extensive depths of

material that needs to be removed. Observation by a competent inspector should be done to verify the removal of organic material near B4.

- Conditioned and moisture adjusted to within ± 3 percent of optimum moisture and compacted to minimum of 95% maximum dry density as determined by ASTM D698 "Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³))" in loose lifts of 8 inches or less in thickness
- Compaction should be evaluated in the field with density tests performed every 2500 square feet and/or each lift under sidewalks, pavement, foundations, floor slabs, or other structural elements requiring soil support. A minimum of 3 tests should be performed on each lift
- Cut areas should be proof rolled with a heavily loaded dump truck with a minimum axle load of 16 kips. Soft areas that exhibit permanent deformation more than $\frac{1}{2}$ inches should be over excavated and the soils reconditioned or replaced with select fill or native soils conditioned and compacted as described above.
- Moisture content should be maintained in the compacted subgrade soils until permanently covered by either select fill, sidewalks, pavement, foundations, or floor slabs

Select Fill

Only select fill should be imported onto the project site. We recommend that soils conforming to the following minimum requirements be utilized as select fill:

Select Fill Parameters	
Percent Passing 3 Inch Sieve	100
Percent Passing No. 200 Sieve	< 75
Liquid Limit	< 40
Plasticity Index	< 18

Additionally, soils classified as CH, MH, PT should not be used as select fill. Soils classified as ML from processed shale, sandstone, or siltstone should only be used if approved by the Geotechnical Engineer for use as select fill.

When properly processed to the anticipated cut materials may be used as select fill and the percent passing the 200 sieve neglected.

Select fill should be:

- Moisture conditioned within ± 3 percent of optimum moisture and compacted to a minimum of 95% of maximum dry density as determined by ASTM D698 "Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³))." Loose lift heights should be 8 inches or less in thickness.
- Compaction should be evaluated in the field with density tests performed every 2500 square feet of each lift under sidewalks, pavement, foundations, and floor slabs, or other structural element requiring soil support. A minimum of 3 tests should be performed on each lift of select fill
- Moisture content should be maintained in the compacted select fill soils until permanently covered by sidewalks, pavement, foundations, or floor slabs or other elements.

Foundation System Recommendations

Based on the field exploration and visual classification of the encountered soils, we recommend the following foundations systems be evaluated for the economics of construction and project scope:

Spread and Spot Footings

Conventional spread and spot footings may be used at this site. Footing may be proportioned based on a net allowable bearing capacity of 6000 psf if bearing in native soil a minimum of 2 feet below original grade or 2500 psf if bearing in select fill. Footings should bear a minimum of 2 feet below the closest adjacent finished grade. Minimum footing width should be 16 inches.

Settlement of footing less than 8 feet in width and proportioned using the bearing capacity given above is anticipated to be less than 1 inch. Differential settlement is typically one-

half the total settlement but may approach the total settlement where soft or loose soils are encountered.

Drilled Shaft Foundations

Drilled, cast-in-place, shafts may also be used at this site. This foundation system consists of drilled shafts and grade beams. The drilled shafts support column loads and grade beams support and distribute wall loads and/or floor loads to the drilled shafts. Drilled shafts will act as both end and skin (friction) bearing and should bear a minimum of 5 feet below original grade with a minimum length of 3 shaft diameters in the either the stratum 1 or 2 formations encountered at the site. Minimum shaft diameter should be 18 inches. Shafts should be spaced a minimum of 3 shaft diameters apart, center to center.

Shafts may be proportioned based on a net allowable end bearing capacity of 20,000 psf and a skin friction of 1,200 psf for that portion of the shaft embedded into Stratum 3 soils and extending more than 5 feet below original grade. Uplift on the shafts can be resisted by using this same skin friction plus an allowance for shaft weight.

Settlement of shafts mobilizing the full bearing capacity indicated above is anticipated to be approximately 1.5% of the shaft diameter, i.e., 30 inch diameter shafts are anticipated to settle approximately ½ inches plus an allowance for the shaft shortening due to the soil-structure interaction.

Shafts should be cast as soon as practicable after drilling. Preferably within 4 hours. No shaft hole should be left open over night. If a shaft hole is left open, the portion of the shaft socketed into the Stratum 1 or 2 formations should be re-drilled prior to casting.

Retaining Walls

We anticipate that the relatively short retaining wall on the north side will be either a cast in place retaining wall or some form of stabilized earth wall with a behind the wall drain and appropriate water proofing. These can be designed as follows:

Retaining walls which are laterally supported and can be expected to undergo only a slight amount of deflection (i.e., less than 0.1 percent of wall height for granular soils or less than 1.0 percent of wall height for clay soils) should be designed for an at rest lateral earth pressure. The at rest lateral earth pressure is computed on the basis of an equivalent fluid unit weight, depending on the backfill material. The equivalent unit weights are given in the following table.

Laterally Supported Retaining Structures	
Equivalent Unit Weight	Backfill Material
55 pcf	Imported select fill meeting requirements
55 pcf	On-site Hard Strata

Retaining structures which can deflect sufficiently to mobilize the full active earth pressure condition should be designed for an active lateral earth pressure. The active lateral earth pressure is computed on the basis of an equivalent fluid unit weight, depending on the backfill material. The equivalent unit weights are given in the following table. Walls designed for these lesser earth pressure values must be detailed and specified such that (1) hydrostatic pressure can not develop and (2) compactive effort used on backfill is limited to that required to achieve 90 to 95 percent of standard Proctor density.

Retaining Structures Allowed To Deflect; Active Condition	
Equivalent Unit Weight	Backfill Material
40 pcf	Imported select fill meeting requirements
40 pcf	On-site Hard Strata

To utilize the active earth pressures given in the preceding table, either imported select backfill should extend at the surface to a horizontal distance from the retaining wall equal to its height (i.e., 1:1 slope of native soil).

Alternatively, given the near surface hard strata, a near vertical cut can be made leaving space for drainage behind the wall.

The moist unit weight used in our evaluation is 130 pcf for the on-site clayey soils, a cohesion of 20 psi, and a friction angle of 22°. At these values the retained earth, at 5 feet, is effectively self supporting. However, the exposed face of the Garber formation may deteriorate when subjected to weathering depending on the degree of cementation. The timely construction of the retaining wall is necessary if this construction option is selected.

Resistance to Sliding and Overturning

Ultimate resistance to lateral sliding at the bottoms of footings may be calculated based on a coefficient of friction of 0.5 for footings placed on granular imported soils or on an adhesion of 800 psf for footings placed on-site hard Stratum 1 and 2 soils. Sliding resistance may also include ultimate passive pressure against the front of the footings which can be calculated using an equivalent fluid unit weight of 265 pcf. The designer may use the passive pressure in this zone only if there is a certainty of no loss of toe soil. If necessary, additional sliding stability may be derived from the use of a key embedded into soil beneath the base and utilizing the equivalent fluid unit weight for passive lateral earth pressure for the resisting stratum. A factor of safety of at least 1.5, computed as follows, should be applied to these ultimate resistance values:

$$F_{\text{sliding}} = \text{sum resisting forces} / \text{sum driving forces}$$

Similarly, the safety factor against overturning with respect to the toe should be at least 1.5, computed as follows:

$$F_{\text{overturning}} = \text{sum of moments to resist overturning} / \text{sum of overturning moments}$$

Behind Wall Drainage

We recommend that the designer provide drainage from groundwater and/or moisture infiltration from behind the retaining wall. Some stabilized earth retaining walls provide this by draining between blocks. However, if the hard wall solution is used, then a behind wall drainage using a granular material and a perforated drain pipe should be used such as a french drain. It is likely that groundwater will infiltrate any granular backfill and perch if not allowed to drain and can result in retaining wall failure over time.

Site Drainage Considerations

An important part of any construction project is the drainage of water away from the structure. We recommend the following:

- The site should be sloped such that water drains away from the structure.
- Sidewalks and/or pavement should not be placed such that water is trapped between the pavement and the structure.
- Roof drainage should be directed away from the structure and not allowed to pond or pool in landscaping areas near the structure.
- Landscaping should be graded below finished floor elevation and slope away from the structure. Drainage should be provided for all plant beds adjacent to pavement, sidewalks, curb and gutter, or the building on the project site to mitigate moisture intrusion into the subgrade.

Pavement Recommendations

Pavement Sections

Our laboratory testing found a measured California Bearing Ratio (CBR) of the near surface soils as approximately 11.9. This would correspond to a modulus of subgrade reaction, k_s , of 215 pci, and a resilient modulus of 11,000 psi. Our pavement recommendations are based on typical light commercial traffic. This consists of passenger vehicles and light duty trucks in the parking areas and a mixture of

delivery vehicles (medium duty commercial trucks) with the aforementioned vehicles in the main access arteries and delivery dock area.

