HOUSING DEVELOPMENT CORPORATION

REQUEST FOR PROPOSAL (RFP)

FOR

DEVELOPMENT AND OPERATION OF CO-LIVING HOUSING IN HULHUMALE'PHASE II (N4-42)

PROPOSAL REFERENCE NUMBER: HDC(161)-CM/IU/2020/270

ANNOUNCEMENT DATE: 25th November 2020

PROPOSAL SUBMISSION DEADLINE: 04th January 2021

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SECTION I. INSTRUCTIONS TO PROPONENTS (ITP)

A. GENERAL		
1. Scope of Proposal	1.1	The Lessor; HOUSING DEVELOPMENT CORPORATION LIMITED an incorporated limited liability company operating under the registration number C793/2008 and having its registered office at HDC Building, 3rd Floor, Hulhumalé Republic of Maldives (hereinafter called and referred to as "the Lessor",) issues this Request for Proposal (RFP) for Project specified in Section IV. Lessor's Requirements. The name of the Project and Proposal Reference Number of this RFP is **provided in the RFP Data Sheet.**
	1.2	Throughout this RFP Documents: (a) the term "in writing" means communicated in written form and delivered against receipt; (b) except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular; and (c) "day" means calendar day.
2. Corrupt and Fraudulent Practices	2.1	It is requirement of Lessor that proponents, suppliers, contractors and their agents (whether declared or not), sub-contractors, sub-consultants, service providers or suppliers, and any personnel thereof, observe the highest standard of ethics during RFP process and execution of Works. In pursuance of this policy, the Lessor: (a) defines, for the purposes of this provision, the terms set forth below as follows: (i) "Corrupt practice" means the offering, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution; and (ii) "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of HDC, and includes collusive practice among Proponent

		(prior to or after Proposal submission) designed to establish Proposal prices at artificial noncompetitive levels and to deprive HDC of the benefits of free and open competition. (b) will reject a proposal for award if it determines that the proponent recommended for award, or any of its personnel, or its agents, or its sub-consultants, sub-contractors, service providers, suppliers and/or their employees, has, directly or indirectly, engaged in corrupt or fraudulent practices in competing for the contract in question. (c) will sanction a firm or individual, at any time including declaring such firm or individual ineligible, either indefinitely or for a stated period of time: to be awarded a contract from Lessor. (d) will terminate the contract after having given fourteen (14) days' notice to the Proponent.
3. Eligible Proponents	3.1	A Proponent must be a registered business (sole trader, partnership or limited liability company) – subject to ITP 3.2 and ITP 3.3.
	3.2	**Unless otherwise specified in the RFP data sheet,** in case a Joint Venture (JV) is proposed by Proponent(s) the minimum percentage of equity share proportion of local partner(s) in a JV shall not apply.
	3.3	A Proponent shall not have a conflict of interest. Any Proponent found to have a conflict of interest shall be disqualified. A Proponent may be considered to have a conflict of interest for the purpose of this RFP process, if the Proponent: (a) directly or indirectly controls, is controlled by or is under common control with another Proponent; or (b) receives or has received any direct or indirect subsidy from another Proponent; or (c) has a relationship with another Proponent, directly or through common third parties, that puts it in a position to influence the proposal of another Proponent, or influence the decisions of the Lessor regarding this RFP process; or

		(d) submits more than one proposal in this RFP process by business entity. Participation by a Proponent in more than one Proposal will result in the disqualification of all Proposal in which such Proponent is involved.
	3.4	A Proponent shall not be under suspension from proposal submission by the Lessor.
	3.5	A Proponent shall provide such evidence of eligibility satisfactory to the Lessor, as the Lessor shall reasonably request.
B. CONTENTS OF RFP DOCUMENTS		
4. Sections of RFP Documents	4.1	The RFP Documents include all the Sections specified below, and should be read in conjunction with any Addenda issued in accordance with ITP 6. • Section I. Instructions to Proponents (ITP) • Section II. RFP Data Sheet • Section III. Qualification and Evaluation Criteria • Section IV. Lessor's Requirements • Section V. Business Proposal Requirement • Section VI. Contract Terms
	4.2	Unless obtained directly from the Lessor, the Lessor is not responsible for the completeness of the RFP Documents, responses to requests for clarification, or Addenda to the RFP Documents in accordance with ITP 6. In case of any contradiction, documents obtained directly by the Lessor shall prevail.
	4.3	The Proponent is expected to examine all instructions, forms, terms, and specifications in the RFP Documents. Failure to furnish all information and documentation required in RFP Documents as per ITP 4.1 may result in rejection of the proposal.
5. Clarification of RFP Documents, Pre-Proposal Meeting	5.1	A Proponent requiring any clarification of the RFP Documents shall contact the Lessor in writing at the Lessor's address **specified in the RFP Data Sheet** or raise its enquiries during the Pre-Proposal Meeting, if provided for in accordance with ITP 5.2. The Lessor will respond in writing to any request for clarification, provided that such request is received no later than the enquiry deadline

		specified in the RFP Data Sheet. The Lessor shall promptly publish its response at the web page **specified in the RFP Data Sheet.** Should the clarification result in changes to the essential elements of the RFP Documents, the Lessor shall amend the RFP Documents following the procedure under ITP 6 and ITP 16.2.
	5.2	If so, **specified in the RFP Data Sheet**, the Proponent's designated representative is invited to attend a pre-proposal meeting. The purpose of the meeting will be to provide information about the project, proposal procedures, clarify issues and to answer questions on any matter that may be raised at that stage.
	5.3	Minutes of the pre-bid meeting, if applicable, including the text of the questions asked by Proponents, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be published promptly in webpage in accordance to ITP 5.1. Any modification to the RFP Documents that may become necessary as a result of the pre-proposal meeting shall be made by the Lessor exclusively through the issue of an Addendum pursuant to ITP 6 and not through the minutes of the pre-proposal meeting. Nonattendance at the pre-proposal meeting will not be a cause for disqualification of a Bidder.
6. Amendment of RFP Documents	6.1	At any time prior to the deadline for submission of proposal, the Lessor may amend the RFP Documents by issuing addenda.
	6.2	Any addendum issued shall be part of the RFP Documents and shall promptly publish the addendum on the Lessor's web page in accordance with ITP 5.1.
	6.3	To give Proponents reasonable time in which to take an addendum into account in preparing their proposal, the Lessor should extend the deadline for the submission of proposal, pursuant to ITP 16.2.

C. PREPARATION OF PROPOSALS		
7. Cost of Proposal	7.1	The Proponent shall bear all costs associated with the preparation and submission of its proposal, and the Lessor shall not be responsible or liable for those costs, regardless of the conduct or outcome of the RFP Process.
8. Language of Proposal	8.1	The RFP, as well as all correspondence and documents relating to the RFP exchanged by the Proponent and the Lessor, shall be written in the ENGLISH or DHIVEHI language.
9. Documents Comprising the Proposal	9.1	The Proposal shall comprise the following: (a) Letter of Price Proposal Form in accordance with ITP 10; (b) Bid Security in accordance with ITP 13; (c) Written confirmation authorizing the signatory of the Proposal to commit the Proponent, in accordance with ITP 14.2 and ITP 14.3; (d) Business Proposal Requirement stipulated in Section V; (e) In the case of a Proposal submitted by a Joint Venture (JV), the JV agreement or letter of intent to enter into JV including but not limited to scope of works to be executed by respective partners and equity share percentage of the respective partners; (f) Any other document required in RFP data sheet.
10. Letter of Price Proposal	10.1	The Letter of Price Proposal shall be prepared using the Form 02 in Section V. The form must be completed without any alterations to the text, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested.
	10.2	The Proponent shall quote prices conforming to the requirements specified in Section IV.
11. Currencies of Proposal	11.1	The currency(ies) of the proposal are to be quoted in Maldivian Rufiyaa (MVR).

12. Period of Validity of Proposals		Proposal shall remain valid for the period **specified in the RFP Data Sheet.** A proposal valid for a shorter period shall be rejected by the Lessor as non-responsive.
13. Bid Security		The Proponent shall furnish as part of its proposal, a bid security in original form and in the amount and currency **specified in the RFP Data Sheet.**
	13.2	The Bid Security shall be valid for the period **specified in the RFP Data Sheet.**
	13.3	The Bid Security shall be a demand guarantee in forms of an unconditional guarantee issued by a locally registered Bank or financial institution (such as an insurance, bonding or surety company). The bid security shall be submitted as per Form 01 in Section V.
	13.4	The Bid Security of a JV shall be in the name of the JV that submits the bid. If the JV has not been legally constituted into a legally enforceable JV at the time of bidding, the bid security or shall be in the names of all future members as named in the letter of intent referred to in ITP 3.1 and ITP 9.1
	13.5	Any proposal not accompanied by a substantially responsive bid security shall be rejected by the Lessor as non-responsive.
	13.6	The Bid Security of the successful Proponent shall be returned as promptly as possible once the successful Proponent has signed the Contract.
	13.7	The Bid Security of unsuccessful Proponents shall be returned as promptly as possible upon the successful Proponent's signing the Contract.
14. Format and Signing of Proposal	14.1	The Proponent shall submit one original of the documents comprising the proposal as described in ITP 9.1.
	14.2	The original and all copies of the proposal shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Proponent. This authorization shall consist of a written confirmation of a Power of Attorney to sign on behalf of the Proponent. The name and position held by each person signing the

		authorization must be typed or printed below the signature. All pages of the proposal where entries or amendments have been made shall be signed or initialed by the person signing the proposal.
	14.3	In case the Proponent is a JV, the Proposal shall be signed by an authorized representative of the JV on behalf of the JV, and so as to be legally binding on all the members as evidenced by a power of attorney signed by their legally authorized representatives.
	14.4	Any inter-lineation, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the proposal.
D. SUBMISSION AND OPENING OF PROPOSALS		
15. Sealing and Marking of Proposals	15.1	Proponents shall submit their proposal by mail or by hand. If so, **specified in the RFP Data Sheet**, Proponents shall have the option of submitting their Proposal electronically. Procedures for submission, sealing and marking are as follows: (a) Proponents submitting Proposal by mail or by hand shall enclose the original of the Bid in one sealed single envelope, duly marking the envelope as "ORIGINAL BID". (b) Proponent submitting Proposal electronically shall follow the electronic bid submission procedures **specified in the RFP data sheet.**
	15.2	The inner and outer envelopes shall: (a) bear the name and address of the Proponent; (b) bear the name of the Project and shall be addressed to the Lessor; (c) bear the specific proposal reference number of this RFP process indicated in RFP Data Sheet; (d) bear the name, address and contact number and contact person of the Proponent. (e) bear a warning not to open before the time and date for proposal opening in accordance with ITP 16.1. (f) include Form 04 - Proposal Checklist

	15.3	If all envelopes are not sealed and marked as required, the Lessor will assume no responsibility for the misplacement or premature opening of the proposal.
16. Deadline for Submission of Proposal	16.1	Proposals must be received by the Lessor at the address and no later than the Proposal Submission date and time **specified in the RFP Data Sheet.**
	16.2	The Lessor may, at its discretion, extend the deadline for the submission of proposals by amending the RFP Documents in accordance with ITP 6, in which case all rights and obligations of the Lessor and Proponents previously subject to the deadline shall thereafter be subject to the deadline as extended.
17. Late Proposal	17.1	The Lessor shall not consider any proposals that arrives after the deadline for submission of proposal specified in ITP 16. Any proposal received by the Lessor after the deadline for submission of proposal shall be declared late, rejected, and returned unopened to the Proponent.
18. Proposal Opening	18.1	The Lessor shall open Proposals at the address on the date and time **specified in the RFP Data Sheet** in the presence of Proponent's designated representatives and anyone who choose to attend. Any specific electronic bid opening procedures required if electronic bidding is permitted in accordance with ITP 15.1, shall be **specified in the RFP Data Sheet.**
	18.2	The Lessor shall open the proposals one at a time and read out and record the following (a) the name of the Proponent; (b) the presence of original Bid Security; (c) the proposed prices in Price Proposal Form; (d) any other details as the Lessor may consider appropriate
	18.3	Only proposals read out and recorded at proposal opening shall be considered for evaluation. No Proposal shall be rejected at the opening except for late proposal in accordance with ITP 17.1 and proposals that are not in accordance with Form 04 - Proposal Checklist.

	18.4	The Lessor shall prepare a record of the proposal opening that shall include, as a minimum: the name of the Proponent; the Price; and the presence or absence of a bid security, if one was required. The Proponents' representatives who are present shall be requested to sign the record. The omission of a Proponent's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Proponents who submitted proposal on time.
E. EVALUATION AND COMPARISON OF PROPOSALS		
19. Confidentiality	19.1	Information relating to the evaluation of proposals, comparison of proposals and recommendation of contract award shall not be disclosed to Proponents or any other persons not officially concerned with the RFP process until information on Contract award is communicated to all Proponents in accordance with ITP 27.
	19.2	Any attempt by a Proponent to influence the Lessor in the evaluation of the proposals or Contract award decisions may result in the rejection of its proposal.
	19.3	Notwithstanding ITP 20.2, from the time of proposal opening to the time of Contract award, if a Proponent wishes to contact the Lessor on any matter related to the RFP process, it shall do so in writing.
20. Clarification of Proposals	20.1	To assist in the examination, evaluation, and comparison of the proposals, and qualification of the Proponents, the Lessor may, at its discretion, ask any Proponent for a clarification of its proposal, giving a reasonable time for a response. Any clarification submitted by a Proponent that is not in response to a request by the Lessor shall not be considered. The Lessor's request for clarification and the response shall be in writing. No change, including any voluntary increase or decrease, in the prices or substance of the proposal shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Lessor in the evaluation of the proposals, in accordance with ITP 24.

	20.2	If a Proponent does not provide clarifications of its proposal by the date and time set in the Lessor's request for clarification, its proposal may be rejected.
21. Deviations, Reservations, and Omissions	21.1	During the evaluation of proposal, the following definitions apply: (a) "Deviation" is a departure from the requirements specified in the RFP Documents; (b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the RFP Documents; and (c) "Omission" is the failure to submit part or all of the information or documentation required in the RFP Documents.
22. Determination of Responsiveness	22.1	The Lessor's determination of a proposal's responsiveness is to be based on the contents of the proposal itself, as defined in ITP 9.1.
	22.2	A substantially responsive proposal is one that meets the requirements of the RFP Documents without material deviation, reservation, or omission.
	22.3	A substantially responsive proposal is one that meets the requirements of the RFP Documents without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that, (a) if accepted, would (i) affect in any substantial way the scope, quality, or performance of the Works specified in the Contract; or (ii) limit in any substantial way, inconsistent with the RFP Documents, the Lessor's rights or the Proponent's obligations under the proposed Contract; or (b) if rectified, would unfairly affect the competitive position of other Proponents presenting substantially responsive proposal.

	22.4	If a proposal is not substantially responsive to the requirements of the RFP Documents, it shall be rejected by the Lessor and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.
23. Correction of Arithmetical Errors	23.1	Provided that the proposal is substantially responsive, the Lessor shall correct arithmetical errors on the following basis: (a) if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Lessor there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected; (b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and (c) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.
	23.2	Proponents shall be requested to accept correction of arithmetical errors. Failure to accept the correction in accordance with ITP 23.1, shall result in the rejection of the Proposal.
24. Evaluation of Proposal	24.1	The Lessor shall use the criteria and methodologies listed in Section III Qualification and Evaluation Criteria.
25. Lessor's Right to Accept Any Proposal, and to Reject Any or All Proposal	25.1	The Lessor reserves the right to accept or reject any proposal, and to annul the RFP process and reject all proposal at any time prior to contract award, without thereby incurring any liability to Proponents. In case of annulment, all proposals submitted and specifically, bid securities, shall be promptly returned to the Proponents.

F. AWARD OF CONTRACT		
26. Award Criteria	26.1	Subject to ITP 25.1, the Lessor shall conditionally award the Contract to the Proponent(s) whose proposals has been determined to be substantially responsive to the RFP Documents and scored the highest marks as specified in ITP 24.1, provided further that the Proponent is determined to be qualified to perform the Contract satisfactorily.
27. Notification of Conditional Award	27.1	Prior to the expiration of the period of proposal validity, the Lessor shall notify the successful Proponent, in writing, that its proposal has been accepted.
	27.2	Until a formal contract is prepared and executed, the successful Proponents' proposal and the notification of conditional award shall constitute a binding Contract.
	27.3	Failure of the successful Proponent to fulfill the obligations in ITP 28 and ITP 29 or sign the Contract in accordance with ITP 31 shall constitute sufficient grounds for the annulment of the conditional award and forfeiture of the bid security. In that event the Lessor may award the Contract to the next highest evaluated Proponent whose offer is substantially responsive and is determined by.
28. Performance Guarantee	28.1	Within 30 (thirty) days of the receipt of notification of conditional award from the Lessor, the successful Proponent shall furnish the Performance Guarantee as specified in the Section VI Contract Terms. If the performance security furnished by the successful Proponent is in the form of a bond, it shall be issued by a bonding or insurance company that has been determined by the successful Proponent to be acceptable to the Lessor. A foreign institution providing a bond shall have a correspondent financial institution located in the Lessor's Country.
29. Concept Drawing	29.1	Within 30 (thirty) days of the receipt of notification of conditional award from the Lessor, the successful Proponent shall submit concept drawing in accordance with Section IV. Lessor's Requirements.
	29.2	In case the Proponent is required to submit the concept drawing in Section V. Business Proposal Requirement, the Lessor will review the submitted concept drawing and if required provide comments for concept drawing along with

		the notification of conditional award. The successful proponent shall rectify the concept drawing and submit revised concept drawing within 14 (fourteen) days of the receipt of notification of conditional award from the Lessor.
30. Signing of Contract	30.1	Promptly upon notification of the conditional award, the Lessor shall send the successful Proponent the Contract.
	30.2	Within 7 (seven) days of the success fulfilment of the obligation stipulated in ITP 28 and ITP 29, successful Proponent shall sign the Contract with Lessor.

SECTION II: RFP DATA SHEET

A. GENERAL	
ITP 1.1	The Name of the Project: **Development and Operation of Co-living Housing in Hulhumale' Phase II (N4-42)**
ITP 1.1	The Reference Number of Proposal Process is: **HDC(161)-CM/IU/2020/270**
ITP 3.2	Joint Venture share proportion restriction shall not apply.
B. CONTENTS OF RFP DOCUMENTS	
ITP 5.1	For **clarification purposes** only, the Lessor's address is: **Business Development, Marketing & Sales** Housing Development Corporation Ltd. Ground Floor, HDC Building Hulhumalé, Maldives Tel: (+960)3355 369, (+960)3355 195 E-mail: sales@hdc.com.mv
ITP 5.1	Webpage: Corporate website - **hdc.com.mv** MyHulhumalé Properties website - **properties.hdc.com.mv**
ITP 5.1	The deadline for request for clarification is on or before **December 2020 1400hrs**
ITP 5.2	The **pre-proposal meeting** shall take place at the following date, time and place; Date: **09th December 2020** Time: **1400hrs** Place: Online Meeting held via Zoom. Link for online Zoom meeting will be shared to the registered parties for pre-proposal meeting. In order to minimize technical issues please join the meeting 10 minutes prior to the time.
C. PREPARATIONS OF PROPOSALS	
ITP 12.1	Proposal Validity Period: **150** (One Hundred and Fifty) days.
ITP 13.1	The Amount and Currency of Bid Security shall be **MVR 500,000.00** (Maldivian Rufiyaa Five Hundred Thousand) or **equivalent in United States Dollar (USD).**

	The source of exchange rate shall be **Maldives Monetary Authority (MMA)** and the date for the exchange rate shall be 14 (fourteen) days before Proposal Submission deadline.
ITP 13.2	Bid Security Validity Period: **180** (One Hundred and Eighty) days from the deadline for submission of Proposals.
D. SUBMISSION AND OPENING OF PROPOSALS	
ITP 15.1	Proponents do not have the option of submitting their proposal electronically.
ITP 16.1	For **proposal submission purpose** only, the Lessor Address is: **Exhibition Center (Ground Floor)** HDC Building Huvandhumaa Hingun Housing Development Corporation Ltd. Date: **04th January 2021** Time: **1400hrs to 1500hrs**
ITP 18.1	For **proposal opening** shall take place at: **Exhibition Center (Ground Floor)** HDC Building Huvandhumaa Hingun Housing Development Corporation Ltd. Date: **04th January 2021** Time: **1415hrs** ***Proponents do not have the option of submitting their proposal electronically.***

SECTION III. QUALIFICATION AND EVALUATION CRITERIA

This Section contains all the criteria that the Lessor shall use to qualify Proponents and evaluate the proposals. In accordance with ITP 24, no other factors, methods or criteria shall be used. The Proponent shall provide all the information requested in the Section IV, Business Proposal Requirements and proposal shall fulfill requirements in accordance with ITP 9.1.

1. QUALIFICATION CRITERIA

Proponents that meets the requirement set in Qualification Criteria of Section III will be evaluated according to evaluation criteria.

1.1 Financial Resources

(a) Proponent shall demonstrate that it has access to or has full funds to finance the Engineer's Project Cost Estimate by Lessor as per Section III, 3.1.

(b) Proponents who that do not demonstrate it access to or has full funds to meet the proposed investment cost shall be disqualified.

1.2 Outstanding Payment

(a) Proponent shall not have any outstanding payment due to Lessor. Proponents who have payment due at the date of submission RFP shall be disqualified.

1.3 History of Non-Performing Contracts and Litigation History

(a) Proponents shall not have consistent history of court/arbitral award decisions against the Lessor for the last five (5) years.

(b) Proponent shall not have occurrence of non-performance of a contract awarded by Lessor as a result of Proponent default for the last five (5) years

1.4 Single Party Exposure Limit

(c) Proponents shall meet the criteria and requirements set forth in "*Single Party Exposure Limit Policy*" published as per announcement no: HDC (161)-CM/IU/2020/2017 dated on 13th October 2020 available at HDC corporate website and MyHulhumale' Properties website.

Link to the policy:

https://bit.ly/3koaBTh

2. EVALUATION CRITERIA

Proposals that meets the requirement set in Qualification Criteria of Section III will be evaluated based on the following criteria and points will allocated as below:

Criteria	Allocated %
a) Percentage of Revenue Offer	55%
b) Business Plan	25%
c) Experience	20%
Total	**100%**

2.1 PERCENTAGE OF REVENUE OFFER 55%

2.1.1 Interested parties with the highest percentage of revenue offer will be given a score of 100 points whereby points shall be prorated for the other Proponent.

2.1.2 Procedure to Eliminate Outliers

a) In evaluation of percentage of revenue offer, procedure to eliminate the outliers as per below shall be applied.

- Lower Quartile (LQ) - 25% percentile
- Upper Quartile (UQ) - 75% percentile
- Interquartile Range (IQR) = UQ - LQ
- Lower Boundary = Minimum Acceptable Net Present Value (NPV)
- Upper Boundary = UQ + (IQR x 0.5)

b) If the Net Present Value (NPV) of the proposed percentage of revenue offer is higher than the Upper Boundary, the proposal shall be disqualified.

Sample for Eliminating Outliers

The below is a sample of how outlier rates are eliminated.

Minimum Acceptable NPV per Square feet **470.65**

Step 1: Comparison of NPV of acceptable proposals

Proponent Name	**NPV**	
Proponent 1	797.37	Accepted
Proponent 2	713.73	Accepted
Proponent 3	817.56	Accepted
Proponent 4	761.38	Accepted
Proponent 5	896.05	Rejected
Proponent 6	982.46	Rejected
Proponent 7	796.03	Accepted
Proponent 8	711.86	Accepted
Proponent 9	759.32	Accepted
Proponent 10	852.89	Accepted

Step 2: Calculating Quartile Range

Lower Quartile	759.84
Upper Quartile	844.06
Interquartile Range	84.22

Step 3: Calculating Acceptable Range

Lower Boundary	470.65
Upper Boundary	886.17

Note:

- Lower Quartile (LQ) - 25% percentile
- Upper Quartile (UQ) - 75% percentile

- Interquartile Range (IQR) = UQ – LQ
- Lower Boundary = Minimum Acceptable Net Present Value (NPV)
- Upper Boundary = UQ + (IQR x 0.5)

2.2 BUSINESS PLAN - 25%

The business plan will be evaluated based on the following criterion:

2.2.1 Marketing Plan - 30 points

2.2.2 Maintenance/ Facilities Management Plan - 30 points

2.2.3 Financial Plan - 20 points

2.2.4 Operational Plan - 20 points

2.3 EXPERIENCE 20%

2.3.1 **Operational experience** will be evaluated based on the number of years in operation. Maximum points for operations will be given for registered establishments that have been in operation in a relevant field for the past 5 (five) years and points will be pro-rated for Proponents with less than 5 (five) years operation experience.

2.3.2 **Contractor's experience** will be evaluated based on the value of completed projects. Maximum points for contractor's experience will be given to contractor's who have completed projects that amounts to 150% of the Engineer's Project Cost Estimate by Lessor as per Section III, clause 3.1. Contractors with completed projects amounting less than 150% of the Engineer's Project Cost Estimate by Lessor will be evaluated based on pro-rata basis.

2.3.3 **Should the Proponent be an Operator**, maximum 14% will be given for operational experience. Remaining 6% will be allocated for capacity of contractor proposed by the operator (Proponent) in their proposal.

2.3.4 **Should the Proponent be a Contractor**, maximum points 14% will be given based on contractors' experience in development. Remaining 6% will be allocated for capacity of operator proposed by the contractor (Proponent) in their proposal.

2.3.5 **For General Businesses & Individuals,** 10% will be allocated to contractors' experience and 10% will be allocated to operators' experience. With operators and contractors scoring maximum points based on their experience as mentioned in 2.3.1 and 2.3.2.

3. ENGINEER'S PROJECT COST ESTIMATE BY LESSOR

3.1 Engineer's Project Cost Estimate by Lessor for the Project is MVR 162,680,789.00 (Maldivian Rufiyaa One Fifty-Three Thousand, Five Hundred and Ninety-Five).

HOUSING DEVELOPMENT CORPORATION LTD

SECTION IV. LESSOR'S REQUIREMENTS

1. SCOPE OF WORKS

Housing Development Corporation (Lessor) is seeking for interest parties for Development and Operation of Co-living Housing in Hulhumalé Lot N4-42. The selected party (Lessee) will be responsible for the design, construction and management of the property for the duration of lease term as per the guidelines set for this by HDC. The management of property includes but not limited to allocation, administration, supervision and management of the property for the duration of the lease.

2. PERCENTAGE OF REVENUE SHARE

The minimum acceptable percentage of revenue share per month for 'Co-living Housing' (N4-42) is 5% (Five percent) of Net Revenue.

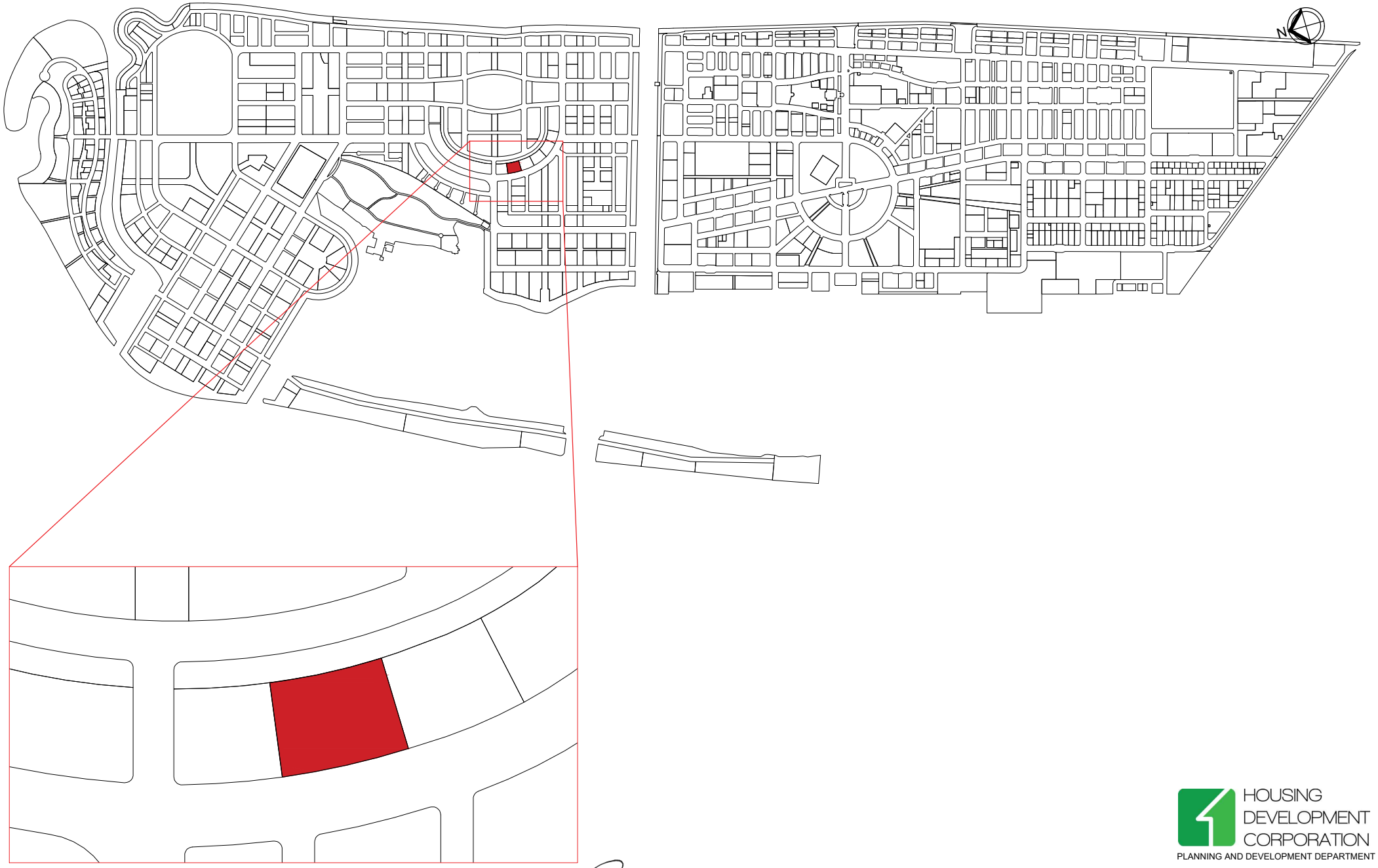
3. DRAWINGS

The drawing contains the location map and plot / unit map of the land to be allocated for the development. (Refer to next page).

Plot Number	Usage	Plot Area
N4-42	Co-living Housing	16,934.07 sqft.

** Areas in the drawings is subjected to minimal changes.*

HOUSING DEVELOPMENT CORPORATION LTD



PROJECT: LOT 20418 (N4-42) - COLIVING HOUSING

DRAWING: LOCATION MAP

Scale: N.T.S | Drawn by: Jilan | Checked by: | Date: 16th July 2020 | Remarks:

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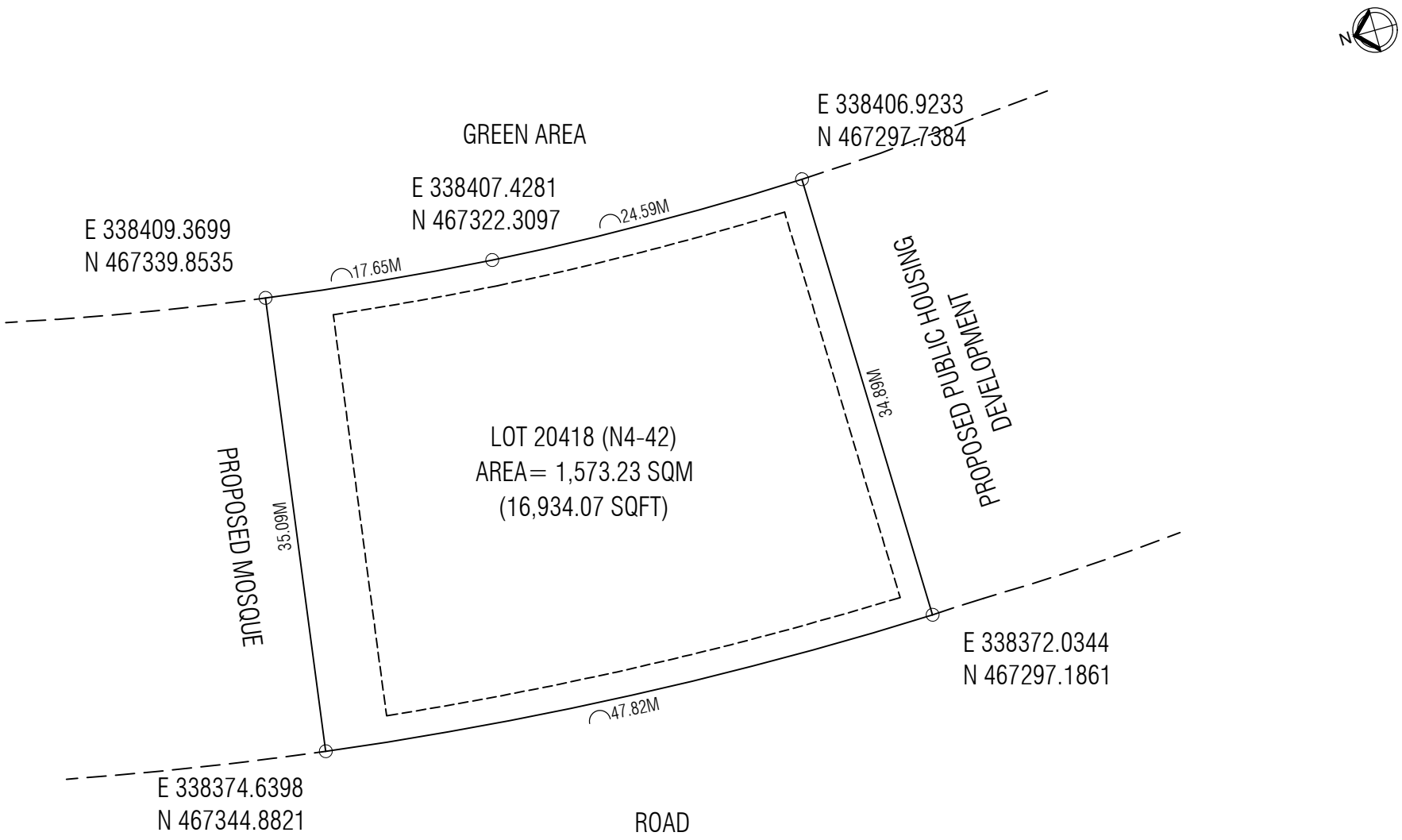

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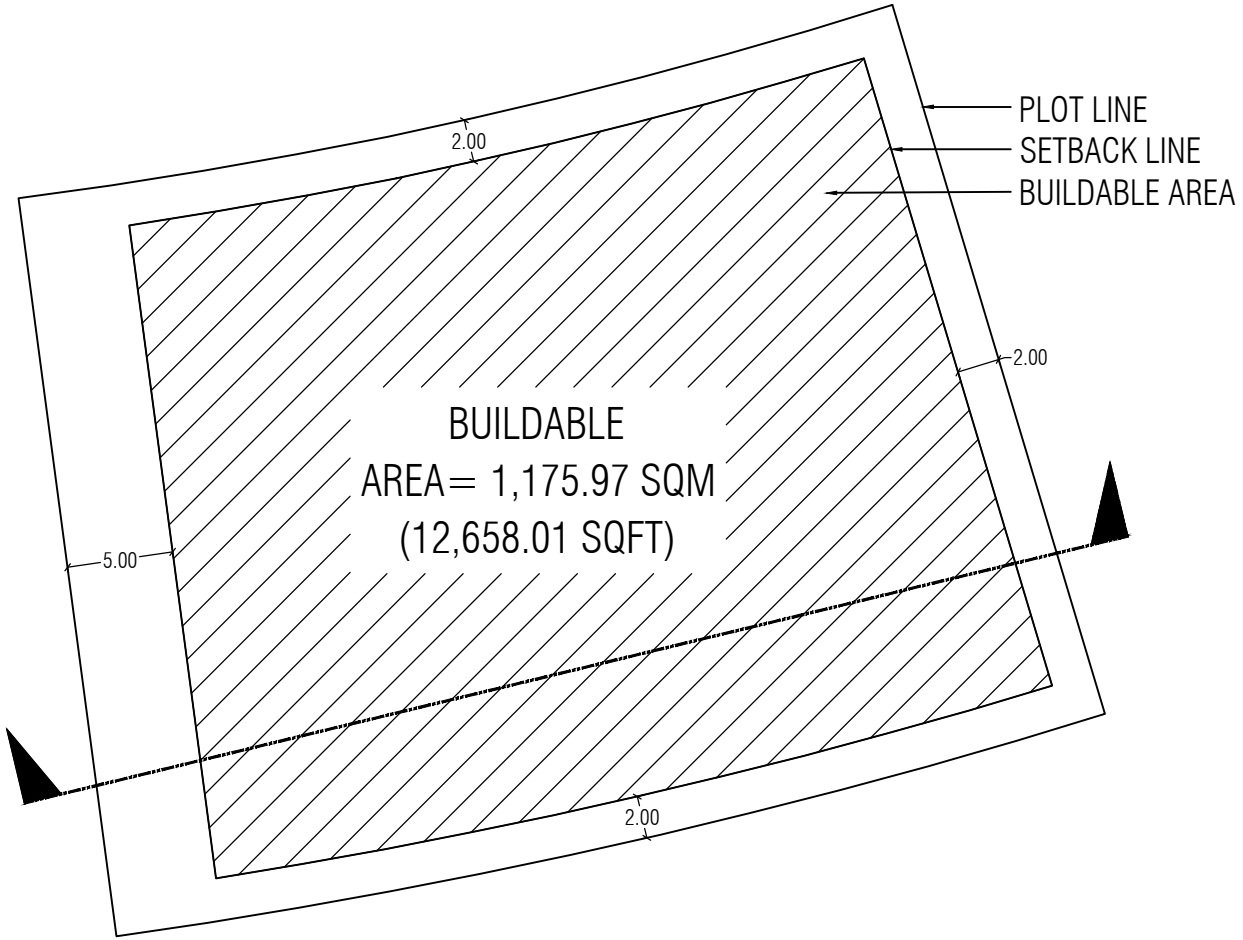
PROJECT: LOT 20418 (N4-42) - COLIVING HOUSING

DRAWING: PLOT MAP

Scale: N.T.S | Drawn by: Jilan | Checked by: | Date:16th July 2020 | Remarks:



Lot Number	Parcel Number	Description	Land Use	Plot Area	Foot Print	Gross Floor Area (G.F.A)	Plot Ratio (F.S.I)	Site Coverage	Max Height / Floors
20418	N4-42	Coliving Housing	Mix-Residential	1,573.23 SQM	1,175.97 SQM	14,817.21 SQM	9.42	75%	14 Floors / 45m
				16,934.07 SQFT	12,658.01 SQFT	159,490.97 SQFT			41m bldg + 4m Lift Machine Room

PROJECT: LOT 20418 (N4-42) - COLIVING HOUSING

DRAWING: SETBACK PLAN

Scale: N.T.S Drawn by: Shahud Checked by: Date:23rd November 2020 Remarks:

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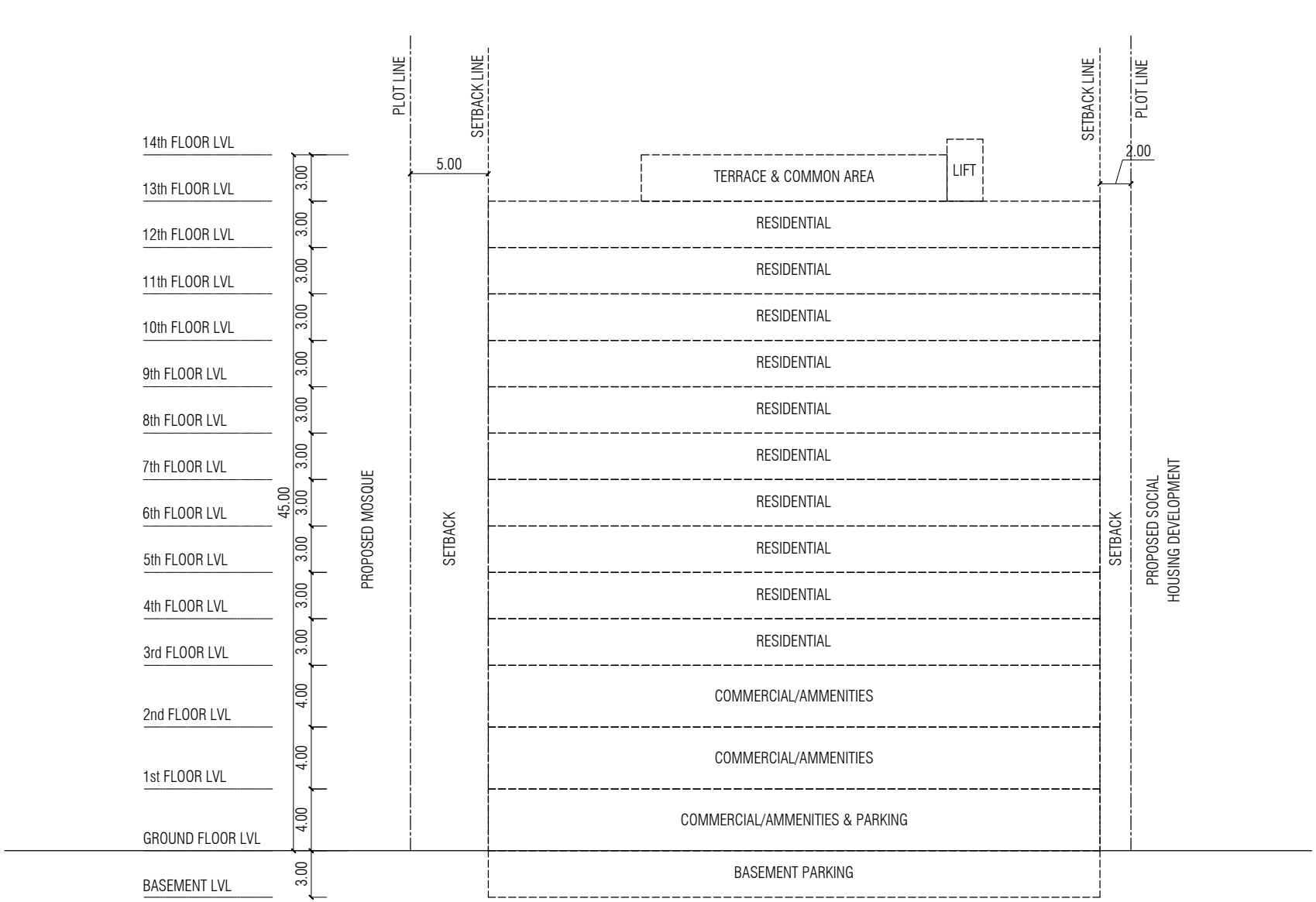

