December 18, 2017

The Town Council meeting was held in the Moose Hill Council Chambers, Town Hall, 268B Mammoth Road, Londonderry, NH.

Present: Chairman Tom Dolan; Vice-Chairman Farrell; Councilor Ted Combes; Town Manager Kevin Smith; Assistant Town Manager Lisa Drabik; Executive Assistant Kirby Brown; Absent; Councilors Jim Butler and Joe Green

CALL TO ORDER

Chairman Dolan called the Town Council special meeting to order. Chairman Dolan led the Pledge of Allegiance. This was followed by a moment of silence for those who were affected by the Amtrak derailment in Washington and all of those who serve us both here and abroad.

PUBLIC COMMENT

Chairman Dolan stated that there are only three Councilors present. One Councilor is feeling under the weather so the meeting will be played by ear. The meeting has to end if there are only two Councilors.

Chairman Dolan stated that the walkway in the back of the building is completed and the Council is pleased with the outcome. It is now compliant and safe for residents.

Vice Chairman Farrell gave an update on the meeting that had taken place with the School Board prior to the start of this meeting. The revenue shortfall was discussed. There is a little over $600,000.00 in shortfall. It is up to the School Board and Town Council to fill in the revenue hole. Vice Chairman Farrell mentioned that he and Councilor Combes met with Dan Lekas and Jen Ganem with the School Board.

Chairman Dolan invited up Ann Chiampa with the Londonderry Historical Society t give a presentation on the dendrochronology study that was recently done. See attached report.

Fire Chief Darren O'Brien and Steve Cotton presented the proposal for the new Central Fire Station.

Chairman Dolan moved around the meeting. Chairman Dolan introduced the remainder of the interviews for Boards/Committees. The Council conducted interviews for the Planning Board, Conservation Commission and SNHPC. The Council voted to appoint Suzanne Brunelle, Leitha Reilly and Martin Srugis to the Southern New Hampshire Planning Commission. Vice Chairman Farrell motioned and second by Counci lCombes. Chair votes 3-0-0. The Council motioned for Bill Mee to appointed to the Londonderry Housing and Redevelopment Authority. Motion made by Councilor Combes and second by Vice-Chairman Farrell. Chair votes 3-0-0. Vice-Chairman Farrell motioned to re-appoint Mary Wing Soares and Art Rugg

to the Planning Board. Second by Ted Combes. Chair votes 3-0-0. Vice-Chairman Farrell motioned to approve Marge Badois, Deb Lievens and Mike Noone to the Conservation Commission. Councilor Combes motioned for Richard Floyd to fill the alternate position on the Conservation Commission. Chair votes 3-0-0.

The Council moved to New Business.

PUBLIC HEARING

The Town Council held a Bond Hearing.

OLD BUSINESS

NEW BUSINESS

Chairman Dolan introduced Order #2017-29, an Order relative to the withdrawal of funds from the Cable Equipment Capital Reserve presented by Finance Director Doug Smith. Motion to approve Order #2017-29 made by Vice Chairman Farrell and second by Councilor Combes. Chair votes 3-0-0.

Chairman Dolan introduced Order #2017-30, an Order relative to the distribution of Fire Equipment Capital Reserve Funds presented by Fire Chief Darren O'Brien. Motion to approve Order #2017-30 made by Councilor Comes and second by Vice Chairman Farrell. Chair votes 3-0-0.

Councilor Combes left the meeting.

PUBLIC COMMENT CONT.

Southern New Hampshire Planning Commission gave a presentation on age-friendly community program and asked if the Town of Londonderry would like to be a pilot town.

BOARD/COMMITTEE APPOINTMENT/RE-APPOINTMENT

Under Public Comment.

APPROVAL OF MINUTES

Approval of Town Council minutes could not take place due to only two Town Council members being present. They will be approved at the January 8th Town Council meeting.

ADJOURNMENT

Motion to adjourn made by Vice Chairman Farrell and second by Councilor Combes. Chair votes 3-0-0.

Notes and Tapes by:	Your name	Date: 12/18/2017
Minutes Typed by:	Kirby Brown	Date: 12/26/2017
Approved by:	Town Council	Date: 01/08/2018

A Dendrochronology Study of Select Timbers from the Holmes House, Londonderry, New Hampshire

William A. Flynt
Architectural Conservator
Historic Deerfield, Inc.
Deerfield, MA

December, 2017

A Dendrochronology Study of Select Framing Timbers from the Holmes House, Londonderry, New Hampshire

Introduction

On October 17th, 2017, a selection of timbers from the Holmes house, located at 24 Griffin Road, Londonderry, NH were sampled by William Flynt for the purposes of conducting a dendrochronology study. The samples were prepped and analyzed at Historic Deerfield by William Flynt, Architectural Conservator.

Background

Dendrochronology, or the study of tree ring growth patterns to date the age of archeological timbers, was initially developed in the 1920's by Andrew E. Douglass using long-lived Ponderosa pines in the Southwest United States. An astronomer by training, Douglass was interested in historical sun spot activity and its relationship to earth's climate. He surmised that by looking at yearly growth ring sequences in long-lived trees growing in an arid environment where moisture is key, he might be able to ascertain yearly variations in climate attributable to sunspot activity. (Baillie, 1982). To push the tree ring database back past the age of living trees, samples were taken from roof poles in Pueblo ruins which turned out to eventually overlap the living tree data. Besides fulfilling his research needs, this work revealed the feasibility of dating archeological structures.

In the 1980's the advent of computer programs to collate data, run comparative analyses, and compile master chronologies enabled unknown samples to be compared to known masters with a high degree of accuracy. Pioneering work in Eastern Massachusetts focusing on Oak (Krusic and Cook 2001, Miles, Worthington and Grady 2002, 2003, 2005) and in the Connecticut River valley initially concentrating on Pitch pine (Krusic 2001,Flynt 2004) and expanding into oak, chestnut, hemlock, and white pine, has revealed the suitability of using dendrochronology as a mainstream research tool for analyzing and establishing construction timber felling dates in the Northeast, a region heretofore considered too variable climatically to provide reliable results.

It should be remembered that trees were usually felled in the winter months with frame preparation occurring shortly thereafter, so the earliest a frame could be raised would be in the year following the felling date delineated in a dendrochronology study such as this.

Procedures

In procuring samples suitable for dendrochronology research, the analyst must be on the lookout for timbers, framing, and boards that exhibit several parameters. First, a bark, or waney, edge must be present if one wishes to establish with certainty the last year of growth. Second, there needs to be a sufficient number of rings in a sample to span several distinctive climactic variations that register as patterns of wide and narrow rings. Ideally, having 100 or more years of growth is best, but more often than not, samples will range from 50 to 100+ years. While it is feasible to get dates on young samples(50-60 rings), spurious results are possible and thus must be reviewed carefully both with longer-lived samples from the same structure as well as with what documentary and stylistic research uncovers. Third, enough samples need to be obtained (10-15 per building episode is usually reasonable) to allow for comparison and the fact that often some will not align for

one reason or another. It is also critical that an assessment be made of the building frame to ascertain that the members from which samples are extracted were not reused or inserted at a later date, or, if so, are duly noted. Fourth, all samples must be labeled and entered into a log book that notes the position of each sampled timber within the structure, its species, whether or not it has wane, and any other information pertinent to the sample. In labeling the samples the following code was employed; LH (Londonderry, Holmes) with the numbers that follow simply referring to the sequence in which the samples were taken.

Samples were extracted using a custom coring bit, chucked into an 18 volt ½" Bosch battery-powered drill that creates a 9/16" hole out of which is obtained a 3/8" core. Core samples were glued into custom wood mounts and sanded using successively finer grit paper (150-600 grit) both on a bench top belt sander and by hand sanding to create a mirror-smooth finish. All samples were then viewed under a Unitron ZST 7.5-45X binocular microscope fitted with cross hairs in one eyepiece to ascertain and mark the number of rings per sample. This was followed with a careful visual review, again under magnification, in an attempt to determine if site-specific growth patterns could be ascertained in order to cross date the samples. Each sample was then placed under the microscope on a Velmex Acu-Rite Encoder sliding stage calibrated to read to the nearest micron (.001mm). Measuring begins at the outer, or last year of growth ring (LYOG), established as 1000, and proceeds to the center of the sample or first year of growth, as measured (FYOG). At the junction of each growth ring, the analyst registers the interface electronically which sends the measurement to the computer via a Quick-Chek Digital Readout. In all of the work in this study, the measuring program PJK16 was used to compile each sample's raw data files. The program transforms the ring widths into a series of indices that relate each ring's growth to its neighbors, thus standardizing the climate-related influences on a year-to-year basis (Krusic 2001). Thus trees from a similar location but growing at different rates should exhibit similar indices. With the raw data in hand, using the program COFECHA (Holmes, 1983) the samples from this site can be compared with each other to determine if all were cut at the same time or within the span of several years or more. The samples are also compared against one or more dated regional master chronologies or site masters of the same species to determine the exact year or years when the samples in question were felled. As strong samples are uncovered, these are added to a fledgling site master and the raw data is again run against this site master to see if additional samples align.