Hot Mixed Asphaltic Concrete (HMAC)

The following pavement section and reference specifications are recommended for HMAC pavement at this project:

HMAC Pavement Section			
Component	Thickness (inches)	ODOT Reference Construction Specification	ODOT Reference Material Specifications
ODOT S3	2.5 (Light Duty)	411	708
ODOT S2 or S3	3.0 (Truck Traffic)		
ODOT S2	3.0 (Light Duty) 4.0 (Truck Traffic)		
Stabilized Subgrade	6.0	SP327-2	

Stabilization to increase subgrade strength is recommended, based on the soil types of the project site. An estimate of approximately 4 percent by dry weight of Portland cement. This is approximately 22.3 pounds of Portland cement per square yard for a 6-inches thick lift. The actual percentage required should be determined on the exposed subgrade soils during construction by the contractor due to the variance in efficacy of the Portland cement.

Rigid Pavement (PCC)

The following rigid pavement section may be used at this site :

Rigid (PCC) Pavement Section			
Component	Thickness (inches)	ODOT Reference Construction Specification	ODOT Reference Material Specifications
Portland Cement Concrete	5.0 (Light Duty) 7.0 (Truck Traffic)	414	701, 702
Stabilized Subgrade	6.0	SP327-2	

Portland cement concrete used for pavement should be Class A as indicated in the reference ODOT material specification.

Stabilization should be as discussed in the HMAC recommendation above.

Isolation joints should be provided where concrete pavement butts against all buildings, manholes, light stanchions, sidewalks, and other immovable structures. Preferably, isolation joints should be filled with pre-molded joint filler.

Contraction joints should be spaced at no more than 12 feet in each direction in unreinforced concrete pavement. Joint spacing may be increased by adding reinforcing steel to the rigid pavement. Reinforcing steel should be supported by chairs and placed at or slightly above the mid-point of the concrete pavement and below the depth of sawcut for joints. To the greatest extent practicable joints should be placed to form square panels and meet at right angles. L, T or wedge shaped panels should be avoided, if possible.

Contraction joints should be sawcut as soon as the saw may be placed on the concrete and used without damaging or raveling the joint edges, ideally within 8 hours of concrete placement. Minimum depth of cut should be 1/3 the slab thickness. The resulting joint should be blown clean and dried with a high pressure compressed air wand and sealed with an elastomeric sealant. Delays in cutting contraction joints may result in uncontrolled transverse and longitudinal cracking.

Appropriate concrete placement and finishing techniques should be used for concrete pavement construction based on the environmental conditions at the time of casting. Curing compounds should be applied to the concrete surface, at the time and amount recommended by the curing compound manufacturer, especially in high wind conditions. This will help reduce surface cracking and crazing of the concrete and maintain water content during the curing process.

Vehicular traffic should not be allowed on the pavement until it has achieved an adequate minimum strength. Typically, automobile and light truck traffic may be allowed on Class A Portland cement concrete pavement in 3 days and 7 days, respectively.

Ingress, Egress and Refuse Container Pick-Up Pads

Ingress and egress and refuse container pick-up locations should consist of rigid pavement with a minimum thickness of 12 inches unless otherwise specified by local ordinance. These pavements should be cast on a 4 inch casting bed conforming to ODOT reference construction specification 414.

Seismic Information

Based on the site geology, field exploration and laboratory testing and using the procedure outlined in Chapter 16, of the International Building Code, the Site Classification for seismic design is Class B. A tabulation of seismic information from ASCE is provided in Appendix "H"

Reliance and Limitations

This report was prepared expressly for the use of for the proposed animal resource center with planned concrete masonry unit (CMU) construction located at 2700 S. Bryant Avenue in Oklahoma City, Oklahoma. The field exploration, laboratory testing and engineering evaluation contained in this report were planned and performed for the scope of the proposed project, as such, the information and recommendations contained in this report may not be adequate and should not be used by other parties or for other projects.

Information contained in this report is intended for design purposes, we recommend that contractors perform their own investigation to determine construction means and methods.

This project, engineering evaluation, and report were conducted in accordance with the standard of care for subsurface explorations and geotechnical engineering in the state of Oklahoma at the time of the investigation.

**Appendix “A”
Site Vicinity Map**

Site Vicinity Map

Animal Resource Center

Legend

Boring

Google Earth

1000 ft



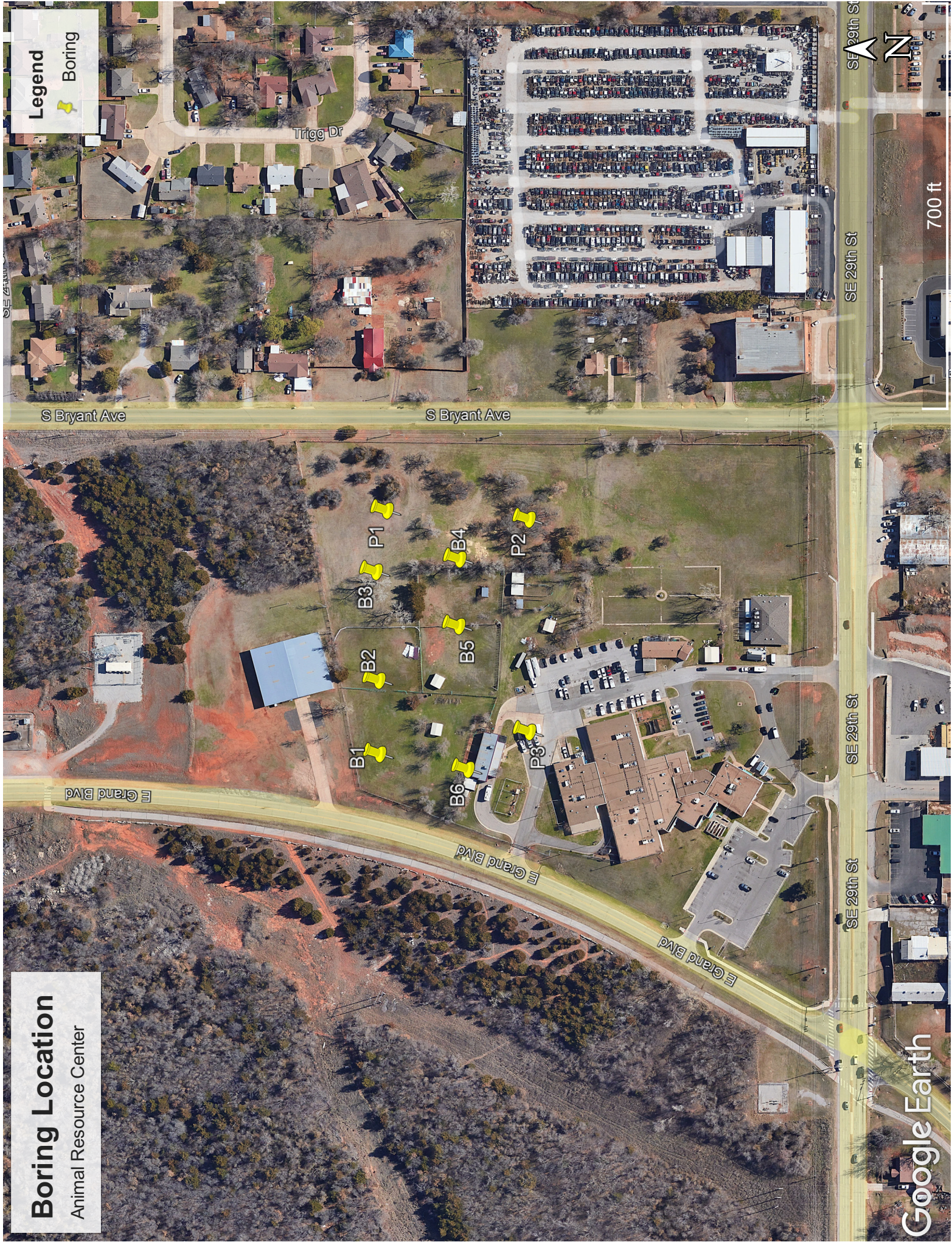
**Appendix “B”
Location of Borings**

Boring Location

Animal Resource Center

Legend

Boring



**Appendix “C”
Boring Logs**



W2 Engineering, Inc.
6616 Melrose Lane
Oklahoma City, OK 73127
Telephone: 4056033467
Fax: 4056033465

BORING NUMBER B1

PAGE 1 OF 1

CLIENT HES/City of Oklahoma City

PROJECT NAME Animal Welfare - MAPS 4

PROJECT NUMBER G010-23

PROJECT LOCATION SE29th and Grand Blvd.

