Demolition and Landscaping

Mid-tier home renovation project for the mitigation of flood damage

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Investigation

Problem

- A concrete pad poured adjacent to a 2,000 sqft residential home is in a state of decay that has resulted in settling at an angle with an incline which is pooling water toward the house and foundation.
- The pad covers an area approximately 100 feet by 15 feet, is of variable thickness from 9 inches to 3 inches, and runs almost the full length of the house increasing the risk for expanded damage to the foundation.

Due to the position of the house relative to the sun this part of the house also does not receive full sun and is mostly shaded for the majority of the day. The issue of pooling water has caused a crack in the foundation of the basement and is flooding when substantial rain or snowmelt occurs or, when frequent low precipitation events occur. Due to the time of year (Fall and Winter in a northern climate) a sealant of the foundation crack needs to wait until warmer weather sometime in the Spring. The situation is exacerbated by a related issue with aging gutters which no longer direct roof run-off away from the house but instead collect and pool water onto the pad. However, due to winter precipitation an intermediary solution is needed to prevent pooling. Current solutions provided by contracts are too expensive for the home owner and require too much time and capital expenditure at this time.

The relevant stakeholders are, the homeowner and the tenants of the basement. Other stakeholders may include potential contractors or day laborers for the project. The homeowner is overwhelmed by the scope and cost of the issue, they are looking for the most effective lowest cost solution that carries the lowest risk. The tenants are seeking a risk mitigation solution that removes the possibility of their dwelling space flooding. The potential laborers seek to mitigate the risk involved in concrete demolition and reduce the manual labor required to demolish the concrete pad.

Solutions

One solution is to hire out a contractor for full demo, removal, and re-pour of the concrete pad. This solution has been quoted at approximately $10,000-$12,000.
The related solution for fixing and replacing the gutters has been quoted at approximately $4,000-$5,000. This solution reduces water but does not address the issue of the pad still collecting and drawing water and runoff toward the foundation.

As a solution between the tenants and the homeowner, the homeowner has agreed to partially demolish the concrete pad to improve drainage, attempt to reuse the material, and mitigate potential damage to the basement until a permanent solution can be implemented in fair

weather. This solution involves renting concrete demolition equipment and executing a multi-stage project.

This solution provides an opportunity to the tenants to benefit from a labor exchange compensation in the form of reduced rent and provides the homeowner with the opportunity to mitigate risk to their property and save money on needed home repairs.

This is an intermediary solution to the above issue of water retention threatening the foundation of a residential home while attempting to reuse materials in subsequent landscaping projects and serve as a low-commitment step toward home renovations without requiring significant expenditures. Equipment rental and materials purchase constitutes the bulk of the cost. Labor is being exchanged against monthly rent and utilities, any accumulation of labor hours at the agreed upon compensation rate over this amount will be paid from the homeowner to the tenants at the completion of the project. It will require approximately 70 hours of labor to complete the task, at $20 per hour this project is estimated to be valued at $1400 plus rental and materials costs.

Analysis

In exploring potential solutions there is a one month exploration phase. Alternative solutions are explored that include contractors, doing nothing, and doing all of the work at once. In this phase much of the decision making in the project developed as a series of correspondences with the primary stakeholder, the homeowner. At the outset of the project, the homeowner did not know their options and was not clear on what the desired outcome of the project was. As conversations went back and forth between the primary stakeholder and the secondary stakeholders, the tenants, there slowly developed a clear set of shared goals and values. Primarily physical and legal risk mitigation, financial concerns, and time concerns. The nature of these exchanges were halted and drawn out due to delays in communications from international travel which extended into the holiday season and resulted in several week lapses in developments.

What developed was a plan to rent equipment for concrete demolition and prepare the slab for removal while enabling drainage into the subsoil. Any time and budget remaining could then be allocated toward reuse of materials from the broken slab in minor landscaping projects.