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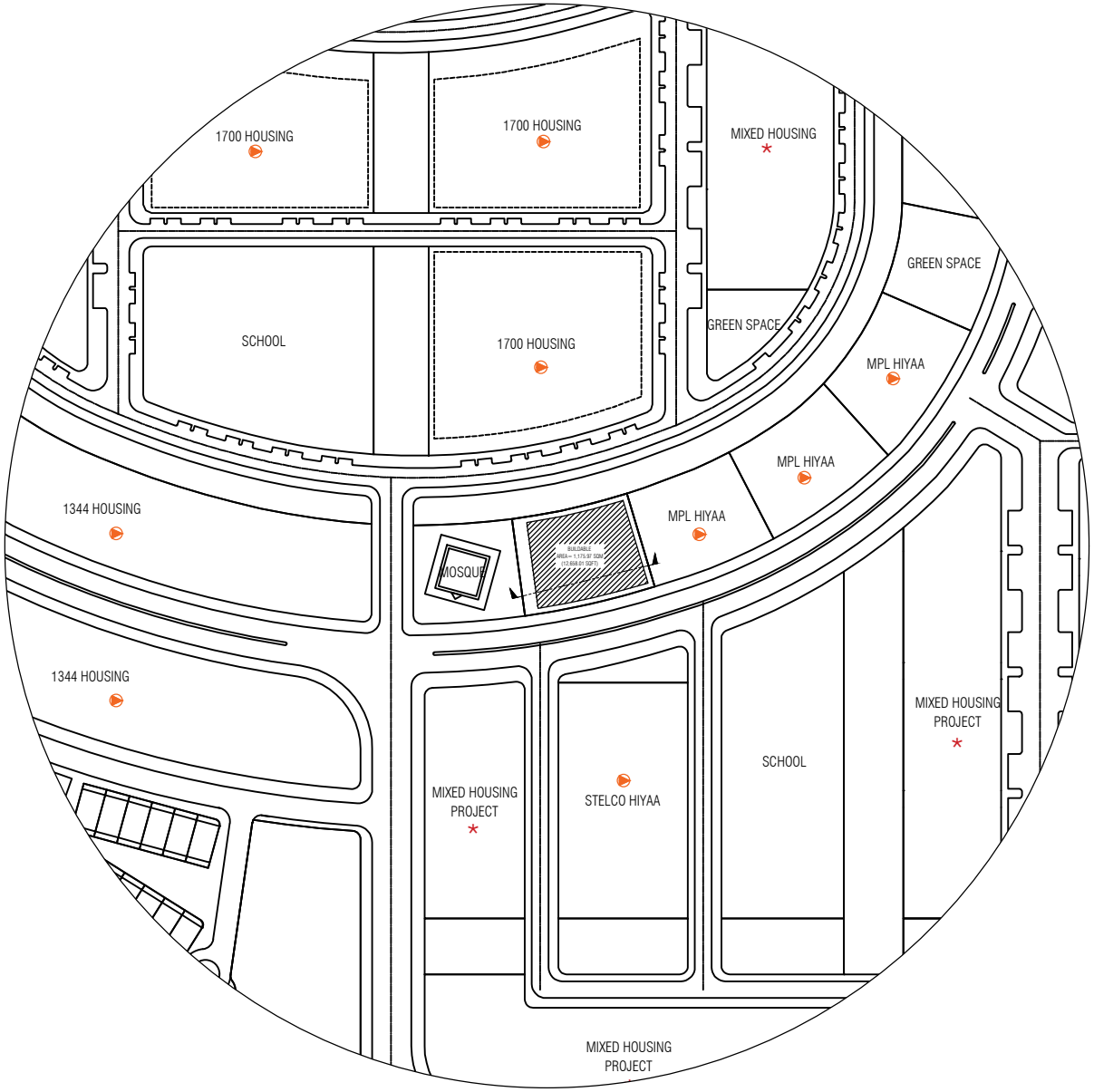
PROJECT: LOT 20418 (N4-42) - COLIVING HOUSING

DRAWING: CONCEPTUAL SECTION

Scale: N.T.S | Drawn by: Shahud | Checked by: | Date: 23rd November 2020 | Remarks:



LEGEND:

- COMPLETED
- ONGOING
- PLANNED
- ROADS (COMPLETED)
- GREEN LINK (PLANNED)

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PROJECT: LOT 20418 (N4-42) - COLIVING HOUSING

DRAWING: SITE CONTEXT

Scale: N.T.S | Drawn by:Jilan | Checked by: | Date:26th October 2020 | Remarks:

4. CONCEPT DESIGN AND GUIDELINE

4.1. Co-Living Project Concept Design

4.2. Development Guidelines

4.3. Submission & Quality Management Criteria,

4.4. Design Guidance Document,

4.5. Installation/Construction Standards & Best Practices

(Refer to Next Page)

HOUSING DEVELOPMENT CORPORATION

PLANNING & DEVELOPMENT DEPARTMENT

CO-LIVING HOUSING DEVELOPMENT GUIDELINES

Planning & Development Department, Housing Development Corporation Ltd, Tel: 3353535, Fax: 3358892, Email:planning@hdc.com.mv

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1. PLANNING GUIDELINES

1.1. INTRODUCTION

1.1.1. This section comprises planning and land use controls defined under these guidelines.

1.1.2. This guideline will be applicable to plots categorized and developed as 'Co-living Housing' in Hulhumalé. Co-living housing is defined as a community living concept where by young professionals / freelancers move in with like-minded people, sharing service costs and benefiting from flexible rental terms.

1.2. LAND USAGE

1.2.1. These allocated land plots are for the construction of Co-Living Housing units whereby it is used mainly for residential usage.

1.2.2. Commercial & amenities spaces should be accommodated as follows

1.2.2.1. 30% of the ground floor level should be allocated for commercial purposes. The rest of the area shall accommodate amenities spaces, parking, circulation & visitor parking.

1.2.2.2. After accommodation for services and circulation the rest of the first floor area is to be allocated for commercial purposes.

1.2.3. 3% - 5% of residential units should be designed for Persons with Disability (PWD). Please refer to 2.7 PWD accessibility of this document for additional details.

1.2.4. Amenities can include shared office space/studio, gallery, gymnasium, swimming pool, space for recreational and sports activities, library, etc.

1.2.5. The building should accommodate the required vehicular parking given under section 1.6 of this document.

1.2.6. Following are prohibited uses of these dwellings:

1.2.6.1. Any industrial use, any use where flammable materials are used, any use where the public is disturbed from loud noises, smell or dust generating and carrying activities, constructing go downs, etc.

1.3. BUILDING HEIGHT, F.S.I AND SETBACK PLAN

1.3.1. Building setback is provided with the Development guideline drawing along with building F.S.I and is calculated as:

$$\text{Floor Space Index (F.S.I)} = \frac{\text{Total covered area of the building}}{\text{Plot area}}$$

1.3.2. Building Height is maximum 14 floors (45 meters) with terrace level.

1.3.3. All commercial floors to have minimum 4m floor to floor height

1.3.4. Al residential floors to have minimum 3m floor to floor height

1.3.5. No part of the building such as roof eaves, gutters and door/window panels, etc. should be projected out into the road beyond the building setback line.

1.3.6. The setback area at ground level can be utilized for circulation or parking but should not be covered above at any level.

1.3.7. The minimum distance between two building blocks/towers in a single plot must be not less than 10m unless stated otherwise.

1.4. DEPTH OF FOUNDATION

1.4.1. The depth of foundation for each building shall be determined by the structural engineer of the development.

1.4.2. The foundation protection method should be submitted with the final detail drawings.

1.4.3. An Environment Impact Assessment Report and Soil Inspection Report needs to be submitted with the detail drawings if:

1.4.3.1. The foundation of the structure is deeper than 1.8m below natural ground level

1.4.3.2. The building height exceeds 31m from the natural ground level

1.5. BOUNDARY WALL

1.5.1. Urban interaction is highly encouraged at street level to provide seamless integration of private and public space without compromising privacy and security.

1.5.2. If required, the developer may choose to have a boundary wall with perforation or demarcate the plot boundary with a natural green verge of maximum 1.2 meters.

1.5.3. A boundary wall of maximum 2 meters is allowed on the rear and sides of the plot. In such a case, the solid portion of the wall is to be 1.2 meters in height with a perforation of up to 2 meters.

1.6. PARKING

1.6.1. The specified amount of parking should be provided within the development site for both residents and visitors.

1.6.2. Parking spaces should be appropriately sized for movement in and around and should cater for disability and wheelchair movement where considered necessary

1.6.3. Basement parking is mandatory for the development. Basement parking will not be included in the FSI calculations.

1.6.4. Minimum clear height for basement should not be less than 2.7m

1.6.5. Motorbike parking shall be provided as per the following ratio:

1.6.5.1. 1 motorbike for each unit (bedroom)

1.6.5.2. An additional 10% of the total number of parking must be allocated for visitor parking

1.7. SERVICES

1.7.1. Consultation is to be done at concept level with service providers of electricity, plumbing, sewerage, GPON, as to how these could be economically and sustainably incorporated into the development.

1.7.2. All developments should provide the GPON fiber cabling system for commercial and residential units. Refer to in-building cabling guidelines.

1.7.3. Any space required by the relevant service provider for the installation or provision of a supporting facility (transformer, pump rooms, storage tanks, service stations, etc.) should be provided well within the given area for the development.

1.7.4. Dedicated utility space at either ground or first floor level should be provided for the provision and/or installation of relevant services as required.

1.7.5. The water quality should comply with the standards set forth by the Health Protection Agency (HPA) if proposed to use a private water supply.

1.7.6. In accordance with the EPA guidelines, it is required to have adequate storage of water (if possible with integrated rainwater harvesting systems) within the development for firefighting and any other emergency usage.

1.7.7. An approved firefighting layout for the development should be obtained from Maldives National Defense Force (MNDF) Fire and Rescue Services.

1.7.8. The discharge of foul water should be to a sewer network approved by the relevant service provider.

1.7.9. The layout of each utility network within the development should generally be in accordance with the established practice of the relevant service provider.

1.7.10. The garbage collection area (away from common areas) with easy access should be provided at each floor level and a central collection area at the ground floor with ease of loading/unloading vehicular access.

1.7.11. A waste management plan is to be developed along with the waste management authority to minimize public intrusion and ease of access.

2. DESIGN GUIDELINES

2.1. INTRODUCTION

This section will comprise of design controls and requirements imposed for this development.

2.2. ACCESS & CIRCULATION

2.2.1. Safe and convenient vehicular drop-off/pick-up area, with universal access should be provided to all dwellings, facilities & services within the plot.

2.2.2. Frontage of the site and pedestrian & vehicular access ways into the site should be designed & constructed by the developer. This includes but is not limited to the pathways, lighting, softscapes, hardscapes & urban furniture.

2.2.3. All circulation routes and entrances should be well defined and well lit. The entrance should be highlighted as well and should be welcoming for walk-in entrances

2.2.4. An adequate amount of elevators should be provided along with an elevator traffic analysis report justifying the number of elevators.

2.2.5. At least one elevator must be fire rated and must be able to accommodate a stretcher.

2.2.6. An adequate number of staircases should be proposed based on the MNDF fire protection guidelines.

2.2.7. Demarcate and provide appropriate lighting on pedestrian routes.

2.2.8. Disability access should be integrated at all pedestrian and vehicular drop off/ pick up points.

2.2.9. If shared pathways (for vehicles and pedestrians) are to be provided within the development, appropriate markings should be used to indicate pedestrian prominence over vehicles.

2.2.10. Any corridor or walkway with one way and two-way traffic should have a minimum width of 900mm and 1250mm respectively.

2.2.11. Where stepped access is unavoidable especially at ground floor level, the steps should be designed as suitable for physically impaired persons or wheelchair users

2.2.12. Any slope provided at the access ways should be less than 1:50 and with a firm and even surface.

2.2.13. Every storey of a building shall be provided with exit facilities for its occupant load.

2.2.14. There shall be at least two independent exit staircases or other exits from every storey of a building where at least one staircase shall cater for emergency evacuation.

2.2.15. Pedestrian linkages from one building to the other is highly encouraged within the development to promote connectivity and pedestrian interaction

2.2.16. Vehicular pathways within the plot should be designed in a way that is safe, with minimum interruption to both pedestrian pathways and green verges within the plot and during ingress and egress

2.2.17. Use scored, colored, textured and/or similar paving that is distinguishable from the travel lane at the drop off area.

2.2.18. Illuminate all outdoor parking areas with illumination towards the paved areas only and not into any adjacent buildings.

2.2.19. Wherever parking is provided appropriate floor paint marking must be given.

2.2.20. Motorbike parking size: 2m x 0.9m (100mm line thickness)

2.3. PUBLIC OPEN SPACES

2.3.1. Public open spaces are defined as common spaces, such as but not limited to courtyards or terraces, within the building.

2.3.2. Access ways and public areas within the development shall be overlooked by dwellings or otherwise open to surveillance by residents

2.3.3. Open space should generally be attractive and usable by different age groups. Undefined areas, badly shaped, fragmented or unusable spaces which are difficult to maintain should be avoided

2.3.4. Open space should generally be attractive and must be usable for communal activities such as meetings, events and exhibitions, etc.

2.3.5. A communal green space / garden for gathering & leisure activities may be included in the open spaces.

2.3.6. If landscaping is provided, either soft or hard (or both) at common areas, materials with good resistance to vandalism, non-slip and low maintenance should be chosen

2.3.7. Communal green space is to be provided within the development not less than the ratio at 1:1 of the building footprint

2.4. PRIVATE OPEN SPACES

2.4.1. Private spaces are defined as open spaces such as balconies or terraces only accessible through residential units.

2.4.2. Shared common / communal spaces for residents may be provided on the terrace floor.

2.4.3. Minimum size for private open space/balcony should be as given under section 2.6.15 – 2.6.17 of this guideline

2.5. COMMERCIAL

2.5.1. A separate shaded drop off/pick up must be provided for commercial zone.

2.5.2. An elevator must be provided solely for the commercial zone for passengers and loading & unloading purposes.

2.5.3. Partition walls of commercial units shall be basic standard blockwork of minimum 100mm thickness and shall be finished as per guidance document.

2.5.4. All commercial unit entrances and access to corridors should accommodate a PWD access.

2.5.5. CCTV systems along with the cables are to be provided at all common areas.

2.5.6. Drainage must be provided where needed in all corridors and any other open spaces.

2.5.7. Distribution box to be provided in each unit including a separate meter for each unit.

2.5.8. Electrical main panel for commercial units should be provided

2.5.9. The main panel board and transformer should have excess capacity in addition to the required capacity in terms of Amp.

2.5.10. Water connection points and sewerage provisions shall be provided for each commercial unit.

2.5.11. Grease traps must be provided to the development according to MWSC requirement.

2.5.12. Adequate lighting that achieves average lux levels must be provided at all common areas such as corridors, elevator lobby, stairs, etc.

2.5.13. All units should have adequate electricity capacity and provisions.

2.5.14. AC provisions should be given to all commercial units.

2.5.15. A PWD washroom must be provided.

2.5.16. GPON fiber cables should be provided for all units.

2.6. AMENITIES

2.6.1. An elevator must be provided solely for the commercial zone for passengers and loading & unloading purposes.

2.6.2. Partition walls of amenities shall be basic standard blockwork of minimum 100mm thickness and shall be finished as per guidance document.

2.6.3. All amenity space entrances and access to corridors should accommodate a PWD access.

2.6.4. CCTV systems along with the cables are to be provided at all common areas.

2.6.5. Drainage must be provided where needed in all corridors and any other open spaces.

2.6.6. Distribution box to be provided in each unit including a separate meter for each unit.

2.6.7. Electrical main panel for commercial units should be provided

2.6.8. The main panel board and transformer should have excess capacity in addition to the required capacity in terms of Amp.

2.6.9. Water connection points and sewerage provisions shall be provided for each commercial unit.

2.6.10. Grease traps must be provided to the development according to MWSC requirement.

2.6.11. Adequate lighting that achieves average lux levels must be provided at all common areas such as corridors, elevator lobby, stairs, etc.

2.6.12. All common areas, such as lift lobby, corridors, walkways & public toilets should be fully finished by the developer.

2.6.13. All balconies, terraces, and where applicable railings should be provided at a minimum height of 1.2m.,

2.6.14. All units should have adequate electricity capacity and provisions.

2.6.15. AC provisions should be given to all commercial units.

2.6.16. A PWD washroom must be provided.

2.6.17. GPON fiber cables should be provided for all units.

2.7. RESIDENTIAL

2.7.1. Consideration must be given to ease of access and circulation within the residential unit for all occupants especially for the physically impaired.

2.7.2. The pedestrian approach towards the entrance of units should be wide enough for two-way traffic and the main entrance of the dwelling at a minimum width of 900mm.

2.7.3. Weather-resistant non-slip material should be provided where necessary

2.7.4. Adequate lighting should be provided to all residential units.

2.7.5. Design and layout should make use of natural daylight as much as possible to encourage minimum use of electrical lighting.

2.7.6. Opening panels of windows, above ground floor level, should be at a minimum height of 1000mm above the internal floor finish level and any opening below 1000mm should be protected with a safety railing.

2.7.7. Glazing used for doors and windows should be safe and with a nominal thickness proportionate to the area of the panel as per British Standard or equivalent.

2.7.8. Wherever a railing is provided, it should be safe for all occupants, especially for children, with a minimum distance of 125mm openings between the railing members where applicable.

2.7.9. Additional safety measures, to minimize the risk of falling over, should be taken if horizontal railings are to be provided.

2.7.10. Floor finishes in wet areas should be provided with slip-resistant surfaces.

2.7.11. Every dwelling should be connected to electricity and GPON networks.

2.7.12. Every dwelling should be provided with an adequate pressure of water for domestic use as per the service providers' requirements.

2.7.13. AC provisions should be given to all units.

2.7.14. All units must have a minimum finishing level as per the Finishing Schedule in Design Guidance Document. This does not include any loose furniture.

2.8. PWD ACCESSIBILITY

2.8.1. Entrances

2.8.1.1. Easy accessibility between internal and external spaces, and between internal spaces, provides a safe transit point for people with limited mobility and people who use a wheelchair.

2.8.1.2. Guidelines to consider:

- **a)** Make wide enough for wheelchair access
- **b)** Provide adequate maneuvering space
- **c)** Provide even, non-slip surfaces
- **d)** Provide ramped access for ease of dealing with more than one level and for easy entry from external to internal spaces
- **e)** Provide lighting for safety and security
- **f)** Install sounding devices, such as a doorbell, to identify visitors

2.8.2. Indoor circulation

2.8.2.1. Circulation through different spaces must be well planned for easy maneuverability, especially for people with limited mobility and people who use a wheelchair.

2.8.2.2. Incorporate spaces wide enough for wheelchair access

2.8.2.3. Ensure door handles are lever handles to make

2.8.3. Bathrooms and toilets

2.8.3.1. At least 1 suite should be designed and furnished for maximum comfort and ease of use.

2.8.3.2. The following aspects should be included in at least 1 bathroom of allocated PWD units.

a) Minimum 850 mm width door, preferably opening out or sliding.
b) Sufficient space for people using wheelchairs or other assistive devices.
c) Adequate handrails and grab bars to assist people to get to and from a wheelchair and to assist people with reduced strength.
d) Security and privacy feature so users can easily close and lock the bathroom or toilet door.
e) Toilets with a minimum dimension of 1.6 m x 2.4 m, or 2.0 m x 2.7 m if a shower is included and with an in-swinging door.
f) Toilets located against the wall diagonal from the entry door.
g) Firmly fixed-grip rail next to the WC, 800 mm high.
h) Accessories, such as mirrors and towel rails, 900 mm to 1.1 m high.
i) Firmly fixed washbasin to the wall at a height of between 800 mm to 850 mm.
j) Single-lever taps.
k) Drop-down or removable shower seat in the shower.

2.8.4. Pantry

2.8.4.1. Provide work surfaces at a comfortable height for people using wheelchairs

2.8.4.2. Provide ease of access to the opening and closing of windows and doors.

2.8.5. Bedroom

2.8.5.1. At least one bedroom should be designed and furnished for maximum comfort.

2.8.5.2. Provide spaces large enough to allow for easy maneuverability

2.8.5.3. Make entrance wide enough for wheelchair access

2.8.5.4. Provide lighting for safety and security

2.8.6. Ensure that all aspect of the building complies with the Maldives Disability Act.

2.9. STRUCTURAL & CIVIL WORKS

2.9.1. The designed lifespan of the main structure should be a minimum of 50 years.

2.9.2. The structural design must be done in accordance with British standards or any superseded European standard (Eurocode). The developer must include a local registered engineer during the design process and should get the drawings stamped by an accredited structural checker.

2.9.3. Necessary standards for construction to ensure the quality of workmanship and site safety during construction should be followed

2.9.4. At the concept stage as a deliverable, the developer should propose a structural system/material as well as the proposed methodology brief with the above mentioned standards.

CO-LIVING HOUSING
LOT 20418 (N4-42)

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CO-LIVING PROJECT
CONCEPT DESIGN
HULHUMALE'

DESIGNER:
AHMED ASNADH — Architectural
NAME — Structural

DRAWN BY:
AHMED ASNADH
23 NOVEMBER 2020

REVISION

NAME	DATE

SCALE: AS GIVEN
SHEET NO: -

CHECKED BY:
MOHAMED SAIF — Architectural
NAME — Structural
Electrical & Mechanical
Communication

APPROVED BY:
HUSSAIN ZIYATH
DATE

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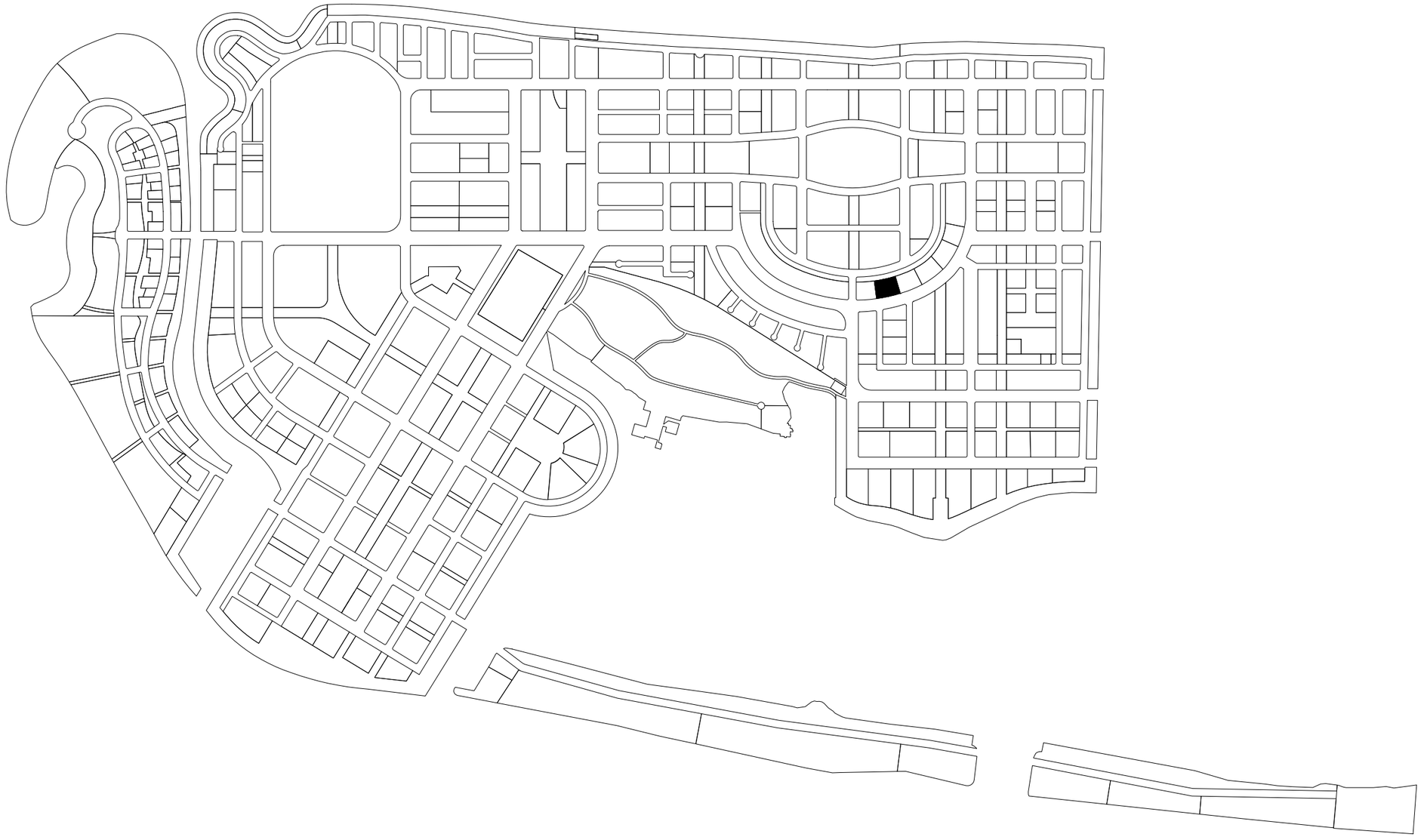

LOCATION PLAN

SCALE 1:200

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CO-LIVING PROJECT
CONCEPT DESIGN
HULHUMALE'

DESIGNER:

AHMED ASNADH — Architectural

NAME — Structural

DRAWN BY:

AHMED ASNADH
23 NOVEMBER 2020

REVISION

NAME	DATE

SCALE: AS GIVEN

SHEET NO: -

CHECKED BY:

MOHAMED SAIF — Architectural

NAME — Structural

Electrical & Mechanical

Communication

APPROVED BY:

HUSSAIN ZIYATH
DATE

SHEET CONTENT:
LOCATION PLAN

PAGE NO.

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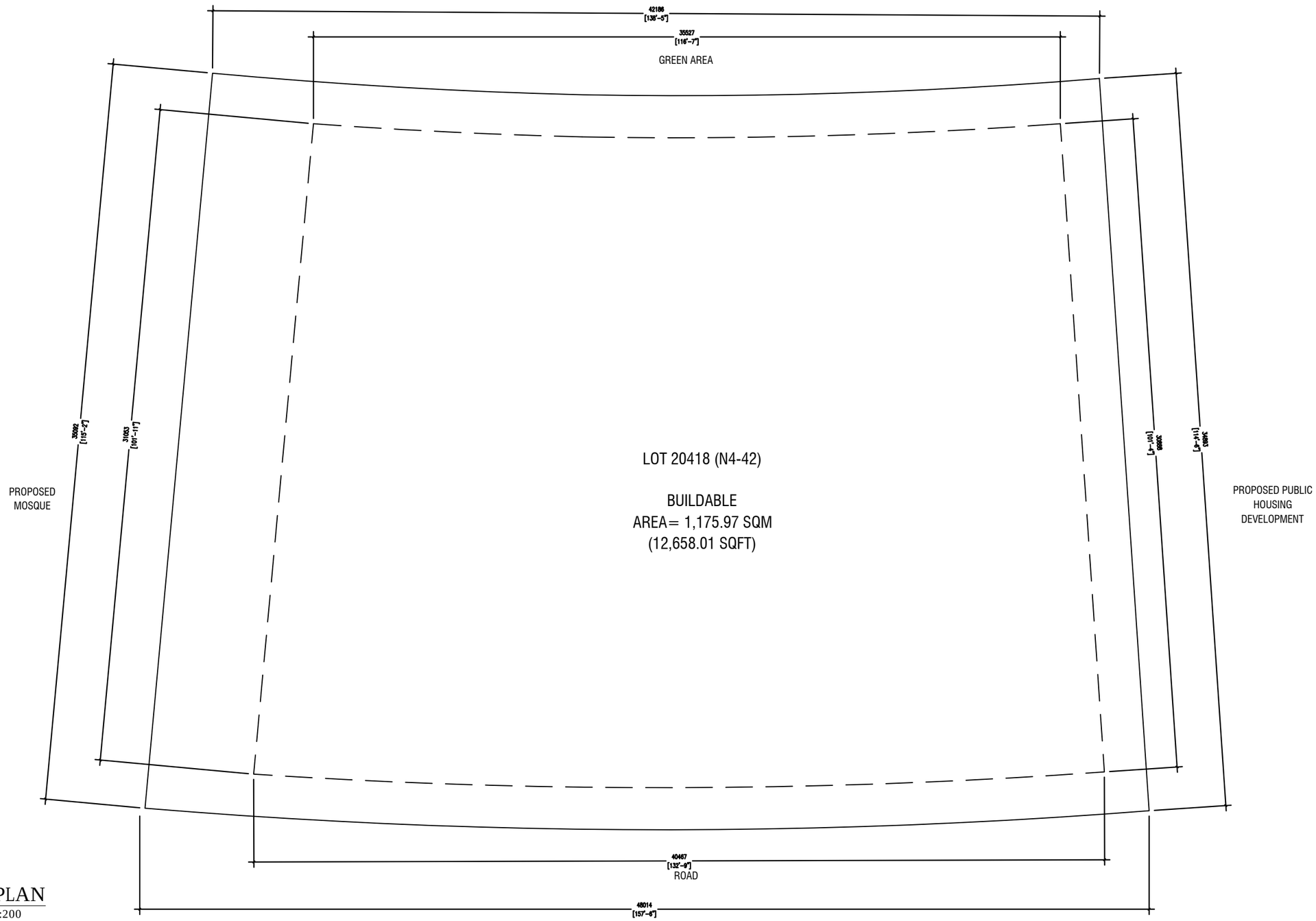

SITE PLAN

SCALE 1:200

0 1m 2m 3m 5m

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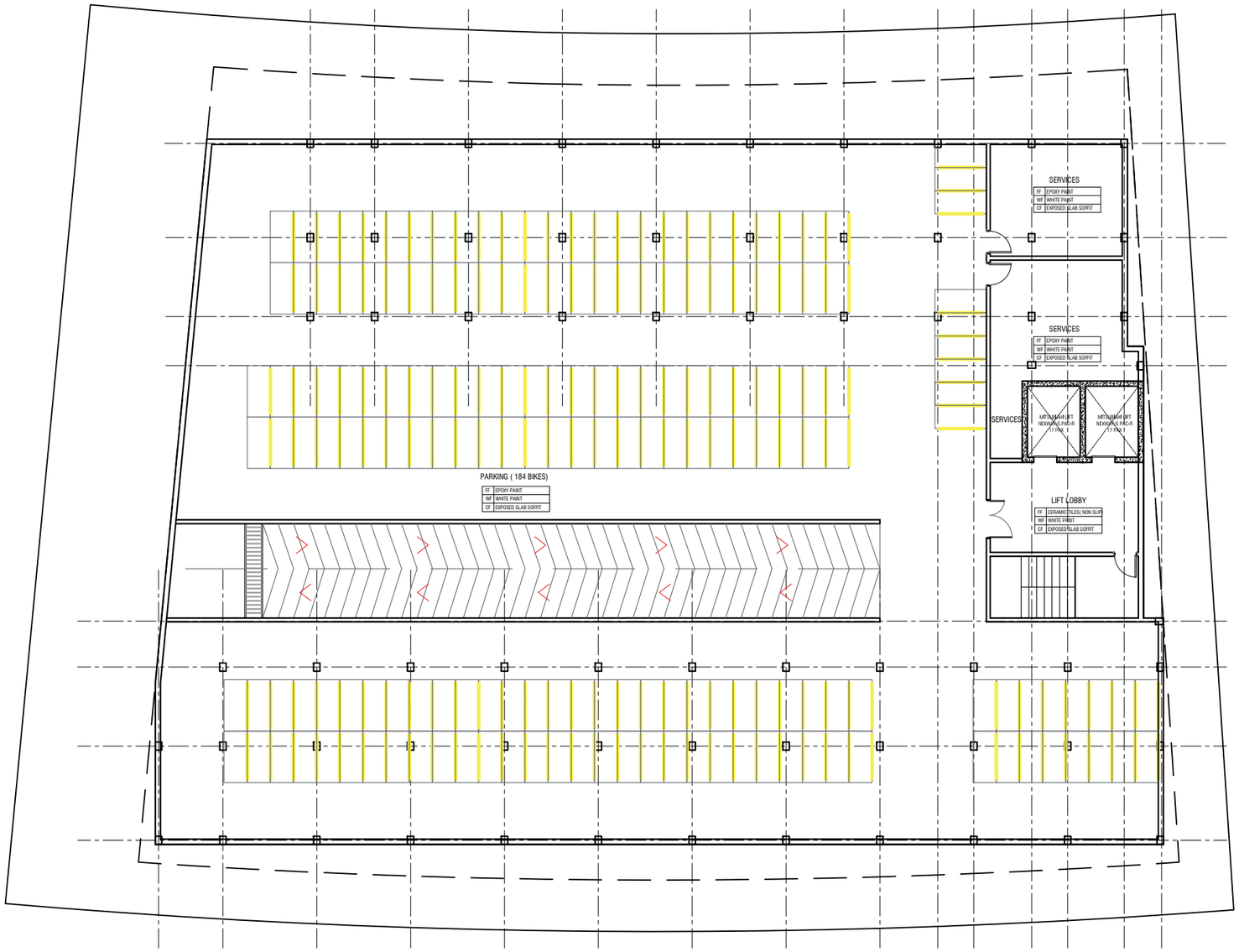
CO-LIVING PROJECT
CONCEPT DESIGN
HULHUMALE'

DESIGNER:		DRAWN BY:	CHECKED BY:		APPROVED BY:	SHEET CONTENT:	PAGE NO.
AHMED ASNADH	NAME	AHMED ASNADH	MOHAMED SAIF	NAME		SITE PLAN	A02
Architectural	Structural	23 NOVEMBER 2020	Architectural	Structural			
		REVISION					
		NAME / DATE					
		SCALE: AS GIVEN / SHEET NO: -	Electrical & Mechanical	Communication	HUSSAIN ZIYATH DATE		



BASEMENT LAYOUT

SCALE 1:200

0 1m 2m 3m 5m

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CO-LIVING PROJECT
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REVISION
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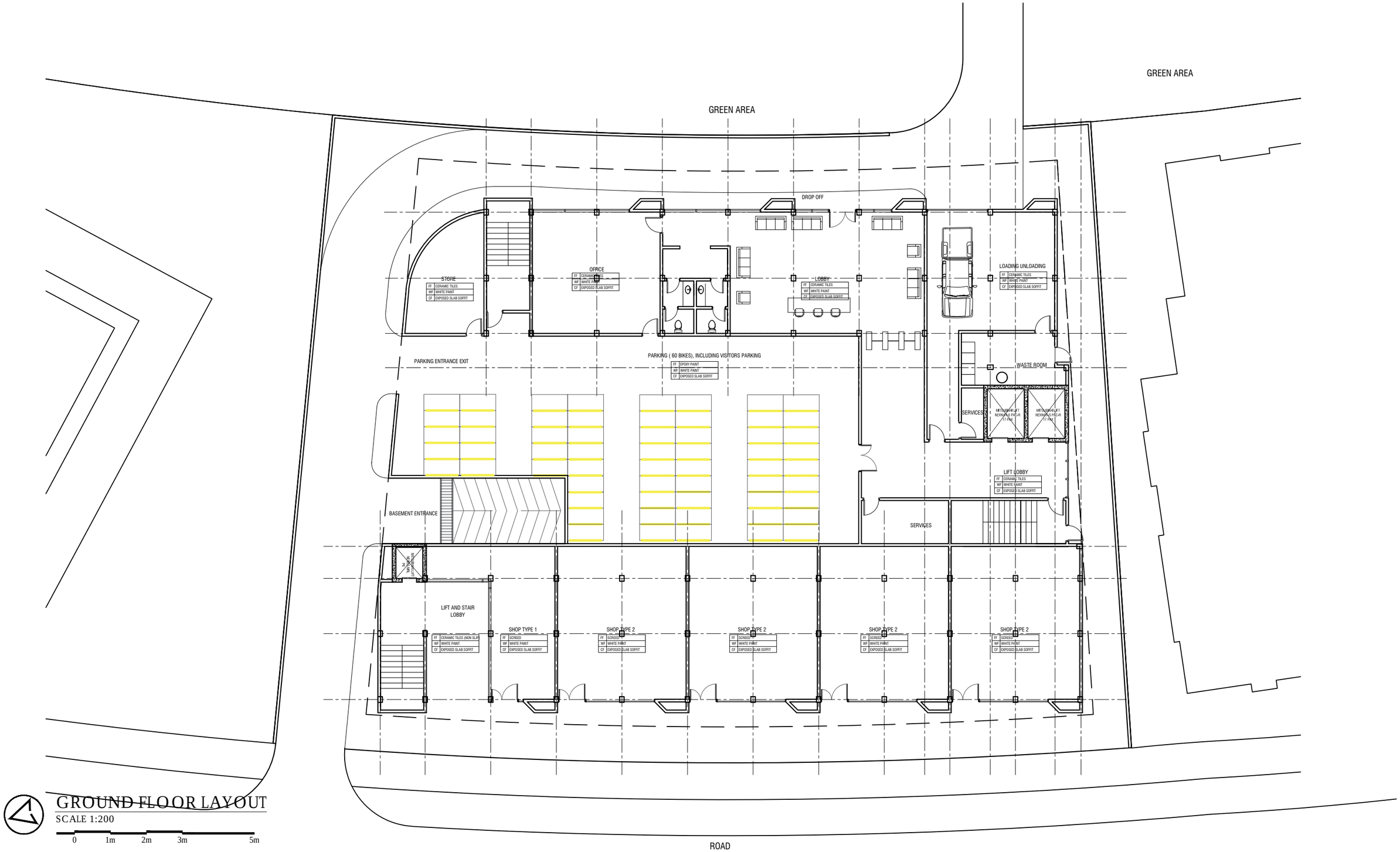
SHEET CONTENT:
BASEMENT FLOOR PLAN

PAGE NO.
A03



GROUND FLOOR LAYOUT

SCALE 1:200

0 1m 2m 3m 5m

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GROUND FLOOR PLAN

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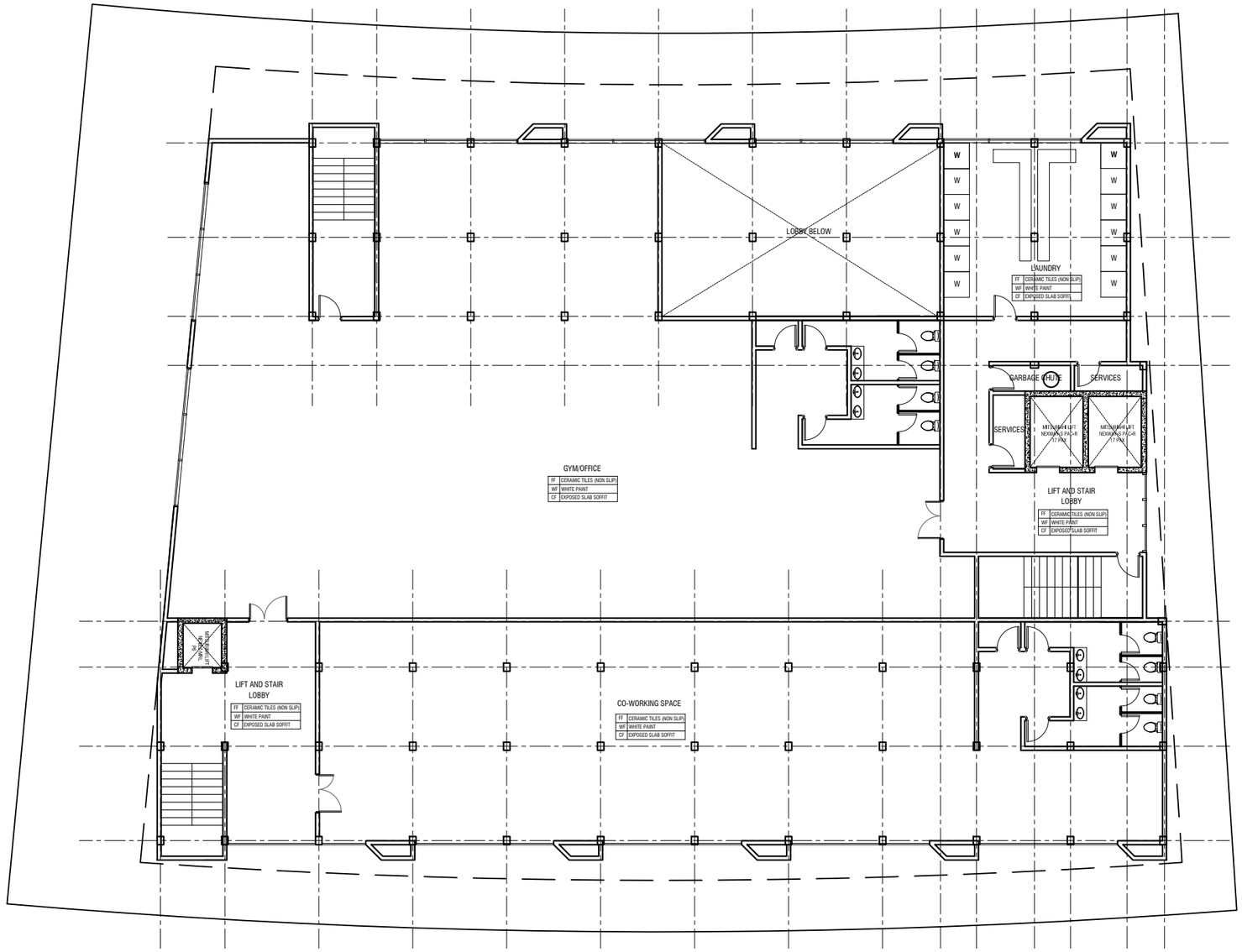
A04



