To: Housing Committee

From: Amanda Hrgovic, Program Manager, Housing Finance and
Jason Hingley, Director, Housing Planning, Development and Finance
Regional Planning and Housing Services Department

Date: June 21, 2021 Meeting Date: July 7, 2021

Subject: **Draft Metro Vancouver Housing 2022 – 2026 Capital Development & Capital Maintenance Plans**

RECOMMENDATION

That the Housing Committee receive for information the report dated, June 21, 2021, titled "Draft Metro Vancouver Housing 2022 – 2026 Capital Development and Capital Maintenance Plans."

EXECUTIVE SUMMARY

The draft 2022 – 2026 Metro Vancouver Housing Capital Development and Capital Maintenance Plans have been prepared following direction received at the April 8, 2021 Metro Vancouver Board Budget Workshop and as part of Metro Vancouver's focus on enhancing transparency and governance over the capital plan. This is a new step in our budget process for this year and the intent is the Housing Committee provide feedback and input, which will be incorporated into the Fall budget presentations to the Committees and Boards.

The draft 2022 Capital Development cash flow is $48.3M with a total estimated spend of $441.0M over the five years. The draft 2022 Capital Maintenance cash flow is $9.9M with a total estimated spend of $72.9M over the five years. The budget cycle-over-cycle development plan has increased by $48.4M (15.4%) and the 5-year capital maintenance plan has increased by $14.1M (32.4%) from the corresponding years in the prior year capital plans.

PURPOSE

To present to the Committee the draft Metro Vancouver Housing 2022 – 2026 Capital Development and Capital Maintenance Plans for input and feedback, which will then be incorporated into the Fall Budget approval process.

BACKGROUND

On April 8, 2021, Metro Vancouver held a Board Budget Workshop with the objective to seek direction for the preparation of the 2022 - 2026 Financial Plan. In addition, Metro Vancouver is looking to enhance the transparency and governance over the capital planning process and give the opportunity to the Housing Committee to provide input and feedback earlier to be incorporated into the 2022 – 2026 Financial Plan.

METRO VANCOUVER HOUSING CAPITAL DEVELOPMENT AND CAPITAL MAINTENANCE PLANS

Metro Vancouver Housing initiatives and cash flows within the draft 2022 – 2026 Capital Plan over the five years are guided by the *Metro Vancouver Housing 10-Year Plan's* key objectives:

- ***Expand:*** Strategic redevelopment of existing sites and expansion through partnerships with member jurisdictions, as well as the Province of BC and the Federal government. A total of 1,064 units are included in the draft 2022 – 2026 Capital Plan, which represents 78.8% of the *Metro Vancouver Housing 10-Year Plan* target to develop ***at least*** 1,350 units over the next decade;
- ***Preserve:*** Safeguard and maintain the existing portfolio through capital maintenance. Preserve a portfolio Facility Condition Index = or < 20% over next 10 years;
- ***Provide:*** Support diverse, affordable, livable and inclusive communities;
- ***Energy Efficiency:*** Reduce energy consumption by 25% for new construction (from 2015 National Energy Code for Buildings); and
- ***Climate Action:*** Reduction of GHG emissions by 45% (from 2010 levels) by 2030.

Capital Development Plan Highlights

The draft 2022 - 2026 Capital Development Plan includes cash flows of $48.3M for 2022 and a total of $441.0M over the five-year budget cycle. There are seven projects approved that in 2022 will be at various stages of completion. Construction on 2 projects: Kingston Gardens and Welcher Avenue will begin in Q4 2021, with budgeted cash flows of $25M and $18M in 2022, respectively. Completion of detailed design and construction tender for Heather Place B requires cash flows of $2.4M in 2022. Schematic design and development approvals are scheduled for four projects in 2022: Eastburn Square, Malaspina, Southwynde and Pitt Meadows - Civic Centre.

Table 1. Capital Development Projects in 2022

Project	# Units	Budgeted Cash Flows 2022	2022 Key Milestones
Kingston Gardens – Phase 1, Surrey	85	$25.0M	Breaking ground with construction Q1
Welcher Avenue, Port Coquitlam	63	$18.0M	Breaking ground with construction Q1
Heather Place Building B, Vancouver	87	$2.4M	Finalizing detailed design and construction tender
Eastburn Square, Burnaby	172	$0.8M	Schematic design and development approvals
Malaspina - Phase 1, Coquitlam	85	$0.5M	Schematic design and development approvals
Southwynde – Burnaby	122	$0.8M	Schematic design and development approvals
Civic Centre – Pitt Meadows	122	$0.8M	Schematic design and development approvals
Projects in Planning (5-year planning)	328	$0.0M	Will rely on Housing Committee and MVHC Board feedback and endorsement before progressing from the planning stage
Total	1,064	$48.3M	

The capital development program for 2022 - 2026 is projected to be funded by $30.1M in forgivable loans, $326.8M external borrowing, and $84.1M MVHC development reserves. The total cash flows of $441.0M over the five years includes projects that are in the early planning stages and have not yet been endorsed by the Committee and Board. There are no budgeted cash flows in 2022 for these Projects in Planning.

