PROPOSAL

Modular Classroom Project
RFP # 3306
Package 2:
TECHNICAL SUBMISSION

Closing Time: 11 a.m. (local time) on August 3, 2010

Proponent: Shelter Industries Inc.
3294 – 262nd Street
Box 1318, Aldergrove
BC, Canada V4W 2V1
Tel. (604) 856-1311
Fax (604) 856-5200

Contact Person: Chris Yamamoto

E-mail address: cyamamoto@shelterindustries.com

SHELTER INDUSTRIES INC.
3294 – 262nd. Street, Box 1318, Aldergrove, B.C., Canada V4W 2V1
Telephone: (604) 856-1311 Fax: (604) 856-5200

September 29, 2010

Ministry of Education
c/o Partnerships BC
2320, 1111 West Georgia Street
Vancouver, BC V6E 4M3

ATTENTION: Dawn Hart

RE: Updated Technical Submission
Request for Proposals
For Modular Classrooms
RFP #3306

Dear Ms. Hart:

Shelter Industries Inc. is pleased to provide our "Technical Submission" for the design, production, delivery, installation, commissioning and associated work for the modular classrooms required throughout the province. This Technical Submission is based on our original proposal of August 3, 2010 and subsequent meetings and discussions. We are confident that our Technical Submission provides information and documentation that demonstrates that *Shelter Industries Inc.* is capable of performing the contractor's responsibilities and obligations under the master agreement and the modular classroom contracts.

We confirm that our proposal is in compliance with Schedule B – "Statement of Requirements" (with minor deviations noted in the Technical Submission).

Our Technical Submission includes the following information and documentation:

- Proponent Team
- Project Delivery
  - General approach
  - Technical
  - Production
  - Delivery & Installation
  - Project Management
  - Drawings

. . . /2

We trust our Technical Submission satisfies the requirements of this "RFP" including the detailed requirements outlined in your Appendix "B" – Proposal Requirements.

Yours very truly

SHELTER INDUSTRIES INC.

Chris Yamamoto
Project Director

Package 2 – Technical Submission

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- Millwork and Schedules
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- Foundation Pile Layout (Struct)
- Foundation Pile Layout (Alternative) (Struct)
- Framing Plans and Point Loads (Struct)
- Cross Sections and Details (Struct)
- Assembly Schedule
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- Fire Protection & Roof Plan (Mech)
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Appendix S - Specification Notes

Appendix T - Shelter Site Checklist & Substantial Completion

Appendix U - Product Content Assurance Data

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Appendix W - Preliminary Master Program Schedule

Appendix X - Schedule A 4 (see Appendix W)

Appendix Y - Quality Assurance Manual Excerpts

Appendix Z - Shelter Industries and Roofing Warranties

Executive Summary

Within British Columbia the education sector has regularly had to address the challenges of changing school population and modular classrooms have continued to provide then with both short and long term solutions. Traditionally the response to portable classrooms has been mixed as everyone wants the ability to have the capital to build what they want. Over the years there have been changes to the extent that School Districts even work with consultants to enhance the design and performance.

Since 1985 *Shelter Industries* Inc has played a central part in the growth of modular construction in BC. From its inception the partners have embraced and encouraged employees and contractors alike to act as team players in providing a solution to client groups. Its knowledge and willingness to work with the client, especially on design and build projects, has established its reputation for quality and service. This is especially true with respect to education, where we have seen multiple successes with a variety of institutions. These include:-

- School District #39 (Surrey) – Over the last 4 years includes approximately 60 classrooms
- School District # 43 (Coquitlam) – Over the last 2 years approximately 20 classrooms
- A 22,000 SF new school in the Peace District which included a library, stage and full gymnasium
- Surrey College – 17,000 SF classroom complex
- Vancouver School Board – 23,500 SF of facilities
- Simon Fraser University – 10,000 ESL facility
- Alberta P3 schools project - project administrator and manager for the manufacture of 192 classrooms

The proposed Full Day Kindergarten program creates the opportunity for the next generation of modular building solutions that maintains the flexibility of relocation whilst incorporating a brighter and healthier environment and design aesthetic. It also offers the School Districts and the Ministry of Education a program that allows them to work as a team to service different needs with the same outcome.

With the call for a healthier environment, by its very nature modular construction is a more energy efficient means of construction. Reduced construction time and reduced material wastage all minimize the eco- footprint. [redacted]

Our proposed solution includes:-

A. **Established knowledge and experience in education** – This includes combined experience of over 60 years in modular manufacturing and design.
B. **An established manufacturer / team leader** – Where the partners and owners pride themselves in being active participants in a project throughout the process.

C. **Incorporating team members that include experience in modular applications** – Examples being a structural engineer who has worked with all industry players, control systems installers that have worked on the Alberta P3 project, and a recognized manufacturing team that is also establishing itself working within other Provincial partnerships

D.

- [redacted]
- [redacted]
- [redacted]

E.

- [redacted]
- [redacted]
- [redacted]
- [redacted]

F. [redacted]

In summary *Shelter* and its team members have adopted an approach that incorporates combined knowledge in manufacturing of over 60 years. It has applied the talents of individuals, specialists and employees who believe in what modular construction offers. Its experience in education markets has created a good working rapport with many School Districts, which in turn has enabled a better understanding of their expectations and the challenges they face. Our established ability to offer a one stop solution means that we can work with the School Districts rather than be seen as just a supplier.

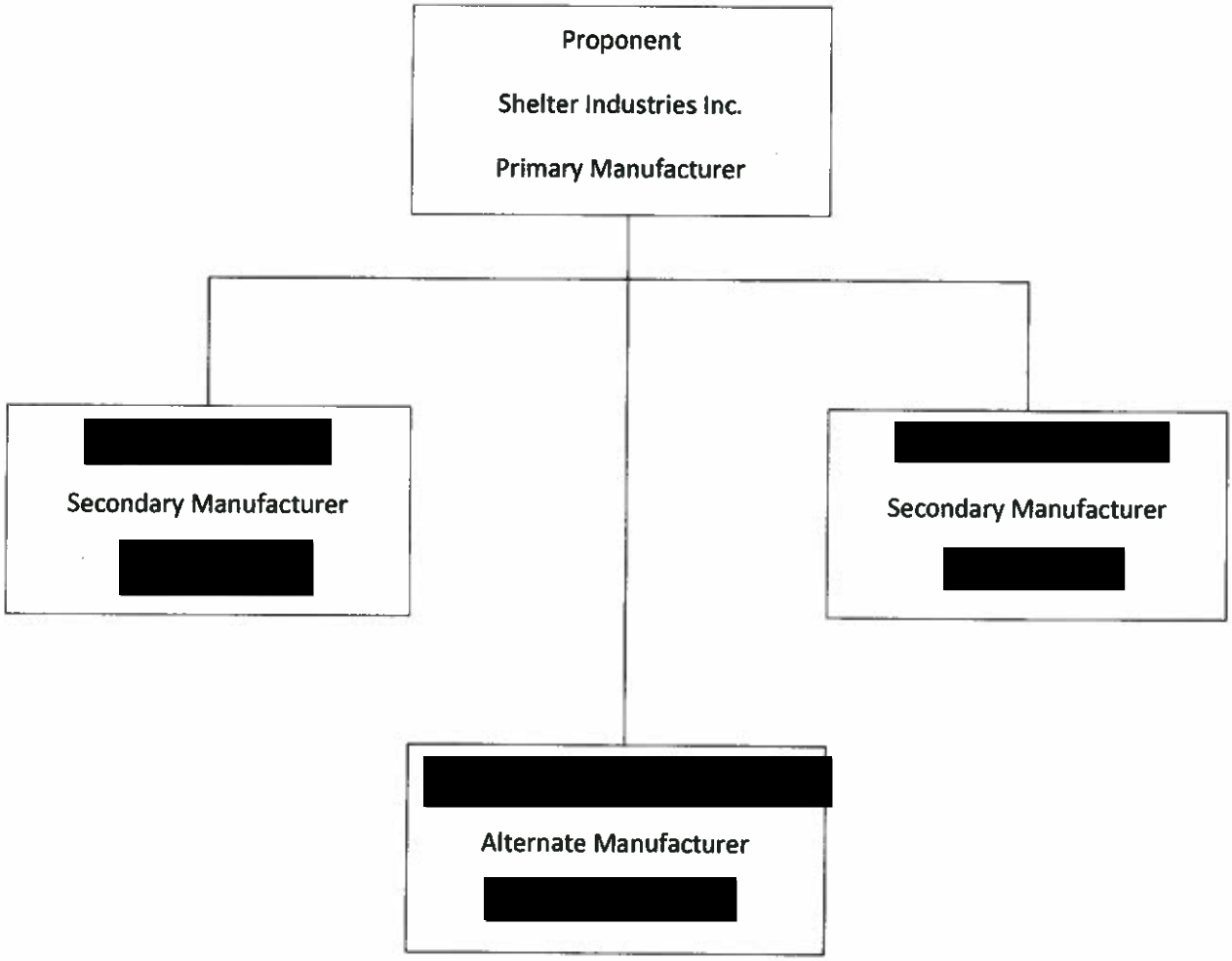
"The Shelter Team looks forward to continued partnerships in education...."

1. PROPONENT TEAM

1.1.1. Team Organization

The charts below outline the company organization. There are no corporate organizational changes expected during the Project lifecycle.

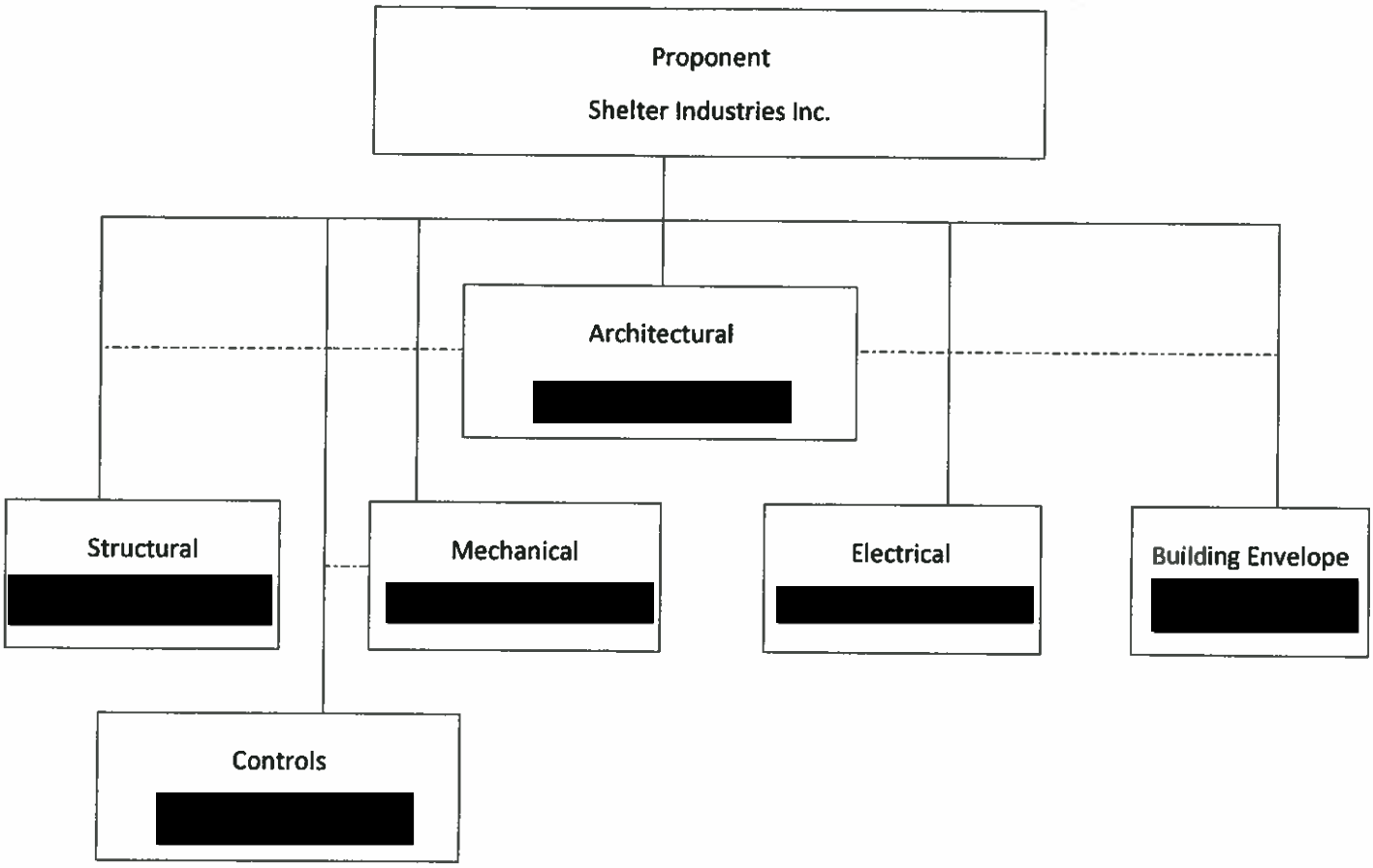
Modular Building Manufacturers



Shelter Industries Inc. will be the primary manufacturer producing the majority of the required modular classrooms. [redacted] and [redacted] will manufacture the balance of the modular classrooms as sub contractors to *Shelter*.

As an alternate manufacturing facility the proponent's sister company, [redacted] will be available to produce modular classrooms under the direct supervision and control of *Shelter*.

Design Team

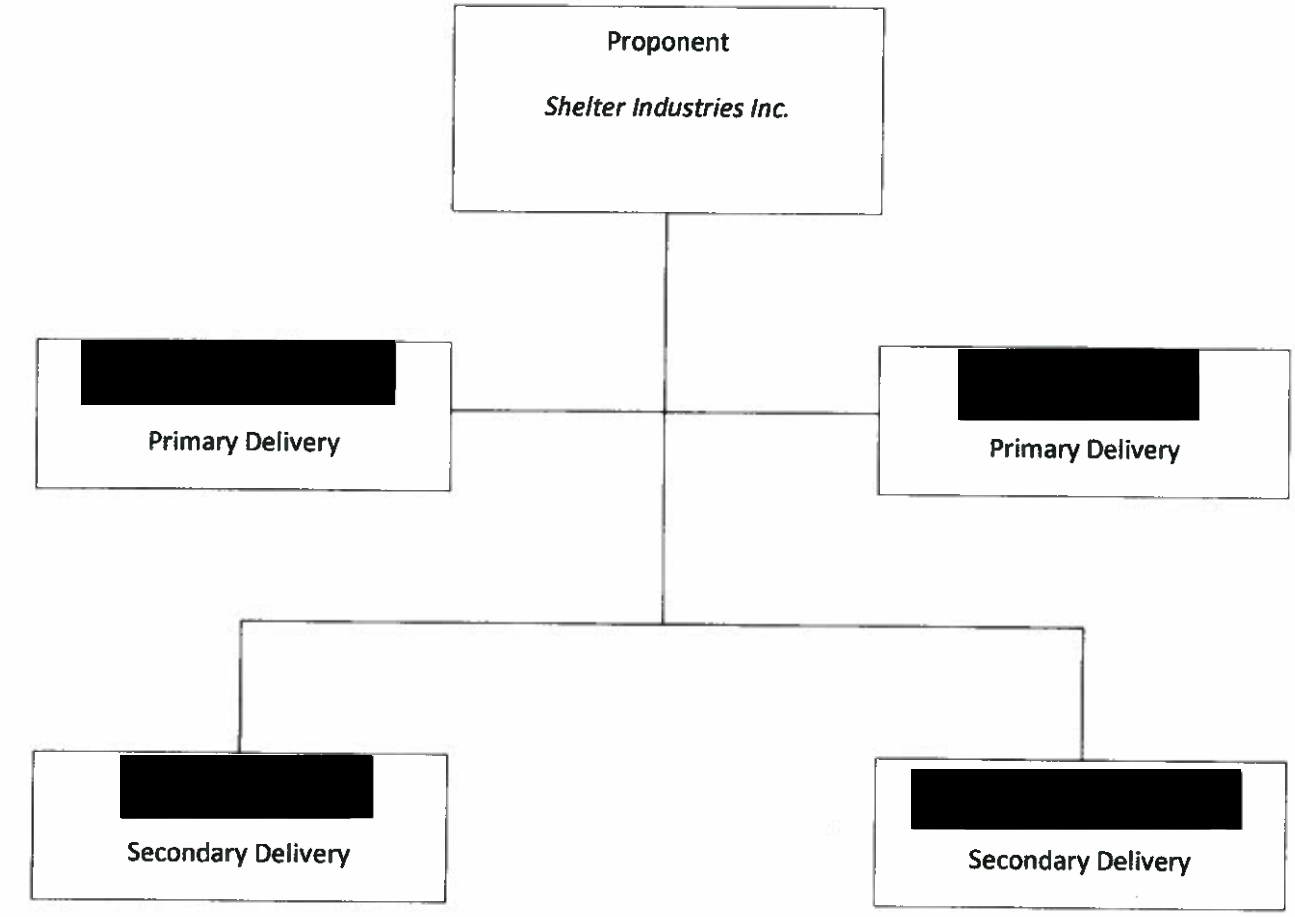


Design team members will work together during the design phase and construction phase of the project providing supervision and certification of modular classrooms during the design, production, delivery, installation and commissioning of the modular classrooms.

The architect, as the coordinating professional, will coordinate the activities of the other design team members.

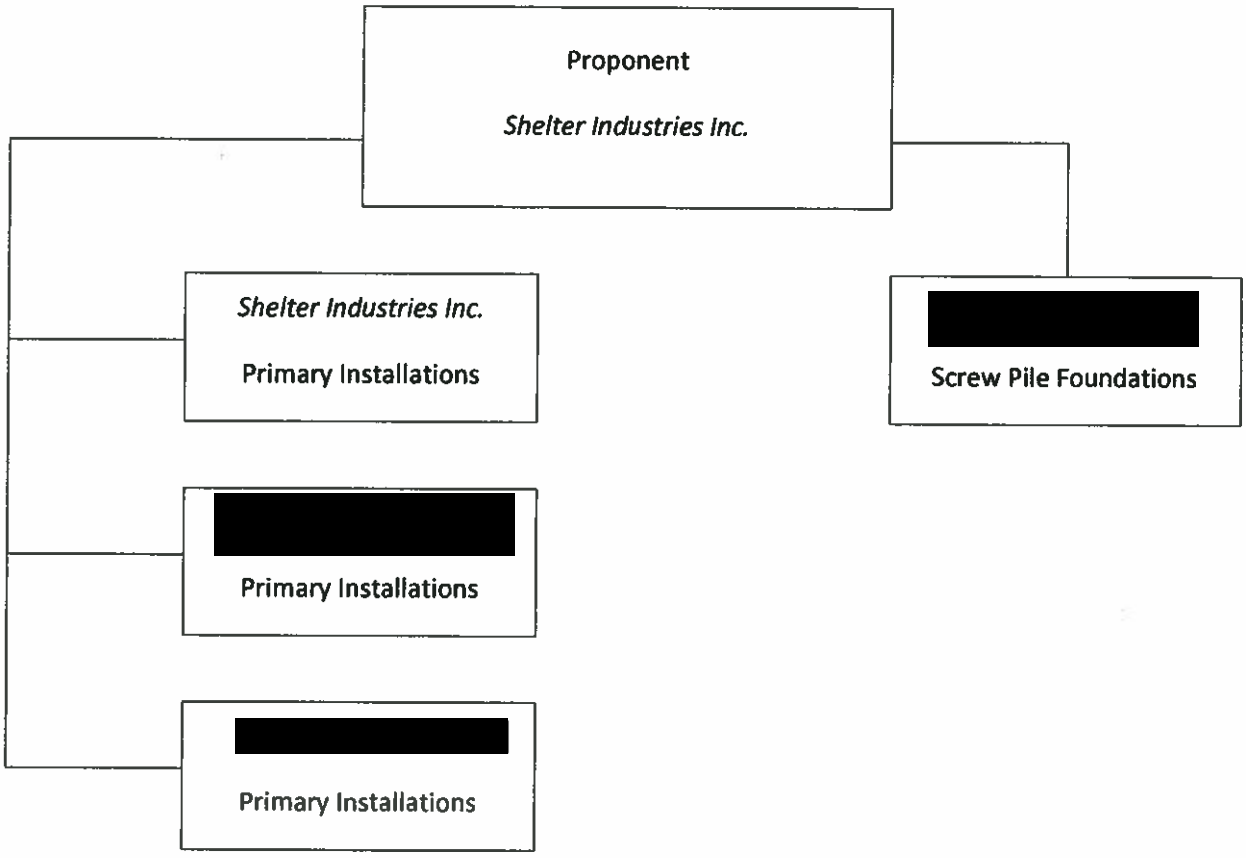
All members of the design team are independent corporations providing services to the proponent on a fee for services basis.

Delivery Teams



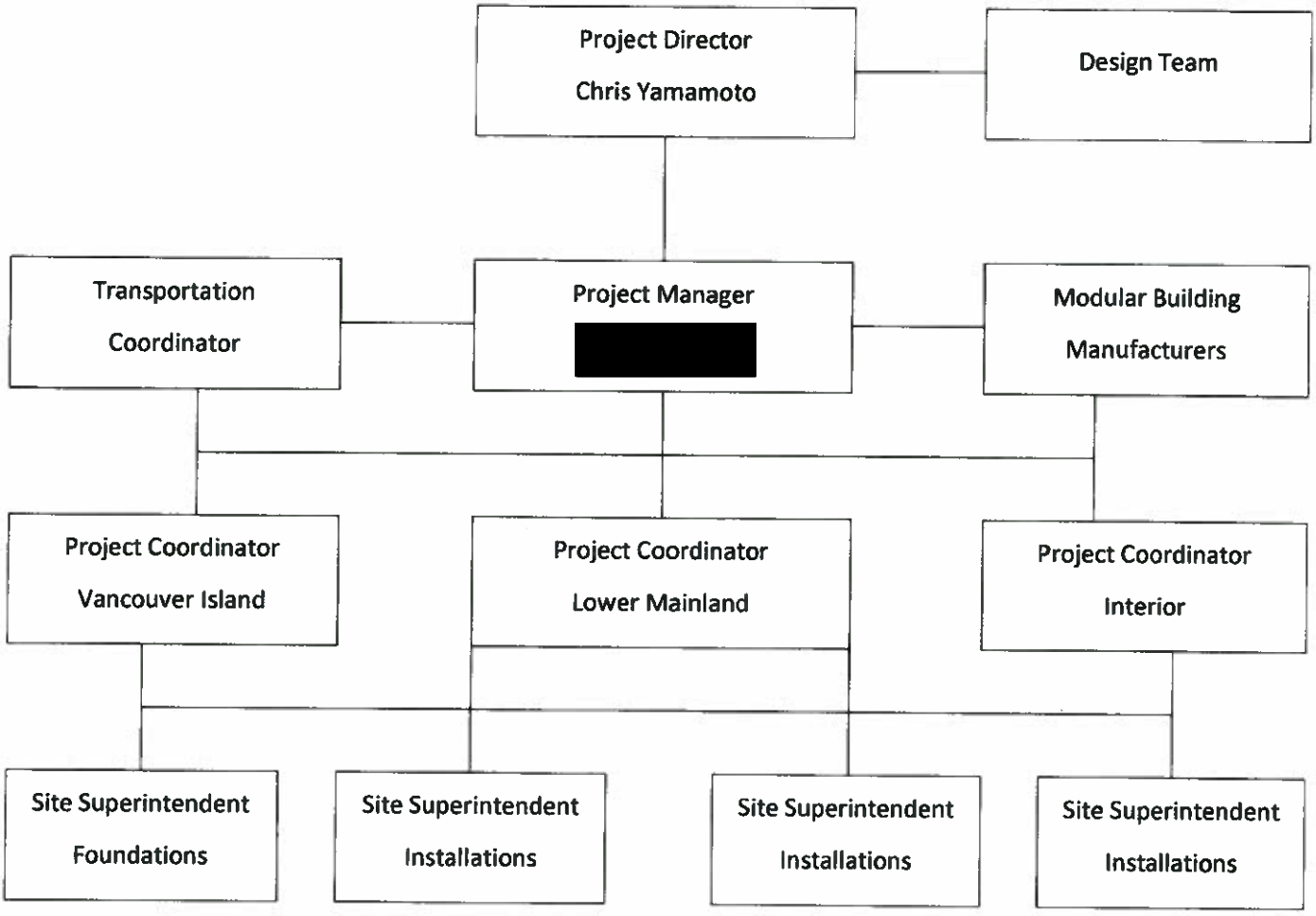
[redacted]

Installation Teams



[redacted]

Project Management Team
Shelter Industries Inc.



Shelter Industries is a corporation led by the President in a unique hands-on style, where the team members are considered the most important asset, and as such, every member is an integral part of a closely connected net. They are a responsibility based group with well utilized strengths.

Please see Appendix A for key team member profiles.

