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9-28-1895

### Specification for Range of Glass Houses for Ogden Goelet by Lord & Burnham Company

Lord & Burnham

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(COPY)

New York, Sept. 28th, 1895.

-- SPECIFICATION --  
for

RANGE OF GLASS HOUSES  
for

-- OGDEN GOELET --

NEWPORT,

RHODE ISLAND.

P L A N :

To consist of a Palm House 30' x 68', divided by a glass partition into two compartments, one compartment being 30' x 36', the other 30' x 32'; one Vinery 20' x 62', divided by a glass partition into two compartments, one compartment adjoining the Palm House to be 20' x 25' 0", and the other being 20' x 37' 0"; one Rose House 20' x 45' 4"; one Stove House 12' x 33' 6"; one Leanto Nectarine House 10' x 42'; one Fig House 15' x 17', and a Peach House 15' x 25'; one Passage 20' x 16' 8". The present wall dividing the coal cellar and boiler rooms in the cellar of potting room to be removed so as to make one room. A new coal cellar 20' x 24' will be built as per dotted lines on plan. The arrangement of the plan to be substantially as shown by the accompanying plans.

IRON FRAME WORK:

All foundation walls except those around potting house to be capped with a heavy cast iron sill, set solid in cement mortar. These sills to be furnished in 8' 4" lengths as far as practicable. Each length to be securely fastened



together, and have all corners and intersections cast mitred. Wrought iron rafters bent to the shape of the various houses will start at the sills and continue to ridge which will run the entire length of each of the houses. All rafters to be placed 8' 4" apart as far as practicable, and be secured to the iron sills with special lugs bolted to sills and rafters. They will be secured to the iron ridge and to each other by a pair of strong cast iron brackets which will also serve as supports for the ventilating shaft.. Our patent Non-Freezable iron gutters will be placed around the sides of houses at spring line. They will be furnished in 8' 4" lengths and be secured to the iron rafters with a special cast iron bracket which will also serve to form the joints between the various lengths of gutters. They are also so constructed as to form a support for the sash bars of roof and for the ventilating sash along the sides of houses. They have almost their entire surface exposed to the inside temperature of the various houses, thereby readily freeing themselves from snow and ice. All gutters to have proper outlets to drain water from same. Runs of lateral iron purlins will be placed between each pair of rafters between the spring line and ridge. The number of purlins and distance between same to vary to meet the requirements of the different houses. All purlins will be constructed of angle iron, drilled to receive the screws by which the sash bars are held in position. All purlins to be thoroughly bolted to rafters with special fittings. These iron members enumerated above, will form a strong and durable frame work for the support of the other members of the house, and will in all cases have sufficient strength to sustain all weights and strains which they may be called upon to bear.



All wood used throughout to be clear Gulf cypress, unless otherwise specified. The iron rafters and ridges will be capped with wood. That on rafters to be  $1\frac{7}{8}$ " x  $1\frac{7}{8}$ "; that on ridges to be  $1\frac{7}{8}$ " by about 5". By thus covering this portion of the iron frame, all trouble from expansion and contraction of metal is avoided. The ridges to have a wooden cap to which the iron cresting of the houses will be secured. Five sash bars  $1\frac{5}{16}$ " x  $1\frac{7}{8}$ " will be placed between each pair of rafters, extending from flanges of iron gutters to vent purlins. They will be secured to these two members with our special sash bar clips, and be screwed to the intermediate purlins. All rafter caps and sash bars to be cut from the solid to fit the shapes of the various roofs, and be grooved on the sides to catch the condensation which forms on the glass, thereby preventing damage by its dripping on the plants and foliage.

#### GABLES & PARTITIONS:

To be constructed in a thorough and substantial manner with angle iron door posts, wooden sash bars, etc., necessary to complete same, and glazed as specified under "GLAZING". All gables to be furnished with a glazed hood supported by brackets placed over the door ways. The partition between the potting house and the various compartments to be formed by the brick walls of potting house.