Capital Development Plan Changes

The completion of multi-year projects is complex and are subject to change due to a variety of factors including delays in construction timing caused by global events and pandemics, changes in scope and city permitting processes. Changes or delays to the project schedule may impact the project costs and budgeted cash flows. The prior cycle capital plan for budget years 2021 – 2025 projected cash flows of $354.4M. There are adjustments in the 2022 -2025 budget cycle of $48.4M. As reported to the Housing Committee in May 2021, project costs increased by $12.3M due to greater than expected project escalation experienced in the past 12 months and adjustments made to the projects currently in planning increased the future expected cash flows by $36.1M. Additional cash flows for 2026 total $77.8M, leading to total projected cash flows of $441.0M over the five-year budget cycle.

Table 2. Breakdown of total revised 2022 – 2026 Capital Development Plan compared to prior cycle Capital Development Plan

Delivery By	Prior Cycle Capital Development Plan 2021-2025	Cash Flow 2021	Adjustments to 2022-2025 Capital Development Plan					Cash Flow 2026	Draft Capital Plan 2022-2026
			Carry-Forward	Deferrals / Accel.	Risk	Scope	Total		
Capital Development	$354.4M	($39.6M)	-	-	$12.3M	$36.1M	$48.4M	$77.8M	$441.0M

Capital Maintenance Plan Highlights

The draft 2022 - 2026 Maintenance Plan proposes a budget of $9.9m for 2022 and a total of $72.9 over the five-year budget cycle. The 2022 plan includes three rehabilitation projects where building envelops and mechanical systems will be upgraded providing new full building lifecycles, improving tenant comfort, and increasing energy efficiency through improved building performance. These three projects account for 59% of the total maintenance budget. The remaining 41% of the budget will fund targeted building maintenance including window, roof and cladding replacements, along with unit renovations.

Table 3. Maintenance Plan for 2022

Project	# Units	2022 Budget	2022 Key Milestones
Strathearn Court Rehabilitation - Vancouver	96	$3.4M	35% completion
Kelly Court Rehabilitation - Vancouver	45	$1.2M	Substantial completion
Evergreen Downs Rehabilitation - Delta	38	$1.2M	Substantial completion
Targeted maintenance <$0.5M		$2.1M	Substantial completion
Unit renovations		$2.0M	Substantial completion
Total		**$9.9M**	

Capital Maintenance Plan Changes

The Capital Maintenance Plan has traditionally included smaller targeted repairs, maintenance and replacement work funded with capital reserves. However, the building infrastructure has already reached or is approaching the end of its standard building life cycle and requires larger full building envelope and mechanical system upgrades to maintain heathy, livable homes for tenants. Through ongoing asset management assessments, several full building rehabilitation projects were identified and phased through the longer maintenance plan. However, in an effort to accelerate the delivery of this rehabilitation work, staff has considered alternative funding options, that would enable an expedited schedule of rehabilitation work under existing budget envelopes. Through financing full building rehabilitation work, staff propose increasing the scope of projects delivered from the corresponding prior year budget cycle by $14.1M and included a further $15.3M in 2026.

Further to improving tenant comfort and wellbeing, and ensuring the long-term preservation of existing affordable housing, expediting the implementation of these projects will also enable MVH to apply for available CMHC, FCM and CleanBC grants targeting green building retrofits and the preservation of affordable housing.

Table 4. Breakdown of total revised 2022 – 2026 Maintenance Plan compared to prior cycle Maintenance Plan

Delivery By	Prior Cycle Maint. Plan 2021-2025	Cash Flow 2021	Adjustments to 2022-2025 Capital Maintenance Plan					Cash Flow 2026	Draft Capital Maint. Plan 2022-2026
			Carry-Forward	Deferrals / Accel.	Risk	Scope	Total		
Capital Maintenance	$53.0M	($9.5M)	-	-	-	$14.1M	$14.1M	$15.3M	**$72.9M**

ALTERNATIVES
This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS
The 2022 – 2026 Capital Development Plan includes cash flow of $48.3M for 2022 and a total of $441.0M over the five years. The 2022 – 2026 Capital Maintenance Plan includes cash flow of $9.9M for 2022 and a total of $72.9M over the five years. The intent is that the Housing Committee provide feedback and input, which will then be incorporated into the Fall budget presentations to the Committees and Boards.

