

University of Iowa
Department of Civil & Environmental Engineering
Project Design & Management
(CEE:3084:0001)

Fire Station Restoration



Prepared for:

City of Mason City, IA

Prepared by:



D3 Consultants

To the best of my knowledge all information provided in the enclosed report, both programmatic and financial, is complete and accurate at the time of submission.

Authorized Signature

Date

Brendan Durkin - Project Manager

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Executive Summary

The following report, prepared by D3 Consultants (a hypothetical engineering firm), provides engineering services for the structural evaluation and repurposing of an existing fire station in the City of Mason City, IA. Work tasks included a complete structural analysis followed by a feasibility study and a final recommendation for the project. The final recommendation was selected from three conceptual design alternatives. The first alternative being an office space, the second being an archive/storage space, and the third being demolition/office space. After careful consideration, D3 Consultants recommends the renovation of the existing fire station, and repurposed into a private office space. The total project cost will be \$300,000, and a detailed analysis of this can be found in Section 4 of this report. The final project deliverables include this design report, 3D renderings of the interior and exterior of the building, and a site plan set.

D3 consultants is a student engineering team specializing in the structural analysis of existing buildings, sites, and interior design work to repurpose structures. Located in Iowa City, IA, the team contains four partners each bringing a different level of expertise to the company. The managing partner of the team, Brendan Durkin, has experience in the contracting and construction field, leads as project manager. Melissa Chanto Lukert, who has a background in the design of structural systems and knowledge of structural analysis software, leads the structural engineering team. James Robinson, who brings an architectural and interior design perspective lead the design department to the projects. Kaxing Jiao provides technical services, has experience with various design softwares, and can take on other necessary pertinent roles.

The report begins with an Introductory section providing, an insight into the overall outline of the structure of the report. The Problem Statement section follows which allows D3 Consultants to develop and explain our understanding of the design task. The Problem Statement section is broken into six sub-categories, which include Design Objectives, Approaches, Constraints, Challenges, Societal Impacts, and Other Categories. Some of the constraints of the project include space availability, time, budget, and desire to be a historical landmark. Some of the challenges presented are the age of the building, asbestos, lead paint, historical significance, and team experience. Further development of the details of the constraints and challenges are in Section 2.3 and 2.4 of the report.

After the Problem Statement, section comes the Preliminary Development of Alternative Solutions section. The Selection Process section follows describing the process by which the selection of the final design alternative. Next comes the Final Design Details section providing the presentation of the final design. The Cost and Construction Estimates section follows the Final Design Details and provides a detailed discussion of the total project cost and project scheduling as appropriate. The report comes to an end with a Conclusion section and a Bibliography. An appendix concludes the report containing any additional information or attachments relevant to the project.

1. Introduction

D3 Consultants, a student engineering team, has been tasked by a course to assess possible renovations or repurpose of an abandoned firehouse located in Mason City. The firehouse was erected in 1939; it remained in use until 1972 when it no longer useful as a fire station. Designed in historic Art Deco style, the firehouse become part of history due to Federal funds in response to the economic crisis of the early 1930's. The historical significance of the firehouse is important to the city, and therefore it was imperative to attempt to the save the historic building. D3 Consultants has determined the best course of action for the fire station is reconstruction of the interior walls and roof, while keeping the current foundation as well as the exterior walls intact. Reconstruction of the firehouse will allow the building to have a versatile space, therefore making it suitable for a private office. The following report expands on the presented project.

2. Problem Statement

The Fire Station Renovation Project is an opportunity for restoration and repurpose of the current building. The project requires an assessment of the current building infrastructure in order to determine the current state of the building. The project involves cost assessments, meeting zoning requirements, as well as bringing the building back up to current building codes. D3 consultants has provided the client with a feasibility study, along with a recommendation for the Fire Station Renovation Project. The recommendation entails three design alternatives, and a full development of the best alternative. A formal presentation as well as finalized plans for the Fire Station Restoration Project will be presented to the client to end the project.

2.1. Design Objective

Mason City has had an abandoned firehouse since 1972. The City of Mason City approached D3 Consultants to explore potential repurpose of the firehouse. Built in the 1939 the firehouse was designed in art deco style, and since has become important to the historical preservation society. D3 Consultants plans to honor the style of the building by providing a plan to repurpose this iconic building while minimizing negative societal impacts. D3 Consultants has provided a flexible design, which allows the potential buyer with a variety of layouts and uses.