Planning

Phase 1 Assessment

- Clean and prepare space for assessment and demolition
- Calculate approximate material volume to be removed and disbursed
- Calculate approximate labor hours to complete equipment and machinery tasks
- Shop for rental equipment rates

Phase 2 Planning and Design

- Design landscaping plan using approximate material volumes and types
    - Assess existing material
    - Specify uses for different rubble sizes from pad demo
        - Large cuts are to be used as pavers and fill
        - Mid-size gravel is to be used as general purpose fill for base layer, walkways, and leveling material
        - Small particulate material is to be used as fill for paver walkways and finishing
    - Determine location of paths
    - Approximate material type per new landscape feature
    - Establish stockpile zones near work spaces per material type to reduce double work and labor
- Reclaim existing material and prep work area
    - Store non-project related materials
    - Clean work area of debris and common items
    - Reclaim and compile existing materials in designated zones
    - Get initial design approval from homeowner
- Coordinate labor scheduling and equipment rental
    - Schedule equipment rental to maximize equipment run-time against cost
    - Schedule labor to maximize equipment run-time

Phase 3 Execution

- Equipment rental and major labor tasks
    - Equipment pickup
        - Scheduled equipment rental checkout and pickup
        - Approximately **1 labor hour**

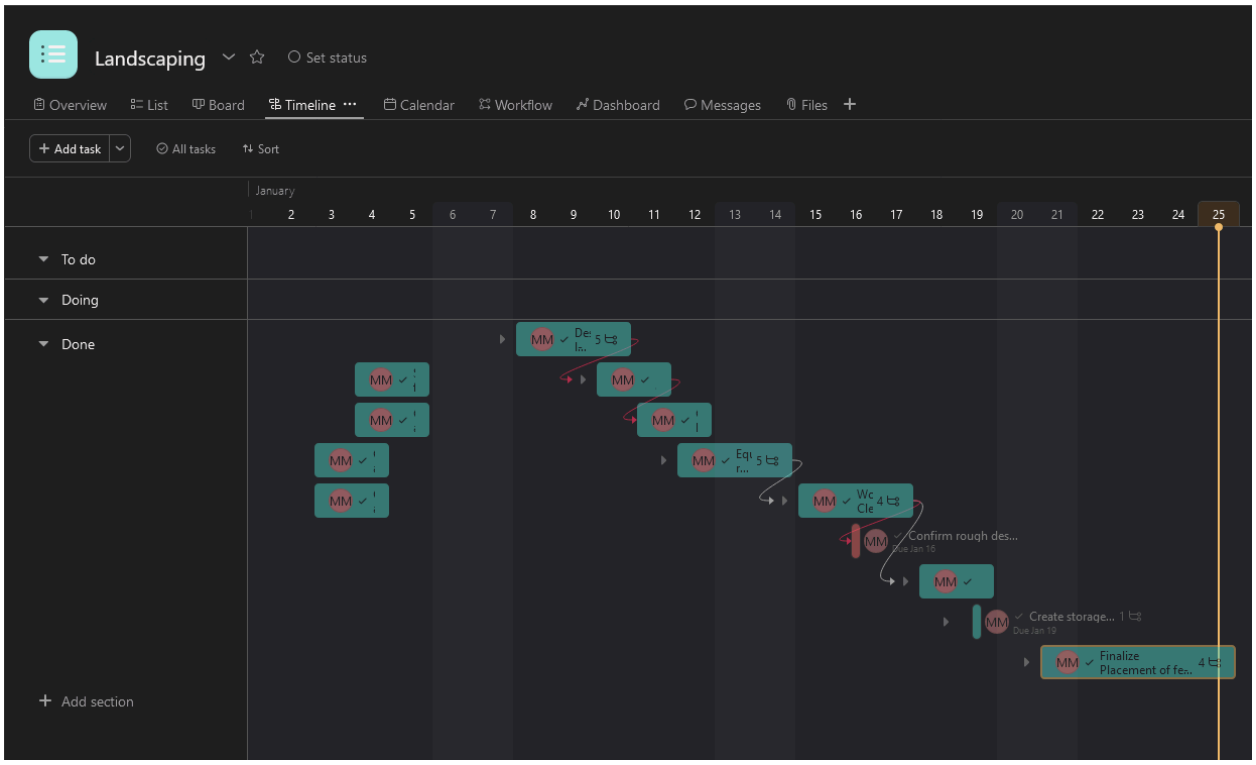
    - Concrete saw
        - Cut grid into pad, approximately 3ft by 5ft slabs
        - Cut guard cut near house (to reduce transfer of vibration from jackhammer from pad to foundation)
        - Two person team for maximizing run-time and safe operation
        - Approximately 5 hours x 2 people = **10 labor hours**
    - 90lb Jackhammer
        - Punch hole grid into cut slabs to maximize fracture of pad and maximize drainage
        - Two person team for maximizing run-time, safe operation, and reducing physical fatigue for operators.
        - Approximately 8 hours x 2 people = **16 labor hours**
    - Safety checks on equipment and laborer PPE
        - Initial and periodic safety and maintenance checks on rental equipment operation
        - Approximately 2 hours x 2 people = **4 labor hours**
    - Equipment cleaning and dropoff/return
        - Scheduled equipment rental cleaning and dropoff
        - Approximately **1 labor hour**
- Worksite Cleaning and assessment
    - Wash machined area with water to reduce dust and clean materials
    - Assess rubble size
    - Sort and Stockpile salvage materials/Remove pavers
        - Locate and move Large chunks/pavers (stepping stone size, larger than foot)
        - Locate and move Mid-size gravel (golf ball up to foot size)
        - Leave small particle size for fill later
    - Clean as you work premise for keeping tidy piles
    - Confirm rough design and layout with homeowner
        - Reassess and repeat as needed to confirmation
- Initial Placement and distribution of materials
    - Level plots for landscape features
    - Add gravel
    - Assess layout and available salvage material
    - Jigsaw area and pieces to a loose pattern
    - Assess layout and path appearance
    - Redistribute gravel on paths as needed
    - Confirm appearance and shape of design with homeowner
    - Create storage for interim pieces
    - Stockpile unused material with like material
- Finalize Placement of features
    - Demarcate and set aside initial layout
    - Lay path base layer
    - Add pavers