CONCLUSION
The 2022 – 2026 Capital Development and Capital Maintenance Plans illustrate how Metro Vancouver Housing supports the *Metro Vancouver Housing 10-Year Plan* and the financial impacts of these projects over the next five years. The guiding principles of the Capital Plans are to ***Expand*** Metro Vancouver Housing's portfolio through redevelopment and partnerships with member jurisdictions and other levels of government, ***Preserve*** Metro Vancouver Housing's existing portfolio through capital maintenance to support affordability and improve sustainability and accessibility, and continue to ***Provide*** safe, inclusive and diverse homes and communities throughout the region. The Capital Development and Capital Maintenance Plans competitively target reductions in energy consumption and GHG emissions.

The presentation of the draft 2022 – 2026 Capital Development and Capital Maintenance Plans for Metro Vancouver Housing provides the opportunity for the Housing Committee to provide input and feedback which will then be incorporated into the Fall Budget budget presentations to the Committees and the Boards.

Attachments *(46359587)*
1. Draft Housing 2022-2026 Capital Development Plan
2. Draft Housing 2022-2026 Capital Maintenance Plan

46336848

METRO VANCOUVER HOUSING CORPORATION
CAPITAL PORTFOLIO
HOUSING DEVELOPMENT
2022-2026 PROJECTED CASH FLOW

5.2 ATTACHMENT 1

	ACTUALS ESTIMATED TO DEC 31 2021	2022 CAPITAL CASH FLOW	2023 CAPITAL CASH FLOW	2024 CAPITAL CASH FLOW	2025 CAPITAL CASH FLOW	2026 CAPITAL CASH FLOW	ACTIVE STAGE	PRIMARY DRIVER
CAPITAL EXPENDITURES								
Heather Place - Building B	$ 2,000,000	2,400,000	13,400,000	18,000,000	12,300,000	-	Starting 2021 - Detailed Design	Expand/Re-develop
Kingston Gardens - Phase 1	8,000,000	25,000,000	11,600,000	-	-	-	Starting 2021 - Construction	Expand/Re-develop
Welcher Avenue	2,800,000	18,000,000	11,500,000	3,800,000	-	-	Starting 2021 - Construction	Expand/Re-develop
Eastburn Square (2021 Projects in Planning)	500,000	800,000	3,400,000	25,100,000	29,000,000	5,000,000	Planned	Expand/Re-develop
Malaspina (2021 Projects in Planning)	500,000	500,000	1,700,000	16,000,000	20,000,000	-	Planned	Expand/Re-develop
Pitt Meadows Town Centre (2021 Projects in Planning)	500,000	800,000	3,500,000	17,500,000	20,000,000	3,500,000	Planned	Expand/Member Partnerships
Southwynde - Burnaby (2021 Projects in Planning)	500,000	800,000	2,300,000	17,800,000	20,500,000	3,500,000	Planned	Expand/Member Partnerships
Projects in Planning	-	-	800,000	7,200,000	59,500,000	65,800,000	Planned	Expand/Re-develop and Member Partnerships
Total Projects	**$ 14,800,000**	**$ 48,300,000**	**$ 48,200,000**	**$ 105,400,000**	**$ 161,300,000**	**$ 77,800,000**		
TOTAL CAPITAL EXPENDITURES	**$ 14,800,000**	**$ 48,300,000**	**$ 48,200,000**	**$ 105,400,000**	**$ 161,300,000**	**$ 77,800,000**		

SUMMARY BY DRIVER						
Expand/Re-develop	$ 13,800,000	$ 46,700,000	$ 42,050,000	$ 67,100,000	$ 95,800,000	$ 43,200,000
Expand/Member Partnerships	1,000,000	1,600,000	6,150,000	38,300,000	65,500,000	34,600,000
Total	**$ 14,800,000**	**$ 48,300,000**	**$ 48,200,000**	**$ 105,400,000**	**$ 161,300,000**	**$ 77,800,000**