DATE STARTED 9/5/23

COMPLETED 9/5/23

GROUND ELEVATION

HOLE SIZE 4.5"

DRILLING CONTRACTOR GD, LLC

GROUND WATER LEVELS:

DRILLING METHOD 4.5" SSA

AT TIME OF DRILLING ---

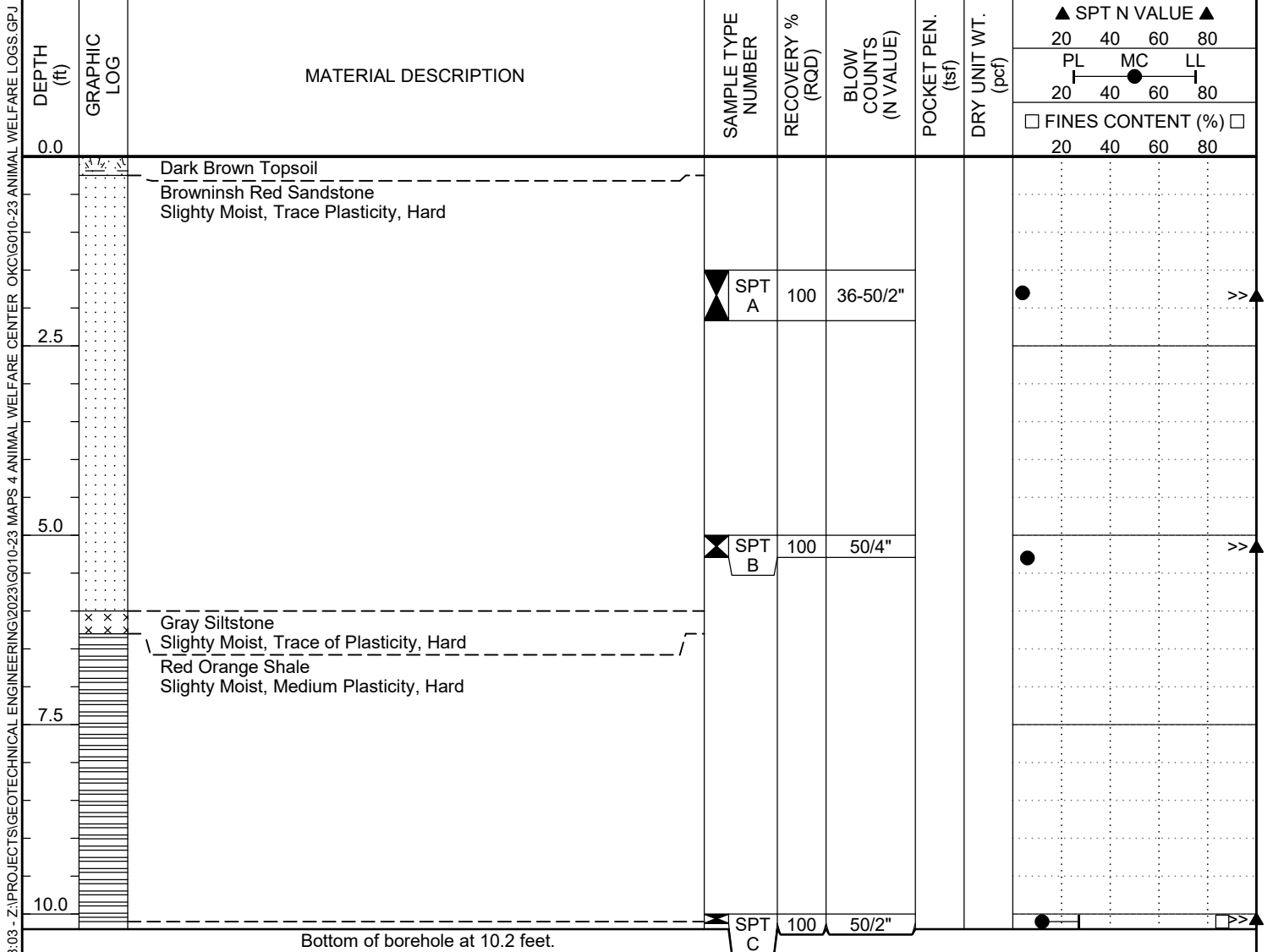
LOGGED BY ALW

CHECKED BY ALW

AT END OF DRILLING ---

NOTES

AFTER DRILLING ---





W2 Engineering, Inc.
6616 Melrose Lane
Oklahoma City, OK 73127
Telephone: 4056033467
Fax: 4056033465

BORING NUMBER B2

PAGE 1 OF 1

CLIENT HES/City of Oklahoma City

PROJECT NAME Animal Welfare - MAPS 4

PROJECT NUMBER G010-23

PROJECT LOCATION SE29th and Grand Blvd.

DATE STARTED 9/5/23 COMPLETED 9/5/23

GROUND ELEVATION HOLE SIZE 4.5"

DRILLING CONTRACTOR GD, LLC

GROUND WATER LEVELS:

DRILLING METHOD 4.5" SSA

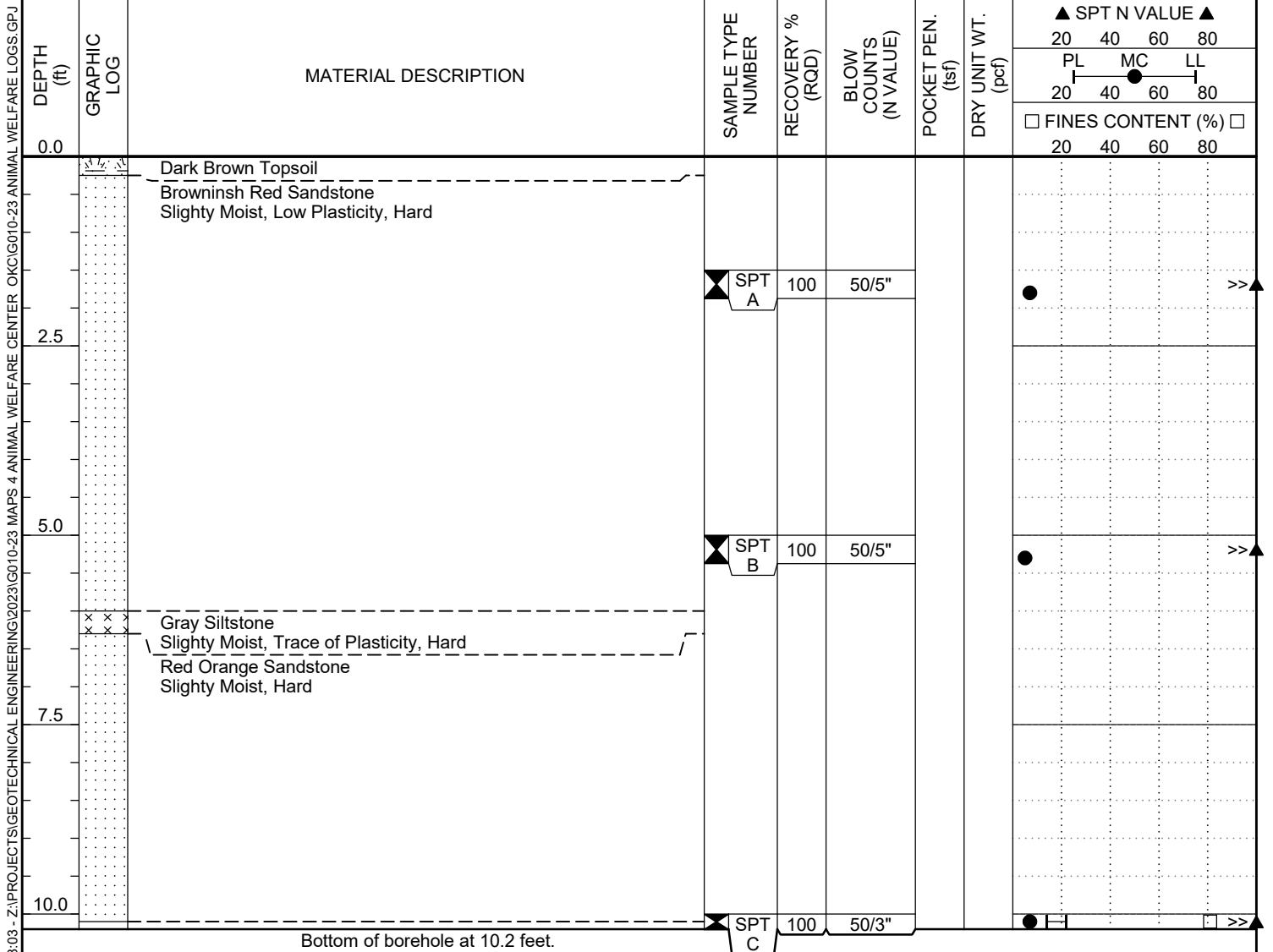
AT TIME OF DRILLING ---

LOGGED BY ALW CHECKED BY ALW

AT END OF DRILLING ---

NOTES

AFTER DRILLING ---





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6616 Melrose Lane
Oklahoma City, OK 73127
Telephone: 4056033467
Fax: 4056033465

BORING NUMBER B3

PAGE 1 OF 1

CLIENT HES/City of Oklahoma City

PROJECT NAME Animal Welfare - MAPS 4

PROJECT NUMBER G010-23

PROJECT LOCATION SE29th and Grand Blvd.