1.1. Relevant Experience

Reference nominated Project #1 – Modular Classrooms, Bird-Graham Schools

- *Shelter Industries Inc.* took a lead role in developing and managing this project.
- 192 modular classrooms on 16 Alberta school sites. Contract value $28 million

- Directly responsible for assembling and managing multi-disciplinary teams including design, production and delivery integration
- Modular classrooms included K-4, K-6 and K-9 school sites
- All modular classrooms, in conjunction with the core schools, were designed and constructed to attain *Leed Silver* rating
- The project involved managing sub-contractors, both at the factory and to accomplish delivery of the 192 classrooms over an 8 month period
- All classrooms were manufactured and delivered in accordance with the contract project schedule
- With 16 school sites requiring modular classrooms, we coordinated the priorities and schedules of 16 separate project managers
- The project required logistics management of manufacture, delivery and owners' installation crews.
- *Shelter Industries Inc.* has produced more modular classrooms for use in the British Columbia public school system than any other modular building manufacturer in British Columbia. Our familiarity with codes, regulations and standards for modular classrooms has been proven year after year.

Team Experience

The Team ensuring this Project will be a success has been responsible for the successful outcome of the nominated projects. They have been working together for the past 10 years and boast a combined expertise of over 60 years in the modular building industry.

- In projects of various complexities and sizes, similar and often more complex than the Modular Classroom Project, some of which presented anecdotal sets of challenges that prompted effective mitigation strategies. This exposure has been invaluable in strengthening the Team, making it most capable of delivering solutions under demanding conditions.
- Efficiently utilizing our multidisciplinary Team comprised of Engineering, Manufacturing, Project Management and Field Support groups. Our Team is comprised of fully integrated individuals of diverse academic and practical backgrounds who have been assembled together for their technical and practical skills, but most importantly, for their ability to work together.
- *Shelter Industries* has over the past 25 years, built an equally well functioning team of corporate gold partners who provide specialized support such as Architectural, Mechanical and Electrical Engineering on an as-needed basis.

Completing Projects in an Elementary, Middle or High School Environment

Shelter Industries Inc. has completed many School projects in an Elementary, Middle School, High School and University environment. In addition to manufacturing, delivering and installing hundreds of Portable Classrooms, *Shelter* has constructed semi-permanent Annexes for both Elementary

School and High School applications. Permanent Modular School facilities have been constructed by Shelter for Delta School District, North Vancouver School District and Peace River South. University/College facilities have been constructed for Simon Fraser University, Okanagan University College, University of the Fraser Valley, and Surrey College. For Surrey School District, *Shelter* designed, manufactured, delivered and installed several "Annex" classroom facilities. The finishes were selected to provide a more durable yet cost effective solution for the supplemental teaching facility requirement. For Peace River South School District, *Shelter* provided the design, manufacture, delivery and installation of a full Elementary School, including a Gymnasium, for the "Pouce Coupe Elementary School" replacement.

Energy Efficient and Sustainable Projects:

Shelter's most recent experience designing and manufacturing energy efficient and sustainable Classrooms involved the provision of 192 LEED Silver Modular Classrooms through "Bird-Graham Schools" for the Alberta Ministry of Education. The design and construction required strict compliance with LEED's requirements and construction procedures. Following the construction of a Prototype Classroom, manufacturing began in June, 2009 at the "Greensmart Manufacturing" factory (sister facility) in Dawson Creek, B.C. [redacted]

Project Management Experience

- *Shelter Industries Inc.* takes pride in their ability to manage complicated projects. For the Alberta School Board project (see details on form A-2, project No.1) *Shelter* designed, manufactured, and delivered 192 modular LEED silver certified classrooms to 16 unique school sites. Our specially designed project schedule tracking system, enabled us to accomplish this complex project in a very timely manner.
- The schedule for the Surrey College project (see form A-2 project No. 3) was challenging, as the college was required to open on a specific date to start the semester. Delay or late completion was simply not an option. Our solution was to enhance our schedule; *Shelter* coordinated the site work (i.e. excavation, reinforced concrete foundation, off site and site services etc.) to be concurrently performed while the module units were being manufactured. This allowed us to crane the units into place at the exact completion of the concrete foundation.
- In 2009, the *Shelter* team rose to another schedule challenge for a Vancouver School Board project. We manufactured and installed 25,000 square feet of new classrooms, and relocated 10,000 square feet of classrooms for school openings on three separate sites for September of 2009.
- The Team is accustomed to working with multiple clients effectively. Our processes and structure have accommodated as many as 8 different projects, progressing simultaneously through our 14,000 square meter manufacturing facility, our 11 member Engineering team and Supply Chain departments. In addition, as the leading

corporation, *Shelter Industries* has a proven track record of successfully engaging its subcontract partners, which, combined with the flexibility of our internal Team, has been the key element for successfully completing multiple projects and ensuring customer satisfaction.

- Effective project coordination at *Shelter Industries* is achieved by creating an environment where the Team members understand their role, responsibilities and expected contribution to the project. At the start of each project, a Project Manager is assigned the task of coordinating the development and manufacturing aspects, while a Site Manager's task is to see that installation teams and subcontractors are engaged and are fully aware of the scope of supply and timeline.

1.2. Personnel and Availability

The key individual on the project will be [redacted] will be available full time as the senior project manager dedicated to the project. His specific project duties and responsibilities will include:

- Ensuring the project is complete on time and within budget.
- Managing the day-to-day operational and tactical project components.
- Reviewing high-level deliverables across the project.
- Implementing engagement review and quality assurance procedures.
- Managing scope and mitigating risk across projects.
- Managing revenue goals set for the project.
- Serving as key participant in team and client meetings.
- Effectively communicating relevant project/practice information to customer and associates on site.
- Handling personnel situations
- Identifying opportunities for change and improvement throughout the implementation of the project.
- Managing day-to-day client interaction and expectations throughout the project.
- Complying with and enforcing standard policies and procedures.
- Maintaining safety requirements at all times.

1.2.1. The Team understands the importance and magnitude of this Project and has developed forward-looking strategies that will enable a successful outcome. In anticipation to *Shelter Industries* engaging in the Modular Classroom Project, as the Key Individual, [redacted] has begun the process of delegating a portion of his responsibilities to be able to place the Modular Classroom Project in the forefront; as a result, *Shelter Industries* can confirm [redacted] full availability and dedication. In addition, *Shelter Industries* is prepared to expand the team as needed if market conditions give way to an unexpected surge in demand.

1. PROJECT DELIVERY

1.1. General Approach

1.1.1. Compliance with Statement of Requirements

Compliance Statement

In general the submitted proposal complies with the "Statement of Requirements" with the following notable exceptions:

2.4.1:

3.1.3:

3.1.4:

3.1.8.2:

9:

[redacted]

Basic Code Analysis

[redacted]

[redacted]

1.1.1. Design Process and Design Review

Design Management Plan


[redacted]

Classroom prototype completed December 15th.

2.2. Technical

2.2.1. Project Design Objectives

2.2.2. Building Description and Details

Renderings and Project Cover Sheet – Appendix C

Plans and Reflected Ceiling Plan – Please see Appendix C

Interior Elevations and Sections - Please see Appendix C

Exterior Elevations - Please see Appendix C

Cluster Plans – Please see Appendix C

Schedules – Please see Appendix C

Cross Sections and Details – Appendix C, also mentioned in Structural

Sample Panels

2.2.3. Structural

All relevant drawings and sections have been reviewed and sealed by [redacted] with the appropriate seal added. Also see Appendix C.

2.2.4. Electrical

All relevant drawings and sections have been reviewed and sealed by [redacted] with the appropriate seal added. Also see Appendix C.

2.2.5. Mechanical Systems

Appendix C - Plumbing & HVAC Floor Plan
- Fire Protection & Roof Plan
- Specifications
- Schedules and Details

Note: 2.2.2, 2.2.4 and 2.2.5 are also contained in Appendix S

2.2.6. Site Preparation

[redacted]

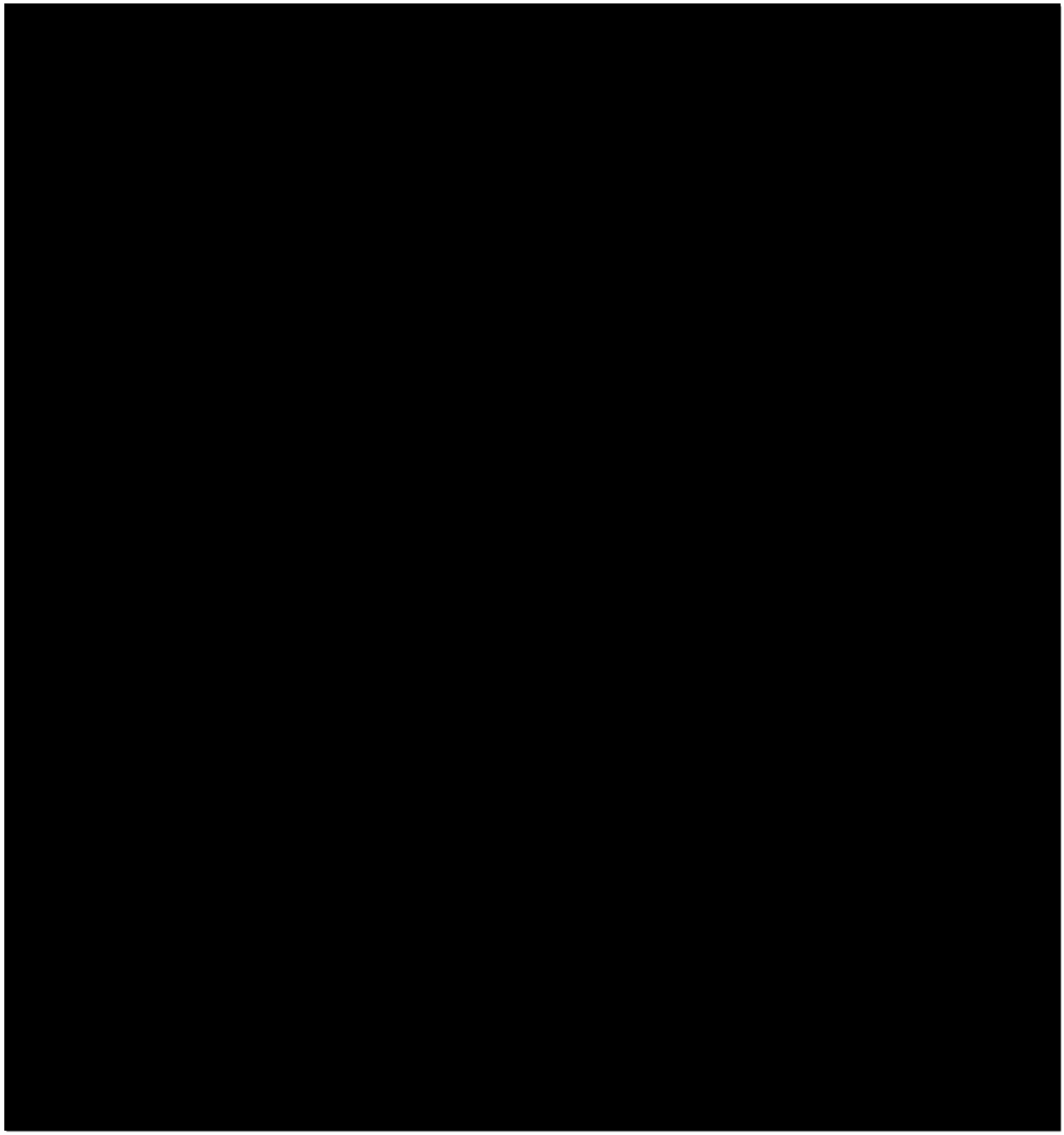
Site Preparation Requirements

[redacted]

School district will be responsible for locating and marking underground utilities such as irrigation systems, septic fields, septic tanks, water lines, gas lines, hydro that could possibly be damaged by our crane, tow truck or site crew.

Please see Site inspection checklist in Appendix T.

2.2.7. Mould Prevention and Control



2.2.8.Sustainability

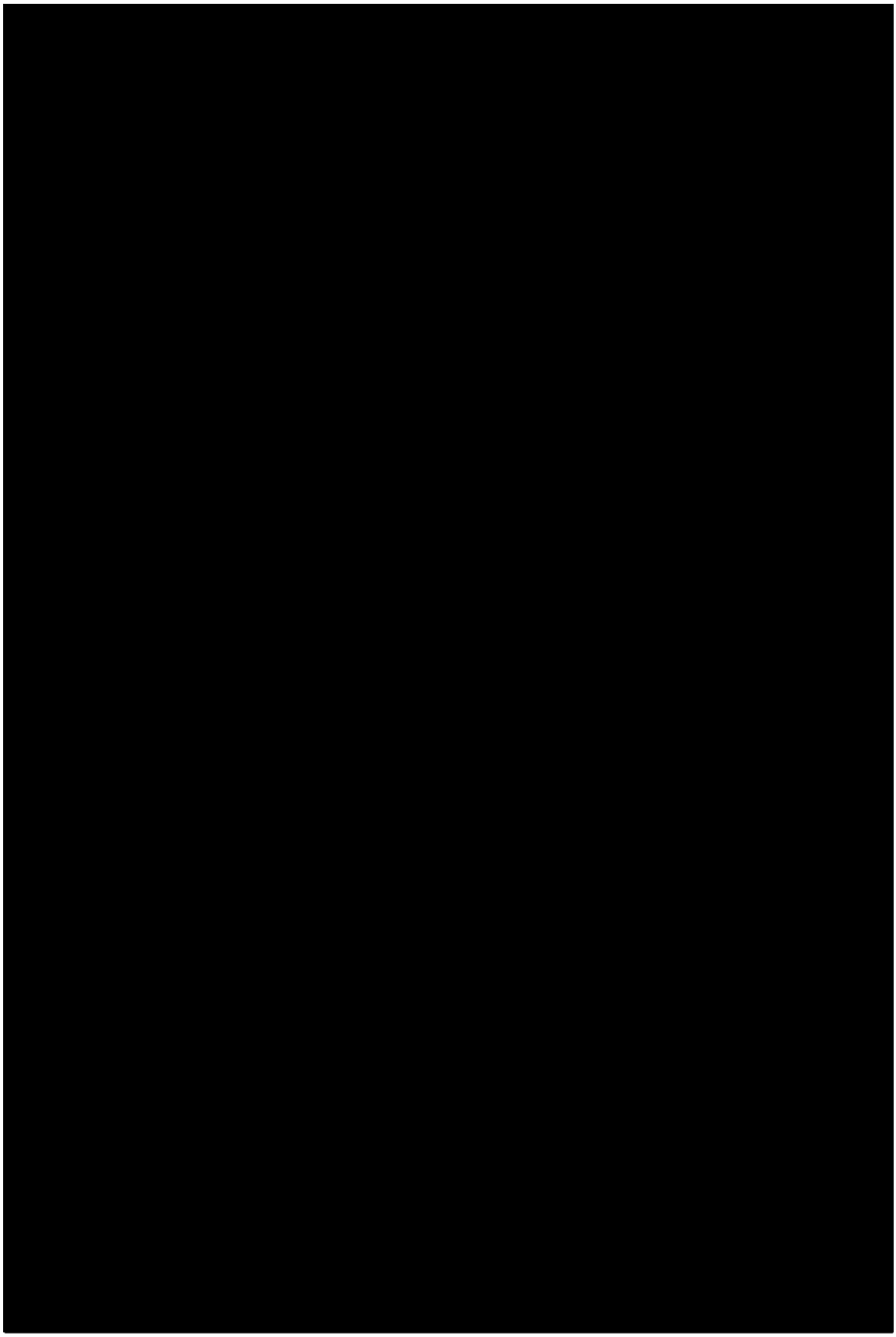
LEED

New construction for the modular classroom project is accomplished according to LEED (Leadership in Energy and Environmental Design Green Building Rating System) requirements wherever possible.

Shelter Industries understands that the LEED Green Building Rating System™ encourages and accelerates global adoption of sustainable green building and development practices through the creation and implementation of universally understood and accepted tools and performance criteria. LEED is not new to *Shelter Industries* and this project will be treated with the same thoroughness as all our other previous LEED-driven undertakings.

Please see Appendix U for Product Content Assurance Data Table

Energy Efficiency Performance and Features:



[redacted]

2.3. Production

2.3.1. Production Capacity

Primary Manufacturing Facility

- *Shelter Industries Inc.*, Aldergrove, British Columbia

[redacted]

Secondary Manufacturing Facility

- [redacted]

Secondary Manufacturing Facility

- [redacted]

Alternate Manufacturing Facility

- [redacted]

Please see Appendix V for letters of commitment from [redacted]

2.4. Delivery & Installation

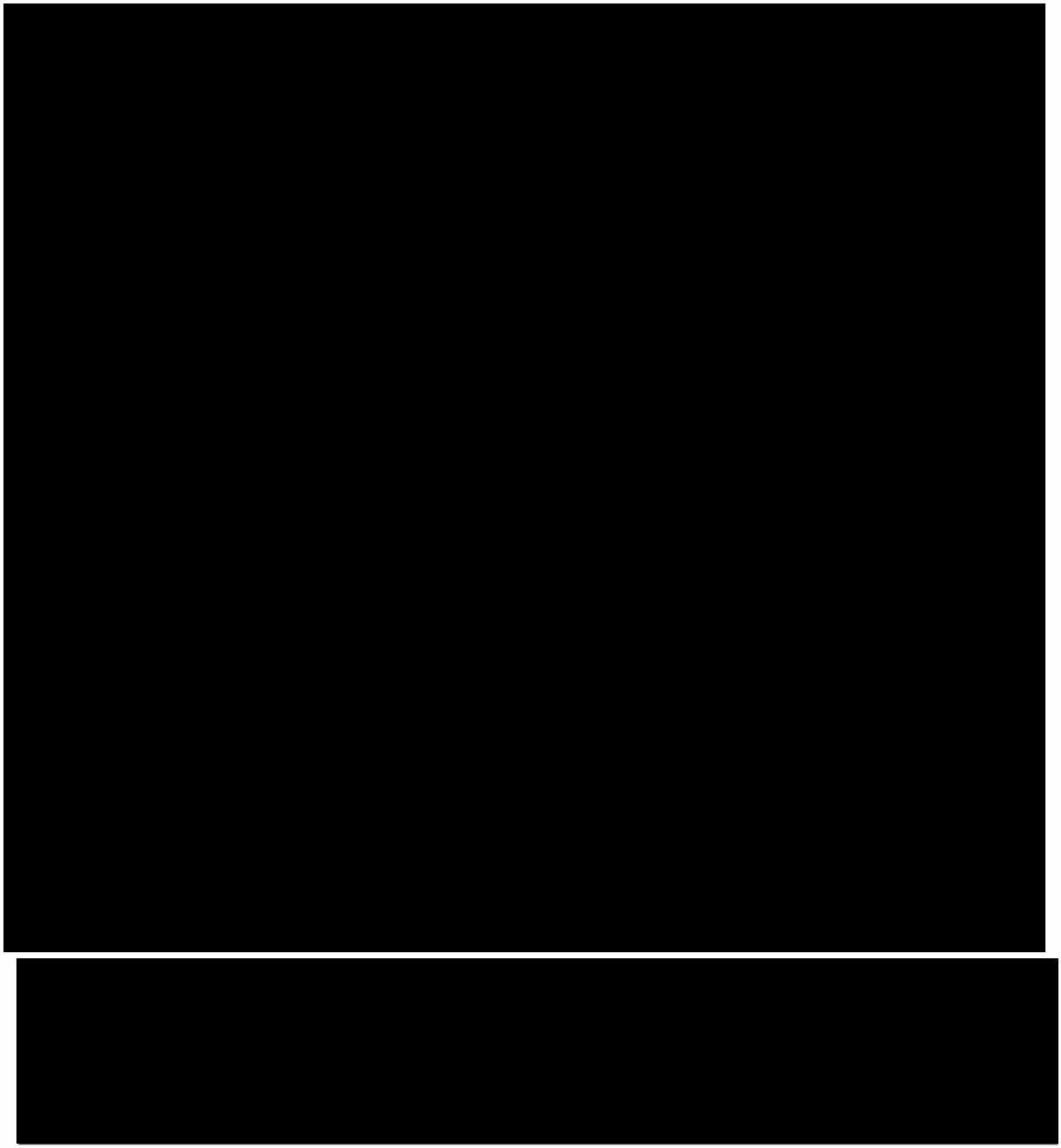
2.4.1.Methodology

[redacted]

Health & Safety will be in compliance with WorkSafe BC Rules and Regulations in conjunction with *Shelter*'s Health and Safety Program. Smoking is strictly prohibited on school grounds. Our personnel are familiar with the school logistics such as no movement of equipment during commencement, recess, lunch, and dismissal.

3. .PROJECT MANAGEMENT

3.1. Schedule Management



[redacted]

3.2. Quality Assurance

[redacted]

Servicing: Section 4.19 of *Shelter's* Quality Assurance Manual

Section 4.19 describes the policy and procedures for performing, verifying and reporting that servicing/warranty work on modular building product, meets the specified requirements.

Please see Appendix Y for excerpts of the relevant sections of *Shelter Industries Inc. Quality Assurance Manual*. A full copy is available for review, upon request.

3.3. Approvals

Shelter's architects and consulting engineers will provide the city/municipality/district which has jurisdiction over the particular site with schedules and design for their review and approval.

Shelter will coordinate with said jurisdiction for final inspections of each individual school site; which will be forwarded to the designated contact person of each particular school board.

[redacted]

Certificate of Roof Warranty – please see Appendix Z.

Certificate of Shelter Warranty – please see Appendix Z.