46359587

METRO VANCOUVER HOUSING CORPORATION
CAPITAL PORTFOLIO
HOUSING MAINTENANCE
2022-2026 PROJECTED CASH FLOW

5.2 ATTACHMENT 2

	ACTUALS ESTIMATED TO DEC 31 2021	2022 CAPITAL CASH FLOW	2023 CAPITAL CASH FLOW	2024 CAPITAL CASH FLOW	2025 CAPITAL CASH FLOW	2026 CAPITAL CASH FLOW	ACTIVE STAGE	PRIMARY DRIVER
CAPITAL EXPENDITURES								
Strathearn Court	-	3,360,000	3,360,000	1,680,000	-	-	35% completion	Expand/Preserve
Kelly Court	1,400,000	1,260,000	-	-	-	-	Substantial completion	Expand/Preserve
Evergreen Downs	2,250,000	1,200,000	-	-	-	-	Substantial completion	Expand/Preserve
Manor House	$ -	-	3,000,000	2,000,000	-	-	Planned	Expand/Preserve
Regal Hotel	-	-	-	-	2,300,000	1,800,000	Planned	Expand/Preserve
Le Chateau	-	-	1,200,000	1,200,000	-	-	Planned	Expand/Preserve
Crown Manor	-	-	1,170,000	1,400,000	-	-	Planned	Expand/Preserve
Minato West	-	-	2,000,000	3,300,000	2,200,000	2,200,000	Planned	Expand/Preserve
Somerset Gardens	-	-	-	4,000,000	4,000,000	4,000,000	Planned	Expand/Preserve
Other Maintenance	5,838,074	4,100,000	3,830,000	3,290,000	7,710,000	7,330,000	Planned	Expand/Preserve
Total Projects	**$ 9,488,074**	**$ 9,920,000**	**$ 14,560,000**	**$ 16,870,000**	**$ 16,210,000**	**$ 15,330,000**		
TOTAL CAPITAL EXPENDITURES	**$ 9,488,074**	**$ 9,920,000**	**$ 14,560,000**	**$ 16,870,000**	**$ 16,210,000**	**$ 15,330,000**		

To: Housing Committee

From: Jason Hingley, Director Housing Planning, Development & Finance
Regional Planning and Housing Services

Date: June 18, 2021 Meeting Date: July 7, 2021

Subject: **Exploring Modular Housing Construction**

RECOMMENDATION
That the Housing Committee receive for information the report dated June 18, 2021, titled "*Exploring Modular Housing Construction*".

EXECUTIVE SUMMARY
The Metro Vancouver Housing 10 Year Plan seeks to strategically expand the Metro Vancouver Housing portfolio to create more affordable housing in the region. The Housing Committee requested that staff investigate and compare modular construction to more conventional on site construction methods. This report explores the benefits and drawbacks of modular compared to conventional construction.

The analysis found that modular construction has a number of benefits including quality control, reduction in waste and the potential for a shorter construction schedule. Cost comparisons suggested higher hard costs, caused by a redundancy in the amount of material used to construct modules, as well as additional transportation of modules to site. However, this could potentially be offset by a shorter construction phase which would result in less interest accrued in construction financing and faster rent-up. Modular construction is another viable construction option for MVH and will be explored as a preferred alternative during the feasibility stage of project development.

PURPOSE
To inform the Housing Committee about Modular Housing Construction.

BACKGROUND
The *Metro Vancouver Housing 10-Year Plan* endorsed by the Board in 2019 sets a goal to strategically expand Metro Vancouver Housing's portfolio of affordable homes. This report provides the Housing Committee with information about modular construction as one of a number of methods to consider when planning new housing development or redeveloping existing sites.

MODULAR DEVELOPMENT
The *Metro Vancouver Housing 10-Year Plan* set a target to expand the number of homes in the Metro Vancouver Housing portfolio through redevelopment of existing sites and partnerships with members on new sites. In 2020, the MVHC Board endorsed a number of development priorities for the next 10 years. To explore construction methods to deliver on these development priorities, staff engaged WSP to compare off-site modular construction to conventional timber and lightweight steel frame construction. Conventional construction describes constructing and assembling all building components in place, on site for multi-family apartments up to six storeys. Staff also spoke to two leading off-site modular development companies to discuss the design, manufacturing and construction process and to better understand the costs associated with modular development.

There are different methods of developing off-site construction solutions (modular), also known as Design for Manufacture and Assembly (DfMA). This broadly describes systems, technologies and methodologies that include some degree of pre-fabrication of building elements in an offsite location, designed with the ease of site assembly in mind to achieve an improved or enhanced product or schedule. This research and report is focused on '**volumetric modular'**, where complete and finished three dimensional modules are pre-fabricated offsite and erected as large elements to form the structure with wood as the primary construction material.