- Create rubble base fill for future concrete pour

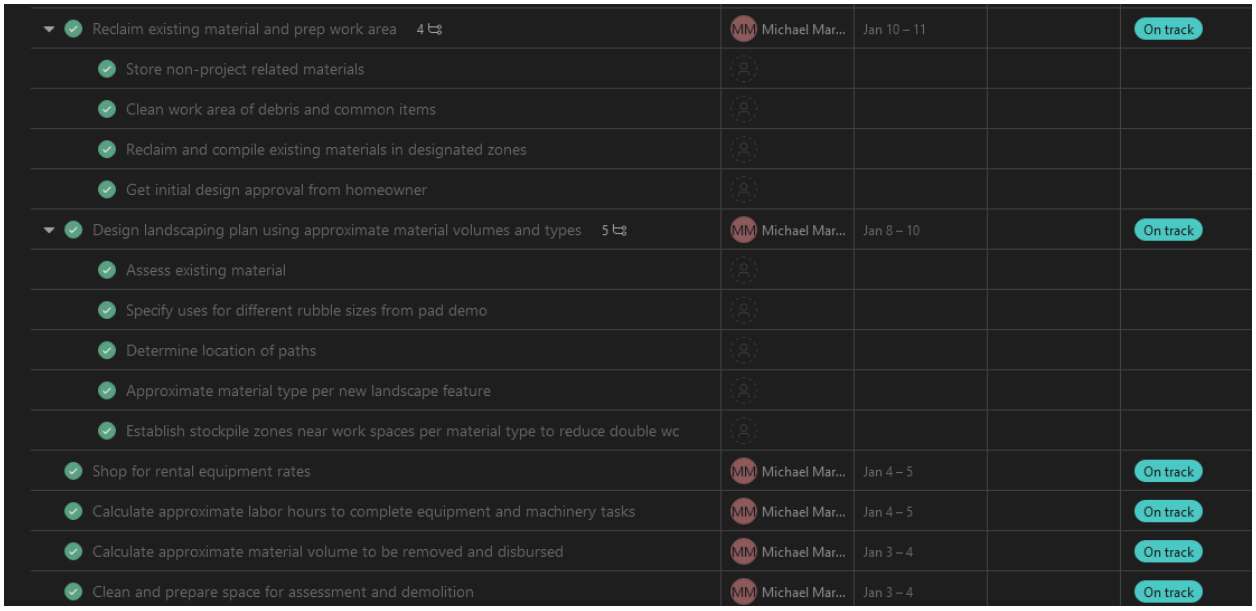
Execution

The following screenshots demonstrate the execution represented in an Asana board. There is a project timeline followed by the full project task list in chronological order. All tasks were completed by a 2 person team of myself and my partner. The tasks presented were executed in brief work stints each day, with no workday beyond the equipment usage days being