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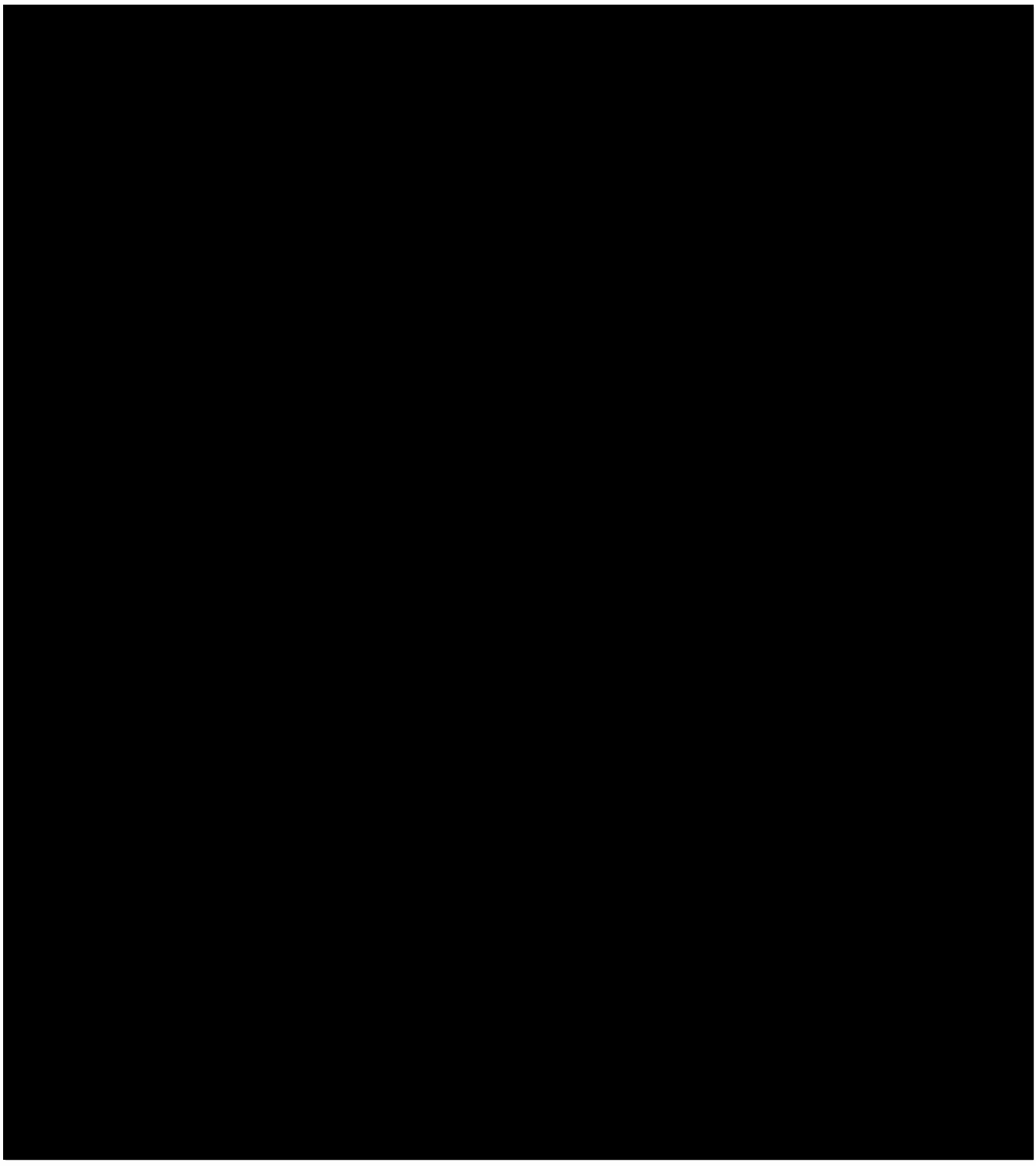
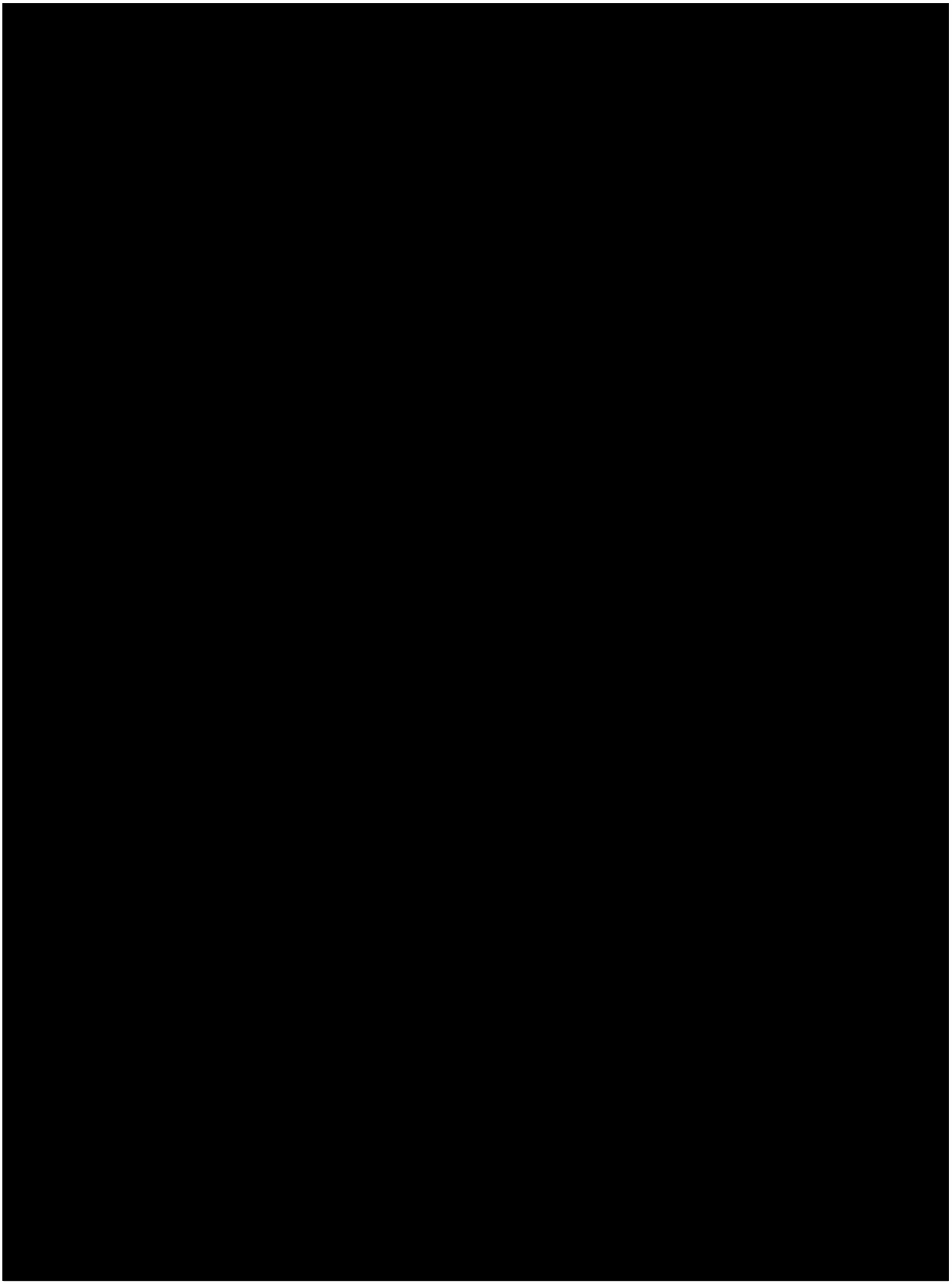
APPENDIX A – 1.1 – TEAM MEMBER PROFILES

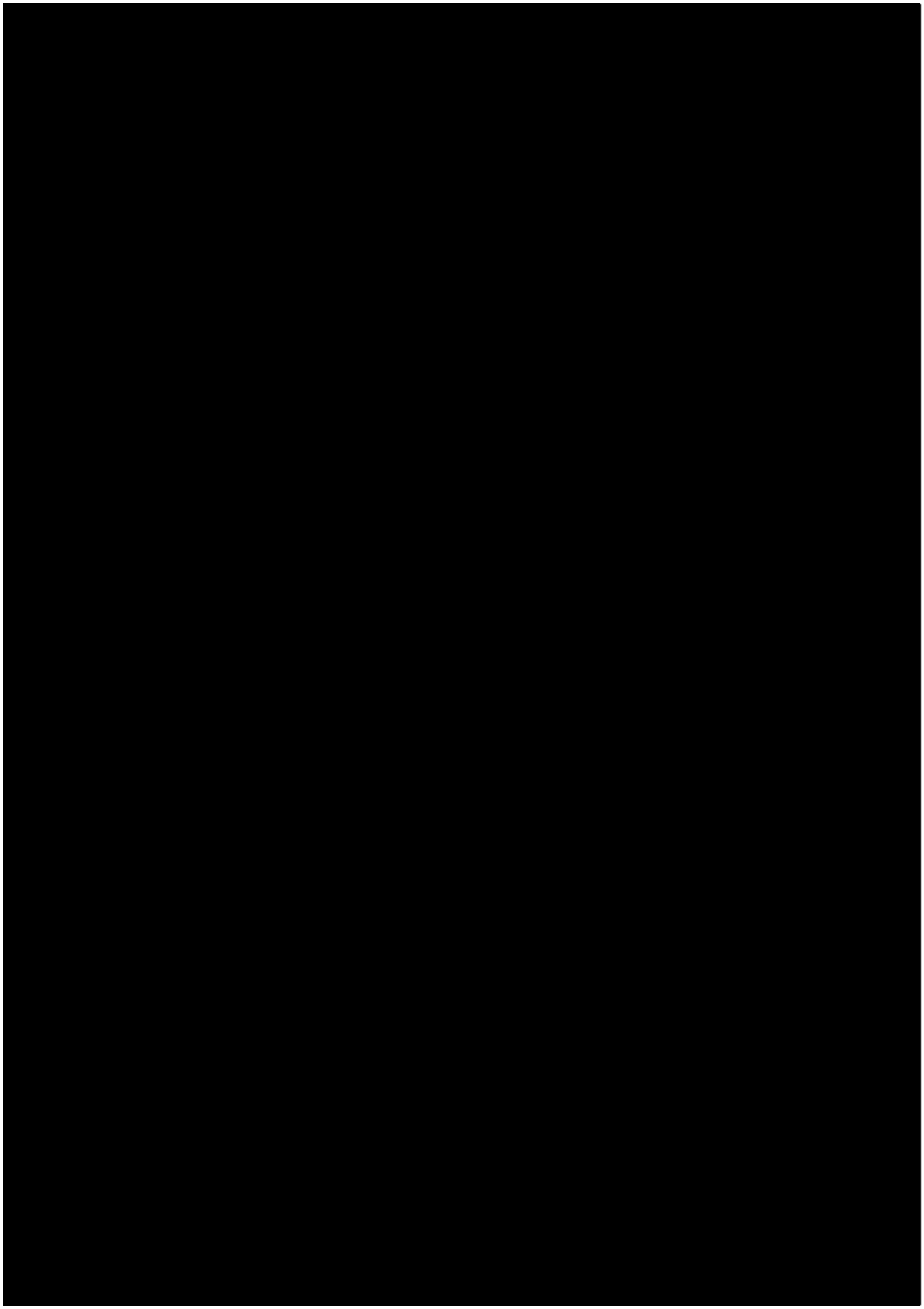


Sunday, July-25-10
Proponents Representative:

Chris Yamamoto, Senior Projects Manager

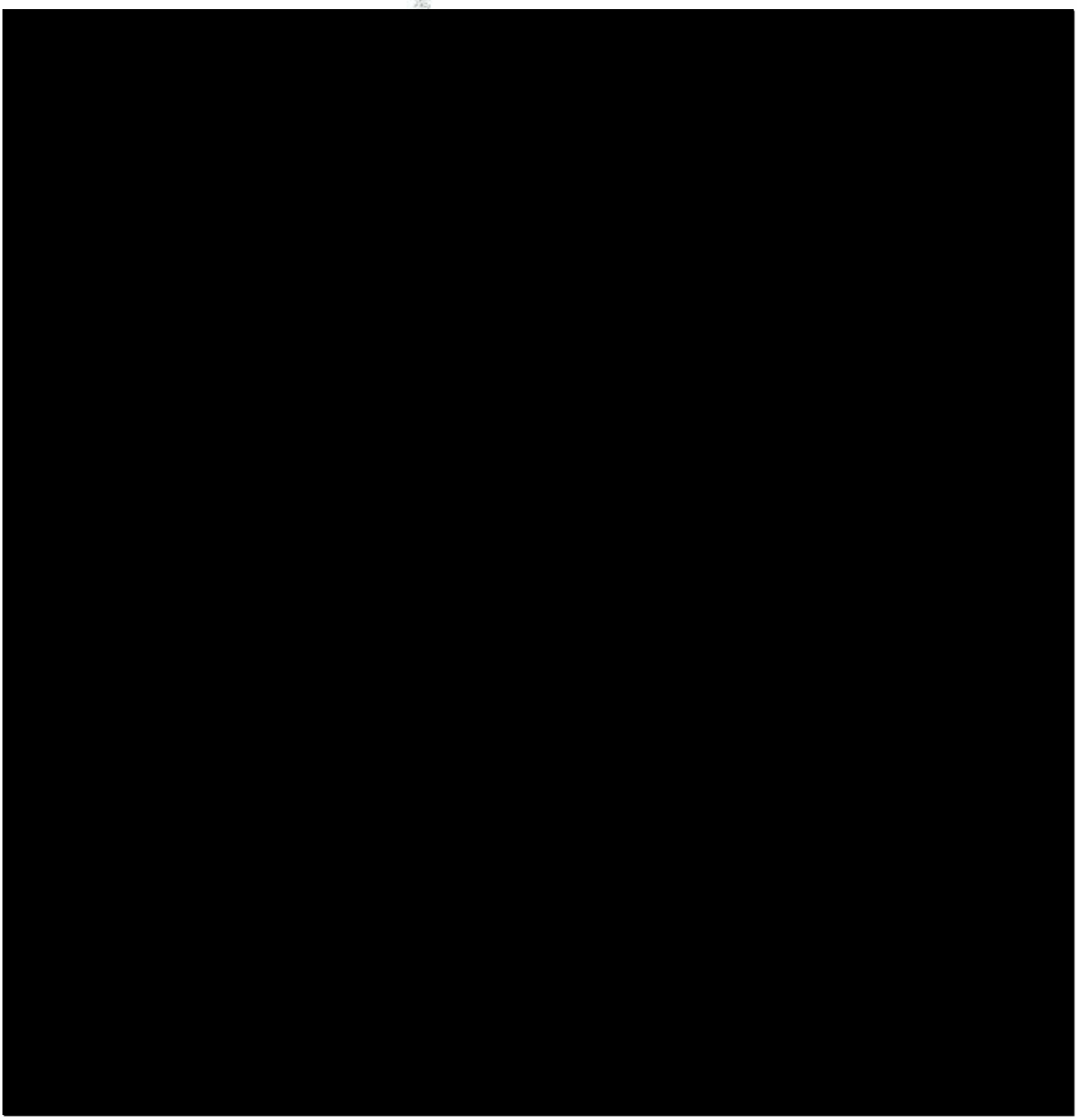
Shelter Industries Inc
3294 – 262nd Street
Aldergrove, BC V4W 2V1
Tel. 604.856.1211 / Fax. 604.856.5200
Email: cyamamoto@shelterindustries.com

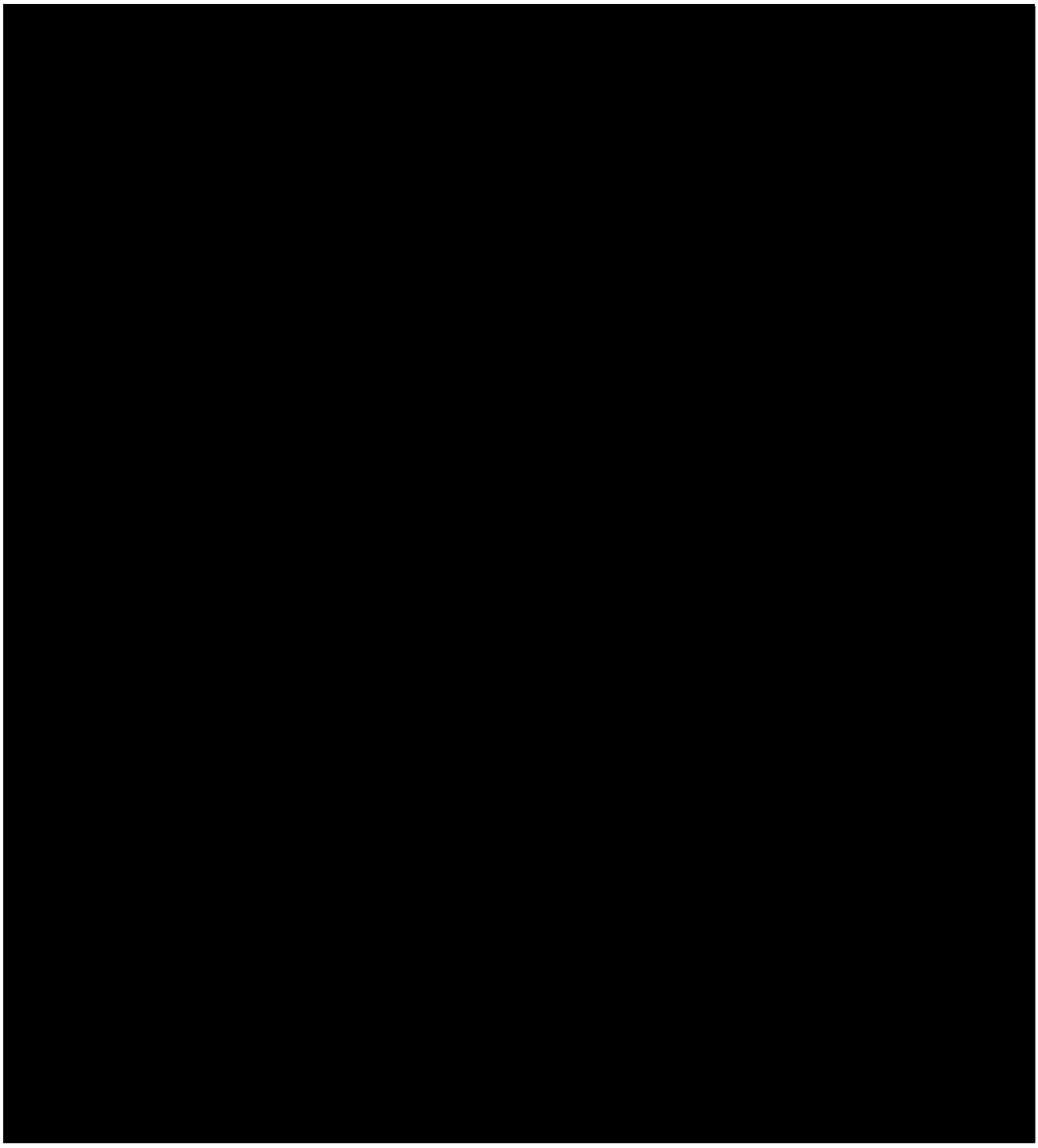


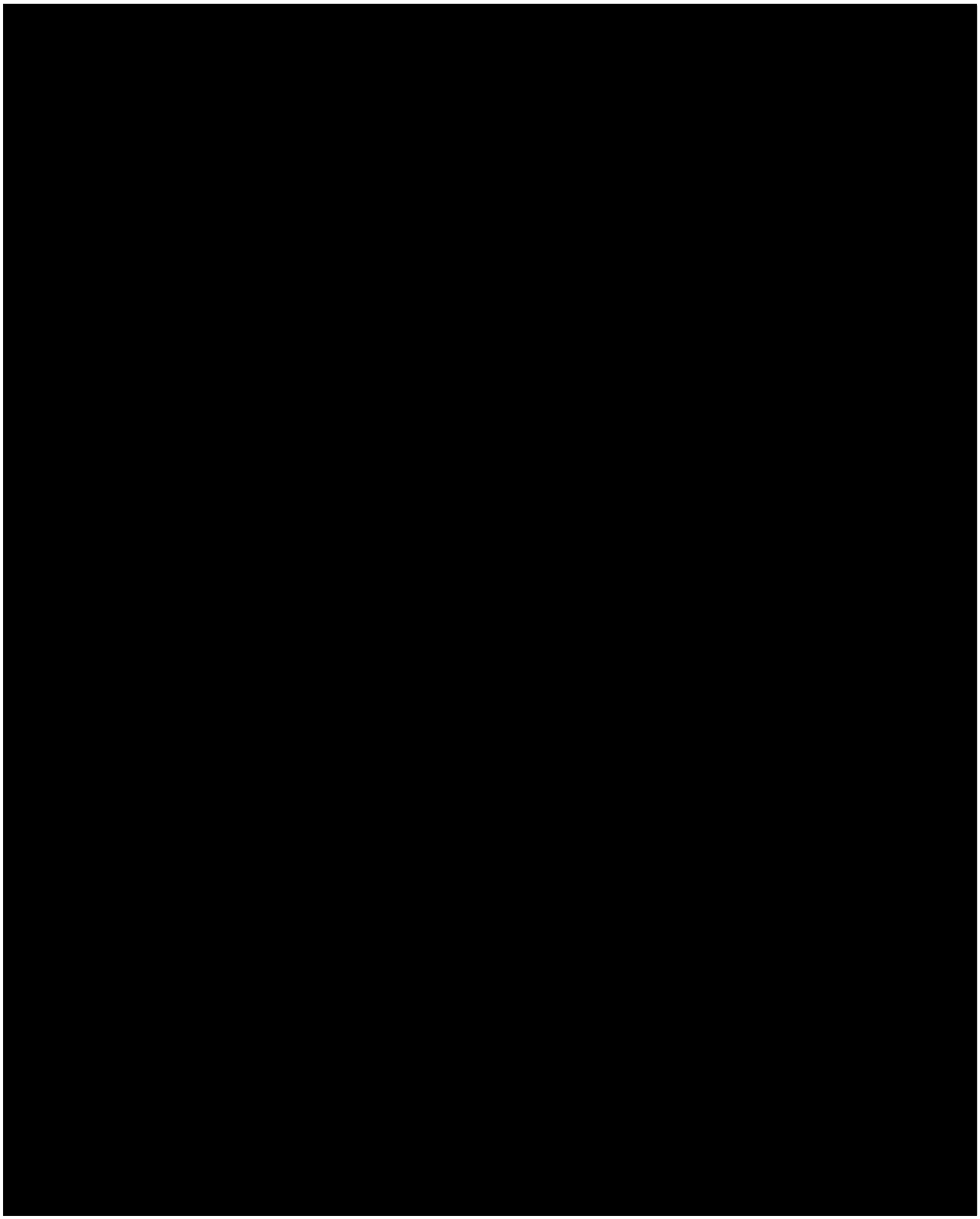


- Winfield Recreation Centre, Lakes District (2006)
- Lord Strathcona School Mechanical Assessment (2006)
- Kelowna YMCA Gym Addition Report (2006)
- Bulkley Valley Recreation Centre, Aquatic Centre Mechanical Assessment (2005)
- Lion's Gate Studios, North Vancouver, Mechanical Systems Assessment (2005)

Fort Langley Firehall

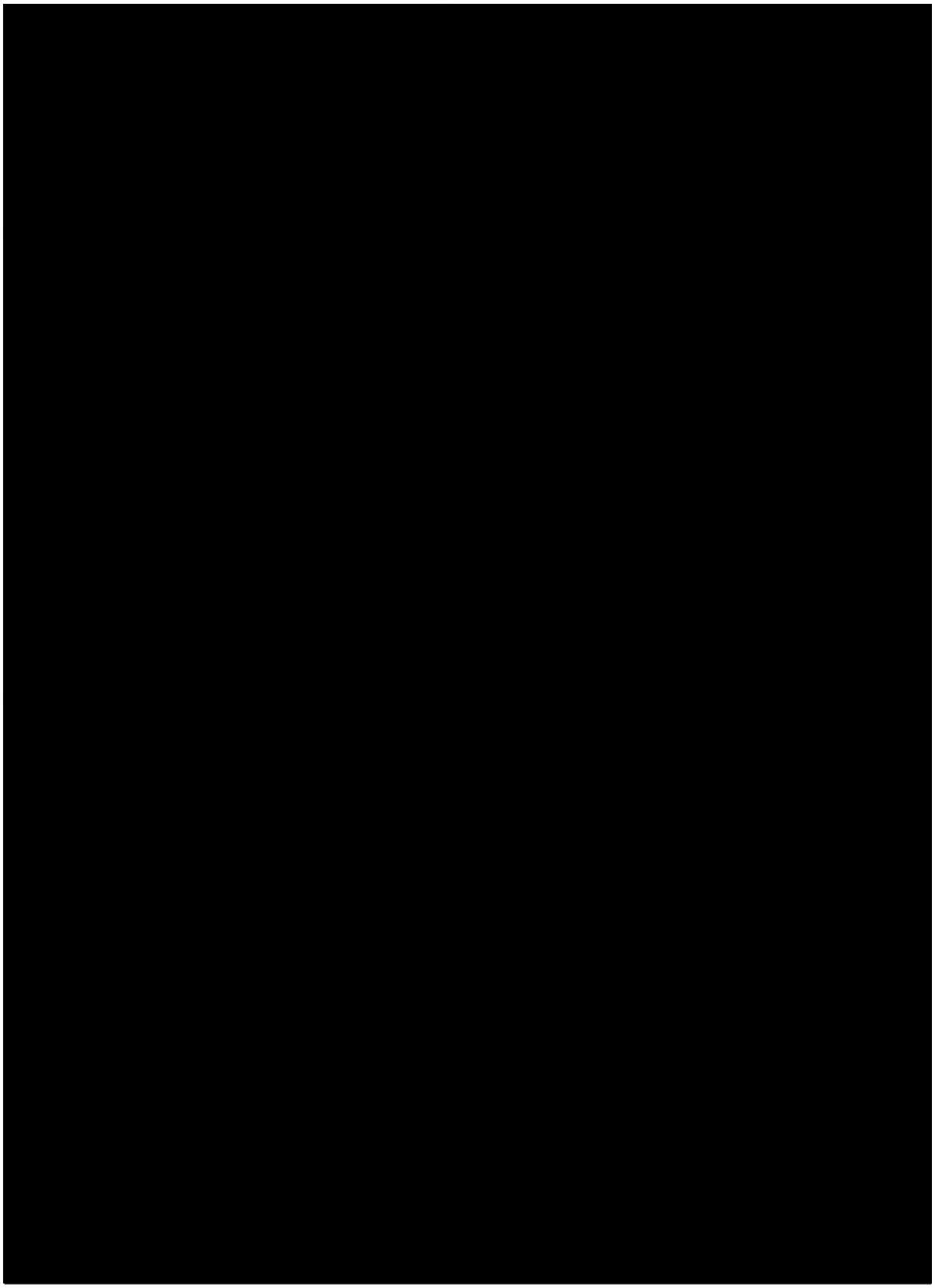






SHELTER
INDUSTRIES INC.

APPENDIX B – 1.3 – [redacted] CV



SHELTER INDUSTRIES INC.

APPENDIX C – 2.2.1 (C) RENDERINGS & 2.2.2 A00 PROJECT COVER

MODULAR CLASSROOMS

INTERIOR RENDERING

SHELTER INDUSTRIES INC.

RENDERING COLOURS MAY NOT BE AS THE FINAL DESIGN. FOR ILLUSTRATIVE PURPOSES ONLY


MODULAR CLASSROOM
INTERIOR RENDERING
SHELTER
INDUSTRIES INC.
RENDERING COLOURS MAY NOT BE AS THE FINAL DESIGN. FOR ILLUSTRATIVE PURPOSES ONLY

MODULAR CLASSROOMS

SINGLE UNIT RENDERING

SHELTER INDUSTRIES INC.

RENDERING COLOURS MAY NOT BE AS THE FINAL DESIGN. FOR ILLUSTRATIVE PURPOSES ONLY

MODULAR CLASSROOMS

TWO UNIT CLUSTER RENDERING

SHELTER INDUSTRIES INC.