DATE STARTED 8/31/23

COMPLETED 8/31/23

GROUND ELEVATION

HOLE SIZE 4.5"

DRILLING CONTRACTOR GD, LLC

GROUND WATER LEVELS:

DRILLING METHOD 4.5" SSA

AT TIME OF DRILLING ---

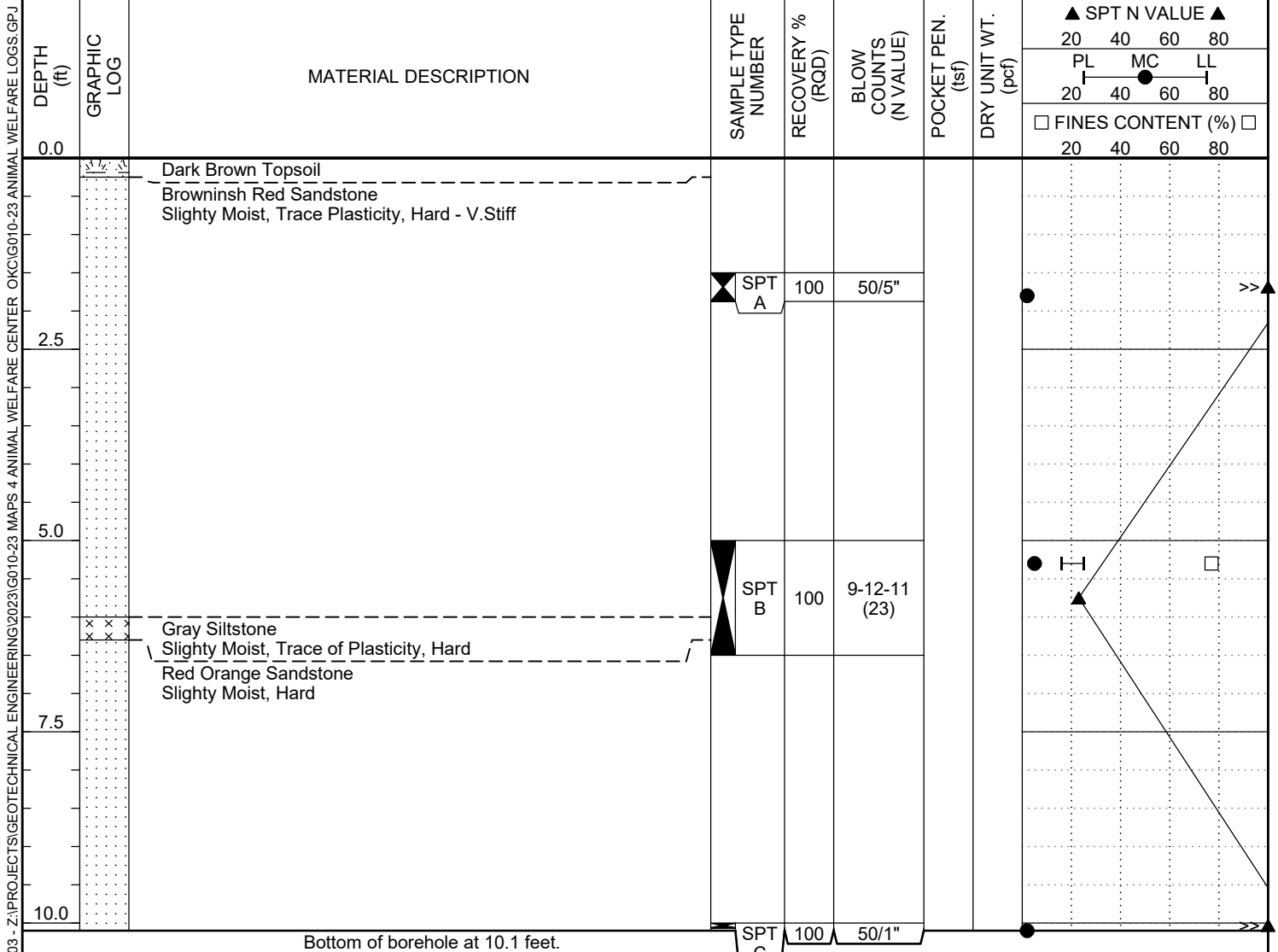
LOGGED BY ALW

CHECKED BY ALW

AT END OF DRILLING ---

NOTES

AFTER DRILLING ---





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6616 Melrose Lane
Oklahoma City, OK 73127
Telephone: 4056033467
Fax: 4056033465

BORING NUMBER B4

PAGE 1 OF 1

CLIENT HES/City of Oklahoma City

PROJECT NAME Animal Welfare - MAPS 4

PROJECT NUMBER G010-23

PROJECT LOCATION SE29th and Grand Blvd.

DATE STARTED 9/1/23 COMPLETED 9/1/23

GROUND ELEVATION HOLE SIZE 4.5"

DRILLING CONTRACTOR GD, LLC

GROUND WATER LEVELS:

DRILLING METHOD 4.5" SSA

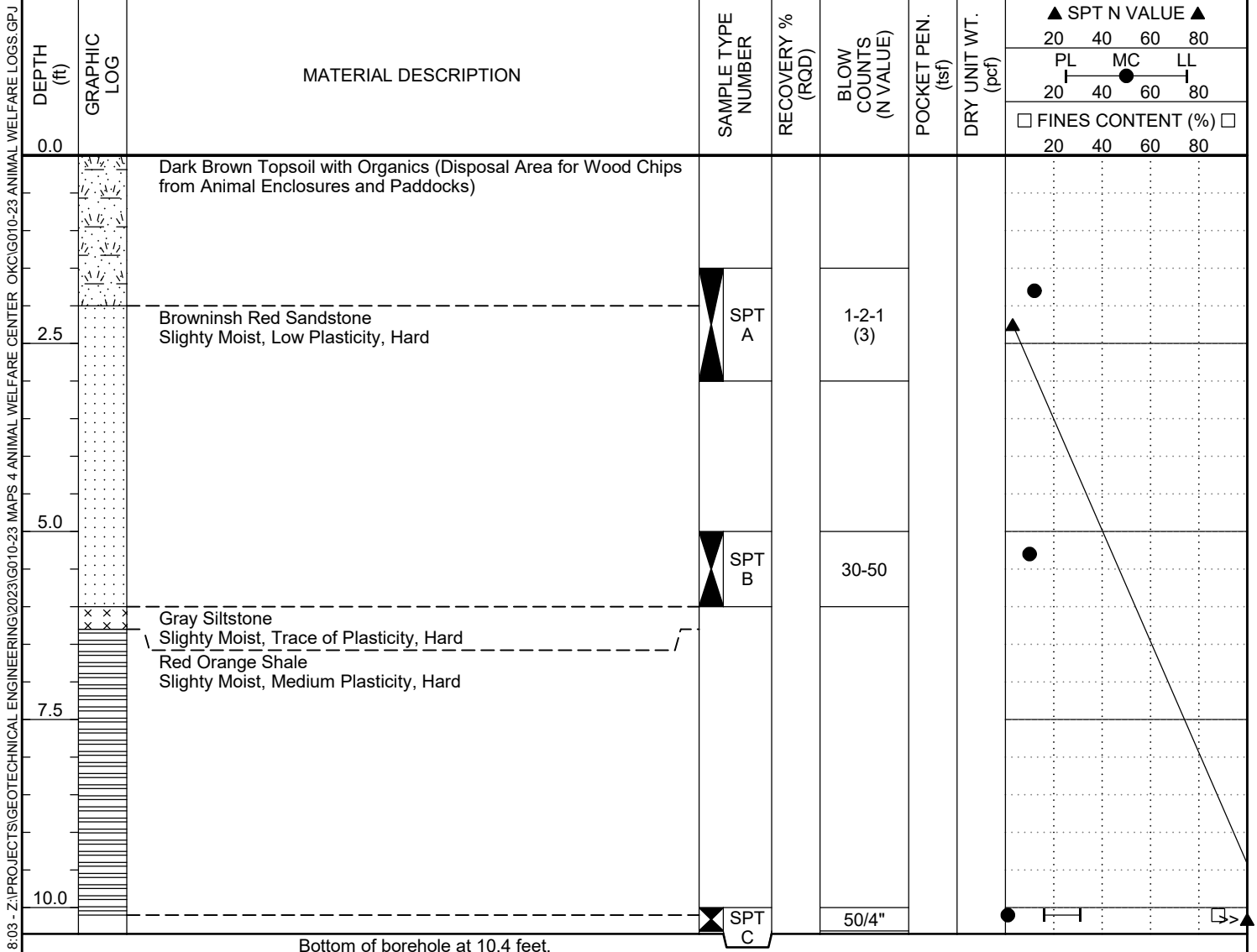
AT TIME OF DRILLING ---

LOGGED BY ALW CHECKED BY ALW

AT END OF DRILLING ---

NOTES

AFTER DRILLING ---





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Oklahoma City, OK 73127
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Fax: 4056033465

BORING NUMBER B5

PAGE 1 OF 1

CLIENT HES/City of Oklahoma City

PROJECT NAME Animal Welfare - MAPS 4

PROJECT NUMBER G010-23

PROJECT LOCATION SE29th and Grand Blvd.