With COFECHA samples are broken down into ring groups of 50 years that are then compared to various dated masters. The 50-year ring groups in an individual sample are lagged a certain number of years (in this study lags of 5 and 10 years were used) to provide an overlap of data within the groupings. The results are displayed in a series of ways with Part 8 "Date Adjustment for Best Fit Matches for Counted Unknown Series" composed of columns with the "best fit" being in column #1, the next "best fit" in column #2 and so on out 11 columns. The "add" number is the number to be added to the last year of growth (1000) to provide the year date of felling, while the "corr" number relates to how well the "add" meshes with the master. A correlation coefficient of .3281 is considered the threshold of significance. High correlation values (preferably over .40) accompanying consistent "add" numbers in the first column usually reveal reliable results. In the example below, consistent "add" numbers with strong correlations

appearing in the first column for samples DLBH-07 and 08 reveal each samples true date of felling (1784 and 1782 respectively). Sample DLBH-09 does not show consistently strong correlation with any particular date. Note that the lag used in this example is 10 years.

SERIES	COUNTED SEGMENT	CORR ADD # 1	CORR ADD # 2	CORR ADD # 3	CORR ADD # 4	CORR ADD # 5	CORR ADD # 6	CORR ADD # 7	CORR ADD # 8	CORR ADD # 9	CORR ADD #10
DLBH-07	937- 986	784 .51	712 .47	729 .37	713 .37	847 .33	846 .31	728 .30	813 .29	800 .29	763 .28
DLBH-07	947- 996	784 .54	712 .45	760 .33	816 .31	729 .31	800 .29	713 .29	671 .29	847 .26	808 .25
DLBH-07	951-1000	784 .41	760 .35	712 .35	661 .31	787 .30	800 .29	774 .29	729 .27	808 .26	832 .25
DLBH-08	929- 978	782 .44	746 .42	793 .33	760 .32	705 .32	840 .31	858 .30	689 .30	824 .28	685 .26
DLBH-08	939- 988	782 .61	746 .37	689 .34	840 .30	725 .29	708 .27	723 .27	806 .27	684 .25	724 .25
DLBH-08	949- 998	782 .69	669 .47	840 .41	722 .32	806 .28	708 .27	700 .26	683 .25	723 .25	720 .24
DLBH-08	951-1000	782 .69	669 .38	840 .38	722 .34	757 .29	700 .28	730 .25	659 .24	838 .23	723 .23
DLBH-09	932- 981	713 .52	785 .35	848 .35	744 .35	729 .32	863 .31	846 .28	849 .26	693 .26	714 .25
DLBH-09	942- 991	846 .38	713 .36	785 .33	848 .33	729 .29	727 .29	790 .29	693 .28	761 .28	705 .27
DLBH-09	951-1000	799 .43	783 .39	731 .30	689 .30	808 .29	767 .27	756 .26	790 .25	814 .24	846 .24

Once samples from a site are firmly dated and grouped into a site master, Part 2 "Correlations with Master Series of all Segments as Dated and Measured" and Part 3 "Segments Correlating Low, or Higher, at other than Dated Position" of COFECHA can be viewed to see how well each sample correlates with the others in the group and where weak areas within the ring counts are located for further scrutiny.

Results (See Figure 1)

Discussion

Oak

Five of the 16 samples, four rafters and one corner post, were fabricated out of oak. While not long lived, they had sufficient ring counts to make analysis feasible. An attempt to align the samples amongst themselves to determine whether they were all felled in the same year or over several years met with success. Chart 1 reveals samples LH-12, 14, and 16 were all felled the same year while LH-11 and 13 reflect a last year 3 and 4 years earlier. This is not surprising as both LH-11 and 13 had damage at their waney edge resulting in the loss of several of their outermost rings. Thus, it is highly likely that these two samples came down at the same time as the other three. With this information in hand comparisons with dated oak masters ensued. While there are no dated oak masters in the general vicinity of Londonderry, a number of masters do exist for eastern and central Massachusetts. Comparing the Holmes house oak samples to two large eastern Massachusetts masters known as Boston 01 (1530-1785) and Boston 02 (1454-1769) somewhat surprisingly revealed no convincing or realistic dates with strong correlation coefficients from sample to sample or within any one sample(Chart 2). Comparing the five samples to a Northern Worcester County oak master (1577-1848) in central Massachusetts (Chart 3) revealed strong alignment for LH-12,14,and 16 to 1822 while LH-13 aligns with 1818, four years earlier than the others, in agreement with the results noted on Chart 1. In addition there is a suggestion that LH-11 could date to 1819, three years earlier than LH-12,14, and 16, again in line with what is depicted on Chart 1. Moving a bit further west, the Holmes house oak samples were run against a Connecticut River Valley (MA) oak master (1577-1857). On Chart 4, LH-12,14, and 16 again show strong alignment with 1822, LH-13 aligns well with 1818 and LH-11 shows a bit more strength for possibly dating to 1819. With such strong results being repeated , the five

Holmes house oak samples were assigned these early 19th century dates to create a Holmes house oak site master (Chart 5).

Pine

The remaining11 samples were all pitch pine, a species for which there is extensive data collected in the Connecticut River Valley but only limited data to the east. As with the oak, the first series of tests were aimed at establishing the felling relationship between all the samples. Somewhat surprisingly, this met with minimal success with only a few samples exhibiting some affinity with the others, though not to the extent where correlations could be established with certainty. Only samples LH-05 and 06, two ceiling joists in the north parlor, appear to align as being felled the same year. Moving to comparisons with dated masters, the samples were compared to a large Connecticut River Valley of Massachusetts pitch pine master (Chart 6) where some results are of interest. LH-03 strongly aligns with 1822 while LH-02 shows an affinity for the same date in the first half of its life. LH-06 however, shows good correlation with a date of 1752 for most of its growth. When the samples are compared to a more localized Montague, MA pitch pine master that includes both historical data as well as living tree data (Chart 7) LH-03 once again aligns well with 1822, and LH-01 shows more strength to perhaps align with 1822. Unfortunately tests of the Holmes house pitch pine samples with other small pitch pine site masters in eastern Massachusetts and southeastern New Hampshire did not provide any meaningful results.

Discussion

In spite of the fact that a majority of the samples appeared suitable for analysis, it was disappointing that the pine samples could not be aligned amongst themselves to allow for better interpretation of the results when the samples were compared to dated masters. Additionally, the pine's lack of aligning significantly with any of the dated masters further hampered the analysis. In spite of these shortcomings, the few oak samples did align both amongst themselves and convincingly with several dated masters which revealed their having come down during the winter of 1822/23. While the rafters have been reworked to increase the pitch of the roof and thereby might cause one to wonder if they might be from some other structure, sample LH-16 was extracted from one of the original corner posts which helps to lock in this date with the rafters and thus the entire frame.

While the pine turned out not to be very useful for this study, LH-03 did show strong correlation with 1822 when compared to several Connecticut River Valley pitch pine masters which is significant in that it agrees with the oak data. Were it not for the affinity for the same date as what the oak is showing, these alignments would not hold much weight as it was also noted that LH-06 aligned for a good portion of its life with a date of 1752. This is one of the drawbacks when the samples do not align well amongst themselves to help validate the results revealed when compared to dated masters. Unfortunately as LH-03 is the only sample, and a fairly short-lived one at that, to align with this specific date (though LH-01 and 02 do show weak correlations with 1822 in parts of their growth sequences for this same date when compared to various Connecticut River Valley pitch pine masters), a Londonderry site master for the species cannot be established.

Reviewing the observations of James Garvin with this new information in hand would suggest that rather than being alterations, the few early 19th century features Garvin notes (knee walls, granite splitting methods) appear to relate to the initial period of construction. While the house is slated for demolition, and it may already be gone, a search of documentation relating to this parcel and the owners in the period between 1820 and 1825 should reveal more details surrounding the house construction. The felling dates of the oak during the winter of 1822/23 would indicate that the frame was erected no earlier than the spring of 1823.

Acknowledgments

The author would like to thank David Colglazier for his interest in exploring the possibility of having a dendrochronological study of the Holmes house undertaken and especially to Ann Chiampa who spent the morning at the house on sampling day with crow bar and hammer in hand tearing through a built in book case and post casings to expose the southeast corner post which provided a critical sample (LH-16) to this study. As well, the author thanks Bruce Hoadley for his help in confirming the pine samples as being one of the southern yellow pines, most likely pitch pine, and James Garvin for the use of his framing plans to illustrate the sampling locations in this report.

Sources:

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Miles, D.W.H, Worthington,M.J., together with Cook, E. and Krusic, P. 2006. *The Tree-Ring Dating of Historic Buildings from Eastern Long Island, New York.* Oxford Dendrochronology Laboratory, South Oxfordshire.