1ST FLOOR LAYOUT

SCALE 1:200

0 1m 2m 3m 5m

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1ST FLOOR PLAN

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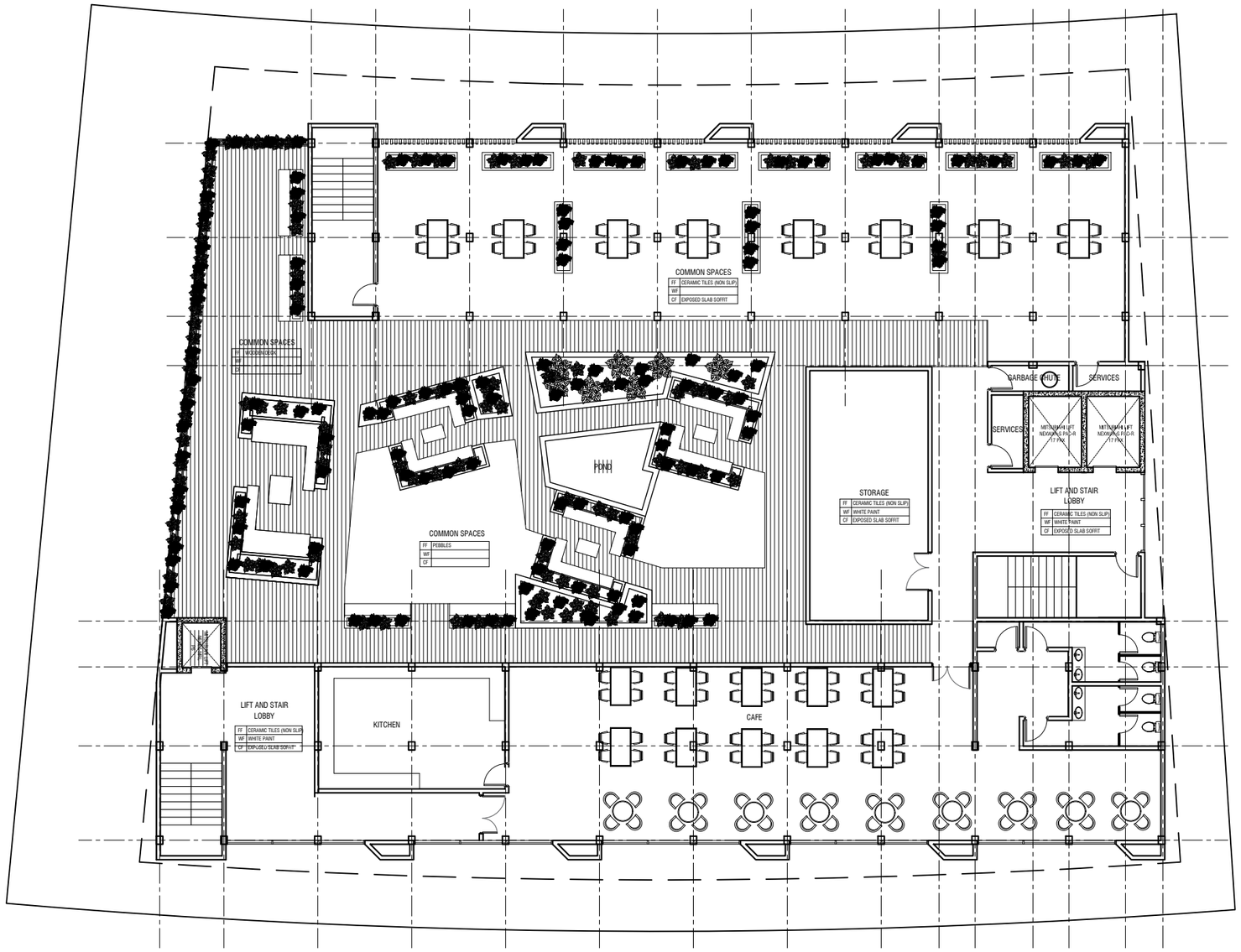
A05



2ND FLOOR LAYOUT

SCALE 1:200

0 1m 2m 3m 5m

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2ND FLOOR PLAN

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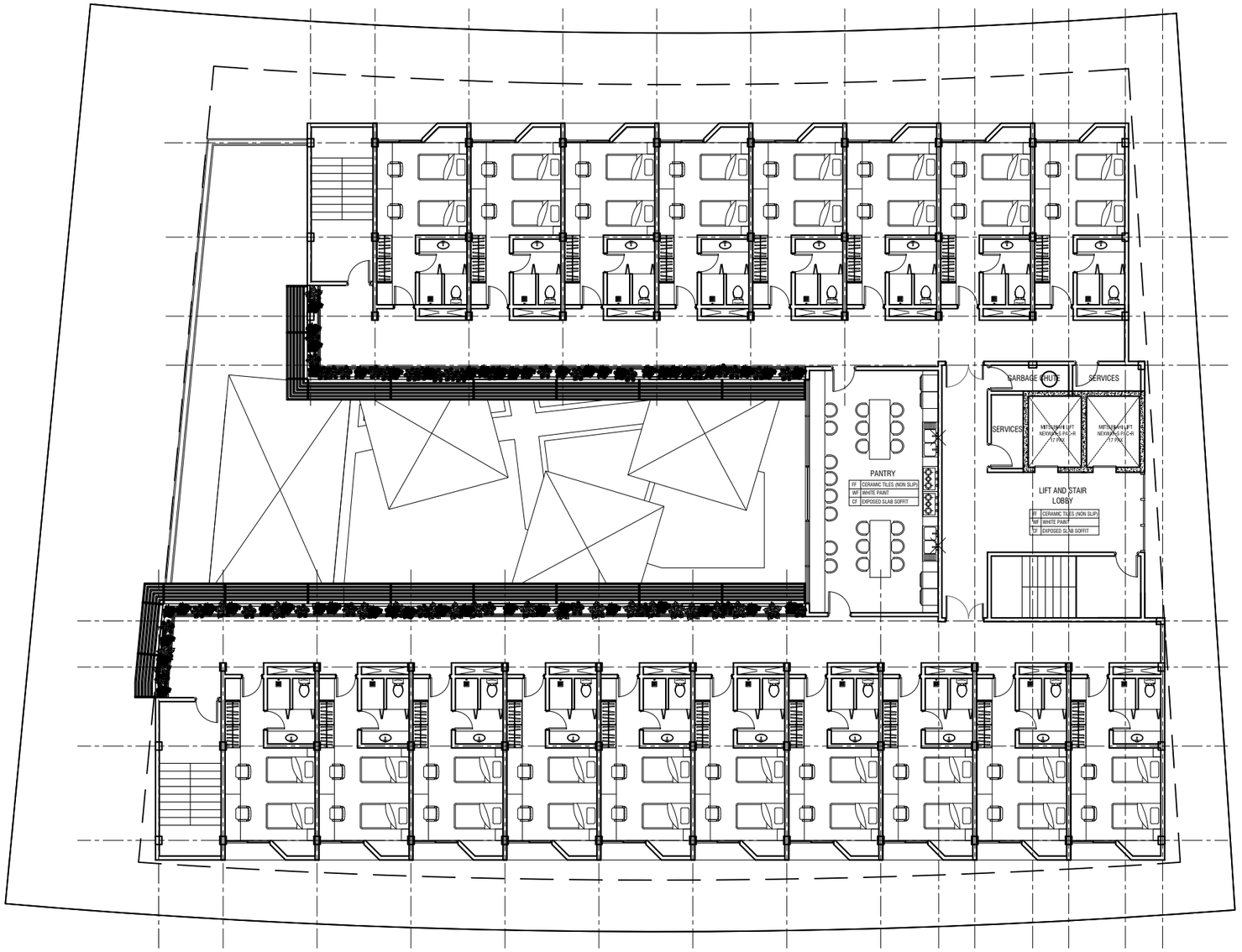
A06



3RD TO 11TH FLOOR LAYOUT

SCALE 1:200

0 1m 2m 3m 5m

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SHEET CONTENT:
3RD TO 11TH FLOOR PLAN

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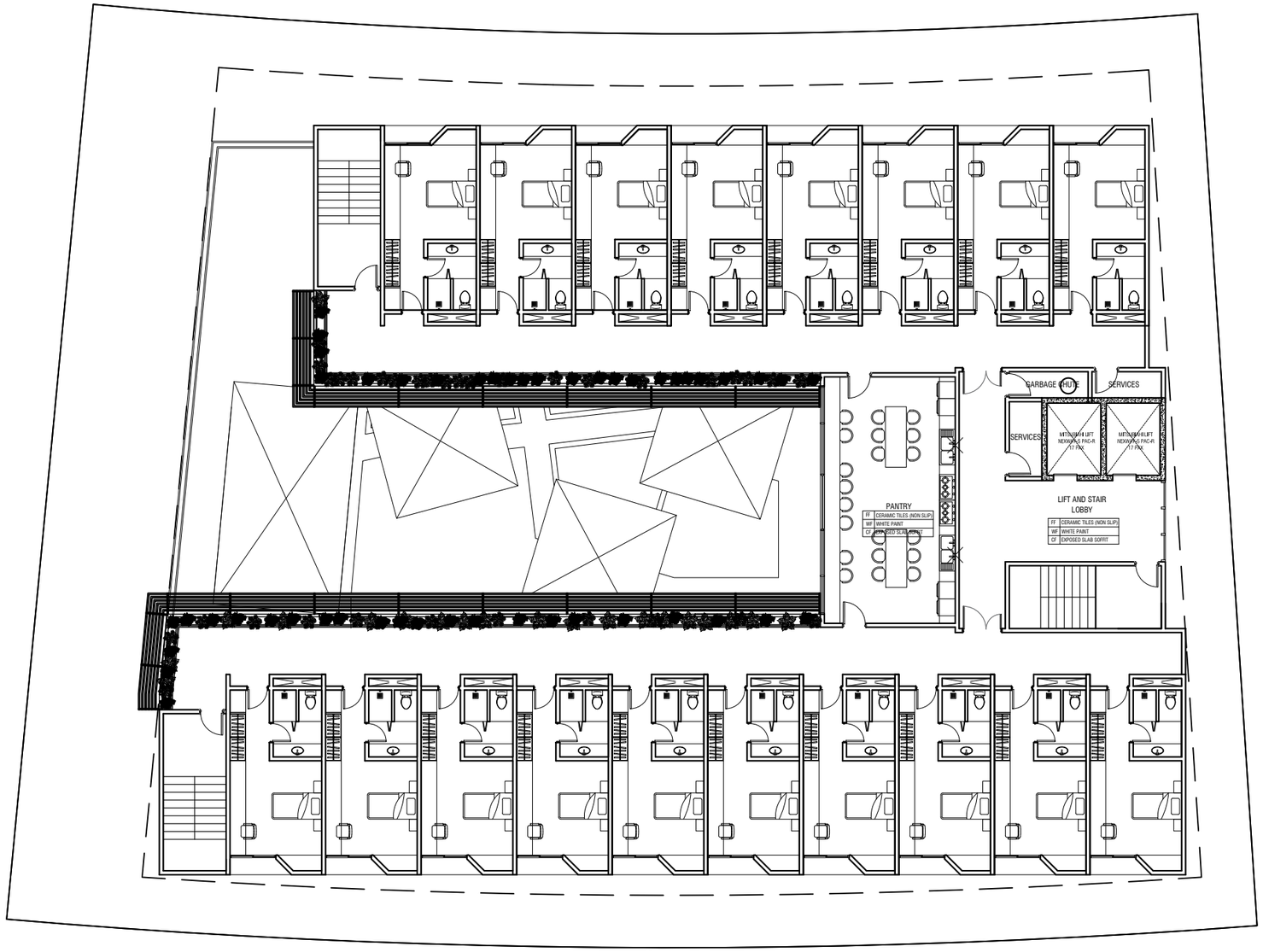
A07



12TH TO 13TH FLOOR LAYOUT

SCALE 1:200

0 1m 2m 3m 5m

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12TH TO 13TH FLOOR PLAN

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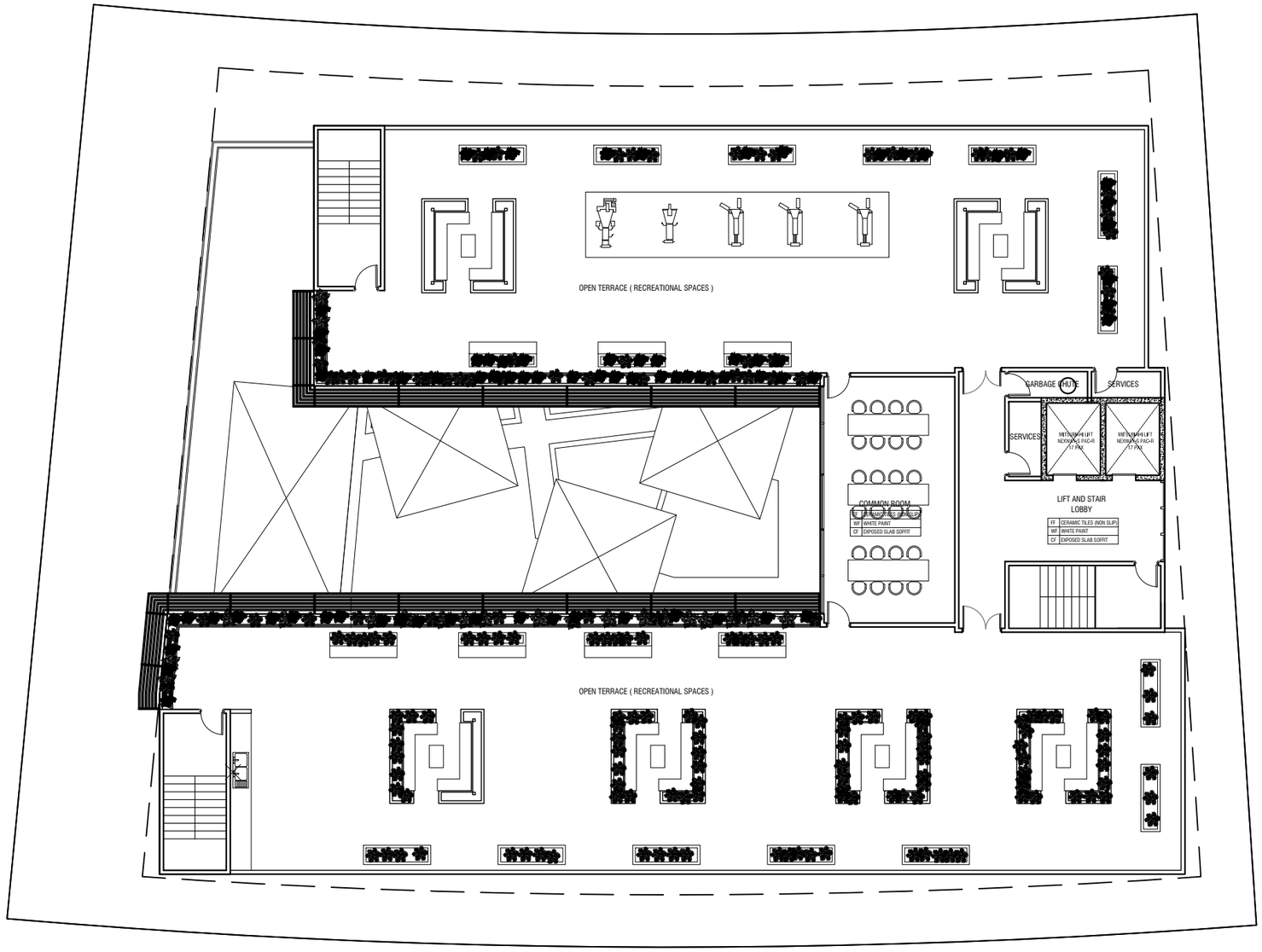

TERRACE FLOOR LAYOUT

SCALE 1:200

0 1m 2m 3m 5m

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TERRACE FLOOR PLAN

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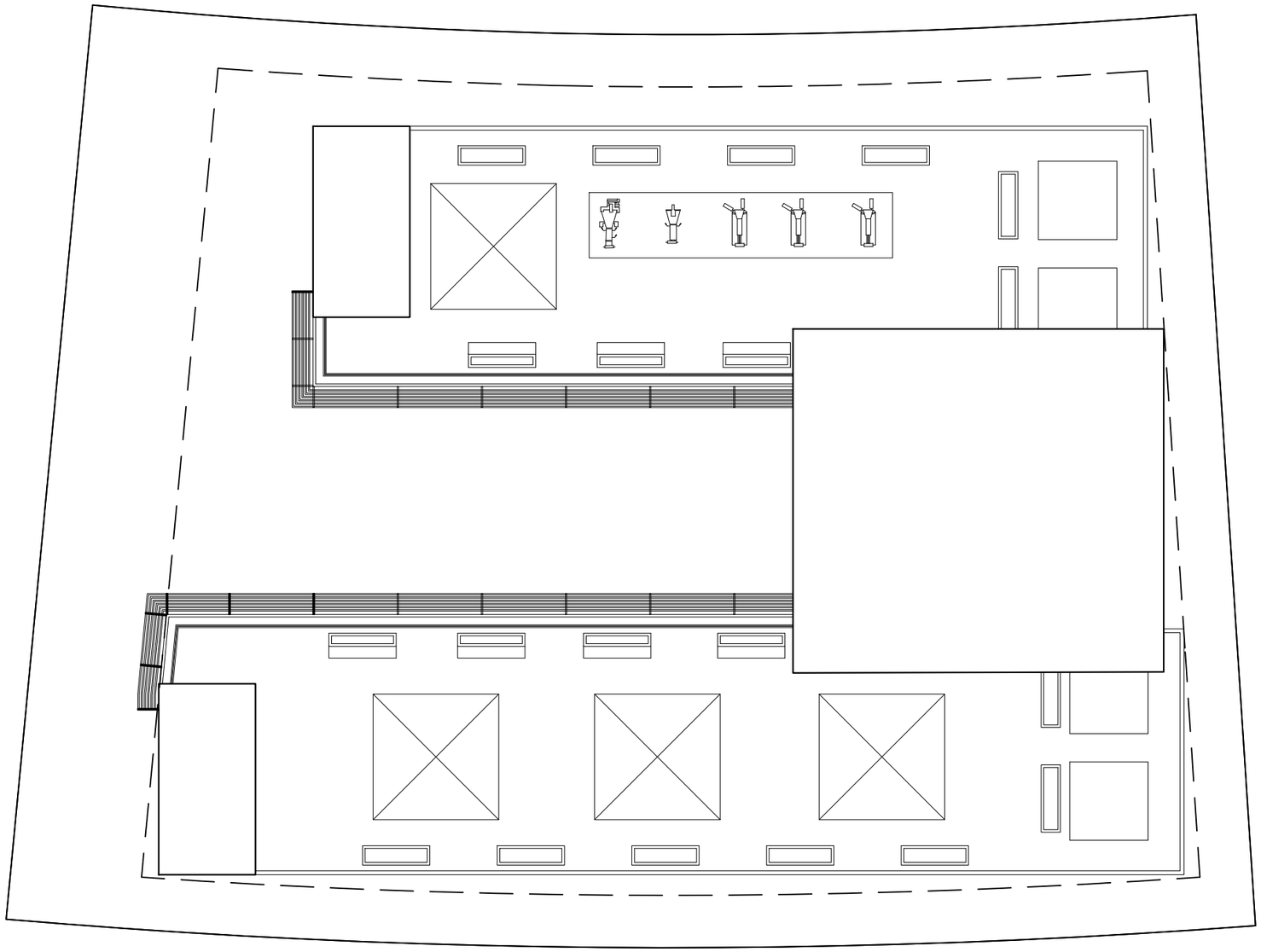
A09



ROOF LAYOUT

SCALE 1:200

0 1m 2m 3m 5m

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ROOF PLAN

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SCHEMATIC SECTION

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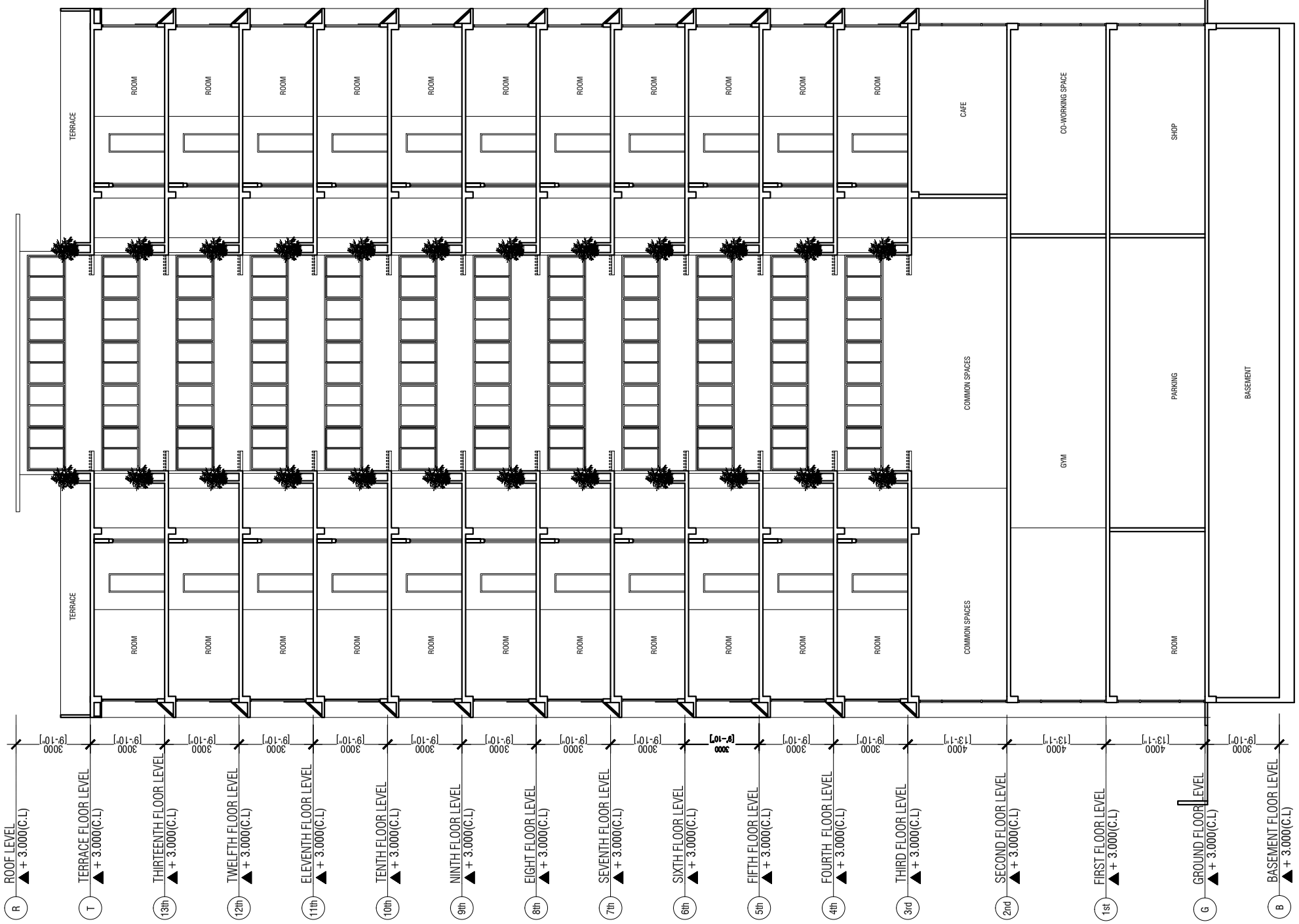

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SCHEMATIC SECTION

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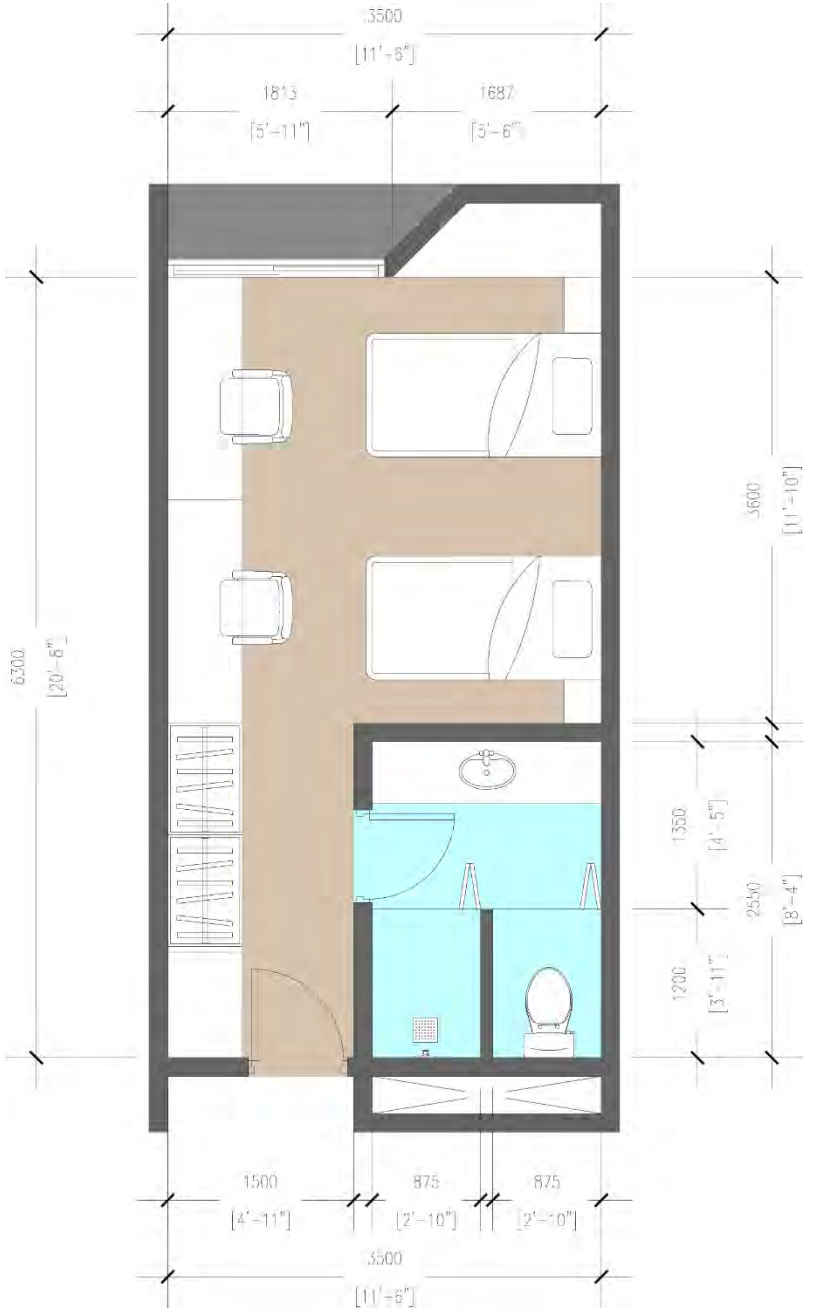
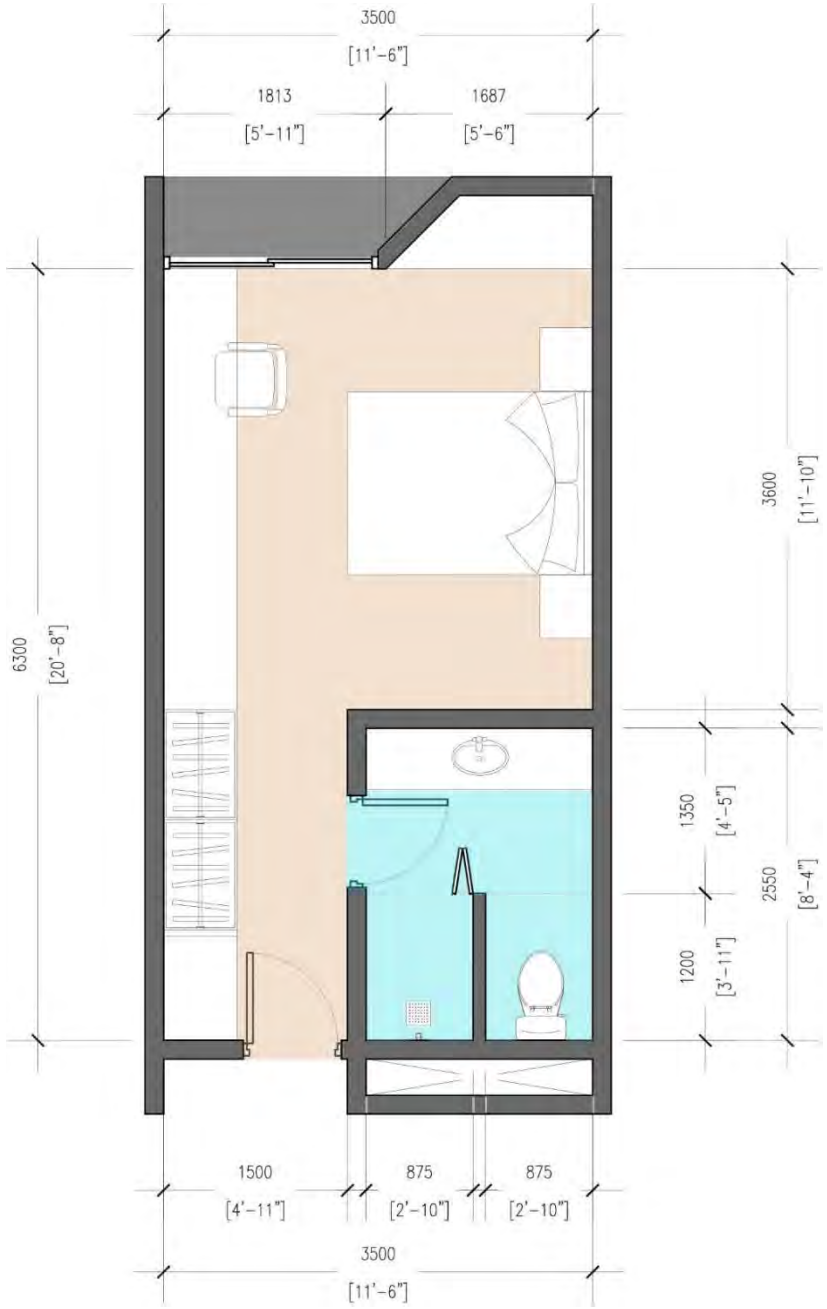
Sharing Room layout



Single Room layout



Approach from north east side

Approach from south east side


View from Mosque


Terrace


Common Courtyard

MDU- MBU - SMB - SFU INSTALLATION/CONSTRUCTION STANDARDS & BEST PRACTICES

MDU- MBU - SMB - SFU INSTALLATION/CONSTRUCTION STANDARDS & BEST PRACTICES

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Acronyms used:

- MULTI DWELLING UNIT (MDU)
- MULTI BUSINESS UNIT (MBU)
- SMALL BUSINESS (SMB)
- SINGLE FAMILY UNIT (SFU)
- FIBER DISTRIBUTION BOX (FDB)
- FIBER ENTRANCE JUNCTION BOX (FEJB)
- JUNCTION BOX (JB)
- INDIVIDUAL UNIT TERMIATION BOX (IUTB)
- HIGH CAPACITY MICRO DUCT (HCMD)
- SINGLE MICRO DUCT (SMD)
- OPEN ACCESS NETWORK (OAN)
- END OF LINE HANDHOLE (ELHH)

1. OVERVIEW OF WORK REQUIRED

1.1. SINGLE OR FIRST MDU/MBU BUILDING

1.1.1. A 50mm HDPE duct will be buried underground from the interior area in the 1st building, designated as the area for the installation of the new Fiber Distribution Box (FDB) to the Open Access Networks (OAN) End of Line Handhole (ELHH). The duct will be left sticking out of the ground, 1 m, next to the ELHH so that it can be terminated by others into the ELHH. See exhibit 11.2 (pg28)

1.1.2. The 50 mm duct will be stubbed up to the bottom of the newly installed telecom board in the 1st building.

1.1.3. Others will run a D series loose tube Dielectric outdoor fiber cable from the ELHH through the newly buried 50mm HDPE duct to the FDB space. 3.5 m of slack fiber will be left at the FDB

1.1.4. If this is a building with multiple floors, a Junction Box (JB), per 24 or less duct, will be installed on each floor near and with access to the riser. See Exhibit 11.1 (pg27)

1.1.5. High Capacity MicroDuct (HCMD) packages will be used exclusively between the FDB and each floors JB.

1.1.6. HCMD will run from the Top of the FDB Board and will enter and terminate in the designated floors JB

1.1.7. Single MicroDuct (SMD) will be terminated in the designated floors JB and then be run from the JB to each individual unit and will terminate at a newly installed Individual Units Termination Box (IUTB).

1.1.8. Once this is completed a 2 Count fiber cable will be run from the FDB through the high capacity microduct to the designated floor and JB. A one wrap service loop will be left in the JB and the 2-count fiber cable will continue through the designated SMD, to the individual unit and to the IUTB.

1.1.9. A minimum of 3.5 meters of slack fiber will be left at the FDB end and the IUTB. The ONT will be installed in the future at the IUTB by others.

1.2. MULTIPLE BUILDINGS ON SAME PLOT

1.2.1 If there is more than 1 building on the plot, each subsequent building will have a designated telecom space with a Telcom board and Fiber Entrance Junction Box (FEJB) installed on the wall. See exhibit 11.4 (pg30)

1.2.2 Multiple 152.4 mm schedule 40 PVC pipes will be run from the bottom of the newly installed telecom board for the FDB in building 1, underground, to the newly installed telecom board and terminated into the newly installed Fiber Entrance Junction Box (FEJB) in building 2, 3 and so on.

1.2.3 Theses PVC pipes will be stubbed up to the bottom of the 1st buildings telecom board and terminated in the bottom of each subsequent buildings Fiber Entrance Junction Box (FEJB) mounted to the Buildings telecom board.

1.2.4 The number of subsequent 152.4 mm PVC needed will be determined by the subsequent building sizes and number of units to be serviced. Each 152.4 mm PVC will carry multiple Single MicroDuct (SMD) between buildings.

1.2.5 If this subsequent building is a building with multiple floors, a Junction Box (JB) will be installed on each floor near and with access to the riser.

1.2.6 HCMD packages will be used exclusively between the FEJB and each floors JB.

1.2.7 The HCMD will terminated into the top of the FEJB and run from the Top of the FEJB and to the designated floors JB and terminate into the designated JB

1.2.8 SMD will be terminated in the designated floors JB and then be run from the JB to each individual unit and will terminate at a newly installed Individual Units Termination Box (IUTB).

1.2.9 Once this is completed a 2 Count fiber cable will be run continuously from the FDB in the 1st building through the SMD's in the 150 mm PVC Pipe to the designated subsequent buildings FELB a one wrap service loop will be left in the FEJB and the 2-count fiber will continue through the installed HCMD to the designated floors JB. A one wrap service loop will be left in the JB and the 2-count fiber cable will then continue through the designated single microduct, to the individual unit and to the IUTB.

1.2.10 A minimum of 3.5 meters of slack fiber will also be left at the FDB end and the IUTB

1.3. SMB'S AND SFU'S

1.3.1. The requirement for these buildings will be to bury a 50 mm HDPE duct from the designated location where the IUTB will be installed in the SMB or SFU, and the ELHH.

1.3.2. The duct will be left sticking out of the ground, 1 m, next to the ELHH so that it can be terminated by others into the ELHH. See exhibit 11.2 (pg20)

1.3.3. Once installed, a D-series outdoor dielectric fiber cable will be pulled in by others and 3.5 m of slack will be left at the IUTB for future installation of the ONT by others

2. COMPONENTS FOR MDU'S, SMB'S, AND SFU'S

2.1. COMPONENTS OF A MDU DISTRIBUTUION SYSTEM

2.1.1. Distributing a Fiber Optic Network throughout an MDU property requires several stages of equipment and materials between the Open Access Network facilities and each type and size of building and individual unit.

- 50 mm HDPE duct
- 48 count D series outdoor dielectric cable
- Telecom board (1st building and subsequent buildings)
- Fiber Distribution Box (FDB) (1st building)
- Fiber Entrance Junction Box (FEJB) (subsequent buildings)
- Multiple 150.4 mm schedule 40 PVC Pipe (1st building to subsequent buildings)
- 8.5/6 mm High capacity Microduct packages (HCMDP) (24, 19,12,7, way etc.) (1st building and subsequent buildings)
- Junction Boxes (JB) (1st building and subsequent buildings)
- 10/6 mm Single MicroDuct (SMD) (1st building and subsequent buildings)
- 2 count indoor Fiber (1st building and subsequent buildings)
- Individual Unit Termination Box (IUTB) (1st building and subsequent buildings, SMB's and SFU's)

3. FIBER ENTRANCE

3.1. GENERAL (NON-SMB/SFU)

3.1.1. All MDU Buildings on the plot will need a Telecom space that is on the floor that is at actual ground level and meets the following criteria.

3.2. GENERALSPACE REQUIRMENTS FOR FDB & FEJB (NON-SMB/SFU)

3.2.1. Fiber Entrance requires spaces suitable for the installation and maintenance of the Fiber Optic Network Equipment. It must be at ground level, safe, secure and easily accessible for the installation of connection equipment, connection of the building to the network and connection of multiple buildings to the FDB Building.

3.2.2. The following points are required for selection and placement of the fiber entrances in all buildings of the MDU Plots:

- Ground level
- Easy access
- Securable entry
- Secure from damage or tampering
- Has adequate lighting
- Dry and free of moisture damage
- Clean and free of dust of vaporous chemicals
- Will not cause an obstruction hazard
- Wall space to accommodate a 121.92 cm X 243.84 cm X 19.05 mm (4' X 8" x ¾") plywood board secured to the wall
- Must have at least 1 meter of clearance in front of the Telcom board and equipment.

3.2.3. This area does not require electrical power.

3.3. BUILD & ACCESS REQUIREMENTS FOR FDB & FEJB (NON-SMB/SFU)

3.3.1. The FDB and FEJB area will require unobstructed wall space as follows

3.3.2. For the FDB, a space on the wall in this area is needed to accommodate a 121.92 cm X 243.84 cm X 19.05 mm (4' X 8" x ¾") plywood board attached to the wall and made ready for the future installation of FDB by others and used to dress the fiber cables.

3.3.3. For the FEJB, a space on the wall in this area is needed to accommodate a 121.92 cm X 243.84 cm X 19.05 mm (4' X 8" x ¾") plywood board secured to the wall. You will then install a 121.92 cm X 121.92 cm by minimum depth of 304.8 mm, Electrical style Junction Box with cover, centered on the plywood and attached to the wall.

3.3.4. The 1st building to be built on the plot will house a future Box (FDB) on the ground level floor.

3.3.5. The FDB and FEJB should be located in the Mechanical / Telecom designated area or other room that can accommodate, that will be securable and on the ground level.

3.3.6. When the property has multiple buildings on (1) plot, only (1) Fiber Distribution Box (FDB) will be installed and it will be installed in the 1st building built.

3.3.7. FDB's and FEJB's are important pieces of equipment that service multiple customers and therefore they need to be secure and easily accessible, at all times, for installation and repair purposes.

3.3.8. The Telecom space chosen must also have available and easy access with the straightest paths possible to the buildings riser area.

3.3.9. The space should also be as close as possible to the Open Access Networks (OAN) End of Line Handhole (ELHH) for access to the network.

4. CONNECTION OF OPEN ACCESS NETWORK (OAN), FIBER DISTRIBUTION BOX (FDB), FIBER ENTRANCE JUNCTION BOX (FEJB) & JUNCTION BOXES (JB)

4.1. FDB CONNECTION TO THE OAN

4.1.1. A 50mm HDPE Duct is to be installed underground from the FDB location in the Building 1, to the Open access network, End of Line Handhole (ELHH).

4.1.2. The 50 mm HDPE duct will be terminated and stubbed up at the bottom of the Telcom board.

4.1.3. The 50 mm HDPE duct should be stubbed up from the floor in the FDB space at least 304.8 mm and not more than 457.2 mm.

4.1.4. The other end of the 50 mm HDPE duct should be buried and run to either side of the ELHH, leaving 1 m of duct above ground next to the ELHH.

4.1.5. The duct will be terminated by others.

4.1.6. D series fiber outdoor cable will be run into the building by others.

4.1.7. The 50 mm duct is to be sealed water tight at both ends.

4.2. FDB CONNECTION TO THE FEJB

4.2.1. You must calculate the number of units to be served in each subsequent building.

4.2.2. Using that data, you must determine how many 10/6 mm SMD's will be necessary to carry each unit's individual 2 count fiber from the FDB in the 1st buildings to each subsequent buildings FEJB.

4.2.3. Once that is determined, by using the OD's of the 10/6 mm SMD needed, and the ID of the 150.4 schedule 40 PVC pipe, determine how many 150.4 schedule 40 PVC pipe will need to be installed between the buildings to accommodate the amount of fiber to be carried continuously from the FDB in Building 1 through the FEJB in subsequent buildings.

4.2.4. The 150.4 schedule 40 PVC pipe, is not to be filled with 10/6 mm SMD, equal to more than 80% of the available area.

