9th July 2002

Scrutiny Report to the City Council

Review of the Cathedral Square Construction Project

Further copies of this report can be obtained from:

Rose Haarhoff
Scrutiny Support Officer
303 1731
E-mail: rosemary.haarhoff@birmingham.gov.uk

Contents

1. Preface

By Councillor Mike Olley
Chair of the Co-ordinating
Overview and Scrutiny Committee

There can be no doubt that as Britain's largest city, we deserve first rate squares. The recent world cup has clearly demonstrated how the public can and want to make the best use of these open public areas.

Initially we anticipated a few problems getting this report due to the current lack of co-ordination between different council departments but this problem was overcome by the approach used by the outside consultant - Robert A Harrision, and I acknowledge the extensive internal partnership work involved in putting this report together, which in my opinion is a fair and balanced view - one worthy of much respect.

I see this report as a way forward as we continue to develop a strategy, which makes Birmingham an innovative, modern and forward thinking city – not only observed by authorities in the UK but also from our European neighbours. We are in a continual process of learning and this report does indeed raise some very relevant issues on how we can do things better next time round.

Mike Olley

2) CONSULTANT'S BRIEF

1. The brief was to investigate complaints/comments received by the Council with regard to a construction scheme known as Birmingham Cathedral Square at St. Phillip's Churchyard, Colmore Row, Birmingham B3 2QB, and if possible make recommendations for future contracts of this nature.

2. It is understood that negotiations are still continuing with the contractor for the scheme with regard to additional costs and the entitlement to additional extension of time to the contract period. This report reflects the current situation with regard to delay to the completion of the works and culpability for the delays.

3) FINDINGS

BRIEF DESCRIPTION OF THE BIRMINGHAM CATHEDRAL SQUARE SCHEME

3. The scheme comprised site clearance including the removal of items of street furniture, relocation of services, environmental work comprising fencing with metal entrance features, footways, seating areas, walls, monument restoration, lighting, irrigation, drainage, roadworks, archaeological works and soft landscaped areas.

FUNDING

4. The scheme is almost entirely externally funded with the majority of the funding being by way of grant from the Heritage Lottery Fund. A further grant has been obtained from the European Regional Development Fund.

5. The external funding is fixed at or about the time the contract is awarded to the successful contractor with no additional funding being available to pay for additional costs incurred due to additional payments made under the contract or any other costs incurred.

6. In addition the conditions of the funding are that no changes should be made to the scheme once the funding is granted. Consequently there is little or no flexibility with regard to making changes to the scheme (possibly by omitting work) to save costs or the time period for construction if for instance cost or time overruns occur, so that the Council does not become liable for the shortfall in funding.

7. Consequently there is a risk associated with projects that are externally funded in that if problems occur such that additional expenditure is necessary, the funding of the additional expenditure has to be found by the City Council. It is not clear that the Members were aware of this at the time the contract was entered into and the external funding agreed.

8. In addition a risk analysis was not undertaken with regard to the potential for additional expenditure so that Members could be aware of the commitment that the Council was undertaking and the possibility of additional funding being required.

COMPLAINTS/COMMENTS

9. The complaints/comments received are of two kinds:
   a) The specification for aspects of the scheme, in particular:
      The introduction of cast iron railings around the perimeter of the churchyard and
      The failure to relay the existing York stone paving slabs and the replacement with new slabs.
   b) The failure to complete the scheme within the stated period and coupled with this the apparent lack of activity on site at various times.

THE PARTIES MAKING COMPLAINTS/COMMENTS

10. Although the City Council has received unofficially various complaints/comments, the Birmingham Evening Mail has been the main source of criticism of the scheme.

PROCEDURE FOR PRODUCING THE REPORT

11. It was agreed that the following procedure would be adopted for producing the report:
    a) Review of the contract documents with particular reference to the issues raised in complaints/comments.
    b) Interview the people making the complaints/comments
    c) Interview the relevant officers involved
    d) Produce the Report

INTERVIEWS

12. Interviews have been held with the following:

David Bell	Birmingham Evening Mail
David Pywell	Director of Transportation
Emrys Jones	Director of Planning and Architecture
Jim Kelly	City Centre Management Team
Adrain Rourke	Acting Head, Landscape Development, Co-ordinating Consultant
Lynne Stirling	Acting Principal Landscape Architect, Contract Administrator
Ray Powell	Group Quantity Surveyor, Post contract Quantity Surveyor
Jim Quinn	Major Projects Co-ordinator, City Council Joint Lead Client Officer
Michael Delaney	Cathedral Administrator, Cathedral Joint Lead Client Officer