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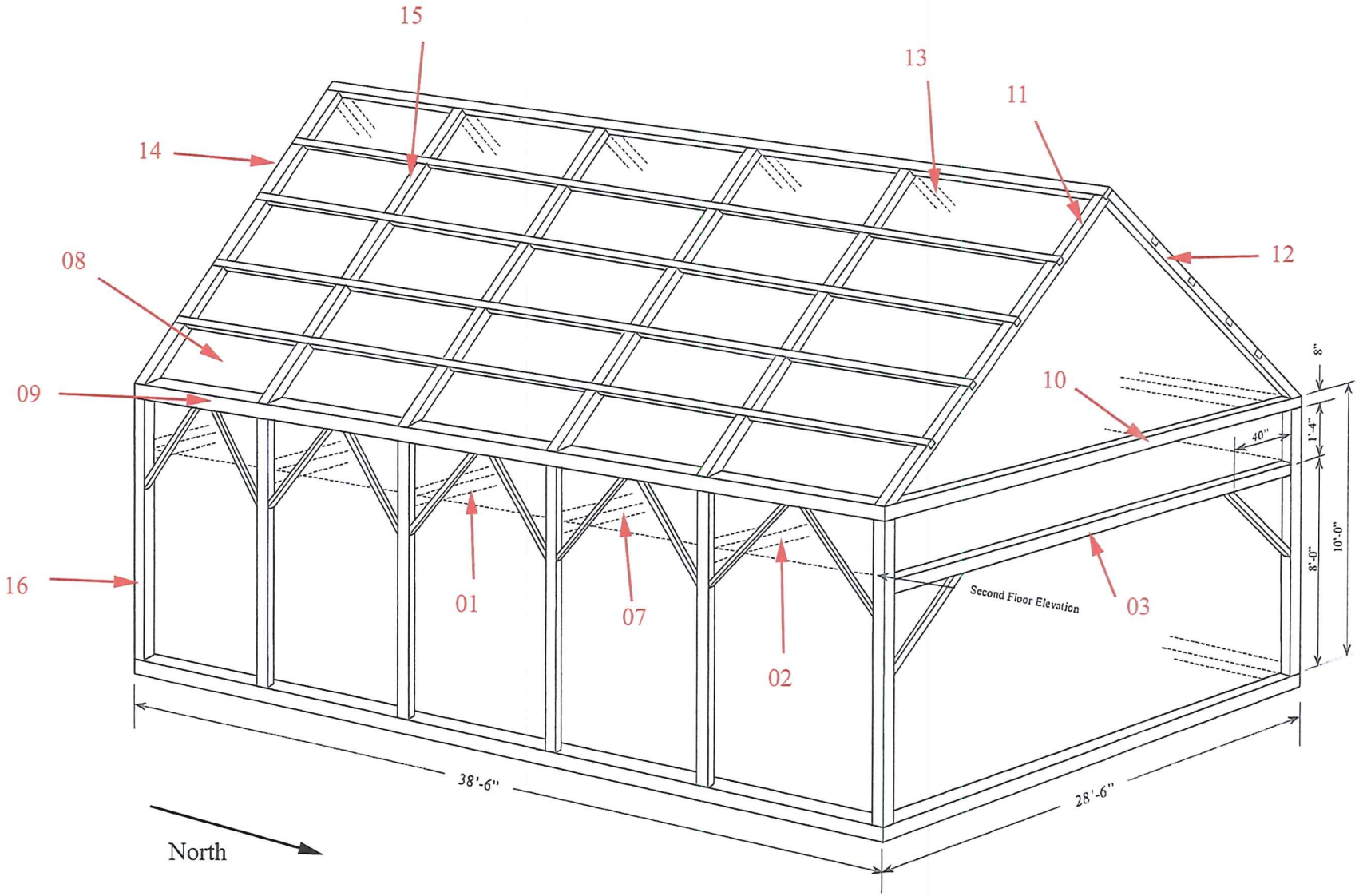
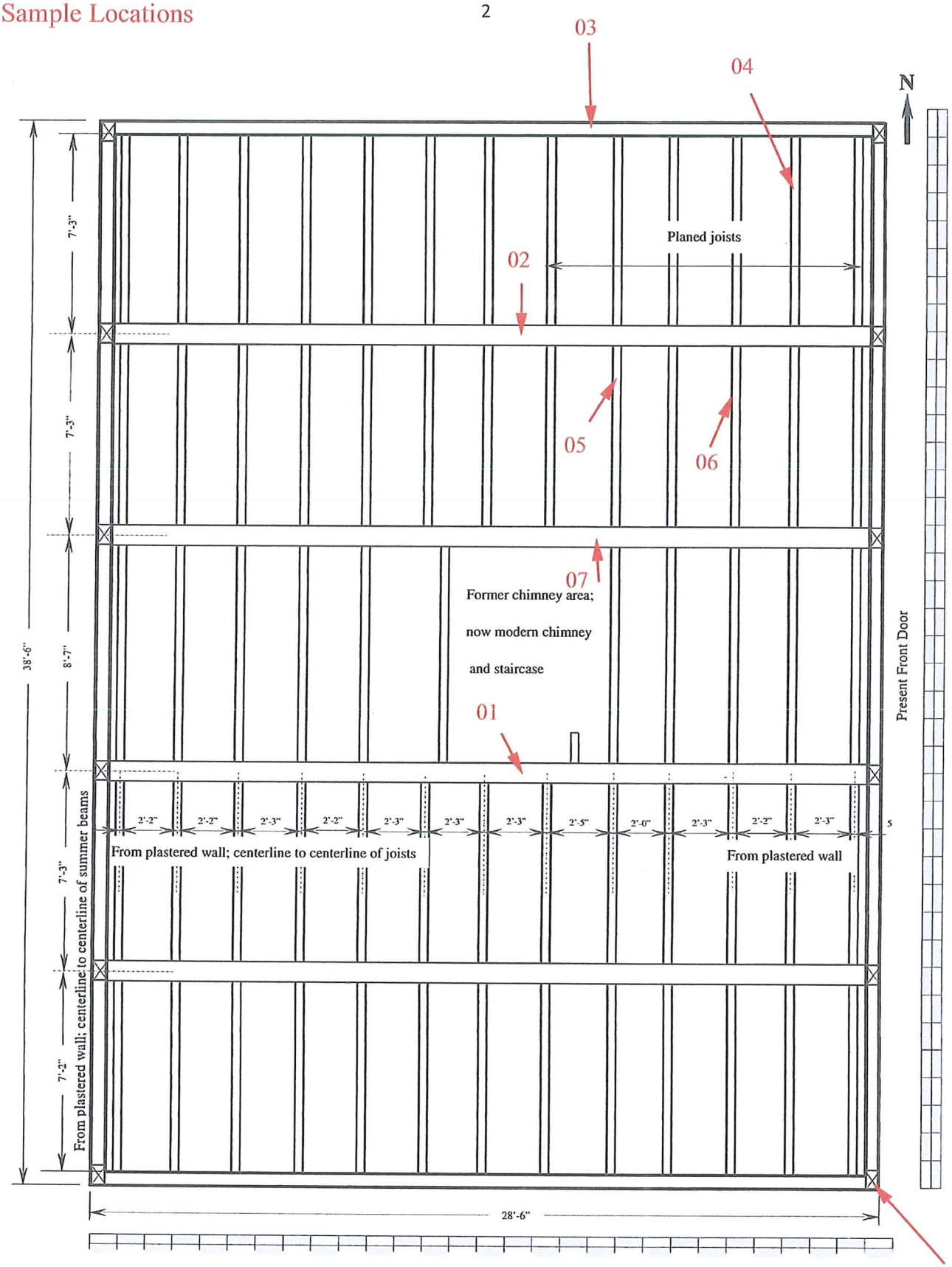
Sample locations



HOLMES HOUSE FRAME—AXONOMETRIC VIEW

Not to Scale

Drawing courtesy of James Garvin



FRAMING PLAN OF THE SECOND STORY OF THE HOLMES HOUSE

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Drawing courtesy of James Garvin

FIGURE 1

HOLMES HOUSE, LONDONDERRY, NH

SAMPLE	AGE	FYOG	LYOG	DATE	WANE	SPECIES	LOCATION
LH-01	66	935	1000	1822(wk)	Y	PIRI	3RD TIE BEAM FROM S.END,1ST FL.CEILING
LH-02	93	908	1000	1822(wk)	Y	PIRI	2ND TIE BEAM FROM N.END,1ST FL.CEILING
LH-03	64	937	1000	1822	Y	PIRI	NORTH END TIE BEAM,1ST FL.CEILING
LH-04	147	854	1000	ND	Y	PIRI	N.PARLOR,2ND CEILING JOIST FR.S.WALL,BAY 1
LH-05	106	895	1000	ND	Y	PIRI	N.PARLOR,5TH CEILING JOIST FR.S.WALL,BAY 2
LH-06	108	893	1000	ND	Y	PIRI	N.PARLOR,3RD CEILING JOIST FR.S.WALL,BAY 2
LH-07	80	921	1000	ND	Y	PIRI	3RD TIE BEAM FR.N.END,1ST FL.CEILING
LH-08	89	912	1000	ND	Y	PIRI	SOUTH END TIE BEAM AT PLATE LEVEL
LH-09	49	952	1000	ND	Y	PIRI	WEST PLATE
LH-10	48	953	1000	ND	Y	PIRI	NORTH END TIE BEAM AT PLATE LEVEL
LH-11	60	941	1000	1819	Y*	QUSP	NORTHEAST END RAFTER
LH-12	64	937	1000	1822	Y	QUSP	NORTHWEST END RAFTER
LH-13	54	947	1000	1818	Y*	QUSP	W.SLOPE,2ND RAFTER FROM N.END
LH-14	67	934	1000	1822	Y	QUSP	SOUTHEAST RAFTER
LH-15	65	936	1000	ND	Y	PIRI	E.SIDE,2ND RAFTER FROM S.END
LH-16	76	925	1000	1822	Y	QUSP	SOUTHEAST CORNER POST

FYOG - FIRST YEAR OF GEROWTH-AS MEASURED
LYOG - LAST YEAR OF GROWTH
PIRI - PITCH PINE
QUSP - OAK
(wk) - WEAK
* - OUTERMOST FEW RINGS LOST DURING CORING DUE TO BUG DAMAGE.TIMBERS LIKELY FELLED IN 1822.

