MULGRAVE ROAD THEATRE

Functional Program and Pre-Design Planning

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Introduction

Solterre Design has been engaged by the Mulgrave Road Theatre (MRT) to produce a functional programming and needs analysis and a preliminary "Class D" Construction Budget for their future theatre creation and performance facility.

The goal of MRT is to create a well-designed, sustainable and cost-effective facility that can house the organization and a performance space under one roof. Creative space planning is a crucial part at this stage -- including considerations for adaptive reuse, universal accessibility, functional adaptability, and convertibility of spaces.

This report provides an outline for building requirements for functional programming: including program and service areas, site considerations, space for equipment, occupant load, and a synopsis of spatial adjacencies. Preliminary sustainability and accessibility building goals are established, including: Sustainable Site Development, Water-Use Reduction, Operational Energy Efficiency and On-Site Energy Production, Material Use and Durability, Indoor Air Quality and Occupant Comfort and Accessibility. This report outlines preliminary cost estimates based on the programming established by MRT with Solterre Design. It concludes with an outline of the required tasks, decisions and opportunities available to transform the concept of a new Mulgrave Road Black Box Theatre into a reality.

Project Approach

In order to accomplish the scope of work set out in our contract: "Mulgrave Road Theatre-Functional Programming and Design Pre-Planning Project, #1839", dated November 14, 2018; the following work was outlined:

- preliminary meeting with client to discuss program spaces;
- review existing documentation, energy data, etc.;
- site visit to existing theatre and potential new facility sites
- meetings with key MRT staff;
- development of program of space needs, adjacencies and requirements;
- development of preliminary 'Class D' cost estimate;
- outline of available project delivery methods;
- consolidation of the above into this Project Report.

Background

The existing building at 68 Main Street, Guysborough, has been the home of Mulgrave Road Theatre for decades. It is a charming building long associated with the theatre. The building is used primarily as an administrative, new play development center, and performance space for the theatre. The Masonic Hall, which had previously been used as an MRT rehearsal/performance space, has recently been converted into a rental storage facility. Chedabucto Place Performance Center has been used on occasion.

The difficulties with the existing building primarily have to do with its size limitations, and limited property size, significantly constricting expansion possibilities. Even with the consent of the Municipality to allow expansion within the Main Street and Queen Street rights-of-way, expansion would be very limited and expensive to bring the building to code for an assembly occupancy or meet the desired occupant loads.

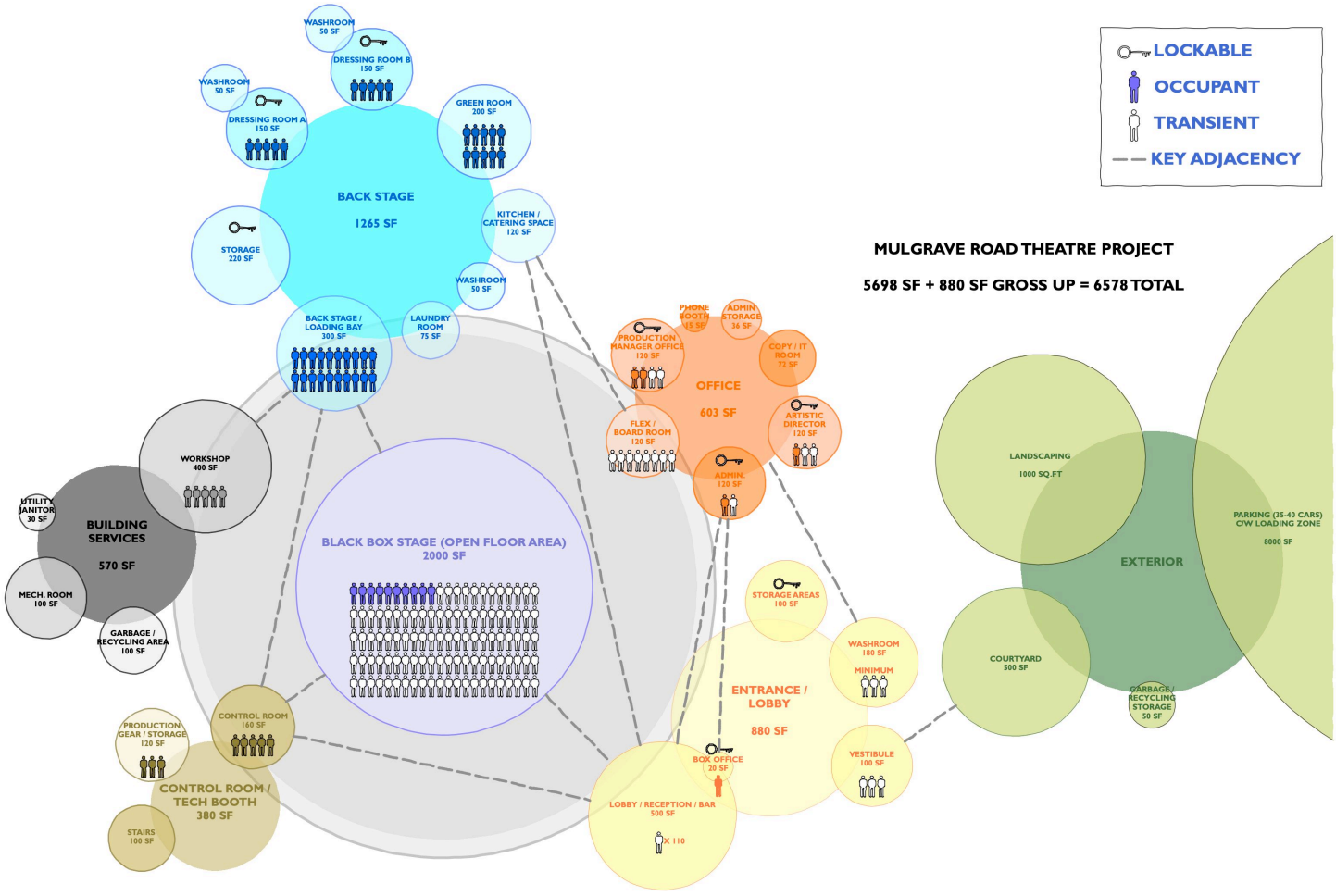
These expansion difficulties were identified in a September 29, 2015 letter from Strait Engineering, along with a Site Plan prepared by Strait Engineering showing possible areas of limited expansion.

It was because of these space limitations that the focus of this study shifted from an earlier examination of the existing building and site to possibilities for a new building on a new site, a decision supported by the MRT Board in September, 2016, and envisioned in the December 2014, "Mulgrave Road Theatre Infrastructure Requirements" report prepared by Emmy Alcorn, MRT Artistic Director.

Functional Program

As a first step, Solterre worked with Emmy Alcorn and the staff of MRT to outline and size the required program spaces. This site is still to be confirmed by the client as the selected site.