4.2.5. These PVC pipes will be terminated in the FDB building by stubbing them up from the floor in the FDB space at least 304.8 mm and not more than 457.2 mm.

4.2.6. These same PVC pipes will then be terminated into the bottom of the newly installed FEJB.

4.2.7. The 10/6 SMD will then be run from the FDB through the PVC pipe into the FEJB.

4.2.8. Each SMD must be labeled.

4.3. JUNCTION BOX (JB)

4.3.1. Junction Boxes (JB) are used to connect and transition the individual 2 count fiber from HCMD to SMD and to hold a service loop.

4.3.2. These Junction Boxes should be a minimum of (H) 397.764 mm x (W) 304.8 mm x (D) 136.652 mm. You will install 1 JB per 24-way HCMD package. The JB's called out for use are reversible and the door is changeable. The HCMD will enter from the top and the SMD will leave from the top through the plate shown below.

Junction Box

Installed in reverse

Drill hole for 8/6 mm 24-way HCMD

Flex Port fittings 10/6 mm SMD

4.3.3. If the floor has 24 or less units to serve, 1 JB is all that is needed for that floor. If there are 25 units to be served on that floor, then you would install 2 JB and so on. One JB is required for each 24 or less units served.

4.3.4. The JB's are to be located as close to and with access to the risers on each floor.

4.3.5. The space chosen must have the following:

- Ease of access
- Securable
- Secure from damage and tampering
- Adequate light
- Dry and free from moisture
- Clean and free of dust or vaporish chemicals
- Will not cause obstruction hazard
- Must have at least a clearance of 1 meter in front of the JB

4.3.6. A rubber gasket or similar item will be used to seal around the HCMD's termination into the JB.

4.3.7. Each HCMD package and individual Microduct must be labeled.

4.4. FDB/FEJB CONNECTION TO JB

4.4.1. There is to be (1) JB per floor of multi-floor buildings for every 24 units served on that floor.

4.4.2. 24-way 8.5/6 mm HCMD will run directly and continuously between the FDB or FEJB (depending on building) and 1 designated floor JB.

4.4.3. By determining the number of individual units to be served on each floor, you will determine the number of 24-way 8.5/6 mm HCMD packages you will need to run to a designated floor and in turn, how many JB's are needed on that floor.

4.4.4. No SMD will be used between FDB or FEJB's and any floors JB.

5. DUCT CONNECTIONS

5.1. FEJB TO JB

5.1.1. The 24-way 8.5/6 mm HCMD will terminate and leave the FEJB for the JB's from the top of the FEJB.

5.1.2. A rubber gasket or similar item will be used to the HCMD into the FEJB. The seal is to provide a Secure termination to the FEJB and to also maintain the FEJB's seal.

5.1.3. A rubber gasket or similar item will be used to seal the HCMD into the JB. The seal is to provide a Secure termination to the JB and to also maintain the JB's seal.

5.1.4. Each 8.5/6 mm SMD inside the HCMD package must be labeled at both ends.

5.1.5. The HCMD package itself must also be labeled on both ends.

5.2. FDB TO JB

5.2.1. The 24-way 8.5/6 mm HCMD will be strapped to the top of the FDB's Telecom Board and run to the designated JB.

5.2.2. A rubber gasket or similar item will be used to terminate the HCMD into the JB. The seal is to provide a Secure termination to the JB and to also maintain the JB's seal.

5.2.3. Each 8.5/6 mm SMD inside the HCMD package must be labeled at both ends.

5.2.4. The HCMD package itself must also be labeled on both ends.

5.3. JB TO INDIVIDUAL UNIT TERMINATION BOX (IUTB)

5.3.1. 10/6 mm Single Microduct (SMD) will be run from the JB on the designated floor to the individual units IUTB.

5.3.2. 10/6 mm SMD will be terminated into the JB through the 10/6 Flex Port Fittings in the JB in the entrance exit plate of the JB

5.3.3. The opposite end of the 10/6 mm SMD will terminate through the ITUB's 10/6 mm entrance plate.

5.3.4. Each SMD must be labeled on both ends.

6. ITEMS & MATERIALS

6.1. IUTB

6.1.1. The IUTB is simply a box to allow termination of the entry fiber and the connection of the ONT. ONT to be installed by others.

6.1.2. Acceptable IUTB.

Individual Unit Termination Box (Single Unit Box)

SC/APC adapter plate

10/6 entrance plate

Strain relief exit plate & adapter

6.1.3. This is the unit to be installed on the wall in each individual unit.

6.1.4. The 10/6 mm SMD will be terminated to this IUTB through the Entrance plate.

6.1.5. Each IUTB Box (Single Unit Box) you install will require all (4) items shown:

1. Single Unit Box
2. SC/APC adapter plate
3. 10/6 mm Entrance plate
4. Exit plate with strain relief adapter

6.1.6. The IUTB should be installed in a designated room that will be most convenient and used for tv viewing, internet usage etc. There must be access to power (230V / 60HZ).

6.2. 8.5/6 MM 24-WAY HCMD &10/6 MM SMD

6.2.1.1. The purpose of this section is to provide simple instructions that can be used to design or construct any premise and ensure it is fiber ready. This applies to new buildings.

6.2.1.2. Prerequisite

6.2.1.3. Personnel must have suitable industry training and / or qualification before undertaking this work.

6.2.2.1. 10/6 mm SMD riser rated plenum LSZH

- FieldShield FS-DCR-NT-610-PS-2000F

1.	OD	10.01 mm
2.	ID	6.25 mm
3.	Wall thickness:	1.88 mm
4.	Slip layer minimum:	0.102 mm
5.	Minimum bend radius:	132.08 mm
6.	Material:	thermoplastic
7.	Rating:	Plenum
8.	Markings:	Part number, Date Code, Footage marks every 609.6 mm

6.2.2.2. Each duct must have a pull string

- 24-way HCMD Riser Rated Plenum LSZH

1.	Outside Dimensions	H X W 38.6 mm x 52.7 mm
2.	Outside Diameter	52.7 mm
3.	Weight per 30.488 cm	0.3234 kilos
4.	Safe working Pull Strength	1,411.12 kilos
5.	Over sheath thickness	0.762 mm
6.	Bend radius – supported	406.4 mm
7.	Bend Radius Unsupported	812.8 mm
8.	Shipping length	304.8 m
9.	Markings:	Part number, Date Code, Footage marks every 609.6 mm

6.2.2.3. HCMD Internal SMD

- OD 8.5 mm
- ID 6.7 mm
- Wall thickness Minimum 0.76 mm
- Wall Thickness Maximum 0.86 mm

6.2.2.4. Each duct must have a pull string

6.3. DUCT ATTACHING, SECURING & DUCT PATHWAYS

6.3.1. Defects

6.3.1.1. Any defects caused must be rectified prior to closing up any walls, ceilings etc., otherwise it could result in the fiber path being unusable and surface mounted conduit being used.

6.3.2. Deviations

6.3.2.1. Any need to deviate from this standard must be discussed with, and approved by, an appropriate HDC Engineer representative before continuing.

6.3.2.2. Once the paths are determined between the Fiber entrance and the JB's HCMD will be installed.

6.3.2.3. The product for both 8/6 HCMD and 10/6 SMD is Low Smoke Zero Halogen (**LSZH**) plenum, riser rated microduct that can be easily run through internal cavities.

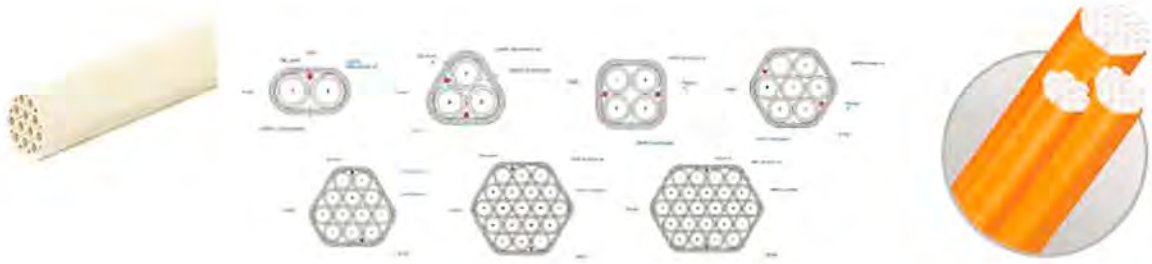
6.3.2.4. The microduct has a thin wall which can kink very easily, therefore it must be handled accordingly, with the number of bends kept as low as possible. You must also adhere to the minimum bend radius.

6.3.2.5. If the product is incorrectly installed it may adversely affect the delivery of the fiber, rendering the installation unusable.

6.3.2.6. Attaching LSZH Single Microduct and High Capacity Micro duct.

6.3.3.1. LSZH microduct is easily crushed. For this reason, extreme care must be taken when using cable ties to hold or attach it. If cable ties were applied too tightly, the microduct could be crushed, which would damage any fiber inside, or make it impossible to pull or blow a fiber cable through it.

10/6 Single Micro Duct



8.5/6 mm 24-way HCMD

6.3.4. Internal Surface Mounting

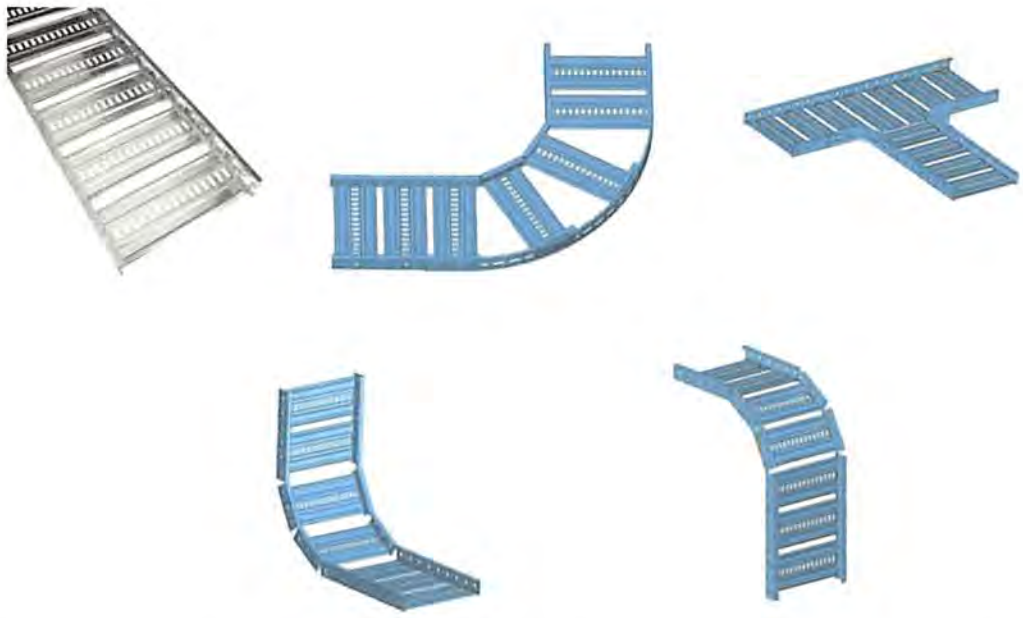
6.3.4.1. A variety of a fixing products can be used. Below are 2 examples.

6.3.4.2. Other methods for holding or attaching LSZH microduct both vertically and horizontally, are Velcro (19 mm or similar) or using insulation tape wrapped two or three times around. The microduct can even be attached to an existing cable.

6.3.4.3. All LSZH, individual Micro Duct or High Capacity Micro Duct, should be supported every 300mm to prevent the tube to lose shape or kink over time.

6.3.5. Riser and Multi Duct Home Runs

6.3.5.1. When running the product vertically, such as in a riser, or when running large numbers of SMD and especially HCMD, extra care must be taken when managing bends at each floor as this is a prime area for kinks or crushing.



6.3.5.2. Unitray / Unistrut should be installed to create the main runs from the FDB / FEJB to the riser and up the riser.

6.3.5.3. Unitray is also a recommended alternative for each floor's duct runs from the JB's to the individual units.

6.3.6. Drilling

6.3.6.1. The drilling angle allows the pre-fibred microduct pass through without compromising the minimum bend radius.

6.3.7. Premise

6.3.7.1. At the final position within the premise, a IUTB (Single Unit Box) will be used to house the Fiber microduct. The microduct terminated at the box and the Fiber is left with a 3.5 m slack hanging.

7. DUCT INSTALL

7.1. DUCT

7.1.1. Pathway

7.1.1.1. Pathway is critical. The following chart lists the recommended bend radius and installation tensile of the SMD and HCMD Microduct.

7.1.1.2. When you exceed these recommendations, you put stress on the sidewalls of the MD, causing friction when pushing/pulling fibers. The chances of damage (i.e. kinking, stretching, or ovaling of the MD) increase dramatically.

	Riser 10/6 mm and 8.5/6 mm
Installation Tensile	10/6: 154.22 kilos per 30.48 cm 8.5/6: 154.22 kilos per 30.48 cm
Bend Radius	10/6: 132.08 mm 8.5/6: 152.4 mm

7.1.1.3. Microduct (MD) is manufactured with a smooth core slip lining that allows the fibers to be pushed and/or pulled through the MD with a very low coefficient of drag when MD is installed properly.

7.1.1.4. All installations should be smooth, plumb and free of kinks.

7.1.2. Duct

7.1.2.1. HCMD: 24-way Enterprise Plenum LSZH FuturePath 8.5mm / 6mm Duct Package

7.1.2.2. SMD: FieldShield Plenum, Riser Rated LSZH 10/6mm Single Microduct

7.1.2.3. 10/6 mm SMD to be used FS-DCR-NT-610-PS-2000F. The red indicates the length of that microduct. You can purchase it with less or more footage.

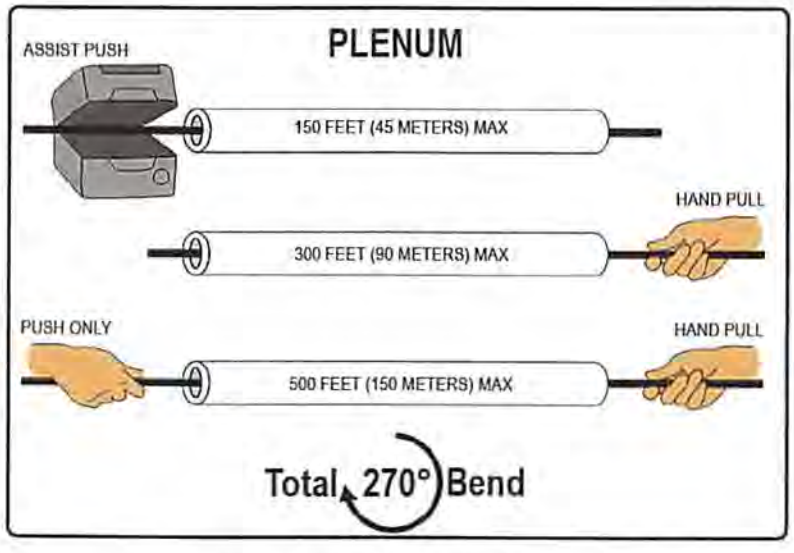
7.1.2.4. 8.5/6 mm HCMD 24-way part #10004859 to be used.

7.1.2.5. See spec sheet attached

7.2. PULL POINTS

- There is no maximum distance when using the pull point installation process. Pull point maximum distances include one 270° (ISP) bend per pull point. This gives you the ability to maneuver around objects at no more than a 90° bend. As an example, three 90°s, or six 45°s, are allowed in the 270° rule.

7.2.1. The following charts are recommendations for a successful installation of the required push pull fiber to be used (between pull points).



Push Pull Plenum Riser LSZH

7.3. PULL STRING

7.3.1. Pulling Tensile

- Use Microduct that shipped with a pre-installed pull string with a 50lb pulling tensile. This allows for enough strength to pull the fiber cables when the MD is installed correctly. When the MD is installed correctly, it should never feel difficult to pull. If it is difficult to pull this is an indication that the MD has exceeded the bend radius and the 360°/270° rule per pull point.
- Exceeding the pulling tension will cause the string to cut into the duct.
- When tying off Microduct to pull fibers, tie MD at an angle so that the pull string will not cut into the duct when tension is applied. Pull string cuts into the duct when the bend radius has been exceeded.
- If max pulling tension is exceeded while installing, the pre-connectorized fiber end (SC, LC or MPO) may break.

7.3.2. Secure Pull String

- If not utilizing the pull string immediately, expose enough pull string to catch in the end cap, or tape off at both ends.

7.3.3. Tape

- The use of tape inside the Microduct (taping pull string) is not recommended. The slip lining on both the MD and the fiber jackets will cause the tape to release. Tape can come off inside the MD and cause a blockage.

7.3.4. Pull Lube

- The use of a "pulling lube" is not required in Clearfield MD. It can become sticky/gummy when left to dry. This will cause issues if you ever need to replace the fiber. If using a water base, it can freeze in the MD and cause issues later down the road as well.

7.4. PLANNING THE ROUTE

7.4.1. Keep the Route as Straight as Possible

- Place the runs to minimize the amount of duct required. Choosing the route with the least amount of bends is key.

7.4.2. Pull Point

- Plan for pull points at intervals recommended for the products being used.

7.4.3. Long and Sweeping Bends 90° Bend

- The use of 45° sweeping bends is highly recommended as they are easier to pull through than 90° bends and should be used whenever possible.
- Be sure to maintain bend radius.

7.5. INSTALLING MICRODUCT

7.5.1. Leave 10ft of Slack Per Side

- If leaving MD for another team, leave 10 feet of slack at each end. This will allow the technician to find the pull string when tension has been applied and cut at installation. The pull string can and will relax back into the duct approximately 6-8 feet. Use of a rotary MD cutter is suggested to trim the MD to length while not cutting the pull string.

7.5.2. Pay from the Top

- When installing MD from a reel, pay the MD off over the top of the reel. Coming from underneath puts too much tension (ovaling/stretching the duct) when installing. If this occurs, you must remove the damaged MD before fiber can be placed.

7.5.3. Remove Twists

- Be sure to remove any twists before installing. This reduces the chance of kinking or unnecessary bends (undulations) especially during OSP installations (i.e. trenching). Excessive undulations reduce max installation distances.

7.5.4. Repair or Remove Damage

- Exceeding installation tensions (see Figure 1) of the MD will cause the MD to stretch. This can also happen when pulling around sharp edges.
- When kinked, stretched, or ovaled, you must pull enough MD to remove the damage area from an end point (terminal or pull point), or remove the section and repair with a coupler.

7.5.5. De-Burring and Coupling

- De-burr between coupled joints and use appropriate coupler for MD size.
- When coupling two MD's be sure to de-burr the MD ends before coupling. This will allow for a smooth transition for the fiber. Failure to do so can cause the fiber to break at the connector crimp tube.

7.5.6. Label Ducts

- Permanently label each end of the Microduct for easy identification later.

7.5.7. Cap the Duct Ends

- It is IMPERATIVE that the ends of the duct are capped/sealed. This will keep contaminates out of the duct (mud, sand, water, drywall dust, etc.). When end caps are not available, folding the end over and taping, or wrapping electrical tape to seal off the end is acceptable.

7.6. MICRODUCT MDU/MBU IMPLENTATION GUIDELINES

7.6.1. There are two types of MD specifically for indoor applications: plenum (white) and riser (cream).

- Utilize BICSI and NEC codes for pull points.
- Follow all local codes and practices as well as fire stopping procedures.

7.6.2. Supporting Duct

- When installing ISP, vertical or horizontal straight runs should be supported every 16-24 inches. Use of plastic cable strap clamps is recommended. When using multiple ducts; double up (2-hole) cable strap. Do NOT over tighten or crush MD.
- Use of MD organizing brackets are suggested.
- Sweeping 45° bends are recommended. Do not exceed 90° turns.

7.6.3. Installation

- Do not interfere with drywall installation.
- Drill your "right of ways" in a manner that will not interfere with the bend radius or add additional bends.

7.6.4. Hidden Slack Loops

- DO NOT leave "slack loops" hidden. These extra bends are not desired when pulling fiber.

8. FIBER

8.1. Push Pull Fiber Required

- A (2) count, Oval, Push/Pull fiber with a 3mm OD, Plenum, Riser-Rated and LSZH.

8.1.1. Recommended Push Pull fiber.

- Fiber cable to be used is FA-CA1-002-8ZD-B-03000F. The red is the length in one piece. You can purchase it with less or more footage.

8.1.2. See spec sheet attached

8.2. PUSH PULL FIBER INSTALL

8.2.1. Keep Fiber Clean

- Do not allow fiber to lie in dirt or water. If there is any type of foreign contamination on the fiber jacket it will end up in the MD and create a blockage inside the duct as there is a tight tolerance between cable O.D. and duct I.D.

8.2.2. Distances

- The images (Figures 2) show the recommended maximum distances for pulling fibers. Following these best practices have allowed longer pull distances.

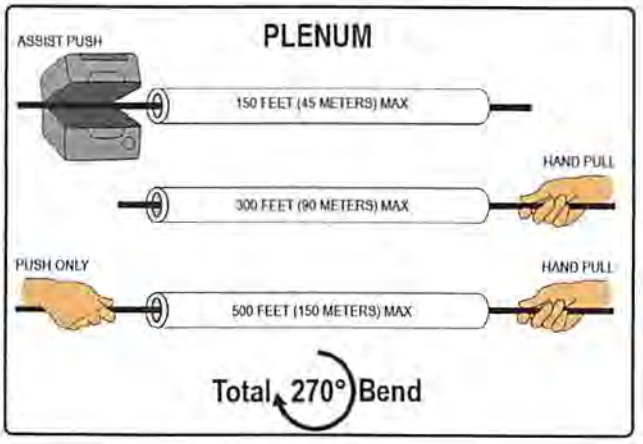


Figure 2

8.2.3. Pull Sock/Loop

- If Fiber Cable is to be pulled, you must use a pulling sock.
- The required fiber is also designed to be pushed.

8.2.4. Spool Deployment Method

- When installing a drop on a spool, the spool has a large hole where you can use a variety of items to pay off the fiber from the spool. We suggest utilizing a turn table ("Lazy Susan") and cardboard dispensing box made for the drop wheel (see "tools and accessories" for these options available from Clearfield). Using an a-frame, a broomstick or even a long screwdriver placed through the hole and inserted into the ground (or held) is also acceptable.

8.2.5. Relieve Tension

- When installing fiber, it is helpful to take up the tension off the reel when paying out the fiber. Keep a small amount of slack on the fiber as you guide it into the duct in a push-pull technique. This small amount of tension from the reel can greatly affect the force

needed to pull the fiber into the duct. On longer runs this will especially important. This is the case even with the 900um deploy reels. Gently spin the deploy reel while pulling on the far end.

8.2.6. Half Hitch

- When installing Strong Fiber, be sure to follow the instructions to tie off (half-hitch) the pulling eye string to the metal crimp tube before pulling the fiber.

9. LABELING

9.1. You must label the following:

- FDB Telecom Board
- FEJB
- JB
- IUTB
- HCMD
  - Each end of the outer jacket of the 24-way.
  - Each end of the stripped out 8.5/6 mm SMD inside the HCMD 24-way
- SMD 10/6 mm duct, each end

HCMD 24-way

9.1.1. The HCMD must be labeled on both ends of each individual HCMD package.

- Example: You will place the labeled on the outer sheath just prior to:

  1. The end of the sheath as it is secured to the FDB Telecom Board
  2. Just prior to entering the FEDB
  3. Just prior to entering each JB

9.1.1.1. Labeling example:

- FDB Telecom Board Building, B001 – Floor, F001 – Room, R001 etc.
- FEJB Building, B001 – Floor, F001 – Room, R001 etc.
- JB Building, B001 – Floor, F001 – Room, R001– JB, JB001, etc.
- IUTB Building, B001 – Floor, F001– Unit, U001, etc.
- HCMD

1. Each end of the outer jacket of the 24-way.

    a. Building, B001 – Floor, F001 – Room, R001 Duct Package, DP001 etc.
    b. Add JB when terminated at the JB

2. Each end of the stripped out 8.5/6 mm SMD inside the HCMD 24-way

    a. Building, B001 – Floor, F001 – Room, R001 - Duct Package, DP001 – Duct, D001 etc.
    b. Add JB when terminated at the JB

- SMD 10/6 mm duct, each end

    a. Building, B001 – Floor, F001 – Room, R001 - Duct Package, DP001 – Duct, D001 etc.
    b. Add JB when terminated at the JB

10. MATERIALS

10.1. FIBER

- Required to install a 2 count, Single mode, Oval, 3mm OD, Push/Pull, LSZH, Plenum, Riser.

10.1.1. Recommended Fiber cable is: Clearfield, FieldShield Pushable Optical Fiber cable

- Part number: FS-CA1-002-8ZD-B 03000F

10.1.2. See Information sheet

10.2. INDIVIDUAL UNIT TERMINATION BOX (IUTB)

10.2.1. Required to install a Termination Box in the individual units that will terminate the 10/6 mm SMD and allow the connection of the ONT by others. This box must have a tension relief for the ONT fiber.

10.2.2. Recommended IUTB is: A Clearfield YOURx-Tap single unit box, with the following add on.

1. Part Numbers
2. Empty Single Unit Box TAPX-ZBC-ZZZZ-ZZZZ
3. SC/APC Adapter Plate 018458
4. Entrance Plate 018852
5. Exit Plate with Connector 019849

10.2.3. See Information sheet

10.3. JUNCTION BOX (JB)

10.3.1. Required to install JB's that will fit an 8.5/6 24-way HCMD in and up to 24 10/6 SMD out.

10.3.2. Recommended JB: A Clearfield YOURx-Flex Box with the following add-ons:

10.3.3. Junction Box / Flex Box with Flex Port Entrance exit plate accommodating 24 10/6 exit fittings.

- Part Number
- FDP-Xwbf-cplate-24

10.3.4. See Information sheet

10.4. SINGLE MICRO DUCT (SMD)

10.4.1. Requirement is: A Riser Rated 10/6 mm Micro Duct

10.4.2. Recommended item is Clearfield FieldShield Riser Rated 10/6 mm Microduct

- Part Number:
- FS-DCR-NT-610-PS-2000F
- FieldShield, 10 MM, RISER, NON-TONABLE-WHITE, 2,000 FOOT (609.60 M) SPOOL

10.4.3. See Information sheet

10.5. HIGH CAPACITY MICRO DUCT 24-WAY (HCMD)

10.5.1. Requirement is: A Riser Rated 8.5 mm/6 mm 24-way Micro Duct package.

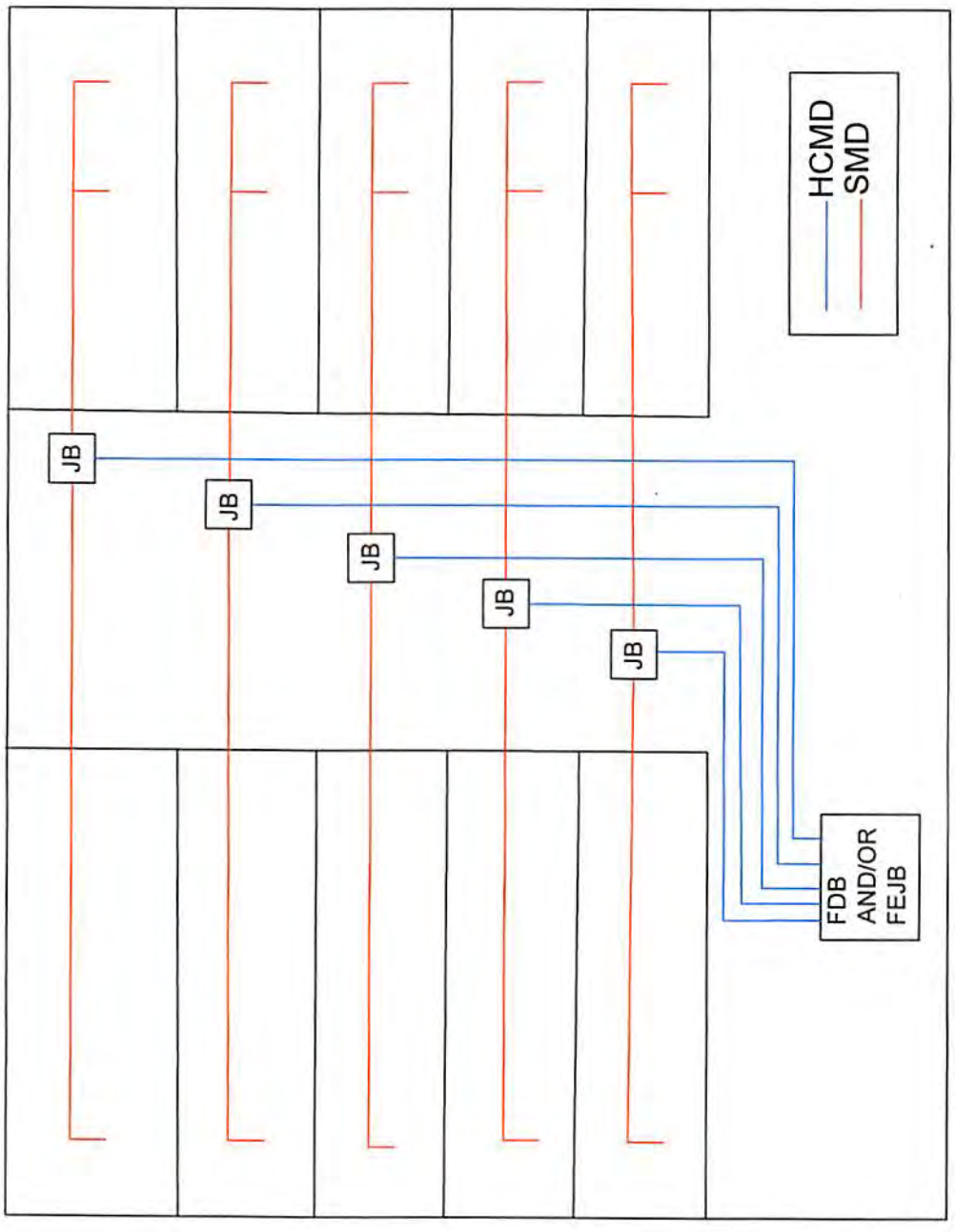
10.5.2. Recommended item is, Dura-line Enterprise FuturePath Microduct system - 8.5 mm/6 mm 24 way.

- Description: 8.5 mm X 6 mm 24-way Riser
- Part Number 1000ft (304.8 m) #10004601
- Part Number 2500ft (762 m) #10008984
- Part Number 6000ft (1828.8 m) #10008985

10.5.3. See Information sheet

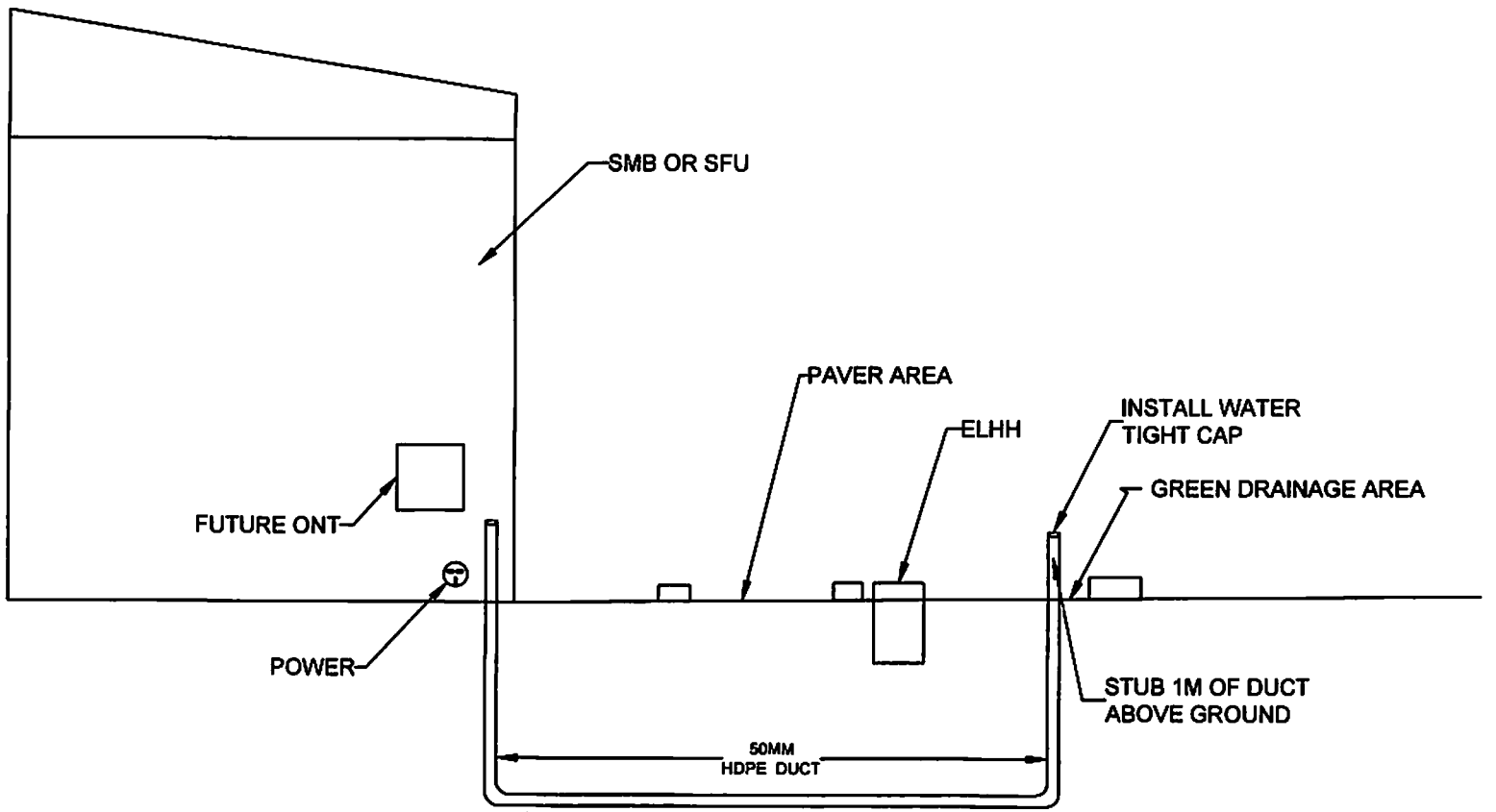
11. TYPICALS DRAWINGS, MATERIAL SHEETS & INFORMATIONAL SHEETS

See next page

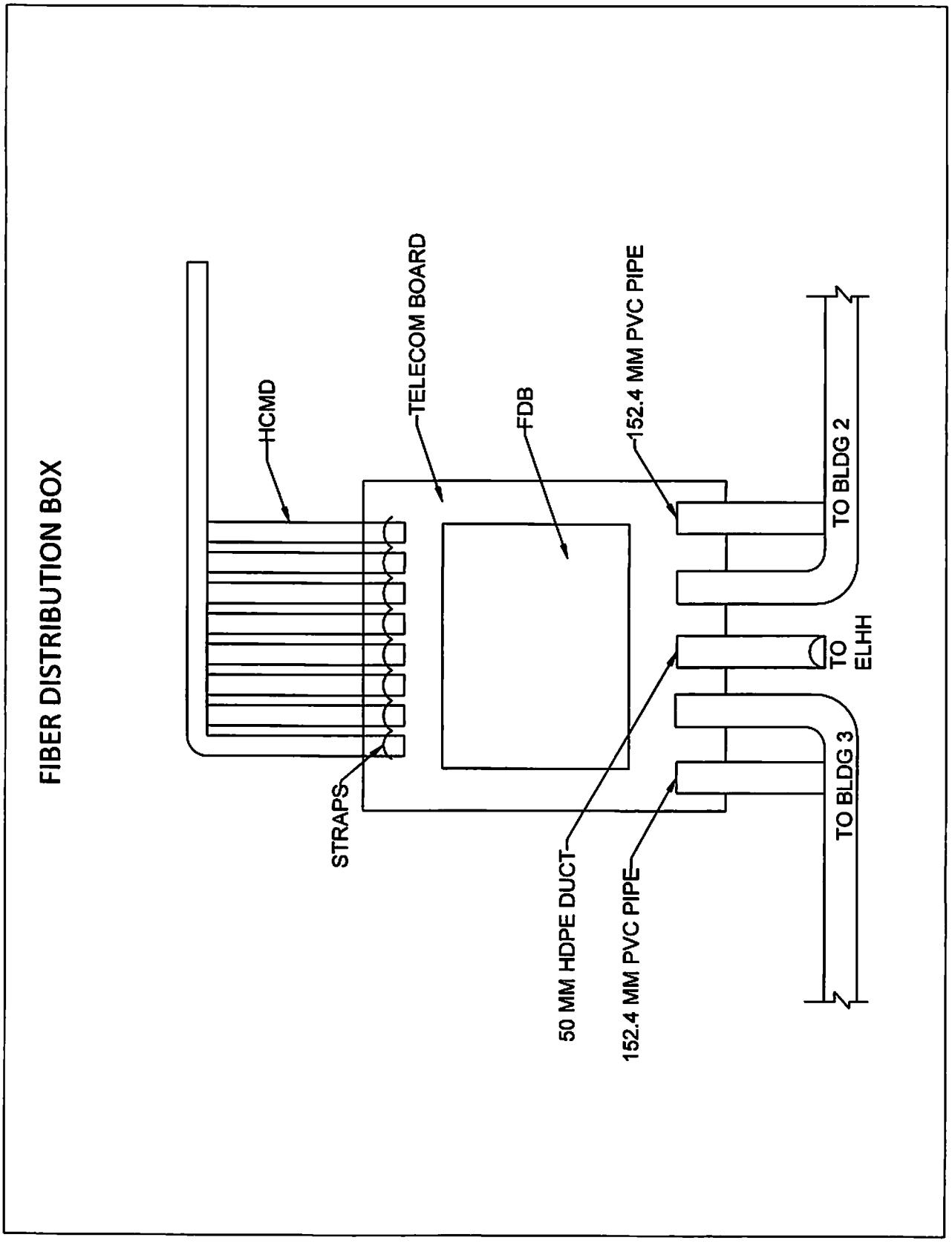


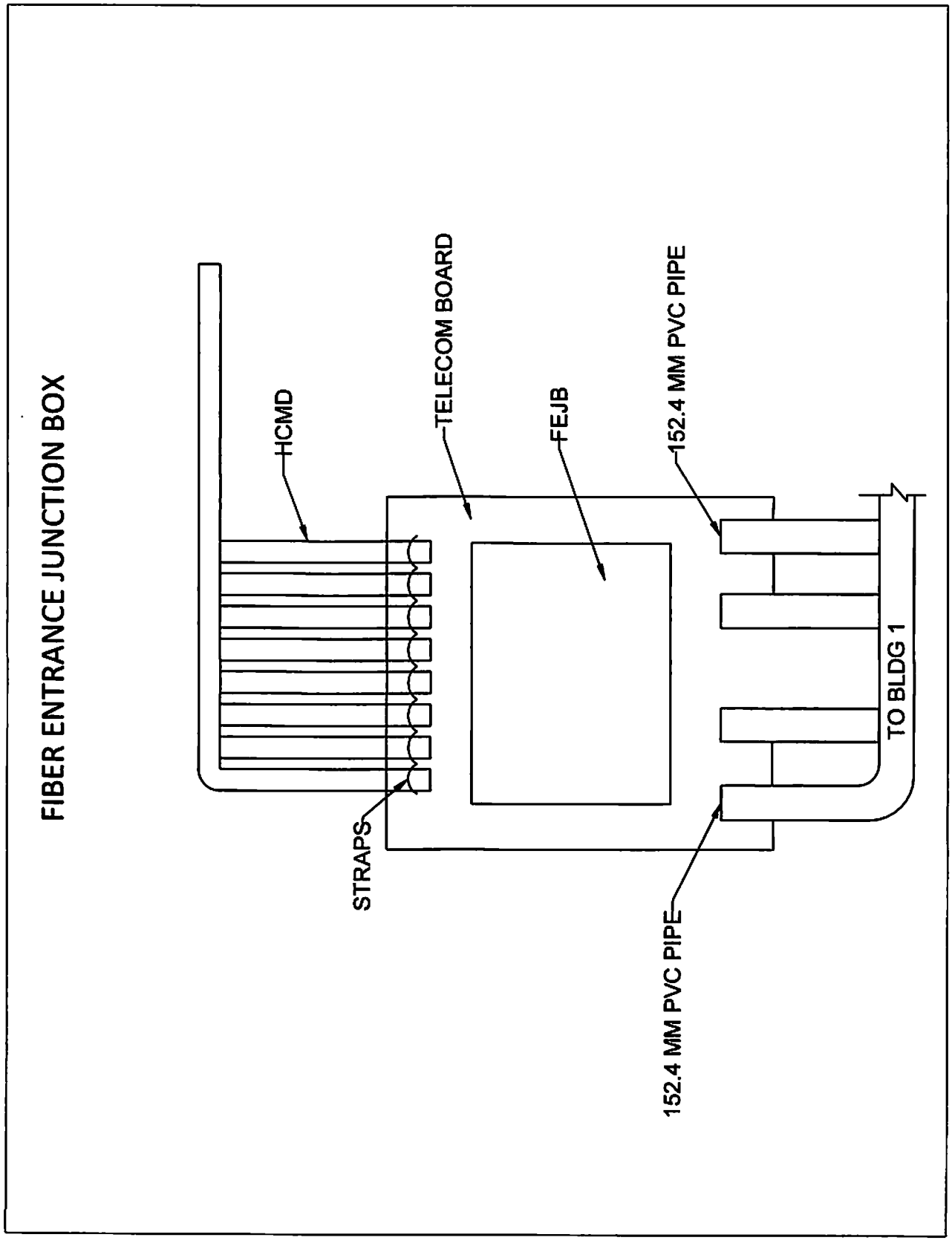
MICRO DUCT SCHEMATIC

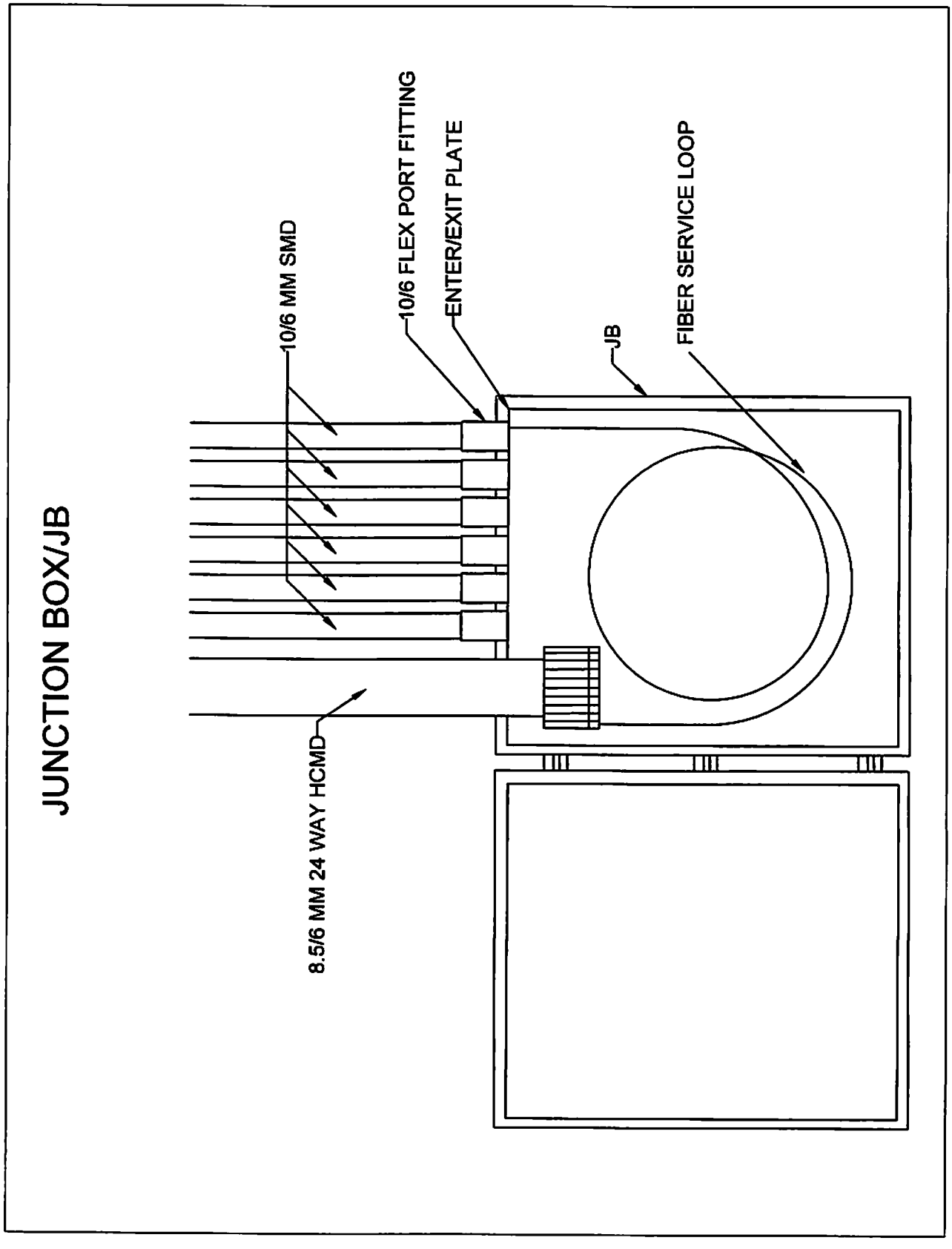
SMB OR SFU



11.2 28


FIBER DISTRIBUTION BOX
HCMD
TELECOM BOARD
FDB
152.4 MM PVC PIPE
TO BLDG 2
TO ELHH
TO BLDG 3
STRAPS
50 MM HDPE DUCT
152.4 MM PVC PIPE


FIBER ENTRANCE JUNCTION BOX
HCMD
TELECOM BOARD
FEJB
152.4 MM PVC PIPE
TO BLDG 1
STRAPS
152.4 MM PVC PIPE


JUNCTION BOX/JB
10/6 MM SMD
10/6 FLEX PORT FITTING
ENTER/EXIT PLATE
JB
FIBER SERVICE LOOP
8.5/6 MM 24 WAY HCMD

FieldShield®
Pushable Optical Fiber

CLEARFIELD

Application

Designed to simplify the placement of fiber, FieldShield Pushable Optical Fiber reduces the cost of any fiber deployment, while providing industry leading protection when mated with FieldShield Microducts. Pushable Optical Fiber is either pulled or pushed through microduct at turn-up, maximizing installation efficiency. In the event of a later fiber cut, the fiber can be easily pulled from the microduct. The duct is then repaired and a new FieldShield Pushable Assembly is pushed or pulled through the microduct for a fast and cost-effective restoration.