CHART 1

PART 2: CORRELATIONS WITH MASTER SERIES OF ALL SEGMENTS AS DATED AND MEASURED Tucson-Mendoza-Hamburg-Lamont ProgLib

32-YEAR CUBIC SPLINE FILTER; CORRELATIONS OF 50-YEAR SEGMENTS LAGGED 5 YEARS

FLAGS: __A = CORRELATION UNDER 0.3281; __B = CORRELATION HIGHER AT OTHER POSITION

ØSEQ	SERIES	INTERVAL	920 969	925 974	930 979	935 984	940 989	945 994	950 999	955 1004	960 1009	965 1014	970 1019	975 1024	980 1029	985 1034	990 1039	995 1044	1000 1049	1005 1054	1010 1059	1015 1064	FLAGS/ TOTAL
1	LH-11	938- 997	=	=	=	.63	.56	.60	.52	=	=	=	=	=	=	=	=	=					
+																							0/ 4
2	LH-12	937-1000	=	=	=	.50	.50	.61	.65	.61	=	=	=	=	=	=	=	=					
+																							0/ 5
3	LH-13	943- 996	=	=	=	=	.63	.65	.63	=	=	=	=	=	=	=	=	=					
+																							0/ 3
4	LH-14	934-1000	=	=	.50	.55	.54	.61	.65	.65	=	=	=	=	=	=	=	=					
+					___B	___B																	2/ 6
5	LH-16	934-1000	=	=	.57	.63	.58	.61	.52	.46	=	=	=	=	=	=	=	=					
+																							0/ 6

PART 8: DATE ADJUSTMENT FOR BEST MATCHES FOR COUNTED OR UNKNOWN SERIES Tucson-Mendoza-Hamburg-Lamont ProgLib

LH OAK VS LH OAK ALIGNED
50-YEAR SEGMENTS LAGGED 5 YEARS

SERIES	COUNTED SEGMENT	CORR ADD # 1	CORR ADD # 2	CORR ADD # 3	CORR ADD # 4	CORR ADD # 5	CORR ADD # 6	CORR ADD # 7	CORR ADD # 8	CORR ADD # 9	CORR ADD #10	CORR ADD #11
LH-11	941- 990	-3 .79	-9 .29	5 .19	6 .12	8 .11	3 .11	-6 .11	-11 .10	0 .07	-12 .05	-15 .03
LH-11	946- 995	-3 .77	-18 .17	-9 .16	-6 .15	3 .14	-19 .13	-11 .09	-2 .08	-20 .08	-1 .07	-15 .05
LH-11	951-1000	-3 .73	-19 .24	-2 .17	0 .14	-18 .11	-22 .10	-24 .10	-25 .07	-16 .05	-8 .04	-20 .04
LH-12	937- 986	0 .65	3 .23	8 .18	-3 .17	-4 .17	14 .08	9 .06	-1 .05	-11 .03	6 .03	13 .00
LH-12	942- 991	0 .65	-17 .27	3 .26	9 .15	-14 .11	-8 .09	-11 .09	8 .09	-13 .08	-3 .08	6 .04
LH-12	947- 996	0 .74	-20 .36	-17 .24	3 .18	-8 .15	-11 .08	-16 .07	-3 .07	-13 .06	-18 .05	-1 .00
LH-12	951-1000	0 .76	-20 .33	-17 .26	-16 .16	-25 .11	-8 .10	-18 .09	-9 .06	-4 .04	-13 .04	-2 .02
LH-13	947- 996	-4 .76	-18 .28	2 .17	4 .10	-15 .09	-10 .09	-12 .09	-21 .08	-7 .07	-20 .03	-16 .02
LH-13	951-1000	-4 .76	-18 .22	-15 .15	-10 .09	-17 .09	-7 .06	-12 .05	-21 .05	-20 .05	-5 .01	-13-.01
LH-14	934- 983	0 .81	-9 .48	17 .29	8 .19	-6 .13	14 .12	3 .12	1 .10	-8 .05	-3 .04	16 .04
LH-14	939- 988	0 .78	-9 .33	-3 .26	8 .15	-6 .15	3 .09	-12 .07	1 .04	-2 .02	9 .01	-11 .00
LH-14	944- 993	0 .78	-9 .17	-6 .16	-8 .16	-17 .13	-3 .13	-14 .11	3 .08	-11 .03	1 .03	-2-.01
LH-14	949- 998	0 .82	-6 .24	-9 .22	-23 .21	-17 .16	-20 .16	-8 .16	-3 .12	-14 .07	-2 .01	-1 .01
LH-14	951-1000	0 .82	-17 .29	-23 .22	-9 .22	-6 .21	-20 .20	-8 .16	-26 .16	-3 .15	-14 .10	-2 .02
LH-16	925- 974	0 .87	9 .34	12 .14	6 .13	17 .13	26 .11	23 .09	21 .08	20 .08	3 .05	7 .01
LH-16	930- 979	0 .82	9 .19	6 .19	12 .13	20 .12	17 .10	-2 .08	-3 .04	21 .02	15 .01	2 .00
LH-16	935- 984	0 .77	-9 .13	-2 .10	9 .09	6 .08	3 .06	16 .04	2 .04	15 .04	-8 .03	-7 .03
LH-16	940- 989	0 .73	-15 .17	9 .17	-8 .13	-14 .13	-12 .11	-9 .09	-3 .07	2 .05	11 .05	-7 .05
LH-16	945- 994	0 .75	-8 .22	-17 .16	-14 .15	-15 .15	2 .08	-2 .05	-3 .02	-12 .01	-5 .01	-6 .00
LH-16	950- 999	0 .68	-9 .14	-3 .14	-24 .12	-17 .11	-8 .08	-2 .07	-25 .05	-15 .04	-7 .03	1 .02
LH-16	951-1000	0 .68	-26 .30	-9 .15	-1 .13	-18 .13	-3 .11	-24 .09	-15 .06	-25 .05	-17 .04	-2 .03

CHART 2

PART 8: DATE ADJUSTMENT FOR BEST MATCHES FOR COUNTED OR UNKNOWN SERIES — Tucson-Mendoza-Hamburg-Lamont ProgLib

LH OAK VS BOSTON 01 (1530-1785)
50-YEAR SEGMENTS LAGGED 5 YEARS

SERIES	COUNTED SEGMENT	CORR ADD # 1	CORR ADD # 2	CORR ADD # 3	CORR ADD # 4	CORR ADD # 5	CORR ADD # 6	CORR ADD # 7	CORR ADD # 8	CORR ADD # 9	CORR ADD #10	CORR ADD #11
LH-11	941- 990	695 .34	666 .32	618 .32	675 .30	636 .29	642 .28	759 .27	769 .26	709 .26	598 .25	609 .24
LH-11	946- 995	709 .33	666 .32	585 .31	675 .30	639 .28	636 .28	609 .27	695 .27	598 .25	759 .23	697 .22
LH-11	951-1000	601 .36	585 .35	639 .30	609 .30	710 .28	625 .26	732 .25	670 .24	675 .24	695 .23	593 .23
LH-12	937- 986	714 .37	636 .34	681 .33	698 .32	601 .31	750 .31	625 .30	748 .24	682 .24	697 .24	654 .21
LH-12	942- 991	636 .38	601 .38	625 .35	698 .35	714 .35	681 .33	588 .28	654 .28	734 .24	697 .24	768 .24
LH-12	947- 996	636 .33	584 .31	601 .30	768 .30	625 .30	661 .29	588 .28	654 .27	653 .26	770 .26	678 .23
LH-12	951-1000	768 .39	584 .37	625 .33	636 .31	709 .28	674 .28	681 .28	601 .27	661 .25	654 .25	588 .23
LH-13	947- 996	713 .33	750 .32	736 .30	600 .30	654 .29	597 .27	678 .27	697 .26	730 .26	680 .25	584 .25
LH-13	951-1000	750 .36	600 .35	599 .34	654 .32	713 .31	736 .30	761 .28	678 .27	697 .26	730 .26	680 .25
LH-14	934- 983	731 .38	618 .38	717 .32	734 .31	732 .31	645 .30	718 .30	661 .29	672 .29	768 .28	753 .28
LH-14	939- 988	661 .31	734 .30	717 .28	619 .27	606 .26	636 .26	628 .23	732 .23	754 .22	676 .22	728 .21
LH-14	944- 993	734 .38	625 .32	636 .28	619 .28	604 .27	676 .26	628 .25	658 .24	786 .23	661 .22	601 .22
LH-14	949- 998	734 .38	636 .34	625 .34	676 .26	582 .25	604 .24	601 .23	682 .22	786 .21	595 .21	658 .21
LH-14	951-1000	734 .37	625 .35	636 .34	579 .27	601 .25	676 .24	582 .23	658 .23	604 .22	717 .22	603 .21
LH-16	925- 974	681 .42	627 .34	801 .28	764 .27	645 .27	712 .26	790 .25	770 .25	726 .25	718 .24	654 .24
LH-16	930- 979	627 .32	645 .32	681 .31	629 .31	764 .30	801 .30	601 .29	615 .27	671 .26	690 .25	770 .25
LH-16	935- 984	601 .46	627 .30	645 .29	801 .28	738 .27	669 .26	770 .25	631 .25	700 .24	629 .24	698 .22
LH-16	940- 989	601 .49	627 .33	736 .31	738 .26	645 .24	669 .24	656 .23	770 .23	740 .22	700 .22	734 .22
LH-16	945- 994	601 .47	627 .41	673 .33	736 .32	770 .30	671 .28	656 .27	738 .26	613 .26	740 .25	625 .25
LH-16	950- 999	627 .42	670 .33	736 .32	654 .31	603 .31	761 .31	673 .30	671 .29	601 .27	705 .25	612 .23
LH-16	951-1000	627 .41	781 .34	673 .33	736 .33	658 .32	601 .32	656 .30	669 .29	671 .29	613 .29	654 .28