2.2. Approaches

D3 consultants split the project into three segments, the firehouse, parking lot, and the HVAC system. The firehouse was determined to be in a multi-use zone area, from Mason City Zoning Map. This allowed certain freedoms when developing alternatives for the project. D3 Consultants finalized the design by selecting a versatile office space as the desired alternative. The office space adhered to the International Building Code 2015 (IBC 2015). The IBC was the standard to which our building design was motivated, combined with the AISC Steel Design Manual. The firehouse was also made to meet the International Fire Code 2012 as to meet all standards Mason City has present. The parking lot of the building was designed utilizing the Iowa DOT standards. The DOT provided guidelines as to maximum and minimum grades for the parking lot for runoff. The manual also provided the design followed for the curb that surrounds the parking lot and aids with runoff. Runoff and storm water management was dealt with in accordance to the Department of Natural Resources (DNR) guidelines. The design recommendation for the HVAC system came from the design standards recommended by Weatherization Assistance Program Technical Assistance Center (WAPTAC). WAPTAC combined with an online load calculator finalized the design and recommendation listed in the final design details. The cost estimate of the project was done using RSMeans online data.

2.3. Constraints

The Fire Station Restoration posed several constraints on the project. The station is located in a Multi-Use zoning space; however, availability of space limited the potential uses of the building. The available space was a hard constraint on the project, on the west side of the building there is a fence 15 feet from the building, the south side is blocked due to the pump station fence, and to the north, the land is already developed. The new purpose of the building was limited by parking availability, due to the lack of buildable space. Budget for the current project was a soft constraint; the client did not give an official budget to D3 Consultants, therefore limited itself to a budget efficient project. The project had a hard constraint on time; the project design had to be completed by a certain date. The current building was considered a hard constraint; the building was found to be structurally deficient, the current building footprint will be utilized in the new design due to keeping the current foundation; refer to Figure D-4 in Appendix D. Lastly, a potential constraint was if the building was desired to be a historical place. If the building is to have this status then material and limits in renovation are controlled heavily. D3 Consultants designed the building by sticking to the rules of a historical place instead.

2.4. Challenges

Challenges encountered in this project included, however were not limited to: the age of the building, asbestos, lead paint, historical significance, experience, as well storm water management. The building was built in 1939 and was utilized as a fire station until 1972, however it has been vacant since the 1980's and there are no records of maintenance. The lack of records posed an issue due to the lack of knowledge of the structural integrity of the building and potential problems. The building potentially could have asbestos and lead paint, and there is no information available that would say the contrary. The age of the building brought up the challenge of its historical significance to the town. The historical preservation society has showed interest in attempting to make the building a historical place. In order for the building to be eligible to become a historical place, it must meet certain requirements in the restoration process. The lack of experience in the field for D3 posed as a challenge; the team had never previously worked with a building attempting to achieve historical place status. The team was capable of navigating the challenges. The last concern in the project was dependent on the potential use or renovation of the building. The building and storm water management were assessed, and aided in developing a plan to bring it back up to today's standards. This aforementioned challenge has driven the design of the building and posed challenges as to where supports for the new roof system are placed as well as a new entrance to the building.

2.5. Societal Impacts

Renovating the Firehouse Station will have societal impacts. Rehabilitation of the exterior work will provide a lasting impression of the Art Deco style of architecture and its significance in Mason City's diverse architectural heritage. When completed in 1939, the fire station was a prime example of Art Deco architectural and contained some of the best firefighting technologies of its time. Incorporating the historical significance of the building within the design will create a sense of pride among the community and the history behind it. The renovation will also show the importance of the role that firefighters play in protecting the community. The restoration of the exterior and interior will rejuvenate a building that is reflective of the period in which it originally built.

Another societal impact is contractors within Mason City will have the chance to work on the construction aspects of the project. This will allow local contractor businesses to thrive and work on a project that is important to the community they live in. Depending on the use of the building, members of the community will be able to utilize the services being provided. The renovation could also provide the opportunity for a local business to gain a space where their business can thrive within the community. If rented, Mason City would collect property taxes as well as leasing fees from the tenant of the building. Any other State and Local taxes will be conducted which would in return be put back into the community and the State of Iowa.

The impacts that make the project worth the cost of design and construction are having contractors within Mason City work on the construction aspect and the different taxes that can be collected and placed back into the community. The renovation of the exterior back to its original look is also an important impact and one that will leave a lasting impression among the community. These are many of the reasons why D3 Consultants believes the rehabilitation of the fire station can have a positive impact on Mason City.