Available in 1, 2, 6, 12, 24 and 48 fiber counts

Description

FieldShield Pushable Optical Fiber is a durable and crush resistant product that is suitable for most indoor or outdoor environments. Manufactured using PBT jacketing, pushable optical fiber offers flexibility as well as resistance to chemicals. FieldShield Pushable Optical Fiber is typically recommended to be used in conjunction with FieldShield Microduct.

Features and Benefits

Integrity

- Available in singlemode
- Supports all industry standard connectors

Protection

- Bend-insensitive (G.657.A2) fiber protects optical signal with minimal to zero attenuation down to a 10 mm radius
- Tough PBT jacketing provides high column strength and low coefficient of friction to maximize push and pull distances
- Lightweight and high crush resistance
- One and two fiber drops protected by water blocking Kevlar strength member
- 6 to 48-fiber utilize water blocking gel

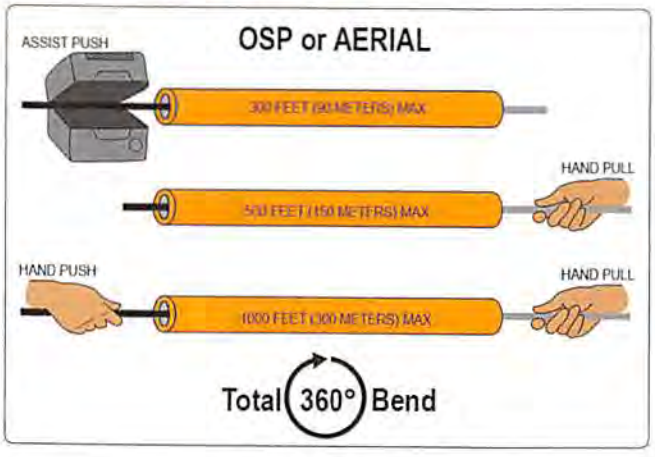
Access

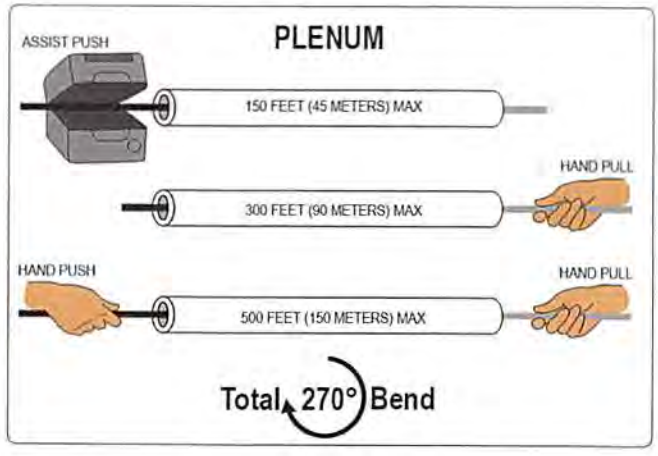
- Standard color is black
- Tech-friendly 250 µm fiber inside the outer jacket reduces splicing steps and installation costs
- Suitable for all types of indoor and outdoor implementations within a microduct

Investment

- Pushes directly into a Clearview® Cassette, FieldShield is optimized for placement alongside Clearfield® FieldSmart® fiber management platforms
- Quick and easy deployment allows capital investment to be aligned to customer take rates
- Available in multiple fiber counts up to 48 fibers

Recommended Push/Pull





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FieldShield®
Pushable Optical Fiber

CLEARFIELD

Technical Specifications

FieldShield Pushable Optical Fiber	
Fiber	Corning ClearCurve Optical Fiber or equivalent
Water Peak	ZWP (Zero Water Peak)
Bend-Insensitive	Bend-Insensitive Fiber G.657.A2
Color Code	TIA/EIA 598 (US Standard)
Fiber Count	Any fiber count up to 48 fibers
Pushable Connectors	FieldShield SC/UPC, SC/APC, Simplex and Duplex LC/UPC, Simplex and Duplex LC/APC, MPO
Standard Connectors	SC/UPC, SC/APC, LC/UPC, LC/APC, FC/UPC, FC/APC, ST/UPC, HFOC SC/APC, MPO
Internal Fiber Size	250 µm
Outside Diameter	1 to 12-fiber : 0.118" (3.0 mm); 24-fiber: 0.156" (3.96 mm); 48-fiber :0.217" (5.51 mm)
Color	Black
Material	PBT
Bend-Radius	10 mm minimum
High Temperature Aging	(-40°C + 85°C) ≤ 0.05 dB/km
Temperature & Humidity Cycling	≤ 0.05 dB/km *(at -10°C to 85°C and 95% RH)*
Water Immersion (23 ± 2°C)	≤ 0.05 dB/km
Operating Temperature	-40°F to 176°F (-40°C to 80°C)
Installation Temperature	-14°F to 158°F (-26°C to 70°C)
Installation Tension	20 lbf for 3 mm; 20 lbf for 4 mm
Markings	Part number, lot number and footage markers every two feet (609.60 mm)

Pre-Configured Part Numbers

Part Number	Description
FS-CA1-001-8ZD-B 01000F	FieldShield boxed Pushable Optical Fiber, 1-fiber (250 µm), singlemode, 3 mm jacket, 1000 feet (305 m)
FS-CA1-001-8ZD-B 02000F	FieldShield boxed Pushable Optical Fiber, 1-fiber (250 µm), singlemode, 3 mm jacket, 2000 feet (610 m)
FS-CA1-001-8ZD-B 03000F	FieldShield boxed Pushable Optical Fiber, 1-fiber (250 µm), singlemode, 3 mm jacket, 3000 feet (914 m)
FS-CA1-001-8ZD-B 05000F	FieldShield boxed Pushable Optical Fiber, 1-fiber (250 µm), singlemode, 3 mm jacket, 5000 feet (1,524 m)
FS-CA1-002-8ZD-B 01000F	FieldShield boxed Pushable Optical Fiber, 2-fiber (250 µm), singlemode, 3 mm jacket, 1000 feet (305 m)
FS-CA1-002-8ZD-B 02000F	FieldShield boxed Pushable Optical Fiber, 2-fiber (250 µm), singlemode, 3 mm jacket, 2000 feet (610 m)
FS-CA1-002-8ZD-B 03000F	FieldShield boxed Pushable Optical Fiber, 2-fiber (250 µm), singlemode, 3 mm jacket, 3000 feet (914 m)
FS-CA1-006-8ZD-B 01000F	FieldShield boxed Pushable Optical Fiber, 6-fiber (250 µm), singlemode, 3 mm jacket, 1000 feet (305 m)
FS-CA1-006-8ZD-B 03000F	FieldShield boxed Pushable Optical Fiber, 6-fiber (250 µm), singlemode, 3 mm jacket, 3000 feet (914 m)
FS-CA1-012-8ZD-B 01000F	FieldShield boxed Pushable Optical Fiber, 12-fiber (250 µm), singlemode, 3 mm jacket, 1000 feet (305 m)
FS-CA1-012-8ZD-B 03000F	FieldShield boxed Pushable Optical Fiber, 12-fiber (250 µm), singlemode, 3 mm jacket, 3000 feet (914 m)
FS-CA1-024-8ZE-B 01000F	FieldShield boxed Pushable Optical Fiber, 24-fiber (250 µm), singlemode, 4 mm jacket, 1000 feet (305 m)
FS-CA1-024-8ZE-B 02000F	FieldShield boxed Pushable Optical Fiber, 24-fiber (250 µm), singlemode, 4 mm jacket, 2000 feet (610 m)
FS-CA1-024-8ZE-B 05000F	FieldShield boxed Pushable Optical Fiber, 24-fiber (250 µm), singlemode, 4 mm jacket, 5000 feet (1,524 m)
FS-CA1-048-8ZF-B 01500F	FieldShield boxed Pushable Optical Fiber, 48-fiber (250 µm), singlemode, 5.5 mm jacket, 1500 feet (457 m)
FS-CA1-048-8ZF-B 02500F	FieldShield boxed Pushable Optical Fiber, 48-fiber (250 µm), singlemode, 5.5 mm jacket, 2500 feet (762 m)

YOURx™
YOURx-TAP

CLEARFIELD

Application

The YOURx-TAP provides a secure demarcation point between the service provider network and multiple customer environments – SFU, MDU or business. YOURx-TAP gives the network service provider both the ability to store slack fiber as well as provide a test access point (TAP) for ease of deployment and network maintenance without needing to have access to the interior of the customer premise. With the ability to accept a variety of drop cables, YOURx-TAP can be wall or pole mounted, and can be integrated into any network architecture and deployment.

Description

Slack storage of excess fiber has always been an issue within network design and deployment. The YOURx-TAP, with the smallest demarcation footprint in the industry, provides the ability to store up to 600 feet (182.88 m) of slack fiber storage (300 feet - 91.44 m per reel) using the FieldShield® Deploy Reel with 900 µm FieldShield StrongFiber®. This eliminates the need for having a large, bulky and unsightly box on the side of an SFU, MDU or business location, to store excess or unused fiber.

With its hinged removable cover design, YOURx-TAP is easily accessible for craft personnel to access the box during both initial service installation and ongoing maintenance. FieldShield Deploy Reels are easily installed into YOURx-TAP by simply snapping them onto the post bracket that is mounted inside the box. Each post bracket has a built-in feature that locks the deploy reel in place once the fiber has been pulled to the specified location.

Once mounted inside the box, the StrongFiber Deploy Reels are deployed by using a pull string to pull fiber from the bottom reel back through the 10 mm FieldShield Duct and connect it to the distribution/access point. Bringing fiber to the inside of the customer location is accomplished by using the top reel and pulling it to the desired location. Either 900 µm StrongFiber (with a ducted pathway) or 3 mm FLEXdrop™ fiber can be used for this internal application.

Drop Cable Options

Clearfield® recognizes the fact that flat drop connectivity in the last mile is a widely-used product and is a good solution for both direct buried and aerial drop applications. Listening to our customers' requests, **FieldShield FLATdrop** was developed and designed to fit into YOURx-TAP. FieldShield FLATdrop cable assemblies come pre-terminated from the factory and are available in multiple lengths. Cable assemblies are placed and brought to YOURx-TAP, where the connector is snapped into place on the bottom of the box, providing an air/water tight connection.

FieldShield D-ROP is the cable-in-conduit solution and the name stands for "restorable one pass" drop. It is a fiber pre-placed in a 7 mm O.D. microduct that reduces the traditional FieldShield solution from a two-step process to a one-step process. Rather than establish the route path of the duct and then push the FieldShield pre-terminated drop to the customer as a second step, D-ROP combines these two functions into one. Distance limitations are no concern when using D-ROP as the pre-terminated fiber is already installed.

FieldShield FLEXdrop provides all the same characteristics as current 3 mm pushable/pullable FieldShield Fiber, with increased flexibility and reduced jacket memory, providing better slack storage and routing while decreasing the risk of kinking. UL listed cable can be routed, without protection of duct, into the inside premise through walls, stapled and/or applied using local contractor accepted practices. FLEXdrop can be used with YOURx-TAP and deploy reels for connectivity to the terminal as well as for final connectivity inside the premise at the ONT or fiber jack/demarcation.

FieldShield StrongFiber is a durable high tensile strength fiber when compared to other fibers of its size. It is suitable for both indoor and outdoor environments. Manufactured with premium bend-insensitive fiber, FieldShield StrongFiber offers high tensile strength to resist damage to the fiber during installation in the FieldShield Microducts. When terminated with a FieldShield Pullable Connector, the FieldShield StrongFiber can be quickly deployed, and in turn, reduces installation time drastically.

FieldShield Pushable Optical Cable is a durable and crush-resistant product that is suitable for most indoor or outdoor environments. Manufactured using PBT jacketing, FieldShield offers maximum push/pull distance as well as resistance to chemicals.

Clearfield highly recommends a ducted solution when deploying FieldShield FLEXdrop, StrongFiber and FieldShield Pushable Fiber.

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YOURx™
YOURx-TAP

CLEARFIELD

YOURx-TAP has been designed with maximum customer flexibility in mind. YOURx-TAP is available:

- Empty (for future fiber deployment)
- With L-Bracket that holds single fiber adapter
- With one or two FieldShield® Deploy Reels – each holding up to 300 feet (91.44 m) of 900 µm StrongFiber
- With Multiple Drop Options
  - FieldShield StrongFiber
  - FieldShield FLATdrop
  - FieldShield FLEXdrop™
  - FieldShield Pushable/Pullable Fiber
- Two insertable/interchangeable cable entrance plates are incorporated into the bottom of the box
  - Plate with couplers for bringing in one or two 10 mm FieldShield Microduct or FieldShield FLATdrop assemblies
  - Blank plate - providing multiple cable, duct and connector feed options into the YOURx-TAP
- Access port on rear of box, allows for direct fiber deployment into the customer location
- Available with optional private labeling on the front cover to easily identify service provider's identification

Designed for all environments, the YOURx-TAP has a gasketed cover, watertight duct fittings and is made from impact and UV resistant PBT and PC material. Clearfield® optical fiber terminations have been tested compliant to GR-326 requirements with certification currently pending through Telcordia.

Features and Benefits

Integrity

- Terminations are designed and tested to Telcordia GR-326
- Supports singlemode SC connectors
- 100% performance tested for insertion loss, return loss and final mechanical inspections
- Small footprint

Protection

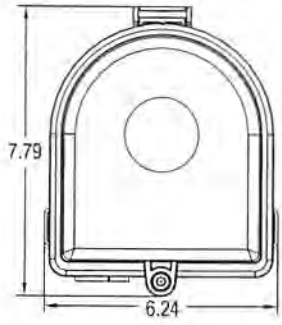
- Designed to meet NEMA 4 criteria
- Gasketed cover for protection from elements
- Watertight connectors for sealing of duct
- Pin in hex screw for reduced tampering
- Enclosure made of high-impact UV resistant thermal plastic material - to resist and withstand corrosive environments

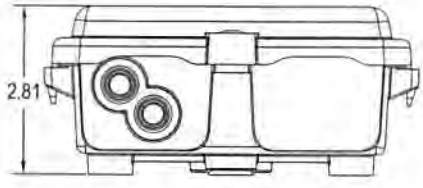
Access

- Accepts multiple drop options for maximum flexibility
- Removable hinged cover allows for easy access to closure
- Available with up to two deploy reels
- Lockable Pins hold deploy reels in place once fiber is deployed
- Available in SC/APC, SC/UPC
- Wall and pole mount applications available

Investment

- Available with pre-terminated deploy reels, which minimizes splicing and connectorization field costs
- Can add reels after box has been installed
- Available all hours of the day, without customer needing to be there to identify potential problems





Technical Specifications

YOURx-TAP	
Dimensions	7.8" H x 6.25" W x 2.81" D (198.12 mm x 158.75 mm x 71.37 mm)
Box Options/Connector Availability/Capacity	Empty, no deploy reels With L-Bracket that holds single fiber adapter One or two StrongFiber Deploy Reels: SC/APC or SC/UPC with up to 300 feet (91.44 m) of 900 µm StrongFiber Empty Reel available for slack storage of FLATdrop or FLEXdrop™
Drop Options/Connector Types	StrongFiber Deploy Reels: SC/APC or SC/UPC FieldShield® FLATdrop: with hardened connector FieldShield D-ROP: Cable-in-conduit FieldShield FLEXdrop FieldShield Pushable Fiber
Cable Entrance/Exit	One or two 10 mm YOURx FlexPort Empty plate, allows for other industry connectors to be installed
Private Labeling	Standard: comes with Clearfield® logo No logo Private labeling available (500 piece minimum). Contact Clearfield sales representative for details.
Mounting Options	Wall or pole mount

Configured Part Numbers

TAPX - ___ ___ ___ - ___ ___ ___ ___ - ___ ___ ___ ___

Bottom Reel (Typically Feeder) — Top Reel (Typically Distribution)

1 2 3 4 5 6 7 8 9 10 11

1 Select Box Type
A = 1 StrongFiber Deploy Reel
B = 2 StrongFiber Deploy Reels
C = 2 reels (1 StrongFiber Deploy and 1 TAP Slack Storage Reel)
D = 2 reels (1 SRD Reel with adapter; 1 StrongFiber Deploy)
E = 2 reels (1 SRD Reel with adapter; 1 TAP Slack Storage Reel)
M = Box with L Bracket and SCA Adapter (No Reels)
Z = Empty

2 Select Logo Type
A = CLFD logo
B = No logo
C = Private label - Custom logo (500 piece min.)

3 Select Cable Entrance Plates
A = Default – includes 1 blank and 1 dual entrance plate
B = Includes 2 dual entrance plates
C = Includes 2 blank plates

4 Select Connector 1 (inside plugged into adapter)
A = SC/UPC - Standard
C = SC/APC - Standard
Z = No connector – empty reel. Choose this when FLATdrop or D-ROP is used for feeder.

5 Select Connector 2 (take off end)
B = SC/UPC – Pullable
D = SC/APC – Pullable
Z = No connector

6 Select Fiber Type
S = StrongFiber
Z = No fiber

7 Select Reel 1 Length - Feet

2 = 50 (15.24 m)	8 = 200 (60.96 m)
3 = 75 (22.86 m)	9 = 225 (68.58 m)
4 = 100 (30.48 m)	A = 250 (76.20 m)
5 = 125 (38.10 m)	B = 275 (83.82 m)
6 = 150 (45.72 m)	C = 300 (91.44 m)
7 = 175 (53.34 m)	Z = No Fiber

8 Select Connector 1 (inside plugged into adapter)
A = SC/UPC – Standard
C = SC/APC – Standard
Z = No connector – empty reel

9 Select Connector 2 (take off end)
B = SC/UPC - Pullable
D = SC/APC - Pullable
Z = No Connector

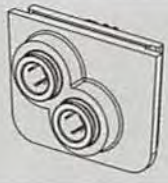
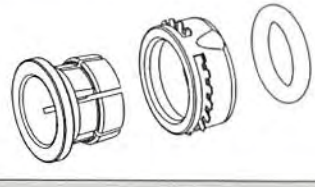
10 Select Fiber Type
S = StrongFiber
Z = No Fiber

11 Select Reel 1 Length - Feet

2 = 50 (15.24 m)	8 = 200 (60.96 m)
3 = 75 (22.86 m)	9 = 225 (68.58 m)
4 = 100 (30.48 m)	A = 250 (76.20 m)
5 = 125 (38.10 m)	B = 275 (83.82 m)
6 = 150 (45.72 m)	C = 300 (91.44 m)
7 = 175 (53.34 m)	Z = No Fiber

NOTE: Pin-in-hex screw bit (015075) is not included and needs to be ordered seperately as a special item

Pre-Configured Part Numbers

Part Number	Description	Image
018458	Kit - L Bracket and SC/APC Adapter	
SRD-CZZZ-ZZZ	Empty StrongFiber Deploy Reel with SC/APC Adapter	
SRD-AZZZ-ZZZ	Empty StrongFiber Deploy Reel with SC/UPC Adapter	
TAP-REEL-EMPTY	Empty slack storage reel for YOURx-TAP, includes mounting pin, holds up to 50 feet (15.24 m) of FLEXdrop™	
018041	Blank plate	
018250	Plate with two 10 mm YOURx FlexPorts	
016280	10 mm YOURx FlexPort	
015075	Single hex bit insert for securing the pin-in-hex screw on YOURx-TAP	

YOURx™
Flex Box

CLEARFIELD

Application

Carriers are faced with many challenges when cabling MDUs in both existing (brownfield) and new construction (greenfield). One such challenge is how to manage incoming duct, while supporting varying number of subscribers in different configurations with slack management while also reducing installation time. Clearfield's patent-pending YOURx Flex Box addresses these challenges with a flexible and scalable solution all within a single wall box.

Flex Box with Clearview Blue

Description

The YOURx Flex Box is a secure, modular wall box with slide-in aggregator plate that supports multiple cable entries like, individual fiber cables, conduit and microduct in an organized manner. Installers simply push the microduct into the aggregator plate and they are ready to pull fiber. Slack storage is provided for both incoming and outgoing fiber in separate areas to reduce service interruptions when turning up additional subscribers. The drop wheel feature accommodates up to 16 individual drop wheel assemblies with each drop wheel supporting up to a 200' (60.96 m) of FieldShield® StrongFiber storage. The SmartRoute Plate can also be mounted in the Flex Box, providing spool technology and MPO connectorization. Using the Clearview® Cassette, Drop Wheel assembly or SmartRoute Plate allows for a plug-and-play concept which reduces installation time.

Flex Box with Drop Wheel

Features and Benefits

Integrity

- Utilizes the Clearview Blue Cassette, Clearview xPAK and FieldShield Drop Wheel
- 1" inside mounting hole pattern for multiple applications
- Dual snap ensures lid secures to box

Protection

- Security screw with ability to secure with padlock
- Gasket seal
- Grounding lug included

Access

- Internal mounting holes for easy installation
- Top and bottom entry/exit points
- Reversible door allows for dual direction mounting

Investment

- Scalable
- Slide-in aggregator plates eliminate the need for additional duct organizer
- Clearview Cassette, Clearview xPAK, Drop Wheel or SmartRoute Plate

Combo Plate Includes 3/4" (19.05 mm) Connector

Duct Plate

Cradle Assembly

Individual Drop Wheel

Cradle Assembly with Drop Wheels Installed

PON Plate Includes 1/2" (12.70 mm) Connector

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YOURx™
Flex Box

CLEARFIELD

Technical Specifications

YOURx Flex Box	
Dimensions	15.66" H x 12.00" W x 5.38" D (397.76 mm x 304.80 mm x 136.65 mm)
Material	UV rated, flame retardant, V0 rated
Port Density	Two cassettes (24 ports), up to 16 in drop wheel, SmartRoute Plate 24 port
Connectivity Types	Clearview® Blue, Clearview xPAK, Drop Wheel, SmartRoute Plate
Aggregator Plate	Duct Plate supports (24) 10/6 mm and (2) 14/10 mm Microduct Combo Plate supports (24) 10/6 mm Microduct
Drop Wheel	Fiber type - FieldShield® StrongFiber
Drop Wheel Connector	Pullable SC/APC and SC/UPC to standard SC/APC and SC/UPC
Drop Wheel Cable Length	200 feet (60.96 m) FieldShield StrongFiber
Drop Wheel Material	Black Thermoplastic

Configured Part Numbers

W S ___ - ___ ___ ___ - ___ ___ ___ - ___ Z Z ___ ___ ___ ___

[1] [2] [3] [4] [5] [6] [7]

[1] Select Module Type

B = Cassette
N = Cassette with Male MPO
M = Drop Wheel with Male MPO (Includes Drop Wheel)
S = Drop Wheel with Splitter (Includes Drop Wheel)
C = Cradle Assembly with MPO (Male) (No Drop Wheels)
E = Cradle Assembly with Splitter (No Drop Wheels)

[2] Select Port Count

If Cassette:
012 = 12 ports
024 = 24 ports
If Drop Wheel:
004 = 4 ports
008 = 8 ports
012 = 12 ports
016 = 16 ports

[3] Select Connector Type

If Cassette:
A = SC/UPC
C = SC/APC
F = LC/UPC
H = LC/APC
If Drop Wheel:
A = SC/UPC
C = SC/APC

[4] Select Mode and Type (Inside Cassette or Drop Wheel)

0 = Cradle Assembly (No Drop Wheels)
1 = Singlemode Non-ribbon (For Drop Wheel, Cassette or MPO)
2 = Singlemode Ribbon (Patch and Splice Only)

[5] Select Jacket Construction (Inside Cassette or Drop Wheel)

F = Loose Tube Patch and Splice (For Cassette Only)
S = StrongFiber (For Drop Wheel Only)
Z = None (Ribbon Patch and Splice) (For Cassette Only)

[6] Select Aggregator Plate Type

C = Combo Plate *Includes 10/6 mm FlexPort fitting and One Sealcon Connector
D = Duct Plate *Includes 10/6 mm and (1) 14/10 mm FlexPort fitting

** 10/6 mm FlexPorts will match the port count selected in #2.*

[7] Select Length of Fiber

If Cassette or Drop Wheel Cradle = Leave Blank
200F = Drop Wheel Assembly

Pre-Configured Part Numbers

Flex Box Loaded With FlexPort Fittings

Part Number	Description
FDP-xWBF-CPLATE-24	Flex Box loaded with (24) 10/6 mm FlexPort fittings in combo plate with cable management
FDP-xWBF-DPLATE-24	Flex Box loaded with (24) 10/6 mm FlexPort fittings in duct plate and (1) 14/10 mm shipped along with cable managemen
FDP-xWBF-PPLATE-32	Flex Box loaded with (32) 10/6 mm FlexPort fittings in PON plate and (1) sealcon connector

Flex Box Empty Without FlexPort Fittings

Part Number	Description
FDP-xWBF-CPLATE	Empty Flex Box with combo plate and cable management. No FlexPort fittings
FDP-xWBF-DPLATE	Empty Flex Box with duct plate and cable management. No FlexPort fittings

Pre-Configured Part Numbers

Individual Drop Wheel

Part Number	Description
DW-001-SCU-SCU 200F	Drop wheel, loaded with loaded with 200 feet (60.96 m) FieldShield StrongFiber, terminated with pullable SC/UPC to SC/UPC connectors
DW-001-SCA-SCA 200F	Drop wheel, loaded with loaded with 200 feet (60.96 m) FieldShield StrongFiber, terminated with pullable SC/APC to SC/APC connectors

Accessories

Part Number	Description
016280-06	FlexPort Fitting, 10 mm, Quantity - 6
016280-12	FlexPort Fitting, 10 mm, Quantity - 12
018107	FlexPort Fitting, 14 mm, Quantity - 1
018664	Plug, FlexPort, 10 mm
018665	Plug, FlexPort, 14 mm

Configured Part Numbers - SmartRoute Plate

(Order Empty Flex Box and FlexPort Fittings)

S R P - ___ ___ ___ ___ - ___ ___ ___ ___
[1] [2] [3] [4] [5] [6] [7] [8]

[1] Select Front Connector Type
A = SC/UPC
C = SC/APC
F = LC/UPC
H = LC/APC

[2] Select Cable Type
1 = SM stranded non-ribbon, plenum rated
3 = MM stranded non-ribbon, plenum rated

[3] Select Cable Construction
Y = IFC Plenum
W = FieldShield

[4] Select Number of Fibers
1 = 12 Fibers
3 = 6 Fibers

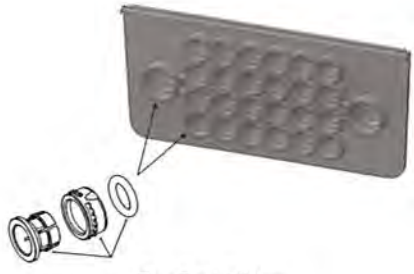
[5] Select Rear Connector Type
A = SC/UPC
C = SC/APC
F = LC/UPC
H = LC/APC
N = MPO Male Pushable
P = MPO Female Pushable
Z = None

[6] Select Rear Breakout
B = 1 meter
C = ½ meter
Z = None

[7] Select Rear Upjacketing
A = 900 µm
B = 2mm
Z = None

[8] Select Length
1 = 25 feet (7.62 mm)
2 = 50 feet (15.24 mm)
3 = 75 feet (22.86 mm)
4 = 100 feet (30.48 mm)
5 = 125 feet (38.10 mm)
6 = 150 feet (45.72 mm)
7 = 175 feet (53.34 mm)
8 = 200 feet (60.94 mm)

Individual Drop Wheel



FlexPort Fitting

SmartRoute Plate

FieldShield®

Riser Rated 10/6 mm Microduct

CLEARFIELD

Application

Simplifying the placement of fiber, while providing protection for all indoor elements, FieldShield Riser Rated 10/6 mm Microduct is specifically designed for applications requiring small pathways in confined spaces. Rugged crush resistance protects FieldShield Riser Rated 10/6 mm Microduct from the rigors of all industry standard deployment methods, while the rigid column strength allows microducts to be deployed through occupied duct previously thought to be exhausted. Riser Rated 10/6 mm Microduct has an outer diameter of 10 mm and an inner diameter of 6 mm.

Description

FieldShield Riser Rated 10/6 mm Microduct is a durable, crush resistant micro-conduit designed to increase the protection of fiber while decreasing installation and maintenance expenses. Manufactured using high density thermoplastic, FieldShield Riser Rated Microduct offers superior durability and protection.

Features and Benefits

Integrity

- Compliant to Telcordia GR-3155
- UL-2024 listed

Protection

- Quick and easy to install
- Riser Rated 10/6 mm Microduct has high tensile strength and crush resistance
- Designed for applications designated as riser air space

Access

- Industry standard beige provides high visibility for indoor installation applications in existing conduit and by itself
- Standard nylon pull string simplifies deployment of fiber
- Smooth core slip lining reduces drag co-efficient enabling fiber to be pushed or pulled with minimal resistance

Investment

- Maximizes capacity of existing conduit previously considered exhausted
- Provides industry leading protection for any indoor riser rated application

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FieldShield®

Riser Rated 10/6 mm Microduct

CLEARFIELD

Technical Specifications

FieldShield Riser Rated 10/6 mm Microducts	
Length	2,000 feet (609.60 m) per spool (-0 / +5%)
Outside Diameter	0.394" (10.01 mm)
Inside Diameter	0.246" (6.25 mm)
Wall Thickness	0.074" (1.88 mm)
Slip Layer	Minimum 0.004" (0.102 mm)
Ovality	≤ 5%
Installation Tension	340 lbf
Minimum Bend-Radius	132.08 mm/5.2" radius
Material	Thermoplastic
Operating Temperature	-40°F to 176°F (-40°C to 80°C)
Installation Temperature	-14°F to 158°F (-26°C to 70°C)
Color	White
Markings	Part number, lot number, footage markers every two feet (609.60 mm)
Spool Size	12" ID x 24" OD x 14" W (304.80 mm x 609.60 mm x 355.60 mm)
Weight	84 lbs

Pre-Configured Part Numbers

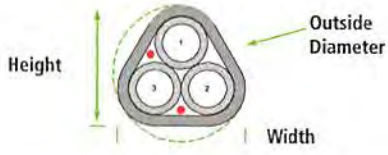
Part Number	Description
FS-DCR-NT-610-PS-2000F	FieldShield Microduct, 10 mm, riser, non-toneable, white, 2,000 foot (609.60 m) spool

Enterprise FuturePath MicroDuct System—8.5 mm/6 mm

FuturePath 24-Way Configuration

MicroDuct Specifications

PARAMETER	VALUE
OD	8.5 mm ± 0.10 (0.335" ± 0.004")
Wall Min.	1.14mm (0.045")
Wall Max.	1.24mm (0.049")
ID Min.	5.92mm (0.233")
Materials	HDPE, Riser, Plenum, LSHF, Armored
Fiber Count	6, 12, 24, 48, 72, 96 strand MicroCable SM, MM
Shipping Length (in feet per reel)	1,000 2,500 4,000 5,000 6,000 Custom lengths available



Outside Dimensions: Height x Width

Outside Diameter: Used to Calculate Fill Ratios

FuturePath Mechanical Specifications

	CONFIGURATION						
PARAMETER	2-WAY	3-WAY	4-WAY	7-WAY	12-WAY	19-WAY	24-WAY
Outside Dimensions HxW (inches)	0.44/0.77	0.75/0.79	0.79/0.93	1.04/1.13	1.33/1.46	1.62/1.80	1.62/2.13
Outside Dimensions HxW (mm)	11.2/19.7	19.0/20.2	20.2/23.7	26.4/28.7	33.8/37.2	41.1/45.7	41.1/54.2
Outside Diameter (inches)	0.77	0.85	0.93	1.13	1.48	1.80	2.13
Outside Diameter (mm)	19.7	21.5	23.7	28.7	37.7	45.7	54.2
Over-Sheath Thickness	0.050"	0.060"	0.060"	0.060"	0.060"	0.060"	0.060"
HDPE Over-Sheath Color	Orange	Orange	Orange	Orange	Orange	Orange	Orange
Rated Over-Sheath Color	Natural	Natural	Natural	Natural	Natural	Natural	Natural
MicroDuct	Natural	Natural	Natural	Natural	Natural	Natural	Natural
HDPE Locate Wire (optional)	20 ga.	20 ga.	20 ga.	20 ga.	20 ga.	20 ga.	20 ga.
Rated Locate Wire	No	No	No	No	No	No	No
Ripcords	2	2	2	2	2	2	2
Bend Radius Supported	5"	8"	8"	11"	14"	16"	16"
Bend Radius Un-Supported	10"	16"	16"	22"	28"	32"	32"

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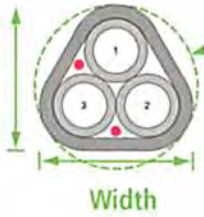
Enterprise FuturePath MicroDuct System—8.5 mm/6 mm (cont.)

Ordering Information

DESCRIPTION	DURA-LINE NO.				
	1000 FT	2500 FT	4000 FT	5000 FT	6000 FT
8.5 mm x 6 mm 1-way HDPE	10005861	—	—	—	—
8.5 mm x 6 mm 2-way HDPE	10004625	10008884	—	10004624	—
8.5 mm x 6 mm 3-way HDPE	10004654	10008885	—	10008886	—
8.5 mm x 6 mm 4-way HDPE	10004655	10004656	—	10008887	—
8.5 mm x 6 mm 7-way HDPE	10004659	10004874	—	—	10008888
8.5 mm x 6 mm 12-way HDPE	10004662	10004663	—	—	10004664
8.5 mm x 6 mm 19-way HDPE	10004665	10008882	—	—	10006770
8.5 mm x 6 mm 24-way HDPE	10004668	10008883	—	—	10004669
8.5 mm x 6 mm 1-way Riser	10008758	—	—	—	—
8.5 mm x 6 mm 2-way Riser	10004866	10004586	—	10008986	—
8.5 mm x 6 mm 3-way Riser	10008987	10008988	—	10008989	—
8.5 mm x 6 mm 4-way Riser	10004591	10004867	—	10008990	—
8.5 mm x 6 mm 7-way Riser	10004592	10008992	—	—	10004594
8.5 mm x 6 mm 12-way Riser	10004596	10008979	—	—	10008980
8.5 mm x 6 mm 19-way Riser	10004599	10008981	—	—	10008982
8.5 mm x 6 mm 24-way Riser	10004601	10008984	—	—	10008985
8.5 mm x 6 mm 1-way LSHF					
8.5 mm x 6 mm 2-way LSHF	10008934	10008935	—	10008936	—
8.5 mm x 6 mm 3-way LSHF	10008937	10008938	—	10008939	—
8.5 mm x 6 mm 4-way LSHF	10008940	10008941	—	10008942	—
8.5 mm x 6 mm 7-way LSHF	10008943	10008944	—	—	10008945
8.5 mm x 6 mm 12-way LSHF	10008925	10008926	—	—	10008927
8.5 mm x 6 mm 19-way LSHF	10008928	10008929	—	—	10008930
8.5 mm x 6 mm 24-way LSHF	10008931	10008932	—	—	10008933
8.5 mm x 6.7 mm 1-way Plenum	10008755	—	—	10008755	—
8.5 mm x 6.7 mm 2-way Plenum	10004851	10010091	—	10010093	—
8.5 mm x 6.7 mm 3-way Plenum	10008950	10010095	—	10010096	—
8.5 mm x 6.7 mm 4-way Plenum	10004853	10010092	—	10010094	—
8.5 mm x 6.7 mm 7-way Plenum	10004856	10010097	—	10010098	—
8.5 mm x 6.7 mm 12-way Plenum	10004857	10010099	—	10010100	—
8.5 mm x 6.7 mm 19-way Plenum	10004858	10010101	—	10010102	—
8.5 mm x 6.7 mm 24-way Plenum	10004859	10010103	—	10010104	—
8.5 mm x 6 mm 4-way Armored	—	—	10004888	—	—
8.5 mm x 6 mm 7-way Armored	—	—	10004889	—	—
8.5 mm x 6 mm 19-way Armored	—	—	10004890	—	—

Specification Notes:



SWPS (Safe Working Pull Strength)*:
Calculated at 80% of maximum tensile strength.

Outside Dimensions: Height x Width

Outside Diameter: Used to Calculate Fill Ratios When Placing Into Larger Conduit

Bend Radius Definitions:
During installation, use the Unsupported Bend Radius guidelines (20 times the bend radius). After installation, use the Supported Bend Radius guidelines (10 times the bend radius). Large, sweeping bends increase fiber installation performance.