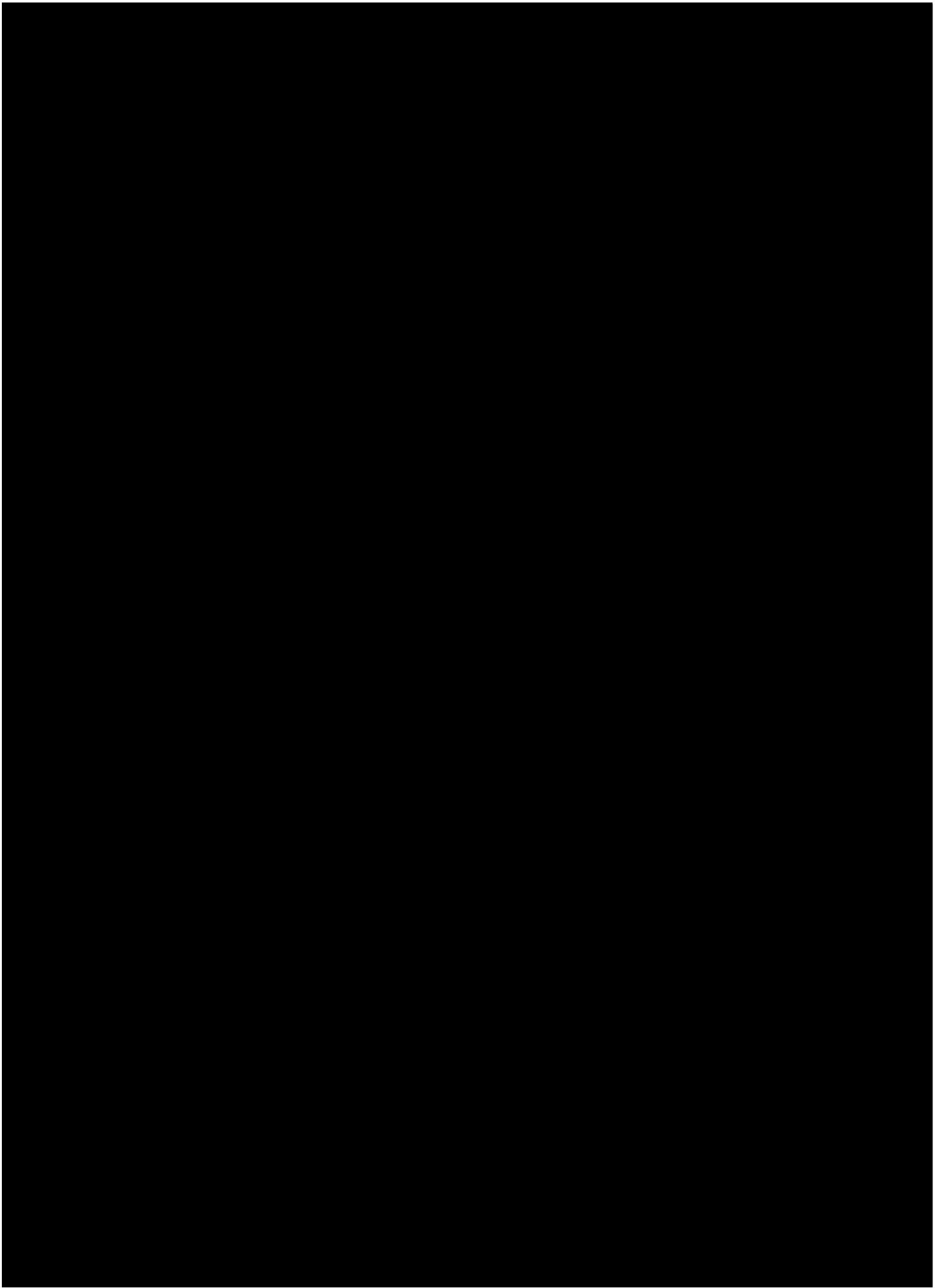
RENDERING COLOURS MAY NOT BE AS THE FINAL DESIGN. FOR ILLUSTRATIVE PURPOSES ONLY

MODULAR CLASSROOMS

FOUR UNIT CLUSTER RENDERING

SHELTER INDUSTRIES INC.

RENDERING COLOURS MAY NOT BE AS THE FINAL DESIGN. FOR ILLUSTRATIVE PURPOSES ONLY



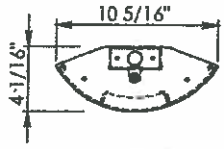
CBA - Commercial Basket A

Specification-Grade Surface or Suspended-Mount Direct/Indirect Baffled Luminaire

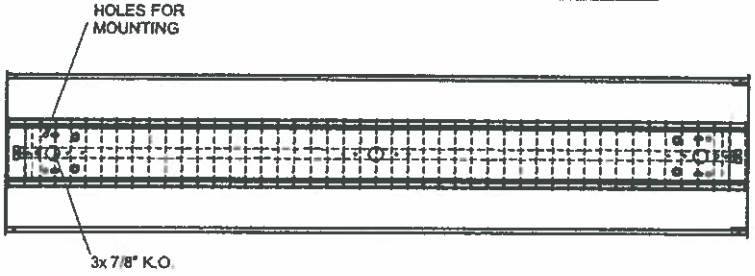
Photometrics - Please consult www.viscor.com for photometric results.

Product Details

Dimensions



MODEL			ACTUAL LENGTH A (in.)
1 Lamp	2 Lamp	3 Lamp	
148	248	348	46
148	248	348	48



Ordering

CBA [ ] [ ] - [ ] [ ] [ ] [ ] - [ ] → Options

No. of lamps in Cross Section
1
2
3

Nom. Length (in.)
46
48

Lamp Type
T5
T5HO
T8

Lamp Watts
See table below

Ballast Type
N - Instant Start
P - Prog. Start
R - Rapid Start

Voltage
120 - 120V
347 - 347V
UNV - 120-277V
UN4 - 347-480V

Example:
CBA246-T5HO54PUNV-B01M01

Lamp Watts

Nominal Length	Nom. Lamp Watts T5	T5HO	T8
46	28	54	-
48	-	-	32

Certain configurations may not be available. Consult the factory for more information.

Ballast Options
(See Option Code Section For More Information)

- ☐ B01 Ballast Disconnect - In-line Power Disconnect (CSA-UL Req'd For Voltages above 150v)
- ☐ B02 Dimming Addressable Digital (dali)
- ☐ B03 Dimming Low Voltage
- ☐ B04 Dimming Line Voltage
- ☐ B08 Ballast - High Ballast Factor
- ☐ B09 Ballast - Low Ballast Factor
- ☐ B30 Emergency Lighting Battery Pack Spec Grade
- ☐ B33 Emergency Lighting Battery Pack 1-lamp
- ☐ B34 Emergency Lighting Battery Pack 2-lamp

Finish Options
(White is standard)

- ☐ F03 Silver
- ☐ F09 White Easy

Packaging Options

- ☐ K0 Pack Bulk

Mounting Options (select one only)

- ☐ M01 Aircraft Cable
- ☐ M23 Mounting Speedy Hanger
- ☐ M26(xx) Mounting Stem and Canopy 3/8-in IP (5/8-in OD) (specify length (xx) 6-in increments)
- ☐ M30 Mounting Suspension Set (speedy hangers with 48-in chains)

Approval and Rating Options

- ☐ X6 USA Market
- ☐ X7 CSA and USA Market

X = Standard Option
Other options may be available.

LITHONIA LIGHTING

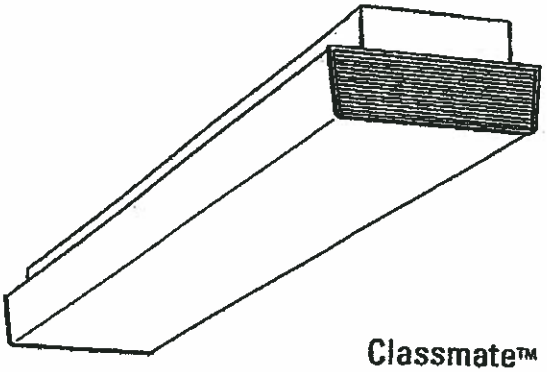
Notes	Type

FEATURES & SPECIFICATIONS

Wraparound

CLM

4' and 8' Lengths
1, 2 and 3 Lamps



Classmate™
Specification Wraparound

TYPE "B"

ATTRIBUTES

Choice of high impact, vandal-resistant acrylic, prismatic diffuser or Holophane® #7101-A injection-molded acrylic diffuser. Certain airborne contaminants can diminish integrity of acrylic. Click here for Acrylic Environmental Compatibility table for suitable uses.

End of diffuser includes decorative white injection-molded end caps.

Pyramidal prisms minimize lamp image.

Spring pin diffuser support prevents accidental opening and simplifies maintenance.

Channel includes hemmed edges.

Ballast cover secured by 1/4 turn fasteners; no tools required.

Twist and lock anti-vibration lampholders.

Available in tandem-wired lengths.

Guaranteed for one year against mechanical defects in manufacture.

CONSTRUCTION

Metal parts are die-formed from code gauge steel. Diffuser is 100% acrylic. No asbestos used in this product.

Thermally protected, resetting, Class P, HPF, non-PCB, UL listed, CSA certified ballast is standard. Sound rated A. Standard combinations are CBM approved and conform to UL 935.

FINISH

High-gloss, baked white enamel finish. Five-stage, iron-phosphate pretreatment ensures superior paint adhesion and rust resistance. Painted parts finished with high-gloss, baked white enamel.

ELECTRICAL SYSTEM

Fixture conforms to UL 1570 and is suitable for damp locations. AWM, TFN or THHN wire used throughout rated for required temperatures.

ENERGY

Luminaire Efficacy Rating (LER) and Annual Energy Cost:

Two-lamp LER.PW = 77. Annual Energy Cost = $3.12.
Based on 32W T8 lamp, 2850 lumens, and energy-saving electronic ballast. Ballast factor = .88, input watts = 58.

Calculated in accordance with NEMA standard LE-5.

LISTING

UL listed to US and Canadian safety standards (see Options). NOM Certified (see Options).

Specifications subject to change without notice.

ORDERING INFORMATION

Example: **TCLM 2 32 277 1/4 GEB**

Series	Number of lamps	Lamp type	Diffuser type[1]	Voltage	Options
CLM 8-5/8" wide	1	32 32W T8 (48")	(blank) High impact prismatic	120	GEB Electronic ballast, ≤ 20%THD
For tandem, double-length unit, add prefix T. Example: TCLM. Two 4' diffusers provided on 8' units.	2	40 40W T12 (48")	IM Injection-molded Holophane #7101	277	GEB10IS Electronic ballast, ≤ 10% THD, instant start
	3			347	1/3 One 3-lamp ballast
	Not included.			Others available.	1/4 One 4-lamp ballast
					2/3 Two 3-lamp ballasts
					EL Self-contained emergency inverter
					CSA Listed and labeled to comply with Canadian Standards
					NOM NOM Certified

Accessories

Order as separate item.

SQ__ Swivel-stem hanger (specify length in 2" increments).
1B Ceiling spacer adjusts from 1-1/2" to 2-1/2" from ceiling.

NOTE:
1 Diffuser ships separate from fixture.

MODULAR CLASSROOM PROJECT

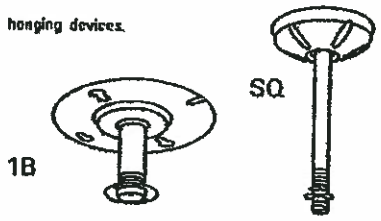
MOUNTING DATA

For unit or row installation, surface or stem mounting.

Unit installation —Two single-stem hangers required.

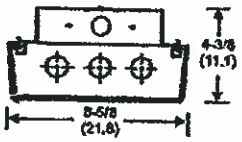
Row installation — One hanger per fixture plus one per row required.

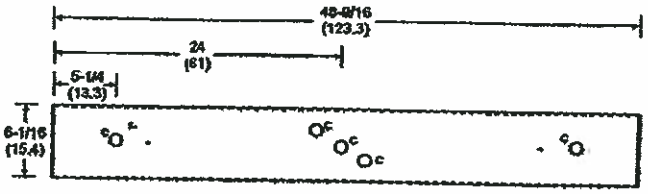
See ACCESSORIES below for hanging devices.



DIMENSIONS

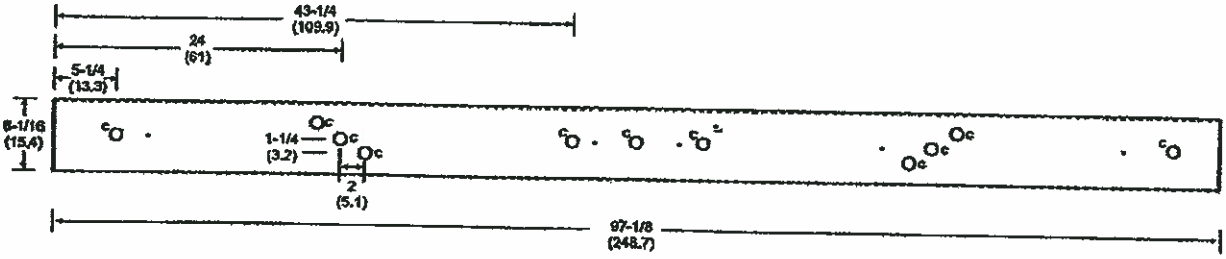
Inches (centimeters). Subject to change without notice.





TYPE "B"

C = 7/8 (2.2) diameter K.O.



PHOTOMETRICS

CLM 1 32

Report LTL 6998 - Lumens per lamp = 2850

S/MH (along) 1.3 (across) 1.6

Coefficient of Utilization

Ceiling	80%			70%			50%		
Wall	70%	50%	30%	70%	50%	30%	50%	30%	10%
0	89	89	89	86	86	86	80	80	80
1	81	78	75	78	75	73	71	69	67
2	75	69	64	72	67	63	63	59	58
3	69	62	56	66	60	55	57	52	49
4	63	55	49	61	54	48	51	46	42
5	58	49	43	56	48	42	45	40	36
6	54	44	38	52	43	37	41	36	32
7	50	40	34	48	39	33	37	32	28
8	46	36	30	44	35	29	33	28	24
9	42	32	26	41	31	26	30	25	21
10	39	29	23	38	28	23	27	22	19

Zonal Lumens Summary

Zone	Lumens	%Lamp	%Fixture
0-30	494	17.3	20.7
0-40	846	29.7	35.4
0-60	1463	51.3	61.1
0-90	1912	67.1	79.9
90-180	480	16.9	20.1
0-180	2392	83.9	100.0

CLM 2 32

Report LTL 7085 - Lumens per lamp = 2850

S/MH (along) 1.3 (across) 1.5

Coefficient of Utilization

Ceiling	80%			70%			50%		
Wall	70%	50%	30%	70%	50%	30%	50%	30%	10%
0	102	102	102	98	98	98	90	90	90
1	92	87	83	87	83	79	76	73	71
2	83	75	69	79	72	67	67	62	58
3	76	66	59	72	64	57	59	53	49
4	70	59	51	66	57	49	52	46	42
5	64	53	45	61	51	43	47	41	36
6	59	47	40	56	46	38	42	36	32
7	55	43	35	52	41	34	39	32	28
8	51	39	32	49	38	31	35	29	25
9	48	36	29	45	35	28	32	27	22
10	44	33	26	43	32	25	30	24	20

Zonal Lumens Summary

Zone	Lumens	%Lamp	%Fixture
0-30	1089	19.1	21.5
0-40	1831	32.1	36.2
0-60	3122	54.8	61.6
0-90	4148	72.8	81.9
90-180	915	16.1	18.1
0-180	5164	88.8	100.0

CLM 2 32 IM

Report LTL 7084 - Lumens per lamp = 2850

S/MH (along) 1.3 (across) 1.7

Coefficient of Utilization

Ceiling	80%			70%			50%		
Wall	70%	50%	30%	70%	50%	30%	50%	30%	10%
0	101	101	101	97	97	97	89	89	89
1	92	88	84	88	84	81	78	75	73
2	84	77	72	80	74	69	68	64	61
3	77	68	62	73	66	60	61	56	52
4	71	61	54	67	59	52	54	49	44
5	65	54	47	62	52	46	49	43	39
6	60	49	42	57	47	40	44	38	34
7	56	44	37	53	43	36	40	34	30
8	52	40	33	50	39	32	37	31	27
9	48	37	30	46	36	29	34	28	24
10	45	34	27	43	33	27	31	25	22

Zonal Lumens Summary

Zone	Lumens	%Lamp	%Fixture
0-30	1152	20.2	23.0
0-40	2001	35.1	39.9
0-60	3396	59.6	67.8
0-90	4078	71.5	81.4
90-180	934	16.4	18.6
0-180	5011	87.9	100.0

LITHONIA LIGHTING®

An AcuityBrands Company

Sheet #: CLM

Lithonia Lighting
Fluorescent
One Lithonia Way, Conyers, GA 30012
Phone: 800-858-7763 Fax: 770-929-8789
www.lithonia.com

MODULAR CLASSROOM PROJECT
RFP # 33306

LITHONIA LIGHTING®

Notes	Type

Commercial Wall Bracket

WC

T5 and T8
2', 3' or 4' Lengths
1 or 2 Lamps

FEATURES & SPECIFICATIONS

INTENDED USE

For wall or ceiling mounting — vertical or horizontal. Ideal for stairwells, corridors, lavatories or any utility application. Certain airborne contaminants can diminish integrity of acrylic. Click here for Acrylic Environmental Compatibility table for suitable uses.

ATTRIBUTES

Easy maintenance design for individual or tandem mounting. For row mounting, order RMT option.

CONSTRUCTION

Heavy-duty code grade steel. Metal parts are die-formed.

FINISH

Five-stage iron-phosphate pretreatment ensures superior paint adhesion and rust resistance. Standard finish is high-gloss, high reflectivety, baked white polyester (architectural black available).

OPTICAL SYSTEM

Available with high performance A12 pattern clear acrylic or low brightness matte white opal acrylic. Front metal fascia eliminates direct illumination. Provides up/down distribution.

ELECTRICAL SYSTEM

AWM, TFN or THHN wire used throughout, rated for required temperatures. UL/CSA Listed ballast disconnect with strain relief and leads provided standard.

INSTALLATION

End caps spring-loaded for easy diffuser removal.

LISTING

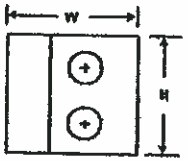
UL Listed to US and Canadian safety standards. Optional: Mexico NOM.

WARRANTY

Guaranteed for one year against mechanical defects in manufacture.

Specifications

Length: 24 (609), 36 (914) or 48 (1218)
Width: 4-5/8 (118)
Depth: 4-9/16 (116)
Weight: 14 lbs (6.3 kg)



All dimensions are inches (millimeters). Specifications subject to change without notice.

TYPE "C"

ORDERING INFORMATION

For shortest lead times, configure product using **standard options (shown in bold).**

Example: WC 2 32 120 MVOLT GEB10IS

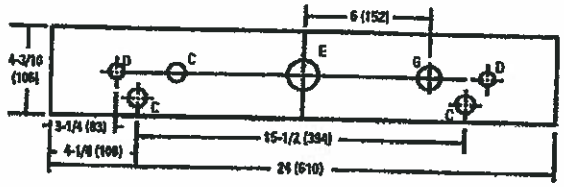
Series	Number of lamps	Lamp type	Diffuser type	Voltage	Options
WC All purpose wall bracket	1 2 Not included.	17 17W T8 (24") 25 25W T8 (36") 32 32W T8 (48") 14 14W T5 (24")[2] 21 21W T5 (36")[2] 28 28W T5 (48")[2] 24 24W T5HO (24")[2] 39 39W T5HO (36")[2] 54 54W T5HO (48")[2]	(blank) Matte white opal acrylic A12 #12 pattern acrylic FAC Matte white opal acrylic with front metal fascia FA12 #12 pattern acrylic with front metal fascia	120 277 347 MVOLT[1] Others available.	CO Grounded convenience outlet, 120V only (lower right)[1] S1 Pull-chain switch; installed bottom right; on/off operation of all lamps only (120V only)[1] GEB10IS Electronic ballasts, ≤10% THD, instant-start GEB10PS Electronic ballasts, ≤10% THD, program-start MB Architectural black finish RMT Row mount[3] CSA CSA Certified

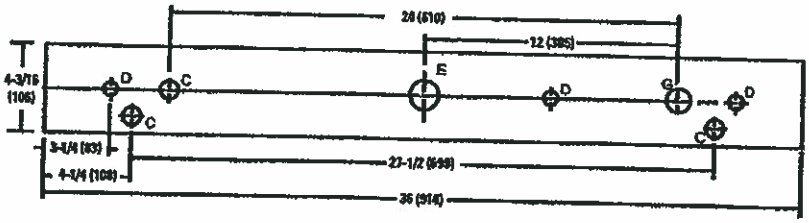
NOTES:

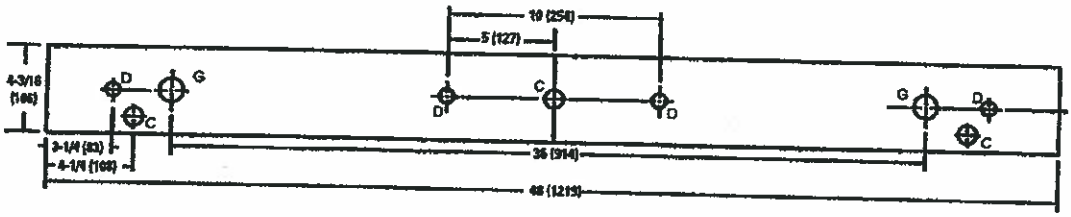
1 For optional locations, consult factory.
2 All T5 lamp types use GEB10PS ballast only.
3 Includes continuous row joiner band. Not available with CSA; models requiring CSA labeling ship standard with joiner band.

MODULAR CLASSROOM PROJECT
RFP # 3306

MOUNTING DATA

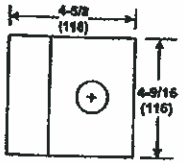


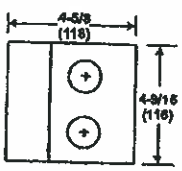




DIMENSIONS

Inches (millimeters). Subject to change without notice.





C = 7/8 (22) Dia. K.O.
D = 11/16 (18) Dia. K.O.
E = 2(51) Dia. K.O.
G = 1-1/8 (29) Dia. K.O.

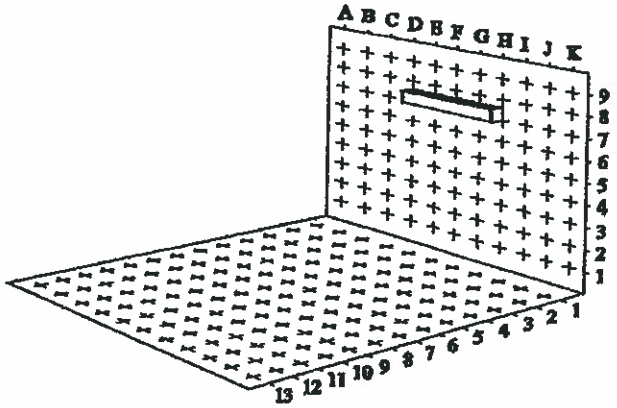
TYPE "C"

PHOTOMETRICS

Calculated using the zonal cavity method in accordance with IESNA LM41 procedure. Vertical and horizontal illuminance is calculated with fixture mounting 7' above floor. Reflectances 80/50/20%. Full photometric data available upon request.

WC 2 32
Report LTL 5736
Initial point illuminance on wall and horizontal work surface (fc)
X and Y coordinates are on 12" centers.

	X	A	B	C	D	E	F	G	H	I	J	K
Vert.	9	3	4	6	11	15	16	15	11	6	4	4
	8	3	4	6	18	31	33	31	18	6	4	3
	7	2	3	3						3	3	2
	6	2	3	5	16	28	30	28	16	5	3	2
	5	2	2	4	6	8	9	8	6	4	3	2
	4	2	2	3	3	4	4	4	4	3	2	2
	3	2	2	2	3	3	3	3	3	2	2	2
	2	1	2	2	2	2	2	2	2	2	2	1
	1	1	2	2	2	2	2	2	2	2	2	1
	Y											
Horiz.	1	6	7	8	9	10	10	10	9	8	6	5
	2	6	7	8	10	11	11	11	10	9	7	6
	3	6	7	8	10	11	11	11	10	9	7	7
	4	7	7	8	10	11	11	11	10	9	8	7
	5	6	7	8	9	10	10	10	9	9	7	7
	6	6	7	7	9	9	9	9	9	8	7	6
	7	5	6	6	7	7	7	7	7	7	6	5
	8	5	5	6	6	7	7	7	6	6	5	5
	9	5	5	5	6	6	6	6	6	6	5	5
	10	4	4	4	4	5	5	5	4	4	4	4
	11	3	3	4	4	4	4	4	4	4	3	3
	12	3	3	3	4	4	4	4	4	4	3	3
	13	2	2	3	3	3	3	3	3	3	2	2



LITHONIA LIGHTING®
An AcuityBrands Company

Sheet #: WC

Lithonia Lighting
Fluorescent
One Lithonia Way, Conyers, GA 30012-3957
Phone: 800-858-7763 Fax: 770-929-8789
www.lithonia.com

MODULAR CLASSROOM PROJECT
RFP #3306

LITHONIA LIGHTING

Notes	Type

FEATURES & SPECIFICATIONS

INTENDED USE — For building- and wall-mounted applications.