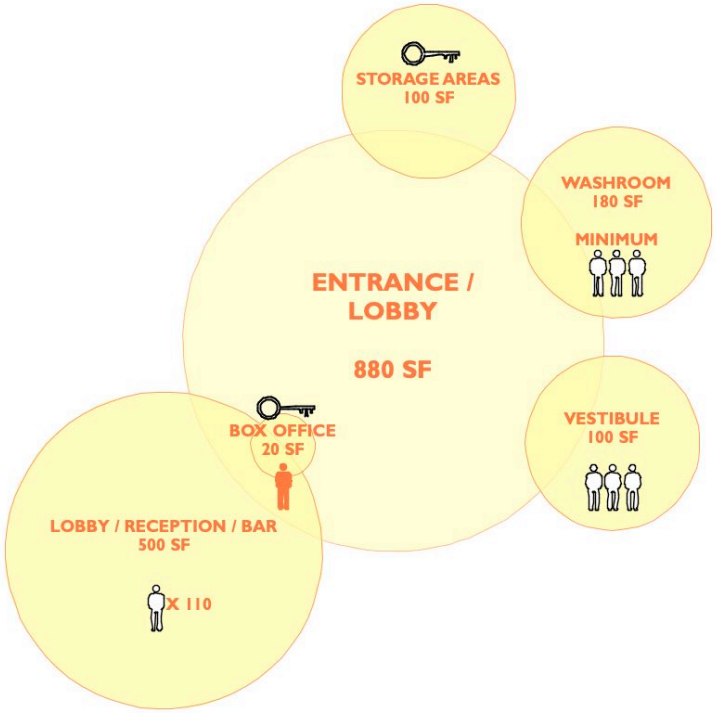
The new MRT theatre envisioned is an approximately 6,600sf, single-level facility containing a 2,000 sf, minimum 90-100 seat black box, creation and performance space with automated retractable seating. The building will also house a lobby, offices, dressing rooms, storage space, rest-rooms, workshop facilities, a light and sound booth, and exterior gathering areas, landscaping, and parking. See Schedule A: "Mulgrave Road Theatre Requirements" for a full chart of space requirements



Functional Program Adjacency Diagram

The following section outlines the area, occupant load and function of the spaces required for the new building.

Entrance / Lobby

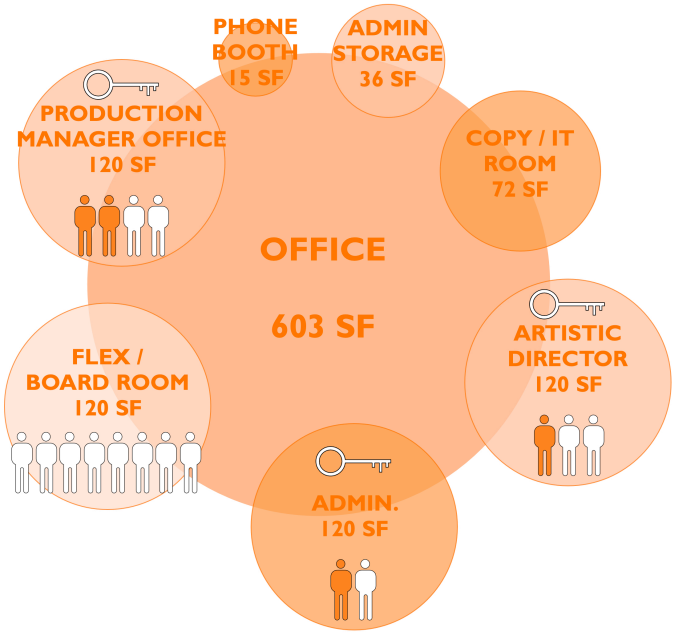


Entrance / Lobby	Occ. Load	Area	Function
Vestibule	3	100	waiting area, event posters
Lobby / Reception / Bar	110	500	waiting area for 100+ ppl pre-show, intermission, post-show
Box Office	1		accessible to IT tech/service
Washrooms	3	180	accessible, non-gender washroom
Storage Areas		100	store portable ticket counter, bar
		880	sf

Notes:

- Vestibule
  - airlock entry and waiting area, event display;
- Lobby /Reception / Bar
  - private event rental space;
  - area for art work;
  - elderly seating;
  - built-in bar area, coffee service;
  - built-in coat rack;
- Box Office
  - designated area within Lobby, glass window to Administration Office;
- Washroom
  - individual barrier-free washrooms (up to an occupant load of 110 people);
- Storage Area
  - Storage, coat rack, ticket booth, stacking chairs for attendees.

Office

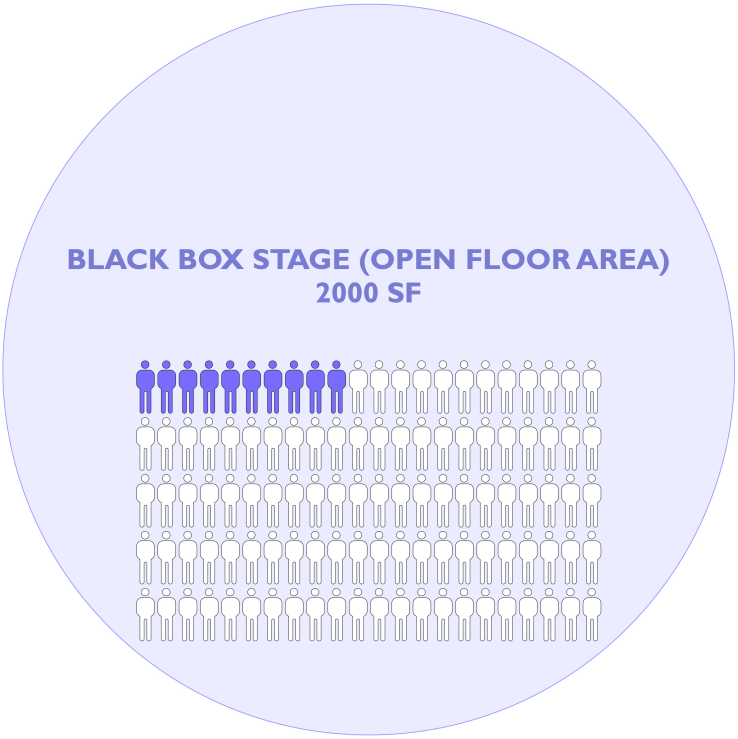


Office	Staff	Occ. Load	Area	Function
Artistic Director	Emmy	3	120	private office
Administration	Sherry	2	120	office / reception
Production Manager(s) Work Space		4	120	tour PM(s) workspaces
Flex Office / Board Room	TBC	8	120	flex office / meeting room
Phone Booth / Private Space		1	15	private call or recording TBC
Administration Storage			36	
Copy Room / IT			72	
			603	sf

Notes:

- Artistic Director
  - 1 desk, 2 guest chairs, small meeting table, filing cabinet, shelving;
- Administration
  - 1 desk, 2 guest chairs, 2 legal size filing cabinets;
- Production Manager(s) Work Space
  - 2-3 flexible workspaces;
- Flex Office / Board Room
  - 1 desk / meeting table (4 pie shape sections = one meeting table), 12 chairs, shelf,
- Phone Booth / Private Space (TBC)
  - chair, charger plug;
  - Investigate potential 6x6 recording space to replace phonebooth
- Administration Storage
  - admin / accounting file boxes, posters, previous production copies, etc;
- Copy Room / IT
  - photocopier, laser printer, print supplies, IT, server, wifi.