more than 4 total labor hours (2 hours per person). This brought the project total labor hours to approximately 120 hours.

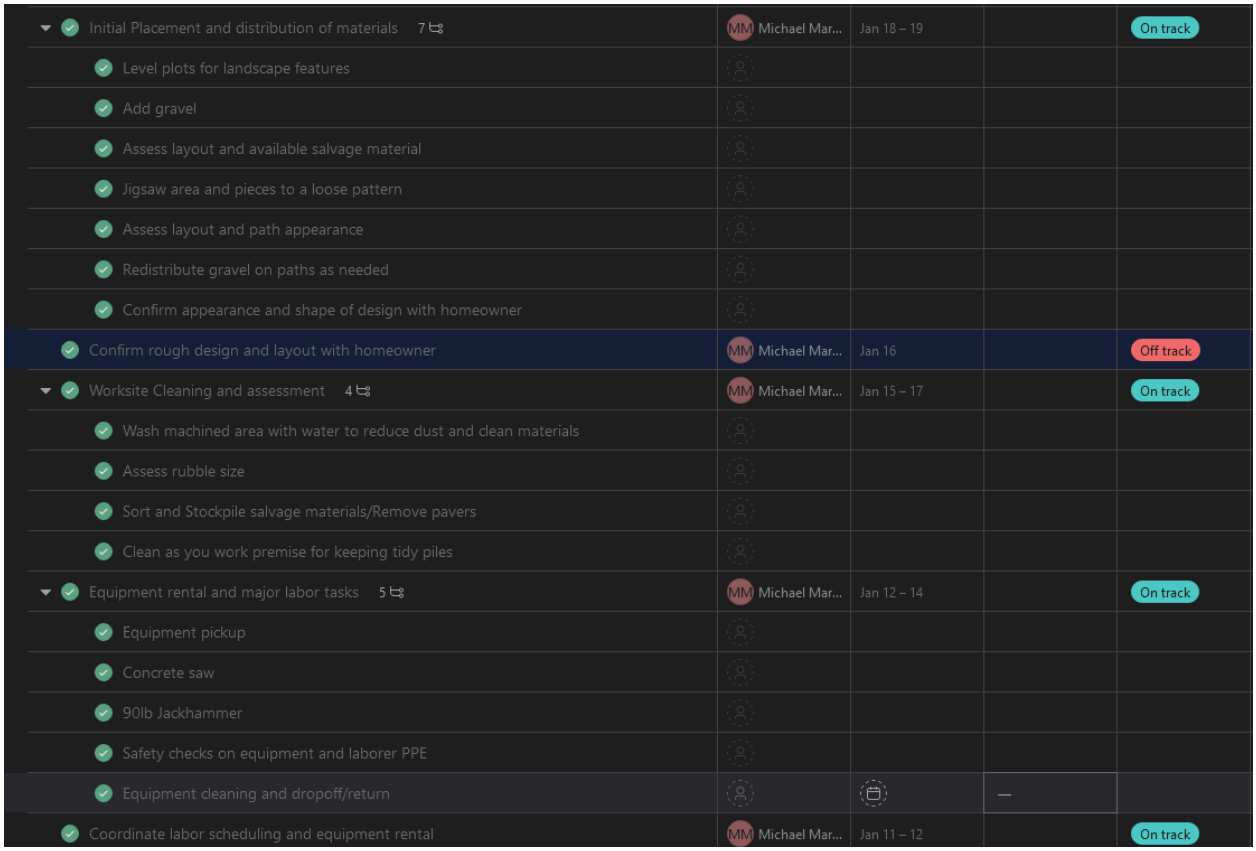
Submitted with this report is a csv export of the Asana project, due to the features of Asana, I was unable to add team members without them being registered as an asana team member. We primarily planned this project on paper and then used the Asana board to finalize the timeline and execution order.