CONSTRUCTION — Rugged, die-cast, single-piece aluminum housing. Die-cast doorframe has a 1/8" thick tempered glass lens. Doorframe is fully gasketed with one-piece solid silicone.

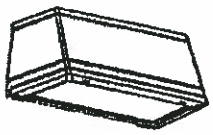
FINISH — Standard finish is textured dark bronze (DDBT) corrosion-resistant polyester powder finish, with other architectural colors available.

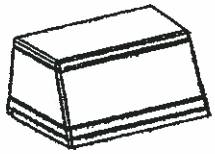
OPTICAL SYSTEM — Hydroformed reflector for superior uniformity and control. Medium throw (MD) full cutoff distribution only.

ELECTRICAL SYSTEM — HID utilizes a high-reactance, high-power factor ballast. Ballasts are 100% factory tested. Porcelain, medium-base socket with copper alloy, nickel-plated screw shell and center contact. Compact fluorescent utilizes an electronic, high frequency ballast. Compact fluorescent socket is four-pin positive latching thermoplastic. UL Listed. Quick-disconnect plug easily disconnects reflector from ballast and fixture from supply wires.

INSTALLATION — Easily installed using provided mounting strap. Mount to any nom-combustible vertical surface or to a 4" round or square outlet box. Back access through slotted gasket.

LISTING — Listed and labeled to UL standards. Listed and labeled to CSA standards (see Options). NOM Certified (see Options). IP65 rated. Wet location listed.





Decorative Wall-Mounted Lighting

WSTM

METAL HALIDE
50W-70W
HIGH PRESSURE SODIUM
35W-70W
COMPACT FLUORESCENT
26DTT, 26-42TRT

Standard dimensions - WSTM

Length: 12.50" (31.75 cm)
Depth: 7.50" (19.05 cm)
Height: 5.75" (14.60 cm)
Weight: 14.00lbs (6.35 kg)

TYPE "D"

All dimensions are inches (centimeters) unless otherwise specified.

ORDERING INFORMATION

For shortest lead times, configure product using **standard options (shown in bold).**
Example: WSTM 70M MD 120 DNAT LPI

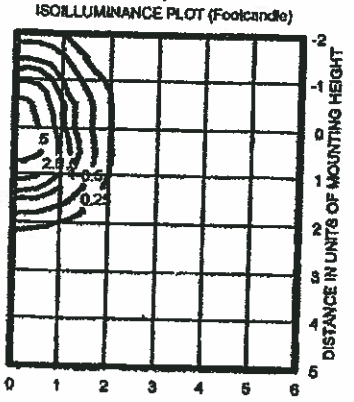
WSTM		MD				
Series	Wattage/source	Distribution	Voltage	Options		Lamp[13]
WSTM	Metal halide **50M** **70M** High pressure sodium 35S[1] 50S 70S Compact fluorescent 26DTT ← 26TRT **32TRT** **42TRT**	**MD** Medium throw	**120** 208[2] 240[2] **277** 347 **TB** **MVOLT**[3,4]	Shipped installed in fixture SF Single fuse (120, 277, 347V)[5] DF Double fuse (208, 240V)[5] EC Emergency circuit (incandescent, 25W max.)[6,7] GMF Internal slow-blow fusing[8,9] DC12 Emergency circuit 12 volt (20W or 35W)[6,7,9] DC2012 Emergency circuit 12 volt (20W lamp included)[6,7,9] QRS Quartz restrike system (75W max.)[7,11] CR Enhanced corrosion resistance CRT Non-stick protective coating[10] PE Photoelectric cell-button type[6,11] DFL Diffusing lens **CSA** CSA Certified **NOM** NOM Certified	Shipped separately WSUT5 Uptilt 5 degrees WSTMWG Wire guard[11] Architectural colors[12] Standard textured colors (blank) **Dark bronze textured** DSST Sandstone **DNAT** Natural aluminum **DWHG** White **DBLB** Black Optional textured colors DBNH Bronze DSPD Dark gray DSPJ Light gray DSPE Green DSPG Dark red DSPF Rust DSPH Red Striping SDDB Dark bronze SDWH White SDBL Black SDNA Natural aluminum SDSS Sandstone SDTG Tennis green SDBR Bright red SDBUA Dark blue SDGYM Gray SDYLB Yellow	**LPI** Lamp included **LLP** Less lamp

NOTES:
1 120V only.
2 Consult factory for availability in Canada.
3 Optional multi-tap ballast (120, 208, 240, 277V); (120/347V in Canada).
4 Multi-volt electronic ballast (compact fluorescent lamps) capable of operating any line voltage between 120V and 277V.
5 Must specify voltage. Not available with MVOLT or TB.
6 Maximum wattage lamp included.
7 Available for HID sources only.
8 Available for compact fluorescent only.
9 Not available with SF or DF.
10 Black finish only.
11 Must be ordered with fixture; can not be field installed.
12 Additional architectural colors available; see www.lithonia.com for more information.
13 Must be specified.

MODULAR CLASS ROOM PROJECT
RFP # 3306

WSTM 70S MD (COATED LAMP) TEST NO: LTL15242

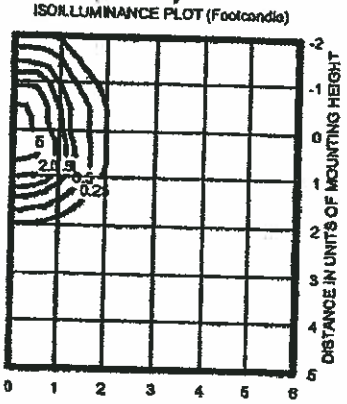
ISOILLUMINANCE PLOT (Footcandle)



70W lamp, horizontal lamp orientation
Footcandle values based on 12' mounting height, 5950 rated lumens.
Luminaire Efficiency: 65.9%

WSTM 70M MD (COATED LAMP) TEST NO: LTL15245

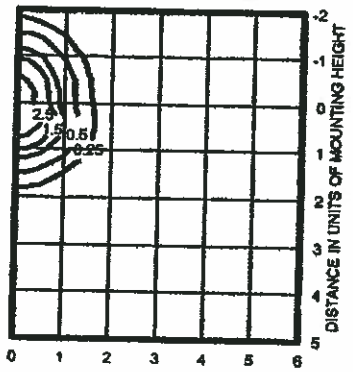
ISOILLUMINANCE PLOT (Footcandle)



70W lamp, horizontal lamp orientation
Footcandle values based on 12' mounting height, 5800 rated lumens.
Luminaire Efficiency: 60.7%

WSTM 42TRT MD TEST NO: LTL15247

ISOILLUMINANCE PLOT (Footcandle)



42W lamp, horizontal lamp orientation
Footcandle values based on 12' mounting height, 3200 rated lumens.
Luminaire Efficiency: 55.2%

TYPE "D"

MODULAR CLASSROOM PROJECT
RFP #3306

LITHONIA LIGHTING®
An AcuityBrands Company

Sheet #: WSTM-M-S-CF

Lithonia Lighting
Outdoor Lighting
One Lithonia Way, Conyers, GA 30012-3957
Phone: 770-922-9000 Fax: 770-918-1209
www.lithonia.com

AIREDALE

air conditioning for every environment

Submittal For Approval

JOB TITLE:

CLASSMATE HE UNIT
WITH
25 KW ELECTRIC HEATER
AND
HOT WATER COIL

Date: 7/23/2010

Created Using
AccuSpec V8.62

AIREDALE
air conditioning for every environment

AccuSpec V8.62

SUBMITTAL SCHEDULE & DATA

Technical Specifications - Classmate High Efficiency Units

Job Name: Engineer:
Location: Architect:
Submitted by: Contractor:

			Unit Tag	
Model Number		CHH3/1-230/410-		
Quantity of Units		1		
PERFORMANCE-REFRIGERANT		HFC-R410A (1 Stage)		
FULL LOAD (1) (2)				
Cooling Capacity Total	Mbh	35.0		
Cooling Capacity Sensible	Mbh	27.8		
Heat Pump Capacity (COP)	Mbh	34.6		
EER				
SUPPLY VOLTAGE		230/60/1		
SUPPLY FAN				
Fan – (Quantity) Type		(2) Direct Drive Centrifugal		
Nominal Airflow	CFM	1200		
Motor Size	Hp	1/2		
Max External Static Pressure	" WC	0.25		
POWERED EXHAUST				
Fan – (Quantity) Type		(2) Backward Curved Motorized Impeller		
Nominal Airflow	CFM	2300		
Motor Size	Hp	1/3		
Max External Static Pressure	" WC	0.1		
ENERGY RECOVERY WHEEL				
Outdoor Air (Cooling/Heating)	CFM	NA		
Total Recovered Cooling (3)	Mbh	NA		
Total Recovered Heating (3)	Mbh	NA		
ELECTRIC HEATING				
Heating Capacity (Stages)	Kw	25 (1)	SEPARATE POWER	
GAS HEATING		NA		
Heating Capacity Input (Stages)	Btu/hr	NA		
Heat Exchanger (Access Side)				
HYDRONIC HEATING		NA		
Air Data (Outside/Return/OA CFM)	°F	NA		
Fluid Flow Rate		NA		
Hydronic Heating Capacity	Btu/hr	NA		
Temp/Press. Drop or Condensate		NA		
OPERATING WEIGHT	lbs	735		

(1) Performance data based on no external static
(2) Cooling (Heat Pump) capacity based on Air at 80/67°F (70/60°F) Dry/Wet Bulb & 95°F (47/43°F) Ambient
(3) Cooling (Heating) based on Room 75/63°F (70°F) Dry/Wet Bulb, Ambient 95/78°F (0°F) Dry/Wet Bulb

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SUBMITTAL SCHEDULE & DATA

Model	Description	Qty	Tag
CHH3/1-230/410-	Classmate High Efficiency Unit	1	
49448	CHH3/1-230/410-	1	
#56675	Outside Air Economizer-Std	1	
#48914	Carel Controller	1	
#48946	Disconnect Switch	1	
#22222	Beige (Hammertone Finish)	1	

Electrical Data – Main Unit

Supply Voltage	Full Load Amps (FLA)	Miminum Circuit Ampacity (MCA)	Maximum Overcurrent Protection (MOP)
230/60/1	24.3	28.6	40.0

Electrical Data – 25 kW Electric Heater

Supply Voltage	Full Load Amps (FLA)	Miminum Circuit Ampacity (MCA)	Maximum Overcurrent Protection (MOP)
230/60/1	109	136	136

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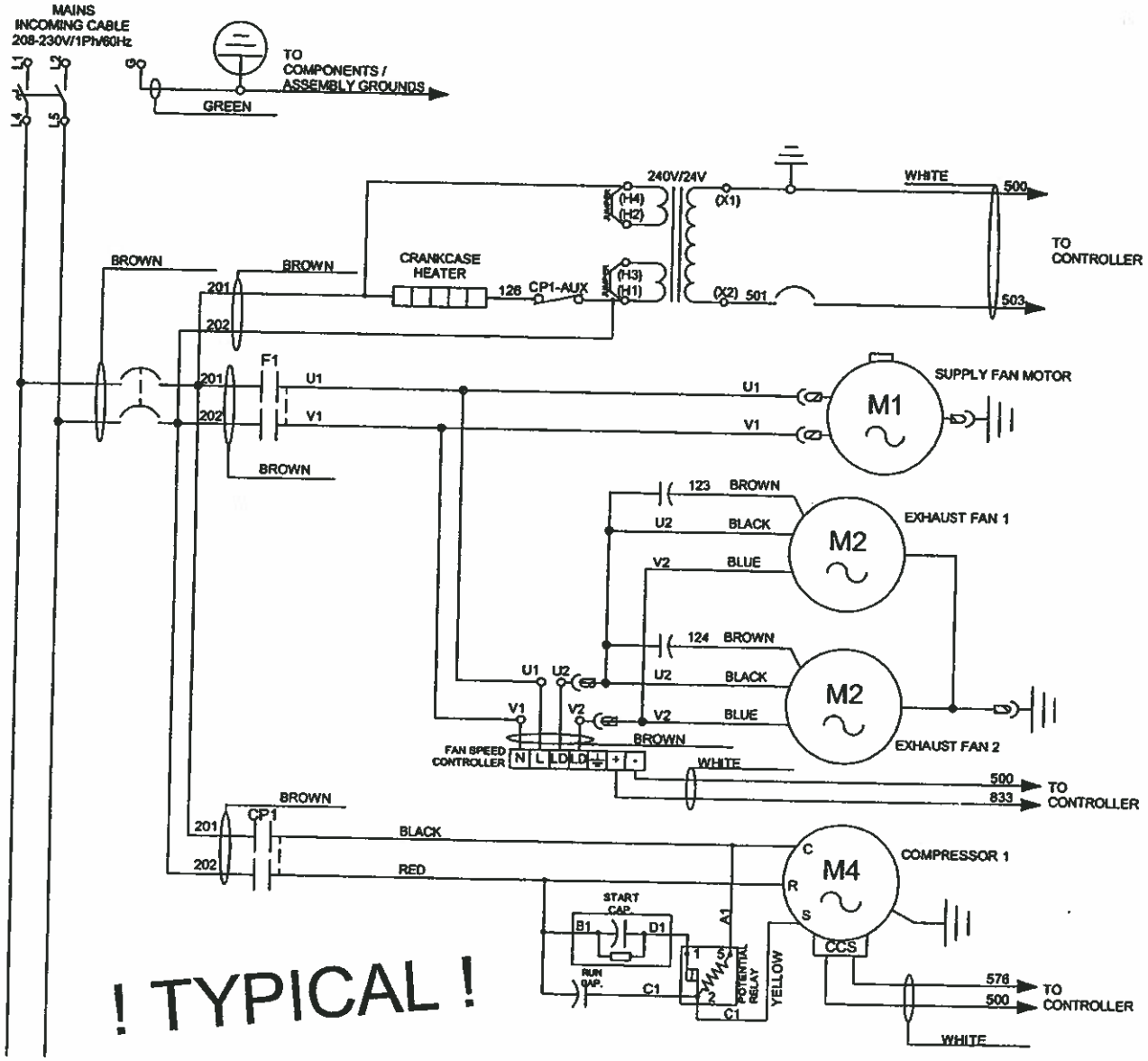
UNIT WIRING DIAGRAM

Tag:



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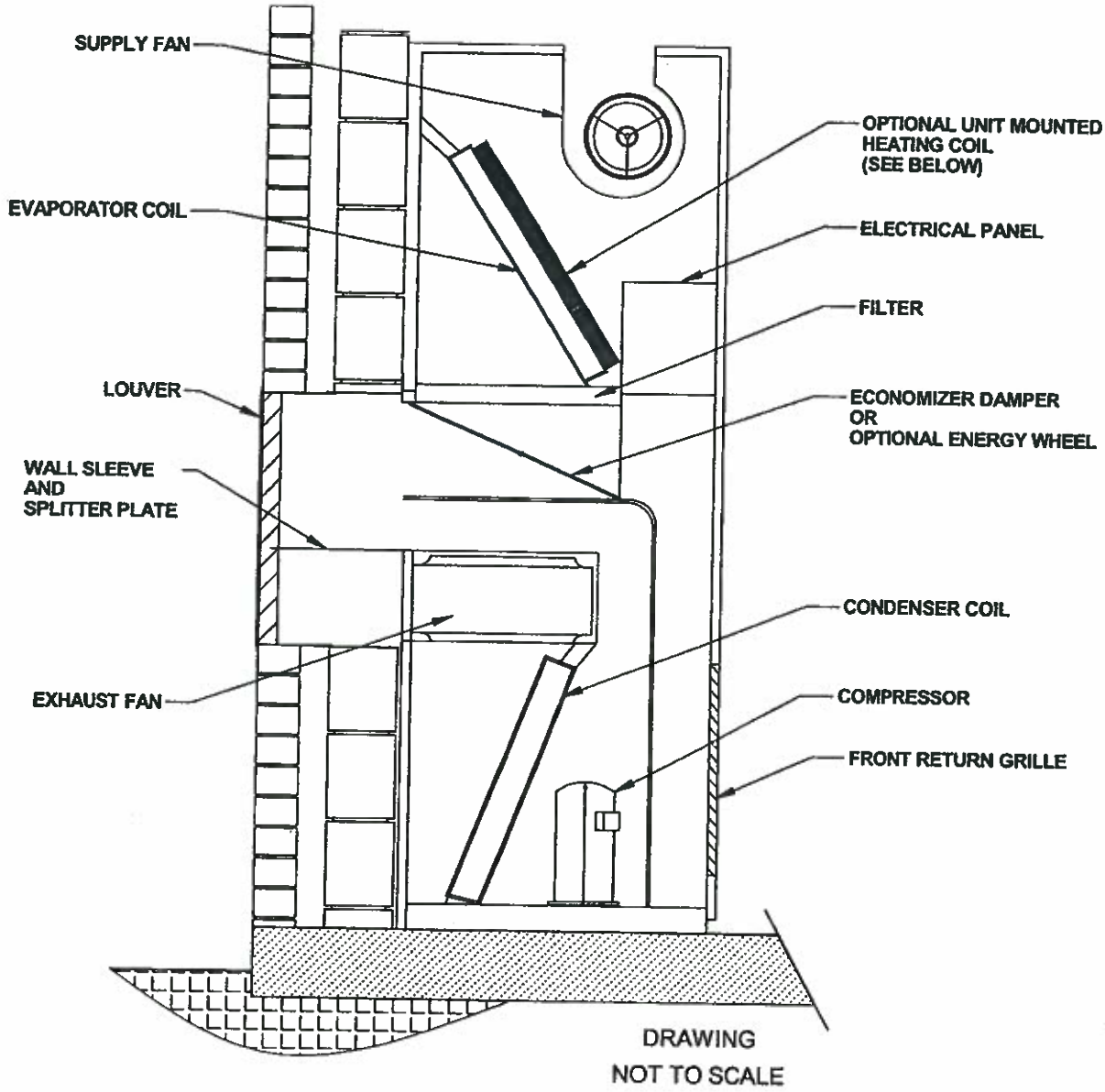
GENERAL ARRANGEMENT

Model CHH 3 - General Arrangement
Tag:



Optional Unit Mounted Heating: **None**

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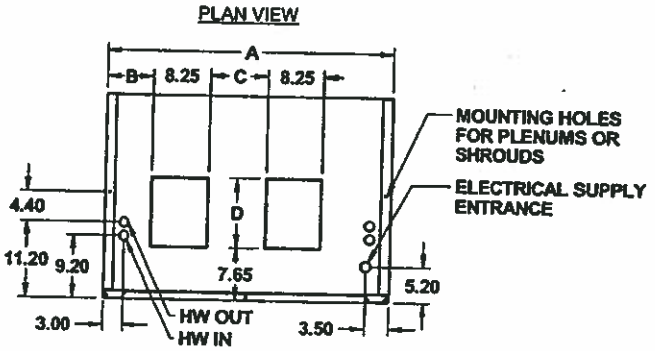
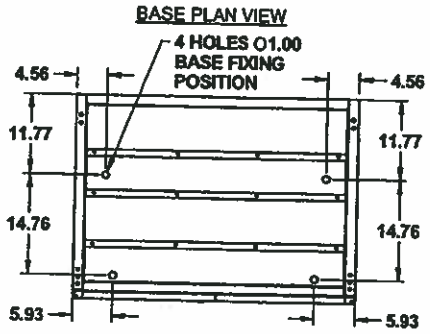
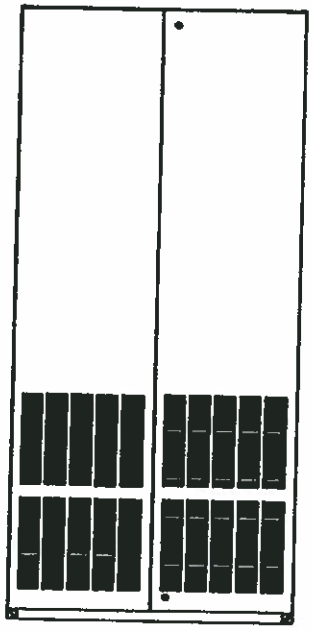
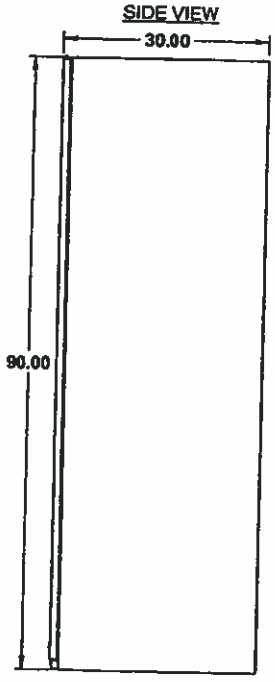
DIMENSIONS – UNIT

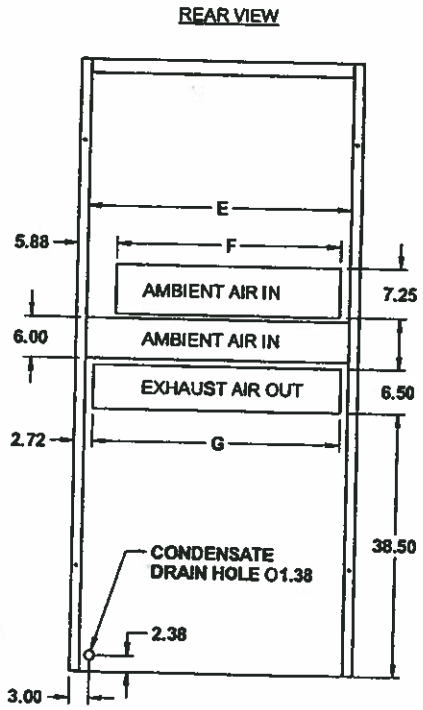
Model CHH3/1-230/410- Dimensions
Tag:











Unit Dimensions (inches)

UNIT SIZE	A	B	C	D	E	F	G	Approximate Weight	Filters - (Qty) Dimensions
3 Ton	42.00	7.00	8.25	10.25	39.00	33.25	36.75	735	(2) 16 x 20

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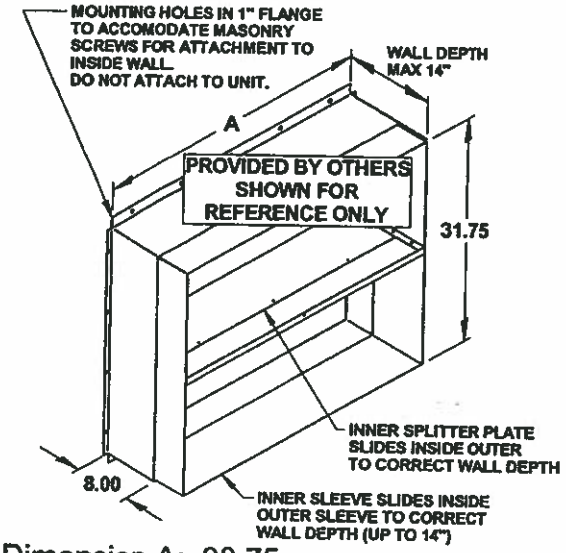
DIMENSIONS – WALL SLEEVE AND LOUVER

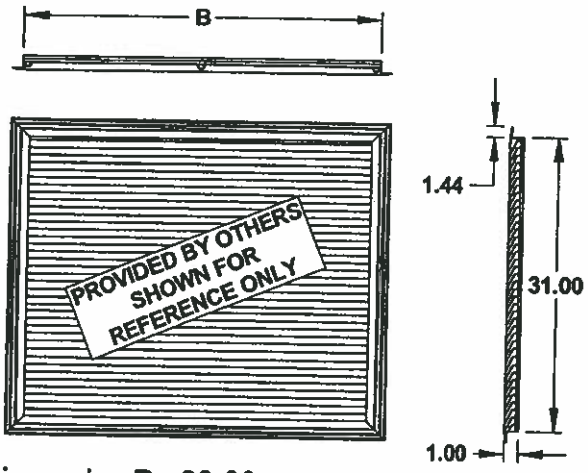
Model CHH3/1-230/410- Dimensions
Tag:

Wall Sleeve



Dimension A: 38.75

Louver



Dimension B: 38.00

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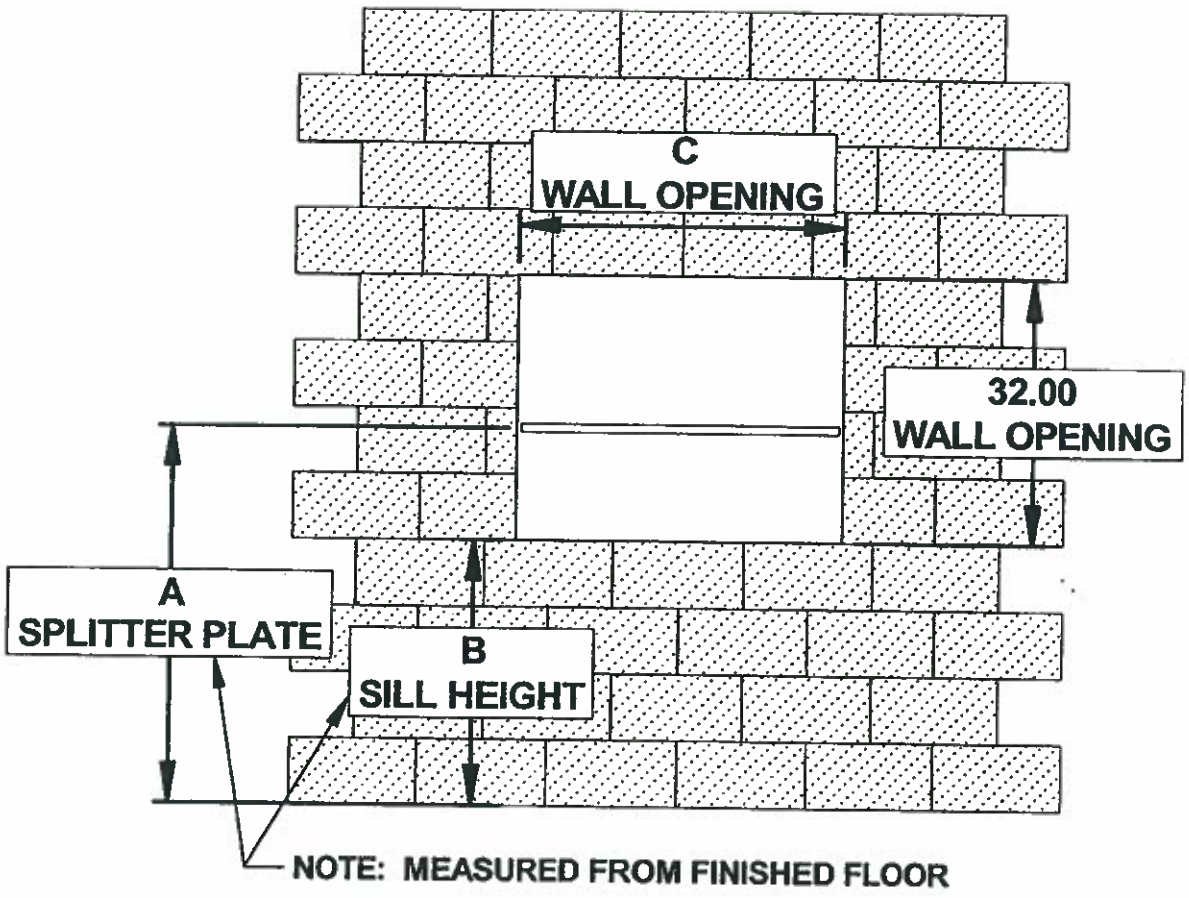
DIMENSIONS – WALL OPENING

Model CHH3/1-230/410- Dimensions
Tag:



Wall Opening Dimensions (inches)

Splitter Plate A	Sill Height B	Wall Opening C
45.50	26.00" to 38.00"	39.00

Specifications
Tag:

General
The supplied product shall be an Airedale self-contained air conditioning unit available as a heat pump unit ventilator. The unit shall be floor-mounted and vertically sized to allow the supply air to be ducted or supplied through a high level plenum. All access and maintenance shall be through the front of the unit.