Performance Stage / Black Box

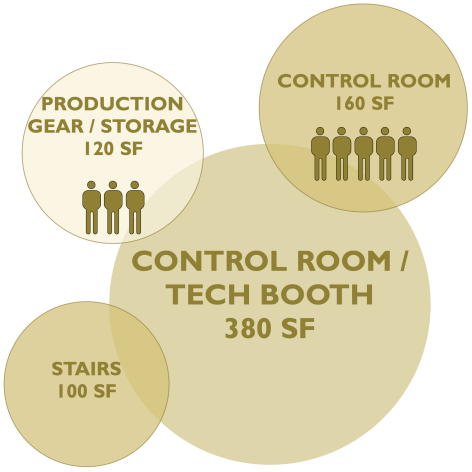


Performance Stage / Black Box	Occ. Load	Area	Function
Black Box Stage (Open Floor Area)	110	2000	20' high space to u/s grid, catwalk above
Seating Area			retractable seating system
		2000	sf

Notes:

- Black Box Stage (Open Floor Area)
  - entrance from Lobby to have double doors (and be light-locked);
  - catwalk grid above;
  - 2 actor entrance doors from Back Stage;
  - ideally daylit with black-out panels;
  - rental events (table and chairs);
  - stage curtain;
- Seating Area
  - accolade model system for 90 seats occupies +600 sf when fully expanded;
  - minimum 2 wheelchair accessible spaces required and guest accompaniment.

Control Room / Tech Booth

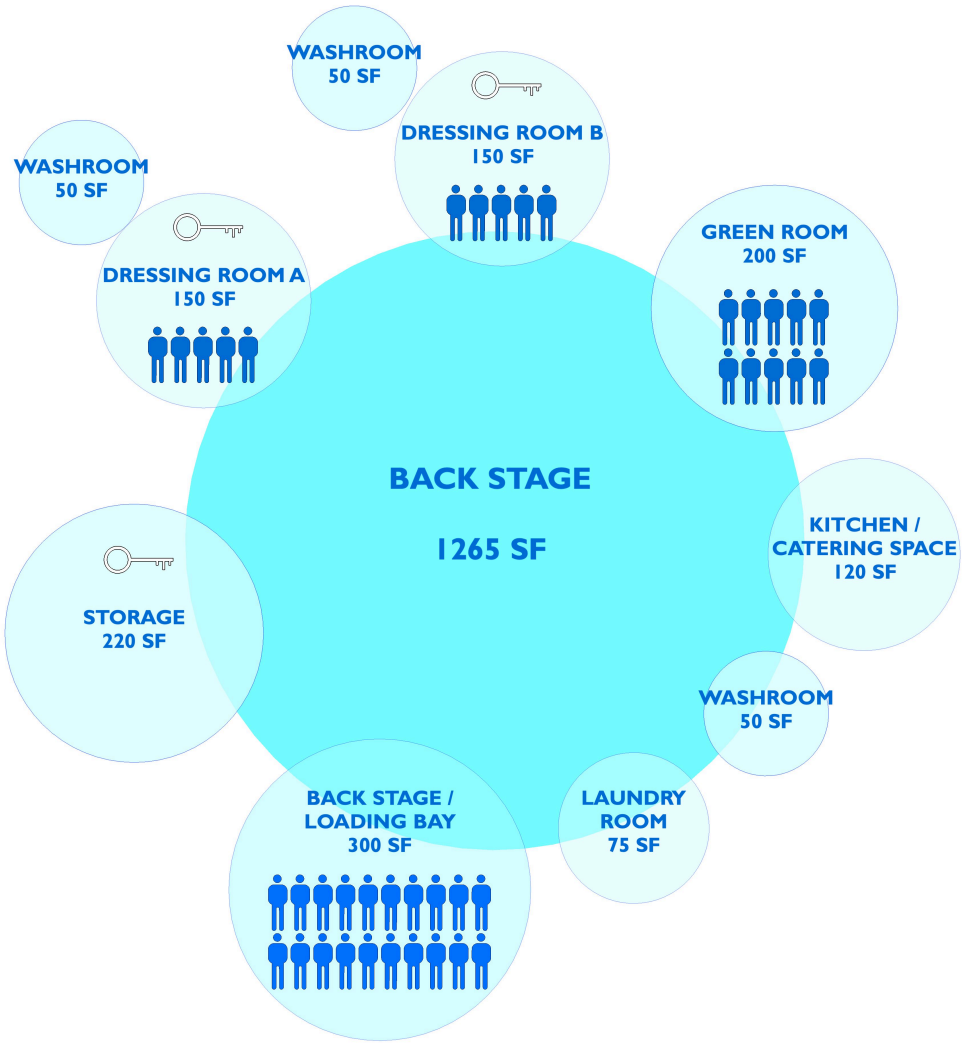


Control Room / Tech Booth	Occ. Load	Area	Function
Control Room	5	160	technical equipment for productions,
Production Gear / Storage	3	120	space adjacent to/or in Control Room
Stair Access to Control Room		100	
		380	sf

Notes:

- Control Room
  - mixer and workspace;
  - operable window to black box;
  - night vision monitor;
  - dimmer rack;
- Production Gear / Storage
  - storage wall / cabinet for gels, cables, lights;
  - work area to assemble gear;
- Stair Access to Control Room
  - access to catwalk;

Back Stage

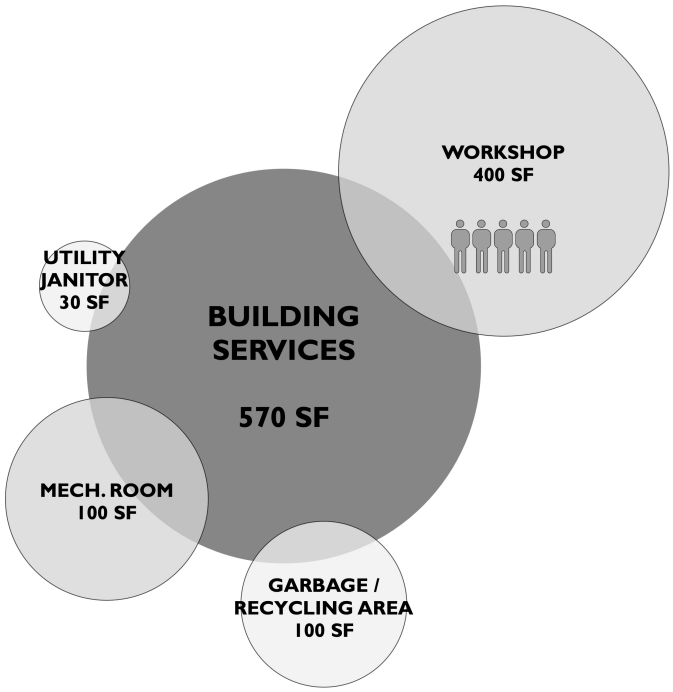


Back Stage	Occ. Load	Area	Function
Dressing Room A	5	150	dressing and make up area
Dressing Room B	5	150	dressing and make up area
Green Room	10	200	actor preparation area
Kitchen / Catering Space		120	performance catering, rental catering
Washroom	1	50	back stage washroom
Laundry Room	1	75	wash costumes and props, hang drying area
Storage		220	sets, props and costumes, possible loft storage area
Back Stage/Loading Bay	20	300	
		1265	sf

Notes:

- Dressing Room A
    - counter with lit mirror;
    - 4-5 chairs;
    - sink;
    - wardrobe rack;
    - private toilet;
    - shower;
- Dressing Room B
    - counter with lit mirror;
    - 4-5 chairs;
    - sink;
    - wardrobe rack;
    - private toilet;
    - shower;
- Green Room
    - 2 sofas;
    - table and 6 chairs, small kitchenette area;
- Kitchen / Catering Space
    - kitchen (fridge, microwave, kettle, sink, stove, dishwasher) connected to lobby;
- Washroom
    - toilet;
    - sink;
    - accessible (over-size costumed actors);
- Laundry Room
    - 8' rack to hang dry costumes;
    - shelving;
- Storage
    - 15' rack for costumes;
    - shelving and tote storage;
    - large props;
    - chairs / tables trolley space.
- Backstage / Loading Bay
    - active storage for 4x8 flats;
    - double door access to stage and loading bay;
    - access to Green Room;
    - panel touch-up area;
    - unload area for visiting troupes;
    - quick change area;
    - actor hangout;