#### S A S H :

Palm House to have a line of  $3' \times 8' 4" \times 1\frac{1}{2}"$  ventilating sash placed on either side of ridge. All other



houses to have a line of 30" x 1 1/2" x 8' 4" ventilating sash placed on either side of ridge. These sash at ridge to be formed into continuous lines of ventilation in each compartment by having a flat piece of iron secured to each sash at their junction. The Palm House to have a line of large sash placed around the sides extending from the top of iron sill to the under side of sash sill which will be placed about 2' 7" below spring line. There will be a line of 2' 4" ventilating sash placed along the sides of Palm House, extending from the top of sash sill to the under side of iron gutter. The Vinery, Fig, Peach, and Nectarine houses to have a line of 3' 4" x 1 1/2" x 8' 2" ventilating sash placed along the sides extending from top of iron sill to under side of iron gutter. The Rose, Stove and Passage Houses will have a line of 2' 4" x 8' 2" x 1 1/2" ventilating sash placed along the sides, extending from top of iron sill to under side of iron gutter to which they will be hinged. All sash to be of the design shown on elevation, and be made in a thorough and substantial manner; mortised and tenoned together, and all joints thoroughly white leaded.

#### D O O R S :

All openings in gables and partitions to be provided with doors, having glass panels in upper part and wooden panels in lower part; to be thoroughly mortised and tenoned together, and all joints thoroughly white leaded.

#### VENTILATION:

All sash at ridge of the various houses to serve as ventilators for the various compartments. The small sash around sides of Palm House; also the sash below spring line



in other houses to serve as ventilators, thus forming four lines of ventilation in the Palm, Rose and Stove Houses; also four lines in the Vinery, Peach and Fig Houses, while the Nectarine House and Passage will have three lines. All ventilating sash to be operated by our Improved Worm and Gear Ventilating Apparatus, adjustable and self-locking at any point, thereby holding the vents open at any desired angle.

#### STAGING:

Tables will be placed around the sides of the Palm House. Beds will be placed in the Rose and Stove Houses; also in the Passage. One of the beds in the passage way will be specially arranged for propagating purposes. The frames of all staging to be of iron; cross legs of angle iron will be placed every 5', one end of which will be supported by special fittings secured to the iron sills, the other end to be supported by pipe post legs. The tops of tables to be formed with  $3/4$ " slate with planed top surfaces and sawed edges in suitable lengths and widths. The bottoms of beds to be constructed with porous tile. The sides of beds to be constructed with  $5\ 3/4$ " x  $1\ 1/8$ " cypress boards, thoroughly secured to the iron frame work and properly braced. All staging to be made in a thorough and substantial manner, and be furnished with the necessary angle and tee irons, fittings, etc. to complete same.

#### WIRING:

The Vinery, Peach, Fig and Nectarine Houses to have a galvanized iron trellis placed in same constructed in the following manner:- Heavy galvanized iron wire will start at



the cast iron sills on one side of the house, and continue to the other side, following the shapes of roofs, and extending about 15" below the glass. There will be ten of these wires placed in every 8' 4". They will be securely fastened to the iron sills and be supported at each run of purlins with galvanized garden eyes secured to the iron purlins.

#### SLAT WALKS:

Slat walks constructed of Georgia pine will be placed in the Vinery, Peach, Fig and Nectarine Houses. Walks to be 3' wide.

#### HEATING:

To be accomplished with our usual hot water system. Sufficient 4" external diameter cast iron pipe will be placed in the various houses to maintain the following temperatures in coldest winter weather:- Palm House 60 to 65 degrees; Rose House 60 to 65 degrees; Vinery 60 to 65 degrees; Nectarine House 60 to 65 degrees; Stove House 65 to 70 degrees; Peach House 50 to 60 degrees; Fig House 60 to 70 degrees. A coil will be placed under the propagating bed in passage, having sufficient capacity to heat the bed to 80 degrees. All pipes to be furnished in 9' lengths as far as practicable, and put together with rust caulked joints. The heating system to be provided with the necessary fittings, valves for the control of heat in each compartment, expansion tanks, automatic air cocks, etc., necessary for a complete working apparatus. The system will be operated by three No. 5 Lord & Burnham Improved Hot Water Boilers. These boilers to be connected to chimney with a galvanized iron smoke pipe, and be provided with a set of fire tools. Valves to be placed in the



heating system, so arranged as to allow the boilers to be shut off.