Heat pump units shall also offer one stage of mechanical heating with automatic defrost control.

The unit shall be constructed in accordance with ETL & CSA standards, and a label shall be affixed to the unit listing the product code under which it is registered.

The unit shall be constructed following ISO: 9001 quality control program procedures and be fully assembled and tested prior to shipment.

Cabinet
The cabinet shall be constructed from aluminized steel, degreased and coated with an electrostatically applied baked-on polyester powder paint. The paint finish shall be easily cleanable and hard wearing to give maximum protection. The cabinet shall be insulated with acoustic foam insulation containing no fibrous materials. The foam insulation shall have a fire rating of UL94HF-1.

The front of the unit shall contain a low-level return air grille integral to the front of the doors and a sound attenuating inlet plenum. The doors shall be hinged with a spring-loaded pin to allow for easy removal if required. Doors shall be secured with a key lock.

The rear of the unit shall allow for high sill outside air discharge (up to 38"). A condensate connection stub shall also be provided internally at the rear of the unit for connection to the field installed building condensate drain.

Unit Color
The unit color shall be Beige (Hammertone Finish).

Compressor
The refrigeration system shall contain a one stage hermetic scroll compressor equipped with a crankcase heater to guard against liquid flood-back conditions and the elimination of oil foaming upon start up. The compressor shall contain an internal unloading mechanism to provide capacity control and enable part load efficiencies to be increased. An internal overload protector shall protect the compressor against excessive motor temperatures and currents. The compressor shall also be mounted on 125# all neoprene vibration absorbers for quiet operation.

Refrigeration System
The unit shall utilize HFC-R410A (1 Stage) and shall be fitted with a thermal expansion device, using check valves to prevent short cycling of refrigerant during the heat pump operation and a reversing valve to enable the unit to operate in both cooling and heat pump mode. A factory set defrost switch, a function normally included with the microprocessor controls or provided by Airedale when controls are by others, shall be fitted to allow defrosting of the outside coil when in heat pump mode. Factory set high and low-pressure switches shall be fitted; manual reset high pressure and low-pressure cut-out. A sight glass shall also be included for system observation.

Coils
The unit shall contain an enhanced, high efficiency, cross-rifle tubed condenser coil. The unit shall also contain a quick draining evaporator coil. Both coils shall be ideally positioned for optimal airflow and heat transfer, and fitted to stainless steel drain trays.

Fans & Fan Motor
The indoor fan assembly shall consist of two blowers and one common-shafted electronically commutated motor (ECM). The ECM motor shall have a wide range of programmable speed and torque characteristics for ultra high efficiency and low audible noise. The ECM motor provides constant airflow by automatically adjusting the speed if the external static pressure changes. The DC motor features a brushless, permanently lubricated ball bearing construction for maintenance free operation. The ECM motor shall also be fully programmed to compensate for a wide variety of static pressures as well as lack of maintenance (dirty air filters). The outdoor fan assembly shall consist of two backward curved plug fans with centrifugal blower wheels fitted with electronic speed control to allow for airflow adjustment.

Filter
Each unit shall be fitted with 2" thick radial pleated disposable cotton and synthetic blend filters. The filters shall have a Minimum Efficiency Reporting Value of MERV 8 when evaluated per ASHRAE standard 52.2.

Economizer
Each unit shall be fitted with a spring return modulating damper that acts to mix the outdoor air with the return air. The damper shall have the capability of permitting only the outside air into the space, or recycling the return air and allowing only a minimum of outside air to enter the space. Full modulation allowing any mixture of outside air and return air shall be possible. A minimum damper position setting shall also be possible to continuously maintain outside air ventilation requirements dependent on control via the unit's microprocessor controller.

Control Panel
Located at the top of the unit behind the front door, the control panel shall contain a 24-volt control circuit transformer and all necessary contactors, relays and circuit breakers to provide the necessary control. All components located in the panel shall be clearly marked for easy identification. All terminal blocks and wires shall be individually numbered. All electrical wires in the control panel shall be run in an enclosed trough. Wiring outside the control panel shall be run in a protective sleeve.

Powered Exhaust
Powered exhaust shall be integral to the unit to prevent over pressurization of the space with the exhaust fan capable of exhausting 100% equivalent of the fresh air.

Microprocessor Controls - Standard Carel Control
The unit shall be fitted with a programmable microprocessor controller mounted outside the air stream and specifically designed to operate the unit in an energy efficient manner using pre-engineered control strategies. The microprocessor shall determine mode of operation based on the return air, supply air, and ambient air temperatures.

The microprocessor controller shall be capable of managing the unit in each of the following modes of operation:
- Free Cooling
- Stage One Mechanical Cooling: 100% capacity compressor, high speed supply fan
Heat Pump Mode
- Stage One Heating: 100% capacity compressor, high speed supply fan

The microprocessor controller shall also modify the minimum damper position to compensate for mode of operation and fan speed.

Options - Factory Installed

Disconnect Switch
The unit shall be fitted with a power disconnect switch located on the control panel, sized for the full load amperage of the unit to enable the unit to be disconnected from the power supply prior to any maintenance. In the off position the switch can be locked out.

Accessories - Field Installed

Compressor Warranty
Every compressor shall carry a standard one year warranty. The compressor warranty applies to parts only.

SHELTER INDUSTRIES INC.

APPENDIX S – 2.2.8(C) – SPECIFICATION NOTES (16 PAGES)

School District Supplied Foundations:

School District Responsibilities

Building permit in place

BC 1 call report to be supplied to Shelter at least 3 weeks prior to foundation installation.

Minimum 16' wide clear access to site.

Confirm Foundation material used (concrete, wood or other) with Shelter.

Foundation schedule to be provided by School District to Shelter.

Best practices recommend removing grass & organic matter for blocked or screw pile foundation in building location and replacing with gravel & poly vapor barrier.

Full access to the final location for crane & tow truck with no encumbrances. (eg O/H lines, site slope)

Snow removed to provide truck & crane access and safe working environment on site.

Locating and marking underground utilities such as irrigation systems, septic fields / tanks, water lines, sewer lines, gas lines, hydro lines that could possibly be damaged by a crane, tow truck, or site crew.

Contaminated soils remediated prior to Shelter arrival on site.

Supply temporary power.

Shelter Supplied Foundations:

School District Responsibilities

Building permit in place

Geotech reports submitted to Shelter complete and available with modular school contract with individual school district.

BC 1 call report to be supplied to Shelter at least 3 weeks prior to foundation installation.

Minimum 16' wide clear access to site.

Surveyed site location for building placement.

Contaminated soils remediated prior to Shelter arrival on site.

Foundation schedule to be provided to School District by Shelter.

Locating and marking underground utilities such as irrigation systems, septic fields / tanks, water lines, sewer lines, gas lines, hydro lines that could possibly be damaged by a crane, tow truck, or site crew.

Remove grass & organic matter in building location and replace with gravel & poly vapor barrier.

Snow removed to provide truck & crane access and safe working environment on site.

Full access to the final location for crane & tow truck with no encumbrances.

Supply temporary power.

SHELTER INDUSTRIES INC.
3294 - 262nd ST., BOX 1318, ALDERGROVE, B.C., CANADA V4W 2V1
TELEPHONE: (604) 534-1311 1-800-561-3822 FAX: (604) 856-5200

CHECKLIST FOR SITE CO-ORDINATOR & CREW

Copies of completed reports to:

- ☐ Site Co-ordinator
- ☐ Design Main File
- ☐ Production Manager
- ☐ Quality Manager
- ☐ Sales_____

A) Pre-Shipping:

Site Contact: _____
Job No.: _____
Client: _____
Site Location: _____

1. Site co-ordinator checks all change orders. ☐ Date: _____
2. Site co-ordinator met with complexing co-ordinator to review material list & order of shipping materials in appropriate unit #'s. ☐ Date: _____
3. Site co-ordinator issues file folder for site crew containing plans, spec's, change orders and complexing materials list ☐ Date: _____
4. _____

B) Pre-Set-Up	Good	Fair	Bad	See Reverse ✓	Comments
1. Site Conditions					
2. Exterior Conditions of Units					Damage due to transport ☐ Other
3. Interior Condition Check					Damage due to transport ☐ Other

C) Site Crew Work Done	Yes	No	N/A		Comments
1. Junction of Units - Doors					
2. Junction of Units - Openings					
3. Roofing Junctions					Glued ☐ Welded ☐ Capped ☐
4. Exterior Junctions					
5. Pads & Blocking as per Spec.					
6. Skirting					Painted ☐
7. Steps & Landings					Painted ☐
8. A/C or HVAC Mounted					Precharged Lines Connected ☐
9. Vents Extended					
10. Hoods Installed					
11. Ducting Installed					Duct Insulated ☐
11a. Fire Caulking					
12. Floor Junctions					
13. Skylights Installed					
14. Junctions Insulated					
15. Fire Up/Test Furnaces					
16. Electrical Interunit					Connect to A/C ☐

D) Re-Work (Describe on back of sheet including hours and costs.)

E) Sub-Trades On-Site	No	W.I.P.	Complete	Comments
1. Plumbing - Crawlspace				Tested ☐
- Service Connect				Tested ☐
2. Electrical - Crawlspace				Tested ☐
- Service Connect				Tested ☐
3. A/C Mechanic				Tested ☐
4.				

Report Signed _____ Date _____

Page 2 - (Checklist for Site Co-ordinator & Crew)

A) Multi-Unit Projects May Need Comments on Specific Units on:

1. Exterior Conditions of Units	#	
2. Interior Condition Check	#	
3. Junction of Units - Doors	#	
4. Junction of Units - Openings	#	
5. Roofing Junctions	#	
6. Exterior Junctions	#	
7. A/C or HVAC Mounted	#	
8. Vents Extended	#	
9. Hoods Installed	#	
10. Ducting Installed	#	
11. Fire Caulking	#	
12. Floor Junctions	#	
13. Skylights Installed	#	
14. Junctions Insulated	#	
15. Fire Up/Test Furnaces	#	
16. Electrical Interunit	#	

B) Re-work details, hours & costs, comments

Report Signed _____ **Date** _____

SHELTER INDUSTRIES INC.
REVIEW OF SUBSTANTIAL COMPLETION

COMPLETED BY: _____

JOB NO. _____ CLIENT _____

LOCATION _____

BRIEF PROJECT DESCRIPTION _____

_____

DATE OF SUBSTANTIAL COMPLETION _____

_____

THE FOLLOWING INFORMATION SHOULD BE PASSED BACK TO SALES DEPT., ADMIN., SITE SET-UP CREW AND PLANT WORKERS; OTHER _____

DEFICIENCIES CORRECTED, REPAIRED BY WHOM?

_____

_____

POSITIVE COMMENTS BY CLIENT

_____

_____

_____

SUGGESTIONS FOR FUTURE PROBLEM PREVENTION OR SERVICE & PROD. IMPROVEMENT

_____

_____

_____

_____

DATE OF REPORT _____ SIGNED _____

(USE REVERSE IF EXTRA ROOM IS REQUIRED)

SHELTER INDUSTRIES INC.

APPENDIX U – 2.2.8 PRODUCT CONTENT ASSURANCE DATA

SHELTER INDUSTRIES INC.

APPENDIX V – 2.3.1 [redacted]

LETTERS

OF COMMITTMENT

SHELTER INDUSTRIES INC.

APPENDIX W – PRELIMINARY MASTER SCHEDULE PROGRAM

ID	Task Mod	Task Name	Duration	Start	Finish	Pre	Resource Names
1		**Master Agreement**	**0 days**	**Thu 07/10/10**	**Thu 07/10/10**		**Ministry & Shelter**
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22		**S.D. Classroom Typical Preliminary Schedule**					
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							

ID	Task Mod	Task Name	Duration	Start	Finish	Pre	Resource Names
33		[redacted]					
34							
35							
36							
37							
38							
39							
40							

SHELTER INDUSTRIES INC.

APPENDIX Y – 3.2 – QUALITY ASSURANCE MANUAL EXCERPTS

SHELTER INDUSTRIES INC.

QUALITY ASSURANCE MANUAL

ISSUE 2
May 1996

3294 - 262nd Street
P.O. Box 1318
Aldergrove, British Columbia
Canada V4W 2V1
Tel: (604) 534-1311
Fax: (604) 856-5200

0.2 QUALITY MANUAL CERTIFICATION

It is the policy of Shelter Industries Inc., to maintain the Quality Assurance Program as described in this manual. We hereby certify that this Quality Assurance Manual wholly describes the Quality Assurance Program in use within Shelter Industries Inc.

General Manager, Harold Clifford

Quality Assurance Manager, Bruno DePedrina

0.3 FOREWORD

Total dedication to customers pays off at Shelter Industries, a leading B.C. manufacturer of modular and relocatable buildings.

Shelter Has constructed over 2500 modules since starting up in late 1984. Its portfolio includes teaching facilities for Kelowna's Okanagan College, Eagle Harbour recreation centre in West Vancouver, a large school addition in Coquitlam, numerous day cares in Greater Vancouver, and a 16000 square-foot, two-storey office complex and gate facility for Howe Sound Pulp and Paper.

Many of Shelter's buildings are permanent buildings, built to the same stringent codes as traditional site-built buildings, but as a rule they are better built than many site-built structures. In fact they look virtually the same; the only key difference is that Shelter's are built in a factory. That difference is what offers so many key advantages to Shelter customers. For one thing, because factory production is very efficient and minimizes waste, Shelter buildings are priced very competitively. As well, they can be supplied more quickly than site-built buildings. And they are not exposed to delay or harm from adverse weather conditions or site problems. While, they may be permanent, the buildings are relocatable, so they can be moved to another site if ever required. They can also be expanded with minimal disruption.

Shelter buildings are constructed using only top-quality building materials, such as kiln-dried lumber and reliable name-brand finishing materials. The company employs experienced tradesmen and professionals -- Shelter's four employee shareholders have worked in the industry since the late 1960s and 1970s. Finally, factory production permits strict quality control and careful, systematic monitoring of the building at each stage of production.

The result is better buildings and satisfied customers who have made Shelter one of the fastest growing companies in Canada.

1.0 SCOPE

This Quality Assurance Manual describes the Quality Assurance Program implemented within Shelter Industries Inc.

This Quality Assurance Program is applicable to the design, manufacture, and installation and servicing of **Modular Relocatable Buildings.**

The Quality Assurance Program is intended to demonstrate objective evidence that:

a) Shelter Industries Inc., is capable to design and manufacture to stated performance requirements.

b) Shelter Industries Inc., is capable in achieving customer satisfaction by preventing nonconformity's in design, development, production, installation, and servicing of products.

The provisions of the Quality Assurance Program as set forth in this manual apply at all times, whether or not the quality assurance requirements are specified in the contracts.

The quality program, established to implement the company quality policy shall satisfy the requirements of the Canadian Standards Association Certification Policy with respect to required procedures and evidence of conformity to the following applicable standards:

British Columbia Building Code – 2006
Canadian Electrical Code – Part 1 (2006)
CSA Certification – Manufactured Commercial / Industrial Relocatable Structures – Part 9/Part 10
Alberta Building Code – Part 10 Relocatable Industrial Accommodation
CSA Standard A277 – Manufactured Homes

4.1.1 QUALITY POLICY

[redacted]

3.0 DEFINITIONS

[redacted]

4.0 RESPONSIBILITIES

[redacted]

5.0 QUALITY POLICY

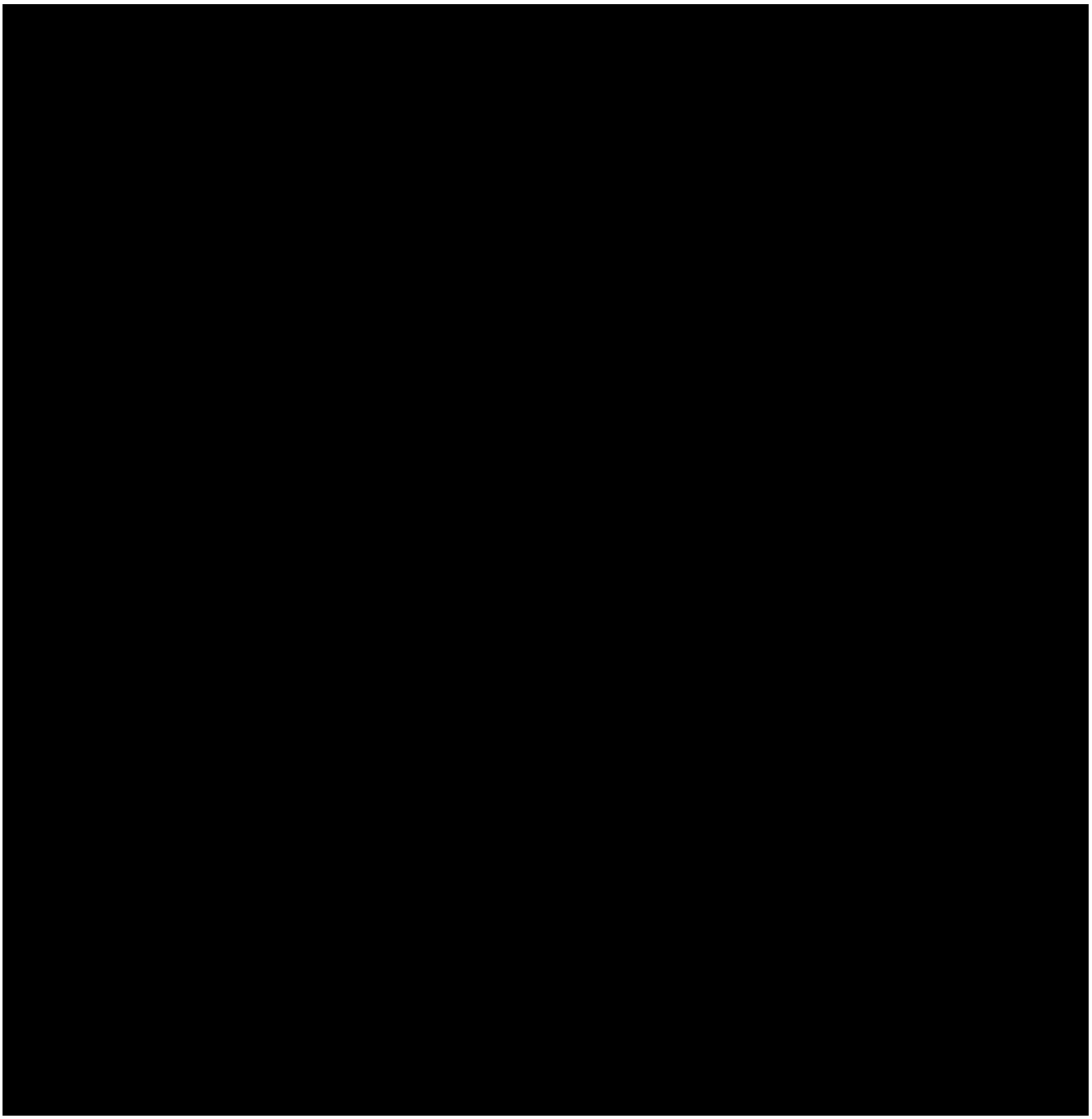
[redacted]