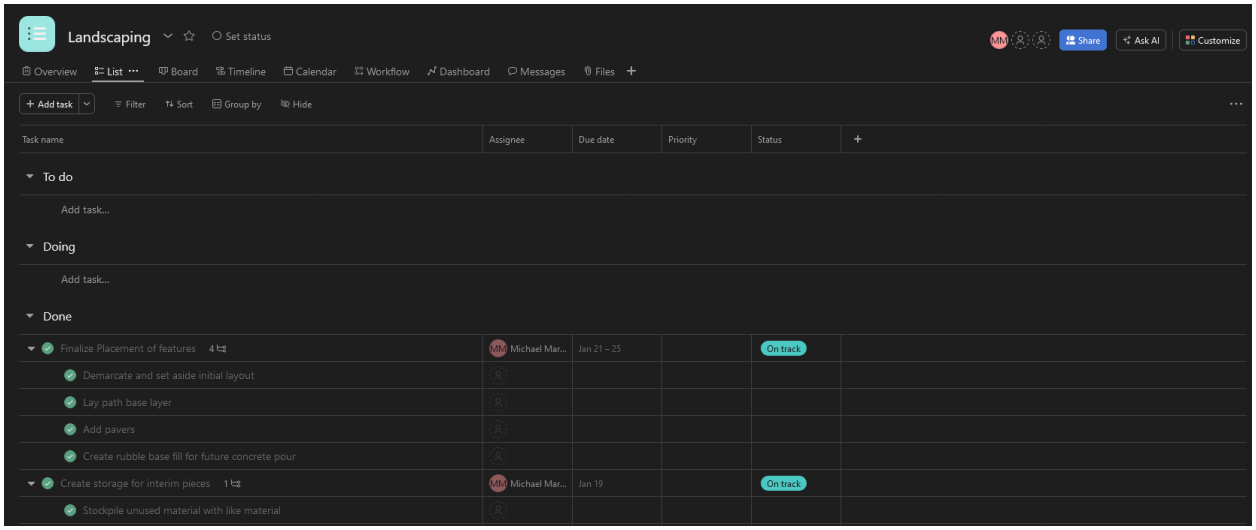
Screenshot figure of Asana project timeline.



Screenshot figure of Asana task list Jan 3-11



Screenshot figure of Asana task list Jan 11-19



Screenshot figure of Asana task list Jan 19-25

Evaluation

Task execution resulted in an intermediate landscape solution which provided crucial drainage away from the damaged foundation. This acts as a stop-gap solution for winter until proper temperature sensitive treatment of the foundation crack can be pursued in fair weather conditions. In addition to mitigating the risk of basement flooding with this execution we were able to reuse material in the existing landscape implementation for a new design and more functional layout of the new landscape architecture for the homeowner.

This project resulted in value-added contributions toward the landscape of the home, while allowing existing tenants to pursue labor trade in exchange for rental dues. This mutually beneficial project will continue at a future date under fair weather conditions. Although communication delays postponed the project start date, once agreement was reached to start the project, planning and execution proceeded without notable interruptions. Equipment rental was extended one day due to failure of the jackhammer after 3 hours of runtime. The rental company compensated us for the extra day for the inconvenience and there was no delay to the project schedule due to built in buffer time around equipment dependent tasks.

In conclusion, this landscaping project was executed by 2 people working in tandem for the planning and execution of a solution to patio drainage and basement flooding which allowed for selective reuse of material and an economical landscape revitalization project. The homeowner is happy with the results and the tenants are satisfied with the quality of work and compensation for the project.