DATE STARTED 9/1/23 COMPLETED 9/1/23

GROUND ELEVATION HOLE SIZE 4.5"

DRILLING CONTRACTOR GD, LLC

GROUND WATER LEVELS:

DRILLING METHOD 4.5" SSA

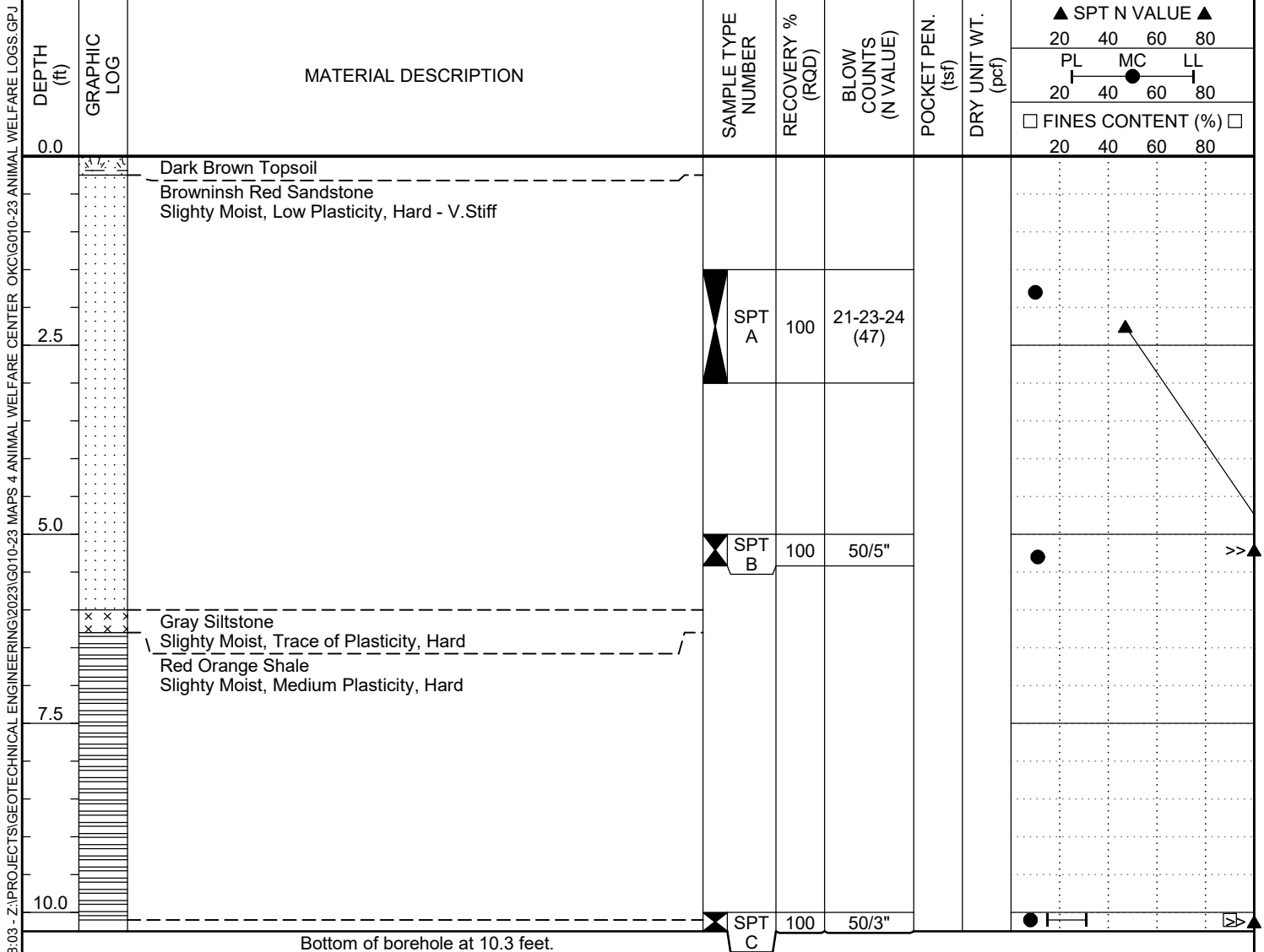
AT TIME OF DRILLING ---

LOGGED BY ALW CHECKED BY ALW

AT END OF DRILLING ---

NOTES

AFTER DRILLING ---





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6616 Melrose Lane
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Fax: 4056033465

BORING NUMBER B6

PAGE 1 OF 1

CLIENT HES/City of Oklahoma City

PROJECT NAME Animal Welfare - MAPS 4

PROJECT NUMBER G010-23

PROJECT LOCATION SE29th and Grand Blvd.

DATE STARTED 9/1/23 COMPLETED 9/1/23

GROUND ELEVATION HOLE SIZE 4.5"

DRILLING CONTRACTOR GD, LLC

GROUND WATER LEVELS:

DRILLING METHOD 4.5" SSA

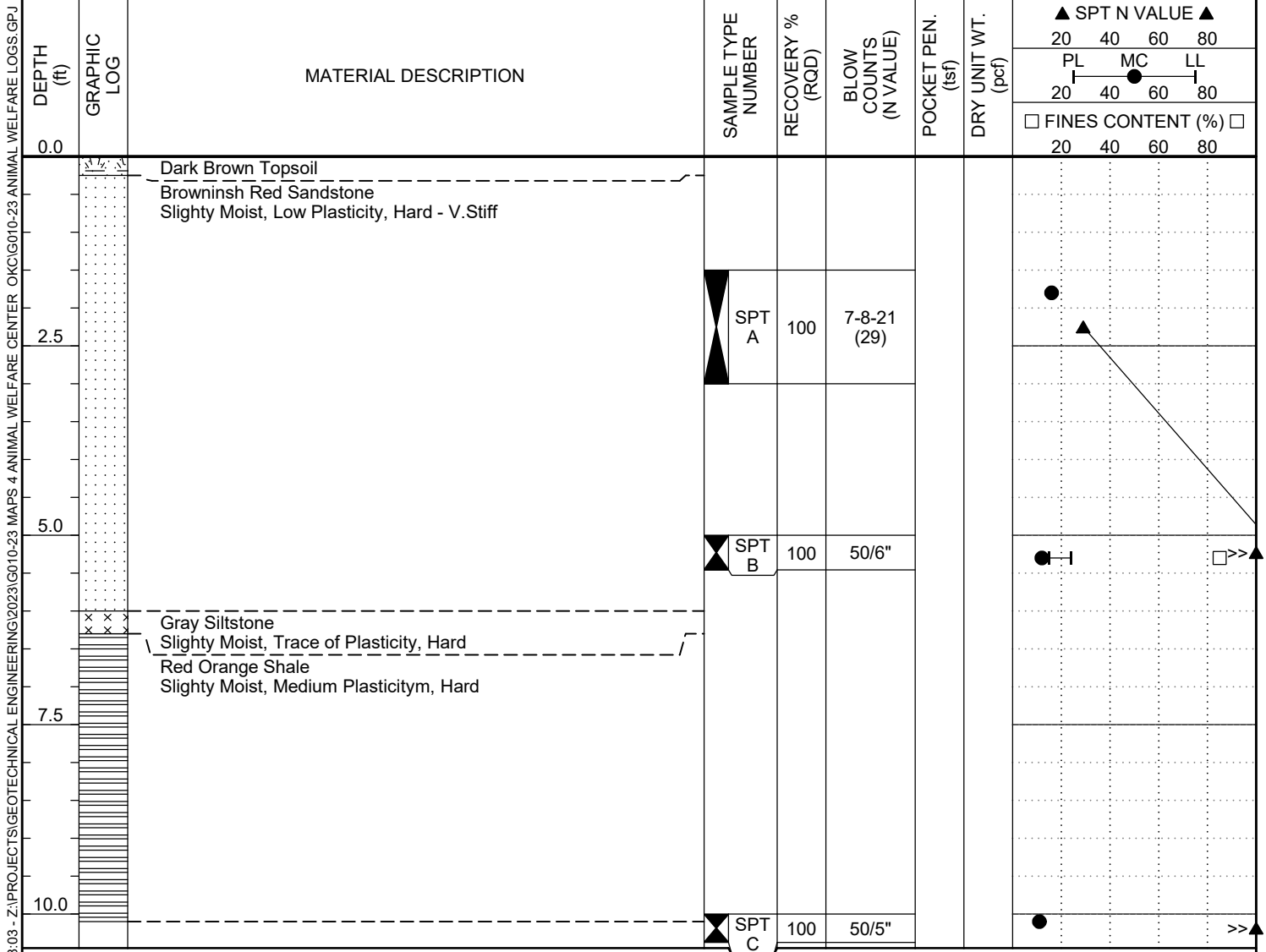
AT TIME OF DRILLING ---

LOGGED BY ALW CHECKED BY ALW

AT END OF DRILLING ---

NOTES

AFTER DRILLING ---





W2 Engineering, Inc.
6616 Melrose Lane
Oklahoma City, OK 73127
Telephone: 4056033467
Fax: 4056033465