THE CONTRACT DOCUMENTS

13. The contract documents comprise:
    Pre-Tender Health and Safety Plan
    Tender Document dated September 1999
    Bills of Quantities Volume 1 – General Conditions and Preliminaries
    Bills of Quantities Volume 2 – Project Specification
    Bills of Quantities Volume 3 – Measured Works
    Masonry Specification
    Schedule of Works for Restoration of Churchyard Monuments
    External Lighting Specification
    Irrigation System Specification Nr. 3599 (D)
    Drawings

THE CONDITIONS OF CONTRACT

14. The Conditions of Contract are specified in Bill of Quantities Volume One to be the Standard Form of Building Contract Local Authorities With Quantities 1980 Edition incorporating various amendments. These are commonly known as the JCT80 Conditions of Contract and are used extensively throughout the construction industry.

15. The contract is based on an allocation of risk between the respective parties with provision for additional payments to the contractor or the extension of the contract period if problems are encountered for which the Employer has responsibility.

16. Likewise, if the contract overruns the contract period for reasons which are the contractor's liability, there is a pre-determined level of damages per week (liquidated damages) that the contractor has to pay to the Employer. The level of Liquidated Damages will be discussed later in this report.

17. Traditionally this form of contract, coupled with the procurement method of awarding the contract to the lowest bidder, has produced claims for additional payments and/or additional time by the contractor. It does not embrace the current practice of "partnering" within the construction industry so that problems can be identified and overcome at an early stage.

18. It does not appear that alternative forms of contract or procurement were investigated at the contract preparation stage. In particular, for a scheme of this nature, it would be advantageous to appoint a preferred contractor at early stage in the development of the contract who would be involved in the evolution of the contract and identify problems at this stage. The contractor would be part of the construction team, and although this would possibly increase the development costs, the contract would be entered into with more certainty with regard to final cost etc.

19. The preferred contractor should be chosen on the basis of a quality submission in which it would have to demonstrate a track record in the particular type of project and the ability to manage such a project. Cost, although a factor, would not necessarily be the overriding issue with regard to the appointment of the preferred contractor.

THE CONTRACTOR

20. The contract was awarded to Kennedy Asphalt Limited, Chaddick Lane, Astley Manchester, M29 7JS.The tender sum was £1,990,605.10. The next lowest tender was £2,159,518.00.

THE ISSUES WITH REGARD TO SPECIFICATION

The introduction of the cast iron railings around the perimeter of the churchyard

21. The comments/complaints on this aspect of the scheme centred around two main points.

22. The first point was the necessity for the railings to be introduced in the first place. It is felt in some quarters that the railings provide a barrier to people entering the churchyard, which many people regard as a green open space in the centre of Birmingham. On the other hand other people point out that the area is a churchyard with many graves and the railings merely prevent people crossing the churchyard at points other than designated footpaths. The opinions are purely subjective.

23. However, the viewpoints are academic because it was a condition of the Heritage Lottery Funding that the railings had to be re-introduced so that the churchyard could be restored, as much as possible, to its former state. The railings had been removed during the last war so that the cast iron could be used for munitions. It is a fact therefore that without the re-introduction of the railings the funding would not have been obtained and the scheme would not have gone ahead.

24. The second point is the height of the railings introduced. Before discussing the various viewpoints it should be noted that the design team spent considerable time

and effort in arriving at railings that were sympathetic to the churchyard and the various aspects of the Cathedral. It is understood that the Cathedral Architects and Administrators are totally happy with the railings in-situ.

25. It has been suggested that the railings are considerably higher than the railings previously in place. However photographic evidence of the railings being dismantled during the Second World War demonstrates that there were two heights of railing. Around the perimeter of the churchyard the railing was of a similar height to that reinstated. The photographs also show that there were railings adjacent to the footpaths and these were of a lower height.

26. The height of the railings re-introduced is compatible with those shown to be previously around the perimeter of the churchyard. It should be noted that railings have not been re-introduced adjacent to the footpaths across the churchyard.