Building Services



Building Services	Occ. Load	Area	Function
Workshop	5	400	prop and flat assembly and storage
Utility/Janitorial		30	
Mechanical Room		100	
Garbage/Recycling Area		40	
		570	sf

Notes:

- Workshop
  - hand tools;
  - portable table saw;
  - 6x12 assembly bench;
  - paint area;
  - plywood racks;
  - dust collection system;
  - 20-30 flats (long-term storage);
  - connected to Loading-in area;
- Utility / Janitorial
  - mop sink;
  - cleaning supply storage;
  - chemical storage area;
- Mechanical Room
  - heating system;
  - ventilation equipment;
  - connections to power, water and sewer;
- Garbage / Recycling Area
  - separate waste stream collection bins (garbage, recycling, refund/non-refund, paper, etc;

Gross-Up

Gross-Up Area Increase	Area	Function
Circulation (halls, corridors, interior walls)	580	based on 10% of sub-total interior area
Wall thickness (Passive House wall increase)	300	additional area to increase wall performance
	880	sf

Total Heated Building Area	**6578**	sf

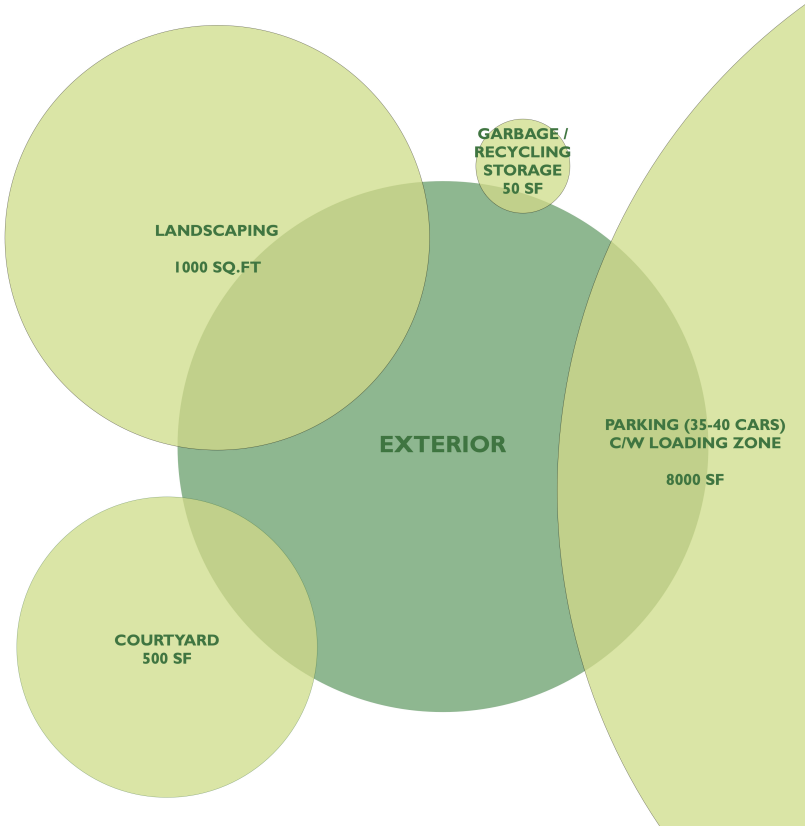
Notes:

- The functional program accounts for required areas within each space. It does not include space required for walls and circulation areas (halls, stairs, transition areas). Gross Up is an estimated area in a functional program which accounts for wall thicknesses and circulation areas;
- Standard gross up factors assumed for circulation areas and wall thicknesses;
- High performance wall assembly (thicker walls) assumed for exterior

Total Building Area

The above-mentioned functional program areas, including Gross-Up, totals 6678 sf in the total heated building area. This total may adjust slightly during the Schematic Design phase, as each space and adjacency of spaces can lead to subtle changes. The building area will require review if working with the existing NSLC facility. Challenges of adapting an existing building are outlined later on page13.

Exterior Spaces



Exterior		
Garbage and Recycling/Storage	50	
Loading Zone		cube van access to Loading Bay doors
Courtyard	500	meetings and breaks, 8-10 people
Parking	8000	30-45 vehicles
Landscaping	1000	
Exterior Area	**9550**	sf

Notes:

- Garbage and Recycling Storage
  - green bin, recycling;
  - garbage containers from Loading Bay;
- Loading Zone
  - temporary parking and unloading area to Loading Bay;
- Courtyard
  - gathering area pre-show;
  - investigate retractable screens, awning, roofed area;
  - intermission;
  - private events (special event tent);
- Parking
  - accessible parking spots;
  - gravel or paved to be confirmed with final site confirmation;
  - available street parking to be confirmed;
- Landscaping
  - Low-maintenance, xeriscaping;

Adjacencies

Space adjacency analysis can be defined as the optimization of the flow of movement from one space to another, related to the function of the space. The goal for the MRT new theatre building is to efficiently plan for optimal connections between the variety of functions. The space adjacency analysis will be used to inform initial schematic design layouts. Depending on the importance of relationships between certain spaces, several options for adjacencies can be considered. See Schedule B "Mulgrave Road Theatre Spatial diagram.

The adjacency issues for MRT to consider are as follows:

- Public access limited to lobby, public washrooms and theater, unless otherwise invited into offices and work areas;
- Work Areas to have efficient access to washrooms, work rooms and board room;
- Back stage needs efficient adjacencies for actors and crew to theater spaces;
- Kitchen/Catering room should have easy access to front of house and green room;
- Prioritized access to daylight for offices, workspaces and gathering areas;
- Efficient access to exterior (entrance, parking, deliveries);
- Efficient location of all areas that require plumbing and additional mechanical services;

Additional Considerations

The aesthetics of a theater are key to setting the stage for the production taking place therein. The exterior and front-of-house facilities need to host the audience before, during, and after a performance. Those needs include everything from the manner in which audience members get information about a performance to how they will access transportation when the performance ends.

If proposed new MRT will consist of reusing the existing NSLC building, care will be taken to give the theatre a look and identity of its own that celebrates the new theatre rather than retaining the look of and brand of the NSLC.

Attention will be given to the appearance of the exterior of the theatre, and front-of-house facilities so they are experienced by patrons as welcoming spaces that enhance the drama and excitement of a live theatre experience.

Theatre Equipment

The following list to be confirmed by MRT and final technical details will involve an A/V theatre consultant:

- intercom
- retractable theater seating
- performance lighting systems
- performance sound reinforcement
- performance rigging
- motorized lifts
- performance "blacks"
- audio and video relay to backstage/lobby
- paging systems
- assistive listening systems
- stage manager's control systems
- catwalks
- A/V presentation systems
- pipe grids and tension-wire grids
- adjustable acoustic devices
- stage platforms and equipment

NSLC Site Layout

This report focuses on the use of the NSLC site at 10559 Main St. Guysborough as it is the most promising site candidate at the time of report. Site layout sketches 'A' and 'B' should be considered as preliminary examples of how the required program might fit with the existing NSLC building and site. They should not be considered design floor plans. Proper consultation with the client and analysis of the existing building must be completed in the subsequent Schematic Design phase in order to confirm the workability of the options. 'As-built' drawings have yet to be obtained from NSLC. If none are available, this work will be required prior to schematic design work. The perspective drawings are intended to show how the building addition massing options fits on site and are not representative of final building forms or materials.