Other common types of modular include '**panelization**' where panels of floors, walls, roofs are pre-fabricated, '**components**' where sections of a unit (i.e. bathrooms) are pre-fabricated, and '**elements**', which is becoming more common in mass timber developments. Lightweight structural steel is another effective material to execute stud wall floor joist systems, however WSP's experience has shown that it does not compete as favourably on price compared to timber elements. Further, there are fewer suppliers and trades in the current multi-residential development market that can deliver these products, creating more procurement headwinds and a less competitive pricing environment. For low rise construction in Metro Vancouver, lightweight steel construction presents very limited opportunity for an advantage over lightweight timber.

Conventional vs. Modular Construction

When planned and executed appropriately and comprehensively, modular construction offers some benefits when compared to conventional in situ construction; however, there are some important considerations and potential drawbacks with modular construction. Table 1 explores primary benefits and drawback of modular construction.

Table 1. Benefits and Drawbacks to Modular Construction

Common Benefits	Common Drawbacks
Reduced construction schedule: • Module fabrication can occur simultaneously with site preparation works and foundation and/or podium construction. • It is possible that the production, transportation and assembly of the modules can be substantially quicker than conventional on-site assembly.	**Doubling up:** • As each module needs its own roof and floor, and every module needs its own wall to complete the internal finish and to provide transportation strength, there is some redundancy in material and additional material is required. • The redundancy results in deeper floor and wider wall assemblies, which consume more of the available space of the site plan and available height limit.
Reduced waste: • Operating in a controlled environment where materials are closely managed. • Material savings resulting in both costs savings and carbon reductions.	**Complexity**: • Complex framing can be required around plumbing runs; complexity works against the efficiency benefits of the off-site process.

Higher quality control: • Oversight and quality inspections are easily and promptly executed, while the repetitive process results in efficiency and quality.	**Seismic connections:** • The nature of the connection and lateral force resisting system (LFRS) requirements needs to be carefully assessed and the design must accommodate these considerations from an early stage by maximizing the ability of the LFRS to perform. • It may be necessary to increase the amount of on-site work to accommodate.
Controlled environment for manufacturing: • By constructing within a factory environment, construction is protected from weather (rain, wind, snow etc.) and climatic impacts, including a buffer against thermal variances. • Since modules are constructed one at a time, there are production line quality benefits and works never occur in difficult to access locations or more than one storey in the air.	**Regulatory:** • Authority with jurisdiction may require early engagement for inspection to ensure the project stays on schedule.
Safer construction: • Working in a controlled environment on repetitive tasks, and with a very limited exposure to height, modular construction substantially reduces well known Health, Safety and Environment (HSE) risks.	**Building Envelope:** • Careful consideration must be given to the design of the joints between units for continuity of air/vapour/moisture barriers. This may be more difficult if constructed tight against an existing structure. • Possible cold bridging at the corners where two units are connected as there will likely be a "gap" in the cavity insulation.
Acoustic performance: • The overall system is often better than a conventional building, since there is a double structure build up and air gap between levels – every module has a distinct floor and roof – and between adjacent units – as every module has its own wall.	

Energy Performance

WSP reports that there is general consensus in the industry (also backed up by preliminary research by the Zero Energy Mass Custom Home Network) that the enhanced quality control in a factory environment translates into higher air tightness of building modules (in modular construction) relative to the equivalent envelope areas in conventional construction. This is particularly true when not only windows and doors are assembled as part of the modules, but also HVAC penetrations are sealed in a factory environment. However, module joints (in addition to thermal bridging) introduce a very significant potential for increased infiltration in modular construction.

Procurement Strategy
Modular construction has specific building design and construction oversight considerations that require specialized skills and experience that differs from conventional construction. To realize the potential to expedite a project schedule (and associated benefits of reduced cost uncertainty) with modular construction, a design-build (one company is contracted to both design and construct the project) procurement approach is recommended. This differs from the design-bid-build (separate competitive design and construction contracts are procured) approach most commonly used with conventional construction. Therefore, early commitment to modular construction is required. While it is possible to modify and convert a modular design into a conventional build, converting from a conventional design to modular is not as straight forward.