3. Preliminary Development of Alternative Solutions

Alternative 1 - Office Space

The approach to Alternative 1 was designing an office space with an open floor plan allowing the interior space to be customized depending on the use of the building. Figure B-2 illustrates the following description of the office space. The space includes a main entrance located on the west side of the building with a reception area and two restrooms. If desired, the open space can accompany a large conference room, a private office, a reception area, and a large area for desk clumps. The open space implies a modern office feel of teamwork and collaboration. The design of the office space has been done in a way to accommodate any type of business. The parking lot, Figure A-2, is located on the north and west sides of the building. The design of the interior space will reflect upon the historical significance of the building, and the chosen materials are in accordance with the exterior materials of the building. Preserving the historical significance is important in this approach and the design reflect this. The brick façade of the building appeared weathered and damaged; refer to Figure D-5 in Appendix D. The exterior bricks will be renovated and replaced with similar brick. The large east side door will be taken out and replaced with a wall that from the exterior still mimics a garage door, however it will be a permanent wall. It is important to show that a door existed here although making it into a regular wall. The windows and doors will be replaced with similar types. An important part of this renovation is removing the majority of the center load bearing wall and replacing it with three columns and a steel beam to carry the load. This will allow for a much larger usable interior space. The structure will be supporting a new roof as the current one is in disrepair. The site will allow for drainage to the northeast corner of the parking lot into a small bioretention cell. Guidelines and approaches from the Technical Preservation Services of the U.S. Department of the Interior will be used, as well as the IBC 2012 and the Mason City Fire Code. The fire code of Mason City gives the Fire Marshall the authority to require construction documents, and calculations for all fire protection system; therefore, we will adhere to the present codes of Mason City. A Building Permit Application would have to be completed and turned into the Building Inspections Division of the City of Mason City. The building is in the multi-use zone under the Mason City Zoning Ordinances. Any other Mason City Building Ordinances will be obtained accordingly.

Alternative 2 - Archive/Storage Space

The approach to Alternative 2 is designing an archival storage space with an open floor concept. The space would include a main entrance on the west side of the building and two restrooms. If desired, the space can provide a private office and a reception area. The main feature of the building is the large area where the firetruck was parked back when the building was originally used as a fire station. This area will be converted into a large storage area for unique or historic documents. They will be placed in large storage shelves that can be accessed easily. An area inside the building will be designated as a document viewing station. This area will allow for documents to be fully opened and laid out on a large table with proper lighting making them easily viewable. The parking lot will be located on the north and west sides of the building. The design of the interior space will reflect upon the historical significance of the building, and the chosen materials will be in accordance with the exterior

materials of the building. Preserving the historical significance is important in this approach and the design will reflect this. The exterior bricks would be renovated and replaced with the same kind of material. The large east side door will be taken out and replaced with either brick or some material that can mimic the door. It is important to show that a door existed here although making it into a regular wall. The windows and doors will be replaced with similar types. Guidelines and approaches from the Technical Preservation Services of the U.S. Department of the Interior will be used, as well as the IBC 2012 and the Mason City Fire Code. The fire code of Mason City gives the Fire Marshall the authority to require construction documents, and calculations for all fire protection system; therefore, we will adhere to the present codes of Mason City. A Building Permit Application will be completed and turned into the Building Inspections Division of the City of Mason City. The building is in the multi-use zone under the Mason City Zoning Ordinances. Any other Mason City Building Ordinances will be obtained accordingly.

Alternative 3 - Demolition/Office Space

Alternative 3 in the project is reserved in case the building is found to be unsalvageable. The station has been left to the elements without upkeep since the 1980's; therefore, if the building inspection demonstrates that the building is beyond salvage it will be torn down. However, tearing the building down allows for new opportunity. The new building will hold the characteristics of the Art Deco style station in the 1930's with an interior that is up to today's standards. The third alternative will entail rebuilding the exterior, and creating an interior that is suitable for a private office space, as described in Alternative 1. The exterior will be rebuilt exactly the same as the original with the same brick facade. This last alternative, like the others, will adhere to the IBC, Mason City Fire Codes, and the guidelines provided by the Technical Preservation Services of the U.S. Department of the Interior. The proper permits for demolition and building will be submitted to the Building Inspection Division of City of Mason City.

4. Selection Process

D3 Consultants developed three potential alternatives for the firehouse. Each alternative was evaluated based on feasibility, societal impact, and community needs. The area available for the firehouse is limited therefore; it limited the potential uses for the building. The alternative selected was based on the land available, the least invasive when it came to societal impact, and due to discussion with the client's preferred direction. The private office space ranked as the most feasible and economical of the alternatives, followed by demolition, and archive/storage place ranked lowest. A private office space allows the building to maintain an exterior that honors the art deco style, while providing a small parking lot for the potential office. D3 chose this alternative because it honored the historical significance of the building, and allowing the town to keep such an important structure erect.

5. Final Design Details

After discussion with the city, it was determined that design alternative 1 was the best option for the repurposed space. Designing an office space with an open floor plan, that would allow the interior space to be rearranged based on the use of the building, suited the desired needs of the city.

A site visit was conducted in coordination with the city engineer, assistant city engineer, city fire marshal, and city building inspector. Their impressions and comments on the structure were weighted heavily in the early our design decisions. Included in these, was the decision to replace the existing roof; which had fallen into disrepair and was severely deteriorated. (See pictures of site visit with commentary in Appendix D).