Existing Building Benefits

The existing building has significant value that can be taken advantage of for a new MRT theater space. The existing building is approximately 3100 square feet and would accommodate about 45% of the required space defined in the functional program. A significant addition would house the remaining program including the black box theatre itself. The existing building is a simple shape and construction. Four interior columns carry the roof structure which means that interior walls are non-loadbearing and can be easily removed. The building water is supplied by a drilled well to the north to the building. Investigation is required to determine if the building is connected to the original on-site septic field or to the more recent municipal sewer system.

The two logical locations for the addition are between the existing building and the road and behind the existing building. The existing paved parking lot is of value and should be maintained as much as possible for theatre parking.

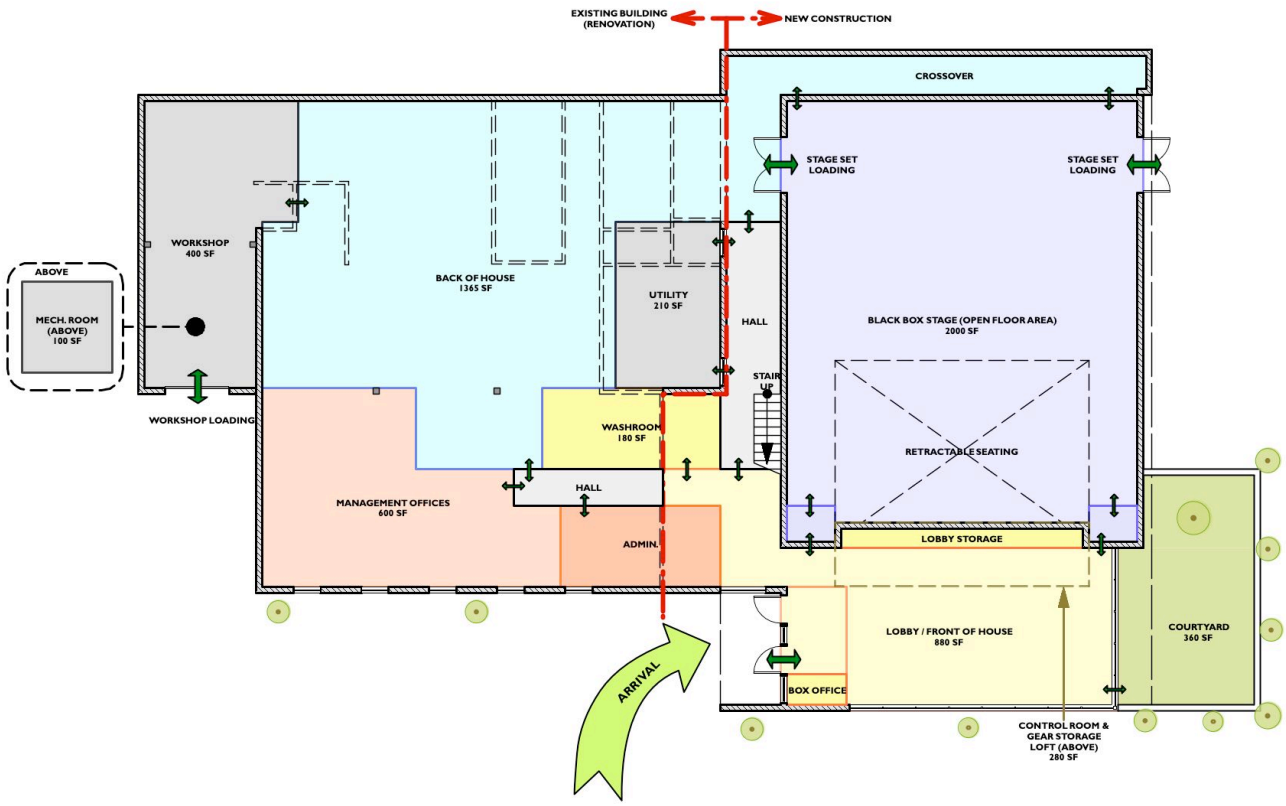
Existing Building Challenges

Working with an existing building could mean that some program adjacencies will be harder to achieve compared to starting from scratch. Other challenges and expenses could include:

- developing an entirely new layout;
- possible hazardous material remediation including lead paint and asbestos;
- replacing roofing and/or siding for aesthetic or quality reasons;
- replacing interior finishes for aesthetic reasons;
- limitations on energy efficiency due to existing conditions;
- unknown building issues such as rot or mold that need to be addressed;