BORING NUMBER P1

PAGE 1 OF 1

CLIENT HES/City of Oklahoma City

PROJECT NAME Animal Welfare - MAPS 4

PROJECT NUMBER G010-23

PROJECT LOCATION SE29th and Grand Blvd.

DATE STARTED 9/1/23 COMPLETED 9/1/23

GROUND ELEVATION HOLE SIZE 4.5"

DRILLING CONTRACTOR GD, LLC

GROUND WATER LEVELS:

DRILLING METHOD 4.5" SSA

AT TIME OF DRILLING ---

LOGGED BY ALW CHECKED BY ALW

AT END OF DRILLING ---

NOTES

AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
0.0		Dark Brown Topsoil						20	40	60	80
2.5		Red Brown Sandy Shale Moist, Low Plasticity, Hard	GB A								
5.0			SPT B		50/4"						

Bottom of borehole at 5.3 feet.

GEOTECH BH PLOTS - GINT STD US.GDT - 10/2/23 18:03 - Z:\PROJECTS\GEOTECHNICAL ENGINEERING\2023\G010-23 MAPS 4 ANIMAL WELFARE CENTER OKC\G010-23 ANIMAL WELFARE LOGS.GPJ



W2 Engineering, Inc.
6616 Melrose Lane
Oklahoma City, OK 73127
Telephone: 4056033467
Fax: 4056033465

BORING NUMBER P2

PAGE 1 OF 1

CLIENT HES/City of Oklahoma City

PROJECT NAME Animal Welfare - MAPS 4

PROJECT NUMBER G010-23

PROJECT LOCATION SE29th and Grand Blvd.

DATE STARTED 8/31/23

COMPLETED 8/31/23

GROUND ELEVATION

HOLE SIZE 4.5"

DRILLING CONTRACTOR GD, LLC

GROUND WATER LEVELS:

DRILLING METHOD 4.5" SSA

AT TIME OF DRILLING ---

LOGGED BY ALW

CHECKED BY ALW

AT END OF DRILLING ---

NOTES

AFTER DRILLING ---

GEOTECH BH PLOTS - GINT STD US.GDT - 10/2/23 18:03 - Z:\PROJECTS\GEOTECHNICAL ENGINEERING\2023\G010-23 MAPS 4 ANIMAL WELFARE CENTER OKC\G010-23 ANIMAL WELFARE LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
0.0		Dark Brown Topsoil						20	40	60	80
		Red Brown Sandy Shale Moist, Low Plasticity, Hard									
2.5			GB A								
5.0											
			SPT B		50/2"						

Bottom of borehole at 5.2 feet.



W2 Engineering, Inc.
6616 Melrose Lane
Oklahoma City, OK 73127
Telephone: 4056033467
Fax: 4056033465

BORING NUMBER P3

PAGE 1 OF 1

CLIENT HES/City of Oklahoma City

PROJECT NAME Animal Welfare - MAPS 4

PROJECT NUMBER G010-23

PROJECT LOCATION SE29th and Grand Blvd.

DATE STARTED 9/1/23 COMPLETED 9/1/23

GROUND ELEVATION HOLE SIZE 4.5"

DRILLING CONTRACTOR GD, LLC

GROUND WATER LEVELS:

DRILLING METHOD 4.5" SSA

AT TIME OF DRILLING ---

LOGGED BY ALW CHECKED BY ALW

AT END OF DRILLING ---

NOTES

AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
0.0		Asphalt Pavement Approximately 4-inches thickness						20	40	60	80
2.5		Red Brown Sandy Shale Moist, Medium Plasticity, Hard	GB A								
5.0			SPT B		50/4"						
Bottom of borehole at 5.3 feet.											

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
			HIGHLY ORGANIC SOILS		

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

**Appendix “D”
Laboratory Test Results**

Summary of Laboratory Results												
Project	Animal Resource Center				W2 Project No.	G010-23						
Location	2700 S. Bryant Avenue, Oklahoma City, OK 73129				Client	City of Oklahoma City						
Boring Number	Sample Description	Depth (feet)	Moisture Content (%)	Atterberg Limits (% Moisture)	Sieve Analysis (% Passing)				Soil Classification			
					LL	PL	PI	#4	#10	#40	#200	USCS/AASHTO
B1	Reddish Brown Silty Shale	0-1.5	4.1									
	Reddish Brown Silty Shale	1.5-5	5.7									
	Reddish Brown Silty Shale	5-10	11.6	27 11 16	27	11	16	100	100	96	85.9	CL/A-6(11)
B2	Orange Red Sandstone	0-1.5	6.5									
	Orange Red Sandstone	1.5-5	4.6									
	Orange Red Sandstone	5-10	7.0	22 14 8	22	14	8	100	100	94	80.8	CL/A-4(4)
B3	Brown Silty Clayey Sand	1.5-3	2.4									
	Brown Silty Shale	5	7.1	25 16 9	25	16	9	100	100	85	68.7	CL/A-4(4)
	Brown Silty Shale	10	1.4									
B4	Brown silty Shale	1.5	11.5									
	Reddish Brown Silty Shale	5	10.0									
	Reddish Brown Silty Shale	10	0.5	31 16 15	31	16	15	100	100	98	87.7	CL/A-6(12)
B5	Red Shale	1.5	10.3									
	Red Shale	5	10.6									
	Red Shale	10	8.3	31 15 16	31	15	16	100	100	94	90.1	CL/A-6(13)

Summary of Laboratory Results											
Project	Animal Resource Center			W2 Project No.	G010-23						
Location	2700 S. Bryant Avenue, Oklahoma City, OK 73129			Client	City of Oklahoma City						
Boring Number	Sample Description	Depth (feet)	Moisture Content (%)	Atterberg Limits (% Moisture)			Sieve Analysis (% Passing)				Soil Classification
				LL	PL	PI	#4	#10	#40	#200	
B6	Reddish Brown Silty Shale	1.5	16.4								
	Reddish Brown Silty Shale	5	11.9	24	15	9	100	100	98	84.7	CL/A-4(5)
	Reddish Brown Silty Shale	10	10.0								
P1	Reddish Brown Silty Shale		3.8	24	15	9	100	100	90	75.4	CL/A-4(4)
P2	Reddish Brown Silty Shale		12.5	27	17	13	100	100	93	86.6	CL/A-6(9)
P3	Reddish Brown Silty Shale		11.3	34	15	19	100	100	97	86.9	CL/A-6(15)

Appendix “E”
Standard Proctor Testing

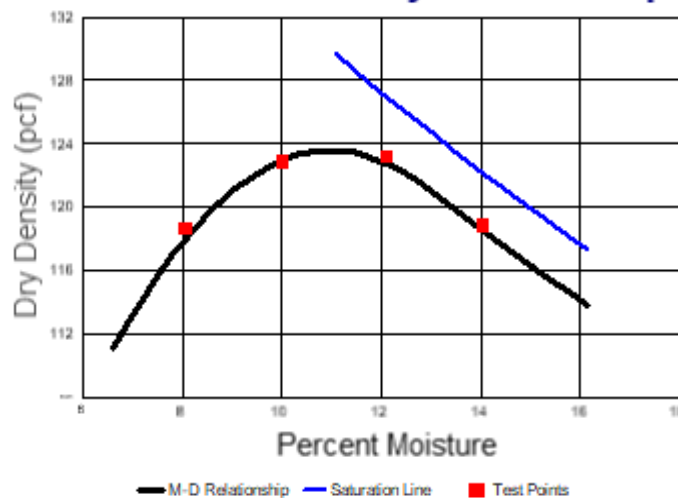
Report of Moisture-Density Relationship (Modified Effort)

Project	MAPS 4 Animal Resource Center	W2 Project No.	G010-23
Location	2700 S. Bryant Avenue, Oklahoma City	Task Number	N/A
Client	City of Oklahoma City	Date of Report	09/14/23
Client Contact	Todd Edmonds, AIA	Date Sampled	09/05/23
Contractor	N/A	Sampled by	ALW, MM
Architect	HSE Architects	Sample Location	Composite P1, P2 & P3
Engineer	N/A	Quantity Represented	Reddish Brown Silty Shale

Test Results

Trial Number	Moisture Content	Dry Density
1	8.1%	118.6
2	10.0%	122.8
3	12.1%	123.2
4	14.0%	118.8

Optimum Moisture Content (percent)	11
Maximum Dry Density (pcf)	123.6
Soil Description	Reddish Brown Silty Shale
USCS Soil Classification	-
AASHTO Soil Classification	-
Specific Gravity Used	2.7 Assumed

Moisture Density Relationship**Applicable Specifications**

ASTM	D698, D1556, D1557, D2216, D3740
AASHTO	T99, T180

Distribution

City of Oklahoma City	Email
HSE Architects	Email

Respectfully Submitted

Arvel L. Williams, P.E.