Preliminary design work of the site began shortly after the formal visit. Given the proposed usage of the space, we determined that 6-8 spots would be minimally required. Using vehicle-tracking software to develop a parking lot design our team was able to create space for minimum number of spaces originally; however, after a small reconfiguration, we were able to obtain 8 regular spaces as well as 2 handicap spaces for the building. The parking lot was designed to direct all the storm water runoff from the parking structure as well as the building into a small bioretention cell located in the southeast corner of the site. The site plan and details of the storm water calculations can be found in Figure A-2 through Figure A-5, Appendix A.

The new structure for the building was originally designed to be separate from the entire existing structure based entirely off columns and beam supporting the new roof leaving the current load-bearing walls free. This would allow the future owner to tear down the walls and rebuild them without having to replace the entire structure. However, it was determined that this design was not feasible as it was more expensive and the existing buried footings would not allow for proper load transfer. The new roof design will be similar to the existing roof, using open web steel joists to carry the load of the insulated corrugated steel roof to the exterior walls and a new center beam. The center beam is the only major change to the structure, by removing the center wall and replacing it with a new beam and columns the interior of the building becomes far more useable. The structural framing plans are included in Appendix B. The new roof structure was determined by following the design guidelines from ASCE 7-10 and utilizing the AISC Steel Construction Manual for member selections.

The new interior space will feature a large open concept floor plan with restrooms and a small break room/kitchenette in the northwest corner of the building. The main entrance has been moved to the north wall of the structure inside the former hose-drying tower. This will allow for employees and visitors to flow naturally from the parking lot into the building while also maintaining the maximum useable space inside the structure. The interior walls will be “padded” out to allow for new mechanical chases as well as insulation. The floor of the truck bay on the east of the building which is currently 5½ inches lower than the main floor will be raised to level the entire structure with a false floor. All the windows and doors will be upgraded to double pane insulated glass and solid insulated core respectively. All changes to finishes viewable from the exterior will be to 1930’s Art Deco period style to maintain the historic feel of the structure. Renderings of the new space are included in Appendix B.

The exterior of the building will receive heavy restoration, resulting in about 80% replacement of the brick facade due to water damage. The only two changes to the exterior structure as it exists today are the restoration of the glass block windows in the hose tower, currently the opening have been bricked over, and the replacement of the overhead truck door on

the south face of the building; this will be replaced by a new wall to close the opening. However, the exterior facade of the wall will mimic the appearance of the old overhead door while achieving a far greater insulating efficiency.

The redesign for the building was done while keeping in mind historic place status. The new building design does not, as far as D3 Consultants can tell, violate any standards, which would deem the firehouse ineligible to file for historic place status.

6. Cost and Construction Estimate

The construction cost estimate was done by using the Building Construction Cost with RSMeans (<https://www.rsmeans.com>). The square footage construction cost estimator provided by the website was used to estimate the total cost of the building. The square footage estimator is a simple way to get a basic estimate of cost. Some of the parameters taken into account were the building location, building square footage, building perimeter, building category, and added fees. The square footage of the building is around 2,424 ft² and the building perimeter is around 170 feet. The building category was classified as Commercial Renovation and the added fees included contractor, architectural, and user fees. All parameters and a Report Summary from RSMeans can be seen in more detail in the Appendix C. The total labor and material cost estimate per square footage is \$300,000 based off RSMeans first quarter data for 2017.

7. Conclusion

In conclusion, we at D3 Consultants believe that Alternative 1 is the best option for the renovation of the fire station in Mason City, IA. Some of the key points of this option include a redesigned roof, an expanded parking lot, renovated brick exterior, and a modern open space interior. This design stresses the importance of the exterior look of the building, and we believe that this is how historical significance is achieved. The open space concept of the interior will allow the building to be used by several different disciplines in the future. The cost of the renovation is \$300,000, and we believe this is a reasonable estimate and worth the cost. The community will benefit greatly from this design through monetary and emotional value. D3 Consultants believes that Alternative 1 best fits our design objective of honoring the style of this iconic building and providing a plan to repurpose it.