FUTUREPATH – 8.5mm/6mm

HDPE MICRODUCT SPECS:	
OD	8.5mm (0.33")
ID Min.	5.9mm (0.23")
Weight (#/ft)	0.018
Min. Bend Radius Sup	3"
Min. Bend Radius Unsup	6"
SWPS*	96 lbs

RISER MICRODUCT SPECS:	
OD	8.5mm (0.33")
ID Min.	5.9mm (0.23")
Weight (#/ft)	0.022
Min. Bend Radius Sup	3"
Min. Bend Radius Unsup	6"
SWPS*	89 lbs

PLENUM MICRODUCT SPECS:	
OD	8.5mm (0.33")
ID Min.	6.7mm (0.26")
Weight (#/ft)	0.024
Min. Bend Radius Sup	3"
Min. Bend Radius Unsup	6"
SWPS*	89 lbs

LSHF MICRODUCT SPECS:	
OD	8.5mm (0.33")
ID Min.	5.9mm (0.38")
Weight (#/ft)	0.021
Min. Bend Radius Sup	3"
Min. Bend Radius Unsup	6"
SWPS*	77 lbs

MATERIALS:

- ☑ HDPE
- ☑ RISER
- ☑ PLENUM
- ☑ LSHF
- ☑ ARMORED

MICRODUCT/FUTUREPATH PACKAGING:

- Up to 6,000' per reel
  Custom lengths available
- MicroDucts consecutively numbered and printed every 2 inches

FIBER:

Fiber Count: 6, 12, 24, 36, 48, 72 & 96 (SM) strand MicroCable
SM, MM
Fibers up to 4.5mm OD

Specifications 8.5/6mm	2-Way	3-Way	4-Way	7-Way	12-Way	19-Way	24-Way
Outside Dimensions HxW (inches)	0.44/0.77	0.75/0.79	0.79/0.93	1.04/1.13	1.33/1.46	1.62/1.80	1.62/2.13
Outside Diameter (inches)	0.77	0.85	0.93	1.13	1.48	1.80	2.13
OSP Locate Wire	20 ga.	20 ga.	20 ga.	20 ga.	20 ga.	20 ga.	20 ga.
Ripcords	2	2	2	2	2	2	2
MicroDuct Color	Natural	Natural	Natural	Natural	Natural	Natural	Natural
Standard Colors (Custom Available):							
OSP Over-Sheath Color	Orange	Orange	Orange	Orange	Orange	Orange	Orange
Rated Over-Sheath Color	Natural	Natural	Natural	Natural	Natural	Natural	Natural
Min. Bend Radius Sup (inches)	5	8	8	11	14	16	16
Min. Bend Radius Unsup (inches)	10	16	16	22	28	32	32
Safe Working Pull Strength (SWPS)*							
HDPE (lbs)	404	593	733	1,112	1,727	2,528	3,099
Riser (lbs)	419	615	749	1,119	1,724	2,502	3,050
Plenum (lbs)	377	508	626	1,057	1,644	2,552	3,111
LSHF (lbs)	354	518	634	951	1,461	2,127	2,593

ENTERPRISE PLENUM FUTUREPATH – 8.5mm/6mm (6.7mm)

MICRODUCT SPECIFICATIONS:

OD	8.5mm ± 0.10 (0.335" ± 0.004")
Wall Min.	0.76mm (0.03")
Wall Max.	0.86mm (0.03")
ID Min.	6.7mm (0.26")

FIBER:

Fiber Count: 2, 6, 12, 24, 48 , 72 strand eABF MicroCable
SM, MM – OM-1, OM-2, OM-3, OM-4

SHIPPING LENGTH – FEET PER REEL:

1,000'
Custom Lengths Available

HDPE INSTALLATION TEMPERATURE SPECS:

MINIMUM TEMPERATURE: -30°F (-34°C)
MAXIMUM TEMPERATURE: +165°F (+74°C)

SPECIFICATIONS:

All Conduits produced to: GR-3155-CORE
All Fiber Optic Cable produced to: GR-409-CORE

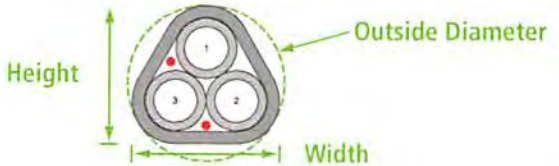
ETL Listed to UL 2024 & CSA C22.2 No.262-04

STANDARD FEATURES:

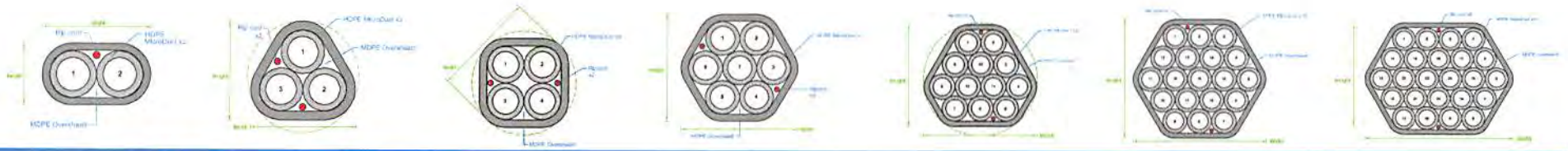
Over-Sheath/MicroDuct Color: Opaque White
Ripcords: 1 per 2-way; 2 all others

Outside Dimensions: Height x Width

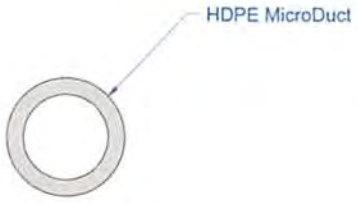
Outside Diameter: Used to Calculate Fill Ratios



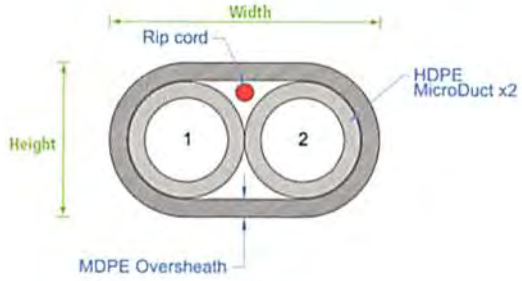
	2-Way	3-Way	4-Way	7-Way	12-Way	19-Way	24-Way
Outside Dimensions HxW (inches) Outside Dimensions HxW (mm)	0.38/0.71 9.5/18.0	0.67/0.71 17.0/18.1	0.71/0.85 18.1/18.1	0.97/1.06 24.5/26.8	1.26/1.39 32.0/35.4	1.56/1.74 39.6/44.2	1.52/2.07 38.6/52.7
Outside Diameter (inches/mm)	0.71/18.0	0.77/19.5	0.85/21.7	1.06/26.8	1.41/35.7	1.74/44.2	2.07/52.7
Weight/Foot (lbs)	0.076	0.106	0.134	0.229	0.369	0.577	0.713
Safe Working Pull Strength (lbs)	377	508	626	1,057	1,644	2,552	3,111
Over-Sheath Thickness	0.020"	0.020"	0.020"	0.025"	0.025"	0.030"	0.030"
Bend Radius – Supported (inches)	7	7	8	10	14	16	16
Bend Radius – Unsupported (inches)	14	14	16	20	28	32	32
Length: 1,000 ft	PART # 10004851	PART # 10008950	PART # 10004853	PART # 10004856	PART # 10004857	PART # 10004858	PART # 10004859



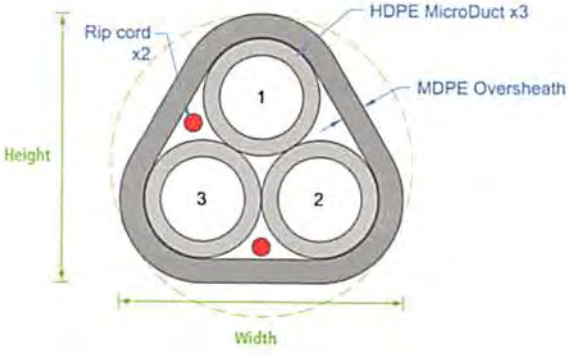
FUTUREPATH Configurations



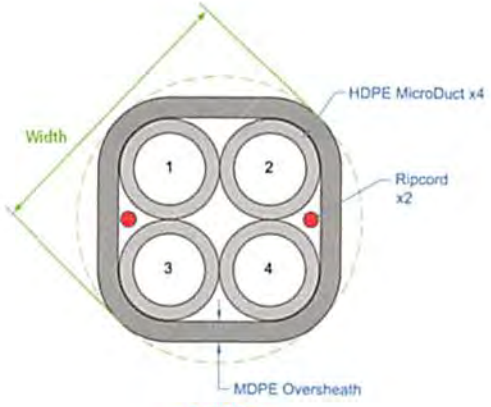
Individual



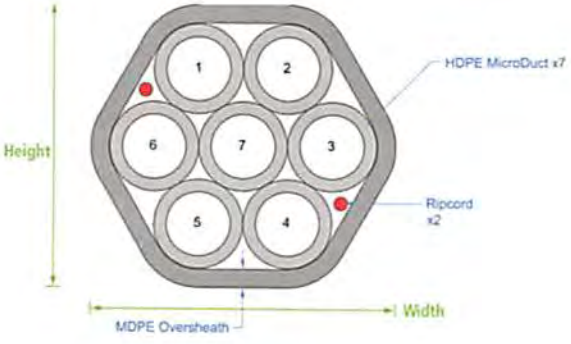
2-Way



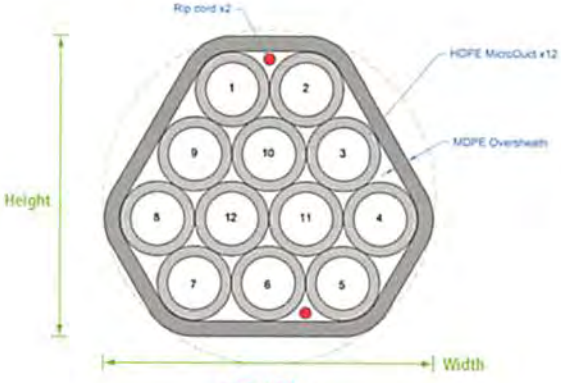
3-Way



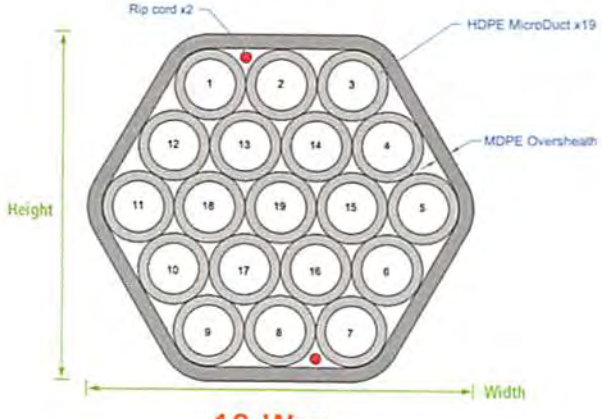
4-Way



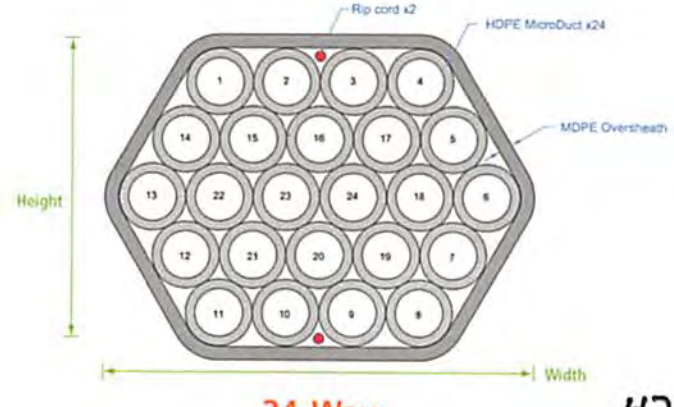
7-Way



12-Way



19-Way



24-Way

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Plumett UltimaZ P2P-V20 Model

MicroJet PR-196 Model

MiniJet Pneumatic-Drive Model

Cable Jetting Equipment

Plumett UltimaZ P2P-V20

The UltimaZ® P2P-V20 is ideal for pushing and jetting Enterprise MicroCables and ABF cables into standard or riser-rated single, or bundled FuturePath MicroDuct products. It is powered by common electric corded and cordless drills. The UltimaZ can be outfitted with inserts to accept Enterprise MicroDucts (5 mm, 7 mm, 8 mm, 8.5 mm, 12 mm, 12.7 mm OD) and cables ranging from 1 - 4.5 mm OD.

Plumett MicroJet

The MicroJet® PR-196 is ideal for pushing and jetting Enterprise MicroCables and ABF cables into standard or riser-rated single, or bundled FuturePath MicroDuct products. The MicroJet can be outfitted with inserts to accept typical Enterprise MicroDucts (5 mm, 7 mm, 8 mm, 8.5 mm, 12 mm, 12.7 mm OD) and cables ranging from 1 - 8.5 mm OD. Other MicroJet models and inserts available.

Plumett MiniJet

The MiniJet® is ideal for Enterprise applications where larger micro or conventional optical fiber cables are being placed in ducts up to 1.66" (42 mm) OD, or FuturePath and single MicroDuct sections, such as feeder routes between structures in a campus or MDU environment. The MiniJet is a highly versatile jetting machine that is available with a pneumatic drive system.

Specifications

PARAMETER	VALUE		
	PLUMETT ULTIMAZ P2P-V20	PLUMETT MICROJET PR-196	PLUMETT MINIJET
Cable OD	1 mm - 4.5 mm (0.04" - 0.33")	1 mm - 8.5 mm (0.04" - 0.33")	4.0 mm - 16. 0 mm (0.16" - 0.63")
Duct OD	5 mm - 12.7 mm (0.20" - 0.50")	5 mm - 16.0 mm (0.20" - 0.63")	7.0 mm - 42.0 mm (0.28" - 1.65")
Operation	12V – 18V 3/8" cordless drill or standard 3/8" drill	Pneumatic	Pneumatic

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Cable Jetting Equipment

Ordering Information

DESCRIPTION	DURA-LINE NO.
ULTIMAZ P2P-V20—Kit includes: P2P Housing, Variable Drive, Counter, Air Connector (G1/8"), Carrying Case, Tools and Spares	20003753
ORDER SEPARATELY	
Drive Wheel—Fits Cable 3.1 to 3.5 mm (order 2 each)	20001576
Drive Wheel Cable—Fits 3.6 to 4.0 mm (order 2 each)	20001573
Duct Insert P2P 8.5 mm	20003754
Cable Guides P2P 5 mm	20003755
O-Rings—Set of 6 Duct OD 8 mm	20001684
Lip Seal Set Cable—2.4 to 3.3 mm x 7 mm OD	20001647
Lip Seal Set Cable—3.4 to 4.3 mm x 7 mm OD	20003790
OPTIONAL COMPONENTS	
Duct Insert P2P 8.0 mm	20003758
Pressure Wheel—Rubber	20003759
Pressure Wheel—Aluminum	20001690
OPTIONAL 12.7 MM COMPONENTS (All items below needed for 12.7 mm Kit)	
Duct Insert P2P 12.7 mm to 5 mm OD Cable	20003757
O-Rings— Set of 6 12.7 mm P2P	20003756
Lip Seal Set Cable 3.4 to 4.3 mm x 12 mm OD	20001888
Lip Seal Set of 6 Cable 4.4 to 5.3 mm x 12 mm OD	20001642
Air Connection G1/4"	20003791
Nut Collar P2P Large	20003792
MICROJET PR-196 System—Kit includes: PR-196 Unit, Counter, Air Connector, Air Controls, Carrying Case, Tools and Spares	20001659
ORDER SEPARATELY	
Duct Insert Set OD 8.5 mm (3.1-5.6 mm Cable)	20001599
Duct Insert Set OD 12.7 mm (3.0-8.0mm Cable)	20001587
Cable Insert Set Dia. 4-8 mm	20001565
Duct O-Ring for 8 mm	20001668
Duct O-Ring for 12 mm	20001665
Lip Seal Set 3.4-4.3 mm	20001888
Steel Tire with U-Groove 3.1-3.5 mm Cable	20001878
Steel Tire with U-Groove 3.6-4.0 mm Cable	20001890
Duct Clamp Accessory—External	20001582
MINIJET P-01 System—Kit includes: Pneumatic-powered Tractor Drive, Counter, Air Controls, Accessory Case, Storage Box, Tools and Spares	20001661
ORDER SEPARATELY	
Duct Insert Set OD 12.7 mm	20001586
Cable Insert Set Dia. 6-8 mm	20001566
Lip Seal Set for Cable Dia. 7.0-7.5 mm	20001640
Lip Seal Set for Cable Dia. 7.5-8.0 mm	20001641

Additional Jetting Accessories

PRODUCT TYPE	DESCRIPTION	DURA-LINE NO.
Lube Sponge	Spreaders 7 mm for 6 mm ID, 20/PK	20001938
Lube Sponge	Spreaders 12 mm for 10mm ID, 20/PK	20001697
Lubricant	MicroJet Lube, 8 oz. Bottle	20001927
Cable Caps/Tips	Cable Caps 3.5 mm, 10/PK	20001549
Cable Caps/Tips	Cable Caps 4.0 mm, 10/PK	20001554

Spreaders

MicroJet Lube

Cable Cap

Couplers, End Caps and Plugs

Bulkhead Fitting

Gas Block Connector

MicroDuct Round Cutter

MicroDuct Straight Cutter

Accessories

A comprehensive line of Micro Accessories are available to complete your network. With our Enterprise End-to-End Solutions, we offer Micro Couplers, Cross-Connect Cabinets, Splice Closures, Optical Termination Hardware and Tools.

Ordering Information—Accessories

PRODUCT TYPE	DESCRIPTION	DURA-LINE NO.
COUPLERS		
12.7 mm x 12.7 mm	Straight Coupler	20001832
8.5 mm x 8.5 mm	Straight Coupler	20001834
TRANSITIONS		
8.5 mm x 8 mm	Reducer Coupler	20001884
8.5 mm x 5 mm	Reducer Coupler	20001883
8 mm x 5 mm	Reducer Coupler	20003016
10 mm x 8.5 mm	Reducer Coupler	20001881
END CAPS		
12.7 mm	End Cap	20001482
8.5 mm	End Cap	20001819
PLUGS		
12.7 mm	End Plug	20002828
8.5 mm	End Plug (for HDPE and Riser Only)	20001523
BULKHEAD FITTINGS		
12.7 mm	12.7 mm Bulkhead Connector with Lock Ring	20003017
8.5 mm	8.5 mm Bulkhead Connector with Lock Ring	20001712
GAS BLOCK CONNECTORS		
8.5 mm	8.5/6 mm Gas Block Connector for cable 3.3-4.0 mm	20002104
12.7 mm	12.7/10 mmm Gas Block Connector for cable 5 mm - 8 mm	20003363
TOOLS		
Cutter 8-19 mm	MicroDuct Straight Cutter 8-19 mm OD	20001856
Cutter Round	Round MicroDuct Cutter	20001745
Cutter Ratchet	2 in. Ratchet Cutter	20001803
Cutter Ratchet 1-1/2"	1-1/2" Ratchet Cutter	20001923
Slitter	Slitter Longitudinal	20001937
Slitter	Longitudinal Sheath Slitter	20003768
Unlocking Tool	Tool MicroDuct Coupler Collet Unlocking Tool	20001866
CLOSE-DOWN ASSEMBLY		
8.5 mm	CO Close-Down Assembly, 8.5 mm	20003018

Ratchet Cutter

Longitudinal Sheath Slitter

Close-Down Assembly

Accessories (cont.)

Ordering Information—Connectors

PRODUCT TYPE	DESCRIPTION	DURA-LINE NO.
FUTUREPATH ENCLOSURE CONNECTORS		
8.5/6 X 1	Enterprise - FuturePath Enclosure Connector D 8. 5 mm x 1	20003048
8.5/6 X 2	Enterprise - FuturePath Enclosure Connector D 8. 5 mm x 2	20001915
8.5/6 X 3	Enterprise - FuturePath Enclosure Connector D 8.5 mm x 3	20003049
8.5/6 X 4	Enterprise - FuturePath Enclosure Connector D 8.5 mm x 4	20001916
8.5/6 X 7	Enterprise - FuturePath Enclosure Connector D 8.5 mm x 7	20001917
8.5/6 X 12	Enterprise - FuturePath Enclosure Connector D 8.5 mm x 12	20001918
8.5/6 X 19	Enterprise - FuturePath Enclosure Connector D 8.5 mm x 19	20001919
8.5/6 X 24	Enterprise - FuturePath Enclosure Connector D 8.5 mm x 24	20001920
12.7/10 X 1	Enterprise - FuturePath Enclosure Connector D 12.7 mm x 1	20003050
12.7/10 X 2	Enterprise - FuturePath Enclosure Connector D 12.7 mm x 2	20003051
12.7/10 X 3	Enterprise - FuturePath Enclosure Connector D 12.7 mm x 3	20003052
12.7/10 X 4	Enterprise - FuturePath Enclosure Connector D 12.7 mm x 4	20003053
12.7/10 X 7	Enterprise - FuturePath Enclosure Connector D 12.7 mm x 7	20003054

FuturePath Enclosure Connector

FieldShield®
Duct Accessories

CLEARFIELD

Airtight Coupler

Description

Airtight Couplers are designed to provide simple, 2-click plug-and-play joining of microducts, enabling longer runs and safe pushing and pulling performance.

Pre-Configured Part Numbers

Part Number	Description
FS-CPLR-7MM-7MM-10	FieldShield Microduct Airtight Coupler, 7 mm to 7 mm, 10 pack
FS-CPLR-8MM-8MM-10	FieldShield Microduct Airtight Coupler, 8 mm to 8 mm, 10 pack
FS-CPLR-10MM-10MM-10	FieldShield Microduct Airtight Coupler, 10 mm to 10 mm, 10 pack
FS-CPLR-12.7MM-12.7MM-10	FieldShield Microduct Airtight Coupler, 12.7 mm to 12.7 mm, 10 pack
FS-CPLR-14MM-14MM-10	FieldShield Microduct Airtight Coupler, 14 mm to 14 mm, 10 pack

Airtight Transition Coupler

Description

Airtight Transition Couplers are used to join two different sizes of microduct.

Pre-Configured Part Numbers

Part Number	Description
FS-CPLR-8MM-10MM-10	FieldShield Microduct Airtight Transition Coupler, 8 mm to 10 mm, 10 pack
FS-CPLR-10MM-12.7MM-10	FieldShield Microduct Airtight Transition Coupler, 10 mm to 12.7 mm, 10 pack
FS-CPLR-12.7MM-14MM-10	FieldShield Microduct Airtight Transition Coupler,12.7 mm to 14 mm, 10 pack

End Cap

Description

End caps are airtight caps used to keep debris out of the end of the microduct when pulling duct through existing conduit and plowed holes, sealing the end of the conduit temporarily. The end cap is a clear cap that installs much like the couplers providing an airtight seal.

Pre-Configured Part Numbers

Part Number	Description
FS-END-STP-10MM-10	FieldShield Microduct End Caps, 10 mm, 10 pack
FS-END-STP-12.7MM-10	FieldShield Microduct End Caps, 12.7 mm, 10 pack
FS-END-STP-14MM-10	FieldShield Microduct End Caps, 14 mm, 10 pack

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Clearfield

For FieldShield® Microduct and Fiber

Tools and Accessories

Couplers

Part Number	Description
FS-CPLR-7MM-7MM-10	FieldShield Microduct Airtight Coupler, 7 mm to 7 mm, 10 pack
FS-CPLR-8MM-8MM-10	FieldShield Microduct Airtight Coupler, 8 mm to 8 mm, 10 pack
FS-CPLR-10MM-10MM-10	FieldShield Microduct Airtight Coupler, 10 mm to 10 mm, 10 pack
FS-CPLR-12.7MM-12.7MM-10	FieldShield Microduct Airtight Coupler, 12.7 mm to 12.7 mm, 10 pack
FS-CPLR-14MM-14MM-10	FieldShield Microduct Airtight Coupler, 14 mm to 14 mm, 10 pack

Transition Couplers

Part Number	Description
FS-CPLR-8MM-10MM-10	FieldShield Microduct Airtight Transition Coupler, 8 mm to 10 mm, 10 pack
FS-CPLR-10MM-12.7MM-10	FieldShield Microduct Airtight Transition Coupler, 10 mm to 12.7 mm, 10 pack
FS-CPLR-10MM-14MM-10	FieldShield Microduct Airtight Transition Coupler, 10 mm to 14 mm, 10 pack
FS-CPLR-12.7MM-14MM-10	FieldShield Microduct Airtight Transition Coupler,12.7 mm to 14 mm, 10 pack

End Caps

Part Number	Description
FS-END-STP-10MM-10	FieldShield Microduct End Caps, 10 mm, 10 pack
FS-END-STP-12.7MM-10	FieldShield Microduct End Caps, 12.7 mm, 10 pack
FS-END-STP-14MM-10	FieldShield Microduct End Caps, 14 mm, 10 pack

Microduct Repair Kit

Part Number	Description
FS-MD-FLD-RPR-KIT-7MM	FieldShield Microduct Field Repair Kit, 7 mm
FS-MD-FLD-RPR-KIT	FieldShield Microduct Field Repair Kit, 10 mm
FS-MD-FLD-RPR-KIT-14MM	FieldShield Microduct Field Repair Kit, 14 mm

Field Installable FlexConnector

Part Number	Description
FSD-FIFC-4PAK	Field installable FlexConnector in 4 pack
FSD-FIFC-SCA-4PAK	Field installable FlexConnector with splice-on SC/APC connectors, 4 pack

Rotary Cutter

Part Number	Description
FS-TCUT-8-10MM	FieldShield Rotary Duct Cutter, 8 to 14 mm microducts
FS-TCUT-3-4MM	FieldShield Rotary Duct Cutter, 3 to 4 mm jackets

Clearfield
For FieldShield® Microduct and Fiber

CLEARFIELD

Duct Cutter

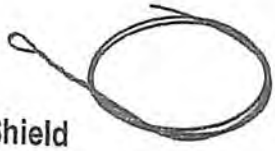
Part Number	Description
FS-DCUT-8-10MM	FieldShield Duct Cutter, 8 to 14 mm microducts

De-Burring Tool

Part Number	Description
FS-MD-DBR-TOOL	FieldShield Microduct De-Burring Tool, 8 mm to 10 mm, blue

Assist Module

Part Number	Description
FS-ASSIST-T	FieldShield, Assist Module, with mounting tripod
FS-ASSIST-KIT-BELT	FieldShield Assist Module, replacement belt kit (includes two belts)
FS-ASSIST-KIT-PLATE	FieldShield Assist Module, replacement wear plate kit (includes two wear plates)



FieldShield Pull Sock

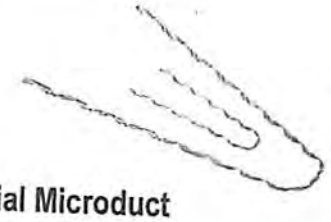
Part Number	Description
FS-PUL-3-4MM	FieldShield Pull Sock, for 3 to 5.5 mm FieldShield Pushable Fiber
FS-PUL-5-9MM	FieldShield Pull Sock, for 5 to 9 mm FieldShield Pushable Fiber

Microduct Pulling Eyes

Part Number	Description
FS-PUL-CRT-6MM-M	FieldShield Microduct Pulling Carrot, 6 mm ID, metal, with string tie on
FS-PUL-CRT-10MM-M	FieldShield Microduct Pulling Carrot, 10 mm ID, metal, with string tie on

Clearfield

For FieldShield® Microduct and Fiber



Aerial Microduct Attachment

Part Number	Description
FS-DEADEND	FieldShield Aerial Microduct Attachment, dead end
FS-DEADEND-AD10	FieldShield Aerial Microduct Attachment, large cable
FS-AERIAL-SPLICE	FieldShield Aerial Microduct Attachment, open wire splice, galvanized, BWG-10 0.134" x 14"

Turn Table

Part Number	Description
FMA-XXX-100	Turn Table, Small, for deploying FieldShield products, 12" base
FMA-XXX-101	Turn Table, Large, for deploying FieldShield products, 24" base

Proofing Mandrels

Part Number	Description
FS-DUCT-PROOFING-TOOL	Includes both 6mm and 10mm proofing mandrels
FS-DUCT- PROOFING-KIT	Includes both proofing mandrels and a spool of string

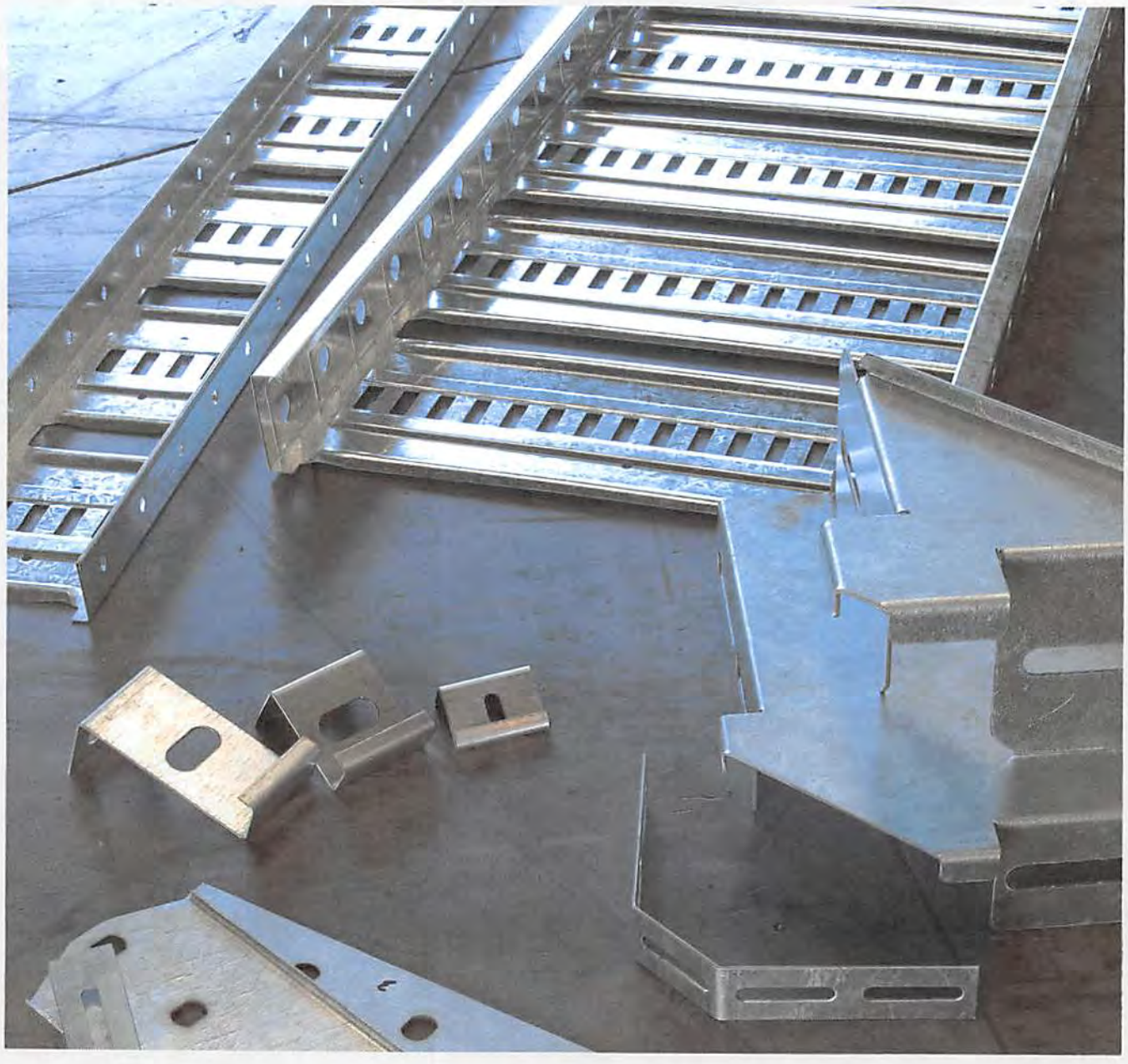
D-ROP Deadend
FS-DEADEND-LG7

D-ROP Opener
FS-DUCT-OPENER

FieldShield Dispensing Box
FS-SPOOLBOX-10

YOURx Breakout Pulling Tool
FS-PUL-YOURX

Unistrut Ladder tray : Unitray



Our Unitray system offers the contractor the ability to site-manufacture all required junctions, thereby reducing installation cost over traditional cable trays and ladders.

Unitray also presents the most comprehensive range of accessories such as cost effective prefabricated reducers for speed of installation on site and a more appealing finish.

Unitray is used widely as an architectural cable support, and the comprehensive range of light, medium, and heavy duty products ensure that the Unistrut Unitray system is an aesthetically pleasing and cost effective cable support medium.

Unistrut has the widest distribution organization throughout both Australia and New Zealand, ensuring easy access to the Unitray range and the full range of complementary Unistrut support systems plus other cable support ranges.

Unitray by Unistrut without question offers a comprehensive and cost effect support medium with the famous unrivalled

UNISTRUT QUALITY GUARANTEE.

QUALITY UNISTRUT GUARANTEE

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Unistrut - Tables and Key

To assist you in navigating through this catalogue we have divided this catalogue into defined sections :

Straights	*- Page 05*
Fittings	*- Page 08*
Accessories	*- Page 11*
Technical	*- Page 13*

Material Finish

Finish	Code
Galvabond	GB
Hot Dipped Galvanised	HG
Stainless Steel	SS
Zinc Plated	ZP
Aluminium	AL

Icon Key - Features

Time Saving

New!

Self Splice

Sold as Pair

Light Weight

Sold as individual

Galvabond (GB)

Base material is supplied ex the Steel Mill in pre-galvanised finish, in accordance with AS/NZS 1397, with a coating class of Z275.
The material is slit to width, punched and formed in to the Unitray profile.

Hot Dipped Galvanised (HG)

Coatings are applied generally in accordance with AS/NZS 4680. The thickness of the coating is dependent on the material thickness of the component being galvanised. It should be noted that due to the galvanising process, the thickness of the coating will vary over the surface and should be taken into account during component assembly. It may be necessary to remove excess build-up prior to use.

Stainless Steel (SS)

Corrosive resistant stainless steel with no additional surface treatment. This material option provides the best corrosion resistance available. Stainless steel is used primarily in marine environments or food processing facilities.

Zinc Plated (ZP)

Fasteners are electroplated generally in accordance with AS 1897.

Aluminium (AL)

Lightweight and corrosive resistant - ideal for marine industry

Other – Powder Coated (EPC)

When specific applications require other commercially available finishes, they can be supplied according to specification.

Special Materials and Coatings available upon request

UT1 Unitray

UNISTRUT presents the new Unitray range, with a versatile profile that adds strength and simplifies installation.

UT1 is available with 30mm side height, 3 metres in length and a variety of widths to meet all your application needs.

Light Weight

Sold as individual

Nominal **Size (W)**	**Length**	**Part No.**	
mm	mm	GB	HDG
100	3000	UT1-100G	UT1-100H
125	3000	UT1-125G	UT1-125H
175	3000	UT1-175G	UT1-175H
250	3000	UT1-250G	UT1-250H
325	3000	UT1-325G	UT1-325H

Basic load 20kgs/linear meter on 1.5m span

UT3 Unitray

UNISTRUT presents the new Unitray range, with a versatile profile that adds strength and simplifies installation.

UT3 is available in differing finishes with 50mm side height, 3 metres in length and a variety of widths to meet all your application needs.

NOTE : Normal size (W) is measured from inside of top return flanges. Actual width W1 = W+22mm

Light Weight

Sold as individual

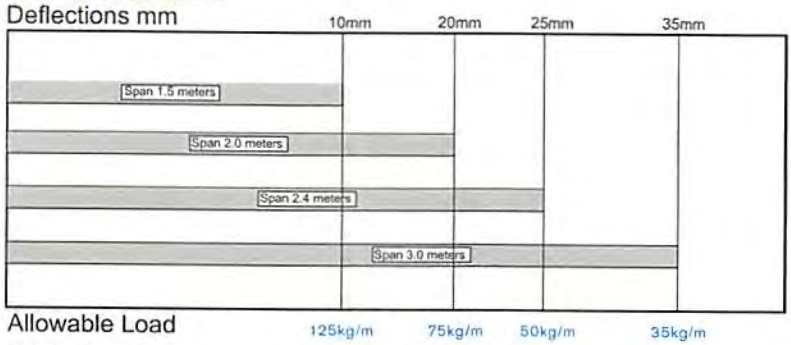
Nominal Size (W)	Actual Size (W1)	Length	Part No.			
mm	mm	mm	GB	HDG	AL *	SS *
150	172	3000	UT3-150G	UT3-150H	UT3-150AL	UT3-150SS
300	322	3000	UT3-300G	UT3-300H	UT3-300AL	UT3-300SS
450	472	3000	UT3-450G	UT3-450H	UT3-450AL	UT3-450SS
600	622	3000	UT3-600G	UT3-600H	UT3-600AL	UT3-600SS

NOTE : * Special order only - non-returnable

Basic load 125kgs/linear meter on 1.5m span

UT3 CABLETRAY

Deflections mm



NOTE : The deflections have been provided as a guide based on CONTINUOUS spans.

UT5 Unitray

UNISTRUT presents the new Unitray range, with a versatile profile that adds strength and simplifies installation.

UT5 is available in differing finishes with 85mm side height, 3 metres in length and a variety of widths to meet all your application needs.

Light Weight

Sold as individual

NOTE : Normal size (W) is measured from inside of top return flanges.
Actual width W1 = W+22mm

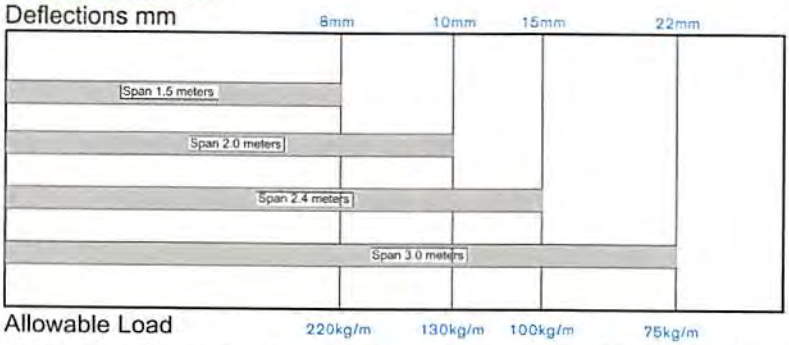
Nominal Size (W)	Actual Size (W1)	Length	Part No.			
mm	mm	mm	GB	HDG	AL *	SS *
150	172	3000	UT5-150G	UT5-150H	UT5-150AL	UT5-150SS
300	322	3000	UT5-300G	UT5-300H	UT5-300AL	UT5-300SS
450	472	3000	UT5-450G	UT5-450H	UT5-450AL	UT5-450SS
600	622	3000	UT5-600G	UT5-600H	UT5-600AL	UT5-600SS

NOTE : * Special order only - non-returnable

Basic load 75kgs/linear meter on 3.0m span

UT5 CABLETRAY

Deflections mm



Allowable Load 220kg/m 130kg/m 100kg/m 75kg/m

NOTE : The deflections have been provided as a guide based on CONTINUOUS spans.

UT1 - Unitray Fittings

UT1 - 30mm Tray Gusset

Type	Part No.		
	GB	HDG	EPC *
UT1	UT1AG-G	UT1AG-H	UT1AG-E

UT1 - 30mm Splice Plate

Type	Part No.		
	GB	HDG	EPC *
UT1	UT1SP-G	UT1SP-H	UT1SP-E

UT1 - 30mm Hold Down Bracket

Type	Part No.		
	GB	HDG	EPC *
UT1	UT1HDB-G	UT1HDB-H	UT1HDB-E

UT1 - 30mm Link Plate

Type	Part No.		
	GB	HDG	EPC *
UT1	UT1LP-G	UT1LP-H	UT1LP-H

UT1 - 30mm Radius Plate

Type	Part No.		
	GB	HDG	EPC *
UT1	UT1RP-G	UT1RP-H	UT1RP-E

1.2 metre length

Key

Code	Material
GB	Galvabond
HDG	Hot Dipped Galvanized
EPC *	Electro Powder Coated

NOTE : * Special order only - non-returnable

UT3 - Unitray Fittings

UT3 - Tray Gusset

Type	Part No.			
	HDG	EPC *	AL *	SS *
UT3	UT3AG-H	UT3AG-E	UT3AG-AL	UT3AG-SS

UT3 - 50mm Splice Plate

Type	Part No.				
	GB	HDG	EPC *	AL *	SS *
UT3	UT3SP-G	UT3SP-H	UT3SP-E	UT3SP-AL	UT3SP-SS

UT3 - 50mm Hold Down Bracket

Type	Part No.				
	GB	HDG	EPC *	AL *	SS *
UT3	UT3HDB-G	UT3HDB-H	UT3HDB-E	UT3HDB-AL	UT3HDB-SS

UT3 - 50mm Link Plate

Type	Part No.				
	GB	HDG	EPC *	AL *	SS *
UT3	UT3LP-G	UT3LP-H	UT3LP-E	UT3LP-AL	UT3LP-SS

UT3 - 50mm Radius Plate

Type	Part No.				
	GB	HDG	EPC *	AL *	SS *
UT3	UT3RP-G	UT3RP-H	UT3RP-E	UT3RP-AL	UT3RP-SS

3 metre length

Key

Code	Material
GB	Galvabond
HDG	Hot Dipped Galvanized
AL *	Aluminium
SS *	Stainless Steel
EPC *	Electro Powder Coated

NOTE : * Special order only - non-returnable

UT5 - Unitray Fittings

UT5 - 85mm Tray Gusset

Type	Part No.			
	HDG	EPC *	AL *	SS *
UT5	UT5AG-H	UT5AG-E	UT5AG-AL	UT5AG-SS

UT5 - 85mm Splice Plate

Type	Part No.				
	GB	HDG	EPC *	AL *	SS *
UT5	UT5SP-G	UT5SP-H	UT5SP-E	UT5SP-AL	UT5SP-SS

UT5 - 85mm Hold Down Bracket

Type	Part No.				
	GB	HDG	EPC *	AL *	SS *
UT5	UT5HDB-G	UT5HDB-H	UT5HDB-E	UT5HDB-AL	UT5HDB-SS

UT5 - 85mm Link Plate

Type	Part No.				
	GB	HDG	EPC *	AL *	SS *
UT5	UT5LP-G	UT5LP-H	UT5LP-E	UT5LP-AL	UT5LP-SS

UT5 - 85mm Radius Plate

Type	Part No.				
	GB	HDG	EPC *	AL *	SS *
UT5	UT5RP-G	UT5RP-H	UT5RP-E	UT5RP-AL	UT5RP-SS

3 metre length

Key

Code	Material
GB	Galvabond
HDG	Hot Dipped Galvanized
AL *	Aluminium
SS *	Stainless Steel
EPC *	Electro Powder Coated

NOTE : * Special order only - non-returnable

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Accessories and Technical cutting fittings

Centre Hold Down Clamp

Type	Part No.
Universal	GB
Each	UTCHD

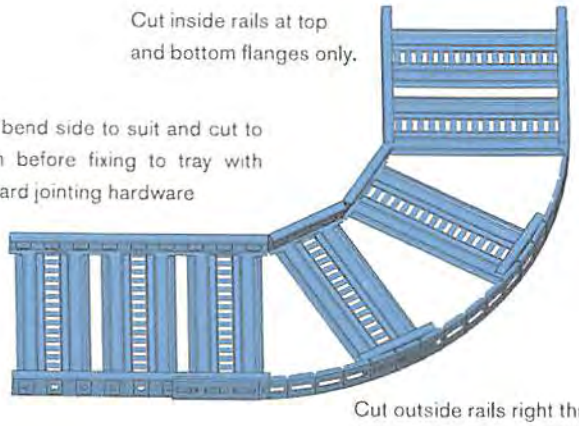
Nuts & Bolts

	Part No.	
	Bolt	Nut
Each	UTBZ	UTNZ

Flat Bend

Cut inside rails at top and bottom flanges only.