27. In conclusion, this complaint/comment has to be discounted as a result of the necessity to re-introduce the railings in order to qualify for lottery funding, without which the scheme would not have been viable.

28. In addition the height of the railings can be demonstrated to be compatible with the railings previously in place around the perimeter of the churchyard, and are considered by the Cathedral Administrators to be totally in keeping with the characteristics of the Cathedral.

<u>The failure to relay the existing York stone paving slabs and the replacement with new slabs.</u>

29. The complaints with regard to the York stone paving slabs are that:
    a) The existing York stone paving slabs should have been taken up and relaid.
    b) The existing York stone paving slabs taken up were sold by the contractor who thus made a profit which should have gone to the city council.

30. The specification for the paving works required the existing York stone paving slabs to be taken up and removed from site. New York stone paving slabs were to be provided and laid by the contractor.

31. This report does not comment upon the specification for the new paving slabs because the appearance and acceptability of them is purely subjective, and in general it is understood that all interested parties are happy with the quality of the slabs and the laying.

<u>The existing York stone paving slabs should have been taken up and relaid.</u>

32. Before discussing whether the existing York stone paving slabs should have been taken up, stored and then relaid it should be noted that the slabs in question were not the original slabs but were second hand slabs that had been bought and laid during the late 1970's/early 1980's.

33. During the preparation of the contract documents the design team gave careful consideration to the possible re-use of the existing York stone paving slabs.

34. Site inspections and meetings were held and it was apparent from the discussions and investigation work carried out that:
    a) The slabs varied in thickness from 75mm. – 150mm. This would produce considerable problems when re-laying and would therefore incur considerable additional costs.
    b) From the safety aspect the slabs were considerably pitted and in wet conditions slippery. This exposes the City Council and possibly the Cathedral authorities to the prospect of claims due to personal injury.
    c) Many slabs were broken and would therefore need re-cutting and there would be considerable wastage. Consequently there would not be enough quantity of slabs to carry out the new scheme resulting in a mix and match. This solution would have been unacceptable to all concerned due to the difficulty of producing a suitable match. There would have also been the problem of ascertaining contractually whether the correct match had been achieved resulting in inevitable

argument with the contractor and consequent claims for additional cost and time extensions.

35. The design team also obtained quotations from recognised specialist paving sub-contractors for the taking up and re-laying of the paving slabs and it was apparent that there was no economic advantage to be obtained from re-using the existing paving slabs.

36. On the basis of all the above factors, and bearing in mind that as the existing slabs were obtained and laid comparatively recently there was no heritage value in relaying them, the decision was taken to dispose of the existing slabs and provide new high quality York stone paving slabs.

37. In conclusion it is considered that the potential re-use of the existing slabs was properly investigated and the decision to dispose of the existing slabs and provide new ones was correct when all the factors were considered.

<u>The existing York stone paving slabs taken up were sold by the contractor who thus made a profit which should have gone to the city council.</u>

38. Under any construction contract, unless it is stated to the contrary, any materials that are not to be re-used become the property of the contractor and it is quite common for the contractor to sell salvageable materials and hence make profit from the materials.

39. The alternative is for the contract documents to state that the material becomes the property of the employer who then has the problem of storing the material and disposing of it itself.

40. On this contract the design team recognised that there was the potential for the contractor to sell the York stone slabs and consequently an item was inserted in the Bills of Quantities for the contractor to enter a credit value of the slabs.

41. In the event the contractor priced the credit at nil. However, this does not mean that no credit has been given by the contractor to the Employer since the credit value could have been included in other Bills of Quantities items. It is not possible to say categorically what credit has been given since the Employer does not have access to the pricing strategy of the contractor. It is rumoured, however, that the contractor received approximately £60,000 to £80,000 for the slabs. On the basis that its tender was approximately £160,000 lower than the next lowest tenderer it does appear, therefore, that the credit value of the slabs was taken into consideration when the tender was prepared.

42. What also has to be considered is the risk associated with this item for the contractor. It was possible that when the slabs were raised a considerable number of them broke and/or were not re-useable. In addition there may have not been a readily available market for them at the time they were taken up, involving the contractor in storage costs until a market was available. This would also involve the contractor in double handling the materials with consequent additional costs.

43. It is possible that the contractor has not included any credit value in the tender, and consequently any additional sum arising from this source is additional profit. However the contractor was taking a risk with the credit item which he was perfectly entitled to do.