Appendix A



Figure A-1: Current contours of the site

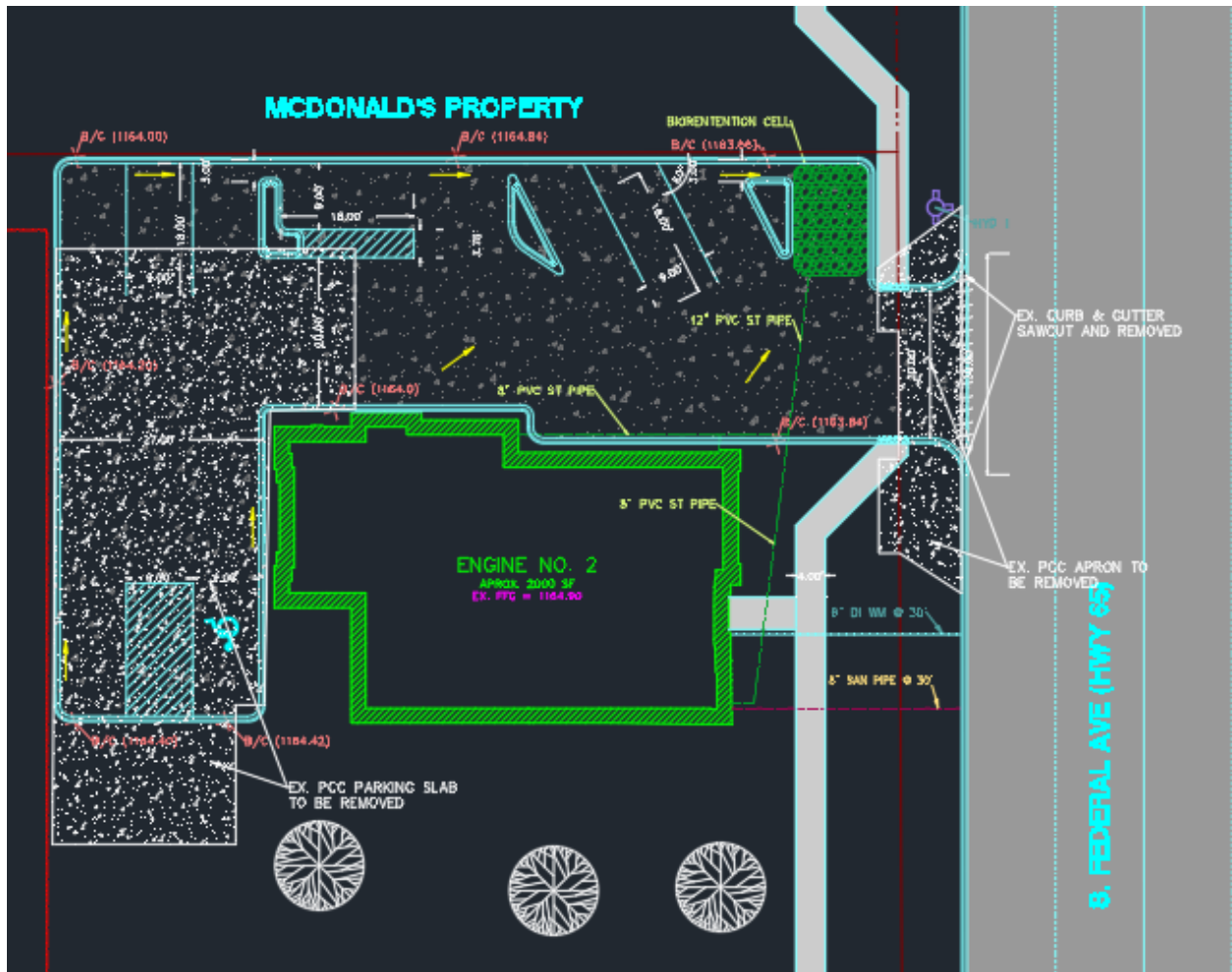


Figure A-2: Site Plan with parking lot graded and bioretention cell

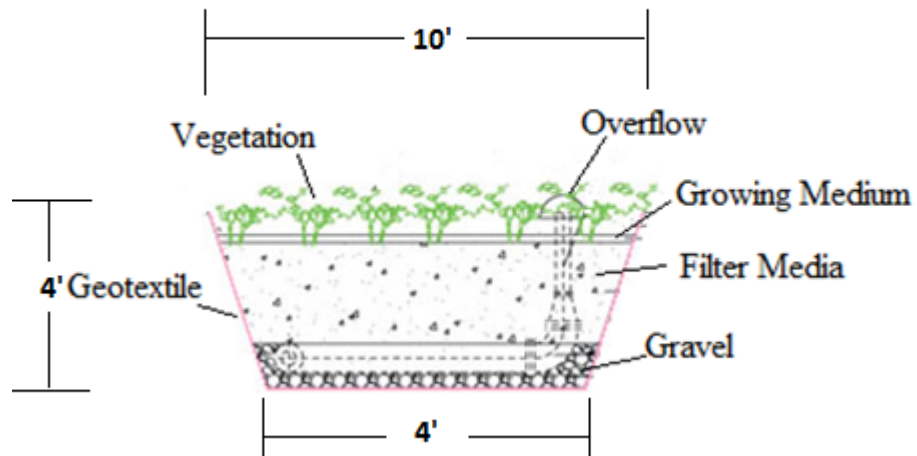


Figure A-3: Bioretention cell: Total Volume: 364 cf / Storage Capacity 130 cf

Section	Item	Input
Basin	Hyd Type =	Rational
	Area (ac) =	0.19
	Runoff Coeff (C) =	0.95
	Tc Method =	TR55
	Tc (min) =	1
Storm	Distribution =	-0-
	Duration (hrs) =	-0-
	Rec Limb Factor =	1.00
Calcs	Frequency (yrs) =	25
	Target Q (cfs) =	0.00