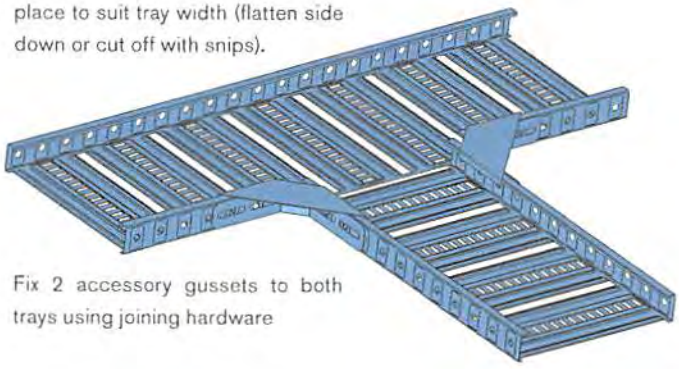
Form bend side to suit and cut to length before fixing to tray with standard jointing hardware



Cut outside rails right through (3 full cuts makes 90° bend).

Tee

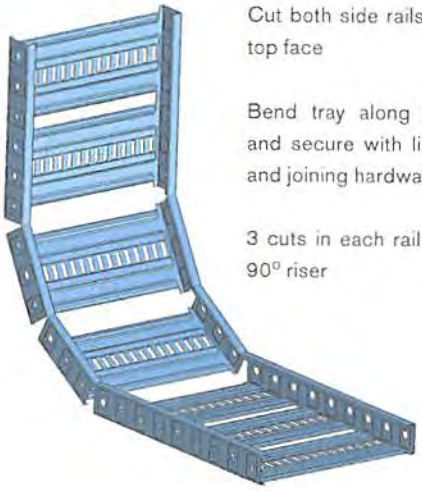
Cut side rail to bottom face in 2 place to suit tray width (flatten side down or cut off with snips).



Fix 2 accessory gussets to both trays using joining hardware

Note. Cross is the same proceedure repeated on both sides

Inside Riser

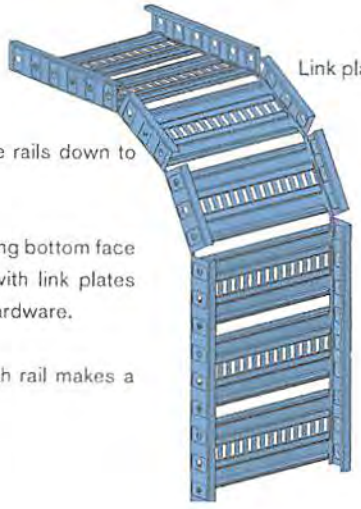


Cut both side rails down to top face

Bend tray along top face and secure with link plates and joining hardware.

3 cuts in each rail makes a 90° riser

Outside Riser



Link plate

Cut both side rails down to bottom face

Bend tray along bottom face and secure with link plates and joining hardware.

3 cuts in each rail makes a 90° riser

Technical - Materials

Often the most difficult decision to be made is the selection of material, because it involves the most cost-sensitive of compromises.

Material choice is directly related to service life and the longer the required life the more expensive will be the materials. The cost of these materials also must be considered as an equation of initial investment versus maintenance costs and eventual replacement.
Because service conditions for Unitray can vary over an enormously wide range, even within a single installation, it is impossible to write down any hard and fast rules on the subject of corrosion and expected lifespan.
The following may be considered a guide as to what can be expected from the various materials and finishes currently available for our cable support systems.

Galvabond

Galvabond, also known as Pre-Galvanised, is the most commonly used product finish for internal installations.The Z275 impregnated coating shows good resistance to corrosion in protected environments,and is cost effective against all other coating options.

Aluminium

Aluminium is also a popular choice of material for Unitray. Most frequently it is selected because of its excellent performance in marine environments such as is found on wharves, coal loaders or similar Port Facilities where salt spray or salt laden atmosphere is present. Another reason for using aluminium is that it offers a long maintenance free life which is important in cases where access for future painting or repairs may be costly and difficult.
For any given load class or capacity, aluminium Unitray is more expensive than their galvanised steel counterparts. Aluminium Unitray can also be expected to have a greater deflection than an equivalent steel system. On the other hand, they are lighter, more readily handled and are easy to work with, resulting in faster installation and therefore lower installation cost.

Hot-Dip Galvanized Steel

Hot-dipped galvanised steel (after fabrication) is a common selection, as it is economical to purchase and suitable for most conditions of outdoor exposure. For indoor applications, or anywhere that is essentially free from moisture, galvanised Unitray can be considered to have an indefinite life. That is, they should last as long as the plant, building, cabling or equipment which they service.

On a typical industrial or processing plant installation, exposed to weather, moisture and airborne industrial pollution, a basic life of approximately ten years can be expected. This is not to say that the Unitray will be completely corroded in that time but it is the probable life of the corrosion protection finish. Beyond that time, rapid decay can be expected and maintenance costs will increase substantially in order to keep the Unitray serviceable.
If installed near the coast, the effect of salt laden air may shorten the expected life. Also galvanising is sensitive to some chemicals, especially sulphurous compounds, which may be intrinsic to plant operations where the Unitray is installed. Correspondingly, a longer life will be expected in lighter industrial situations and if drier conditions exist.

Stainless Steel

Stainless Steel is sometimes considered as a material for Unitray, usually where extremely high corrosion resistance, coupled with difficulty of servicing after installation and a high degree of reliability are essential requirements. An off-shore oil drilling platform may be one example where these conditions exist.

Unistrut, more than you imagine.

Product range

Wire Baskets

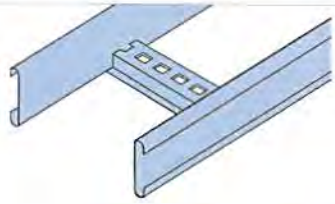
Ideal for a variety of applications, our wire baskets feature a self splicing system, designed to be simple to assemble and proven to be 80% faster in mounting time than standard splicing – eliminating the need for nut and bolt connections.

Cable Trays

A simple and cost effective support for communication and power cable distribution. Slots running down the length of the trays enable easy installation of cable ties,and the joggled end for joining lengths and accessories eliminates the requirement for separate joiners. Aesthetically pleasing for architectural requirements.

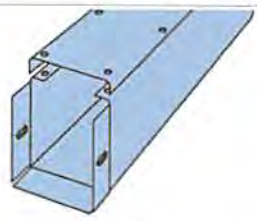
Cable Ladders

Unistrut cable ladders are the ideal solution when installing large power cables that need to be supported safely. Available in light, medium and heavy duty patterns to suit your application and in Aluminium, glavanised steel, stainless steel and fibreglass materials.



Cable Duct

The Unistrut Trunking system is designed to be quick and simple to assemble, providing real time saving as well as remaining a reliable product throughout its natural life cycle. Preassembled Internal Trunking Connectors allow you to securely connect trunking lengths in seconds, giving a neat external finish.



Metal Framing

The original Unistrut metal framing offers unrivalled quality and durability and is designed to work with the full range of new Unistrut parts and accessories. Designed and created by us, our metal framing underlines our commitment to produce products you'll be proud to install.

Sector focus

Oil and gas

Rail

Petrochemical

Aviation

Datacentres

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HOUSING DEVELOPMENT CORPORATION

PLANNING & DEVELOPMENT DEPARTMENT

DESIGN GUIDANCE DOCUMENT

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1. INTRODUCTION

The intent of this document is to guide the developer to design this development to local and international standards, guidelines accepted by this corporation.

This document has been established as a guide to functionality, materials, products, workmanship & services. Developers are encouraged to go beyond these standards and recommendations to foster innovative, healthy, efficient, and sustainable housing developments.

2. DESIGN CONSIDERATIONS

2.1 SITE DEVELOPMENT

The most impactful design decisions are often made during the site planning phase, laying The groundwork for a project that positively contributes to the lives of its residents and to Its neighborhood, and creating the framework for the rest of the design development.

- Design the development to take into consideration the potential negative impacts of adjacent properties, including but not limited to, overshadowing, overlooking & wind tunnel effect.
- Consider prominent view corridors and physical intersections.
- Design and orient the building to take into consideration climatic factors where there are maximum benefits to be derived from natural lighting, energy efficiency (e.g. Solar heat gain), and protection from weather elements. The installation of a future solar thermal system or solar photovoltaic system must be considered.
- Design the ground floor of the building to express the individuality of the residential and commercial units, if applicable, through architectural expression and the inclusion of entrance doors, canopies, and windows addressing the street. Ensure appropriate sidewalk width is provided to accommodate the anticipated pedestrian traffic flow.
- Utilize the existing site's features in creating compatible and well-defined amenity areas for adults and/or child-oriented activities. Minimize the overshadowing of amenity spaces by neighboring buildings. Create shading through natural means (e.g. Deciduous tree planting).
- Consider vehicular, bike, and pedestrian circulation through and around the site.
- Create well-defined public places (street, garden, park, walkway, mews, square, etc.) Through the massing of built-form. Avoid creating residual, unusable spaces.
- Establish play area within walking distance from residential units (dwellings, windows) and/or communal spaces.
- At corner developments, consider concentrating any commercial activities along the main thoroughfares and allow for residential and more passive uses alongside streets.
- At midblock or infill sites, consider small-scale strategies, such as orientation and screening, to mitigate sub-optimal conditions, such as noise, traffic, and unpleasant views.

2.2 BUILT FORM

The mass of a building—its form and size—accommodates interior program while also providing a sense of identity and presence on the street. Massing articulations, such as varied building heights and setbacks, can visually connect a building to adjacent structures and respond to a neighborhood's character and scale.

Thoughtful and well-designed massing can help to make even a large residential building sensitive to the pedestrian scale and feel like home. Working within zoning constraints, the mass of a building should be designed to take advantage of a site's best features, including views and connections to neighboring buildings while also mitigating any challenging conditions.

- Design the development to take into consideration the potential negative impacts of adjacent properties, including but not limited to, overshadowing, overlooking & wind tunnel effect.
- Consider breaking up the scale of overall massing to relate to lower or adjacent building heights.
- Consider using setbacks to optimize views and public outdoor spaces, such as yards and terraces

- At corner developments, consider concentrating bulk adjacent to existing buildings with height, and integrating lower heights adjacent to open spaces and pedestrian thoroughfares.
- At midblock or infill sites, consider concentrating bulk at the center of the building, and stepping down toward adjacent lower buildings and the street.

2.3 FACADE

Façades are building's "faces" to the neighborhood, bringing together massing and material decisions to create presence and character. While a street-facing façade can help to create a welcoming identity for the building and its residents, buildings often have visible rear and side façades, giving additional design opportunities.

The façades of a building should be designed with colors, materials, and articulations that form a coherent image. Different faces should be designed in response to interior programs and site conditions. It may be appropriate, for instance, to have distinct and complementary façade designs for street- and rear-facing sides of a building. A beautiful façade can help give residents and neighbors a sense of dignity and feeling of home.

The following points must be taken into consideration when designing the façade of the establishment.

- Consider how façade design can help enhance the building's character and identity both in the existing community and for its residents.
- Consider how each façade uniquely responds to adjacent programs and conditions.
- Consider avoiding co-planer material connections to further break down the overall massing.
- Consider using functional components, such as sunshades or window frames, to provide depth and shadow lines.
- Consider adding green walls or ornamental plants to the façade.
- Building services should be screened with proper access for maintenance, within the façade.

2.4 PEDESTRIAN & VEHICULAR CIRCULATION

- Sidewalks shall be provided along the full length of the building along any facade bordering streets and parking areas, where workable.
- Locate additional site access points for loading and unloading and back of house services as far as possible from street intersections to minimize conflicts.
- Pedestrian walkways shall be differentiated from driving surfaces through the use of durable landscape treatments and/or surface materials.
- All pedestrian ways shall be scaled to the use and expectations of pedestrian volumes in any given location with the minimum width of the sidewalk, no less than 1.5m.
- Sidewalks shall connect main areas of pedestrian activity such as transit stops, street crossings, building and store entrances, bike racks, and feature adjoining landscaped areas that include trees, shrubs, lighting, signage, benches, flowerbeds, groundcovers or other similar amenities.
- Ensure that the internal road networks and flow of traffic within the boundary shall be designed to complement the development.
- Design the layout of walkways to follow natural pedestrian traffic patterns with a hard surface such as concrete, unit pavers, natural stone pavers, or other suitable material, to discourage routing across lawns and play areas.
- Consider the design of garbage and move-in/out areas to ensure the ability of large trucks to maneuver.

2.5 VEHICULAR PARKING

- All parking must be accommodated within the plot area. & according to parking requirements.
- Controlled/structured parking and surface can be located at the perimeter of the lot adjacent to the access roads.
- Controlled/structured parking, mechanical parking, and or surface parking can be proposed by the developer.
- Provide separate vehicular and pedestrian circulation systems with a strong emphasis on pedestrian linkages between uses. Make provisions for pedestrian routes through the parking area(s) with sightlines at intersections of walkways and vehicular traffic.
- Separate parking aisles from primary vehicle circulation routes and entry drives whenever possible.
- Use design elements that are visually interesting and consistent with other streetscape materials used in the overall development.
- Utilize Universal Design techniques where feasible to provide a separation between driveway curb-cuts and drop-off areas to minimize turning conflicts; provide a clear separation of vehicular traffic between drop-off zones and access to either a parking lot or parking structure; and design drop-off lanes so as not to obstruct traffic flow when motorists are stopped to discharge passengers.

2.6 FORM, MATERIALS & AESTHETICS

Both aesthetic and functional, building materials can enhance a development's massing and Façade strategy, while also contributing to overall building identity. Materials also contribute To a development's environmental impact, constructability, and durability. By selecting Sustainable materials as part of a high-performance building envelope, designers can reduce Environmental impact and energy costs.

Materials should be selected with local construction expertise in mind, noting that a well-designed building requires quality construction. Durable, easily-maintained materials can contribute to the longevity of a building; up-front investment in materials and construction details often results in cost savings over time by reducing the need for renovations.

2.6.1 GENERAL MATERIAL REQUIREMENT

- Establish consistent levels of material quality and detail.
- To encourage materials that are complimentary to the large-scale open landscape and natural surroundings.
- All primary building facades shall incorporate materials that are durable, economically maintainable, and of a quality that will retain their appearance and finish over time & withstand climatic conditions.

2.6.2 SIGNAGES

- Provide a comprehensive signage system that considers the orientation, location, direction, and distance of signage based on the physical layout of the project.
- Ensure that all exterior signage is durable, low maintenance, and vandal resistant.
- Provide project identification sign(s) at the main entrance that includes the development name and address.
- Provide internal way-finding signage in all driveways, parking areas, lobby areas, and at each elevator location.
- Provide metal/cast aluminum door numbers and plates. Door numbers are to be centered within the door width at a height of 1,800 mm (70 in.) From the ground to the top of the plate using tamperproof membrane screws.
- Provide text and identification plates for all multi-purpose and utility rooms.
- Provide traffic signs & floor marking wherever needed.

2.7 LANDSCAPING DESIGN

Outdoor open spaces are critical amenities for residents, and can also provide benefits to the general public. Extending from interior common spaces, front and rear yards, as well as other kinds of open space, such as terraces, are vital design components that can help connect a new building with adjacent development and existing urban fabric.

Front boulevards often provide a semi-public threshold between private development and the street, while courtyards, terraces, and rooftops are typically favorite places for residents to gather. Open spaces should be designed and landscaped to accommodate residents' and neighbors' desired uses and to contribute to sustainability and resiliency goals.

- Design landscaping to compliment the development and amenity spaces, enhance the image of the neighborhood and address practical considerations, such as wind protection, buffering, and shade.
- Use landscaping for practical benefits and solutions, such as:
    - A colonnade of trees for protection from sun, rain, and wind.
    - A grid of trees that will produce a "roof canopy" of foliage to create a secluded sitting area for passive recreation.
    - A berm adjacent to an open sodded area, which will act as a separation between outdoor spaces and can also, be used for an informal sitting area.
- Consider planting hardy, water saving, indigenous species, especially in passive areas, to reduce the demand for irrigation and maintenance.
- Plantings along streets, at monument signs, and other key locations shall be designed using a plant palette and design approach as defined in these guidelines.
- The development of building sites shall be consistent in landscape design to provide overall continuity to the project. Landscape treatments of the building site, parking lots, and streetscape are critical elements of the site development.
- Incorporate landscaping elements to provide maximum shade for hard surface areas.
- Design site-landscaping layout to accommodate and support all desired and required outdoor activities, such as garden plots and or outdoor exercise areas.
- Ensure outdoor furniture design on the site is durable and unified in style (e.g. Garbage receptacles, benches, etc.).
- Ensure that all aspects of outdoor landscaping are PWD friendly.

2.8 PWD ACCESSIBILITY

The following points are to be considered when designing to ensure that the development is universally accessible.

GENERAL SPACES

2.8.1 SIGNAGE

- Sign surface should prevent Glare & be of a durable weatherproof material
- Colors should contrast with the surrounding surface to avoid confusing people with low vision & blindness
- Color combinations should be red & green or yellow & blue to avoid confusing people with low vision & blindness
- Letters should be sized in proportion to the reading distance
- The international symbol of access should be used where appropriate

2.8.2 PATHWAYS

Pathways include paved and unpaved footpaths. They must be safe for all users, particularly people with low vision and blindness or mobility disability.

- Clear of all obstructions

- Seal or upgrade unpaved footpath surfaces, where possible, since these often become hazardous in adverse weather conditions
- Construct slopes that do not exceed a gradient of 1:12
- For slopes that exceed 1:12, install ramps and allow for landings with a minimum dimension of 1 m x 1 m every 9 m, to enable rest opportunities
- Use smooth, continuous, non-slip and even surfaces for all pathways
- Install a guide strip comprising a tactile line in a color that contrasts with the pavement for people with low vision and blindness
- Install tactile tiling on pedestrian routes of travel, with a minimum 30% luminance contrast to adjacent surfaces
- Place tactile tiling at pedestrian crossings and around obstructions that are difficult for people with low vision and blindness to detect
- Avoid stepped curbs or, if required, ensure they are between 70 mm and 150 mm high
- Place drains, grating and manholes outside pedestrian pathways to avoid potential changes in pathway texture and height
- Cover all drains, gratings, and manholes for safety, ensuring covers are level with the path surface and have narrow grid patterns

2.8.3 PARKING

Parking spaces

- Locate disability-reserved parking spaces no more than 50 m from a main building entrance
- Design car parking spaces for people with disability that are a minimum width of 3.4m x 4.8m with an adjacent minimum 2.4 m wide shared space for wheelchair transfers
- Design motorbike parking spaces for people with disability that are a minimum width of 1.5m x 2m
- Provide same-level access from disability-reserved parking spaces to kerb
- Ramps and pedestrian pathways where possible.

Drop-off zones

- Design at a minimum 3.2 m wide for ease of mobility and safety
- Make parking spaces for people with disability wide enough to accommodate two cars
- Position within 30 m of accessible building entrances to reduce the need to travel long distances
- Provide curb ramps to negotiate changes in level from parks to footpaths
- Provide clear signage to reduce potential for confusion
- Provide tactile guide strips for improved security and safety
- Consider installing bollards to define zones.

2.8.4 DOORS

- Install each door with a door handle, extra pull handle, glazing, kick plate and sign
- Select doors with a minimum of 2 m clear height to avoid head contact with the top of the door frame
- Install single doors at the recommended minimum clear opening of 850 mm
- Install door hardware, such as latches, locks, handles and pulls, that can be easily grasped with one hand
- Provide lever-type handles, not knobs, for ease of use
- Incorporate recesses at doors in corridors to avoid obstructing main traffic
- Paint door and/or door frames in a color of a minimum 30% contrast with the adjoining wall to help people with low vision and blindness identify them
- Install automatic sliding doors, where possible, where circulation space is restricted

- Avoid spring-operated doors which are hard to pull open and can be a hazard when swinging back (if spring-operated doors are used, two-way opening doors with an adjacent window are preferred)
- Avoid door swings extending over steps or ramps and set back at least 1.5 m to avoid tripping and falling
- Position door swings to account for the space being entered (for example, with wheelchair accessible toilets, doors should open outwards or be sliding).

2.8.5 ENTRANCES & LOBBIES

Entrances

- Make at least one entrance, preferably the main one, accessible by people using wheelchairs
- Connect accessible pathways to accessible indoor and/or outdoor parking areas, drop-off areas, local public transit stops and public footpaths
- Provide adequate covered space in front of entrances for shelter and protection from adverse weather conditions
- Paint entrance doors in a color that contrasts with surrounding surfaces
- Provide lighting at entrances and along accessible pathways.

Lobbies

- Make lobbies accessible for people using wheelchairs and provide enough space for their maneuverability
- Construct counters 850 mm ± 20 mm high for ease of mobility and engagement with staff or communication items like telephones
- Provide public seating outside main circulation paths so people can engage socially, rest or wait
- Choose furnishings of colors that contrast with the floor and surrounding walls for easy maneuverability

Corridors

- Allow for an unobstructed clear path of travel with a minimum width of 1.5 m (preferably 1.8 m), for ease of mobility and maneuverability with other pedestrians (low traffic corridors should be a minimum 1 m width)

2.8.6 HANDRAILS & RAILINGS

- Provide handrails around all accessible balconies, galleries, hazardous areas, platforms, ramps, roofs and stairs for safety, assistance and rest opportunities
- Install handrails at a minimum height at 1200mm at apartments
- Check that installation arrangement are in line with safety and accessibility guidelines.

2.8.7 INSTALLING RAMPS

- Provide ramps when stairs obstruct the free passage of pedestrians and people with disability
- Provide at least one accessible entrance to a public building, preferably the principal entrance
- Locate ramps immediately adjacent to entrances, lobbies, and stairs
- Calculate sufficient space for ramps and landings to provide appropriate slope and include rest and passing areas
- To all services and facilities should be addressed and incorporated into any design, which could include upper floor access by way of a ramp.
- Slope: 1:12 is the recommended minimum for a non-assisted person in a wheelchair. The slope can be increased to 1:10 where the wheelchair user is assisted.
- Width: Varies according to use, configuration, and slope, but the minimum is 1 m.

- Landings: Provide at least every 9 m, at every change of direction and the top and bottom of every ramp. Landing width should be a minimum of 1 m and clear from obstructions.
- Handrails: Provide on both sides and along the full length of every ramp, 900 mm to 1 m high, returning at ends or turning down to minimize injuries. Handrails should extend for a distance of a minimum of 300 mm at the top and bottom of ramps. For ramps wider than 3 m, an intermediate rail could be installed.

2.8.8 ELEVATORS

- Ensure the dimension of elevator enables easy access by a person in a wheelchair
- Install a handrail on at least two sides
- Position the control panel so it is easily accessible and can be easily viewed
- Install door re-opening activators, audio-visual signals, and floor audio announcements
- Install a non-skid floor
- Select a door color that contrasts with the color of the walls, floor and the landing area in front of elevator doors
- Provide minimum elevator floor space of 1.4 m x 1.6 m
- Provide controls positioned 850 mm to 1.2 m high
- Install braille and tactile signage at the appropriate height.

2.8.9 STAIRS

Steps

- All steps in one flight should be uniform.
- Steps should be 150 mm to 180 mm high and not less than 260 mm deep.
- Open riser staircases should not be used as they pose a risk.
- Angled risers are preferred to nosing's, but if nosings are used they should be rounded and not project more than 40 mm.
- Nosings should have permanent color contrasts to facilitate ease of use for people with low vision and blindness.
- Stair covering should be slip-resistant, firmly fixed, and easy to maintain.
- Landings should be provided at least every 15 steps to assist people who cannot manage long staircases.
- Each landing should be at least 1.2 m long.

Width

- The clear width of stairways should be at least 1 m, preferably 1.5 m allowing for easy two-way traffic.

Handrails

- Handrails should be provided on both sides of a flight of stairs and each side of landings.
- With wider stairs, intermediate handrails should be installed.
- Handrails should be positioned between 800 mm and 1 m above the floor finish.
- Handrails must extend a minimum of 300 mm beyond the top and bottom steps, turning to the wall.
- Handrails should be supported on brackets that do not obstruct continuous hand contact with the handrail.

Tactile marking

- Tactile warning strips should be provided at the top and bottom of stairs and at intermediate landings, to alert people with low vision and blindness to the location of the stairs.
- A textural marking strip is essential and should be at least 600 mm deep, extending over the full width of the stairs.

Accessibility Design Guide

- To provide orientation for people with low vision, the marking strip should be in a color that contrasts with the surrounding surface.

Lighting

- Staircases should be well lit during all hours of the day.

2.9 SUSTAINABILITY

A key design aim should be to consider & ensure that each housing scheme is economically, socially, and environmentally sustainable. This is facilitated by:

- The provision of a pleasant living environment which meets the needs, and, as far as possible, the preferences of the residents and fosters the development of the community;
- The encouragement of energy efficiency both at construction stage and during the lifetime of the building e.g. By climate-sensitive design which takes account of the orientation and surrounding features to control wind effects while optimizing sunlight, daylight and solar gain benefits;
- Having due regard to the social and environmental consequences associated with the use of materials and resources, e.g. Minimizing the use of scarce non-renewable resources and using renewable resources and materials which have minimum environmental consequences, wherever practicable; and
- The integration of the new housing into the existing natural and built environment in a way that makes a positive contribution to the overall environment of the locality.

The degree to which the designer can favorably influence micro-climate is frequently determined by the size, location, and nature of the site. In deciding on the site layout, designers should have regard to:

- The scope for optimizing daylighting and solar gain for dwellings through the orientation and spacing of buildings;
- The scope for optimizing the advantages of shelter and direct sunlight through the location and orientation of play areas, courtyards and gardens relative to existing features both on and adjacent to the site, e.g. Buildings, walls, trees, hedges;
- The scope for ground shaping and landscaping to provide greater shelter and limit the extent of overshading of buildings, play areas and other areas which are intended to be extensively used by residents; and
- The need to limit funneling and channeling of the wind, e.g. Appropriate building spacing and orientation, avoidance of long straight building lines, avoidance of passageways through buildings.
- Aim to maximize the use of existing natural drainage patterns and to limit the requirement for separate disposal of surface water offsite. The extent of new impervious surfaces should be limited to reduce peak surface water runoff.
- The choice of materials for site works should have regard to cost, performance, durability, maintainability, and overall environmental impact.
- Due regard should be had to the full lifecycle cost and environmental impact of the materials used. The potential for recycling and reuse should also be taken into account.
- There should be a preference for material from renewable or recycled sources, where available, economic and appropriate for the function.
- The design should aim to ensure that all materials should be used efficiently with a minimum of waste.

2.10 SICK BUILDING SYNDROME

The designer & developer must consider, document & explain the expected lifecycle of systems & components. From the evidence to date, some risk factors have been identified and which should be avoided if possible. These include:

- Poor provision for daylight and/or uncontrolled solar gain,
- Sealed windows,
- Large areas of soft furnishing, open shelving, and filing,
- Use of inadequately tested materials, paints, joining mastics, and glues,
- Type of lighting and position giving glare and flicker,
- Services and areas not designed for easy cleaning and maintenance.

The interaction between airtightness, ventilation and emissions must be understood. A relatively small mistake in one area may be reinforced elsewhere and create a substantial problem. Key factors in this area are the following:

- Provision of sufficient fresh air (at least 8 liters per second per person in non-smoking areas and up to 30 in smoking areas)
- Air inlets that are not close to exhaust or outdoor pollution sources and that are supplied with adequate filtration
- Removal or dilution of airborne pollutants (e.g. Separate extract ventilation from office machinery and smoking rooms)
- Provision of a comfortable temperature, related to the activities in the building
- Prevention of air stagnation and draughts (airflow rates 0.12-0.3 m/s)

2.11 FINISHING SCHEDULE

This finishing schedule sets the standard for the finishes of common facilities & spaces and commercial spaces in mix residential housing developments. Please refer to 'Housing Typology Requirement' sheet attached for the finishing standards of the housing units.
The developer is asked to use this as a reference when finalizing the finishes of the spaces as mentioned in the schedule. The developer is to ensure the quality & durability of the proposed materials by reviewing the specifications & test reports pertaining to the proposed materials. It is advised that all the materials are of ISO standards. If the developer or contractor is to propose an alternative material other than given in the table, the developer or contractor is required to submit to HDC for approval.

COMMON FACILITIES & SPACES

	FLOOR	WALL	CEILING	NOTES
ENTRANCE LOBBY	Homogeneous tile Non-slip finish (600x600mm)	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	Glazed aluminum sections are preferred to provide good visibility & natural light in the building
ELEVATOR LOBBY	Homogeneous tile Non-slip finish (600x600mm)	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by	

		client.	client.	
PUBLIC CORRIDORS	Homogeneous tile Non-slip finish (600x600mm)	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	Provide corner guards at all exposed corners & handrails on one side
EXIT STAIRS	Concrete, epoxy painted	Concrete, epoxy painted	Concrete, smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	Paint/powder-coated GI handrail & railings
MANAGEMENT OFFICE	Porcelain tile Non-slip finish 300x300mm	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	
MULTI-PURPOSE ROOM	Porcelain tile Non-slip finish (600x600mm)	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	All paint must be washable.
STORAGE ROOMS	Concrete, epoxy painted	Concrete, epoxy painted	Concrete, smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	
PUBLIC WASHROOMS	Porcelain tile, non-slip (300x300mm)	Porcelain tile up to ceiling level on all walls	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	Concealed flush tank for WC
PARKING	Concrete, epoxy paint. Spaces to be marked & numbered	Painted concrete. Columns painted base color coded to each level	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	Provide protection & jacketing to all exposed services. Exits & lobby areas to be clearly identified/ color-coded for each level. Columns to be painted in contrasting color to

				floor paint.
GARBAGE ROOM	Concrete, epoxy flooring	Porcelain tile up to a minimum 1,800mm on all walls	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	
JANITORS ROOM	Porcelain tile, non-slip (300x300mm)	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	
SERVICE ROOMS	Concrete, epoxy painted	Concrete and/or block, epoxy painted	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	Provide structural backing for equipment
MEETING ROOM	Porcelain tile Non-slip finish (600x600mm)	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	Smooth putty finish with base sealer & 2 coats of paint as specified by client	
SECURITY ROOM	Porcelain tile Non-slip finish 300x300mm	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	Smooth putty finish with base sealer & 2 coats of paint as specified by client	

COMMERCIAL UNITS

	FLOOR	WALL	CEILING	NOTES
PUBLIC CORRIDORS	Homogeneous tile Non-slip & weather resistant finish outdoor (600x600)	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	Provide corner guards at all exposed corners & handrails on one side

STAIRS	Concrete, epoxy painted	Concrete, epoxy painted	Concrete, smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	Paint/powder-coated GI handrail & railings
COMMERCIAL UNITS	Bare screed finish	Smooth putty finish	Smooth putty finish	
STORAGE ROOMS	Concrete, epoxy painted	Concrete, epoxy painted	Concrete, smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	
PUBLIC WASHROOMS	Homogeneous tile, non-slip	Tile up to ceiling level on all walls	Smooth putty finish with base sealer & 2 coats of paint as specified by manufacture and approved by client.	Concealed flush tank for WC

NOTE:

- Skirting – must be provided in all the spaces at 100mm from finish floor level.
- Paint – to be selected by the client. 2 coats must be applied with a base sealer (also should fulfill the manufactures requirement for the approved paint).
- GI grade: BS 1387 (class a/b/c)
- Additional safety measures, to minimize the risk of falling over, should be taken if horizontal railings are to be provided

Doors & windows

- Aluminum doors & windows should be of 1.2mm thick & powder coated with a thickness of 60-80 microns
- All main doors should be solid wooden doors with a minimum fire rating of 1 hour.
- All main doors should have a minimum of 4 hinges, lock handle, chain bolt latch & peephole.
- Glazing used for doors and windows should be safe and with a nominal thickness proportionate to the area of the panel

3. BUILDING SERVICES

This section provides the general requirements for the mechanical services of a mix residential building.

The basic Mechanical Services covered in this section are: -

4.2 Air-conditioning and mechanical ventilation services;
4.3 Fire Protection Services;
4.4 Cold Plumbing Services;
4.5 Sanitary Plumbing Services;
4.6 Vertical Transportation Services (Elevator Services)

3.1 GENERAL REQUIREMENTS

- All relevant works must comply with the requirements of local and statutory authorities having jurisdiction over part/s of the works including but not limited to:

  a) Housing Development Corporation (HDC)
  b) Male' Water & Sewerage Company Pvt Ltd (MWSC) – Water and Sanitation Authority
  c) Maldives National Defense Force (MNDF) – Fire Protection Authority
  d) Ministry of Environment & Energy
  e) Ministry of Health

- According to the Intergovernmental Panel on Climate Change (IPCC), buildings are responsible for one-third of all Green House Gas (GHG) emissions. In addressing to this, several measures as below can be taken in order to design a building that will be more energy efficient.
  - Energy saving lighting system with motion sensors;
  - Efficient equipment in buildings

- Service areas shall occur away from public streets, parks, plazas, and adjoining development.
- Views of service areas from streets, parks, plazas, pedestrian walkways, and adjoining development shall be screened.
- Screening enclosures shall be incorporated into the building architecture and utilize the same materials as the principal building to the greatest degree possible.
- Screening shall include walls or fences of a minimum height of 6 feet to provide complete screening from normal eye level on all sides where access is not needed.
- When designing the mechanical services, the developer must ensure that all aspects, wherever possible, is PWD friendly. All emergency services must be designed so that in case of an emergency, a person with any form of disability is aware of the situation.
- All the mechanical services must be suitable for local weather conditions (marine environment).
- It is recommended that consultation be done at concept level with services providers of electricity, plumbing, sewerage, telecommunication, and cable TV, as to how these could be economically and sustainably incorporated into the development.
- Any space required by the relevant service provider for the installation or provision of a supporting facility (transformer, pump rooms, storage tanks, service stations, etc.) Should be provided well within the given area for the development
- Dedicated utility space at either ground or first floor level should be provided for the provision and/or installation of relevant services as required

- The developer is required to submit a proposal for the below mentioned systems during the concept stage and the drawings needed for the said systems must be submitted during the detail drawings submission.

3.2 AIR-CONDITIONING AND MECHANICAL VENTILATION SERVICES

3.2.1 Design considerations

Design principles, equipment selection, and material specifications must be in line with good engineering practice and must give due regard to the following: -

- Comfort conditions;
- The simplicity of design and installation;
- Ease of operation and maintenance;
- Energy conservation and environmental impact;
- System flexibility and adaptability;
- Recognized and acceptable design standards;
- Screened within the façade to be aesthetically appealing,
- During the design stage, take consideration to provide AC & AC outdoor unit provisions.
- Provide kitchen hood outdoor unit provisions.
- Toilet ventilation provisions

3.2.2 Regulations & Standards

The latest edition of the following standards must generally apply to the design of the air conditioning and mechanical ventilation systems. Where there is a difference in standards or requirements between two documents or between a document and the specific requirements of the local authorities having jurisdiction, the more stringent standard or requirement must be applicable:

- Indoor Air Quality (IAQ)
- The latest edition of ASHRAE 62 “Ventilation for Acceptable Indoor Air Quality”
- Latest Edition of SMACNA, ASHRAE, and ARI standards.
- CIBSE guidelines

3.2.3 Mechanical Ventilation System

Mechanical ventilation must be provided in all services areas.

- Air filtration
  - The air filtration system must generally be designed in accordance with the above mentioned standards.
- M&E Plant rooms
  - Pump rooms, electrical transformer, and switchgear rooms, refuse chamber and other electrical rooms must be mechanically ventilated.
  - All M&E Plant rooms must be separated from each other
- The ventilation system must be provided with automatic controls to turn on and off on demand. Manual override systems must be provided to manually operate the ventilation system as needed. The ventilation system must also be interlocked with the fire protection system.

3.3 FIRE PROTECTION SERVICES

The section covers the general requirements for Fire Protection Systems.

a) Portable Fire Extinguisher
b) Automatic Carbon Dioxide System (for Electrical Low Voltage Room and Genset Room)
c) Clean Agent for Electrical Substation
d) Hose Reel System

e) Wet Riser System
f) Automatic Fire Detection System

3.3.1 Regulations & Standards

- The following standards, codes of practice, and regulations must apply for all works carried out in this contract.
  a) National Fire Protection Association (NFPA)
  b) Maldives National Defense Force (MNDF)
- All design must comply with the Statutory Regulations and requirements of the relevant Government Agencies & Local Authorities.
- Submission of plans to the authorities must be performed by registered Professional Engineers.
- Commissioning and testing of the Fire Protection facilities must be carried out by a qualified fire protection developer registered with MNDF
- All emergency services must be designed to be PWD friendly. In case of an emergency, a person with any form of disability must be aware of the situation.

3.3.2 System Requirements

a) Automatic Fire Detection and Alarm System

- The building must be equipped with a fully addressable type Automatic Fire Detection & Alarm System.
- The main fire alarm panel must be installed in Fire & Water Room located at the Ground Level.
- Incoming water supply into Sprinkler and Wet Riser / Hose Reel tanks must be from external water mains and also from seawater in the event of a fire.
- Addressable heat/smoke detectors must be installed within the elevator lobbies and M & E Rooms.
- Manual call points and alarm sounders with strobe lights must be installed to provide manual activation of fire alarm and must be located along escape routes and outside staircases.
- The manual call points must be of the break-glass type surface mounted at 1.4m above floor level.
- Ensure that the fire alarms have strobe lights.

b) Portable Extinguisher

- Approved type Portable extinguisher will be located beside hose-reels and along escape routes for ease of identification and access.
- Suitable extinguishers must be provided for mechanical and electrical plant rooms.

c) Automatic Carbon Dioxide System

- Carbon Dioxide System must be designed based on NFPA 12 requirements and must be installed in unmanned areas such as Electrical Low Voltage Rooms or Consumer Room, Gen Set Rooms, IT Server Rooms, Energy and Power Authority Switchgear Room and Transformer Rooms to meet Fire Protection Authority and Energy and Power Authority's requirement.

d) Hose Reel System

- The Hose Reel system must be designed to BS 5306 Part 1 and complying with the requirements of the Local Fire Department.
- Generally, all escape staircases, escape routes and large areas must be provided with hose reels. They will be located such that all parts of each floor are within 30m of the nearest hose reel.

- The hose reel drum must include 25mm dia. X 30m long approved type hose and nozzle located inside the hose reel riser or cabinet with glass front panel. Suitable signage must be provided.
- During regular pump testing, the valve along the Test Line of the Hose Reel System must be opened to allow the water to be returned to the Fire Fighting Water Storage Tank instead of being discharged into the drain.

e) Wet Riser System

- The Wet Riser must be designed to the local Fire Department and BS 5306 Part 1.
- Landing valves must be located at max. 60-meter radius at each floor and to which a rubber-lined hose with nozzles can be connected.
- The landing valve and hose must be located in the same compartment complete with a glass front panel.
- During regular pump testing, the valve along the Test Line of the Hose Reel System must be opened to allow the water to be returned to the Fire Fighting Water Storage Tank instead of being discharged into the drain.

3.4 COLDWATER PLUMBING SERVICES

The section covers the general requirements of the Cold Water Plumbing Services. Generally, the works for the Cold Water Plumbing services must include the following: -

a. Coldwater should be supplied directly from mains to the storage tank in each building.
b. Coldwater storage tank must be provided
c. Tanks must be easily accessible for maintenance purposes.
d. The tank sizes shall be calculated in accordance with the regulations and necessary guidelines by the relevant authorities.
e. The tanks must comply with all health and safety requirements for the storage tanks.
f. The rainwater tank overflow must be connected to the ground well tank, where the ground well must be used primarily for irrigation purposes.
g. Recommended to use any brand of quality which is available locally, such as DAVEY or equivalent.
h. Pressurized pipes shall be higher grade such as PPR
i. Gravity pipes shall be higher grade such as HDPE
j. The water quality should comply with the standards set forth by the Health Protection Agency (HPA) if proposed to use a private water supply
k. It is highly recommended to have adequate storage of water (rainwater harvesting integrated) within the development for firefighting and any other emergency usage

All materials should be suitable for Maldivian Environment (Marine Environment) Which is locally available

The developer is required to submit a proposal for the above-mentioned systems during the concept stage and the drawings needed for the said systems must be submitted during the shop drawings submission.