NSLC Site Diagram

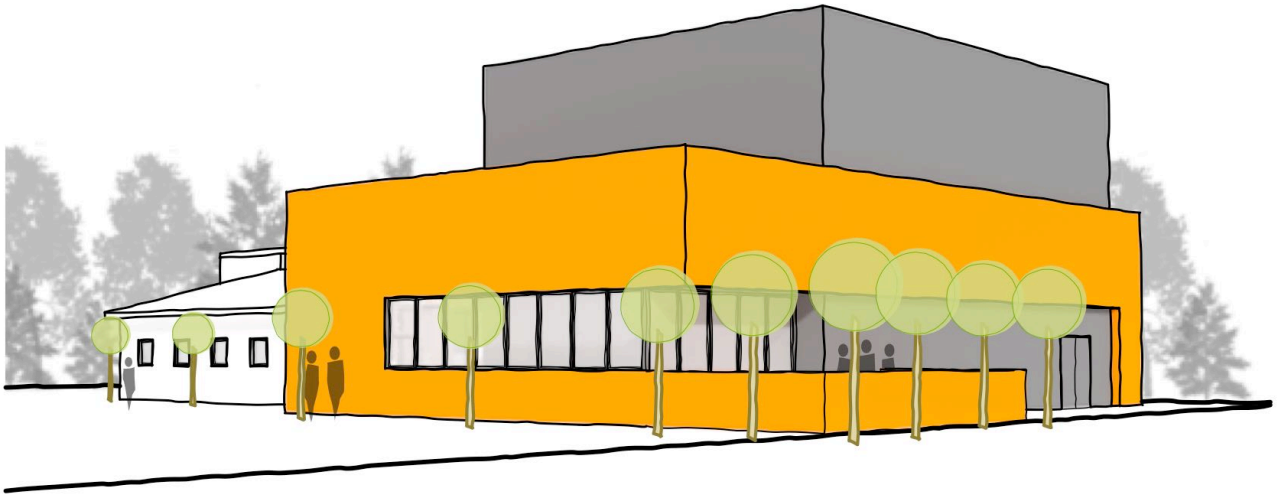
Site Layout Sketch A



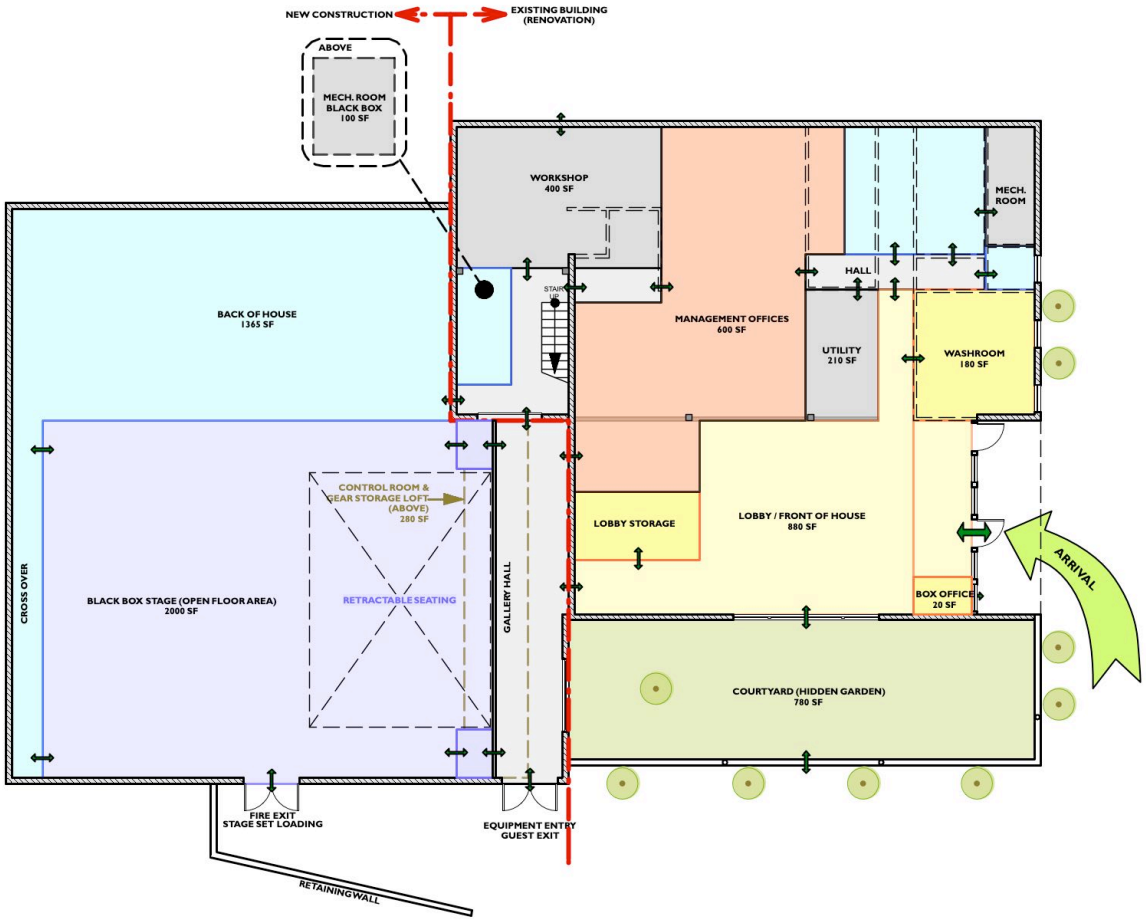
A

COMMENTS:

- BUILDING AREA - 6750 SF (3100 SF EXISTING, 3650 SF NEW)
- NEW BUILDING IN FRONT OF EXISTING STRUCTURE
- LOBBY IN NEW CONSTRUCTION ALLOWS FOR MORE DYNAMIC SPACE
- COURTYARD CREATES A BUFFER BETWEEN LOBBY AND ROAD
- EXISTING BUILDING BEHIND NEEDS MINIMAL MODIFICATION
- EXISTING LOADING BAY USED FOR WORKSHOP



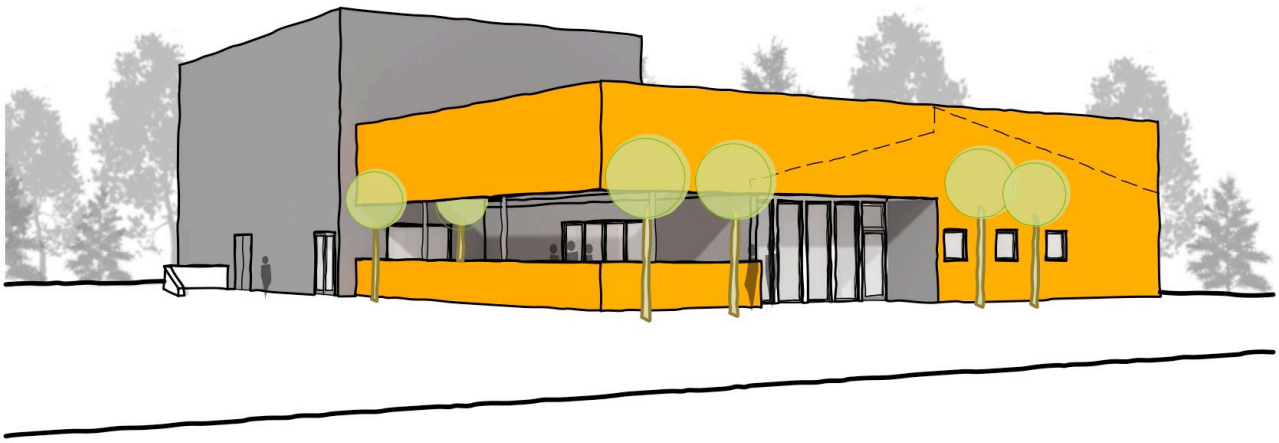
Site Layout Sketch B



B

COMMENTS:

- BUILDING AREA - 6950 SF (3100 SF EXISTING, 3850 SF NEW)
- THEATRE BEHIND EXISTING BUILDING
- THEATRE HAS MORE SOUND BUFFER FROM ROAD
- LOBBY IN EXISTING BUILDING - 10' CEILING HEIGHT LIMIT
- COURTYARD CREATES A DYNAMIC SPACE BETWEEN LOBBY AND PARKING LOT
- TALL PARAPET AROUND COURTYARD AND EXISTING BUILDING CREATES A UNIFIED FORM
- CIRCULATION SPACE BETWEEN LOBBY AND THEATRE EXPANDED TO CREATE A 'GALLERY HALL'
- LARGER CIRCULATION INCREASES BUILDING SIZE



Ecological Goals

For a building to be truly sustainable, it must pass the test of time. Ultimately, this project must aim to build better instead of bigger – by incorporating design features that make beautiful, space-efficient, adaptable, durable, economically – and environmentally – beneficial architecture-carefully thought through in context to the local ecology and landscape.

Although Solterre is an experienced Passive House, LEED and Green Globes consultant, we do not suggest pursuing any one standard or certification at this time. MRT may choose to pursue certifications if doing so makes additional funding available. The process and related costs of certification would be an addition to the cost estimates included in this report.

Even without green certifications, Solterre's extensive experience and resources apply many different sets of standards and combine approaches that are appropriate for the size and scope of this building, and its related site. This section of the report identifies measures that are suggested at the Pre-Design phase of the project. This list will be assessed and revised in subsequent design phases.

Sustainable Site Design

To promote active transportation amongst visitors and employees, the new building should provide bike racks and potentially a changeroom / shower room for active commuters. Although, small, measures like this help reduce pollution, greenhouse gas production, and land development impacts from single occupancy vehicle use, and encourage healthy lifestyles.

Site design should look at practical approaches to reduce the amount, rate and quality of stormwater that leaves the site. The team will focus on low impact development option such as, but not limited to naturalized landscaping, bioswales, minimizing new hardscapes and consider options for existing hardscapes utilizing permeable pavers, etc.

Site lighting should be designed to minimize night-sky pollution.

Water Use Reduction

Landscaping with local and adapted plants eliminates the need for permanent irrigation. High-efficiency toilets and low flow lavatories and showers maximize water efficiency and reduce the burden on the drilled well and wastewater systems.