Figure A-4: Rational Method factors to determine required bioretention cell volume of 106 cf and runoff rate of 0.6 cfs

Section	Item	Input
Basin	Hyd Type =	Rational
	Area (ac) =	0.19
	Runoff Coeff (C) =	0.95
	Tc Method =	TR55
	Tc (min) =	3
Storm	Distribution =	-0-
	Duration (hrs) =	-0-
	Rec Limb Factor =	1.00
Calcs	Frequency (yrs) =	25
	Target Q (cfs) =	0.00

Figure A-5: Rational Method factors to determine runoff rate pre-build, 0.3 cfs

APPENDIX B

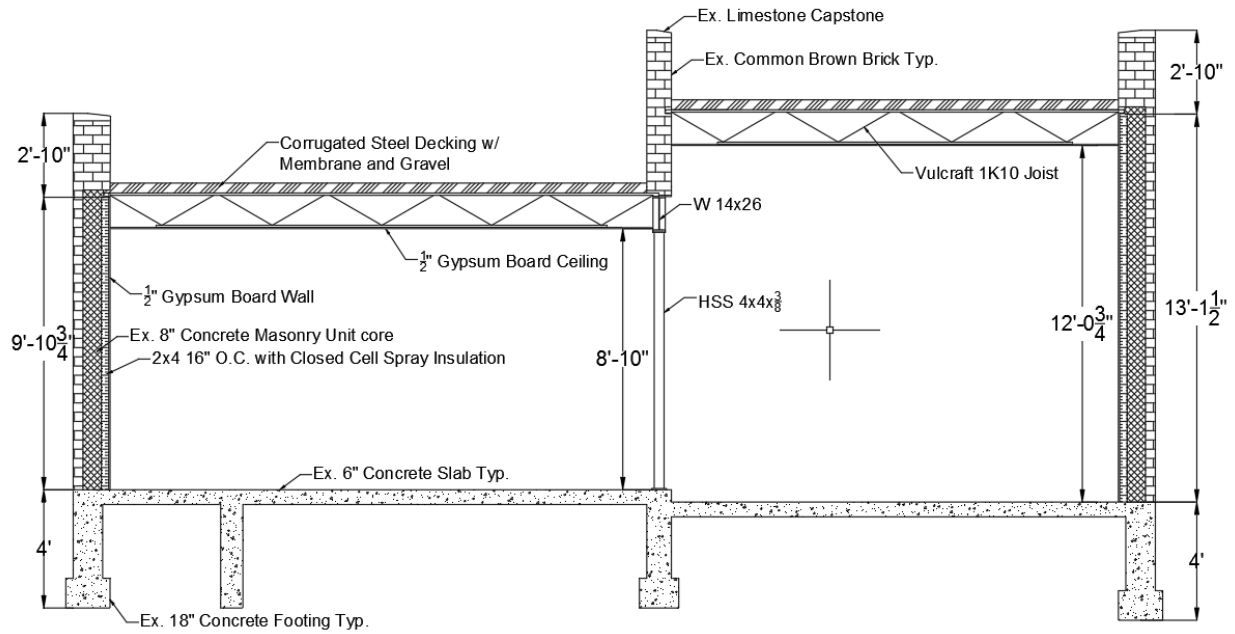


Figure B-1: Wall cross section of firehouse.