Development Costs and Schedule
With a more predictable process, and more work happening in a controlled factory environment, there is the potential for greater cost and schedule certainty with modular construction. However, modular manufacturing requires a manufacturing plant and associated overheads, a skilled trade workforce, transportation of units to the construction site, and modules that require almost twice as much wood[1] compared to conventional construction. Given the current cost of lumber, this last consideration has a significant impact on modular's ability to compete on price with conventional construction at this time.

Generic cost and schedule estimates[2] were provided by two modular manufacturers. Costs were 6% to 25% higher per square foot and $16,000 to $63,000 more expensive per unit compared to conventional construction cost estimates; however, schedules are expected to be shorter given site and civil works can occur at the same time as modular fabrication offsite. It is important to note that without a detailed design this cost and schedule information is unconfirmed and provided only for context.

IMPLICATIONS FOR METRO VANCOUVER HOUSING
Modular construction provides MVH with another viable construction tool to deliver on its target to expand affordable homes set out in the *10-year plan*. As this comparison between volumetric modular construction to conventional stick frame identifies there are a number of possible benefits to modular, particularly a shorter construction schedule, fewer unknowns and generally accepted higher construction quality control, however there is also higher construction costs that should be expected and a redundancy of material (wood) required, although less waste. Given the likely trade-off between cost versus speed between modular and conventional construction, MVH will include volumetric modular as a method of construction analyzed during the feasibility stage of project planning before a recommendation is presented to the Housing Committee and Board for endorsement.

ALTERNATIVES
This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS
This is an information report and does not have any direct financial implications. The cost of the WSP report was part of the 2021 operating budget. As part of the capital project framework and stage gate

[1] Each module needs its own roof and floor, and every module needs its own wall to complete the internal finish and to provide transportation strength, there is some redundancy in the amount of material required. While not entirely double, since ceilings do not need to have the capacity of floors, and the outside finish of a wall doesn't need to have the specification of the inside finish, there is additional material.
[2] Detailed cost and schedule estimates would require detailed building design, given the intent of this report is to introduce and compare construction types generic cost and schedule estimates are provided.

process, construction type analysis and procurement strategy would be recommended to the MVHC Board before a project is initiated. An Offsite (fabrication) Readiness Assessment (Attachment) was suggested by WSP to quantify core considerations of modular construction against the conventional approach.

CONCLUSION

MVH is expanding its housing portfolio to increase the amount of affordable housing in the Metro Vancouver region. To deliver on the development priorities endorsed by the MVHC Board, staff investigated and compared modular construction to more conventional on site construction methods. This report explores general benefits and drawbacks, energy performance, procurement approaches, as well as schedule and cost comparisons. The analysis found that modular construction has a number of benefits including quality control, reduction in waste and potential for a shorter construction schedule. Cost comparisons suggested higher hard costs, caused by a redundancy in the amount of material used to construct the modules as well as additional transportation of modules to site. However, this could potentially be offset by a shorter construction phase which would result in less interest accrued in construction financing.

ATTACHMENTS *(46043916)*

Offsite Readiness Assessment

45944203

Offsite Readiness Considerations			Current Rating	Potential Rating
Site Issues	Site Access	Good road to site, clearance under power lines Are there site constraints that support/hinder Offsite		
	Unloading	Sufficient area for flat-bed trucks to unload Sufficient area to store modules from unload to placement		
	Craneage	Adequate crane locations Issues with oversailing/encroachment		
	Wind speed	Abnormal wind issues might impact placement May be a consideration for high rise		
Project Issues	New / refurb	Is the project a new build or an upgrade project		
	Procurement	Does the procurement model permit early engagement by contractors or Offsite suppliers		
	Supply Chain	Does a local supply chain exist sufficient to satisfy the project needs		
	Scale	Is there sufficient volume to be attractive to the supply chain		
	Commercial	Are the Offsite costs competitive? Can the adjusted cash flow be accommodated		
	Schedule	What aspects of the schedule are critical – overall, site time, are there weather impacts		
Building/Design Issues	Timing	Has the concept of Offsite construction been considered from the start, or is it being retrofitted to a complete design		
	Repetitive	Is the layout and configuration suitable for repetitive elements, and generally rectilinear		
	Architecture	Does the architectural intent support an Offsite design		
	Special Features	Does the building include special features that impact Offsite design – balconies, set-backs, roof terraces, curved façades,		
	Alignment	Does the structural fame align vertically to eliminate transfers		
	Floor Spans	Are the spans within the limits of Offsite elements		
	Lateral System	Height and location (seismic load) will inform lateral system, shear wall material and locations, as well module/element connections		
Total				