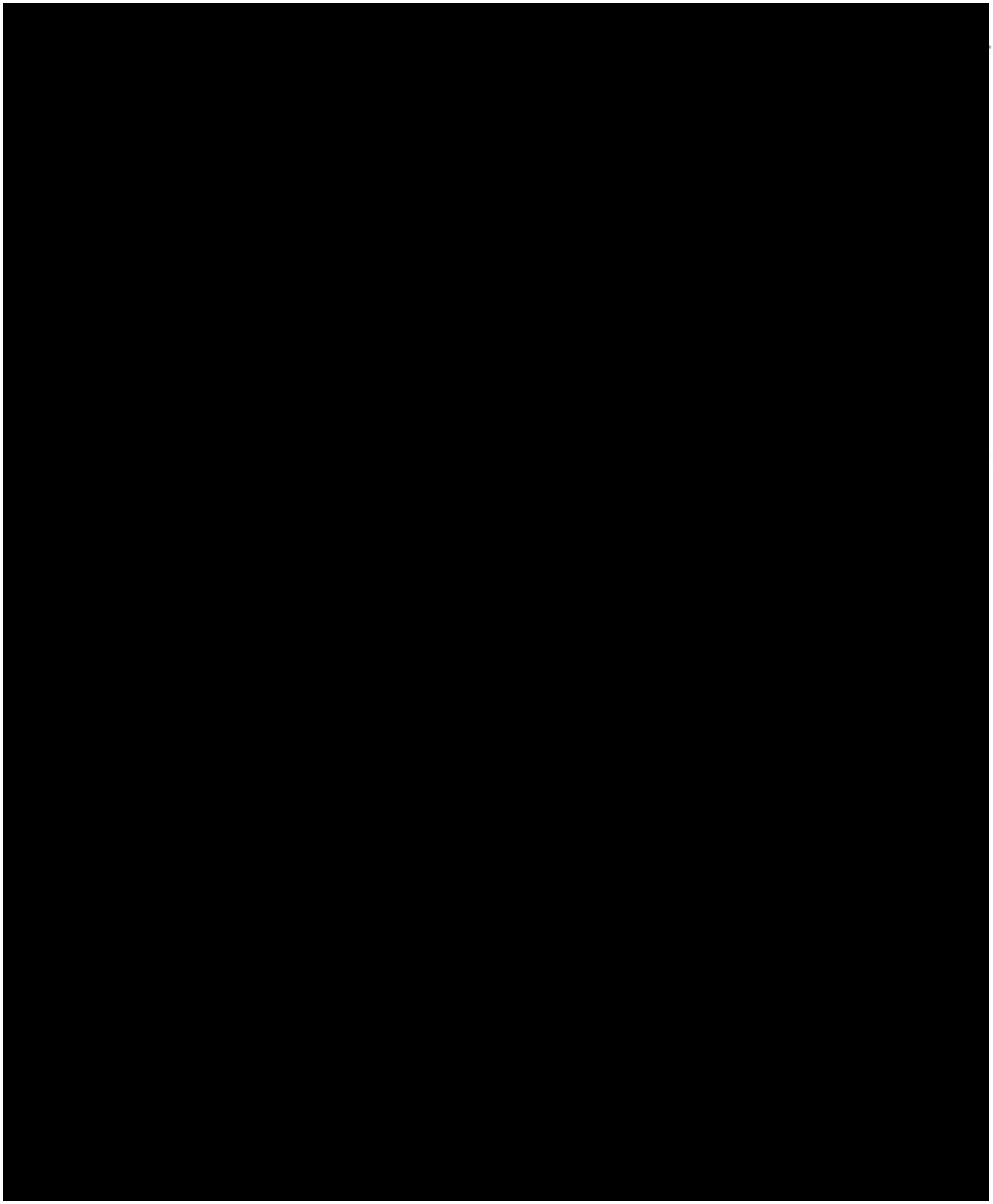
6.0 QUALITY POLICY IMPLEMENTATION

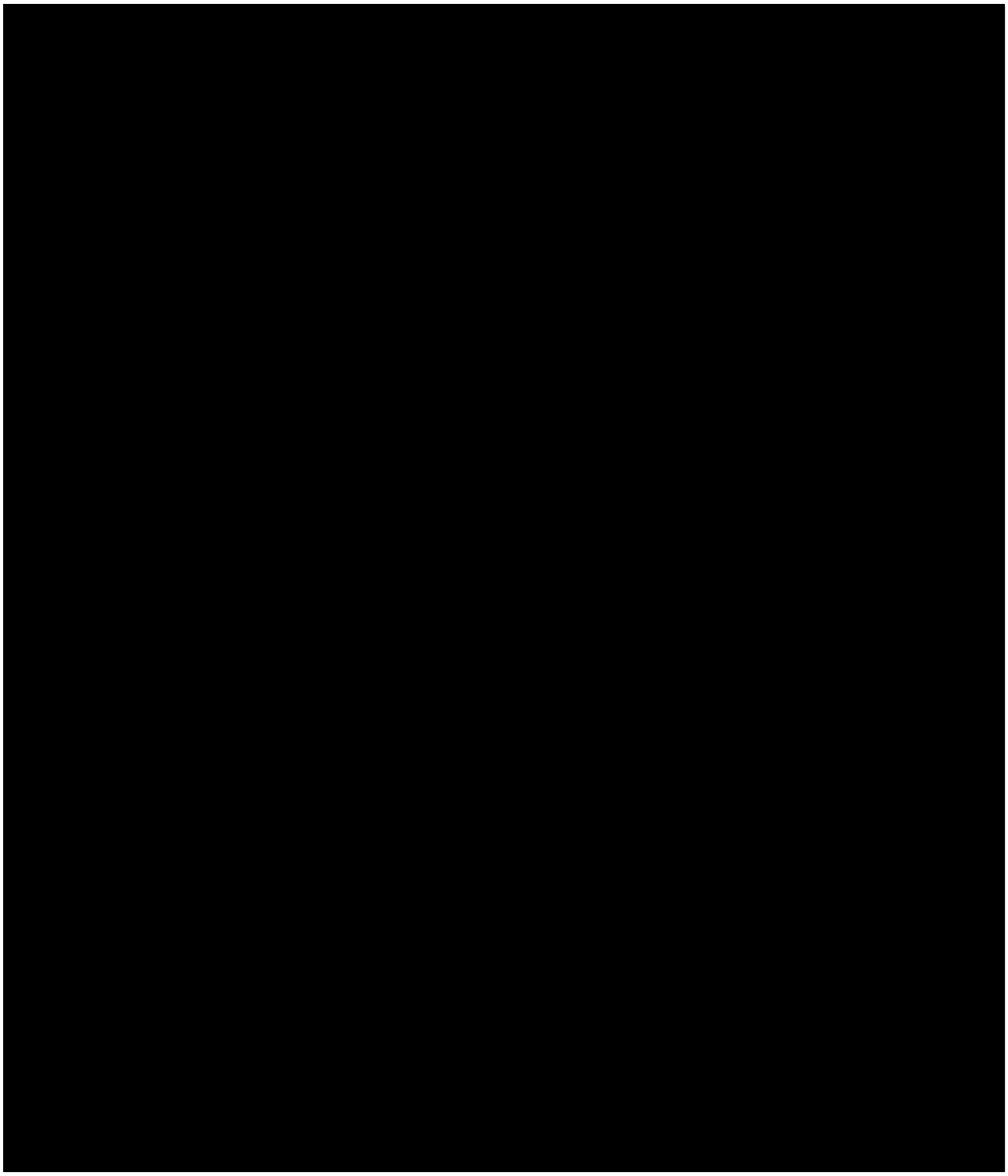
7.0 QUALITY POLICY VERIFICATION

SECTION 4.1.2 - ORGANIZATION CHART

2.0 RESPONSIBILITIES AND AUTHORITY







[redacted]

[1] For clarification of "Levels" see section 4.18 of the Q.A. Manual.

[redacted]

5.0 MANAGEMENT REPRESENTATIVE

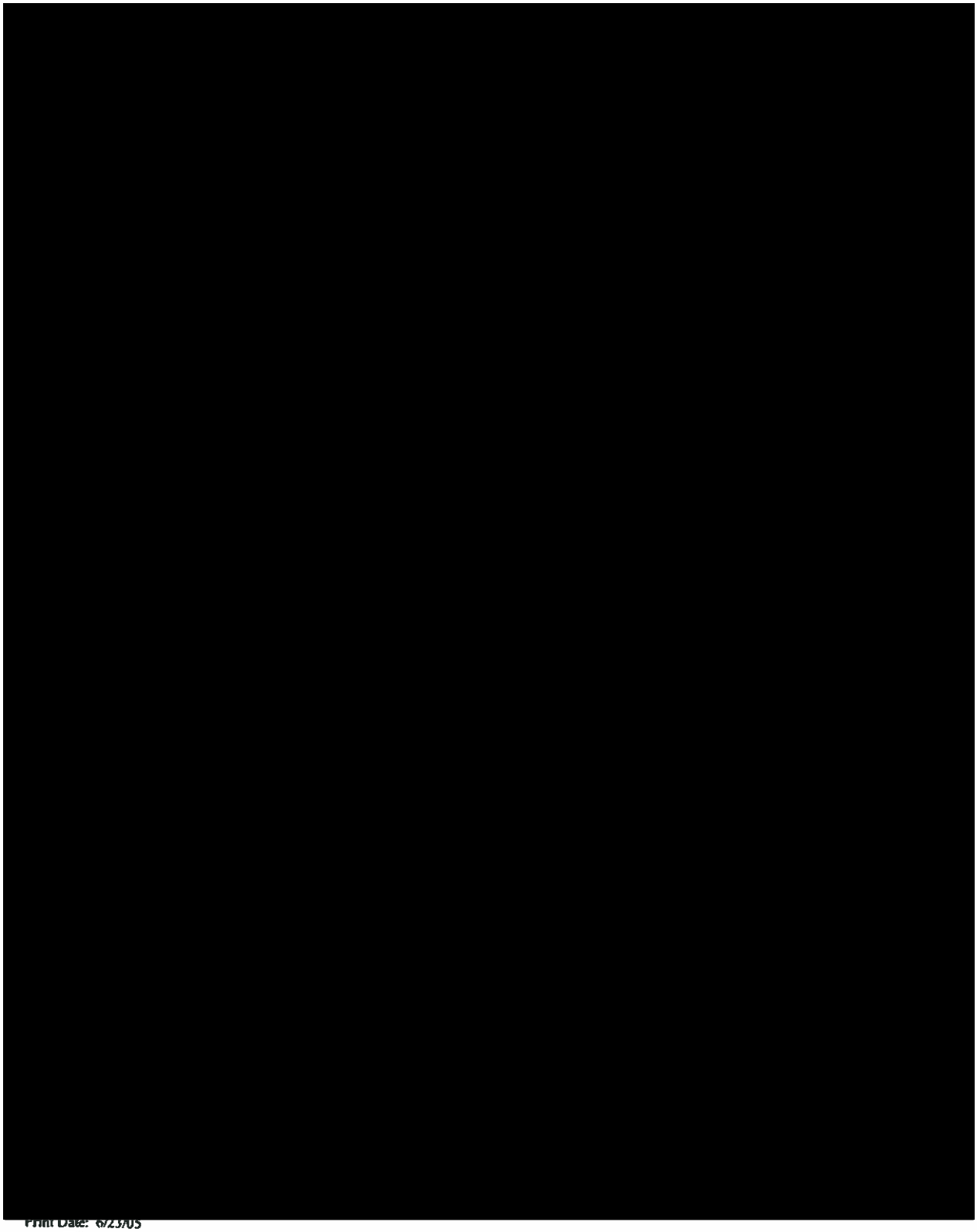
[redacted]

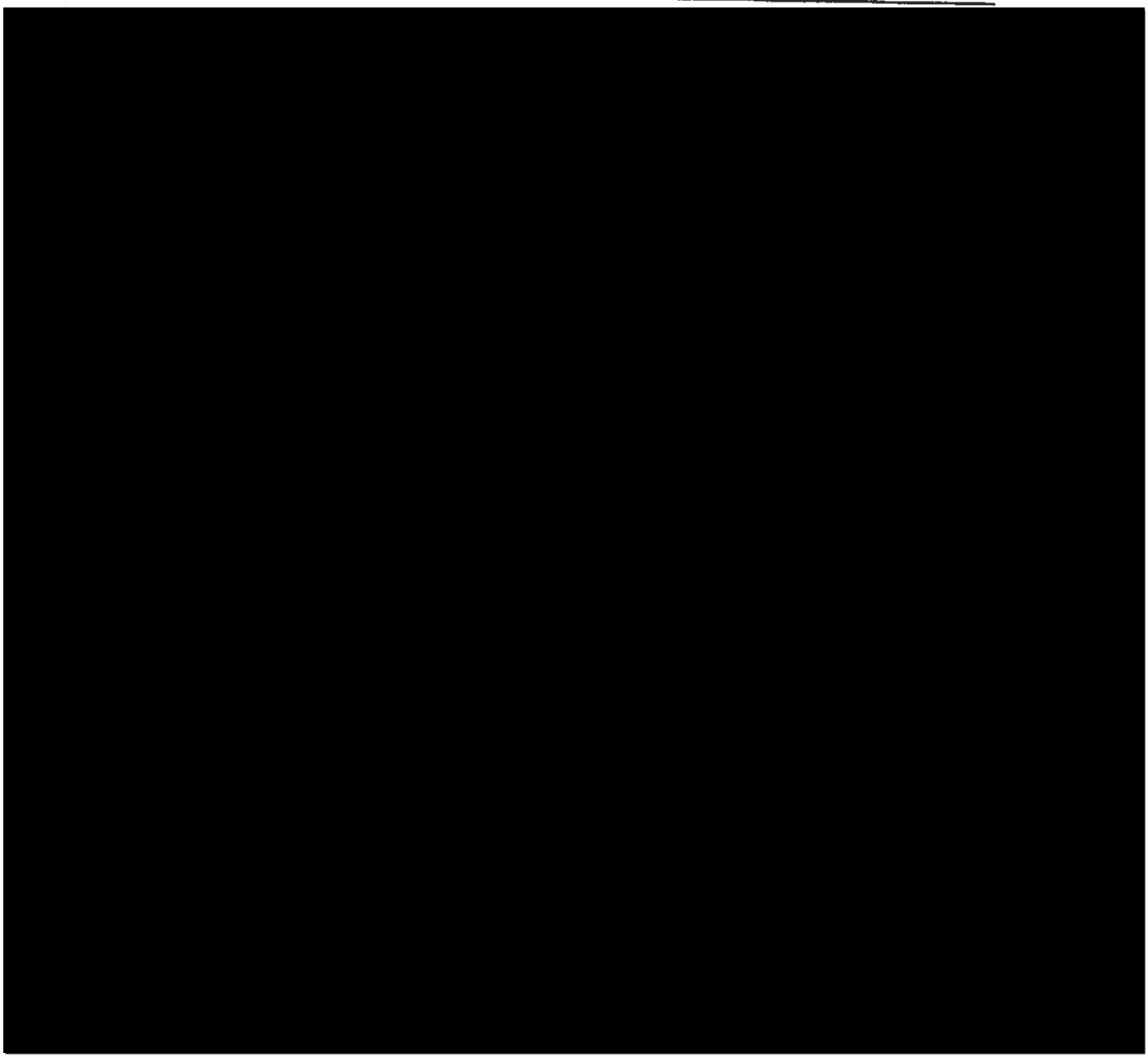
[redacted]

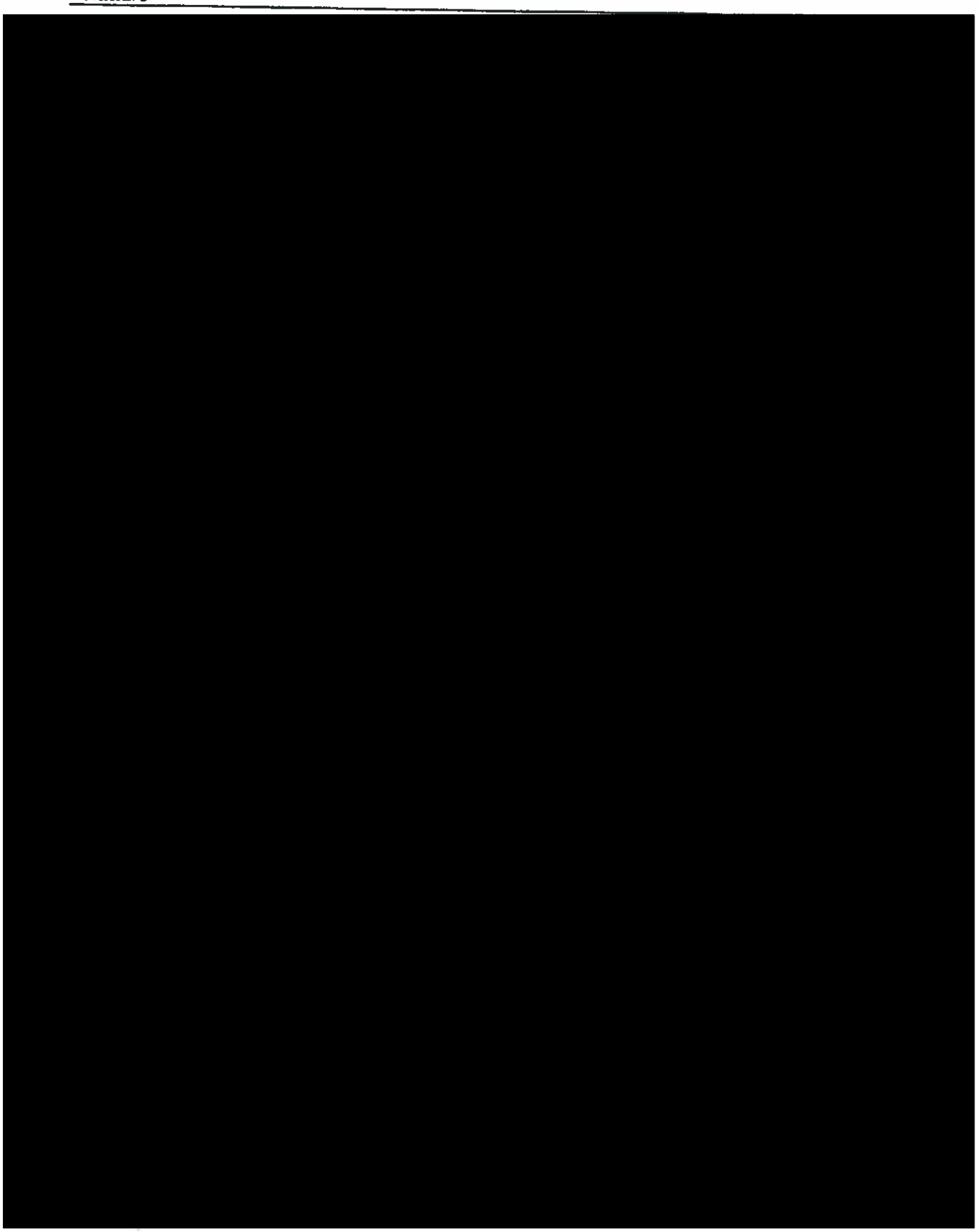
OPERATION	QUALITY ASSURANCE	PROCEDURES/STANDARDS	QUALITY RECORDS	RESPONSIBILITY
[redacted]				

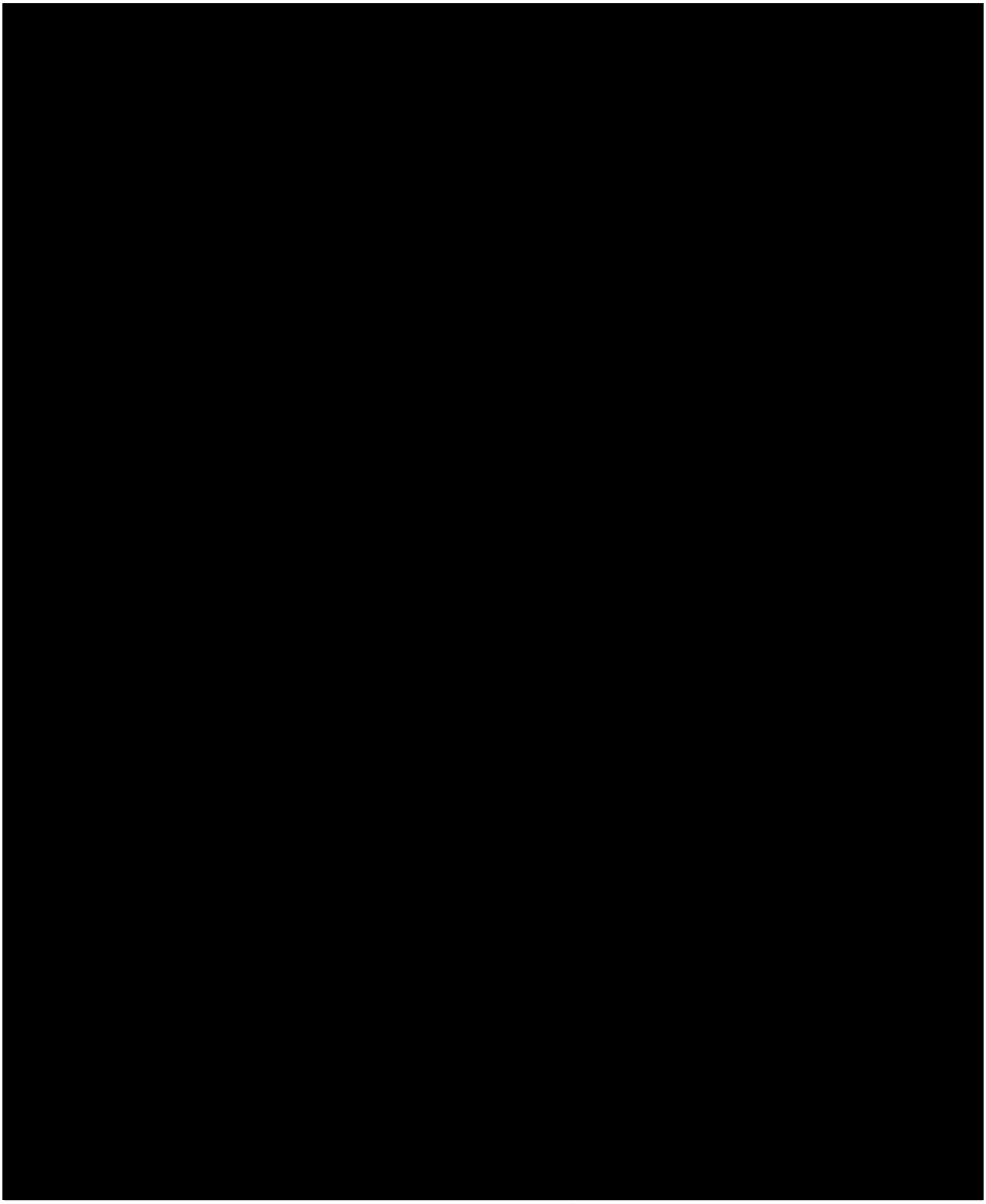
OPERATION	QUALITY ASSURANCE	PROCEDURES/STANDARDS	QUALITY RECORDS	RESPONSIBILITY
[redacted]				