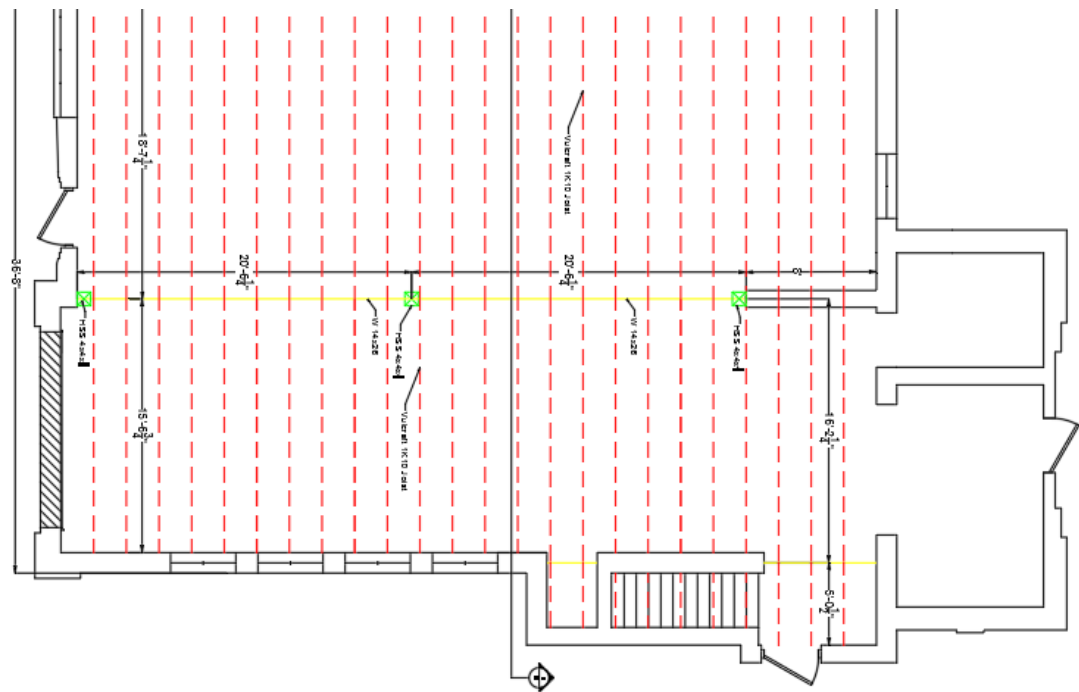


Figure B - 2: Structural Floor Plan of firehouse.

APPENDIX C

ENGINEER'S OPINION OF PROBABLE COST - SITE WORK

FIRE HOUSE RENOVATION

2020 SOUTH FEDERAL AVE

MASON CITY, IA

APRIL 28, 2017

	DESCRIPTION	QUANTI TY	UNI T	UNIT PRICE	EXTENSI ON
SCHEDULE I - EXCAVATION AND GRADING IMPROVEMENTS					
1	Mobilization			\$3,500.00	\$3,500.00
2	Silt Fence (Wire Back)	360	LF	\$2.50	\$900.00
3	Tree Protection Fence	57	LF	\$2.25	\$128.25
4	Clay Excavation	15	CY	\$3.50	\$52.50
5	Topsoil Stripping and Stockpiling	60	CY	\$2.25	\$135.00
6	4" Topsoil Respread and Seeding	320	SY	\$1.50	\$480.00
7	Sodding	340	SY	\$4.00	\$1,360.00
8	General Plantings				\$2,000.00
TOTAL SCHEDULE I - EXCAVATION AND GRADING IMPROVEMENTS					\$8,596.25
SCHEDULE II - UNDERGROUND IMPROVEMENTS					
A. SANITARY SEWER IMPROVEMENTS					
1	6" PVC Sanitary Sewer - SDR 26	30	LF	\$25.00	\$750.00
SUBTOTAL A - SANITARY SEWER IMPROVEMENTS					\$750.00
B. WATER MAIN IMPROVEMENTS					
1	4" PVC Water Main	20	LF	\$22.00	\$440.00
2	1" Water Service	20	LF	\$15.00	\$300.00
SUBTOTAL B - WATER MAIN IMPROVEMENTS					\$740.00
C. STORM SEWER IMPROVEMENTS					
1	8" PVC Storm Sewer Pipe	78	LF	\$18.00	\$1,404.00
2	12" PVC Storm Sewer Pipe	34	LF	\$28.00	\$952.00
3	Trench Backfill	120	LF	\$18.00	\$2,160.00
SUBTOTAL C - STORM SEWER IMPROVEMENTS					\$4,516.00
TOTAL SCHEDULE II - UNDERGROUND IMPROVEMENTS					\$6,006.00

**SCHEDULE III - ON-SITE PARKING LOT
IMPROVEMENTS**

1	Subgrade Preparation - Fine Grading	238	SY	\$2.25	\$535.50
2	Subbase Granular Material - 6" (CA6)	238	SY	\$7.00	\$1,666.00
3	PCC Pavement - 8"	238	SY	\$38.00	\$9,044.00
4	Concrete Curb Type B-6.12	150	LF	\$12.00	\$1,800.00
5	Pavement Removal	390	SY	\$10.00	\$3,900.00
6	Sawcut Pavement, Full Depth	235	LF	\$3.50	\$822.50
7	PCC Sidewalk - 4" with Subbase	325	SF	\$3.50	\$1,137.50
8	Pavement Markings	1	LS	\$1,000.00	\$1000.00