#### PAINTING:

The entire frame work of iron and wood to receive three coats of paint. The first coat on iron to be Prince's Metallic, while that on wood will be a preparation of Oxide of Iron and Oil. These coats to be applied at the factory before the material is shipped. After the frame work is erected, and before the glass is set, the structure to receive one coat of pure white lead and linseed oil. After the glass is set, the entire structure to receive a finishing coat of pure white lead and linseed oil. Sash and doors to receive the same finish as rest of wood work. Ventilating machinery to receive two coats of paint. Heating pipes to receive one coat of black. The iron frames of all staging to have two coats of Prince's Metallic. The wooden sides of beds also to have two coats of Prince's Metallic.

#### GLAZING:

All glass used throughout the houses to be double thick French or American in 16" widths and suitable lengths. All glass to be clear, except that used in the glazing of the roof and side sashes of Palm House, and the roof glass of Propagating House, which will be ground glass. All glass to be bedded in our special green house putty, and each light secured with wedge shaped zinc nails. Where the glass laps iron gutters, a "Z" shaped zinc glazing strip will be placed, thus forming a tight and secure setting for glass at this point.



HARDWARE:

All doors to be provided with mortise locks and keys to pass, cast brass knobs and trimmings. Doors to be hung with cast steel hinges having loose pins. All ventilating sash to be hung with cast hinges, having brass pins.

PLUMBING:

Galvanized iron mains will be connected to the present supply having sufficient capacity to supply the following hose bibbs with a steady flow of water:- Each of the Palm Houses; also the Rose House to have two hose bibbs placed in each. Each of the other houses to have one hose bibb each. All hose bibbs to be brass with a 3/4" outlet. All pipes to be put together with leaded joints, and be supplied with the necessary fittings, etc., necessary to complete the plumbing work in a thorough and substantial manner.

LEADERS:

Galvanized iron leaders will be provided connecting outlets of iron gutters with uprights of drains.

MASONRY WORK:

See mason's specifications attached.

FINAL:

Our estimate calls for a completed structure in every respect, including the freight and cartage on all material and the fares and expenses of workmen while erecting



the structure. These specifications are of a general nature. All minor details entering into the construction to be carried out according to our usual detail in a thorough manner.

LORD & BURNHAM COMPANY.



(COPY)

New York, Sept. 28th, 1895.

-- MASONRY SPECIFICATION --  
for

RANGE OF GLASS HOUSES  
for

-- OGDEN GOULET --

NEWPORT ,

RHODE ISLAND.

The work to be laid out carefully according to the accompanying plans, and the following description. All measurements on plan must be accurately followed, as the iron work will be constructed according to these measurements, and cannot be altered to suit any errors in the masonry work. In no case must the drawings be scaled. If any measurements are lacking, or should any points in the plan not be understood, the Contractor to apply to Architect about same. The work to be carried out in strict accordance with the plans and specifications to the true and full intent of their meaning, notwithstanding every item in the work is not particularly mentioned. Should the contractor introduce any material other than that specified, or should any work prove unsatisfactory, the same to be removed and replaced at the Contractor's own expense. Contractor to furnish all scaffolding material, labor, etc., necessary to complete the masonry work.

GRADING:

All grading necessary for the inside of houses to establish the inside grades to be accomplished by placing the



earth in 6" courses. Each course to be thoroughly wet and tamped before the next course is placed on top of same. This work to be done in a thorough manner as the cement walks and heating piers will be built on top of same.

#### EXCAVATING:

Do all excavating necessary for foundation walls, trenches, cellar, borders for Vinery, Peach and Fig Houses. All excavations for borders to be 3' 6" deep. Excavations for foundation walls in all cases to extend to good hard firm bottom and below frost line. The cellar to be excavated to allow a depth of 7' 4 1/4" to the under side of iron beams. All garden soil will be removed from the entire site to be occupied by the building.

#### DISPOSING OF EARTH:

Remove all earth that may remain after the inside grades are established, from the site, and dispose of same.

#### FOUNDATIONS:

Build all foundation walls except those for Vinery with local stone laid on their natural beds, and set solid in cement mortar. Foundation walls in all cases to be 18" thick, and to extend to within 5" of natural grade. The walls enclosing coal room to be of stone. Foundation walls to extend 3' 6" below grade.