PART 8: DATE ADJUSTMENT FOR BEST MATCHES FOR COUNTED OR UNKNOWN SERIES — Tucson-Mendoza-Hamburg-Lamont ProgLib

LH OAK VS BOSTON 02 (1454-1769)
50-YEAR SEGMENTS LAGGED 5 YEARS

SERIES	COUNTED SEGMENT	CORR ADD # 1	CORR ADD # 2	CORR ADD # 3	CORR ADD # 4	CORR ADD # 5	CORR ADD # 6	CORR ADD # 7	CORR ADD # 8	CORR ADD # 9	CORR ADD #10	CORR ADD #11
LH-11	941- 990	534 .42	620 .37	527 .34	733 .33	687 .32	605 .27	600 .27	617 .26	751 .26	644 .26	639 .24
LH-11	946- 995	534 .42	527 .37	510 .36	620 .35	600 .33	644 .32	639 .31	751 .31	605 .30	577 .29	733 .28
LH-11	951-1000	534 .34	617 .32	695 .32	510 .31	584 .31	600 .30	527 .29	620 .29	577 .28	639 .27	696 .27
LH-12	937- 986	639 .39	714 .29	770 .29	698 .27	642 .26	611 .24	586 .24	736 .24	751 .23	644 .22	569 .22
LH-12	942- 991	770 .37	639 .35	644 .30	608 .29	714 .29	515 .27	642 .27	736 .27	586 .27	699 .27	697 .26
LH-12	947- 996	579 .37	770 .36	603 .34	537 .34	674 .29	512 .29	639 .28	583 .27	736 .27	754 .26	555 .24
LH-12	951-1000	603 .39	579 .36	674 .35	754 .29	639 .29	583 .29	512 .28	513 .27	555 .26	679 .25	586 .24
LH-13	947- 996	533 .44	750 .33	765 .32	571 .32	509 .29	604 .29	632 .26	624 .26	622 .26	515 .26	713 .26
LH-13	951-1000	533 .44	622 .38	624 .36	750 .34	571 .31	632 .28	552 .28	765 .27	515 .27	627 .26	509 .25
LH-14	934- 983	602 .42	572 .38	628 .35	664 .34	731 .32	555 .32	586 .31	717 .29	778 .28	674 .28	531 .27
LH-14	939- 988	602 .39	555 .34	626 .32	537 .31	603 .30	697 .28	572 .28	578 .28	717 .28	628 .27	528 .26
LH-14	944- 993	603 .47	602 .36	555 .31	579 .30	636 .29	734 .29	664 .28	601 .27	628 .27	528 .26	550 .26
LH-14	949- 998	603 .49	636 .35	602 .34	579 .33	555 .31	601 .30	528 .29	734 .29	531 .28	537 .26	550 .26
LH-14	951-1000	603 .49	602 .35	579 .35	555 .31	528 .30	601 .30	734 .28	531 .28	695 .28	513 .27	510 .27
LH-16	925- 974	557 .39	609 .38	635 .38	581 .37	764 .31	683 .29	664 .28	718 .27	549 .26	690 .26	564 .25
LH-16	930- 979	557 .45	635 .39	537 .36	581 .32	683 .30	609 .29	764 .29	623 .27	790 .27	688 .27	647 .26
LH-16	935- 984	537 .37	736 .36	770 .36	557 .34	581 .32	635 .31	647 .30	688 .29	690 .27	664 .27	555 .27
LH-16	940- 989	736 .46	537 .46	770 .35	608 .35	555 .35	557 .34	656 .31	581 .31	754 .30	690 .28	623 .27
LH-16	945- 994	736 .48	537 .44	754 .36	770 .35	656 .34	555 .34	581 .33	557 .32	608 .31	513 .29	528 .28
LH-16	950- 999	736 .44	579 .38	670 .38	555 .32	581 .32	537 .31	674 .30	608 .28	656 .28	761 .28	705 .27
LH-16	951-1000	736 .42	656 .35	581 .34	579 .32	537 .31	754 .28	658 .28	674 .28	710 .28	528 .25	694 .25

CHART 3

PART 8: DATE ADJUSTMENT FOR BEST MATCHES FOR COUNTED OR UNKNOWN SERIES Tucson-Mendoza-Hamburg-Lamont ProgLib

LH OAK VS NORTHERN WORCESTER COUNTY WITH MT WACHUSETT TO 1848 (1577-1848)
50-YEAR SEGMENTS LAGGED 5 YEARS

SERIES	COUNTED SEGMENT	CORR ADD	# 1	CORR ADD	# 2	CORR ADD	# 3	CORR ADD	# 4	CORR ADD	# 5	CORR ADD	# 6	CORR ADD	# 7	CORR ADD	# 8	CORR ADD	# 9	CORR ADD	#10	CORR ADD	#11
LH-11	941- 990	819	.43	830	.43	827	.38	695	.32	759	.31	803	.29	653	.28	811	.28	846	.28	714	.23	709	.23
LH-11	946- 995	811	.37	830	.37	819	.35	827	.33	695	.30	803	.30	709	.27	751	.27	714	.27	693	.27	846	.26
LH-11	951-1000	827	.36	696	.35	695	.31	789	.29	693	.28	811	.27	766	.25	803	.24	830	.24	732	.24	758	.23
LH-12	937- 986	822	.56	681	.38	762	.32	698	.32	770	.30	714	.28	830	.26	852	.26	836	.25	752	.25	748	.25
LH-12	942- 991	822	.41	770	.38	636	.37	681	.33	811	.30	698	.29	656	.27	714	.27	734	.26	699	.25	762	.25
LH-12	947- 996	822	.45	770	.41	656	.33	631	.30	806	.30	681	.28	653	.27	734	.24	674	.24	811	.24	636	.23
LH-12	951-1000	822	.41	631	.35	770	.34	674	.33	656	.31	681	.28	813	.27	752	.26	814	.25	695	.25	737	.25
LH-13	947- 996	818	.60	750	.37	734	.37	713	.36	786	.31	832	.30	663	.29	851	.28	635	.28	652	.27	634	.26
LH-13	951-1000	818	.61	750	.36	734	.33	832	.32	713	.32	802	.31	635	.30	786	.30	652	.30	683	.29	627	.27
LH-14	934- 983	731	.39	717	.36	770	.36	847	.34	813	.33	732	.33	645	.33	753	.31	822	.29	656	.28	855	.27
LH-14	939- 988	822	.42	717	.38	847	.36	792	.34	653	.33	664	.30	830	.29	732	.29	770	.27	754	.26	769	.25
LH-14	944- 993	822	.44	792	.31	847	.30	770	.29	734	.28	636	.27	656	.27	717	.26	653	.25	754	.24	813	.24
LH-14	949- 998	822	.43	792	.30	770	.30	656	.29	847	.28	636	.28	849	.27	830	.27	734	.27	717	.26	653	.26
LH-14	951-1000	822	.45	656	.33	717	.30	847	.29	792	.28	830	.27	734	.26	653	.26	664	.25	770	.25	631	.24
LH-16	925- 974	822	.54	698	.32	790	.32	738	.31	664	.31	764	.31	740	.30	754	.27	717	.26	652	.25	796	.25
LH-16	930- 979	822	.55	738	.36	698	.34	656	.31	683	.31	790	.30	762	.28	664	.27	764	.27	752	.26	662	.25
LH-16	935- 984	822	.50	738	.38	855	.37	762	.36	770	.30	736	.27	752	.24	698	.24	664	.23	839	.23	656	.23
LH-16	940- 989	822	.45	656	.33	736	.32	738	.31	855	.31	762	.29	839	.27	842	.26	770	.25	673	.24	684	.23
LH-16	945- 994	822	.52	656	.37	673	.32	738	.31	736	.30	754	.30	842	.27	684	.26	839	.26	770	.25	654	.24
LH-16	950- 999	822	.57	656	.38	670	.31	638	.27	823	.27	761	.26	673	.23	674	.23	839	.23	752	.22	654	.22
LH-16	951-1000	822	.56	656	.43	638	.28	788	.28	658	.28	720	.27	672	.26	777	.26	673	.26	674	.25	670	.24