Energy-Efficiency and On-Site Renewable Energy

In terms of energy consumption adapting an existing building is one of the most effective strategies for minimizing environmental impacts. Re-purposing an existing building reduces the use of new materials and the environmental impacts and CO_2 emissions connected to the construction of a new building, while the embodied energy of the existing material is preserved and not wasted. Furthermore, the substantial wastage from demolition that would otherwise go to landfill is also avoided.

We suggest taking a huge step forward in creating an energy plan to reduce the energy consumption for the new MRT theater building, compared to the current facilities, and to design a high-performance system for the black box space. This proposed energy reduction is possible using Passive House targets, strategies, and modeling. Passive House is the world's leading standard in energy efficient construction and requires an aggressive approach to energy reduction that focuses on:

- Super-insulation;
- Airtightness;
- High performance windows;
- Incorporating high-efficiency heat recovery ventilation;
- Minimizing thermal bridges.

Passive House design presents a solid business case as a high value investment in energy-efficiency, carbon reduction, building quality and occupant comfort. Certification is not a requirement to achieving these benefits.

Reusing the existing NSLC building will pose some challenges and restriction to energy efficiency. Solterre will work with MRT to devise a best value efficiency upgrades to the existing building portion of the project.

There is a new solar provincial photovoltaic incentive program for non-profit organizations in Nova Scotia called the "The Solar Electricity for Community Buildings Pilot Program". This program is a "bid in" model where a qualified organization, like MRT, can conduct a feasibility analysis for solar PV and apply to this program with a bid price for which they would agree to sell solar generated power to the grid on a 20-year term. To date, accepted bid prices have dramatically decreased the simple pay-back time period making for a very attractive long-term building energy, cost strategy for organizations such as MRT.

https://novascotia.ca/solar/solar-electricity-community-buildings.asp

A target of Net Zero Energy, with building energy demands reduced through Passive House measures and offset by building mounted solar photovoltaics, would be a wonderful showpiece for the Guysborough community. This can be made more affordable with programs like those offered by Efficiency Nova Scotia and the new Solar Community Buildings Program.

Materials and Resources

The design should incorporate design features and materials that make a beautiful, space efficient, adaptable, durable, and environmentally beneficial workplace. Where possible, the design should utilize and highlight local materials especially natural materials such as wood and stone in order to highlight the local ecology and landscape. Salvaged, recycled and recyclable materials should also be considered. Construction assemblies and detailing should utilize familiar, local construction knowledge and techniques in support of the regional knowledge and local economy.

Indoor Environmental Quality

Even a minimal improvement in the new building's Indoor Environmental Quality (IEQ) for occupants will have long-lasting benefits of improved morale, occupant comfort and staff retention. To provide a superior indoor environment, the design must optimize natural and mechanical ventilation effectiveness with cost-effective strategies through careful attention to design, material choices, and system performance. Interior construction materials will be low-VOC to limit off-gassing and improve indoor air quality.

MRT's new theatre can achieve exceptional daylight penetration in many significant ways. Windows on the north and south facades promote glare-free daylight and passive solar heating benefits. Core spaces like building services, storage and mechanical rooms are ideally located on the northeast and northwest perimeter, allowing solid insulated walls and strategically located windows at these locations while minimizing glare and summertime solar heat gain.

Options to daylight the black box theatre for daytime rehearsal space will be investigated. 'Black out' panels for performances will be critical.

Indoor acoustic separation is a crucial aspect between successful theatre design and public reception spaces. Walls and doors must be sufficiently soundproofed, and any meeting spaces must be able to be made private. Office areas will consider acoustic considerations, such as absorptive materials, wall angles and ceiling heights to reduce ambient noise. One synergy of super insulated exterior walls is their excellent noise reduction which will be key in reducing road noise in the new black box theatre space. Solterre will work with the chosen theater consultant to give special consideration to the acoustic qualities in the theater space to support vocal performance.

Life-Cycle Considerations

Life-cycle considerations include the ability to adapt the space as the organization's needs change over time. The new MRT building will be designed to accommodate the current mix of spaces and users, while remaining flexible and responsive to future needs. Thoughtful structural and architectural design can allow for this flexibility. Mechanical and electrical systems must be adaptable to new layouts, uses and occupants over time. Assemblies can be tested for long term durability through Passive House computer modeling.

Solterre Sustainability Matrix

Solterre has created a decision-making matrix to assist the client and their team to identify and prioritize sustainability goals for their project. The matrix (see Schedule C: "Solterre Sustainability Matrix") groups general

green project goals and includes more specific detailed targets within each goal. Not always are green building goals compatible for a given project or building site, or wise to consider in every new construction.

The client and their team are guided by Solterre to complete this matrix early in the Schematic Design phase to assist the architect in prioritizing design and budget considerations for the green goals for the project.

Accessibility

It is of high importance that the MRT be accessible and barrier-free. The building must be welcoming for all, universal and democratic. Along with the universal design standards outline in the 2015 National Building Code, the new building design should look to the Lifetime Design standard for best practice standards.

Construction Estimate

Project cost estimates are based on the above functional requirements document and the historical cost of similar work. Costs are adjusted to include for location, performance targets, quality, and scale. All figures include provincial and federal taxes.

Many factors are unknown at this time and must be confirmed prior to initiating the Schematic Design phase of the project. For example, site development costs, possible renovation of existing site and phasing options will affect a construction budget. Costing for the following items have not been included in either estimate:

- Site Development
    - additional parking area or improvement to existing
    - storm-water control
    - building remediation
    - landscaping
    - exterior signage
- Fixtures and Furnishings (furniture, appliances, Artworks etc.)

Contingency allowances are shown in each budget breakdown to allow a reserve for unforeseen circumstances.

- In this Class D estimate, a 10% Design Contingency is included to account for minor changes during the development of the design and construction documents. The percentage of design contingency decreases as the project develops and the degree of uncertainty decreases. As construction drawings are finalized; the design contingency is eliminated.
- A 10% Construction Contingency is included to account for unforeseen or unpredicted work associated with the construction of the project. Like the design contingency, the percentage of contingency decreases as the degree of uncertainty decreases. Typically, a 5% contingency is carried into construction.

Design consultant fee estimate includes fees for the Project Architect as well as Structural, Mechanical and Electrical Engineering. It would not include, Civil Engineering or special Theater Consultants.

Project estimates outlined in this section are presented for preliminary construction budget planning only and must be reviewed prior to contract. Conventionally, at the pre-design stage this form of cost planning has an expected accuracy within 20%.

Solterre Area Costs

Area costs are based on the total square footage and room description. This is commonly used in cost planning during pre-design stages as the concept of cost per square foot is easily understood and applicable to all buildings. Costs are based on gross floor area of the proposed facility, therefore a “Gross Up” factor is applied to account for walls and halls.

Notes and definitions:

- *The Consultant Fees are an estimate of architectural, structural, mechanical and electrical consultant design fees and construction administration. **A full design proposal and fee outline will be provided by Solterre Design**- Additional consulting MRT may consider outside this budget might include:

- Project manager
- Geotechnical engineering
- Surveyor
- Civil engineer
- Landscape architect

MRT Opportunities

The new MRT will be an efficient, well-insulated, well-ventilated, user-friendly, healthful and comfortable environment for both staff and visitors to the building. Highlighted below are a few impactful and innovative opportunities this project presents to MRT and the greater community.