#### BRICK WORK:

Build all walls from top of foundations to the various heights shown on plan with good hard burned brick of A. W. K. Brand. All exterior walls except partitions to be



12" from the top of foundation walls to within three courses of the top. These three last courses to be 8". The brick walls in Vinery, Peach and Fig Houses to be carried on brick arches and piers. Piers to be 1' x 2' and be carried up about 2' 6". Spring segmental arches 12" thick from top of piers, the crown of arch to be 5" below grade. Bottom of piers to have proper foundations of stone underneath same. All brick work to be laid in best English Portland cement mortar, composed of one part cement, and three parts sand, with enough putty lime mortar added to easily work the cement. All mortar to be used only when freshly mixed. The joints between bricks not to exceed 5/16". All brick walls to be thoroughly bonded together, and have every other course a header course. The tops of all brick walls to have an 8" header course placed on top of same. This header course must be exactly 8" as our cast iron sills fit over same, and no chipping or cutting of header is allowed after same is set.

#### DRAINS:

Lay all drains indicated on plan with vitrified tile pipe. The drains to be connected with 3" uprights located inside of houses as indicated on plan. The Palm House to have three uprights on each side of same. The Vineries and Rose House to have four uprights; all other houses to have two uprights. The joints in all pipes to be laid with cement. The end of pipes will be thoroughly wet before the cement is placed in the joints. Collect all drains and carry and connect them to main drains. The floor in new coal room to be provided with a drain having a brass strainer over the opening. This drain to be connected to main system.



#### TRENCH:

Build a trench extending 16" below level of walks where necessary to allow the heating pipes to be taken past door ways. Walls of trench to be built of brick.

#### CHIMNEY:

A new chimney to be built located where shown on plan. Chimney to be built of brick from the bottom of cellar to a height of 16' above roof of potting house. Chimney to contain one flue 16" x 24"; one flue 16" x 16", and a flue for ventilation 4" x 16". Flues to extend from iron cleaning doors which will be placed about 4' below iron beams to the top of chimney. Place a 9" thimble in the 16" x 16" flue and a 12" thimble in the 16" x 24" flue. These thimbles to be located about 16" below iron beams. Place iron cleaning doors underneath thimbles. Chimney to have a proper foundation at least 2' thick, and extending 1' outside of chimney on all sides. Chimney to be capped with a blue stone chimney cap as per full size detail. Cap to have proper openings for flues in same.

#### CELLAR:

Build a new cellar 20' x 24' as indicated by dotted lines on plan. Bottom of this cellar to be on the same level as that of present cellar. The walls of cellar to be of stone as specified under "FOUNDATIONS". Floor to be of concrete, and to have a pitch so as to drain water to outlet of drain which will be placed in center of cellar.

#### IRON BEAMS & ARCHES:

Place 10" steel beams on top of foundation wall of



cellar. These beams to be placed 4' centers and have 4" brick arches turned between same. To have two runs of 5/8" tie rods placed between beams, connected to same in a thorough manner. Level off the floor covering tops of arches and beams with cinders. Cinders to have 3" of concrete placed over same. Concrete to be covered with 1/2" Portland cement. This floor to be made absolutely water tight.

#### COAL CHUTE:

Remove the present coal chute and use all available material in same in building a new one, located that coal can be put in new cellar.

#### TEARING AWAY:

Remove the present partition separating the coal and boiler rooms; also cut an opening in the foundation walls 3' wide to allow entrance from present cellar into new. Place two 6" steel beams over the opening properly spaced to carry the brick wall of potting house above. Wall up the two windows on the south side of the potting house. Tear down the present chimney after the new one is built. Remove the two flags now at the entrances on the south and east sides of potting house and place them, one of the outside entrance of Palm House, the other on the outside entrance of Rose House.

#### P I E R S :

Build 15 piers 8" x 2' x 4' for the support of heating pipes in Vineries. Build about 70 piers 8" x 2' x 2' for the support of other heating pipes. These piers to be built under the direction of the mechanics who put in the



heating apparatus. Build a pier 12" x 12" for the support of iron girder in present cellar. All piers to have suitable foundations of stone or concrete underneath same.

#### SETTING BOILERS:

Build brick bases for three boilers, size of each base about 4' x 6' x 8" high. Provide a bottom of concrete for bases having a pitch towards front of boilers. This to be done under the direction of the mechanics who put in the heating apparatus.

#### O. F. P.:

Leave openings in walls where marked O. F. P. on plan to allow the heating pipes to pass through. Brick in around openings after pipes are in position.