President

**Appendix “F”
Laboratory CBR Testing**

Specimen A Information**CBR Test**

File Name

G010-23 ANIMAL RESOURCE CENTER

Project Information

Project No. G010-23

Date: 9/18/2023

Project Name: Animal Welfare OKC

Client: City of Oklahoma City

Sample Location: 2700 S. Bryant Avenue, OK

Sample Description: Reddish Brown Silty Shale

Remarks: Remolded more than 95% of Maximum Dry Density-Standard Effort

Specimen A DataSoaked Height (in): 4.67
Swell (%): 0.860Liquid Limit: Max Dry Dens. (pcf): 123.6
Plastic Limit: Opt. Moisture (%): 11**Mold Info**

Height (in)	4.63
Weight (g)	8031.7
Soil Weight + Mold (g)	12615.40
Soil Weight (g)	4583.70
Mold Volume (in ³)	130.8
Dry Density (pcf)	120.3

Moisture Percentage

	Initial	Avg Final
Moist Soil + tare (g)	92.43	85.93
Dry Soil + tare (g)	84.77	78.12
tare (g)	15.48	15.51
Moisture (%)	11.04	12.5

Specimen A Test Data

Read Number	Load (lbs)	Disp. (in)	Force on Plunger (psi)	Penetration (in)	CBR
0	99.1	0.512	0.0	0.000	
1	201.6	0.538	34.2	0.026	
2	284.2	0.562	61.7	0.051	
3	367.7	0.588	89.5	0.076	
4	456.9	0.613	119.3	0.101	11.93
5	548.6	0.638	149.8	0.126	
6	637.0	0.664	179.3	0.152	
7	720.5	0.689	207.1	0.177	
8	802.3	0.714	234.4	0.202	15.63
9	891.5	0.739	264.1	0.227	
10	984.9	0.764	295.2	0.253	
11	1079.1	0.790	326.6	0.278	
12	1170.8	0.815	357.2	0.303	18.80
13	1263.3	0.841	388.1	0.329	
14	1355.9	0.866	418.9	0.354	
15	1440.1	0.891	447.0	0.379	
16	1523.6	0.916	474.8	0.405	20.64
17	1612.0	0.941	504.3	0.429	
18	1700.4	0.967	533.8	0.455	
19	1783.9	0.992	561.6	0.480	
20	1843.3	1.012	581.4	0.500	22.36

Test Performed By: JJ

Checked By: JJ

California Bearing Ratio Test Report

Date 9/18/23

Date

Checked By

Date

J J

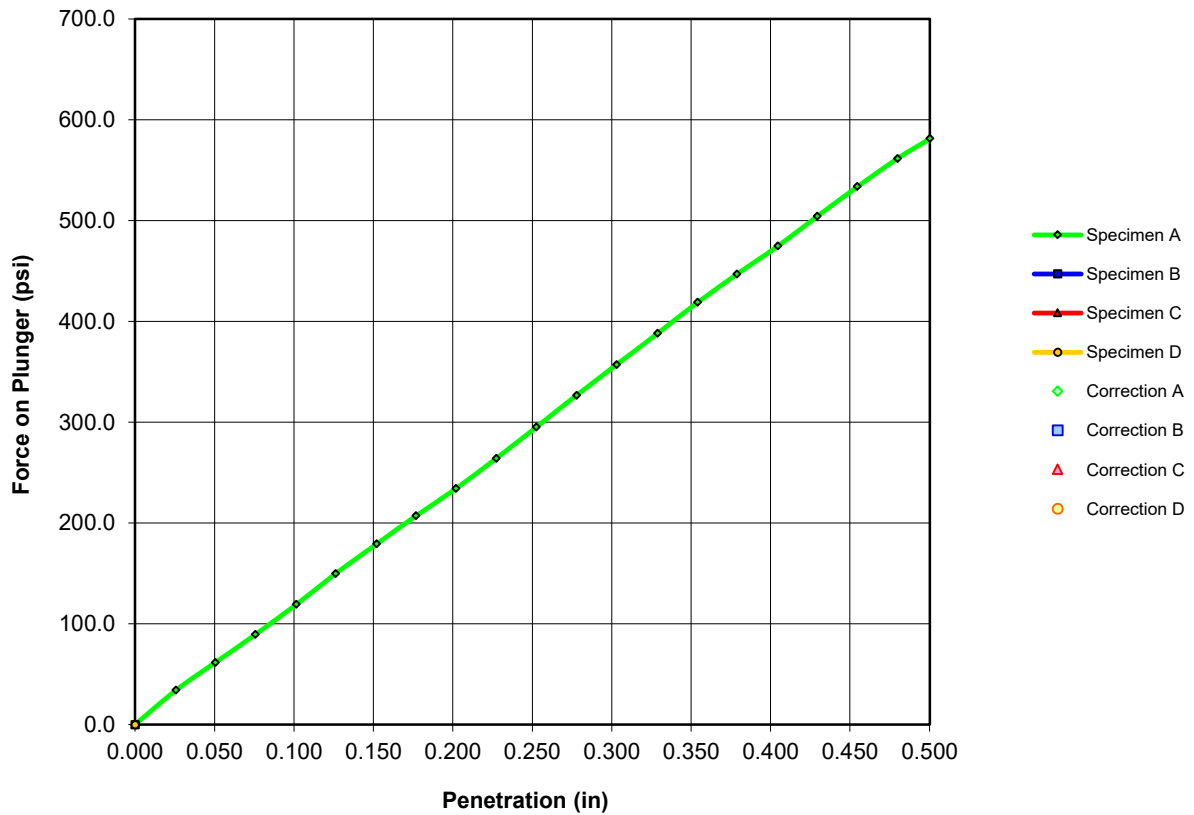
Computed By

9/18

Date

Tested By JJ

Load Penetration Curve



CBR Results

Results	A	B	C	D	Average
0.1 in Pen.	11.9				11.9
0.2 in Pen.	15.6				15.6
Moisture (%)	11.04				11.04
Density (pcf)	120.255				120.255
Final Moisture (%)	12.5				12.50
Final Density (pcf)	120.495				120.495

Project Information

Project Num	G010-23	Sample Location	
Project	Animal Resource Center	Specimen A	2700 S. Bryant Avenue, OK
Date	9/18/2023	Specimen B	
Client	City of Oklahoma City	Specimen C	
		Specimen D	
		Test Variables	
Job Ref.	N/A	Liquid Limit:	
Sample Num.	A	Plastic Limit:	
Remarks			

**Appendix “G”
Geological Information**

Geological Formation

Animal Resource Center

Smith Village

E Grand Blvd

SE 15th St

S Bryant Ave

Del City

Approximate Location

SE 29th St

SE 29th St

SE Grand Blvd

S Bryant Ave

S Sunnylane Rd

S Eastern Ave

Google Earth
SE 44th St

SE 44th St

SE 44th St

1 mi



Legend



Approximate Boring Location



Garber Sandstone

XML	JSON	Shapefile
-----	------	-----------

ENID- Mostly orange-brown, fine- to medium-grained quartzose sandstone and conglomerate, grading northward into shale and calcitic siltstone. Thickness, about 600 feet (180 m). (Sumner Group) *OKLAHOMA CITY-* Mostly orange-brown to red-brown fine-grained sandstone, irregularly bedded with red-brown shale and some chert and mudstone conglomerate. Thickness ranges from 150 feet in south to 400 feet or more in north. (Sumner Group) *LAWTON-* "Garber Sandstone," Pg. reddish-brown, fine-grained sandstone and mudstone conglomerate, 160 to 210 feet (49 to 64 m) thick, containing a basal sandstone, the "Asphaltum Sandstone Bed," about 10 to 60 feet (3 to 18 m) thick. (Sumner Group) *ARDMORE-SHERMAN-* Sandstone, red-brown, fine- to coarse-grained; thickness, about 110 to 150 feet, including Fairmont Shale west of Elmore City, Garvin County.