3.4.1 Regulations & Standards

- The following standards, codes of practice, and regulations must apply for all works carried out in this contract.
    a) The relevant British Standard Specification (BS)
    b) Male' Water and Sewerage Company Pvt. Ltd. (MWSC)
    c) Latest Edition of ASHRAE standards
- All design must comply with the Statutory Regulations and requirements of MWSC.
- Submission of plans to the authorities must be performed by Professional Engineers. Commissioning and testing of the Cold Water and Sanitary facilities must be carried out by the qualified Cold Water and Sanitary contractor registered with MWSC and Local Authority.

3.4.2 System requirements

- The Domestic Cold Water System tank must have 1-day storage capacity equipped with pumping system.
- The cold water pumping system must be provided with the essential electrical supply.

3.5 SANITARY PLUMBING SYSTEM

Generally, the works for the Sanitary Services must include, but not limited, to the following:

1. Internal soil, waste, vent and anti-siphon, pipework, fittings, and accessories for all toilets.
2. Domestic manholes, floor traps, gully traps, and accessories.
3. The drainage system shall be directly connected to the Municipal mains.
4. Essential power supply to pump control panels c/w wirings.

3.5.1 Regulations & standards

- All design must comply with the Statutory Regulations and requirements of MWSC.
- The developer is required to submit a proposal for all the Cold Water Plumbing Services during the concept stage and the drawings needed for the said systems during the shop drawings submission.
- Submission of plans to the authorities must be performed by Professional Engineers. Commissioning and testing of the Cold Water and Sanitary facilities must be carried out by the qualified Cold Water and Sanitary contractor registered with MWSC and Local Authority.

3.5.2 System Requirements

- The developer must propose a sanitary plumbing system to dispose of all soil and wastewater from all sanitary fixtures.
- Ensure water supply is separately measured for each residential unit, amenity space, parking garage & exterior use.
- Specify water conservation devices including low flow plumbing fixtures such as shower heads & water sufficient toilets.
- Provide packaged, pressure booster pumps with cold water supply in high-rise buildings.
- Provide shut-off valves for all individual water risers. Ensure all shut-off valves are clearly marked and easily accessible from common corridors.
- Allow for thermal expansion of piping and equipment. Provide expansion loops or joints on all main runs and all risers. Provide a pre-manufactured expansion joint(s) for all piping when crossing the building's expansion joints. Isolate pipes to control vibrations.
- Finish piping insulation with a protective cover painted and labeled for identification.
- Provide each unit with a main water shut-off valve and ensure each hot and cold-water supply fixture within the unit has an easily accessible isolation valve.
- Provide floor drains in public and barrier-free bathrooms.
- Provide a clean-out on every floor for accessing and cleaning drainage stacks.
- Provide garbage chute wash down facilities with sanitizing and odor control.
- Recommended to use a cutter pump system within the property for sewerage.
- Recommended to use slab drop method or wall mount WC for bathrooms.
- All horizontal and vertical service ducts should be easily accessible

3.6 VERTICAL TRANSPORTATION SERVICES (ELEVATOR)

3.6.1 System Requirements

- The elevators must be equipped with a backup power system in case of power outages. The developer must also propose an air conditioning system for the elevator machine room.
- The developer is required to submit a proposal for the above-mentioned systems during the concept stage and the drawings needed for the said systems must be submitted during the shop drawings submission.
- The vertical transportation system (Elevators) is to facilitate the movement of tenants and other personnel in the building, the following must be provided: -
    a) Passenger Elevators
    b) Fire Elevator – must be able to accommodate a stretcher
    c) Service elevators for commercial units
- The number of elevators can be proposed by the developer along with an elevator traffic analysis report.
- The Elevator will have the following basic function: -
    a) Passenger Elevator - To transport people from Ground Floor to all other floors.
    b) Fireman Elevator – to use for maintenance purpose only
    c) Service Elevator – to use for commercial floors
- The elevators must have the following:
    a) Speed - 4 meter per second
    b) Type - VVVF Motor type
    c) Operation - Group Communication
    d) No. Of stops: depending on number of floors
    e) Automatic rescue device (ARD)
    f) Emergency call system
    g) Emergency lights
    h) Machine room with AC
    i) Door Type - Centre Opening (Double Door)
    j) CCTV
- At least one elevator must be PWD friendly

4. ELECTRICAL SERVICES REQUIREMENTS

This section covers the basic requirements of Mechanical & Electrical Services. Generally, the works for Mechanical and Electrical services must include, but not limited to, the following: -

a. Cabling from the nearest STELCO transformer
b. Air-Conditioning & Mechanical Ventilation Services;
c. Fire Protection Services;
d. Cold Plumbing Services;
e. Sanitary Plumbing Services;
f. Vertical Transportation Services (Elevator Services);
g. Electrical Low Voltage Services;
h. Emergency Electrical Supply (Generator Set);
i. Communication Services comprising of: -
    1. Telephone & Internet Connection
    2. Internal Network cabling
    3. Public Address System
    4. Card Access System
    5. Elevator Access System
    6. CCTV System
    7. Automatic Barrier Gate System
    8. Guard Tour System
    9. GPON

4.1 GENERAL REQUIREMENTS

- All relevant works must comply with the requirements of local and statutory authorities having jurisdiction over
- Part/s of the works including but not limited to:
    a) HDC – Local Council
    b) Male' Water & Sewerage Company Pvt Ltd (MWSC) – Water and Sanitation Authority
    c) State Electric Company Ltd (STELCO) – Energy and Power Authority
    d) Relevant Telecom and Internet Service Provider
    e) Maldives National Defense Force (MNDF) – Fire Protection Authority
    f) Ministry of Environment and Energy
- The developer is required to submit a proposal for the above-mentioned systems during the concept stage and the drawings needed for the said systems must be submitted during the shop drawings submission.
- It is recommended that consultation be done at concept level with services providers of electricity, plumbing, sewerage, telecommunication, and cable TV, as to how these could be economically and sustainably incorporated into the development.
- Any space required by the relevant service provider for the installation or provision of a supporting facility (transformer, pump rooms, storage tanks, service stations, etc.) Should be provided well within the given area for the development
- Dedicated utility space at either ground or first floor level should be provided for the provision and/or installation of relevant services as required

4.2 ELECTRICAL SERVICES

4.2.1 Regulations, Standards, and code

The following standards, codes of practice and regulations, and any other subsequent revision or amendment must apply for all electrical works carried out in this contract.

a. Energy and Power Authority
b. The Regulation of the Electrical Equipment of Building
c. Electrical Engineers, United Kingdom.
d. The relevant British Standard Specification (BS)
e. The British Standard Electrical Code of Practice.
f. Local Fire Protection Authority
g. Maldives National Building Code
h. National Fire Protection Association. (NFPA)
i. Maldives Civil Aviation Authority (CAA)
j. Illuminating Engineering Society (IES) – Recommendation for lighting
k. The requirement of Telecom and Communication Authority
l. The latest edition of ASHRAE standards
m. CIBSE guidelines
n. Institute of Electrical Engineers (IEE)

4.2.2 Design considerations

- The electrical requirement shall be based on the load calculation where the power supply to be connected to the mains grid. The incoming supply shall be confirmed from the local Energy and Power Authority.
- Ensure individual revenue-grade suite metering is provided for the unit, common laundry facility, common amenity space, commercial units, and exterior use.
- Consider solar power systems for energy conservation and sustainability.
- Ensure a dedicated circuit is provided for each receptacle to avoid tripping when multiple appliances are used at the same time.
- Ensure all electrical conduits are concealed (surface mounted conduits will not be permitted).
- Provide rough-in for telecommunications equipment (computer, telephone, cable, etc.) And audiovisual (A/V) equipment in all common areas.
- Provide a rough-in box for fiber optic cable in each master bedroom (consult provider for sizes of the rough-in).
- Ensure electrical rooms are independent of all other spaces. Locate electrical rooms in one area, adjacent to other service rooms and preferably accessible by a service corridor, and as far as possible from residential units.
- Ensure that adequate ventilation is provided in transformer vaults and switchgear rooms to prevent overheating and equipment failure.
- LEDs must be provided in the following areas:
    a. Car park area & ramp
    b. M&E Plant Room
    c. Staircases
    d. Service Areas
- LEDs must be provided in the following areas:
    a. Elevator lobby
    b. All other common areas
- LEDs and control gear must be provided for general and functional lighting. Architectural, interior decorative and landscape lighting must be based on a proposal by respective specialist lighting consultants.
- External lighting fixtures must also be LEDs. The mounting column and fixture type must match the existing installation in the vicinity for aesthetic purpose and subject to the Architect/Landscape Architect selection.
- Separate electrical meters shall be installed for elevators, rooftop and all common area services including common lighting shall be connected to separate meter.
- Separate metering panel for commercial units and dedicated service elevator.
- Provide electrical power sockets for common areas and rooftop for maintenance purpose

- All outdoor/wet area power sockets, switches, and lights should be weatherproof
- Shaver socket and heater socket for the bathroom should be provided
- Emergency lights for all common areas, services rooms, and escape routes must be provided
- A surge protector (type 2) for all ICT equipment's must be provided

4.2.3 System Requirement

- All electrical equipment must be earthed in accordance with IEE Electrical regulation.
- Fire-rated cables will be used for essential service power according to the local Fire Protection Authority's requirement. Lighting and power system will be allocated using essential and
- Non-essential system. As for the Main switchboard, it must be designed to accommodate the different load category.
- Current local Energy and Power Authority practice and IEE Wiring Regulations must be strictly complied with.
- The emergency lighting system must consist of self-contained emergency luminaires, which must independently detect loss of normal supply and automatically switch on the integral D.C. battery supply. The lighting system must be designed by alternating circuits, grouping of lighting switches to meet the functional requirements of end-users. All external lights shall be controlled by a digital timer with the provision of manual control switches.
- All stairways, corridors, equipment rooms, and areas required by regulations must be adequately provided with exit and emergency lighting. The exit and emergency lighting must be installed to the requirements of the local Fire Protection Authority.
- The standby Generator Set should provide essential loads such as elevator, fire pump system, common area lights, access control system and booster pump system
- All the necessary safety and protection devices must be installed to meet the Local Authority's requirements.
- An emergency accessway must be illuminated at all times from the essential supply to meet Local By-Laws. Emergency exits must have Exit Lights fitted for safe evacuation during emergencies.
- To meet local MNDFs requirements, self-contained emergency lights must also be provided to escape staircases.
- Earth leakage protection and miniature circuit breakers must be installed to ensure that maximum safety and convenience of maintenance is afforded to every DB's.
- For the overall safety of the installation, efficient electrical earthing and lightning protection systems must be installed.

a) Lighting

- The illumination levels must be generally in accordance with the IES Code of Practice, CIBSE Code for Interior Lighting and Lighting Guide 3 (LG3), and current practices.
- The lighting system must be designed by arrangements of alternating circuits and selective grouping of light switching to achieve multi-levels of illuminance.
- A daylight harvesting system must also be incorporated into the design to maximize the use of sunlight while minimizing energy consumption.

b) Self-contained Emergency Lighting

- Self-contained emergency lighting of 3 hours' duration must be designed to local Fire Protection Authority's requirement.
- The self-contained emergency lights during the mains healthy condition would operate from the main supply while simultaneously charging the battery.
- During a main power failure and the Gen Set supply failure, the same lamp while is utilized except that it would now operate from the battery.

- When the mains supply and or the Gen Set supply resume, the lamp would revert to normal operations from the main supply and or the Gen Set supply.

c) Exit Sign

- These self-contained types Exit Sign with standby batteries and automatic charging facilities will be provided.
- During mains healthy condition, it would operate using the main supply, whilst during the Main power failure and the Gen Set supply failure, they will operate using the built-in battery.

d) Earthing System

- Earthing system must be installed in accordance with the requirement of BS Code of Practice CP 1301, IEE Wiring Regulation (16th Edition) and Rules and Regulations of local Energy and Power Authority.
- The earthing system must comprise of neutral point earthing, copper tape interconnections, and earth electrodes.
- A separate power system must have a common earth connection.
- Each of the systems below should have its dedicated earthing system meeting their respective earthing requirements: -
  1. Electrical system
  2. Equipment frame
  3. Telecommunication system
  4. Lightning protection system

- With the exception of Telecom's system, the rest must be integrated by linking them with buried bare copper conductors of appropriate size. The purpose is to bring the earth resistance of the entire system to a lower value under the constraint of space available for the discharge of electric current to the ground.
- Telecom system should be isolated from the integral system as far as possible to avoid the transfer of potential to Service Provider's electronic equipment and the telecommunication system.

e) Lightning Protection System

- To ensure safety to the building and its occupants if lightning happens to hit it directly, lightning protection must be proposed.
-
- This proposal must be submitted during the concept stage and drawings must be submitted with the detail design submissions.

4.3 COMMUNICATION SERVICES

4.3.1 Assumptions / Design Criteria

- Card Access System will be provided to every residential level.
- Elevator Access System will be provided to every elevator.
- CCTV system must be using Dome/Bullet IP Camera capable to record HD Video and Audio
- GPON fibre optics cables must be provided to each unit & services stations wherever required.

4.3.2 System Description

a) Building Access Control

- The access control system uses RFID Cards as a medium of access.

- All authorized tenants must carry their RFID Card at all-time, otherwise will be treated as a visitor.
- A visitor will be issued with a visitor card and entry should be accompanied by authorized personnel.
- Any forced entry will be noticed with an alarm to access the control room/security room.
- **Common Area Access** – all the tenants/authorized person should be able to access the common area of the building by using an RFID card.
- **Elevator Access** – this enhances the overall security of the building by restricting tenant access to their respective floors only

b) CCTV System

- The CCTV system must be designed to provide 24 hours' video recording facility at Security Control Room for individual cameras installed in the building.
- Cameras must be provided at the entrance guardhouse and entrance lobby point, which will be connected to a recorder and TV monitor.
- The CCTV system must be able to capture the surrounding area, perimeter, entrance elevator lobby, car parks.
- All activities within the premises & perimeter surrounding to keep track and recorded for playback if necessary.

c) Carpark Barrier Gate System

- The developer must propose a car park barrier gate system near the entrance to the car park consisting of:
  1. Controller
  2. Ingress/egress barriers
  3. Access card reader
  4. Manual switch

5. References

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HOUSING DEVELOPMENT CORPORATION

PLANNING & DEVELOPMENT DEPARTMENT

SUBMISSION & QUALITY MANAGEMENT CRITERIA

Planning & Development Department, Housing Development Corporation Ltd, Tel: 3353535, Fax: 3358892, Email:planning@hdc.com.mv

1.0 SUBMISSION (DELIVERABLES AND CRITERIA)

1.1 CONCEPT DESIGN STAGE

Concept drawings should focus on how it is integrated to site and surrounding context. All floor plans should indicate the usage of specific floor spaces with its area as well as built Up Area (BUA) along with gross floor area (GFA).

Format of submission should include (but is not limited to) a PowerPoint presentation of the concept design stage submission. A compiled PDF of the above documents should be submitted in digital format. AutoCAD drawings should be submitted for all the drawings.

Concept design should include the following drawings & documents (minimum requirement);

A. ARCHITECTURAL

1. Concept brief
2. Location plan
3. Site plan showing the surrounding context
4. Parking layouts
5. Vehicular and pedestrian circulation layout addressing the surrounding context
6. Floor plans, sections and elevations
7. Relevant blow-up details
8. Proposed material schedule and mood board
9. Interior and exterior perspective images (3D rendered visuals)

B. STRUCTURAL

Structural concept will include the following drawings and documents;

1. Layout plan drawing showing the structural members (such as column, beam, slabs, sheer wall. etc.) with estimated size & location. Details regarding selection of member size without effecting architectural concepts. (Details of clear heights achieved in specific locations can be highlighted)
2. A report stating:
   a) Pro and cons of the preferred structural system with respect to the architectural design.
   b) Explain the structural system in relation to structure's durability for the intended lifetime of the building.
   c) Explain the Structural design including the design code, design parameters (considered loads) & analysis method preferred by structural design engineer, details of the software(s) to be used for design, formats of design sheets (if any).
   d) Details of proposed foundation system based on the available geotechnical parameters. It should be noted that the wind speed for the design can be obtained from local metrological department.
   e) Assessment of the environmental conditions and the requirement that is applicable for the design with reference to code of practices. This includes, but not limited to covers to be provided for reinforcement, grade of steel, water proofing for foundation, min concrete grade with maximum water cement ratio, admixtures to be used for concrete etc. based on standards.
   f) Minimum cement content details for different grades of concrete, in order to achieve a durable concrete for its intended life time
   g) Details regarding fire rating of the building

C. BUILDING SERVICES

Proposals for the following systems must be submitted as a report

1. Air-Conditioning System and proposed locations
2. Mechanical Ventilation System and proposed locations
3. Fire Safety Design
   a)Fire Detection and Alarm System
   b)Portable extinguisher

c) Fire blankets
d) Dry riser system
e) Hose reel system
f) Wet Riser System

4. Water, Drainage and plumbing proposal
5. Vertical Transportation Services (Lift)
6. Lighting and Power System
7. Emergency Lighting System
8. Earthing System
9. Lightning Protection System
10. Emergency Electrical Supply (Generator Set)
11. GPON in building network
12. Building Access Control
13. CCTV System
14. Public Address System
15. Carpark Barrier Gate System

1.2 DETAILED DESIGN STAGE

Detailed design will be submitted after concept design approval as follows:

1. Architectural drawings (by a locally registered professional architect) of all plans, elevations and major sections. (Refer to local planning guidelines)
2. Structural drawings and calculations, methodology (stamped and signed by a locally registered professional engineer)
3. Foundation protection method
4. Building services drawings (electrical, water plumbing and sewage, GPON, HVAC, Vertical transport, Fire Safety)
5. Material and finishing schedule
6. Local authority approvals, including but not limited to Fire Drawings and Panel board drawings.
7. Soil Investigation/Geotechnical Survey report (If required)
8. Environmental Impact Assessment report

Minimum three (3) sets of the above-mentioned drawings and documents should be submitted. Drawings Submission Form with the appropriate parts filled and signed by Registered Architect and Engineer.

1.3 SHOP DRAWINGS AND AS BUILT

The following drawings shall be submitted after completion of construction and prior to usage of the building.

- As built Architectural drawings
- As built Structural drawings
- As built Services drawings (Water, Sewage, Electrical, Ventilation & Air-conditioning, Firefighting and Communication/GPON)
- Copy of approvals given by Authorities, such as but not limited to MNDF Fire, Ministry of Health, STELCO, MEA, MWSC

With the submission of required documents, HDC would provide the necessary feedback for each stage. In giving feedbacks we would check whether if it fits the development guidelines, design guidance documents, international standards and the standards set by HDC. A two-way dialogue to attain a satisfactory level of work will be pursued. Upon submission of the documents HDC reserves a duration of 14 working days to process and provide comments or approval. A period of 14 working days will be taken to provide comments for concept drawing. If the drawings are not approved and comments are sent after checking, revised drawings are to be submitted within 14 working days. Please note that for each submission14 working days will be taken to comment. In addition to that, the duration taken to comment on Detail drawings stage will be minimum of 10 working days and maximum is 20 working days

If the party fails to correct after sending comments twice, the party needs to apply again as a new project proposal along with the application fee. This is to encourage carefulness from the client and to maximize efficiency from both stakeholders.

Once the concept drawings are approved, the detail drawings shall comply to the approved concept drawings and if in any case if there are changes to such as floor plans sections and elevations in the detail stage, a revised concept drawings approval should be submitted. It is mandatory to approve concept if the changes need to be brought to aforementioned drawings.

Physical implementation process can be initiated once drawing approval is given by HDC. Any modifications or amendments to the drawings should be informed and applied for approval prior to initiating any physical works on site which contradicts the approved drawings. Drawings and documents mentioned in shop drawings and as-built drawings can be submitted during implementation or after construction prior to applying for building usage permit. With the Successful completion and submission of the documents and drawings and after fulfilling of other mandatory requirements set by the Building Control Unit, Building Usage Permit will be awarded.

2.0 REQUIREMENTS OF THE CONSULTANT

Developer is required to hire a locally registered Project Management (PM) consultant for the quality assurance of the building. The PM consultant should be a 3rd party independent person or a firm that is locally registered under Ministry of National Planning, Housing & Infrastructure. This consultant should be unbiased in the works and while reporting to HDC. The consultant should be hired prior to the commencement of any site works. Once hired, the consultant should approve and submit a Construction Quality Management Plan (CQMP) from the Developer or Contractor before any physical works on site are carried. Duties and responsibilities of the consultant are as follows:

2.1 RESPONSIBILITIES

A. ASSURANCE OF CONSTRUCTION QUALITY

Necessary tests should be carried out on site and off site to ensure the quality of the final product. This includes, but not limited to compressive strength of concrete, tests done to ensure strength of steel, Slump test, Sieve Analysis and material specifications.

B. ASSURANCE OF FINISHING QUALITY

Consultant should ensure that the works are carried out according to the approved standards, methodologies, CQMP and drawings and if not mentioned as per the best practices followed. Consultant should also ensure that all works are carried out using approved materials which meets the standards as per the guidelines and the intended purpose for quality, safety and durability.

C. MATERIAL APPROVAL

All the materials used in the building structure, services and finishing shall be approved by the consultant. In approving the materials, the consultant shall ensure it meets the standards as per the guidelines and the intended purpose for quality, safety and durability. All the records of approved materials and its specifications should be kept and shared to HDC according to the reporting criteria.

D. APPROVE METHODOLOGIES

Prior to commencement of any construction works, Consultant should evaluate, suggest any improvements and approve method statements submitted by the developer. Consultant should ensure that the approved methodologies meet the intended purpose. All the methodology approvals should be kept on record and shared with HDC according to the reporting criteria.

E. ISSUING SITE INSTRUCTIONS

Issued site instructions should be recorded and submitted to HDC as per the reporting criteria.

F. APPROVE AS-BUILT DRAWINGS

The consultant should ensure the approved as-built drawings are accurate and meets onsite physical development.

2.2 REPORTING

All the following reports should be signed or stamped by the consultant. All the monthly reports should be submitted by the consultant before 10th of every month.

A. INTIAL REPORT

i. Construction Quality Management Plan (CQMP)
ii. Safety Plan
iii. Work methodologies

B. MONTHLY REPORT

i. Project Brief
ii. Ongoing works and upcoming works for the next month
iii. Overall construction progress showing the planned vs actual progress in the form of a Gantt chart
iv. Accidents report
v. Challenges faced during implementation
vi. Test & Analysis reports
vii. List of attended inspections and its reports
viii. List of instructions given on site
ix. Documentation of approved methodologies
x. Documentation of approved materials

C. PROJECT COMPLETION REPORT

i. Summary of Project
ii. Challenges faced during the implementation
iii. Maintenance requirements
iv. Services systems manuals
v. As-Built Drawings

SECTION V. BUSINESS PROPOSAL REQUIREMENT

To establish its qualifications to perform the contract in accordance with *Section III Qualification and Evaluation Criteria* and to determine the proposal as substantially responsive proposal, Proponent shall provide the information requested in the corresponding documents included hereunder.

1. BID SECURITY AS IN FORM 01

2. LETTER OF PRICE PROPOSAL AS IN FORM 02

3. LEGAL DOCUMENTS:

3.1 Copy of Business Registration Certificate.

3.2 Copy of GST Registration certificate (for the relevant and similar work)

3.3 Copy of Trade permit (for the relevant and similar work).

3.4 For Partnership: Partnership Deed / Agreement.

3.5 For Company; Memorandum and Articles of Association of the Company.

3.6 For Company; Board Resolution of the Company confirming Board of Director's approval for proposed work.

3.7 Information of the Authorized Representative as in Form 03.

3.8 Power of Attorney to sign on behalf of the Proponent in accordance with ITP 14.2.

3.9 In the case of a Proposal submitted by a Joint Venture (JV), the JV agreement or letter of intent to enter into JV including but not limited to scope of works to be executed by respective partners and equity share percentage of the respective partners;

4. FINANCIAL DOCUMENTS

4.1 Financial proposal including method of financing the proposed investment and estimated investment value. Proposed method of financing for investment can be equity financing, equity injection, bank finance, external finance such as financier company, lines of credit, time deposit, tradable bonds or combination of various financing methods.

4.2 Copy of GST and BPT Returns Statement of the past 3 (three) years.

4.3 For Sole Proprietorship, bank statements of the most recent 06 (six) months of the business entity or the monthly balance or monthly average balance confirmation. The submitted statement shall be original, authorized and sealed by the bank / financial institution.

4.4 For Company, audited financial statements of the past three 03 (three) years authorized by a certified audit firm / individual and management account of the current year.

4.5 If bank financing is proposed by Proponents, bank comfort letter, bank guarantee or any other relevant documents shall be submitted. The submitted documents shall include the Proponent(s) name and name of proposed work/ project.

4.6 If equity injection or external financing is proposed by Proponents, relevant documents including but not limited to Proponent(s) name, name of the proposed work/project and letter of commitment for financing shall be submitted demonstrating access to or availability of funds.

5. BUSINESS PLAN:

The Proponent shall submit a business plan including:

5.1 Marketing Plan

a) Product strategy including target market & product alignment with Hulhumalé Master plan

b) Pricing strategies

c) Promotional strategies

5.2 Maintenance/ Facilities Management Plan

a) Maintenance/ facilities management structure

b) Proposed management fee structure

5.3 Financial Plan

a) Financial forecast

b) Investment appraisal and indicators

5.4 Operational Plan

a) Proposed project schedule

b) Management and operational details

c) Creation of employment opportunities to locals

6. EXPERIENCE

6.1 Proponent shall submit documents proving their experience including project completion letters including project values, reference letter or any other relevant documents proving the experience in the field or similar business activities.

7. PROPOSAL CHECKLIST

7.1 Proposal Checklist as in Form 04 should be attached outside the sealed envelope.

FORM 01: BID SECURITY FORM

WHEREAS, *(name of Proponent)* (hereinafter called "the Proponent") has submitted their bid dated *(date of submission of bid)* to (name of works) in *(insert lot number),* Hulhumalé (hereinafter called "the Bid").

KNOW ALL PEOPLE by these presents that We *(name of bank)* having our registered office at *(address of bank)* (hereinafter called "the Bank") are bound unto the Housing Development Corporation Ltd of the Republic of Maldives, registration number C-793/2008 (hereinafter called "Lessor") in the sum of *MVR ..... (Maldivian Rufiyaa) for* which payment well and truly to be made to the said Lessor, the Bank binds itself, its successors, and assigns by these presents.

SEALED with the Common Seal of the said Bank this ..... Day of 2020.

THE CONDITIONS of this obligation are:

1. If the Proponent

(a) Withdraws its Bid during the period of bid validity

2. If the Proponent, having been notified of the acceptance of its Bid by the Housing Development Corporation Ltd during the period of bid validity:

(a) Refuses to accept the award;

(b) Fails to submit the Performance Guarantee; or

(c) Fails to execute the term and conditions of Development and Lease Agreement; or

We undertake to pay to the Lessor up to the above amount upon receipt of his first written demand, without the Lessor having to substantiate his demand, provided that in his demand the Lessor will note that the amount claimed by him is due to him owing to the occurrence of the above condition.

This Guarantee will remain in force up to and including the date (insert date) 180 days from *(date of proposal submission)* after the deadline for submission of this Guarantee or as it may be extended by the Lessor, notice of which extension(s) shall be given to the Bank. Any demand in respect of this Guarantee shall reach the Bank not later than the above date.

This guarantee shall supersede all agreements between us and the Proponent in relation to this Bid. If there are any inconsistencies between this guarantee and any other document exchanged between us and the Proponent, the terms of this guarantee shall prevail.

This guarantee shall be governed by and construed in accordance with the laws of Republic of Maldives.

_____

(Seal and signature of the bank / financial institution)

FORM 02: LETTER OF PRICE PROPOSAL

Date: .....
Name of the Project: .....
Proposal Reference No: .....

To: Housing Development Corporation Ltd.
Ground Floor, HDC Building
Hulhumalé, Maldives

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Request for Proposal (RFP) documents including all addenda issued in accordance with Instruction to Proponents (ITP) 6.

(b) We meet the eligibility requirements and have no conflict of interest in accordance with ITP 3;

(c) We have not been suspended nor declared ineligible by the Lessor in accordance with ITP 3.5.

(d) We have no outstanding payment due to the Lessor in accordance with Section III.

(e) We have no litigation history and non-performance of a contract in accordance with ITP 3.6 and ITP 3.7.

(f) We, (insert *company name and company registry number)*, offer to (insert name of the Project).

(g) We undertake, to propose the percentage of revenue of our proposal as .....% *(percentage in numbers) (percentage in words)*

(h) Where the proposal is successful, we undertake, to pay whichever is higher, of quoted percentage of revenue to HDC or minimum monthly guarantee rate per square feet per month.

(i) Where the proposal is successful, we undertake, to adhere the concept design and guidelines stated in Section IV, 4, during the designing and construction of proposed project.s

(j) Our proposal shall be valid for a period of One Hundred and Fifty (150) days from the date of proposal submission deadline in accordance with RFP document and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

(k) We understand that this proposal, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed; and

(l) We understand that Lessor is not bound to accept the highest evaluated proposal or any proposal that may receive.

Proponent:

Name: .....

(Seal)

Address: .....

Duly authorized to sign the proposal for and on behalf of the Company:

Name: .....

Title: .....

Signature: .....

Date: .....

FORM 03: INFORMATION OF THE AUTHORIZED REPRESENTATIVE

Date: .....

Proposal Reference No:.....

To: Housing Development Corporation Ltd.
Ground Floor, HDC Building
Hulhumalé, Maldives

This is to authorize (*Name, ID number*) as a representative of (*Name of the Proponent*) to carry out the Project related to RFP (ref no) and to liaise with Lessor on behalf of the (*Name of the Proponent*)

Proponent:

Name: .....

Address: .....

.....

Signature and Stamp

Authorized Representative (preferably fulltime personal):

Name: .....

Designation: .....

ID Number: .....

Contact Number: .....

Email Address: .....

.....

Signature

FORM 04 - PROPOSAL CHECKLIST

Proponents are required to Form 04 – Proposal Checklist outside the sealed envelope of the Proposal.

Proponent	For HDC use	
☐	☐	1. Bid Security as in FORM 01
☐	☐	2. Letter of Price Proposal as in FORM 02
☐	☐	3. Copy of Business Registration Certificate
☐	☐	4. Board Resolution as in SECTION V 3.6
☐	☐	5. Proposal Checklist ss in FORM 04 attached outside sealed proposal.

NOTE:

- **PROPOSALS WITHOUT THE SPECIFIED DOCUMENTS STATED IN THE FORM 04 PROPOSAL CHECKLIST WILL BE REJECTED AT THE TIME OF PROPOSAL OPENING.**

SECTION VI. CONTRACT TERMS

1.	**Parties to the Agreement**	Housing Development Corporation Ltd HDC Building Hulhumalé (hereinafter referred to as "lessor", which expression shall include its successors-in-title, liquidators, administrators and lawful assignees where the context so requires or admits). [Address of the successful Proponent] (hereinafter referred to as "lessee/ developer", which expression shall include its successors-in-title, liquidators, administrators and lawful assignees where the context so requires or admits)
2.	**Objective**	2.1. The objective of this agreement is to lease the land to the lessee to undertake the development and operation of 'Co-living Housing' in Hulhumale' as per the agreement terms set forth by HDC.
3.	**Performance Guarantee**	3.1. Submission of Performance Guarantee amounting to 5% of Engineer's Project Cost Estimate by Lessor within 30 (thirty) calendar days from the receipt of conditional award letter subject to: o Local Parties: Minimum of MVR500,000 maximum of MVR 5,000,000 o International Parties: Minimum USD100,000 maximum USD1,000,000
4.	**Concept Drawings**	4.1. HDC will provide the concept for the development of the Co-living housing facility in the RFP. The developer must adhere to the concept provided by HDC. 4.2. The developer should declare that the developer would not deviate from the concept during the detailed drawing stage and in the development of the Co-living housing facility. 4.3. The developer may bring minor changes to the concept provided by HDC given that the developer adheres to the guidelines provided by HDC. 4.4. The developer should propose the changes to the concept within 30 (thirty) calendar days from the receipt of conditional award letter. It is upon the sole discretion of HDC to accept any changes to the concept. In case HDC rejects proposed changes to the concept, the developer should proceed with the concept provided by HDC.

		4.5. Ensure rectifications and submission of the final concept drawings as per the comments of HDC within 14 (fourteen) calendar days of HDC's comments being communicated. 4.6. Revised concept cannot be submitted prior to receiving comments from HDC. 4.7. The developer will have to address all issues highlighted in comments for drawings prior to submission of revised concept. 4.8. If the concept is changed / revised and resubmitted for approval, after the initial approval has been given, the developer will be charged a review fee of MVR 3 per square meter. 4.9. Corrections can be made to the concept only up to a maximum of two times.
5.	**Financing**	5.1 The lessee agrees to finance the construction and development of the project.
6.	**Land**	6.1. The land identified for the project is plot number N4-42, measuring an area of 16,934.07 square feet.
7.	**Land Usage**	7.1. The land should primarily be used for the development and operation of a 'Co-living Housing' in Hulhumale' as per the concept provided by HDC.
8.	**Lease Term**	8.1. The lease period is 30 years from the date of signing the agreement.
9.	**Lease Rate / Minimum Monthly Guarantee**	9.1. The Lease Model is Minimum Monthly Guaranteed Lease model, whereby the lessee agrees to pay the Minimum Monthly Guarantee Lease or the parentage agreed on the net revenue, whichever is higher, to the lessor as the lease. 9.2. The Minimum Monthly Guaranteed Lease (MMG) Rate is MVR 5 per square feet per month for the first 5 years from lease effective date. 9.2.1 The Minimum Monthly Guaranteed lease will be due on the 1st of each Calendar Month, and should be paid to the lessor no later than the 10th of Each Calendar month. If fails to make payment before 10th, the lessee must pay delay penalty as per the lessor's policies 9.2.2 The Minimum Monthly Guaranteed Lease Rate will be revised every five years based on the Market Inflation Rate based on the formulae NR=P(1+i+5%), where • NR: is the new MMG Rate for the next 5 years.

		• P: is the MMG Rate for the preceding 5 years. • I: is the Cumulative Inflation of the preceding 5 years for the real estate inflation of Greater Male Region published by Maldives Monetary Authority or Any Government Relevant Body. 9.3 The Percentage of Revenue Share on the net Revenue is [proposed % by the lessee]. 9.3.1 The Net Revenue shall mean the aggregate of the following amounts. 9.3.1.1 Total of all revenue generated by the lessee from utilizing the land or any property developed on the land calculated based on Accounting Accrual Concept. 9.3.1.2 Deduct any Return Inwards. 9.3.1.3 Deduct any Direct Taxes such as, but not limited to, GST levied by the government. 9.3.2 The lessee must submit the Sales Report of each month before 15th of each Calendar Month, and must submit Audited Quarterly Sales Report within 30 calendar days of quarter end for avoidance of doubt, a quarter is: • 1st Quarter: 1st January to 31st March of each year. • 2nd Quarter: 1st April to 30th June of each year. • 3rd Quarter: 1st July to 30st September of each year. • 4th Quarter: 1st October to 31st December of each year. 9.4 The lease effective date shall be the date of land handover.
10.	**Lease Deposit**	10.1 The lease deposit amount shall be the total of first 03 (three) months' minimum monthly guarantee. 10.2 This amount should be paid within 7 (seven) working days of detailed drawing approval and prior to land handover.
11.	**Grace Period**	11.1 Grace period shall be until the completion of construction and development (maximum 18 months) from the agreement signing date where no rent shall be payable by the lessee.
12.	**Construction and Development Period**	12.1 The lessee shall proceed with the construction and developments on the Land as per the "Project Plan and Schedule" (as per the term 18.2), once the land is handed over to the Lessee. 12.2 The Lessee shall complete the construction and development of the 'Co-Living Housing' within a maximum period of 18

			(eighteen) calendar months from the agreement signing date (detailed drawing submission duration is exclusive of the 18-month period).
13.	**Land Handover**	13.1	The development land/site will be handed over to the lessee within 7 (seven) working days of detailed drawing approval and upon settlement of the lease deposit.
14.	**Management of the lands & developed property**	14.1.	The Lessee shall be liable for the management and administration of the developed property, which includes and are not limited to operation, supervision, maintenance, effecting insurance, and providing full-time security of the property throughout the term of this agreement.
15.	**Lease of Commercial Units**	15.1. 15.2. 15.3.	The lessee may undertake lease of the commercial units of the Co-living housing facility, provided the lessee has completed 20% of civil works of the project. Once 20% of civil works are completed by the lessee, the lessee shall submit progress report (as per clause 18.6) stating that 20 % of civil works has been completed, whereupon, lessor shall inspect the progress and grant written permission for lease. This permission shall suffice as the permission to collect advance payment / lease from the party interested in leasing commercial unit from the Co-living Housing. However, the lessee shall not lease the co-living rooms or take any booking fee from interested individuals. The lessee should not collect any payments from potential tenants (or pre-lease the commercial units of the Co-living Housing) who wishes to lease the commercial unit from the building prior to the written approval from HDC.
16.	**Independent Consultant**	16.1	The developer shall employ a licensed independent consultant (approved by a regulatory body) to the project, until completion of the construction and development.
17.	**Business Model**	17.1 17.2 17.3 17.4 17.5	A minimum of 9 floors (162 units) should be designated for twin-sharing rooms. Developer is allowed the flexibility to choose the rent model for the remaining 2 floors (either to use as co-living rooms or rooms for daily rent) to guarantee project feasibility. Rooms can only be rented out to locals. Twin-sharing rooms and single rooms should be rented out for a period of at least 1 month and up to a maximum of 2 years for a single tenant. The rent charged per bed should not deviate from the prices proposed by HDC (refer to term 17.6).

		17.6 The prices proposed by HDC for the first 5 years are as follows ▪ Twin-sharing Rooms: 3,500 MVR/person/month ▪ Single Rooms: 6,000 MVR/person/month ▪ Rooms for daily rent: rent can be decided by the operator 17.7 The prices charged for twin-sharing rooms and single rooms can be revised every 5 years. The maximum lease rate charged should not go beyond the rate calculated from the formulae below: P(1+i+5%) where; P = monthly lease rate for the preceding year, and i = cumulative inflation for the five years which will be real estate inflation for the Male' area in the MMA statistics reports. 17.8 In case of sublease of all commercial units to one tenant, HDC should get the offer of first refusal. A certified independent valuer shall determine the market value of the development. 17.9 Mortgage rights of the land can be granted as per HDC's mortgage policy.
18.	**Duties and Obligations of Lessee**	18.1 Submit detailed drawings to Lessor within 60 (sixty) calendar days of agreement signing. 18.2 Submit project plan and schedule timeline within 30 (thirty) calendar days from the date of approval of detailed drawings. 18.3 Submit the Bill of Quantity (BOQ) including the cost and manpower plan within 30 (thirty) calendar days from the date of approval of the detailed drawings. The BOQ must be agreed by both parties within 14 (fourteen) calendar days of its submission. 18.4 If required as per the lessor's guidelines, submit an Environmental Impact Assessment (EIA) report approved by the Environmental Protection Agency (EPA) Maldives, within 30 (thirty) calendar days from the date of approval of detailed drawings. 18.5 Commence mobilization within 30 (thirty) calendar days from the date of approval of Detailed Drawings. 18.6 Submit monthly progress report of the development project once the development site is mobilized. The lessee shall grant the rights to HDC to publish the progress update. 18.7 Comply with all the protocols, guidelines of the relevant authorities. 18.8 Communicate and obtain approval from lessor for any changes to the structure or the buildings.

		18.9 Should install and maintain in the developed commercial building, at lessee's sole cost, such fire protection system or equipment as is deemed necessary by governmental and insurance bodies. 18.10 Make payments to the relevant authorities for all utility services consumed or supplied inclusive of electricity meters, water meters and telecommunication connections to the land and/or the premises during the term. 18.11 The developer should ensure segregation between male and female tenants. 18.12 The developer should make use of smart systems (e.g. payment systems) in the operation of the Co-living housing facility.
19.	**Obligation of HDC**	19.1 HDC should handover the land plots as per the Clause 13 of the agreement. 19.2 HDC should provide comments for the drawings no later than 14 days of drawings submission. 19.3 Providing right of access to the land for the Developer, upon availability of land, to conduct surveys related to the Project. 19.4 Provide all the required information requested by the Developer, without unreasonably withholding or delaying the information. However, HDC shall not be held responsible for any delay caused which is beyond the control of HDC. Nevertheless, where possible, HDC shall make the best of efforts to minimize the delay.
20.	**Termination**	20.1 Lessor may serve 30 (thirty) calendar days written notice to the lessee to terminate the agreement in the event the lessee fails to pay the rent and/or penalty as per the terms of the agreement for a period of 3 (three) consecutive months. 20.2 The lessor may terminate the agreement without any compensation payable to the lessee in the event the rent due and/or penalty remains unpaid as the end of 30 (thirty) calendar days written notice period. 20.3 If the lessee fails to perform any of its obligation under the agreement, the lessee shall be granted a period to rectify the breach along with a fine amount between MVR 5,000 and MVR 100,000 considering the degree of the breach, to be determined by the sole discretion of the lessor. 20.4 If the lessee fails to pay the fine and cure the breach within the extension period, the lessor has the right to terminate the agreement and give the lessee a duration of not less than 30

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			(thirty) calendar days to vacate the land and handover the land to the lessor.
		20.5	The lessee may terminate the agreement immediately without any prior written notice, if the lessee fails to perform any of the fundamental obligations.
		20.6	The lessee may terminate the agreement by serving 6 (six) months' written notice upon the lessor of its intention to do so for any reason whatsoever.

DISCLAIMER:

- **This contract terms only includes the key points of the agreement. The agreement is not limited to the clauses included in this contract terms.**
- **The proposal submitted by the successful Proponent shall be a part of the agreement.**