#### CEMENT WALKS:

Build all walks where tinted brown on plan in the following manner:-

Prepare a bed of concrete about 3 1/2" thick, composed of one part English Portland cement, two parts sand, and four parts broken stone or gravel. Over this lay a stiff mortar, composed of equal parts of best English Portland cement and clean, sharp sand to a depth of 1/2", making the entire depth when finished about 4". Care must be taken that the bottom concrete is not set before the top mortar is placed on top of same. Lay up in squares alternately of about 4' each, each square being completed including the top mortar before the next is commenced. Carry walks up in center about 1" to turn away surface water. Tint walks to a dark slate color; "A" 3 1/2" of concrete, "B" 1/2" of cement mortar,



"C" to be laid first, and "D" to be filled in after "C" is laid. All walks to be mitred at angles, and all corners curved as per radius shown on plan.

#### BLUE STONE:

Provide rubbed and chamfered blue stone sills for all outside door ways, as per full size detail to be furnished later. Provide one blue stone platform for outside entrance of Vinery. This platform to be 6" thick. Provide one chimney cap as per full size detail.

#### COPING:

The center bed in Palm House to have a 4" rubbed blue stone coping placed around same. Coping to be as per full size detail. Stones to have proper foundations. Stones to be furnished in lengths as indicated on plan.

#### SETTING SILLS:

Prepare and place in position a bed of cement on top of all walls in which to bed iron sills. This to be done under the direction of the mechanics who erect the superstructure.

#### CEMENT WASH:

All exposed brick work on the inside of houses to have three coats of cement wash at completion.

#### WHITEWASH:

Tint walls of old and new cellar with two coats of lime whitewash.



#### PRISMATIC GLASS:

Place one light of prismatic glass, so arranged as to light new cellar.

#### PROTECTING WALLS:

Mason to protect the walls after the same are built until such time as the superstructure is ready to be built on same, from rain and frost.

#### F I N A L :

To complete the potting house floor after the old chimney is removed and make all changes in the floor necessary to accommodate the new chimney. Make good all defects in the masonry work after the other mechanics are through, and leave everything in a first class condition.

LORD & BURNHAM COMPANY.



(COPY)

-:- AMENDMENTS MADE OCT. 5TH, 1895-:-

All bench cappings to match those in the present houses.

All bench frames finished green.

All glass to be double thick French; that in the passage house roof to be clear.

All hose bibbs to be nickel plated.

All foundation walls to be not less than 3' 6" deep below outside finished grade.

Cellar walls to be 2' thick.

Fig, Peach and Nectarine Houses to have solid foundations, (no arches).

Present boilers to be connected with new chimney.

Cresting to be made the same as that on the present houses.

We agree to finish and complete all the work in connection with this range by the 15th day of January, 1896, to the satisfaction of the Owner or his Agent.



Specification  
of  
Contract  
for  
Lord & Burman

to the attention of the Office of the Secretary



LORD & BURNHAM COMPANY,  
160 FIFTH AVENUE,  
NEW YORK CITY.

Gentlemen:—

I hereby accept your

proposition to erect the range of Green houses consisting of a Palm house, 30' x 68'; one Vinery, 20' x 62'; one Rose house, 20' x 45'4"; one Stove house 12' x 31'6"; one Nectarine house, 10' x 43'; one Fig house, 15' x 17'; one Peach house, 15' x 25'; one Passage house 20' x 16'8".

according to plans, specifications and estimate

dated, September 28, 1895..

Together with amendments dated October 5/1895.

The range to be completed and left in perfect order by January 15, 1895.

The same to be maintained <sup>as regards any imperfect work done by the Contractors</sup> in thorough repair for a period of six

(6) months from that date, hail storm and fire excepted, for the Sum of Sixteen thousand, Eight hundred and Thirteen (\$16,813.00) dollars.

Payments to be made as follows:— \$3,000. when the foundations are erected; \$5,000. when the material for the superstructure is on the ground; \$4,000. when the iron frame is erected, and the balance of \$4,813. when all is finished and completed.

~~Yours respectfully,~~

Witness  
John Gale

Oct 8th 95 Witness  
Hauca Bran

Ogden G. G. G.  
Lord & Burnham Co  
By W. A. Burnham President