44. In conclusion it is considered that it was correct for the employer to not to take possession of the existing paving slabs and the inclusion in the Bills of Quantities for a credit item was the correct approach.

45. How the contractor priced the credit item was entirely at his risk. Commercially it could have resulted in various returns for the contractor including a loss. There is no evidence to suggest that the contractor has made excessive profits from this item, and in addition there is no basis on which any assessment can be made with regard to any allowance the contractor may have made elsewhere in the tender for the credit due.

THE FAILURE TO COMPLETE THE SCHEME WITHIN THE STATED PERIOD

The anticipated contract period.

46. The Tender documents required that the works should be carried out in two phases. Broadly speaking these phases comprised:
    a) Phase 1- All works within the boundary of the existing churchyard walls including work on the walls and the erection of the railings.
    b) Phase 2 - All works external to the churchyard.

47. The contract documents at tender stage defined the following periods within which the works had to be completed.

Phase 1	Commence	14/02/00
	Complete	26/01/01
	Time for completion	347 days
Phase 2	Commence	26/01/01
	Complete	28/06/01
	Time for completion	153 days
Total period	Phase 1 & Phase 2	499 days

Phase 1 had to be complete before the commencement of Phase 2.

The actual contract period

48. In the event the works were completed within the following time periods:

Phase 1	Commence	10/04/00
	Complete	23/08/01
	Time for completion	501 days
Phase 2	Commence	26/03/01
	Complete	4/12/01
	Time for completion	253 days

Overall Time for Completion	754 days

Mitigation of delay

49. To mitigate delay Phase 2 works were commenced before completion of Phase 1. The effects of this were as follows:

Phase 1	Commence	10/4/00
	Complete	23/8/01
Phase 2	Commence	26/3/01
	Complete	4/12/01
Overall time for completion		603 days

50. Consequently as a result of the mitigating action taken the overall completion period was reduced by 151 days.

Delay to commencement

51. The first thing to be noted from the above is that the commencement of the works on site was delayed from 14 February 2000 to 10 April 2000. The reason for this was that the Heritage Lottery funding was not confirmed until 10 March 2000. At tender stage it had been anticipated that the funding would have been confirmed such that the works could commence on site on 14 February 2000.

52. The delay to the commencement could not have been anticipated by either the City Council or the contractor. Consequently the contractor was awarded an extension of time for completion of the works of 8 weeks, the delay between the original anticipated start date and the actual start date. It should be noted that the delay to the commencement of the works was not something that could have reasonably foreseen by the Employer. No criticism is therefore justified with regard to this delay.

Investigation of alternative construction phasing

53. During the period of the delay in gaining confirmation of the Lottery Funding, the design team and the contractor looked at alternative methods of carrying out the works such that hoarding off the entire area of the churchyard for the duration of Phase 1 could be avoided. It was found that the time for completion of the works would increase by approximately eight weeks. In addition the direct cost of the works would increase by between £150,000 and £200,000 depending upon how the works were phased.

54. Clearly additional funding was not available and in addition the additional time anticipated was unacceptable. Consequently it was decided to proceed with the scheme as tendered.

Delays to Phase 1 works

55. It can be seen from the above that Phase 1 of the works was subject to considerable prolongation. The time taken for this phase was 501 days whereas the period allowed in the contract 347 days. However, it is difficult to make comparisons because, as stated above, Phase 1 and Phase 2 were overlapped and run concurrently. This would have inevitably had an effect on the progress of the individual phases.

56. In addition, there were no sanctions within the contract by way of damages if Phase 1 exceeded the allowable period, and consequently the overall completion of the contract was focussed upon rather than completion of individual phases.

57. It should be recorded however that the hoarding around the churchyard were removed in September 2001, before completion of the works and the footpath across the churchyard was opened to pedestrians on 11 June 2001.

Causes of delay to Phase 1 for which the contractor has entitlement to an extension of time.