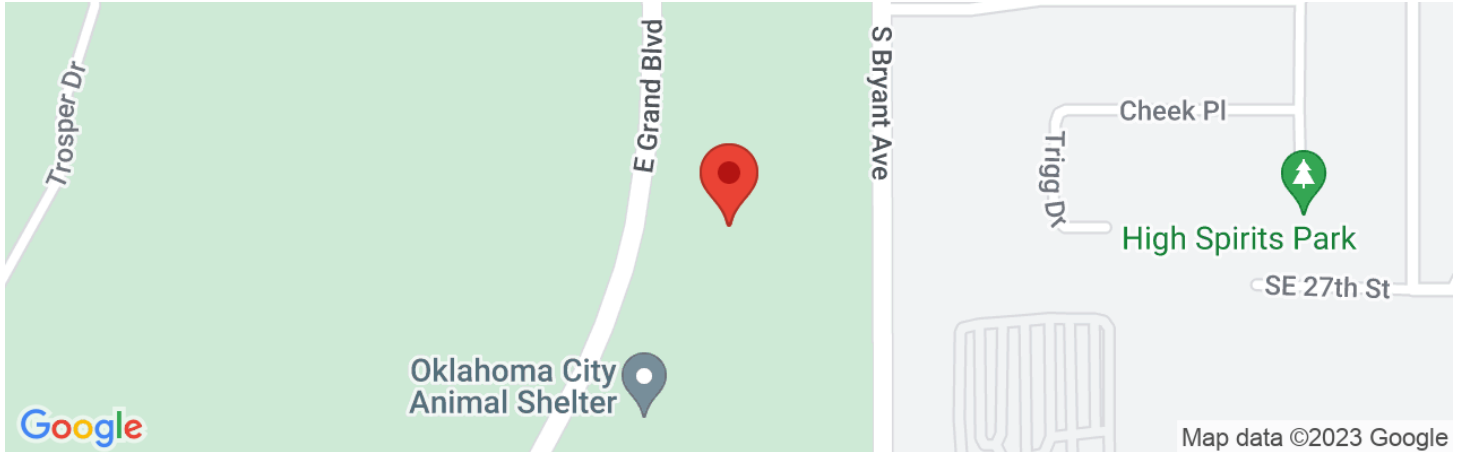
State	Oklahoma
Name	Garber Sandstone
Geologic age	Early Permian
Lithologic constituents	Major Sedimentary > Clastic > Sandstone (Bed) Sedimentary > Clastic > Conglomerate (Bed) Minor Sedimentary > Clastic > Mudstone > Shale (Bed) Sedimentary > Clastic > Siltstone (Bed) Sedimentary > Chemical > Chert (Bed)
References	<p>Heran, W.D., Green, G. and Stoesser, D.B., 2003, A Digital Geologic Map Database of Oklahoma: USGS Open File Report 03-247, scal https://pubs.er.usgs.gov/publication/ofr03247</p> <p>Bingham, R.H. and Bergman, D.L., 1980, Reconnaissance of the water resources of the Enid quadrangle, north-central Oklahoma: Okl: 1:250,000, 4 sheets. (Geology on sheet 1 compiled by R.H. Bingham, and R.O. Fay, 1973.)</p> <p>Cederstrand, J.R., 1996e, Digital geologic map of Enid quadrangles, north-central Oklahoma: U.S. Geological Survey Open-File Report http://ok.water.usgs.gov/gis/geology https://pubs.er.usgs.gov/publication/ofr96374</p> <p>Bingham, R.H. and Moore, R.L., 1975, Reconnaissance of the Water Resources of the Oklahoma City quadrangle, central Oklahoma: C 1:250,000, 4 sheets. (Geology on sheet 1 compiled by R.H. Bingham and R.O. Fay, 1973.)</p> <p>Cederstrand, J.R., 1996i, Digital geologic map of Oklahoma City quadrangles, central Oklahoma: U.S. Geological Survey Open-File Report http://ok.water.usgs.gov/gis/geology https://pubs.er.usgs.gov/publication/ofr96378</p> <p>Havens, J.S., 1977, Reconnaissance of the water resources of the Lawton quadrangle, southwestern Oklahoma: Oklahoma Geological Survey Bulletin 100 (Geology on sheet 1 compiled by R.O. Fay, 1967-68 and J.S. Havens, 1973.)</p> <p>Cederstrand, J.R., 1996g, Digital geologic map of Lawton quadrangles, southwestern Oklahoma: U.S. Geological Survey Open-File Report http://ok.water.usgs.gov/gis/geology https://pubs.er.usgs.gov/publication/ofr96376</p> <p>Hart, D.L., 1974, Reconnaissance of the water resources of the Ardmore and Sherman quadrangles, southern Oklahoma: Oklahoma Geological Survey Bulletin 98 (Geology on sheet 1 compiled by D.L. Hart, and R.O. Fay, in 1970.)</p> <p>Cederstrand, J.R., 1996a, Digital geologic map of Ardmore-Sherman quadrangles, south-central Oklahoma: U.S. Geological Survey Open-File Report http://ok.water.usgs.gov/gis/geology https://pubs.er.usgs.gov/publication/ofr96370</p>
NGMDB product	NGMDB product page for 55294
Counties	Carter - Cleveland - Comanche - Cotton - Garfield - Garvin - Grant - Jackson - Jefferson - Kay - Kingfisher - Kiowa - Lincoln - Logan - Love - McClain -

**Appendix “H”
Seismic Site Information**



MAPS 4 Animal Resource Center

Latitude, Longitude: 35.43758348, -97.46066258



Date	10/3/2023, 12:23:21 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	B - Rock

Type	Value	Description
S_S	0.31	MCE_R ground motion. (for 0.2 second period)
S_1	0.081	MCE_R ground motion. (for 1.0s period)
S_{MS}	0.279	Site-modified spectral acceleration value
S_{M1}	0.065	Site-modified spectral acceleration value
S_{DS}	0.186	Numeric seismic design value at 0.2 second SA
S_{D1}	0.043	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	B	Seismic design category
F_a	0.9	Site amplification factor at 0.2 second
F_v	0.8	Site amplification factor at 1.0 second
PGA	0.186	MCE_G peak ground acceleration
F_{PGA}	0.9	Site amplification factor at PGA
PGA_M	0.167	Site modified peak ground acceleration
T_L	12	Long-period transition period in seconds
S_{sRT}	0.31	Probabilistic risk-targeted ground motion. (0.2 second)
S_{sUH}	0.335	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
S_{sD}	1.5	Factored deterministic acceleration value. (0.2 second)
S_{1RT}	0.081	Probabilistic risk-targeted ground motion. (1.0 second)
S_{1UH}	0.088	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S_{1D}	0.6	Factored deterministic acceleration value. (1.0 second)
$PGAd$	0.5	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA_{UH}	0.186	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.925	Mapped value of the risk coefficient at short periods

Type	Value	Description
C_{R1}	0.921	Mapped value of the risk coefficient at a period of 1 s
C_V	0.803	Vertical coefficient

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VI. APPENDIX

PRELIMINARY COST ESTIMATE



OKLAHOMA CITY ANIMAL SHELTER

ADMINISTRATION / CLINIC / ADOPTION / KENNELS FACILITIES

PROJECT: OKLAHOMA CITY ANIMAL SHELTER
 LOCATION: OKLAHOMA CITY, OK
 SCOPE: ADMINISTRATION / CLINIC / ADOPTION / KENNELS FACILITIES
 ESTIMATOR: PRE CONSTRUCTION SERVICES, INC.

COST ANALYSIS: SQUARE FOOT COSTING APPROACH
 ESTIMATE FORMAT: UNIFORMAT II
 ARCHITECT/CLIENT: HSE ARCHITECTS

FILE: 22-064
 DESIGN: SCHEMATIC

SUMMARY OF COSTS	TOTAL
A SUBSTRUCTURES	\$1,672,216
B SHELL	\$8,431,786
C INTERIORS	\$4,158,730
D SERVICES	\$10,425,412
E EQUIPMENT & FURNISHINGS	\$2,340,805
F SPECIAL CONSTRUCTION & DEMOLITION	\$287,287
G BUILDING SITEWORK	\$3,623,142
TOTAL CONSTRUCTION	\$30,939,377

COST PER SQUARE FOOT \$468.73

AREA OF CONSTRUCTION:

FLOOR 1 58,131 SF
FLOOR 2 7,876 SF

TOTAL FLOOR AREA: 66,007 SF

MAPS 4 ANIMAL SHELTER
PRELIMINARY REPORT
THANK YOU