CHART 4

PART 8: DATE ADJUSTMENT FOR BEST MATCHES FOR COUNTED OR UNKNOWN SERIES Tucson-Mendoza-Hamburg-Lamont ProgLib

LH-O VS CONNECTICUT RIVER VALLEY OAK MASTER SUMMARY (1566-1857)
50-YEAR SEGMENTS LAGGED 5 YEARS

SERIES	COUNTED SEGMENT	CORR ADD # 1	CORR ADD # 2	CORR ADD # 3	CORR ADD # 4	CORR ADD # 5	CORR ADD # 6	CORR ADD # 7	CORR ADD # 8	CORR ADD # 9	CORR ADD #10	CORR ADD #11
LH-11	941- 990	819 .49	641 .38	827 .36	652 .31	771 .30	620 .29	617 .27	664 .26	735 .24	769 .23	733 .23
LH-11	946- 995	819 .42	641 .39	619 .38	827 .32	695 .27	709 .27	735 .27	620 .26	771 .26	694 .25	652 .24
LH-11	951-1000	619 .44	695 .37	641 .35	819 .33	828 .33	718 .32	696 .31	656 .26	804 .26	694 .25	608 .25
LH-12	937- 986	822 .73	838 .40	752 .38	675 .31	871 .30	636 .30	869 .28	659 .28	623 .27	806 .27	679 .26
LH-12	942- 991	822 .64	752 .38	659 .34	636 .33	831 .31	675 .31	679 .31	838 .31	770 .30	851 .30	735 .28
LH-12	947- 996	822 .61	806 .36	831 .34	770 .34	752 .32	721 .28	697 .28	851 .28	860 .26	754 .25	659 .25
LH-12	951-1000	822 .51	831 .44	806 .38	659 .35	721 .34	696 .33	674 .32	781 .32	770 .31	697 .31	829 .30
LH-13	947- 996	818 .64	750 .38	786 .35	795 .34	678 .33	607 .33	663 .32	734 .31	833 .28	761 .27	662 .27
LH-13	951-1000	818 .65	750 .42	678 .36	786 .36	607 .33	662 .32	761 .31	833 .31	795 .31	734 .30	663 .29
LH-14	934- 983	628 .37	655 .35	754 .35	753 .33	790 .33	696 .32	814 .32	849 .30	691 .30	768 .29	816 .29
LH-14	939- 988	822 .44	790 .31	814 .31	697 .30	854 .29	847 .27	830 .27	792 .26	628 .26	753 .26	816 .25
LH-14	944- 993	822 .48	816 .36	814 .34	790 .33	656 .31	638 .30	620 .27	752 .26	854 .26	718 .25	860 .24
LH-14	949- 998	822 .50	814 .38	816 .33	656 .33	790 .31	620 .31	638 .31	831 .26	682 .25	599 .25	854 .25
LH-14	951-1000	822 .53	814 .40	620 .34	656 .34	816 .33	638 .33	790 .31	831 .29	599 .27	854 .24	674 .23
LH-16	925- 974	822 .46	858 .39	664 .37	748 .33	774 .30	849 .30	638 .28	623 .27	738 .27	688 .27	625 .26
LH-16	930- 979	822 .50	858 .36	738 .31	623 .30	748 .30	752 .29	774 .28	620 .27	664 .27	650 .26	638 .26
LH-16	935- 984	822 .56	688 .42	623 .41	772 .40	774 .35	799 .32	738 .31	770 .30	871 .30	625 .27	649 .27
LH-16	940- 989	822 .51	688 .39	772 .37	649 .35	770 .34	842 .32	611 .30	710 .29	738 .28	799 .28	638 .28
LH-16	945- 994	822 .52	842 .36	611 .34	770 .34	710 .32	799 .30	772 .30	638 .29	648 .29	844 .29	649 .28
LH-16	950- 999	822 .51	842 .37	670 .32	648 .31	596 .31	614 .31	772 .30	694 .29	824 .28	857 .27	611 .27
LH-16	951-1000	822 .45	842 .41	694 .41	754 .34	611 .29	824 .28	593 .28	596 .27	649 .27	765 .27	788 .27

CHART 5

PART 2: CORRELATIONS WITH MASTER SERIES OF ALL SEGMENTS AS DATED AND MEASURED Tucson-Mendoza-Hamburg-Lamont ProgLib

32-YEAR CUBIC SPLINE FILTER; CORRELATIONS OF 50-YEAR SEGMENTS LAGGED 5 YEARS

FLAGS: __A = CORRELATION UNDER 0.3281; __B = CORRELATION HIGHER AT OTHER POSITION

ØSEQ	SERIES	INTERVAL	1745 1750 1755 1760 1765 1770 1775 1780 1785 1790 1795 1800 1805 1810 1815 1820 1825 1830 1835 1840 1794 1799 1804 1809 1814 1819 1824 1829 1834 1839 1844 1849 1854 1859 1864 1869 1874 1879 1884 1889	FLAGS/ TOTAL
1	LH-11	1760-1819	= = = .63 .58 .52 = = = = = = = = = = =	
+				0/ 3
2	LH-12	1759-1822	= = .50 .50 .58 .61 .61 = = = = = = = = = =	
+				0/ 5
3	LH-13	1765-1818	= = = = .63 .63 = = = = = = = = = = =	
+				0/ 2
4	LH-14	1756-1822	= = .50 .59 .59 .65 .65 = = = = = = = = = =	
+			___B	1/ 5
5	LH-16	1756-1822	= = .57 .64 .60 .49 .46 = = = = = = = = = =	
+				0/ 5

PART 8: DATE ADJUSTMENT FOR BEST MATCHES FOR COUNTED OR UNKNOWN SERIES Tucson-Mendoza-Hamburg-Lamont ProgLib

LH OAK VS LH OAK SITE MASTER
50-YEAR SEGMENTS LAGGED 5 YEARS

SERIES	COUNTED SEGMENT	ADD # 1 CORR	ADD # 2 CORR	ADD # 3 CORR	ADD # 4 CORR	ADD # 5 CORR	ADD # 6 CORR	ADD # 7 CORR	ADD # 8 CORR	ADD # 9 CORR	ADD #10 CORR	ADD #11 CORR
LH-11	941- 990	819 .79	813 .29	827 .19	828 .11	830 .11	825 .11	816 .11	811 .10	822 .07	810 .05	807 .03
LH-11	946- 995	819 .77	804 .17	813 .16	816 .15	825 .14	803 .13	811 .09	820 .08	802 .08	821 .07	807 .05
LH-11	951-1000	819 .73	803 .24	820 .17	822 .14	804 .11	800 .10	798 .10	797 .07	806 .05	814 .04	802 .04
LH-12	937- 986	822 .65	825 .23	830 .18	819 .17	818 .17	836 .08	831 .06	821 .05	811 .03	828 .03	835 .00
LH-12	942- 991	822 .65	805 .28	825 .26	831 .15	808 .11	814 .09	830 .09	811 .09	809 .08	819 .08	828 .04
LH-12	947- 996	822 .74	802 .36	805 .24	825 .18	814 .15	811 .08	806 .07	819 .07	809 .06	804 .05	821 .00
LH-12	951-1000	822 .76	802 .33	805 .26	806 .16	797 .11	814 .10	804 .09	813 .06	818 .04	809 .04	820 .02
LH-13	947- 996	818 .76	804 .28	824 .17	826 .10	807 .09	810 .09	812 .09	801 .08	815 .07	802 .03	806 .02
LH-13	951-1000	818 .76	804 .22	807 .15	812 .09	805 .09	815 .06	810 .05	801 .05	802 .05	817 .01	809-.01
LH-14	934- 983	822 .81	813 .48	839 .29	830 .19	816 .13	836 .12	825 .12	823 .10	814 .05	819 .04	838 .04
LH-14	939- 988	822 .78	813 .33	819 .26	830 .15	816 .14	825 .09	810 .07	823 .04	820 .02	831 .01	811 .00
LH-14	944- 993	822 .78	813 .17	816 .16	814 .16	805 .13	819 .13	808 .11	825 .08	811 .03	823 .03	820-.01
LH-14	949- 998	822 .82	816 .24	813 .22	799 .21	805 .16	802 .16	814 .16	819 .12	808 .07	820 .01	821 .01
LH-14	951-1000	822 .82	805 .29	799 .22	813 .22	816 .21	802 .20	814 .16	796 .16	819 .15	808 .10	820 .02
LH-16	925- 974	822 .87	831 .34	834 .14	828 .13	839 .13	848 .11	845 .09	843 .08	842 .08	825 .05	829 .01
LH-16	930- 979	822 .82	831 .19	828 .19	834 .13	842 .12	839 .10	820 .08	819 .04	843 .02	837 .01	824 .00
LH-16	935- 984	822 .77	813 .13	820 .10	831 .09	828 .08	825 .06	838 .04	824 .04	814 .04	837 .03	815 .03
LH-16	940- 989	822 .73	807 .17	831 .17	814 .13	808 .13	810 .11	813 .09	819 .07	824 .05	833 .05	815 .05
LH-16	945- 994	822 .75	814 .22	805 .16	808 .15	807 .15	824 .08	820 .05	819 .02	810 .01	817 .01	816 .00
LH-16	950- 999	822 .68	813 .14	819 .14	798 .12	805 .11	814 .08	820 .07	797 .05	807 .04	815 .03	823 .02
LH-16	951-1000	822 .68	796 .30	813 .15	821 .13	804 .13	819 .11	798 .09	807 .06	797 .05	805 .04	820 .03