58. The only evidence available with regard to the causes of delay to Phase 1 of the works is in a letter to the contractor dated 6 October 2001 from the contract

administrator, and the Time Extension Order dated 10 November 2001. These documents confirm that as well as the delay of eight weeks at the commencement of the contract, further extensions of time amounting to four weeks five days had been awarded. This award was stated to be for:

a) Revisions to the lighting package resulting from the necessity for the cost of the package to come within the budgeted costs. Ten days extension of time was awarded for this occurrence.
b) Additional work on the boundary walls. Ten days extension of time was awarded for this occurrence.
c) Soft spots, capping of crypts, diversion of services, conservation works and construction of a new wall. No specific extension of time was allocated to each of these occurrences.
d) Inclement weather. No specific time was allocated to this occurrence.

59. On the basis that a) and b) carried awards of twenty days extension of time and the total additional extension of time was four weeks five days, c) and d) contributed 13 days extension of time.

60. From experience all the factors listed above as contributing to the extension of time are fairly common unpredictable events occurring within construction contracts and the overrun resulting from this is not considered to be exceptional. Consequently it would be difficult if not impossible to make allowance for such occurrences within the prescribed contract period such that overruns could be avoided.

<u>Causes of delay to Phase 1 for which the contractor does not have entitlement to an extension of time.</u>

61. The letter from the contract administrator dated 6 October 2001 also identifies other delays for which the contractor is culpable and consequently no extension of time is applicable, as follows:

a) Poor quality of lighting columns and the failure of the supplier to adhere to the drawings and specification.
b) Poor quality of the fencing delivered to site.
c) Slow progress in the installation of electricity cables etc.

62. The quality of equipment supplied by the contractor will be discussed later in this report.

Causes of delay to Phase 2 for which the contractor has entitlement to an extension of time.

63. The only evidence available with regard to the causes of delay to Phase 2 of the works is Time Extension Order dated 10 November 2001. This order gave the contractor an extension of time of three weeks due to the failure of Bryants to remove their hoarding from Temple Row which prevented access to part of the phase 2 works.

64. The Pre-Tender Health and Safety Plan identified other contracts adjacent to Cathedral Square which would be ongoing during the Cathedral Square contract period. The Health and Safety plan identifies two building projects but does not identify the “Bryant” contract. In the event several additional building contracts adjacent to Cathedral Square commenced during the period as well as a considerable number of utilities works.

65. It would appear that the Cathedral Square refurbishment was a catalyst for the commencement of various developments around the square, all of which had planning permission but had delayed commencement. It is understood that the Bryant development fell into this category.

66. Consequently at tender stage it was not possible to foresee any delay or disruption emanating from this project but it was almost inevitable that as a result of this development and the additional works taking place in the vicinity some delay would occur.

Overall delay to the completion of the contract.

67. It can be deduced from the above that the overall completion of the project was delayed from 28 June 2001 to 4 December 2001, giving a total delay of twenty two

weeks five days. However, extensions of time of only fifteen weeks five days were granted. Consequently there is delay of seven weeks for which the contractor has culpability.

68. Other than the reasons stated above there appears to be no other reasons for the late completion of the project.

Liquidated damages for delay

69. The contract sets out a sum of money per day for liquidated damages if the contractor is late in the completion of the contract due to reasons for which he has culpability. In this case the sum per day is £220.00, and consequently the contractor has a current liability of £10,780.00 in liquidated damages and it is understood that this sum is currently being withheld from payments being made to the contractor.

70. The liquidated damages had been calculated in advance and inserted in the tender documents. The damages were calculated on the basis of the staff the Employer anticipated being engaged in the administration of the contract. It is considered that the sum of £220.00 per day calculated is insufficient to cover the Employer's damages if delay occurs. The calculation of the liquidated damages has been reviewed and the daily cost of supervision does appear to have been considerably underestimated. It is considered that for a project of this nature a full time supervisory team should have been envisaged rather than the part-time input on which the liquidated damages was calculated.

71. Although liquidated damages cannot be a penalty, and should be a genuine pre-estimate of the damages that would be incurred if delay occurs, it is considered that the sum of £220.00 per day is not only unreasonably low, but also fails to provide the contractor with any stimulus to speed up the works to ensure completion on time.

72. Examination of the liquidated damages calculation identifies that it was anticipated that the site supervisory team would be involved on a part time basis for approximately one day per week. It is considered that it would have been reasonable

to assume a full time involvement of the supervisory staff, and a truer value of the liquidated damages should have been £2,000 to £3,000 per day.

The contractor's obligation under the contract with regard to site management and programming.