**TOTAL SCHEDULE III - ON-SITE ROADWAY
IMPROVEMENTS** \$19,905.5

SUBTOTAL SCHEDULES I-III \$34,507.75

CONTINGENCY @25% \$8,626.94

TOTAL **\$43134.69.**

ENGINEER'S OPINION OF PROBABLE COST - BUILDING RESTORATION

FIRE HOUSE RENOVATION

2020 SOUTH FEDERAL AVE

MASON CITY, IA

APRIL 28, 2017

	DESCRIPTION	QUANTI TY	UNIT	UNIT PRICE	EXTENSI ON
SCHEDULE I - EXTERIOR RENOVATION					
A. WINDOW REPLACEMENT					
1	Steel Windows Stock, including frame, trim and insul. glass	10	Ea.	\$1,194.93	\$11,949.30
SUBTOTAL A - WINDOW REPLACEMENT					\$11,949.30
B. DOOR REPLACEMENT					
1	Standard Hollow Metal Frames	3	Ea.	\$172.85	\$518.55
2	Standard Hollow Metal Doors	3	Ea.	\$361.98	\$1,085.94
SUBTOTAL B - DOOR REPLACEMENT					\$1,604.49
C. BRICK RESTORATION					
1	Red, 4" x 2-2/3" x 8", running bond	3964	SF	\$10.59	\$41,978.76
2	Pointing masonry, tuck, cut, and re-point, soft old mortar, running bond	3964	SF	\$3.35	\$13,279.40
SUBTOTAL C - BRICK RESTORATION					\$55,258.16
D. ROOF REPLACEMENT					
1	Open web bar joist, 30' to 50' spans, horizontal bridge spans	2.5	Ton	\$2,145.4	\$5,363.53
2	Open type steel roof decking, 1-1/2" deep, under 50 sq ft, 22 gauge	2330	SF	\$4.15	\$9,669.50
3	Gravel, 3" thick	259	SY	\$6.01	\$1,556.59
4	Insulation, polyurethane foam, sprayed, 4" thick	2330	SF	\$6.18	\$14,399.40
5	Membrane waterproofing, on slabs, felt	2330	SF	\$1.19	\$2,772.70
SUBTOTAL D - ROOF REPLACEMENT					\$33,761.72
TOTAL SCHEDULE I - EXTERIOR RENOVATION					\$102,573.7

SCHEDULE II - INTERIOR RENOVATION

A ELECTRICAL SERVICE DISTRIBUTION

1	Switchgear, switchboard, panels, circuit breaker, 120/208 V, 3 phase, 800 A	2330	SF	\$6.84	\$15,937.2
SUBTOTAL A - ELECTRICAL SERVICE DISTRIBUTION					\$15,937.2
B	PLUMBING SERVICE DISTRIBUTION UPGRADES	2330	SF	\$4.05	\$9,436.50
C	HVAC SERVICE DISTRIBUTION	1	Lump Sum	\$8,232.40	\$8,232.40
D	BATHROOM RENOVATION	150	SF	\$70.00	\$11,237.3
E	KITCHEN/BREAKROOM RENOVATION				\$4,780.97
F	INSTALL OF LOAD BEARING BEAM, W14 x 28	45	LF	\$55.50	\$2,497.50
G	GENERAL COMMERCIAL INTERIOR RENOVATION				
1	Wall finishes	2330	SF	\$2.71	\$6,314.30
2	Floor finishes	2330	SF	\$4.57	\$10,648.1
3	Ceiling finishes	2330	SF	\$3.72	\$8,667.60
4	Lighting and branch wiring renovation	2330	SF	\$2.23	\$5,195.90
SUBTOTAL G - GENERAL COMMERCIAL INTERIOR RENOVATION					\$30,825.9
TOTAL SCHEDULE II - INTERIOR RENOVATION					\$82,947.7
SCHEDULE III - SELECTIVE DEMOLITION					
1	Asbestos abatement	1	SUM	\$4,200.00	\$4,200.00
2	Lead paint removal	1	SUM	\$3,000.00	\$3,000.00
3	Interior full gut, commercial building	2330	SF	\$7.81	\$18,197.3
5	Dump charges, building construction materials	3	TON	\$74.00	\$222.00
4	Existing roof	2330	SF	\$0.86	\$2,003.80
5	Load bearing wall removal	84	LF	\$1.23	\$103.32
TOTAL SCHEDULE III - SELECTIVE DEMOLITION					\$27,726.4
SUBTOTAL SCHEDULES I-III					\$213,247.8
CONTINGENCY @25%					\$53,311.9
TOTAL					\$266,559.8

APPENDIX D



Figure D-1: The ceramic wall tiling was no longer on the wall in most rooms



Figure D-2: The roof appeared to have suffered severe water damage. The roofing membrane was severely rusted.



Figure D-4: Foundation of the building appeared to be structurally sound, and in good condition.



Figure D-5: Exterior of building, the surface of the bricks appeared damaged.