CHART 6

PART 8: DATE ADJUSTMENT FOR BEST MATCHES FOR COUNTED OR UNKNOWN SERIES Tucson-Mendoza-Hamburg-Lamont ProgLib

LH-P VS CONNECTICUT RIVER VALLEY(MA) PITCH PINE MASTER SUMMARY TO 1848 (1526-1848)
50-YEAR SEGMENTS LAGGED 10 YEARS

SERIES	COUNTED SEGMENT	CORR ADD # 1	CORR ADD # 2	CORR ADD # 3	CORR ADD # 4	CORR ADD # 5	CORR ADD # 6	CORR ADD # 7	CORR ADD # 8	CORR ADD # 9	CORR ADD #10	CORR ADD #11
LH-01	935- 984	727 .33	657 .32	751 .32	685 .31	857 .30	822 .28	590 .28	828 .28	827 .27	673 .27	763 .27
LH-01	945- 994	568 .40	727 .38	751 .36	627 .35	657 .31	673 .30	822 .30	769 .28	634 .28	789 .28	677 .28
LH-01	951-1000	822 .46	769 .42	627 .40	568 .39	727 .32	634 .31	593 .31	751 .30	728 .30	789 .29	591 .29
LH-02	908- 957	822 .50	859 .49	716 .34	883 .33	775 .33	828 .32	614 .28	676 .28	696 .28	811 .27	789 .26
LH-02	918- 967	822 .48	859 .39	800 .30	764 .29	789 .29	775 .28	696 .27	601 .27	649 .26	659 .26	872 .25
LH-02	928- 977	822 .39	789 .35	709 .34	685 .30	868 .29	713 .29	672 .28	735 .25	659 .25	765 .24	688 .23
LH-02	938- 987	834 .48	709 .38	789 .37	757 .35	773 .35	580 .34	751 .34	656 .31	848 .30	715 .29	822 .28
LH-02	948- 997	773 .37	580 .37	810 .35	798 .33	697 .32	685 .29	579 .28	568 .25	709 .25	757 .24	616 .24
LH-02	951-1000	773 .38	580 .32	798 .30	810 .29	579 .28	757 .27	697 .27	685 .26	829 .26	699 .25	648 .25
LH-03	937- 986	822 .61	637 .47	785 .42	681 .41	733 .35	761 .32	709 .30	769 .30	589 .28	721 .26	846 .25
LH-03	947- 996	822 .63	733 .46	681 .40	785 .35	810 .35	637 .33	707 .33	769 .31	653 .31	572 .31	677 .29
LH-03	951-1000	822 .59	733 .40	810 .36	637 .34	681 .33	769 .32	707 .32	652 .31	572 .31	785 .31	732 .29
LH-04	854- 903	680 .42	658 .39	815 .39	742 .36	877 .31	817 .31	868 .31	706 .30	699 .30	902 .30	707 .30
LH-04	864- 913	658 .43	877 .41	865 .37	750 .36	762 .35	803 .33	722 .33	680 .32	817 .32	815 .29	660 .26
LH-04	874- 923	660 .41	865 .38	855 .36	877 .32	803 .32	658 .31	742 .31	817 .30	760 .29	762 .28	889 .27
LH-04	884- 933	660 .35	760 .35	661 .33	679 .33	642 .32	802 .31	694 .30	631 .30	899 .29	641 .28	910 .28
LH-04	894- 943	642 .42	760 .38	661 .38	660 .36	679 .34	742 .33	855 .32	643 .32	659 .31	867 .31	621 .30
LH-04	904- 953	742 .41	679 .37	642 .36	760 .34	660 .33	659 .32	818 .31	677 .30	780 .29	888 .28	805 .27
LH-04	914- 963	742 .45	833 .37	643 .36	784 .35	785 .34	679 .33	760 .32	623 .30	642 .30	783 .29	759 .27
LH-04	924- 973	784 .50	821 .35	642 .32	796 .31	809 .30	644 .29	805 .28	759 .28	608 .26	856 .25	783 .25
LH-04	934- 983	784 .48	608 .46	759 .36	796 .33	636 .33	821 .33	856 .31	768 .31	714 .30	644 .29	627 .28
LH-04	944- 993	608 .41	821 .39	636 .38	675 .33	790 .31	664 .31	714 .29	671 .28	591 .27	773 .27	784 .25
LH-04	951-1000	821 .48	636 .36	608 .35	563 .34	671 .30	591 .29	805 .27	773 .27	651 .26	585 .26	714 .26
LH-05	895- 944	876 .37	856 .36	866 .35	781 .34	771 .33	701 .32	822 .31	811 .31	888 .30	639 .30	769 .29
LH-05	905- 954	610 .44	856 .40	866 .37	888 .34	876 .34	822 .34	782 .33	771 .32	854 .31	847 .31	794 .31
LH-05	915- 964	610 .48	692 .38	847 .37	770 .36	722 .35	876 .35	672 .34	782 .33	846 .30	609 .29	637 .29
LH-05	925- 974	610 .47	822 .39	637 .36	722 .35	692 .33	856 .33	868 .30	589 .29	628 .28	770 .27	672 .26
LH-05	935- 984	752 .38	798 .35	629 .34	785 .33	610 .33	628 .32	692 .31	770 .29	722 .28	728 .28	856 .28
LH-05	945- 994	785 .41	752 .40	748 .37	668 .32	770 .32	571 .31	628 .31	774 .30	629 .30	692 .27	653 .26
LH-05	951-1000	752 .40	774 .39	683 .37	644 .37	629 .36	798 .31	761 .29	748 .29	571 .28	712 .28	776 .27
LH-06	893- 942	752 .47	640 .41	702 .37	819 .34	877 .33	772 .31	661 .27	618 .27	857 .27	731 .26	804 .24
LH-06	903- 952	752 .49	611 .39	746 .36	819 .33	782 .33	640 .32	772 .31	867 .31	724 .31	676 .29	877 .28
LH-06	913- 962	752 .50	611 .37	804 .36	691 .35	696 .32	868 .31	724 .31	880 .31	663 .27	734 .27	713 .25
LH-06	923- 972	752 .53	691 .37	611 .35	696 .33	722 .33	841 .30	797 .30	817 .29	676 .28	700 .27	800 .27
LH-06	933- 982	752 .47	692 .45	722 .42	696 .40	587 .38	734 .36	841 .30	724 .30	842 .28	676 .26	747 .26
LH-06	943- 992	587 .40	747 .39	752 .36	571 .34	672 .32	734 .31	692 .30	668 .28	588 .28	748 .26	722 .26
LH-06	951-1000	672 .39	752 .37	571 .36	587 .36	624 .34	652 .31	747 .31	588 .30	644 .29	563 .29	663 .26
LH-07	921- 970	614 .44	774 .41	775 .39	822 .35	868 .33	673 .31	734 .31	696 .30	828 .29	813 .28	653 .27
LH-07	931- 980	774 .39	813 .36	776 .36	657 .35	614 .35	696 .33	751 .32	650 .31	868 .31	791 .29	673 .28
LH-07	941- 990	776 .41	657 .38	813 .37	650 .35	614 .35	639 .30	774 .30	823 .29	729 .28	763 .26	751 .25
LH-07	951-1000	822 .35	756 .34	729 .33	657 .31	614 .31	650 .31	776 .31	568 .28	594 .28	813 .28	677 .27
LH-08	912- 961	748 .37	630 .37	868 .37	694 .35	628 .34	774 .34	722 .33	824 .31	629 .30	601 .29	859 .29
LH-08	922- 971	774 .46	630 .39	868 .38	722 .36	628 .35	811 .34	835 .33	629 .32	610 .31	694 .31	748 .31
LH-08	932- 981	648 .44	774 .38	630 .38	629 .33	813 .31	848 .30	786 .28	834 .27	847 .27	823 .27	628 .26
LH-08	942- 991	648 .38	843 .34	673 .33	693 .30	630 .30	848 .29	718 .28	733 .28	728 .28	653 .27	813 .27
LH-08	951-1000	676 .35	673 .32	680 .31	798 .31	630 .30	568 .30	661 .26	703 .26	786 .26	842 .26	771 .25
LH-09	952-1000	842 .44	737 .40	784 .38	710 .36	795 .33	829 .31	775 .31	797 .30	696 .28	649 .27	642 .26
LH-10	953-1000	561 .47	817 .34	785 .33	762 .32	711 .31	848 .30	645 .29	622 .28	702 .28	830 .28	581 .28
LH-15	936- 985	848 .40	827 .39	655 .36	591 .35	738 .34	683 .34	778 .33	789 .32	815 .28	776 .25	698 .25
LH-15	946- 995	752 .37	756 .37	685 .34	751 .33	827 .30	591 .30	817 .29	822 .29	829 .28	803 .26	848 .26
LH-15	951-1000	756 .42	714 .34	727 .33	822 .32	738 .30	817 .30	698 .28	776 .28	673 .27	846 .27	610 .27