73. The contract requires the contractor to maintain various records of site progress and in particular to provide monthly programmes so that progress can be accurately monitored and corrective and mitigating action taken when delays become apparent.

74. It is understood that the contractor did not readily comply with the requirements of the contract with regard to programming, adopting a reactive rather than pro-active approach to the problems that occurred.

75. In addition, it would appear that the contract administrator was not firm with the contractor in requiring the information to be provided, which results in the appearance that not enough pressure was placed upon the contractor to carry out the works within the extended contract period.

76. It should be added however that if a contractor does not comply with the requirements of the contract with regard to planning and programming it is very difficult to impose sufficient sanctions on the contractor such that he will co-operate. The failure to plan adequately and provide monthly programmes would not in itself justify terminating the contract, and in this case, even if it did the culpable delay is such that by the time another contractor could be in place the delays would have been compounded.

77. The main way of obtaining the co-operation of the contractor in these circumstances is by taking it up at a high level with the contractor. This does not appear to have happened in this case until the delay was irretrievable.

THE APPARENT LACK OF ACTIVITY ON SITE AT VARIOUS TIMES

Introduction

78. This is very difficult to make a judgement upon. The site was surrounded by hoarding for a considerable period of time and consequently it was not possible to adequately observe the site and ascertain the level of activity within the site boundary from outside. Any criticism with regard to lack of activity is therefore considered to be generally anecdotal.

Site Records

79. The contract requires the contractor to keep considerable contemporary records of activities on site including the level of resources on a daily basis. Once again, as with the programming, it is understood that the contractor generally failed to comply with the requirements of the contract in this respect. Detailed comments on the level of activity are therefore not possible.

80. The clerk of works, on behalf of the contract administrator has kept records of labour, plant etc. when he has visited the site, but they are limited by the number of visits made and are only a snapshot at the time of the visit.

81. The clerk of works records show reasonable levels of resources but it is not possible to make in depth comments with regard to progress etc. using these records. By the very fact that the contractor was in culpable delay for approximately seven weeks it can be deduced however that the contractor did not progress the works at the required rate.

4) RECOMMENDATIONS

A. The City Council anticipates further contracts where external funding will be the predominant method of financing. For this reason the lessons learnt from this project should be put into practice. The recommendations given below are intended to assist in future contract arrangements.

B. From the outset there should be a council member nominated to “own” the project. In addition a senior officer of the council should be nominated to be in overall control of the project. The contract should require the contractor to nominate a senior employee (such as a director) to be personally responsible for the project. The three people nominated should be required to meet on a regular basis (say monthly) with the contract administrator and with other key members of the project staff in attendance, as and when required. The purpose of the meeting should be:

   a) To monitor progress of the project and agree measures to ensure that avoidable delays do not occur.
   b) To review the financial aspects of the project and in particular identify any potential unforeseen or additional costs.

   To this end particular emphasis should be placed on the contractor producing the progress records, programming etc. required by the contract so that meaningful discussion and decision making can be achieved.

C. A preferred contractor should be appointed at an early stage in the development of the contract who should be an integral part of the construction team.

D. Negotiations should be held at a high level with the external funding agency to try to obtain flexibility with regard to funding such that if additional costs are incurred, that are not the contractor’s liability, then these are reimbursed by the funding agency as part of the overall grant.

E. If flexibility cannot be obtained, a detailed risk analysis should be carried out and presented to members so that they are aware at early stage of potential with regard to finance or delay to completion.

F. Alternative forms of contract should be investigated, particularly if flexibility in funding can be obtained. For example, target cost contracts can be particularly advantageous for this type of funding arrangement.

G. Some delays on this project have been caused by the supply initially of sub-standard equipment (fencing and lighting), and the necessity to carry out remedial works. Lists of approved suppliers were given in the contract documents but the contractor had the option of proposing alternative suppliers, an option that was taken on several occasions. In future consideration should be given to purchasing the various equipment by the employer and supplied to the contractor. The employer's preferred suppliers could then be used on the scheme.

H. Most of the complaints on this project have emanated from the local press. It would appear that in some cases the press has been misinformed. Consideration should therefore be given to more regular press briefings so that greater accuracy and understanding can be achieved.

Robert A. Harrison, BSc, MSc, LLB, CEng, MICE, FCIArb
Construction Contracts Consultant, Arbitrator and Adjudicator