4.4 DESIGN CONTROL

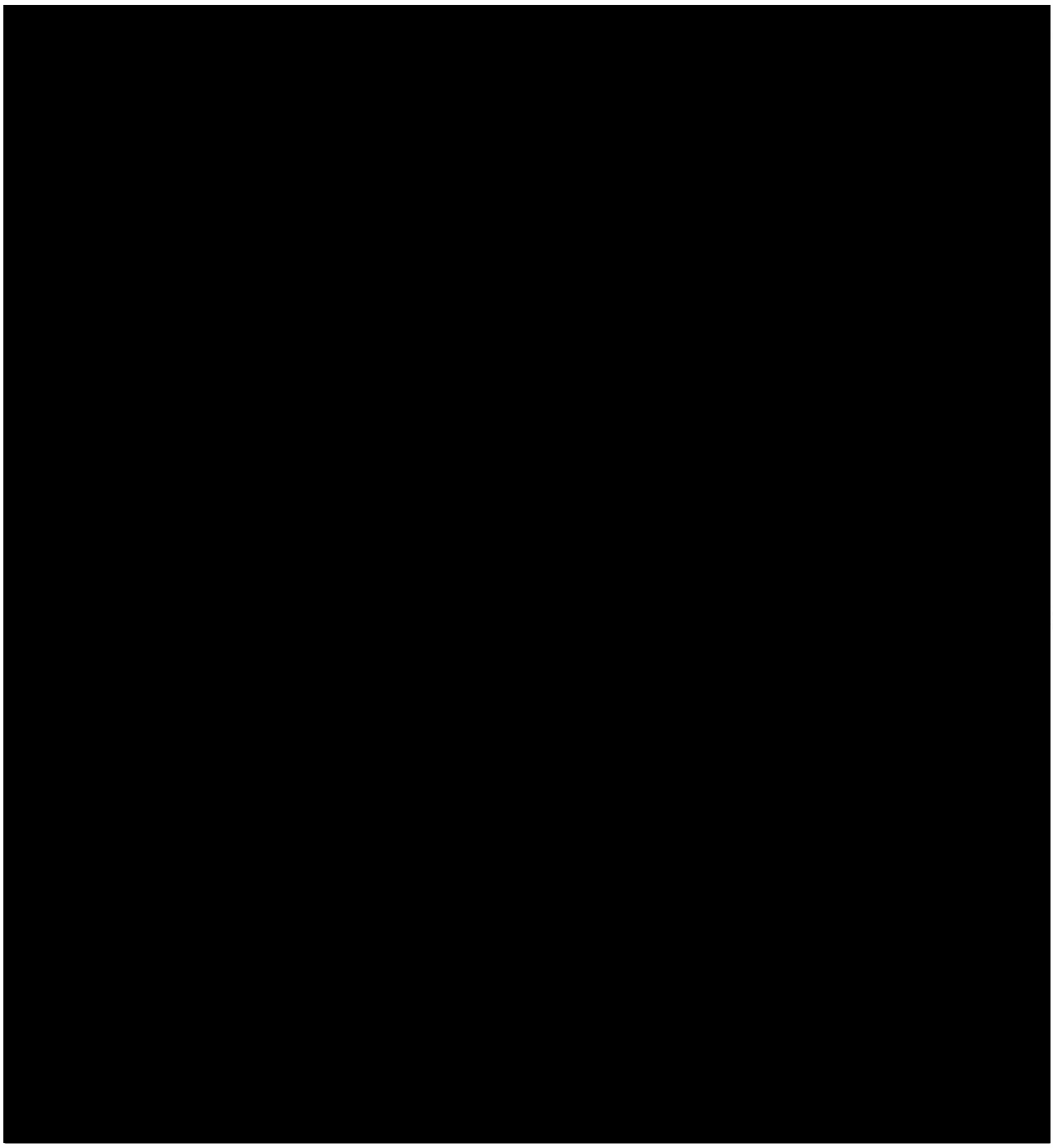


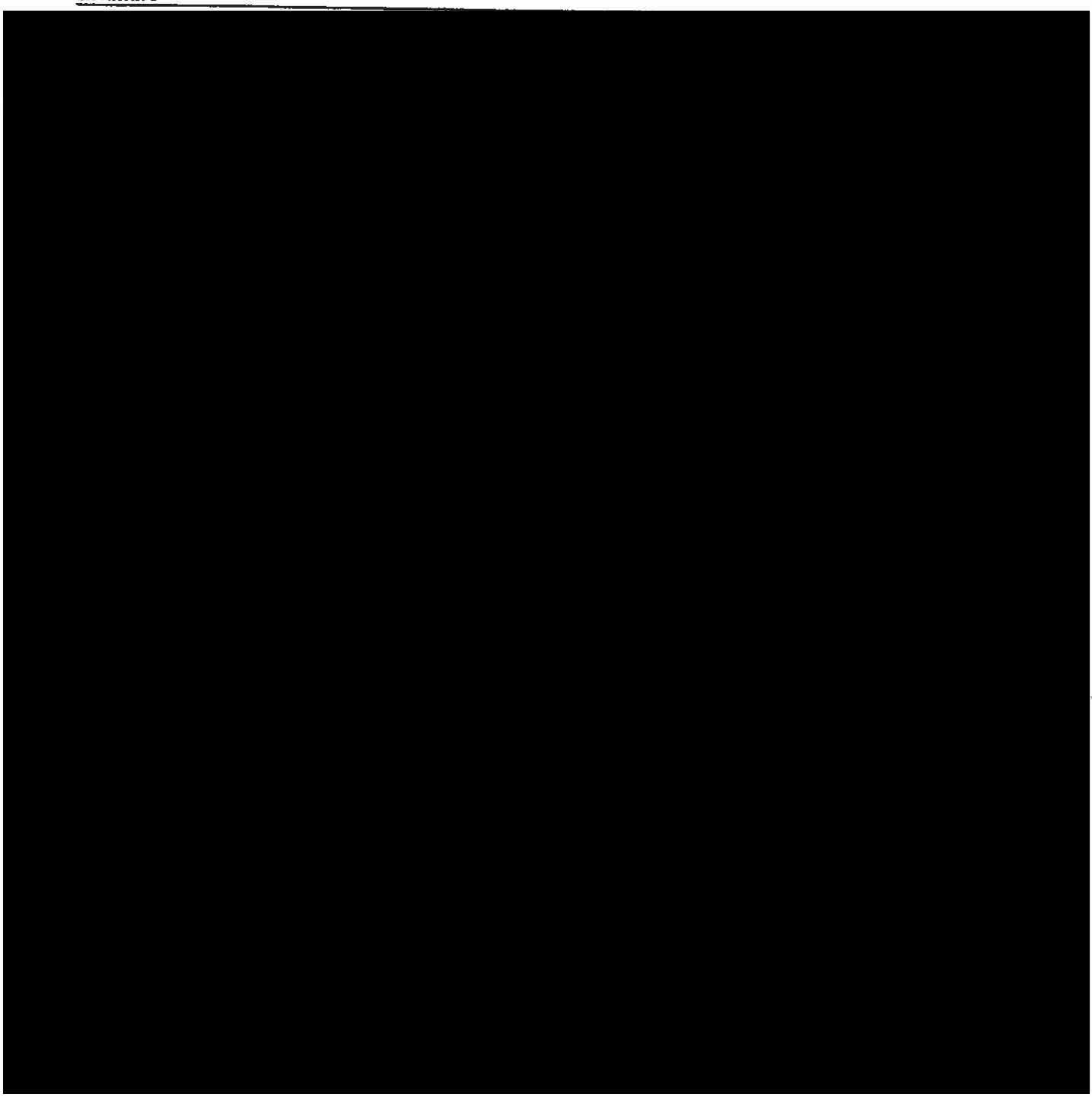


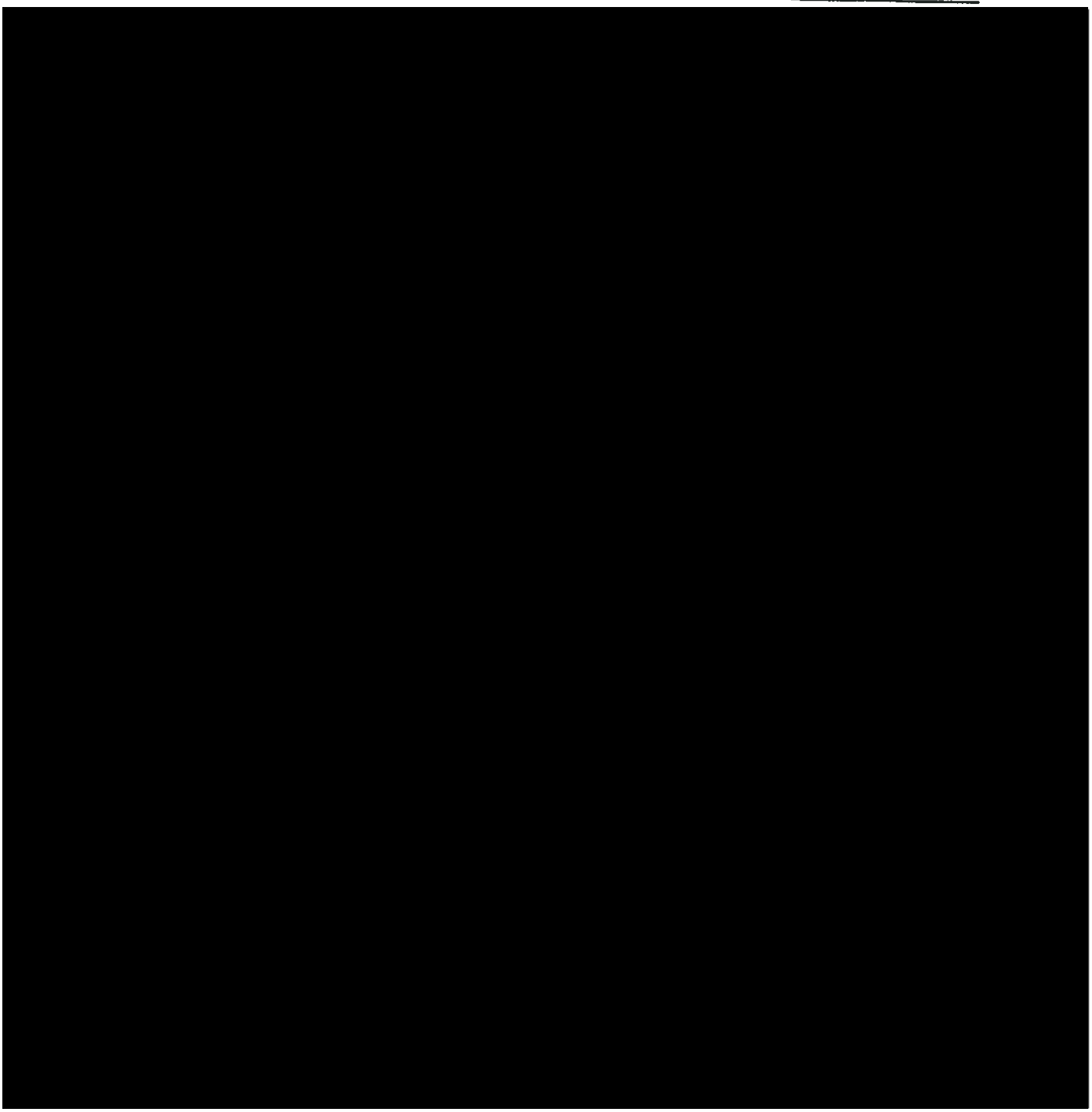




4.9 PROCESS CONTROL







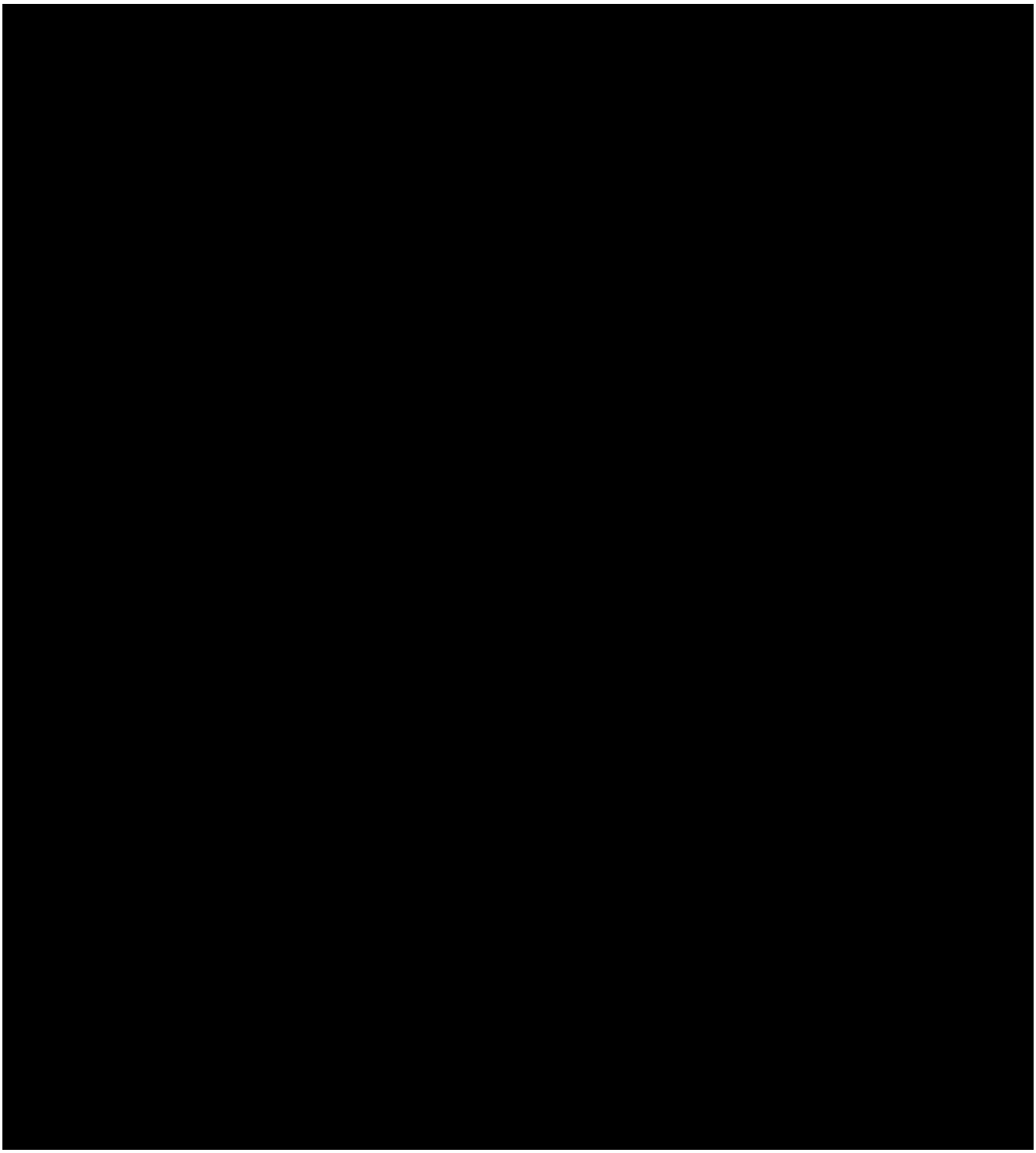
[redacted]

products may be released to next operation, if the next operation does not interfere:

a) with the inspection or verification activities; or

b) with the possible repair/reworks which may be required for dispositioning the nonconformity's.

4.13 CONTROL OF NONCONFORMING PRODUCT

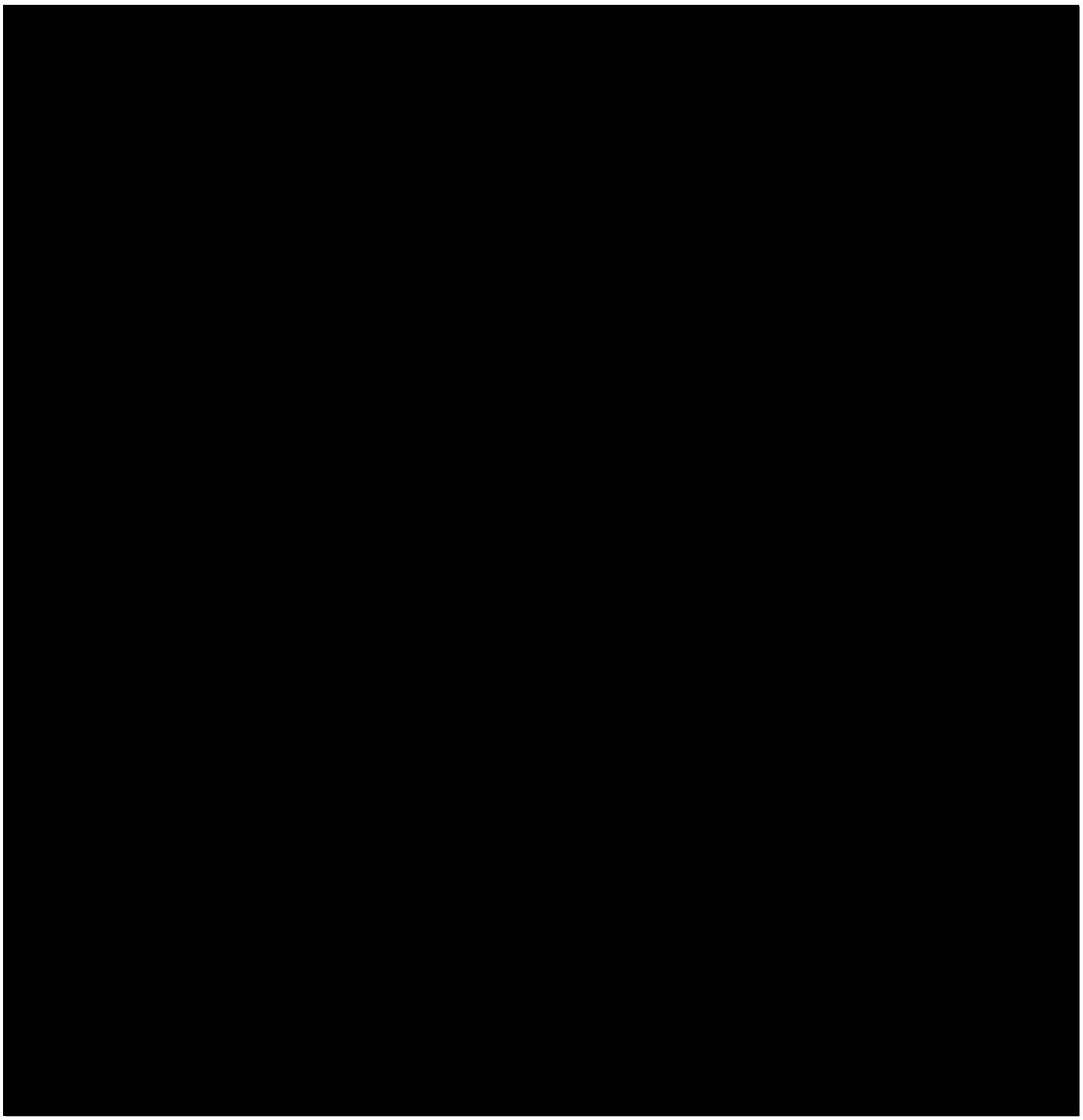


[redacted]

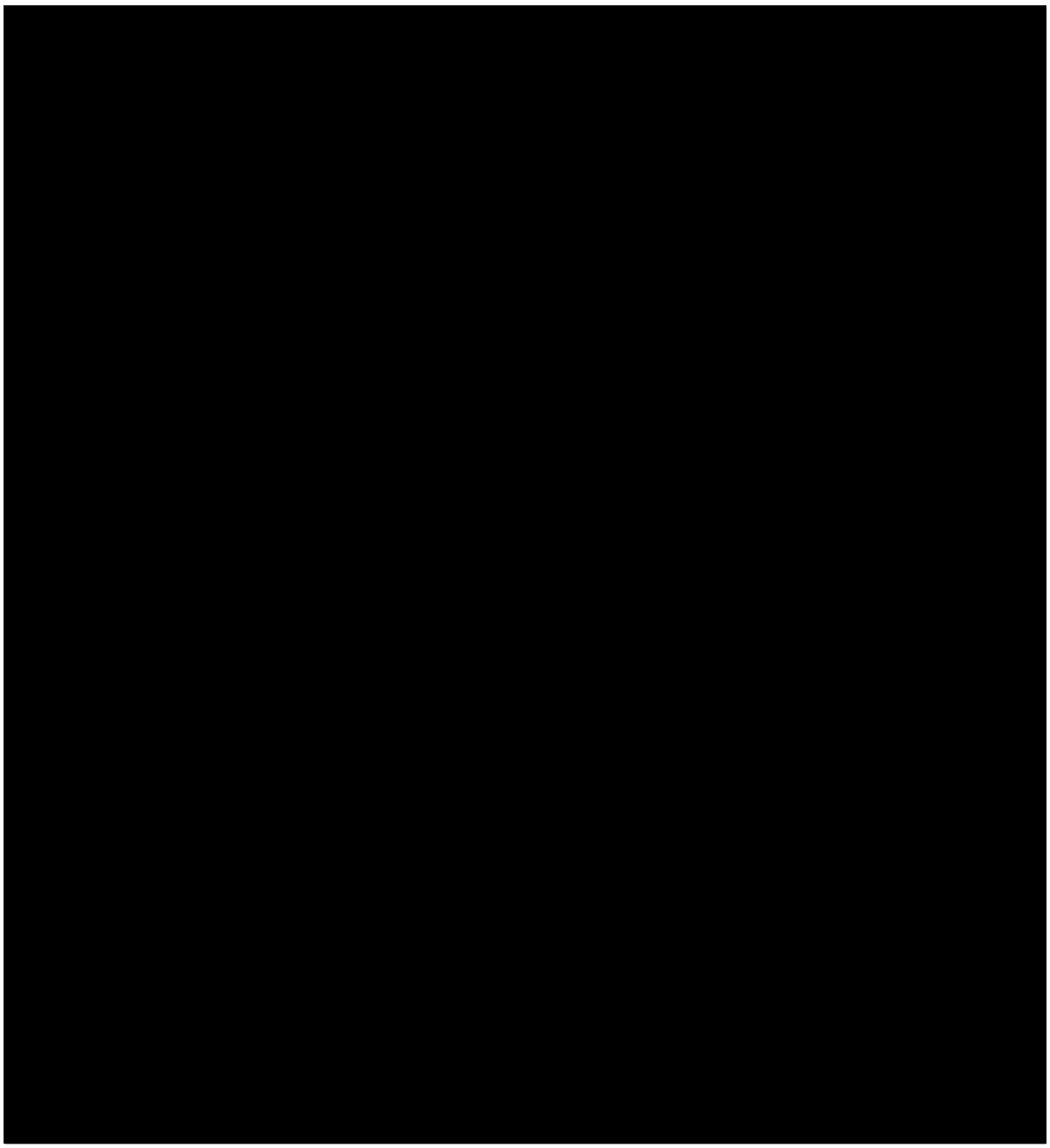
PROCEDURE

[redacted]

4.14 CORRECTIVE AND PREVENTIVE ACTION



4.19 SERVICING



SHELTER INDUSTRIES INC.

APPENDIX Z – 3.2 – SHELTER AND ROOFING WARRANTIES

RCABC

RCABC Guarantee Corp.
("RGC")

TEN (10) YEAR GUARANTEE CERTIFICATE

Guarantee No. _____ Guarantee Value _____

Owner _____

Owner Address _____

Project Description _____ (The "Roof")

Project Location _____

Roofing Contractor _____ Tel.: _____

Manufacturer / Supplier _____

Date of Completion of Work _____

Guarantee Period: From _____ and ending _____

LIMITED GUARANTEE OF WORKMANSHIP AND MATERIALS

On the conditions noted below, RGC and Roofing Contractor (together and each of them, guarantee to repair or have repaired at their own expense, leaks in new materials only utilized in the roofing membrane or flashings of the Roof which occur during the Guarantee Period and which are caused only by:

a) faulty workmanship of the Roofing Contractor, or
b) defects of manufacturing in the materials used by the Roofing Contractor in the application of the roofing membrane of the Roof
c) notwithstanding the Guarantee Period, the guarantee for the said material is limited to the period for which the manufacturer's commitment to, and indemnification of, RGC is in effect and honoured by the manufacturer.

This Guarantee is given to and accepted by the Owner on the following conditions:

1) The full extent of the liability of each of us to the Owner for or arising out of installation of the Roof is limited to this Guarantee;
2) Neither of us shall be liable to the Owner for any leaks in or repairs to any part of the Roof, in any way resulting from any other cause;
3) The recommendations, restrictions, limitations and conditions set forth on the reverse shall be deemed to form part of this guarantee;
4) We shall have no responsibility for any consequential damage, including but not limited to loss of or interruption in any business or damage to the building or contents therein;
5) The Owner shall deliver to each of us personally within the Guarantee Period, notice in writing immediately that repairs are required under this Guarantee; we shall have a reasonable time to have the repairs done, and we cannot be required to have any repairs done outside our regular working hours; until required repairs are done, the Owner shall protect the Roof, all buildings affected and all contents from loss or damage from leaks;
6) The liability with respect to any particular claim shall be limited to an amount not exceeding the value (as printed above) of the contract with the roofing contractor for the installation of the guaranteed roof;
7) The Owner cannot require repairs to be done when there are any accounts owing to the Roofing Contractor for installation of the Roof, but time shall still run under the Guarantee period;
8) The Owner cannot require repairs to be done to remedy any failure or the result of any failure in proper and prudent maintenance of the Roof;
9) Removal and reinstallation of materials (eg. soil/plants/drainage mediums) relating to planters or landscaped roof areas that restrict access to the roof membrane for the purpose of inspection and/or repair, is the responsibility of the Owner.

The Corporate Seal of
RCABC Guarantee Corp.
Was properly affixed in the presence of:

_____

10

The Corporate Seal of
Roofing Contractor
Was properly affixed in the presence of:

_____

Warning

Roofing membranes in use today may be made with chemical properties that are not compatible with other materials. Use of incorrect materials for patching and repair may cause irreversible damage to your roof. Some materials may have limited shelf life.

Consult a professional before working on this roof.
Call a member of the Roofing Contractors Association of British Columbia ("RCABC").

An ongoing preventative maintenance program will not only extend the life of the roofing system but will also detect minor problems before damage is widespread. The most effective program is simply a program of scheduled inspections and corrective action.

The ideal time to plan your roof maintenance program is when you receive your "RGC Roofing System Record" file at the completion of your roofing job.

Suggested Inspections & Maintenance

1. Regular walk-over inspections should be made at least twice a year, once in the spring, and once in the fall.
2. Spring inspections permit observation of possible winter damage and allow for maintenance to be scheduled and completed during the best possible weather.
3. Fall inspections can disclose requirements for preventative measures that should be taken in preparation for the oncoming winter.
4. Extra inspections should be made after major storms or after any construction activity that could affect the roofing system.
5. If you need help - Call a professional - Call a Member of RCABC

Further Restrictions, Limitations & Conditions

To maintain the validity of the RGC Guarantee the building owner must:

ENSURE that the roof and its components are properly maintained. Items such as caulking of flashings, maintenance of gum pans, clearance of drains and debris, wind scouring of gravel, etc., are considered maintenance items and are the building owner's responsibility. Not completing necessary roof maintenance will invalidate the balance of the guarantee period. Ask your RCABC professional roofing contractor for assistance.

UNDERSTAND that the guarantee is not negotiable or transferable without the written consent of the guarantor(s).

UNDERSTAND that if a claim under the guarantee proves not to be within coverage then the costs of inspection, investigation and subsequent repairs will be to the building owner's account.

UNDERSTAND that "reused" materials (typically reused metal flashings) are specifically excluded from coverage by the RGC guarantee.

ENSURE that any modifications or repair work done on the roof during the guarantee period is performed to RGC Guarantee Standards by an RCABC member and inspected by an RGC accepted independent inspection firm. RGC must be notified in writing of any modifications or repairs to the roof under guarantee.

UNDERSTAND that access to the roof must be granted to an RGC accepted independent inspection firm in order to carry out the mandatory two-year reinspection, 5 year and 8 year maintenance inspections.

UNDERSTAND that the guarantee may be voided if the building use changes to any other purpose than that for which it was originally designed.

UNDERSTAND that the guarantors do not assume liability for any leakage resulting from construction failures, distortions, settlement or faulty design; hail, lightning, earthquake, gale force winds, or any other acts of God; nor does this guarantee include liability for damage to the building or contents therein.

9734 – 201st Street Langley BC V1M 3E8 Tel (604) 882-9734 Fax (604) 882-1744

SHELTER INDUSTRIES INC.
3294 – 262nd. Street, Box 1318, Aldergrove, B.C., Canada V4W 2V1
Telephone: (604) 856-1311
Fax: (604) 856-5200

CERTIFICATE OF WARRANTY

Terms and Conditions - Purchase of New Structures

Owner: School District No. _____

Project: Supply _____ Modular Classrooms

School: _____ Classroom Serial No.: _____

Contractor: Shelter Industries Inc.

[redacted]

. . . /2

[redacted]

Date of Substantial Completion of School

Contractor:

SHELTER INDUSTRIES INC.

Harold A. Clifford
Chief Operating Officer