CHART 7

PART 8: DATE ADJUSTMENT FOR BEST MATCHES FOR COUNTED OR UNKNOWN SERIES — Tucson-Mendoza-Hamburg-Lamont ProgLib

LH PINE VS MONTAGUE, MA PITCH PINE TO 1848 (1750-1848)
50-YEAR SEGMENTS LAGGED 10 YEARS

SERIES	COUNTED SEGMENT	CORR ADD # 1	CORR ADD # 2	CORR ADD # 3	CORR ADD # 4	CORR ADD # 5	CORR ADD # 6	CORR ADD # 7	CORR ADD # 8	CORR ADD # 9	CORR ADD #10	CORR ADD #11
LH-01	935- 984	816 .34	857 .33	822 .32	847 .29	827 .28	817 .27	828 .20	861 .18	826 .16	846 .15	836 .13
LH-01	945- 994	822 .35	847 .22	817 .20	816 .19	827 .17	836 .14	828 .11	811 .08	823 .08	843 .08	846 .06
LH-01	951-1000	822 .49	847 .25	802 .21	803 .21	827 .18	817 .18	845 .14	833 .14	840 .11	828 .11	804 .10
LH-02	908- 957	859 .44	883 .33	861 .23	870 .19	848 .18	849 .18	853 .15	880 .15	858 .13	885 .11	850 .10
LH-02	918- 967	859 .30	880 .24	861 .20	872 .19	879 .16	868 .16	835 .16	867 .14	869 .13	853 .13	848 .12
LH-02	928- 977	829 .26	868 .25	861 .23	859 .20	826 .18	843 .17	822 .17	848 .17	869 .16	828 .14	867 .12
LH-02	938- 987	834 .38	843 .25	859 .24	848 .24	829 .23	822 .20	851 .13	813 .10	861 .09	845 .09	815 .08
LH-02	948- 997	810 .28	829 .23	843 .22	834 .16	827 .14	817 .13	831 .13	822 .12	816 .12	813 .11	808 .11
LH-02	951-1000	829 .31	810 .25	843 .23	815 .20	804 .14	813 .14	834 .13	816 .12	818 .11	848 .10	845 .09
LH-03	937- 986	822 .50	857 .30	824 .17	846 .16	843 .16	839 .13	851 .13	841 .11	827 .11	820 .10	836 .09
LH-03	947- 996	822 .57	810 .37	836 .24	851 .21	812 .18	841 .17	843 .14	824 .14	848 .13	831 .13	803 .11
LH-03	951-1000	822 .56	810 .35	836 .23	812 .22	827 .15	841 .14	832 .13	848 .13	831 .13	839 .13	802 .13
LH-04	854- 903	904 .28	926 .28	945 .27	937 .27	916 .25	906 .19	935 .17	915 .17	936 .16	934 .16	918 .12
LH-04	864- 913	896 .32	889 .24	908 .22	894 .22	906 .22	935 .22	910 .20	916 .18	926 .17	891 .16	928 .16
LH-04	874- 923	899 .31	896 .31	910 .28	877 .27	889 .25	908 .24	894 .20	888 .17	886 .12	887 .12	925 .12
LH-04	884- 933	899 .34	910 .32	867 .31	877 .28	889 .26	896 .24	888 .23	869 .23	908 .23	879 .22	891 .20
LH-04	894- 943	867 .32	899 .32	888 .31	889 .26	877 .24	887 .21	875 .21	879 .20	896 .18	876 .18	878 .17
LH-04	904- 953	888 .30	877 .22	867 .20	851 .19	876 .18	875 .17	878 .15	849 .15	887 .15	889 .14	854 .12
LH-04	914- 963	843 .22	870 .20	875 .17	878 .16	877 .16	836 .16	849 .15	876 .15	837 .13	879 .12	867 .11
LH-04	924- 973	856 .24	862 .23	831 .22	870 .20	850 .20	875 .16	842 .13	836 .12	851 .12	855 .11	832 .10
LH-04	934- 983	856 .27	821 .27	831 .26	842 .23	862 .19	851 .18	819 .17	843 .16	853 .14	855 .13	820 .12
LH-04	944- 993	821 .39	820 .27	831 .19	851 .17	844 .15	812 .14	819 .12	841 .12	845 .11	842 .11	838 .10
LH-04	951-1000	821 .46	844 .25	812 .22	831 .20	805 .18	842 .16	800 .16	841 .15	830 .14	802 .12	847 .12
LH-05	895- 944	876 .38	866 .33	888 .29	877 .24	864 .23	856 .22	885 .18	886 .18	859 .16	899 .16	897 .12
LH-05	905- 954	876 .36	856 .35	888 .34	866 .33	846 .31	847 .30	864 .26	885 .23	877 .22	854 .21	867 .20
LH-05	915- 964	847 .40	846 .36	835 .36	876 .34	866 .27	859 .27	864 .26	867 .25	856 .18	868 .18	844 .16
LH-05	925- 974	856 .32	846 .30	868 .26	864 .26	866 .21	835 .19	847 .18	842 .17	867 .17	829 .16	834 .15
LH-05	935- 984	856 .28	817 .25	822 .24	846 .23	864 .22	823 .15	857 .12	829 .12	821 .12	835 .11	841 .11
LH-05	945- 994	817 .25	846 .19	807 .18	822 .14	840 .12	841 .11	825 .11	848 .11	811 .11	842 .11	829 .10
LH-05	951-1000	840 .24	817 .21	829 .19	822 .18	827 .18	807 .16	818 .13	819 .13	800 .10	799 .09	805 .09
LH-06	893- 942	877 .30	896 .24	867 .22	889 .20	897 .19	865 .18	887 .15	886 .11	870 .11	872 .10	906 .10
LH-06	903- 952	867 .28	865 .27	889 .25	887 .24	877 .24	856 .20	896 .16	880 .15	868 .14	870 .14	855 .14
LH-06	913- 962	868 .32	880 .25	867 .23	886 .21	846 .20	843 .19	847 .18	845 .15	841 .15	855 .14	872 .13
LH-06	923- 972	868 .29	867 .23	876 .23	841 .22	829 .17	855 .16	845 .14	843 .14	846 .13	856 .13	853 .12
LH-06	933- 982	817 .34	841 .26	829 .23	823 .19	842 .17	853 .15	855 .13	864 .13	863 .10	822 .10	839 .10
LH-06	943- 992	817 .21	811 .18	855 .18	825 .16	821 .16	822 .15	841 .14	835 .13	856 .13	844 .11	839 .11
LH-06	951-1000	817 .22	839 .20	822 .19	819 .18	799 .15	827 .13	800 .13	844 .11	818 .11	801 .10	841 .10
LH-07	921- 970	868 .39	835 .22	859 .21	873 .21	866 .17	867 .16	847 .16	840 .16	848 .11	849 .10	842 .09
LH-07	931- 980	868 .38	822 .24	834 .22	827 .22	828 .19	847 .18	859 .18	866 .16	857 .14	840 .11	823 .10
LH-07	941- 990	813 .29	857 .23	834 .22	822 .18	823 .17	811 .17	848 .17	827 .14	847 .12	835 .12	816 .10
LH-07	951-1000	822 .41	803 .28	834 .27	842 .26	813 .24	811 .21	827 .18	845 .17	833 .16	823 .16	848 .15
LH-08	912- 961	868 .32	877 .32	879 .27	847 .26	848 .23	866 .22	858 .22	859 .20	867 .15	878 .14	880 .14
LH-08	922- 971	868 .35	858 .25	866 .22	837 .22	877 .22	835 .21	847 .21	848 .20	834 .16	876 .15	869 .14
LH-08	932- 981	822 .29	823 .24	837 .24	857 .23	848 .22	834 .21	866 .20	858 .20	847 .16	835 .16	846 .14
LH-08	942- 991	843 .34	857 .30	822 .22	848 .22	813 .19	817 .16	832 .15	837 .15	834 .12	842 .11	827 .11
LH-08	951-1000	817 .27	822 .22	842 .21	837 .20	805 .19	834 .18	807 .17	827 .16	848 .15	816 .13	810 .12
LH-09	952-1000	842 .33	816 .22	829 .20	830 .19	807 .17	838 .14	828 .14	809 .14	841 .12	819 .12	814 .11
LH-10	953-1000	848 .36	817 .36	798 .28	830 .27	839 .25	816 .22	829 .21	797 .21	806 .20	827 .19	815 .19
LH-15	936- 985	848 .44	827 .33	829 .27	817 .25	816 .24	822 .24	862 .20	855 .16	815 .16	843 .15	857 .12
LH-15	946- 995	829 .35	848 .29	817 .28	827 .27	822 .26	816 .23	815 .19	846 .18	805 .18	847 .17	834 .10
LH-15	951-1000	822 .34	846 .28	817 .26	848 .25	827 .24	816 .24	805 .23	802 .21	803 .19	834 .17	829 .16