Becoming a Green/Solar Initiative Demonstration

MRT will have the opportunity to be a green building and a showcase facility. To accomplish these goals, Solterre will work closely with MRT to implement three key principles to guide the design process: energy reduction before supply, passive systems before active ones, and simplicity.

Careful documentation of the construction process can create a story-line of the creation of the new MRT facility. This information can be shared in social media, Mulgrave Road Theatre website and media outlets, brochures, and various educational formats.

Monitoring, measurement and verification of the new MRT building performance can also be a data collection project, with a web-based interface, being an opportunity to inform interested public regarding occupant energy usage, future building decision making for future high-performance projects in Guysborough and beyond.

Destination for Community Gatherings

The new facility can offer a gathering place for community and private events and meetings. Special care should be taken during the design process to create welcoming, beautiful and daylit spaces that reflects the unique history of the Theatre and the region.

Integration of MRT Digital Strategy

Following recommendations in the MRT Digital Strategy dated March 2020, the construction of a new facility is a great opportunity to provide building-integrated technologies that allow MRT to leverage new physical and virtual creative spaces and streamline existing administrative processes.

Data infrastructure must allow for existing and emerging media technologies with high bandwidth. Conduits, cable trays and communications areas should be sized to allow for future growth and/or new system types. Digital feedback and control of building systems such as heating, cooling, ventilation, solar energy production and general energy use should be evaluated and implemented where practical and useful.

Special consideration should be given to how a rural-based organization such as MRT can leverage and improve their creative potential through video, digital collaboration and display technologies.

Environmental Resiliency

Increasing risk of severe weather events and societal upheavals experienced in our globalized world are providing new challenges to our built infrastructure. Strategies of super insulation, airtightness and high efficiency systems mean buildings can stay habitable and comfortable for long periods without power, requiring minimal energy to remain functional. On-site renewable energy systems, like photovoltaics, can also provide energy to run low demand communications and lighting systems.

The ecological goals and energy efficiency measures outlined in this report not only reduce MRT's environmental impact and carbon footprint but also make the organization more resilient to the effects of climate change; such as severe weather events and power outages.

Cultural Resiliency

Designing a space for resiliency must incorporate and support cultural values and practices. A new facility for MRT could provide opportunities to engage with local Mi'kmaw or other local groups that are historically underrepresented in theatre culture. Indigenous resiliency is rooted to identity, land and cultural practices. There are multiple sources of resiliency in Indigenous communities, such as spirituality, family values, teachings from Elders, ceremonial rituals, and oral traditions. Discussions with Indigenous groups could take the form of collaboration on permanent art for the facility and ceremonial rituals. It could also lead to future collaboration within the new creative and performance center for traditional storytelling and new creative performance projects.

Methods for Project Delivery

Below are the common forms of contract for delivering building design and construction. Solterre can discuss with MRT client group the best form of project delivery based on their goals and timeline.

Stipulated Price Contract (Design-Bid-Build)

This is the most commonly used construction delivery method. It includes three distinct phases (design, tender and construction). In the first phase MRT would engage an architect led design team to prepare design and construction drawings and specifications. MRT, with the assistance of the architect, would then hire a contractor by competitive bidding (tender process) to build the facility under a construction contract (usually based on a standard construction contract - CCDC 2 Stipulated Price Contract). Once the construction contract is awarded, the architect, or partnering organization, provides the Construction Administration work and reviews/certifies the construction on behalf of MRT.

Advantages:

- Widespread use and familiarity;
- Clear roles assigned to each party;
- Thorough resolution of the program requirements and design prior to construction;
- Direct professional relationship between the client and architect;
- Competitive pricing through tender process.

Disadvantages:

- Separation of design and construction restricts useful communication;
- "Extras" are perceived to be costlier and more prevalent (although all deliveries carry a contingency);
- The contractor is unknown when documents are prepared;
- Pre-qualification of contractors is crucial as contracts are typically awarded to lowest bidder (but not necessarily recommended in this case).

Modified Design-Build Contract

In this delivery method MRT would hire an Architect to provide the Schematic Design. At the conclusion of Schematic Design, the Architect will work with MRT to select a design-build firm/general contractor that would partner with the architect to ensure the design intent and performance goals. This contract type usually has two distinct phases (design and construction). Architectural design services (design development and construction documents) are provided while cost is monitored by construction company to stay within the Owner's budget. Based on the design, the contractor usually proposes a maximum price which includes a fee for managing construction. The Architect performs construction administration.

Advantages:

- Functional program (owner's requirements) and owner's decision are committed early;

- Cost benefit analysis is addressed early and refined throughout design by the builder;
- Immediate feedback received from contractor on design options;
- Streamlined process can increase efficiency;
- Collaborative team approach is reinforced.

Disadvantages:

- Requires a high degree of trust, as the primary criticism of design-build is that decisions are based more on cost rather than design or long-term value.

Construction Management Delivery Method

Construction Management is lesser known but has gained favour and can replace the traditional concept of a traditional design-bid-build contract between the Owner and the Contractor. This method allows the Owner to hire an architect and construction manager ("CM") at the same time with no competitive bidding by contractors. The owner, architect, and the CM are a "team" who work together to design a project, and once a project is designed, the CM is the actual contractor for the project, hiring all sub-trades and sub-consultants. This process can reduce overall project costs by having an established construction budget earlier in the design process. It can enhance competitive bidding on sub-trades and consultants, contract negotiation, value engineering, reduced change orders, and eliminate unnecessary scope and cost.

Advantages:

- Provides the Owner a guaranteed maximum price earlier in the process;
- Optimize and accelerate the design and construction schedule;
- Receives more accurate estimates due to the CM participating in the pre-construction process and providing earlier feedback on costs;
- Owner has access to all construction costs, an "open book" process;
- A CM may be able to coordinate the involvement of community members or NSCC grads in the process, with early coordination with those groups, within CM role;
- Fast-tracked schedules by bidding portions of the work at different times to keep the project moving forward.

Disadvantages:

- A lesser known process for local sub-trades and consultants to consider;
- A CM fee may be higher than a General Contractor's project management fee, even though construction costs may be lower as a result of a CM process;
- Availability of an experienced CM in the Guysborough area may be limited.

Next Stages

Choosing a Design Team

The next step for MRT is to engage an architect led consultant team to develop the design and construction cost estimates, and to select a site. The consultant team would include an architect, structural engineer, mechanical engineer and electrical engineer. In addition, it is recommended to separately engage a civil engineer, theater equipment consultant, landscape architect and cost consultant. If selected as the design architect, Solterre would recommend design consultants well suited to the MRT project requirements.

This next phase would involve design workshops with the MRT team to consolidate design options and optimize user input. This stage will also include:

- Confirmation of NSLC site;
- Initiate discussions for Project Delivery Method, and provide sample contracts;
- Establish the design sub-consultants

- Establish a project time-line for design and construction;
- Discuss any phasing options for various components of the functional program;
- Initiate schematic design work;
- Produce design material and graphics for fundraising and grant opportunities;
- Have a professional cost consultant provide a class C estimate based on schematic design.

Conclusion

Our architectural firm, Solterre Design, looks forward to working with MRT on the design phase of this building, collaborating to lead the Mulgrave Road Theatre towards energy independence while becoming a high-performance showcase. Solterre has experience in bringing some of Canada's highest energy-efficient buildings to fruition.

Thank you, Emmy Alcorn, Sherry McGee and the MRT community for the opportunity to work with you on this function program project.

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